

The New York University Concourse Project

New York City



TECHNICAL REPORT ONE

Existing Conditions and Design Criteria

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Lighting/Electrical Option
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September 29, 2008

EXECUTIVE SUMMARY

Technical report one analyzes four specific spaces and the existing lighting conditions to help establish the design criteria. The design criteria follows the guidelines of the IESNA and ASHRAE/IESNA Standard 90.1. The four specific spaces analyzed are the Tisch lobby/atrium, general classroom, MBA student lounge, and Gould plaza.

The lighting system enhances the modern look of the architectural space of the newly renovated Stern School of Business. Each specific space contains a set of criteria in which the lighting design needs to address. This set of criteria encompasses a variety of guidelines set for the performance of the lighting system and recommendations for human comfort. Examples of these guidelines include glare control, daylight integration, lighting distribution of surfaces, and modeling of faces and objects. Computer models were constructed to evaluate the detailed performance of the existing lighting system.

Overall, the design criteria for the four specific spaces are established and the existing lighting condition meets the requirements of IESNA and ASHARE/IESNA Standard 90.1. The lighting design for the four spaces is able to provide enough light levels for safety, reading/writing, visual comfort, and interest in the space.

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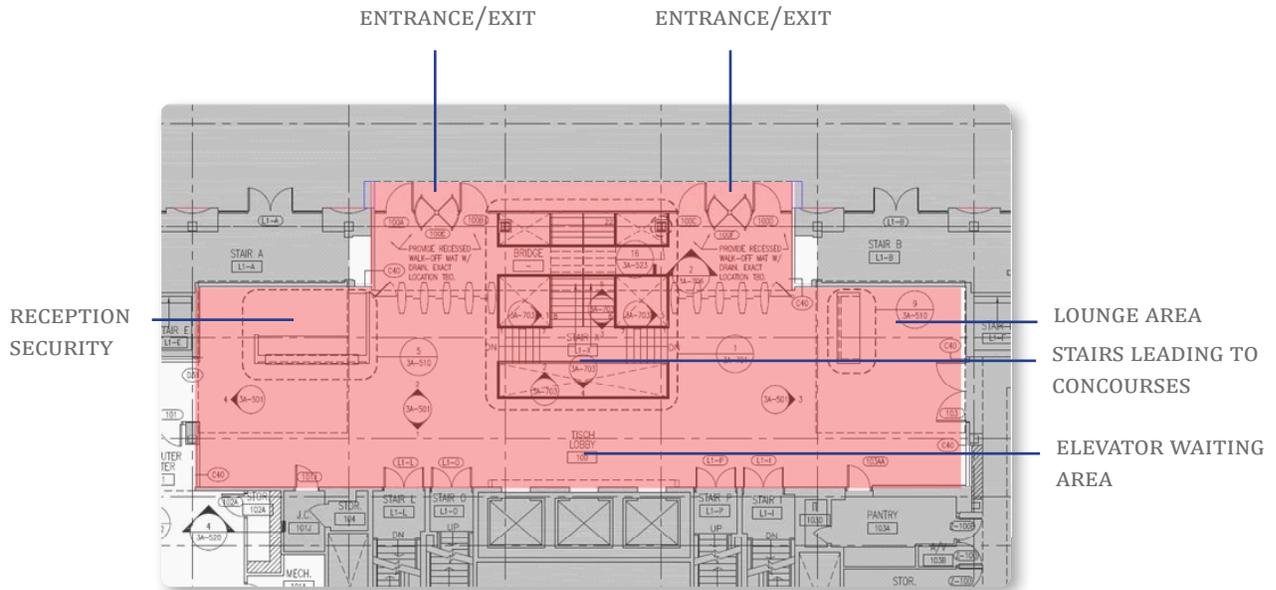
Tisch Hall/Atrium

Tisch Hall is located at the center south of Gould Plaza. The building is located between Kaufman Management Center and Warren Weaver. The building hosts a number of classrooms for the New York University's Stern School of Business.

There are two entrances (revolving doors) that lead into Tisch Hall. The atrium space has a glass bridge that sits close to the curtain wall. There are two sets of stairs that lead to the bottom levels (upper and lower concourses) of Tisch Hall. In the lobby there are three elevator doors, sofa, reception desk, and hallways that lead to other buildings. The new design will help introduce daylight into the space.



TISCH HALL, BETWEEN WEST 4TH AND WEST 3RD ST

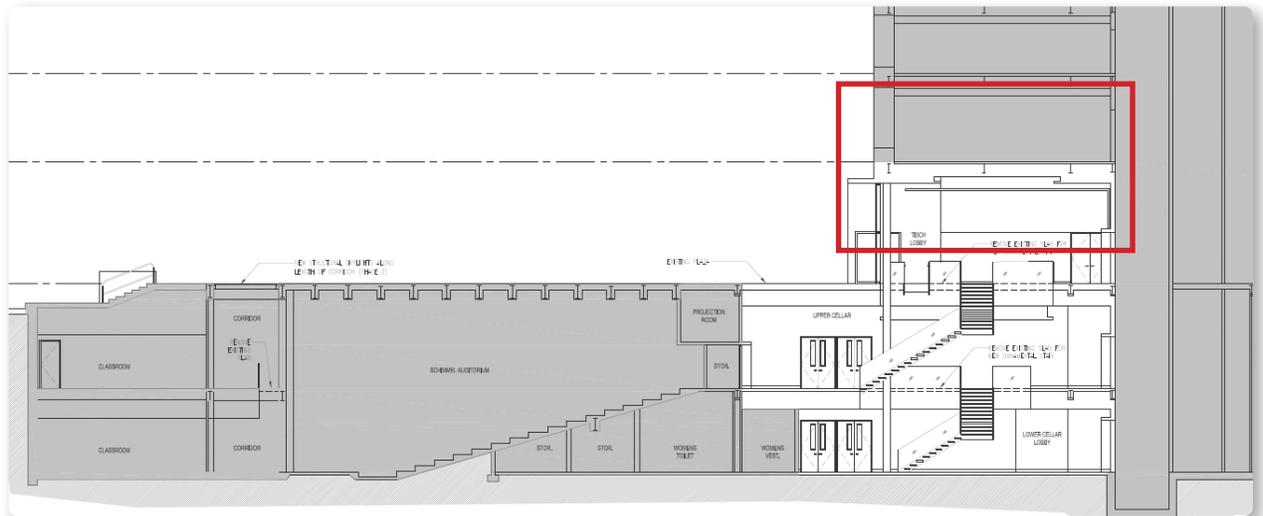


TISCH HALL LOBBY, GROUND LEVEL

Tisch Hall/Atrium

MATERIALS FOR TISCH LOBBY

Finishes for Tisch Lobby			
Type	Description	Finish	Reflectance (assumed)
Wall			
ST-2	Batek Diamante Limestone	Grey	0.5
WD-2	Bamboo Patina panel	Light Brown	0.3
P-1	White finish	Eggshell	0.9
Wall Base Finish			
ST-2	Batek Diamante Limestone	Grey	0.5
CT-5B	Gateway Ceramic Flooring	Sterling Grey	0.3
Flooring			
CT-5A	Gateway Ceramic Flooring	Sterling Grey	0.3
Ceiling			
ST-2	Batek Diamante Limestone	Grey	
ACT-5	Bamboo Patina panel	Light Brown	0.9
P-1	White finish	Eggshell	0.9



TISCH LOBBY (IN RED)

Tisch Hall/Atrium

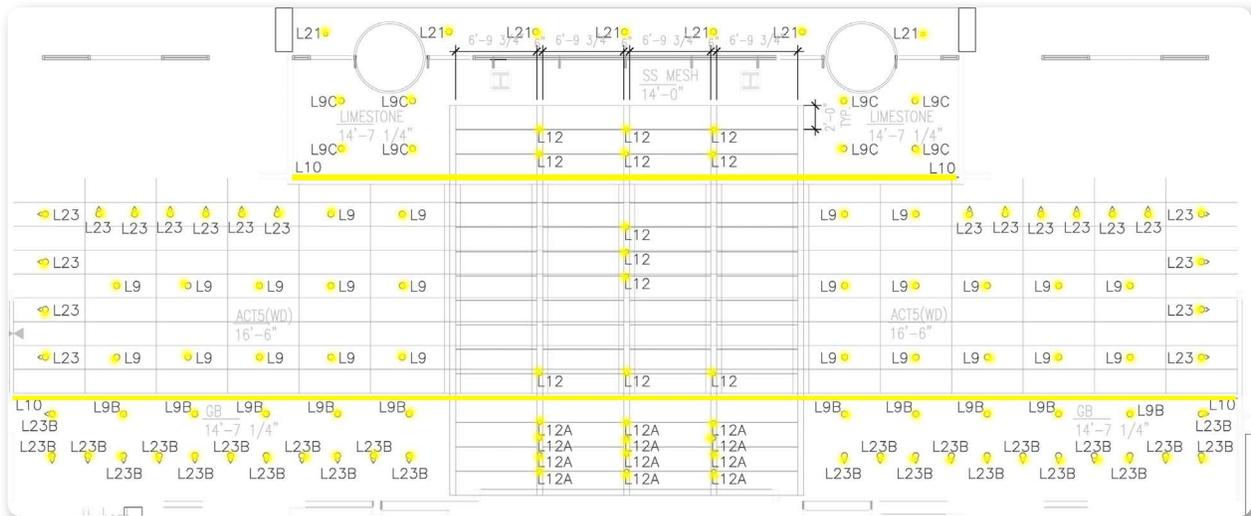
EXISTING LIGHTING CONDITIONS

The lighting system in Tisch Lobby consists of 9 types of luminaire. The fluorescent and high intensity discharge lamps complements well with the cool surfaces (grey limestone, ceramic flooring, and white eggshell finish) of the space.

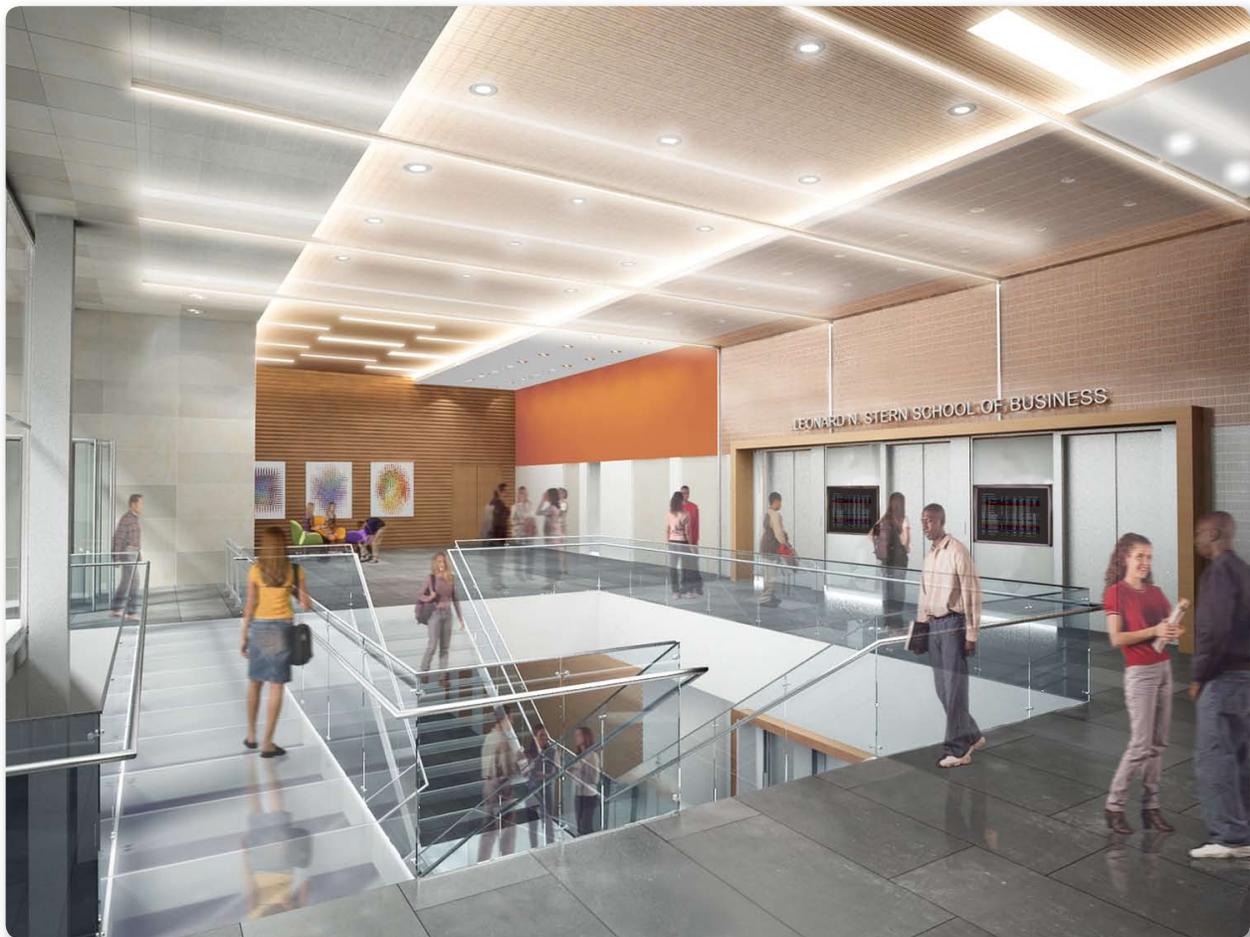
At the two revolving doors of the lobby, eight ED17 metal halide downlights are used to light the entrance. The center of the lobby, 24 metal halide downlights, lights the elevator waiting area and the stairs that lead down to the upper and lower concourses. On the west and east sides of the lobby, a combination of PAR 38 metal halide washwallers and ED18 downlights make up the lighting. The lobby also has staggered fluorescent strips that light the inner coves of the ceiling, creating a welcoming and relaxing atmosphere in the lobby.

