

[ARC61804]

GREEN STRATEGIES FOR BUILDING DESIGN

Assignment 2
Reflective Write-Up

Bioclimatic Flexi-Office, Saigon, Vietnam

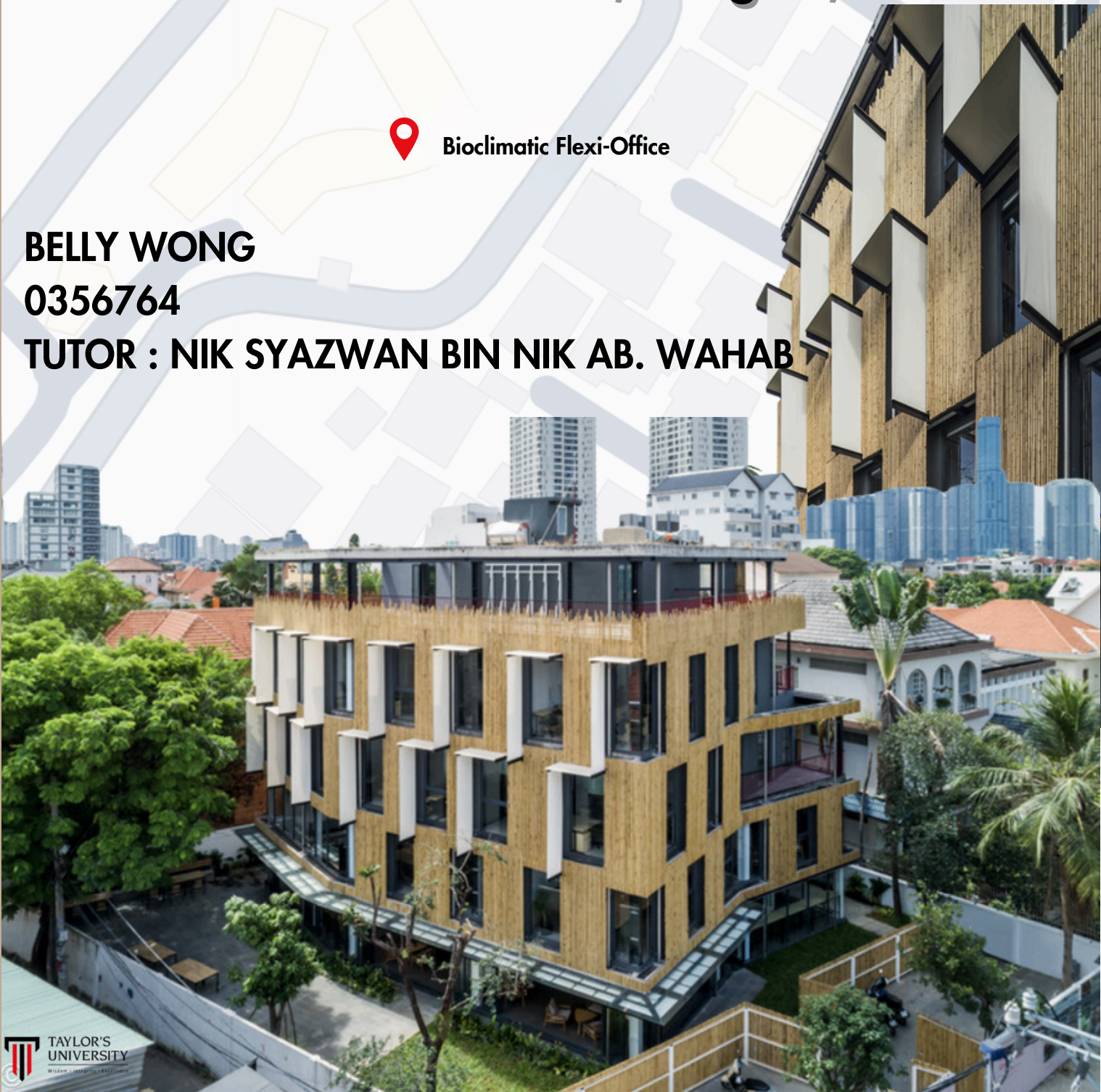


Bioclimatic Flexi-Office

BELLY WONG

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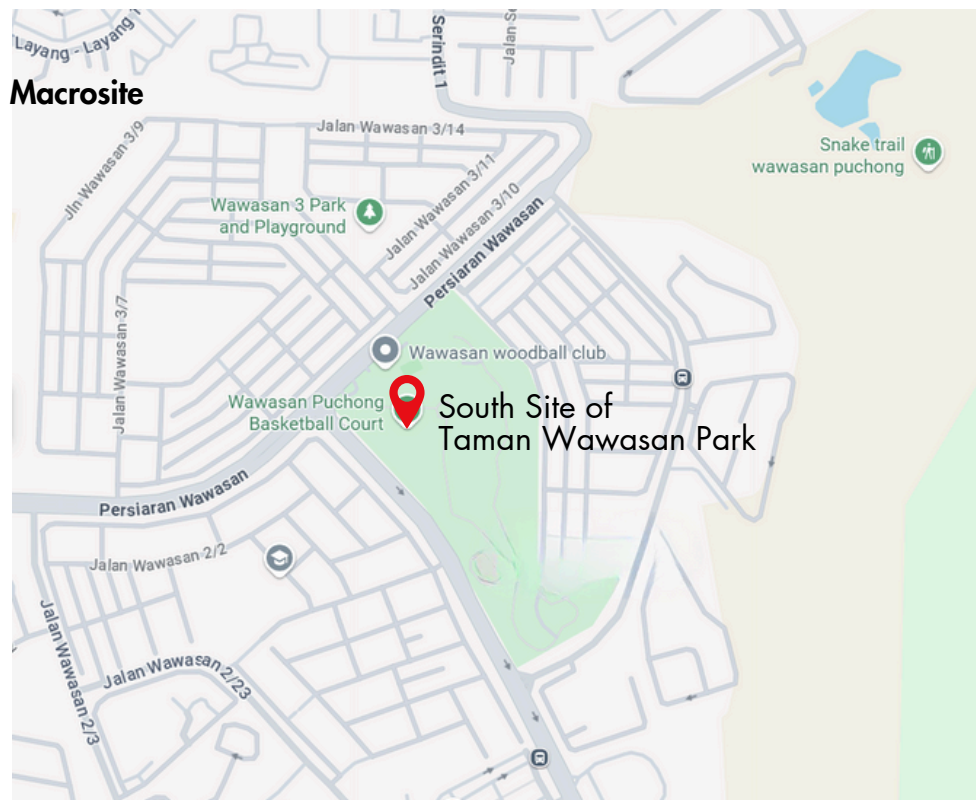
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INTRODUCTION

Studying the Bioclimatic Flexi-Office in Saigon, Vietnam, has made me realize how much consideration and attention to detail go into creating architecture that is not only adaptable and useful but also incredibly sustainable and climate-responsive. The project offers a comprehensive passive design strategy that balances architecture, human comfort, and climate, creating a harmonious blend of natural systems and creative design.

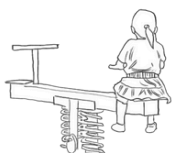
