Gould Plaza Background Information

Gould Plaza is surrounded by Kaufman Management Center, Tisch Hall, and Warren Weaver. Located between West 4th Street and West 3rd Street, the plaza is diagonally across from Washington Square Park, where many of the New York University buildings are located. Gould Plaza is at the heart of the Stern School of Business campus. The 27,360 sq.ft plaza is a meeting point in which crowds of students gather.
## Materials for Gould Plaza

### Finishes for Gould Plaza

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
<th>Finish</th>
<th>Reflectance (assumed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Floor</td>
<td>Concrete Floor</td>
<td>Grey</td>
<td>0.2</td>
</tr>
<tr>
<td>Floor</td>
<td>Patteremed Stones on floor</td>
<td>Red</td>
<td>0.2</td>
</tr>
<tr>
<td>Skylight</td>
<td>Skylight</td>
<td>Glass</td>
<td>0.1</td>
</tr>
<tr>
<td>Artwork</td>
<td>Sculpture</td>
<td>Metal</td>
<td>0.8</td>
</tr>
<tr>
<td>Ramp</td>
<td>Stone</td>
<td>Brown</td>
<td>0.4</td>
</tr>
</tbody>
</table>

![Glass](#)  ![Red Stone](#)  ![Concrete Floor](#)
Considerations & Criteria

Appearance of Space and Luminaires
• Located in an urban setting, Gould Plaza is an open public square owned by NYU. The surrounding tall buildings provide shade from direct sunlight.
• The plaza is a cozy and relaxing environment for students to interact.
• The space needs to introduce an impression of relaxation, and pleasantness.
• The plaza lighting should be integrated with the architecture of the space.

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.

Light Distribution surfaces
• Light distribution near the building entrances and walkways will needs to be uniform to provide a well defined walkways.

Light distribution on Task Plane (Uniformity)
• The lighting distribution is at the ground level of the plaza. It is vital to provide enough light levels for people walking at night.

Luminance of Room Surfaces
• Maintain light levels as uniform as possible for main walkways.

Modeling of Faces and Objects
• The facial rendering should also be a critical concern for safety reasons. The art work on the plaza and the ramp will need to be lit.

Points of Interest
• Points of interest to be lighted: Art Statue located at the south west corner of the plaza. Entrances to Tisch Hall, KMC, and Weaver Hall will needs to be lit.

Reflected Glare
• Reflected glare is not a concern in this space.
Considerations & Criteria

Shadows
• Shadow is not a concern in this space.

Source/Task/Eye Geometry
• Lighting the perimeter of the plaza will help define the boundaries of the plaza.

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
• None.

Special Considerations
• In-grade daylight windows near the stairs leading to Gould Plaza.

Illuminance (Horizontal)
• 1 fc on walkways - (IESNA Handbook - Figure 22-10. Recommended Average Maintained Illuminance Level for Pedestrian Ways)
• 0.5 fc away from main walkways - (IESNA Handbook - Figure 22-21. Recommended Average Maintained Illuminance Level for Parking Lots - Enhanced Security)

Illuminance (Vertical)
• 0.5 f on vertical surface for walkways
(IESNA Handbook - Figure 22-10. Recommended Average Maintained Illuminance Level for Pedestrian Ways)

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 Lighting Design

The lighting design of Gould focuses on providing adequate light levels for safety to walk at night. A combination of metal halide, LED, fluorescent, and halogen sources will be used to light the plaza.

Tisch Hall, Weaver Plaza, and KMC Entrance
Luminaires will be mounted on the exterior facade of buildings to provide sufficient light levels for walking. Metal halide lamps will be used since the light levels are higher compared to fluorescent sources and the color rendering index is better compared to halogen sources.

Plaza Center
An NYU logo will be created with frosted glass with LEDs underneath to light it. LEDs were chosen to help with maintenance issues. Since the LEDs underneath the glass logo cannot provide enough vertical illumination, light poles are proposed to provide vertical illumination for safety.

Outdoor Plaza Bench Area
Step lights and halogen sources will be used. The halogen sources will help make the trees look more warm and pleasant. The step lights offer illumination on the ground for people to see where they walk.

Stairs to West 4th Street
Step lights and LEDs mounted under the railing of the stairs provide illumination on the steps.
*Larger lighting plan can be found in Appendix : L101
## Lighting Fixture Schedule for Gould Plaza

