MASTERPLAN OF NONG FAB LNG TERMINAL

1. MAIN ENTRANCE
2. DROP OFF
3. VISITOR DROP OFF
4. PICK UP POINT
5. PARKING (CAR:27/BUS:4)
6. FOREST AREA
7. BIOSWALE
8. MELALEUCA FOREST
9. SWAMP PEAT FOREST
10. BEACH FOREST
11. LEARNING TRAILS
12. RIPARIAN ZONE
13. RETENTION POND
14. CLOUD FOREST
15. CLIMATIC ATRIUM
16. OFFICE DROP OFF
17. STAFF PARKING (CAR:69)
18. DETENTION LAWN
19. AMPHITHEATER
20. SERVICE PARKING (CAR:28)
21. SUB ENTRANCE
22. GREEN ROOF

A. GUARD HOUSE
B. ADMINISTRATION BUILDING
C. SPIRIT HOUSE
D. WORKSHOP BUILDING
E. FIRE STATION
F. LABORATORY
G. PLANT NURSERY
H. OPERATION GUARD HOUSE
J. GIS BUILDING

THE HARMONIZED JUXTAPOSITION BETWEEN INDUSTRY AND NATURE

NONG FAB LNG TERMINAL PROJECT

PATTAYA

ROYAL THAI NAVY

SATTAHIP

SATTAHIP
COMMERCIAL PORT

U-TAPAO
INTERNATIONAL AIRPORT

NONG FAB
LNG TERMINAL

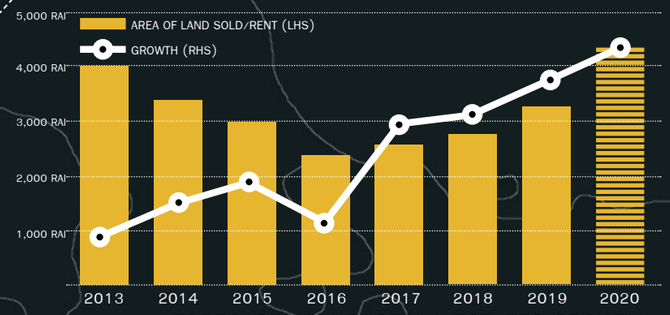
MAP TA PHUT
INDUSTRIAL PORT

WATER SYSTEM

WATERSHEDS

DEVELOPMENT AREA

ENERGY LINE



FORECAST OF INDUSTRIAL ESTATES GROWTH

NONG FAB LNG TERMINAL : MAP TA PHUT AREA

RAYONG HAS COVERED A NUMBER OF WATER SYSTEMS AND WATERSHEDS. HOWEVER, WITH THE RAPID DEVELOPMENT OF THE INDUSTRIAL ZONE, MUCH EXISTING ECOSYSTEMS AND WATER SYSTEMS ARE UNDER THREAT. THEREFORE, THE DESIGN TEAM HAS TAKEN THE OPPORTUNITY OF THIS PROJECT TO DEVELOP AN ECO-FRIENDLY LNG TERMINAL, WHICH AT THE SAME TIME COULD HELP PRESERVING THE WATERSHED AND ITS ECOLOGY.

LNG RECEIVING TERMINAL AREA

1 NATURAL GAS PRODUCTION
BY NATURAL GAS PRODUCER

↓

LIQUEFACTION PROCESS
BY LNG SUPPLIER

2 JETTY AND BERTH AT
NONG FAB LNG TERMINAL

TRANSPORTATION TO LNG TERMINAL
BY LNG SUPPLIER/LNG SHIPPER
(VESSEL SIZE 125,000-264,000 M³)

3 LNG STORAGE TANK
BY PTT LNG

250,000 M³ PER TANK NATURAL GAS CAPACITY MAXIMUM 15 MTPA (MILLION TON PER ANUAL)

4 REGASIFICATION
BY PTT LNG

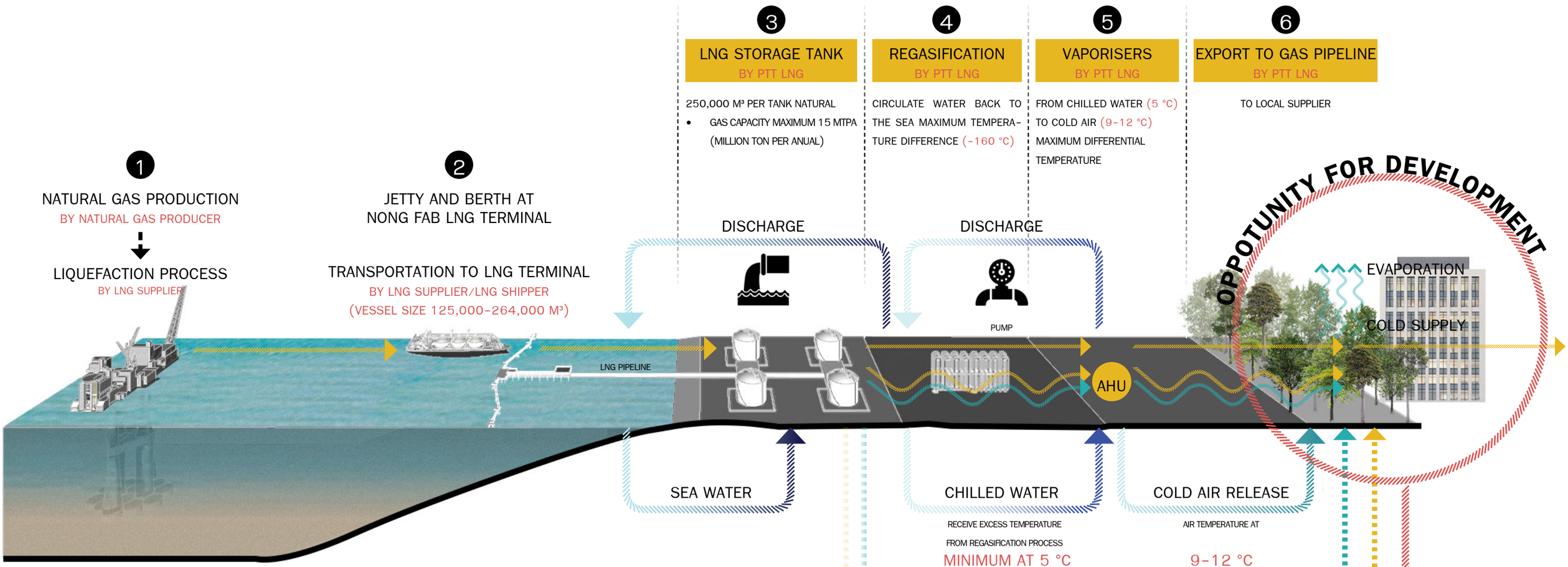
CIRCULATE WATER BACK TO THE SEA MAXIMUM TEMPERATURE DIFFERENCE (-160 °C)

