TAYLOR'S UNIVERSITY

Wisdom • Integrity • Excellence

|ARCHITECTURAL DESIGN PROJECT|
ENVIRONMENTAL & TECHNOLOGY REPORT

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1.0 PROJECT INTRODUCTION

The selected site located at jalan ampang, sandwiched between the bukit nanas forest reserve and klang river. It is a strategic location as it is very accessible,bus stops are all around and dang wangi lrt station is in a stone throw's distance.

Base on the demographic studies, the therapeutic performing arts centre aims to tagret cityfolks living around: office workers, students and nearby residences.

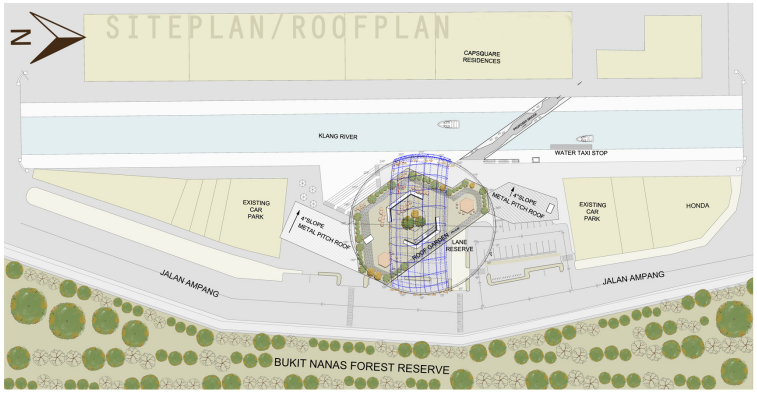
There will be a proposed link bridge connecting the site and the 37 storeys capsquare residence right behind the therapeutic performing arts centre. Since the government is implementing the 'river of life' project along klang river, there will be a water taxi stop in the selected site as well to bring in visitors.

Respond to the site context and demographic studies, the objective is to create a place for recreation and relaxation for the cityfolks.

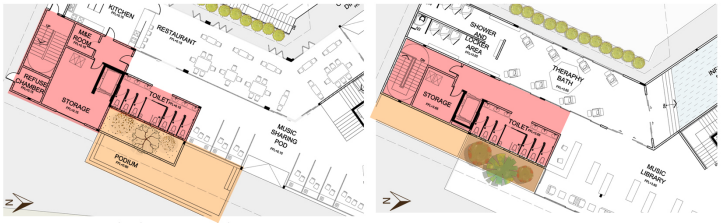
Existing buildings are backing the river, might cause water polution as lack of public surveillance

tall buildings behind the site are able to shade the centre

2.0 ORIENTATION



As the high altitude of sun during most of the year in hot humid region like Malaysia, west and south facades are harder to shade, therefore the building is designed to face along **NORTH-EAST** orientation.



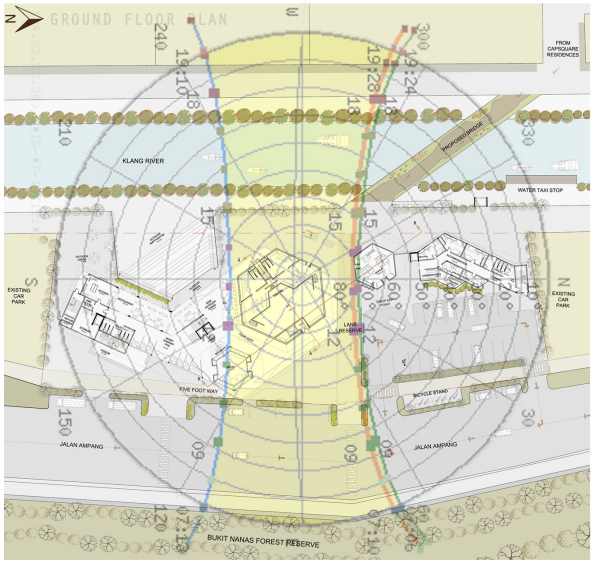
GROUND FLOOR FIRST FLOOR

As shown on the diagrams above, the service zones (toilet, storage) are place at the outer portion of the building to avoid direct sunlight enter to main activity zones.

