



M.ARCH STUDIO
Semester 02

STAGE 2
Unit CARC7109
Thesis 01

STUDIO TUTOR
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M.ARCH
Master of Architecture
(ARB/RIBA Part 2) 2020/21

UCA Canterbury
School of Architecture

INSTITUTION REVOLUTION
The Institution is dead, long live the Institution

VIVINA JOSEPH SELPHY

A SYNERGETIC NETWORK OF RESILIENCE

PROJECT BRIEF

A SYNERGETIC NETWORK OF RESILENCE

This project as the name suggests is a network of water towers and boat terminal that contributes in resolving the ongoing problems caused by back water tourism in Allapuzha,Kerala,india.

Back water tourism is the main source of attraction and the most revenue generating tourism in kerala because of the vast network of canals and rivers it hosts. Houseboats travelling through these canals and rivers are degrading the quality of water affecting many factors like decreased rice crops,locals unable to get access to clean water for domestic purposes,decreased production of aquaculture etc.

There is a considerable lack of discipline in houseboat travel routes,timing and parking allotments which also causes major congestion in the waterways disturbing the local community and ecological balance.The aim of this project is to tackle the two main problems that is water pollution and and overcrowding of houseboats. This is achieved by proposing a terminal for houseboats which allocates parking for houseboats,repair facilities,tourism offices to keep the houseboats /back water tourism orderly and other several activities such as getting to experience fishing, learning about coir industry and participating in coir making, learning about pokkali fields and eco-tourism etc recreational facilities etc.

The project also houses off-grid, self-sustaining infrastructural water tower units that aims to respond to allepy’s most immediate challenges: limited access to clean drinking water, electricity, and the pollution caused due to the tourist activities that contribute to the downfall of the ecosyste.Each unit pumps canal water /rainwater to be stored on elevated tanks, which when filtered and distributed strategically to local communities and agriculture fields.Driven by the research these water towers are designed to exist in the most vulnerable areas of alappuzha’s , the water tower is designed to be located in various parts of the waterways in order to navigate the routes of the tourist boats(houseboats,shikaras,motorboats etc). and tourist activities keeping the primary function of the towers to remain the same which is water storage and filtrations .

INTRODUCTION

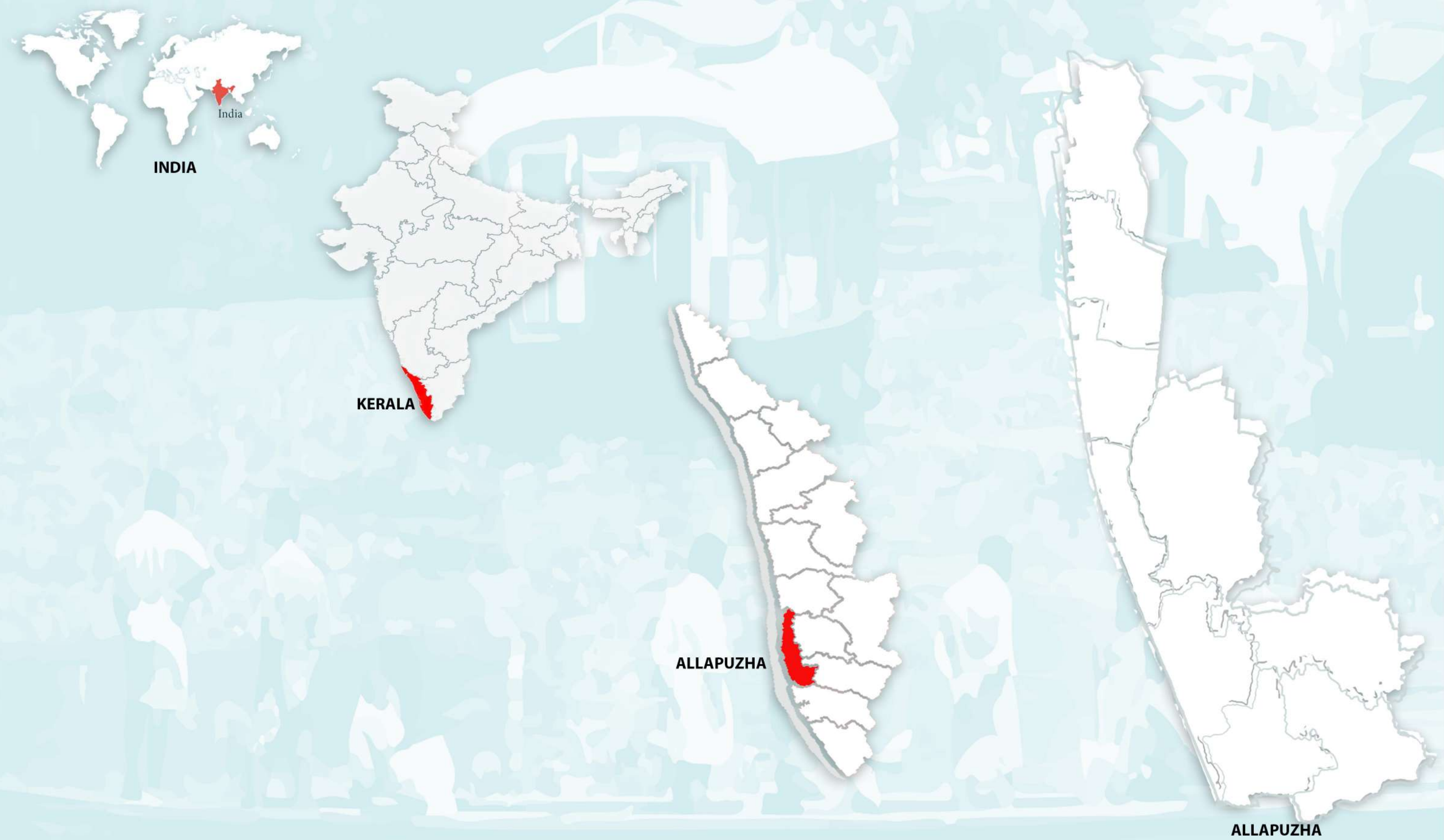
ALLAPUZHA HOUSEBOAT TOURISM

REFERRED TO AS THE VENICE OF THE EAST, ALAPPUZHA HAS ALWAYS ENJOYED AN IMPORTANT PLACE IN THE MARITIME HISTORY OF KERALA. TODAY, IT IS FAMOUS FOR ITS BOAT RACES, BACKWATER HOLIDAYS, BEACHES, MARINE PRODUCTS AND COIR INDUSTRY. ALAPPUZHA BEACH IS A POPULAR PICNIC SPOT. THE PIER, WHICH EXTENDS OUT TO THE SEA HERE, IS OVER 137 YEARS OLD. ENTERTAINMENT FACILITIES AT THE VIJAYA BEACH PARK ADD TO THE ATTRACTION OF THE BEACH. THERE IS ALSO AN OLD LIGHTHOUSE NEARBY WHICH GREATLY INTRIGUES ALL VISITORS.

ANOTHER DELIGHTFUL EXPERIENCE WHILE IN ALAPPUZHA IS THE HOUSEBOAT CRUISE. THE HOUSEBOATS YOU FIND IN THE BACKWATERS OF ALAPPUZHA ARE IN FACT A REWORKED VERSION OF THE KETTUVALLAM OF OLDEN TIMES. KETTUVALLAM IS A MALAYALAM WORD, ‘KETTU’, REFERS TO DWELLING STRUCTURES AND ‘VALLOM’ MEANS BOAT. IN THE OLDEN DAYS, KETTUVALLAM OR BOAT WITH THATCHED ROOF THAT COVERS OVER WOODEN HULLS WAS USED TO CARRY TONS OF RICE AND SPICES.

OF LATE, HOUSEBOATS COME EQUIPPED WITH ALL THE COMFORTS OF A GOOD HOTEL ROOM INCLUDING FURNISHED BEDROOMS, MODERN TOILETS, COZY LIVING ROOMS, A KITCHEN AND EVEN A BALCONY FOR ANGLING. AN UNINTERRUPTED VIEW OF LIFE IN THE BACKWATERS CAN BE ENJOYED WHILE STAYING IN A HOUSEBOAT. CRUISING PAST LUSH PADDY FIELDS, PALM THATCHED HAMLETS, RED TILED-ROOF COTTAGES, TINY WATERFRONT CHURCHES, ANCIENT WOOD AND STONE TEMPLES, CANTILEVERED CHINESE FISHING NETS, TRAVELERS CAN GET FLEETING GLIMPSES OF THE SIMPLE LIVES OF THE VILLAGERS LIVING ALONG THE BANKS OF THE WATERWAY. OTHER INTERESTING WATERSIDE ACTIVITIES INCLUDE COPRA DRYING, FISHING, HOUSEBOAT BUILDING AND RICE FARMING ON RECLAIMED LANDS BELOW SEA LEVEL .

LOCATION MAP



ALLAPUZHA HOUSEBOAT TOURISM

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SITE HISTORY



MAP OF ALLAPUZHA

Alappuzha district was carved out of erstwhile Kottayam and Kollam districts.

- In the 16th century Portuguese came into prominence in the political scene of the district. Christianity became popular in all parts of the district and they built several churches.
- In the 17th century the Portuguese power declined and the Dutch had a predominant position in the principalities of this district.
- During the reign of Dharmaraja, the district improved by all means. Raja Kesava Das, Diwan of Travancore who was known as the 'Maker of modern Alleppey' made Alappuzha a premier port town of Travancore. He constructed several roads and canals to improve communications and built warehouses. He gave all facilities to merchants and traders from far and near.

DUTCH TOWN PLANNING PRINCIPLES OF ALAPPUZHA



WATERWAYS

Waterway becomes the life line of the town.

Design criteria — Dutch lineal urban pattern of canal, road and building blocks.

Skillful location of public buildings — to save from monotonous building facades.

Alignment of building blocks parallel to the canal and placement of a landmark to terminate the vista.

Important crossings are accentuated by citing a religious building along the canal front.

DIKE TOWN - Rivers / backwaters were diked.

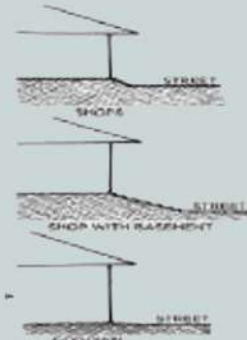
Canals provides a valuable central space and a setting for public buildings across on both sides.

Larger buildings at prominent places is the symbol of secular authority.

Landmarks — Church Towers



Public buildings



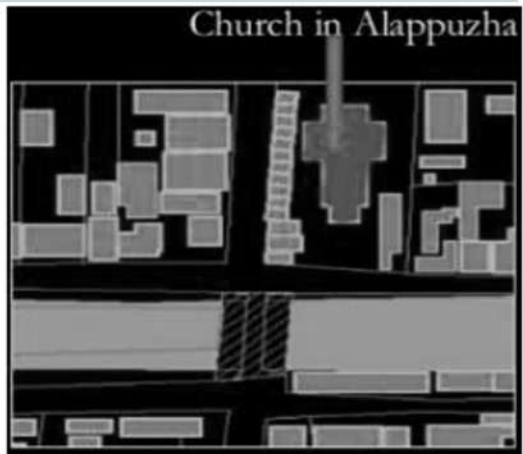
Godowns



Shops

BUILDING STUDY

- The buildings were placed with respect to canal ,So that the entire façade can sen only from the canal,not the road.
- The buildings along the canal have low plinth.Shops and buildings having basement floor,having 1 to 1.2m,Above the ground level.
- Godowns do not have plinth from their entrances for their easy conveyance of goods.



Church in Alappuzha

Important crossings are accentuated by citing a religious building along the canal front.



Plan of canal stretch in Alappuzha

CANALS

Waterway becomes the life line of the town.

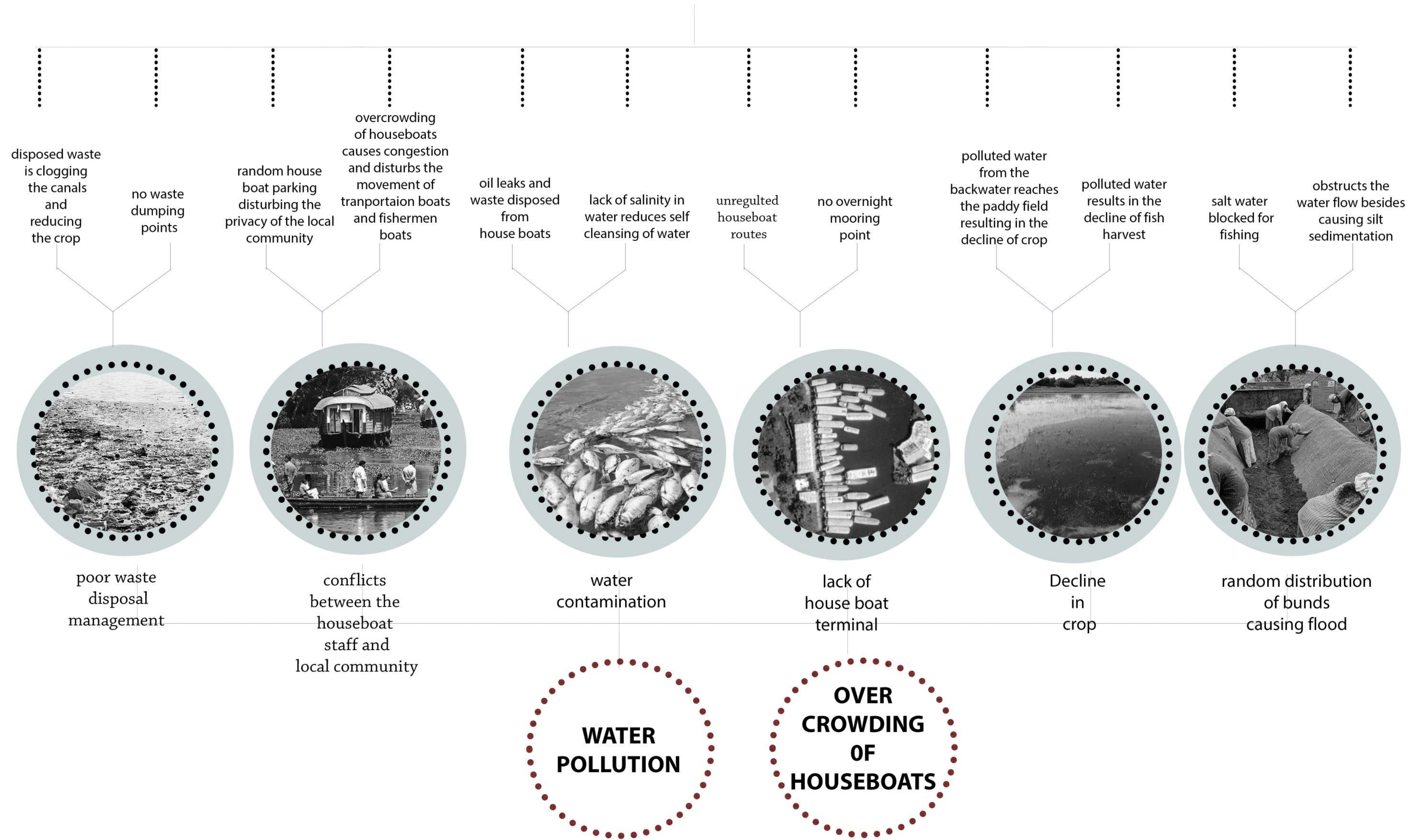
Design criteria — Dutch lineal urban pattern of canal, road and building blocks.

Skillful location of public buildings — to save from monotonous building facades.

This zone was developed in 1800 AD reason for the development of this zone is the port.This zone also has many famous structures like light house,Jain temple,muppalam,distrcit collectorate,masjids etc. Initially this zone was residential zone having gujarathi settlement. Open built ratio of this zone is 54%. building in the zone sea view ward,cicivl station ward.

IDENTIFIED ISSUES

NEGATIVE IMPACTS OF BACKWATER TOURISM ON THE LOCAL ENVIRONMENT



STUDY ON HOUSE BOATS

TYPES OF HOUSE BOATS



1. Standard Kerala houseboats
This is a basic houseboat and for authentic experience of Kettuvllam of bygone era. Most of these boats come without an air conditioner & are devoid of any entertainment services. The bedrooms & living rooms are merely not plush.



2. Deluxe Houseboats – Each Deluxe type of houseboats in Kerala is furnished comfortably and attractively while hewing close to tradition. The boats have one, two or three air-conditioned bedrooms. All have an open-air living area and a fully- equipped kitchen. From the viewing deck, or through your bedroom’s picture window, and on a canoe through the backwater heartland, you will see simplicity in action, and the result is immediate: slowed down, de-stress, rejuvenate They are much more comfortable houseboats in which air conditioner is also provided. Tourists who approach backwater tour package operators are mainly provided with these kind of houseboats. Deluxe houseboats offer deluxe



3. Superior Deluxe Houseboats – As the name suggests, these are superior than Deluxe category of Houseboats with extensive services such as uniformed butlers and 24 hours air conditioners. People or travelers who are accustomed to star hotels should hire super Deluxe houseboats among the types of Houseboats in Kerala to enjoy their cruise & stay experience. These houseboats are obviously highly priced as they provide some additional services along with the deluxe accommodation facilities



4. Premium/Luxury houseboats
The above houseboat is ideally suited for enjoying overnight cruises and Backwater holiday trips of 3 and more days. Spacious, bright and comfortable Houseboat with well appointed elegant bedrooms for opulent voyage on backwaters. Exclusivity and comfort at all times. Enjoy the highest degree of relaxation with the services and facilities in this premium types of houseboats in Kerala. It provides a bedroom with double bed or two single beds. There is also a cozy slouching area with decorous upholstered lounge sofa where guests can relax.



