

# Eastside III

Pittsburgh, PA

Nina Italiano  
Lighting + Electrical





# Eastside III

Pittsburgh, PA



## INTRODUCTION

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## LOWER LOBBY

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## KITCHEN+BILLIARD

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[system redesign](#)



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# Building Overview

## Building Statistics

Location	East Liberty, Pittsburgh, PA
Occupant Type	Mixed-use: <i>Retail + Luxury Apartments</i>
Size	221,000 SF
Stories	6
Completion	June 2016

## Project Team

Owner	The Mosites Company
Architect	Design Collective, Inc.
CM	PJ Dick, Inc.





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## Concept Development



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### LOWER LOBBY

lighting design | daylighting | acoustics



### KITCHEN+BILLIARD

lighting design



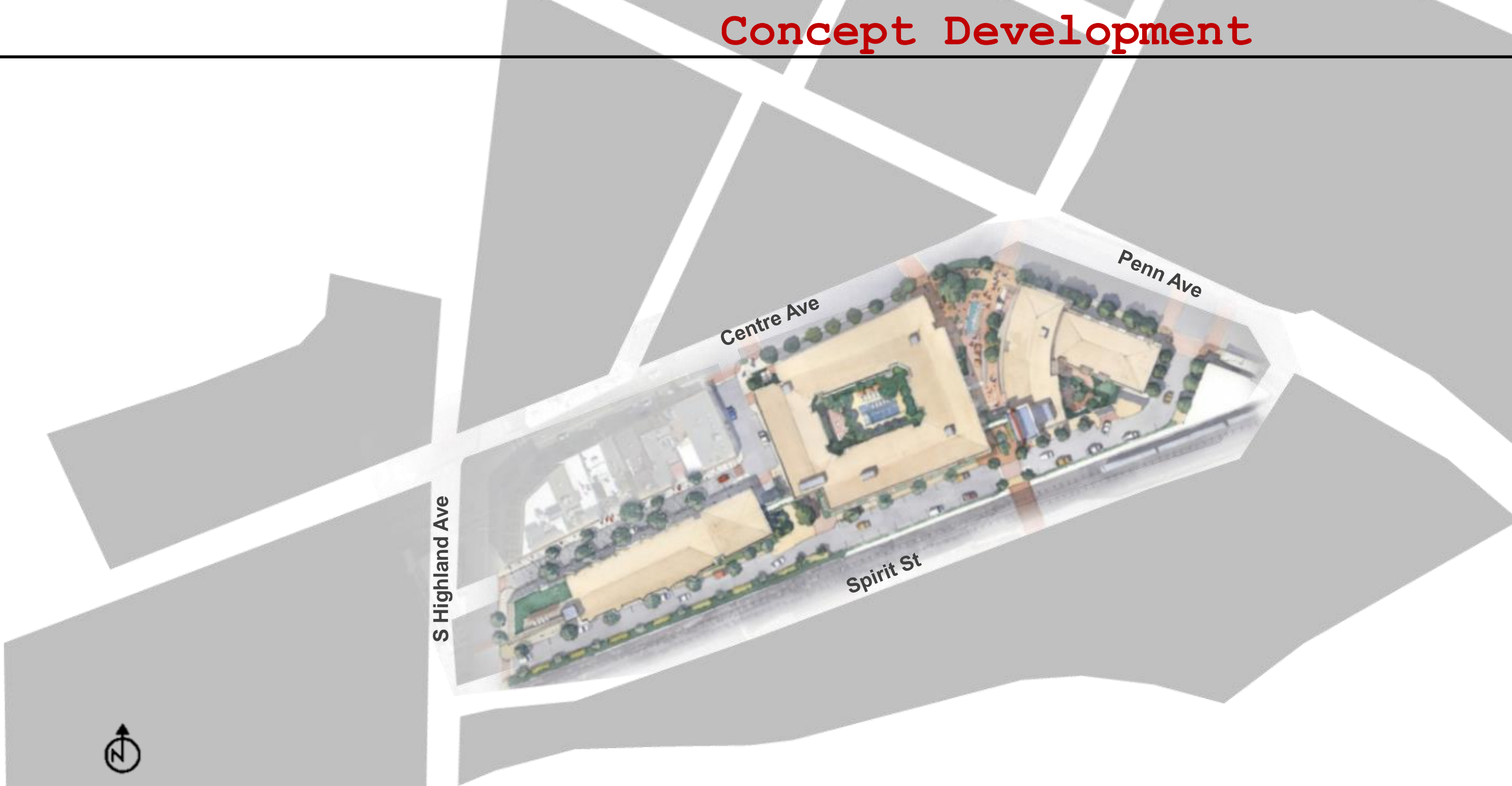
### ELECTRICAL

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# Project Scope



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## KITCHEN+BILLIARD

[lighting design](#)



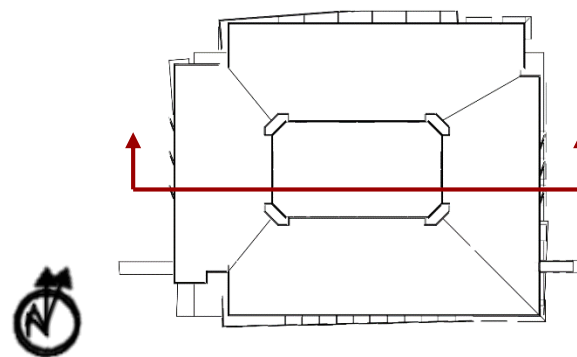
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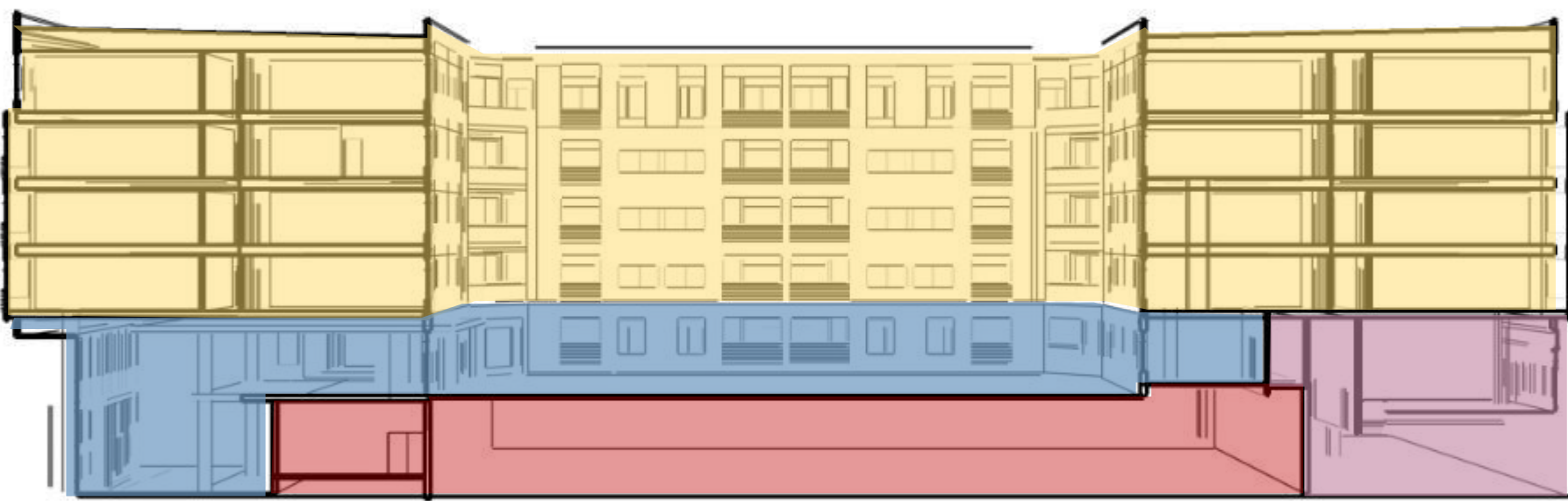
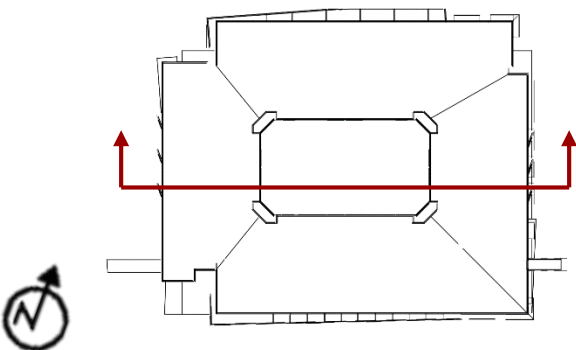
## ELECTRICAL





[system redesign](#)



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-  Residential Units
-  Residential Amenities
-  Retail
-  Underground Parking

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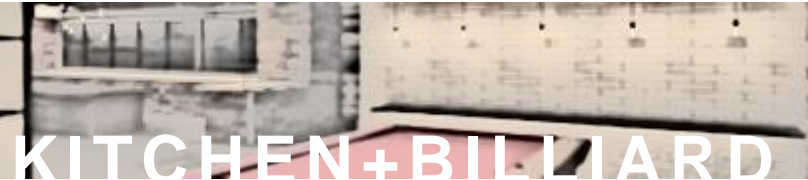
# Project Scope



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[lighting design](#) | [daylighting](#) | [acoustics](#)



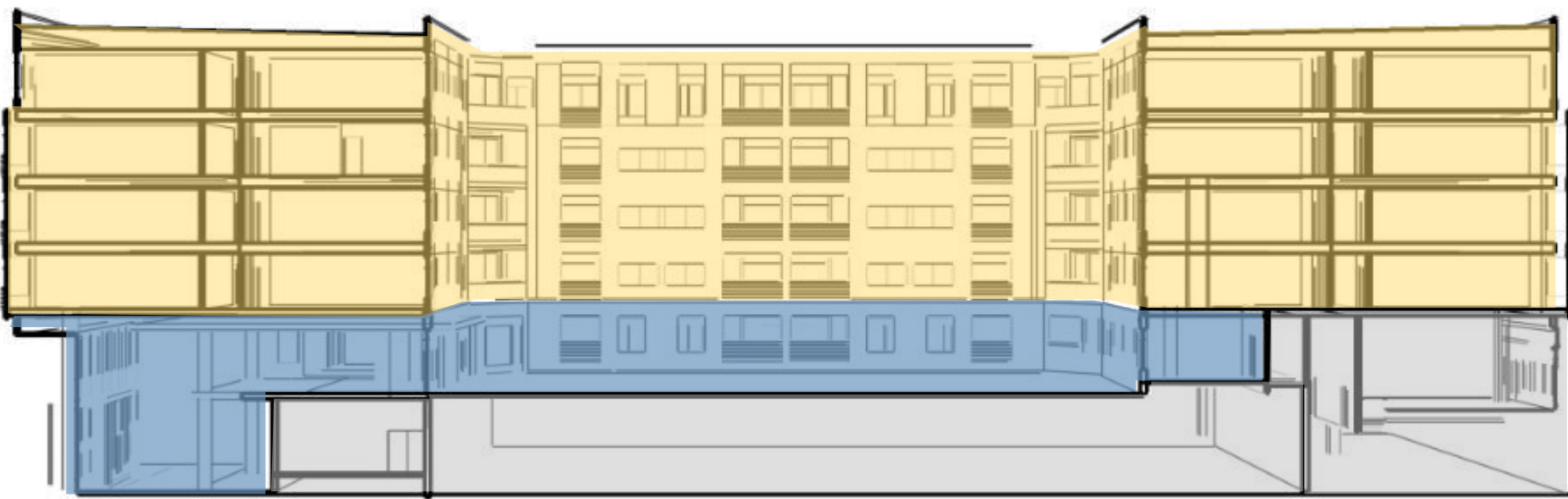
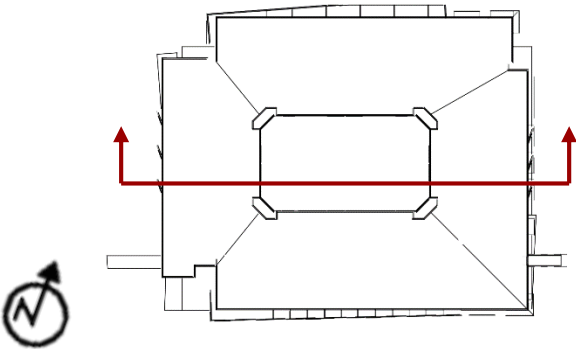
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- Residential Units**
- Residential Amenities**
- Retail
- Underground Parking



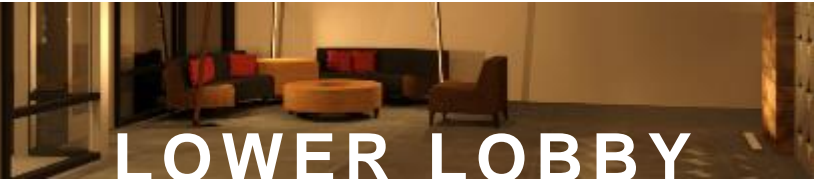
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## KITCHEN+BILLIARD

lighting design



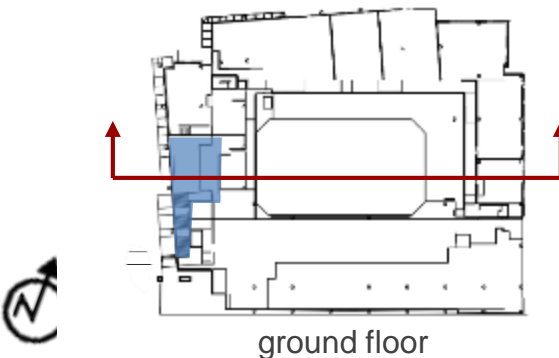
## ELECTRICAL

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## Lower Level Lobby

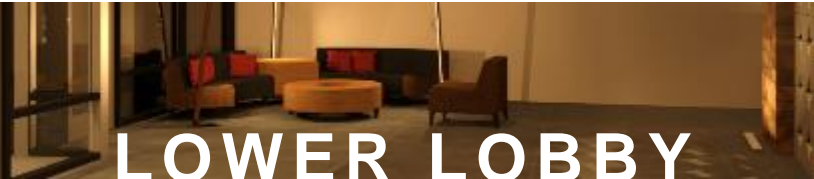


# Eastside III

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lighting design | daylighting | acoustics



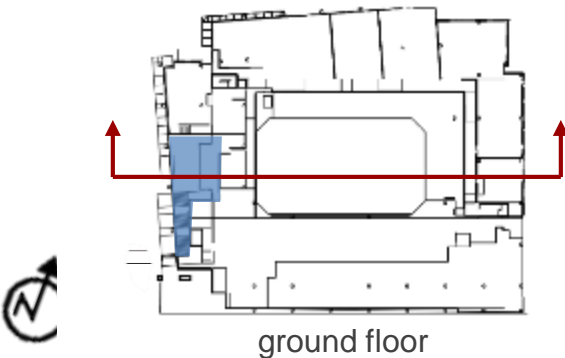
lighting design



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Lower Level Lobby

# Lighting Design

## Qualitative Criteria

Visual Interest + Aesthetics

Circulation + Transition

Occupant Comfort

## Quantitative Criteria

Lobby Circulation – 50 lux

Lobby Lounge – 150 lux

Uniformity – 4:1

LPD – 1.3 W/sf



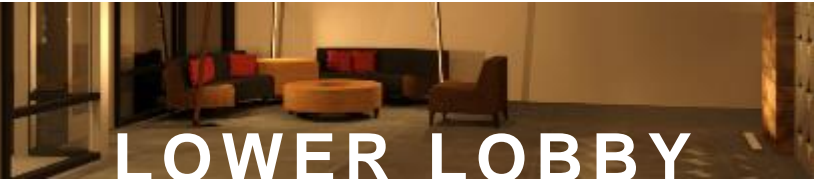
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lighting design



## ELECTRICAL

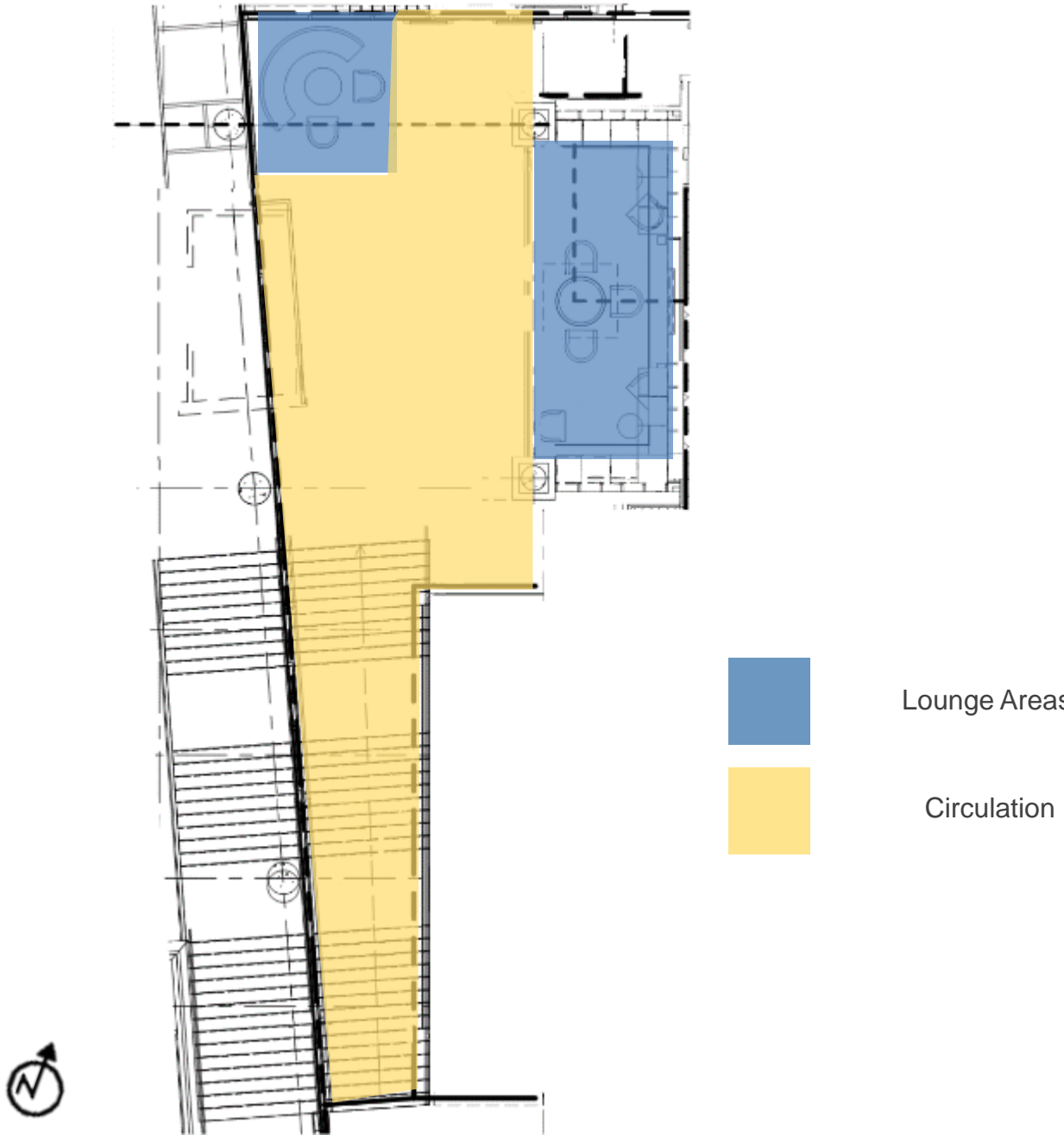
system redesign



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# Lighting Layout





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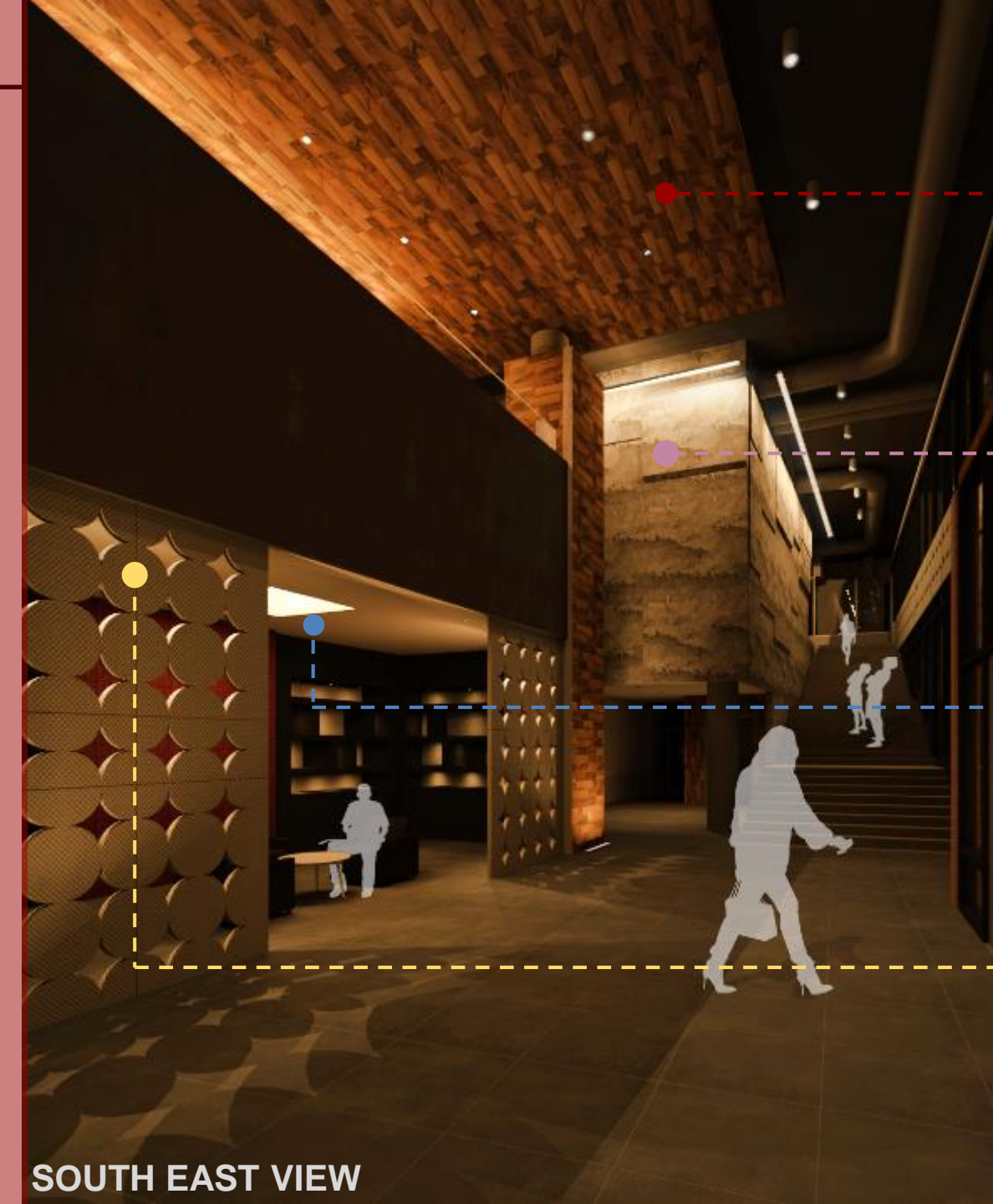


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SOUTH EAST VIEW

# Lighting Layout



Recessed + Suspended Downlights



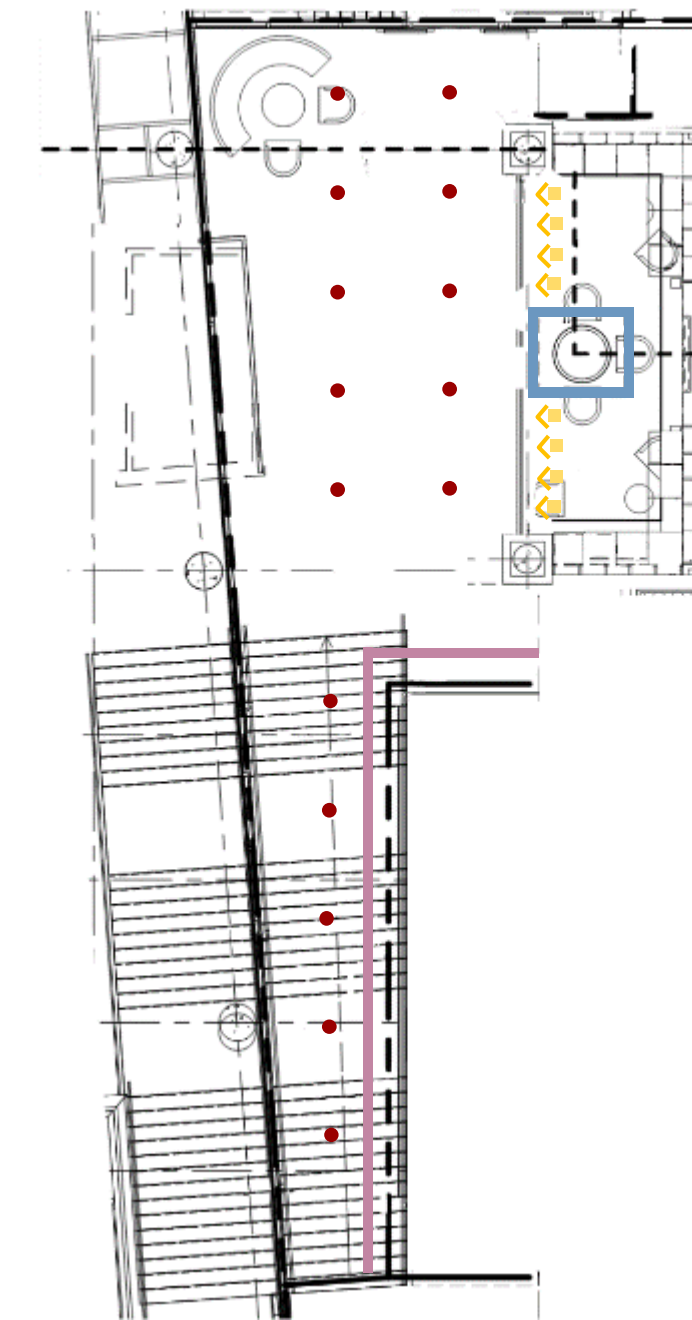
Suspended Wallgrazer



Cove Uplight



Recessed Adjustable Spotlight





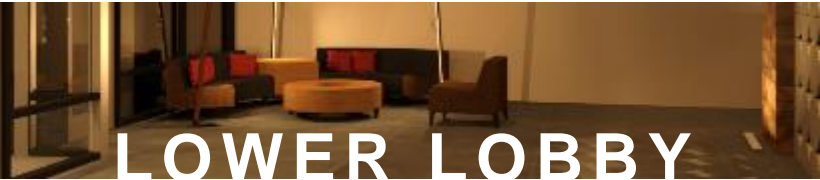
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SOUTH EAST VIEW

# Illuminance Summary

## IES Recommended Data

Lobby Circulation – 50 lux

Lobby Lounge – 150 lux

Uniformity – 4:1

LPD – 1.3 W/sf

## Achieved Data

Lobby Circulation – 120 lux

Entertainment Lounge – 116 lux

Uniformity – 2.5:1

LPD – 0.75 W/sf



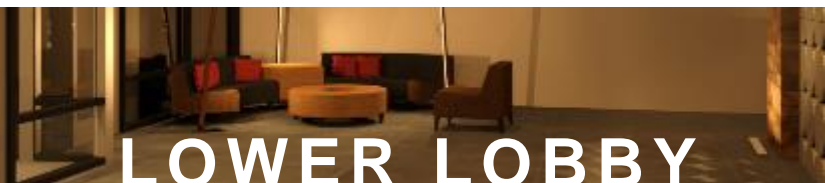


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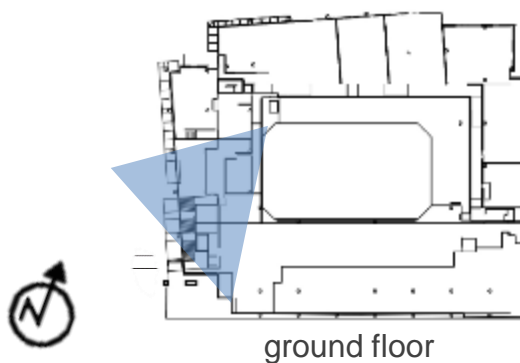
lighting design



