



Lobby - Lighting Design

The main lobby in Duques is hall is located on the first and second floor of the building. It is the main pathway in and out of the building for the more important spaces, such as the auditorium and capital market classroom, which are found on the first floor. Two primary entrances are found in the space, the main entrance to the building and the



Picture L.1

side entrance, which is found in the supporting stair well. The first floor of the lobby doubles as a multi purpose area. Chairs and lounge tables have been set up to allow students a place to congregate between classes, and the space is also suitable for a larger meeting place for any banquet type function. The second floor is not designed in the same fashion. It has openings to the floor below it, while the main part of the room is the pathways running between the spaces.

Design for the lobby is very important, as it will be the first place that influences a visitors impression of the building. It is important to provide light on the task plane for motion and other simple visual tasks, but it is also important to add light to the vertical plane to enhance that atmosphere of the space. The openings between the first and second floor allow for unique lighting opportunities, and the lobby itself gives the opportunity to provide visual emphasis on any type of display for the space.

Study rooms were placed at six locations in the lobby. These rooms function as their own spaces, but are different from the classrooms that are serviced from the lobby. The study rooms only hold a small group of people, and provide a contained environment in which to meet and discuss away from the distractions of an open environment. Normally, these rooms would be considered separately from the space, but I included them in the design of my lobby. One wall of the room is completely clad in glass and faces the lobby so people can see inside out and outside in. Calculation information such as fc levels and power density was considered separately but included in this analysis.

As in the capital market classroom and the auditorium, finishes become an important part of the space. In the lobby, where it is as important to highlight the vertical planes, properly highlighting the finishes will also bring out the most from the architecture.



Picture L.2



Design Considerations

The biggest consideration for this space was taking advantage of the two floors, and using the other architectural principles of the building in the lighting design. Placing light around the perimeter of the space was a large consideration. By lighting the walls and the ceiling, it is not only possible to create a degree of psychological comfort, but to also cause the eye to perceive the space as being larger than it truly is. Lighting levels also became a very important aspect to consider in the design of the lobby. Large levels of light are not commonly used in areas designed primarily for motion tasks. However, the main floor of the lobby is designed to be a meeting place as well as a passage way, which affected the design of the space.

The primary goal for the space was to create a visually important environment. Upon entering the space, the viewers attention should not only be drawn through the space, but to the different parts of the lobby in which someone would want to travel to. Carefully highlighting the entrances to the varying parts of the room was very important in the design of this space.

Design Criteria

All design criteria is based upon the standards set forth in the IESNA Lighting Handbook, and the following criteria was taken from it.

Path finding was the biggest concern in the space. The lobby is first, before any thing else, the first place anyone must visit before passing to any other part of the building. Everyone who must travel into and around the building must pass into the lobby, and should be able to easily find their way to their destination

Providing adequate lighting levels was another very important consideration. Lighting the task plane, the floor in this case, is vital to the needs of the person traveling from space to space with in the building. However, placing light on the vertical planes through the room is just as important. With high levels of traffic passing through the space, it is not only important to place light on the vertical plane of where someone is going, but on the face of people that they will meet with in the space.

Lighting the entrance to the lobby is very essential in the design of the space as well. The main entrance to the building should be very welcoming and inviting to anyone approaching the building. As most people will be entering through this primary entrance, enhancing the space with accent lighting will give the opportunity to display artwork or anything the owner should desire.

Once again the type of light present within the space will help to influence the atmosphere of the lobby and of the building. Lamps that will clash with the finishes of the building or fail to light the areas of architectural interest will only hinder the design of the space.



Design Standards

Horizontal Illumination

Main Lobby – min 30 fc

Second floor – 10fc to 20 fc

Hallways – 10 fc

Vertical Illumination

Vertical surfaces first floor – 30 fc or greater

Vertical surfaces second floor – 20 fc or greater

** Fc values vary throughout the space based on the areas that are to be highlighted. Vertical surfaces were designed to be greater than many of the horizontal levels to help highlight the areas of the room that are more important.

Power Density requirements

1.3 w/ft² (**Ashrae Standard 90.1 standards**)



Fixture Schedule

Fixture cut sheets can be found in (**appendix L**), and the lamp and ballast data that was used with each of the fixtures can be found directly after it.

Label	Description	Lamps	Manufacturer	Voltage	Wattage	Ballast
A7	Narrow assymetric wall light, open reflector and dry wal mounting	(1) T5 - T5-A	Focal Point	277	28W	Electronic
A8	Continuous run, recessed perimeter light, open aperature wall wash	(1) T8 - T8-B	Focal Point	277	32	Electronic
A9	Cove light, continuous run option, painted white housing	(1) T5 - T5-A	Lightolier	277	28W	Electronic
A10	4' long continuous run up light, lensed portion for optional downlight	(1) T8 - T8-B	Mark Lighting	277	35W	Electronic
A11	Pendant fixture with square shape, up and down light, louvered down light	(2) T8 - T8-B	Axis	277	64W	Electronic
A12	Square shaped pendant fixture, direct indirect with louvered down light	(1) T5- T5ho-A	Alight	277	49W	Electronic
B2	8.5" circular recessed downlight, horizontal mounted lamp	(1) Triple tube - TT-B	Erco	277	32W	Electronic
B3	Narrow 7x12 inch square recessed wall washer, lensed in silver finish	(1) Triple tube - TT-C	Eliptipar	277	45W	Electronic
B4	Square wall decorative wall sconce, ADA compliant fixture	(1) Triple tube - TT-A	Visa	277	26W	Electronic
B5	4x9 recessed downlight with open aperature, specular white finish	(1) Triple tube - TT-A	Lightolier	277	26W	Electronic
B6	4" small recessed circular downlight, open aperature	(1) Triple tube - TT-D	Portfolio	277	18W	Electronic
B7	4x4" square recessed downlight, lensed with comfort clear finish	(1) triple tube - TT-B	Lightolier	277	35 W	Electronic
D1	Pendant hung decorative downlight, white housing open aperature	(1) Metal Halide	Erco	277	70 W	-





