

Final Architectural Design Studio

TAMIANG RECREATION CENTER

Design of recreational facility with flood mitigation approach and
green open space in Kuala Simpang



Student ID

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Supervisor

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INTERNATIONAL UNDERGRADUATE PROGRAM IN ARCHITECTURE



DEPARTMENT of
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한국건축학교육인증원
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UNIVERSITAS
ISLAM
INDONESIA

Final Architecture Design Studio
Department of Architecture
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with Flood Mitigation Approach and Green Open
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PREMISE

Kuala Simpang of Aceh Tamiang is the city which is known as the center of trade and commerce and due to its position as the gate of Aceh province. Aceh Tamiang District is an area which is really rich in oil and gas sector and also one of the centers of oil palm plantations in Aceh. In addition, Aceh Tamiang also relies on the transportation sector because of its strategic position and marine transportation is one of the important alternatives because the district has two major rivers which are Tamiang River and the Kaloy River. Aceh Tamiang Regency also relies on its agricultural, manufacturing, and trading capabilities.

The largest river basin unit in the Aceh Tamiang District are Tamiang River, Simpang Kiri River, Simpang Kanan River, Sungai Meuku Lake, Manyak Payed River, and other small rivers that flow into East Coast. The rivers in this district are the source of for irrigation to rice fields and plantations both used by the community and private. The hydrological flow of the existing river then flows through semi-technical irrigation as well.

AUTHENTICATION SHEET

Final Architectural Design Studio Entitled:

Design of Tamiang Recreation Center of Kuala Simpang with Flood Mitigation Approach and Green Open Space in Kuala Simpang

Student's Full Name : Cut Thifal Nadya Thary

Student's Identification Number : 17512057

Has been evaluated and agreed on : January 26, 2022

Supervisor

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Head of Architecture Undergraduate Program



Assist. Prof. Yulianto P. Prihatmaji, S.T., M.T., IPM., IAI.

LETTER OF AUTHENTICITY

The undersign below:

Student's Full Name : Cut Thifal Nadya Thary
Student's Identification Number : 17512057
Study Program : Department of Architecture
Faculty : Faculty of Civil Engineering and Planning

I hereby declare that this design work is the result of my own work and is not the result of plagiarism and does not contain any work that has been submitted for a bachelor's degree at a university or has been published by another person, except mentioned in references.

Medan, 19 February 2022
Author



Cut Thifal Nadya Thary
17512057

FOREWORD

Praise and Gratitude to Allah SWT who has given grace and love. The author can complete the final architectural design project entitled "Tamiang Recreation Center of Kuala Simpang with Flood Mitigation Approach and Green Open Space in Kuala Simpang".

The author realizes during the process of making this project have received so much help and supports from many parties. On this occasion, I would like to thank to:

1. Allah SWT with all the blessings and guide so in the process, it is always finding the convenience and the guidance to finish this project.
2. For my mother Yusriati, who always support me and give motivation and encourage me to finish the final project.
3. Ayah Teuku Bob Harris and Papa Fatkhur Rokhman who always give me emotional support and energy to do the final project.
4. Ir. Wiryono Raharjo M.Arch., Ph.D. as supervisor lecturer in Architectural Design Studio who always have given time, knowledge, constructive criticism, and patience so that the author can do better in working on the final project.
5. Dr. Ir. Revianto Budi Santosa, M.Arch and Dr. Ir. -Ing. Ilya Fadjar Maharika, M.A, IAI. as the jury lecturers during the final design studio who give criticism.
6. Nur khadijah, Anisah Asya Mawaddah, Fairuz Nabila, Ariq Aliyusuf and Sheika Azzahra for being my bestfriend that always support me and encourage me to finish the Project and the one that give me inspiration to do this Project.
7. Friend from Architecture UII, Vanidia Vegantara, Aanisah Ayu Wulandari and Ajeng Sharma Sharietta who always encourage me to finish the project, gives some references and tips for the project.

The author is fully aware that this work not so close from the word perfect, therefore all constructive criticism and suggestions for the perfection of this undergraduate final project are highly expected. Hopefully this final project can also be useful for the author as well as for all of us.

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CHAPTER 1

INTRODUCTION

This chapter explains the location, issue background, problem formulation and goals to overcome the problems occurred.

1.1 BACKGROUND

1.1. BACKGROUND OF KUALA SIMPANG

During the Dutch colonial era, the head of government of Aceh Tamiang was the Controleur. However, at the time of independence, Aceh Tamiang turned into a Tamiang Kewedanaan led by a Wadena. Along with the progress and development of the times, the term Tamiang Kewedanaan changed to a sub-district led by a Camat. It is part of the current Aceh Tamiang district. (Feri, 2018).

Aceh Tamiang district was established based on the law of no 4 the year 2002, consisting of 12 districts led by Bupati and Camat. In 2017, the population was 287,733 people with an area of 1,956.72 km² and population distribution of 147 people/km².

This district is located on the strategic eastern route of Sumatra and is only approximately 250 km from the city of Medan, resulting in prices of goods in this area being relatively cheaper than other areas of Aceh.

1.2. COMMON ISSUES

The river of Kuala Simpang City is a green open space located on the Tamiang river as a liaison between 2 areas, which are Kuala Simpang's downtown as a trading district and the Karang Baru as a government and business district. If we look at the common problems that occur in the Kuala Simpang and Karang Baru areas, caused by floods by high rainfall intensity and land subsidence in the river.

The city of Kuala Simpang needs public facilities which have some important points as a medium to develop community interaction, marketplace, cultural performances, pedestrian access, etc. To improve the quality of public life and meet the needs of green open space in Aceh Tamiang that still has not reached the criteria of qanun concerning the provision of green open space which it must reach 30% of the green area.

To overcome this phenomenon, the Kuala Simpang Waterfront will be designed not only for recreational activities but also for flood retention and abundant green open space.

1.3. FUNCTION'S BACKGROUND

The tourism sector is a sector that has the potential to be developed as a source of regional income (PAD). The programs for the development of regional tourism resources and its potential area are expected to contribute to economic development. The arrival of tourists to a Tourist Destination Area (DTW) has provided prosperity and welfare for the population. As with other sectors, tourism also affects the economy of an area or tourist destination country. The size of the influence differs from one region to another or from one country to another (Sammeng, 2001).

Many lands have the potential to be used as a tourist center in Aceh Tamiang, especially Kuala Simpang City. Some of the tourist attractions in Aceh Tamiang are generally in the form of open nature such as waterfalls or rivers and the visitors to these tourist attractions are generally from residents. One of the potential spots that have to be developed is located near the riverbank (31 meters from the riverbank) which will be developed into a green open space in the future.

Unfortunately, because Kuala Simpang does not have recreational facilities, then local people choose to do vacation outside the city, for instance, Medan. The city that is quite close to Kuala Simpang (103 meters) if compared the distance to Banda Aceh. So that local revenue (PAD) revolves in Medan or it can be said that the economy in Medan is much more developed because residents from outside the area choose to do recreational things there.

Recreation centers can be the largest foreign exchange income that will encourage economic growth, increase regional income, empower the community's economy, expand employment and business opportunities. It is hoped that this recreation center will be the first in the city of Kuala Simpang which serves as a source of local revenue (PAD) and is able to advance the economy in Kuala Simpang City. It is hoped that by building a recreation center in Kuala Simpang City, economic development will increase rapidly.

2. Recreation Center as Cultural Identity

- Stilt Building (Rumah Panggung)

Stilt building has a strong cultural identity to be implemented. It also has several function to responds the environment, those are as flood retention and as a place where the people stored boat. The design of a recreation center with the type of building on stilts is to response of flooding problem, especially in an area on the edge of a river.

One of the benefits of houses on stilts is that they are free from flood-prone areas such as those downstream of rivers, lakes, swamps, which will be the best option for flood-prone areas. High support poles will be safer from flooding. The house on stilts will suitable for people who live in coastal areas who are worried about high tides.

What's more, the facilities that will be provided relate to the cultural theme of Aceh Tamiang, so that this type of building will strengthen the theme that will be raised.

- Culinary Center

Culinary plays an important role in presenting as a cultural identity. Culinary may sound trivial, but food also one of the part motivating factor that drives individual action in a particular community or the whole society. Food is part of a life cycle pattern. Food can be said to be a binder of the separation of one community from another. When away from home, food connects a sense of belonging in an unfamiliar world. Culinary is a concept about food, thus culinary is an element of culture, which is related to historical roots, colonialism, myths, religion, and values in a society.

1.4. SITE'S BACKGROUND

Macro Location

The government of the Republic of Indonesia according to the 1945 Constitution recognizes and respects special or special regional government units that are regulated by law.

Based on the constitutional journey of the Republic of Indonesia, Aceh is a regional government that is special in relation to one of the distinctive characteristics of the history of the Acehnese people. For this reason, the Indonesian government ratified the Law of the Republic of Indonesia Number 11 of 2006 concerning the Government of Aceh as the legal basis that strengthens Aceh's position as a Special Region

The city of Kuala Simpang is one of the capitals of the Aceh Tamiang district, which is also the border between the provinces of North Sumatra and Aceh Darussalam. This area is often trafficked by visitors who travel far, for instance from Medan to Banda Aceh.



Figure 1.2. Map of Aceh and North Sumatra Province
Source : Wikipedia



Figure 1.3. Map of Kuala Simpang City
Source : Ministry of Public Works and
Settlement

OVERVIEW OF KUALA SIMPANG CITY (Mezo Location)

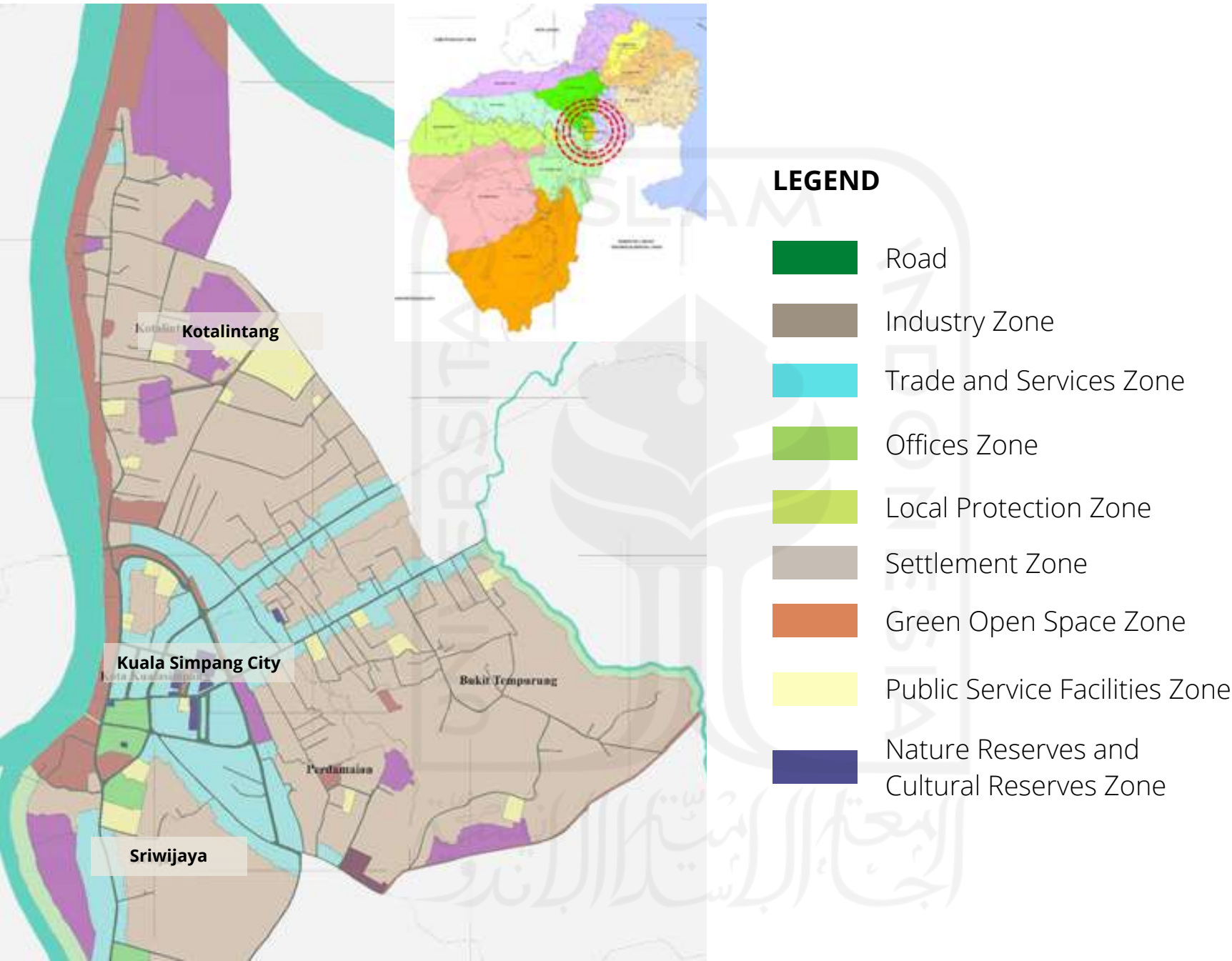


Figure 1.4. Map of Kuala Simpang City
Source : Ministry of Public Works and Settlement of Aceh Tamiang

CONTEXT OF KUALA SIMPANG CITY

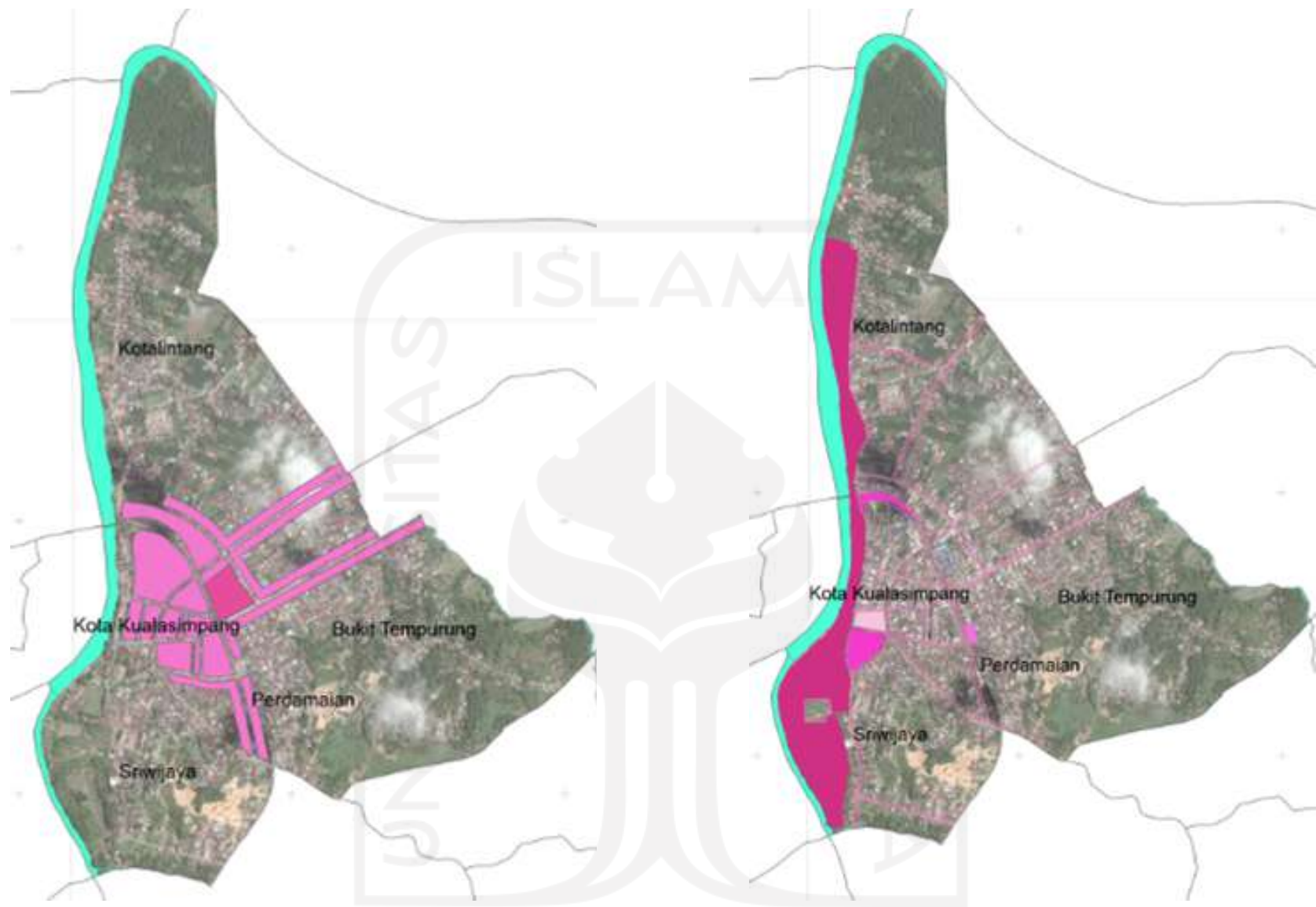


Figure 1.5. Context of Kuala Simpang City
Source : Ministry of Public Works and Settlement of Aceh Tamiang



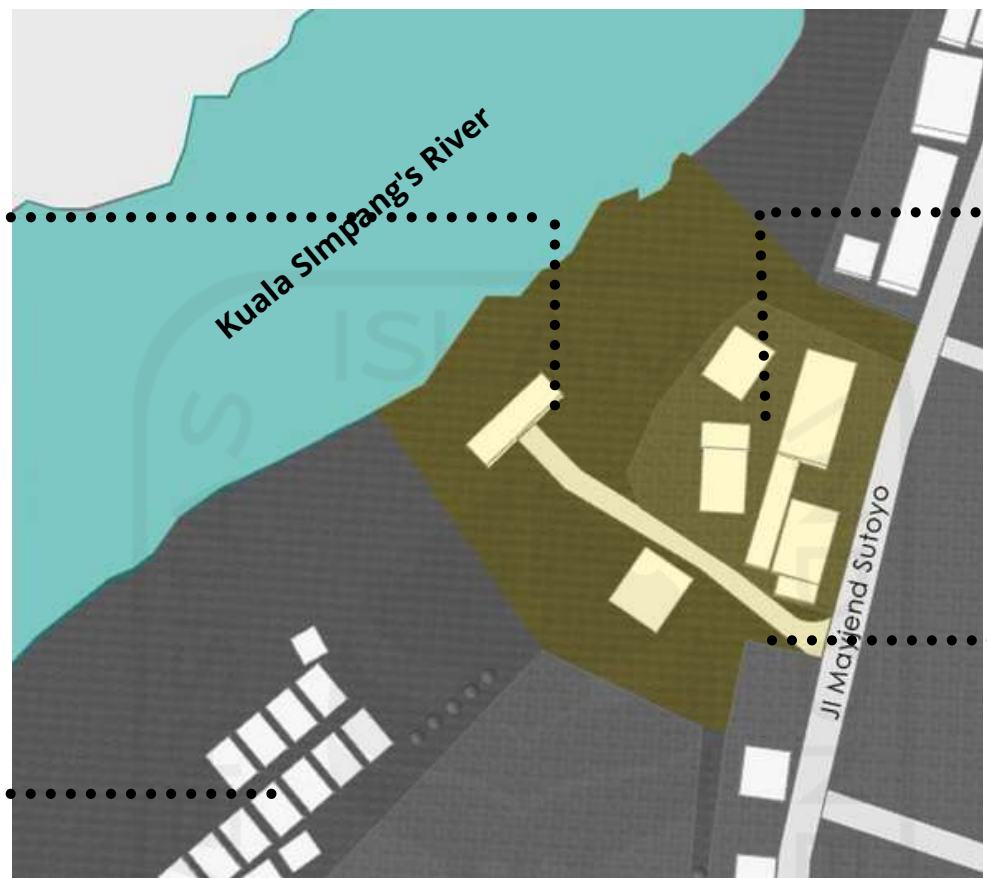
Micro Location



Abandoned Pier



Village



National Narcotics Board (BNN)



Gapura (Entrance)

Figure 1.6. Public Facilities and Settlement around Kuala Simpang's River
Source : Author's Documentation

1.2 PROBLEM FORMULATION

Erosion

In tropical area, the cause of erosion is generally high rainfall intensity. The intensity and the amount of rainfall determine the dispersion strength of the soil, the carrying capacity and the damage to the soil (Arsyad, 1989).

River erosion is the movement of a mass of rock or soil caused by continuous flowing river water. The phenomenon that occur on the outskirts of the Kuala Simpang River is the edge/outskirt erosion which will later cause widening on the right and left sides of the river.

Flood Prone

The cause of flooding in the Kuala Simpang river generally occurs due to high rainfall intensity, the river has no dam and land subsidence on the riverbanks. However, this event only occurs in certain places, usually in an area 40 meters from the river. Another cause is the sharp slope of the land. There are differences in the contours of each land, especially the comparison of contours on the highway and the site area is very sharp.

Major Causes

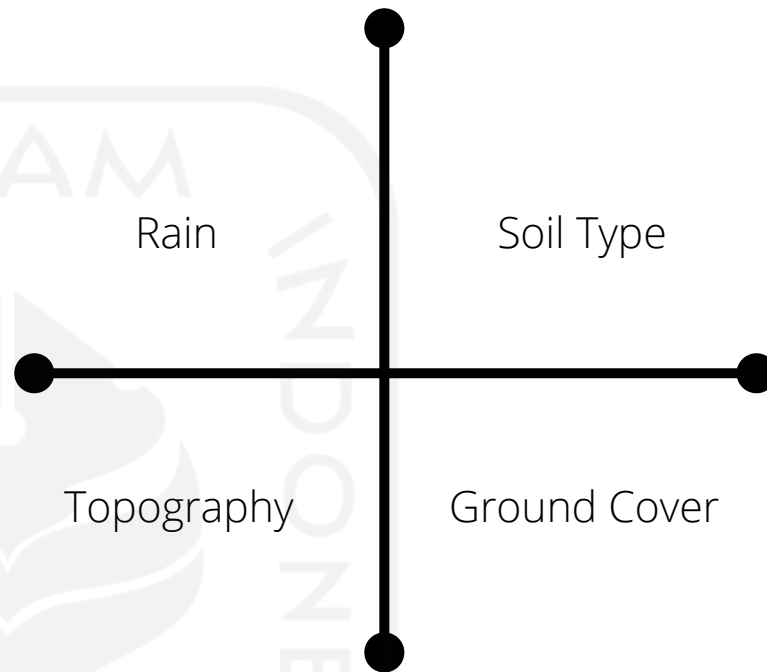


Figure 1.7. Factor of Land Subsidence
Source : Author's Documentation

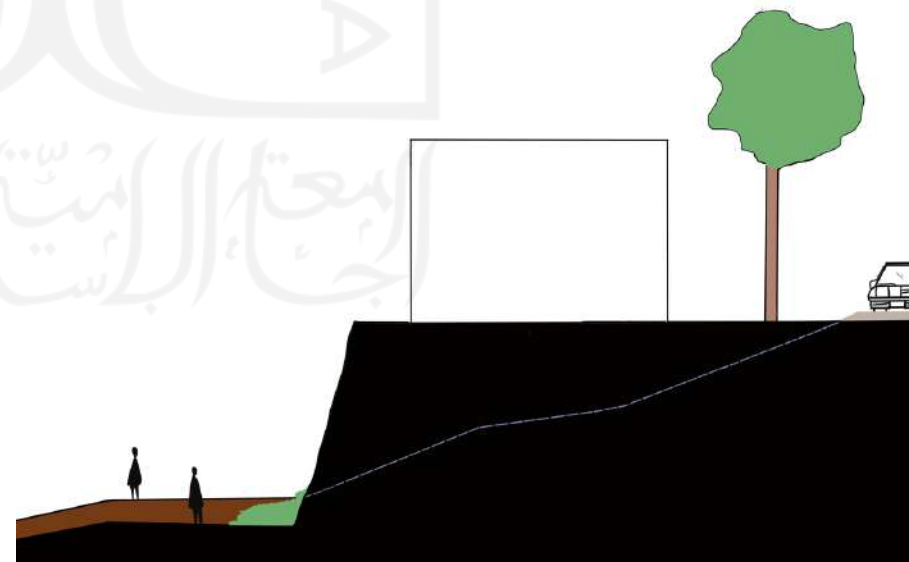


Figure 1.8. Land Slopes
Source : Author's Documentation

Lack of Recreation Space

Aceh Tamiang district, especially the city of Kuala Simpang, has some land that has not been developed and a lot of tourism potentials spot such as some waterfalls that have not been officially used as tourist attractions and riverbanks that have not even been developed as green open areas.

Playground and recreational facilities are also rare so that the people of Kuala Simpang prefer to do vacation in big cities like Medan or Banda Aceh only for recreation. There are multiple of recreational building facilities in Kuala Simpang, but most of them it's for educational (Historical) purpose only.

1. Istana Karang

Istana Karang is a heritage palace from the Karang Kingdom in Aceh Tamiang. In this tourist spot, it presents a historical tour.

These tourist object used to be abandoned and not maintained. So in 2020, the Aceh Tamiang district government renovated this building and provided a collection of Aceh Tamiang historical relics.



Figure 1.9. Istana Karang
Source : Author's Documentation

2. Istana Benua Raja

Istana Benua Raja was quite close to the Istana Karang. The palace itself is an ordinary house building that has a Dutch architectural style which is dominated by the color yellow. Unique buildings with green courtyards can be the best destination for relaxing on the weekend.



Figure 1.10. Istana Benua Raja
Source : Author's Documentation

Education

Education is not urgent issue that occurred in Kuala Simpang, but since the chosen site is strongly related to flood mitigation, It would be a good idea to elaborate recreational space with education, so people can play while learning things.

Problem Formulation Diagram

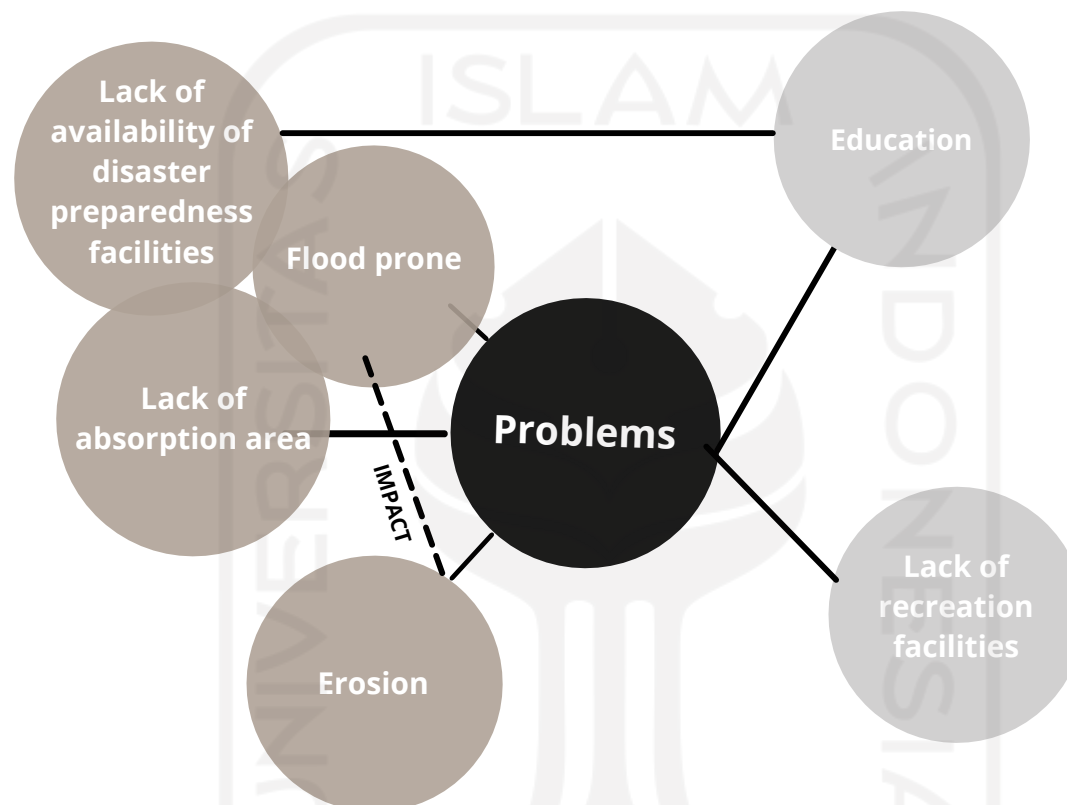


Figure 1.11. Problem Formulation
Source : Author's Documentation

Question

- 1.How to design a recreational center on the banks of the Kuala Simpang river by adding several functional facilities that provide a comfortable and pleasant place while giving education and information about the culture of Aceh for the visitors?
- 2.How to adopt the flood retention concept in the design of recreational facility to prevent impact of flood to the building?

1.3

AIM

- 1. Creating good quality architecture that has a positive impact on the surrounding community.
- 2. Based on RTRW 2013 - 2033 Spatial Planning Objectives, their aim is "Realization of Agribusiness, Industry, Trade and Service Districts with Disaster Mitigation Approach"

1.4

DESIGN OBJECTIVE

ECONOMICAL	RECREATIONAL	CULTURAL	ECOLOGICAL
Improve regional income (PAD)	Improve Community Needs	Enhancing public knowledge of Aceh culture.	Flood friendly
Activate space along the river	Increase recreational boating activity		Provide flood retention
Support Commercial Activity			

Table 1.1. Objectives
Source : Author's Documentation

PROBLEM SOLVING MATRIX

	FORMAL PROBLEM	PRACTICAL PROBLEM	SOLUTION
DESIGNER The Architect	Integrated people activities with building function	Designing tourist spot as an identity of the city	Recreation Center with flood mitigation approach and green open space
USER Local Community	Recreation center is needed to increase local revenue	Local Community need a decent place as a dock and marketplace	Recreational Center as one of a source of income
CLIENT Ministry of Public Works and Settlements	The city need to accommodate recreational activities and green open space development	Designing flood-resistant Building	Designing with ecological Approach
REGULATOR Government	30 meters from the edge of the river is the land owned by the local government to be used as a part green open space	Creating effective circulation for vehicles and prioritizing pedestrians.	Prioritizing Green Open Space in the design

Table 1.2. Problem Solving Matrix
Source : Using Brian Lawson's Matrix by Author

CHAPTER 2

LITERATURE REVIEW



This chapter explains the definition of the title and the theory related to functions, approaches, typology, etc to related topics.

With the literature review, it is hoped that it will help the design process in the future and as a design reference or parameter.

2.1 TITTLE DEFINITION

2.1.1. RECREATION

Recreation is an activity that is needed by every human being by traveling to a place. It is an activity that is used to fill spare time with certain goals, including mental and attitude refreshment, pleasure and pleasure when a person's physical or mental strength (Krippendorf).

There are various types of recreation areas, some people said that recreation is a place in the area located at open space without being limited by a building and some said that there is also the type of recreational space that provide the building/closed-space as recreational space like shopping mall for instance.

Function of Recreation (Aletheia Rabbani, 2021):

1. Preserve Nature
2. Maintain cultural value
3. Increase creativity
4. relieve fatigue or boredom after activities or work
5. Meet the needs of social function

Type of Recreation (Aletheia Rabbani, 2021):

1. Tour, is a journey undertaken for leisure and recreation as well as preparation for this activity. Tourists usually travel around 80km or more from their homes for recreational purposes.
2. Sport, is an activity carried out by the human body both physically, mentally and spiritually. Based on the type, sports are divided into 2, namely traditional and modern sports.
3. Amusement place, is a fun activity that is done to fill spare time by doing light exercise that can be done individually or in groups. There are games that are limited by age and some that can be played by all ages.

RECREATION CENTER IN INDONESIA

Efforts to develop the recreational sector involve the entire community, in addition to state and private administrators. Although there have been many implementations and government efforts in developing tourism. The government in this case is very dependent on the support of the community and the private sector. This means that in order to achieve the success of the government in carrying out development, it is necessary to support awareness, dedication and loyalty from the entire community.