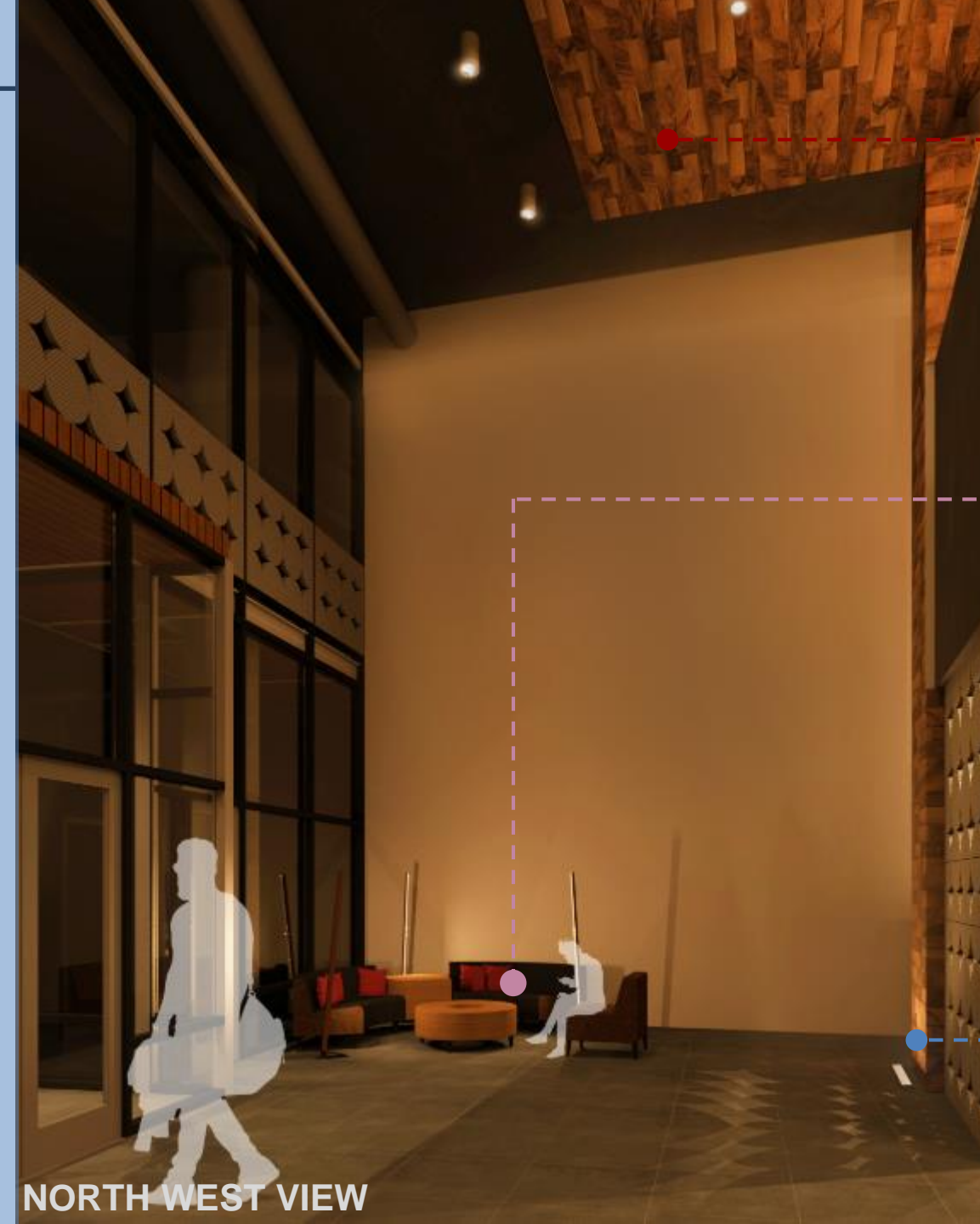
system redesign



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NORTH WEST VIEW

## Lighting Layout



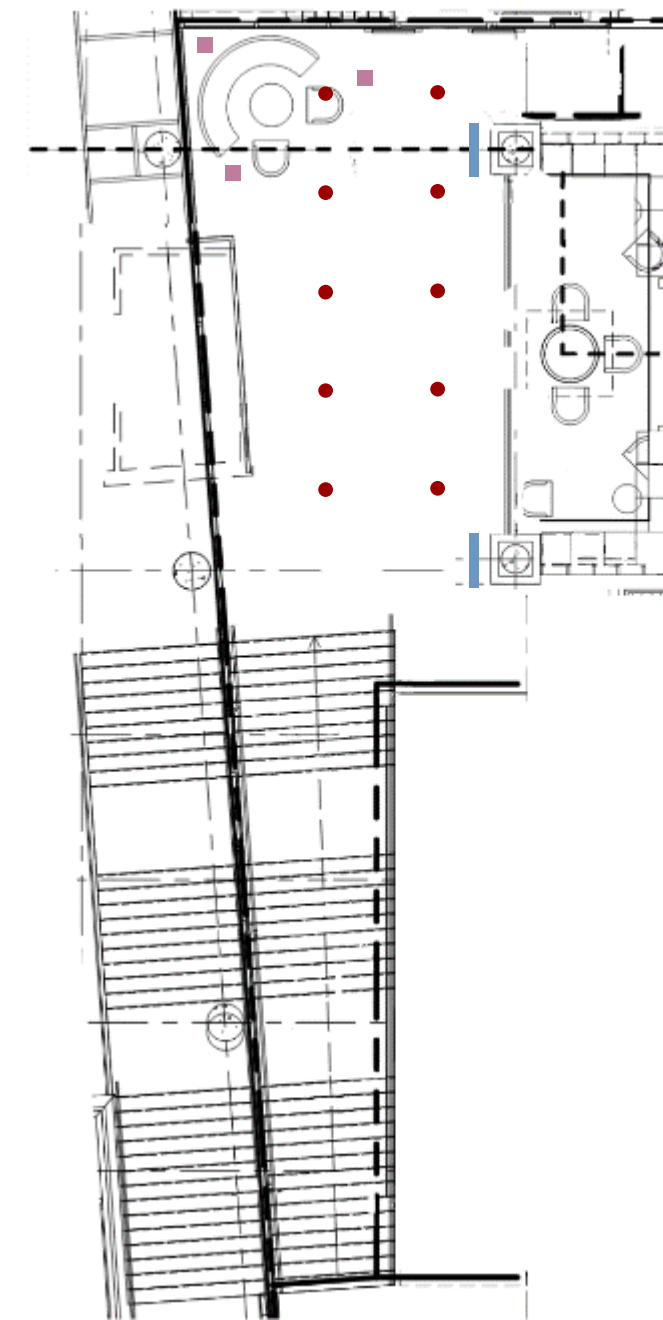
Recessed + Suspended Downlights



Decorative Floor Lamp



In-Ground Uplight





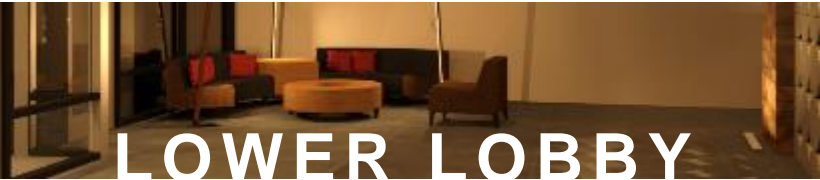
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lighting design



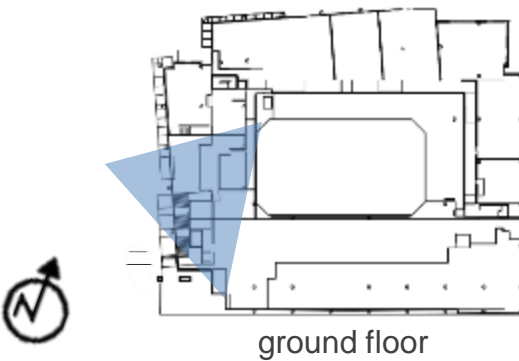
## ELECTRICAL

system redesign

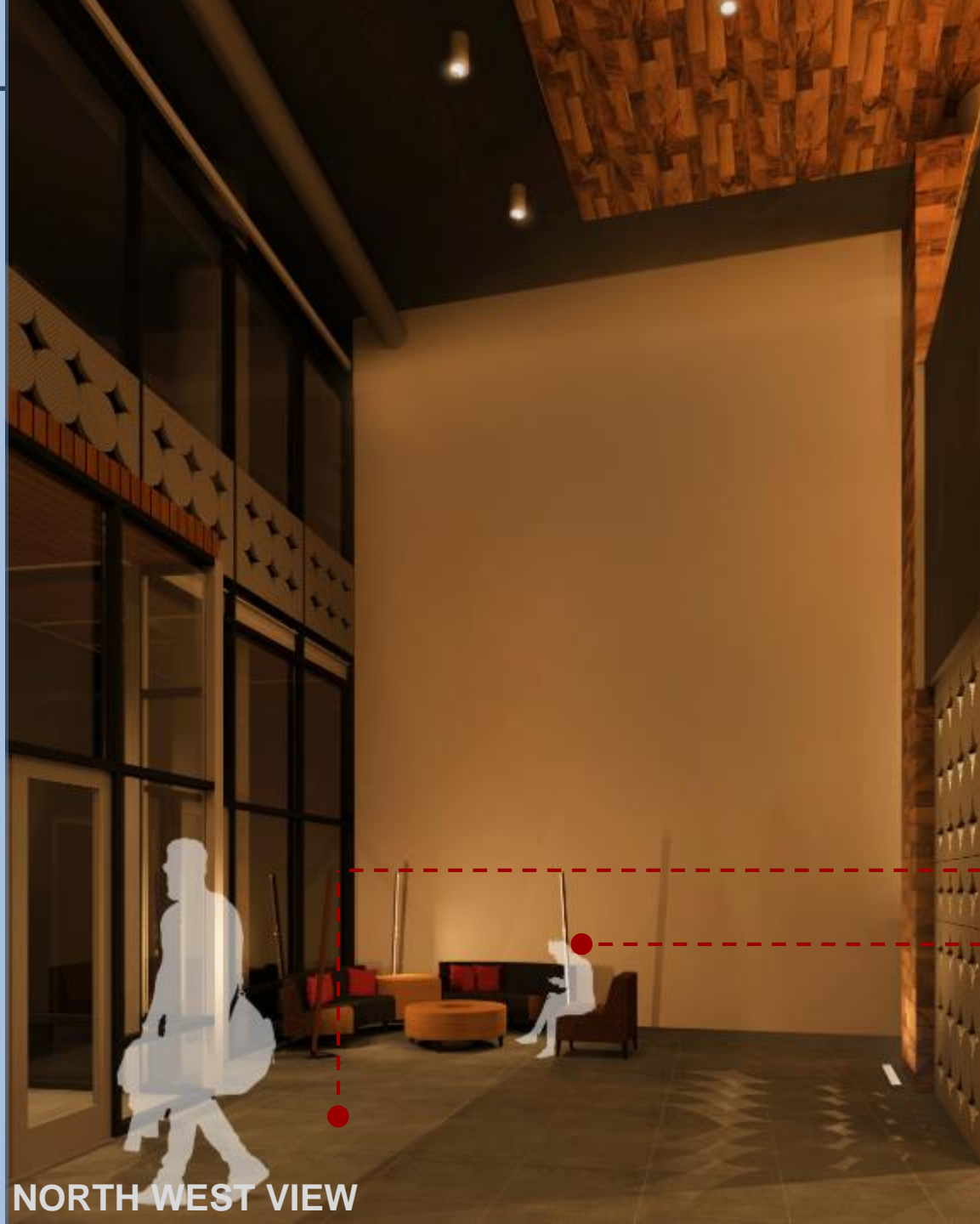


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NORTH WEST VIEW

# Illuminance Summary

## IES Recommended Data

Lobby Circulation – 50 lux

Lobby Lounge – 150 lux

Uniformity – 4:1

LPD – 1.3 W/sf

## Achieved Data

Lobby Circulation – 120 lux



Lobby Lounge – 116 lux



Uniformity – 2.5:1



LPD – 0.75 W/sf



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## Daylighting Design



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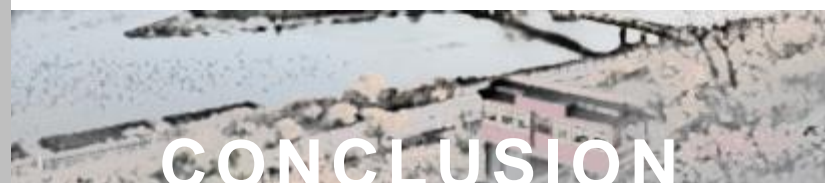
### KITCHEN+BILLIARD

lighting design



### ELECTRICAL

system redesign

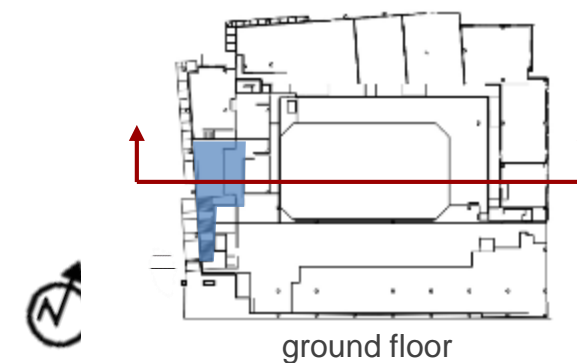


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### Design Goals

Create Visual Interest

Reduce Glare

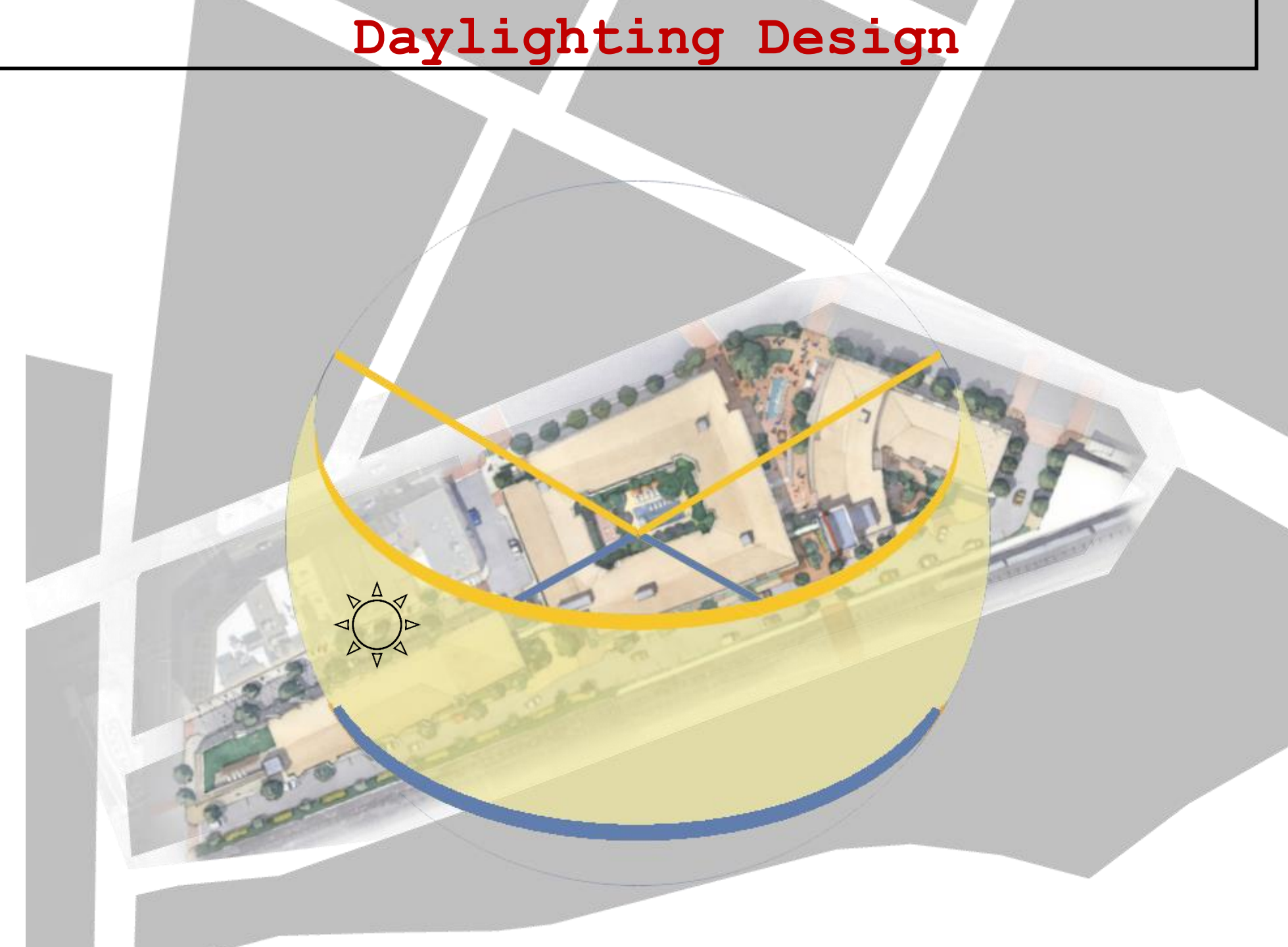


ground floor



Site Visit – September 11, 2016 | 4 PM

## Daylighting Design



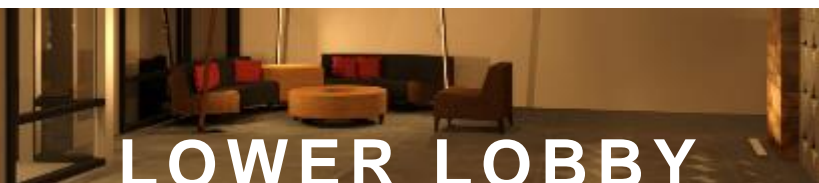


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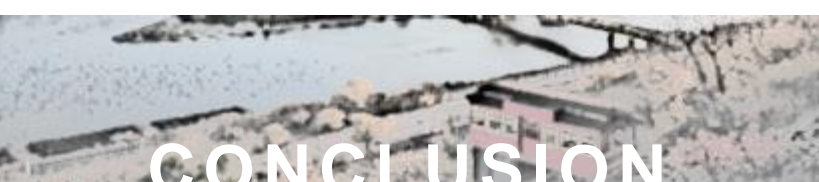
lighting design | **daylighting** | acoustics



lighting design



system redesign



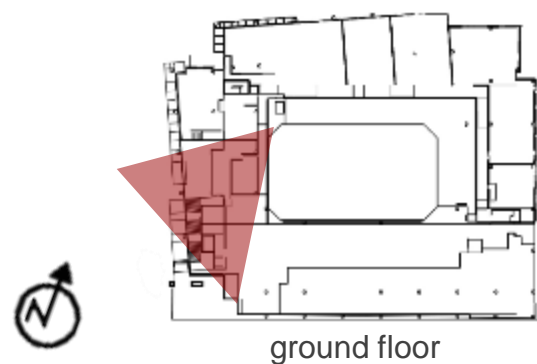
acknowledgements

## Lower Level Lobby

### Design Goals

Create Visual Interest

Reduce Glare

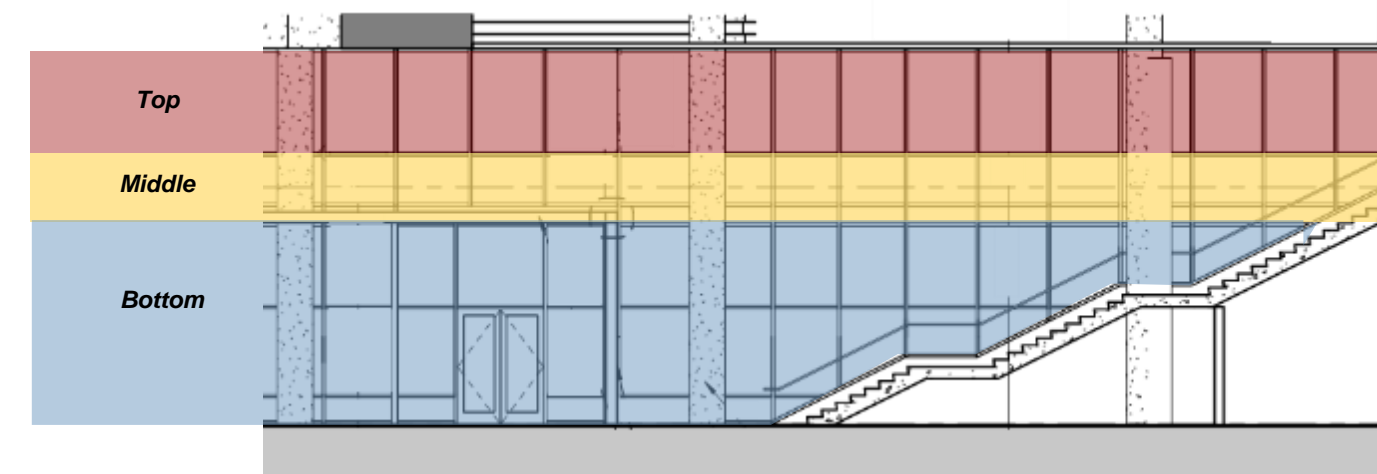


ground floor



Site Visit – September 11, 2016 | 4 PM

### Preliminary Study – AGi32



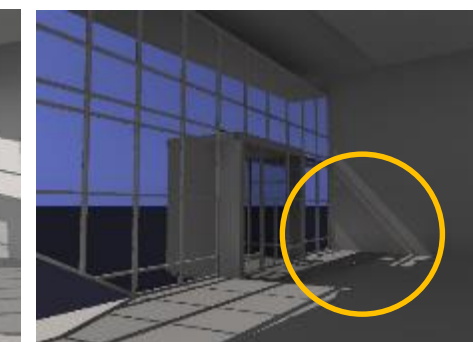
South West Elevation



December 22, 3 PM



September 22, 3 PM



June 22, 3 PM

North West View of Lounge



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lighting design | **daylighting** | acoustics



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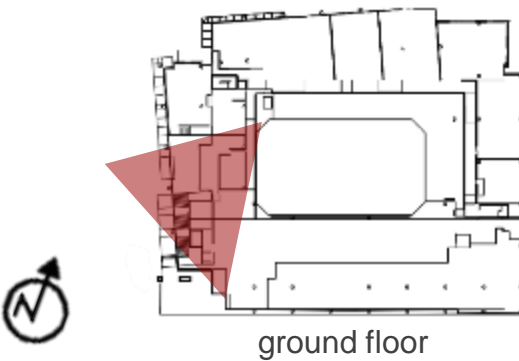
acknowledgements

# Lower Level Lobby

## Design Goals

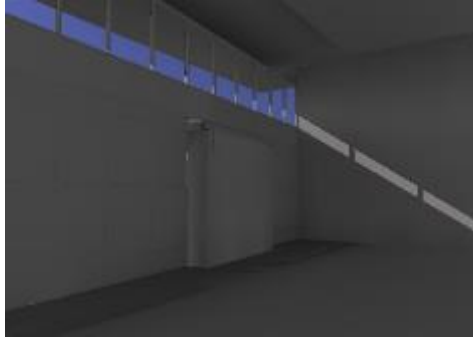
Create Visual Interest

Reduce Glare

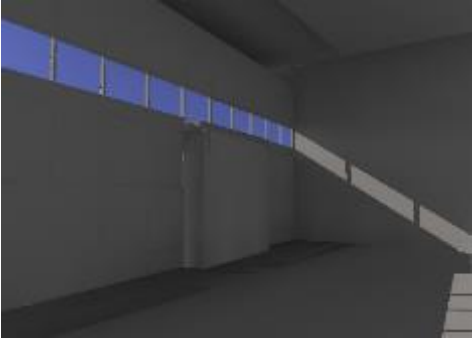


Site Visit – September 11, 2016 | 4 PM

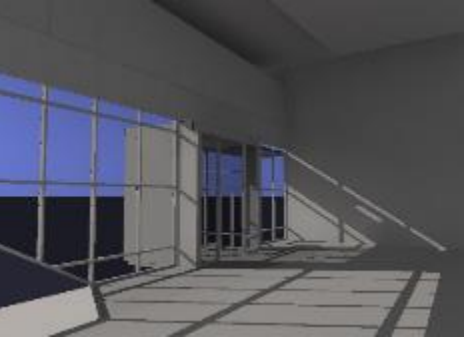
## Preliminary Study – AGi32



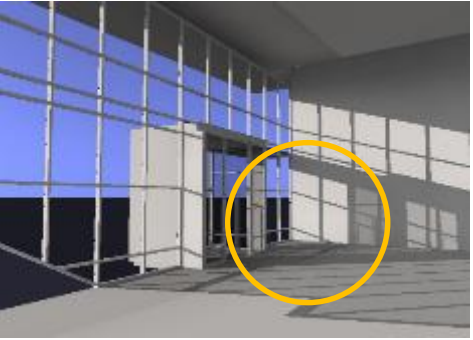
no change needed



visual interest



reduce glare

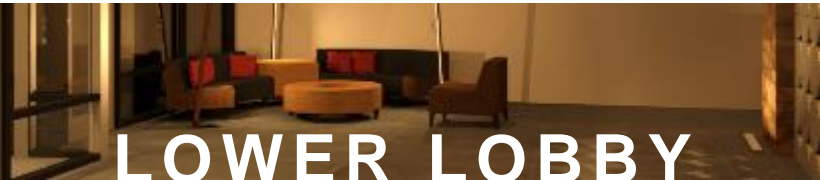


September 22, 3 PM



# Eastside III

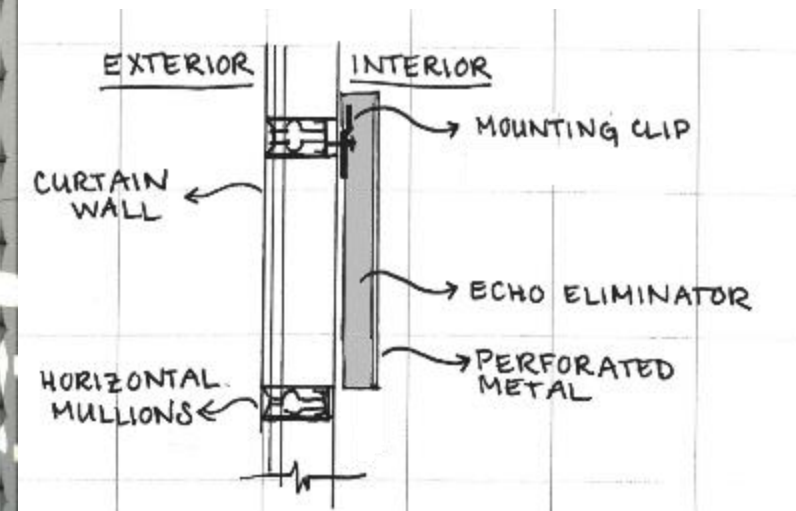
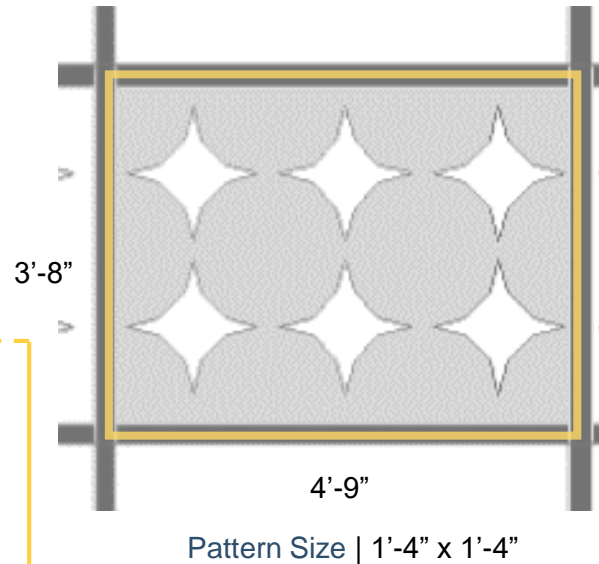
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## Design Goals

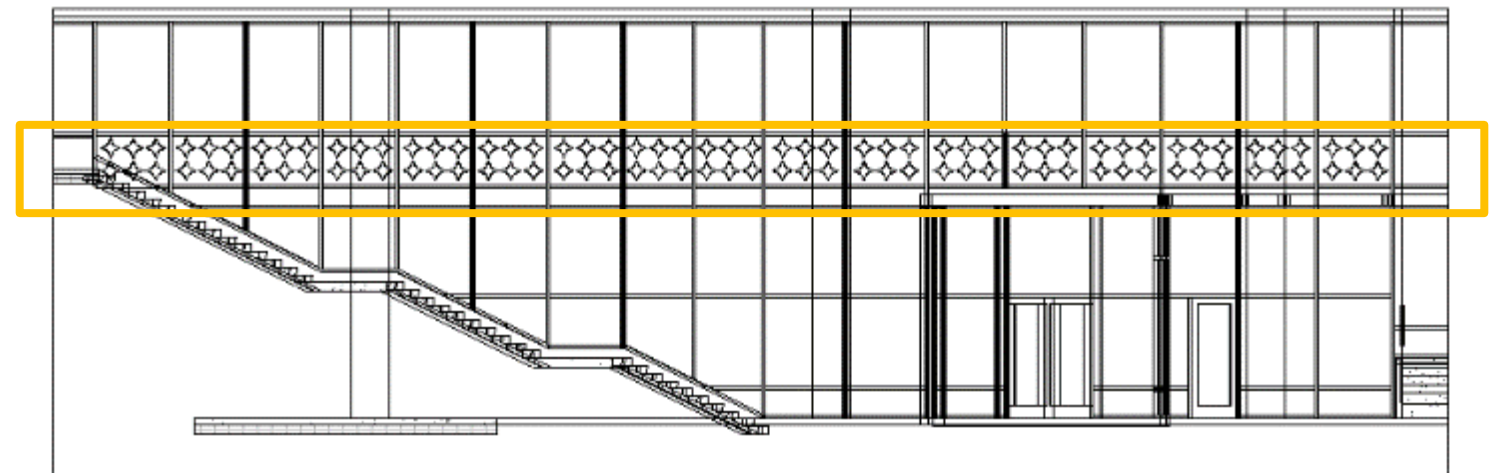
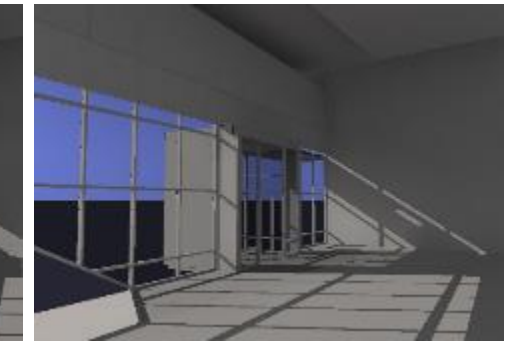
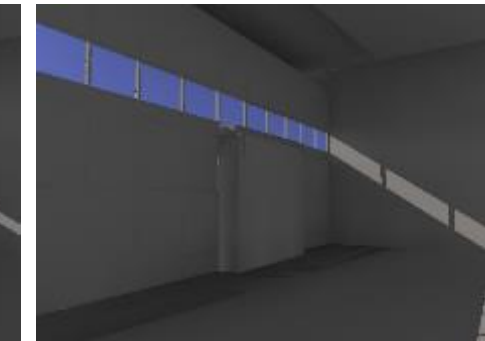
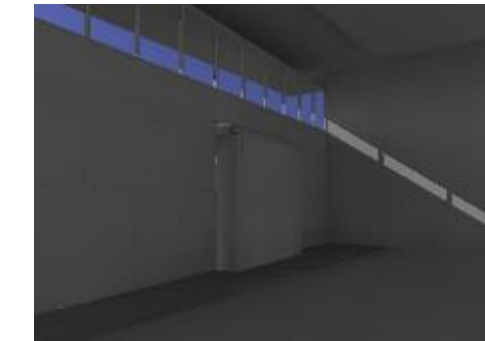
Create Visual Interest

Reduce Glare



Panel Mounting Detail

## Visual Interest Study – Mock-Up + Revit



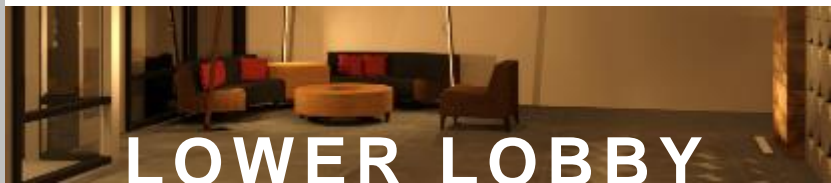


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## Design Goals

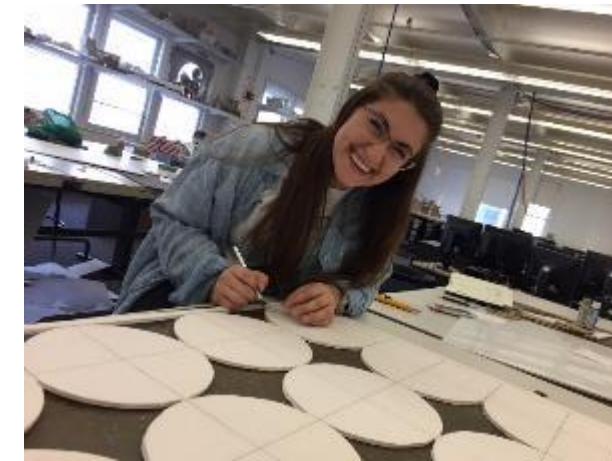
Create Visual Interest

Reduce Glare



September 22 | 3 – 5 PM

## Visual Interest Study – Mock-Up + Revit



½ Scale



3:50 PM



4:20 PM



4:40 PM



5:00 PM



5:20 PM



6:00 PM

March 31, 2017 | 4 – 6 PM | South West Facing Window

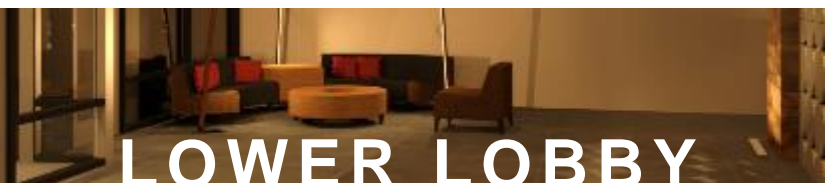


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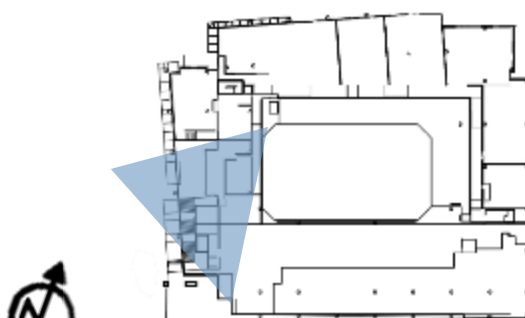


