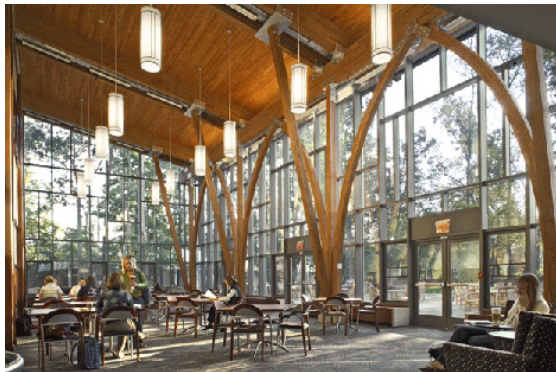


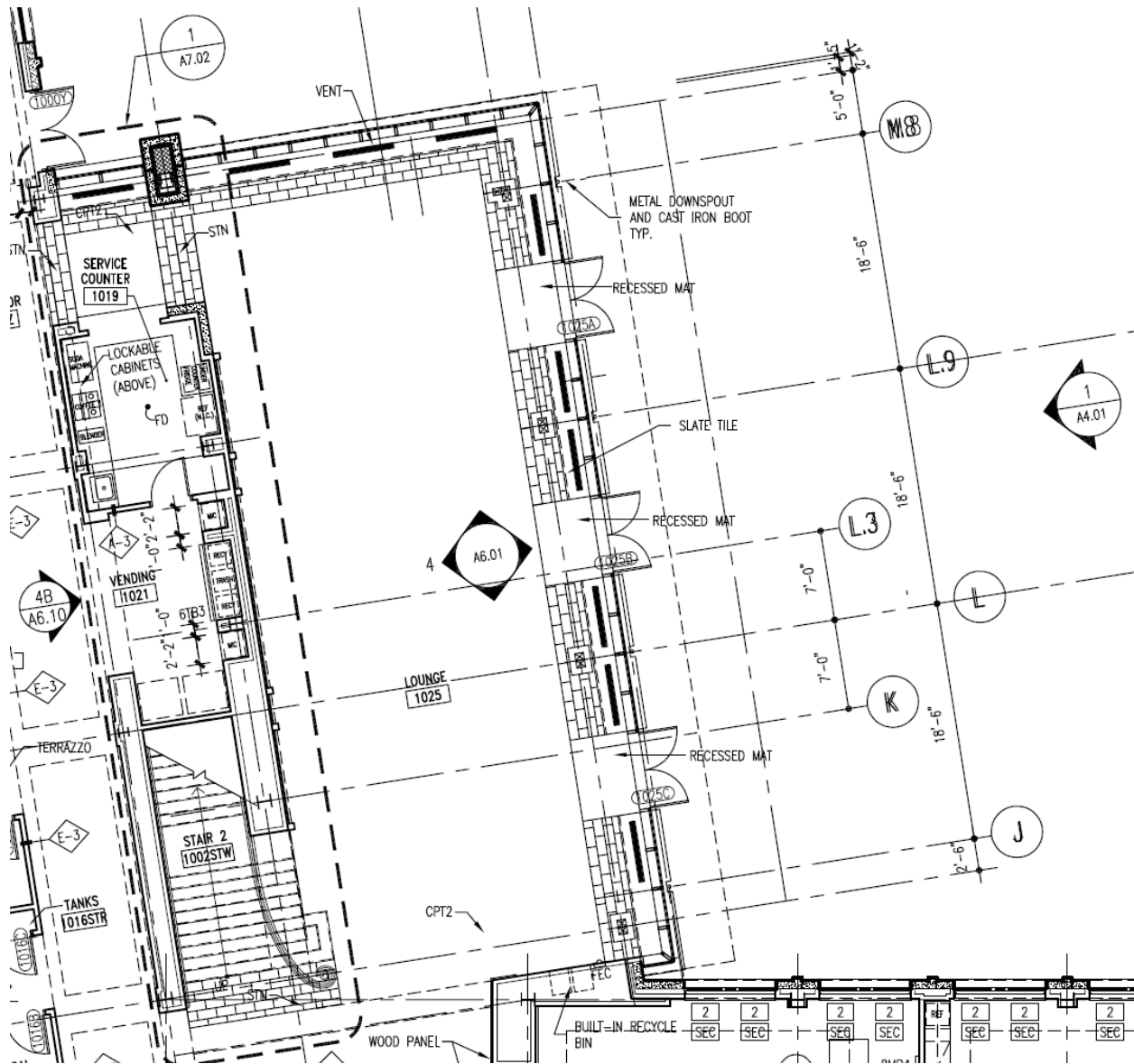
Café DUSON- Overview

Café DUSON is a study lounge with seating and tables to seat approximately 65 people in an area of about 1850 SF. The café is a double high space with full height windows on the North and Eastern walls. This space also contains large arching roof supports that are large wooden timbers and made to look like Gothic Cathedral arches, which follow the Duke University architectural style. Café DUSON is designed to hold a feeling of relaxation while still having a studious atmosphere.

The lighting design intent for this space was to tie lighting and architectural feel together with the other interior spaces that were redesigned, the lobby and the auditorium. The first lighting goal was to create a clean look as one looks out across the space, just like in the auditorium. The second goal was to bring a sense of Gothic style to the space with a chandelier, the same chandelier from the lobby that also symbolizes the school. The final goal was to integrate part of the lighting into the large beams with the mechanical ducts to help in visually cleaning up the space but also refer back to the lobby and the luminaire locations between the beams.

