

# Technical Report I

jack risser | lighting/electrical

s. good | the nerman museum

overland park, kansas | sept 16<sup>th</sup>, 2013.

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## Executive Summary:

The Nerman Museum of Contemporary Art was selected for this technical report on existing conditions. The four spaces that were examined were:

|Solarium

|Café

|Auditorium

|Gallery

Each of these spaces were examined for their current lighting solution such as lighting plans, floor plans, finishes, layout, glazing types, etc. A design criterion was then classified to evaluate the existing spaces. Throughout the report, all spaces demonstrated quality design, but there is room for improvement. The solarium could use a more creative lighting approach with daylight control integration. The café could benefit from a more dramatic, tense, and imaginative lighting scheme that draws patrons in. Incorporating more daylighting into the auditorium could enhance the learning process and facilitate creativity. The gallery is very well designed but could be refined with more controls. All of these spaces could be developed with more respect to the museums architectural branding in general.

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## Building Overview:

### Location Building name

The Nerman Museum of Contemporary Art

### Location and site

Johnson County Community College

Overland Park, KS

### Building Occupant Name

The Nerman Museum

### Occupancy or function types

Education | Art Gallery | Café

### Size

38,190 SF

### Number of stories above grade / total levels

2 stories above grade | 2 total

### Dates of construction

Start: April 2005

Completion: August 2007

### Actual cost information

Approx. \$15 million

Details not released

### Project delivery method

Design Bid Build

# Solarium:

Located inbetween the existing community college building and the museum, the solarium is the main connection point for the campus side of the Nerman Museum. Additional seating for the café is located on the interior wall against the museum. The rest of the space is an open circulation space.



## Existing Conditions

- Area | 3,120 ft<sup>2</sup>
- Length | 92 ft
- Width | 34 ft
- Ceiling Height | sloped: 38 ft to 44 ft



The space is extremely tall and open to facilitate movement to and from the museum and the college building. It is surrounded by three sides of glazing to simulate an outdoor environment, but still function as part of the architecture as a whole. The two solid sides of the existing building and the museum create a cavern, making the glass appear suspended in the void.

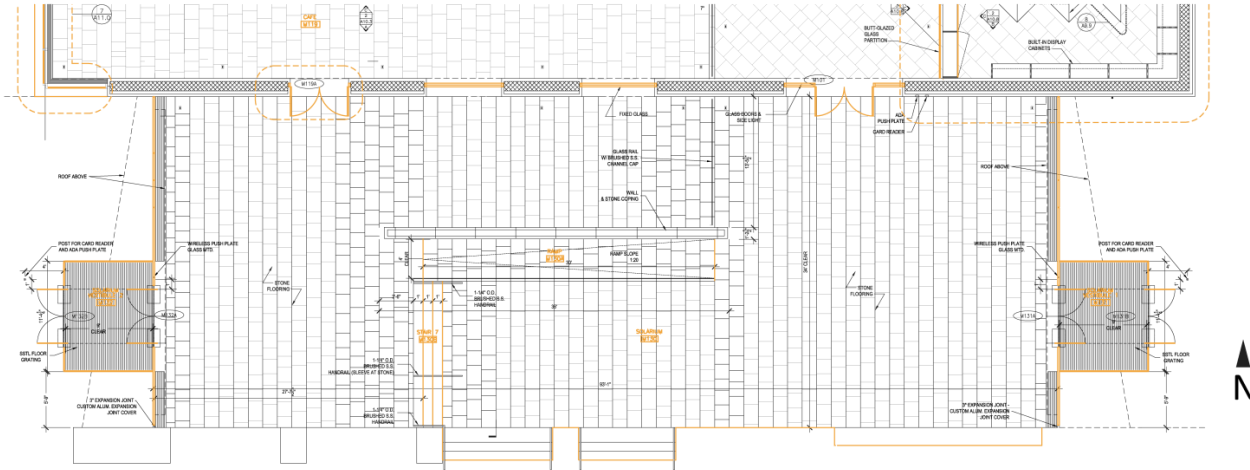


fig 1: solarium floor plan

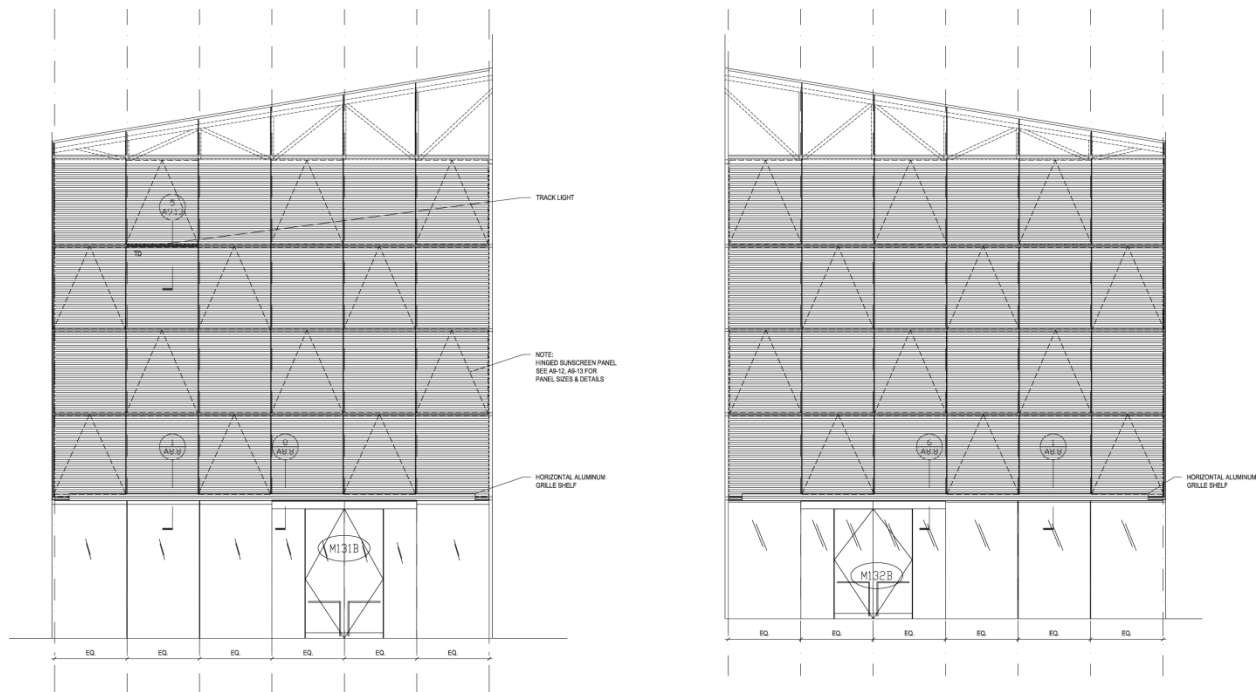


fig 2: solarium elevations

## lighting and controls

The lighting for the solarium is affected mainly by its multistory space and the expansive glazing on the ceiling and two walls. There is a perforated metal mesh that is used as a daylight control feature across most of the glass. This material allows a surface to be lighted. The main technique used in this space is indirect lighting from wall sconces or uplighting from the soffits above the doors. Track lighting mounted to the metal mesh is also used to provide additional illumination where needed. One of the areas that needs a higher illuminance level is the seating for the café. Here, the track lighting is concentrated in that zone. The indirect lighting solution enables the space to feel spacious and provides the users easy navigation through the room.

