Forum

(View from east end)

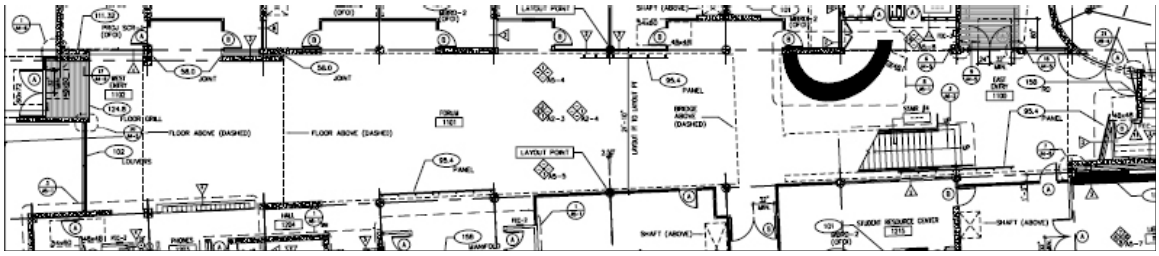
Design Synopsis

At the heart of the Student Resource Building is the triple height Forum. This space serves as the main pedestrian thoroughfare between inner campus and the adjacent neighborhood of Isla Vista. An exposed staircase provides access to the upper levels where corridors have views that overlook into the space. The roof covering this portion of the roof is raised, allowing space for clerestories to wrap around all four sides hence allowing ample daylight penetration throughout the year.

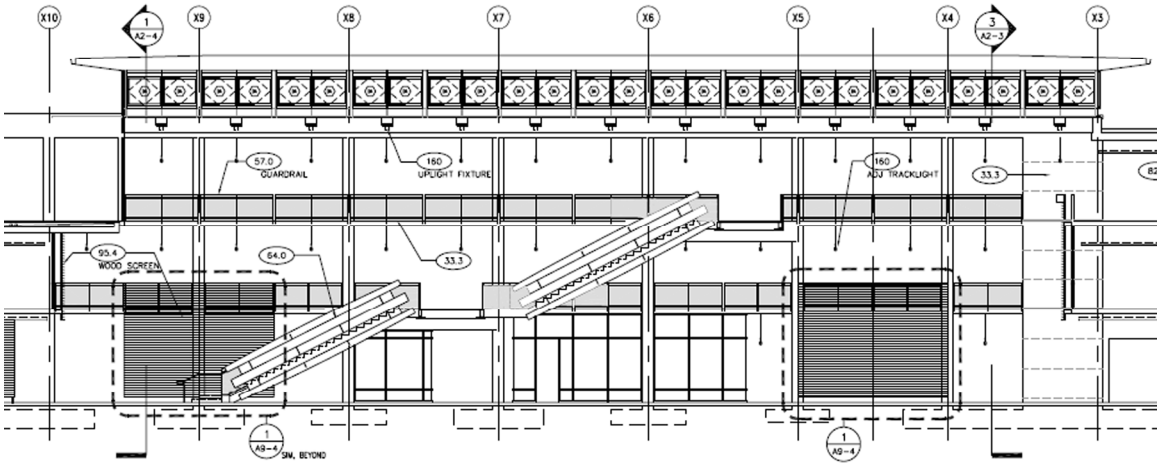
After reflecting on the comments at the schematic design presentations, some adjustments have been made to the design. For example, instead of relying on reflected light from the ceiling to provide for the ambience required in this space, a series of localized linear pole lights have been put in place at ground level to provide for a design that has a more “human-scale”

Other changes include the installation of LED under-railing lights to provide sufficient light on the stairs and pedestrian bridges as well as the led panels on the walls. In consideration of the overall power density in this space, the linear fluorescent strip lights originally proposed to highlight the wood screen has been deleted from the original design.

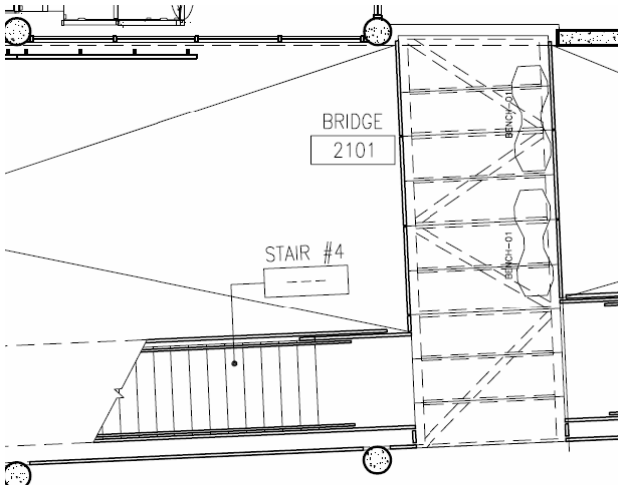
Existing Layout



1F Floor Plan



Forum Section



Pedestrian Bridge Plan (Typ.)

Design Criteria

Space and Luminaire Appearance

The space is subject to a high pedestrian volume due to the fact that it connects Isla Vista with UCSB. Therefore, lights should be placed in such a manner as to make the architecture of this space more visually appealing. Like the North-East Plaza, people will also use this place to socialize and as such, a comfortable and inviting appearance will also be desired. Luminaire appearance should conform to the architectural design in this space and if possible, hidden from view.

Color Appearance and Color Contrast

Selected lamps should provide for balanced color rendition of people and materials in this space. Color contrast and variation may be desired to increase visual interest in this space.

Daylight Integration and Controls

Clerestories in this area provide a great opportunity for daylight integration. Daylight harvested should aim at providing all ambient illumination during the day and if necessary be supplemented by the light installed here. This system should be controlled by strategically placed roof-top photocells that will monitor available daylight levels throughout the day and respond by adjusting the level of artificial illumination. Direct and reflected glare from the sun should also be avoided and if necessary, provide additional shading devices within the atrium space.