There are also podium with greeneries serve as buffer zone for light to enter the indoor spaces.

Beside the large overhangs, the protruding upper floors naturally shaded the lower floor main entrance as well.

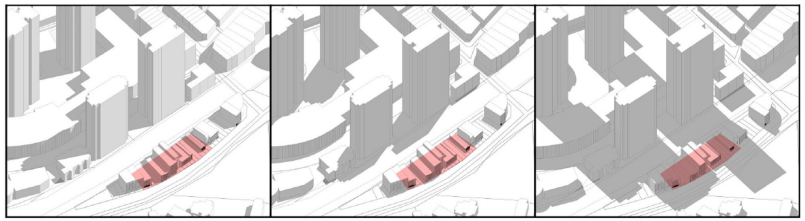
3.0 SOLAR ANALYSIS



Sun path
- Today
- June solstice
- December solstice
- Annual variation
- Equinox (March and September)

Sunrise/sunset
- Sunrise
- Sunset

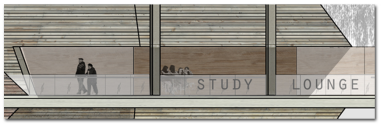
Time
- 00-02
- 03-05
- 06-08
- 09-11
- 12-14
- 15-17
- 18-20
- 21-23



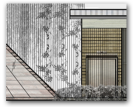
22th June 10am | 22th June 12pm | 22th June 3pm

As shown in the sunpath diagrams, the selected site is shaded most of the time (except morning)by the 37th storeys capsquare residence, hence outdoor activities are encouraged to carry out **during afternoon or late noon.**

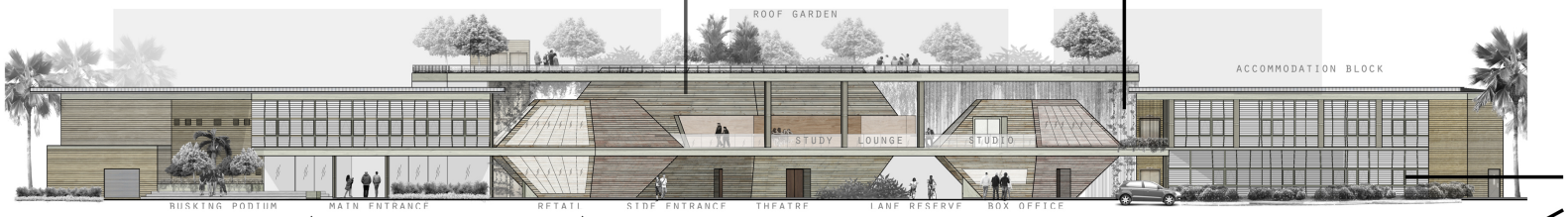
Although most of the **west facade** has **large openings or curtain wall**, the shadow casted by the **tall buildings has blocked most of the western sunlight from entering the west facade.** Furthermore, the overhanging of rooftop garden has also provide shade for most of the building. **Trees and vegetation** are planted all around the buildings for shading purpose. **Creepers filter the sunlight** that enter into the building, giving an intersting light and shadow experience at the same time provide partially enclosure to the space.