Indonesia Especially Kuala Simpang City has a lot of potential and natural resources that have not been developed optimally, including the tourism sector. The development of the tourism sector is expected to provide benefits to the community, because it is one of the developing economy sectors (source of income).



2.1.2. WATERFRONT CITY APPROACH

Waterfront is a development of the riverbank or seaside, which take place at the edge of the beach, the riverside or lake. Literally, the definition of "waterfront" is a part of the city bordering the water and port area (Echols, 2003).

Waterfront development means a development process that has visual and physical contact with water, the development of urban areas whose physical nature is close to water where the form of development of the city's face is oriented to the water.

Types of Waterfront City by project based on (www.propertyandthecity.com)

1. Conservation, the arrangement of the old waterfront which until now can still be enjoyed.
2. Redevelopment, efforts to revive old waterfront functions by changing or rebuilding existing facilities.
3. Development, creating a new waterfront that meets the needs of the city by reclaiming the beach.

Waterfront City functions based on (www.propertyandthecity.com) :

1. Mixed-used waterfront in which there are housing, offices, restaurants, markets, hospitals, and recreational facilities.
2. Recreational waterfront that provides recreational facilities, such as parks, playgrounds, fishing grounds, and cruise ship facilities.
3. Residential waterfront which contains housing such as housing, apartments and resorts.
4. Working waterfront equipped with fishing grounds commercial, yacht repair, heavy industry and functions Harbor.



2.1.3. TROPICAL MODERN ARCHITECTURE

Tropical architecture can be defined as an architectural concept that are able to adapt to tropical climatic conditions. The tropical climate itself has its own characteristics such as hot climate throughout the year, high humidity, high rainfall, wind movement, different air conditions and sometimes for annual flooding.

Modern architecture is a development of the style that has been established since the 1900s which is also a form of progress in construction technology. The main goal is to maximize function by avoiding too many ornaments and decorations.

Tropical modern architecture is known to use natural materials or take advantage of natural conditions that are considered sufficient to represent the value of the tropics. The layout of the house from the existing spaces in the building, air circulation and lighting, to the use of materials must all take into account the climate and weather in the tropics.

This kind of architecture is very suitable to be applied to the design of a community recreational center, when considering the issues that occur in the selected land. The land requires absorption land so that the land can be used as minimal as possible.

2.2

RELEVANT THEORY TO THE OBJECT

Recreational Space and Facilities

Manali Patel (2021) through her research on an inquiry into Integrated Socio-Cultural Values in Design of Recreational Space states that recreational spaces hold a strong importance in planning of cities and in development of societies and culture. The idea of recreation as an inclusive activity has existed across many civilizations and it has evolved as an international and more promising practice through advancements in cultures, technology and lifestyle over the years.

Designers have to convey the design to the client who is usually a builder, contractor or the owner of the space and they have to design for a definite group of people who will become the occupants and dwellers of the space (Bassan, 2016)

It is important for designers to consider things when designing recreational space like multiplicity of uses, various principles which improve the experiences of the space (Manali Patel, 2021)

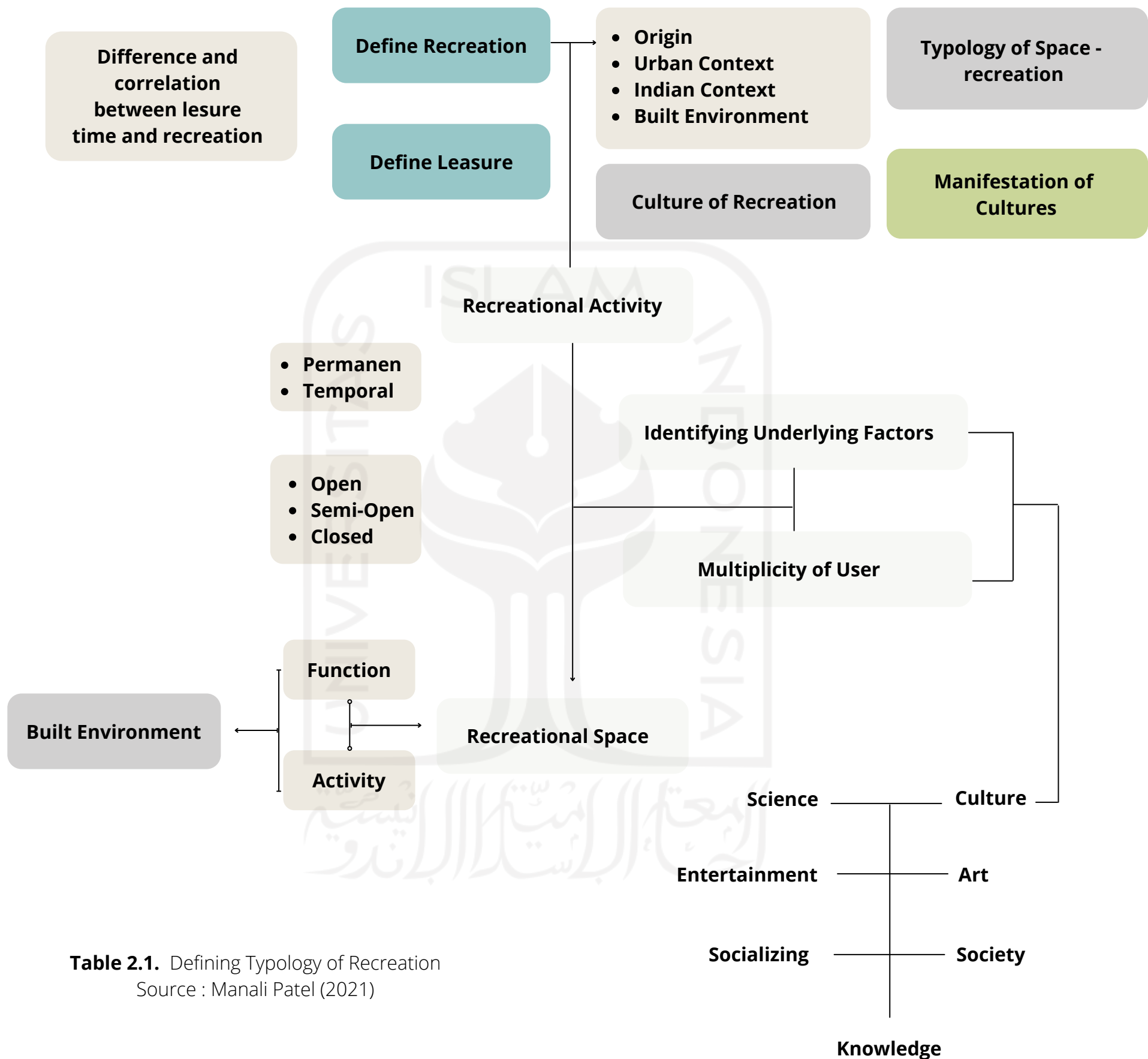


Table 2.1. Defining Typology of Recreation
Source : Manali Patel (2021)

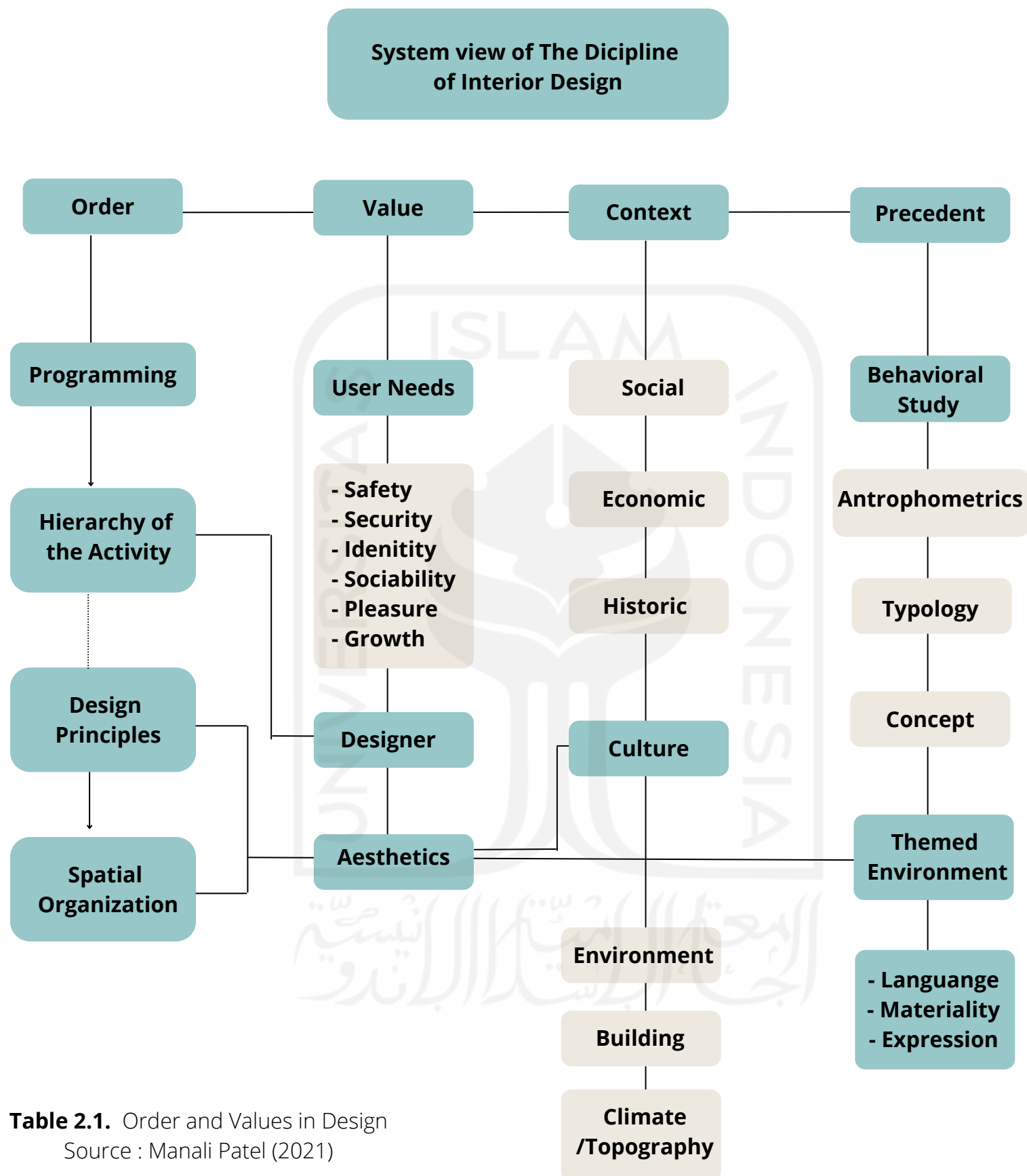


Table 2.1. Order and Values in Design
Source : Manali Patel (2021)

Flood Mitigation System

According to Kodoatie and Sugiyanto (2001), the causes of flooding can be classified into 2 categories, those are caused by natural causes and human actions, including:

- Rainfall. Indonesia has a tropical climate so that throughout the year it has two seasons, the rainy season which generally occurs between October and March, and the dry season which occurs between April and September. In the rainy season, high rainfall will cause flooding in the river and if the flood exceeds the river bank, there will be flooding or inundation.
- Effect of Physiography. Physiography or physical geography of the river such as the shape, function and slope of the watershed, river slope, hydraulic geometry (sectional shape such as width, depth, longitudinal section, river bed material), river location etc. are things that affect the occurrence of flooding.
- Erosion and Sedimentation. Erosion and sedimentation in watershed have an effect on

reducing the cross-sectional capacity of the river. The amount of sedimentation will reduce the capacity of the channel, causing inundation and flooding in the river.

4) river capacity. Reduction of flood flow capacity in rivers

Concept of Flood Resiliency

Resiliency is the quality of being able to return quickly to a previous good condition after problems (Cambridge Dictionary, 2020). In disaster risk management, flood resiliency is the inverse vulnerability, in which being vulnerable in the context of flood risk means exposure and sensitivity towards the disaster (Van Veleen, 2016).

ISSUES	RESOLUTIONS
Reducing Structural Damage	(i) Decreasing the surface area exposed to floods. (ii) Removing the standing structural elements getting submerged and replacing with tension cables. (iii) Elevating the structure during floods. (iv) Retractable walls which allow water to pass through instead of offering hindrance.
Safeguarding Human Lives	(i) Providing a method of evacuation. (ii) Accomodating a raft which allows an option of locomotion if necessary. (iii) A constrained floating structure which lasts if extreme floodwaters rise extensively beyond expected and designed for.
Sustaining Livestock	(i) Providing enough storage for their nutrition to outlast the stagnant flood period of a month. (ii) Accomodation at an elevated level. (iii) Floating structure. (iv) Not stocking chemicals and fertilisers near. (v) Floating Garden to sustain and grow food if it falls short.

Table 2.1. Issue Programme
Source : Tonoy Sarma

While resiliency may define as the salvation towards a challenge and risk, it is a continuous process and cycle that need to be routinised. (LRM 2) defines resiliency as an approach of adaptation that is based on incremental lifecycle that suggests resiliency as an act of continuous effort and process needed in developing resilient urban development.



Figure 2.1. Concept of Resilience: Inverse Vulnerability
Source : Hazwan Bin Husain,2020 adapted from
(Van Veleen, 2016)

Housing System for Flood Mitigation

Housing system for flood prevention is needed to reduce damage which caused by flood, safeguarding human life and sustaining livestock.

Conceptual

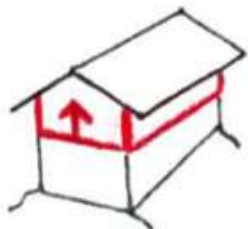
A ground-based mud house is the real Assamese traditional house. They do not like to live in stilt houses like the Mishing do, because they think it will not be comfortable and convenient. According to them cleanliness, hygiene, and good sanitation practices cannot be ensured in this style of living. For conservative people, it is virtually taboo to follow the Mishing way of living.



A traditional rural Assamese dwelling.



Outer profile of the dwelling. The floor may remain as the dwellers want it.

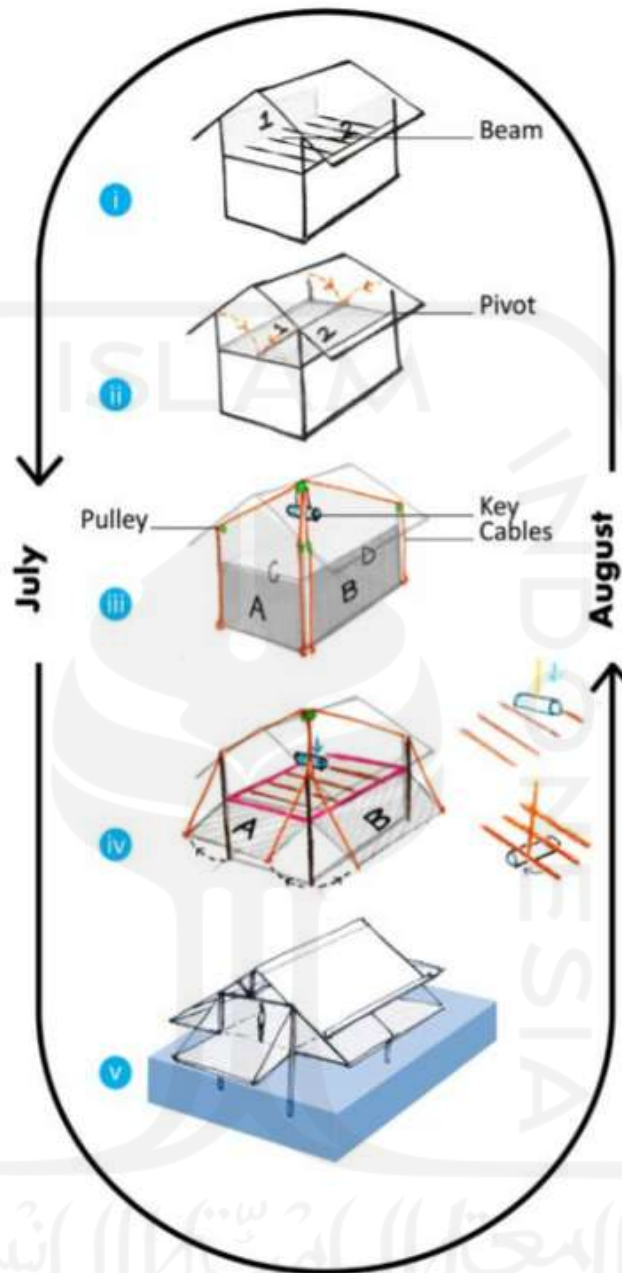


Increase the existing height and provide an array of beams at the break.

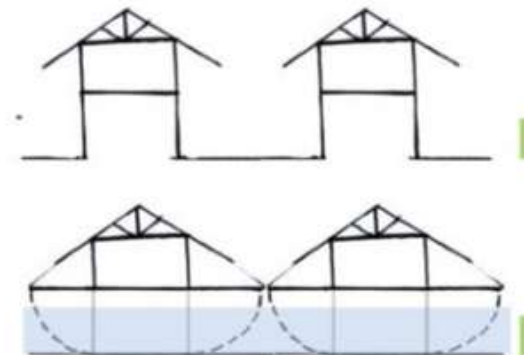


Increase the existing size and overhang of the roof.

Fig. Basic concept sketch

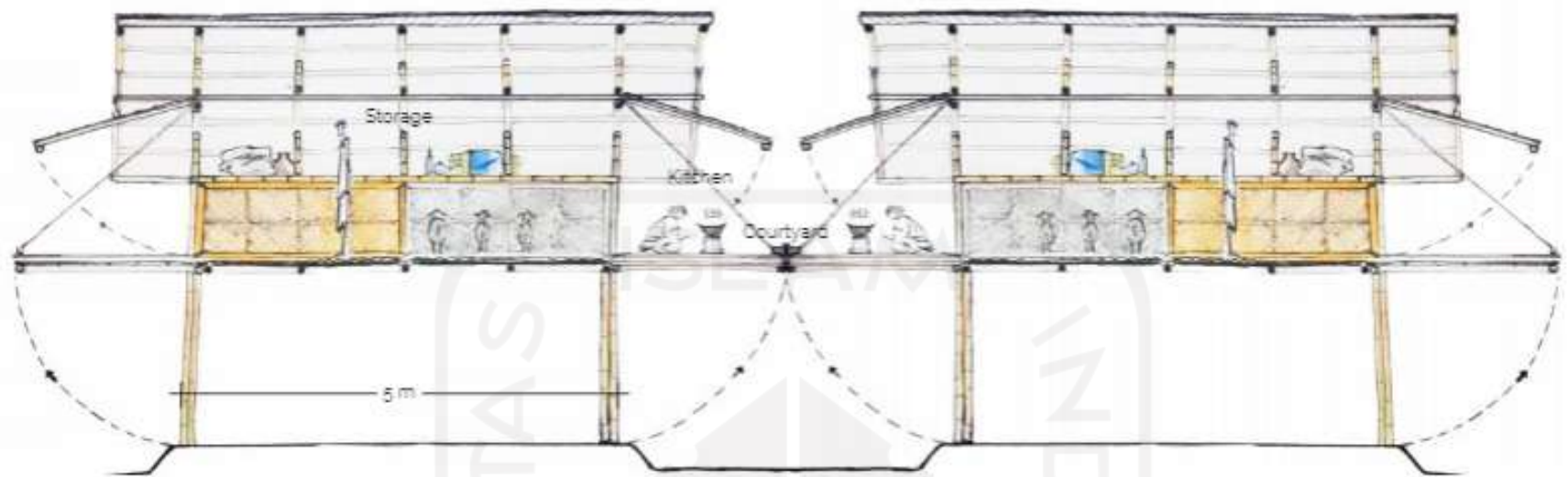


- i Beams run along the break of the external wall which works as storage for the year
- ii Before the onset of monsoon, upper wall 1 and 2 swing along the pivot on the beam to make a floor on the upper level.
- iii A system of pulleys connect to the side wall which are attached to 1 key counterweight
- iv On pulling the key down, the existing wall rises up and transforms into floors for the upper level.
- v Raising up the walls into floors allows
 - Free passage of flood waters through the building.
 - Decreasing the surface area exposure to floods reduces damage risk.
 - Allows the settlement to continue above with least disturbance.

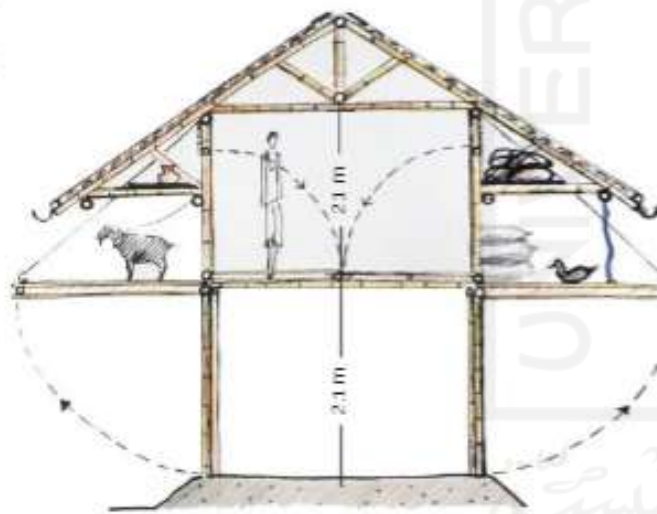


- 1 Houses are independent all year round
- 2 During monsoon floods they become interdependent, forming common space which also work as evacuation routes

Figure 2.2. Flood Retention Building Concept
Source : Tonoy Sarma



The walls move up and connect creating a courtyard at the upper level.
The roof overhang doubles up as a storage space.



The livestock can take shelter in the semiopen added floor area formed by raised walls. It also works as storage



(25 x 1) m panels are kept on the beams on top. They act as walls to replace the swinging walls during monsoons. They also act as a ceiling for the rest of the year.

Figure 2.3. Flood Retention Building Design
Source : Tonoy Sarma

Housing System for Flood Mitigation

The housing concept of this stilt house is almost similar to the concept of a vernacular house in Indonesia. But the difference is, this concept provides a solution to how architecture solves the problem. How the house can withstand flooding and how to move the furniture stored under it.

The wall can be used as the floor and works as storage. The wall in the second floor also can be used as flat roof. This kind of concept is very much needed in flooded areas and residents who have livestock to improve quality and efficiency in their daily lives.

2.3 PRECEDENT STUDIES

1

Zhangjiagang Town River Reconstruction

Public Space, Refurbishment

Location: Suzhou, China

Architects: Botao Landscape

Area: 65000 m²

The bridge has a function to link the north and the south areas so it is very beneficial for public to cross the river. It is also provide the other facilities like amphitheater and other sitting areas. The sculpture designs on street corners make external public spaces blend with the theme and form an integral outdoor landscape of public spaces.





2

Chicago Navy Pier

Public Space

Location : Chicago, IL, United States

The Chicago Navy Pier is the most popular tourist attraction in the America. Architects reactivated the public domain of the Naval Pier as a vibrant social and recreational area, and connected the dock back to the city. It is organized into two categories and scales, a single large structure combining buildings with landscapes and smaller objects emphasizing the pier and framing new views over Lake Michigan.



Source: Archdaily.com

CHICAGO NAVY PIER



3

City Hall+community center Czech design

Public Space

Location: Czech Republic

Architects : Plukk Architect

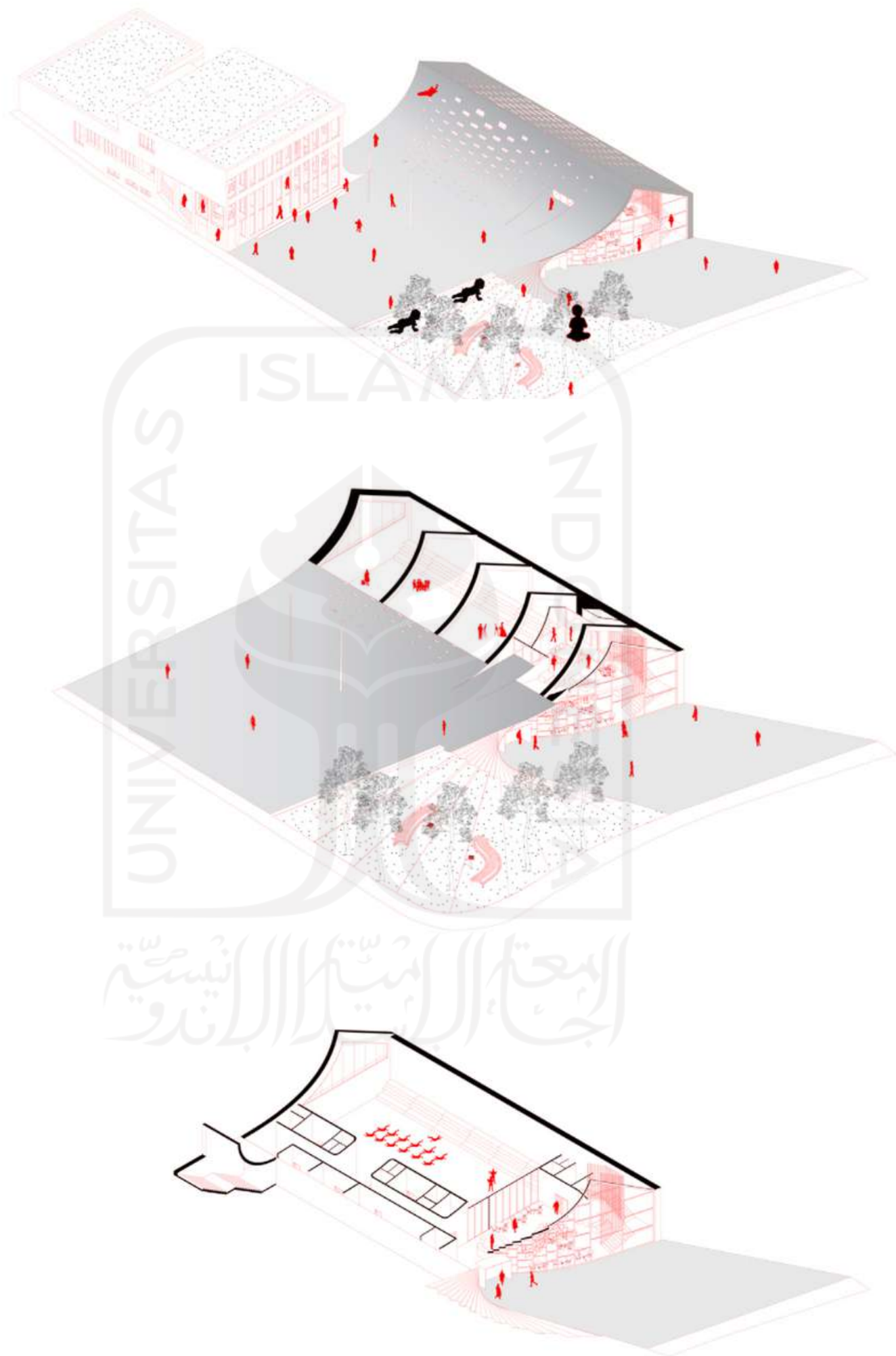
This project utilizes a sloping site to create two buildings with different architectural languages, linked together with active public spaces to create one multifunctional city center.

The project program is divided into two parts, with the town hall located on the upper terrace, and the community center below. A square in front of the town hall, which can serve as a public meeting room, farmer's market, or a summer movie venue, rises to a rooftop accessible from the community center.



Source: Archdaily.com

CITY HALL + COOMUNITY CENTER OF CZECH



4

Butterfly House

Location : Penjiwaan Community, ubud,
bali, indonesia
Architects : Alexis Dornier

Embodied as part of the community spirit in Bali, the architect designed the butterfly house as a place that blurs the line between indoor and outdoor environments. This new residence combines a palette of natural materials with a structure that rises from the ground on columns, resulting in an open living area that flows into the surrounding landscape.





2.4 ORIGINALITY & NOVELTIES

NO	AUTHOR	TITLE	APPROACH	TPOLOGY	LOCATION	YEAR	DIFFERENCES
1.	Sekar Kinanti Herpradanti	Pontianak Waterfront Craft and Culinary Center	Contextual Architecture	Crafts and Culinary Center	Pontianak	2020	Designing with Contextual approach
2.	Malikul Ashtar	Mall Design in Pontianak City	Green Architecture	Shopping Center	Pontianak	2020	Function of The Building
3.	Zakiyya Rona Ariba	Resort and Seafood Store	Mixed-Use Waterfront	Stores	Jepara	2021	Function of the Design
4.	Azizah Nurul Muflihah, Dita Ayu Rani Natalia	Tanjung Adikarto Waterfront Tourism Area Design With Community Development Approach	Community Development	Fish Stores and Fishing Area	Yogyakarta	2019	Focusing on the Local Economic Development
5.	Rina Meimuna, Ir. Ahmad Saifullah MJ, M.Si.	Widuri Beach Culinary Park Integrated with Tourism In The Waterfront Area with Ecological Architecture Approach	Ecological Architecture	Culinary Center	Pemalang, Central Java	2015	Focusing on Culinary and tourist park

CHAPTER 3

METHOD



3.1. Introduction to Design Method

The design method is needed to learn the theoretical basis of design and how to achieve these goals methodologically. Introduction of ways and sequences of designing and building thinking methods that are in accordance with the design problem process, which is called problem solving methods. Development of the ability to analyze and read symptoms or problems critically every movement what is happening around.

The other benefit is to gaining unique essential insights or truths results in more holistic solutions to achieve a better experience for users with their experiences, services, environments and systems rely on.

1

PLAN

**Research
Observe
Analyse**

2

DESIGN

**Use Cases
Design Concepts
Wireframes**

3

DEVELOP

**Design Handover
Communicate
Visual Design**

4

DEPLOY

**Design Quality Check
Usability Testing
Approval**

3.2. Systematic Method by Peter H. Jones

- Strategy by Idealization & appreciating wickedness and complexity. means limitations in design such as government regulations, etc. are able to encourage the creativity of designers to solve problems.
- Discovering purpose of the design. The design will not be useful if there is no purpose. The goals comes from the problems experienced by a community, so the design will act as a solution.
- Designing by boundary framing and system ordering. In this phase, the designer should use the cases and create design concept to respond the problem without ignoring the boundary and system orders.
- Developing by Generative emergence and continuous adaptation. The designer should keep revising and developing the design to achieve better result to respond the surroundings problem.
- Deploying by Self-organizing & placement and feedback coordination. Before the design will be deploy in reality, the design should pass the quality check and usability testing by following the boundaries and regulations.

