RE-DESIGN OF SUNGAI KUNJANG BUS TERMINAL AS AN ECONOMIC ACTIVITY CENTER IN SUNGAI KUNJANG

DESAIN ULANG TERMINAL BUS SUNGAI KUNJANG SEBAGAI PUSAT KEGIATAN EKONOMI DI SUNGAI KUNJANG

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DEPARTMENT of ARCHITECTURE

Final Architecture Design Studio
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STATEMENT OF AUTHENTICITY

I hereby declare that all parts of this work are my own work, except for those parts that clearly refer to other sources marked with citations. No outside assistance, either in whole or in part, was involved in the process. I also confirm that there is no conflict of intellectual property, and all ideas and writings contained in this work are fully attributed to the author and supervisor. The final result of this work is submitted to the Department of Architecture, Universitas Islam Indonesia, for educational and publication purposes.

Yogyakarta, 11 Januari 2025

Hairurrohid Multazam
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ATTESTATION SHEET

Studio Akhir Desain Arsitektur yang Berjudul:
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Desain Ulang Terminal Bus Sungai Kunjang Sebagai Pusat Kegiatan Ekonomi di Sungai Kunjang
Re-Design of Sungai Kunjang Bus Terminal as an Economic Activity Center in sungai kunjang

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Quality in the Final Architecture Design Studio book
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PREFACE

Praise be to God Almighty, who has given His smoothness, strength, and guidance so that the writing of this Final Project can be completed on time. Without His blessings and grace, the author would not have been able to complete this work.

With gratitude, the author has successfully completed this thesis with the title “Re-Design of Sungai Kunjang Bus Terminal as an Economic Activity Center in Sungai Kunjang”.

Last but not least, the author would like to express his gratitude to all those who have provided support and assistance in the process of writing this thesis. My appreciation and gratitude goes to:

1. To Allah SWT, who has given His mercy and grace, so that the author is given ease in every process of preparing this final project.
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6. To Rahma Amelia Fitry, who always supports and accompanies the author during the process of preparing this final project. Thank you for your prayers, attention, and various valuable inputs that have been given, thus helping the author in completing this final project.

The author recognizes that this work is far from perfection. Therefore, with humility, the author apologizes if there are shortcomings or mistakes in writing this thesis. Constructive criticism and suggestions are highly expected for future improvements.

Design Premise

Sungai Kunjang Terminal, as a Type B terminal in Samarinda, has enormous potential given its strategic geographical location. It is located along the Mahakam River, which is one of the most important transportation routes in East Kalimantan. The terminal benefits from being located in an industrial area in Sungai Kunjang Subdistrict. This area is not only the center of industry, but is also directly connected to the inter-city route that specifically serves large vehicles, such as intercity trucks and buses.

The geographical advantage of Terminal Sungai Kunjang is further strengthened by its proximity to the port, making it an important point in the logistics and cargo distribution chain in Samarinda. Around the terminal area, there are various economic activities, ranging from logistics, cargo, ports, large shopping centers such as BigMall, to various micro, small and medium-sized enterprises (UMKM). All of this shows that this area has very high economic potential, especially in terms of regional economic development, especially in Sungai Kunjang Sub-district.

However, despite its potential, Sungai Kunjang Terminal faces a number of serious challenges, particularly in terms of infrastructure and facilities. Some of the main problems at the terminal include inefficient vehicle circulation, inadequate parking areas, and administrative management that needs to be improved. These facilities are no longer able to meet the needs of terminal users. Therefore, revamping and upgrading the terminal's infrastructure is a critical need.

Redesigning the Sungai Kunjang Terminal is important because it plays a strategic role in supporting the local and regional economy. By maximizing the potential of this area as a center of economic activity, it can function not only as a transit point for large vehicles, but also as an economic center that triggers the growth of industry, logistics, and trade. This effort is in line with Samarinda's 2021-2026 Rencana Pembangunan Jangka Menengah Daerah (RPJMD), where one of the main priorities is to improve land and river transportation infrastructure to strengthen the regional economy and meet community needs. The improvement and development of the Sungai Kunjang Terminal will support the government's vision to create better and more sustainable infrastructure, thereby having a positive impact on the economy and lives of the people of Samarinda.

Premis Desain

Terminal Sungai Kunjang, sebagai terminal Tipe B di Samarinda, memiliki potensi yang sangat besar karena letak geografisnya yang strategis. Terminal ini terletak di sepanjang Sungai Mahakam, yang merupakan salah satu jalur transportasi terpenting di Kalimantan Timur. Terminal ini juga diuntungkan dengan lokasinya yang berada di kawasan industri di Kecamatan Sungai Kunjang. Kawasan ini tidak hanya menjadi pusat industri, namun juga terhubung langsung dengan jalur antar kota yang khusus melayani kendaraan besar, seperti truk dan bus antarkota.

Keunggulan geografis Terminal Sungai Kunjang semakin diperkuat dengan lokasinya yang berdekatan dengan pelabuhan, sehingga menjadi titik penting dalam rantai distribusi logistik dan kargo di Samarinda. Di sekitar area terminal, terdapat berbagai kegiatan ekonomi, mulai dari logistik, kargo, pelabuhan, pusat perbelanjaan besar seperti BigMall, hingga berbagai usaha mikro, kecil, dan menengah (UMKM). Semua itu menunjukkan bahwa kawasan ini memiliki potensi ekonomi yang sangat tinggi, terutama dalam hal pengembangan ekonomi wilayah, khususnya di Kecamatan Sungai Kunjang.

Namun demikian, terlepas dari potensinya, Terminal Sungai Kunjang menghadapi beberapa tantangan yang cukup serius, terutama dalam hal infrastruktur dan fasilitas. Beberapa masalah utama di terminal ini antara lain sirkulasi kendaraan yang kurang efisien, area parkir yang kurang memadai, dan pengelolaan administrasi yang perlu ditingkatkan. Fasilitas-fasilitas tersebut sudah tidak mampu lagi memenuhi kebutuhan pengguna terminal. Oleh karena itu, pembenahan dan peningkatan infrastruktur terminal menjadi kebutuhan yang sangat penting.

Perancangan ulang Terminal Sungai Kunjang menjadi penting karena memiliki peran strategis dalam mendukung perekonomian lokal dan regional. Dengan memaksimalkan potensi kawasan ini sebagai pusat kegiatan ekonomi, maka tidak hanya berfungsi sebagai tempat transit kendaraan besar, tetapi juga menjadi pusat ekonomi yang memicu pertumbuhan industri, logistik, dan perdagangan. Upaya ini sejalan dengan Rencana Pembangunan Jangka Menengah Daerah (RPJMD) Kota Samarinda 2021-2026, di mana salah satu prioritas utamanya adalah meningkatkan infrastruktur transportasi darat dan sungai untuk memperkuat perekonomian daerah dan memenuhi kebutuhan masyarakat. Peningkatan dan pengembangan Terminal Sungai Kunjang akan mendukung visi pemerintah untuk menciptakan infrastruktur yang lebih baik dan berkelanjutan, sehingga memberikan dampak positif bagi perekonomian dan kehidupan masyarakat Samarinda.

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01

01

/ BACKGROUND

ECONOMIC ACTIVITY IN SAMARINDA

Samarinda City is the capital city of East Kalimantan Province which is directly adjacent to Kutai Kartanegara Regency. The rivers that pass through Samarinda City have a considerable influence on the development of the city. As one of the most important regional economic centers in East Kalimantan, Kota Samarinda has a strategic position and position for various **industrial activities, trade and services, as well as environmentally sound and green settlements.**

Source : Explore Merah Putih, YouTube.com

Figure 1: Mahakam river (source: Explore Merah Putih, YouTube.com)

Based on Regional Regulation No. 2 of 2014 concerning the Samarinda City Spatial Plan for the 2014-2034 period, Samarinda City has a spatial planning objective to realize Samarinda City as an edge city based on **trade, services and industry that is advanced, environmentally sound and green, and has a competitive advantage to improve the welfare of the community.** The concept of the Edge City is the word Edge, which is not only the motto of Samarinda City, which is an acronym for Shady, Neat, Safe and Comfortable, but also a reflection of Samarinda City which is located in the riverside area, which is the part directly adjacent to the water.

The rate of growth and the dominance of the economy, which is dominated by the **trade, hotel, and restaurant sectors as well as the services sector in the economy of Kota Samarinda**, have a direct effect on population growth, which is mostly caused by population migration (RKPD, 2023). This indicates that Kota Samarinda has a strong attraction for people from outside the region, especially for investment and trade sector opportunities. This condition further strengthens the role of Kota Samarinda as a city of services and trade.

Source : Author's Analysis

Figure 2: Readymix (source: adhimix.co.id)

Figure 3: Kapal tongkang batubara (source: Detik.com)

CONTRIBUTION OF SUNGAI KUNJANG TO THE LOCAL AND REGIONAL ECONOMY

Sungai Kunjang is one of the sub-districts in Samarinda, East Kalimantan. This area has developed into a strategic industrial location that is very important to the city's economy. Its location on the banks of the Mahakam River, which is one of the largest rivers in Kalimantan, allows easy access to water transportation and can support distribution and logistics activities. The Mahakam River itself serves as an important transportation route for goods, especially mining and plantation products which are important industries in East Kalimantan. Sungai Kunjang is an ideal place for industry and warehousing as Samarinda develops into the economic center of East Kalimantan. The area is highly desirable for businesses engaged in mining, wood processing, ready mix, logistics, and distribution due to adequate infrastructure, such as land transportation routes and proximity to Samarinda Port. Various large and small businesses utilize this infrastructure for warehousing, loading and unloading, and distribution.

Sungai Kunjang continues to attract investors and is expected to play a greater role in supporting the economy of Samarinda and its surroundings. Sustainable industrial development and good environmental governance will strengthen Sungai Kunjang's position as an important industrial area in the East Kalimantan region, especially as part of the planned relocation of the national capital that will strengthen key economic sectors in the area.

TARGETS AND CHALLENGES OF LAND TRANSPORTATION INFRASTRUCTURE DEVELOPMENT IN SAMARINDA CITY

Figure 4: Vision & mission table (source: P-RPJMD 2021-2026)

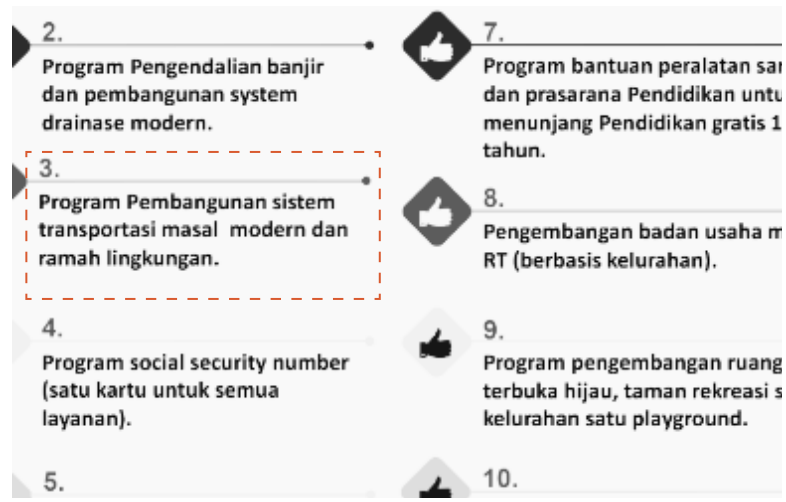


Figure 5: Work program (source: P-RPJMD 2021-2026)

The government has planned the development of land transportation infrastructure in Kota Samarinda, including efforts to increase the availability of road networks and transportation facilities and infrastructure. This planning target has been set in the 2021-2026 P-RPJMD, in which the target set for 2026 is to reach 82.80% for the availability of the road network and 96.50% for transportation facilities and infrastructure. However, in 2022, the achievement of transportation facilities and infrastructure had only reached 41.96%, still far from the expected target. In addition, the program to develop a modern and environmentally friendly mass transportation system is also an important component in this plan, which aims to increase citizen mobility and reduce negative impacts on the environment.

Wilayah Strategis	Arah Kebijakan	Fokus
Kawasan Industri dan Pelabuhan di Kecamatan Palaran dan di Kecamatan Samarinda Kota	- Pengembangan kawasan untuk menampung pengadaan fasilitas terminal peti kemas - Pengembangan terminal barang umum/cargo dan terminal penumpang	- Pengembangan fasilitas pelabuhan Palaran - Pengembangan kawasan industri - Perencanaan dan pembangunan fasilitas dan infrastruktur

Figure 6: Regional strategy (source: P-RPJMD 2021-2026)

The government also plans to develop passenger terminals and freight terminals to improve transportation and logistics efficiency in line with the city's economic growth. The passenger terminal will be developed with modern facilities and better transportation integration to reduce congestion. Meanwhile, the cargo terminal will become a major distribution center with loading and unloading facilities and warehouses to support the growing logistics needs. Both projects aim to strengthen the economic sector, create jobs and encourage infrastructure investment in Samarinda.

Figure 7: Waiting room atmosphere (source: author, 2024)

DEVELOPMENT OF SUNGAI KUNJANG TERMINAL IN THE SAMARINDA SPATIAL PLAN (RTRW)

In the context of Samarinda's Regional Spatial Plan (RTRW, 2013), the transportation system in the Karang Asam area, particularly the Sungai Kunjang Terminal, plays an important role as a key link between the economic sector and the community. The development of this terminal is planned to not only improve accessibility, but also support **logistics activities** by optimizing warehousing and goods distribution areas. Its strategic position makes it a hub for the integration of various modes of transportation, such as **public transport, motorcycle taxis, and river transport**, which are important for economic growth and mobility in the Samarinda region.

Figure 8: Terminal sungai kunjang situation (source: author, 2024)

Sungai Kunjang Terminal is one of the main transportation hubs in Samarinda City, East Kalimantan, connecting various areas in the city and its surroundings. In addition to being a **transportation hub**, the terminal is also a vibrant center of economic activity, with a variety of small and medium-sized enterprises developing around it. Food stalls, retail kiosks, and street vendors provide the needs of passengers and transportation workers, while workshops and transportation services such as city transportation, ojek, and goods delivery services support daily activities. It also facilitates logistics and vehicle repair services that are essential for smooth mobility, while budget lodging and luggage storage services round out the services for terminal users. As a **hub of economic activity**, Sungai Kunjang Terminal not only supports transportation, but also contributes significantly to local economic growth by creating jobs and meeting the needs of the local community.

TERMINAL RENOVATION PLAN FROM THE GOVERNMENT

Figure 9: Terminal renovation plan (source: RRI.co.id)

Figure 10: Terminal renovation plan (source: Kaltimedia.com)

The planned renovation of Sungai Kunjang Terminal in Samarinda was initially planned to be carried out in 2024. However, due to the elections, the implementation can only take place in 2025. Although the exact date is still uncertain, the certainty of the renovation is strengthened by the monitoring and measurement of the terminal's condition by related agencies, as revealed by the Terminal Coordinator, Eko Novianto, in an interview with RRI.

Eko also highlighted several obstacles faced by the terminal during its operation, especially related to micro, small and medium enterprises (UMKM) in the terminal area. According to him, UMKM in the terminal **cannot operate optimally** due to the inadequate condition of the terminal, with **limited facilities** and **an environment that looks dirty and shabby**. As a result, many sellers choose to close their stalls, while passengers often shop outside the terminal.

During the renovation, all buses operating at the terminal will be diverted to Sungai Kunjang Harbor, which is opposite the terminal. Only departing buses will be allowed to park at the pier due to limited space at the port, to ensure systematic flow to avoid congestion. Once the renovation is complete, the terminal's operational arrangements will be reorganized more systematically to improve passenger convenience and contribute to local revenue growth.This renovation is an important step to improve transportation services in Samarinda and reshape terminal operations for greater convenience and efficiency.

MANAGER OF SAMARINDA'S SUNGAI KUNJANG TERMINAL

Figure 11: Terminal condition (source: author, 2024)

Sungai Kunjang Terminal in Samarinda City is managed by the Terminal Management Unit (Unit Pelaksana Teknis Daerah, UPTD), which is under the auspices of the Samarinda City Transportation Agency. This UPTD is responsible for the management of nine terminals spread across various locations in Samarinda. Sungai Kunjang Terminal, as a **type B terminal**, is an important center for community mobility, **both for inter-city transportation within the province, city transportation, and rural transportation** (Yogiantoro, 2017). In addition to carrying out daily operational management, the UPTD is also tasked with ensuring that the facilities within the terminal function properly, including services for passengers, bus route arrangements, as well as management of other supporting facilities, such as kiosks and parking lots. The UPTD's responsibilities also include arranging and repairing infrastructure that supports the smooth operation of transportation at the terminal, as well as maintaining the order and comfort of passengers using these facilities.

In carrying out its duties, the UPTD works closely with various parties, such as **transportation companies and security forces**, to ensure security and smooth operations. The professional management of the UPTD Terminal Management Unit is expected to improve the quality of transportation services in Samarinda City, especially at the strategic Sungai Kunjang Terminal, by continuously improving facilities and infrastructure to support more efficient mobility. The UPTD also plays an important role in supporting the **local economy**, by providing space for micro, small and medium enterprises (UMKM) in the terminal area, although there are still challenges related to infrastructure and optimal management of business space. Efforts continue to be made to integrate development programs, including more environmentally friendly mass transportation.

DESIGN ISSUES AND DESIGN OBJECTIVES

General Problem Formulation

How to re-design Sungai Kunjang Terminal to function not only as a transportation hub, but also as a center of economic activity that encourages local economic growth and provides long-term benefits for the surrounding community?

Spesific Problem Formulation

- How can the terminal accommodate the role of transportation while integrating sustainable commercial activities?
- How to improve the accessibility of the terminal to make it easily accessible to the general public, both transportation users and visitors interested in economic activities around the terminal?
- How can the spatial design of the terminal be optimized to accommodate different types of economic activities, such as shopping areas, food stalls, local markets, and small and medium enterprise (UMKM) spaces?

Design Goal

The design goal for the Sungai Kunjang Terminal aims to create a center of economic activity by providing commercial facilities that capitalize on the logistics potential of the surrounding area, especially for inter-city freight forwarding. As such, it is expected that the terminal will significantly boost the regional economy. Optimizing vehicular and pedestrian circulation through clear and separated paths will reduce congestion and improve user safety. The design includes the creation of a BRT stop that bridges the access of pedestrians and passengers who want to use the city transit without having to go too far into the terminal area. The terminal also aims to empower the local economy by supporting small and medium enterprises (UMKM), thus creating synergies between transportation and economic activity in the vicinity.

Design Benefits

The design of the Sungai Kunjang Terminal provides a range of benefits, including increased economic activity through commercial facilities that support inter-city freight forwarding, which will encourage SME growth and increase local revenue. Optimization of vehicular and pedestrian circulation will reduce congestion and improve transport efficiency, while clear and separated lanes will improve user safety. Accessibility is also improved through the integration of public transportation and the provision of facilities for people with disabilities, ensuring all users can access the terminal easily. In addition, comfortable and attractive public spaces will encourage social interaction, make the terminal a pleasant gathering space, and increase tourist attraction, which in turn will have a positive impact on the local tourism sector.

Design Limitations

There are several criteria that limit this design, among others:

- **The design uses a Mix-Use Development approach ato support passenger and logistics activities, as well as additional facilities such as commercial or office areas**
- **The design will focus on creating a dynamic center of economic activity as well as efficient and good circulation arrangements. To solve the design problems based on the architectural aspects of the problem formulation**
- **Design Mix-Use, Combining warehouse in the terminal design will make it an attractive multifunctional center**

Design Method

- Terminal Classification Identification: First, it is necessary to understand the classification of type B terminals to determine the relevant characteristics and needs.
- Secondary Data Collection: Next, secondary data collection is carried out to analyze the potential and existing problems at the existing location, including social, economic, and infrastructure aspects.
- Precedent Study: Studying precedent examples relevant to the design objectives and evaluating different design elements to gain inspiration and insights that can be applied in the design of this terminal.

DESIGN FRAMEWORK

FRAMEWORK

Re-Design of Sungai Kunjang Bus Terminal as an Economic Activity Center in Sungai Kunjang

Architectural Issues

- Infrastructure facilities do not meet the criteria of a Type B terminal
- Irregular terminal circulation
- No clear boundaries between parking areas, circulation, and terminal activities
- Inadequate facilities

Non-Architectural Issues

- Economy activities in Sungai Kunjang District
- RPJMD 2021-2026, development plan for land transportation infrastructure in Kota Samarinda
- The local government's renovation plan for Sungai Kunjang Terminal, to be carried out in 2025.

enhance terminal fasilities and terminal activity

Improving Land Infrastructure in Samarinda

increasing economy activites in Sungai Kunjang District

General Problem

How to re-design Sungai Kunjang Terminal to function not only as a transportation hub, but also as a center of economic activity that encourages local economic growth and provides long-term benefits for the surrounding community?

Spesific Problem

- How can the terminal accommodate the role of transportation while integrating sustainable commercial activities?
- How to improve the accessibility of the terminal to make it easily accessible to the general public, both transportation users and visitors interested in economic activities around the terminal?
- How can the spatial design of the terminal be optimized to accommodate different types of economic activities, such as shopping areas, food stalls, local markets, and small and medium enterprise (UMKM) spaces?

DESIGN ISSUES

Mass Layout | Spatial Layout | Circulation Layout | Mix-Use Function

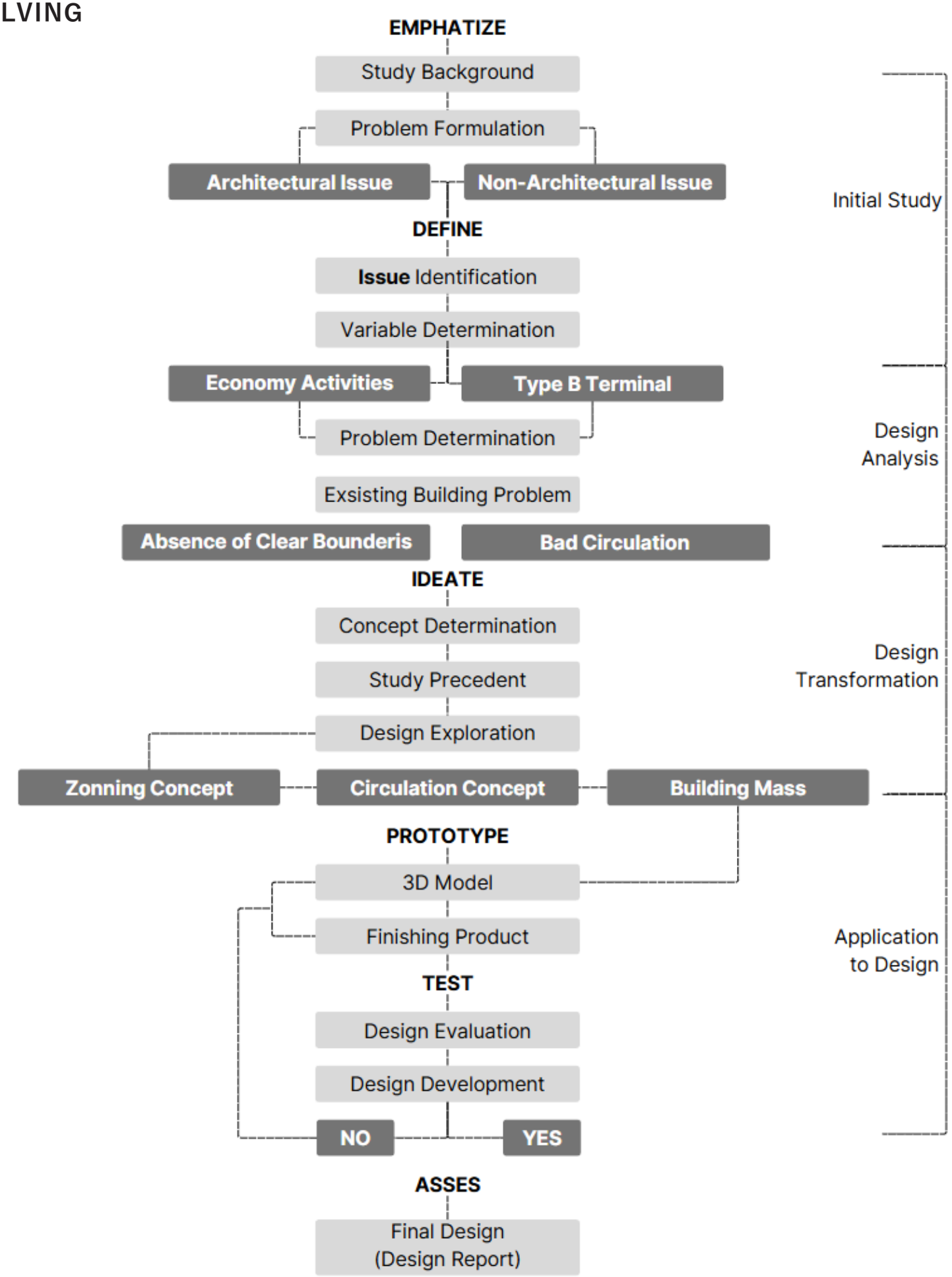
Concept

Schematic

Design Formulation

Design Development

PROBLEM SOLVING METHOD



EXCELLENCE, ORIGINALITY AND NOVELTY

Title Description	Concept	Difference	Authors
Re-Desain Terminal Bus Giwangan Dengan Aspek-Aspek Green Terminal	Redesign Giwangan Terminal in accordance with type A standards by applying aspects of Green Terminal to overcome the problems of vehicle and human circulation in Giwangan Terminal.	The lesson is the same redesign and Same Tipology, Different Approach, Different Design Objective	Farras Satria Pradipta, 2023
Re-Desain Stadion Palaran Dengan Pendekatan Arsitektur Berkelanjutan	Redesign the building using an energy-efficient sustainable architecture approach so that Palaran Stadium can be actively used again.	The lesson is the same redesign but different building typologies, different approaches, Different Design Objective	Andre Dwinanda Siswita , 2024
Perancangan Terminal Condongcatur dengan -Prin sip TOD (Transit Oriented Development)	Revitalizing the terminal by applying the principles of Transit Oriented Development (TOD) to attract people to use public transportation again. The public transportation system that has been implemented at Concat Terminal is Bus Rapit Transit (BRT) this system is applied to Transjogja transportation.	Same Tipology, Same Approach, Different Design Objective	Moh. Bintang Lazuardi R, 2018
Pengembangan Bangunan Fungsi Campuran di Kawasan Lempuyangan Dengan Pendekatan TOD (Transit Oriented Development)	A mixed-use building model with a TOD approach consisting of commercial retail, housing equipped with human and vehicle circulation arrangements to overcome crowd circulation and backlogs equipped with socialization spaces in the Lempuyangan area.	Different Building Tipology, Same Approach, Same Design Objective	Aulia Ariestiarini Feridianti, 2018

Source : Author's Analysis

02

02 / STUDY PROBLEM

TERMINAL SUNGAI KUNJANG

Figure 12: Terminal sungai kunjang location (source: author, 2024)

Sungai Kunjang Bus Terminal is one of the Type B terminals in Samarinda City that functions to accommodate road transportation for city transportation within the province (AKDP) and city transportation (AK). Its location, close to the Mahakam River bridge, makes Sungai Kunjang Bus Terminal one of the main choices for people coming to Samarinda or traveling to various regions in East Kalimantan. In addition, Sungai Kunjang Bus Terminal has also recently become a transit facility for passengers who want to go to APT Pranoto Samarinda International Airport, which is 35.6 km away or about 1 hour and 11 minutes by Damri Bus (Therrisia, 2020). In addition, by walking 100 m, passengers can continue their journey to or from the Sungai Kunjang Ship and Goods Port.

Location :

- Jl. Untung Suropati, Karang Asam Ulu, Kec. Sungai Kunjang, Kota Samarinda, Kalimantan Timur 75243, Indonesia

Asset Status :

- Sunga Kunjang Terminal is an asset of the East Kalimantan Provincial Government.

Size :

- 14.390 m2

BUILDING CODE

Pasal 73
General provisions of zoning regulations for office designation areas as referred to in article 70 letter c includes:
determination of building intensity with provisions including:
1. KDB at a maximum of 40 (forty) percent;
2. KLB at a minimum of 3 (three) floors;
3. KDH is at least 20 (twenty) percent;
4. GSB between 3 (three) to 4 (four) meters;
5. the maximum building height is equal to the maximum KLB.

SIZE SITE	KDB	KLB	KDH
14.390 m2	5.756 m2	17.268 m2	2.878 m2

Figure 13: Indonesia map (source: author, 2024)

Figure 14: East kalimantan map (source: author, 2024)

Figure 15: Samarinda city map (source: author, 2024)

Figure 16: Sungai kunjang district map (source: author, 2024)

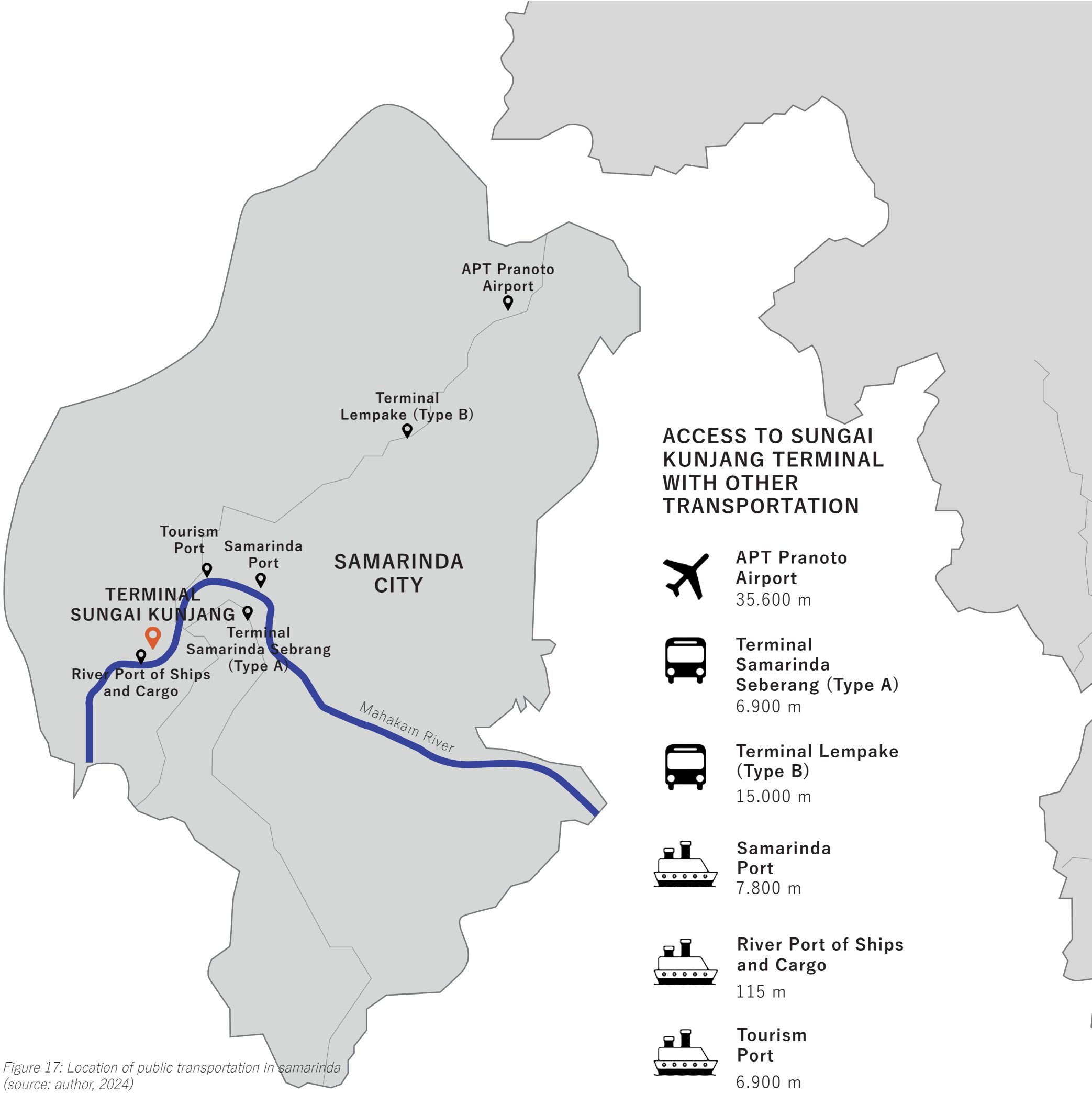


Figure 17: Location of public transportation in samarinda (source: author, 2024)

Figure 18: Location of terminal destination (source: author, 2024)

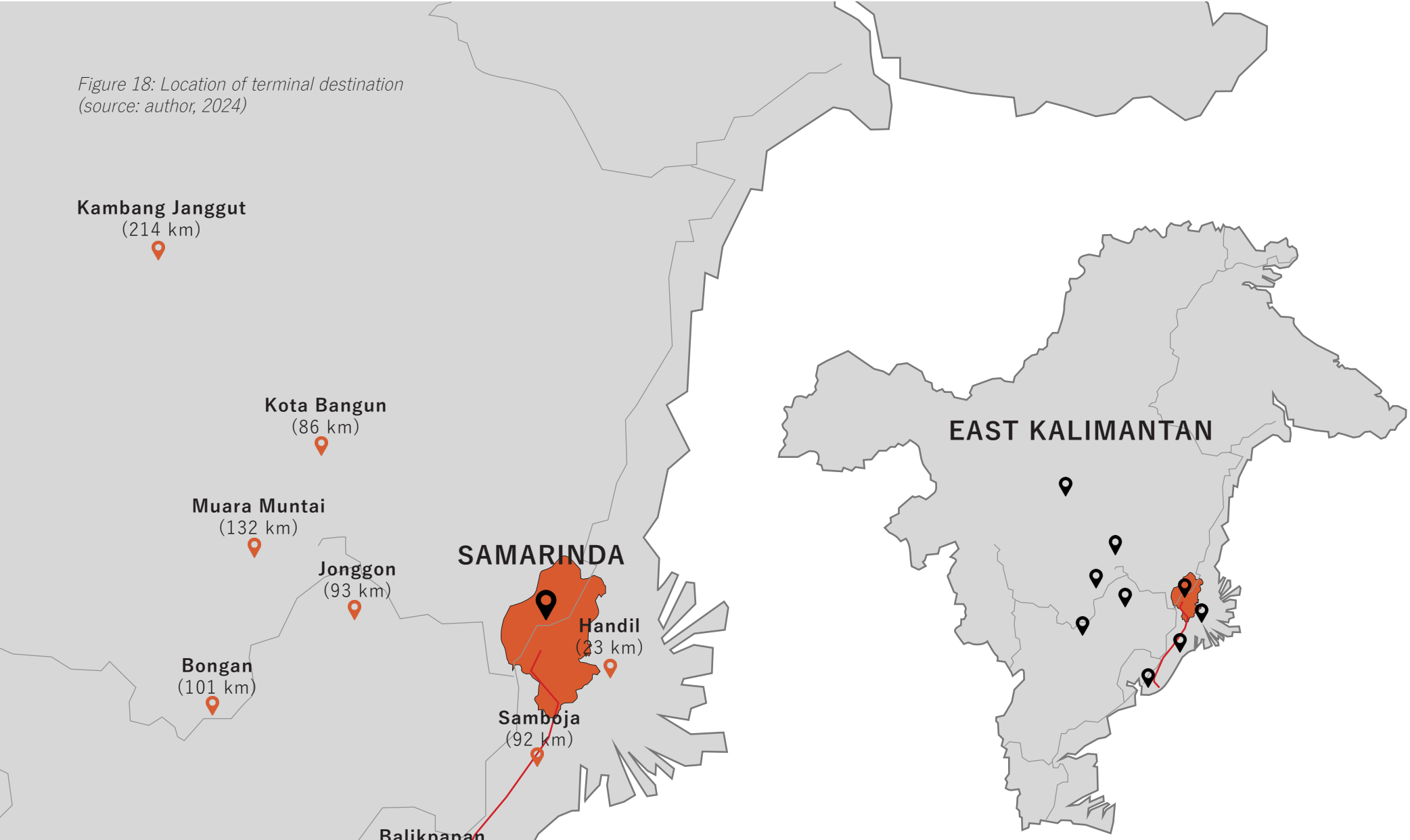


Figure 19: Location of terminal destination (source: author, 2024)

Table 1. Terminals route (source: Dishub Kaltim)

RUTE	UNIT		VISITIORS	
	Arrive - Departure		Arrive - Departure	
BALIKPAPAN	29	29	39	120
KOTA BANGUN	2	1	52	40
BONGAN	1	1	21	10
MUARA MUNTAI	1	1	15	8
KEMBANG JANGGUT	1	1	15	8
JONGGON	1	1	0	4
SAMBOJA	1	1	6	9
HANDIL	1	1	5	4
Data Terminal Sungai Kunjang Wednesday, 26 April 2023	**37**	**23**	**153**	**203**

Table 2. Data terminal (source: Dishub Kaltim)

TERMINAL	UNIT ARRIVE	UNIT DEPARTURE	PEOPLE ARRIVE	PEOPLE DEPARTURE	YEAR
SUNGAI KUNJANG	11.605 8.608	11.513 8.712	80.476 50.570	79.735 53.200	2018 2019
Dinas Perhubungan Prov Kaltim					

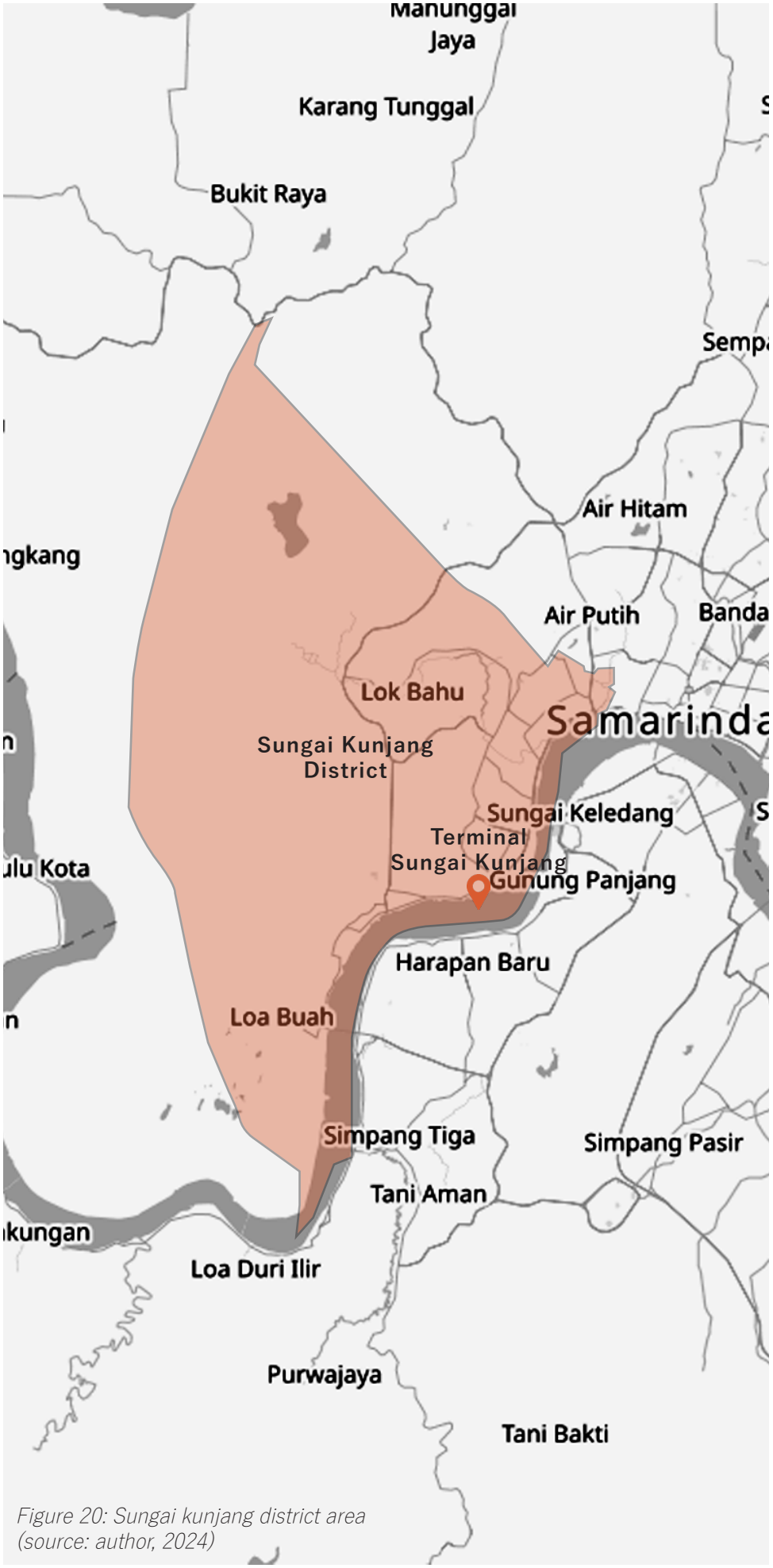


Figure 20: Sungai kunjang district area (source: author, 2024)

GEOGRAPHY OF SUNGAI KUNJANG TERMINAL

The Sungai Kunjang Terminal is located in the industrial area of Samarinda. Therefore, economic activity in the area is growing rapidly along with the region's increasing role as a logistics and distribution center in East Kalimantan. The warehousing area in Sungai Kunjang is a storage facility for large quantities of goods before they are distributed, either by land or river. The warehousing system here plays a significant role in maintaining a stable supply of goods and reducing distribution costs and time.

Warehousing in Sungai Kunjang also attracts many investors, as the area has the potential to become a thriving economic center. Many logistics, distribution and manufacturing companies have established their storage and distribution facilities in the area, creating new jobs for the local community. The presence of these warehouses encourages the development of other supporting sectors, such as transportation services, heavy vehicle maintenance, provision of transport equipment, and infrastructure maintenance services.

Figure 21: Warehouse area (source: author, 2024)

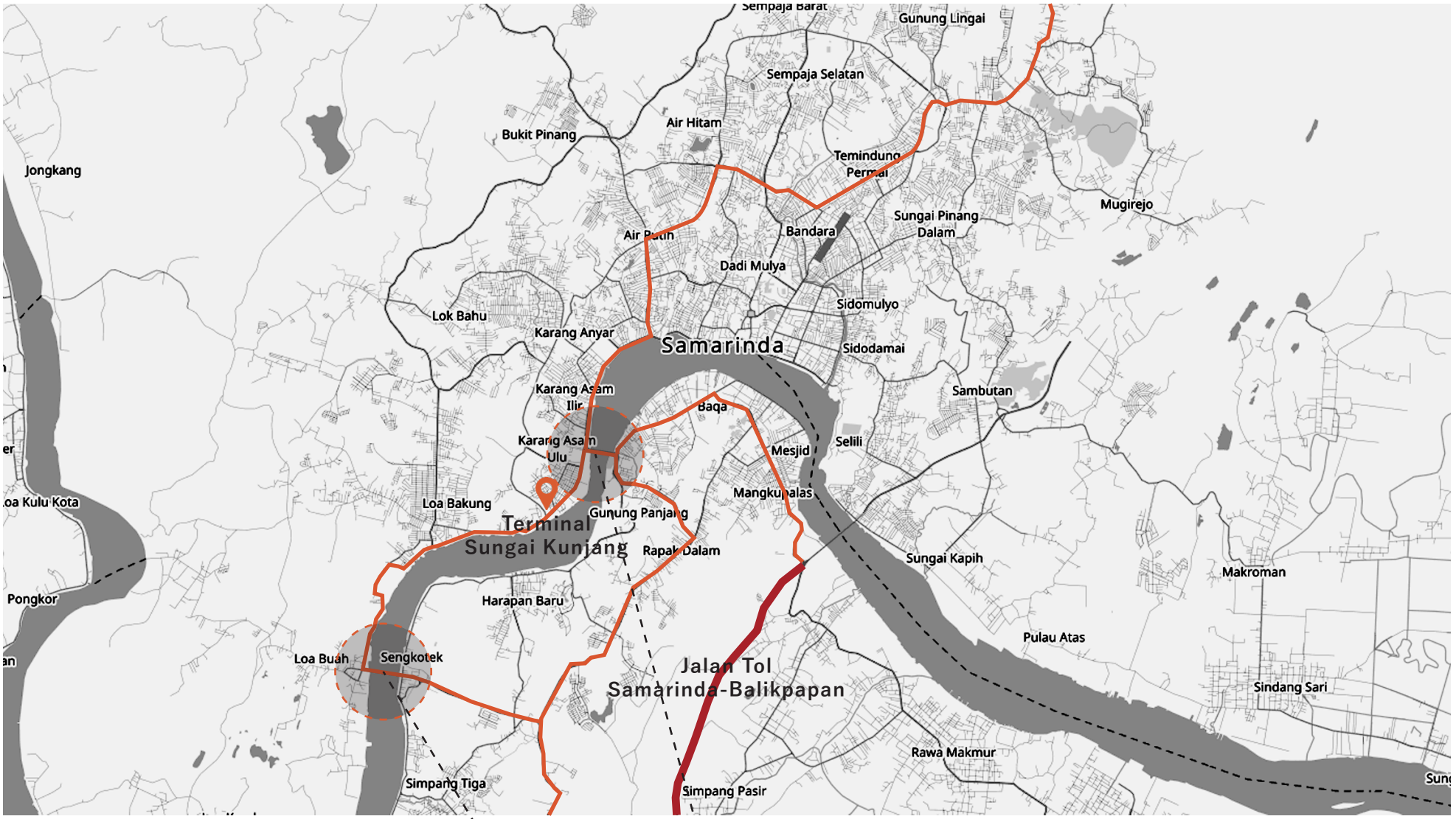


Figure 22: National roadmap (source: author, 2024)

Terminal Sungai Kunjang is located right on the edge of a main road or national road that connects various cities and provinces. This location makes Sungai Kunjang Terminal very strategic in supporting transportation and distribution activities, as it has easy access to the dense land transportation network and river routes.

Mahakam Bridge

Figure 23: Mahakam bridge (source: author, 2024)

Mahulu Bridge

Figure 24: Mahulu bridge (source: author, 2024)

Figure 25: Warehouse building (source: rumah123.com)

WAREHOUSE ACTIVITY IN SUNGAI KUNJANG

Warehouse managers in Samarinda come from various types of organizations or companies, including:

- **Logistics and Distribution Companies:** Large companies such as PT Pos Indonesia, JNE, J&T, Tiki, and several other international logistics companies often manage their own warehouses to support distribution services in East Kalimantan and beyond. They operate the warehouses as transit points for goods shipped to and from the area.

- **Specialized Warehousing Companies:** Some companies are specialized in the warehouse rental business, such as PT Cipta Sukses Logistics or PT Samudera Indonesia Tbk. These companies focus on managing warehouses that can be rented out by various businesses with different storage needs.

- **Local government and regional-owned enterprises (BUMD):** In Samarinda, some warehouses are also managed by local governments or BUMDs. This is usually to support local industrial activities, such as the agriculture, plantation, or seafood sectors, with the aim of strengthening the regional economy.

- **Industrial Estate Managers:** In industrial estates, area managers often also provide warehousing facilities. For example, Kariangau Industrial Estate (KIK) in Balikpapan, which is close to Samarinda, provides warehouses for industrial companies operating in East Kalimantan.

Figure 26: Palet/racking system (source: logistics.ru)

Warehouse users in Samarinda are very diverse, ranging from small businesses to large companies. Some of the main user categories are:

- **Retail and E-commerce Companies:** Retail and e-commerce businesses, such as Tokopedia, Shopee, Lazada, as well as local retailers and distributors of consumer products, often rent warehouses in Samarinda to store stock items so that they can more quickly serve consumers in Kalimantan.

