



Revitalization Penggaron Bus Station: Leveraging Strategic Planning to Transforming the Area into a Thriving Business Hub.

Revitalisasi Terminal Bus Penggaron: Memanfaatkan Perencanaan Strategis untuk Mengubah Area Menjadi Pusat Bisnis yang Berkembang.

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Perancangan

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Revitalization Penggaron Bus Station: Leveraging Strategic Planning to Transforming the Area into a Thriving Business Hub. Perancangan revitalisasi terminal Penggaron sebagai area pusat perkembangan ekonomi di kota Semarang yang memiliki Mix Fungsi sebagai Area Exhibition.

saya menyatakan bahwa seluruh bagian karya ini adalah karya sendiri kecuali karya yang disebut referensinya dan tidak ada bantuan dari pihak lain baik seluruhnya ataupun sebagian dalam proses pembuatannya. Saya juga menyatakan tidak ada konflik hak kepemilikan intelektual atas karya ini dan menyerahkan kepada Jurusan Arsitektur Universitas Islam Indonesia untuk digunakan sebagai kepentingan pendidikan dan publikasi.

Yogyakarta,

Penulis



Muhamed Yoga DwiAji Wiyarno



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“Aksara Waktu”

‘Every journey is a story, and every building is the script that writes it in silence.’





Abstrak

Salah satu langkah strategis untuk meningkatkan mobilitas urban dan keberlanjutan kota adalah revitalisasi Terminal Penggaron menggunakan pendekatan Transit-Oriented Development (TOD). Proyek ini dirancang untuk menggabungkan fungsi campuran, atau pembangunan berbagai fungsi, yang menciptakan lingkungan yang dinamis dengan berbagai aktivitas dan kebutuhan masyarakat. Metode TOD mengutamakan aksesibilitas transportasi publik, ruang yang ramah pejalan kaki, dan pengurangan ketergantungan pada kendaraan pribadi.

Terminal berfungsi sebagai pusat transportasi yang terintegrasi dengan fasilitas komersial, ruang seni, dan ruang publik dalam desain ini untuk mendorong pertumbuhan ekonomi, interaksi sosial, dan daya tarik budaya. Arsitektur kolonial digunakan untuk mencerminkan nilai historis dan identitas lokal Semarang dan menciptakan estetika yang harmonis dengan lingkungan.

Selain itu, melalui penggunaan energi yang efisien, desain ruang yang efisien, dan koneksi antara sistem transportasi dengan aktivitas perkotaan, proyek ini mempertimbangkan konsep keberlanjutan. Metode ini diharapkan akan memungkinkan Terminal Penggaron untuk berkembang menjadi pusat transportasi modern yang dapat meningkatkan kualitas hidup masyarakat dan mendukung perkembangan umum kawasan.



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Abstract

One of the strategic measures to improve urban mobility and city sustainability is the revitalization of Penggaron Terminal using the Transit-Oriented Development (TOD) approach. The project is designed to incorporate mixed-use, or mixed-function development, which creates a dynamic environment with a variety of activities and community needs. The TOD method prioritizes public transportation accessibility, pedestrian-friendly spaces, and reduced dependence on private vehicles.

The terminal serves as a transportation hub integrated with commercial facilities, art spaces, and public spaces in this design to encourage economic growth, social interaction, and cultural attraction. Colonial architecture is used to reflect the historical value and local identity of Semarang and create a harmonious aesthetic with the environment.

In addition, through efficient energy use, efficient space design, and the connection between the transportation system and urban activities, the project considers the concept of sustainability. This method is expected to enable Penggaron Terminal to develop into a modern transportation hub that can improve people's quality of life and support the general development of the region.



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Introduction 01

Semarang City as the Economic Hub of Central Java

Semarang City is a strategic city located in the middle of Java Island. Java Island, located between 60 50' - 70 10' South latitude and 1090 35' - 1100 50' East longitude. 1090 35' - 1100 50' East Longitude. Semarang City's position as the capital of of Central Java province and supported by its strategic location on the Java economic traffic of Java Island makes Semarang City not only plays a role as the center of government but also one of the centers of **economic development**. as the center of government but also one of the economic centers in Central Java. Semarang City has a strategic location as a development corridor in Central Java Province which consists of four gateway nodes, namely the north coast corridor, north coast corridor gateway nodes, namely the north coast corridor, south corridor, east corridor and west corridor. corridor, and is also supported by a number of transportation facilities such as the Port of Tanjung Emas Port, Ahmad Yani International Airport, Terboyo Terminal.

When viewed regionally, Semarang City is included in the Kedungsepur region (Kendal Regency - Demak Regency - Semarang Regency - Semarang City - Salatiga City - Grobogan Regency) which covers a total of 85 (eighty five) sub-districts, with Semarang City consisting of 16 sub-districts. In the development and growth of Central Java, Semarang City plays an important role, especially with its port, land transport network (railways and roads) and air transport, which are potentials for Central Java Regional Transport Node and Central Java Regional Transit City. Another important position is the strength of its relationship with outside Java, directly as the centre of the central national region.

In the context of Central Java Province's development, Semarang City is also part of the **KEDUNGSEPUR national strategic area which is the centre of trade and service activities, industry and education**. In addition, Semarang City is also part of the JOGLOSEMAR regional growth centre triangle along with Yogyakarta and Solo. The strategic position and function of Semarang City as the centre of trade and service activities, industry and education then have an impact on the development of existing development in Semarang City because as is known, trade and service activities, industry and education are the activities that invite the most people to move in it. This is what also makes Semarang City attractive to many immigrant residents.

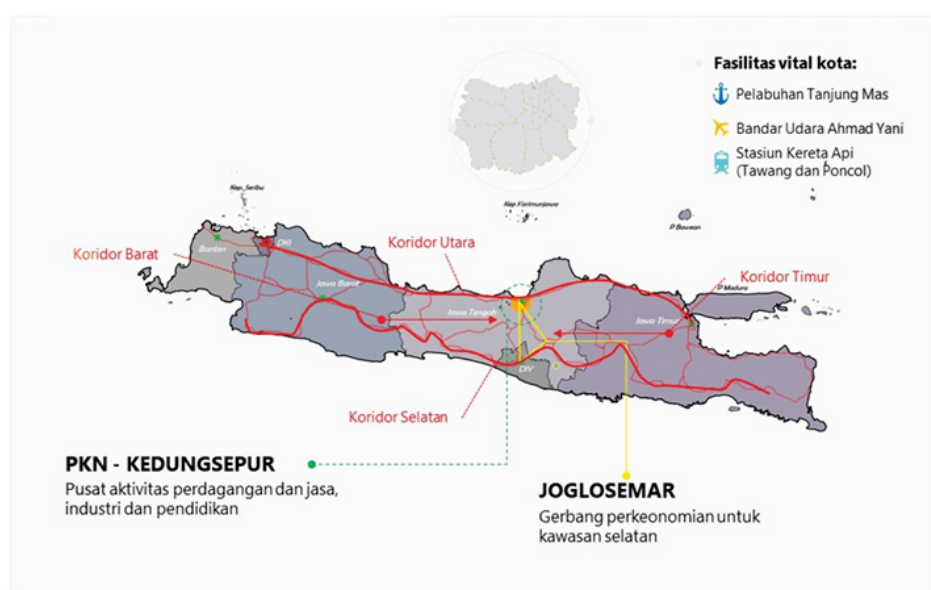


Figure 1. Map of Joglosemar

Source : Bapedda Kota Semarang, 2020

Potential Development of Semarang City

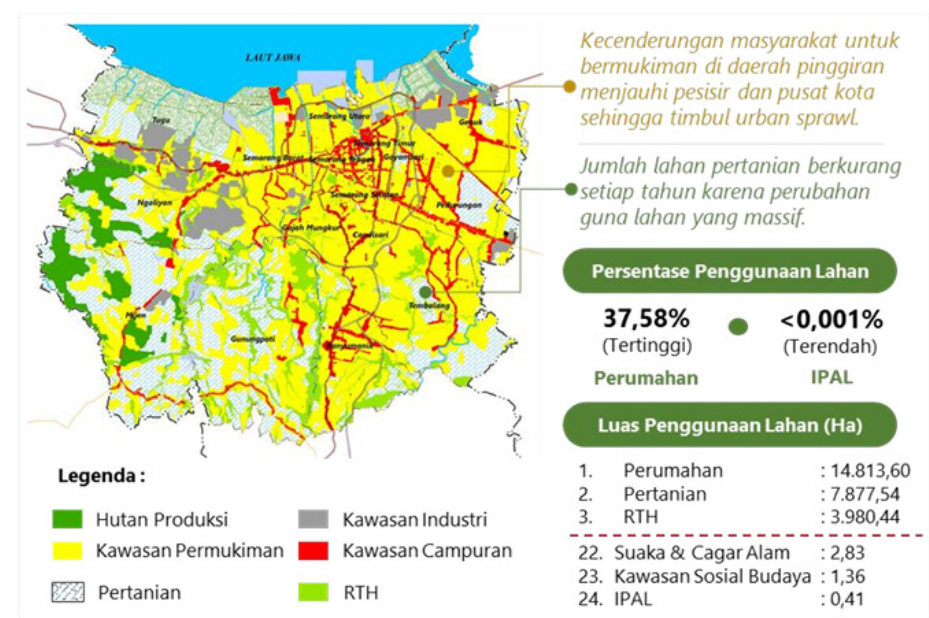


Figure 2. Potential map of Semarang city area
Source : Dinas Penataan Ruang Kota Semarang, 2020

Semarang City's growth is mostly focused on its west, east, and south sides. Semarang City has the potential to grow as a cultivation region for industries including mining, industry, tourism, agriculture, and fisheries, among others, based on its growth features and orientation. Semarang City's regional regulations No. 14/2011 on the **Semarang City Regional Spatial Plan (RTRW) 2011-2031 state that there are three policy focuses for the development of Semarang City's spatial structure: (i) policies and strategies for developing national and regional functions; (ii) policies and strategies for developing the Semarang metropolitan area; and (iii) policies and strategies for developing the Semarang metropolitan area. metropolitan region of Semarang; and (iii) policies and plans for the growth of the internal activities service structure of Semarang City.**

In addition to focusing on regional development through spatial structure and spatial pattern plans, Semarang City also applies strategic area development as a regional development effort by looking at the potential of an area. A strategic area means an area in which activities take place that have a major influence on the spatial layout of the surrounding area, other activities in similar fields and activities in other fields and provide community welfare. Geographical conditions, the dominance of regional activities and infrastructure support for carrying out activities will support strategic areas for regional development.

The role of Semarang City in the Kedungsepur KSN Constellation

The Kedungsepur region is designated as a **centre for international-scale economic activities based on trade and services**, industry and tourism while taking into account sustainable food agricultural land. There are several structuring policies for this region, including those related to the city system, the development of infrastructure systems, the establishment and improvement of protected - cultivated area functions, economic development, and increased coordination and integration of development through inter-regional cooperation (KAD), partnerships and community roles. In the overall policy Semarang City's role and its relationship with its neighbouring regencies and municipalities. In the spatial planning strategy, Semarang City is positioned as the core city in the Kedungsepur Region, which is positioned as the centre of trade and services, agro-industry, and tourism on an international, national, and regional scale to encourage the surrounding cities (within the Kedungsepur Region) to support the core urban activities. In general, the Kedungsepur region is directed towards the realisation of the Semarang metropolitan area as the provincial capital. as the **main economic growth centre of Central Java; the development of economic strategic areas in** the context of special the development of economic strategic areas in the context of special economic zones; the realisation of intraregional relations as the distribution centre for products from inland areas due to its location around the Pantura

According to the **RPJMD (Regional Medium-Term Development Plan) of Central Java Province, in line with Presidential Regulation (Perpres) No. 79/2019 on the acceleration of development**, focuses on development policies and strategies in the Kedungsepur region. Kedungsepur is a strategic area that includes Semarang City and its surrounding areas, such as Demak, Kendal, and Grobogan Regencies. The region is seen as an economic growth centre that has great potential, especially through the improvement of transport infrastructure. The policies promoted in this RPJMD emphasise improving the quality and range of infrastructure services, including transport, telecommunications, energy, and natural resources (SDA), which are carried out in an integrated and equitable manner. This policy aims to strengthen inter-regional connectivity and improve accessibility to support economic growth and improve people's quality of life. The strategy implemented in the policy involves improving the quality of the infrastructure network and creating integrated transport services on land, sea and air. These developments are critical to accelerating the mobility of people and goods, as well as reducing congestion and improving transport efficiency. **One of the main programmes underway is the revitalisation of Penggaron Terminal, a type B terminal serving inter-provincial city transport (AKDP) and city transport routes.** The revitalisation of the terminal is expected to improve land transportation facilities and services, which will directly support the improvement of accessibility and mobility in the Semarang region and beyond.

The Role of Business Hubs in Economic Development in Terminal Areas

A business hub is a central point of activity that promotes **connectivity** and exchange within a specific industry, region, or even across different sectors. It can take various forms, such as financial hubs (like Wall Street), technology hubs (like Silicon Valley), or logistics hubs (like Dubai). These hubs act as magnets for businesses by offering shared resources, infrastructure, and proximity to partners, clients, and talent. They are designed to boost **collaboration, innovation, and economic growth** by facilitating access to networks, expertise, and services in one place

Business hubs work by attracting various stakeholders—startups, **established businesses**, investors, and research institutions—into a concentrated area where they can share knowledge, infrastructure, and services. These hubs often feature co-working spaces, incubators, and accelerators, creating a dynamic environment where businesses can flourish through collaboration and the sharing of resources. Additionally, the physical presence of businesses in the same location helps foster organic interactions, leading to new business opportunities and partnerships

In the context of a terminal, particularly one focused on revitalization or Mix-use development, a business hub can play a crucial role in enhancing the economic viability and attractiveness of the space. A terminal is often more than a transit point; it can serve as a commercial, social, and business center. By incorporating a business hub, a terminal can offer several advantages

Attracting businesses and services : The hub can host services like retail stores, logistics operations, offices for transportation companies, or even tech startups that focus on smart transit solutions.

Stimulating local economic growth : By clustering businesses and services in a single location, the terminal hub can become a local economic driver. It attracts not only travelers but also local businesses that can take advantage of the high foot traffic.

Encouraging collaboration : The terminal hub can facilitate partnerships between different businesses, such as logistics companies, e-commerce platforms, and even urban planners who aim to improve transit infrastructure.

Improved passenger experience : The business hub can provide amenities like restaurants, co-working spaces, and digital services for travelers, creating a seamless and enriched travel experience. This added functionality can make the terminal a destination itself, not just a passage point

Urban Issues: High Crime Rates and Vulnerability to Flooding

The rapid development dynamics of Semarang City and its pluralistic society will lead to social changes in the community. On the other hand, population growth that is not balanced with the availability of facilities will have negative impacts such as increasing unemployment, increasing poverty rates, and can lead to increased crime rates. For 5 years from 2016 - 2020, number of prominent criminal offences (crime index) by type are as follows

Type of criminal offence	Amount in the year				
	2016	2017	2018	2019	2020
a . Pencurian Dengan Pemberatan	7	4	1	1	0
b. Pencurian Dengan ranmor	152	121	83	19	33
c. Pencurian denga kekerasan	17	10	10	2	4
d. Penganiayaan berat	47	10	13	30	19
e. Pembunuhan	0	1	5	1	3
f. Pembunuhan	0	1	1	2	0
g. Uang Palsu	3	0	3	0	0
h. Narkotika	0	1	4	N/A	N/A
i. Perjudian	0	0	0	0	0
j. Pemerasan / Ancaman	0	1	1	4	3
k. lainnya	1.850	1.479	1.322	1.092	1.268
Total	2.085	1.628	1.443	1.151	1.330

Table 1. Table of the number of crimes that occurred in Semarang city in 2016 - 2020
Source : Polrestaes Kota Semarang, 2021

In the period 2016-2020, the number of crime rates in Semarang City fluctuated. In 2016-2019, Semarang City's crime rate experienced a significant decline. Meanwhile, in 2019-2020, Semarang City's crime rate increased to 1,330 incidents. In 2019 the highest case occurred in serious maltreatment with 30 cases, in 2020 it was motorbike theft, which reached 33 cases. In addition, an increase in traffic accidents is one of the components in other types of criminal offences.

Criminality in public facilities such as terminals has a significant impact on their safety, comfort, and operational functions. Terminals, as centres of community activity, are often targeted by petty crimes such as theft, thuggery, and other criminal acts. The density and crowds in terminals create opportunities for criminals, especially thieves, to operate more freely. Cases of theft of personal belongings, such as bags, wallets, and mobile phones, are common, which makes people feel unsafe when using these facilities. This insecurity can lead to a decrease in the number of public transport users and affect the overall mobility of the community.

The effect of crime also has an impact on the local economy around the terminal. People who feel unsafe will tend to avoid the terminal, thus reducing the number of public transport users and harming local merchants and businesses that depend on the terminal's crowds. Therefore, solutions such as implementing **CPTED (Crime Prevention Through Environmental Design)** are important in **terminal design**. This approach incorporates security aspects, such as good lighting, open surveillance areas, and architectural designs that support safe and comfortable public spaces for users.

In conclusion, to support Semarang as a growing economic centre, renovating vital infrastructure such as terminals is a crucial step. Terminals serve not only as a means of transportation, but also as centres of community activity that influence the security and smooth running of the local economy. Therefore, the revitalisation of the terminal should be done with a holistic approach, including the improvement of safety, comfort and accessibility. The architectural business approach offers a sustainable solution that not only improves the transport function, but also maximises the economic potential of the city. By designing a modern, safe and efficient terminal, Semarang can strengthen its role as the economic centre of Central Java while promoting more inclusive and sustainable economic growth.

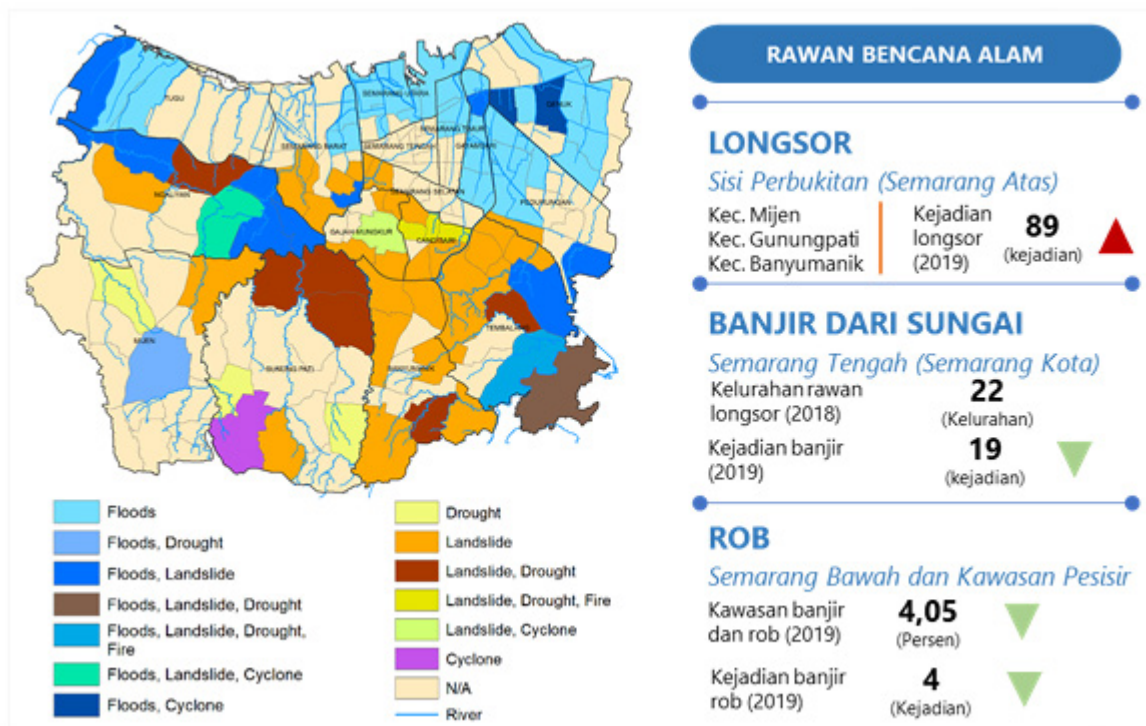


Figure 3. Map of disaster-prone areas in Semarang City
 Source : Badan Penanggulangan Bencana Daerah Kota Semarang, 2020

In terms of disaster-prone areas, Semarang City has disaster-prone areas consisting of rob, flood, landslide and land movement. consist- ing of tidal floods, floods, landslides and land movements. This condition is inseparable from the physical condition of Semarang City in the form of coastal and hilly areas. coastal areas as well as hilly areas. The location of Semarang City on the coast of the Java Sea coast of the Java Sea makes Semarang vulnerable to tidal floods. flooding. **The tidal flooding that occurred in Semarang has started since 1957.** Flooding in Semarang is caused by several things: sea level rise and land subsidence. sea level and land subsidence. A number of the city’s vital infrastructure facilities such as airports, stations and harbours are located in areas prone to tidal flooding. The situation is worsened by the phenomenon of climate change. The current climate change has an impact on **sea level rise and is exacerbated by land subsidence due to exacerbated by land subsidence due to excessive underground water withdrawal**, the city of Semarang is often hit by water extraction, Semarang City is often hit by tidal floods and floods at certain periods. and flooding at certain periods.

Design Issue and Objective

General Problem Formulation

How can terminal revitalization integrate its functions as an efficient transportation hub and a vibrant business hub to enhance user experience while driving local economic growth in a sustainable manner?

- How the redesign of terminal infrastructure improve the flow of passenger movement and transportation modes to be more efficient?
- How the development of business facilities at the terminal contribute to local economic growth?
- How the integration between the terminal and the surrounding area maximize the terminal's function as an economic and business center?

General Problem Formulation

The aim of this project is to revitalize a Type B terminal into a multifunctional, financially sustainable, and bussines-integrated hub. By applying TOD approach, the design will not only enhance the terminal's core transportation functions but also transform it into a profitable asset that stimulates local economic growth. This approach positions the terminal as more than a transportation hub, but as a sustainable business model that benefits both users and stakeholders.

- Enhancing operational processes to optimize passenger flow and comfort.
- Integrating mixed-use spaces for commercial activities, generating revenue.
- Supporting local economic growth by providing spaces for community activities and bussiness

Design Benefits

The main benefit of revitalization terminal Penggaron is connectivity between the terminal and the surrounding economic and industrial centers, which can be leveraged to increase visitor flow while supporting business development in the terminal area. **A convenient pedestrian walkway** integrated with malls and markets can encourage more people to visit the terminal, not only as a transit point, but also as an economic and commercial destination. The interior design of the terminal can include commercial spaces such as retail shops, small kiosks, and food courts that appeal to visitors from malls or transport users. By creating **multifunctional business zones** within the terminal, we can invite local businesses and international tenants to set up shop, ultimately increasing the economic value of the terminal itself. **Flexibility** of space is key the terminal can be designed to accommodate a variety of activities, from business space to commercial services, without compromising its primary function as a transport hub.

Design Limitations

- The design will focus on the integration of business functions, convenience, holistic design will make the terminal a vital node for mobility and economy in the area as well as supporting local economic.
- To solve the design problems based on the architectural aspects of the problem formulation.
- Mix Used Development by Integrating commercial spaces (such as retail stores, restaurants, and offices) can increase the terminal's revenue potential. This transforms the terminal into a multifunctional hub that attracts not only travelers but also local visitors, creating a steady flow of customers.
- Develop a revenue model that includes leasing commercial spaces, partnering with local businesses, and fostering public-private partnerships (PPPs) for sustainable economic growth. Establish marketing strategies to attract both passengers and non-passengers to the terminal as a destination for shopping, dining, and community events.

Design Methods.

- Preliminary Study of Terminal Typologies : Review studies on Definitions and Basic Concepts: Terminal Functions, Facilities, and Services.
- Secondary Data Collection : Secondary data collection provides valuable insights into existing problems and the potential of an area. By leveraging a variety of data sources and analytical techniques, stakeholders can make informed decisions that guide the revitalization of the terminal and enhance its role as a transportation and business hub. Mix Used Development by Integrating commercial spaces (such as retail stores, restaurants, and offices) can increase the terminal's revenue potential. This transforms the terminal into a multifunctional hub that attracts not only travelers but also local visitors, creating a steady flow of customers.
- Precedent Study : A precedent study tailored to the revitalization of Terminal Tipe B Penggaron offers valuable insights that can shape the project's design and operational strategies. By learning from existing successful terminals, the revitalization can effectively enhance connectivity, stimulate economic activity, and create a vibrant space that serves the needs of the community and its users.

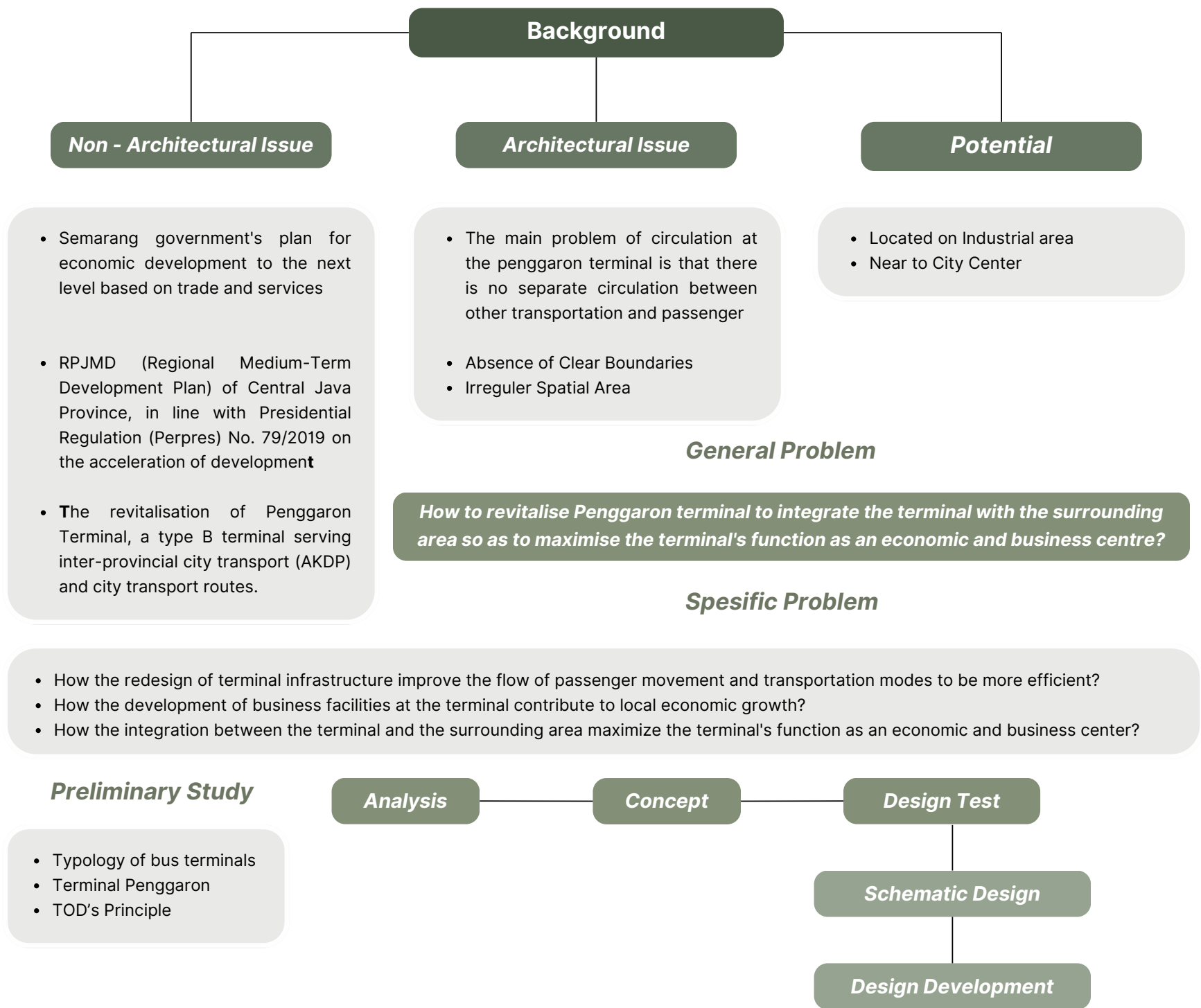


Figure 4. Framework
Source : Author's Analysis

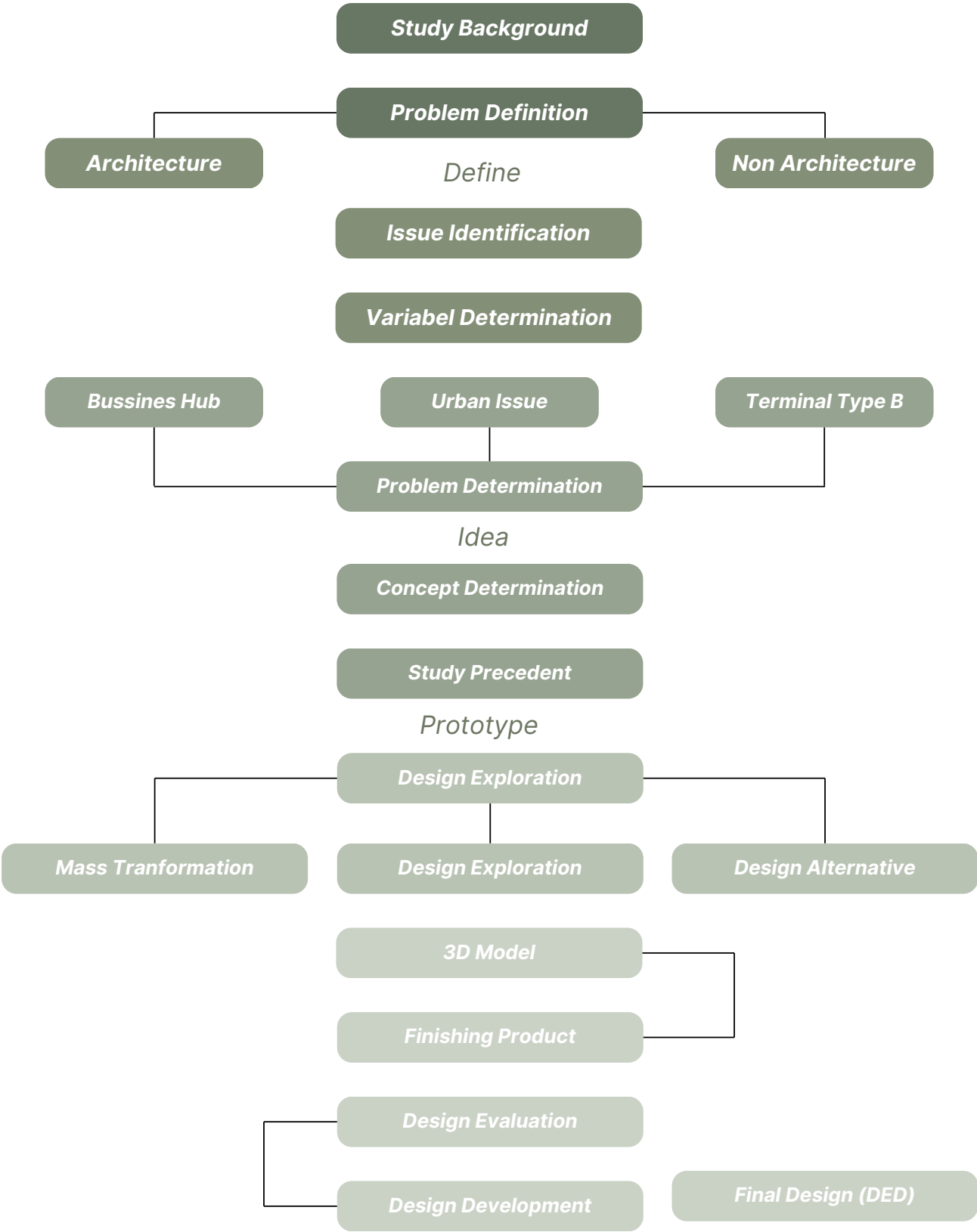


Figure 5. Framework
Source : Author's Analysis

Title Description	Leason Learned	Difference	Authors
Redevelopment Mixed Use Building In Lempuyangan Area With Transit Oriented Development Approach	The difference in concept lies in the function of the building typology and the target of this project. This project prioritises the mix used function of the surrounding buildings and the impact on gentrification.	This project focuses on transforming the terminal into a multifunctional centre that uses mixed used development as a reference.	Aulia Ariestiarini Feridianti, 2019
Re-Desain Terminal Bus Giwangan Dengan Aspek-Aspek Green Terminal	This project designs the Giwangan Type A terminal using the concept of green building and performance based design.	There are differences in the context of the approach where this project uses a green building approach On the other hand, this research is more focussed on the TOD approach in order to increase the mobility of the project.	Farras Satria Pradipta, 2023
Re-Desain Terminal Bus Giwangan Type A with Biophilic Design Approach	This project adapts nature the Biophilic Design approach. Biophilic design combines buildings, people, and nature, which has the effect of relaxing and reducing stress levels experienced by humans.	This approach focuses more on the development of transport infrastructure and interaction between transport modes. While it can incorporate natural elements, the aim is to improve transport efficiency and integrate the terminal with economic activity, rather than solely to create an atmosphere of relaxation.	Zahra Hanan Amany, 2020
Desain Terminal Bus Condongcatur dengan Pendekatan TOD (Transit Oriented Development)	This project aims to revitalize the terminal by implementing Transit Oriented Development (TOD) principles to encourage the use of public transport. The Concat Terminal currently utilizes a Bus Rapid Transit (BRT) system, specifically the Transjogja transport network.	The revitalisation of Terminal Type B Penggaron focuses on the principles of Transit Oriented Development, which integrates transportation, design and economy more holistically to create a more functional and attractive space for users and the surrounding community.	Moh. Bintang Lazuardi R, 2018

02 *STUDY PROBLEM*



DEPARTMENT *of*
ARCHITECTURE

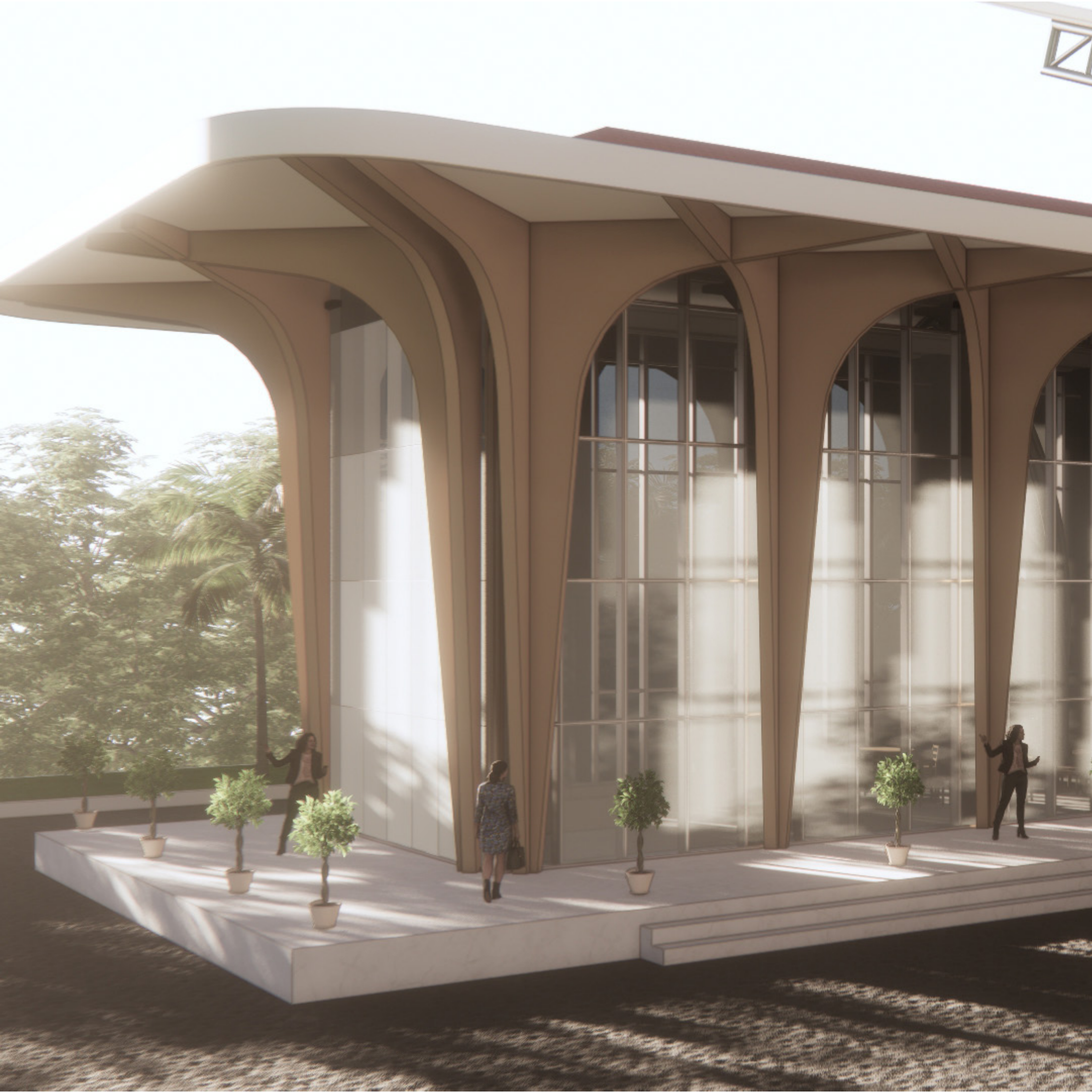


한국건축학교육인증원
Korea Architectural Accrediting Board



CANBERRA
ACCORD







Site Context

Penggaron Terminal is one of the most important terminals in Semarang City, acting as a transportation hub for intercity and intra-provincial public transportation. Strategically located in the eastern part of Semarang City, the terminal is the main link between various transportation routes from Semarang to the eastern region of Central Java and beyond. Penggaron Terminal serves various types of transportation modes such as intercity buses, buses within the province, and city transportation, thus functioning as a vital mobility node for the surrounding community. However, the existing condition of this terminal still faces various challenges, including the management of vehicle circulation that is not yet optimal, the lack of supporting facilities for passengers, and the need for revitalization of building infrastructure and public areas.