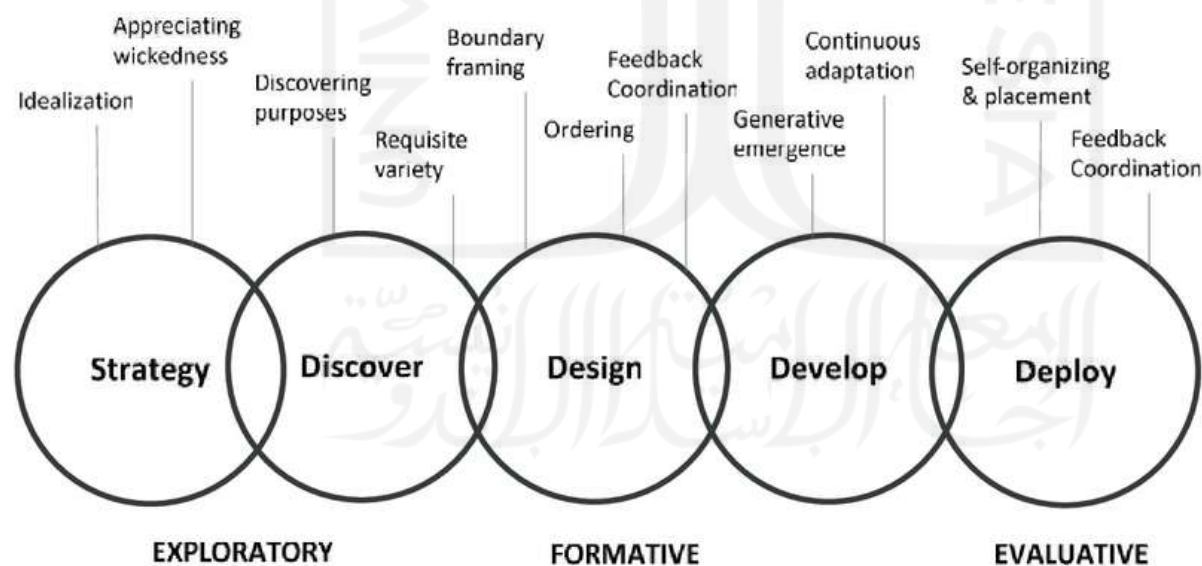


Figure 3.1. Design methods for systemic design research
Source : Peter H. Jones

3.3. Design Method by Author

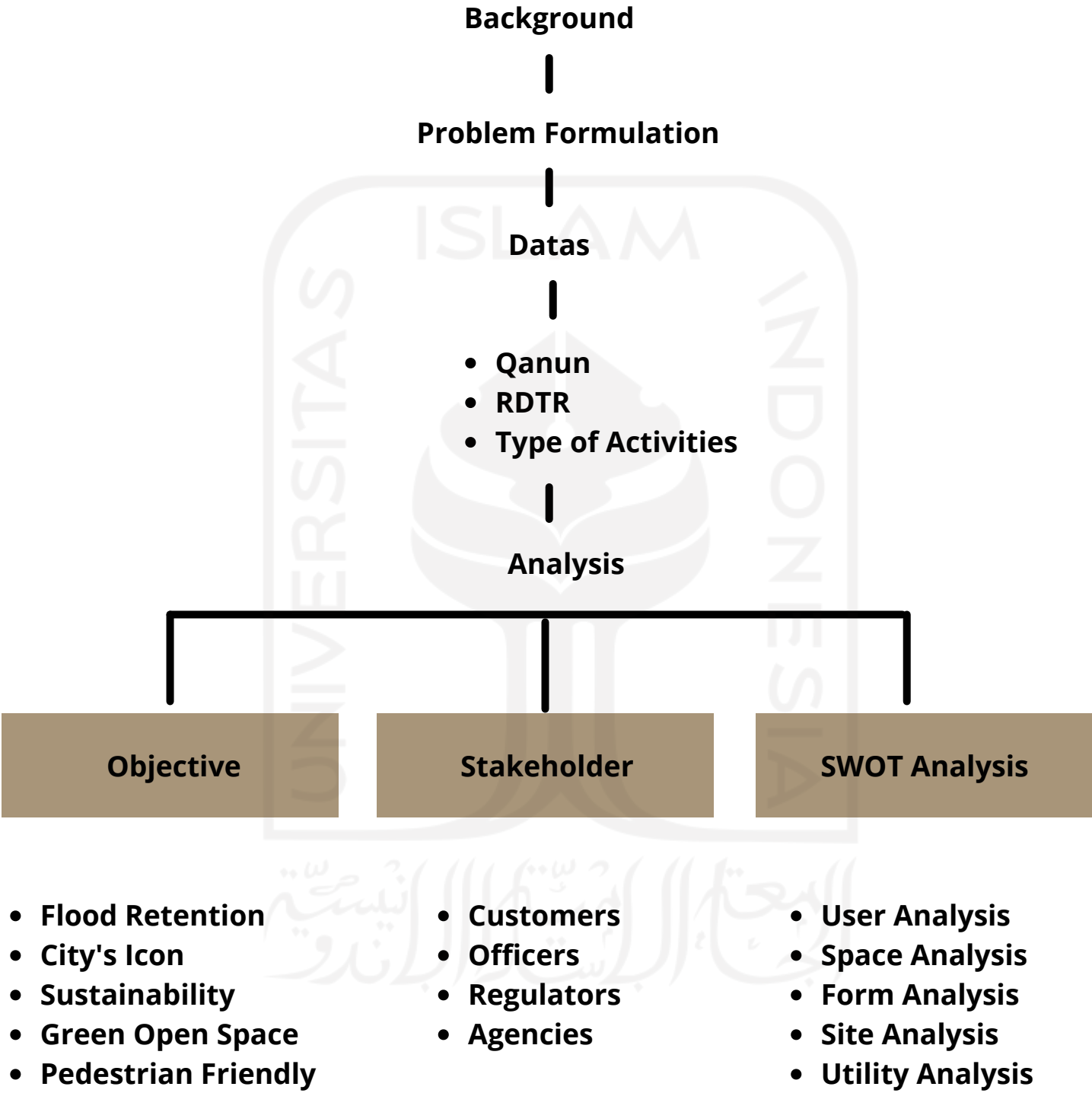


Figure 3.2. Design methods
Source : Author Documentation



CHAPTER 4

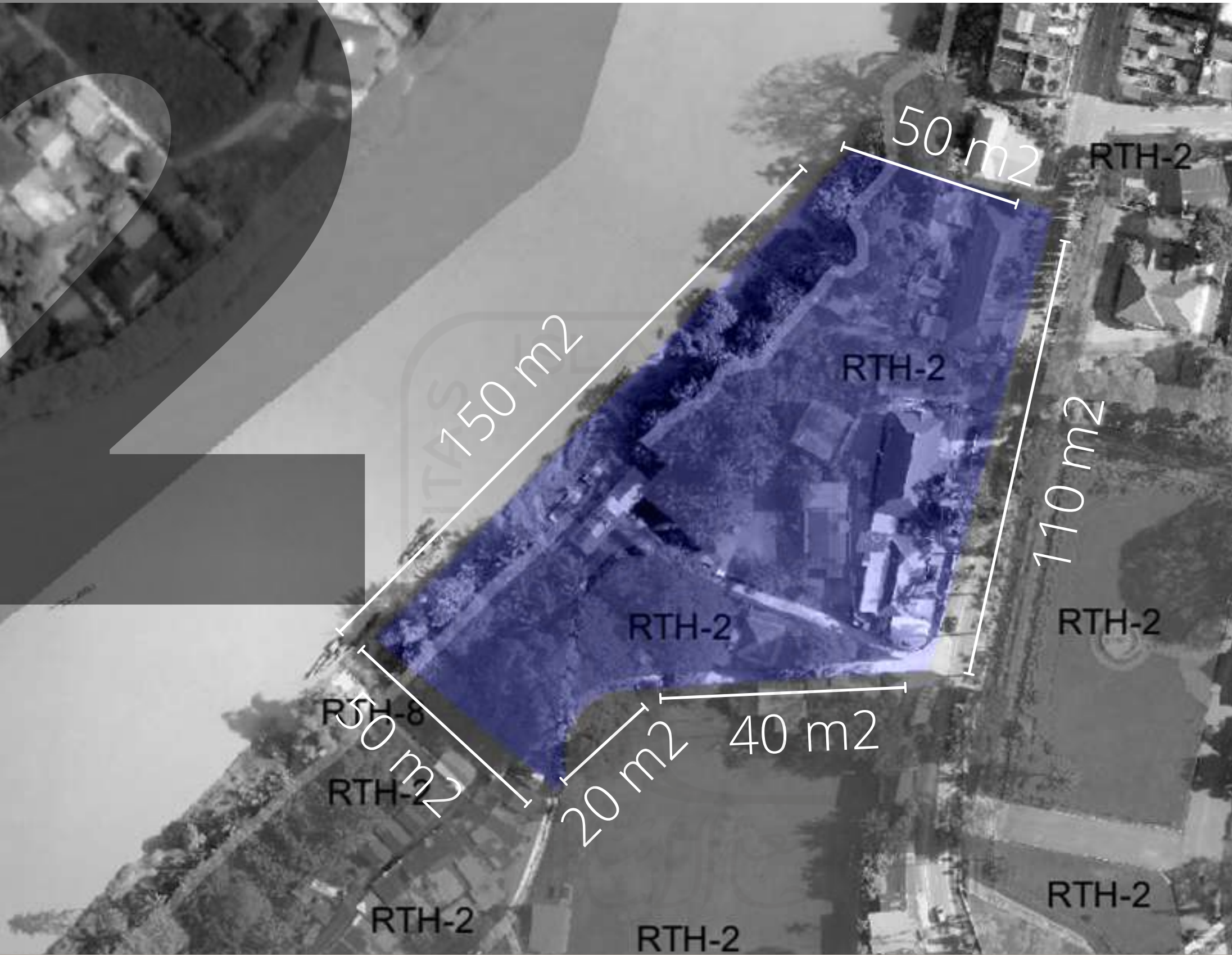
SITE CONTEXT

ANALYSIS



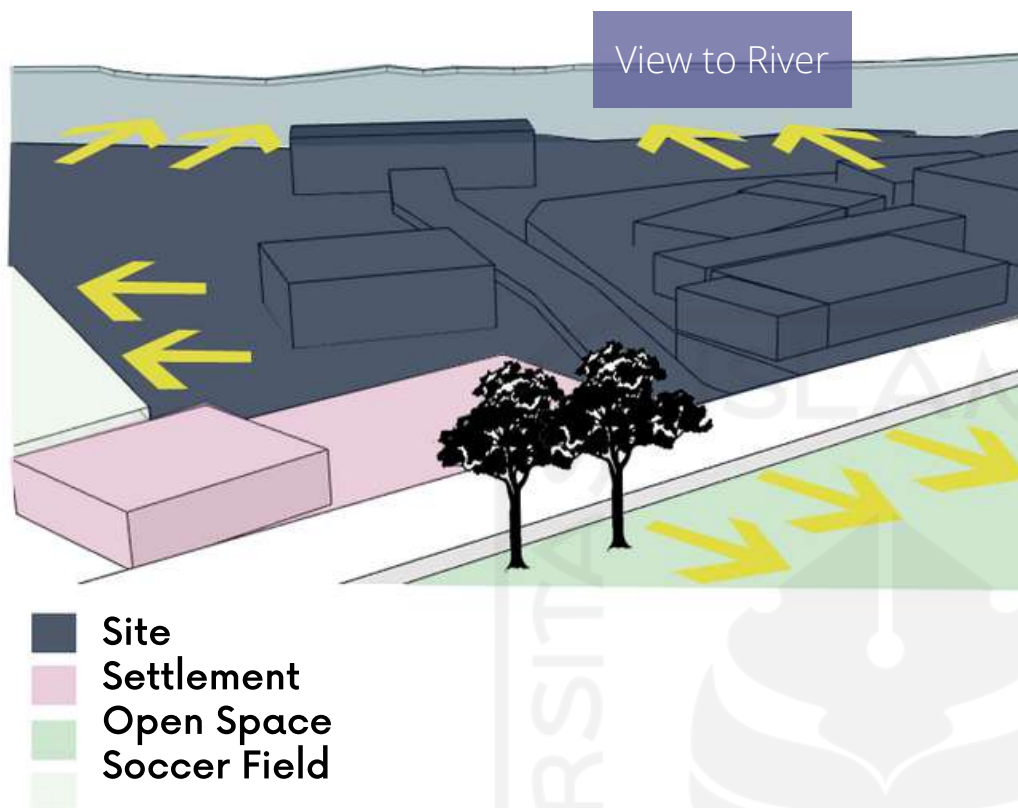
3,5 HECTARE
SITE THAT ARE ALLOWED TO
BE USED

- Based on UU No. 26 of 2007-2032 concerning Spatial Planning, the spatial planning of the city area must include a plan for the provision and utilization of green open space with a minimum area of 30% of the city area.
 - The proportion of 30% is a minimum measure to ensure the balance of the city's ecosystem, both are for the balance of the hydrological system and the balance of the microclimate, as well as other ecological systems that can increase the availability of clean air needed by the community, and at the same time increase the aesthetic value of the city.
 - The river border green open space is the green line located on the left and the right of the river which has the main function of protecting the river from various disturbances that can damage the condition rivers and their sustainability. According to existing regulations, rivers in urban areas consist of dammed rivers and unbanked rivers, each of them has different regulations.
- for unbanked river:
- a) Rivers that have a depth of not less 3 m, the demarcation line is set at least 10 m from the river bank at the time it is determined.
 - b) Rivers that have a depth of in between 3 m to 20 m, the demarcation line is set at least 15 m from the river bank at the time of stipulation.
 - c) Rivers that have a depth of more than 20 m, the demarcation line is set at least 30 m from the river bank at the time it is determined.



USED SITE

Total Area 12.400 m2 / 1.24 ha
BCR 30 % from Total Area : 3.720 m2



POTENTIAL VIEW

From the site's position, there are 2 prominent views, namely the view towards the river and the open field. With this, the orientation of the building to be built will be more inclined towards the east and west.



ACCESSIBILITY

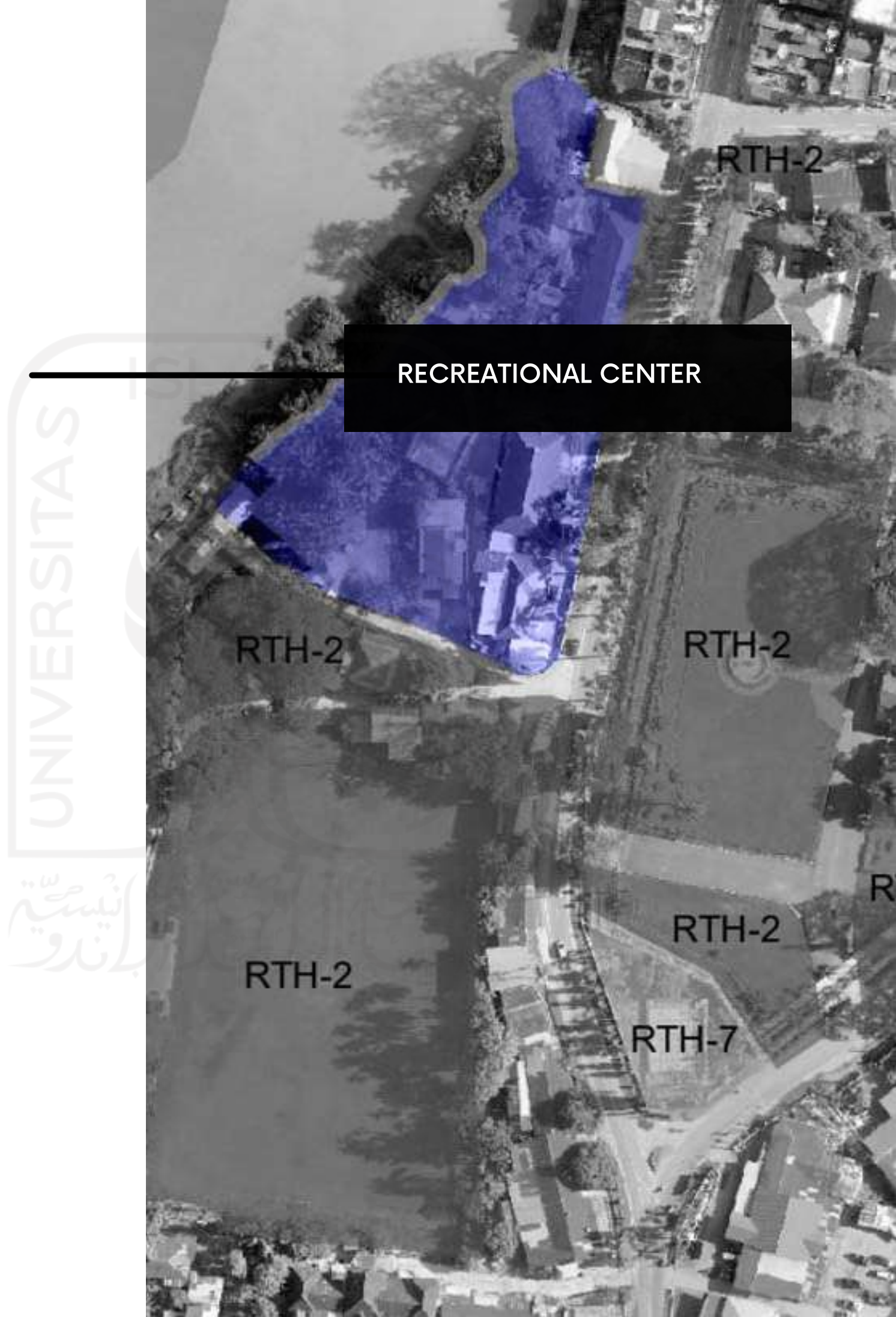
To enter the site, there are different contours on the main road and the neighborhood road, but the road is not too steep and safe for vehicles to pass.

SITE ANALYSIS

The location where the building will be built. This area is allowed by ministry of public works to build a community recreation center and in the future this land will be acquired.

The Existing site consist of:

- BNN (National Narcotics Board)
- Fire Company (firefighter)
- Other local government building
- Mosque
- Settlements

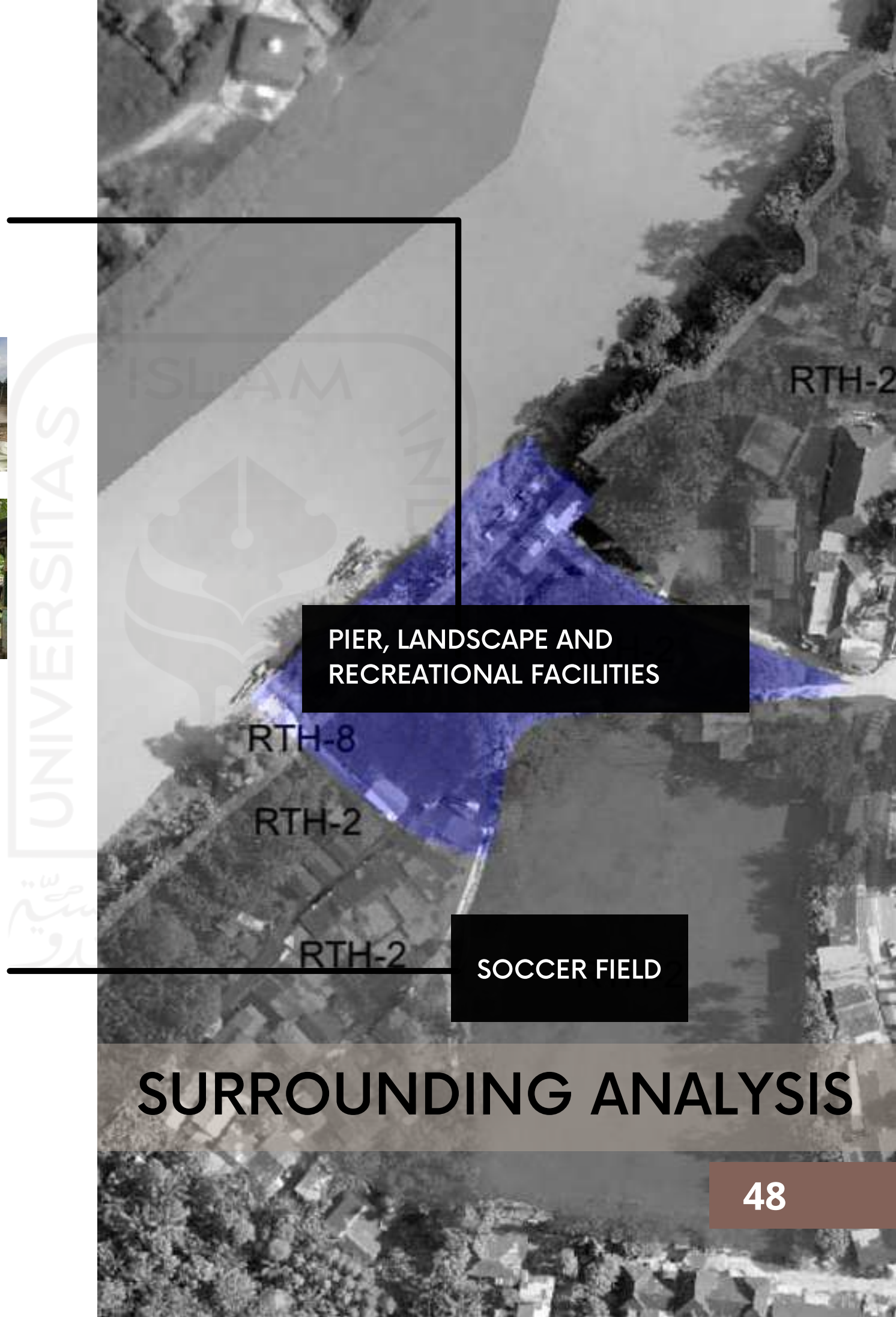


For this area, it is recommended to arrange the landscape, recreational facilities and pier.



This is vacant area, why not built here?

On this soccer field, the ministry of public work only allows making green opening space arrangements. On this area is not allowed to build buildings



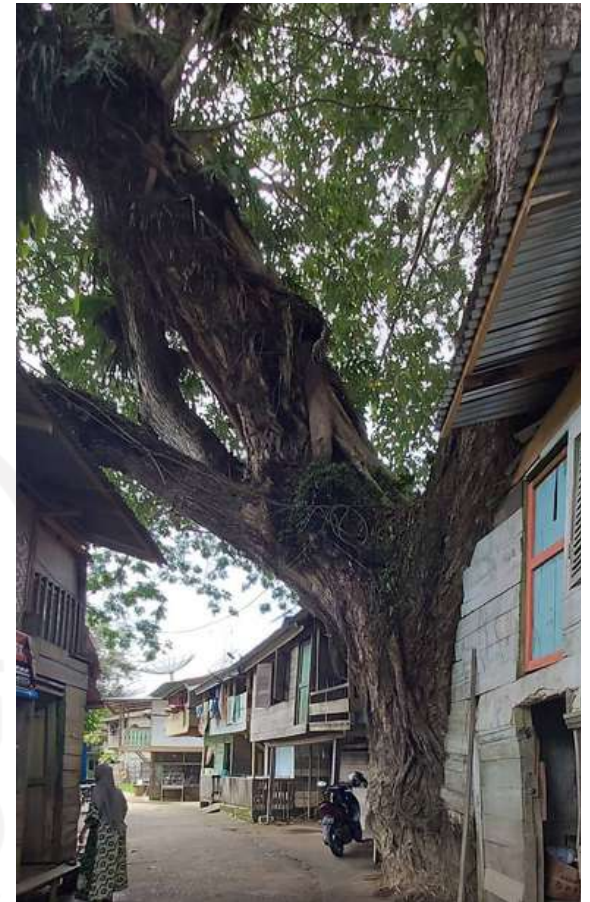
SURROUNDING ANALYSIS

SITE CONDITION AN CHALLENGES

After experiencing the earthquake and tsunami in 2004, Aceh Tamiang was struck by another disaster, the 2006 flood, which swept away many houses of residents from 11 sub-districts and also washed away many documents. The water level reached 2-4 meters and recorded as the biggest flood in Aceh tamiang. Before the flood disaster came, the houses in this area were designed without considering natural disasters, so they were easily destroyed in this incident.

Until now, The riverside area is known as a flood area in the Kuala Simpang City, so that people whom live in this area adapts to its environment. As can be seen in the following picture, the houses of residents have a distinctive typology. Their houses are higher than the houses in general which are built in the city center, so that their houses will still stand strong even though the environment is flooded.

There are other problems experienced by the people of Kuala Simpang, especially residents who live on the banks of the river, they experience economic limitations. If we look at their daily activities and work and it can be seen also from the physical building, even though the building has been designed as high as possible to avoid from flooding but many parts have been damaged or almost collapsed due to the age of the building.





Flood Information : Annually

This flood usually occurs annually. People who live in this area say that floods usually occur in October and November and the maximum flood height that occurs annually is 1.78 meters and the minimum height is 1.22 meters

The height of the ground floor which needed by the community adjusts to the height of the floods that occur each year. The required height is approximately 2-3 meters for the ground floor.

Community's Activity

People who live on the edge of Kuala Simpang usually provide water transportation services for people who come from downstream or villages, who want to trade in the city of Kuala Simpang.

Flood Additional Information

Another cause that causes flooding is the selected area is a downhill road if passing from a main road. When the intensity of the rain increases, the water from the river will overflow and the rainwater from the side of the road will flow into the site area as shown on this following picture.

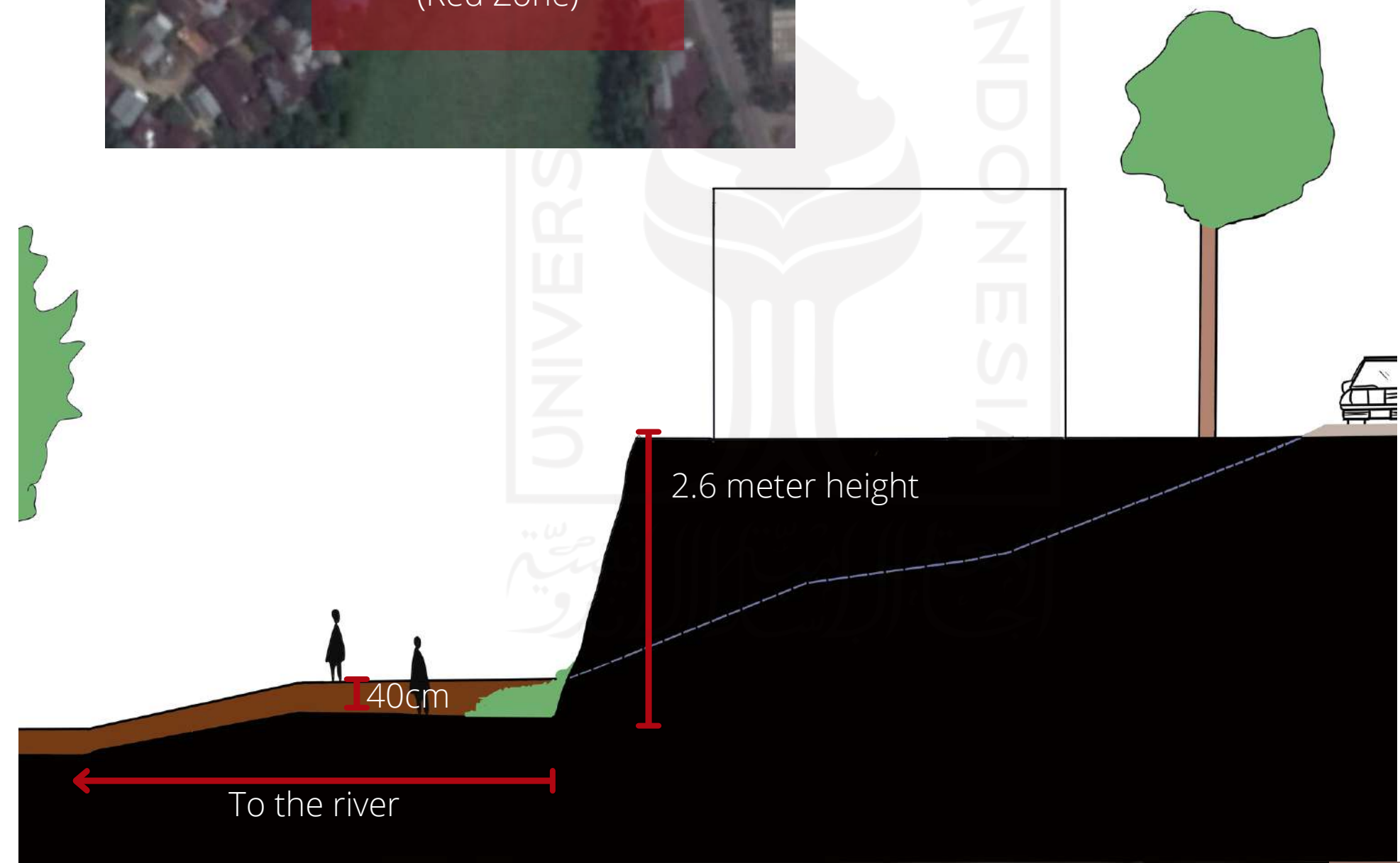
EXISTING SITE AND CHALLENGES

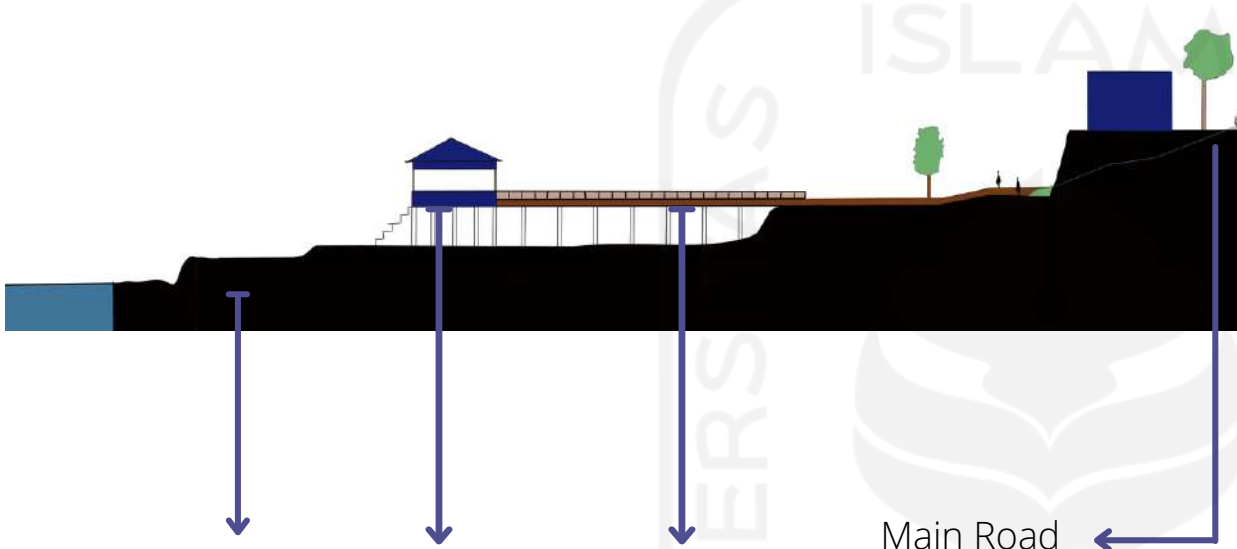
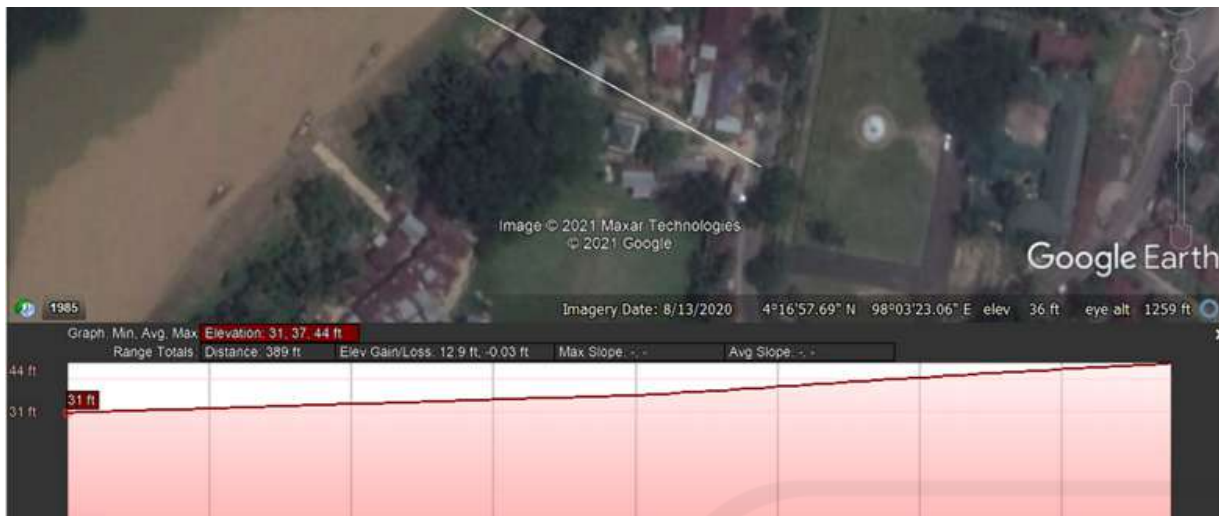


SITE INFORMATION | ENTRANCE TO THE SITE



Section





Annual Flood Data

Maximum flood height is 1.7 - 2.0 meter depth from the ground (from the pier as shown in the figure) and the minimum is 1.2 depth from the ground.

