

ARCHITECTURAL LIGHTING SCHEMATICS

UTILITIES III: ARCHITECTURAL LIGHTING FINAL PLATE

PROJECT TITLE
OBRA: ORTIGAS BUILDING
FOR RECEPTION AND ARTS

DESIGNED BY
ALLARDE, JILLIAN IVAN

PROFESSOR
ARCHITECT RICHELLE REYES BARIA

ARCH 143

UTILITIES III: ARCHITECTURAL LIGHTING



01 | DESIGN CONCEPT & LIGHTING DESIGN GOALS

01 | DESIGN CONCEPT & LIGHTING DESIGN GOALS

DESIGN CONCEPT
Located at the heart of Ortigas CBD, the project aims to become the **physical, functional, and cultural centerpiece** of the area through the **merging of the core principles of urban design, sustainability, and TOD**—catalyzing establishments within its domain. Such concepts is reflected in its **curvilinear form** (mirrors of institutional and commercial nature of the building) and **integration of green space**.

PURPOSE OF THE SUBJECT SPACE
The ground floor level of the main building of this project is the focal point of this analysis. The **6-meter high space** constitutes the **lobby, reception area, and exhibit halls** of the main building.

LIGHTING DESIGN GOALS
• Maximize daylighting through installation of big windows, skylights, and proper application of building materials (dominant white interiors and reflective elements)
• Utilize artificial lighting fixtures that are **aesthetically and functionally suitable** to the character of the space

BUILDING ORIENTATION
The building facade is strategically positioned facing the north to **maximize the soft daylight from north** and **create visual hierarchy from main road's vantage point**.



02 | LIGHTING STRATEGIES



03 | ANALYSIS AND CONCLUSION

03 | ANALYSIS, RECOMMENDATION AND CONCLUSION

SPECIFICATIONS & COMPUTATIONS

<ul style="list-style-type: none"> Size: 0.5' and 11.5'x11.5' Type: LED Built-in Lumens: 3200 Watts: 24 Color Temp: 3000 (soft white) CRI: 85 	<ul style="list-style-type: none"> Size: 0.5' and Diameter 7.3' Type: LED Built-in Lumens: 2900 Watts: 14 Color Temp: 3000 (soft white) CRI: 80 	<ul style="list-style-type: none"> Size: 0.90x3.60m Type: LED Oval Suspension Lumens: 3200 Watts: 40 Color Temp: 3000 (warm white) CRI: 80
---	---	--

LUMEN METHOD (ZONAL CAVITY)

$E = 200k; A = 630qm; P = 2700lm; h = 6m; hcc = 0; hcc = 4.5m; hcc = 1.5m; RCR = 271; CCR = 0; FCR = 90$
 $Pc = 80\%; Pv = 50\%; Pf = 30\%; Pcc = 0.76; Pfc = 0.29; CU = 0.61; LLF = 0.85; LL = 2700lm$
 $N = \frac{200 (630)}{(0.61)(2700)(0.85)(0.61)} = 90 \text{ FIXTURES}$

WATT PER SQUARE METHOD

$W = \frac{200 (630)}{100} = 1,260 \text{ WATTS} ; \frac{1,260}{14} = 90$



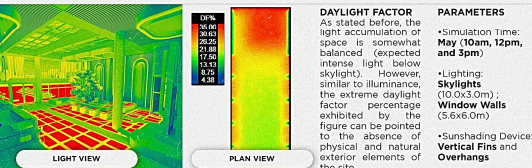
LUMINANCE

As seen above, throughout the given time, the luminance ranges from 200 to 2,500 cd/m² which is within the range of the ideal luminance level for the space. Visually, these three simulation figures show a dominant green color, which suggests a balanced spread of daylight within the structure.



ILLUMINANCE

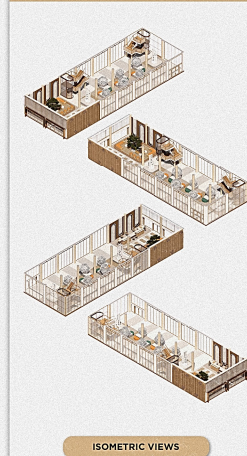
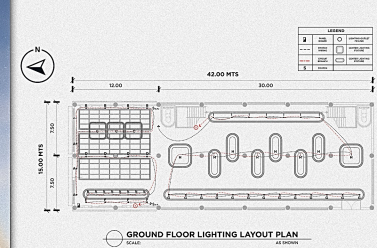
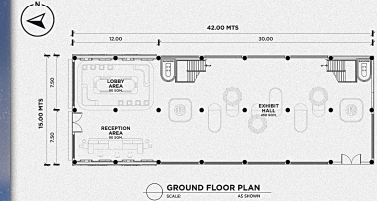
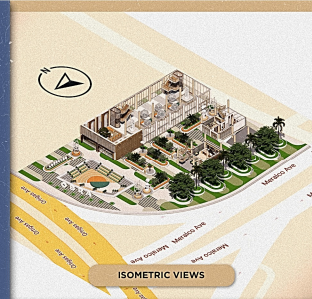
For the illuminance, the level stretches from 1,000 to 8,200 lux. This huge number might root from the absence of physical and natural barriers of site in the simulation, which should lower the light intensity.