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## Design Goals

Create Visual Interest

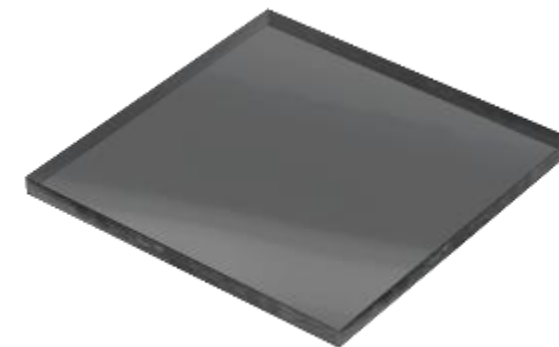
Reduce Glare



ground floor



SEPTEMBER 22 | 3PM

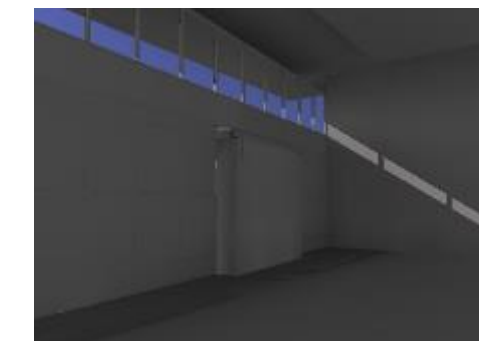


**Base Case** | Tvis = 0.68

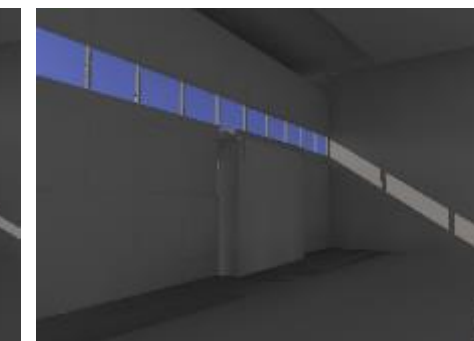
**Redesign 1** | Tvis = 0.47

**Redesign 2** | Tvis = 0.38

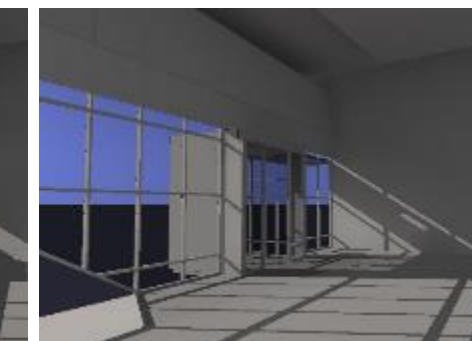
## Glare Study – Rhino + DIVA



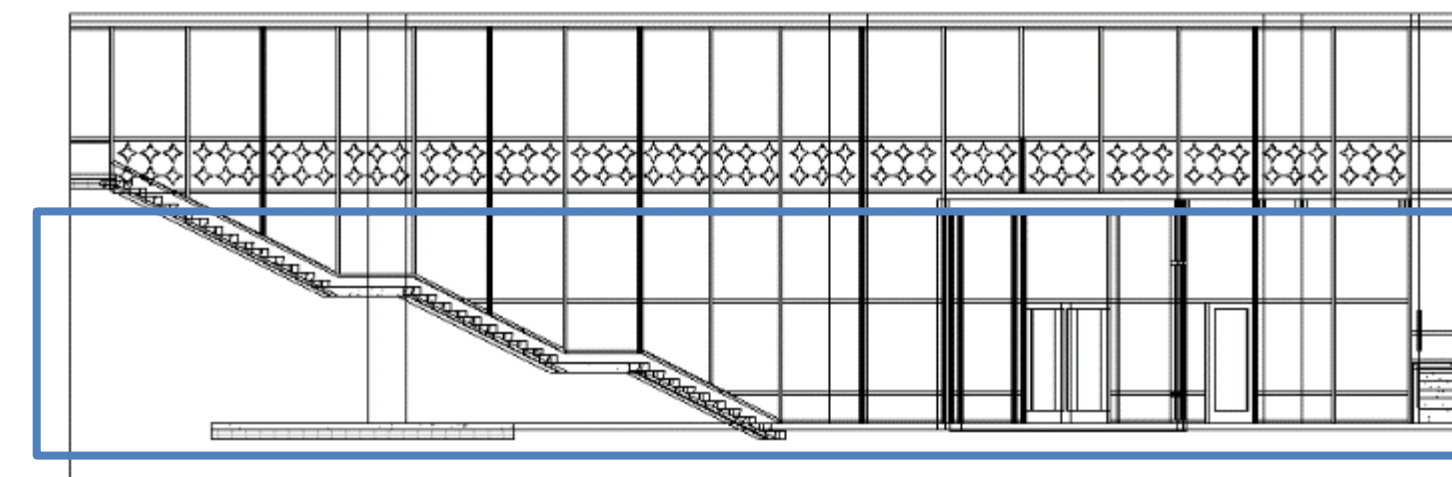
no change needed



visual interest



reduce glare





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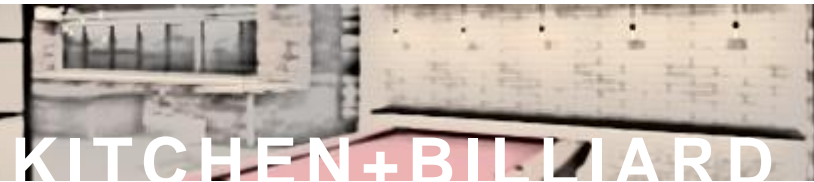
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lighting design | **daylighting** | acoustics



## KITCHEN+BILLIARD

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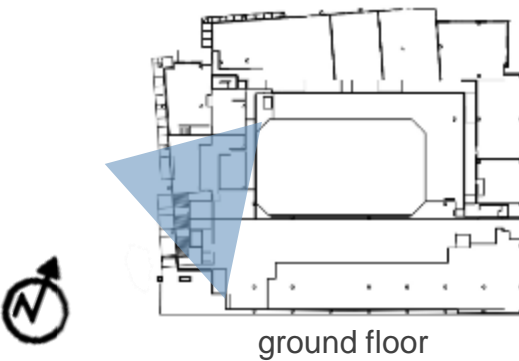
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## Design Goals

Create Visual Interest

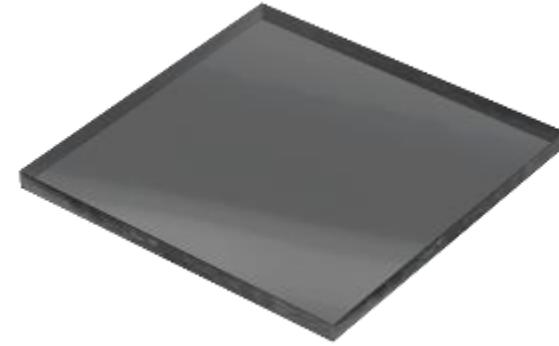
**Reduce Glare**



ground floor



SEPTEMBER 22 | 3PM



**Base Case** | Tvis = 0.68

**Redesign 1** | Tvis = 0.47

**Redesign 2** | Tvis = 0.38

## Glare Study – Rhino + DIVA

### Criteria + Considerations

**Reduce** Annual Intolerable Glare

**Reduce** Annual Sun Exposure (ASE)

**Maintain** Acceptable sDA @ 150 lux

	Base Case	Redesign 1	Redesign 2
Intolerable Glare	281 hrs	146 hrs ↓	116 hrs ↓
ASE (%)	7.6%	6.3% ↓	5.8% ↓
sDA (%)	74.4%	64.9% —	58% ↓



# Eastside III

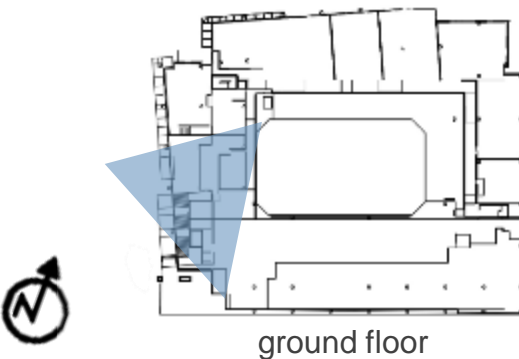
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## Design Goals

Create Visual Interest

Reduce Glare

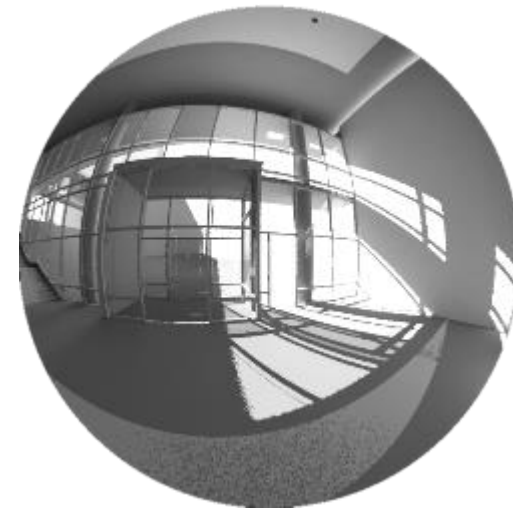


SEPTEMBER 22 | 3PM

## Daylight Glare Probability

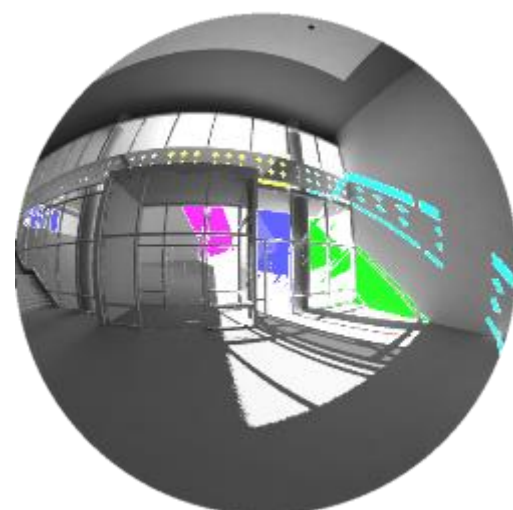
Scale	DGP (%)
Imperceptible Glare	< 35%
Perceptible Glare	35 40
Disturbing Glare	40 45
Intolerable Glare	> 45%

## Glare Study – Rhino + DIVA



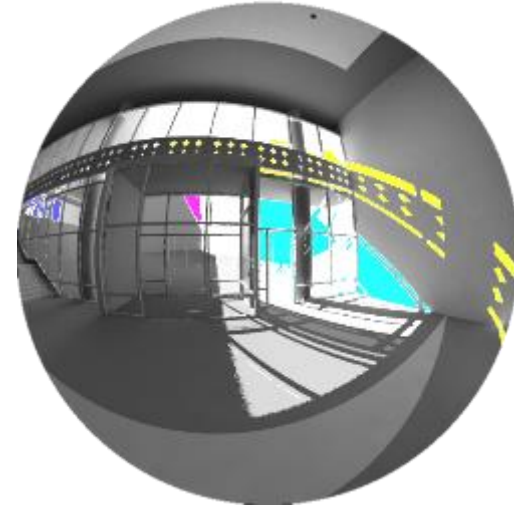
Base Case

100% DGP



Redesign 1

26% DGP



Redesign 2

24% DGP

Point In Time Glare Study - September 11, 2016 | 4 PM



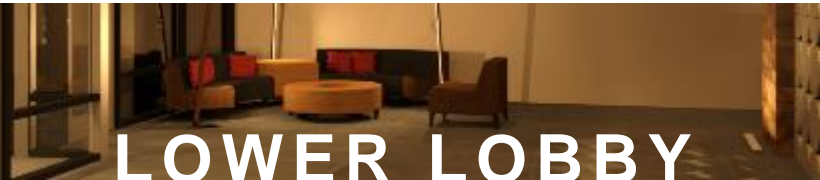
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lighting design | daylighting | **acoustics**



## KITCHEN+BILLIARD

lighting design



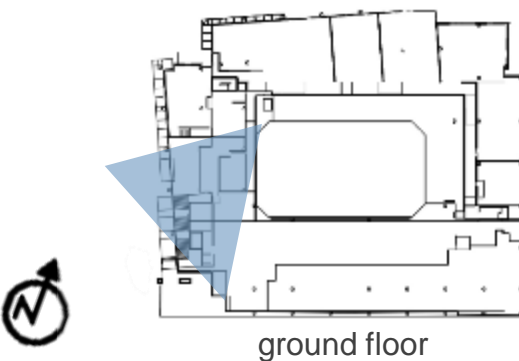
## ELECTRICAL

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## CONCLUSION

acknowledgements



ground floor

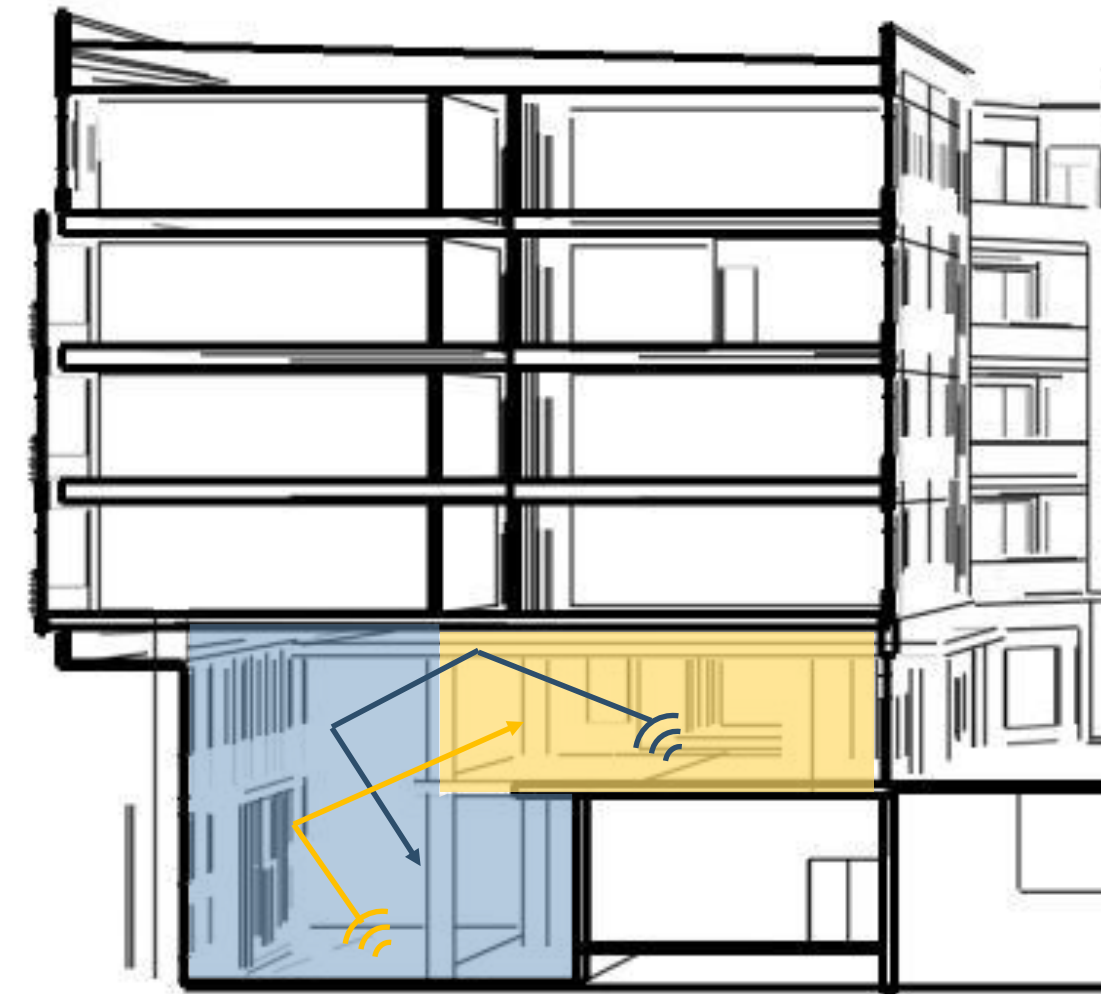
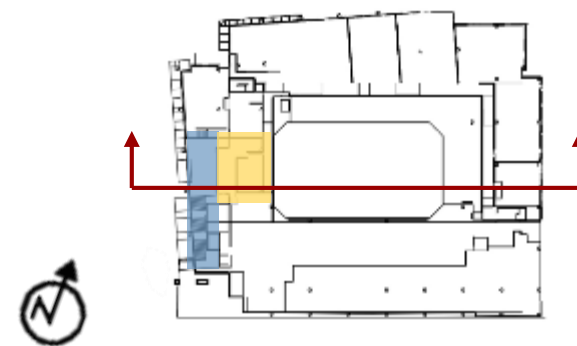