Lamp Data

Label	Type	CRI	CCT	W	Initial Lumen	Mean Lumen	Manufacturer
T8-B	T8	80	3500	32	2950	2800	Philips
T5-A	T5	80	3500	21	2100	1974	GE
TT-A	TT	80	3500	26	1800	-	Philips
TT-B	TT	80	3500	35	2400	-	Philips
TT-C	TT	80	3500	45	3200	-	Philips
TT-D	TT	80	3500	18	1200	1130	Philips
T5ho-A	T5Ho	80	3500	49	4900	4606	GE
MH-1	MH	80	4200	70	5700	4560	Philips

Ballast Data

Label	W	Lamp	Dimming	BF	Manuf
BL-5	32	t8	no	1	Advanced
BL-6	21	T5	no	1	Advanced
Btt-4	18	TT	no	1	Advanced
Btt-5	26	TT	no	1	Advanced
Btt-6	35	TT	no	0.98	Advanced
Btt-7	45	TT	no	0.98	Advanced
BL-1b	54	t5ho	no	1	Advanced

Light Loss Factor

The assumed room cleaning period for this room was 12 months and the room was kept under the clean category. The calculated percent of expected dirt depreciation was 12%. Data for this section was assumed to be lower than actual standards would be. By assuming standards to be low, it provides the design in the space will be over sufficient as opposed to under sufficient.

$$RC = (2.5 * 11 * 383.5) / 4455.8 = 2.4$$

RC is assumed same for the second floor, same overall area and height.



Label	Maintenance Category	LLD	RSDD	LDD	BF	LLF
A3	V	0.80	0.95	0.88	1.00	0.67
A4	IV	0.80	0.98	0.39	1.00	0.70
A5	II	0.80	0.94	0.80	1.00	0.71
A5a	II	0.80	0.94	0.80	1.00	0.71
A6	VI	0.80	0.80	0.95	1.00	0.61
A6a	VI	0.80	0.80	0.95	1.00	0.61
B2	IV	0.80	0.98	0.89	1.00	0.70

** LLD was determined at standard .8 value for fluorescents.

** All ballast factors were calculated at 1.0, as all other values were under estimated

Power Density

First Floor

Label	Wattage	Quantity	Power Density
A7	28	0	0
A8	32	8	256
A9	28	0	0
A10	35	10	350
A11	64	8	512
A12	49	8	392
B2	32	16	512
B3	45	3	135
B4	26	2	52
B5	26	3	78
B6	18	0	0
B7	35	10	350
D1	70	4	280
Total = 2917 W/ft2 = 0.655			

Second floor

Label	Wattage	Quantity	Power Density
A7	28	4	112
A8	32	20	640
A9	28	55	1540
A10	35	0	0
A11	64	16	1024
A12	49	8	392
B2	32	8	256
B3	45	0	0
B4	26	2	52
B5	26	3	78
B6	18	6	108
B7	35	10	350
D1	70	4	280
Total = 4832 W/ft2 = 1.798			

Following the ASHRAE 90.1 standards, the first floor would meet the requirements but the second floor would not do to the amount of indirect lighting that is present within the space. To accommodate for this, the first and second floor were considered together as one space, so the savings for the first floor would balance out the loses for the second floor.

$$(2917 + 4832) / (4455 + 2688) = 1.1 \text{ W/ft}^2$$

Controls

The controls for the Lobby are much easier then the controls for the auditorium and for the capital market classroom. As interesting as the space is, the building is a simple education facility and there is no need for multiple settings within the space.



Controlling the lights is as simple as wiring a switch into the circuit, as no Grafik Eye type system will be needed in this setting.

One situation arises with the installation of a switch. Placing a switch on the wall would be easy enough, but in a space with as many people passing through, the switch will most likely be tampered with. A few options arise, such as placing a switch in the open, but having it only become accessible with a key. A simple enough solution; however, that particular solution was avoided in this case. Placing a switch on the wall becomes the equivalent of placing a foreign object within the space. To avoid this, the lights were placed on the building time clock, allowing for automatic on and off according to the times that the building will typically be used. An override switch will be contained in one of the electrical rooms.