Glare Considerations

As most of the surrounding office spaces on either side of the atrium on all three levels utilize a glass façade, direct and reflected glare both from the sun or installed lighting should be avoided to satisfy the need for providing a comfortable environment for social interaction.

Light Distribution and Uniformity

A sufficient level of uniformity should be provided to meet the needs of occupant safety but some variation is desired to create visual interests.

Surface Luminances

The goal is use light as a means to draw people from point to point across this atrium; therefore overly uniform luminance levels on surfaces of this space should be avoided. For task-areas such as on the tables and counter, luminance ratio should be optimized to allow for best possible task-visibility. IESNA recommends the following luminance ratios:

3:1 Task and Adjacent Surround
10:1 Task and Non-Adjacent Surfaces

This is especially critical for the projection screen near the west end of the forum area to allow for good visibility.

Facial/ Object Modeling

In any space that caters for social interaction, good facial rendition is required.

Points of Interest

The psychological experience of this space by occupants should be considered. By nature, people are drawn to areas of higher luminance and so with that in mind, points of interest should be created to provide visual interests as well as draw people from one end to the other. Light should also be used in such a manner as to draw attention to the unique architectural features of this space such as the exposed staircase and the cross bracing system that supports the clerestory area.

Shadows

Sufficient illumination should be provided to avoid any over dark/ shadowed areas. This is particularly important on the study tables and ceramic counter top areas on the ground level.

Source/ Task/ Eye Geometry

Sources should be positioned to avoid reflected glare on the task plane.

Surface Characteristics

There are a variety of different surfaces in this atrium. Though light should be used to accentuate their materiality, special care should be given to those surfaces that have a relatively higher level of reflectance (i.e. ceramic counter area) to avoid discomfort glare.

IESNA Illuminance Recommendations

Horizontal

Cat. B: Simple orientation for short visits	50 lx (5 fc)
Cat C: Working spaces where simple visual tasks are preformed	100 lx (10 fc)

Vertical

Cat. A: Public spaces	30 lx (3 fc)

Schedules and Lighting Layouts

Luminaire Schedule
Location: Forum

Type		Quantity	Catalog No.	Lamping / Ballast	Watts/ Fixture	Ballast/ fixture	Total Watts	Voltage
F1		144	**Ambisol UK, SlabLight™** (0.5 x 1 FT) Surface-mounted LED panel w/ non transparent fascia	(L1) White Philips LumiLeds	1	-	144	277 V
F2		22	**Color Kinetics, Colorblast** 123-000005-00	36 High intensity RGB LEDs	50	-	1100	277 V
F5		10	**Bega 8945MH** Linear Ceramic Metal Halide Luminaire	1- (L2) GE Lighting 20017 CMH/T/U/942/G12	173	1 - (B1) Advance Transformers: 71A5437BP	1730	277V
F6		177	**IO Lighting, Lux Rail** 0-06-SSS-1-PM-GL-45-5K-1-277-I	9 LEDs (6 warm white, 3 cool white)	8	-	1416	277V
F7		8	**Selux, "M100": M1RS-1T5HO-OD-RC-008-WH-277-DM** Thin Profile Recessed Fixture	1 - (L5) GE Lighting 39982 F28W/T5/830	33	1 - (B2) Lutron Eco-10: ECO-T528-277-2	264	277V
F9		9	**IO Lighting, Line Series 2.0** 0-04-I-3k-90-100-1-18-2-4	LEDs (warm white)	15	-	135	277

Total Watts:	4789	**W**
Space Area:	4052	**SF**
Achieved Power Density:	**1.18**	**W/SF**
Allowed Power Density:	1.20	**W/SF**
Status:	Ok	

Based on calculations, the implemented design falls under the 1.20 W/sf allowed for this type of space as specified by California's Title 24 (2006).

Lamp Types Schedule
Location: Forum

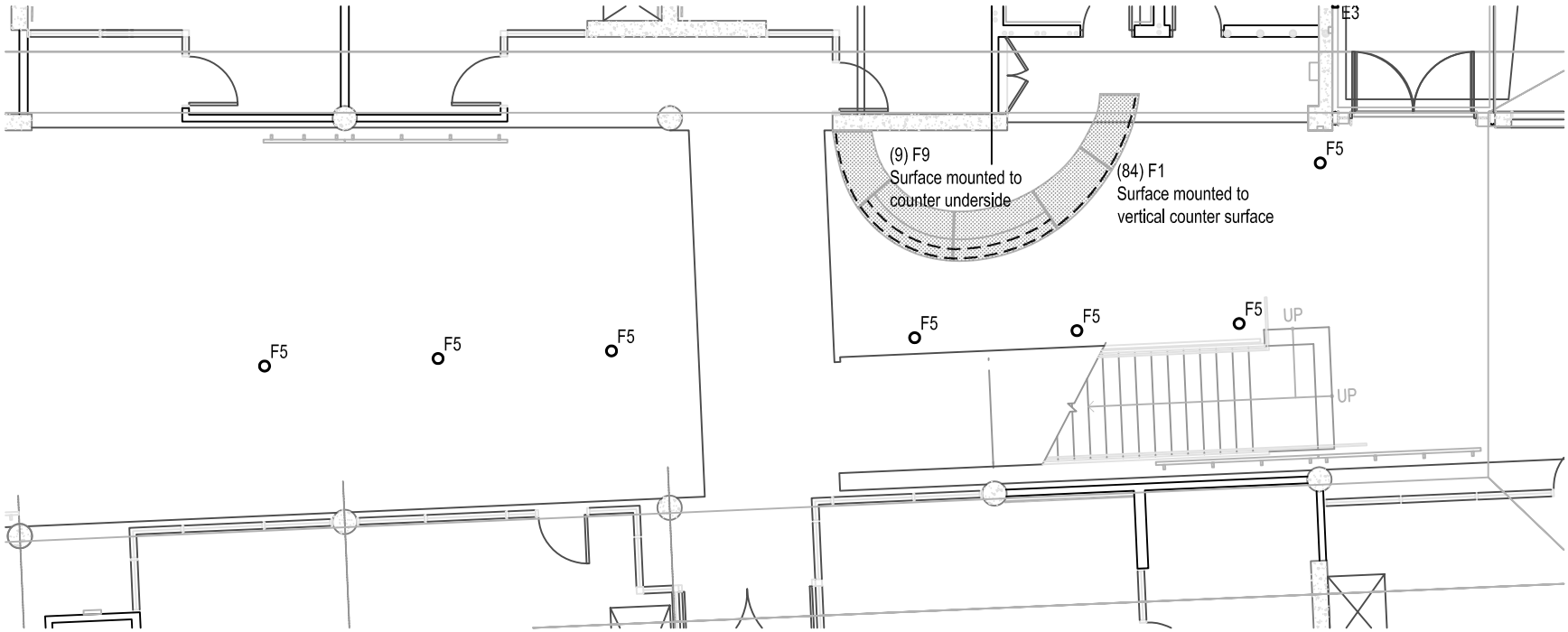
Type	Manuf.	Designation	Rated Wattage	Base	CRI / CCT	Rated Life (hrs)	Initial Lumens	Assoc. Fixture	Assoc. Ballast
L1	Philips Lighting	LumiLEDS	(see F1)	n/a	70 / 4500K	50000	120	F1	-
L2	General Electric	92584 CMH/T/U/942/G12	150	G12	82 / 3000K	12000	14000	F5	B1
L5	General Electric	46704 F28W/T5/830/ECO	28	G5	85 / 3000K	30000	2900	F4	B2