<table>
<thead>
<tr>
<th>Image</th>
<th>Type</th>
<th>Manufacture</th>
<th>Fixture Description</th>
<th>Watt</th>
<th>Quantity</th>
<th>Lamp</th>
<th>Ballast</th>
<th>Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>I.9</td>
<td>Bega Step light</td>
<td>Recessed wall luminaire</td>
<td>16</td>
<td>30</td>
<td>CF13DD/835/ECO</td>
<td>Advance</td>
<td>H-1B13-TP-BLS</td>
<td>2287P</td>
</tr>
<tr>
<td>I.10</td>
<td>Luxrail LED handrail</td>
<td>2.1</td>
<td>48</td>
<td>LED</td>
<td>Driver</td>
<td>06-CAA-1-WM-NR-45-34HO-80-277V</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I.11</td>
<td>Bega Recessed wall luminaire</td>
<td>Recessed wall luminaire with unshielded light</td>
<td>27</td>
<td>22</td>
<td>CF26DT/E/IN/835/ECO Osram Sylvania</td>
<td>Advance RCF-2S26-H1-LD-QS</td>
<td>2850P</td>
<td></td>
</tr>
<tr>
<td>I.12</td>
<td>Erco Tesi In-ground luminaire</td>
<td>Lens wallwasher for metal halide lamps</td>
<td>45</td>
<td>7</td>
<td>MC39TC/U/G8.5/830PB Osram Sylvania</td>
<td>Advance RMH-39-K</td>
<td>33715.023</td>
<td></td>
</tr>
<tr>
<td>I.13</td>
<td>Louis Poulsen Nimbus LED</td>
<td>Inground accent and marker illumination</td>
<td>9</td>
<td>6</td>
<td>LED</td>
<td>Driver</td>
<td>NIM-PWR-9 LED White - 277V - ST STEEL ANTI-SLIP STRAIGHT - W/SLEEVE</td>
<td></td>
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<tr>
<td>I.15</td>
<td>B.K Lighting McKinley Series (PAR20)</td>
<td>Adjustable outdoor lighting system</td>
<td>50</td>
<td>18</td>
<td>50PAR20/HAL/NFL30 Osram Sylvania</td>
<td>-</td>
<td>-</td>
<td></td>
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<tr>
<td>I.16</td>
<td>Erco Cylinder Façade luminaire</td>
<td>Direct/indirect lighting for metal halide lamps</td>
<td>26</td>
<td>21</td>
<td>MC20T6/U/G8.5/830/PB</td>
<td>Advance RMH-20-K</td>
<td>85026.023</td>
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</tr>
<tr>
<td>I.1B</td>
<td>Kurt Versen Downlight</td>
<td>Two reflector optical system for wide distribution</td>
<td>52</td>
<td>12</td>
<td>CF32DT/E/IN/835/ECO Osram Sylvania</td>
<td>Advance ICF-2S42-M2-LD@230</td>
<td>P949</td>
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<tr>
<td>I.18</td>
<td>iLight Technologies Plexineon White 1X Series</td>
<td>Accent lighting solution with LED technology designed to be used straight or bent</td>
<td>100W per 32 ft</td>
<td>104</td>
<td>LED</td>
<td>Driver</td>
<td>T-24-W5-S.S.104/8SC 00</td>
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</table>

*Light Loss Factor for Outdoor is based on Light Loss Factor from the Roadway Lighting in the IESNA Handbook (Figure 22-25)
### Energy Calculation for Gould Plaza

<table>
<thead>
<tr>
<th>Type</th>
<th>Manufacturer</th>
<th>Watt</th>
<th>Quantity</th>
<th>Power</th>
<th>Energy Allowed</th>
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<tbody>
<tr>
<td>L9</td>
<td>Bega Step light</td>
<td>16</td>
<td>30</td>
<td>480</td>
<td>27360 sq.ft x 0.2 W/sq.ft</td>
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<td>L10</td>
<td>Luxrail</td>
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<td>100.8</td>
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<td>L11</td>
<td>Bega Recessed wall luminaire</td>
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<tr>
<td>L12</td>
<td>Eros Tests Inc.</td>
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<td>315</td>
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<tr>
<td>L13</td>
<td>Louis Poulsen Nimbus LED</td>
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<td>6</td>
<td>54</td>
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<tr>
<td>L14</td>
<td>Schot Ritorno Round Symmetrical</td>
<td>80</td>
<td>8</td>
<td>640</td>
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<tr>
<td>L15</td>
<td>B-K Lighting McKinley Series (PAR20)</td>
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<td>18</td>
<td>900</td>
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<tr>
<td>L16</td>
<td>Eros Cylinder Facade luminaire</td>
<td>26</td>
<td>21</td>
<td>546</td>
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<tr>
<td>L17</td>
<td>Kurt Versen Downlight</td>
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<td>12</td>
<td>624</td>
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<tr>
<td>L18</td>
<td>iLight Technologies Flexitron White IX Series</td>
<td>100W per 32 ft</td>
<td>104</td>
<td>325</td>
<td></td>
</tr>
</tbody>
</table>

**Consumed Power**: 4578.8 W  
**Power Density**: 8.37 W/sq.ft

Red - Designed  
Blue - IESNA recommended

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### Energy

The lighting power density analysis was performed with the space by space method recommended by ASHRAE Standard 90.1-2007. The energy code limits the plaza to 0.2 W/sq.ft. The total energy consumed in the plaza is about 4580W, well below the 5472 W limitation.

