INTERNATIONAL UNDERGRADUATE
PROGRAM IN ARCHITECTURE



DESIGN OF

WATER COLONY

FUTURE WATER ADAPTIVE SETTLEMENT IN SUDIMAMPIR AREA RESPONDING TO RISING SEA LEVEL IN BANJARMASIN

By Muhammad Thirafi Hadyan Syarief

SUPERVISOR
Dr.-Ing. Ir., Ilya Fadjar Maharika .,MA.,IAI

UNIVERSITAS ISLAM INDONESIA

DEPARTMENT of ARCHITECTURE

FINAL ARCHITECTURAL DESIGN STUDIO

Laboratorium Pemodelan Arsitektur dan Perkotaan

Design of
WATER COLONY
Future Water Adaptive Settlement in Sudimampir Area Responding to Rising Sea Level In Banjarmasin

By Muhammad Thirafi Hadyan Syarief
SID | 18512096

Supervisor
Dr.-Ing. Ilya Fadjar Maharika, IAI

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DEPARTMENT of ARCHITECTURE

AUTHENTICATION SHEET

Final Architectural Design Studio entitled :

Design of Water Colony : Future Water Adaptive Settlement in Sudimampir Area Respoding To Rising Sea Level in Banjarmasin

Student's name	: Muhammad Thirafi Hadyan Syarief
Student ID Number	: 18512096
Has been evaluated and agreed on	: 29th July 2022

Supervisor	Examiner 1	Examiner 2
Ilya Fadjar Maharika, Dr.-Ing., Ar., Ir., MA., IAI.	Wiryono Raharjo, Ir.,M.Arch., Ph.D.	Revianto Budi Santosa, Dr., Ir., M.Arch. IAI

Acknowledged by :

Head of Architecture Undergraduate Program

Yulianto Purwono Prihatmaji, Dr., Ar., IPM., IAI

STATEMENT OF AUTHETICITY

By signing this form, I :

Student Name : Muhammad Thirafi Hadyan Syarief
Student Number : 18512096
Study Program : Architecture
Faculty : Faculty of Civil Engineering and Planning
University : Universitas Islam Indonesia

state that all parts of the thesis work / final project entitled

Design Of Water Colony : Future Water Adaptive Settlement in Sudimampir Area Respoding To Rising Sea Level in Banjarmasin

is a work of its own except the work mentioned in the reference and there is no help from any other party either in whole or in part in the process of making it. The final result of this work was handed over to the Department of Architecture, Islamic University of Indonesia for use for educational and publication purposes, but the intellectual property rights are still owned by the author.



Muhammad Thirafi Hadyan Syarief

PREFACE

Assalamualaikum Wr. Wb

Praise the presence of Allah SWT, The One and Only God for the abundance of grace, His gift, and His power so the preparation of the final architectural design studio report titled "Design of Water Colony : Future Water Adaptive Settlement in Sudimampir Area Respoding To Rising Sea Level in Banjarmasin" can be completed. The author realizes that the process of designing and implementing of this report can be done inseparable from the support of many parties, therefore the author wants to express appreciation and gratitude to:

1. Allah SWT., who has given His gifts, instructions, ease, and power in every research process and the preparation of the final project report so that the author can complete it.

2. I want to thank my parents, Subhan Syarief my father, Nurmayani my mother, and both my sisters Nur Syaima Dhiya Savitry and Nursyahla Savitry that i respect and care for, who always give encouragement, support, motivation, and compassion.

3. Dr.-Ing.Ar. Ir. Ilya Fadjar Maharika, MA., IAI. as supervisor who has an important role in the research and preparation of this final project report, with all his patience and great kindness has provided guidance, inputs, and knowledge to the author.

4.Ir. Wiryono Raharjo M,Arch ,Ph.D. as 1st jury who has given input, criticism, and advice to the author so that the writing of this report can be better.

5. Dr. Ir, Revianto Budi Santosa M.Arch,IAI.,as 2nd jury who has given input, criticism, and advice to the author so that the writing of this report can be better.

6. Sultan,Rifqi,Aljau,Fae,Ummi,Daffa,and Bdur and many other author's classmates that have given tremendous supports, knowledge-sharing process, and motivate to jointly complete this final architectural design studio.

7. Last but not least, I wanna thank myself to work in this final project very hard and believe in myself that my project will provide benefits to readers and society. I am very grateful to be given the opportunity to complete this final project with the effort that I put into this project in the hope that it will help the future to be better.

The author realizes that in the preparation of this report is far from perfection, in terms of language, drawing, and writing. Therefore, the author expects constructive criticism and suggestions that will later become a provision of experience for the author to be better in the future. Hopefully this report is useful for all who read it, as well as the author in particular.



Muhammad Thirafi Hadyan Syarief

ABSTRACT

The city of Banjarmasin as a city at the very end / downstream in the province of South Kalimantan with geographical conditions that are below sea level and located surrounded and even on the side of a large river which is directly connected to the sea of course also greatly affected by the impact of global climate change or the sea level rise.

The Sudimampir area, Ujung Murung and Pasar Lima are historical areas that have contributed a lot in triggering the growth of the city of Banjarmasin. The condition of the area's old infrastructure (the average building is over 50 years old) has made many of the conditions unfit for function. This condition makes the area even more worrisome, it is feared that soon, it will not even take ten years to function because the puddle of water will increase.

From the above, three main problems are obtained that will be addressed:

1). Looking for a development concept that is able to deal with issues of the impact of rising water which will be stronger in the riverbank area;
2). Maintaining and strengthening the existence of the Sudimampir service trade center area and the surrounding area as the initial center for triggering the growth of the city of Banjarmasin (an area of historical value).
3). Carry out the stages of structuring / development without ignoring or stopping service trading activities in the area.

keywords : *sea level rise ; resilient city; resilient architecture; Sudimampir service trading center area*

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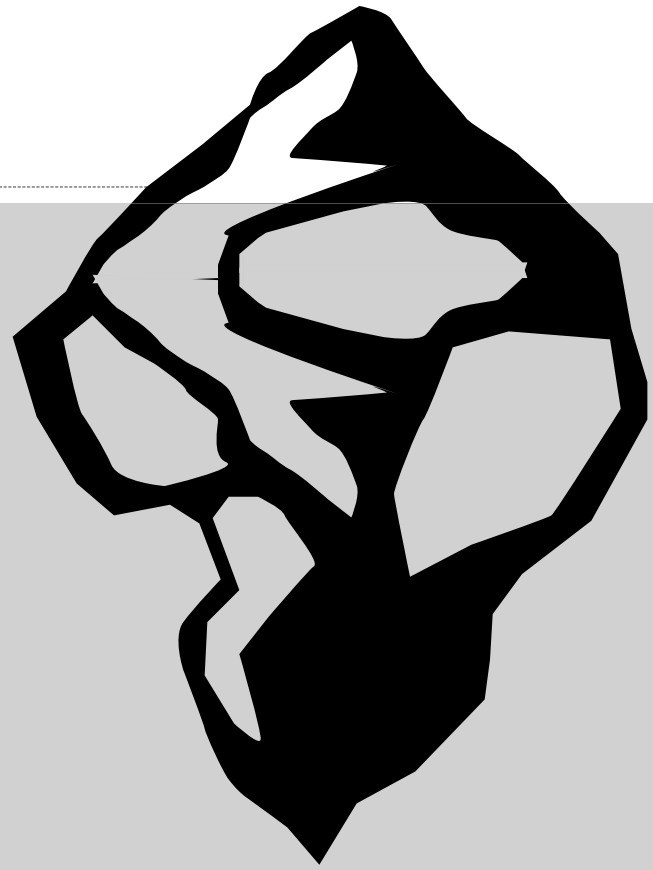
CHAPTER 1
INTRODUCTION

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1.1 BACKGROUND

GLOBAL WARMING

Both Antarctica and Greenland are losing ice each year—around 350 billion tons—and as a result, the global sea level has increased 11.1 millimeters since 1992. This image depicts a midsummer canal formed by melting ice, which eventually transports water away from the glacier to the sea.



The Effect of Global Warming

One of the effects of global warming is climate change, which is defined as an increase in global temperature from year to year as a result of the greenhouse effect. Global climate change is the rise in the intensity of the greenhouse effect caused by the existence of gases in the atmosphere that absorbs heat rays, namely infrared rays generated by the planet.It is also stated that climate change can be caused by internal natural processes, external influences, or human actions that alter the composition of the atmosphere and land usage on a continual basis. Changes in the Earth's atmosphere's physical characteristics, such as temperature and rainfall distribution, as well as the melting of polar ice caps, have a large influence on climate change in numerous sectors, one of which is sea-level rise.

The environmental crisis and global climate change threaten coastal cities in various countries. Indonesia is one of them. As an archipelagic country surrounded by sea, Indonesia's coastal areas are expected to be increasingly crowded below sea level and one of the cities that will be most affected is Banjarmasin.

According to an article from mediaindonesia.com, South Kalimantan has a low Environmental Quality INDEX (IKLH), which is the worst of the five provinces in Kalimantan and ranks 26 out of 33 provinces in the country.

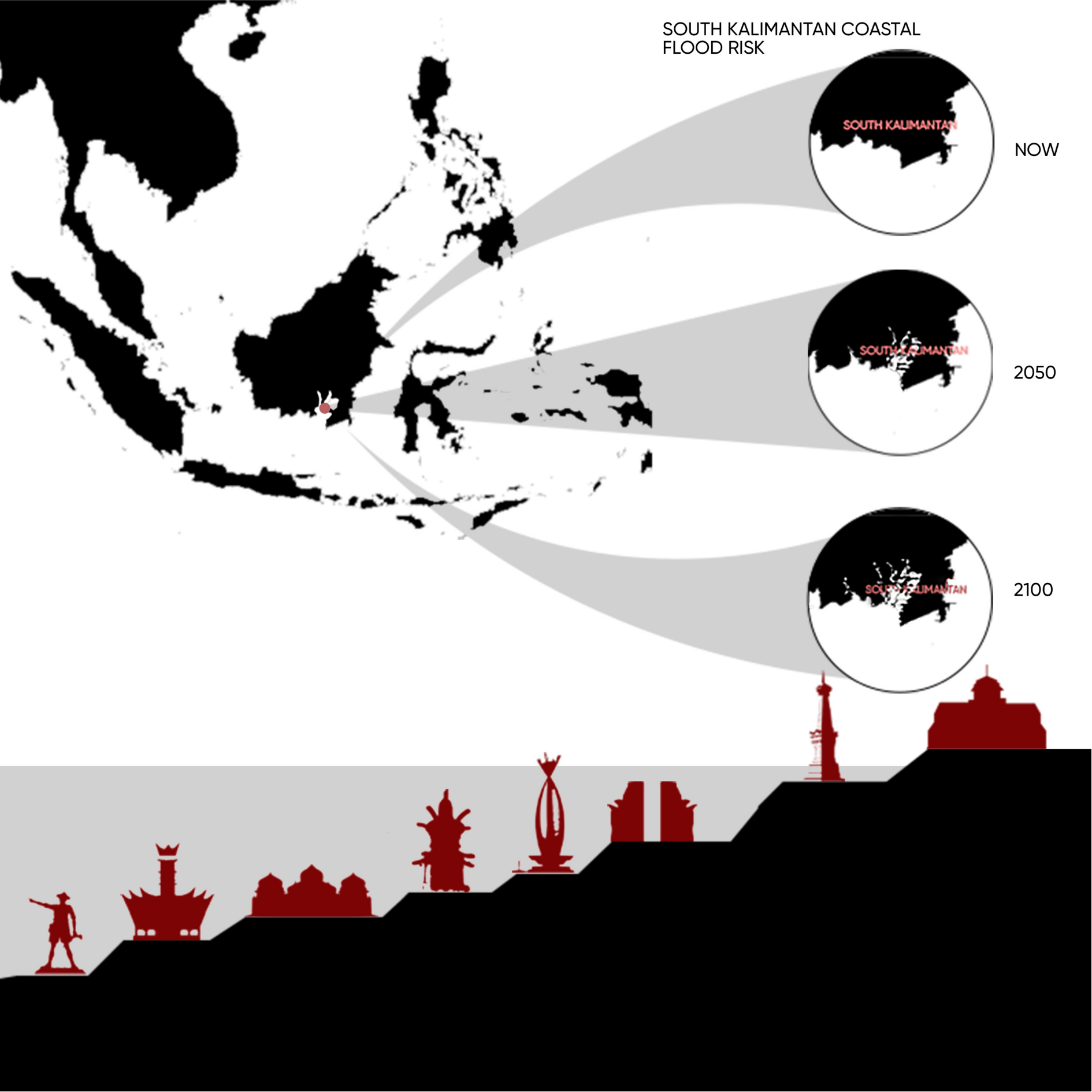
Coastal Flood Risk in Banjarmasin

Chronic flooding will expand as sea levels rise over the century, and more land will be permanently lost to the water. According to CoastalDEM's elevation data, land that presently houses 200 million people might be permanently submerged below the high tide level by 2100.

The negative news is once again focused on Asia. The countries with the most population living on terrain that might be permanently flooded by 2100 are China, Bangladesh, India, Vietnam, Indonesia, and Thailand—151 million in all, with 43 million in China alone.

Banjarmasin itself is geographically located between 3°16'46'' to 3°22'54'' south latitude and 114°31'40'' to 114°39'55'' east longitude. Located at an average altitude of 0.16 m below sea level with swampy and relatively flat area conditions. At high tide almost the entire area will be flooded. In Banjarmasin, the proportion of land impacted by the tidal flood reached 85.5 percent, nearly double that of DKI Jakarta's 44.8 percent. Meanwhile, 86.6 percent of residential areas are expected to be flooded. This indicates that by 2050, the land around Banjarmasin




SOUTH KALIMANTAN COASTAL
FLOOD RISK
SOUTH KALIMANTAN
NOW
2050
2100

HISTORY PICTURE OF BANJARMASIN
A CITY OF THOUSAND RIVER









Banjarmasin as a River City

Banjarmasin is a city in Indonesia's South Kalimantan region. Banjarmasin is known as the "City of a Thousand Rivers" because of its location, which is surrounded by big, medium, and tiny rivers. The Martapura River, which connects Banjarmasin to neighboring cities in South Kalimantan, divides the city. The river is very influential on the development of the city of Banjarmasin. The existence of this river provides challenges for the people of Banjar in adapting to their environment. Adaptation to the environment triggers the growth of settlements on the river banks, with houses built along the river and then developing towards the land. When viewed from these developments, the formation of the City of Banjarmasin started from the river environment and settlements on the river banks.

The life of riverside communities in Banjarmasin City can be seen in lanting houses and riverside houses. from history, the formation of this settlement was initiated by people who lived on the Martapura river; these people lived by the nomadic way with their boats. According to Alfisyah (2014), the activities carried out by the boat people are gathering forest products and catching fish, the results of these activities are used to meet daily needs and also for sale, these buying and selling activities are carried out between boats. To facilitate access and reduce energy when pedaling a boat to sell, some boat people concentrate their selling activities in one place, and then a collection of boat people selling in an area develops into a market. According to Alfisyah (2014), Around the 17th century, these boat people were rarely seen, and instead, there were a collection of houses floating on the river with a function as a place to sell. Population growth caused boats to no longer be able to accommodate more and more families.

New Typology of Future Settlement

A settlement, locality, or populated place is a community where people reside in geography, statistics, and archaeology. A settlement's complexity can range from a small number of houses clustered together to the biggest of metropolis with surrounding urbanized regions. Hamlets, villages, towns, and cities are examples of settlements. A settlement may have known historical qualities such as the period or era in which it was originally settled, or it may have been settled by specific individuals.

Sea-level rise is one of the things that can endanger human settlements' existence. Coastal areas should expect more regular and severe flooding from high tides and storm surges as sea levels rise. Such floods will eventually cause damage to roads, bridges, buildings, and other infrastructure, as well as reduce property values. Rising sea levels are already having an impact on many coastal towns.

Future settlements are hope to be inclusive, safe, resilient and sustainable, The New Urban Agenda identifies multisectoral urban planning, local financing, access to safe and affordable housing, provision of adequate basic services, investment in affordable and low-emission public transportation networks, and participatory and inclusive approaches to planning, implementation, and monitoring as critical factors for future urban and human settlements development in order to ensure local ownership and long-term sustainability.

Aplication of Water Adaptable Concept

To respond to future conditions, the use of the concept of water adaptable architecture is one way to answer the problem of sea-level rise, The term "aquatecture" refers to a type of architectural modification that is designed to minimize and control floods (long and short term). Water and architectural design may come together in this typology to provide dynamic and dependable mitigation strategies. Supporting systems will be included across the impacted regions, in addition to adaptive building design. Alternative energy generation, alternative agriculture, mixed-use industries, alternative transportation, and water filtration zones will all be included.

1.2 PROBLEM STATEMENT

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Design Problem Study

Problem Statement

Based on the background that has been studied, there are several problem formulations obtained

General Problems

How can the design of Water Colony in the Sudimampir area with the concept of aquatecture help and be effective in solving the problem of sea-level rise in Banjarmasin in the next few years?

Specific Problem

How to design a mix-use that can adapt to the water level in case of sea-level rise in Banjarmasin?

How to create buildings that can improve the quality of the Banjarmasin city area while still being able to maintain the character of the river city?

How to organize the area so that it can provide improvements in terms of economy, security, comfort and sustainability of life in the future?

Goals& Objective

Goals

Designing a mix-used area that can become the center of activity for residents of the city of Banjarmasin if there is a rise in sea levels in the next few years

Can be the prototype of a floating environment that can make the city of Banjarmasin a Resilient floating city

Provide solutions for the future that can help cities recover from rising sea levels that are causing coastal cities to sink

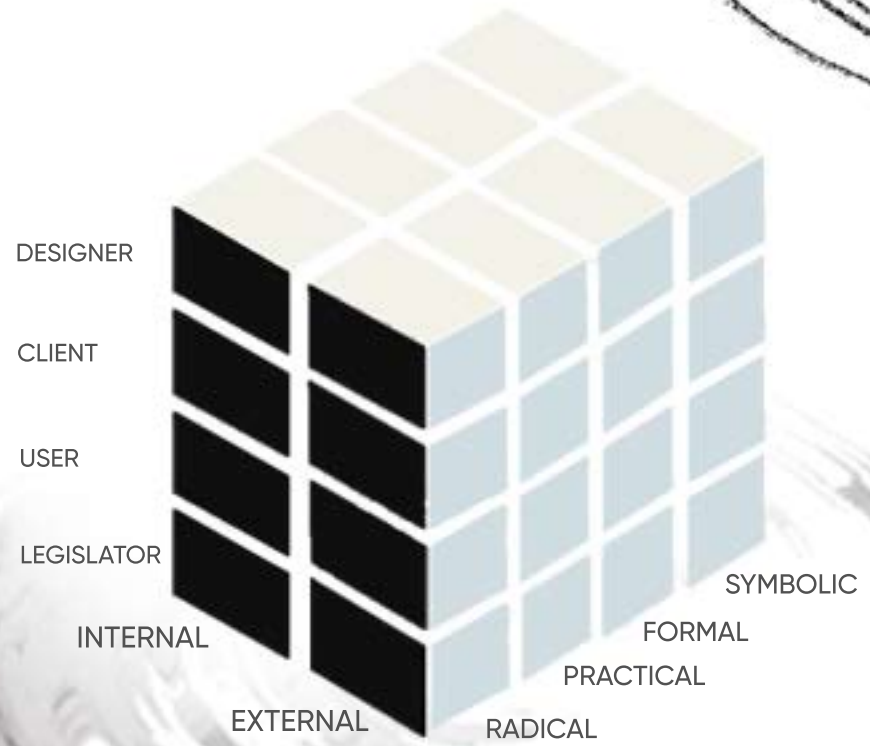
Objective

Form a Future Settlemen that can adapt in case of rising sea levels that can drown coastal cities

Can answer the future of Banjarmasin, as a resilient floating city

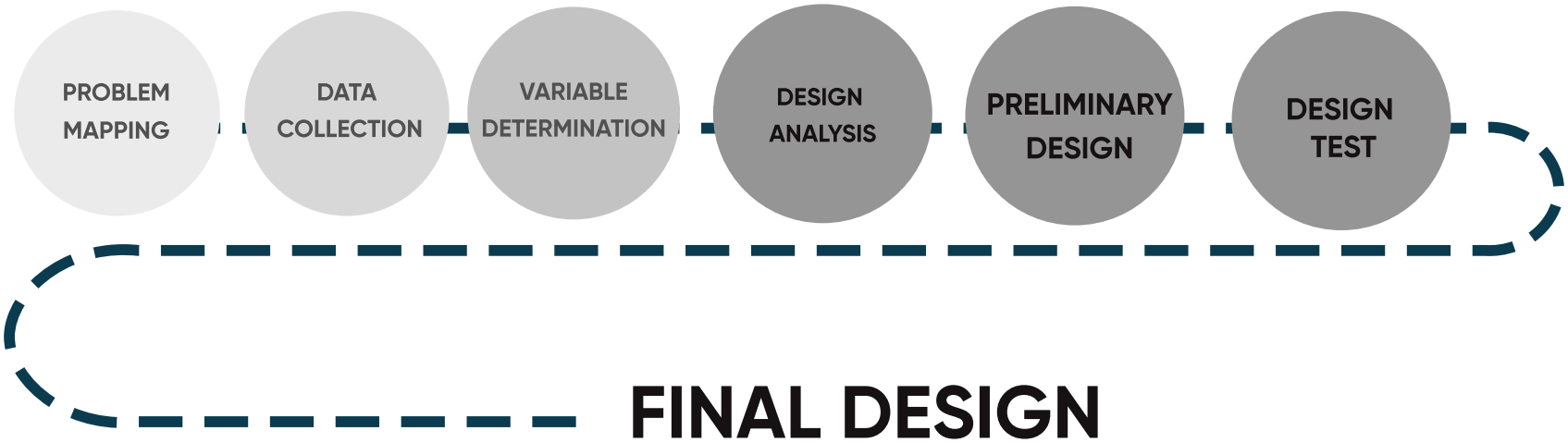
Lawson (2005)

The classic design thinking method, image design, and the combination of design and science were all described. The thinking technique that blends design and science broadens the design process and allows for scientific evaluation.



	Formal Problem	Practical Problem	Symbolic Problem	Radical Problem
REGULATOR -LAWS OF THE REPUBLIC INDONESIA NUMBER 24 YEAR 2007 - GOVERNMENT REGULATION OF THE REPUBLIC OF INDONESIA NUMBER 34 YEAR 2009 - UN Sustainable Development Group	**LAWS OF THE REPUBLIC INDONESIANUMBER 24 YEAR 2007 LAW ON DISASTER MANAGEMENT** Chapter 4 Disaster management aims to: a. provide protection to the public from threat of disaster; b. aligning existing laws and regulations there is; c. ensure the implementation of disaster managementin a planned, integrated, coordinated, and comprehensive manner; d. respect local culture; e. build public and private participation and partnerships; f. encourage the spirit of gotong royong, solidarity, and generosity; and g. create peace in social life, nation and state.	**GOVERNMENT REGULATION OF THE REPUBLIC OF INDONESIA NUMBER 34 YEAR 2009 ABOUT GUIDELINES FOR MANAGEMENT OF URBAN AREAS** Chapter 23 (1) Rural areas can be planned to become New Urban Areas. (2) New Urban Area Planning is prioritized for: a. provide residential space; b. provide new space for the needs of industry, trade, and services; c. provide space for government services; and /or d. provide space for the development of national,provincial and district strategic activity centers.	***SOUTH KALIMANTAN PROVINCE REGULATIONS NUMBER 4 THE YEAR 2017 ABOUT BANUA CULTURE AND LOCAL WISDOM*** Chapter 1 -Banua culture is the whole result of ideas, behaviors, works, thoughts and adaptations of the Banua people to the times and environment in the Region which is formed to achieve safety and happiness with elements of local wisdom that function as guidelines for the life of society, nation and state. - Cultural Management is an effort to preserve a culture that carried out through the development of cultural values, wealth management culture, cultural diversity management, and cooperation development cultural wealth for the purpose of advancing the nation's civilization and public welfare	**UN Sustainable Development Group** Shared principles for resilience-building 1) Leave no one behind and focus on the most vulnerable and at-risk populations. 2) Ensure equality, nondiscrim-ination and a humanrights-ba sed approach. 3) Be accountable for pursing inclusive partnerships. 4) Do No Harm. 5) Engage and commit over the long term in a flexible, yet strategic approach. 6) Pursue context-specific and tailor-made approaches 7) Act early to prevent. 8) Build on local and national capacities for ownership and leadership.
USER - Banjarmasin Civilian - Banjarmasin Governmen - Visitor	Safe Place As a place that makes users who are feeling safe and comfortable in that place	Supporting Place As a place that can support future user needs In rising Sea levels	New Historical Place as a place for the development of new history developed by the community	Restorative Place The Place is expected to be able to provide a restoration to the society in banjarmasin
CLIENT -The Government of South Kalimantan Province : DINAS PEKERJAAN UMUM DAN PENAT-AAN RUANG (PUPR)	provide a place that can ensure the safety of the city community against rising sea levels in Banjarmasin	Space Arrangement as well as infrastructure to help communities to adapt to rising sea levels and integrate social activities	architecture can represent the future and reflect the history and culture of Banjarmasin	To help the city to bounce back from negative experie-nces and disturbances
- DESIGNER	create a new building typology that can help respond to disasters that will occur in the next few years	Creating a new system that responds to a water hight condition	Creats a new history that can reflecting on old history	Creating A Resilience Floating City In banjarmasin

1.3 Design Method



The first description of the design is a technique or step that is completed in a design process, and this approach aids the design in creating the design idea. The designer conducted an initial overview of the design technique when creating a design. The technique step begins with identifying the border of the original planned location.

Design Problems: Analyze problems or issues both on the micro and macro scales, as well as the possibility of physical functions of the structure and site existing. The issue formulation includes both architectural and non-architectural elements.

Data Collecting: Data collection, both primary and secondary, can aid in the resolution of problems and concerns. Primary data were gathered via observations of the existing region, which included land usage, existing building and site characteristics, and so forth. While secondary data is made up of The first description of the design is a technique or step that is completed in a design process, and this approach aids the design in creating the design idea.

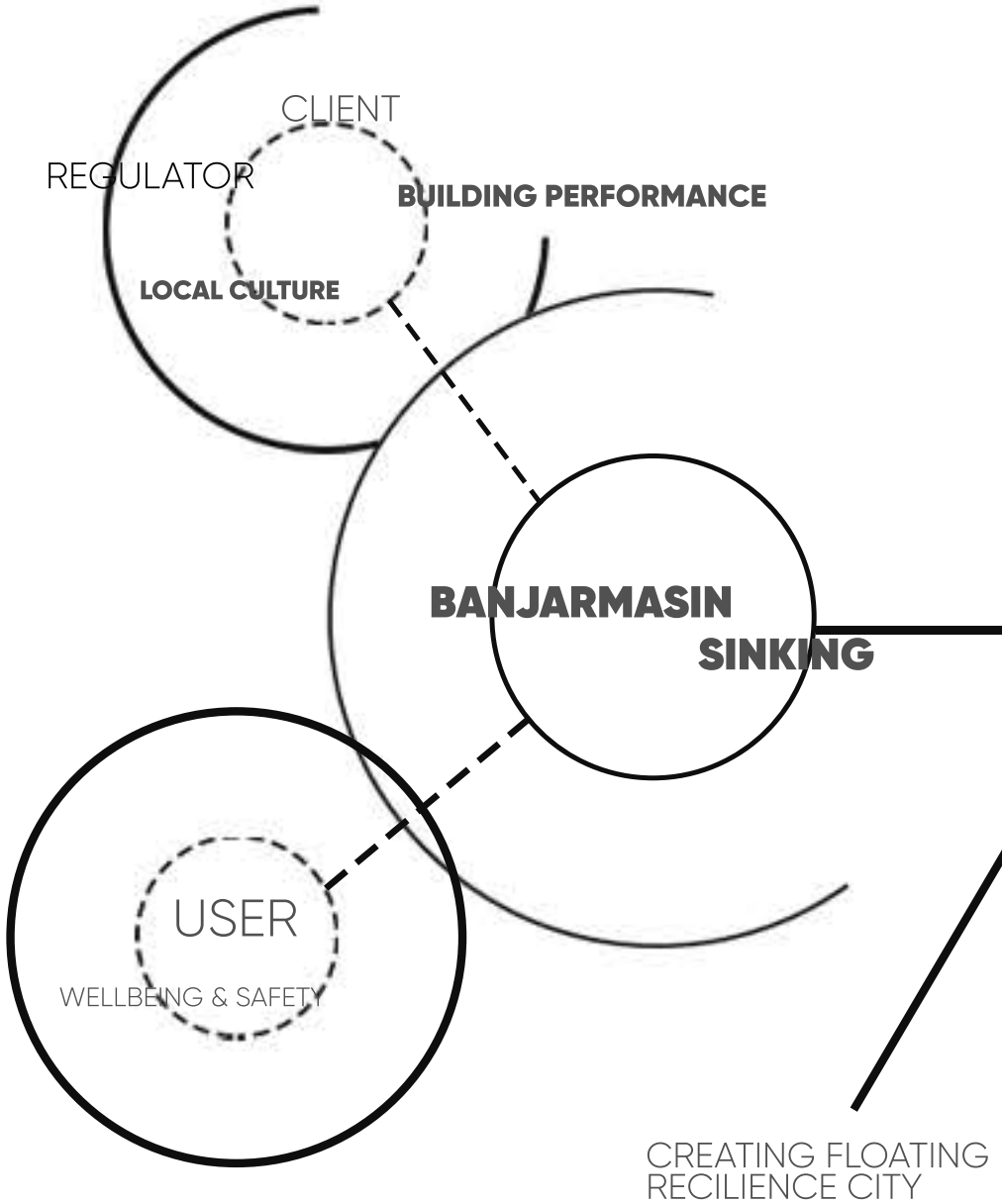
Variable Determination: Determination of the selected variables based on the design theme, namely Aquatecture. This theme was chosen as guidelines in designing and formulating problems.

Preliminary Design: The preliminary design is a development of the data analysis outcomes. The author establishes the original design concept in drawings of design concepts, which are subsequently turned into quantifiable digital representations utilizing 3d mode; in this initial design.

Design Testing: Design testing is done once the design has been finalized. This design test is useful for determining the design's compatibility using preset benchmarks or variables. Also, the website. The issue formulation includes both architectural and non-architectural elements.

Design Development: The tested original design will be examined to see whether it can be developed into a design that is complete and adheres to applicable drawing standards.

1.4 Design Hyphothesis Study



RADICAL IMAGE

RESILIENCE ARCHITECTURE

The resolution of the rising sea levels can be done by using using buildings that can adapt to environmental changes, in this case is rising sea levels

Durability and Longterm viability of the project

Optimize the use of on-site renewable energy

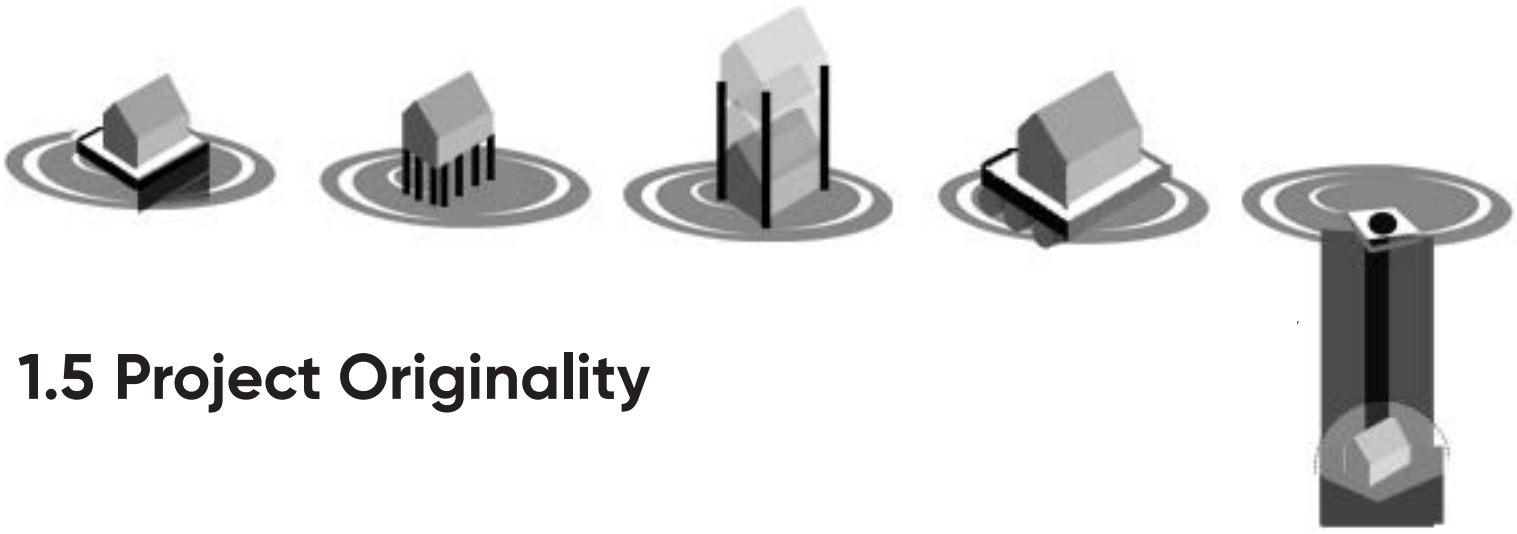
Adapt to environmental changes



Create social structures that reinforce the fabric of the community

Provision for basic human needs

reduce dependence on distantly obtained transportation fuels



1.5 Project Originality

Perancangan pasar terapung pada kawasan siring sungai martapura kota Banjarmasin dengan pendekatan Ecological water culture

Approach : Ecology Water Culture
Author : Fadel Wirawan Gunaldi
Publication : 2019
Concept : Contextual, floating architecture
Similarity : Approach, Context
Differential : Location,Typology

Perancangan Kampung dengan Pendekatan Arsitektur Apung sebagai Solusi terhadap Kenaikan Permukaan Air Laut.
Studi kasus : Kampung Baru Balikpapan Barat

Approach : Floating Architecture
Author : Hermawan Juliansyah
Publication : 2020
Concept : Contextual, floating architecture
Similarity : Approach, Problem
Differential : Location,Typology

Hunian Terapung sebagai Solusi Kenaikan Muka Air Laut di Jakarta

Approach : Floating Architecture
Author : Nastiti, Adelia Hanindya
Publication : 2017
Concept : Contextual, floating architecture
Similarity : Approach, Problem
Differential : Location

DESIGN LIMITATION

1). Provide design options for future building concept models that are able to overcome or adapt to problems with the impact of rising sea / river water (universal / global disasters);

2. Able to maintain the existence of the area remains a historical area of the city of Banjarmasin;

3. Presenting the concept of continuously building service trading activities

CHAPTER 2 PROBLEM AND STUDIES

2.1 Location Site and Context Analysis
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2.1 LOCATION SITE & CONTEXT ANALYSIS

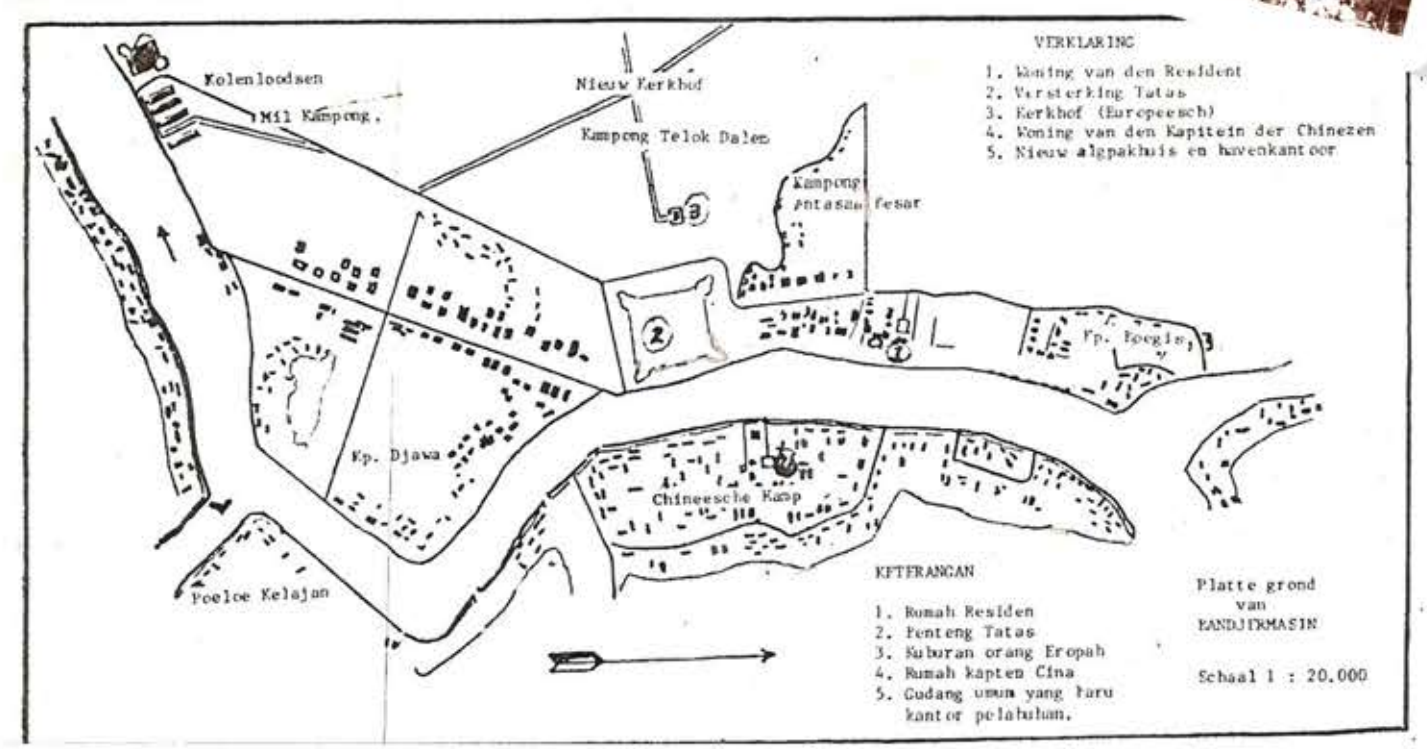
Sudimampir Area



Sudimampir is an old story from the past about Banjarese economic development. A type of market that formed the forerunner of Banjarmasin's economic development and expansion. According to some locals, it is the oldest modern market in South Kallmantan dating back to the Dutch period.

In the wake of economic expansion more space in the city centre of Banjarmasin was dedicated to commercial activities. In the late nineteenth century the Dutch colonial government built several trading posts, such as Pasar Sudimampir and Pasar Lama. Pasar Lama, which is in Kampong Bugis, atracted Chinese and Arab entrepreneurs who set up their businesses there.











SOCIO-ECONOMIC-CULTURAL OF THE PEOPLE IN THE SUDIMAMPIR AREA

The **economy** in the area is a trade center and that area was the first trading center in Banjarmasin, but now the area is stagnant and tends to decline due to inadequate infrastructure and every tide especially when it rains most of it is flooded.

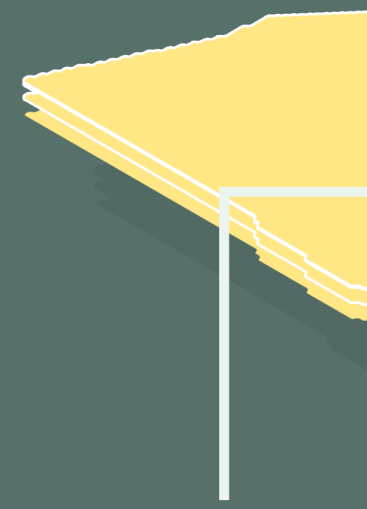
From **socio-cultural**; in this area has multy ethnic inhabitants (Chinese, Arabic, Malay / Banjar and Javanese / Madurese). Here is also adjacent to places of worship of several religions.

The **problems** that occur in this area are even more abandoned by residents (many buildings are no longer working) as a result, many homeless people occupy the buildings.

and now due to the elevation of the road and the lack of infrastructure for the drainage of the buildings around the flood-affected because of the rain and the overflow of the river

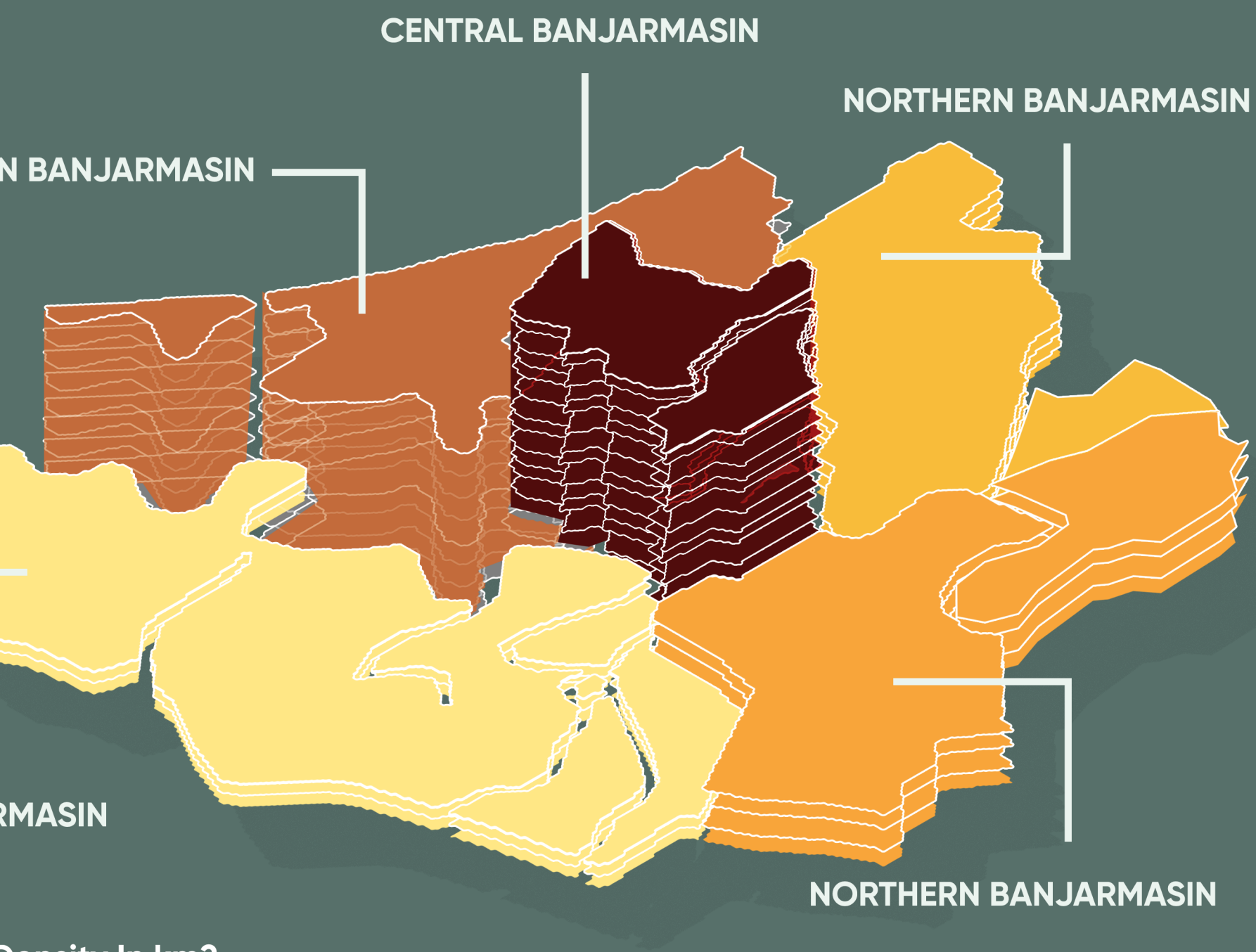
POPULATION DENSITY OF BANJARMASIN

BY DISTRICT

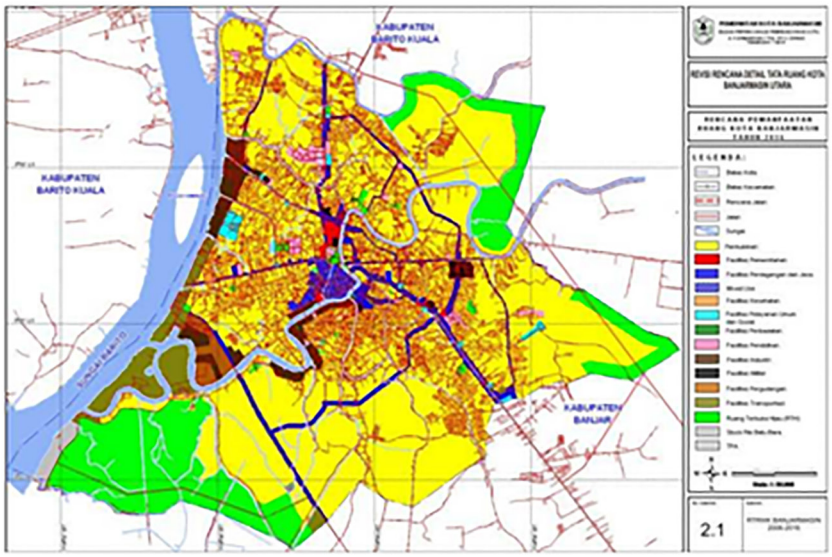


People D

4284 k


CENTRAL BANJARMASIN
NORTHERN BANJARMASIN
N BANJARMASIN
RMASIN
NORTHERN BANJARMASIN
Density In km2
m 2
4285
6400 km 2
6401
7290 km 2
7291
10646 km 2
10647
13953 km 2

LAND USE





1. :- Bank Indonesia
   - Bank BNI
   - Bank Syariah
   - Bank BRI
   - Bank Danamon
   - Bank Kalsel
2. - Siring Menara Pandang
   - Taman Kamboja
3. :- Tempat parkir umum
4. - Kantor Pajak
   :- Kantor Walikota
5. : -PolSub Sudimampir
   -Pos polisi
6. - Masjid Raya Sabilal
   - Masjid Noor
   - Masjid Jami Al-Misbah
   - Katedral Keluarga Kudus
7. :- Apotik Arjuna
   - Apotek Arif
   - Apotik Global Farma
8. - Kayuh Baimbai Okey
   - Mie Ayam Solo Mahkota
   - Ramayana Plaza Mitra
   - KFC
   - Dutamall Banjarmasin
9. - Jago Print
   - Yaris Samudera Foto Copy
10. - Lapangan Tenis
11. :- Posko Pemadam Kebakaran Repela
12. :- Kantor Pos Banjarmasin
13. : - Halte Malabar
14. - Pasar Ujung Murung
    -Pasar Terapung
15. - Ulin General Hospital
16. - Perpustakaan RTH Kamboja
    - Badan Perpustakaan Dan Arsip Daerah

