



T HESIS
T I T L E

MARINE SCIENCE CENTRE AND OSERVATORY

**NAME - HARSHITAA SHANKER
SECTION - 4A
SUBJECT- ARCHITECTURAL THESIS
COLLEGE- MBS SCOOOL OF PLANNING AND
ARCHITECTURE**

WHAT IS THE PROJECT ?

IT IS A PROJECT BY ICZM INTEGRATED COASTAL ZONE MANAGEMENT. THE ICZM PLAN AND PROTECTION OF COASTAL RESOURCES AND ESTABLISHMENT OF A MARINE RESOURCE INFORMATION AND CONSERVATION CENTRE (MRCI) DEVELOPED FOR RESEARCH, EDUCATION, INFORMATION, ENTERTAINMENT PURPOSE. IT HAS PROPOSED IT IN THREE STATES GUJRAT, ORISSA, CHENNAI.



WHAT IS AN MRCI CENTRE?

IT WILL AN EDUTAINMENT INSTITUTION FOR THE PURPOSES OF SCIENTIFIC RESEARCH, CONSERVATION, DISSEMINATION OF SCIENTIFIC KNOWLEDGE ON THE ANIMALS AND THEIR ECOSYSTEM THROUGH INTERACTIVE AND EXPERIENTIAL MEDIUM.

WHY DO WE NEED IT?

INDIA IS ONE OF THE LARGEST PENINSULAS IN THE WORLD WITH WATER SURROUNDING FROM 3 SIDES, THE ARABIAN SEA TO THE WEST, THE INDIAN OCEAN TO THE SOUTH AND BAY OF BENGAL TO THE EAST. INDIA HAS A COASTLINE OF 7500KM.

CONSERVATION OF MARINE LIFE AND THE ECOLOGICAL BALANCE, WHICH IS DISRUPTED BY THE ACTIVITIES OF MAN.

THE IDEA IS TO CREATE AWARENESS OF THE VAST OCEAN AND ITS POTENTIALS THAT IS SOMETHING MOST PEOPLE WHO LIVE IN A COUNTRY WITH ONE OF THE BIGGEST COASTLINE DON'T HAVE PROPER KNOWLEDGE ABOUT.



AIM-

THE ICZM AIMS AT :-

1. TO DESIGN A MARINE COMPLEX WHICH WILL BE A BARRIER FREE DESIGN. IT WILL BE INSTITUTIONAL BUILDING WITH SOME RECREATIONAL FACILITIES. EDUCATION WILL HAPPEN IN INFORMAL WAYS IT WILL EDUCATE PEOPLE AND STUDENTS ABOUT THE RICH MARINE LIFE AND BIODIVERSITY OF AQUATIC LIFE.

2. A CENTRE WHERE SCIENTISTS, STUDENTS, TEACHERS CAN STUDY AND CARRY OUT THEIR RESEARCH ABOUT MARINE LIFE AND DESIGNING AN UNDERWATER OBSERVATORY WHERE MARINE LIFE CAN BE OBSERVED.

3. TO ALSO INCREASE THE COUNTRY'S ECONOMY BY MAKING THIS CENTRE ALSO A TOURIST ATTRACTION TO EARN GOOD REVENUE AND EXHIBIT THE RICH MARINE CULTURE OF INDIAN COASTLINE.

COMPONENTS

IT WILL HAVE RESEARCH LABS, MARINE DISPLAYS, LECTURE HALLS, WORKSHOPS, OBSERVATORY FOR PRACTICAL TRAININGS ALONG WITH SOME EDUTAINMENT SPACES THAT WILL ALSO BE ACCESSED BY PUBLIC.

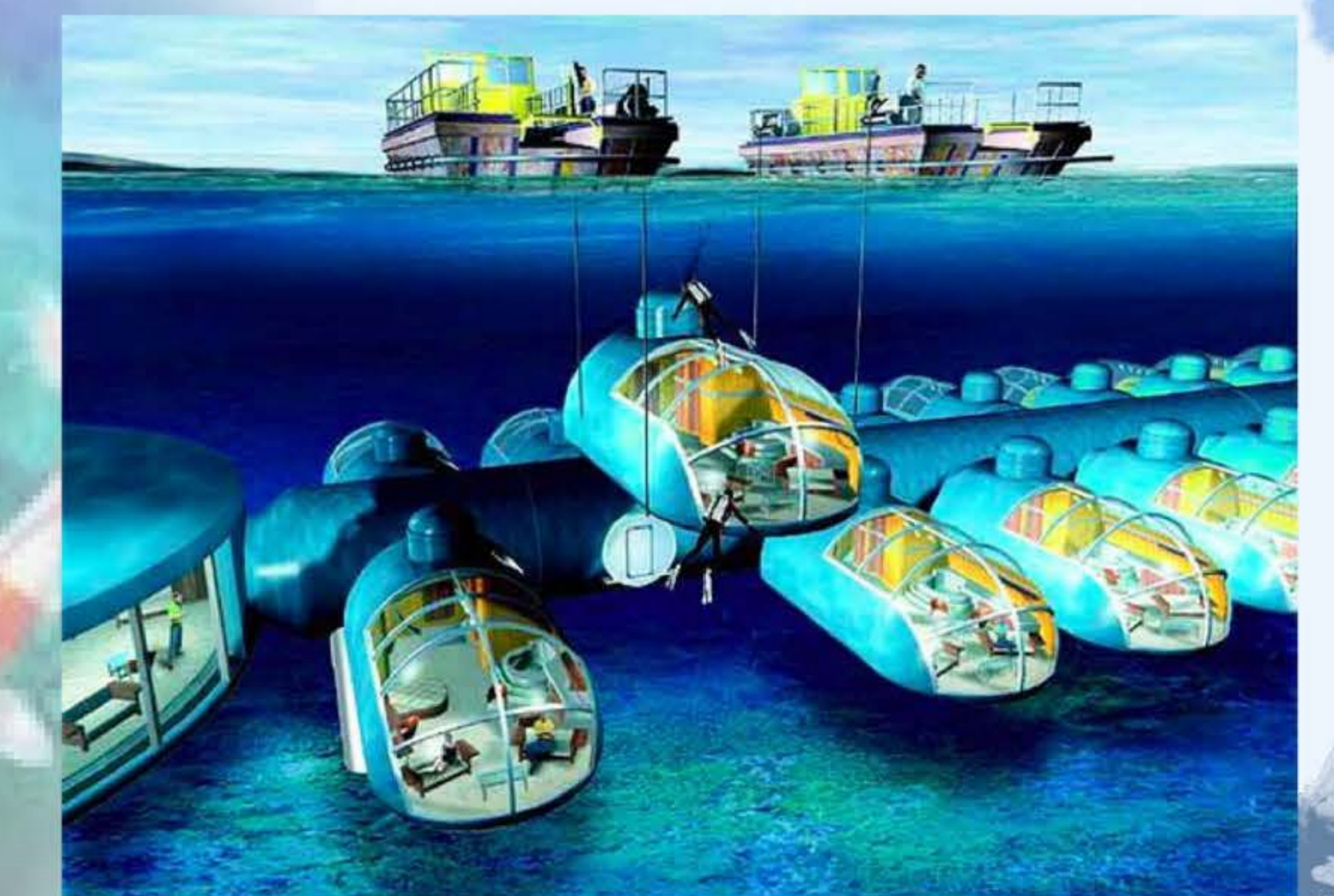


IT WILL BE ONE OF A KIND PROJECT THE FIRST EVER TO BE PROPOSED IN INDIA AND HAS POTENTIAL TO BECOME A MAJOR LANDMARK FOR THE AREA.

A BRIEF IDEA OF WHAT THE PROJECT WILL BE BASICALLY DEAL WITH ARE AS FOLLOWS:-

- ACRYLIC MARINE EXHIBITS OF TANKS TO DISPLAY DIFFERENT MARINE ENVIRONMENT AND ITS BIODIVERSITY.
- RESEARCH CENTRES AND LABS
- AUDIO-VISUAL ROOMS
- RESTAURANTS AND SOUVENIR SHOPS
- HOSTEL, STAFF HOUSING
- WORKSHOPS
- UNDERWATER TUNNEL AND OBSERVATORY FOR DIVERS.
- MARINA AQUA THEATRE FOR EVENTS.

INTRODUCTION



MARINE SCIENCE CENTRE AND OBSERVATORY

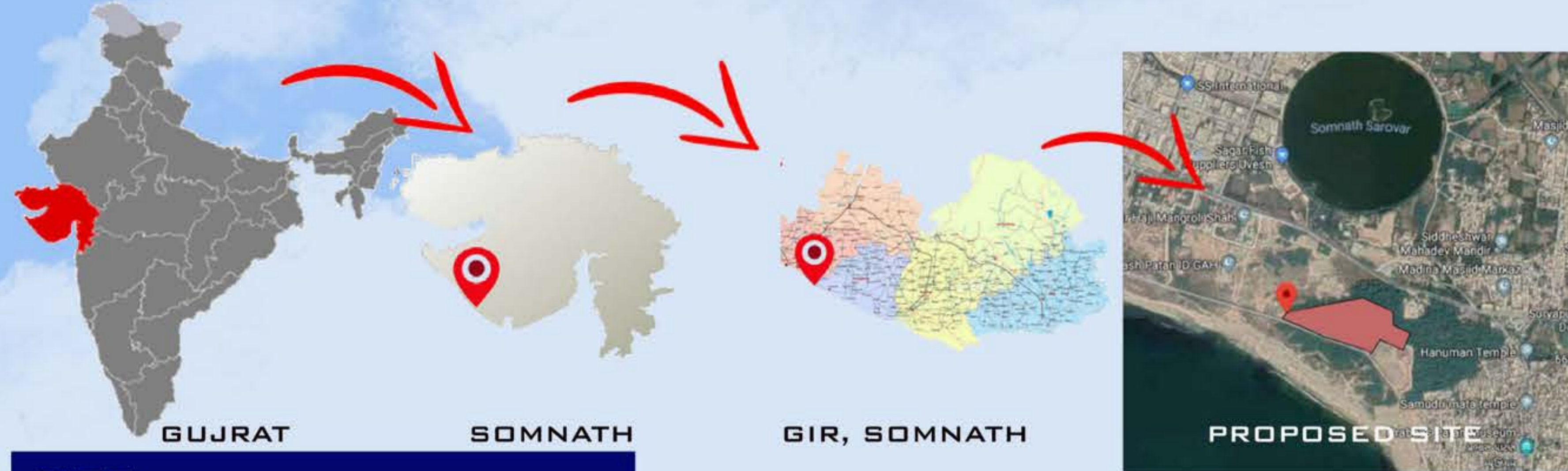
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DWARKA SECTOR-9

NAME: HARSHITAA SHANKER
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GUIDE: PROF. D.L. SRIVASTAVA



SITE LOCATION-

GIR SOMNATH, GUJRAT- GIR SOMNATH DISTRICT WAS CARVED OUT OF JUNAGADH DISTRICT. IT IS SITUATED ALONG THE SOUTH WEST COAST ON THE SAURASHTRA PENINSULA, BESIDE ARABIAN SEA. GIR SOMNATH IS FAMOUS FOR ITS SOMNATH TEMPLE, FIRST JYOTIRLINGA OF LORD SHIVA AMONG THE 12 JYOTIRLINGAS. MAJOR INDUSTRIES ALSO HOUSE IN THIS DISTRICT LIKE AMBUJA CEMENT, ADITYA BIRLA. FISHRIES HAVE BEEN ALSO SOME MAIN INDUSTRIES IN THIS TOWN.



SITE



GEOGRAPHICAL AREA- 3755 SQ.M

POPULATION-946790

CLIMATE-HOT SEMI-ARID CLIMATE

COASTAL REGION ZONE II

VEGETATION-PROSOPIS JULIFLORA IS

FOUND AS THE MOST DOMINANT SPECIES

ALONG THE COAST.

SITE APPROACH -

SOMNATH RAILWAY STATION-2.3KM

VERAVAL AIRPORT-64KM

SOMNATH BUS STAND 1.7KM

BYE LAWS

THE PROPOSED SITE COMES UNDER JUNAGADH URBAN DEVELOPMENT AUTHORITY (JUDA) OF GUJRAT RECREATIONAL ZONE CATEGORY D2.

ACCORDING TO JUDA BYE LAWS FOLLOWING BUILDING NORMS ARE TO BE FOLLOWED

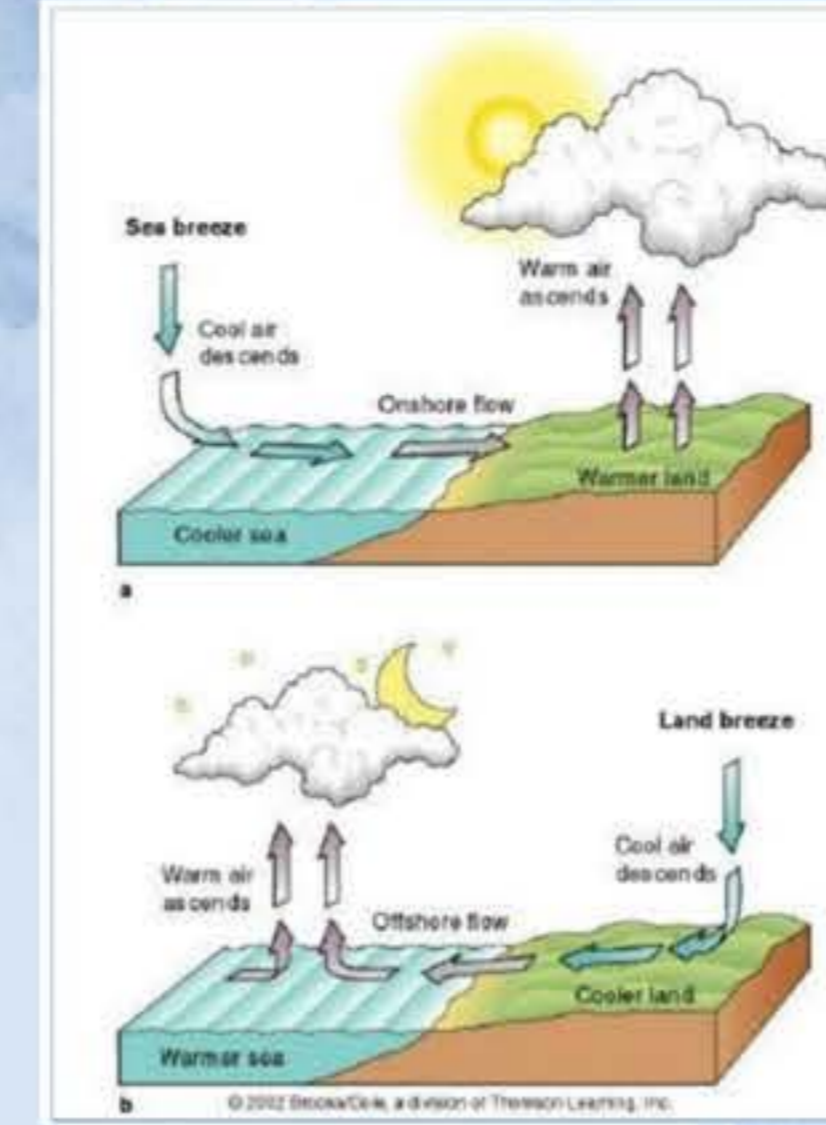
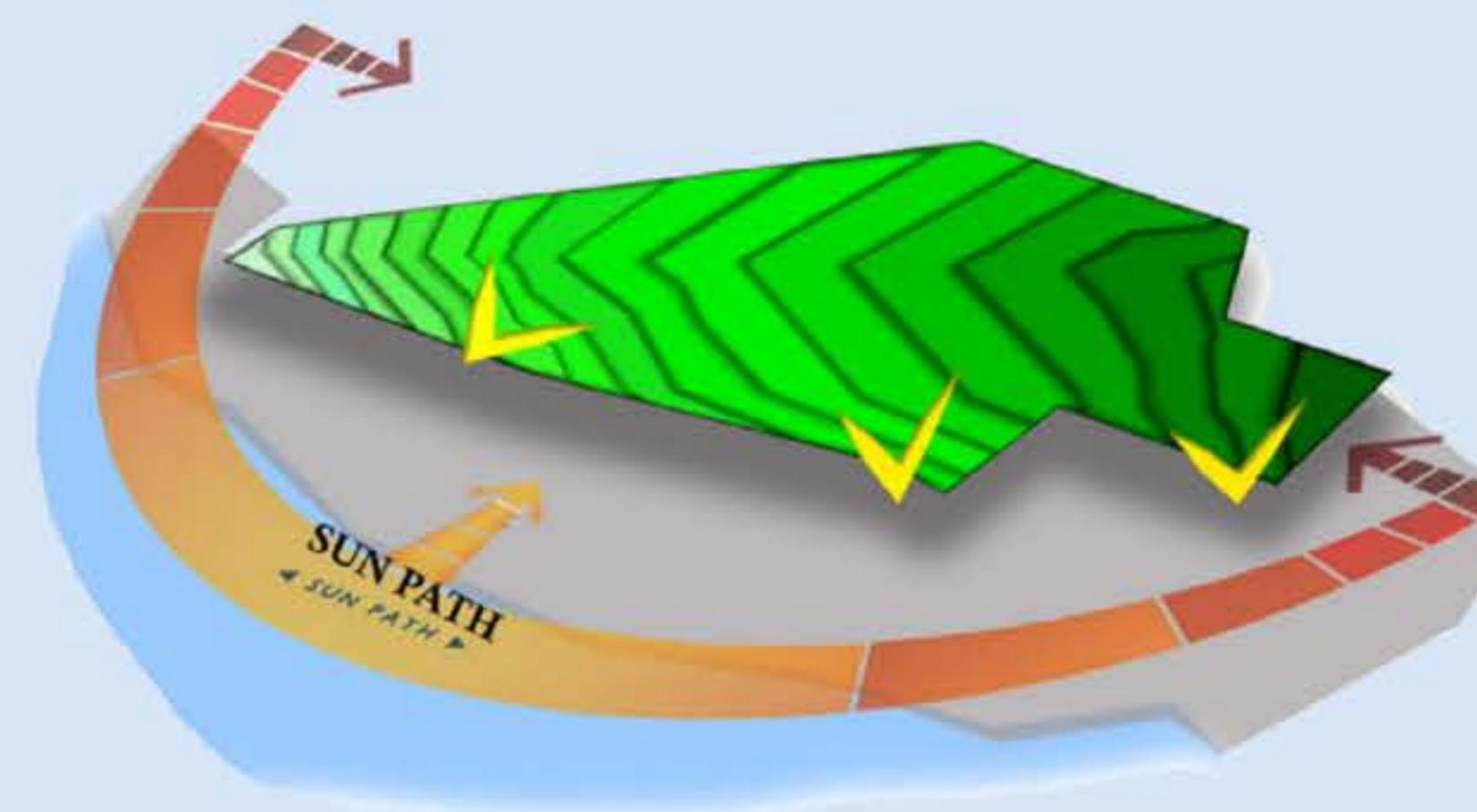
BUILDING TYPE- EDUCATIONAL AND RECREATIONAL
 PERMISSIBLE HEIGHT- 70-80M
 PERMISSIBLE SETBACKS - 9M FROM ROAD SIDE)