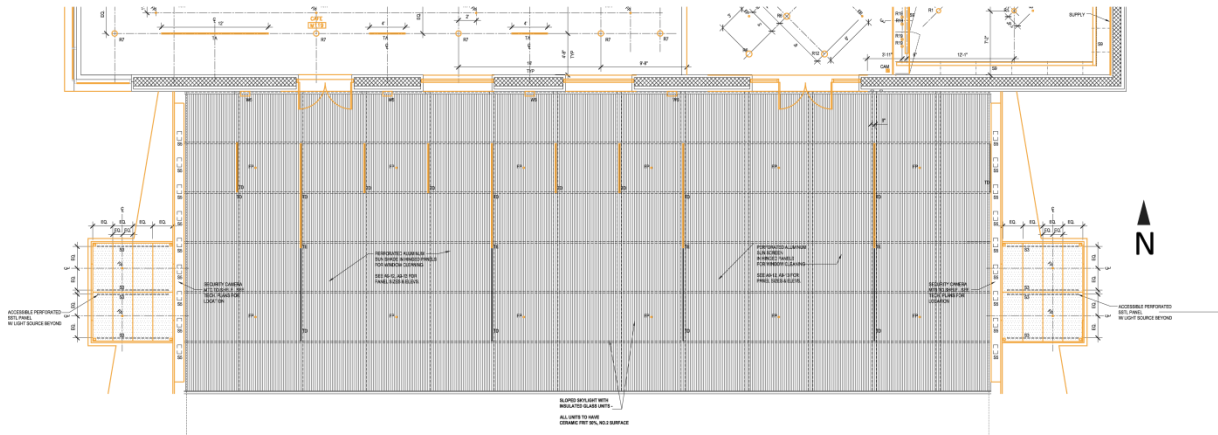


fig 3: solarium rcp

### Solarium Equipment Schedule

Type	Description	Mounting	Lamp	Ballast	Voltage	Input (W)	Manufacturer
S5	Ceramic metal halide wall mounted sconce, upright	Wall mounted	G12	-	120 V	150	Elliptipar
T1	Halogen mono point track wall wash	Track mount	PAR 38 FL	-	120 V	100	LSI
TA	Recessed track housing, flangeless, 2 circuit track	Recessed	-	-	120 V	-	LSI
W5	Ceramic metal halide, upright sconce	Soffit mount	G12	-	120 V	150	Hess

## finishes and glazing

For the solarium, like most of the building, the finishes and materials used are fairly simple. The stone found on the outside of the museum, can also be found on the walls of the inside. The floor is also covered in the limestone. This gives the building continuity in design and its image. Being a contemporary museum, it is appropriate to use a minimal amount of conflicting finishes. The building as a whole can be unified by under its clean lines and simple geometry. Two sides and the roof are also finished with glazing, making daylight a predominate feature. A perforated metal mesh is used as a daylight control material to block glare and limit the amount of total sunlight coming into the space. The glass is fairly transmissive and it could be looked at for further improvement.

### Solarium Finishes

Type	Description	Color	Reflectance	Manufacturer
floor	stone	off white	.6	-
walls	stone   aluminum   brick	off white   silver   red	.6   .7   .25	-
ceiling	metal	silver	.7	-

### Solarium Glazing

Type	T <sub>vis</sub>	U <sub>winter</sub>	U <sub>summer</sub>	SHGC	SC
glazing-1	.7	.36	.34	.41	-

## Design Criteria

The Illuminating Engineering Society Tenth Edition Lighting handbook is used for the following design criteria. The specifics below are listed in order of importance.

### lighting power density

ASHRAE 90.1 2010 dictates the lighting power densities (watts / ft<sup>2</sup>) for all spaces in this building. These criteria are very important to meet because it a required code by the state. The building cannot be used if these codes do not comply. Details are summarized below.

### Solarium LPD

Space	Allowance
Solarium - circulation	.02 per ft (height)



## illuminance

The illuminance for the space is important to space due to the fact that it's a main circulation and connection point for the museum and the existing building it links. The space doesn't need an abundance of light, but there does need to be a hierarchy of light that moves patrons through the space and also highlights the café seating area. The criteria are summarized below.

### Solarium Illuminance (IES recommendations)

Space	$E_h$ (lux)	$E_v$ (lux)
rendering/work areas	150	50
social/waiting areas	40	15

## circulation

Circulation for the solarium is important because it needs to take users from the outside or the existing building and move them into the museum. The café seating area is an important pivot point where foot traffic can flow around.

## glare

Glare is an important factor for this space in particular due to the fact it is covered in glass on three out of six sides. Controlling daylight will be paramount in making this a pleasant space.

## controls

Controls for this space were not used, but will be further studied and implemented in daylight control.

## uniformity

Uniformity guidelines are laid out in the IES Tenth Edition Lighting Handbook. The main motive to achieve these uniformities is to limit visual distraction and isolate the task in each space.

### Solarium Uniformity (IES recommendations)

Space	$E_{max}:E_{avg}$	$E_{h-avg}:E_{h-min}$	$E_{v-avg}:E_{v-min}$
solarium	-	2:1	-

## sustainability

This project does not currently hold sustainability features, but sustainability techniques will be researched and considered especially in the area of daylighting.

## psychological impression

The solarium's psychological impression is to provide an atmosphere that reinforces circulation and wayfinding. It wants to draw people into the museum and also be a pleasant area to eat in the café seating area. Often times, it is the first area the patrons will enter.

## Evaluation of Existing Lighting

The existing lighting for the solarium is a very acceptable design. The indirect lighting scheme makes for a pleasant environment visually inside and out. From the outside, it becomes a glowing beacon; a box of light delicately linking the contemporary and the old. There could be more of an emphasis on the pathways and into the entrance of the museum. Since the space is so expansive and unique, a more creative solution could be implemented to further enhance the style and brand of the architecture as a whole. Quantifiably, the illuminance of the circulation space is about 5 fc, while the café area is at 20fc, which is about right for this type of room.