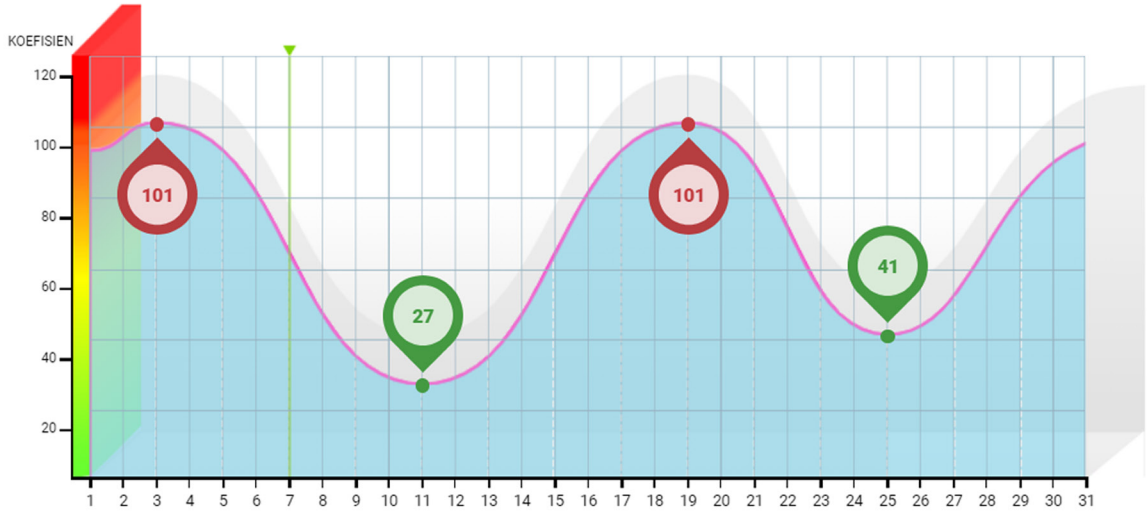
MARTAPURA RIVER TIDE



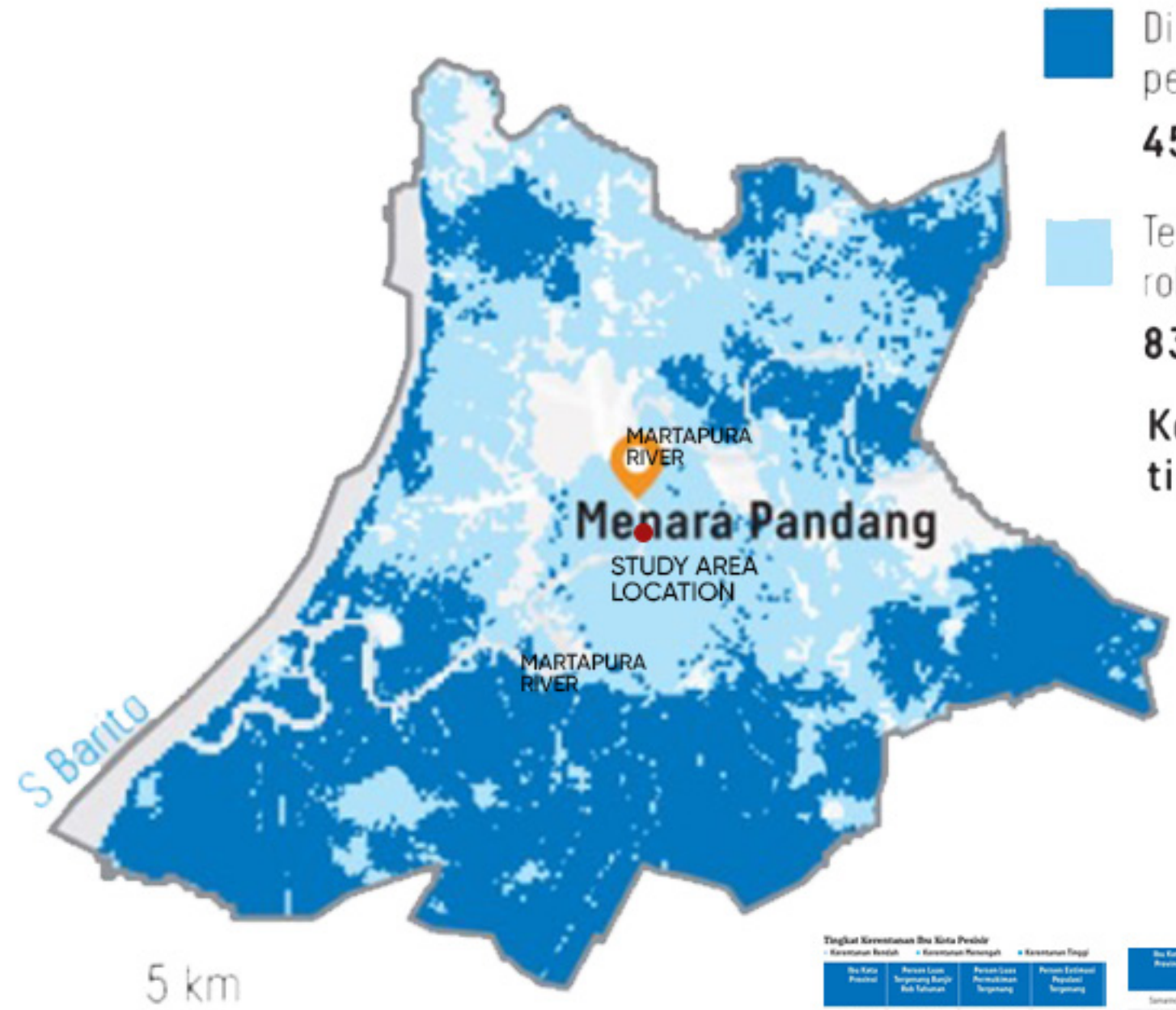
PASANG LAUT
- Pasang naik
- Pasang surut

KETINGGIAN
- Pasang naik tinggi
- Pasang surut tinggi
- Tinggi maks
- Tinggi min

KOEFISIEN
- Koefisien pasang surut



KOEFISIEN
- sangat tinggi
- tinggi
- rata-rata
- rendah



Banjarmasin

Tingkat Kerentanan Ibu Kota Pesisir

- Kerentanan Rendah
- Kerentanan Menengah
- Kerentanan Tinggi

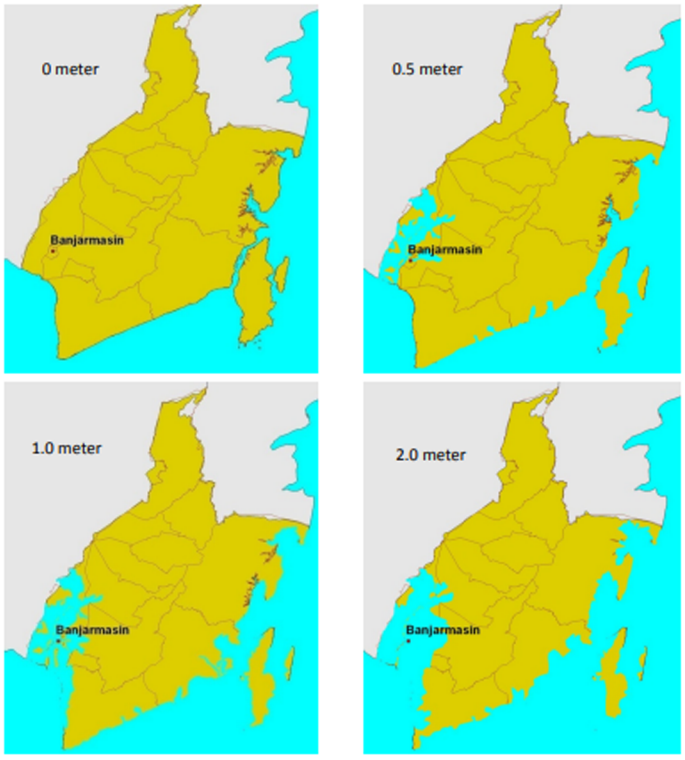
Ibu Kota Provinsi	Persen Luas Tergenang Banjir Rob Tahunan	Persen Luas Permukiman Tergenang	Persen Estimasi Populasi Tergenang
Samarinda	3,6%	3,6%	2,8%
Kendari	3,8%	3,5%	10,2%
Manado	3,4%	6,7%	7,4%
Serang	7,8%	1,7%	2,5%
Banda Aceh	17,9%	11,8%	11,0%
Pangkal Pinang	27,7%	10,9%	15,2%
Makassar	9,9%	11,6%	14,7%
Medan	17,7%	3,0%	3,9%
Tanjung Selor	10,2%	20,5%	25,9%
Semarang	14,6%	18,3%	18,1%
Mataram	33,6%	26,2%	29,3%
Surabaya	24,7%	30,4%	30,8%
Denpasar	37,3%	25,1%	30,7%
Ambon	5,8%	33,1%	38,4%
Pontianak	17,9%	32,9%	29,5%
DKI Jakarta	44,8%	37,7%	46,3%
Padang	13,7%	36,1%	36,2%
Palembang	62,8%	30,2%	34,2%
Gorontalo	23,0%	46,9%	51,0%
Tanjung Pinang	44,7%	48,9%	47,0%
Banjarmasin	85,5%	86,6%	83,6%





FLOOD MAP REPRESENTATION

Sea Level Rise Impact Data



Inundation zone in South Kalimantan Province for different SLR scenarios

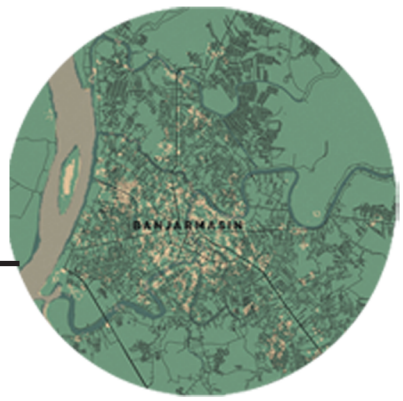
Sea Level Rise Yearly Prediction



2030



2050

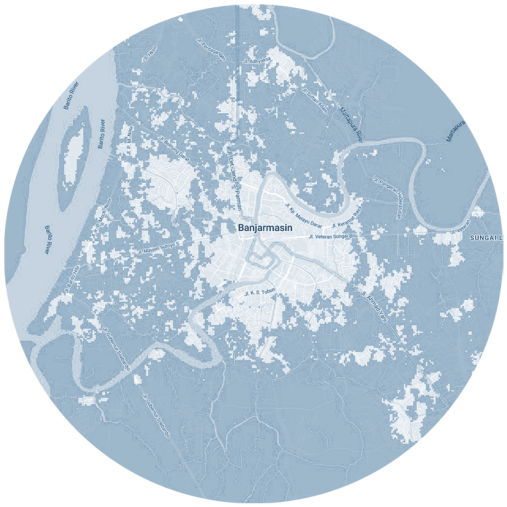


2100

Flood Risk Map
(Rissing Sea Levels Over The Years)



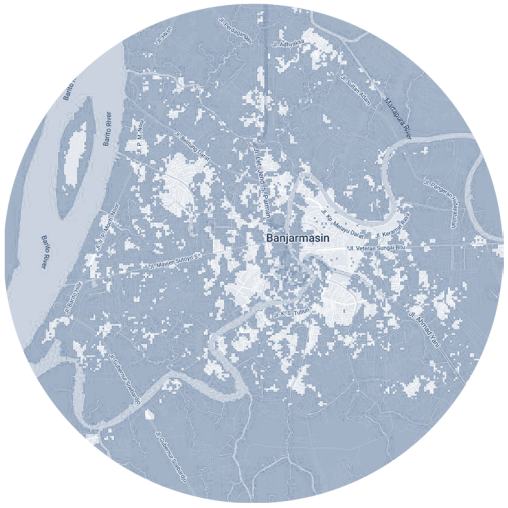
2025
+0,5 M



2030
+1,5 M



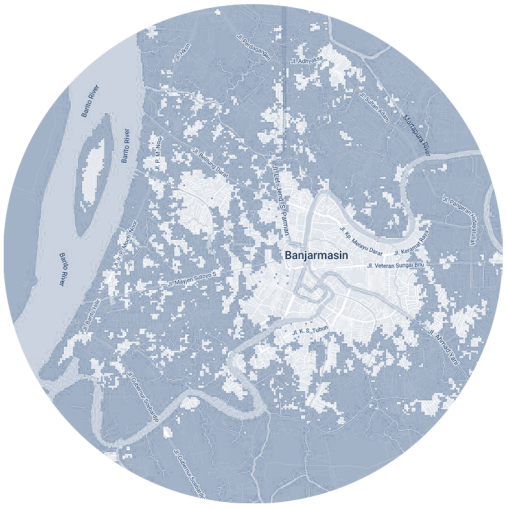
2040
+1,9 M



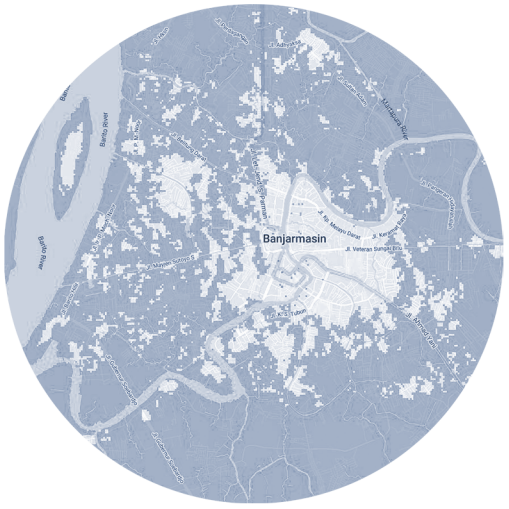
2080
+2,3 M



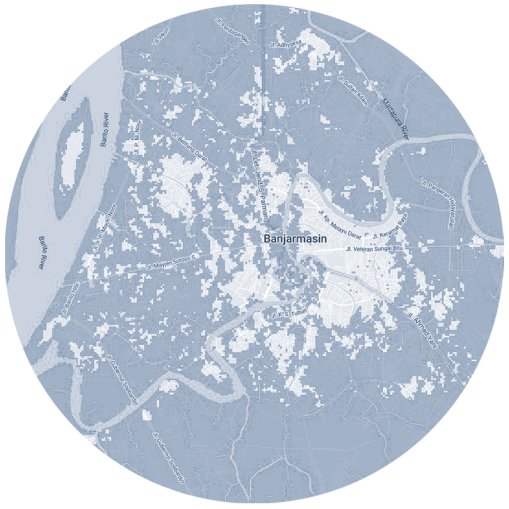
20
+2



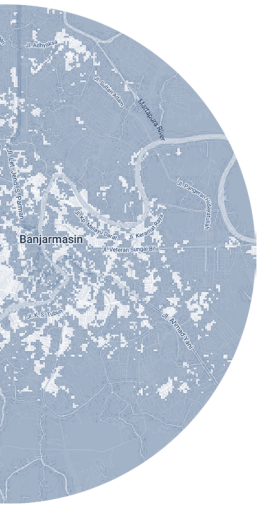
2050
+2,0 M



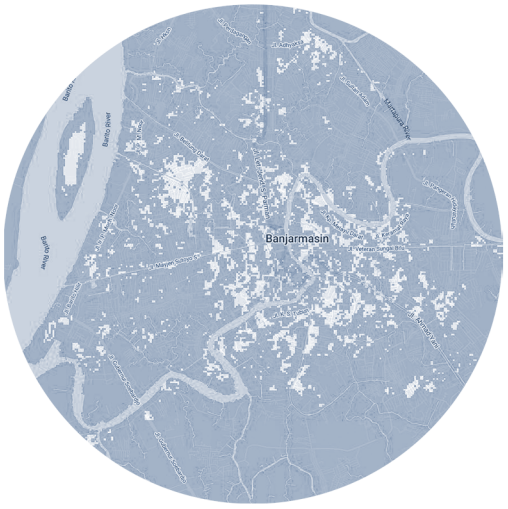
2060
+2,1 M



2070
+2,2 M



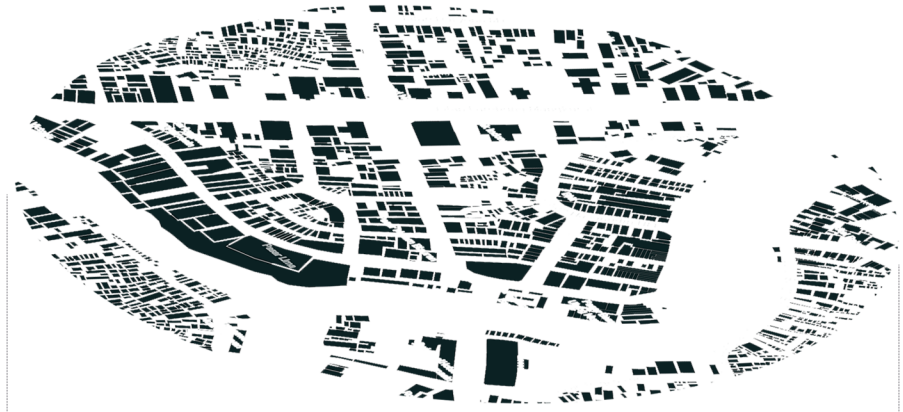
090
2,4 M



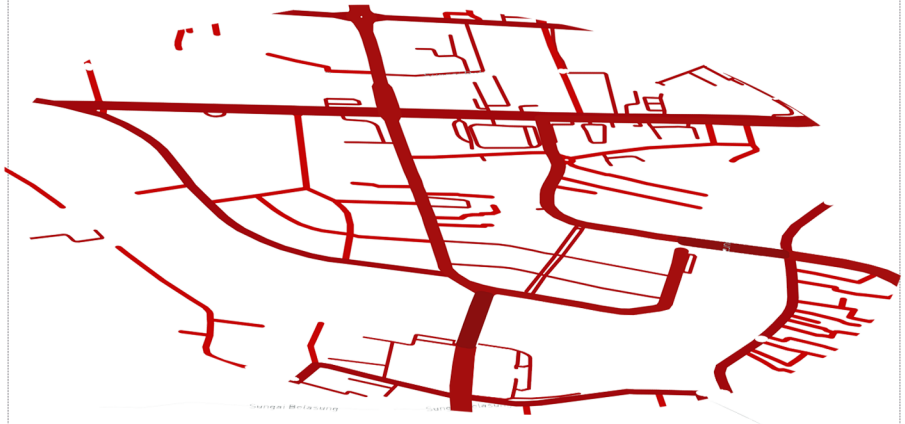
2100
+2,5 M

AREA ANALYSIS

BUILDING PATERN

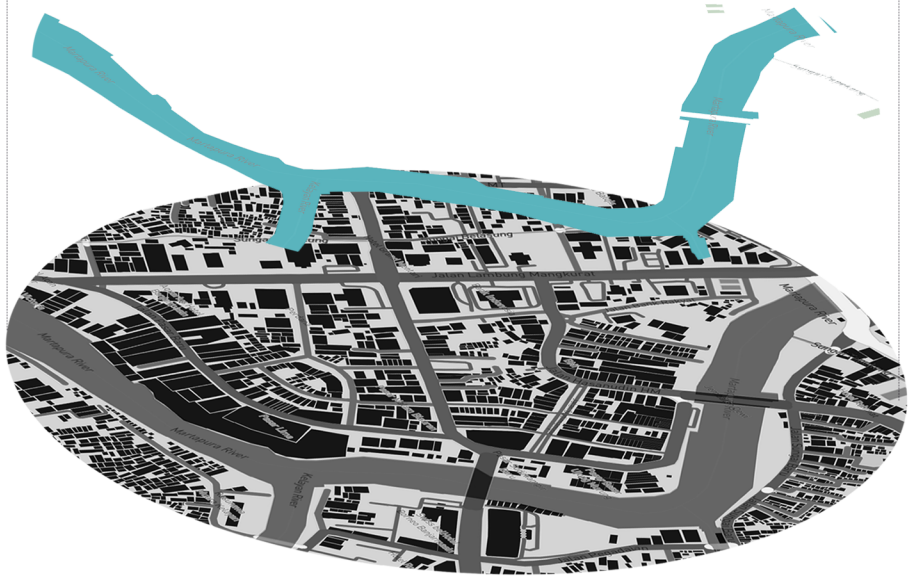


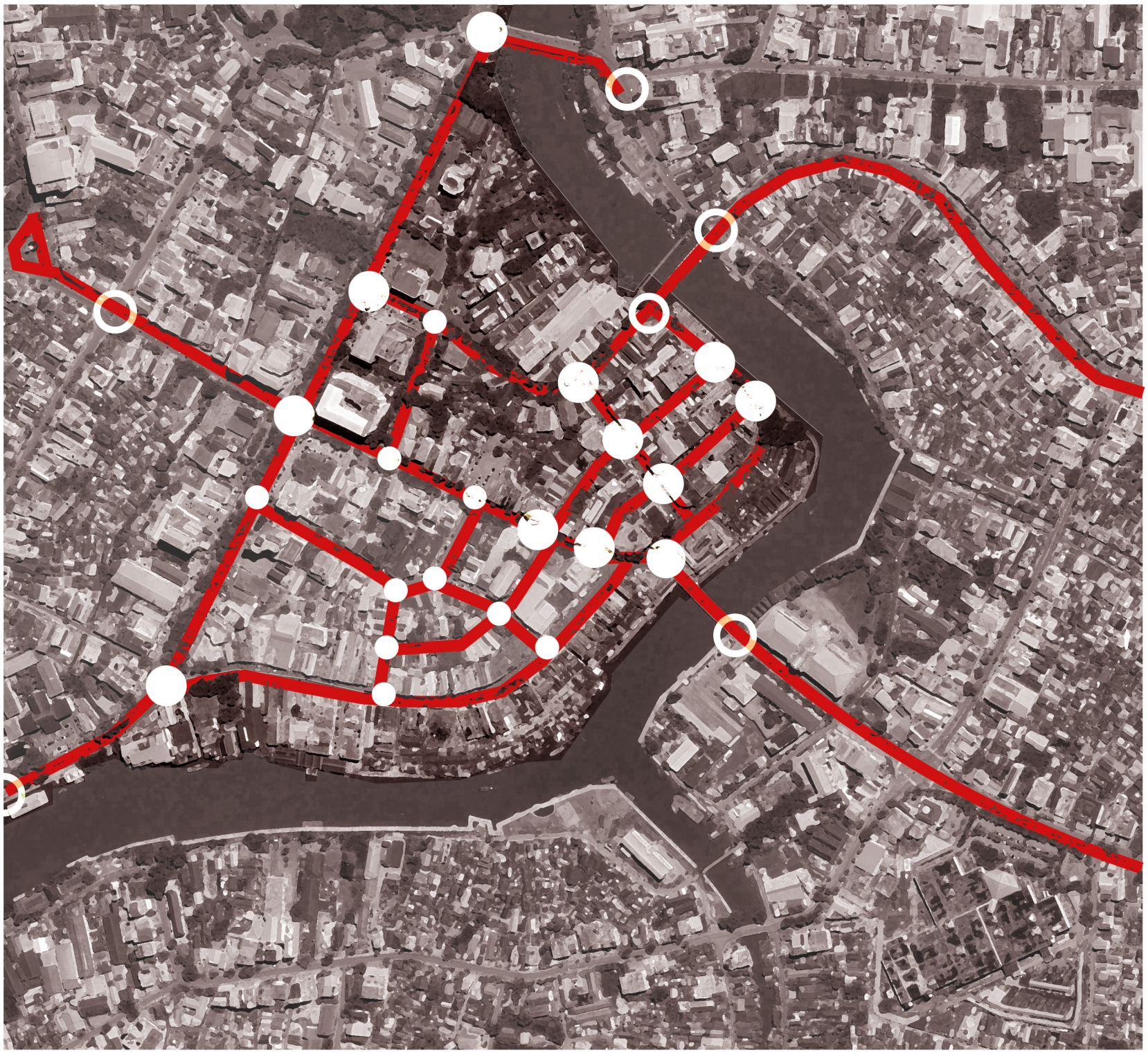
ROAD CONECTION



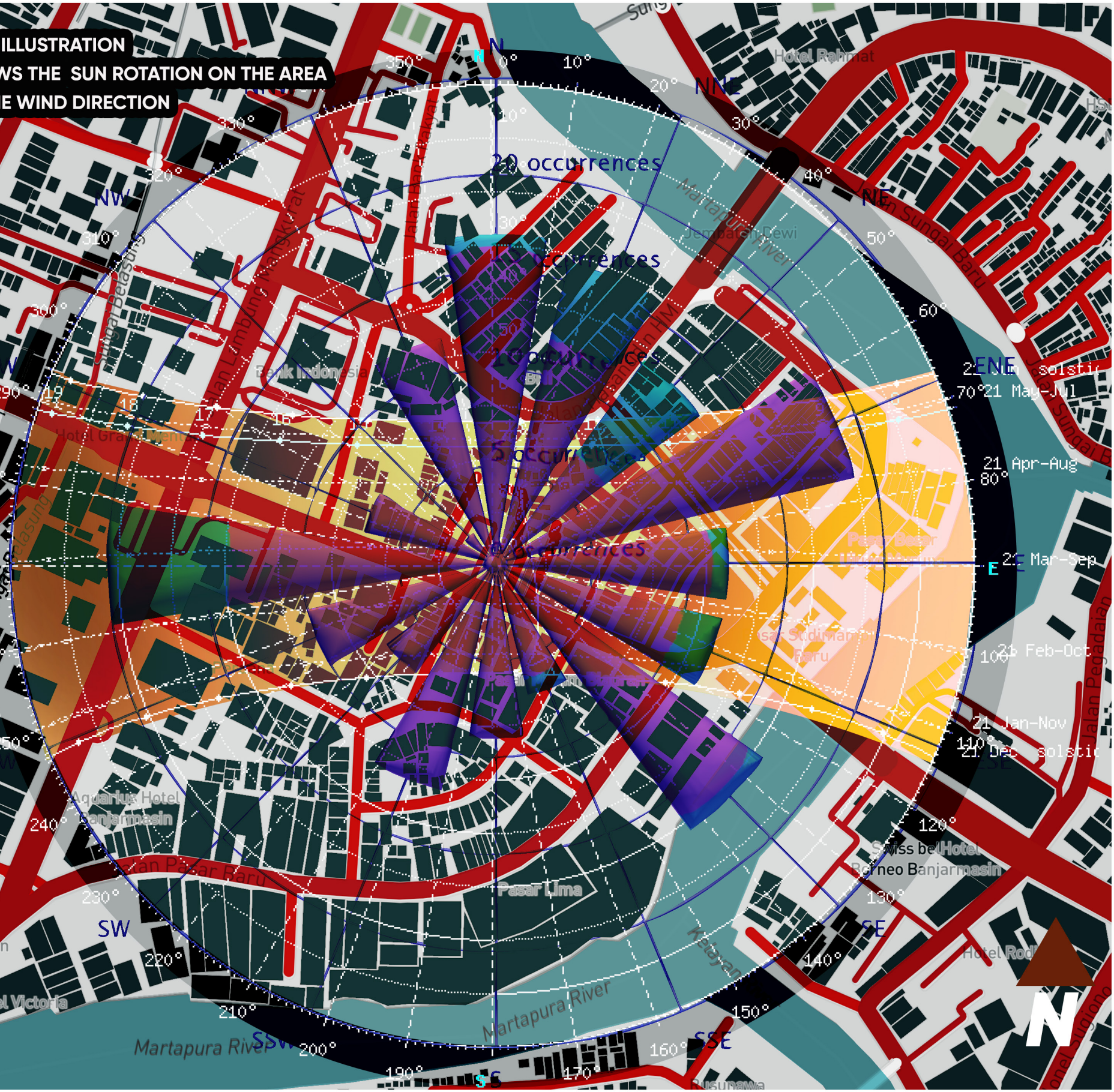
RIVER CONECTION

FOCUS AREA

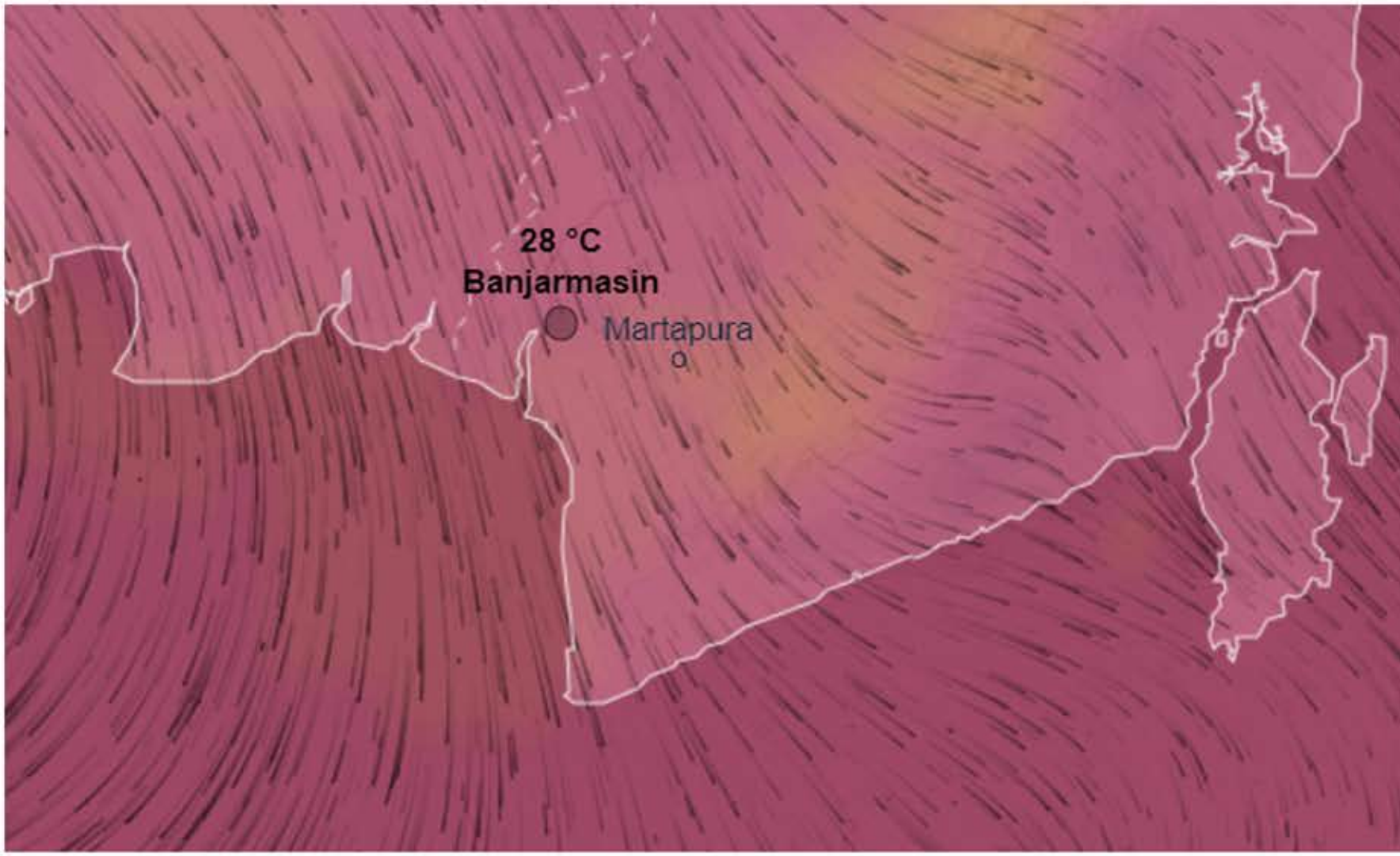



LEGEND
MAIN AREA ENTRANCE
CONNECTION
BUILDING
WATER


BANJARMASIN
Sungai Barito
BANJARMASIN
AREA LOCATION
MARTAPURA
FOCUS AREA
DESIGN AREA
Sungai Martapura
The location chosen is in the Sudimampir area because there is the origin of the development of civilization in the city of Banjarmasin, namely the center of Water, trade, politics, and religion. where the surrounding area was once the residence of the Dutch and until now has turned into a trading center that is well known by the residents of Banjarmasin.
IN THIS
IT SHOW
AND TH
Jalan Haryono M.T.
Banjar


ILLUSTRATION
WS THE SUN ROTATION ON THE AREA
E WIND DIRECTION
20 occurrences
5 occurrences
21 Apr-Aug
21 Mar-Sep
21 Feb-Oct
21 Jan-Nov
Martapura River
Pasar Lima
Aquarius Hotel Banjarmasin
Swiss-Belhotel Borneo Banjarmasin
Bank Indonesia
Hotel Rahmat
N
NNE
NE
ENE
E
SE
SSE
S
SSW
SW
WSW
NW
NNW

Climate Data Of Banjarmasin



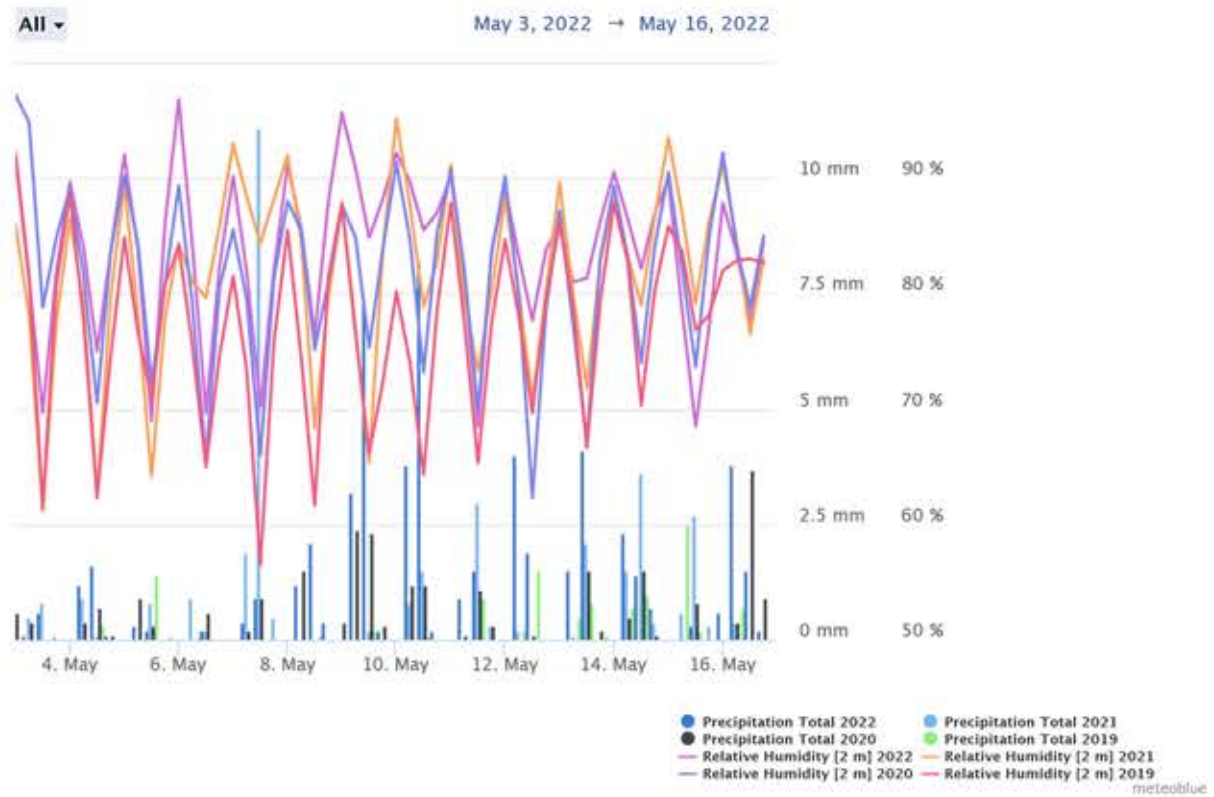
In Banjarmasin, Over the course of the year, the temperature typically varies from 23°C to 33°C and is rarely below 22°C or above 35°C.

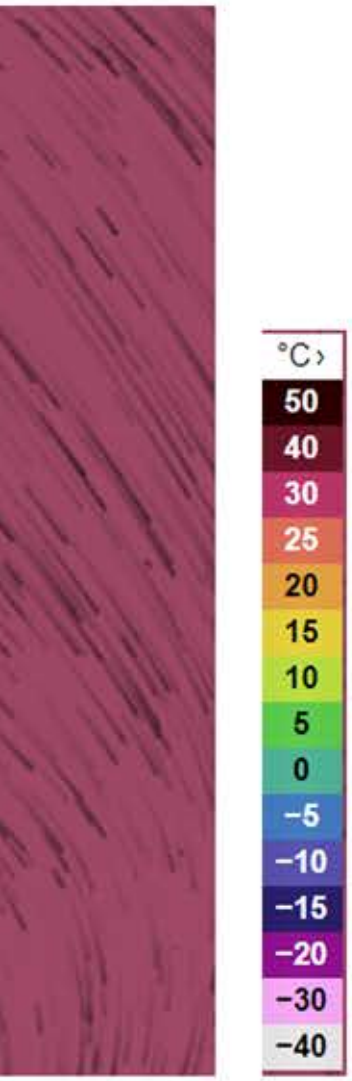
Based on the beach/pool score, the best time of year to visit Banjarmasin for hot-weather activities is from mid June to early October.

The hot season lasts for 2.0 months, from August 25 to Oc an average daily high temperature above 32°C. The hottest m in Banjarmasin is May, with an average high of 32°C and lo

The cool season lasts for 3.3 months, from December 1 to M average daily high temperature below 31°C. The coldest mon Banjarmasin is December, with an average low of 24°C and

PRECIPITATION AND RELATIVE HUMIDITY

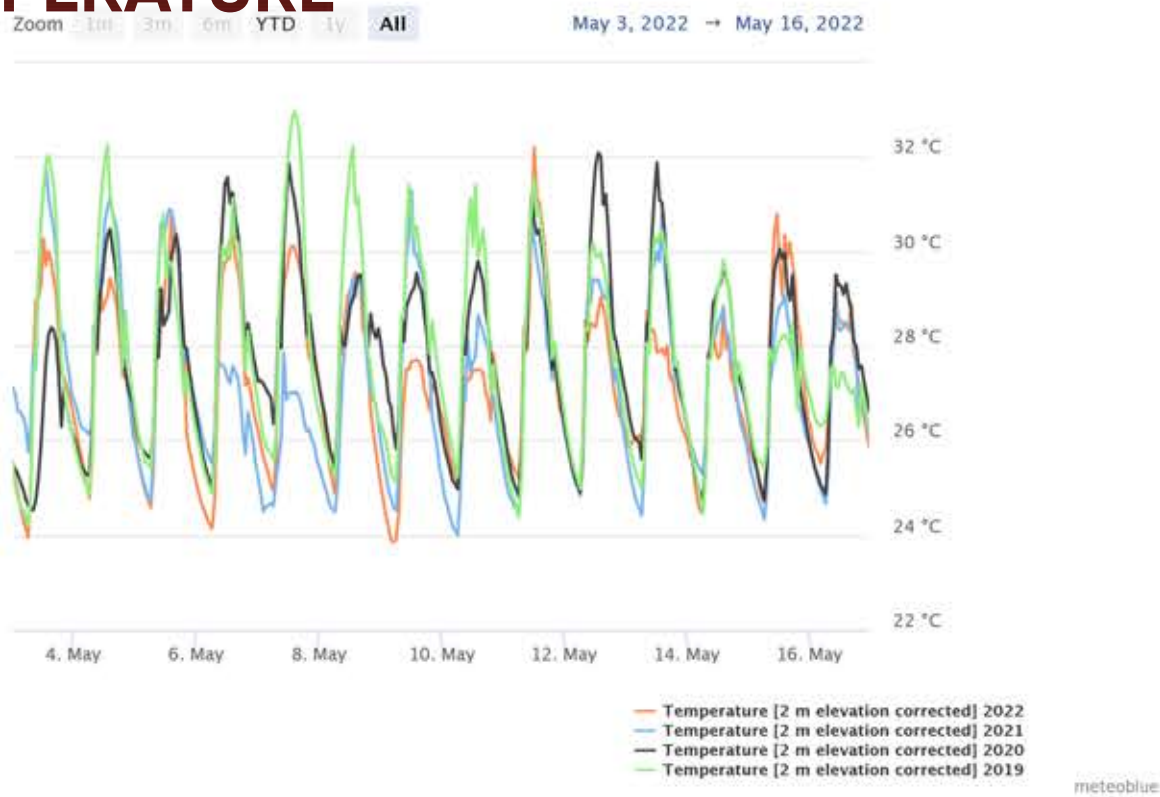




CTOBER **24,** WITH
ONTH OF THE YEAR
W OF **25°C.**

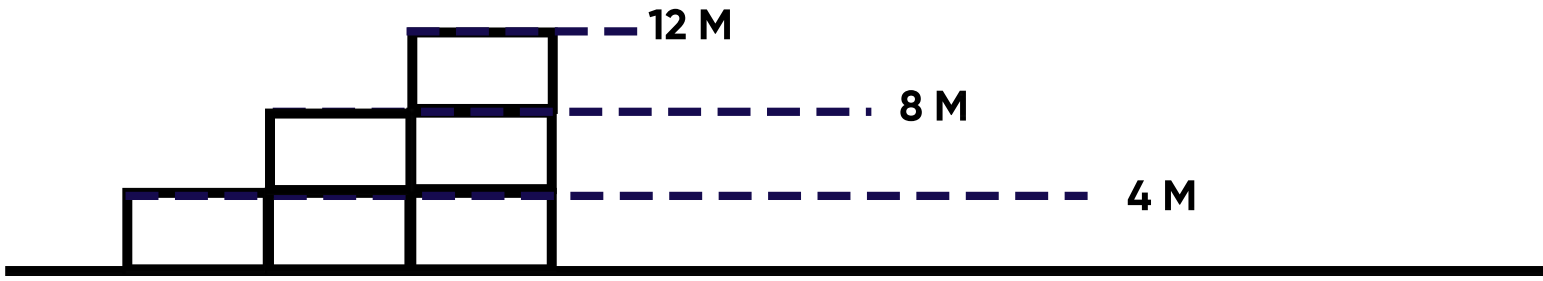
MARCH **10,** WITH AN
TH OF THE YEAR IN
HIGH OF **30°C.**

TEMPERATURE



Architectural Quality of Sudimampir Area





LIVING SPACE /INVENTORY

LIVING SPACE /INVENTORY

MARKET

The average building in Sudimampir has a building of 2-3 floors, and is a trading facility that also functions as a residential area as well as a warehouse.

The condition of buildings in this area is increasingly being abandoned by residents (many buildings are no longer functioning) as a result, many homeless people occupy the building.

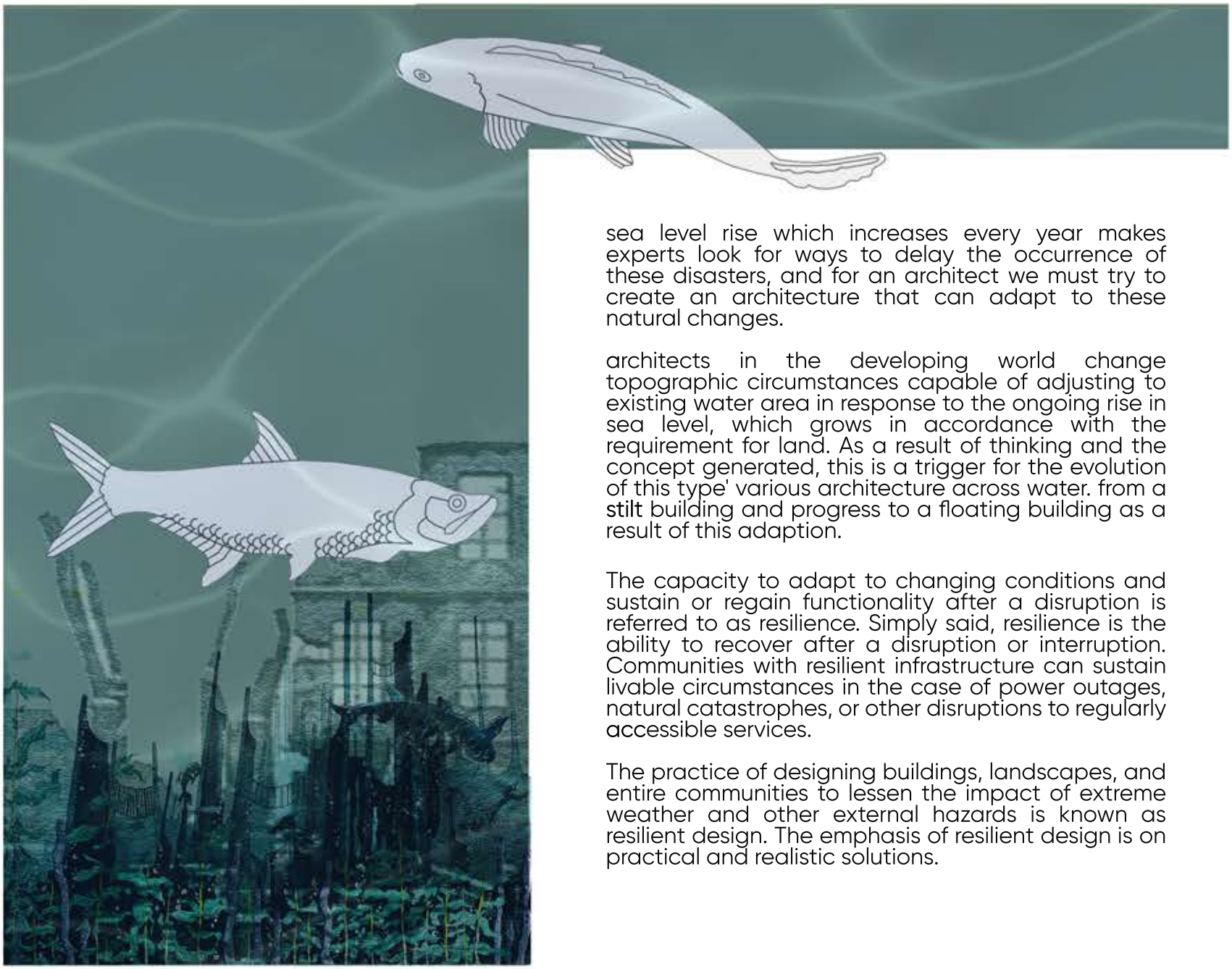
and now due to the elevation of the road and the lack of drainage infrastructure the surrounding buildings have been flooded due to rain and overflowing rivers so that the structure of the building is no longer adequate.

2.2 Handling Sea Level Rise in Architecture



The author tries to find, explore, examine what is architects have done in solving this problem. So that a theoretical study and similar design precedents are needed to provide a broader picture for the author. In addition, the study of precedents provides evidence success of a similar design to the problem studied by the authors

Design review parameters are necessary in order to measure the benefits and weaknesses of a design on a variable. In contrast to the root of the problem, this previous evaluation has value as a remedy to natural catastrophe concerns. The authors discovered the Resilience Architecture technique in this scenario.