Taman Wawasan Park, Malaysia, where my final project is located, has a tropical climate that is comparable to Bioclimatic Flexi-Office. As a result, my design, which consists of a collection of community buildings serving a variety of purposes (elderly care, child learning, performance space, gardening, and outdoor plaza), can incorporate many of the bioclimatic strategies used in the Flexi-Office. These strategies will help me reduce energy consumption, enhance user comfort, and harmonize with the surrounding natural parkland.



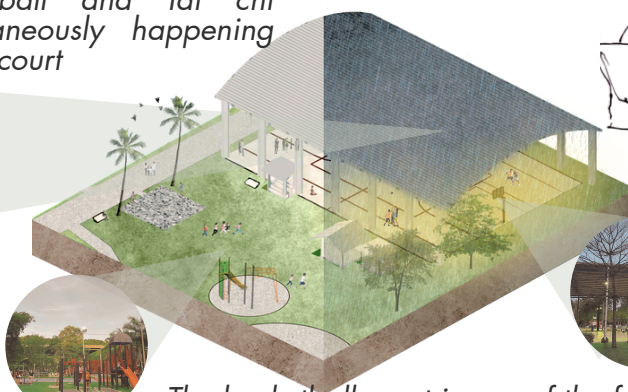
My chosen site:

next beside basket ball court

Basketball and Tai chi simultaneously happening at the court



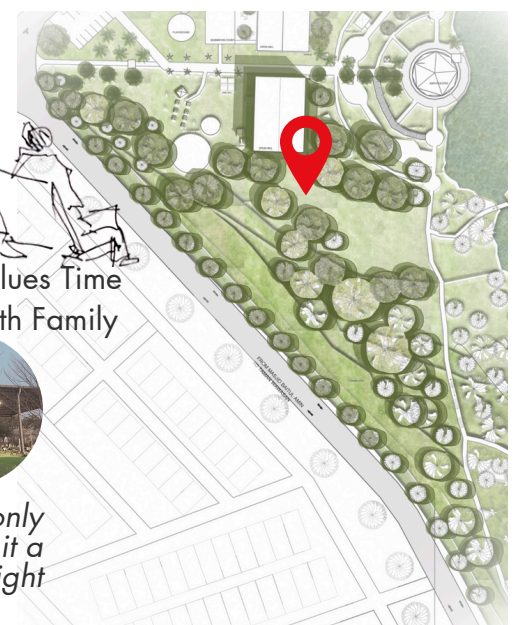
Kids running around the playground



Values Time with Family



The basketball court is one of the few only well lit facilities in the park, making it a safe space at night