Lighting Fixture Schedule for Tisch Lobby								
Type	Manufacture	Fixture Description	Watt	Quantity	Lamp	Ballast	Mounting	Voltage
L9	Edison Price	Recessed ED17 metal halide downlight ceiling	58	24	MP50/C/U/MED Osram Sylvania	electronic ballast	recessed	277
L9B	Edison Price	Recessed ED17 metal halide downlight ceiling	58	10	MP50/C/U/MED Osram Sylvania	electronic ballast	recessed in gypsum board	277
L9c	Edison Price	Recessed ED17 metal halide downlight ceiling	58	8	MP50/C/U/MED Osram Sylvania	electronic ballast	recessed in stone ceiling	277
L10	SPI	Surface mounted fluorescent cove	8.3w/lf	135'	FP28/830/ECO Osram Sylvania	electronic ballast	mounted in cove	277
L12	Edison Price	Stem mounted PAR20 adjustable accents	45	12	CMH39PAR20/FL General Electric	remote electronic ballast	mounted between metal mesh tiles	277
L12A	Edison Price	Stem mounted PAR20 adjustable accents	45	12	CMH39PAR20/FL General Electric	remote electronic ballast	mounted between metal mesh tiles	277
L21	Edison Price	Recessed Exterior rated metal halide downlight	58	7	MP50/C/U/MED Osram Sylvania	electronic ballast	mounted in exterior stone ceiling	277
L23	Edison Price	Recessed PAR38 metal halide wallwasher	78	20	CDM70/PAR38/FL/ 3K/ ALTO Philips	electronic ballast	mounted in wood ceiling	277
L23B	Edison Price	Recessed PAR38 metal halide wallwasher	78	24	CDM70/PAR38/FL/ 3K/ ALTO Philips	electronic ballast	-	277

Tisch Hall/Atrium



TISCH HALL LOBBY, LIGHTING PLAN



RENDERING OF TISCH LOBBY

Tisch Hall/Atrium

CONSIDERATIONS & CRITERIA

APPEARANCE OF SPACE AND LUMINAIRES

- The Tisch Lobby is intended to create a spacious and pleasant environment for people entering the building. The idea is to make the space feel comfortable for people to relax and sit down to have a chat. The modern feel of the lobby, with the cool surfaces (metal and glass), help establish NYU Stern School of Business as an attractive school to pursue an academic career.
- The luminaire for this space would need to incorporate well with the modern look of the lobby. Indirect luminaires can be used to hide the luminaire from view to help make the space look clean and comfortable.
- The luminaires can also highlight the aesthetics of the architectural space; the columns, school logo and name, various wall materials and ceiling panels. An emphasize on lighting the horizontal and vertical surfaces/edges can enhance the visual interest of the architecture.

COLOR APPEARANCE (AND COLOR CONTRAST)

- The space is filled with cool surfaces with high reflective and bright surfaces. There are still some surfaces that are warm (bamboo) within the space. The wall finishes are grey limestone, bamboo panels, and white finish. The wall base finishes are lime stone and ceramic grey. As for the floor, they are ceramic grey panels. In the ceiling, there are also bamboo panels, grey limestone, and white finish panel boards.

DAYLIGHT INTEGRATION AND CONTROL

- The large glass panels would provide daylight into the space. Daylighting integration and controls can be utilized to help conserve energy usage. Automatic photoelectric controls as well as manual dimming can be incorporated into the design.
- Building is north east facing so there is some light that comes through. However, Warren Weaver blocks most of the sunlight so further study needs to be done to see if light does penetrate through. Window shades or direct glare devices will not be needed. There is still a good amount of northern light coming into the space which can be incorporated with the electric lighting of the lobby.

DIRECT GLARE

- Direct glare will not be a concern.

LIGHT DISTRIBUTION SURFACES

- Light distribution will need to be uniform on the floor.
- The limestone, resin panels, and wood panels on the walls can be grazed or highlighted to bring out the rich details and textures of the space.
- Non-uniform lighting in the space can help create visual interest.

Tisch Hall/Atrium

CONSIDERATIONS & CRITERIA

Light distribution on Task Plane (Uniformity)

- The lighting distribution on the floor will be crucial for people to see where they walk. In general, the lighting level in the lobby will need to be bright enough for security purposes to see the people entering/leaving the building.

Luminance of Room Surfaces

- Luminance level on the floor would need to be uniform. The business school name will need to have higher luminance levels for people to see. Since the lobby is a converging point of various spaces, the lighting will need to address the paths to the other compartments of the building. The focus should be lighting the elevator waiting area, stairs leading down into the upper and lower concourses, and the path leading to the Tisch computer lab will need to be brighter. The lighting brightness level can help define various traffic pattern. Other surfaces such as the wall will be lit as well.

Modeling of Faces and Objects

- Modeling of faces will be crucial in this space. Security guards will need to see the people entering/leaving the building. The stairs will also need to be bright enough for people to not fall. Objects such as direction signs and security table will need to be lit. The architectural glass bridge at the front of the entrance can also be lighted to showcase the modern aspect of the space (edges of the steel of the Glass Bridge and steel rim can be lighted since glass cannot be lighted).

Points of Interest

- Points of interest to be lighted are the security desk, lounge area, elevator waiting area, paths leading to other compartments of the building (stairs leading down to the upper and lower concourses of the building), paintings, and Stern School of Business logo and words.

Reflected Glare

- The reflected glare will be a concern for the atrium glass and the glass around the stairs.

Shadows

- Shadows will not be a big concern in this space.

Tisch Hall/Atrium

CONSIDERATIONS & CRITERIA

Source/Task/Eye Geometry

- Light sources can also be positioned in a creative way to help lead people into various spaces in the building.

Sparkle/Desirable Reflected Highlights

- Not an issue.

Surfaces Characteristics

- Stainless steel doors, painted doors, glass doors, and fire rated wood doors.
- Walls are limestone, resin panels, wood panels, and painted gypsum wall board.
- The floor is concrete with a high gloss.
- The curtain wall is glass fin wall system with glass wall insulated glazing unit.
- The revolving doors are glass.
- The stairs are steel.

System Control and Flexibility

- The lighting system needs to always be on for security issues. The lighting system should be grouped into various regions. During nighttime, when there are not many people in the building, lighting in certain areas of the lobby can be dimmed or turned off.

Special Considerations

- Limestone canopy & frames at the entrance can be lighted. A lighting control during the nighttime can be addressed for architectural features while other applications will be dimmed (still needs to be on for security purposes).

Illuminance (Horizontal)

- 10 fc –(IESNA Handbook: hotel lobby general lighting) on floor

Illuminance (Vertical)

- 10 fc –(IESNA Handbook: hotel lobby general lighting) on walls

Energy

- 1.3 W/sq ft, additional 1.0 W/sq ft for decorative lighting – (IESNA Standard 90.1-2007: Lobby)

Tisch Hall/Atrium

CRITIQUE AND EVALUATE - IMAGE ANALYSIS

Based on the renderings of the Tisch Lobby, the lighting is appropriate for the space. The lighting makes the space look clean and it complements well with the finishes and textures of the modern lobby. All the luminaires are hidden in the ceiling, with the luminaires arranged in long strips of light (cove and slot system). The metal halide downlights are able to provide extra brightness in the space. These spaces are the elevator waiting area, atrium stairs that lead to the upper and lower concourses of Tisch Hall, and the entrance of Tisch Hall. Cove lighting effects in the lobby create a glowing effect in the ceiling. This effect attracts the attention to the beauty and nature of the building materials. The lobby is modern with the use of materials such as glass, limestone, bamboo, and bright finishes. Overall, I believe the luminaires used are stylish since the finishes on these luminaires are modern with metallic finishes. The luminaires also blend well with the architecture; LEDs are incorporated into the rail of the glass bridge, fluorescent strips hidden in the coves under the gypsum board of the elevator waiting area and the fluorescent slot system integrate well into the ceiling acoustical panel boards.



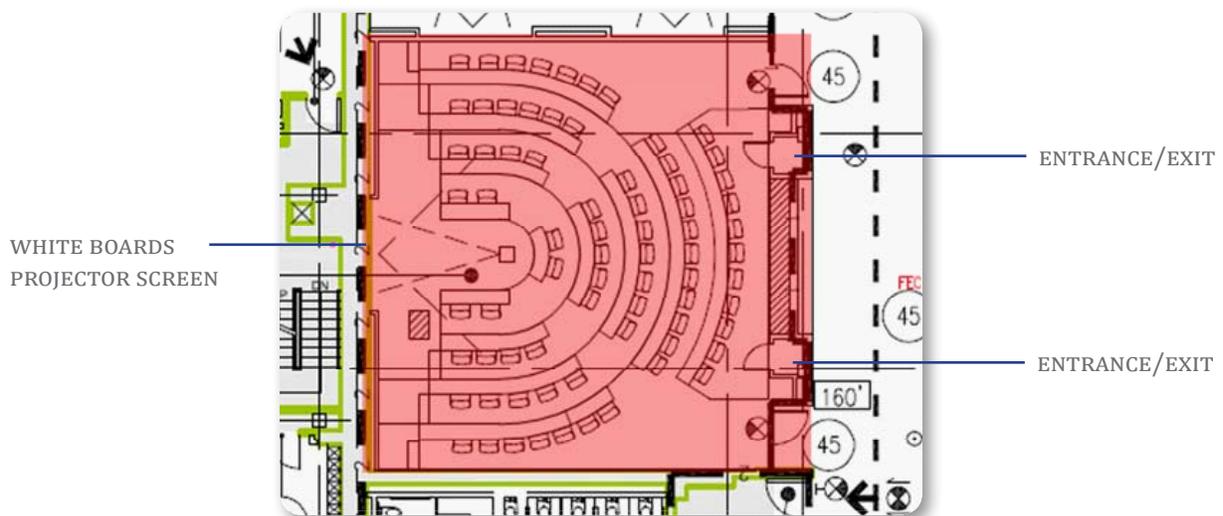
General Classroom

One of the objectives of the NYU Concourse Project is to connect the three existing buildings. In the concourse project, new classrooms are constructed for the Stern School of Business. The classroom sizes range from a capacity of 20-73 occupants. These new classrooms are constructed to create a comfortable and flexible learning environment.

The classroom (U18) is rectangular. The seating arrangement is semi circular with a total of 73 seats. There are three white boards at the front, with the center white board having a vertical sliding component that can be adjusted into a projection surface. The projection screen at the front is attached to the ceiling of the classroom. The seating arrangement is divided into various elevation heights.



EXAMPLE OF A TYPICAL CLASSROOM

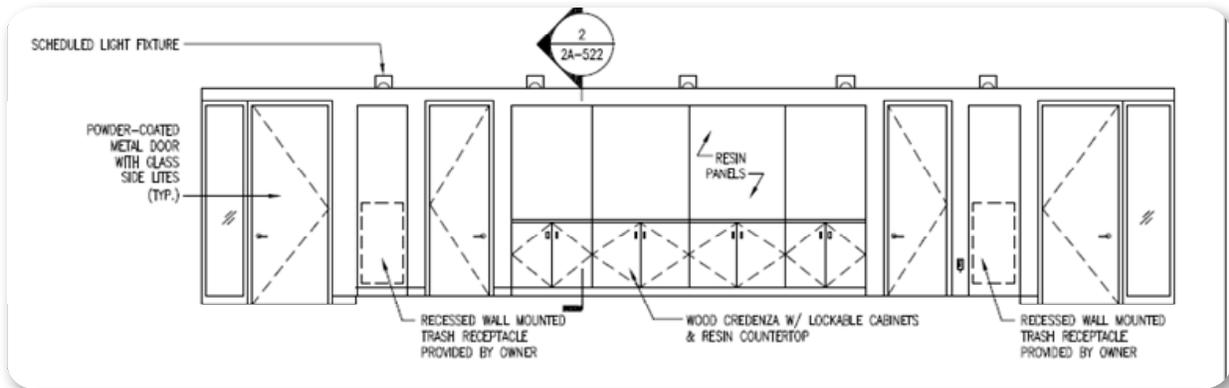


PLAN OF CLASSROOM U18

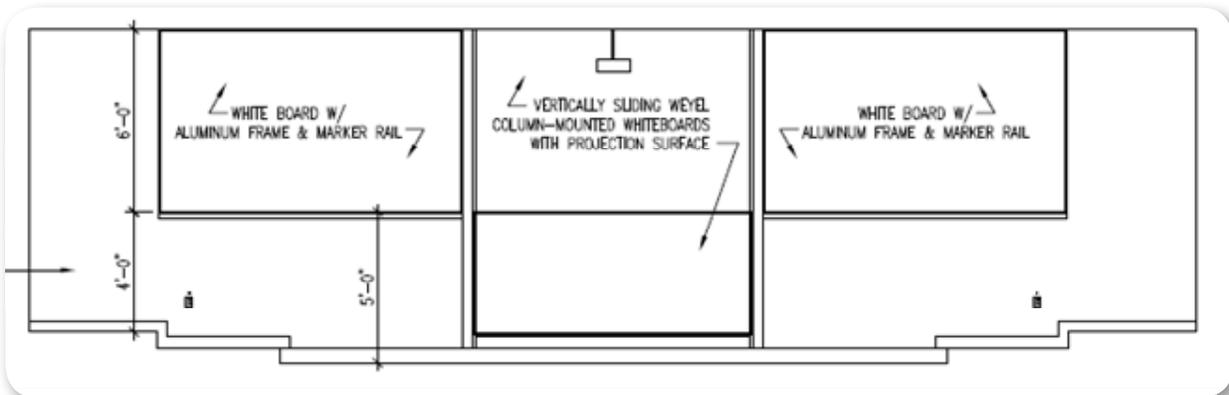
General Classroom

MATERIALS FOR GENERAL CLASSROOM [U18]

Finishes for Classroom [U18]			
Type	Description	Finish	Reflectance (assumed)
Wall			
P-5	Eggshell Finish	Concord Ivory	0.4
P-6	Eggshell Finish	Swiss Coffee	0.4
Wall Base Finish			
RB-5	Rubber Thermoplastic	Bright Orange	0.5
RB-6	Rubber Thermoplastic	Bright Orange	0.5
Floor			
CPT-3	Broadloom carpet	Navy Blue (assumed)	0.3
Ceiling			
ACT-2	Ceiling Material	White	0.9



EAST ELEVATION OF INTERIOR OF CLASSROOM



WEST ELEVATION OF INTERIOR OF CLASSROOM

General Classroom

EXISTING LIGHTING CONDITIONS

The lighting system in the classroom consist a mixture of parabolic louvers , wallwashers, and slot fixtures. All three luminaires use a standard 28W T5 fluorescent lamp at 3000K. Since the desks in the classroom are arranged in a semi-circular format, the lighting design needs to provide enough lumens on the surface of the table. The solution from Cline Bettride Bernstein is to spread out the forty two 1' x 4' louvers throughout the classroom. The direct and indirect illumination on walls helps make the space appear brighter.