Location

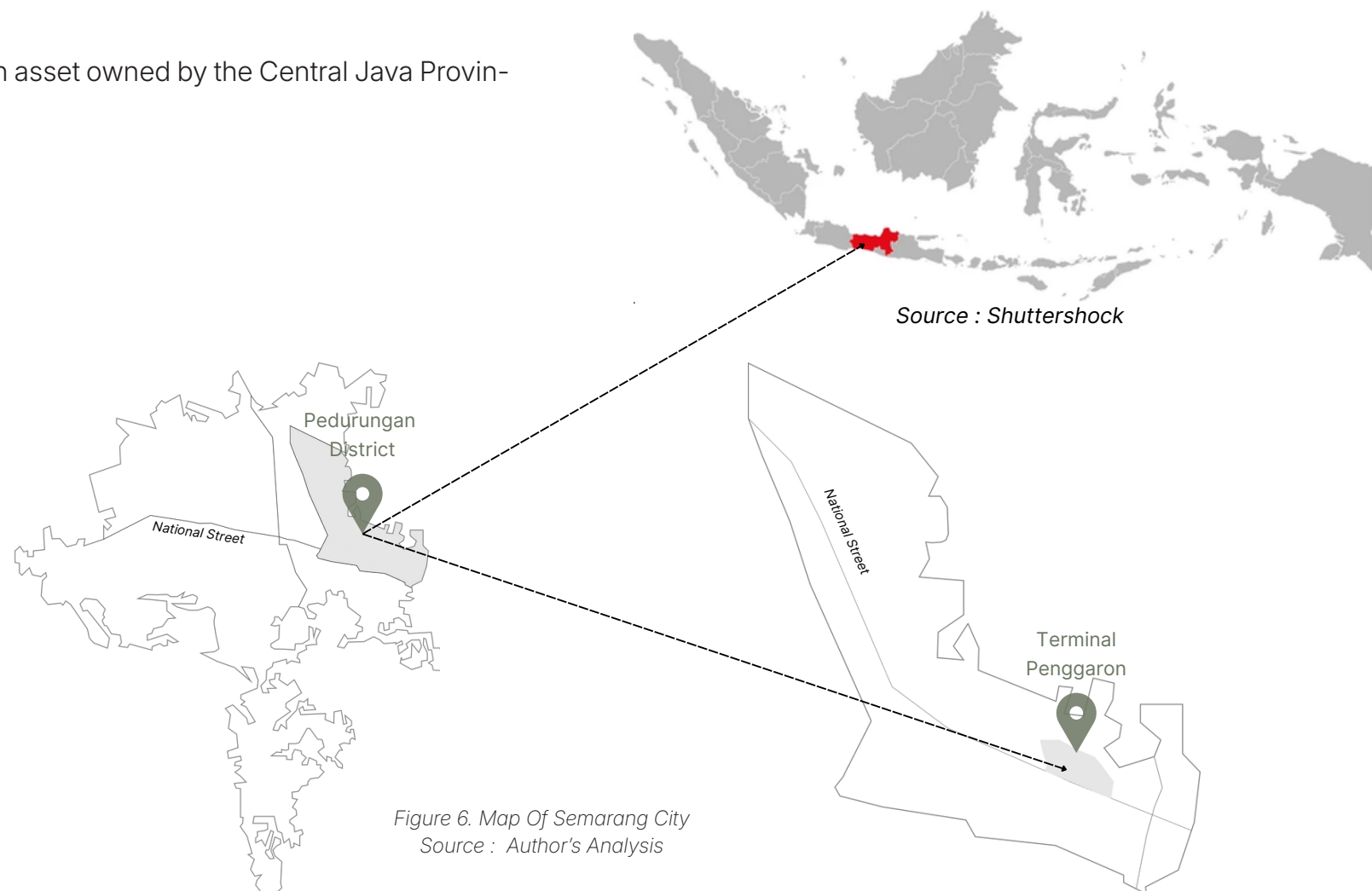
Jl. Brigjen Sudiarto, Kelurahan Pedurungan Kidul, Kota Semarang

Area

29.850 M2

Status

Penggaron terminal is an asset owned by the Central Java Provincial Government.



Access to penggaron terminal with other transportation

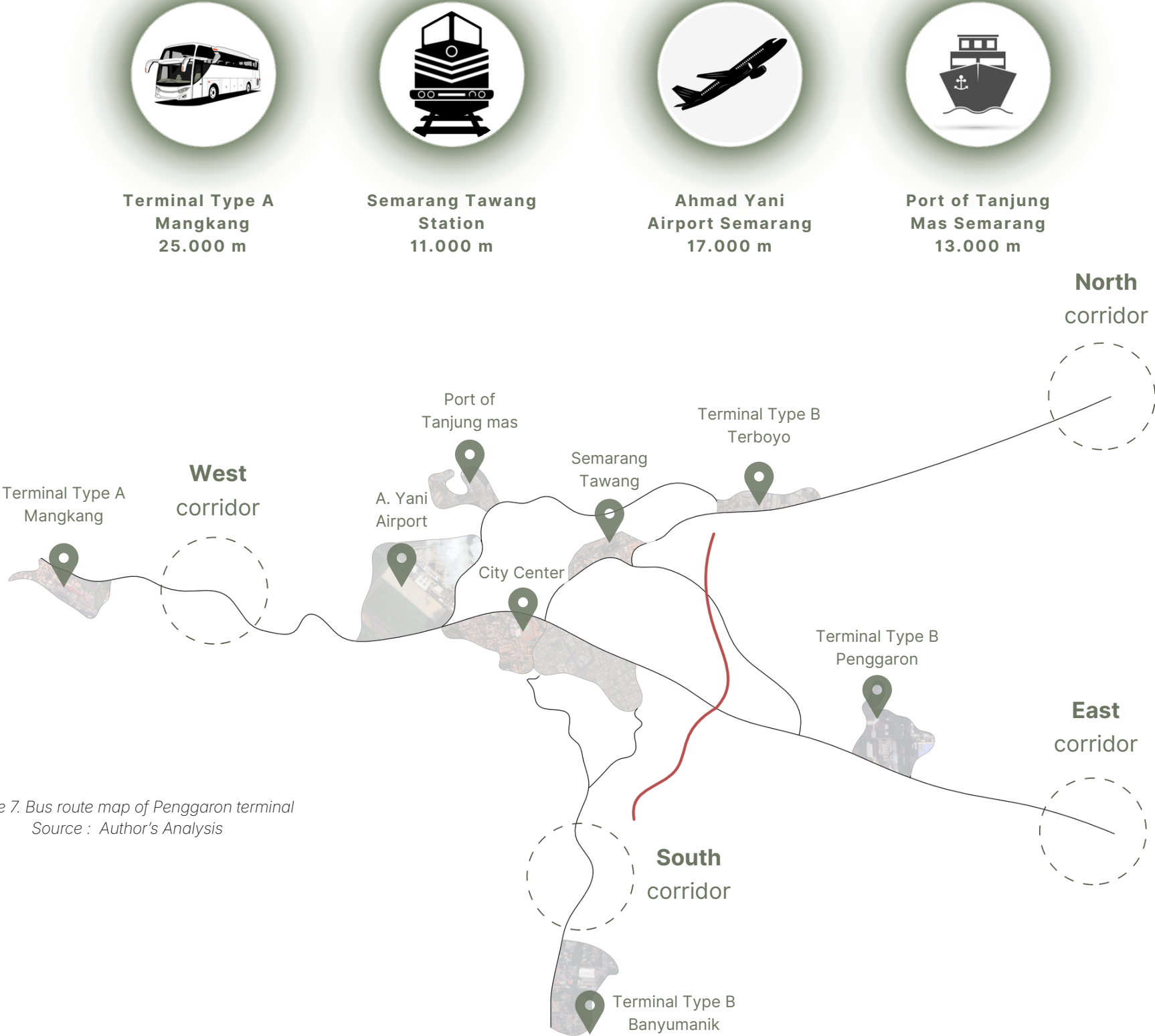


Figure 7. Bus route map of Penggaron terminal
Source : Author's Analysis

Existing Conditions

The condition of the Penggaron Terminal facilities shows a range of states. About 48% are in good condition, functioning well with minimal upkeep. Around 42% are in fair condition, requiring some repairs or upgrades. Another 7% are slightly damaged, needing minor repairs but still operational, while 3% are severely damaged and in need of major repairs or replacement.

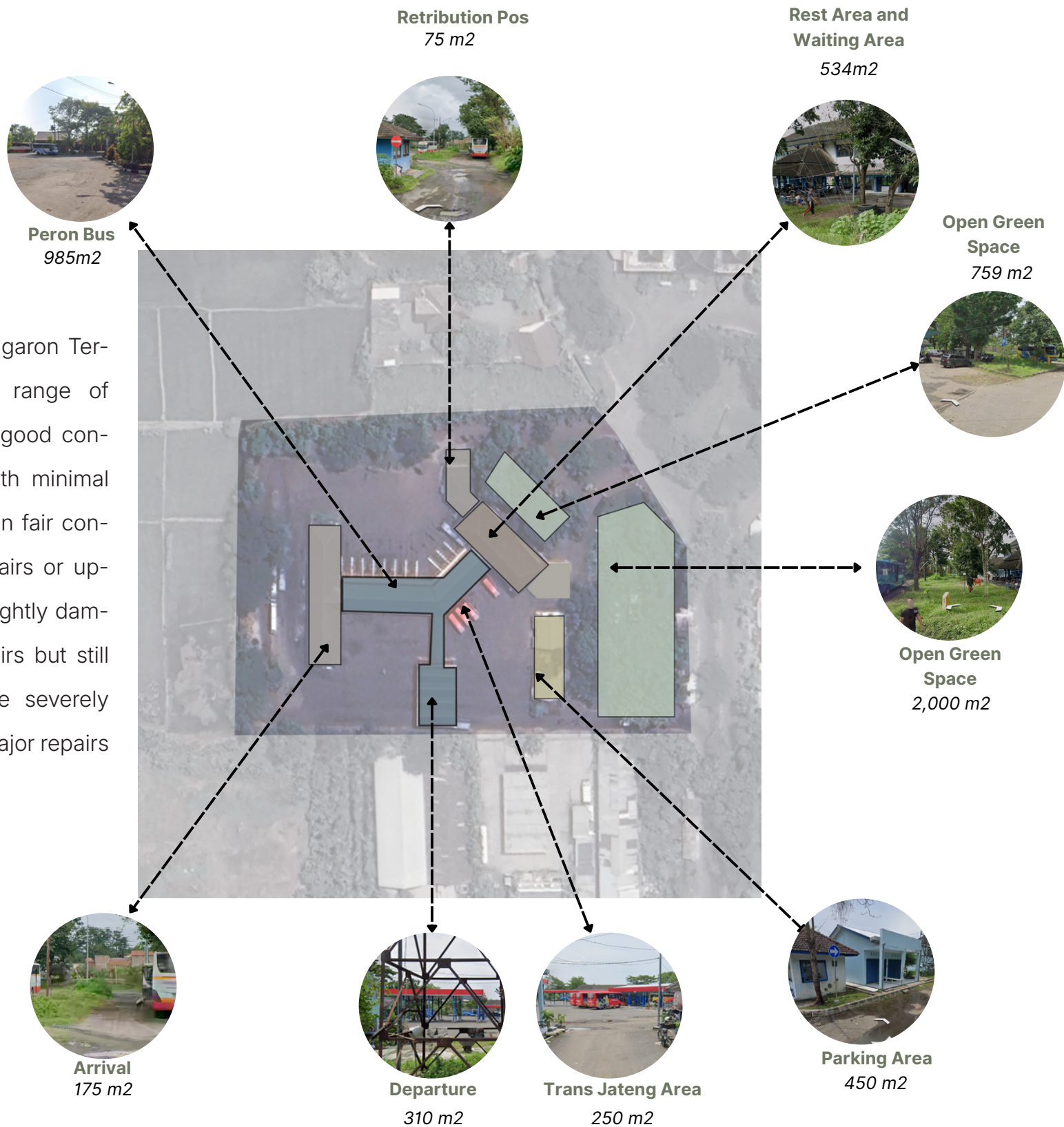


Figure 8. Existing Conditions Terminal Penggaron
Source : Author's Analysis

Terminal Penggaron Plan

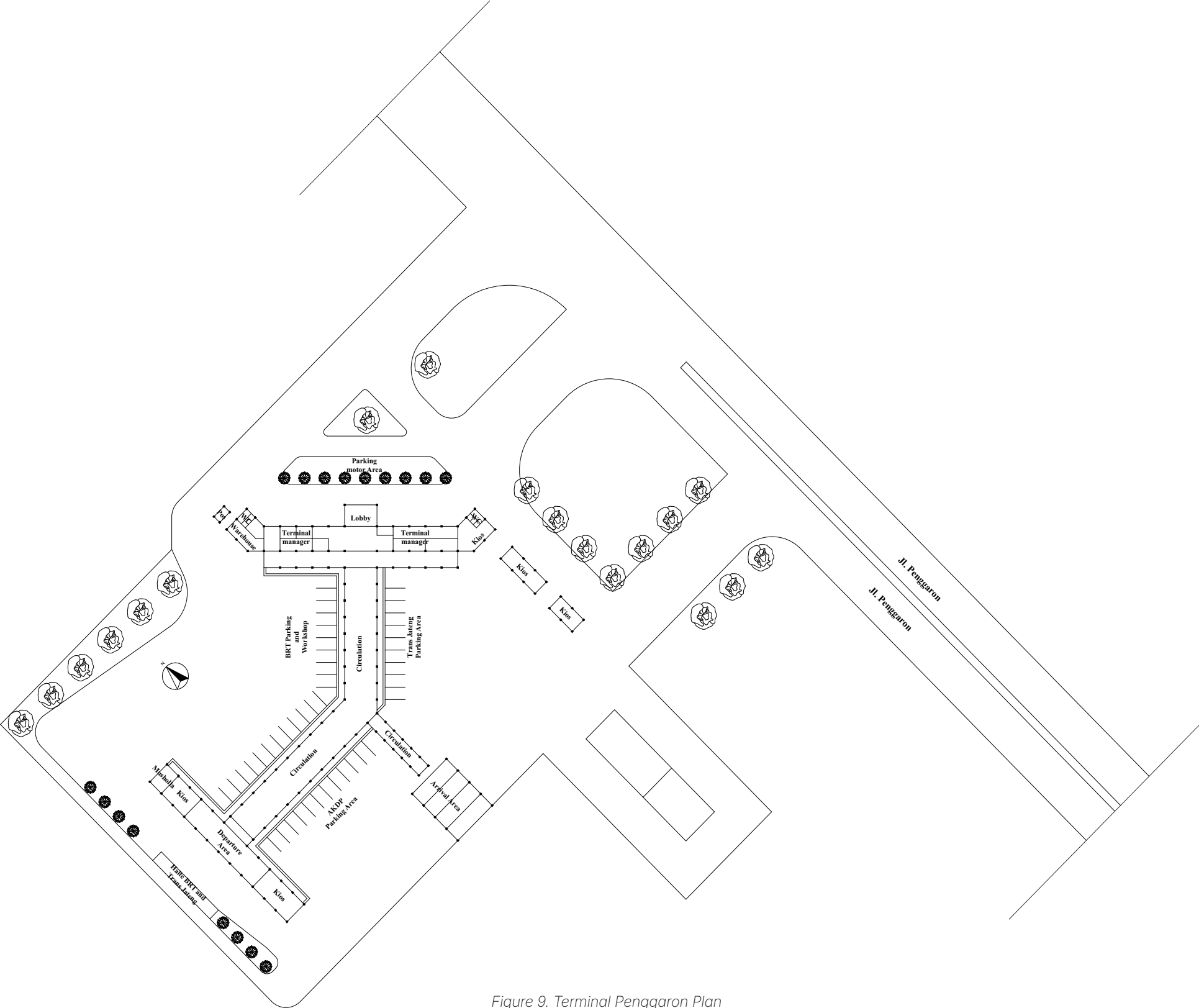


Figure 9. Terminal Penggaron Plan
Source : Author's Analysis

Terminal penggaron
Monograph

Terminal building Area

A. Terminal Office Area

a. Upper Floor:	225 m2
Terminal Head Room / TU	: 60 m2
Data Room	: 18 m2
Meeting Room	: 72 m2
Guest Transit Room	: 12 m2
Hallway	: 39 m2
Toilet / KM / WC	: 12 m2
Stairs	: 12 m2
Lower Floor:	528 m2

b. Lower floor :	528 m2
KM/WC	: 24 m2
Kiosk Block A	: 54 m2
Police Security Officer Room	: 12 m2
Information Room	: 12 m2
Terrace (Hall)	: 84 m2
Stairs	: 12 m2
Healty Room	: 12 m2
Circulation	: 240 m2

Personil

Operational Officer (Dishub)	: 18 Persons
Security Officer	: 2 Persons
Cleaners Officer	: 7 Persons

B. Support Facilities

Waiting Area	: 585 m2
Kiosk Blok A	: 522 m2
KM/WC	: 12 m2
Building Cargo (BPBD)	: 487 m2
Kiosk Blok C	: 304 m2
Monitoring Post	: 25 m2
Retribution pos	: 25 m2
Driver Rest Area	: 25 m2
Musholla	: 81 m2

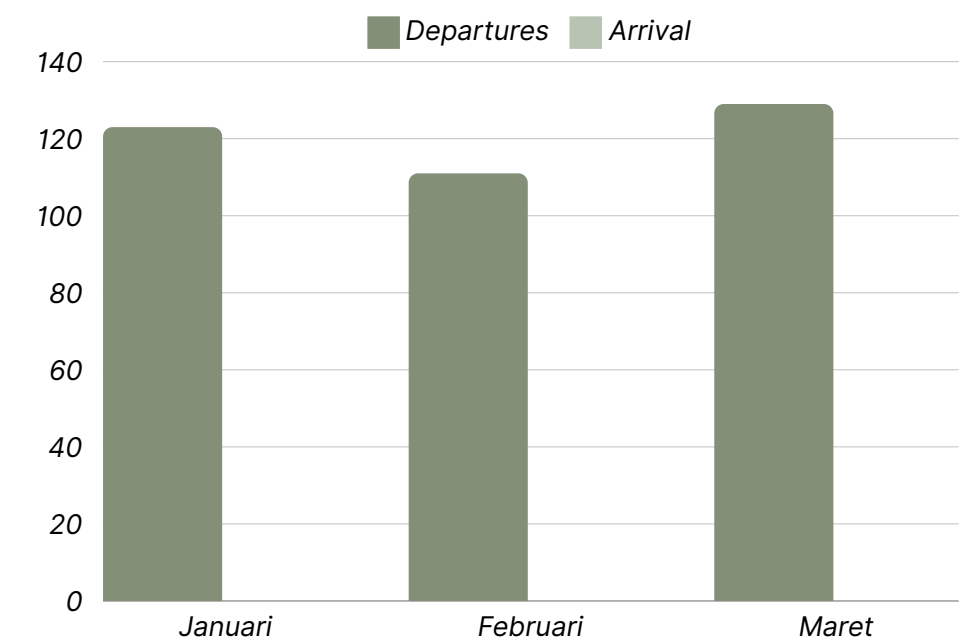
C. Operational Facilities Area

Arrival Bus Area	: 3.024 m2
Departure Bus Area	: 1.512 m2
Rest Area Bus	: 8.064 m2
Parking Area	: 1.560 m2
Track	: 3.900 m2

Terminal capacity

Arrival Path	: 3.024 m2
AKDP	: 9 Path
City Bus	: 7 Path
Parking Bus Area	: -/+ 50 Big Bus

AKAP passenger arrivals and departures at Penggaron terminal Quarter 1 2024



AKDP passenger arrivals and departures at Penggaron terminal Quarter 1 2024

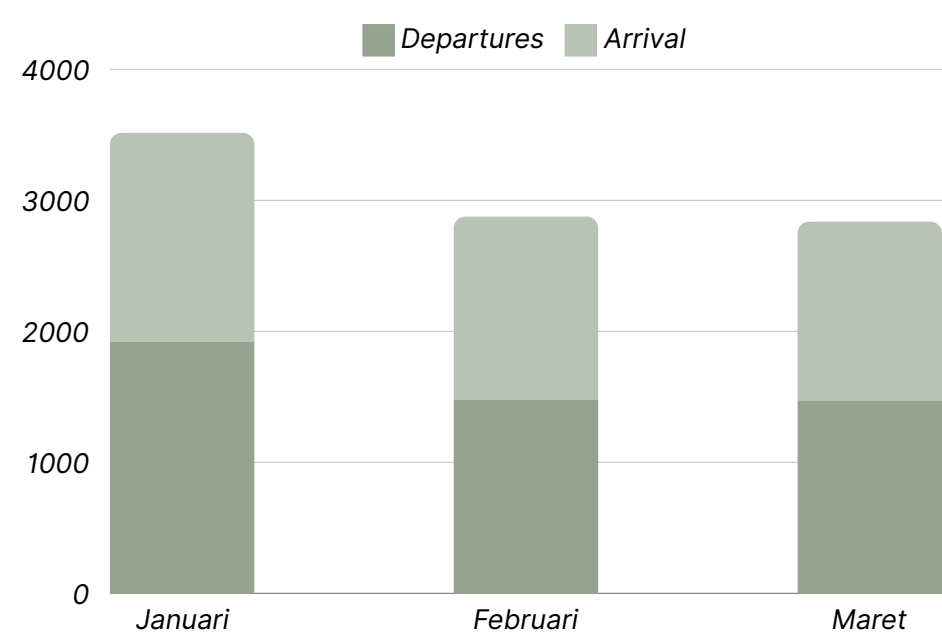
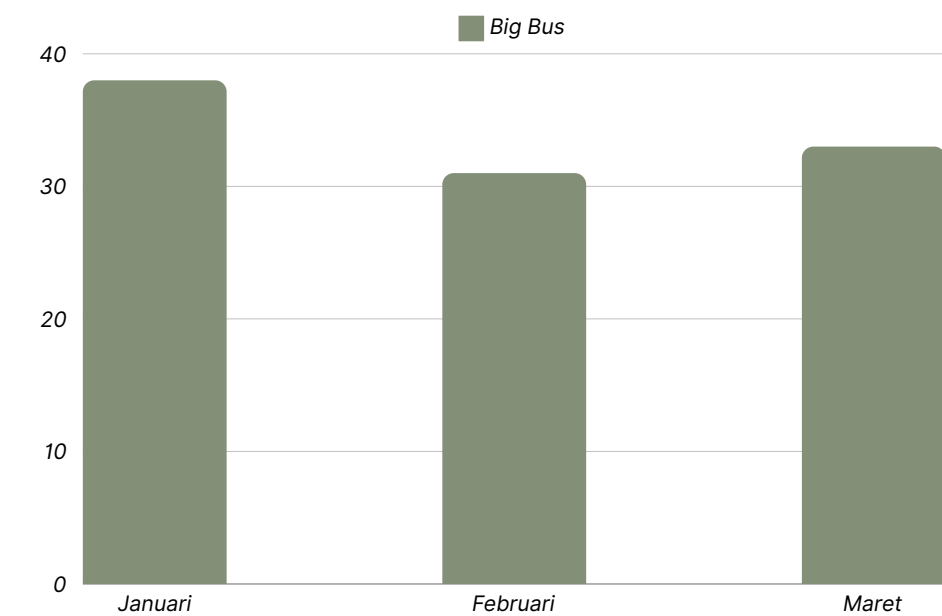


Figure 2. Table of Terminal Penggaron Passenger Data
Source : Department of Transportation

The data on AKAP (Intercity Interprovincial) passenger arrivals and departures at Penggaron Terminal for Quarter 1 of 2024 shows the following departure figures: In January, there were 123 departures, in February, 111 departures, and in March, 129 departures.

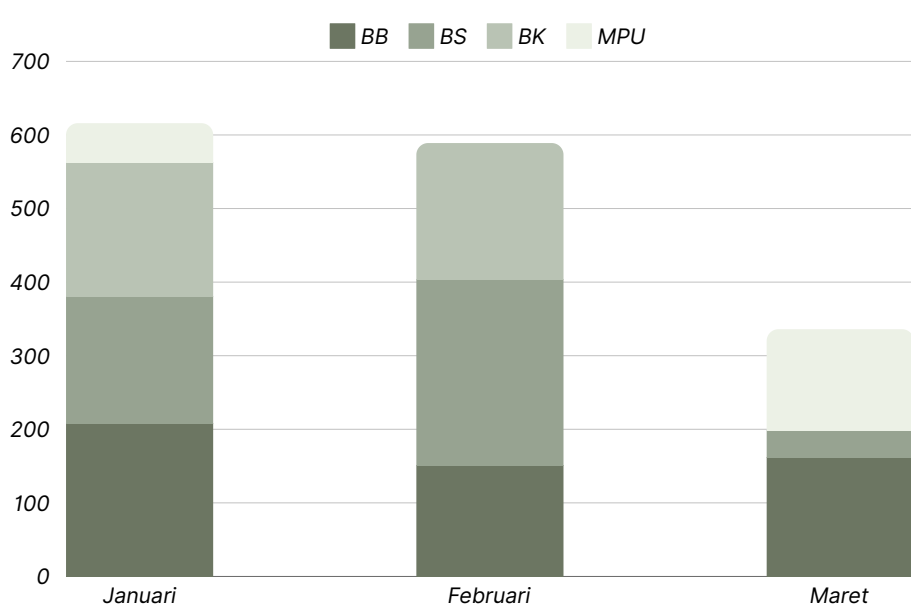
The AKDP (Intercity Intraprovinial) passenger traffic at Penggaron Terminal for Quarter 1 of 2024 shows a dynamic flow of arrivals and departures. In January, the terminal recorded 1,925 departures and 1,590 arrivals, indicating a busy month with a higher volume of departures compared to arrivals. February saw a slight decrease in activity, with 1,483 departures and 1,393 arrivals, reflecting a more balanced but lower passenger traffic compared to January. March continued this trend with 1,475 departures and 1,362 arrivals, showing a consistent, albeit slightly reduced, level of activity. Overall, the terminal experienced steady passenger movement throughout the first quarter, with departures consistently outpacing arrivals each month.

AKAP flow at Penggaron Terminal in the first quarter of 2024



The AKAP (Intercity Interprovincial) bus flow at Penggaron Terminal in the first quarter of 2024 shows moderate activity. In January, 38 buses were recorded, followed by a slight decrease in February with 31 buses. In March, the number of buses increased slightly to 33. This data reflects a relatively stable flow of AKAP buses throughout the quarter with minor fluctuations

AKDP flow of Penggaron Terminal Quarter 1 2024



The AKDP (Intercity Intraprovincial) bus flow at Penggaron Terminal during the first quarter of 2024 demonstrates fluctuating patterns across different vehicle categories. In January, the terminal recorded 208 BB (Big Bus) trips, 172 BS (Medium Bus) trips, 182 BK (Small Bus) trips, and 54 MPU (Passenger Car) trips. February saw a decline in BB trips to 151, while BS trips increased to 253. BK trips remained steady at 185, but there were no MPU trips recorded. In March, BB trips slightly rebounded to 161, but BS trips sharply dropped to 38, and no BK trips were recorded. Meanwhile, MPU trips saw a significant increase, with 137 trips recorded. This data highlights noticeable variations in the types of vehicles operating at the terminal across the first quarter of 2024.

Table 3. Table of Terminal Penggaron Bus Data
Source : Department of Transportation

Vehicle Retribution for Terminal Penggaron Year 2023

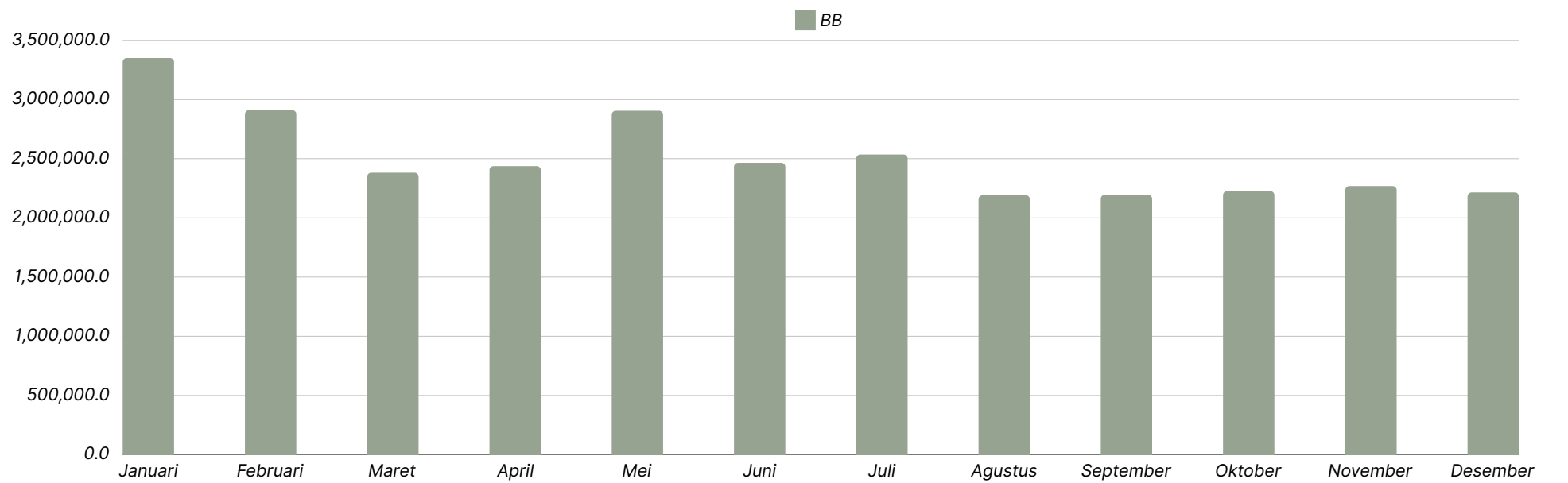


Table 4. Revenue table of Penggaron terminal
Source : Department of Transportation

The significant points from the 2023 terminal fee revenue at Penggaron Type B Terminal are as follows:

- Highest Revenue: January recorded the highest revenue at IDR 3,351,000, marking the peak for the year.
- Steady Decline: There was a noticeable decline in revenue from March (IDR 2,832,000) to June (IDR 2,465,000).
- Second Half Stability: From August to December, the revenue remained relatively stable, hovering around IDR 2.2 million, with no major fluctuations.
- Lowest Revenue: August saw the lowest monthly revenue of the year at IDR 2,191,000. This reflects a peak in early 2023, followed by a gradual decrease and stabilization in the second half of the year.

Terminal Penggaron AKDP Bus Route

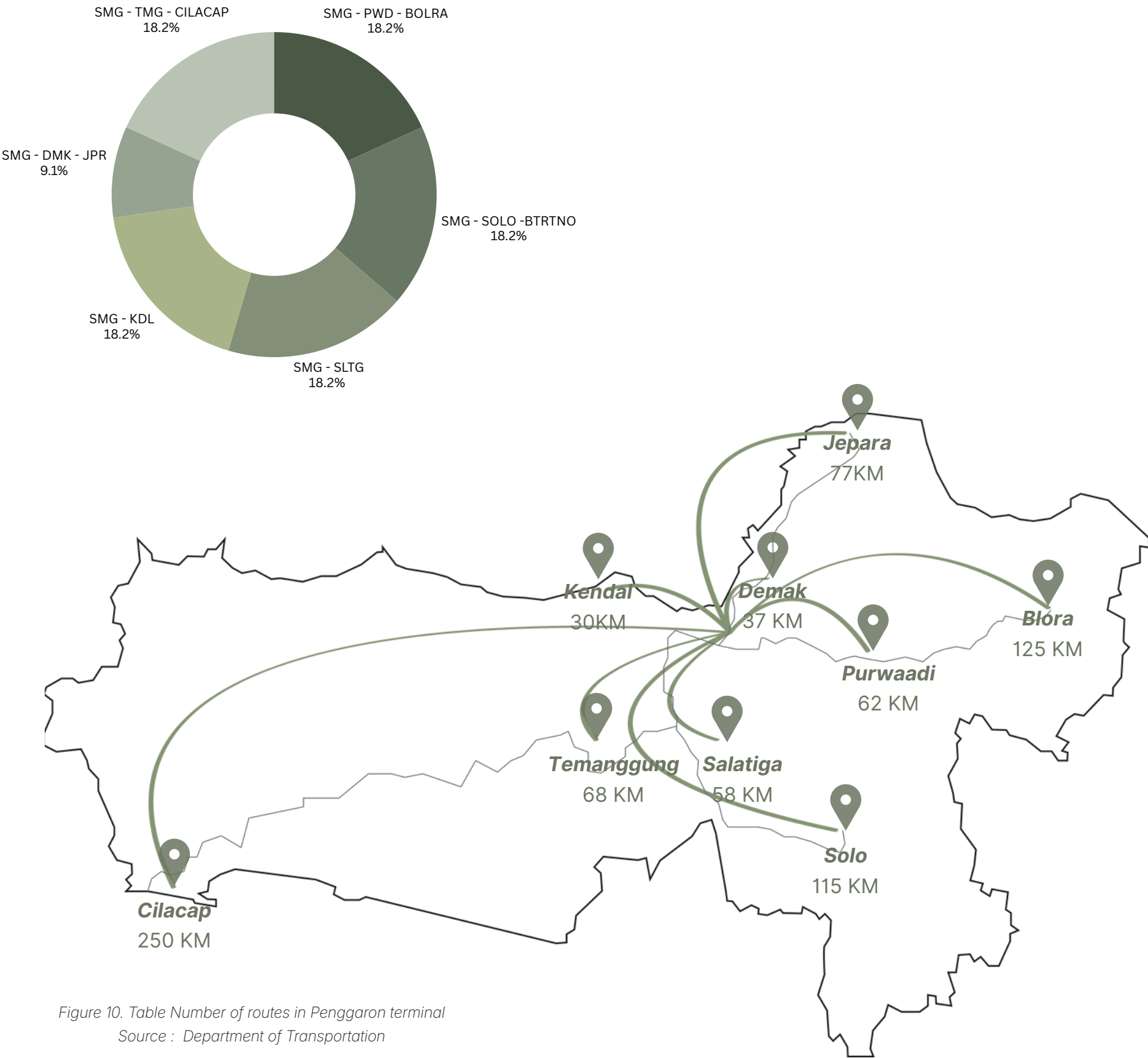


Figure 10. Table Number of routes in Penggaron terminal
Source : Department of Transportation



Figure 11. Old Town Semarang City
Source : Author Site Survey Documentation

Old Town in Semarang City, Central Java

Heritage tourism as one of the icons of Semarang City

Semarang offers rich heritage tourism potential, blending Javanese, Chinese, Dutch, and Arab cultural influences. Key attractions include the historic Kota Lama, with its **Dutch colonial architecture**, and Lawang Sewu, a former railway headquarters known for its unique design and historical significance. The Sam Poo Kong Temple honors Admiral Zheng He and **reflects Chinese-Japanese heritage**, while the Blenduk Church and vibrant kampungs like Chinatown offer insight into the city’s diverse history.



Dugderan: A Tradition Of Welcoming Ramadan In Semarang City

Figure 12. Annual Exhibition in Semarang City
Source : Government of Semarang City

Annual Exhibition, such as **Dugderan and Cheng Ho Festival**, attract many tourists and promote local culture.

The Dugderan and Cheng Ho Festival are major annual events in Semarang that celebrate the city's cultural diversity and attract numerous tourists. **Dugderan**, marking the start of Ramadan, features parades and the symbolic Warak Ngendog creature, reflecting Javanese, Chinese, and Arab influences. **The Cheng Ho Festival**, honoring Chinese admiral Zheng He, includes lion dances and ceremonies at Sam Poo Kong Temple, celebrating Chinese-Japanese heritage. These festivals not only promote tourism but also strengthen Semarang's multicultural identity and cultural preservation.

Architecture



Figure 13. Blenduk Church Old town Semarang City

Source : Government of Semarang City

Gereja Blenduk, Old Town, Semarang City

The Dutch colonial architecture of Semarang is a testament to the city's complex history, reflecting **European styles** adapted for the hot, humid tropical climate of Indonesia. During the Dutch colonial period, which spanned from the 17th century to the early 20th century, European architectural practices were adapted to suit **local environmental** conditions. This adaptation is seen in the design of iconic buildings like Lawang Sewu, the Blenduk Church, and structures throughout Kota Lama (Old Town), which collectively display elements tailored to maximize comfort in a tropical setting. These buildings were constructed with thick walls made from durable masonry and stone, which help regulate indoor temperatures by absorbing heat during the day and releasing it slowly at night. Additionally, high ceilings are a notable feature that, paired with large windows and verandas, allow for natural airflow and **reduce the need for artificial cooling systems**.

Many colonial buildings in Semarang also used local materials like teak wood, known for its resistance to humidity and pests, which made the buildings both durable and well-suited to the climate. This reliance on locally sourced materials not only reduced maintenance needs but also enhanced the buildings' resilience in a tropical setting.

Architecture

1. Natural Ventilation

Emphasizing cross-ventilation is crucial. Design elements like open courtyards, high ceilings, and large windows create a flow of air that cools the building naturally, minimizing dependence on air conditioning. Traditional louvers and jalousies (angled window slats) can be used to regulate airflow while blocking sunlight.

2. Shaded Facades and Verandas

Adding wide verandas, covered walkways, and shading devices around facades prevents direct sunlight from heating the building. In a modern adaptation, green facades or vertical gardens can reduce solar heat gain and improve air quality around the structure.

3. Double Roof and Insulation Techniques

Implementing double-roof systems with an air gap helps to dissipate heat. Additionally, modern insulation materials can further enhance the roof's effectiveness, maintaining a cooler interior. Using sloped roofs made from reflective or locally sourced materials further optimizes thermal efficiency.

4. Rainwater Harvesting and Green Spaces

Given Semarang's monsoon season, incorporating rainwater harvesting systems in roof designs can aid in water conservation. Integrating green roofs or garden spaces into the building design also helps with rainwater absorption and provides natural cooling.



Figure 14. Semarang Train Station
Source : Government of Semarang City

Semarang Train Station, Semarang City

Site potential

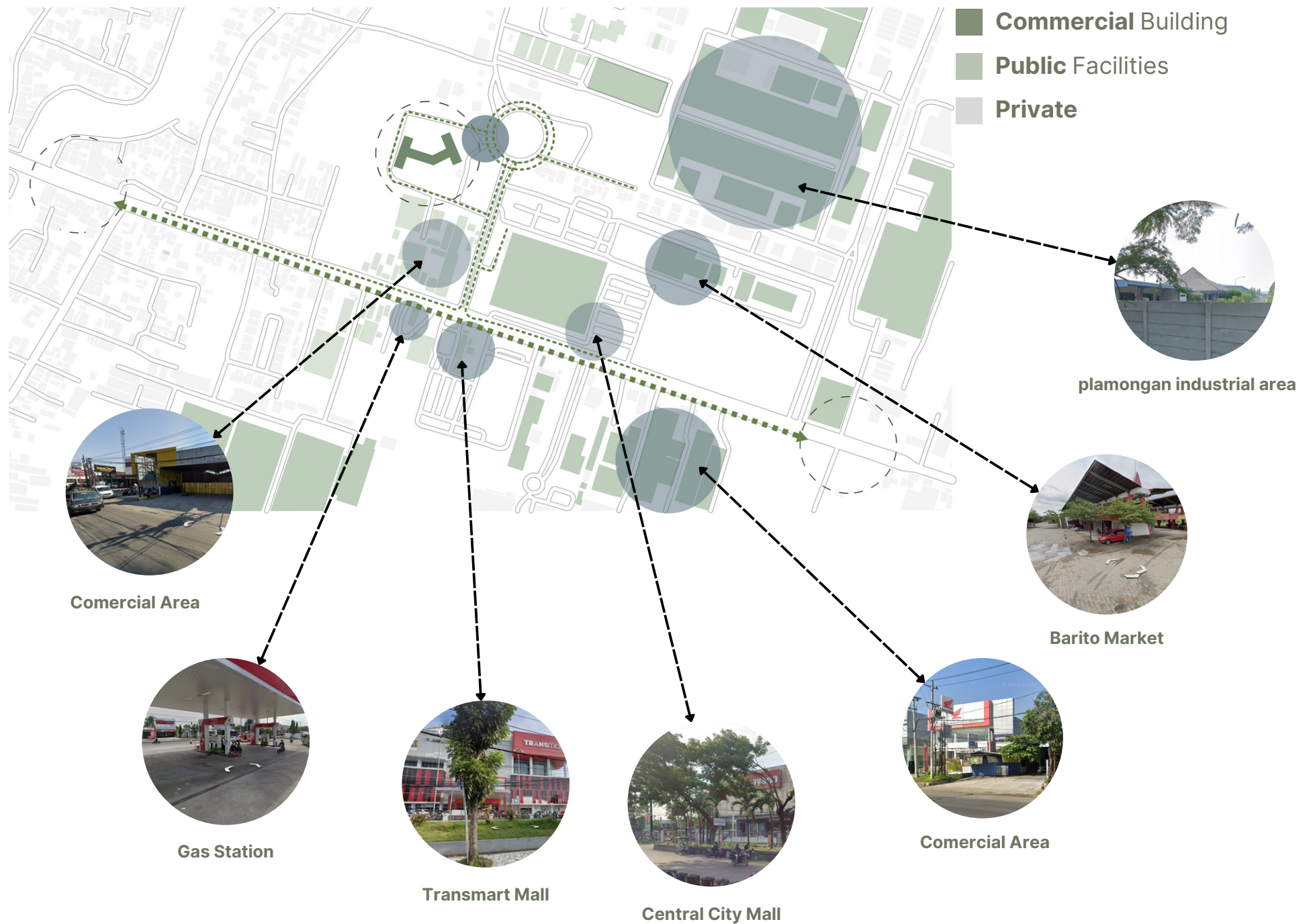


Figure 15. Site Potential Diagram
 Source : Author's Analysis



Figure 16. Existing Conditions
Source : Author's Analysis

The Terminal Penggaron site has significant potential as a **commercial and public attraction hub**. Its location is enhanced by two nearby public malls, which draw high foot traffic and create a natural flow of visitors. The commercial area provides a foundation for varied business opportunities, making it a hotspot for retail and service industries. Additionally, the long street surrounding the terminal is well-suited for **attracting people**, as it offers ample visibility and accessibility, which can boost local commerce and enhance the terminal's role as a central gathering space.