SITE PLANNING

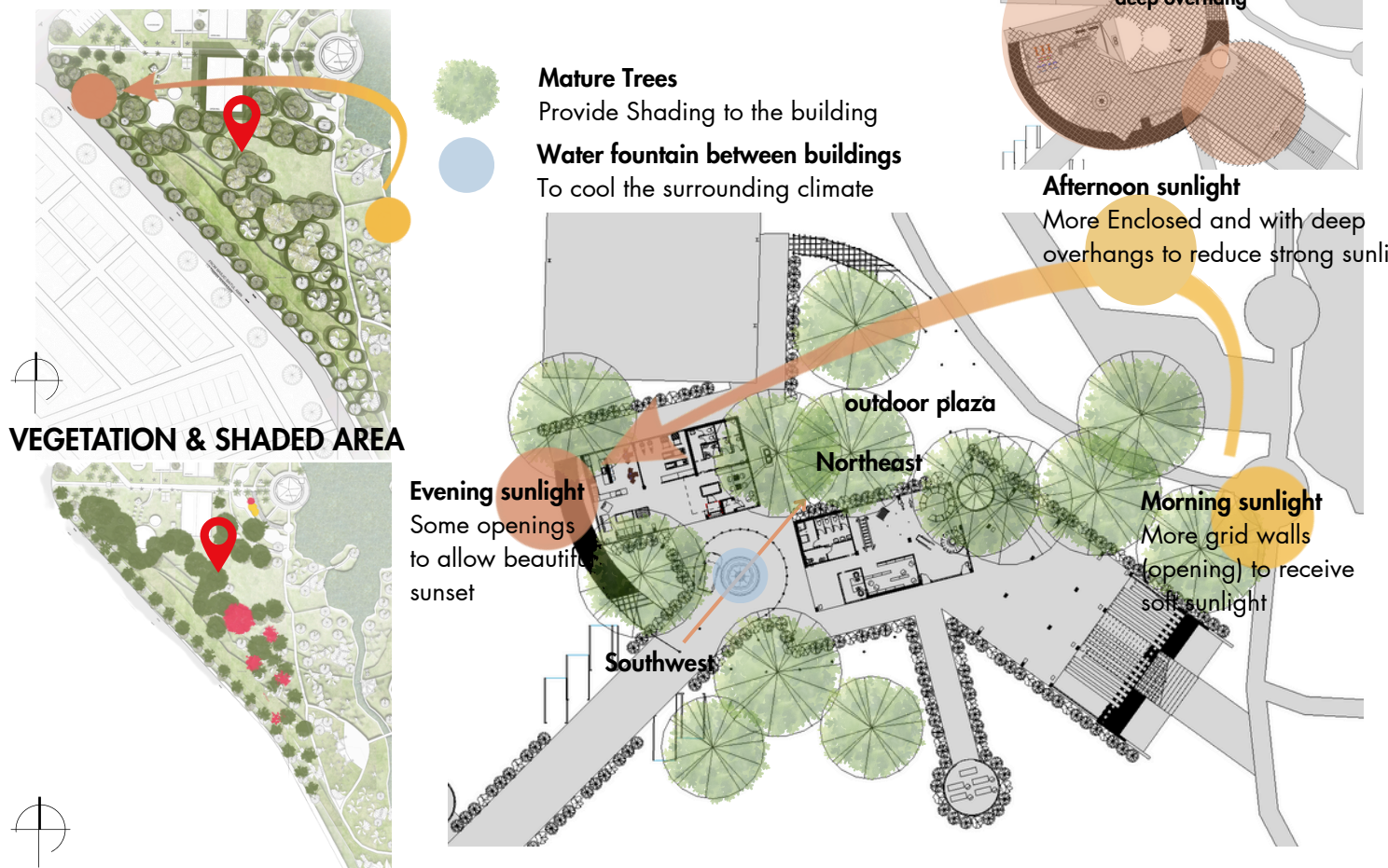
I discovered how careful site orientation and integration with natural elements can greatly enhance thermal comfort and sustainability in tropical architecture by studying the Bioclimatic Flexi-Office in Saigon. The structure is oriented with care to **maximize natural light** while **reducing overheating and glare**. It lessens reliance on mechanical systems by utilizing the directions of the prevailing winds to improve natural ventilation. A significant passive role is also played by the thoughtful placement of **water features and vegetation**; trees and green buffers lessen the building's environmental impact while simultaneously lowering ambient temperatures and solar heat gain. Maintaining existing, mature trees creates an ecological link between the natural and built environments and helps reduce the effects of urban heat islands.

Applying these principles to my final project at Taman Wawasan Park, where the site follows a **Southwest to Northeast** orientation, I plan to design the building clusters to align with this axis while carefully **managing solar exposure**.

To mitigate the harsh afternoon sun from the Southwest, façades on that side will be shaded by preserved **mature trees** and integrated with **green walls or deep overhangs**.

On the Northeast-facing sides, I will allow **controlled morning light** to brighten indoor spaces through **filtered openings**. Between buildings, water features like **fountains** will help cool the microclimate through evaporation, while **tree-shaded community plazas** and activity zones provide comfortable outdoor areas for gathering and play. These passive elements will work together to improve environmental performance while maintaining a harmonious relationship with the park's natural context.