Floor Plan

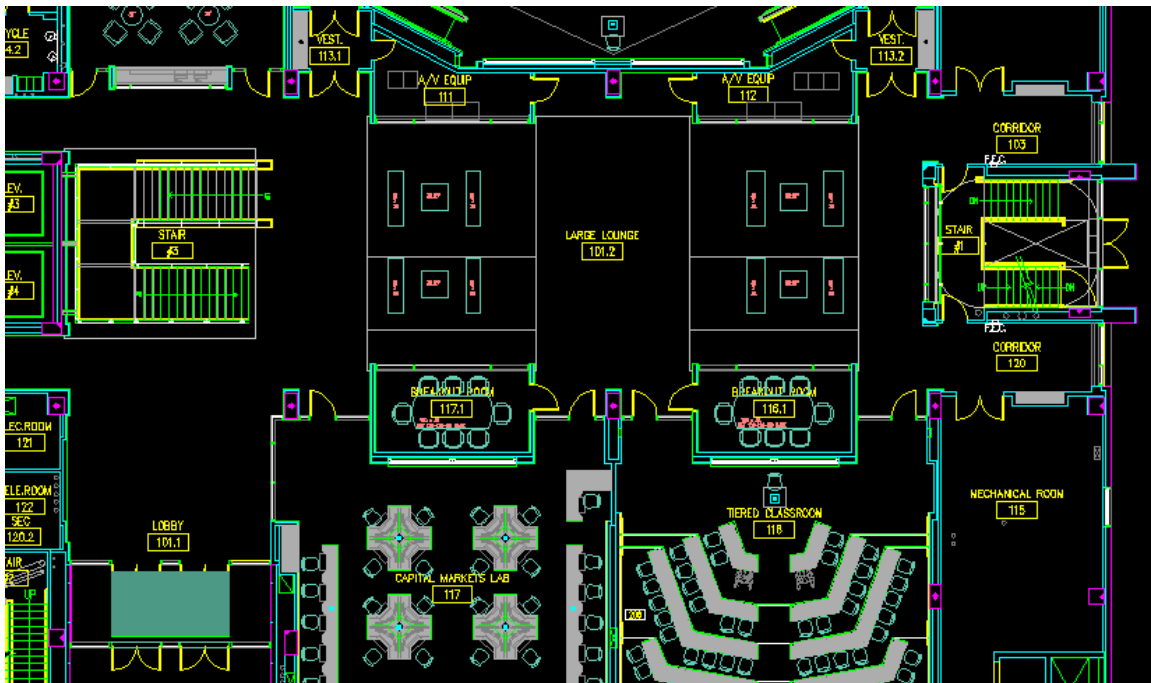
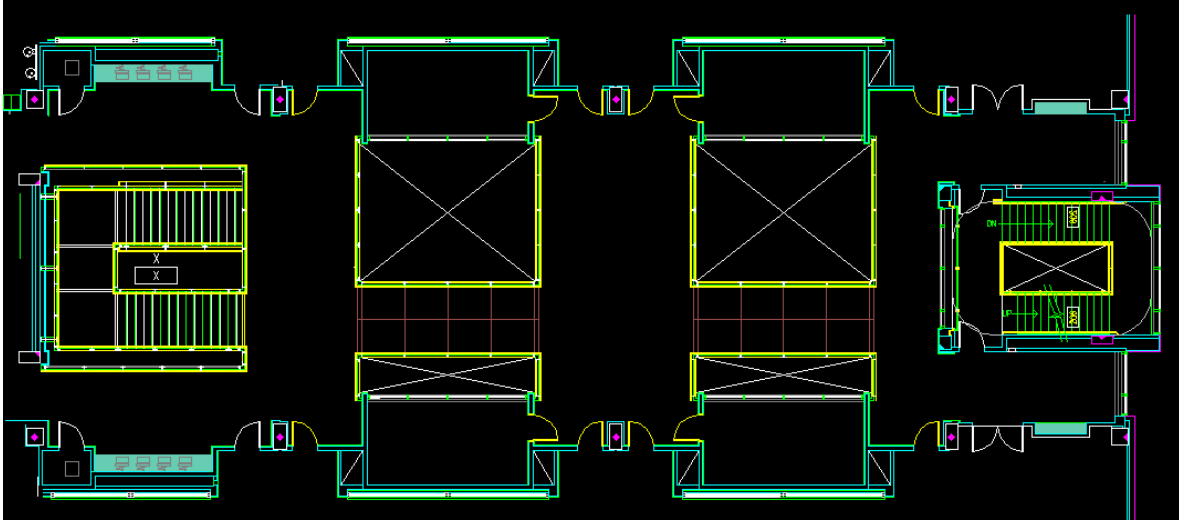