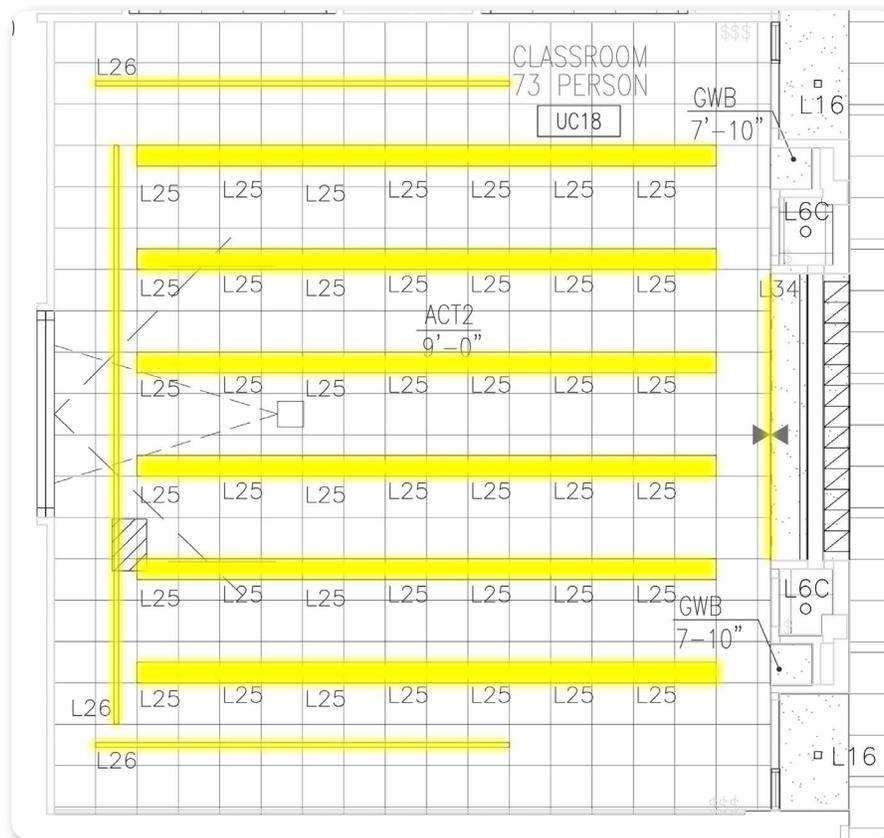
On the north and south side of the classroom, 20' of recessed wallwashers are used to wash the walls. At the front of the classroom, 28' of the same type of recessed wallwasher are used to light the white boards. At the back of the classroom, lensed fluorescent strips are placed in a slot to light the wooden credenza and cabinets. The lighting controls in the room are digital switches



EXAMPLE OF A TYPICAL CLASSROOM

General Classroom

Lighting Fixture Schedule for General Classroom								
Type	Manufacture	Fixture Description	Watt	Quantity	Lamp	Ballast	Mounting	Voltage
L25	Zumtobel	Recessed fluorescent 1x4 center parabolic louver and glowing side panels	33	42	FP28/830/ECO Osram Sylvania	hi-low ballast with two switch legs	-	277
L26	Peerless Lighting	Recessed linear fluorescent wall washer	33w per 4'	68'	FP28/830/ECO Osram Sylvania	program start ballast	-	277
L34	Mark Lighting	Recessed fluorescent lense slot fixture	8.3w/ft	14'	FP28/830/ECO Osram Sylvania		-	277



LIGHTING PLAN OF CLASSROOM U18

General Classroom

CONSIDERATIONS & CRITERIA

APPEARANCE OF SPACE AND LUMINAIRES

- The typical classroom is intended to create a comfortable learning environment in which students can enhance their learning experience. The focus point is the three white boards and projection surface at the front of the classroom. Lighting levels on the vertical surface would need to be bright enough for people to read.
- The desks will be arranged in a semi-circular format which can help contribute to the newly designed luminaires to be arranged in a playful manner with the orientation of the desks.
- The space needs to introduce an impression of visual clarity and pleasantness to provide students with the best learning environment. Luminaires need to be positioned right above the desks to provide enough ambient light for working conditions.
- The projector located on the surface of the ceiling would be an obstacle for any suspended luminaires (block projector view).

COLOR APPEARANCE (AND COLOR CONTRAST)

- The color surfaces of the classroom are bright. The wall finishes are ivory and light coffee toned with a white ceiling panel boards with a navy blue carpet.
- The lighting from the luminaires needs to accompany the cool tones of the classroom to make the space feel clean and efficient. In a brighter and cool toned environment, work efficiency is higher in comparison to a relaxed warm tone environment. The cool tone will also help enhance the reading visibility of the white boards at the front of the room.

DAYLIGHT INTEGRATION AND CONTROL

- Daylight integration will not be a concern since there are no windows.

DIRECT GLARE

- If the luminaires are pointed towards the white boards, at the front of the classroom (provide enough light level on the vertical surface of the board), direct glare will be a concern for the person teaching at the front of the room. The space is intended to provide a comfortable learning/teaching environment so direct glare will need to be addressed.

General Classroom

CONSIDERATIONS & CRITERIA

LIGHT DISTRIBUTION SURFACES

- Light distribution on the tables will need to be uniform to provide an equal learning condition for every student in the classroom. The light distribution on the three white boards at the front of the room will need to be uniform so that the visibility conditions will be the same.

LIGHT DISTRIBUTION ON TASK PLANE (UNIFORMITY)

- The lighting distribution at the desk plane (2.5 feet for table height) will need to provide enough light for writing and reading.
- Since the floor will not all be on the same plane (various seating heights), the light level on the floor would need to be maintained as uniform as possible for safety.

LUMINANCES OF ROOM SURFACES

- The front of the classroom (whiteboard and podium) should have higher luminance levels in the space followed by the desks (student sitting area). The back and side of the space will have lower light levels on the walls. The floor should have the least amount of light level in comparison with the rest of the surfaces.

MODELING OF FACES AND OBJECTS

- A healthy learning environment would provide sufficient light levels for the professor and students to communicate. Facial recognition will be a critical concern for the professor at the front of the room and the students sitting.
- The three white boards in the front of the board also need to have enough brightness for reading.

POINTS OF INTEREST

- Points of interest to be lighted: Three white boards and podium at the front of the room.

REFLECTED GLARE

- The reflected glare on the projection screen will be a concern for students looking. It would be hard to read if the board is too bright This can be prevented by using luminaires with a narrow beam angle or adjustable luminaire to prevent light from spilling onto the projection screen.

General Classroom

CONSIDERATIONS & CRITERIA

SHADOWS

- Sufficient light levels should be provided so that shadows do not interfere with writing and reading visibility (desk and white boards at front of room).

SOURCE/TASK/EYE GEOMETRY

- Light sources need to be positioned right above the table height for writing, reading, facial rendering purposes.
- Light source will also need to be positioned correctly to provide enough light levels on the white boards.

SPARKLE/DESIRABLE REFLECTED HIGHLIGHTS

- Not an issue.

SURFACES CHARACTERISTICS

- Vertical sliding white boards with rear projection screen.
- Painted gypsum wall board.
- Resin panels.
- Wood credenza with locker cabinets, resin counter top, and adjustable shelves.
- Doors are coated metal.

SYSTEM CONTROL AND FLEXIBILITY

- Since the classroom would have a variety of different learning conditions (lecture, presentation with projector screen), the classroom must have a flexible lighting control tailored towards the different activities.
[Lecture mode] – light levels can be adjusted to have a better writing/reading.
[Presentation mode] - lighting levels will need to dim so that the projection screen will be bright enough to see.

SPECIAL CONSIDERATIONS

- None.

General Classroom

CONSIDERATIONS & CRITERIA

ILLUMINANCE (HORIZONTAL)

- [Study Mode] 30 fc –(IESNA Handbook: Reading Handwriting tasks- #2 pencil and softer leads)

ILLUMINANCE (VERTICAL)

- [Presentation Mode] Less than 5 fc on front screen project systems – (IESNA DG17-05)

ENERGY

- 1.4 W/sq ft – (IESNA Standard 90.1-2007: Classroom/lecture/training)
1.0 W/sq ft for accent

General Classroom

CRITIQUE AND EVALUATE - AGI ANALYSIS

The biggest concern in the classroom is to see if there is enough light levels on the desks for writing and reading. The other concern was the three white boards and projection screen up front in the classroom. Simple shapes were used to build the desks and white boards with approximate reflectance levels.

The computer software analysis reveals that there is enough light on the tables. The first set of tables (4" above the white board level), received about an average of 34 fc. The second row of tables (8" above the white board level), received about an average of 35 fc. As the row gets higher in elevation, the light level starts to decrease. This is due to the fact the arrangement of the luminaires in the space and the orientation of the desks in the back. On average, the first two rows of desks receive more light since they are directly sandwiched under two rows of luminaire. The back rows situate under one row of luminaire. The back row desks receive about 28 and 24 fc respectively. The light levels are lower but are still reasonable for writing and reading. Overall, the desks do meet the 30 fc requirement set by the IESNA standard.

The light levels on the white boards are reasonable for reading. The light levels range from 22 fc to 80 fc. Higher luminance values appear at the upper portion of the white board due to the closeness to the light source (compact fluorescent wall washers). The wall washers would need to be mounted further from the white board to provide uniform light levels across the board.

On the floor of the classroom, even though the classroom elevates, there is enough illumination from the front to the back of the room. The illumination range from 5 to 25 fc. The minimum illumination in a corridor in the IESNA handbook is 5 fc. Only at the corners in the back of the room (3-5 fc), are the illumination lower. The lower illumination is not a concern since the space will not be used for any particular task.

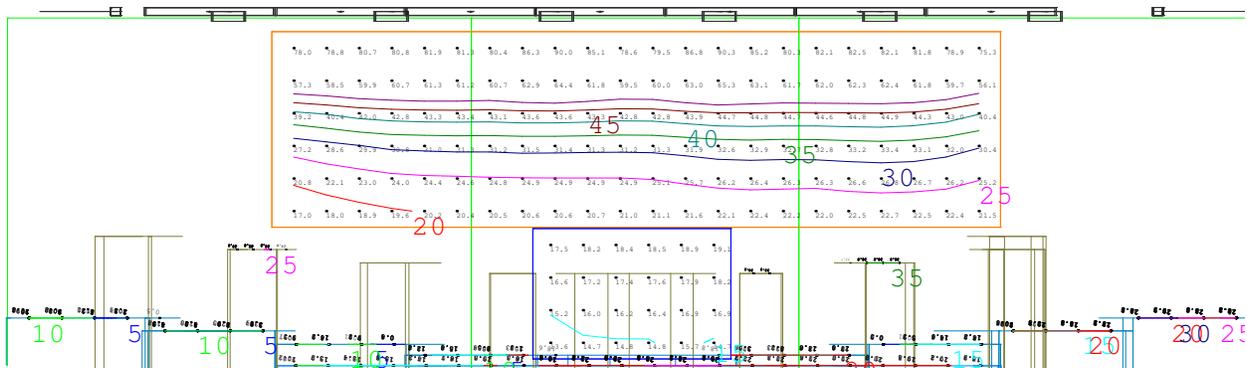
The current lighting design fulfills the criteria set by IESNA. For my design, I plan to redesign from scratch to improve the uniformity lighting level on various surfaces.

General Classroom

Luminaire Schedule					
Symbol	Qty	Label	Arrangement	Lumens	LLF
	17	L26	SINGLE	2418	0.777
	42	L25	SINGLE	1209	0.777
	3	L34	SINGLE	2418	0.777

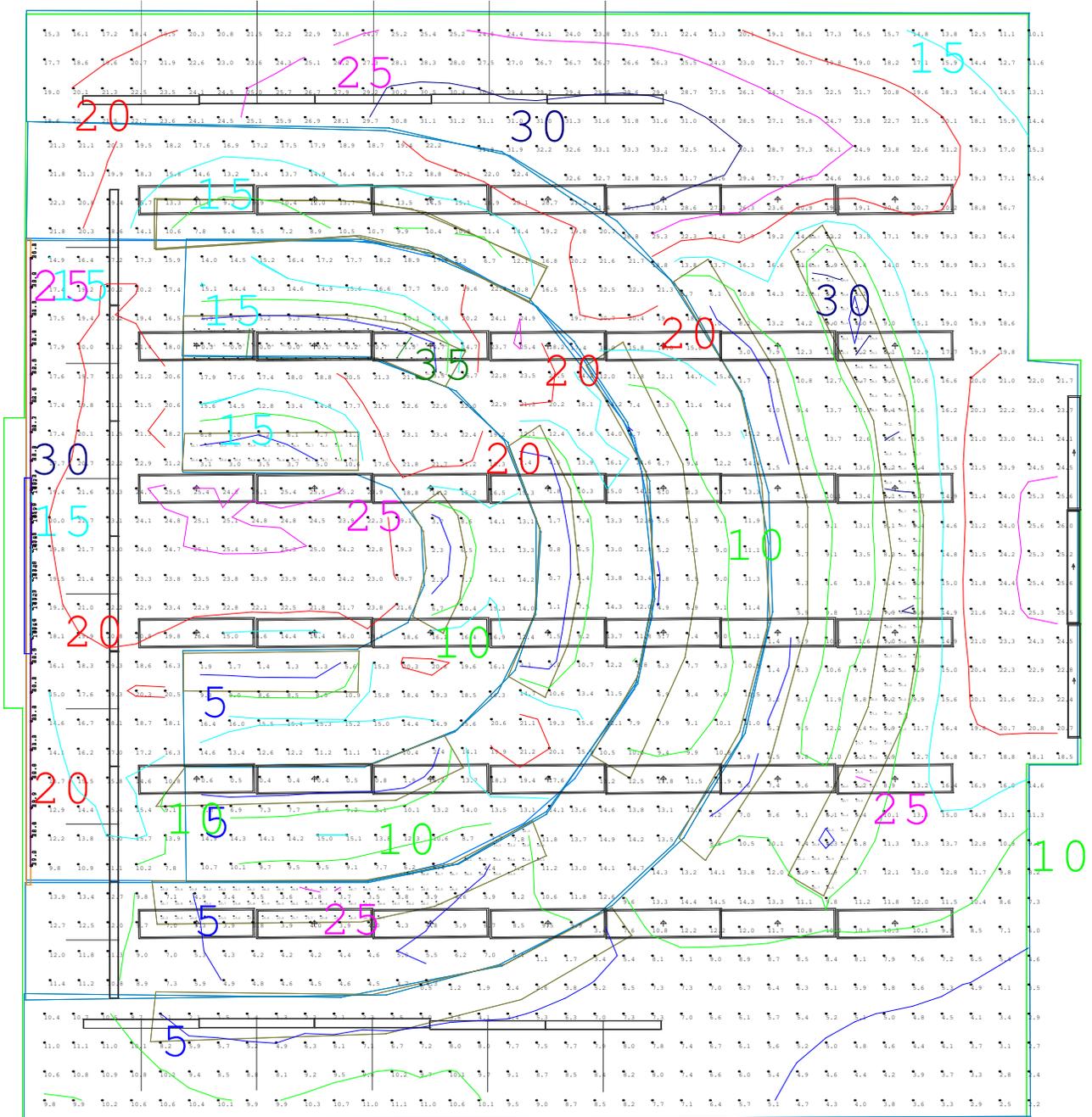
Calculation Summary							
Label	CalcType	Units	Avg	Max	Min	Avg/Min	Max/Min
B4_Top	Illuminance	Fc	11.58	22.5	3.4	3.41	6.62
B5_Top	Illuminance	Fc	14.55	33.4	0.5	29.10	66.80
B3_Top	Illuminance	Fc	11.52	25.3	0.1	115.20	253.00
White Board_Side_1	Illuminance	Fc	43.98	90.2	17.0	2.59	5.31
projection surface_Side_3	Illuminance	Fc	16.75	19.1	13.6	1.23	1.40
Teaching Podium	Illuminance	Fc	19.68	25.5	7.8	2.52	3.27
Table-B2_Top	Illuminance	Fc	33.98	34.6	32.8	1.04	1.05
Table B3_Top	Illuminance	Fc	35.17	36.5	32.8	1.07	1.11
Table B5_3_Top	Illuminance	Fc	27.73	32.0	20.5	1.35	1.56
Table B4_2_Top	Illuminance	Fc	23.86	25.0	22.0	1.08	1.14
B2_Top	Illuminance	Fc	13.48	23.4	1.3	10.37	18.00