SUN PATH

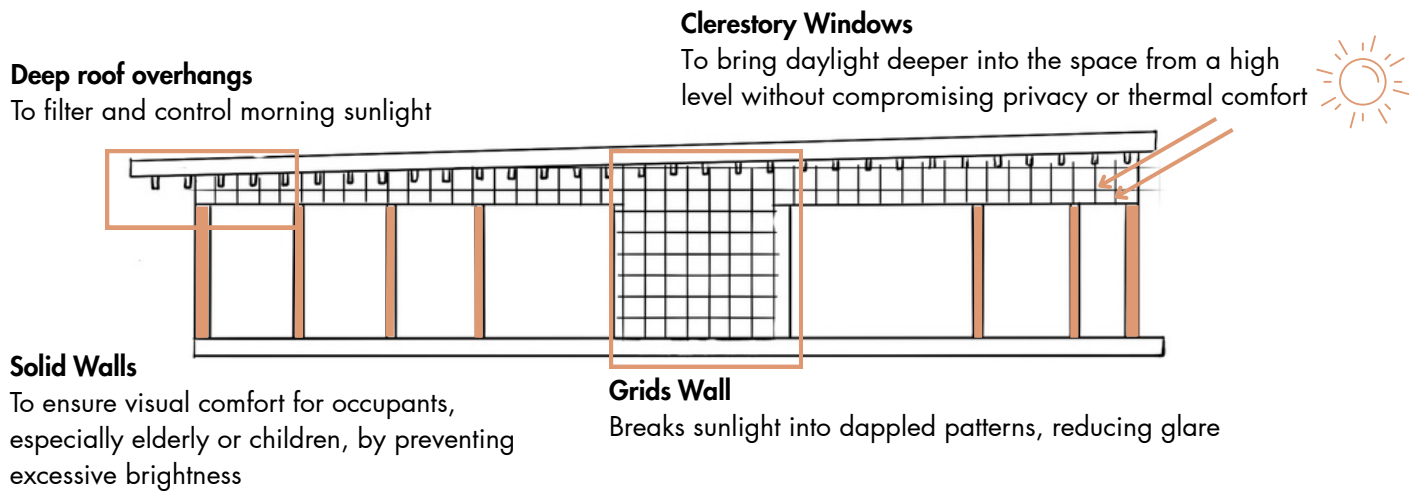


DAYLIGHTING

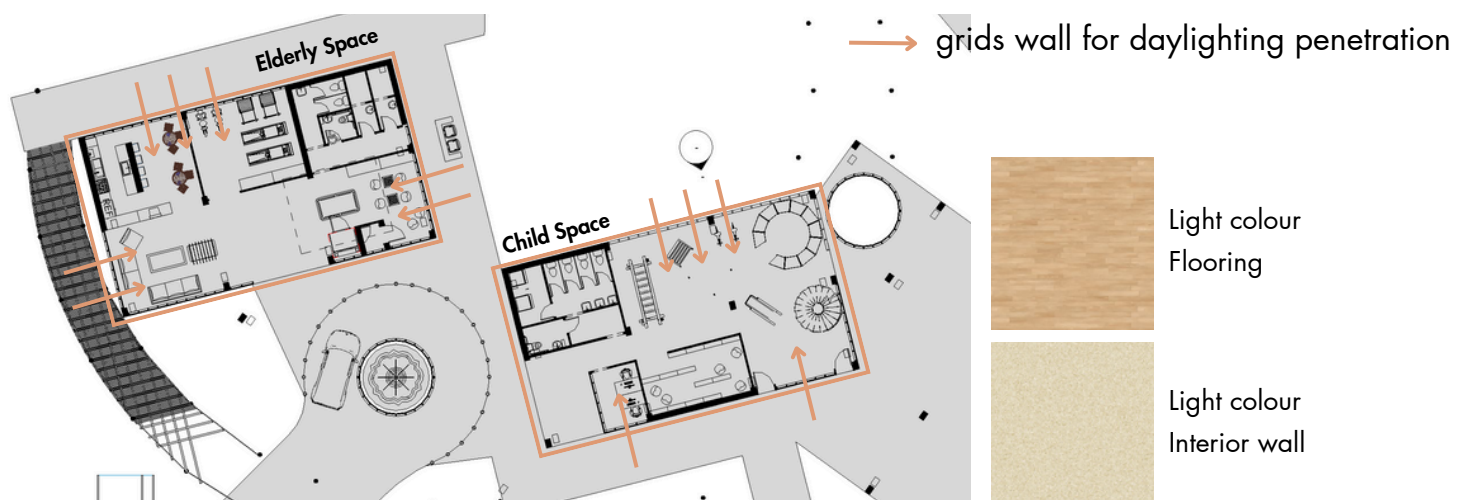
From the Bioclimatic Flexi-Office, I learned that optimizing daylight does not simply mean allowing more sunlight into a building—it involves carefully managing light through design techniques that enhance comfort and reduce energy use. The building achieves this by adjusting the **window-to-wall** ratio to balance daylight access and solar heat gain. It also incorporates **daylight shelves** and **light reflectors**, which redirect sunlight deeper into the space while avoiding harsh glare. Additionally, the **internal layout** is arranged to make the most of natural light, ensuring that key activity areas benefit from even, diffused illumination throughout the day.

For my project in Taman Wawasan Park, I plan to incorporate similar daylighting strategies, adapted to my building's Southwest to Northeast orientation.

