

SUSTAINABLE BUILDING: DESIGN CONCEPT FOR A FOUR STORY

Chantelle Ieremia Paletasala Faolotoi, SUCON Consultancy Ltd

ABSTRACT

This paper qualifies as a Architectural, Engineering Design and Concept. This concept formatted in the form of a PowerPoint presentation provides concept drawings and plans for a sustainable four (4) storey building that was intended to be submitted for consideration for construction. Unfortunately, the project was withdrawn and scrapped by the Government of Samoa in 2018. As the concept had already been developed, the concept has now been shared as knowledge sharing material to inspire similar developments.



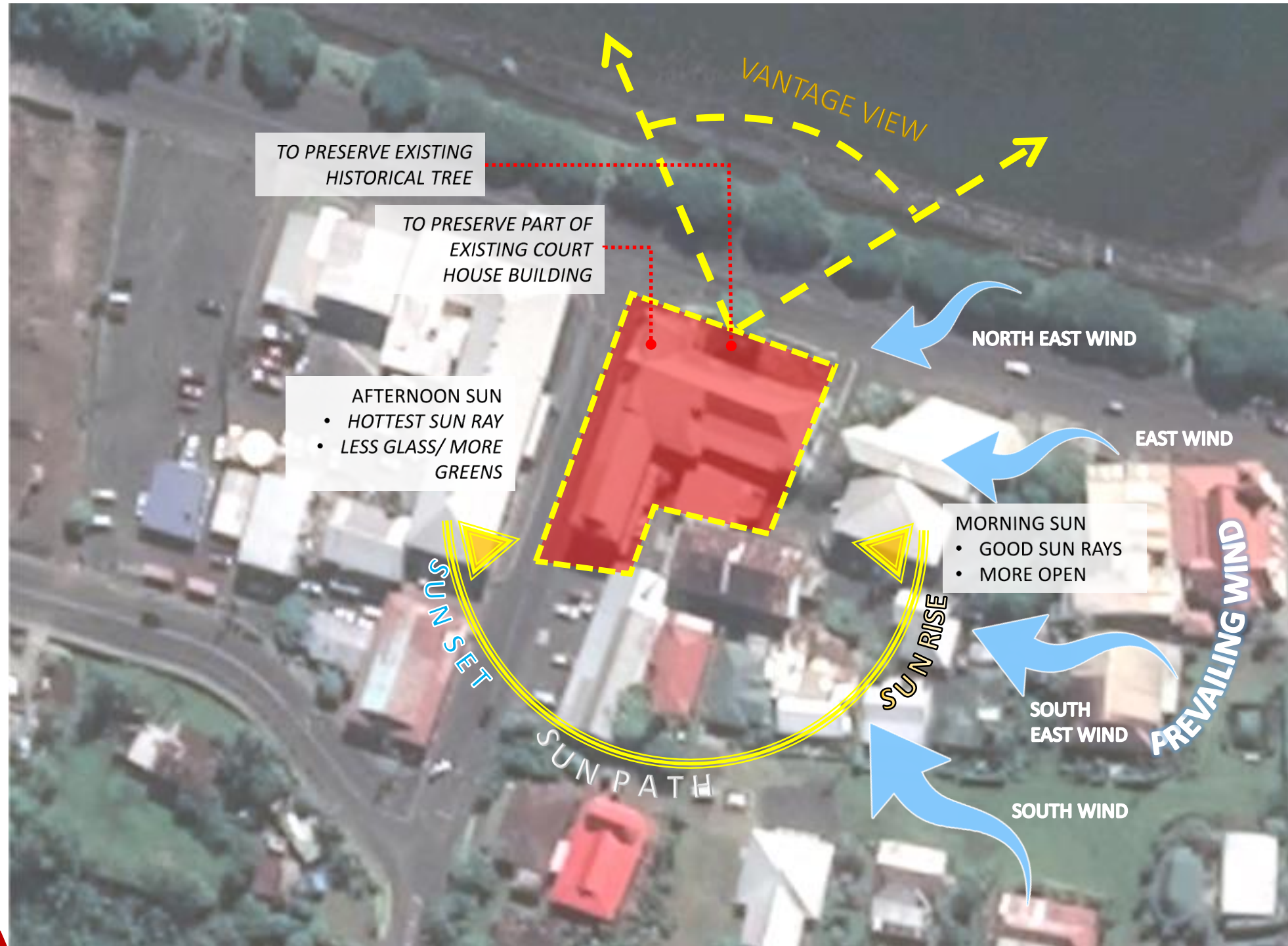
OUR TARGET DESIGN OBJECTIVES

01

- Modern Design
- Innovative/Forward Looking
- Inspiring/Futuristic
- Dynamic & Technologically Advanced
- Reflects Economically Vibrant Image of Samoa
- Should have Sufficient Natural Light & Ventilation
- Should Reflect Enduring Values of Organization
- Finishes Should cater Long Term Maintenance
- Follows “PUMA” Statutory Requirement
- ECO Friendly & Climate Change Resilient



1.1 SITE ANALYSIS & DESIGN STUDY



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NOTE:
REFER TO APPENDIX FOR STUDY REFERECES



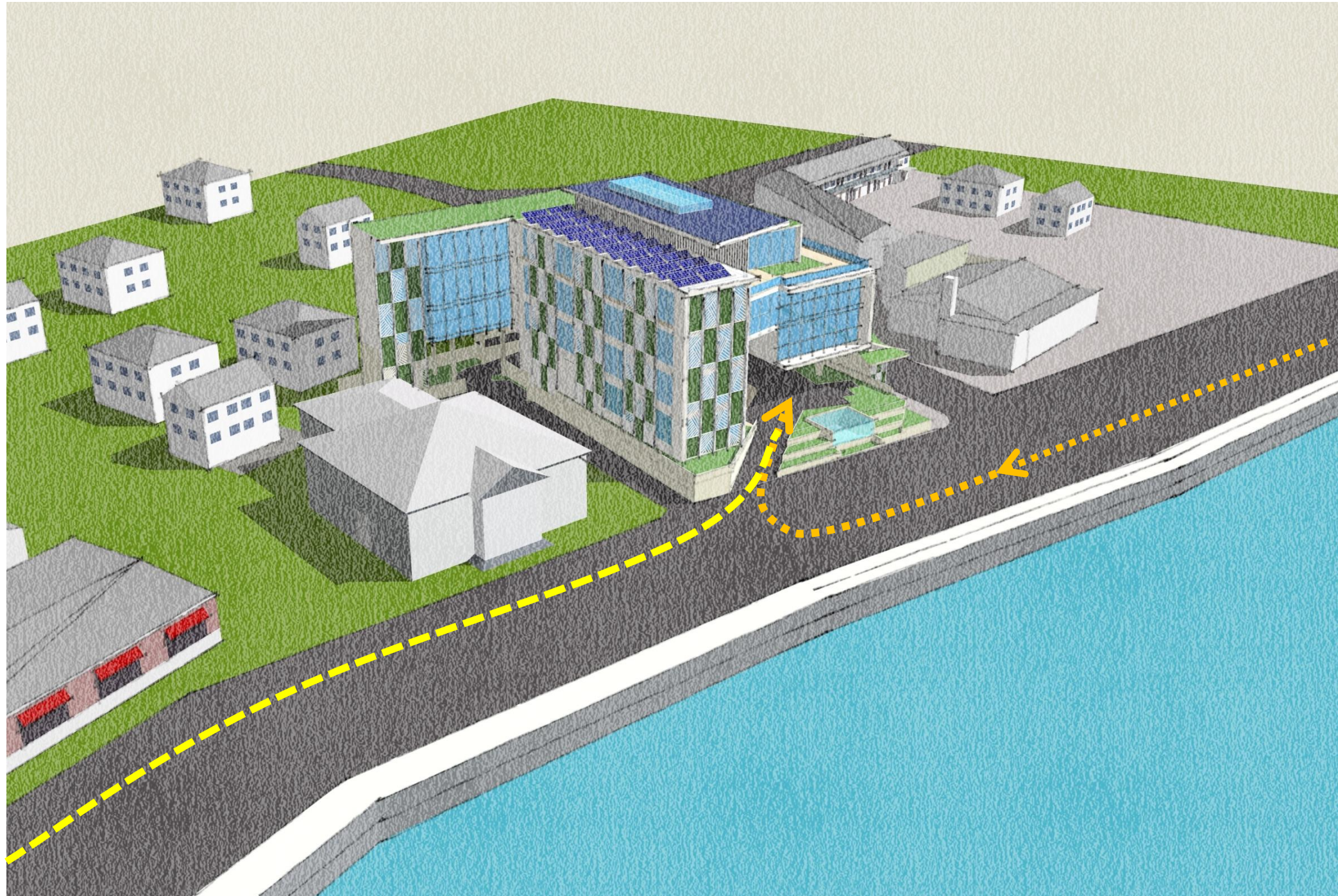
02

COMPETITION ENTRY

- Design Concept
 - Visual sketches & Study
 - Design Narrative
 - Plan
 - Sections/Elevations
 - Perspective & Walkthru Experience
- Cost Estimate