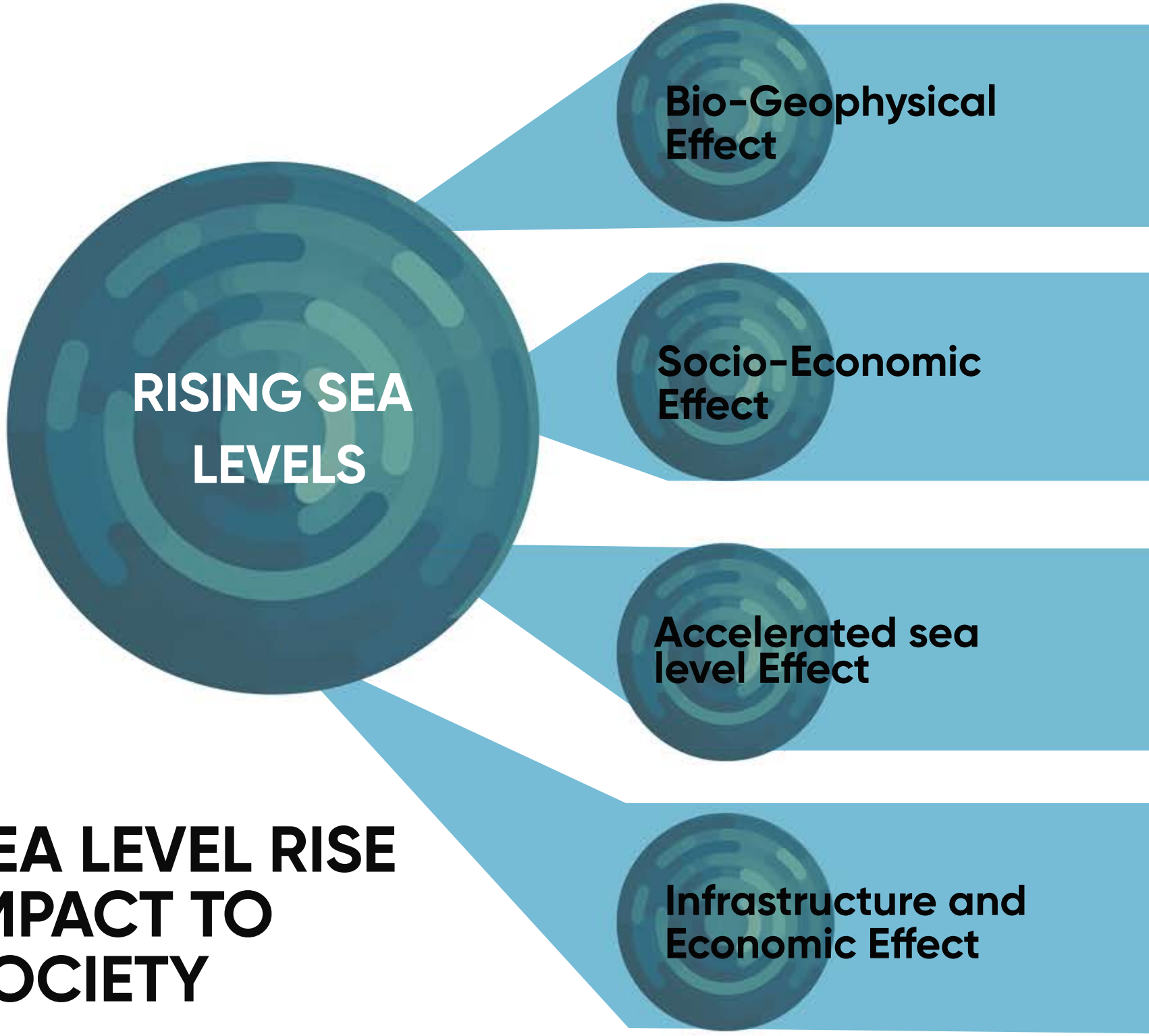
sea level rise which increases every year makes experts look for ways to delay the occurrence of these disasters, and for an architect we must try to create an architecture that can adapt to these natural changes.

architects in the developing world change topographic circumstances capable of adjusting to existing water area in response to the ongoing rise in sea level, which grows in accordance with the requirement for land. As a result of thinking and the concept generated, this is a trigger for the evolution of this type' various architecture across water. from a stilt building and progress to a floating building as a result of this adaption.

The capacity to adapt to changing conditions and sustain or regain functionality after a disruption is referred to as resilience. Simply said, resilience is the ability to recover after a disruption or interruption. Communities with resilient infrastructure can sustain livable circumstances in the case of power outages, natural catastrophes, or other disruptions to regularly accessible services.

The practice of designing buildings, landscapes, and entire communities to lessen the impact of extreme weather and other external hazards is known as resilient design. The emphasis of resilient design is on practical and realistic solutions.

SEA LEVEL RISE IMPACT TO SOCIETY



DISPLACEMENT OF COASTAL LOWLAND AND WETLAND

INCREASED COASTAL EROSION

INCREASED FLOODING

SALINATION OF SURFACE AND GROUNDWATERS

LOST OF PROPERTY AND LAND

INCREASED FLOOD RISK/LOSS OF LIFE

DAMAGE TO COASTAL PROTECTION WORKS AND OTHER INFRASTRUCTURE

LOSS OF RENEWABLE AND SUBSISTENCE OF RESOURCES

LOSS OF TOURISM ,RECREATION, AND COASTAL HABITATS

IMPACT ON AGRICULTURE AND AQUACULTURE

IMPACT ON LIVELIHOODS

DECLINE IN HEALTH OR LIVING STANDARDS

THREAT TO HOUSING QUALITY

DIVERSION OF RESOURCES

INCREASING PROTECTION COST

INCREASING INSURANCE PREMIUMS

POLITICAL AND INSTITUTIONAL INSTABILITY

THREATS TO PARTICULAR CULTURE

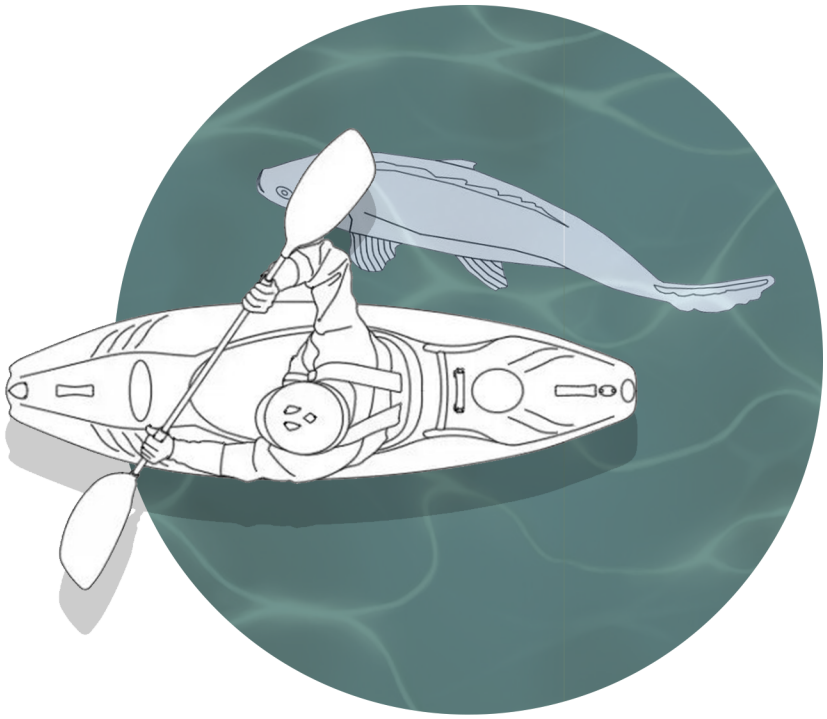
2.3 Resilience Architecture Design Principle

Designing a building with resiliency entails beginning the design process by carefully considering the building's typical use scenarios, common points of stress due to normal use, and the most likely disaster situations in the environment that could threaten the building's integrity and/or endanger its occupants. Because the local environment is always a significant aspect in deciding whether a building is resilient or not, resilient architecture is always regionally unique. *(Resilient Design: Is Resilience the New Sustainability? ,2013)*

Resilient Design Principle

- Transcendence of scales
- Provision for basic human needs
- Diverse and redundant systems

- Simple, passive, and flexible systems
- Durability
- Local, renewable, or reclaimed resources
- Anticipation of interruptions and a dynamic future
- Lessons from nature
- Social equity and community
- Implementation in stages



Achieving Resilience at the Building Scale

- Design and build (or remodel) structures to withstand extreme storms, flooding, wildfires, and other consequences of climate change. Locate crucial systems that will endure flooding and bad weather.

- Model solutions should be based on future climate circumstances as much as feasible, rather than previous data.

- Create buildings that will remain habitable in the case of a prolonged loss of electricity or heating fuel by reducing energy loads and relying on passive heating and cooling solutions (passive survivability).

- Build long-lasting structures with rainscreen detailing, hurricane-resistant windows, and interior finish materials that can dry out and not need to be replaced if they become wet.

- Make atractive building that will be cherished and cared for.

- Optimize the use of on-site renewable energy

-Rely on traditional design methods that were used prior to the introduction of air conditioning and central heating. To optimize durable design, combine these design ideas with current materials.

Achieving Resilience at the Community Scale

- Create or assist in the creation of social structures that reinforce the fabric of the community. Community meeting spots, dog parks where people can get to know their neighbors, central mailbox sites, and community bulletin boards with ridesharing alerts and other postings might all be included.

- Design communities to reduce dependence on distantly obtained transportation fuels; allow for human-powered mobility choices to access important services.

- Provide food security by relying on local or regional food systems and long-term, low-energy food storage solutions.

- Create community facilities (resilience hubs) that can serve as gathering places during emergencies and interruptions in services, and outfit such facilities with access to key services, including water, electricity for charging cell phones, etc.

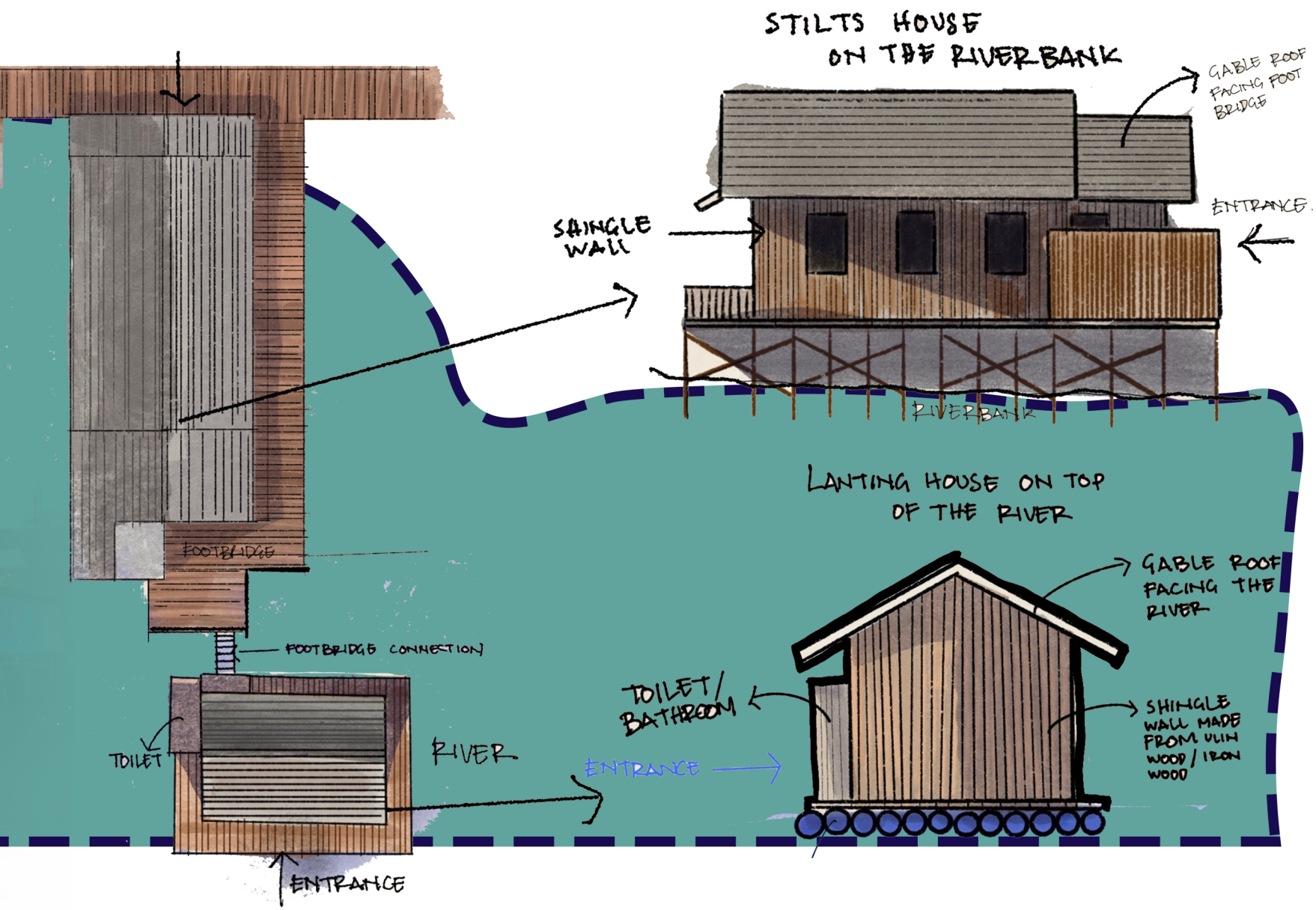
-

2.3 How Local Architecture Responding to Water

The river has had a significant impact on the development of Banjarmasin. The existence of this river presents difficulties for the residents of Banjar in adjusting to their surroundings. Adaptation to the environment causes the development of villages on the river banks, with buildings placed along the river and later spreading out to the land. Based on these events, the establishment of Banjarmasin began with the river environment and communities on the river banks.



The stilt house design is suitable for flood-prone areas and is considered adaptive to climate change.



Climate - Resilient and Inclusive City (CRIC) Program Opportunities and Recomendation

Climate change mitigation is a primary goal for the European Union (EU). The European Green Deal is a solution to these issues, with the goal of transforming the EU into a fair and prosperous society with a modern, resource-efficient, and competitive economy with zero net greenhouse gas emissions by 2050.

The EU and Indonesia are collaborating on the Climate Resilient and Inclusive Cities (CRIC) initiative to assist cities in creating a resilient and inclusive future there are ten Indonesian pilot cities under the CRIC project offers a comprehensive overview of city characteristics, policy gaps and climate-related policies in the cities of Pangkalpinang, Pekanbaru, Bandar Lampung, Cirebon, **Banjarmasin**,Samarinda, Mataram, Kupang, Gorontalo and Ternate.



Key Opportunities

Three significant opportunities exist to stimulate improvements in Banjarmasin's urban circumstances toward becoming a more climate-resilient and inclusive city: technology development and collaborations, the Climate Village Program, and the city's current spatial plan revision.

Technology and Partnerships

The government can enlist the help of private companies and international organizations to provide public services, such as river transportation and new mode of transportation

Climate Village Program

raise public understanding about the significance of climate change mitigation It is critical to ensure that the program is focused on empowering the community via training and socializing.

Revision Of the Spartial Plan

opportunity to redirect the development pattern from currently low-rise and sprawling to become a more compact city that is more dense and vertical in the city center (central business district) while safeguarding water catchment areas, flood plains, and rural areas from becoming concrete and hardscape.

Disaster Risk Reduction- Tackling Floods Systemically

The city will enact an ordinance requiring the construction of dwellings on stilts that replicate the structure of traditional houses in the region. The stilt home design is appropriate for flood-prone locations and is deemed climate-change adaptation.

Disaster Risk Reduction- Tackling Floods Systemically

Reduce GHG emissions in critical areas such as agriculture, forestry, and peatlands, energy and transportation, industry, waste management, and other supporting activities. It also requires a special policy governing low-emission/green transportation in order to decrease GHG emissions.



Involve the Community in City Planning and Developmen

Many of the attempts to execute the spatial plan would involve land acquisition, such as for public parks, water catchment areas, drainage channel expansion, and so on. Landowners may object to plans to purchase their property for public use if they do not receive any advantages from it.

However, this does not mean that the government should abandon its intention to buy and redevelop land in the public interest. One strategy to examine is "vertical land consolidation," which is a win-win proposition between the government and private landowners.

Strengthening Regional Plan

Strong environmental regulations are essential for achieving a climate resilient and inclusive city. Several policies are now judged unfit for climate change, and "polluter pays" principles should be tightened. Some areas that require strong policy are: energy and transportation, low-emission private automobiles (operational age) and waste management, and slum settlement rehabilitation with suitable facilities.

2.5 Basic Human Needs

While buildings provide fundamental human necessities such as shelter and protection, architecture has an influence on the emotional condition of anybody who interacts with it. A building, whether intentionally or unintentionally, can evoke feelings of belonging, wonder, terror, or optimism.

LOVE AND B

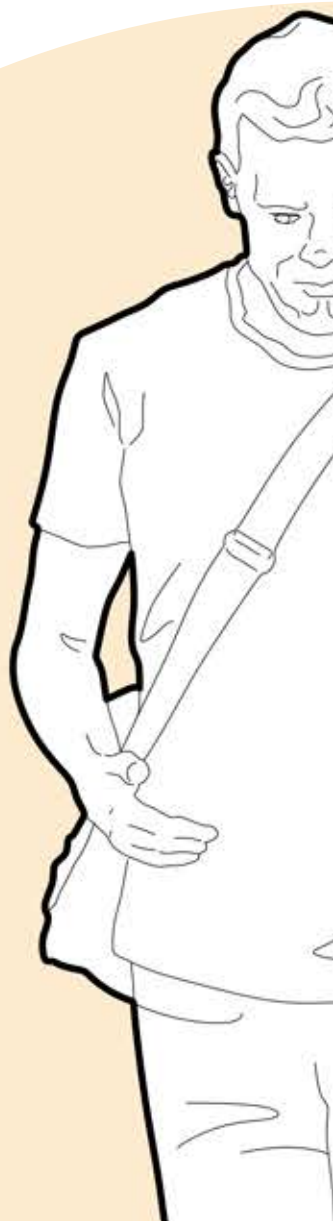
Social and involves fe

SAFETY NEEDS

self-worth, accomplishement and respect

PHYSIOLOGICAL NEEDS

biological requirements for human survival,
e.g. air, food, drink, shelter, clothing, warmth, sleep.



WHY IMPORTANT FOR RESILIENCE ?

to create a resilient architecture we must also study the theoretical basis of basic human needs as the basis for environmental development in the building

ELONGING

eelings of belongingness



ESTEEM

the needs for security and safety become salient

SELF ACTUALIZATION

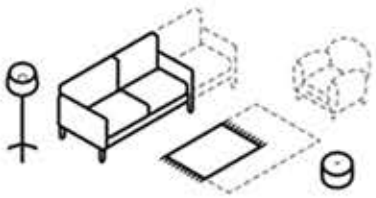
Self-fulfillment, seeking personal growth

2.6 Crowd Building Concept

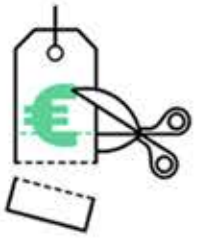
WHAT IS CROWD BUILDING ?

The crowdbuilding method incorporates future owners at an early stage of the real estate project, resulting in communities that have an emotional commitment to the structures in which they live. As a result, crowdbuilding encourages the acquisition of units by owners-occupiers rather than investors, implying that the building will be well maintained. It also facilitates the building of shared spaces through interactions with and between future owners, who may vote on the sort of place they like. It is an excellent technique to improve their relationships and ensure the building's best adaptability to new usage.

BENEFITS OF CROWD BUILDING



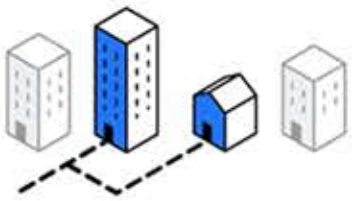
Tailored housing



Homeownership made easier



More owners-occupiers



First step of larger urban crowdsourcing

2.7 Modular Architecture

Modular architecture is based on the assembly of modules that are linked together to form a certain structure. Unlike traditional buildings, modular homes are constructed outside of their ultimate site.

This distinguishes them not just from traditional dwellings, but also from prefabricated houses, with which they share several features. The modules are constructed individually and transported to their final destination in the same manner. This provides for more control of the building process, keeping it out of the way of severe weather and other potential degradation, making the method safer and more convenient, as well as more exact and simpler to check and regulate.

This form of architecture has certain features that we have learned to appreciate:



Advantages of modular architecture

Transport: Because the modules are separate parts, moving them is straightforward, allowing building to begin in sites where conventional construction would be more complicated.

Replaceable elements: Because they are distinct modules, they are maintained independently and broken pieces are easily replaced. Similarly, repair does not include time-consuming labor or delays.

Personalization: Because this sort of building method allows for alterations and additions, customisation is possible even when the work is in advanced or final stages.

Fast construction: yet again, the fact that the modules are created

Modular Building Material Study

Although materials such as aluminum have been utilized in the building of modular homes, the most usually employed are steel, wood, and concrete due to their mechanical properties, which fit ideally to modular architecture.



Steel

Steel is a Recomended and popolar material in modular construction because of its adaptability, as well as its insulating and fireproofing capabilities, not to mention its longevity.

The benefits of prefabricated steel modules are as follows:

Steel is pliable and lightweight as a material, thus it may be utilized to create tailored buildings with daring designs that do not require pillars or intermediary walls. It is also simple to transport.

Steel : Steel is very flame-retardant, therefore in the case of a fire, the building will be unharmed.

Durability: owing to the treatment, the steel may be retained in the same state for many years without cracking or structural alterations, making maintenance simple.



WOOD

Wood is a traditional construction material for modular houses. It is very customizable, and while it does not allow for as unique or daring designs as concrete or steel, it does exhibit the typical appeal of a wooden house.

Wood has the benefit of being largely recyclable and having extremely high insulating capabilities as a construction material. Even with modern treatments, it is extremely fire resistant.

Furthermore, the common characteristics of modular housing must be included. That is, transportation, quality control, construction pace, and so forth.

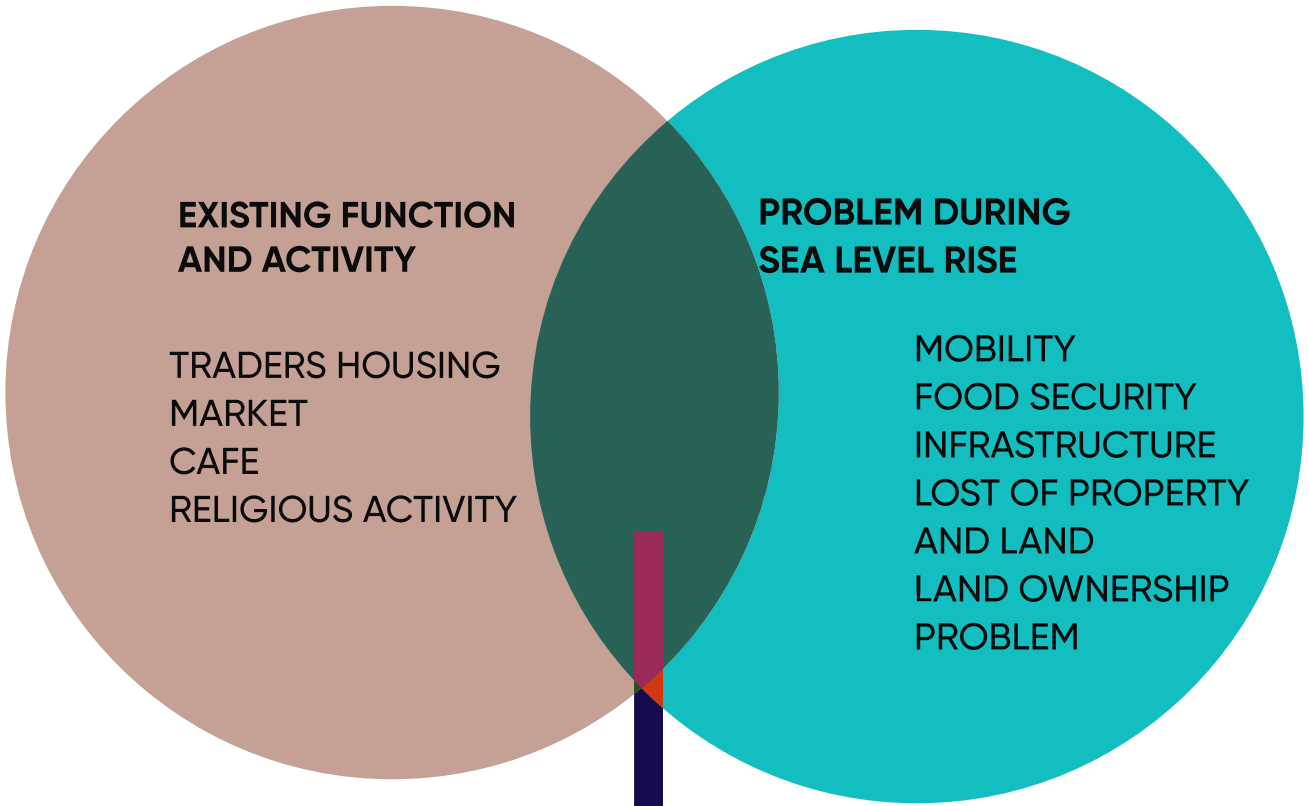


CONCRETE

Because of its weight and solidity, concrete is frequently utilized in huge buildings for modular housing. A cement-coated metal construction, on the other hand, is typically utilized for single-family or small-sized residences.

Concrete structures, like steel ones, are extremely sturdy and require minimal maintenance beyond checking for cracks.

2.8 Building Typology Analysis



RESULTS FROM THE ANALYSIS BETWEEN THE EXISTING BUILDING TYPOLOGY AND ALSO THE PROBLEMS THAT INCREASE WHEN SEA WATER RISE CREATES ALTERNATIVE NEW BUILDING TYPOLOGIES THAT CAN INCREASE THE EXISTENCE OF THE AREA AND ALSO INCREASE THE RESILIENCE OF THE AREA

NEW BUILDING TYPOLOGY AND BUILDING FUNCTION STUDY

What Describe "imaginative" building that fullfil the most important design problem in the matrix	How Describe the design strategies/framework (concept, pattern, force based)	Value Describe expected value/ additional value, goals with your design
Alternative 1 **Water Sanctuary** An living area that support safety and the progress of the city of Banjarmasin,here can provide activities such as farming, aquaculture, and other activities that can support the wellbeing of the citizens.	Using a concept of modular so it will be easy to implement growth concept to fulfilled the needs of the citizen. The spatial pattern will be reflecting to the old existing	1. To help people to adjust to the rising sea levels that affected Banjarmasin, 2. Creates design that reflects the old history and culture of Banjarmasin 3. Provide a sustainable living value to the colony. 4. Can be the new landmark of Banjarmasin 5. To help the economic adjustment incase of sinking 6. Become a stopover place for locals and visitors 7. To increase the cooperation within the city 8. To ensure equality to all 9. To create a safe and creative space for the people
Alternative 2 **Water Trade Terminal** is an area where it becomes a center where residents can buy or sell resources, information, history, and also as a stopover for travelers. This building will fulfill the problem of people adapting to the new situation so it can be as a restorative space for people	this place became the initial area for the community's economic development after the rise in sea levels, here also became a new cultural center that would tell about the city of a thousand rivers. It will be using an adaptable water structure and infrastructure	
Alternative 3 **The River Collaborative Center** As an area for working together to achieve the goals of a resilient city, this area will be a place of activity, that support the well-being of the user	The area will be the center of activity of the civilian. the building will be put or connected to the old existing building with a structure that can adjust to water levels. The existing building will be used as an infrastructural space.	
Accumulation of 3 **Water Colony** The place for the new settlement for banjarmasin city and the center for the rise of the new culture Banjarmasin city as a floating resilience city. It will support many activity like residential area and it can becomes a center where residents can buy or sell resources, information, history, and also as a stopover for travelers.This building will fulfilled the problem of safe place for the citizen so it can ensure safety for the future	Creating a new narrative of the history of banjarmasin that Reincarnation from the old culture, using the concept of modular aquatecture so it can respond to the rising water and can be easily adjusted to the people needs The spatial pattern will be reflecting to the old existing building that already drowned The area will be the center of activity of the civilian. the building will be put or connected to the old existing building with a structure that can be adjust	

2.9 PRECEDENT STUDY

PRECEDENT STUDY 1

The Water Parliament –
Return of the Ancient Rattanakosin Island – Bangkok City in 2100
By Tyler Lim | National University of Singapore



The project is a cautionary story of a new Water Parliament in Bangkok that recognizes and appreciates sea level rise as an opportunity, using three interconnected water infrastructure as an urban redevelopment toolbox to revive Traditional Thai Water Culture.

The thesis is based on a fictional scenario of Bangkok city's inhabitable landscape in the year 2100, where a new Water Government is situated at the historic Rattanakosin Island that deals with water commons and is subject to groups of residents who stand in for the culture and people of the Thai city. It mixes traditional Thai water culture with more contemporary technology and infrastructure while concentrating on a particular component of water.





LESSON LEARNED

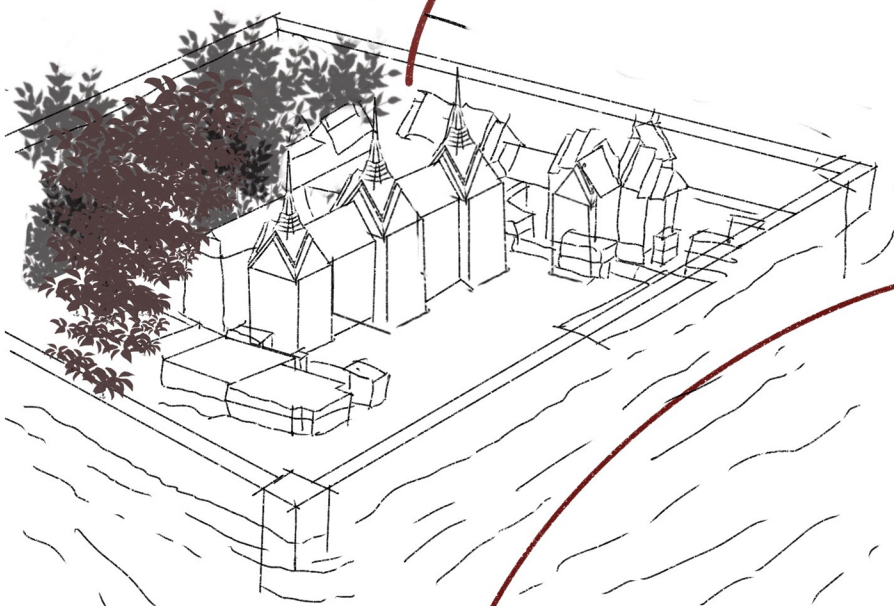
What I got from this thesis project is:

1. how the architect was able to apply the concept of floating in answering the problem of sea level rise.

2. The architect was able to combine modern architecture with traditional

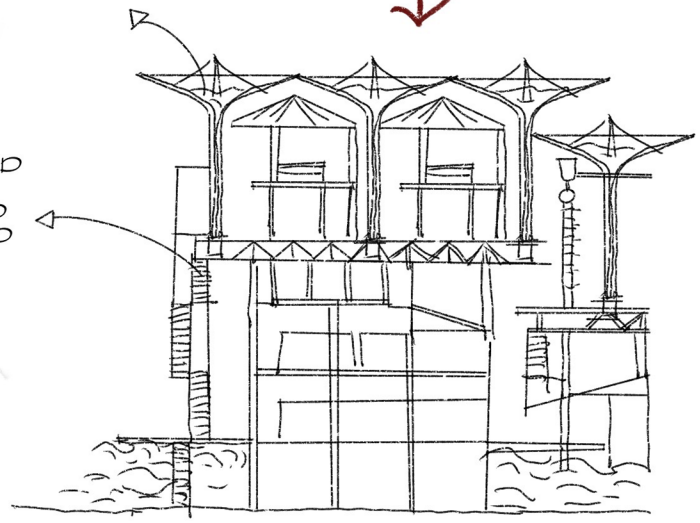
3. How the architect designing adaptive infrastructure that can grow from the existing environment and engage the people directly in design to create strong and comprehensive design

USING A RING OF DEFENCE AROUND THE ANCIENT AND HISTORIC MONUMENT TO KEEP THEM AS THEY ARE WHEN SEA LEVEL RISE



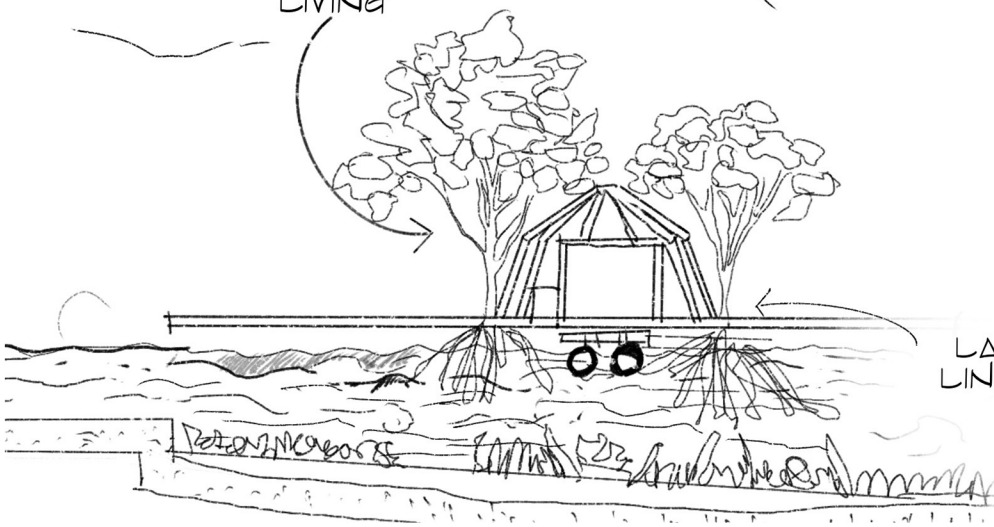


USING WATER FUNNEL ROOF AS RAINWATER HARVESTING



USING SCAFFOLD STRUCTURES THAT ACTIVATED WHEN THE FLOOD GOES UP

USING MANGROVES TO ACTIVATE AQUACULTURE LIVING



MANGROVE LAGOON ACT AS LINE OF COASTAL DEFENSE

PRECEDENT STUDY 2

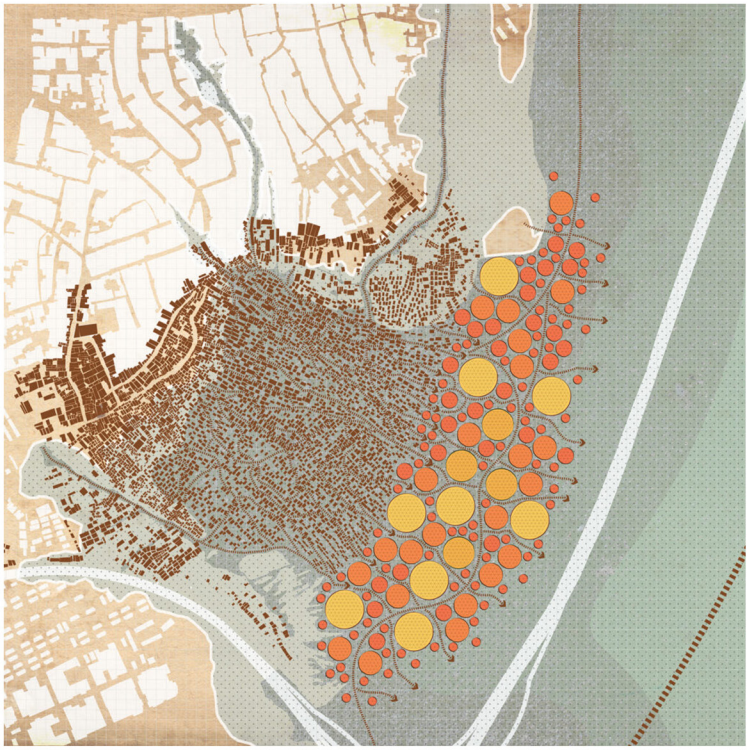
Lagos City of Water (*International Winner)
Water No Get Enemy By Lloyd Martin



DRising sea levels, more rain, and flooding are becoming a daily experience for Lagos residents as a result of the effects of climate change. The plan accepts this unavoidable scenario. imagining a new type of city that strengthens the partnership between people and water.

consciously choosing to employ the monopile construction method used in offshore wind farms rather than the more common floating method, which has a short lifespan and frequently breaks after heavy rains. Communities may grow and be immune from flooding because to the pile's robust construction.

Service Platforms, Biorefineries, and Market/Sports fields serve each community cluster. The Clusters develop naturally over time, evolving to meet Lagos' ever rising housing demand. The idea of a house as an enclosed loop in which the home's metabolism and circular economy are of utmost significance.

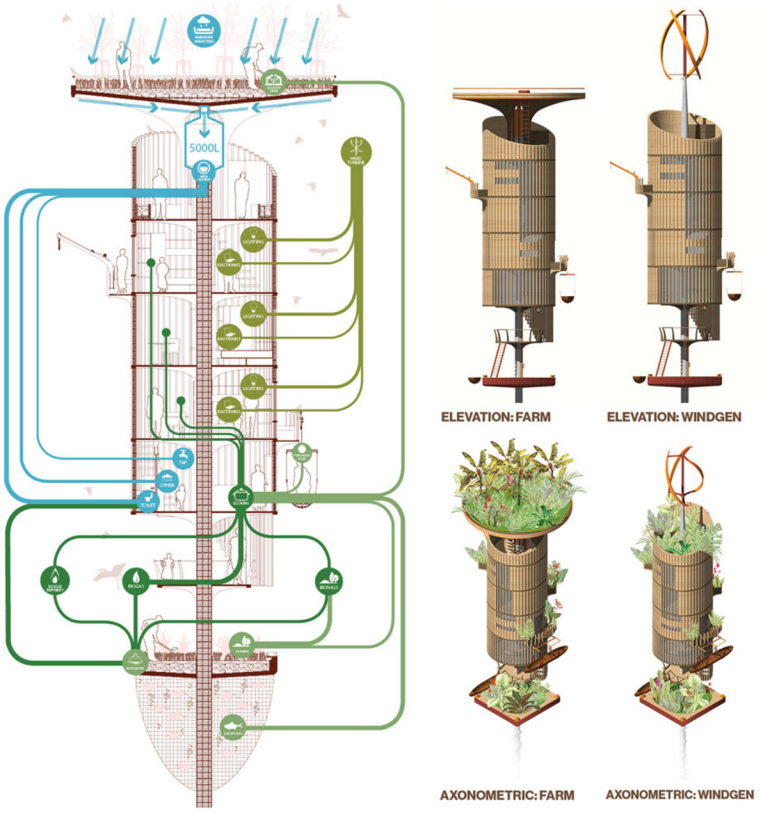


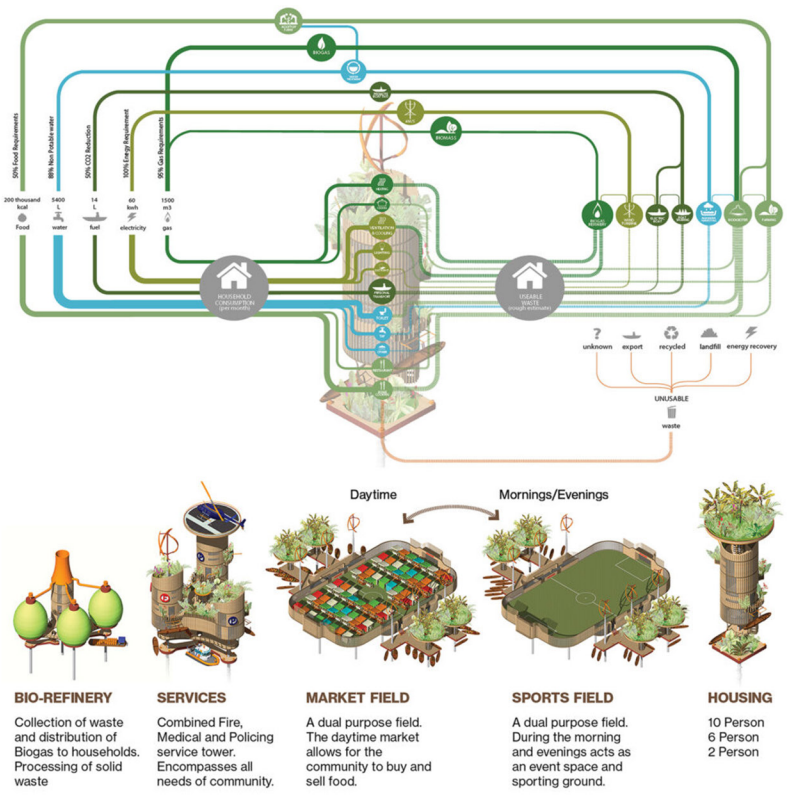
LESSON LEARNED

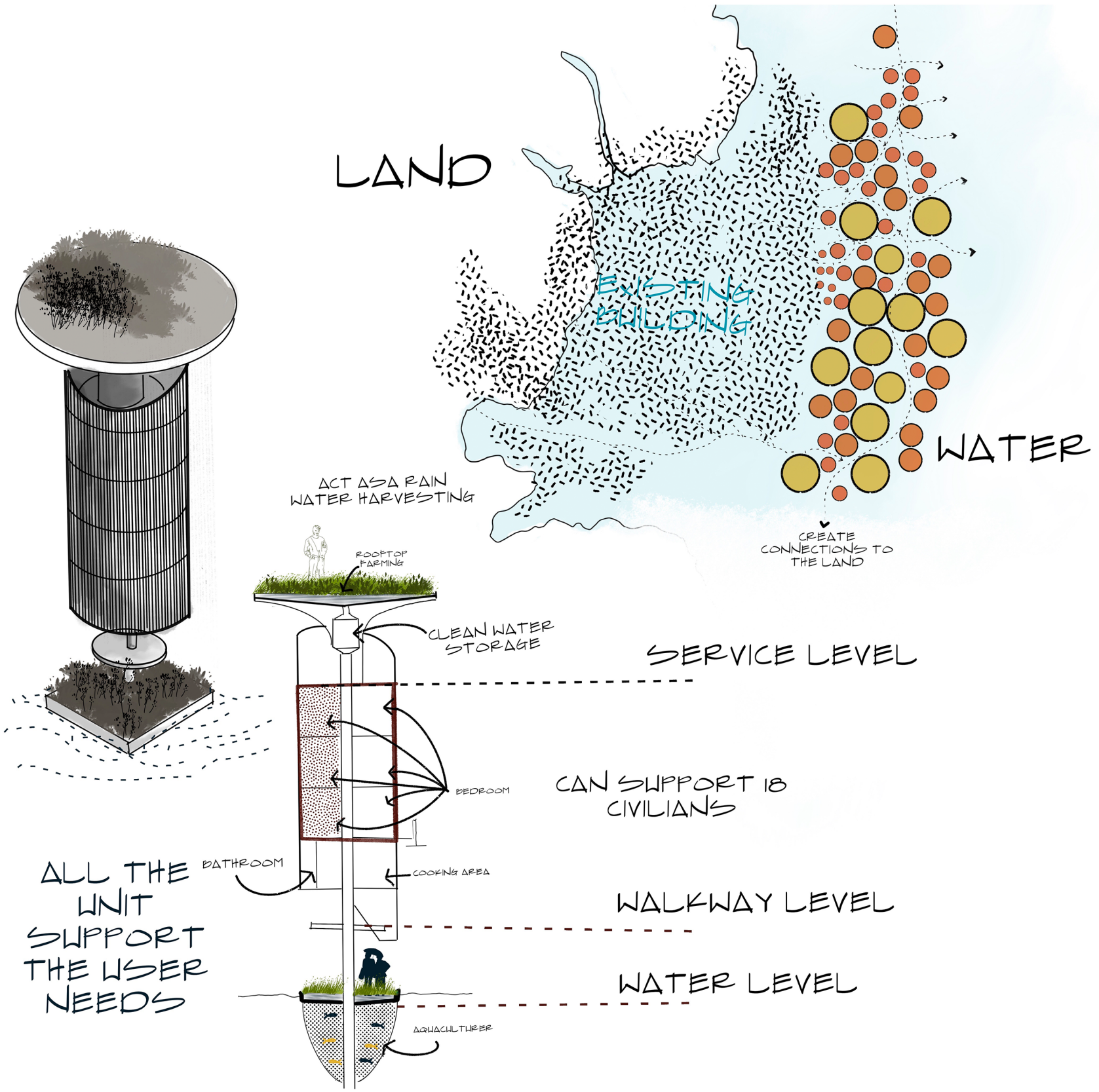
What I got from this project is:

1. how the architect was able to apply the concept of floating in answering the problem of sea level rise.

2. how the architect was able to create a system that can help the needs of citizens



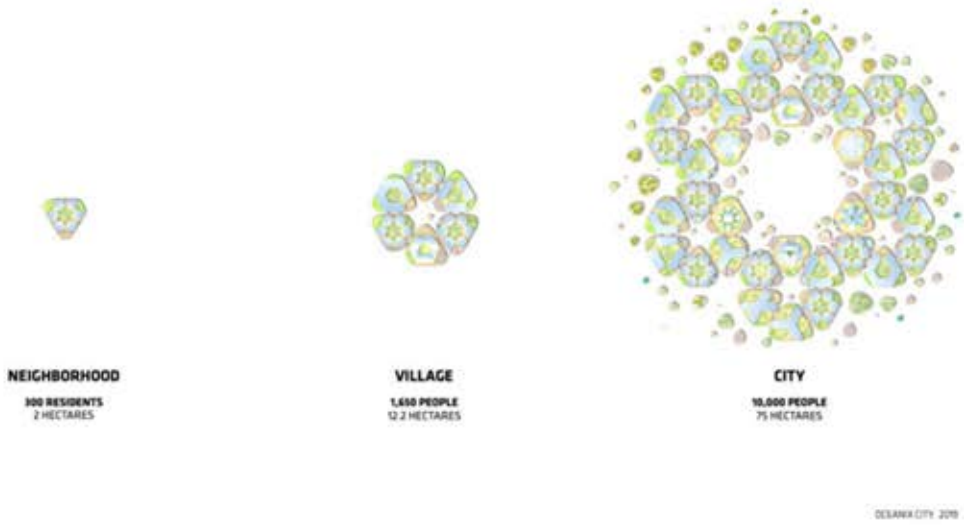



LAND
EXISTING BUILDING
WATER
CREATE CONNECTIONS TO THE LAND
ACT ASA RAIN WATER HARVESTING
ROOFTOP FARMING
CLEAN WATER STORAGE
SERVICE LEVEL
BEDROOM
CAN SUPPORT 18 CIVILIANS
ALL THE UNIT SUPPORT THE USER NEEDS
BATHROOM
COOKING AREA
WALKWAY LEVEL
WATER LEVEL
AQUACULTURE

PRECEDENT STUDY 3

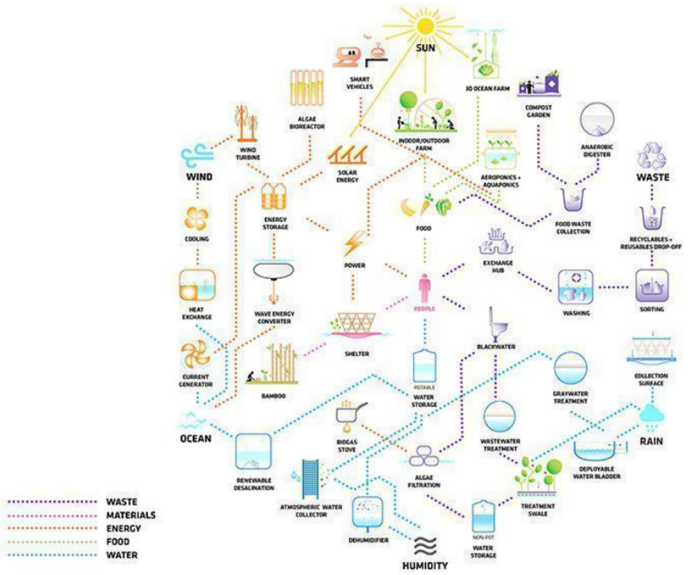
Oceanix By Bjarke Ingels' BIG





OCEANIX CITY is a concept for the world's first resilient and sustainable floating town for 10,000 residents on 75 hectares, supporting UN-New Habitat's Urban Agenda. A modular marine metropolis' architecture is based on the Sustainable Development Goals and channels waste, food, water, and energy flows. OCEANIX CITY is intended to organically develop from neighborhoods to villages to cities with the potential to scale as it grows, changes, and adapts over time.