### Control

The luminaires in the plaza will be controlled from Tisch Hall. The lighting will be connected to the Lutron Grafik Eye system. All lights in the Gould Plaza zone will either be on/off.
Gould Plaza

Perspective Rendering

Pseudo Rendering
Gould Plaza

Pseudo Rendering

Pseudo Rendering
Perspective Rendering

Pseudo Rendering
Calculations

Gould Plaza
Calculations
Calculations
Calculations

<p>| | | | | | | |</p>
<table>
<thead>
<tr>
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<td>3.6</td>
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</tr>
<tr>
<td>5.0</td>
<td>3.4</td>
<td>1.9</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Diagram of Gould Plaza with measurements indicated.
Calculations
Gould Plaza Design Summary

The lighting design of Gould focuses on providing adequate light levels for safety to walk at night. The design philosophy is to reinforce the light levels at the main pathways and entrances. A custom lighted NYU logo is also created at the heart of the plaza to reinforce the NYU school spirit. The lighting design consists of metal halide downlights mounted on the outer walls of Tisch and Weaver Hall. A number of light poles are also proposed at the heart of the plaza to provide illumination for the benches and the walkway to west 4th street. At the steps on the north side of the plaza, step lights and light rails are proposed. Next to the stair steps recessed wall luminaires are used to light the ramp. At the center of the plaza, outdoor bench areas are proposed with landscape lighting.

The lighting provides a guide to help direct people at night. The average illumination in the plaza meets the recommended 1 fc. Even at areas with light levels lower than 1 fc, the illumination levels meet the 0.5 fc suggestion for outdoor parking - enhance security.

The boundaries of the plaza are lit so that people can see where they will walk to. The lighting also creates an interesting walking experience with the proposed NYU logo and lit art piece at the corner of the plaza. The lighting design consumes 4580 W, well below the 5472 W limitation.

<table>
<thead>
<tr>
<th>Label</th>
<th>Calculation Type</th>
<th>Units</th>
<th>Avg</th>
<th>Max</th>
<th>Min</th>
<th>Avg/Min</th>
<th>Max/Min</th>
</tr>
</thead>
<tbody>
<tr>
<td>Artwork</td>
<td>Illuminance</td>
<td>Fc</td>
<td>5.44</td>
<td>11.40</td>
<td>0.20</td>
<td>27.20</td>
<td>39.33</td>
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<td>stairs step 5</td>
<td>Illuminance</td>
<td>Fc</td>
<td>1.19</td>
<td>11.20</td>
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<td>NA</td>
<td>NA</td>
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<td>stairs step 3</td>
<td>Illuminance</td>
<td>Fc</td>
<td>1.83</td>
<td>16.30</td>
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<td>18.30</td>
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<td>stairs step 1</td>
<td>Illuminance</td>
<td>Fc</td>
<td>1.39</td>
<td>19.20</td>
<td>0.00</td>
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<td>NA</td>
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<tr>
<td>Weaver Hall Entrance</td>
<td>Illuminance</td>
<td>Fc</td>
<td>1.40</td>
<td>4.50</td>
<td>0.20</td>
<td>7.00</td>
<td>22.50</td>
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<tr>
<td>Tisch Hall entrance</td>
<td>Illuminance</td>
<td>Fc</td>
<td>1.74</td>
<td>8.30</td>
<td>0.00</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>backpath (between Tisch &amp; Weaver)</td>
<td>Illuminance</td>
<td>Fc</td>
<td>1.18</td>
<td>3.30</td>
<td>0.30</td>
<td>4.90</td>
<td>NA</td>
</tr>
</tbody>
</table>
Tisch Hall Background Information

Tisch Hall is located at the south center of Gould Plaza. Situated 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 connect to the other buildings. The new design will help introduce daylight into the space.
# Materials for Tisch Lobby

## Finishes for Tisch Lobby

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
<th>Finish</th>
<th>Reflectance (assumed)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Wall</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ST-2</td>
<td>Batek Diamante Limestone</td>
<td>Grey</td>
<td>0.5</td>
</tr>
<tr>
<td></td>
<td>(smooth)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>WD-2</td>
<td>Bamboo Patina panel</td>
<td>Light Brown</td>
<td>0.3</td>
</tr>
<tr>
<td>P-1</td>
<td>White finish</td>
<td>Eggshell</td>
<td>0.9</td>
</tr>
<tr>
<td><strong>Wall Base Finish</strong></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>ST-2</td>
<td>Batek Diamante Limestone</td>
<td>Grey</td>
<td>0.5</td>
</tr>
<tr>
<td>CT-5B</td>
<td>Gateway Ceramic Flooring</td>
<td>Sterling Grey</td>
<td>0.3</td>
</tr>
<tr>
<td><strong>Flooring</strong></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>CT-5A</td>
<td>Gateway Ceramic Flooring</td>
<td>Sterling Grey</td>
<td>0.3</td>
</tr>
<tr>
<td><strong>Ceiling</strong></td>
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<tr>
<td>ST-2</td>
<td>Batek Diamante Limestone</td>
<td>Grey</td>
<td>0.5</td>
</tr>
<tr>
<td>ACT-5</td>
<td>Bamboo Patina panel</td>
<td>Light Brown</td>
<td>0.9</td>
</tr>
<tr>
<td>P-1</td>
<td>White finish</td>
<td>Eggshell</td>
<td>0.9</td>
</tr>
</tbody>
</table>

---

Tisch Lobby (in red)
Considerations & Criteria

Appearance of Space and Luminaires
• Tisch Lobby intends to create a spacious and pleasant environment for people traveling to the various compartments of the building. The appearance of the lobby consists of both cool (metal and stone) and warm surfaces (bamboo).
• The luminaire for this space would need to incorporate well with the modern look of the lobby.
• The luminaires can also highlight the aesthetics of the architectural space (wall, cove, metal overhang).