8M (OTHER THAN ROAD SIDE)
 PARKING AREA-10% OF BUILDING UNIT AREA.
 PERMISSIBLE FSI- 1.5-2
 SITE AREA-41,110SQM
 BUILT UP AREA- SITE AREA X FSI
 61,665SQM
 SITE HIGHEST LEVEL- 20M (FROM SEA LEVEL)
 SITE LOWEST LEVEL-10M(FROM SEA LEVEL)

SITE SURROUNDINGS-



SUN PATH AND WIND DIR -



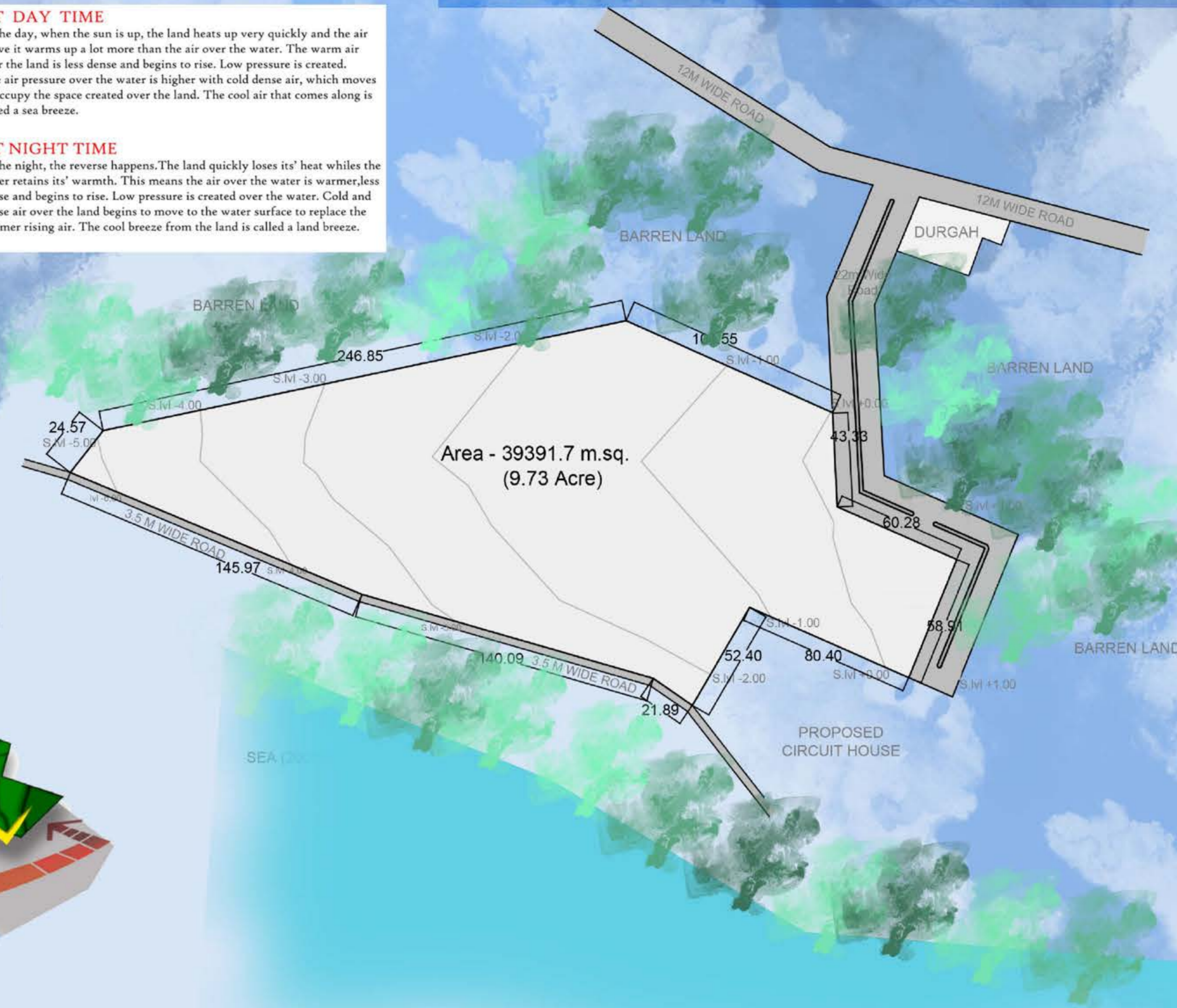
AT DAY TIME

In the day, when the sun is up, the land heats up very quickly and the air above it warms up a lot more than the air over the water. The warm air over the land is less dense and begins to rise. Low pressure is created. The air pressure over the water is higher with cold dense air, which moves to occupy the space created over the land. The cool air that comes along is called a sea breeze.

AT NIGHT TIME

In the night, the reverse happens. The land quickly loses its' heat while the water retains its' warmth. This means the air over the water is warmer, less dense and begins to rise. Low pressure is created over the water. Cold and dense air over the land begins to move to the water surface to replace the warmer rising air. The cool breeze from the land is called a land breeze.

SITE ANALYSIS



TRAFFIC MOVEMENT -



FRONT ROAD - 6M WIDE WITH 2M FOOT-PATHS ON EACH SIDE.

BILESWARE STREET - 14M WIDE WITH TWO WAY MOVEMENT, NO TRAFFIC CONGESTION ALONG SITE

BEFORE CONSTRUCTION OF ANY STRUCTURE PERMISSION HAS TO BE TAKEN FROM THE SOMNATH TEMPLE TRUST

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ABOUT THE TARAPOREVALA AQUARIUM



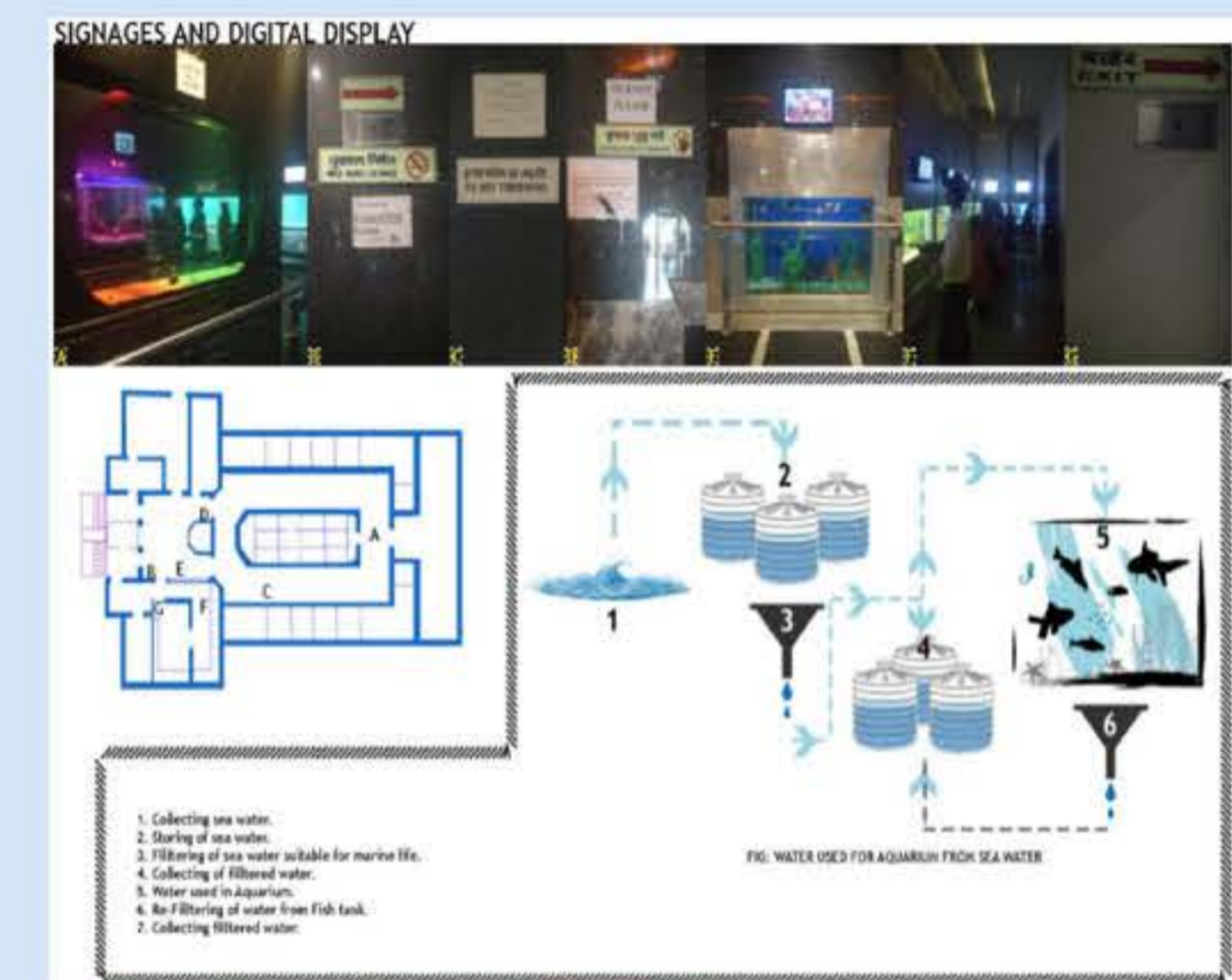
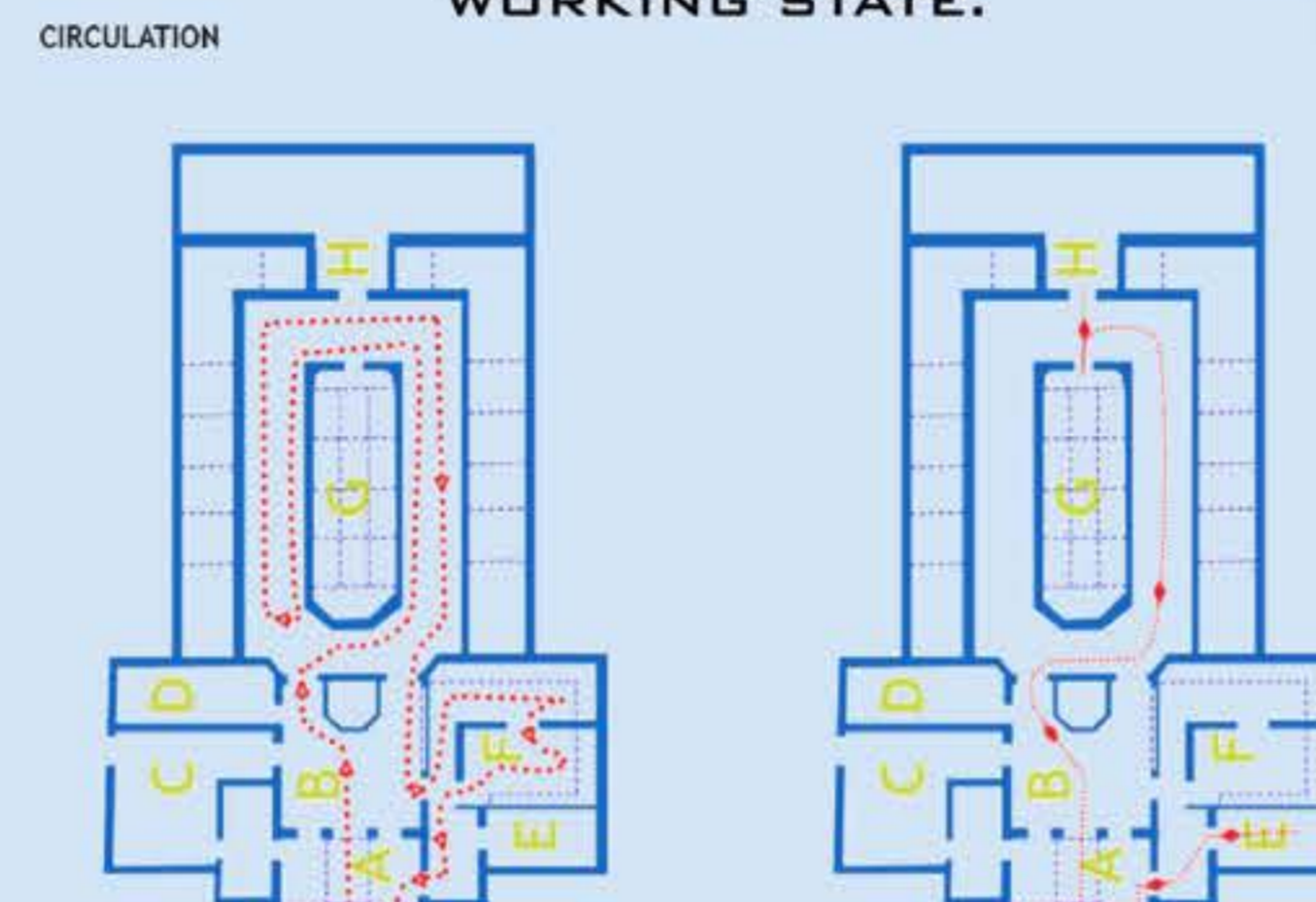
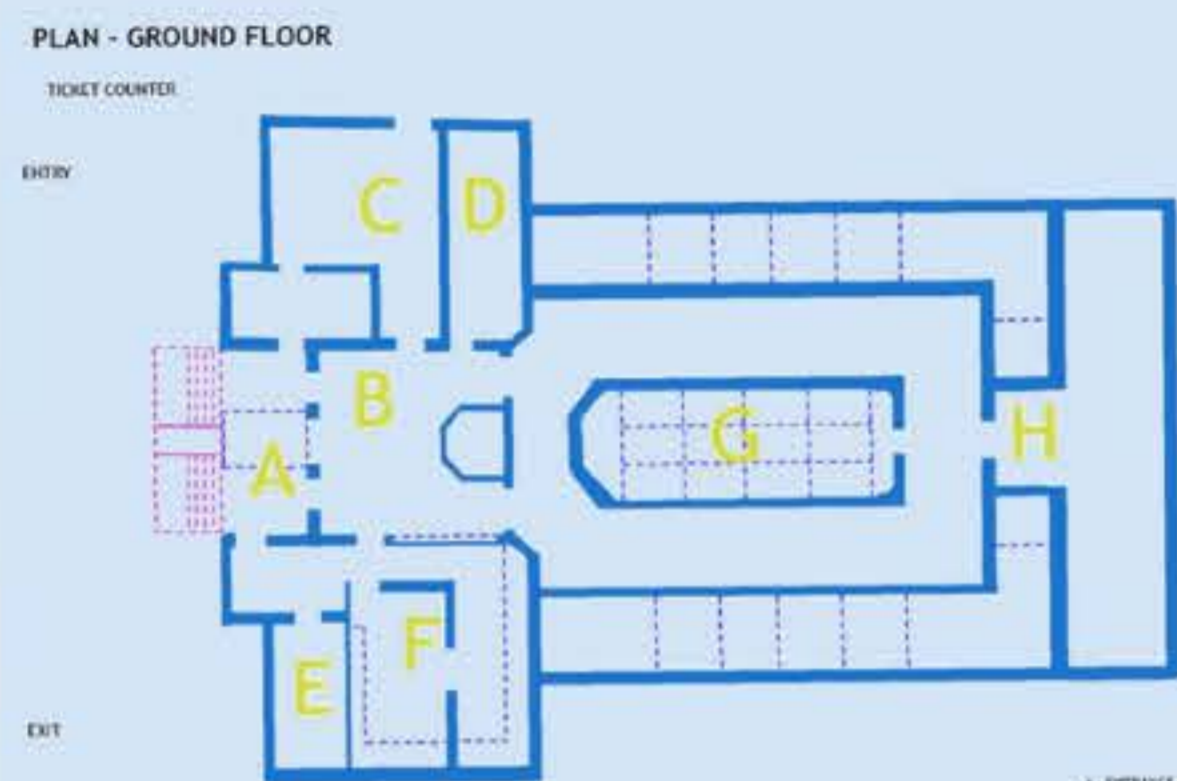
MAHARASTRA



MUMBAI



THE TARAPOREVALA AQUARIUM IS LOCATED ON THE WESTERN COAST OF THE COUNTRY IN THE LETROPOLIS CITY MUMBAI AT MARINE DRIVE, NEAR CIARNI ROAD AREA.
 YEAR OPENED- 1951
 TIMINGS- 11AM-8PM
 THE FIRST MADE AQUARIUM IN INDIA AND IS STILL UNDER WORKING STATE.



CIRCULATORY SYSTEM-
 IT IS A CLOSED WATER SYSTEM I.E. WATER ONCE TAKEN IS USED OVER AND OVER AGAIN.
BASEMENT RESERVOIR-> OVERHEAD TANKS-> DISPLAY TANKS.
 THERE IS NO PARKING INSIDE THE PREMISES APART FOR THE STAFF AND ADMIN. PEOPLE HAVE TO PARK IN THE NEARBY PARKING SPACE OF THE COMPLEX AND ACCESS VIA WALKING AFTER COLLECTION OF THERE TICKETS.
 ILLUMINATION OF TANKS IS DONE BY CONCEALED BULBS.
 THE SKY LIGHT IS COVERED BY TINT BLUE TO CONTROL THE GROWTH OF ALGAE.



TUNNEL TANK FEATURES
 1. Floor Glass (at entrance) - 120mm Thick.
 2. Length - 15ft.