Figure L.1
Figure L.2

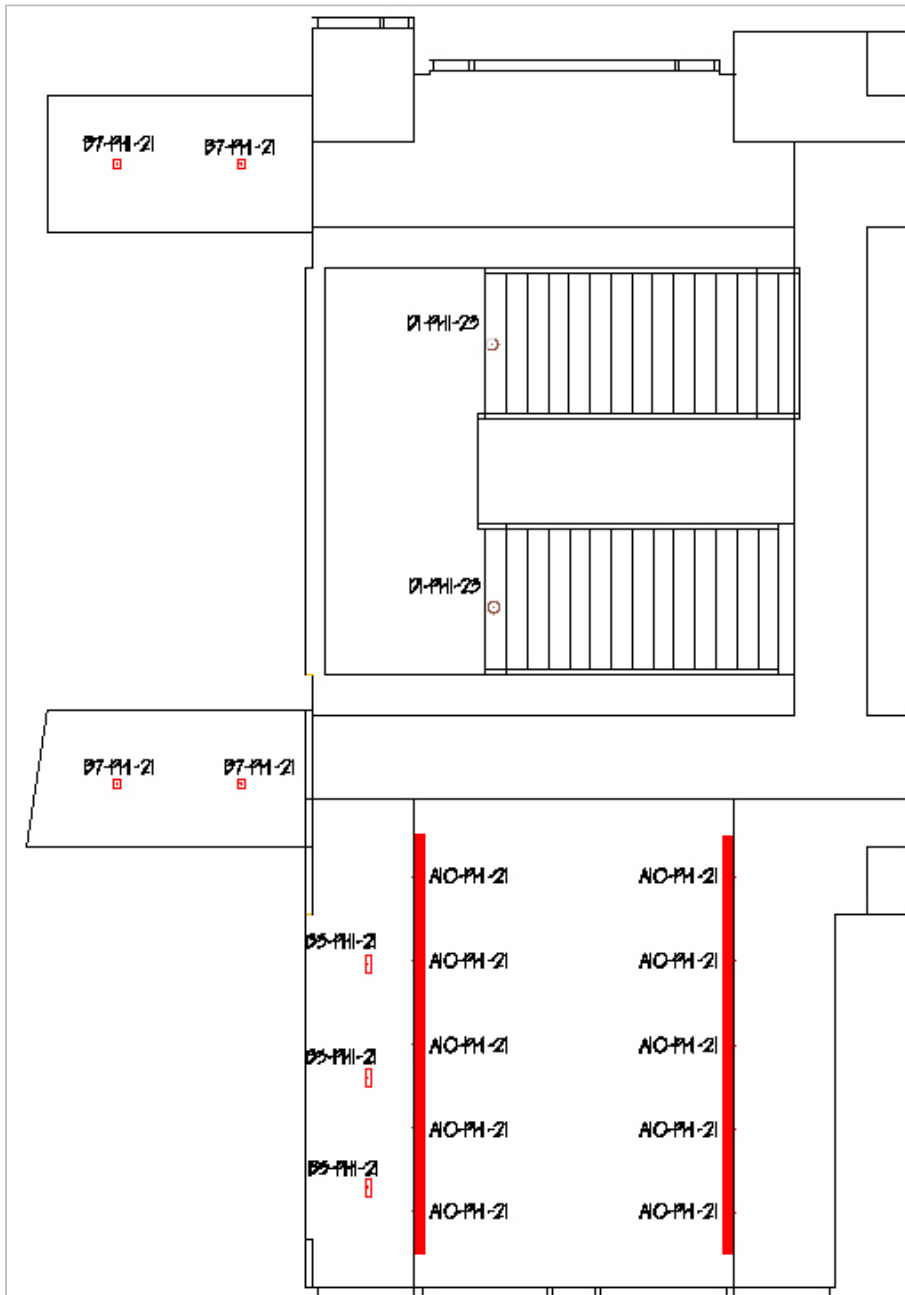


Luminaire Plans

The following figures contain the luminaire layout for the lobby. Each luminaire is labeled in the similar manner

X1 – PXX – X – X

The first number represents the fixture's representation in the luminaire plan. The second number is the panel on which the circuit can be found, the third number is the branch circuit on the panel, and finally, the final number is in correspondence to the dimming zone of the room when dimming is applicable.



Ceiling Plan 1.A

The area shown in this portion of the luminaire plan is the entrance to the lobby and the open stairwell directly in front of that entrance.

Figure L.3



Ceiling Plan 1.B

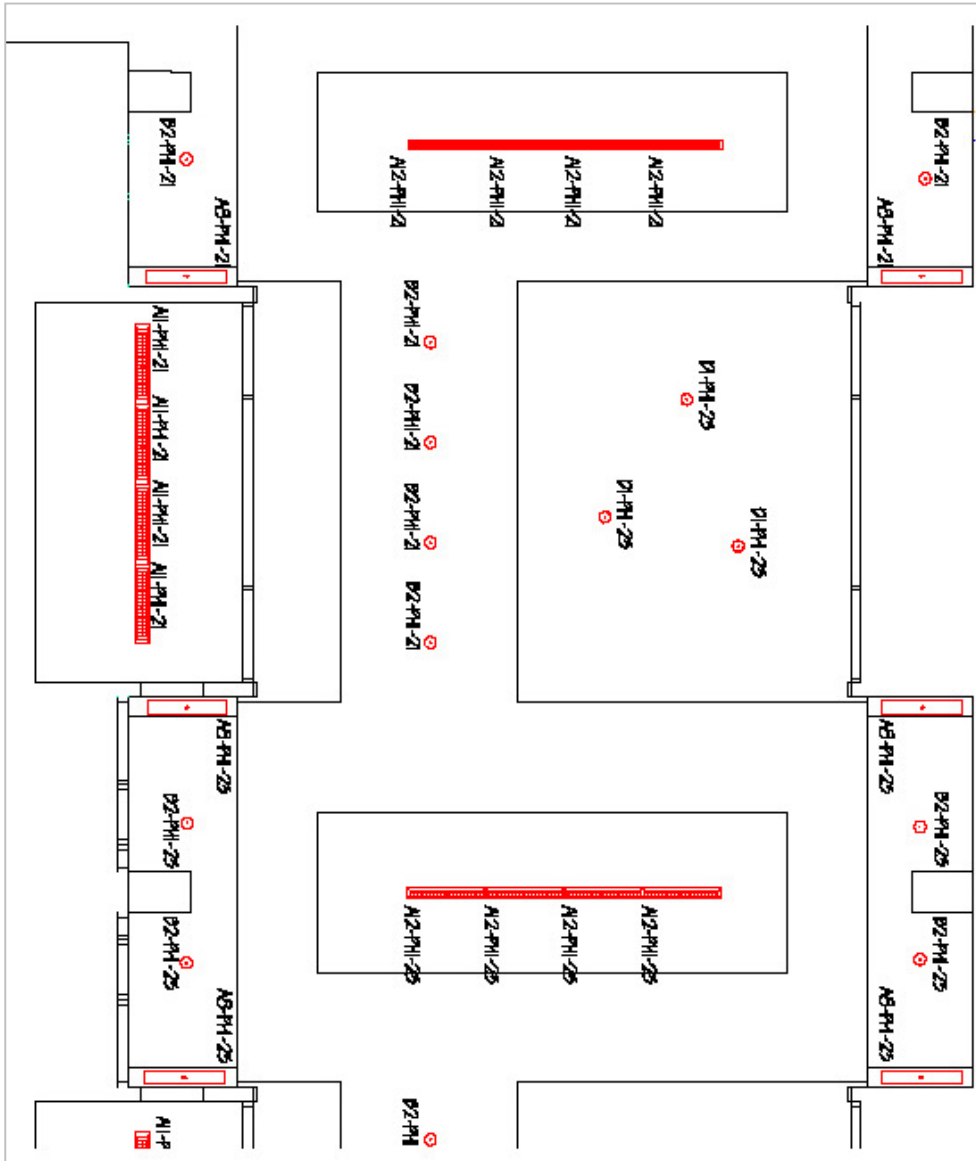


Figure L.4

Figure L.4 is a representation of the middle portion of the first floor. Contained in this space are two of the four openings to the floor above, as well as one of the study rooms, which can be found on the lower portion of the page. The areas that are set back are the entrances to the classrooms.