5 VAPORISERS
BY PTT LNG

FROM CHILLED WATER (5 °C) TO COLD AIR (9-12 °C) MAXIMUM DIFFERENTIAL TEMPERATURE

6 EXPORT TO GAS PIPELINE
BY PTT LNG

TO LOCAL SUPPLIER



LNG LINE
SEA WATER
CHILLED WATER
COLD EXCHANGE
DISCHARGED TEMPERATURE
DISCHARGED WATER
WATER RUNOFF
TEMPERATURE RELEASED FROM OPERATION

PROCESS OPERATION DIAGRAM

BENEFITS

1

WATER RUNOFF

USE RUNOFF WATER FOR ECOLOGICAL RESTORATION

2

TEMPERATURE RELEASED FROM OPERATION

1. INDOOR AIR CONDITIONING
2. HUMIDITY FOR MICRO CLIMATE

WATER RUNOFF

USE RUNOFF WATER FOR
ECOLOGICAL RESTORATION

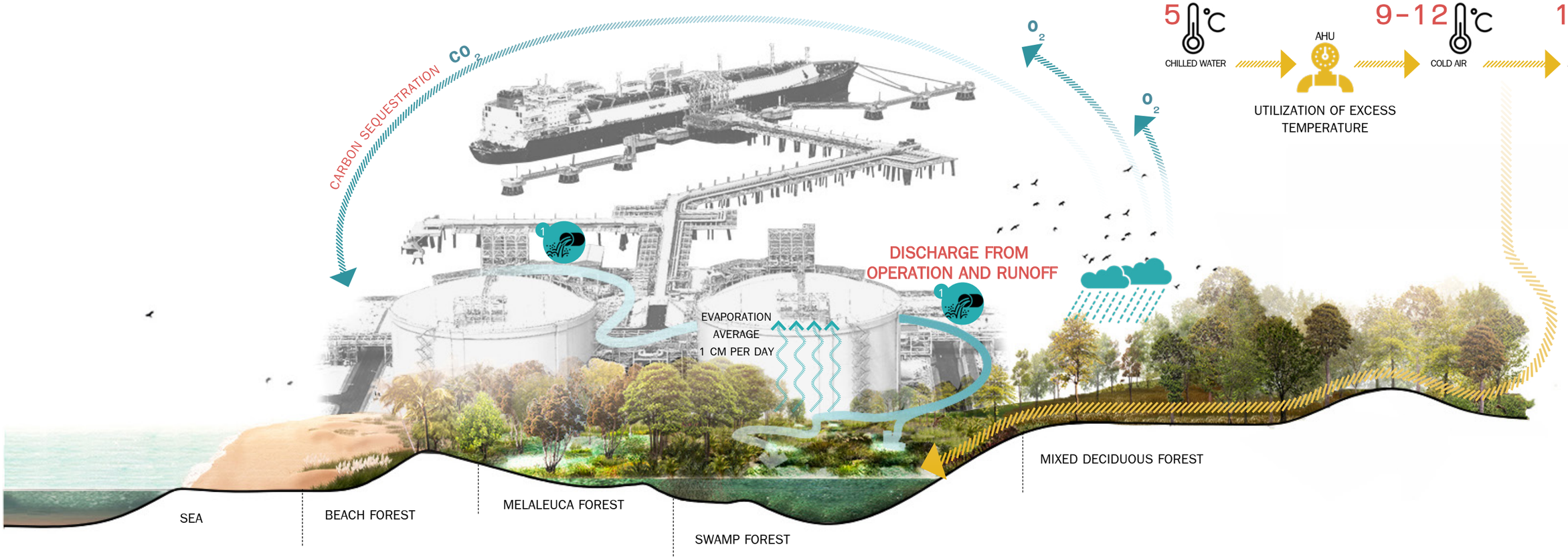
TEMPERATURE RELEASED FROM OPERATION

1. INDOOR AIR CONDITIONING
