The Pennsylvania Academy of Music

David Smith

Final Senior Thesis Presentation

April 18, 2007

The Pennsylvania Academy of Music

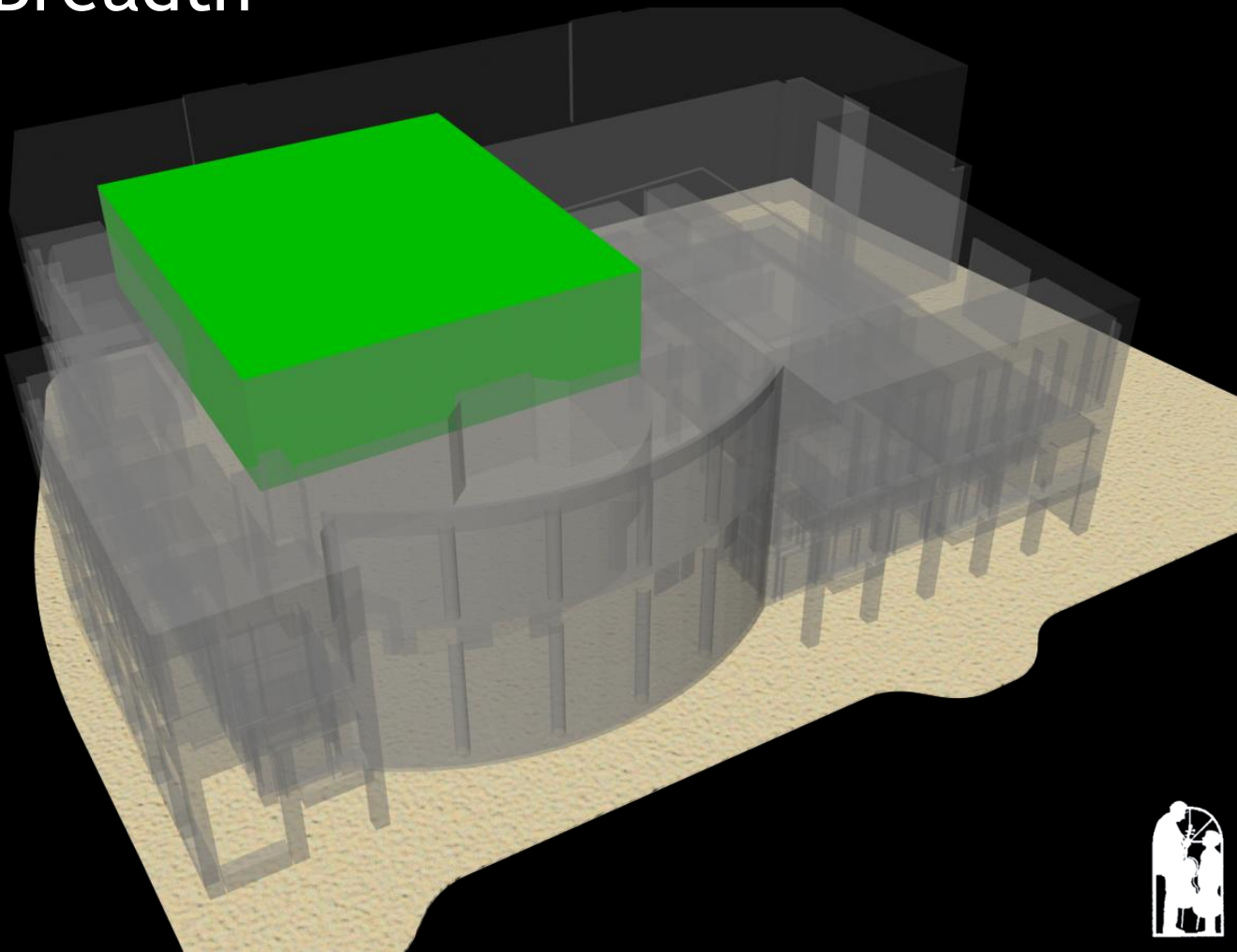
Overview

Overview

Roof Terrace

-Architectural Breadth

-Structural Breadth

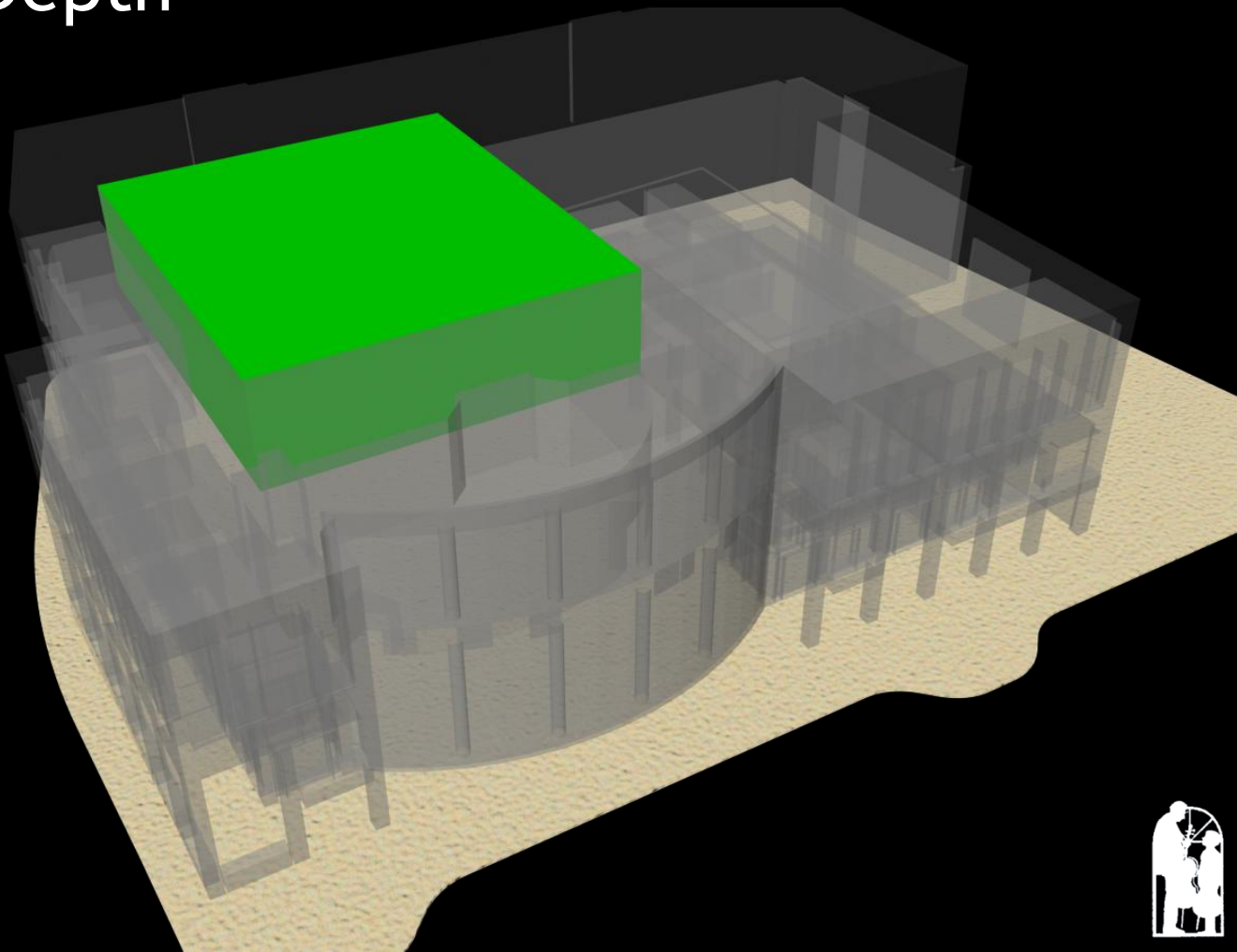


Overview

Rooftop Terrace

-Lighting Depth

-Electrical Depth

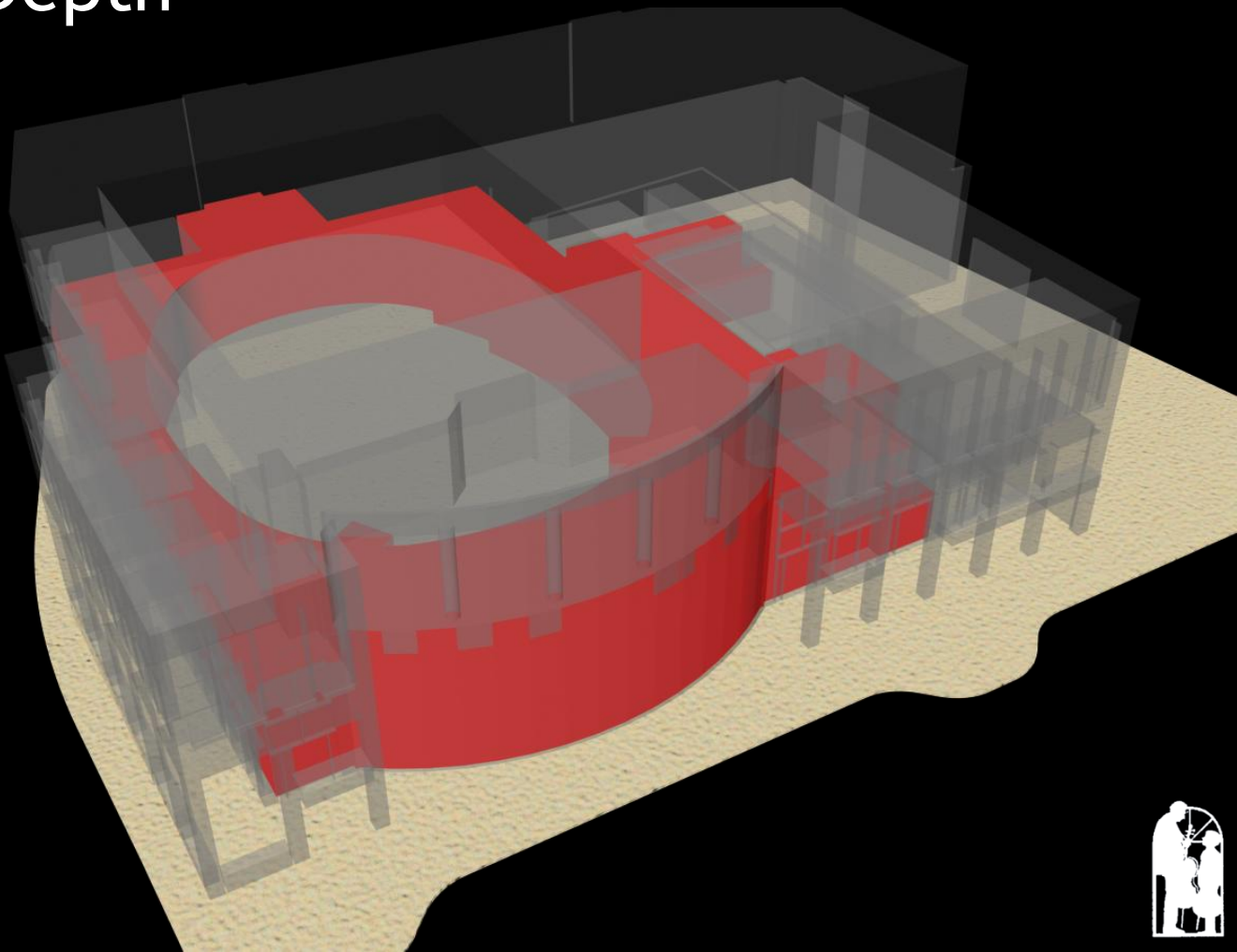


Overview

Grand Foyer

-Lighting Depth

-Electrical Depth

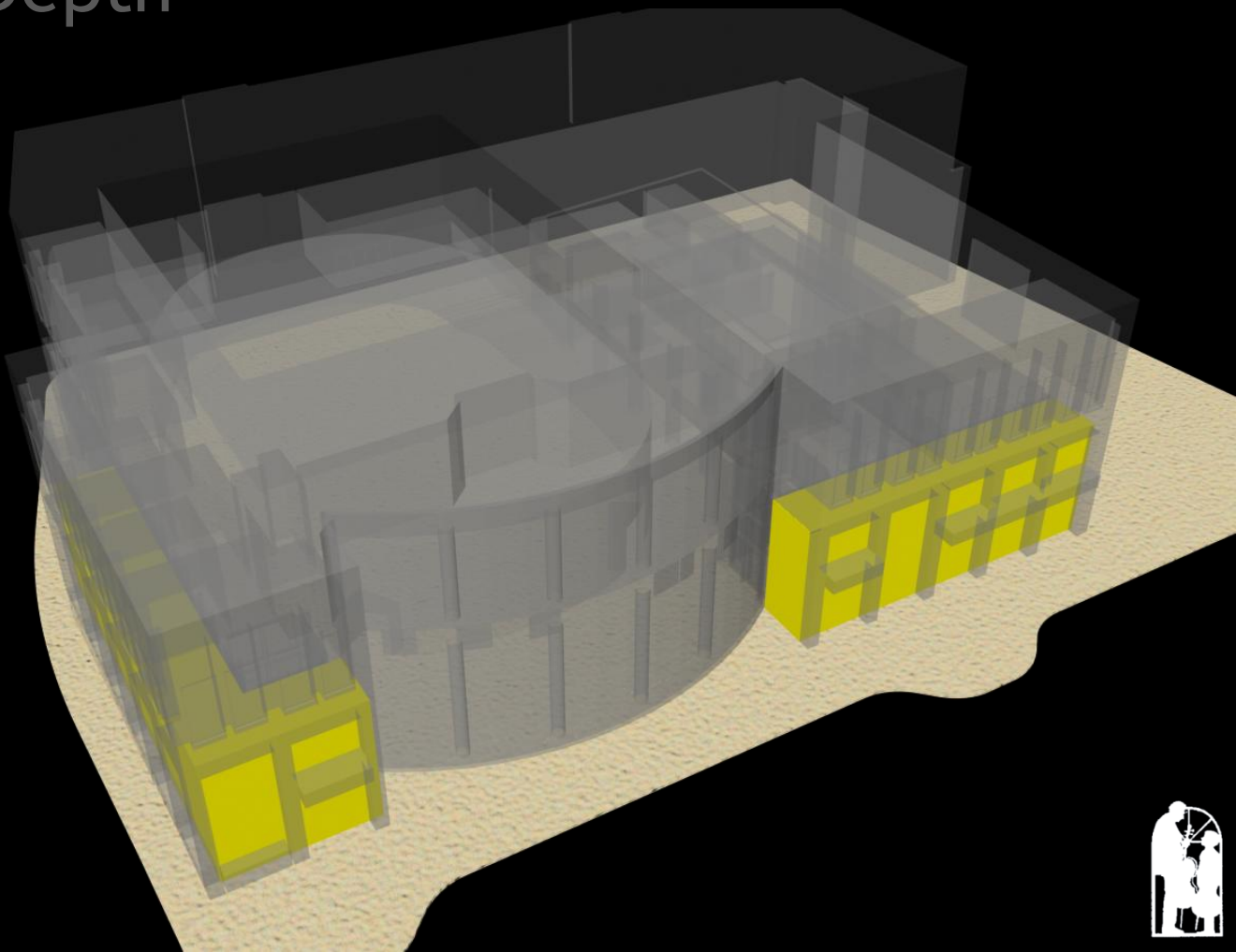