The normal situation is when the river water does not reach the ground or sometime it reach the ground at least 5 meter from the river



Source: Author's Documentation

Before Flooding

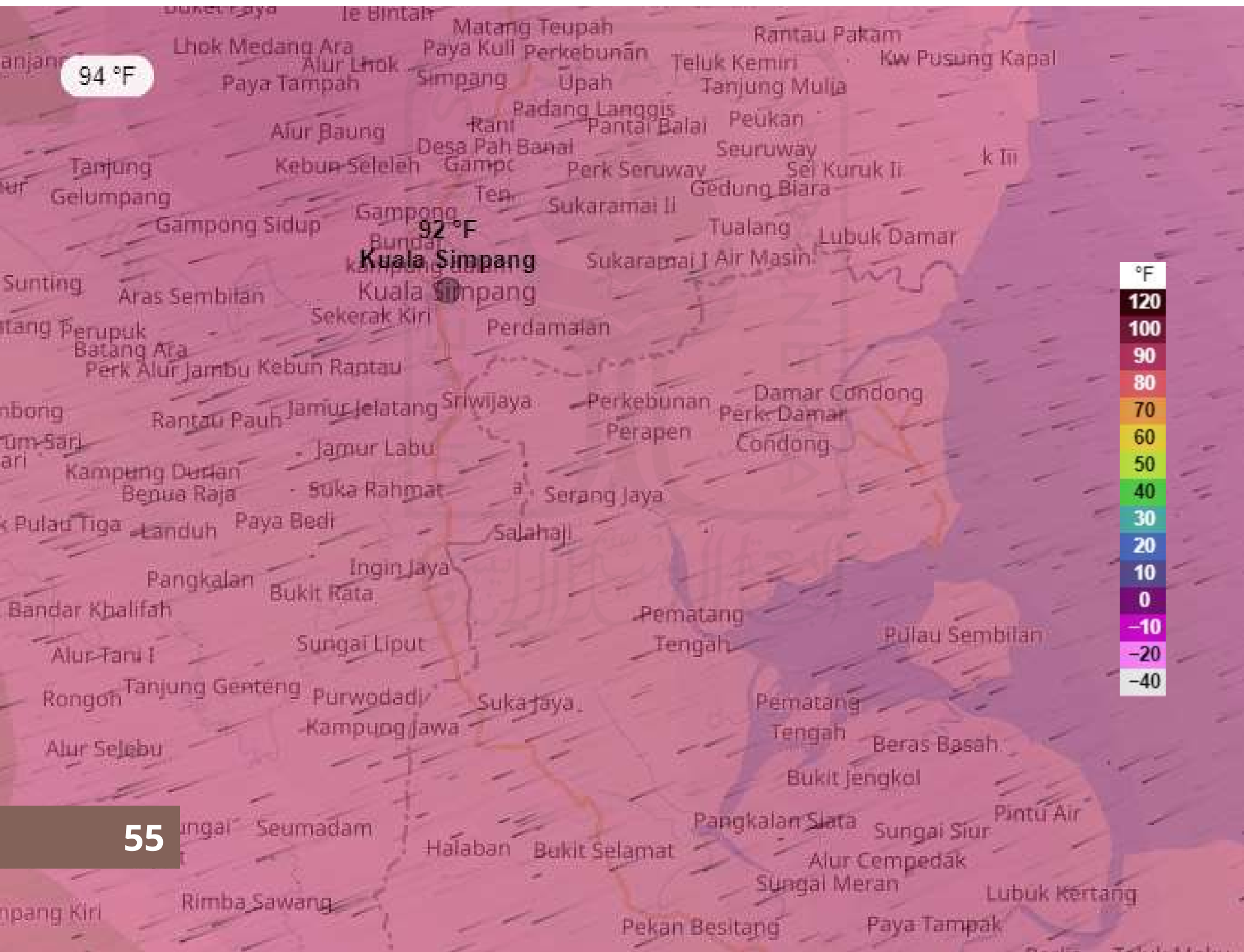
**Flooding
approximately 100-120 cm
minimum water level**



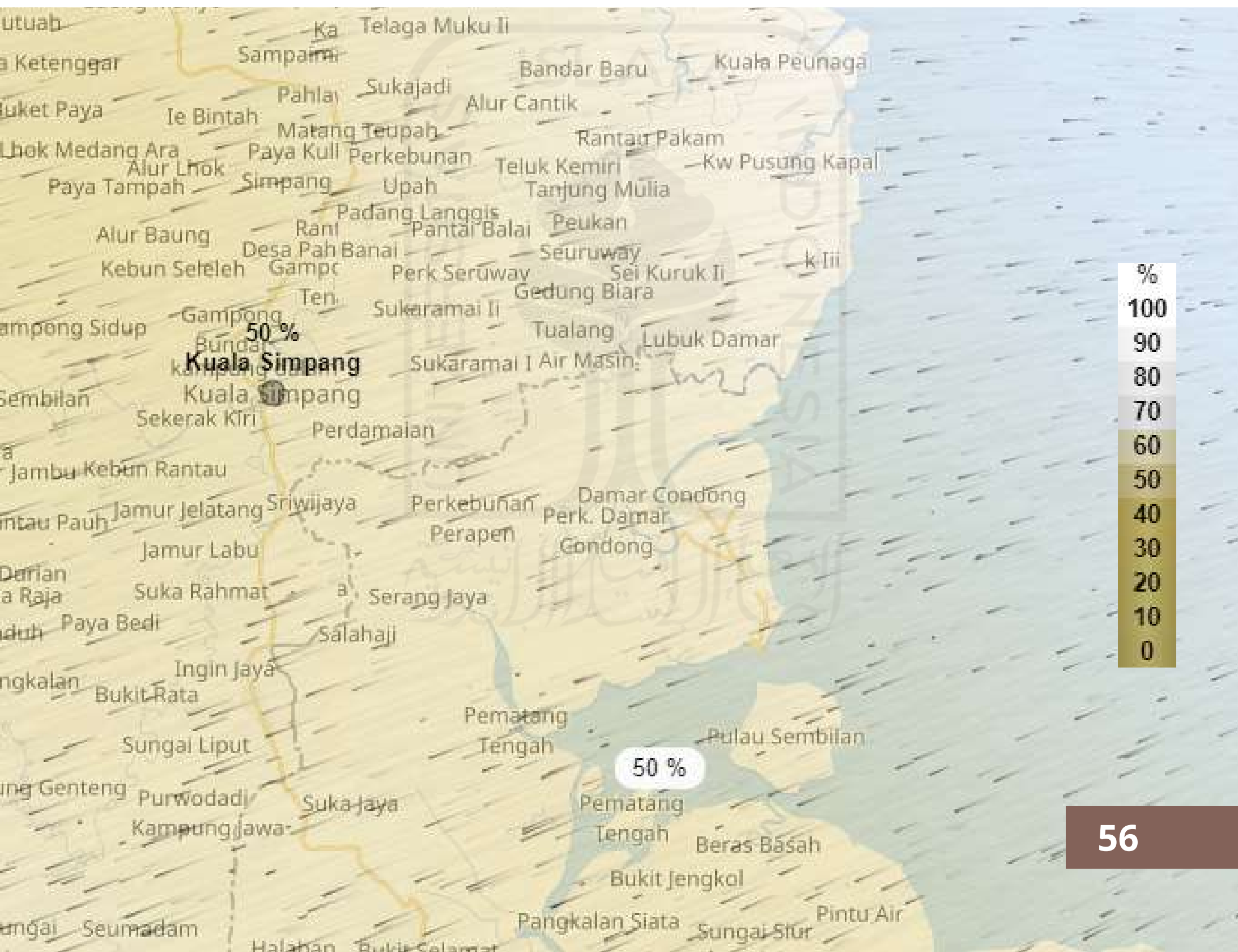
Source: Author's Documentation

| CLIMATOLOGY

Average Temperature : 33,3 Celcius



Humidity: 50%



Analysization should be done before the designing process, what's the need of the civilian and the city. Therefore creating a design which responds to the result of the analyzation process.

To meet the needs of green space in the city of Kuala Simpang which is still below 20% and recreational space also the part of the green space. It is more suitable and unique if it will be place on the riverbank.

This points are being prioritize:

- Flood Retention Space
- Playgrounds
- Indoor Park
- Culinary Space
- Edu park space
- Gallery
- Souvenir Shops
- Limited Transportation Access
- Pier
- Fishing Area (Additional)

Why it has some point to prioritize?

Flood Retention Area

Soil erosion often occurs in the Kuala Simpang River, due to land subsidence and there are no embankments in the river. It would be better to create a space, where people walking by enjoying the ambience of the waterfront and the area can be used as flood retention as the flood going up. It would be better to people to while people still enjoying the ambience of the waterfront and the area can be used as flood retention.

Playgrounds (edu-park space)

Due to the lack of knowledge of the history of Kuala Simpang by its own residence and the newcomers, it would be better if the playground also utilized as historical learning space.

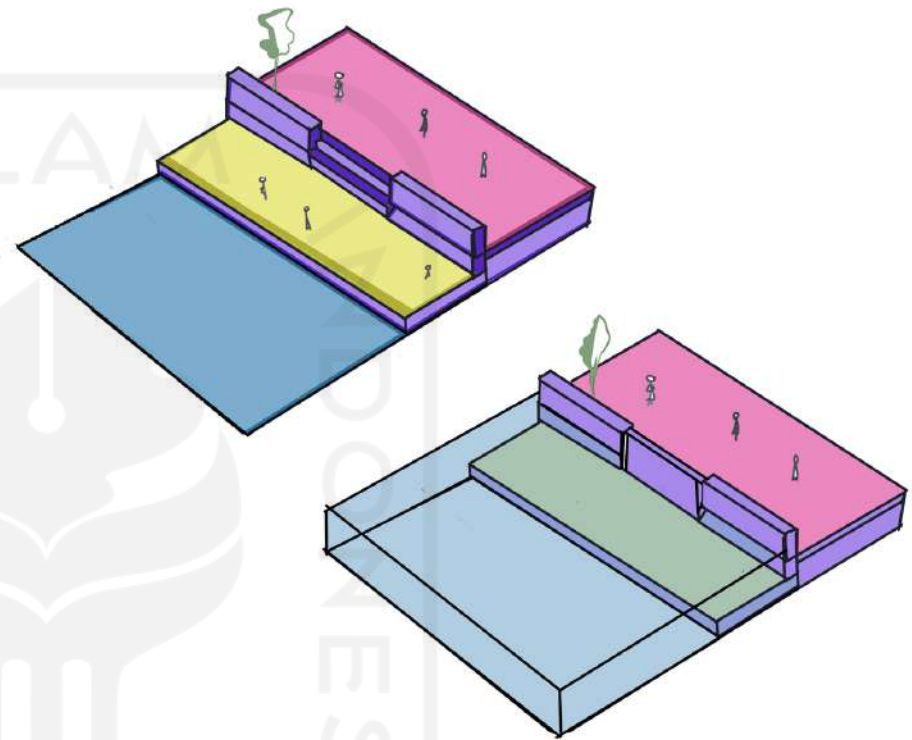
Pier and Fishing Area

there is land beside the river that has not been developed, after analyzing that many people who carry out activities with water transportation and residents who live around this site really need a pier, then the design of the pier will be the main point in the design

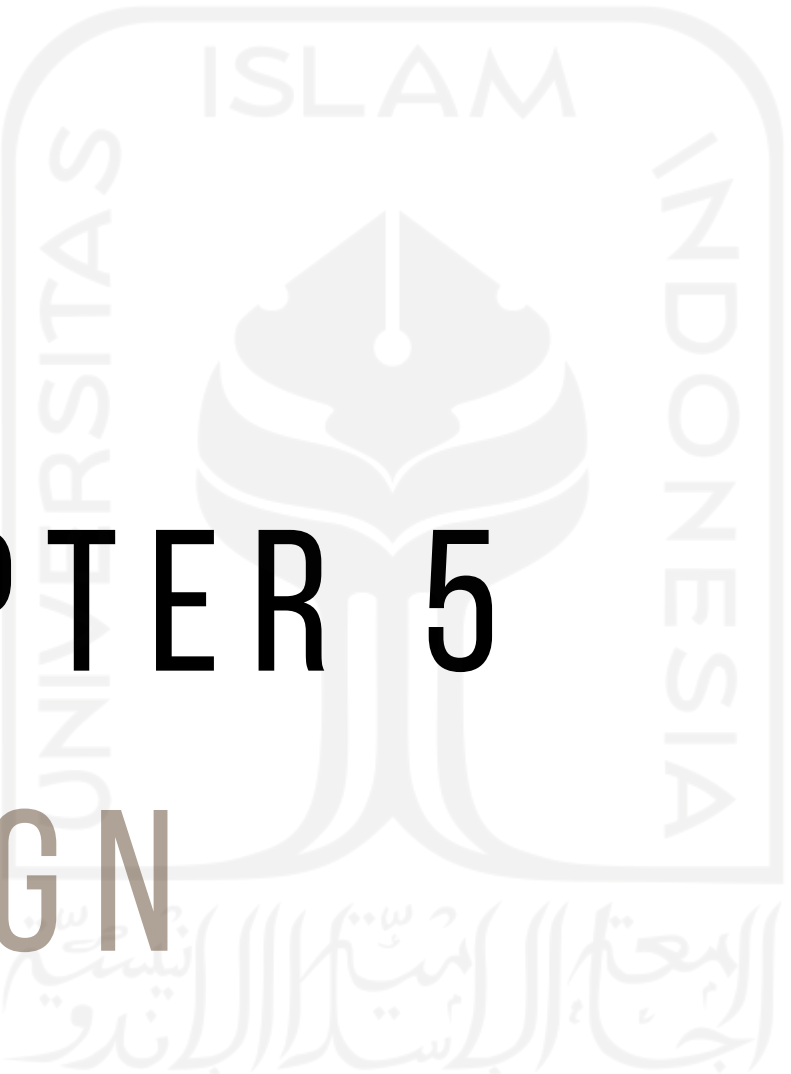
For the prevention of erosion, generally use counter-measures by installing a retaining wall in the form of semi-gravity. Even though a retaining wall has been provided, this does not guarantee whether the potential for flooding will decrease or not in the future, so that other alternatives are needed to reduce disaster risk

Flood resistant design for landscaping by providing a lower space or with a little higher elevation from river water.

The initial design hypothesis and approach would be a recreational center that possess the resiliency ability against annual flood and future flash-flood. There are 2 concepts that will be implemented into the design, Those are the concept of flood resistance for landscape design and for buildings.



Flood Retention for Landscape Design



CHAPTER 5

DESIGN

EXPLORATION

RECREATIONAL ACTIVITIES ANALYSIS

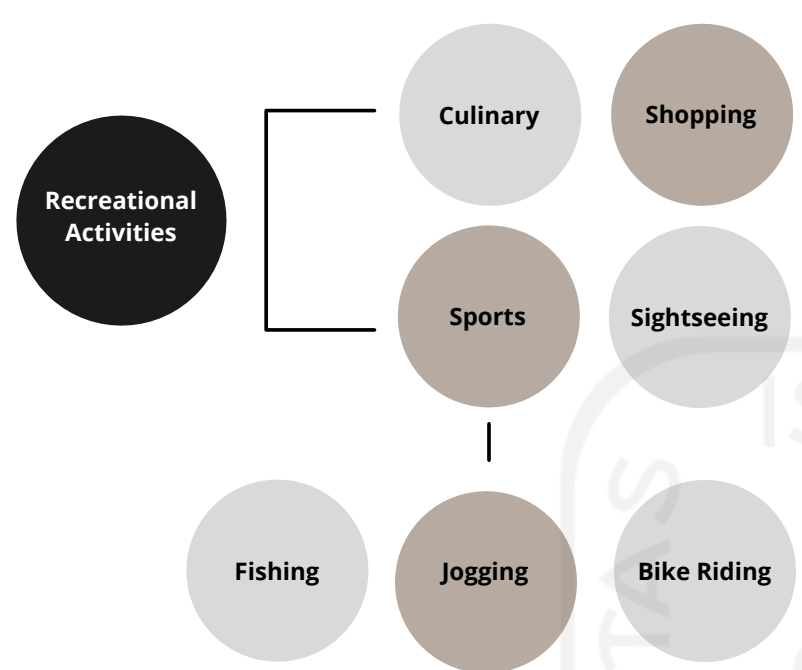


Figure 5.1. Recreational Activities of People in Kuala Simpang
rce : Author's Documentation

FACILITIES FOCUSED

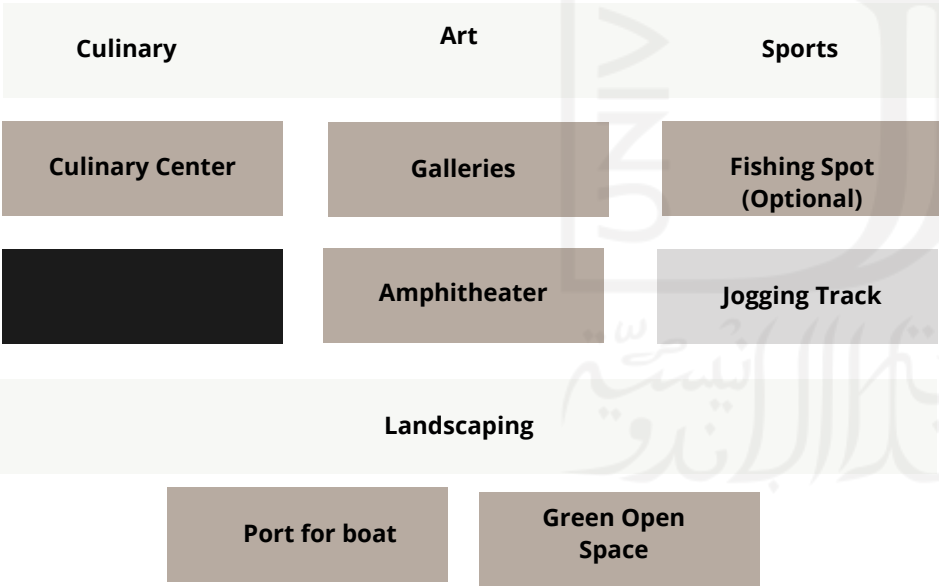


Figure 5.2. Facilities focused based on people activities
Source : Author's Documentation

The figures shows the recreational activities which done by people of Kuala Simpang. The data is taken based on the results of observations, interviews with the community, and the facilities which desired by the community.

SPACE PROGRAMMING

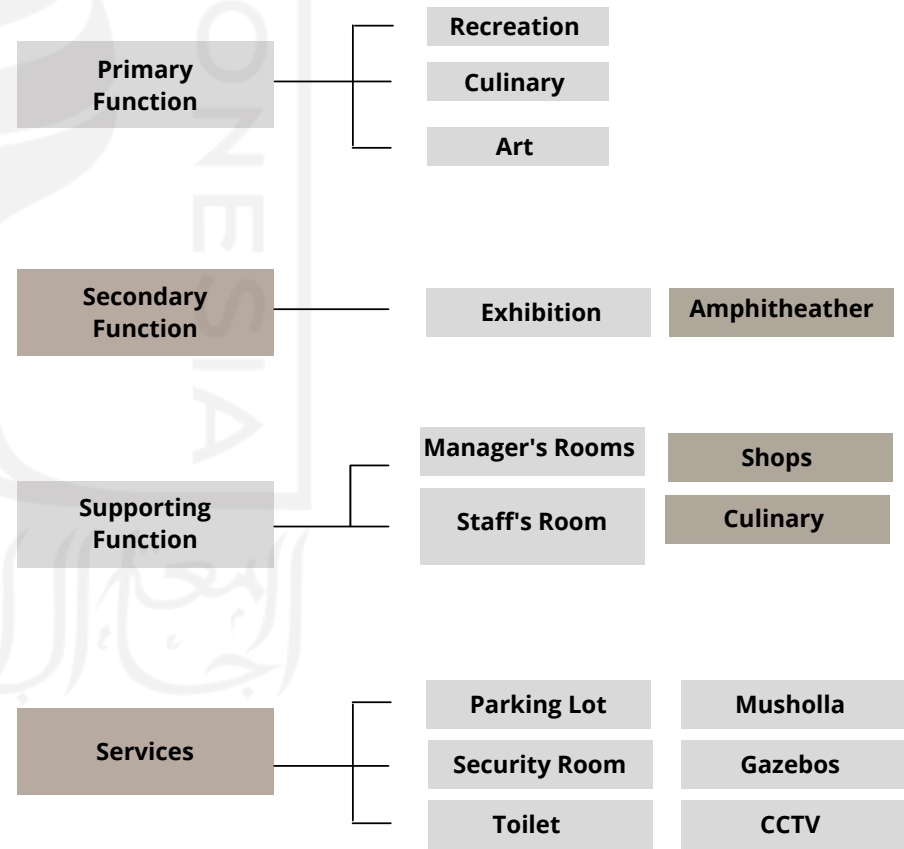


Figure 5.3. Space Programming
Source: Author's Documentation

USER TARGET	ACTIVITY	NEED OF SPACE
Tourist	Gathering	Gathering Space
	Enjoying Art Performance	Amphitheater and Gallery
	Eating	F&B
	Enjoying The View	Gazebos and Sitting Area
	Boating Activity	Pier/Docks
	Mitigation System Learning	Workshops and Library
	Shalah	Mosque
Student	Mitigation System Learning	Workshops and Library
	Doing or enjoying Art Performance	Amphitheather and Gallery
	Boating Activity	Pier/Docks
	Eating	F&B
	Shalah	Mosque
Local People	Doing or enjoying Art Performance	Amphitheather and Gallery
	Boating Activity	Boat Dock
	Eating	F&B
	Doing sports	Jogging Track
	Shalah	Mosque
Seller	Trading	F&B
		Shops
Street Vendors	Trading Goods/Foods	Trading Space

Table 5.1. Need of Space
Source: Author's Documentation

RECREATIONAL FACILITIES BASED ON BUILDING CODES AND REGULATION OF ACEH

No	Menu	Activities	
1	Tourism Area Arrangement	1	Development of tourist information center and its equipment
		2	Construct changing room or toilet
		3	Tourist attraction park arrangement: 1. Making Pergola 2. Garden Light Installation 3. guardrail construction
		4	Stage construction
		5	a. Construction of supporting facilities for tourist attractions: 1. Souvenir stall 2. Plaza hawker/culinary center 3. Mosque b. Revitalization of supporting facilities for tourist attractions: 1. Souvenir stall 2. Plaza hawker/culinary center 3. Mosque
		6	Construction of pedestrian paths/walks/roads within the area, boardwalks, pedestrians, and parking lots.
		7	Manufacture of directional signs
2	Tourism Amenities		a. Tourist dock construction.
		1	b. Construction of docking/stopping points for sailing ships (yachts).
		2	Construction of a dive center and its equipment.
		3	Construction of a surf center and its equipment.

Table 5.2. Recreational Activities based on Aceh's RDTR
Source: Author's Documentation

Some activities are may not tied to the results of the recreational needs analysis in the figure above. The space needed by the community in accordance with the activities they expect will still be provided, but there are additional facilities to complement the function of the space and also to achieve the goal of "recreational center to support educational needs". Because in this building the concept of a building with a flood mitigation system will be applied, it would be better if this system was collaborated with educational needs.

RECREATIONAL ACTIVITIES ANALYSIS

Category	Classification	Function	B1	GF	F1	Rooftop	%	BCR%
Public	Hall	Lobby		v			20%	30%
		Lift Lobby		v				
		Rest Rooms		v				
		Gathering Space		v				
	Commercial	Culinary Center		v			20%	
		Shops		v				
	Circulation	Drop off Area		v			15%	
		Parking Lot	v	v				
Pedestrian Access			v					
Emergency Stair Room		v	v	v				
Semi-Public	Functional Space	Flood Resiliency Workshops	v	v	v		40%	
		Atrium		v	v			
		Gallery		v				
		Library			v			
		Co-working Space		v	v			
Private	Mechanical & Electrical	MEE System Operator Room	v	v	v	v	5%	
		CCTV, Soundsystem, PABX	v					
		Pump Room & GWT	v					
		Roof watertank				v		
		Genset Room	v					
		Lift House				v		
	Utility Room	Janitor Room		v	v			
		Toilet		v	v			
	Management & Support	Receptionist Room		v				
		Security Room	v	v				
		Staff Meeting Room		v				
		Director's Room		v				
		Storage	v					
		TOTAL %						
Landscape	Outdoor Facilities	Amphitheater & Stages					-	70%
		Observation Tower						
		Riverwalk						
		Leisure Area (Gazebos)						
		Pier/docks for boat						
		Open Space/Plaza						
		Jogging Track						
		Mosque						

TOTAL SITE 12400 m2 / 1.2 Hectar

- LAND USED FOR BUILDING (3.720 M2) BCR 30%
- 11.160 FOR FAR (3.0)
- 8680 M2 FOR GCR (70%)

HALL 11.160 x 5% = 558 m2
COMMERCIAL 11.160 x 20% = 2.232 m2
CIRCULATION 11.160 x 15% = 1.674 m2
FUNCTIONAL SPACE 11.160 x 40% = 4.464 m2
PRIVATE SPACE 11. 160 x 5% = 558 m2

SPACE PROGRAMMING ALTERNATIVE

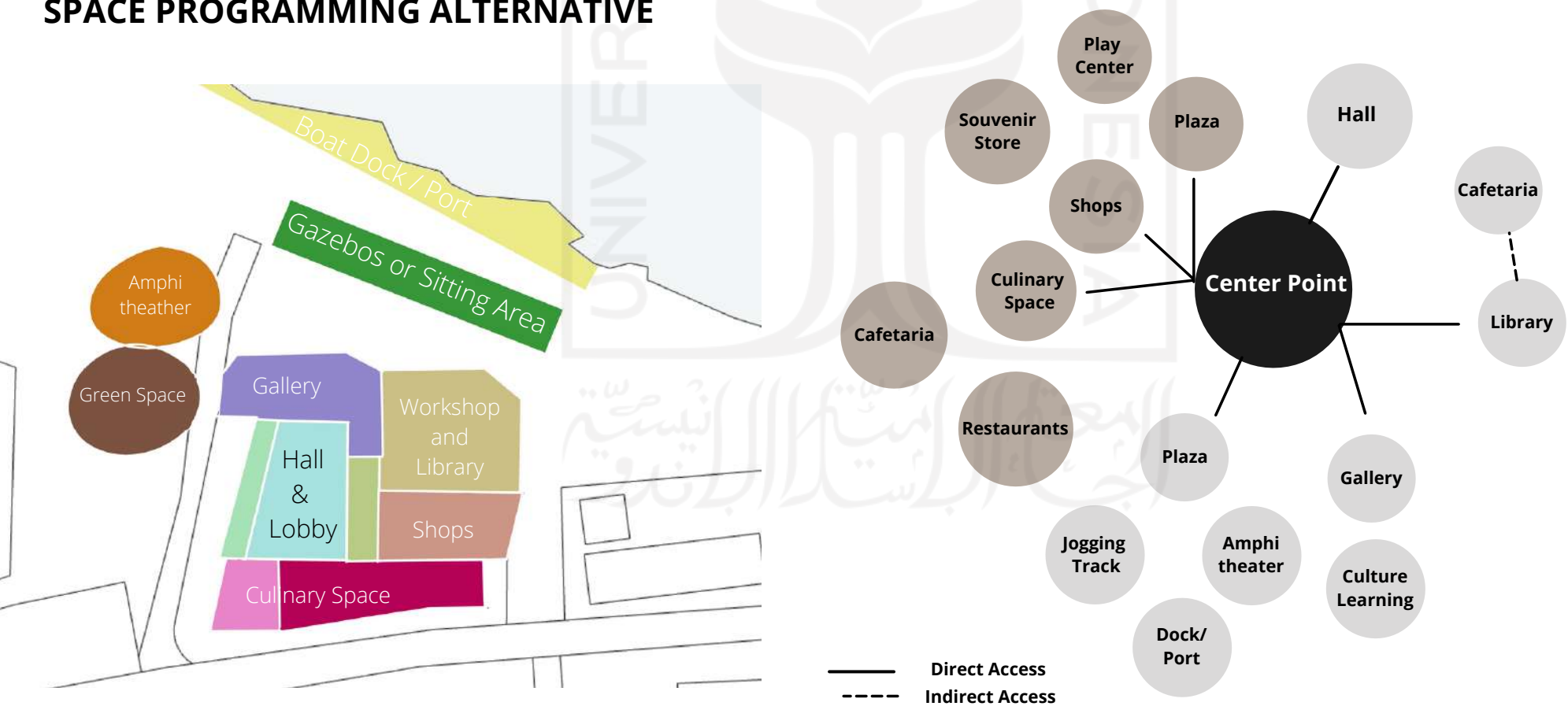
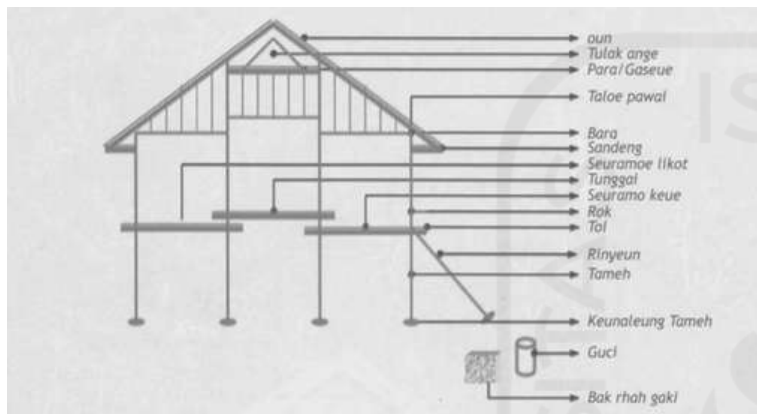


Figure 1.4. 1st Alternative Zoning
rce : Author's Documentation

Figure 1.4. Bubble Diagram for Zoning
Source : Author's Documentation

STILT HOUSE CONCEPT WITH ACEH ARCHITECTURE AND ORNAMENTS

Typology of Aceh Architecture



Some activities are may not tie to the results of the recreational needs analysis in the figure above. The space needed by the community by the activities they expect will still be provided, but there are additional facilities to complement the function of the space and also to achieve the goal of a "recreational center to support educational needs". Because in this building the concept of a building with a flood mitigation system will be applied, it would be better if this system collaborated with educational needs.

What kind of education will be proposed? The culture and art of Aceh is the answer. The way to give education not only provide the facilities but give the symbol of Aceh culture on facade or building shape, and this type of stilts house give a lot of benefit for flooded area and avoid a lot of mechanical maintenance by it.

FLOOD RESILIENCY CONCEPT

FLOOD RESILIENCY BUILDING

The concept of flood mitigation that will be applied to the design is "amphibious building", which is an effective concept to protect buildings from flooding. When the flood comes, this amphibious house will rise automatically by following the water level.

WATERFRONT DEVELOPMENT

Waterfront development also helps in disaster management efforts. The first strategies is an upland strategy that does not involve river water directly, but involves changes to the land area of the river. The second is the riverline strategy of protecting the river line from erosion, blocking storm stress.