2. HUMIDITY FOR MICRO CLIMATE

HUMIDITY FOR
MICRO CLIMATE

5°C CHILLED WATER → AHU → 9-12°C COLD AIR → 15°C AIR TEMPERATURE

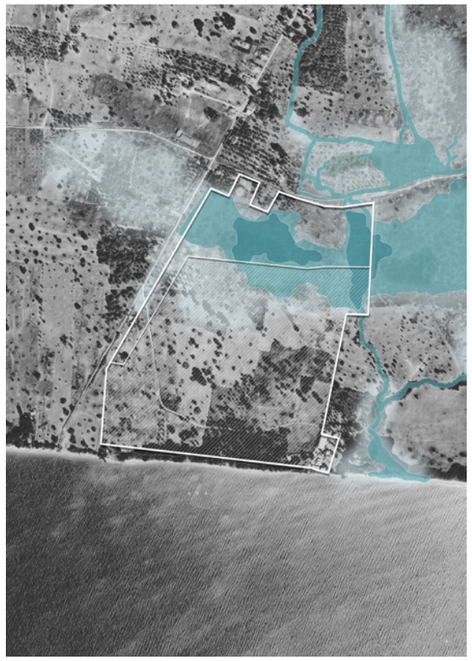
UTILIZATION OF EXCESS
TEMPERATURE



NONG FAB LNG TERMINAL AREA

THE HARMONIZED JUXTAPOSITION BETWEEN INDUSTRY AND NATURE

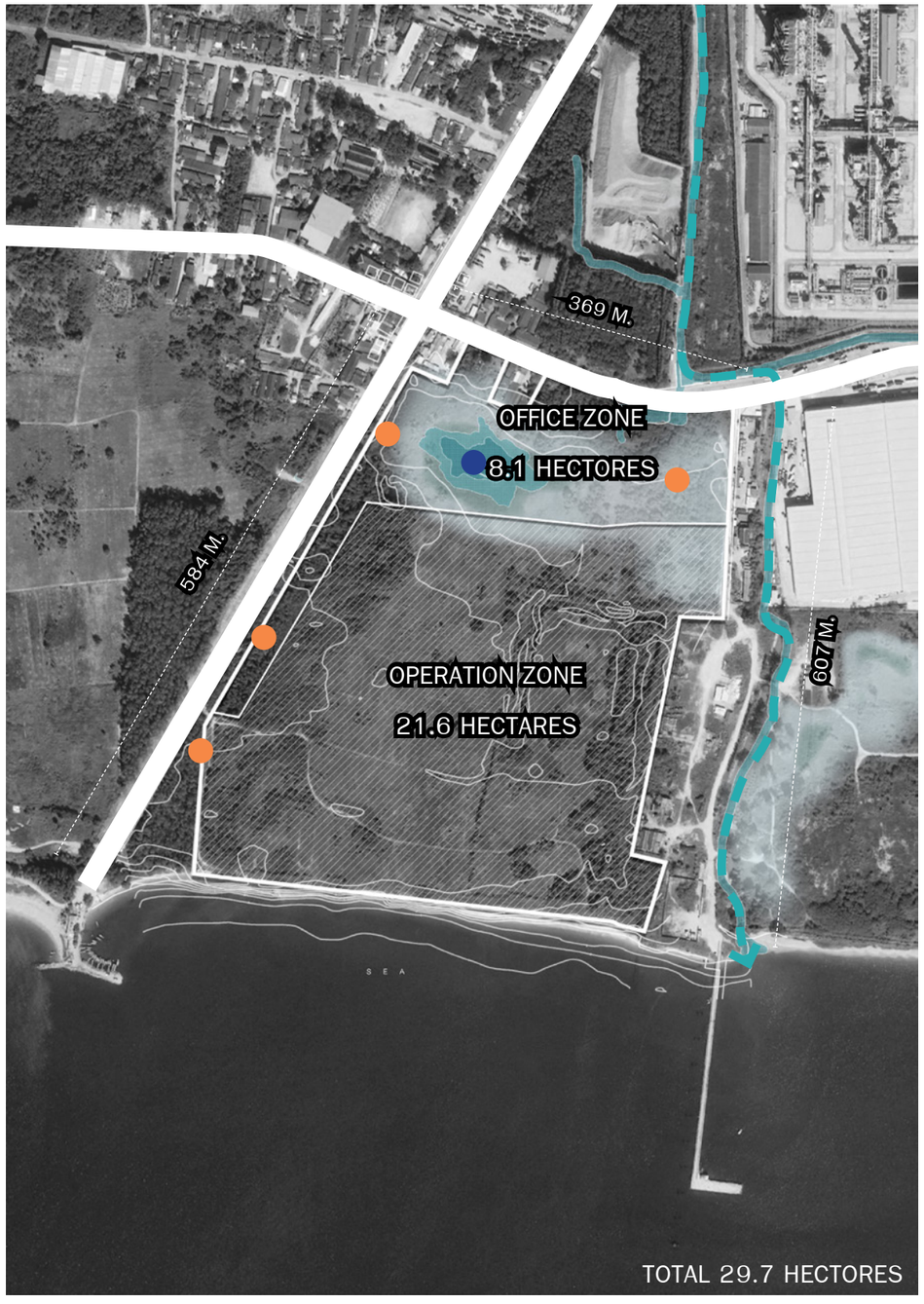
SITE CHARACTER AND ANALYSIS



YEAR 1975

YEAR 1990

YEAR 2002



THE SOIL SAMPLE LOCATION
WATER SAMPLE LOCATION

YEAR 2017

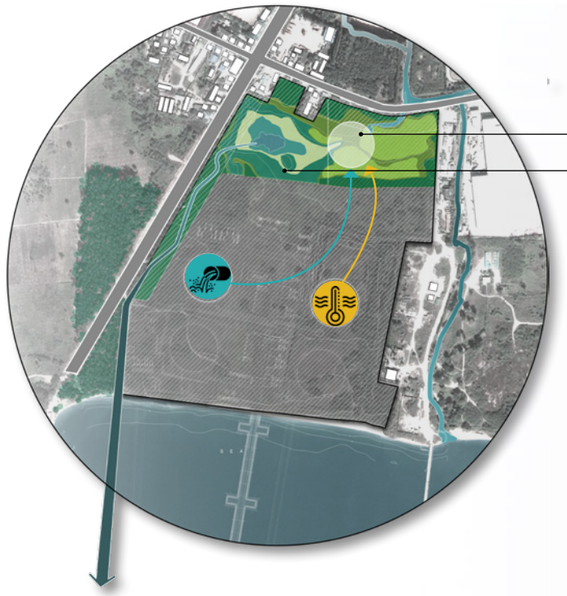
SURROUNDED COMMUNITY AREA

ADJACENT AREA

30 M. PROTECTION STRIP

10 M. PROTECTION STRIP

BEACH FOREST



DEVELOPMENT AREA

REFORESTRATION AREA

WATER RUNOFF