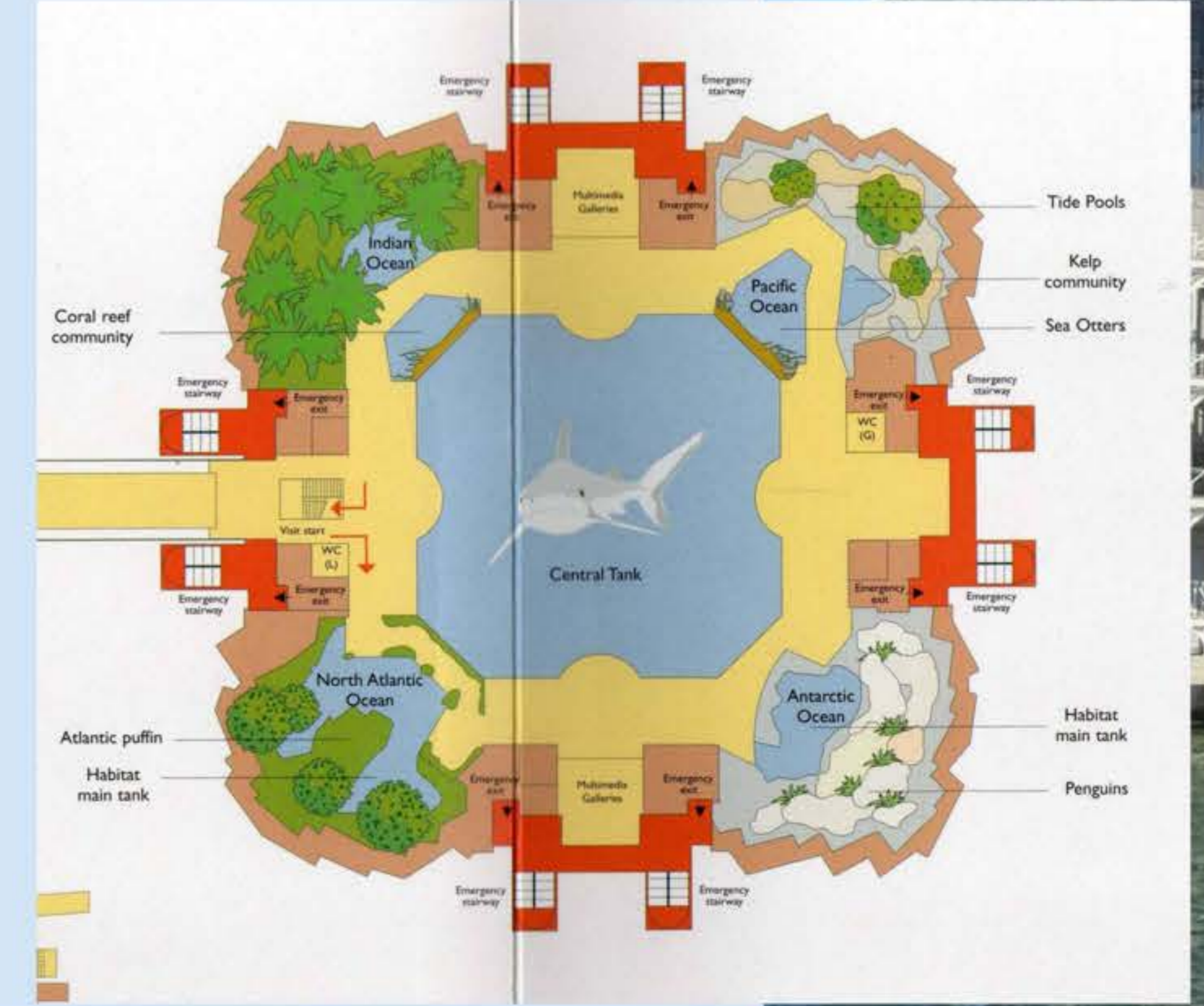
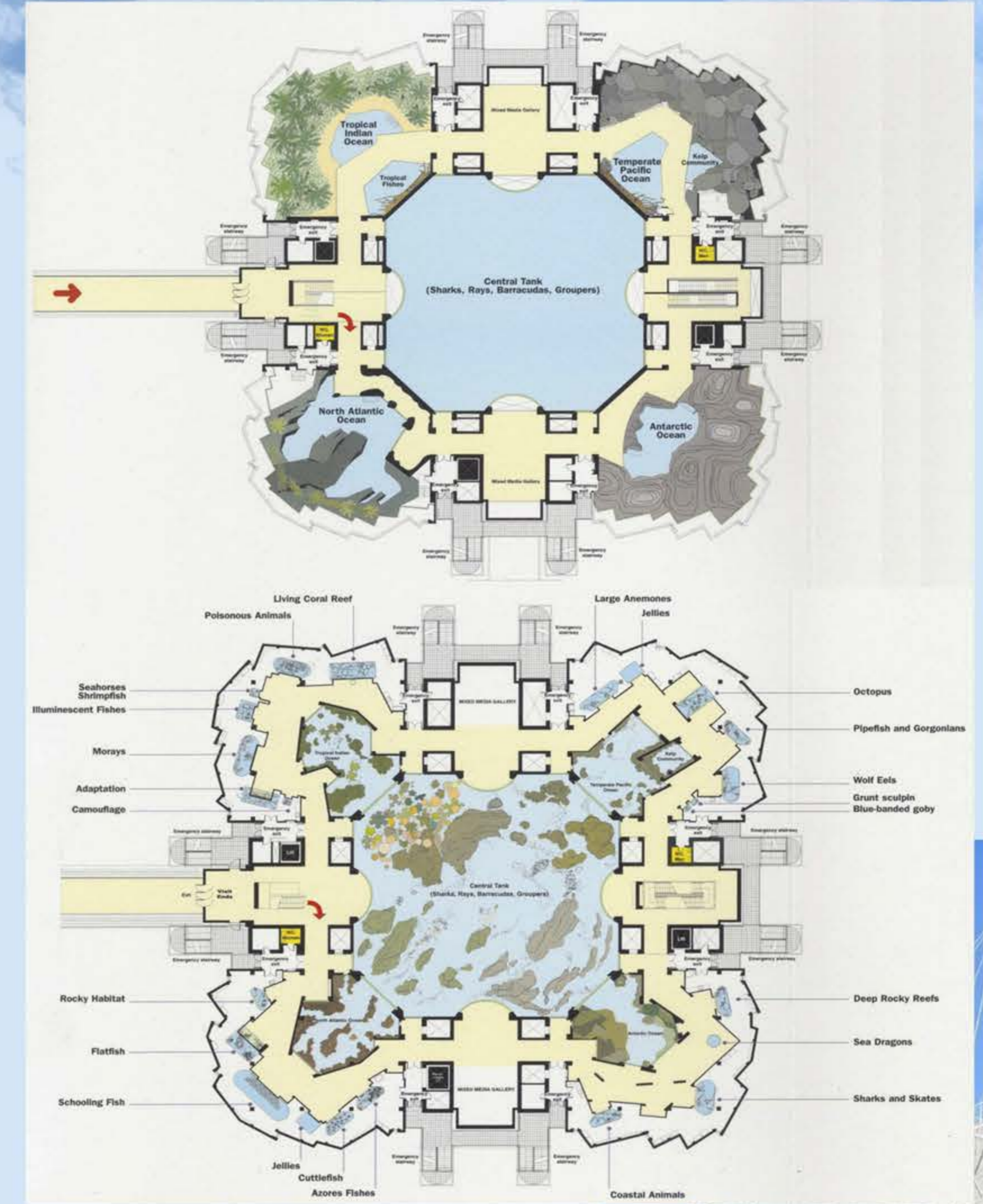
FRESH WATER TANK
 1. 10ft x 8ft x 4ft in dimension. (28 Tanks)
 2. Water for fresh water tanks are collected from sea and treated.

TROPICAL WATER TANK
 1. 15 Tanks
 2. 4ft x 4ft x 2ft in size.

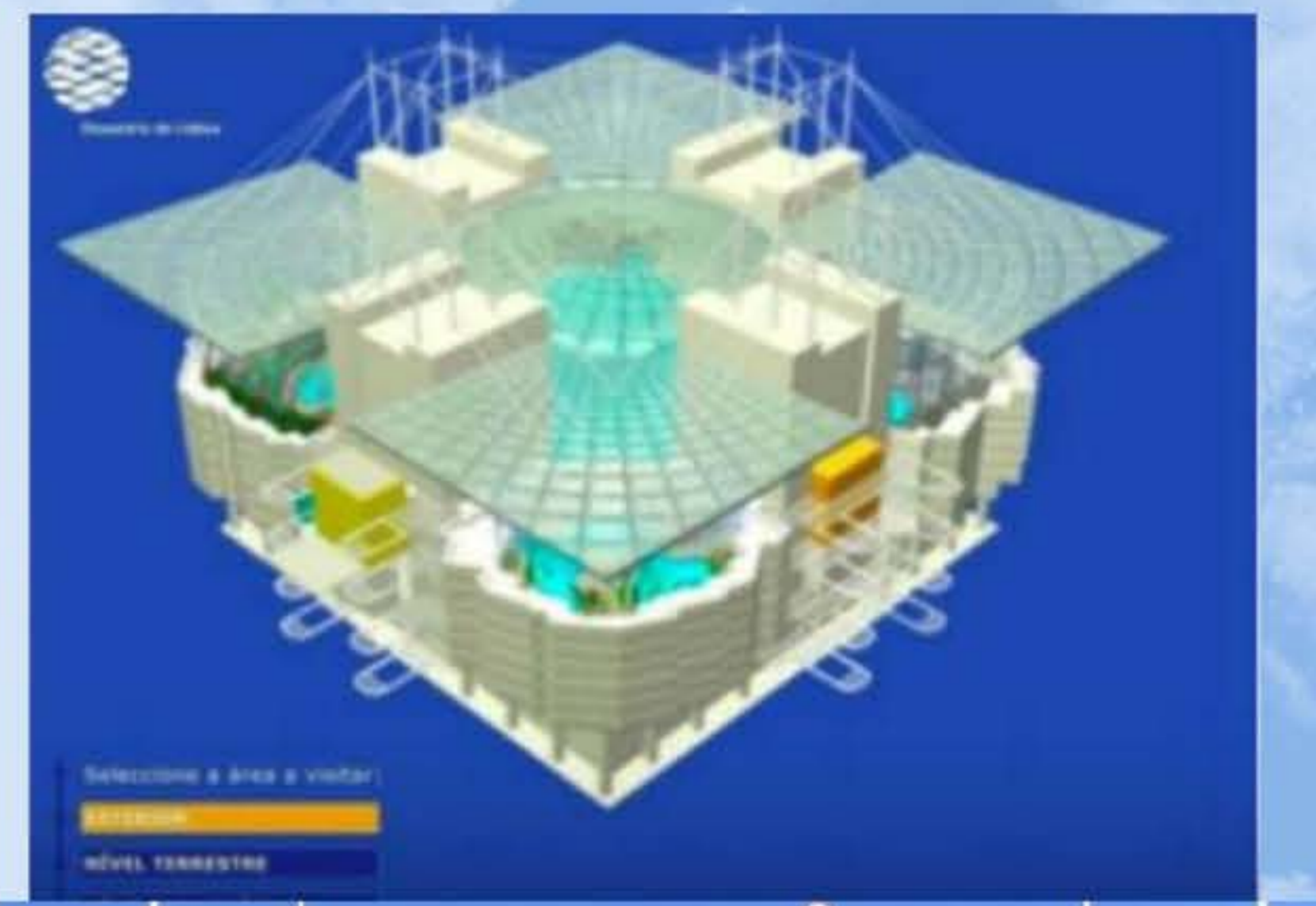


LISBON OLIVIA -

ABOUT THE BUILDING- THE COMPLEX CONSISTS OF TWO MAIN BUILDINGS ONE ADMINISTRATIVE AND THE OTHER PUBLIC DISPLAY. THE STRUCTURE IS CONNRCTED BY A BRIDGE FROM LAND TO GIVE A REMAKABLE UNDERWATER EXPERIENCE. VISITORS ENTER THROUGH A RAMPED BRIDGE TO AN UPPER LEVEL. THERE IS A CENTRAL TANK AND FOUR OTHER TANKS .



CASE STUDIES



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MARINE LIFE

WE LIVE ON A BLUE PLANET. ABOUT 71% OF THE EARTH'S SURFACE IS COVERED IN WATER, AND A WHOPPING 97% OF THIS IS FOUND IN OUR SEAS AND OCEANS.



MARINE LIFE, OR SEA LIFE OR OCEAN LIFE, IS THE PLANTS, ANIMALS AND OTHER ORGANISMS THAT LIVE IN THE SALT WATER OF THE SEA OR OCEAN.

UNDERSTANDING THE LIFE CYCLES, HABITS, HABITATS, AND INTER-RELATIONSHIPS OF MARINE LIFE CONTRIBUTES TO OUR UNDERSTANDING OF THE PLANET AS A WHOLE. HUMAN INFLUENCES AND RELIANCE ON THESE SPECIES, AS WELL AS CHANGING ENVIRONMENTAL CONDITIONS, WILL DETERMINE THE FUTURE HEALTH OF THESE MARINE INHABITANTS.

THE FAUNA IS MADE UP OF ALL THE ANIMALS AND LIVING BEINGS THAT EXIST IN THE OCEAN, REGARDLESS OF THEIR SIZE. FROM THE SMALLEST LIKE PROTOZOA TO THE LARGEST VERTEBRATES LIKE WHALES. THEY INCLUDE A GREAT VARIETY OF SPECIES, FROM MAMMALS

THERE IS A GREAT VARIETY OF PLANTS IN THE MARINE FLORA, MAINLY SEA-WEEDS. OCEANS ARE FULL OF THEM AND EACH CONTAINS A WIDE RANGE OF DIFFERENT LIFE FORMS, SOME OF WHICH ARE SO SMALL THAT THEY CAN ONLY



HONEYCOMB-HEXAGON



THE HEXAGON IS THE CONNECTING CENTER OF UNIVERSAL COHERENCE WHICH TIES EVERYTHING TOGETHER AND LINKS EVERYTHING BACK.

THE HEXAGON HAS UNCANNY PROPERTIES.

THIS MINIMIZES THE AMOUNT OF MATERIAL NEEDED TO BUILD THESE BOUNDARIES, HENCE THE USE OF HEXAGONS BY HONEYBEES.



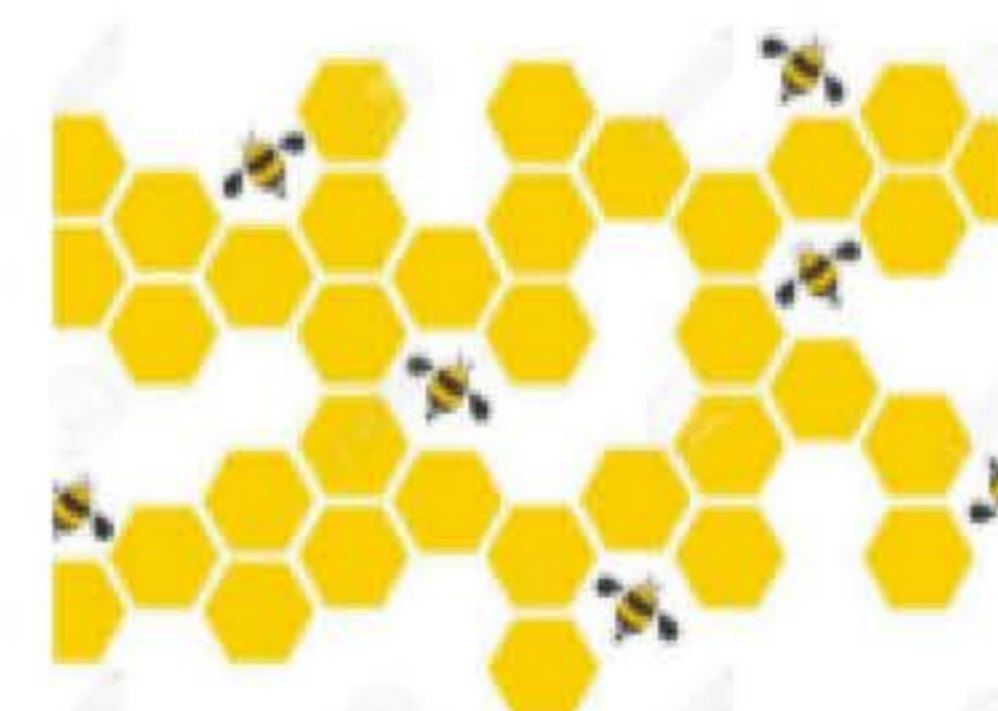
HEXAGONS ARE STRUCTURALLY STABLE - THEIR REGULARITY AND EVENNESS OF SHAPE ALLOWS THEM TO REPEAT, AND THEIR NEAR-CIRCULARITY ALLOWS MAXIMUM PERFECT LOAD DISTRIBUTION.

HEXAGONS ARE THE PERFECT COMPROMISE BETWEEN CIRCULARITY AND ANGULARITY.



WAVE MITIGATION

THE GEOMETRY OF THIS SHAPE USES THE LEAST AMOUNT OF MATERIAL TO HOLD THE MOST WEIGHT



THE HONEYCOMB DESIGN PROVIDES AN EXCEPTIONAL COMBINATION OF STRENGTH AND EFFICIENCY,

LIGHTWEIGHT HONEYCOMB DESIGN SOLUTIONS ARE USED IN A WIDE RANGE OF INDUSTRIES, INCLUDING THE AEROSPACE, MARINE, MILITARY, CONSTRUCTION AND AUTOMOTIVE MARKETS.

MIGHT EVEN BE SURPRISED TO KNOW THAT HEXAGONAL SHAPE IS PRESENT THROUGHOUT YOUR LIFE AND NATURE IN MORE PLACES THAN ONE.



THE GIANT'S CAUSEWAY-OURIST SPOT IN IRELAND WHICH HAS SUCH A BIZARRE NAME..THE ROCK FORMATION IS A RESULT OF THE RAPID COOLING OF LAVA, SPECIFICALLY THE COLUMNAR BASALT.

THE MAJESTIC SNOWFLAKES-ANOTHER EXAMPLE OF FINDING HEXAGONS IN NATURE IS THE HUMBLE SNOW-FLAKE. THEY ARE MESMERIZING AND QUITE MYSTERIOUS ON HOW THEY GET THE HEXAGONAL SHAPE.