Light Loss Factor for General Classroom [U18]									
	Maintenance Category	Dirt Conditions	Cleaning Period	LDD	Initial Lumens	Mean Lumens	LLD	BF	Total LLF
L25	IV	Clean	12 months	0.88	2600	2418	0.93	0.95	0.78
L26	IV	Clean	12 months	0.88	2600	2418	0.93	0.95	0.78
L34	V	Clean	12 months	0.88	2600	2418	0.93	0.95	0.78



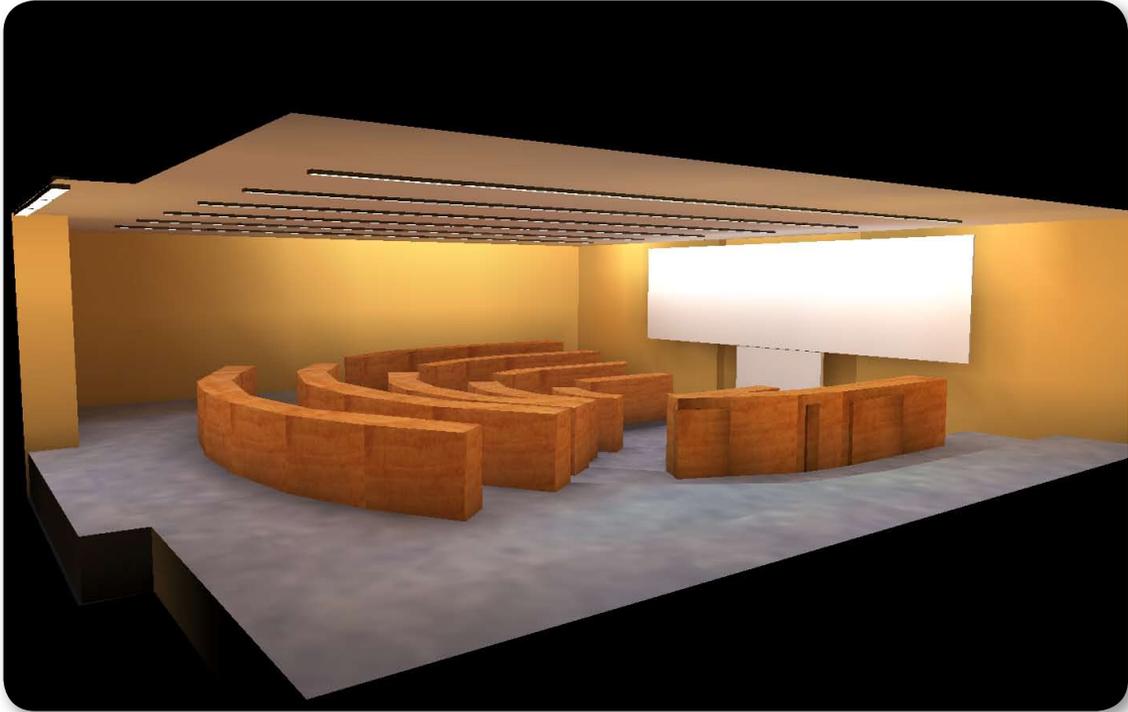
CALCULATIONS ON THE WHITE BOARDS AND PROJECTION SCREEN (VERTICAL SURFACE)

General Classroom

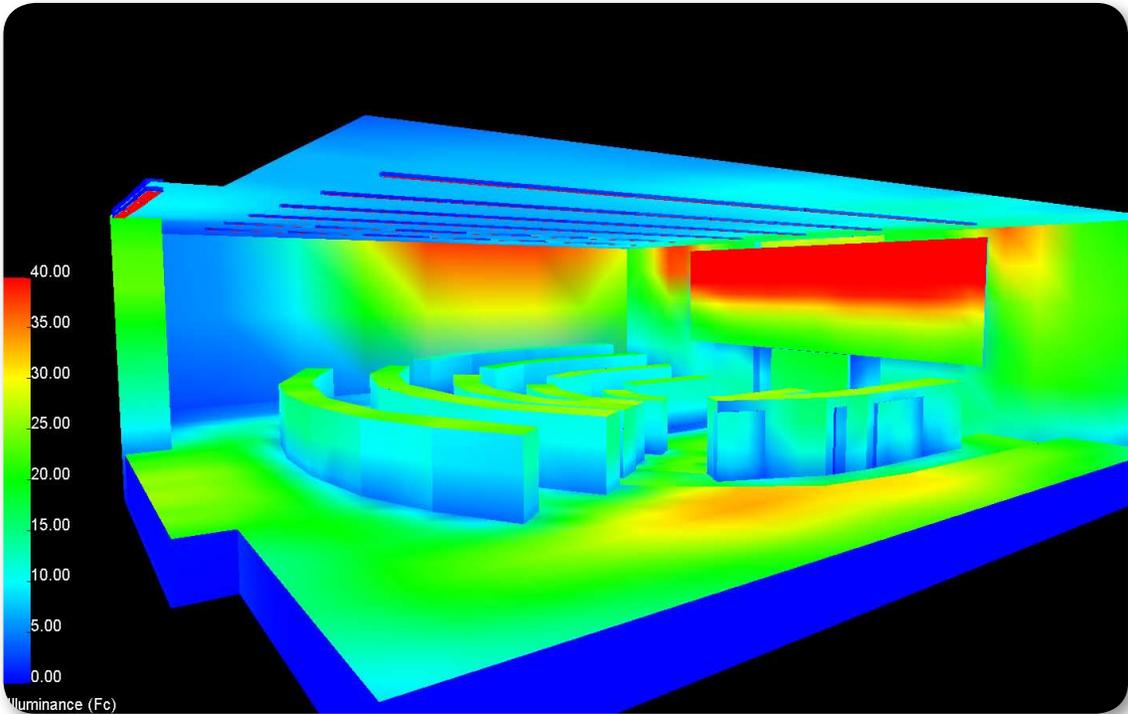


CALCULATIONS ON THE CLASSROOM
(HORIZONTAL SURFACE)

General Classroom



AGI RENDERING OF CLASSROOM

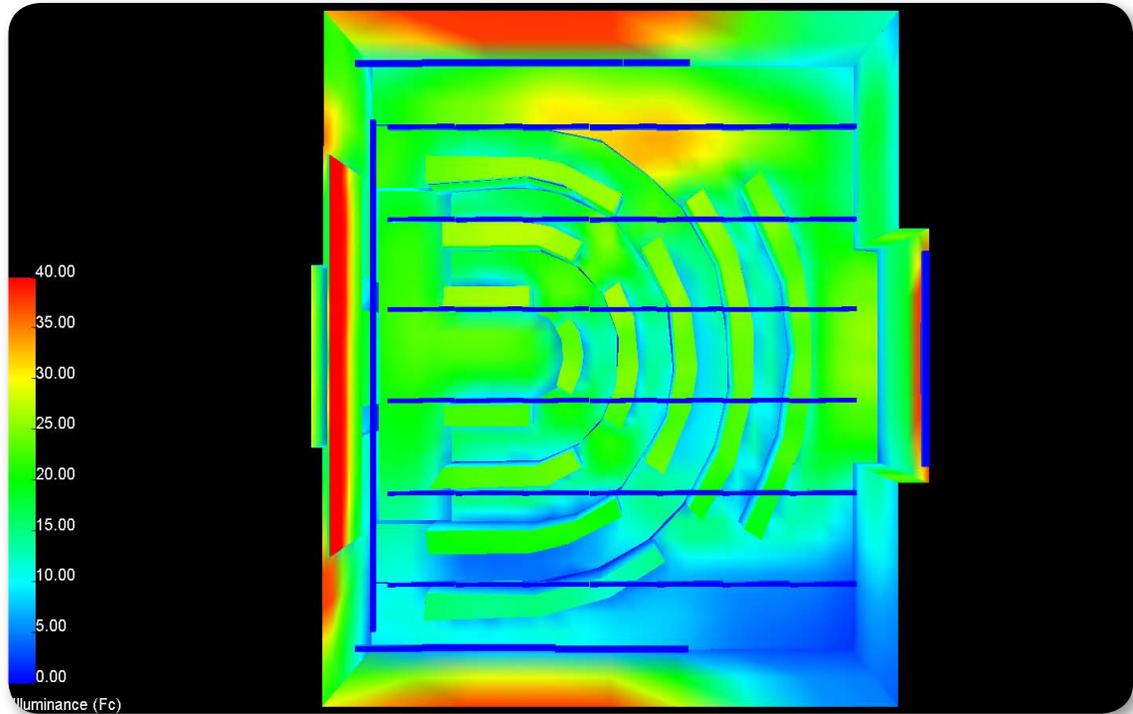


PSEUDO RENDERING OF CLASSROOM

General Classroom



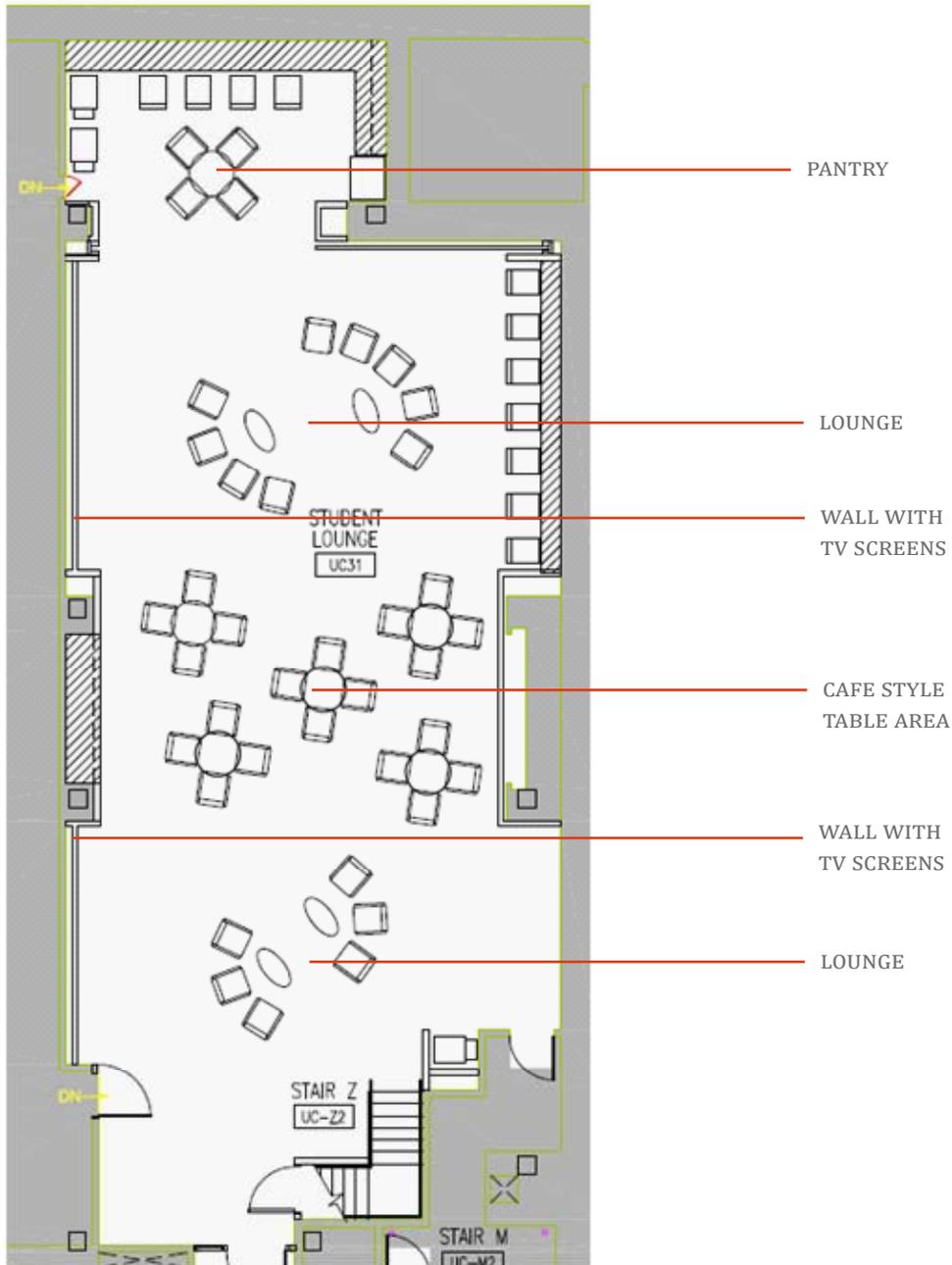
AGI RENDERING OF CLASSROOM



PSEUDO RENDERING OF CLASSROOM

MBA student lounge

Located in the upper concourse, the MBA student lounge is a student lounge for the students of the master's business administration program. The 2,100 sq.ft is divided into four sections. There is a pantry in the back, area for lounge tables and working counter, café style table area, and another lounge area. On the west walls, there are three sets of television monitors.