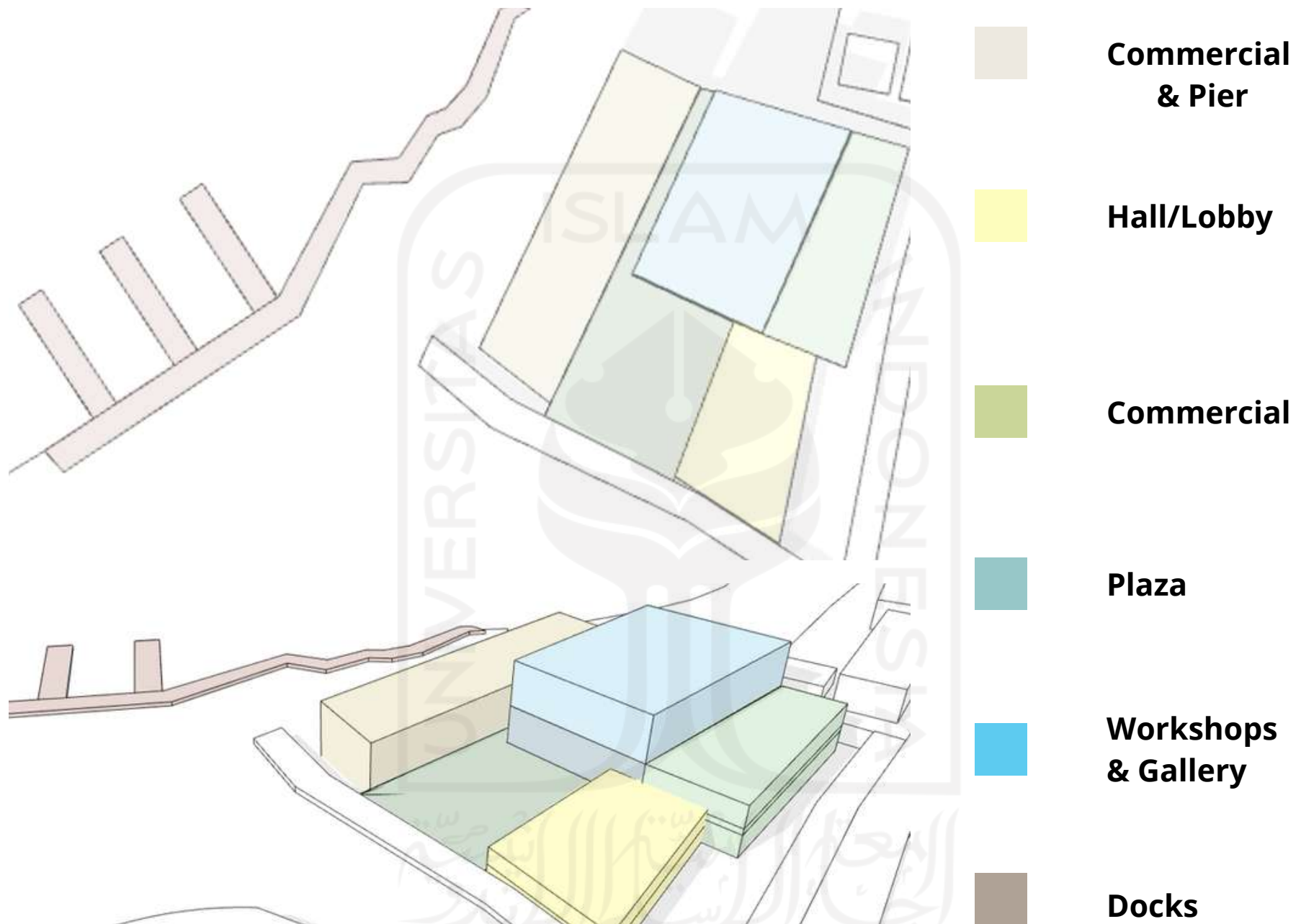
INTEGRATION BETWEEN BUILDING SYSTEM AND EDUCATIONAL NEEDS

By applying traditional architecture on the design and provide supporting facilities for talented people to conduct their abilities (Art performance, Traditional art. etc) is already part of integration with educational needs.

GREEN OPEN AREA INTEGRATION

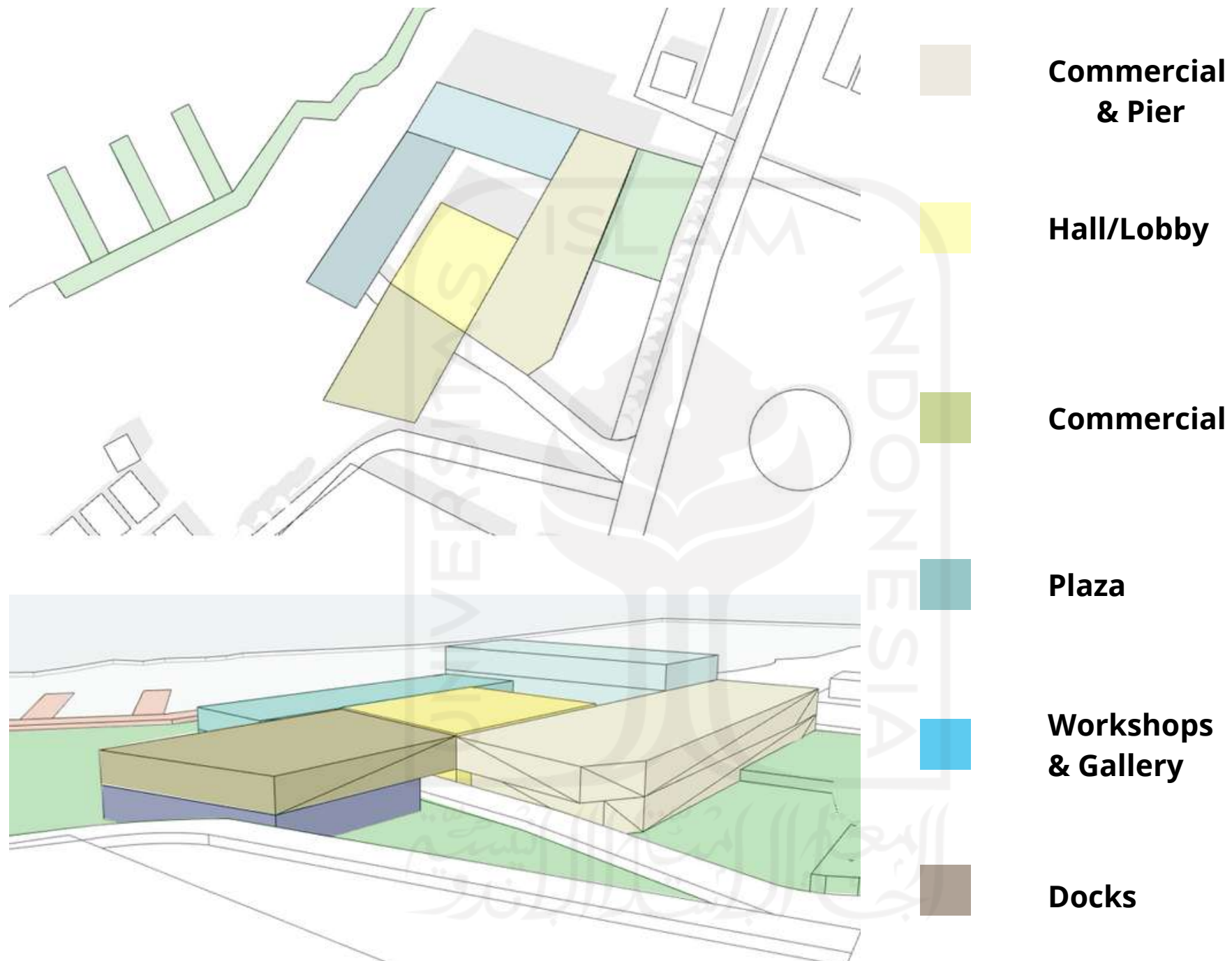
Integration with green open areas also plays an important role as flood resilience. Trees that are able to withstand high water intensity will be used as a absorption area.

BUILDING MASS EXPLORATION 1ST ALTERNATIVE



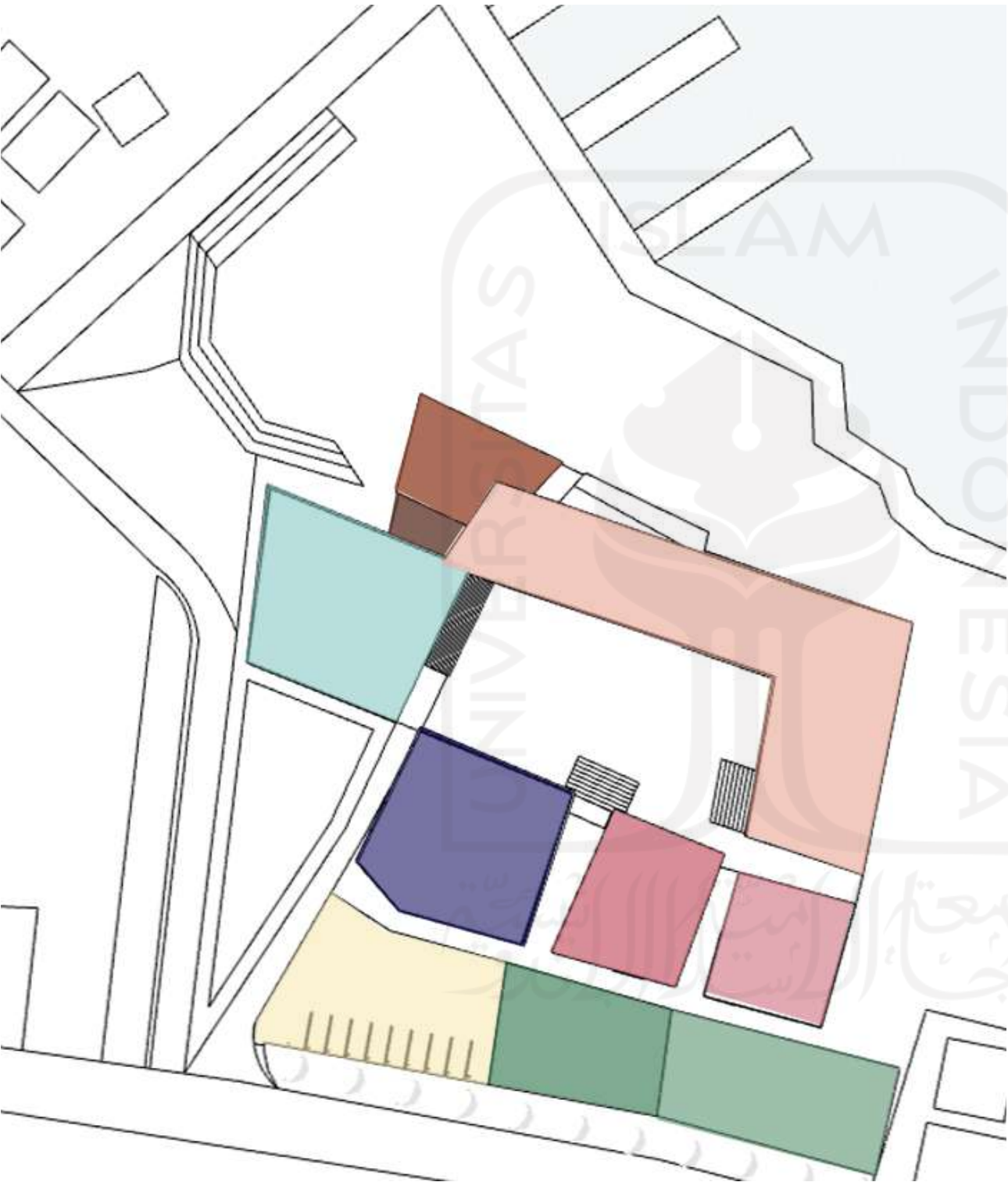
The 1st Alternative does not provide sky bridge and looks plain. The masses doesn't have barrier from the open green space if compared to 2nd alternative. It is also not enough to meet the building coefficient ratio (BCR).

BUILDING MASS EXPLORATION 2ND ALTERNATIVE (Chooosen Alternative)



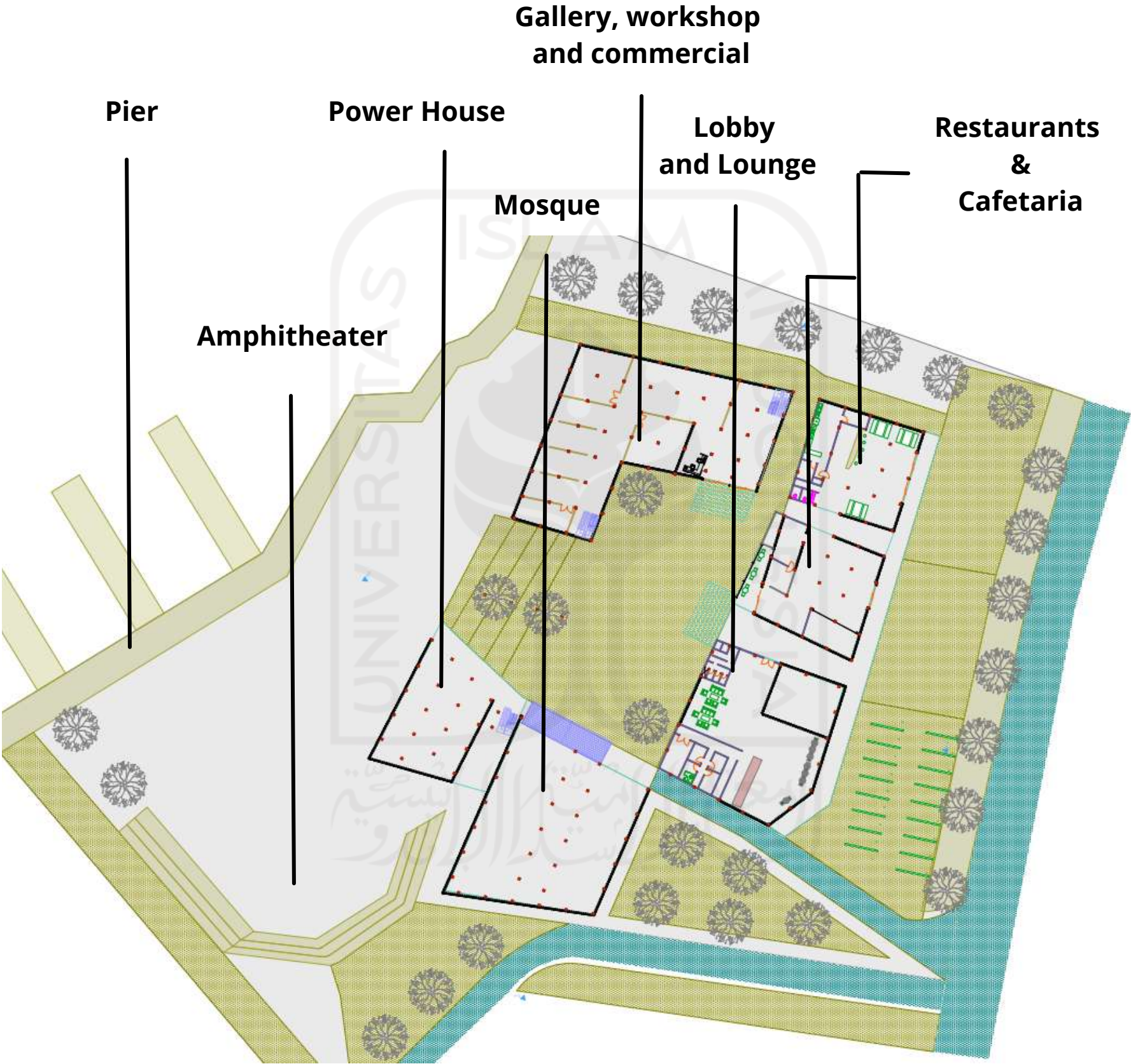
The 2nd Alternative provide sky bridge and stacking other mass for certain function. This kind of building mass is easier to apply the stilt house (Rumah panggung) structure and create unique ambience around the plaza. The building also pretty close from the river so the people easier to enjoy the view from the building.

BUILDING MASS EXPLORATION



-  **Gallery, Workshop & Commercials**
-  **Restaurant and Cafeteria**
-  **Parking Lot**
-  **Lobby and Lounge**
-  **Musholla**
-  **Stair**
-  **Power House**

SITE PLAN



Green Open Space & Access

Perspective view from main road



Perspective view from river



Green Area



Vehicle Access



Pedestrian Access

Safety and Gathering Spot

Perspective view from main road

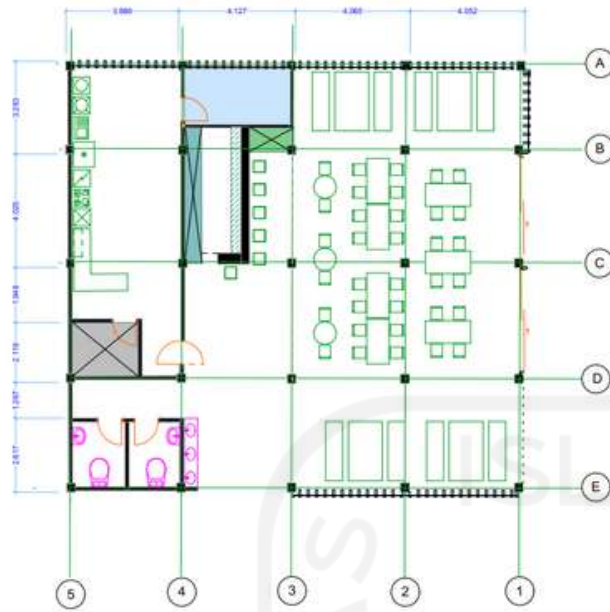


Perspective view from river



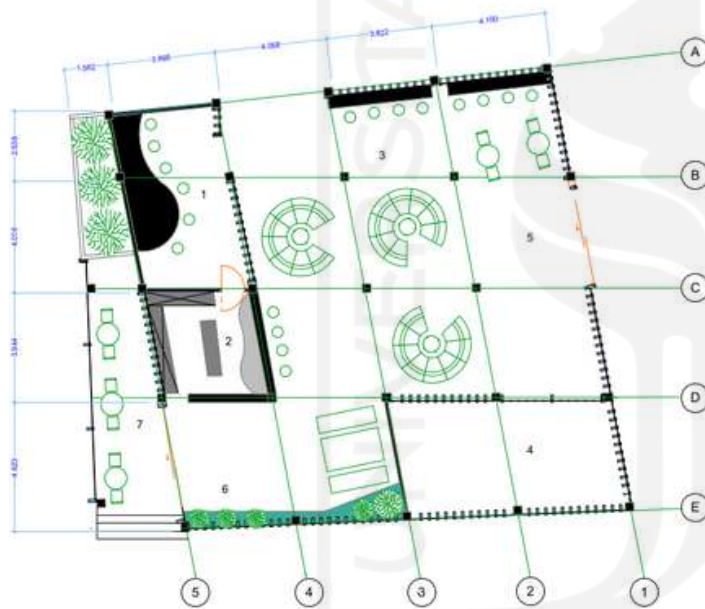
 **Emergency Stairs**  **Gathering Space**

Plans



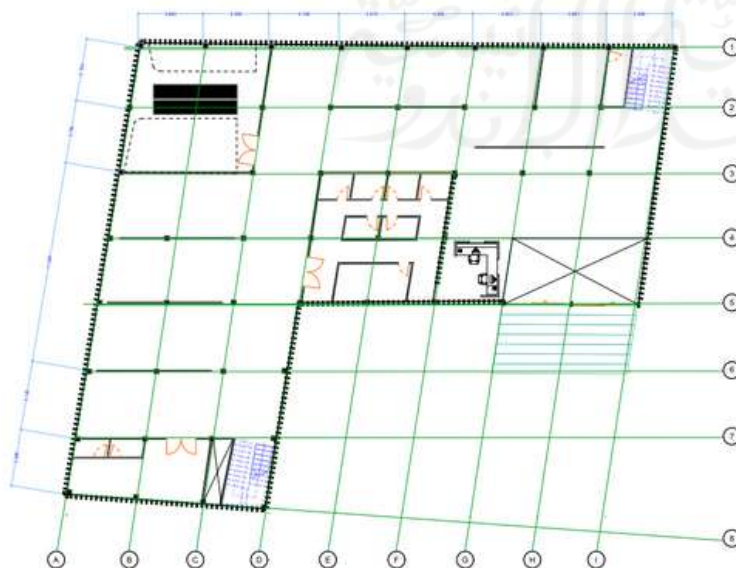
Restaurant 1st Floor

- 1 Kitchen
- 2 Preparation/heating space
- 3 Sitting Area
- 4 Toilets
- 5 Storage
- 6 Janitor



Cafeteria 1st Floor

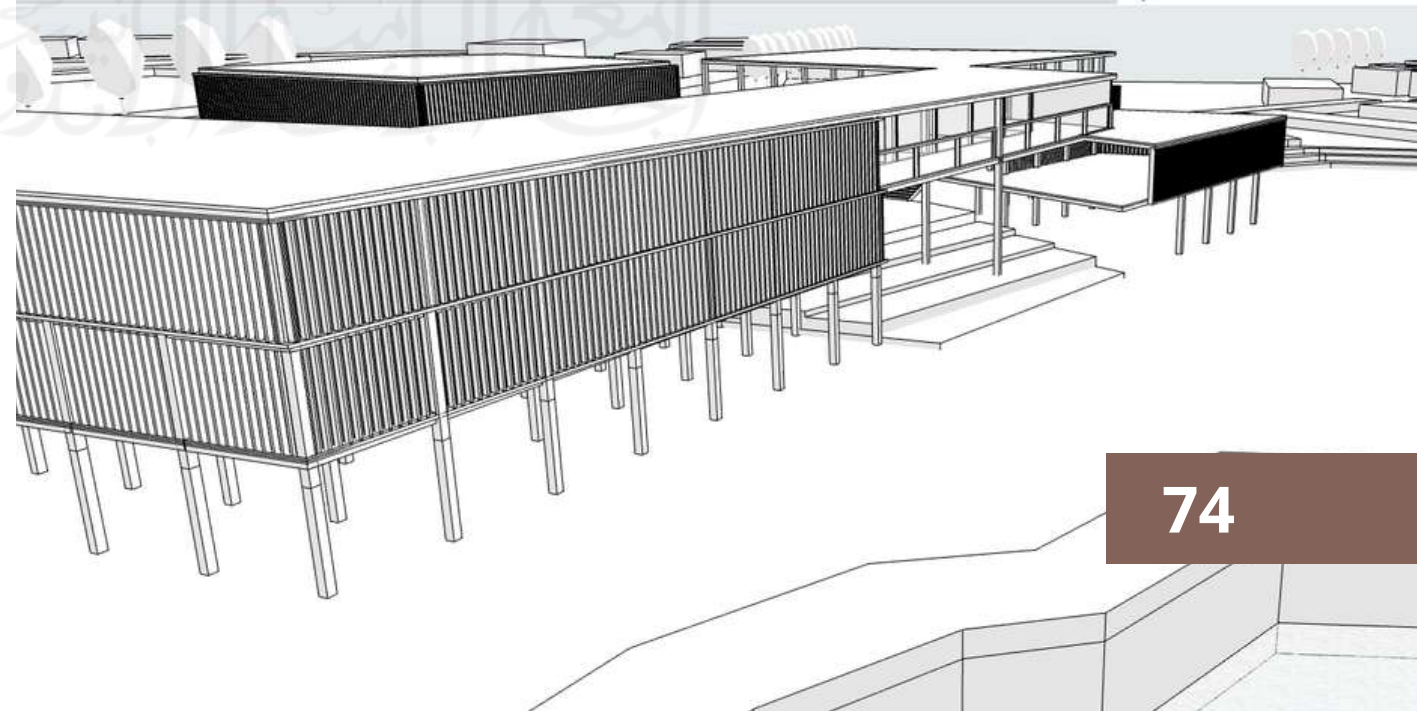
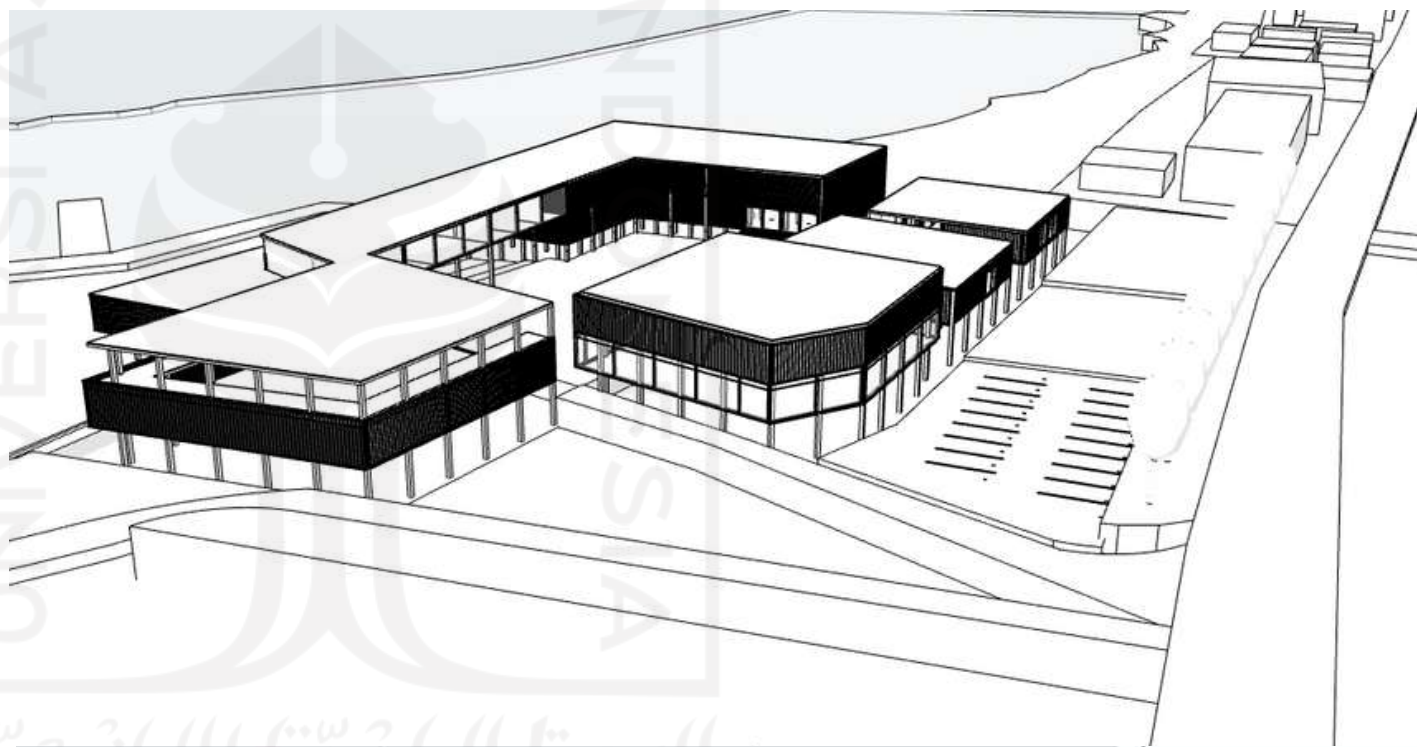
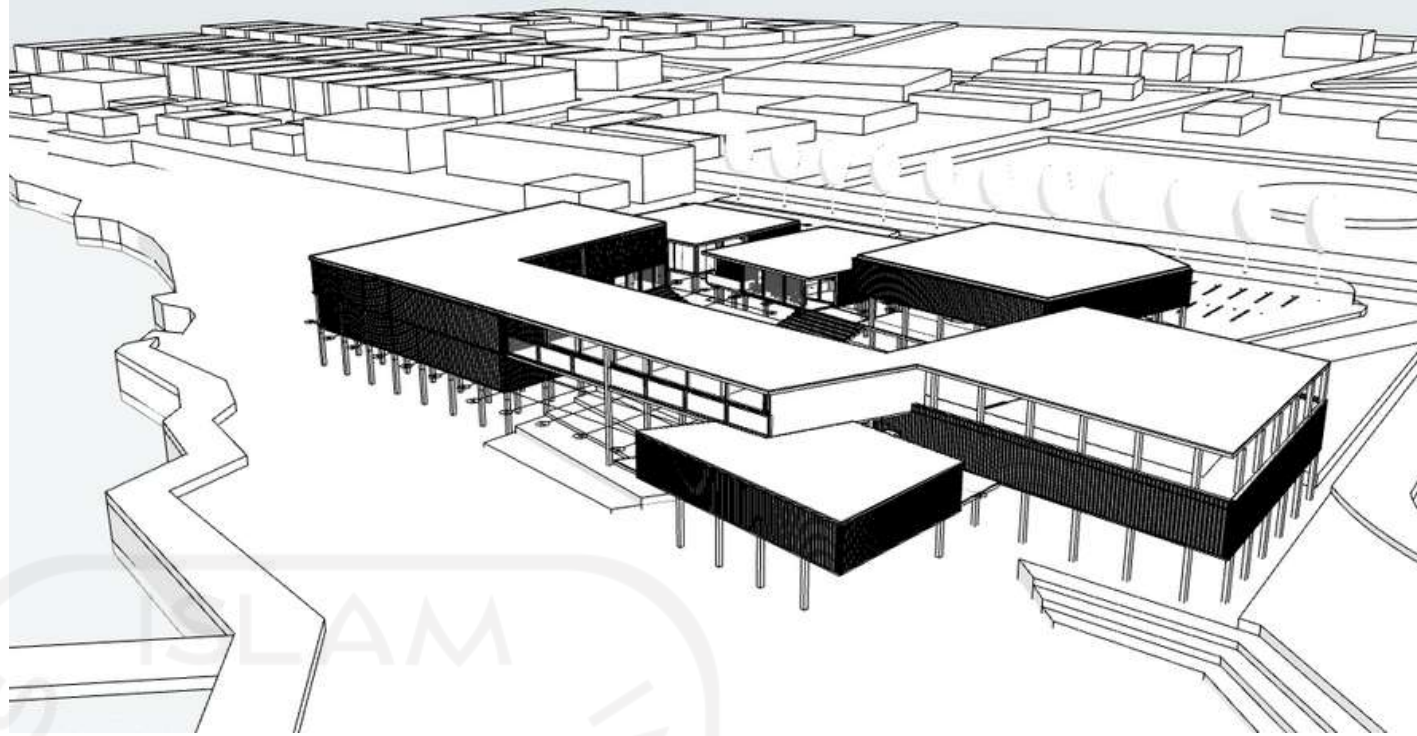
- 1 Co-working Space
- 2 F&B
- 3 Sitting Area
- 4 Shops
- 5 Entrance Foyer
- 6 Interior Garden
- 7 Outdoor sitting Area



Gallery

- 1 Reception
- 2 Office
- 3 Screening Room
- 4 Art Common
- 5 Gallery
- 6 Storage
- 7 Art Library

Perspectives





CHAPTER 6

FINAL DESIGN

Property Size

The building codes and regulation based on RDTR of Aceh Tamiang as follows :

- 1.Maximum building coverage ratio based on codes is 30% or 3720 m2 and the BCR on the design 2825 m2
- 2.Maximum floor area ratio based on codes is 3.0 or 11.160 and the FAR on the design is 5425 m2
- 3.Minimum of Green Coverage Ratio is 70% or 8680 m2 with minimum setback is 15m2 from the River.

TOTAL SIZE AREA		SET-BACK FROM THE RIVER	
BCR 30%	12400 m2	15 m2 (based on regulation)	
FAR 3.0	3720 m2		
GCR (70%)	11.160 m2	20 - 50 m2 (on existing project)	
PUBLIC	F&B	MEE	Control Room
	Shops		Genset Room
SUPPORT	Musholla		GWT
	Green Open Space		HVAC Room
SUPPORT	Boating Activity Area (Pier)	CIRCULATION	Emergency Stairs
	Co-working Space		Ramp
	Multifunction Hall		Pedestrian Bridges
	Rest Room		Pavement in Landscape
			Parking Lot

Table 6.1. Building Codes and Space Program
Source : Author's Documentation

Spatial Programming and Zoning

The arrangement follows what kind of activities people do, whether they're like to do indoor or outdoor activities and considering the needs of green open space for Kuala Simpang City. The Space programming diagram shows that green open space has larger area than the building, even in the center of the building (pedestrian bridge provide circulation for visitors to have an access into each building and also considered as green open space.