Figure 17. Existing Conditions
Source : Author's Analysis

Site Problem

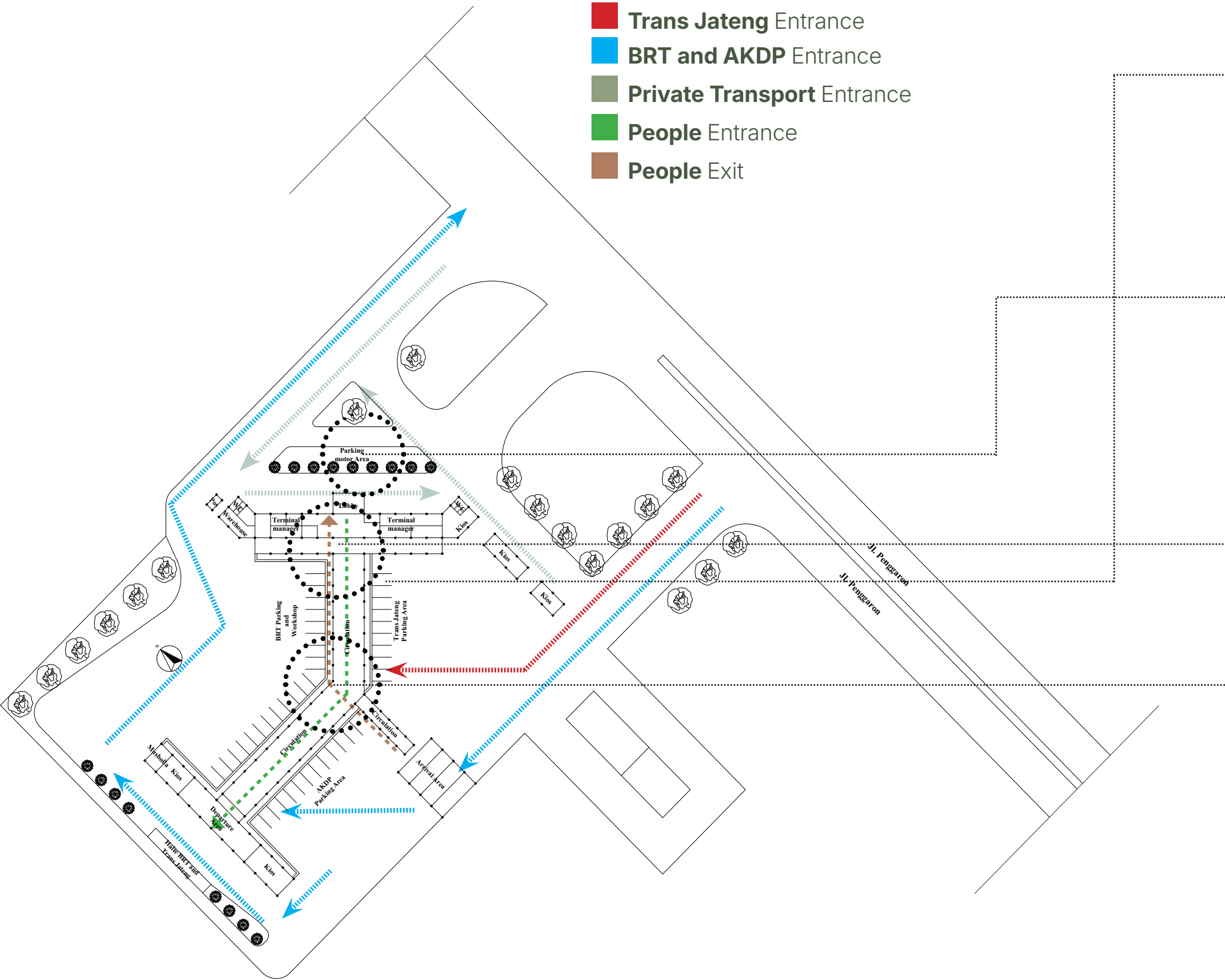


Figure 18. Site Problem Diagram
Source : Author's Site Survey Documentation



Irregular **motorbike** parking



Insufficient **Peron bus**



No separation between **arrivals** and **departures**



No **passenger** introductory limit for **Bus**

Figure 19. Aminity
Source : Author's Site Survey Documentation

Site Problem

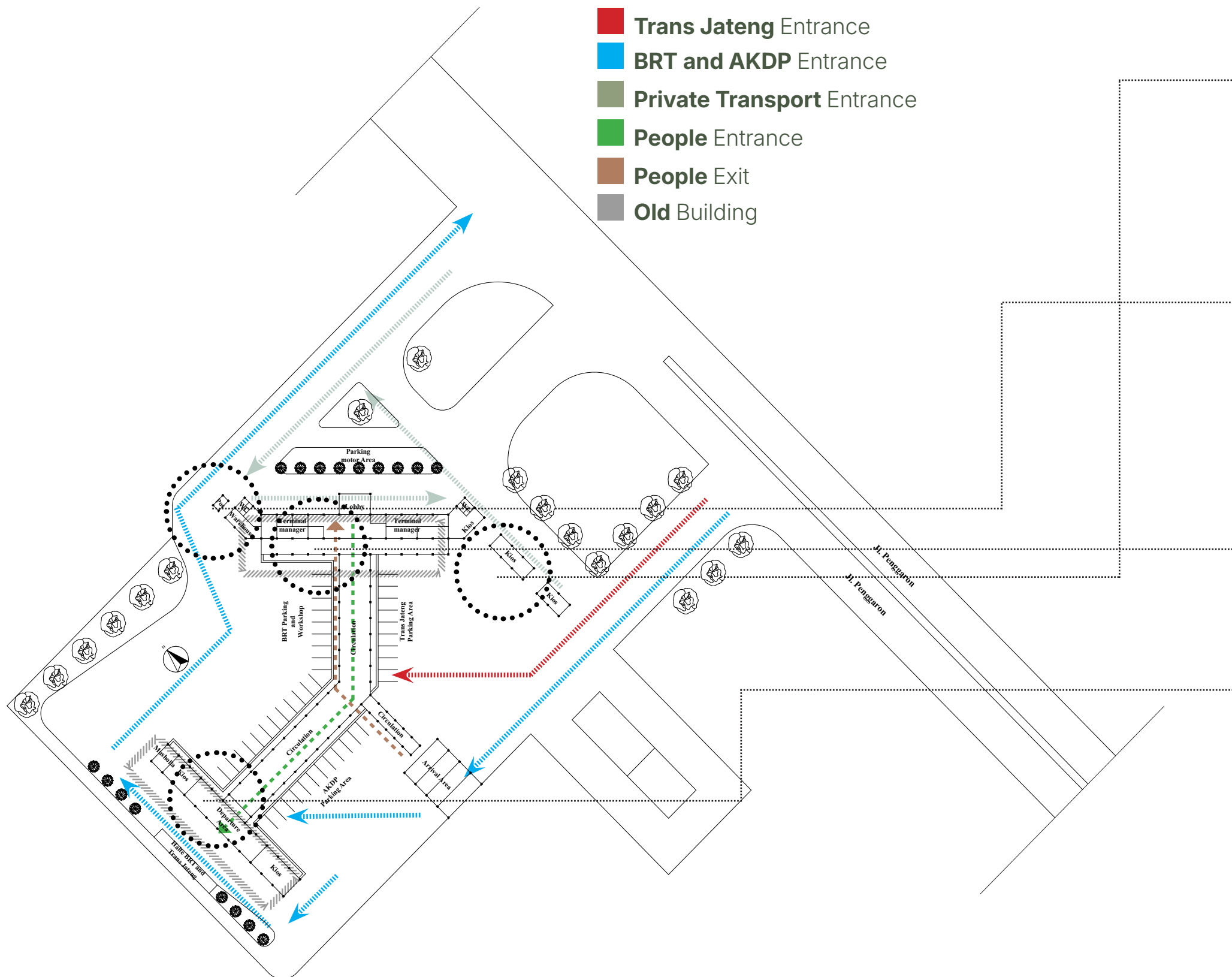


Figure 20. Site Problem Diagram

Source : Author's Site Survey Documentation



Insufficient **Facility Condition**



Insufficient **Support Facility**



Insufficient **Facility Condition**



Insufficient **Facility Terminals Manager**

Figure 21. Aminity
Source : Author's Site Survey Documentation

Climate Condition

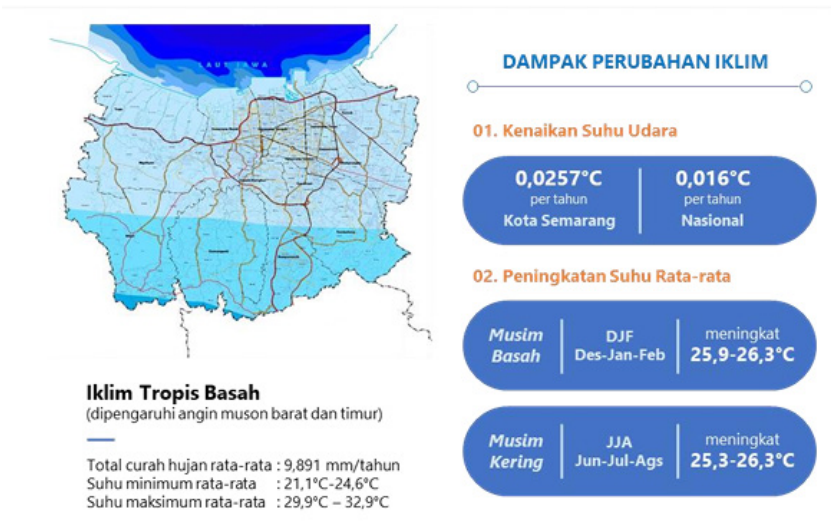


Figure 22. Climate Condition of Semarang City
Source : Bappeda Kota Semarang, 2020

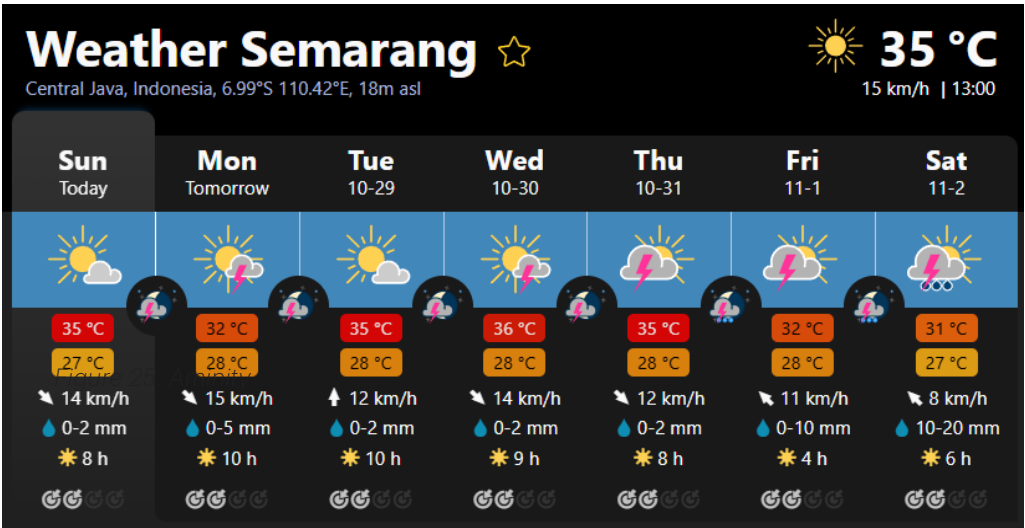


Figure 23. Weather Conditions
Source : Meteoblue

Semarang, the capital city of Central Java in Indonesia, has a tropical monsoon climate (Am according to the Köppen climate classification). Here’s a detailed breakdown of its climate characteristics:

Temperature

Consistent Warm Temperatures: Semarang experiences warm temperatures throughout the year, with average highs ranging from **29°C to 32°C** (84°F to 89°F). The coolest months are typically **July and August**, while the warmest are from **September to October**.

Rainfall And Seasons

Monsoon Influence: Semarang has a monsoon season, which results in distinct wet and dry periods.

Wet Season: Typically from November to April, marked by high rainfall with monthly averages between 200 to 400 mm (8 to 16 inches). January tends to be the rainiest month, often exceeding 400 mm (16 inches) of rainfall.

Dry Season: Spanning from May to October, rainfall is minimal, with some months (like August) receiving less than 50 mm (2 inches) of rain. The transition from wet to dry season can occasionally have residual rain.

Climate Condition

Humidity and Winds

High Humidity: Due to its tropical location, humidity remains high year-round, often ranging from 70% to 90%.

Winds : The monsoon winds influence wind patterns, with stronger winds typically blowing during the rainy season. Coastal winds near Semarang also contribute to a coastal breeze effect, especially in the northern parts of the city.

Climate Trends and Adaptation

Warming Trends: Like much of Indonesia, Semarang has observed slight increases in temperature over recent decades, attributed to global warming.

Adaptation: Infrastructure planning in Semarang is increasingly considering climate resilience, especially regarding flood management, seawalls, and drainage improvements.

Challenges Due to Climate

Flooding: Due to heavy rainfall during the wet season, parts of Semarang are prone to flooding. This is compounded by the low-lying coastal areas, which are vulnerable to tidal flooding.

Sea-Level Rise: Coastal erosion and rising sea levels are growing concerns for Semarang’s urban planning, affecting the low-elevation areas near the Java Sea.

StrengthWeakness

1. Strategic location near key transportation routes (roads, high-ways).

2. Existing infrastructure for public transport functions.

3. Potential for connectivity with other transport hubs (train sta-tions, airports).

4. Proximity to commercial and residential areas.

5. Potential Mix-Use Function of Terminal as Exhibition Area in Semarang

6. Preserv Main Structure Elements and Demolish Architectural Elements

1. Outdated facilities, poor maintenance of existing structures.

2. Limited amenities and services for passengers.

3. Safety and security concerns, including lighting and surveil-lance issues.

4. Lack of effective zoning and land-use planning around the terminal.

Inside Factors

OpportunitiesThreads

1. Room for commercial development (restaurants, retail, ser-vices).

2. Improvement of pedestrian areas and public spaces, creating a more user-friendly environment.

3. Potential partnerships with private investors for mixed-use de-velopment.

4. Integration of Colonial Architectural Style in Terminal Design to Preserve the Distinctive Character of Semarang City

5. use of Colonial Building strategy concept for Tropical climate

1. Risk of project delays due to bureaucratic processes.

2. Environmental impact regulations that may slow or restrict de-velopment.

3. Resistance from local businesses or residents to redevelop-ment plans.

4. Competition from other transportation hubs or services

Outside Factors

What is Transit-Oriented Development (TOD)?

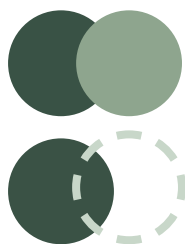
TOD, or Transit-Oriented Development, is an approach to urban development designed to bring people, services, and activities together with quality public transport supported by walking and cycling conditions to facilitate shorter trips, better lifestyles, and more efficient use of city resources.

At its core, TOD promotes compact city growth by integrating land development and transport service. Compact development counters sprawl, which leads to less dependence on motor vehicles, shorter commutes, and reduced exposure to noxious fumes and dangerous traffic. TOD makes living and moving without a car not only possible, but enjoyable.

How is TOD inclusive?

Transit-Oriented Development (TOD) promotes inclusivity by ensuring that diverse populations have access to public transportation, affordable housing, and essential services. It prioritizes walkable neighborhoods, which accommodate people with varying mobility needs, such as the elderly and disabled. Mixed-use development in TOD areas fosters social integration by combining residential, commercial, and public spaces. Additionally, TOD supports sustainability by reducing car dependence and offering equitable access to urban amenities for low-income residents.

Ways to achieve TOD



Improvements to a traditional neighborhood.

Many traditional neighborhoods are built around walking and public transit and have many or most elements of TOD. Modifications can further improve TOD, such as creating more pedestrian zones, adding more density of activities, or bringing in more options for sustainable transport modes.



Upgrading an informal settlement.

Many existing low-income and informal communities can benefit from much-needed services and infrastructure and housing improvements. Upgrading without displacement yields stronger community ties while fostering more efficient use of the land area.



Infill and brownfield redevelopment

In existing urbanized areas, infill and reclaiming of underutilized space can bring more local activity, increase local capital, and provide more spaces to live, anchored around existing transit service.



Developing a new neighborhood

Planning new neighborhoods in areas thoughtfully appropriated for growth provides the opportunity for bringing all aspects of TOD in a holistic manner. New neighborhoods can be planned with mixed uses, walking, and public transport to maximize development potential and ensure short and convenient trips and healthier environments.

The Eight Principles of TOD

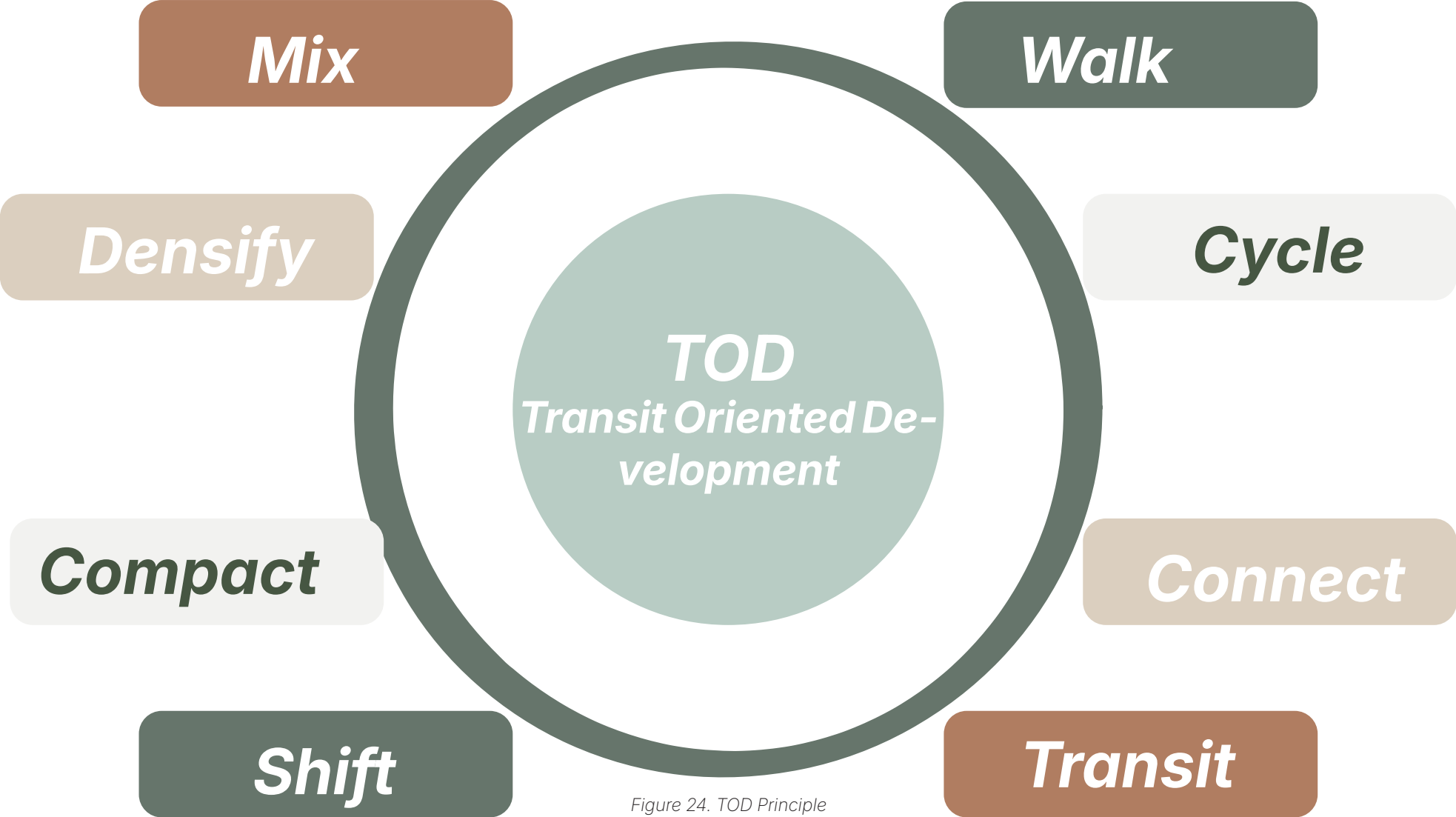


Figure 24. TOD Principle
Source : Author's Analysis

TOD, or Transit-Oriented Development, benefits people, cities, and the environment. Its benefits are interrelated, as it is a comprehensive and holistic approach to development.

TOD is good for the people who live in cities and neighborhoods developed on the principles of inclusive access because their needs are at the center of the design of sustainable transport modes, neighborhoods, and spaces. It promotes health and safety, and it can bolster socioeconomic equity. For babies and toddlers, a group especially susceptible to impacts of motor vehicles, TOD creates neighborhoods where they can grow healthy and where their caregivers can find resources locally. For the cities, TOD brings innumerable benefits for resource efficiency and economic development. It also bolsters the overall resilience of cities and reduces susceptibility to climate change. For the environment, TOD helps mitigate sprawl-related impacts such as greenhouse gas (GHG) emissions or degradation of natural habitats.

TOD Standarts Developed by ITDP (*Institute for Transportation & Development Policy*)

1. Walkways

The most basic feature of urban walkability is complete, continuous, and safe walkway networks that provide clear protection from motor vehicles and are accessible to all people, including those with disabilities.

2. Crosswalks

Crosswalks are necessary for safely connecting the walkway network across vehicle traffic and are a critical part of making walkable areas accessible to all people, including those with disabilities.

3. Visually Active Frontage

Visually active frontages promote safety from crime in walkable areas through informal observation and surveillance by people inside buildings. This is often described as "eyes on the street."

4. Physically Permeable Frontage

Sidewalks that are lined with continuous ground-floor activity and services have fewer zones of inactivity, thereby creating a more attractive walking environment that is safer from crime.

5. Shade and Shelter

Shade and shelter help to make the walkable environment more comfortable and more accessible by protecting pedestrians from heat, rain, and other elements.

6. Small Blocks

Small blocks reduce trip distances, making walking more convenient for trips.

7. Prioritized Connectivity

Connectivity that prioritizes walking over motorized forms of transportation improves walkability by making walking more convenient relative to other modes of transportation.

8. Complementary Uses

A mix of uses reduces the distance between homes and services, thereby improving access. Shorter trips are more likely to be done by walking.

9. Access to Local Services

Having basic services within easy walking distance enables more of these trips to be undertaken on foot.

Preliminary Study of the Building Design Typology

Basic Definition and Concept : Functions, Facilities, and Terminal Services

The terminal is one component of the transportation system which has the main function as a temporary stop for public vehicles to raise and lower passengers and goods to the final destination of a trip, as well as a place of control, supervision, regulation and operation of the passenger and goods transport flow system, besides that it also functions to smooth the flow of passengers or goods. (Department of Transport 1996)

According to Government Regulation of the Republic of Indonesia Number 79 of 2013 concerning Road Traffic and Transport Networks, a terminal is a base for public motorised vehicles used to regulate arrivals and departures, loading and unloading of people and or goods, and transfer of transport modes. Terminals consist of 2 (two) types, there are

Passenger Terminals

Freight Terminals



Figure 25.. Terminal Penggaron
Source : Author's Survey



According to Government Regulation of the Republic of Indonesia Number 79 Year 2013 on Road Traffic and Transport Network, passenger terminal organisers are must provide terminal services in accordance with the minimum service level standards. standard. Passenger terminal service level standards there are :

- Services of main facilities and supporting facilities in accordance with the type and class of terminal, and terminal.
- Standard operating procedures for terminal services.

The classification of terminals according to several criteria based on the Department of Transport Transportation (1996) Terminal Classification Based on Terminal Space.

- The main terminal (A) is ± 5 ha for Java and Sumatra, 3 ha for other islands. other islands.
- Intermediate terminals (B) are ± 3 ha for Java and Sumatra, and 2 ha for other islands.
- Branch terminals (C) are dependent on the need.

Name	Space Requirements
Parking Area	-
• AKAP	-
• AK	800
• AKDP	540
• ADES	900
• Private	500

Name	Space Requirements
Service Space	500
Vehicle circulation	2.740
Workshop	100
Rest Room	50
Warehouse	25
Reserved Parking Space	1.370
Waiting Room	2.250
People Circulation	900
Restroom	60
Kiosk	1.350
Musholla	60
Administration Room	59
Supervisor's Room	23
Counter	3
Retribution	6
Information Room	10
Treatment Room	30
Outdoor Space	4.890
Total Area	17.251
Development Reserve	17.251
Land Requirement	34.502

Table 5. Terminal Classification
Source : Department Transportation

Minimum service standards for terminals according to the Minister of Transportation regulations: PM 40 of 2015

No.	Services Component	Service Parameters
1.	Departure Services	<ul style="list-style-type: none">• Availability of adequate and comfortable passenger waiting areas.• Availability of vehicle arrival information both visually and audibly.• Transparent and orderly ticket sales system.• Availability of departure and arrival schedules both visually and audibly.• Vehicle arrangement within the terminal according to designated zones.• Passengers are directed to the appropriate place to wait or board vehicles.• Provision of special facilities for persons with disabilities, such as toilets, special lanes, and other accessibility features.• Availability of safe and orderly parking for public and private vehicles.• Terminal facilities such as buildings, toilets, and parking areas are always well-maintained and clean.• Regular monitoring of vehicle and passenger safety.• Periodic inspections of vehicle roadworthiness before departure.• Terminal area security is provided by security personnel on duty 24/7.• Passengers are only allowed to board vehicles with valid tickets.• Provision of cleanliness facilities such as toilets, trash bins, and other sanitation areas that are well-maintained.• Adequate lighting is provided throughout the terminal, including in waiting areas, vehicle lanes, and parking areas.• Availability of health facilities such as a health post providing first aid and rest areas for passengers in need.• Clear and transparent ticket price information, available through ticket counters or electronic information systems.• CCTV installation in strategic areas of the terminal to monitor the safety and security of passengers and vehicles.
2.	Arrival Services	
3.	Ticket Services	
4.	Information Services	
5.	Vehicle Arrangement Services	
6.	Passenger Arrangement Services	
7.	Services for Persons with Disabilities	
8.	Parking Services	
9.	Facility Maintenance Services\	
10.	Safety Supervision Services	
11.	Vehicle Maintenance Services	
12.	Passenger Security Services	
13.	Ticket Supervision Services	
14.	Cleanliness Services	
15.	Lighting Services	
16.	Health Services	
17.	Ticket Price Information Services	
18.	CCTV and Electronic Security Services	

No.	Services Component	Service Parameters
19.	Vehicle Lane Services	<ul style="list-style-type: none">• Vehicle lanes within the terminal are well-organized to avoid traffic congestion and accidents.• Availability of security posts that are easily accessible by passengers and staffed 24/7.• Assistance services for elderly passengers, pregnant women, or passengers requiring special attention.• Public vehicles are stationed in designated areas and adhere to scheduled departure and arrival times.• Provision of hygienic food and beverage kiosks that do not interfere with terminal traffic flow.• Availability of clean and proper toilets for use by passengers and terminal staff.• Availability of an information counter providing details on schedules, tickets, and other terminal facilities.• Availability of sufficient clean water facilities for passenger and staff needs.• Provision of a proper and comfortable nursing room for mothers breastfeeding their children.• Availability of a clean and proper prayer room for passengers who wish to pray.• Availability of procedures and facilities for handling emergencies such as fires, natural disasters, or other emergency situations.• Availability of clear and easily accessible evacuation routes for passengers and terminal staff.• Provision of adequate trash bins throughout the terminal area to maintain cleanliness.• Provision of safe and orderly facilities for passengers crossing from one area to another within the terminal.• Availability of an emergency information post that passengers can contact in case of emergencies.
20.	Security Post Services	
21.	Services for Passengers Needing Special Assistance	
22.	Public Vehicle Services	
23.	Food and Beverage Kiosk Services	
24.	Toilet Services	
25.	Information Counter Services	
26.	Clean Water Services	
27.	Nursing Room Services	
28.	Prayer Room Services	
29.	Emergency Response Services	
30.	Evacuation Route Services	
31.	Trash Bin Services	
32.	Pedestrian Crossing Services	
33.	Emergency Information Post Service	

No.	Services Component	Service Parameters
34.	Smoking Area Services	<ul style="list-style-type: none">• Provision of a designated smoking area separate from the main terminal area, following applicable regulations• Availability of an orderly vehicle queuing system that does not disrupt the traffic flow within the terminal.• Traffic flow within the terminal is regulated to avoid congestion and accidents.• Provision of adequate and comfortable seating in the passenger waiting area.• Proper organization of entry and exit lanes in the terminal to avoid congestion and ensure smooth access for vehicles and passengers.• Provision of special lanes for persons with disabilities, ensuring easy and safe accessibility.
35.	Vehicle Queue Management Services	
36.	Internal Traffic Flow Services	
37.	Seating Services	
38.	Entry and Exit Lane Services	
39.	Disability Lane Accessibility Services	

Table 6. Minimum Service standart terminal
Source : Department Transportation

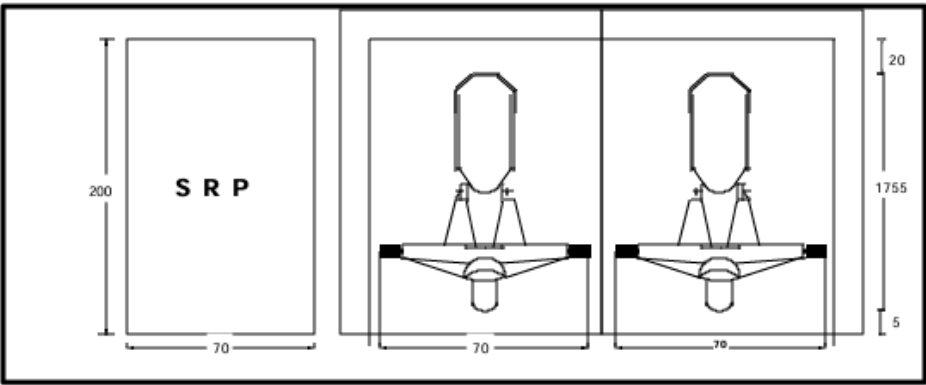
Vehicle size standards

Potential tourists, traders, employees of the terminal services, and bus operating firms typically drive vehicles and motorbikes into the terminal. bus operating businesses and terminal services. Furthermore, bus vehicles with two different bus sizes are used by City buses, AKDP, AKAP, and Damri. These two bus sizes are as follows:

Type of Vehicle	Length	Width	High
Motorcycle	2.20 m	0,70 m	1
Car	3.60 m	1.60 m	1.35 m
Bus	7,82 m	2.10 m	3.26 m
Bus	11 m	2.50 m	3.26 m

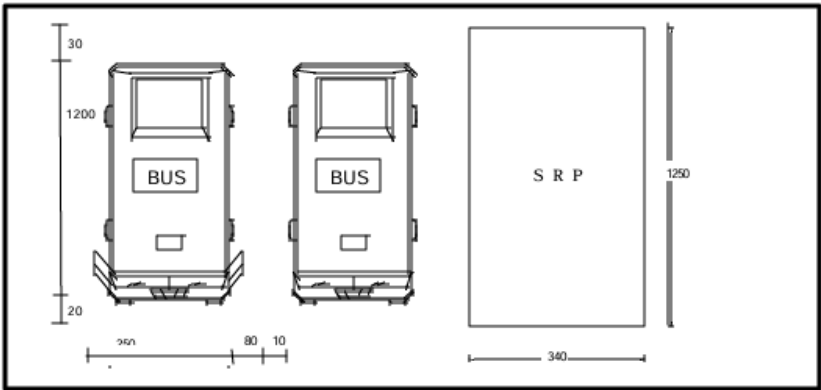
Table 7. Dimension of vehicles
Source : Earnest Neurfat, Data Arsitek

Parking Space Unit



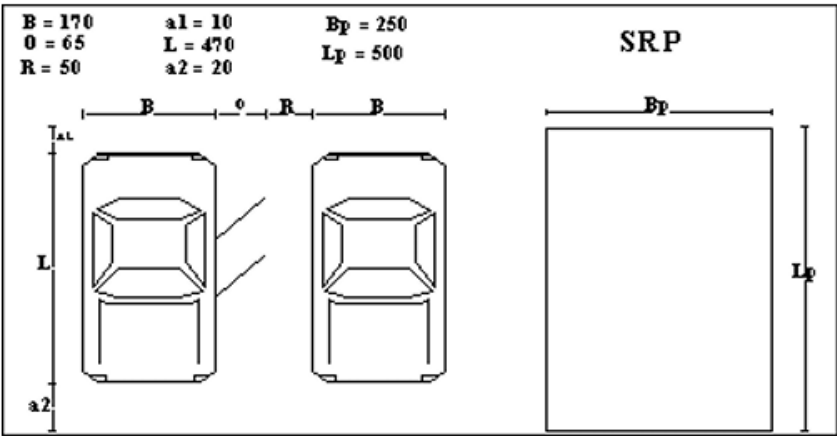
Parking Space Unit for Motorcycle

Figure 26. Parking Space unit for Motorcycle
Source : Departmen of Transportation



Parking Space Unit for Bus

Figure 27. Parking Space unit for Bus
Source : Departmen of Transportation

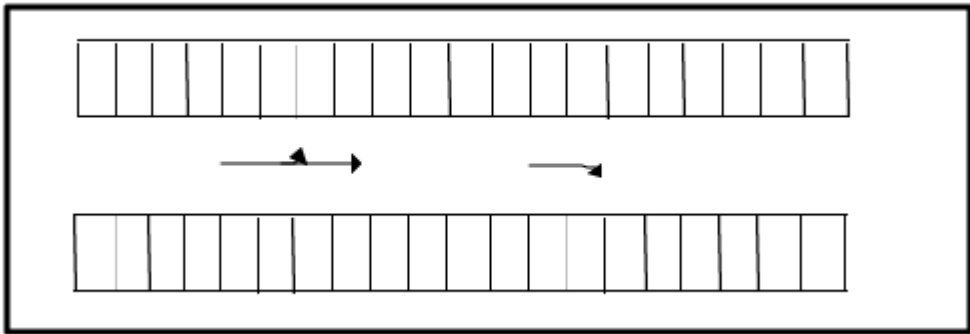


Parking Space Unit for Car

Figure 28. Parking Space unit for car
Source : Departmen of Transportation

Motorcycle Parking Pattern

In general, the vehicle position is 90o. In terms of space effectiveness, the 90° angle position is most favorable.



Car Parking Pattern

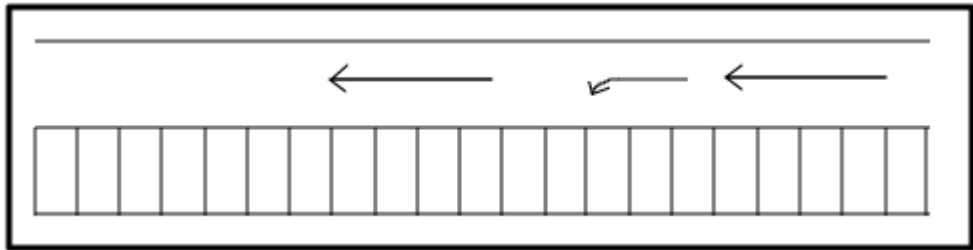


Figure 29. car Parking Pattern
Source : Departmen of Transportation

This parking pattern has more capacity when compared to the parallel parking pattern. compared to the parallel parking pattern, but the ease and convenience for drivers to maneuver in and out of parking spaces is less than the parallel parking pattern. parking spaces is less when compared to parking patterns with an angle smaller than 90.

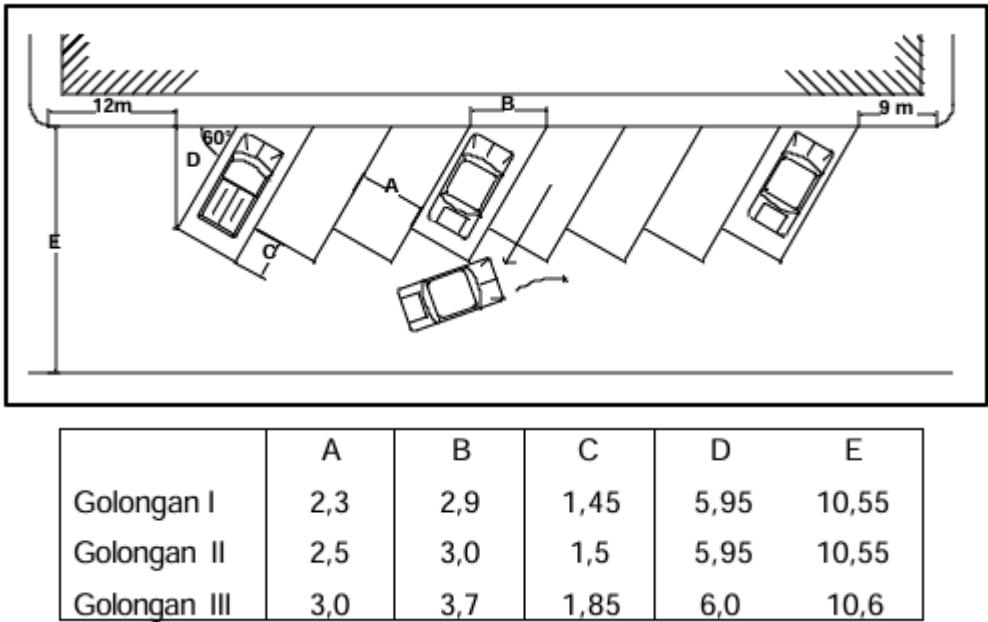


Figure 30. car Parking Pattern
Source : Departmen of Transportation

Art Exhibition Definition

- **Definition**

An art exhibition is a space that facilitates artists to display their artworks to the public, be it paintings, sculptures, photography, installations, or other multimedia works. Its main function is to introduce artworks to the public and provide an aesthetic experience and inspiration for visitors.