In the second-floor gallery space, I will introduce **grids walls and clerestory windows** to bring in **filtered daylight** without direct sun exposure. To prevent overheating and glare from the northeast morning sun, I will design **deep roof overhangs** that shade the façade while still **allowing soft light** to enter.



The internal layout will be **zoned** to allow **deeper daylight penetration** in the central areas, supported by **light-colored materials** that reflect light throughout the space. These strategies aim to create **glare-reduced** interior environments, especially for spaces that serve children and the elderly, ensuring visual comfort and energy efficiency while enhancing the connection between indoor and outdoor spaces.

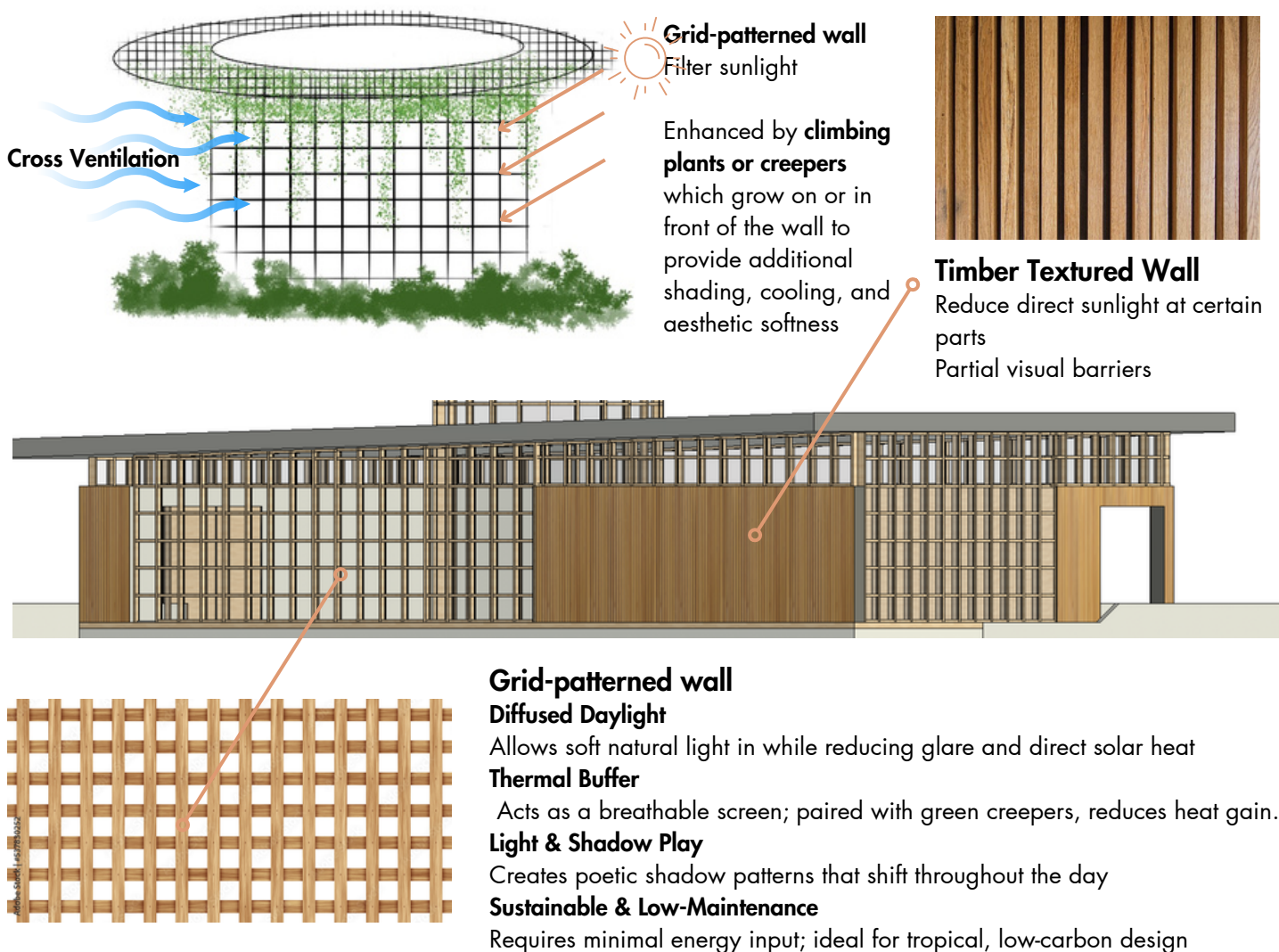


FACADE DESIGN

From the Bioclimatic Flexi-Office, I learned how passive facade design can be both functionally effective and environmentally responsive in a tropical setting. The building features a **double-skin facade** system, which improves **thermal insulation** while maintaining flexibility for **changing interior functions**. Elements like operable **timber louvers** and **greenery walls** are used to provide shading, regulate heat gain, and allow natural ventilation—all without sacrificing aesthetics. By using locally sourced, breathable materials, the design embraces the climate while reducing environmental impact, blending functionality with regional identity.

In my Taman Wawasan Park project, I intend to apply these strategies by using **porous timber façades** combined with **grid wall patterns** for the childcare and elderly zones. These facades will allow **natural air movement** while **controlling sunlight** and maintaining visual privacy.