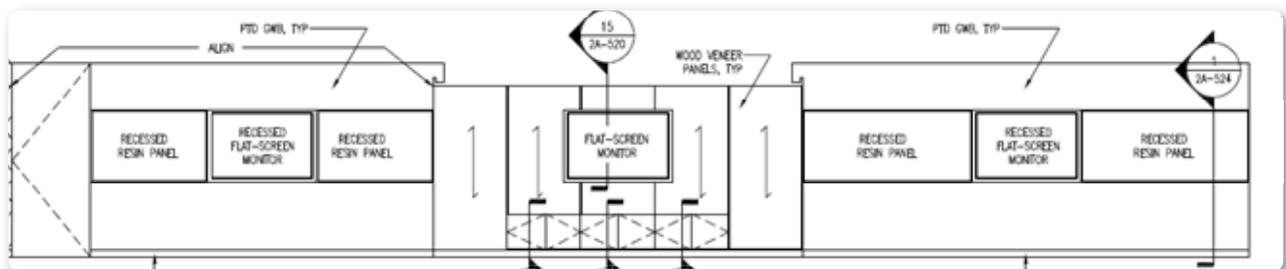


MBA STUDENT LOUNGE FLOOR PLAN

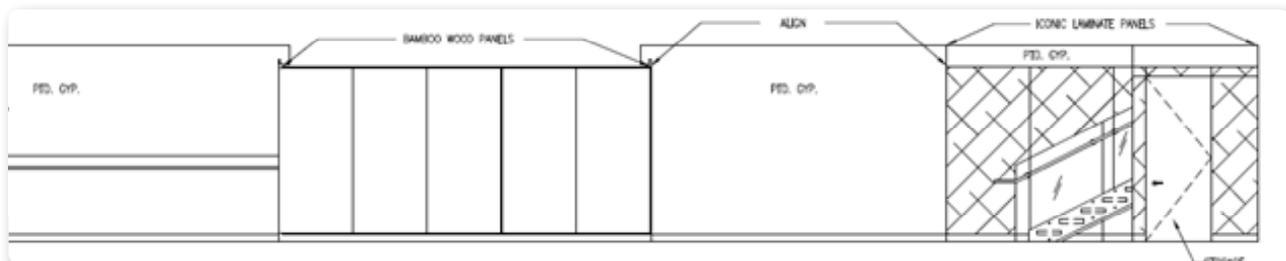
MBA student lounge

MATERIALS FOR MBA STUDENT LOUNGE

Finishes for MBA Student Lounge [U31]			
Type	Description	Finish	Reflectance (assumed)
Wall			
P-1	Eggshell Finish	White	0.9
WD-3	Bamboo Patina panel	Light Brown	0.4
Wall Base Finish			
CT-5	Gateway Ceramic Flooring	Sterling Grey	0.5
CT-5B	Gateway Ceramic Flooring	Sterling Grey	0.5
Floor			
CT-5	Gateway Ceramic Flooring	Sterling Grey	0.5
CT-5A	Gateway Ceramic Flooring	Sterling Grey	0.3
RF-2	Rubber Sheet Flooring	Fossil	0.3
Ceiling			
ACT-3	Acoustical panels	White	0.9
ACT-4	Acoustical panels	white metal panels	0.9



WEST ELEVATION OF LOUNGE



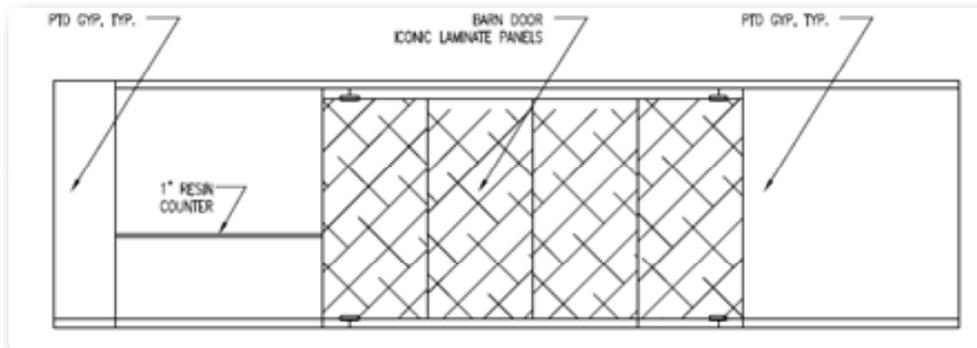
EAST ELEVATION OF LOUNGE

MBA student lounge

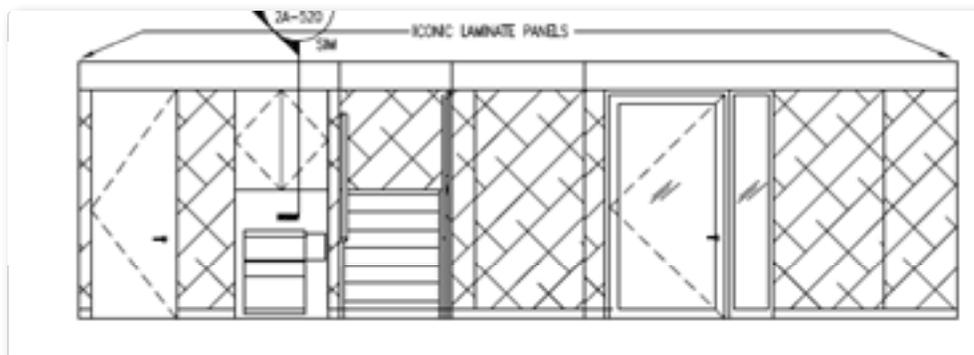
EXISTING LIGHTING CONDITIONS

The lighting systems in the student lounge consist of only fluorescent and LED sources. The 28W T5 fluorescent strips are arranged in a playful manner that defines the relaxing and fun atmosphere of the student lounge. At the center of the lounge, 15 compact fluorescent downlights are positioned right above the desks. There are also compact fluorescent wallwashers aimed at the center walls. In the pantry area, there are under cabinet linear fluorescent fitted under the cabinets.

Lighting Fixture Schedule for MBA Student Lounge								
Type	Manufacture	Fixture Description	Watt	Quantity	Lamp	Ballast	Mounting	Voltage
L4	Edison Price Lighting	Recessed 32W compact fluorescent downlight	36	20	CF32DT/E/IN/830 Osram Sylvania	electronic ballast	-	277
L4A	Edison Price Lighting	Recessed 32W compact fluorescent wallwasher	36	8	CF32DT/E/IN/830 Osram Sylvania	electronic ballast	-	277
L30	Alkco	Linear fluorescent under cabinet light	33	8'	FP28/830/ECO Osram Sylvania	electronic ballast	Mount under cabinet	277
L33	Selux	Recessed lensed fluorescent slot light	33	38	FP28/830/ECO Osram Sylvania	electronic ballast	-	277
L40	iO Lighting	Cove mounted asymmetric warm white LED	7.6w/ft	26'	Warm white (3000K) LED iO Lighting	driver	-	277

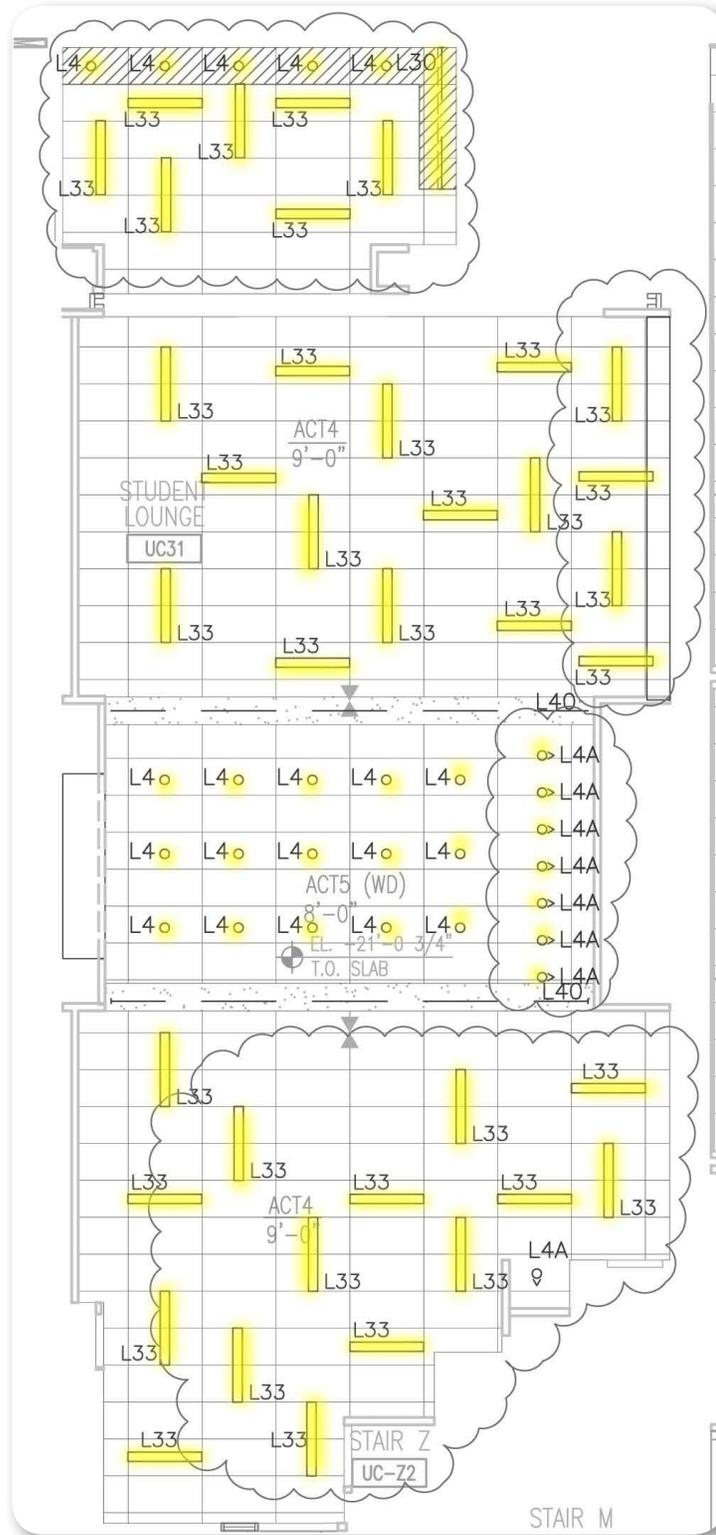


NORTH ELEVATION OF LOUNGE



SOUTH ELEVATION OF LOUNGE

MBA student lounge



LIGHTING PLAN FOR MBA STUDENT LOUNGE

MBA student lounge

CONSIDERATIONS & CRITERIA

APPEARANCE OF SPACE AND LUMINAIRES

- The MBA student lounge is intended to create a relaxing atmosphere. The objective is to provide a comfortable space in which students can study, relax, and have a good time. The student lounge has a lounge area, tables, counter for computers, and pantry area.
- Luminaires in the lounge can be artistic and decorative to emphasize the playfulness and relaxing atmosphere. Non-uniform lighting can be addressed to help create visual interest in the space. The challenge is to attract people into a space with no daylight or windows.

COLOR APPEARANCE (AND COLOR CONTRAST)

- The MBA student lounge has various wall panels and finishes to provide a variety of texture and patterns to light. The color appearance for the lounge has both cool and warm surfaces to light.
- The student lounge can have different lighting conditions tailored to different needs (study mode, entertainment/party/special events mode). For the entertainment mode, the lighting can be different colors modes adjusted to the ideal scenery and atmosphere.

DAYLIGHT INTEGRATION AND CONTROL

- Daylight integration will not be a concern since there are no windows in the student lounge.

DIRECT GLARE

- Direct glare should be a concern to avoid any discomfort in the lounge area. Luminaires need to be positioned to avoid glare.

LIGHT DISTRIBUTION SURFACES

- The idea is to light the space to make it relaxing and interesting so that students will be attracted to the space. To create an interesting atmosphere, wood and iconic panel can be lighted to highlight the rich patterns to bring out the architectural features of the lounge. Lighting on the wall can create a dramatic effect to make a person enjoy the space.
- Light should not fall on the flat screen to minimize the glare reflection.

MBA student lounge

CONSIDERATIONS & CRITERIA

LIGHT DISTRIBUTION ON TASK PLANE (UNIFORMITY)

- Light distribution on the tables and chairs will need to be uniform to provide a good writing/reading environment. The pantry and computer counter will also need to provide uniform light levels.

LUMINANCES OF ROOM SURFACES

- Avoid high luminance levels on television screen
- The hierarchy of the luminance levels is divided between the surfaces in which work will be done (table, pantry table, computer table) and the decorative surfaces (bamboo patterns on the wall, ceiling). The decorative surfaces should have higher luminance values so that the attention will be on the architectural features. Based on the lighting impression studies done by John Flynn, there is a tendency for people to be in remote areas of lower intensity lighting [The luminance level on the tables, lounge table, computer tables, and pantry table will have enough lighting for reading and writing].

MODELING OF FACES AND OBJECTS

- Modeling of faces and objects is not critical. The space is designed to provide a comfortable and relaxing atmosphere.

POINTS OF INTEREST

- Since the MBA student lounge is designed to give students a chance to relax and study, the points of interest to be lighted are the architectural details in the space, creating a visual interest in the space to attract people to come into the lounge.

REFLECTED GLARE

- The only concern for reflected glare would be from the three flat screens, laptops, and reading material.

SHADOWS

- Shadows should not interfere with paper task on the table.

MBA student lounge

CONSIDERATIONS & CRITERIA

SOURCE/TASK/EYE GEOMETRY

- For round study tables at the center of the student lounge, luminaires will be mounted above to provide sufficient lighting for reading/writing.

SPARKLE/DESIRABLE REFLECTED HIGHLIGHTS

- Not an issue.

SURFACES CHARACTERISTICS

- A few of the materials (ceiling [ACT-3 &ACT-4] and wall [P-1]) in the lounge have high reflectance so will help illuminate the space. The matte and satin finishes in the room provide a beautiful finish to the architecture of the space. The colors of the surfaces are white, sterling grey, metallic, bamboo brown and fossil white.

SYSTEM CONTROL AND FLEXIBILITY

- The lighting system in the student lounge can be flexible for different modes (study and entertainment/parties/special events). Occupancy sensors can be incorporated into the lighting system so energy can be saved when there is no one in the lounge.

SPECIAL CONSIDERATIONS

- None.

ILLUMINANCE (HORIZONTAL)

- [Study Mode] 30 fc –(IESNA Handbook: Reading Handwriting tasks- #2 pencil and softer leads)

ILLUMINANCE (VERTICAL)

- None

ENERGY

- 1.2 W/sq ft – (IESNA Standard 90.1-2007: Lounge/Recreation)

MBA student lounge

CRITIQUE AND EVALUATE - AGI ANALYSIS

The MBA student lounge is a large space with a variety of different activities (table, television, lounge area, pantry). The computer analysis needs to see if there is enough light levels for the different activities. At the center of the lounge, where all the tables are, the average illuminance value is 40 fc. That is more than the required 30 fc in the IESNA handbook. For the pantry counter in the back, the compact fluorescent and under cabinet luminaire provides an average of 45 fc and 25 fc respectively for the two pantry counters. For the wall lit with wallwashers, the average illuminance level is 15-25 fc. The light levels in the rest of the space range from 20-25 fc on the ground level. The lighting levels do meet the IESNA standard.

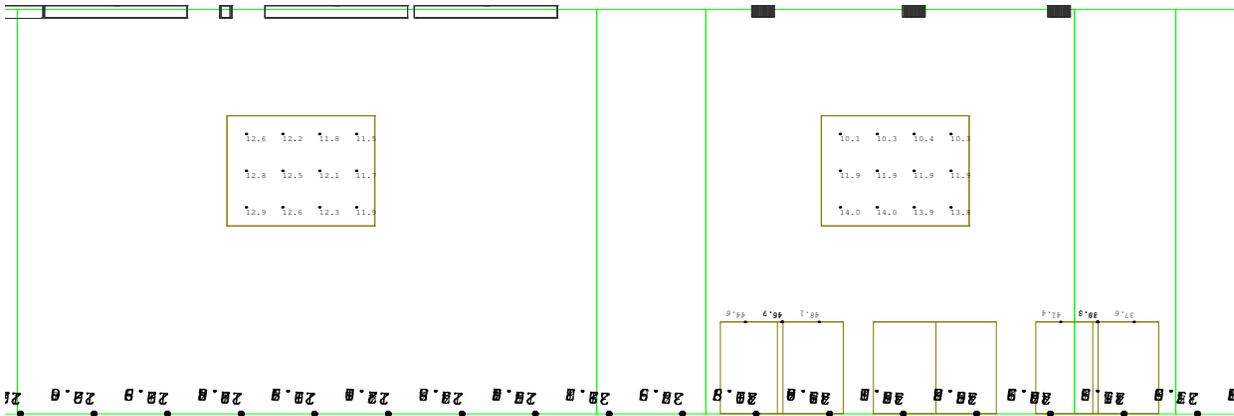
For the lighting in the lounge, the lighting luminaire seems to be too generic. The challenge of this space is to attract people into the basement level of a building. In order to do that, I believe the lighting needs to be interesting and fun, thus help the space to become comfortable. The lounge can introduce decorative luminaires that would bring visual interest to the space. The architecture features in the space are also spectacular, the bamboo texture and patterns can be lit to bring the attention of the architecture style. I believe the best idea to light the student lounge would be to focus on a theme that accompanies well with the architecture of the space. The theme would need to be creative to give students a reason to come down into the basement level of a building to study, work, relax, and hangout.

