

Lobby – Lighting Redesign

Description of Space

The lobby is located on the first floor of the building. Upon entering the building through the curved façade that features large expanses of glass, one would find themselves in the lobby of the building. The auditorium entrance would then be straight ahead when in the lobby. The lobby will be mainly used for a circulation space although the space will have plasma screens in it. A small retail space is located in one corner of the lobby and is not included in the lighting redesign. The lobby is 70' wide by 110' long with the ends tapering out to a triangle. This equates to an area of 6,597 ft². The two-story height ceiling provides the space with a various options for the lighting design. The ceiling is 15' high where the spaces are not two-stories high.

Floor Plan

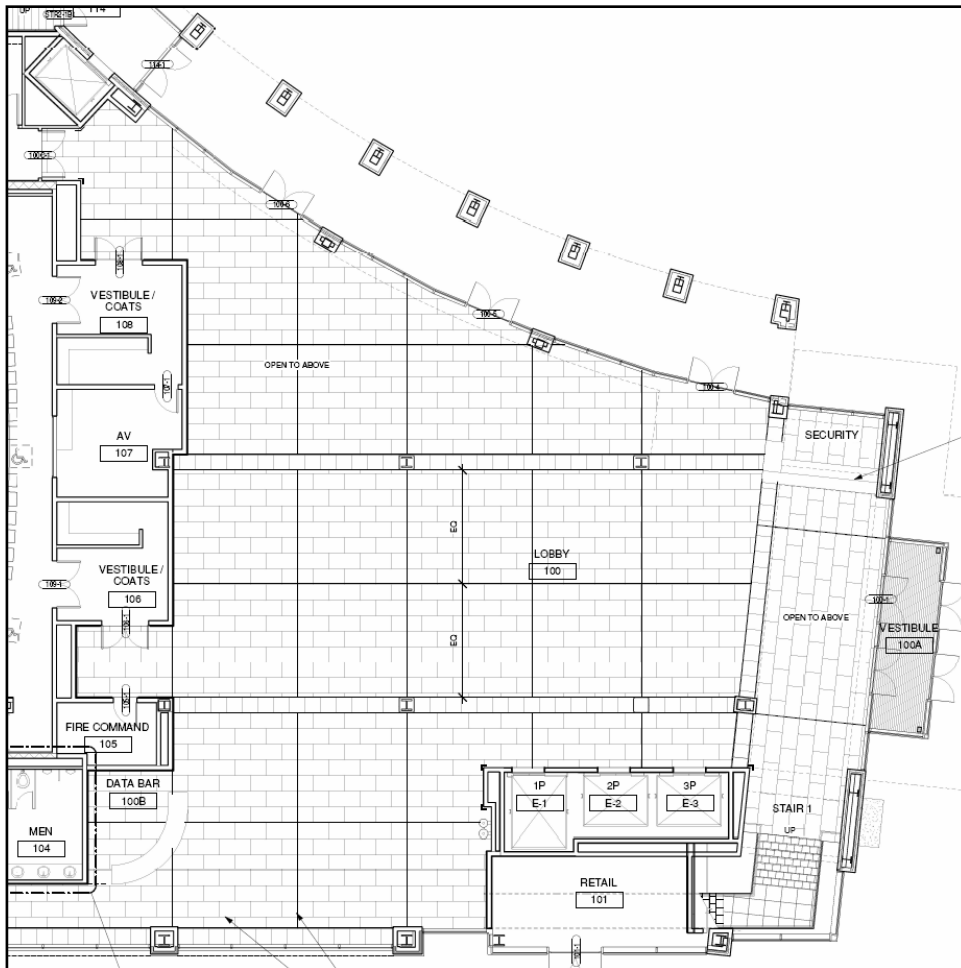


Figure 8: Lobby Floor Plan

Design Concept

The design concept of the lobby is to provide an inviting appeal to the space by adding sparkle and aesthetically pleasing fixtures. The large glass façade provides daylighting into the space, which will provide an opportunity to save on energy. The space is in the middle of the plaza and auditorium, so a smooth transition is necessary between the three spaces. The lighting design should accent the architecture and have a warm CCT for the wood panels used in the space. Attention to the plasma screens is also necessary in the lobby. Since the lobby is only used for circulation, the controls should be simple to use.