- **Manufacturing Companies:** Companies that manufacture goods around Samarinda or Balikpapan often need warehouses to store raw materials or finished products. For example, companies in the palm oil, timber, and mining sectors use warehouses as temporary storage before goods are shipped to customers.

- **Agricultural and Plantation Companies:** Palm oil, rubber, and other agricultural product plantation companies in East Kalimantan also need warehouses to store their products before they are further processed or shipped elsewhere.

- **Heavy Equipment and Spare Parts Company:** Samarinda and Balikpapan, as the centers of the mining and plantation industries in Kalimantan, have many companies that store heavy equipment and spare parts in warehouses. For example, companies such as PT Trakindo Utama or Hexindo Adiperkasa often have specialized warehouses to store mining equipment and spare parts.

- **Building Materials and Infrastructure Providers:** Infrastructure projects in East Kalimantan, especially after the development of the potential new capital city (IKN), encourage building material providers to store materials in warehouses around Samarinda for easy access to various projects.

- **Pharmaceutical and Health Product Distributors:** Pharmaceutical and health product distribution companies also often rent warehouses with special standards, such as warehouses with temperature and humidity controls, to ensure products remain in good condition.

- **Small and Medium Enterprises (UMKM):** Many SMEs in Samarinda, such as culinary, craft, and textile businesses, rent a small warehouse to store their products so that they can focus on sales and production.

Figure 27: Facilities around terminal (source: author, 2024)

POTENTIAL IN RADIUS 600M

1 RSIA Herawaty

Figure 28: RSIA Herawaty (source: earth.google.com)

2 BigMall Samarinda

Figure 29: BigMall Samarinda (source: earth.google.com)

3 Gas Station

Figure 30: Gas station (source: earth.google.com)

4 Senior High School 8 Samarinda

Figure 31: SMA N 8 Samarinda (source: earth.google.com)

5 River Port of Ships and Cargo

Figure 32: Situation of river port (source: earth.google.com)

6 Balaidiklat LHK Samarinda

Figure 33: Balaidiklat Samarinda (source: earth.google.com)

7 Kantor Balai Pelatihan Kerja

Figure 34: Vocational Training Center (source: earth.google.com)

EXISTING CONDITION OF TERMINAL SUNGAI KUNJANG

Figure 36: Terminal main building situation (source: author, 2024)

There are no proper waiting facilities, so the departure lounge and arrival lounge are combined into one area. Given that this building is quite old, the building facilities have a lot of damage such as to the roof and ceiling of the building.

Figure 37: Store facilities (source: author, 2024)

There is no specific parking space for the stalls so visitors park in front of the stalls which disrupts circulation.

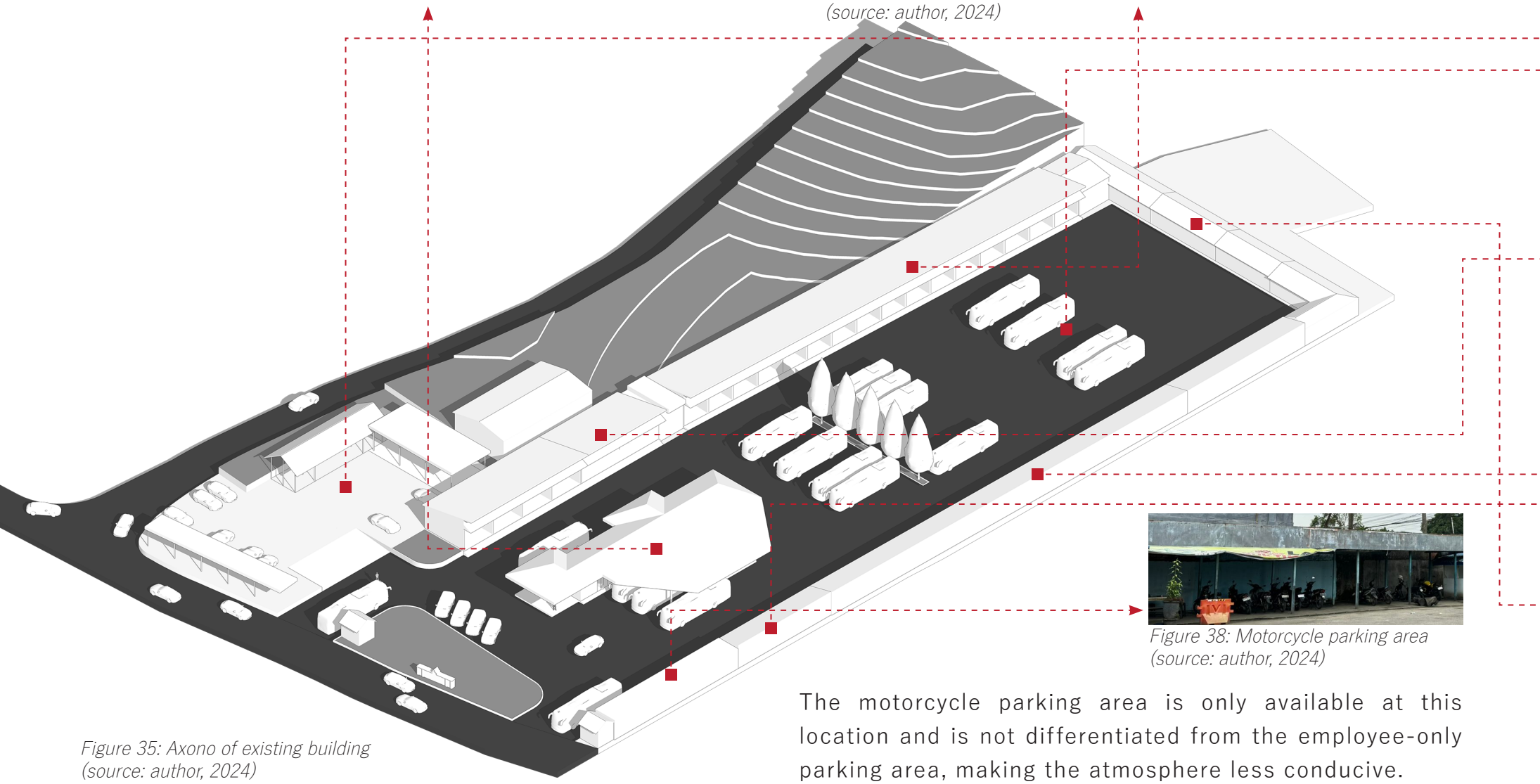


Figure 35: Axono of existing building (source: author, 2024)

Figure 38: Motorcycle parking area (source: author, 2024)

The motorcycle parking area is only available at this location and is not differentiated from the employee-only parking area, making the atmosphere less conducive.

Figure 39: Empu station
(source: author, 2024)

There is no clear signage so private vehicles sometimes park in empu area. Poor parking circulation.

Figure 40: Bus parking area (source: author, 2024)

The building serves as a rest area for bus drivers, and the area is also used as a workshop for vehicles. This causes the surrounding environment to look dirty and poorly maintained.

Figure 41: Rest room facilities (source: author, 2024)

This area is a public area such as toilets, prayer rooms and market stalls. There is no circulation path or signage for pedestrians so it can be dangerous if a vehicle passes

Figure 43: Driver's rest area (source: author, 2024)

The building serves as a rest area for bus drivers, and the area is also used as a workshop for vehicles. This causes the surrounding environment to look dirty and poorly maintained.

Figure 42: Old store building
(source: author, 2024)

This area is a location for stall, but the facilities are poor. The condition of the building looks fragile and dangerous, so it does not support comfort or safety for visitors and vendors.

Figure 44: Abandoned building
(source: author, 2024)

This building was originally used to buy departure tickets, but it has been abandoned and is no longer in use.

CIRCULATION IN TERMINAL

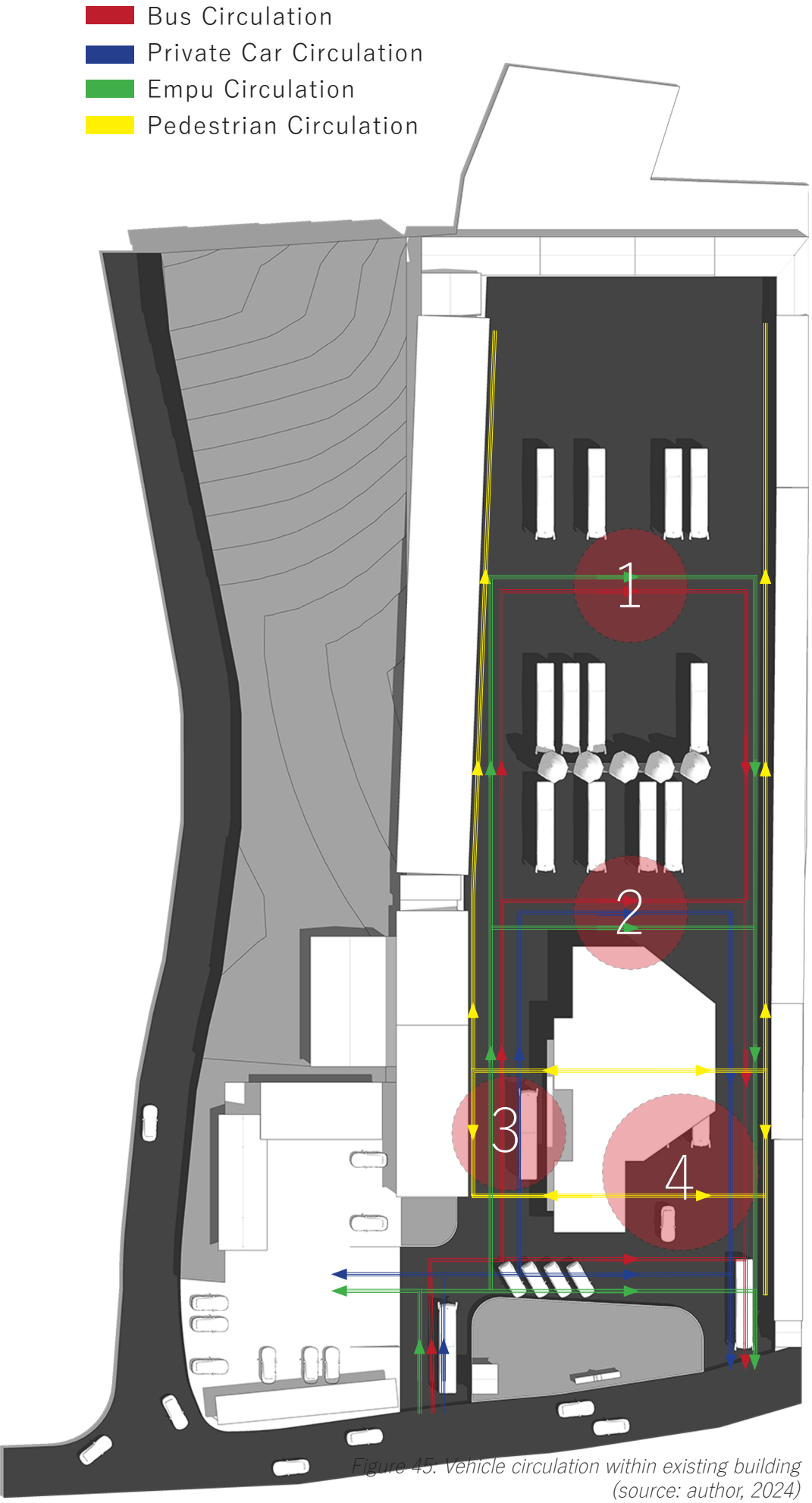


Figure 45: Vehicle circulation within existing building (source: author, 2024)

1

Figure 46: Bus parking situation (source: author, 2024)

There are no parking signs or markings for buses, so traffic circulation on the road is unclear

2

Figure 47: Untidy bus parking (source: author, 2024)

Circulation is in the parking alley for bus vehicles, which can cause congestion in this area.

3

Figure 48: Main access through terminal (source: author, 2024)

Departure lounge and arrival lounge are combined into one area and also there are no circulation signs and special stops for other types of public transport

4

Figure 49: Condition during peak hours (source: author, 2024)

Figure 50: Crowded lobby area (source: author, 2024)

Departure lounge and arrival lounge are combined into one area and also there are no circulation signs and special stops for other types of public transport

ABSENCE OF CLEAR BOUNDARIES

Vehicle users park their vehicles irregularly due to the absence of parking signs and parking area markers at the terminal.

Figure 52: Endangering pedestrians (source: author, 2024)

1

Motorcycle users park in front of the store that can disturb the circulation within terminal.

Figure 53: Motorcycle parking in front of store (source: author, 2024)

2

Figure 54: Terminal lobby condition (source: author, 2024)

3

Not only in front of the store, private vehicles are still seen parking in the terminal platform area, both cars and motorbikes.

The empu area has only one lane for entry and exit, and there are no markers for the parking area and special signs for the empu parking.

Figure 55: Empu parking area (source: author, 2024)

4

Empu park in front of the terminal platform area which can interfere with vehicle circulation.

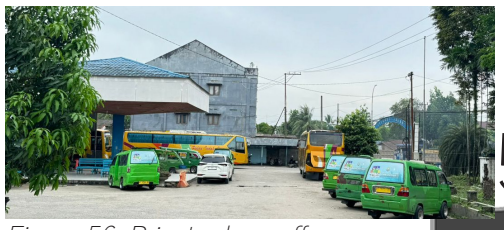


Figure 56: Private drop-off area (source: author, 2024)

5

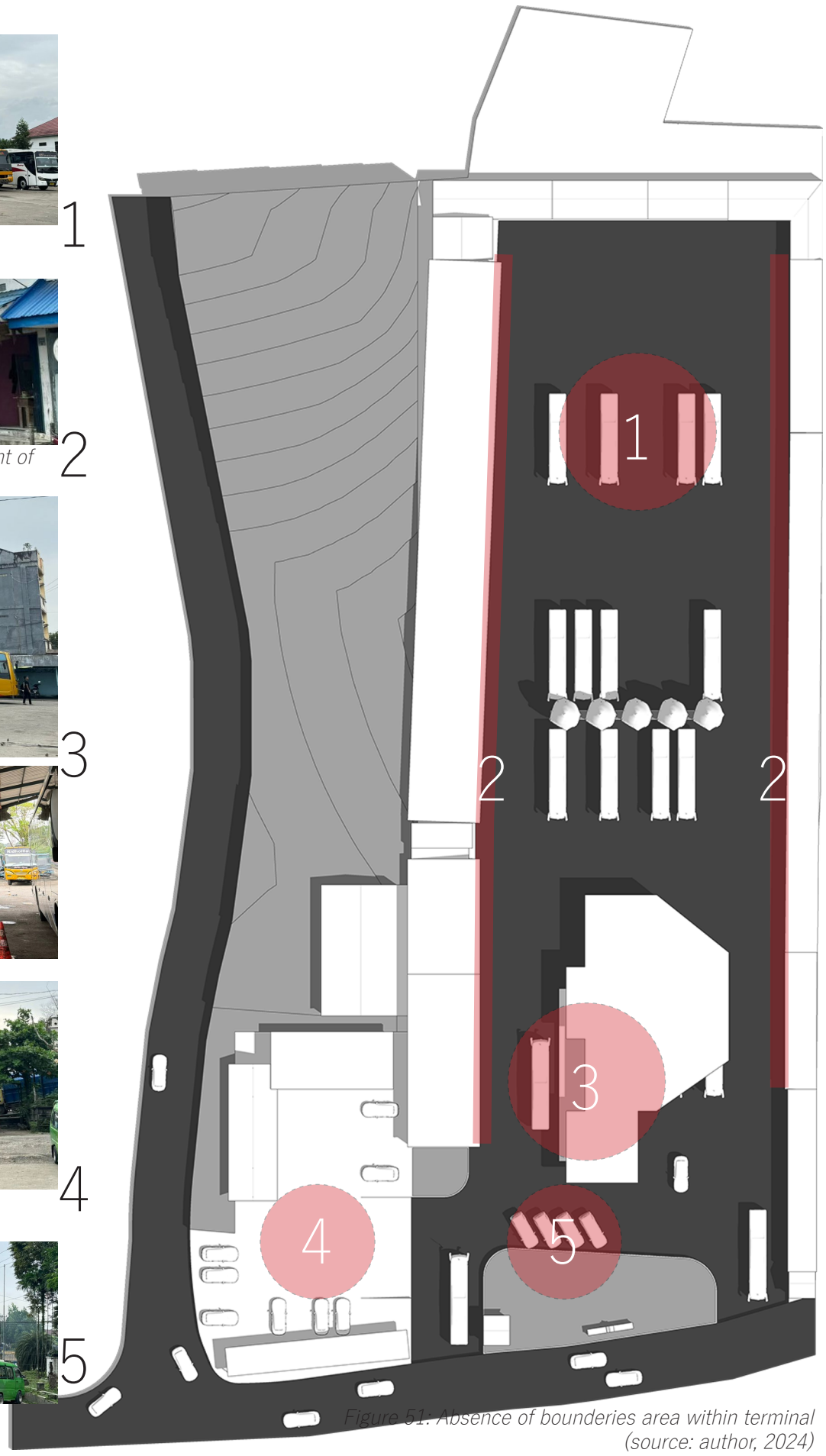


Figure 51: Absence of bounderies area within terminal (source: author, 2024)

LOKAL COMMUNITY IN SAMARINDA

Samarinda is a city divided by the Mahakam River, which not only divides the region, but also serves as a vital water transportation route. The Mahakam River plays an important role in the mobility of Samarinda, both for passenger and freight transportation with various types of boats.

This river route is also an attractive tourist attraction, such as river cruises, which offer beautiful scenery and unique experiences for tourists. In addition to its role as a transportation and tourism route, the Mahakam River also significantly supports the economy of Samarinda. Various economic activities take place along this river, ranging from transportation of commodities such as coal and crops, to aquaculture businesses in floating cages. The Mahakam River is also the venue for cultural and water sports activities, such as traditional boat races and the Mahakam Festival, which features cultural attractions typical of Samarinda. The existence of the Mahakam River not only enriches the economy and tourism, but also strengthens the social and cultural ties of the people of Samarinda, making it a dynamic center of city life.

Figure 57: Mahakam river
(source: Explore Merah Putih, YouTube.com)

On the Mahakam River, transportation infrastructure plays an important role in connecting areas along the river and supporting the economic and social activities of the people of Samarinda and surrounding areas.

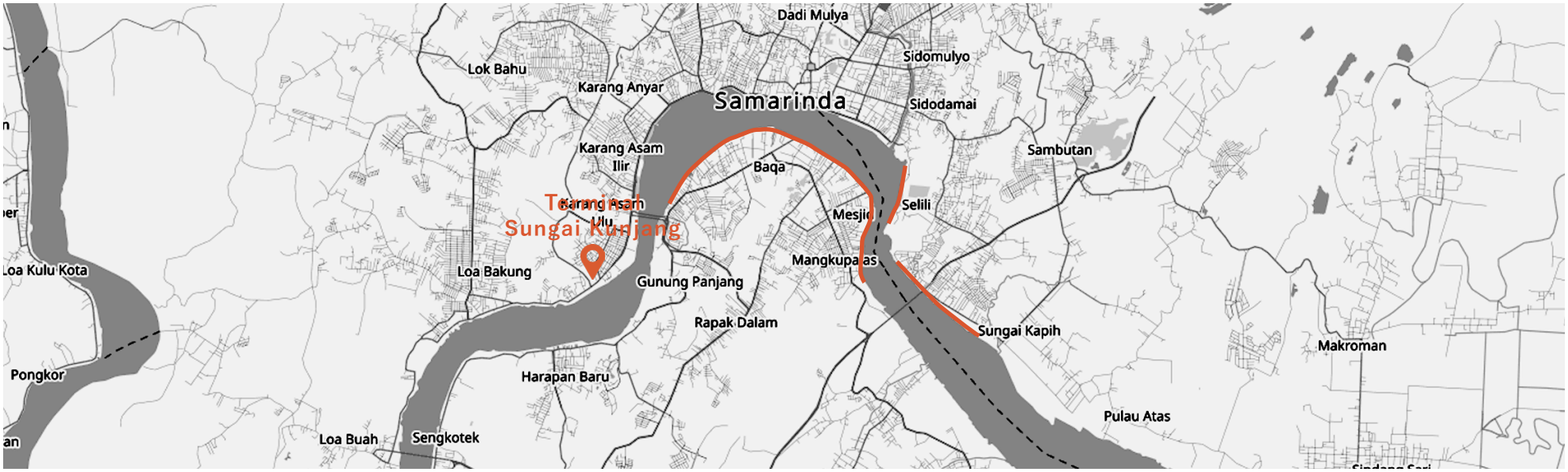


Figure 58: Map of user tambangan boat (source: author, 2024)

Figure 59: Tambangan boat (source: Hypeabis.com)

Perahu Tambangan:

Tambangan boats are traditional boats used to cross the river or connect one village to another along the Mahakam River. It is the most common and affordable means of transportation, used daily by communities living on the banks of the river. These boats often carry only a few passengers at a time and operate on short lines.

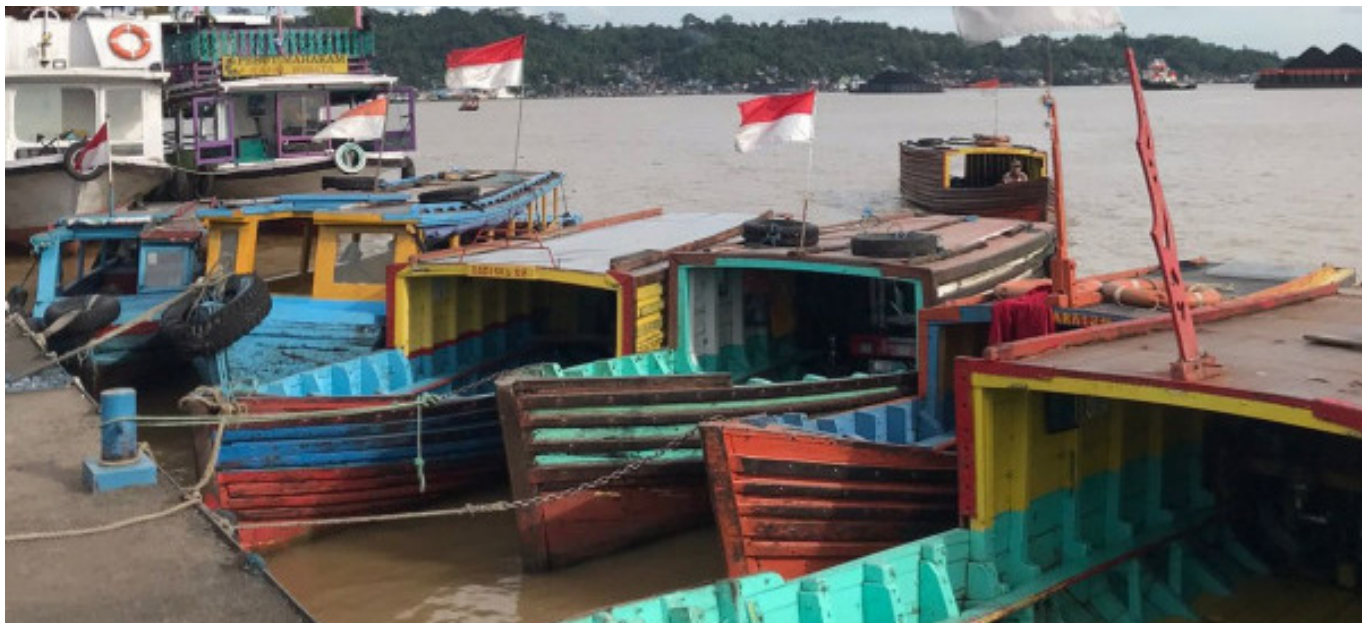


Figure 60: Tambangan boat (source: TribunKaltim.com)

Figure 61: Tongkang boat
(source: Explore Merah Putih, YouTube.com)

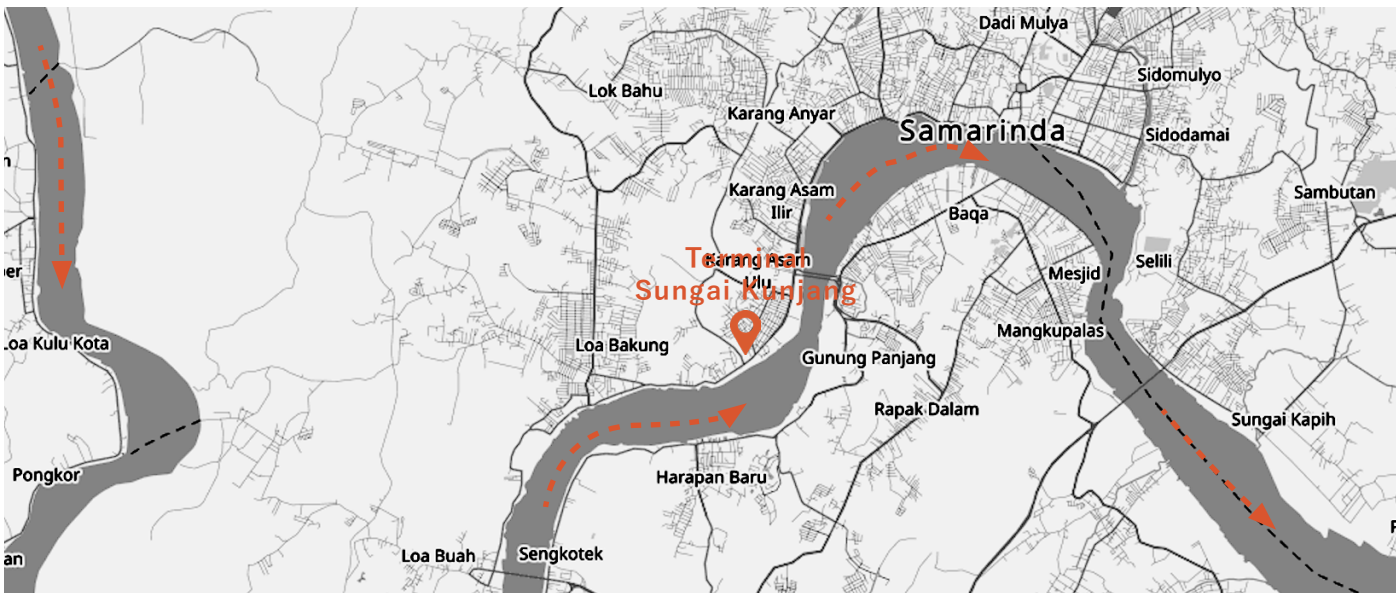


Figure 62: Circulation of tongkang boat
(source: author, 2024)

Tongkang Batu Bara:

One common sight on the Mahakam River are barges carrying coal. These barges are large flat-bottomed vessels capable of carrying very large quantities of coal at once, often towed by tugboats. The Mahakam River flows from upstream in the interior of East Kalimantan to downstream where it empties into the Makassar Strait.

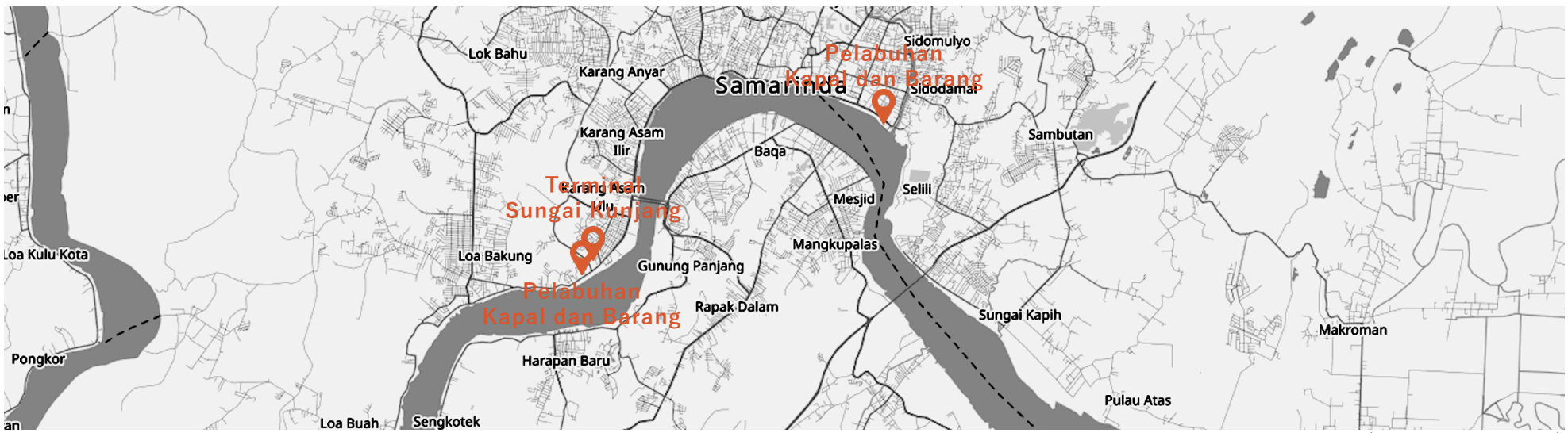


Figure 63: Location of harbor in Samarinda (source: author, 2024)

Kapal Kargo:

The Mahakam is the main route for transporting commodities from the interior of East Kalimantan to major ports or processing factories. Large cargo ships carrying coal, timber, crops and construction materials form the backbone of goods distribution in the region.

Kapal Penumpang Antar-Kota:

Larger passenger vessels serve routes between towns or distant villages along the Mahakam.These boats have a larger capacity and usually sail on a fixed schedule, carrying passengers who travel further. Facilities are also better than those of the mooring boats, with seating spaces and some even providing toilets.

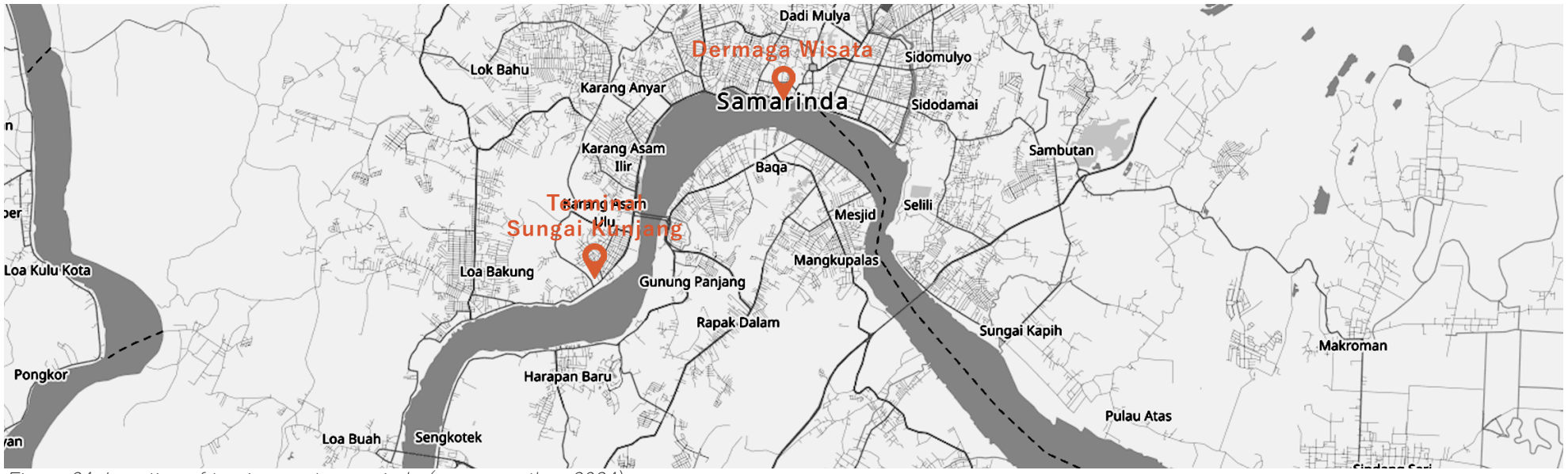


Figure 64: Location of tourism port samarinda (source: author, 2024)

Wisata Susur Sungai Mahakam:

Tour boats are used for recreational activities such as river cruises, where tourists can enjoy the scenery along the Mahakam River and see the lives of riverside communities, bridges, and Mahakam dolphins. Each tour boat is equipped with various facilities to support the comfort and safety of tourists. This two-level wooden ship has been in operation since March 18, 2017. This boat serves tourist travel routes to Kumala and Kutai Lama islands, Kutai Kartanegara, and Samarinda route itself.

Samarinda route itself.

Figure 65: Mahakam pesut ship (source: KabarBUMN.com)

Figure 66: Boat race (source: Eksposkaltim.com)

Wisata Susur Sungai Mahakam:

Tour boats are used for recreational activities such as river cruises, where tourists can enjoy the scenery along the Mahakam River and see the lives of riverside communities, bridges, and Mahakam dolphins. Each tour boat is equipped with various facilities to support the comfort and safety of tourists. This two-level wooden ship has been in operation since March 18, 2017. This boat serves tourist travel routes to Kumala and Kutai Lama islands, Kutai Kartanegara, and Samarinda route itself.

ARCHITECTURE IN SAMARINDA

Architecture in Samarinda reflects a harmonious blend of local culture, colonial heritage and modern influences that create a unique character for the city. The various buildings in Samarinda not only reflect the cultural identity of East Kalimantan but also involve architectural elements that demonstrate urban development and progress. This uniqueness is seen in traditional buildings rich in cultural symbols, large mosques with luxurious designs, and modern buildings that adorn the city of Samarinda.

Figure 67: Traditional kalimantan house, lamin house (source: kumparan.com)

Figure 68: Goverment office (source: wikipedia.org)

In the local culture department, traditional architecture such as the Dayak tribe's Rumah Lamin and the Kutai Traditional House play an important role in introducing Samarinda's rich cultural heritage. Rumah Lamin, with a length that exceeds that of an ordinary building, is often decorated with distinctive carvings and bright colors that depict the diversity of Dayak culture. The building has a floor that is quite high off the ground, commonly known as a stilt house, originally to avoid the threat of wild animals and to adapt to the condition of Kalimantan's land, which is mostly swampland. The house is rich in Dayak carvings that have become an icon of Samarinda and East Kalimantan culture; these carved elements are often adapted in modern building designs. On the roof, Rumah Lamin is also decorated with distinctive Dayak ornaments, further emphasizing the local cultural identity.

Many modern architectural buildings in Samarinda follow the shape and aesthetics of Kalimantan's Rumah Lamin. For example, the Samarinda Governor's Office building features typical Dayak motifs and is adorned with Borneo carvings that decorate the exterior and roof of the building. This touch of traditional ornamentation gives the building a strong local identity, while enriching the modern design with cultural elements typical of Kalimantan.

Figure 69: Stilt house near river (source: gurusiana.com)

Figure 70: Modern stilt house near river (source: KaltimPost.com)

The stilt house system is also adapted to riverine areas Along the Mahakam River, many traditional stilt houses have been retained. These stilt houses were built to protect against river flooding and have a design that allows for good airflow, remaining functional in the river environment.

Not only in traditional residential buildings, the stilt house system is also still often used in modern buildings or public buildings in Samarinda. Along with the times, this stilt house system has undergone modernization, with the use of concrete material as the foundation, thus providing better durability and stability without leaving the typical architectural values of Kalimantan.

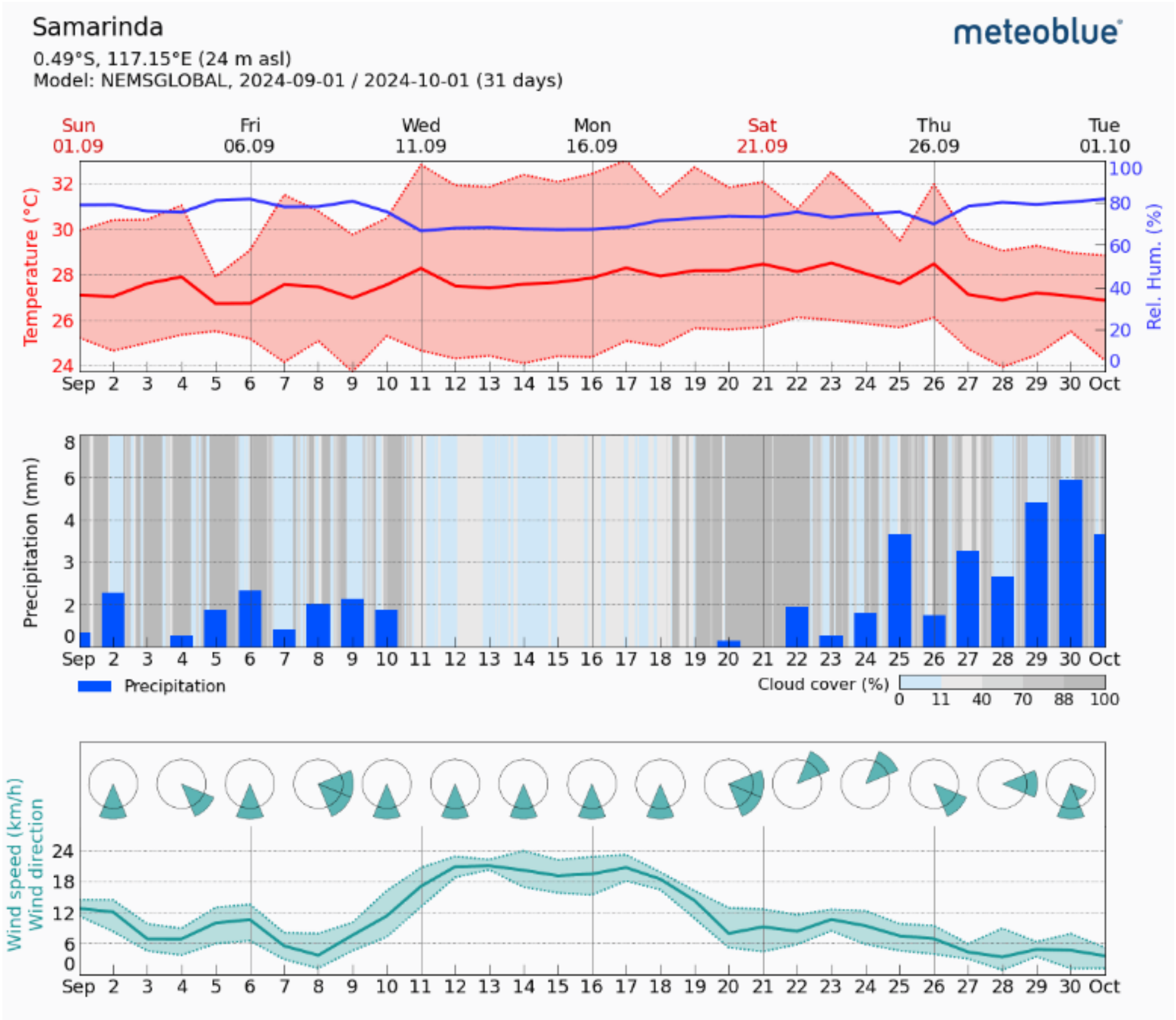


Figure 71: Average of climate in samarinda (source: meteoblue.com)

TEMPERATURE

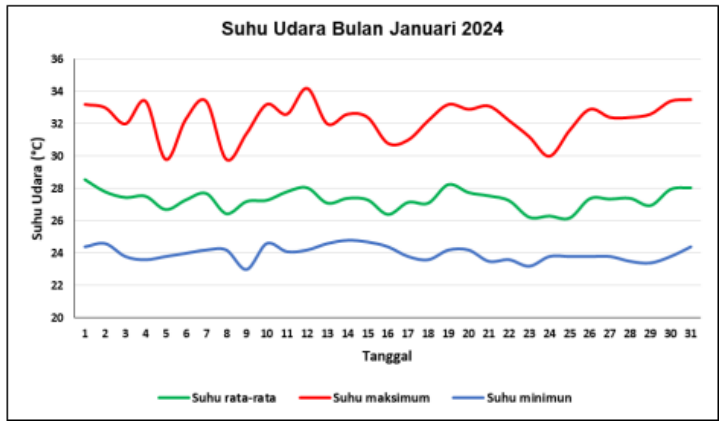


Figure 72: Air temperature chart January 2024 (source: BMKG, 2024)

The graph shows the air temperature in January 2024 from Aji Pangeran Tumenggung Pranoto Meteorological Station. The average air temperature in January 2024 was 27.3°C, with a low temperature of 26,2°C and a high temperature of 28.6°C, respectively. On January 12, 2024, the highest air temperature reached 34.2°C, and on January 9, 2024, the lowest temperature was 23.0°C.

HUMIDITY

Figure 74: Average air humidity chart January 2024 (source: BMKG, 2024)

Based on the figure, the average humidity in January 2024 is 85%. The highest level occurred on January 16, 2024, which was reached 92%, while the lowest average air humidity occurred on the 4th and on January 30, 2024, the humidity only reached 78%.

RAINFALL

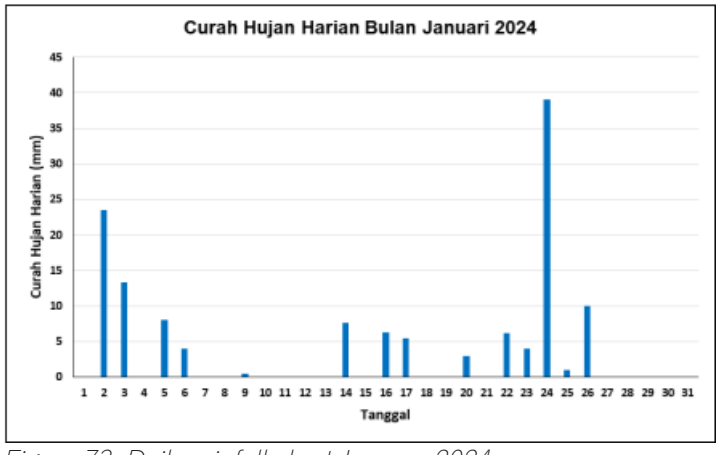


Figure 73: Daily rainfall chart January 2024 (source: BMKG, 2024)

The total rainfall in January 2024 reached 132 mm, with 14 rainy days. The highest daily rainfall reached 39 mm on January 24, 2024, as shown in the figure.

WIND CONDITION

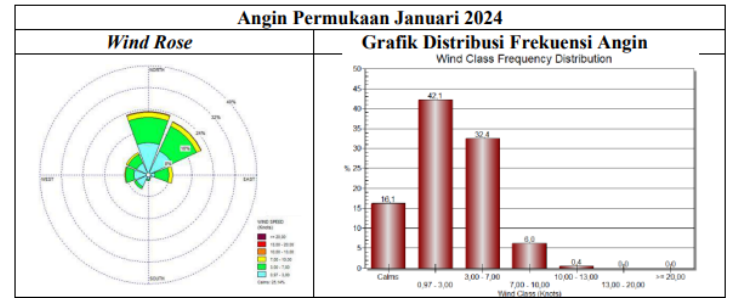


Figure 75: Wind rose January 2024 (source: BMKG, 2024)

In January 2024, the main winds in Samarinda were from the north and northeast with speeds between 1 and 3 knots, with a percentage of 42.1%. The highest wind in January 2024 was 12 knots, on January 27, 2024.

TERMINAL TYPE CLASSIFICATION

Determination of terminal type and class is based on service function, service facilities and authority. Based on the service function, passenger terminals are classified into three types of terminals (PP RI No.43 of 1993), namely:

- Type A passenger terminal, which serves public passenger vehicles for inter-provincial city transportation (AKAP), and cross-border transportation between countries, inter-city transportation within the province (AKDP), city transportation (AK) and rural transportation (ADES).
- **Type B passenger terminal, which serves public passenger vehicles for inter-city transportation within the province (AKDP), city transportation (AK) and rural transportation (ADES).**
- Type C passenger terminal, which serves public passenger vehicles for rural transportation (ADES).

As a type B terminal, Sungai Kunjang terminal plays an important role in community mobility. Various types of transportation serve this terminal, such as inter-provincial city transportation (AKDP), city transportation, and rural transportation. The terminal is classified as a type B terminal because its function focuses on providing transportation within the province and other public transportation.

Type A terminals serve inter-provincial transportation (AKAP), while type B terminals are managed by the provincial government and have greater responsibilities than type C terminals. To support passenger convenience, type B terminals usually have waiting rooms, ticket counters, parking lots, and other public services. Therefore, the Sungai Kunjang Terminal plays an important role in improving connectivity and population mobility in the area.

TERMINAL TYPE CLASSIFICATION

The technical requirements that must be owned by type B terminals include:

1. located in a municipality or regency and in an inter-city transportation route network within the province
2. located on an Arterial or Collector Road with a road class of at least class III B
3. the distance between two type B passenger terminals or with type A terminals is at least **15 km** on Java Island and **30 km** on other islands
4. available land area of at least 3 hectares for terminals in Java and Sumatra, and **1,5 - 2 hectares** in other islands (for building area according to needs)
5. have an entrance or exit access road to and from the terminal, at least 50 meters in Java and **30 meters** in other islands, calculated from the road to the exit or entrance of the terminal.

For the convenience and smooth running of passenger services, type B terminals must have facilities that meet the standards. The standard area requirement for this type B passenger terminal is 1,5 - 2 Ha (Indahsari, 2018) . This is based on the functions and facilities available at type B terminals. In addition, this type B terminal must also have main facilities and supporting facilities at least the main facilities and supporting facilities.

AREA REQUIREMENT OF TYPE B PASSENGER TERMINAL

A. Kendaraan		Kebutuhan Luas (m2)
Ruang Parkir	AKAP	-
	AKDP	540
	AK	800
	ADES	900
	Pribadi	500
Ruang Service		500
Sirkulasi Kendaraan		2.740
Bengkel		100
Ruang Istirahat		50
Gudang		25
Ruang Parkir Cadangan		1.370
B. Pemakai Jasa		
Ruang Tunggu		2.250
Sirkulasi Orang		900
Kamar Kecil/Toilet		60
Kios		1.350
Musholla		60
C. Operasional		
Ruang Administrasi		59
Ruang Pengawas		23
Loket		3
Retribusi		6
Ruang Informasi		10
Ruang Pengobatan		30
Ruang Perkantoran		100
D. Ruang Luar		4.890
Luas Total		17.251
Cadangan Pengembangan		17.251
Kebutuhan Lahan		34.502
Kebutuhan Lahan untuk desain (Ha)		3,5

Figure 77: Terminal space requirment (source: Indahsari, 2018)

TERMINAL CIRCULATION

At the terminal to be able to achieve the functions and objectives have demands, namely security, comfort, smoothness, convenience and speed (Adisasmita, 2011, in dina, 2015):

Circulation safety
- Avoiding crossing between fleet flows and people.
- Creation of an atmosphere that can deter crime against passengers.
- There is a unidirectional flow of vehicle movement, clarity of division of the running direction and no crossing.

Circulation Comfort
- The terminal is a public building that requires openness and breadth of view.
- Terminal users are protected from vehicle fumes, direct sunlight, protected from rain and vehicle noise.
- Has a space that meets the requirements.

Smooth circulation
- Smooth circulation is not crowded and does not interfere with each other.
- There is a clear separation of circulation flows. Freedom of movement for vehicles and passengers.
- Avoiding undirected circulation patterns.

Ease of circulation
- Ease for prospective passengers in choosing a vehicle that is in accordance with the desired service destination.
- Ease of bus movement within the terminal.
- Ease for passengers to reach other desired spaces.
- Grouping of bus activities between cities, within cities, between provinces and transportation for easy achievement of public vehicles.