Ceiling Plan 1.C

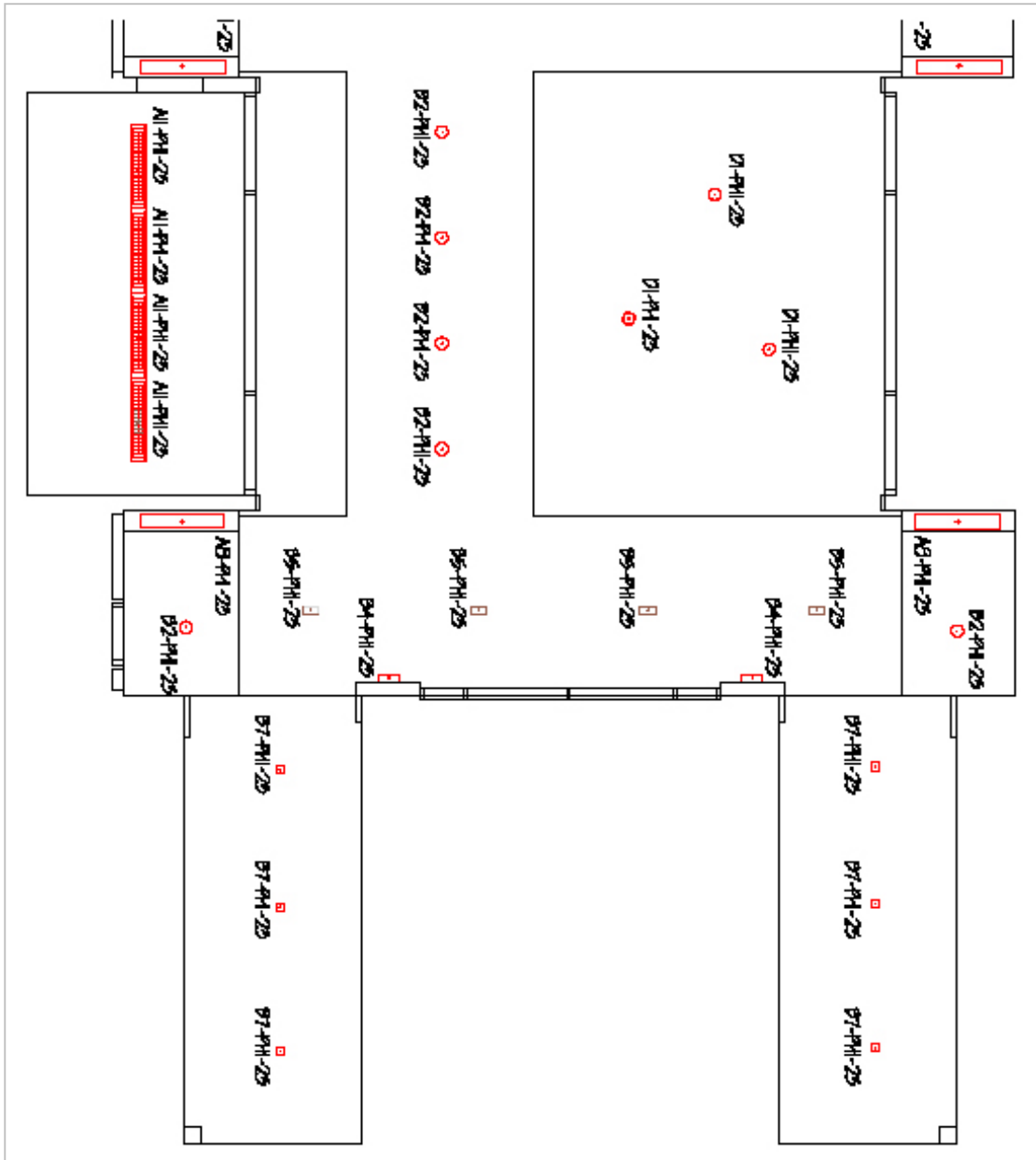


Figure L.5

Figure L.5 is the last luminaire plan for the first floor. It contains the back hallways, which leads to the secondary stairwell in the building. Also in this plan is the second study room on the first floor. Next to the study rooms are the entrances to the different classroom, and the second set of openings to the second floor.