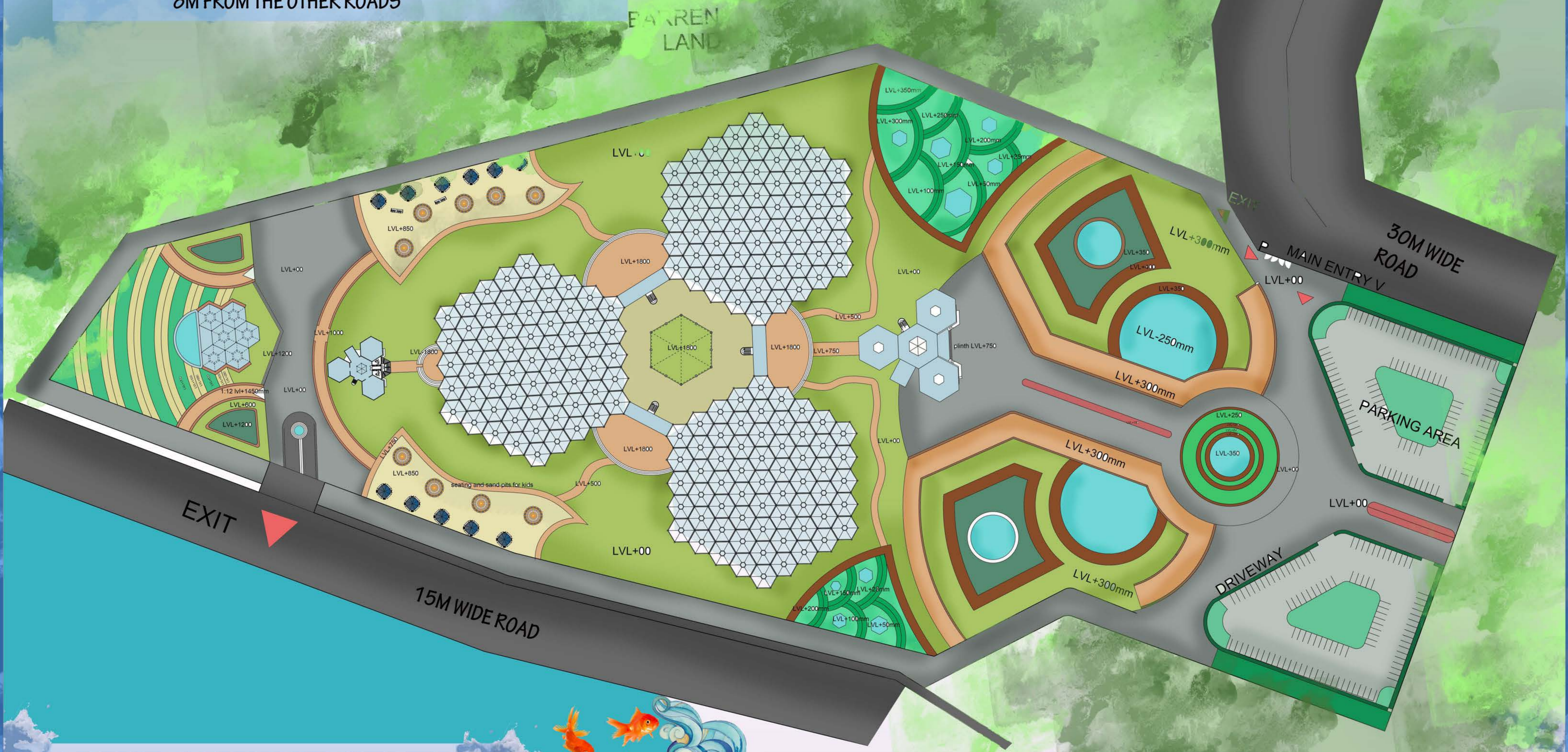
HEXAGON ON A TURTLE SHELL-NATURE HAS NUMEROUS BEAUTIFUL SPECIES THAT REFLECT MAGNIFICENT DESIGNS, AND ONE OF THE SPECIES ARE TORTOISES. THEIR SHELLS ARE WHAT PROTECT THEM, AND ON THEM, WE CAN ALSO FIND HEXAGONS.

EVERYTHING BEGINS WITH CARBON YOU MAY FAIL TO NOTICE HEXAGON IN YOURSELF, BUT YOU NEED TO REMEMBER THAT THERE ARE SEVERAL BILLIONS OF THEM IN OUR BODY THAN YOU CAN EVER IMAGINE. IT ALL COMES DOWN TO THE ELEMENT THAT IS PRESENT THROUGHOUT OUR BODY - CARBON.



SITE PLAN

AREA ANALYSIS
SITE AREA- 41,200 SQM
FSI- 1.5
BUILT UP AREA- 61,700 SQM
PARKING AREA-10% OF BUILDING UNIT AREA.
PERMISSIBLE HEIGHT - 70-80M
SETBACKS - 9M FROM THE FRONT ROAD
8M FROM THE OTHER ROADS



MARINE SCIENCE CENTRE AND OBSERVATORY

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SCALE
1:500

LANDSCAPE PLAN

DOLPHINARIUM



SAND PITS FOR KIDS



OPEN SITTING SPACES



STEPPED SITTING



GRAND WELCOME



GRASS SEATING



SHADED PERGOLAS



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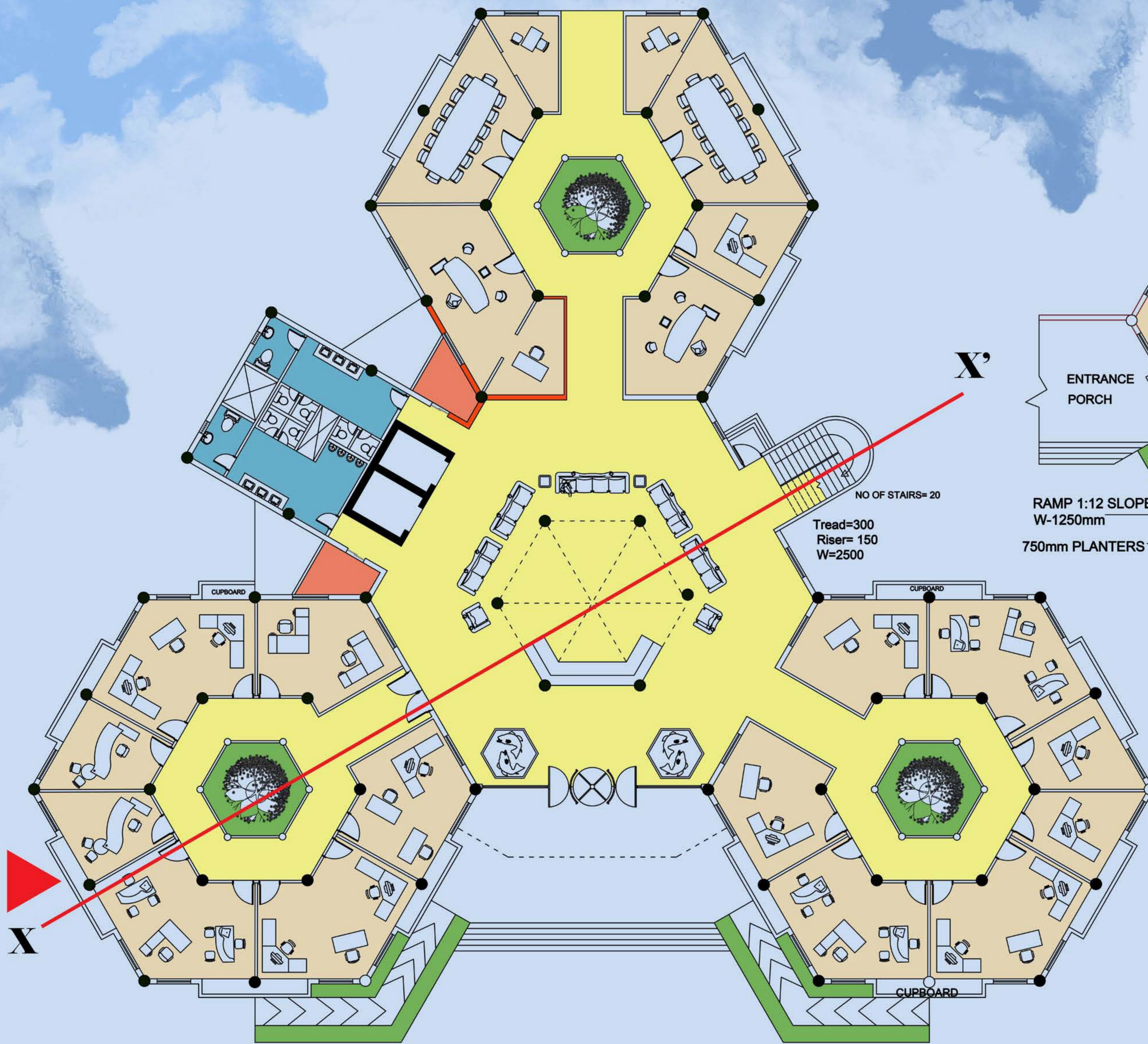
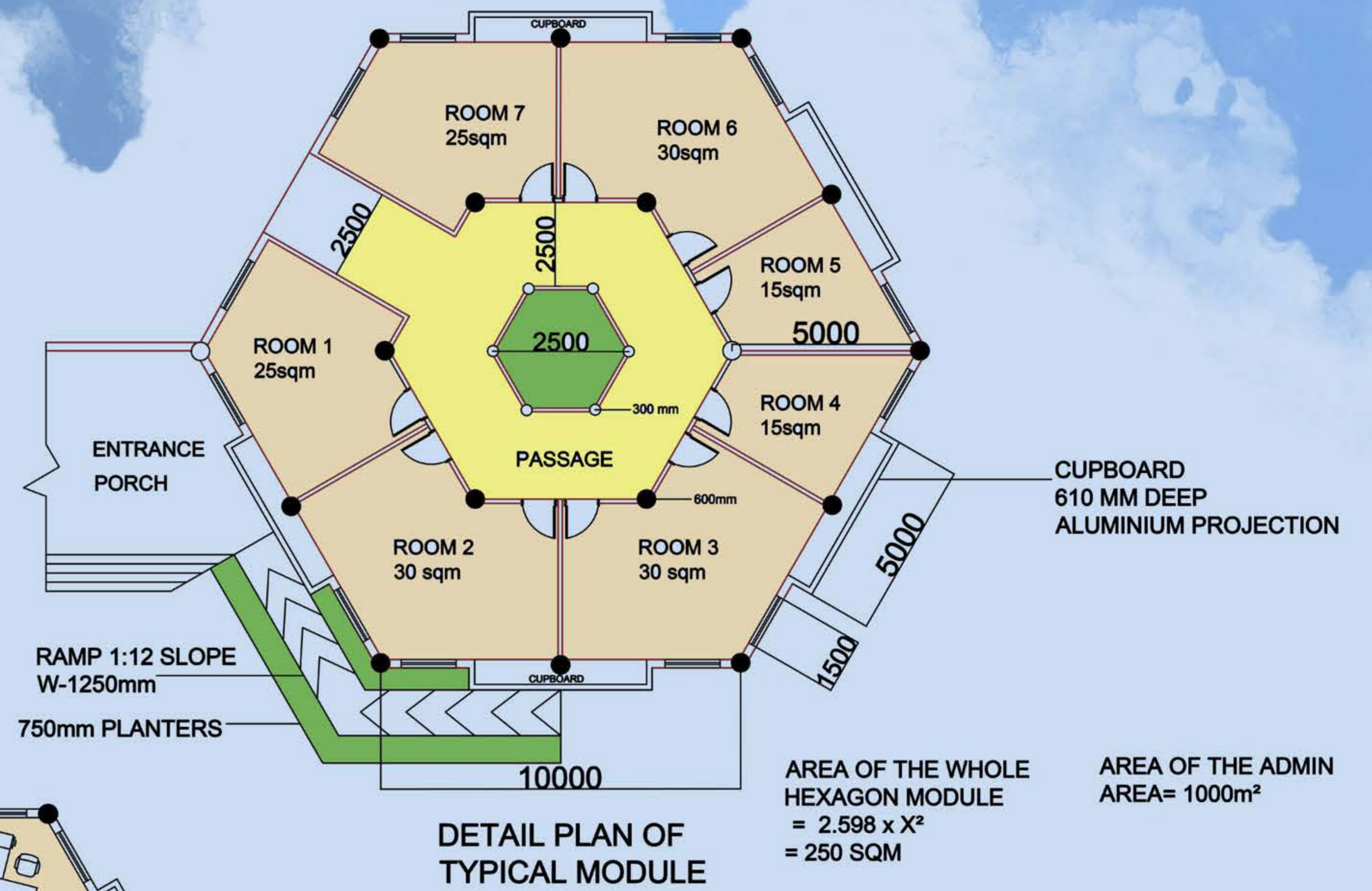
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SCALE
1:500

ADMIN PLAN



- OFFICES**
- CIRCULATION**
- WET AREAS**
- OPEN COURTYARD**
- SERVICE ROOMS**

GROUND FLOOR

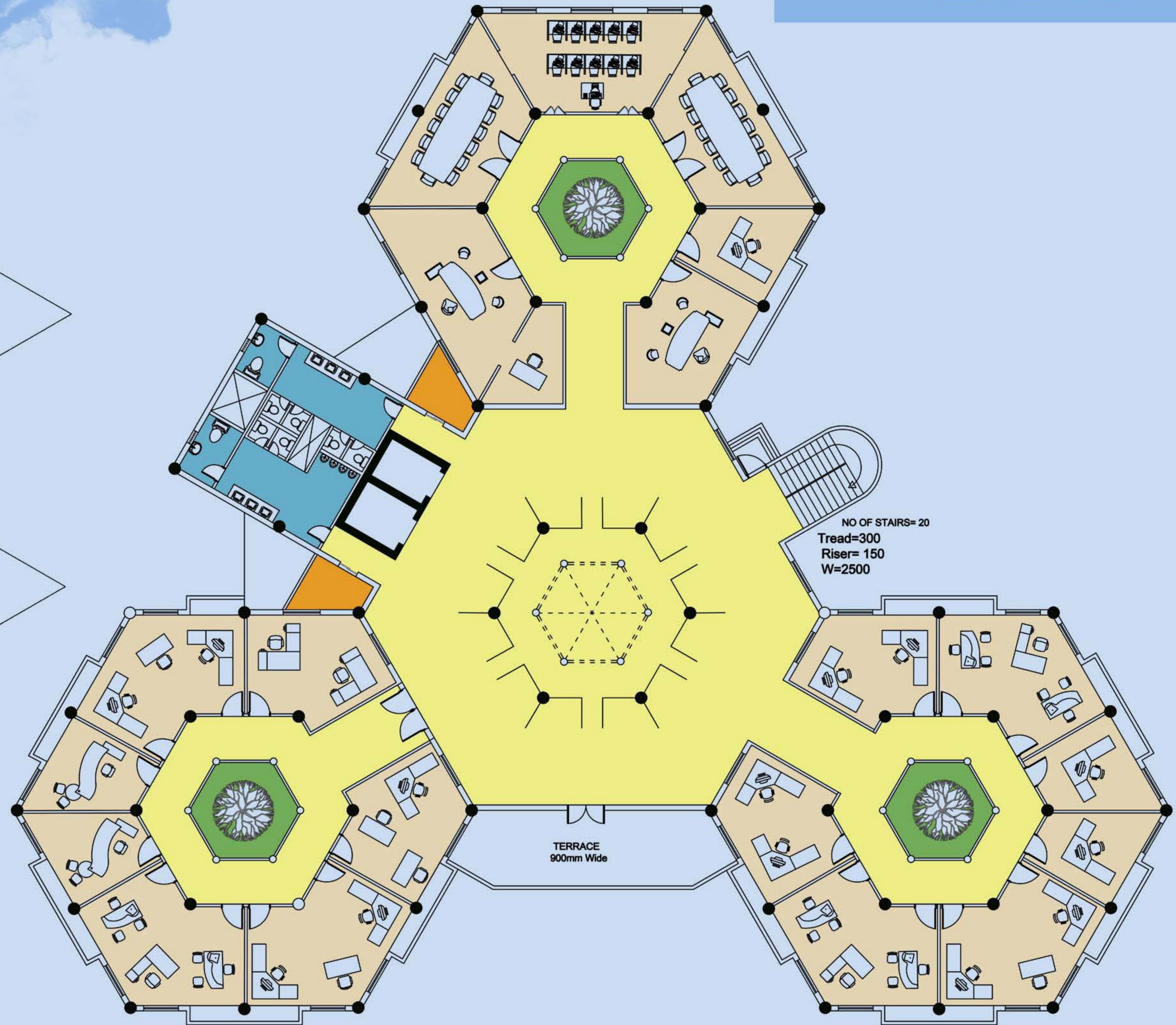
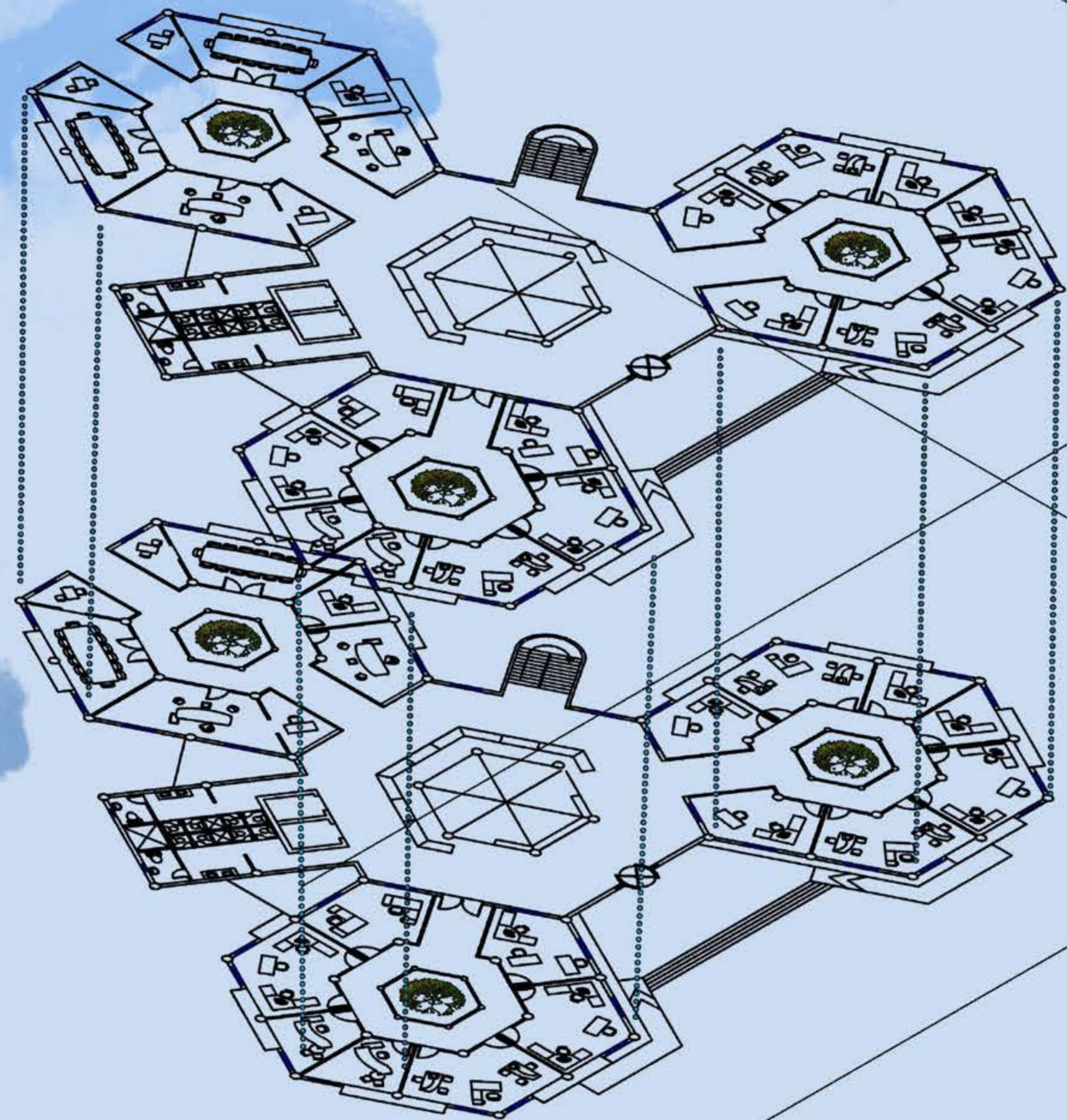
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SCALE
1:200

