

# Green Strategies for Building Design (ARC61804)



## suncatcher

Final Report - Integration  
with ADIV Final Project

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# 1.0 Introduction

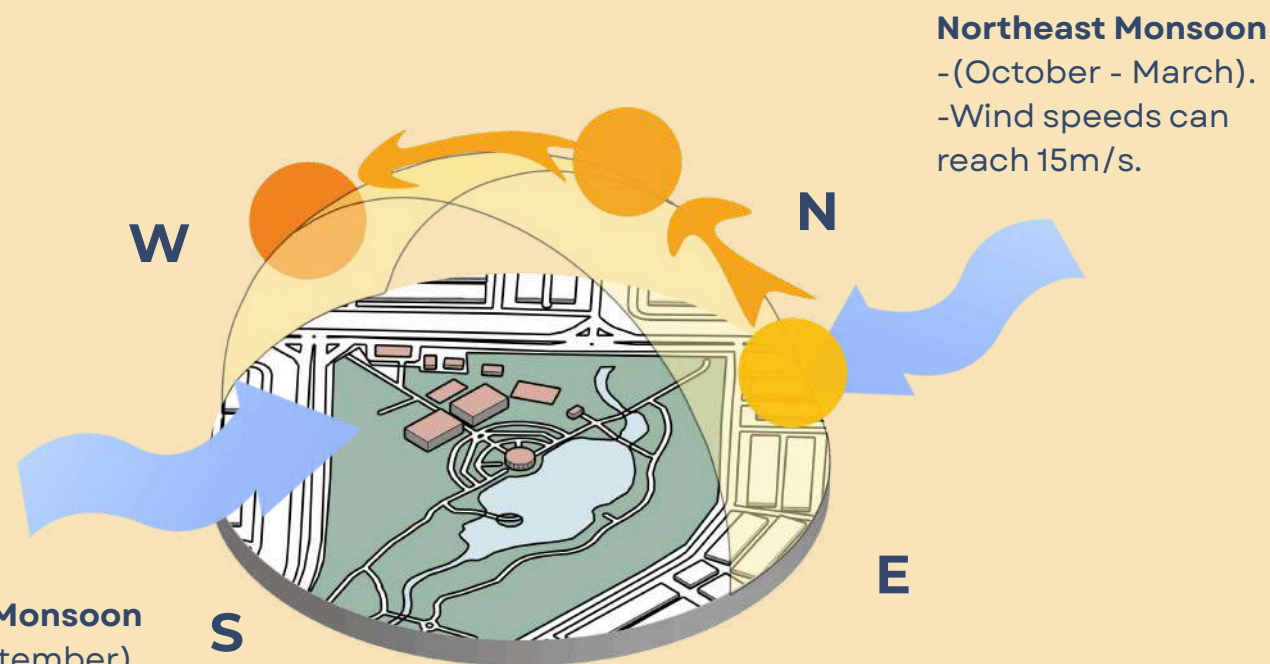
Taman Wawasan Recreational Park is a 25.6 acre neighbourhood park located in Puchong. It serves the surrounding community and visitors, providing jogging tracks, basketball courts, playgrounds, and other sporting facilities.