On the west-facing elevations, where heat is **most intense** in the afternoon, I'll install **green screens** and **vertical garden panels** to provide living **shade** and **reduce surface temperatures**. Key areas like terraces and semi-outdoor spaces will be **shaded** and act as thermal buffer zones, creating comfortable resting points for users. These facades will be designed to be compatible with natural ventilation systems, helping reduce dependency on mechanical cooling and enhancing overall comfort for community members of all ages.

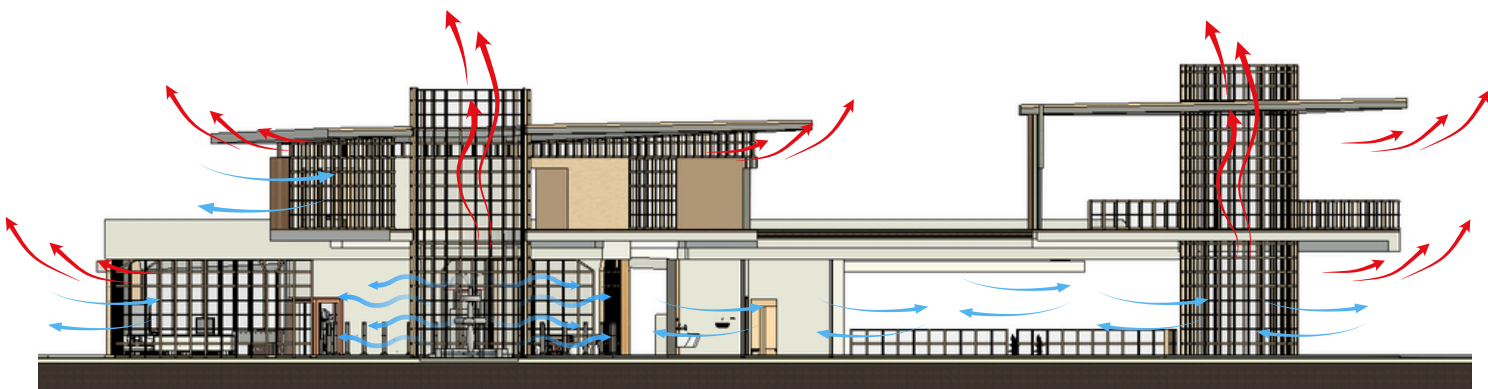
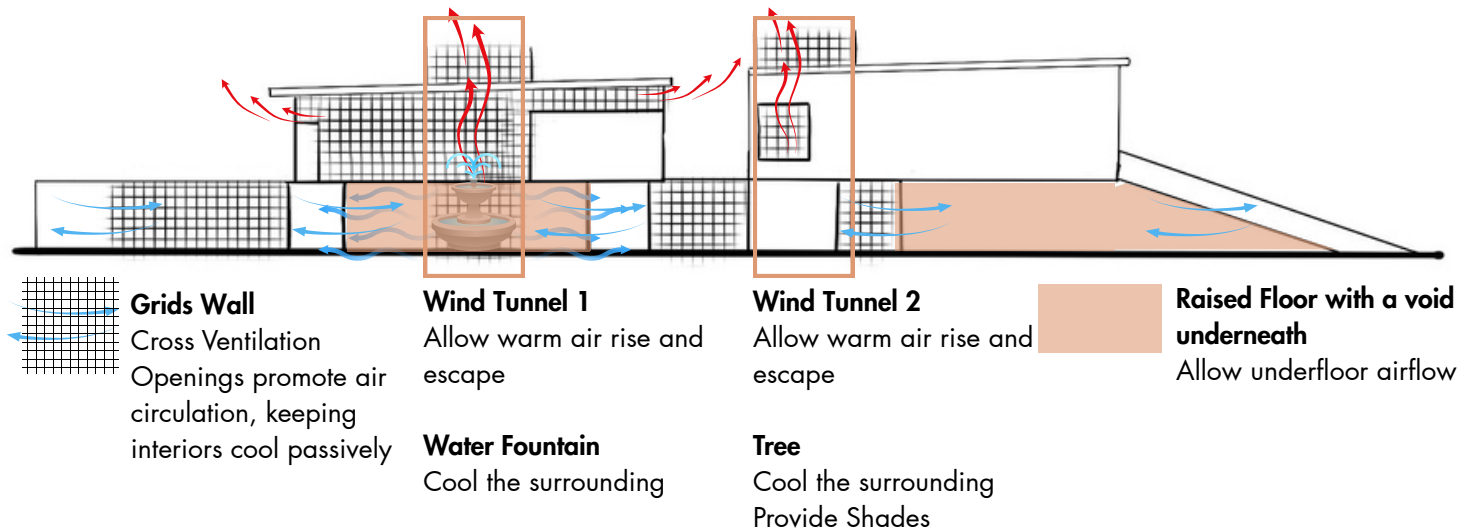


NATURAL VENTILATION

From the Bioclimatic Flexi-Office in Saigon, I learned how passive ventilation systems can significantly enhance thermal comfort in tropical buildings. The design strategically integrates **stack ventilation** and **cross-ventilation** to allow fresh air to flow through the spaces naturally. By using **wind corridors**, **open courtyards**, and **vertical voids**, the building channels breezes through internal spaces, cooling them without the need for mechanical systems. Additionally, the use of **operable windows** gives users control over airflow, allowing them to adapt the space based on weather conditions and personal comfort needs. This not only improves energy efficiency but also creates a more responsive and user-friendly environment.