Design Criteria*Appearance of Space and Luminaires*

The appearance of the space and luminaires is extremely important when lighting the lobby to this “new heart of campus”. The appearance of the space and luminaires has to be aesthetically appealing. The architecture, such as the double height space, columns, and wood paneling, can be highlighted.

Color Appearance (and Color Contrast)

Color appearance can affect visibility and aesthetics. A color rendering index (CRI) of 70 or above is acceptable when dealing with educational facilities; however, a CRI greater than 80 may be needed in order to ensure a pleasant appearance of skin tones.

Daylighting Integration and Control

The space incorporates an expansive curved glass façade on the entire northeast wall. This will be an issue for the use of the VDT on the walls and may cause glare on the screen. The orientation of the plasma screens with respect to the daylighting is used in order to cut down on the directed glare. A daylighting system can be used to limit the amount of energy used in the room during the day. Controls such as a photo sensor and switching can be used to dim the luminaires in the room when daylighting is entering the room.

Luminances of Room Surfaces

User comfort and satisfaction is increased when spaces deliver both direct and diffuse light to the occupant and task. With the number of luminaires in the space and

daylighting, the luminances of the room surfaces are assumed to be from direct and diffused light. The special surfaces in the space include the doors of the space, the retail room, and the entrance to the lobby.

Modeling of Faces or Objects

The modeling of faces or objects is somewhat important to a lobby. A CRI of 80 or higher will provide a better skin tone color. Another consideration should be that light will hit the face at all angles. In this space with all the different light sources including daylight, the modeling of faces or objects should not be a problem.

Point(s) of Interest

The points of interest in the space include the entrances, exits, plasma screens, circulation paths, retail space, and security space. The points of interest will prosper with a slightly higher illuminance due to the fact that they will stand out, such as the entrances and exits.

Reflected Glare

The reflected glare in the space will be an issue with the VDT screens in the space. Caution should be used when placing luminaires around the area of the plasma screens.

Source/Task/Eye Geometry

The source/task/eye geometry is somewhat important to a lobby application. The angular relationships between the viewer, the task (VDTs), and the luminaire are frequently critical to task visibility. The luminaires should not be placed in the reflected view of the VDTs.

Sparkle/Desirable Reflected Highlights

The lobby is a good place to add sparkle because it enhances the look of the space. Sparkle should not create reflected glare, but may include some desirable reflected highlights, especially in the double height area of the lobby.

Surface Characteristics

The surface characteristics of the space are somewhat important due to the appearance of the space. The surfaces of the space should be a high gloss, grand

looking material. The space should appear to be high class.

Illuminance (Horizontal)

The IESNA handbook calls for a horizontal illuminance of 50 lux (5 fc) on the work plane for circulation.

Illuminance (Vertical)

The IESNA handbook recommends a vertical illuminance of 30 lux (3 fc) for this space. The entrances and exits should have a vertical illuminance of 50 lux (5 fc). Artwork and the directory should have an illuminance of 300 lux (30 fc).

Power Allowances from ASHRAE 90.1 Standards

The power allowance by the space by space method for a lobby is 1.3 W/ft².

Reflectances

Ceiling: Gypsum Wallboard Soffits/banding & Armstrong "Optima Vector" #3900, white acoustical ceiling tile

- Assume 90% ceiling reflectance

Walls: Wood Paneling/Painted Gypsum Wallboard

- Assume 50% wall reflectance

Floor: Cotto D'Este Porcelain Tile "Buxy", Cendre Natural Finish in 2'x2' and 2'x4' tiles