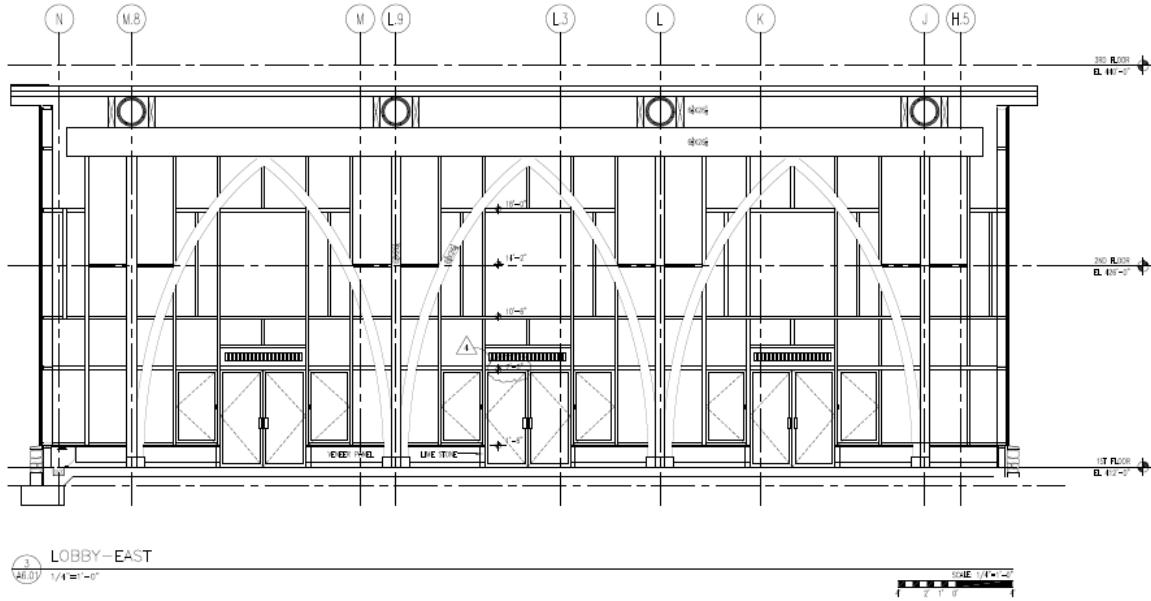


Architectural Plans

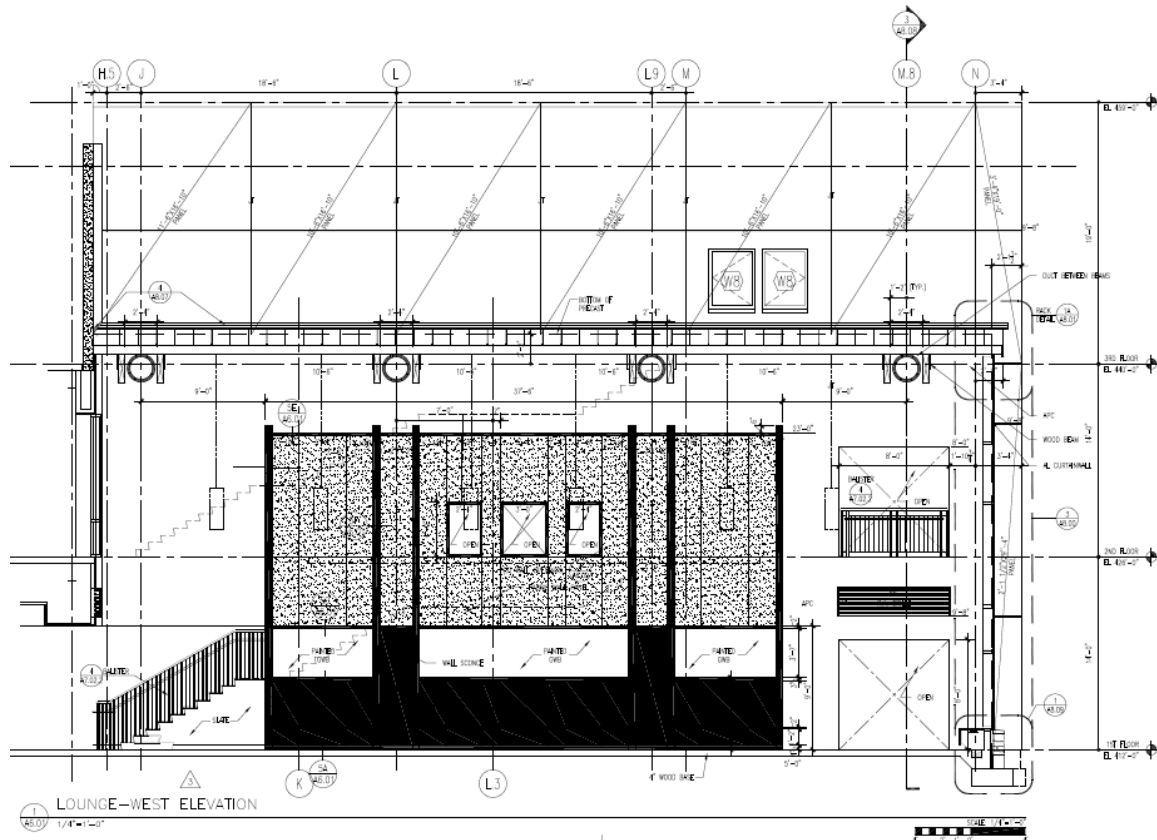