Color Appearance (and color contrast)
• The space is filled with both cool and warm surfaces with high reflectivity. The wall finishes are grey limestone and bamboo panels. The wall base finishes are limestone and ceramic grey. The same limestone is also used on the floor. The ceiling consist of white finish panel boards.

Daylight integration and control
• The large glass panels will provide daylight into the space. Daylighting integration and controls can be utilized to help conserve energy. Automatic photoelectric controls as well as manual dimming can be integrated into the design.
• Building is north east facing with 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.
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
• 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 hallways. The lighting brightness level can help define various traffic pattern.

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 not to fall. An important object to be lit is the security desk. The architectural glass bridge at the front of the entrance can also be lighted to showcase the modern aspect of the space.

Points of Interest
• Points of interest to be lighted are the security desk, 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.

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.
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 smooth 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 will 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
- Daylight integration system with designed lighting system.

Illuminance (Horizontal)
- 10 fc – (IESNA Handbook: hotel lobby general lighting) on floor
- 30 fc on security desk – (IESNA Handbook: Reading Handwriting tasks- #2 pencil and softer leads)

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 Lighting Design

The light design consist a mixture of downlights, recessed fluorescents, LED cove system, and pendants. The main issue is to solve the traffic congestion in the lobby. Proposed ‘light guides’ (recessed linear fluorescents, lighted glass box, and custom pendants) will be used to solve this problem.

Security Desk
At the security desk, suspended decorative pendants provides illumination and visual interest. The use of the pendants also helps bring down the scale of the lobby to the security desk (in large spaces, occupants can often feel out of place due to the high ceiling height).

Elevator Waiting Area
Above the elevator waiting area, recessed LEDs are used to light the school logo. General illumination at the elevator waiting area will be provided by the downlights and recessed ‘light guides’ on the sides of the elevator doors.

Stairs to Upper and Lower Concourse
The decorative custom pendant and downlights will provide illumination to the stairs.

Hallways and Doors to Stairs
A combination of linear recessed fluorescents and glass boxes will be used as ‘light guides’.
Custom Luminaire

The custom luminaire consists of curved metal rings with support metal pieces on the inner corners of the luminaire. A number of thin metal rods are placed at various levels of the luminaire to help support the acrylic blocks. A 24W T5 linear strip is inserted at the center of the luminaire, with a plastic housing over it.

The meaning behind this luminaire symbolizes the building blocks of knowledge. The mixture of all the knowledge is funneled. The funneling represents education being provided to the students.
*Larger lighting plan can be found in Appendix I: L201, L202
# Lighting Fixture Schedule for Tisch Lobby

<table>
<thead>
<tr>
<th>Image</th>
<th>Type</th>
<th>Manufacture</th>
<th>Fixture Description</th>
<th>Watt</th>
<th>Quantity</th>
<th>Lamp</th>
<th>Ballast</th>
<th>Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>L4</td>
<td>Selux M60</td>
<td>Recessed linear fluorescent</td>
<td>39</td>
<td>14</td>
<td>FP28/835/ECO Osram Sylvania</td>
<td>Lutron Eco-10</td>
<td>M6R1-1T5-MA-PM-004-SV-277</td>
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<tr>
<td>L5A</td>
<td>Kurt Versen H8632</td>
<td>Recessed compact fluorescent downlight</td>
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<td>34</td>
<td>CF32DT/E/IN/835/ECO Osram Sylvania</td>
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<td>H8632</td>
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<tr>
<td>L5B</td>
<td>Kurt Versen H8653</td>
<td>Recessed compact fluorescent wallwasher</td>
<td>36</td>
<td>4</td>
<td>CF32DT/E/IN/835/ECO Osram Sylvania</td>
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<td>H8653</td>
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<tr>
<td>CUSTOM</td>
<td>L6 Custom Luminaires</td>
<td>Decorative Pendant</td>
<td>27</td>
<td>3</td>
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<tr>
<td>L7</td>
<td>Electrix Adjustable Linear Fluorescent</td>
<td>Linear Cove System</td>
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<tr>
<td>L8</td>
<td>Schmitz Public</td>
<td>Surface compact fluorescent sconce</td>
<td>46</td>
<td>4</td>
<td>CF42DT/E/IN/835/ECO Osram Sylvania</td>
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<tr>
<td>L19</td>
<td>Color Kinetics eW Cove Powercore</td>
<td>Linear cove System</td>
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<td>19</td>
<td>LED</td>
<td>Driver</td>
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</table>