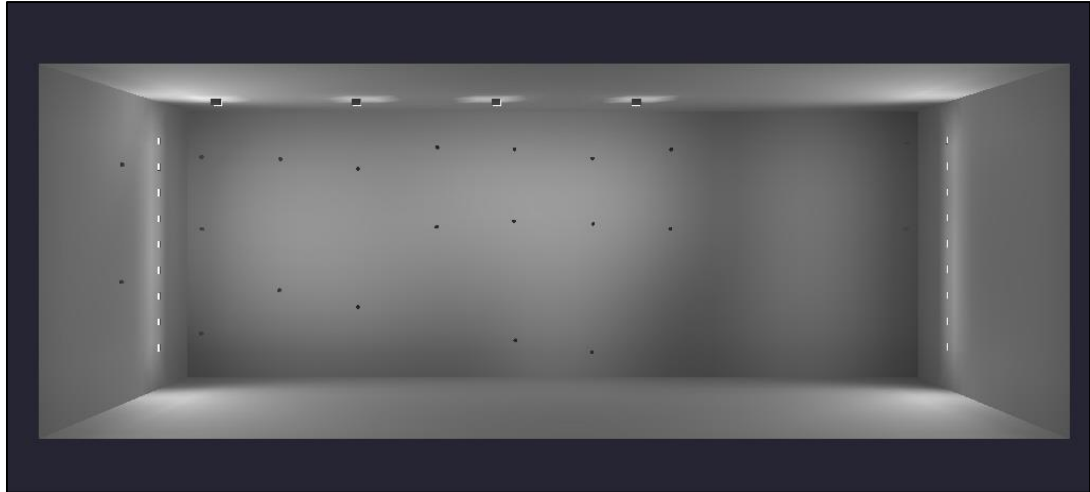


fig 4: solarium top view render

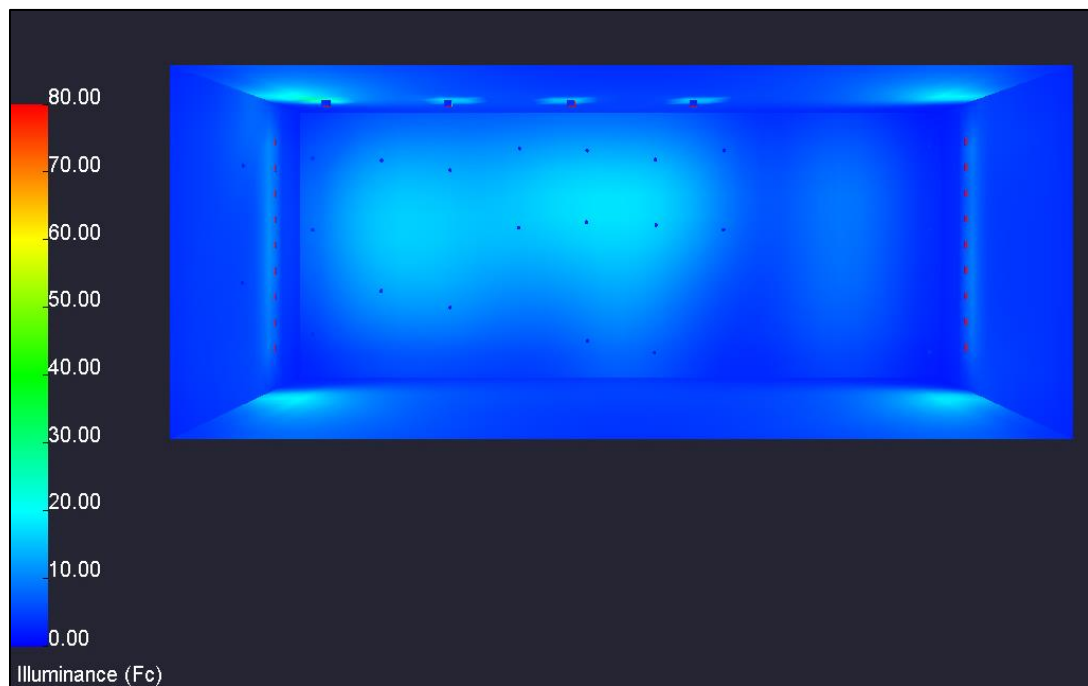


fig 5: solarium top view pseudo render

**Café:**

The café is located just off the solarium and is at the axis of the main hallway for the museum. The space is raised a total of two feet above the hallway with a small stair located on the right side of the space. Seating is located on the left side of the space. It is a long narrow space.



**Existing Conditions**

- Area | 1,480 ft<sup>2</sup>
- Length | 68 ft
- Width | 19 ft
- Ceiling Height | 12 ft



The space is long and narrow to encourage the patrons to move through the café eatery line and continue either to the seating immediately to the left through the glass doors and into the solarium. There are three large floor to ceiling glass windows that look into the solarium and a window to the outside as well.

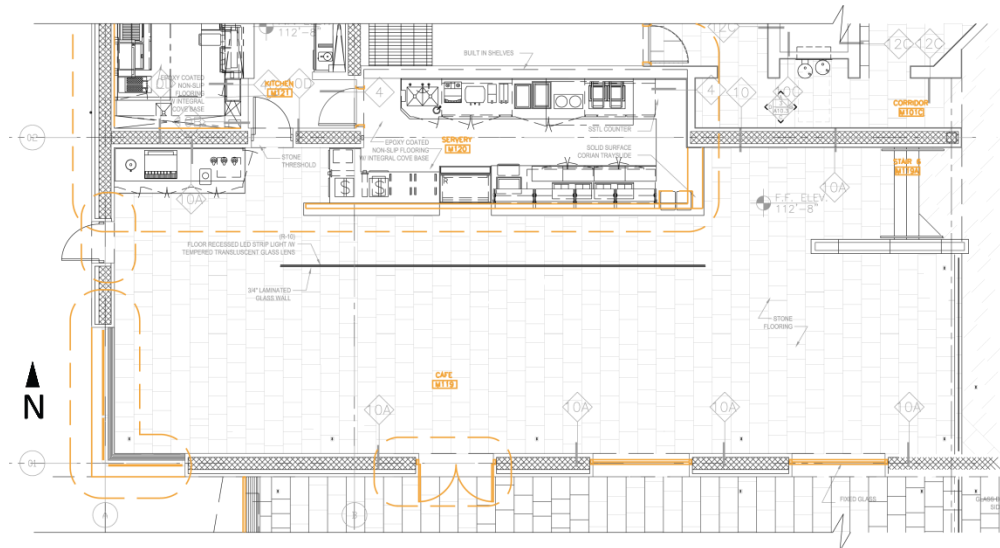


fig 1: café floor plan

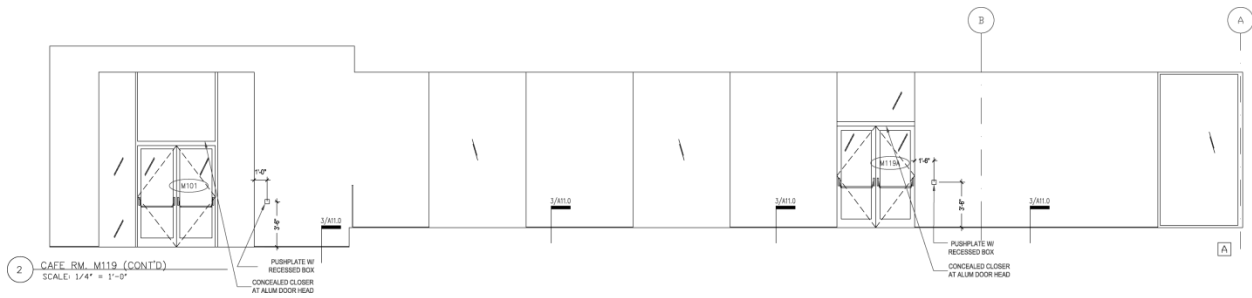


fig 6: café elevation 1

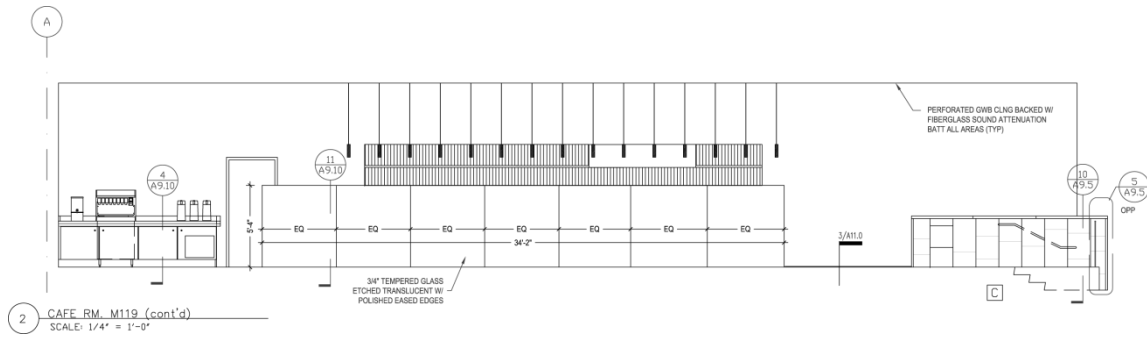


fig 7: café elevation 2

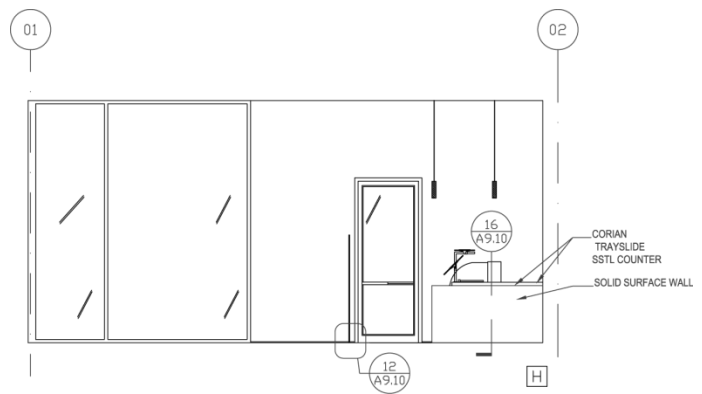


fig 8: café elevation 3

## lighting and controls

The lighting for the café a challenge because of its long narrow profile. Downlights are located over the seating area. Track lighting highlights the art of the walls adjoining the solarium. A pendant fixture hangs over the eatery to highlight the area and call attention to where the patron is supposed to enter the café. Daylight can also spill into the space from the solarium and a window located on the back wall.