TEMPERATURE RELEASED FROM OPERATION

RETENTION POND

RIPARIAN ZONE

OPEN SPACE AREA

FOREST AREA

SWAMP PEAT FOREST

PROTECTION STRIP

SUPPORTING AREA

CIRCULATION

ADMINISTATION BUILDING

WATER RETENTION AREA

30 M. PROTECTION STRIP

BIOSWALE

10 M. PROTECTION STRIP

WATER RUNOFF FOR ECOLOGICAL RESTORATION

TEMPERATURE RELEASED FROM OPERATION

DISCHARGE

INDUSTRIAL AREA

SITE POTENTIAL OPPORTUNITIES

MASTERPLAN OF NONG FAB LNG TERMINAL

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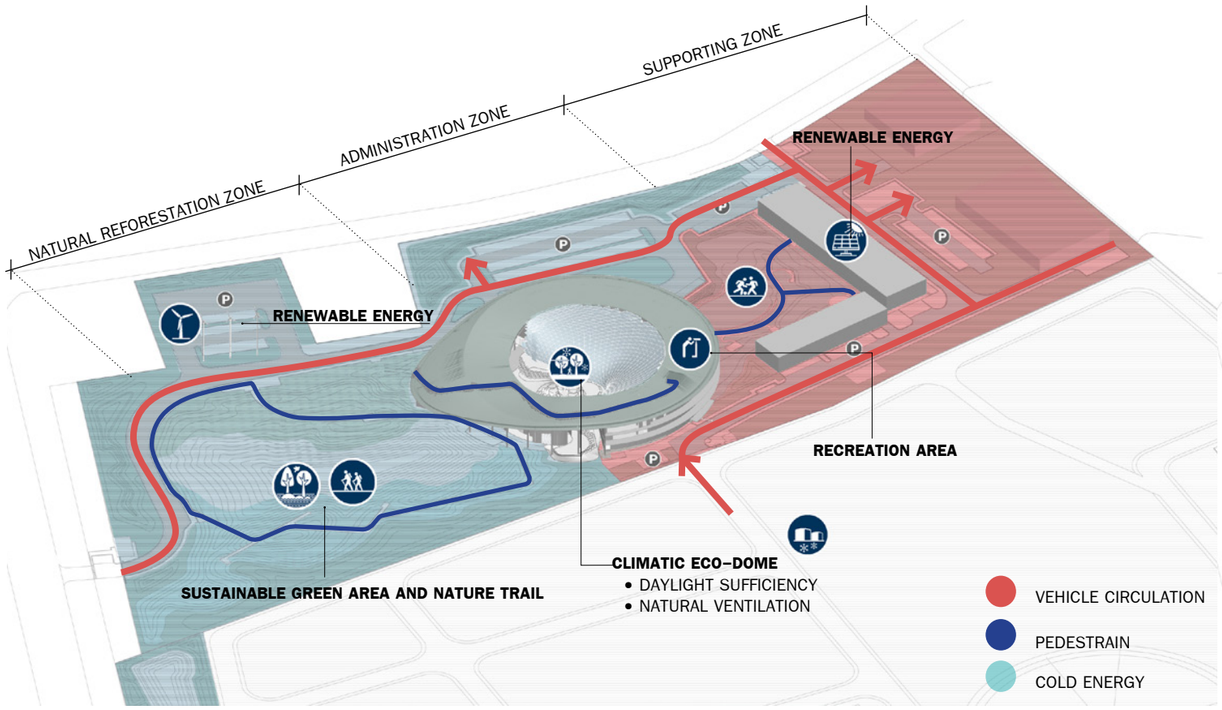
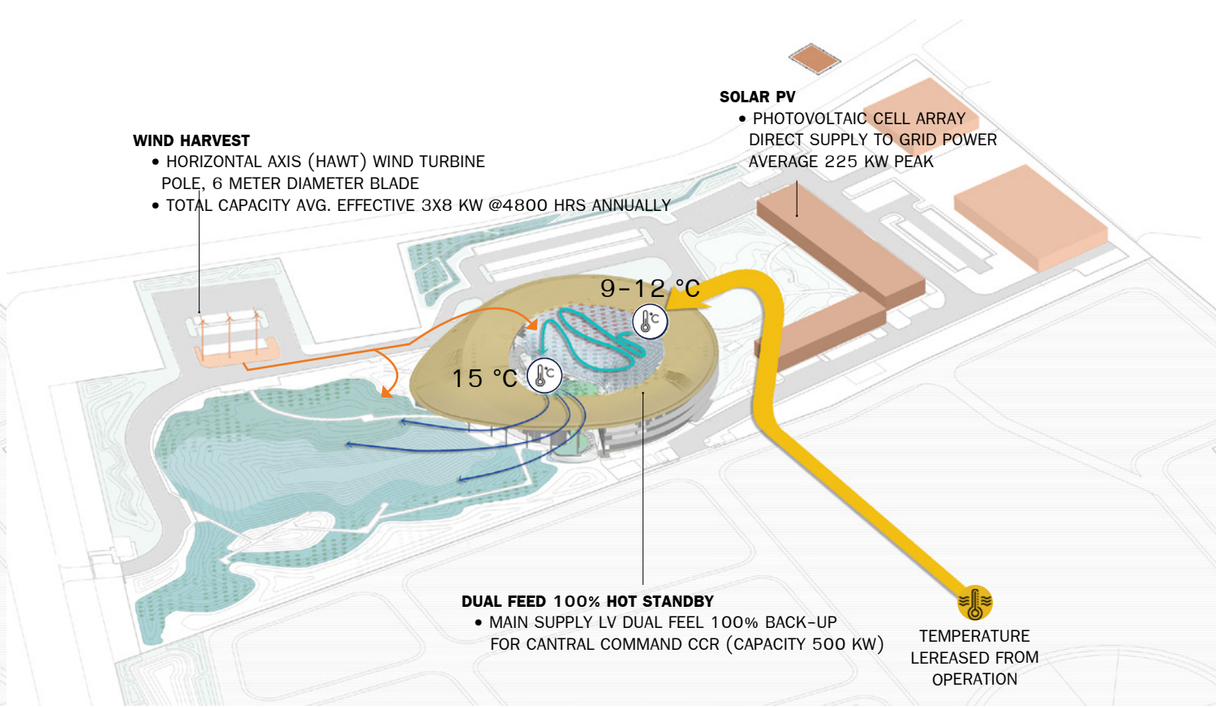
F. LABORATORY
G. PLANT NURSERY
H. OPERATION GUARD HOUSE
J. GIS BUILDING