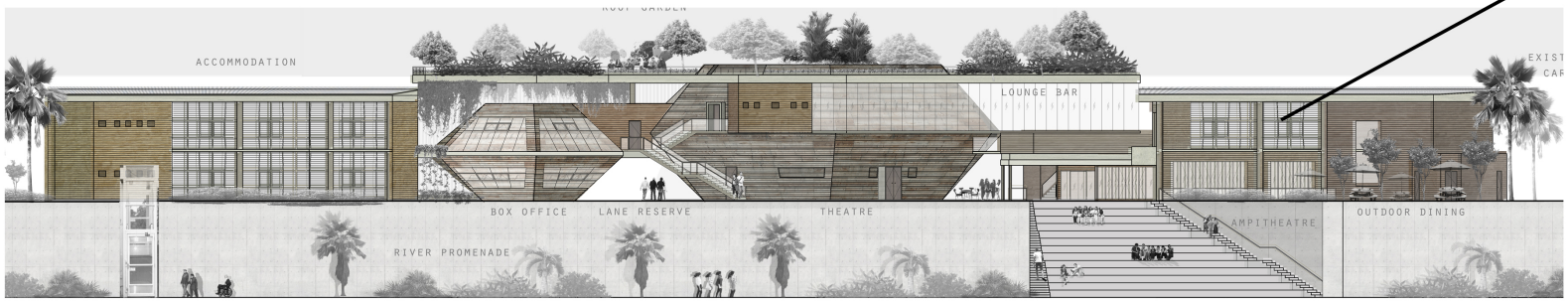
LARGE OVERHANGS SHADE THE INTERIOR SPACES



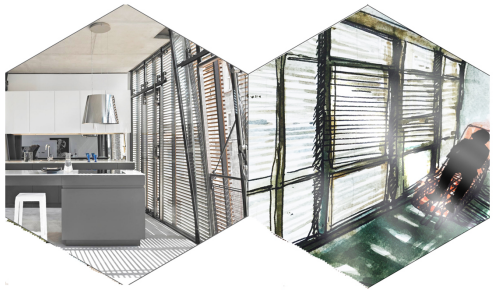
CREEPERS PARTIALLY ENCLOSE THE BUILDING, ENCOURAGE USERS TO INTERACT WITH NATURE AND MAINTAINING THE OUTDOOR ATMOSPHERE. IT HELPS TO FILTER DIRECT SUNLIGHT ENTERS TO BUILDING.



STREETFRONT ELEVATION (NORTH EAST ELEVATION)

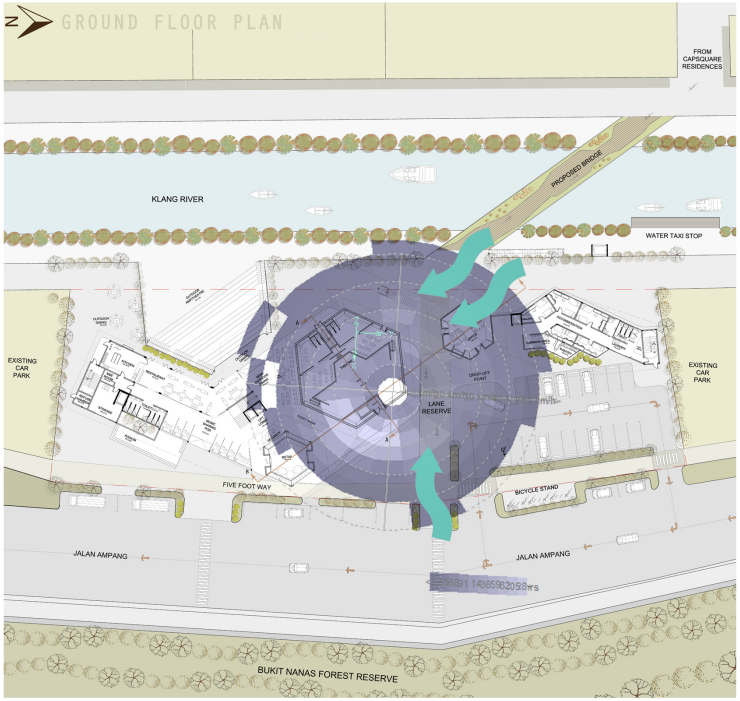


RIVER FRONT ELEVATION (SOUTH WEST ELEVATION)