# Light Loss Factor for Tisch Hall

<table>
<thead>
<tr>
<th>Type</th>
<th>Maintenance Category</th>
<th>Dirt Conditions</th>
<th>Cleaning Period</th>
<th>LDD</th>
<th>Initial Lumens</th>
<th>Mean Lumens</th>
<th>LLF</th>
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<tbody>
<tr>
<td>L4</td>
<td>IV</td>
<td>Clean</td>
<td>12 months</td>
<td>0.88</td>
<td>2900</td>
<td>2697</td>
<td>0.93</td>
</tr>
<tr>
<td>L5A</td>
<td>IV</td>
<td>Clean</td>
<td>12 months</td>
<td>0.88</td>
<td>2400</td>
<td>2064</td>
<td>0.86</td>
</tr>
<tr>
<td>L5B</td>
<td>IV</td>
<td>Clean</td>
<td>12 months</td>
<td>0.88</td>
<td>2400</td>
<td>2064</td>
<td>0.86</td>
</tr>
<tr>
<td>L6</td>
<td>I</td>
<td>Clean</td>
<td>12 months</td>
<td>0.94</td>
<td>1750</td>
<td>1627</td>
<td>0.93</td>
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<tr>
<td>L7</td>
<td>VI</td>
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<td>12 months</td>
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<td>2900</td>
<td>2697</td>
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</tr>
<tr>
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<tr>
<td>L19</td>
<td>VI</td>
<td>Clean</td>
<td>12 months</td>
<td>0.86</td>
<td>135</td>
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<td>-</td>
</tr>
</tbody>
</table>
Tisch Lobby Control

All luminaires will be connected to the Lutron Grafik Eye 3000 System. The Grafik Eye system will use a daylighting sensor to dim the lightings according to the daylight condition in the space.

<table>
<thead>
<tr>
<th>Image</th>
<th>Manufacture</th>
<th>Product Description</th>
<th>Model</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>GRAFIK Eye 3000 Series</td>
<td>Automatic Preset scenes in response to ambient daylight.</td>
<td>GRX-DACPI-MW-PS-WH</td>
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</tbody>
</table>

Energy

The lighting power density analysis was performed with the space by space method recommended by ASHRAE Standard 90.1-2007. The energy code limits the plaza to 1.3 W/sq.ft. The total energy consumed in the plaza is about 3705W, well below the 4596 W limitation.

<table>
<thead>
<tr>
<th>Type</th>
<th>Manufacture</th>
<th>Watt</th>
<th>Quantity</th>
<th>Watt</th>
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</tbody>
</table>

Consumed Power: 3704.5 | 4595.5

Power Density: 1.05 | 1.3

Red - Designed
Blue - IESNA recommended
Perspective Rendering at security gate

Pseudo Rendering
Perspective Rendering at front

Pseudo Rendering
Tisch Lobby

Perspective Rendering

Elevator Lobby
<table>
<thead>
<tr>
<th>7.3</th>
<th>9.3</th>
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<td>13.4</td>
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Tisch Lobby
**Tisch Hall Design Summary**

The lighting of design Tisch Lobby strives to simplify the traffic congestion in Tisch Hall. Tisch Lobby is connected to the various compartments in the building (two hallways, stairs to the lower concourses, elevator lobby, four sets of stairway, and the entrance/exit). The design solution uses light to create guides in which people can be directed to their destination. The lighting guides consist of wall recessed linear fluorescents, custom pendants, and lighting glass blocks. The average illuminance level on the floor is 15 fc, over the recommended 10 fc. With a brighter floor, the physiological feel of the space will be perceived to be larger, cleaner, and safer.

For the hallways and elevator lobby, recessed linear fluorescents are mounted on the sides of the entrance to help guide the occupants. As for the four sets of stairs, above each stairway a glass block is backlit. The glass block consists of student faces mounted on the frosted glass that can create a point of visual interest. In terms of the stairs leading down to the lower concourse, custom pendants are created to make occupants aware of the space below. The rest of the lighting design enhances the overall architecture of the space. The pendants over the security desk are suspended to help bring the physiological feel of the large space down. Fluorescent wallwashers and downlights are used to provide uniform illumination in the space.

The lighting design meets the design criteria. For the illuminance level of the ground floor, there is an average illuminance value of 14.67 fc, which meets the 15 fc design criteria (IESNA suggests 10 fc). The stairs area are also able to provide between 11-12 fc, again over the 10 fc requirement. Overall, the lighting design meets the ASHRAE/IESNA Standard 90.1. The lighting design consumes 3705 watts which is below the maximum of 4596 watts.

<table>
<thead>
<tr>
<th>Label</th>
<th>Calculation Type</th>
<th>Units</th>
<th>Avg</th>
<th>Max</th>
<th>Min</th>
<th>Avg/Min</th>
<th>Max/Min</th>
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<tr>
<td>Lobby ground floor</td>
<td>Illuminance</td>
<td>Fc</td>
<td>14.67</td>
<td>22.4</td>
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<td>Illuminance</td>
<td>Fc</td>
<td>10.96</td>
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<td>Security Desk</td>
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<td>33.9</td>
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<td>NYU Logo</td>
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<td>Fc</td>
<td>31.06</td>
<td>36.2</td>
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<td>8.3</td>
<td>9.8</td>
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<td>1.12</td>
<td>1.32</td>
</tr>
<tr>
<td>Stairs platform</td>
<td>Illuminance</td>
<td>Fc</td>
<td>12.54</td>
<td>15.3</td>
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</table>
Classroom Background Information

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.