1400 HOUSE BOATS AND SHIKARAS



500-600 UNCERTIFIED HOUSE BOATS



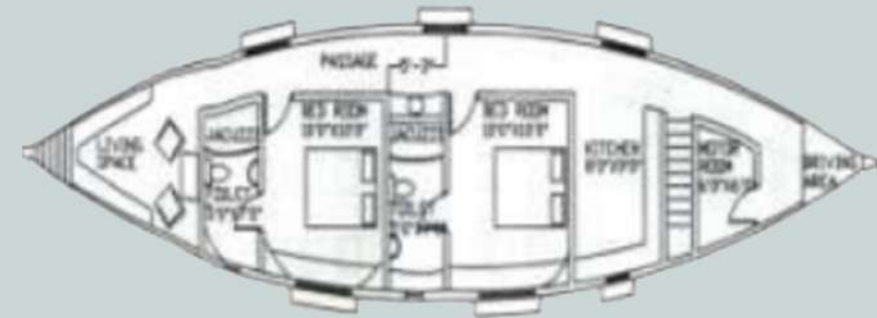
MAP OF ALLAPPUZHA, KERALA

Houseboats and shikharas need to be regulated

A common sight in Alappuzha is the mesmerising houseboat. But the lack of regulation by the SWTD can have adverse effects on its ecology. Today, Alappuzha has 1,400 houseboats and shikaras, of which 400-500 boats are running without certificates, many don’t follow fixed routes or even speed limit/regulations. Moreover, they discharge 230,160 litres of untreated waste water into the Vembanad lake. Oil spillages from the boats, CO2 emissions, noise pollution and vibrations are some of the other issues ailing the region’s ecology.

The 2016 drought in the state, which was the worse in more than 100 years, damaged the transport system of Alappuzha significantly. “Water level decreased to such a level that it is difficult to take boats near the jetties. Low water level also affects the functioning of boats. If the situation gets worse, it will be difficult to take the boats to canals,” complained C S Muraleedharan Nair, Principal Station Master, Alappuzha. Due to a destruction of feeding places and habitat change, the indigenous bird count declined from 1,000 in 2015 to 247 in 2016. Houseboats and shikharas need to be regulated