# Acoustics Study

## Design Goals

Reduce Reflections + RT

Goal RT = 1.0 seconds



Lower Lobby

Kitchen + Billiard



# Eastside III

Pittsburgh, PA



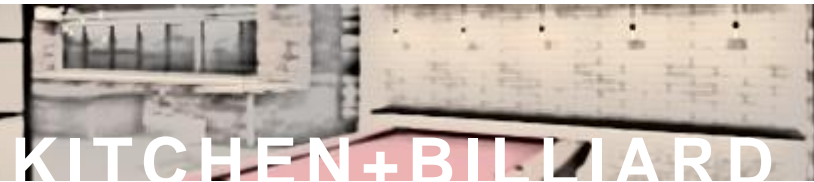
## INTRODUCTION

building overview | concept | scope



## LOWER LOBBY

lighting design | daylighting | **acoustics**



## KITCHEN+BILLIARD

lighting design



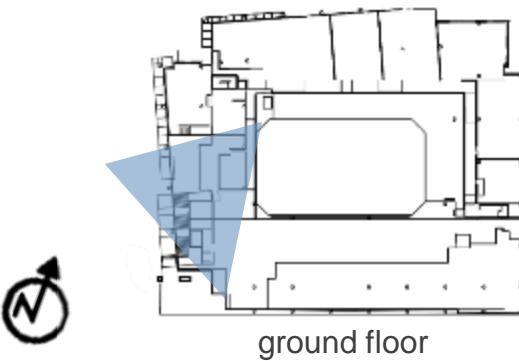
## ELECTRICAL

system redesign



## CONCLUSION

acknowledgements



ground floor

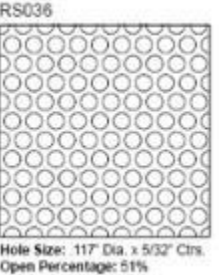


# Acoustics Study

## Design Goals

Reduce Reflections + RT

Goal RT = 1.0 seconds



### Existing Design

RT = 1.70 sec

### Daylight Panel

RT = 1.32 sec

### Daylight + Ceiling Panels

RT = 1.26 sec





# Eastside III

Pittsburgh, PA

## Lighting Design



### INTRODUCTION

building overview | concept | scope



### LOWER LOBBY

lighting design | daylighting | acoustics



### KITCHEN + BILLIARD

lighting design



### ELECTRICAL

system redesign



### CONCLUSION

acknowledgements



### Kitchen + Billiard Room



# Eastside III

Pittsburgh, PA



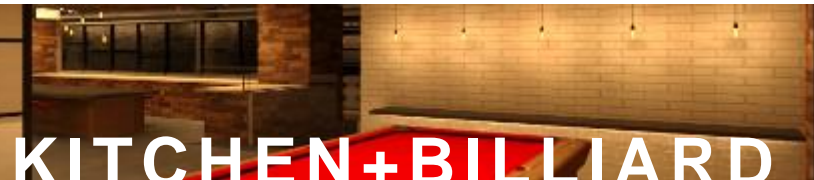
## INTRODUCTION

building overview | concept | scope



## LOWER LOBBY

lighting design | daylighting | acoustics



## KITCHEN+BILLIARD

lighting design



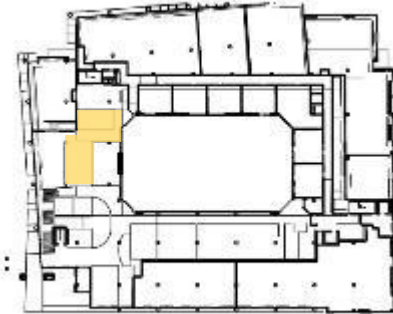
## ELECTRICAL

system redesign

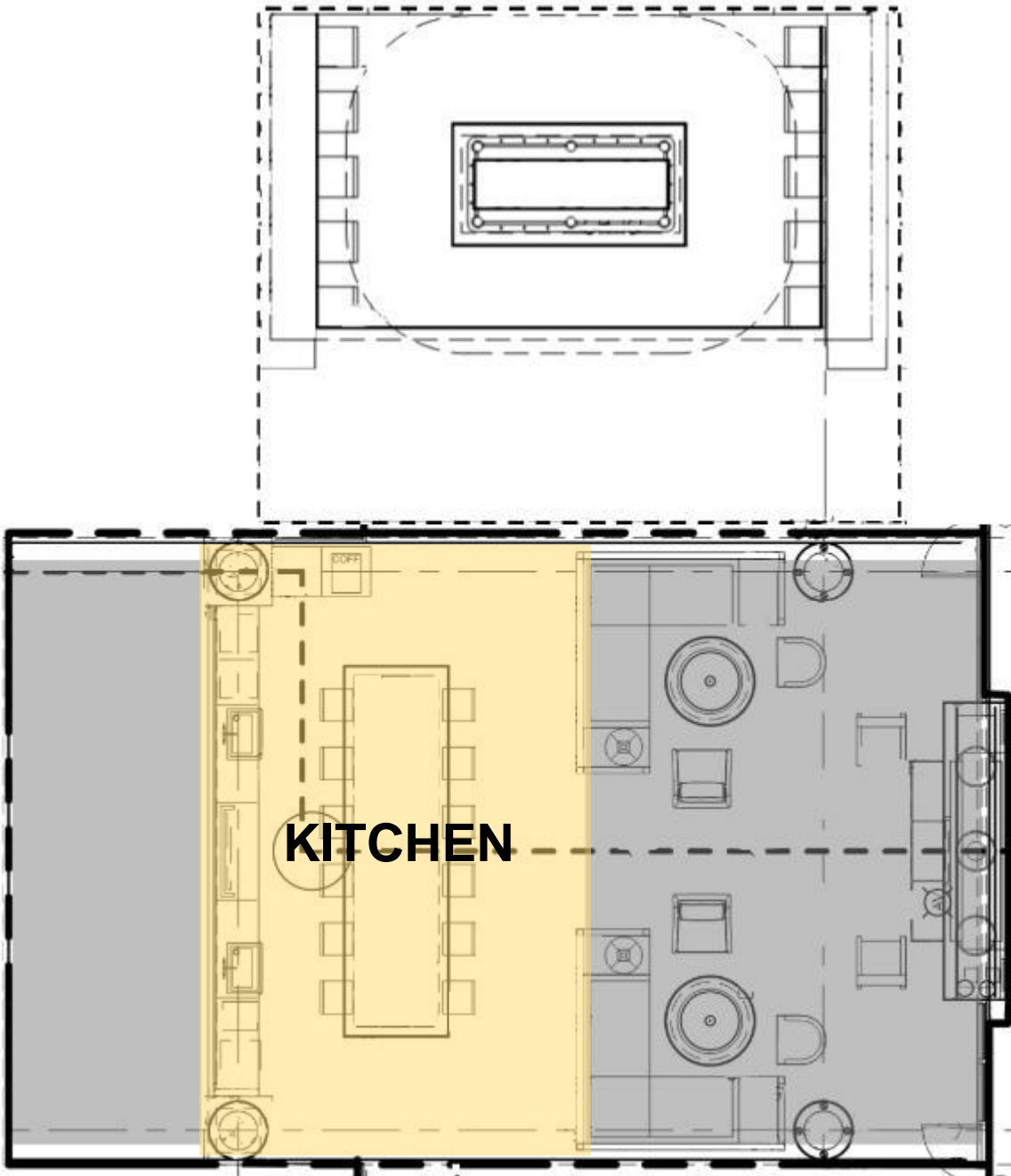


## CONCLUSION

acknowledgements



first floor



## KITCHEN

# Lighting Design

## Kitchen | Qualitative Criteria

Psychological Impressions - *Public*

## Kitchen | Quantitative Criteria

Lounge: Reading/Work Areas – 150 lux

Kitchen Countertop: Serving Food – 200 lux

LPD – 1.2 W/sf



# Eastside III

Pittsburgh, PA



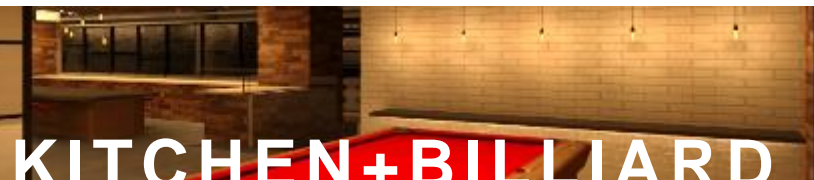
## INTRODUCTION

building overview | concept | scope



## LOWER LOBBY

lighting design | daylighting | acoustics



## KITCHEN+BILLIARD

lighting design



## ELECTRICAL

system redesign

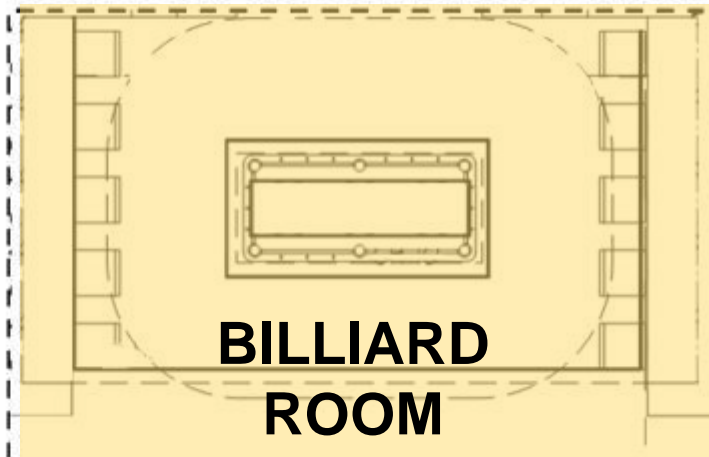


## CONCLUSION

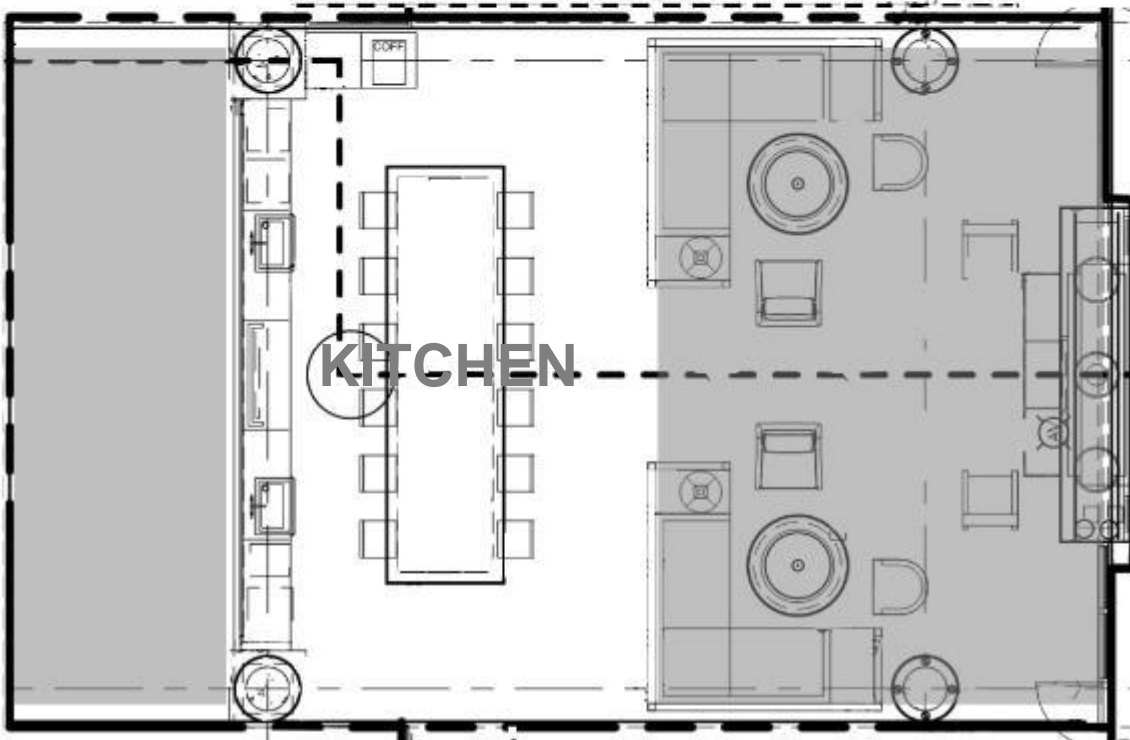
acknowledgements



first floor



## BILLIARD ROOM



## KITCHEN

# Lighting Design

## Billiard Room | Qualitative Criteria

Psychological Impressions - *Private*

## Billiard Room | Quantitative Criteria

Billiard Table – 300 lux

Bar Lounge – 100 lux

LPD – 1.2 W/sf



# Eastside III

Pittsburgh, PA



## INTRODUCTION

building overview | concept | scope



## LOWER LOBBY

lighting design | daylighting | acoustics



## KITCHEN+BILLIARD

lighting design



## ELECTRICAL

system redesign

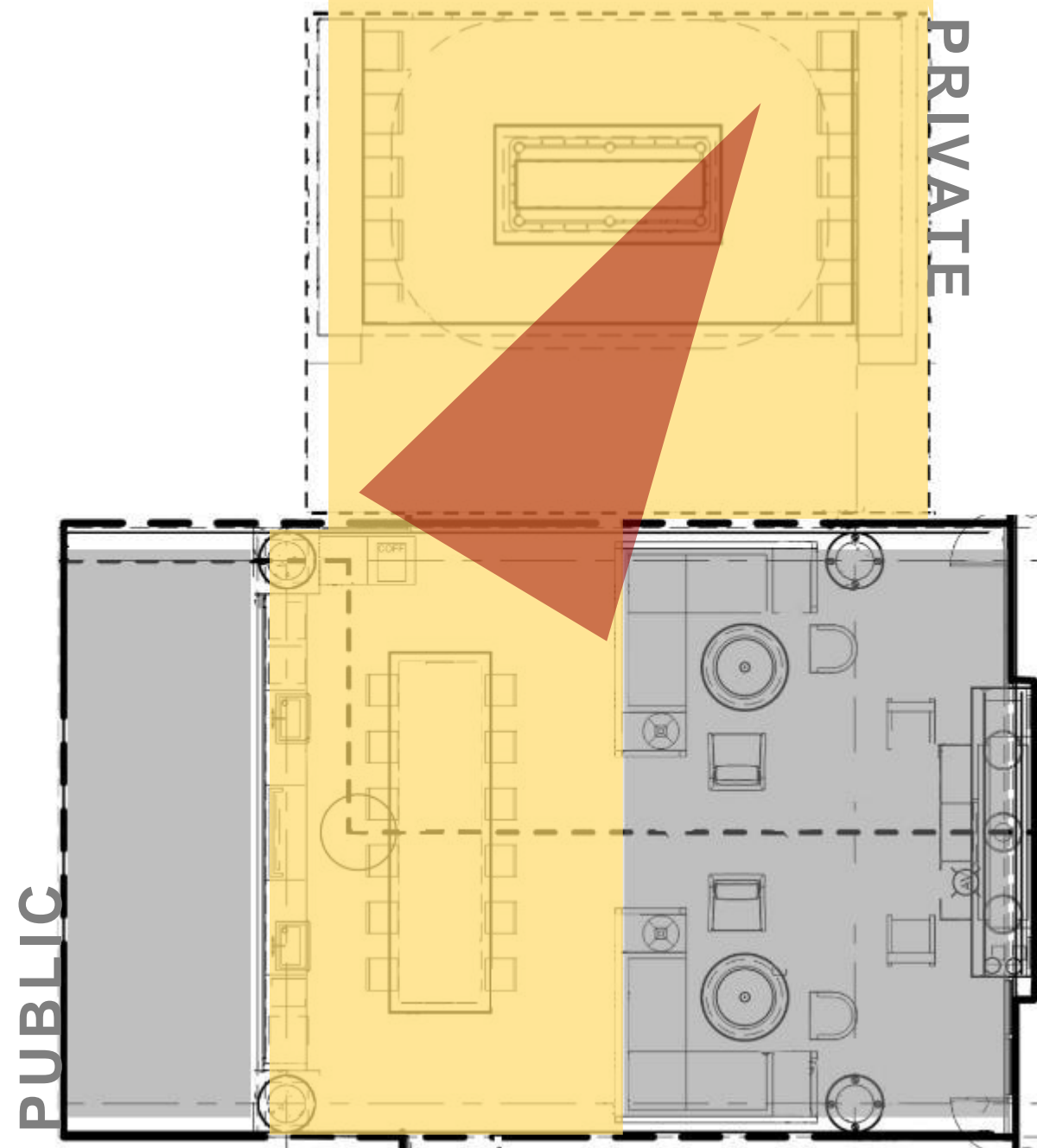


## CONCLUSION

acknowledgements



first floor



SOUTH VIEW



# Eastside III

Pittsburgh, PA



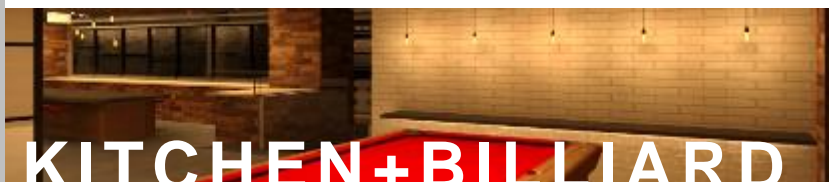
## INTRODUCTION

building overview | concept | scope



## LOWER LOBBY

lighting design | daylighting | acoustics



## KITCHEN+BILLIARD

lighting design



## ELECTRICAL

system redesign



## CONCLUSION

acknowledgements



first floor



NORTH WEST VIEW

# Lighting Layout



Asymmetric Cove Uplight



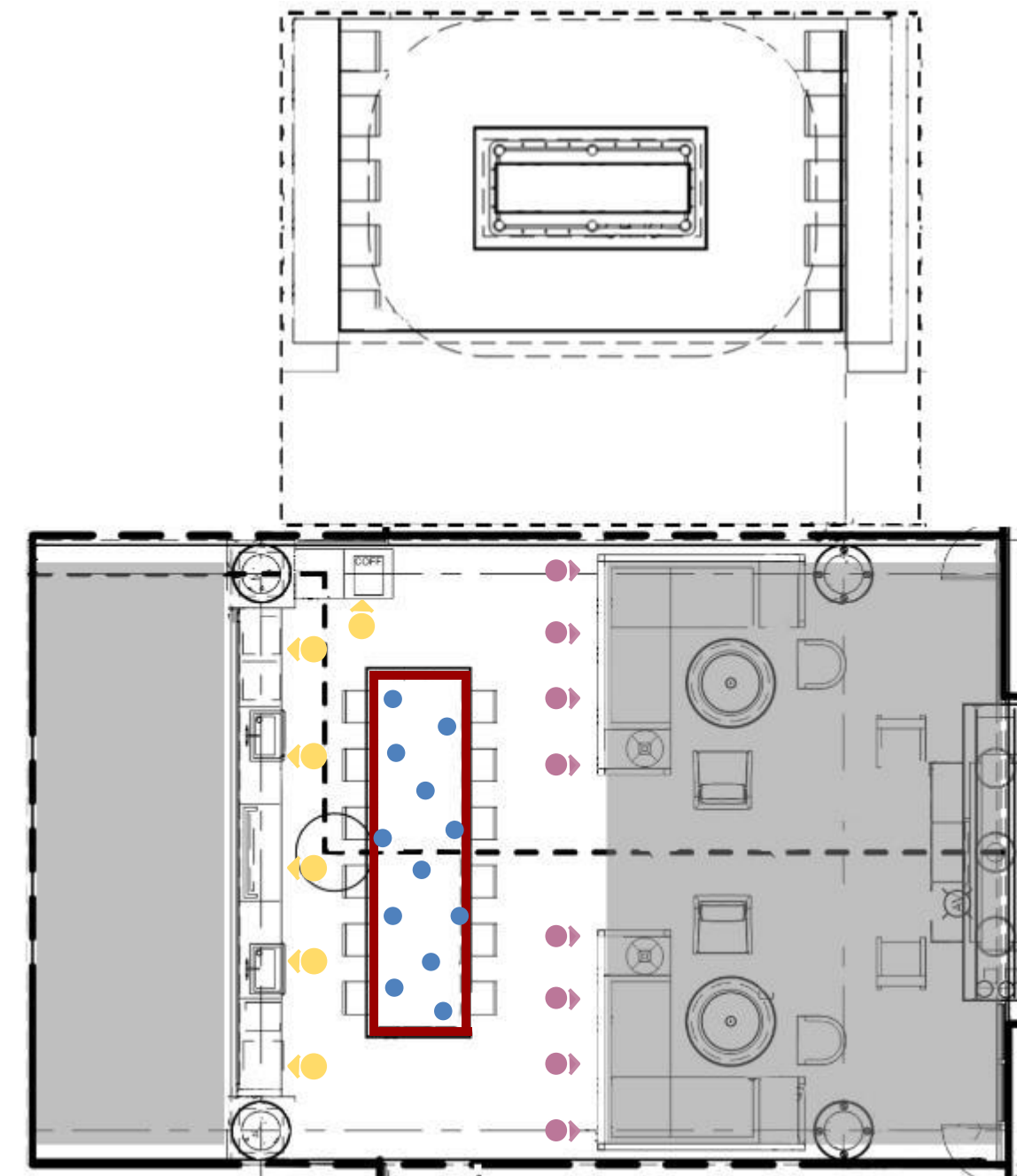
Recessed Wallwash



Decorative LED Filament



Recessed Adjustable Downlight





# Eastside III

Pittsburgh, PA



## INTRODUCTION

building overview | concept | scope



## LOWER LOBBY

lighting design | daylighting | acoustics



## KITCHEN+BILLIARD

lighting design



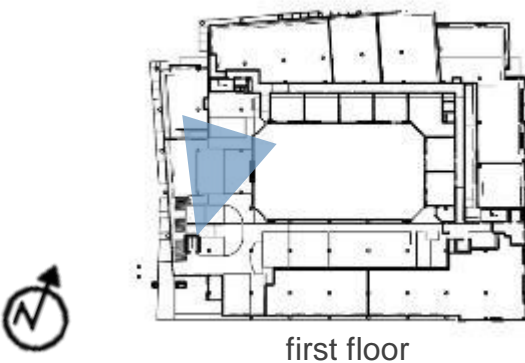
## ELECTRICAL

system redesign



## CONCLUSION

acknowledgements



first floor



NORTH VIEW

## Lighting Layout



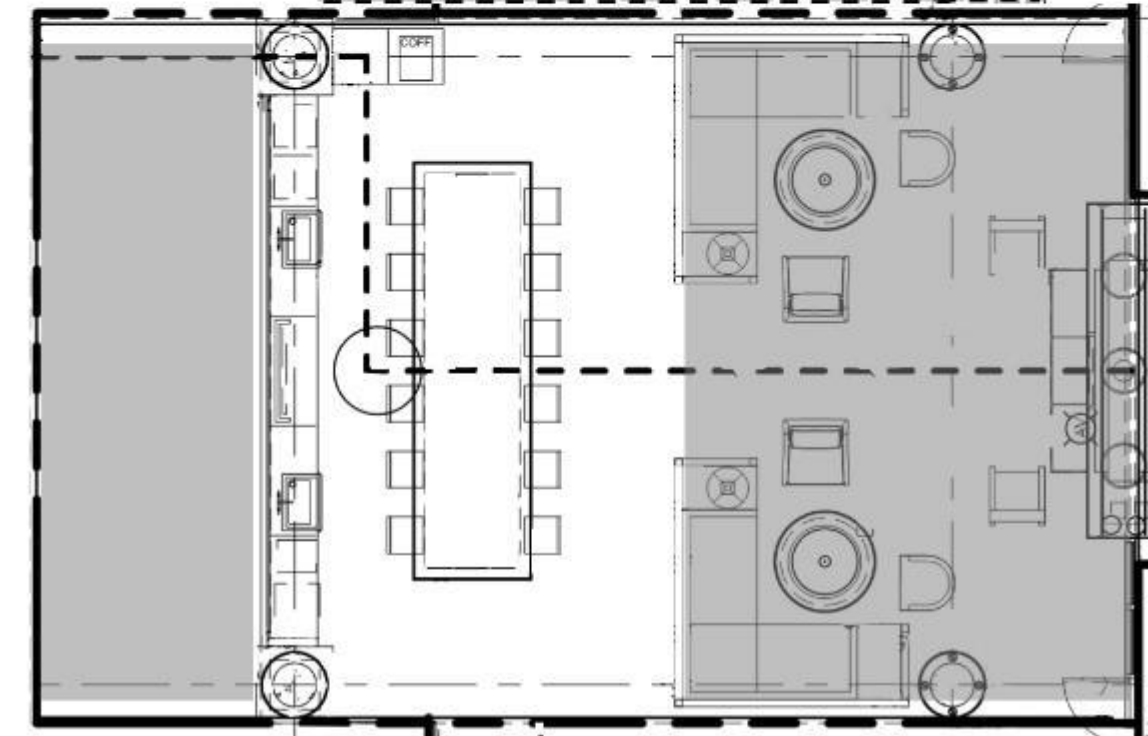
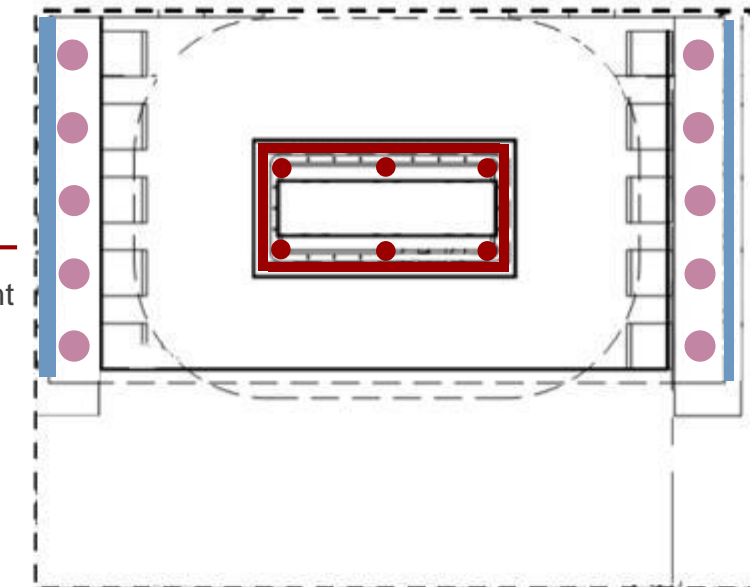
Cove - Linear Uplight + Adjustable Downlight