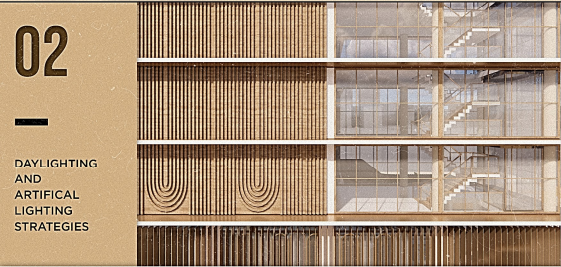
DAYLIGHT FACTOR
As stated before, the light accumulation of space is somewhat balanced (expected intense light below skylight). However, similar to illuminance, the extreme daylight factor percentage exhibited by the figure can be pointed to the absence of physical and natural exterior elements of the site.

PARAMETERS

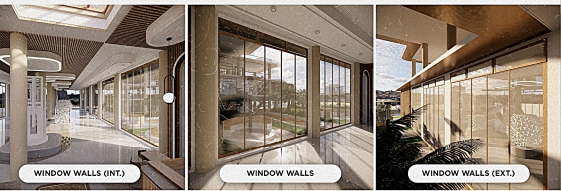
- Simulation Time: May (10am, 12pm, and 3pm)
- Lighting: Skylights (0.9x3.0m); Window Walls (5.6x6.0m)
- Sunshading Device: Vertical Fins and Overhangs



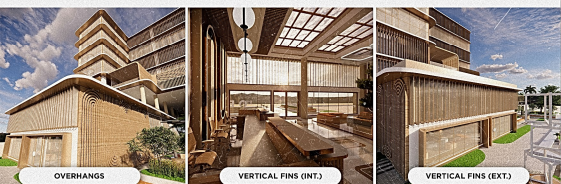
02 | DAYLIGHTING AND ARTIFICIAL LIGHTING STRATEGIES



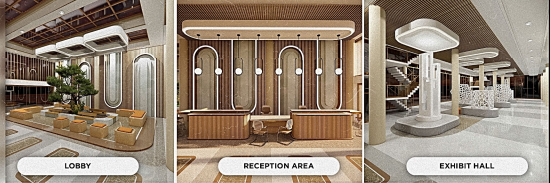
INDOOR LIGHTING: WINDOW WALLS AND INTERIOR MATERIALS
Window walls were installed at the west and east side of the area to accumulate **maximum daylighting**. Sun breakers were not added as structural and natural (vegetation) barriers are present to mitigate harsh lights from the outside. Moreover, **light-colored paints** (white and pastel) and **reflective materials** (marble and granite floor tiles) were employed to **spread out the natural light**.



INDOOR LIGHTING: OVERHANGS AND VERTICAL FINES
To control and diffuse excessive daylight, overhangs and brise soleil such as vertical fins were attached to the skin of the building—**creating soft and mellow daylight** within the space.



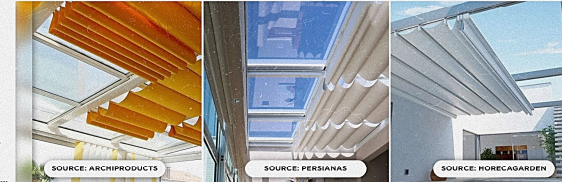
INDOOR LIGHTING: SKYLIGHTS
The addition of skylights brought **visual emphasis to the space**, as it is one of the major highlights of the project. Functionally and economically, the daylight gathered from such is **sufficing the amount of lighting the space needs and minimizing the use of artificial lighting**.



INDOOR LIGHTING: LIGHTING FIXTURES
For most of the area, **recessed ceiling lights** (pin) were utilized for **ambient lighting**. **Center lights** such as curvilinear LED lights, chandeliers, spotlights (for accent wall) were installed for **accent lighting**.



OUTDOOR LIGHTING: PARK LAMPS
Installation of park lamps was done to **illuminate the dark portions of the site**—**beautifying the night views of the park and adding security to the space**.



RECOMMENDATION FOR INDOOR SPACE: SKYLIGHT COVER
As much as the skylights provide maximum daylighting to the space, an issue with **excessive heat absorption** may come into play. Other than the selection of glazing materials for windows such as **Low-e glass**, skylight cover is a good solution as it **diffuses direct sunlight** and gives **flexibility** to the users of the area—covered skylights (noon) or uncovered skylights (morning, night, or rain).



RECOMMENDATION FOR OUTDOOR SPACE: PATHWAY AND PARK FEATURES LIGHTING
Through the addition of pathway and park features lighting the site can benefit functionally and aesthetically. The provision of lighting especially for pathways can aid the users in **wayfinding during nighttime**. Moreover, doing so gives a **highlight to the major site features** such as water features, statues, and topiaries.

CONCLUSION

IMPORTANCE OF DAYLIGHTING AND ARTIFICIAL LIGHTING

With the given information exhibited in this lighting study, the significance of daylighting and artificial lighting in architectural design cannot be emphasized enough. Through daylighting, the admission of natural light is controlled according to the purpose of a space and the needs of its users—forming a connection between the users and natural surroundings. Artificial lighting, on the other hand, provides character to the space through the combination of varying light colors and intensity. Understanding both terms is essential not only in creating a functional and aesthetically-pleasing space but more importantly in improving the experience of the users.

ARCH 143

UTILITIES III: ARCHITECTURAL LIGHTING