Ballasts Schedule
Location: Forum

Type	Manuf.	Catalog Name	# Lamps	Ballast Type	Start Method	Input Watts	Ballast Factor	Power Factor	THD (%)	Assoc. Fixture
B1	Advance Transformers	71A5437BP	1 - (L2)	Magnetic Standard	Ignitor	173	1.00	0.9	<10%	F5
B2	Lutron	Lutron Eco-10: ECO-T528-277-2	2 - (L5)	Electronic Dimming (10%)	Programmed Rapid Start	66	1.00	>0.95	<10%	F4, F7

Notes: *Please see Appendix A for all product cutsheets and complete schedules.*

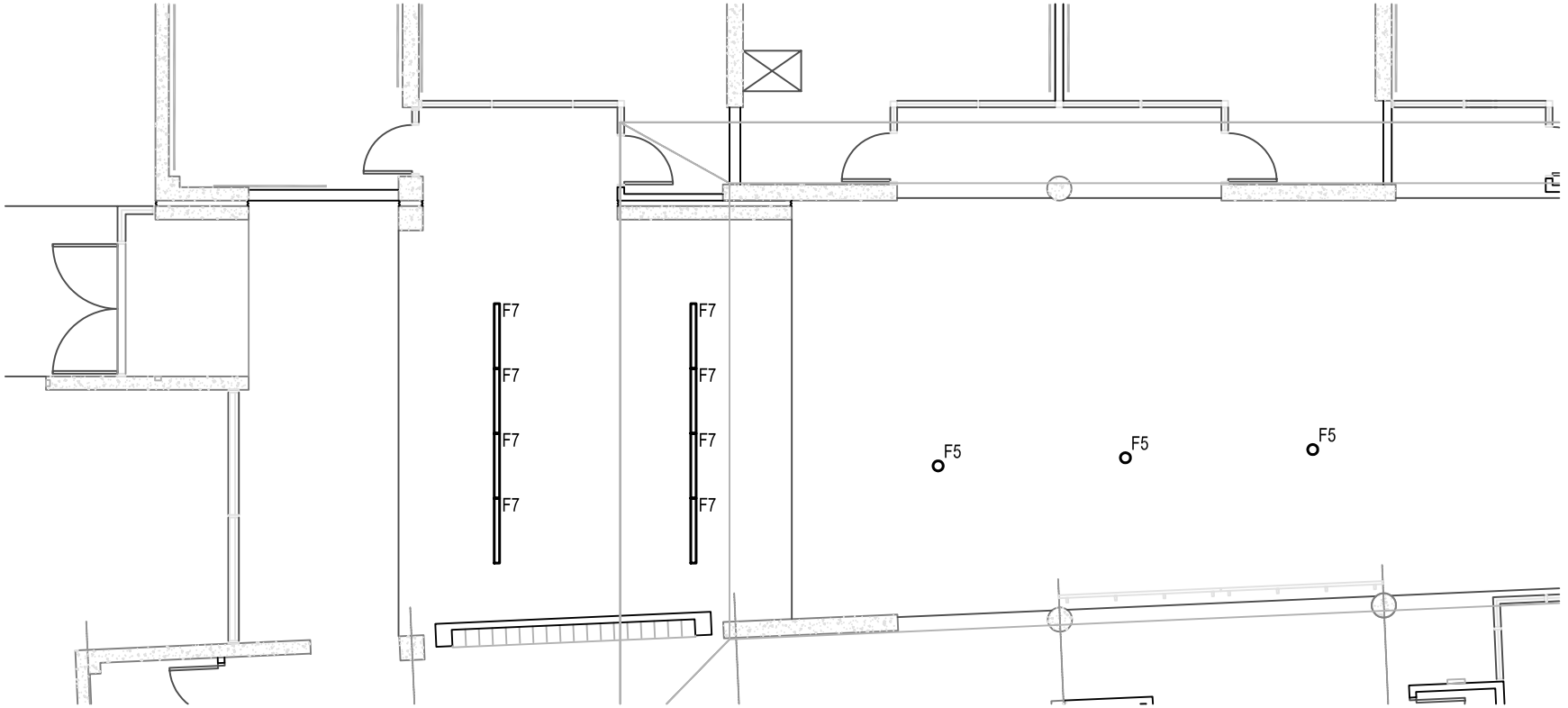
Lighting control intent is located in the electrical depth.