Overview

Building Entrance

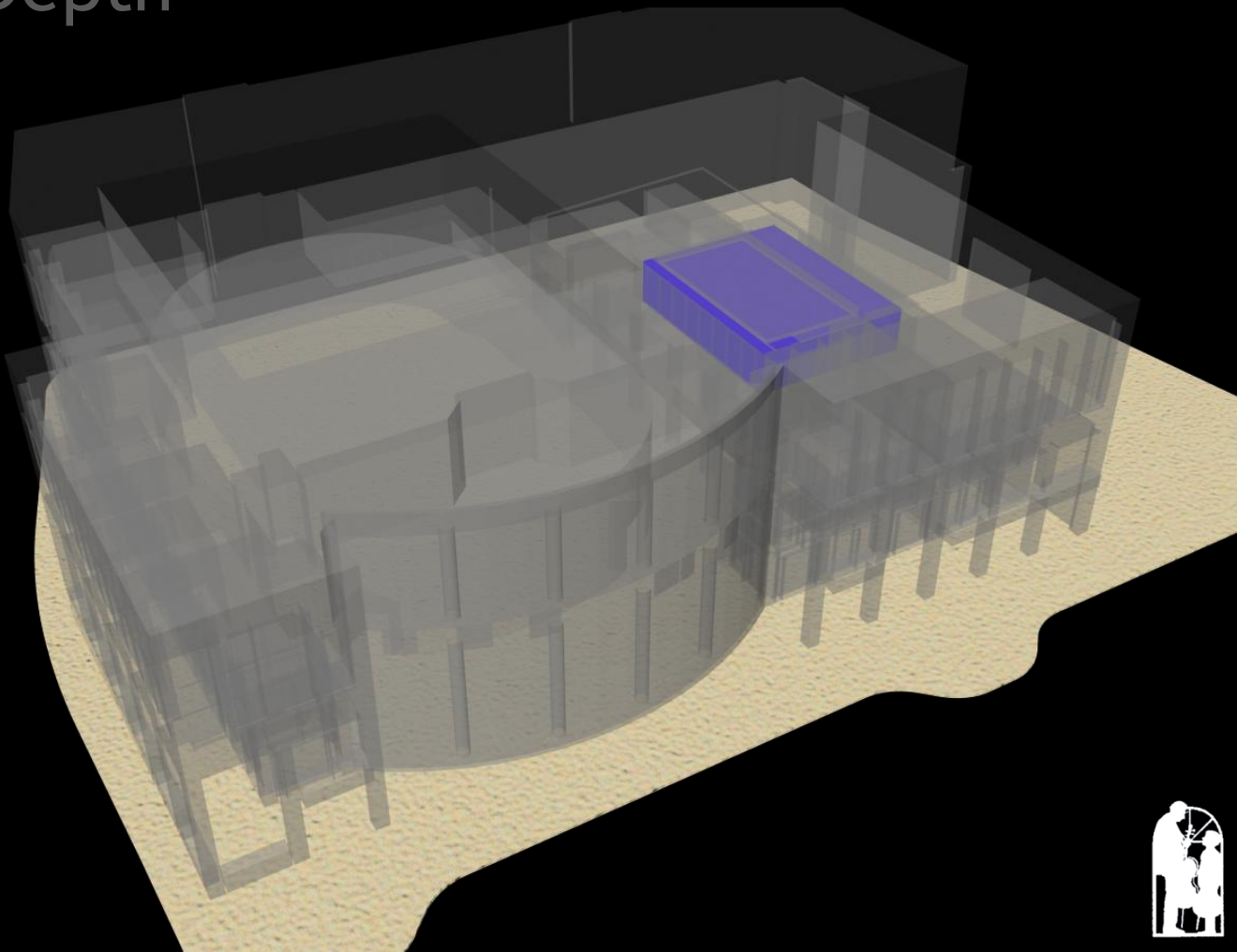
-Lighting Depth

-Electrical Depth

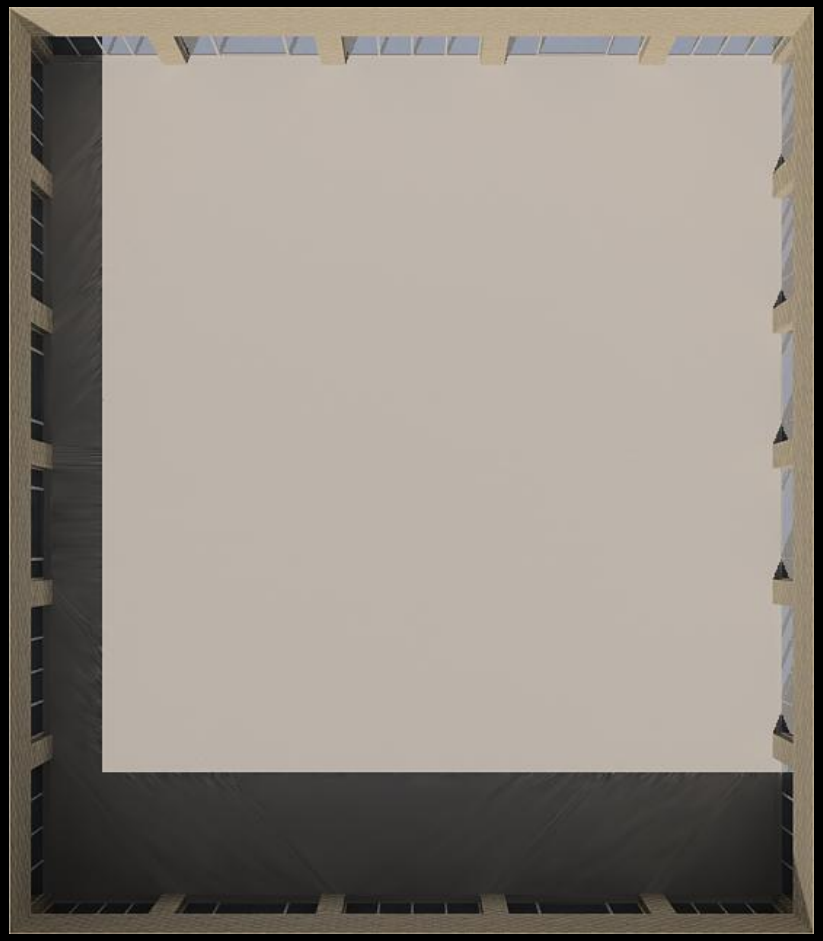


Overview

- Library
  - -Lighting Depth
  - -Electrical Depth



Roof Terrace

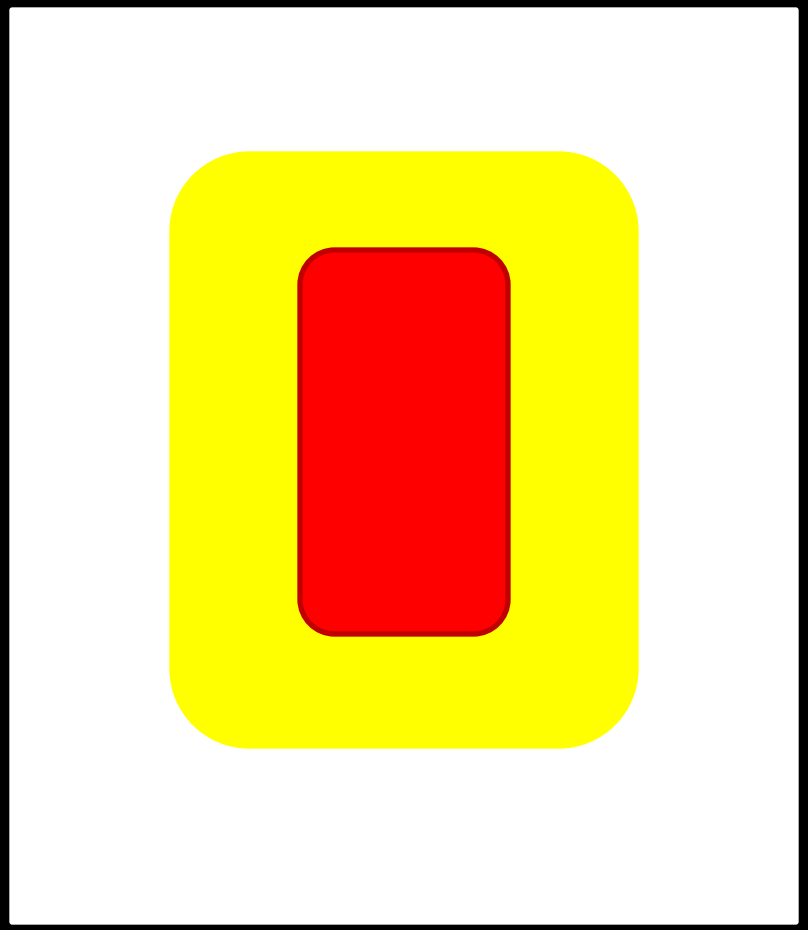


Roof Terrace

Architectural Breadth

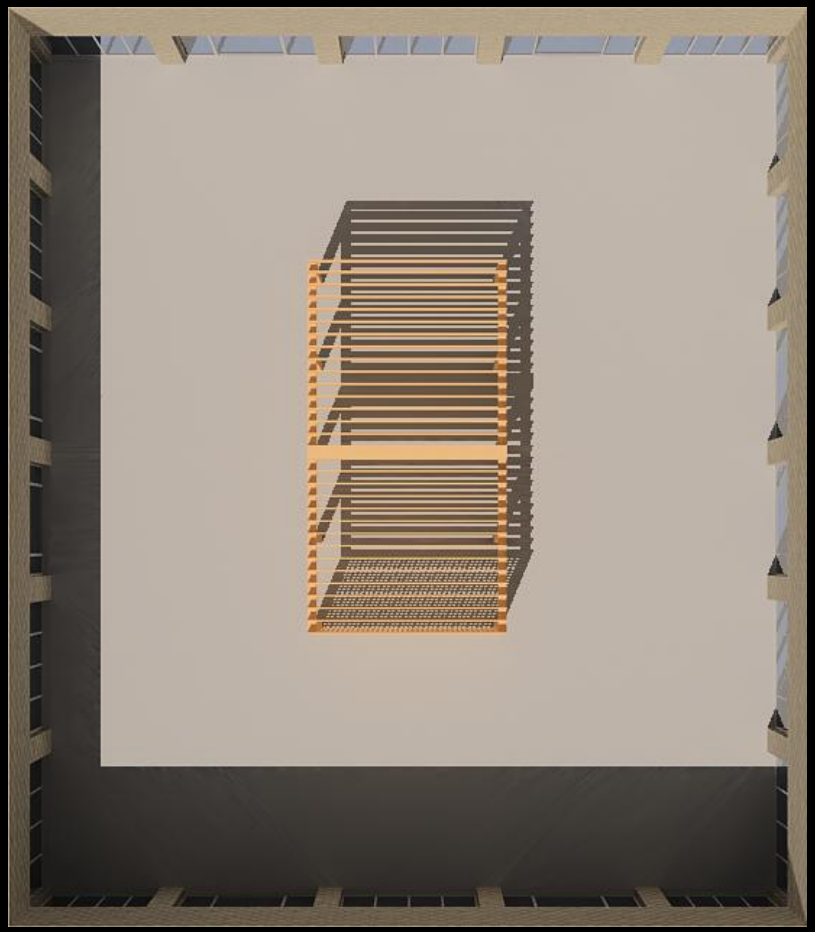
Performance Space

Circulation



Roof Terrace

Architectural Breadth

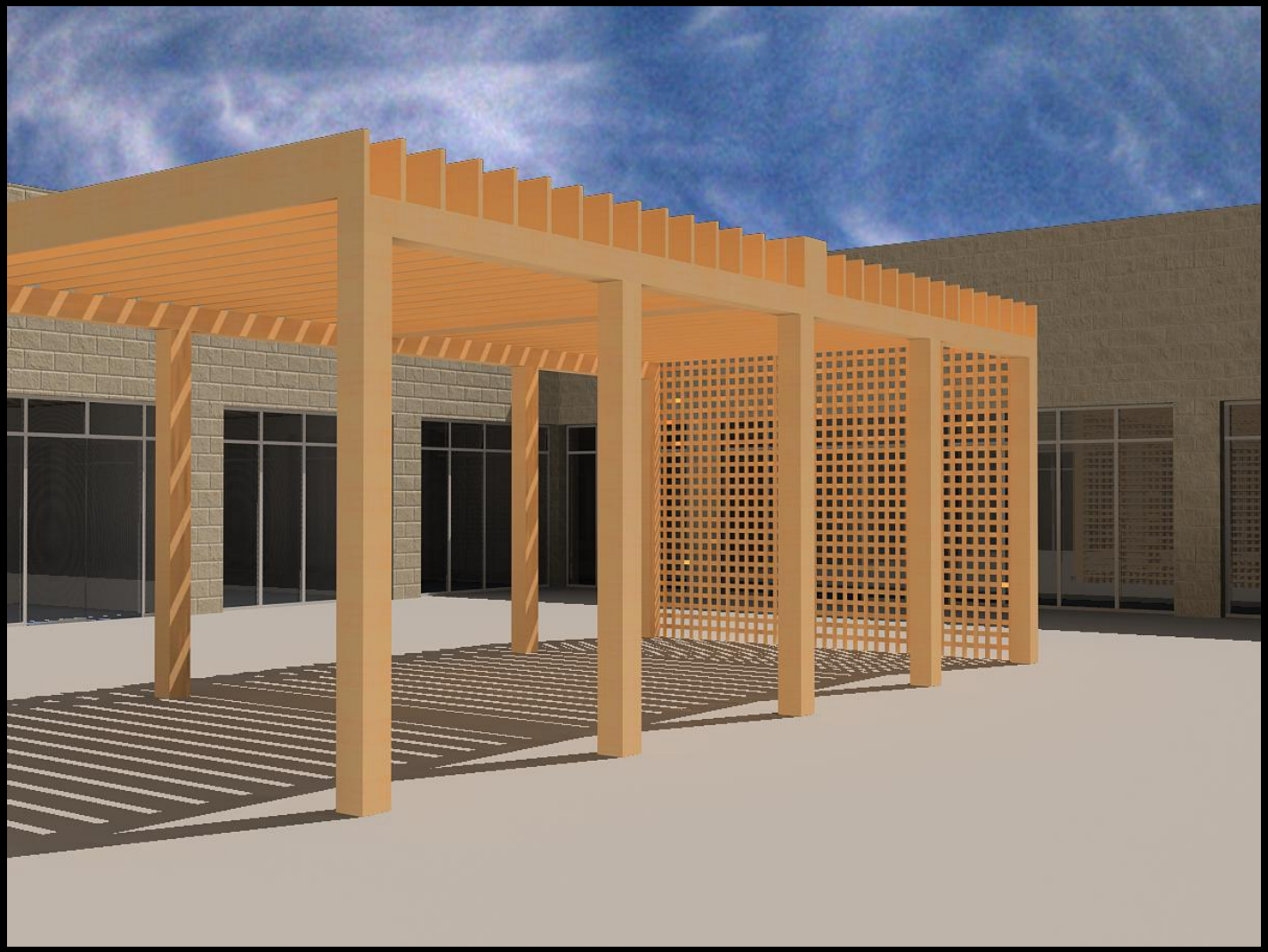


Roof Terrace

Architectural Breadth