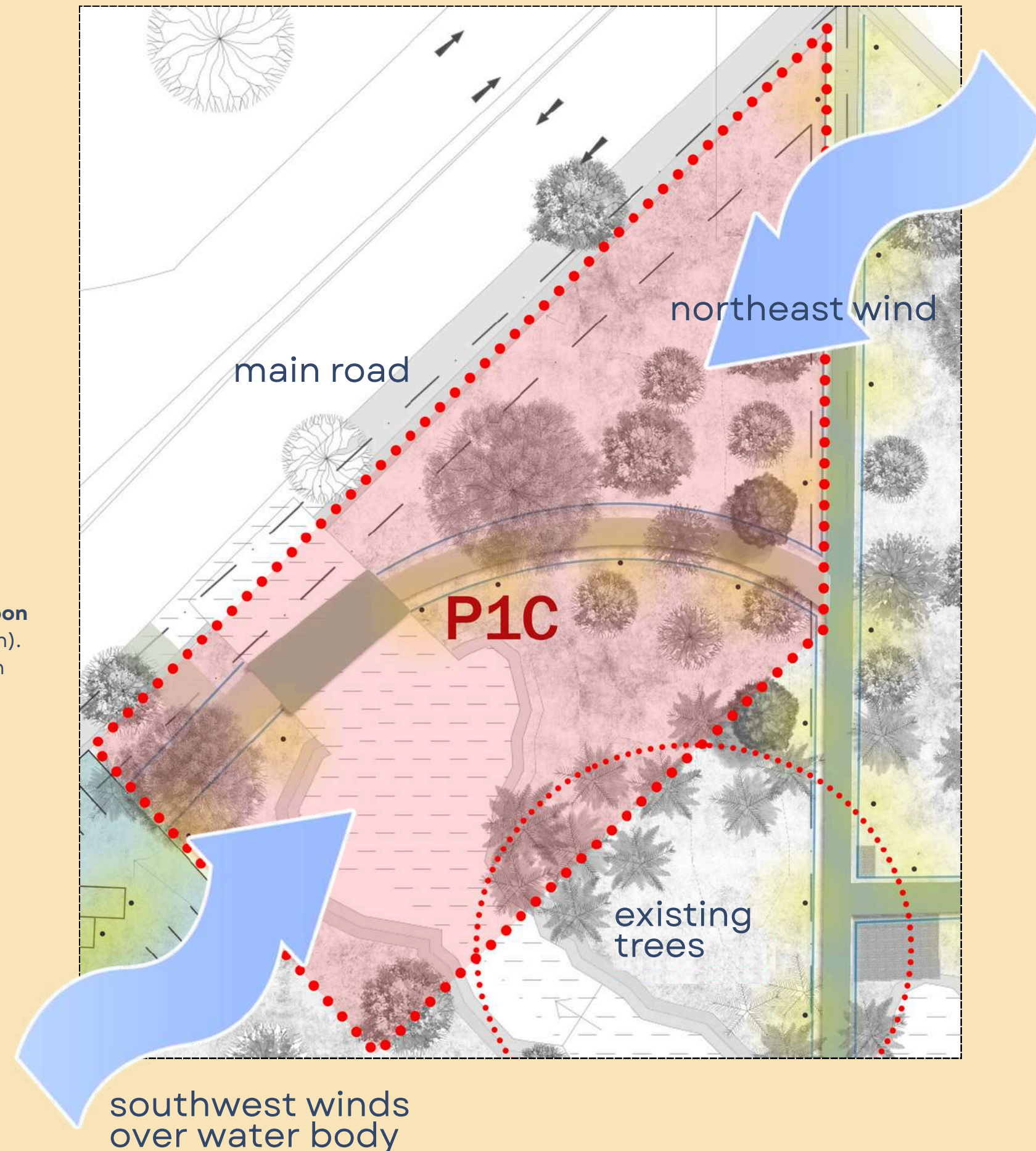


# 1.1 Site Analysis

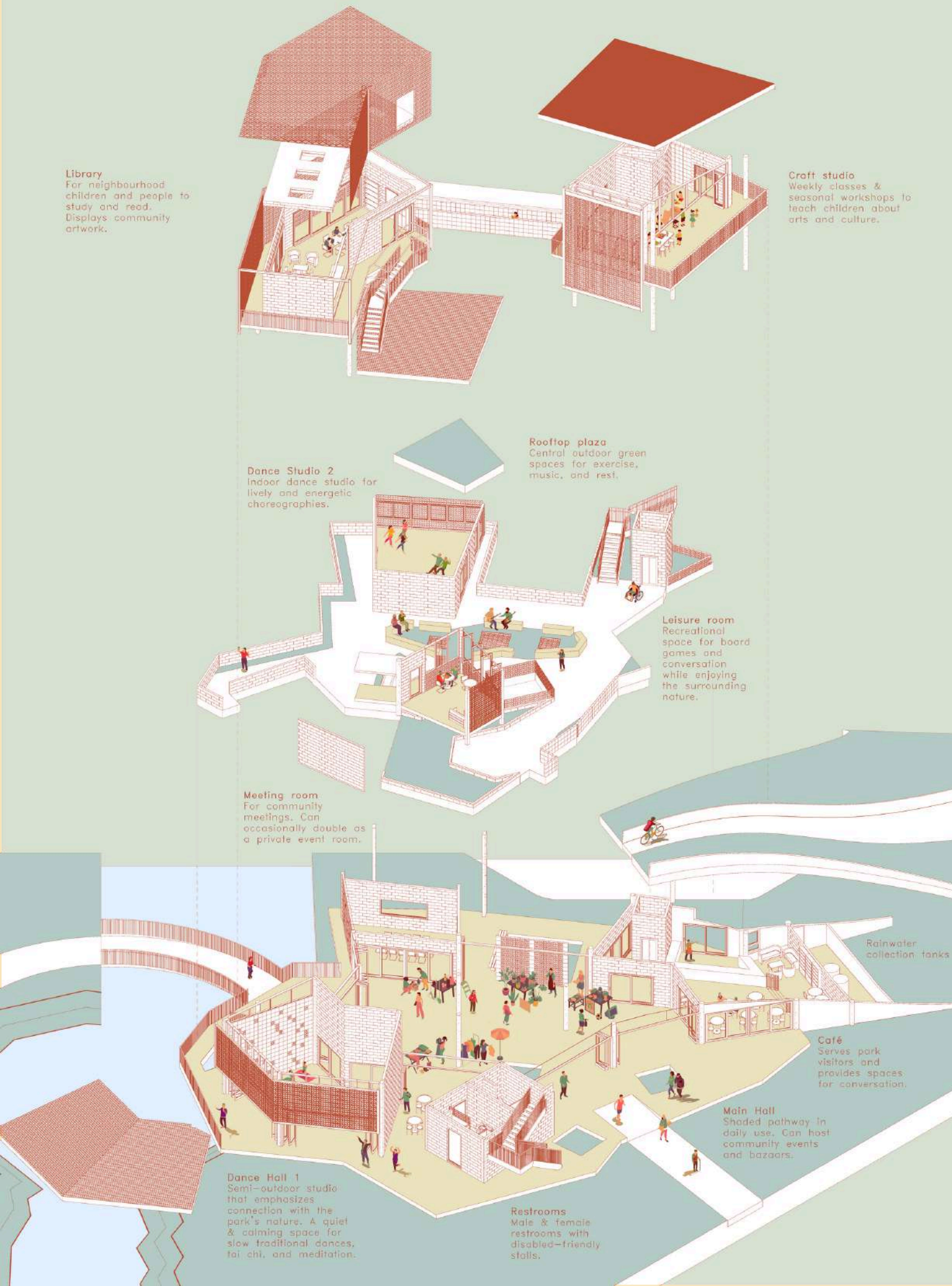
- The site is located on the northernmost end of the park.
- It is on relatively **flat land**, only having slight sloping towards the main road.
- The park's lake crosses through the site on the southwest end, splitting it into two parts.
- This placement of the water body means that **prevailing winds from the southwest** will pass over and be **cooled by the water** before reaching the rest of the site.
- There are **many existing trees** throughout the site, particularly palm trees along the southeastern site boundary.



**Southwest Monsoon**  
-(April - September).  
-Wind speeds are usually below 7m/s.







## 1.2 Project Introduction

**suncatcher** is a three-storey creative & recreational hub for the users of Taman Wawasan Recreational Park.

It consists of a **covered open hall** on the ground floor, a **rooftop garden plaza** on the first floor, and various **other clusters** containing other programs (ie: dance studios, craft studio, library).

On the northeastern end, there is a pedestrian-friendly **sloping green roof** that connects the ground and first floors,