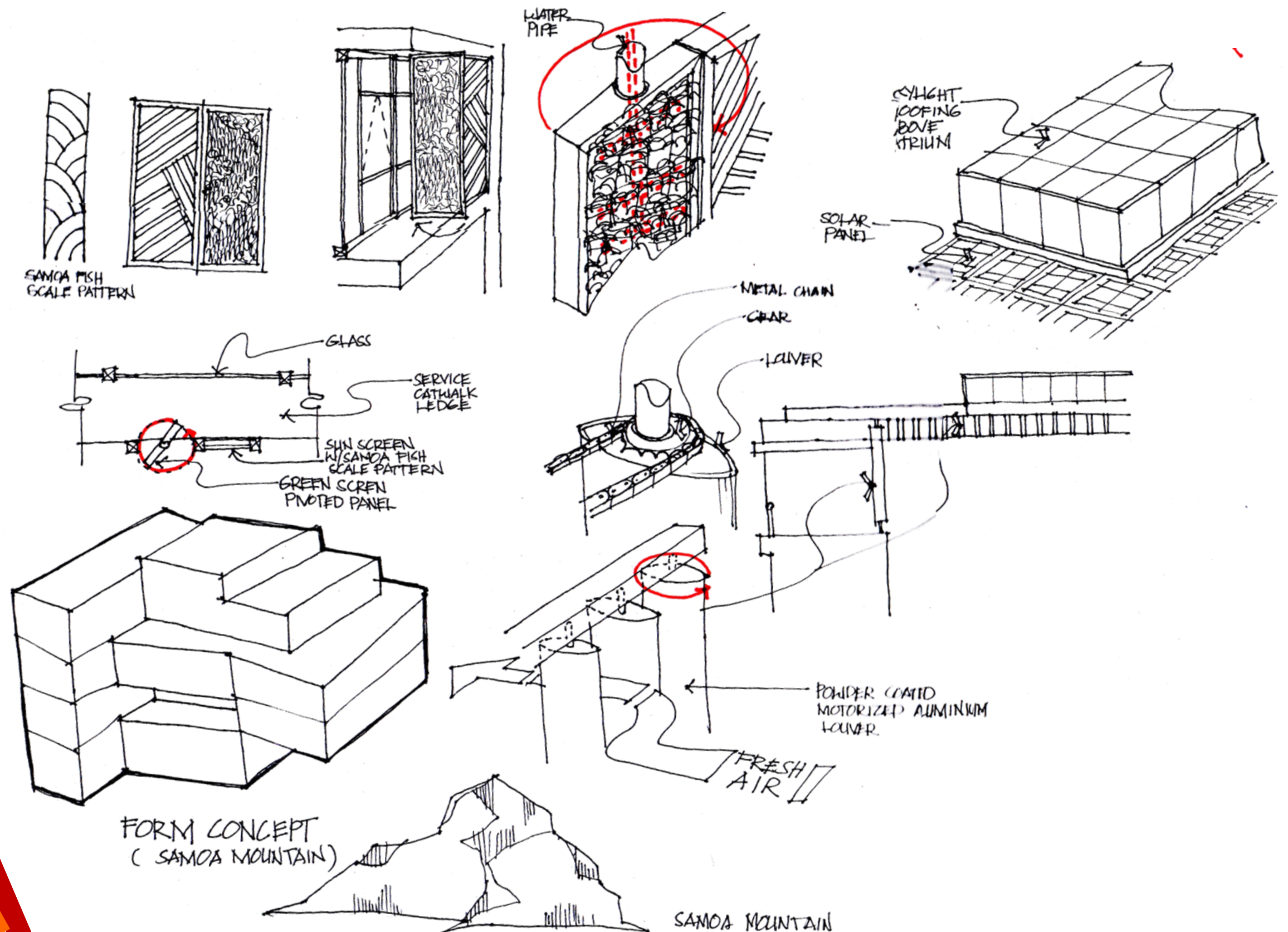
2.1 TRAFFIC ROUTE & ACCESS



TRAFFIC PATH



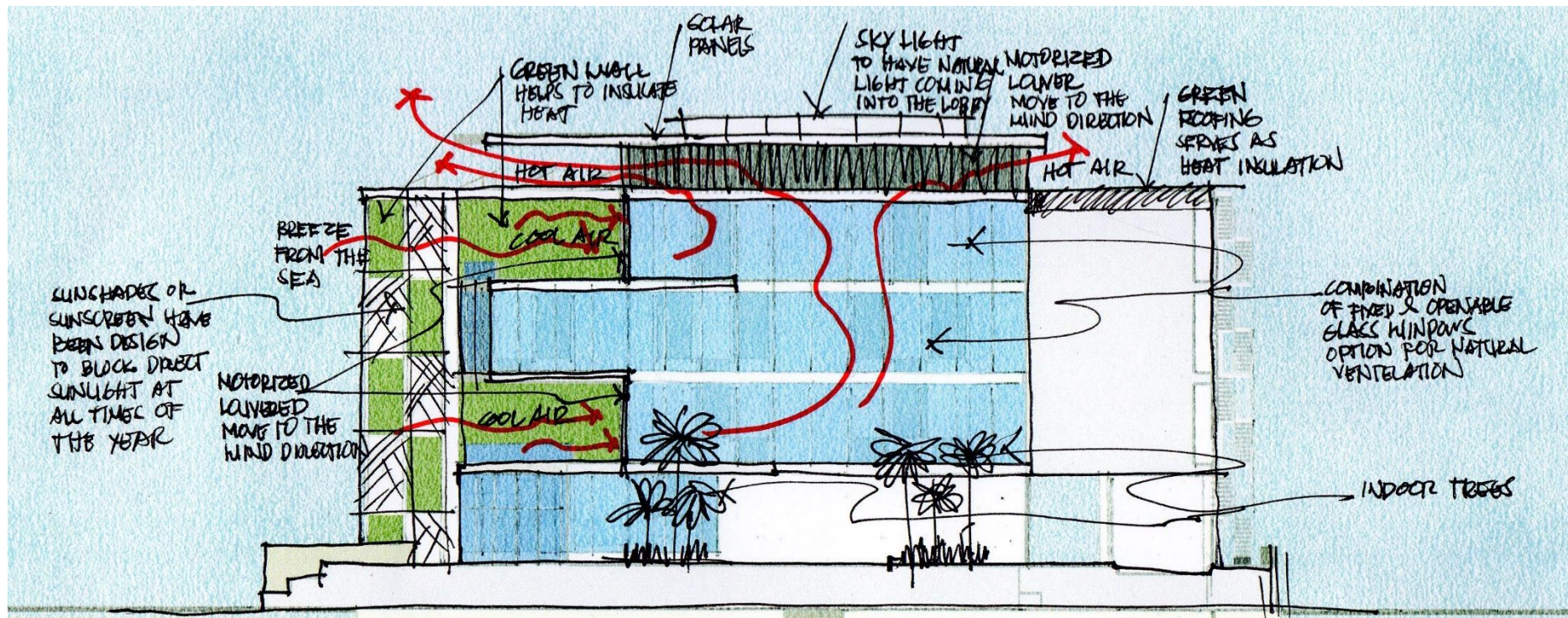
2.2 VISUAL SKETCHES & STUDY



03 DESIGN NARRATIVE

MODERNIZED CULTURE BASED DESIGN PRINCIPLE

Our Design Concept proposal incorporates Samoan Architecture openness character of the building and Samoan Culture-(proverbs, oratory and metaphors, as well as art forms in Samoa, such as symbols & tattooing.)



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8. Finishes Should cater Long Term Maintenance
9. Follows "PUMA" Statutory Requirement (Refer to Appendix)
10. ECO Friendly & Climate Change Resilient

DESIGN CONCEPT REFLECTING THE ORGANIZATION VALUE

Monitoring	Protecting	Promoting	Recommending	Developing	Cooperating
<p>The design concept by used Full Glass Windows which provides visual on the surrounding, aside from this, the full height glass windows also adopts the openness character of the Samoan Architecture</p>	<p>The elevated Ground Floor (Upper Ground Floor), provides adequate Security to the perimeter and answers the sea level rise in the future and by providing a screen which is similar to "Pola" (part of Fale Samoa) that give protection from sun, wind and rain</p>	<p>Represented by adopting the Samoan Roots, which is greatly based on Culture such as Tattooing and Symbols. Using the "Fish/Fish Scales" symbol, and Transform it into a modernized form, is suggesting that even the world is changing we still look back to promote their roots.</p>	<p>Our Concept Design Represents and recommends to Embrace Change & Modernization at the same time Treasuring the Past. This was accomplished by proposing a modernized design concept while still preserving a part of the Existing courthouse which is already considered as a Samoa Heritage..</p>	<p>The building itself Represents the Developing Values of the organization, as it is designed in a modern concept Architecture and as it adopts the current regulation of recycling grey water, it also to promote energy conservation, as we have also considered the use of solar Energy harvesting. This also makes the building more sustainable.</p>	<p>Cooperating values was represented by ensuring that the design proposal puts Nature into consideration. It was acheived by saving the existing historical trees and incorporating them as part of the concept design proposal.</p>



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04



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4.1 PROPOSED LOWER GROUND FLOOR PLAN

NOTE: MAIN PURPOSE OF LOWER GROUND FLOOR IS TO MAXIMIZE THE USE OF SPACE. THE UPPER GROUND FLOOR WAS ELEVATED TAKING INTO ACCOUNT THE POSSIBLE SEA LEVEL RISE DUE TO CLIMATE CHANGE
RAMP UP TO UPPER GROUND FLOOR

SERVICE LIFT & STAIR USE AS ACCESS GOING TO UPPER GROUND FLOOR UPON PARKING

M&E/
UTILITY

M&E & TILITY ROOM, TO ACCOMMODATE ELECTRIC POWER SUPPLY & THE HARVESTED SOLAR ENERGY

EXIT 02

ACCESS ROAD (EXISTING)

LOADING/UNLOADING AREA (SERVICES)

RAMP DOWN FROM UPPER GROUND FLOOR TO EXIT 02/ UTILITY AREA

SERVICE LIFT/ STAIR

FIRE EXIT STAIR

41 Nos of Parking Space

RAMP DOWN FROM UPPER GROUND FLOOR TO LOWER GROUND FLOOR

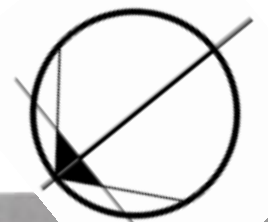
BEACH ROAD (MAIN ROAD)

ACCESS STAIR TO ADMIN OFFICE

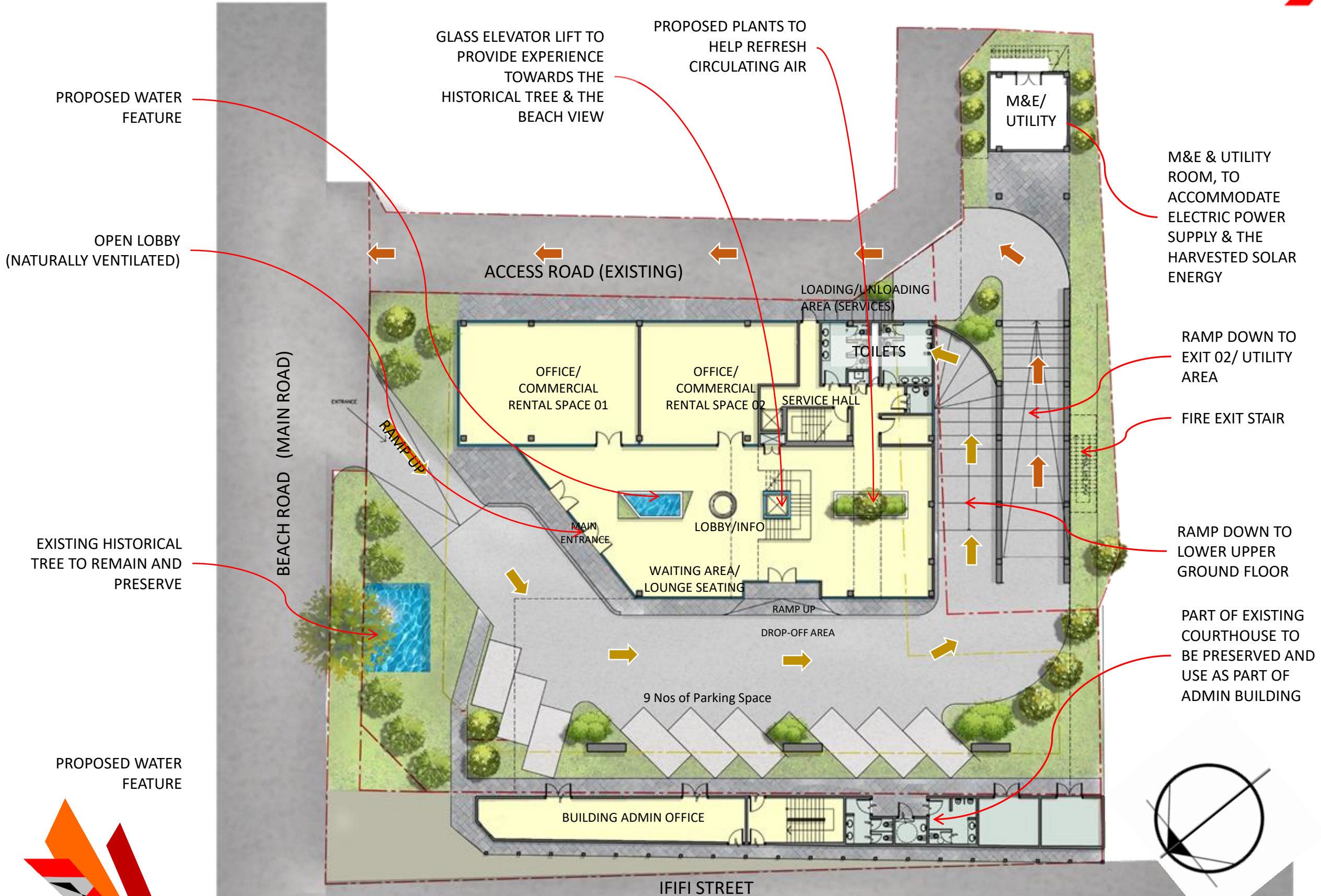
PROPOSED LOCATION FOR GREY WATER HARVESTING STORAGE TO BE USED ON WATERING LANDSCAPE AND GREEN WALL

EXIT 01

IFIFI STREET



4.2 PROPOSED UPPER GROUND FLOOR PLAN



PROPOSED WATER FEATURE

OPEN LOBBY (NATURALLY VENTILATED)