With mixed-use spaces for living, working, and meeting during the day and night, modular neighborhoods of 2 hectares create dynamic, self-sufficient communities of up to 300 members. To produce a low center of gravity and withstand wind, all built structures in the area are confined to a maximum height of seven stories.



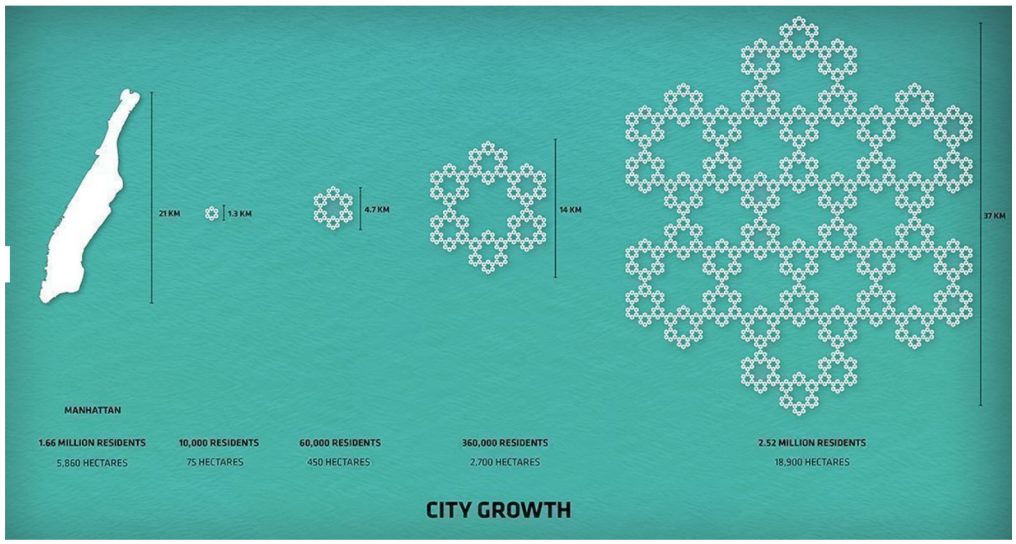
LESSON LEARNED

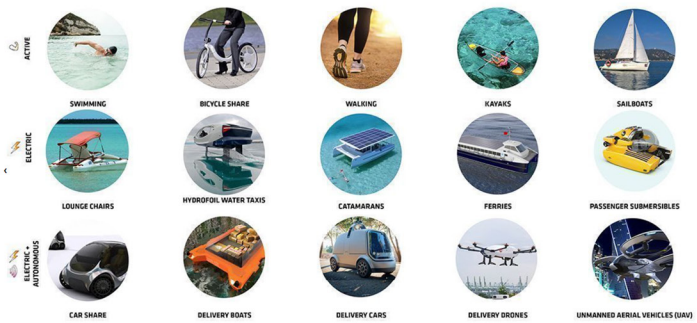
What I got from this project is:

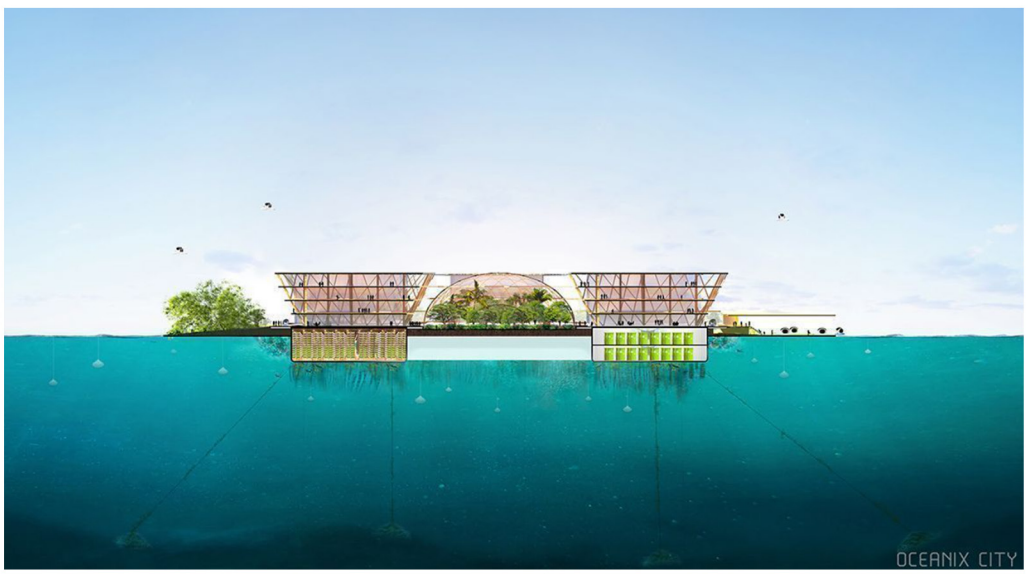
1. how the architect was able to apply the concept of Mobility on a floating structure

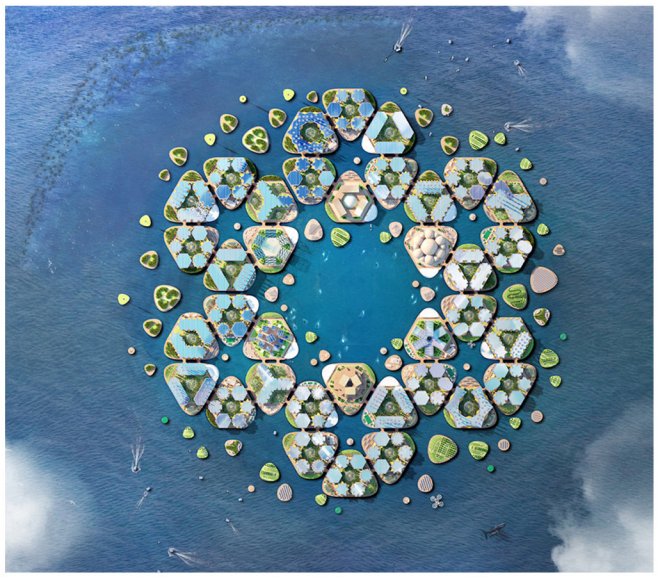
2. how the architect was able to create a system that can help the needs of citizens

3. How the architect using a modular concept to make the the building can develop and meet the development of residents

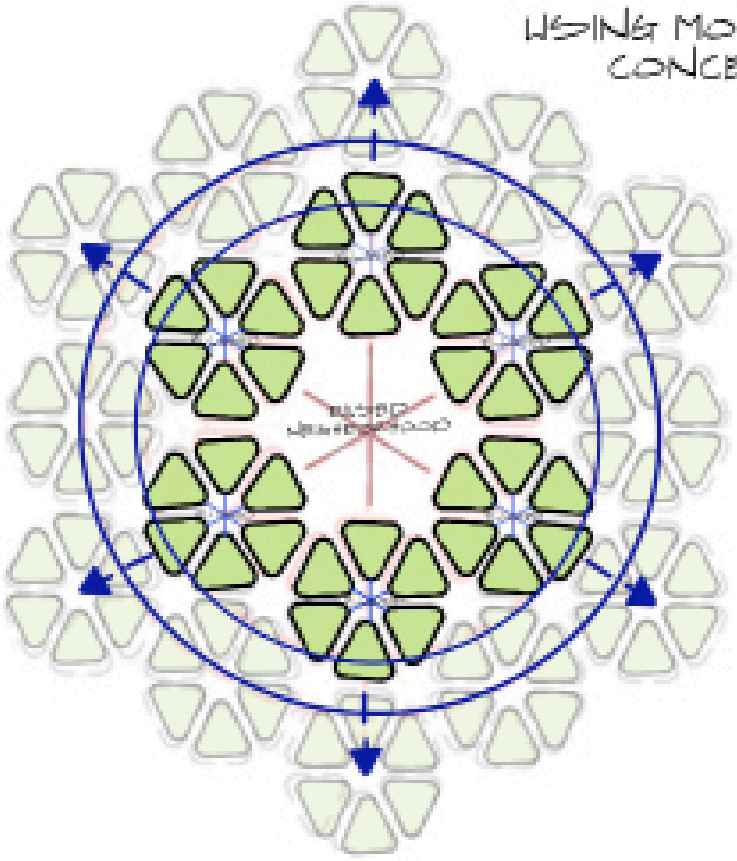








USING MODULAR CONCEPT



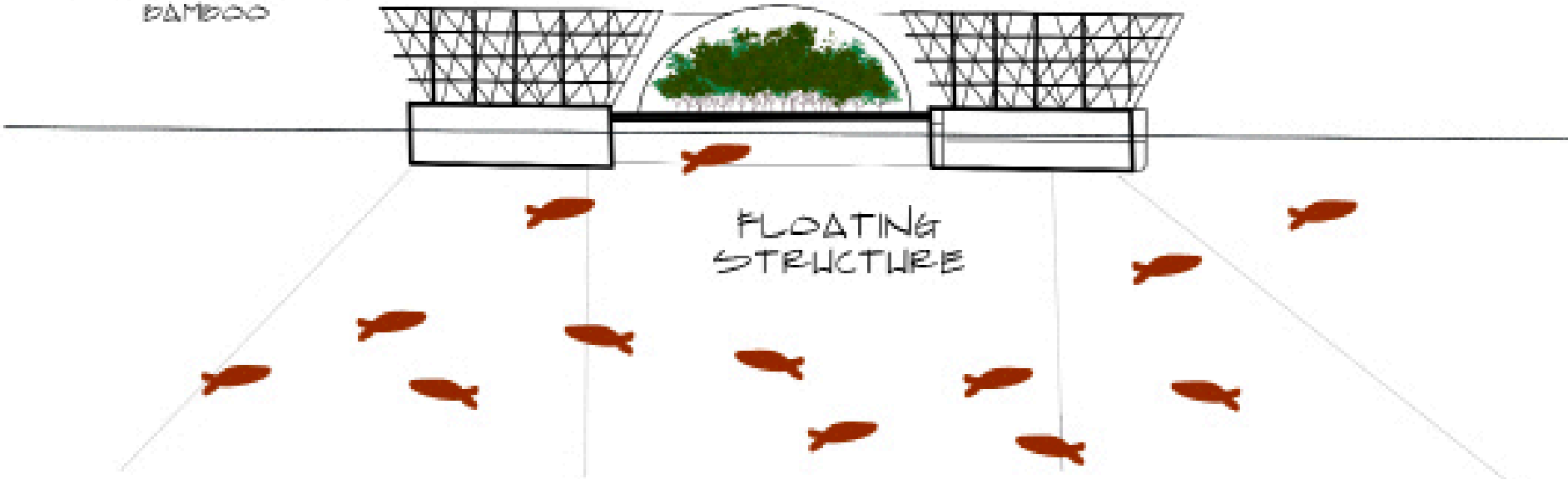
EVERY ISLAND HAS A DIFFERENT FUNCTION BASED ON SDG

CITY THAT CAN CONTAINS 10,000 PEOPLE

FARM FOR AGRICULTURE GUARANTEE FOOD SUPPLY

WIRE TO MAKE THE FLOATING VILLAGE STAYS

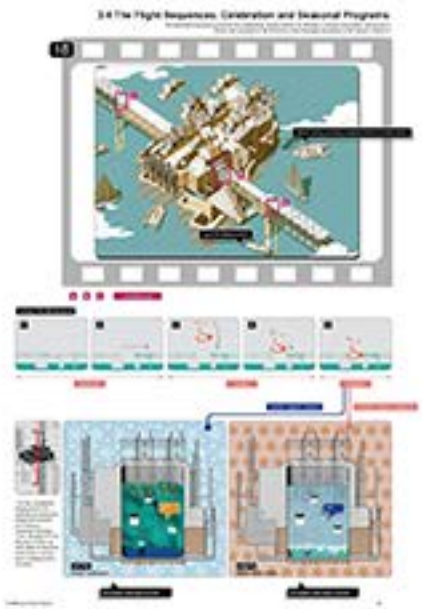
USING LOCAL MATERIAL WOOD + BAMBOO



FLOATING STRUCTURE

PRECEDENT STUDY 4

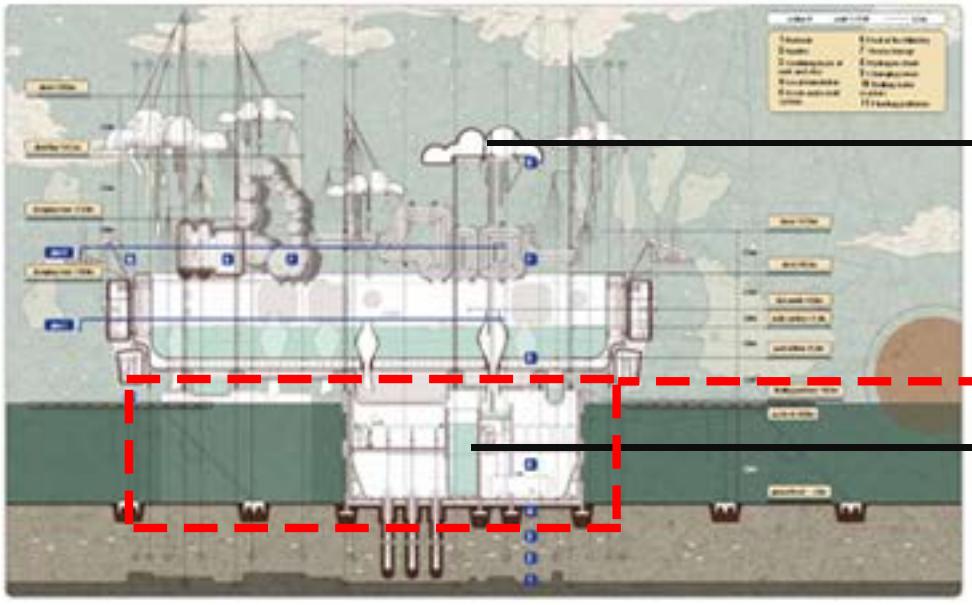
The Ministry of Ocean Wisdom
The Danish Exclusive Economic Zone and Village of Hvide Sande, Denmark





The main symbolic character in Jules Verne's "The Children of Captain Grant" is water. The journey is provided through this medium, which also serves as a means of concealing or disclosing the knowledge that the wanderers searched out during their voyage around the globe. Water serves as both the group's common ground and the interface via which they interact with their surroundings. Today, the idea of water as human territory is still an unexplored concept. Because human economy is solely reliant on acquiring land surface, aside from industrial uses, it has frequently been viewed as the unknown throughout history. The project finds that inhabitable territory includes both land and water.

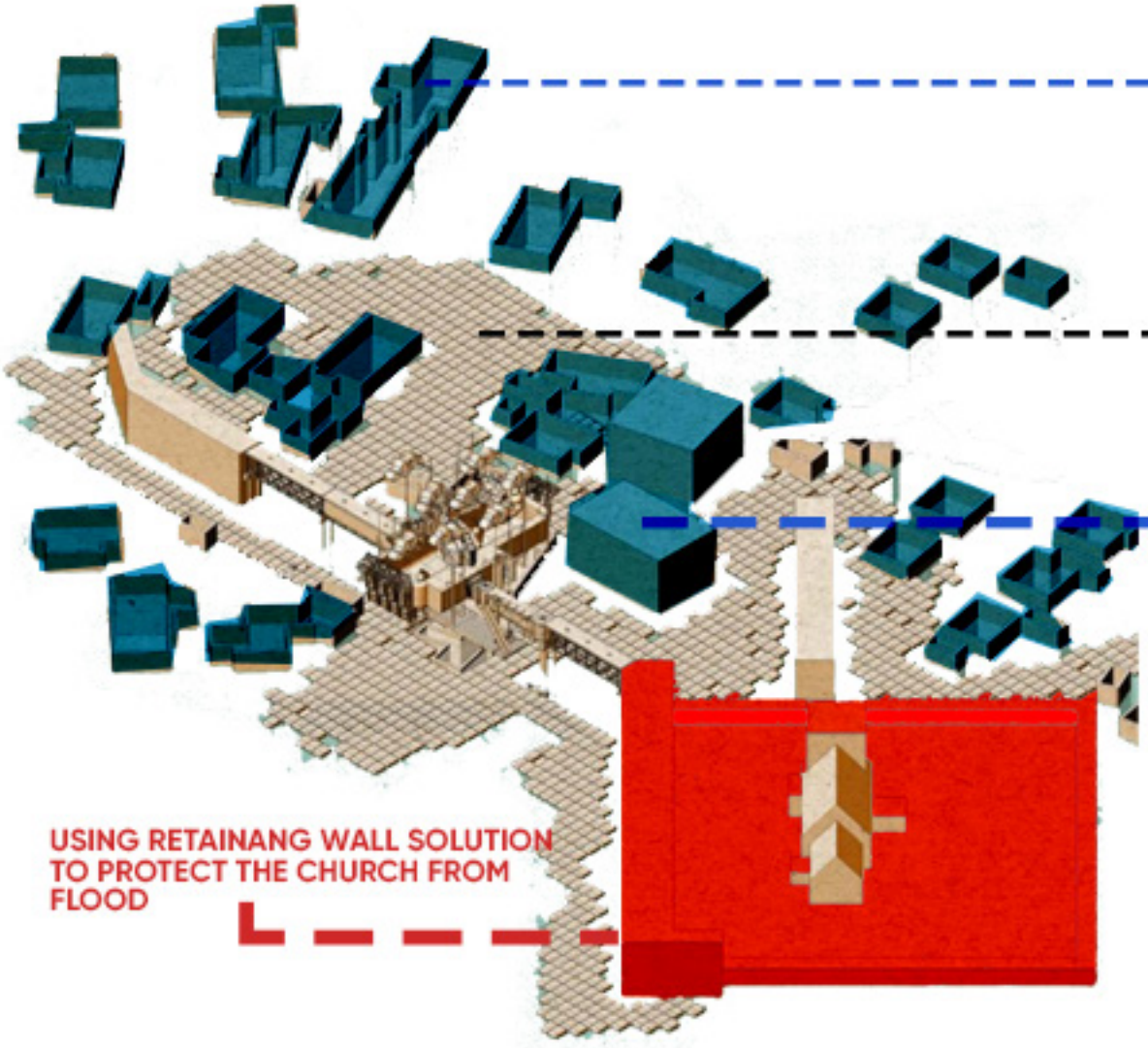
water may create various spatial situations, that it has various states and potentials, and that it is like the golden pot at the end of the rainbow. The Ministry of Ocean Wisdom presents a blueprint for accepting sea level rise and subsequently adopting a waterborne lifestyle.



HYDROGEN BALOON CLOUD
TO LIFT THE BUILDING

THE BUILDING WIIL BE THE SUPPORTING STRUCTURE

EXISTING BUILDING TURN INTO CLEAN WATER INFRASTRUCTURE



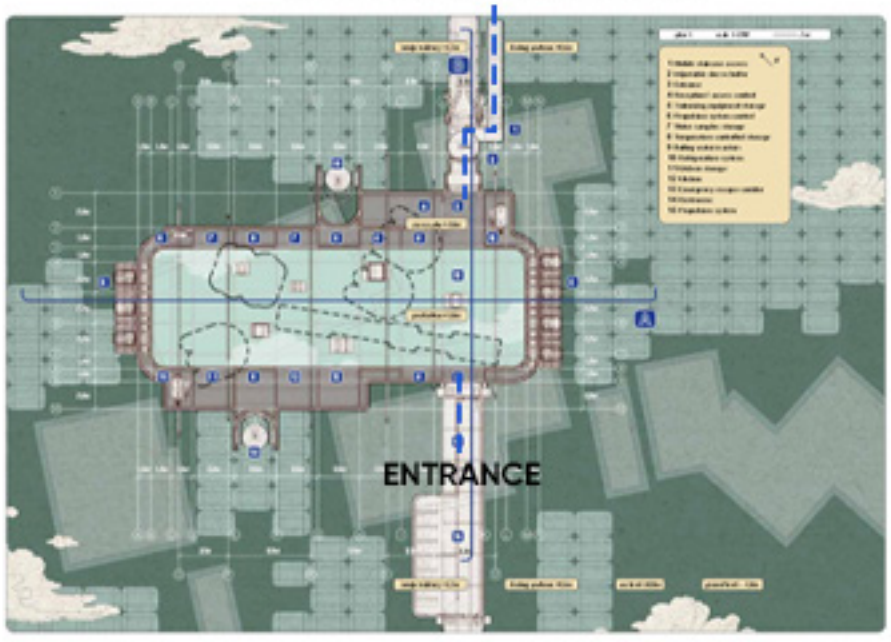
SINKING HOUSE
TURN INTO FRESH WATER
WELLS

FLOATING PIERS
FOR PATHWAY

FLOATING SQUARE

WORKSHOP SPACE

MOBILE STARECASE ACCESS





LAYER 1
EXISTING BUILDING
TURN INTO CLEAN WATER
WELLS



LAYER 2
FLOATING PIERS
& FLOATING SQUARE



LAYER 3
MINISTRY OF OCEAN
WISDOM

UNIVERSITAS ISLAM INDONESIA

CHAPTER 3 DESIGN PROBLEM SOLVING

3.1 Approach To Design Concept
3.2 Crowd Building Role & Scenario
3.3 Site Development And Arrangement
3.4 Site Situation & Site Plan
3.5 Open Plan Concept & Floor Plan
3.6 Elevation & Section
3.7 Module Concept & Type
3.8 Building Space Arrangement
3.9 Building Structural
3.10 Building Infrastructure
3.11 Building Safety
3.12 Building Exterior and Interior

UNIVERSITAS ISLAM INDONESIA

3.1 Approach to Design Concept

rising sea levels threaten the city to sink, so we have to adapt to the situation, by using the concept of crowd building, the community can also participate in the development of resilient city developments in the city of Banjarmasin.

Able to maintain the existence of the area remains a historical area of the city of Banjarmasin

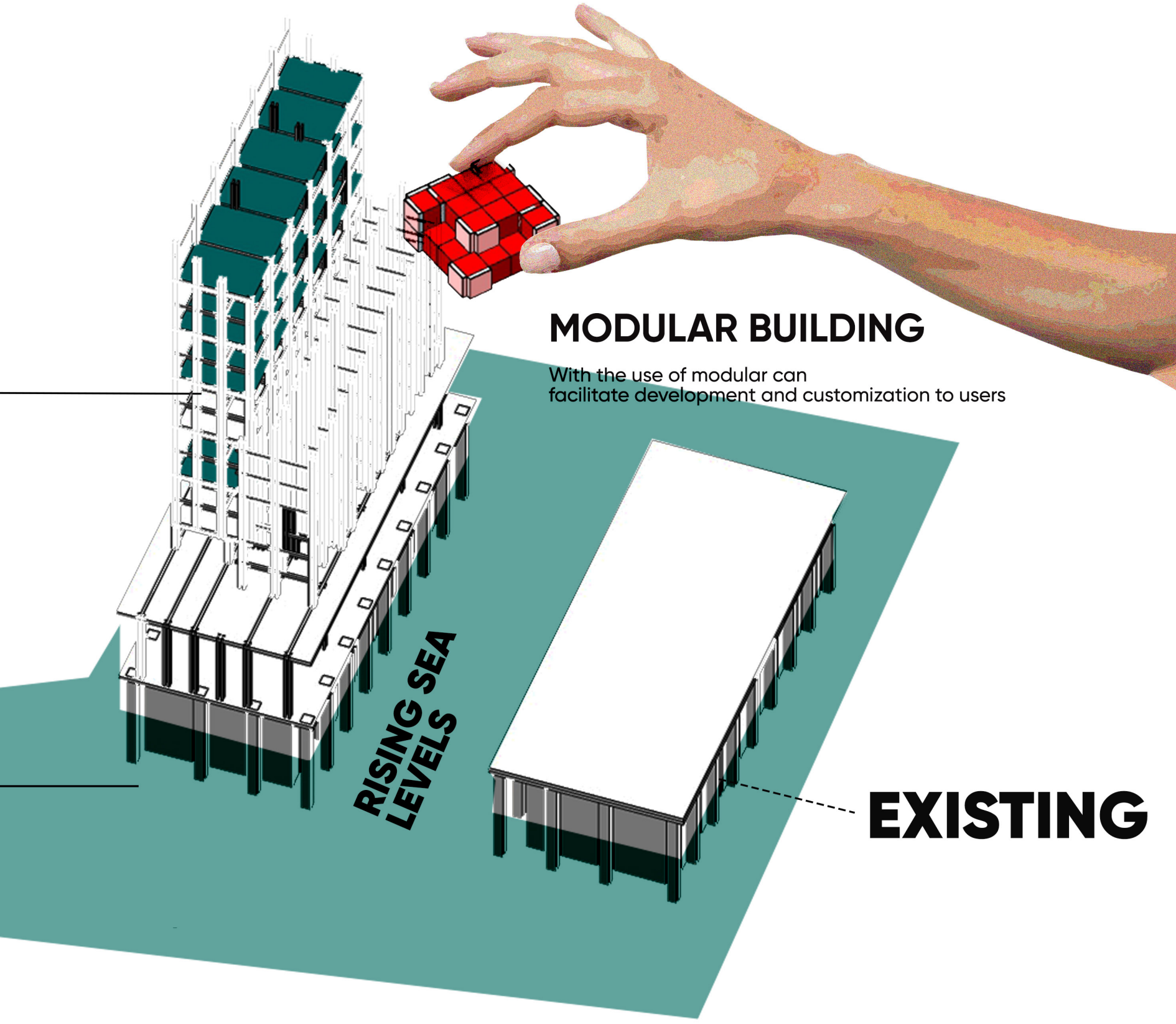
infill design concept

The infill method can be used in urban areas and aims to integrate with the existing land with contemporary construction and design, but still refers to the historical context so as to increase the existence of the area.

CROWD BUILDING APPROACH

the spatial plan would involve land acquisition, such as for public parks, water catchment areas, drainage channel expansion, and so on. Landowners may object to plans to purchase their property for public use if they do not receive any advantages from it. and by using crowd building approach will give both party a win-win apportunity.

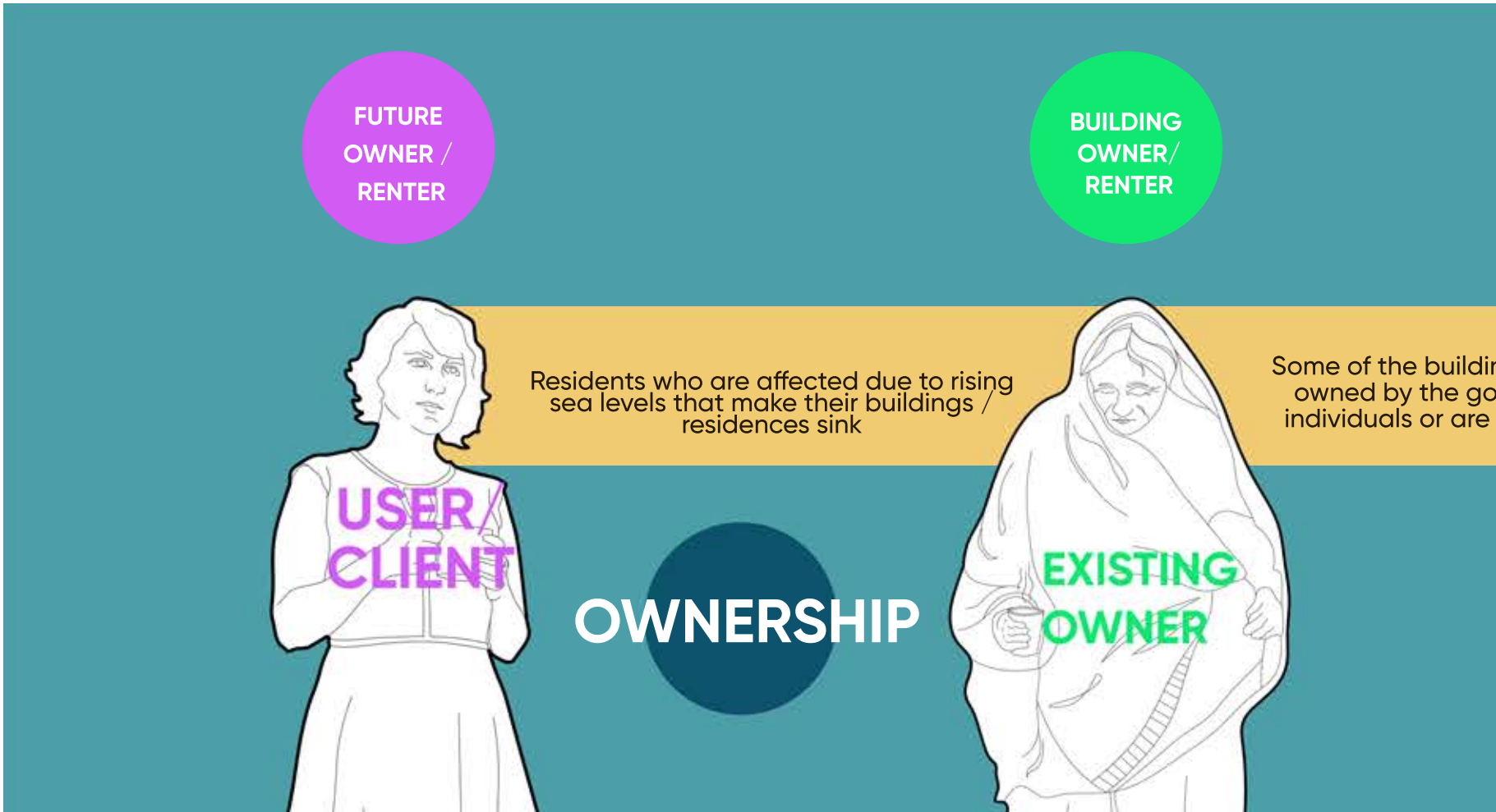
In this case the government construct the structure of the extended building and give a compensasion for the existing owner of the land by giving a place for them on the new extension with a new and improve facility.


MODULAR BUILDING
With the use of modular can
facilitate development and customization to users
RISING SEA
LEVELS
EXISTING

3.2 CROWD BUILDING (ROLE)

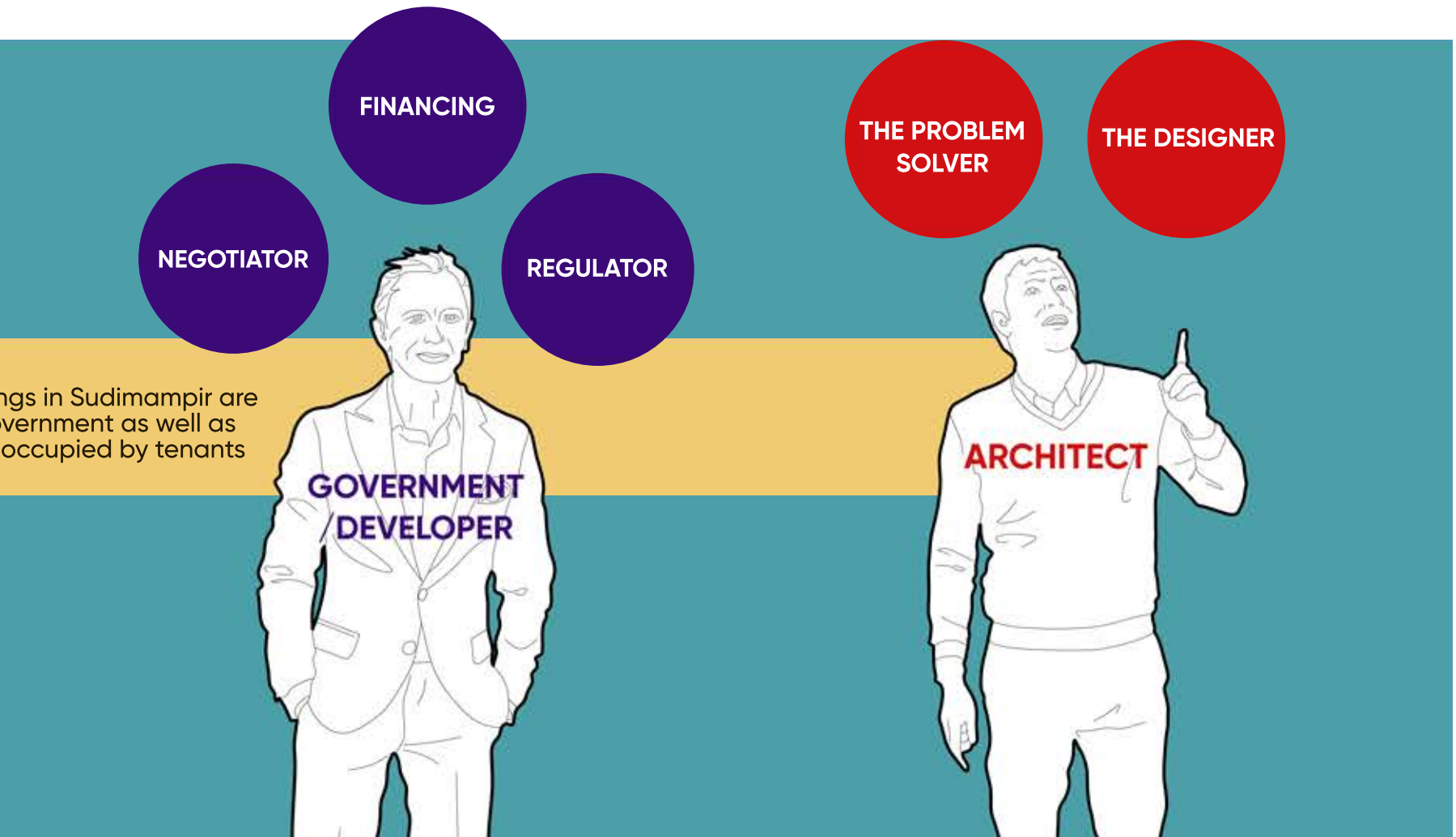
Potential users or future owner decide together how they will use the building in the future

The owner or tenant of the original land has the right to ownership so that they have two options, namely: Selling the sunken building to the government or developer or Accepting alternative solutions offered by the government or developer



The government / developer acts as a negotiator, financer and also the maker of new regulations.

Architect Act as the problem solver and the designer of the project and try to answer the wishes of the old owner as well as the future owner



CROWD BUILDING SCENARIO

STEP 1 .
CREATING NEW REGULATION AND SOCIALIZATION TO THE CIVILIAN

the government always regulates regulations, stating that the area in terms of the condition of the building is no longer feasible (the average age of the building is above 50 years, slums and many are damaged so that they do not meet the requirements of safety, health, comfort and sustainability). The other side of the area is also threatened with degradation due to the effects of global warming.
In this case, the City Government of Banjarmasin together with the city's DPR and also supported by related institutions (which are organizations from outside in terms of dealing with the impact of global warming) need to take steps to save the area.

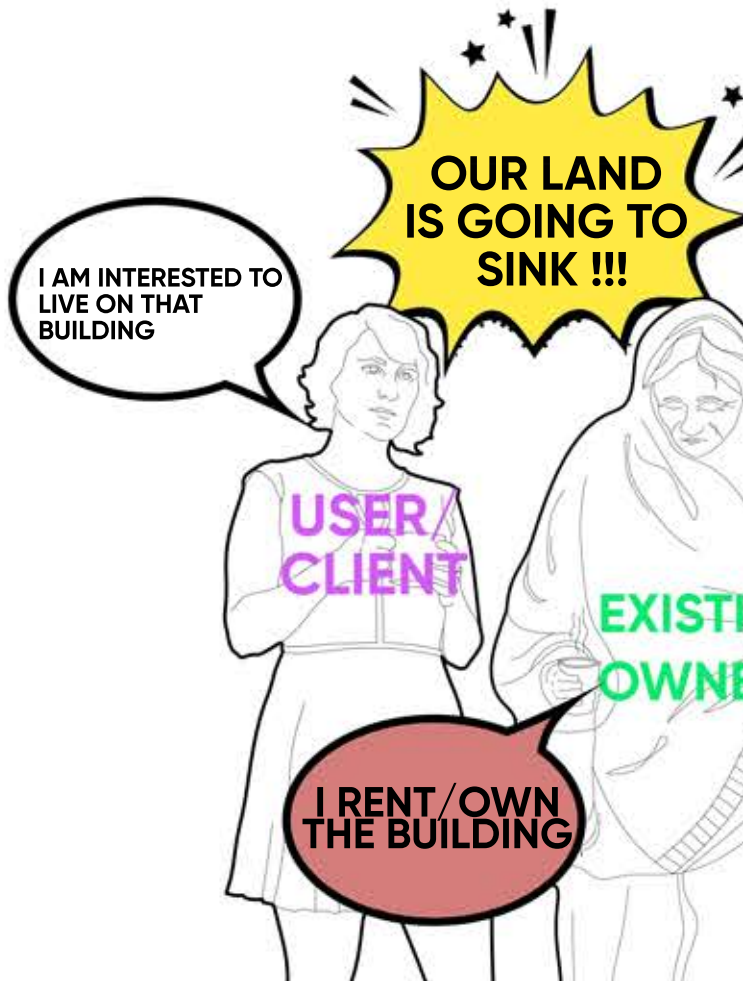
Considering that the area has always played an important role in influencing the economic progress of the city of Banjarmasin, automatically the area has a very high historical value. And with this, of course, it is an obligation to maintain its continuity. Based on this, the Government then needs to issue a REGULATION (Perda) to maintain and improve the existence of the area.

The regulation can take the form of a regional RTRW up to a regional RTBL where later it will require a model of arrangement that may be carried out for the area.

STEP 2 .
SOCIALIZATIO

After the regulation is
regional master plan w
development by referr

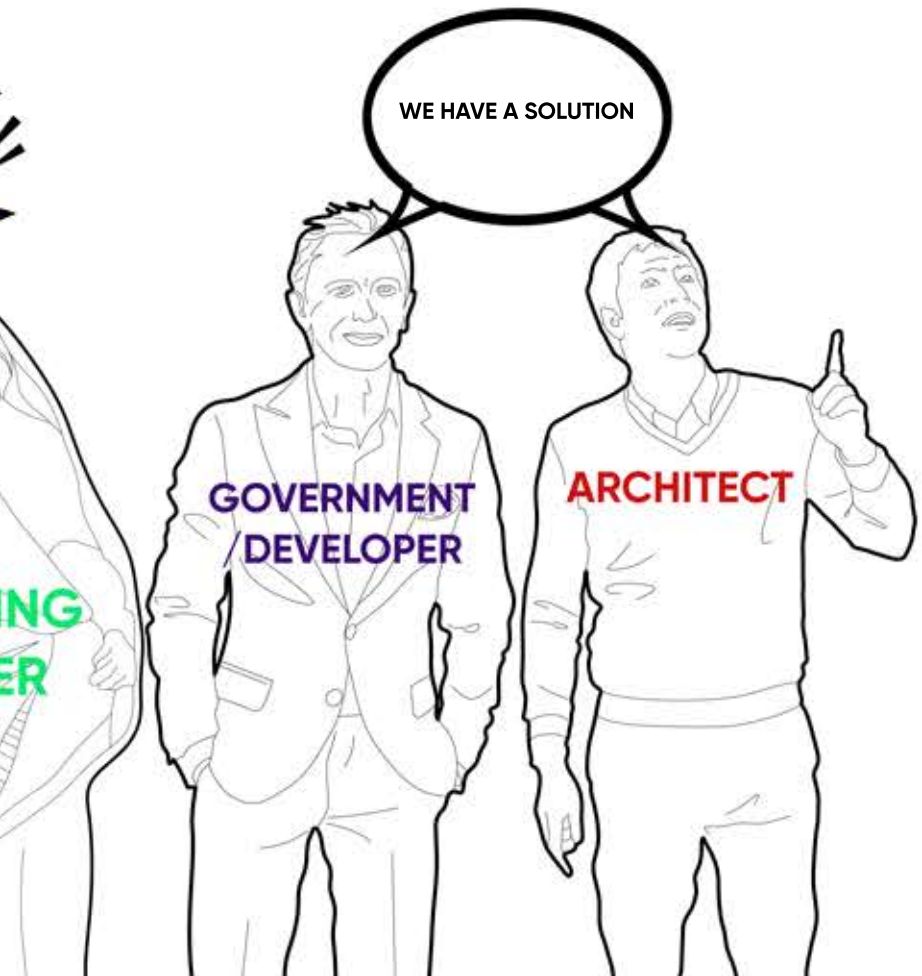
Based on the results
regional roadmap) the
dialogue, socialization
and concepts of the
residents of the area o
etc. related). From th
socialization, there wi
parties; in this case es
the occupants.



N TO THE CIVILIAN

issued, the next step is to make a
ith an alternative model for regional
ing to the regulations.

s of this product (RTRW, RTBL or
en a meeting is held in the form of
and coordination about the plans
regional structuring model to the
r building owners (traders, residents,
e results of this coordination and
ill be synchronization between the
specially between the government,



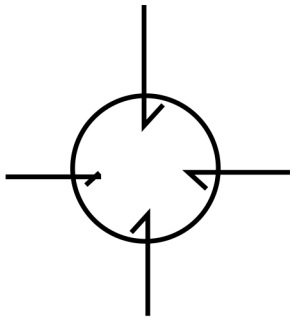
STEP 3 .
FUNDING AND BUILDING PROCESS

In this phase, the government will look for partners to carry out the arrangement. This partner is prioritized for those who have the ability to finance or partners from outside parties (organizations) who are concerned about environmental disasters due to being affected by rising sea levels which are predicted to eliminate historical areas such as the Sudimampir trade center area in the city of Banjarmasin. In this case it is the organization Climate Resilient and
The Inclusive Cities Project (CRIC) funded by the European Union is because Banjarmasin is their pilot city to be developed into a resilient city.

Government partners from the investor side (as funders) will also be directed to be able to communicate and coordinate to make agreements with residents or building owners (traders and or building owners). If an agreement has been reached, then the next stage of making the development concept (feasibility, regional DED and even the development implementation process) can be started.
A synergistic partnership with the principle of mutual benefit between the parties is the main basis for development goals.

3.3 Site Exploration

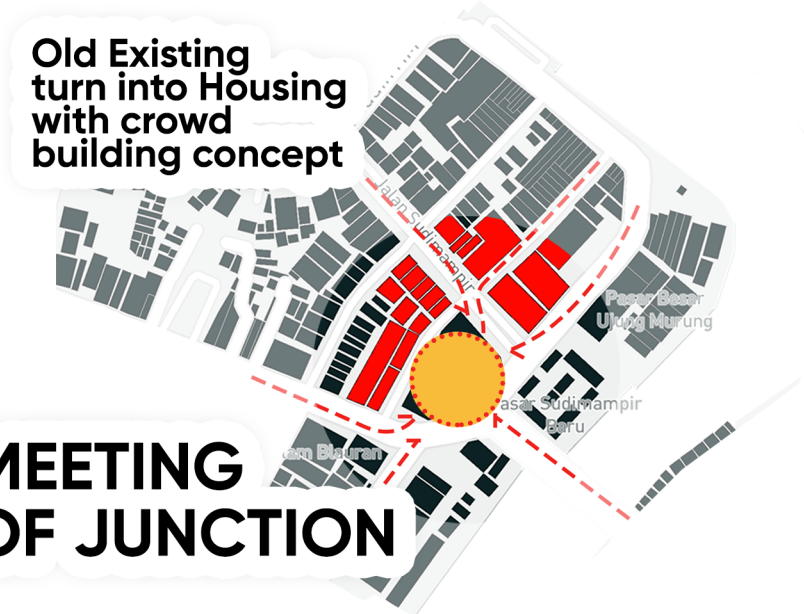
EXPLORATION 1
WHY CIRCLE ?