Figure 6.1. Siteplan Zoning
Source : Author's Documentation

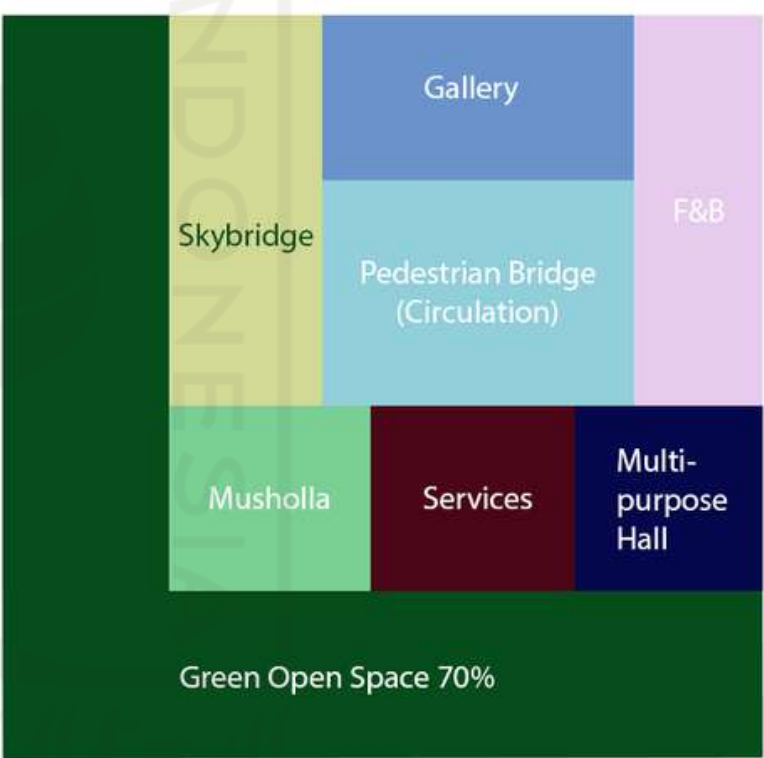


Figure 6.2. Room Programming's Diagram
Source : Author's Documentation

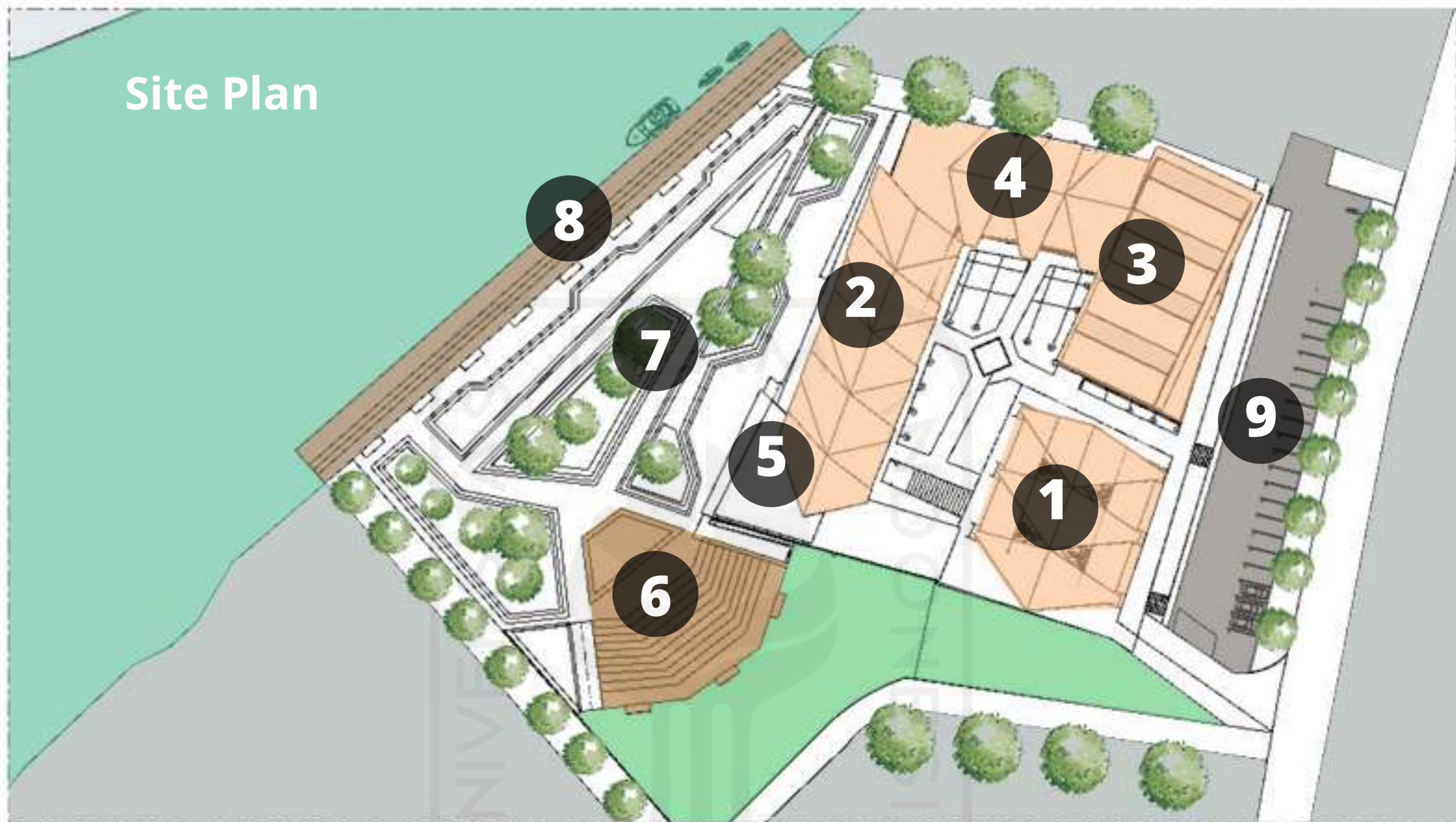


Figure 6.3. Siteplan
Source : Author's Documentation

- | | | | |
|----------|-----------------------------------|-----------|---------------------------|
| 1 | Multifunction Hall | 6 | Amphitheater |
| 2 | Skybridge for Commercials Purpose | 7 | Green Open Area |
| 3 | F&B | 8 | Pier for Boating Activity |
| 4 | Gallery and F&B on Rooftop | 9 | Parking Lot |
| 5 | Musholla | 10 | Services |

Axonometry

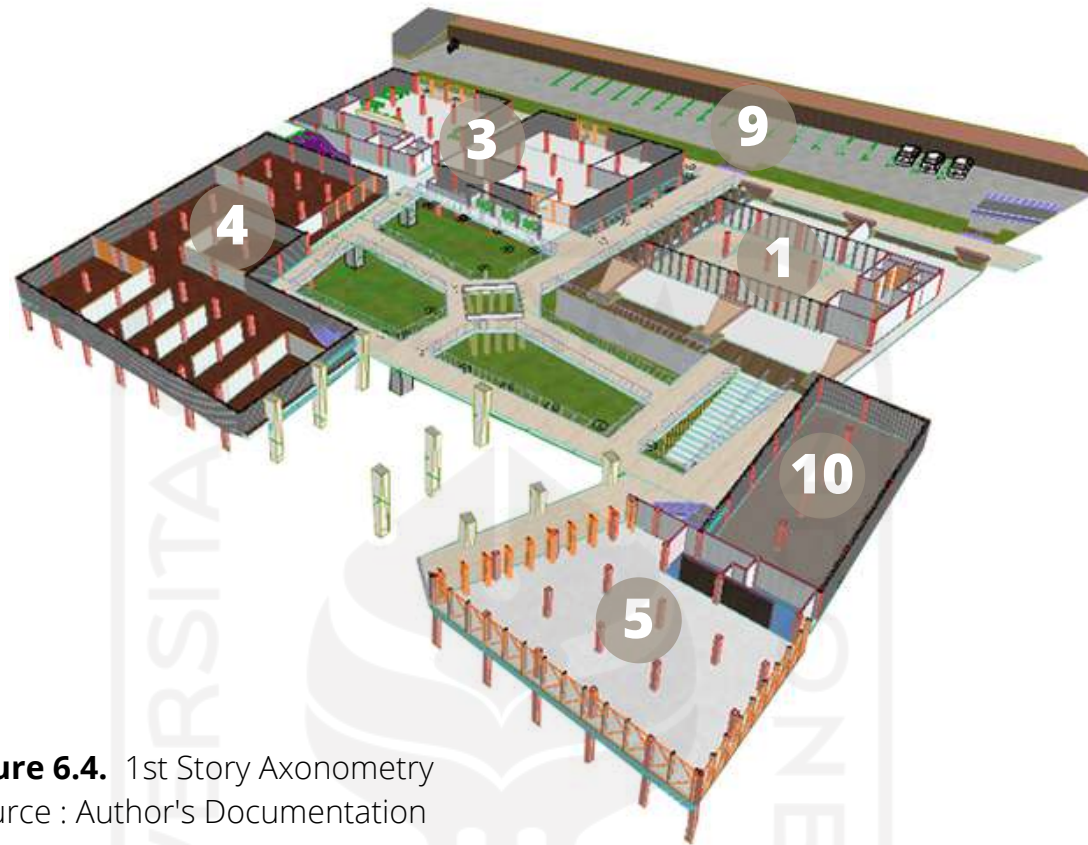


Figure 6.4. 1st Story Axonometry
Source : Author's Documentation

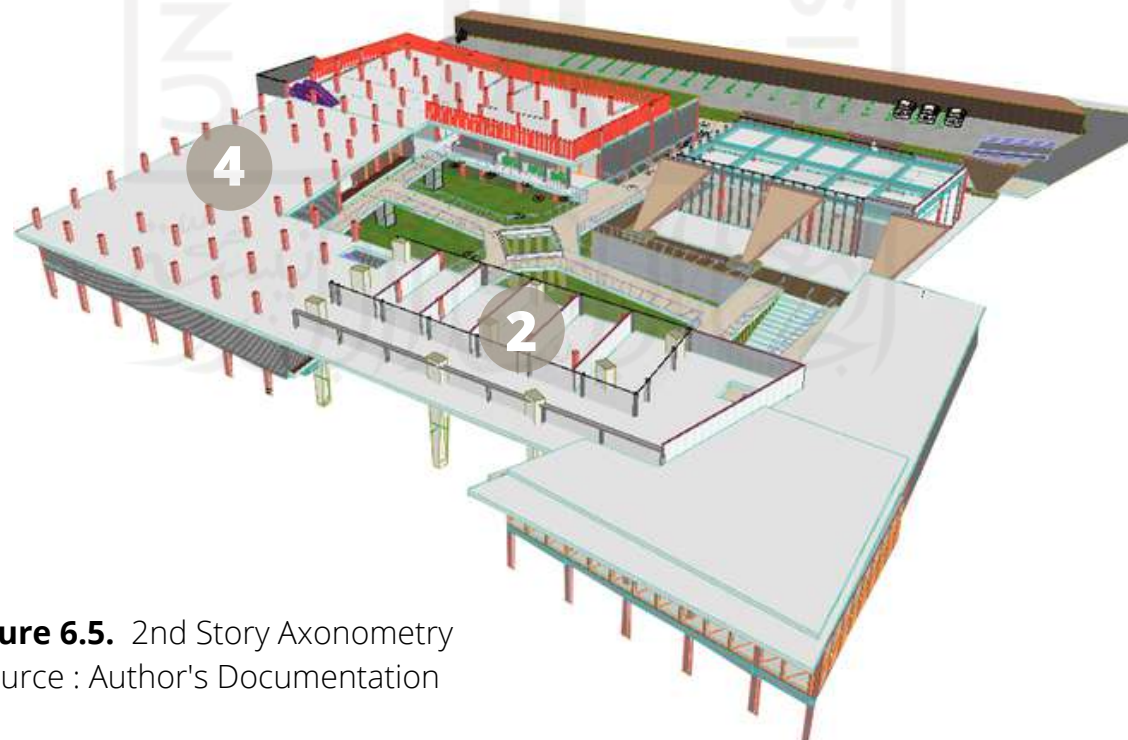


Figure 6.5. 2nd Story Axonometry
Source : Author's Documentation

SITE AND LANDSCAPE DESIGN

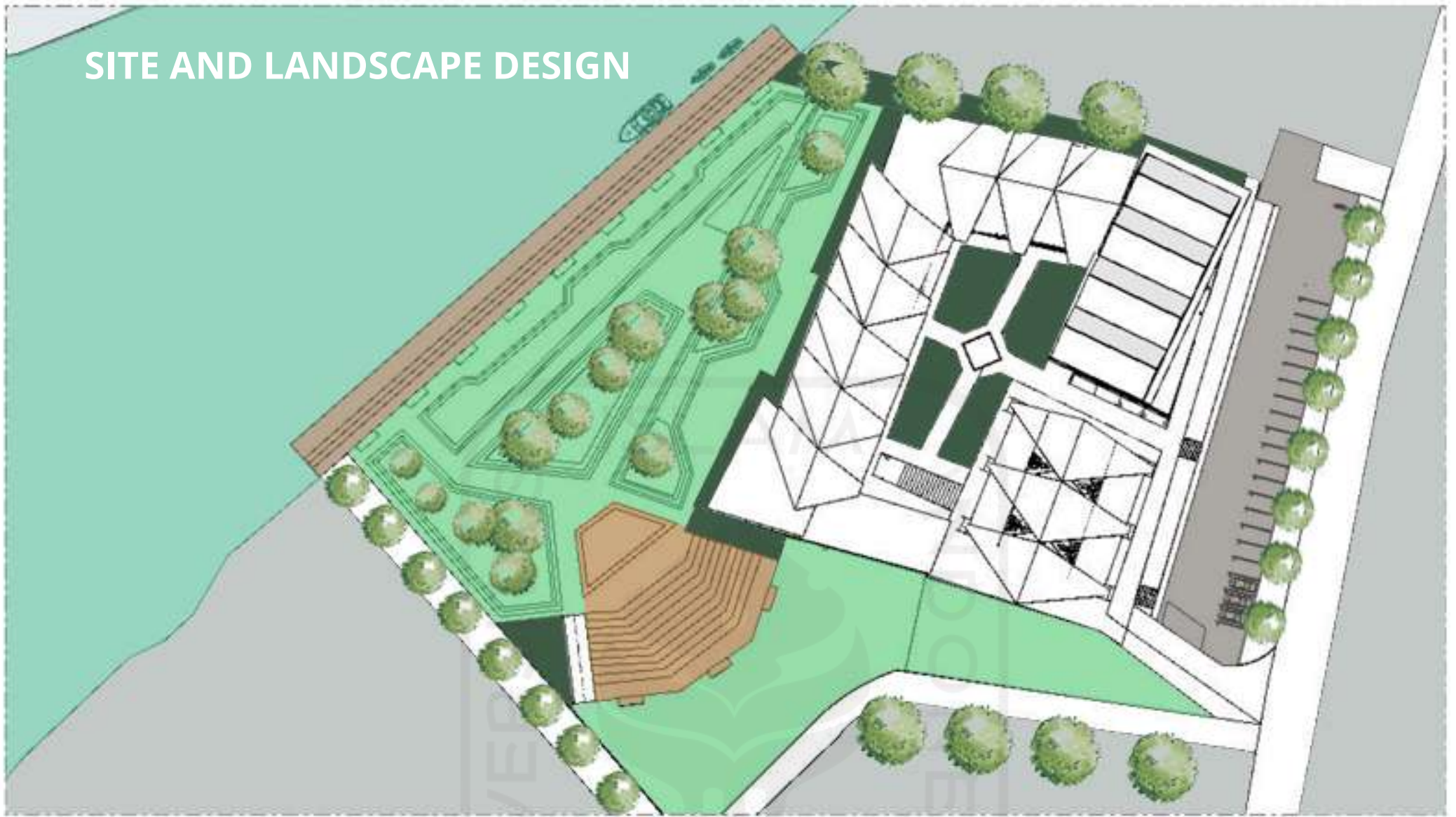


Figure 6.6. Topview
Source : Author's Documentation

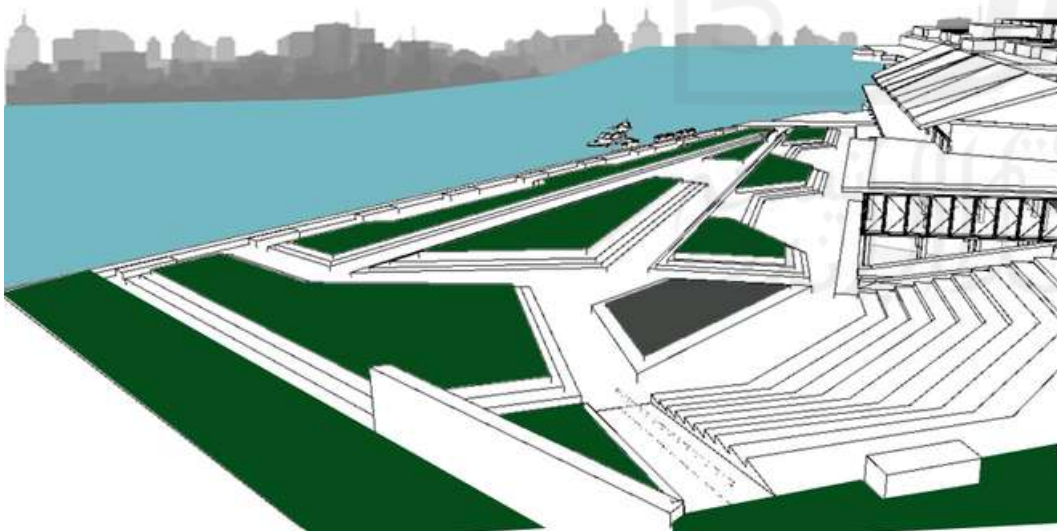


Figure 6.7. Amphitheater Perspective
Source : Author's Documentation



Figure 6.8. Pedestrian Bridge Perspective
Source : Author's Documentation

Landscape for Pier and Amphitheater zone

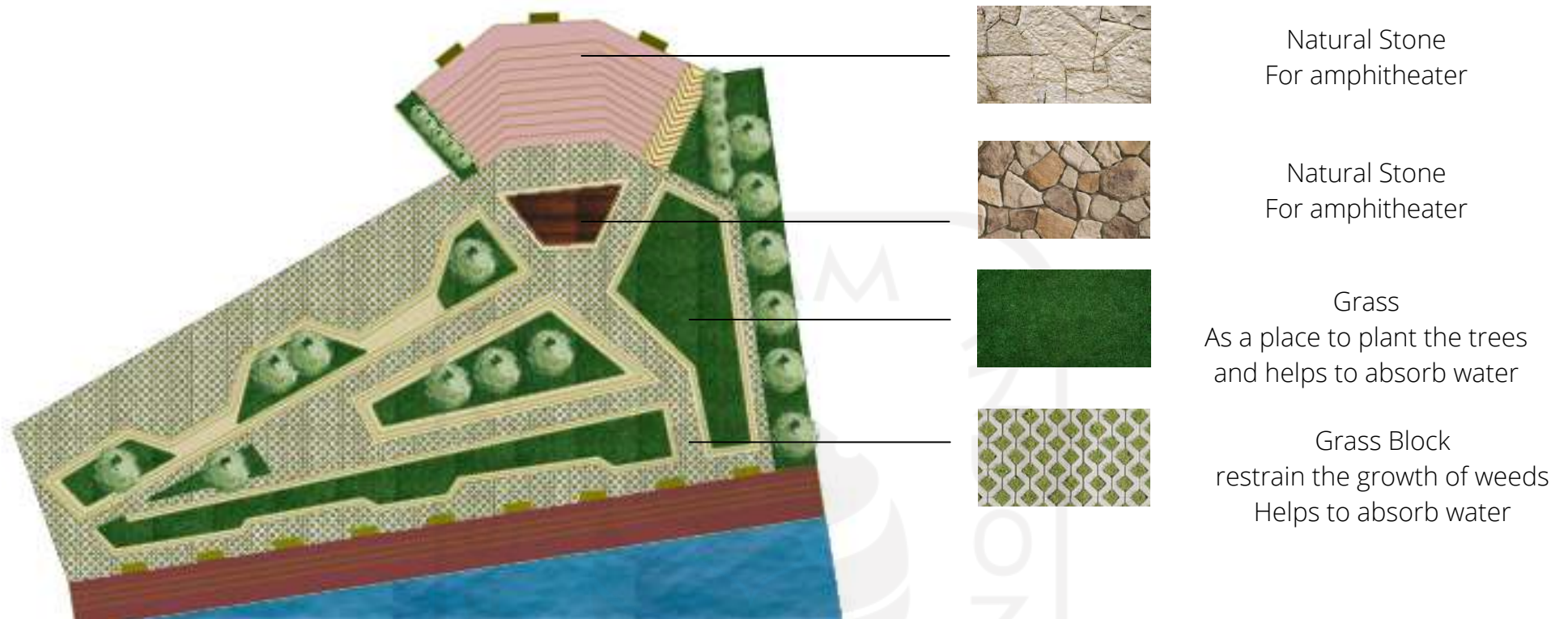


Figure 6.9. Landscape Material
Source : Author's Documentation

The arrangement of landscape design give a good impact for surroundings, This landscape is designed by playing of ground level, which can withstand the movement of water towards the land surface. when dry season, this land can be used as a public facility, and vice versa, if there is a flood then this land will be used as a flood retention area.

Abundant green space also helps for flood prevention. The trees that will be planted on this land are those which able to absorb and restraint rain and flood water as an effort to prevent the water level from rising to the surface.

Trees which tolerates Flood

- River birch (*Betula nigra*)
- Hackberry (*Celtis occidentalis*)
- Sweetgum (*Liquidambar styraciflua*)
- Papaya Tree
- Mango Tree
- Guava Tree
- Bamboo
- Palm Tree

Accessibility and Public Space in Tamiang Recreation Center

The public space is designed by considering the human movement and it is accessible for kids, adults, elderly especially for disabilities. Each stair has ramps for a wheelchair, including the amphitheater also provides access for disabilities. The public space can be used as a playground for children, jogging, and access to the pier, for boating activities with recreational purposes.



Figure 6.10. Pier and Landscape for Gathering Space and Boating Activity
Source : Author's Documentation

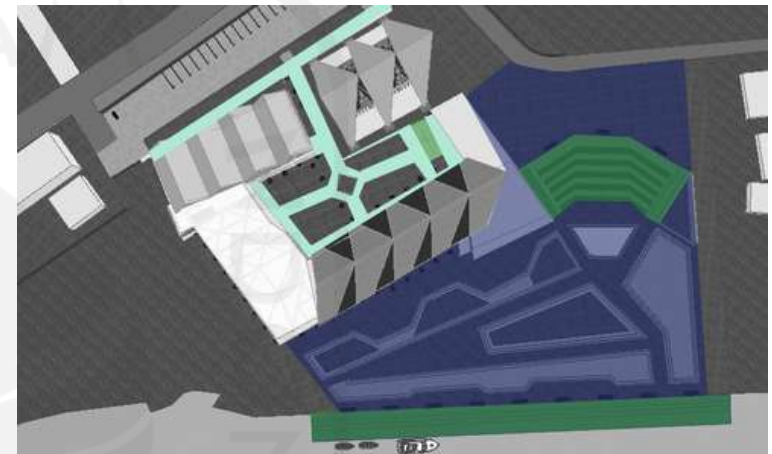


Figure 6.11. People's Movement in Open Space
Source : Author's Documentation

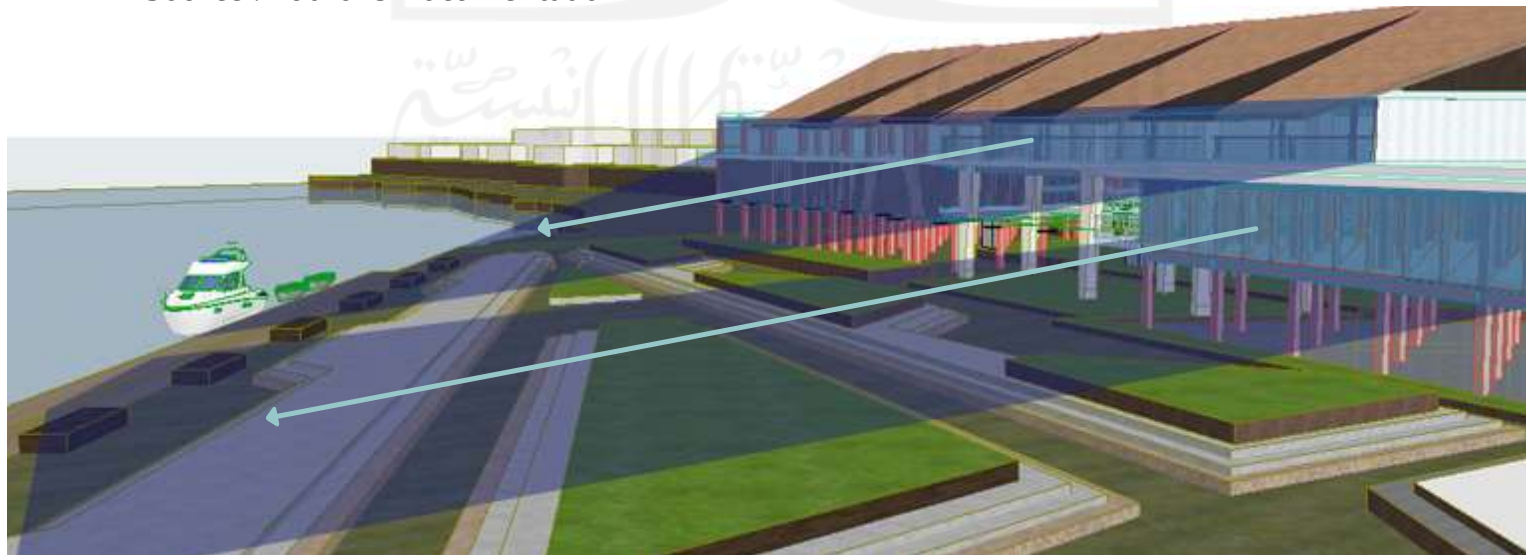


Figure 6.12. Spatial Access from Building
Source : Author's Documentation

The accessibility is split into 2 ways, first is semi-public access. As shown in figure 7.11, the pedestrian bridge is the only one way to access into 4 buildings and consists of downstairs and ramp to green area. Second, there is public access which has no barrier and everyone can access the green public space which is the amphitheater and the pier.

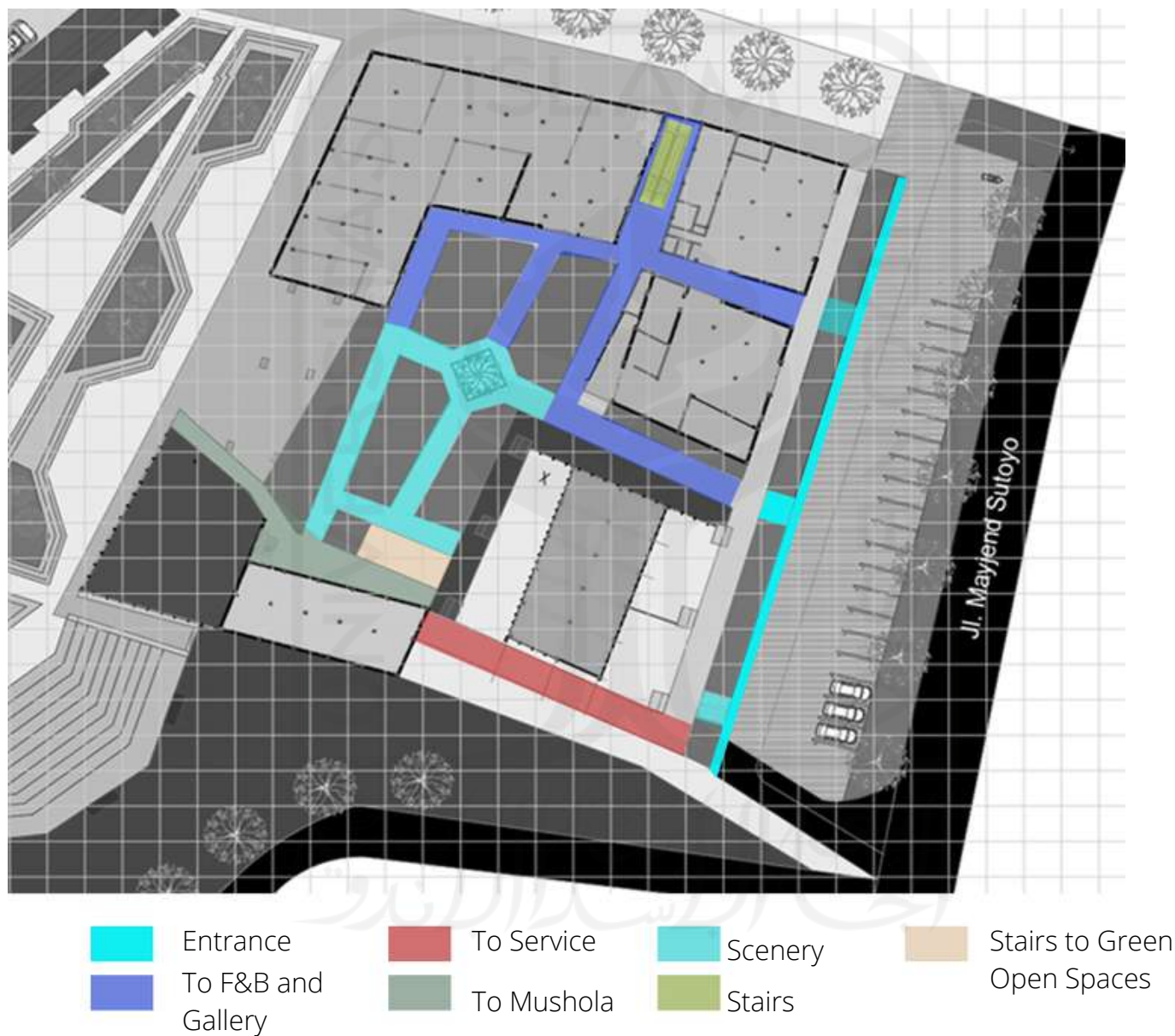


Figure 6.13. People's Movement in Building
Source : Author's Documentation

F&B and Commercial Building

To fulfill recreational needs for the visitor, some spaces are needed for the culinary areas. Building for F&B and retails located right in front of the entrance. There is a restaurant and cafeteria on the first floor and the second floor is for the food court. There is one escalator to access the 2nd floor which is connected between the F&B building and the Gallery building.