- Assume 40% floor reflectance

Fixture Schedule

Label	Description	MH	Lamps	Ballast/ Transformer	Watts	Voltage	Mfr.	Catalogue No.
F-B1	Campbell Pendant with Clear Glass and Sandblasted Stripes	18'	1 - 75 Watt R20	N/A	75	120	Louis Poulsen Lighting	CAM-1/75W/R20 Med-120V-Striped Glass
F-B2	Recessed Compact Fluorescent Downlight/Wallwasher with EvenTone Clear Flange	17'	2 - 26 Watt Triple Tube CFL	ICF-2S26-H1-LD - Advance Smartmate Electronic Programmed Start	52	277	Edison Price Lighting	TRPH 226/7-WW -277-VOL-PS
F-B3	Saturn Maxi Wall Sconce	6.5'	2 - 26 Watt Triple Tube CFL	ICF-2S26-H1-LD - Advance Smartmate Electronic Programmed Start	52	277	Louis Poulsen Lighting	SAW-MAX-2/26W/CF Gx24q-3/4-277V-NAT. PAINT ALUM.
F-B4	41" Dia x 2" Deep Semi-Indirect Area Source with Specular Segmented/White Reflector	12'	4 - 42 Watt CFL & 1 - 38	ICF-2S42-M2-BS - Advance - Smartmate Electronic Programmed Start	168	277	LAM	HR41-4/42-1/382D-HC-CN-62-SGW-SGW-277-ALB/3

Table 6: Lobby Fixture Schedule

Light Loss Factors

The assumed room cleaning period for this room is 6 months and the room is clean. The expected dirt depreciation was calculated at 8%.

$$RCR = [(5)*(H)*(L + W)] / (L)*(W)$$

$$RCR = [(5)*(16'-8")*(88' + 75')] / (6597 \text{ ft}^2) = 2.06 = 2.1$$

Label	Maintenance Category	LLD	RSDD	LDD	BF	LLF
F-B1	IV	0.88	0.98	0.92	1.00	0.79
F-B2	IV	0.92	0.98	0.92	1.00	0.83
F-B3	II	0.92	0.94	0.96	1.00	0.83
F-B4	VI	0.92	0.90	0.91	0.97	0.73

Table 7: Lobby Light Loss Factors

Ballast Information

Label	Type	Ballast Watts	Ballast Factor	Voltage	Max THD %	Mfr.	Catalogue No.
B-B2	Electronic - Programmed Start	54	1.00	277	10	Advance - Smartmate	ICF-2S26-H1-LD@277
B-B3	Electronic - Programmed Start	54	1.00	277	10	Advance - Smartmate	ICF-2S26-H1-LD@277
B-B4	Electronic - Programmed Start	2 @ 93	0.97	277	10	Advance - Smartmate	ICF-2S42-M2-BS@277

Table 8: Lobby Ballast Information

Lamp Information

Label	Type	CRI	CCT	Watts	Initial Lumens	Mean Lumens	Mfr.	Ballast
L-B1	DuraMax 75W Med 120V R20	80	3000	75	570	500	Philips	N/A
L-B2	ALTO PL-T 26W/830/GX2 4q-3/4P ALTO	82	3000	26	1800	1650	Philips	ICF-2S26-H1-LD - Advance Smartmate Electronic Programmed Start
L-B3	ALTO PL-T 26W/830/GX2 4q-3/4P ALTO	82	3000	26	1800	1650	Philips	ICF-2S26-H1-LD - Advance Smartmate Electronic Programmed Start
L-B4	ALTO PL-T 42W/830/GX2 4q-3/4P ALTO	82	3000	42	3200	2950	Philips	ICF-2S42-M2-BS - Advance - Smartmate Electronic Programmed Start

Table 9: Lobby Lamp Information

Power Density

The power density is slightly below the target IESNA value of 1.3 W/ft². The space is at an appropriate illuminance level, so the power density is sufficient.

Label	Ballast Watts	No. of Fixtures	Total Watts	
F-B1	75	22	1650	
F-B2	54	28	1512	
F-B3	54	12	648	
F-B4	224	14	3136	
			6946	Watt Total
			6597	Square Foot Total
			1.05 W/ft²	