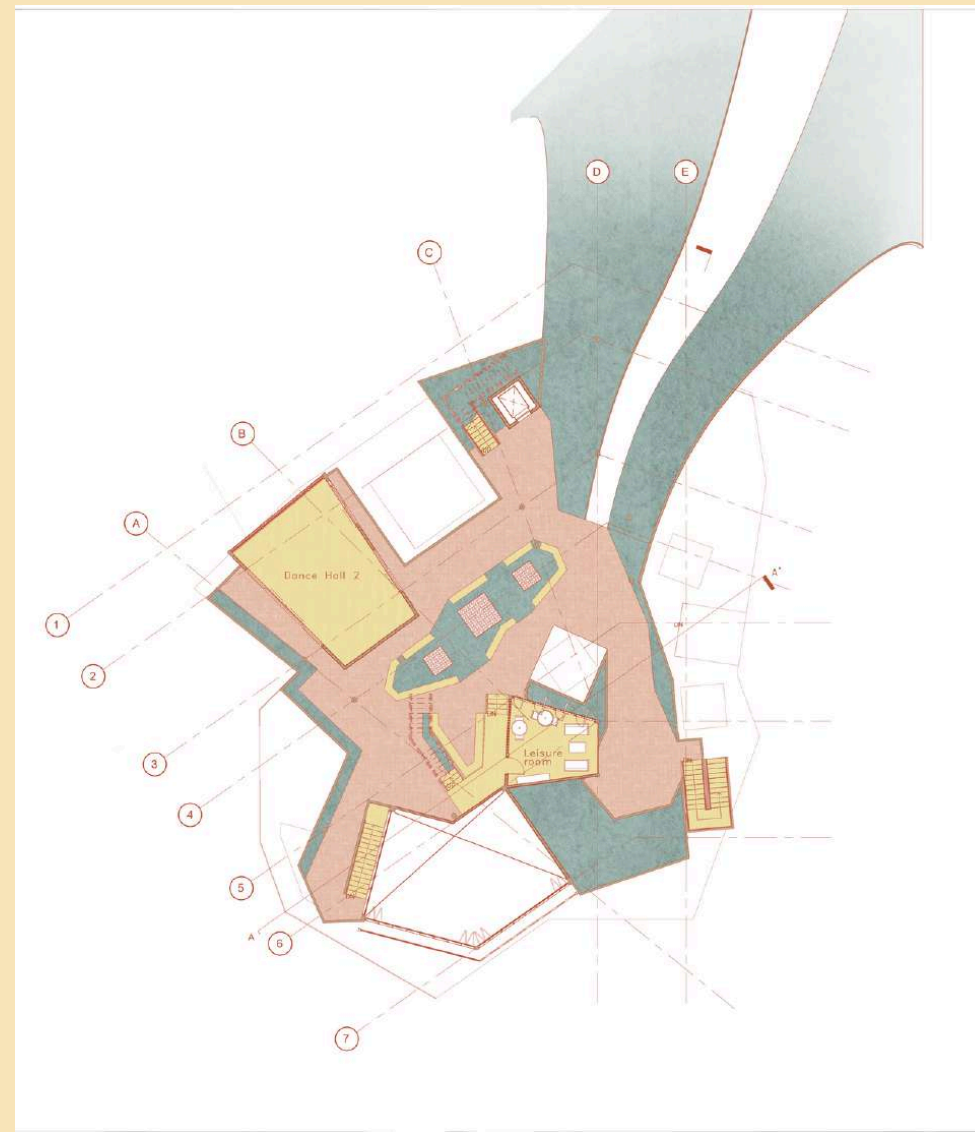




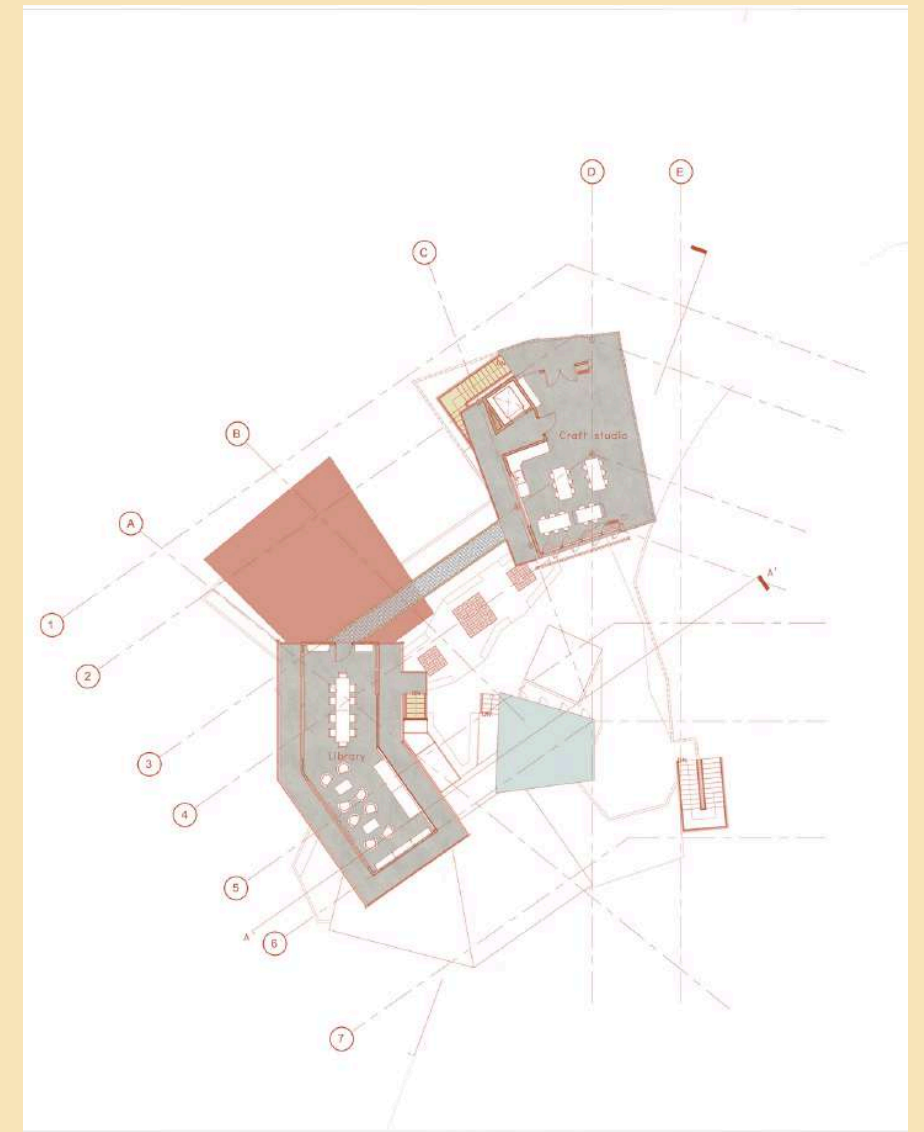
# 1.3 Building Drawings - Floor Plans



GROUND FLOOR



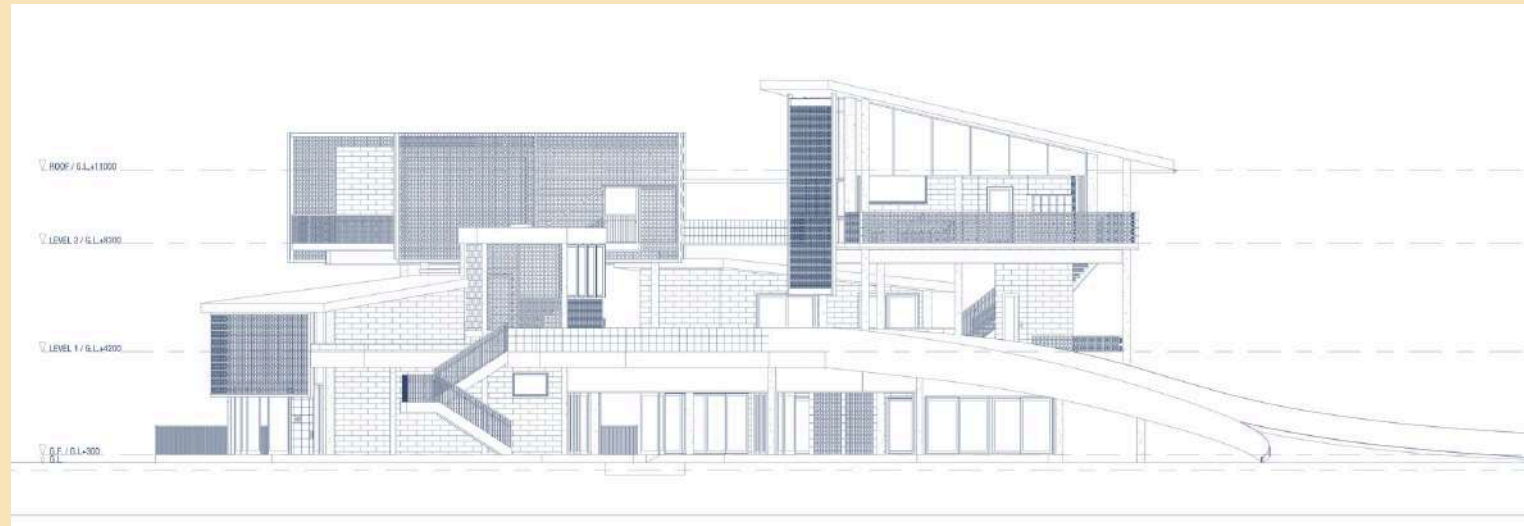
FIRST FLOOR



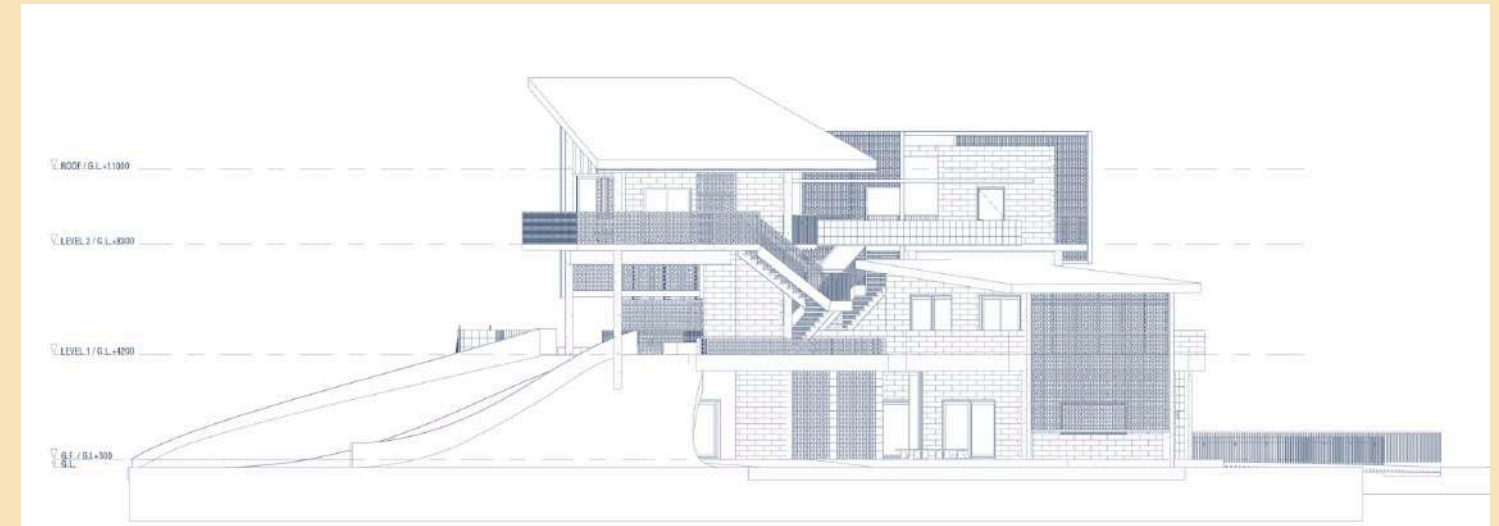
SECOND FLOOR

# 1.4 Building Drawings - Elevations

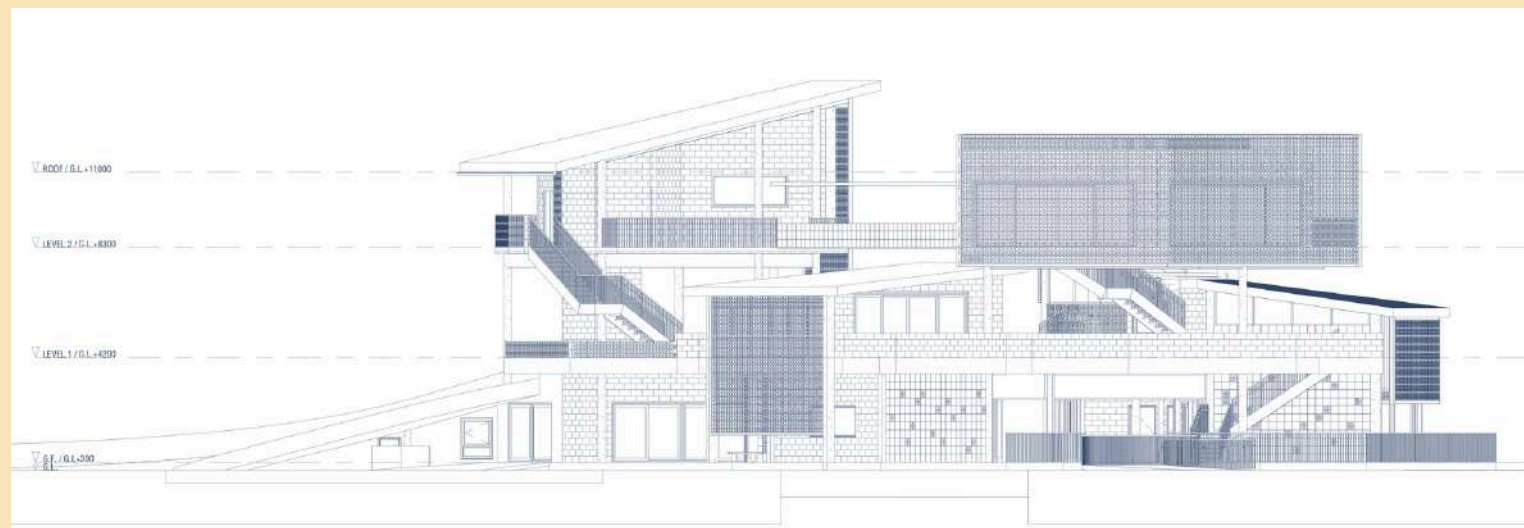
EAST



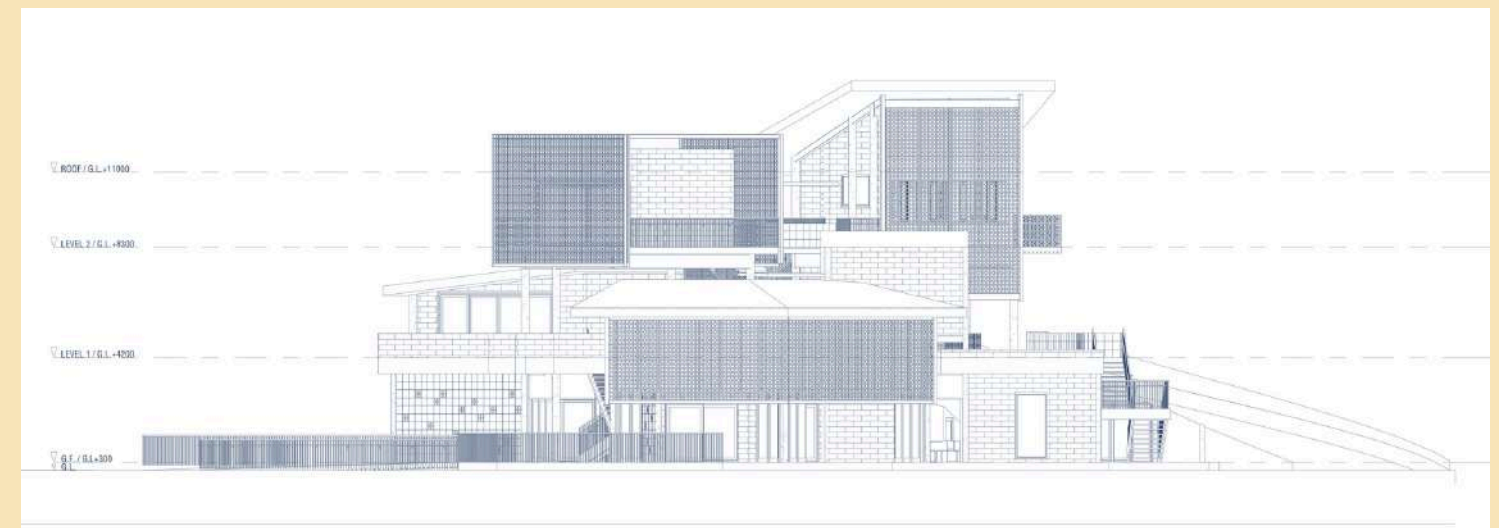