Decorative LED Filament



Under Cabinet LED Strip





# Eastside III

Pittsburgh, PA



## INTRODUCTION

building overview | concept | scope



## LOWER LOBBY

lighting design | daylighting | acoustics



## KITCHEN+BILLIARD

lighting design



## ELECTRICAL

system redesign

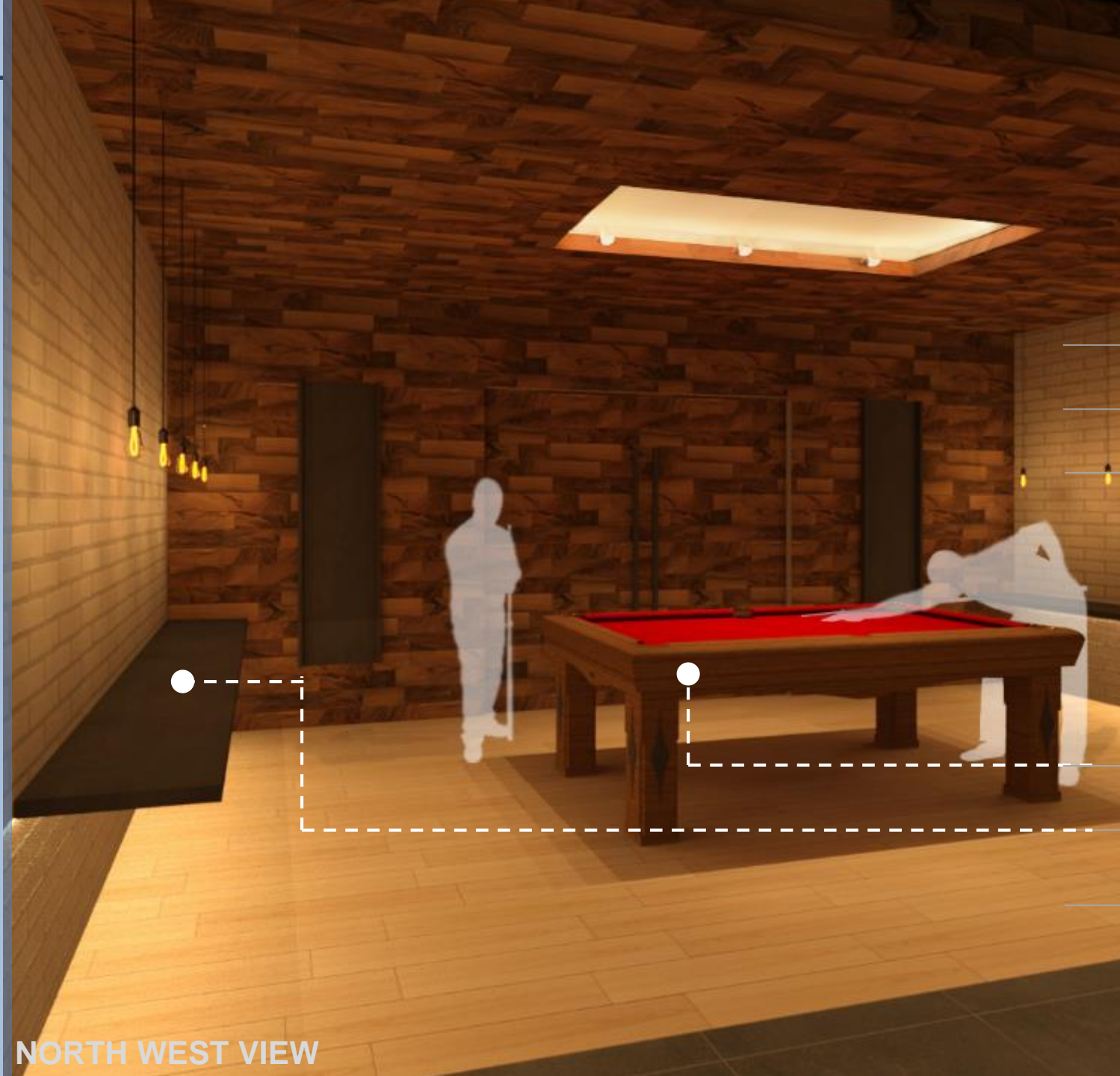


## CONCLUSION

acknowledgements



first floor



NORTH WEST VIEW

# Illuminance Summary

## Billiard | IES Recommended Data

Billiard Table – 300 lux

Bar Lounge – 100 lux

LPD – 1.2 W/sf

## Billiard | Achieved Data

Billiard Table – 375 lux



Bar Lounge – 110 lux



LPD – 0.45 lux





# Eastside III

Pittsburgh, PA



## INTRODUCTION

building overview | concept | scope



## LOWER LOBBY

lighting design | daylighting | acoustics



## KITCHEN+BILLIARD

lighting design



## ELECTRICAL

system redesign



## CONCLUSION

acknowledgements



first floor



NORTH WEST VIEW

# Illuminance Summary

## Kitchen | IES Recommended Data

Kitchen Countertop: Serving Food – 200 lux

Lounge: Reading/Work Areas – 150 lux

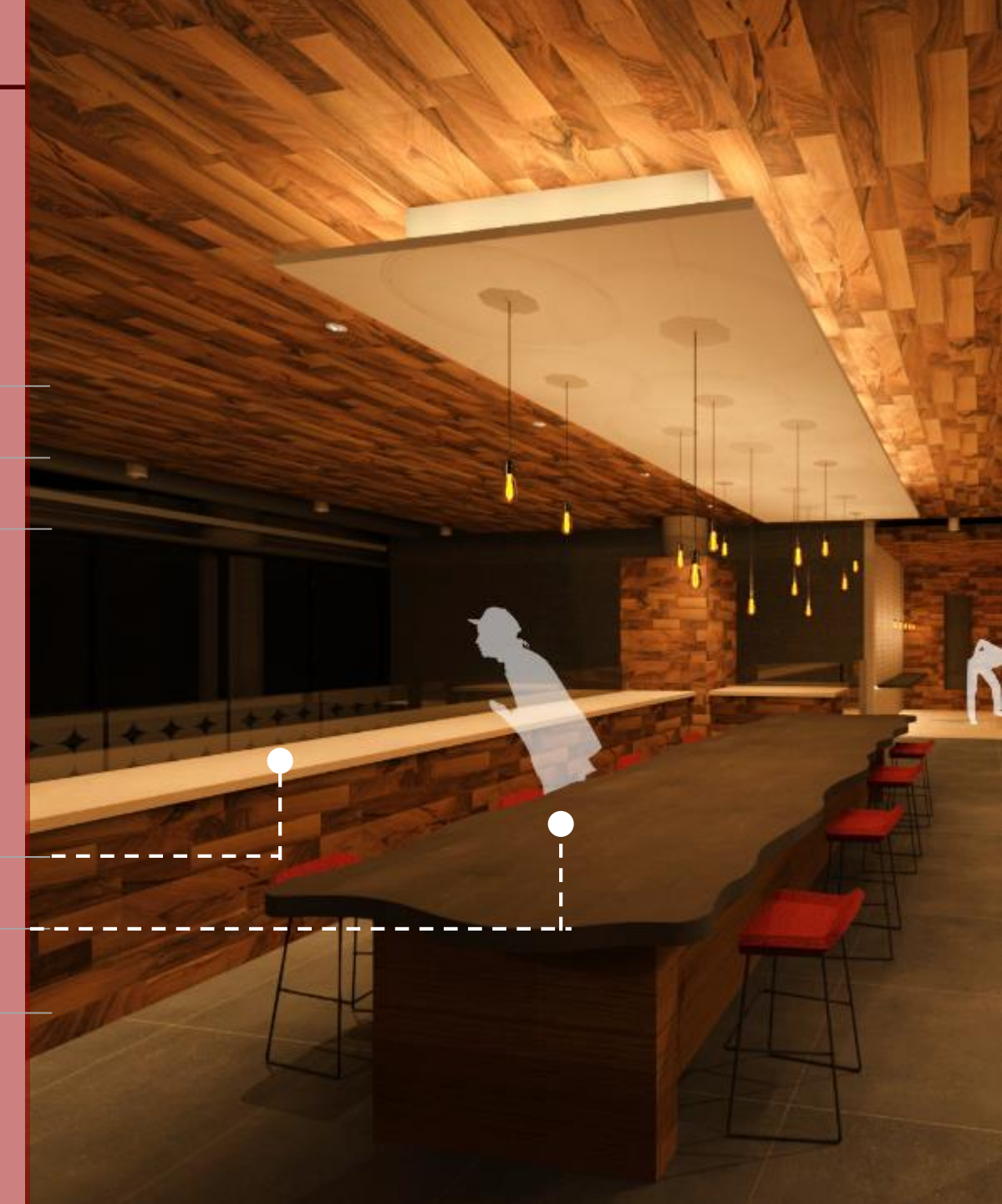
LPD – 1.2 W/sf

## Kitchen | Achieved Data

Kitchen Countertop – 195 lux ✓

Lounge – 145 lux ✓

LPD – 0.45 lux ✓





# Eastside III

Pittsburgh, PA



## INTRODUCTION

building overview | concept | scope



## LOWER LOBBY

lighting design | daylighting | acoustics



## KITCHEN+BILLIARD

lighting design



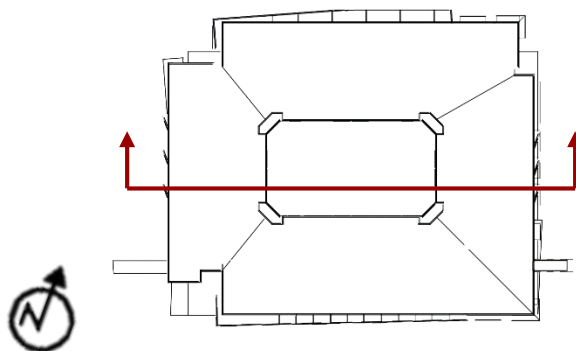
## ELECTRICAL

system redesign



## CONCLUSION

acknowledgements



# Electrical Study

## Existing System



480/277 V



208/120 V

## Proposed System



480/277 V



# Eastside III

Pittsburgh, PA



## INTRODUCTION

building overview | concept | scope



## LOWER LOBBY

lighting design | daylighting | acoustics



## KITCHEN+BILLIARD

lighting design



## ELECTRICAL

system redesign

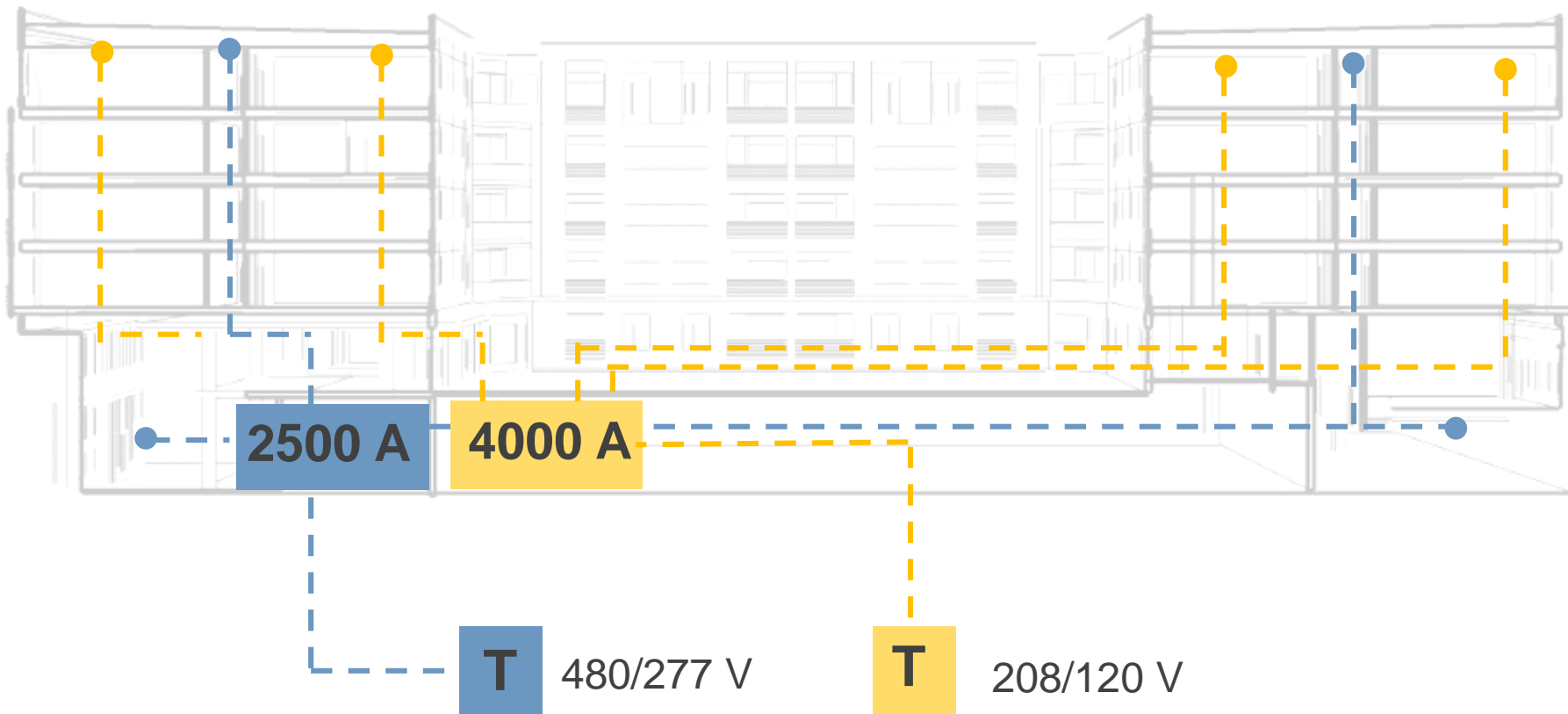


## CONCLUSION

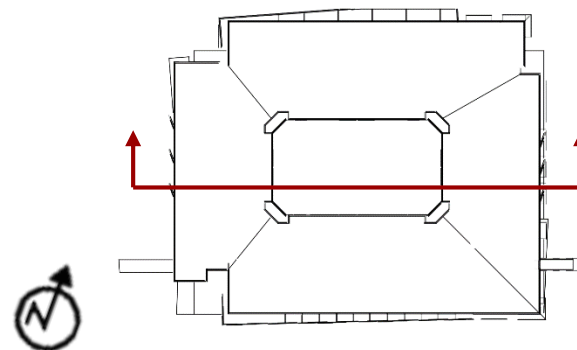
acknowledgements

# Electrical Study

## Existing System



## Proposed System





# Eastside III

Pittsburgh, PA



## INTRODUCTION

building overview | concept | scope



## LOWER LOBBY

lighting design | daylighting | acoustics



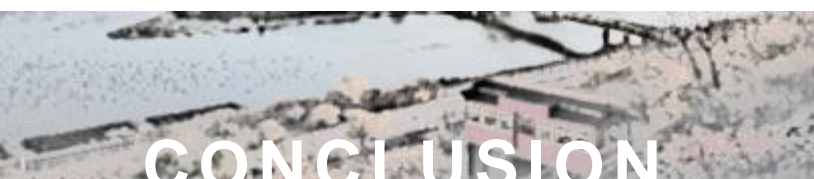
## KITCHEN+BILLIARD

lighting design



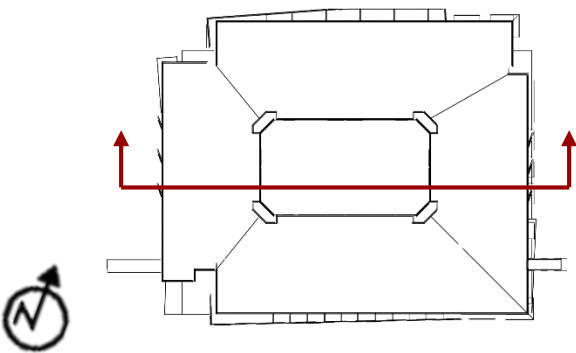
## ELECTRICAL

system redesign



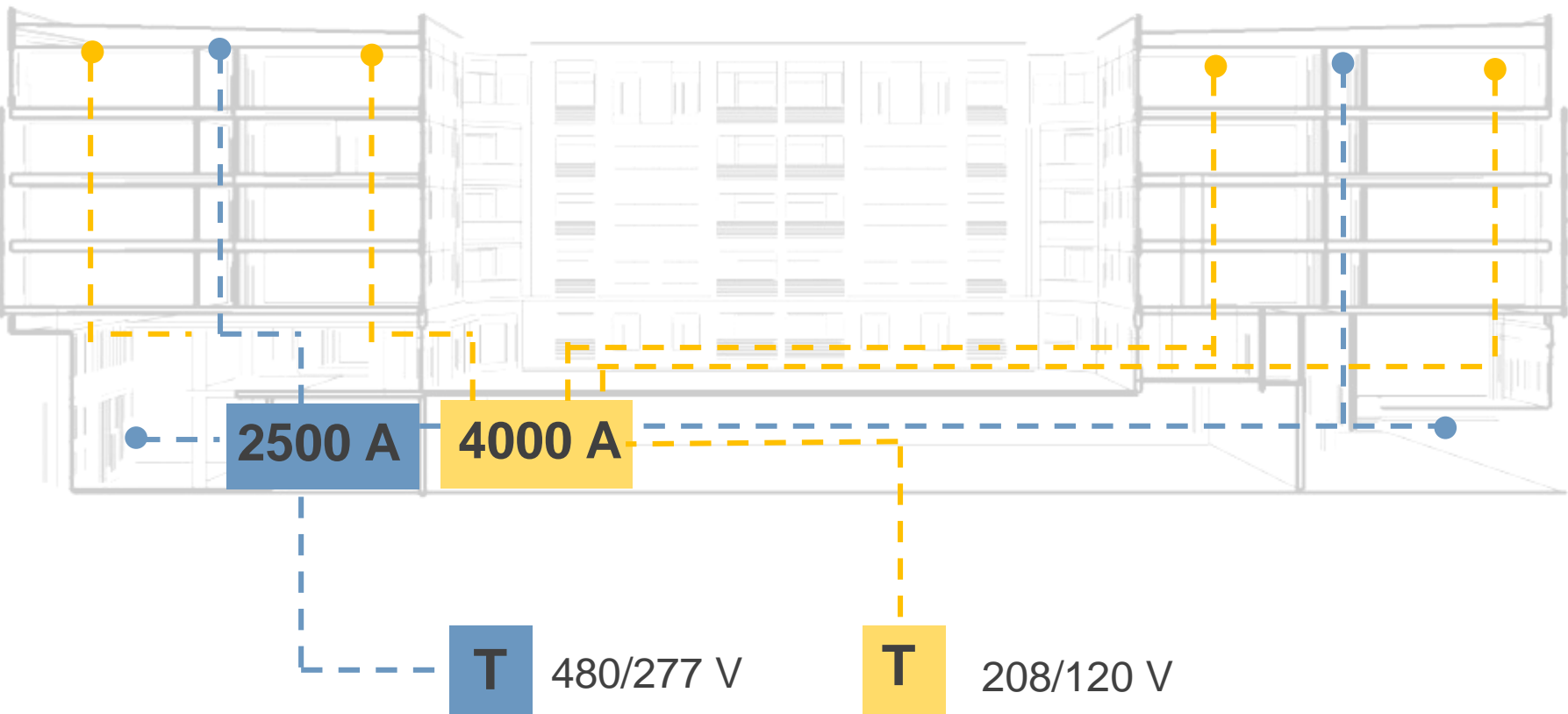
## CONCLUSION

acknowledgements

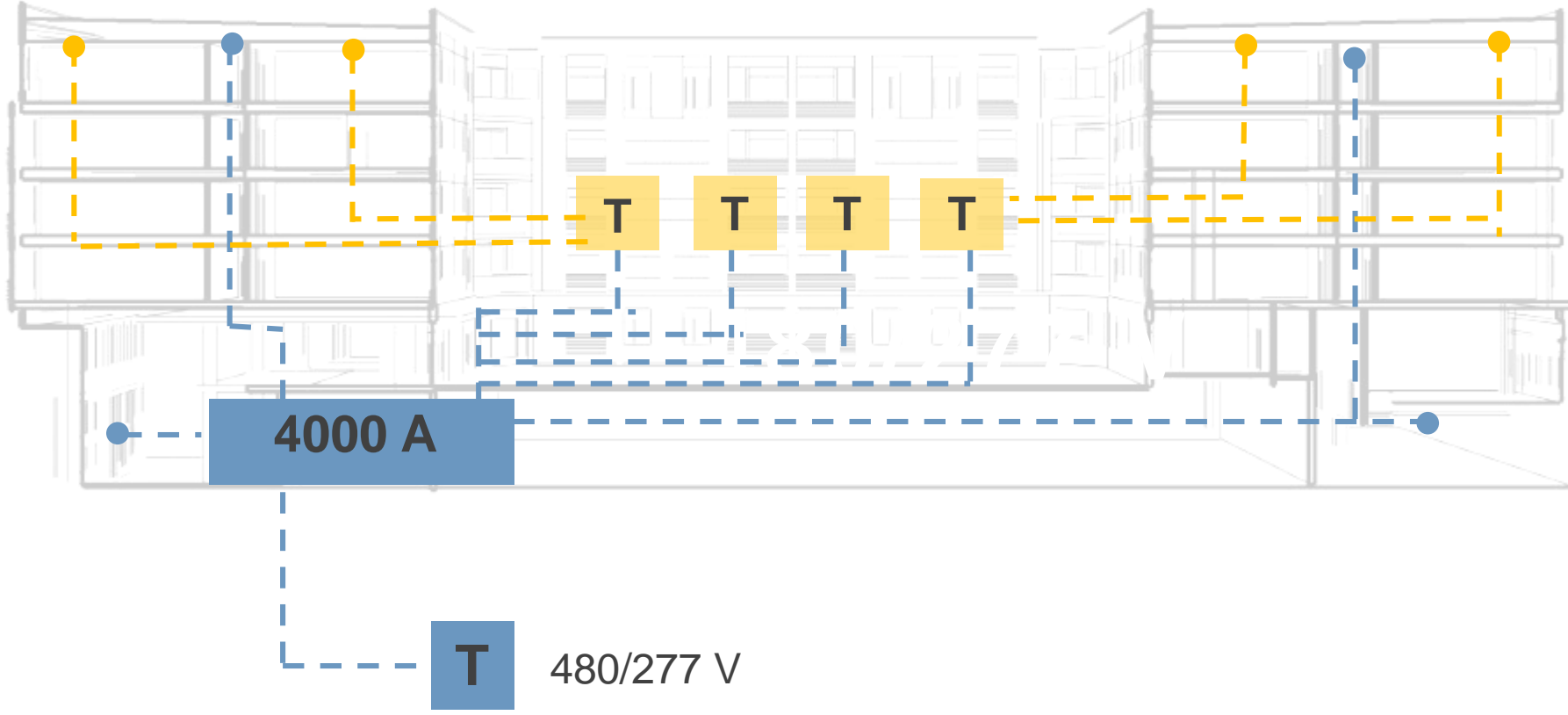


# Electrical Study

## Existing System



## Proposed System





# Eastside III

Pittsburgh, PA



## INTRODUCTION

building overview | concept | scope



## LOWER LOBBY

lighting design | daylighting | acoustics



## KITCHEN+BILLIARD

lighting design



## ELECTRICAL

system redesign



## CONCLUSION

acknowledgements

# Electrical Study

## Design Steps

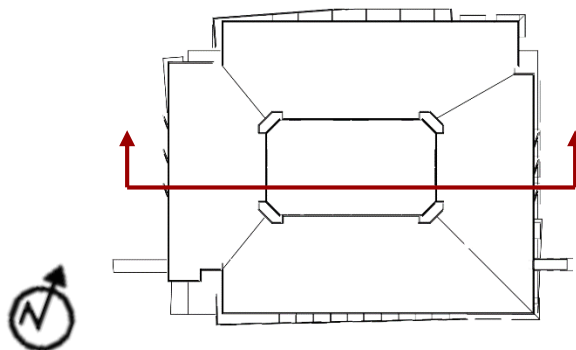
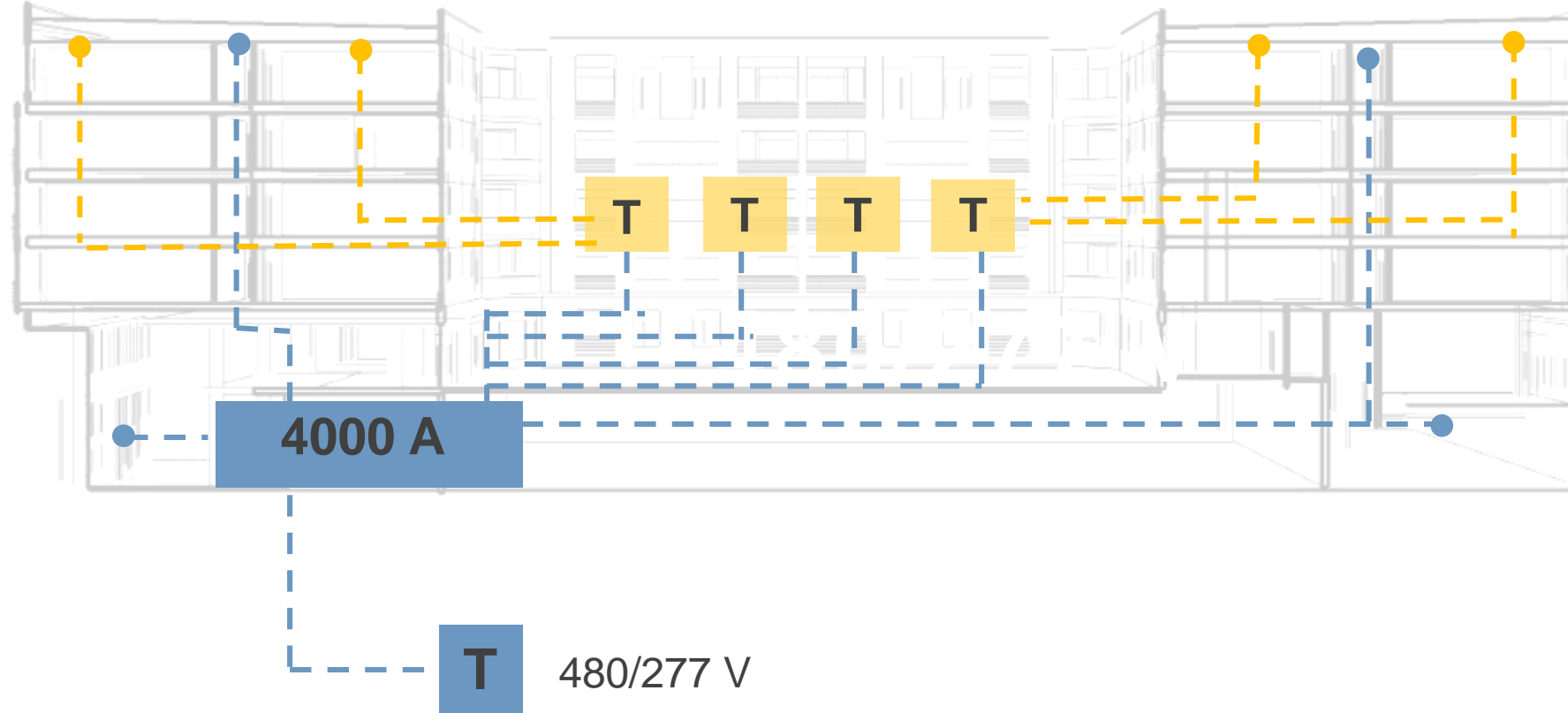
Size new transformers – 500 kVA

Size new feeder, ground + conduit

Size new switchboard – 4000 A

Cost Comparison

## Proposed System





# Eastside III

Pittsburgh, PA

# Electrical Study



## INTRODUCTION

building overview | concept | scope



## LOWER LOBBY

lighting design | daylighting | acoustics



## KITCHEN+BILLIARD

lighting design



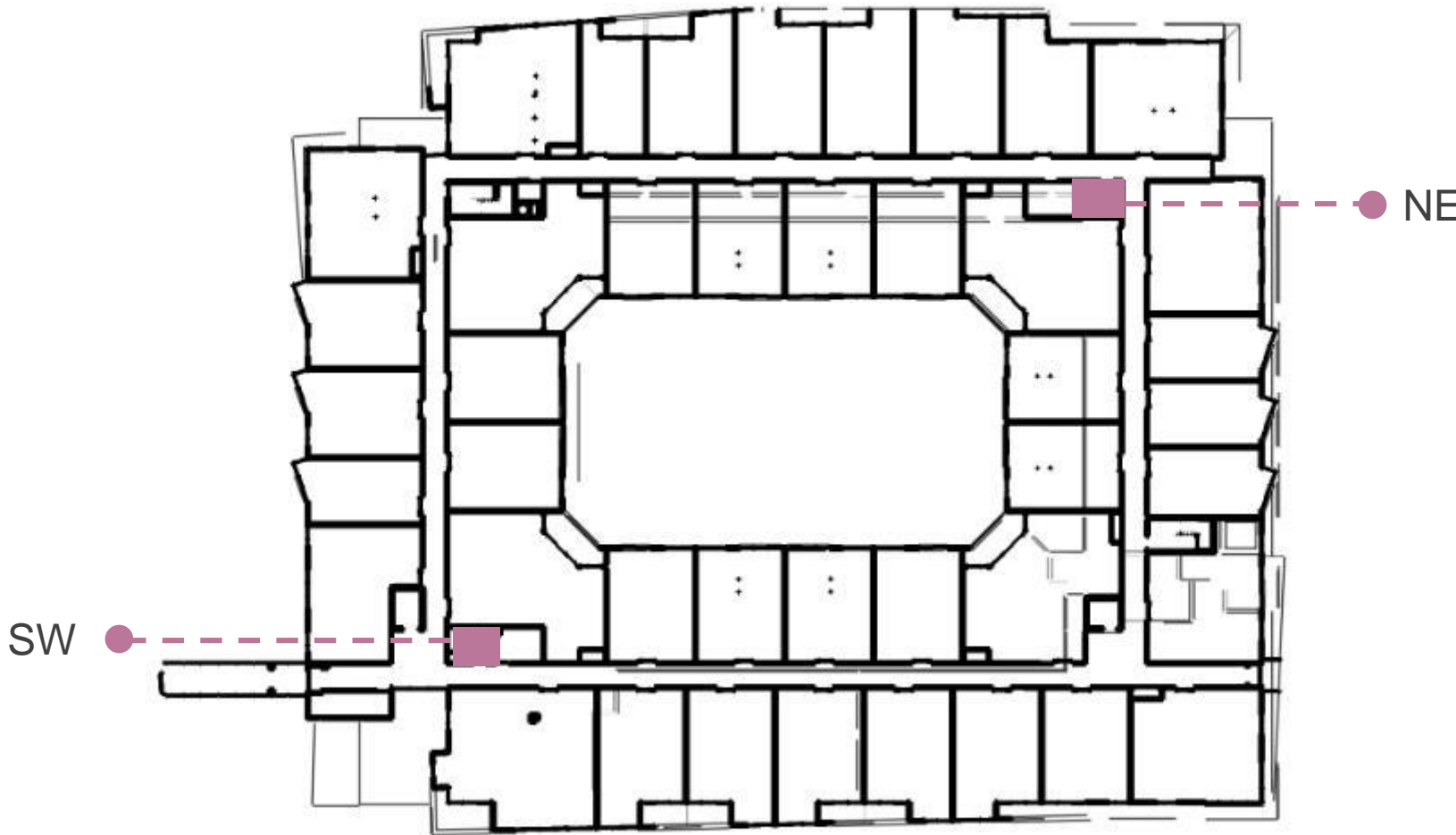
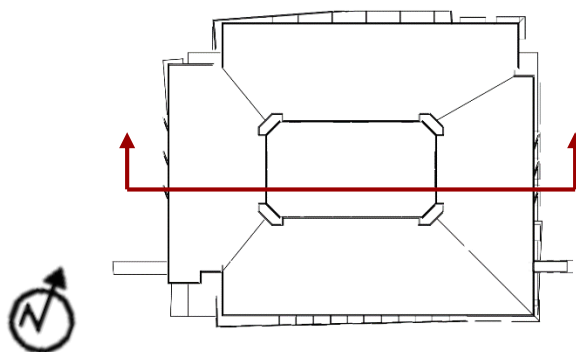
## ELECTRICAL