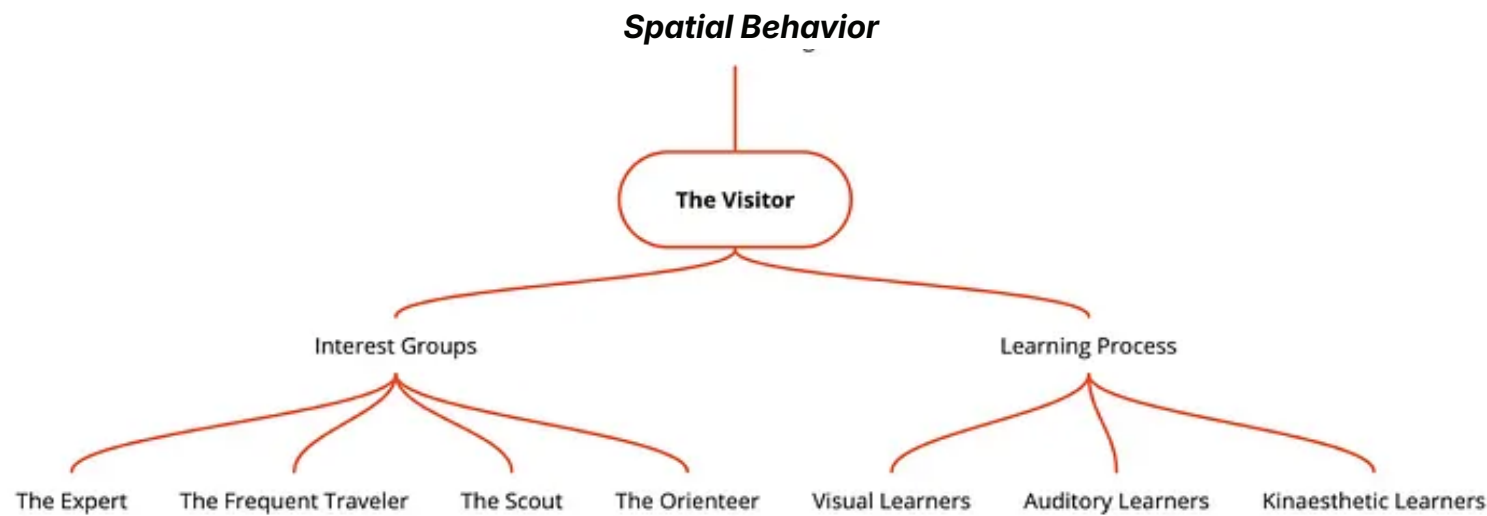
- **Purpose of existence**

Combining a terminal area with an art exhibition in the design can be a unique way to create a multifunctional and aesthetically pleasing public space.

- **Function**

Exhibition design is the fabrication and installation of immersive environments which, through interactive art, transforms physical spaces into meaningful shared experiences at places like:

- Entertainment
- Consumer Brand Event
- Shopping Malls
- Retail Stores
- Trade Show Booths



The most crucial aspect of the exhibition designer’s job is the visitor’s involvement, just as it is in any other area of design. Engaging visitors involves providing them with fresh perspectives and encouraging them to form enduring, good memories of the show. Showing a tourist exhibits and really interacting with them are two different things. It is simpler to establish a connection between involvement and the exhibition’s objectives as it fosters a deeper experience or knowledge.

Fundamental part of creating and distributing museums.

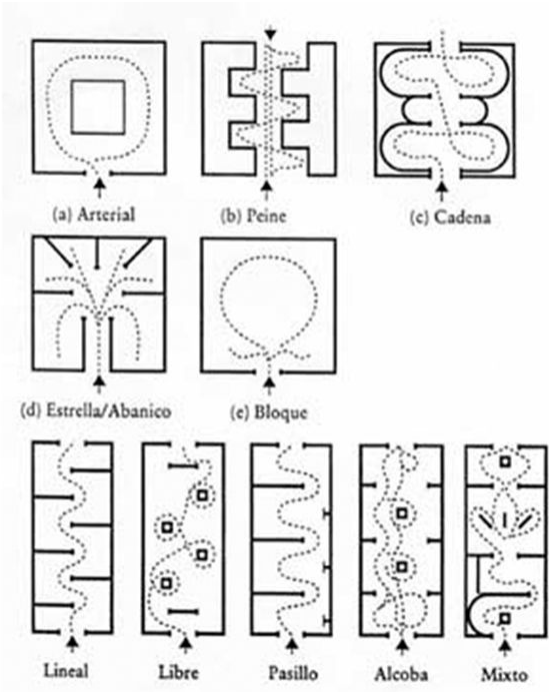


Figure 31. Fundamental part of creating and distributing museums
Source : Estudios Culturales 2003

As can be seen in the image in teh side and although not all of them appear, there are many ways of distributing space in museums or exhibition halls. This has been the subject of study by numerous theorists throughout history, but to summarize, these theories converge in three models: linear, radial or free plan.

Model of exposure circulations according to M. Lembruck (1974)

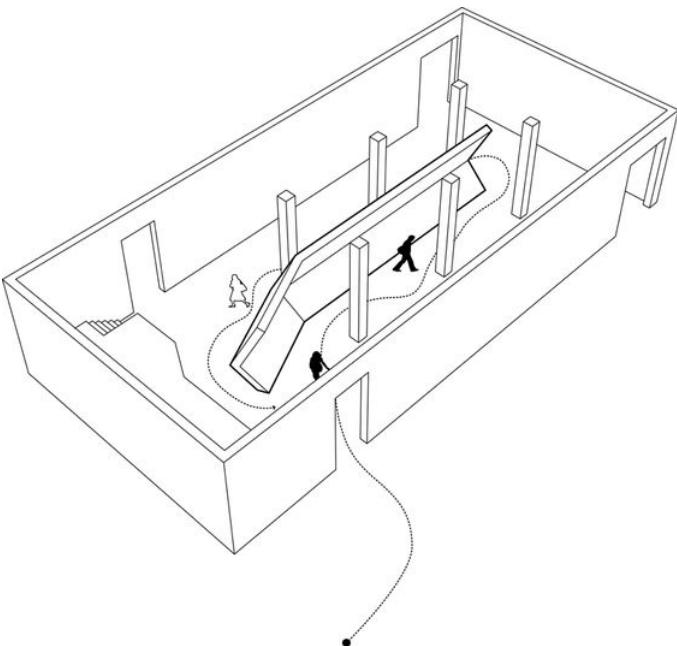


Figure 32. Model of Exposure Circulation by M. Lembruck 1974
Source : snapshot memento : scenography for a photography exhibition

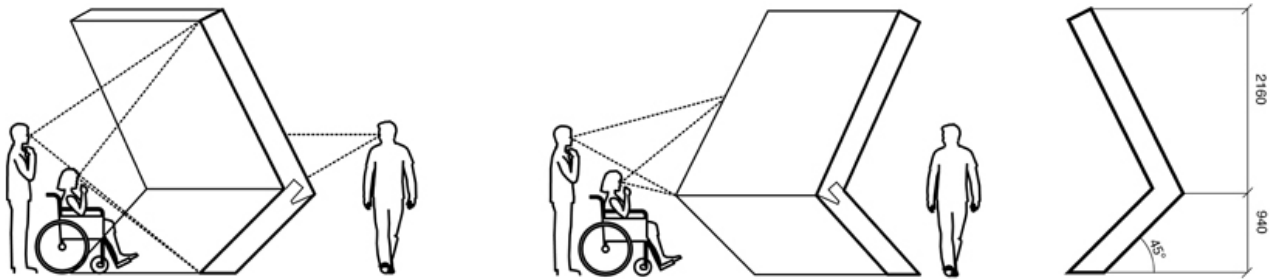


Figure 33. Model of Exposure Circulation by M. Lembruck 1974
Source : snapshot memento : scenography for a photography exhibition

A major ambition for the scenography was to make it totally accessible and experienceable for disabled people. the dimensioning of the structure had thus to answer strict structural as well as ergonomic demands

Characteristic Study of Colonial Architecture

Colonial architecture is a style of architecture that emerged in various regions as a result of colonization by Europeans, such as the Dutch, British, French and Spanish, in the 16th to 19th centuries. The style combines architectural elements from the colonial country with adaptations to the local culture, climate and resources of the colonized region.

In a book by Handinoto in 1996, the characteristics of colonial buildings are:

Gable / Gevel : triangular in shape that follows the shape of the roof.

Tower : has a wide variety of geometric shapes.

Dormer / pseudo-chimney : used for circulation and lighting in its native Netherlands, the dormer is used as a space for a fireplace.

Tympanon : a pre-Christian symbol depicted in the form of a tree of life, a horse's head, or a sun wheel.

Ballustrade : a railing generally made of cast concrete; which serves as a balcony and/or deck guardrail.

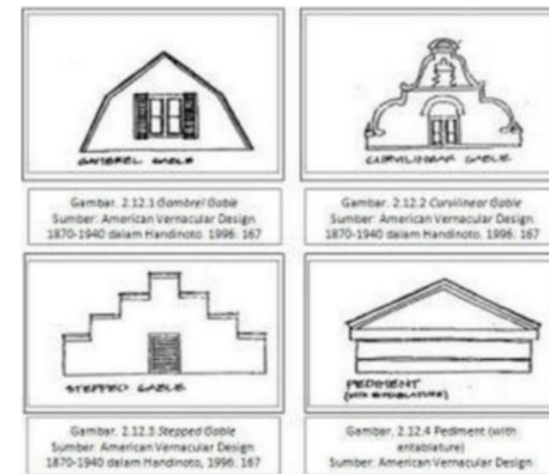
Bouvenlicht / ventilation hole : an opening in the building that is used to fulfill thermal comfort.

Windwijzer / wind pointer : an ornament located above the roof beam which is used as a wind direction indicator.

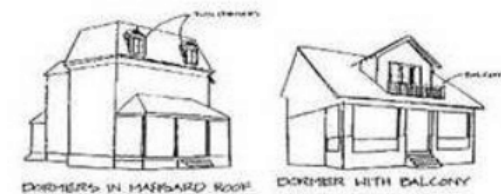
Nok Acroterie (roof top decoration) : located at the top of the roof made of reeds; originally used in farmhouses in the Netherlands.

Geveltoppen (front roof peak ornament) - Voorschot : triangular in shape positioned at the front of the house.

Types of Colonial Building Gables



Colonial Building Dormer Element Detail



Colonial Building Element Detail

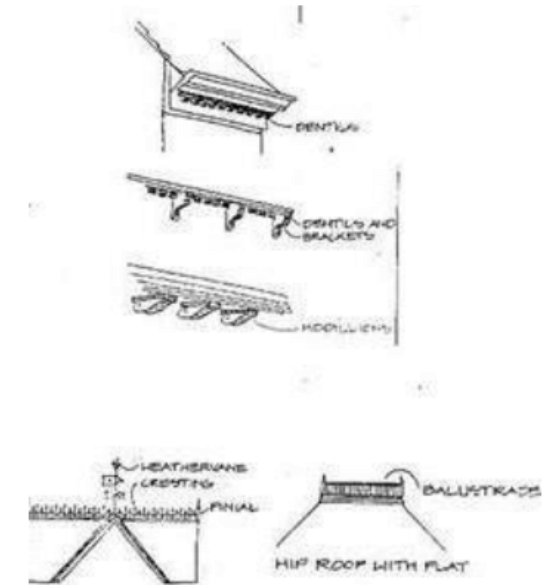


Figure 34. Type Colonial Building Gables
Source : American Design 1870 - 1940 by Hadinoto, 1996

Building Proportions : Colonial styles tend to have symmetrical proportions with a grand and monumental appearance, such as symmetrical facades or the use of repetitive elements.

Columns and Pillars : Colonial buildings often feature large columns as decorative and structural elements. These columns were inspired by classical styles, such as Doric, Ionic and Corinthian in Greek and Roman architecture.

Large Windows and Ventilation : Many colonial buildings have large, tall windows to take advantage of ventilation and natural light. This also served to cope with the tropical climate of the colonies by allowing air to flow and cool the space.

High Roofs and Gables : Colonial buildings often have high or gable roofs, which are useful for air circulation inside the building and reducing heat.

Veranda or Spacious Terrace : Many colonial buildings, especially in tropical regions, are equipped with spacious verandas or terraces. These verandas serve as a shaded area as well as a place to relax.

Use of Local and Imported Materials : Despite using European designs, colonial buildings often incorporate local materials, such as tropical wood or natural stone, which are more resistant to the local climate.

Classical Ornamentation : Colonial architecture often has ornamental details, such as cornices, moldings, or wall panels, that add an elegant and classic feel.

Concept Building Circulation

Terminal User Circulation

Structured Zoning : Separate the terminal user areas into functional zones such as waiting areas, departures, arrivals, and exhibition areas. This helps to create an organised and easy-to-understand flow for visitors.

Clear Entry and Exit : Define the main entry and exit points for pedestrians and passengers. Place clear signage to ensure users can find the right path to the destination zone, such as the exhibition, ticket counter, or waiting area.

Direct Access Path to Exhibition Area : The exhibition area can be accessed from the main waiting area, allowing passengers and general visitors to view and participate in the exhibition without disrupting the main circulation flow.

Transport Circulation (Vehicles and Public Transport)

Separation of Vehicle and Pedestrian Lanes : Separate vehicle lanes (buses, angkots, taxis) from pedestrian lanes to maintain safety and flow.

Departure and Arrival Zoning : Have separate departure and arrival zones to prevent crowds and ensure smooth circulation.

Drop-off and Pick-up Points: Easily accessible drop-off and pick-up areas close to the main entrance, to facilitate passengers arriving or departing by private transport.

Transport Access Points to the Exhibition Area : Pathways or signage for exhibition visitors arriving by public transport or private vehicle to easily find the exhibition site without having to enter the main passenger circulation zone.

Circulation Exhibition Area

Access from Pedestrian Zone : The exhibition area is directly connected to the main pedestrian area inside the terminal, but still has visual boundaries so as not to interfere with the main circulation flow.

Linear Orientation : Create a linear circulation within the exhibition area to allow visitors to follow the path of the exhibition in an orderly manner from start to finish. This also helps avoid overcrowding and enhances the visitor experience.

Flexible Access to Commercial Areas : Exhibition areas can be integrated with commercial zones such as cafes or gift shops, facilitating direct interaction between exhibition visitors and commercial areas without affecting transport and passenger circulation in the terminal.

Direct Exits to Transport Areas or Outside Zones : Provide exits directly connected to the terminal's outer areas or transport links to facilitate exhibition-only visitors to bypass the passenger zone.

Integration of Circulation across Terminals

Easy to Understand Navigation (Wayfinding) : Provide clear and consistent signage to help passengers, exhibition visitors, and public transport users understand the proper flow.

Convenient Transition Areas : Place transition spaces or small plazas around entrances or between exhibition zones and terminals to create relaxing areas for users.

Floor Height or Level Separation : Consider different floor levels in certain areas to separate exhibition user circulation from main passenger circulation,

Precedent

Terminal Type A Bungurasih, Surabaya

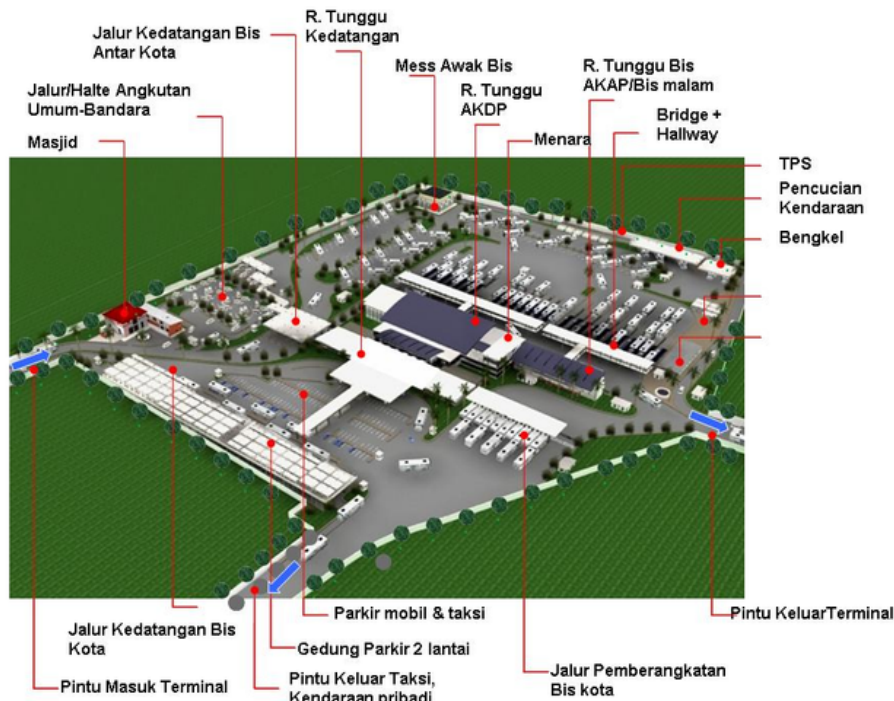


Figure 35. Terminal Type A Bungurasih
Source : Wordpress

Area : 12 ha

Owner : Since 1 April 2022, its management has been delegated to the central government, precisely under the Ministry of Transportation.

Revitalisation Year : The revitalisation process of Purabaya Terminal began in March 2023 and is scheduled to be completed in December 2023.

Management: Currently, Purabaya Terminal is managed by the Land Transportation Management Centre (BPTD) Class II East Java. The current terminal coordinator is Ahmad Badik, S.T., M.M.

The planning concept for the revitalisation of Purabaya Terminal refers to the concept of Convenience and Care Terminal (C2 Terminal) airport.

Convenience: Comfort, safety, cleanliness, beauty, recreation, entertainment, and techno.

- Departure waiting room on the 2nd floor, hall, spacious lobby, connecting hallway, bridge connection Natural and mechanical ventilation
- Terminal Security Unit, passenger safety facilities
- Garden, pond, fountain, art sculpture
- Art building + landscape, commercial stand, souvenirs
- Entertainment stage
- Escalator/travelator, Terminal Information Display & Board

Precedent Learn



Figure 36 Terminal Type A Bungurasih
Source : detik.com

Bungurasih Terminal faces the problem of irregular circulation, where passenger and vehicle flows often mix. The lack of organized vehicle lanes causes congestion, and passengers often have difficulty finding a clear place to wait for departure. In addition, safety and convenience issues are a major concern with many illegal activities such as touts and thugs.

Circulation Separation: Traffic circulation is reorganized with dedicated lanes for buses, taxis, and other public transportation, separated from private vehicle and passenger lanes. This makes the flow of vehicles more organized, reducing congestion in the terminal area. The clear separation of passenger and vehicle flows creates a safer and more organized environment.

Security and Surveillance: Increased surveillance through CCTV and placement of security officers at critical points to monitor passenger activity. Passengers are provided with safer dedicated lanes with direct access to parking lots or pick-up points.

Waiting Area Arrangement: The waiting area was updated with a more spacious and comfortable area, so that passengers do not have to jostle for space. This also involves adding facilities such as food and beverage kiosks, as well as lounges for passengers with special needs.

Facility Improvements: Toilets and places of worship were updated, while commercial areas were restructured to be more organized.

Terminal Type A Tirtonadi, Solo



Figure 37. Terminal Type A Tirtonadi Solo
Source : Skycrapecity Solo

Area : 5 ha

Owner : It is a type A terminal and is owned and managed by the Indonesian Ministry of Transport.

Revitalisation Year : Tirtonadi Terminal undergoes significant revitalisation, with a new face and additional facilities by 2022..

Management: The operational management of Tirtonadi Terminal is carried out by the Ministry of Transportation together with the Solo city government.

The existing condition of Tirtonadi Terminal, only the first floor can be fully utilised, while the second floor, which is more inclined to business activities, is still in the process of being explored by investors since a few years ago. The second floor of Tirtonadi Terminal will be equipped with a convention hall, sports centre, food court, and other supporting facilities.

Precedent Learn



Figure 38. Terminal type B Tirtonadi Solo
Source : Wordpress

Tirtonadi Terminal suffers from sub-optimal governance, with a terminal design that does not support the flow of passenger movements. In addition, integration between bus and other modes of transportation (such as trains and city transportation) has not been well realized, leading to a decline in passenger numbers. There are also issues with inconvenient facilities and overcrowding in some areas of the terminal.

Intermodal Integration : The terminal was redeveloped by adding a skybridge connecting the terminal with Solo Balapan Train Station. This allows passengers to switch modes of transportation without leaving the terminal area, speeding up mobility and convenience.

Integrated Circulation System: The terminal circulation is reorganized with clear separation between arrival and departure areas, as well as lanes for other modes of transportation such as taxis, online motorcycle taxis, and city transportation. Areas for public and private vehicles are also separated, reducing potential congestion and user confusion.

Supporting Facilities: Public facilities such as comfortable waiting rooms, clean toilets, commercial areas and the arrangement of street vendors were also improved to support passenger comfort.

Kaunas Bus Station, Lithuania



Source : <https://miesarch.com/work/3774>

Figure 39. Kaunas, Bus Station Lithuania

The Bus Station is built in an very complicated area that is at the edge of the city center neighboring with railway station. Architecturally, the design of the Station is moved by Kaunas' modernist tradition. The design materializes meaning that is more than urban, functional, and architectural. Now the Station's building is a symbol of the city.nment.

Area : 14 ha

Client :UAB Kautros Nekilnojamasis Turtas

Revitalisation Year : 2016 -2017

Location : Kaunas, Kaunas City Municipality, Lithuania

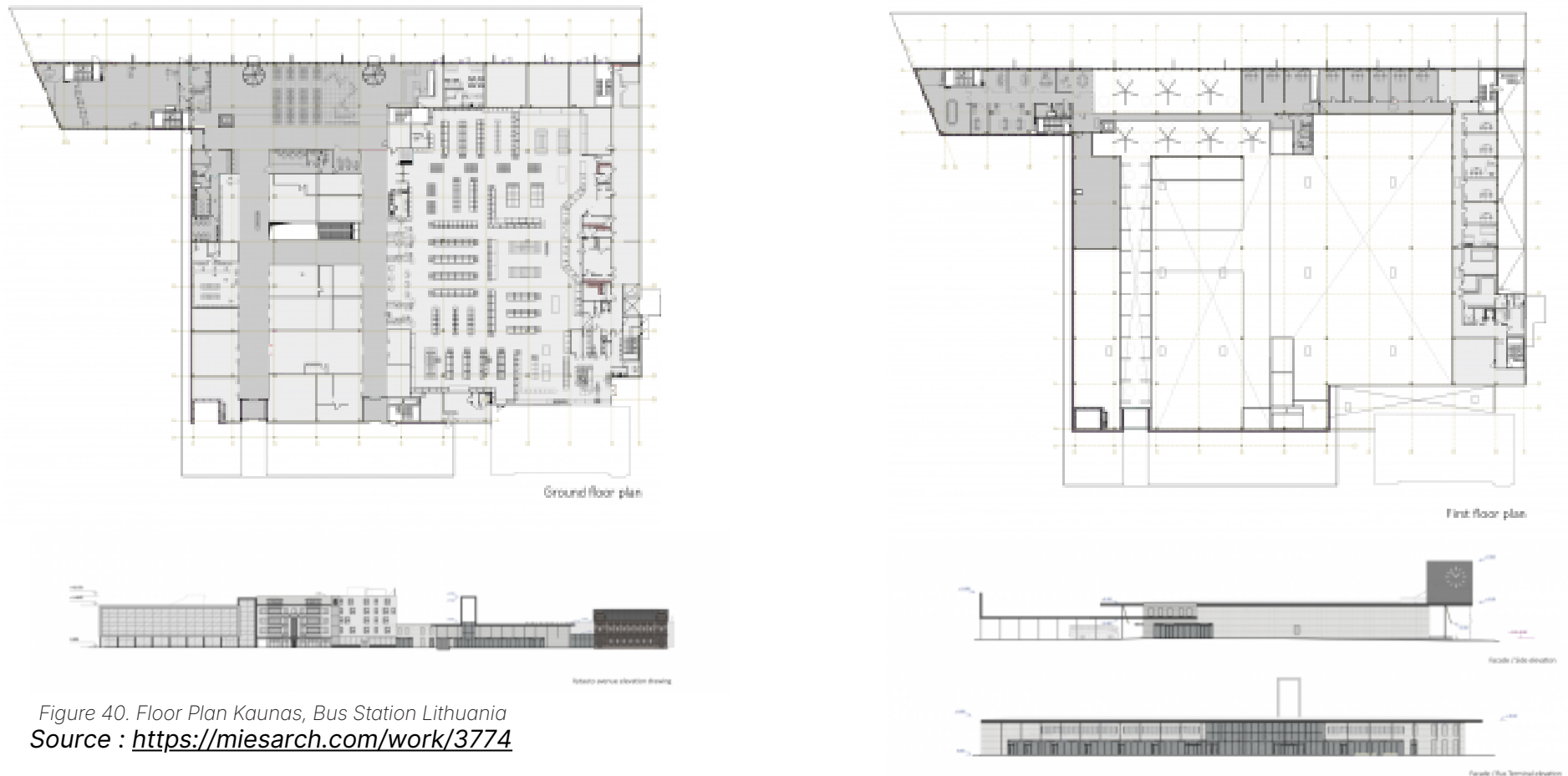


Figure 40. Floor Plan Kaunas, Bus Station Lithuania
 Source : <https://miesarch.com/work/3774>

Circulation and Facilities : Kaunas Bus Station combines urban, intercity, and international transport zones with interconnected internal passages resembling city streets. The station has a mix of service sectors, including a commercial area with shops and restaurants. It also includes platforms for both arriving and departing passengers. The design features a large canopy, under which passengers can gather, and an underground parking facility for cars and bicycles.

Precedent Learn

One key challenge was incorporating the station into **the historical context of the city**. The architects skillfully integrated an old, **heritage-protected building into the modern design**. Another challenge was optimizing transport flow at a site shared with a nearby railway station. The solution **was to create distinct zones for different types** of transportation and provide ample public space to ease congestion

03 *Problem Solving*



DEPARTMENT *of*
ARCHITECTURE



한국건축학교육인증원
Korea Architectural Accrediting Board



CANBERRA
ACCORD



Problem Solving for The Site

The location of the Penggaron Terminal site is on Jalan Brigjen Soediarto KM. 11 Kalurahan penggaron kidul The scope of the design includes the area of terminal building, visitor parking and bus parking with an area of 25,000 m2.

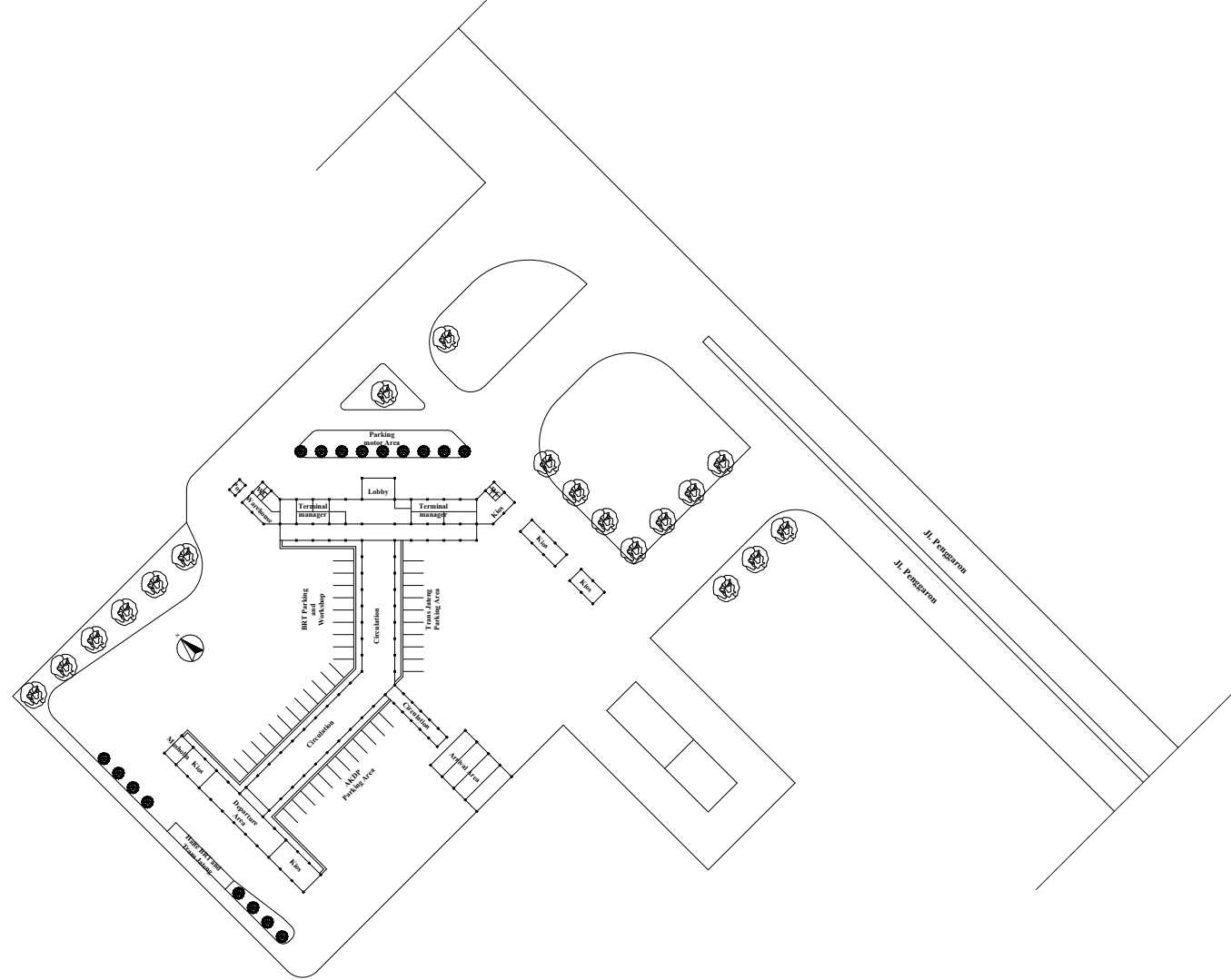


Figure 41. Site Plan Terminal Penggaron
Source : Author's Analysis

Area	Type of Area		Type of Area		
Transportation Area	Facilities and infrastructures	Terminal	KDB	KLB	KDH
			60 %	4 Floor	20 %

Area	KDB	KDH	KLB
25.000m2	15.000m2	5.000m2	60.000

Circulation Concept of Terminal Area

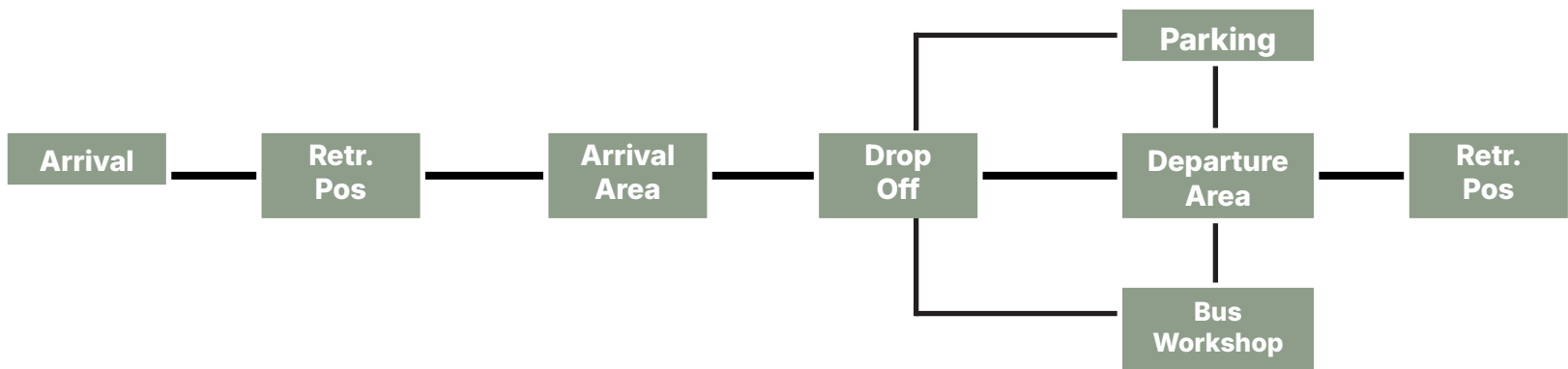
Bus Circulation

In the bus arrival area at the terminal, there are various activities that occur to support operations and passenger needs. The following are the activities that are usually carried out in the area

Arrival and Departure Areas : Separate bus arrival and departure areas to reduce congestion and ensure efficient operations.

Passenger Disembarkation and Boarding Zones : Ensure there are areas that are easily accessible to passengers, with dedicated platforms for boarding and alighting. These platforms should be safe, weather-protected, and have direct access to pedestrian paths or waiting areas.

Bus-only Circulation : Design circulation paths in a circular or loop pattern to allow buses to move smoothly without excessive detours. Provide dedicated entry and exit lanes with adequate queuing lanes.

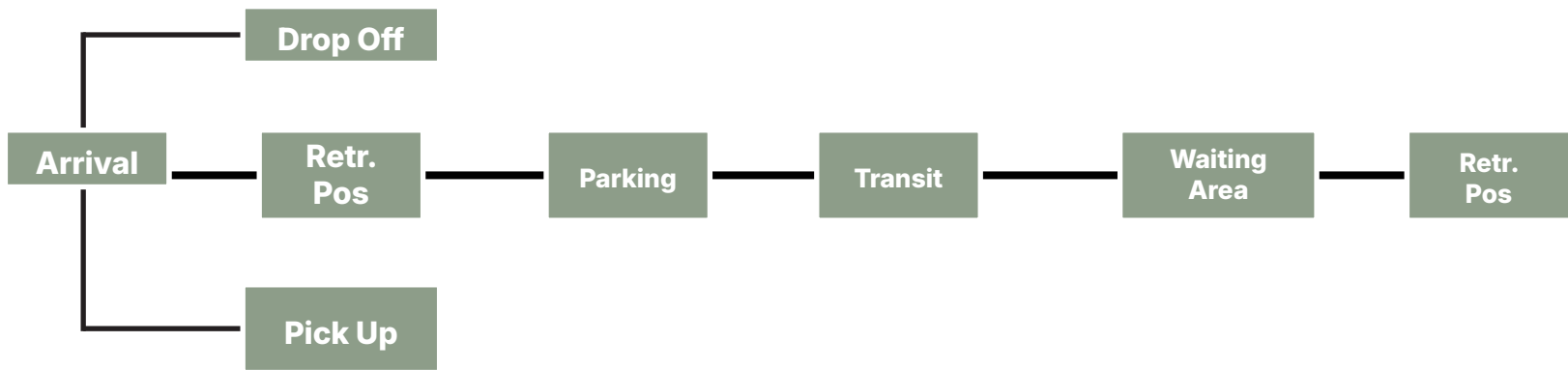


Private Vehicle

Drop-Off/Pick-Up Zone : Provide dedicated drop-off and pick-up areas separate from bus circulation to avoid collision. This zone should be large enough to accommodate the volume of vehicles during peak hours.

Vehicle Parking : Provide sufficient parking areas for private vehicles in a location that is close to but does not interfere with terminal activities. Consider a direct access point to the terminal entrance for pedestrians from the parking area.

Easy Access and Exit : Design entrances and exits that do not conflict with bus lanes and are easily accessible from major roads. At terminals that provide access for private vehicles, there are various activities carried out to support passenger needs and vehicle operations. The following are some of the activities that usually occur in areas that serve private vehicles



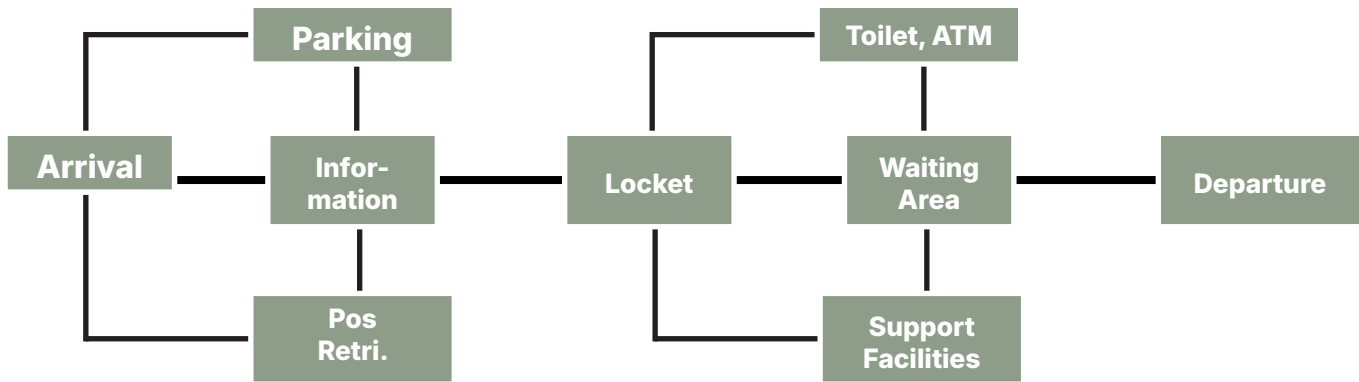
Terminal Users Circulation

Zoning and Orientation : Ensure that the terminal has a clear main path for pedestrians, both from the parking area and from the drop-off zone. Create informative signage so that users know the direction to waiting rooms, bus platforms, public facilities, and other areas.

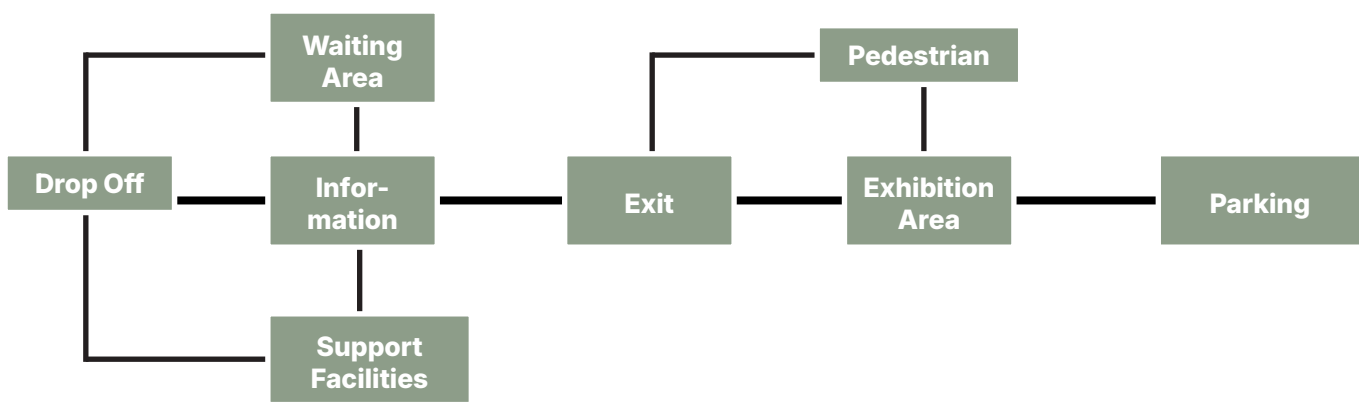
Waiting Rooms and Transitional Zones : The waiting area should be designed to be comfortable, safe, and easily accessible from the bus platform. Provide a transition path from the waiting area to the platform with wide corridors, ramps, or adequate escalators/lifts.

Vertical Circulation : If the terminal is multi-storey, consider vertical flow by providing stairs, escalators, or elevators for easy access.