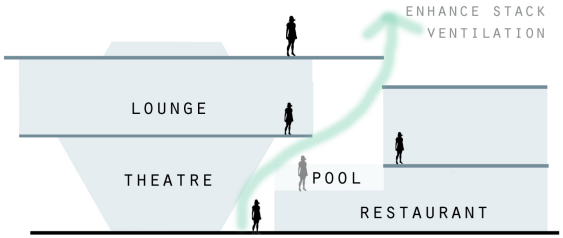


TIMBER LOUVER SCREENING AS FACADE HAS SUCCESSFULLY REDUCE LARGE AMOUNT OF DIRECT SUNLIGHT BY FILTERING IT. IT IS INSTALLED IN ACCOMMODATION BLOCK AND MUSIC SPA, ENABLING THE USERS TO APPRECIATE VIEWS AT THE SAME TIME PROVIDING PRIVACY.

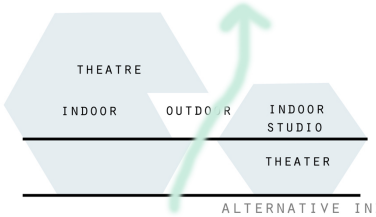
4.0 WIND ANALYSIS



PREVAILING WIND



VOLUMETRIC EXPERIENCE



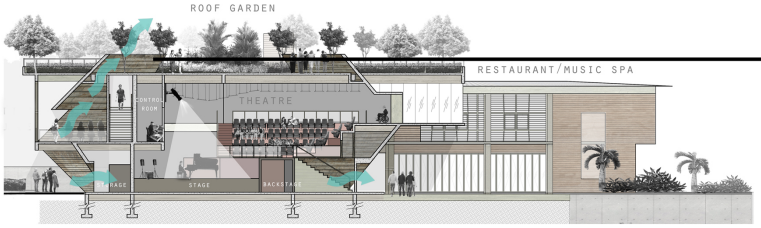
ALTERNATIVE INDOOR & OUTDOOR

According to windrose diagram, the prevailing wind come from **NORTHWEST** and **EAST** direction. Hence, **LARGE OPENINGS** are made larger at the following spots to maximize ventilation.

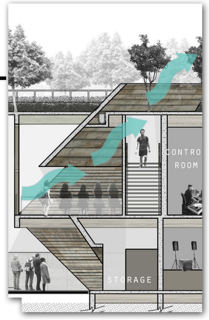
There are a lot of **OPEN SPACES/ SEMI OPEN SPACES** in the building. Wind is easily induced from outdoor to indoor spaces as there are **NOT MUCH ENCLOSURE.** The voids between inclined wall and vertical wall are filled with creepers to serve as partial enclosure. Therefore this allows the building to be sufficiently natural ventilated.

Besides that, there are different volumentric experience in the spaces, with **TRIPLE VOLUME VOID**, that **ENCOURAGES STACK VENTILATION**. Approximately **30%** of the spaces in the building are **NATURALLY VENTILATED**, this has **INCREASE THE ENERGY EFFICIENCY** of the building at the same time **IMPROVED INDOOR'S AIR QUALITY.**

OPENABLE TIMBER LOUVER SCREENS as facade has enhance the ventilation too, providing an **OPTIMUM INDOOR AIR QUALITY** to the users. Due to the spaces are well ventilated, humidity problem from the river shall not be an issue and **THERMAL COMFORT CAN BE ACHIEVED.**