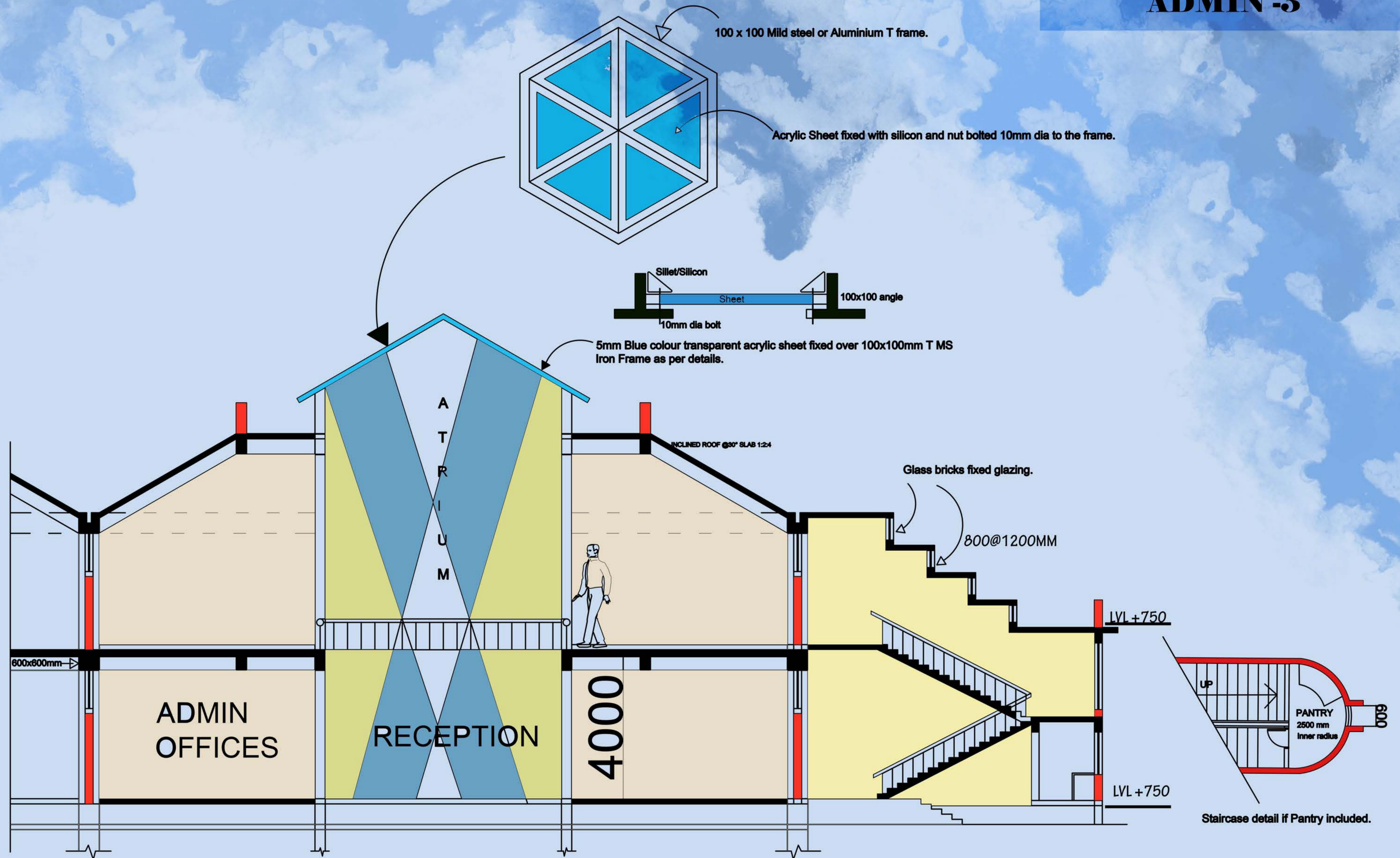


-  **OFFICES**
-  **CIRCULATION**
-  **WET AREAS**
-  **OPEN COURTYARD**

FIRST FLOOR



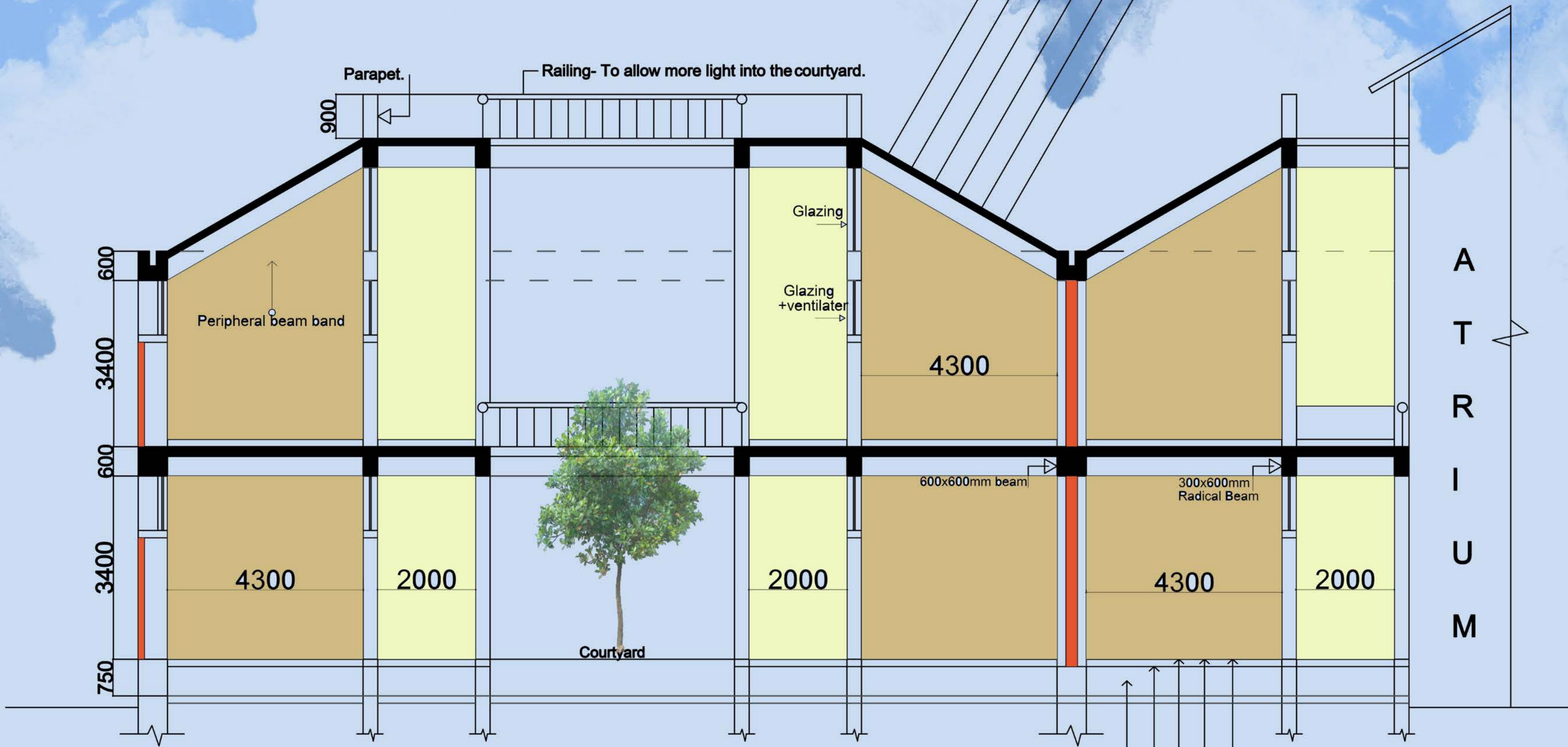
ADMIN -3



**ROOF SPECIFICATIONS
TOTAL- 150mm LAYER**

ADMIN 4

- 5mm thick Coloured 40x40mm CHECKERED GLASS MOSAIC TILE over.
- 10mm White Cement Mortar over 1:3 over
- 20mm Grey Cement Mortar 1:3 over
- 40mm thick First class Brick Tile with 10mm Mortar (1:3)grouting all around.
- 75mm Mud Fuska compacted over.
- 2/3 coats of hot bitumen over.



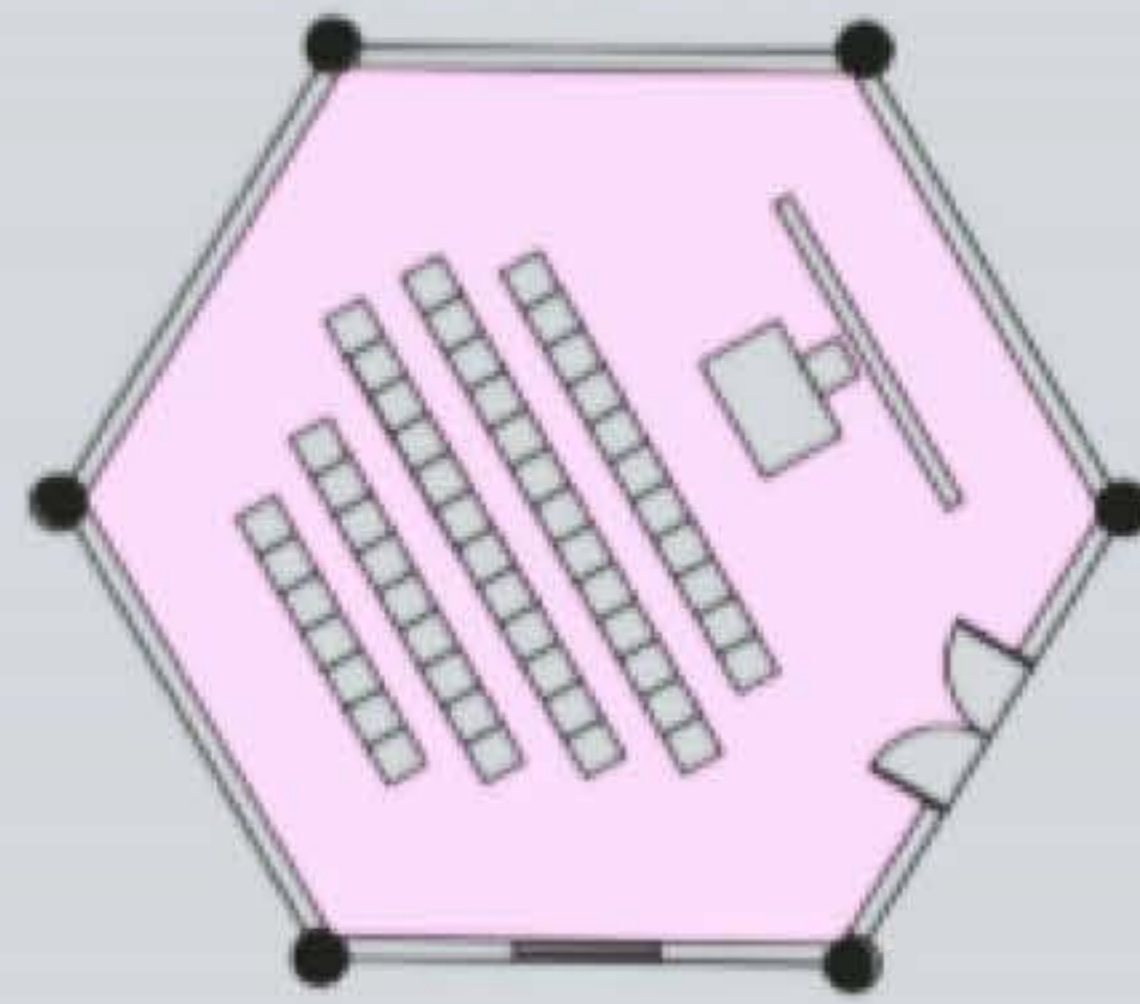
SECTION THROUGH X-X'

- 20mm Polished Granite Floor Over
- 30mm 1:3 Cement Coarse sand mortar
- 100mm BK/Stone ballast over
- 150mm Dry sand filling over
- 450 mm Rammered Earth filling