Can connect to the surrounding environment

Can be acces from everywhere





MEETING OF JUNCTION

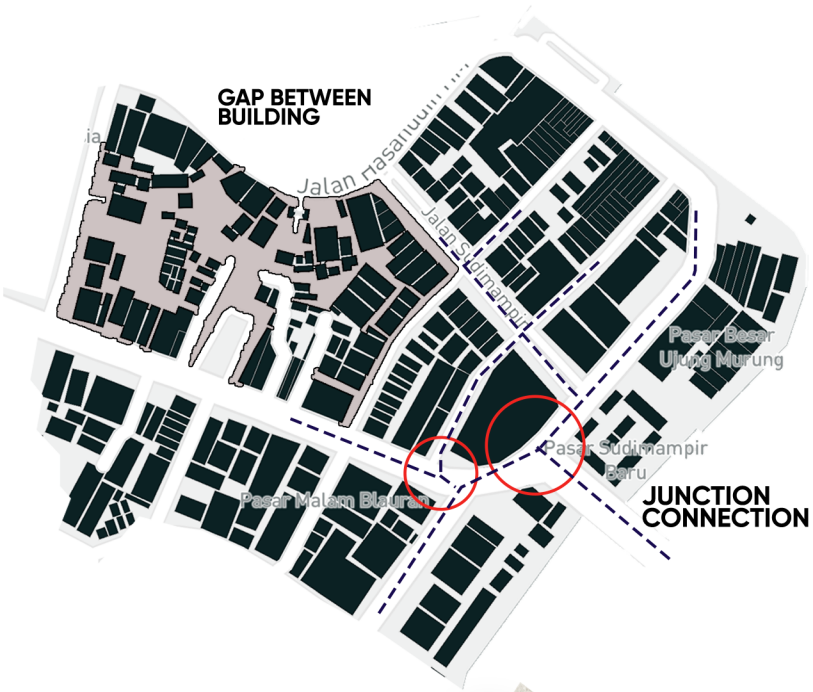


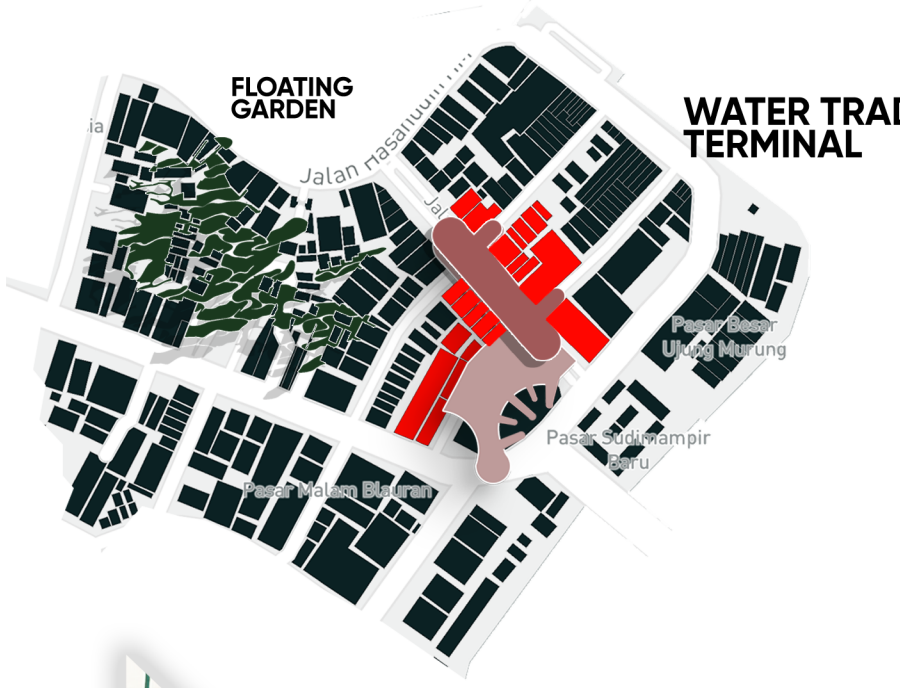
CONCEPTUAL BUILDING EXPLORATION



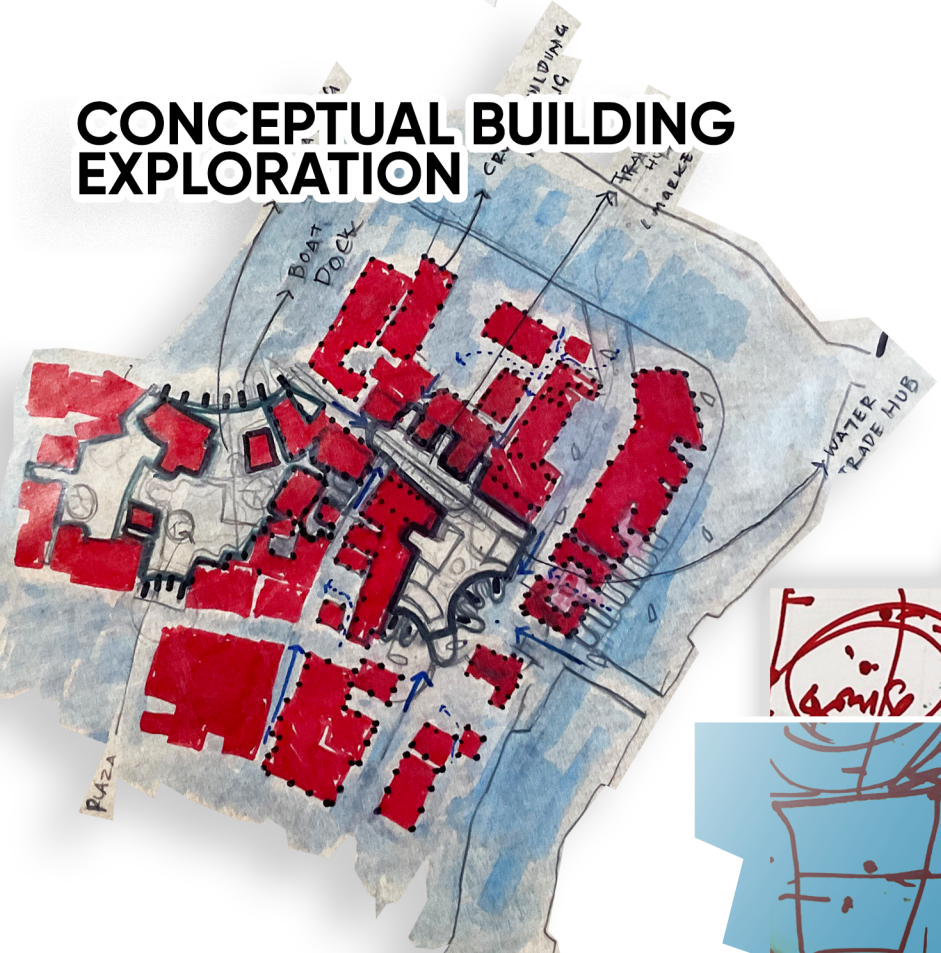

HOUSING
SOCIAL TRADING HUB
BOAT DOCK / PORT

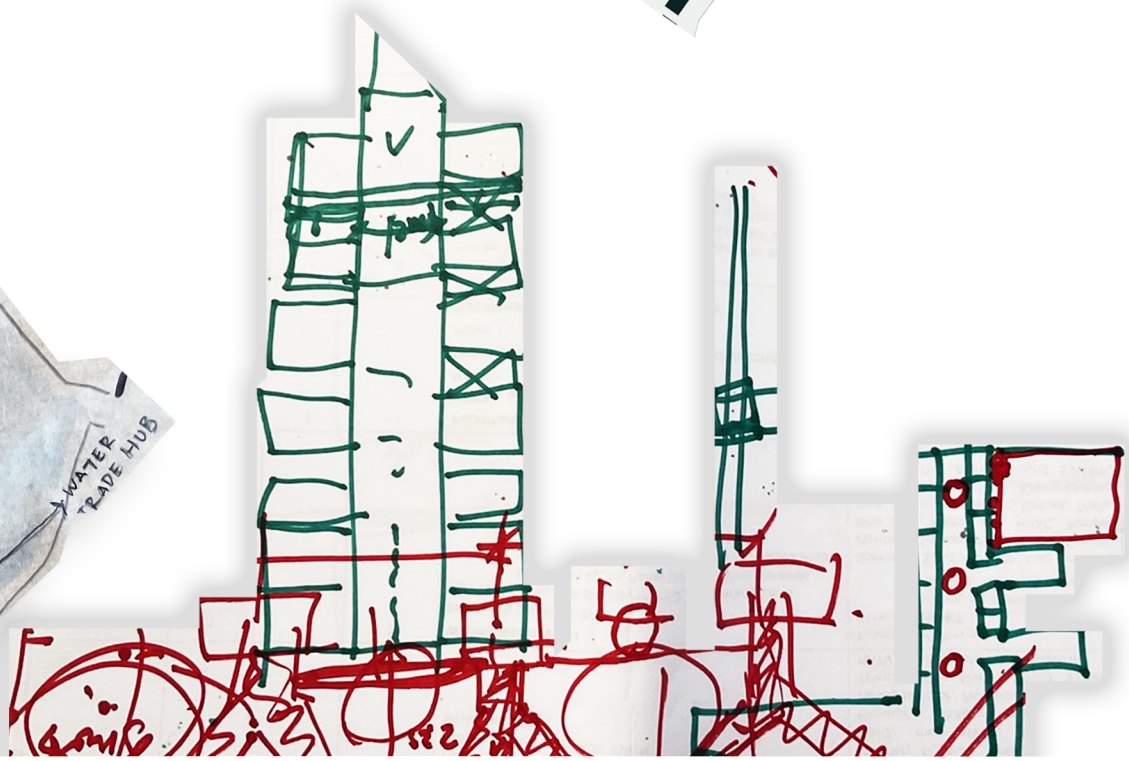
EXPLORATION 2



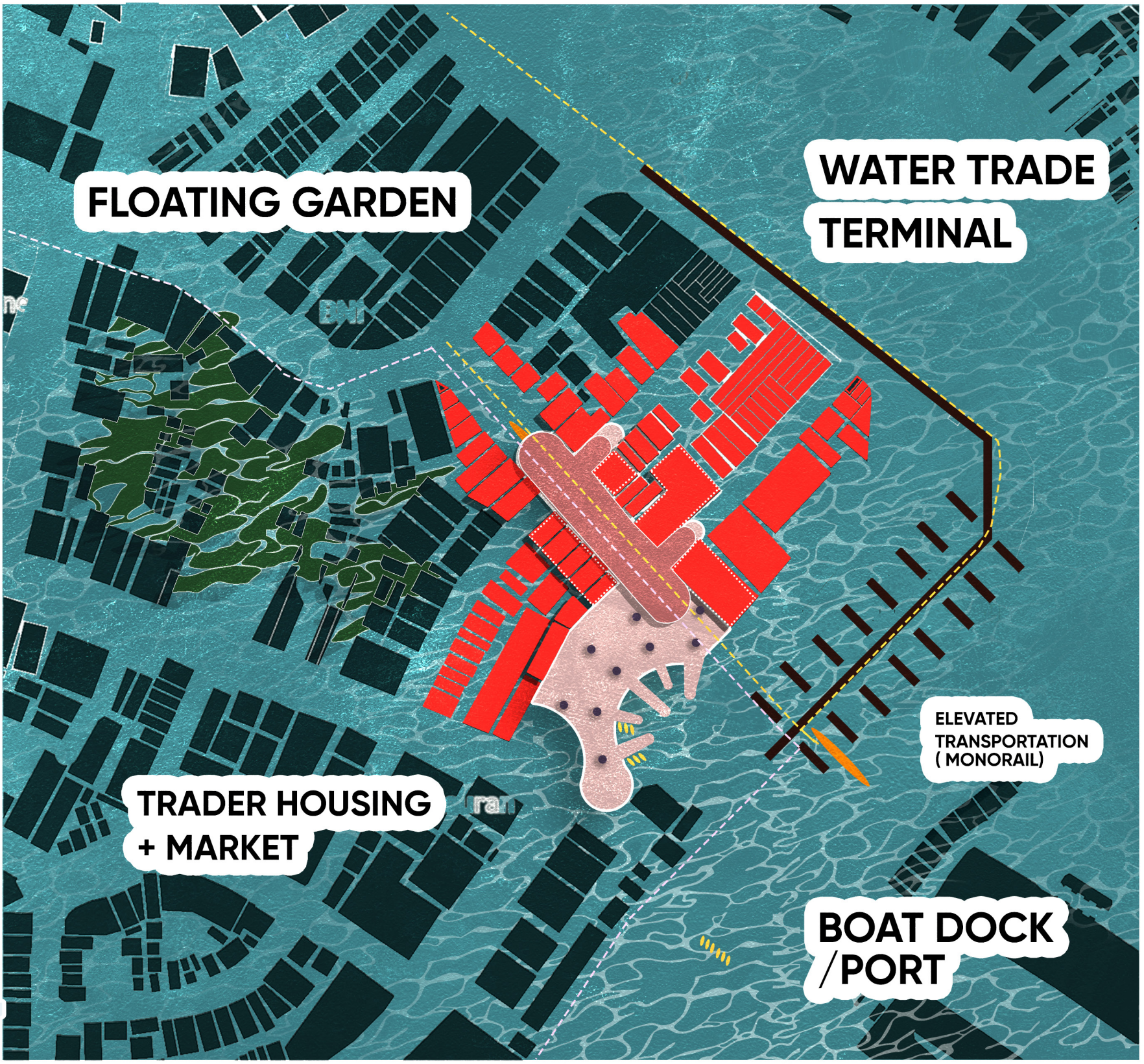


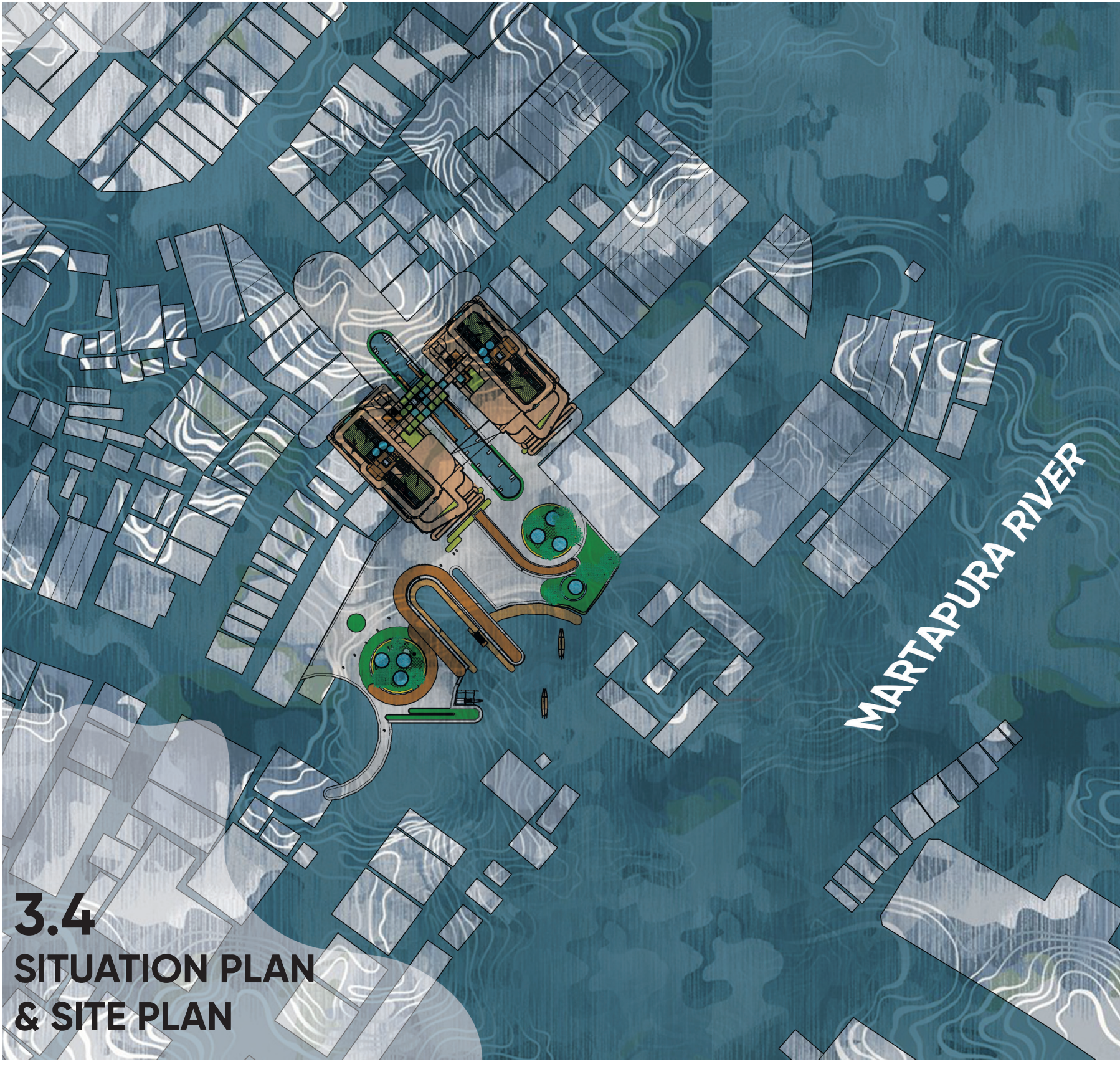
CONCEPTUAL BUILDING EXPLORATION



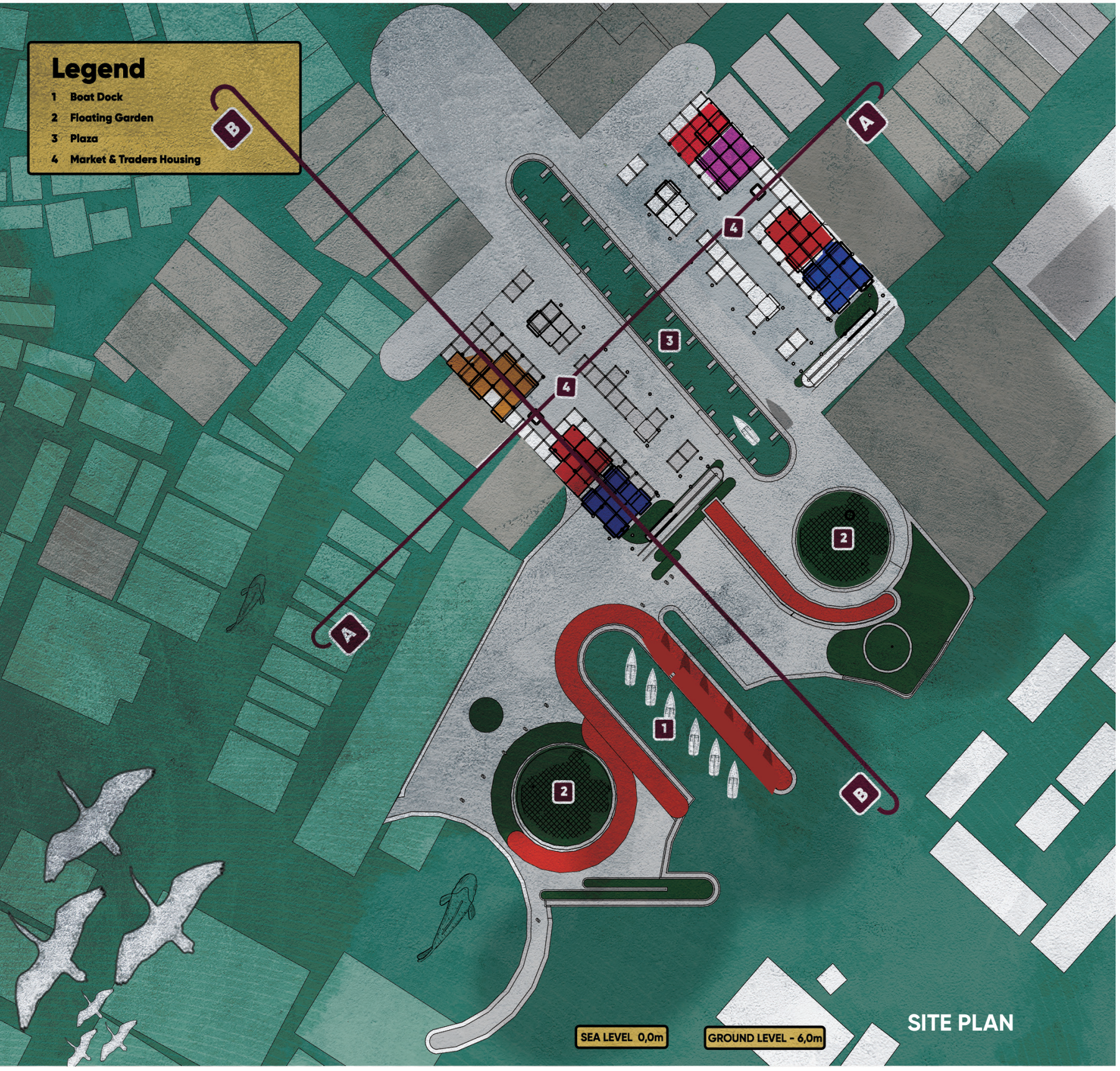





FLOATING GARDEN
WATER TRADE
TERMINAL
ELEVATED
TRANSPORTATION
(MONORAIL)
TRADER HOUSING
+ MARKET
BOAT DOCK
/PORT



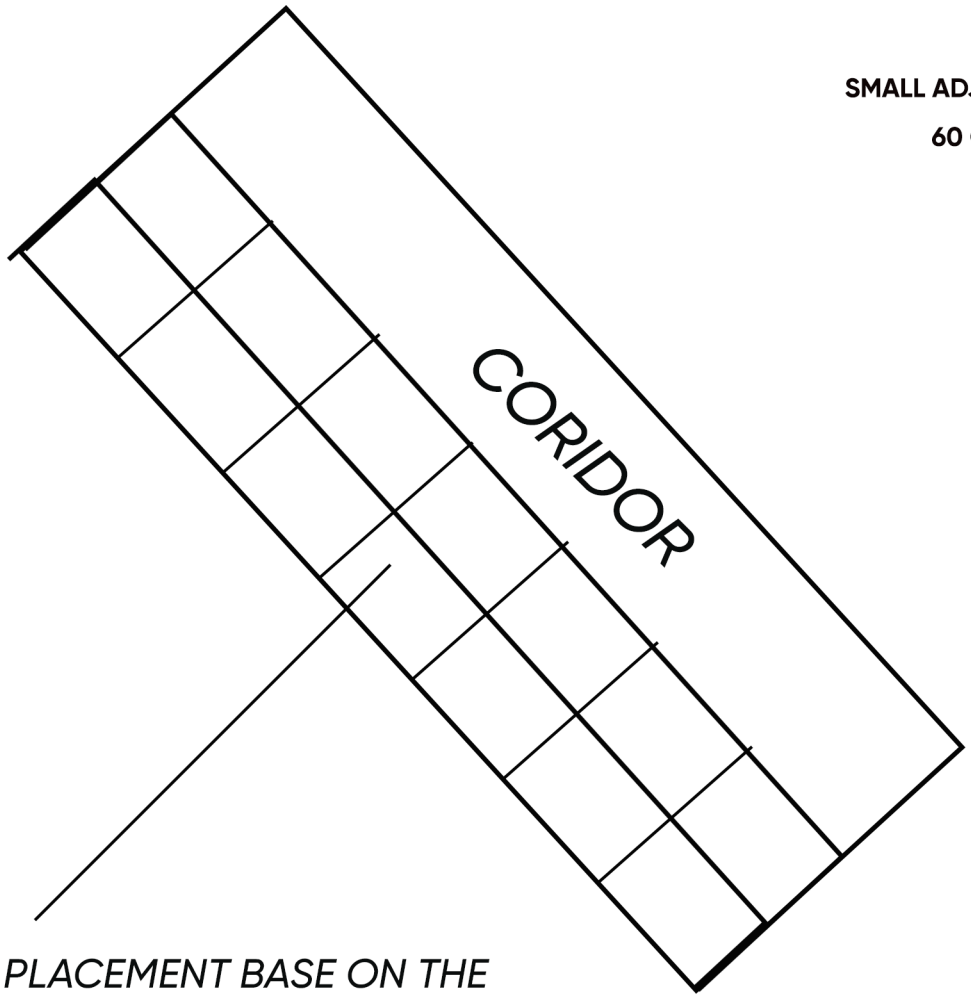
3.4
SITUATION PLAN & SITE PLAN


Legend
1 Boat Dock
2 Floating Garden
3 Plaza
4 Market & Traders Housing
A
B
A
B
4
3
4
2
1
2
SEA LEVEL 0,0m
GROUND LEVEL - 6,0m
SITE PLAN