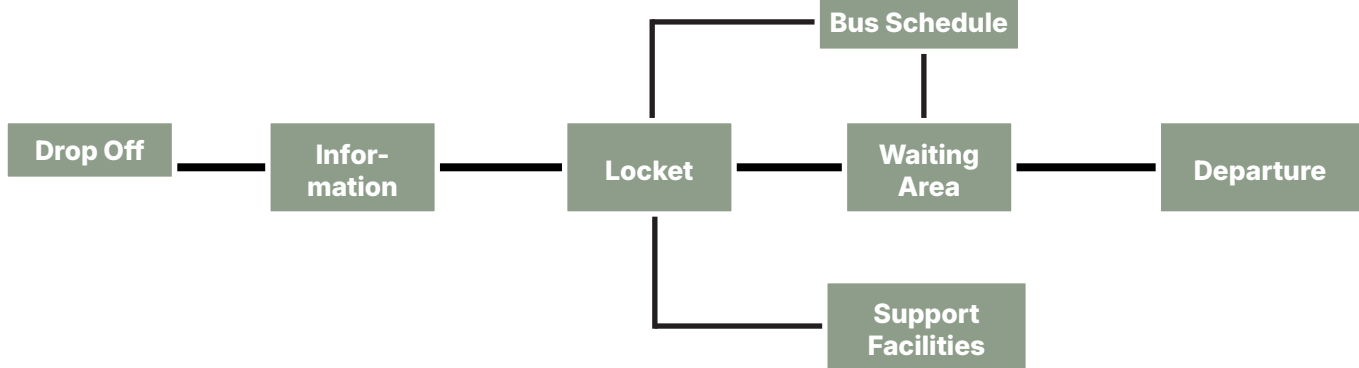
• Passenger Departure



• Passenger Arrival



• Passenger Transit



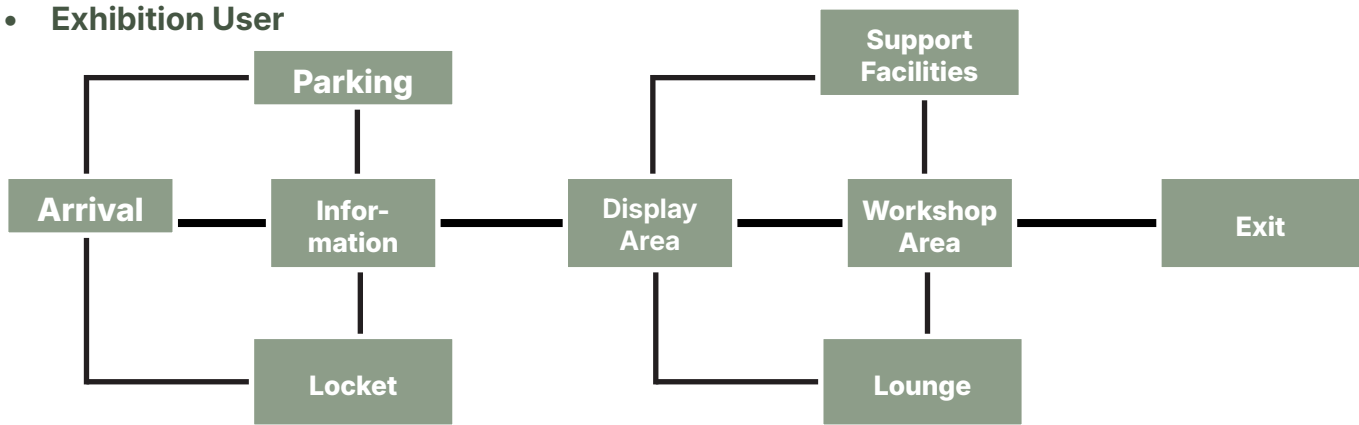
Integrating Mixed-Use Circulation

Special Access for Art Exhibition Visitors : Create a pathway that connects the terminal with the art exhibition area, but remains separate from the main circulation of the terminal to avoid distractions.

Multi-Function Area Arrangement : Ensure that the circulation leading to the art exhibition area is visually appealing, with pathways that blend into the concept and serve as additional gallery or exhibition pathways.

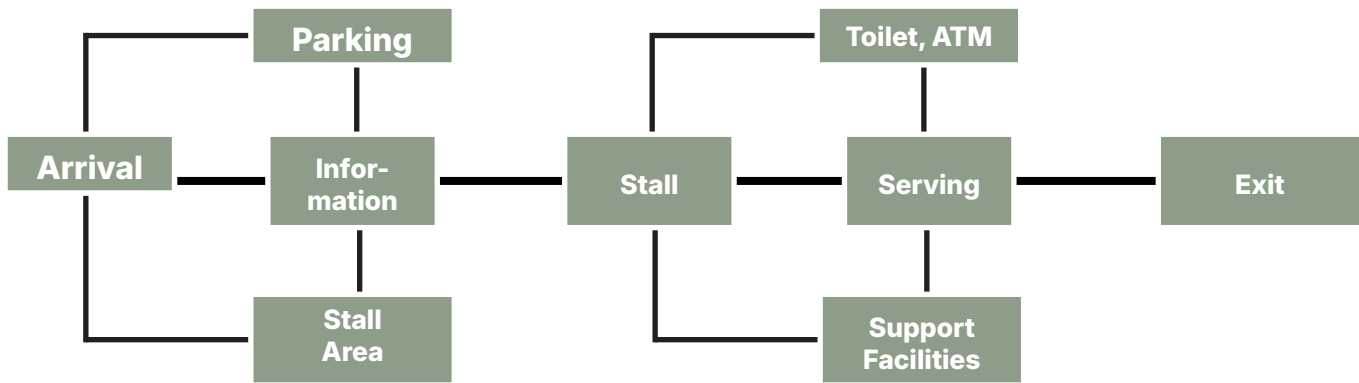
Visitors to an exhibition in a mixed-use terminal will undergo various activities related to the exploration of the exhibition and their comfort. The following are activities that visitors typically engage in at an art exhibition or exhibition area:

• Exhibition User



• Traders

In terminals, merchants play an important role in providing necessities for passengers, drivers and other visitors. Here are the various activities carried out by traders at the terminal:



Space	Activity	Number of User	Area Per User (m2)	Total Area of Users	Spatial
Reception Hall / Garden area	Lounge	400	1	400	
Arrival Area	Arrival Of Passenger	200	1	200	
Departure Area	Exit Of Passenger	200	1	200	
Waiting Area		190	1	190	
Information Booth	Reception	2	1	2	
Ticket Booth		3	0.7	2.1	
Baggage Area	Claiming/Disclaiming	2	0.7	1.4	
Retail Area	Sales And Services	3	0.7	2.1	
Janitor's Room	Maintanance	2	0.7	1.4	
Telephone Both	Communication	2	0.8	1.6	
Support Facilities					
Cafetaria	Eating	18	1	18	
Food Stall	Selling And Buying Food	3	0.7	2.1	
Food Storage/Drop Off	Preservation Of Food	5	1	5	
Diner	Eating	25	1	25	
Support Facilities					
Reception	Lounge	30	0.7	21	
Staff Canteen	Eating	60	1	60	
Kitchen	Cooking	15	1	15	
Storage		5	1	5	
Cash Room	Money And files Storage	2	0.7	1.4	
Record Storage		4	0.7	2.8	

Table 7 Table Room Progammimg
Source : Author's Analysis

Private Area

Semi Private Area

Public Area

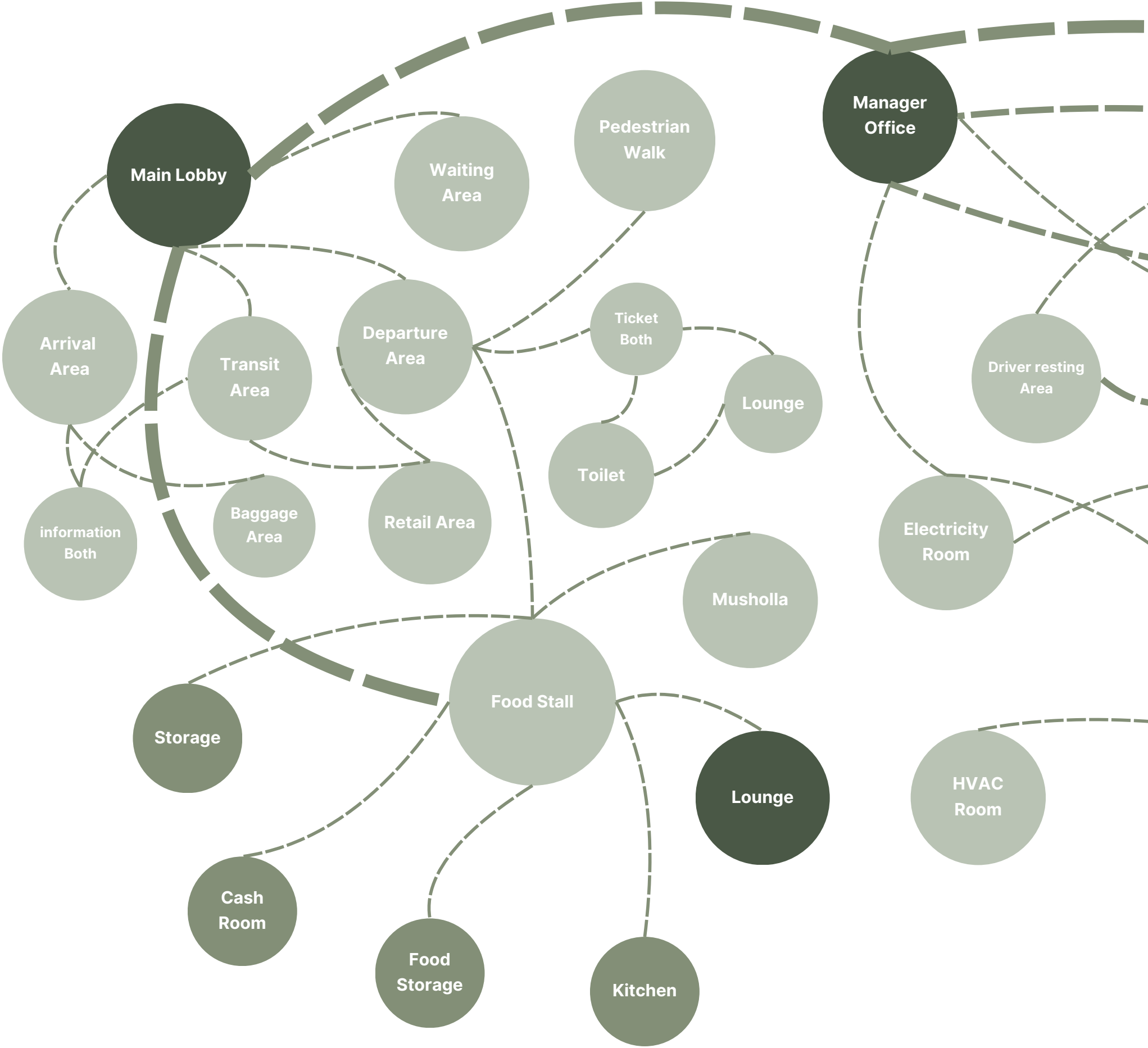
Space	Activity	Number of User	Area Per User	Total Area of Users	Spatial
Mix Use Facility					
Exhibition Area	Exhibition	100	1	100	
Art Space	Lounge	75	1	75	
Exhibition Store	Selling and Buying	50	0,7	35	
Manager Facility					
Manager Office	Working space	5	0.7	3.5	
Costumer Office		5	0.7	3.5	
Office		6	0.7	4.2	
Lounge		15	0.7	10.5	
Administrative Office		8	0.7	5.6	
Revenue Office		4	0.7	2.8	
Conference Room		15	0.7	10.5	
Drivers Office		12	0.7	8.4	
Driver's Resting Office		10	0.7	7	
Utility Room		8	1	8	
Training Room	Maintenance	22	0.7	15.4	
HVAC Room		3	0.7	2.1	
Main Storage		5	1	5	
Electricity Room		2	1	2	
Security	Other	4	0.7	2.8	
Future Expansion		80	0.7	56	

Table 8. Table Room Progamming
Source : Author's Analysis

Private Area

Semi Private Area

Public Area



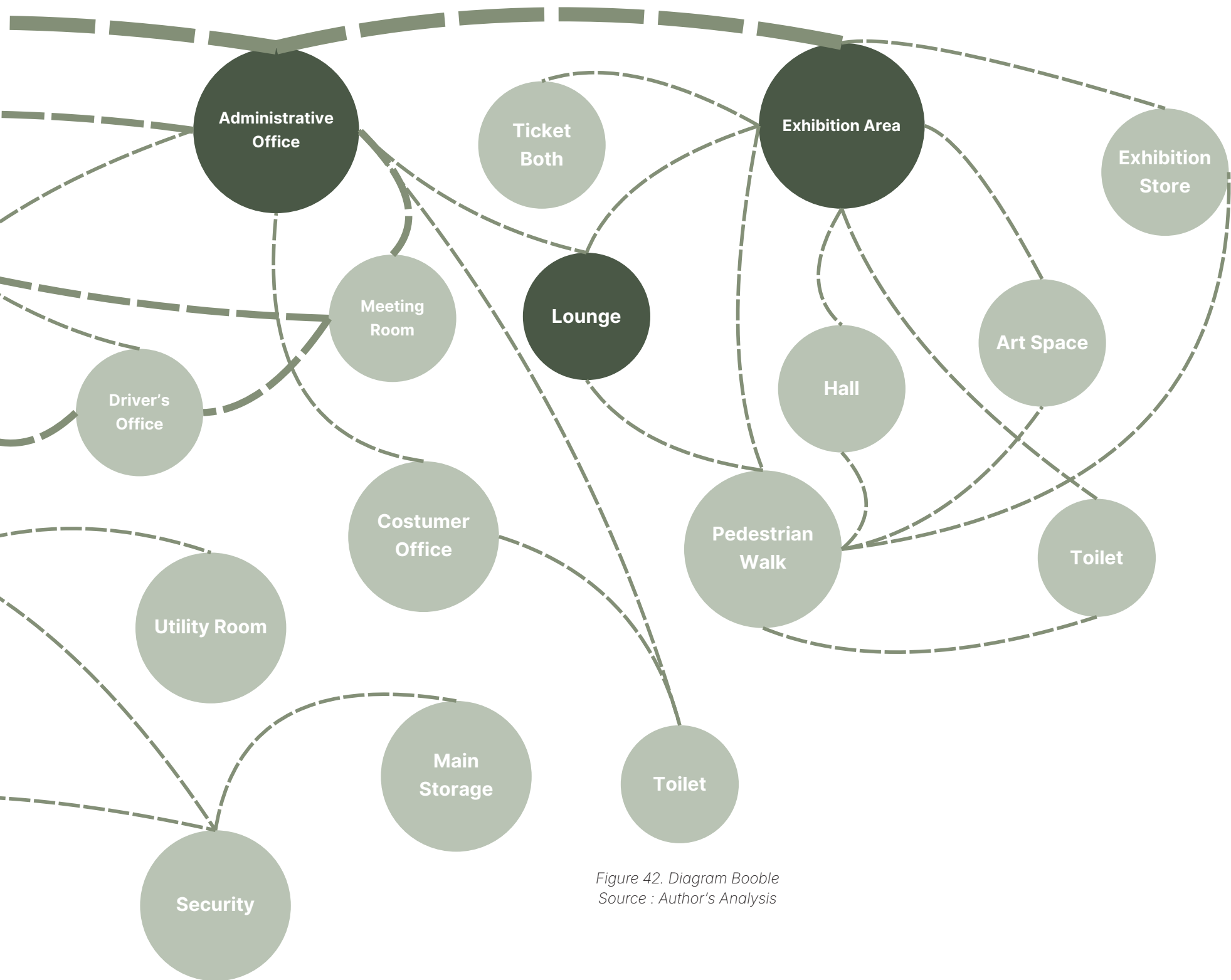


Figure 42. Diagram Booble
Source : Author's Analysis

Demolish Area and Preserv Area

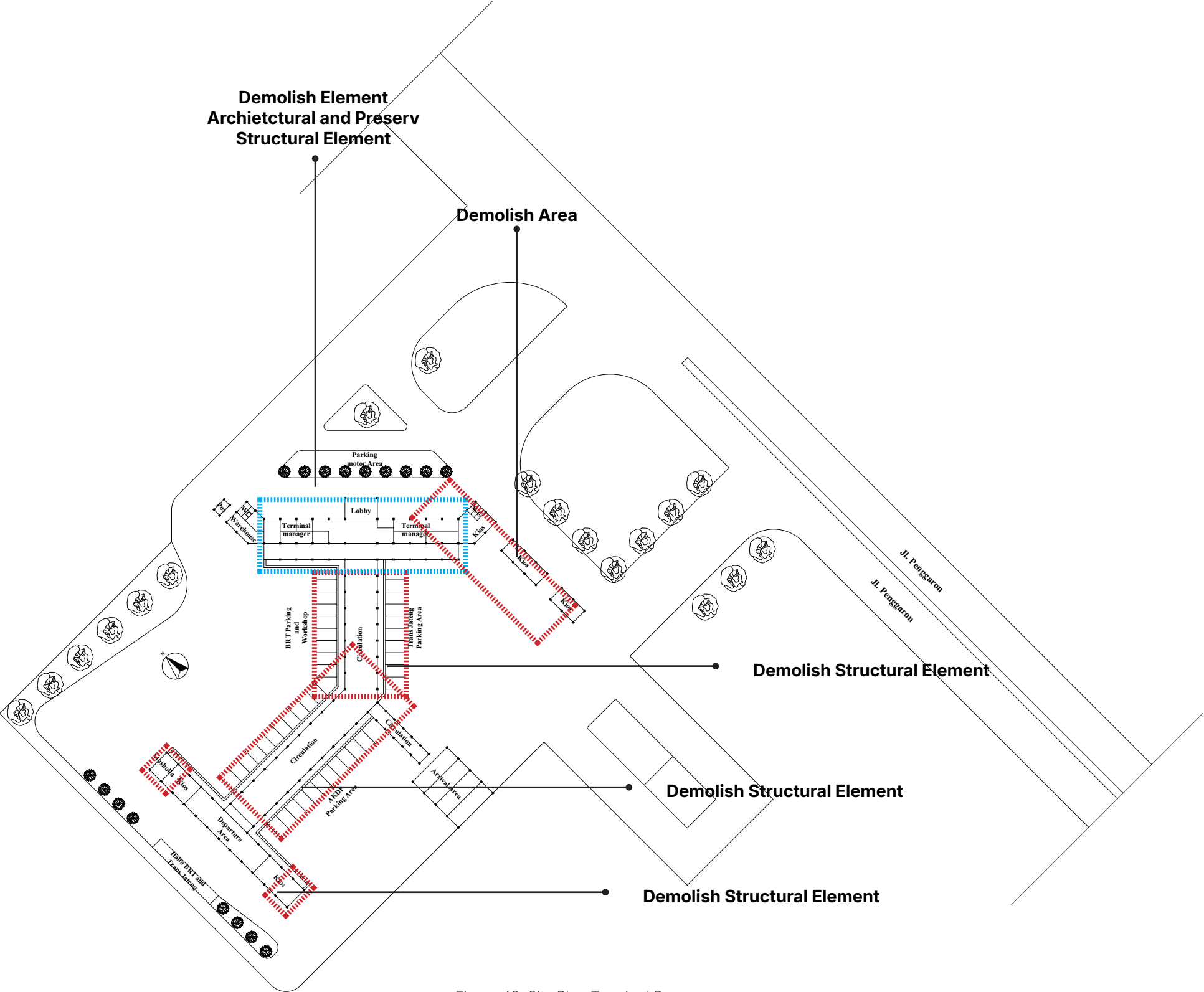


Figure 43. Site Plan Terminal Penggaron
Source : Author's Analysis

Zoning Development



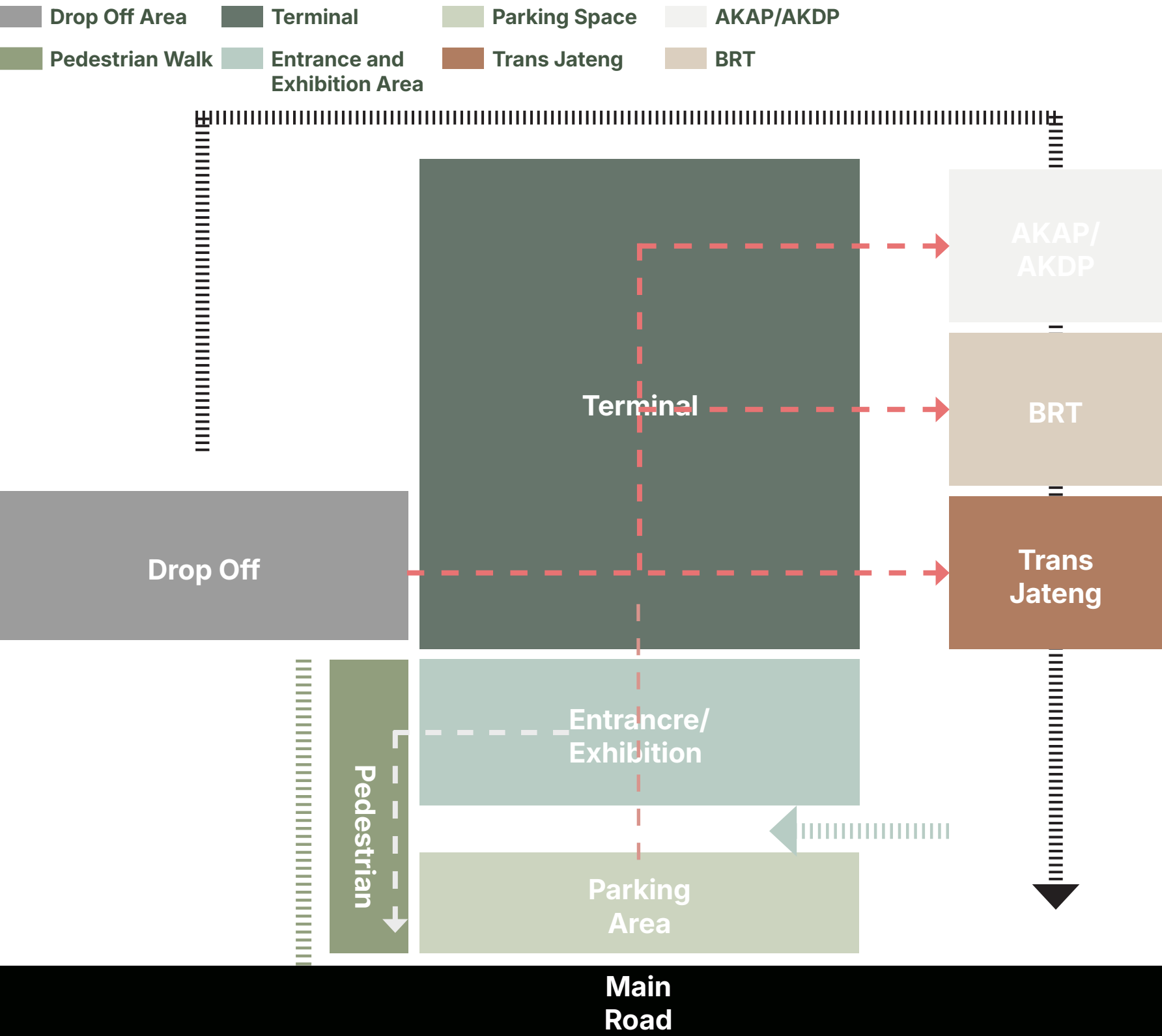
Figure 44. Zoning Development
Source : Author's Analysis

The concept of zoning development for the terminal with the division of areas focused on pedestrians, entry and exit areas, the main terminal, circulation within the terminal, and arrival and departure areas. The goal is to create an efficient, comfortable, and safe space for all terminal users.

-  **UMKM Area**
-  **Pedestrian Area**
-  **Arriva Area**
-  **Departure Area**
-  **Circulation Area**
-  **Terminal Area**
-  **Entrance and Exit Area**

Conceptual Circulation for Terminal

This plan shows more detailed circulation flows for each category of users in the terminal, including buses, private cars, visitors (pedestrians), vendors, as well as art exhibition functions. You can see dedicated circulation paths for each group, designed to reduce conflicts between flows and improve comfort and efficient use of space.



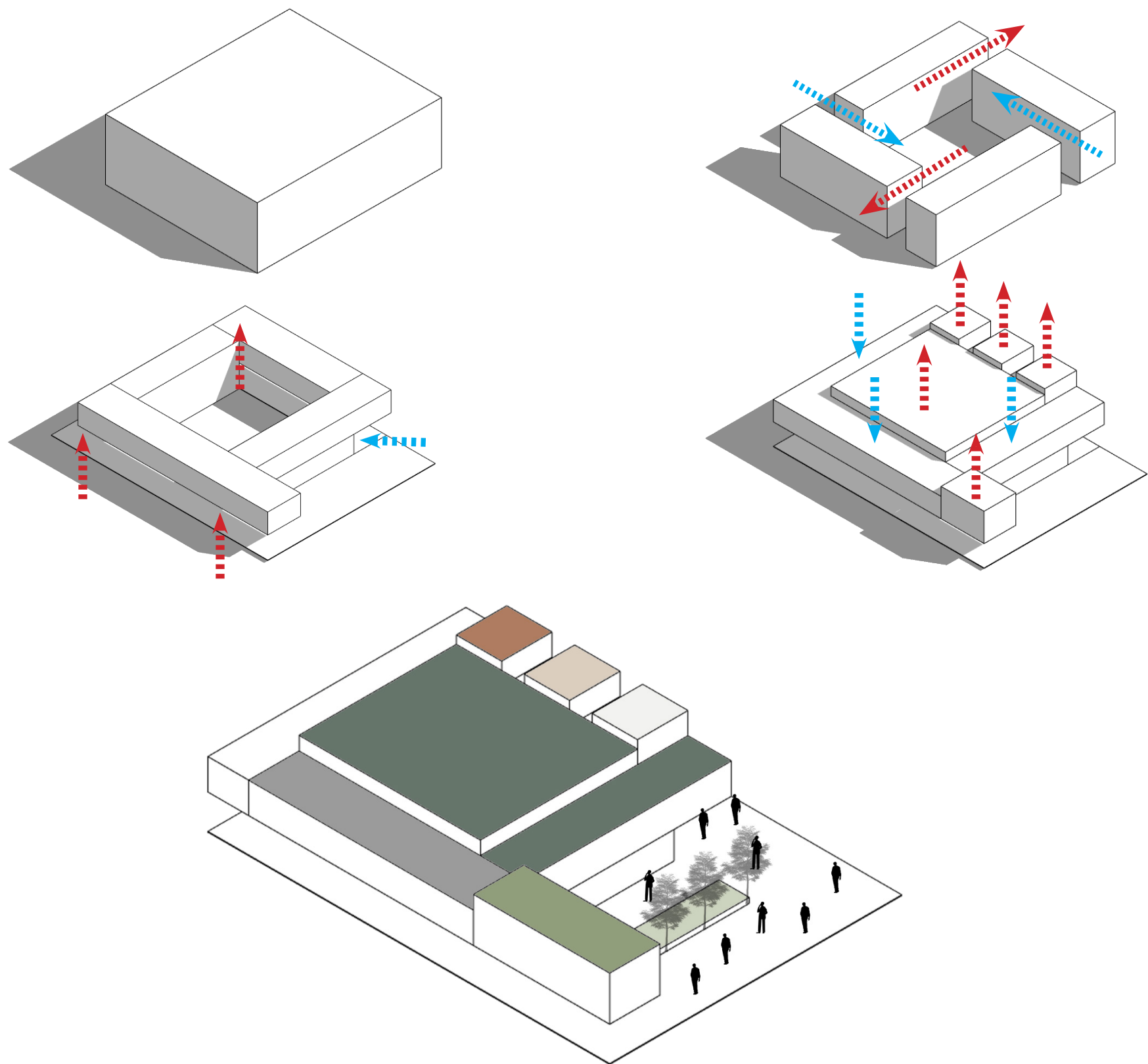
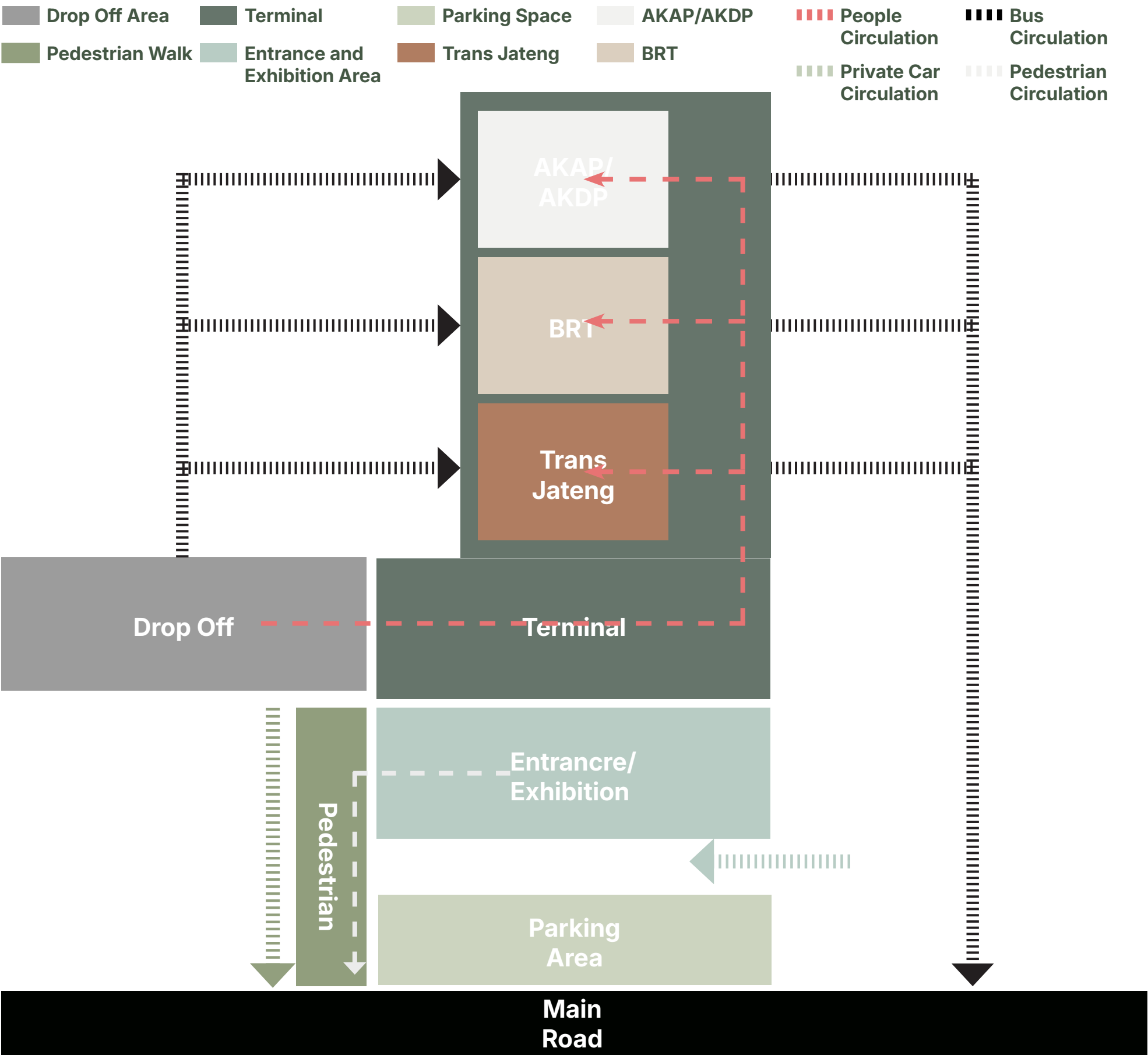


Figure 45. Building mass Exploration
Source : Author's Exploration

Conceptual Circulation for Terminal



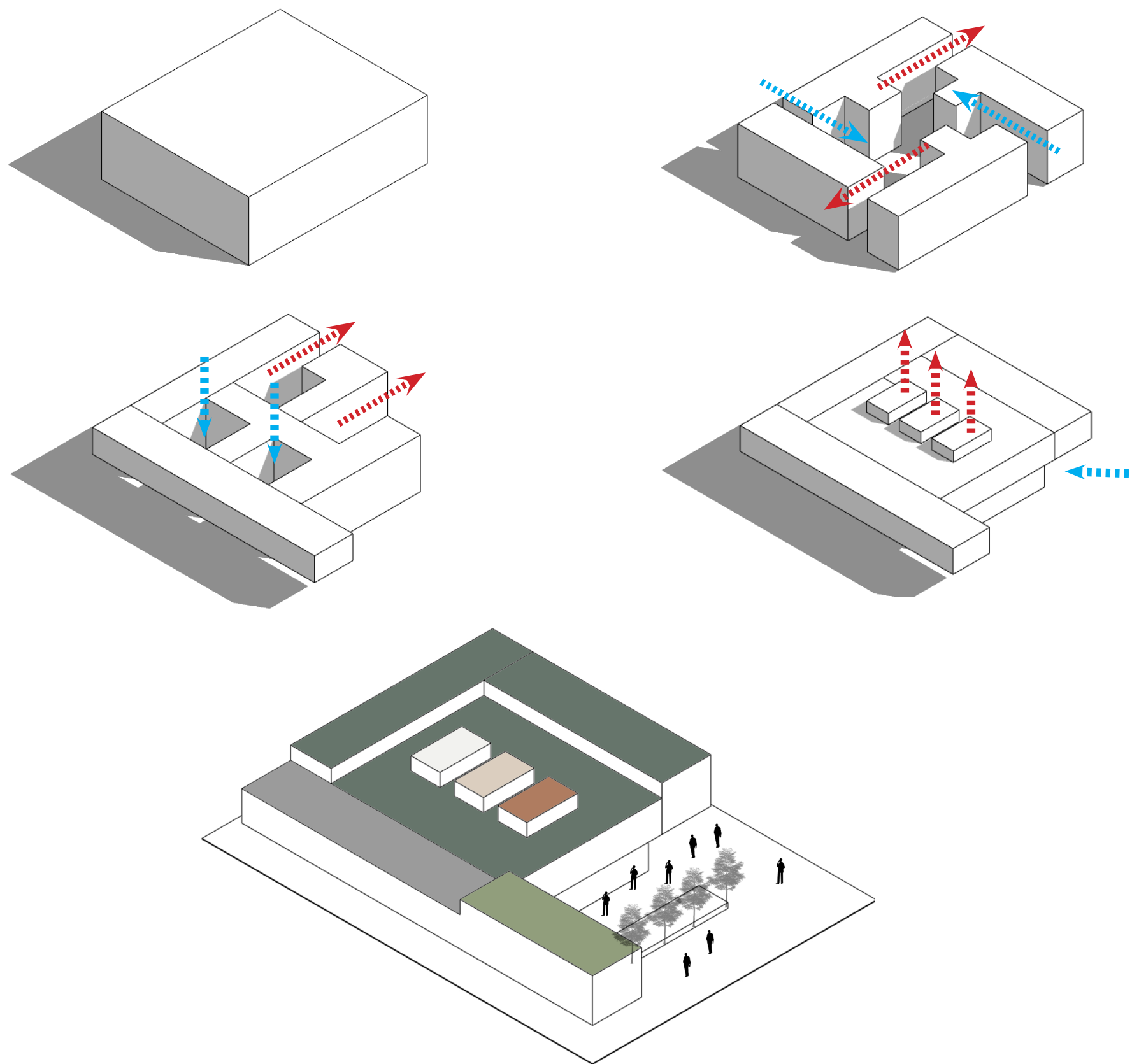
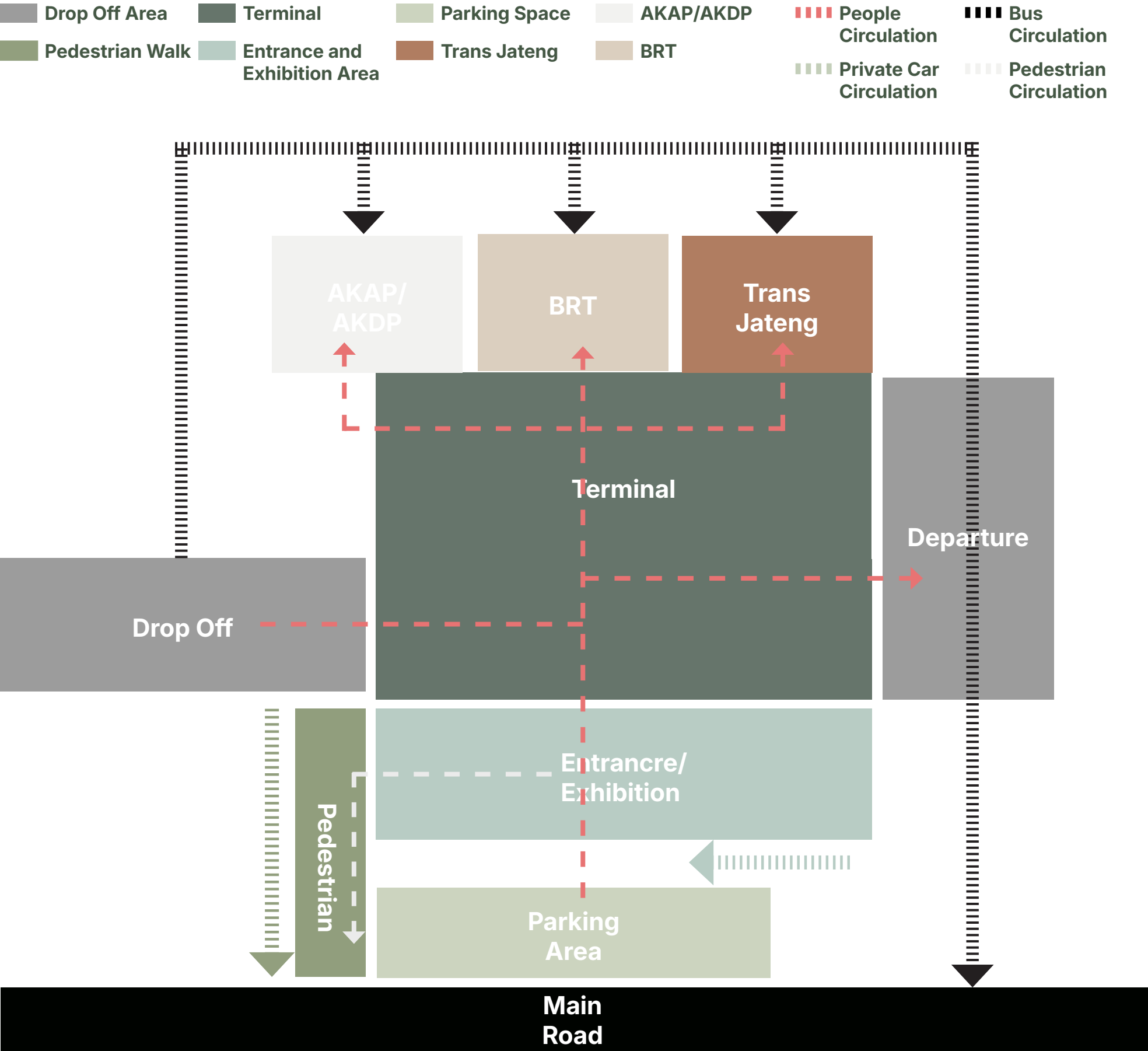