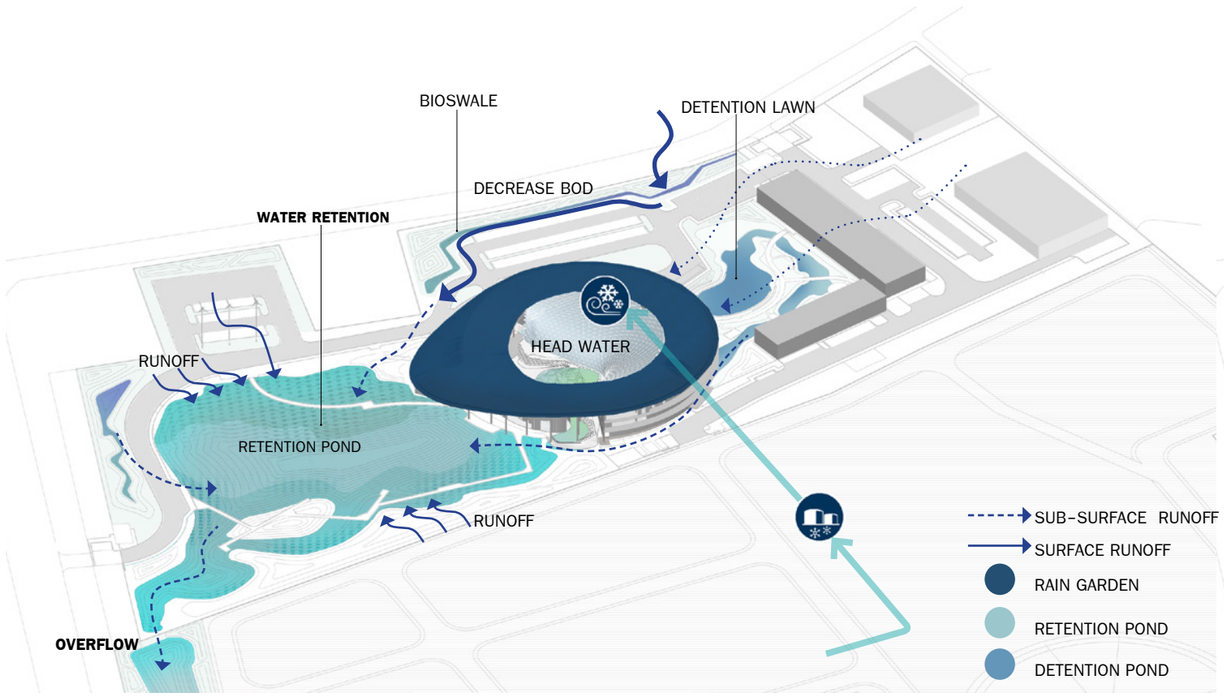
SYSTEMATIC DIAGRAMS



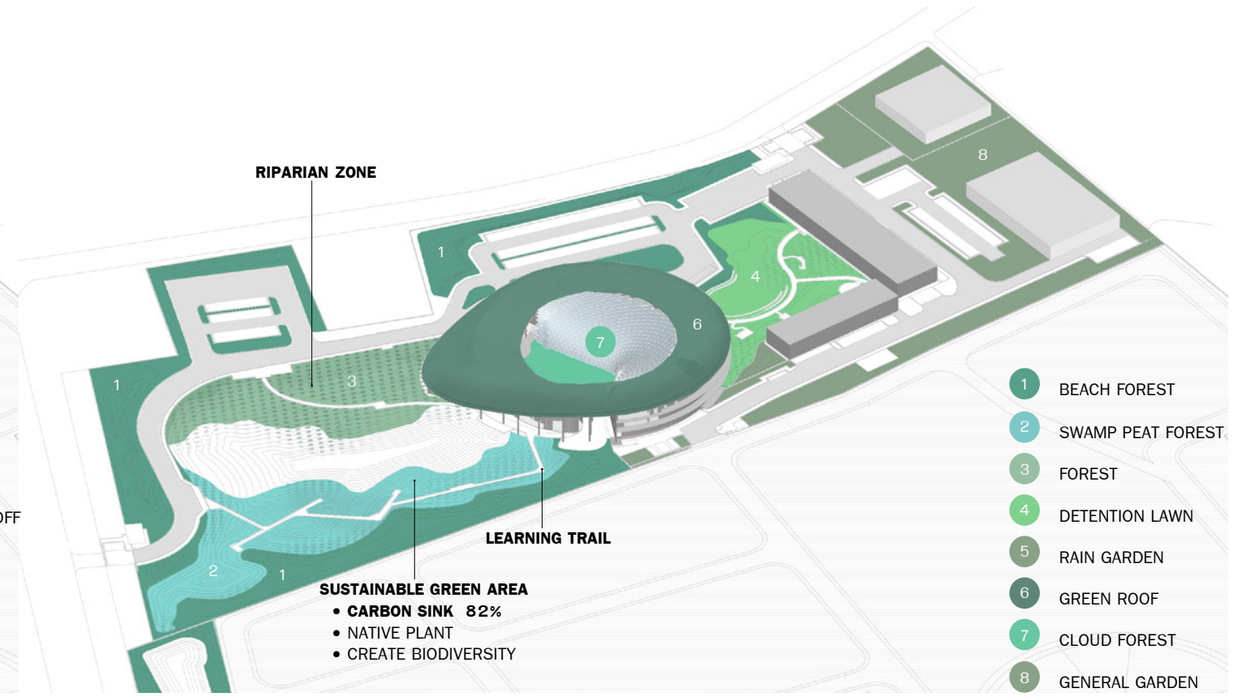
ZONING AND FUNCTION



TEMPERATURE AND ENERGY MANAGEMENT

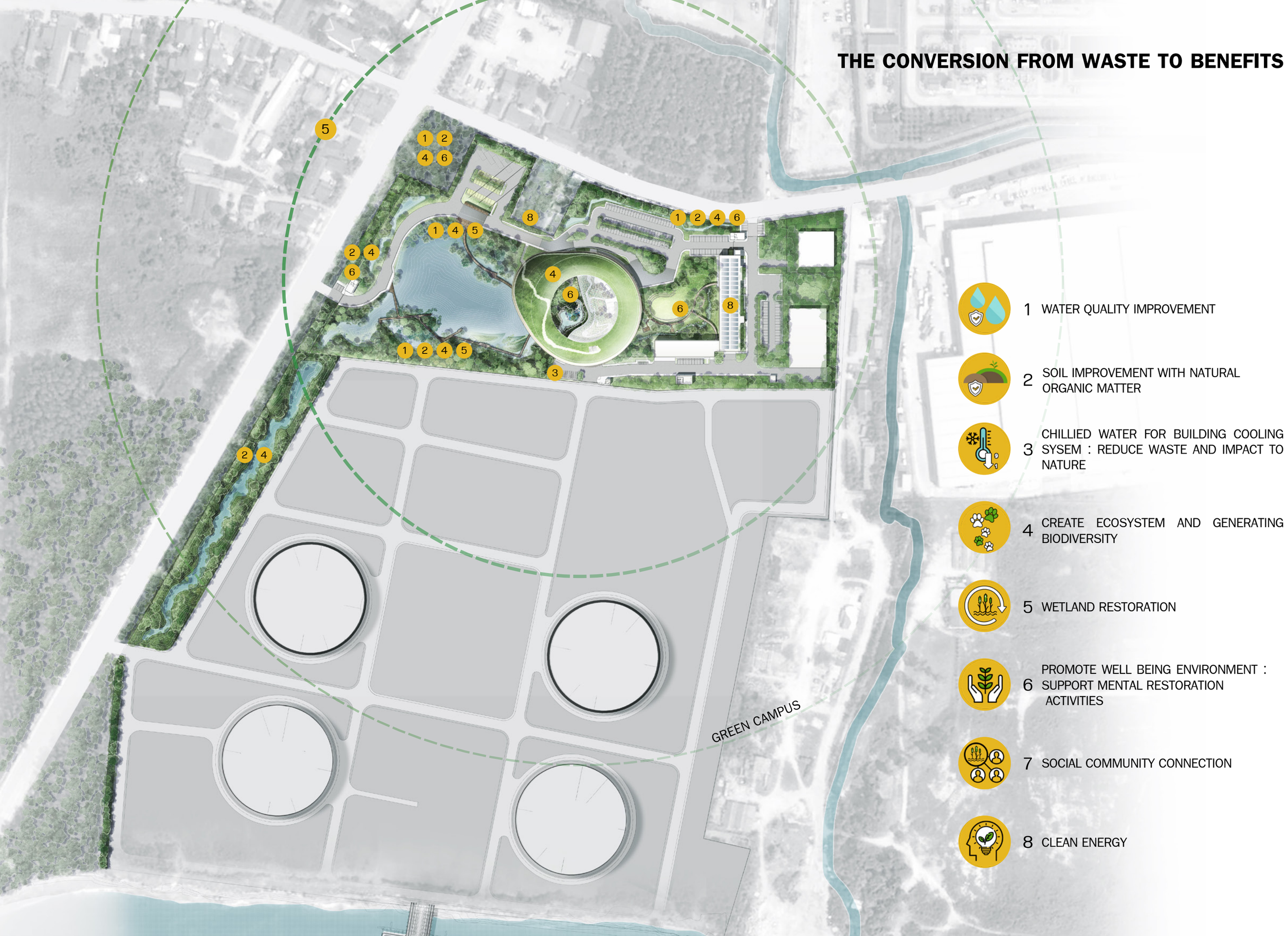


WATER MANAGEMENT



FOREST TYPOLOGY

THE CONVERSION FROM WASTE TO BENEFITS



1 WATER QUALITY IMPROVEMENT

2 SOIL IMPROVEMENT WITH NATURAL ORGANIC MATTER

3 CHILLIED WATER FOR BUILDING COOLING SYSEM : REDUCE WASTE AND IMPACT TO NATURE

4 CREATE ECOSYSTEM AND GENERATING BIODIVERSITY

