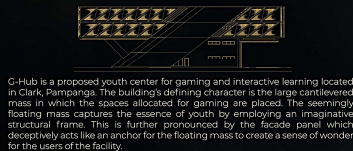


# G-HUB | A YOUTH CENTER FOR GAMING AND INTERACTIVE LEARNING IN CLARK, PAMPANGA

ADRIANO, ADRIEN | 2018-07283 | ARCH 143 | PROF. FLORES-BERNARDO

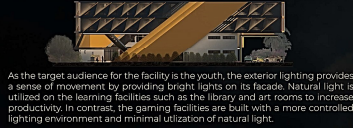
## ARCHITECTURAL DESIGN CONCEPT

## SITE DEVELOPMENT PLAN



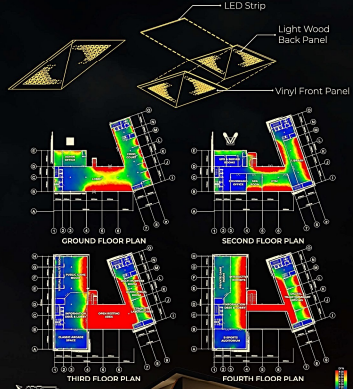
G-Hub is a proposed youth center for gaming and interactive learning located in Clark, Pampanga. The building's defining character is the large cantilevered mass in which the spaces allocated for gaming are placed. The seemingly floating mass captures the essence of youth by employing an imaginative structural frame. This is further pronounced by the facade panel which deceptively acts like an anchor for the floating mass to create a sense of wonder for the users of the facility.

## LIGHTING DESIGN CONCEPT



As the target audience for the facility is the youth, the exterior lighting provides a sense of movement by providing bright lights on its facade. Natural light is utilized on the learning facilities such as the library and art rooms to increase productivity. In contrast, the gaming facilities are built with a more controlled lighting environment and minimal utilization of natural light.

## DAYLIGHTING STRATEGIES AND ANALYSIS



## FAÇADE PANELS

The facade panel assembly consists of a dark gray vinyl front panel with a yellow accent and a light wood finish back panel equipped with an LED Strip. The panel is strategically inclined and folded to block off sunlight especially in the presence of the afternoon sun. The triangular perforations also contribute to the sense of movement while also providing minimal sunlight to the areas they cover. The dark exterior finish provides a sleek and futuristic look to the building, while the interior wood finish acts as a reflective material to maintain brightness within interior spaces.

## DAYLIGHT FACTOR

The building is mainly divided into two wings: The Gaming Wing which consists of public and private game spaces, virtual reality rooms, a classic arcade space, and an E-Sports auditorium; and the Learning Wing which consists of art rooms, computer laboratories, a multi-purpose room and a library.

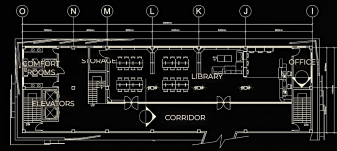
The Gaming Wing is located on the west side of the site. It is strategically placed where the sun sets as this is warmest and harshest sunlight. Incidentally, facade panels cover the entire side effectively protecting the Gaming Wing from the afternoon sun. Furthermore, spaces in the Gaming Wing requires a more controlled artificial lighting environment in order to influence the mood in these spaces more effectively. This is evident from the Daylight Factor Diagram wherein the west-most portion of the Gaming Wing have a Daylight Factor of about 1 DPF% to 3 DPF%, which may create opportunities for a more controlled artificial lighting environment, while a small portion of the east side has a daylight factor of about 3 DPF% to 8 DPF%, these areas may need to be covered up in order to gain more control over the artificial lighting in these spaces.

On the other hand, the Learning Wing is located on the east side of the site in order to utilize the morning sun, which effectively maximizes the productivity in the spaces located in this wing. This can be seen from the Daylight Factor diagram of the library and the art rooms which have a Daylight Factor ranging from approximately 3 DPF% to 8 DPF%, exceeding the required 2-5% DF for areas with a high rate of productivity.

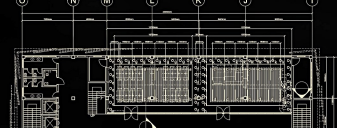
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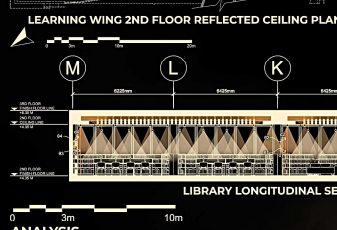
## LIGHTING DESIGN FOR INTERIOR SPACE



## LIGHTING DESIGN APPROACH



## LIGHTING DESIGN APPROACH



## ANALYSIS

The calculations provided for the general lighting are only for half of the ceiling, since the ceiling has a symmetrical design, the same calculations may also be applied for the other half. Based from the calculations and lighting specifications, the proposed lighting design is sufficient for the minimum requirements for the library's reading areas. While the calculations show that the bookshelves are insufficiently lit (requiring a minimum of 200 lux), the calculations only assumed the lighting provided by the adjacent downlights to the bookshelves (i.e. the luminaires not directly in front of the bookshelves; segment was not accounted for). The light spilling from the general lighting and the non-adjacent downlights may be expected to contribute enough illumination to meet the minimum requirement of 200 lux.

## INTERIOR PERSPECTIVES



## LIGHTING DESIGN APPROACH

The Lighting Design Approach for the Library is simplistic and uniform throughout. The goal behind this simplistic approach is to create an equal level of illumination throughout the entire interior space, maximizing the level of productivity within the space.