FLOOR PLAN OF A TYPICAL HOUSE

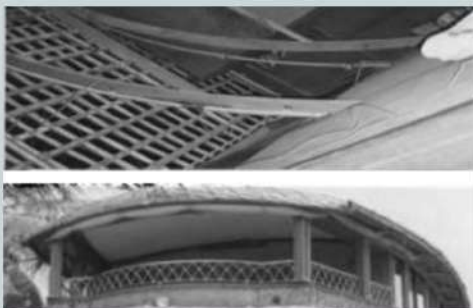


GROUND FLOOR PLAN



FIRST FLOOR PLAN

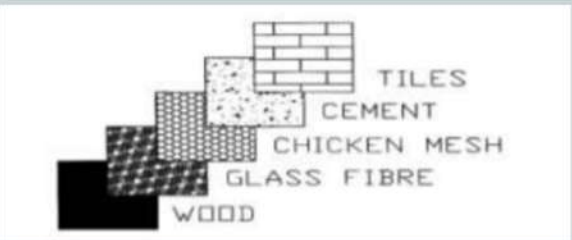
STUDY ON HOUSE BOATS



LOW CEILING



COIR, MARINE PLY, CHICKEN MESH, RIVET

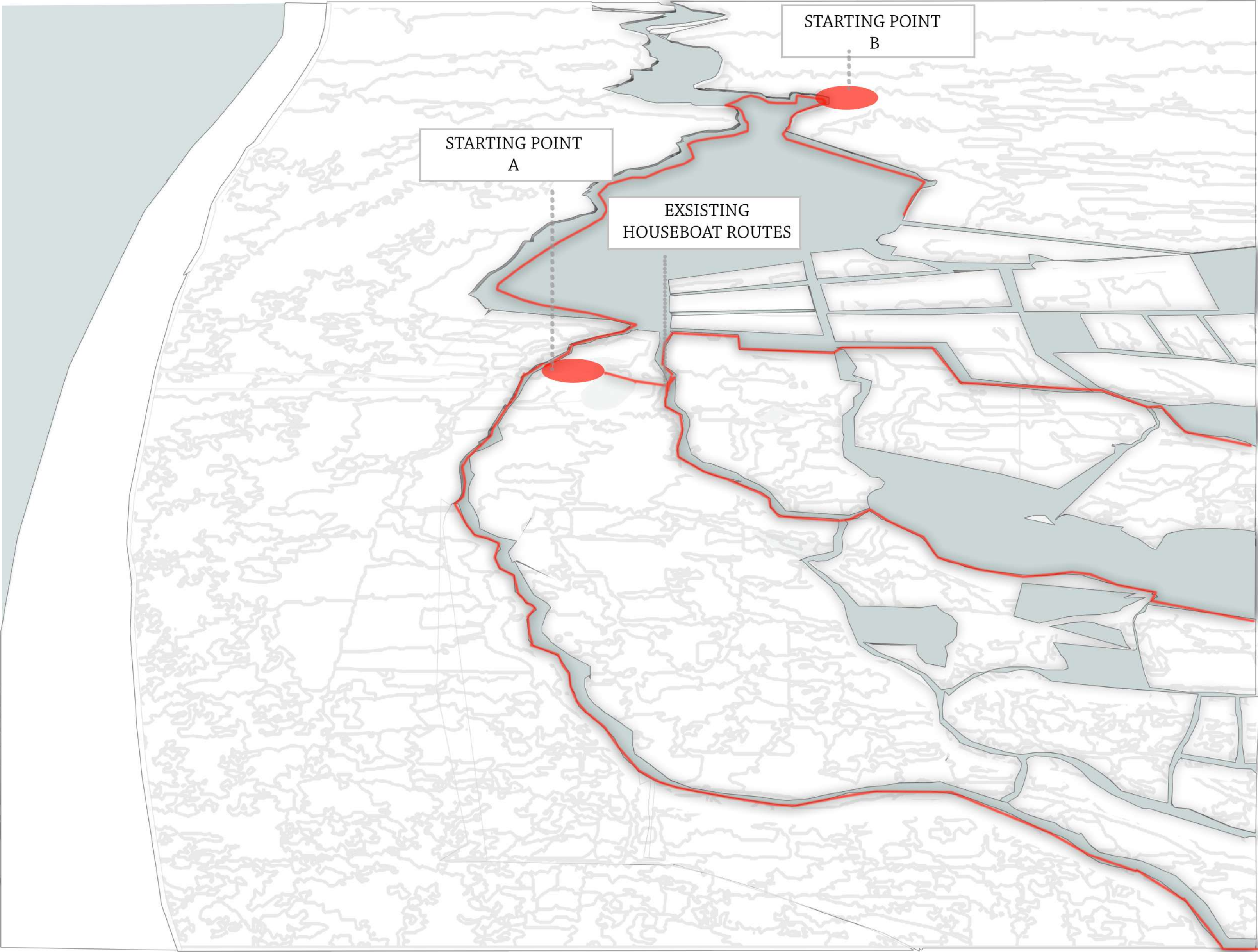


LAYERD FLOORING

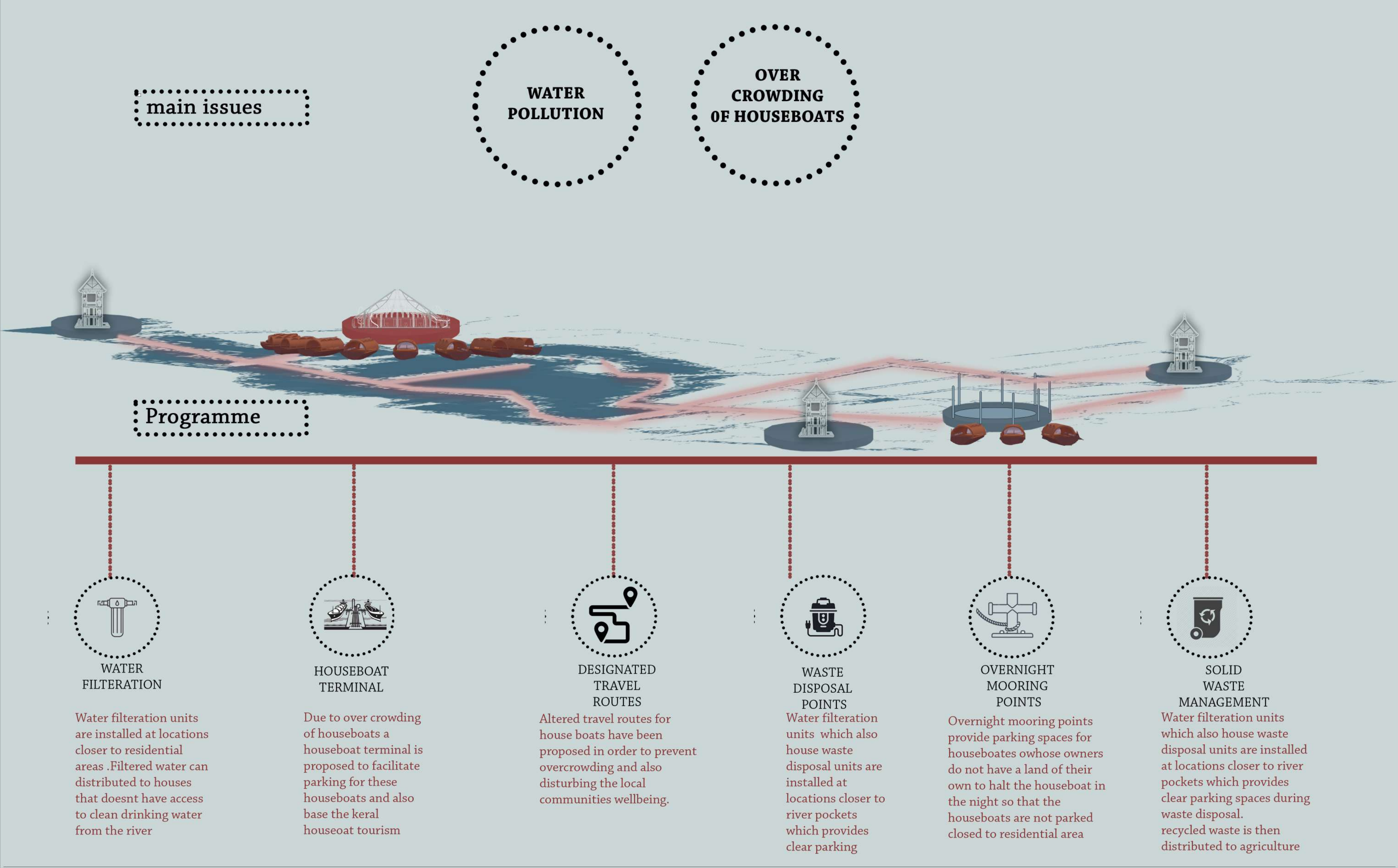


BIOSEPTIC TANK UNDER THE SETAING

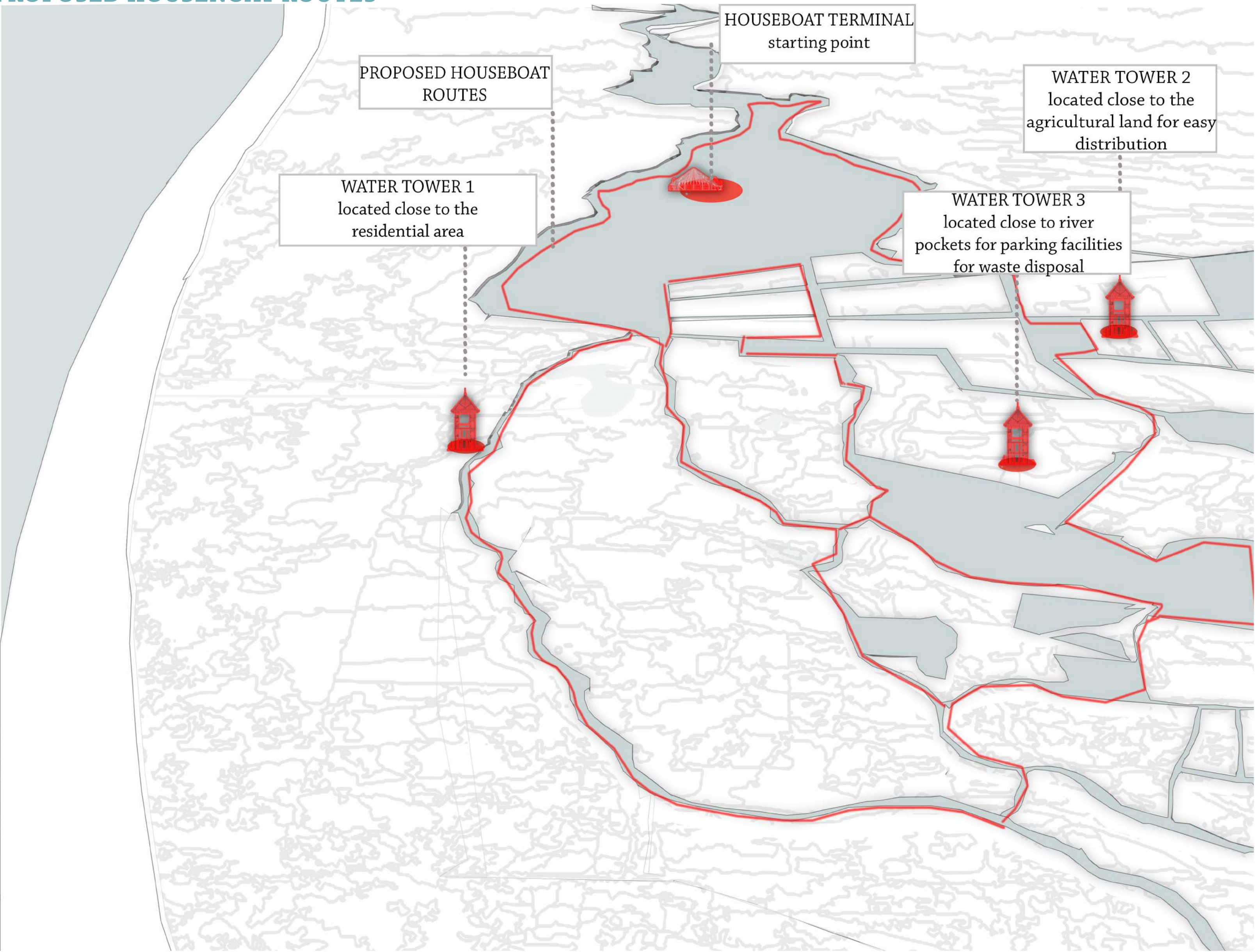
EXSISTING HOUSEBOAT ROUTES



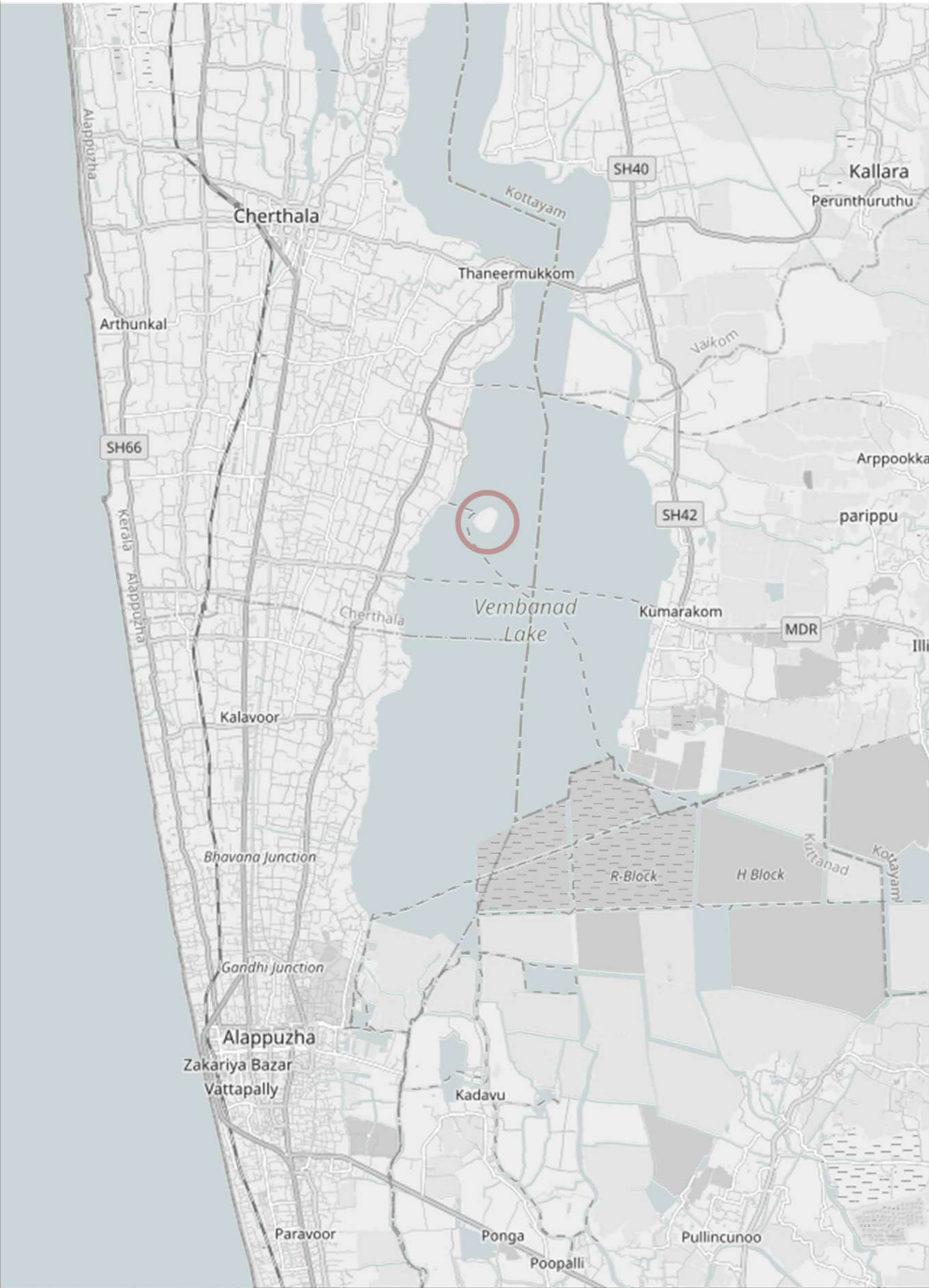
PROPOSED PROGRAMME



PROPOSED HOUSENOAT ROUTES



HOUSEBOAT TERMINAL SITE ANALYSIS



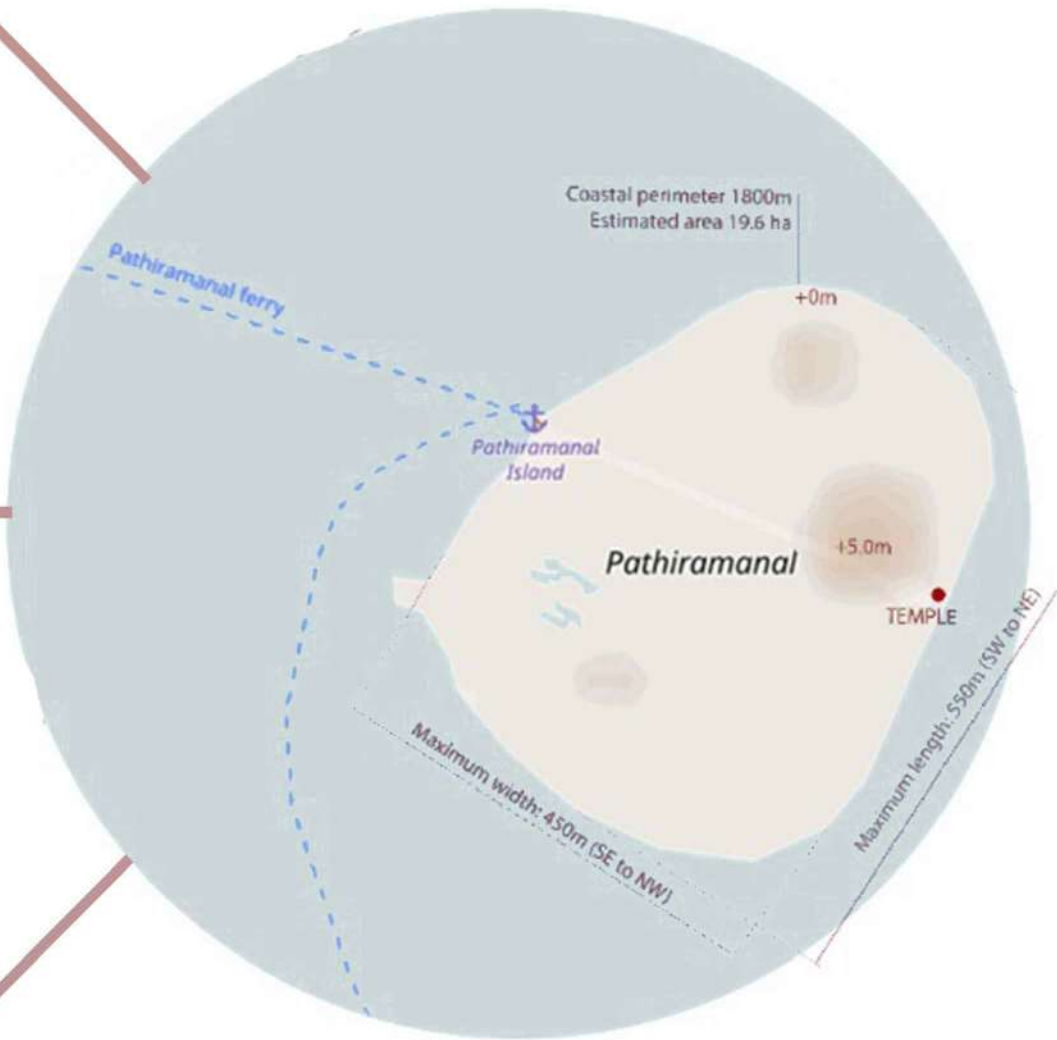
ONLY WALKWAY IN THE ISLAND



PATHIRAMNALA ISLAND



FERRY DOCKING AREA AT THE ENTRANCE TO THE ISLAND



SITE CHOSEN FOR THE HOUSEBOAT

Pathiramanal is a small island in Muhamma panchayat of Alappuzha district. The name Pathiramanal means 'midnight sand'. The scenic beauty of both sides of the lake as well as that of the island is mind blowing. It is home to many rare varieties of migratory birds from different parts of the world

SITE ANALYSIS FOR WATER TOWER INTERVENTION



DESIGN DEVELOPMENT

DESIGN DEVELOPMENT OF THE ARRIVAL TERMINAL

Initial phase
Organic shape has been adapted through out the design to compliment the site location and also to facilitate easy boat circulation

Splitting the volume
volume has been split into two levels to accomodate different functions

Creating layers through volumes
central circulation space has been cut out in order to seperate arrival and departure zones

Skylight
courtyard recieves direct skylight and upper floor gets a courtyard view.

Courtyard
Central plane has been pushed down to create a central courtyard

Circulation
Creating an opening for entry and exit of ferries

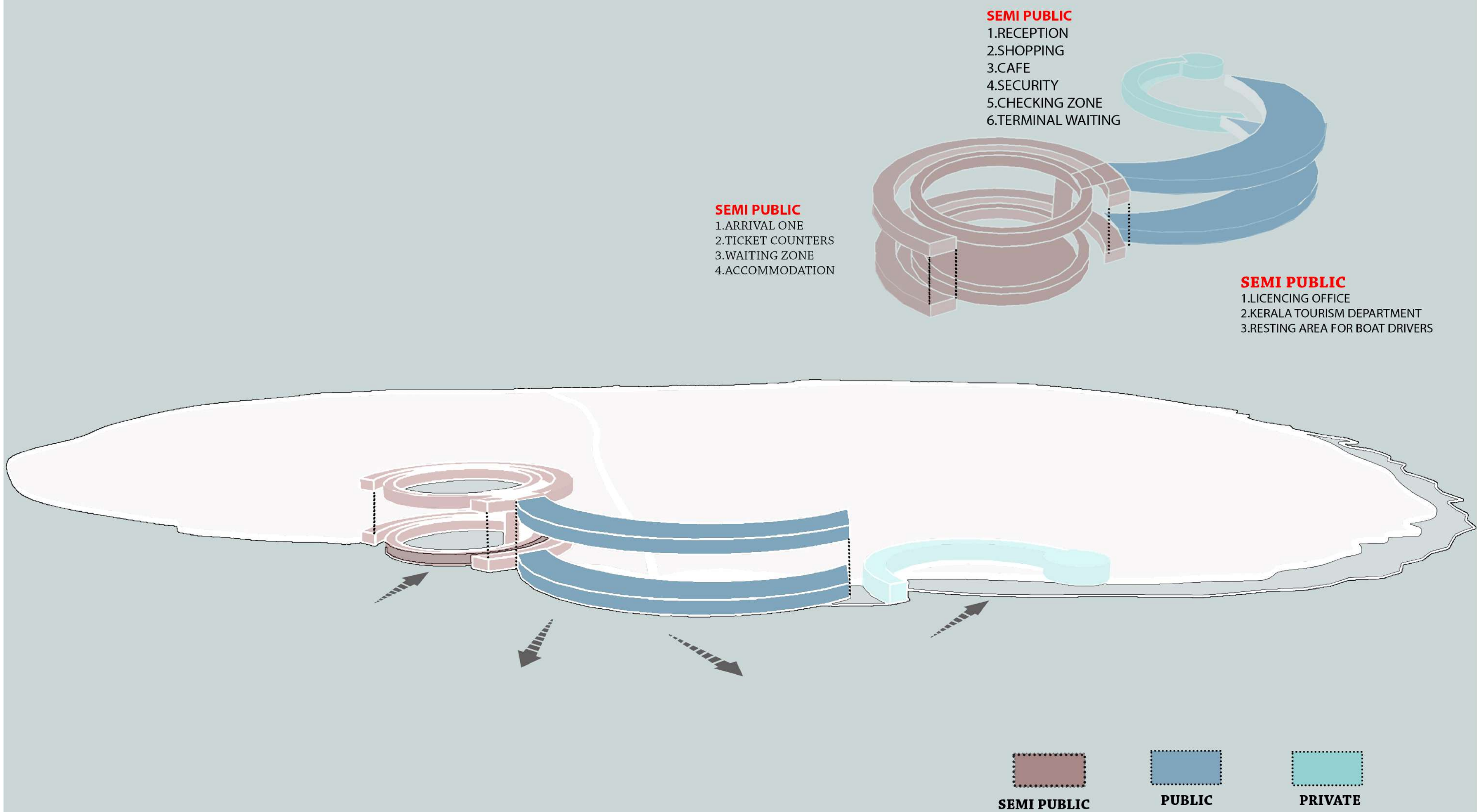
DESIGN DEVELOPMENT ON SITE

Phase 1
The circle shows the area acquired for the building on the site

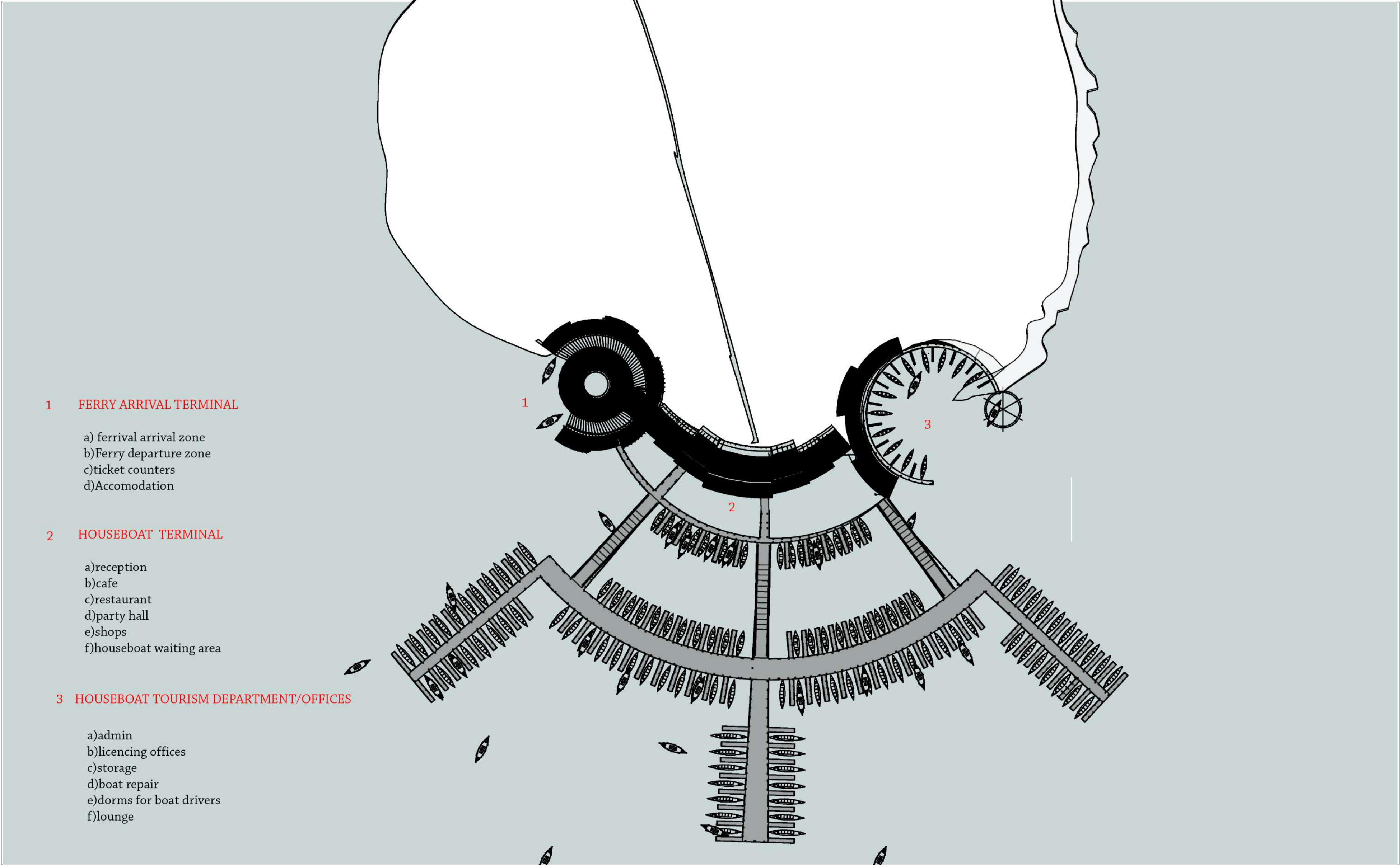
Phase 2
cutting out the edge of the ferry terminal to let the water flow through the building where the ferries will drop and pick up visitors to which the main houseboat terminal is attached

Phase 3
Creating an opening to locate the tourism department offices and also facilitate parking spots for houseboats repairs and monthly checks