5 WETLAND RESTORATION

6 PROMOTE WELL BEING ENVIRONMENT : SUPPORT MENTAL RESTORATION ACTIVITIES

7 SOCIAL COMMUNITY CONNECTION

8 CLEAN ENERGY

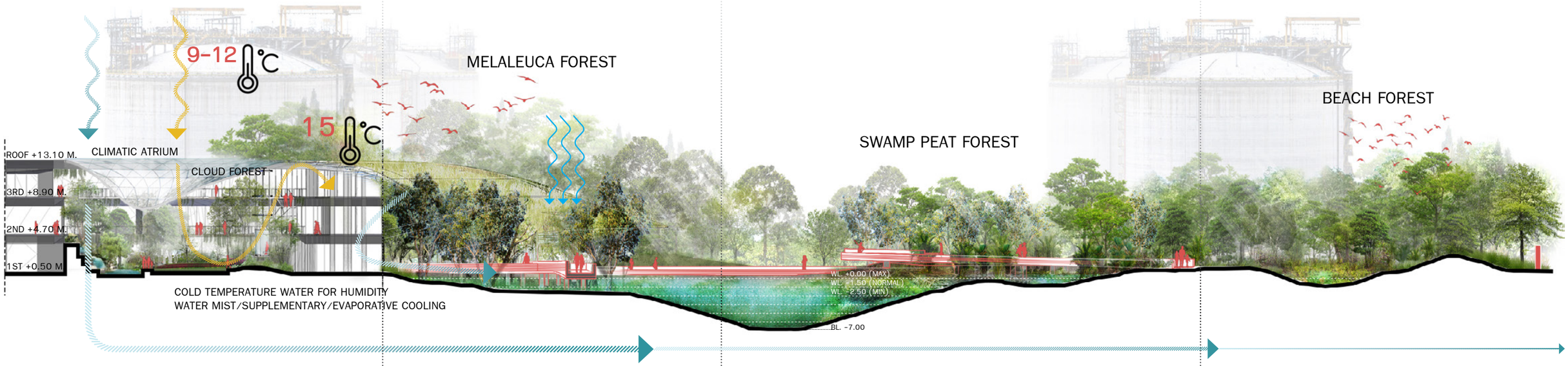
FROM WASTE TO BIODIVERSITY GENERATION

1 RUNOFF WATER

USE RUNOFF WATER FOR ECOLOGICAL RESTORATION

2 TEMPERATURE RELEASED FROM OPERATION

1. INDOOR AIR CONDITIONING
2. HUMIDITY FOR MICRO CLIMATE



Melaleuca cajuputi · *Lepironia articalata* · *Syzygium gratum* · *Syzygium cumini* · *Salix tetrasperma* · *Dipterocarpus alatus*