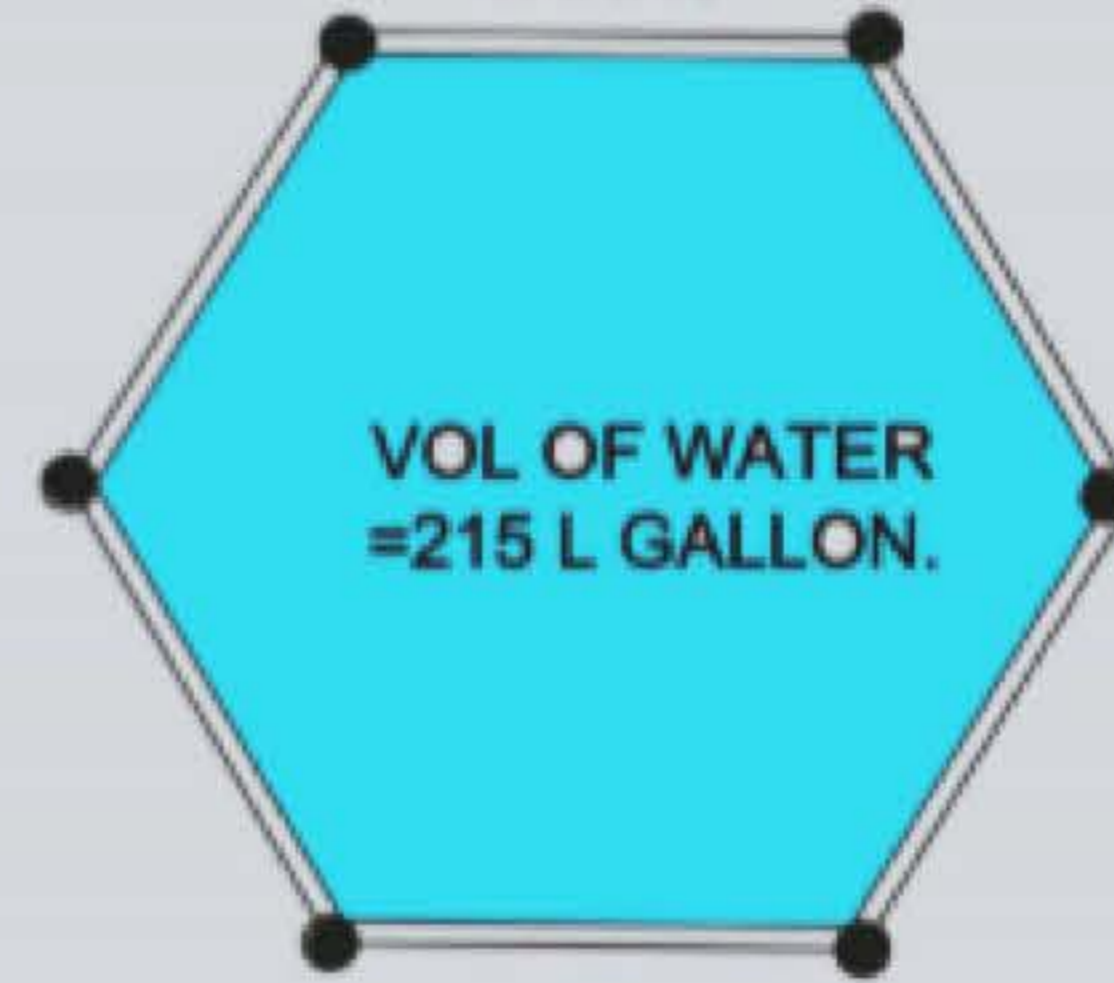
ACADEMIC OCEANARIUM

DETAIL PLAN OF LECTURE ROOM



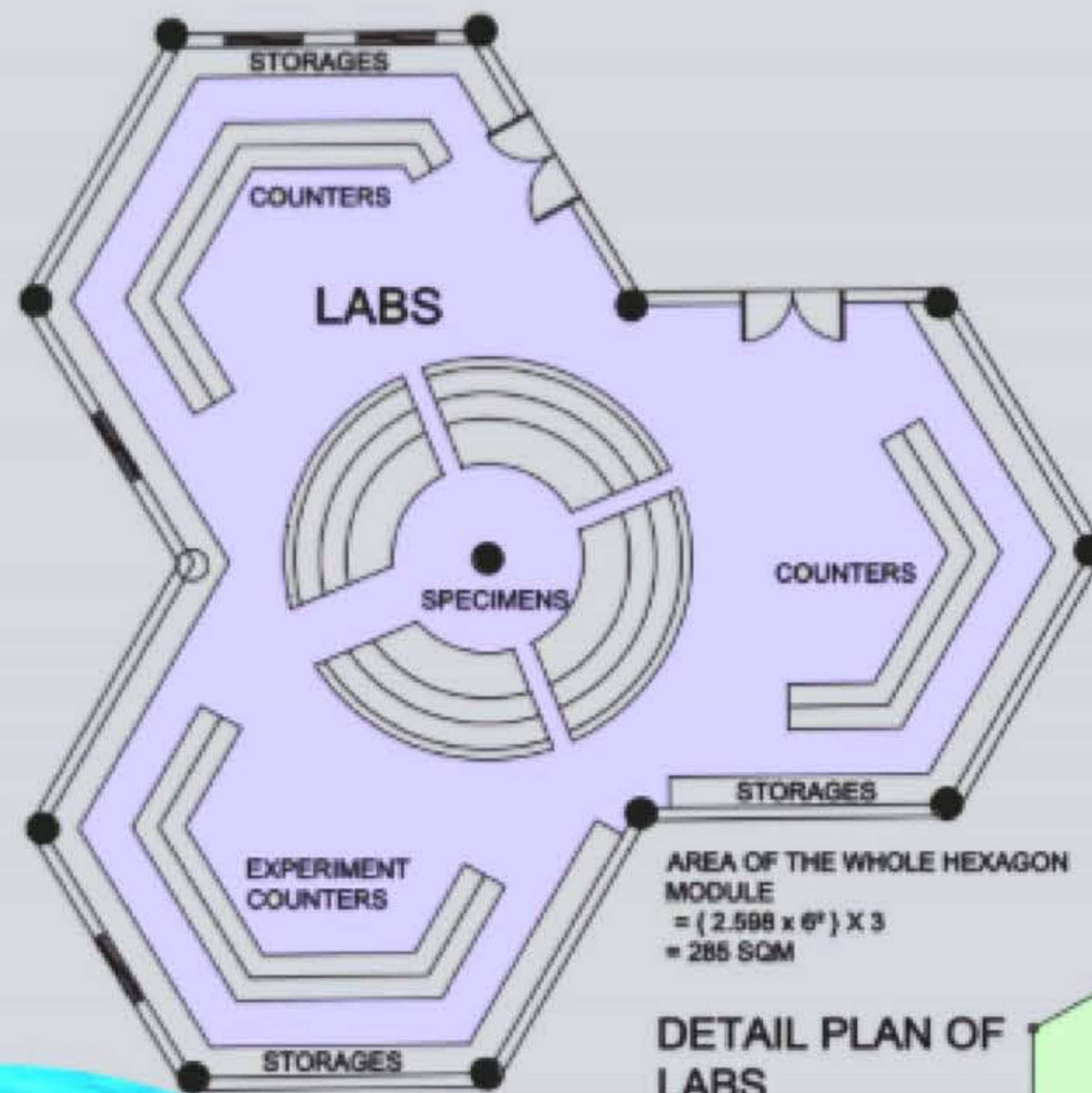
AREA OF THE WHOLE HEXAGON MODULE
 = 2.598×6^2
 = 95 SQM
 1 LECTURE ROOM FOR 50-55 STUDENTS

TANKS



VOL OF WATER
 = 215 L GALLON.

AREA OF THE WHOLE HEXAGON MODULE
 = 2.598×6^2
 = 95 SQM



AREA OF THE WHOLE HEXAGON MODULE
 = $(2.598 \times 6^2) \times 3$
 = 285 SQM

DETAIL PLAN OF LABS

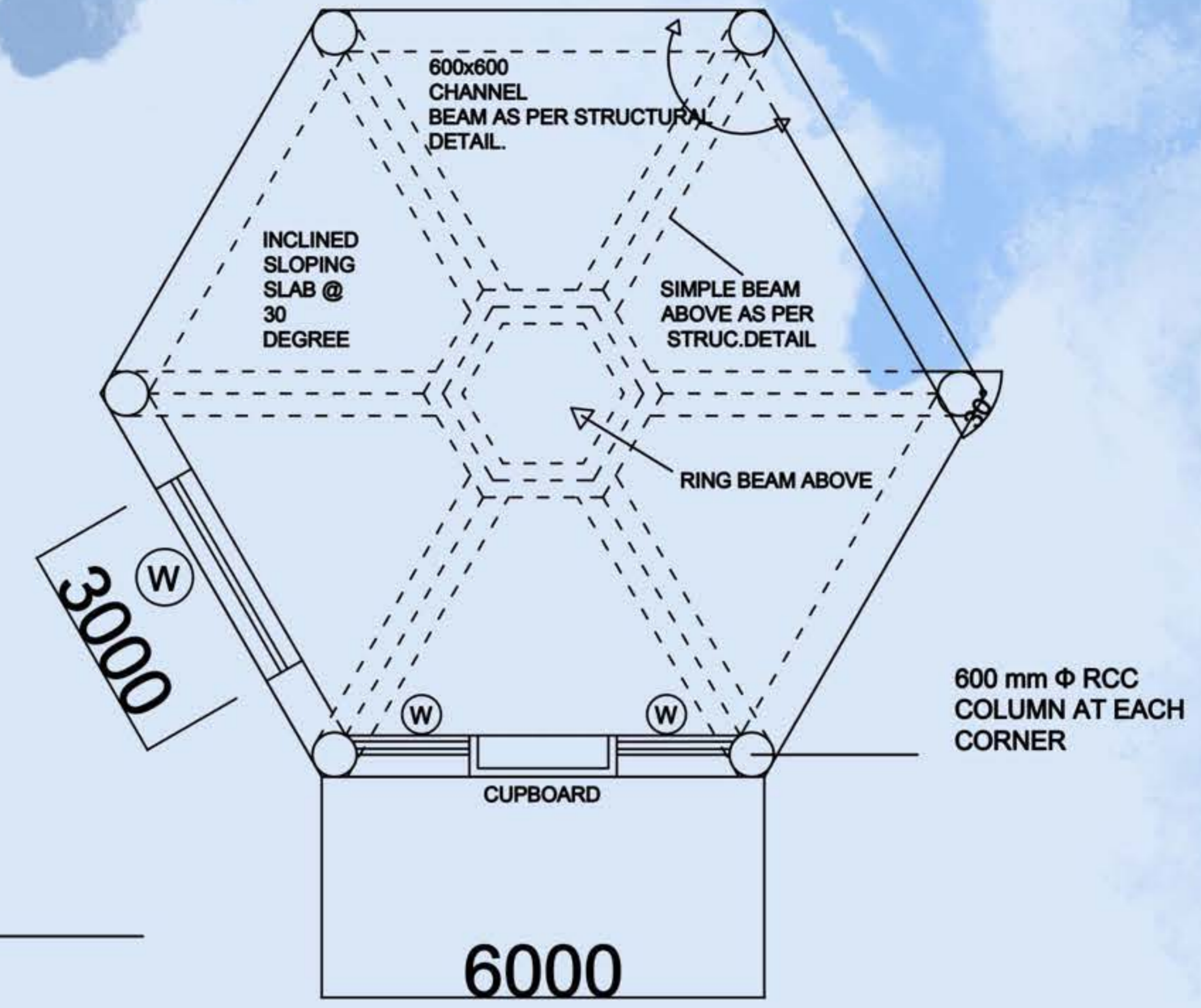
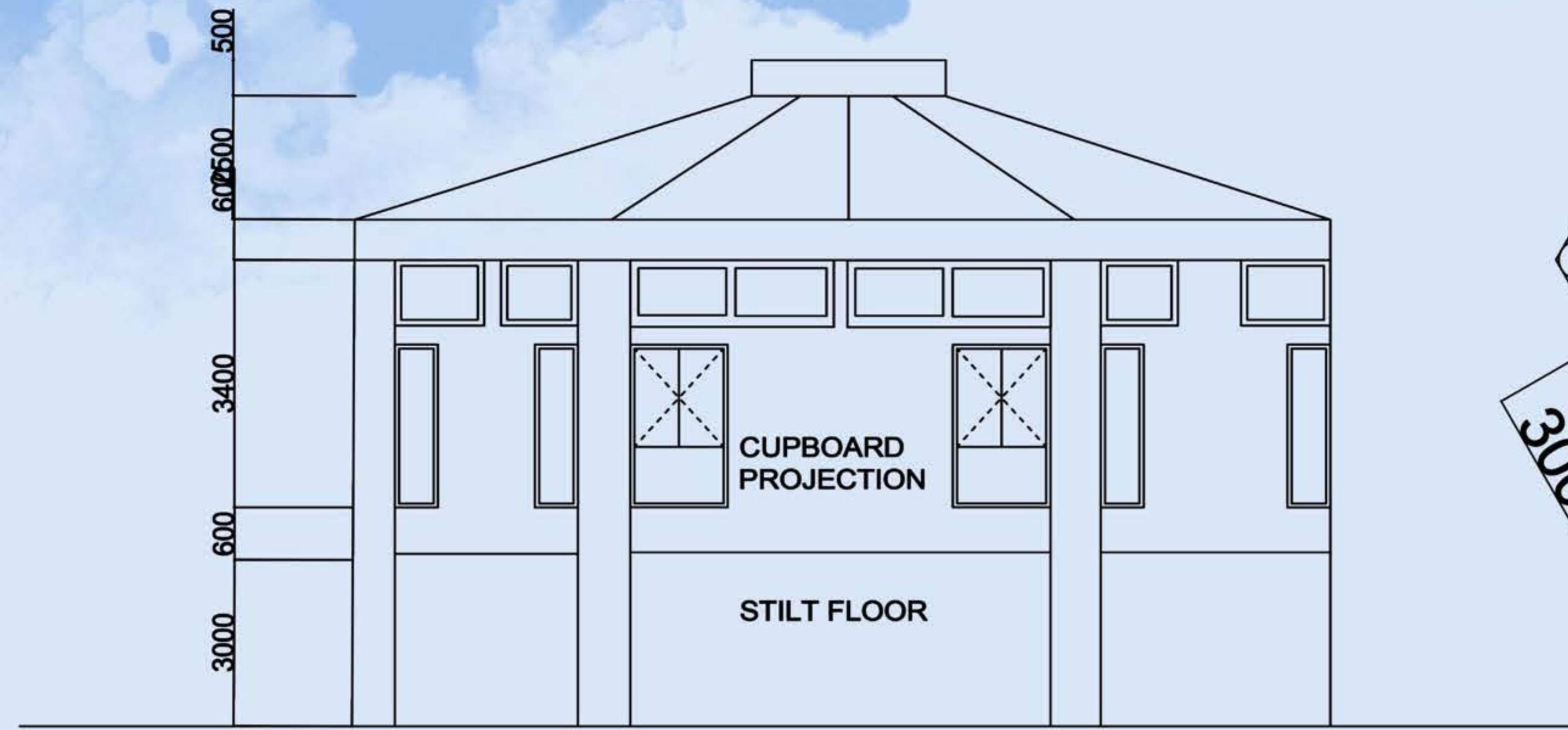


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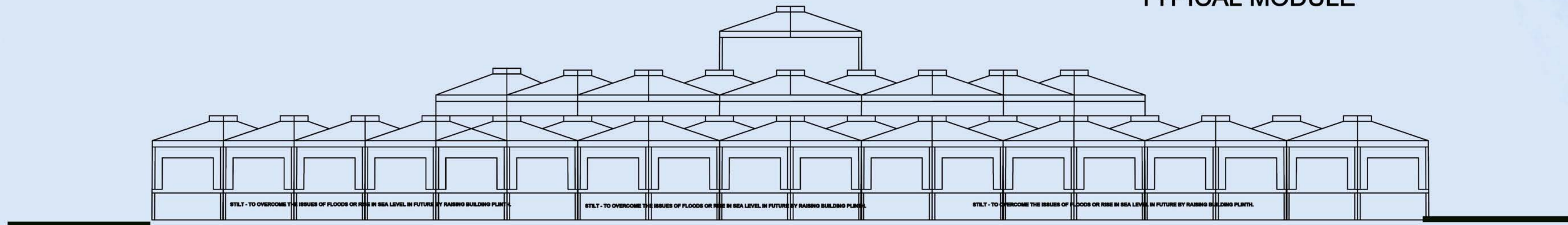
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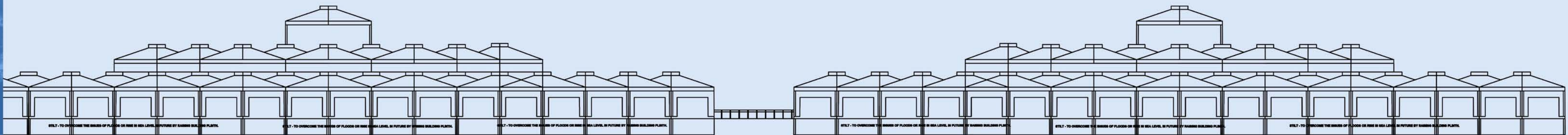