Table 10: Lobby Power Density

Lighting Plan

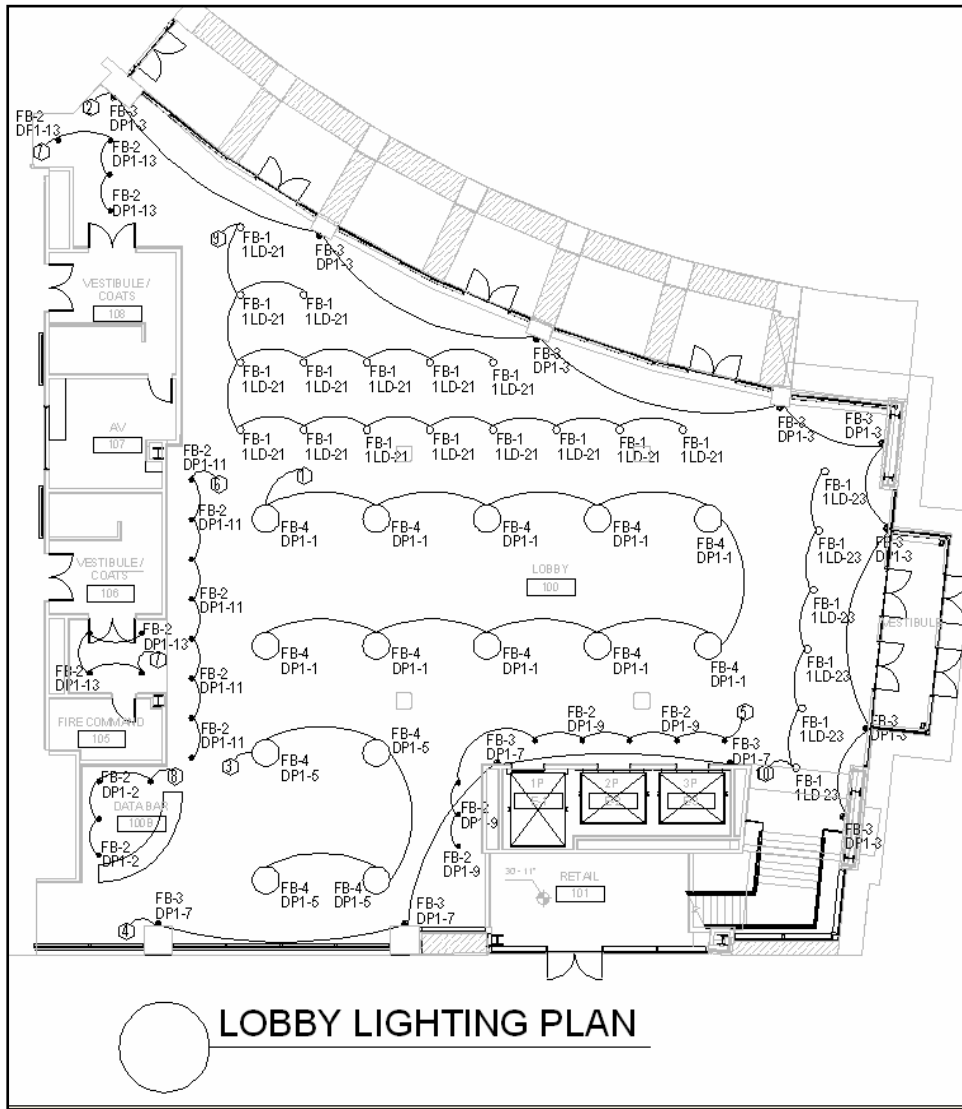


Figure 9: Lobby Lighting Plan

Isometrics

The Isolines from AGI32 were analyzed on the work plane height of 0.0'. The average illuminance throughout the lobby was 21.12 fc. The illuminance value is high for a circulation space, but the space needed a higher illuminance level.

Value (Fc)	Color	Value (Fc)	Color
5	Black	20	Red
10	Blue	25	Magenta
15	Green	30	Dark Blue