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.
## Materials for Tisch Lobby

### Finishes for Classroom

<table>
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<tr>
<th>Type</th>
<th>Description</th>
<th>Finish</th>
<th>Reflectance (assumed)</th>
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<td>Wall Base Finish</td>
<td>Rubber Thermoplastic</td>
<td>Bright Orange</td>
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</tr>
<tr>
<td>Wall Base Finish</td>
<td>Rubber Thermoplastic</td>
<td>Bright Orange</td>
<td>0.5</td>
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<tr>
<td>Furniture</td>
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<td>Red Leather</td>
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</tbody>
</table>

### Classroom West Elevation

![Classroom West Elevation Diagram]
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.
- 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.

Light Distribution surfaces
- Light distribution on the tables will need to be uniform to provide an pleasant learning enviroment 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.
Considerations & Criteria

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.

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.
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.

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

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
Design Objective

Going along with the overall lighting design concept of the New York University Concourse Project, the lighting system for the classroom will strive to enhance the learning experience of students at New York University. Lighting will be addressed on the surfaces that are the most important in the space. In the case for the classroom, the important surfaces are the white boards at the front of the room and the student desks.

Lighting Design

The lighting design consist a mixture of downlights, wallwashers, and recessed linear fluorescents. The downlights are used to provide general ambient lighting and specifically, sufficient light levels on the student desks. For the wallwashers at the front of the classroom, they are used to light up the white board/projection screen. The cove lighting on the sides of the room help graze the wall to make the classroom feel spacious.
*Larger lighting plan can be found in Appendix: L301

Lighting Reflected Ceiling Plan
General Classroom

### Lighting Fixture Schedule for General Classroom

<table>
<thead>
<tr>
<th>Image</th>
<th>Type</th>
<th>Manufacture</th>
<th>Fixture Description</th>
<th>Watt</th>
<th>Quantity</th>
<th>Lamp</th>
<th>Ballast</th>
<th>Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>L1A</td>
<td></td>
<td>Kurt Versen</td>
<td>Recessed compact fluorescent wallwasher</td>
<td>36</td>
<td>27</td>
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<td>Advance IDL-2826-M5-BS</td>
<td>P921</td>
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### Control Schedule for General Classroom

<table>
<thead>
<tr>
<th>Image</th>
<th>Manufacture</th>
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<th>Model</th>
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<tr>
<td></td>
<td>GRAFIK Eye</td>
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### Light Loss Factor for General Classroom

<table>
<thead>
<tr>
<th>Type</th>
<th>Maintenance Category</th>
<th>Dirt Conditions</th>
<th>Cleaning Period</th>
<th>LDD</th>
<th>Initial Lumens</th>
<th>Mean Lumens</th>
<th>LLD</th>
<th>BF</th>
<th>Total LLF</th>
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<tr>
<td>1.1</td>
<td>IV</td>
<td>Clean</td>
<td>12 months</td>
<td>0.88</td>
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<td>0.93</td>
<td>1</td>
<td>0.82</td>
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<tr>
<td>0.88</td>
<td>IV</td>
<td>Clean</td>
<td>12 months</td>
<td>0.88</td>
<td>2900</td>
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<td>0.88</td>
<td>2900</td>
<td>2697</td>
<td>0.93</td>
<td>1</td>
<td>0.82</td>
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</tbody>
</table>
Energy

The lighting power density analysis was performed with the space by space method recommended by ASHRAE Standard 90.1-2007. The energy code limits the plaza to 1.4 W/sq.ft. The total energy consumed in the plaza is about 1914W, right under the 1946 W limitation.

<table>
<thead>
<tr>
<th>Type</th>
<th>Manufacture</th>
<th>Watt</th>
<th>Quantity</th>
<th>Power</th>
<th>Energy Allowed</th>
</tr>
</thead>
<tbody>
<tr>
<td>L1A</td>
<td>Kurt Versen P921</td>
<td>36</td>
<td>27</td>
<td>972</td>
<td>1390 sq. ft x 1.4 wt/sq. ft</td>
</tr>
<tr>
<td>L2A</td>
<td>Selux M100</td>
<td>39</td>
<td>7</td>
<td>273</td>
<td></td>
</tr>
<tr>
<td>L2B</td>
<td>Selux M100 Super Recessed</td>
<td>31</td>
<td>3</td>
<td>93</td>
<td></td>
</tr>
<tr>
<td>L3</td>
<td>Litecontrol Wall/Slot-2000</td>
<td>36</td>
<td>16</td>
<td>576</td>
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**Energy Calculation for General Classroom**

<table>
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<tr>
<th>Type</th>
<th>Manufacture</th>
<th>Watt</th>
<th>Quantity</th>
<th>Power</th>
<th>Energy Allowed</th>
</tr>
</thead>
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<tr>
<td>L1A</td>
<td>Kurt Versen P921</td>
<td>36</td>
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<td></td>
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<tr>
<td>L3</td>
<td>Litecontrol Wall/Slot-2000</td>
<td>36</td>
<td>16</td>
<td>576</td>
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</tbody>
</table>

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**Consumed Power**

<table>
<thead>
<tr>
<th></th>
<th>1914</th>
<th>1946</th>
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</thead>
</table>

**Power Density**

<table>
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<tr>
<th></th>
<th>1.38</th>
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</thead>
</table>

Red - Designed  
Blue - IESNA recommended
Classroom Control Modes

The luminaires in the classroom will be connected to the Lutron Grafik Eye 3000 System. A total of two preset light modes will be used: general mode and presentation mode. During the presentation mode, the downlights will be divided into three different zones and dim accordingly. The main control unit will be at the front of the classroom. Additional wall stations will be located at the entrance to the classroom.