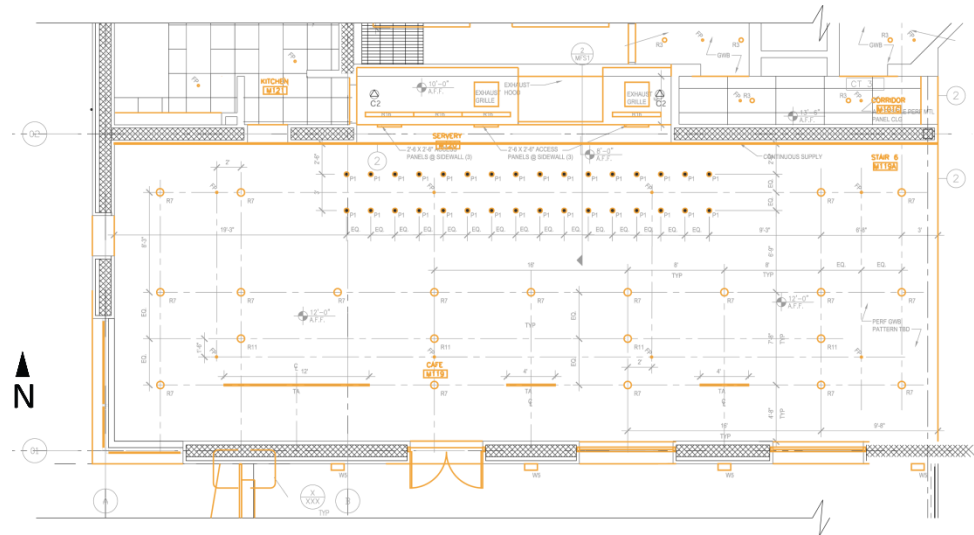


fig 9: café rcp

### Café Equipment Schedule

Type	Description	Mounting	Lamp	Ballast	Voltage	Input (W)	Manufacturer
P1	Fluorescent CFL pendant decorative fixture	Pendant	Fluorescent quad CFL	Integral electronic ballast	120 V	13	D'ac
R7	Halogen downlight, trimless	Recessed	PAR-38 FL	-	120 V	150	Kurt Versen
R11	Compact fluorescent downlight with lens	Recessed	Triple tube	Electronic ballast	120 V	32	Kurt Versen
T1	Halogen mono point track wall wash	Track mount	PAR 38 FL	-	120 V	100	LSI
TA	Recessed track housing, flangeless, 2 circuit track	Recessed	-	-	120 V	-	LSI

## finishes and glazing

In the café, the finishes were kept simple and familiar. The stone found on the outside of the museum are used as the floor material. The walls are painted dry wall. The color matches very closely to the stone color. This compliments the stone very nicely and supports the minimalist, contemporary theme in the architecture. A glass half height wall is also used to divide the space between the eatery line and the café seating. All geometries and shapes are clean and simple which enforces the contemporary theme across the building. Floor to ceiling windows are used to dramatize the space. This gives depth to the space and looks beyond into the solarium.

### Café Finishes

Type	Description	Color	Reflectance	Manufacturer
floor	stone	off white	.6	-
base	aluminum	silver / painted	.7	-
walls	GWB	off white / painted	.7	-
ceiling	perf. GWB	off white / painted	.7	-

### Café Glazing

Type	$T_{vis}$	$U_{winter}$	$U_{summer}$	SHGC	SC
glazing-1	.7	.36	.34	.41	-

## Design Criteria

The Illuminating Engineering Society Tenth Edition Lighting handbook is used for the following design criteria. The specifics below are listed in order of importance.

### lighting power density

ASHRAE 90.1 2010 dictates the lighting power densities (watts / ft<sup>2</sup>) for all spaces in this building. These criteria are very important to meet because it a required code by the state. The building cannot be used if these codes do not comply. Details are summarized below.

### Café LPD

Space	Allowance
café	1.3

### illuminance

The illuminance for the space is important due to the fact that it's a main apex point for the circulation area in the building. The space doesn't need a great amount of light, but it would benefit from a high level of illuminance over the eatery and serverly areas, as well as the dining area.

#### Café Illuminance (IES recommendations)

Space	$E_h$ (lux)	$E_v$ (lux)
coffee shop	100	30
serverly-employee served	500	200

### uniformity

Uniformity guidelines are laid out in the IES Tenth Edition Lighting Handbook. The main motive to achieve these uniformities is to limit visual distraction and isolate the task in each space.

#### Café Uniformity (IES recommendations)

Space	$E_{max}:E_{avg}$	$E_{h-avg}:E_{h-min}$	$E_{v-avg}:E_{v-min}$
coffee shop	-	3:1	-
serverly-employee served	-	2:1	-

### glare

Glare is a concern for this space because of the daylight solarium connected and the window to the outside. The windows are very large, making them potential glare sources. Also, fixture selection must be looked at in order to minimize glare when eating and looking at the menus over the eatery.

### controls

Controls for this space were not used, but will be further studied and implemented in occupancy or vacancy sensors.

### sustainability

This project does not currently hold sustainability features, but sustainability techniques will be researched and considered especially in the area of daylighting.

## circulation

Circulation for the café is fairly important because it needs to get patrons through the line and into the seating area either in the café or the solarium. The café seating area is an important pivot point where foot traffic can flow around.

## psychological impression

The cafe's psychological impression is to provide an atmosphere that promotes relaxation and drama. Keeping with the style and brand of the rest of the interior design, but also branching out and making an impression is important for this space.

## Evaluation of Existing Lighting

The existing lighting for the café is a very clean and straightforward. Downlights provide a majority of the task and ambient light to the space. Track lighting highlights the art on the walls which is important. The main attraction, in terms of lighting design, are the pendant luminaires over the eatery. Here a repetitive pattern reinforces the minimal, clean line theme of the architecture and adds a certain drama to the space. The space could benefit from a more intimate and tense mood in the form of a creative and risky lighting scheme. The illuminance levels seem to be fairly high for the seating area (35 fc) while the service area drops off a bit (25 fc). A different hierarchy of illuminance might be more appropriate.