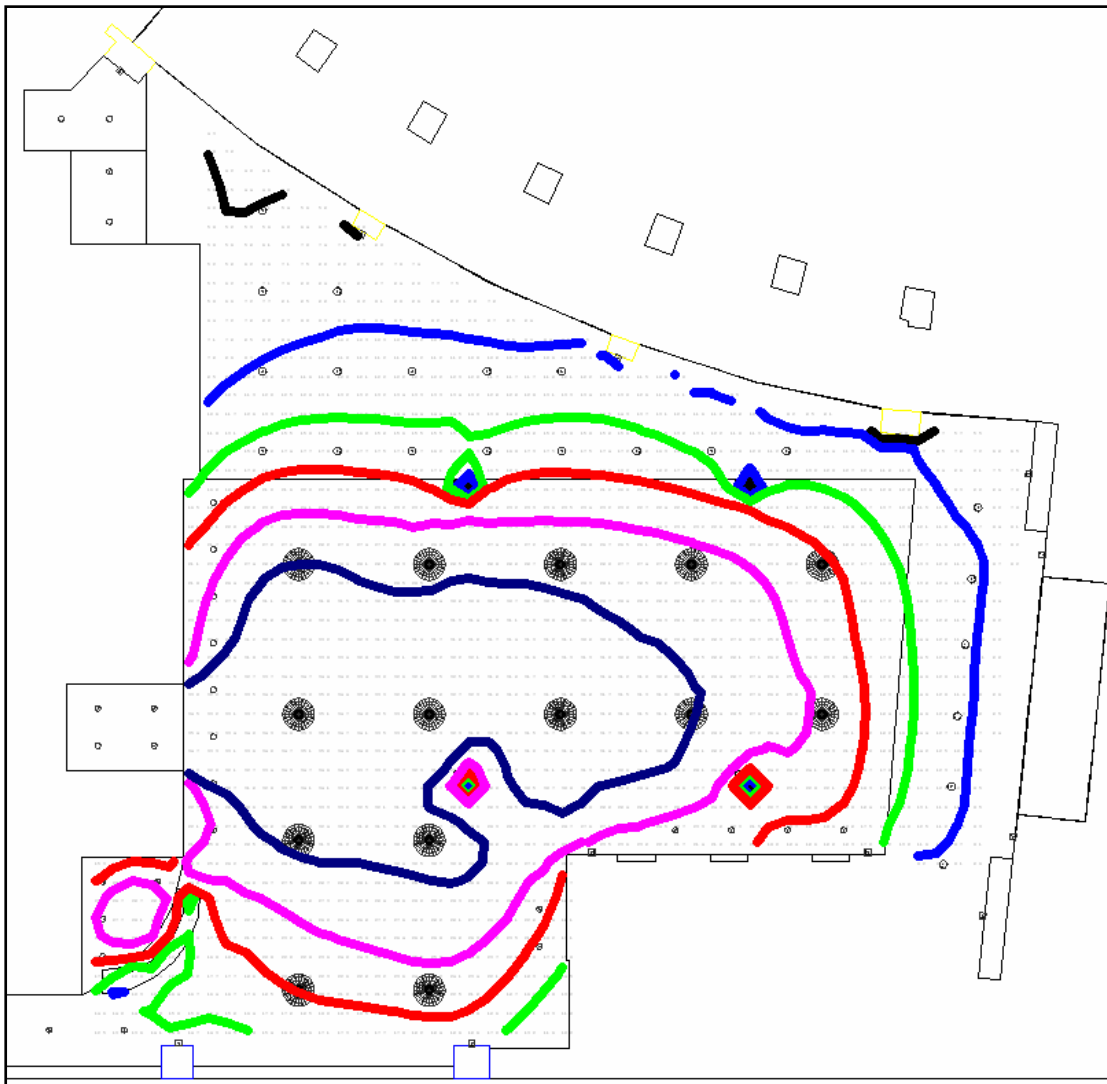


Figure 10: View of Isolines of Lobby

Renderings



Figure 11: Rendering of Lobby (Vestibule Entrance)



Figure 12: Rendering of Lobby (Elevator Entrance)