system redesign



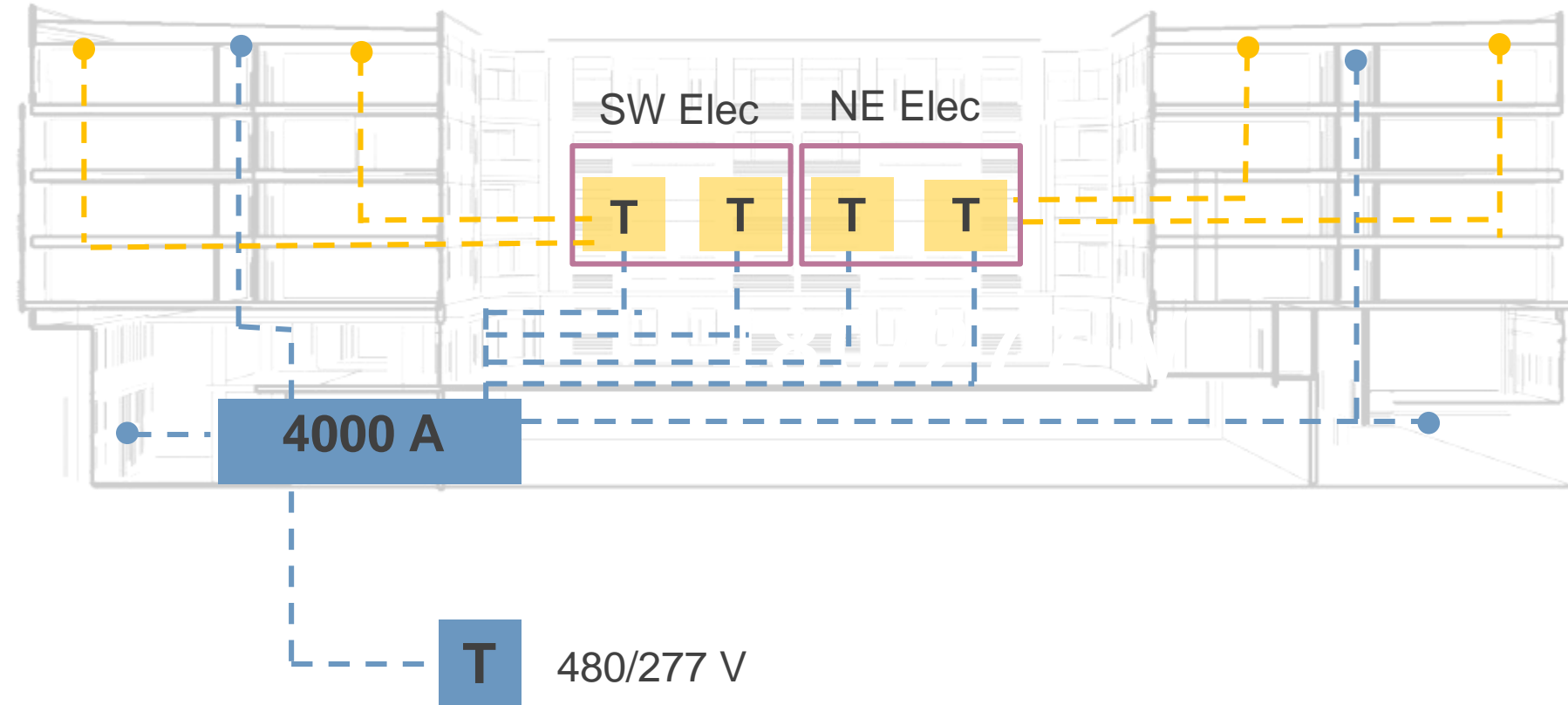
## CONCLUSION

acknowledgements



second floor

## Proposed System





# Eastside III

Pittsburgh, PA

# Electrical Study



## INTRODUCTION

building overview | concept | scope



## LOWER LOBBY

lighting design | daylighting | acoustics



## KITCHEN+BILLIARD

lighting design



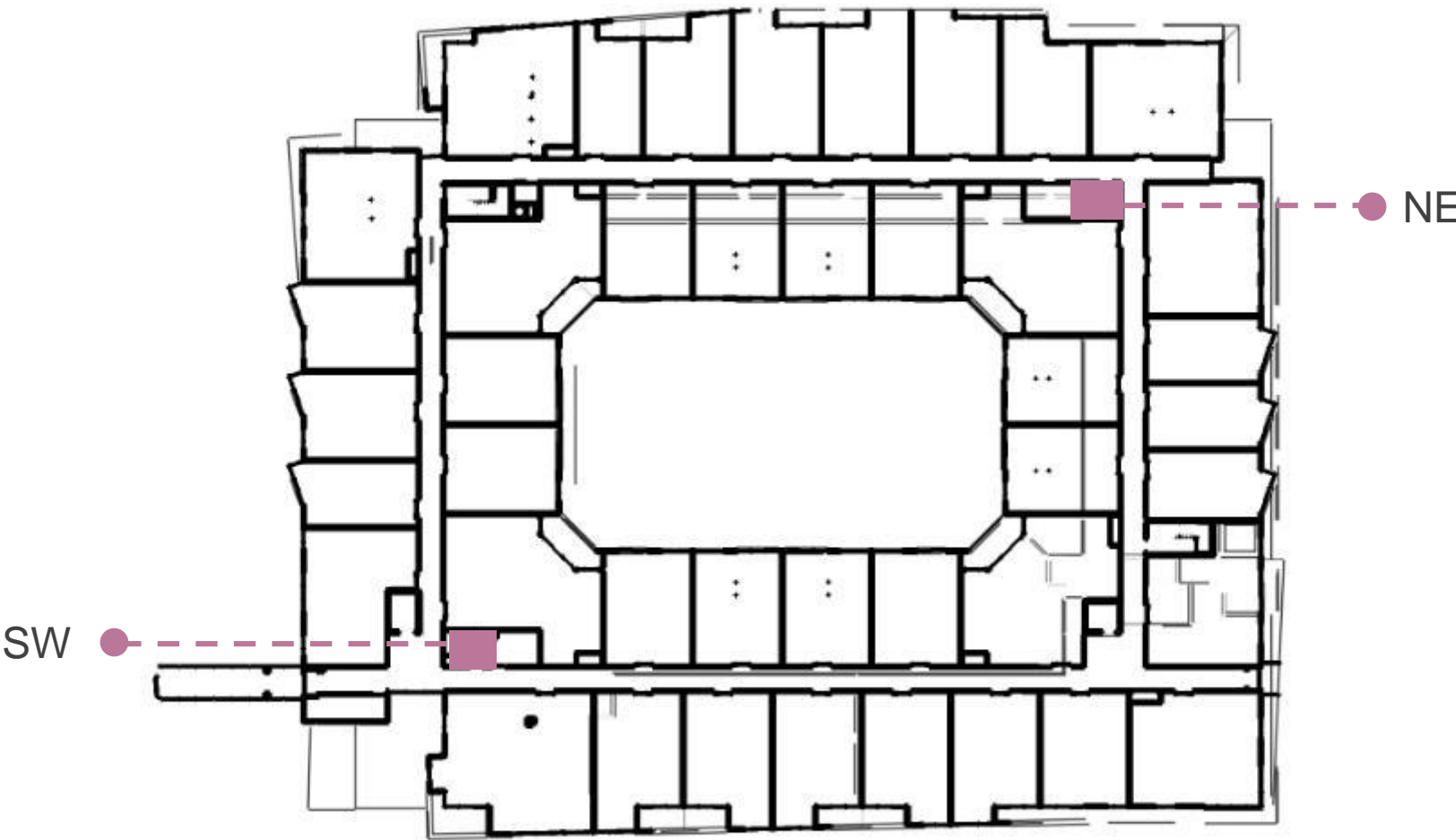
## ELECTRICAL

system redesign



## CONCLUSION

acknowledgements



second floor

## Considerations

Additional Program Space

Additional Cooling to Electrical Room

Acoustical Concerns – borders residential unit



# Eastside III

Pittsburgh, PA



## INTRODUCTION

building overview | concept | scope



## LOWER LOBBY

lighting design | daylighting | acoustics



## KITCHEN+BILLIARD

lighting design



## ELECTRICAL

system redesign

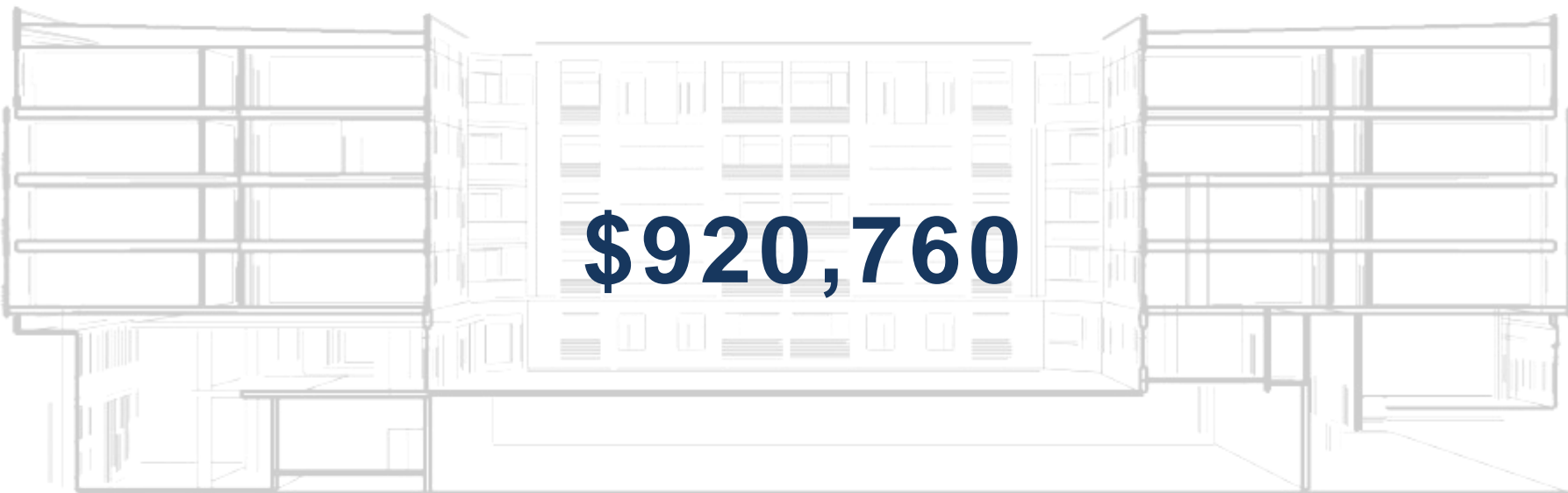


## CONCLUSION

acknowledgements

# Electrical Study

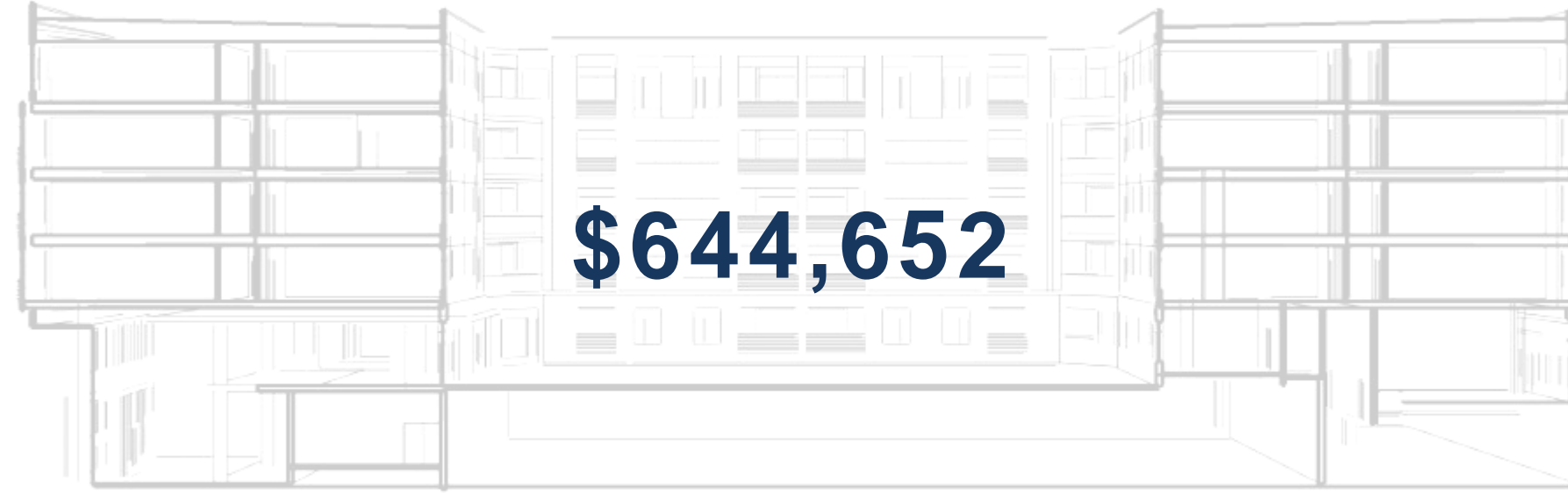
## Existing System \$



480/277 V

208/120 V

## Proposed System \$



480/277 V

## Cost Considerations

Feeders, ground + conduit

Transformers

Switchboards



# Eastside III

Pittsburgh, PA



## INTRODUCTION

building overview | concept | scope



## LOWER LOBBY

lighting design | daylighting | acoustics



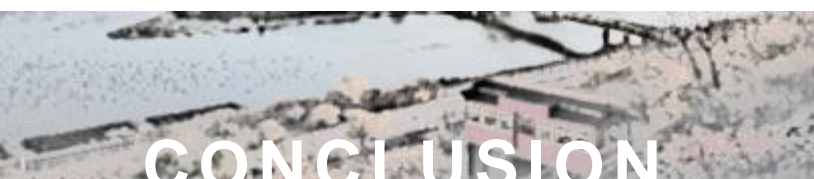
## KITCHEN+BILLIARD

lighting design



## ELECTRICAL

system redesign

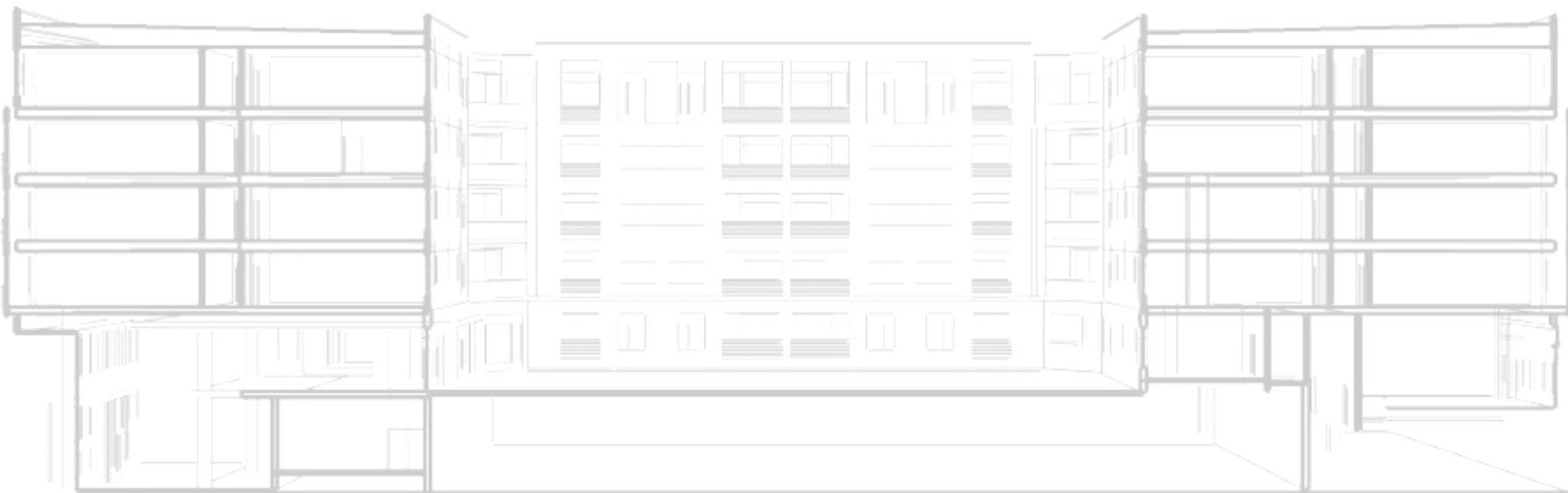


## CONCLUSION

acknowledgements

# Electrical Study

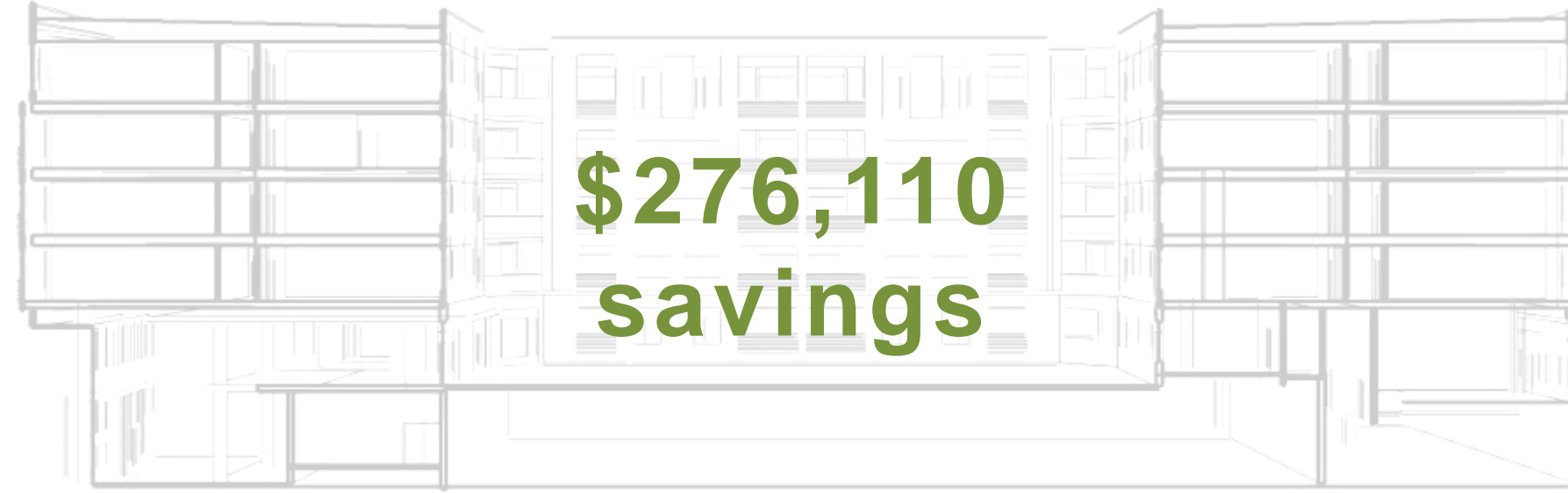
## Existing System \$



480/277 V

208/120 V

## Proposed System \$



**\$276,110  
savings**

480/277 V

## Cost Considerations

Feeders, ground + conduit

Transformers

Switchboards



# Eastside III

Pittsburgh, PA

# INTRODUCTION

building overview | concept | scope

# LOWER LOBBY

lighting design | daylighting | acoustic

# KITCHEN+BILLIARD

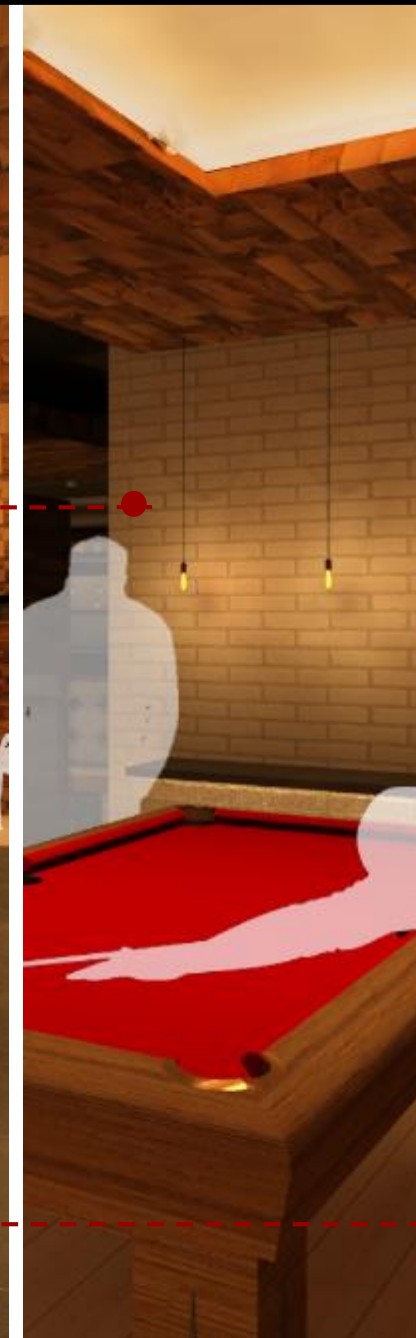
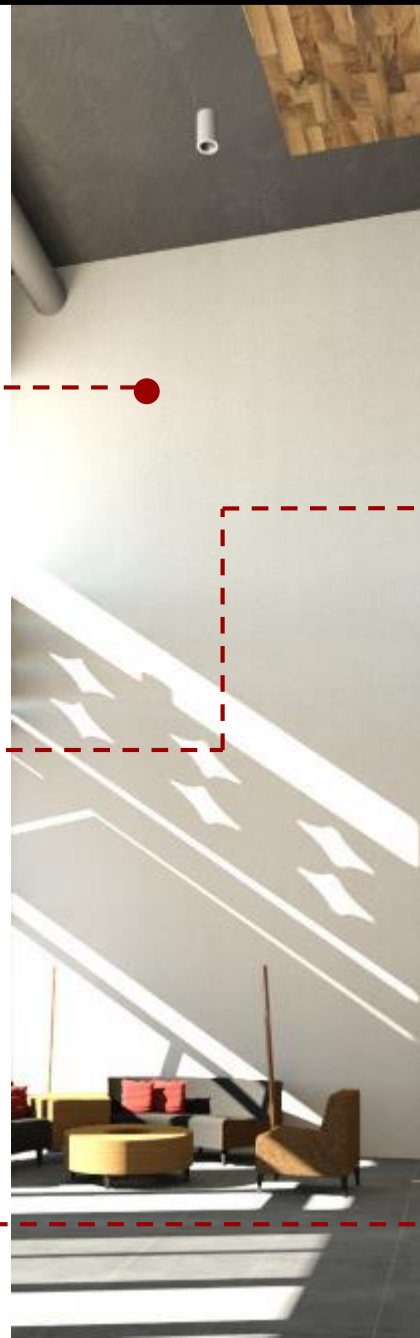
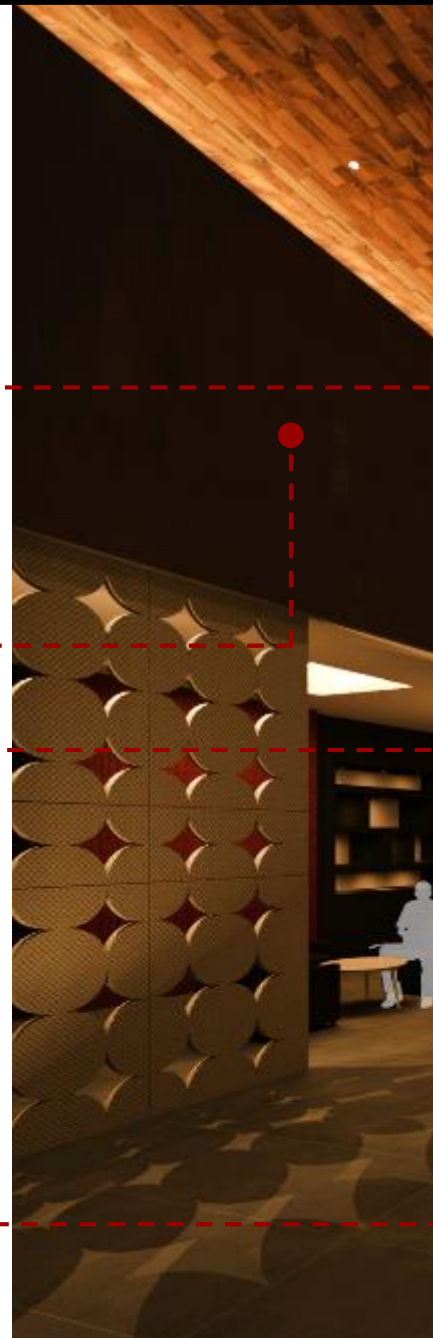
lighting design

# ELECTRICAL

system redesign

# CONCLUSION

## acknowledgements



## Special Thanks!

## AE Department

Dr. Houser

Dr. Mistrick

John Reese

# Ross Weinreb

## Professionals

# The Mosites Company

P.J. Dick, Inc.

## My family, friends + AE family

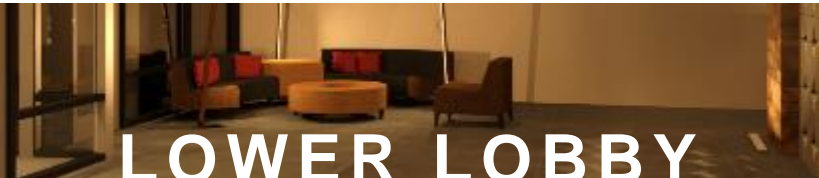


# Eastside III

Pittsburgh, PA



building overview | concept | scope



lighting design | daylighting | acoustics



lighting design



system redesign



acknowledgements

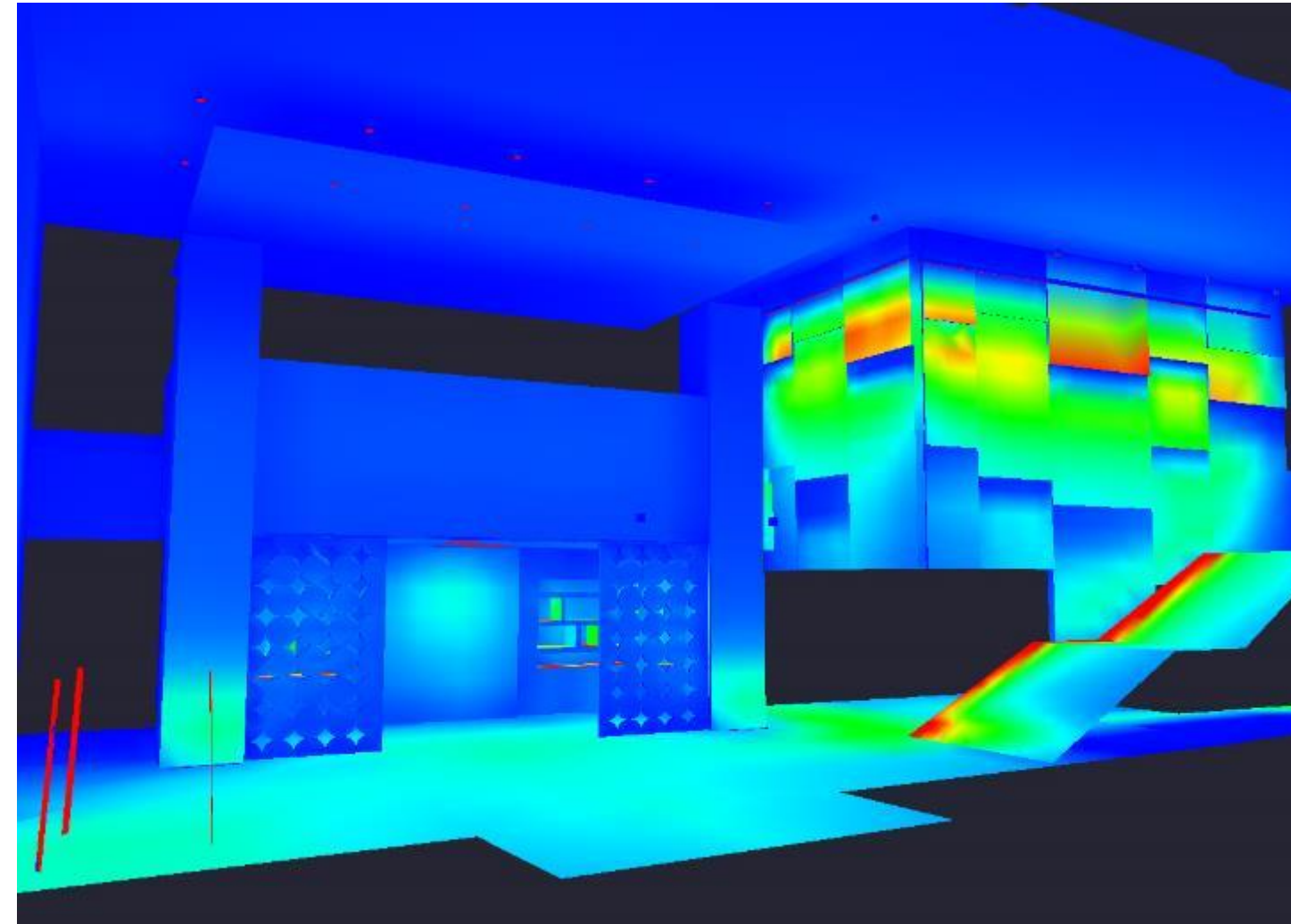


## Illuminance Summary:

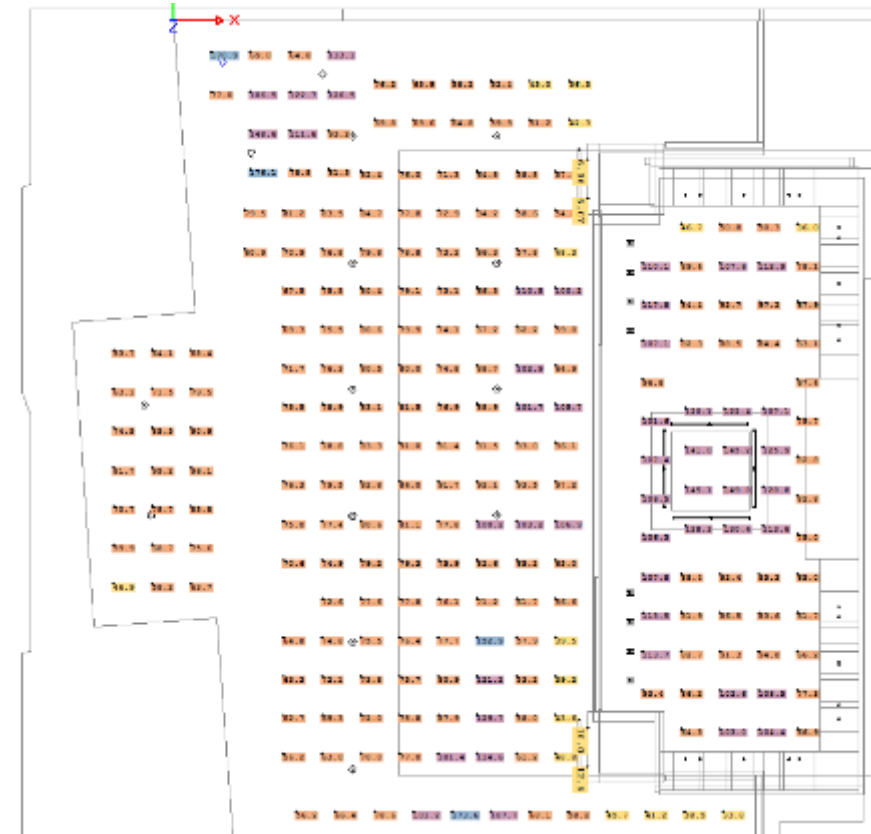
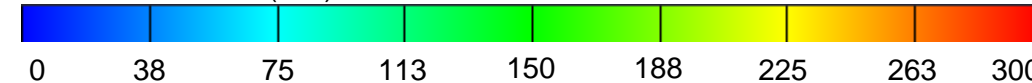
Space	Task	Recommended Avg. Illuminance (lux)	Achieved (lux)	Recommended Avg./Min	Achieved Avg./Min
Lower Level Lobby	Circulation: General, Day	100	124	4:1	2.5
	Circulation: General, Night	50	see note		-
	Lounge: Reading/Work Areas on Table	150	125	-	1.7
Entertainment Lounge	Lounge: Reading/Work	150	116	-	1.45
Vestibule	Entry, Low Activity: Day	75	73	-	1.5
	Entry, Low Activity: Night	40	see note	-	-

## Lighting Power Density Calculation:

Fixture Type	Total Fixtures	Watts/ Fixture	Total Watts (W)	Area (sf)
L1B	4	10	40	1250
L2B	13	10	130	
L3	12	8.5 W/ft	408	
L4	2	13	26	
L5	3	19.8	59.4	
L6	8	7	56	
L7	6	4 W/ft	96	
L8	48	2.5	120	
			Calculated W/sf	0.748
			Allowed W/sf	1.3
			Pass?	YES
			% below ASHRAE?	42%



Illuminance Scale (Lux)



Illuminance Calculation Key	
Colors	Range (lux)
Yellow	0 - 50
Orange	50 - 100
Purple	100 - 150
Blue	150 - 200
Red	200 - 250

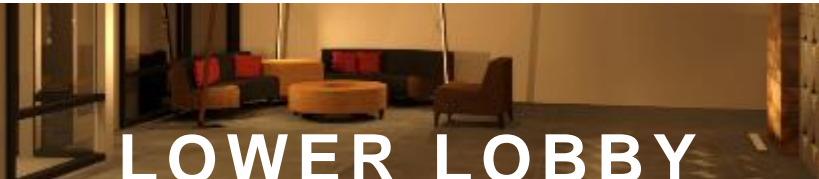


# Eastside III

Pittsburgh, PA



building overview | concept | scope



lighting design | daylighting | acoustics



lighting design



system redesign



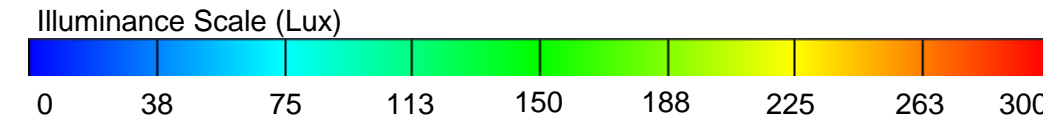
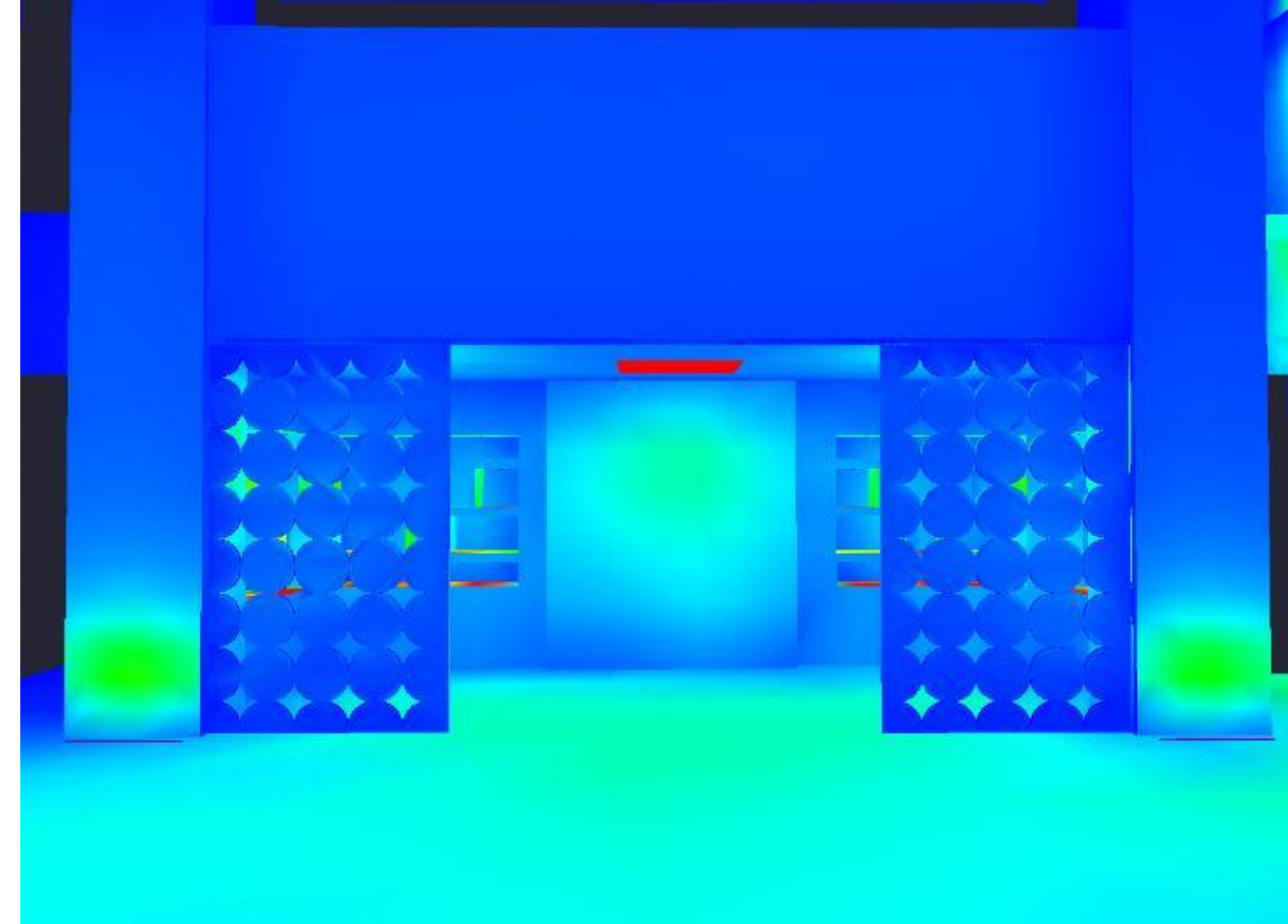
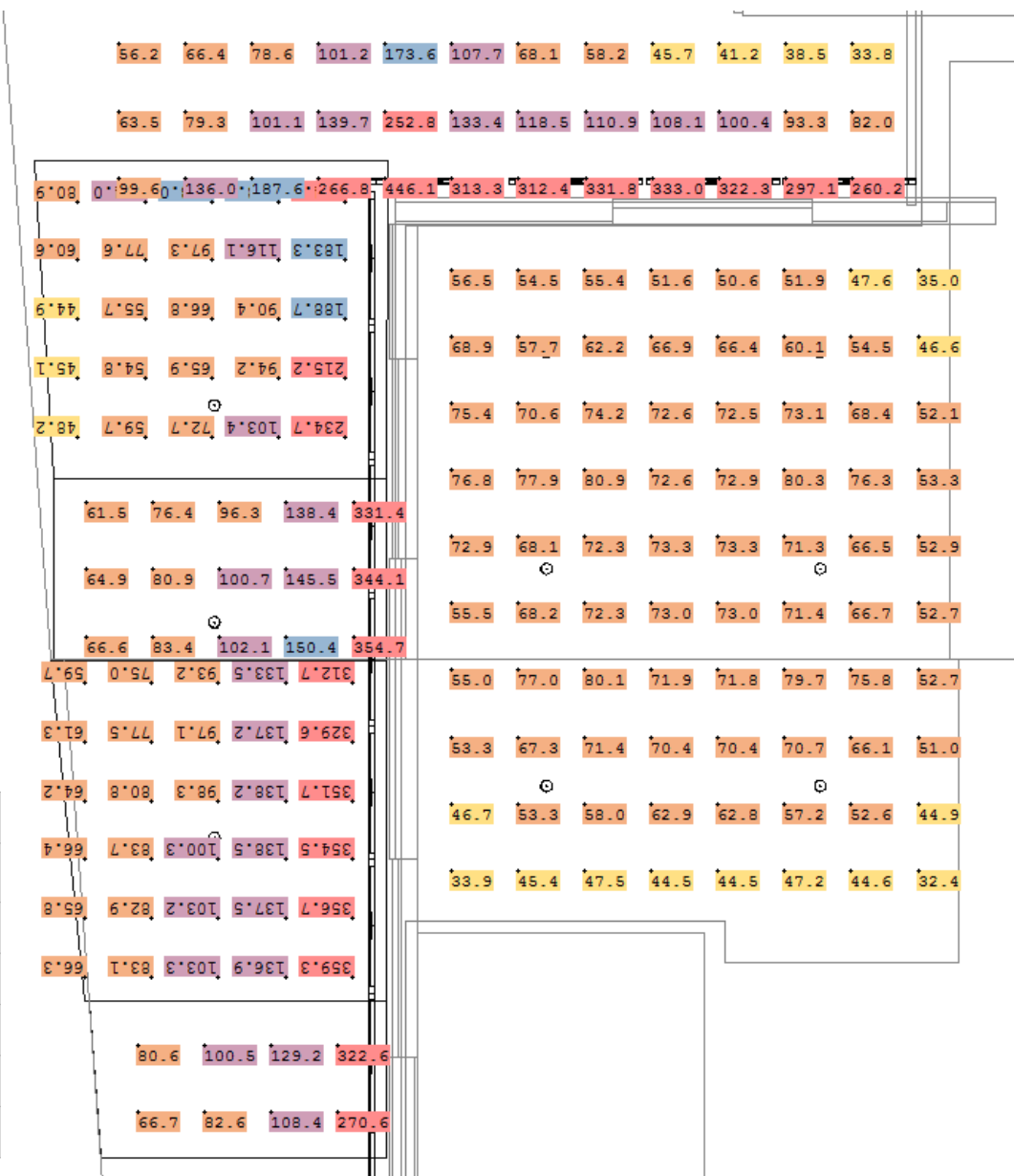
acknowledgements

## Fixture Selection

Type	Description	Manufacturer	Count	Mounting	Lamp	Wattage
L1B	4" Open Downlight, Med-Wide Beam, Specular finish, Clear Aperature and trim, Dimmable	Gotham 4" Evo Downlight	4	Recessed Downlight	LED, 2700K, 750 lms	10 W
L2B	4" Open Cylinder Downlight, 30° Beam, Specular finish, Clear Aperature and trim, Dimmable	Gotham 4" Incito Cylinder	13	Suspended Cylinder Downlight	LED, 2700K, 750 lms	10 W
L3	4' Pendant Asymmetric Wallwasher, 10x30 Bi-Symmetric Optic, Regular Output, Dimmable	Lumenpulse Lumenfacade	12	Suspended Linear Grazer	LED, 3000K, 1730 lms	8.5 W/ft
L4	In-Ground LED Floodlight, Symmetric Distribution	Bega In-Ground	2	Recessed In-Ground	LED, 3000K, 685 lms	13 W
L5	6' Tall Linear LED, Walnut finish, Powder-coated mattle black steel base	Stickbulb 6ft Floor Torch	3	Floor Lamp	LED, 2700K, 397 lms	19.8 W

Type	Description	Manufacturer	Count	Mounting	Lamp	Wattage
L6	3" Square LED Downlight, Adjustable, 40° Beam Distribution, Dimmable	Lumenpulse Lumenalpha Downlight	8	Recessed Downlight	LED, 2700K, 700 lms	7 W
L7	4' Surface-mount, Asymmetric Uplight, Softening Lens, White finish, Dimmable	LF Illumination EF600 Series	6	Surface Mount Cove Uplight	LED, 2700K, 400 lm/ft	4 W/ft
L8	1.7" Small Scale LED Downlight, Machined Aluminum, Dimmable	Lucifer PUKLED Downlight	48	Recessed in shelves	LED, 2700K, 175 lms	2.5 W

Illuminance Calculation Key	
Colors	Range (lux)
	0 - 50
	50 - 100
	100 - 150
	150 - 200
	200 - 250





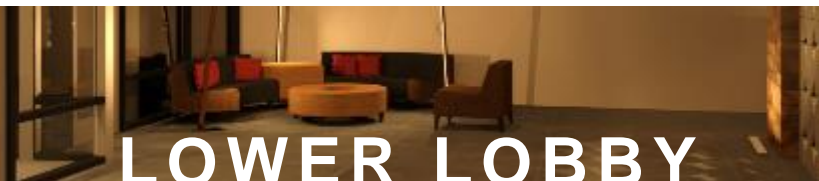
# Eastside III

Pittsburgh, PA

June 22 | 3 – 5 PM



building overview | concept | scope



lighting design | **daylighting** | acoustics



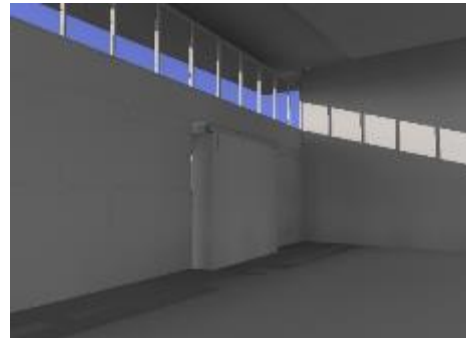
lighting design



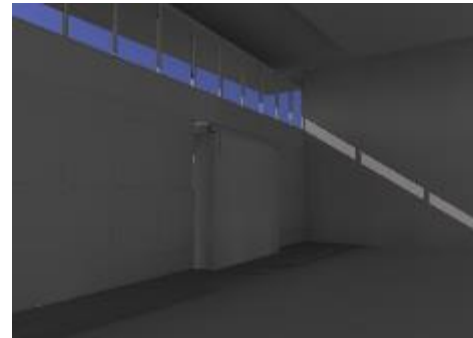
system redesign



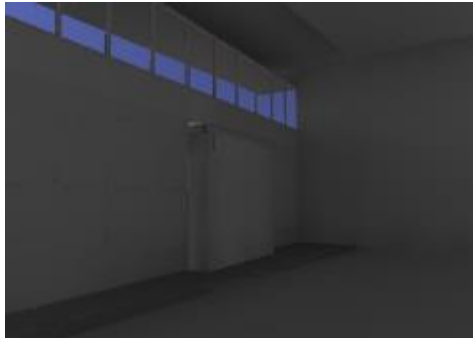
acknowledgements



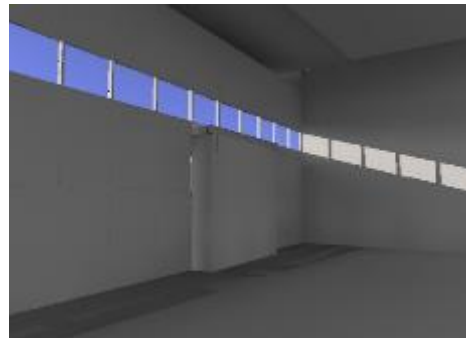
December 22, 3 PM



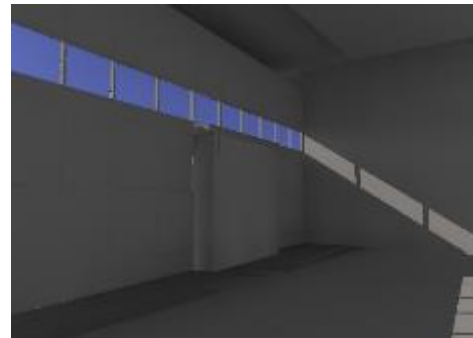
September 22, 3 PM



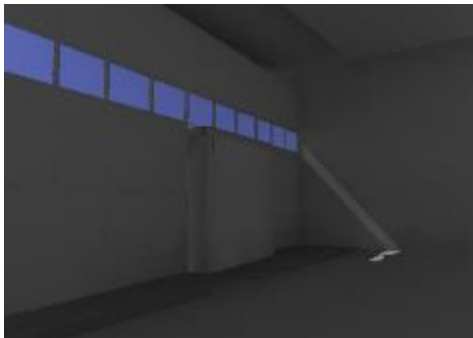
June 22, 3 PM



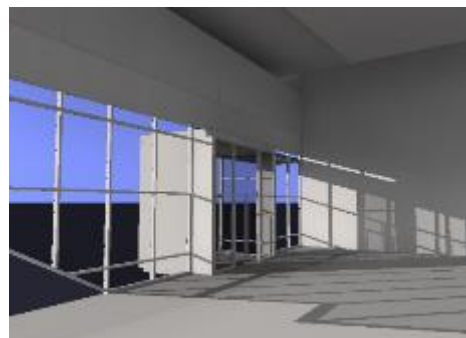
December 22, 3 PM



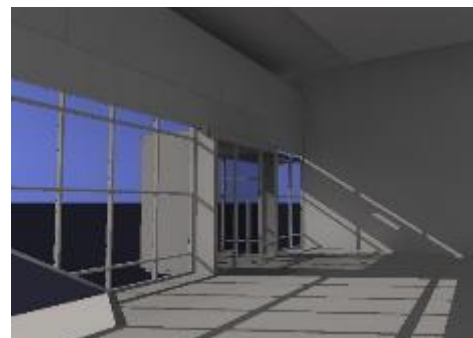
September 22, 3 PM



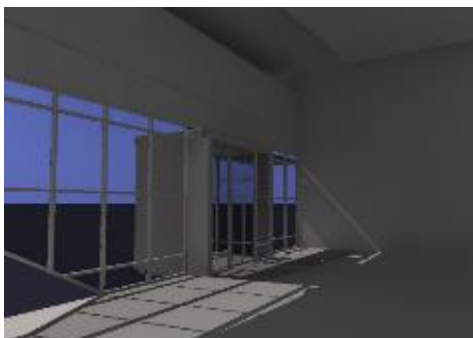
June 22, 3 PM



December 22, 3 PM



September 22, 3 PM



June 22, 3 PM

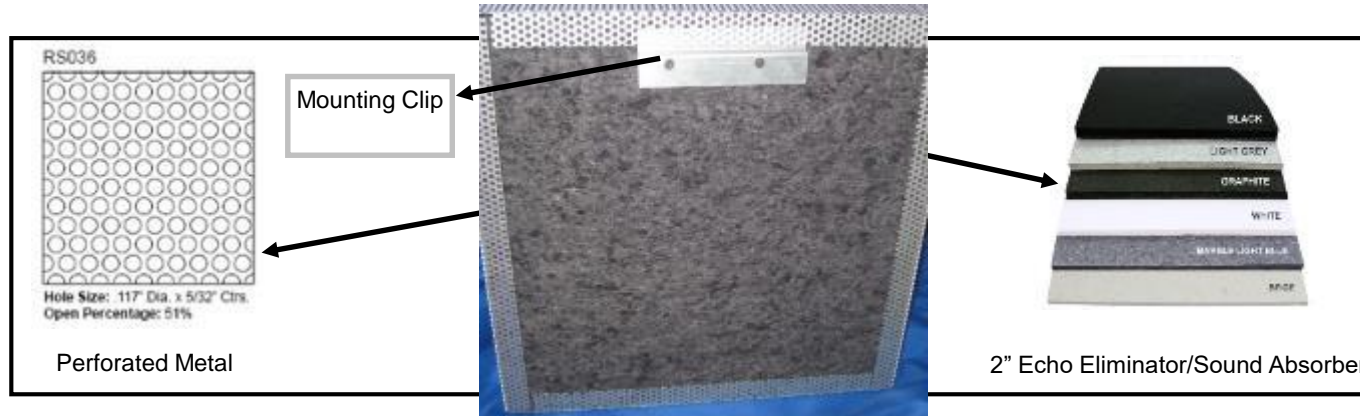
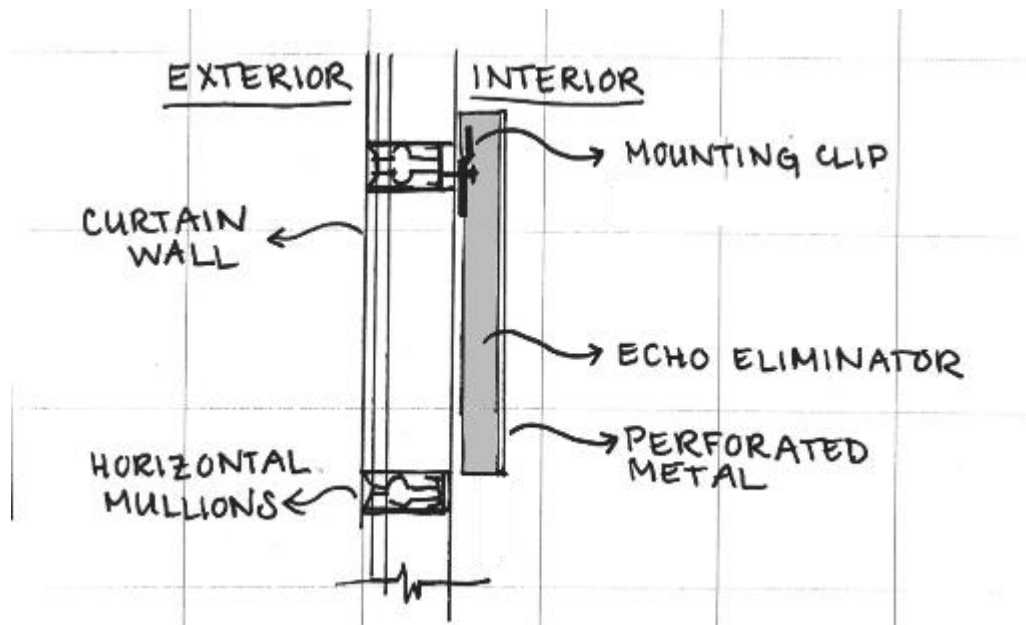