Architectural Interior Elevations

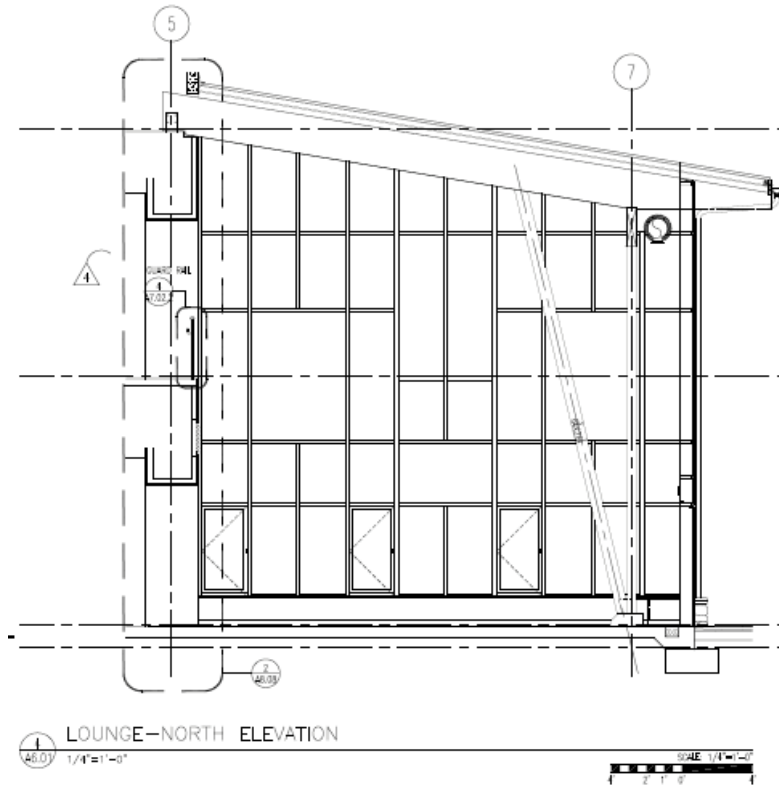
East Interior Elevation:



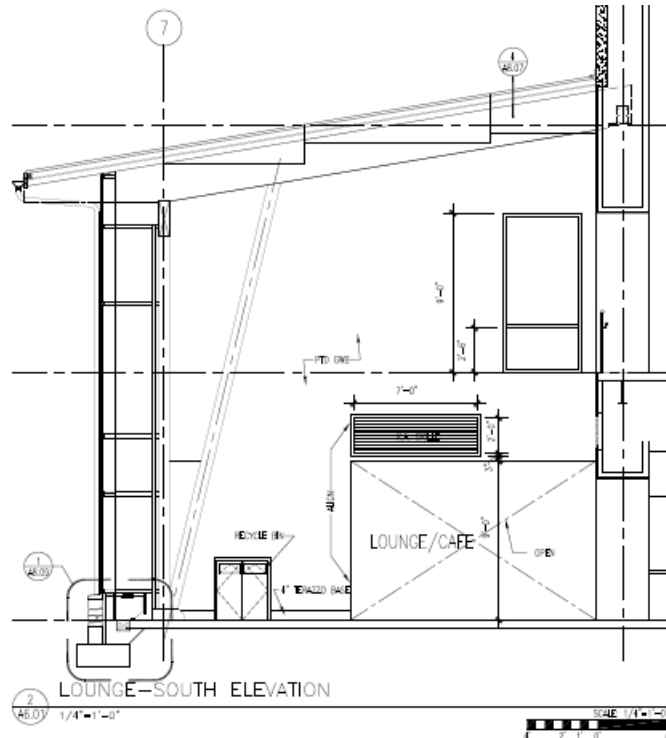
West Interior Elevation:



North Interior Elevation:



South Interior Elevation:



IESNA Design Criteria

Appearance of Space and Luminaires:

Café DUSON is intended to possess a relaxing atmosphere, where you can relax and take a break from the busy schedule of the day. This space already possesses some inherent properties of relaxation with its double high ceiling, natural wood beams, columns, wall paneling and ceiling. Also, the lounge looks out directly onto the courtyard with its gradual curves and the large trees surrounding it. The café also has a modern feel to it with the exposed air ducts and glass and aluminum curtain walls. Therefore, the styles of the luminaires should have a slight modernistic style to them while still holding to the Duke Gothic style. The lighting design intent is to maintain a clean look as you look across the space. For this reason, three chandeliers will be the only fixtures hanging from the ceiling. All the other light fixtures will be incorporated into or hidden by the architecture of the space.

Color Appearance:

The color appearance of the café should have a warm tone to it to enhance the natural tones of the wood throughout the space and maintain the intended feeling of relaxation.

Daylight Integration and Controls:

Café DUSON has glass curtain walls that face North and East. For this reason daylight integration should be utilized to save electrical energy. Also, this space could potentially be used for other events, such as banquets or parties. Therefore, an adjustable control system should be utilized to provide a versatile lighting system.

Direct Glare:

Direct glare from the luminaires is a concern, since the space is intended to have a feeling of comfort and relaxation. Direct sun glare from the easterly glass walls is a concern. However, the large trees that surround the courtyard could potentially diffuse some of the direct glare from the sun on the eastern curtain wall.

Light Distribution on Surfaces:

The space contains a lot of expensive woodwork and should be lit in such a way to bring out its natural beauty. Also, there is a 3-dimensional quality to the wooden arches, beams, and columns that should be expressed. Therefore, portions of the wood should have uniformity while also providing depth with shadows and direct lighting. The arches at night will not be highlighted by light but rather be in silhouette against the wallwashed wall behind it.

Light Distribution on Task Plane:

The task plane should be relatively uniform since there are tables and chairs for studying and working. Also, since this space could potentially have multiple uses, the task plane height could vary but should still maintain a uniform light distribution.