Figure 46. Building mass Exploration
Source : Author's Exploration

Conceptual Circulation for Terminal



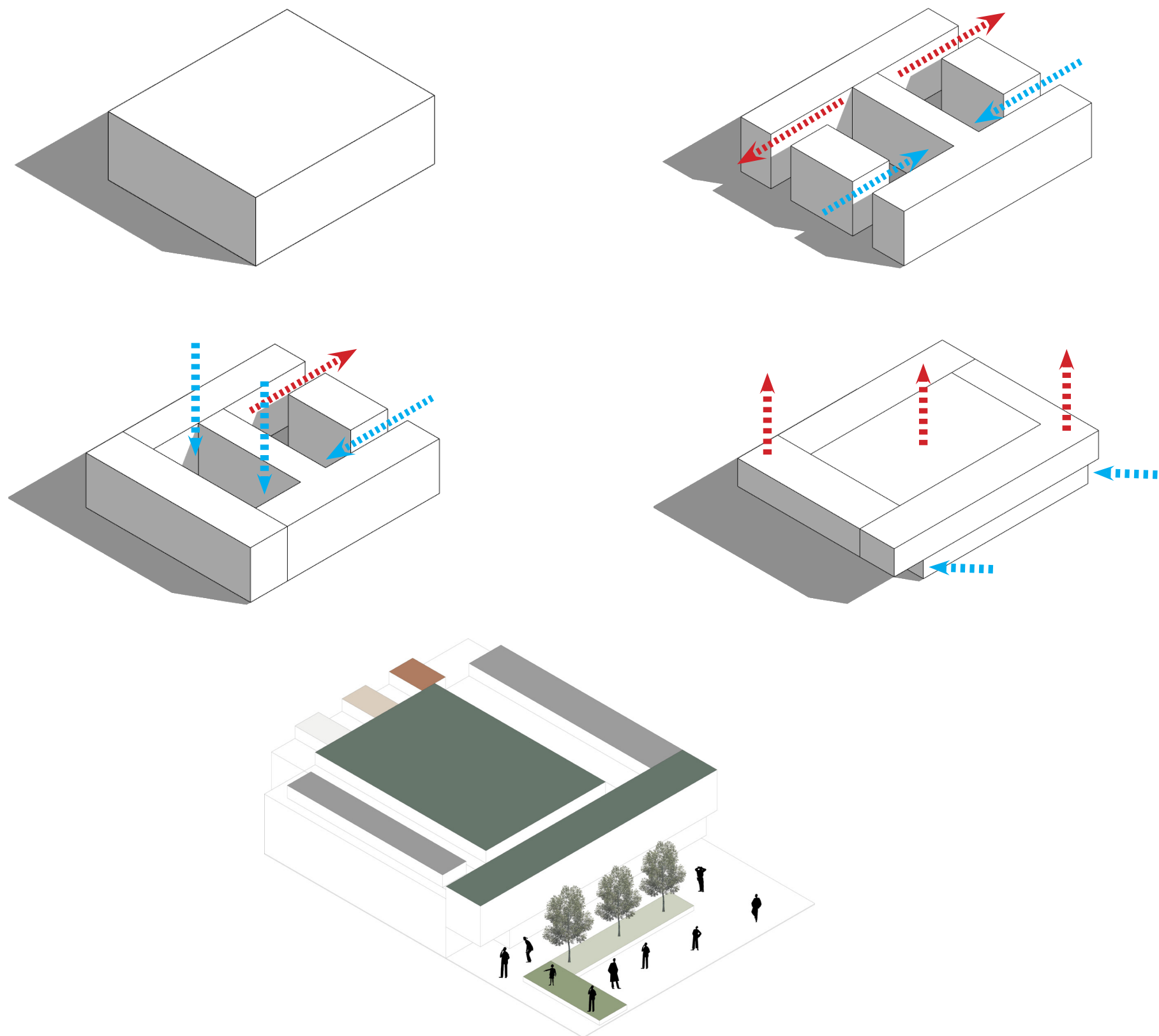


Figure 47. Building mass Exploration
Source : Author's Exploration

Pedestrian Walkway Concept

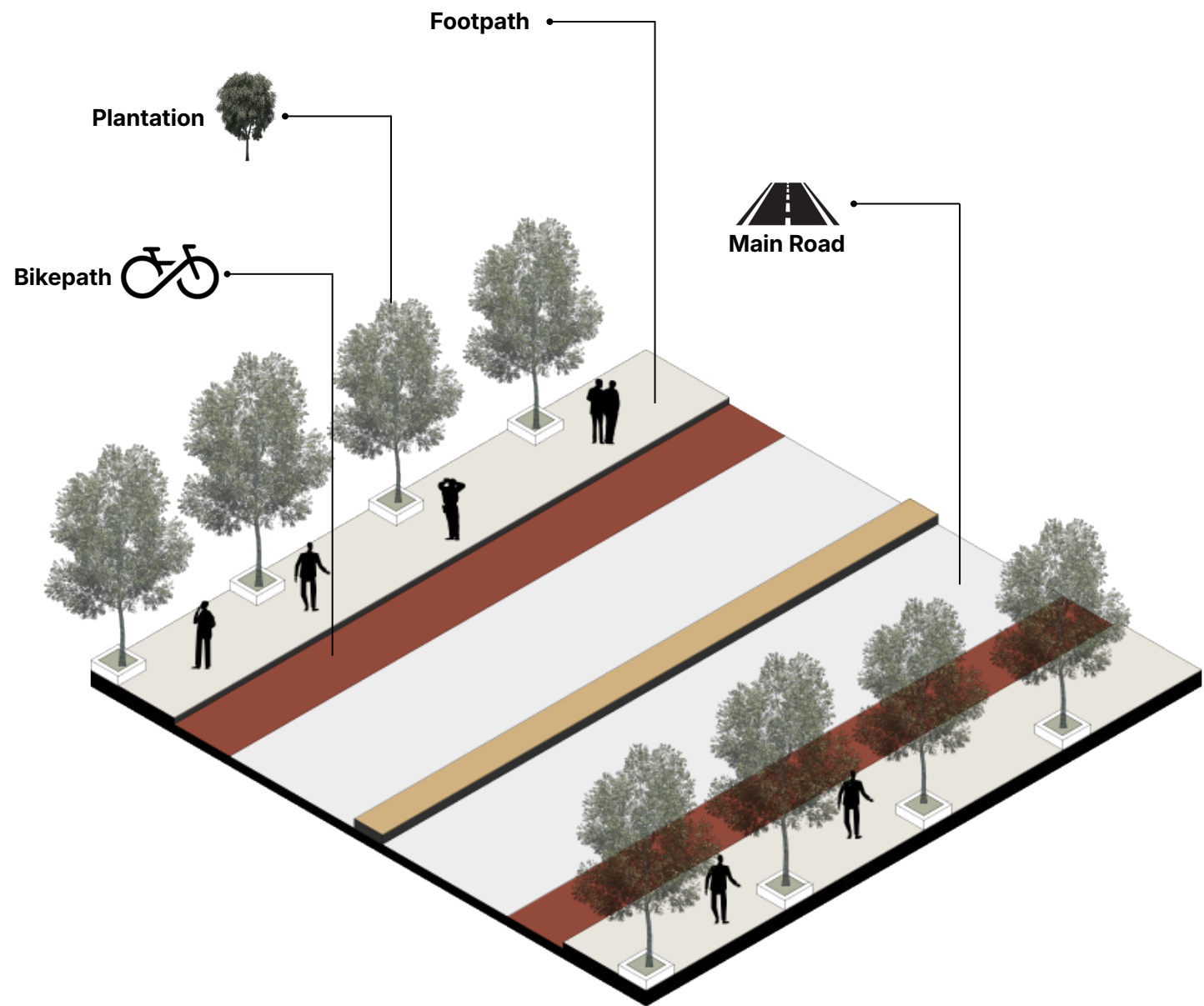


Figure 48. Pedestrian Walkway Concept
Source : Author's Exploration

Pedestrian paths are often complemented by dedicated bicycle lanes, barriers and vegetation. Pedestrian paths are designed to be comfortable and safe, while bicycle lanes are separated by physical barriers or markings to reduce accidents. These barriers maintain order on the path.

Vegetation, such as trees and shrubs, improves aesthetics, provides shade, and absorbs rainwater, creating a comfortable and environmentally friendly environment for all road users. The combination of these elements creates a multifunctional and quality public space.

Parking Area Concept

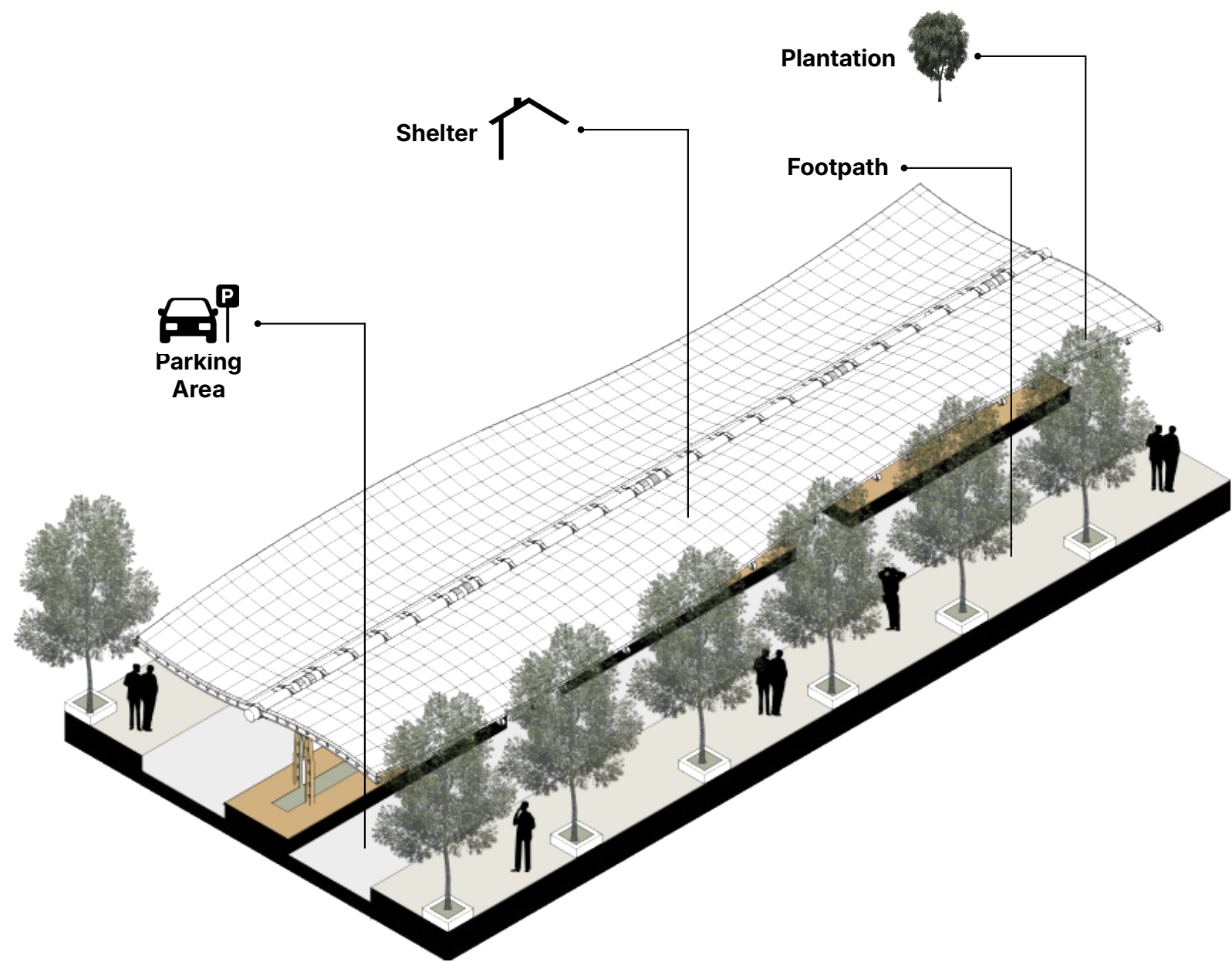


Figure 49. Parking Area Concept
Source : Author's Exploration

The designed parking area has a safe and comfortable pathway to access vehicles, shaded areas for vehicles to protect from heat and weather, and road dividers to regulate traffic flow. Vegetation around the pathway provides aesthetics, additional shade, and helps create a cooler, greener environment.

Drop Off Concept

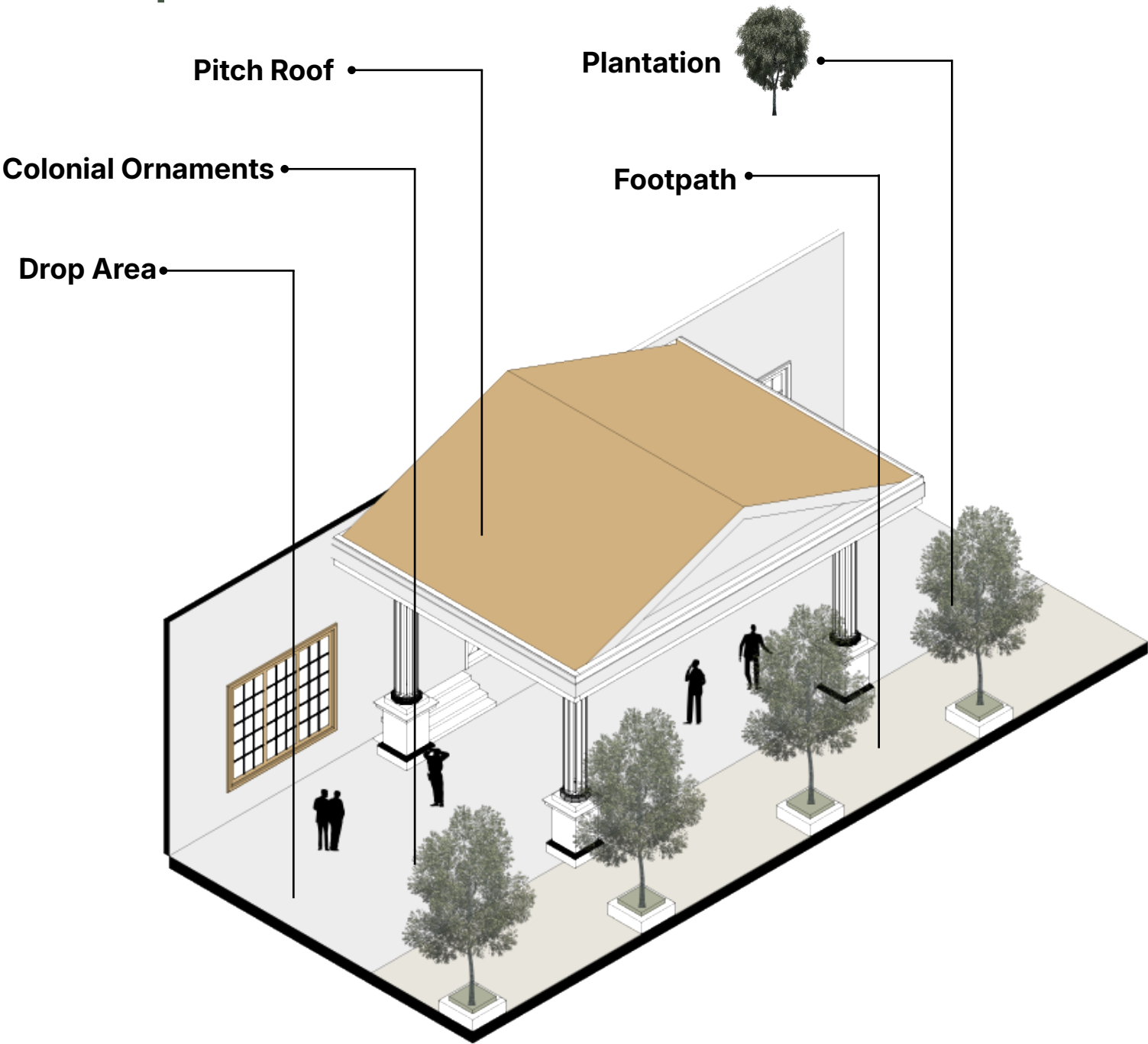


Figure 50. Main Entrance Concept
Source : Author's Exploration

The drop-off area, which represents colonial Semarang, is designed with a classically styled pathway that connects with the main pedestrian area, featuring colonial architectural elements. The pathway is not only aesthetically pleasing, but also designed to be safe and friendly for people with disabilities, with smooth access and facilities that support their mobility. Using a gable roof with a proportional slope angle to maximize rainwater flow.

Second Floor Area

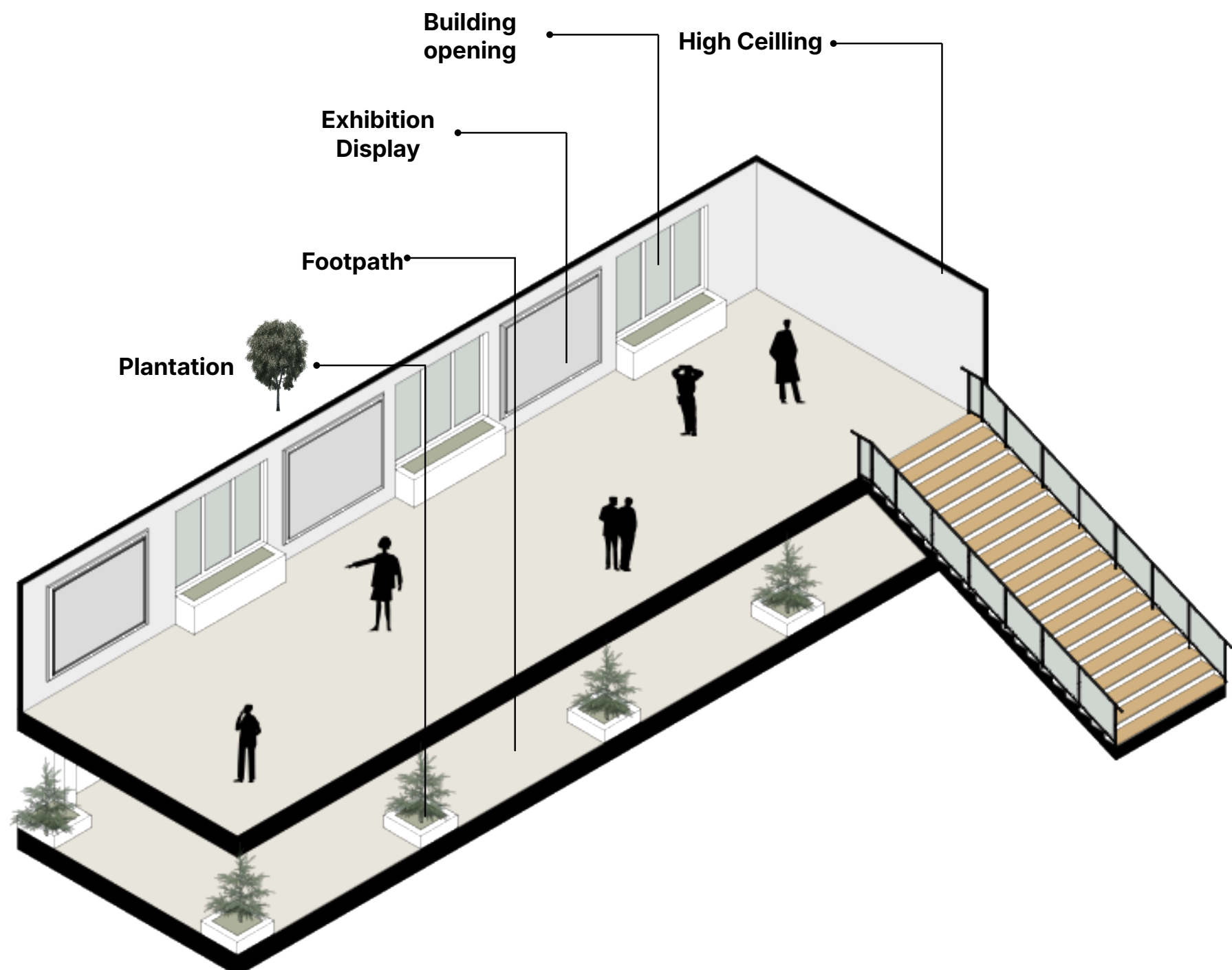


Figure 51. Second Floor Concept
Source : Author's Exploration

The concept of the 2nd floor area, which represents colonial Semarang, is designed with classic elements featuring displays for the exhibition area, complemented by vegetation areas that bring a beautiful feel. In addition, optimal ventilation is integrated to ensure good air circulation, providing maximum comfort in the building area. Large vertical openings are tall windows with wooden louvers to optimize cross ventilation.

Exhibition Concept

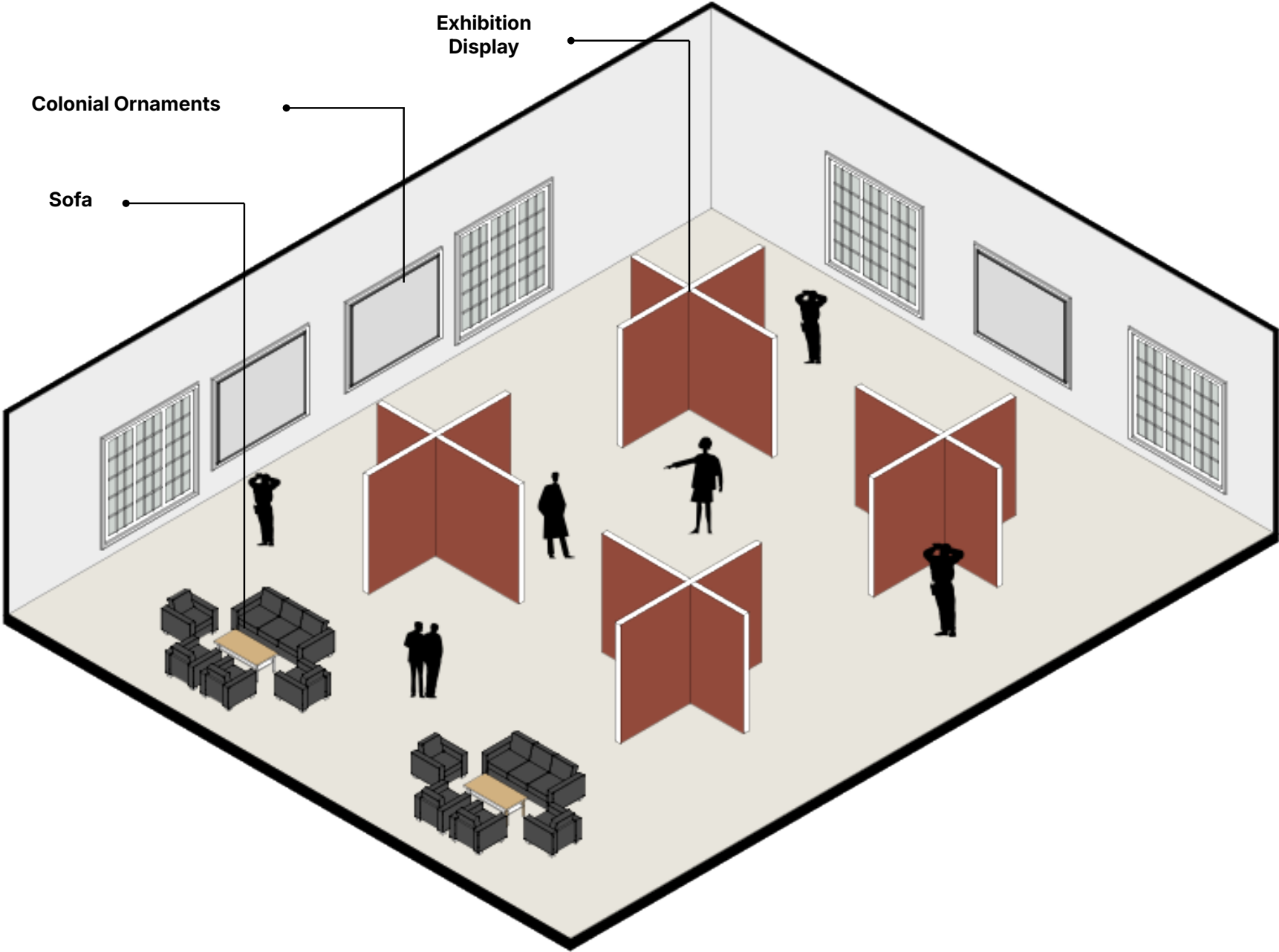


Figure 52. Exhibition Area Concept
Source : Author's Exploration

The Exhibition Area concept, which represents colonial Semarang, is designed with a linear display concept, allowing easy access and orientation of visitors to all areas of the space. The design also ensures easy access for people with disabilities, creating an inclusive and comfortable experience for all visitors.

Waiting Area Concept

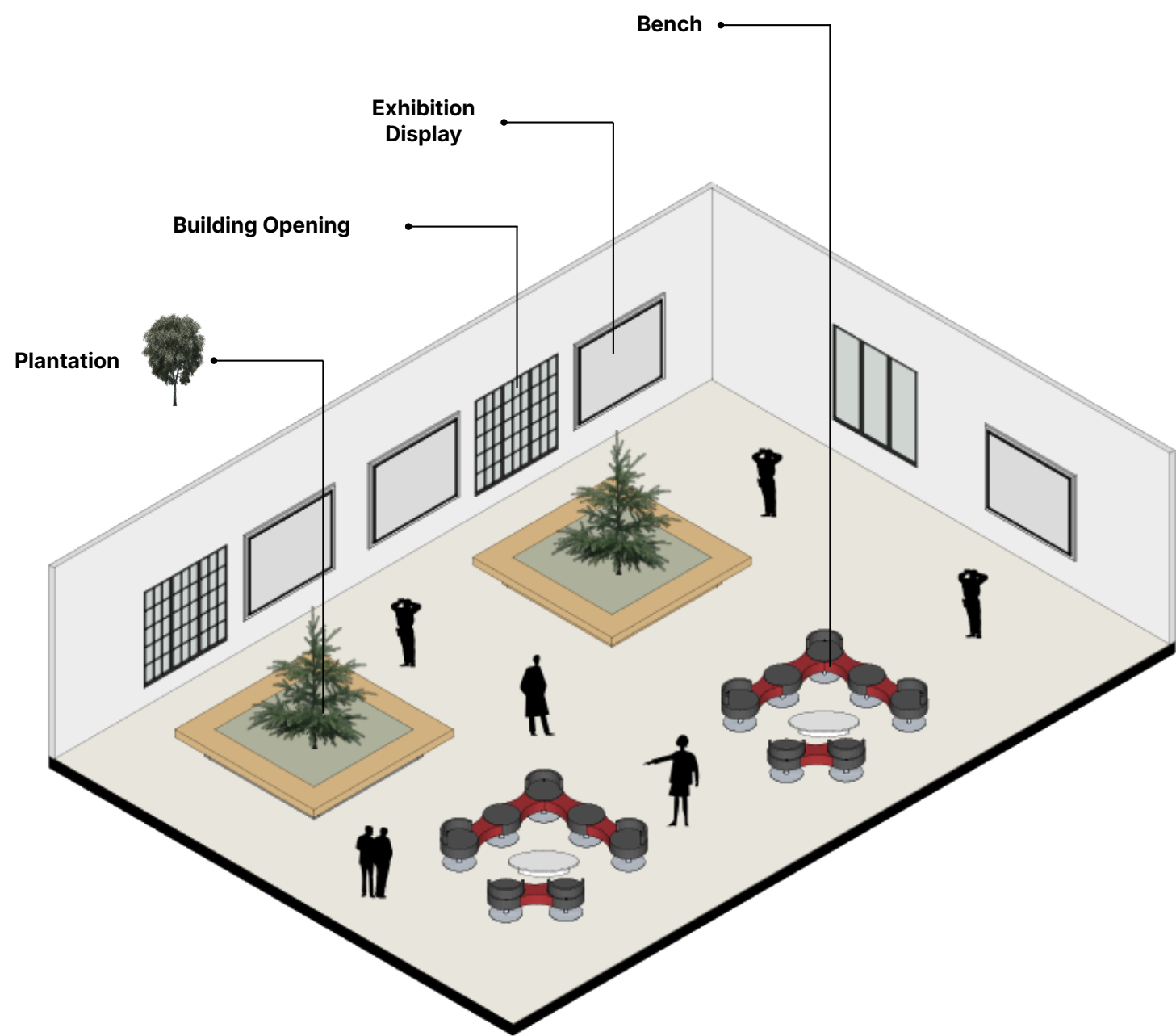


Figure 53. Waiting Area Concept
Source : Author's Exploration

The waiting area concept that represents Semarang in the future is designed to be modern with displays for art and cultural exhibitions, as well as vegetation areas that create a green and calming atmosphere. Good ventilation is integrated to ensure comfortable air circulation, so that potential passengers can wait more comfortably and enjoy the inspiring and fresh environment.

04 *Design Development*



DEPARTMENT *of*
ARCHITECTURE



한국건축학교육인증원
Korea Architectural Accrediting Board



CANBERRA
ACCORD





Datang
Selamat

Site Plan Development

Area	KDB	KDH	KLB
25.000m2	15.000m2	5.000m2	60.000

Area	KDB	KDH	KLB
25.000m2	4.634m2	2.608	60.000

- Private car Circulation
- Bus Circulation
- Pedestrian Walkway

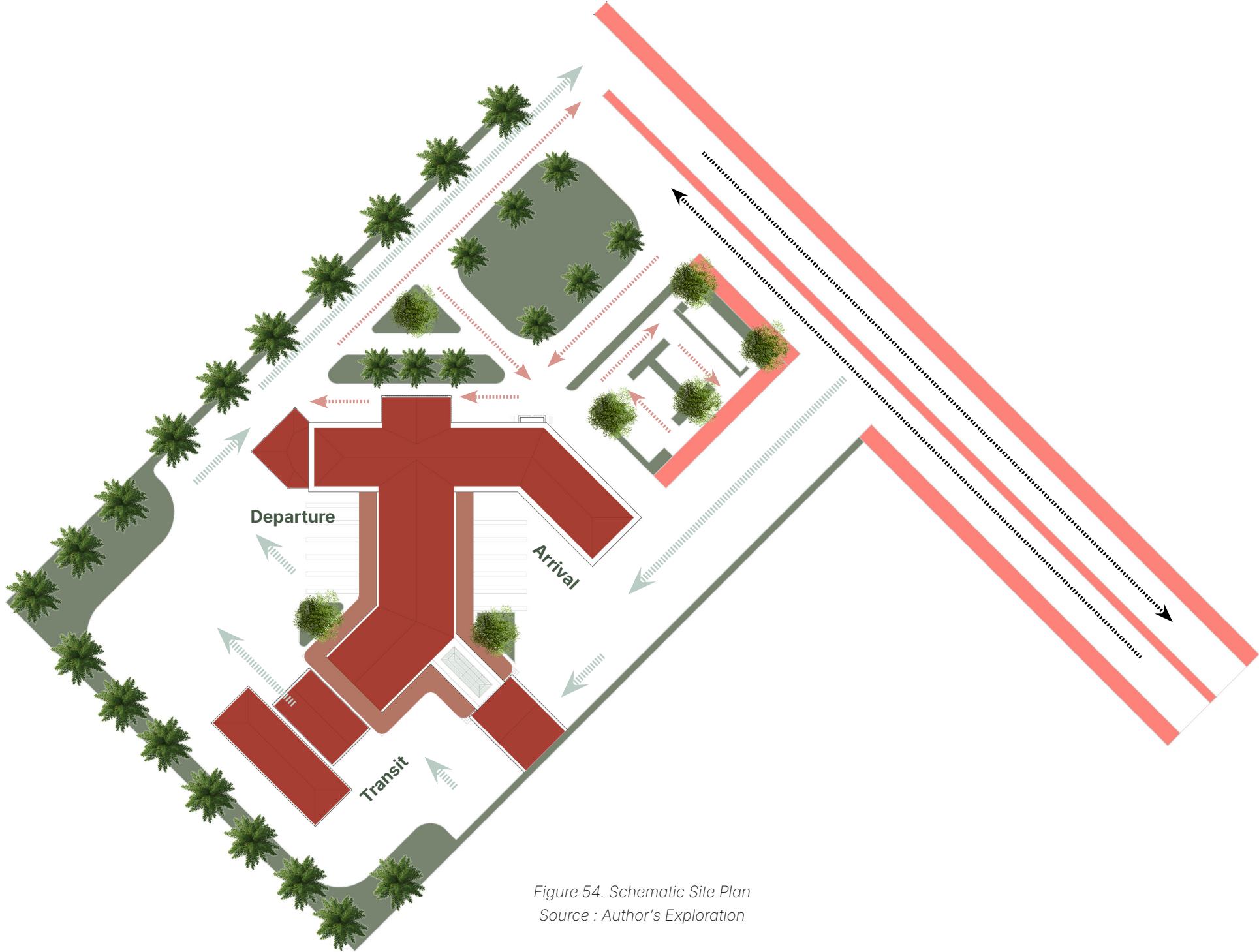


Figure 54. Schematic Site Plan
Source : Author's Exploration



Schematic First Floor Plan



Figure 55. Schematic First Floor Plan
Source : Author's Exploration

Schematic First Floor Plan

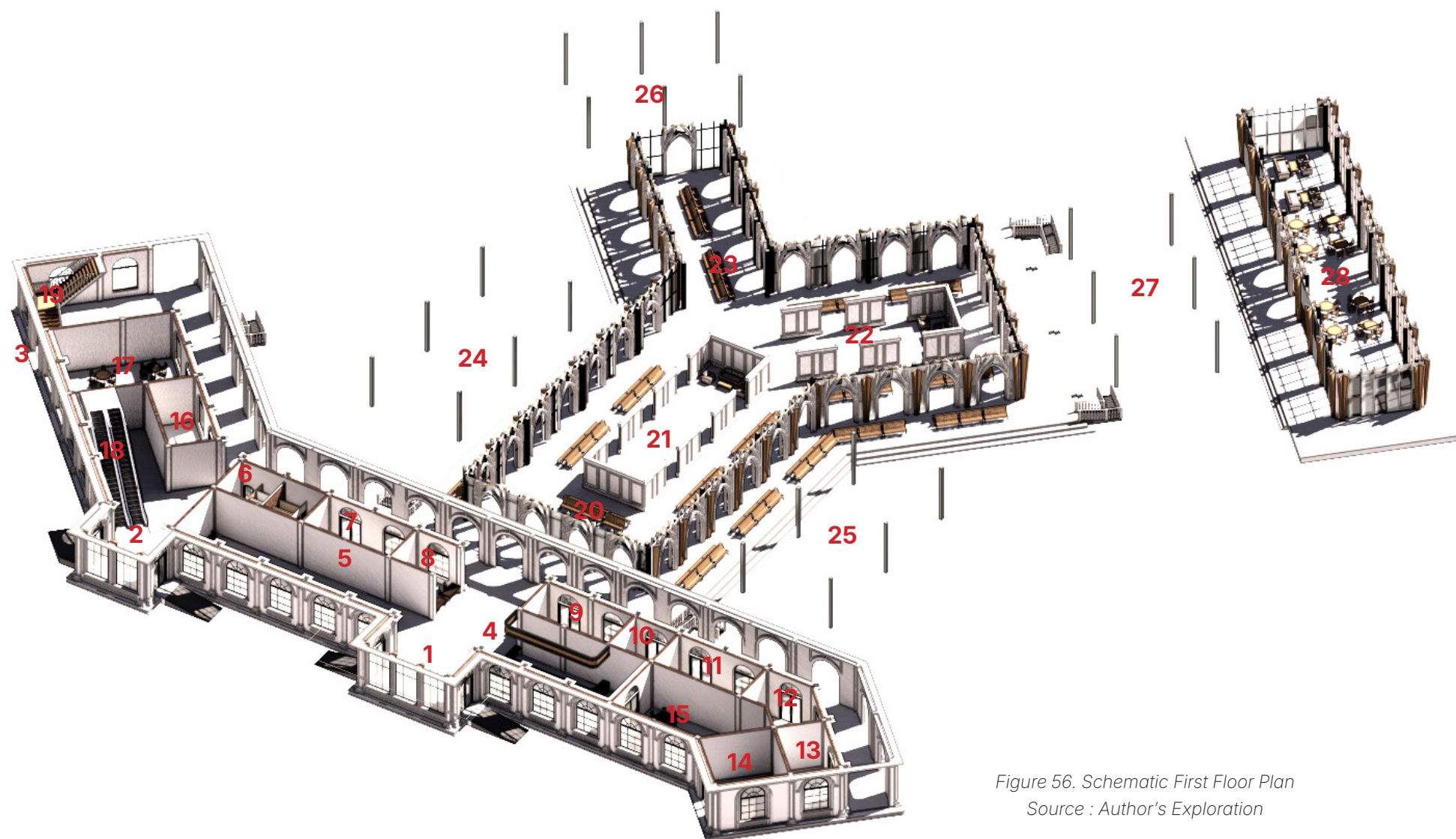


Figure 56. Schematic First Floor Plan
Source : Author's Exploration

- | | | |
|--------------------------|---------------------------|------------------------------|
| 1. Entrance | 11. Manager's Room | 21. Display Area Exhibition |
| 2. Entrance Exhibition | 12. Manager's room | 22. Display Area II |
| 3. Out | 13. Utility Room | 23. Waiting Area |
| 4. Locket Area | 14. Warehouse | 24. Departure Trans Semarang |
| 5. Information Area | 15. Big Tenant | 25. Departure AKAP/AKDP |
| 6. Restroom | 16. Pray Room | 26. Arrival |
| 7. Small Food stall | 17. Small Food Stall | 27. Transit Area |
| 8. Security Pos | 18. Escalator | 28. Driver's Room |
| 9. Adsminitrative Office | 19. Stairs | |
| 10. Security Room | 20. Entrance Waiting Area | |