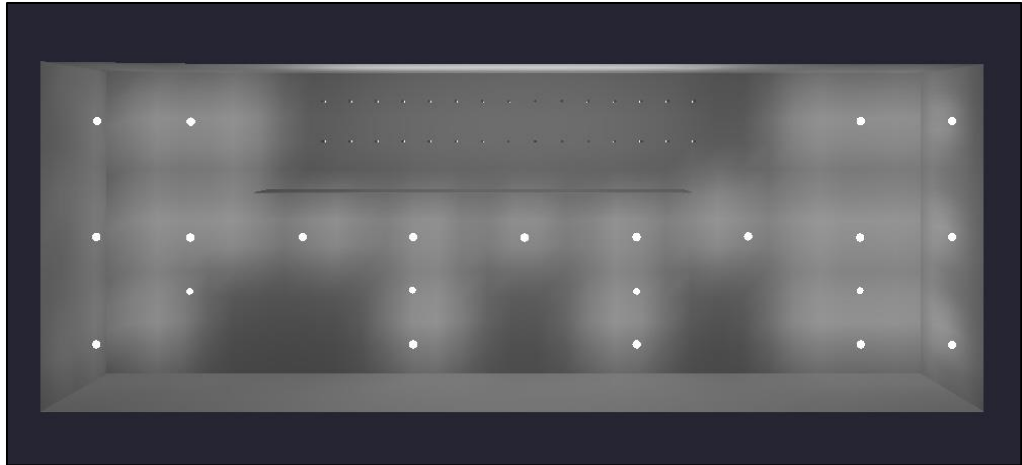


fig 10: café top view render

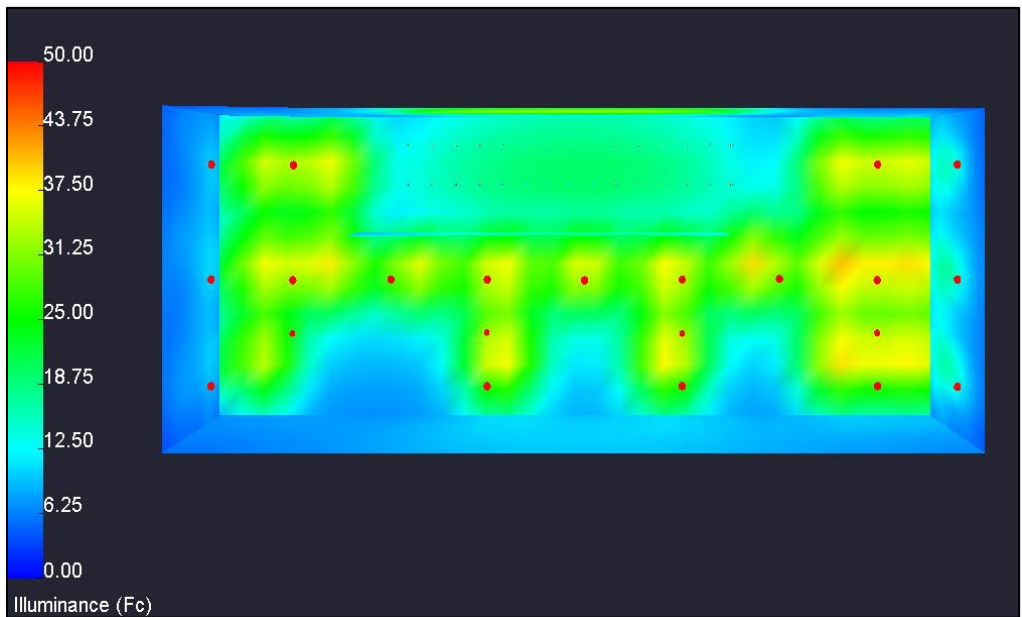
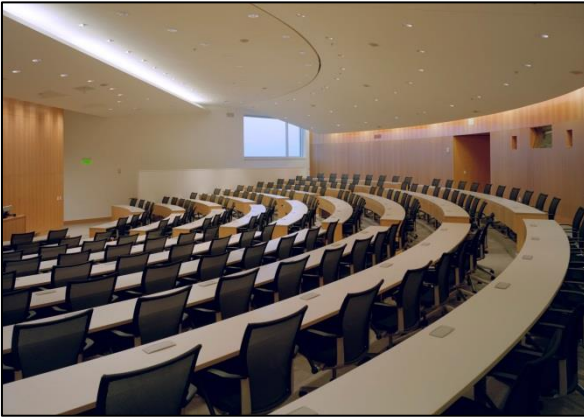


fig 11: café top view pseudo render

## Auditorium:

The auditorium is located on the second floor of the museum, just of the main lobby area. There are two entrances that flank the projection room. The main seating is on a raise platform with the lecture area being at the bottom of the room. There is one large window on the exterior wall. The space is shaped in a quarter circle, making it a tricky space to design. The ceiling is also sloped for acoustics.



### Existing Conditions

Area | 3,180 ft<sup>2</sup>

Radius | 60 ft

Ceiling Height | varies: 15 ft (front)

17 ft (middle)

10 ft (back)

Being shaped in a quarter circle creates a focus point at the head of the room where the lecturer would stand to present. This is obviously a plus for the room. There are four main isles going through the seating. The furniture is curved with the room.