UCSB Student Resource Building

Forum - Lighting Plan (1 of 4)

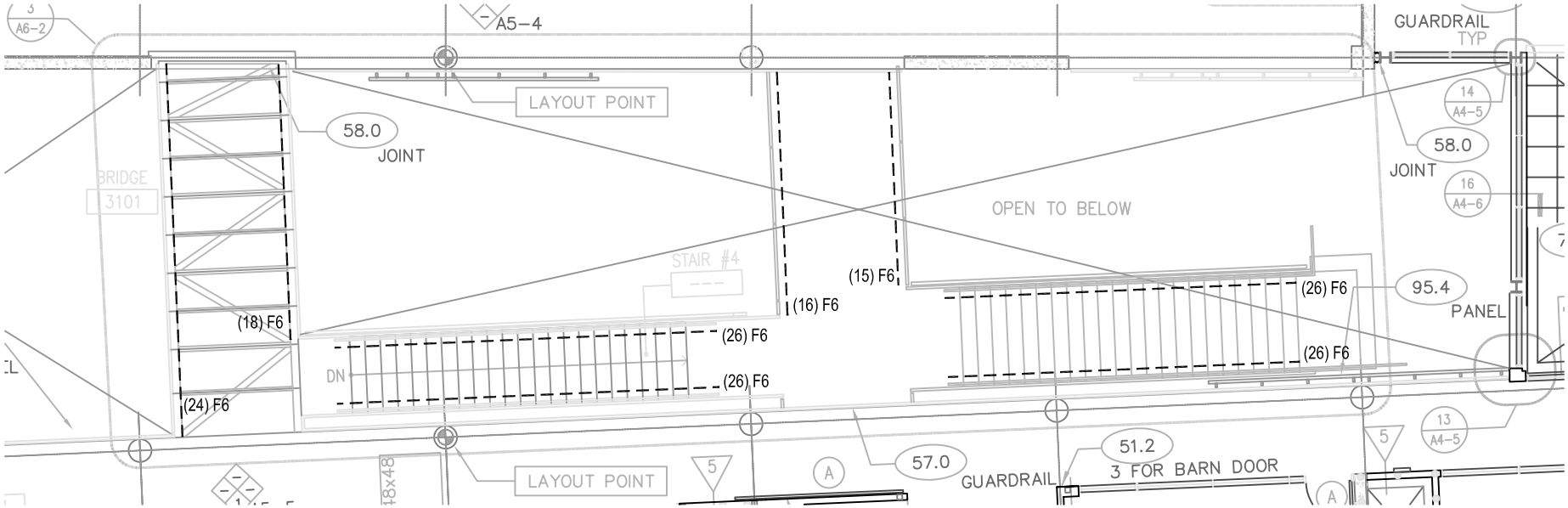
Scale: $\frac{3}{32}$" - 1'-0"



UCSB Student Resource Building

Forum - Lighting Plan (2 of 4)

Scale: $\frac{3}{32}$" - 1'-0"

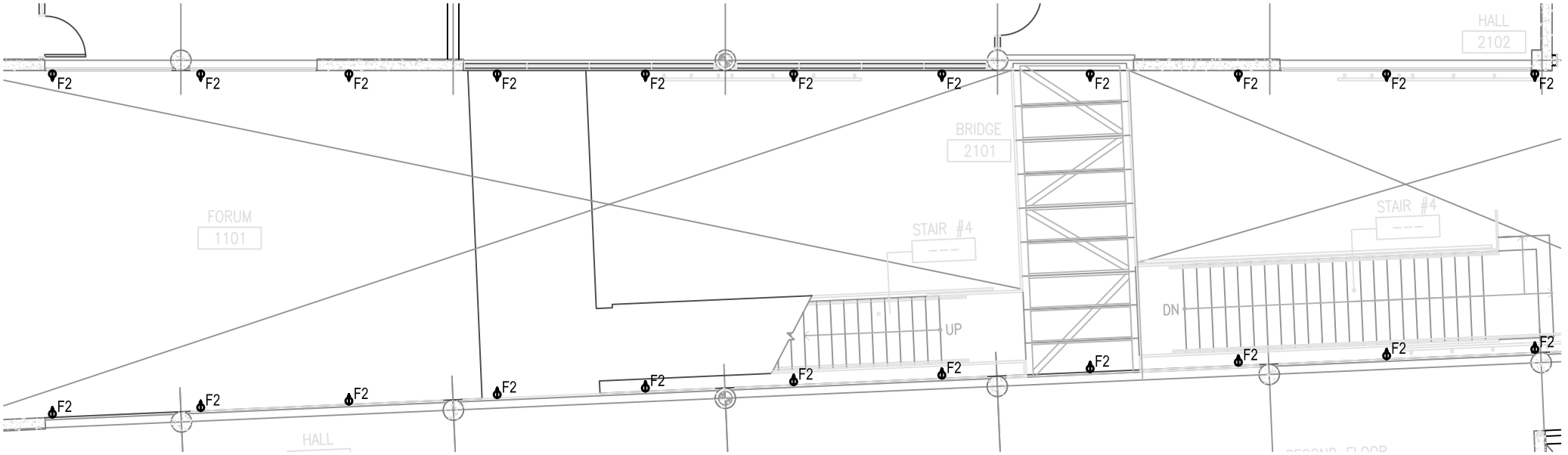


All F6 fixtures mounted @ 42" above tread height

UCSB Student Resource Building

Forum - Lighting Plan (3 of 4)

Scale: $\frac{3}{32}$" - 1'-0"