Circulation Speed
- Flow of passengers and vehicles can move quickly without being disturbed by other activities.
- Passengers can get public transportation with the desired destination quickly from one fleet to another.
- Entry and exit of vehicles and passengers from the terminal can run quickly.

FLOW OF PASSENGER ACTIVITY

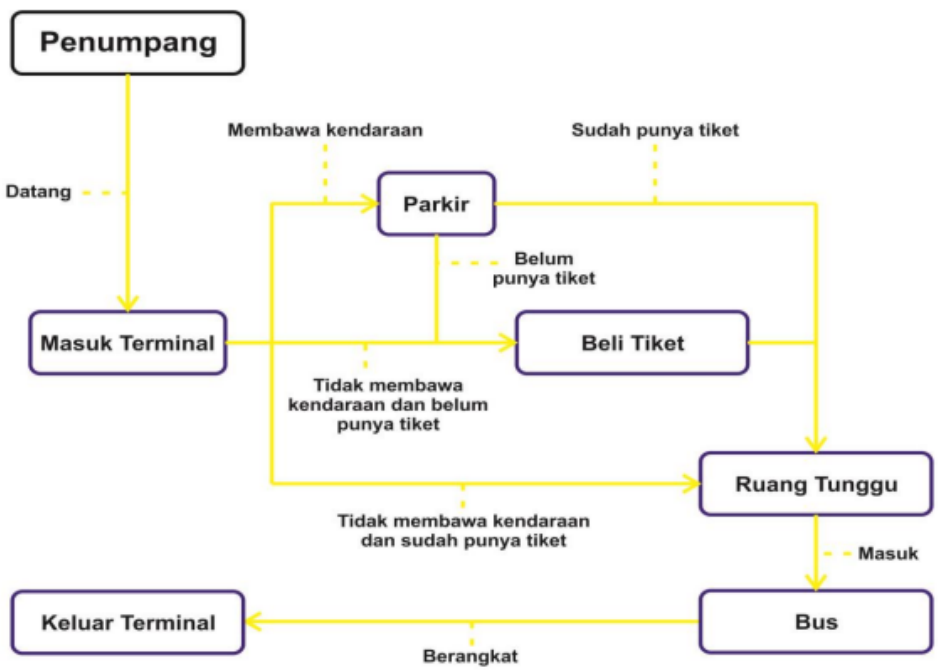


Figure 78: Flow of passenger activity (source: Nasrudin & Purnomo, 2021)

FLOW OF MANAGEMENT TERMINAL

Figure 80: Flow of employee and management activity (source: Nasrudin & Purnomo, 2021)

FLOW OF PUBLIC TRANSPORTATION

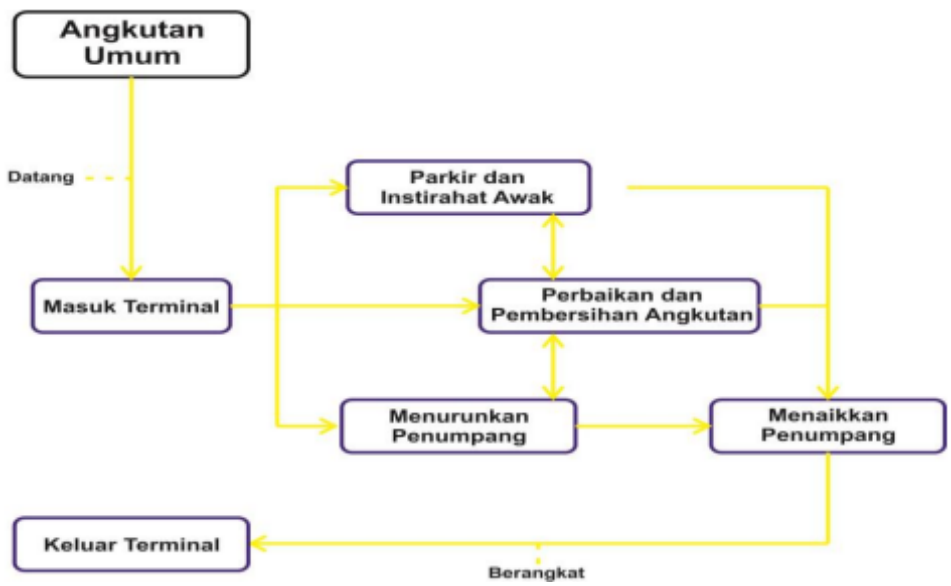


Figure 79: Flow of public transportation (source: Nasrudin & Purnomo, 2021)

FLOW OF DROP-OFF AND PICK-UP

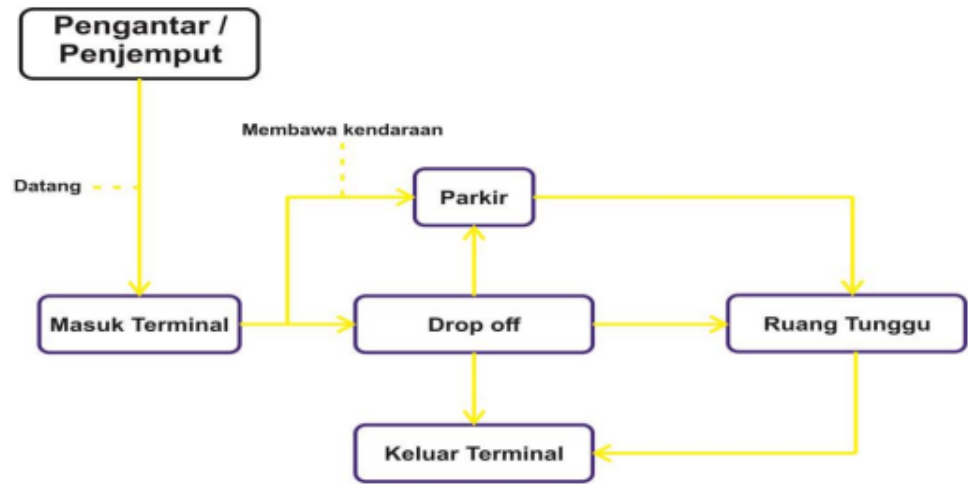


Figure 81: Flow of drop-off and pick-up activity (source: Nasrudin & Purnomo, 2021)

VEHICLE SIZE STANDARDS

In the planning of the Kunjang River Terminal is to combine the terminal and logistics warehousing, therefore the design needs to pay attention to the vehicles that will pass through, these vehicles are in the form of:

Type of Vehicle	Length (cm)	Width (cm)	High (cm)	Source
Motorcycle	220	70	100	NDA
Car	360	160	135	NDA
Medium Bus	782	210	326	NDA
Big Bus	1200	250	326	NDA
Truck Trailer	2100	260	230	Catalogue
Pick Up	360	160	270	Catalogue

Table 3: Vehivle size standards (source: author, 2024)

PARKING SPACE UNIT

Jenis Kendaraan	Satuan Ruang Parkir (m^2)
1. a. Mobil penumpang untuk golongan I	2,30 x 5,00
b. Mobil penumpang untuk golongan II	2,50 x 5,00
c. Mobil penumpang untuk golongan III	3,00 x 5,00
2. Bus/truk	3,40 x 12,50
3. Sepeda motor	0,75 x 2,00

Figure 82: Table of vehicle types
(source: Department of transportation)

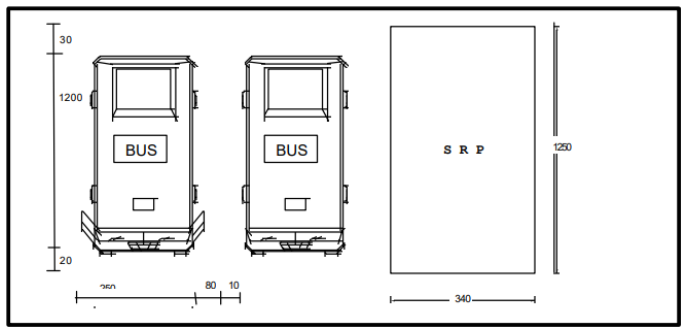


Figure 83: Parking space unit of bus
(source: Department of transportation)

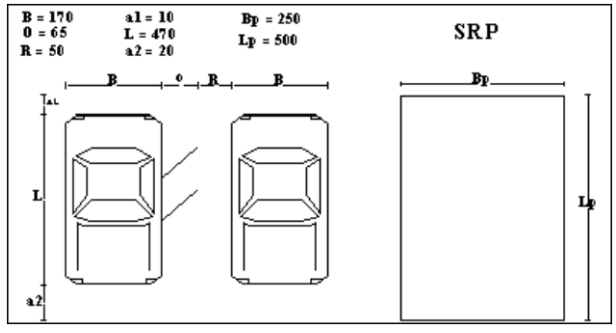


Figure 84: Parking space unit of car
(source: Department of transportation)

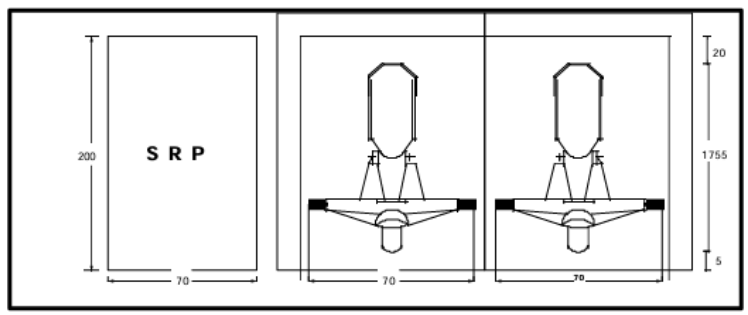
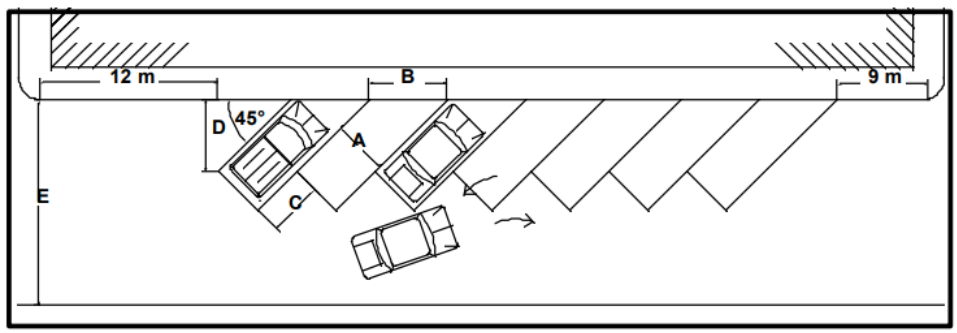


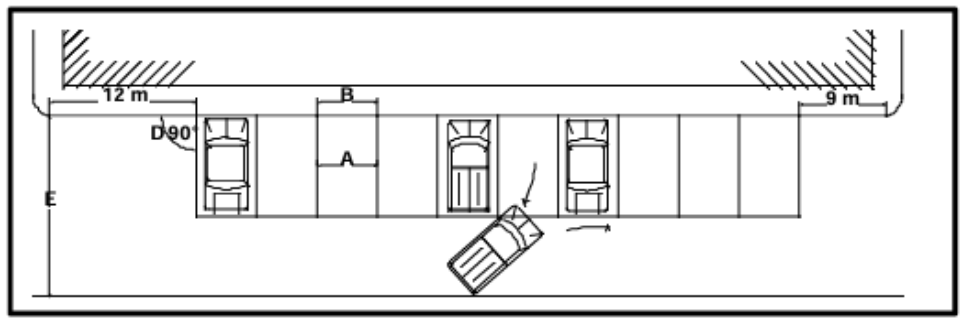
Figure 85: Parking space unit of motorcycle
(source: Department of transportation)

PARKING PATTERN



	A	B	C	D	E
Golongan I	2,3	3,5	2,5	5,6	9,3
Golongan II	2,5	3,7	2,6	5,65	9,35
Golongan III	3,0	4,5	3,2	5,75	9,45

Figure 86: Parking pattern 45 degree
(source: Department of transportation)



	A	B	C	D	E
Golongan I	2,3	2,3	-	5,4	11,2
Golongan II	2,5	2,5	-	5,4	11,2
Golongan III	3,0	3,0	-	5,4	11,2

Figure 87: Parking pattern 90 degree
(source: Department of transportation)

VEHICLE MANEUVERS

KATEGORI KENDARAAN RENCANA	RADIUS PUTAR		RADIUS TONJOLAN (cm)
	Minimum	Maksimum	
Kendaraan Kecil	420	730	780
Kendaraan Sedang	740	1280	1410
Kendaraan Besar	290	1400	1370

Figure 88: Turning radius of freight vehicles
(source: Intercity road geometric planning procedure)

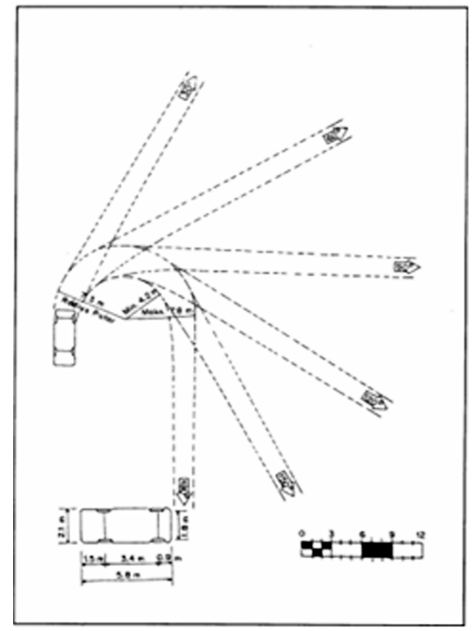


Figure 89: Small vehicle manuvers
(source: Intercity road geometric planning procedure)

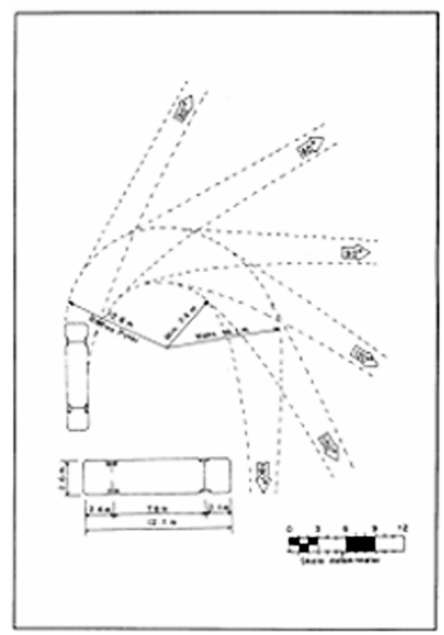


Figure 90: Medium vehicle manuvers
(source: Intercity road geometric planning procedure)

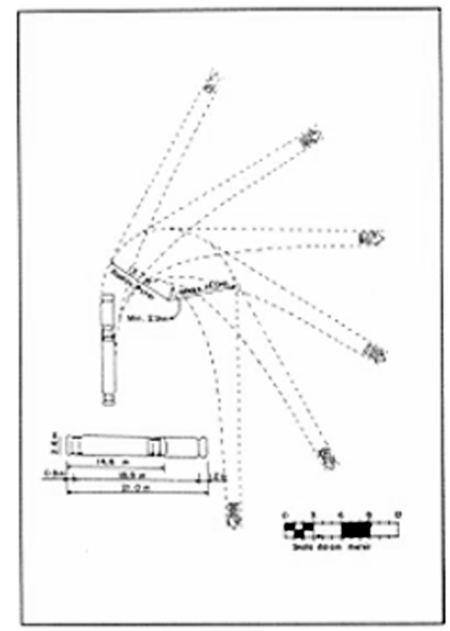


Figure 91: Big vehicle manuvers
(source: Intercity road geometric planning procedure)

WAREHOUSING

Warehousing is a storage activity in a warehouse that includes several processes in handling goods, starting from receiving goods and recording, storing, selecting, labeling, to the process of shipping goods. It can be said that warehousing management is a method of organizing storage activities until the release of stock in the warehouse so that the management of goods can be done effectively.

The functions of a warehouse in logistics include:

- Storage and maintenance of goods before they are distributed to their final destination. The warehouse provides a safe and controlled space to keep goods in good condition during storage.
- A place for packaging goods before they are sent to the customer or final destination. At this stage, the warehouse provides facilities and equipment to carry out appropriate packaging.
- A place for grouping goods, in order to facilitate inventory management, release of goods, and as a facility to make shipments more efficient by grouping goods based on type, destination, or specific orders.
- Order Fulfillment, when an order comes in, the warehouse is responsible for selecting the appropriate goods
- Delivery point, once the order is processed and the goods are packed, the warehouse organizes and executes the delivery of the goods to the final destination location. The warehouse works with logistics and transportation service providers to arrange the delivery process.

TYPE OF WAREHOUSING

- **Gudang umum (Public Warehouse)**

Generally owned and operated by logistics or freight forwarding companies that aim to provide storage and distribution services to customers.

- **Gudang swasta (Private Warehouse)**

Private warehouses are owned and operated by a specific company (private) for the storage of their own inventory and generally follow the requirements of the company.

- **Gudang terpusat (Centralized Warehouse)**

Centralized warehouse is a type of warehouse where all inventory owned by a company is stored in one central location so that it is easy to control stock efficiently.

- **Gudang terdesentralisasi (Decentralized Warehouse)**

Decentralized warehouses involve the use of multiple warehouses spread across different strategic geographical locations. This approach is used when companies have a need to bring their inventory closer to different customers or markets.

- **Gudang terdistribusi (Distributed Warehouse)**

Finally, a distributed warehouse is a warehouse that involves the use of smaller warehouses and is usually located in various strategic locations to facilitate the distribution of goods. Each warehouse serves as a regional or local distribution center.

WAREHOUSE CLASIFICATIONS

Klasifikasi Gudang/Warehouse
“Menurut peraturan Menteri Perdagangan no. 90/MDAG/PER/12/2014 yang membahas tentang Tata Letak dan Tata Letak Gudang Bab II Pendaftaran Gudang Pasal 2
“Gudang dapat ‘dikategorikan atas‘:

Gudang tertutup

- Gudang tertutup kelas A, memiliki ciri yaitu: Memiliki dimensi 100 m2 hingga 1.000 m2. Kemampuan “kapasitas” “penyimpanan” mulai dari 360 m3 sampai‘ 3.600 m3.

- Gudang tertutup Kelas B, memiliki ciri yaitu: Dengan luas lebih dari 1.000 m² hingga 2.500 m². Kemampuan penyimpanan dari 3.600 m3 mencapai 9.000 m3.

- Hanggar tertutup Kelas C, memiliki ciri yaitu: Memiliki dimensi lebih dari 2.500 meter persegi. Kemampuan ‘penyimpanan dengan tinggi diatas‘ “ 9.000 m3.

- Gudang tertutup Kelas D, memiliki ciri yaitu: Gudang yang berbentuk silo atau tangki. Dengan kapasitas penyimpanan minimal 762 m3 atau 500 ton.

Gudang Terbuka

- Gudang ‘terbuka hanya memilki‘ karakteristik ciri dari sisi luas lebar bangunannya saja, yaitupaling minim memilki ‘luas‘ 1000 m2.

LULEBURGAZ BUS STATION

- Location: Lüleburgaz, Kırklareli, Turkey
- Architects : Collective Architects & Rasa Studi
- Area : 1200 m2 (Building Area)
- Year : 2016 Client : Lüleburgaz Municipality

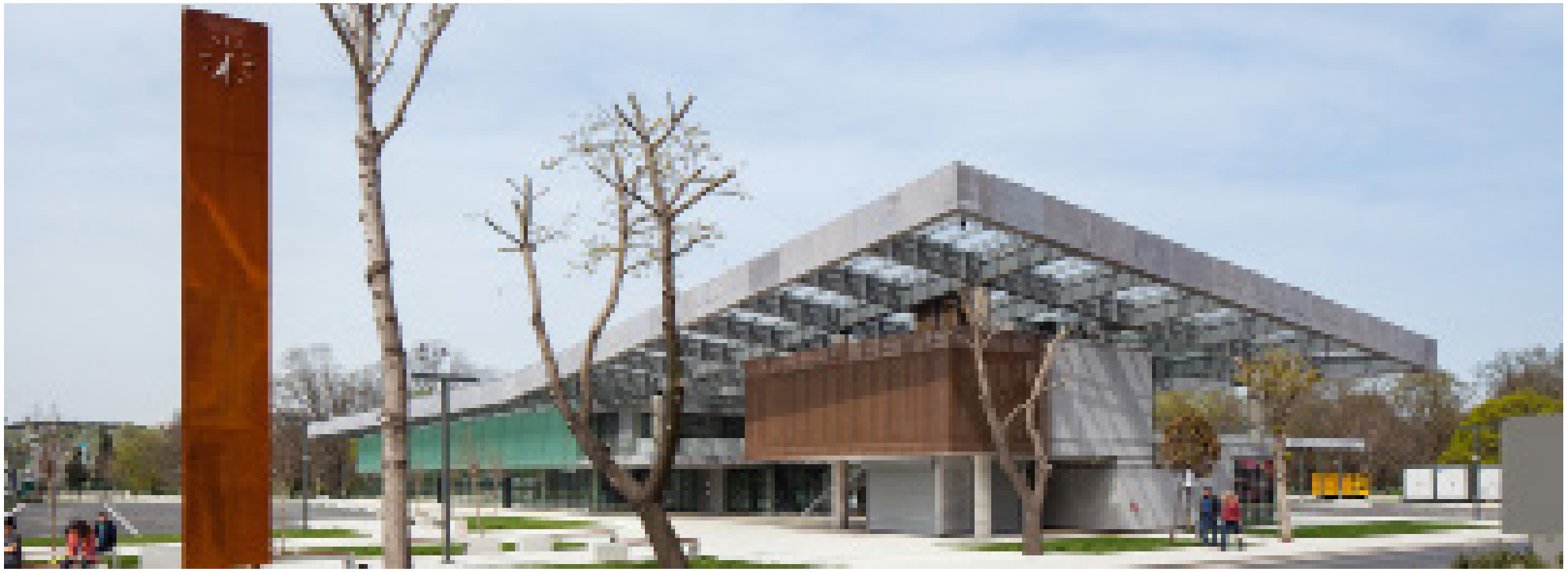


Figure 92: Luleburgaz bus stasion (source: archdaily.com)

Lüleburgaz is one of the cities in Kırklareli province, Turkey. transportation buildings are the entrance of a city, therefore, transportation buildings should not only have symbolic value but also be memorable and unique. Thus, there is a need to design a functional transportation building that also serves as a landmark in Lüleburgaz by utilizing the potential of the land.

The old bus terminal of Lüleburgaz is located on the main road connecting the Edirne-Istanbul line. Its strategic location makes the old bus terminal Lüleburgaz has the potential to become an icon of an attractive and functional city face as an entrance and exit to the city of Lüleburgaz.

The terminal design prioritizes function, circulation and building appearance. The new terminal design uses the same entry-exit points as the existing terminal but with different circulation routes. This is done to maintain the perception and spatial cognition of terminal users. The main mass of the terminal is also placed with an orientation facing east-west so that it can be seen directly from the main road.

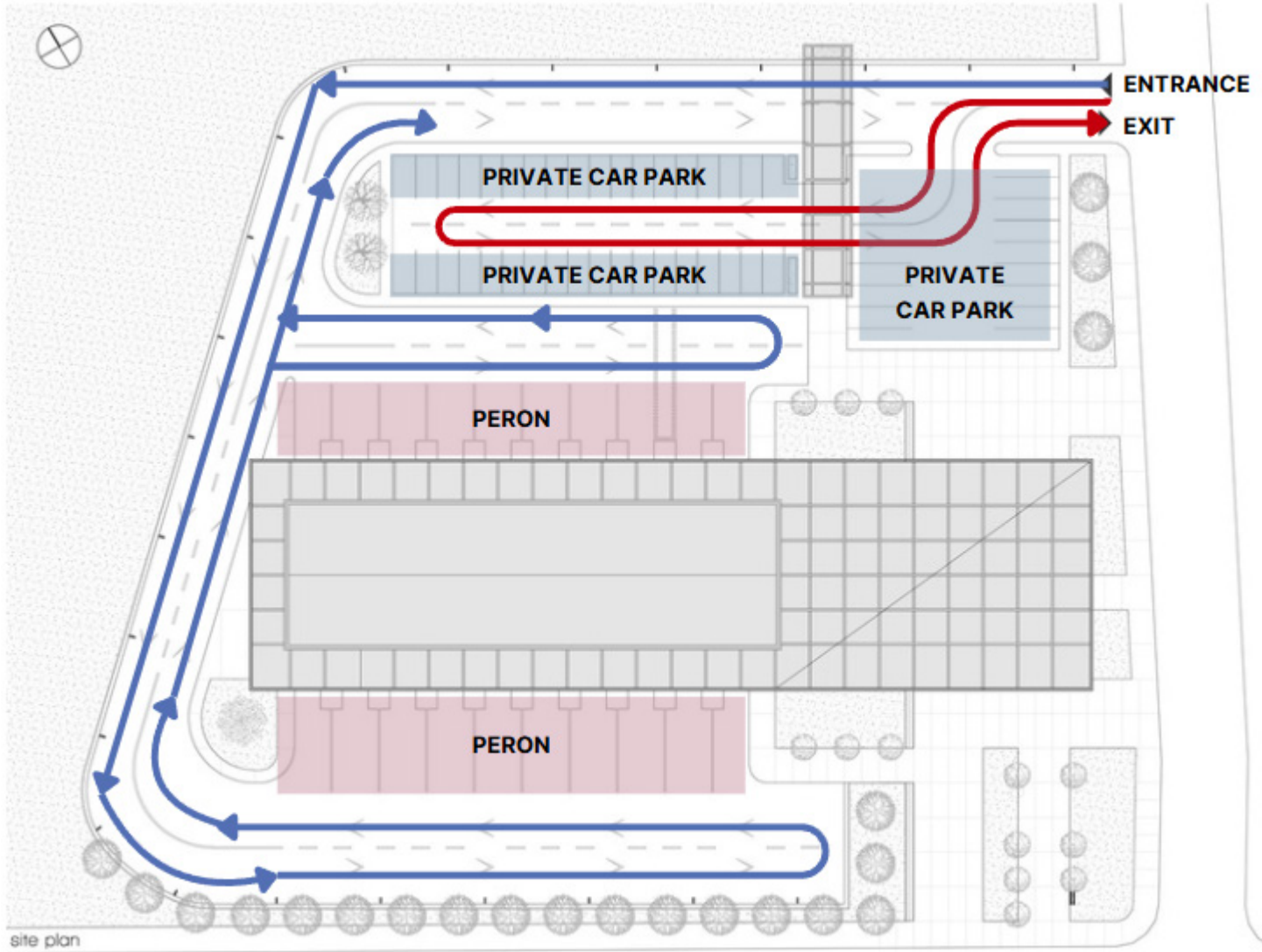


Figure 93: Bus station circulation (source: author, 2024)

The inter-city bus lane is located on the south side of the building while the inner-city bus lane is located on the north side of the site. The separation of the two circulation paths uses the mass of the main terminal building itself. The mass form of this terminal is rectangular with a flat roof with an additional canopy.

Figure 94: Luleburgaz bus stasion (source: archdaily.com)

The spaces located on the ground floor of the building are the information center, ticket office, toilets, lactation room, goods room, and café. The main idea of the placement of space is that there is no separation between the arrival and departure sections, so spaces such as ticket offices and shops are placed between the two areas.

The facade of this terminal is dominated by the use of glass and perforated metal. The use of glass is intended to integrate the indoor space with the outdoor space while creating an icon for the city of Lüleburgaz.

Figure 95: Waiting area luleburz station (source: archdaily.com)

Figure 96: Exterior terminal (source: archdaily.com)

Figure 97: First floor plan (source: author, 2024)

On the 2nd floor of the main mass of the terminal, there is a management office, prayer room, bar, restaurant, terrace, kitchen and kitchen. The informative character is also seen from the use of signage at human eye level and the use of tactile paving can emphasize the circulation path.

Figure 98: Second floor plan (source: author, 2024)

The second floor of the terminal is dominated by spaces designated for building management, and is equipped with several public facilities such as restaurants, kitchens, and more. This area is designed to create a quieter atmosphere, ideal for passengers looking for a place to wait with lower crowd levels compared to the first floor. The relatively quiet atmosphere on the second floor provides extra comfort for those who want to relax before continuing their journey. Unlike the first floor, which is always crowded due to its proximity to the platforms and main passenger activities, the second floor is a quieter and more comfortable option for passengers who want to avoid the hustle and bustle.

SYSTEM WAREHOUSE/OLGOOCO

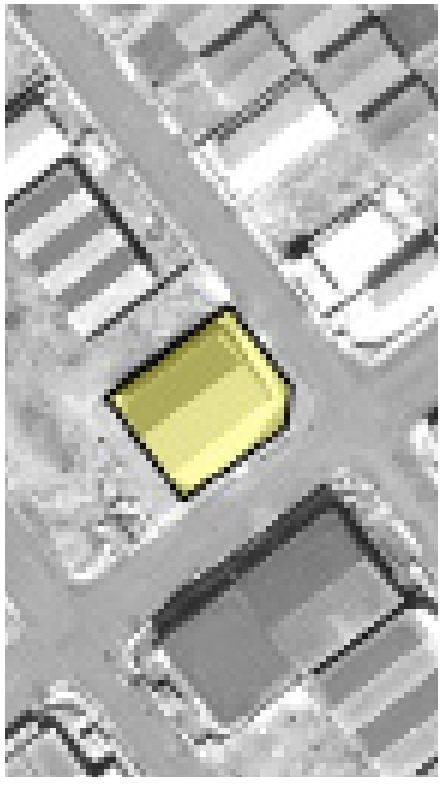


Figure 99: Plan situation (source: archdaily.com)

Figure 100: Exterior building (source: archdaily.com)

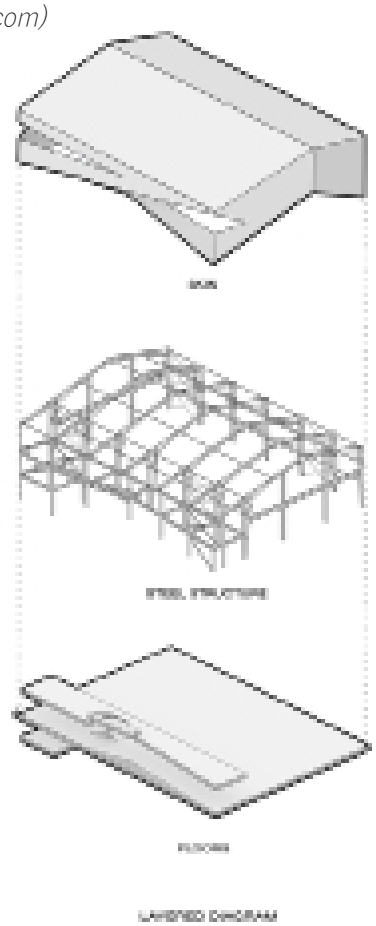


Figure 101 Building Envelope (source: archdaily.com)

Olgocoo buildings utilize a flexible and economical modular structure, allowing for easy changes in function or capacity additions. The structure prioritizes the use of steel and concrete as the main materials, providing strength to withstand heavy loads, such as tall storage shelves and heavy transport vehicles. Columns and beams are designed with large spacing to create clear span, maximizing the efficiency of storage and movement of goods within the warehouse.

Access points are designed to separate the flow of heavy vehicles (trucks, forklifts) from passenger vehicles, creating safety and efficiency. Ramp and loading bay systems are designed with appropriate heights to support the rapid transfer of goods.

Olgocoo emphasizes planned spatial organization to separate operational areas, such as:

- Loading/unloading areas that have direct access to transportation lanes.
- Structured goods storage areas, such as high-rise pallet racking to maximize vertical space height
- Distribution zones that facilitate the picking and delivery of goods according to the logistics flow.

The building optimizes the flow of logistics movement with clear paths and minimal obstacles. Internal circulation adopts a one-way circulation pattern, which prevents congestion or collisions between vehicles and workers.

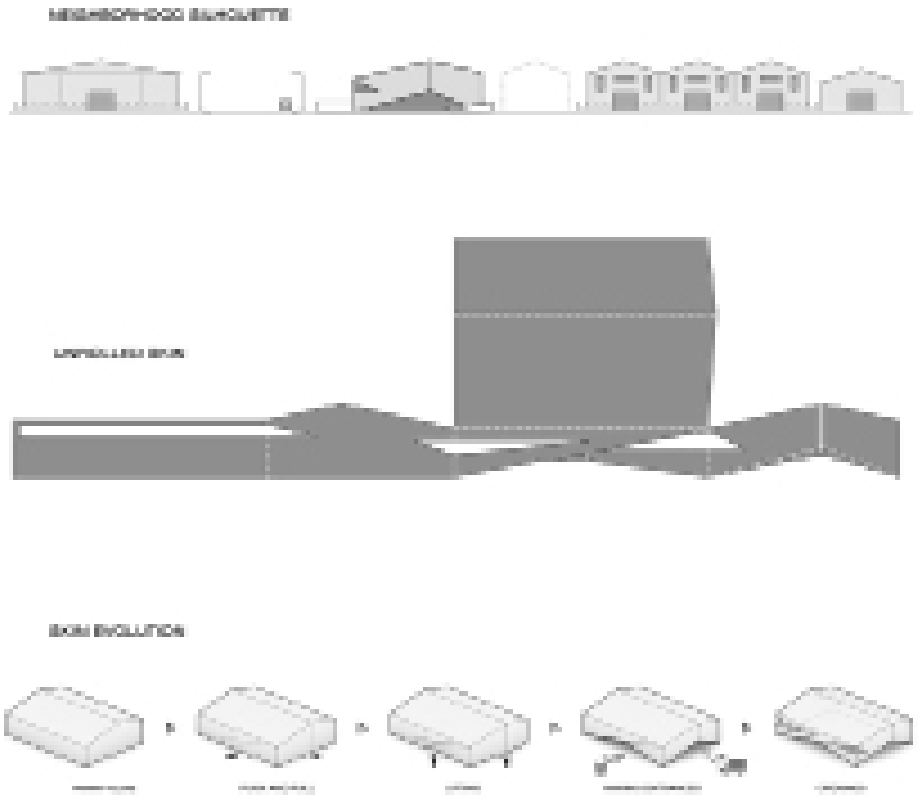


Figure 102: Building circulation (source: archdaily.com)

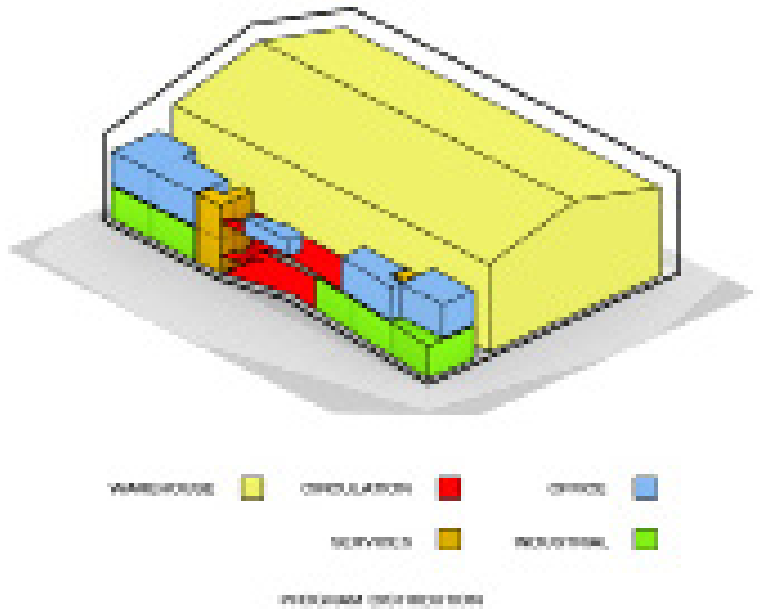


Figure 103: Zoning function (source: archdaily.com)

SWOT
STRENTH, WEAKNESS,
OPORTUNITY & THREADS

Strength

- Geographically located along the Mahakam River, which is one of the main transportation routes in East Kalimantan.
- Located in Kecamatan Sungai Kunjang, which is the main industrial and logistics area in Samarinda, directly connected to the inter-city route that serves large vehicles, such as trucks and buses.
- Adjacent to large shopping centers such as BigMall, ports, MSMEs, and other economic activities that are important points in the logistics and cargo distribution chain in Samarinda.

Weakness

- Vehicle circulation in the terminal area is inefficient, resulting in congestion and long waiting times and the parking area is inadequate to accommodate large volumes of vehicles.
- The current terminal facilities do not meet the needs of users, both for transportation and logistics.
- Terminal administration management needs to be improved to support better operations.
- The location of the terminal, which is already congested with economic activity, makes it difficult to develop additional space if needed.

Opportunities

- This area has high economic potential to become the center of logistics, transportation, and trade in Samarinda because the presence of MSMEs and industrial estates can create collaborative opportunities for local economic growth.
- The proximity to the port opens up opportunities for the development of integration between land and river transportation, increasing the efficiency of logistics distribution.
- In line with Samarinda's RPJMD 2021-2026 which prioritizes improving land and river transportation infrastructure.
- The potential of the area as a shopping destination or center for creative economic activities, given its location near BigMall and the MSME area.

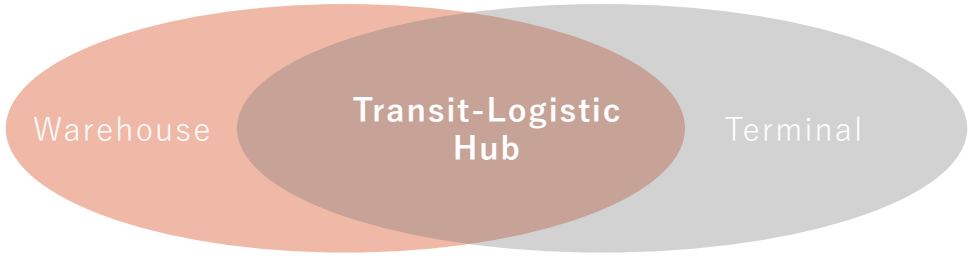
Threads

- The popularity of other modes of transportation, such as air or sea freight, can reduce the volume of terminal users.
- Heavy activity around industrial areas, ports, and shopping centers can cause traffic congestion.
- Large vehicle activity and infrastructure development can increase air, noise and environmental pollution.

03

03 / DESIGN CONCEPT

MIX-USED DEVELOPMENT



Any urban, suburban or rural development, or even a single building, that incorporates a combination of residential, commercial, cultural, institutional, or industrial uses, where the functions are physically and functionally integrated, and that provides pedestrian connections is called a Mix Use Development. More specifically to refer to a mix use development real estate project, it is a building, complex of buildings, or district of a city or town that is developed in a mix use manner by private developers, government agencies, or a combination thereof. Mix Use Development is divided into two, namely, Mix Use Building and Mix Land Use.

Komponen dan konsep perencanaaan Mixed Use (TIBBALDS, 1997)

- Fungsi lahan mix use
- Intensitas perkembangan
- Kepadatan bangunan
- Transit dan parker
- Walkability dan ramah lingkungan
- Type perumaan variatif
- RTH

CIRI-CIRI MIX USE DEVELOPMENT

- Contains 2 or more urban functions such as retail, office, residential, hotel, and entertainment.
- Functional integration and synergy occur
- There is a dependency of needs between each building function that strengthens the synergy and integration between the functions.

TARGET WAREHOUSE DESIGN

The target of the additional building function at the Sungai Kunjang terminal in Samarinda is to provide efficient warehousing as a transit point for goods before they are distributed to consumers. This warehousing will serve as a temporary storage space, enabling better stock management and quick response to market demand. The design of the space will include spacious storage areas with high racks to optimize capacity, as well as receiving and delivery spaces that are easily accessible by transport vehicles. Operational standards will include occupational security and safety, as well as waste management systems that support environmental sustainability. In addition, supporting technologies such as warehouse management systems (WMS) and modern equipment such as forklifts will be implemented to improve operational efficiency. Thus, the addition of this warehousing function is expected to improve the distribution of goods in Samarinda, contribute to local economic growth, and provide better service to consumers.

Room Specificaations	
Storage Area	• Area: Minimum 500-1000 m², depending on the volume of goods to be stored. • Height: Minimum 4-6 meters to allow storage of goods in high racks and maximize capacity.
Receiving and Delivery Area	• Area: Approximately 200 m² to facilitate the loading and unloading of goods. • Design: Should have direct access to storage areas and transportation lanes for operational efficiency.
Office Space	• Area: Approximately 50-100 m² for administrative and management staff. • Facilities: Equipped with work desks, meeting rooms, and rest areas.
Space Requirment	
Material Handling Room	• Equipment such as forklifts, pallet jacks, and conveyor belts are needed to facilitate the transfer of goods in the warehouse.
Packing Room	• Spacious: Around 50 m² for packing activities before shipment.
Security Facilities	• Access control area and CCTV to ensure the safety of stored goods.
Additional Needs	
Employee Rest Room	• A rest area with basic amenities such as kitchenette and restrooms to enhance employee comfort.
Customer Service Room	• If required, provide an area to serve clients or customers who come to the warehouse.

Table 4: Activity in warehouse (source: author, 2024)

Types of warehouse rental services include renting a storage warehouse per pallet, per container, per square meter, or per cubication or per cube. There are also those who rent warehouses based on the rental time, such as renting warehouses on a daily, monthly, and annual basis. Meanwhile, the type of warehouse rental service based on the function of the goods to be stored, consists of:

- Warehouse rental for storage of raw materials, such as iron, wood, sand powder, and so on.
- Warehouse rental for storage of manufactured goods and semi-finished goods.
- Rent a warehouse for transit.
- **Rent a warehouse for sorting goods.**
- Warehouse rental for reverse logistics (the process of moving an item / ownership of goods from consumers to distributors).
- Rent a warehouse for fulfillment center.

While this design targets warehouse rental for sorting goods in collaboration with expedition companies to distribute goods to consumers, the warehouse at this terminal is a storage place for goods for expedition companies and becomes the shipping center or main warehouse of the company.

The warehouse rental system at this terminal is run through an annual rental mechanism managed by the Regional Technical Implementation Unit (UPTD) or the Transportation Agency, which is responsible for managing terminal facilities. According to the needs of the company, the expedition company or related businesses will rent a building consisting of a warehouse as well as other supporting areas, such as office space, operational space, and additional storage space.

With this system, tenants will have full access to the building for one year, which can be extended later as per the agreement. Complete building leasing allows companies to organize the space according to their logistics needs, such as goods organization, sorting, and daily operations. Complete building leasing also allows for better integration between warehouses, workspaces, and administrative functions, making the distribution process and logistics management at the terminal more efficient.

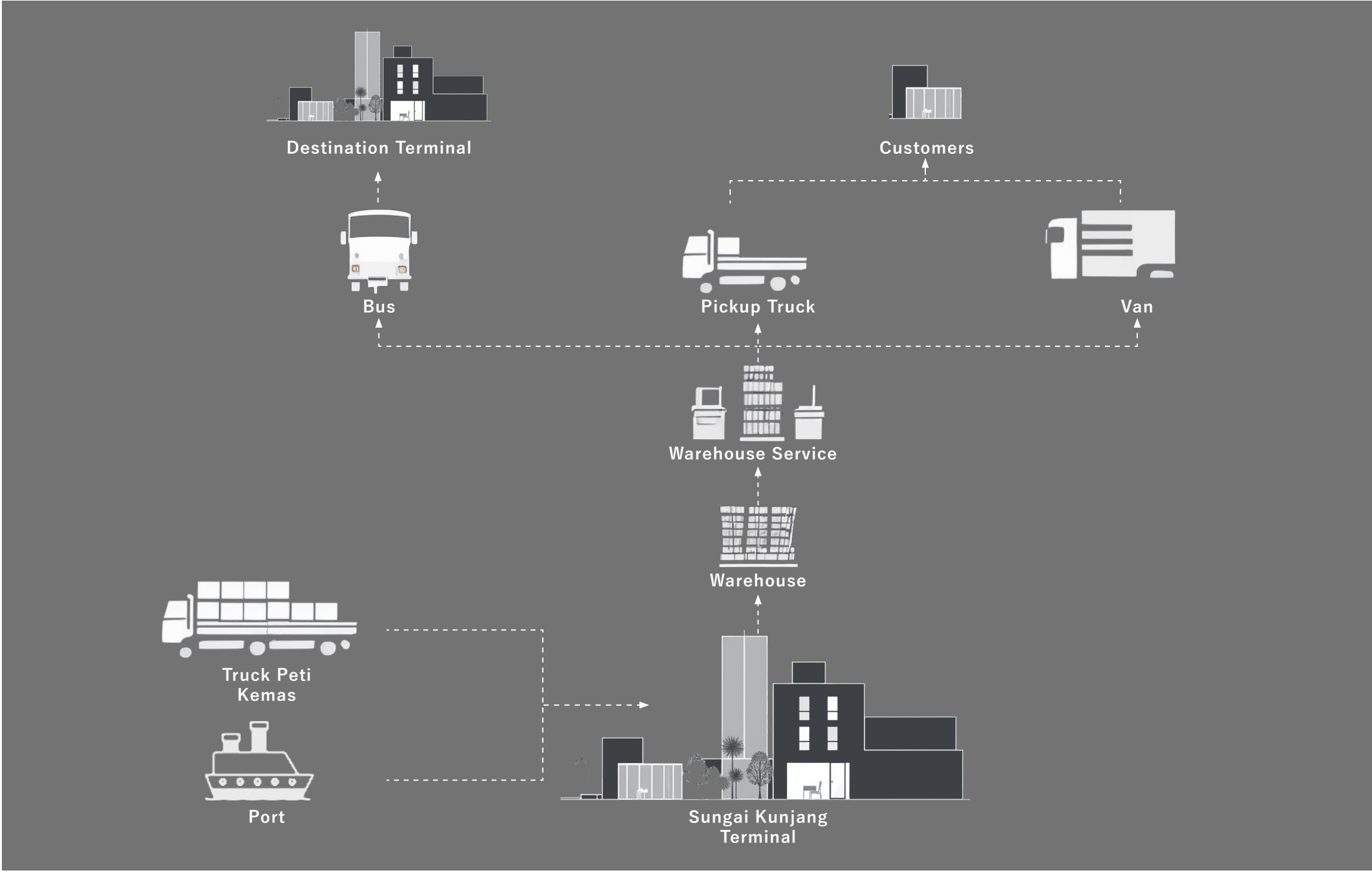


Figure 104: Flow system of existing warehousing within the terminal (source: author, 2024)

A distributed warehouse is a storage and distribution system that involves a network of small warehouses scattered in various strategic locations. Each warehouse in this system functions as a distribution center in a certain area, either regionally or locally, and has a stock of goods ready to be delivered to the surrounding area. By being closer to the consumer or final distribution point, distributed warehouses allow for faster and more efficient delivery of goods.

Distributed warehouse systems are commonly used by companies that have extensive distribution needs or want to ensure that goods can be delivered quickly to various locations, reducing delivery time and transportation costs. In addition, this approach provides flexibility in inventory management and can reduce the risk of delays or disruptions to the supply chain due to the various distribution options from various existing warehouses.

PLERIMINERY DESIGN PLAN

Combining the logistics and terminal functions of the building is the main concept of this design. By providing business opportunities to local residents, the design is expected to be the first step in boosting the local economy. The terminal building also serves as a hub that connects users to Samarinda's tourist attractions, especially through connections to the port around the Sungai Kunjang Terminal.

The mixed-use function in this design includes small-scale warehousing designed to support logistics activities, such as expeditions or shipping goods within and outside the city. The facility provides ideal temporary storage space for small and medium-sized enterprises (SMEs) as well as expedition service providers, thereby accelerating the distribution of goods and boosting local economic potential. By integrating the warehousing function within the terminal area, this design not only serves passenger transportation, but also meets logistics needs, making the terminal a multifunctional center of economic activity.