Modeling of Faces:

Modeling of faces is not of great importance. This space is intended for a relaxing work atmosphere, and therefore having a high vertical illuminance on the peoples' faces is actually not recommended.

Points of Interest:

The large wooden arches that look like Gothic cathedral arches and the wooden columns that support the roof system are a well defined point of interest within the space.

Shadows:

Some shadowing is desired to achieve a sense of depth with the large wooden timbers and arches. The desired lighting effect on the arches looking from the exterior is leaving the arches in strong shadows against the uniformly wallwashed wall behind the arches. However, shadows are not desired on the task plane.

Café DUSON- Existing Conditions

Surface Materials within the Space:

- Gray Thin Outer Carpeting
 - Reflectance = 29%
- Gray Thin Inner Carpet
 - Reflectance = 35%
- Natural Wood Ceiling
 - Reflectance = 9%
- Natural Wood Timber
 - Reflectance = 13%
- White Painted GWB
 - Reflectance = 88%
- Acoustic Wall Panels
 - Reflectance = 48%
- Natural Wood Wall Panels
 - Reflectance = 13%
- Gray Painted Aluminum Mullions
 - Reflectance = 58%

Glazing:

- **G-5:** 1” Insulated Glass Curtain Wall System of Café DUSON
 - U-Value = 0.57
 - Transmittance = 0.55
 - Shading Coefficient = 0.45
- **G-4:** 1” Insulated Glass - Laminated (door glass)
 - U-Value = 0.57
 - Transmittance = 0.55
 - Shading Coefficient = 0.45

Luminaire Schedule

Café DUSON Student Lounge- Luminaire Schedule									
Type	Mounting	Manufacturer	Catalog Number	Lamp	Input Amps	Input Watts	Volts	Ballast Catalog Number	Fixture Description
C	Ceiling Recessed	Cooper Lighting	M6043S-Q-740-10012P	(1) 100W BD17MED CMH GE CMH100/U/830/MED	1.1	118	277	Advance 71A5337J	Max height 6-in 10-in Direct Downlight Horizontal Lamp Core and Coil Ballast
D	Surface	Elliptipar	F305-T328-S-00-2-000	(1) 54W T5HO GE F54W/T5/830	0.52	62	277	Advance ICN4S5490C2LSG_277	4 ft. Asymmetric Cove Electronic Ballast
F	Semi-Recessed	Elliptipar	M204-0175-T-02-B	(1) 175W ED28 CMH MVR175/SP30/U	0.45	206	277	Advance 71A5543T	18-in Louvered Semi-recessed CMH Wallwasher Coir and Coil Ballast
G	Pendant Chandelier	Custom	Custom	(2) 26W Triple Tube CFL GE F26TBX/SPX30A/4P	0.21	58	277	Advance VEZ-2Q26-M2-LD	Custom designed pendant that reflects Gothic Architecture/Style