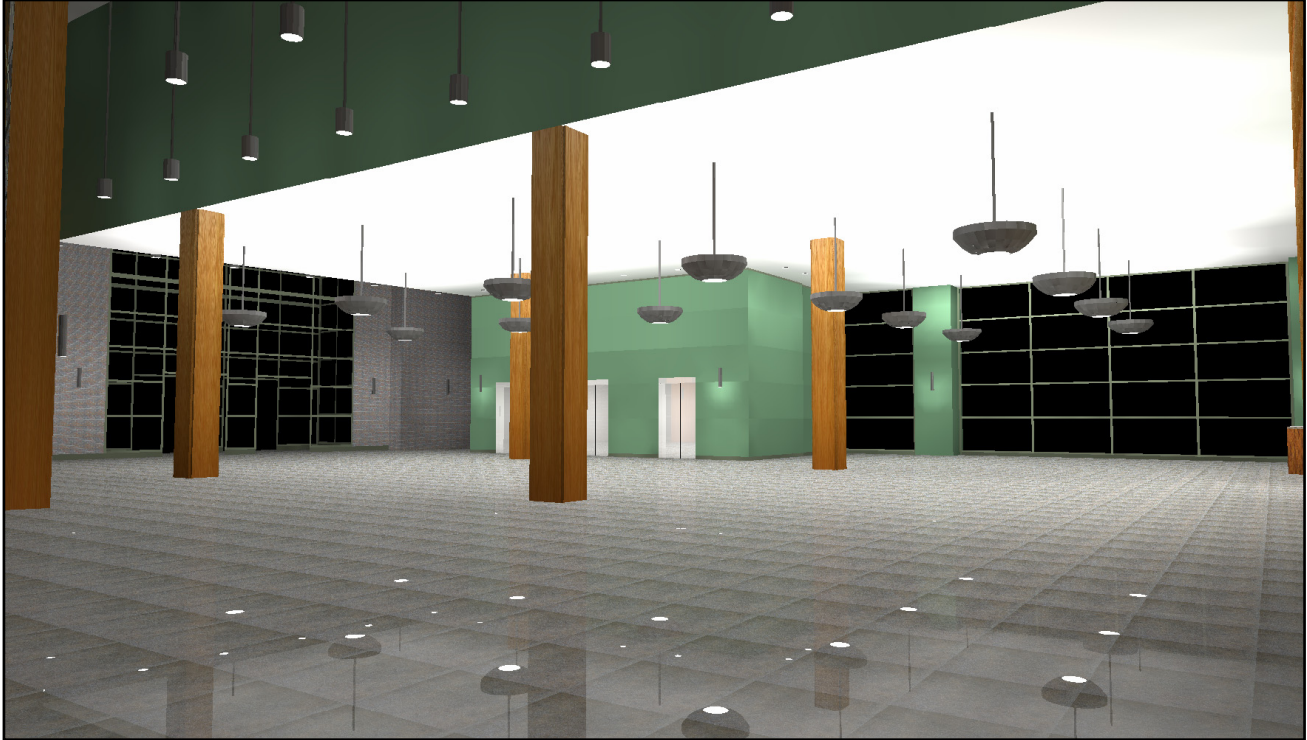


Figure 13: Rendering of Lobby (Glass Façade Entrance)