## ILLUMINATION LEVEL REQUIREMENTS

Type of Area, Task or Activity	Lux Level (E)	Glare Rating	Uniformity (U)	Color Rendition
Library - Bookshelves	200	15	0.50	80
Library - Reading Areas	500	19	0.60	80

## LIGHTING SPECIFICATIONS

Type of Luminaire According to Use	Luminaire Brand & Name	Dimensions	Luminaire Flux (lumens)	CRI	Color Temperature
Downlight (Bookshelves)	CAPELLA CRYSTAL GEN 1 CO	130mm x 200mm (Dia. x H)	6000	80	3000K
General Lighting (Reading Areas)	LOCALIA ROOMS RESPONSE	160mm x 160mm (Square x H)	4500	90	4000K

## CALCULATIONS

Room Name	Room Area (sqm)	Room Volume (cu m)	Room Height (m)	Room Perimeter (m)	Room Shape	Room Orientation	Room Use
Library - Reading Area	100.00	1000.00	10.00	140.00	Rectangular	North	Reading
Library - Bookshelves	100.00	1000.00	10.00	140.00	Rectangular	North	Storage

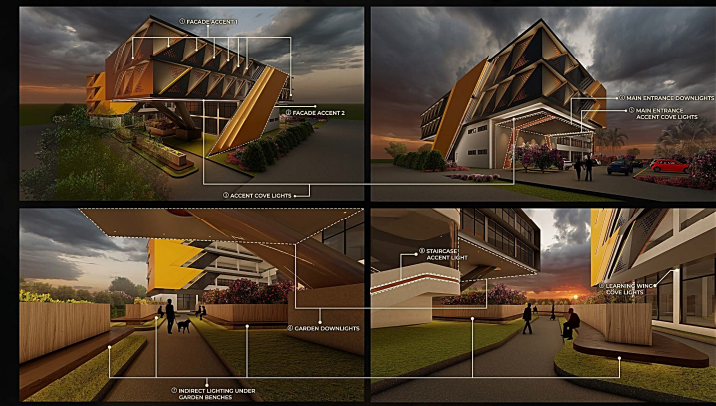
## RECOMMENDATIONS

- While the general lighting meets the minimum requirement for the reading areas, it may be suggested to create a more intricate lighting and ceiling design in order to conform with the building's character.
- In order to reduce visible noise from the possibly excessive light provided by the downlights, a possible solution is to incorporate lighting fixtures within the bookshelves. This also ensures that the illumination level throughout the entire bookshelf is uniform and that the minimum requirement will be met.

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## LIGHTING DESIGN FOR EXTERIOR SPACE (CONCEPTUAL LEVEL ONLY)



## LIGHTING DESIGN APPROACH

The main goal of G-Hub's exterior lighting design is to create a dynamic lighting environment by capturing the essence of youthfulness through an imaginative design process. This can be done by putting emphasis on the exciting elements of the building both architecturally and structurally. To employ this idea, the cantilevered portion of the Gaming Wing will be emphasized through lighting by creating an illusion of a "floating mass", highlighting the building's architectural and structural character.

## ANALYSIS

- The Main Facade Panels are equipped with an LED Strip to highlight the diagonal element of the panels which adds to the sense of direction provided by the facade.
- The "Anchor" of the facade is furnished with accent lights as well to emphasize its diagonality and to distract attention away from the exposed walls of the lower floor, adding to the illusion of the "floating mass" of the cantilevered portion.
- Accent cove lights are placed beneath the cantilevered portion of the Gaming Wing to add to the illusion of the "floating mass" as well.
- Downlights are provided by the main entrance in order to emphasize its purpose as the main entry point (in addition to the attention provided by the cove lights).
- Diagonal cove lights are also present by the main entrance to contribute to the building's aesthetic character and to add emphasis to the main entry point as well.
- Downlights are provided in the garden to help in wayfinding at night time.
- Indirect lighting is provided under the benches to facilitate wayfinding as well, and it also adds to the aesthetic value of the garden.
- An accent light is provided along the walls of the staircase, to put emphasis on the main staircase.
- The cove lights on the learning wing's ground floor provides the sense of a "floating mass" on the wing even without a cantilevered portion.

## CONCLUSION, SUMMARY, AND OVERALL RECOMMENDATIONS

The lighting goals for this project are contrasting for the interior (at least for the library) and exterior spaces. To summarize, the lighting goal for the interior space was to provide a uniform and consistent levels of illumination throughout the entire space in order to maximize productivity. On the other hand, the lighting goal for the exterior space (facade and garden) was to create a dynamic lighting environment that tries to capture the essence of youth. Additionally, daylighting goals were also set wherein the Gaming Wing was required to sustain low levels of daylight to control the mood and aesthetic of artificial lighting while the learning wing was required to have high levels of daylight in order to maintain productivity during day time.

The goals for the interior space were met by calculating the amount of luminaires necessary to meet the minimum required levels of illumination. Meanwhile, only conceptual ideas and suggestions were provided as to how the exterior lighting goals will be met. The daylighting goals were met by implementing proper orientation of the building and spaces and were tested through daylight simulations. As some of these processes are not the most intricate and sophisticated means to achieve the most optimal solutions for lighting design, the following are some recommendations in order to improve the project's lighting design.

- Explore more cost- and energy-efficient lighting options by calculating and estimating fixture prices and energy consumption.
- Run a more intricate and detailed daylighting simulation to achieve more accurate results.
- Run artificial lighting simulations in order to reduce human errors in calculating the required illumination levels for spaces.

To conclude, the importance of lighting (both natural and artificial) must be emphasized. Lighting greatly adds to the character of a building, it brings life to what may seem as a simple design. More importantly, however, is that it adds to our quality of life by creating appropriate atmospheres for our environments which can influence how we feel and how we think.