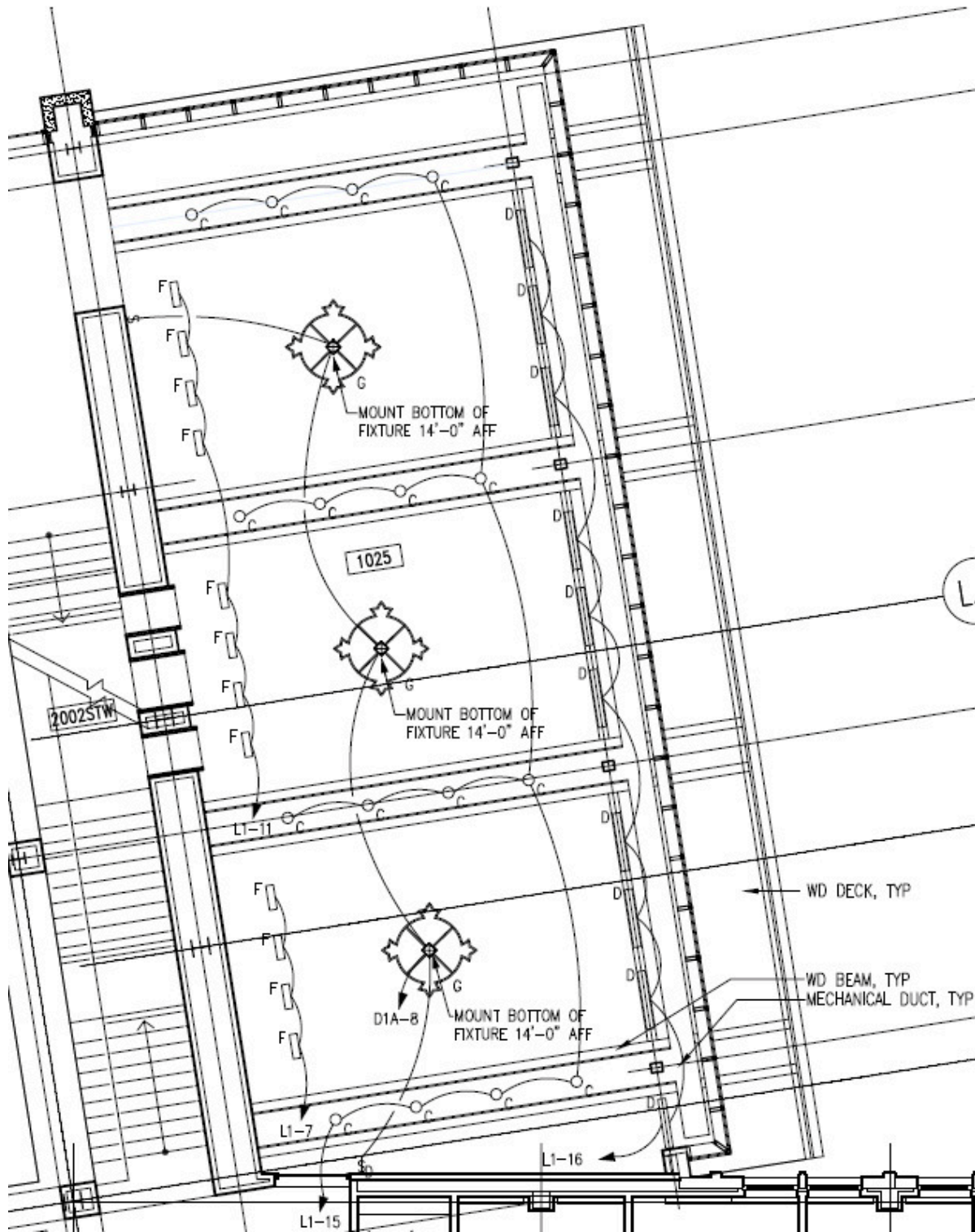
Lamp Schedule

Café DUSON Student Lounge- Lamp Schedule							
Type	Manufacturer	Cat. #	Rated Wattage	CRI / CCT	Rated Life	Initial Lumens	Assoc. Fixture
L1	General Electric	F26TBX/S PX30A/4P	26	82 / 3000K	12000	1710	G
L3	General Electric	CMH100/U/830/MED	100	83 / 3000K	15000	9200	C
L4	General Electric	F54W/T5/830	54	85 / 3000K	20000	5000	D
L5	General Electric	MVR175/S P30/U	175	70 / 3000K	6000	10300	F