GLASS ELEVATOR LIFT TO PROVIDE EXPERIENCE TOWARDS THE HISTORICAL TREE & THE BEACH VIEW

PROPOSED PLANTS TO HELP REFRESH CIRCULATING AIR

M&E & UTILITY ROOM, TO ACCOMMODATE ELECTRIC POWER SUPPLY & THE HARVESTED SOLAR ENERGY

RAMP DOWN TO EXIT 02/ UTILITY AREA

FIRE EXIT STAIR

RAMP DOWN TO LOWER UPPER GROUND FLOOR

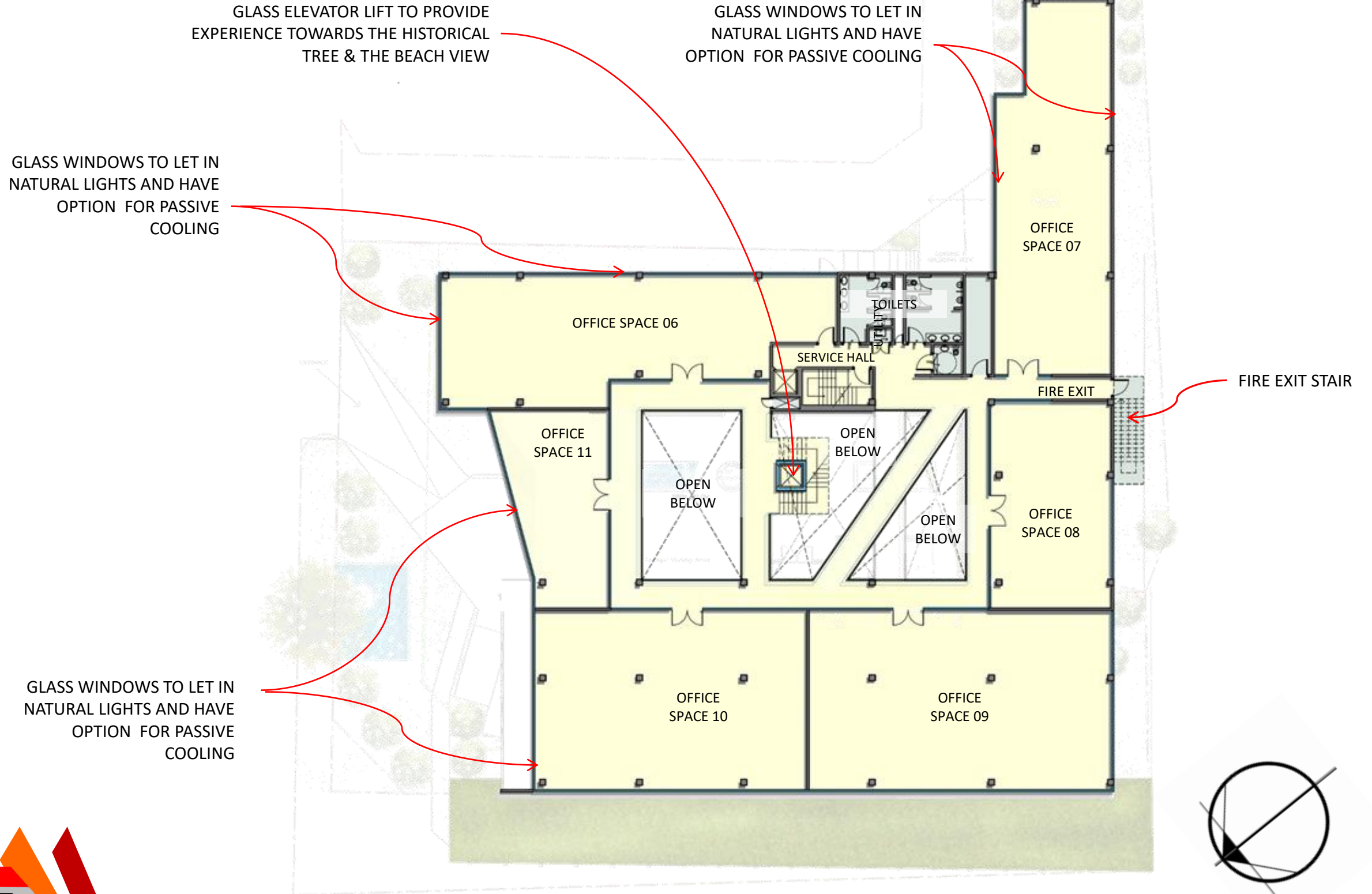
PART OF EXISTING COURTHOUSE TO BE PRESERVED AND USE AS PART OF ADMIN BUILDING

PROPOSED WATER FEATURE

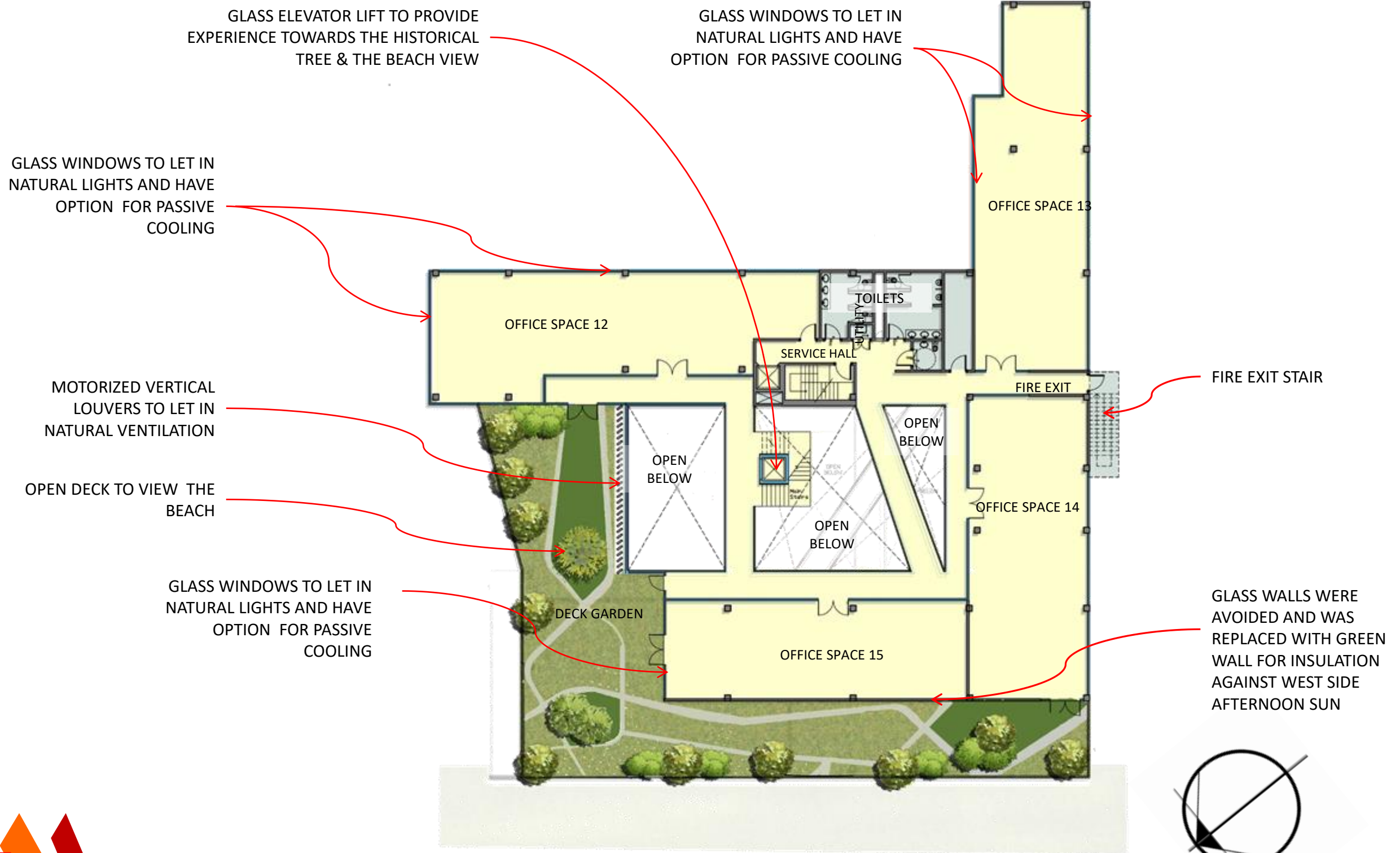
4.3 PROPOSED FIRST FLOOR PLAN



4.4 PROPOSED SECOND FLOOR PLAN

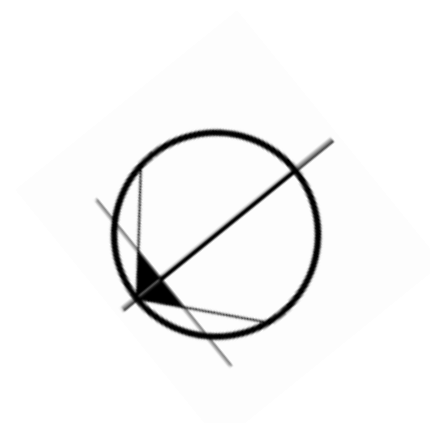
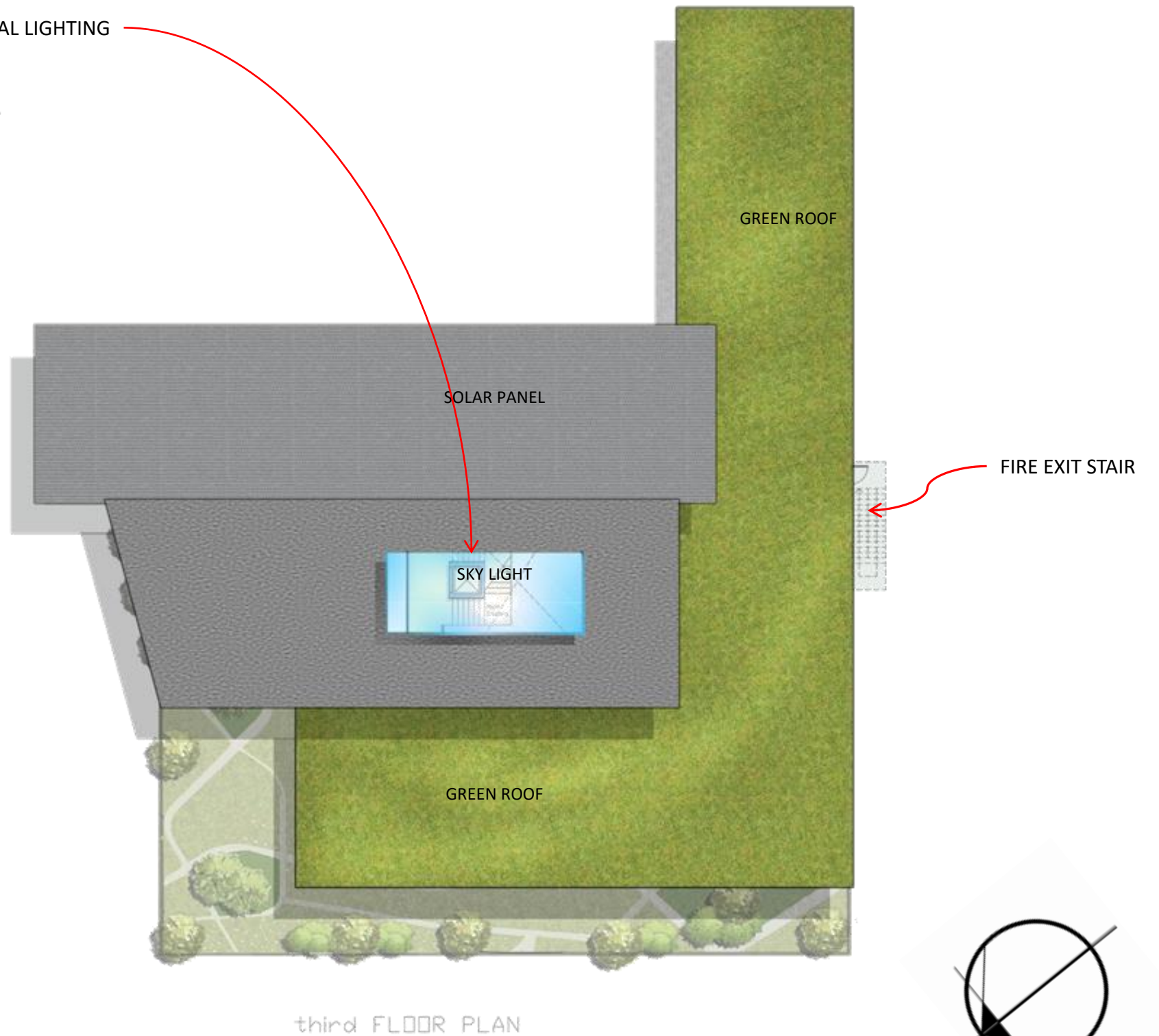