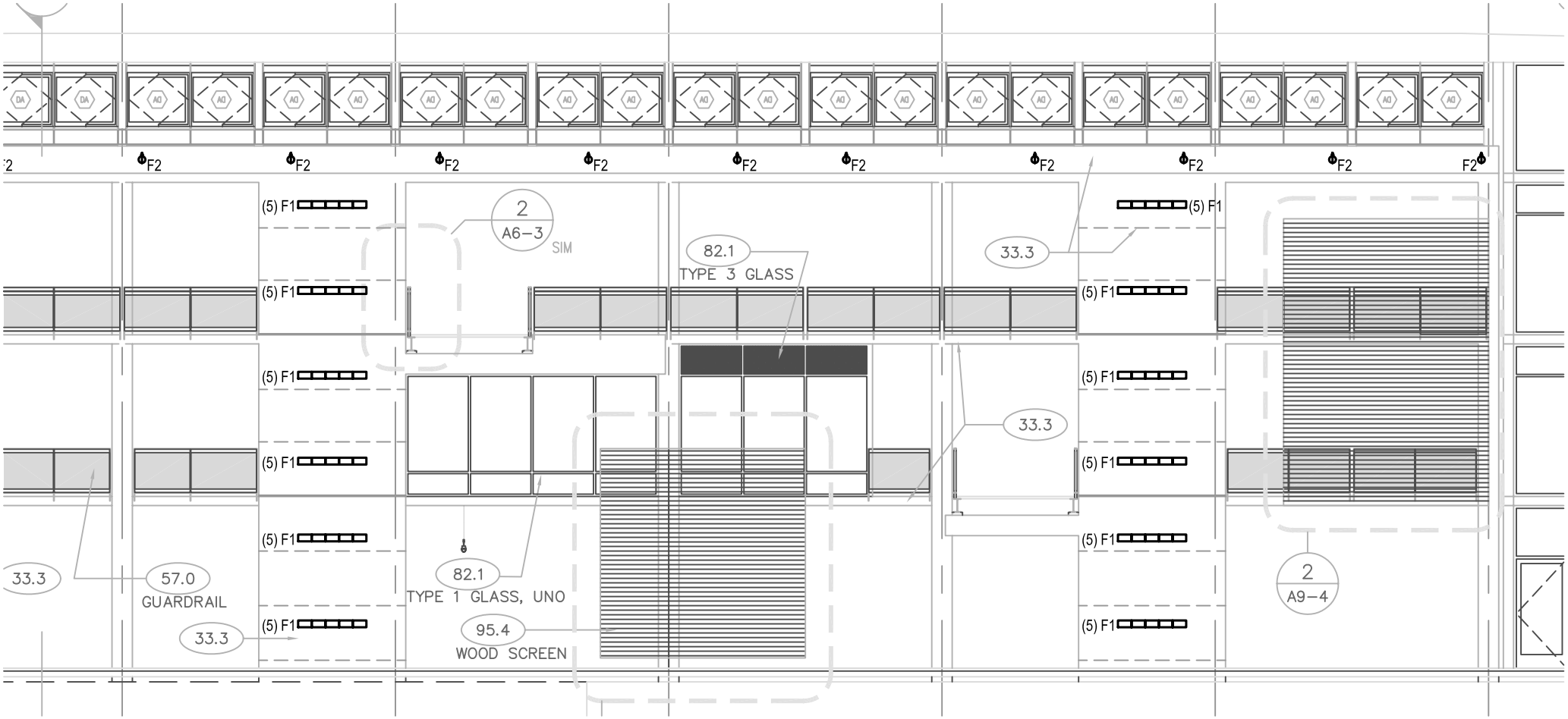


All F2 fixtures mounted @ 37'-6" AFF.

UCSB Student Resource Building

Forum - Lighting Plan (4 of 4)

Scale: $\frac{3}{32}$" - 1'-0"



UCSB Student Resource Building

Forum - Lighting Detail : F1 Location

Scale: $\frac{3}{32}$" - 1'-0"

Assumptions

Surface Reflectances

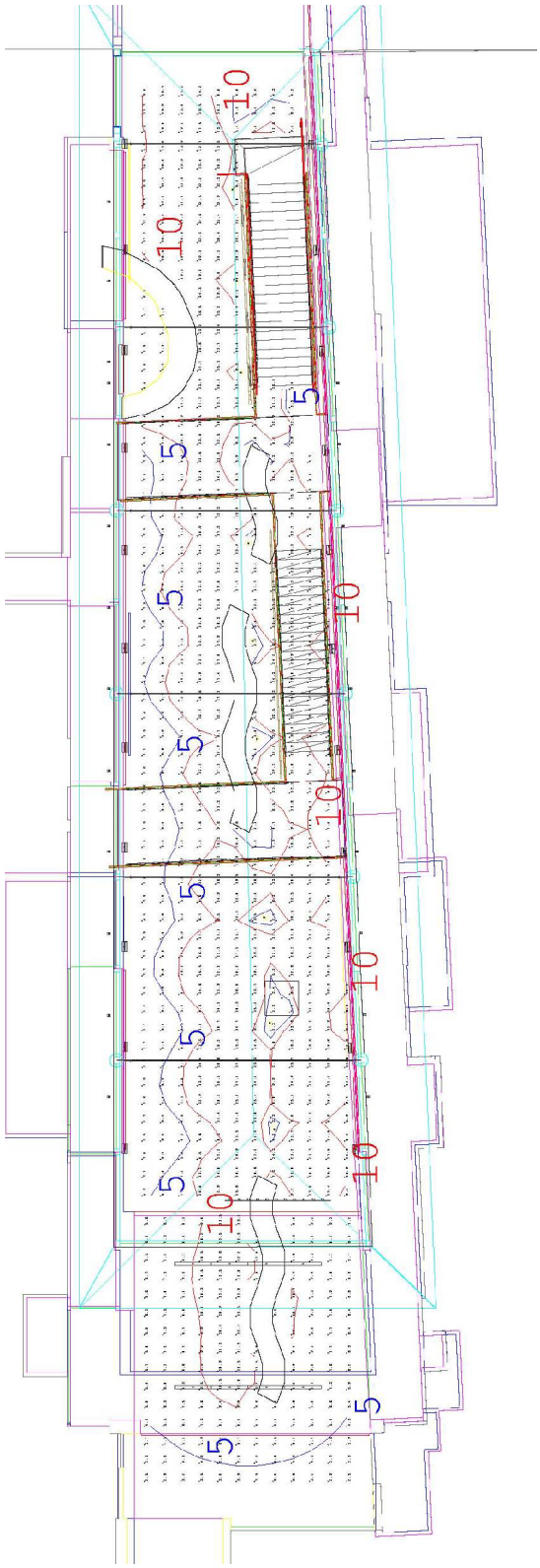
Material	Location	Reflectance (%)
Steel	Stairs and Cross Bracing	22
Ceramic Floor Tiles	1F	42
Walls	-	50
Wood	Decorative screen adjacent to stairs	8
Ceiling	-	80
Stone Counter	1F Counter	40
Carpet	2F and 3F	27
Projector Screen	-	50
Architectural Concrete	Throughout	20