DETAIL PLAN OF TYPICAL MODULE



ELEVATION OF SINGLE CLUSTER



ELEVATION OF TWO CLUSTERS

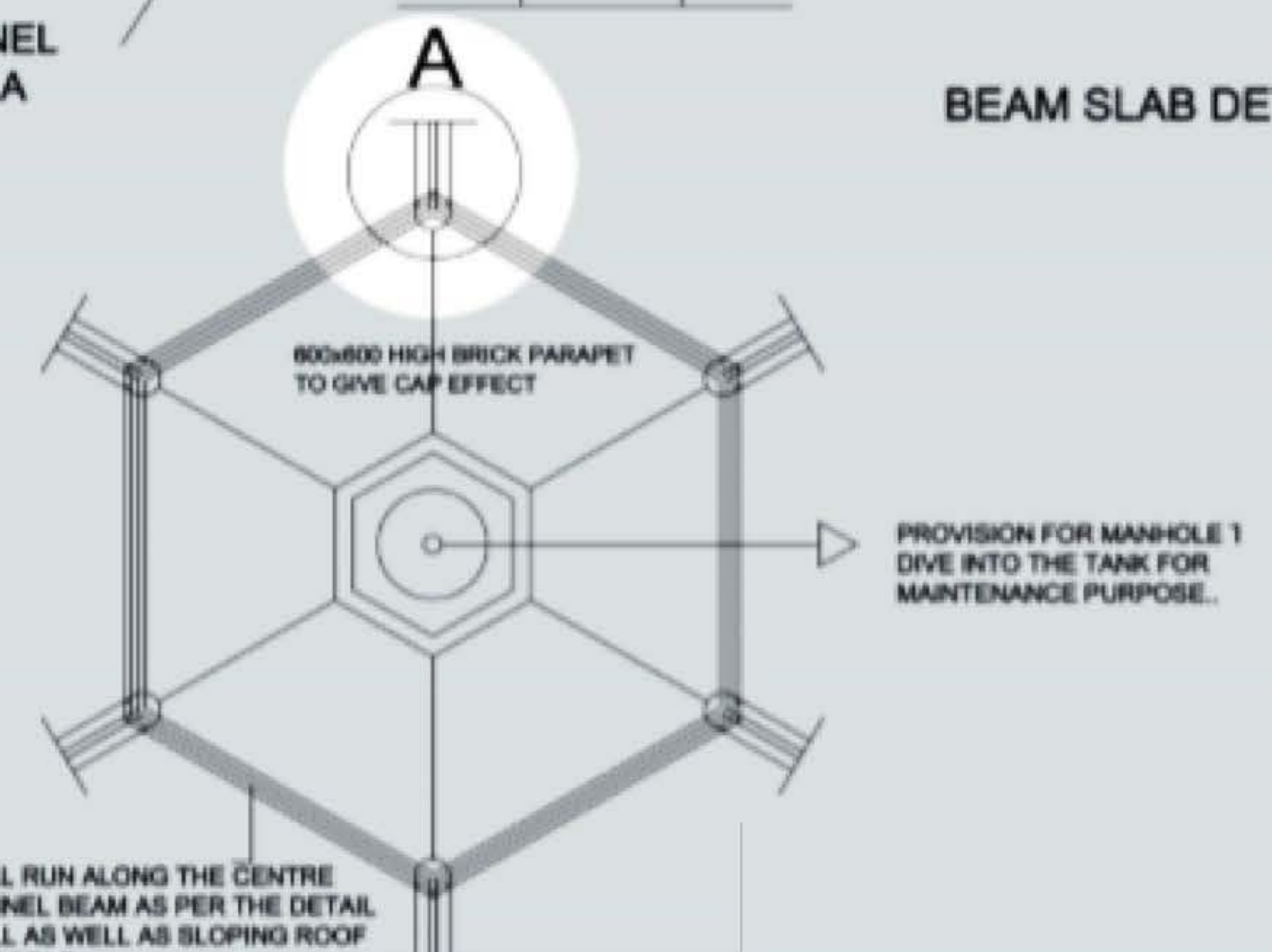
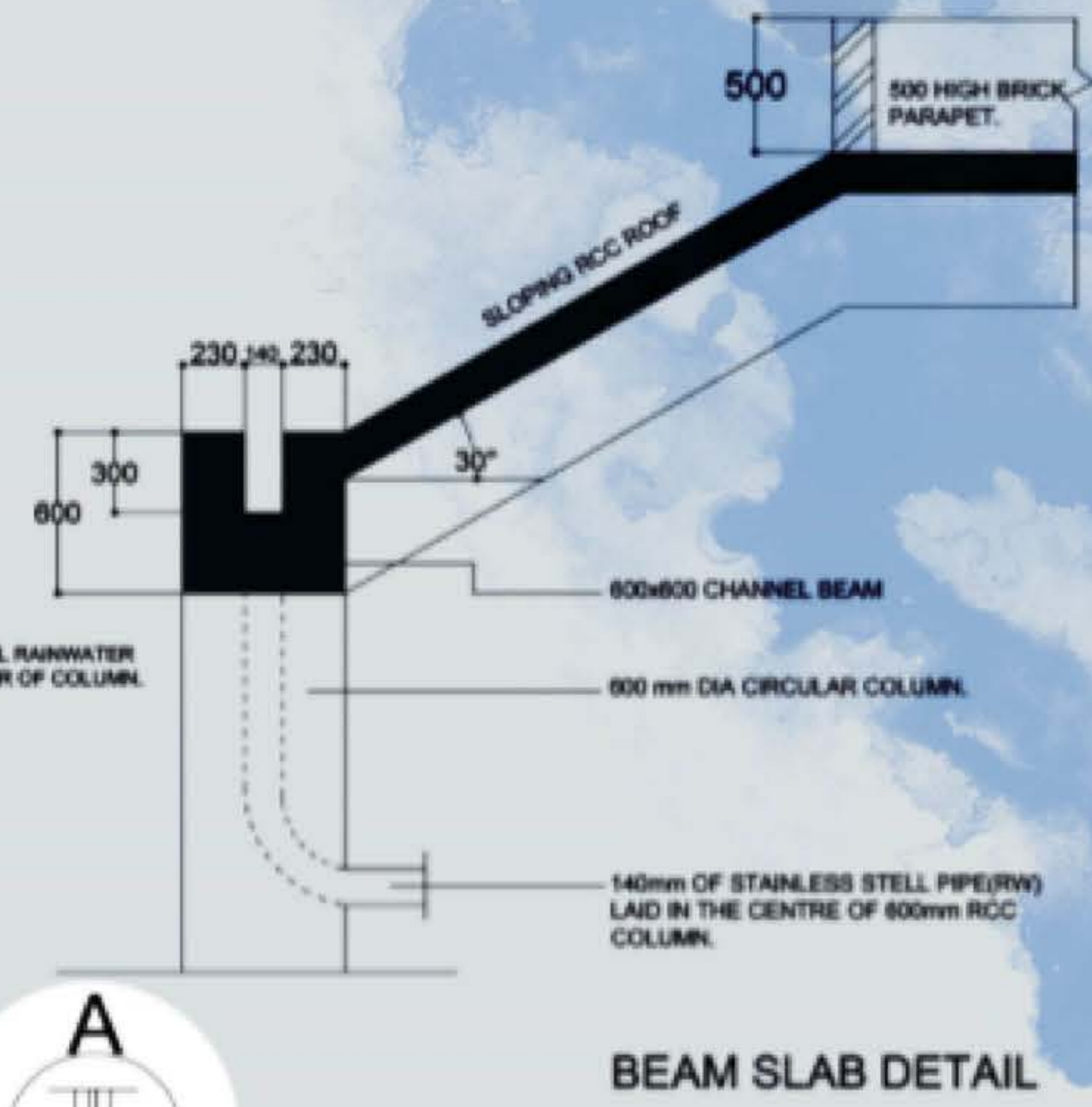
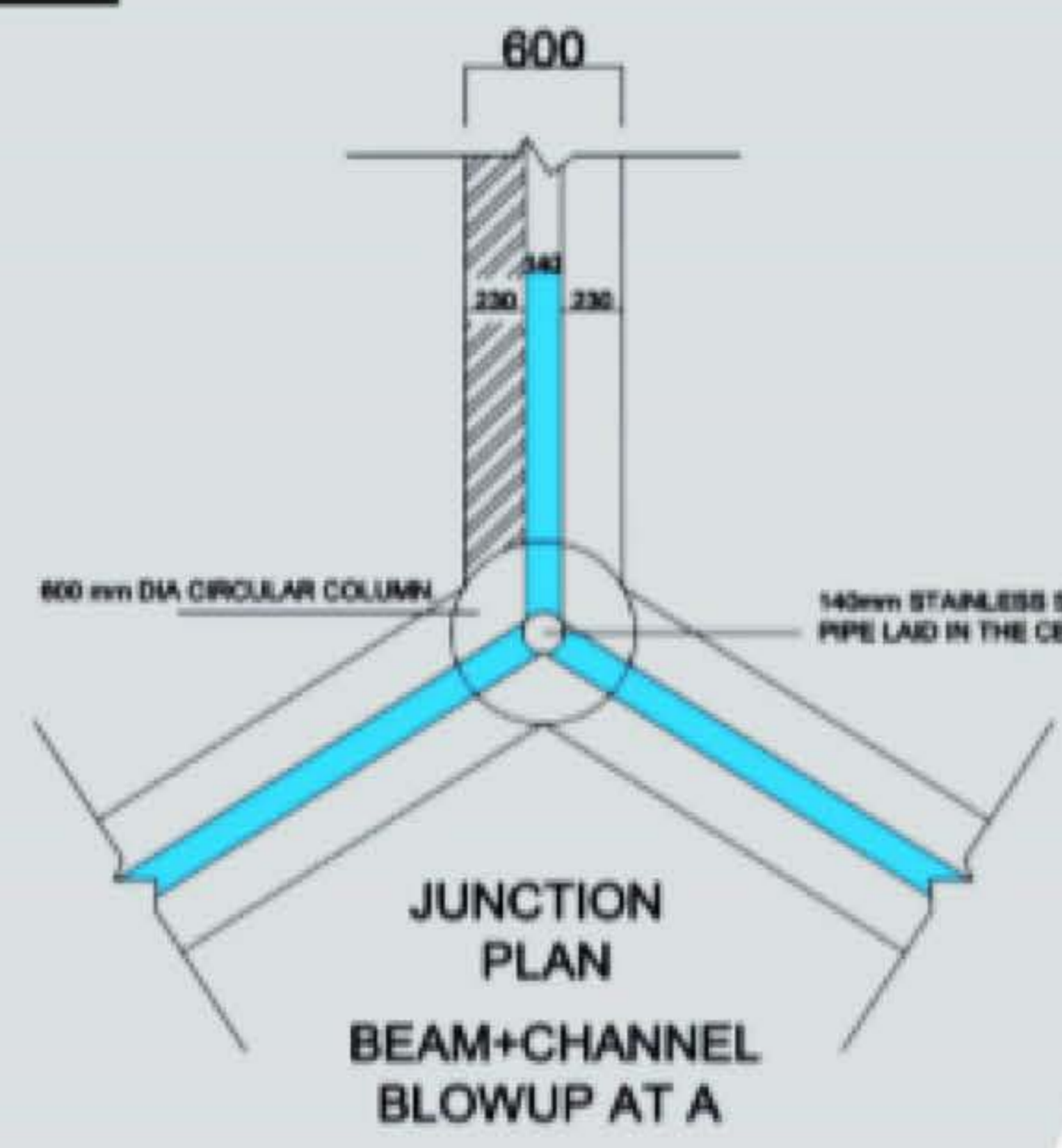
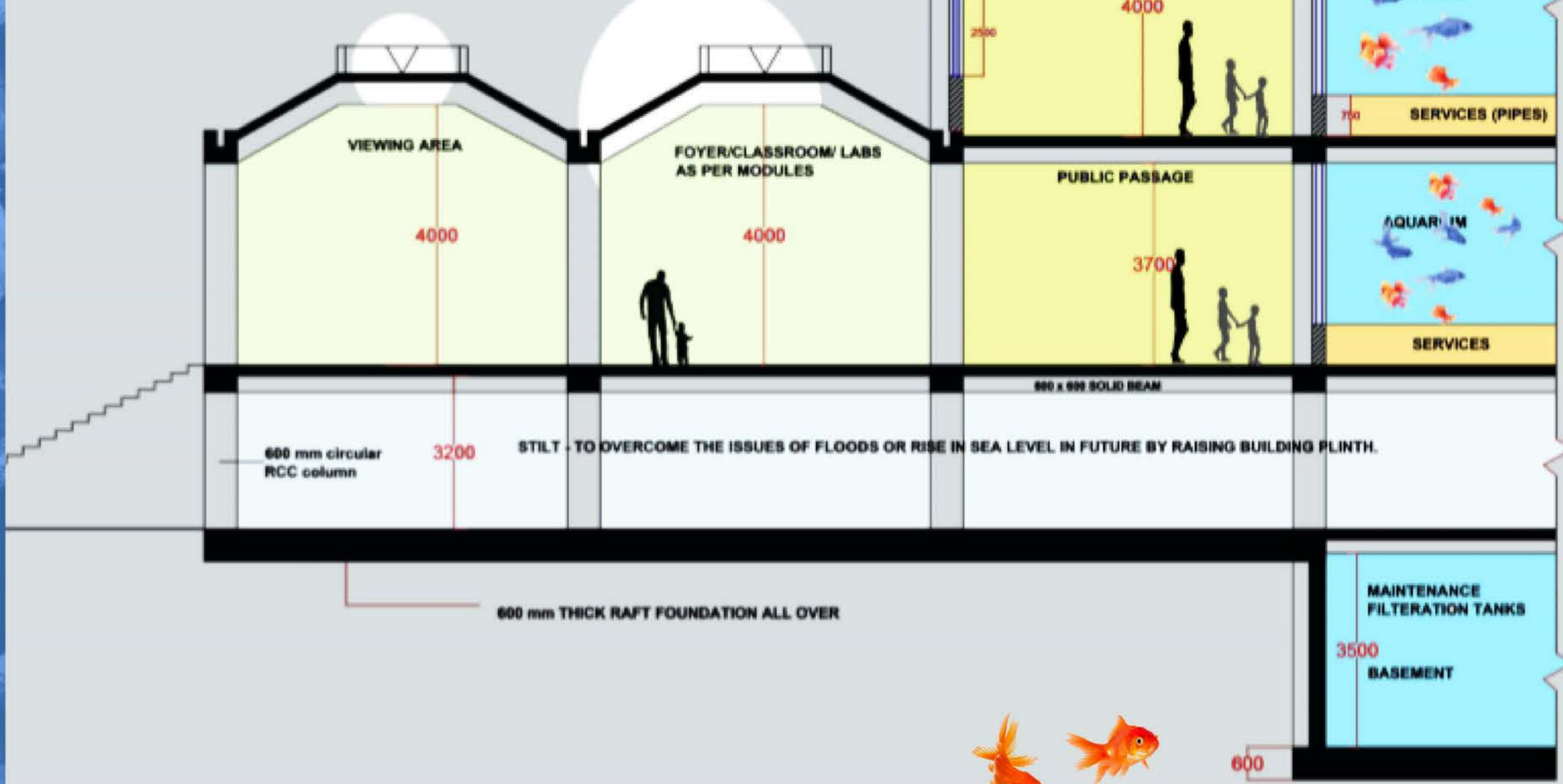
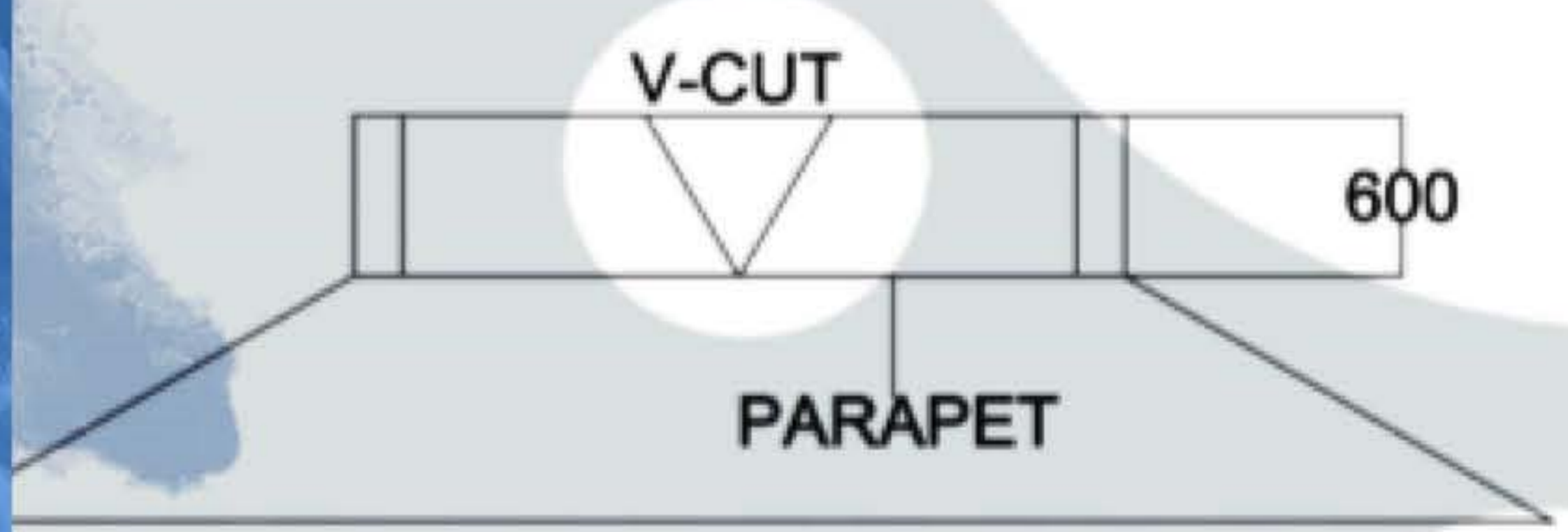
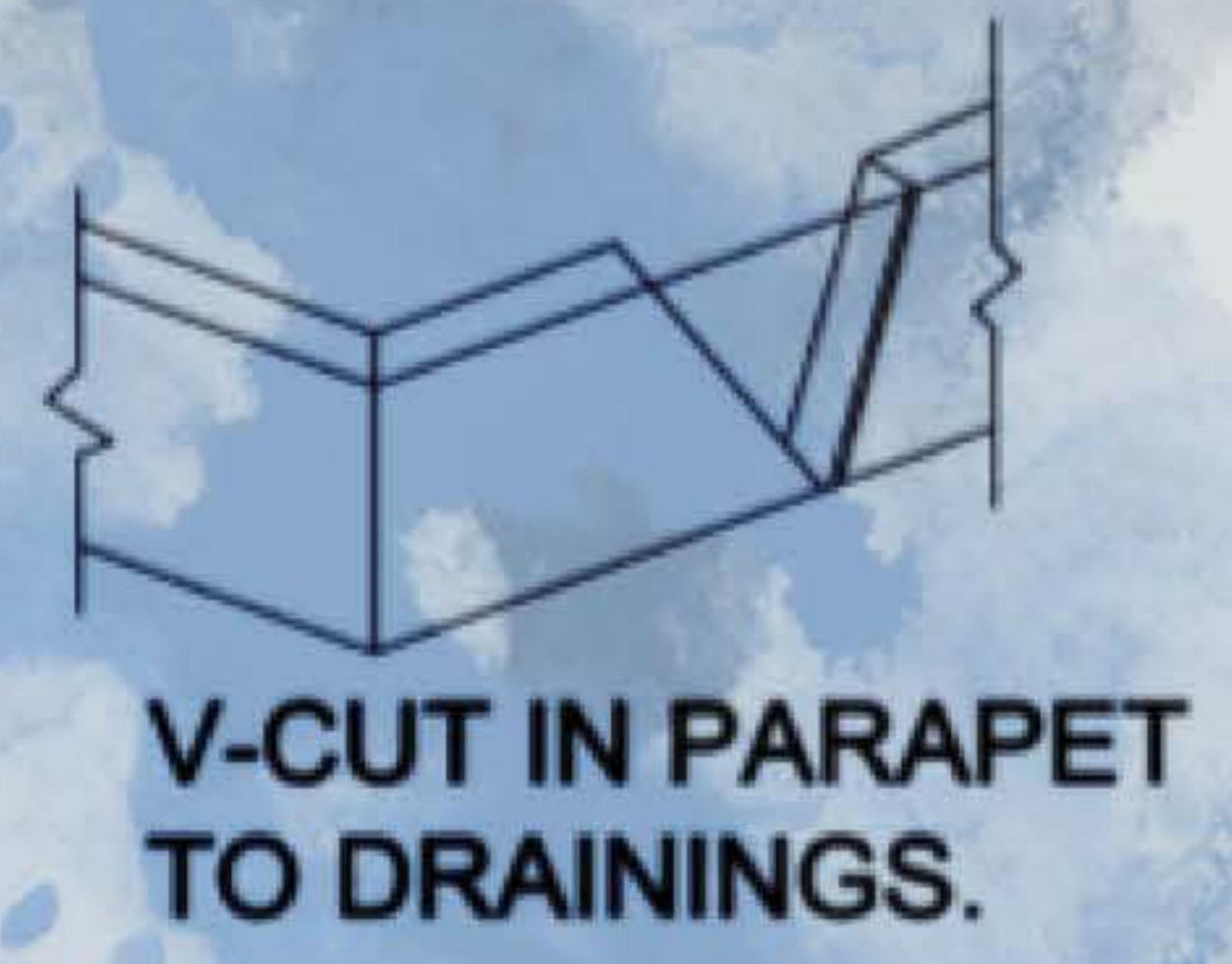
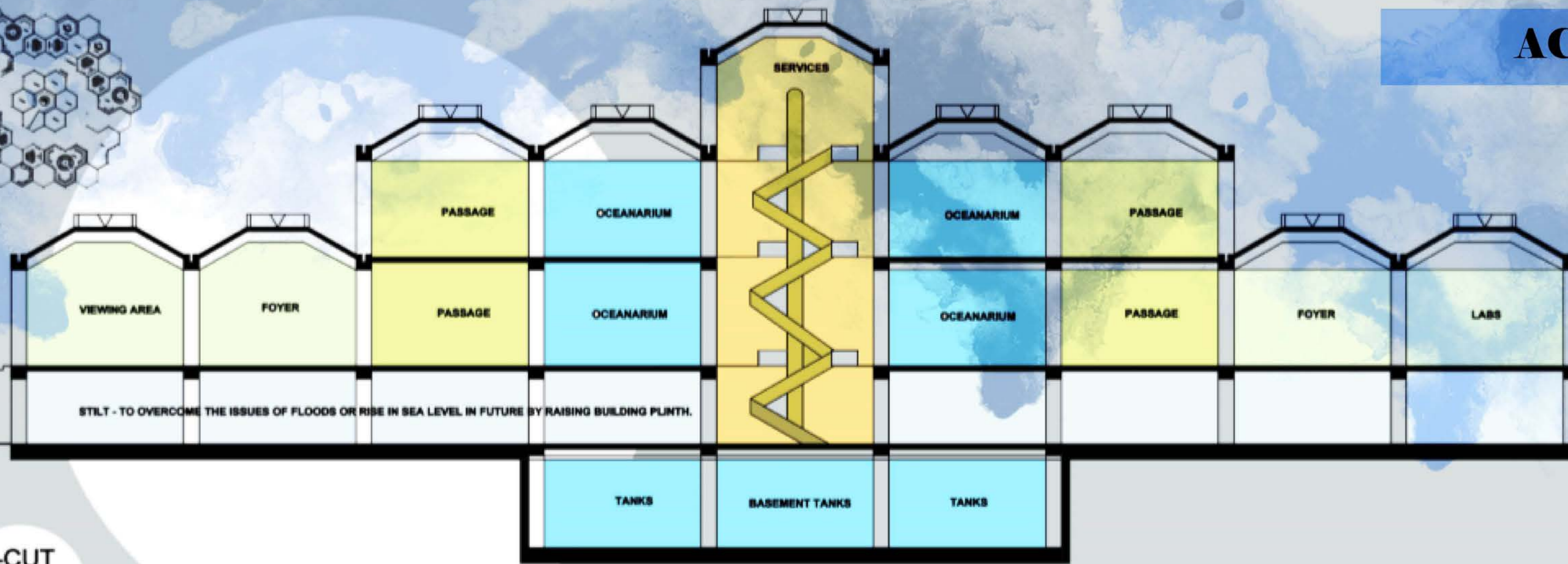
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ACADEMIC



THE RAIN WATER CHANNEL 140x300 WILL RUN ALONG THE CENTRE LINE OF HEXAGONS. THE 600x600 CHANNEL BEAM AS PER THE DETAIL AT BLOWUP A, WILL SUPPORT THE WALL AS WELL AS SLOPING ROOF WITH CHANNEL, SOLID RAFT FOUNDATION ALL OVER.