4.5 PROPOSED THIRD FLOOR PLAN



4.6 PROPOSED ROOF PLAN

SKYLIGHT FOR NATURAL LIGHTING



05

SECTIONS & ELEVATIONS



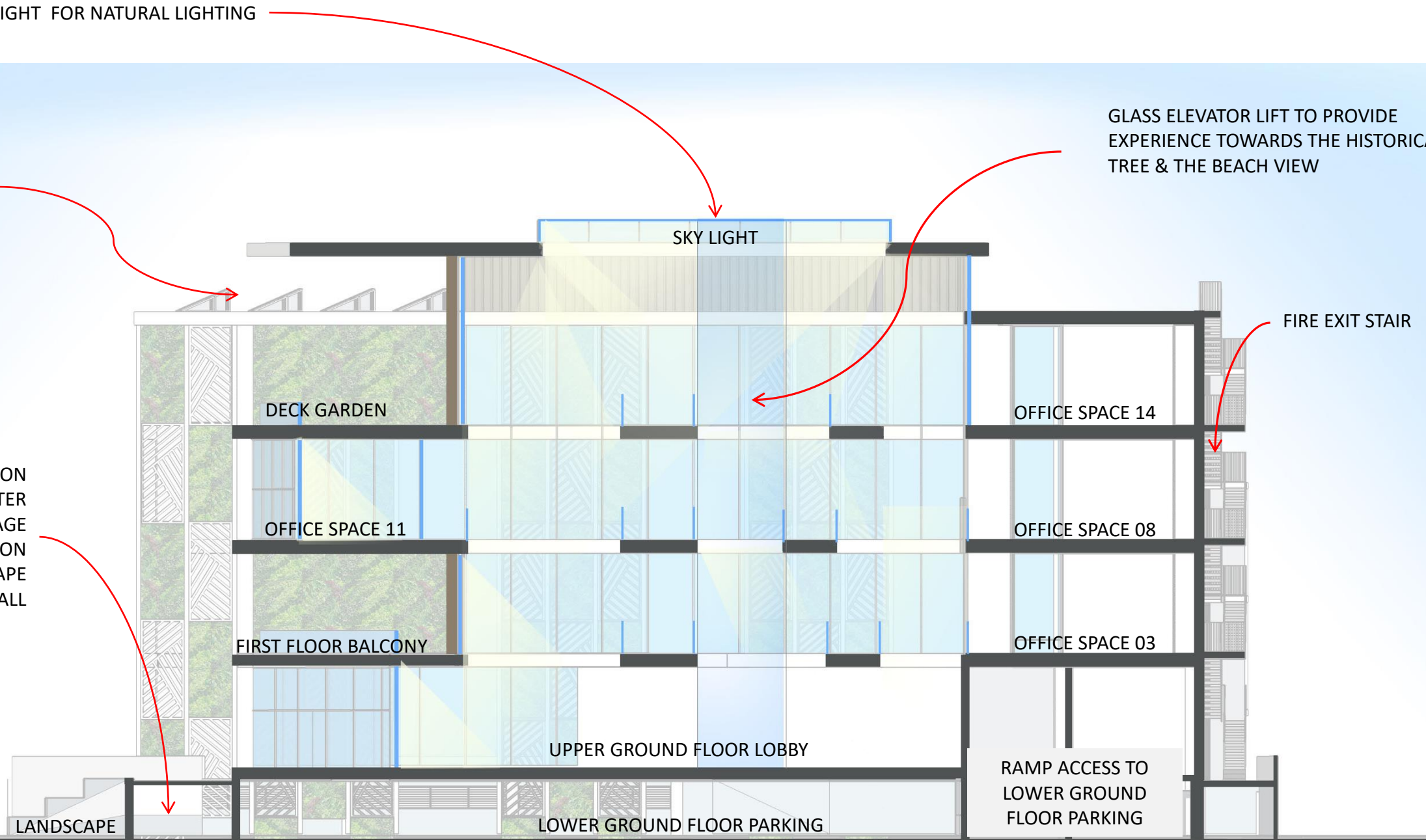
5.1 PROPOSED LONGITUDINAL SECTION

SKYLIGHT FOR NATURAL LIGHTING

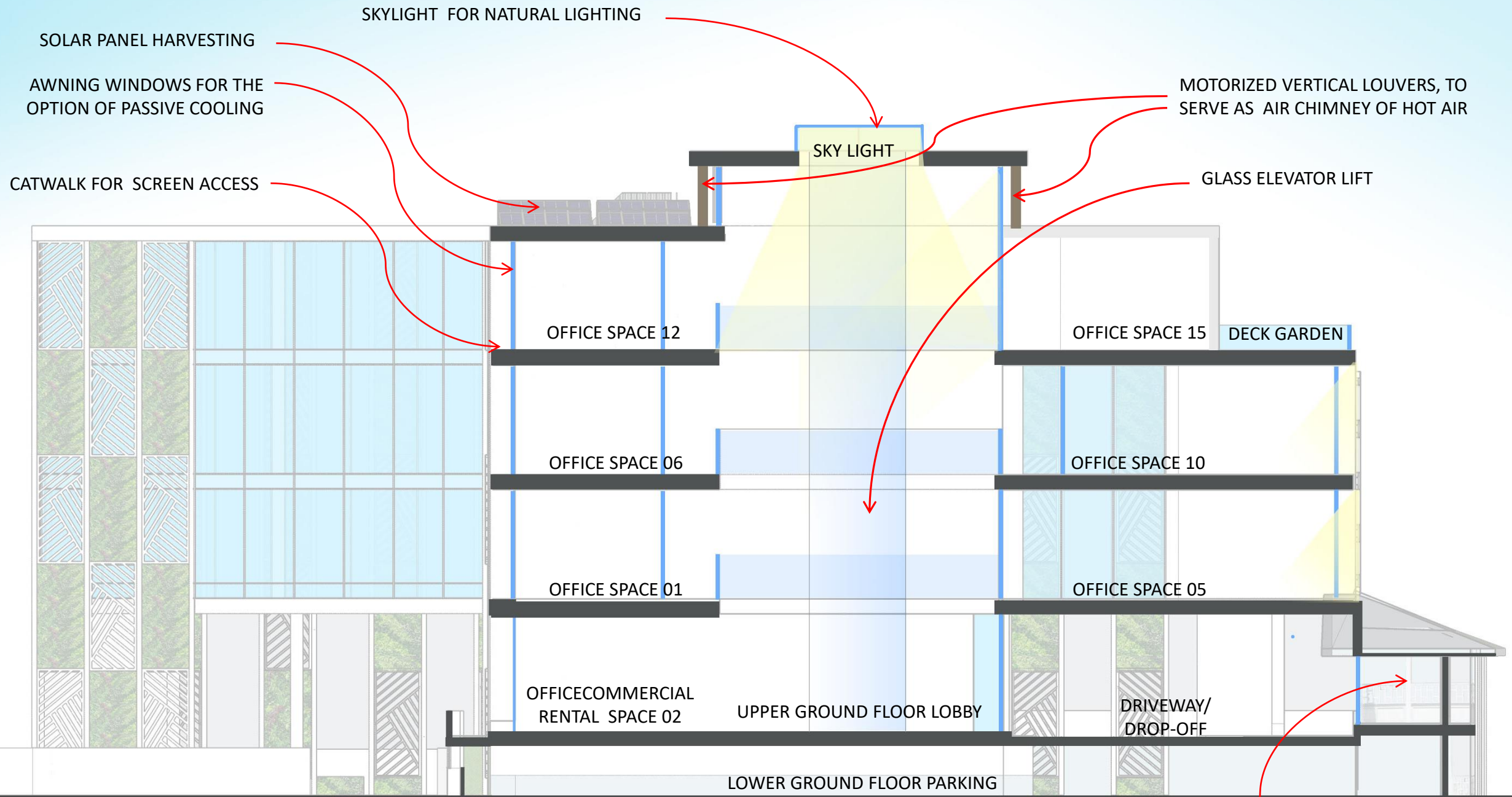
SOLAR PANEL HARVESTING

GLASS ELEVATOR LIFT TO PROVIDE EXPERIENCE TOWARDS THE HISTORICAL TREE & THE BEACH VIEW

PROPOSED LOCATION FOR GREY WATER HARVESTING STORAGE TO BE USED ON WATERING LANDSCAPE AND GREEN WALL



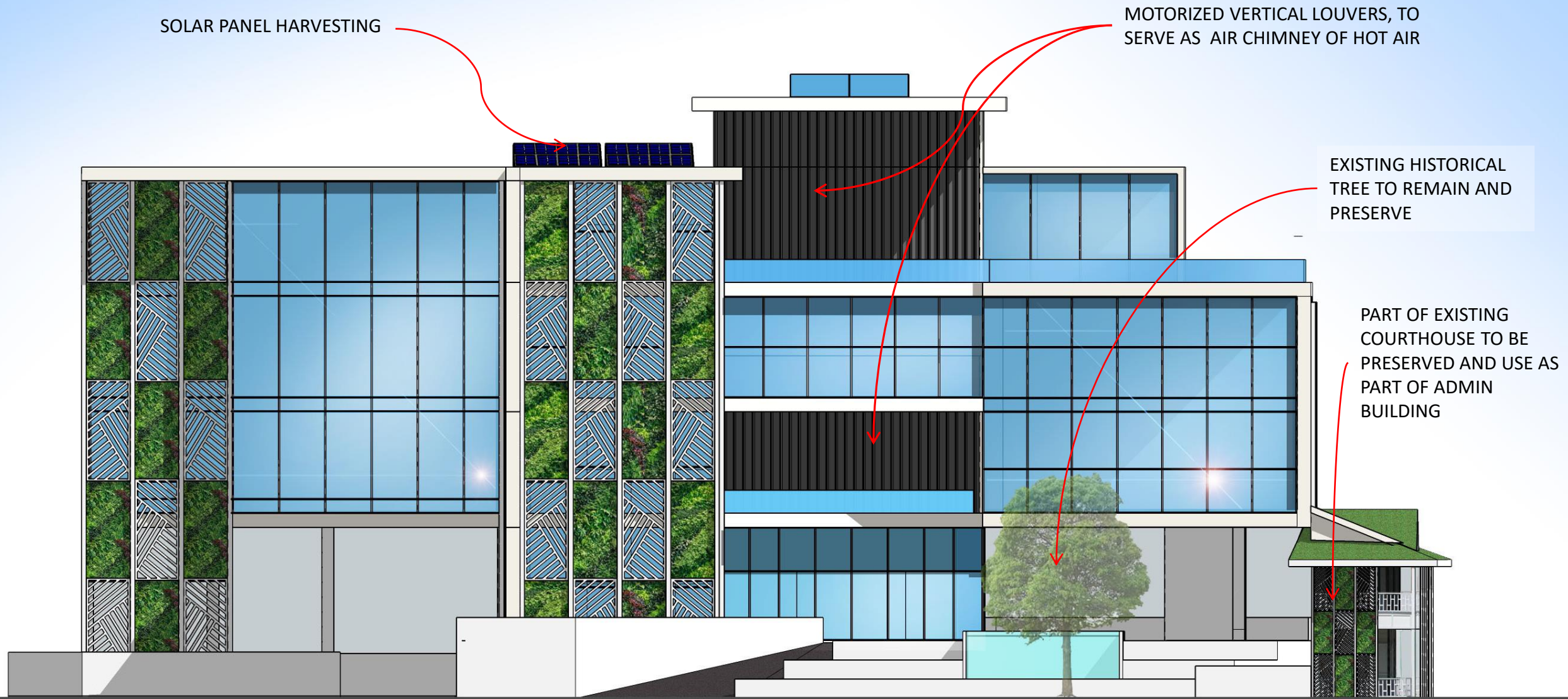
5.2 PROPOSED CROSS SECTION



PART OF EXISTING COURTHOUSE TO BE PRESERVED AND USE AS PART OF ADMIN BUILDING



5.3 PROPOSED FRONT ELEVATION