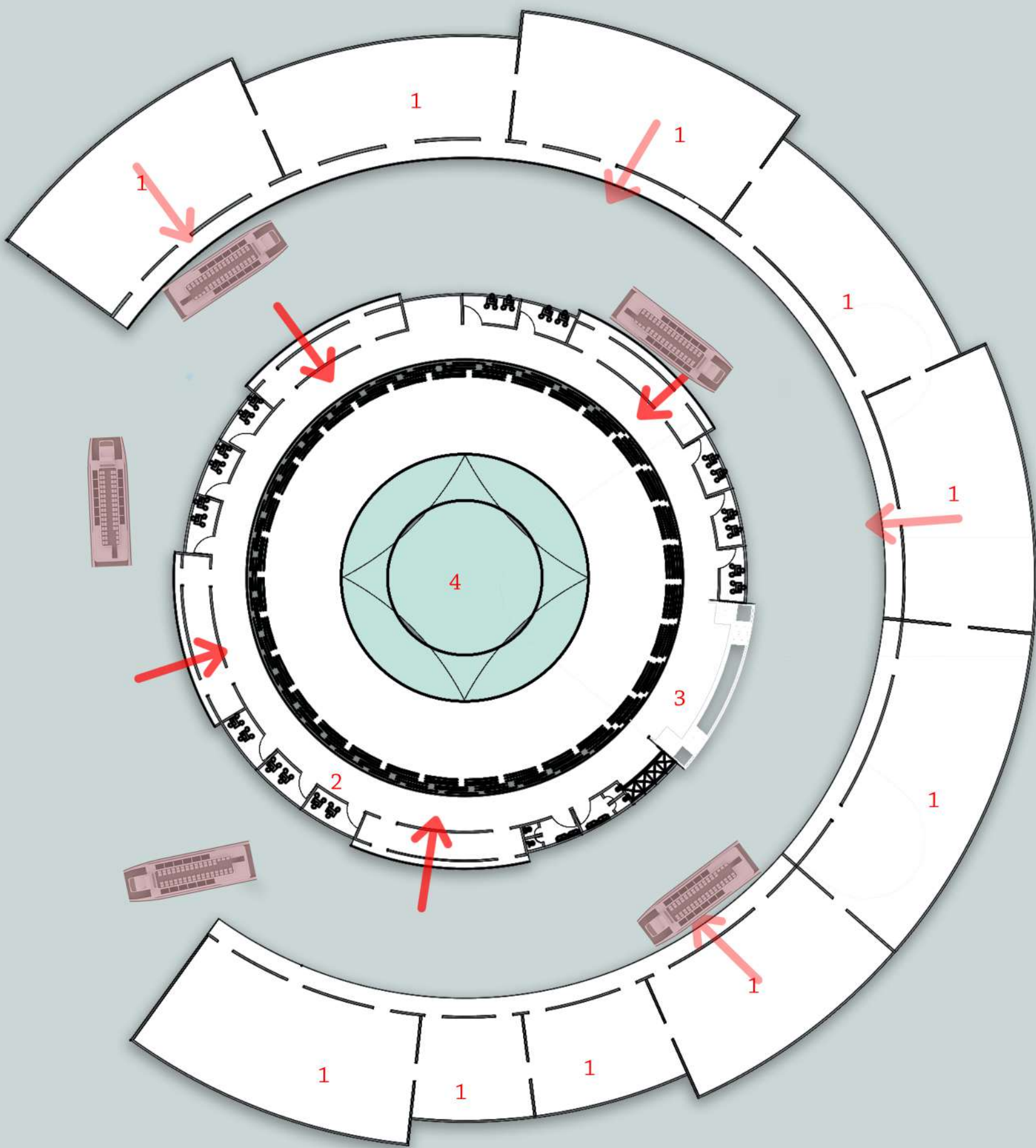
ZONING



MASTERPLAN

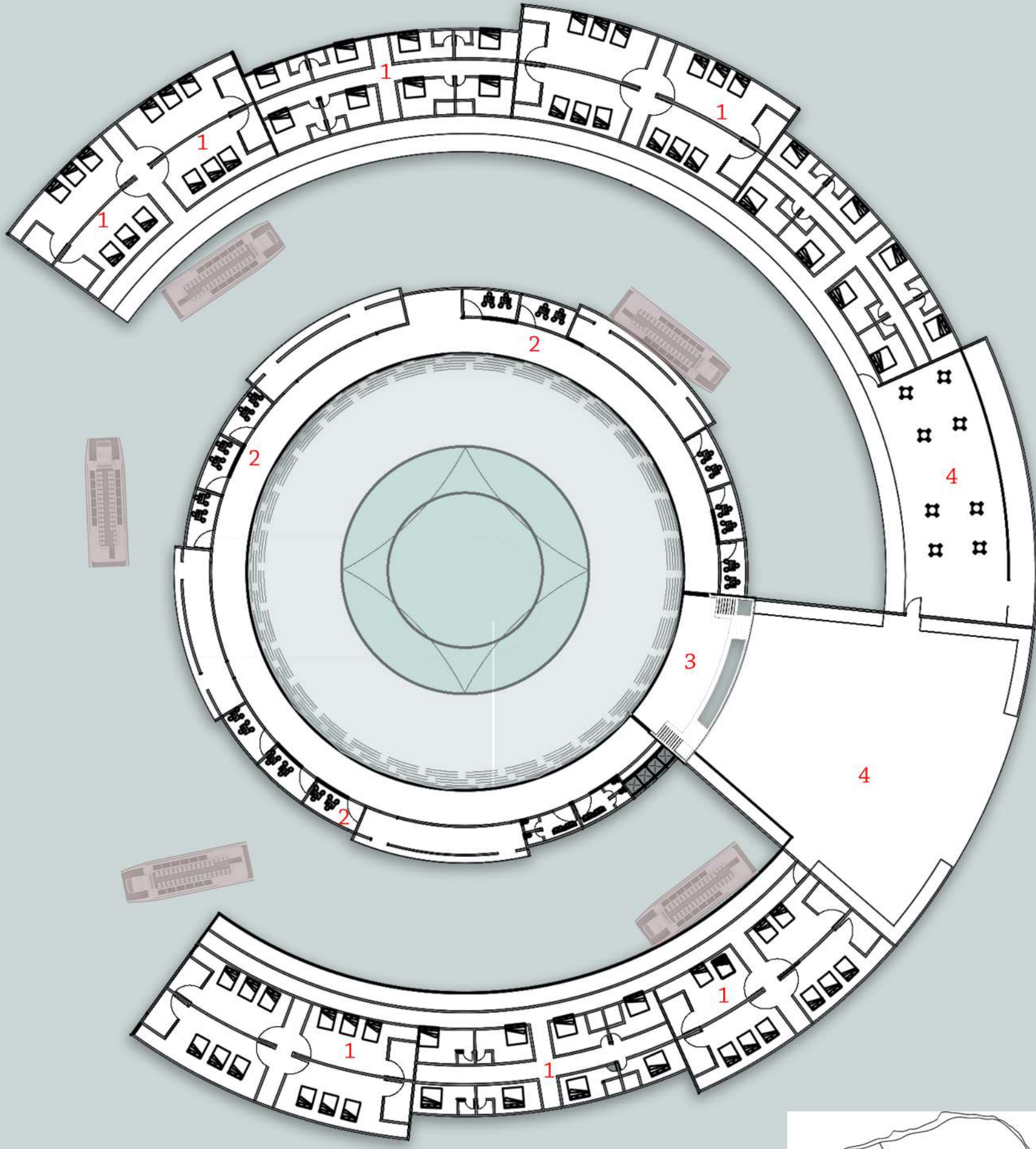


1.ARRIVAL TERMINAL FLOOR PLAN



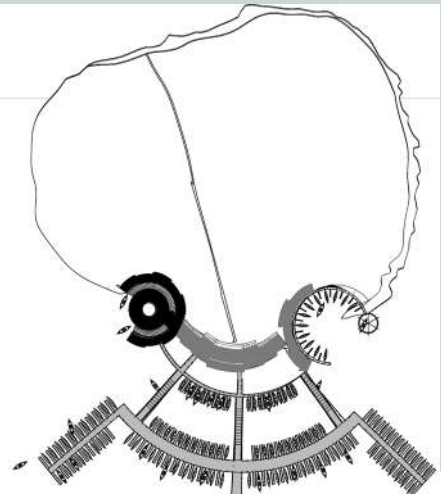
GROUND FLOOR PLAN

- 1 Waiting area to depart on a from the island
- 2 Ticket counters
- 3 Core
- 4 Courtyard

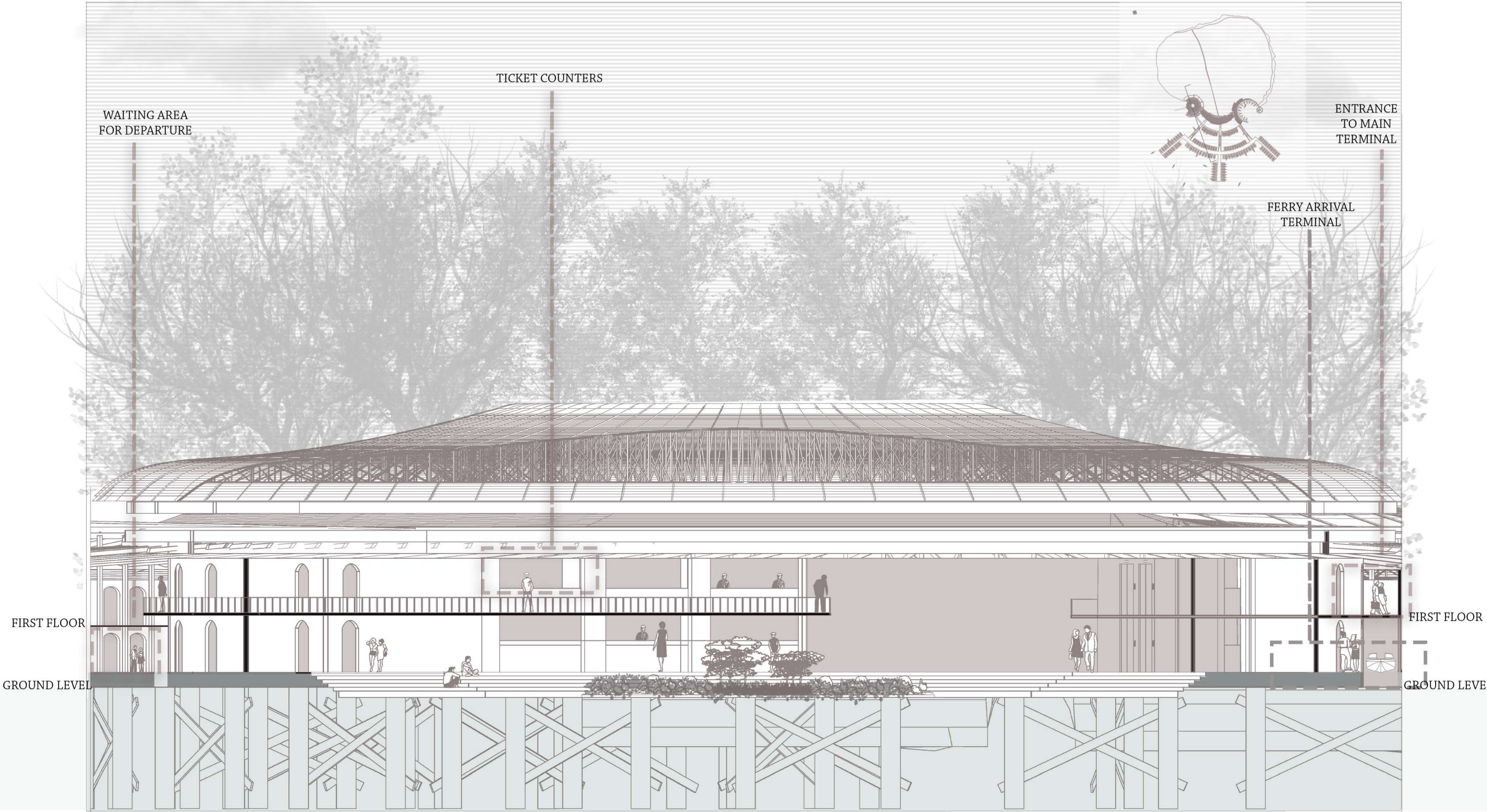


FIRST FLOOR PLAN

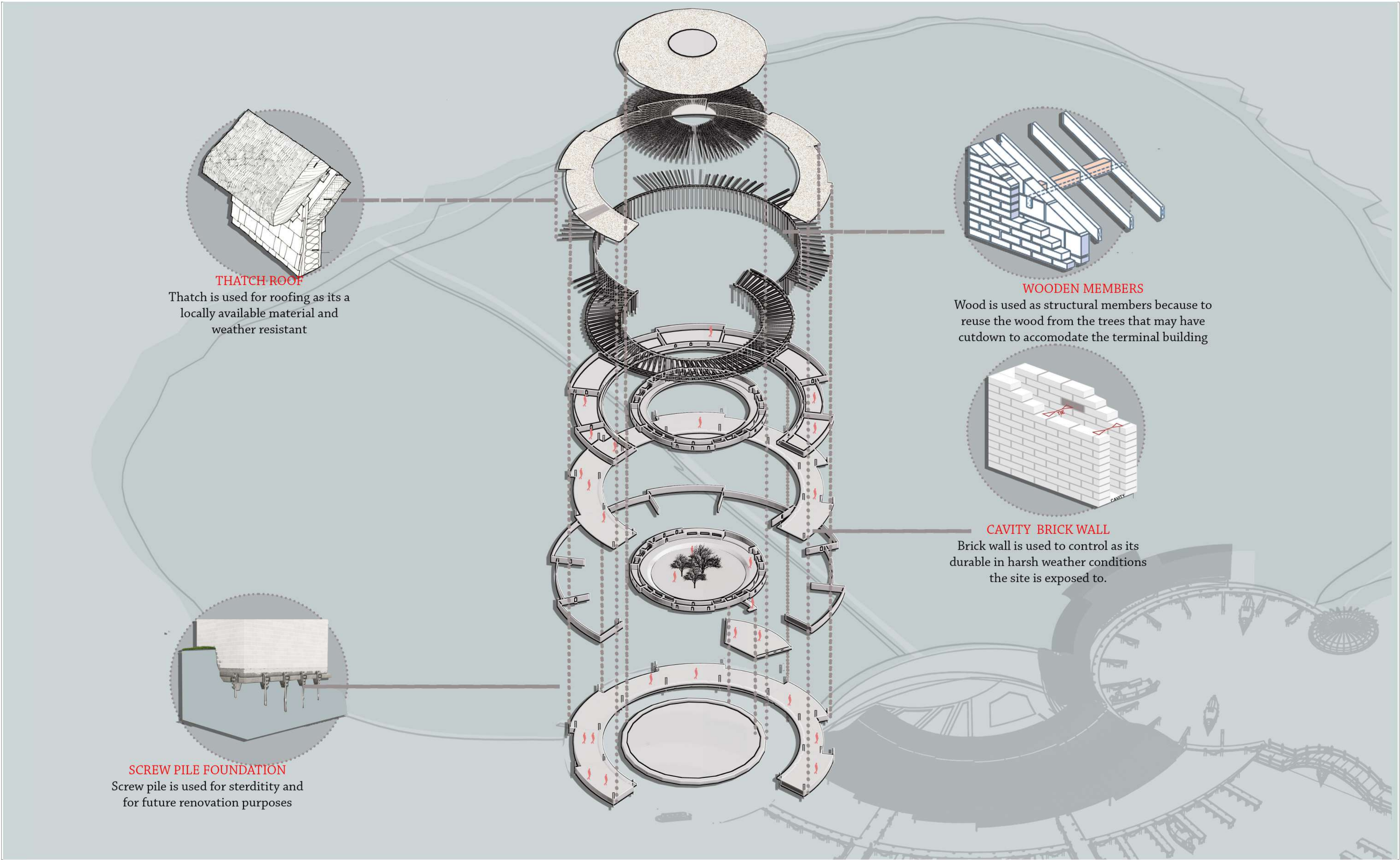
- 1 Hotel rooms for visitors
- 2 Ticket counters
- 3 Core
- 4 Lobby and reception



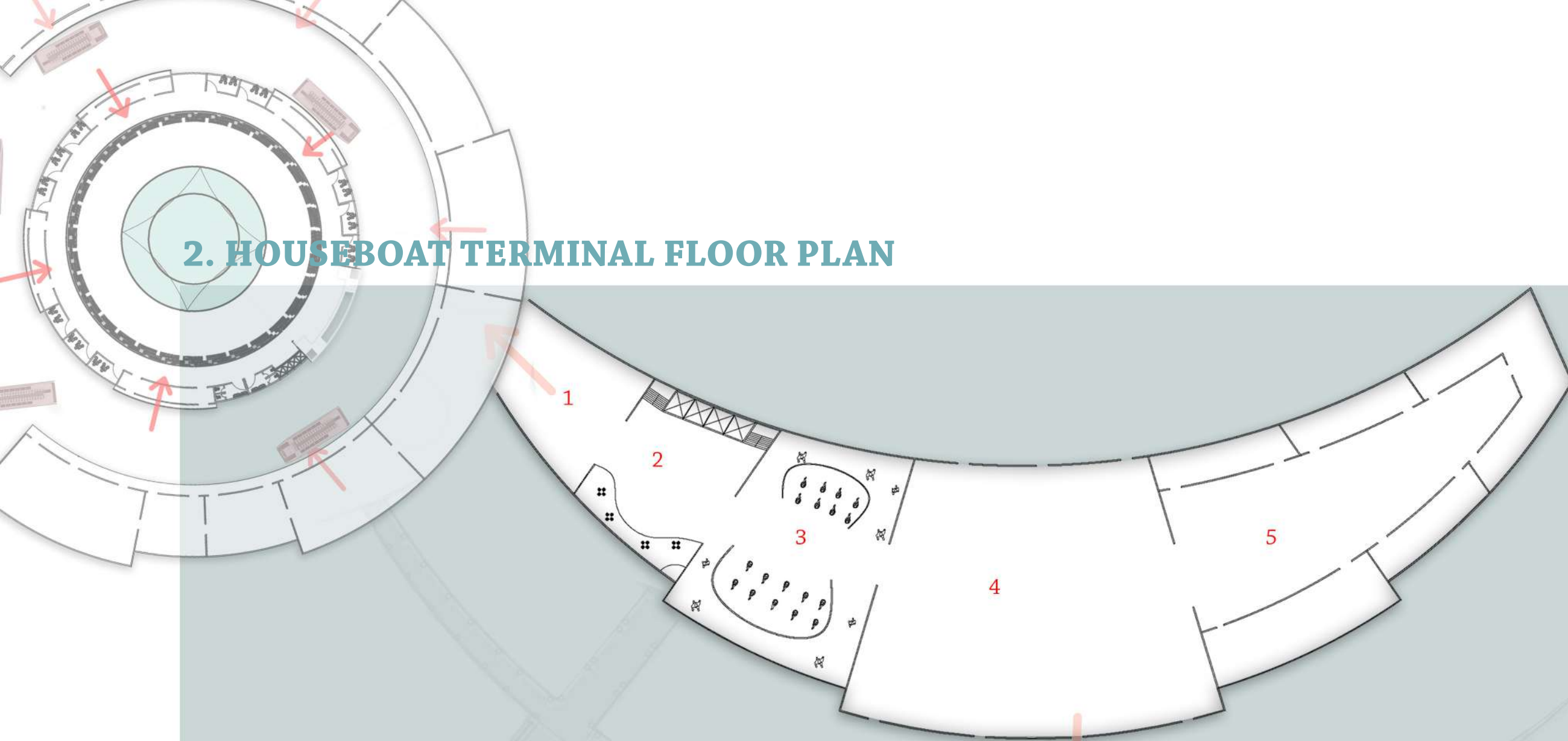
SECTION



AXONOMETRIC DIAGRAM

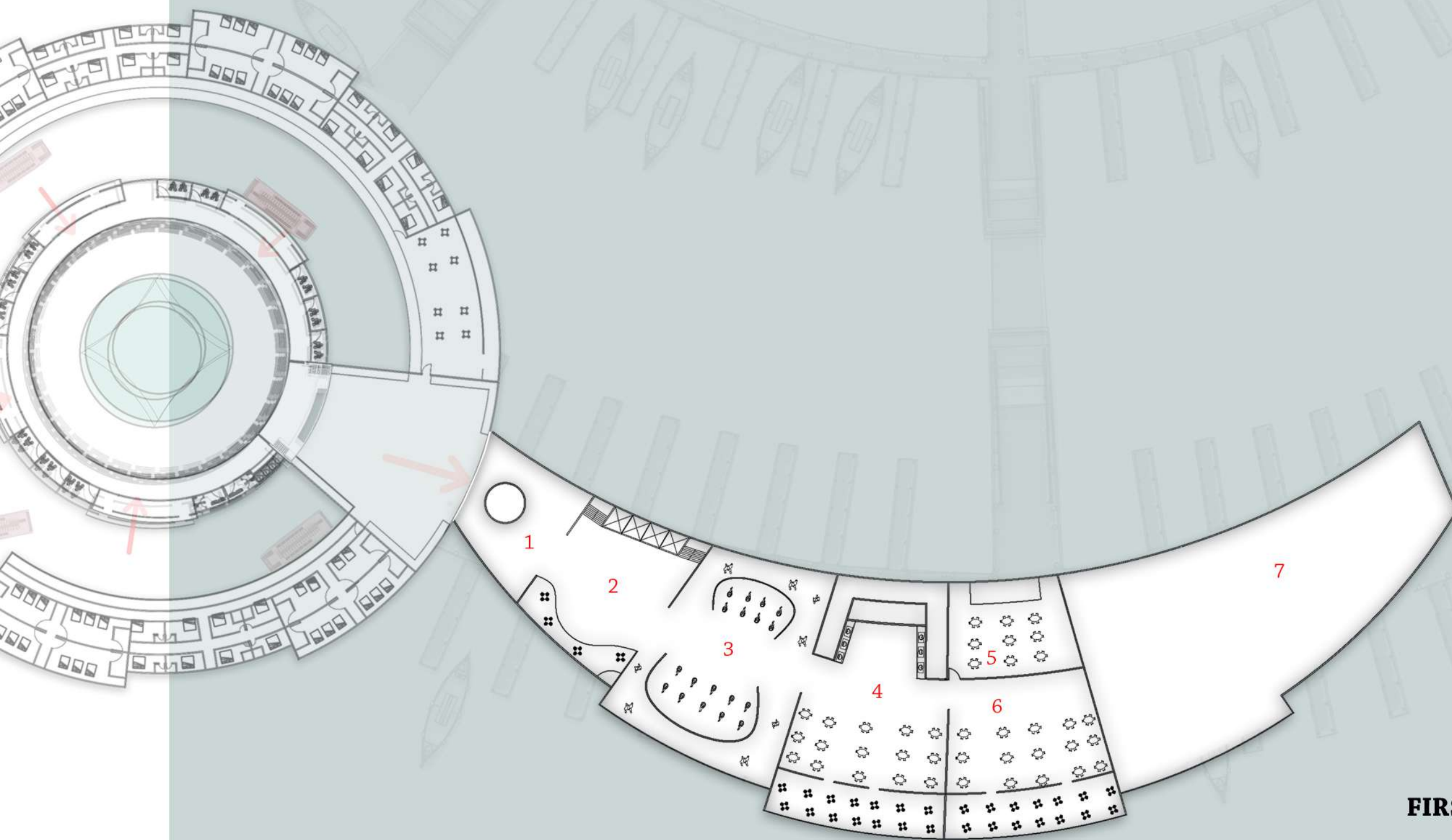


2. HOUSEBOAT TERMINAL FLOOR PLAN



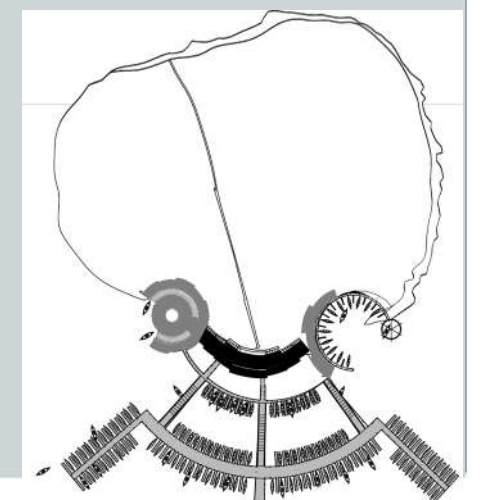
- 1 Toilets
- 2 Lobby
- 3 Gallery/media screening
- 4 Terminal waiting zone
- 5 Shops