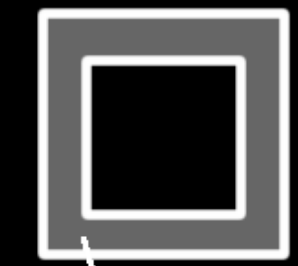
Roof Terrace

Architectural Breadth



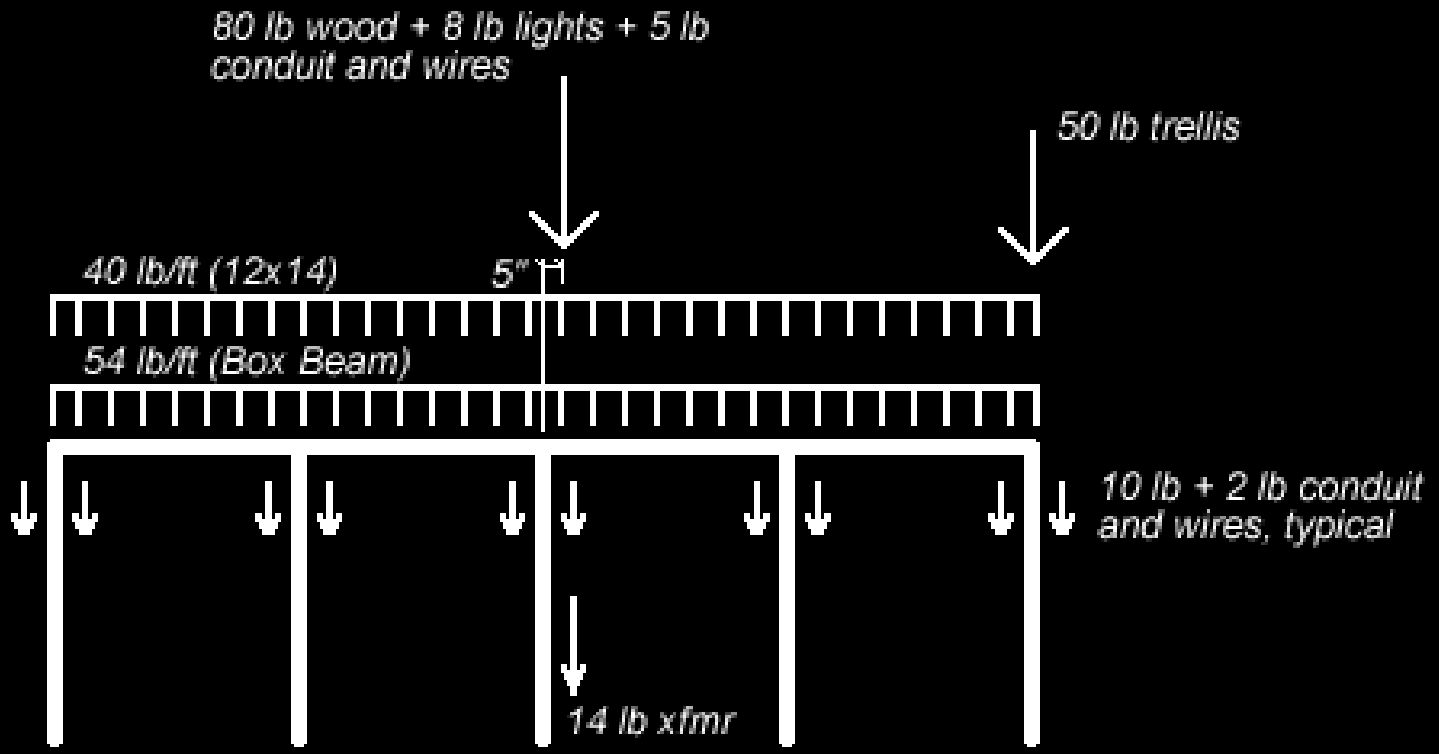
Rooftop Terrace

Structural Breadth



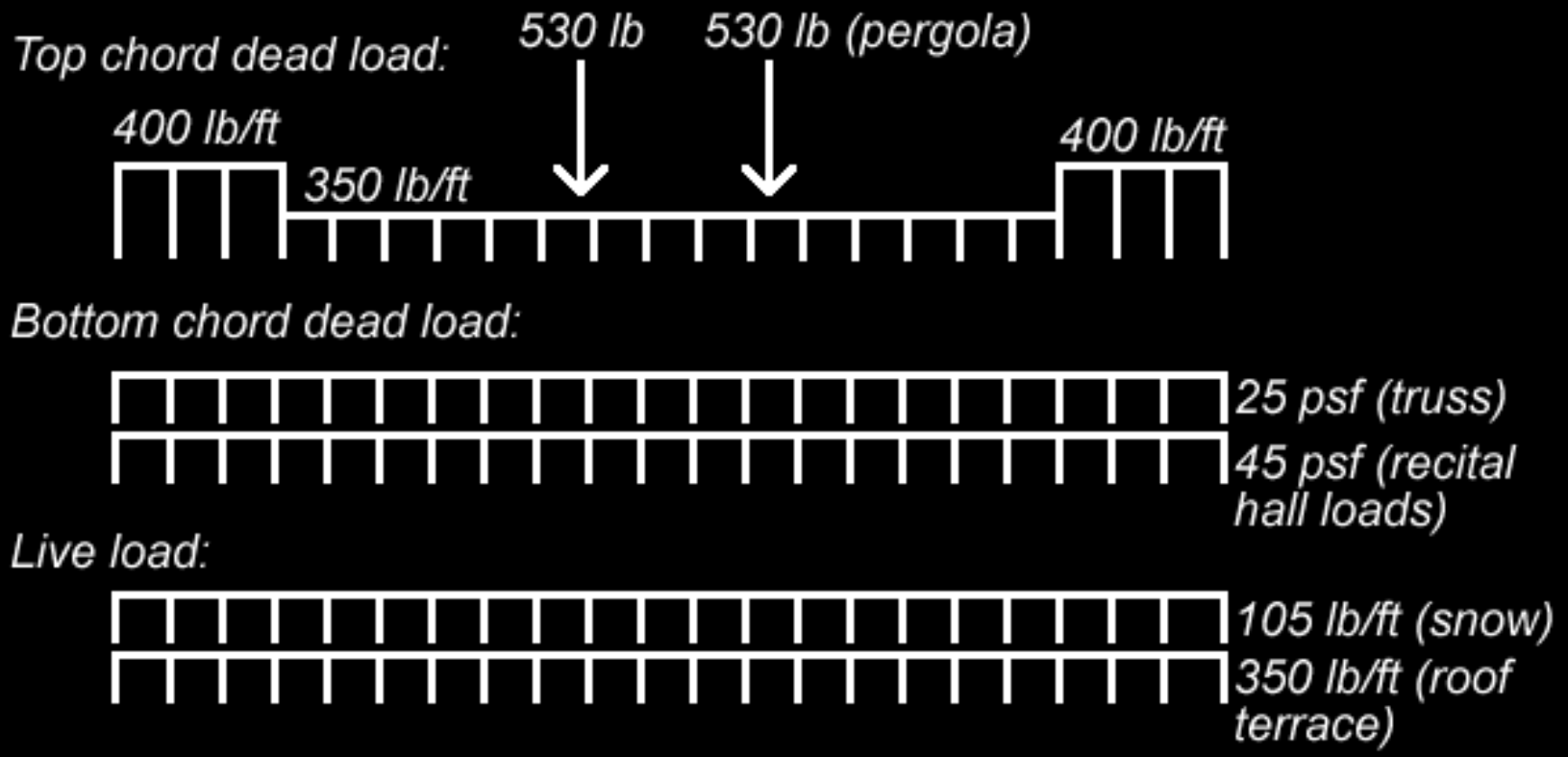
39 in.²

Assume 8" across, 1.5" thick



Rooftop Terrace

Structural Breadth



Roof Terrace

Lighting/Electrical Goals

Create even illumination around and within Pergola

Use volume of light to create intimate performance space

Create flexible and accommodating system of illumination

Roof Terrace