Ceiling Plan 2.A

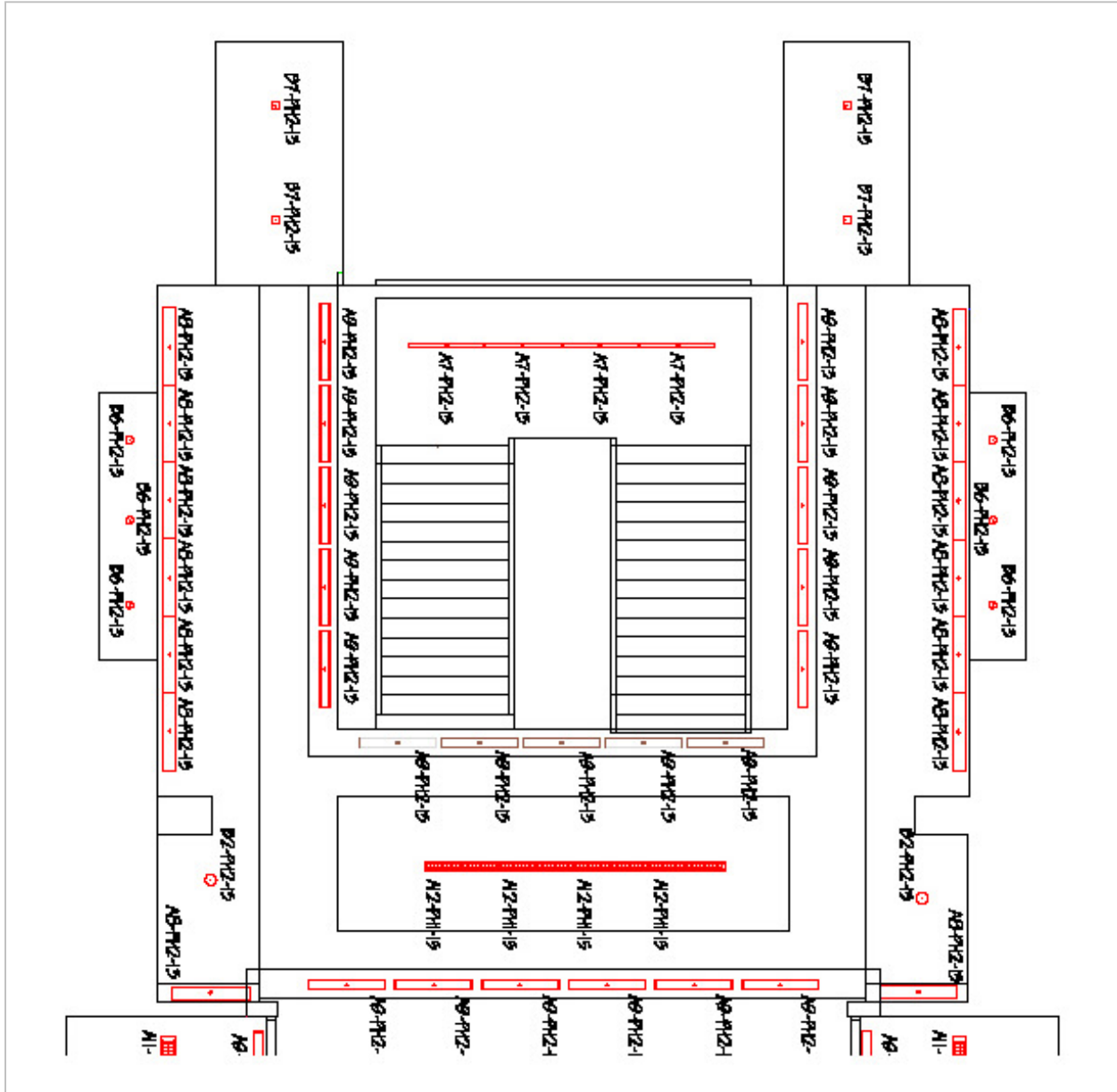


Figure L.6

Figure L.6 displays the first area of the second floor. The steps leading up onto the initial landing and the surrounding area, and the areas on either side for walk up computer stations. Luminaire A8 is a cove fixture, which is set in a cove that is 1.5' tall and 1.5' deep.