Figure 3.4 - Daylighting + Acoustical Panel Details



December 22 | 3-4 PM





# Eastside III

Pittsburgh, PA



## INTRODUCTION

building overview | concept | scope



## LOWER LOBBY

lighting design | **daylighting** | acoustics



## KITCHEN+BILLIARD

lighting design



## ELECTRICAL

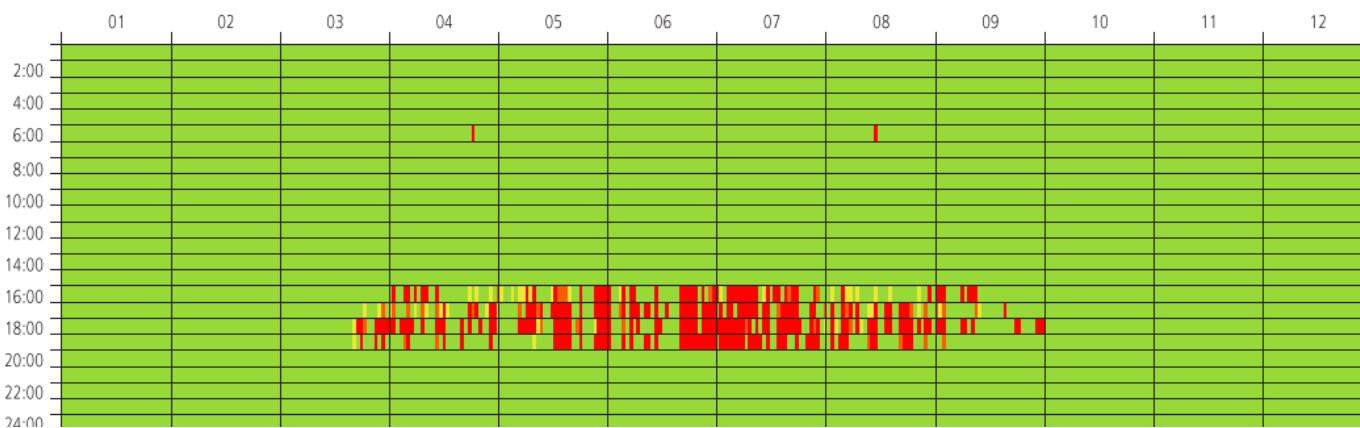
system redesign



## CONCLUSION

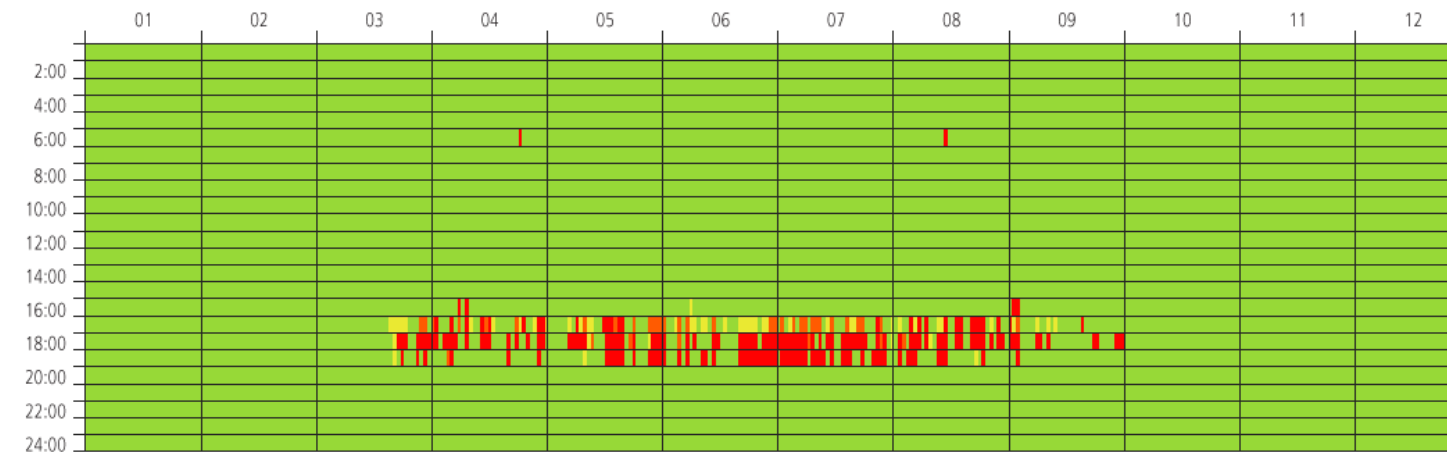
acknowledgements

### Base Case

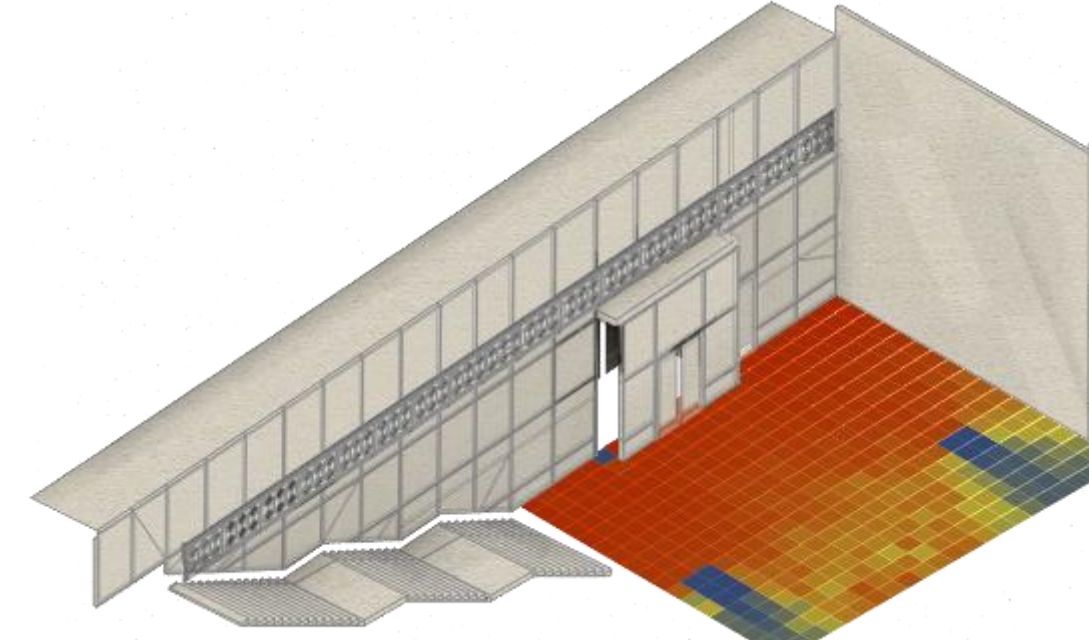
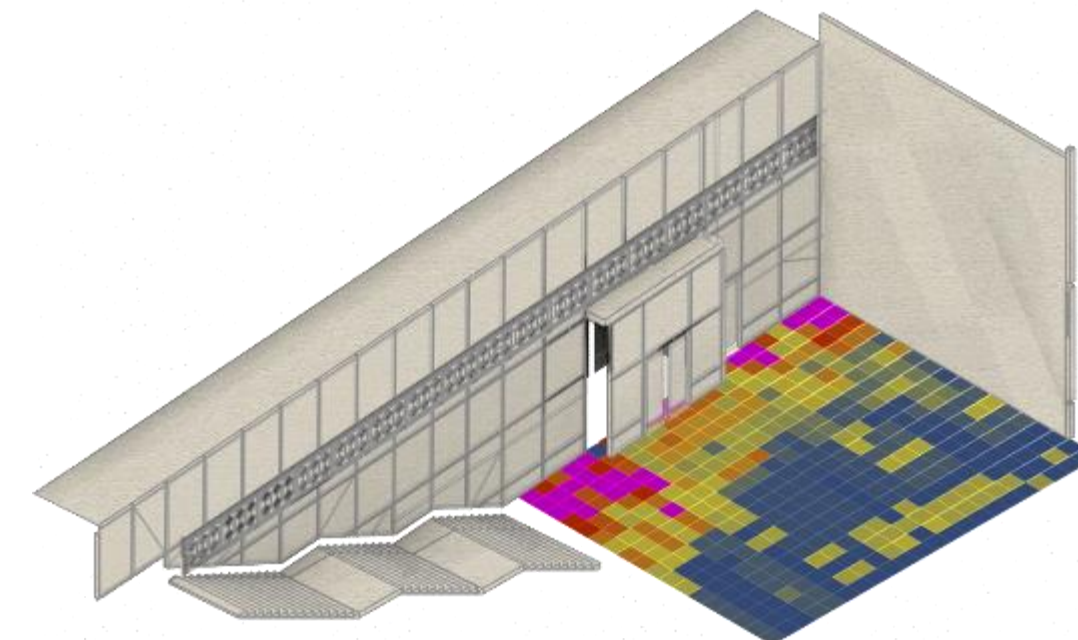
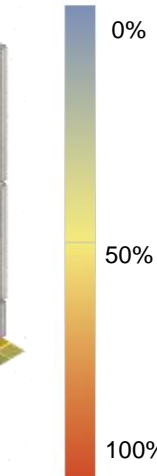
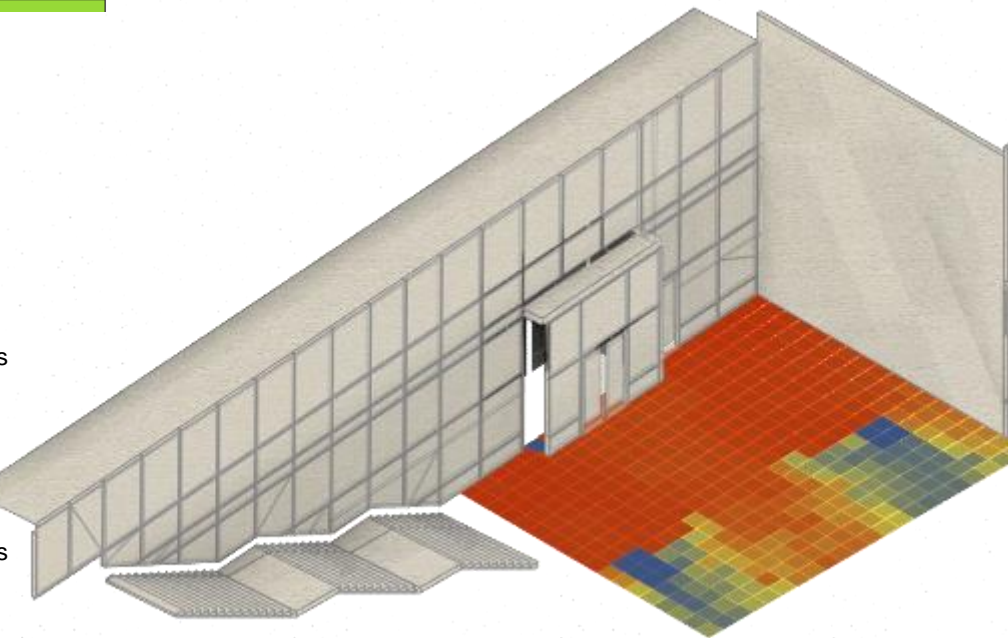
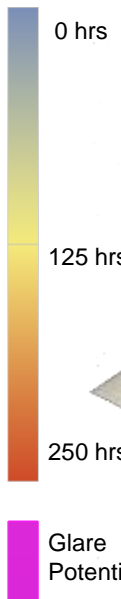
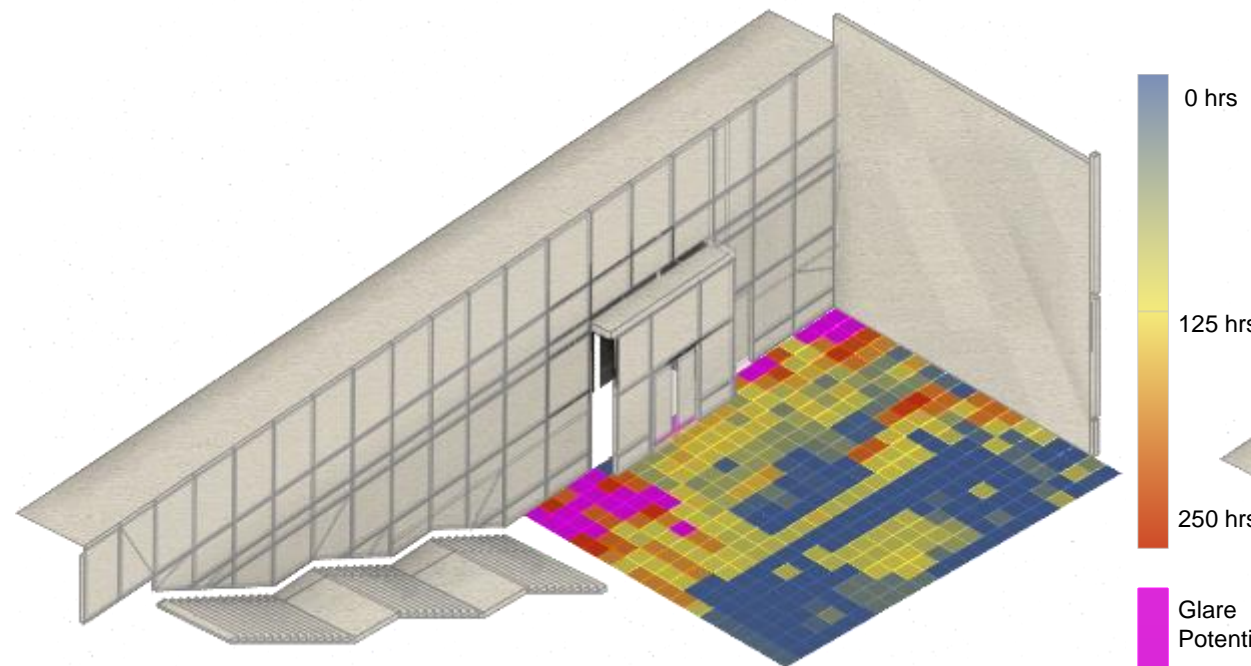


Daylight Glare Probability		
Scale	DGP (%)	# of Hours
Imperceptible Glare	< 35%	8400
Perceptible Glare	35 - 40 %	42
Disturbing Glare	40 - 45 %	37
Intolerable Glare	> 45%	281

### Panel Only



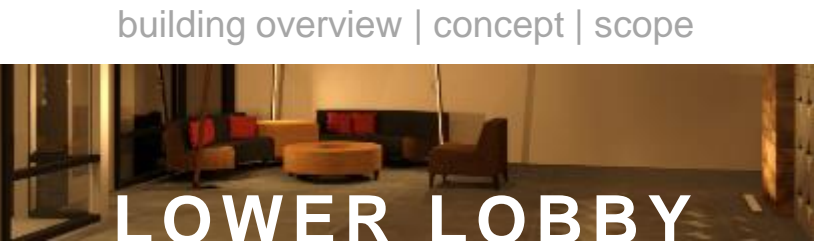
Daylight Glare Probability		
Scale	DGP (%)	# of Hours
Imperceptible Glare	< 35%	8477
Perceptible Glare	35 - 40 %	50
Disturbing Glare	40 - 45 %	39
Intolerable Glare	> 45%	194



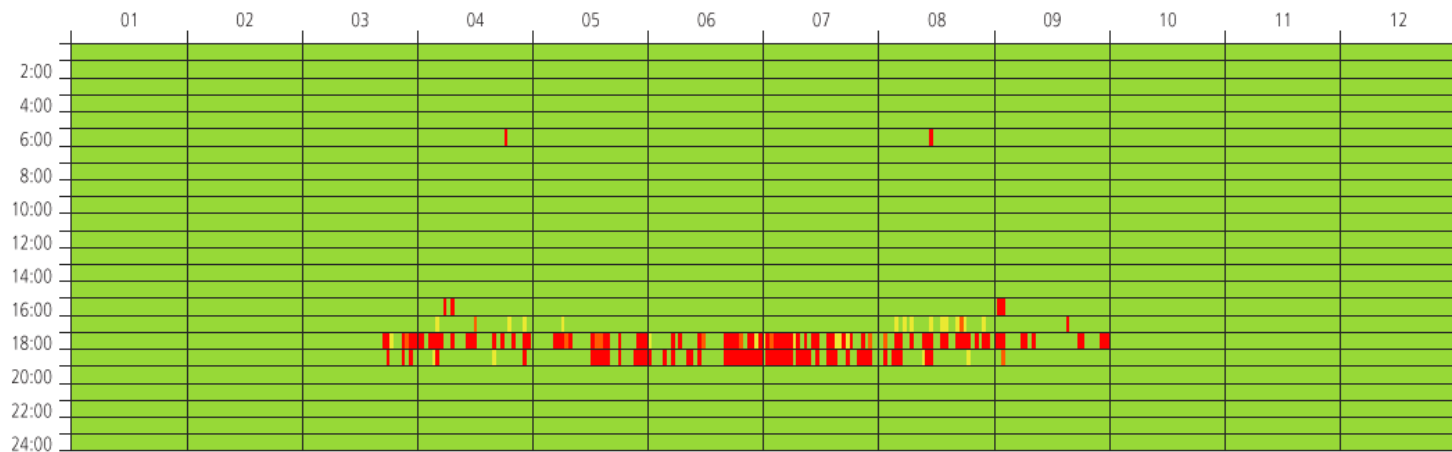


# Eastside III

Pittsburgh, PA

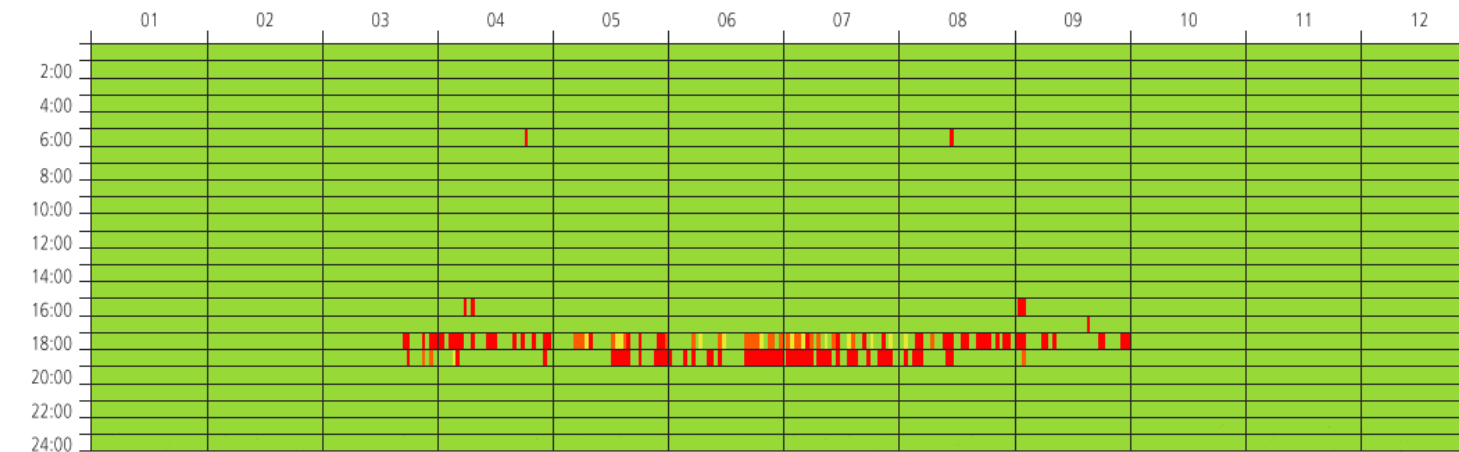


Panel + 0.47 Tvis

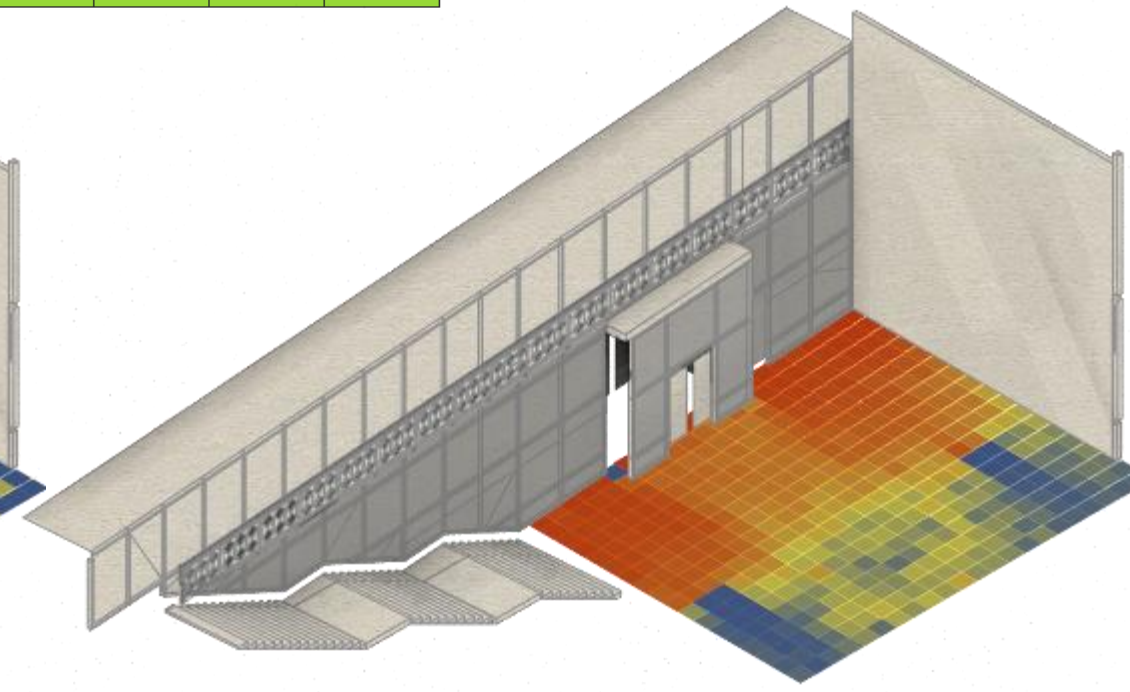
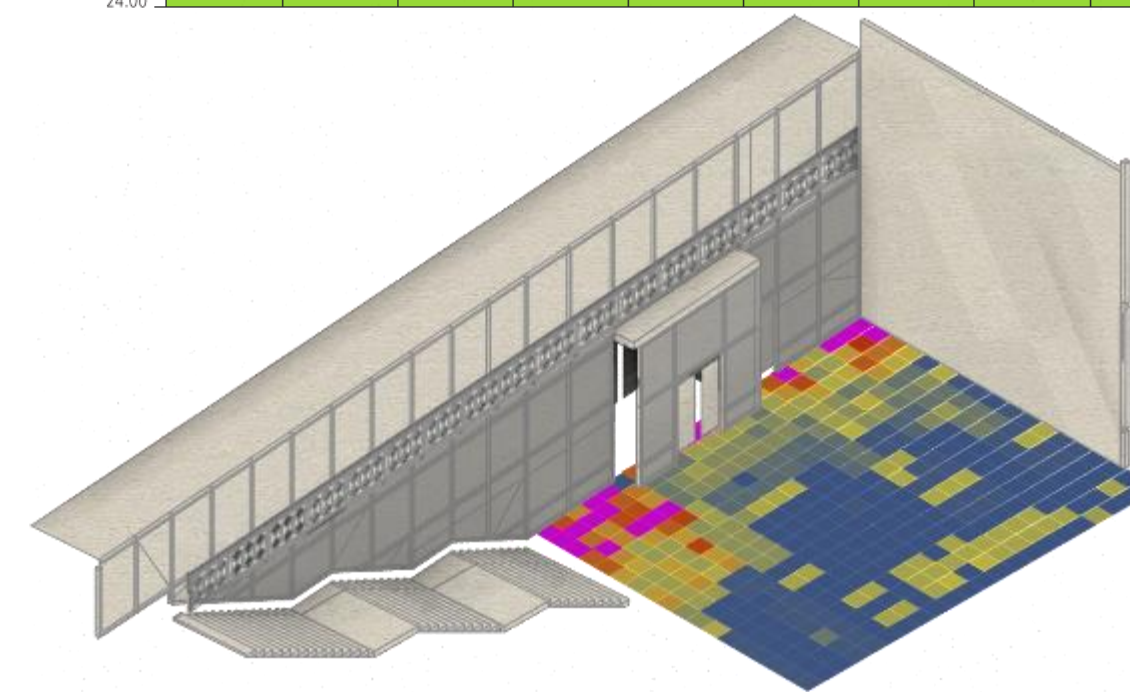
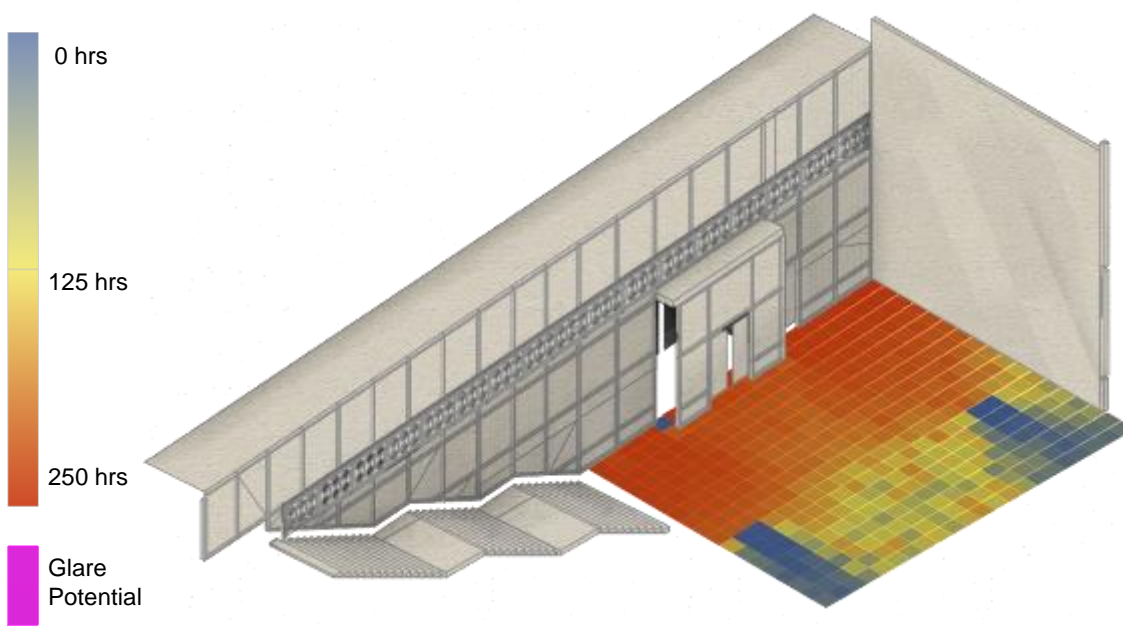
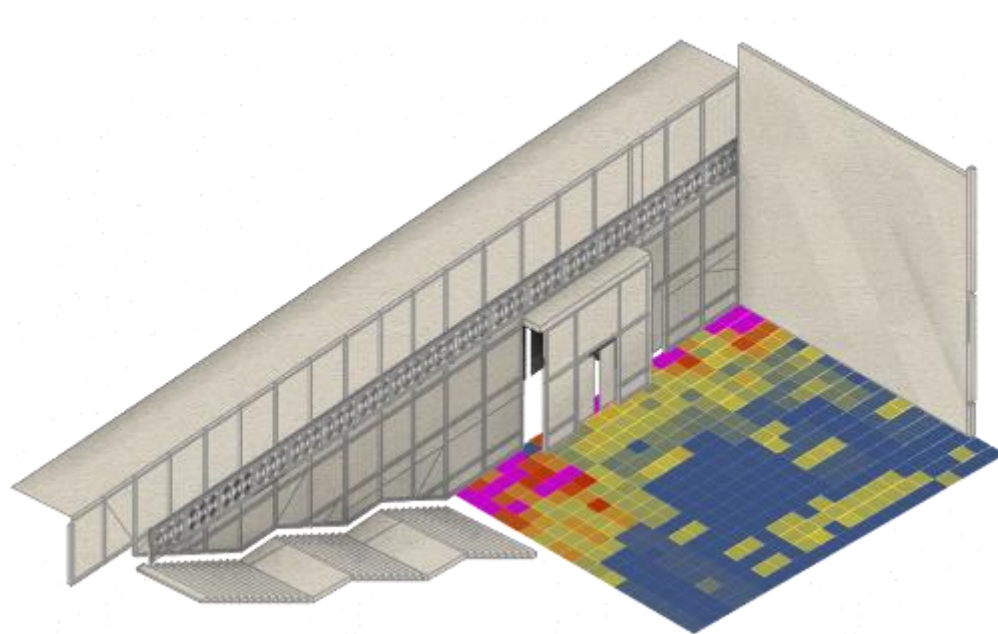