General Mode

No Dimming for any of the luminaires in the space.

Presentation Mode

- 20% Dimming
- 50% Dimming
- 70% Dimming
# General Classroom

## Classroom - General Mode

<table>
<thead>
<tr>
<th>Label</th>
<th>Calculation Type</th>
<th>Units</th>
<th>Avg</th>
<th>Max</th>
<th>Min</th>
<th>Avg/Min</th>
<th>Max/Min</th>
</tr>
</thead>
<tbody>
<tr>
<td>White Board 5</td>
<td>Illuminance</td>
<td>Fc</td>
<td>26.93</td>
<td>30.10</td>
<td>24.20</td>
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<td>Projection Screen</td>
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<tr>
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<td>Fc</td>
<td>16.52</td>
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<tr>
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<td>Illuminance</td>
<td>Fc</td>
<td>13.12</td>
<td>16.60</td>
<td>1.00</td>
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<tr>
<td>3 ft away from board</td>
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<td>Fc</td>
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</tbody>
</table>

*Calculation Summary: Classroom: General Mode*

- Front of room, white board and presentation screen
General Classroom

Classroom - General Mode

- Student desk, row 3 and 4
- Student desk, row 1 and 2
- Student desk, row 3 and 4
Classroom - General Mode

student desk, center row 2 and 3
General Classroom

Classroom - General Mode

student desk, center row 2 and 3
Classroom - General Mode

plan, pseudo rendering

perspective, pseudo rendering
Classroom - General Mode
General Classroom

Classroom - Presentation Mode

<table>
<thead>
<tr>
<th>Label</th>
<th>Calculation Type</th>
<th>Units</th>
<th>Avg</th>
<th>Max</th>
<th>Min</th>
<th>Avg/Min</th>
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<tr>
<td>White Board 5</td>
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<td>1 ft away from board</td>
<td>Illuminance</td>
<td>Fc</td>
<td>1.32</td>
<td>1.60</td>
<td>1.00</td>
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<td>3 ft away from board</td>
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Front of room, white board and presentation screen
General Classroom

Classroom - Presentation Mode

Student desk, center front two rows
Classroom - Presentation Mode

student desk, center back two rows
General Classroom

Classroom - Presentation Mode

plan, pseudo rendering

perspective, pseudo rendering
Classroom - Design Summary

Overall, the lighting system for the classroom meets the design purpose of the classroom. The two lighting modes are able to provide a flexible lighting system to help enhance the learning experience.

For the general lecture mode lighting, the average illuminance level on the desks range from 27 fc to 45 fc, the lighting level does meet the suggested 30 fc by the IESNA handbook. Furthermore, an average of 26 fc is measured on the white board at the front of the room, which is also sufficient for viewing.

In terms of the presentation mode, an average of 3 fc is measured across the projection screens, which is less than the suggested 5 fc requirement from the IESNA DG-17. The table desk maintains an average of 10-17 fc for sufficient light levels to write in the dark.

The lighting system for the classroom is able to address the design criteria and meets the standards of the IESNA Handbook. The lighting design meets the ASHRAE Standard 90.1 2007. A total of 1914W was used, which is under the allowed 1946W.
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.
# Materials for MBA Student Lounge

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
<th>Finish</th>
<th>Reflectance (assumed)</th>
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<td>Wall</td>
<td>P-1 Eggshell Finish</td>
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<tr>
<td></td>
<td>WD-3 Bamboo Patina panel</td>
<td>Light Brown</td>
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</tr>
<tr>
<td>Wall Base Finish</td>
<td>CT-5 Gateway Ceramic Flooring</td>
<td>Sterling Grey</td>
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<td>CT-5B Gateway Ceramic Flooring</td>
<td>Sterling Grey</td>
<td>0.5</td>
</tr>
<tr>
<td>Floor</td>
<td>CT-5 Gateway Ceramic Flooring</td>
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<td>Ceiling</td>
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<tr>
<td></td>
<td>ACT-4 Acoustical panels</td>
<td>white metal panels</td>
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</table>
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 consist a variety of wall panels and finishes.

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. Light-
  ing 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.
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 (baboo 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].

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.

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.

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

Energy
- 1.2 W/sq ft – (IESNA Standard 90.1-2007: Lounge/Recreation)
MBA Student Lounge Lighting Design

The challenge for the lighting design is to attract students down to the basement. There are no windows or skylights in the lounge. The ceiling heights in the basement are low (8ft and 9ft). The design emphasis will need to make the space feel comfortable and spacious.