NORTH



WEST



SOUTH

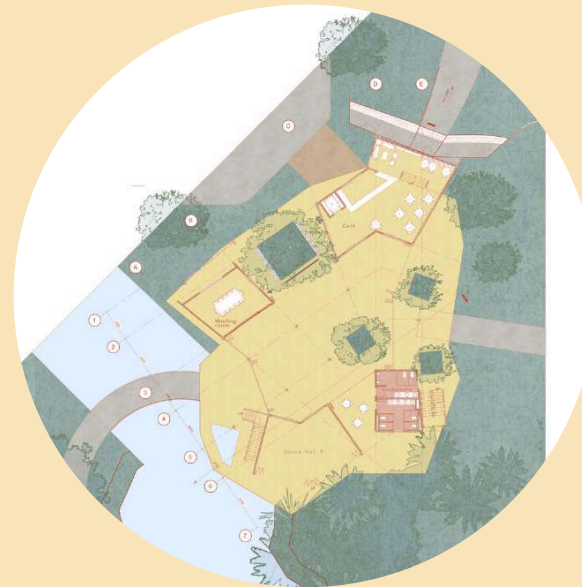




## 2.0 Site Planning



Site Selection



Building Layout



## 2.1 Site Selection

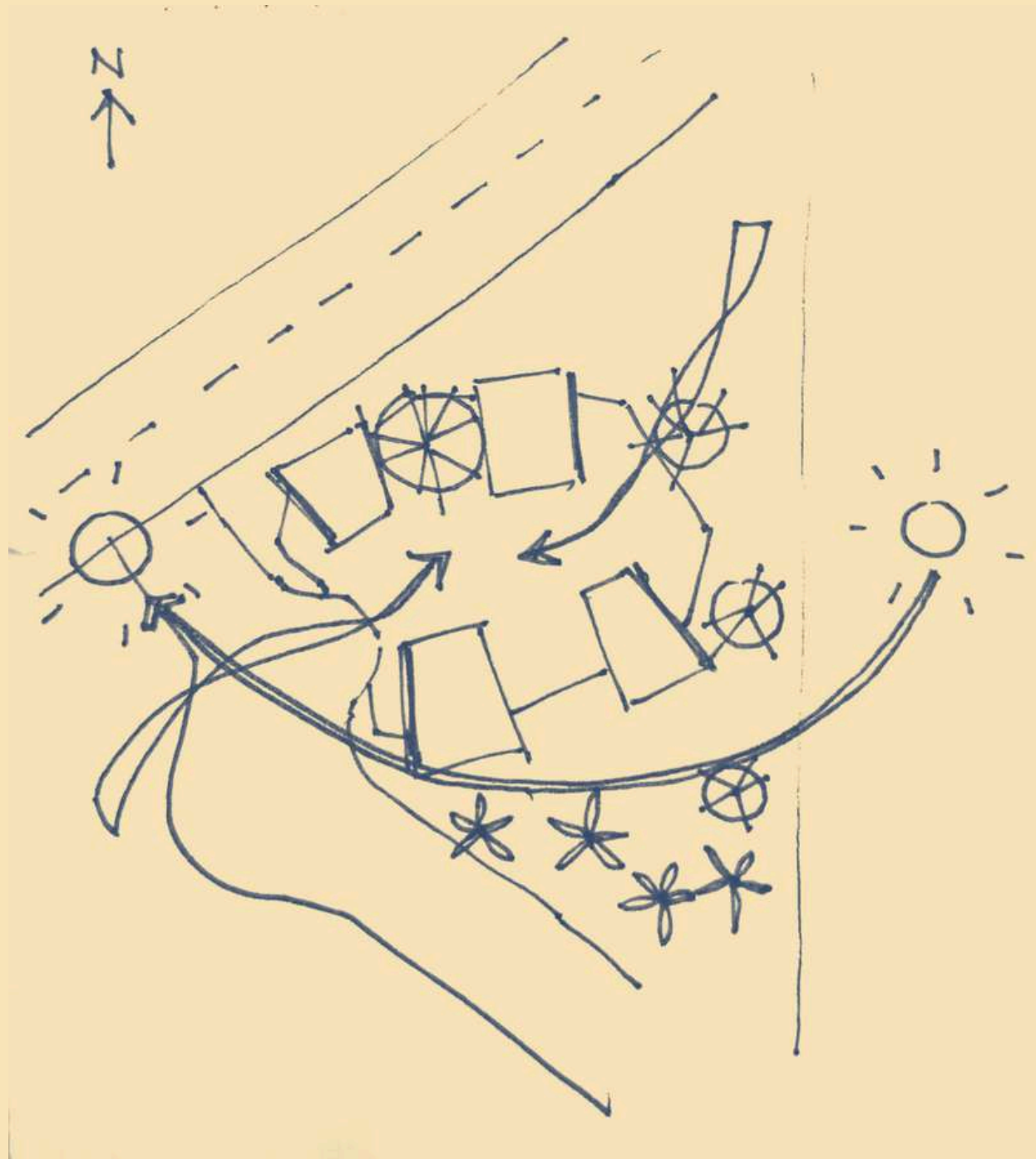
This site was selected for a multitude of reasons. It is currently an underutilised area of the park, as most of the development and hardscape has been done closer to the centre of the park.