The redesign of Sungai Kunjang Terminal will focus on the main building that serves as the bus arrival and departure area, as well as additional facilities, such as services for travelers. The incorporation of existing logistics functions around the terminal is an important part of improving the economy around the terminal. Designed to improve the efficiency and convenience of terminal activities, its most important architectural elements include designing the circulation, layout and landscaping of the building. To support tourism, the design will provide facilities such as co-working spaces, information centers, and other related services.

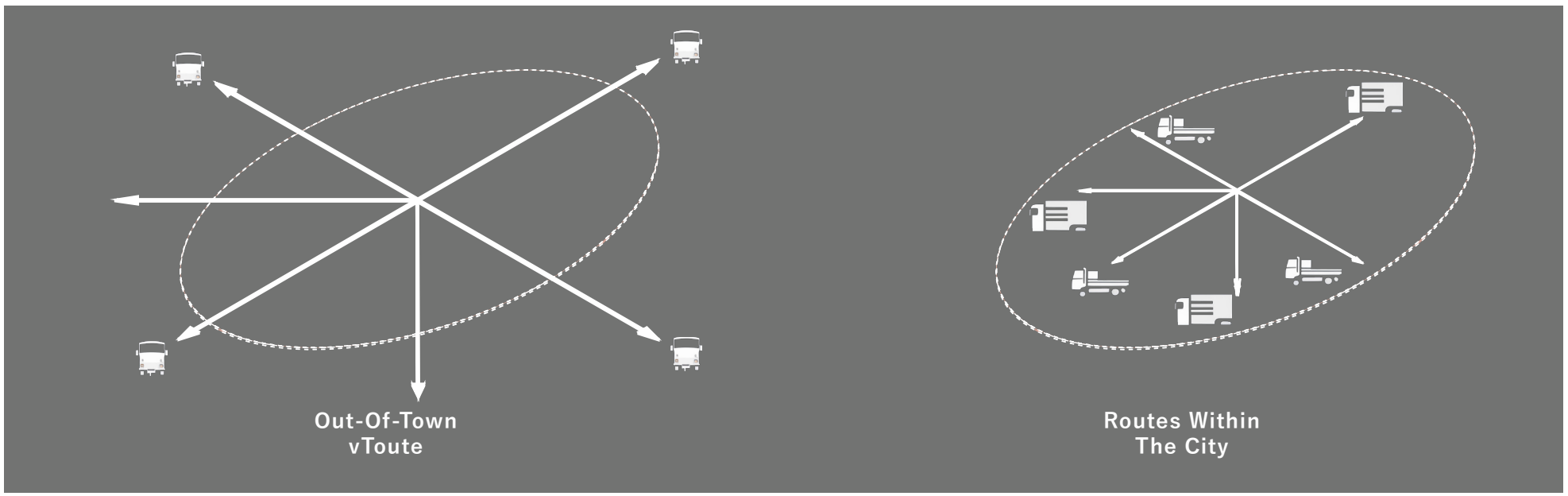


Figure 105: Warehouse system within terminal (source: author, 2024)

For out-of-town parcel deliveries, the goods are sent using a bus that goes directly to the destination terminal.

For delivery of goods within the city, distribution is carried out using standard cars or motorbikes owned by the expedition company directly to consumers.

SITE

Figure 106: Terminal sungai kunjang location (source: author, 2024)

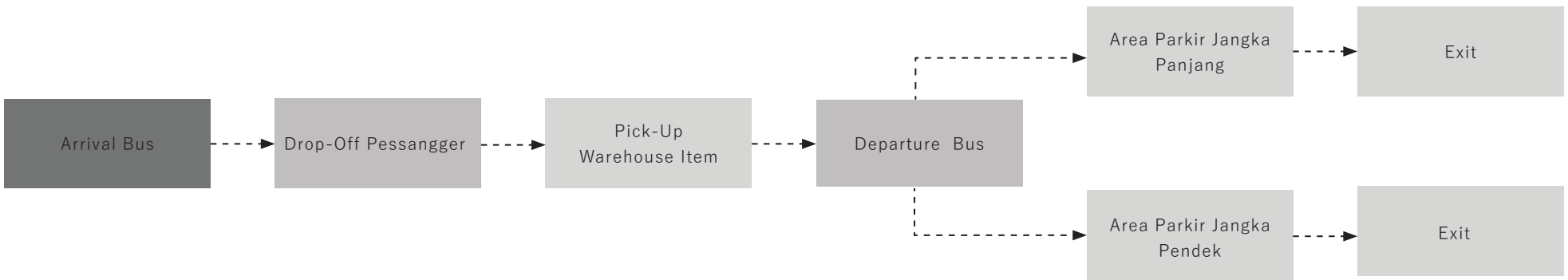
Table 5. Building code (source: Perwali, Samaeinda)

Area Type		Building Code				
Infrastructure	Terminal	KDB max	KLB max	KDH min	GSB	Building Height
		40%	3 floor	20%	3-4 m	16m

Table 6. Regulation implementation (source: author, 2024)

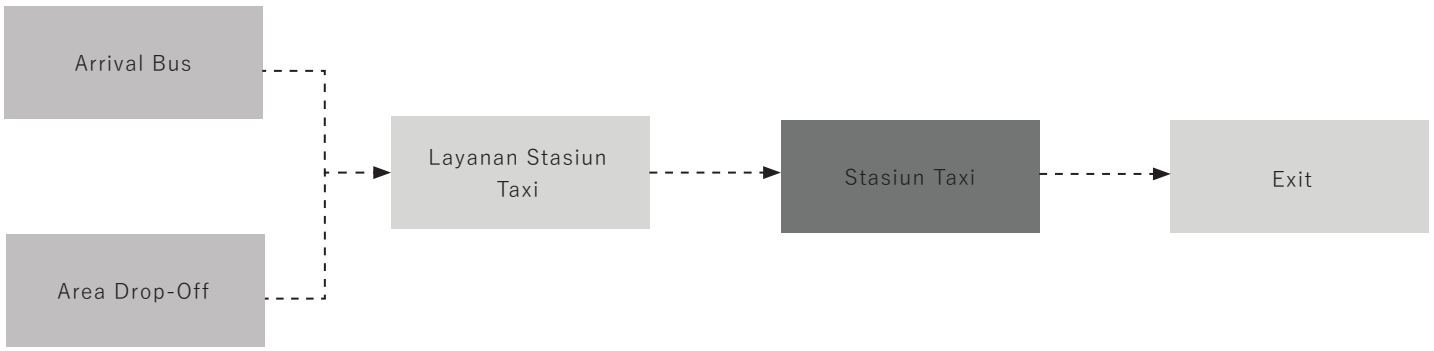
SIZE SITE	KDB	KLB	KDH
14.390 m2	5.756 m2	17.268 m2	2.878 m2

BUS CIRCULATION



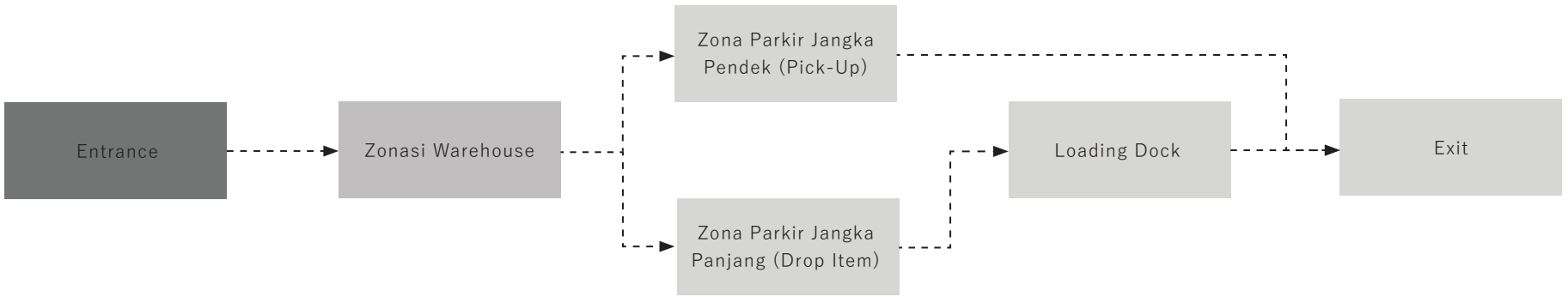
The main terminal building serves as a direct access center to the arrival and departure zones, which are marked with dedicated lanes for vehicles. Along these lanes are short-term parking areas reserved for waiting to pick up or drop off passengers, as well as separate exit lanes to reduce congestion after the arrival or departure process is complete. In addition, long-term parking areas are strategically placed near the arrival and departure zones, intended for users who require longer parking.

EMPU CIRCULATION



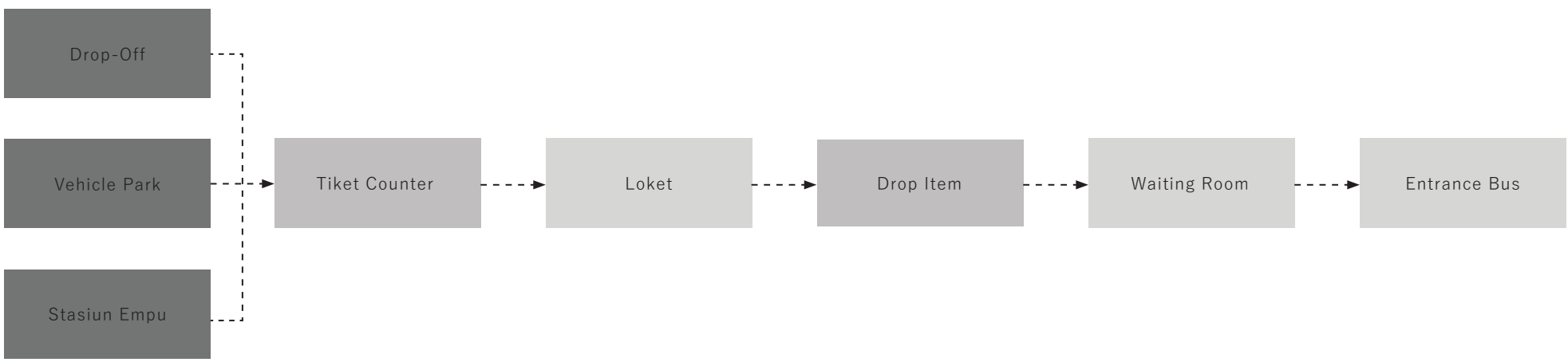
The public transport circulation diagram at Sungai Kunjang Terminal has a dedicated entrance gate that directs vehicles to the drop-off/pick-up area near the main entrance. One-way lanes maintain a smooth flow, with taxi waiting zones around these areas, and safe pedestrian paths to the lobby and tourist pier. Signs are posted to guide the flow of vehicles and passengers.

WAREHOUSE ZONE CIRCULATION



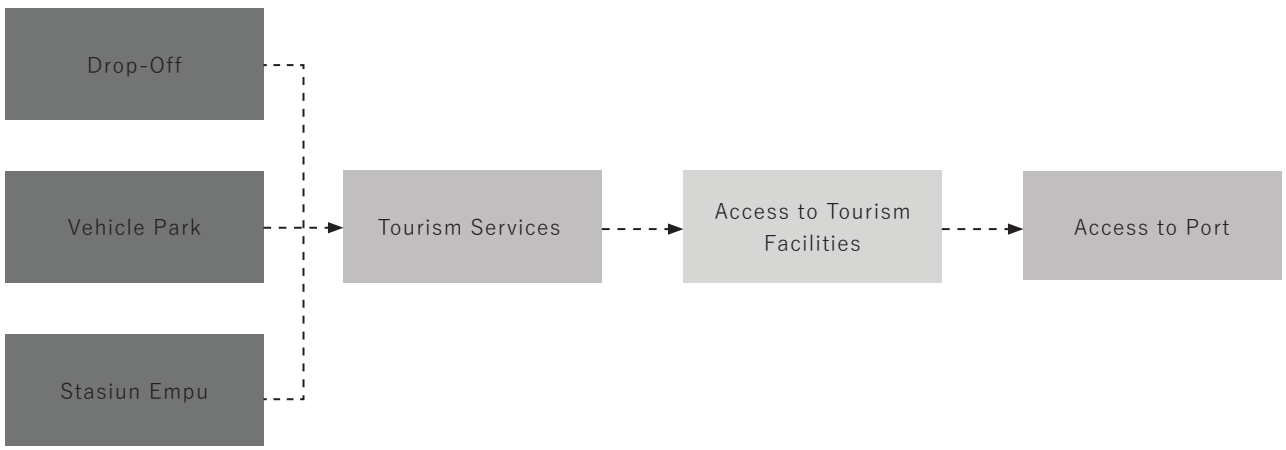
Starting from the dedicated entrance lane to the warehouse zone. The Loading Dock is connected to the Warehousing Zone, which provides storage areas and is connected to the Short Term Truck Parking Zone for trucks that only pick up goods, as well as the Long Term Truck Parking Zone for trucks that take longer to unload. Once unloading is complete, trucks exit through a dedicated exit lane, ensuring efficiency and safety in the processing of trucks and goods.

PESANGGER CIRCULATION



Passengers enter the terminal through the parking area, master station, and drop-off area provided, then head to the ticket counter to purchase or check travel tickets. For passengers who want to send goods, there is a special goods delivery counter located near the ticket counter to facilitate the process of sending goods quickly and safely. After completing their needs at the ticket counter and delivery of goods, passengers are directed to the waiting room to the vehicle area according to their destination.

TOURISM CIRCULATION



Inside the terminal, there is a Bus Stop Area that serves as a place for passengers to get off and board buses and other public transportation, while the Online Taxi Stop is provided specifically for online taxi pick-ups and stops. Passengers using private vehicles can park at the Private Vehicle Stopping Area. In addition, there is a Passenger Service Center that provides information facilities, waiting rooms, and other services to assist passengers. The terminal also has Access to Tourism Facilities, which connects the terminal with nearby tourist destinations, as well as Access to Port, which connects the terminal with the port across the river.

PROPERTY SIZE

Table 7. Passenger and Support Service Facilities (source: author, 2024

Room	Amount	Capacity	Standard	Circulation	Room Size/m^2	Source
Information Center	1	3	2	50%	9	Assumptions
Waiting Room	1	200	0.8	50%	240	NDA
ATM Center	1	4	2	100%	16	NDA
Tenant Stall	13	3	0.8	50%	62.4	Assumptions
Store	2	3	0.8	50%	18	Assumptions
Toilet (Male)	2	5	2.25	30%	25	MH
Toilet (Female)	2	5	2.25	30%	25	MH
Toilet Difable	2	1	2.25	30%	5.7	MH
Breastfeeding Room	1	2	2	50%	6	MH
Loket	4	1	0.8	30%	4.2	NDA
Item Storage	1	3	2	50%	9	NDA
Musholla	2	30	0.8	30%	62.4	Assumptions
Security	3	3	0.8	100%	14.4	Assumptions
Health Room	1	2	5	50%	15	Assumptions
Tourist Information	1	2	5	50%	15	Assumptions
Travel Agent Counter	1	2	0.8	30%	2	Assumptions
				Total	**529.1**	

Table 8. Terminal Manager Operational Room (source: author, 2024)

Room	Amount	Capacity	Standard	Circulation	Room Size/m^2	Source
Office	1	8	2	50%	24	Assumptions
Head Room UPTD	1	1	2	70%	3.4	Assumptions
Toilet	2	1	2.5		5	MH
Meeting Room	1	10	2	50%	30	Assumptions
Genset Room	1	1	21.6		21.6	MH
Cleaning Tool Room	1	5	0.8	50%	6	NDA
Panel Room	1	2	0.8	50%	2.4	NDA
				Total	**92.4**	

Table 9. Bus and Public Transport Fleet Operations Room (source: author, 2024)

Room	Amount	Capacity	Standard	Circulation	Room Size/m^2	Source
Arrival Platform	1	6	50	50%	450	NDA
Depature Platform	1	6	50	50%	450	NDA
Workshop	1	2	50	50%	150	NDA
Vehicle Wash	1	2	50	50%	150	NDA
				Total	**1200**	

Table 10. Warehousin Space Requirements (source: author, 2024)

Room	Amount	Capacity	Standard	Circulation	Room Size/m^2	Source
Pick-Up Zone	1	2	100	10%	220	Assumptions
Drop Item Zone	1	1	100	10%	110	Assumptions
Storage	1		500	10%	550	Assumptions
Packaging Zone	1		150	30%	195	Assumptions
Office	1	8	2	50%	22	Assumptions
Security	2	3	0.8	100%	9.6	Assumptions
				Total	**1106.6**	

Table 11. Parking Space Requirements (source: author, 2024)

Room	Amount	Capacity	Standard	Circulation	Room Size/m^2	Source
Private Car Parking	1	50	12.5	50%	938	NDA
Employee Car Perking		3	12.5	50%	56	NDA
Private Motorcycle Parking		100	1.5	50%	225	NDA
Employee Motorcycle Parking		10	1.5	50%	22.5	NDA
Bus Parking		10	50	50%	750	NDA
Empu Station		30	12.5	50%	562.5	NDA
				Total	**2554**	

ZONNING CONCEPT 1

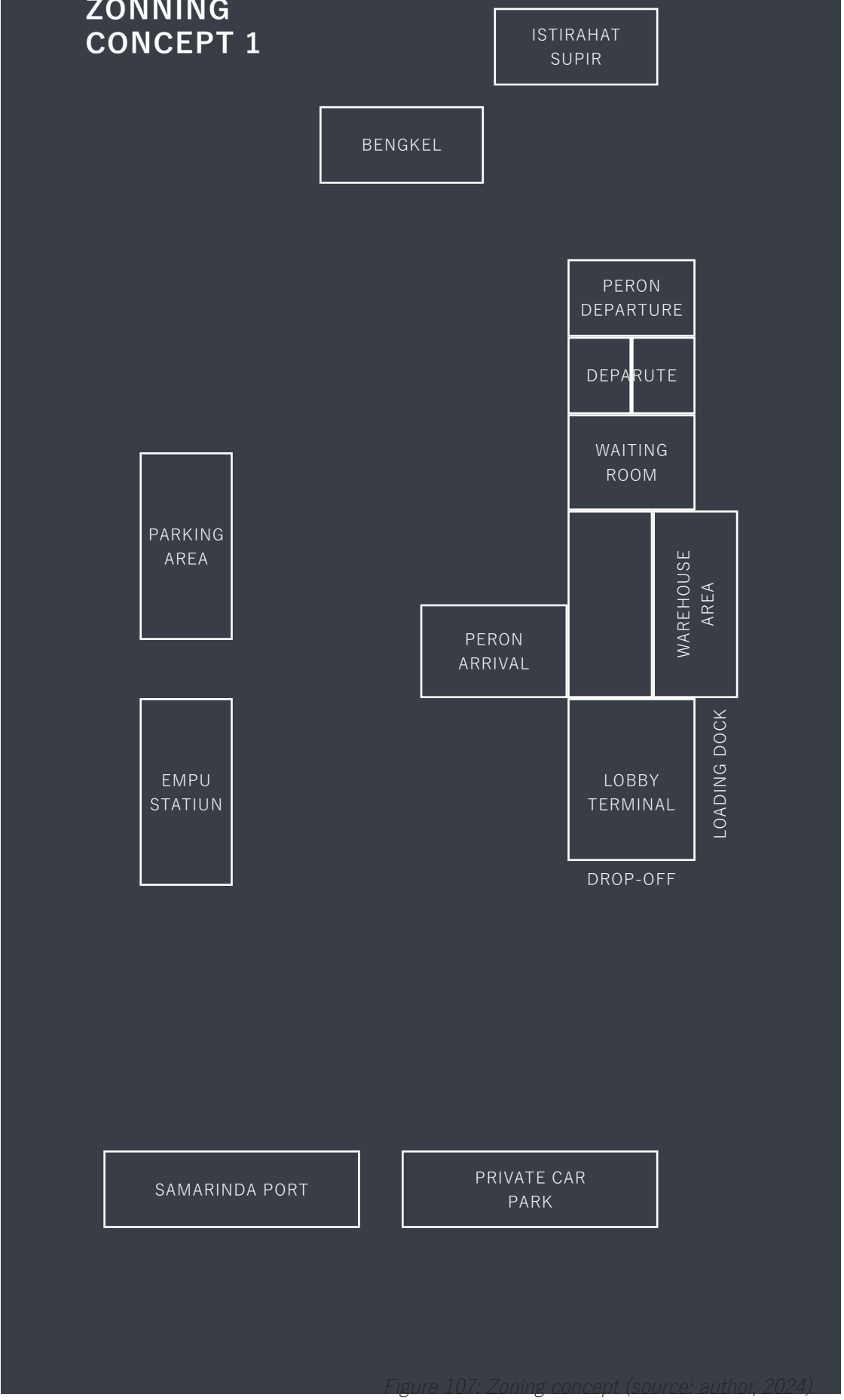


Figure 107: Zoning concept (source: author, 2024)

CONCEPT CIRCULATION 1

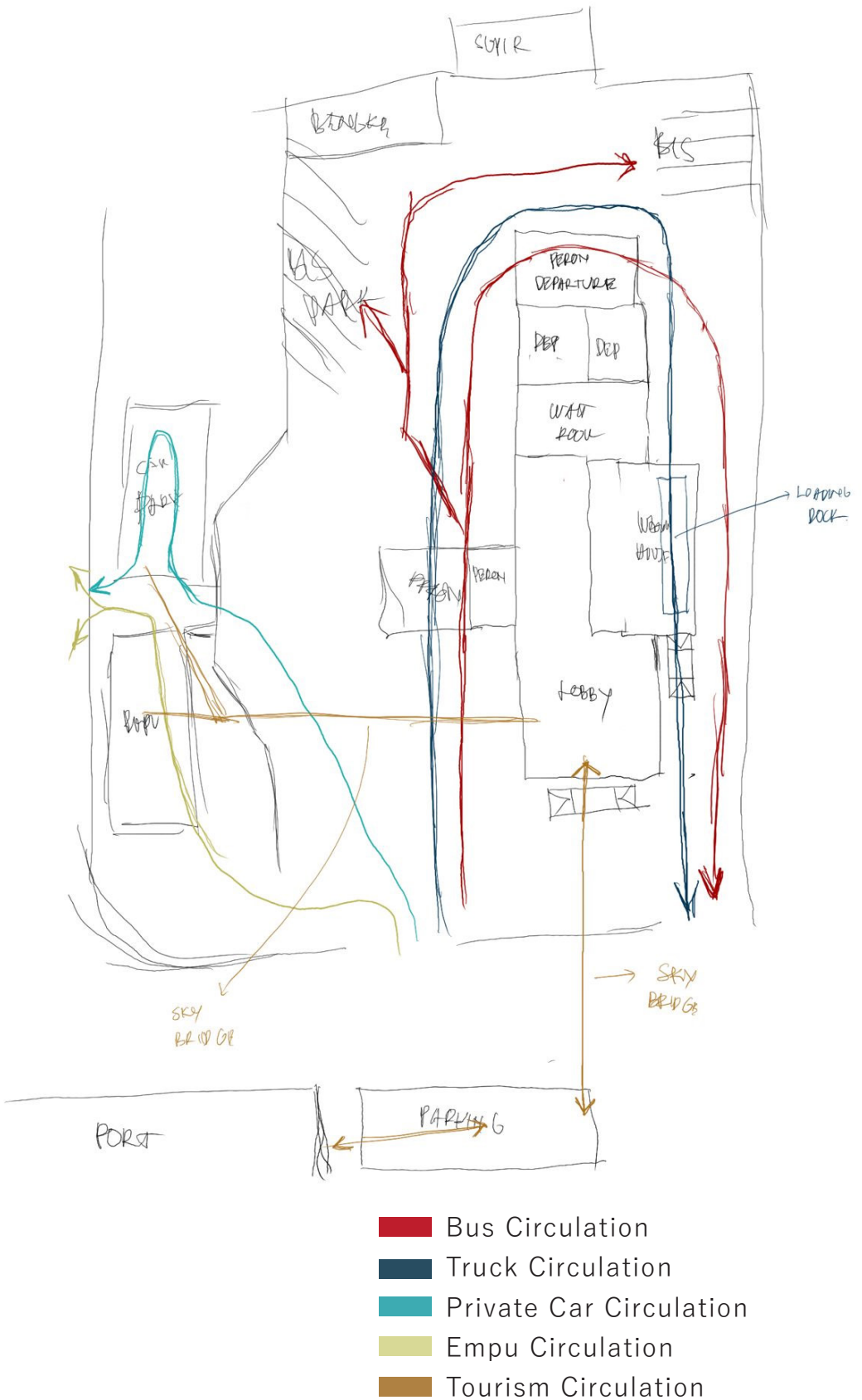


Figure 108: Circulation concept (source: author, 2024)

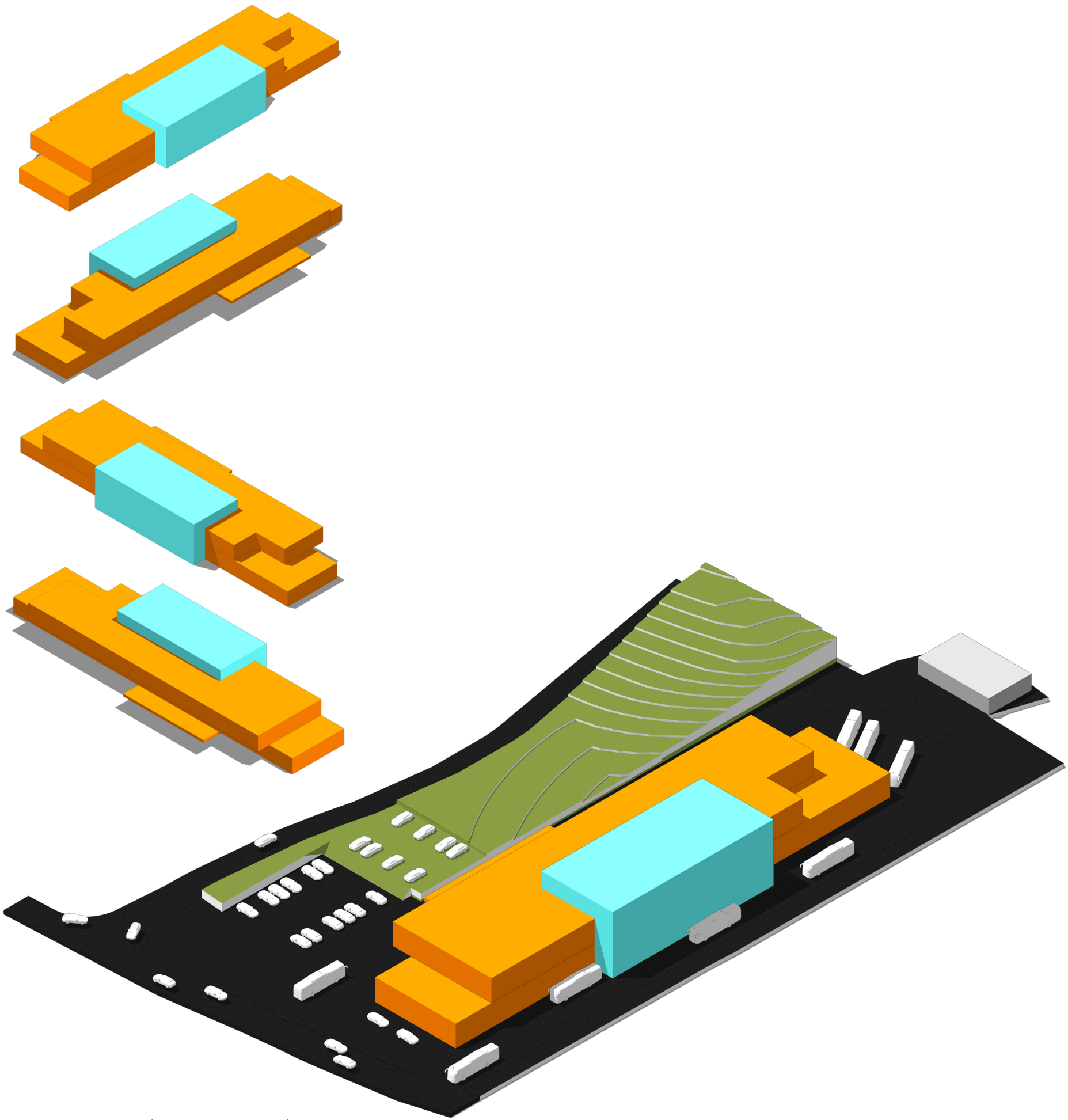
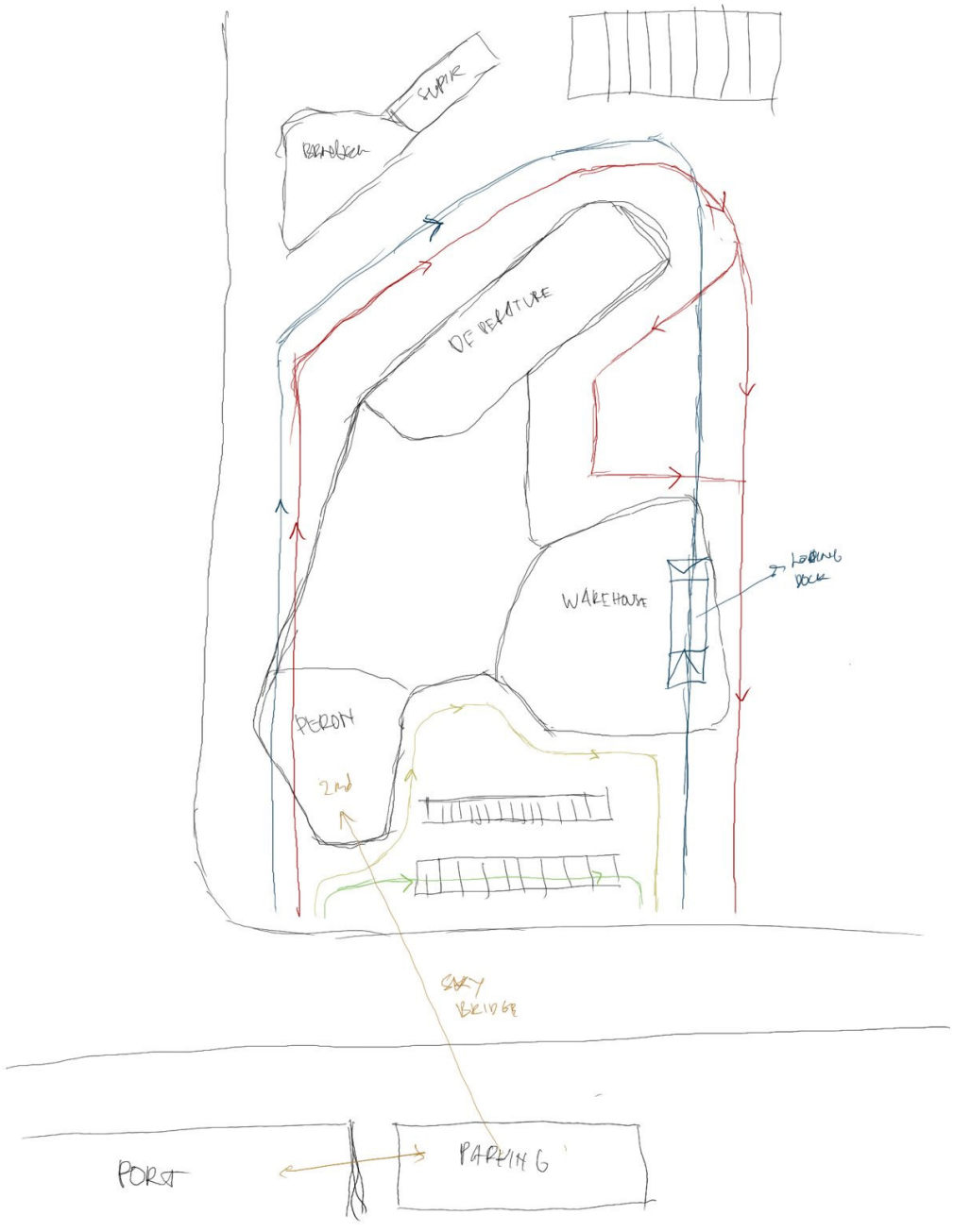


Figure 109: Building mass (source: author, 2024)

ZONNING CONCEPT 2

Figure 110: Zoning concept (source: author, 2024)

CONCEPT CIRCULATION 2



Bus Circulation
Truck Circulation
Private Car Circulation
Empu Circulation
Tourism Circulation

Figure 111: Circulation concept (source: author, 2024)

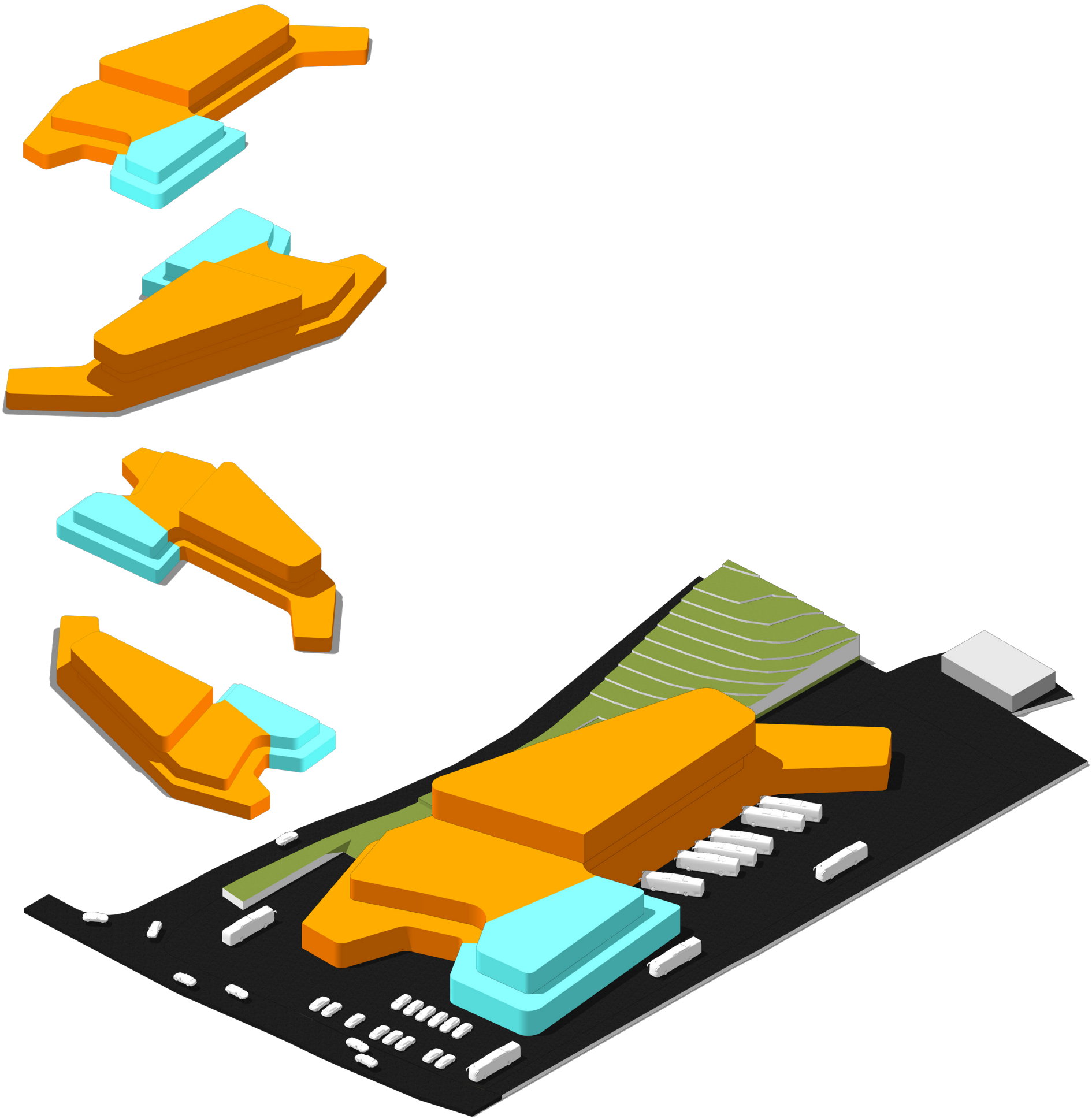


Figure 112: Building mass (source: author, 2024)

ZONNING
CONCEPT 3

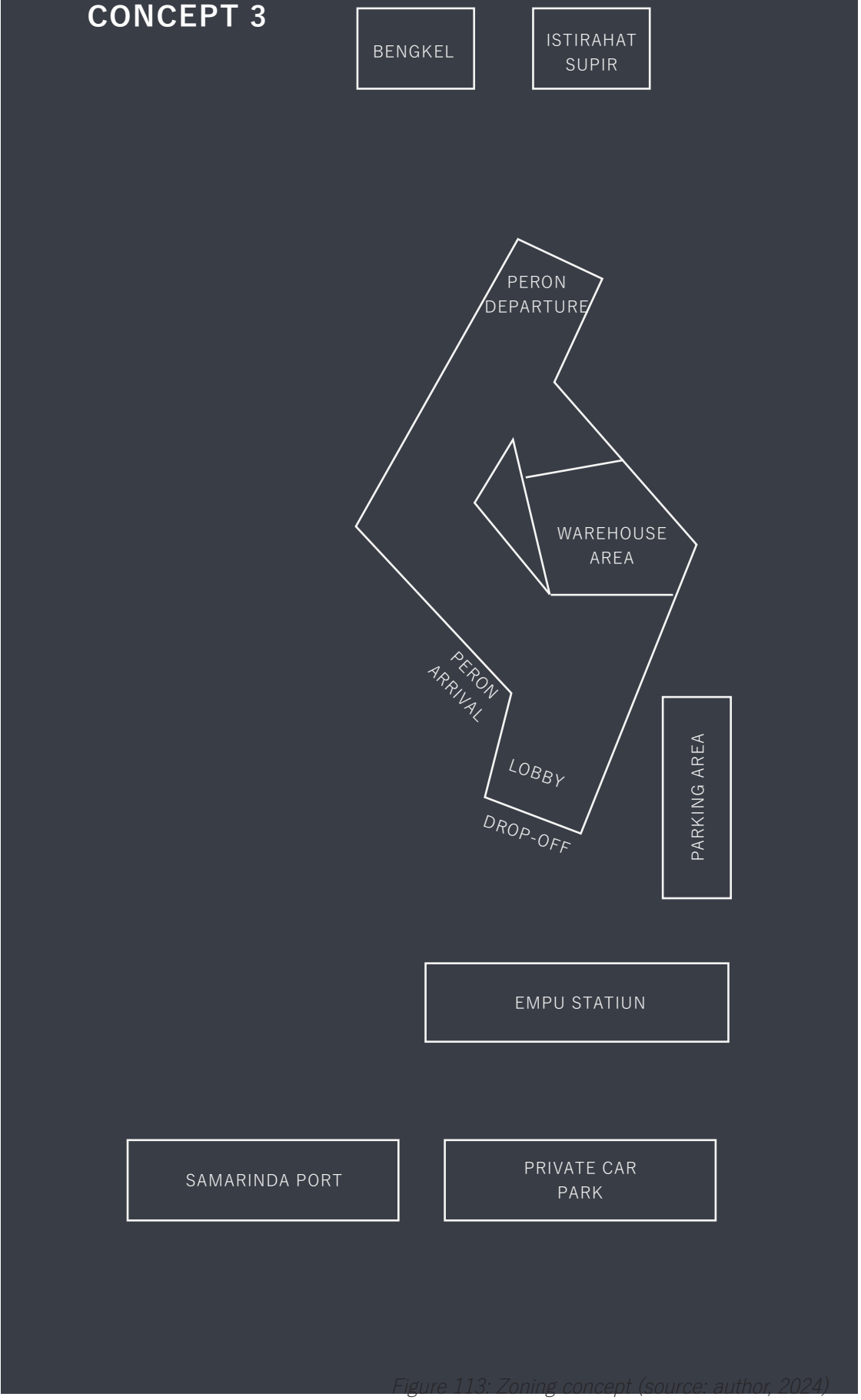


Figure 113: Zoning concept (source: author, 2024)

CONCEPT
CIRCULATION 3

Figure 114: Circulation concept (source: author, 2024)

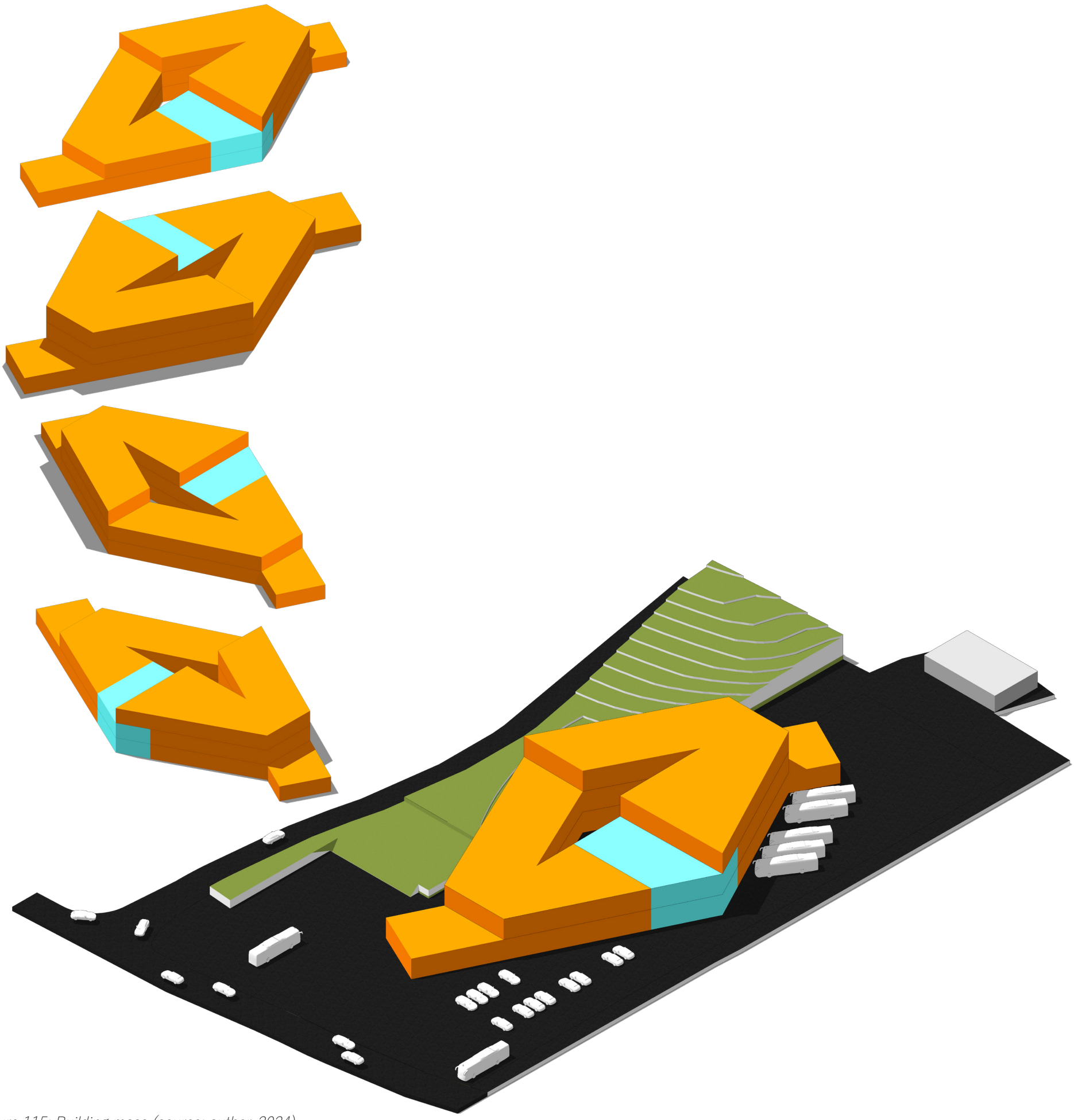


Figure 115: Building mass (source: author, 2024)

DESIGN RESULT

In the design results, it is necessary to evaluate the three alternative mass changes that have been made. Of the three alternatives, one will be chosen that is most efficient in solving the problems of the existing conditions. The main consideration in selecting the change is the effectiveness of circulation, because as explained earlier, the main problem in this building lies in the circulation system within the site.

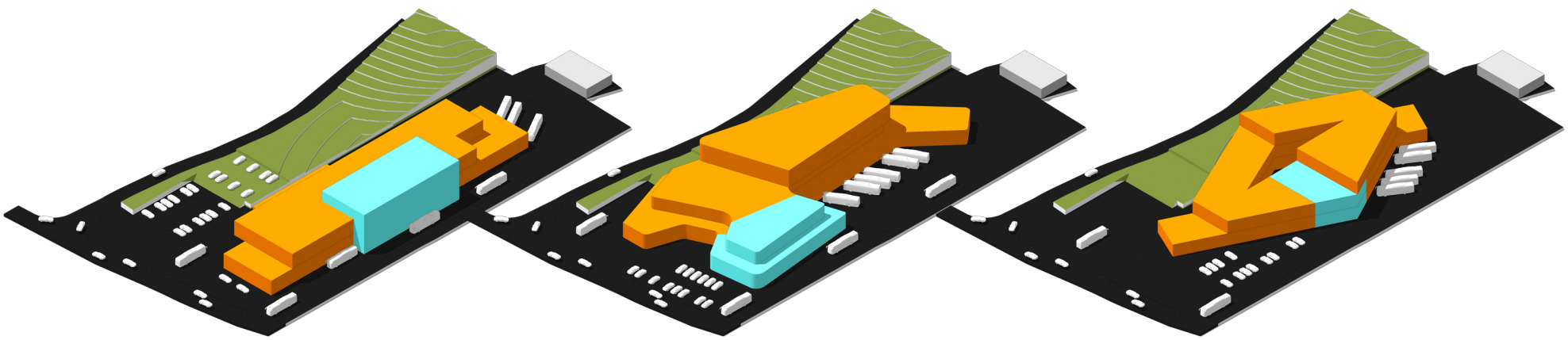


Figure 116: Consideration building mass (source: author, 2024)

This building mass has a very compact form, so it is able to streamline the terminal's circulation needs within the site. However, more in-depth analysis needs to be done to ensure optimal circulation arrangements, especially in separating the terminal, warehouse and private vehicle functions. The separation of circulation is important so that each function can run smoothly without conflict between areas, thus supporting efficiency and user comfort.

This mass change has followed the average maneuver of vehicles on the site, so it has easy circulation for vehicles. but on the other hand, this building has a wide shape so it needs to process the existing contours.

This mass is the same as the second bulding mass, which is concerned with the maneuvering of vehicles in the land, but there is a new problem which is that it takes up a lot of vacant land on the site, reducing the land for building circulation.

Of the three masses, mass 1 was chosen which has a wider circulation than the other masses, in addition, this mass can optimize circulation outside the building and inside the building.

VEHICLE CIRCULATION

In this mass, there are two different building functions, namely the terminal and warehouse. Although they have their respective roles, the two buildings are designed to remain united by considering optimal circulation both inside and outside the building.