Lighting the peripheral
A combination of recessed fluorescent wallwashers and LEDs are used to light the walls and cove of the ceiling. By washing the walls, the occupant will perceive the space to be larger. The lighting design also avoids suspending luminaires since the lounge is not very high.

Relaxing Atmosphere
The placement of the light boxes in zone 3 of the lounge creates a fun atmosphere in which students can play with the lighted furniture.

Reading/Writing
Provide 30 fc on the tables.
MBA Student Lounge

Note: L17 is not mounted to ceiling but moveable light cube.

Lighting Reflected Ceiling Plan

*Larger lighting plan can be found in Appendix I : L401
## Lighting Fixture Schedule for MBA Student Lounge

<table>
<thead>
<tr>
<th>Image</th>
<th>Type</th>
<th>Manufacture</th>
<th>Fixture Description</th>
<th>Watt</th>
<th>Quantity</th>
<th>Lamp</th>
<th>Ballast</th>
<th>Model</th>
</tr>
</thead>
<tbody>
<tr>
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<td>Kurt Versen</td>
<td>Downlight</td>
<td>Recessed compact fluorescent downlight</td>
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<td>5</td>
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<td>P926</td>
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<td>Selux</td>
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<td>9</td>
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<td>18</td>
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<td>Driver</td>
<td>series 1.5</td>
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## Light Loss Factor for MBA Student Lounge

<table>
<thead>
<tr>
<th>Type</th>
<th>Maintenance Category</th>
<th>Dirt Conditions</th>
<th>Cleaning Period</th>
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<th>Total LLF</th>
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<tbody>
<tr>
<td>L1C</td>
<td>IV</td>
<td>Clean</td>
<td>12 months</td>
<td>0.88</td>
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<td>2064</td>
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<td>1.05</td>
<td>0.86</td>
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<tr>
<td>L4</td>
<td>IV</td>
<td>Clean</td>
<td>12 months</td>
<td>0.88</td>
<td>2900</td>
<td>2697</td>
<td>0.92</td>
<td>1.05</td>
<td>0.86</td>
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<tr>
<td>L17</td>
<td>V</td>
<td>Clean</td>
<td>12 months</td>
<td>0.88</td>
<td>1200</td>
<td>960</td>
<td>0.80</td>
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<td>0.70</td>
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<tr>
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<td>IV</td>
<td>Clean</td>
<td>12 months</td>
<td>0.88</td>
<td>800</td>
<td>-</td>
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<td>1</td>
<td>0.88</td>
</tr>
<tr>
<td>L22</td>
<td>VI</td>
<td>Clean</td>
<td>12 months</td>
<td>0.96</td>
<td>29</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>0.96</td>
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</table>
MBA Student Lounge Controls

The control system of the student lounge will consist of 5 switches for 5 zones. No dimming is required in the space. There are no preset zones. The zones are divided as following:

Zone 1 - Cove lighting in ceiling and perimeter wallwash fluorescents
Zone 2 - Recessed fluorescents in lounge zone 1 (near the stairs)
Zone 3 - Downlights in lounge zone 2 (table area)
Zone 4 - Ceiling mount luminaires in lounge zone 3 (with computer counter)
Zone 5 - Pantry lighting

Energy

<table>
<thead>
<tr>
<th>Type</th>
<th>Manufacture</th>
<th>Watt</th>
<th>Quantity</th>
<th>Watt</th>
<th>Energy Allowed</th>
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<tbody>
<tr>
<td>L1C</td>
<td>Kurt Versen Downlight</td>
<td>36</td>
<td>5</td>
<td>180</td>
<td>2100 sq.ft x 1.2W/sq.ft</td>
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<tr>
<td>L2B</td>
<td>Selux M100 Super Recessed</td>
<td>31</td>
<td>24</td>
<td>744</td>
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<tr>
<td>L21</td>
<td>Lightolier Vetro Downlight</td>
<td>50</td>
<td>9</td>
<td>450</td>
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<tr>
<td>L22</td>
<td>io line 1.5</td>
<td>28</td>
<td>18</td>
<td>504</td>
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</table>

Consumed Power: 2178

Power Density: 1.04

Red - Designed
Blue - IESNA recommended
MBA Student Lounge

Pantry

Lounge Zone 3 (with computer counter)
MBA Student Lounge Design Summary

Overall, the lighting system for the MBA Student Lounge meets the design purpose of the classroom. The lighting design is able to make the lounge feel spacious and pleasant. By washing the walls of the lounge and recessing the luminaires, the space feels larger. The proposed light boxes helps creates a relaxing and fun atmosphere in the space. An average of 30-35 fc is provided on the desk for writing/reading purposes. The lighting design meets the ASHRAE Standard 90.1 2007. A total of 1914W was used, which is under the allowed 1946W.

<table>
<thead>
<tr>
<th>Label</th>
<th>Calculation Type</th>
<th>Units</th>
<th>Avg</th>
<th>Max</th>
<th>Min</th>
<th>Avg/Min</th>
<th>Max/Min</th>
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<tr>
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<td>Illuminance</td>
<td>Fc</td>
<td>25.67</td>
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<td>19.90</td>
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<td>28.90</td>
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