Schematic Second Floor Plan

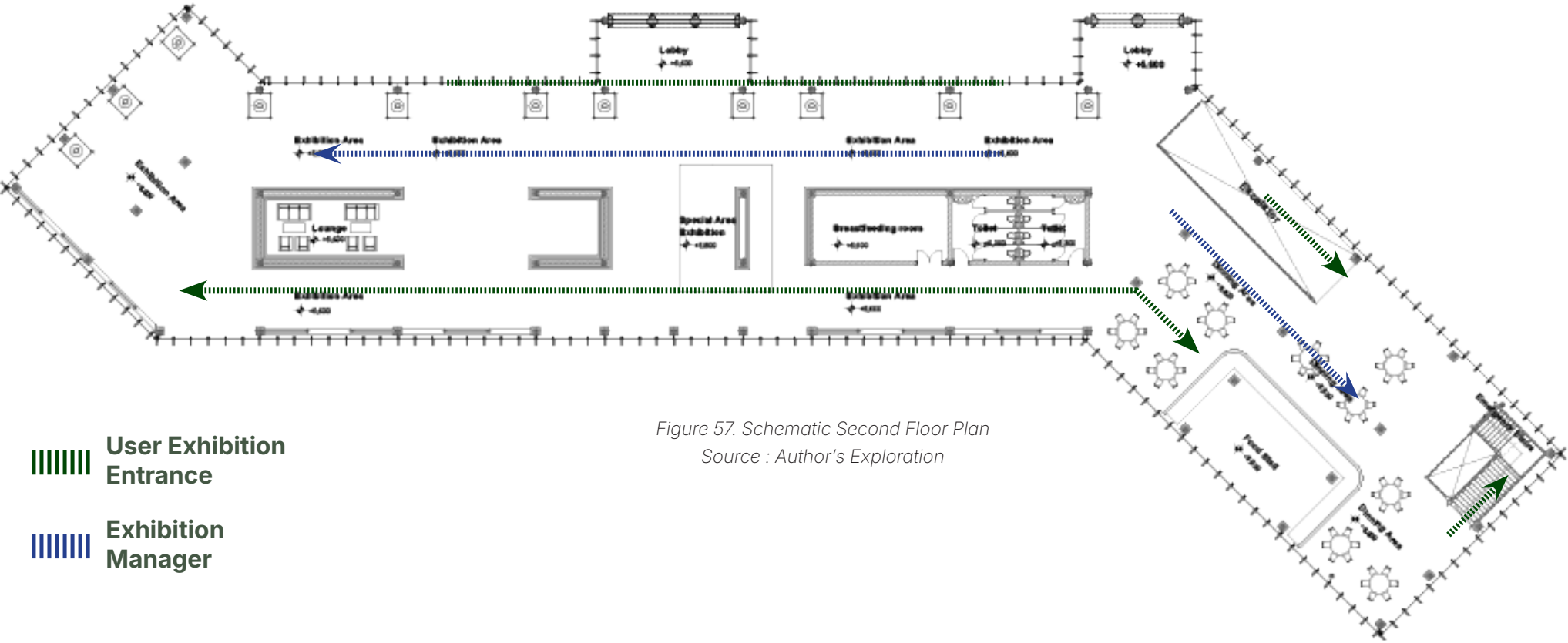
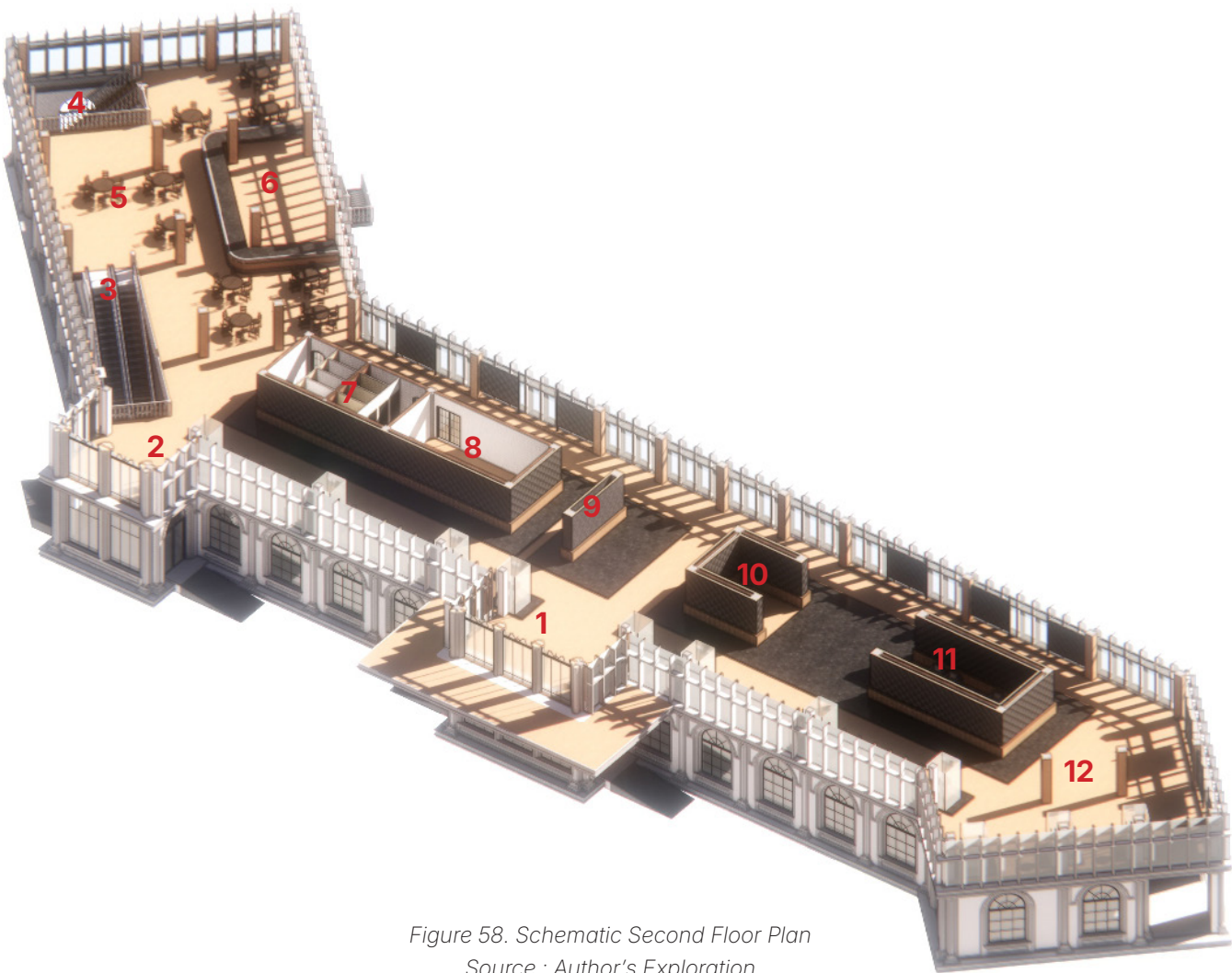


Figure 57. Schematic Second Floor Plan
Source : Author's Exploration

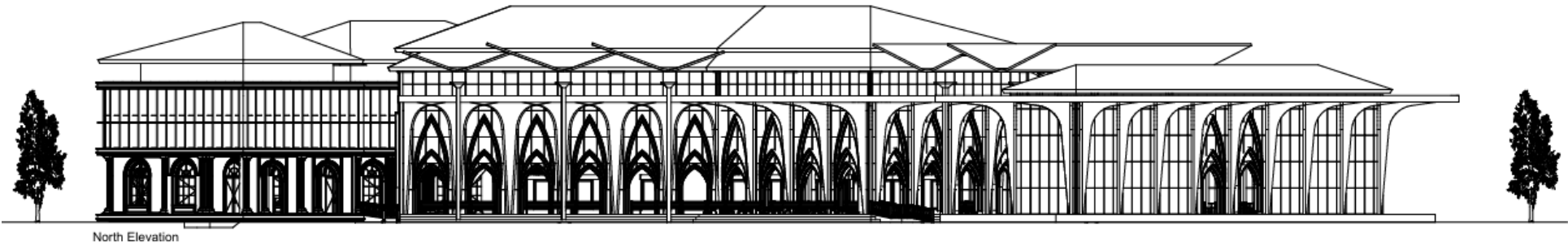
- ||||| User Exhibition Entrance
- ||||| Exhibition Manager



- 1. Main Lobby
- 2. Lobby entrance
- 3. Escalator
- 4. Stairs
- 5. Dinning Area
- 6. Big Tenant
- 7. Restroom
- 8. Lactation room
- 9. Special Exhibition Area I
- 10. Special Exhibition II
- 11. Lounge
- 12. Exhibition

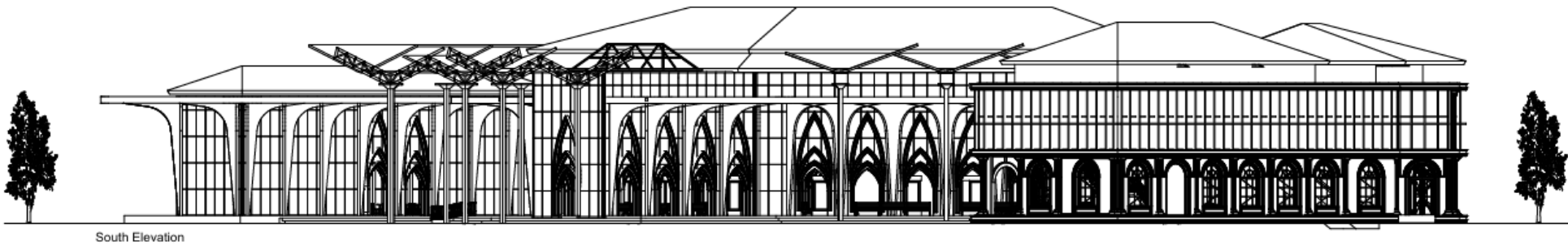
Figure 58. Schematic Second Floor Plan
Source : Author's Exploration

Schematic Building Elevation



North Elevation

Figure 59. Schematic North Elevation
Source : Author's Exploration



South Elevation

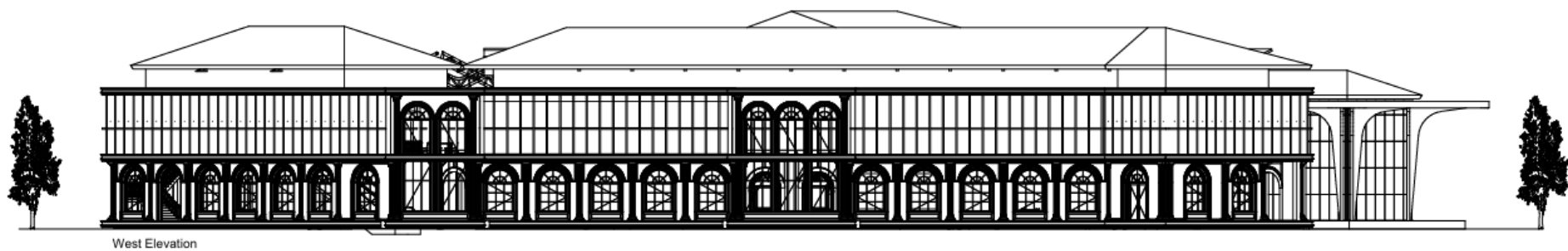
Figure 60. Schematic South Elevation
Source : Author's Exploration

Roof and Structure Pitched roof with a 25-degree slope that reflects colonial proportions. Ventilation on the roof beam for air circulation.

Facade High vertical window openings, wood-paneled with jalousies at the top for natural ventilation. Decorative elements such as simple cornice profiles between floors. Terrace with classically styled columns, giving a welcoming feel to users.

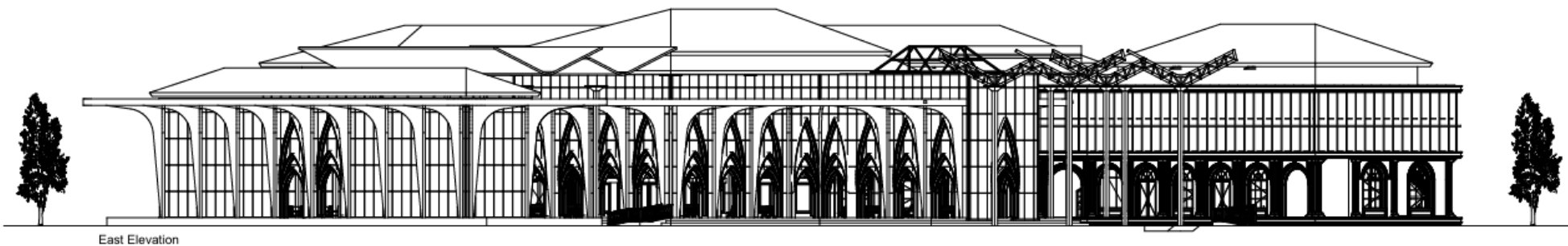
Access and Functionality Main entrance of the terminal with a canopy shading the drop-off area. Vehicle and pedestrian lanes are neatly laid out to facilitate passenger flow.

Schematic Building Elevation



West Elevation

Figure 61. Schematic West Elevation
Source : Author's Exploration



East Elevation

Figure 62. Schematic East Elevation
Source : Author's Exploration

Proportion in the waiting area High columns and spacious elements are often in colonial architecture to give a sense of grandeur as well as functionality. Transition Space In this area by combining modern buildings the transition space between inside and outside with large shading areas. This is applied in terminals to support user circulation.

Schematic Building Section

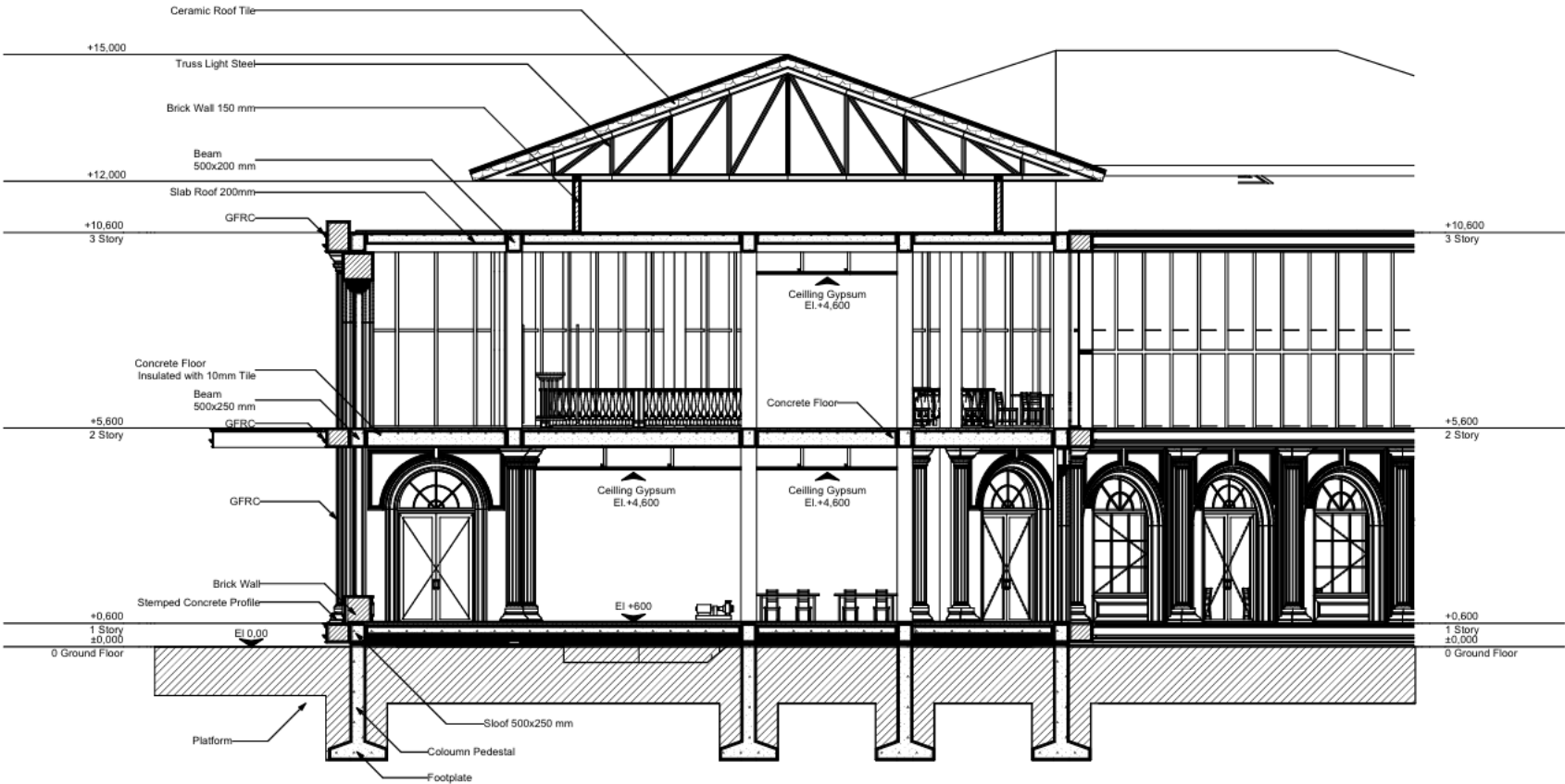


Figure 63. Schematic A-A building Section
Source : Author's Exploration

Schematic Building Section

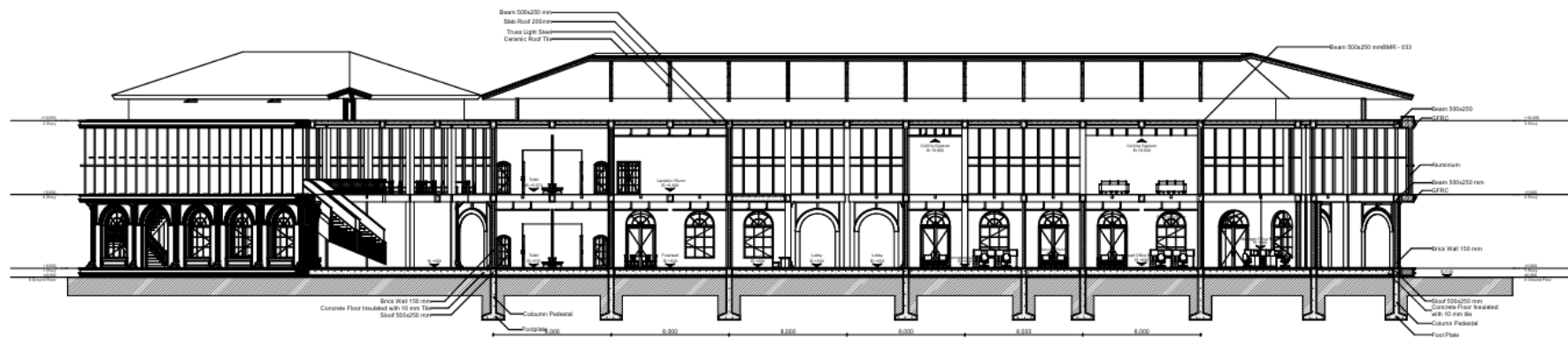


Figure 64. Schematic B-B building Section
Source : Author's Exploration

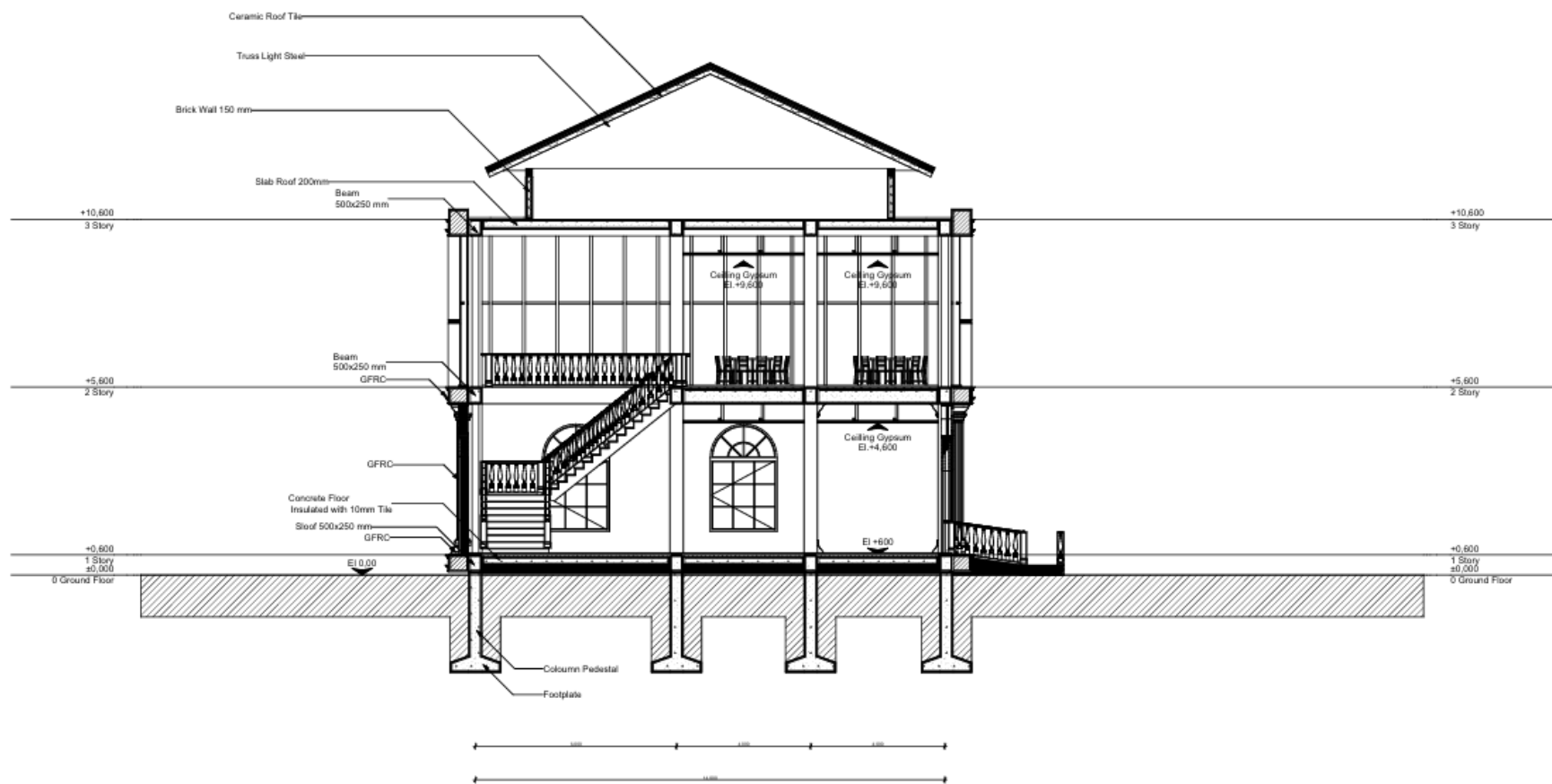


Figure 65. Schematic C-C building Section
Source : Author's Exploration

Schematic Building Floor Plan II

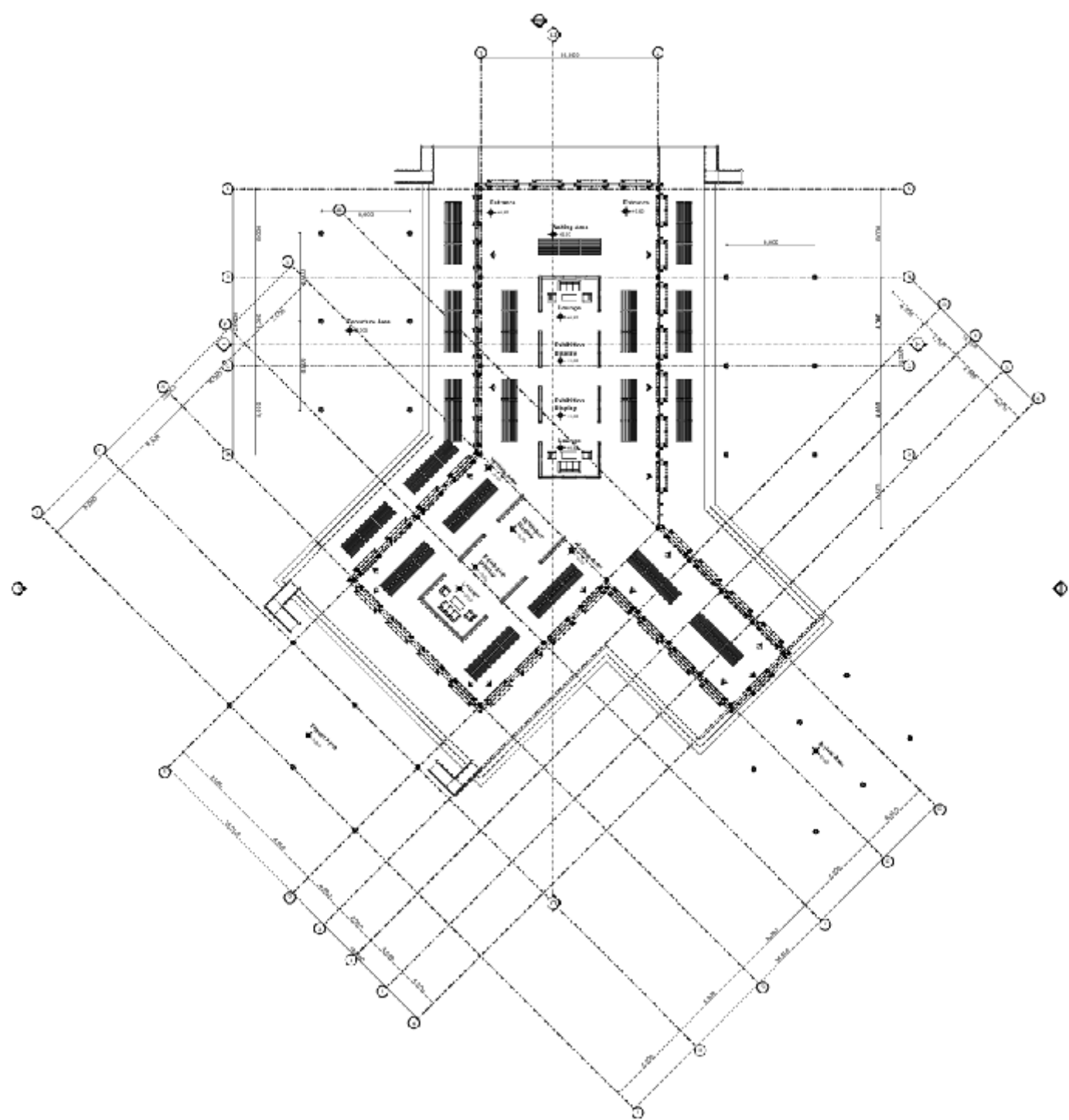
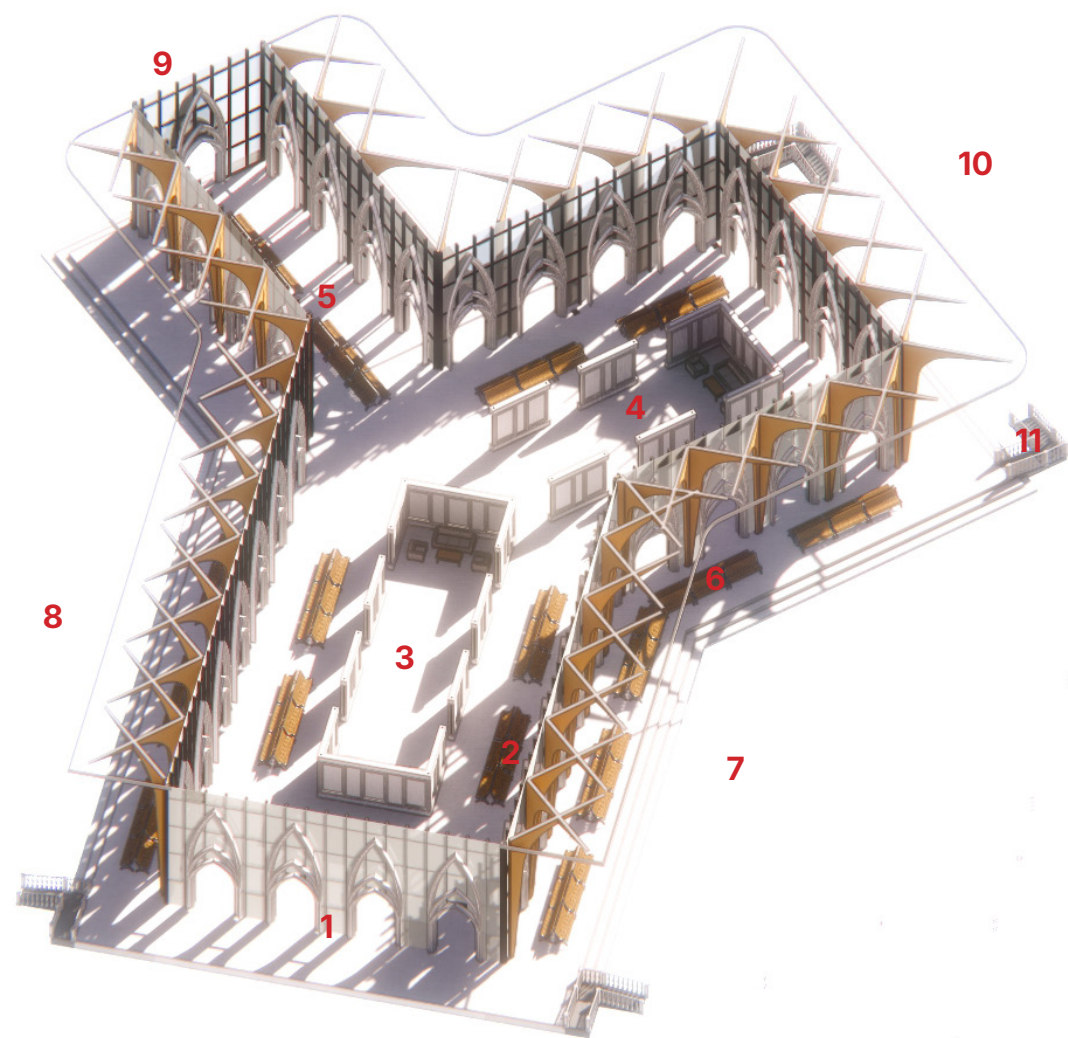


Figure 66. Schematic Building Floor Plan II
Source : Author's Exploration

Schematic Building Floor Plan II



- 1. Main Entrance
- 2. Waiting Area
- 3. Display Exhibition I
- 4. Display Exhibition II
- 5. Waiting Area Arrival
- 6. Outdoor Waiting Area
- 7. Departure AKAP/AKDP
- 8. Departure Trans Semarang
- 9. Arrival
- 10. Transit Area
- 11. Ramp

Figure 67. Schematic Building Floor Plan II
Source : Author's Exploration

Section Building II

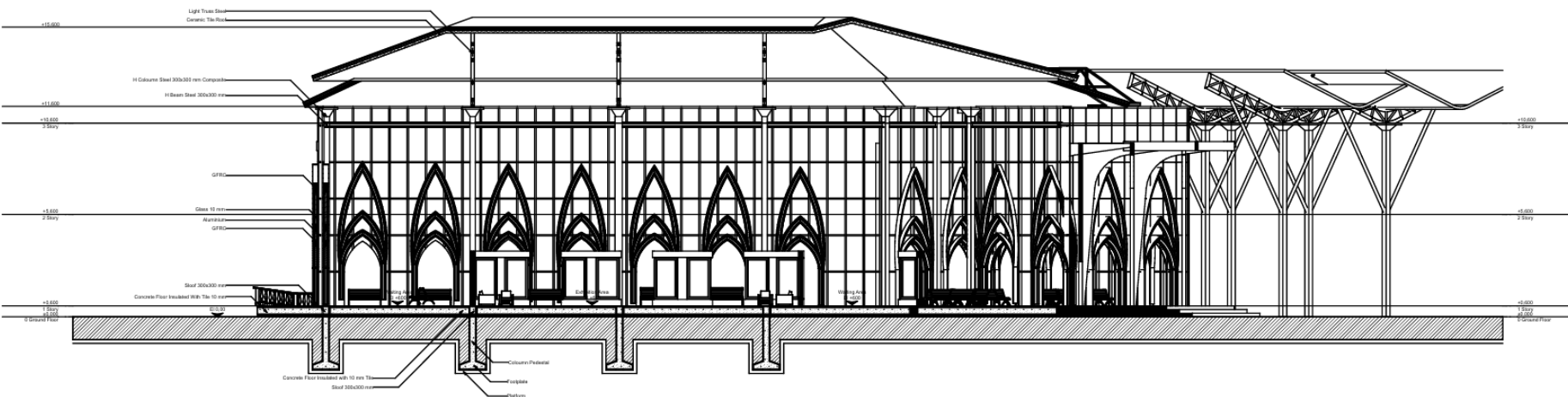


Figure 68. Schematic D-D building Section
Source : Author's Exploration

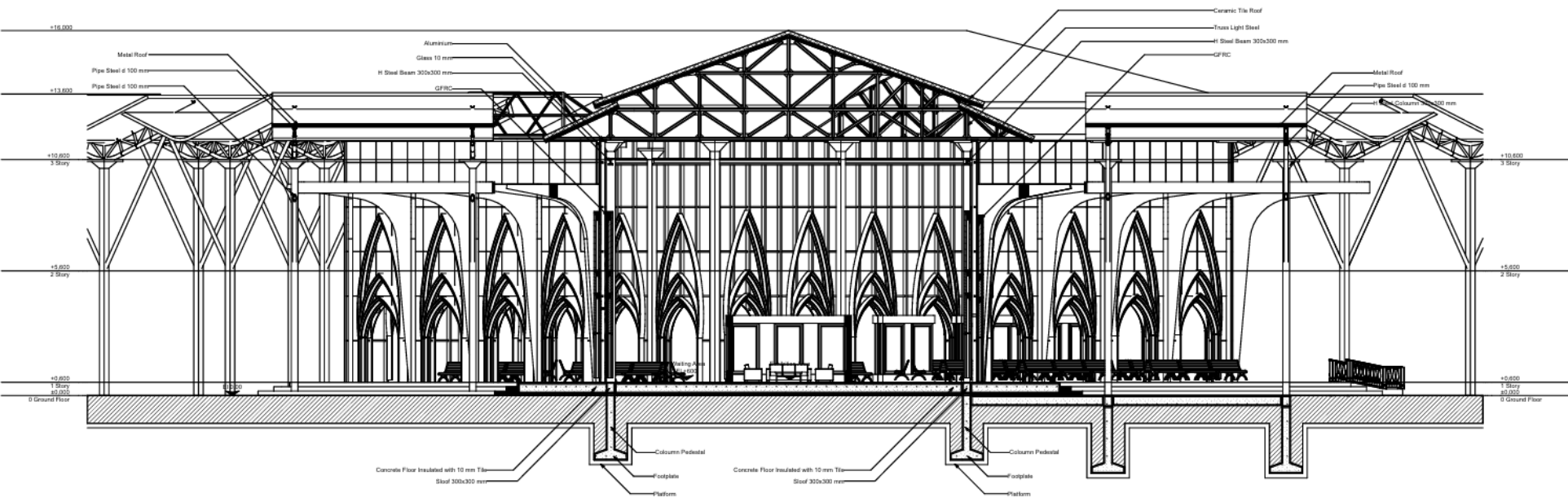


Figure 69. Schematic E-E building Section
Source : Author's Exploration

Schematic Building Elevation II

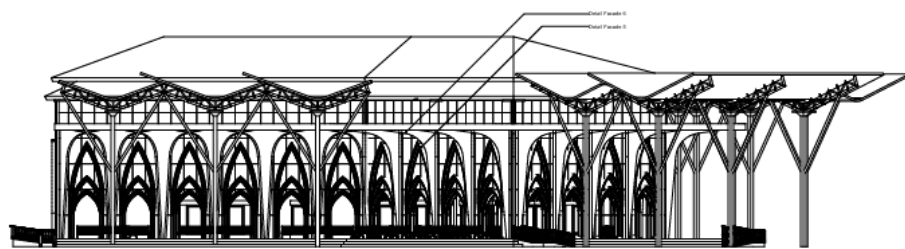


Figure 70. Schematic West Elevation
Source : Author's Exploration

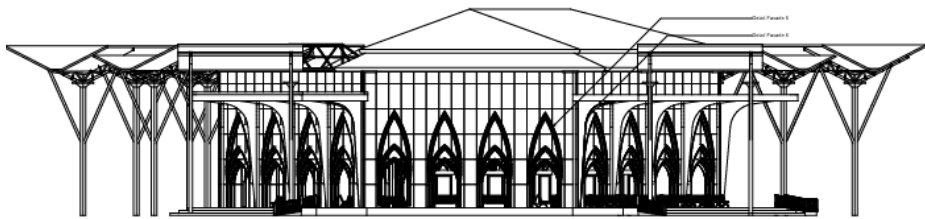


Figure 72. Schematic North Elevation
Source : Author's Exploration

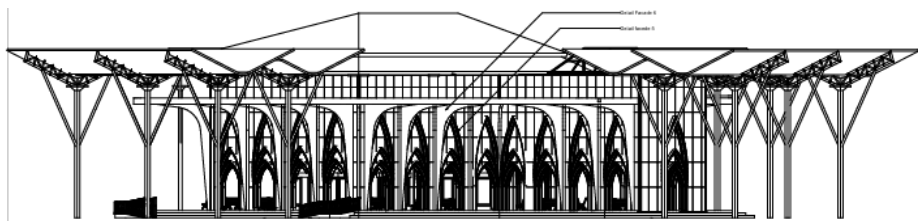


Figure 71. Schematic West Elevation
Source : Author's Exploration

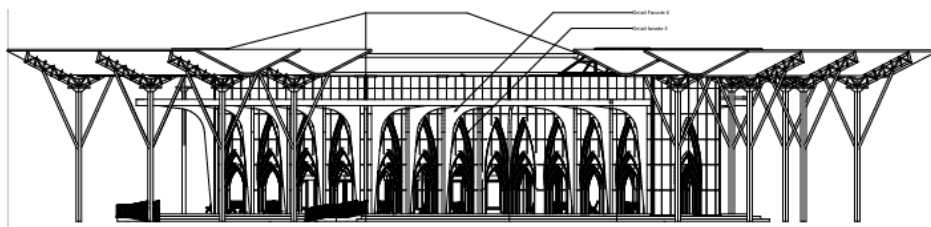


Figure 73. Schematic South Elevation
Source : Author's Exploration

The full glass façade creates a sense of transparency, lightness and openness, allowing maximum natural light in for visual comfort. The wide shading on the terrace acts as a shield from the hot tropical sun, improving thermal efficiency without compromising aesthetics. The space is designed to be more minimalist without a colonial profile to create an interesting contrast with the front façade, and give a futuristic and functional feel.

Space Transition Concept

This design distinction creates a dynamic spatial experience. Visitors feel the historical atmosphere when entering the terminal, and then move to a bright and efficient modern atmosphere in the departure area. This reflects the transition from past to future, in line with the terminal's function as a transit point.