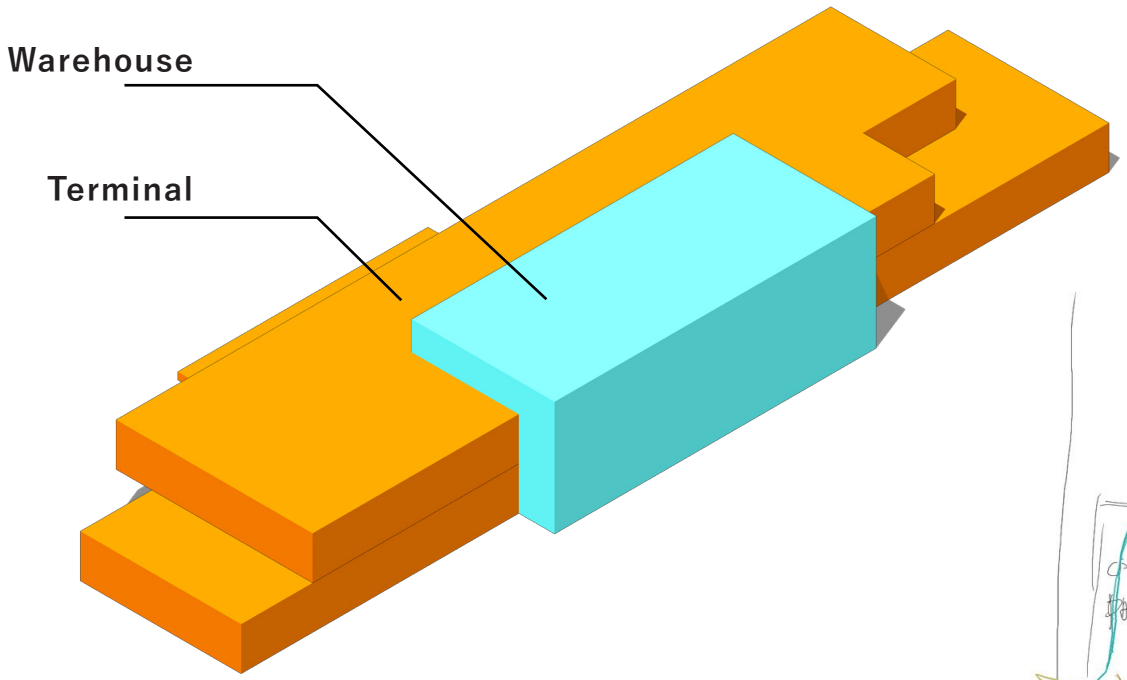


Figure 117: Consideration building mass (source: author, 2024)

In this design, there are four types of vehicle circulation. The main circulation is for buses, followed by truck circulation to the warehouse area, as well as private vehicle and angkot circulation. This circulation design tries to present the most efficient alternative so that each vehicle lane can function optimally without interfering with each other.

- Bus Circulation
- Truck Circulation
- Private Car Circulation
- Empu Circulation
- Tourism Circulation

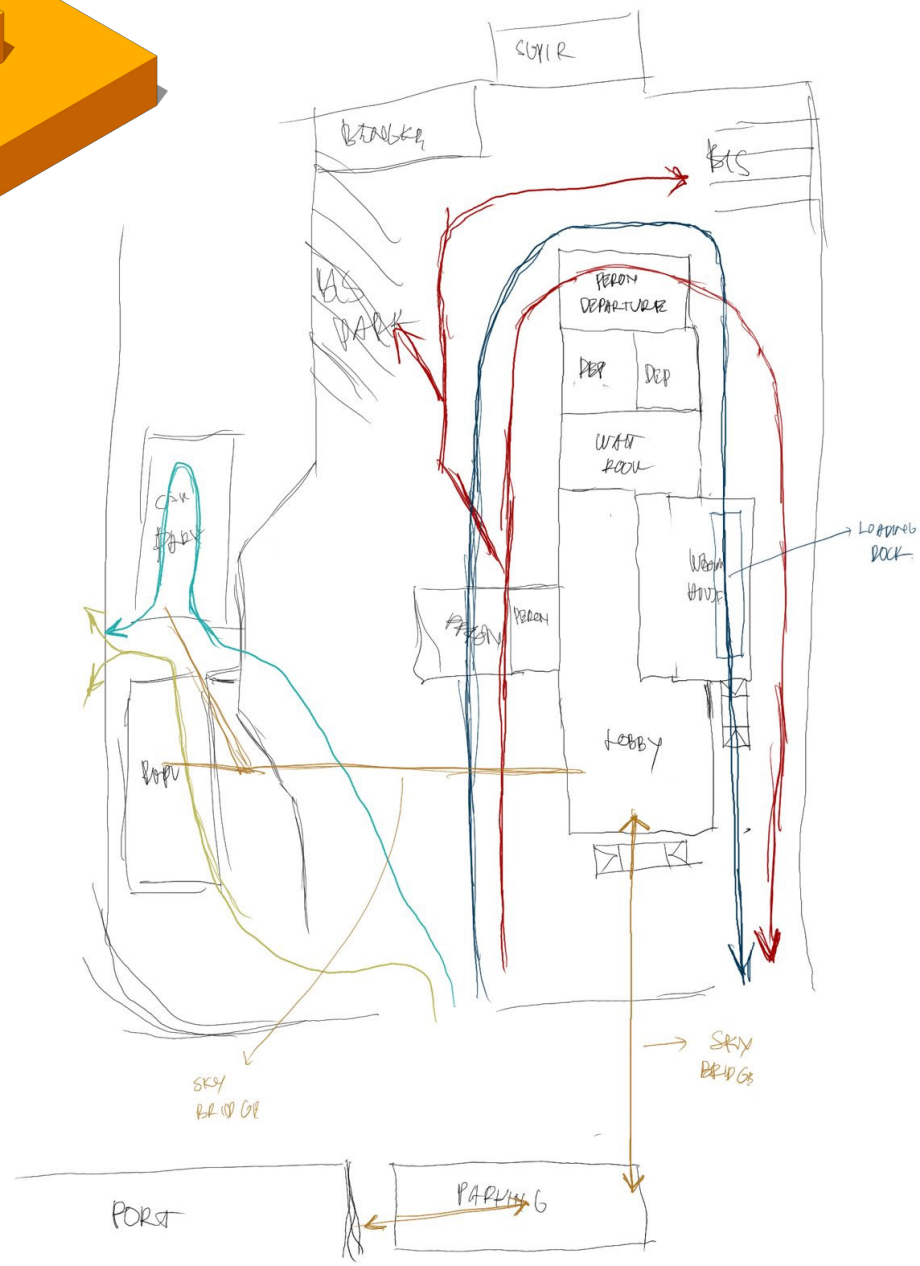


Figure 118: Circulation Concept (source: author, 2024)

BUILDING CIRCULATION

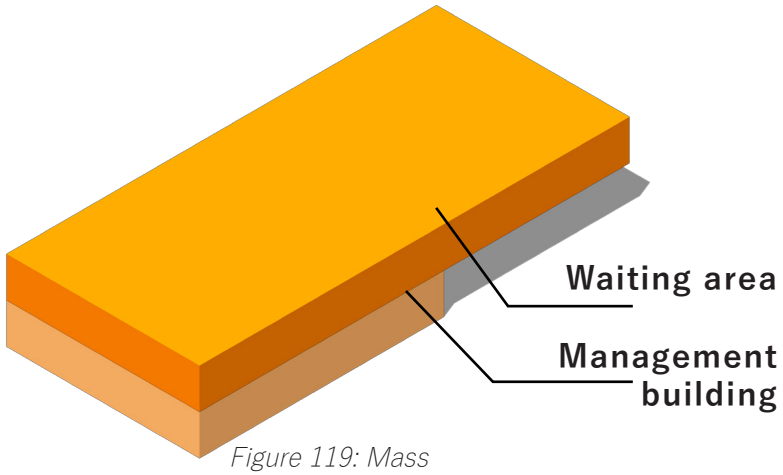


Figure 119: Mass
(source: author, 2024)

Circulation within the building on the first floor is focused on management needs, such as administrative offices. Meanwhile, the entire waiting area is placed on the second floor. Thus, the main activities involving many people are concentrated on the second floor, which tends to be more crowded. This placement aims to maximize vehicle circulation on the first floor so that it remains smooth without being disturbed by building user activities.

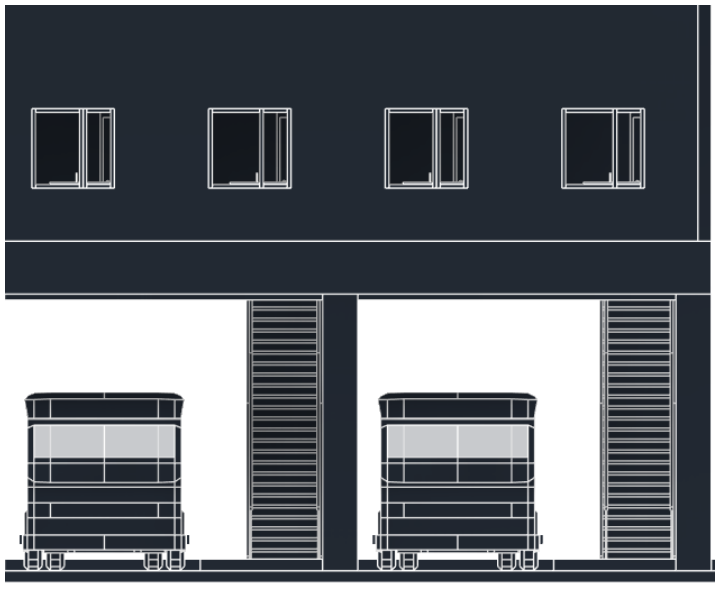


Figure 120: Mass
(source: author, 2024)

Passengers are provided with direct access in the form of stairs connecting the waiting room on the second floor with the departure area of each bus, making it easier to move without disrupting vehicle circulation on the first floor.

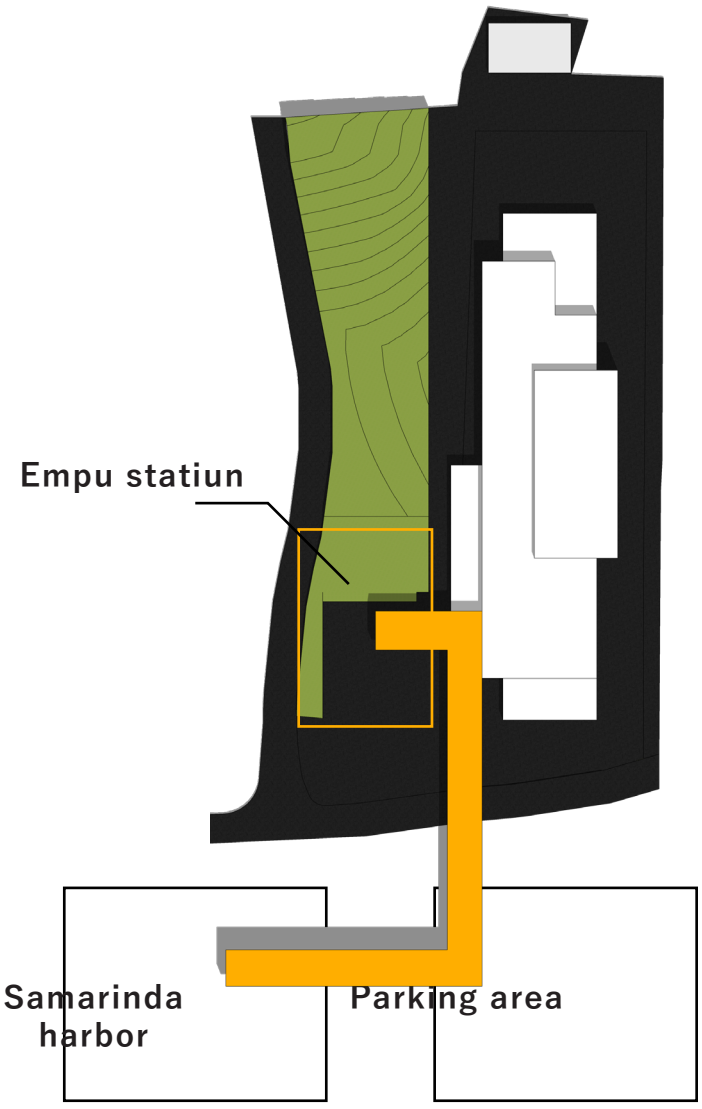


Figure 121: Circulation
(source: author, 2024)

To support activities around the building, especially the harbor, a skybridge was built that is directly connected to the terminal. This facility was designed to support transportation integration while strengthening accessibility in support of ecotourism development in Samarinda.

THERMAL CONCEPT

Samarinda, which has a tropical climate and is located close to the equator and the Mahakam River, requires a roof design that can cope with hot weather conditions and heavy rain. Therefore, a gable roof is the right choice for this building design. A gable roof with sufficient slope can effectively drain rainwater, while its simple shape supports natural ventilation, keeps the room temperature comfortable, and reduces heat buildup inside the building.

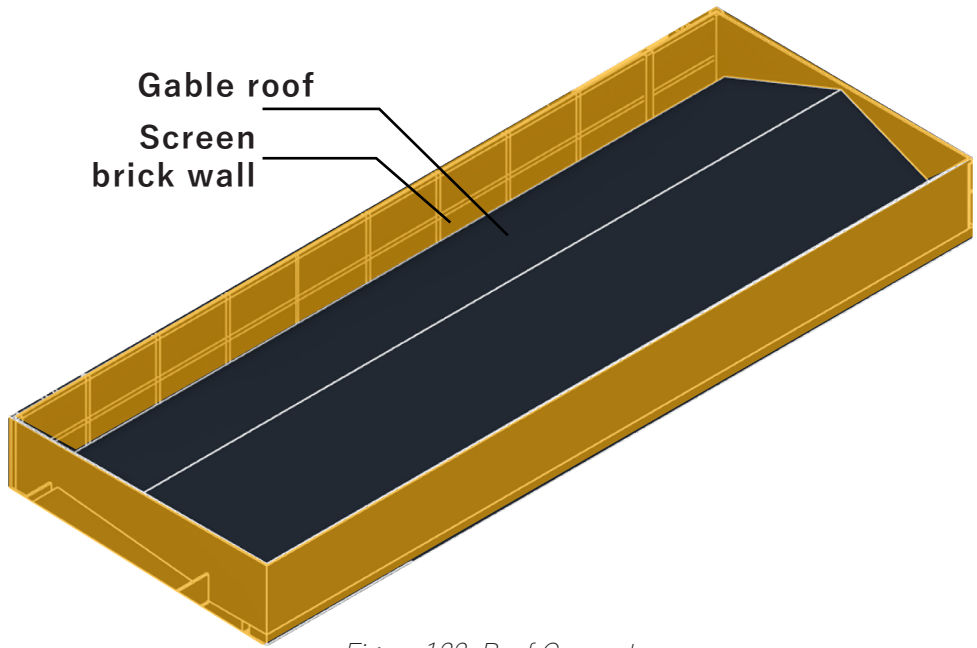


Figure 122: Roof Concept
(source: author, 2024)

In this gable design, the roof is covered by a wall to hide the roof construction, with the hidden roof concept aiming to create a neater and more aesthetic appearance. The wall not only functions as a cover, but will also be installed with a facade specifically designed to beautify the exterior appearance of the building.

04

04 / DESIGN RESULT

This design has met the applicable building regulations in Sungai Kunjang Sub-district, Samarinda, by paying attention to spatial provisions, building height, and ensuring optimal accessibility and connectivity of the area.

Regulation

Table 12. Building Code (source: author, 2024)

SIZE SITE	KDB	KLB	KDH
14.390 m2	5.756 m2	3.2	2.878 m2

Design Implementation

Table 13. Building Code Implementation (source: author, 2024)

SIZE SITE	KDB	KLB	KDH
14.390 m2	3351 m2	0.3	3.008 m2

Initial considerations in this design focused on building and land circulation. The essence of this concept is to ensure that each circulation path can function properly without interfering with each other between building functions. An efficient arrangement allows vehicles, passengers, and building operational activities to move smoothly and be organized, thus supporting optimal integration between building elements.

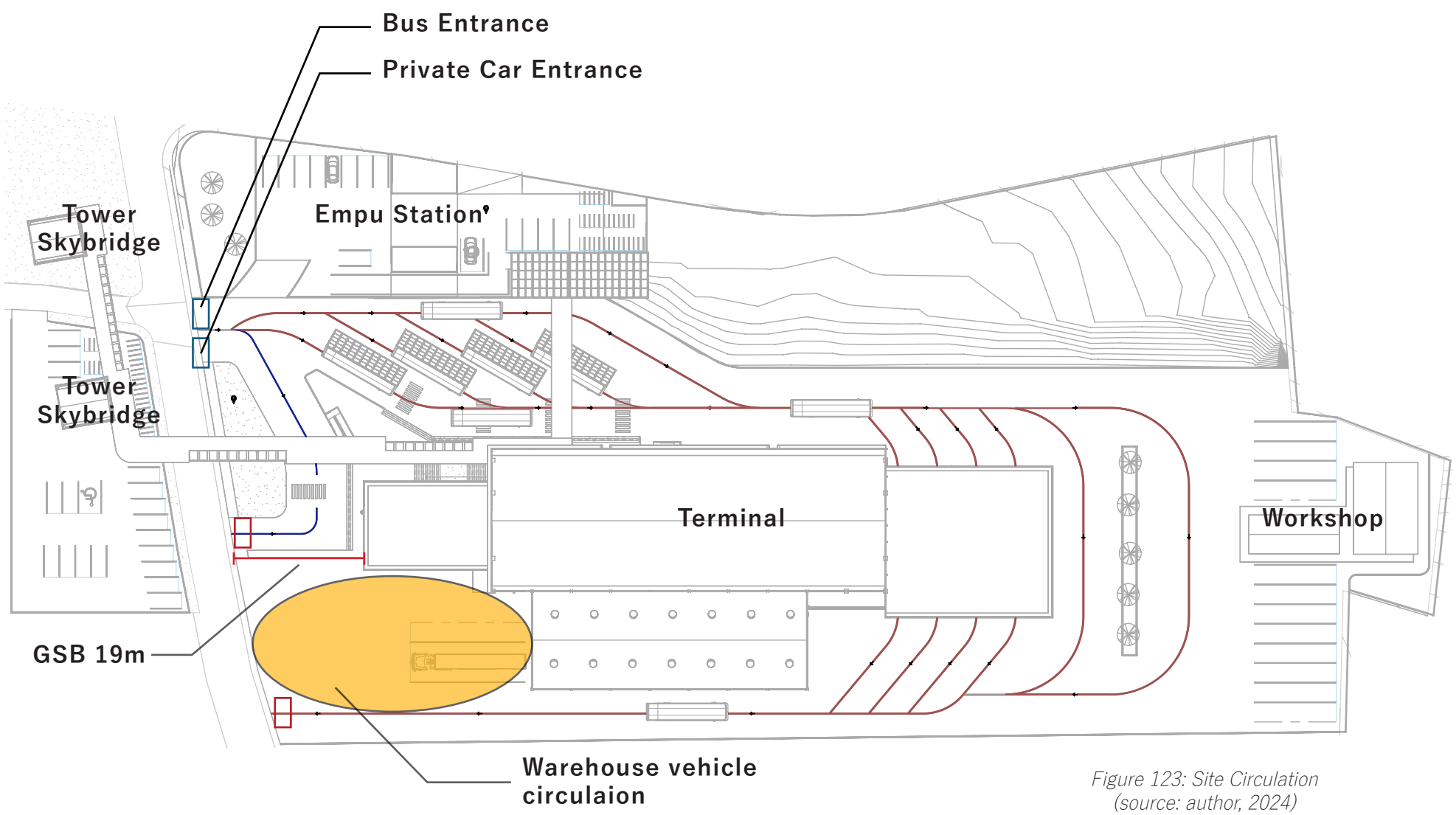


Figure 123: Site Circulation (source: author, 2024)

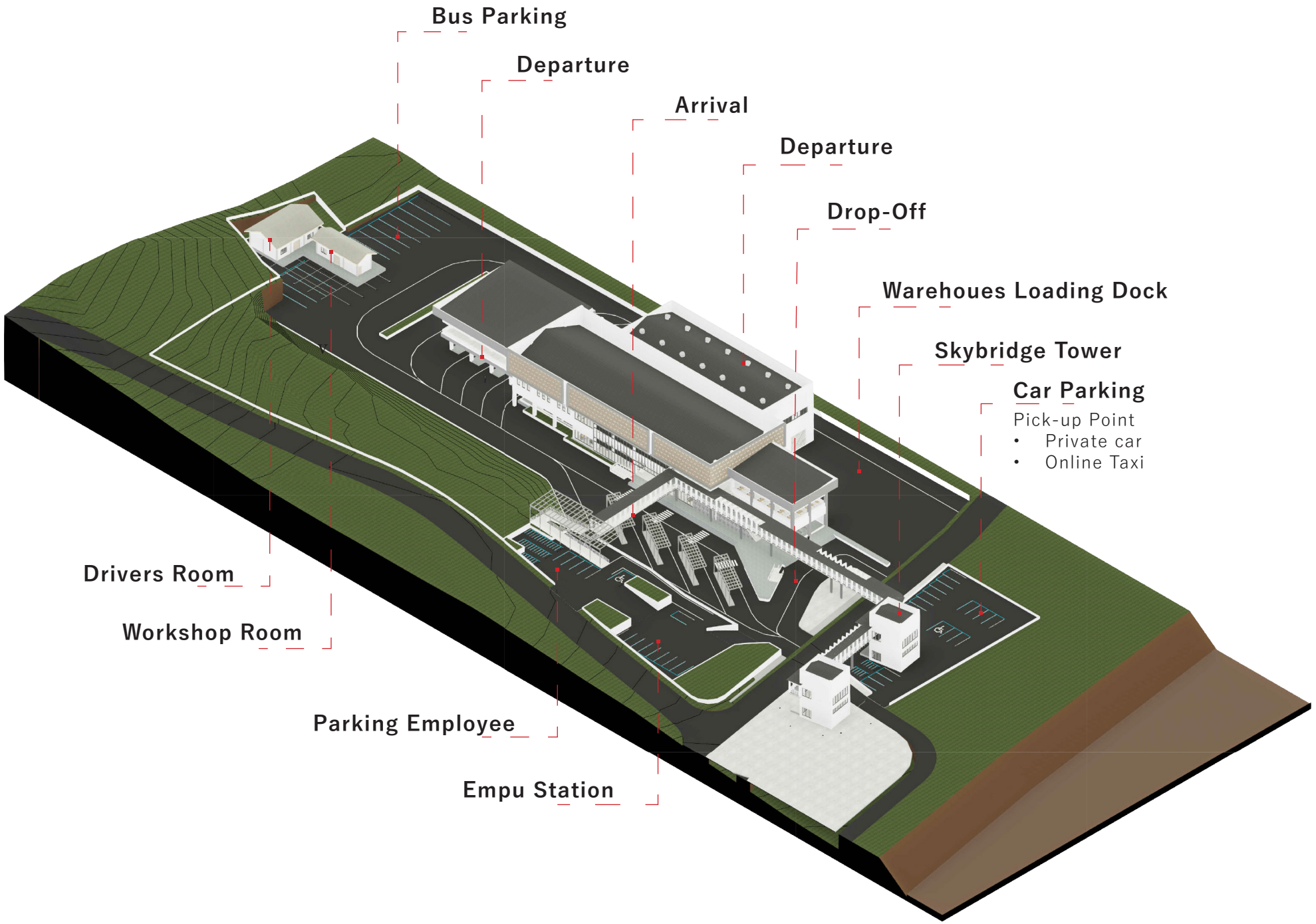


Figure 124: Building Function
(source: author, 2024)

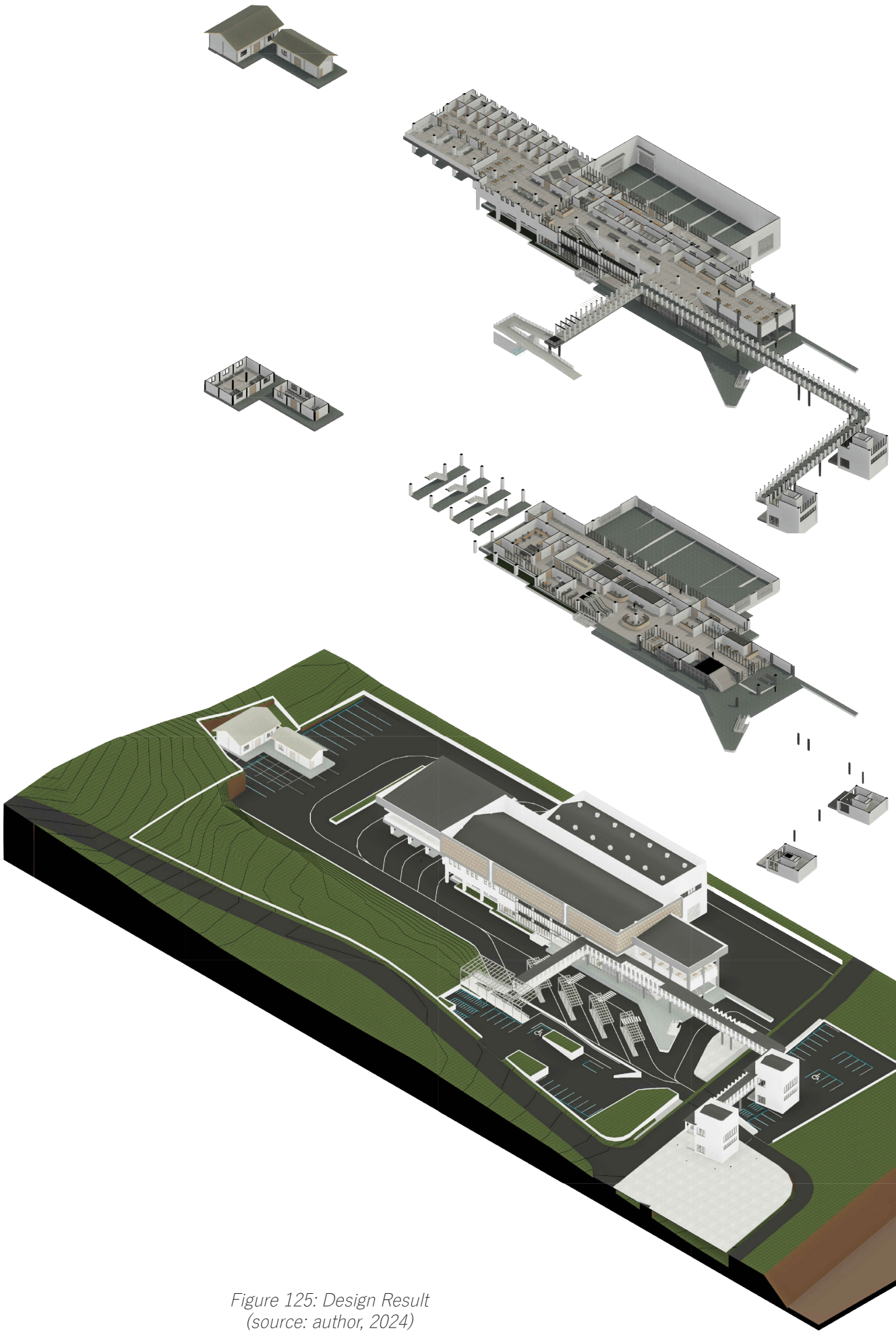


Figure 125: Design Result
(source: author, 2024)

2nd Floor

- Waiting Area
- Tiket Checking
- Food Court Area
- Health Care
- Musholla
- 3 Medium Tenant
- 10 Small Tenant
- Warehouse Office
- Warehouse Meeting Room
- Warehouse Head Room

1st Floor

- Lobby
- Information Center
- Locket Area
- Security Room
- 2 Big Tenant
- Storage Tenant
- Item Recipt Room
- Terminal Office
- Terminal Meeting Room
- Terminal Head Room
- Lobby Warehouse
- Item Packaging Room
- Storage Warehouse
- Panel Room
- Drivers Room
- Workshop

BUILDING CIRCULATION

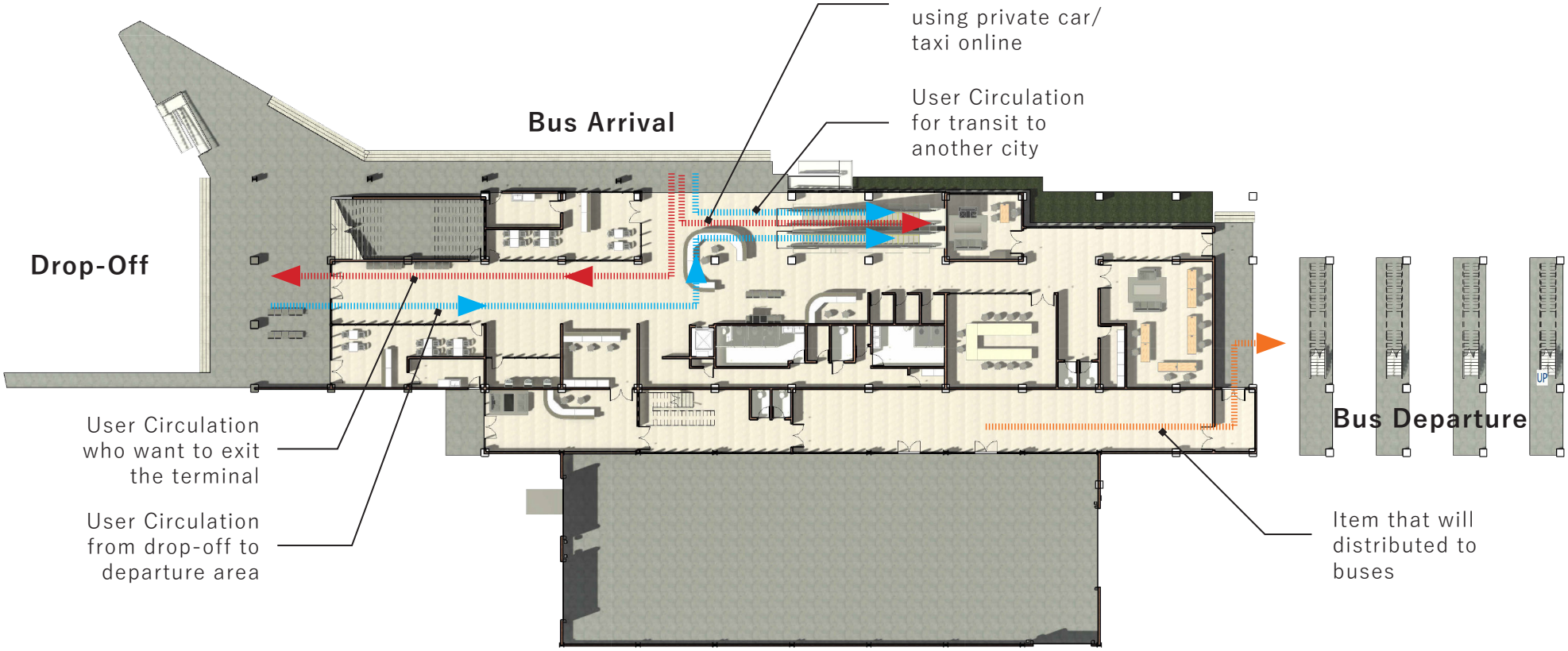


Figure 126: 1st Floor Plan
(source: author, 2024)

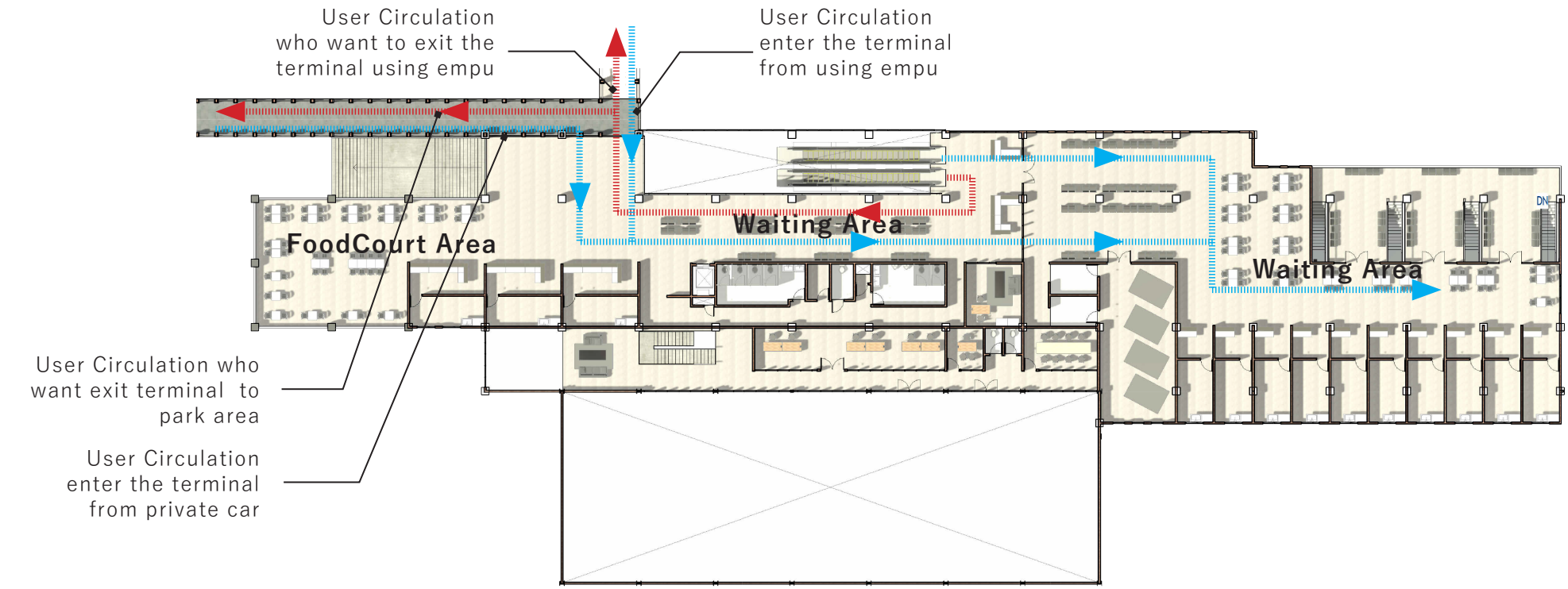


Figure 127: 2nd Floor Plan
(source: author, 2024)

SKYBRIDGE

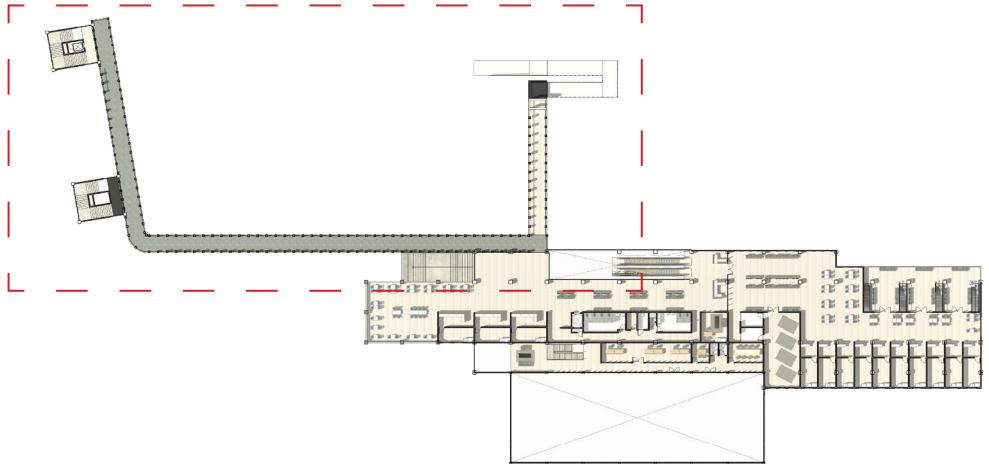
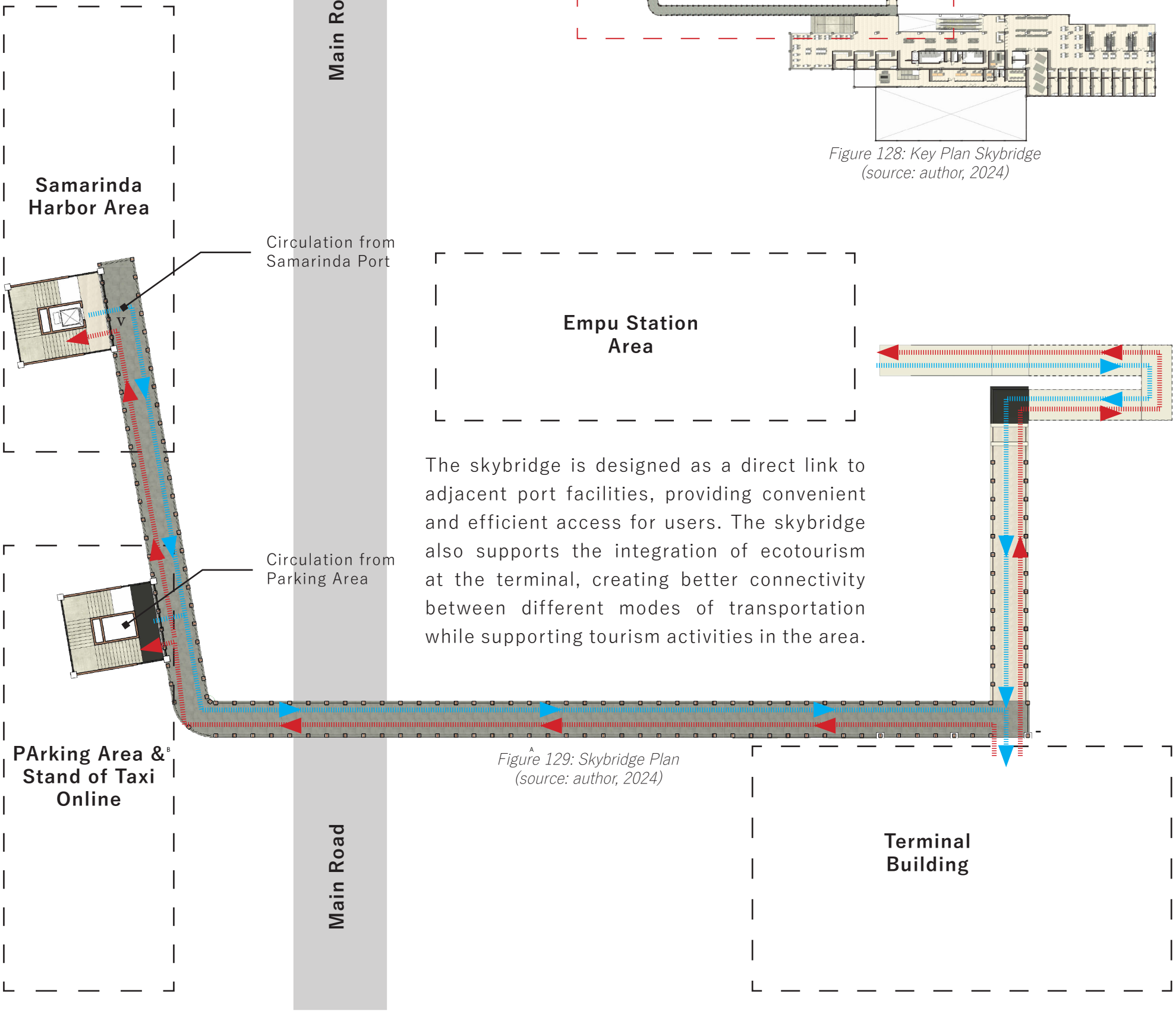


Figure 128: Key Plan Skybridge
(source: author, 2024)



The skybridge is designed as a direct link to adjacent port facilities, providing convenient and efficient access for users. The skybridge also supports the integration of ecotourism at the terminal, creating better connectivity between different modes of transportation while supporting tourism activities in the area.

Figure 129: Skybridge Plan
(source: author, 2024)

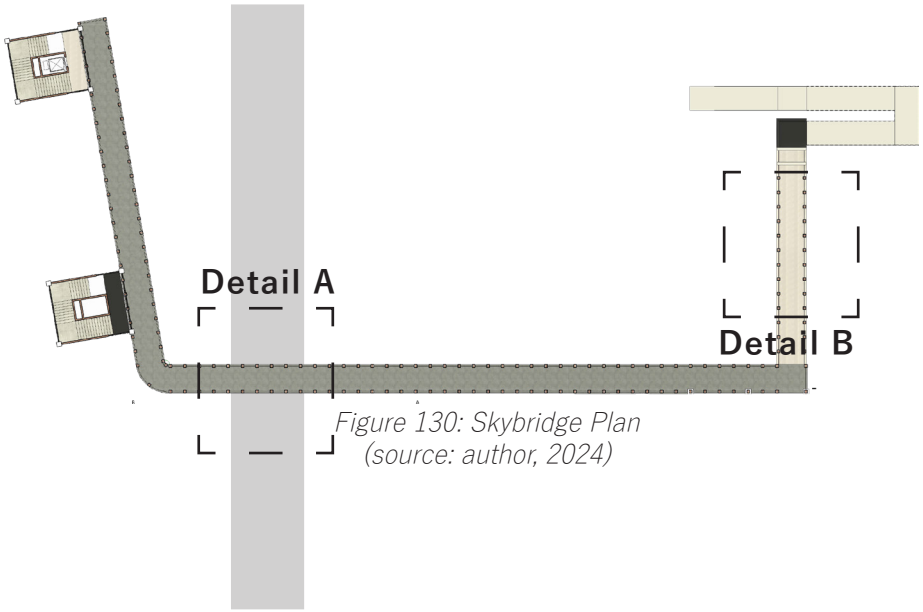
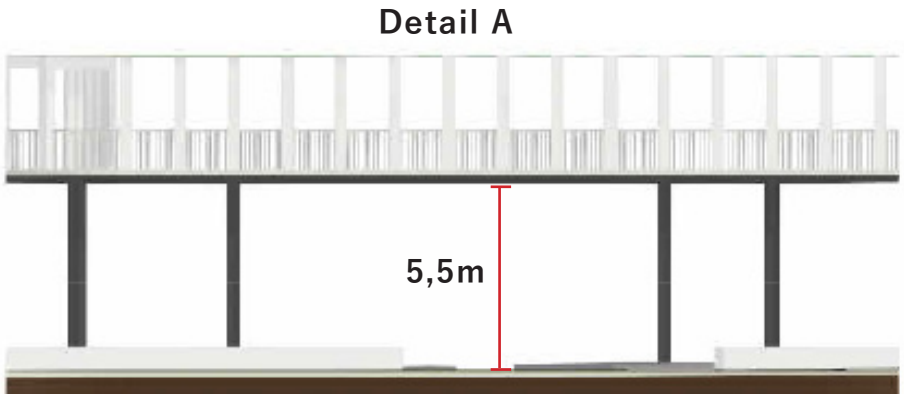
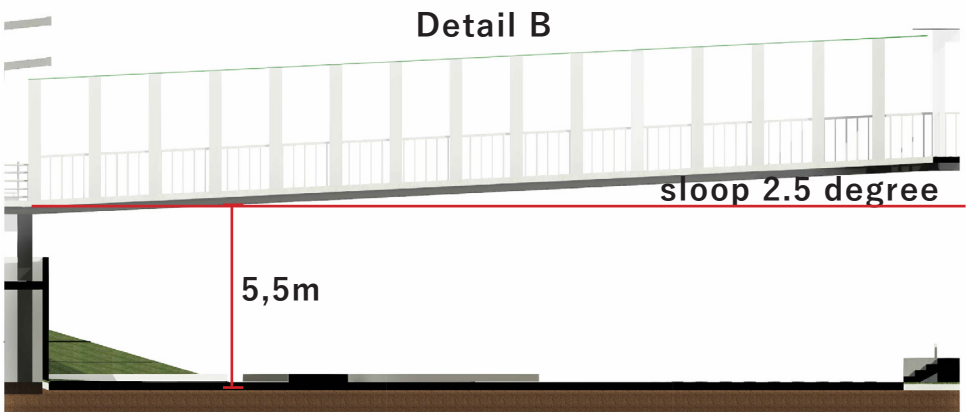


Figure 130: Skybridge Plan (source: author, 2024)

The skybidge in this design has a height of 5.5 meters to ensure that it does not obstruct vehicles passing on the main road or within the building grounds. The height is in accordance with the minimum standards set for fire fighting vehicle access based on applicable regulations, thus ensuring safety and accessibility in emergency conditions.