Ceiling Plan 2.B

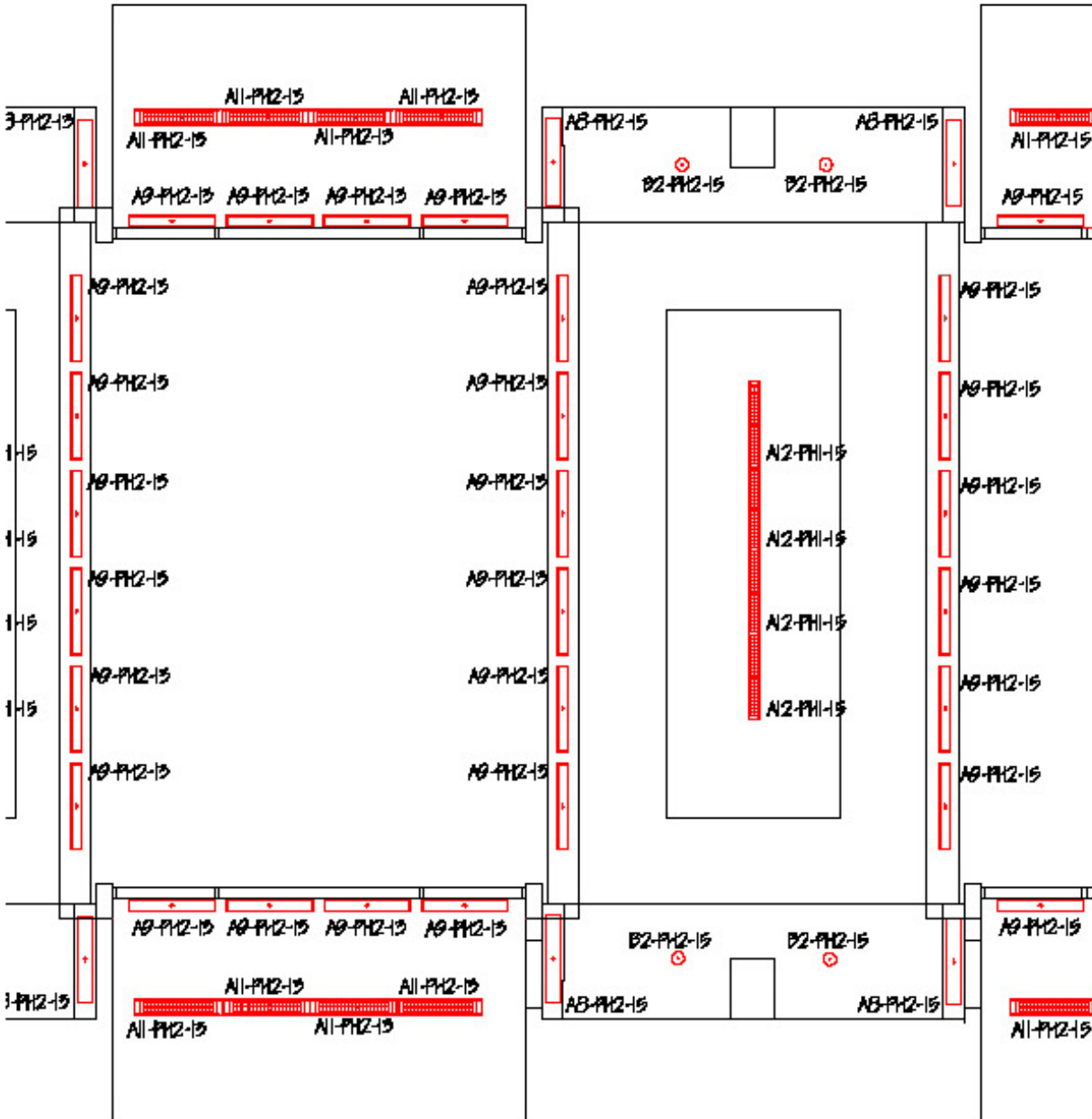


Figure L.7

Figure L.7 is a display of the middle portion of the second floor of the lobby. Again, fixture A8 is a cove light that is set in a cove 1.5' deep and 1.5' tall. The area between the two sets of cove lights is a suspended pathway between the entrances to two of the classrooms.



Ceiling Plan 2.C

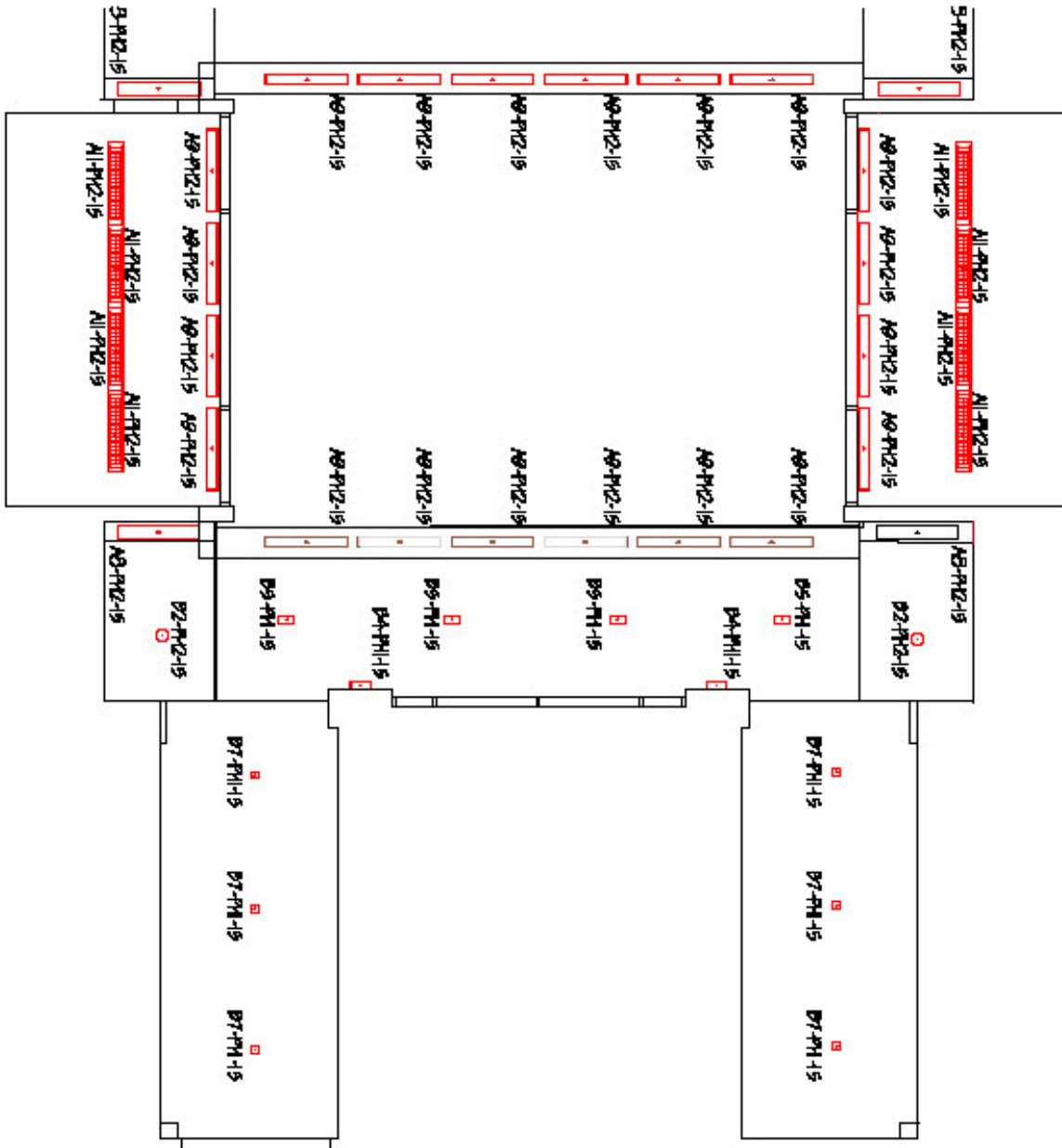


Figure L.8

Figure L.8 is the final portion of the second floor lobby. It contains another set of cove lights that have been placed in a cove of the same dimensions. The two rooms set off of the main part of the lobby are two study rooms.



Calculation Data

The task plane on the first floor, the floor itself, succeeded in reaching the desired fc levels. With the goal of a minimum of 30 fc in this space to provide sufficient lighting for reading tasks that will last only a short amount of time. Levels on the second floor also reach their desired values, washing the floor at values above 10 fc. The results can be seen in this following section, which provides pseudo color renderings of the first floor and the second floor.