Note: (1) All fixture cut sheets are located in the Appendix A

(2) This space is controlled by an astronomical time clock and a wall dimmer

Lighting Plan

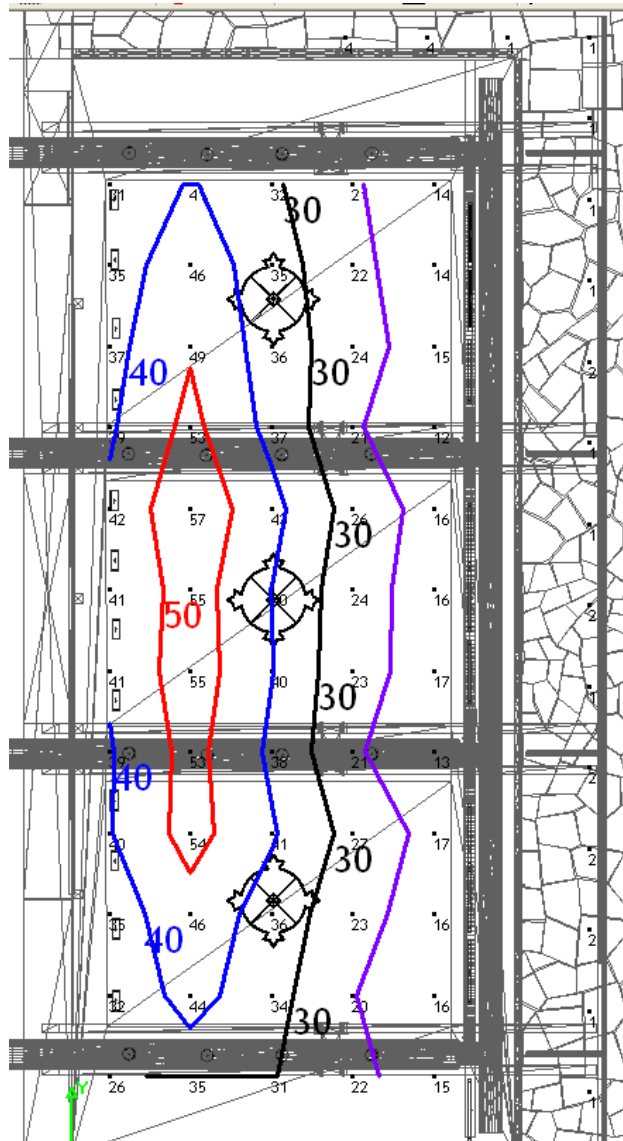


Note: Please refer to Appendix B for 1/8" = 1'0" Lighting and Circuiting Plan

Light Loss Factors

Café DUSON Student Lounge- LLF													
Type	Fixture Description	Lamp	Mean Lumens [Initial Lumens]	LLD	Room Properties (Ft.)		RCR	Assumptions	Expected Dirt Depreciation	RSDD	LDD	BF	Total LLF
C	100W MH Open Maintenance Category III Direct Downlight	(1) 100W BD17MED CMH GE CMH100/U/830/MED	6400	0.696	Height	25.5	6.57	Clean	12	0.96	0.9	1.00	0.60
			9200		Length	67		12 Months Cleaning Cycle					
D	54W T5HO Open top Closed Bottom Maintenance Category VI Asymmetric Indirect Uplight	(1) 54W T5HO GE F54W/T5/830	4700	0.940	Height	25.5	6.57	Clean	12	0.87	0.86	0.99	0.70
			5000		Length	67		12 Month Cleaning Cycle					
F	175W CMH Closed top Louvered Bottom Maintenance Category IV Wallwasher Direct	(1) 175W ED28 CMH MVR175/SP30/U	6500	0.631	Height	25.5	6.57	Clean	12	0.96	0.89	1.00	0.54
			10300		Length	67		12 Month Cleaning Cycle					
G	Custom Pendant Chandelier	(2) 26W Triple Tube CFL GE26TBX/SPX30A/4P	1440	0.842	Height	25.5	6.57	Clean	12	0.96	0.9	1.00	0.72
			1710		Length	67		12 Month Cleaning Cycle					