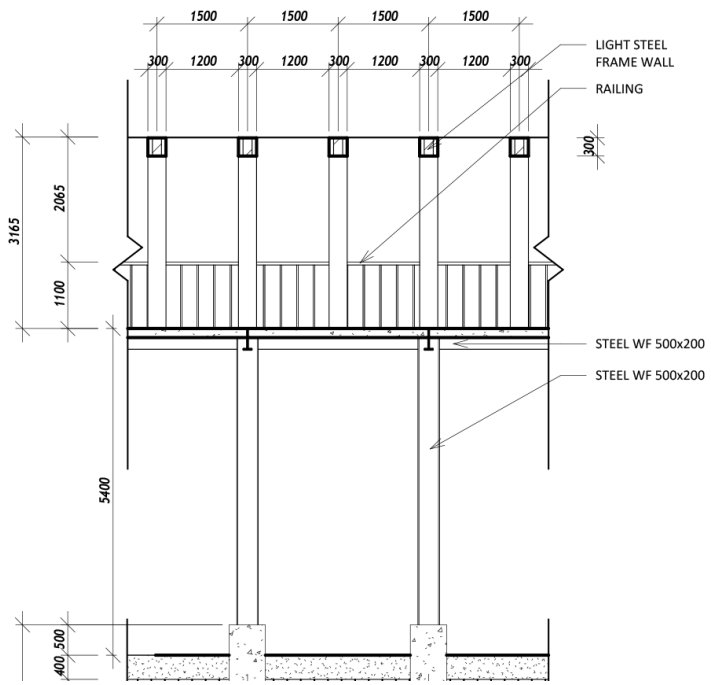


Figure 131: Skybridge Explanation (source: author, 2024)

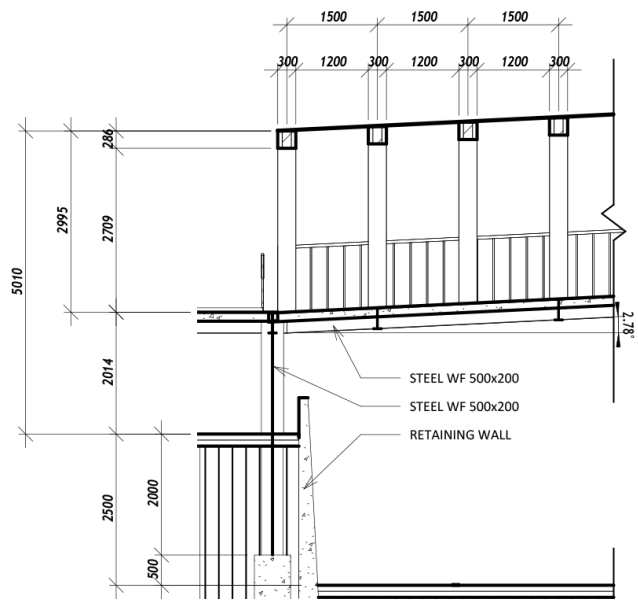


Figure 132: Skybridge Explanation (source: author, 2024)

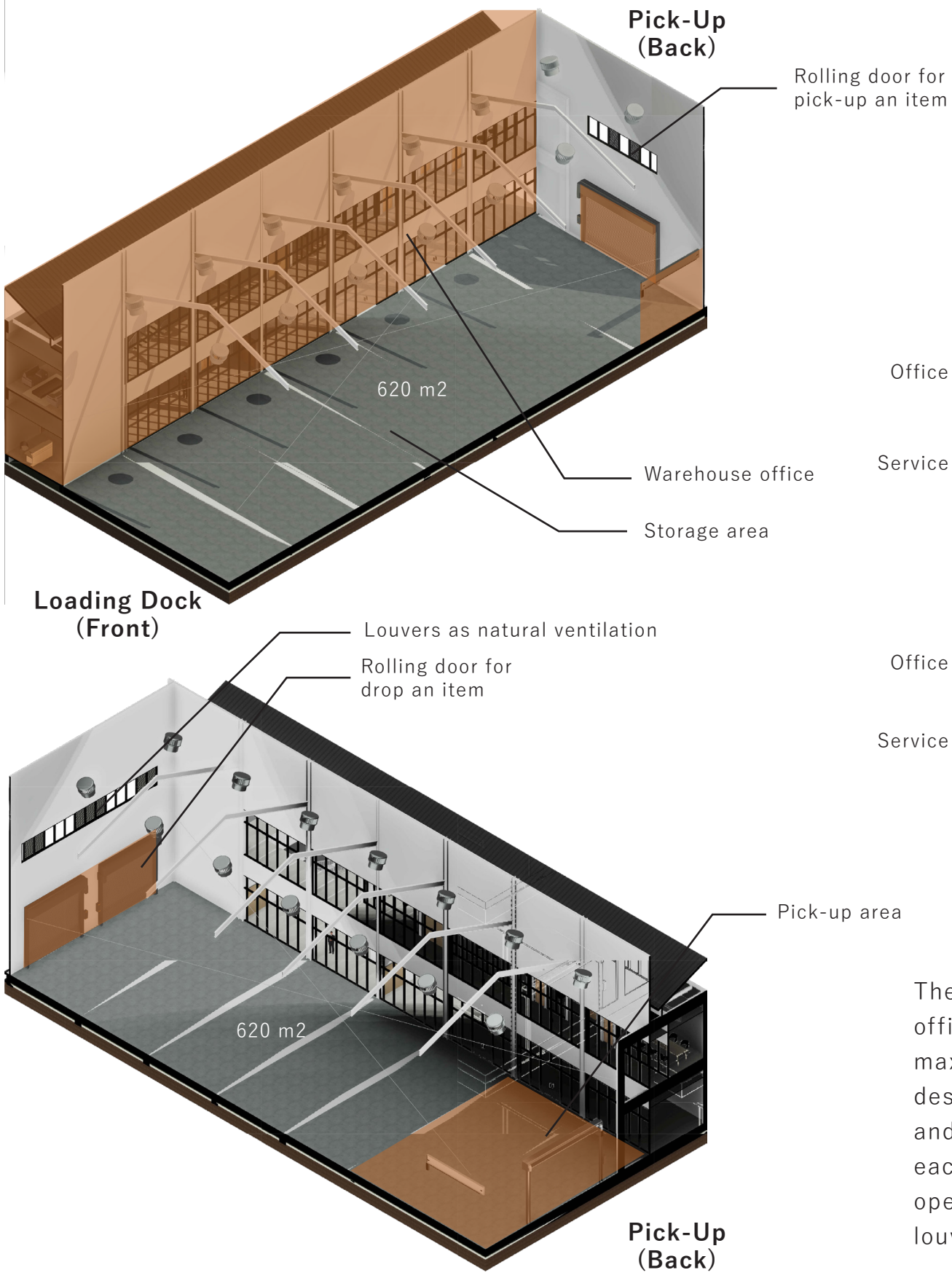


Figure 133: Warehouse Scheme (source: author, 2024)

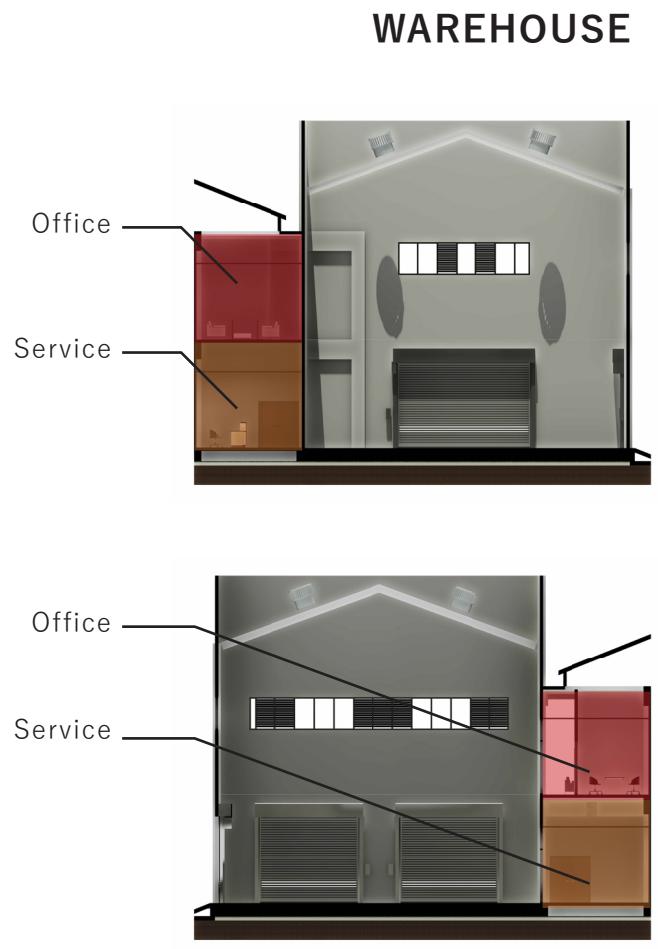


Figure 134: Warehouse Scheme (source: author, 2024)

The divider between the warehouse and the office uses a wall with full glass openings to maximize the circulation of natural light. This design also allows office staff to monitor and maintain goods more easily. In addition, each side of the warehouse is equipped with openings in the form of glass windows and louvers that function as natural ventilation.

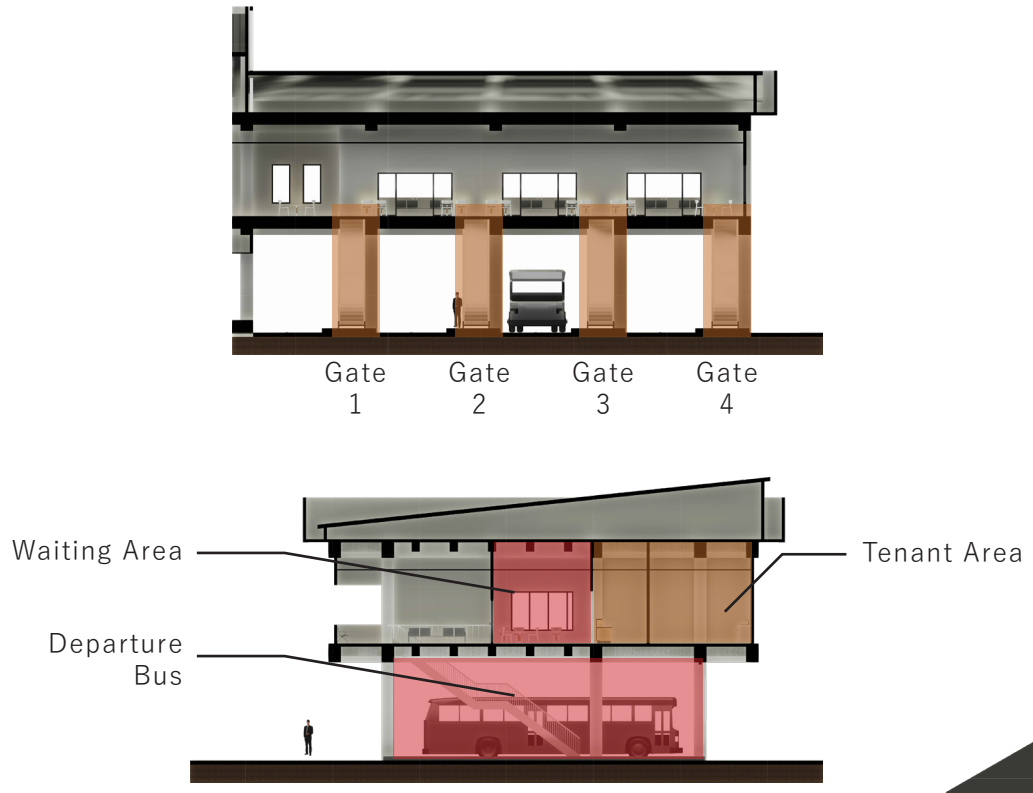


Figure 135: Interior Solving
(source: author, 2024)

DETAIL INTERIOR SOLVING

In the departure area, the waiting room is placed on the 2nd floor. Departure passengers will disembark through the designated stairs according to the gate to their respective destination buses. This waiting room is designed to meet the various needs of passengers by providing a choice of air-conditioned and non-air-conditioned rooms, thus providing comfort according to user preferences.

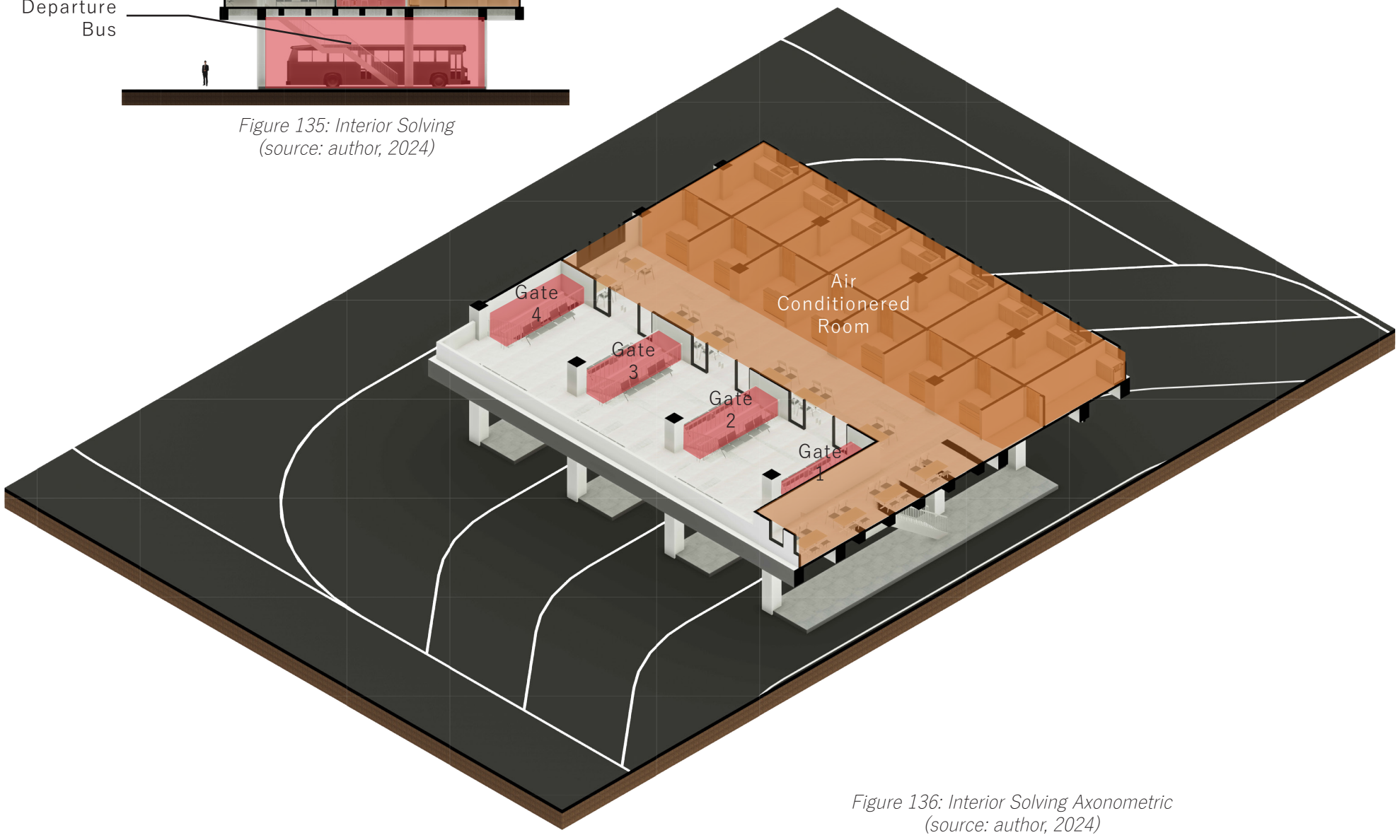
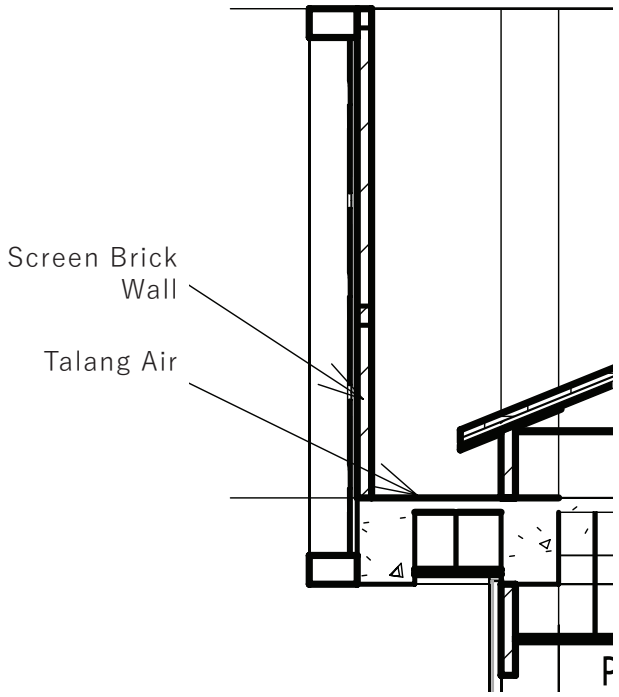


Figure 136: Interior Solving Axonometric
(source: author, 2024)

ROOF DESIGN

Since the design is located in a tropical climate near the equator, a gable roof shape was chosen for its ability to drain rainwater well and support optimal air circulation. However, due to the high roof shape, the roof is covered by a screen wall as an application of the hidden roof concept. The screen wall is equipped with a facade designed to beautify the appearance of the building, giving a modern impression while maintaining the aesthetics of the overall design.



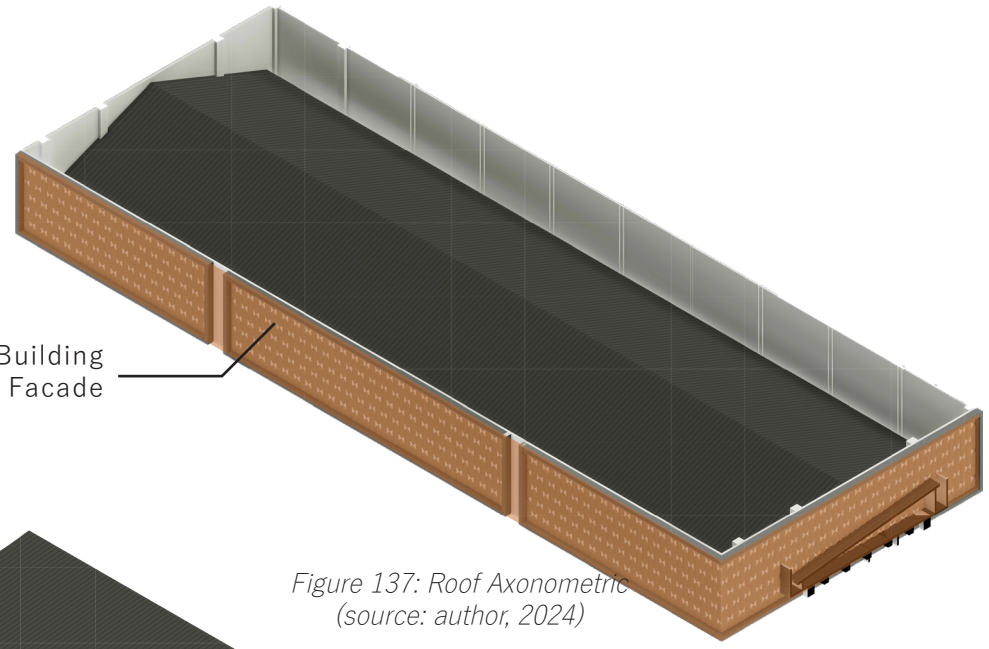


Figure 137: Roof Axonometric (source: author, 2024)

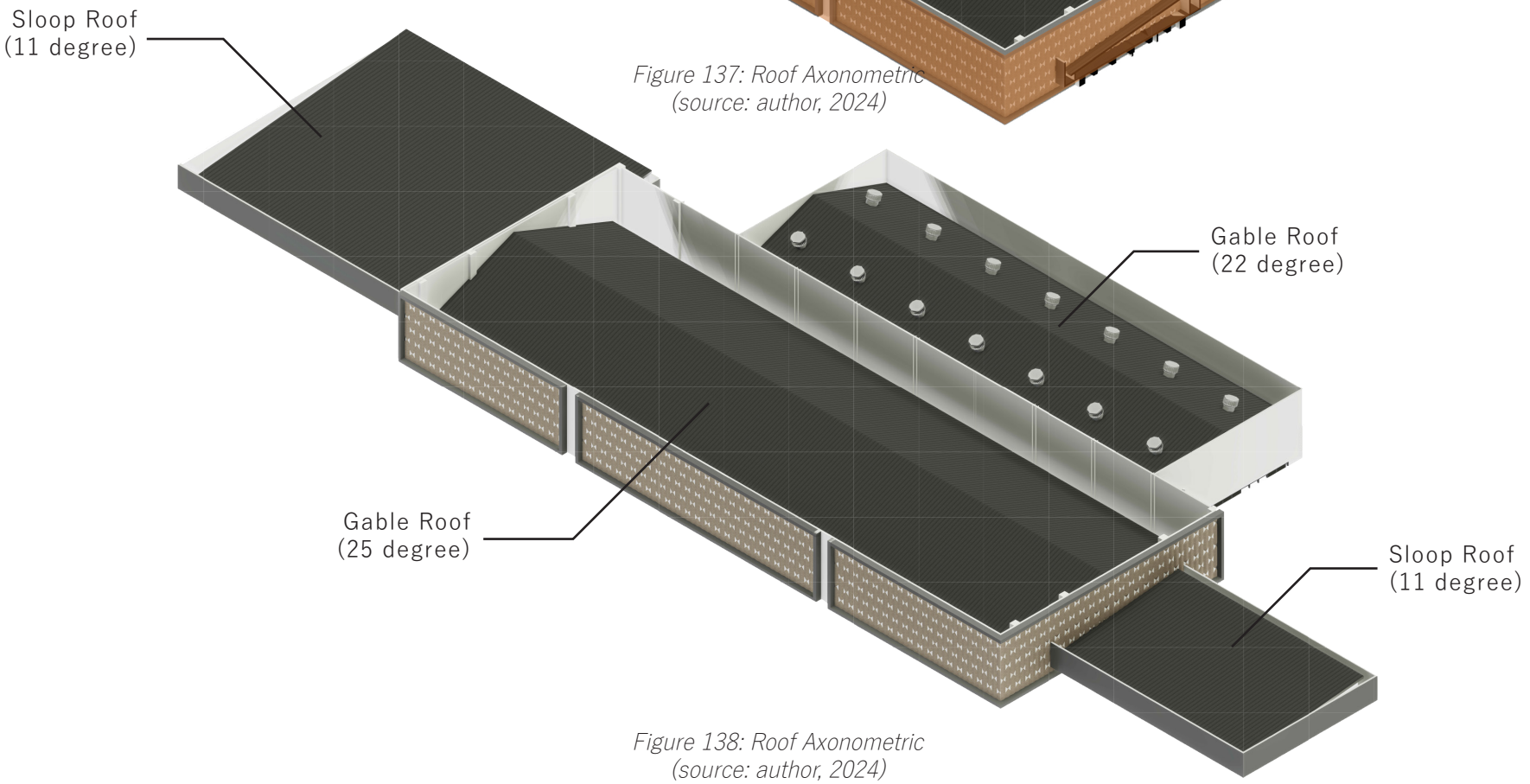


Figure 138: Roof Axonometric (source: author, 2024)

FASAD DESIGN

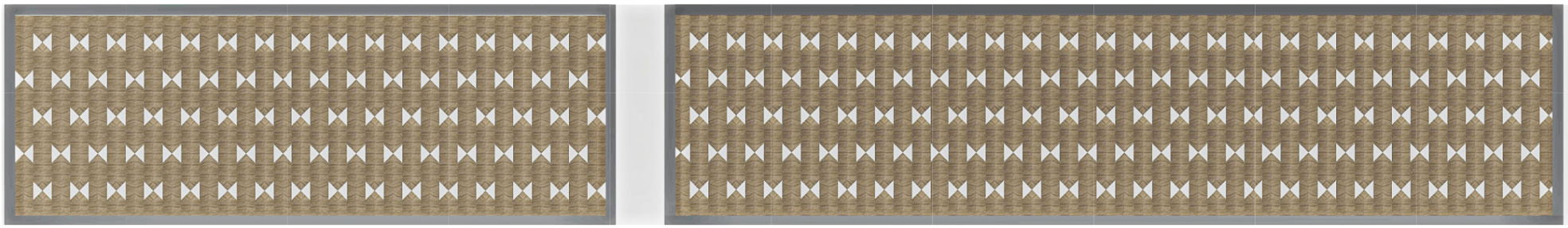


Figure 139: Facade Design
(source: author, 2024)

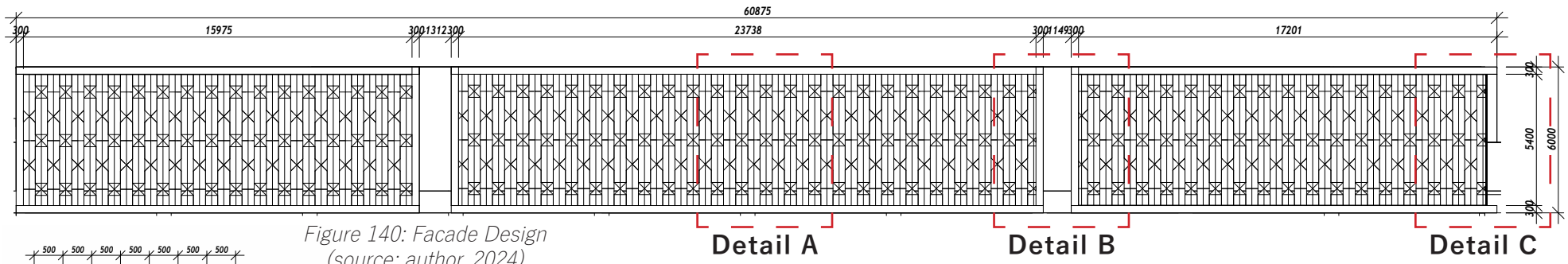


Figure 140: Facade Design
(source: author, 2024)

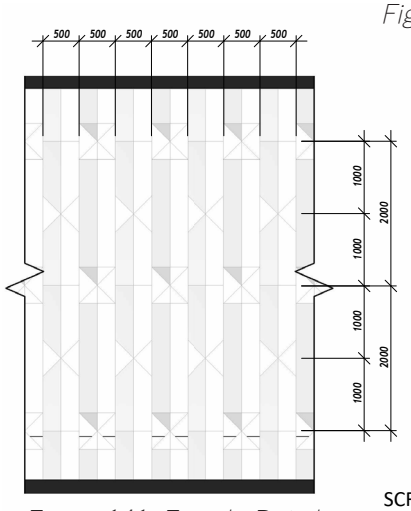


Figure 141: Facade Detail
(source: author, 2024)

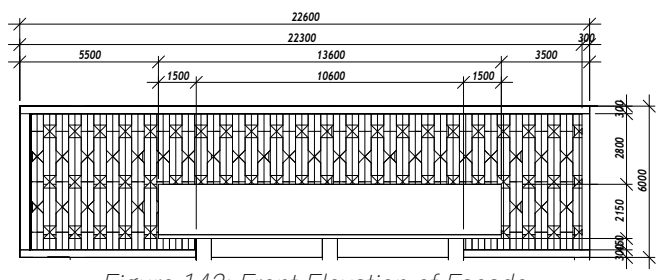


Figure 142: Front Elevation of Facade
(source: author, 2024)

This facade design is inspired by the shape of the Dayak traditional shield, which is characterized by unique traditional carvings. In this design, only the geometric shape is adapted without losing the symbolic value of the shield, but with a modern touch that is more minimalist and aesthetic.

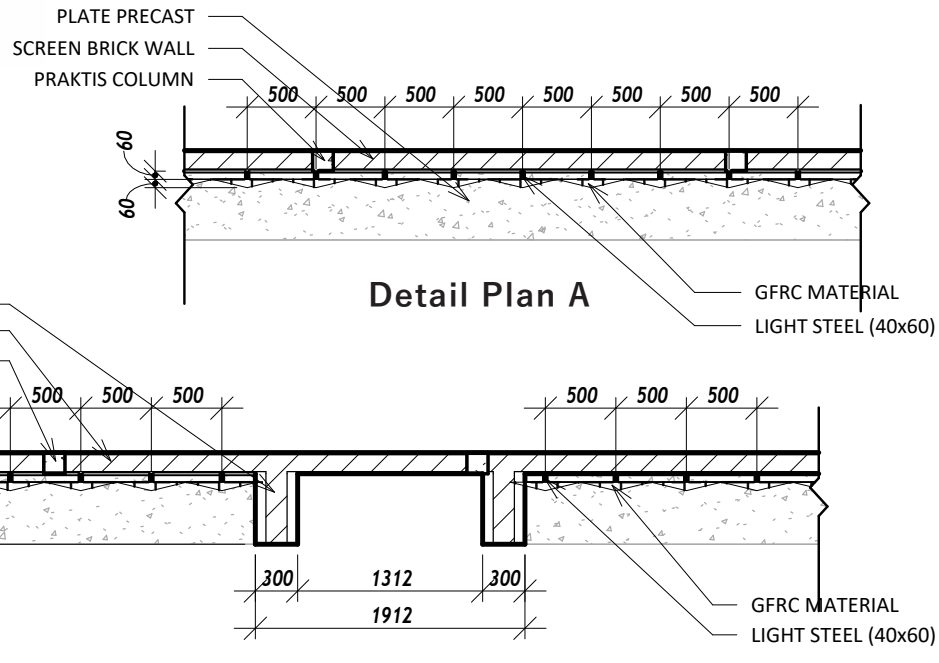


Figure 143: Detail Facade
(source: author, 2024)

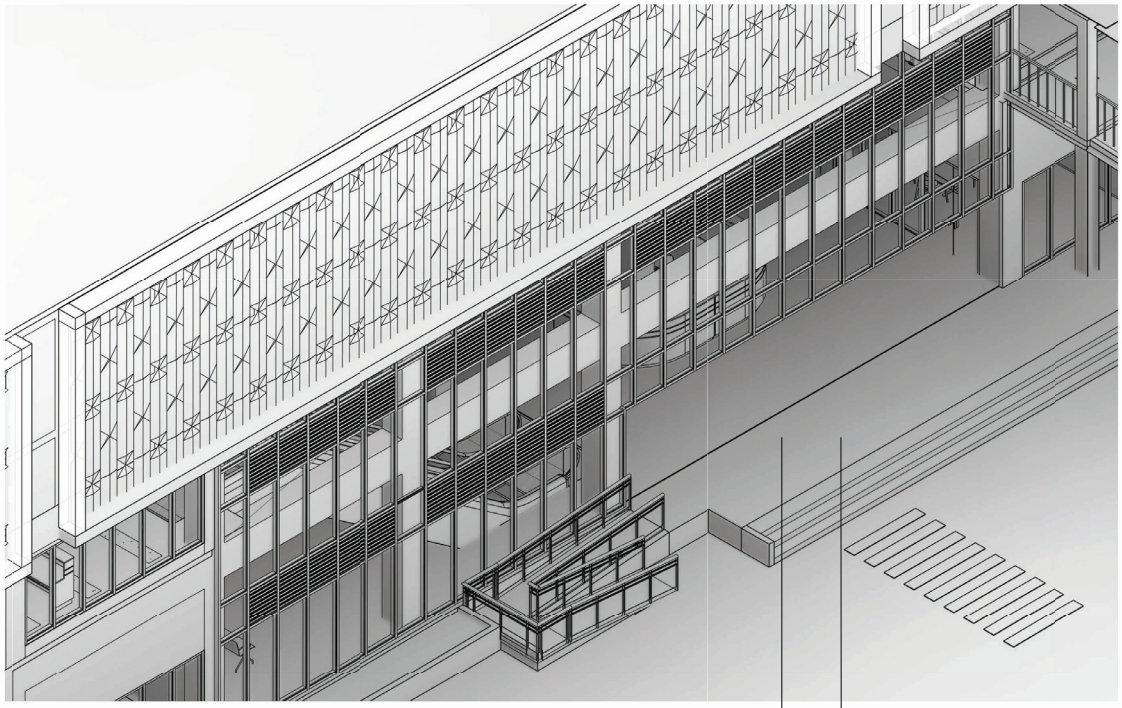


Figure 144: Lobby Arrival
(source: author, 2024)

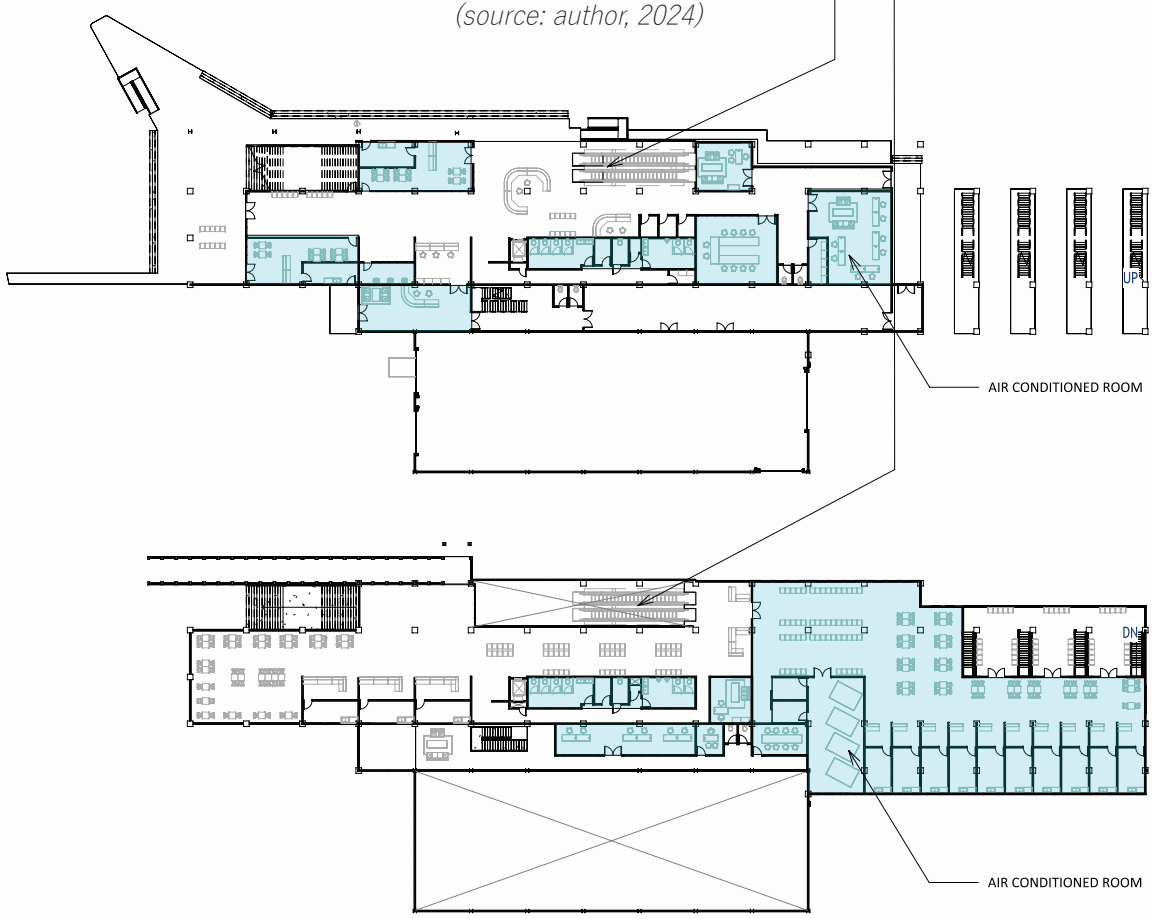


Figure 145: Air Conditionered Room Plan
(source: author, 2024)

NATURAL VENTILATION

Almost 50% of the rooms in this design utilize air conditioning, which is applied only to key spaces to maintain user comfort. Meanwhile, other areas such as the departure lobby and food court area utilize natural ventilation supported by strategic openings and a design that allows for optimal air circulation, thus creating a comfortable and energy-efficient environment.

Figure 146: Detail Opening
(source: author, 2024)

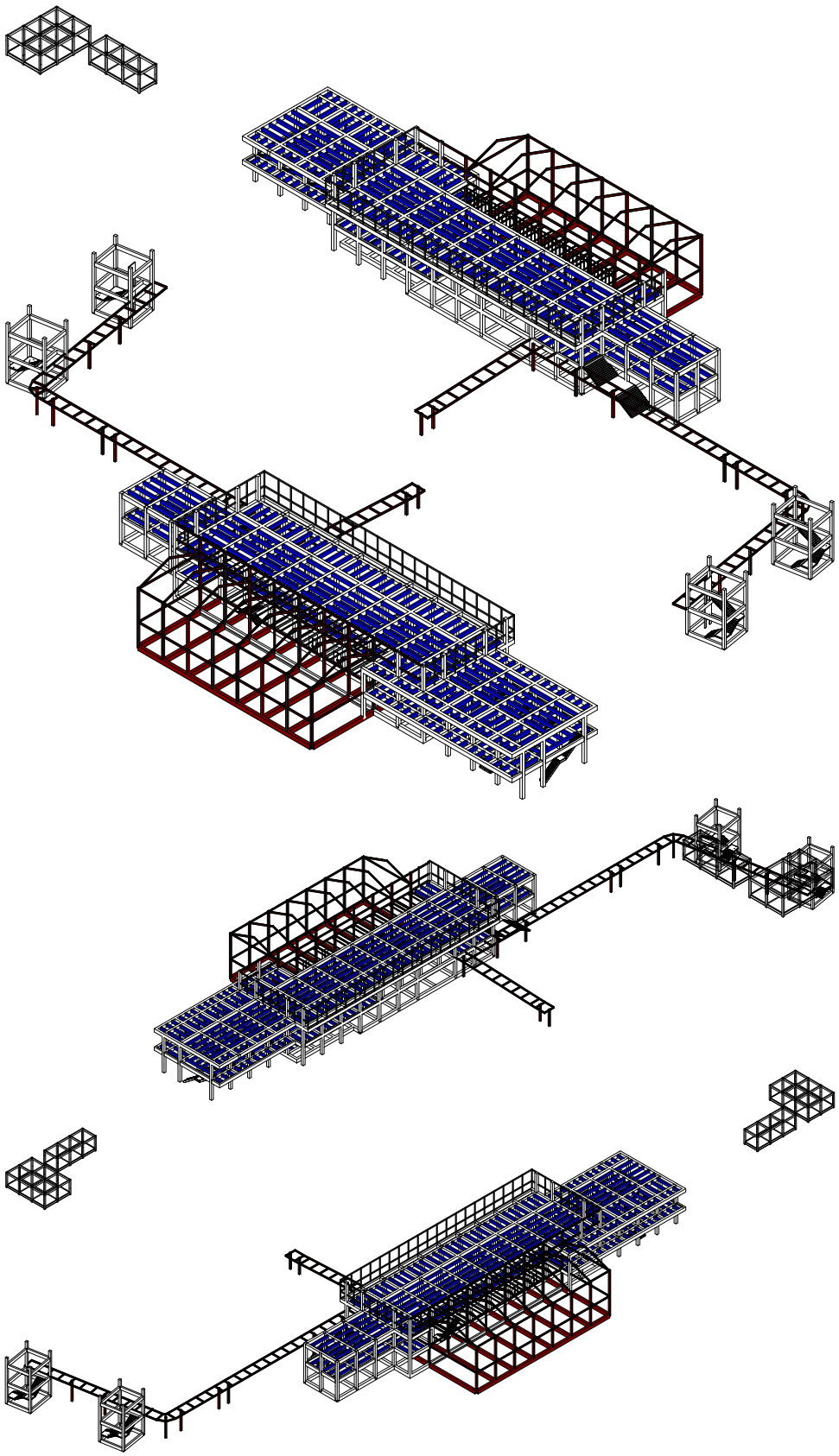


Figure 147: Structure Axonometric
(source: author, 2024)

The span of the beams in this building is quite varied, 5m, 6, 10m. However, to determine the size of the beam, the longest span is 10m.

Beam Size:
- 1/12 x max span
- 1/12 x 10 m = 830mm ---> 900mm
- beam width = 1/2 x 900mm = 450mm

Rounded up to 900m in consideration of the load on the living building and the function of the building.

Beam Joist:
- 2/3 x beam height
- 2/3 x 900mm = 600mm
- joist width = 1/2 x 600mm = 300mm

Column Size:
- Beam width + 100
- 450 + 100 = 550mm ---> 600mm

Thickness of Plate:
- 15cm ---> M-Mercantile (Storage) building function

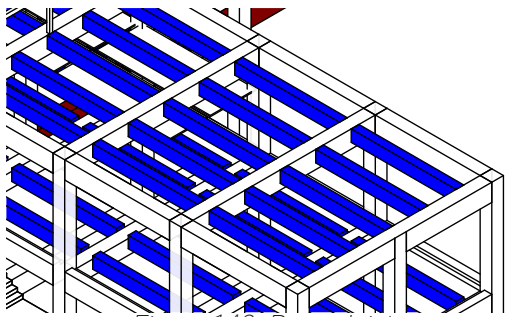


Figure 148: Beam Joist
(source: author, 2024)

Concrete structure
(Column 60x60)
(Beam 60x90)

Steel structure
(Column I-WF 350x175X7X11)
(Beam I-wf 250x125x6x9)

Joist Beam
(Concrete Beam 40X60)
(Steel Beam 200x100x5,5x8)

The spacing between child beams in this design is 1.8 meters, with a total area of 10 m^2, which is still below the maximum allowable 12 m^2. For the floor slab, the thickness was designed at 15 cm, ensuring sufficient structural strength to support the building load, while meeting applicable safety and stability standards.

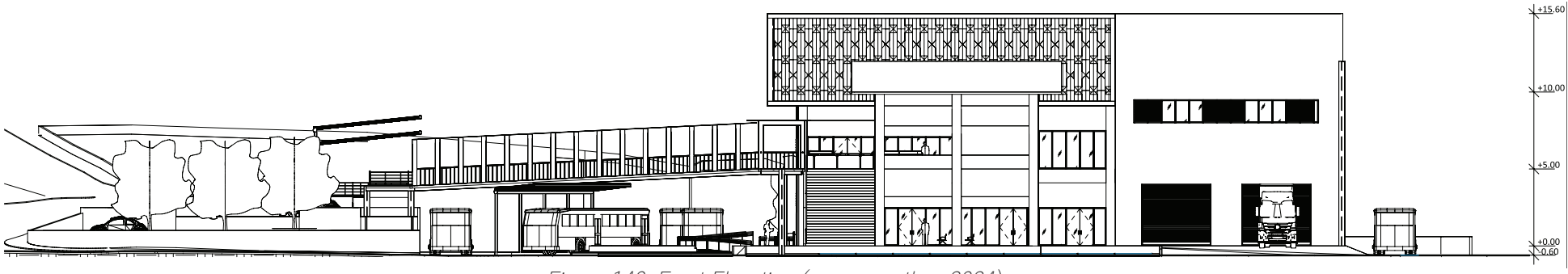


Figure 149: Front Elevation (source: author, 2024)

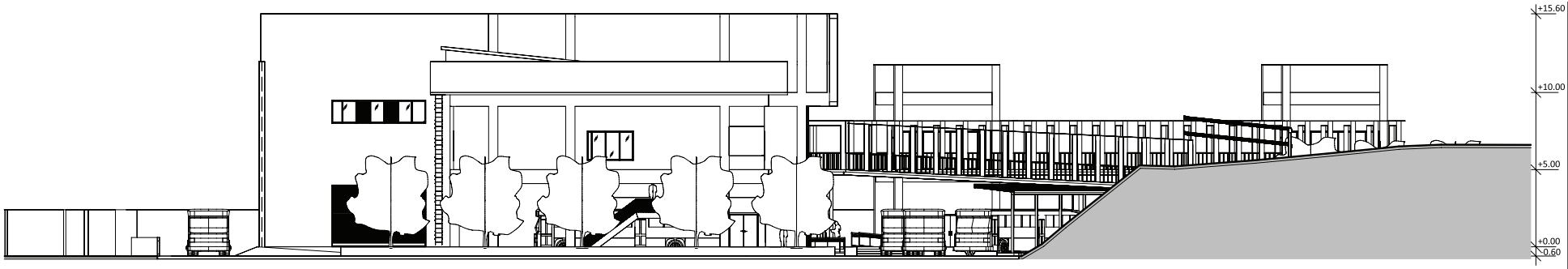


Figure 150: Back Elevation (source: author, 2024)

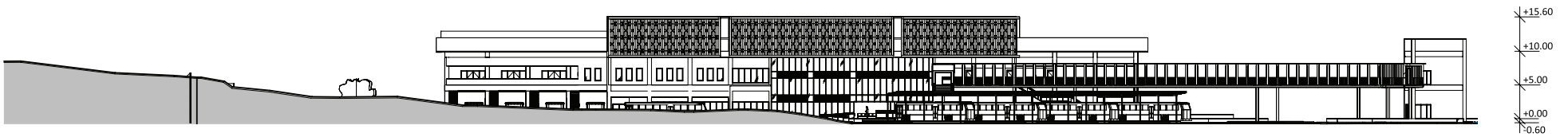


Figure 151: Right Elevation (source: author, 2024)

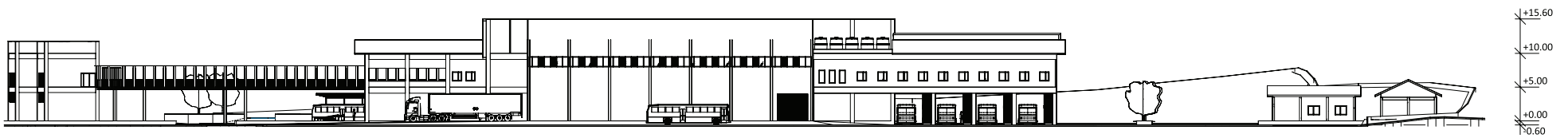


Figure 152: Left Elevation (source: author, 2024)

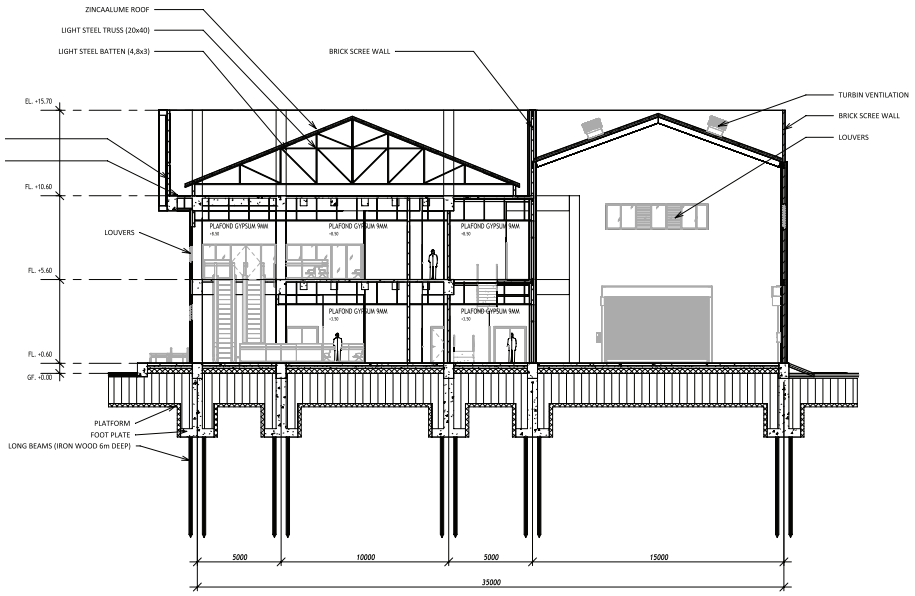


Figure 153: Terminal Section
(source: author, 2024)

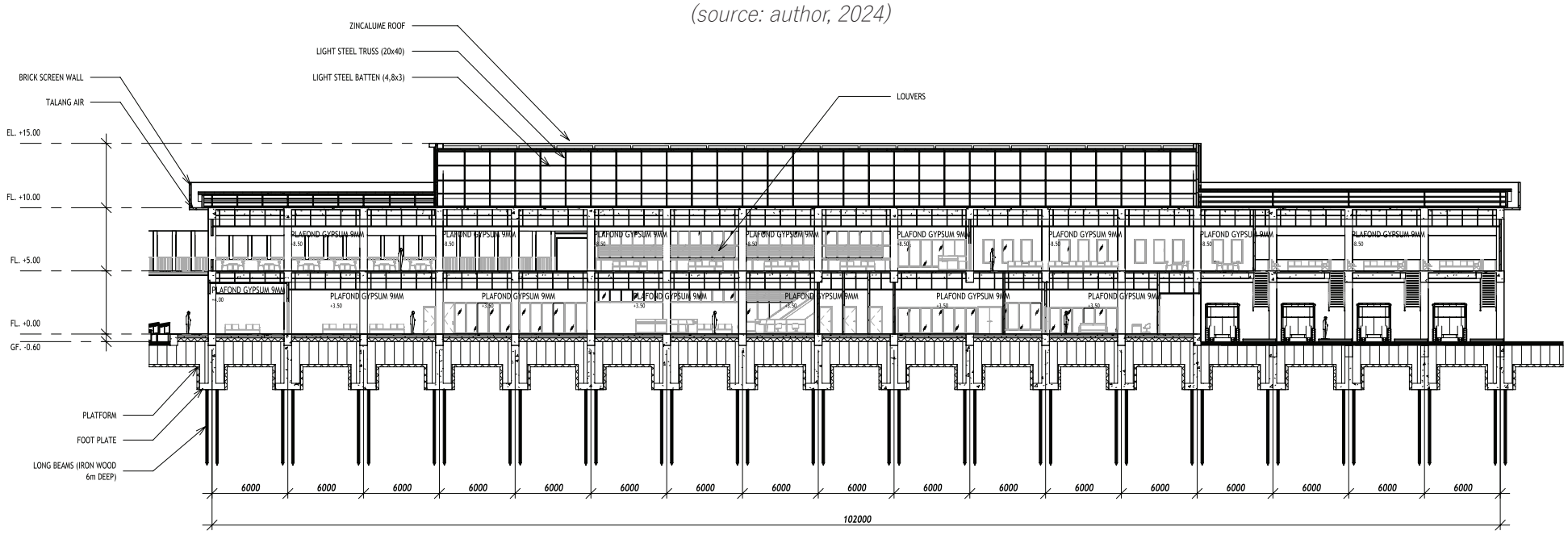


Figure 154: Terminal Section
(source: author, 2024)