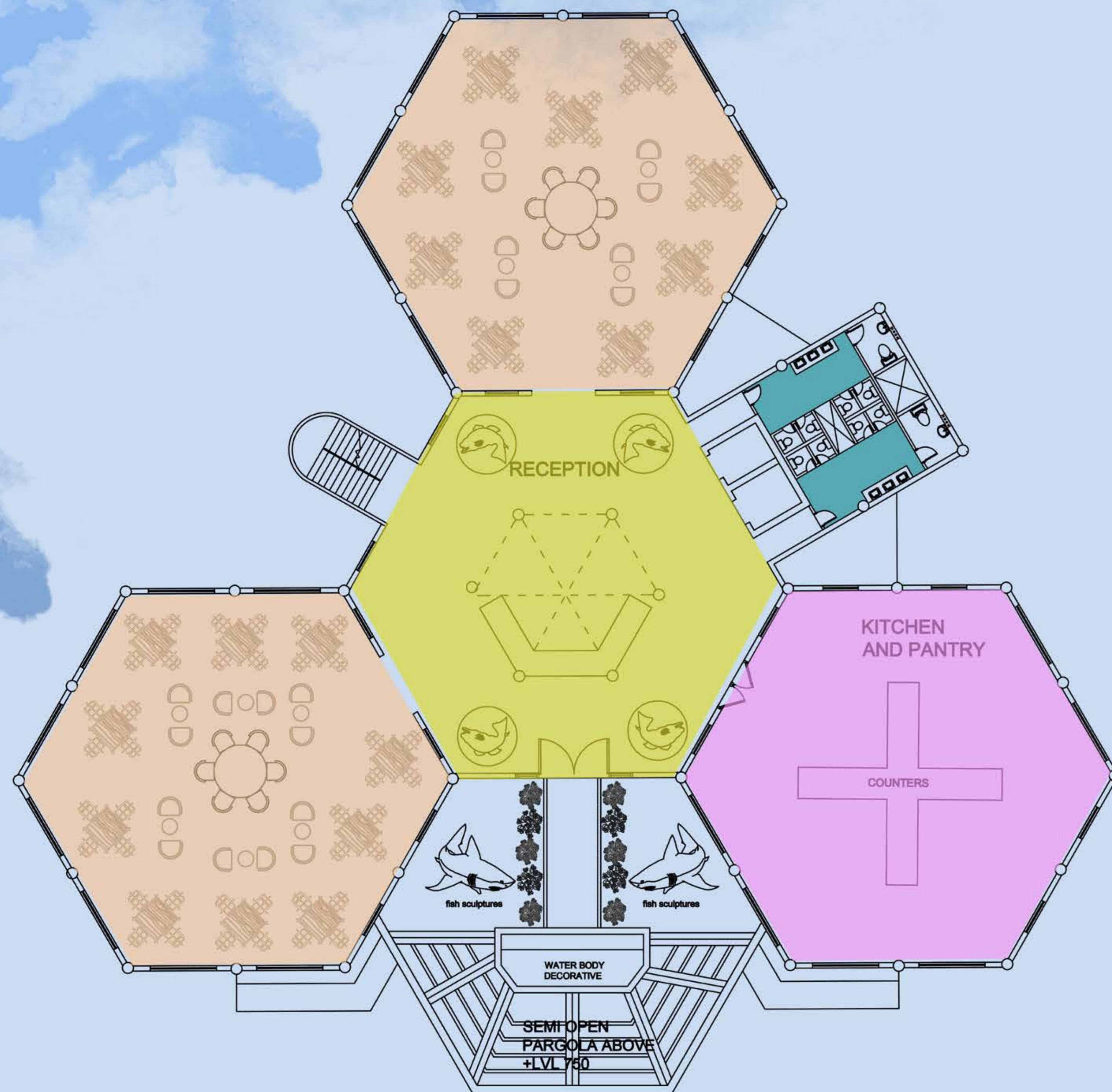
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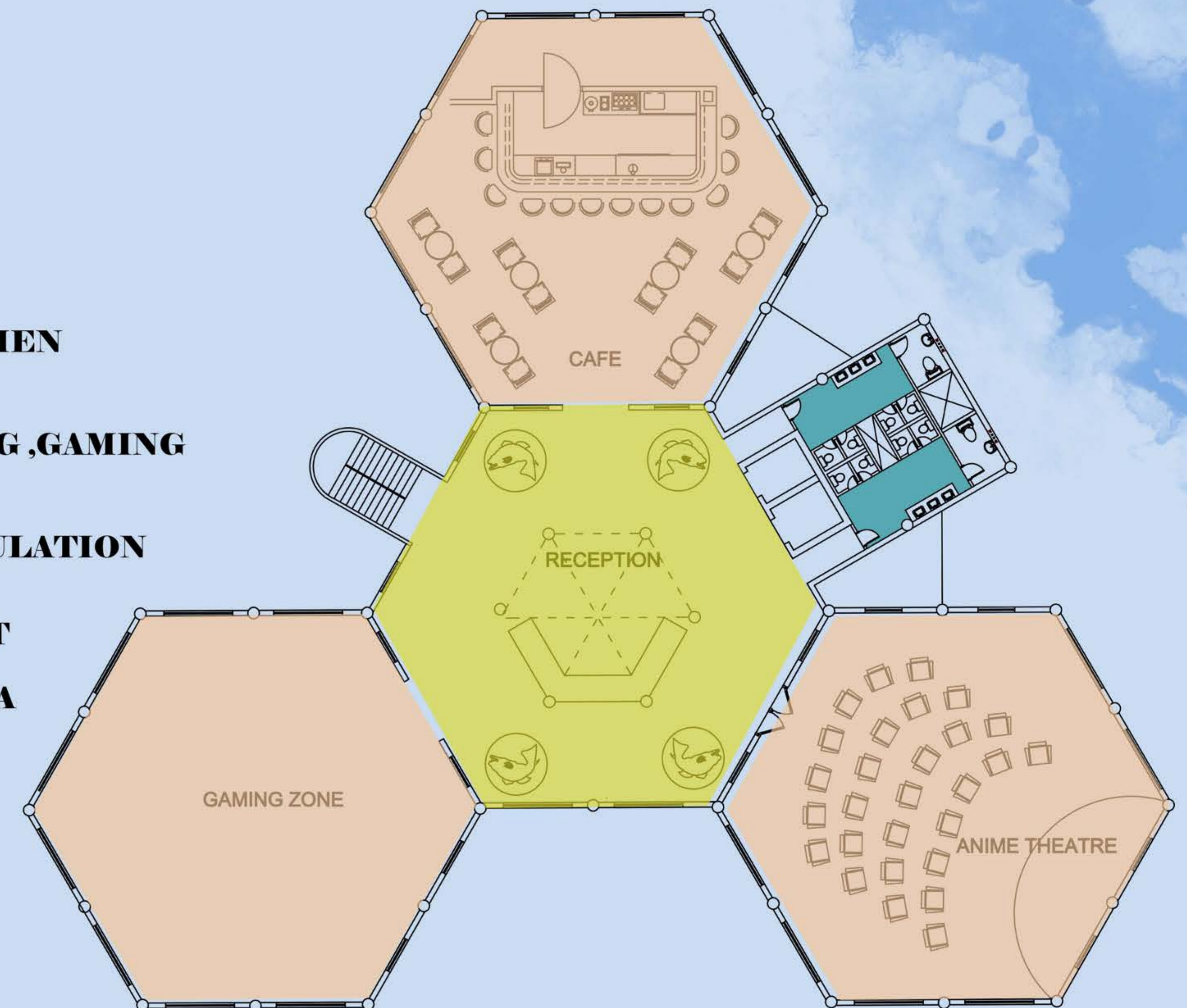
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CANTEEN BLOCK



-  **KITCHEN**
-  **DINING ,GAMING**
-  **CIRCULATION**
-  **WET AREA**



GROUND FLOOR

FIRST FLOOR

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CLUSTER PLAN FOR UNDERWATER SUBMERGED/PARTIALLY SUBMERGED MODULES (RESEARCH SCHOLARS RESIDENTIAL UNITS)

UNDERWATER OBSERVATORY

CONCEPTUAL IDEAS

1. THE STRUCTURE WILL COMPRISE OF HOLLOW MS COLUMNS FILLED WITH CONCRETE.

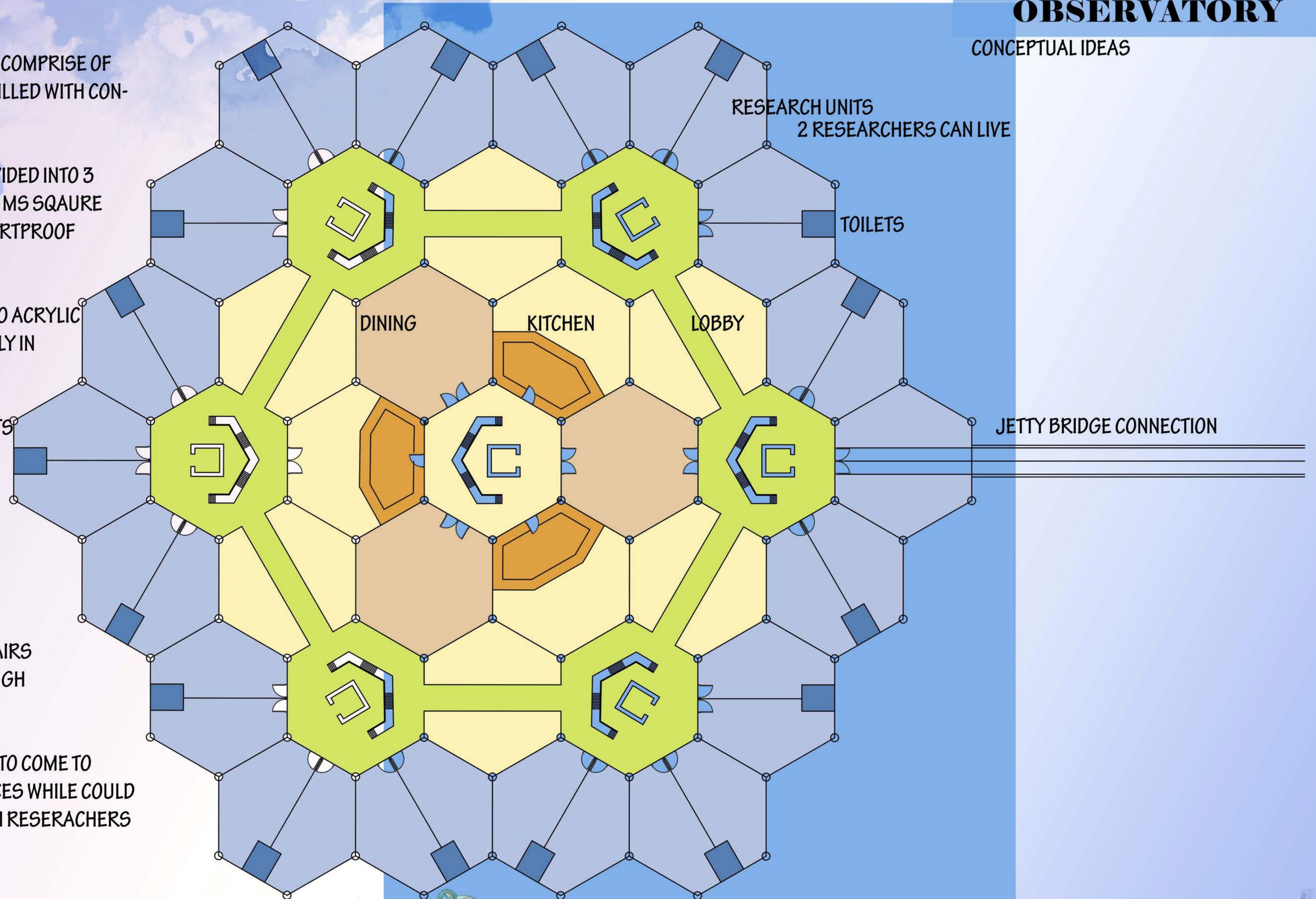
2. GRID OF 6000MM DIVIDED INTO 3 PARTS TO ACCOMODATE MS SQAURE FRAME FOR FIXING BULLRTPROOF GLASS,

3. GLASS IS SUPERIOR TO ACRYLIC SHEETS USED CURRENTLY IN SUCH STRUCTURES.

4. THE RESIDENTIAL UNITS WILL BE FULLY SUBMERGED AT APPROPRIATE LEVEL.

5. THE PURPLE MODULES INCLUDES VERTICAL CIRCULATION ALONG STAIRS AND CONNECTED THROUGH LOBBIES.

6. MAY ALLOW VISITORS TO COME TO HAVE DINING EXPERIENCES WHILE COULD HAVE A PEEPS THROUGH RESERACHERS UNITS.



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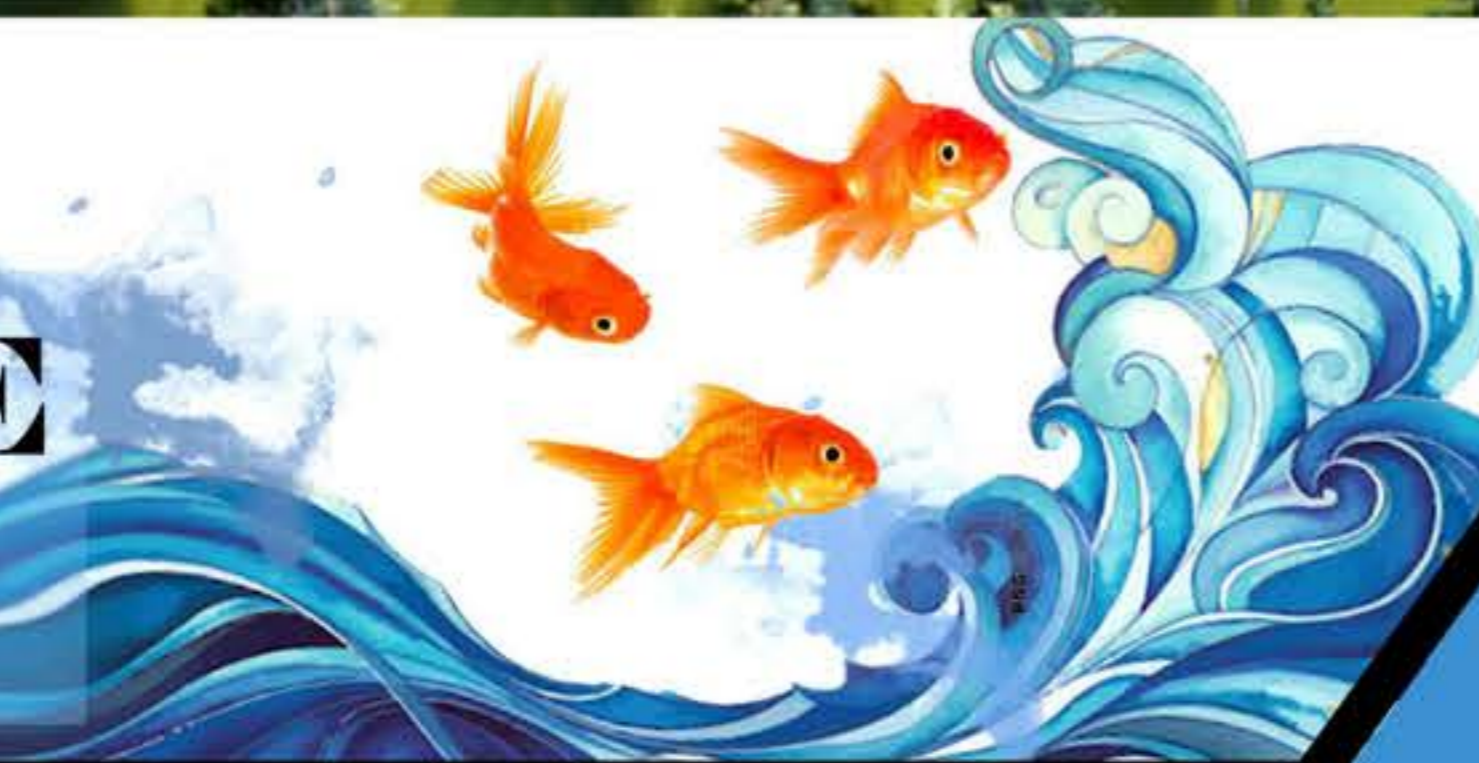
NAME: HARSHITAA SHANKER
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3D VIEWS



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