Luminaire Schedule				
Symbol	Qty	Label	Lumens	LLF
	20	L4	2064	0.742
	7	L4A	2400	0.742
	2	L30	2418	0.777
	38	L33	2610	0.777

Calculation Summary							
Label	CalcType	Units	Avg	Max	Min	Avg/Min	Max/Min
MBA Student Lounge_Floor	Illuminance	Fc	24.12	47.0	8.9	2.71	5.28
Pantry Table_Top	Illuminance	Fc	30.82	32.5	29.4	1.05	1.11
Table_1_Top	Illuminance	Fc	39.44	41.4	37.6	1.05	1.10
Table_Top	Illuminance	Fc	46.40	48.1	44.6	1.04	1.08
flat screen monitor_2_Side_2	Illuminance	Fc	10.88	11.3	10.5	1.04	1.08
Workstation counter_Top	Illuminance	Fc	19.33	21.6	13.7	1.41	1.58
Pantry Counter_Top_1	Illuminance	Fc	36.56	51.3	13.9	2.63	3.69
flat screen monitor_Side_2	Illuminance	Fc	12.03	14.0	10.1	1.19	1.39
flat screen monitor_1_Side_2	Illuminance	Fc	12.24	12.9	11.5	1.06	1.12

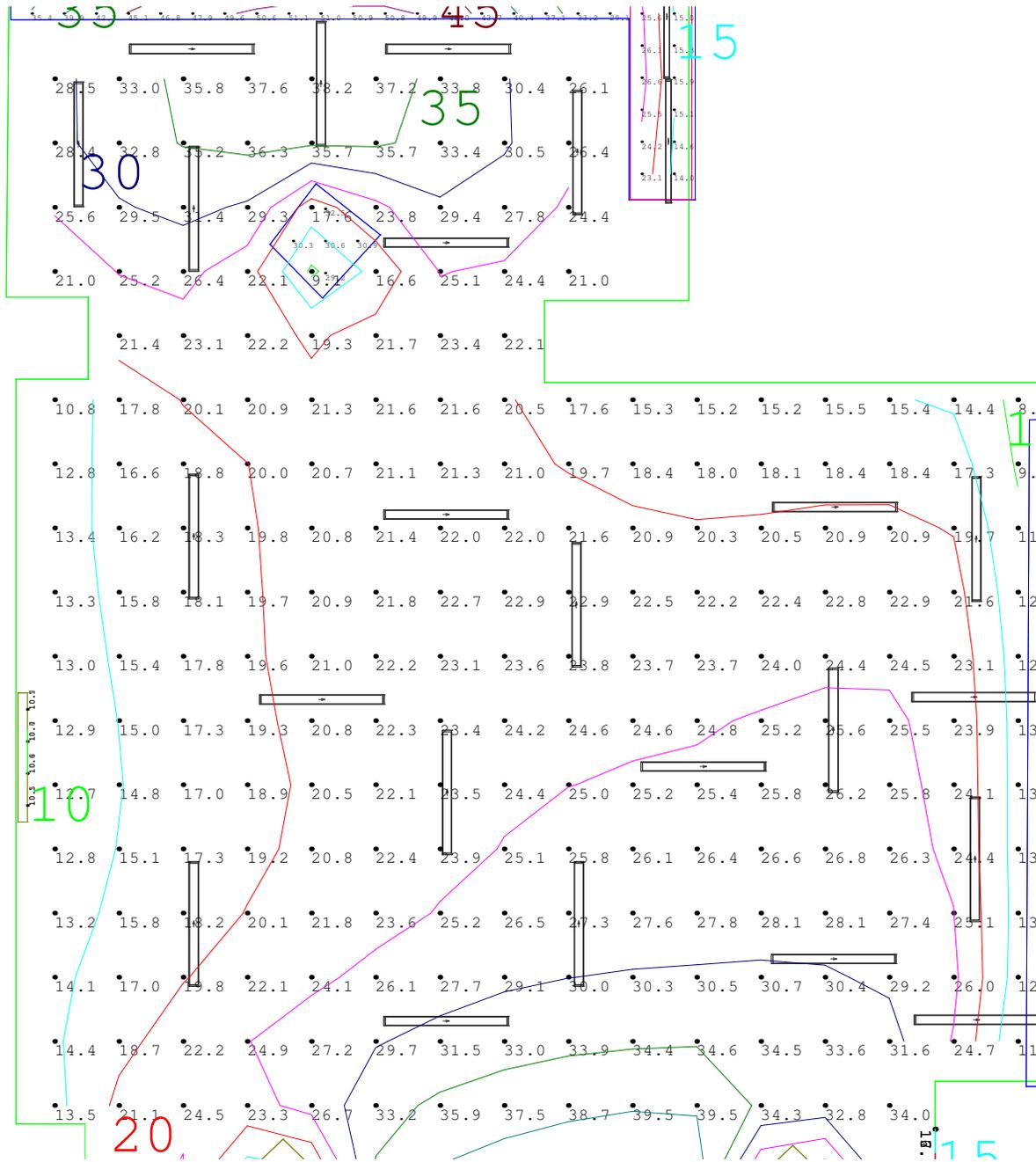
MBA student lounge

Light Loss Factor for MBA Student Lounge [U31]									
	Maintenance Category	Dirt Conditions	Cleaning Period	LDD	Initial Lumens	Mean Lumens	LLD	BF	Total LLF
L4	IV	Clean	12 months	0.88	2400	2064	0.86	0.98	0.74
L4A	IV	Clean	12 months	0.88	2400	2064	0.86	0.98	0.74
L30	IV	Clean	12 months	0.88	2600	2418	0.93	0.95	0.78
L33	V	Clean	12 months	0.88	2600	2418	0.93	0.95	0.78
L40	VI	Clean	12 months	0.88	NA	NA	1	1	0.88



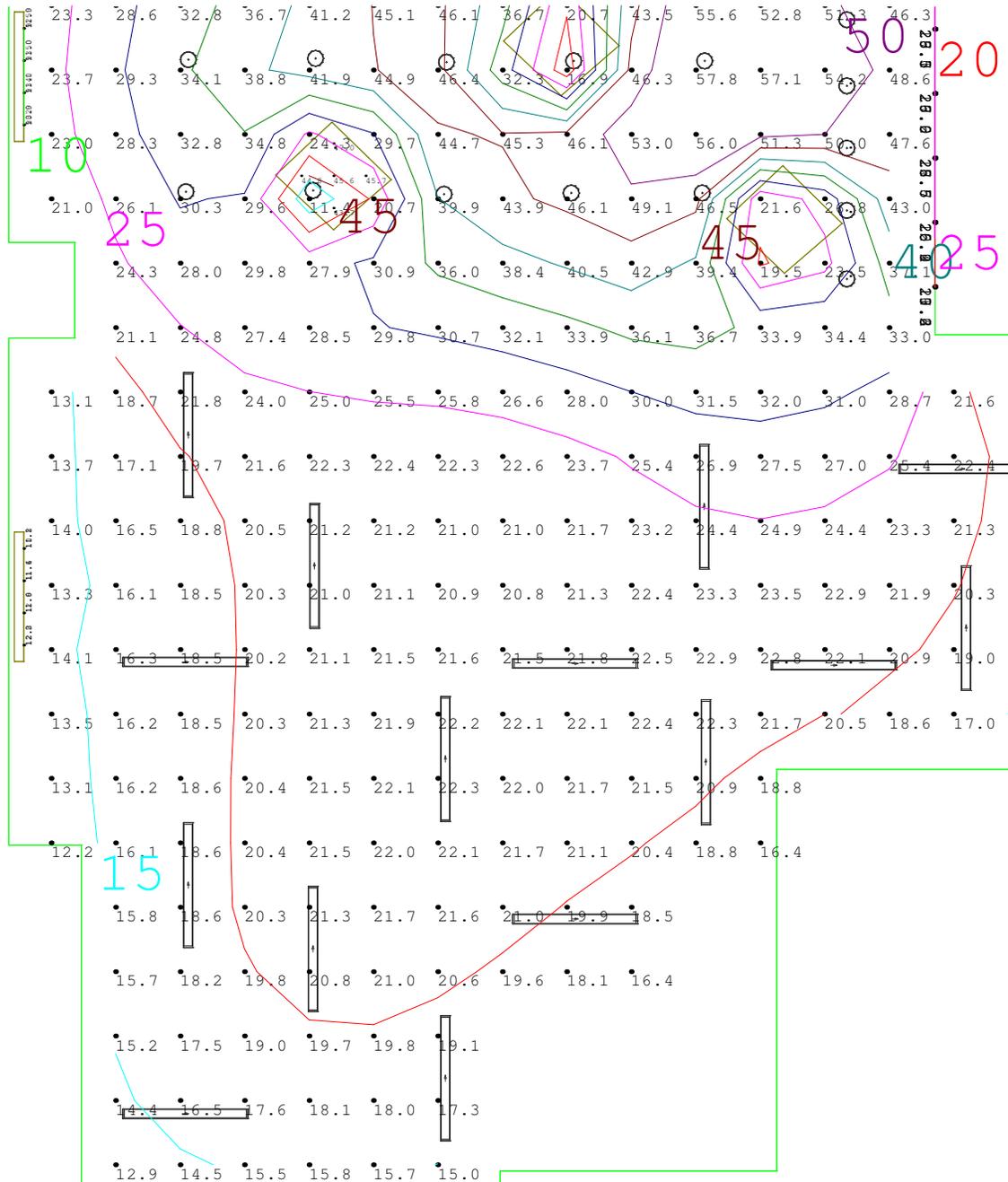
CALCULATION OF LIGHT LEVELS ON TELEVISION SCREEN
(VERTICAL SURFACE)

MBA student lounge



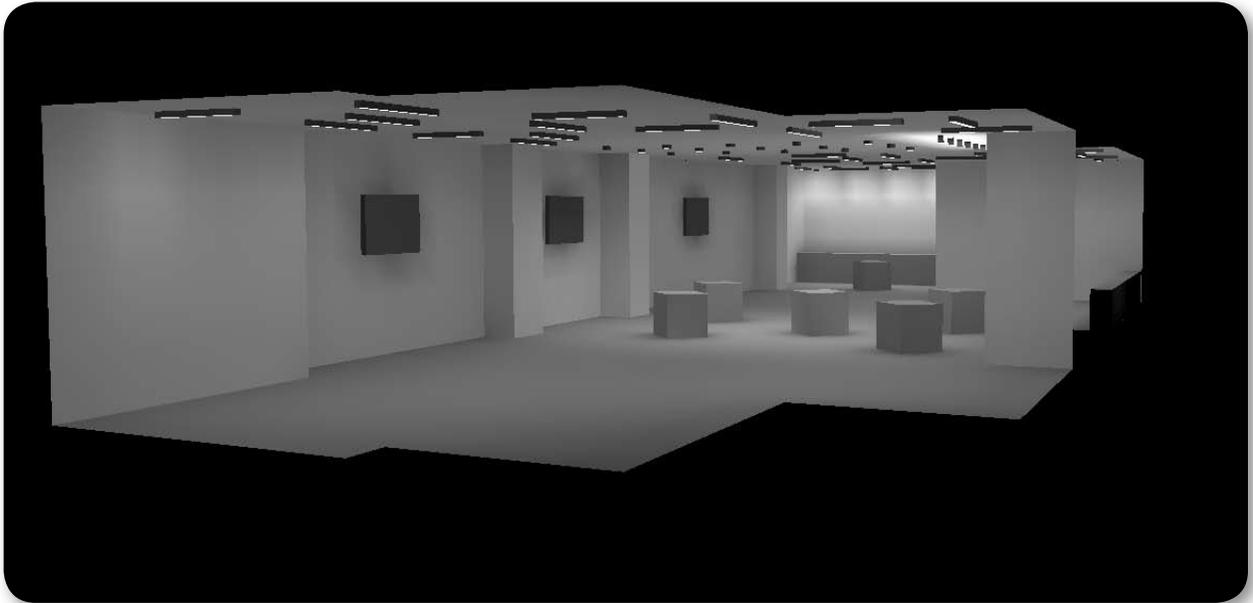
CALCULATION OF UPPER PORTION OF STUDENT LOUNGE
(HORIZONTAL SURFACE)

MBA student lounge

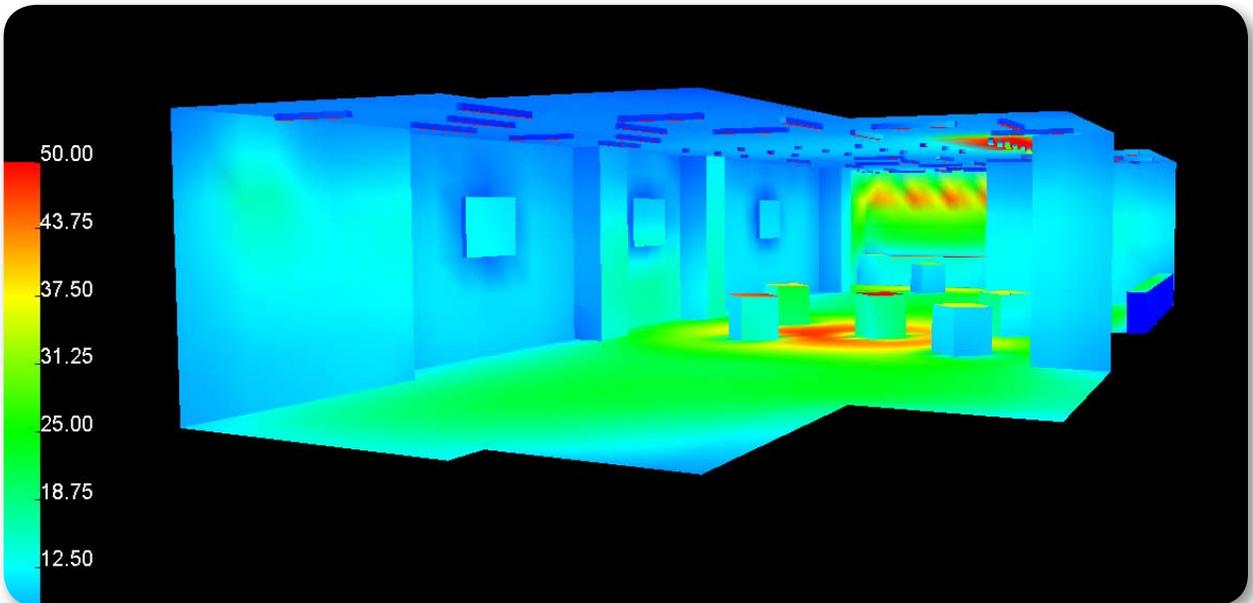


CALCULATION OF BOTTOM PORTION OF STUDENT LOUNGE
(HORIZONTAL SURFACE)