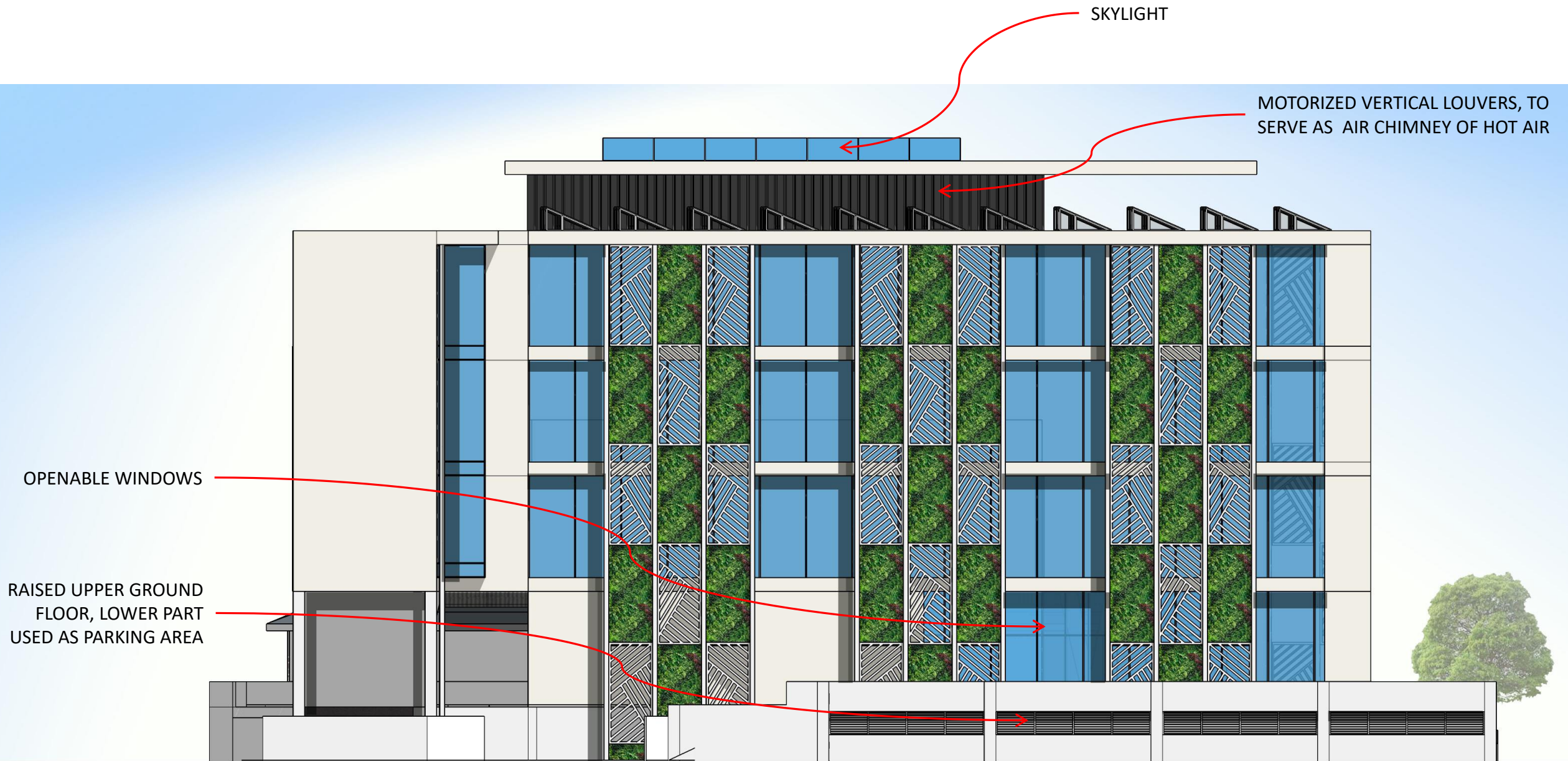


FRONT ELEVATION NOTE:

- DESIGN PROPOSAL IS MOSTLY GLASS AT THE FRONT MAXIMIZE VANTAGE VIEW AT THE BEACH.
- SCREENS WERE PROVIDED ON FACES WITH LESS SHADE, TO HELP CONTROL THE AMOUNT OF SUNLIGHT COMING IN.
- GREEN WALL SCREENS HELP INSULATE HEAT COMING FROM THE SUN



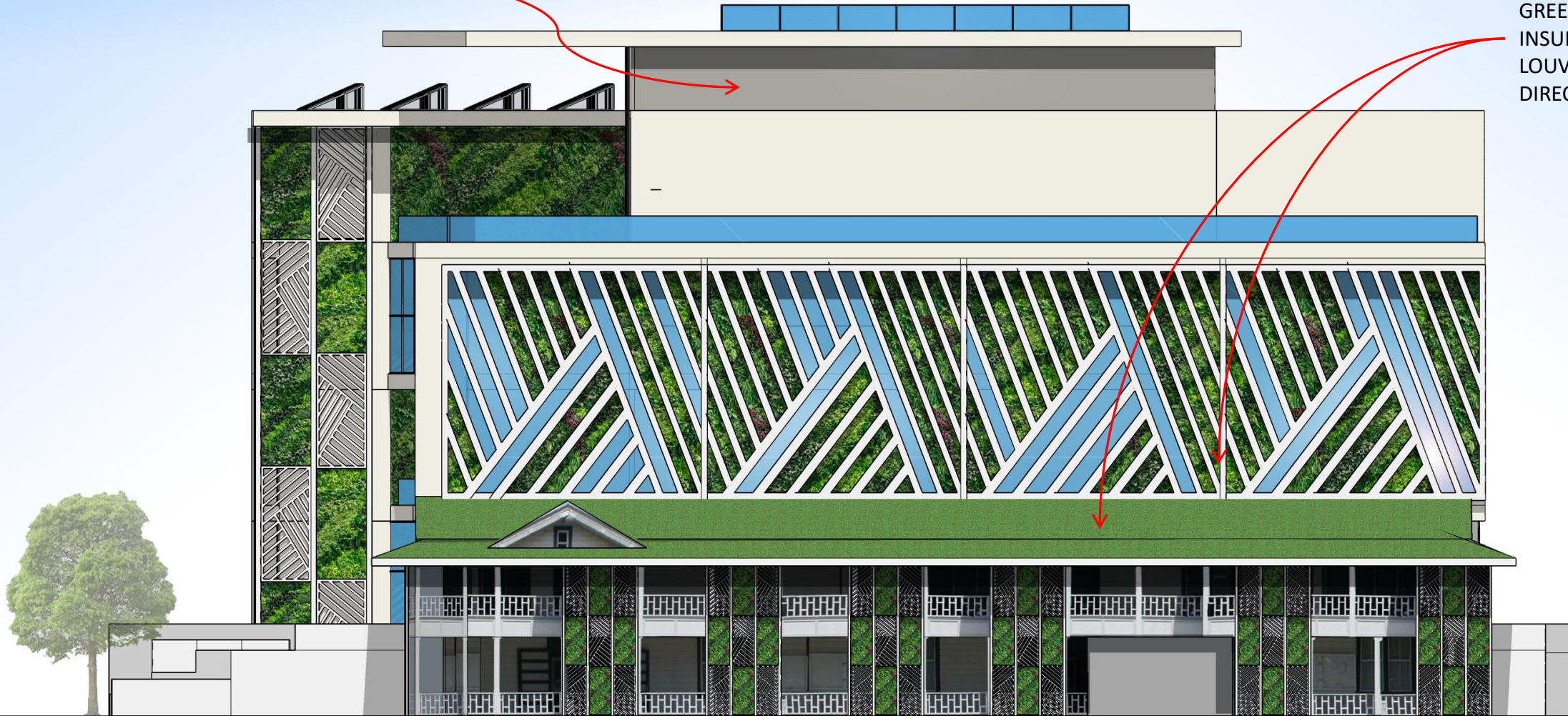
5.4 PROPOSED LEFT SIDE ELEVATION



5.5 PROPOSED RIGHT SIDE ELEVATION

VERTICAL LOUVERS, TO SERVE AS AIR CHIMNEY OF HOT AIR

WINDOWS TO RECEIVE GREEN PLANTS WALL TO HELP INSULATE HEAT. SCREEN LOUVERS SERVES TO MASK DIRECT SUNLIGHT

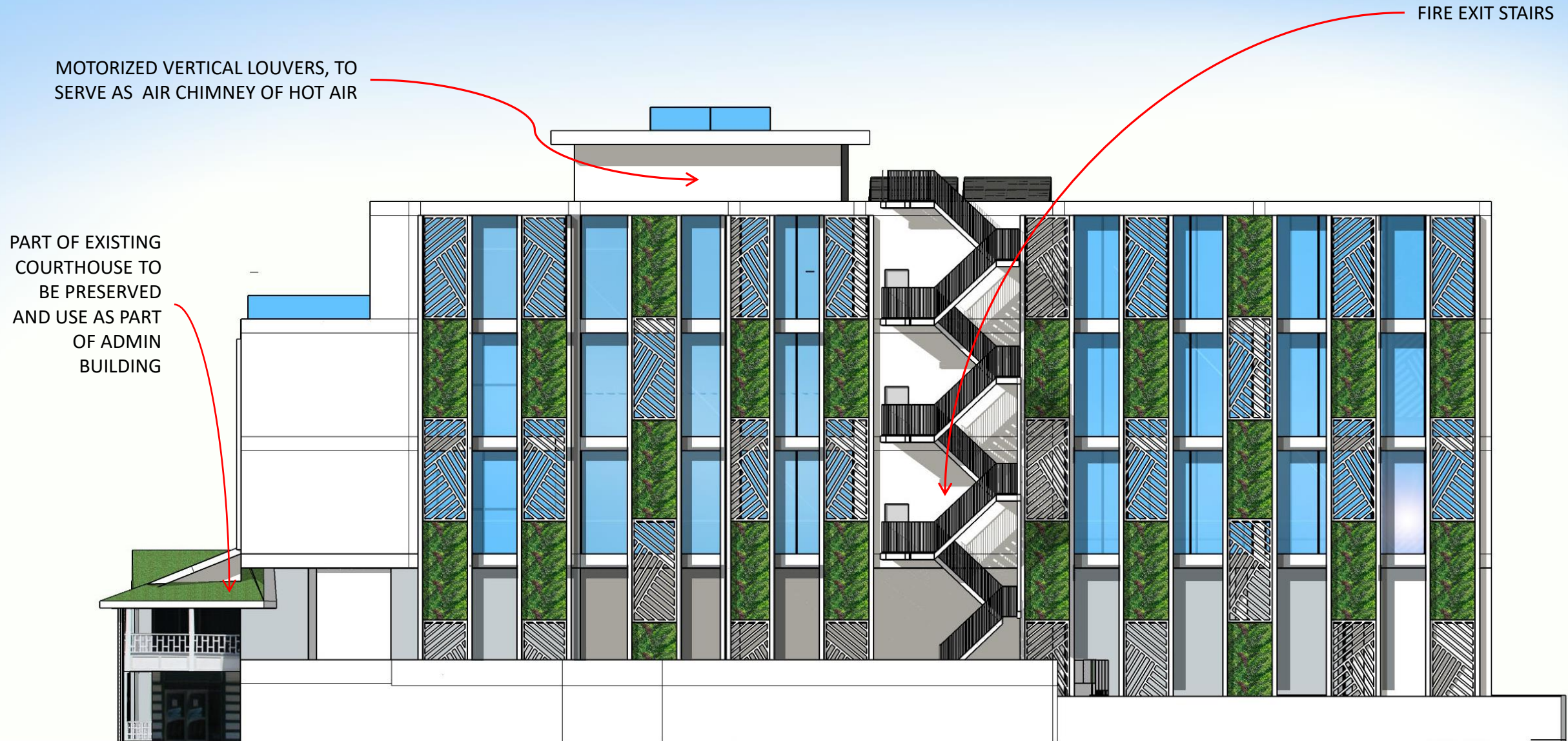


FRONT RIGHT SIDE ELEVATION NOTE:

- THIS PART OF THE BUILDING RECEIVES MOST OF THE AFTERNOON SUN



5.6 PROPOSED REAR SIDE ELEVATION



06

3D IMAGES / ARTIST'S IMPRESSION



6.1 EXISTING PHOTO AT THE TIME - 2018



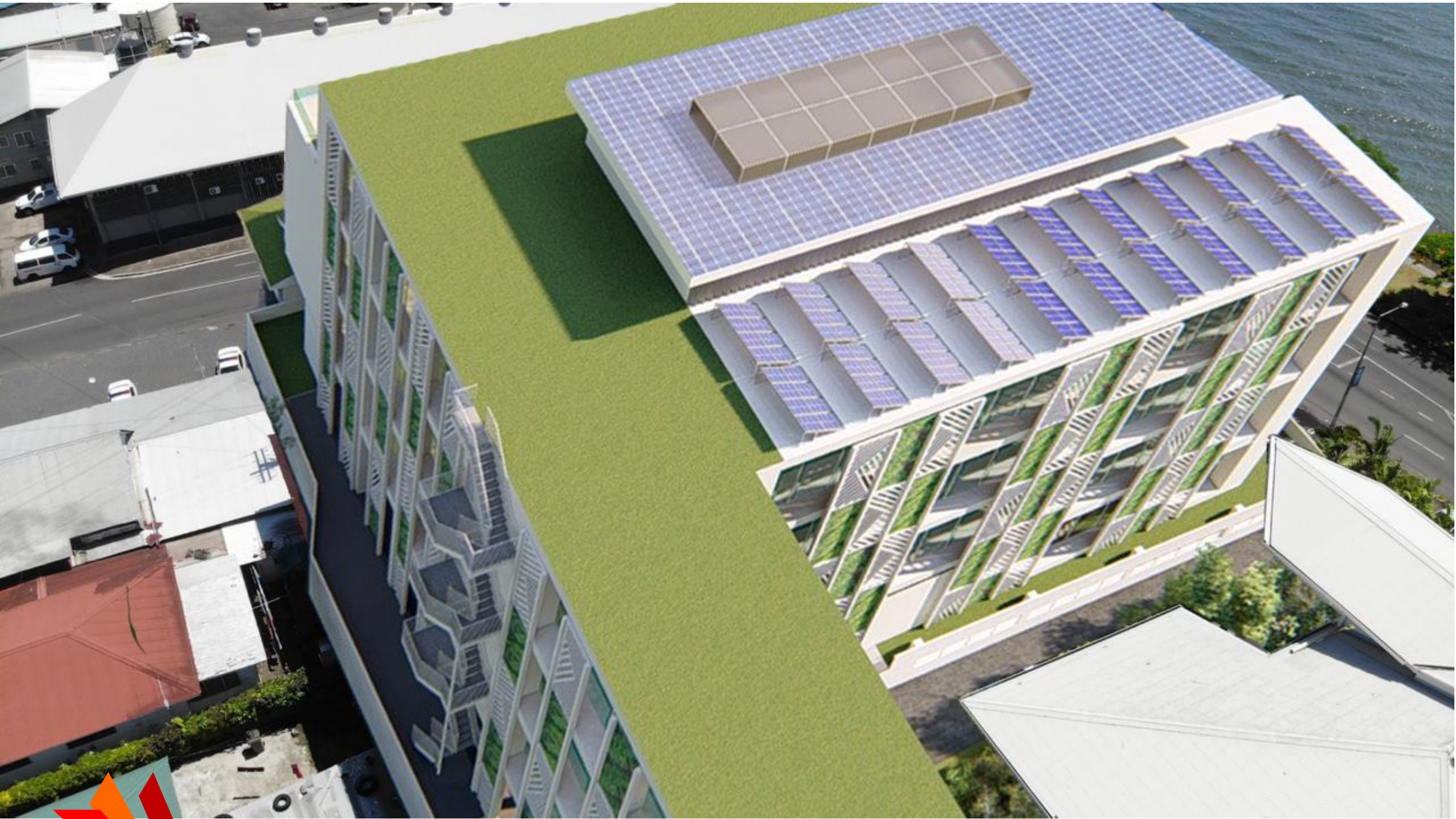
6.2 ARTIST'S IMPRESSION SUPER IMPOSED IN ACTUAL PHOTO

















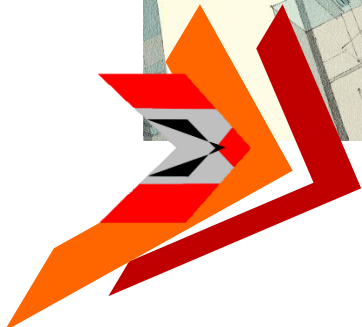
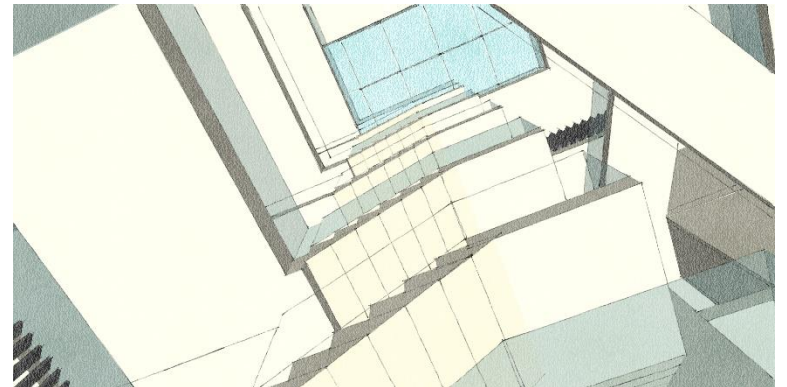
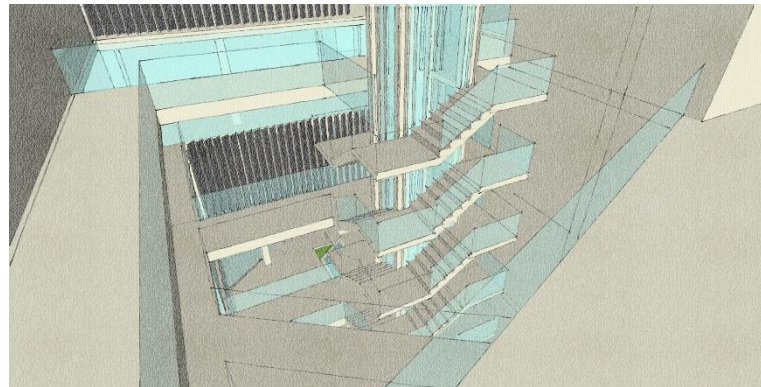
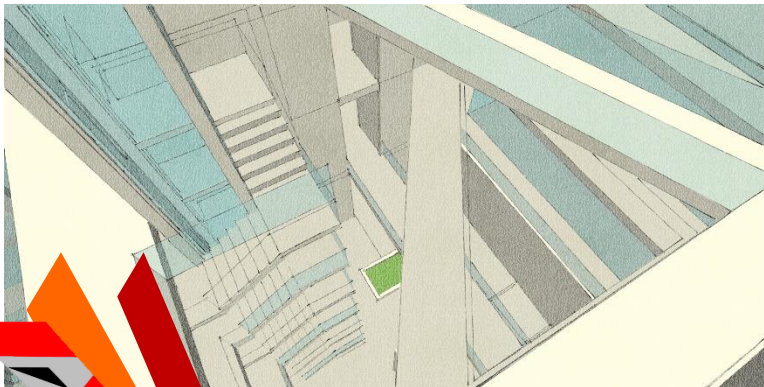
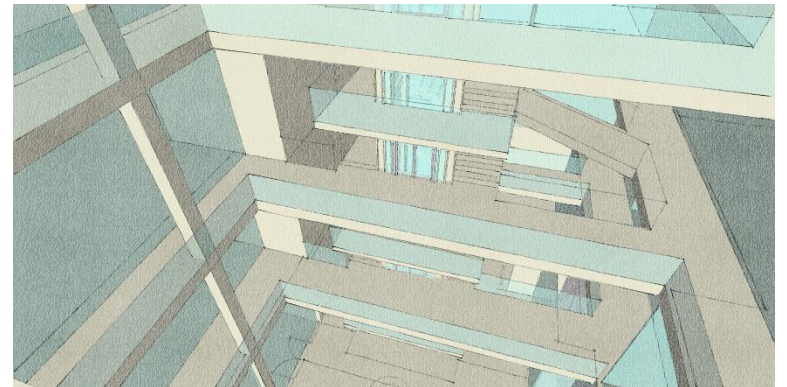
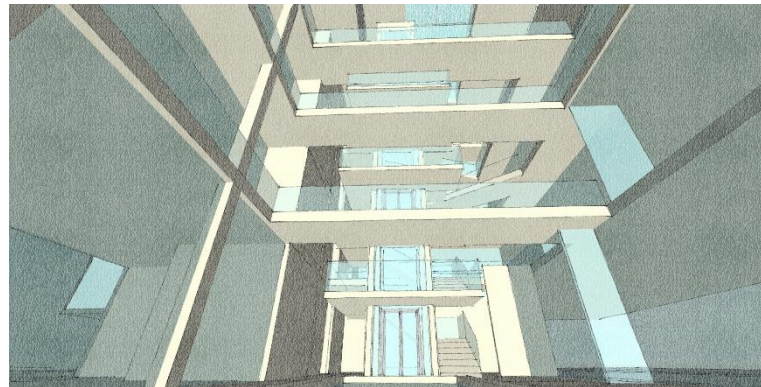
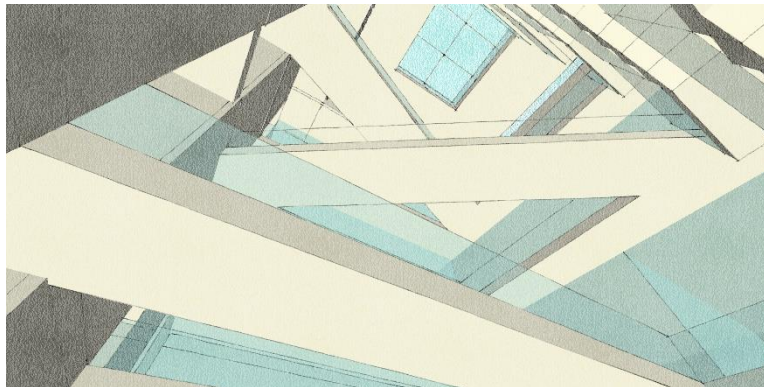
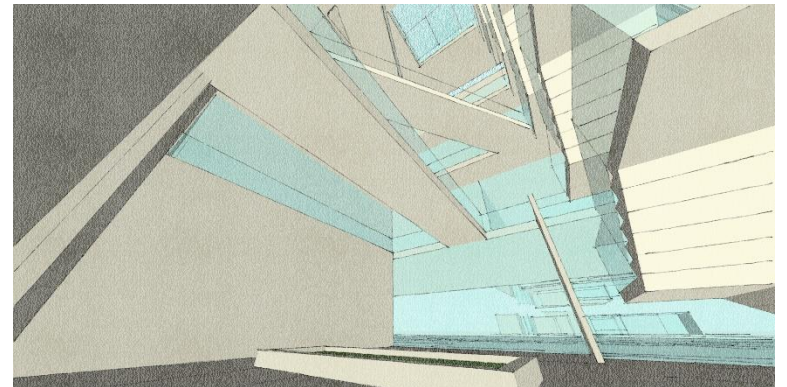
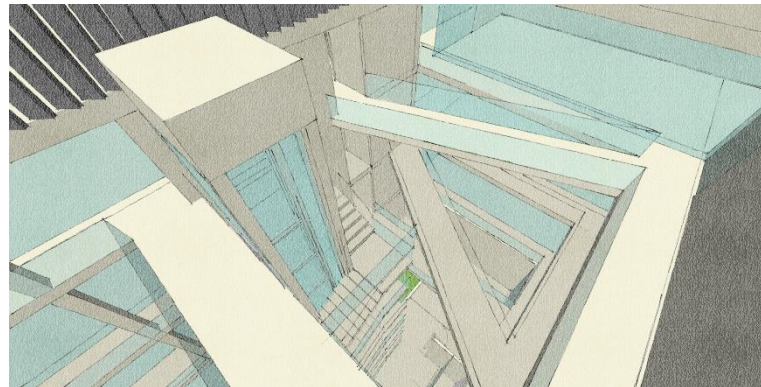