Applying these lessons to my project at Taman Wawasan Park, I plan to enhance natural ventilation by carefully shaping the layout of the building clusters. **Voids and open spaces between buildings** will act as **wind tunnels**, directing prevailing breezes through the site to keep indoor and semi-outdoor areas cool.

In selected blocks, I will use **raised floors** to allow **underfloor airflow**, reducing heat buildup from the ground. For **larger enclosed areas**, I will incorporate clerestory window to facilitate stack ventilation, allowing **warm air to rise and escape** while **drawing in cooler air below**. These strategies will ensure that community spaces remain comfortable and breathable throughout the day, reducing the need for air conditioning and aligning the design with low-energy, climate-sensitive architecture.



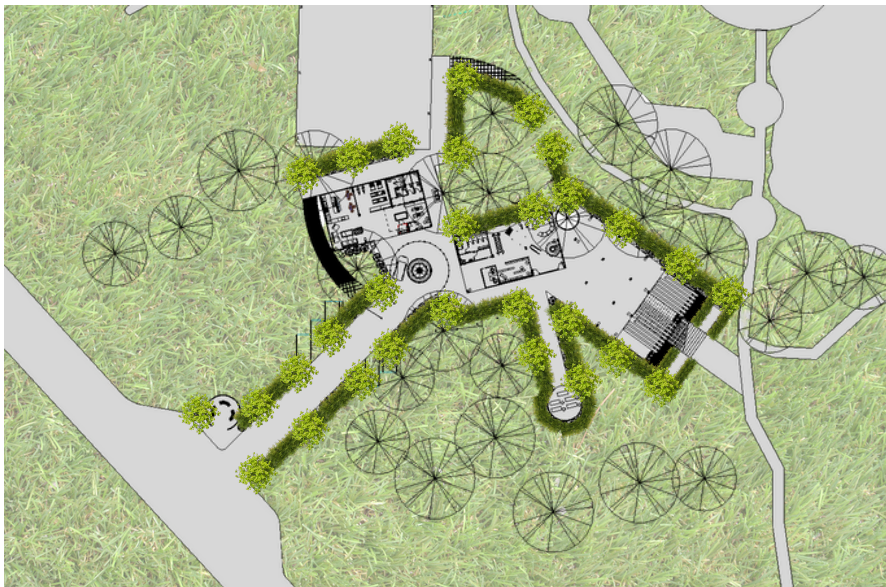
→ Hot Air → Cold Air

STRATEGIC LANDSCAPING

From the Bioclimatic Flexi-Office, I learned that landscaping is not merely aesthetic—it functions as a powerful climate buffer that improves **environmental quality and comfort**. The project integrates layered vegetation, outdoor green walls, and bioswales, which collectively help shade built structures, filter dust and pollutants, and promote **evaporative cooling**. The careful selection of native and drought-resistant plant species further reduces maintenance and irrigation needs, creating a landscape that is ecologically sensitive and self-sustaining. These landscape strategies **reduce ambient temperatures**, control runoff, and enhance biodiversity, all while supporting a comfortable and pleasant microclimate for users.

In my Taman Wawasan Park community project, I will adopt similar approaches by organizing **layered vegetation zones** around each building cluster. These layers—comprising **tall native trees**, **mid-level shrubs**, and **groundcovers**—will provide natural shading, noise buffering, and moisture retention. Key zones such as **pedestrian walkways** and **public plazas** will be flanked by this vegetation to ensure **cool, shaded environments** for daily activities.

Additionally, the child-learning center will feature an **edible rooftop garden**, offering a hands-on space for children to learn about food, nature, and sustainability. These passive landscape strategies will not only improve the thermal comfort of the site but also foster stronger connections between the community and the environment.