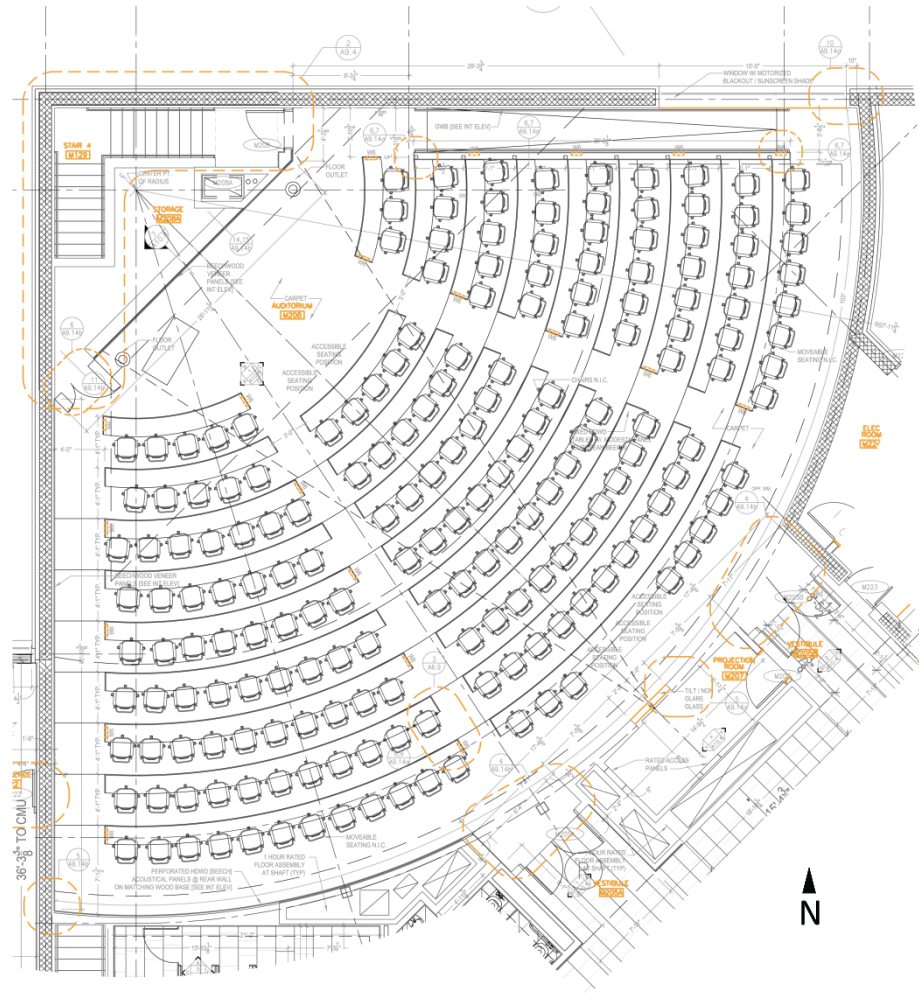


fig 12: auditorium floor plan

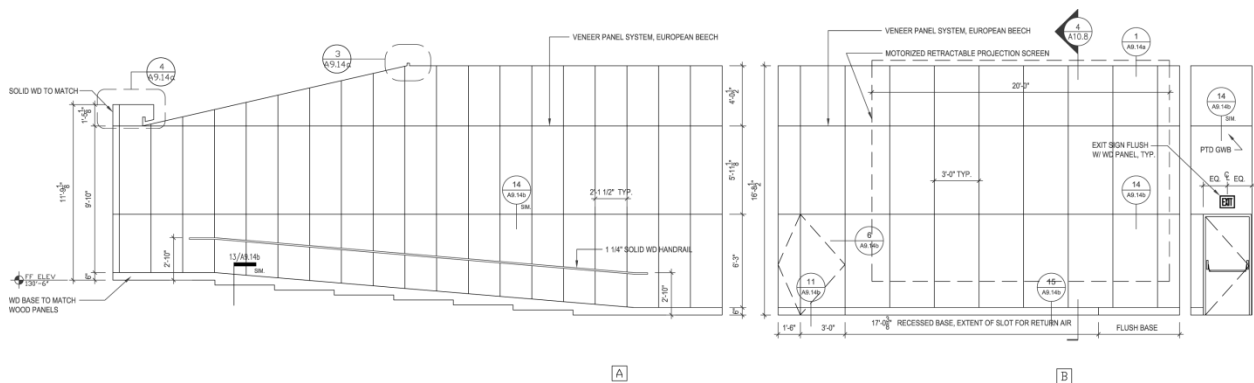


fig 13: auditorium elevation 1

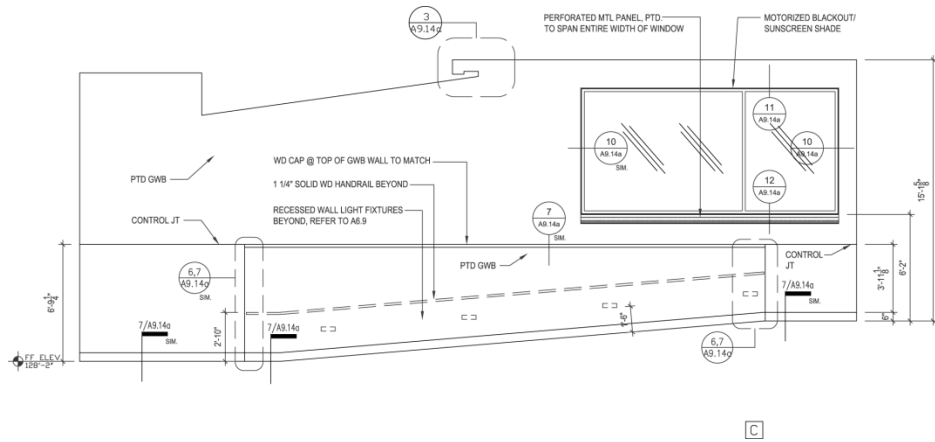


fig 14: auditorium elevation 2

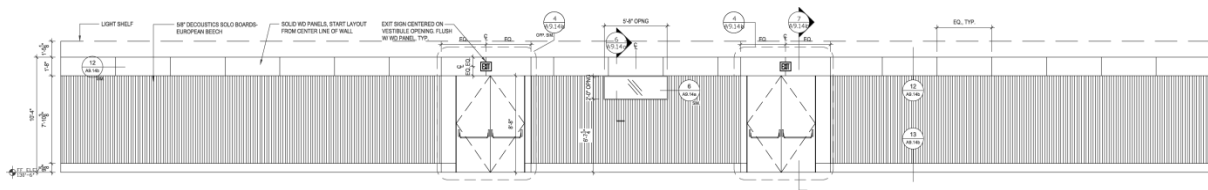


fig 15: auditorium elevation 3

### lighting and controls

The Auditorium is illuminated by metal halide and fluorescent sources. The ceiling is peppered with downlights that provide the general illumination for the desks. Track lighting can be found at the head of the room for a spotlight on the lecturer. These sources have warm color temperatures and high color rendering characteristics. Each band is controlled separately for flexible auditorium tasks. Two cove lighting techniques are used at the first ceiling band and again at the back.



### Auditorium Equipment Schedule

Type	Description	Mounting	Lamp	Ballast	Voltage	Input (W)	Manufacturer
L1	Fluorescent cove, extruded aluminum, specular reflector	Cove mount	(2) T5	Integral electronic HPF ballast	120 V	56	Windirect
L3	Fluorescent strip, formed steel housing	Cove mount	(1) T8	Integral electronic ballast	120 V	32	Litecontrol
R6	Halogen downlight with tilt bracket	Recessed	PAR-38 FL	-	120 V	150	Kurt Versen
R7	Halogen downlight, trimless	Recessed	PAR-38 FL	-	120 V	150	Kurt Versen
R11	Compact fluorescent downlight with lens	Recessed	Triple tube	Electronic ballast	120 V	32	Kurt Versen
T1	Halogen mono point track wall wash	Track mount	PAR 38 FL	-	120 V	100	LSI
TA	Recessed track housing, flangeless, 2 circuit track	Recessed	-	-	120 V	-	LSI

### finishes and glazing

For the auditorium, the finishes and materials used are mostly centered around acoustical purposes. Wood and acoustical material are used on the wall. The floor is covered by carpet to reduce sound vibrations. These materials drive down the reflectance's in the room which in turn makes the amount of light output needed in the room higher. Material details can be found below.

### Auditorium Finishes

Type	Description	Color	Reflectance	Manufacturer
floor	carpet	tan	.3	-
base	vc	off white / painted	.6	-
walls	wood   acoustic   GWB	light stain   off white   off white / painted	.5   .6   .7	-
ceiling	perf. GWB   acoustic (LTD)	off white (varied) / painted	.6	-

### Auditorium Glazing

Type	$T_{vis}$	$U_{winter}$	$U_{summer}$	SHGC	SC
glazing-1	.7	.36	.34	.41	-

## Design Criteria

The Illuminating Engineering Society Tenth Edition Lighting handbook is used for the following design criteria. The specifics below are listed in order of importance.

### lighting power density

ASHRAE 90.1 2010 dictates the lighting power densities (watts / ft<sup>2</sup>) for all spaces in this building. These criteria are very important to meet because it a required code by the state. The building cannot be used if these codes do not comply. Details are summarized below.

### Auditorium LPD

Space	Allowance
auditorium	0.79

### illuminance

The illuminance for the space is very important due to the fact that the tasks in the room are the most important criteria in achieving a good design. The criteria are summarized below.

### Auditorium Illuminance (IES recommendations)

Space	$E_h$ (lux)	$E_v$ (lux)
av and notes	50	15
av no notes	10	6
feature presentation	10	6
no av	100	40
screen	-	10
speaker face	-	3x audience task
demonstration	1000	500

### uniformity

Uniformity guidelines are laid out in the IES Tenth Edition Lighting Handbook. The main motive to achieve these uniformities is to limit visual distraction and isolate the task in each space.

### Auditorium Uniformity (IES recommendations)

Space	$E_{max}:E_{avg}$	$E_{h-avg}:E_{h-min}$	$E_{v-avg}:E_{v-min}$
av and notes	-	2:1	-
av no notes	-	2:1	-
feature presentation	-	2:1	-
no av	-	2:1	-
screen	-	2:1	-
speaker face	-	2:1	-
demonstration	-	3:1	-

### controls

Controls for this space were not used, but will be further studied and implemented in daylight control.

### glare

Glare is an important concern for the visual content on the projector screen and chalk board. The visual tasks at the desks are also a concern especially for computer screen and tablets.

### sustainability

This project does not currently hold sustainability features, but sustainability techniques will be researched and considered especially in the area of daylighting.

### circulation

Circulation for the auditorium can be important to the space but is not a main concern.



## psychological impression

The auditorium's psychological impression is to provide an atmosphere where learning and creativity about art can be expressed and encouraged. A creative and clever lighting scheme would be appropriate here. While fulfilling task light levels, a hint of drama or interest could be beneficial to stimulate the mind.

## Evaluation of Existing Lighting

The existing lighting in the auditorium is very standard and direct. Of all the four spaces being considered, this space seems to have the most potential to be upgraded. The multitude of downlight do nothing for the architecture of the museum and there is very little indirect lighting. Daylighting could also prove to be a valuable feature of this space and is hardly tapped into at the moment. The illuminance values for the space seem to be a little high (55 fc), but over lighting, in this particular task, isn't all that bad.