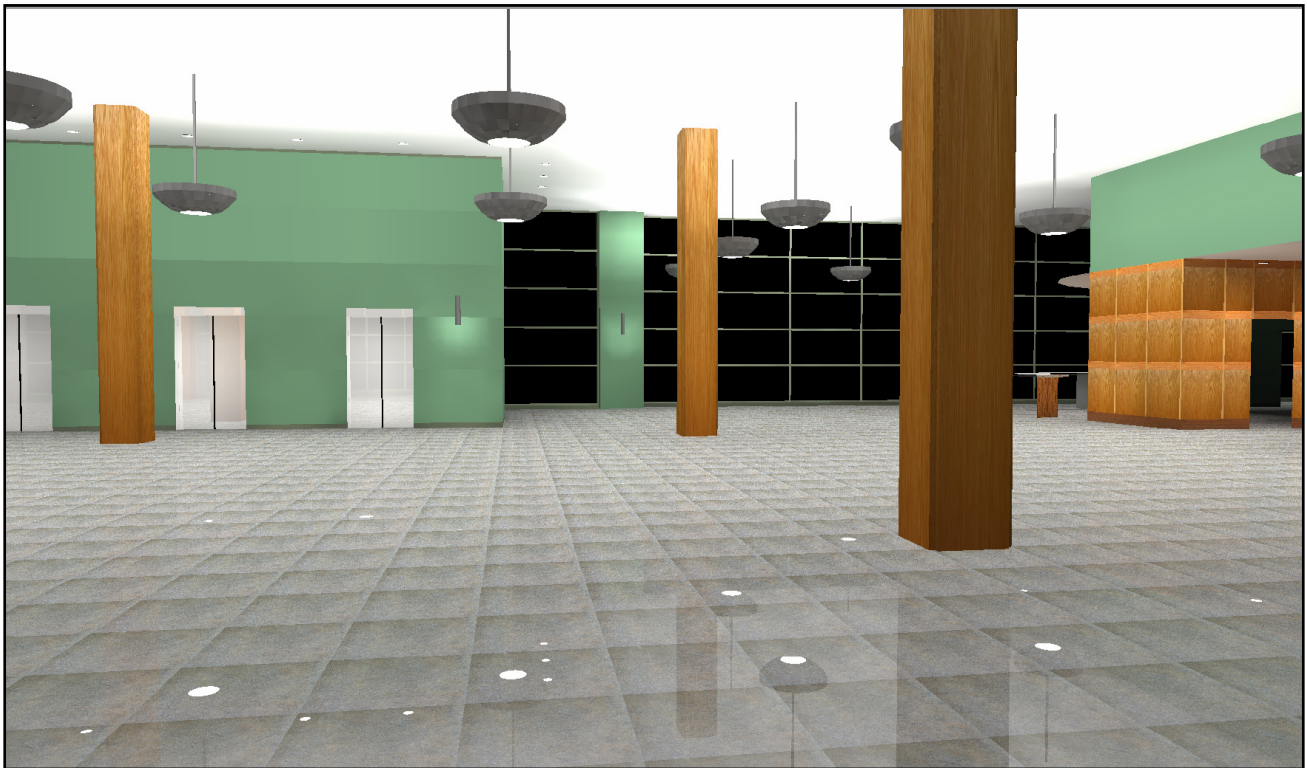


Figure 14: Rendering of Lobby (Glass Façade Entrance)

Pseudo Color Renderings

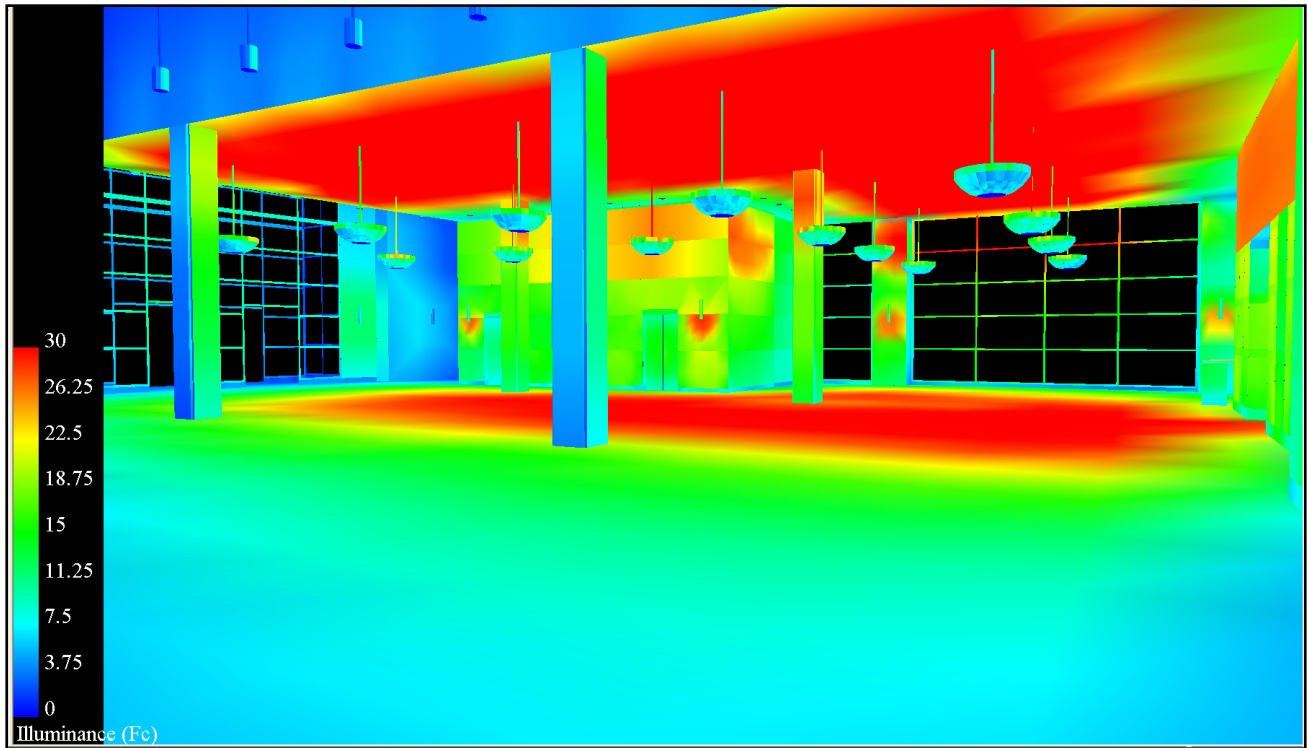


Figure 15: Pseudo Color of Lobby (Glass Façade Entrance)