- **Proximity to roads** for service & vehicular access – Minimal additions to roads required
- **Proximity to existing parking lots**
- **Connects parking to main pedestrian path** – Convenient for pedestrians
- **Proximity to water body** – Helpful for thermal comfort and aesthetics



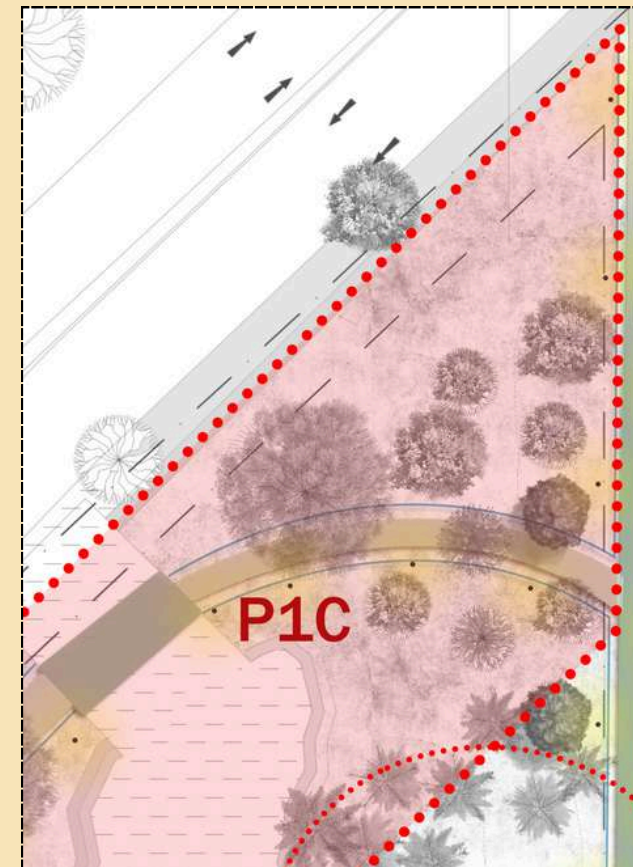


## 2.2 Building layout



- Long-axis running east-west for **reduced exposure** to morning & evening sunlight
- **Cluster layout** with space in the middle to **channel winds**
- **Designed around existing trees** on site – Sustainable and provides shade

Original site



Ground floor on site





# 3.0 Daylighting



- gaps between blocks allow daylighting while taller blocks provide shading for central courtyard



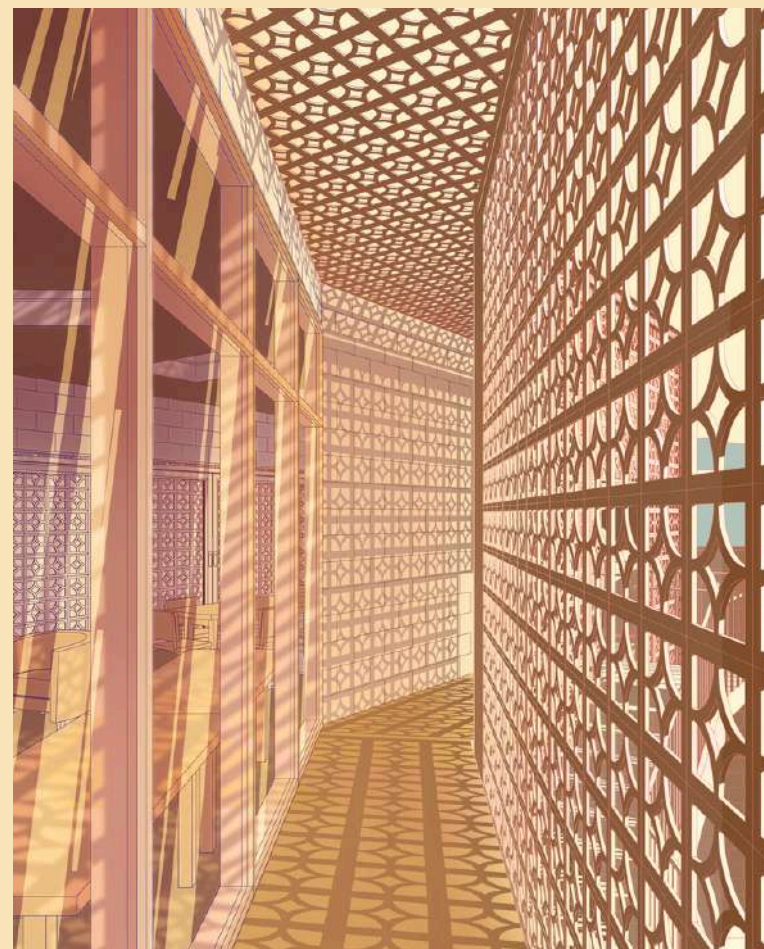
- skylights with metal mesh & glass to let light into the covered area of the ground floor





# 4.0 Facade Design

- Aside from just providing visual interest and privacy, perforated metal facades and vent blocks let in air and daylight while preventing unwanted solar heat and glare

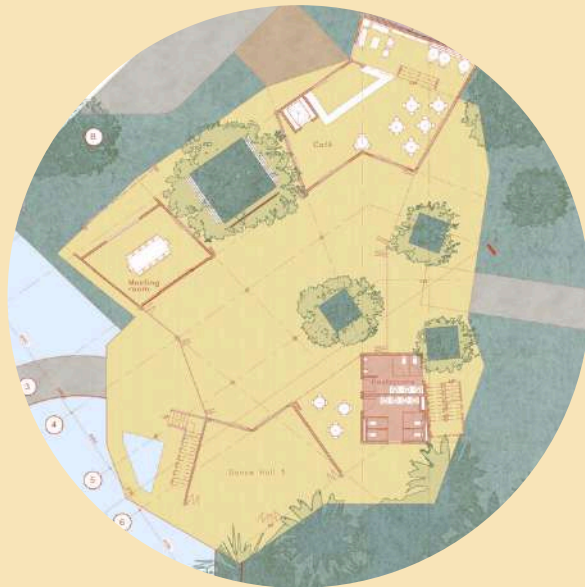


Additionally, they act to diffuse any internal light coming from the buildings at night to prevent excessive glare and light from disturbing the surrounding area.



# 5.0 Natural Ventilation

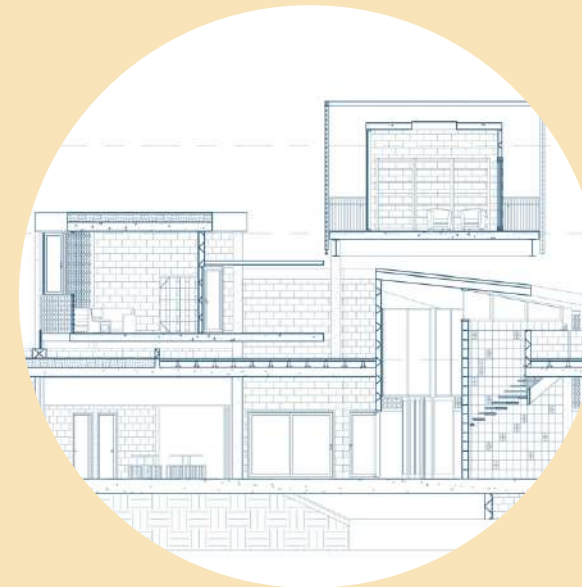
This building's design makes use of ample natural ventilation strategies to improve the thermal comfort of the spaces. They can be split into three categories:



Layout



Openings



Spaces



# 5.1 Natural Ventilation - Layout



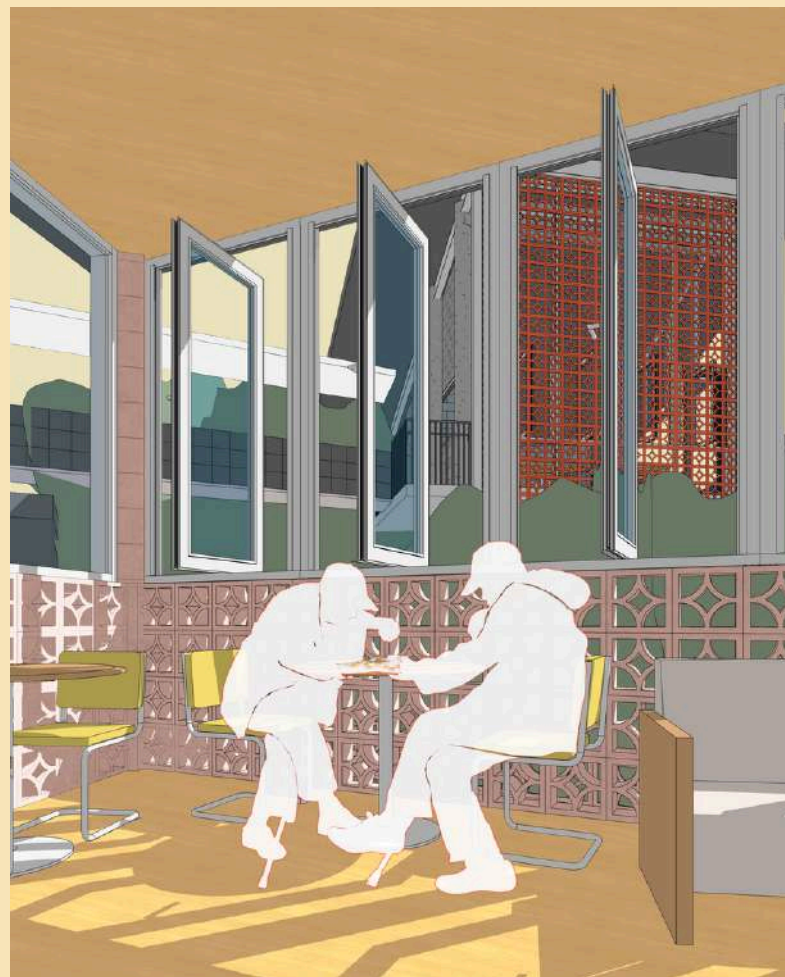
- The **ground level** consists of an axis – an open **covered multipurpose area surrounded on either side** by blocks
- They help **harness the prevailing northeast and southwest winds**, the latter of which would also be **cooled by passing over the lake**