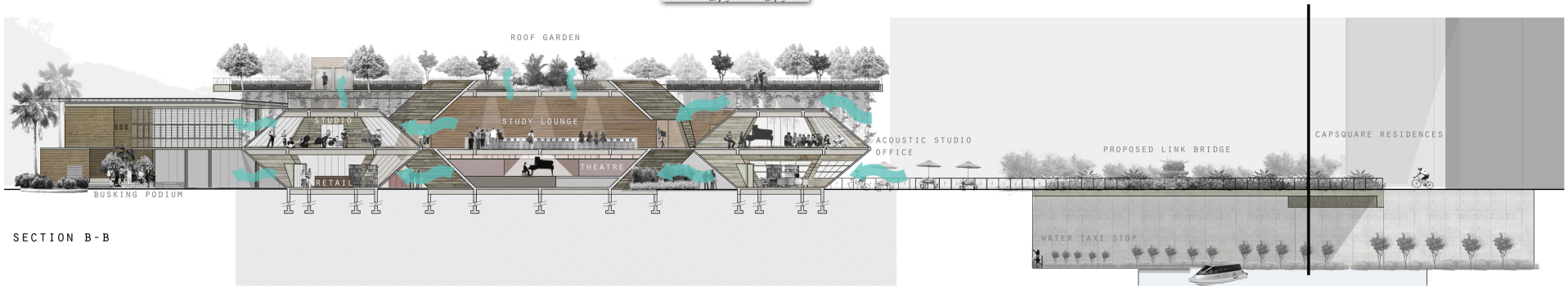


SECTION A-A



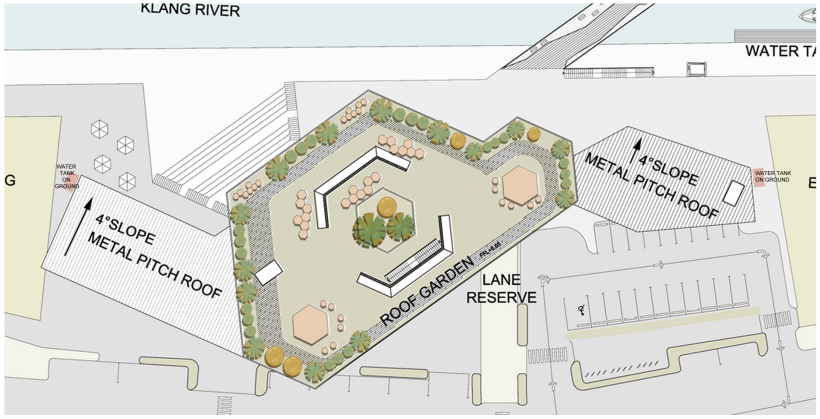
The inclined wall shaped the wind direction towards opening, allow stack ventilation to happen

Evaporation of river has lowered the temperature of waterfront. Humidity problem is not an issue as the building is well ventilated.



SECTION B-B

5.0 GREEN ROOF AND RAINWATER HARVESTING SYSTEM



WATER TANK ON GROUND

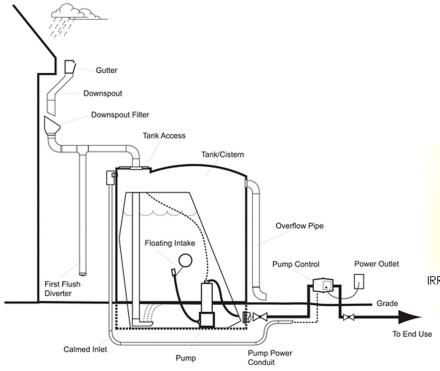
RAINWATER HARVESTING IS A PROCESS OF COLLECTING AND STORING RAINWATER THAT FALLS ON A CATCHMENT SURFACE FOR USE, INDEPENDENT FROM MAIN WATER SUPPLY. THIS **REDUCES DEMAND ON MAIN SUPPLY**,OFFERS SOME RESILIENCE FROM LOCAL SUPPLY PROBLEM AND REDUCES THE AMOUNT OF ENERGY USED FOR WATER TREATMENT AND TRANSPORTATION,HENCE **INCREASING WATER EFFICIENCY.** COLLECTION AND DIVERSION OF SURFACE RUN-OFF ABLE TO **MITIGATE FLOOD RISK** AND **CONTROL DRAINAGE AS PART OF A SUSTAINABLE DRAINAGE SYSTEM.**