Light Loss Factors

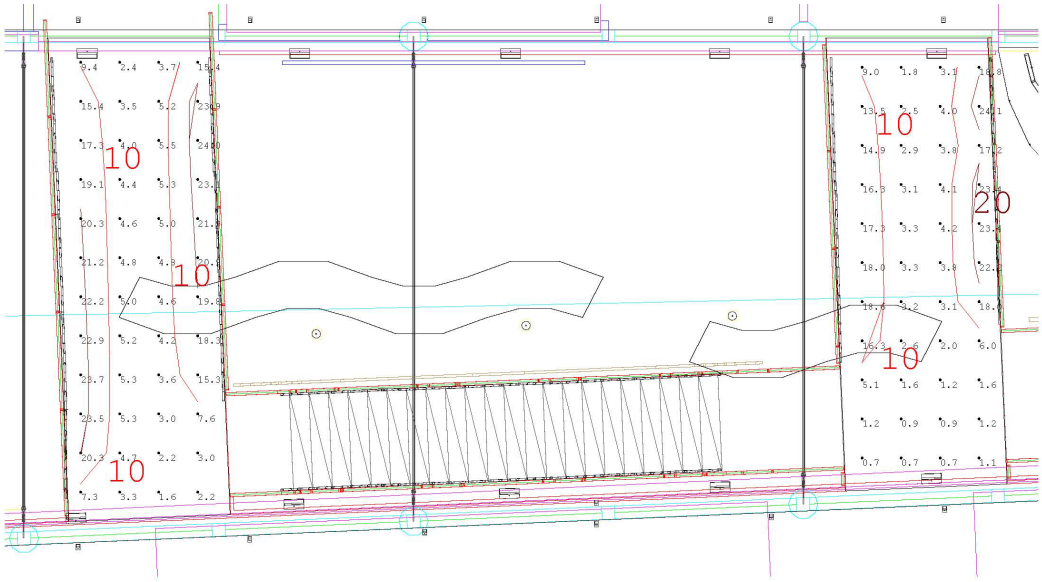
Label	IESNA Maintenance Category	Distribution Type	Environment Cleanliness	Cleaning Cycle	LLF				TOTAL
					LLD	LDD	RSDD	BF	
F1	VI	Direct	Clean	12mo	0.98	0.86	0.95	1.00	0.80
F2	VI	Direct	Clean	12mo	0.98	0.88	0.98	1.00	0.85
F5	VI	Direct	Clean	12mo	0.79	0.88	0.96	1.00	0.67
F6	IV	Direct	Clean	12mo	0.94	0.88	0.96	1.00	0.79
F7	V	Direct	Clean	12mo	0.94	0.88	0.97	1.00	0.80
F9	IV	Direct	Clean	12mo	0.94	0.88	0.98	1.00	0.81

Illuminance Data

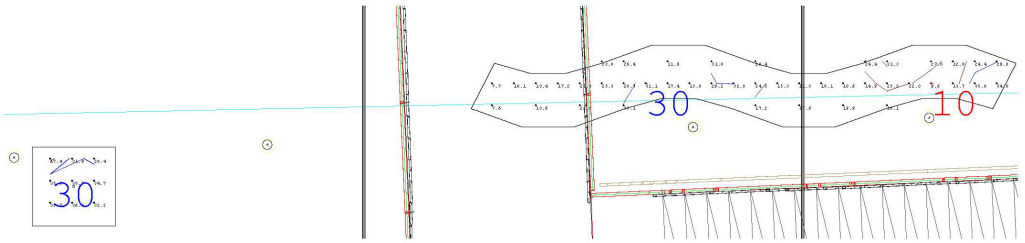
(Software used: AGI32 – v1.92)



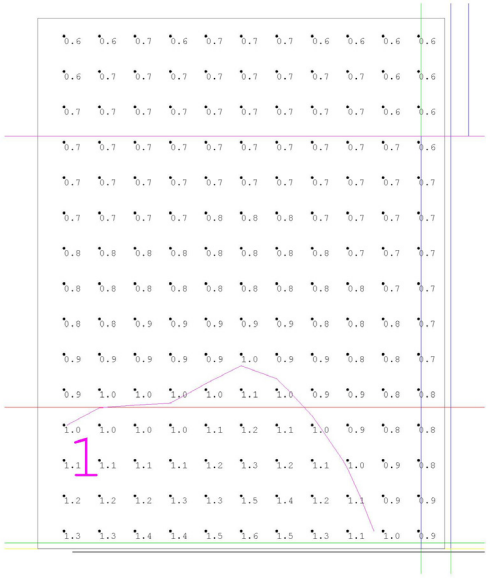
1F Ground: Illuminance Contours



Pedestrian Bridges: Illuminance Contours



1F Furniture: Illuminance Contours



Vertical Projection Screen: Illuminance Contours

AGI32-v1.92 Statistical Summary

Calculation Area	Average Illuminance (fc)	Max. (fc)	Min. (fc)	Avg/min	Max/min
First Floor Ground * (open area)	13.2	39.7	1.4	9.4	28.4
First Floor Ground (covered area including west entry area)	7.6	13.1	2.5	3.0	5.2
Pedestrian Bridge (2F)	7.9	24.2	0.7	11.3	34.6
Pedestrian Bridge (3F)	10.6	24.1	1.7	6.4	14.2
Curved Seating (Ground-level)	19.7	33.4	3.8	5.2	8.8
Info Desk (ground level)	34.1	145.0	2.6	13.1	55.9
(see note) Table Top (ground level)	23.8	34.4	5.5	4.3	6.3
Projection Screen (vertical illuminance)	1.0	1.8	0.7	1.4	2.6