7. ARTIST'S IMPRESSION LOBBY INTERIOR MASSING CONCEPT ONLY



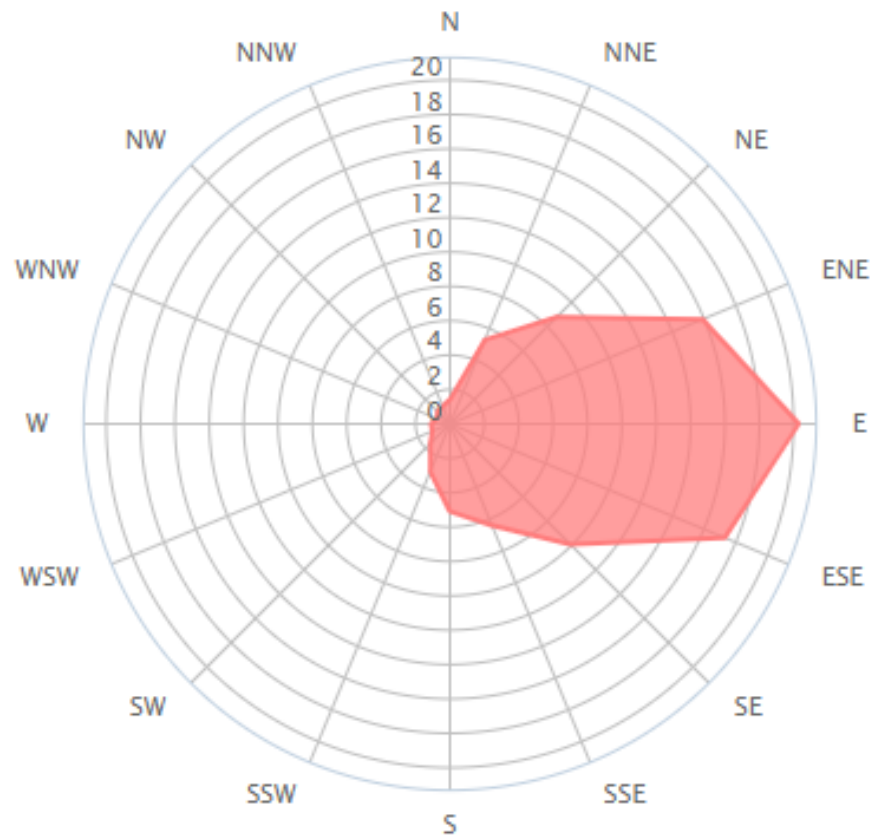
8. WIND DATA

WIND STATISTICS

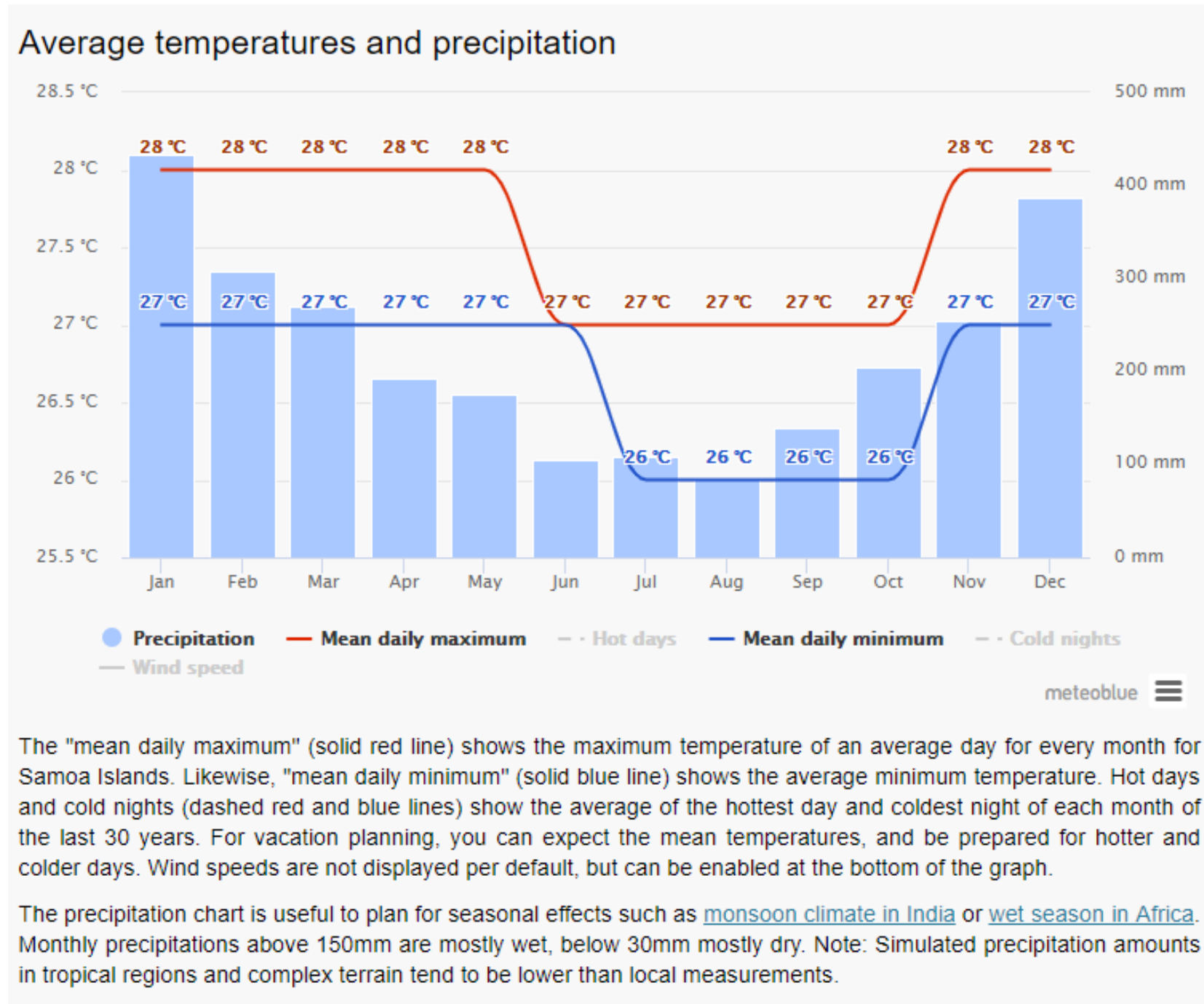
Statistics based on observations taken between 09/2008 - 02/2019 daily from 7am to 7pm local time. You can order the raw wind and weather data in Excel format from our historical weather data request page.

Wind direction distribution in %

- January
- February
- March
- April
- May
- June
- July
- August
- September
- October
- November
- December
- Year



9. SITE ANALYSIS TEMPERATURE & PERCIPITATION DATA



10. PARKING REQUIREMENT & TOILET REQUIREMENT COMPUTATION

B1 – Business <ul style="list-style-type: none"> ▪ offices other than a use within Use Class A2 (financial or professional services). ▪ hire of commercial goods. 	1 space per 60m ²
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TOTAL AREA OF OFFICE SPACES/RENTABLE SPACE = 2800 SQM
 REQUIRED PARKING SLOTS= 2800SQM/60SQM= 46.6 OR 47 PARKING SLOT



Office, Retail, Health + Aged Care (with no over-night accommodation), Communal Residential

Occupancy	Male			Female	
	Toilet	Urinal	Wash Basin	Toilet	Wash Basin
STAFF / OCCUPANTS IN A COMMUNAL RESIDENTIAL BUILDING					
1-15	1	1	1	1	1
16-30	2	2	1	2	1
31-45	3	2	2	3	2
46-60	3	3	2	4	2
>60	add 1 per 20	add 1 per 50	add 1 per 30	add 1 per 15	add 1 per 30
	7	2.8 OR 3	4.6 OR 5	9	4.6 OR 5

COMPUTED REQUIREMENT

TOTAL AREA OF OFFICE SPACES/RENTABLE SPACE = 2800 SQM
 General office ratio is generally estimated at around 1 person per 12-14 sqm
 2800 SQM/ 14 SQM=200 PERSON