Daylight Glare Probability		
Scale	DGP (%)	# of Hours
Imperceptible Glare	< 35%	8577
Perceptible Glare	35 - 40 %	25
Disturbing Glare	40 - 45 %	12
Intolerable Glare	> 45%	146

Panel + 0.38 Tvis



Daylight Glare Probability		
Scale	DGP (%)	# of Hours
Imperceptible Glare	< 35%	8604
Perceptible Glare	35 - 40 %	14
Disturbing Glare	40 - 45 %	26
Intolerable Glare	> 45%	116





# Eastside III

Pittsburgh, PA



## INTRODUCTION

building overview | concept | scope



## LOWER LOBBY

lighting design | daylighting | acoustics



## KITCHEN+BILLIARD

lighting design



## ELECTRICAL

system redesign



## CONCLUSION

acknowledgements

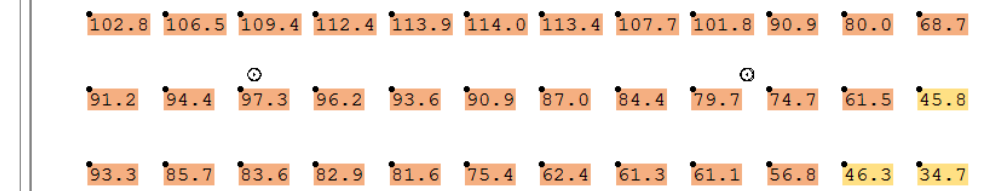
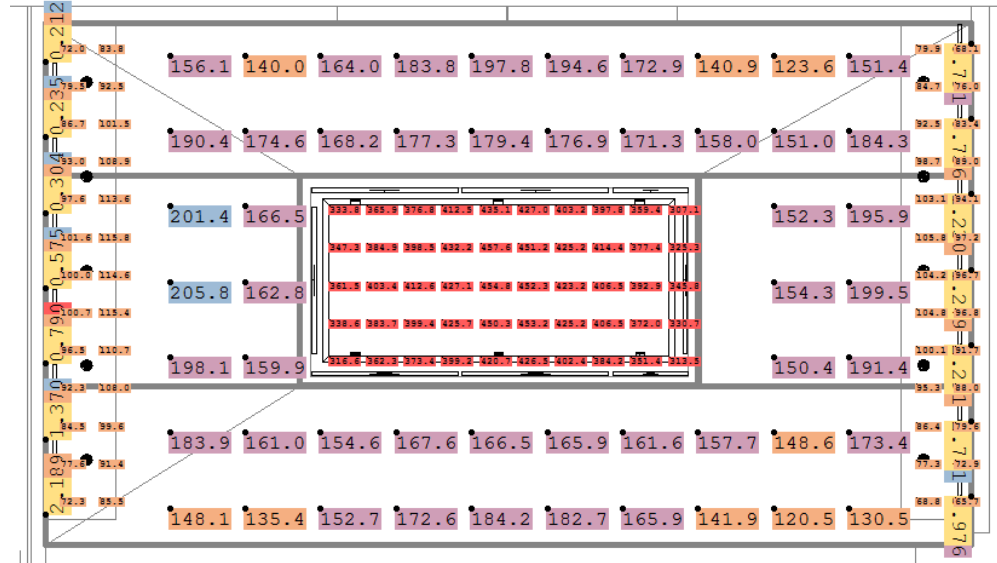
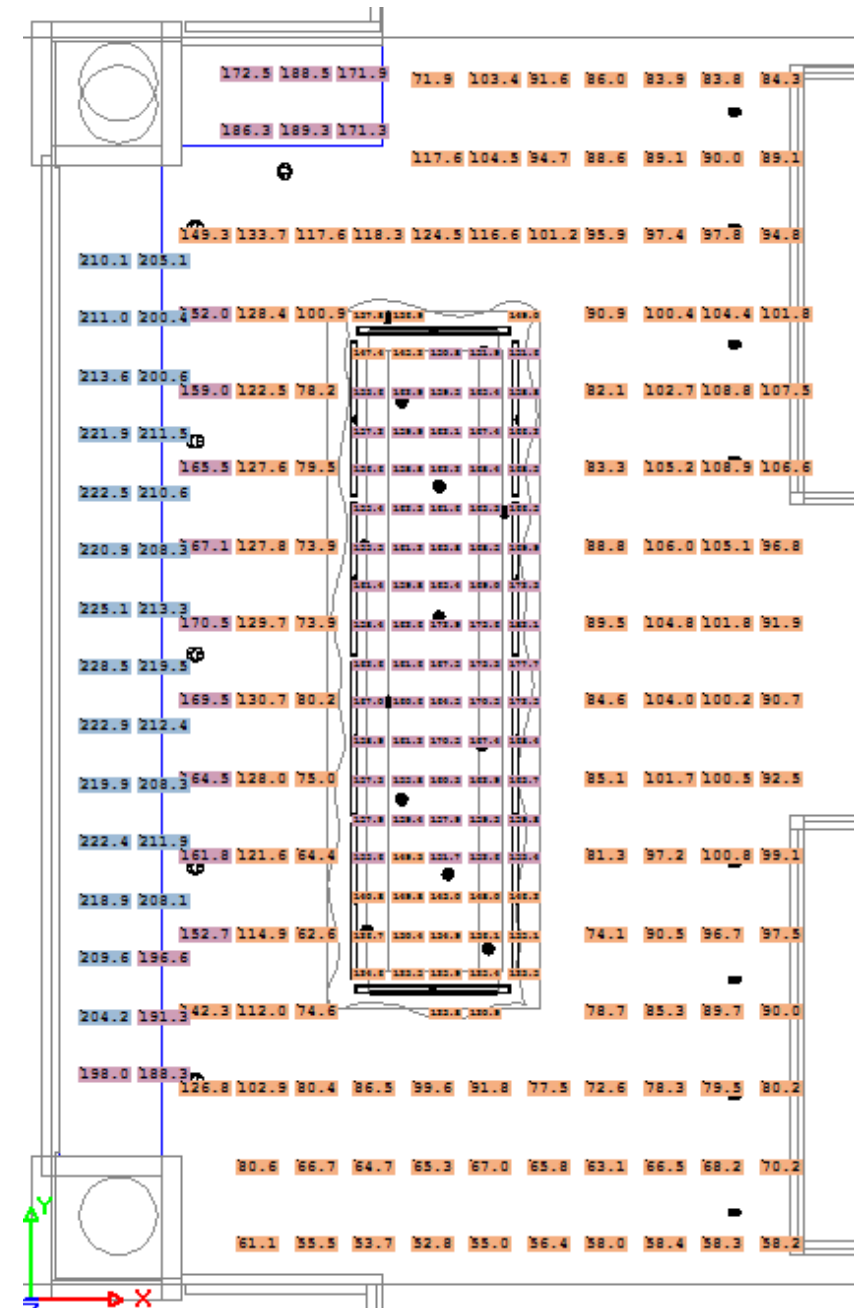
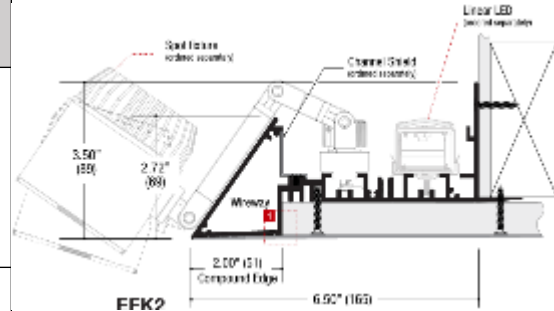
## Fixture Selection

### Billiard

Type	Description	Manufacturer	Count	Mounting	Lamp	Wattage
-	Recessed Linear Cove System, "Zero Edge" Aluminum Dual Channel	LF Illumination, EF200 Dual Channel	-	Recessed Channel System	-	-
L13A	2' Linear LED Unit for EF200 Dual Channel System, Protective Lens, White Finish, Dimmable	LF Illumination, EF200 Linear LED Unit	14	Channel Mounted	LED, 2700K, 440 lm/ft	4 W/ft
L13B	3.15" Cylindrical Small LED for EF200 Dual Channel System, Medium 22° Spot, Matte White, Adjustable, Dimmable	LF Illumination, EF200 Spotlight Unit	6	Channel Mounted	LED, 2700K, 800 lms	9 W
L12	A19 LED Lamp, Amber Glass, Dimmable	Lighting Science LSPro A19 Filament 'The Roxy'	10	Suspended	LED, 2700K, 553 lms	4.5 W
L14	1.5' Linear Under Cabinet, 30° Angled, IP40 Rating, Diffuse Lens, Dimmable	LED Linear Vesta HYDRA SLD3	16	Recessed Under Table	LED, 2700K, 161 lm/unit	1.5 W/unit
L2A	4" Open Cylinder Downlight, 40° Beam, Specular finish, Clear Aperature and trim, Dimmable	Gotham 4" Incito Cylinder	2	Suspended Cylinder Downlight in Corridor	LED, 2700K, 500 lms	6 W

### Kitchen

Type	Description	Manufacturer	Count	Mounting	Lamp	Wattage
L9	2" Open Wallwasher, Semi-specular finish, and trim, Dimmable	Gotham 2" Incito Wallwasher	8	Recessed Wallwasher	LED, 2700K, 500 lms	7 W
L10	4" Open Adjustable Downlight, 40° Beam, 25° Angle, Specular finish, Clear Aperature and trim, Dimmable	Gotham 4" Adjustable Incito Downlight	6	Recessed Downlight	LED, 2700K, 750 lms	7 W
L11	2' Surface-mount, Asymmetric Uplight, Softening Lens, White finish, Dimmable	LF Illumination EF600 Series	20	Surface Mount Cove Uplight	LED, 2700K, 400 lm/ft	4 W/ft
L12	A19 LED Lamp, Amber Glass, Dimmable	Lighting Science LSPro A19 Filament 'The Roxy'	13	Suspended	LED, 2700K, 553 lms	4.5 W



### Illuminance Calculation Key

Colors	Range (lux)
	0 - 50
	50 - 150
	150 - 200
	200 - 300
	300 - 400



# Eastside III

Pittsburgh, PA



## INTRODUCTION

building overview | concept | scope



## LOWER LOBBY

lighting design | daylighting | acoustics



## KITCHEN+BILLIARD

lighting design



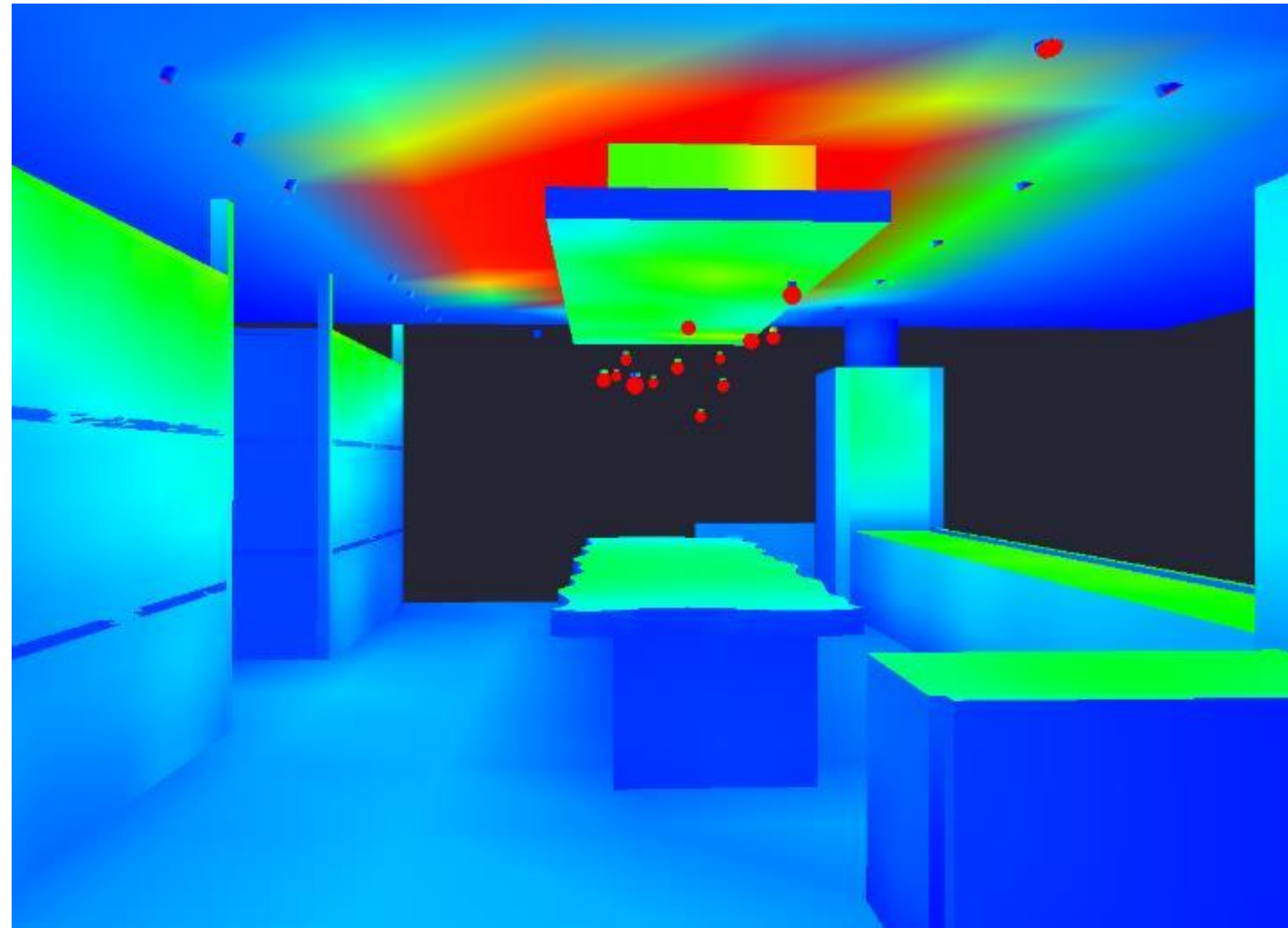
## ELECTRICAL

system redesign

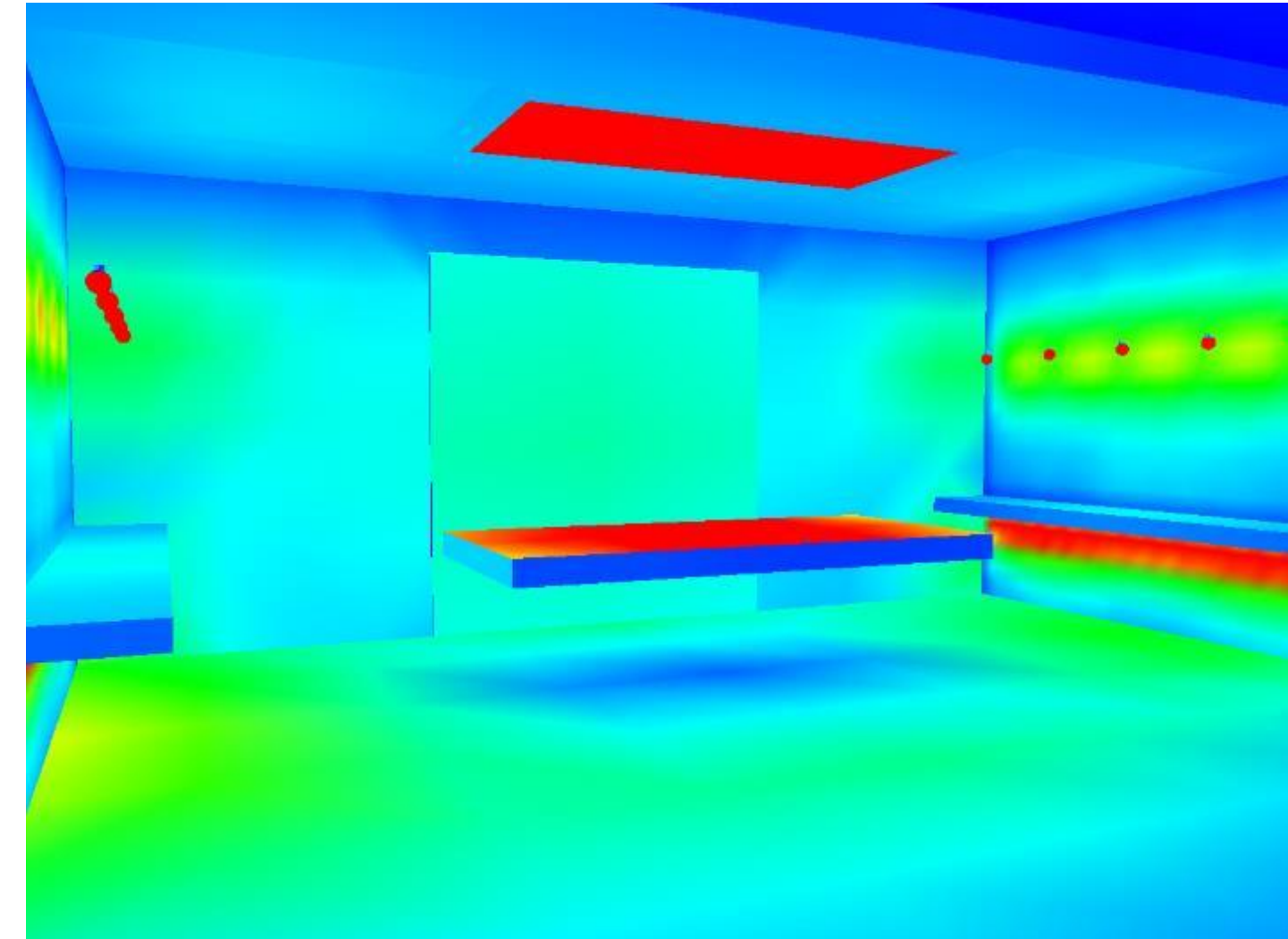
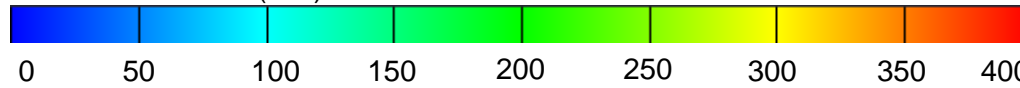


## CONCLUSION

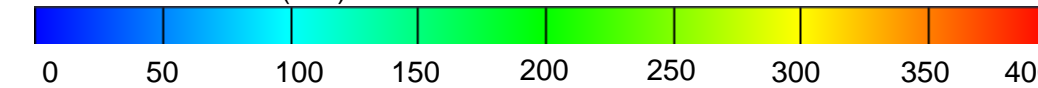
acknowledgements



Illuminance Scale (Lux)



Illuminance Scale (Lux)





# Eastside III

Pittsburgh, PA



## INTRODUCTION

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## LOWER LOBBY

lighting design | daylighting | acoustics



## KITCHEN+BILLIARD

lighting design



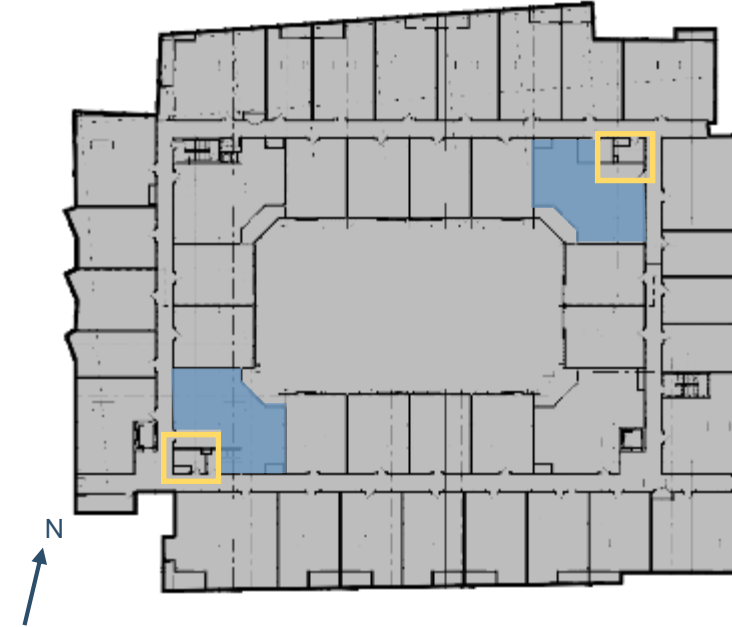
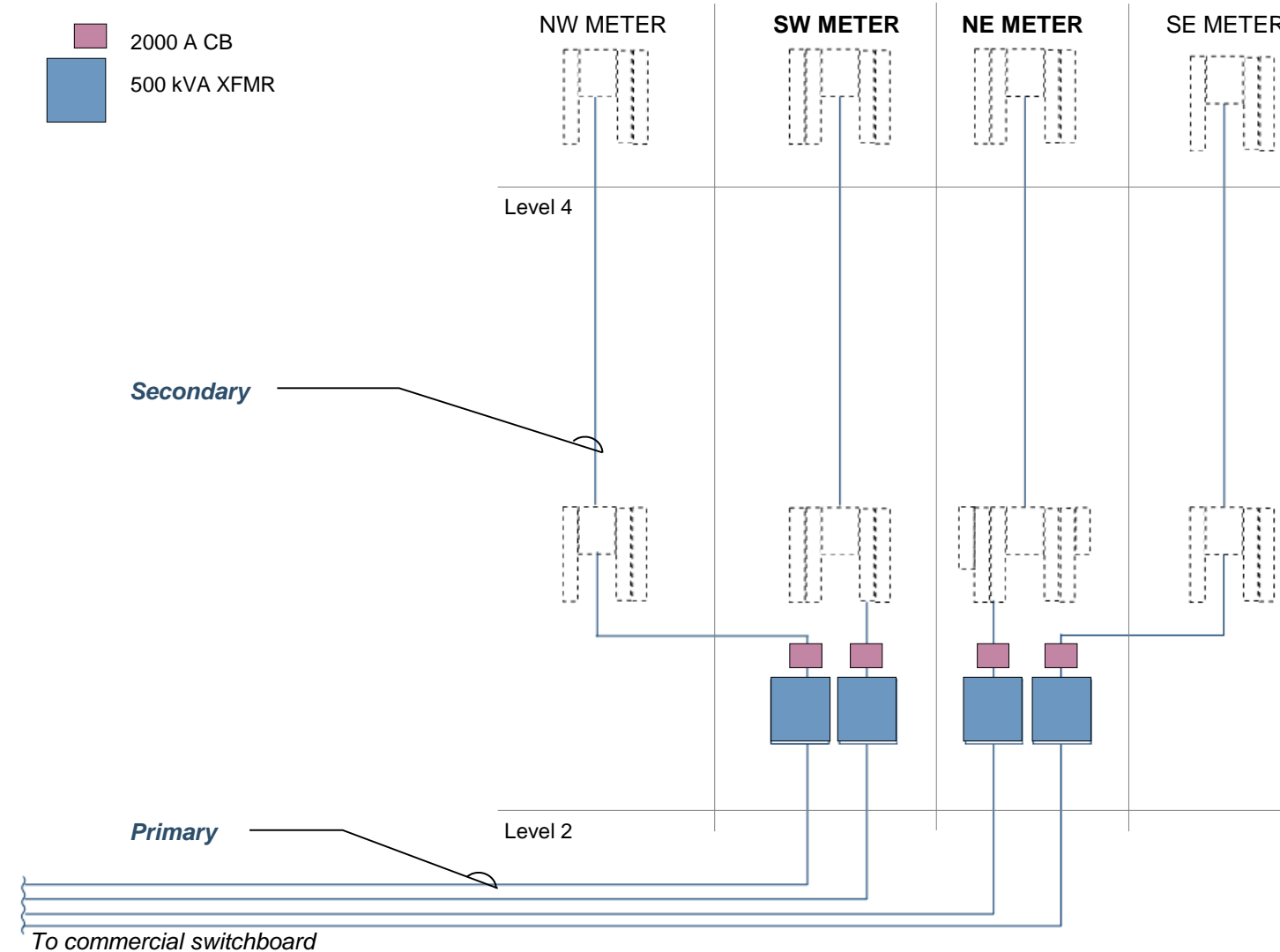
## ELECTRICAL

system redesign



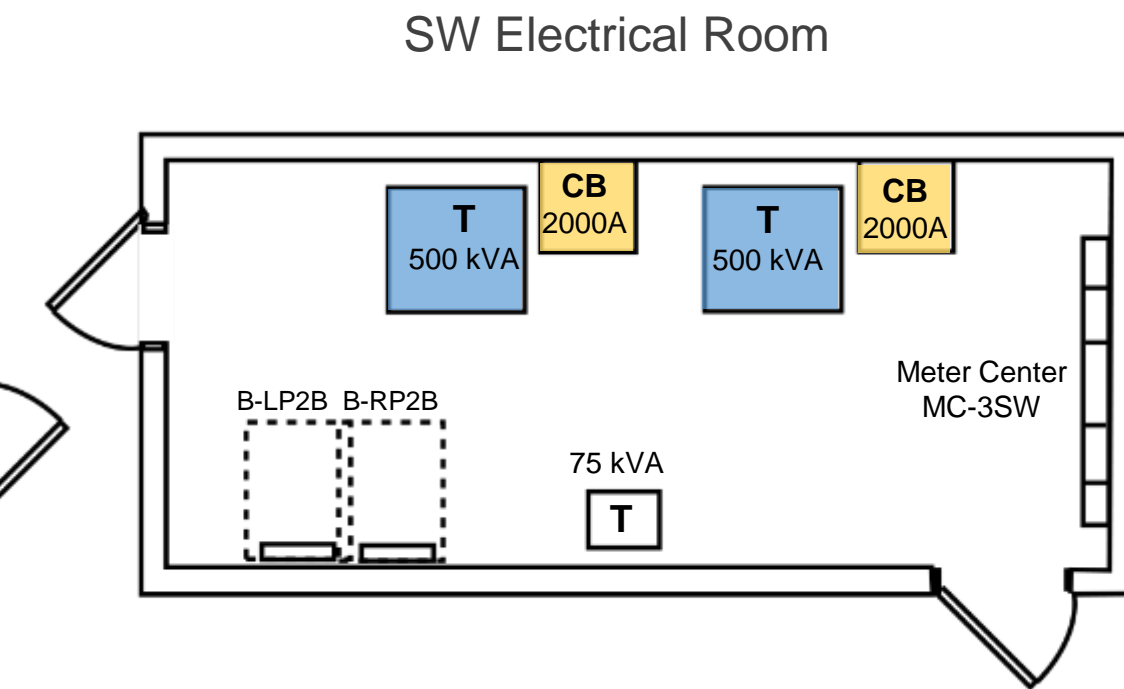
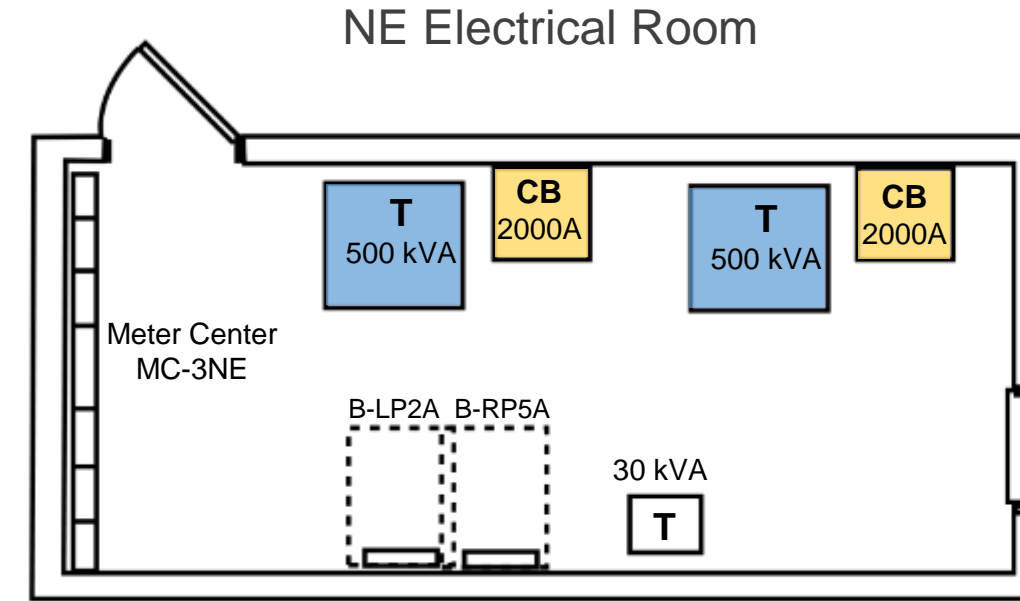
## CONCLUSION

acknowledgements



### Air Supply Needed for Elec Rms

$$500 \text{ [kVA]} * 25 \text{ [W/kVA]} = 12500 \text{ [W]}$$
$$12.5 \text{ [kW]} * 3412.142 \text{ [(BTU/hr) / kW]} = 43504.81 \text{ [BTU/hr]}$$
$$43504.81 \text{ [BTU/hr]} / 12,000 = \mathbf{3.63 \text{ tons}}$$



Existing vs. Proposed Cost Comparison			
Equipment	Existing Design (\$)	Proposed Design (\$)	Savings (\$)
Feeders	\$401,996.32	\$301,837.44	\$100,158.88
Ground	\$76,940.72	\$39,454.90	\$37,485.82
Conduit	\$424,626.20	\$221,115.30	\$203,510.90
Transformers	\$0.00	\$72,520.00	-\$72,520.00
Switchboards	\$17,200.00	\$9,725.00	\$7,475.00
Total Savings			\$276,110.60