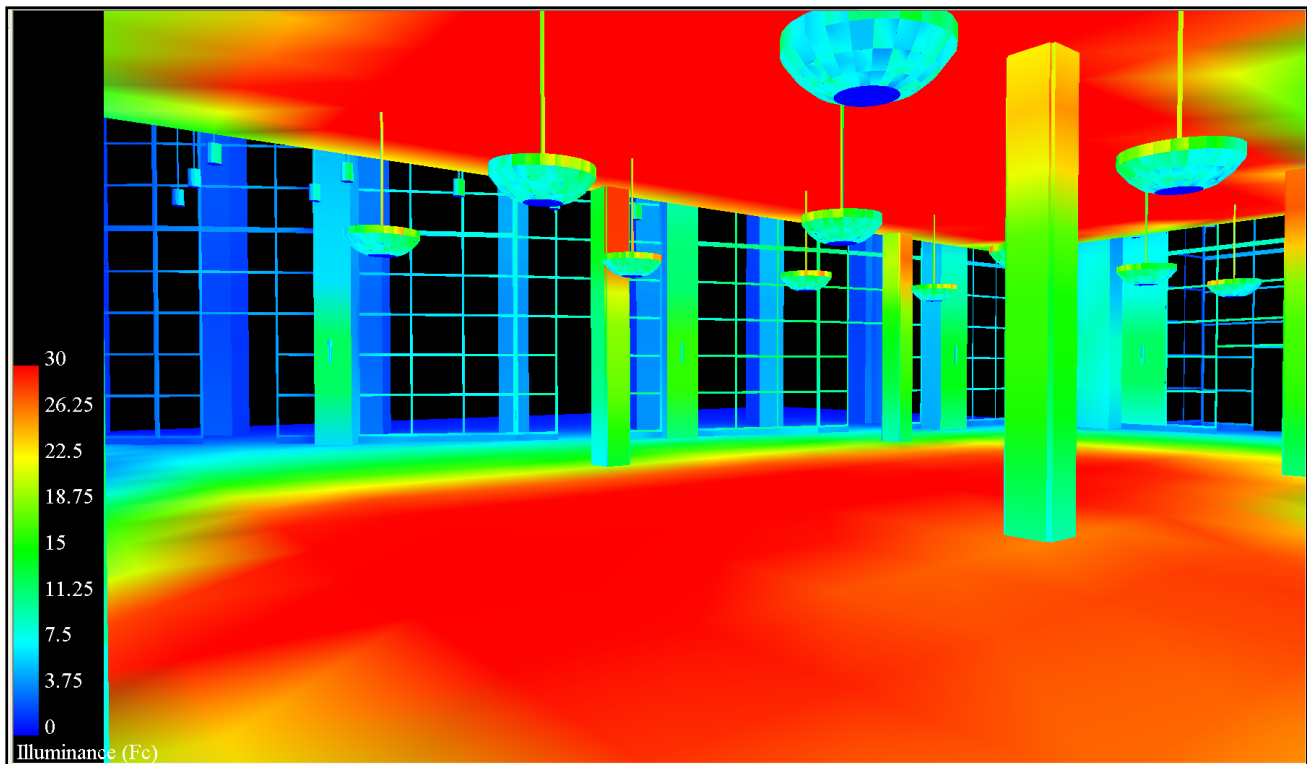


Figure 16: Pseudo Color of Lobby (@ Data Bar)

Conclusion

The lobby has an aesthetically pleasing look with the various high end construction materials and the lighting design. The space achieved all of the design goals by using pendants, recessed downlights, and wall sconces. The average illuminance on the work plane was 21.12 fc, which is above the IESNA value for a lobby/circulation space of 5 fc. However, the power density was 1.05 W/ft², which was under the ASHRAE 90.1 Standards of 1.30 W/ft² for a lobby.