MBA student lounge

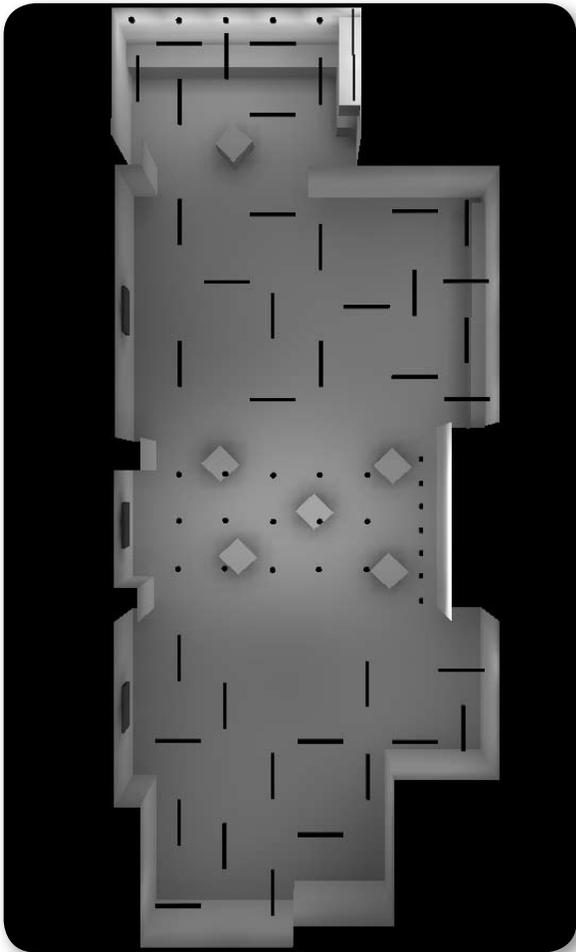


LOUNGE RENDERING FROM SOUTH EAST

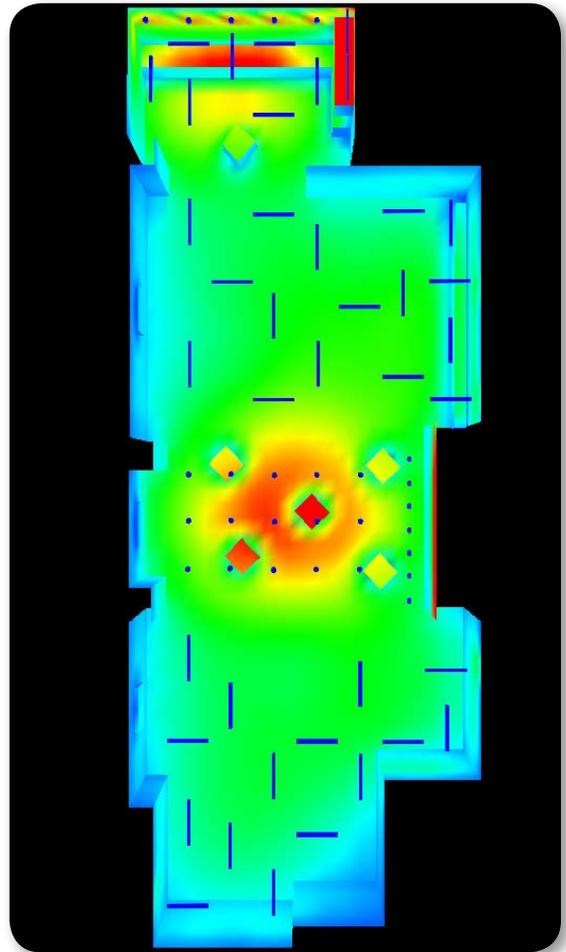


PSEUDO RENDERING FROM SOUTH EAST

MBA student lounge

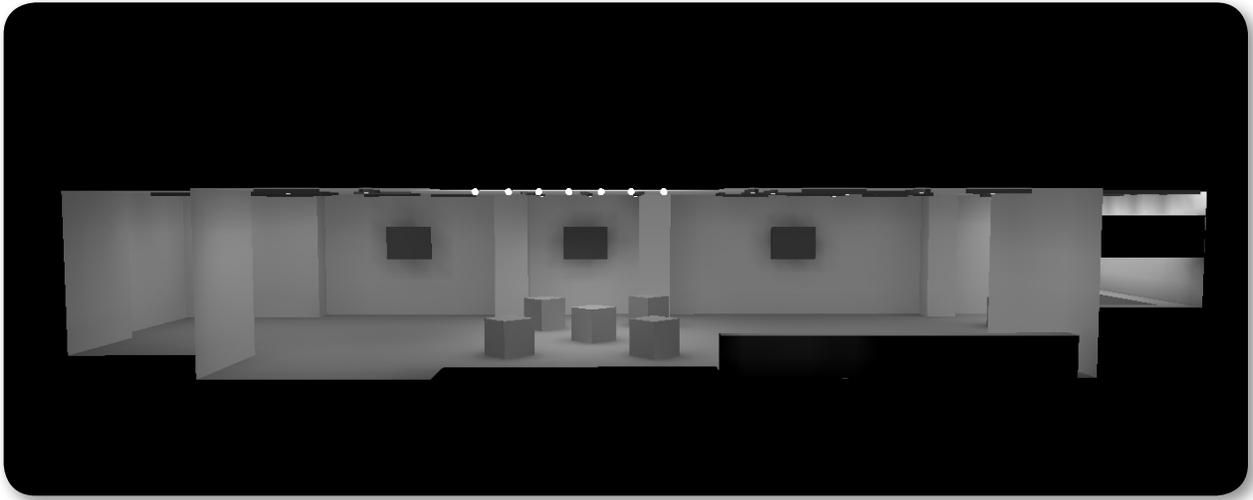


LOUNGE RENDERING FROM TOP VIEW

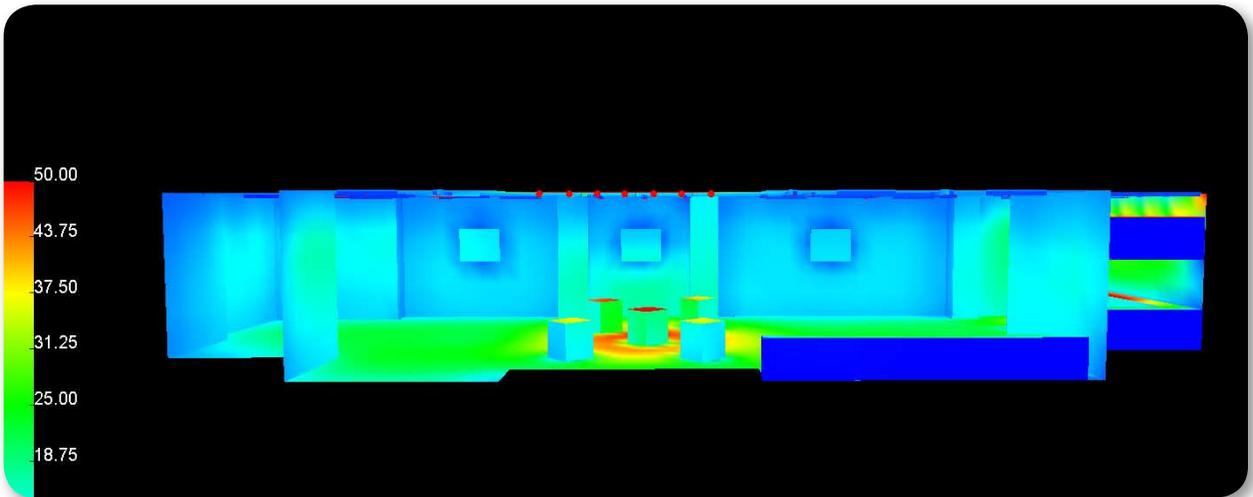


PSEUDO RENDERING FROM TOP VIEW

MBA student lounge



LOUNGE RENDERING FROM EAST



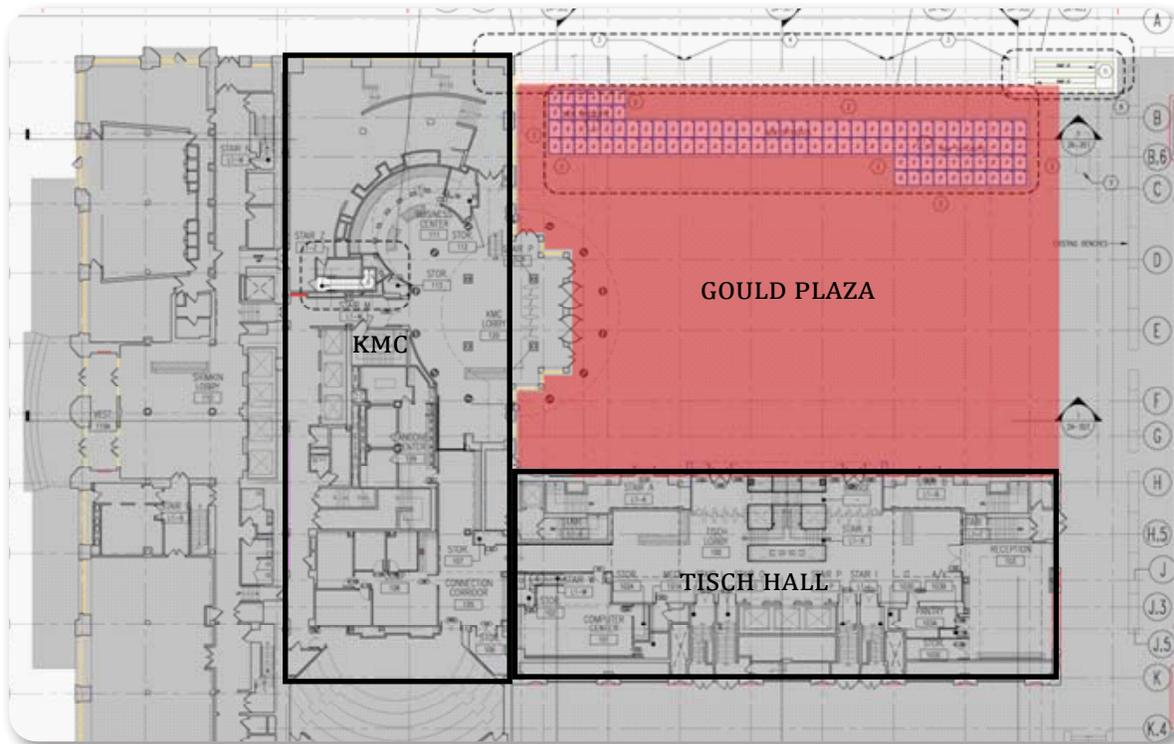
PSEUDO RENDERING FROM EAST

Gould Plaza

Gould Plaza is located between Kaufman Management Center, Tisch Hall, and Warren Weaver. The plaza is between west 4th street and west 3rd street. The plaza is diagonally across from Washington Square Park, where a lot of the New York University buildings are located. Gould Plaza is right at the heart of the Stern School of Business. The Gould Plaza is a meeting point in which crowds of students gather. The plaza is 20,000 sq ft.



GOULD PLAZA, SURROUNDED BY KMC, TISCH HALL, AND WARREN WEAVER



GOULD PLAZA PLAN

Gould Plaza

MATERIALS IN GOULD PLAZA

Finishes for Gould Plaza			
Type	Description	Finish	Reflectance (assumed)
-	Concrete Floor	Grey	0.2
-	Patteremed Stones on floor	Red	0.2
-	Skylight	Glass	0.1



GLASS



RED STONE



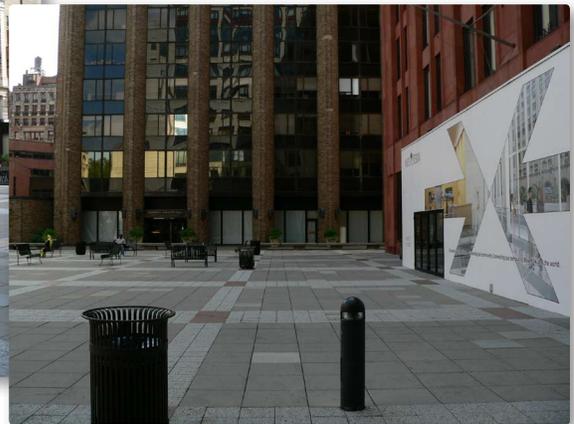
CONCRETE FLOOR

Gould Plaza

MATERIALS/OBJECTS IN GOULD PLAZA



ART PIECE AND NYU LOGO (NORTH WEST AND NORTH EAST OF PLAZA RESPECTIVELY)