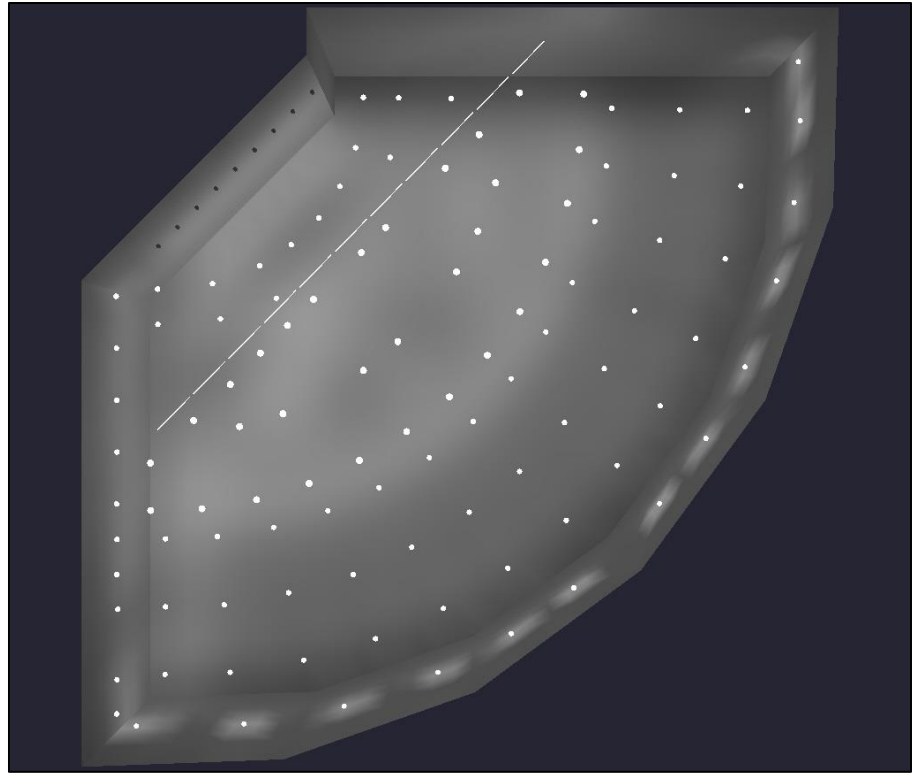


fig 17: auditorium top view render

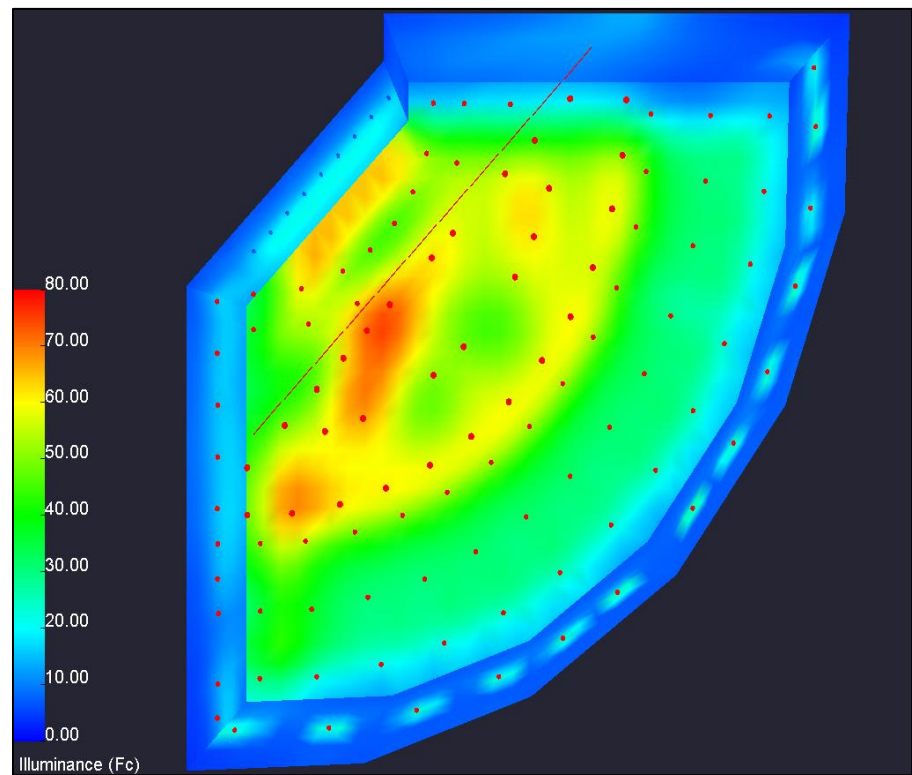


fig 18: auditorium top view pseudo render

## Gallery:

Located in the cantilever part of the second story gallery area, this particular gallery space is a large rectangular room with a floor to ceiling window located askew of its center line. Two linear daylight slots can be found on the shorter sides.



### Existing Conditions

Area | 1,836 ft<sup>2</sup>

Length | 51 ft

Width | 36 ft

Ceiling Height | 16 ft



The space has tall ceilings and plenty of art realstate with giant blank walls. Two openings in the walls create the main footpaths in and out of the space. One opening connects into the adjacent gallery room, and the other opens up to the first floor below with a staircase leading you down. A particular path is not required to find your way around this blank open room.

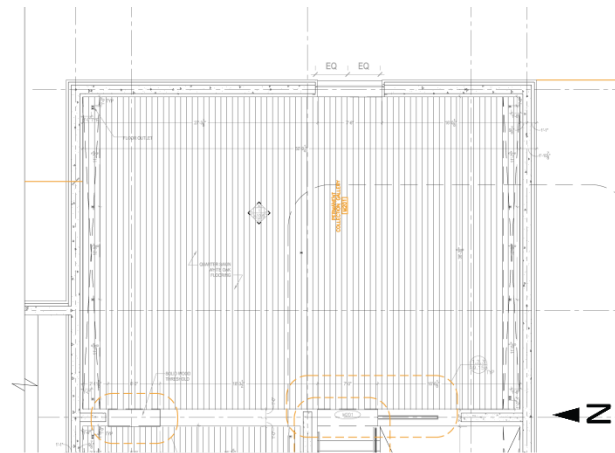


fig 19: gallery floor plan

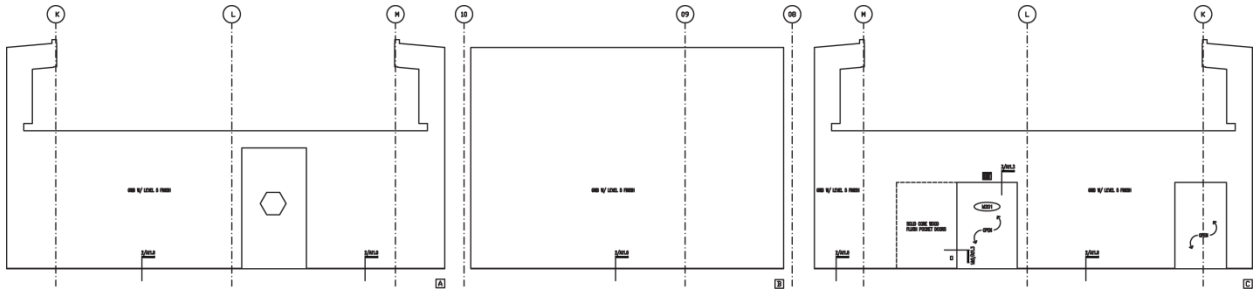


fig 20: gallery elevations

### lighting and controls

The lighting for the gallery uses only a few fixtures. The main ambient lighting for the space is supplied by compact fluorescent downlights. The art is then highlighted by track lighting PAR 38 lamps. The halogen source is very good for color rendering and that is one of the main reasons why it is used here. Other track washes the wall to give good contrast between the wall and the art. Daylighting is also used here in the form of wall slots. This also grazes the wall creating drama to the wall and ceiling's edge.

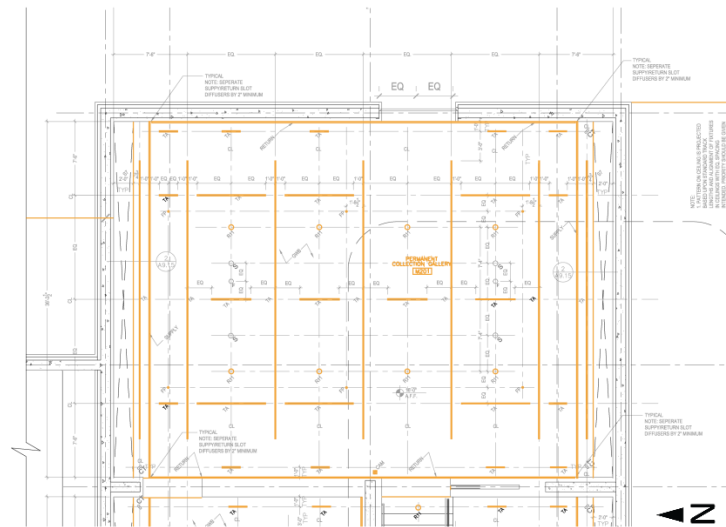


fig 21: gallery rcp

### Gallery Equipment Schedule

Type	Description	Mounting	Lamp	Ballast	Voltage	Input (W)	Manufacturer
R11	Compact fluorescent downlight with lens	Recessed	Triple tube	Electronic ballast	120 V	32	Kurt Versen
T2	Halogen track system spot	Track mount	PAR 38 SP	-	120 V	100	LSI
TA	Recessed track housing, flangeless, 2 circuit track	Recessed	-	-	120 V	-	LSI

### finishes and glazing

For this gallery a simple, minimalist approach was used. The walls are painted white like a blank canvas to allow the artwork to stand out. The wood floor is used to create soft warmth to the room that is in keeping with the natural architecture of the building. Making the gallery a simple rectangular box degrades the interior, but it allows the art to stand on its own.