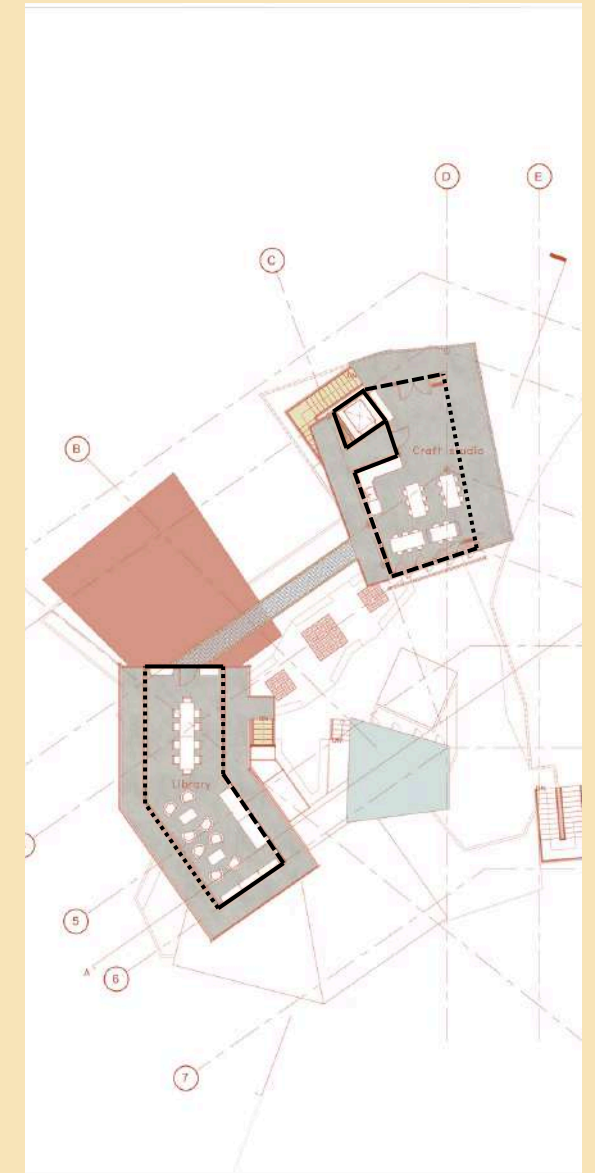
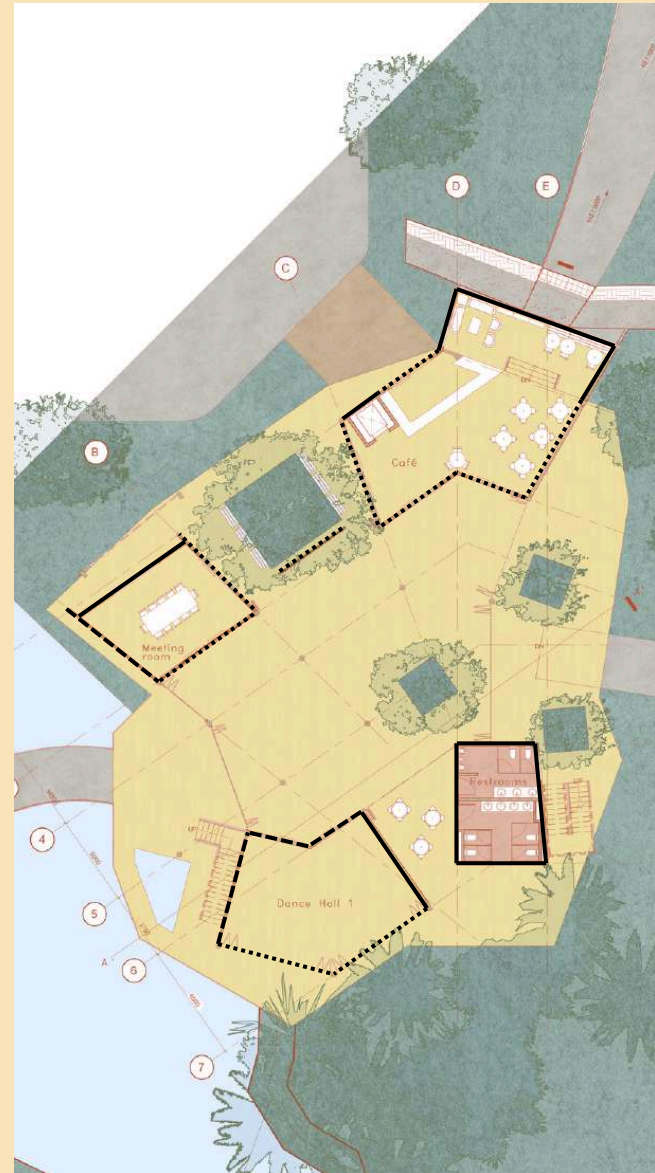
- Despite the first floor being mostly open, its **surrounding buildings** and the **sloped roof** help channel winds into the **central courtyard**.



## 5.2 Natural Ventilation - Openings



- pivot windows, ventilation blocks, perforated metal facades to enhance natural ventilation



- Solid wall (with small windows)
- - - Partially ventilated (Pivot windows, partial ventilation blocks)
- ..... Fully ventilated (full length glass doors, perforated block/metal walls)

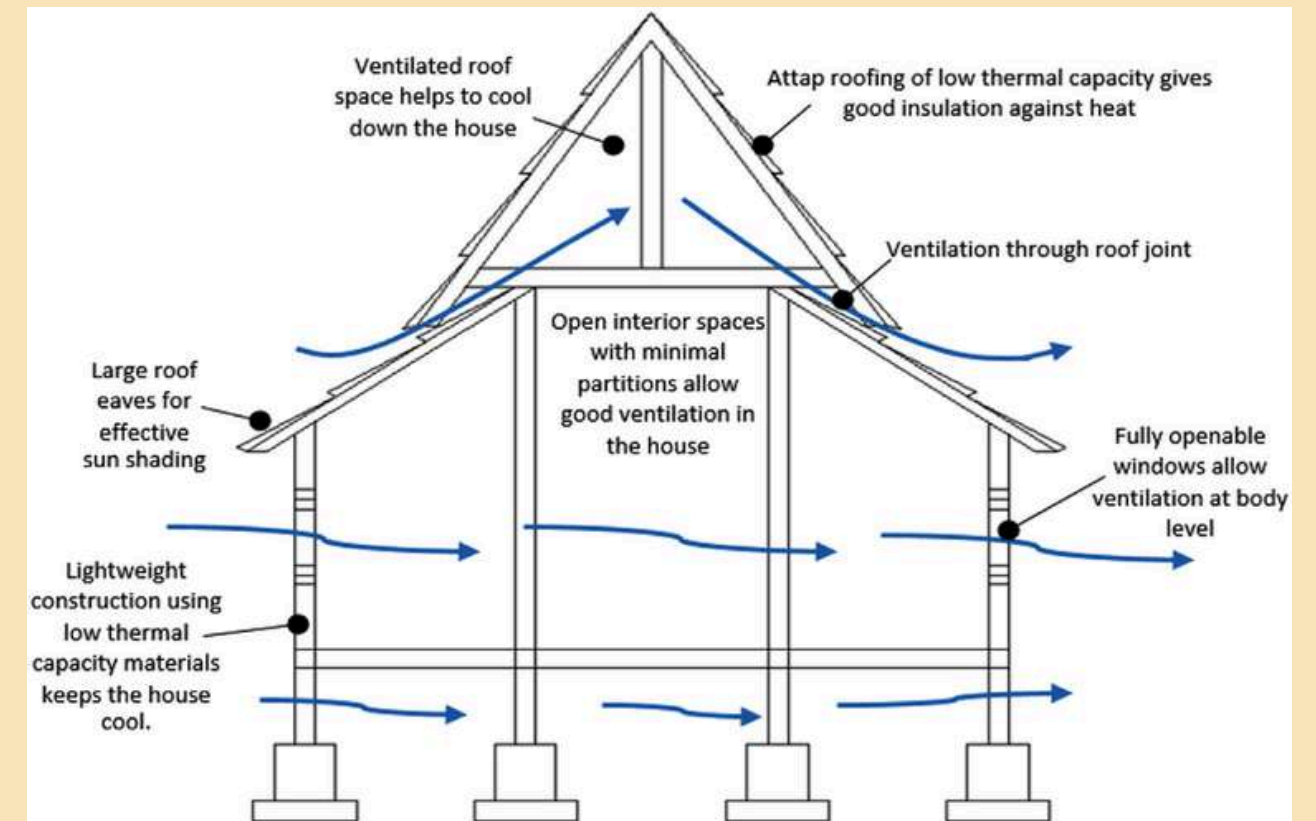
These floor plans have been marked to show how the spaces emphasize openness through doors, windows, and perforated walls.