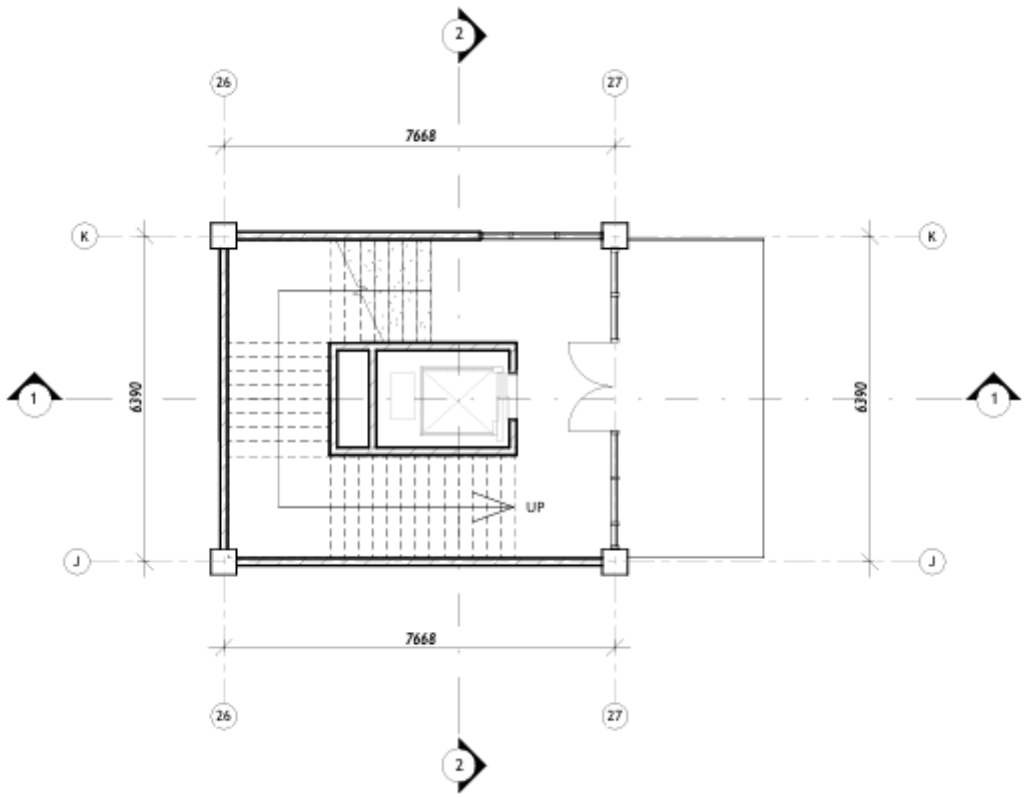


Figure 155: Skybridge Tower Plan
(source: author, 2024)

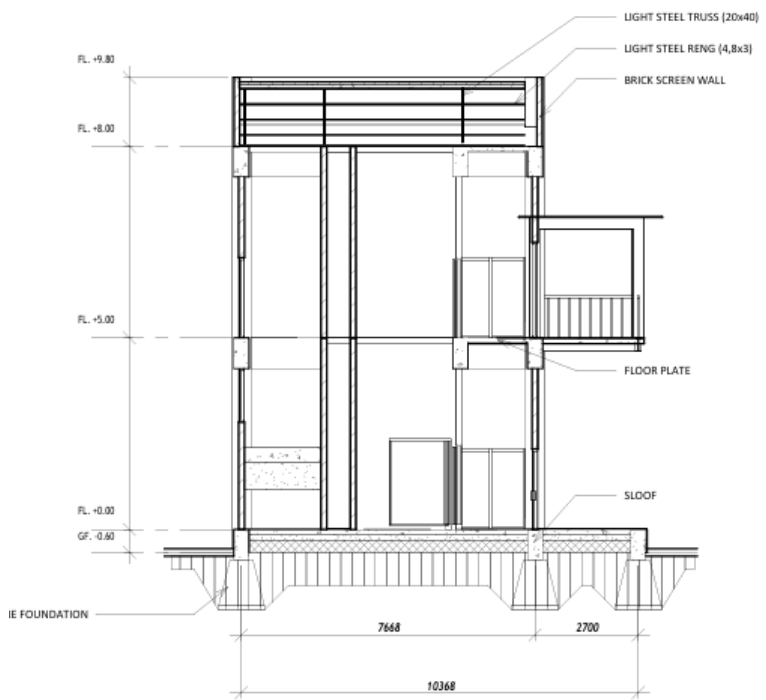


Figure 157: Skybridge Tower Section
(source: author, 2024)

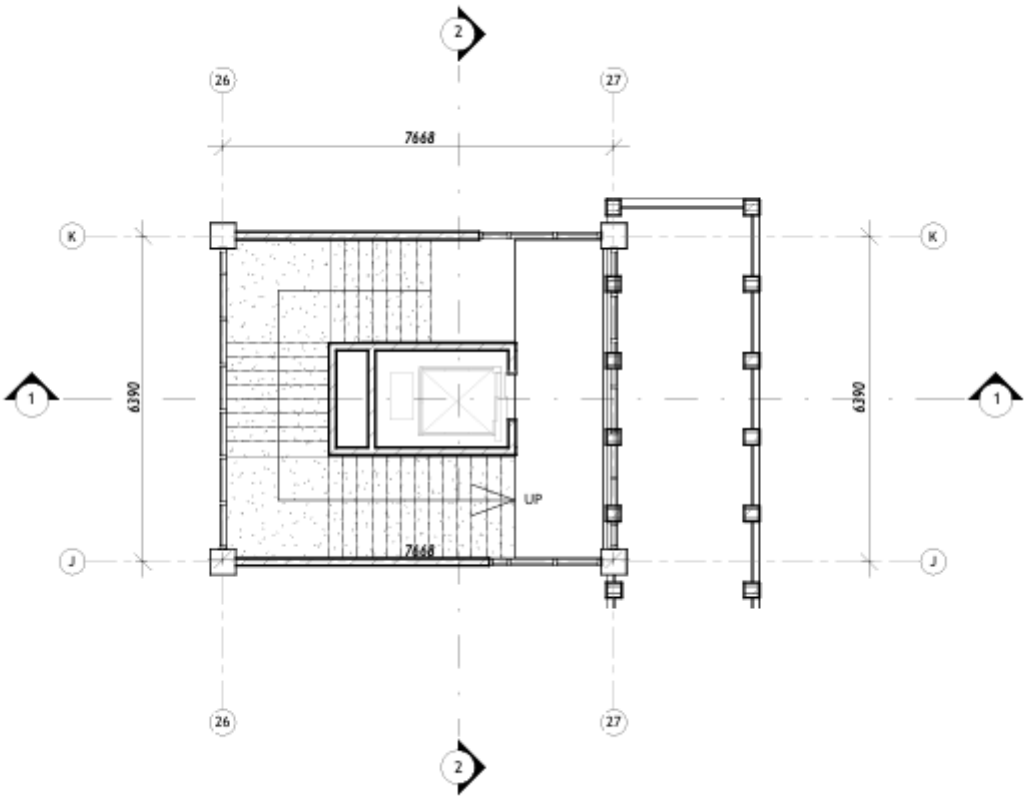


Figure 156: Skybridge Tower Plan
(source: author, 2024)

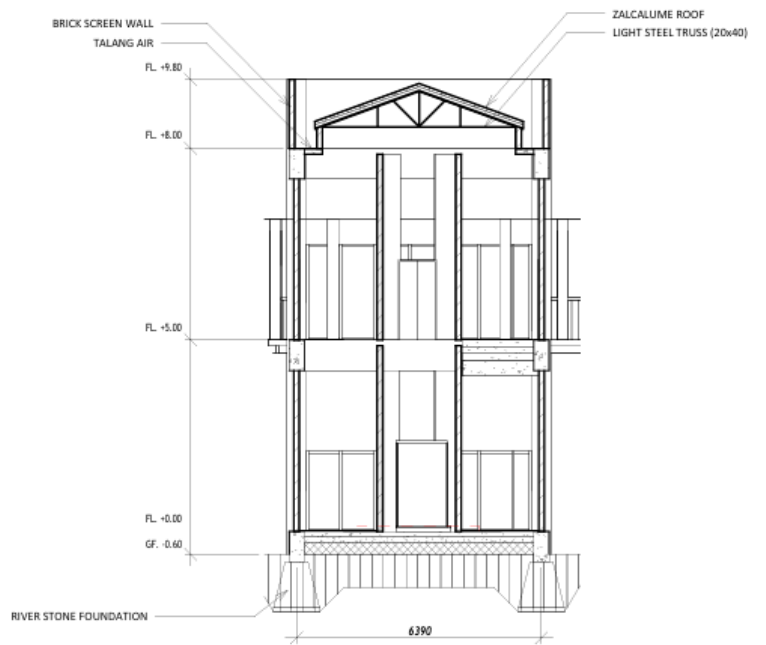


Figure 158: Skybridge Tower Section
(source: author, 2024)

Figure 159: Front Elevation
(source: author, 2024)

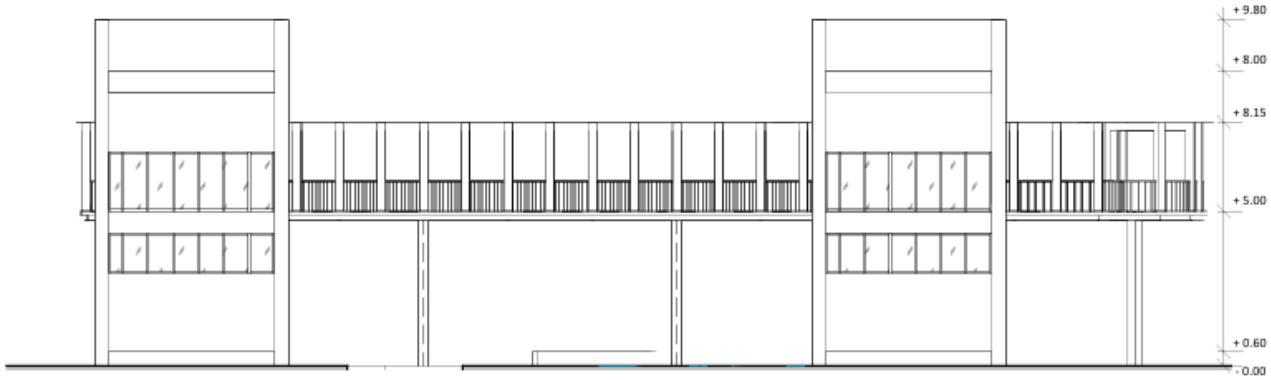


Figure 160: Back Elevation
(source: author, 2024)

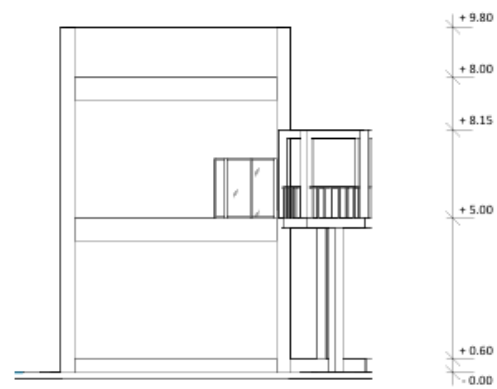


Figure 161: Right Elevation
(source: author, 2024)

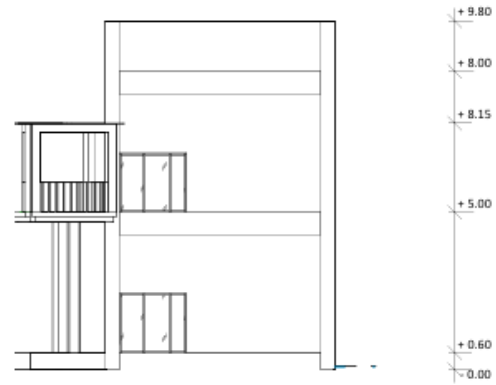


Figure 162: Left Elevation
(source: author, 2024)

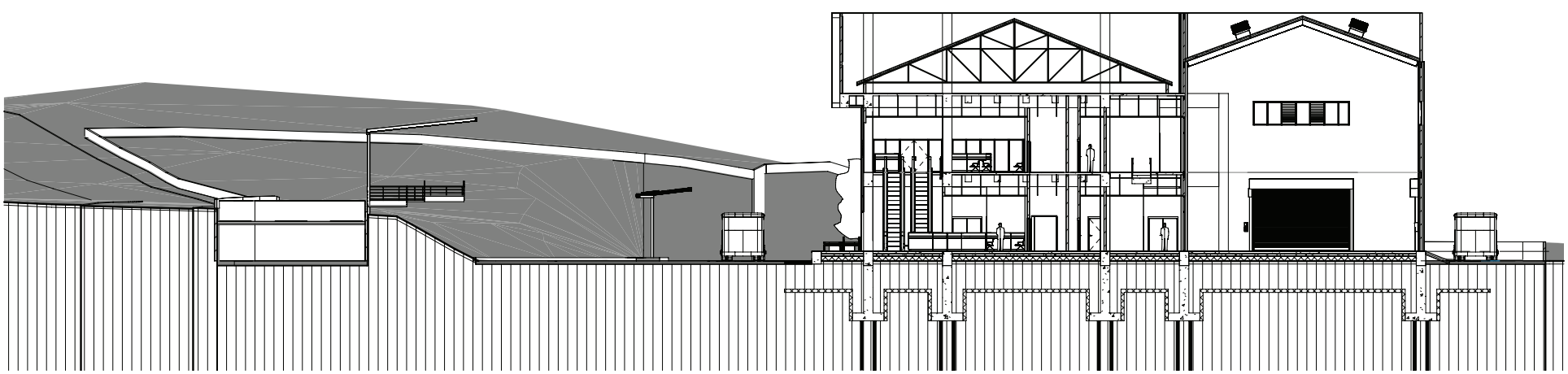


Figure 163: Site Section
(source: author, 2024)

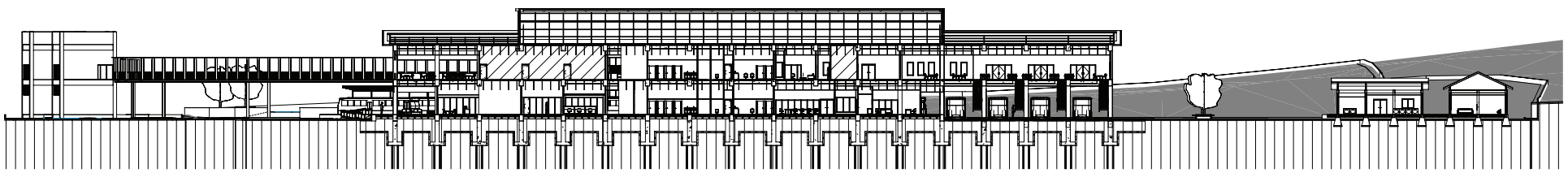


Figure 164: Site Section
(source: author, 2024)

Figure 165: Exterior render
(source: author, 2024)

Figure 166: Exterior Render
(source: author, 2024)

BILL OF QUANTITY

COST BUDGET PLAN

NO		DESCRIPTION OF PLANNING	VOLUME		UNIT PRICE		AMOUNT
I		**MASONRY AND PLASTERING WORK PLAN**					
	1	Brick wall (1st and 2nd floor toilets)	539.00	m²	Rp	122,250.00	Rp65,892,750.00
	2	Brick wall (1st and 2nd floor)	4,621.00	m²	Rp	118,800.00	Rp548,974,800.00
	3	Mixed plastering (1st and 2nd floor toilets)	539.00	m²	Rp	49,350.00	Rp26,599,650.00
	4	Mixed plastering (1st and 2nd floor)	4,621.00	m²	Rp	46,350.00	Rp214,183,350.00
	5	Concrete wall (Grade K475)	38.00	m3	Rp	1,850,000.00	Rp70,300,000.00
						Sub Amount	**Rp925,950,550.00**
II		**FLOOR AND WALL TILE WORK PLAN**					
	1	Polished ceramic floor 60x60cm 1st floor	1,431.00	m²	Rp	114,780.00	Rp164,250,180.00
	2	Polished ceramic floor 60x60cm 2nd floor	1,646.00	m²	Rp	114,780.00	Rp188,927,880.00
	3	Unpolished ceramic floor 40X20cm	1,546.00	m²	Rp	129,840.00	Rp200,732,640.00
	4	Plain ceramic floor 20x20cm for 1st floor toilet	58.00	m²	Rp	116,590.00	Rp6,762,220.00
	5	Plain ceramic floor 20x20cm for 2nd floor toilet	68.00	m²	Rp	116,590.00	Rp7,928,120.00
	6	Andesite stone tiles on the lobby wall	60.00	m²	Rp	129,900.00	Rp7,794,000.00
	7	Ceramic floor for stairs 40X40cm	931.00	m²	Rp	114,780.00	Rp106,860,180.00
						Sub Amount	**Rp683,255,220.00**
III		**ROOFING WORK PLAN**					
	1	Light steel roof truss installation	1,681.71	m²	Rp	155,120.00	Rp260,866,855.20
	2	Zincalume roof installation	2,867.00	m²	Rp	103,000.00	Rp295,301,000.00
	3	Zincalume nok/ridge installation	161.80	m	Rp	35,000.00	Rp5,663,000.00
						Sub Amount	**Rp561,830,855.20**
IV		**CEILING WORK PLAN**					
	1	Ceilling frame 50x100cm (1st and 2nd floor)	3,058.00	m²	Rp	79,400.00	Rp242,805,200.00
	2	GRC Plafond 100x100cm, 4cm thick (1st and 2nd floor toilets)	2,934.00	m²	Rp	72,480.00	Rp212,656,320.00
	3	Gypsum Plafond, thick 9mm (1st and 2nd floor)	124.00	m²	Rp	166,300.00	Rp20,621,200.00
						Sub Amount	**Rp476,082,720.00**
V		**FRAME, DOOR AND WINDOW WORK PLAN**					
	1	Alumunium frame (1st and 2nd floor)	3.68	m³	Rp	2,990,000.00	Rp11,003,200.00
	2	Glass door leaf, 5mm Daun pintu kaca 5mm	37.80	m²	Rp	114,000.00	Rp4,309,200.00
	3	PVC door leaf and frame/fabrication (1st and 2nd floor)	12.00	bh	Rp	662,600.00	Rp7,951,200.00
	4	Samarinda kamper wood frame 6/15 (1st and 2nd floor)	11.16		Rp	8,730,000.00	Rp97,426,800.00
	5	Camphor wood frame teakwood double panel door leaf (1st and 2nd floor)	113.40		Rp	473,450.00	Rp53,689,230.00
	6	Aluminum frame shutters (1st and 2nd floor)	665.83	m²	Rp	738,000.00	Rp491,382,540.00

VI	**DOOR AND WINDOW ACCESSORIES WORK PLAN**						
	1	Door locks, 2 slaag (1st and 2nd floor)	62.00	bh	Rp	293,400.00	Rp18,190,800.00
	2	Toilet door lock (1st and 2nd floor)	12.00	bh	Rp	114,900.00	Rp1,378,800.00
	3	Standard 4 inch door hinges (1st and 2nd floor)	222.00	bh	Rp	47,300.00	Rp10,500,600.00
	4	Engsel jendela standar 3 inci (1st and 2nd floor)	54.00	bh	Rp	27,900.00	Rp1,506,600.00
	5	Double door deadbolt (1st and 2nd floor)	8.00	bh	Rp	95,500.00	Rp764,000.00
	6	Window door deadbolt (1st and 2nd floor)	27.00	bh	Rp	83,500.00	Rp2,254,500.00
	7	Louvers	49.10	bh	Rp	850,000.00	Rp41,735,000.00
	8	Plain glass, 5mm (1st and 2nd floor)	665.83	m²	Rp	117,000.00	Rp77,902,110.00
						Sub Amount	**Rp154,232,410.00**
VII	**PAINTING WORK PLAN**						
	1	Good quality wall paint (1st and 2nd floor)	10,320.00	m²	Rp	74,040.00	Rp764,092,800.00
	2	Medium quality wall paint ceiling (1st and 2nd floor)	6,116.00	m²	Rp	54,540.00	Rp333,566,640.00
	3	Kusen cat minyak (lantai 1 dan 2)	34.57	m²	Rp	73,850.00	Rp2,552,699.10
	4	Daun pintu cat minyak (lantai 1 dan 2)	26.46	m²	Rp	73,850.00	Rp1,954,071.00
						Sub Amount	**Rp1,102,166,210.10**
VIII	**FACADE WORK PLAN**						
	1	Glass fiber reinforced concrete (GFRC)	23.00	bh	Rp	390,000.00	Rp8,970,000.00
	10	Light steel façade frame, 4x6cm	596.00	bh	Rp	135,200.00	Rp80,579,200.00
						Sub Amount	**Rp89,549,200.00**
IX	**INFRASTRUCTURE WORK PLAN**						
	1	Lift and installation	3.00	bh	Rp	350,000.00	Rp1,050,000.00
	2	Escalator and installation	2.00	bh	Rp	670,000,000.00	Rp1,340,000,000.00
						Sub Amount	**Rp1,341,050,000.00**

RECAPITULATION OF COST BUDGET PLAN

NO	DESCRIPTION	AMOUNT	TOTAL
I	PERSIAPAN	5%	Rp857,125,619.00
II	PEKERJAAN STRUKTURAL	30%	Rp5,142,753,716.00
III	PEKERJAAN ARSITEKTURAL	35%	Rp5,999,879,335.30
IV	PEKERJAAN MEP	20%	Rp3,428,502,477.00
V	PAKERJAAN LANSEKAP	10%	Rp1,714,250,667.00
	JUMLAH TOTAL		**Rp17,142,512,385.00**
	PAJAK PPN (12%)		**Rp2,057,101,486.00**
	TOTAL		**Rp19,199,613,871.00**
	DI BULATKAN		**Rp19,200,000,000.00**

Terbilang : Nineteen Billion, Two Hundred Million

PAYBACK PERIOD

NO	DESCRIPTION	VOLUME	SATUAN	UNIT	PRICE	PER-DAY	PER-MONTH	PER YEAR
1	Peron		people	200	Rp2,000.00	Rp400,000.00	Rp12,000,000.00	Rp144,000,000.00
2	Parking FEE		bh	100	Rp5,000.00	Rp250,000.00	Rp15,000,000.00	Rp180,000,000.00
3	Locket tenant	5	m2	3	Rp2,000,000.00		Rp6,000,000.00	Rp72,000,000.00
4	Big tenant	72	m2	2	Rp60,000,000.00		Rp120,000,000.00	Rp1,440,000,000.00
5	Medium tenant	30	m2	3	Rp200,000.00/m		Rp18,000,000.00	Rp216,000,000.00
6	Small tenant	22.5	m2	10	Rp200,000.00/m		Rp45,000,000.00	Rp540,000,000.00
7	ATM	15	m2	4	Rp10,000,000.00		Rp3,300,000.00	Rp40,000,000.00
8	Warehouse	930	m2	1	Rp800,000,000.00		Rp66,000,000.00	Rp800,000,000.00
				GRASS INCOME			**Rp285,300,000.00**	**Rp3,432,000,000.00**
	Water and Energy			10%				Rp343,200,000.00
	Management			5%				Rp171,600,000.00
				INCOME				**Rp2,917,200,000.00**
INCOME AFTER TAX								**Rp2,917,200,000.00**
TOTAL INVESMENT								**Rp19,200,000,000.00**
PAYBACK PERIOD								**6,5 years**

In the calculation of the Cost Budget Plan (RAB), a rough estimate was made with an allocation of 35% for architectural components, while the rest was allocated to preparation, structure, mechanical electrical and plumbing (MEP), and landscaping. Based on these calculations, the total RAB of the building is Rp 19.2 billion.

In the Payback Period analysis, calculations were made based on rental prices that are commonly applicable in the Samarinda market. Revenue is calculated from tenant rentals in the terminal building, platform tariffs, and vehicle parking fees. Based on these calculations, an estimated Payback Period of 6.5 years was obtained.

Figure 148: Roof form (source: author, 2024)

Figure 167: Exterior Render
(source: author, 2024)

Figure 168: Exterior Render
(source: author, 2024)

Figure 169: Exterior Render
(source: author, 2024)

Figure 170: Interior Render
(source: author, 2024)

Figure 171: Interior Render
(source: author, 2024)

Figure 172: Interior Render
(source: author, 2024)

Figure 173: Interior Render
(source: author, 2024)

Figure 174: Interior Render
(source: author, 2024)

Figure 175: Interior Render
(source: author, 2024)

05

05 / DESIGN EVALUATION

	DEPARTURE		
	to Balikpapan	to Melak	to Kota Bangun
6:00			
6:15			
6:30			
6:45			
7:00			
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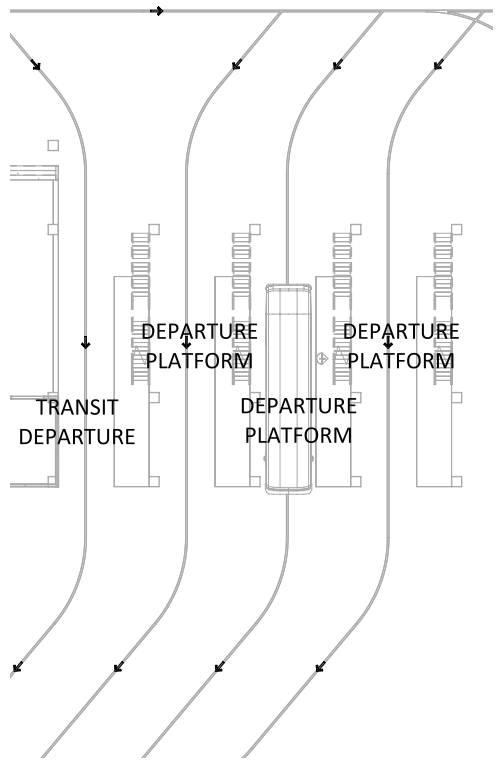
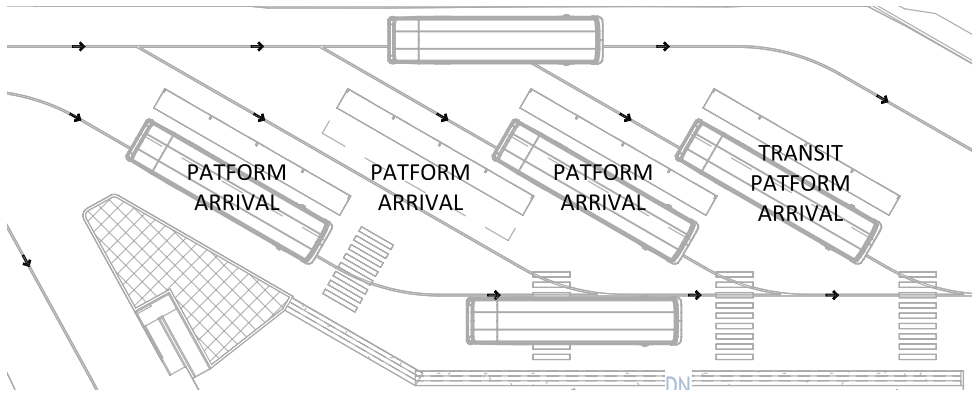
DEPARTURE PLATFORM



In determining the number of departure platforms based on the analysis of the departure schedule at Sungai Kunjang Terminal, it can be seen from the table that there are five simultaneous departure times in one day for the three departure destinations. Therefore, three platforms are required to maximize service during peak hours. In addition, one transit platform is added specifically for destinations to the airport using the Samarinda Damri Bus.

ARRIVAL PLATFORM



Meanwhile, the number of arrival platforms is calculated based on the ratio of bus arrivals at Sungai Kunjang Terminal, assuming buses arrive every 15 minutes from 06:00 to 20:00. It can be concluded that 40 buses arrive every day.

$$\text{Arrival Platform} = \frac{\text{Amount bus x Bus idling time}}{\text{60 minute}}$$

$$= \frac{\text{40 x 5 Minute}}{\text{60 minute}}$$

= 3,33 --> 3 + 1 Transit Platform

= 4 Arrival Platform

NUMBERS OF VISITOR

Data Event Visitor

RUTE	UNIT		VISITIORS	
	Arrive - Departure		Arrive - Departure	
BALIKPAPAN	29	29	39	120
KOTA BANGUN	2	1	52	40
BONGAN	1	1	21	10
MUARA MUNTAI	1	1	15	8
KEMBANG JANGGUT	1	1	15	8
JONGGON	1	1	0	4
SAMBOJA	1	1	6	9
HANDIL	1	1	5	4
Data Terminal Sungai Kunjang Wednesday, 26 April 2023	**37**	**23**	**153**	**203**

Data per Day

TERMINAL	UNIT ARRIVE	UNIT DEPARTURE	PEOPLE ARRIVE	PEOPLE DEPARTURE	YEAR
SUNGAI KUNJANG	11.605 8.608	11.513 8.712	80.476 50.570	79.735 53.200	2018 2019

Dinas Perhubungan Prov Kaltim

Based on terminal visitor data per year, it can be concluded that in 2018 the average terminal visitor reached around 179 people per day. This figure experienced a slight increase in 2019 with an average of 182 visitors per day. However, on the busiest days, such as when there is a major event in Samarinda, the number of visitors only reached around 178 people. This shows that days with special events in Samarinda do not always have a significant surge in visitors compared to the terminal's daily average.

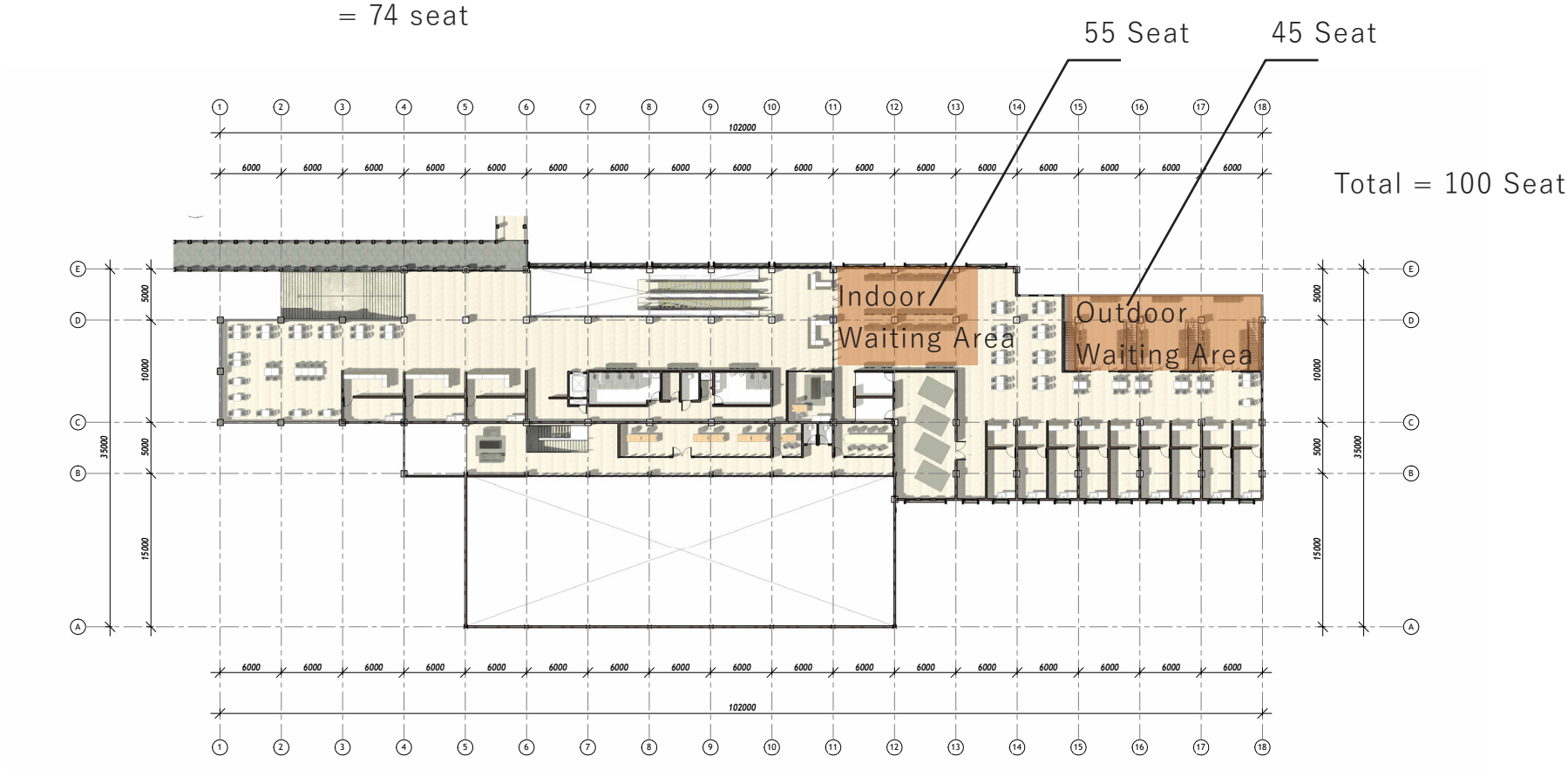
WAITING ROOM REQUIREMENTS

The number of seats required for the terminal waiting area is calculated based on the average number of visitors and additional passengers using DAMRI buses to APT Pranoto Airport. Based on the data, the average terminal visitor reaches 180 people per day. Coupled with DAMRI bus passengers who have departure and arrival intervals every 30 minutes with a capacity of 20 people per bus. Thus, the total need for seats in the terminal waiting room is estimated to be:

/30 menit Bus Arrive and Departure = 2 Bus in 1 Hour
= 2 Bus x Bus Capaciti
= 2 x 20 people
= 40 people + 180 people
= 220 people

One public seating area per 3 people must be provided, so the seats that must be provided at the terminal are:

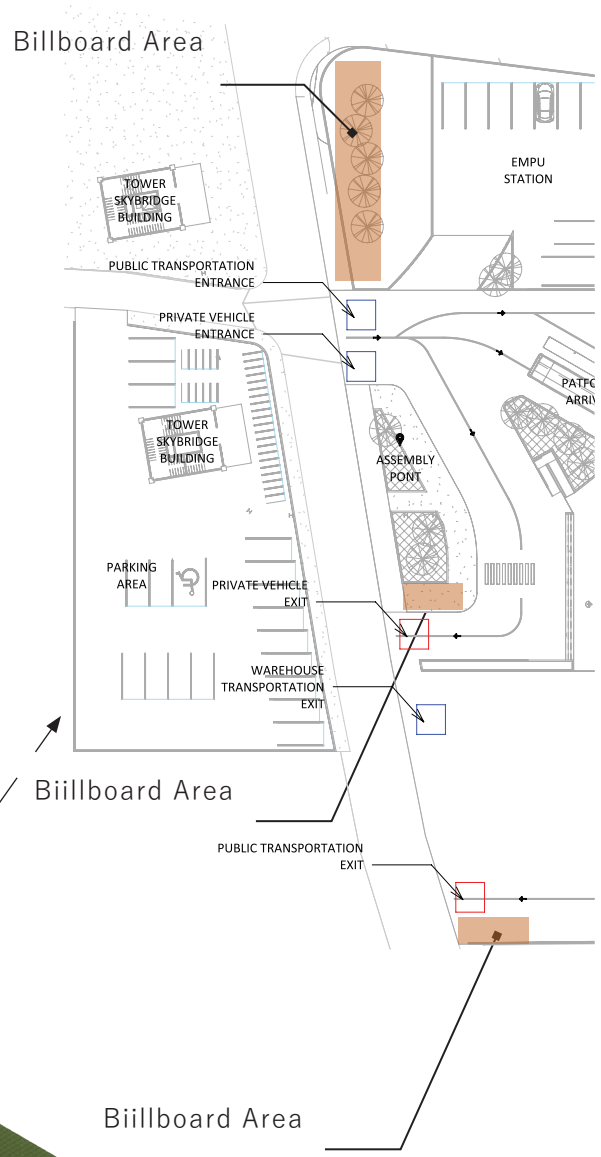
220 people : 3 = 73,3
= 74 seat

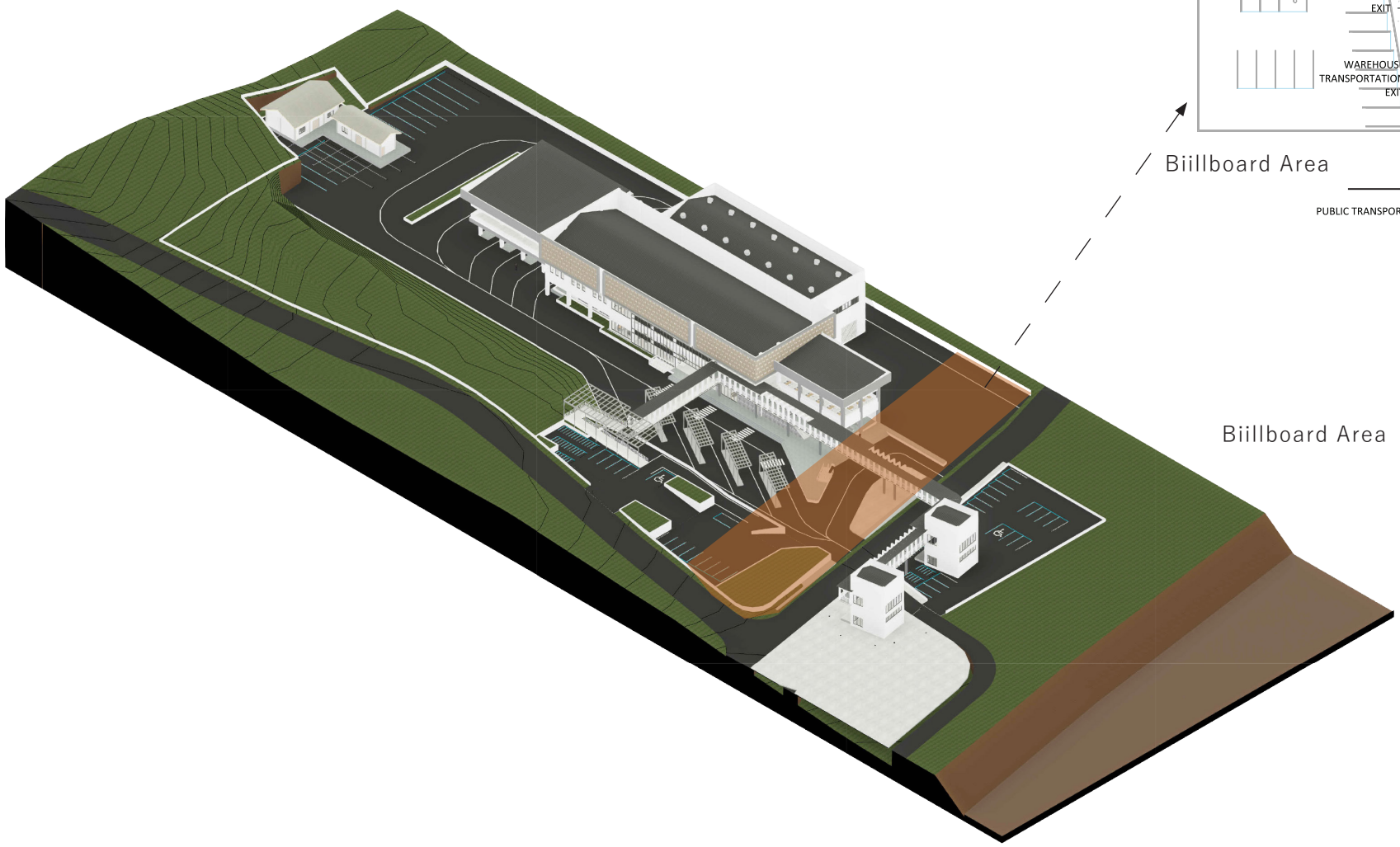


ATTRACT PEOPLE TO TENANT AREA

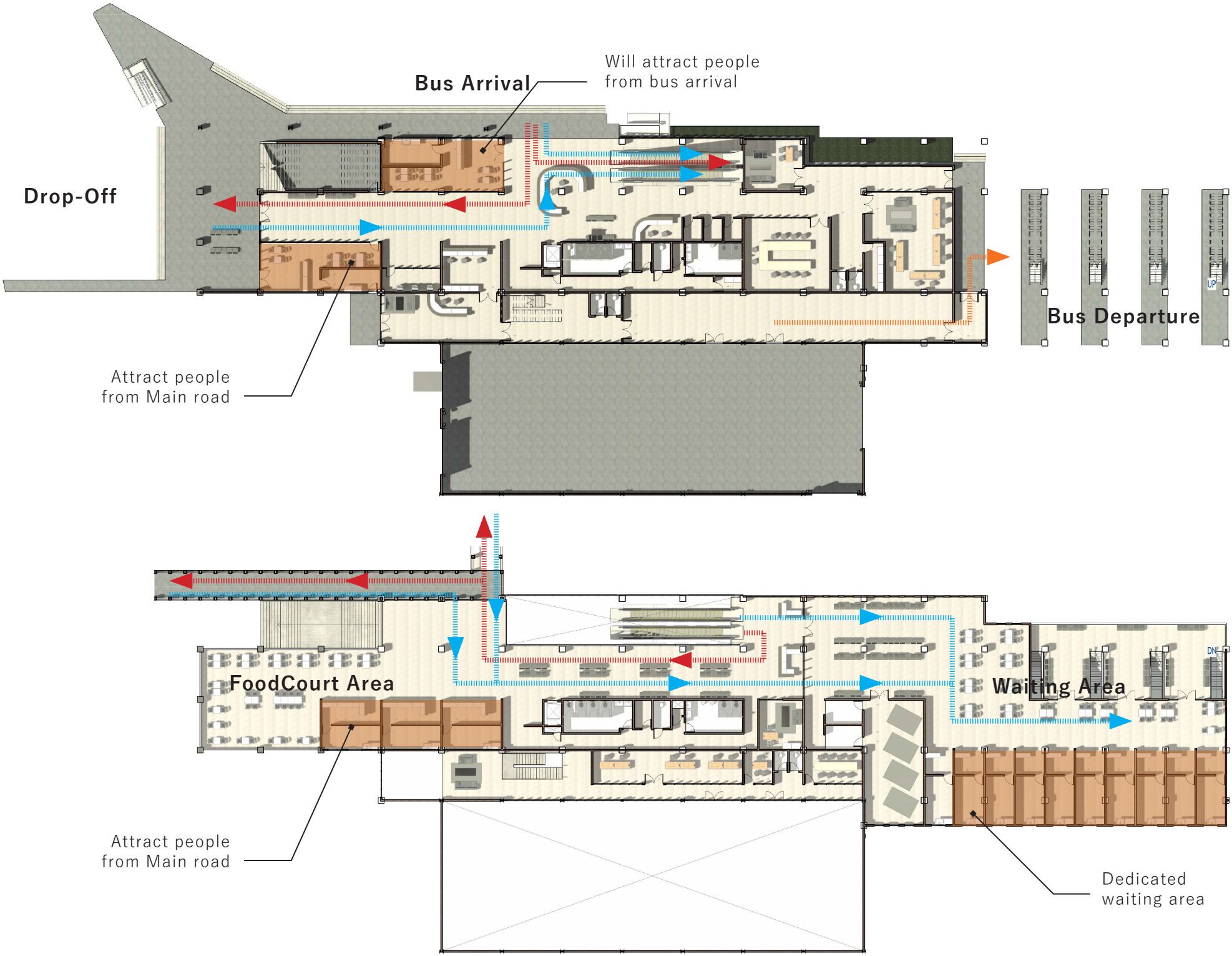
This terminal design maintains the number of function spaces as in the previous building, so the number of tenant spaces in the terminal has not changed. By maintaining the number of tenant spaces, the terminal can still accommodate commercial and service needs for users.

To attract the attention of the public to visit the building without having to use bus facilities, it can be done by installing banners or billboards in front of the building according to the tenants who rent. This design gives tenants the freedom to install billboards, but with predetermined positions to stay in harmony with the aesthetics and layout of the building.

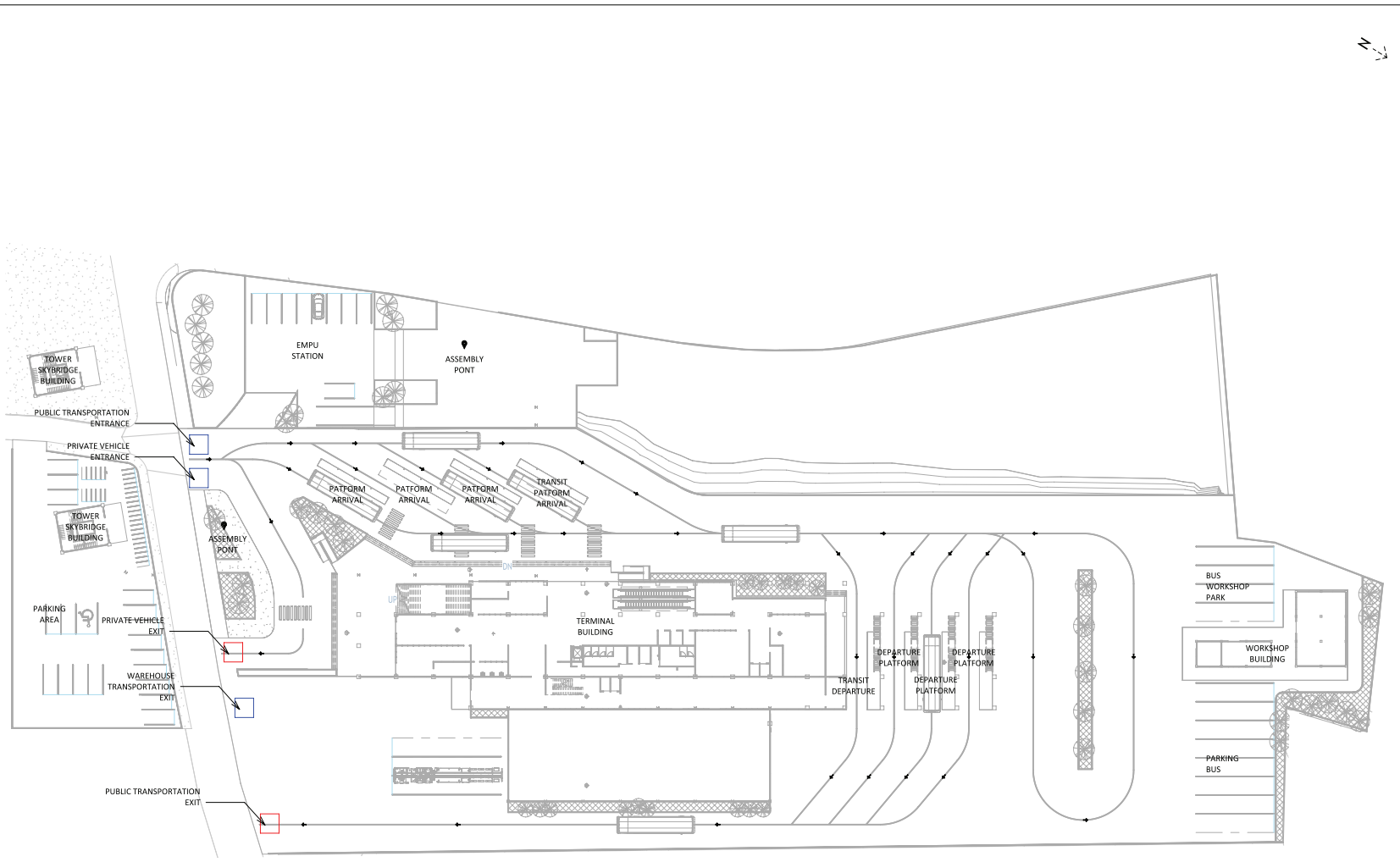




The layout of the space has been designed in such a way as to support efficient human circulation within the building. The strategic placement of tenants, such as the large tenants on the 1st floor, ensures that the flow of user movement naturally passes through the commercial area, thus enhancing convenience as well as accessibility to the various services available.