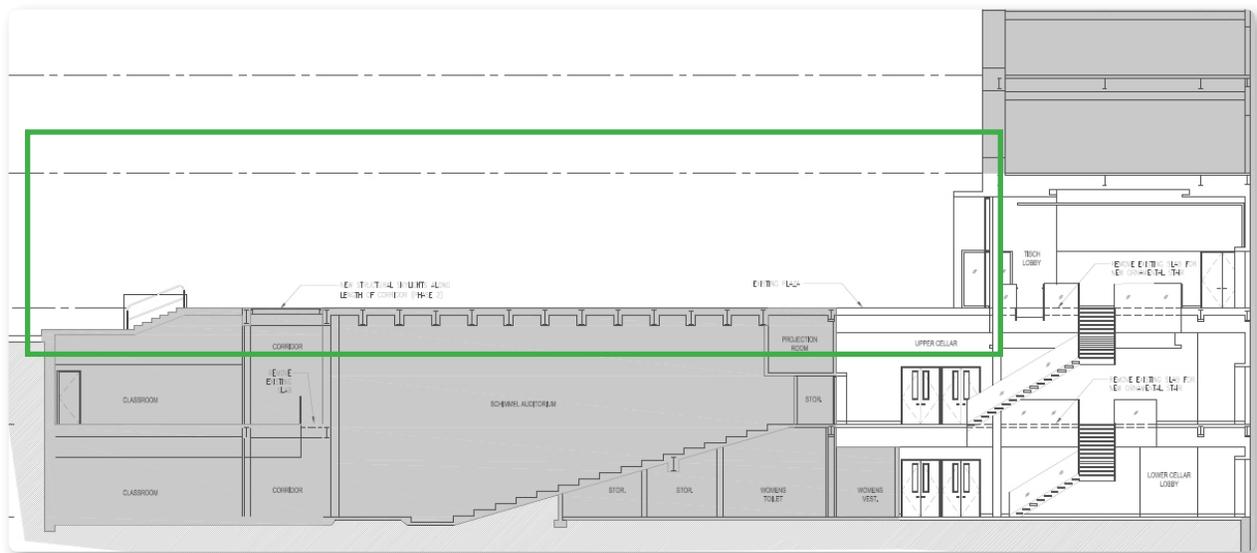
PLAZA CENTER AND TISCH ENTRANCE

Gould Plaza

EXISTING LIGHTING CONDITIONS

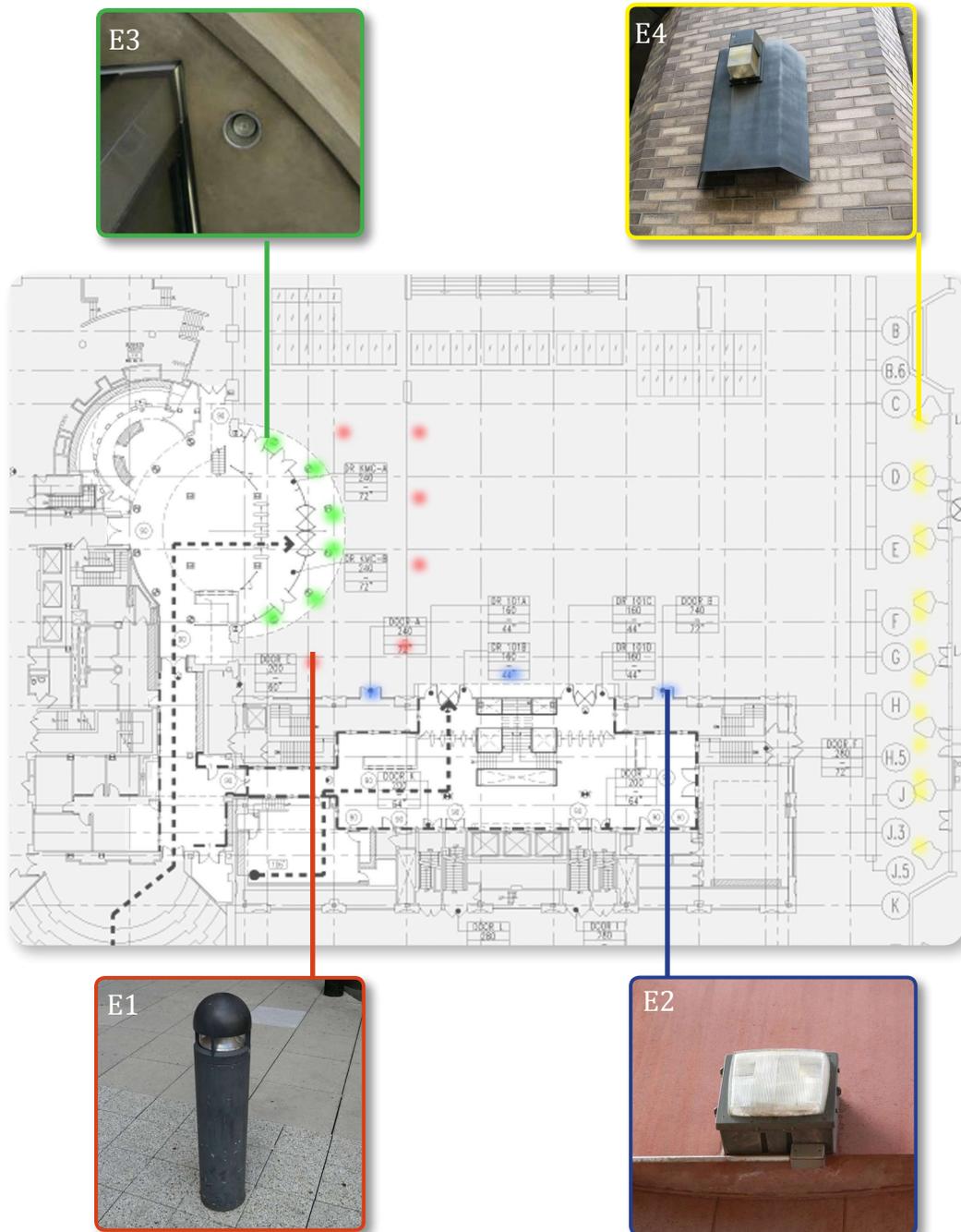
The lighting systems in Gould Plaza consist of five 100W exterior bollards that are positioned around KMC. Within the exterior of KMC, there are metal halide downlights and uplights lighting the columns and exterior façade of KMC. In front of Tisch hall, there are 3 high pressure sodium lamps positioned right above the entrance. On the side of Weaver Hall, 14 wall mounted high pressure sodium lamps make up the lighting of the exterior façade.

Lighting Fixture Schedule for Gould Plaza					
Type	Manufacture	Fixture Description	Watt	Quantity	Lamp
E1	-	Exterior bollards	100W	6	MVR100/U/MED/
E2	-	Exterior high pressure sodium	100W (assumed)	3	-
E3	-	Metal halide downlight	100W (assumed)	6	-
E4	-	Wall mounted high pressure sodium	40W (assumed)	14	-



GOULD PLAZA (IN GREEN)

Gould Plaza



LUMINAIRE KEY FOR GOULD PLAZA

Gould Plaza

CONSIDERATIONS & CRITERIA

APPEARANCE OF SPACE AND LUMINAIRES

- Located in an urban setting, Gould Plaza is an open public square owned by NYU. Surrounded by tall buildings, some of the direct sunlight is blocked to provide shade. The plaza is cozy and comfortable. The purpose of the space is used to provide a relaxing environment for students to interact.
- The space needs to introduce an impression of visual spaciousness, relaxation, and pleasantness.
- The plaza should be open and the luminaire design should not block or interrupt the usage of the space (example: lamp post should not be in the middle of the plaza).
- The current set of luminaires are not bright enough for the plaza, new lighting design of the plaza needs to bring people out to the plaza.

COLOR APPEARANCE (AND COLOR CONTRAST)

- The gray stone floor of Gould plaza, with the red cement exterior of Tisch Hall, brown bricked Warren Weaver, and gray concrete KMC define the colors of the plaza. The lighting needs to complement the colors of the plaza to make the space comfortable. NYU Concourse Project falls into the New York City Landmarks Law which is concerned with the preservation of the city's architectural, historical, and cultural heritage. The new design can be warm lighting that reflects the early 20th century New York City cultural heritage.

DAYLIGHT INTEGRATION AND CONTROL

- Daylight integration will not be a concern for this space. Automatic sensors lights will turn on the lights in the evening.

DIRECT GLARE

- Direct glare should be a concern if people will sit and hangout in the plaza at night. The concern will be the viewing angle of the source. The source would need to be hidden.

LIGHT DISTRIBUTION SURFACES

- Light distribution on the plaza needs to be uniform so that the boundary of the space can be seen and defined. The uniform lighting will also help make people feel space to be in the plaza at night.

Gould Plaza

CONSIDERATIONS & CRITERIA

LIGHT DISTRIBUTION ON TASK PLANE (UNIFORMITY)

- The lighting distribution is at the ground level of the plaza. People need to see where they are walking at night.

LUMINANCES OF ROOM SURFACES

- The luminance level on the floor needs to be bright enough for people to see where they walk.

MODELING OF FACES AND OBJECTS

- The modeling of objects is important so that people can see where they walk. The facial rendering should also be a critical concern for safety reasons. The NYU Stern School Logo and the art work by the stairs in the plaza will need to be lit.

POINTS OF INTEREST

- Points of interest to be lighted: NYU Stern School of Business logo. Art Statue located at the south west corner of the plaza. The door to the building of Tisch Hall and KMC hall needs to be lighted.

REFLECTED GLARE

- Reflected glare is not a concern in this space.

SHADOWS

- Shadow is not a concern in this space.

SOURCE/TASK/EYE GEOMETRY

- Light source will need to distribute light all around to make the plaza bright. Need to avoid direct glare from the source when a person looks at the luminaire.

SPARKLE/DESIRABLE REFLECTED HIGHLIGHTS

- There can be sparkle on the art work located at the south west corner of the plaza to help create visual interest.

Gould Plaza

CONSIDERATIONS & CRITERIA

SURFACES CHARACTERISTICS

- Stone floor of Gould Plaza with pattern course strips.
- Concrete columns located at KMC.
- Red cement of Tisch Hall.
- Brown bricks of Warren Weaver.
- Highly reflective glass of Tisch, Warren Weaver, and KMC.

SYSTEM CONTROL AND FLEXIBILITY

- The lighting system will need to automatically dim, turn on and off during sunrise and sunset.

SPECIAL CONSIDERATIONS

- There are some in-grade daylight windows near the stairs leading to Gould Plaza. Luminaire cannot be mounted over the daylight windows. The luminaire should also not be in a position to block daylight into the upper course.

ILLUMINANCE (HORIZONTAL)

- 5 fc –(IESNA Handbook: Outdoor – Parks, Plazas, and Pedestrian Malls)

ILLUMINANCE (VERTICAL)

- 3 fc –(IESNA Handbook: Outdoor – Parks, Plazas, and Pedestrian Malls)

ENERGY

- 0.2 W/sq ft – (IESNA Standard 90.1-2007: Plaza)
- 30W/linear foot of door width - (IESNA Standard 90.1-2007: Building Entrance and Exit)
- 1.25 W/sq ft - (IESNA Standard 90.1-2007: Canopies and Overhangs)
- 0.2 W/sq ft for each illuminated wall or surface or 5.0 W/linear foot for each illuminated wall or surface length - (IESNA Standard 90.1-2007: Building facade)

Gould Plaza

DAYLIGHTING OBSERVATION

There is a good amount of daylight that comes into Gould Hall. The sun comes from the east side of the plaza in the morning and in the afternoon, the sun is behind Tisch Hall. Most of the daylight going into Gould Plaza and Tisch Hall has been blocked by Warren Weaver. A further daylight study can give me a better understanding of how much daylight goes into the plaza. There is also a possibility that sun does penetrate into Tisch Hall during the summer when the sun is at the highest point. For Gould Plaza, photosensors can be considered for daylight harvesting to power and light up luminaires on the outside.



10 AM - 09.20.2008



12 PM - 09.20.2008



3 PM - 09.20.2008



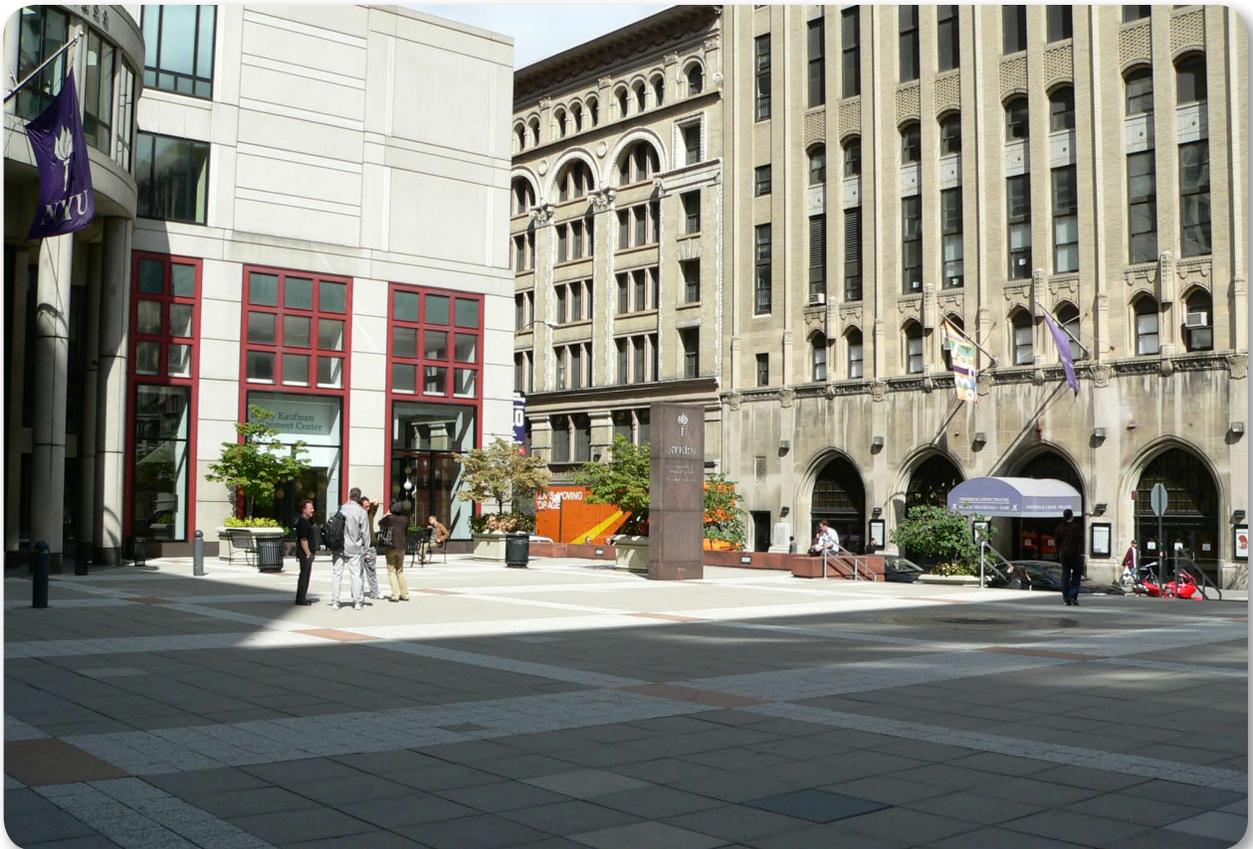
6 PM - 09.20.2008

Gould Plaza

CRITIQUE AND EVALUATE - PHOTO AND TRIP

After a trip to New York City to analyze Gould Plaza, I discovered there are only a few luminaires in the plaza. Most of the light source is high pressure sodium lamps. With the amount of luminaires in the plaza (total of 3 wall mounted high pressure sodium lamps and 6 exterior bollards all centered around KMC), there is not enough light for the 20,000 sq. ft plaza. At the plaza, I had a chance to interview a few NYU students. Based on the responses, I was told that in the nighttime, Gould Plaza is not very active. The lighting condition is poor and the plaza is dark. Students only pass through the plaza in the night to enter into Tisch Hall or KMC to study.

I believe that Gould Plaza should be lit at night to help foster an environment in which people can interact. The lighting in Gould Plaza should relate to NYU and the cultural heritage of New York.



Special thanks to Perkins+Will for the drawings, computer files, and help with questions.

Special thanks to New York University Stern School of Business for allowing me to do the research on the building

Special thanks to AE faculty for the help on the tech report.