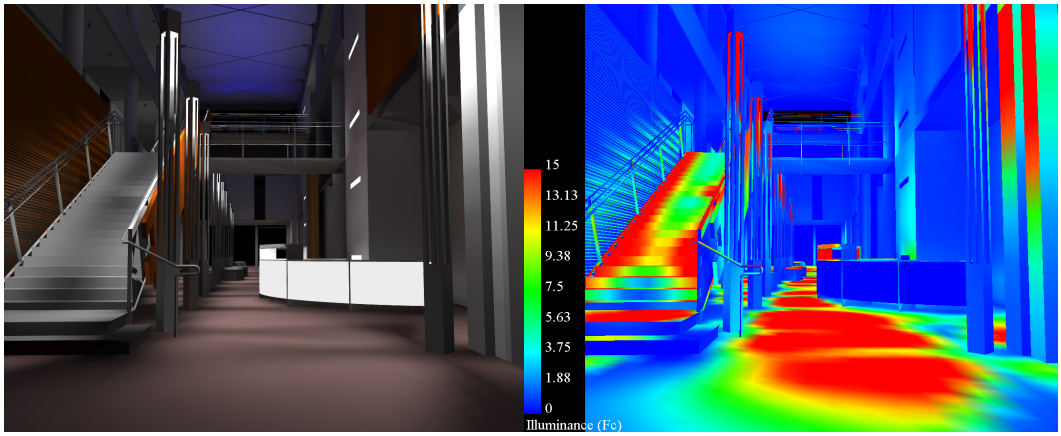
(*) Vertical Illuminance Data

(**) Assumed to be 2.5 ft AFF

Note: *Task lighting system implemented may be dimmed to suit needs of user.*

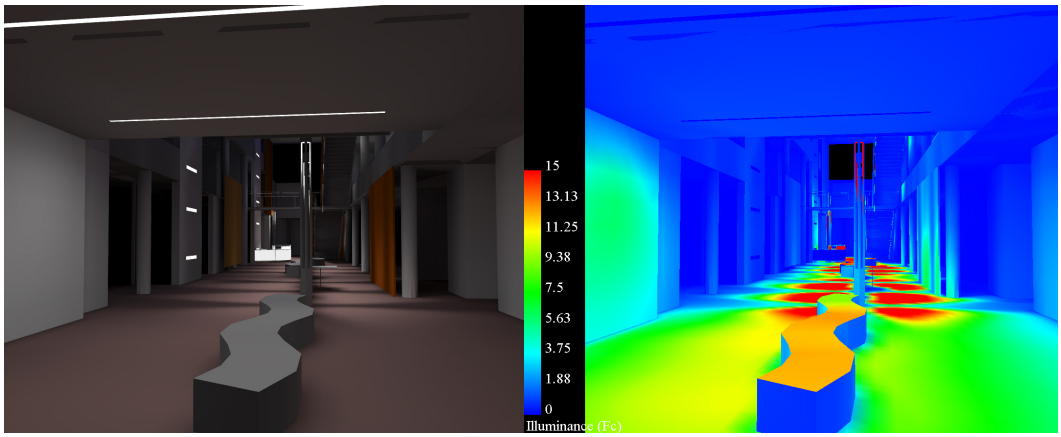
Radiosity Renderings

View from East End



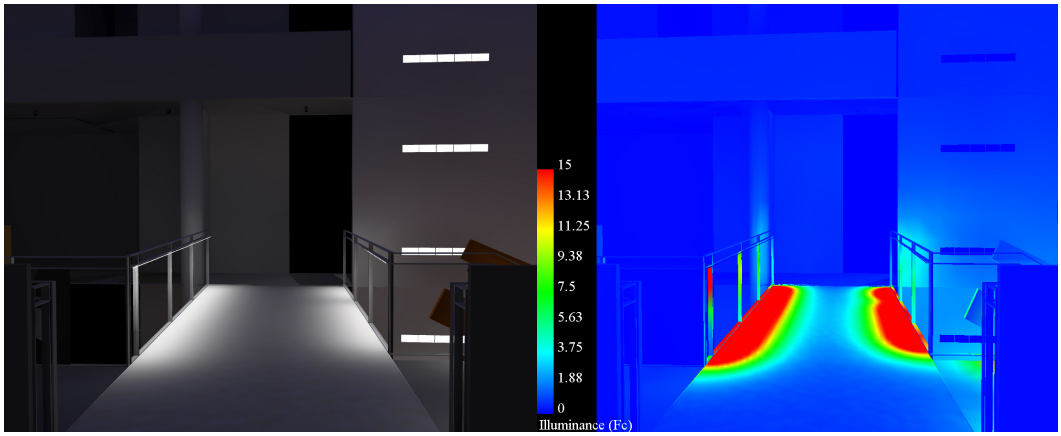
Rendering Pseudo Rendering

View from West End



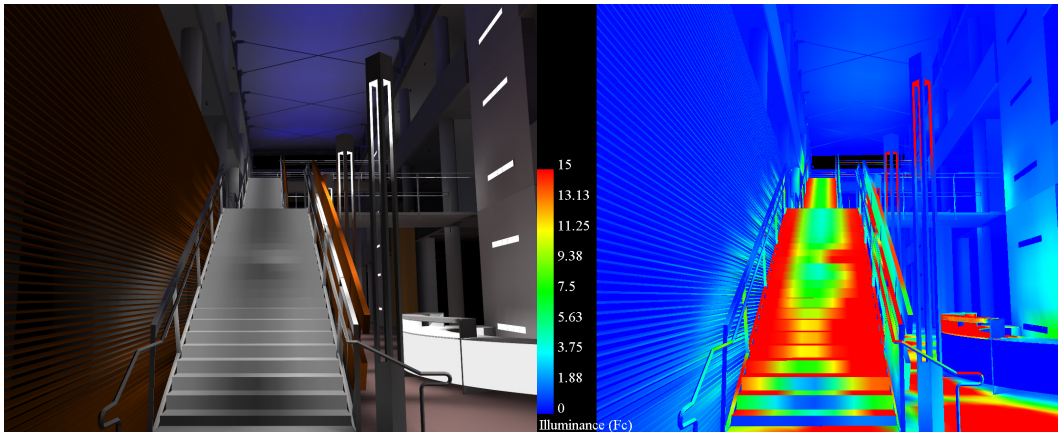
Rendering Pseudo Rendering

2F Pedestrian Bridge



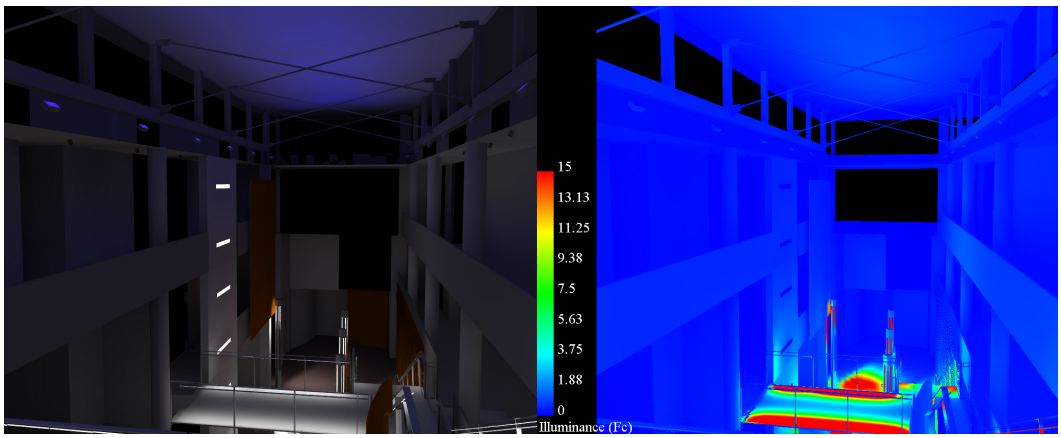
Rendering Pseudo Rendering

Exposed Staircase



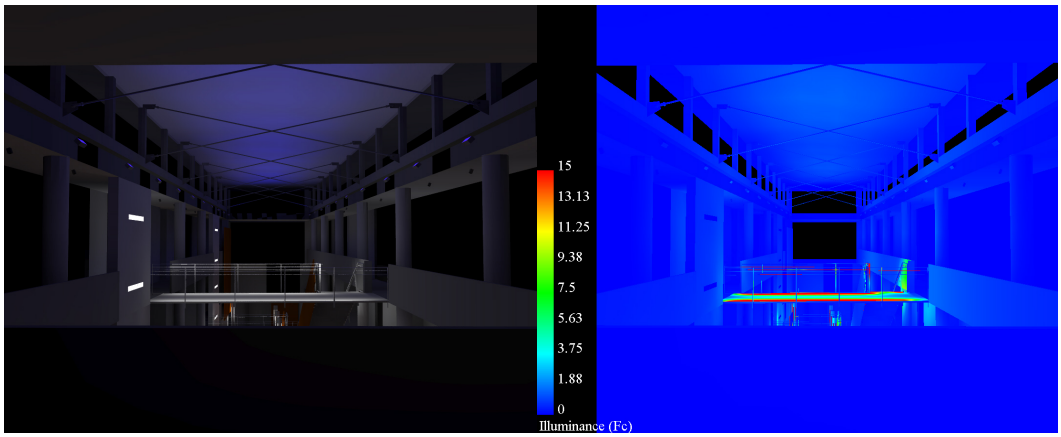
Rendering Pseudo Rendering

View from 3F Pedestrian Bridge



Rendering Pseudo Rendering

View from 3F Forum



Rendering Pseudo Rendering

Daylight Control

For most days throughout the year, a large amount of natural light enters this space through the clerestories that wrap on four sides above. Daylight analysis shows that the system implemented can be essentially switched off between 8am to 4pm after which artificial illumination will be necessary for most areas in this space. As this facility is open 24 hours a day during normal school operation, the ability to rely entirely on natural light for approximately 9 hours a day represents a considerable amount of energy savings. This is illustrated in the following calculation:

Total System Watts: 4.65 KW