SITE PLAN REVISION



PEMERINTAH PROVINSI KALIMANTAN TIMUR
DINAS PERHUBUNGAN
Jl. Kesuma Bangsa No. 01, Sungai Pinang Luar, Kec. Samarinda Kota, Kota Samarinda,
Kalimantan Timur, 75123.
Telp. (0541)737267, Samarinda

PROGRAM

MANAGEMENT OF TERMINALS

ACTIVITY

MANAGEMENT OF TYPE B TERMINAL SAMARINDA

WORK PERFORMED

REDESIGN PLANNING OF SUNGAI KUNJANG TERMINAL SAMARINDA

LOCATION

SUNGAI KUNJANG TERMINAL SAMARINDA

PLANNING CONSULTANT

NAME:	SIGN:
HAIRURROHID MULTAZAM	
AGUS SETIAWAN ST., M. Arch., IAI, GP	

IMAGE CHANGES

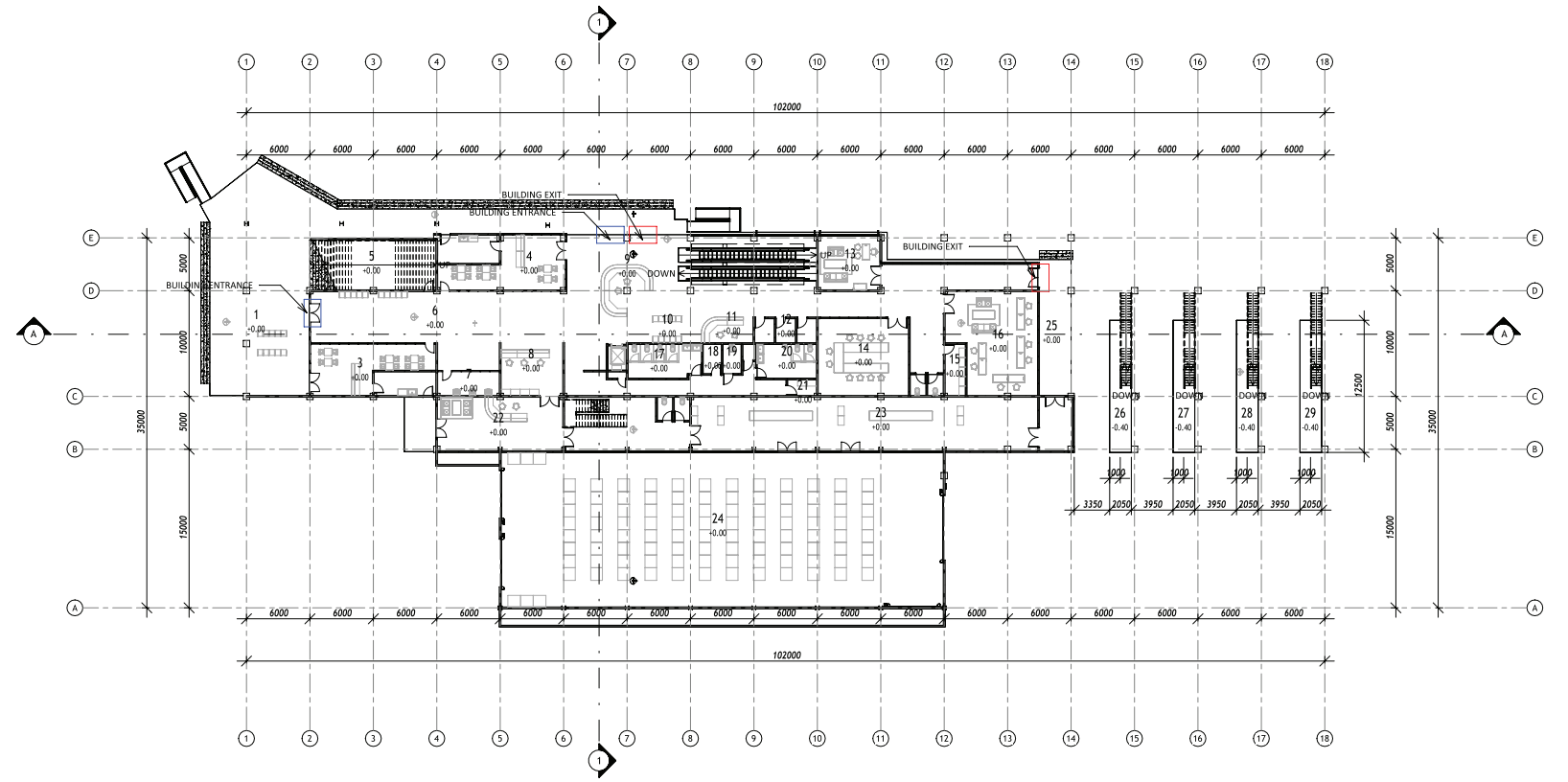
NO.	DATE	REVISION	SIGN

NOTE

IMAGE TITLE	SCALE
SITE PLAN	1 : 450

CODE	PAGE	AMOUNT
	002	29 PAGES

1ST FLOORPLAN REVISION



1 TERMINAL 1ST FLOORPLAN

1 : 300

LEGEND

1.	LOBBY DROP-OFF
2.	LOBBY DEPARTURE
3.	TENANT LOUNGE
4.	TENANT LOUNGE
5.	TENANT LOUNGE
6.	LOBBY
7.	ATM CENTER
8.	ITEM RECIPT
9.	SECURITY ROOM
10.	WAITING AREA

11.	INFORMATION CENTER
12.	TENANT LOCKET
13.	TERMINAL HEADROOM
14.	MEETING ROOM
15.	EMPLOYEE STORAGE ROOM
16.	OFFICE ROOM
17.	WOMEN TOILET
18.	BREASTFEEDING ROOM
19.	DIFABLE ROOM
20.	MEN TOILET

21.	JANITOR ROOM
22.	WAREHOUSE LOBBY
23.	ITEM PACKING AREA
24.	WAREHOUSE STORAGE
25.	ITEM DISTRIBUTION AREA
26.	TRANSIT PLATFORM
27.	DEPARTURE PLATFORM
28.	DEPARTURE PLATFORM
29.	DEPARTURE PLATFORM

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PROGRAM
MANAGEMENT OF TERMINALS

ACTIVITY
MANAGEMENT OF TYPE B TERMINAL SAMARINDA

WORK PERFORMED
REDESIGN PLANNING OF SUNGAI KUNJANG TERMINAL SAMARINDA

LOCATION
SUNGAI KUNJANG TERMINAL SAMARINDA

PLANNING CONSULTANT

NAME:	SIGN:
HAIRURROHID MULTAZAM	
AGUS SETIAWAN ST., M. Arch., IAI, GP	

IMAGE CHANGES

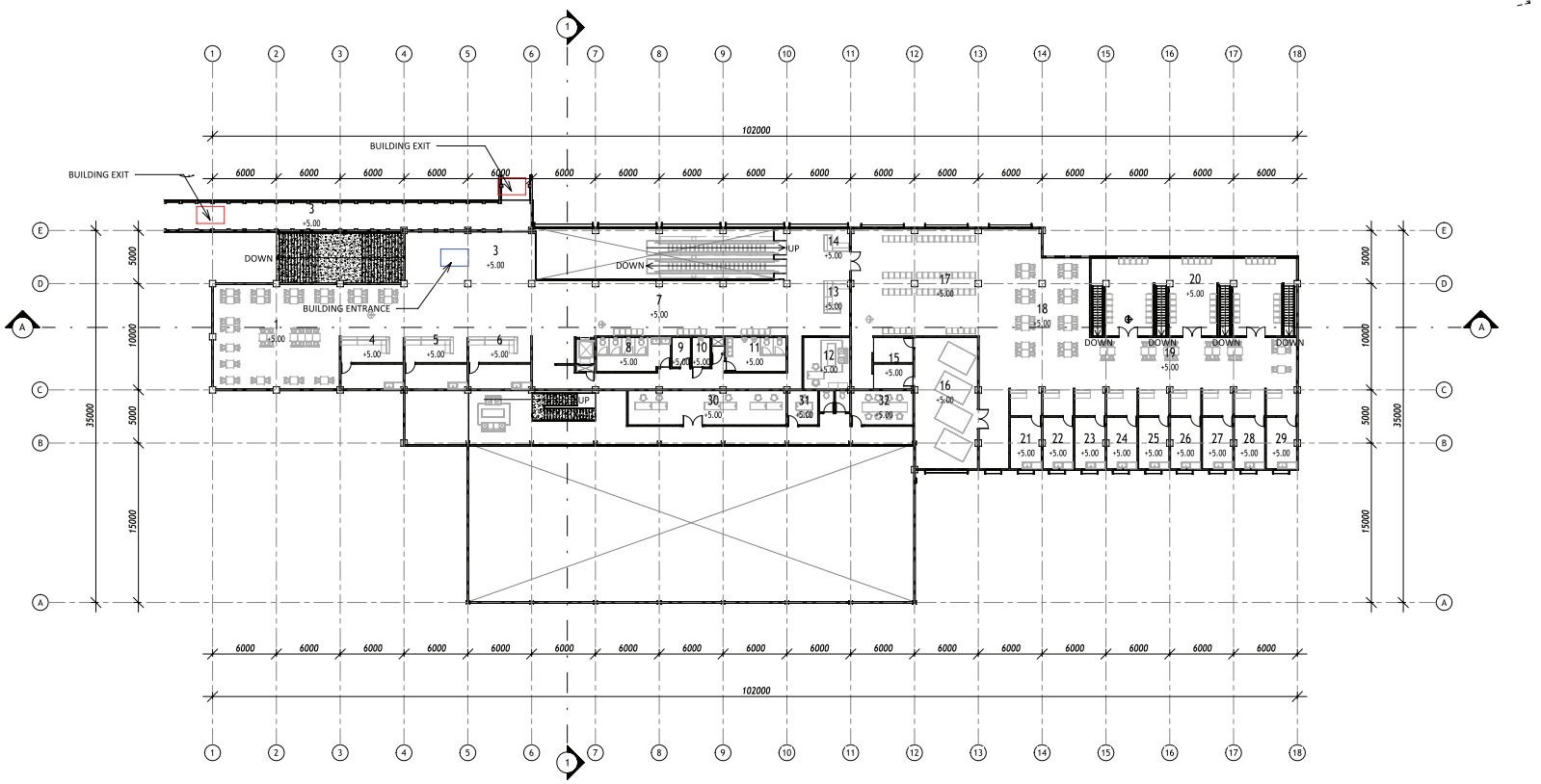
NO.	DATE	REVISION	SIGN

NOTE

IMAGE TITLE	SCALE
TERMINAL FLOOR PLAN	1 : 300

CODE	PAGE	AMOUNT
	003	29 PAGES

2ND FLOORPLAN REVISION



1 TERMINAL 2ND FLOORPLAN
1 : 300

LEGEND

1.	WAITING AREA
2.	LOBBY 2ND FLOOR
3.	SKYBRIDGE
4.	TENANT LOUNGE
5.	TENANT LOUNGE
6.	TENANT LOUNGE
7.	CORRIDOR
8.	WOMEN TOILET
9.	BREASTFEEDING ROOM
10.	DIFABLE TOILET

11.	MEN TOILET
12.	HEALTHCARE ROOM
13.	TIKET CHEKING
14.	TIKET CHEKING
15.	WUDHU PLACE
16.	MUSHOLLA
17.	INDOOR WAITING AREA
18.	INDOOR WAITING AREA
19.	INDOOR WAITING AREA
20.	OUTDOOR WAITING AREA

21.	TENANT
22.	TENANT
23.	TENANT
24.	TENANT
25.	TENANT
26.	TENANT
27.	TENANT
28.	TENANT
29.	TENANT
30.	OFFICE WAREHOUSE

31.	WAREHOUSE HEADROOM
32.	MEETING ROOM

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PLANNING CONSULTANT

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IMAGE CHANGES

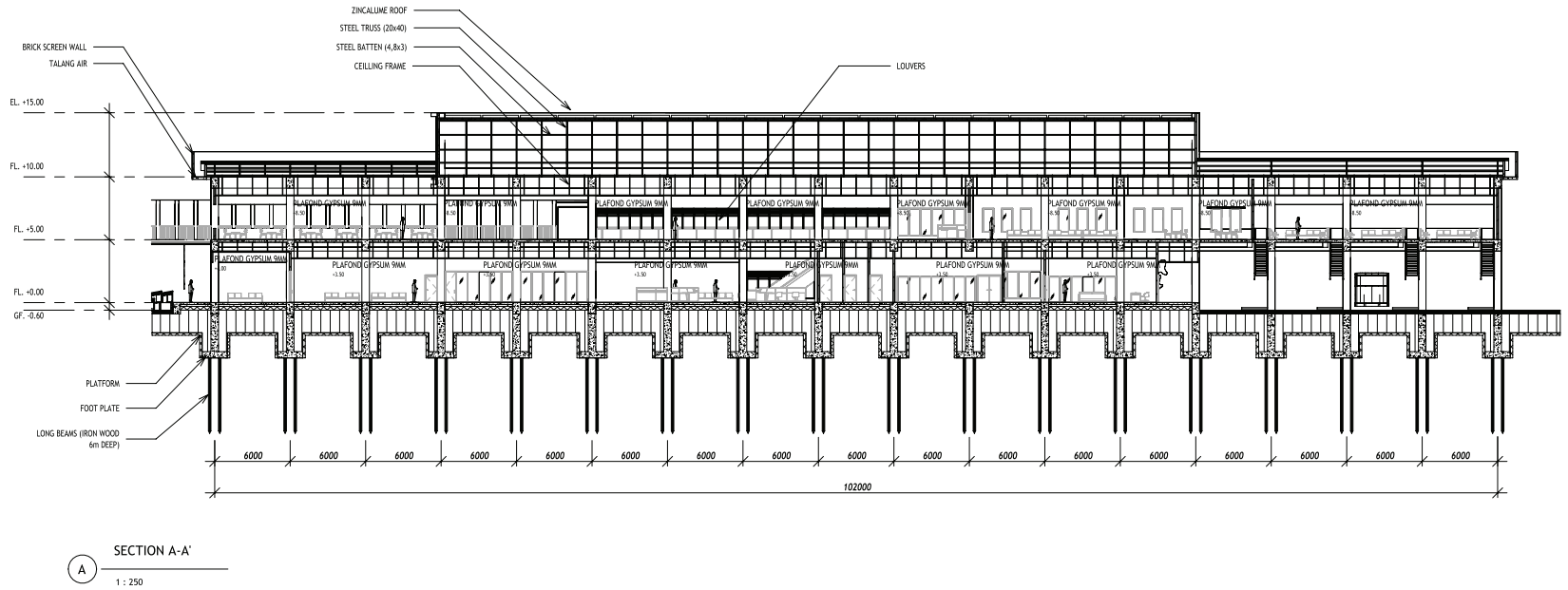
NO.	DATE	REVISION	SIGN

NOTE

IMAGE TITLE	SCALE
TERMINAL FLOOR PLAN	1 : 300

CODE	PAGE	AMOUNT
	004	29 PAGES

BUILDING SECTION REVISION



A SECTION A-A'
1 : 250

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LOCATION
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IMAGE CHANGES

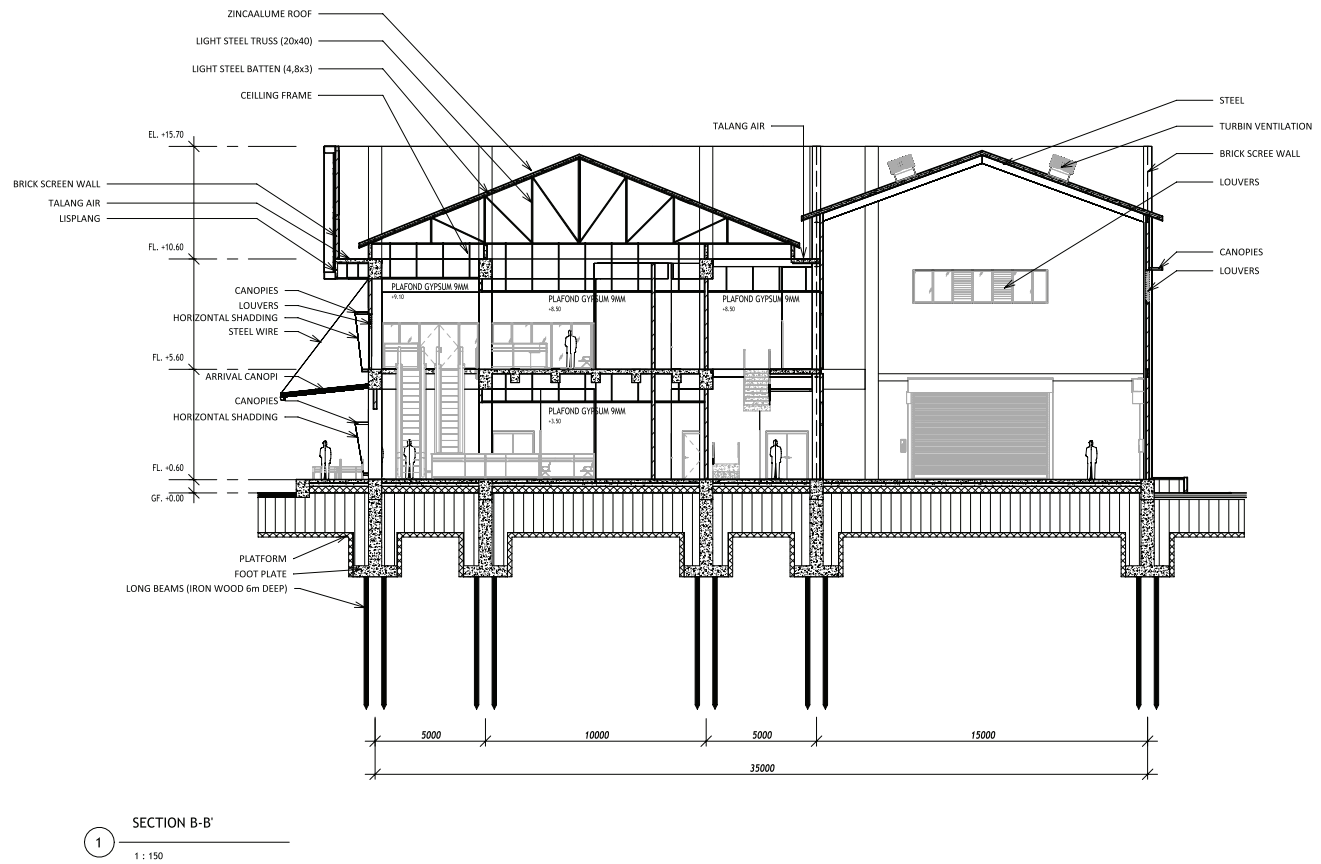
NO.	DATE	REVISION	SIGN

NOTE

IMAGE TITLE	SCALE
TERMINAL SECTION	1 : 250

CODE	PAGE	AMOUNT
	007	29 PAGES

BUILDING SECTION REVISION



1 SECTION B-B'

1 : 150

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REDESIGN PLANNING OF SUNGAI KUNJANG TERMINAL SAMARINDA

LOCATION

SUNGAI KUNJANG TERMINAL SAMARINDA

PLANNING CONSULTANT

NAME:	SIGN:
HAIRURROHID MULTAZAM	
AGUS SETIAWAN ST., M. Arch., IAI, GP	

IMAGE CHANGES

NO.	DATE	REVISION	SIGN

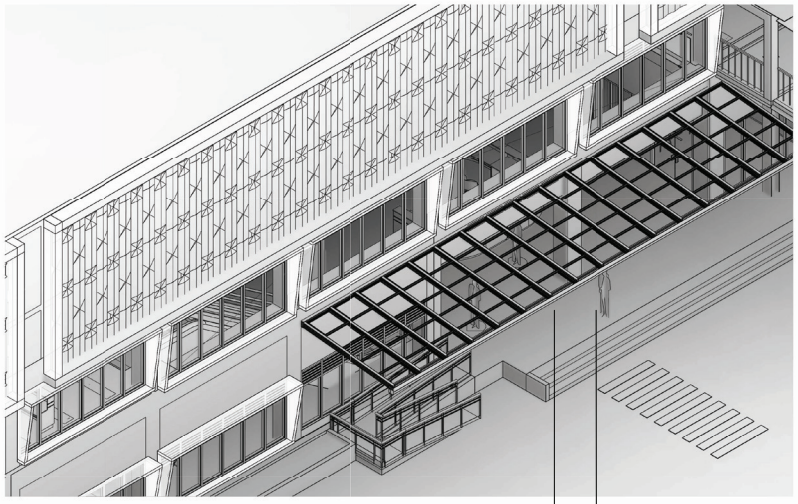
NOTE

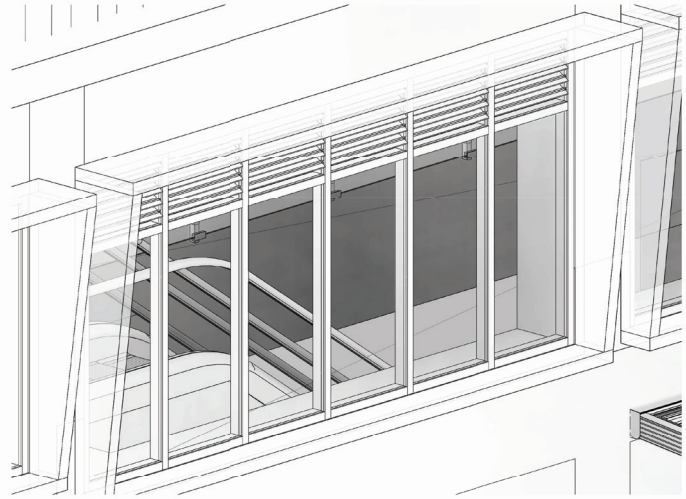
IMAGE TITLE	SCALE
TERMINAL SECTION	1 : 150

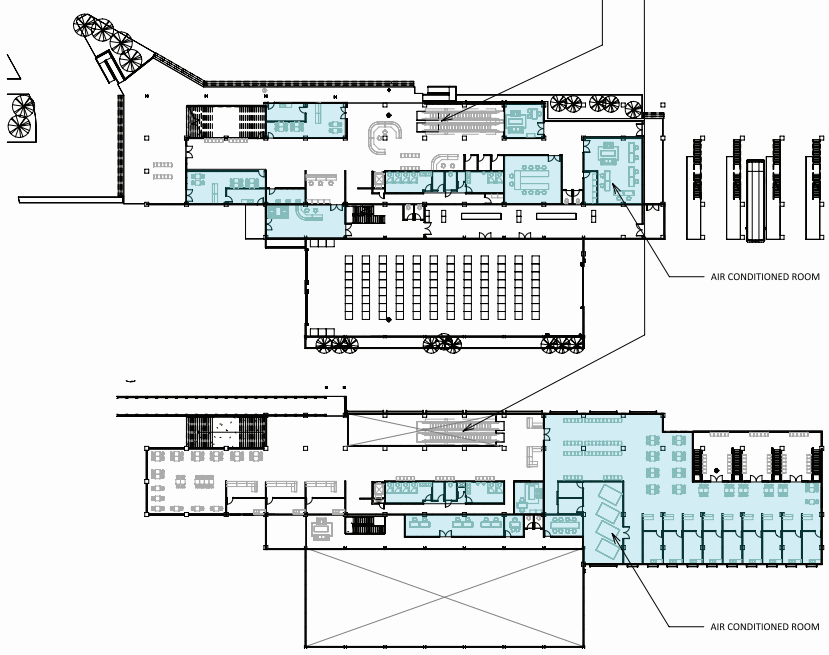
CODE	PAGE	AMOUNT
	008	29 PAGES

NATURAL VENTILATION SCHEME REVISION

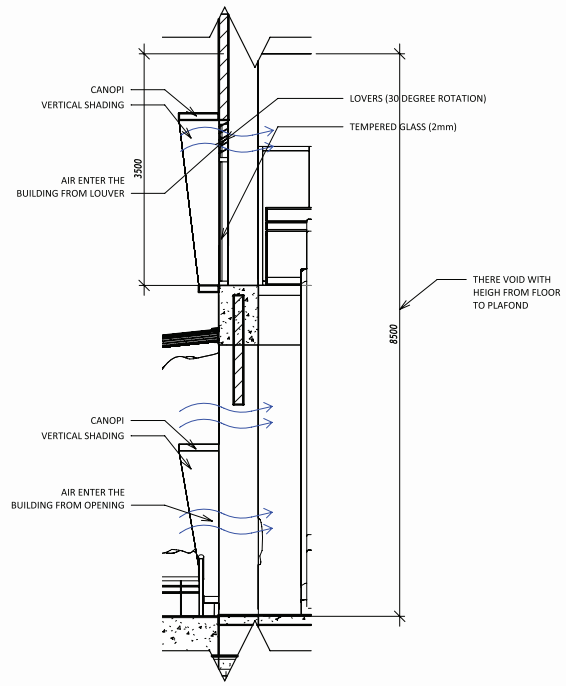
OPENING LOBBY DEPARTURE







ALMOST 50 % ROOM OF THE ROOM AR AIR CONDITIONED. THE USE OF AIR CONDITIONING IS ONLY IN THE MAIN ROOM, OTHER THAN THAT UTILIZING NATURAL VENTILATION FROM LOBBY DEPARTURE AND FOODCOURT AREA



1 NATURAL VENTILATION SCHEME
1 : 50

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REDESIGN PLANNING OF SUNGAI KUNJANG TERMINAL SAMARINDA

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SUNGAI KUNJANG TERMINAL SAMARINDA

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NAME:	SIGN:
HAIRURROHID MULTAZAM	
AGUS SETIAWAN ST., M. Arch., IAI, GP	

IMAGE CHANGES

NO.	DATE	REVISION	SIGN

NOTE

IMAGE TITLE	SCALE
NATURAL ENERGY SCHEME	As indicated

CODE	PAGE	AMOUNT
	025	29 PAGES

06

06 / ATTACHMENT

ARCHITECTURE PRESENTATION BOARD

TERMINAL SUNGAI KUNJANG

RE-DESIGN OF SUNGAI KUNJANG BUS TERMINAL AS AN ECONOMIC ACTIVITY CENTER IN SUNGAI KUNJANG

BACKGROUND

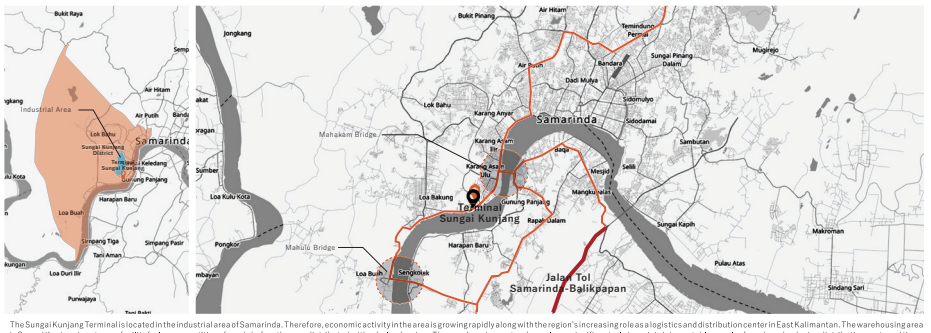
Samarinda City is the capital city of East Kalimantan Province which is directly adjacent to Kutai Kartanegara Regency. The rivers that pass through Samarinda City have a considerable influence on the development of the city. As one of the most important regional economic centers in East Kalimantan, Kota Samarinda has a strategic position and position for various **industrial activities, trade and services, as well as environmentally sound and green settlements.**

Based on Regional Regulation No. 2 of 2014 concerning the Samarinda City Spatial Plan for the 2014-2034 period, Samarinda City has a spatial planning objective to realize Samarinda City as an edge city based on **trade, services and industry that is advanced, environmentally sound and green, and has a competitive advantage to improve the welfare of the community.** The concept of the Edge City is the word Edge, which is not only the motto of Samarinda City, which is an acronym for Shady, Neat, Safe and Comfortable, but also a reflection of Samarinda City which is located in the riverside area, which is the part directly adjacent to the water.

The government has planned the development of land transportation infrastructure in Kota Samarinda, including efforts to increase the availability of road networks and transportation facilities and infrastructure. This planning target has been set in the 2021-2026 P-RPJMD, in which the target set for 2026 is to reach 82.80% for the availability of the road network and 96.50% for transportation facilities and infrastructure. However, in 2022, the achievement of transportation facilities and infrastructure had only reached 41.96%, still far from the expected target. In addition, the program to develop a modern and environmentally friendly mass transportation system is also an important component in this plan, which aims to increase citizen mobility and reduce negative impacts on the environment.

The government also plans to develop passenger terminals and freight terminals to improve transportation and logistics efficiency in line with the city's economic growth. The passenger terminal will be developed with modern facilities and better transportation integration to reduce congestion. Meanwhile, the cargo terminal will become a major distribution center with loading and unloading

MACRO ANALYSIS



The Sungai Kunjang Terminal is located in the industrial area of Samarinda. Therefore, economic activity in the area is growing rapidly along with the region's increasing role as a logistics and distribution center in East Kalimantan. The warehousing area in Sungai Kunjang is a storage facility for large quantities of goods before they are distributed, either by land or river. The warehousing system here plays a significant role in maintaining a stable supply of goods and reducing distribution costs and time.

Warehousing in Sungai Kunjang also attracts many investors, as the area has the potential to become a thriving economic center. Many logistics, distribution and manufacturing companies have established their storage and distribution facilities in the area, creating new jobs for the local community. The presence of these warehouses encourages the development of other supporting sectors, such as transportation services, heavy vehicle maintenance, provision of transport equipment, and infrastructure maintenance services.

Terminal Sungai Kunjang is located right on the edge of a main road or national road that connects various cities and provinces. This location makes Sungai Kunjang Terminal very strategic in supporting transportation and distribution activities, as it has easy access to the dense land transportation network and river routes.

MAHAKAM RIVER ACTIVITIE

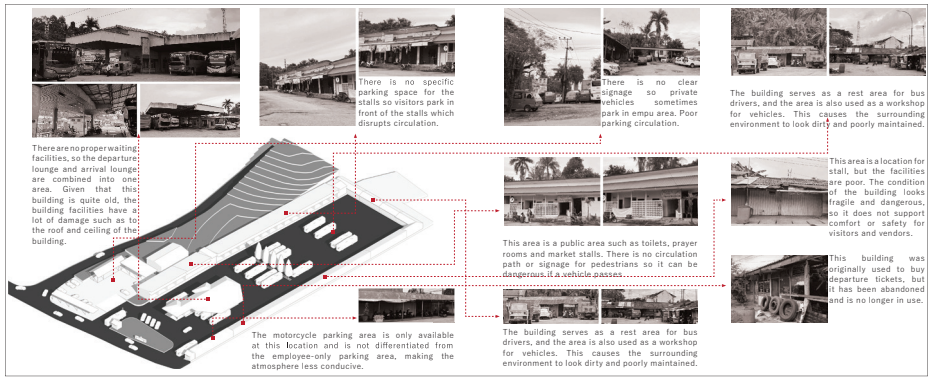
Perahu Tambangan:
Tambangan boats are traditional boats used to cross the river or connect one village to another along the Mahakam River. It is the most common and affordable means of transportation, used daily by communities living on the banks of the river. These boats often carry only a few passengers at a time and operate on short lines.

Kapal Kargo:
The Mahakam is the main route for transporting commodities from the interior of East Kalimantan to major ports or processing factories. Large cargo ships carrying coal, timber, crops and construction materials form the backbone of goods distribution in the region.

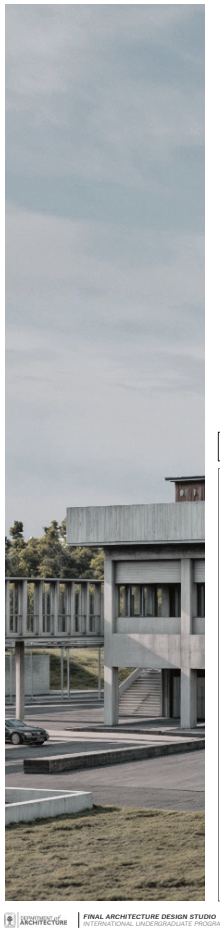
Kapal Penumpang Antar-Kota:
Larger passenger vessels serve routes between towns or distant villages along the Mahakam.These boats have a larger capacity and usually sail on a fixed schedule, carrying passengers who travel further. Facilities are also better than those of the mooring boats, with seating spaces and some even providing toilets.

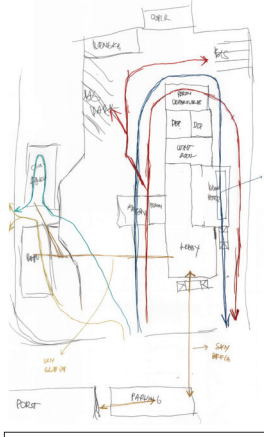
Wisata Susur Sungai Mahakam:
Tour boats are used for recreational activities such as river cruises, where tourists can enjoy the scenery along the Mahakam River and see the lives of riverside communities, bridges, and Mahakam dolphins. Each tour boat is equipped with various facilities to support the comfort and safety of tourists. This two-level wooden ship has been in operation since March 18, 2017. This boat serves tourist travel routes to Kumala and Kutai Lama islands, Kutai Kartanegara, and Samarinda route itself.

Tongkang Batu Bara:
One common sight on the Mahakam River are barges carrying coal. These barges are large flat-bottomed vessels capable of carrying very large quantities of coal at once, often towed by tugboats. The Mahakam River flows from upstream in the interior of East Kalimantan to downstream where it empties into the Makassar Strait.



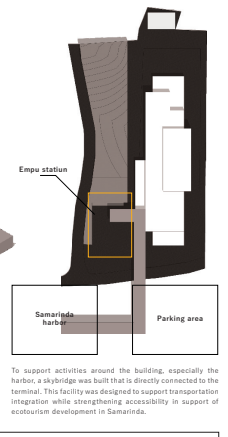
DESIGN CONCEPT





Circulation within the building on the first floor is focused on management needs, such as administrative offices. Meanwhile, the entire waiting area is placed on the second floor. Thus, the main activities involving many people are concentrated on the second floor, which tends to be more crowded. This placement aims to maximize vehicle circulation on the first floor so that it remains smooth without being disturbed by building user activities.

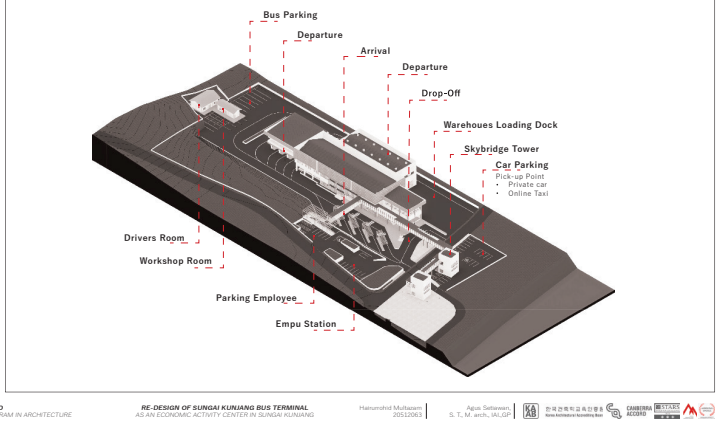
In this design, there are four types of vehicle circulation. The main circulation is for buses, followed by truck circulation to the warehouse area, as well as private vehicle and angkot circulation. This circulation design tries to present the most efficient alternative so that each vehicle lane can function optimally without interfering with each other.



To support activities around the building, especially the harbor, a skybridge was built that is directly connected to the terminal. This facility was designed to support transportation integration while strengthening accessibility in support of ecotourism development in Samarinda.

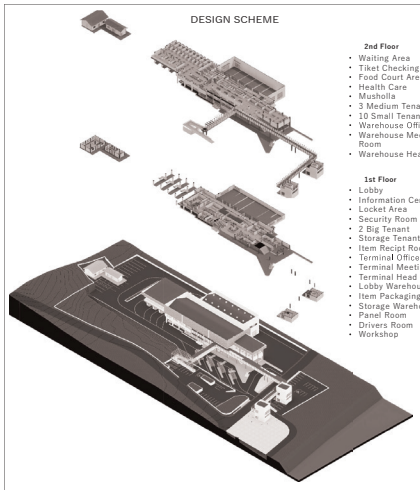
DESIGN RESULT

Initial considerations in this design focused on building and land circulation. The essence of this concept is to ensure that each circulation path can function properly without interfering with each other between building functions. An efficient arrangement allows vehicles, passengers, and building operational activities to move smoothly and be organized, thus supporting optimal integration between building elements.



ARCHITECTURE PRESENTATION BOARD

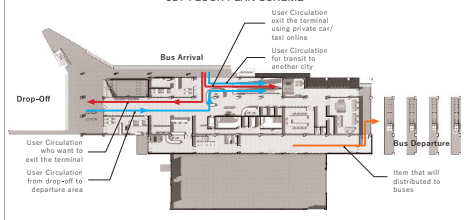
DESIGN SCHEME



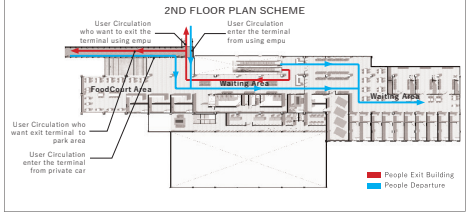
2nd Floor
- Waiting Area
- Tiket Checking
- Food Court Area
- Health Care
- Musholla
- 3 Medium Tenant
- 10 Small Tenant
- Warehouse Office
- Warehouse Meeting Room
- Warehouse Head Room

1st Floor
- Lobby
- Information Center
- Locket Area
- Security Room
- 2 Big Tenant
- Storage Tenant
- Item Reciipt Room
- Terminal Office
- Terminal Meeting Room
- Terminal Head Room
- Lobby Warehouse
- Item Packaging Room
- Storage Warehouse
- Panel Room
- Drivers Room
- Workshop

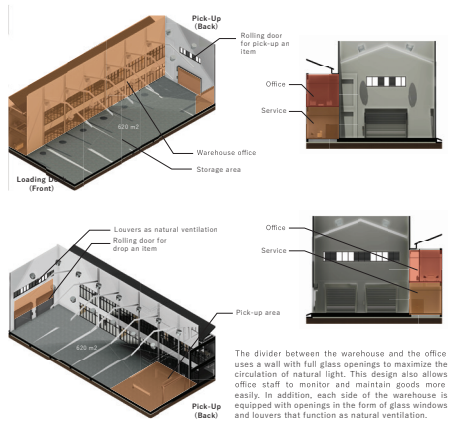
1ST FLOOR PLAN SCHEME



2ND FLOOR PLAN SCHEME

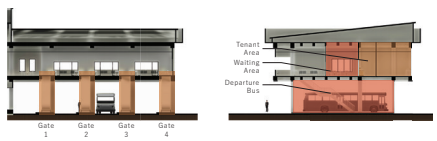


WAREHOUSE

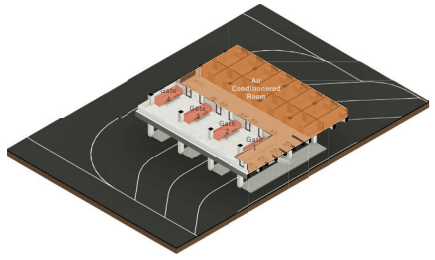


The divider between the warehouse and the office uses a wall with full glass openings to maximize the circulation of natural light. This design also allows office staff to monitor and maintain goods more easily. In addition, each side of the warehouse is equipped with openings in the form of glass windows and louvers that function as natural ventilation.

DETAIL INTERIOR SOLVING

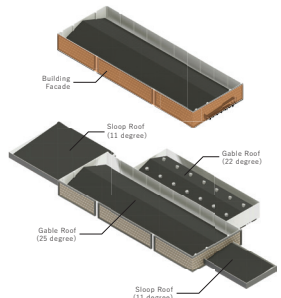


In the departure area, the waiting room is placed on the 2nd floor. Departure passengers will disembark through the designated stairs according to the gate to their respective destination buses. This waiting room is designed to meet the various needs of passengers by providing a choice of air-conditioned and non-air-conditioned rooms, thus providing comfort according to user preferences.

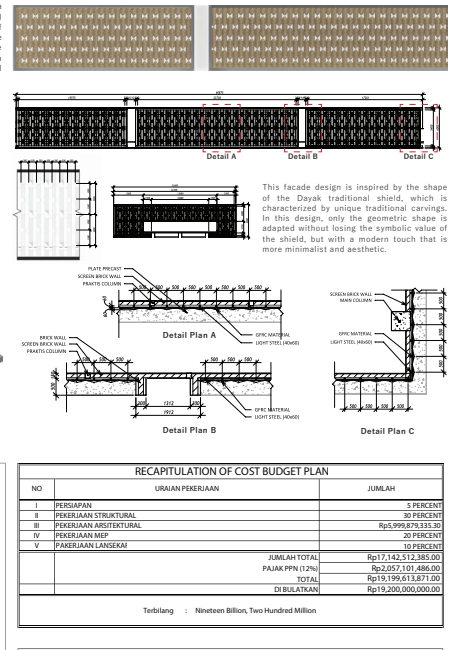


ROOF DESIGN

Since the design is located in a tropical climate near the equator, a gable roof shape was chosen for its ability to drain rainwater well and support optimal air circulation. However, due to the high roof shape, the roof is covered by a screen wall as an application of the hidden roof concept. The screen wall is equipped with a facade designed to beautify the appearance of the building, giving a modern impression while maintaining the aesthetics of the overall design.

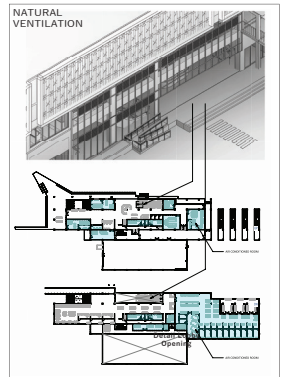


FASADE DESIGN



This facade design is inspired by the shape of the Dayak traditional shield, which is characterized by unique traditional carvings. In this design, only the geometric shape is adapted without losing the symbolic value of the shield, but with a modern touch that is more minimalist and aesthetic.

NATURAL VENTILATION



Almost 50% of the rooms in this design utilize air conditioning, which is applied only to key spaces to maintain user comfort. Meanwhile, other areas such as the departure lobby and food court area utilize natural ventilation supported by strategic openings and a design that allows for optimal air circulation, thus creating a comfortable and energy-efficient environment.

RECAPITULATION OF COST BUDGET PLAN

NO	URAIAN PEKERJAAN	JUMLAH
I	PERSIAPAN	5 PERCENT
II	PEKERJAAN STRUKTURAL	30 PERCENT
III	PEKERJAAN ARSITEKTURAL	Rp5,999,879,335.30
IV	PEKERJAAN MEP	20 PERCENT
V	PAKERJAAN LANSEKAI	10 PERCENT
	JUMLAH TOTAL	Rp17,142,512,385.00
	PAJAK PPN (12%)	Rp2,057,101,486.00
	TOTAL	Rp19,199,613,871.00
	DI BULATKAN	Rp19,200,000,000.00
	Terbilang : Nineteen Billion, Two Hundred Million	

PAYBACK PERIOD

NO	DESCRIPTION	VOLUME	SATUAN	UNIT	PRICE	PER-DAY	PER-MONTH	PER YEAR
1	Paron		people	200	Rp2,000.00	Rp400,000.00	Rp12,000,000.00	Rp144,000,000.00
2	Parking FEE		bh	100	Rp5,000.00	Rp250,000.00	Rp15,000,000.00	Rp180,000,000.00
3	Locket tenant	5	m2	3	Rp2,000,000.00		Rp5,000,000.00	Rp72,000,000.00
4	Big tenant	72	m2	2	Rp60,000,000.00		Rp120,000,000.00	Rp1,440,000,000.00
5	Medium tenant	30	m2	3	Rp200,000,000.00		Rp18,000,000.00	Rp216,000,000.00
6	Small tenant	22.5	m2	10	Rp200,000,000.00		Rp45,000,000.00	Rp540,000,000.00
7	ATM	15	m2	4	Rp10,000,000.00		Rp3,300,000.00	Rp40,000,000.00
8	Warehouse	930	m2	1	Rp800,000,000.00		Rp66,000,000.00	Rp800,000,000.00
					GRASS INCOME		Rp285,300,000.00	Rp3,432,000,000.00
	Water and Energy			10%				Rp343,200,000.00
	Management			5%				Rp171,600,000.00
					INCOME			Rp2,917,200,000.00
					INCOME AFTER TAX			Rp2,917,200,000.00
					TOTAL INVESMENT			Rp19,200,000,000.00
					PAYBACK PERIOD			6.5 years

In the calculation of the Cost Budget Plan (RAB), a rough estimate was made with an allocation of 35% for architectural components, while the rest was allocated to preparation, structure, mechanical electrical and plumbing (MEP), and landscaping. Based on these calculations, the total RAB of the building is Rp 19.2 billion.

In the Payback Period analysis, calculations were made based on rental prices that are commonly applicable in the Samarinda market. Revenue is calculated from tenant rentals in the terminal building, platform tariffs, and vehicle parking fees. Based on these calculations, an estimated Payback Period of 6.5 years was obtained.

3D MODEL
SCALE 1:300

PLAGIARISM CERTIFICATE

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Nomor: 2575968770/Perpus./10/Dir.Perpus/I/2025

Bismillaahirrahmaanirrahiim

Assalamualaikum Wr. Wb.

Dengan ini, menerangkan Bahwa:
Nama : Hairurrohid Multazam
Nomor Mahasiswa : 20512063
Pembimbing : Agus Setiawan, ST., M. Arch., IAI, GP
Fakultas / Prodi : Teknik Sipil dan Perencanaan/ Arsitektur
Judul Karya Ilmiah : RE-DESIGN OF SUNGAI KUNJANG BUS TERMINAL AS AN ECONOMIC ACTIVITY CENTER IN SUNGAI KUNJANG

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, 1/31/2025
Direktur

Muhammad Jamil, SIP.

REFERENCES

Indah Sari, Nur Utami. (2018). Terminal Angkutan Umum Tipe B Di Bengkayang. Jurnal online mahasiswa Arsitektur Universitas Tanjungpura.

Pemerintah Republik Indonesia. (1993). Peraturan Pemerintah Republik Indonesia Nomor 43 Tahun 1993 tentang Prasarana dan Lalu Lintas Jalan. Database Peraturan

Samarinda City Government. (2014). Samarinda City Spatial Plan 2014-2034. https://kaltim.bpk.go.id/wp-content/uploads/2014/09/LD.-Perda-No.24-Th.2013-Ttg-RTRW.Salinan

Samarinda City Government. (2023). Regional Government Work Plan (RKPD) of Samarinda City Year 2023. Samarinda: Samarinda City Government.

Samarinda City Government. (2013). Samarinda City Regional Regulation Number 24 of 2013 concerning the Samarinda City Regional Spatial Plan 2014-2034. Samarinda: Samarinda City Government.

Therrisia, Audrey. (2020). Revitalisasi Terminal Bus Tipe B Sungai Kunjang Di Samarinda Dengan Pendekatan Arsitektur Perilaku. S1 thesis, Universitas Atma Jaya Yogyakarta.

Yogiantoro, Toni. (2017). Tata Kelola Pemeliharaan Terminal Transportasi Umum Di Terminal Sungai Kunjang Kelurahan Karang Asam Ulu Kecamatan Sungai Kunjang Kota Samarinda. eJournal Administrasi Negara.