Illuminance Data

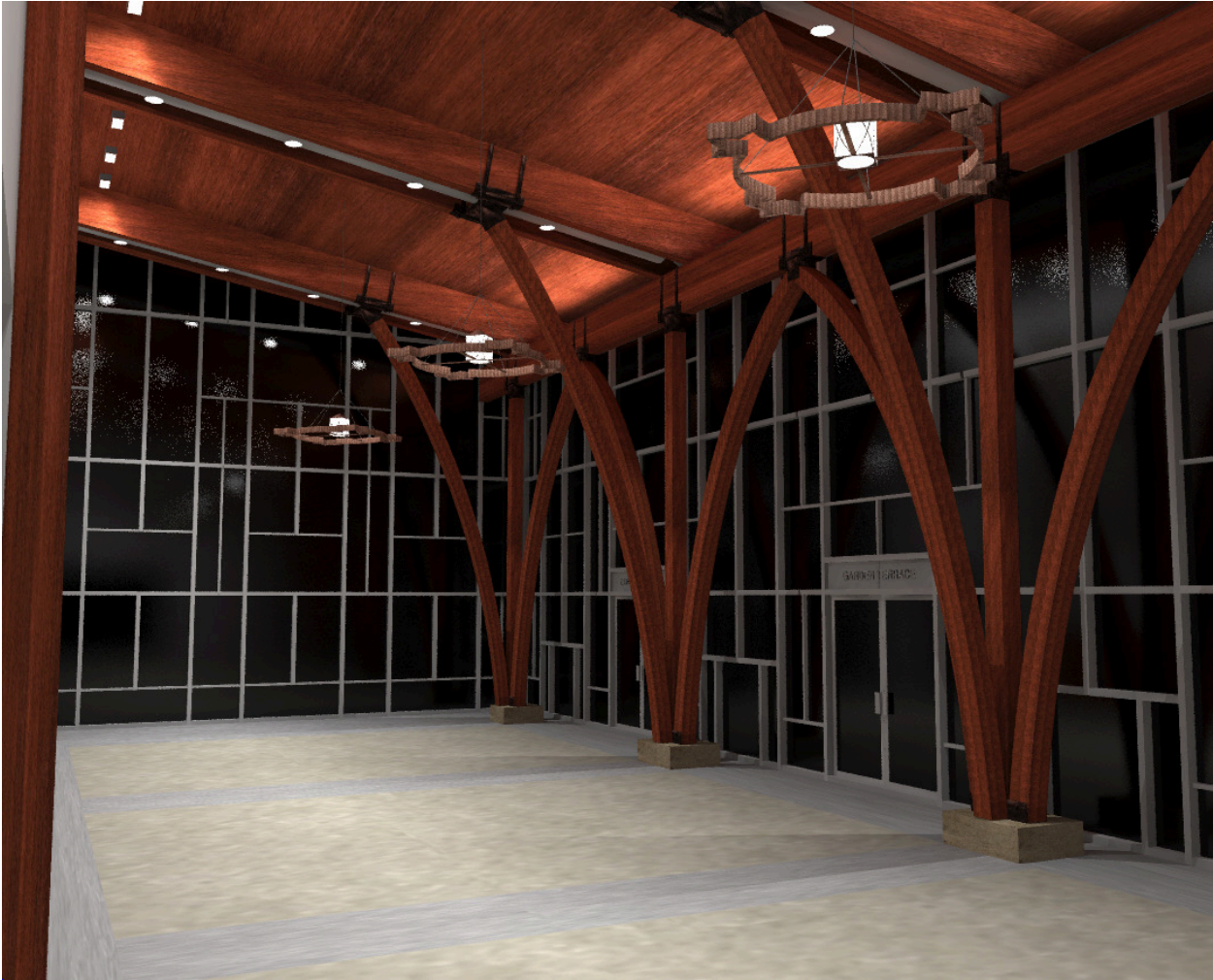


AGI32-v2.0 Statistical Summary

Café DUSON Student Lounge- Illuminance Results					
Average Illuminance	Maximum Illuminance	Minimum Illuminance	Avg/Min	Max/Min	Uniform Gradient
32.2	58.0	12.0	2.7	4.8	1.8

AGI32 Raytraced Renderings

Looking North-Northeast from the Corridor:



AGI32 Radiosity Renderings

Looking North from the Corridor:



Looking Northeast from the Corridor toward the Courtyard:



Looking East from the Second Floor Corridor:



Looking West from the Courtyard:



Power Density

Café DUSON Student Lounge Power Density						
Fixture Type	Fixture Quantity	Fixture Wattage	Total Wattage (W)	Total Area (sf)	Actual Power Density (W/sf)	ASHRAE 90.1 Allowed Power Density
C	12	118	1416			
D	11	62	682			
F	11	206	2266			
			4364	1843	2.30	1.2
Fixture Type	Fixture Quantity	Fixture Wattage	Total Wattage (W)	Total Area (sf)	Actual Power Density (W/sf)	ASHRAE 90.1 Allowed Power Density
G*	3	58	174			
			174	1843	0.09	1.0
*Decorative Fixture, Additional 1.0 W/sf						

Evaluation

This space is just about on target for the recommended horizontal illuminance. It is currently higher by about 9fc. Since I am 0.26 W/sf above the ASHRAE standard, I will look into changing the ballast for the CMH fixtures. For the final submission I am going to Photoshop the wallwashers to soften the white luminous surface, since in reality you would see a soft metallic glow. After making minor modifications and putting my custom fixture in, I am pleased with the results.