Calophyllum inophyllum · *Duabanga grandiflora* · *Carallia brachiata* · *Cratoxylum maingayi* · *Pandanus amaryllifolius*

Syzygium siamensis · *Licuala spinosa* · *Horsfieldia Irya* · *Dillenia obovata* · *Ploiarium alternifolium*

Thespesia populnea · *Diospyros gracilis* · *Barringtonia asiatica* · *Hymenocardia wallichii*

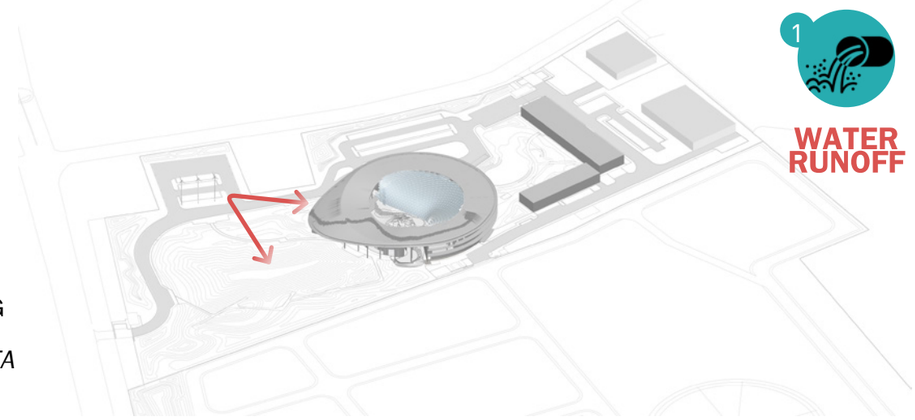
Suregada multiflora · *Hibiscus tiliaceus* · *Cordia subcordata* · *Intsia bijuga*