Lighting Depth

Roof Terrace

Lighting Depth

Horizontal Illuminance Target: 50 lux

Vertical Illuminance Target: 50 lux

Pergola Illuminance Target: 150 lux

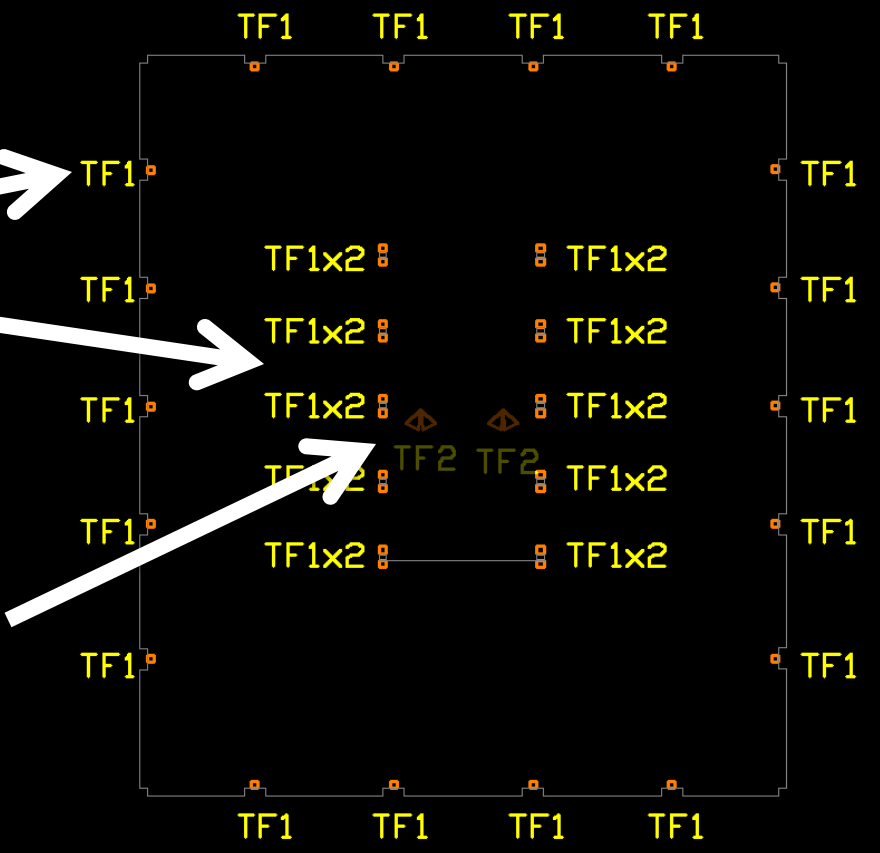
Stage Illuminance Target: 250 lux

Roof Terrace

Lighting Depth

TF1 - Sconce
(42W CFL)

TF2 – Accent Light
(37W Halogen)



Roof Terrace

Lighting Depth

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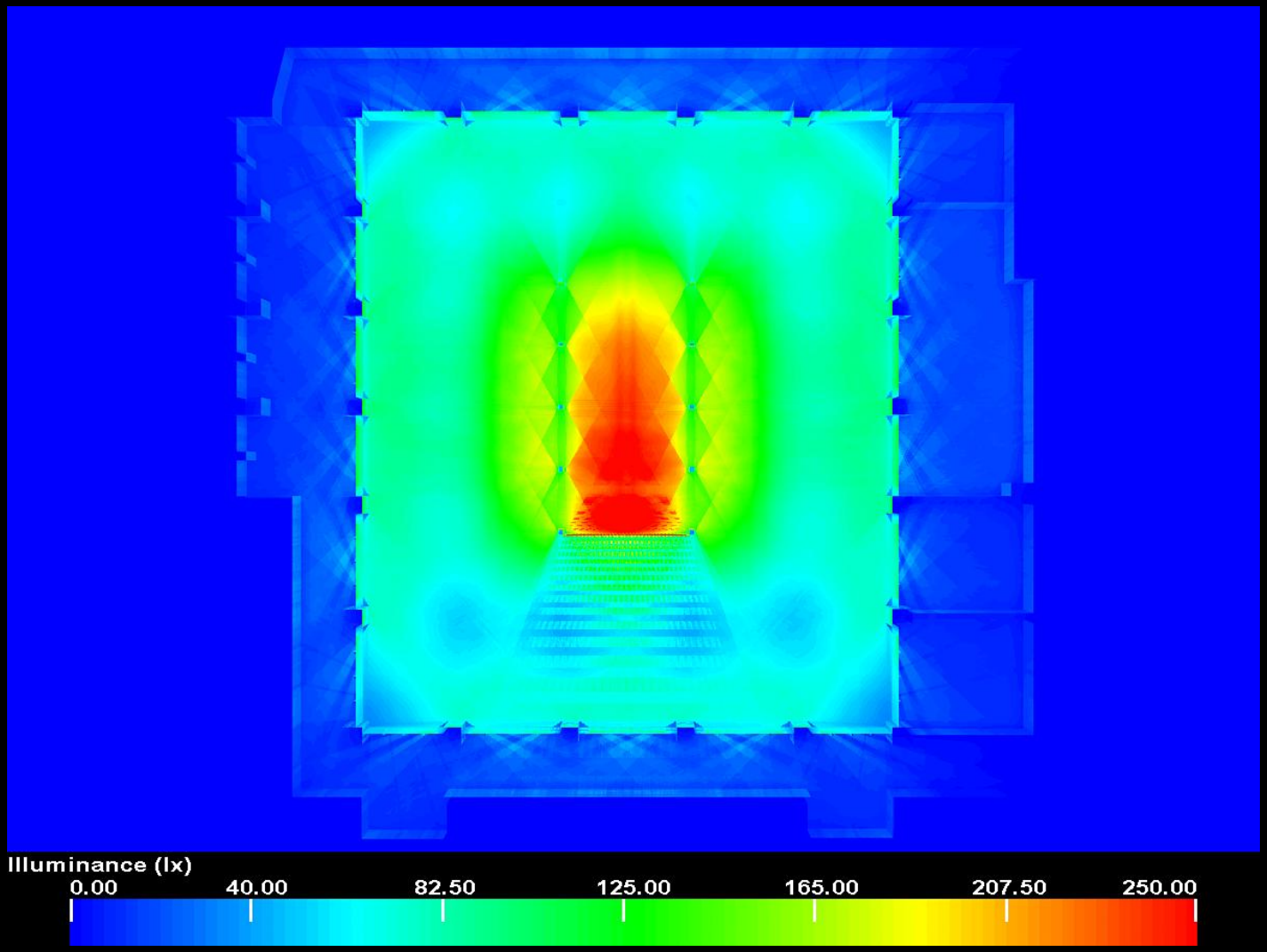
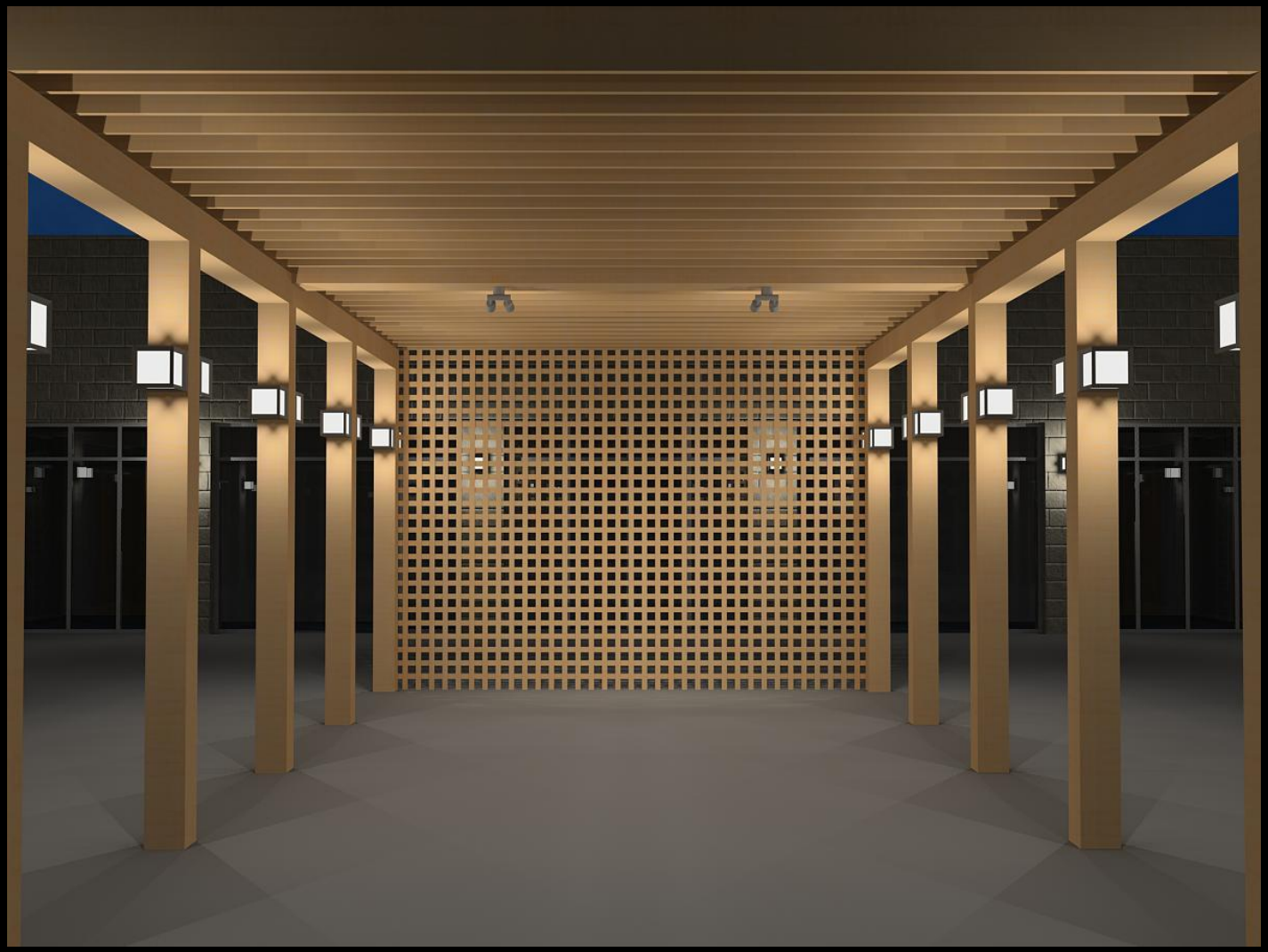
Lighting Depth