Figure 6.14. F&B and Commercial Building Axono Plan
Source : Author's Documentation

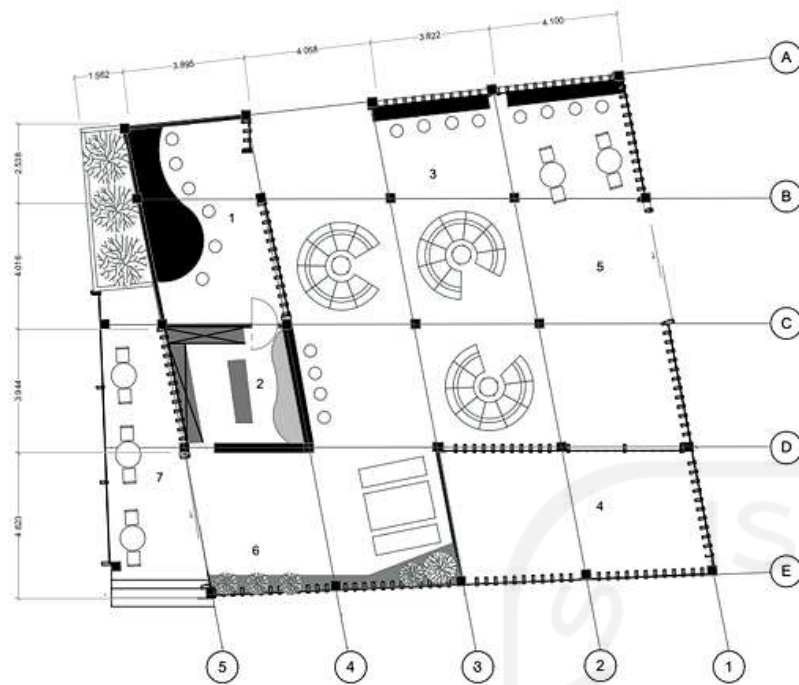


Figure 6.18. Cafeteria on 1st Floor
Source : Author's Documentation

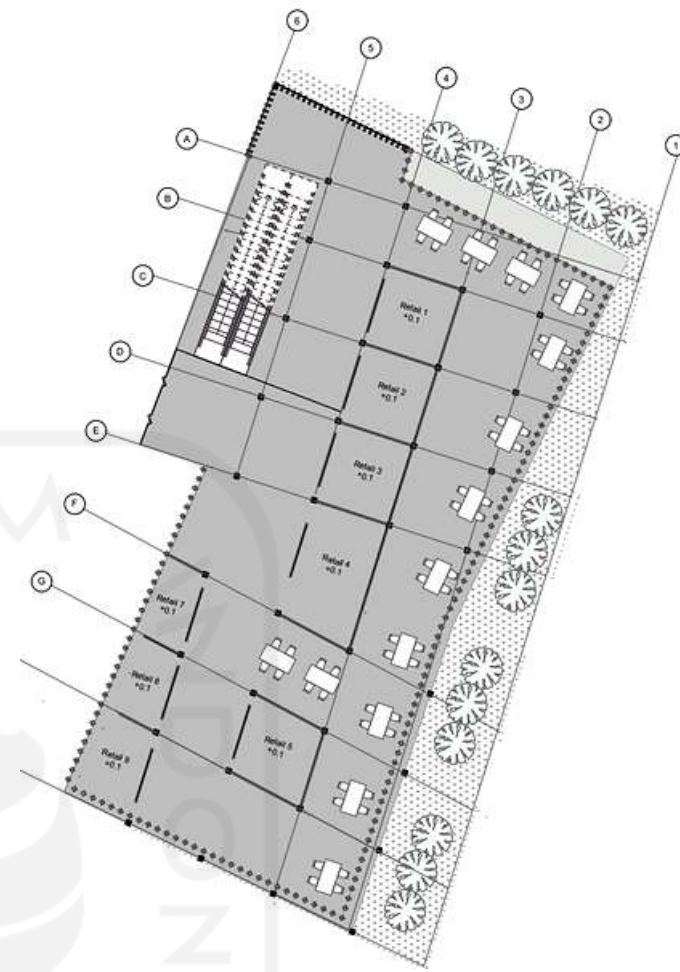


Figure 6.20. F&B on 2nd Floor
Source : Author's Documentation

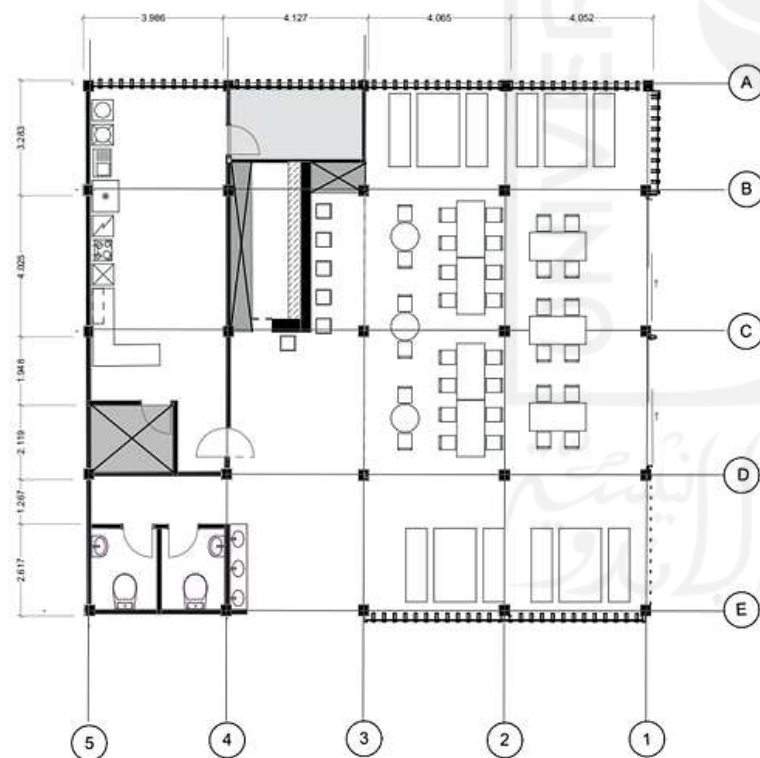


Figure 6.19. Restaurant on 1st Floor
Source : Author's Documentation

Skybridge - For Commercial Purpose

The skybridge will provide some retails and culinary space, also connected with food court which located in 2nd floor of Gallery and F&B Buildings. In this space, people can enjoy the scenery of the river and the landscape while doing their recreational activities.



Figure 6.21. Skybridge Axono Plan
Source : Author's Documentation



Figure 6.22. Gallery Axono Plan
Source : Author's Documentation

Gallery

The gallery located besides F&B and commercial building. It is only have one story and its rooftop will be used as culinary space, which is connected between skybridge and commercial building. The gallery will provide some space for exhibition, screening room, preparation room, art library and services (Toilet, Janitor, MEE).

Multifunction Hall

This design applies the concept of a traditional Aceh roof and its ornaments. This multi-function hall can function to hold various small events, it can even be used as a meeting room and so on.

Musholla

The Musholla has spatial or view access toward the river, as the kiblata has the same direction to the river, people can enjoy the environment while praying.

Services

The service room provide mechanical and electrical, genset room and ground water tank. The service room located besides musholla. It placed higher to avoid damage to the electrical system when a flood comes.



Figure 6.26. Multifunction Hall Interior
Source : Author's Documentation

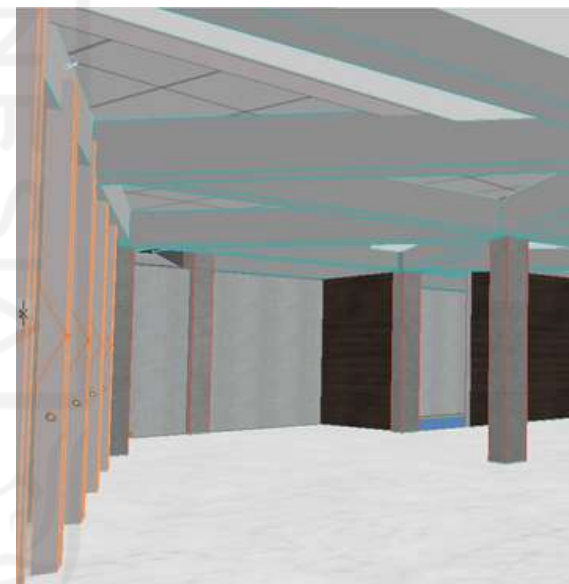


Figure 6.27. Musholla Interior
Source : Author's Documentation

How did The Building of Tamiang Recreation Center Respond The Flood?



Figure 6.28. Skybridge Elevation with Flood Height
Source : Author's Documentation

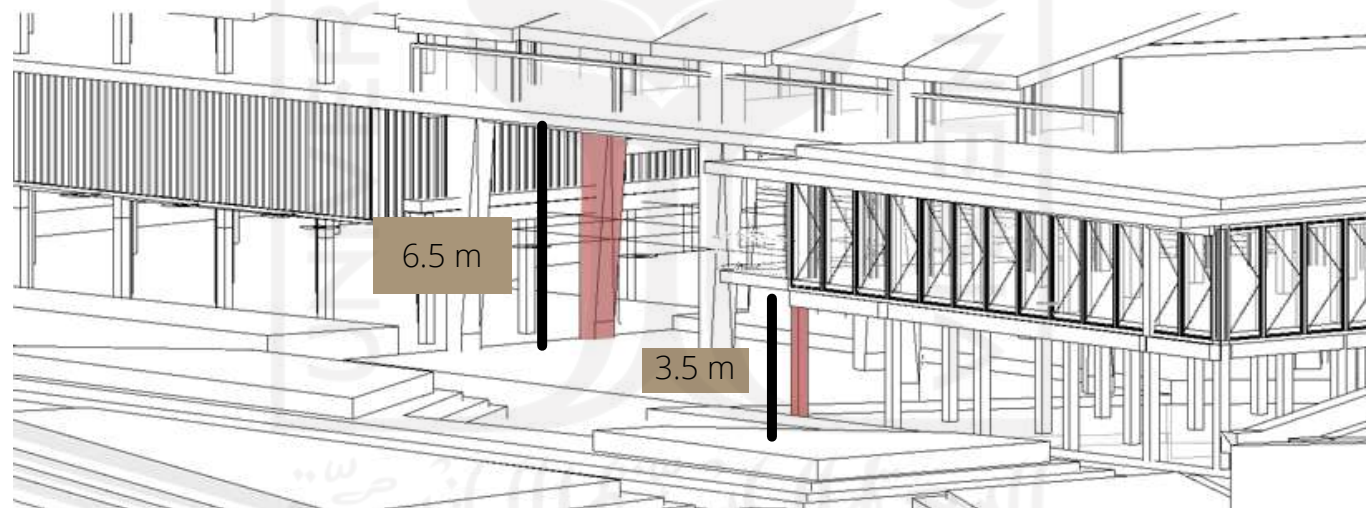


Figure 6.29. Gallery, Skybridge and Mushola Column
Source : Author's Documentation

The height of the column adjusts to the maximum flood height which is 2.7 meters annually. The column height applied to each building is 3.5 meters with 6 special skybridge columns with a height of 6.5 meters. And the central bridge which located in the center of the building is 3.5 height same as the column's.

How did The Landscape Respond The Flood?

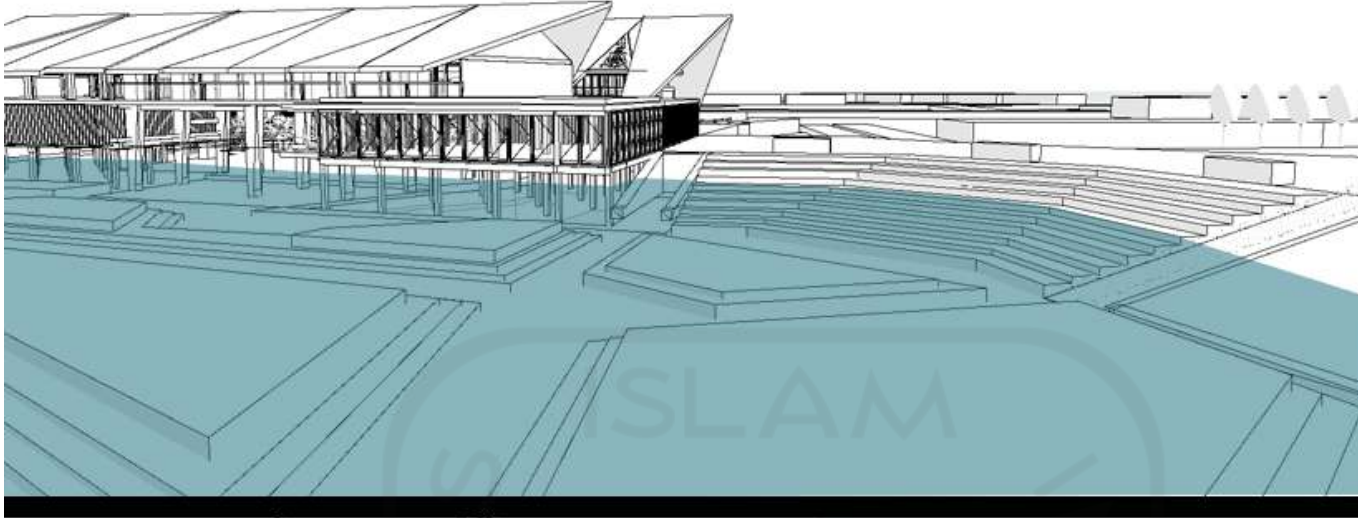


Figure 6.30. Green Open Space and Amphitheater when Flooding
Source : Author's Documentation

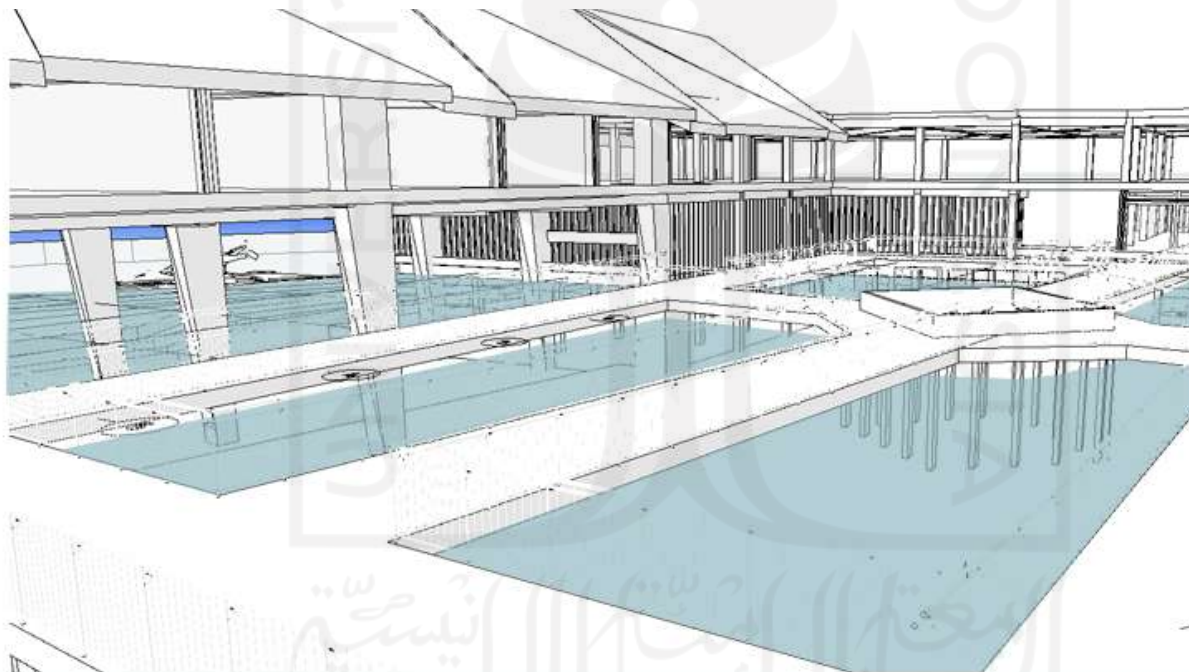


Figure 6.31. Pedestrian bridge when flooding
Source : Author's Documentation

Pretend there's no abundant trees in this landscape design, the amphitheater and some empty area below the building (which is used for column space) are able to resist the flood to not reach the building.

Structure in Axonometry - Column and Beam

The design consist of four buildings and 1 skybridge which is connected by 2 buildings. Most of the structures are using frame structure type and the distance between column is 4m except for the skybridge structure. It has 6 column that larger than the other columns. The common column as shows in the pictures below, the size of this column is 30x30cm meanwhile the distinguished column for the skybridge is 60x80 cm. All the buildings are revealing the structures as part of the concepts of stilt house.

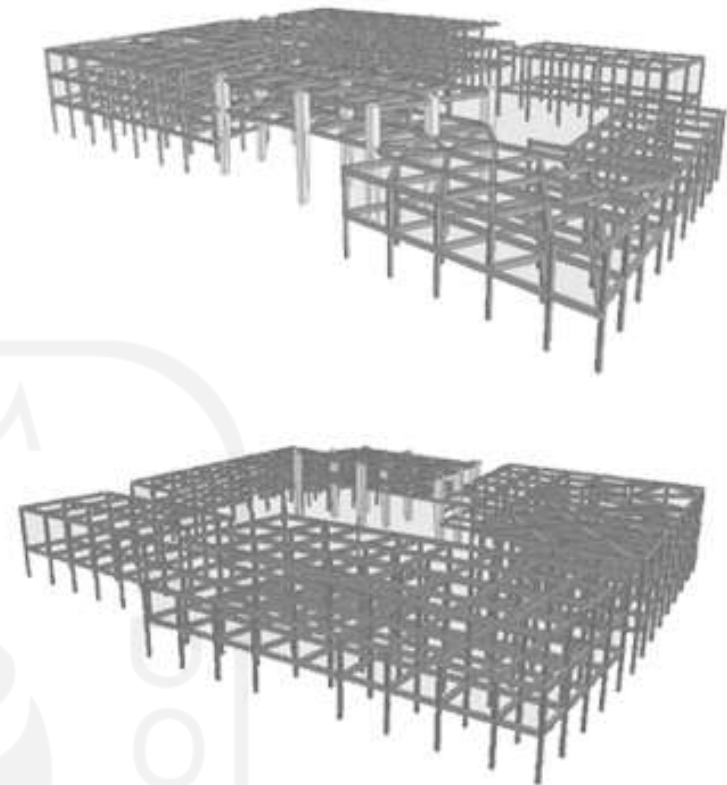


Figure 6.32. Perspectives
Source : Author's Documentation



Figure 6.32. Axonometry
Source : Author's Documentation

For the beam size, it is 400x300 mm and the pattern for some buildings are different, depending on the shape of the roof and aesthetical purpose. The pattern of the beam that distinct from the others are Skybridge and the second Floor of Gallery Building.

F&B and Commercial Building Structure

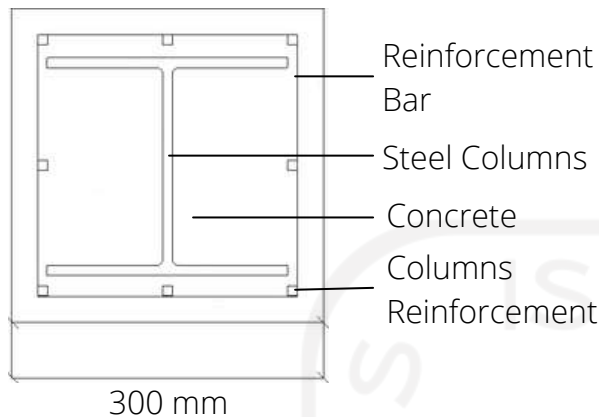


Figure 6.34. Column Detail (30x30cm)
Source : Author's Documentation

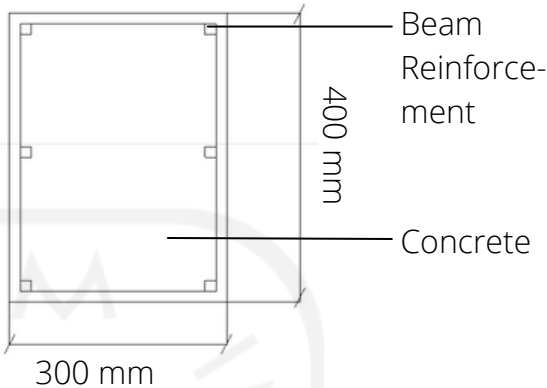


Figure 6.35. Beam Detail
Source : Author's Documentation

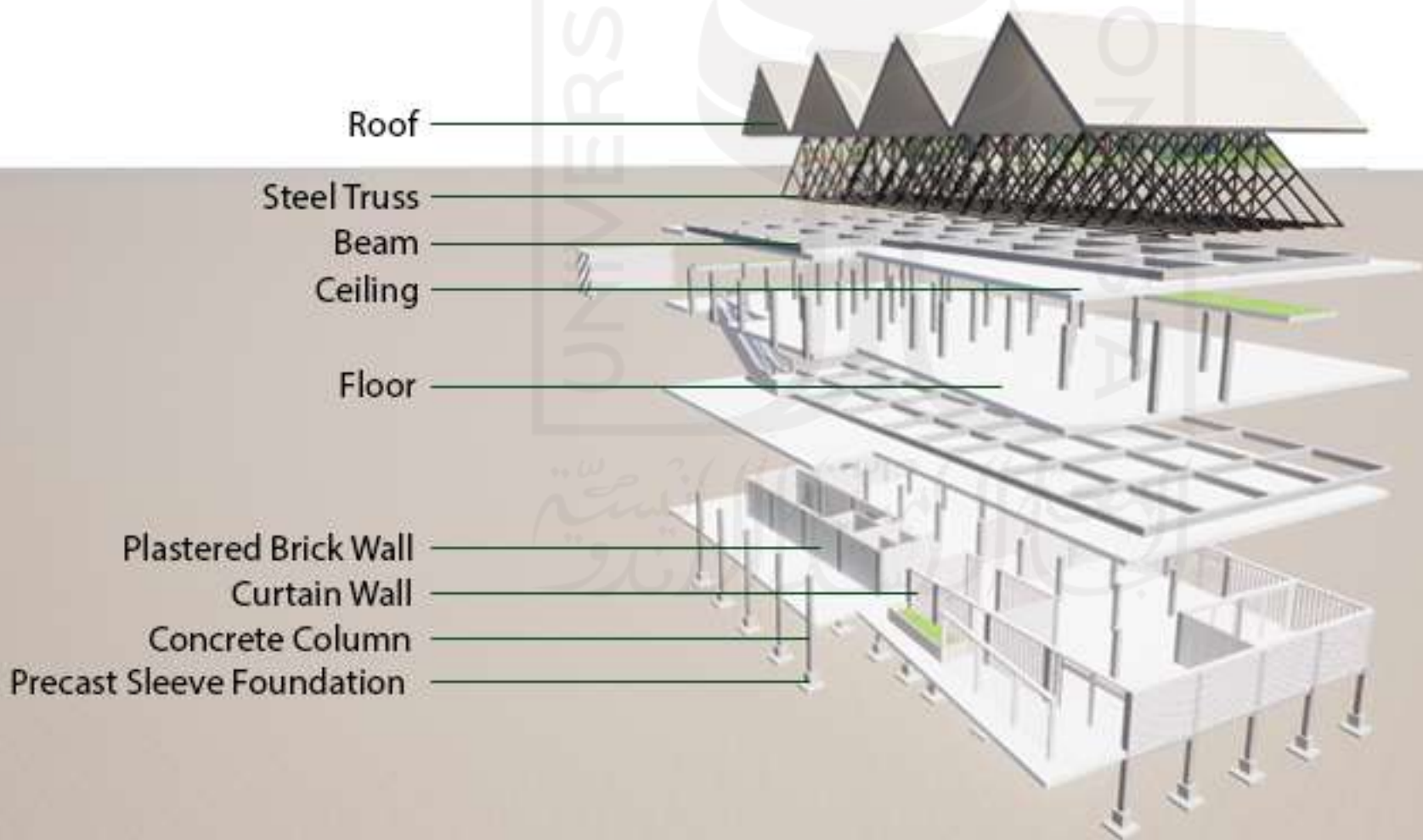


Figure 6.36. F&B Structure in Axonometry
Source : Author's Documentation

Gallery, Skybridge and Musholla Structural System

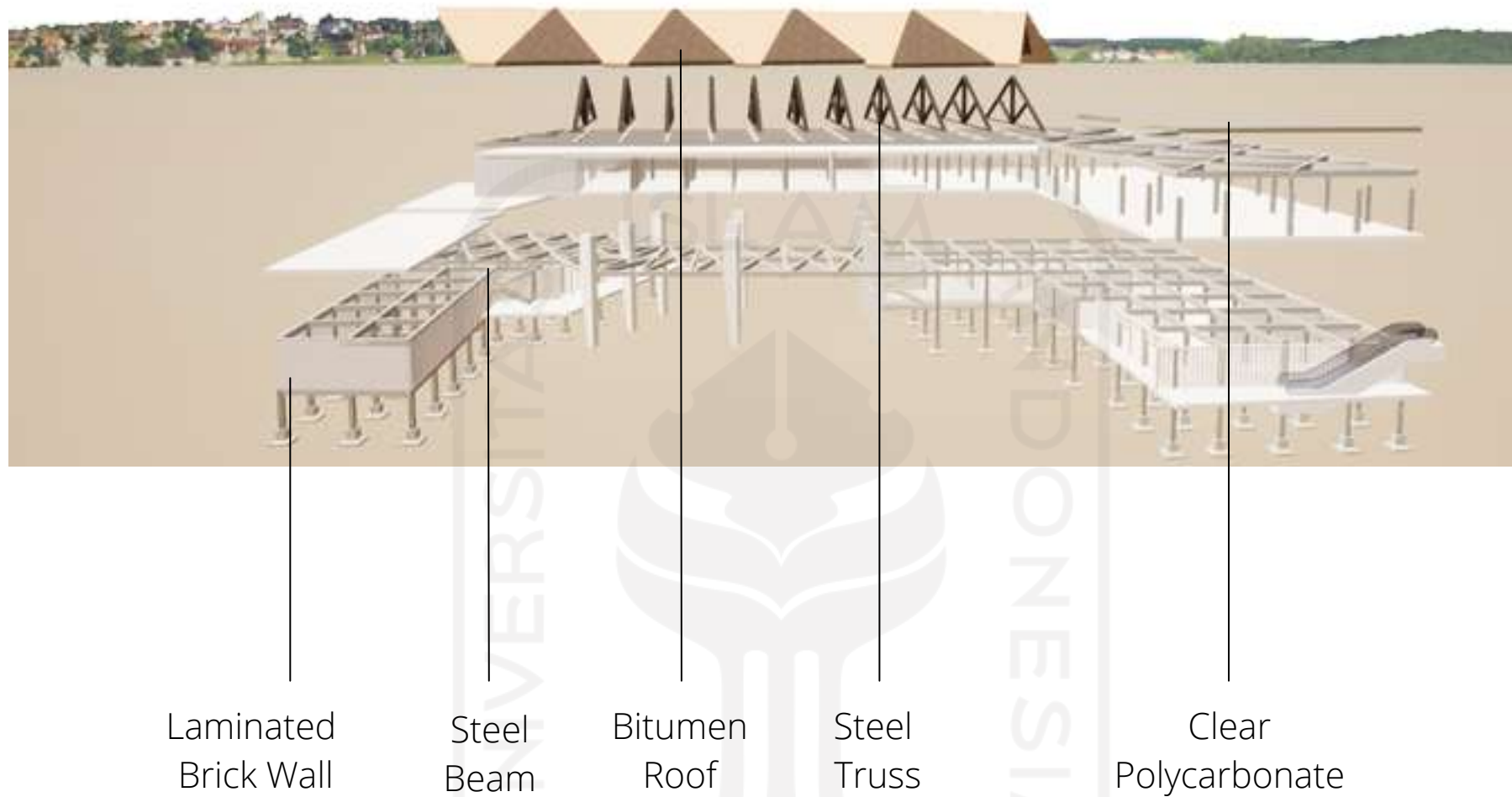
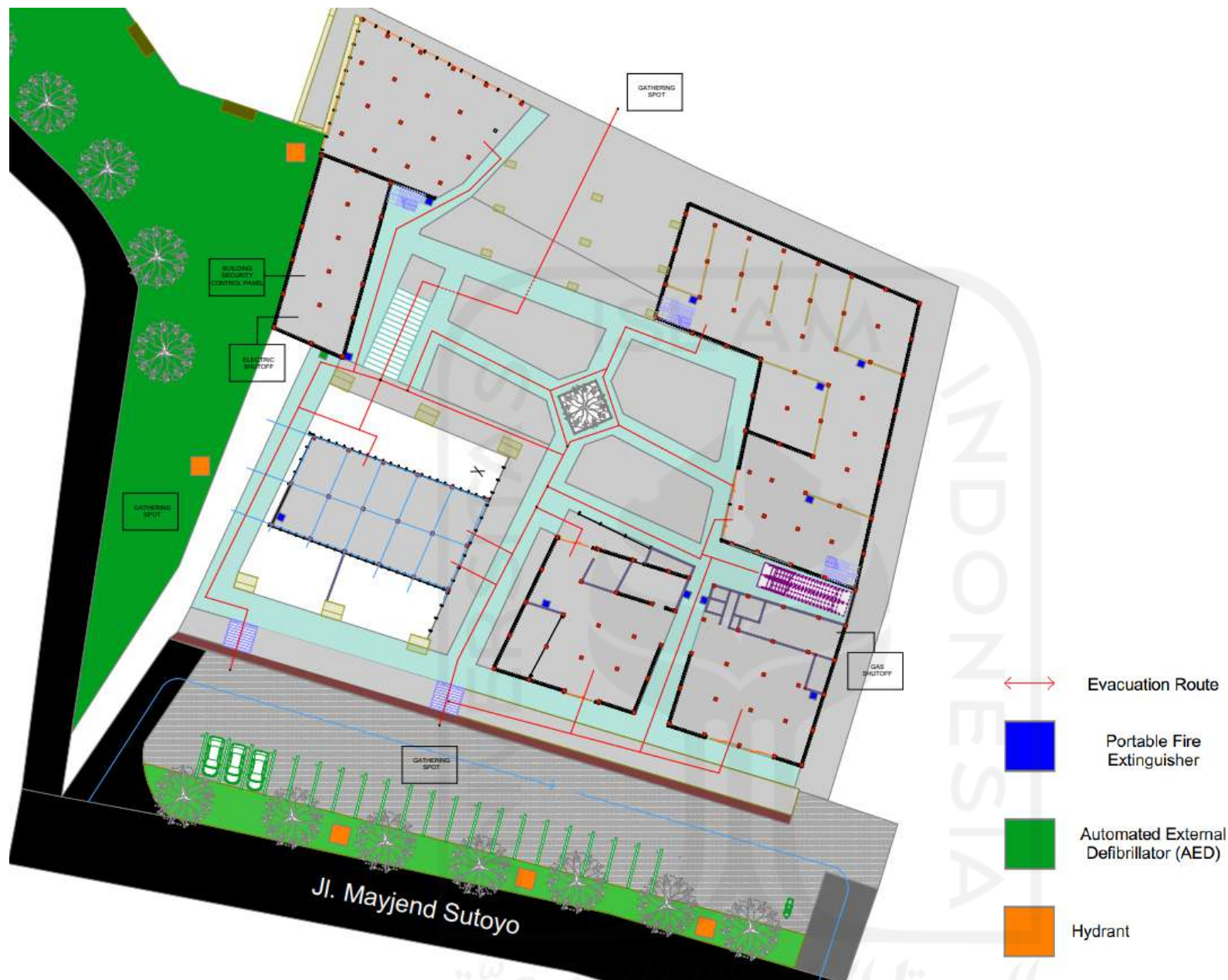


Figure 6.39. Skybridge, Musholla and Gallery's Structure Axonometry
Source : Author's Documentation

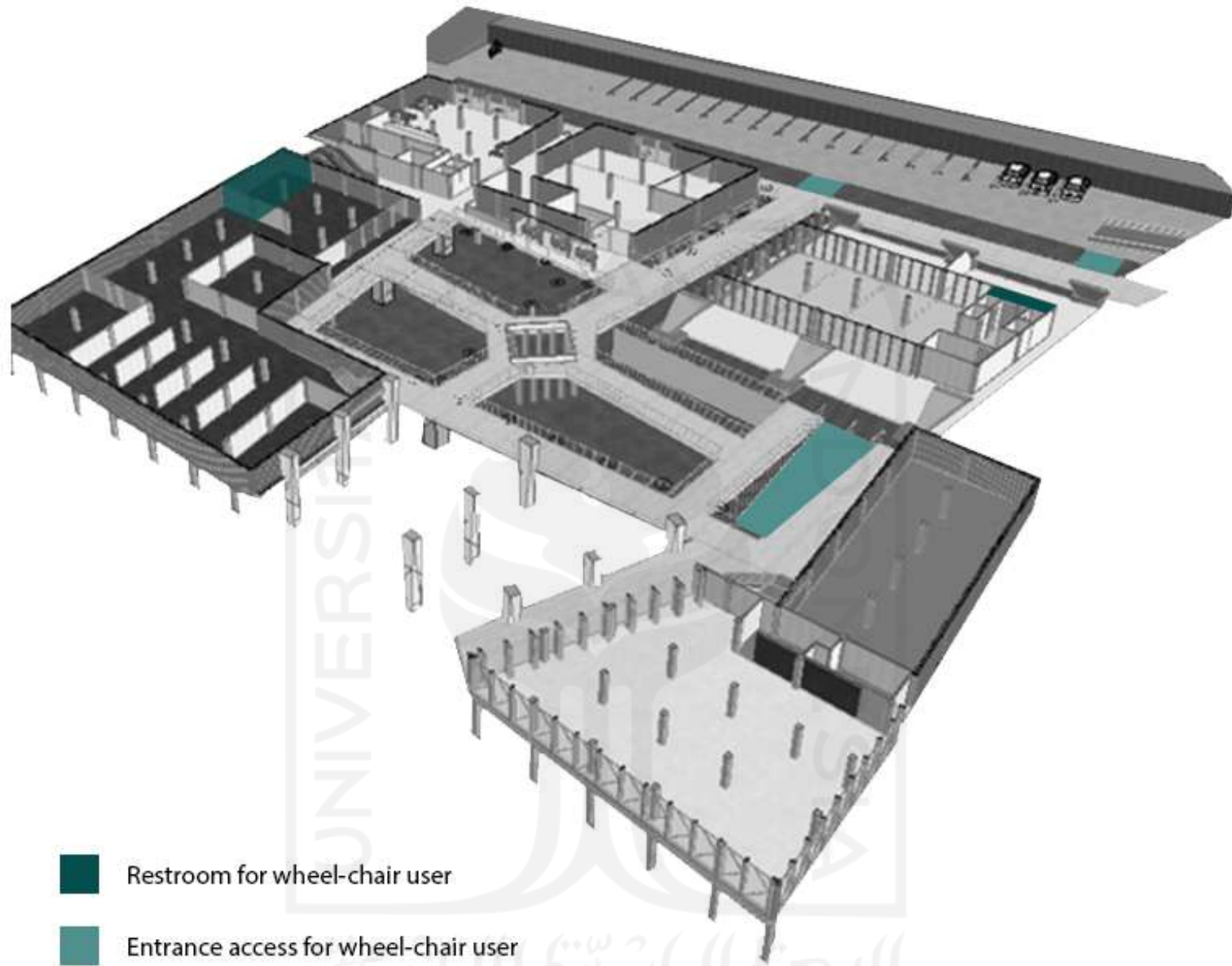
The design structure's material are using same material like other building. In the rooftop for culinary space, it has transparent roof and don't have barrier such as wall and curtain wall but using railink and some vegetation as barrier, so the people who sitting or eating there are able to enjoy the scenery of river and Kuala Simpang City.