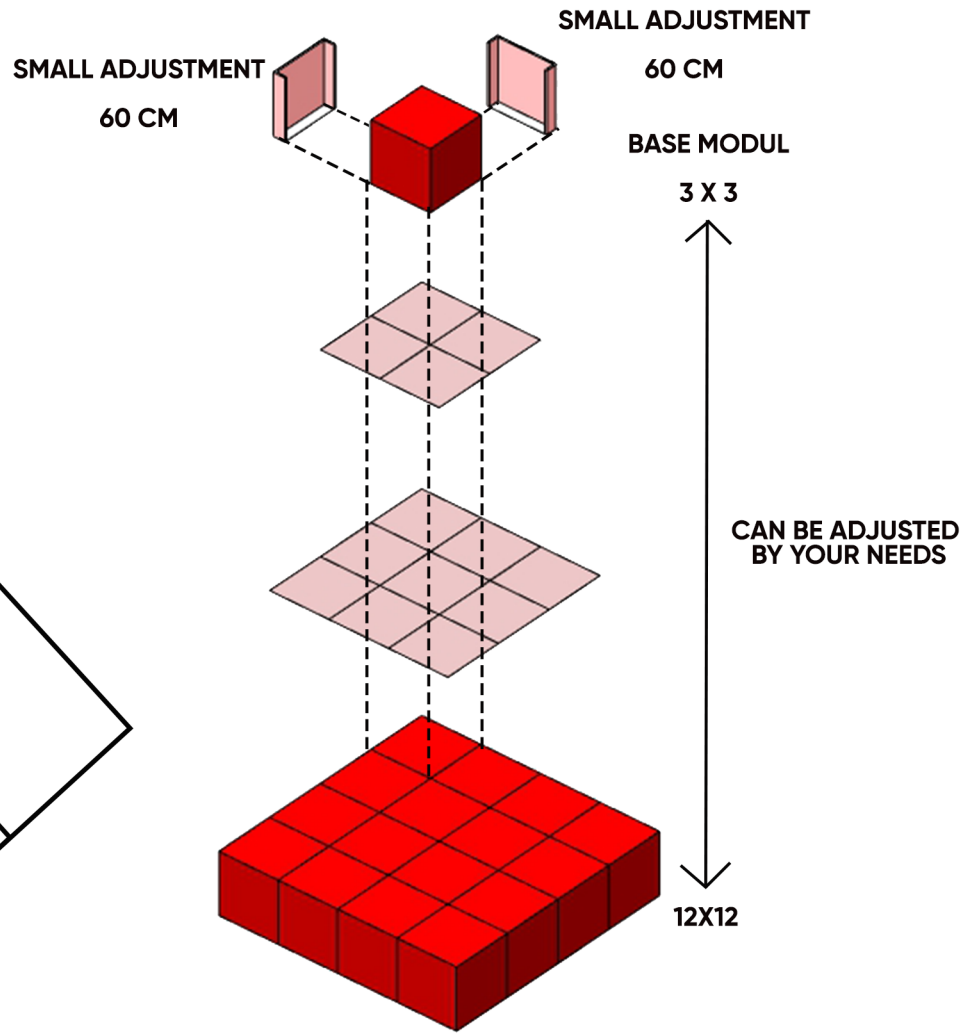
3.5 OPEN PLAN DESIGN



MODULAR UNI
USER PREFERE

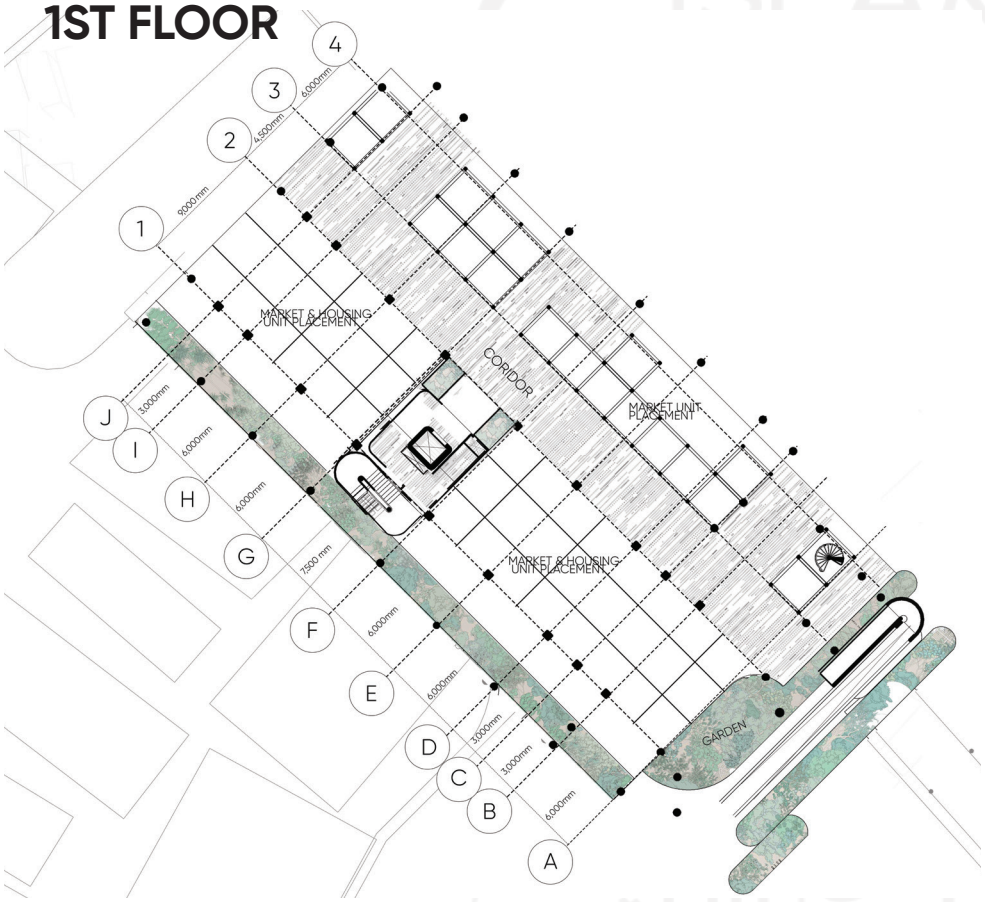


T PLACEMENT BASE ON THE
NCES

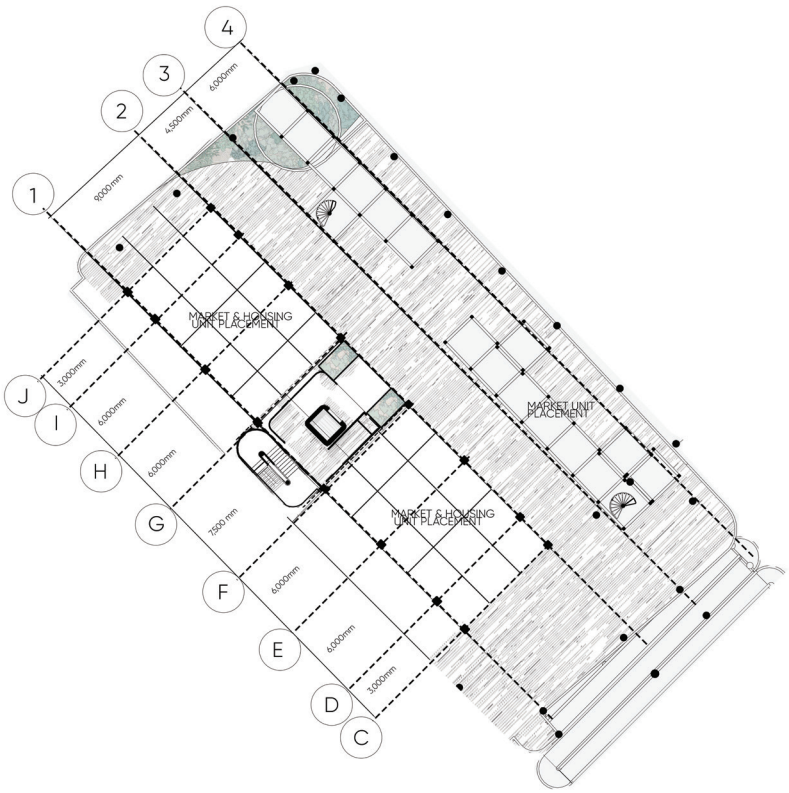


FLOOR PLAN

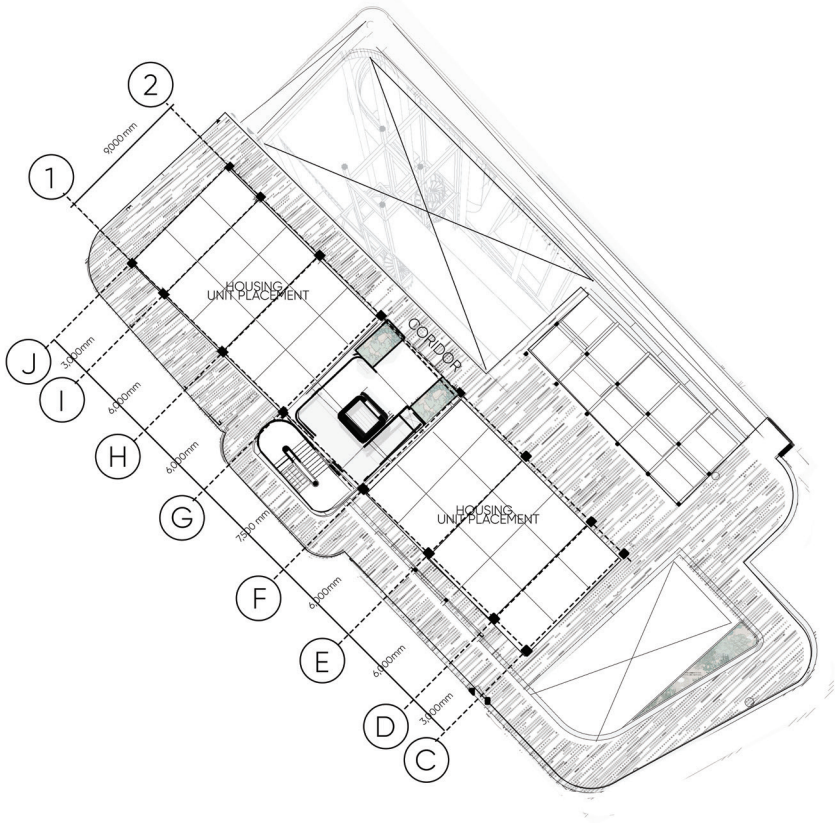
1ST FLOOR



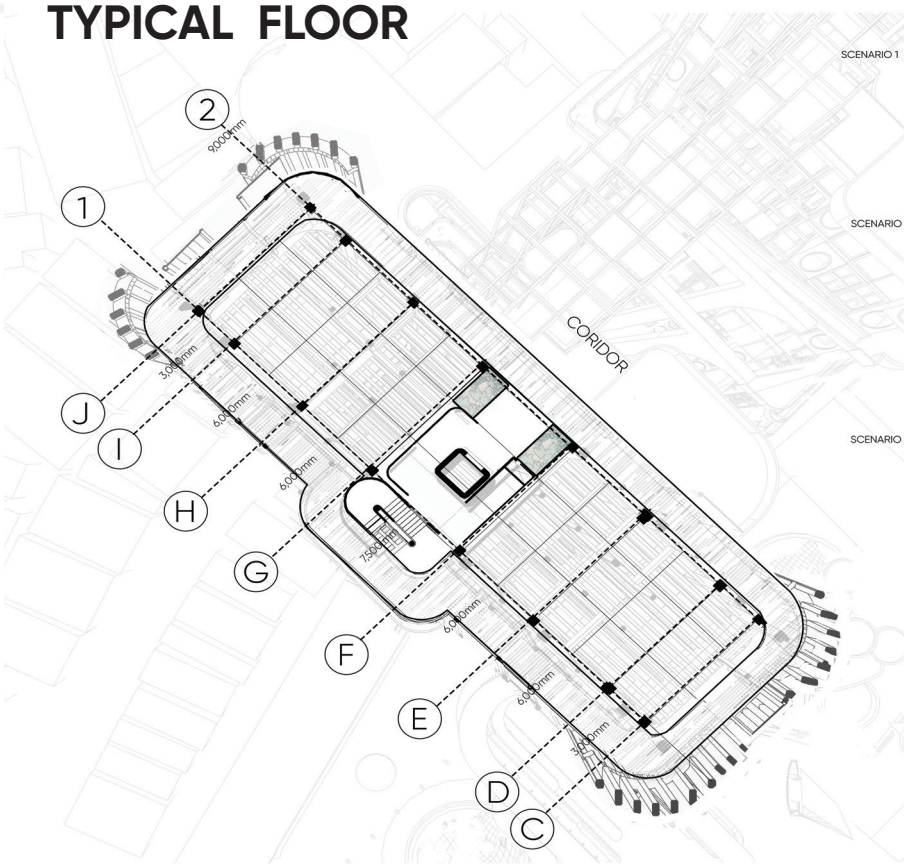
2ND FLOOR

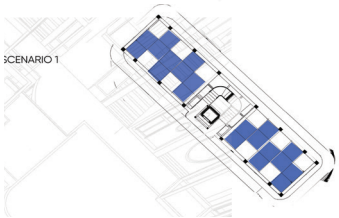


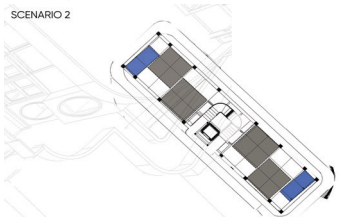
3RD FLOOR

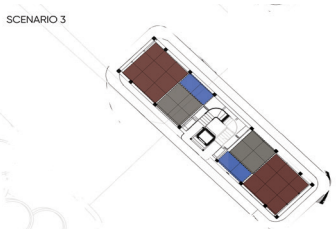


TYPICAL FLOOR





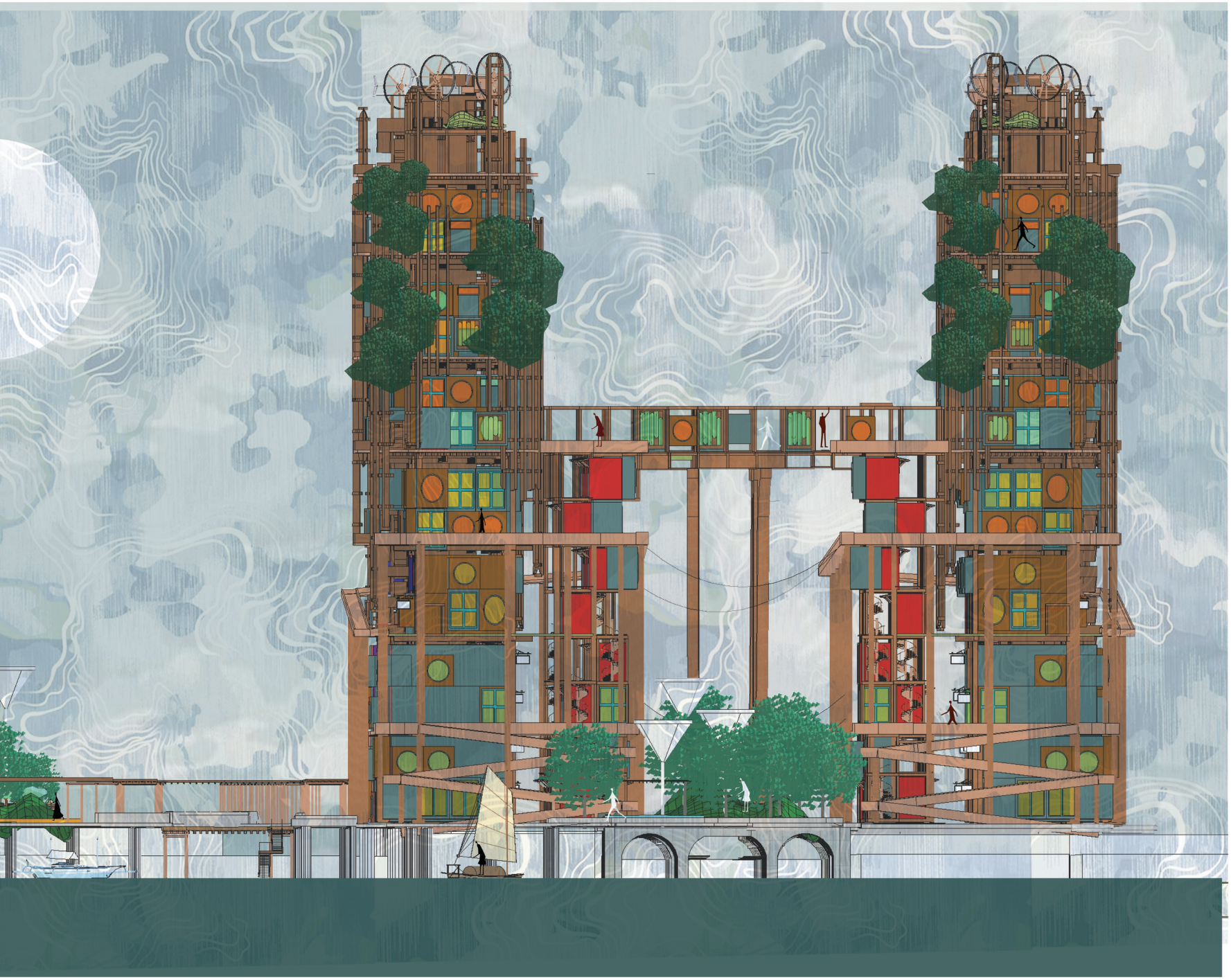




3.6

BUILDING ELEVATION





FRONT ELEVATION

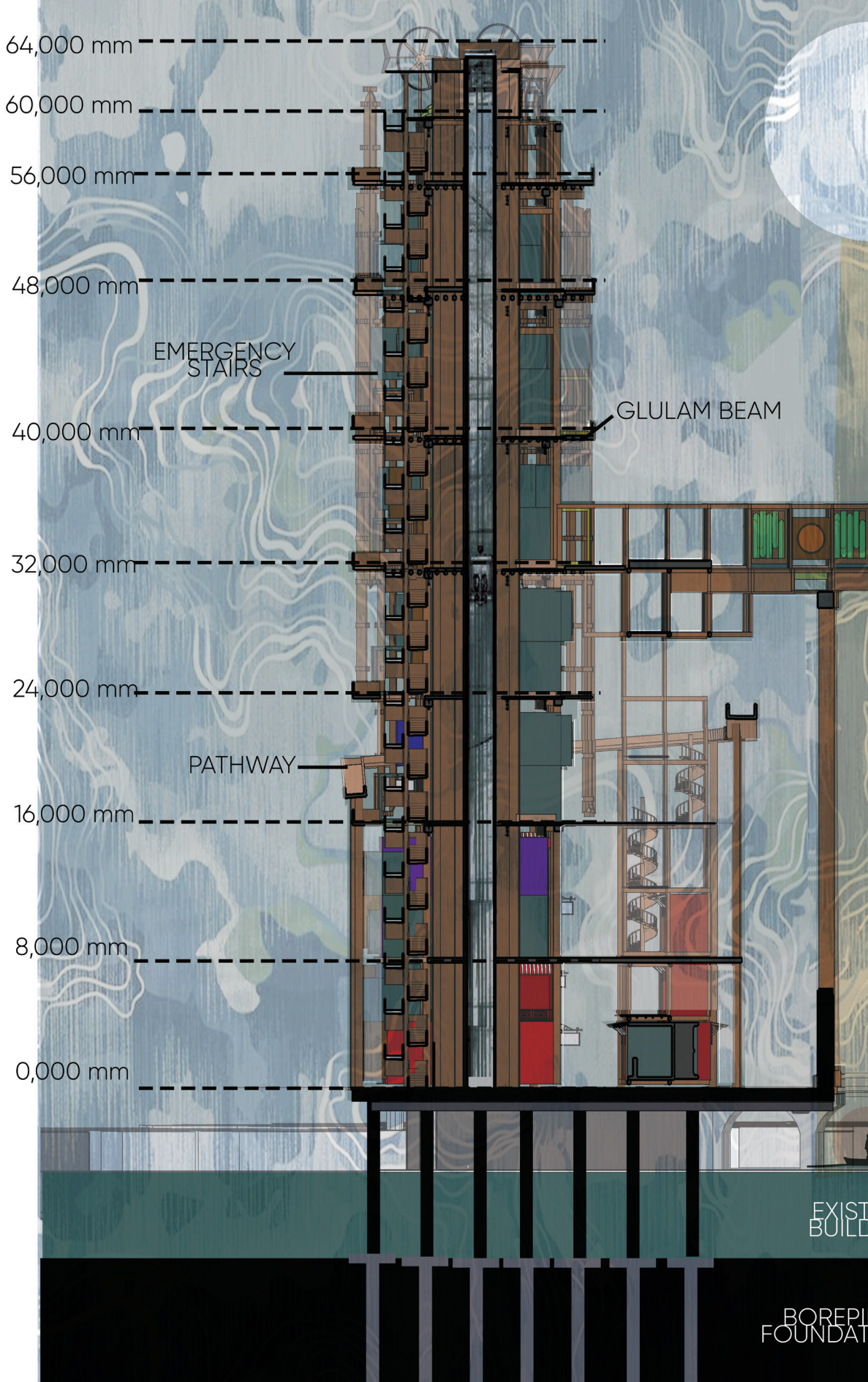


SIDE ELEVATION



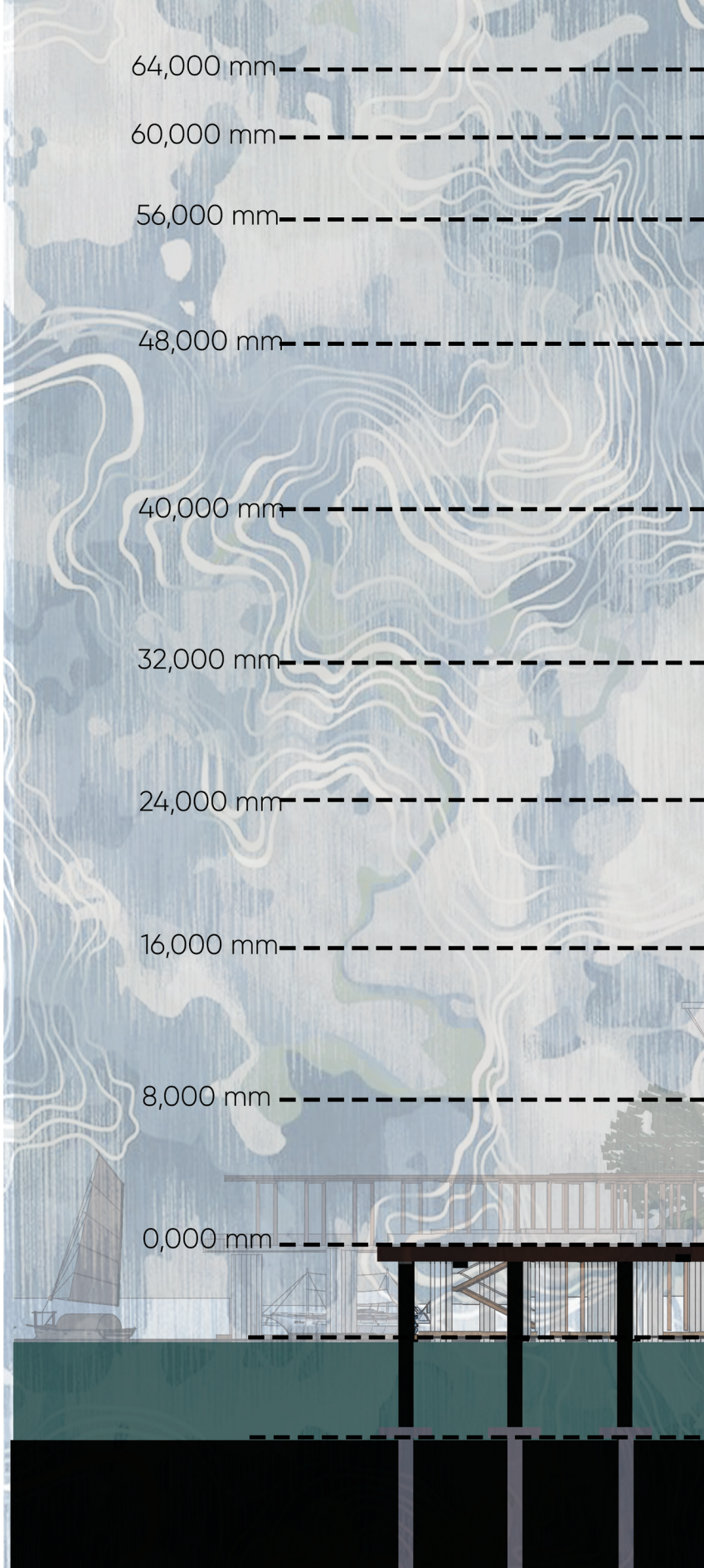
BACK ELEVATION

BUILDING SECTION
A-A



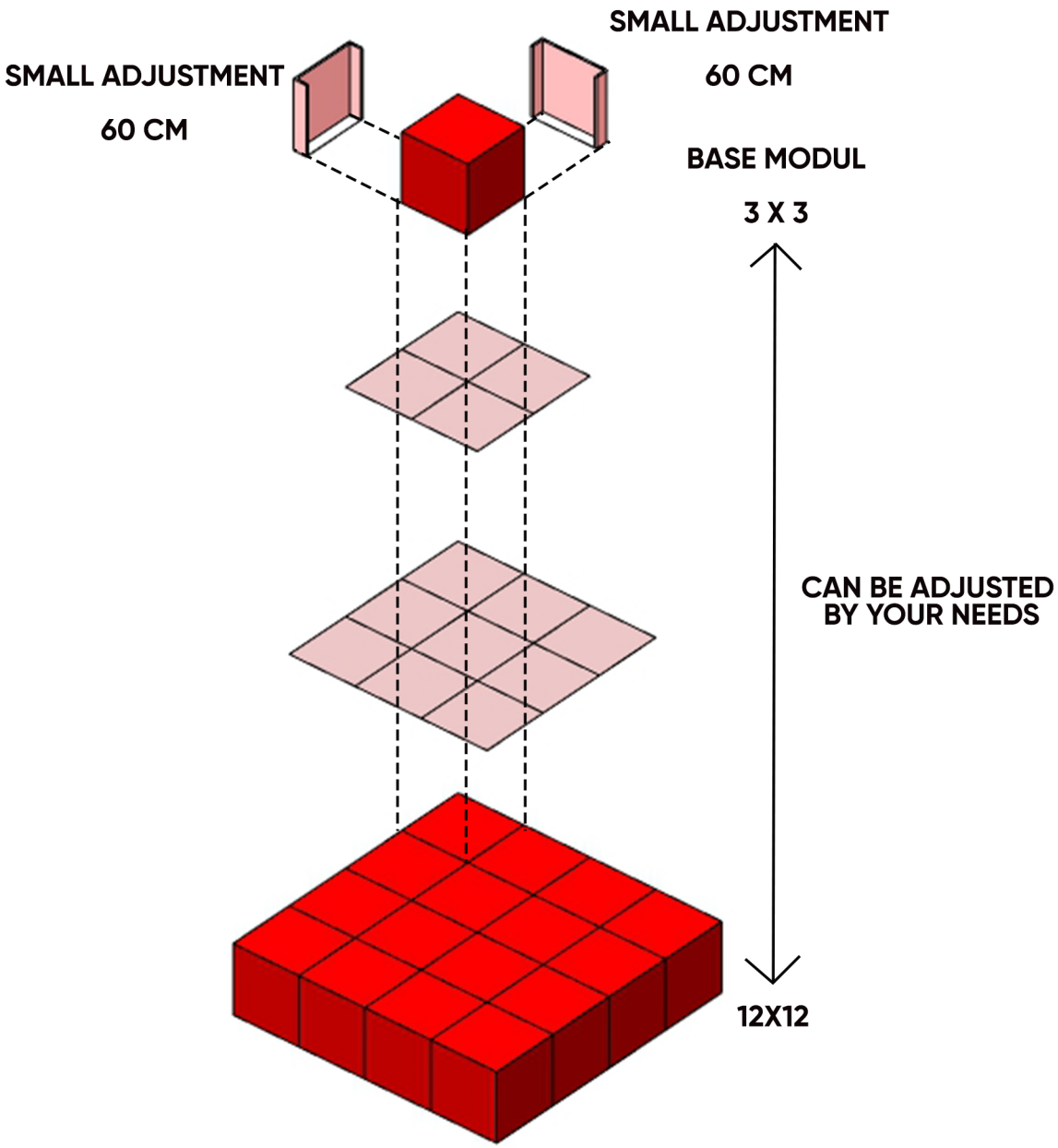

GLULAM
COLUMN

BUILDING SECTION
B-B

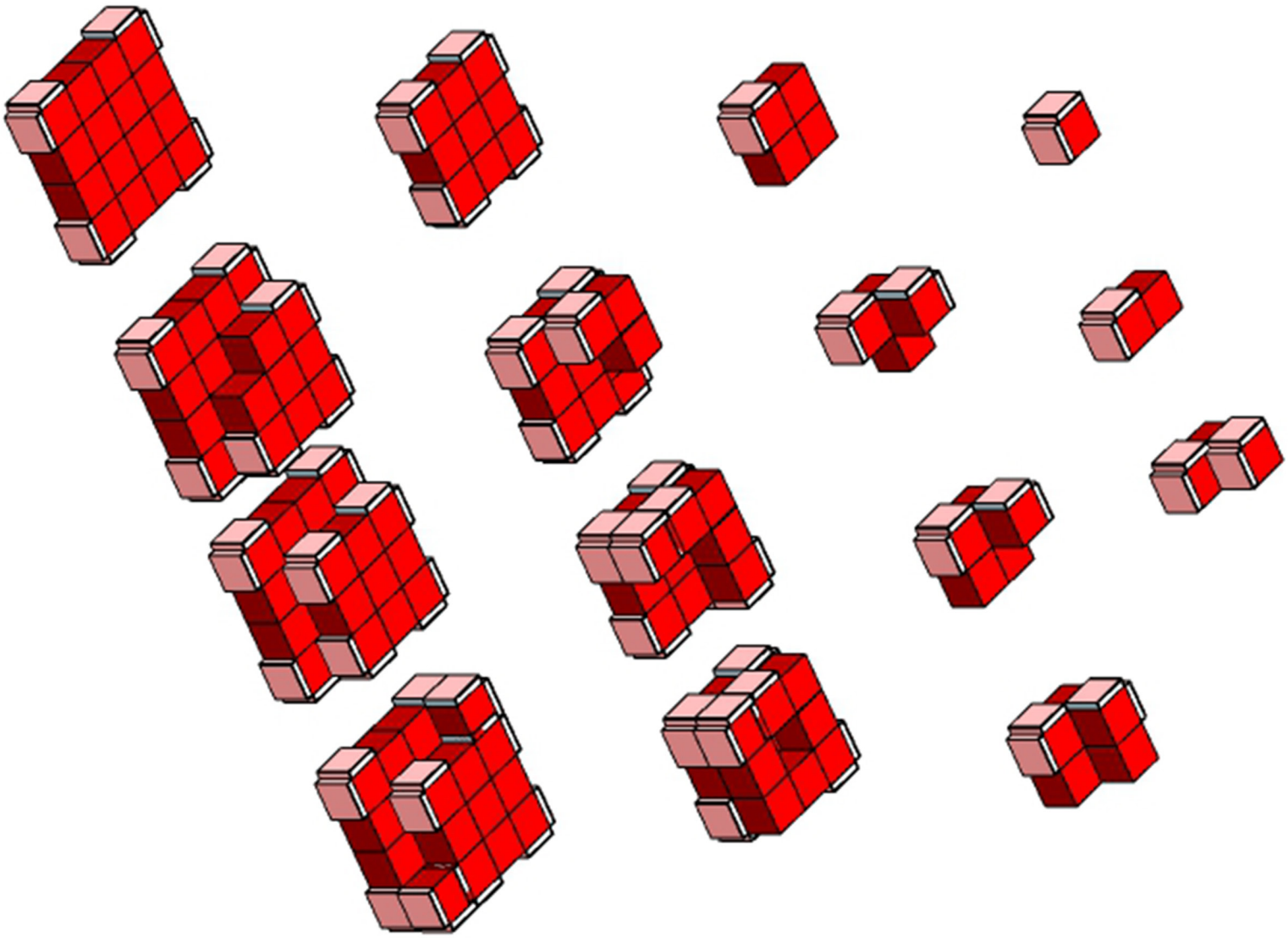



WIND TURBINE
RAINWATER COLLECTOR
RAIN WATER TANK
HANGING GARDEN
ELEVATOR SHAFT
ELEVATED PATHWAY
GLULAM COLUMN
GLULAM BEAM
CONCRETE COLUMN
BORED PILE
FOUNDATION

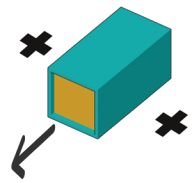
3.7 Adjustable Module Concept

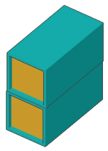


CUSTOMIIZATIOM POSIBILITYS

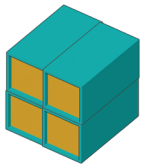


HOUSING
SOURCE MODULES

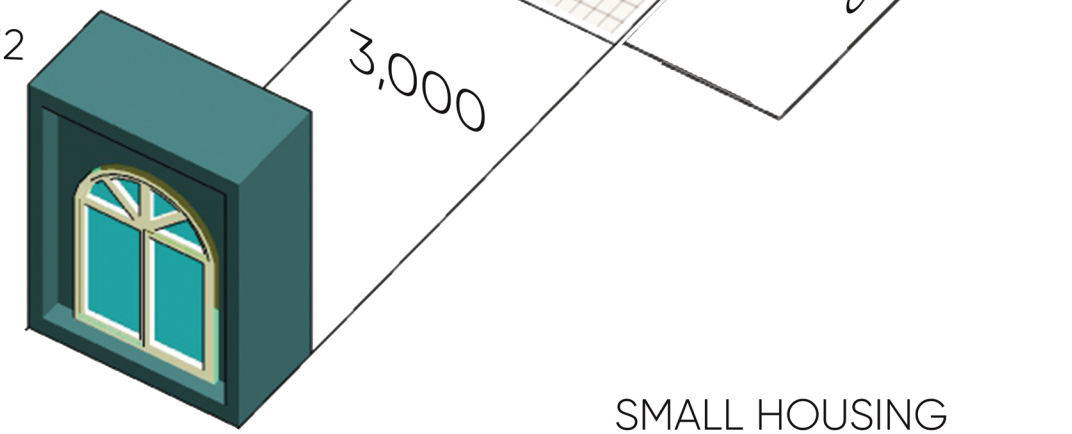




36 M2



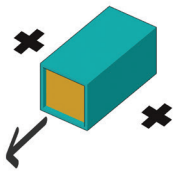
72 M2



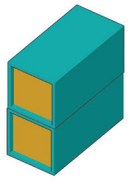
SMALL HOUSING
MODULE 3X6

FOR 1-2 PEOPLE

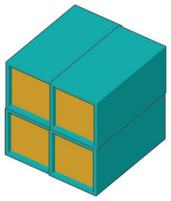
HOUSING
DEVELOPED MODULE



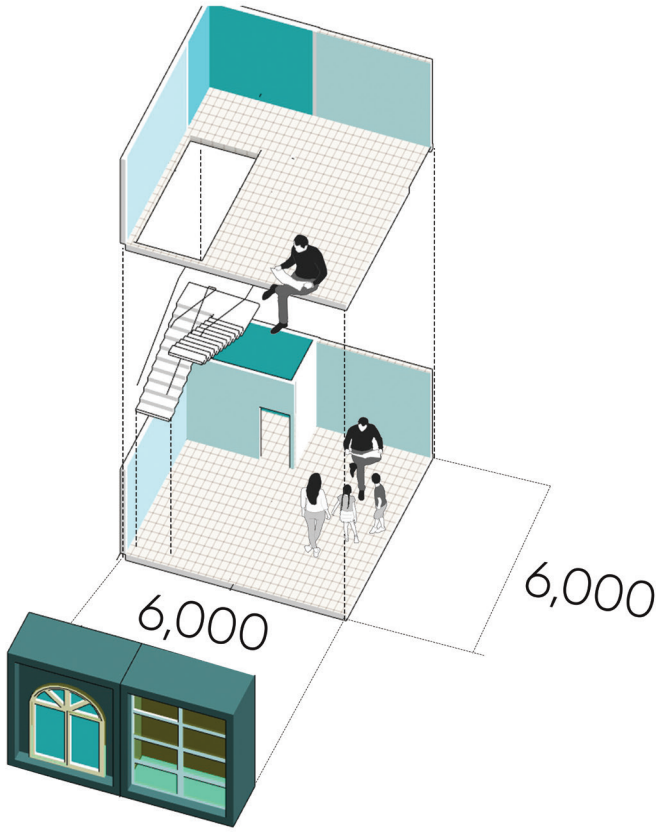
18 M2



36 M2

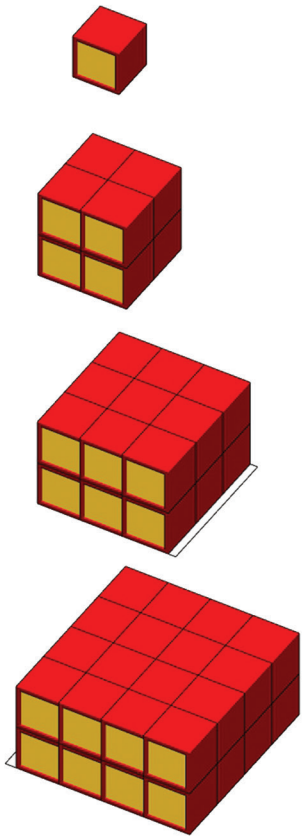


72 M2



LARGE HOUSING
MODULE 6X6

MARKET/VENDOR
SOURCE MODULES

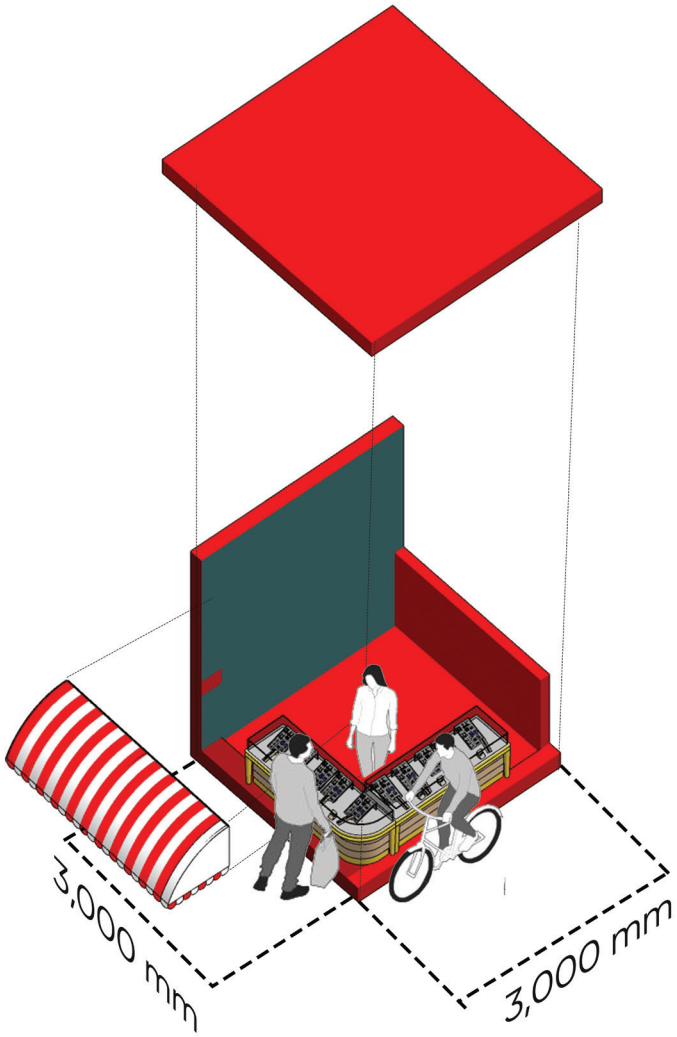


9 M2

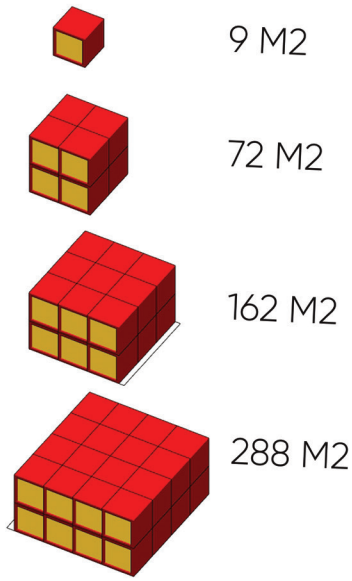
72 M2

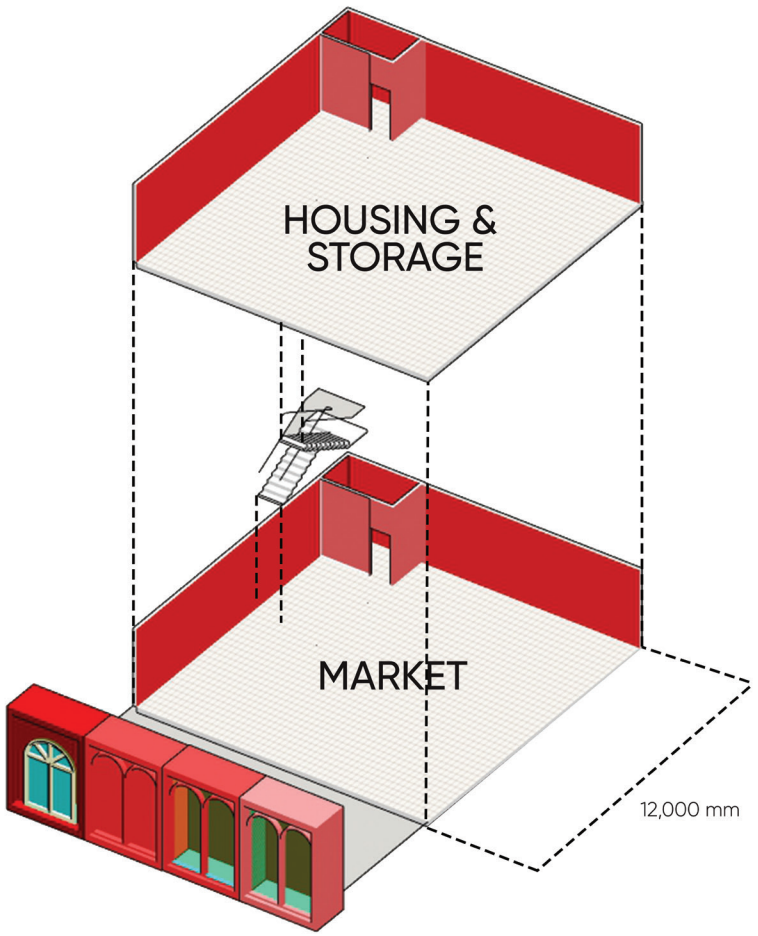
162 M2

288 M2

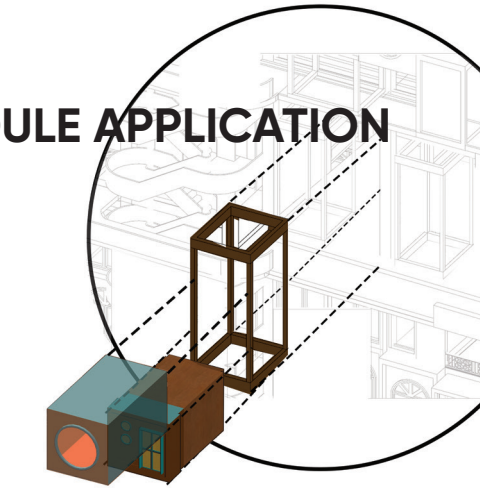


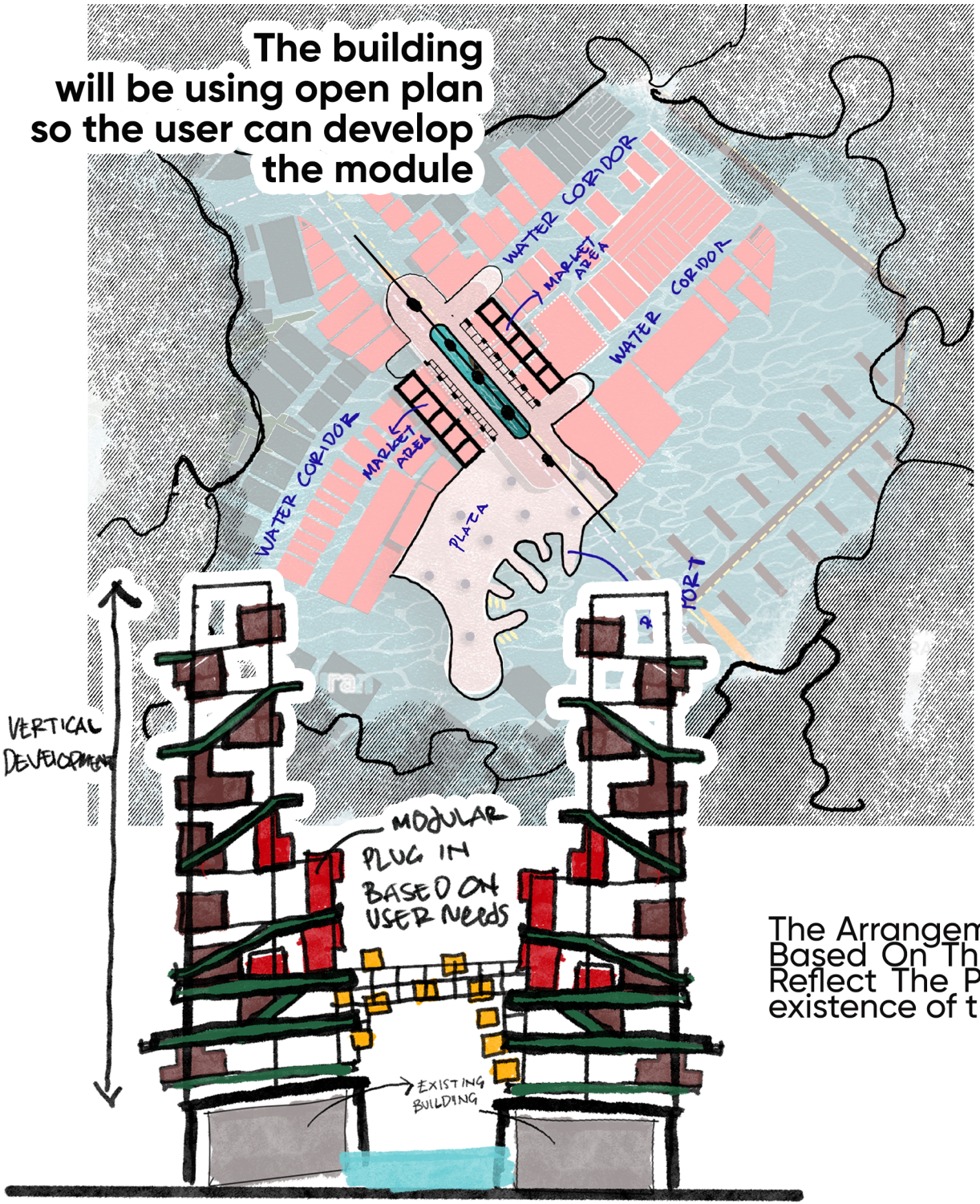
MARKET/VENDOR/HOUSING SOURCE MODULES





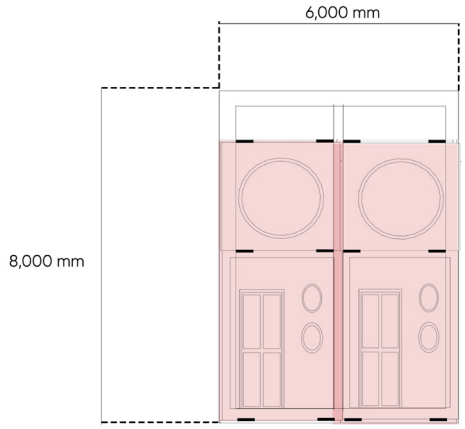
3.8 Building Space Arragement

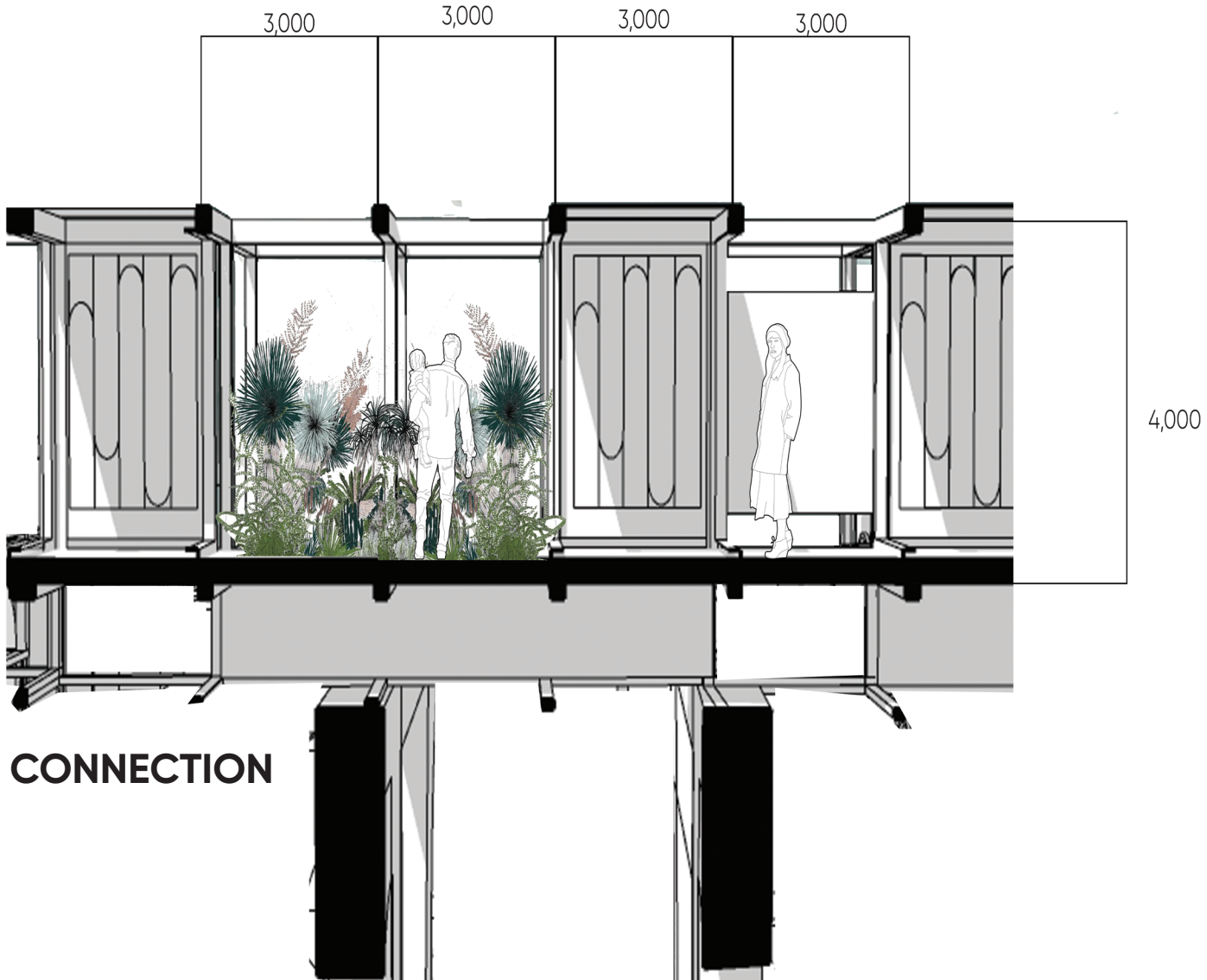




The Arrangement Of The Spaces Is Based On The Existing Building To Reflect The Past And increase the existence of the area