### Gallery Finishes

Type	Description	Color	Reflectance	Manufacturer
floor	wood	light stain	.5	-
base	aluminum	silver / painted	.7	-
walls	GWB	off white / painted	.7	-
ceiling	GWB	off white / painted	.7	-

### Gallery Glazing

Type	$T_{vis}$	$U_{winter}$	$U_{summer}$	SHGC	SC
glazing-1	.7	.36	.34	.41	-

### Design Criteria

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## lighting power density

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### Gallery LPD

Space	Allowance
Gallery - artwork	1.05

## illuminance

The illuminance for the space is very important due to the sensitivity of the artwork it may be lighting. Creating the right amount of contrast between the wall, art and floor will be of great importance when trying to make the art stand out.

### Gallery Illuminance (IES recommendations)

Space	E <sub>h</sub> (lux)	E <sub>v</sub> (lux)
art(high sensitivity)-moderate focals	-	50
art(low sensitivity)-moderate focals	-	200
art(no sensitivity)-moderate focals	-	1000
gallery general-moderate focals	0.1xE <sub>h</sub> of art w/ $\geq 10$	-
security	30	30
work light	150	30

## controls

manual controls for this space were used to control the daylight slots above the walls. Other controls will be further studied and implemented in daylight control for this space.

## uniformity

Uniformity guidelines are laid out in the IES Tenth Edition Lighting Handbook. The main motive to achieve these uniformities is to limit visual distraction and isolate the task in each space. In particular, the gallery space needs to be able to achieve a very specific contrast between the art and the wall behind it. For this reason, uniformity criteria is a very important design consideration.

### Gallery Uniformity (IES recommendations)

Space	$E_{max}:E_{avg}$	$E_{h-avg}:E_{h-min}$	$E_{v-avg}:E_{v-min}$
art(high sensitivity)- moderate focals		2:1	4:1
art(low sensitivity)- moderate focals		2:1	4:1
art(no sensitivity)- moderate focals		2:1	4:1
gallery general-moderate focals		4:1	
security		4:1	4:1
work light		2:1	4:1

#### glare

Glare is also a very important factor when selecting the angle in which to light the art in the gallery. Lighting the art without creating shadows, or producing veiling reflections is very crucial in this space.

#### sustainability

This project uses daylighting features by supplementing the ambient glow with the wall slots. But additional sustainability techniques will be researched and considered especially in the area of daylighting.

#### circulation

Circulation in this area is not a major consideration. Clear well lit entrances are needed in order for the patron to find their way in or out of the gallery space.

#### psychological impression

This gallery's psychological impression create interest and focus to the art at hand. The bit of drama added by the skylight wall slot adds excitement and uniqueness to the room.

### Evaluation of Existing Lighting

The existing lighting for the gallery is a very well thought-out design. The soft wash on the wall is complimented very nicely with the spot lighting on the artwork. This lessens the fatigue on the eye and makes the viewing a more comfortable experience. Overall the space feels like the focus is in the right spot, and that's all you want in a gallery setting.

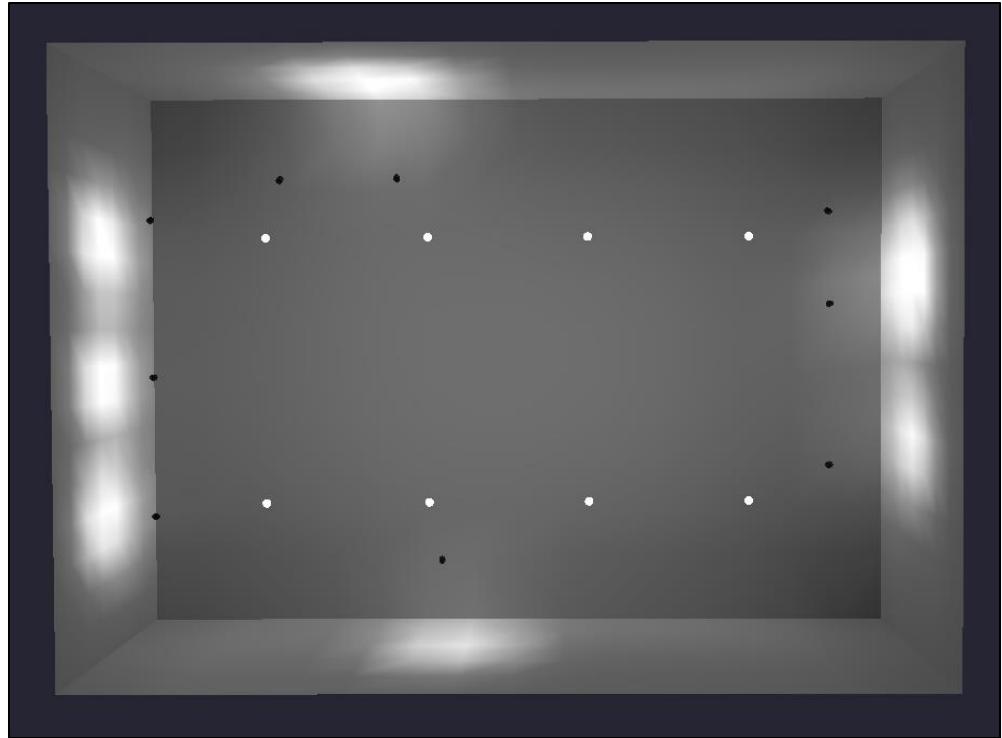


fig 22: gallery top view render

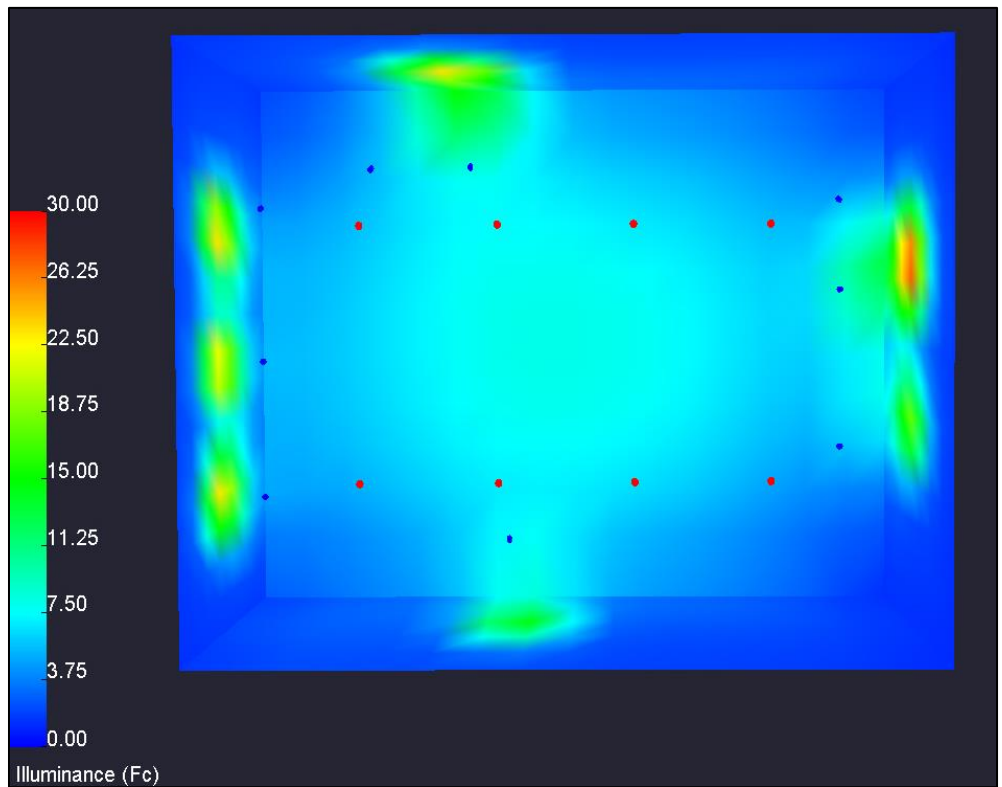


fig 23: gallery top view pseudo render



**Citation:**

All photos courtesy of KSWA.