GROUND FLOOR PLAN

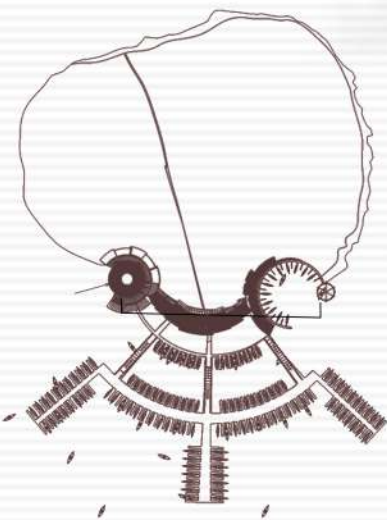


- 1 Reception
- 2 Lobby
- 3 Gallery/screening
- 4 Cafeteria
- 5 Rentable private party hall
- 6 Cafeteria
- 7 Rentable party hall

FIRST FLOOR PLAN



SECTION



GALLERY/TOURISM
SCREENING

CAFETERIA

WAITING AREA
FOR HOUSEBOAT
DEPARTURES

SHOPS

first floor

ground level

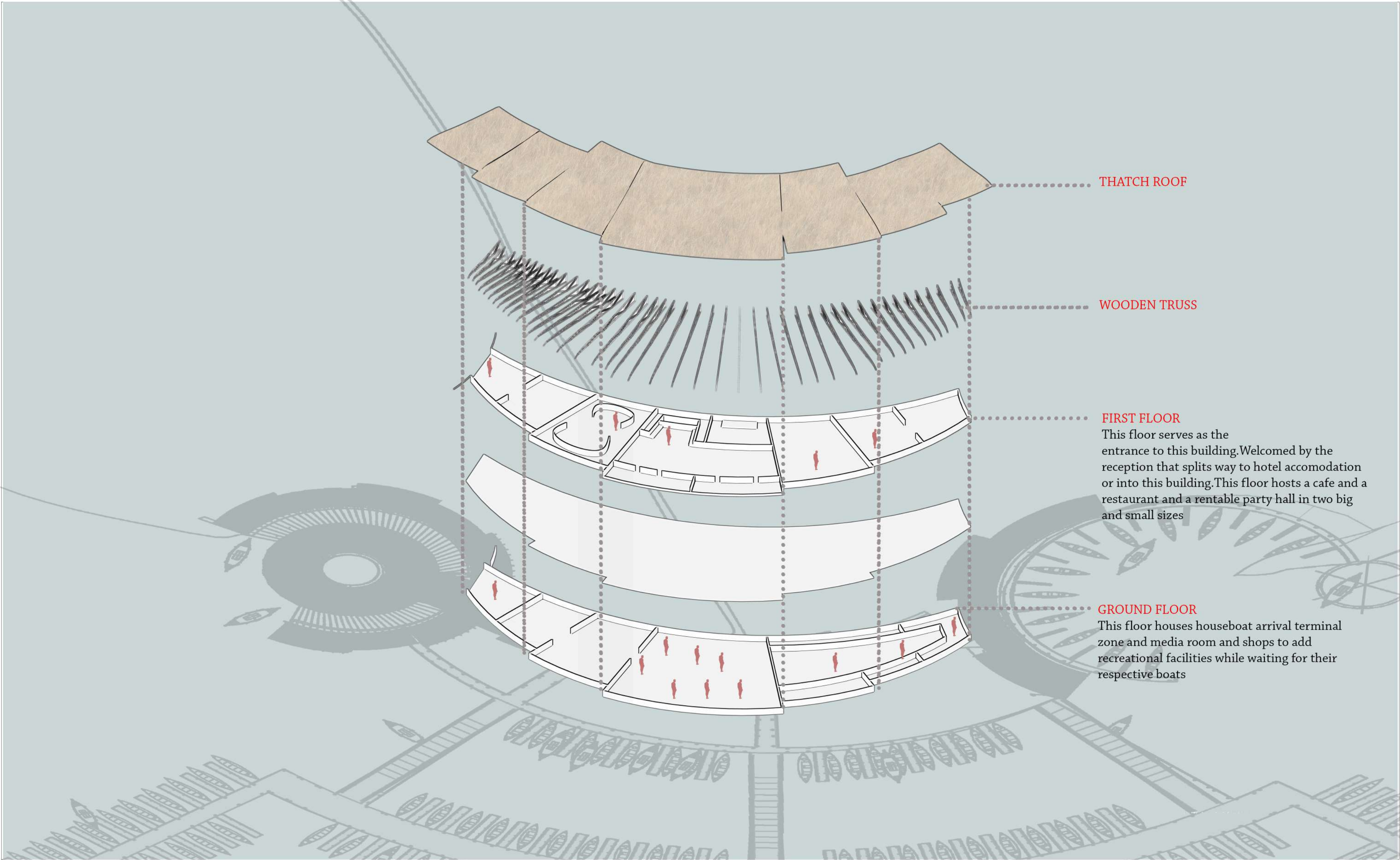
foundation level

first floor

ground level

foundation level

AXONOMETRIC DIAGRAM



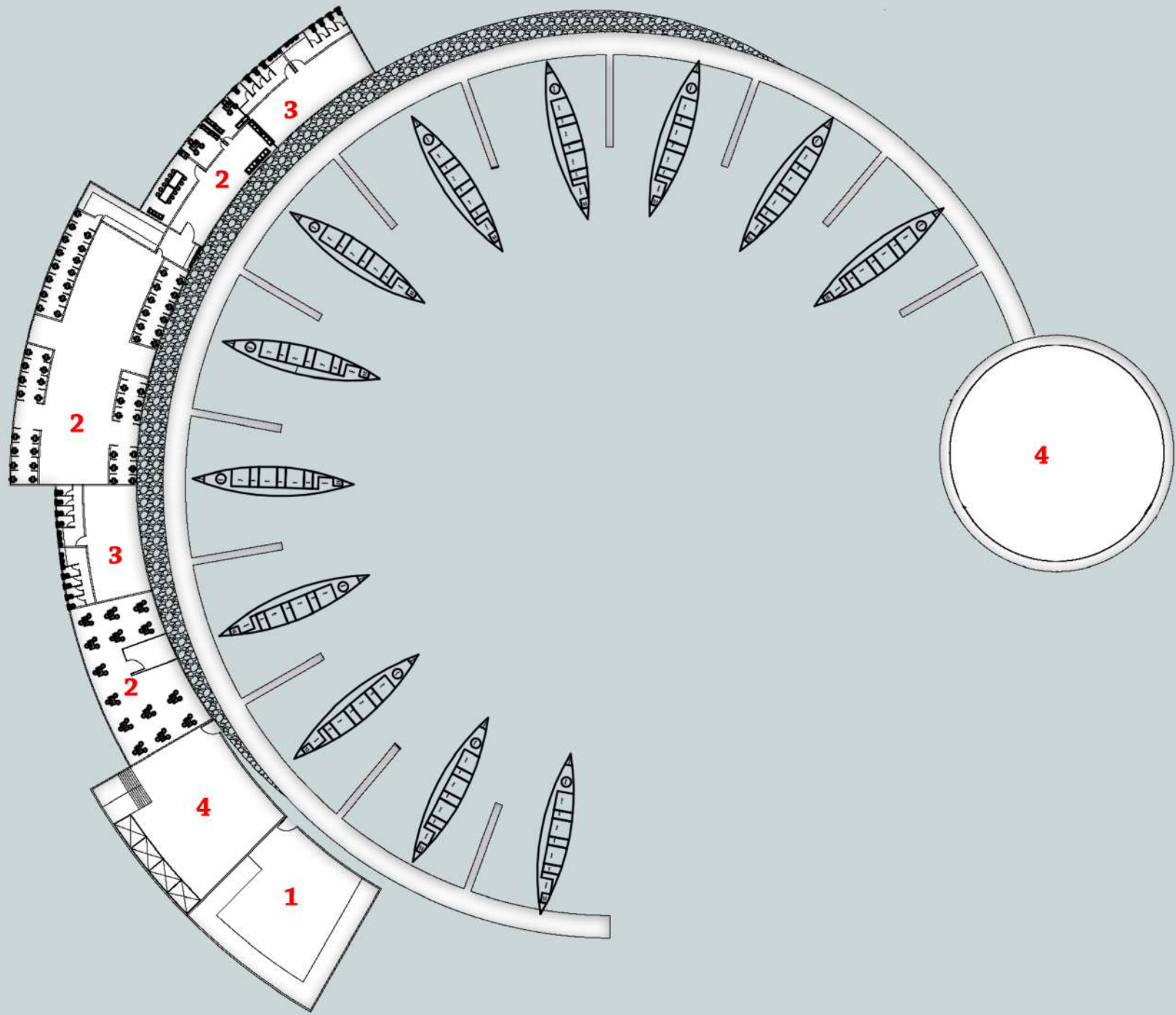
THATCH ROOF

WOODEN TRUSS

FIRST FLOOR
This floor serves as the entrance to this building. Welcomed by the reception that splits way to hotel accomodation or into this building. This floor hosts a cafe and a restaurant and a rentable party hall in two big and small sizes

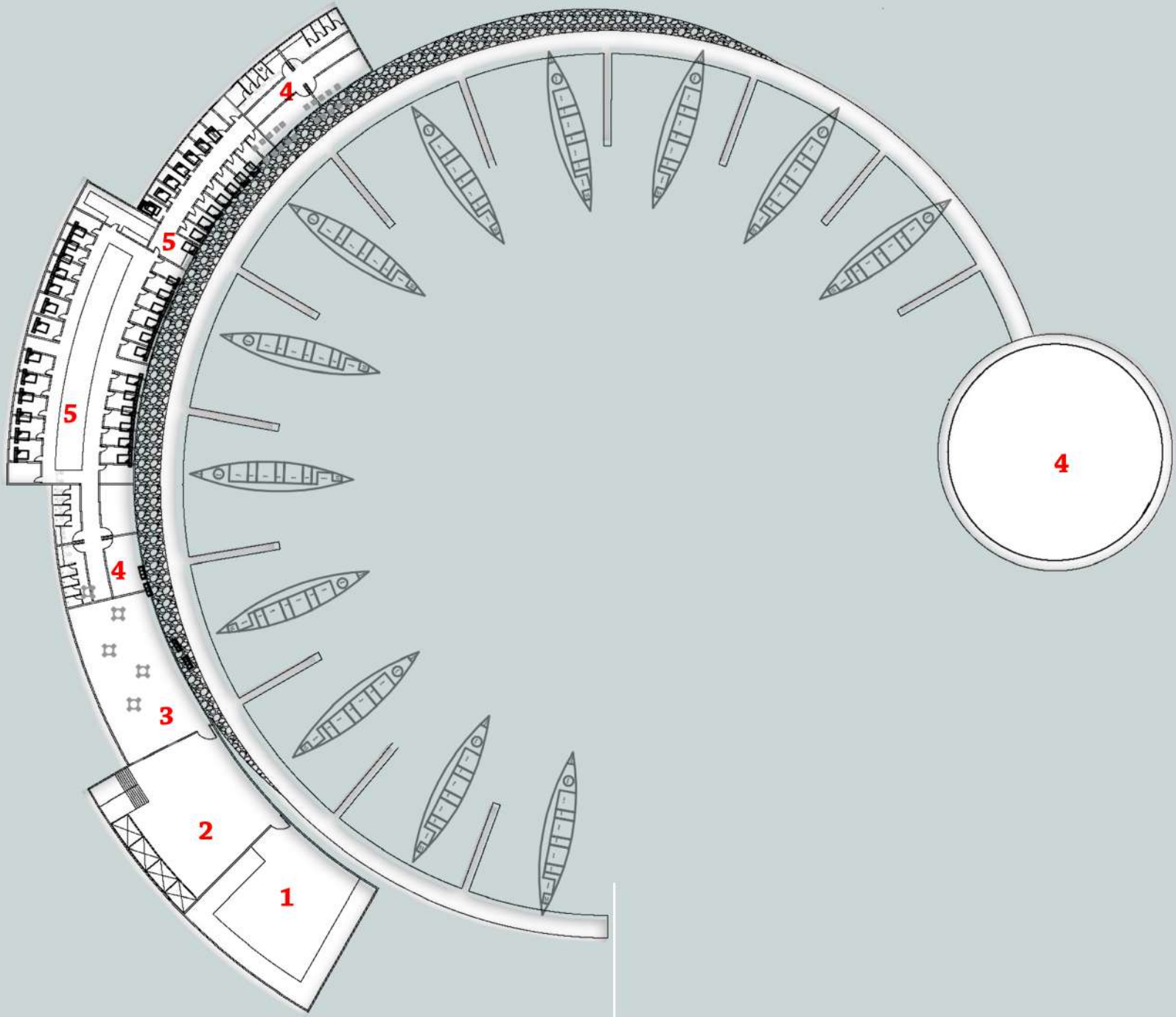
GROUND FLOOR
This floor houses houseboat arrival terminal zone and media room and shops to add recreational facilities while waiting for their respective boats

3.TOURISM DEPARTMENT FLOOR PLAN



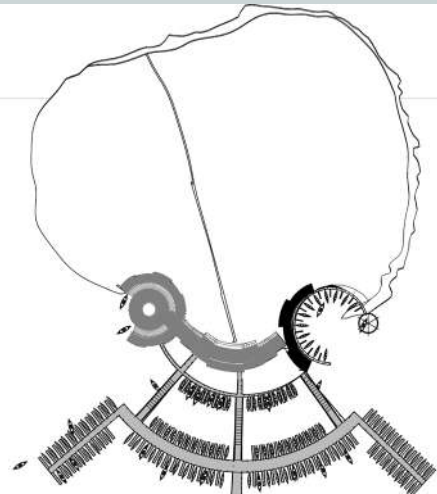
GROUND FLOOR PLAN

- 1 Storage
- 2 Office spaces
- 3 Restrooms and Laundry
- 4 Core/Lobby
- 5 Future provision for boat repair and fuel station

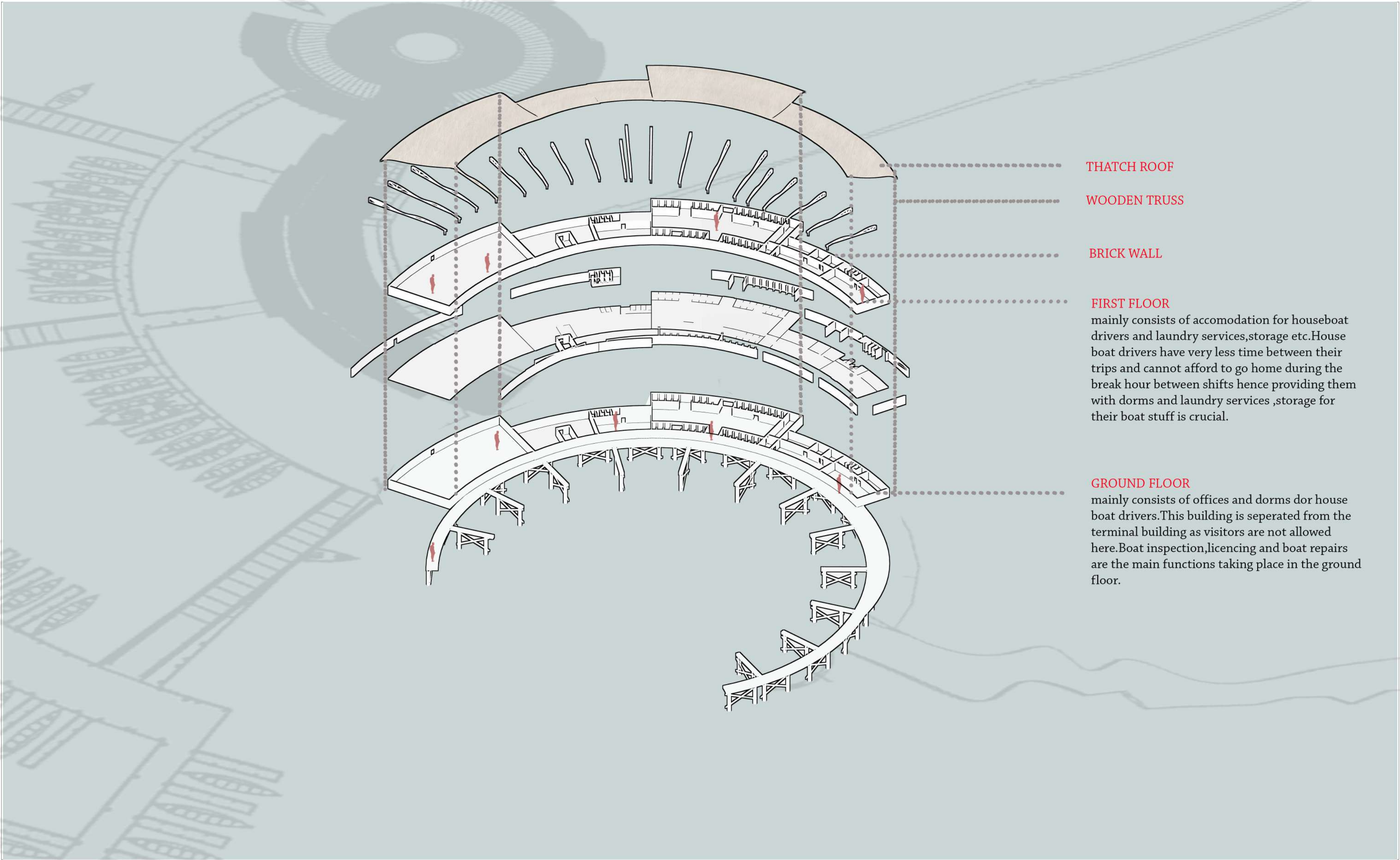


FIRST FLOOR PLAN

- 1 Storage
- 2 Core/Lobby
- 3 Lounge
- 4 Restrooms and laundry
- 5 Dorm rooms for houseboat drivers
- 6 Future provision for boat repair and fuel station