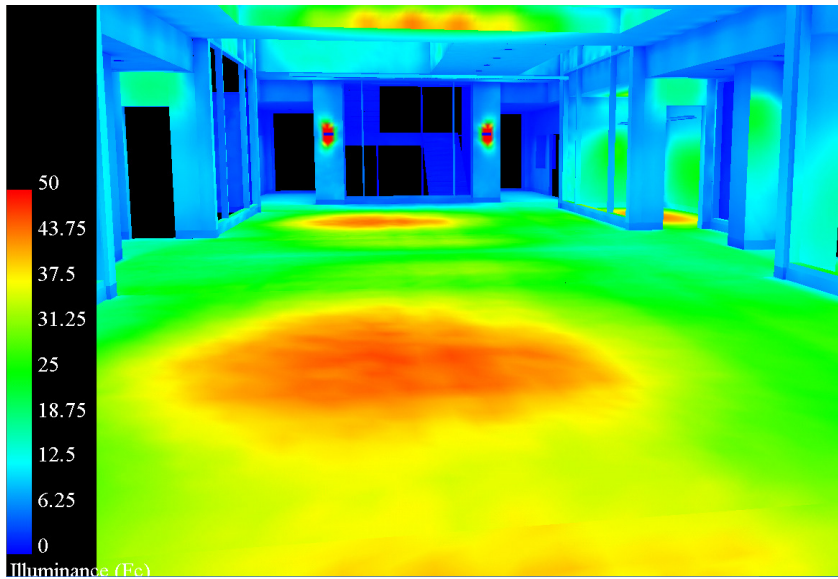


Figure L.1

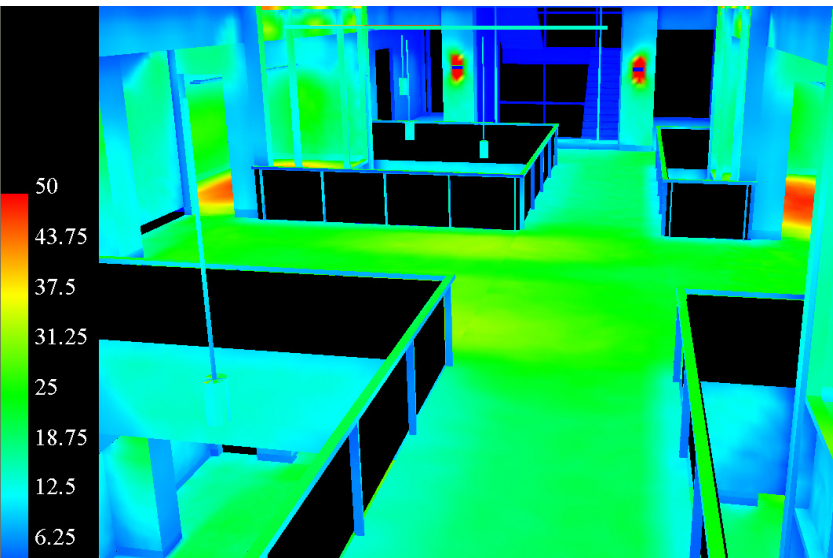


Figure L.2



Spatial Highlights

Another primary concern for the space was the lighting of the more important aspects of the room more prominently, in this case the entrances to the rooms and the main entrance to the building. Using recessed fixtures to bring out the deep rich wooden color of the finish around the classroom entrances, and by highlighting works of art by the building entrance, attention was drawn to these aspects of the room allowing them to stand out more prominently than the rest of the room.



A display at the entrance of the building highlights several works of art in an attempt to draw interest into the space.

Rendering L.1

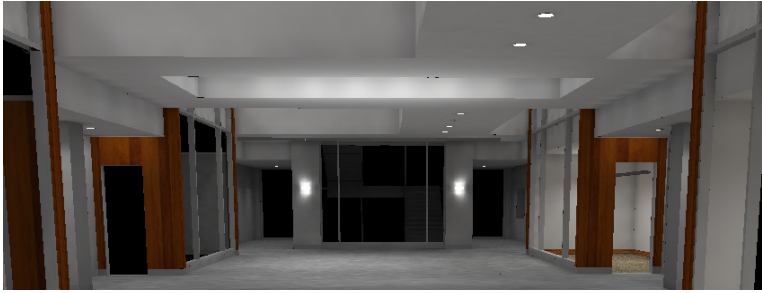


Recessed perimeter lights help to place light on the rich wooden façade that clads the walls around the doorways to draw people into the classrooms.

Rendering L.2

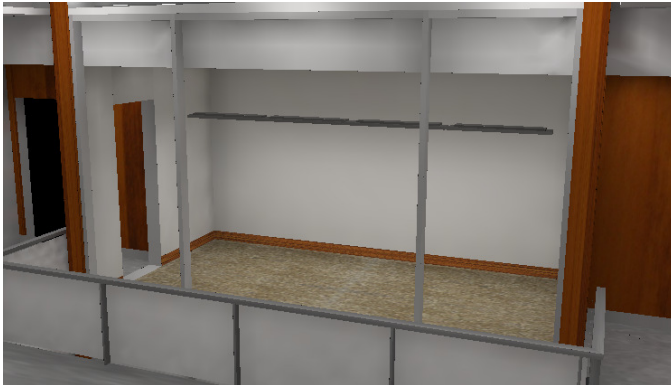


Spatial Renderings



View of the first floor of the Lobby

Rendering L.3



Rendering of one of meeting rooms.

Rendering L.4



Rendered view of the second floor Lobby area.

Rendering L.5



Rendered view of the covered portions of the ceiling.

Rendering L.6