HOWEVER,RAINWATER COLLECTED FROM GREEN ROOF IS AN ALTERNATIVE WATER TECHNOLOGY, THE **SUBSTRATES ARE MORE RAINWATER HARVESTING FRIENDLY** THAN OTHERS. THE RAINWATER COLLECTED FROM GREEN ROOF ARE USED FOR **IRRIGATION PURPOSE** FOR ROOFTOP GARDEN ITSELF WHEREAS THE OTHER ARE COLLECTED FOR IRRIGATION PURPOSE FOR GROUND FLOOR VEGETATION.

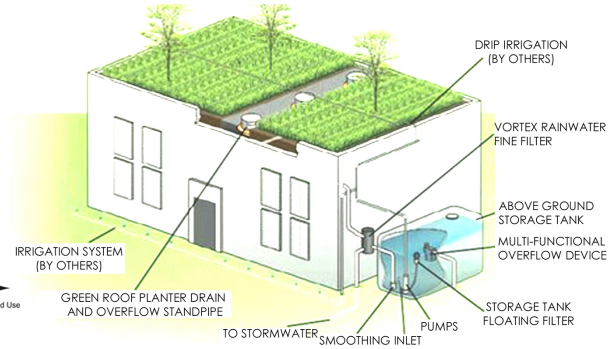
ESTIMATION OF RAINWATER YIELDED PER YEAR
= ROOF AREA X AVERAGE ANUAL RAINFALL
= 2200M2 X 280MM
= 616,000 L/YEAR

AS SHOWN IN ESTIMATION ABOVE, A SIGNIFICANT AMOUNT OF WATER CAN BE SAVED FROM RAINWATER HARVESTING. THE BUILDING AIMS TO CREATE A SUSTAINABLE AND ENVIRONMENT FRIENDLY VENUE FOR PEOPLE TO ENJOY MUSIC.

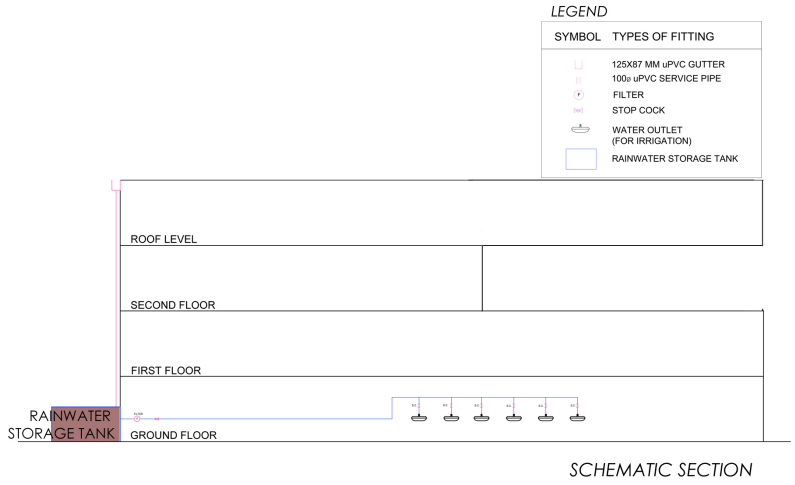
GUTTERS TO PREVENT WATER RETENTION



RAINWATER STORAGE TANK ABOVE GROUND



GREEN ROOF WITH RAINWATER HARVESTING AND DRIP IRRIGATION SYSTEM



SCHEMATIC SECTION

THE SCHEMATIC DIAGRAM ABOVE SHOWED THE RAINWATER HARVEST FROM THE ROOF TRAVELS TO STORAGE TANK ABOVE GROUND AND EVENTUALLY DELIVERS TO WATER OUTLET FOR IRRIGARION PURPOSE FOR GROUND FLOOR VEGETATION.