Shrubs

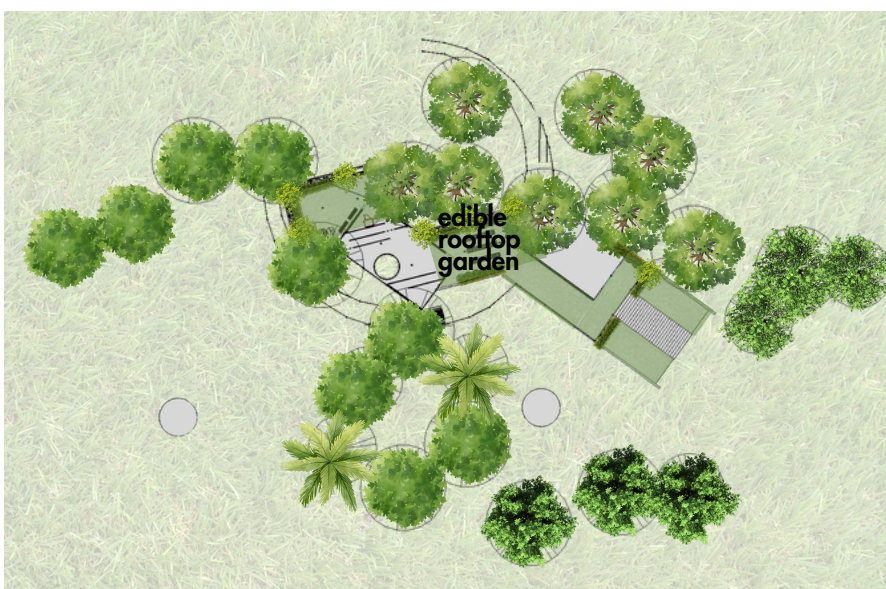


Golden Gardenia Spray of Gold

Trees



Oil Palm Tree Weeping Fig



Satellite Tree Madagascar Almond Tree Blackboard

GroundCover



Cow Grass Carpet Grass

SPATIAL EXPERIENCES

In my design for the community project at Taman Wawasan Park, spatial experience plays a key role in shaping how people interact with nature, architecture, and one another throughout the day. The careful combination of passive design strategies and layered spatial arrangements enhances sensory engagement, comfort, and emotional connection with the environment. Each zone — whether for children, the elderly, or shared public use — is intentionally crafted to create different atmospheres that respond to light, airflow, vegetation, and sound.

As users move through the site, they encounter a rhythm of open, shaded, and semi-enclosed spaces. The grid wall façades produce dynamic patterns of light and shadow, turning even a simple walkway into a poetic corridor that changes with the sun. Shaded terraces and breezeways, cooled by natural ventilation, offer visual relief and tactile coolness — ideal for elderly users seeking restful zones.



Exterior View

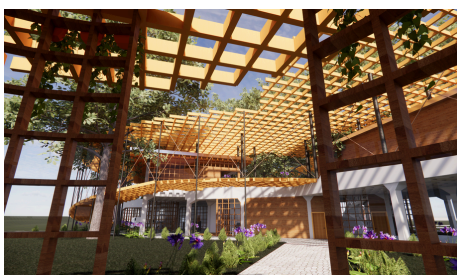


Entrance View



Elderly Activity Space

Meanwhile, children's spaces are brought to life with filtered morning daylight, safe grassy play areas, and sensory gardens on rooftops, designed to foster curiosity and comfort. Between buildings, voids and green buffers allow breezes to pass through, producing a feeling of freshness and natural movement. The inclusion of rainwater features, layered vegetation, and textured, locally sourced materials further reinforces a grounding experience — connecting occupants not just with the built space, but with the climate and ecology around them.



Pod's View



Edible Rooftop Garden



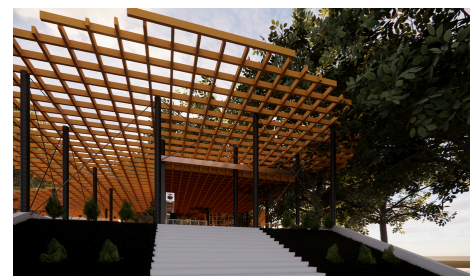
Garden Area



Elderly Lounge



Outdoor Plaza



Outdoor Stairs to first floor

Ultimately, this design doesn't just serve functional needs — it encourages serene wandering, spontaneous gathering, and restful pause. It supports intergenerational use through thoughtful zoning, all while embracing a language of light, air, texture, and greenery that forms a holistic and meaningful spatial journey.

CONCLUSION

Through the study of the Bioclimatic Flexi-Office in Saigon, I gained a deeper understanding of how passive design strategies can be holistically integrated to create climate-responsive, comfortable, and low-impact architecture—especially within a tropical context. Inspired by this, my project at Taman Wawasan Park incorporates a wide range of passive environmental strategies that respond to the site's Southwest to Northeast orientation, local climate, and community needs.

I have organized my building clusters to **optimize ventilation and daylight**, using **voids** between structures as natural wind tunnels and incorporating **raised floors** and **high-level windows** to support cross and stack ventilation.

For daylighting, I adopted strategies such as **grids walls**, **clerestory windows**, and **deep overhangs** to deliver diffused natural light while minimizing glare and solar heat gain. These techniques ensure that key interior spaces remain bright, thermally comfortable, and energy-efficient throughout the day.

On the façades, I employed **porous timber screens**, **green creeper grids**, and **vertical gardens**, especially on sun-exposed orientations, to function as breathable thermal buffers. These façade systems balance shading, airflow, privacy, and aesthetics while allowing for natural cooling and visual connectivity to the outdoors.

In the landscape design, I integrated **layered vegetation**, **edible rooftop gardens**, and **existing mature trees** to enhance microclimate comfort, encourage community engagement with nature, and support biodiversity.

Lastly, by including a **rainwater harvesting system beneath garden zones** and using locally sourced materials, the project supports long-term environmental sustainability.

Altogether, the passive design strategies applied—covering ventilation, daylighting, façade performance, landscape integration, and water management—help transform the community space into a low-energy, people-centered, and climate-adaptive architecture, in tune with both natural forces and social needs.



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