AXONOMETRIC DIAGRAM



THATCH ROOF

WOODEN TRUSS

BRICK WALL

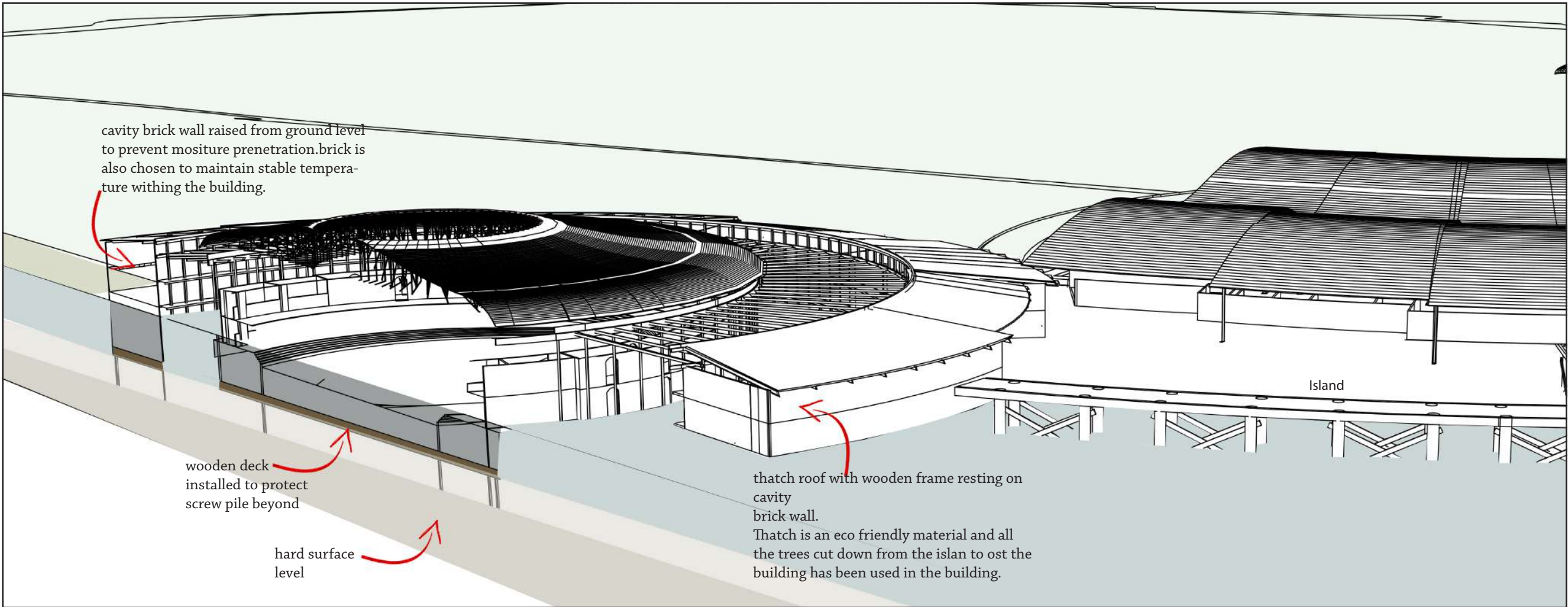
FIRST FLOOR

mainly consists of accomodation for houseboat drivers and laundry services,storage etc.House boat drivers have very less time between their trips and cannot afford to go home during the break hour between shifts hence providing them with dorms and laundry services ,storage for their boat stuff is crucial.

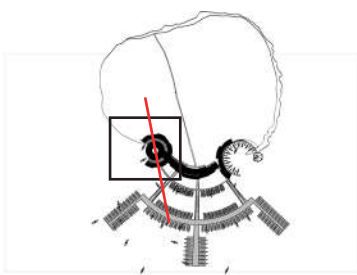
GROUND FLOOR

mainly consists of offices and dorms dor house boat drivers.This building is seperated from the terminal building as visitors are not allowed here.Boat inspection,licencing and boat repairs are the main functions taking place in the ground floor.

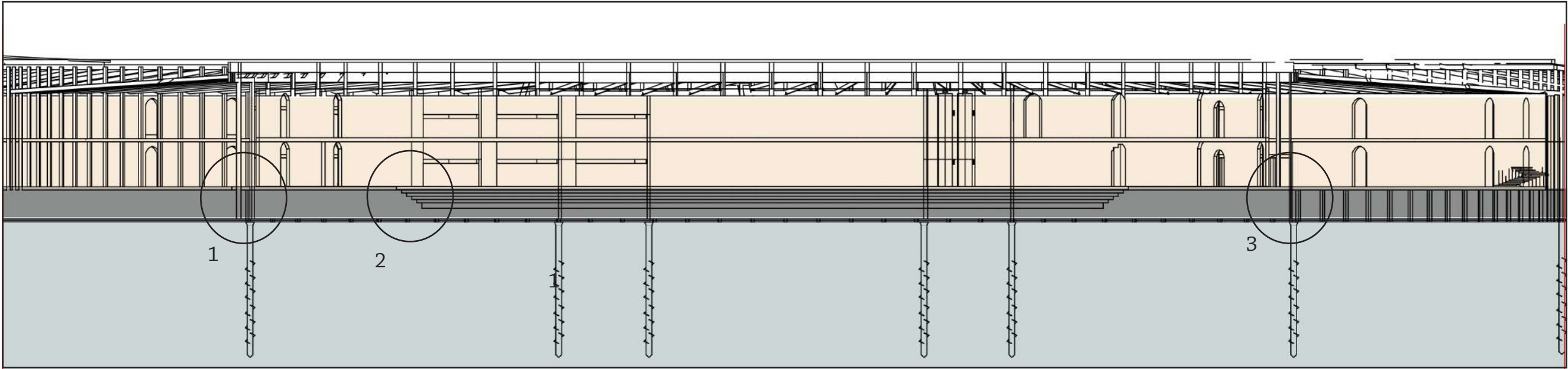
FOUNDATION DETAIL



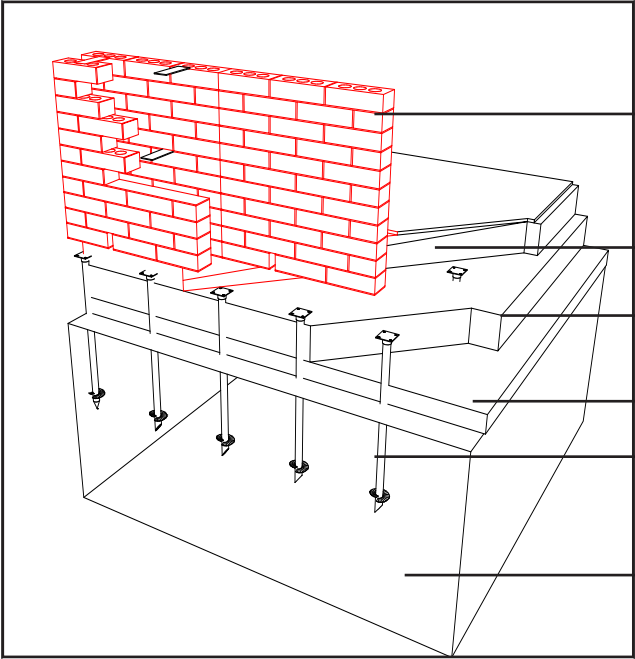
Perspective view showing foundation detail of the



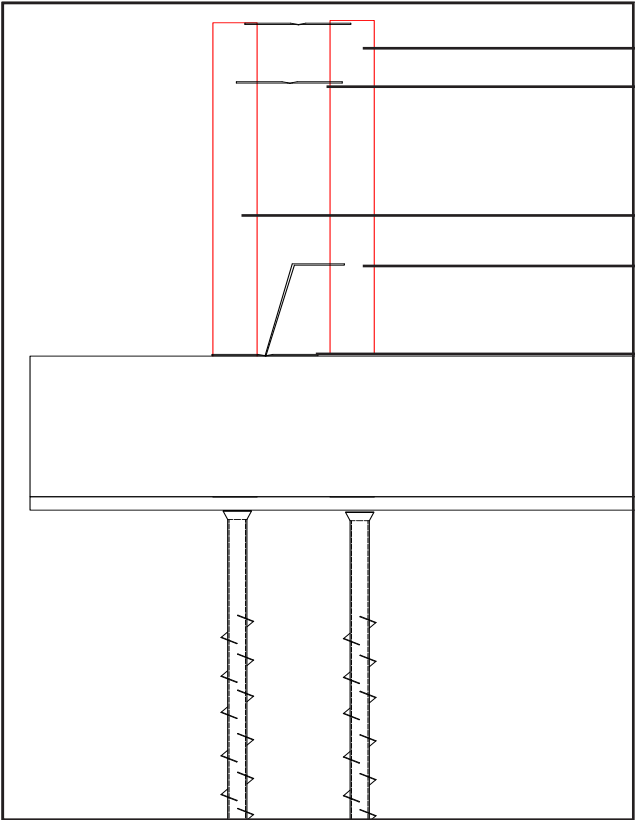
Cavity brick wall



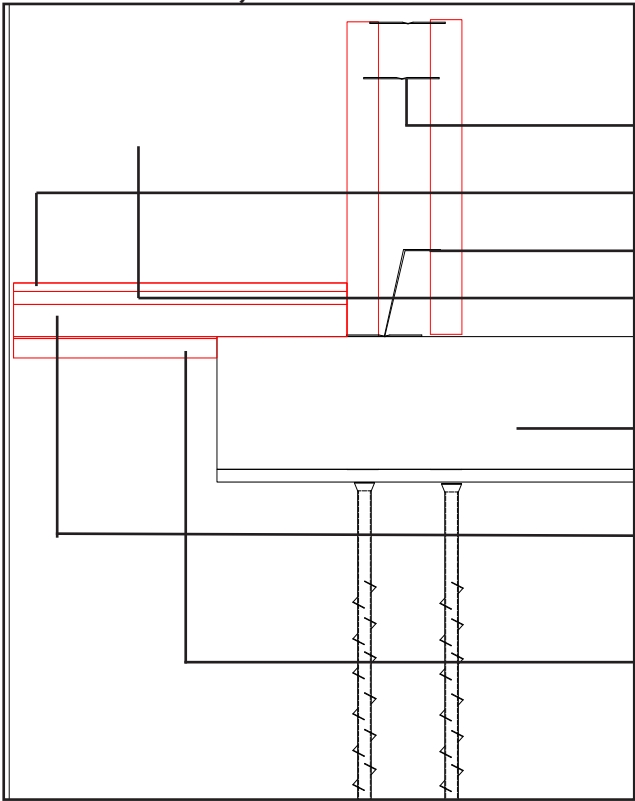
Section showing cavity brick wall



DETAIL 1: Foundation



DETAIL 2: Cavity wall detail

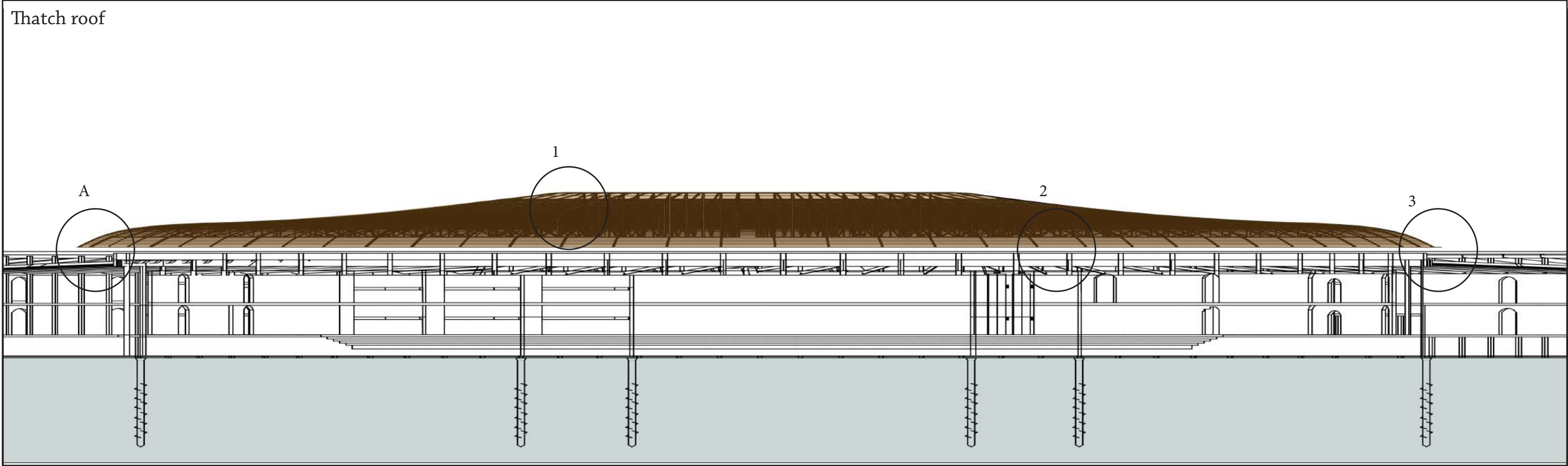


DETAIL 3: Flooring

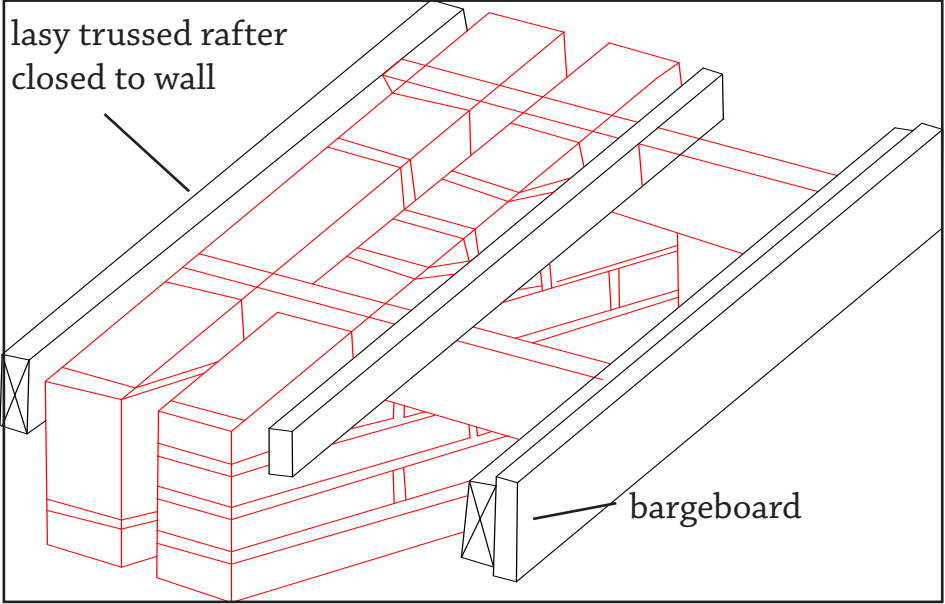
- cavity brick wall
 - concrete slab
 - limestone foundation
 - wooden deck
 - screw piles
 - solid surface level
- inner wall
 - metal tie
 - outer wall
 - flashing to form cavity gutter
 - weep hole

- cavity wall tie
- plaster
- wood floor
- limestone foundation
- sand binding
- damp proof membrane