AMPHIBIANS

REPTILES

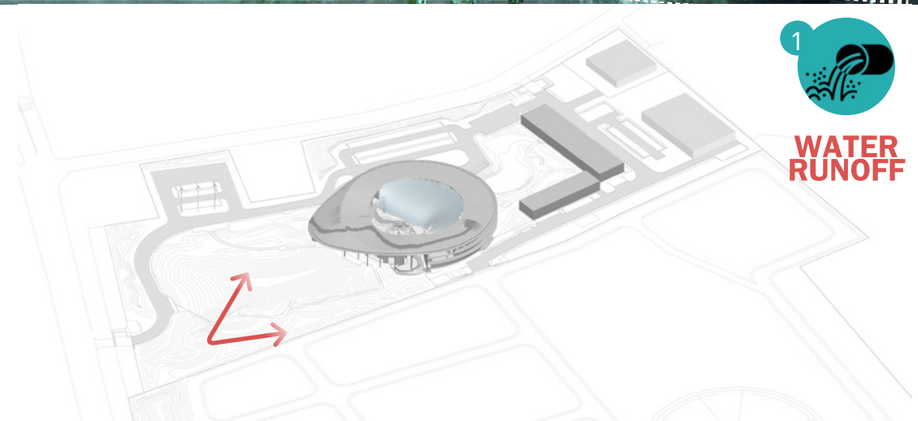
MAMMALS

AVIANS



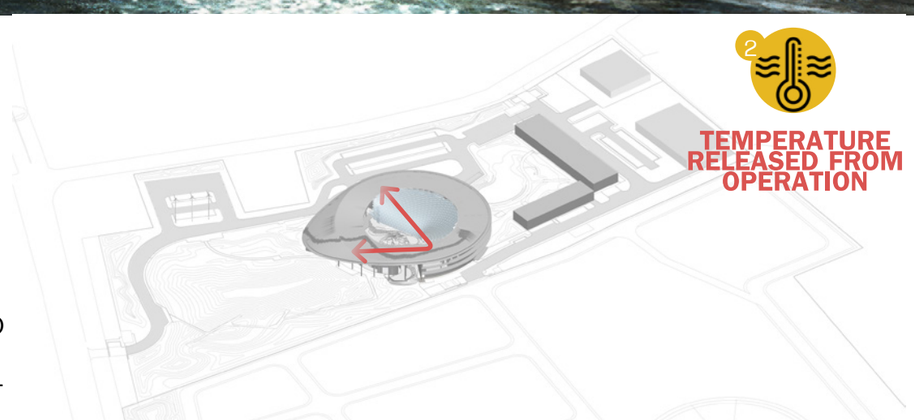
MELALEUCA FOREST ZONE

THE MELALEUCA FOREST IS THE PREDOMINANT FOREST OF THE RAYONG REGION, YET BECOMING ENDANGERED NOWADAYS ALONG WITH THE THRIVING INDUSTRIAL DEVELOPMENT. PERCHING WITH THE FLUCTUATION OF THE WATER TABLE BASED ON THE VOLUME OF RUNOFF AS WELL AS SEASONAL PRECIPITATION, THE DOMINANT SPECIES OF THE MELALEUCA TREES AND *LEPIRONIA ARTICULATA* WILL BE ACCLIMATED TO THIS SPECIFIC MONOCULTURE FLAT LAND.



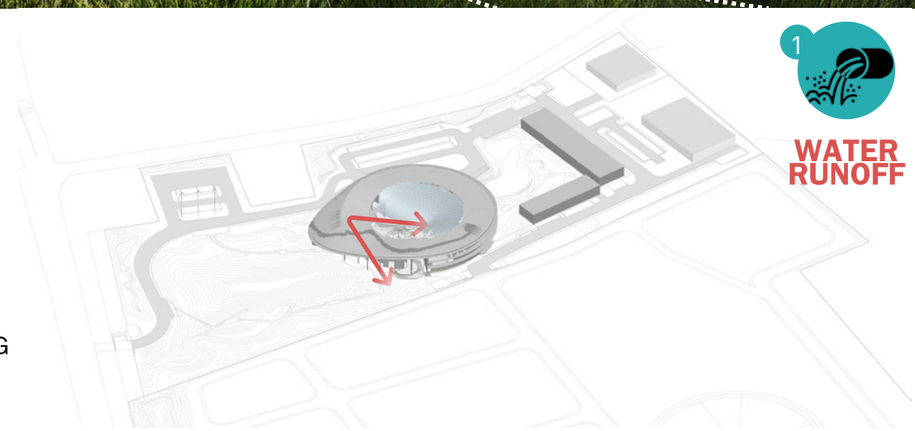
SWAMP PEAT FOREST ZONE

ACROSS THE RETENTION POND IS THE SWAMP PEAT FOREST, WHERE A GREATER DIVERSITY OF PLANTS SPECIES COULD BE FOUND. THIS PLANTS COMMUNITY IS MULTI-LAYERED AND LOW GROWING, PROVIDING A WIDE RANGE OF WILDLIFE HABITATS AND ENHANCING THE BIODIVERSITY. PLANTS ARE GROWING IN WATERLOGGED SOIL, HENCE, ARE DURABLE OF WATER FLUCTUATION AND ARE ABLE TO CONTAIN WATER EVEN AT DRY SEASON.



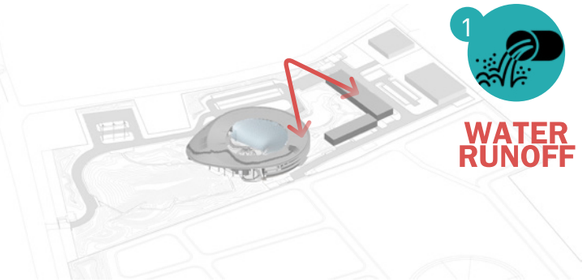
CLOUD FOREST ZONE

THE CLOUD FOREST REPRESENTS THE HEADWATER FOR THE ENTIRE SITE. COLD AIR FROM THE OPERATION ZONE WILL BE UTILIZED AT THE CLOUD FOREST. SINCE THE TEMPERATURE IS UNDER CONTROL AND COOLER THAN THE OPEN AIR OUTSIDE, A DIFFERENT CLIMATE AND HABITAT WILL BE FORMED. FEATURING WITH A WATERFALL AT THIS FOREST, A FOGGY AND MOIST ENVIRONMENT WILL ENCOURAGE THE GROWTH OF FERNS AND MOSSES, AND CREATING A COMFORTABLE ATMOSPHERE FOR ALL USERS.



GREEN ROOF

IN ORDER TO CREATE A SUSTAINABLE ROOFTOP, A NATIVE SPECIES OF WEED FROM RAYONG HAS BEEN CHOSEN TO WIDESPREAD THE ROOF. WHILE IT REQUIRES LOW MAINTENANCE, THE PLANT HAS EFFECTIVELY HELPED PROLONGING RAINWATER AND REDUCING THE TEMPERATURE OF THE BUILDING. THIS AREA WILL BE AN IDEAL VIEWING POINT FOR OBSERVING THE ENTIRE SITE.



SUSTAINABLE WATER MANAGEMENT

DETENTION LAWN / MULTIPURPOSE LAWN

BEING A MULTI-PURPOSE DETENTION LAWN, THIS FLEXIBLE AREA WILL BE SERVED AS A COMMUNAL RECREATIONAL SPACE FOR THE STAFF, WHERE PEOPLE WILL FIND AN AMPHITHEATER AND OPEN LAWN FOR ACTIVITIES; AND BIOSWALES AND SOME SELECTED PLANTS FOR FILTERING THE INCOMING WATER RUNOFF.

BESIDES THE ECOLOGICAL ASPECT, THE PROJECT ALSO ADVOCATES CLEAN ENERGY USAGE. HENCE, RESULTING IN A GREEN CAMPUS, WHICH ALSO PROMOTES SOCIAL CONNECTION AND IS COMMUNITY FRIENDLY.

BY MAKING USE OF THE WATER RUNOFF AND WATER DETENTION, WATER QUALITY WILL BE ENHANCED AND BENEFIT THE NATURE THROUGH RECYCLING AND REDUCING WASTE.