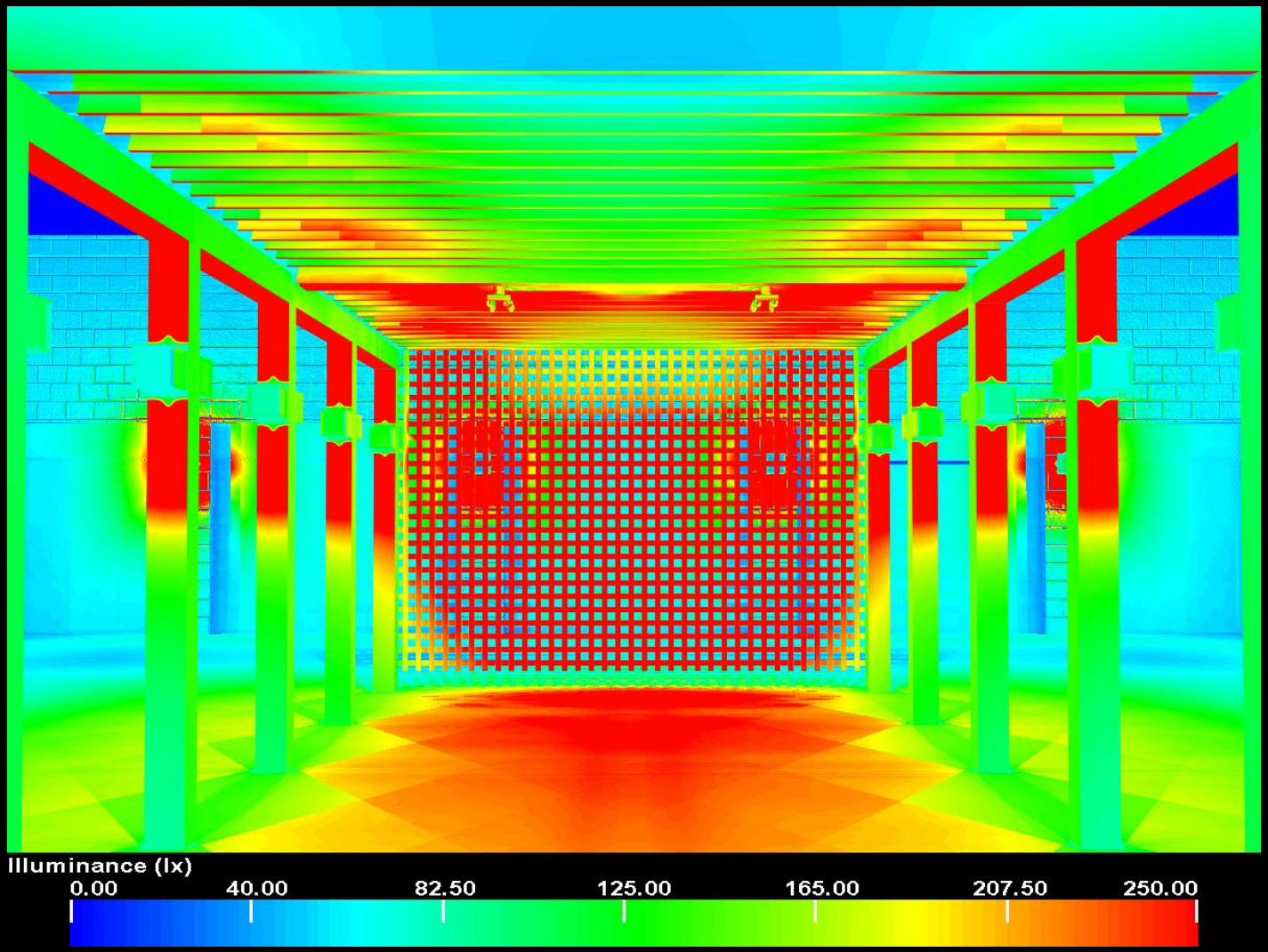
Roof Terrace

Lighting Depth



Roof Terrace

Lighting Depth



Roof Terrace

Electrical Depth

Roof Terrace

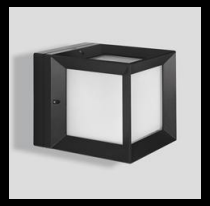
Electrical Depth

TF1 - Sconce
Two Wire Dimming Ballast

TF2 – Accent Light
Dimmable Low Voltage Transformer

Roof Terrace

Electrical Depth



Three Manual Dimming Controls in Teacher's Lounge

Roof Terrace

Electrical Depth

TF1 - Sconce
28 x 49W = 1372W

TF2 – Accent Light
N/A (Theatrical, controlled separately)

Roof Terrace

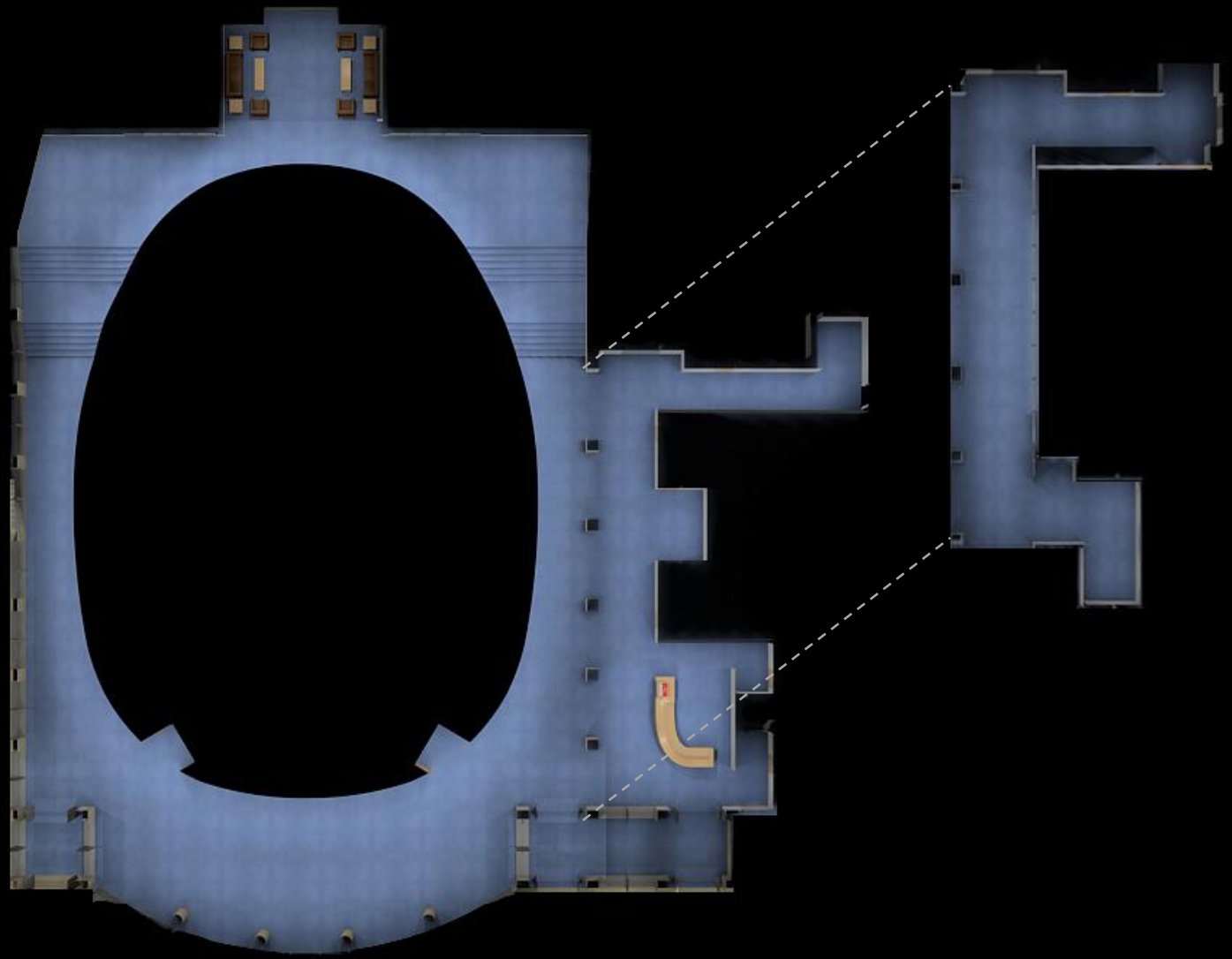
Electrical Depth

Item Description	Measurement	Allowable Power Density	Allowed Wattage
Plaza	1332 ft^2	.20 W/ft^2	866.4
Secondary Entrances	46 ft	20 W/ft	920
Canopy (Pergola)	480 ft^2	1.25 W/ft^2	600
		Subtotal	**2386.4**
		Multiplier	x 1.05
		TOTAL	**2506**