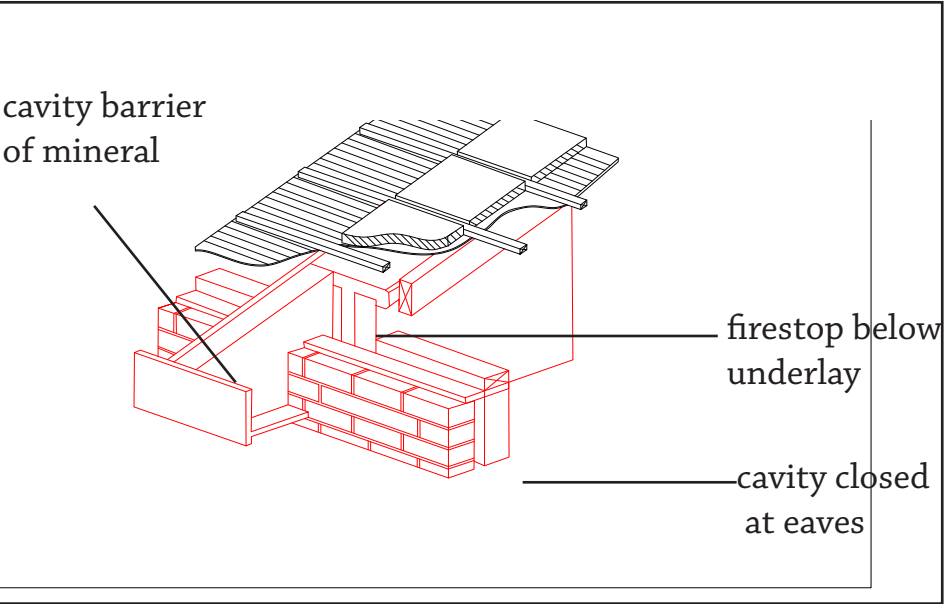
ROOF DETAIL



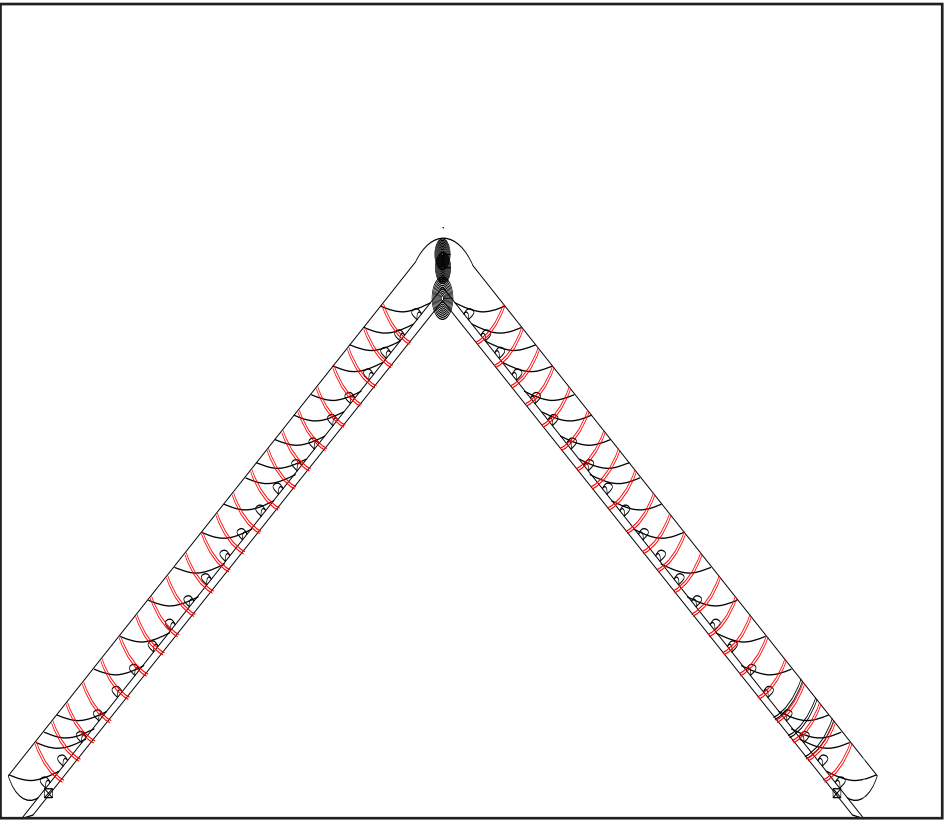
Section showing thatch roofing detail



DETAIL 1:
Cavity wall and lateral wooden members

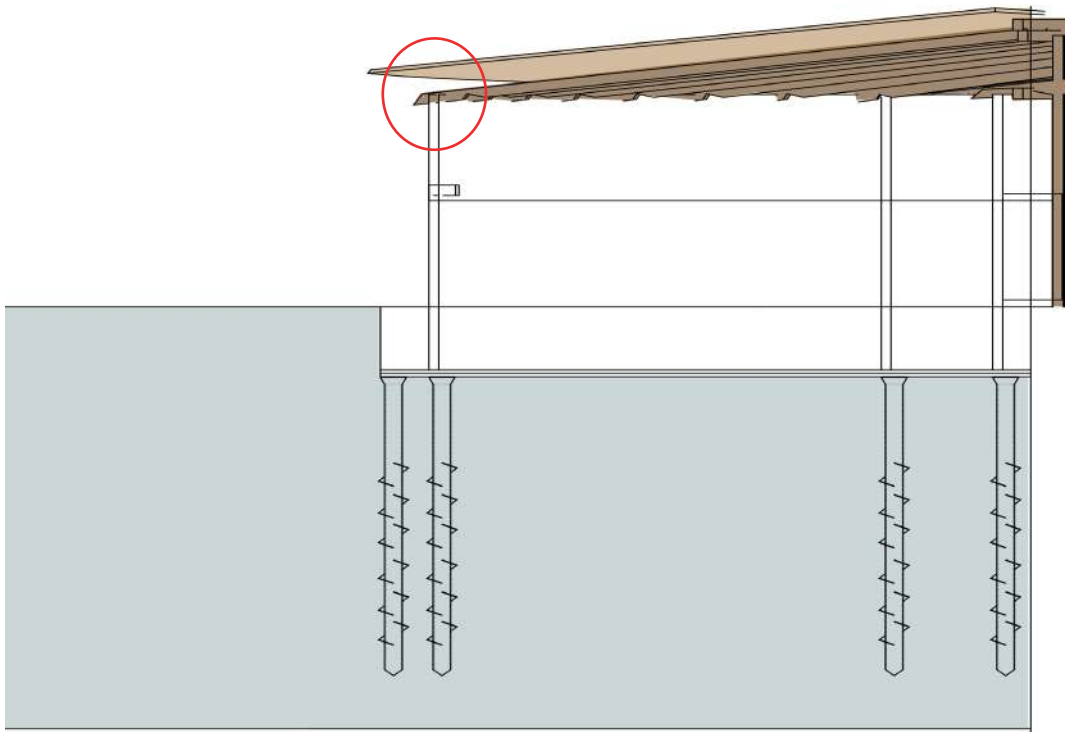


DETAIL 2:
Cavity wall and fireproofing detail

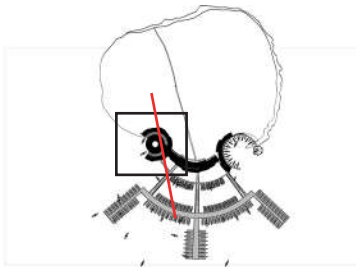


DETAIL 3:
Pre tied eave bundle tied to the wooden members

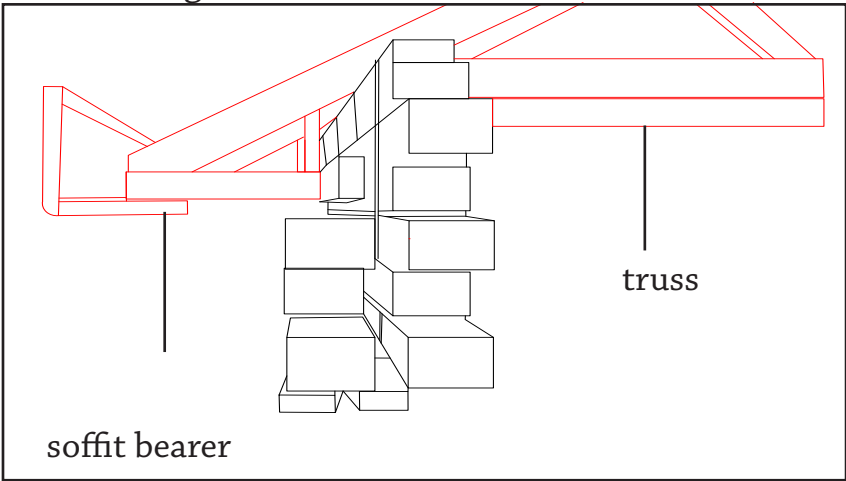
Joinery details of wood and brick wall



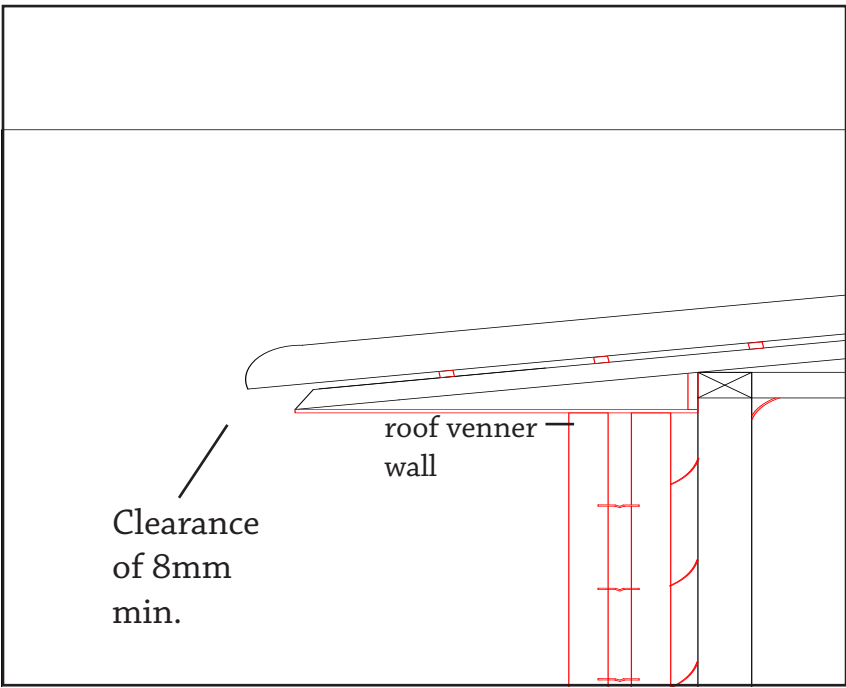
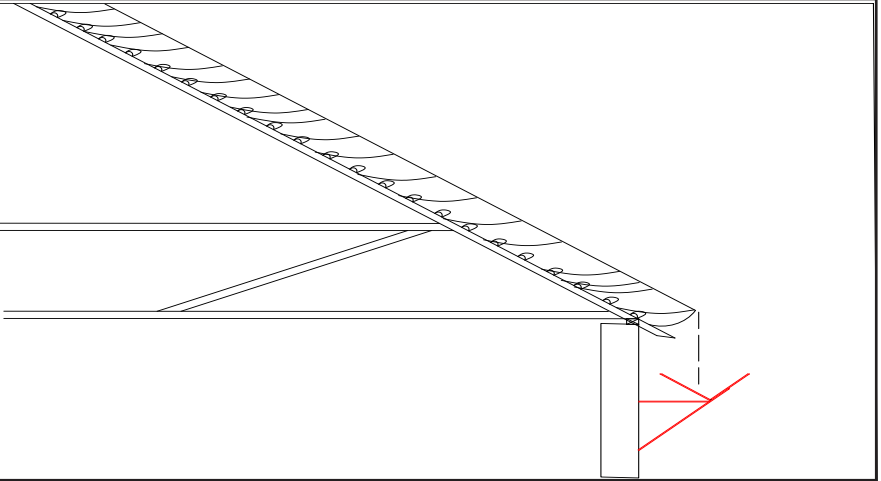
Detail A
Zoomed in view of the exterior thatch roof of the section



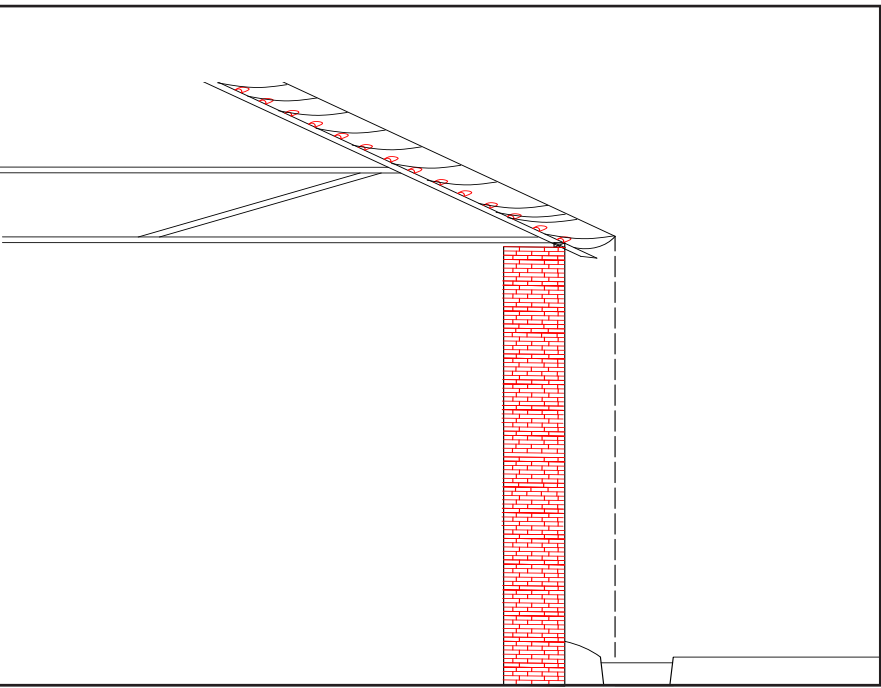
DETAIL 1:
Truss resting on brick



DETAIL 2:
Gutter at eaves level



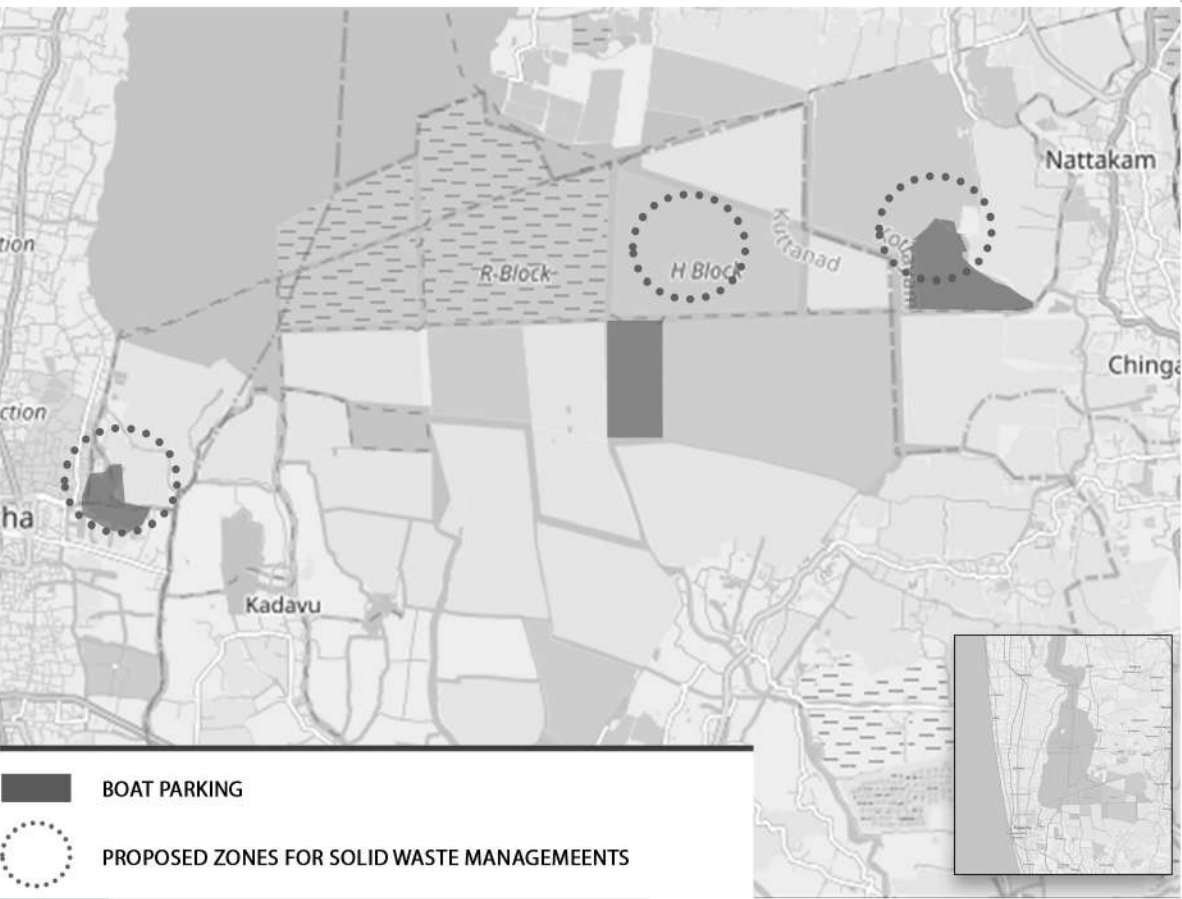
DETAIL 3:
truss resting on cavity wall



DETAIL 4:
Ground level drainage

WATER TOWER WITH SOLID WASTE MANAGEMENT SERVICES

Around 2,30,160 litres of waste water were being discharged from over 600 houseboats operating there. Similarly, a large number of houseboats had been plying without the no-objection certificate (NOC) from KSPCB.



HOUSE BOAT GENERATES 200 TO 1,000 LITRE WASTE PER DAY.