# 5.3 Natural Ventilation - Spaces

Taking inspiration from traditional Malay architecture, this building design employs the use of various natural ventilation strategies.

- Raised floors on stilts
- Fully openable windows
- High ventilated roofs
- Large roof eaves

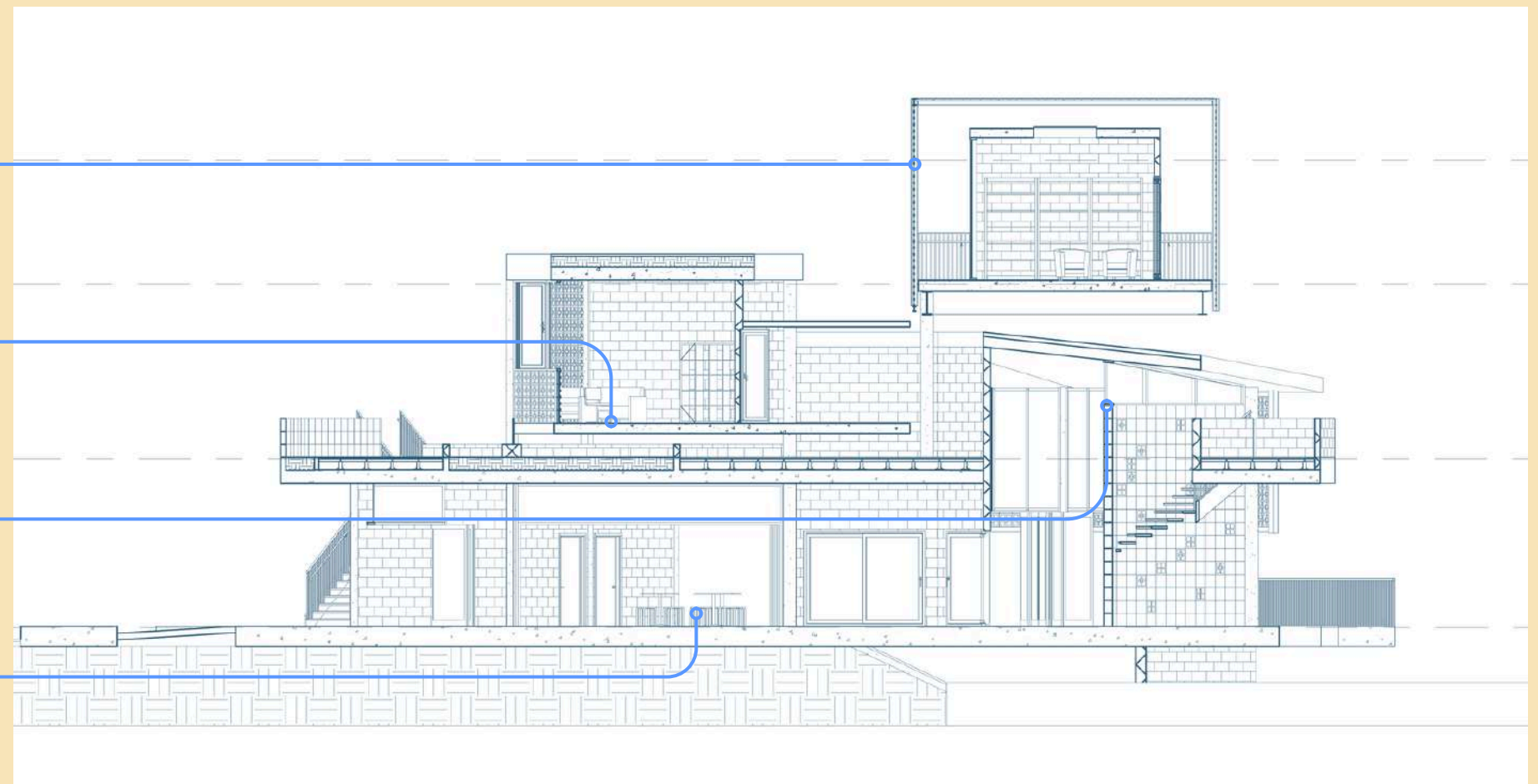


**Shaded corridors** surrounding building for ventilation

**Raised floor** above greenery to help with ventilation, thermal comfort, and moisture control

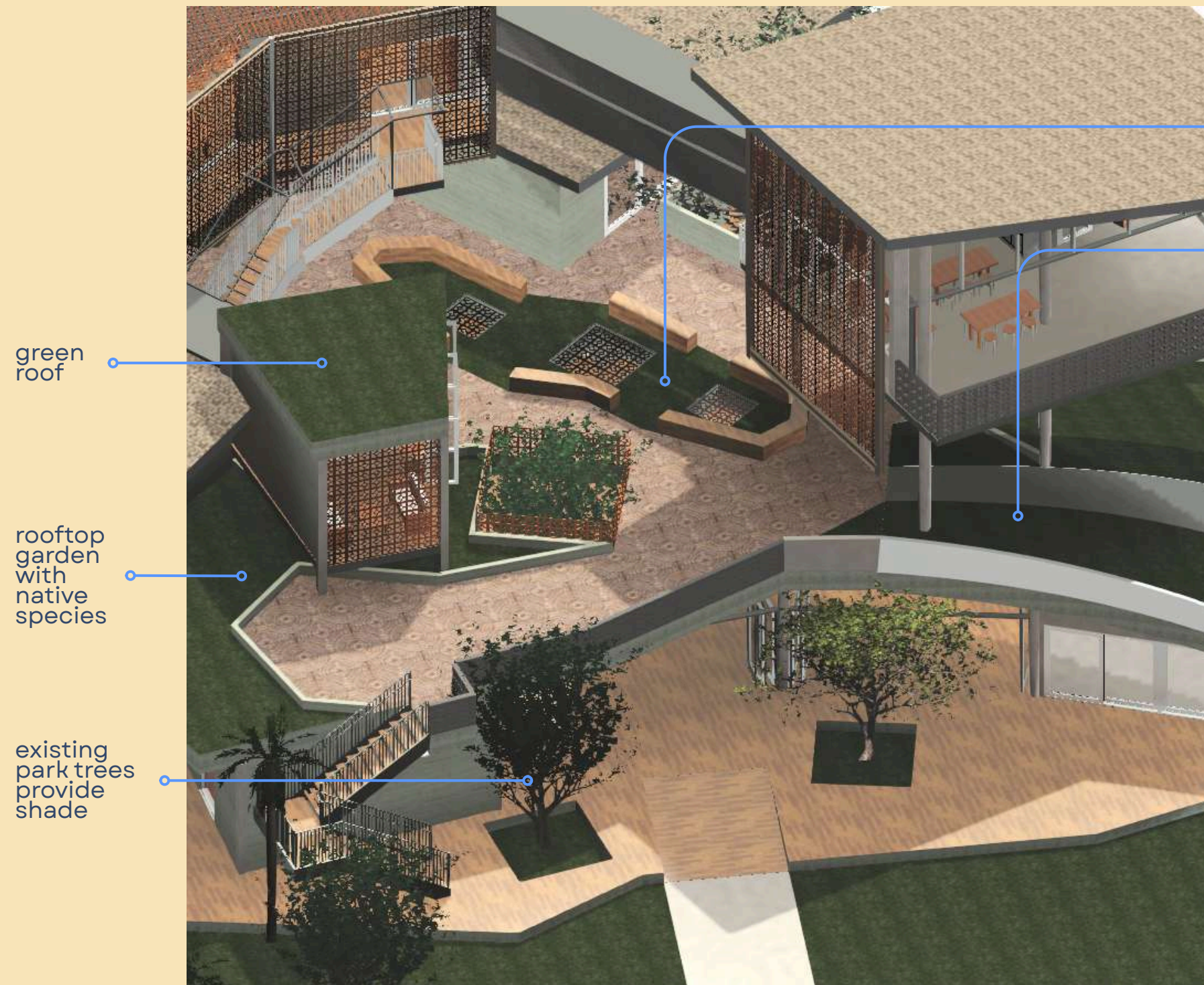
**Double-volume space** with openable clerestory windows

Large interior spaces with **minimal partitions**





# 6.0 Strategic Landscaping



green roof

rooftop garden with native species

existing park trees provide shade

This building was designed to encourage visitors to appreciate nature by making it the focus of different spaces.