(Design uses 1372W)

Source: ASHRAE 90.1-2004

Grand Foyer



Grand Foyer

Lighting/Electrical Goals

Evenly illuminate recital hall wall

Take advantage of illumination differences

Reduce power consumption

Maintain flexibility

Grand Foyer

Lighting Depth

Grand Foyer

Lighting Depth

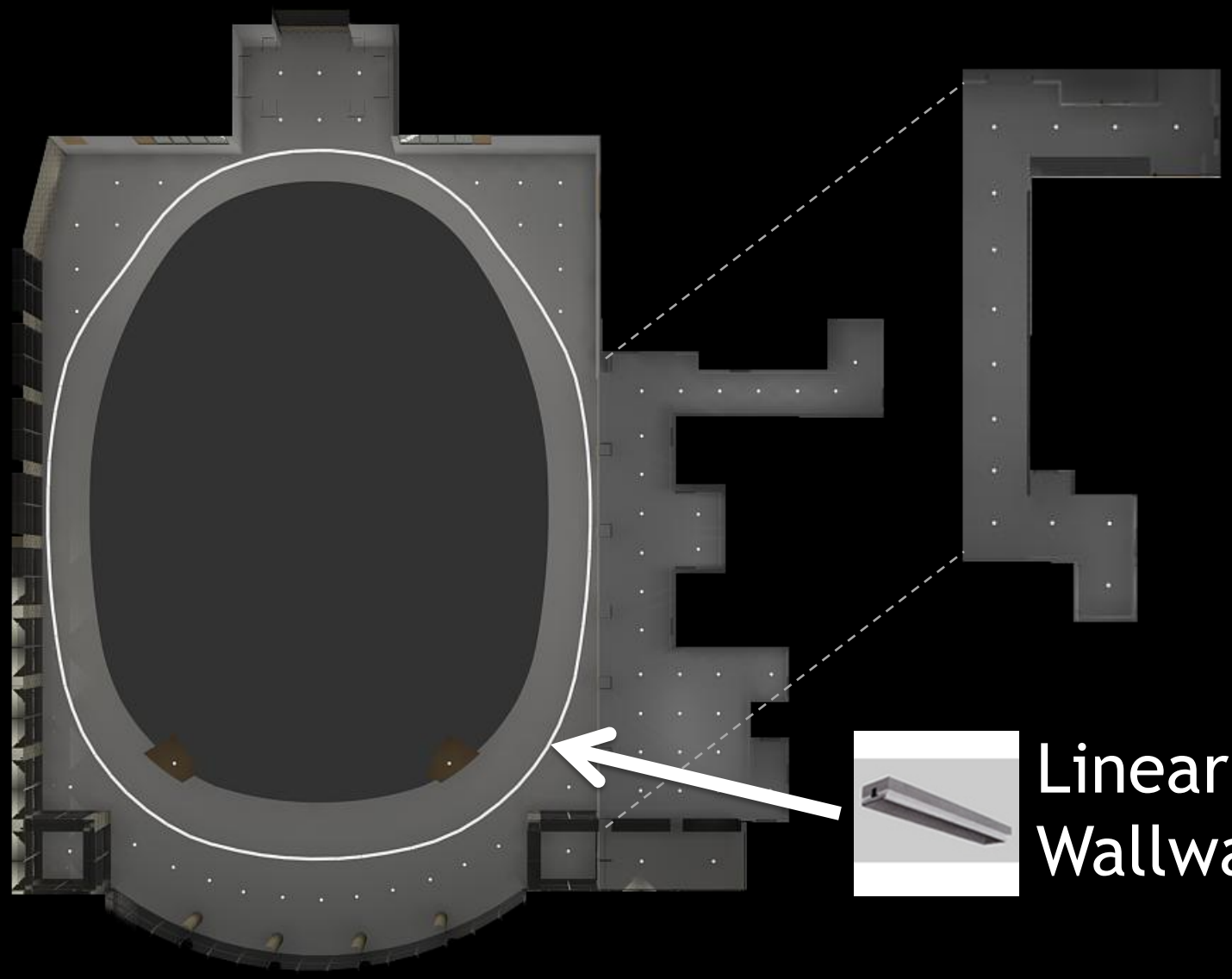
Horizontal illuminance target: 300 lx

Information Desk and Recital Hall Entrance Target Illuminances: 500 lx

Recital Hall Wall Target Illuminance: 200 lx

Grand Foyer

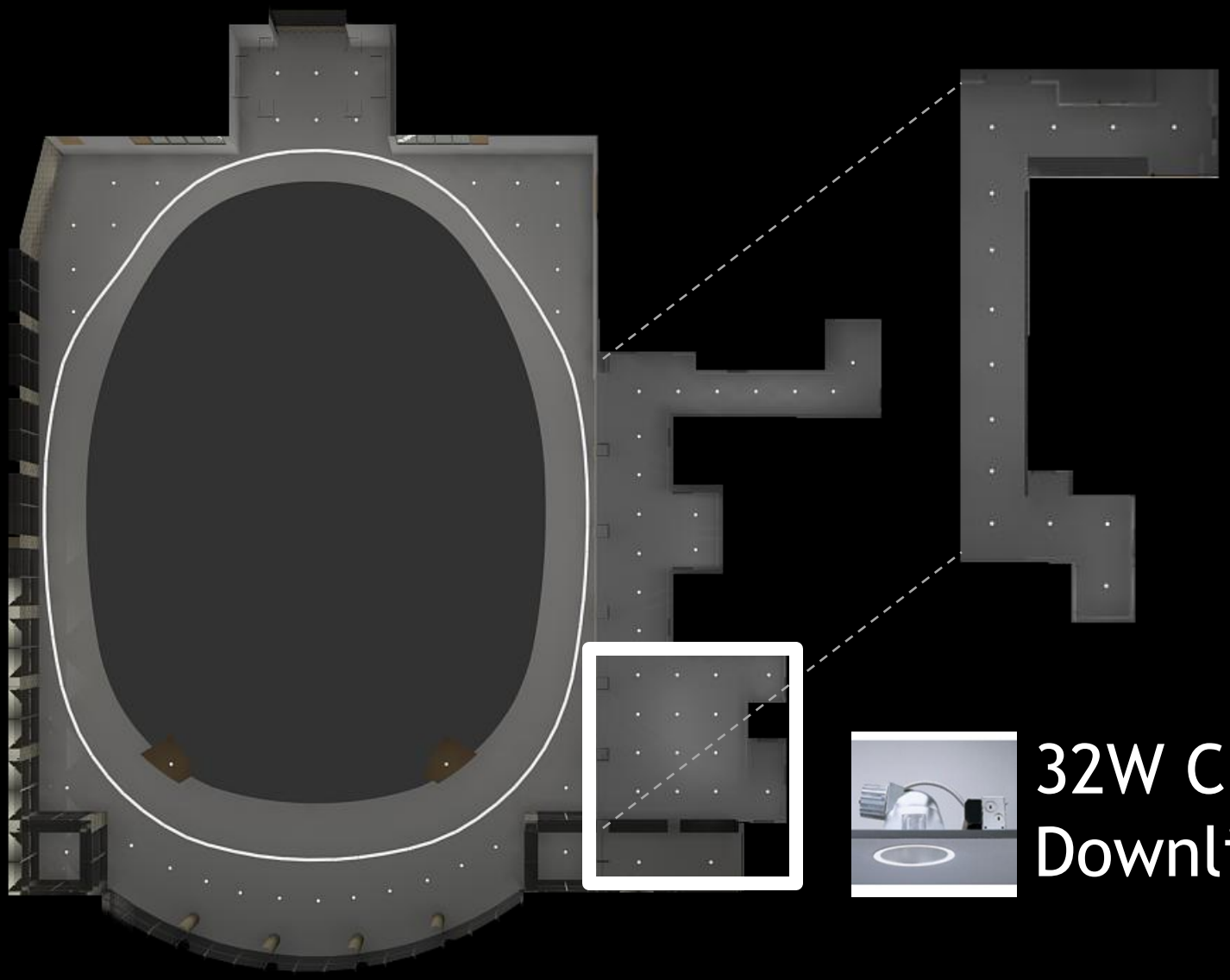
Lighting Depth



Linear
Wallwasher

Grand Foyer

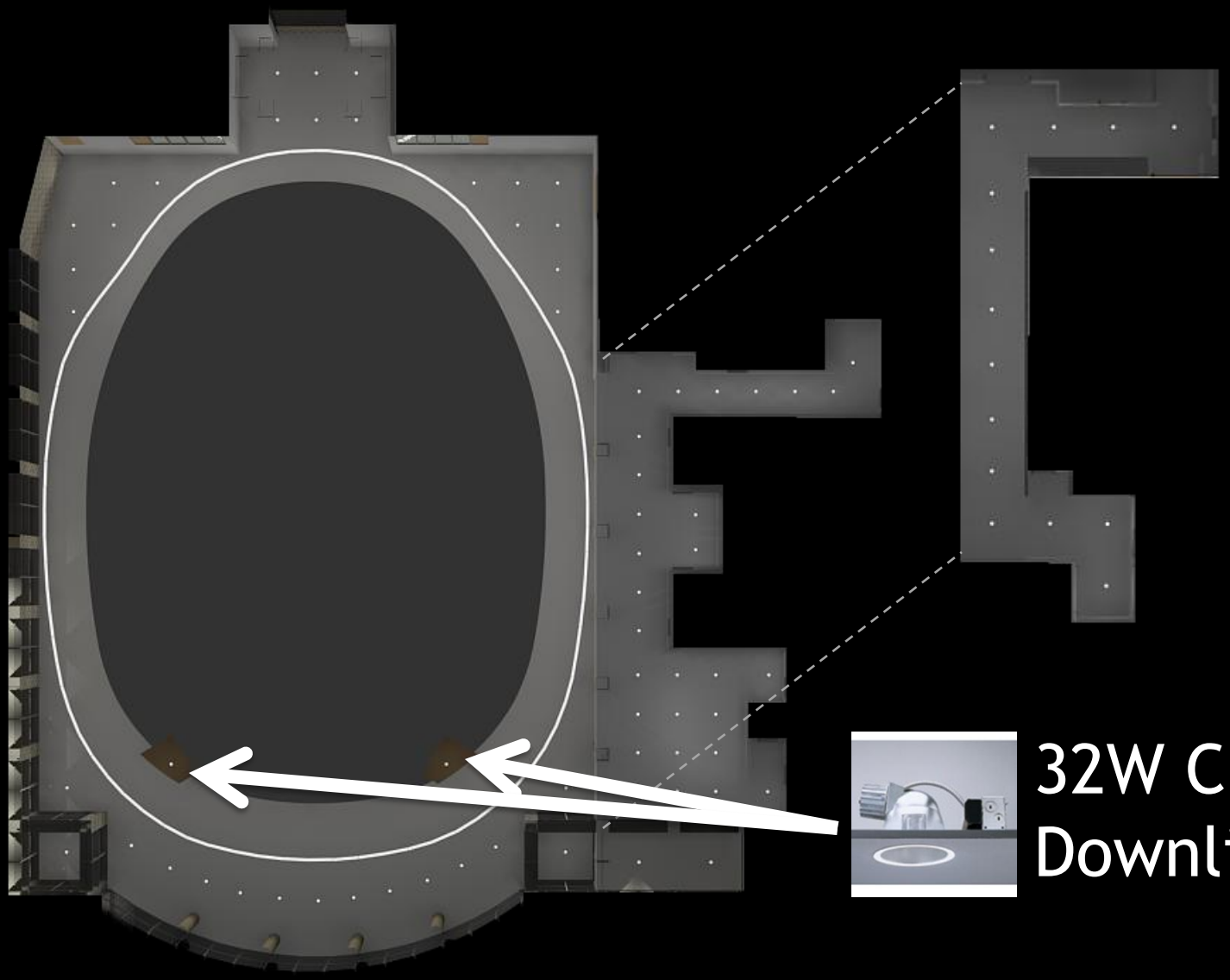
Lighting Depth



32W CFL
Downlight

Grand Foyer

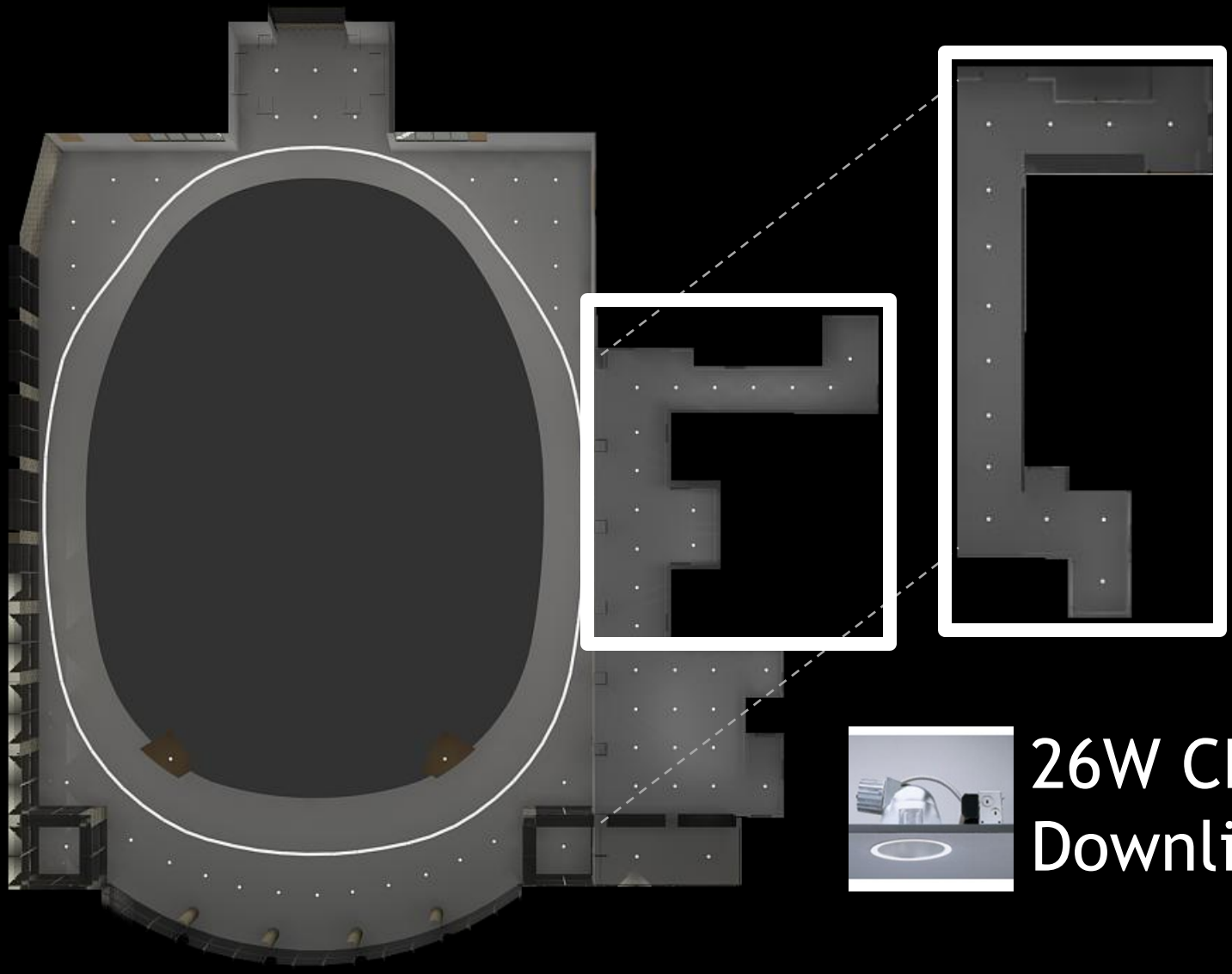
Lighting Depth



32W CFL
Downlight

Grand Foyer

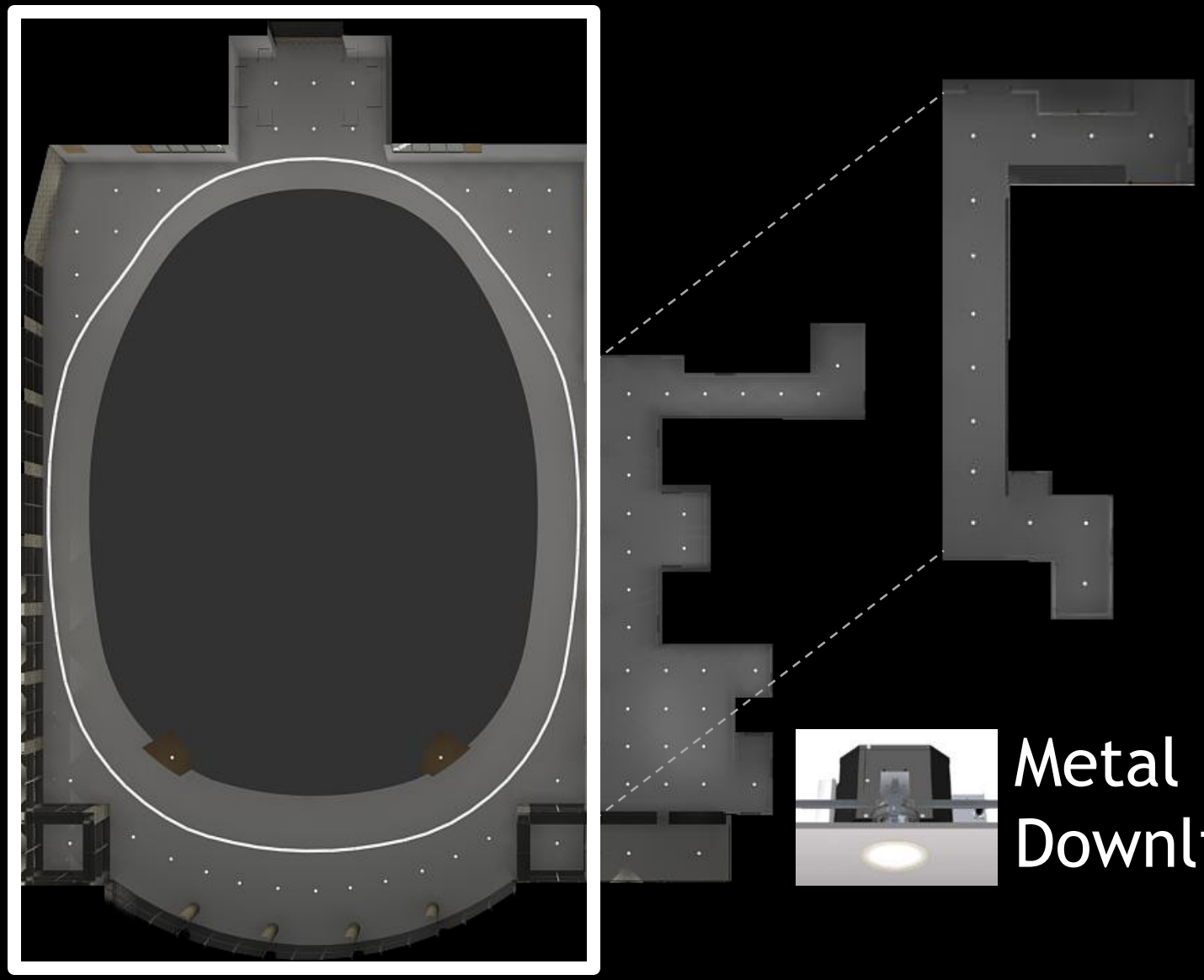
Lighting Depth



26W CFL
Downlight

Grand Foyer

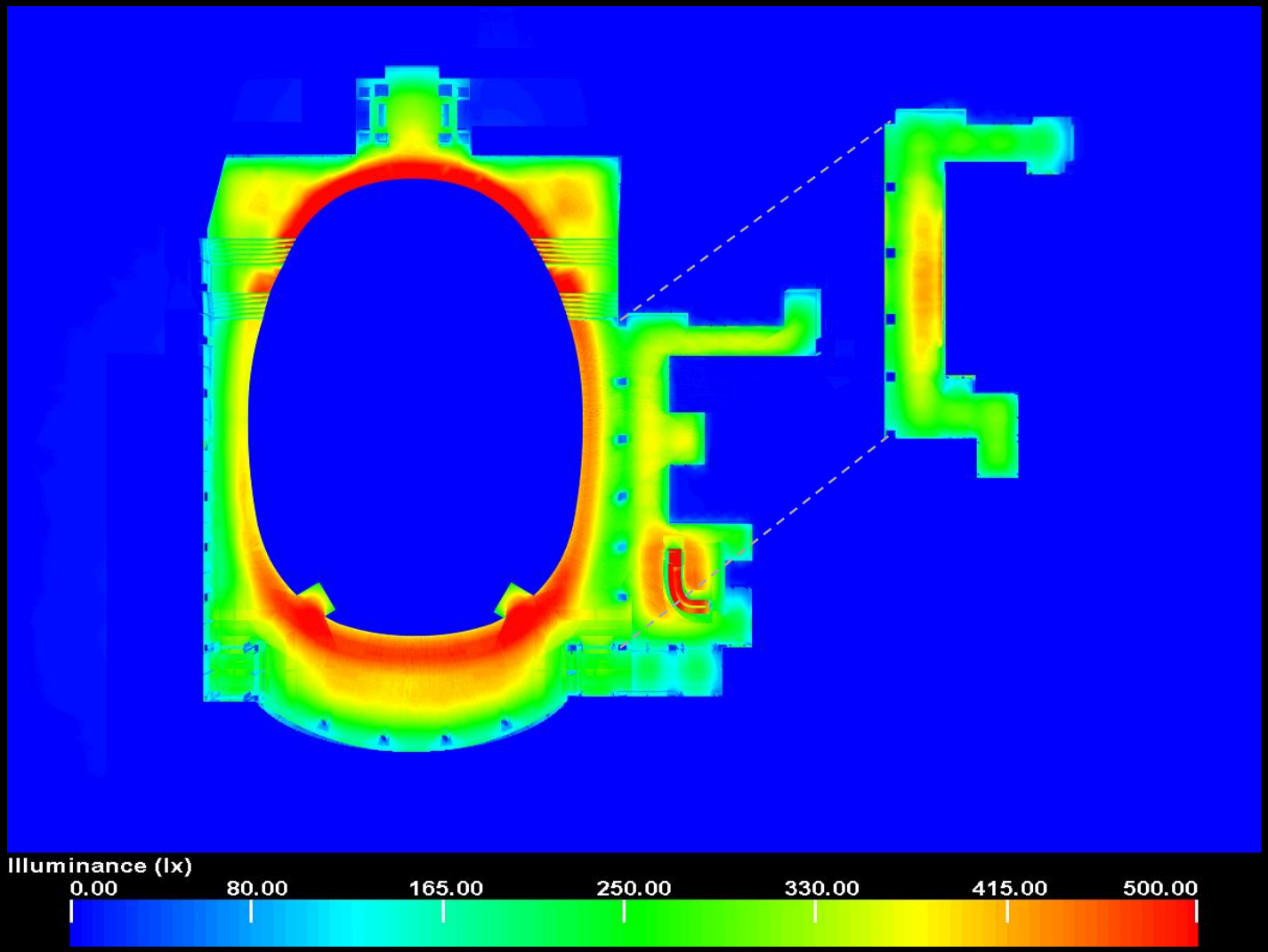
Lighting Depth



Metal Halide
Downlight

Grand Foyer

Lighting Depth

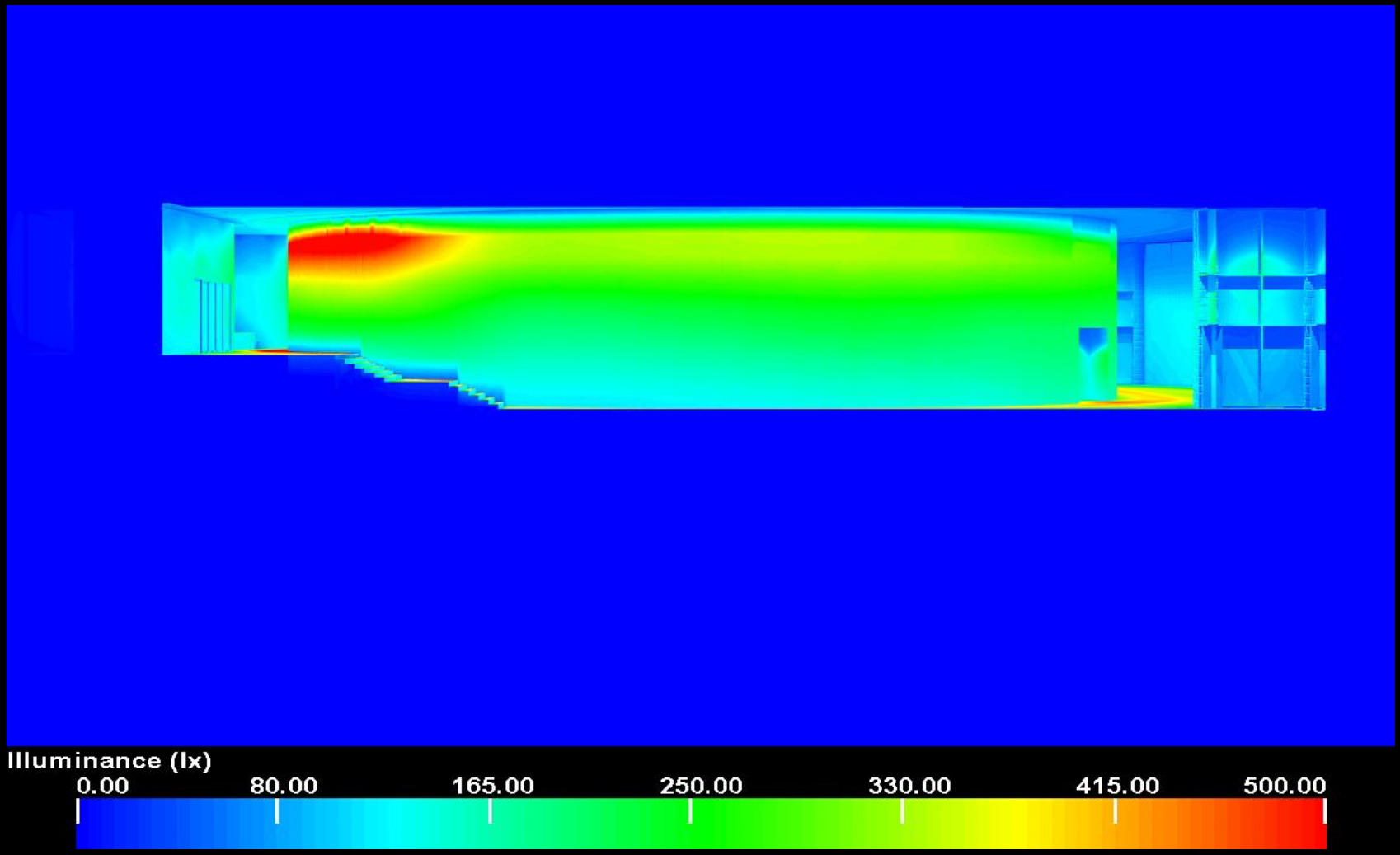


Grand Foyer

Lighting Depth

Grand Foyer