4.65 KW x 9 hrs x 30 days/month = 1255.5 KWH / month

Energy Charge - $/KWH/Meter/Month

Summer Season:	*On-Peak*	*$ 0.23523*
	Mid-Peak	*$ 0.20293*
	Off-Peak	*$ 0.15792*
Winter Season:	*On-Peak*	*-*
	Mid-Peak	*$ 0.16205*
	Off-Peak	*$ 0.15792*
Approximate Average:		*$0.18321*

Therefore: 1255.5 KWH/month x $0.18321 = **$230 savings per month**

Over the course of a year: $230 x 12 = ***$2760 savings per year***

Assuming that the Student Resource Building lasts approximately 40 years, this represents an approximate savings of $110,400 during its lifetime. If we consider the fact that energy cost are rising, the total savings over the same period can be expected to be more than what was just calculated.

Note: *Please consult Appendix C for this space's existing daylight conditions.*

Evaluation

In addition to providing visual interest to the space, the lighting system that has been implemented satisfies the basic illumination requirements described by the IESNA that are typical for a transitional space. The LED ceiling wash system implemented adds visual interest in this space during non-daylight hours as it creates an artificial night sky within this transition space by shading it with a solid blue color. Other elements include the linear LED panels that provide visual cues for movement and localized light columns that transform the space into an exterior streetscape.