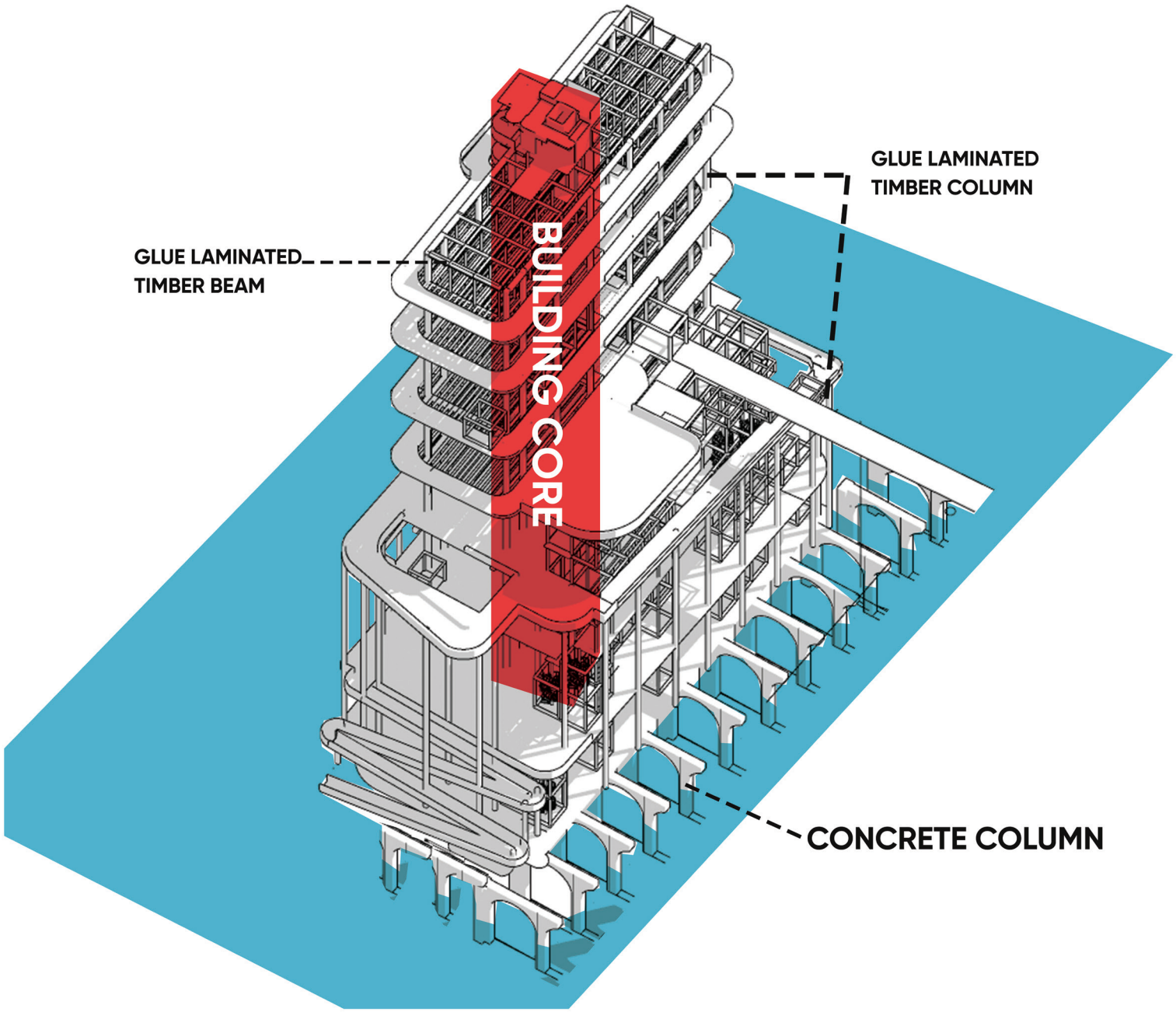




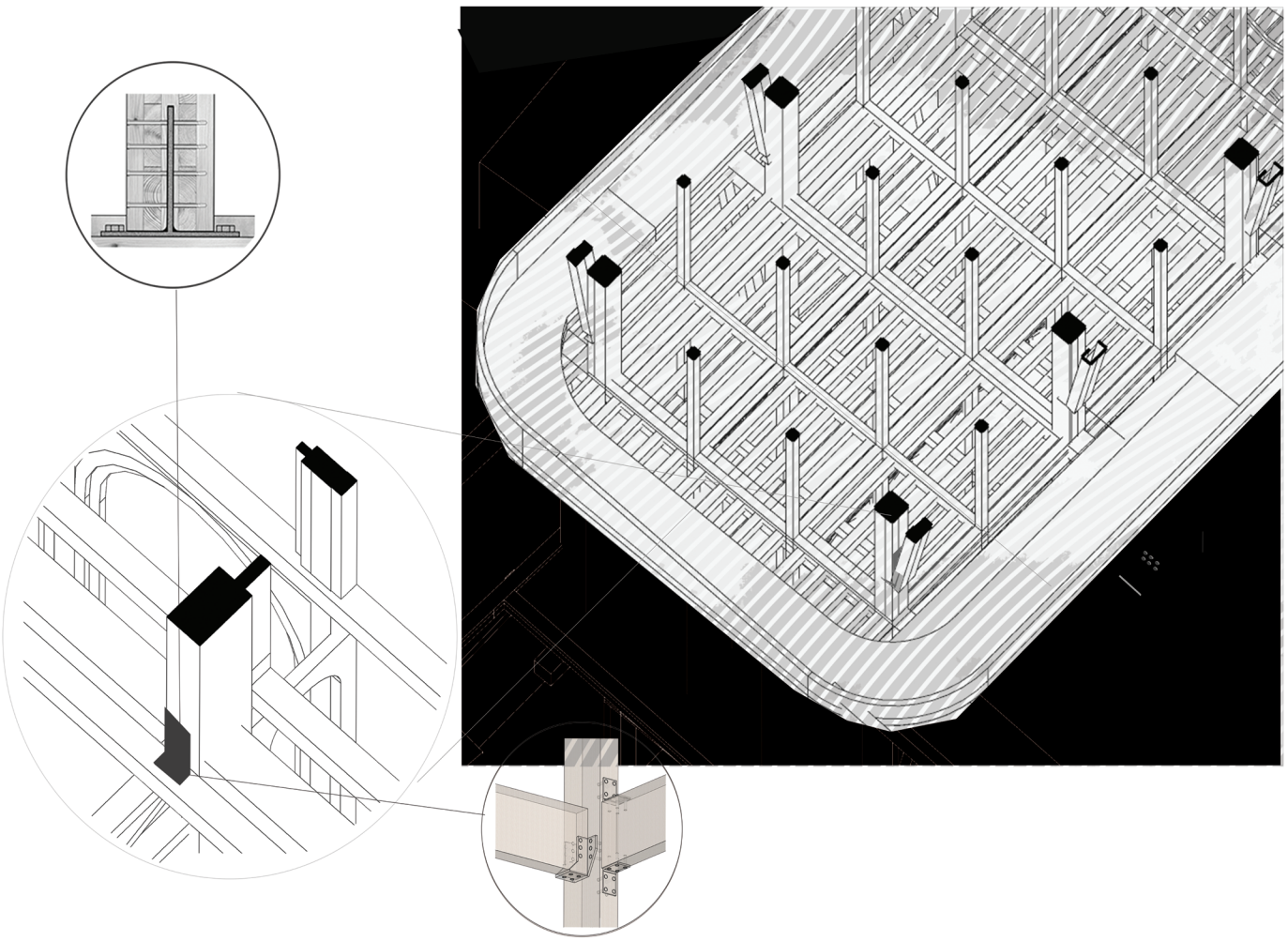


BETWEEN BUILDING CONNECTION

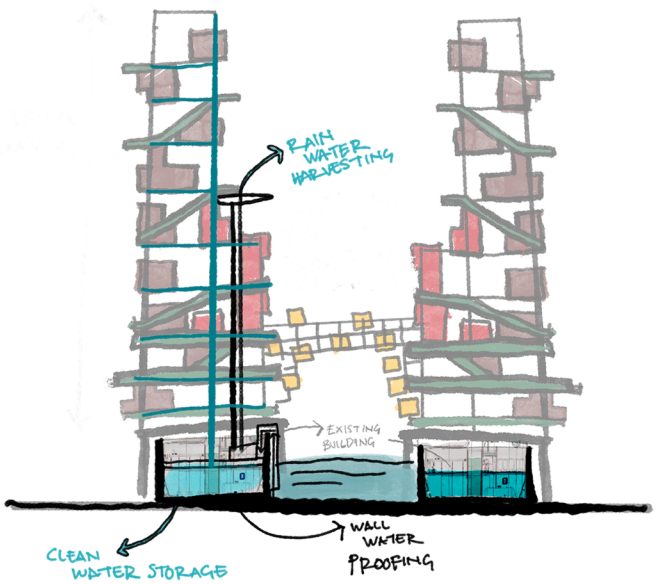
3.9 STRUCTURAL ANALYSIS



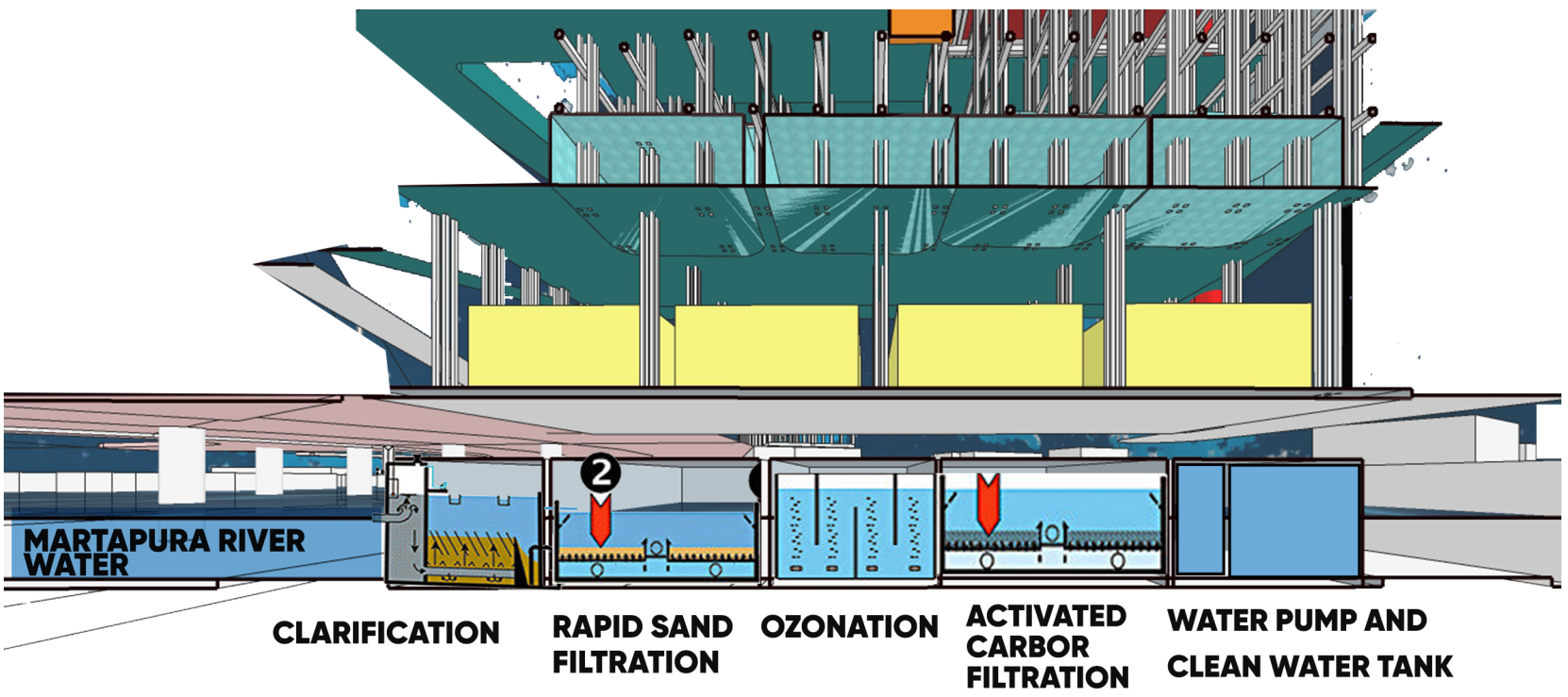
STRUCTURAL DETAIL



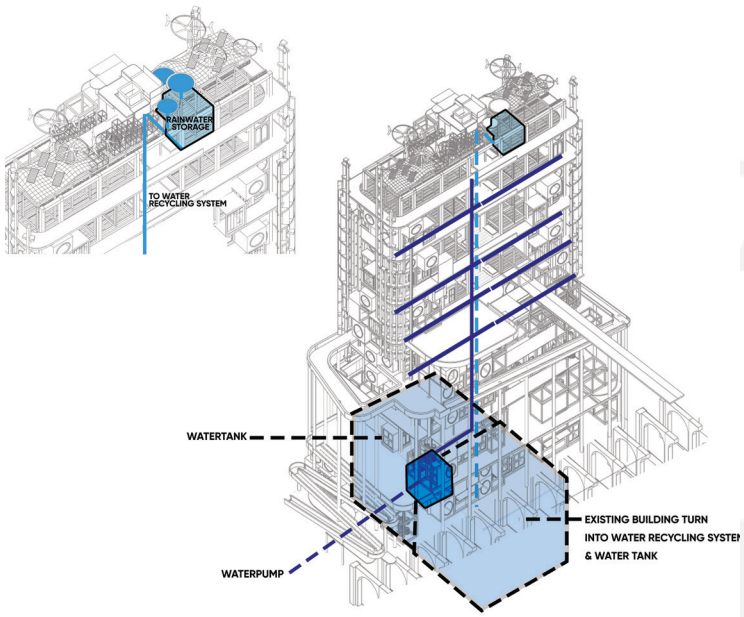
3.10 Infrastructure System



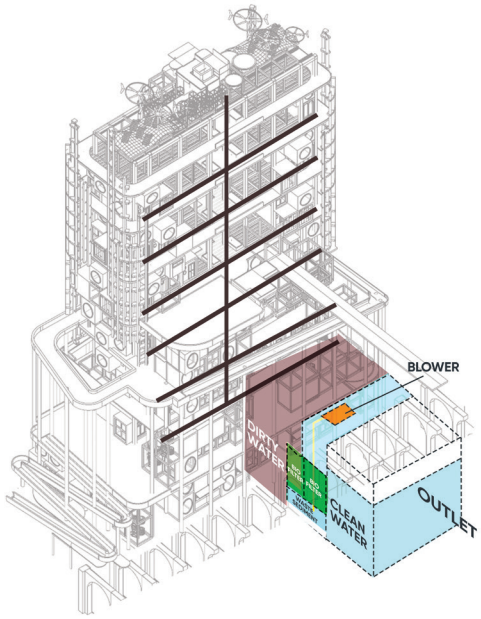
TURN THE EXISTING BUILDING WATER FILTRATION SYSTEM FOR CLEAN WATER



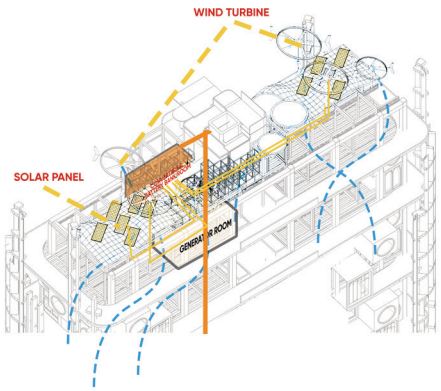
CLEAN WATER SCHEME

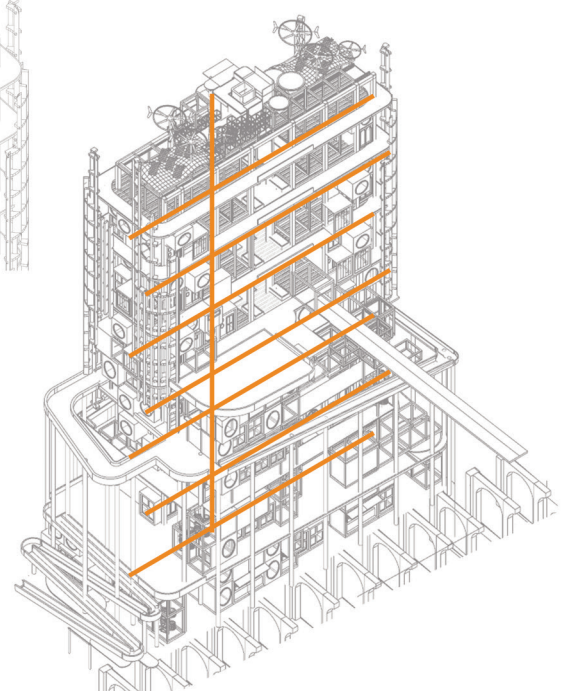


WASTE MANAGEMENT SCHEME

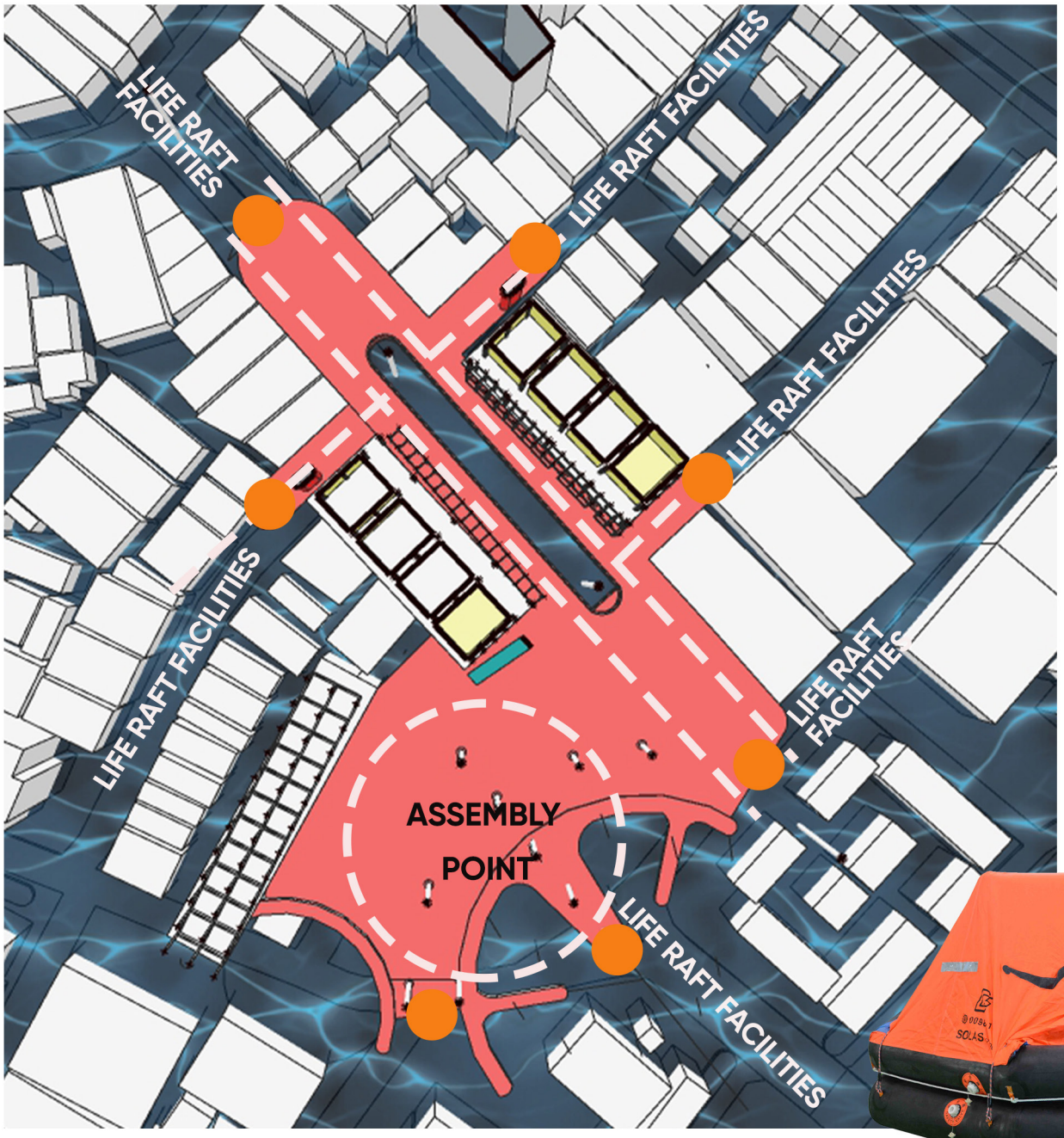


RENEWABLE ENERGY SCHEME



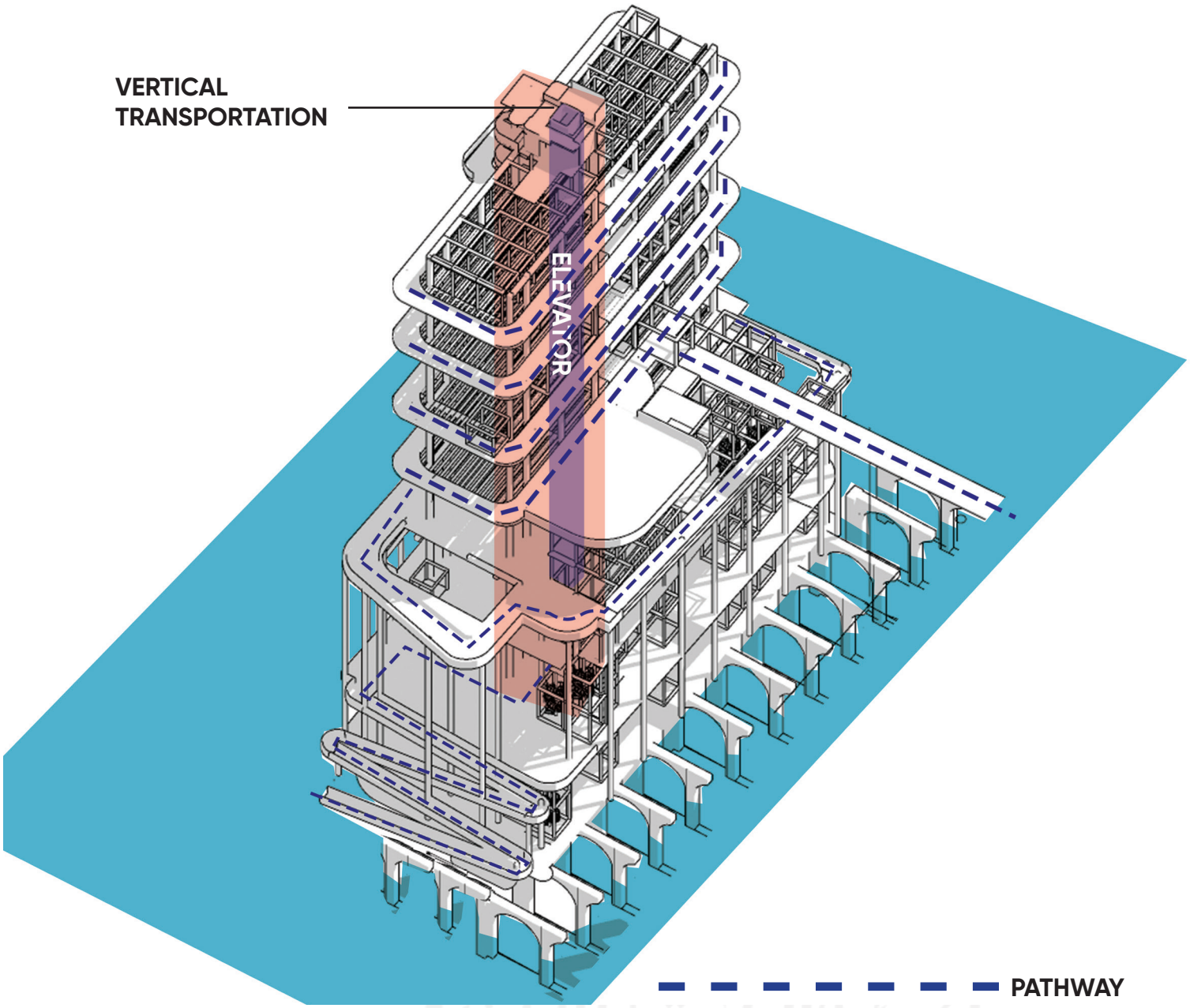


3.11 Building Safety



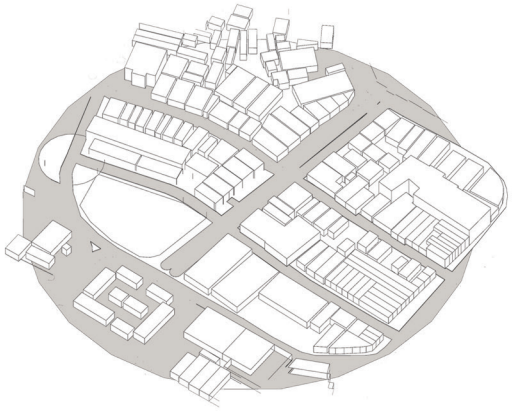
SCHEMATICS OF HOW THE ROUTE AND FACILITY CAN BE USE IF THARE ARE AN EMERGENCY





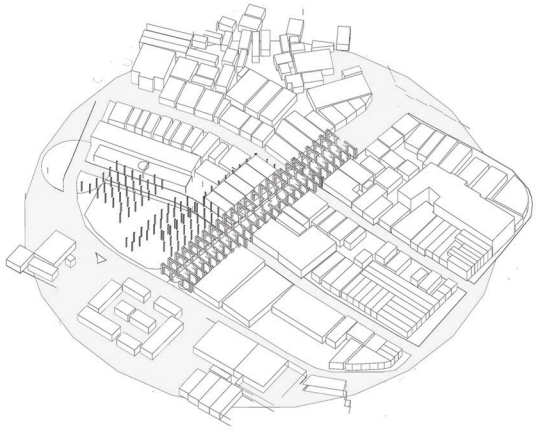
BUILDING MOBILITY SCHEME

BUILDING PHASE



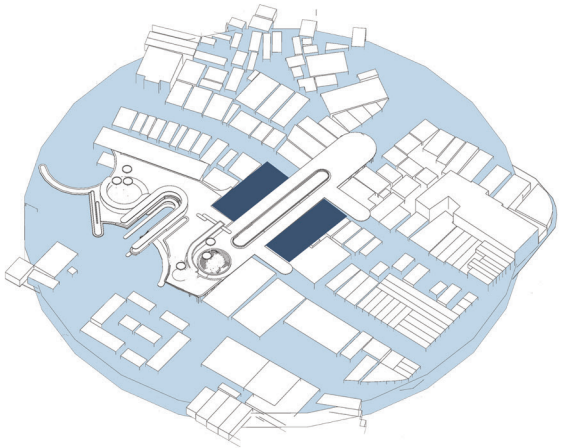
EXISTING CONDITION

the existing condition is a trading center so many activities cannot be disturbed.



PLANTING NEW COLUMN

Construction starts from the center by embedding concrete columns, to form the initial platform for the water colony

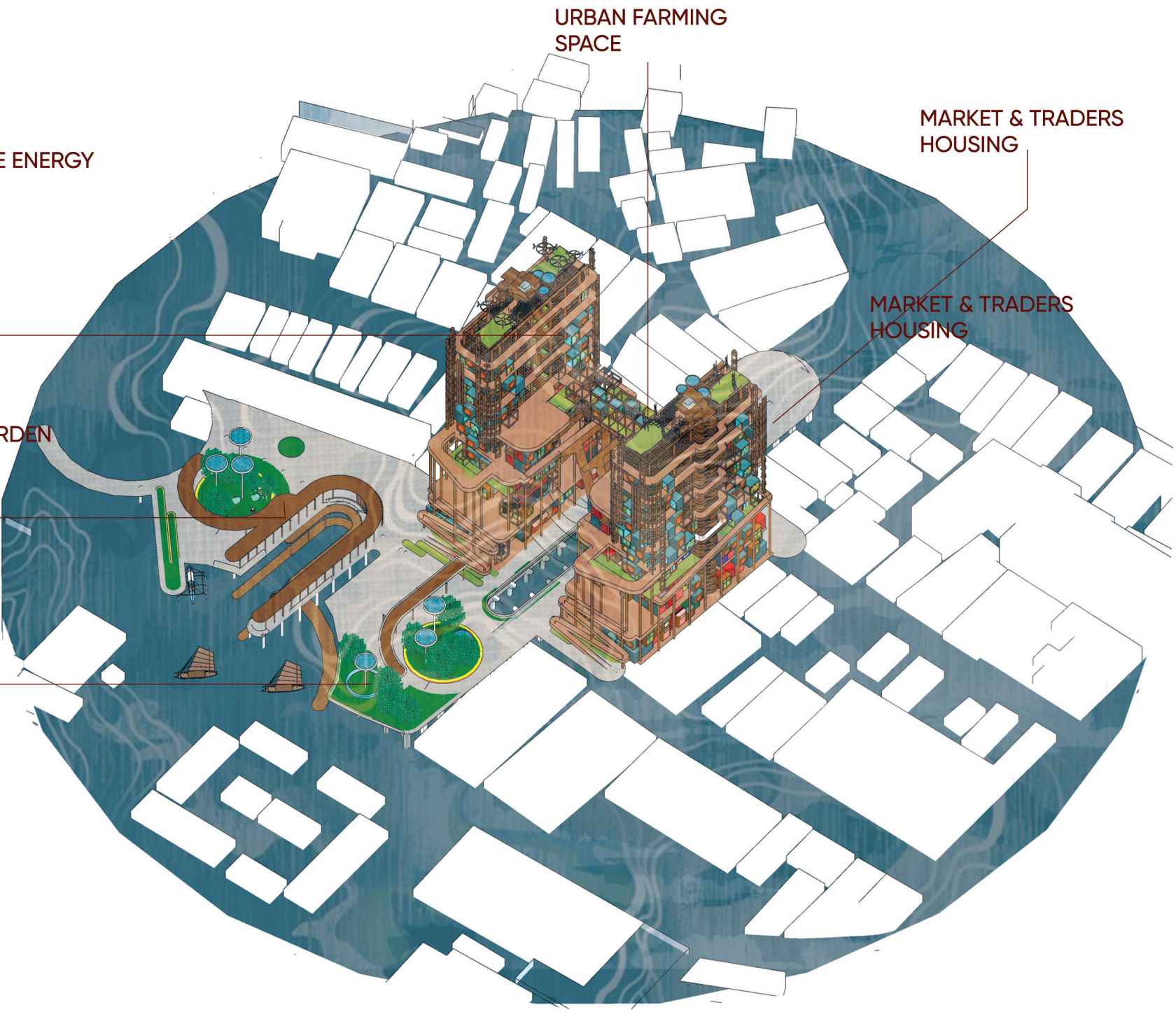


CREATING WATER COLONY PLATFORM

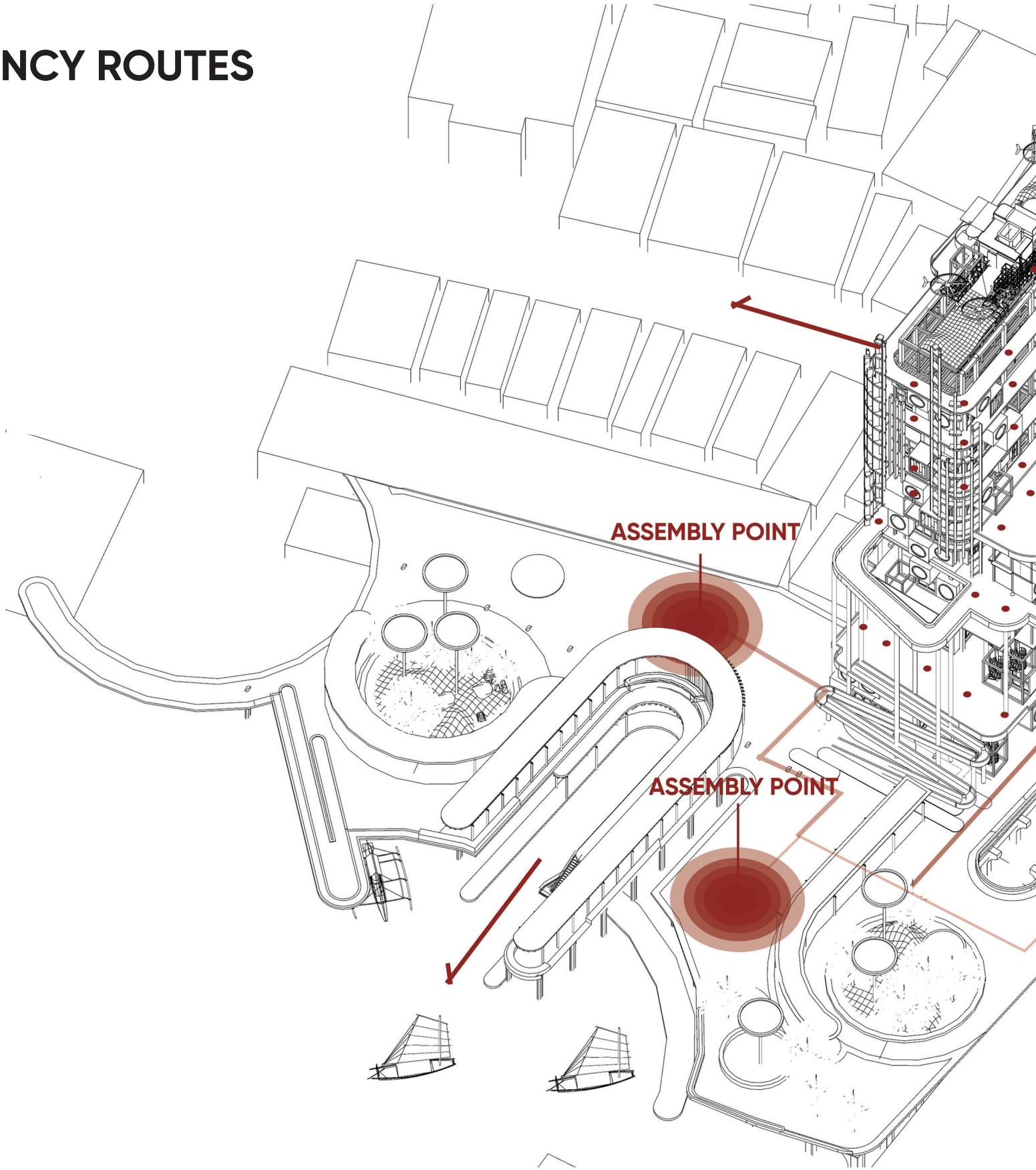
RENWABLE
SYSTEM

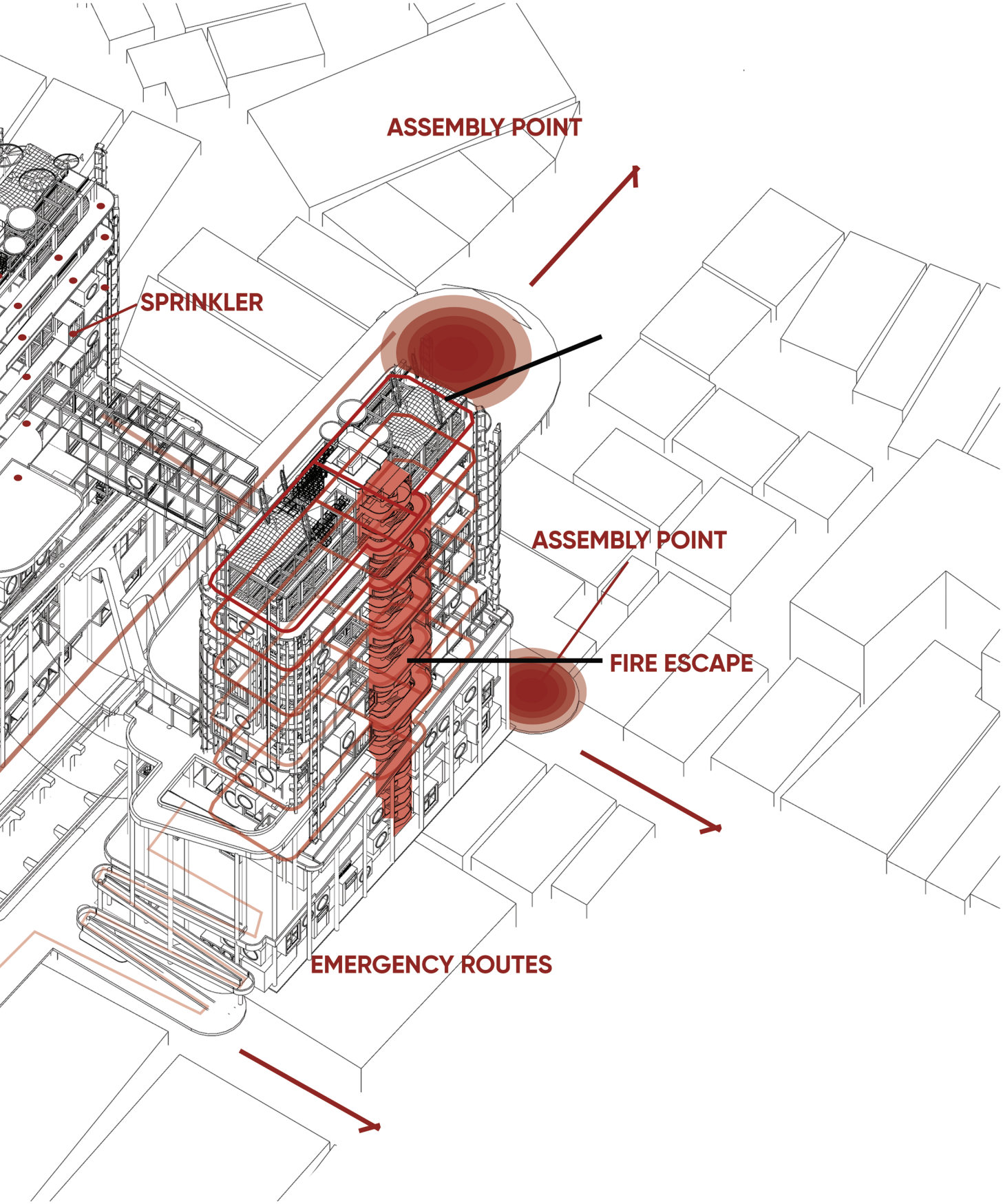
FLOATING GA

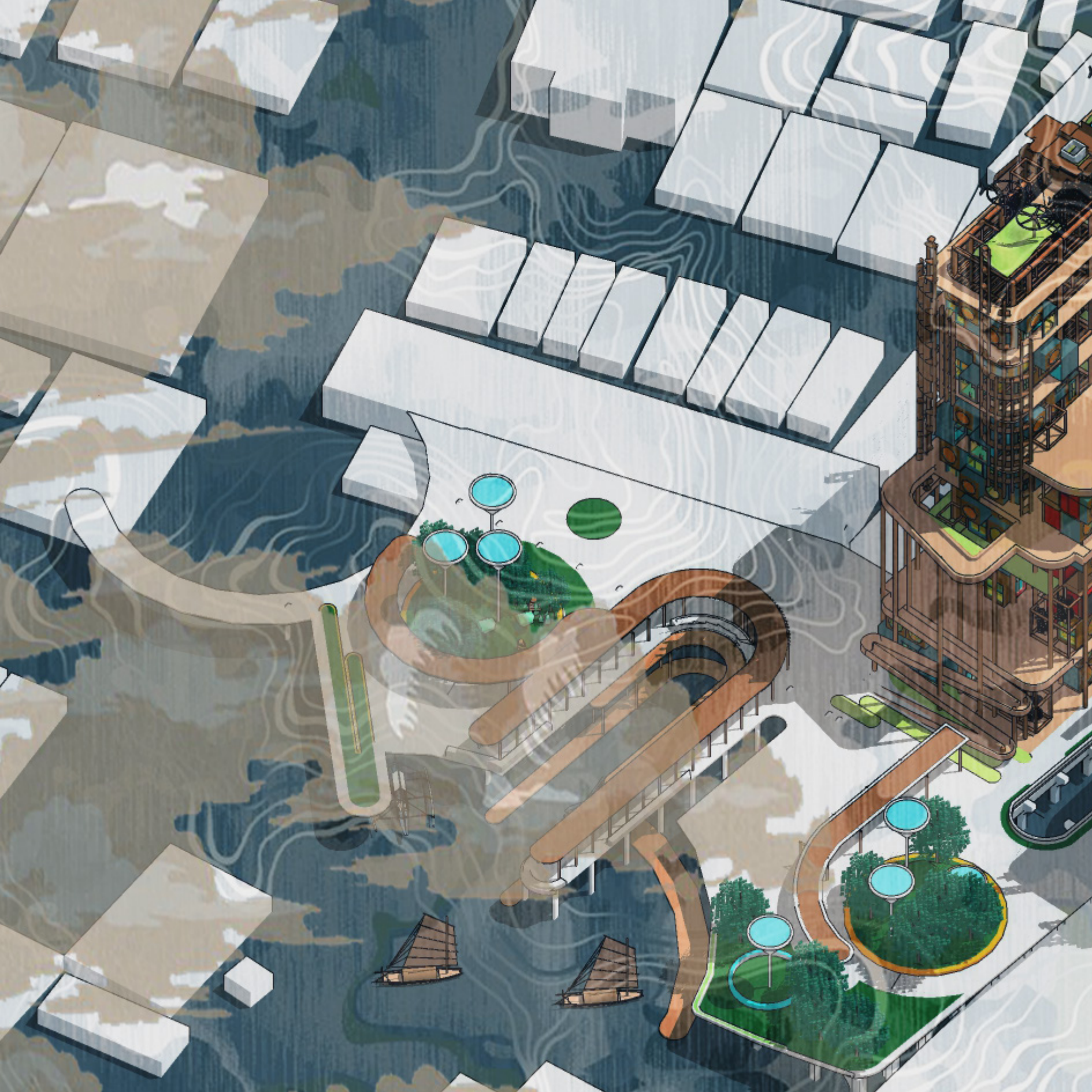
BOAT DOCKS


URBAN FARMING
SPACE
MARKET & TRADERS
HOUSING
E ENERGY
MARKET & TRADERS
HOUSING
RDEN

EMERGENCY ROUTES

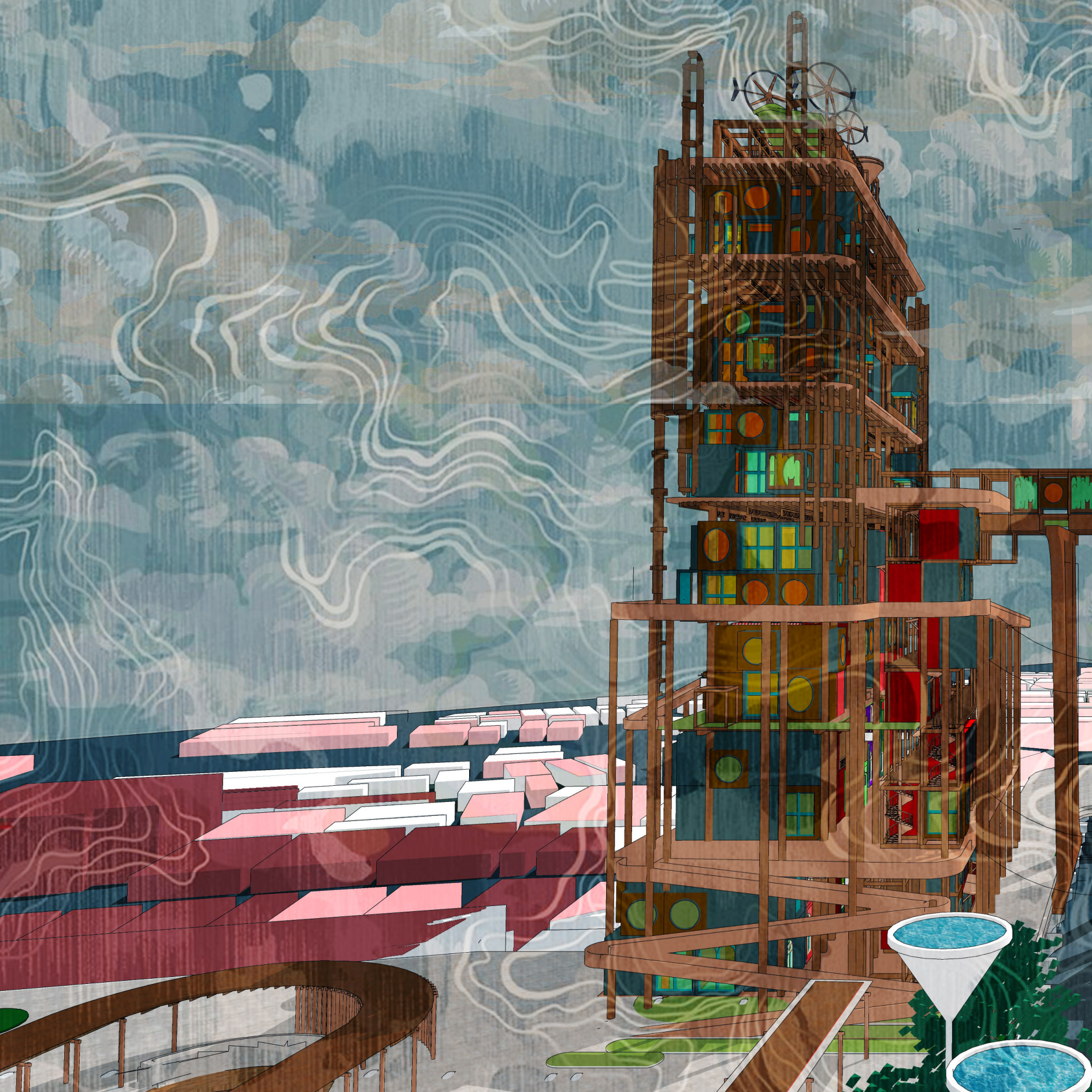


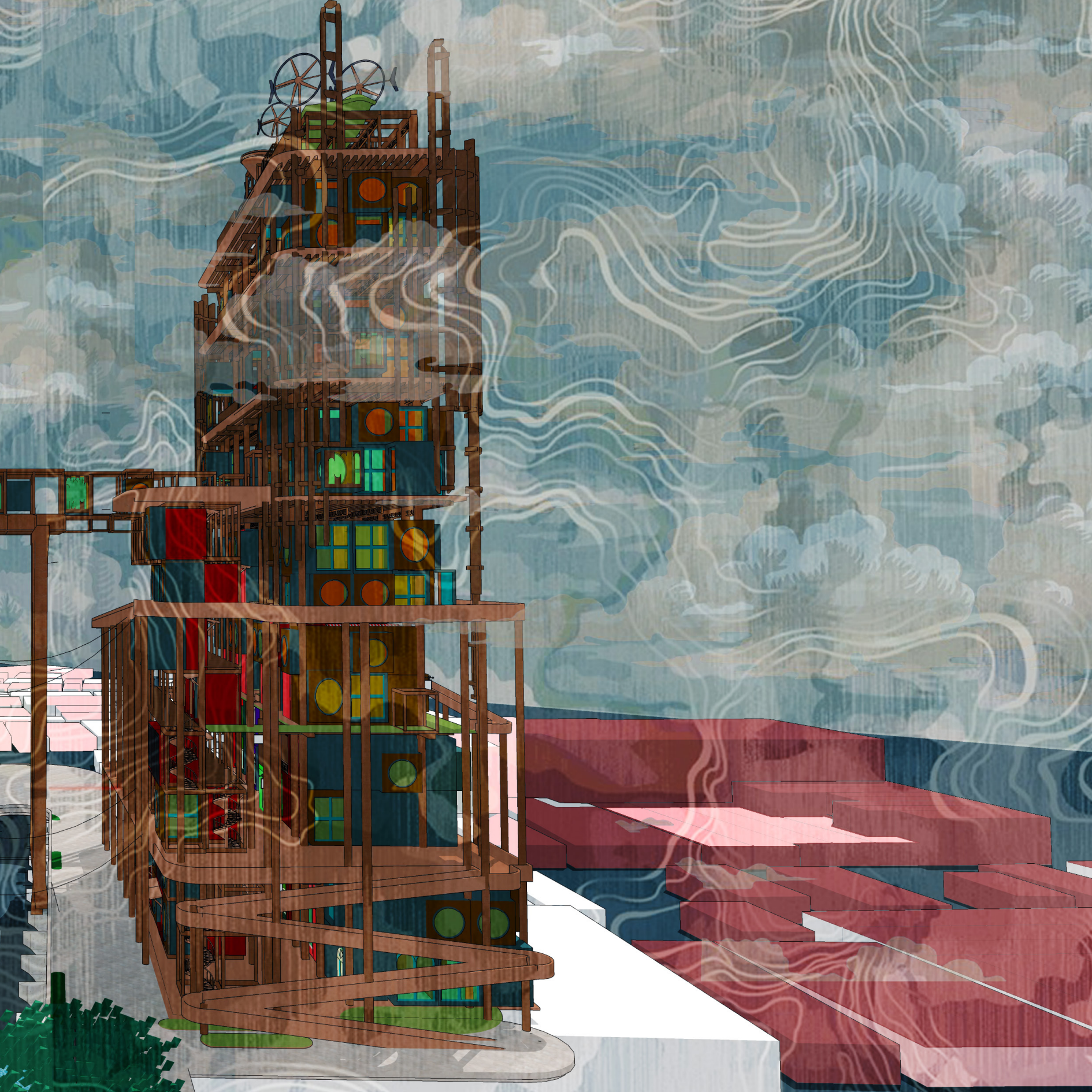

ASSEMBLY POINT
SPRINKLER
ASSEMBLY POINT
FIRE ESCAPE
EMERGENCY ROUTES





WATER COLONY











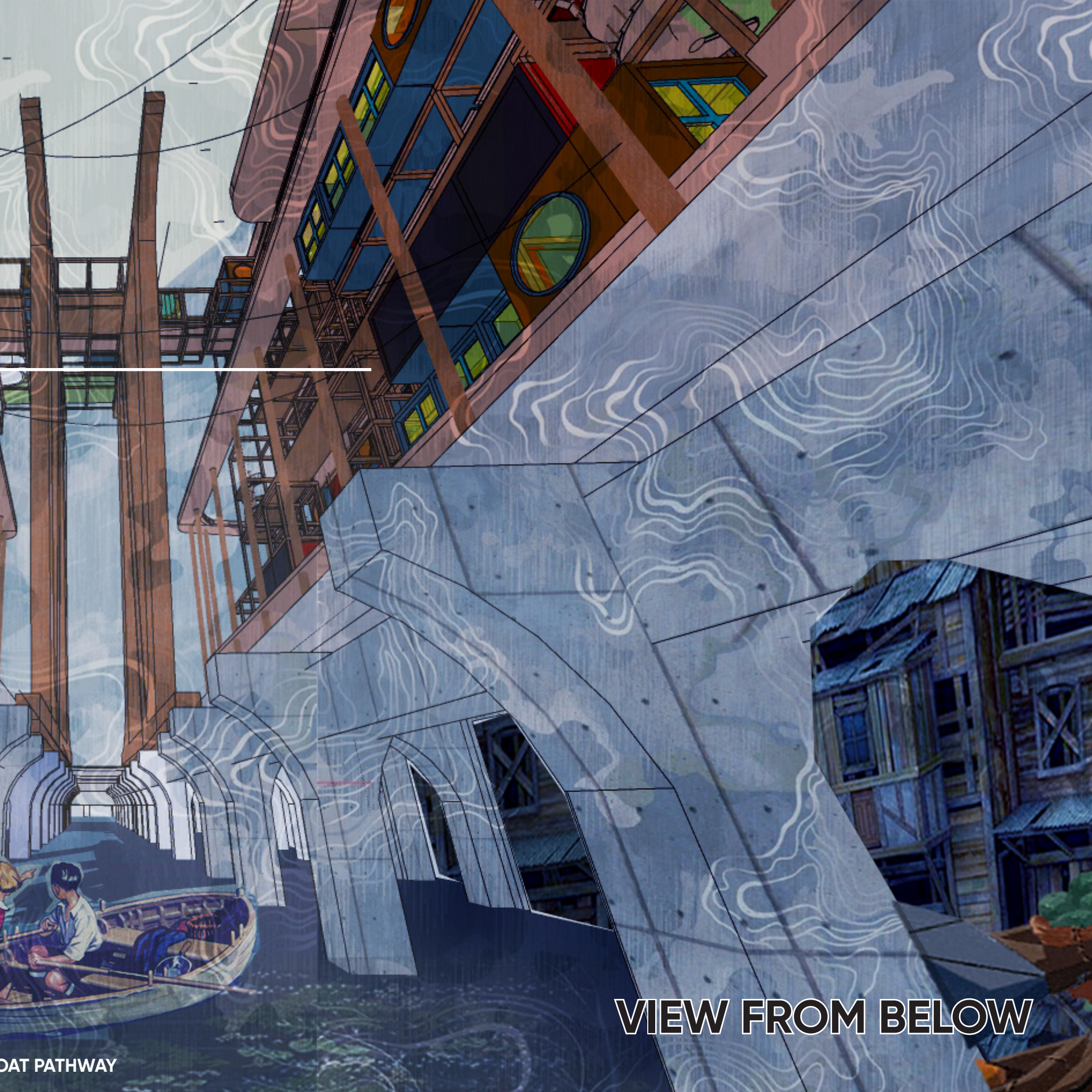



VIEW FROM THE BOAT DOCKS






THE PLAZA
OLD HISTORY OF
SUDIMAMPIR AREA



OAT PATHWAY


CORIDOR
ACTIVITY ON THE HOUSING ZONE


EMERGENCY STAIRS


PLANTING MEDI


IA
THE URBAN FARMING


THE PLAZA
SOTO BANJAR
NASI KUNING
ETUPAT
ANDANGAN


TOKO
SASIRANGAN
TOKO ROT
MIN-SENG






THE MARKET ZONE
MIX AREA MARKET


MARKET AREA
杂货铺的格格乖

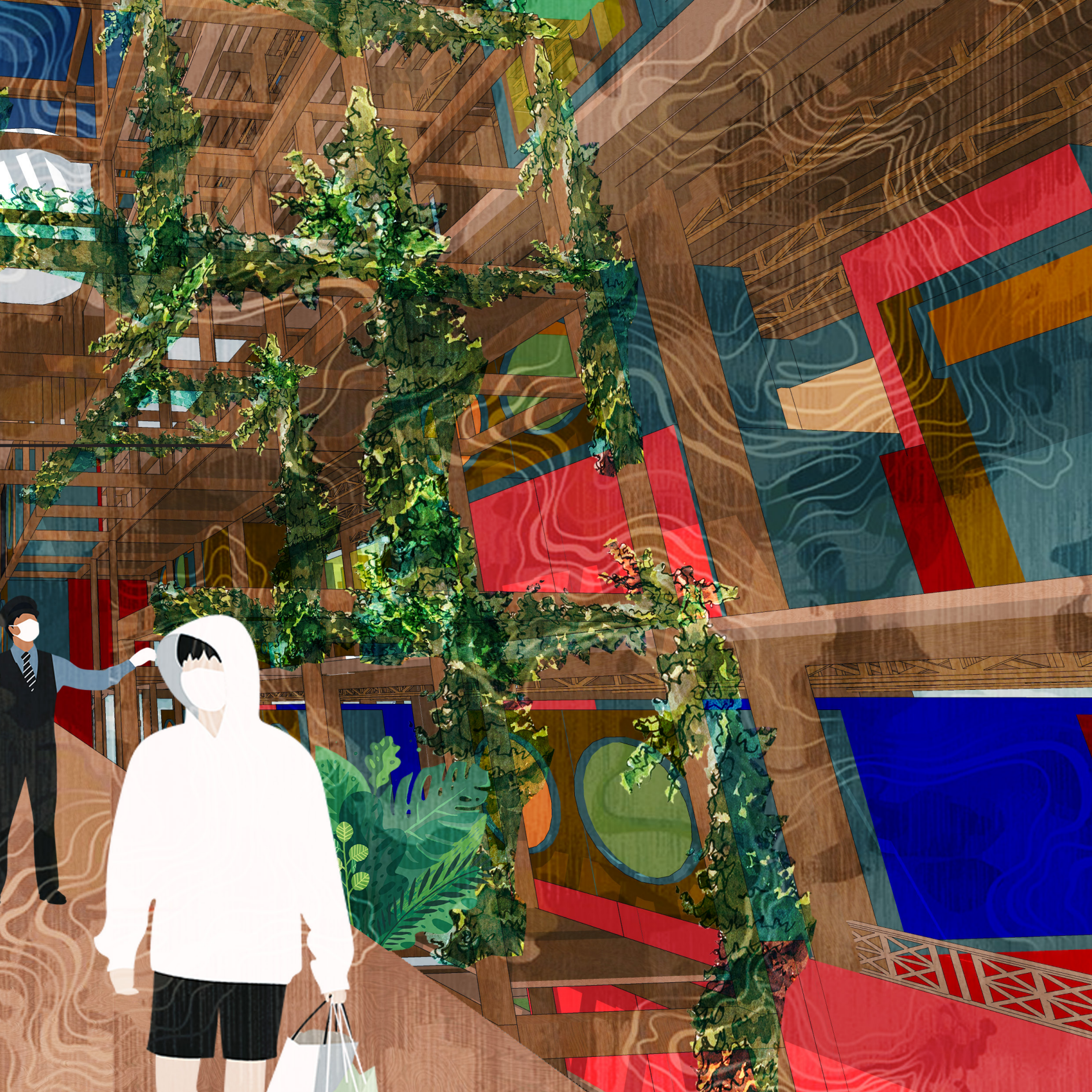

BUILDING PATHWAY






MODULAR HOUSING
HOUSING PATHWAY


HANGING PLANT
BUILDING PATHWAY




TOKO
EMAS
SEHAT SUBUR
FURNITURE


VIEW OF THE MARKET ZONE


BOAT DOCK
GARDEN


RAIN WATER HARVESTING

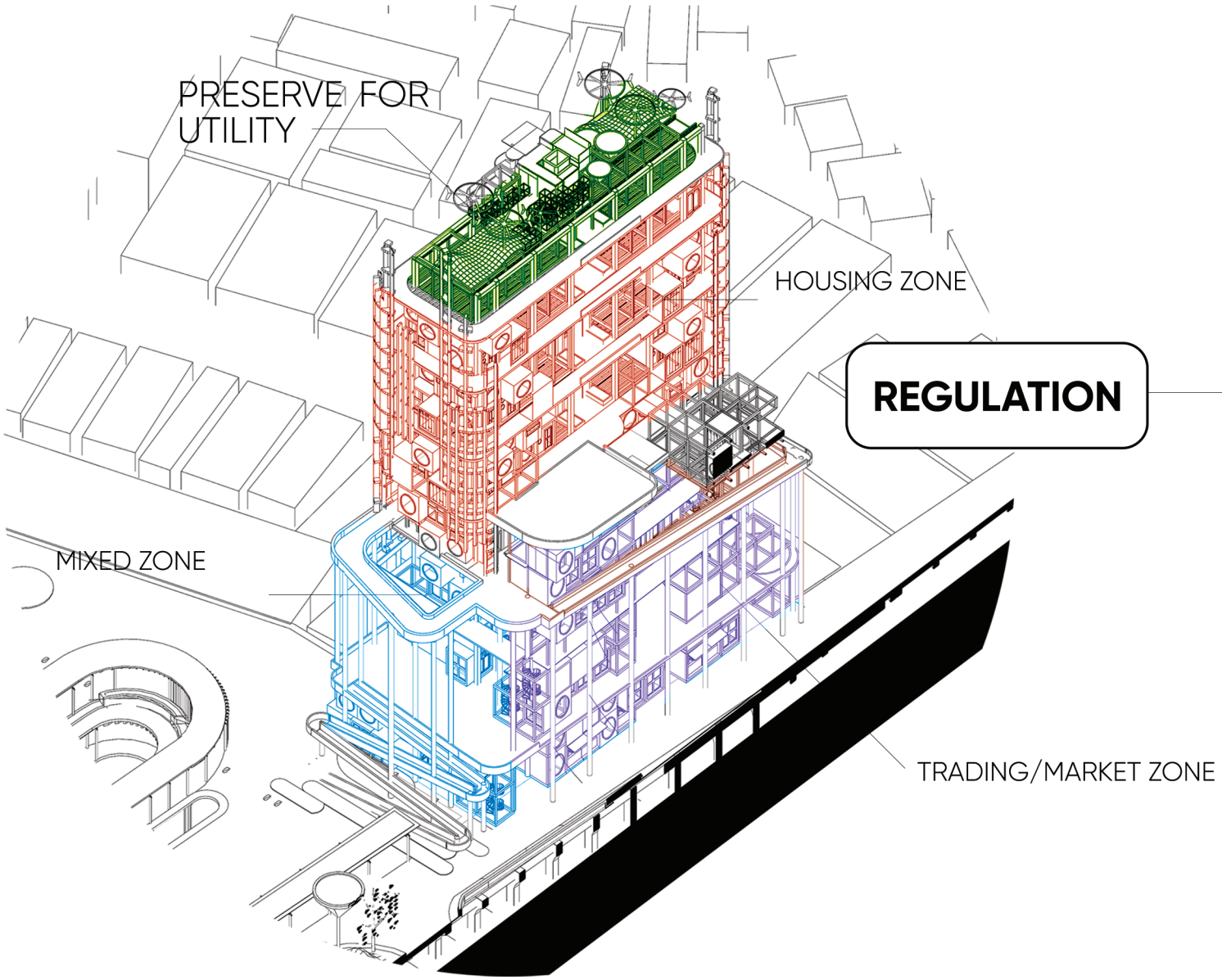
CHAPTER 4 REFLECTIONS

4.1 Building Regulation Explanation
4.2 Building Technology Explanation
4.3 Building Safety Explanation

UNIVERSITAS ISLAM INDONESIA

4.1 Building Regulation Explanation

" Need to provide clear regulations for buildings"
by Jury 1: Ir. Wiryono Raharjo. M. Arch., Ph.D



REGULATION

BAS
FUN
Z

BA
MOD

THERE A
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THE D
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SED ON
NCTION
ZONE

- TRADING ZONE
- HOUSING ZONE
- MIXED ZONE

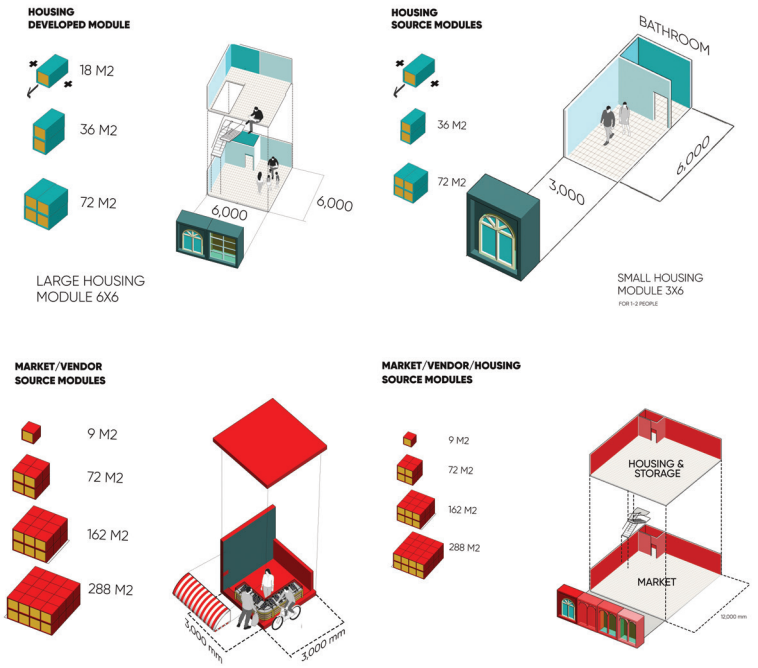
SED ON
DULE SIZE

- HOUSING
  - 18 M2 UNIT
  - 36 M2 UNIT
  - 54 M2 UNIT
  - 72 M2 UNIT
- MARKET
  - 9 M2 UNIT
  - 72 M2 UNIT
  - 162 M2 UNIT
  - 288 M2 UNIT

ARE ONLY 2 TYPES OF
ENT PLANS: VERTICALLY (
IE) AND HORIZONTALLY.

EVELOPMENT PLAN FOR THE OCCUPANT
ST BE CONSULTED AND APPROVED BY THE
BUILDING MANAGER

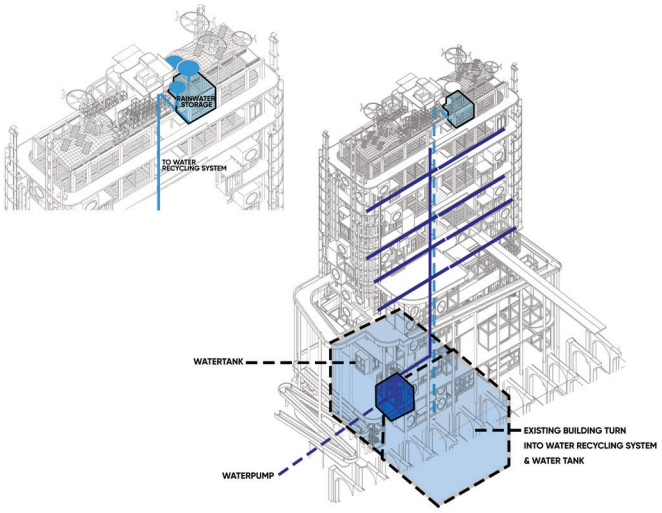
MODULE SIZE



4.1 Buildin

" Give some reasons on the

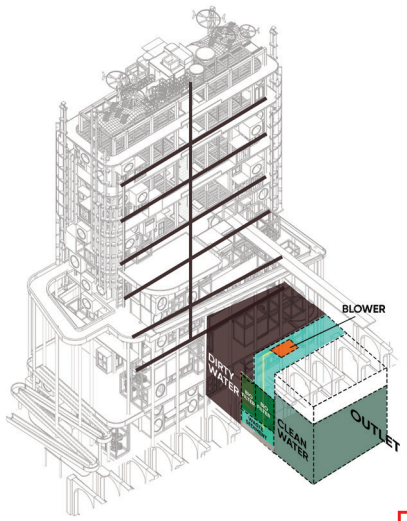
by Jury 2: Dr. Ir. Revi



RAIN WATER HARVESTING & WATER RECYCLING SYSTEM

Techniques for harvesting rainwater have the potential to dramatically lessen the effects of climate change for a better future, in addition to many other solutions that must be put into place on a local and federal level.