Lighting Depth



Grand Foyer

Electrical Depth

Grand Foyer

Electrical Depth

Luminaire Description	Input Watts	Quantity	Watts per Luminaire Type
Incandescent Spotlight	250	97	24250
CFL Downlight	32	42	1344
Decorative	500	3	1500
Decorative	240	1	240
		TOTAL	**27334**

Allowed LPD: 3.3 W/ft^2 (Theater Lobby)

27334 W / 8320 ft^2 = **3.285** W/ft^2

Grand Foyer

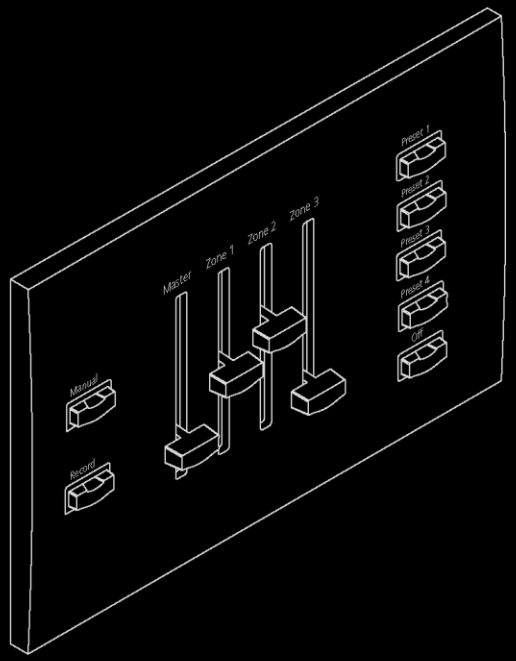
Electrical Depth

Luminaire	Lamps	Input Watts	Ballast Quantity	Watts per Ballast Type
GF1/GF1A	1	35	73	2555
GF1B	1	30	2	60
GF2	1	29	29	841
GF3	1	36	18	648
GF4	1	23	19	437
GF5	1	56	11	616
GF6	1	94	4	376
			TOTAL	**5533**

5533 W / 8320 ft^2 = **0.665** W/ft^2

Grand Foyer

Electrical Depth



Control System

Grand Foyer

Electrical Depth

GF1 - Wallwasher
Two wire dimming ballast

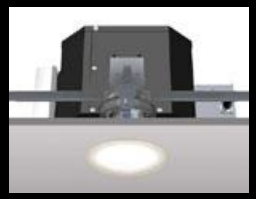
GF1A – Wallwasher
Two wire dimming ballast, dimmed to 50%

GF1B – Wallwasher (3’)
Two wire dimming ballast, dimmed to 50%

Grand Foyer

Electrical Depth

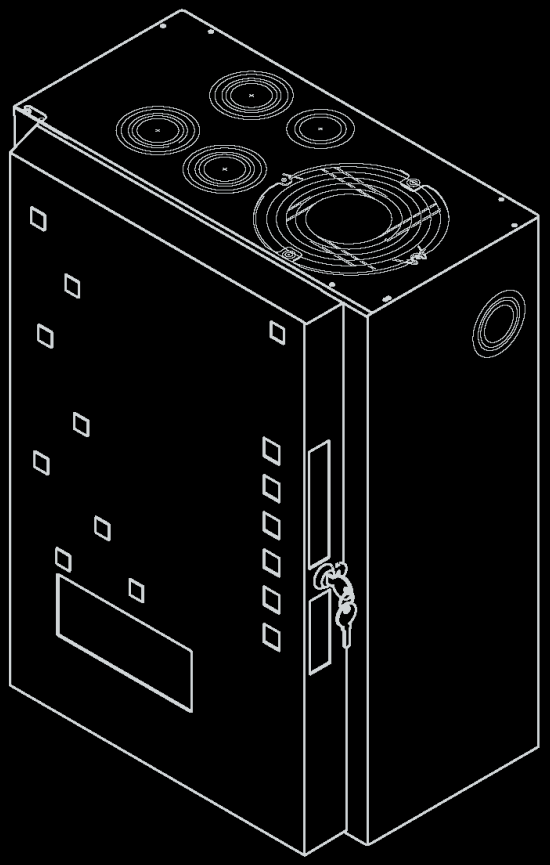
GF2 and GF3 – Lensed CFL Downlights