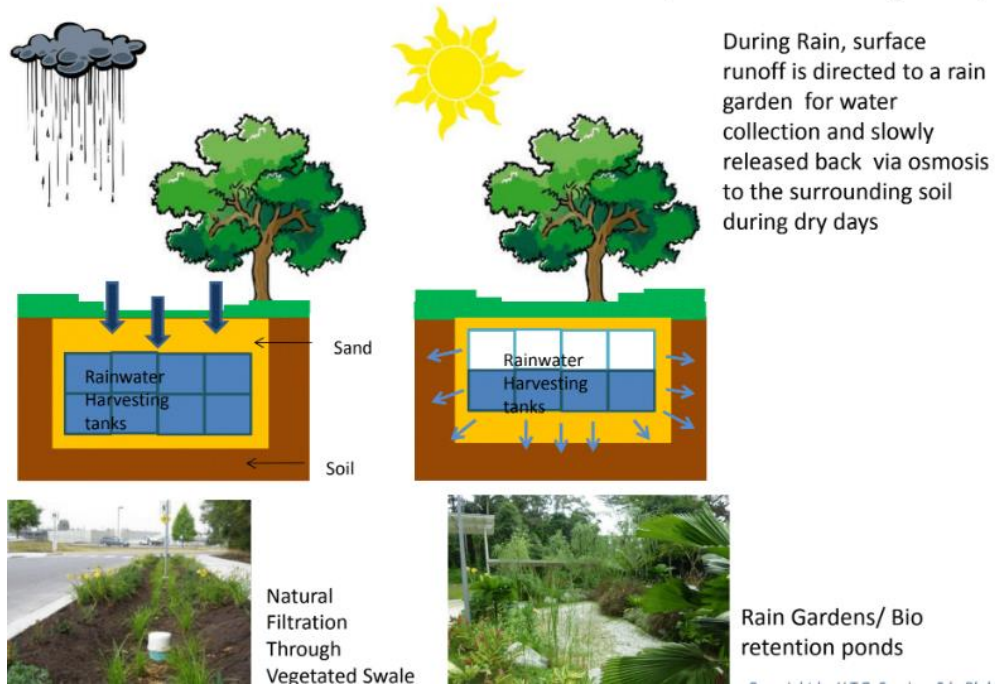


11. RAINWATER HARVESTING

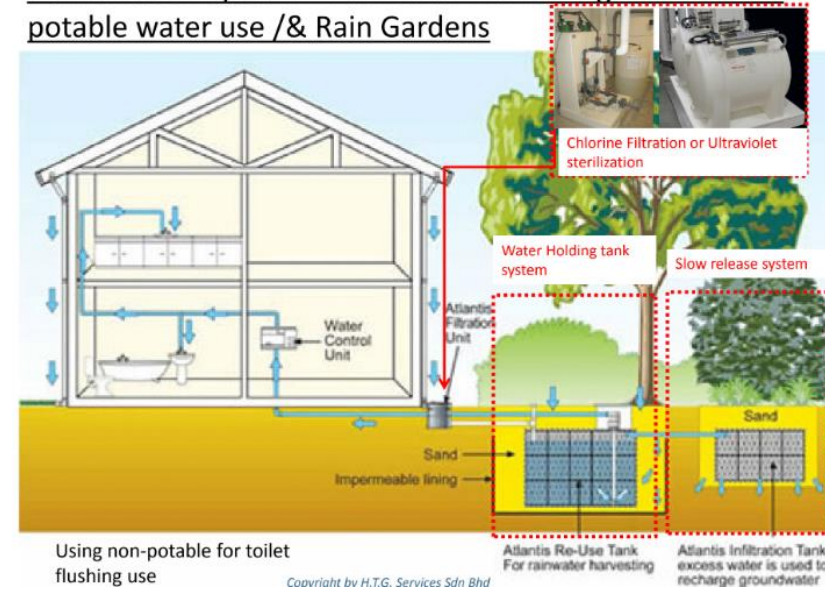
Types of Rainwater Harvesting

- Slow release system – Rain Gardens / Bio-retention ponds and Swales
- Water holding tank system
- Combination systems

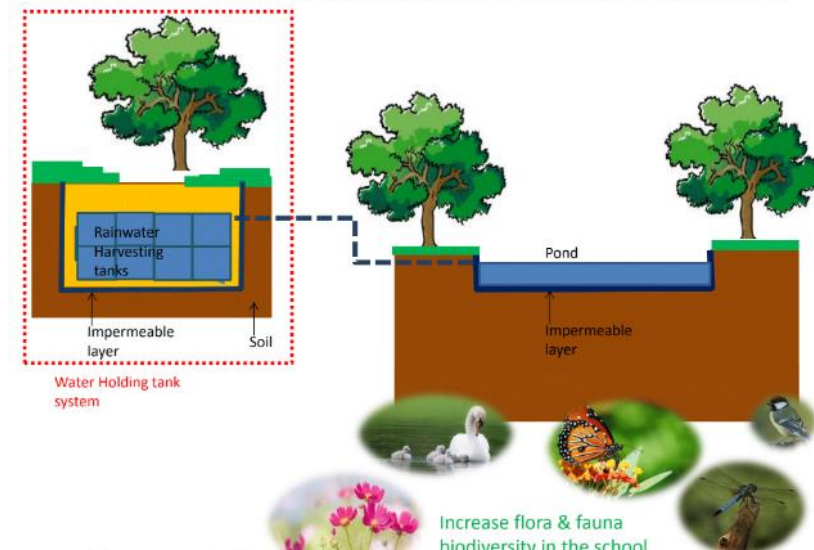
Slow release system



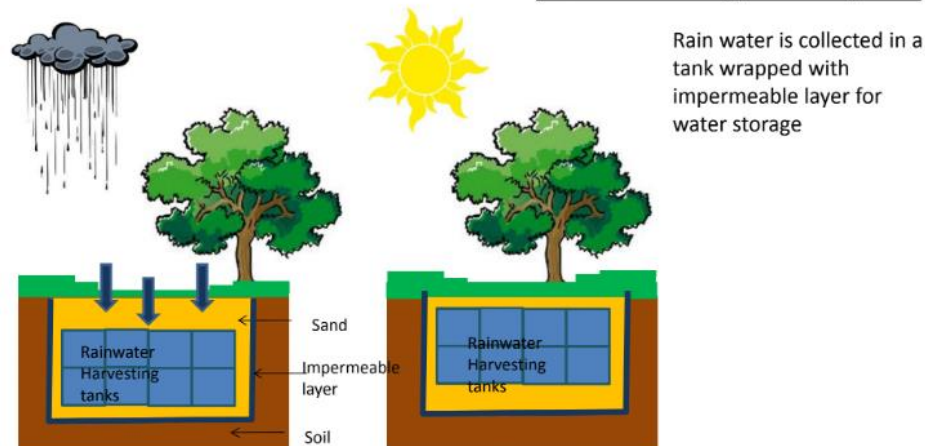
Combination System – Rainwater Harvesting tanks + Non potable water use /& Rain Gardens



Combination System – Rain water Harvesting tanks + ponds



Water holding tank system



Rainwater monitoring systems

Proprietary Control System Monitors and Controls all System Activity

- Controller Considerations
 - Complexity of system
 - Need to record and report system statistics
 - Integration with irrigation control
 - Connectivity to Building Automation System
 - Educational opportunities



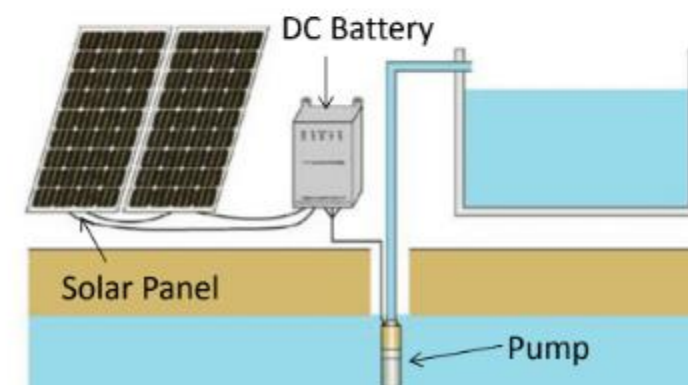
Remote Access Capability



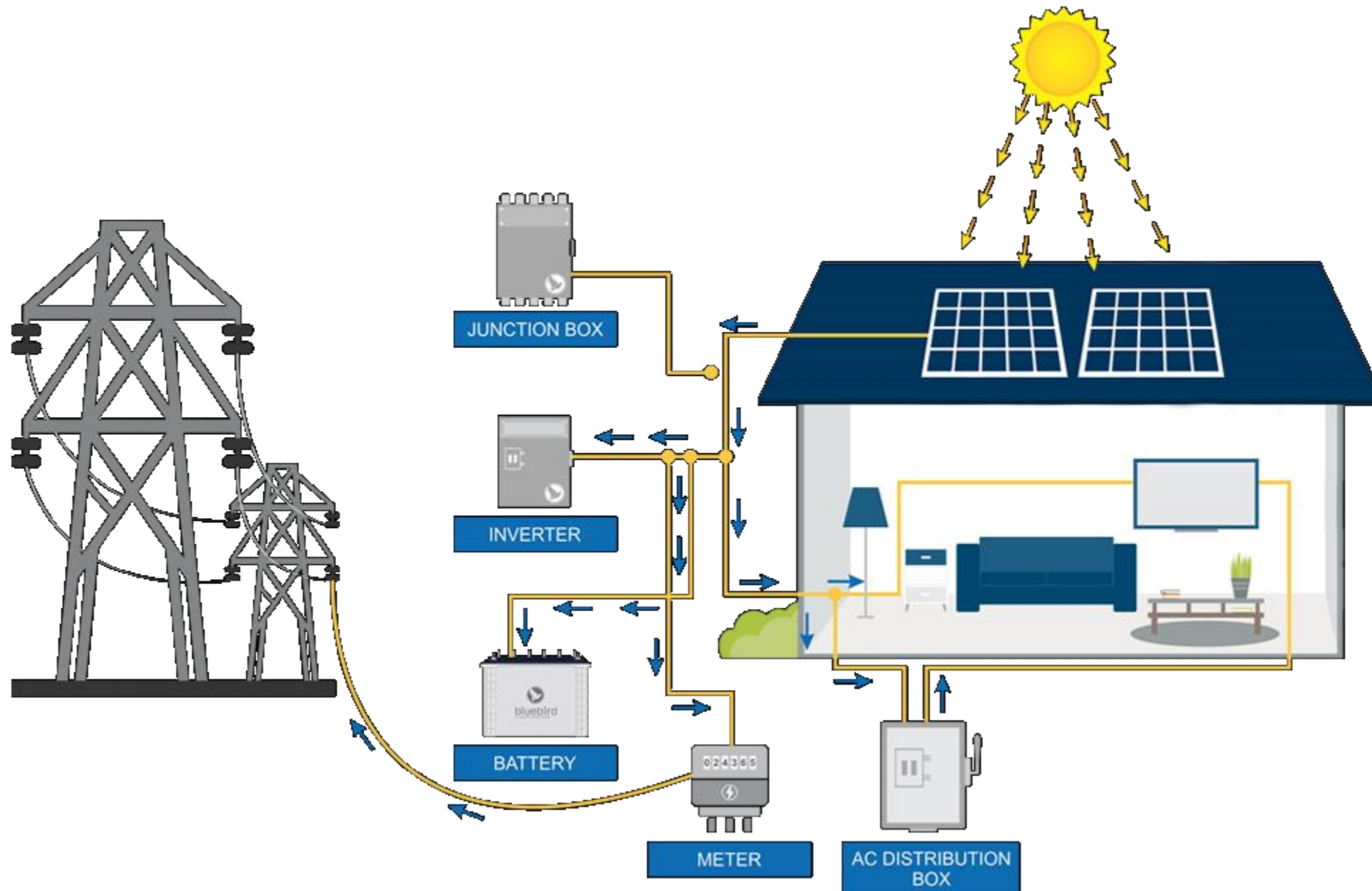
Alternative power source for mechanical operations



Solar Panels may be used as an alternative power source to operate mechanical pumps & filtration systems



12. SOLAR ENERGY HARVESTING



13. CLIMATE CHANGE

Table 1 ENSO Conditions and the Effects of ENSO Changes

Feature	Neutral ENSO Year	El Niño ENSO Year	La Niña ENSO Year
Wind	Normal east to west trade winds	Weaker east to west trade winds; can even blow from west to east	Stronger east to west trade winds
Rainfall	Usual amounts of rainfall with normal variability	American Samoa tends to be drier than usual, and can experience drought	American Samoa tends to be wetter than usual and can experience damaging floods
Sea Level	Usual sea level with normal tide variability	Lower sea levels so that high tides tend to cause less flooding	Higher sea levels so that high tides tend to cause more flooding

Table 1 lists the differences between neutral years, El Niño years, and La Niña years.



[Wikipedia \(na\) 'Achitecture of Samoa', Wikipedia.com
https://en.wikipedia.org/wiki/Architecture_of_Samoa](https://en.wikipedia.org/wiki/Architecture_of_Samoa)

https://unesdoc.unesco.org/ark:/48223/pf0000139897?fbclid=IwAR2puXEJLRjkg5SvI0xyOGozYpW2jxmrQftGVJZr_QrbWI7B40aCzyq8JA

<http://www.jamesschollum.com/samoan-architecture>

<http://samoanstudies.ws/wp-content/uploads/2016/02/3.2-The-Measina-of-architecture-in-Samoa-Fepuleai-Micah-Van-der.compressed.pdf>

<http://www.soest.hawaii.edu/coasts/publications/AmSamoa%20Climate%202016.pdf>