Since future effects of climate change may surely influence the water savings and effectiveness of these systems, these system designers should also include reliable weather prediction models in their rainwater harvesting systems.

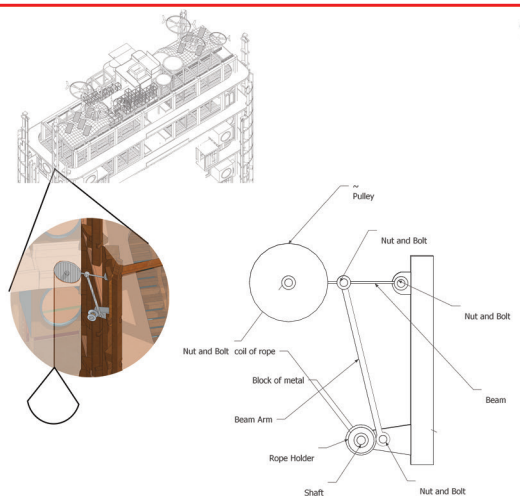


WASTE RECYCLING SYSTEM

Communal Wastewater Treatment Plants (WWTPs) can be used for liquid waste management in densely populated area.

MATERIAL DISTRIBUTION TECHNOLOGY

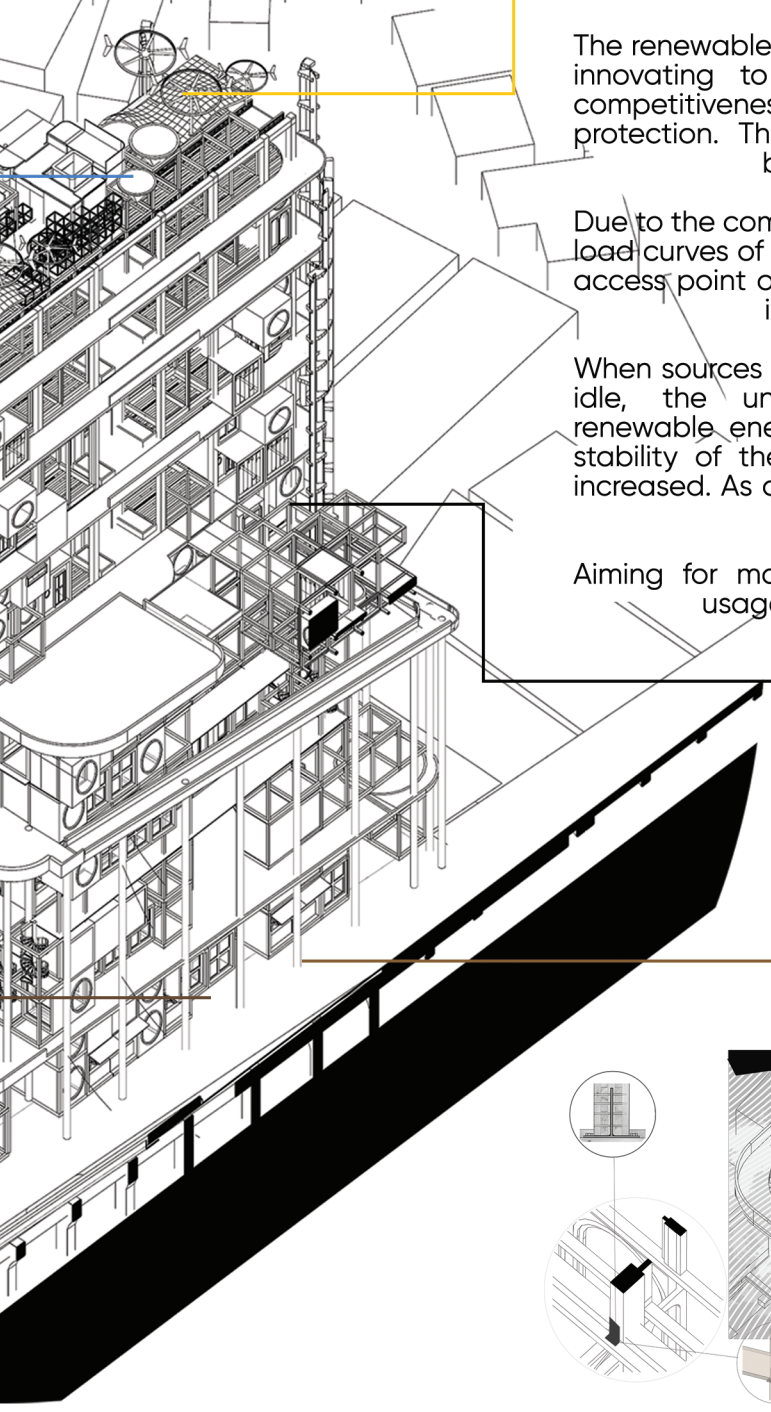
the use of technology such as a pulley can help lift building materials and goods to the top floor.



g Technology

choice of technology and its consequences on your design"

anto Budi Santoso, M. Arch



RENEWABLE ENERGY SYSTEM

hybrid form of renewable energy utilizing solar power and wind.

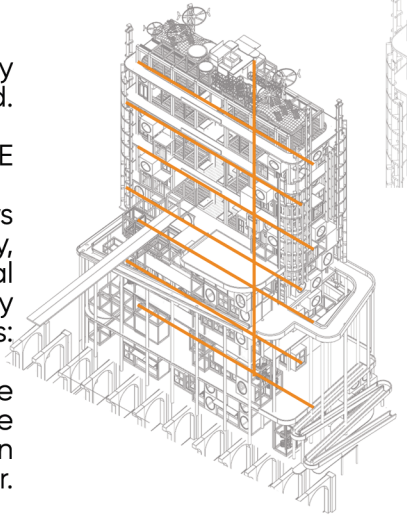
ADVANTAGE

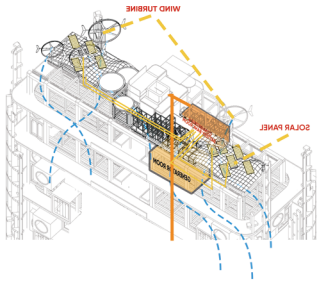
The renewable energy industry is always innovating to boost its productivity, competitiveness, and environmental protection. The following are the key benefits of hybrid projects:

Due to the complementary nature of the load curves of the two technologies, the access point of the hybrid plant has an increased capacity factor.

When sources are switched when one is idle, the unpredictable nature of renewable energy is lessened and the stability of the electricity produced is increased. As a result, the supply point's power is guaranteed.

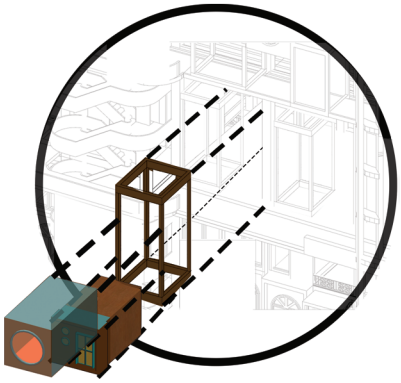
Aiming for maximum efficiency in the usage of electric infrastructure,

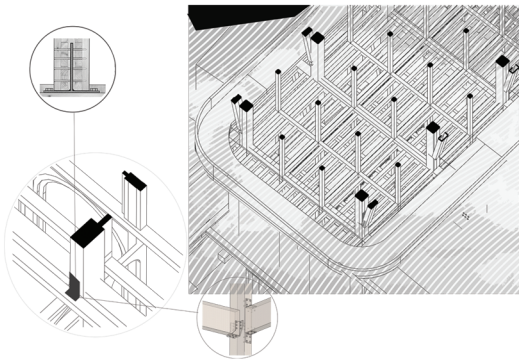




MODULAR PREFAB SYSTEM

fast installation. A modular building can be put together twice as quickly as a concrete one.
this use can make the building more flexible in terms of its development





GLUE LAMINATED TIMBER STRUCTURE

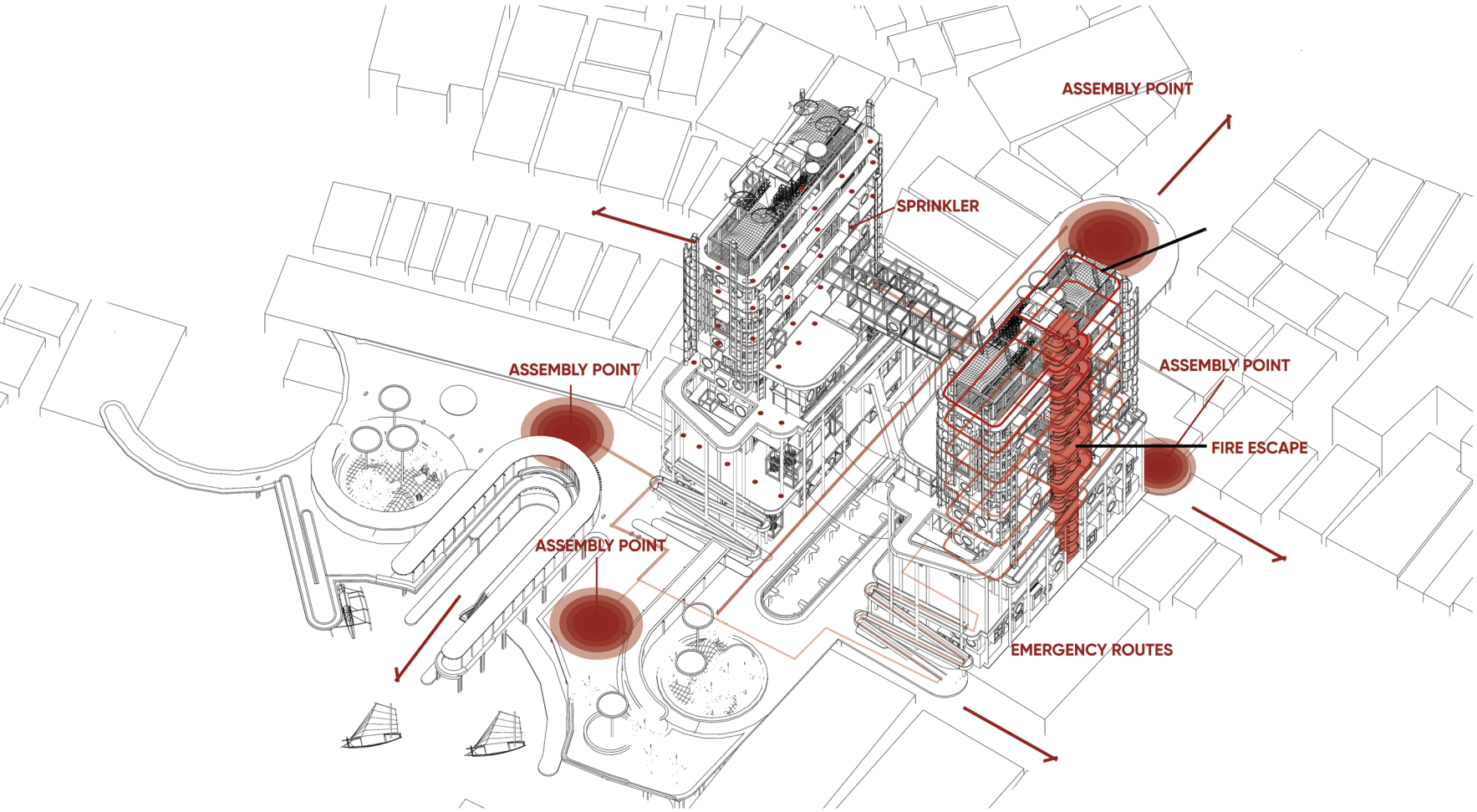
A glue-laminated beam made from a log can be made using a tiny fraction of the energy needed to make steel or concrete.

Compared to other building materials, glulam is more resilient to earthquakes and has stronger fire resistance.

4.3 Building Safety

" How is the safety of the building"

by Jury 2: Dr. Ir. Revianto Budi Santoso, M. Arch



MATERIAL MAINTANANCE

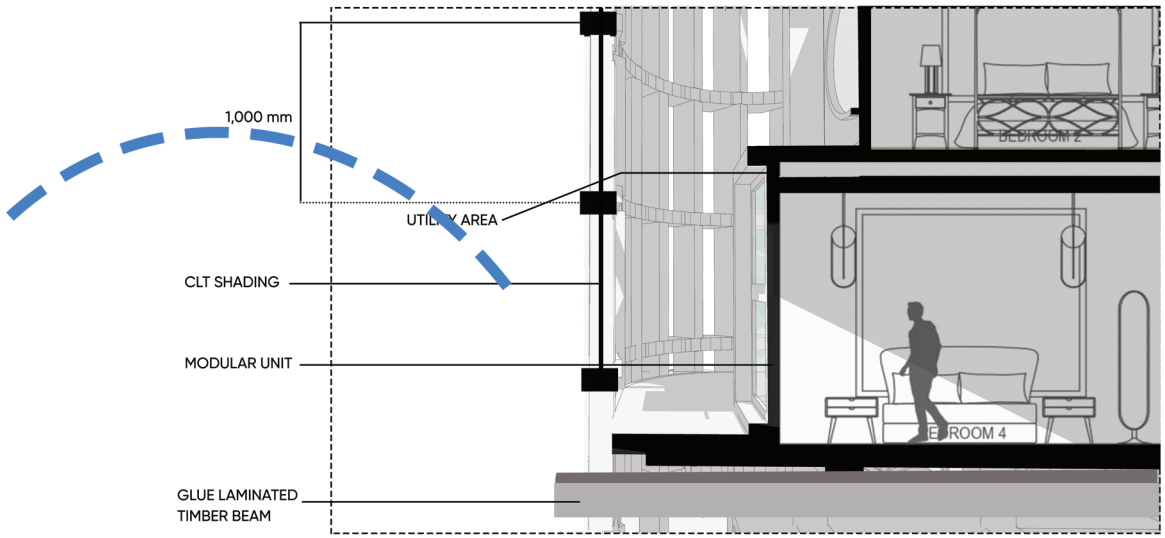


use of treatment level H5, which is The bare minimum preservation treatment necessary to guard against termite infestation and extremely serious decay. When wood is in touch with the ground or fresh water, H5 treatments are used.

"In a burnout fire, the glulam structures maintain their capacity for load-bearing. According to the results of the fire tests, glulam develops a layer of coal that acts as a barrier, preventing the fire from spreading and causing it to go out. A glulam building with such robust dimensions will have a suitably large load-bearing core of new wood, even after prolonged exposure to fire. Additionally, the structures are placed far enough apart from one another to prevent a fire from spreading on its own when only the buildings are burning. As a result, even in the event of a burnout fire in fixtures and furnishings, the structure is kept from collapsing.

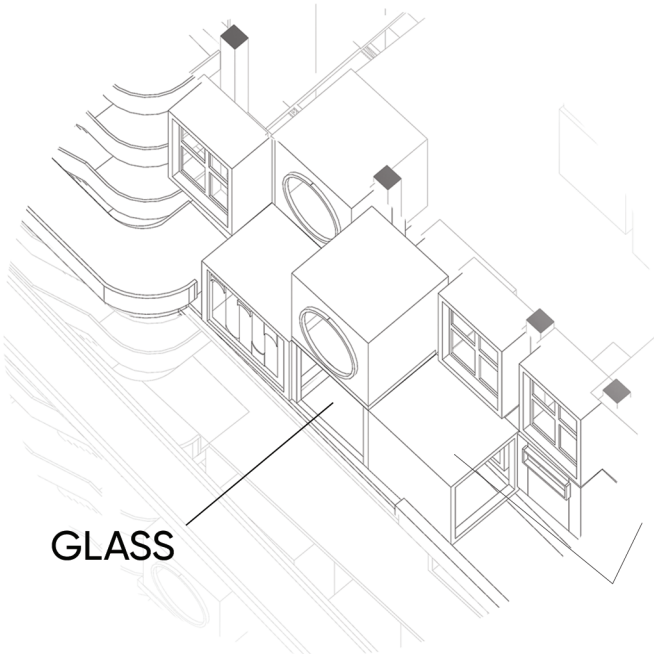
RESPONDING TO WIND

BUILDING ENVELOPE



This envelope functions not only as a building protector but also as a vertical garden

To protect the building from strong winds, the building envelope is made to resemble the shape of a module that has glass openings so that users can still see outside the building.



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Assalamualaikum Wr. Wb.

Dengan ini, menerangkan Bahwa:

Nama : Muhammad Thirafi Hadyan Syarief
Nomor Mahasiswa : 18512096
Pembimbing : Dr.-lng. llya Fadjar Maharika, IAI
Fakultas / Prodi : Teknik Sipil dan Perencanaan/ INTERNATIONAL UNDERGRADUATE PROGRAM IN ARCHITECTURE
Judul Karya Ilmiah : Design of Water Colony : Future Water Adaptive Settlement in Sudi-mampir Area Responding to Rising Sea Level in Banjarmasin

Karya ilmiah yang bersangkutan di atas telah melalui proses cek plagiasi menggunakan **Turnitin** dengan hasil kemiripan (*similarity*) sebesar **13 (Tiga Belas) %.**

Demikian Surat Keterangan ini dibuat untuk dapat dipergunakan sebagaimana mestinya.

Wassalamualaikum Wr. Wb.

Yogyakarta, 7/4/2022
Direktur

UNIVERSITAS ISLAM INDONESIA
DIREKTORAT PERPUSTAKAAN
YOGYAKARTA

Joko S. Prianto, SIP., M.Hum

Pemodelan Arsitektur dan Perkotaan

DESIGN OF

WATER COLONY

FUTURE WATER ADAPTIVE SETTLEMENT IN SUDIMAMPIR AREA RESPONDING TO RISING SEA LEVEL IN BANJARMASIN

One of the effects of global warming is climate change, which is defined as an increase in global temperature from year to year as a result of the greenhouse effect. Global climate change is the rise in the intensity of the greenhouse effect caused by the existence of gases in the atmosphere that absorbs heat rays, namely infrared rays generated by the planet.It is also stated that climate change can be caused by internal natural processes, external influences, or human actions that alter the composition of the atmosphere and land usage on a continual basis. Changes in the Earth's atmosphere's physical characteristics, such as temperature and rainfall distribution, as well as the melting of polar ice caps, have a large influence on climate change in numerous sectors, one of which is sea-level rise.

The environmental crisis and global climate change threaten coastal cities in various countries. Indonesia is one of them. As an archipelagic country surrounded by sea, Indonesia's coastal areas are expected to be increasingly crowded below sea level and one of the cities that will be most affected is Banjarmasin.

The city of Banjarmasin Is a city at the very end/downstream in the province of south kalimanatan, the geographical condition of the area is below sea levels and located surrounded and even adjacent on martapura river which is conected to the sea, thats why it wil be impacted by global climate change.



DEPARTMENT of ARCHITECTURE

DESIGN OF
WATER COLONY

FUTURE FLOATING SETTLEMENTS IN SUDIMAMPIR AREA RESPONDING TO RISING SEA LEVEL IN BANJARMASIN

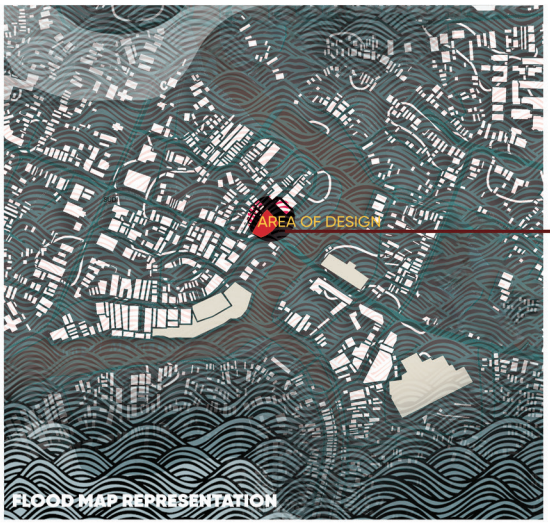
NAME : MUHAMMAD THIRAFI HADYAN SYARIEF

SID : 18512096

SUPERVISOR : Dr.-Ing.Ir.,Ilya Fadjar Maharika .,MA.,IAI

EXAMINER 1 Ir. Wiryono Raharjo M.Arch.,Ph.D.

EXAMINER 2 Dr.Ir., Revianto Budi Santosa ., M.Arch.,IAI



SITE LOCATION
SUDIMAMPIR AREA

Sudimampir is an old story from the past about Banjarese economic development. A type of market that formed the forerunner of Banjarmasin's economic development and expansion. According to some locals, it is the oldest modern market in South Kalimantan dating back to the Dutch period.

In the wake of economic expansion more space in the city centre of Banjarmasin was dedicated to commercial activities. In the late nineteenth century the Dutch colonial government built several trading posts, such as Pasar Sudimampir and Pasar Lama. Pasar Lama, which is in Kampong Bugis, attracted Chinese and Arab entrepreneurs who set up their businesses there.









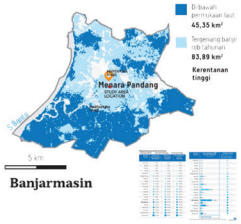
SOCIO-ECONOMIC-CULTURAL OF THE PEOPLE IN THE SUDIMAMPIR AREA

THE **ECONOMY** IN THE AREA IS A TRADE CENTER AND THAT AREA WAS THE FIRST TRADING CENTER IN BANJARMASIN, BUT NOW THE AREA IS STAGNANT AND TENDS TO DECLINE DUE TO INADEQUATE INFRASTRUCTURE AND EVERY TIDE ESPECIALLY WHEN IT RAINS MOST OF IT IS FLOODED.

FROM **SOCIO-CULTURAL**, IN THIS AREA HAS MULTY ETHNIC INHABITANTS (CHINESE, ARABIC, MALAY / BANJAR AND JAVANESE / MADURESE). HERE IS ALSO ADJACENT TO PLACES OF WORSHIP OF SEVERAL RELIGIONS.

THE **PROBLEMS** THAT OCCUR IN THIS AREA ARE EVEN MORE ABANDONED BY RESIDENTS (MANY BUILDINGS ARE NO LONGER WORKING) AS A RESULT, MANY HOMELESS PEOPLE OCCUPY THE BUILDINGS.

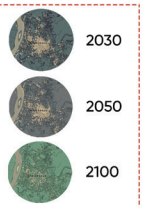
AND NOW DUE TO THE ELEVATION OF THE ROAD AND THE LACK OF INFRASTRUCTURE FOR THE DRAINAGE OF THE BUILDINGS AROUND THE FLOOD-AFFECTED BECAUSE OF THE RAIN AND THE OVERFLOW OF THE RIVER



SEA LEVEL RISE IMPACT DATA

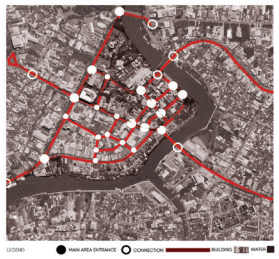


SEA LEVEL RISE YEARLY PREDICTION

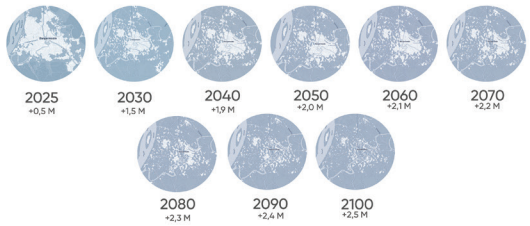


AREA ANALYSIS

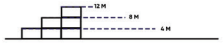


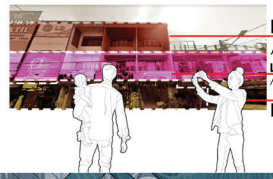


FLOAD RISK MAP
(RISSING SEA LEVELS OVER THE YEARS)



ARCHITECTURAL QUALITY
SUDIMAMPIR AREA





LIVING SPACE /INVENTORY

LIVING SPACE /INVENTORY

MARKET

The gynoge building in Sudimampir has a building of 2-3 floors, and is a trading facility that also functions as a residential office as well as a warehouse.

The condition of buildings in this area is increasingly being abandoned by residents (many buildings are no longer functional) as a result, many homeless people occupy the buildings.

and now due to the elevation of the road and the lack of infrastructure for the drainage of the surrounding buildings, flood-affected the surrounding buildings, and the physical structure of the building is no longer adequate.



DEPARTMENT of ARCHITECTURE

DESIGN OF
WATER COLONY

FUTURE FLOATING SETTLEMENTS IN SUDIMAMPIR AREA RESPONDING TO RISING SEA LEVEL IN BANJARMASIN

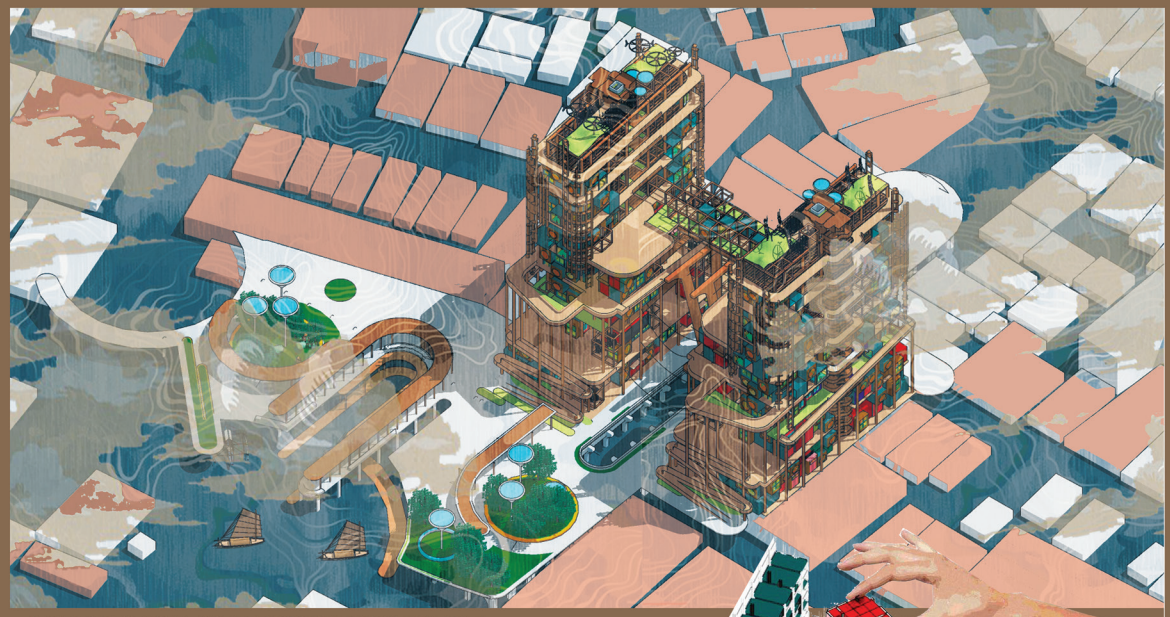
NAME :
Muhammad Thirafi Hadyan Syarief

SID :
18512096

SUPERVISOR :
Dr.-Ing.Ir.,Ilya Fadjar Maharika ,MA.,IAI

EXAMINER 1
Ir. Wiryono Raharjo M.Arch.,Ph.D.

EXAMINER 2
Dr.Ir., Revianto Budi Santosa ., M.Arch.,IAI



APPROACH TO DESIGN CONCEPT

rising sea levels threaten the city to sink, so we have to adapt to the situation, by using the concept of crowd building, the community can also participate in the development of resilient city developments in the city of Banjarmasin.

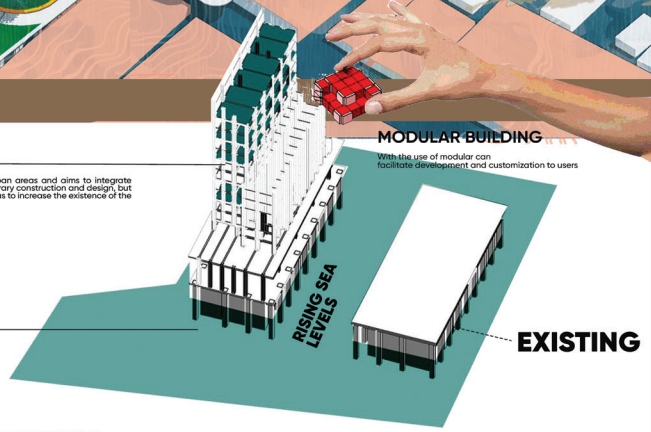
Able to maintain the existence of the area remains a historical area of the city of Banjarmasin

infill design concept

The infill method can be used in urban areas and aims to integrate with the existing land with contemporary construction and design, but still refers to the historical context so as to increase the existence of the area.

MODULAR BUILDING

With the use of modular can facilitate development and customization to users



CROWD BUILDING APPROACH

the spatial plan would involve land acquisition, such as for public parks, water catchment areas, drainage channel expansion, and so on. Landowners may object to plans to purchase their property for public use if they do not receive any advantages from it. and by using crowd building approach will give both party a win-win opportunity.

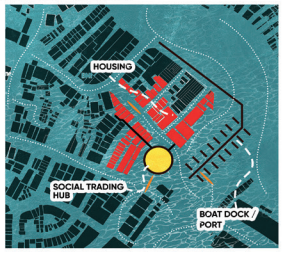
In this case the government construct the structure of the extended building and give a compensasion for the existing owner of the land by giving a place for them on the new extension with a new and improve facility.

SITE EXPLORATION OF THE CONCEPT OF SITE CONTEXT

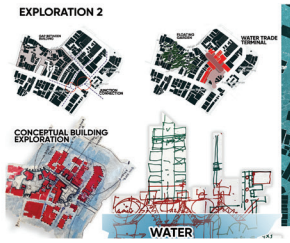
EXPLORATION 1
WHY CIRCLE ?

Can connect to the surrounding environment
Can be acces from everywhere





EXPLORATION 2







CROWD BUILDING SCENARIO

STEP 1 .
CREATING NEW REGULATION AND

the government always regulates regulations, stating that the area in terms of the condition of the building is no longer feasible (the average age of the building is above 50 years, slums and many are damaged so that they do not meet the requirements of safety, health, comfort and sustainability). The other side of the area is also threatened with degradation due to the effects of global warming. In this case, the City Government of Banjarmasin together with the city's DPR and also supported by related institutions (which are organizations from outside in terms of dealing with the impact of global warming) need to take steps to save the area.

Considering that the area has always played an important role in influencing the economic progress of the city of Banjarmasin, automatically the area has a very high historical value. And with this, of course, it is an obligation to maintain its continuity. Based on this, the Government then needs to issue a REGULATION (Perda) to maintain and improve the existence of the area.

The regulation can take the form of a regional RTRW up to a regional RTBL where later it will require a model of arrangement that may be carried out for the area.

STEP 2 .
SOCIALIZATION TO THE CIVILIAN

After the regulation is issued, the next step is to make a regional master plan with an alternative model for regional development by referring to the regulations.

Based on the results of this product (RTRW, RTBL or regional roadmap) then a meeting is held in the form of dialogue, socialization and coordination about the plans and concepts of the regional structuring model to the residents of the area or building owners (traders, residents, etc. related). From the results of this coordination and socialization, there will be synchronization between the parties; in this case especially between the government, the occupants.

STEP 3 .
FUNDING AND BUILDING PROCESS

In this phase, the government will look for partners to carry out the arrangement. This partner is prioritized for those who have the ability to finance or partners from outside parties (organizations) who are concerned with the issue of resilient cities in the city that are affected by rising sea levels which are predicted to eliminate historical areas, such as the Sudimampir trade center area in the city of Banjarmasin. In this case it is the organization Climate Resilient and
The Inclusive Cities Project (CRIC) funded by the Rockefeller Foundation is dedicated to helping its partner cities to be developed into a resilient city.

Government partners from the investor side (as funders) will also be directed to be able to communicate and coordinate to make agreements with residents or building owners regarding the plans that will be carried out if this has been reached. Then the next stage of making the development concept (feasibility, regional DED and even the development implementation process) can be started.
A synergistic partnership with the principle of mutual benefit between the parties is the main basis for development goals.

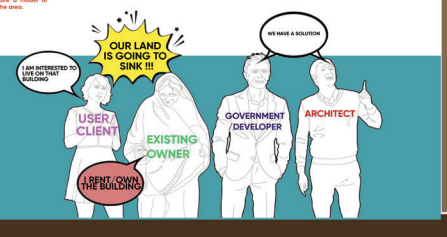
Potential users or future owner decide together how they will use the building in the future

The owner or tenant of the original building in the area is optional, not they have the option, namely: Selling the sunken building to the government or developer. Accepting alternative solutions offered by the government or developer

The government / developer acts as a negotiator, financier and also the maker of new regulations.

Architect Act as the problem solver / consultant / educator of the project and developer / owner the wishes of the old owner as well as the future owner





DEPARTMENT of ARCHITECTURE

DESIGN OF
WATER COLONY
FUTURE FLOATING SETTLEMENTS IN SUDIMAMPIR AREA RESPONDING TO RISING SEA LEVEL IN BANJARMASIN

NAME : Muhammad Thirafi Hadyan Syarief

SID : 18512096

SUPERVISOR : Dr.-Ing.Ir.,Ilya Fadjar Maharika .,MA.,IAI

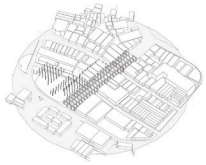
EXAMINER 1 Ir. Wiryono Raharjo M.Arch.,Ph.D.

EXAMINER 2 Dr.Ir., Revianto Budi Santosa ., M.Arch.,IAI

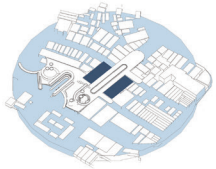
BUILDING PHASE



EXISTING CONDITION

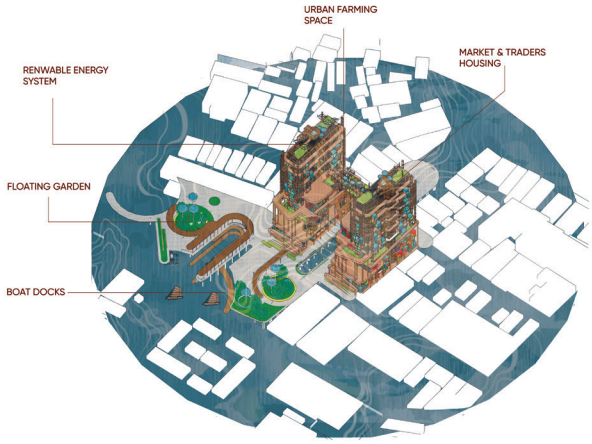


PLANTING NEW COLUMN



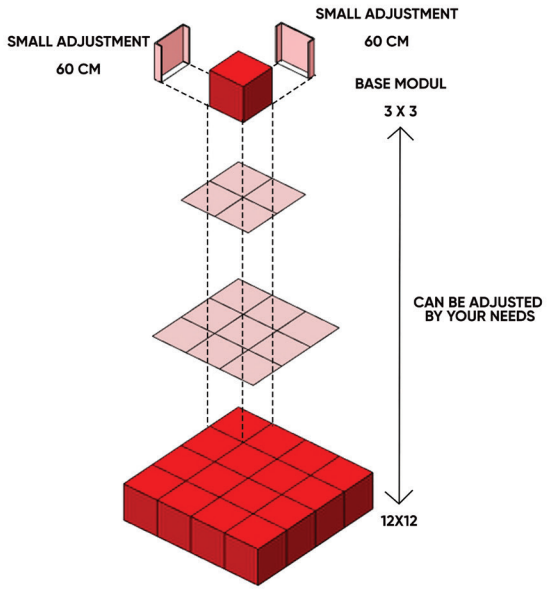
CREATING WATER COLONY PLATFORM

THE PHASE IN BUILDING WATER COLONY IS PLANNED BEFORE THE SEA WATER IS RISING BY PLATING A NEW CONCRETE COLUMN AROUND THE EXISTING BUILDING AND AREA USING A BOREPILE FOUNDATION TO REDUCE THE EXCAVATION OF THE AREA SO THE ACTIVITY CAN STILL BE ACTIVE DURNG THE CONSTRUCTION



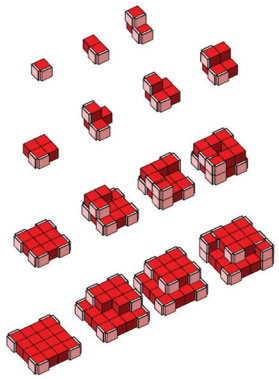


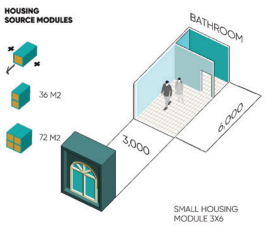
ADJUSTABLE MODULE CONCEPT

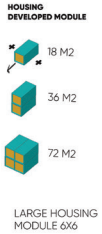


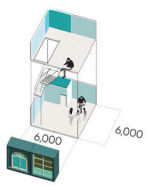
THE MODULE CAN BE ADJUSTED BY THE USER BUT THERE IS A STANDARD TO GIVE USER DIRECTIONS SO NOT TO CREATE SLUM ENVIROMENT BY LIMITING SQUARE METERS FOR MODULE TYPE.

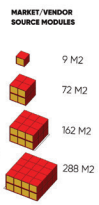
CUSTOMIIZATIOM POSIBILITYS

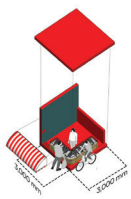


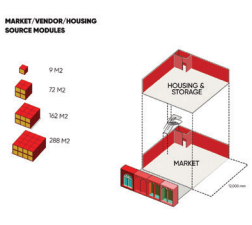












DEPARTMENT of ARCHITECTURE

DESIGN OF
WATER COLONY

FUTURE FLOATING SETTLEMENTS IN SUDIMAMPIR AREA RESPONDING TO RISING SEA LEVEL IN BANJARMASIN

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SID : 18512096

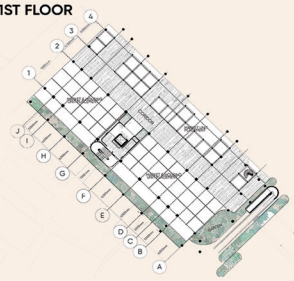
SUPERVISOR : Dr.-Ing.Ir.,Ilya Fadjar Maharika .,MA.,IAI

EXAMINER 1 Ir. Wiryono Raharjo M.Arch.,Ph.D.

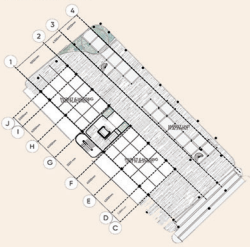
EXAMINER 2 Dr.Ir., Revianto Budi Santosa ., M.Arch.,IAI

FLOOR PLAN

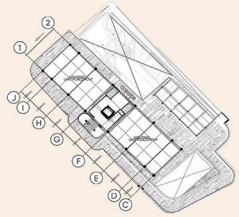
1ST FLOOR



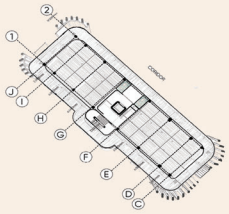
2ND FLOOR



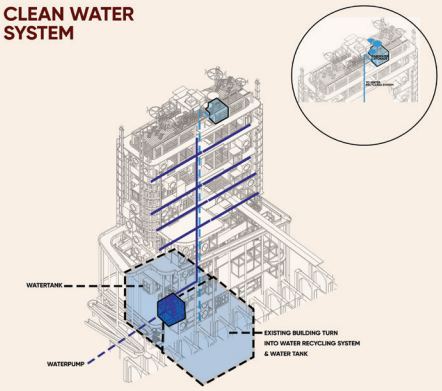
3RD FLOOR



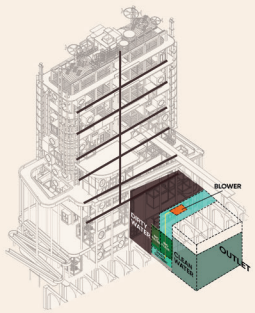
TYPICAL FLOOR



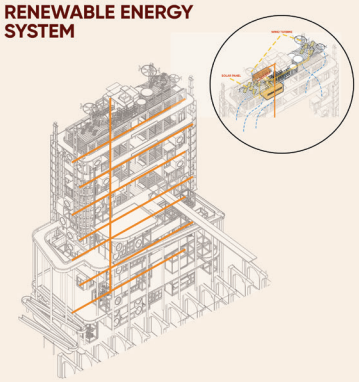
CLEAN WATER SYSTEM



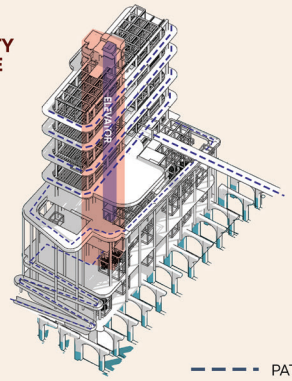
WASTE RECYCLING SYSTEM



RENEWABLE ENERGY SYSTEM

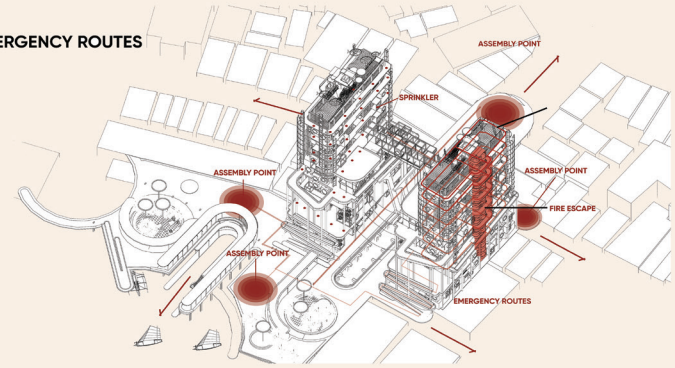


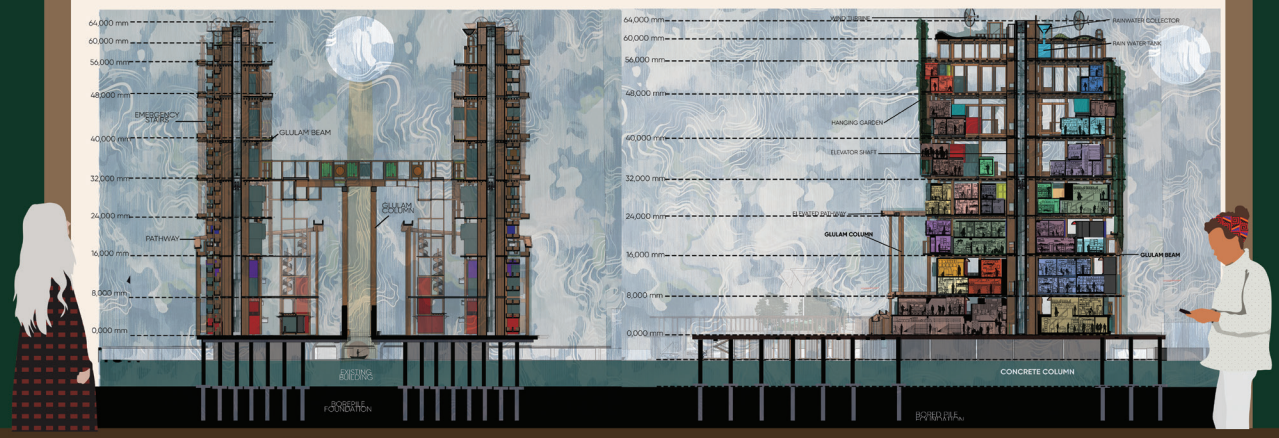
MOBILITY SCHEME



PATHWAY

EMERGENCY ROUTES





DEPARTMENT of ARCHITECTURE

DESIGN OF
WATER COLONY

FUTURE FLOATING SETTLEMENTS IN SUDIMAMPIR AREA RESPONDING TO RISING SEA LEVEL IN BANJARMASIN

NAME :
Muhammad Thirafi Hadyan Syarief

SID :
18512096

SUPERVISOR :
Dr.-Ing.Ir.,Ilya Fadjar Maharika ,MA.,IAI

EXAMINER 1
Ir. Wiryono Raharjo M.Arch.,Ph.D.

EXAMINER 2
Dr.Ir., Revianto Budi Santosa ., M.Arch.,IAI

THIS BUILDING FACILITY WAS MADE BASED ON THE HISTORY OF THE AREA THAT WAS THE CENTER OF THE ECONOMIC DEVELOPMENT OF THE CITY OF BANJARMASIN AND ALSO NEW FACILITY TO SUPPORT THE RESILIENCE ON RISING SEA LEVEL



THE URBAN FARMING



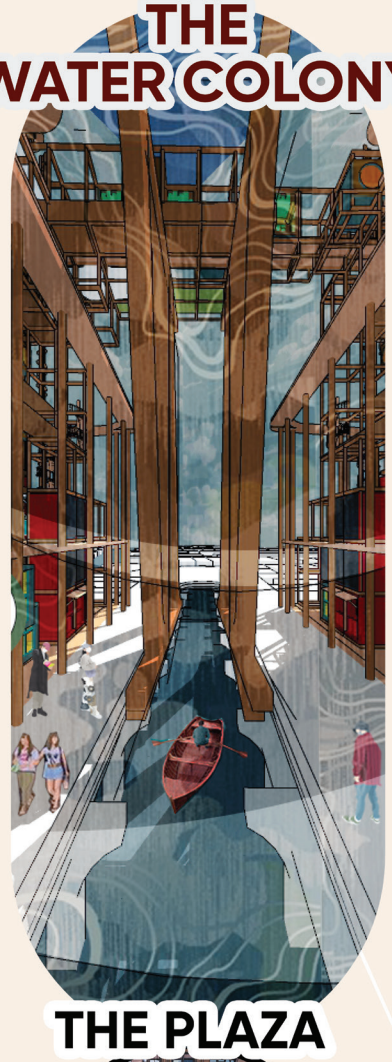
THE MARKET

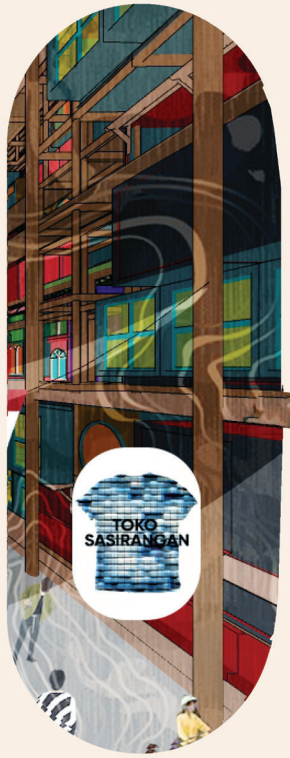
THE WATER COLONY



THE HOUSING









THE MARKET

THE PLAZA



BOAT PATHWAY



THE HOUSING PATHWAY

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MAIN REFERENCES

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IMAGE SOURCE

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Pendidikan Arsitektur dan Perkotaan

UNIVERSITAS ISLAM INDONESIA

DEPARTMENT of ARCHITECTURE

KAAB Korea Architectural Accrediting Board

CANBERRA ACCORD

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