Standard Ballasts



GF4, GF5, and GF6 – Lensed MH Downlights
Standard Ballasts

Grand Foyer

Electrical Depth



Original Dimming Panel DP3A

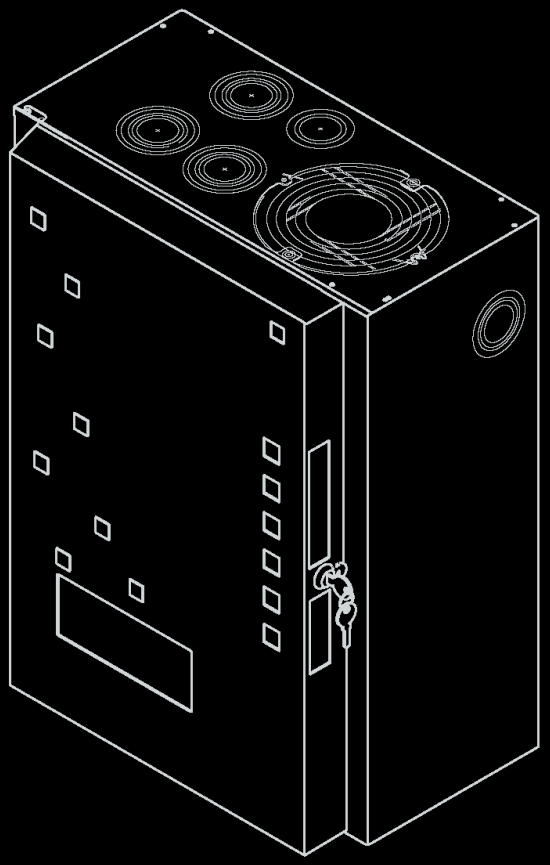
48 circuits (dual 24 circuit panels):

- 24 for Grand Foyer lighting
- 4 for Exterior lighting
- 4 for third floor lighting system
- 16 spare

122 Amps Design Load
4 x 1/0 AWG feeder

Grand Foyer

Electrical Depth



Redesigned Dimming Panel DP3A

12 circuits (single panel):

- 3 for Grand Foyer lighting
- 2 for Exterior lighting
- 4 for third floor lighting system
- 3 spare

28 Amps Design Load
4 x #8 AWG feeder

Conclusions

Addition of Pergola enhanced the functionality of the Roof Terrace

Roof Terrace lighting system created intimate and flexible performance space

Grand Foyer lighting system reduced power consumption while accenting the architecture

Thanks

The Pennsylvania Academy of Music
PJAR Architects
HLB Lighting Design
Cosentini

Professor Mistrick
Ted Dannerth
AE Faculty and Staff

My family, friends, and peers

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