Fire Safety and emergency evacuation schemes



The evacuation access lead people to 3 zones of gathering space, those are to parking lot, green open space in west, and green area in north. Each building is equipped with several fire safety systems such as fire alarms and portable fire extinguishers. Considering that this building provides a lot of space for F&B, it is necessary to provide a "Gas Shutoff" which its function is to cut off gas flow and is only used in emergency situations, for example when people smell gas. The location of the fire department is right next to the Tamiang Recreation Center, however, fire trucks are only able to access around the roadside and hydrants are provided in areas that can be reached by these firetrucks.

Barrier-Free Design Scheme



Each entrance stairs provide ramp for wheelchair-user and be able to access all buildings through pedestrian bridge. There's also downstairs from the bridge to green open space below, by providing ramp with an inclination of 10 degree, it is safe for wheel-chair user to passing through it. For Difable toilets located in multi-function hall and gallery, which have a wider space than other toilets. The Difable toilets also accesible by wheel-chair user.

EXTERIOR





F&B (ABOVE GALLERY)



GALLERY



SKYBRIDGRE



CHAPTER 7

REFLECTION

Jury Comments

1. **The reason why using footplat foundation**
2. **Stilt Grid/Axis should be change into perpendicular grid**
3. **Consider the function or activities beneath the building**
4. **The materials should be change into lightweight material**
5. **Design Value**

Soil Type in The Site

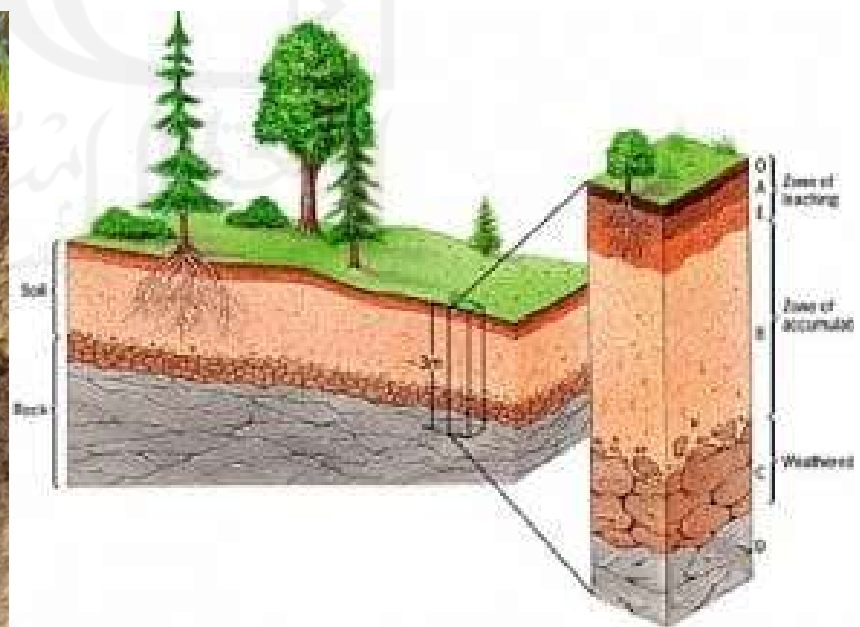
Alluvial Soil

Alluvial soil is one type of soil layer that settles for a relatively long period, then is formed from mud and fine sand that is deposited by air absorbs large amounts of air, and undergoes soil erosion.

The eroded soil absorbs nitrogen, which in the cycle undergoes natural fertilization. Other elements of this alluvial soil can also help the agricultural sector because it contains many nutrients.

Characteristic of Alluvial Soil

Alluvial soils which are dark brown in color are mostly located on the banks of rivers which mostly its function for water absorption. The surface of the water overgrown with parasites or wild plants proves that the alluvial soil is fertile and suitable for planting rice fields. Climate does not affect the quality of alluvial soil close to the water table. That's because water absorption occurs throughout the day.



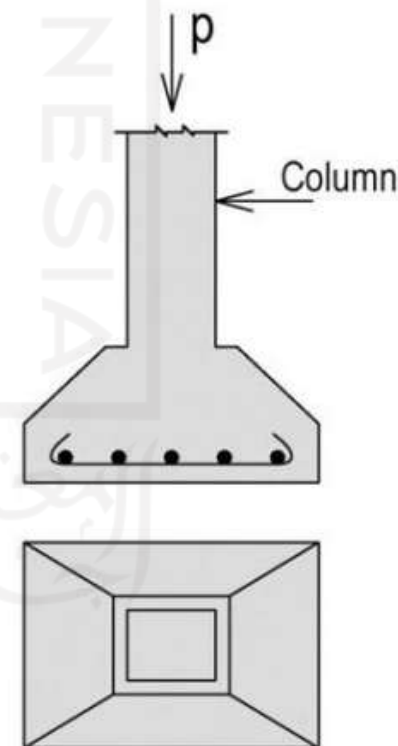
Suitable Fondation Type

The soil condition is moist but not swampy, by analyzing local civilian house, they are using umpak foundation.

This foundation can help align the building with shocks, so that the pillars of the building will not break even in an earthquake. The umpak foundation is placed on the surface of the soil that has been compacted or hardened with river stones (batu kali) and sloof as a binder.



Source: <https://www.99.co/blog/indonesia/jenis-pondasi-rumah/>



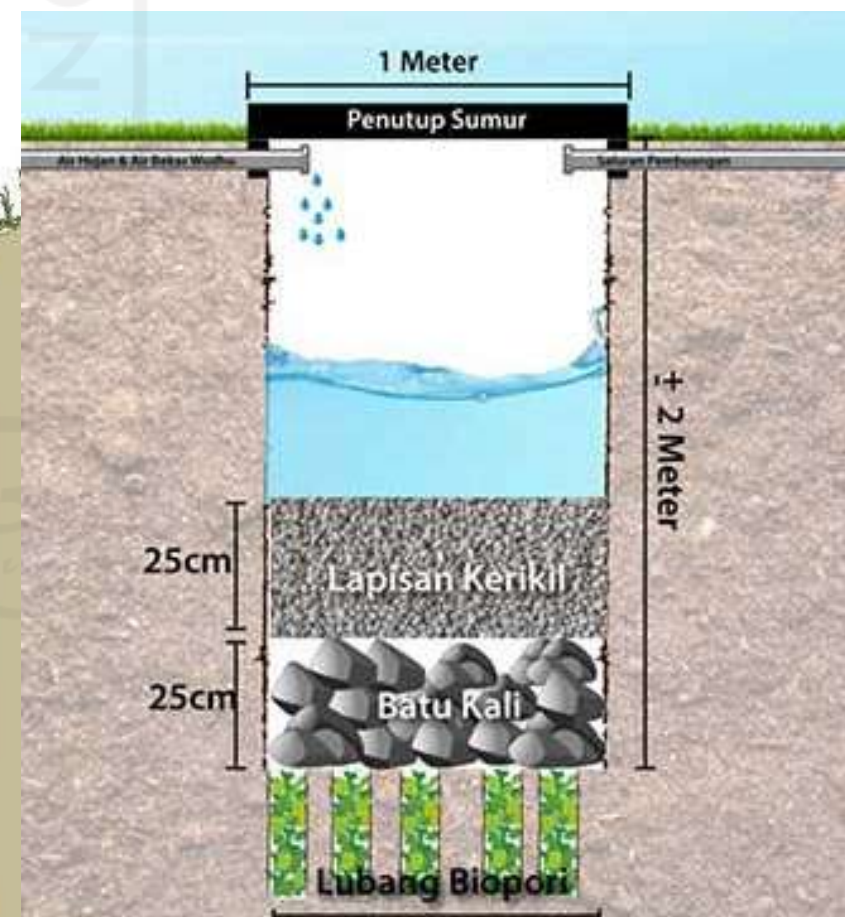
Sloped Footing

Space Beneath the Building

- Using biopore infiltration holes as flood retention areas

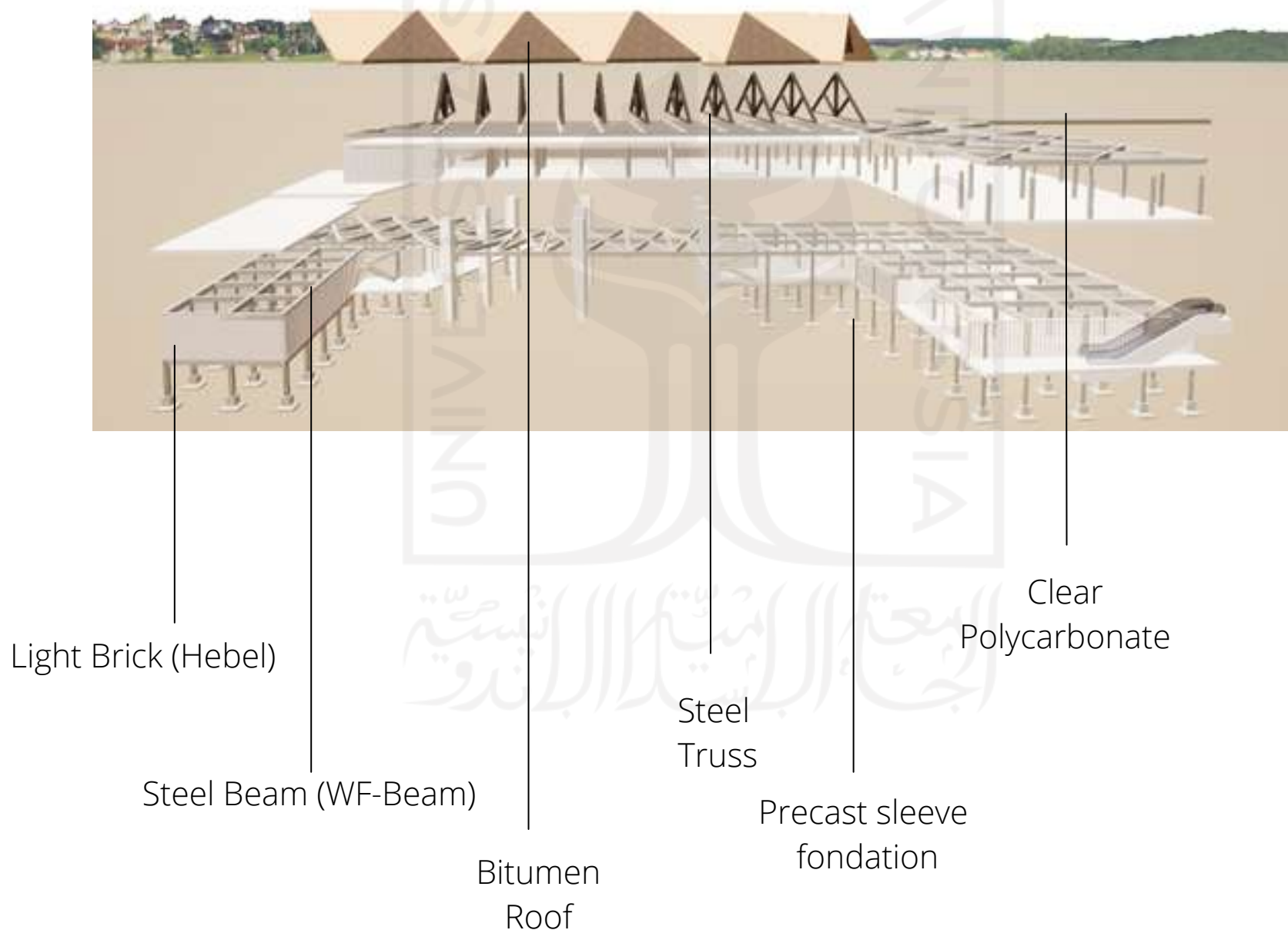
Biopore infiltration holes are cylindrical holes that are made vertically into the ground as a water absorption method aimed at overcoming waterlogging by increasing the water absorption capacity of the soil. Increasing the water absorption capacity of the soil is done by making holes in the soil and filling it with organic waste to produce compost. The organic waste that is piled up in this hole can then support the soil fauna, which in turn is able to create pores in the soil.

- Provide rainwater infiltration wells



Lightweight Building Material

The material that was applied to the building before was using concrete foundation, column, and beam which is contrary to local architectural concepts, that is supposed to use lightweight materials such as wood or steel. So overall, the structure will be change by using combination of concrete and steel material.



Wall Material

Lightweight brick is often called hebel made of a combination of materials such as cement, lime, quartz sand, aluminum, gypsum and water. Manufactured using a machine with a smooth material character, lightweight brick has a better flatness level when compared to red brick. This lightweight brick was created in order to lighten the structural load of a construction building, speed up implementation, and minimize the remaining material that occurs during the wall installation process.

Steel Beam (WF Steel)

WF steel is the perfect element to withstand axial tension and compression. Its light weight, despite having a high density structure, makes this material suitable to be used as a more efficient form of building construction. As a heavy load-bearing material, WF steel should not be made of materials that are easily brittle. The reason is, if this iron is made from raw materials that are easily brittle, it is feared that the object being supported will easily collapse as well. Usually, this material is made of steel blocks formed in the hot rolled steel process.

Bitumen Roof

Bitumen roof is a type of roof whose main constituent composition is asphalt or bitumen enhanced with other materials such as algae coating, fiberglass, and sandstone. In everyday life, this roof is also called asphalt tile, asphalt roof or bitumen tile.

The advantages:

1. Excellent and strong durability
2. Long-term service life
3. Very light-weight
4. Has many types and variations
5. Aesthetic
6. Able to adapt various types of roofs and their inspiration
7. Soundproof
8. Flexibility so that it is easy to form
9. Anti-corrossion
10. Weather-proof

Most of the materials have been changed to lightweight materials, but for wood material is avoided. Although this material is suitable for presenting local architecture, wood has many weaknesses, those are:

1. Wood is easily attacked by wood-eating insects such as termites or other insects. With this weakness, the
2. Contains water and has a major effect on the shape of the wood, therefore the wood must be dried before further processing. And wood is easy to become soft and rotten when submerged in water for a long time.
3. Large waste of materials. Cannot use all raw materials (not 100%) for use.
4. The limited diameter of the wood makes it difficult to get wide raw materials. To cover this weakness the wood must be spliced (widening of the boards).
5. Wood is flammable, especially in a dry state. And then damaged can not be used again. Due to the nature of this weakness, wood is not used in construction that requires heat-resistant and fire-resistant materials, but is used only in supporting construction.

Grid and Axis



Previously the grid's shape was still slanted has been changed to a perpendicular grid. The effects that grid changes have on the design are enormous, those are:

1. Arrangement of furniture is neater
2. Does not hinder accessibility
3. The structure more stable
4. distance between building and river increased from 30 m to 35m

the purpose of making an elongated building is to present local architecture, in which the typical Aceh building form is generally narrow and uses a stilt house structure which its functions is to prevent flooding.

but for multifunction hall, the grid is slightly different from other buildings because the building follows the shape and height of the ground.

Design Value

- Connect society and users, sustainable society
- Desirability of offer
- Fit to needs
- Anticipate environment's problem

ATTACHMENT

- Plagiarism Check
- Architectural Presentation Board

SURAT KETERANGAN HASIL CEK PLAGIASI

Nomor: 1740943597/Perpus./10/Dir.Perpus/X/2021

Bismillaahirrahmaanirrahiim

Assalamualaikum Wr. Wb.

Dengan ini, menerangkan Bahwa:

Nama : Cut Thifal Nadya Thary
Nomor Mahasiswa : 17512057
Pembimbing : Wiryono Raharjo, Ir., M.Arch, Ph.D
Fakultas / Prodi : Teknik Sipil dan Perencanaan/ Arsitektur
Judul Karya Ilmiah : Tamiang Recreation Center of Kuala Simpang with Flood Mitigation Approach and Green Open Space in Kuala Simpang

Karya ilmiah yang bersangkutan di atas telah melalui proses cek plagiasi menggunakan **Turnitin** dengan hasil kemiripan (*similarity*) sebesar **4 (Empat) %**.

Demikian Surat Keterangan ini dibuat untuk dapat dipergunakan sebagaimana mestinya.

Wassalamualaikum Wr. Wb.

Yogyakarta, 1/13/2022

Direktur



Joko S. Prianto, SIP., M.Hum

TAMIANG RECREATION CENTER

A DESIGN OF RECREATIONAL FACILITIES WITH FLOOD MITIGATION APPROACH AND GREEN OPEN SPACE IN KUALA SIMPANG

SITE DESCRIPTION

The river of Kuala Simpang City is a green open space located on the Tamiang river as a liaison between 2 areas, which are Kuala Simpang's downtown as a trading district and the Karang Baru as a government and business district. If we look at the common problems that occur in the Kuala Simpang and Karang Baru areas, caused by floods by high rainfall intensity and land subsidence in the river. The city of Kuala Simpang needs public facilities which have some important points as a medium to develop community interaction, marketplace, cultural performances, pedestrian access, etc. To improve the quality of public life and meet the needs of green open space in Aceh Tamiang that still has not reached the criteria of qanun concerning the provision of green open space which it is must reach 30% of the green area.

PROJECT DESCRIPTION

The Tamiang Recreation Center aims to facilitates the needs of recreational things by considering flood mitigation design reminding that the choosen site is flood prone and provide green open space which it must reach 30% of the green area in Kuala Simpang City.

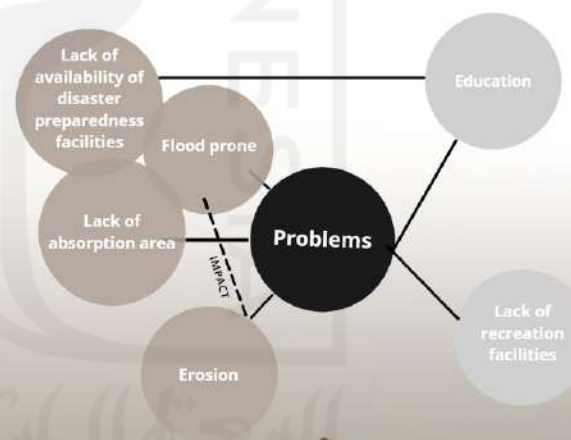
AIMS

ECONOMICAL	RECREATIONAL	CULTURAL	ECOLOGICAL
Improve regional income (PAD)	Improve Community Needs	Enhancing public knowledge of Aceh culture	Flood friendly
Activate space along the river	Increase recreational boating activity		Provide flood retention
Support Commercial Activity			

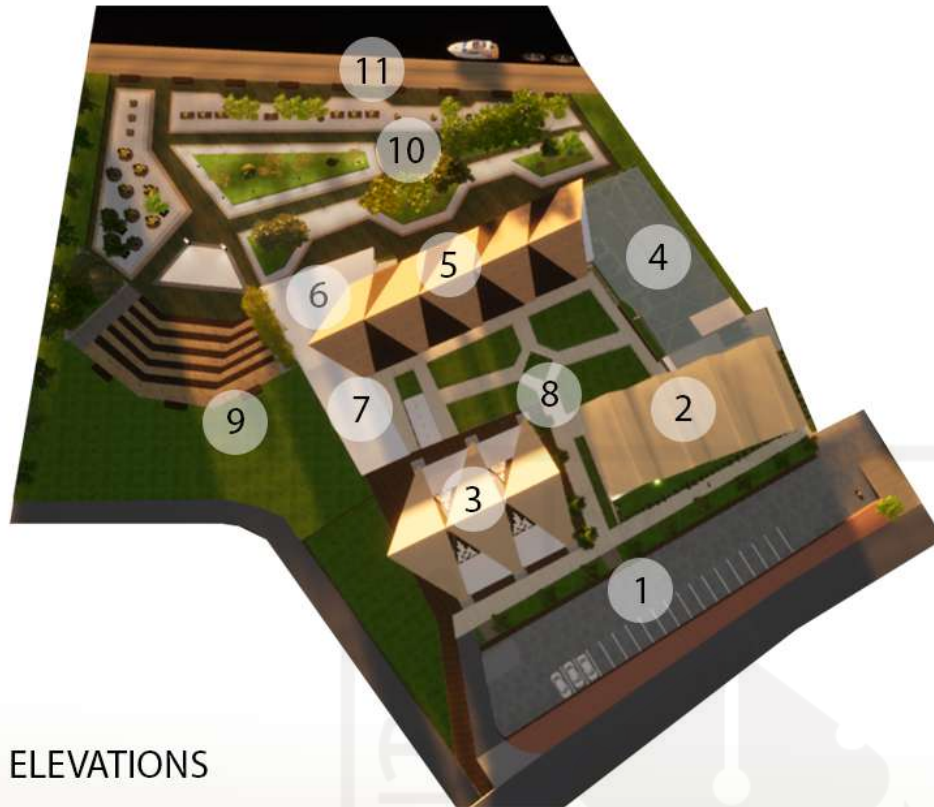
FACILITIES



ISSUES



MASTER PLAN



- 1 Parking Lot
- 2 F&B
- 3 Multi-function Hall
- 4 Food Court
- 5 Skybridge
- 6 Mushola
- 7 Services
- 8 Bridge for Pedestrian
- 9 Amphitheater
- 10 Green Open Space
- 11 Pier for Boating Activity

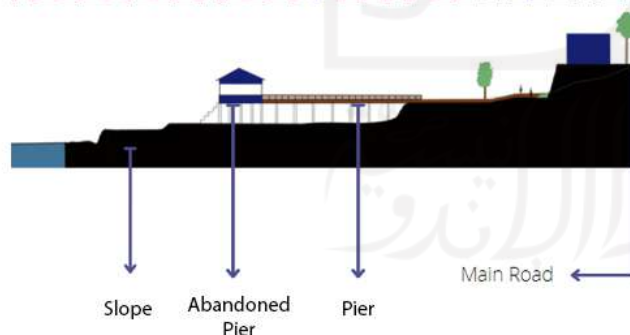
ELEVATIONS



PERSPECTIVE FROM THE BRIDGE



SITE ANALYSIS



Flood Information : Annually

This flood usually occurs annually. People who live in this area say that floods usually occur in October and November and the maximum flood height that occurs annually is 1.78 meters and the minimum height is 1.22 meters

The height of the ground floor which needed by the community adjusts to the height of the floods that occur each year. The required height is approximately 2-3 meters for the ground floor.



POTENTIAL VIEW

From the site's position, there are 2 prominent views, namely the view towards the river and the open field. With this, the orientation of the building to be built will be more inclined towards the east and west.



ACCESSIBILITY

To enter the site, there are different contours on the main road and the neighborhood road, but the road is not too steep and safe for vehicles to pass.

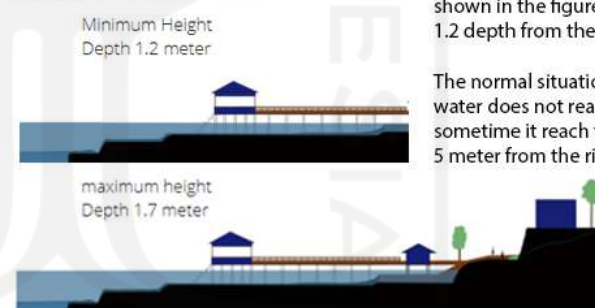


Flood often happens in selected area and the cause is the water flows down from the downhill road if passing from a main road. When the intensity of the rain increases, the water from the river will overflow and the rainwater from the side of the road will flow into the site area as shown in this following picture.

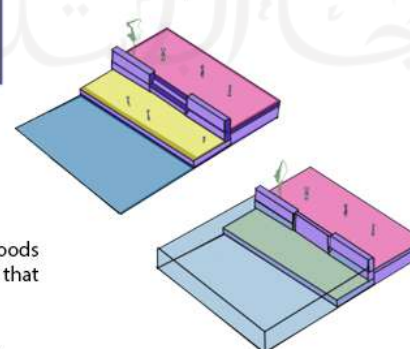
Annual Flood Data

Maximum flood height is 1.7 - 2.0 meter depth from the ground (from the pier as shown in the figure) and the minimum is 1.2 depth from the ground.

The normal situation is when the river water does not reach the ground or sometime it reach the ground at least 5 meter from the river



Concept to overcome flooding (For Landscape)



For the prevention of erosion, generally use counter-measures by installing a retaining wall in the form of semi-gravity. Even though a retaining wall has been provided, this does not guarantee whether the potential for flooding will decrease or not in the future, so that other alternatives are needed to reduce disaster risk Flood resistant design for landscaping by providing a lower space or with a little higher elevation from river water.

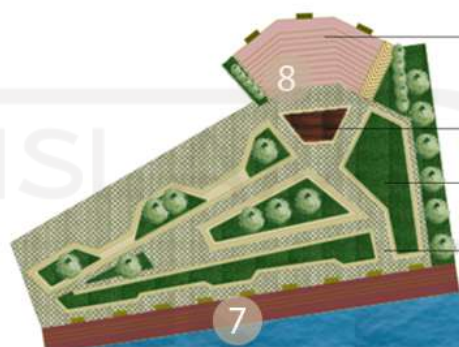
The initial design hypothesis and approach would be a recreational center that possess the resiliency ability against annual flood and future flash-flood. There are 2 concepts that will be implemented into the design. Those are the concept of flood resistance for landscape design and for buildings.

AXONOMETRY



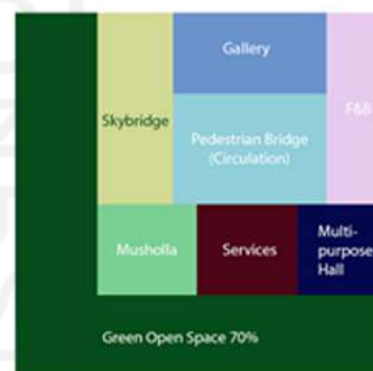
- 1 Multi-purpose Hall
- 2 Skybridge
- 3 F&B
- 4 Gallery & F&B on Rooftop
- 5 Mushola
- 6 Bridge for Pedestrian
- 7 Pier
- 8 Amphitheater
- 9 Parking Lot
- 10 Services Room

The arrangement of landscape design give a good impact for surroundings, This landscape is designed by playing of ground level, which can withstand the movement of water towards the land surface. when dry season, this land can be used as a public facility, and vice versa, if there is a flood then this land will be used as a flood retention area.

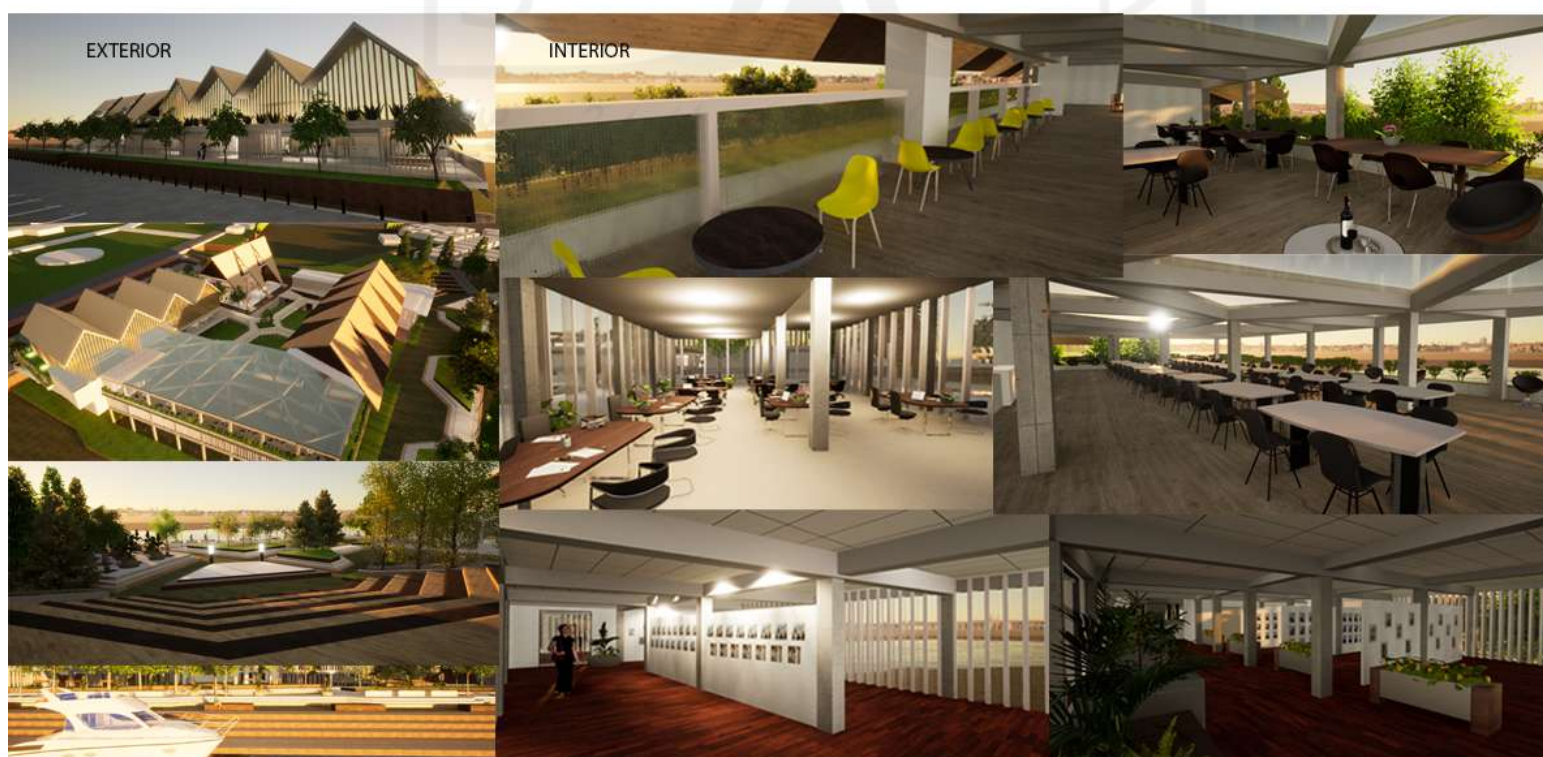


- Natural Stone
For amphitheater
- Natural Stone
For amphitheater
- Grass
As a place to plant the trees
and helps to absorb water
- Grass Block
restrain the growth of weeds
Helps to absorb water

ZONING



The arrangement follows what kind of activities pec whether they're like to do indoor or outdoor activiti considering the needs of green open space for Kual City. The Space programming diagram shows that g space has larger area than the building, even in the the building (pedestrian bridge provide circulation to have an access into each building and also consic green open space.



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Tamiang Recreation Center

Design of Recreational Facilities with Flood
Mitigation Approach and Green Open Space

Cut Thifal Nadya Thary
17512057



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