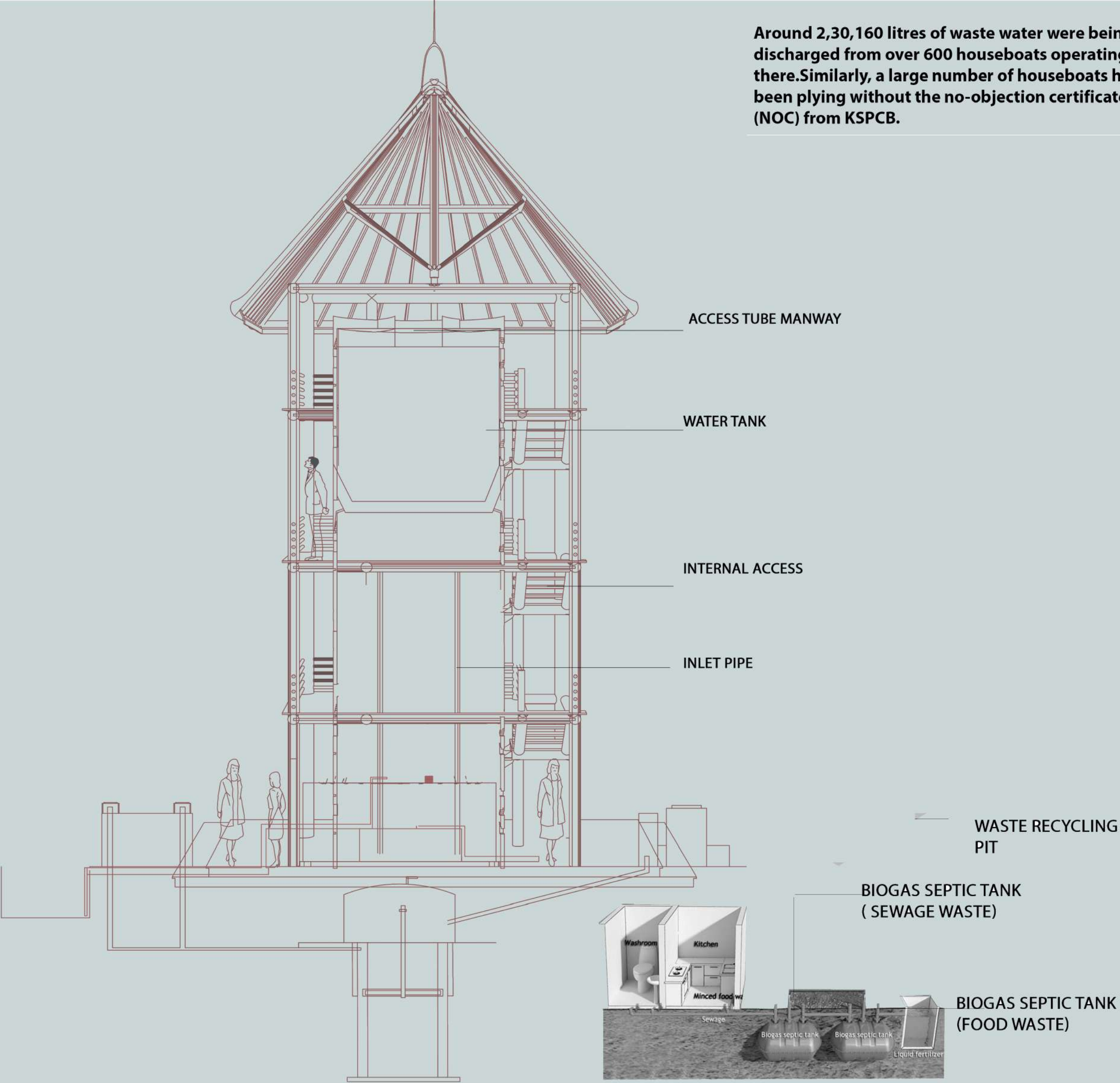
"WASTE GENERATION PER HEAD IS 15 TO 45L IN A HOUSEBOAT.

AN AMOUNT OF 2K IS CHARGED TO DISPOSE THE WASTE

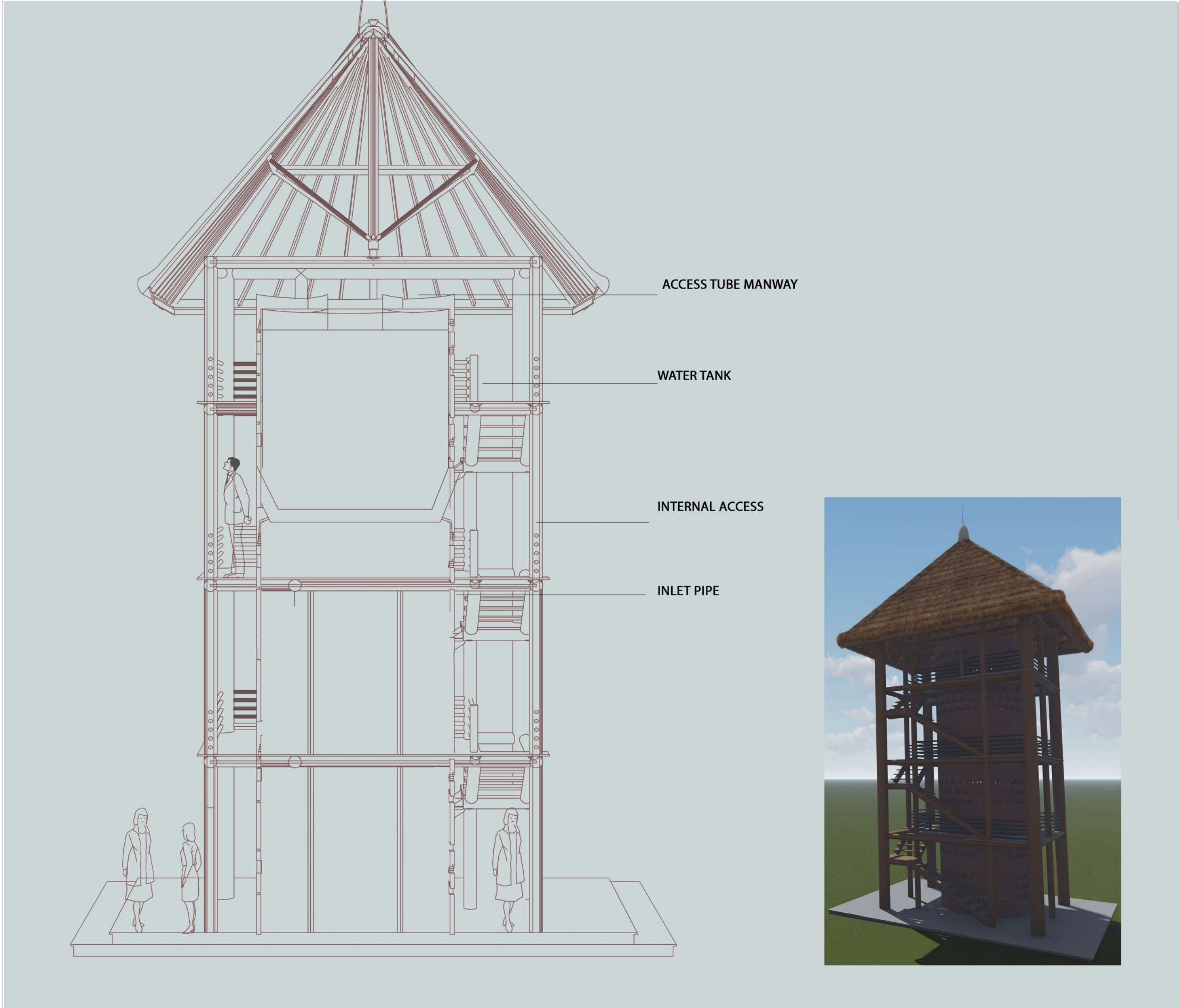
CAPACITY OF THE PLANT 1,80,000 L 90,000L PER DAY

AN AMOUNT OF 2K IS CHARGED TO DISPOSE THE WASTE

UNIT CAN PROCESS WASTE FROM 5-6 BOATS EVERYDAY

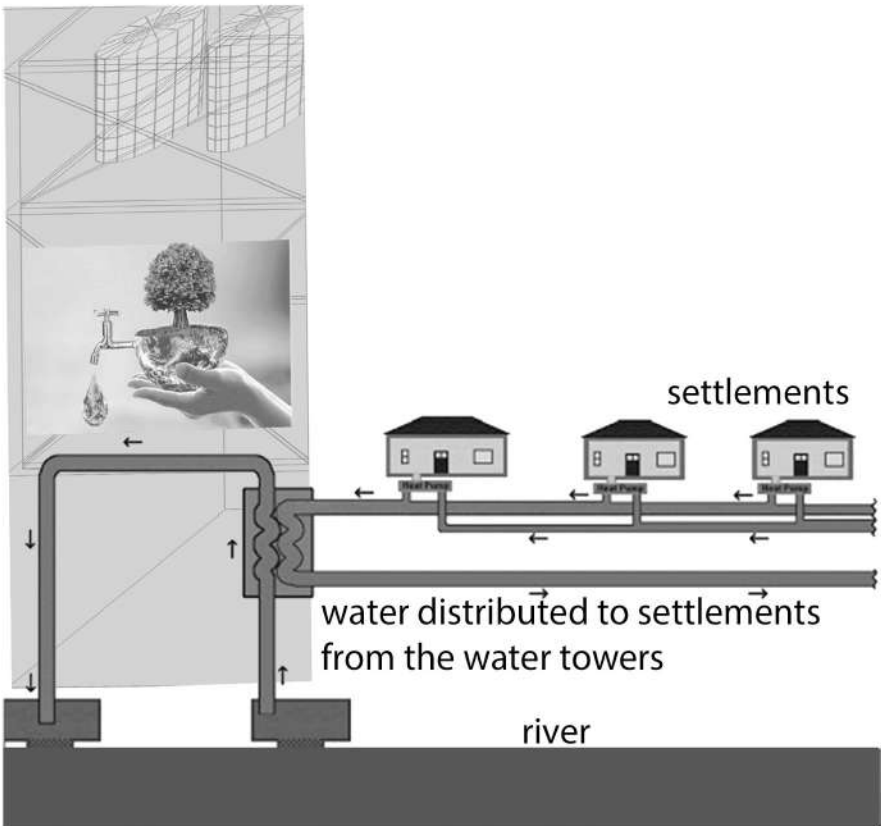


WATER TOWER



- Serves 7000 people/day
- filters 2036l/hr
- Provides 10,000 watts/day

water tower



VIEW OF THE WATER TOWER



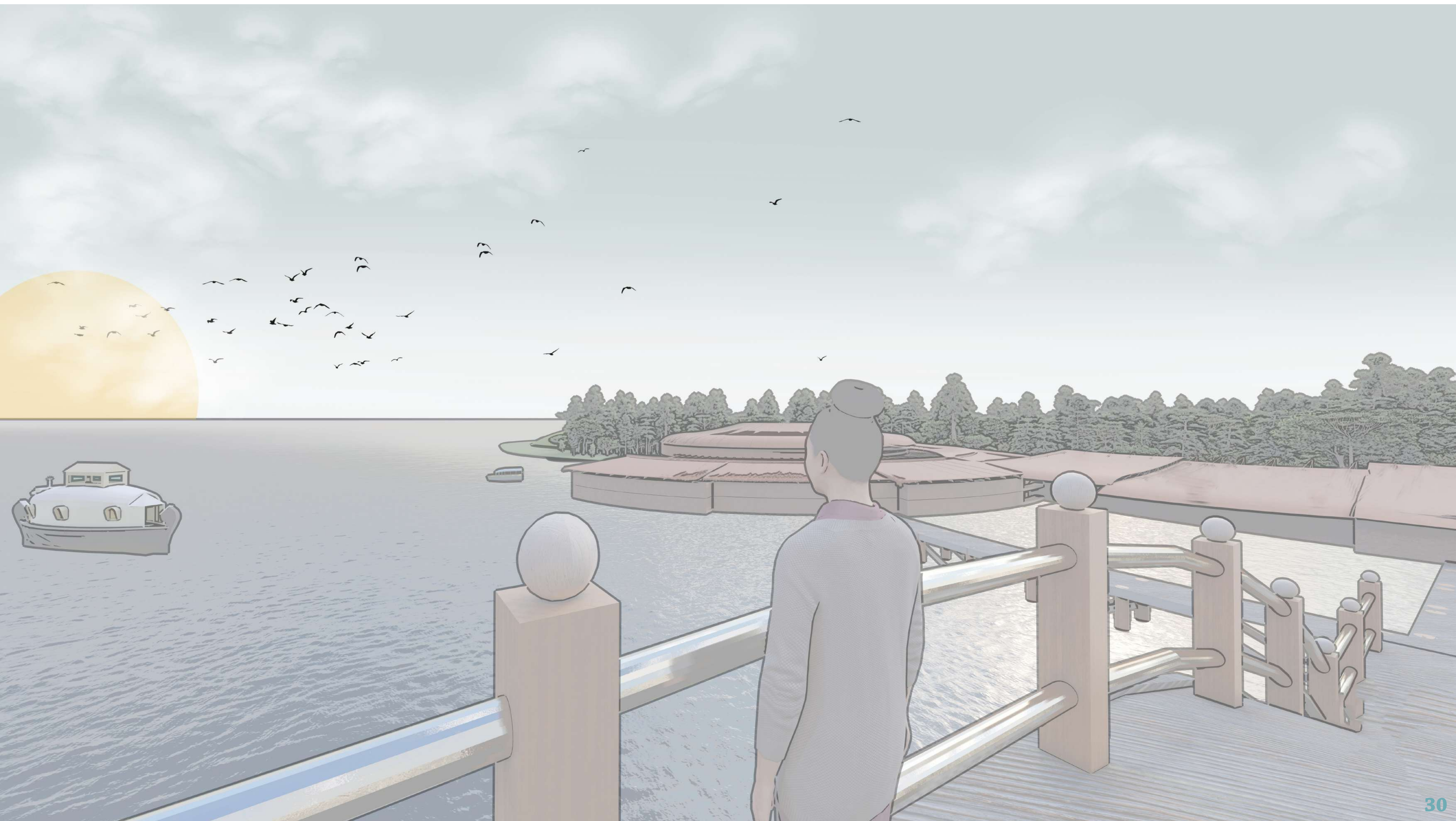
VIEW THROUGH THE FERRY TERMINAL



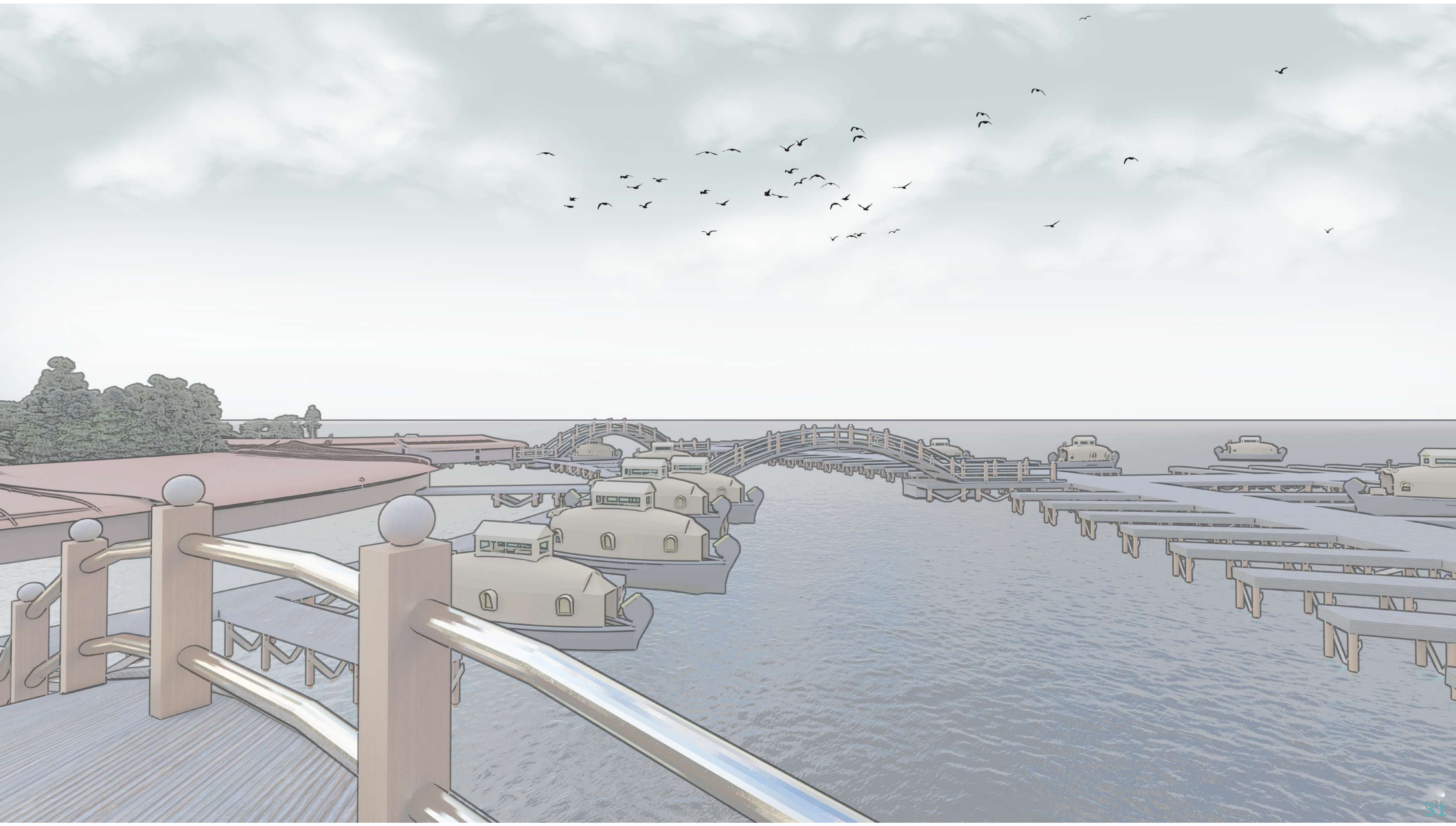
VIEW FROM THE ARRIVAL ZONE/TICKETING AREA



VIEW FROM THE DOCK TOWARDS FERRY TERMINAL



VIEW FROM THE DOCK TOWARDS HOUSEBOAT TERMINAL



VIEW FROM THE DOCK FACING THE TERMINAL