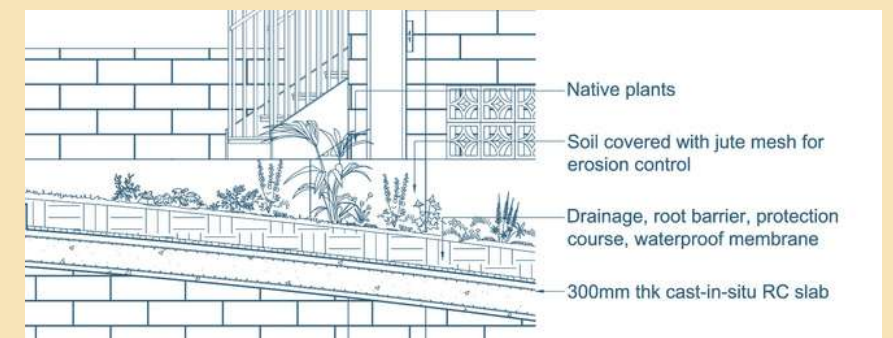
seating around green spaces

sloped green wall/roof accessible to visitors.

Additionally, incorporating verticality into the landscaping allows the greenery to be seen from even outside the park.



◀ North elevation, view from Persiaran Wawasan



Native plants

Soil covered with jute mesh for erosion control

Drainage, root barrier, protection course, waterproof membrane

300mm thk cast-in-situ RC slab

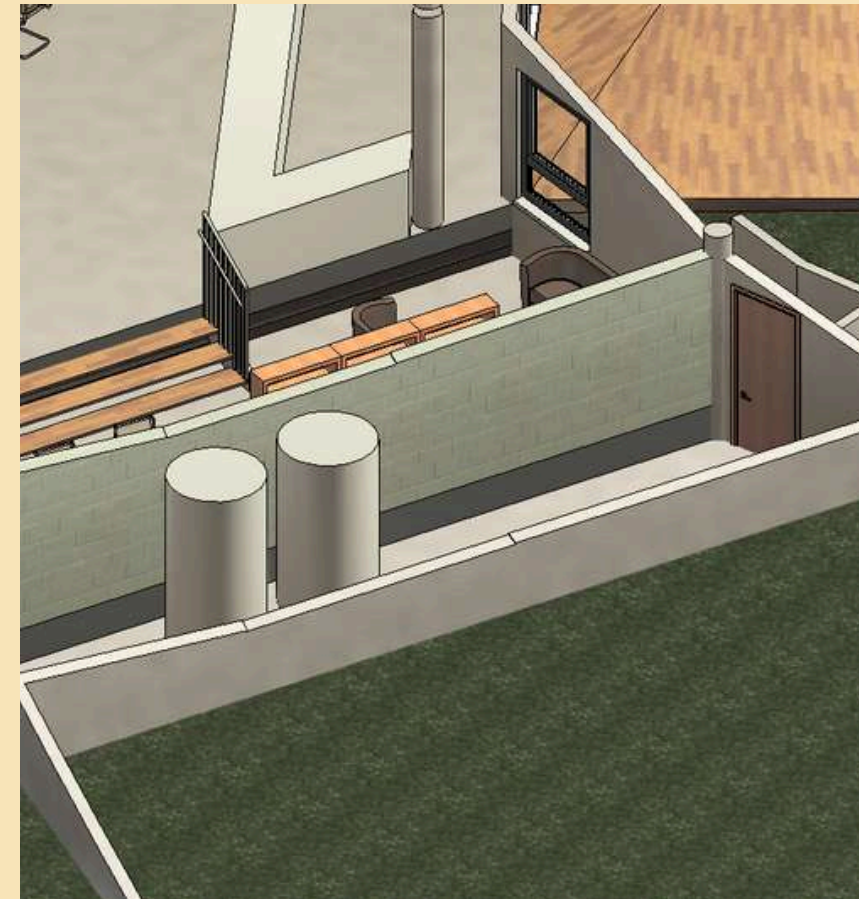


## 7.0 Other Features



### Solar panels

Photovoltaic panels take advantage of the pitched roofs exposure to daylight throughout the day.

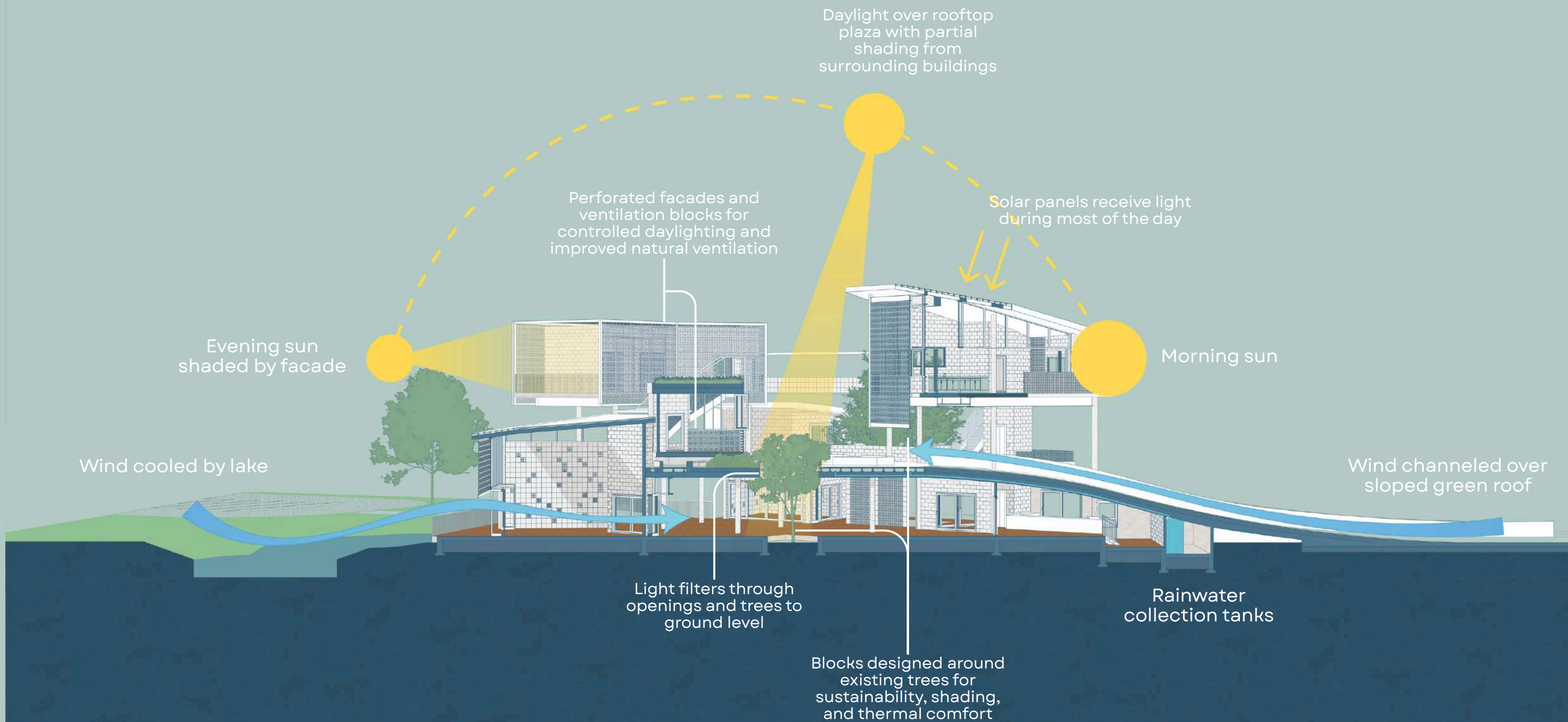


### Rainwater collection

Drainage systems under the rooftop plaza bring water to tanks under the sloped green roof



## 8.0 Sectional Diagram





# References

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