Schematic Building Floor Plan III

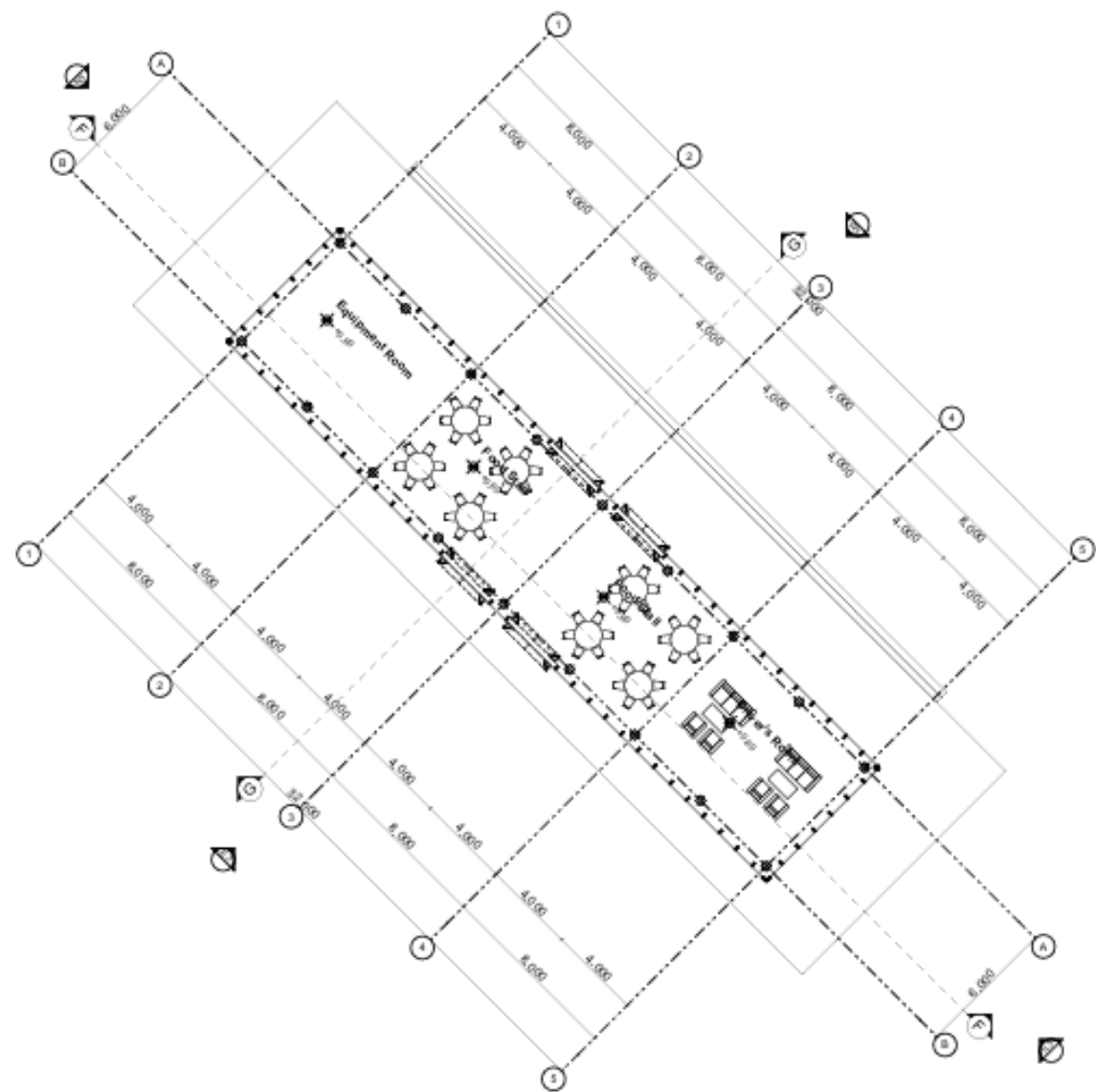
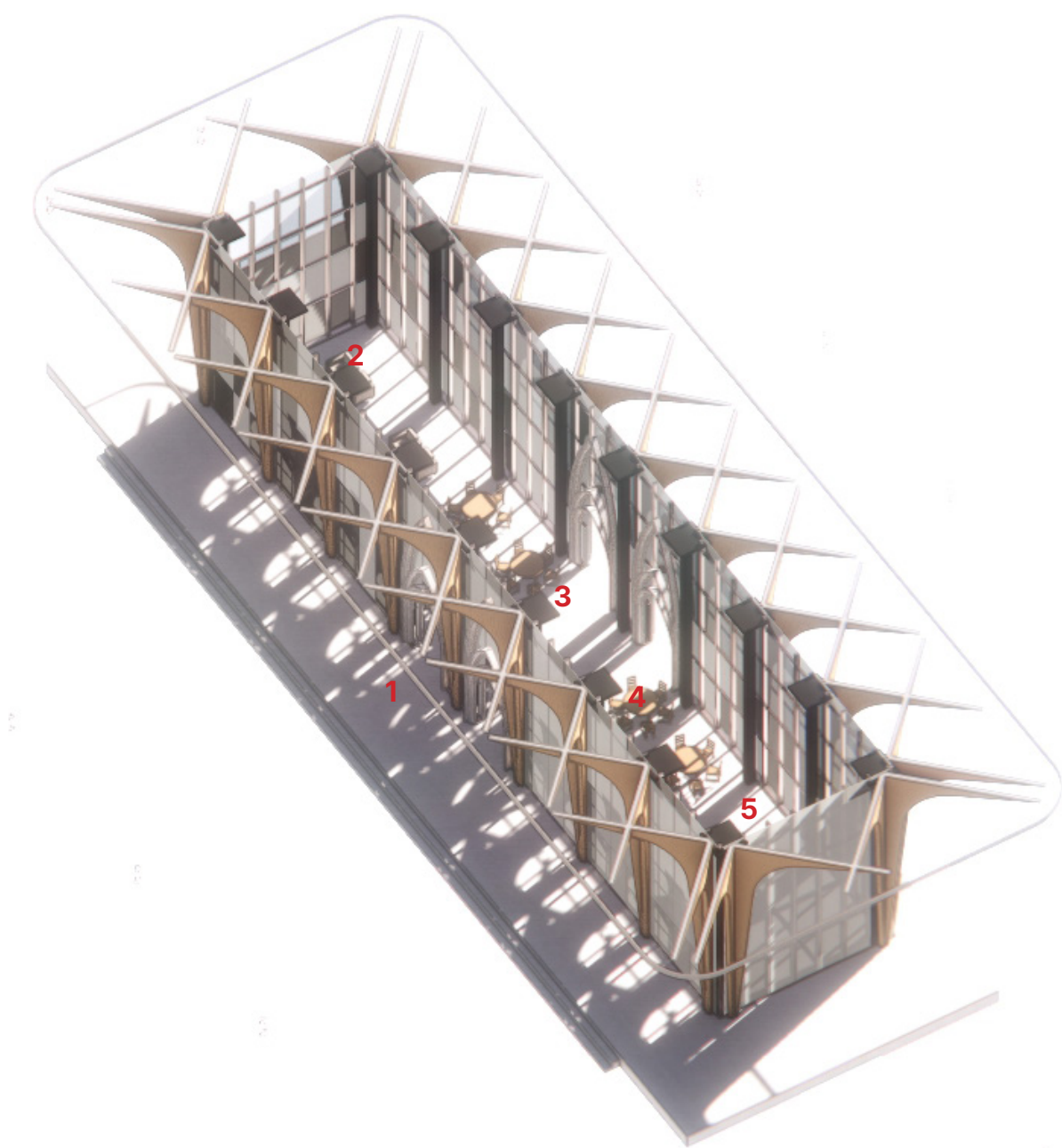


Figure 74. Schematic Floor Plan Building III
Source : Author's Exploration

Schematic Building Floor Plan III



- 1. Main Entrance
- 2. Driver's room
- 3. Small Food Stall
- 4. Dining Area
- 5. Equipment Room

Figure 75. Schematic Floor Plan Building III
Source : Author's Exploration

Section Building III

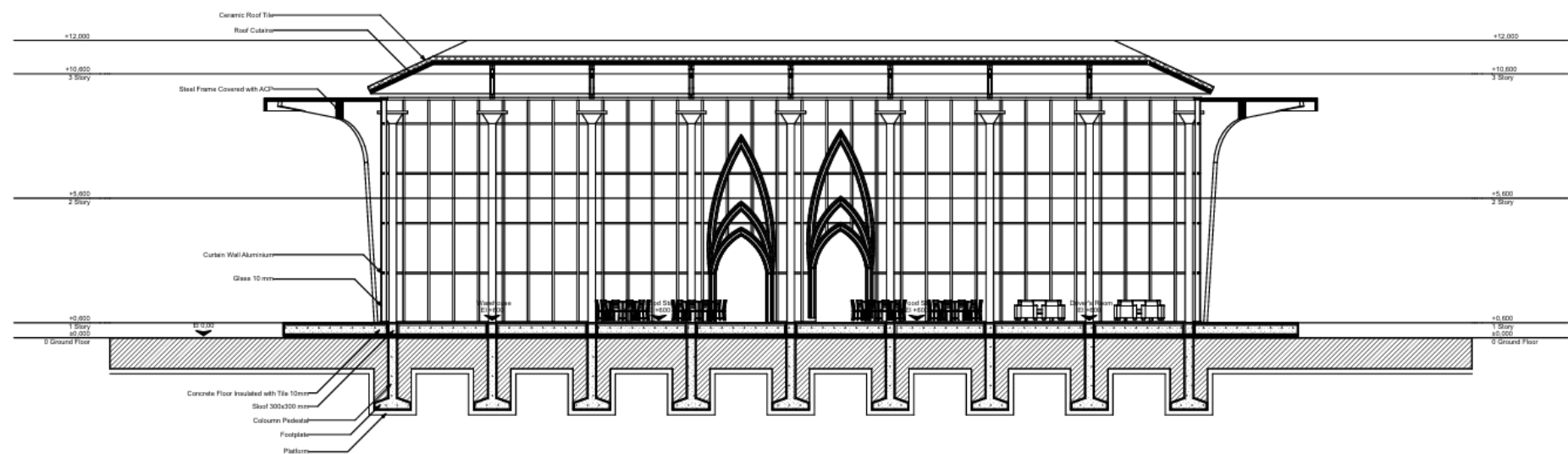


Figure 76. Schematic F-F building Section
Source : Author's Exploration

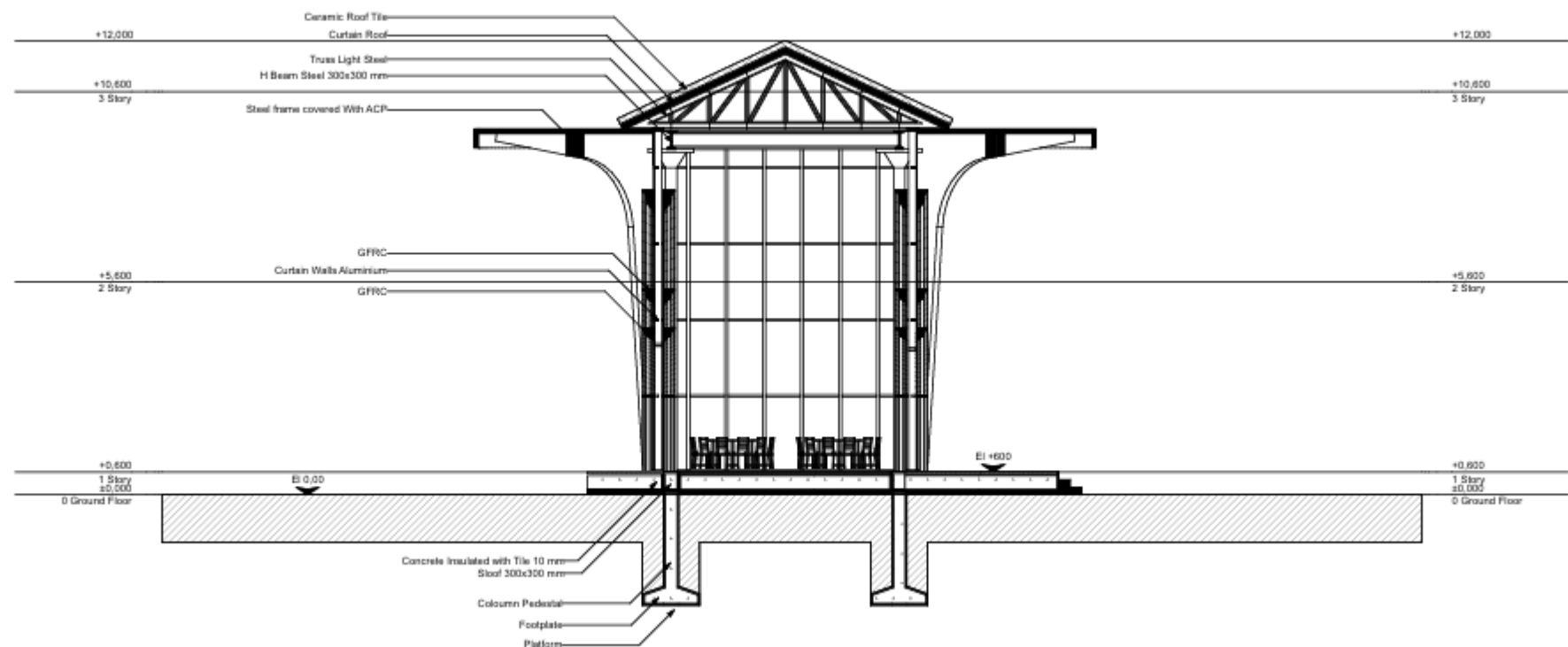


Figure 77. Schematic G-G building Section
Source : Author's Exploration

Schematic Building Elevation III

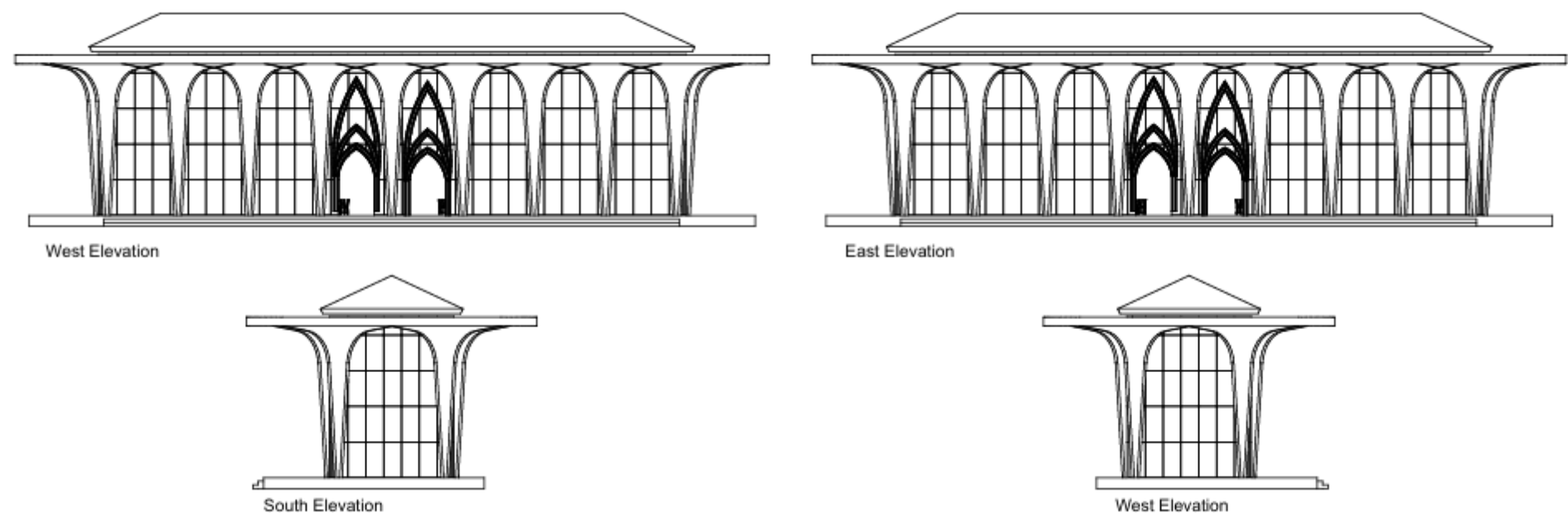


Figure 78. Schematic Building Elevation III
Source : Author's Exploration



Space Transition



Detail Facade

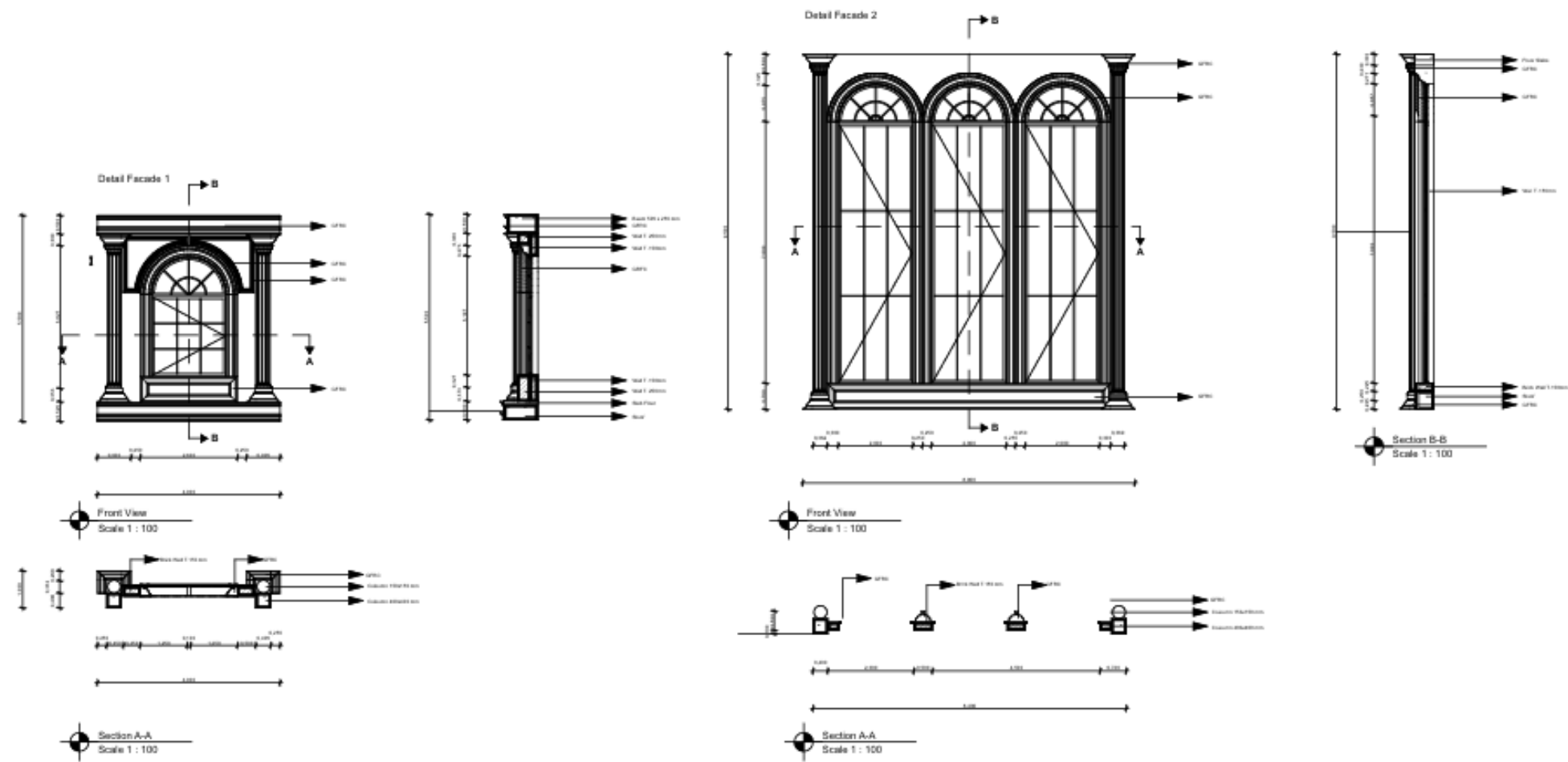


Figure 79. Detail Facade
Source : Author's Exploration

Detail Facade

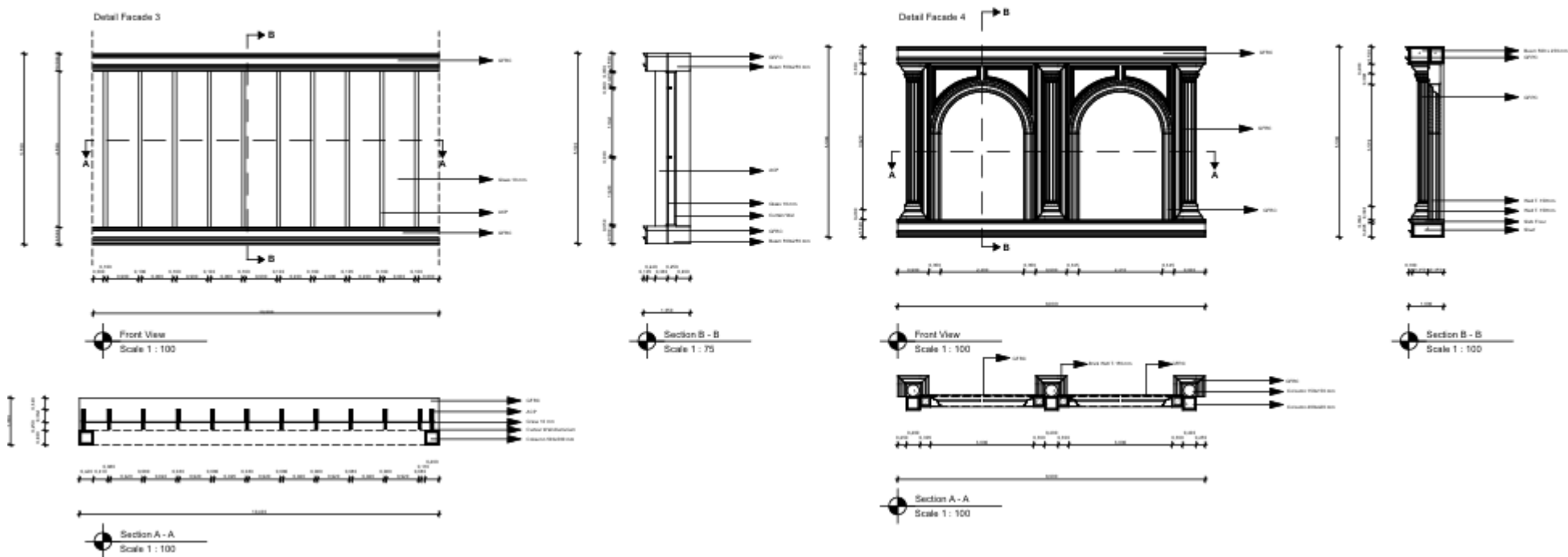


Figure 80. Detail Facade
Source : Author's Exploration

Detail Facade

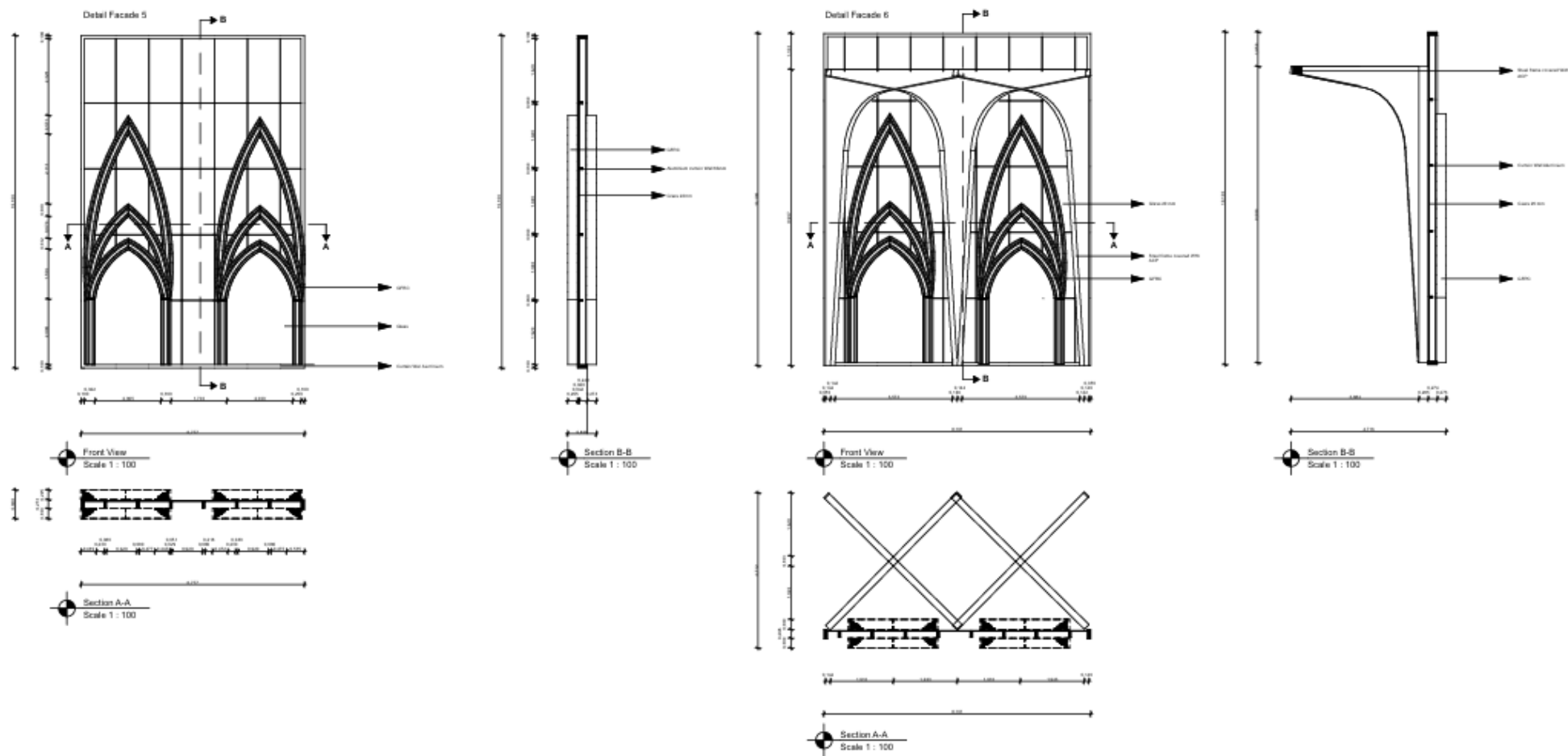


Figure 81. Detail Facade
Source : Author's Exploration

Schematic Building Envelope

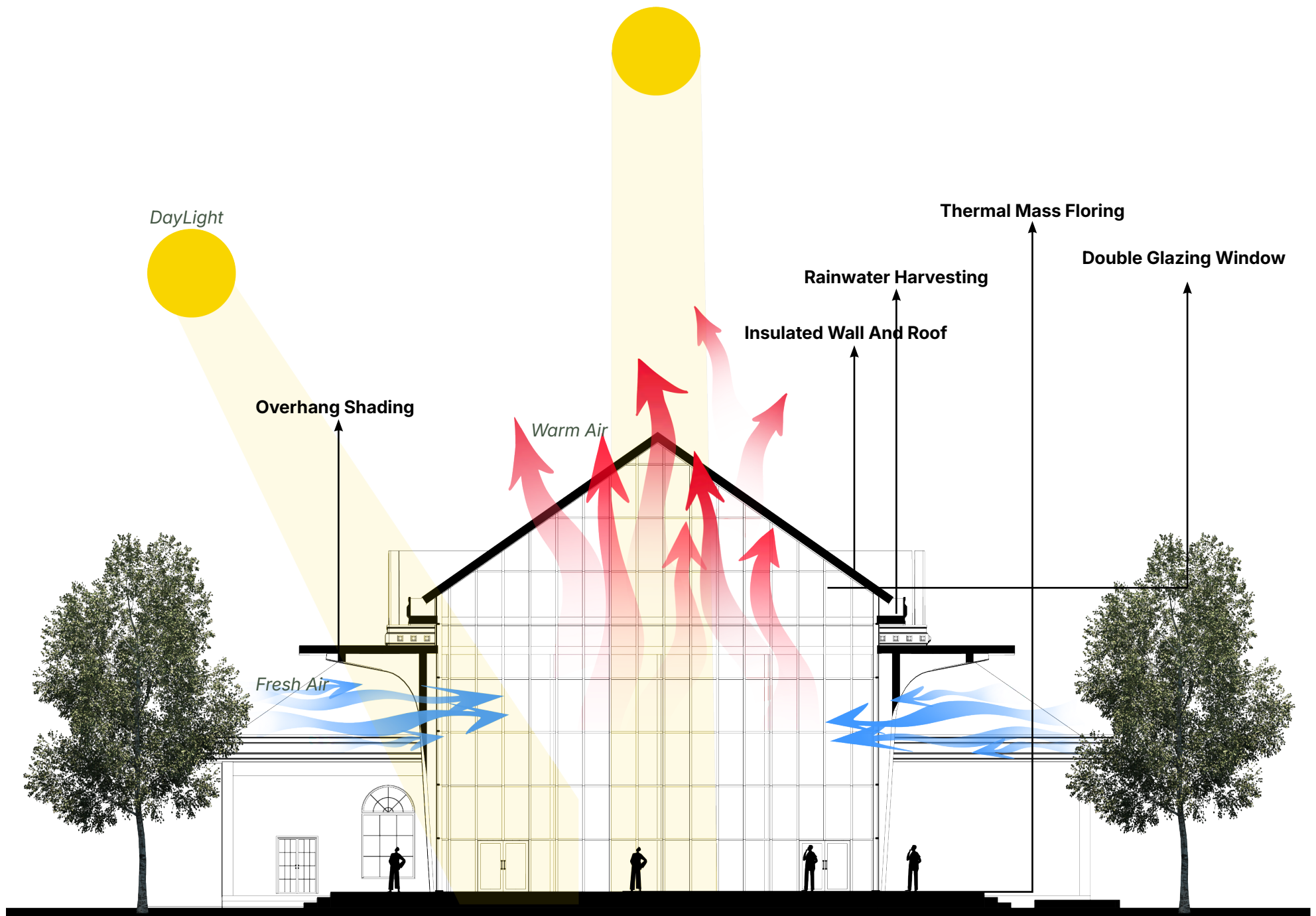


Figure 82. Schematic Building Envelope
Source : Author's Exploration

Schematic Building Structure

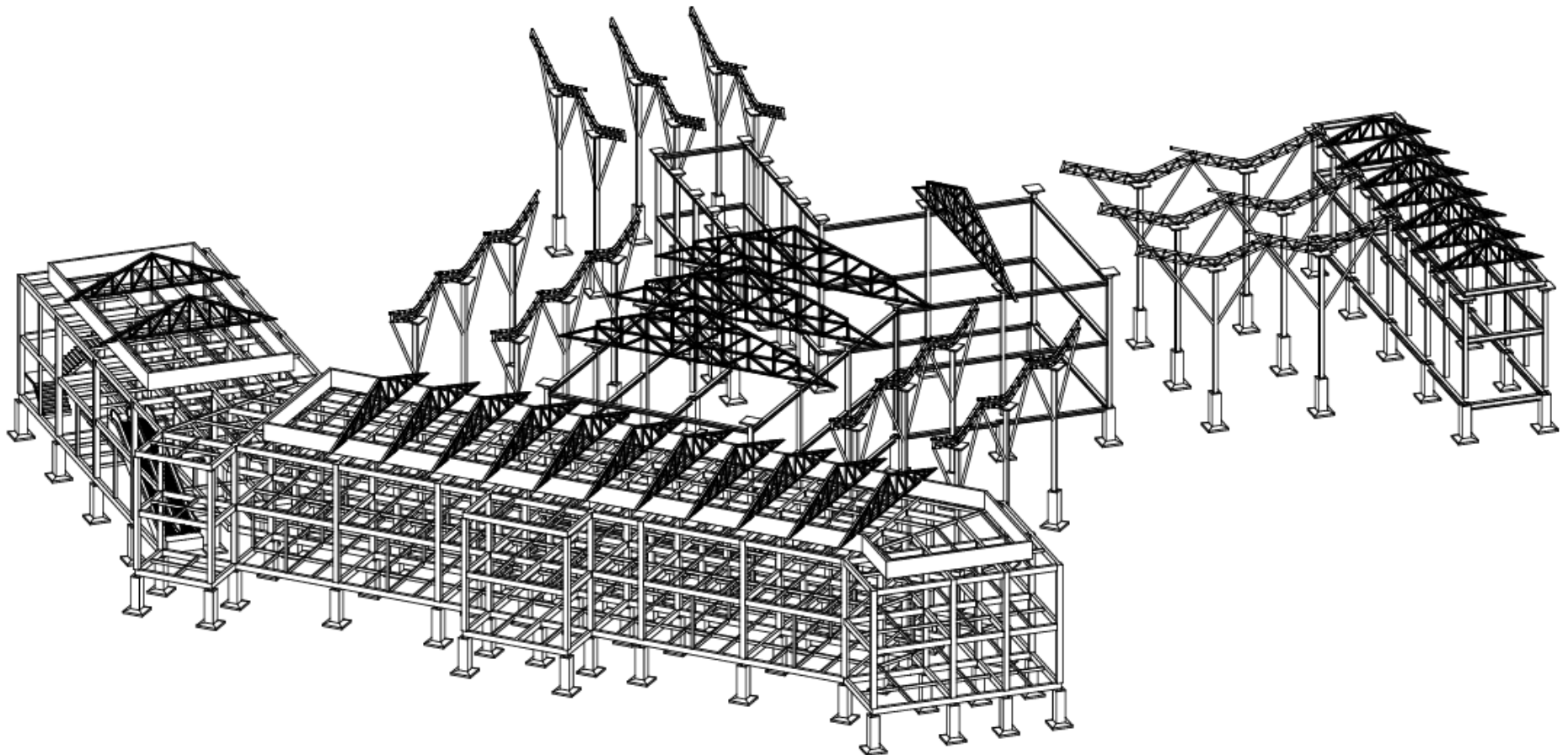


Figure 83. Schematic Structural System

Source : Author's Exploration

At the schematic design stage of the building structure, the planned structural system consists of main elements that support each other to ensure the stability and reliability of the building. **Vertical structural elements using columns** that function as axial and lateral load support, are designed with strong and durable materials. Horizontal elements such as beams are designed to distribute floor and roof loads evenly to the columns. **The foundation is used to effectively transmit** the entire building load to the ground, while the sloof serves as a tie between columns and horizontal load distribution, providing additional stability against movement or deformation. For the super-structure, a steel frame system is used as the roof support element. **Steel frames were chosen for** their high tensile and compressive strength, light weight, and resistance to weather changes, making them suitable for supporting roof designs with large spans or complex geometries.

Schematic Building Safety



Figure 84. Schematic Building Safety
Source : Author's Exploration

Schematic Building Safety

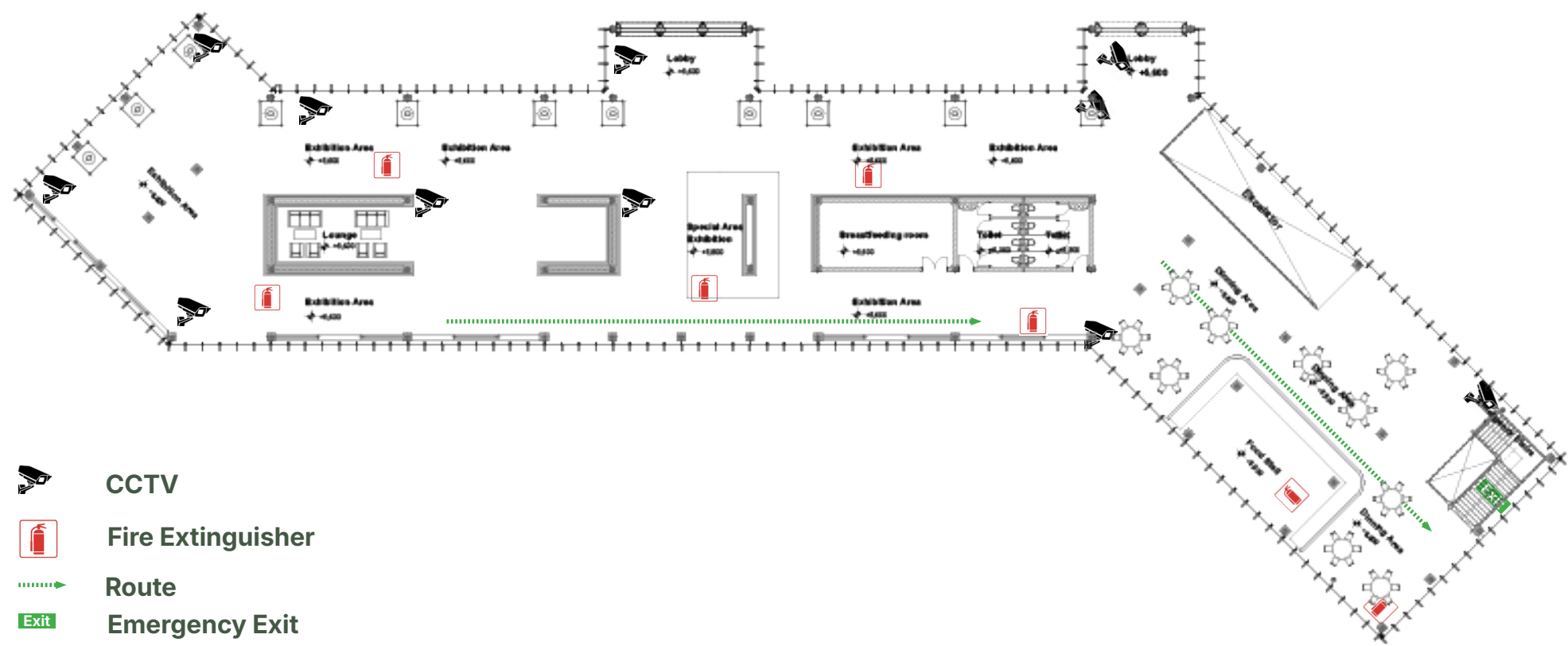


Figure 85. Schematic Building Safety
Source : Author's Exploration

Render Exterior



Terminal Entrance



Exhibition Entrance

Figure 86. Render Exterior
Source : Author's Exploration

Render Exterior



Terminal Departure



Terminal Transit

Figure 87. Render Exterior
Source : Author's Exploration

Render Exterior



Lobby Exhibition



Exhibition Area

Figure 88. Render Interior
Source : Author's Exploration

Render Exterior



Waiting Area



Display Area

Figure 89. Render Interior
Source : Author's Exploration

Building Cost Estimation

Architectural Work Cost

Column1	Column2	Column3	Column4	Column5	Column6	Column7	
I	PEKERJAAN PASANGAN DAN PLESTERAN		HARGA SATUAN				JUMLAH
	1	Dinding bata merah (KM/WC lantai 1 dan 2)	40	m2	Rp	122.250,00	Rp 4.890.000,00
	2	Dinding bata merah (lantai 1, 2 dan pagar)	1691	m2	Rp	118.800,00	Rp 200.890.800,00
	3	Plesteran campuran (lantai 1 dan 2)	4840	m2	Rp	49.350,00	Rp 238.854.000,00
	4	Acian plesteran (lantai 1 dan 2)	4840	m2	Rp	31.800,00	Rp 153.912.000,00
II	PEKERJAAN KERAMIK LANTAI DAN DINDING						
	1	Lantai keramik polis 60x120cm lantai 1	2809	m2	Rp	114.780,00	Rp 406.687.020,00
	2	Lantai keramik polis 60x120cm lantai 2	1290	m2	Rp	114.780,00	Rp 186.766.200,00
	4	Lantai keramik polos 20x20cm untuk KM/WC lantai 1	32	m2	Rp	116.590,00	Rp 3.730.880,00
	5	Lantai keramik polos 20x20cm untuk KM/WC lantai 2	32	m2	Rp	114.780,00	Rp 3.672.960,00
	6	Lantai keramik unpolis 40x40cm pada teras	573	m2	Rp	129.840,00	Rp 74.398.320,00
	7	Lantai keramik 40x40cm untuk tangga	26	m2	Rp	136.390,00	Rp 3.546.140,00
III	PEKERJAAN ATAP						
	1	Pasang rangka atap baja ringan	2613	m2	Rp	155.120,00	Rp 405.328.560,00
	2	Pasaang Atap Metal	1304	m2	Rp	185.000,00	Rp 241.240.000,00
	3	Pasang nok/ bubungan genteng keramik	2613	m3	Rp	114.400,00	Rp 298.927.200,00
IV	PEKERJAAN PLAFOND						
	1	Rangka plafond 50x100cm baja ringan hollow (lantai 1 dan 2)	2276	m2	Rp	79.400,00	Rp 180.714.400,00
	2	Plafond GRC 100x100cm tebal 4cm (WC/lantai 1 dan 2)	64	m2	Rp	72.480,00	Rp 4.638.720,00
	3	Plafond Gypsum 9mm (lantai 1 dan 2)	2276	m2	Rp	166.300,00	Rp 378.498.800,00
V	PEKERJAAN KUSEN, PINTU DAN JENDELA						
	1	Kusen alumunium (lantai 1 dan 2)	10	m2	Rp	8.730.000,00	Rp 87.300.000,00
	2	Daun pintu panel double rangka alumunium (lantai 1 dan 2)	10	m2	Rp	473.450,00	Rp 4.734.500,00
	3	Daun pintu dan kusen PVC / pabrikasi (lantai 1 dan 2)	15,5	m2	Rp	662.600,00	Rp 10.270.300,00
	4	Daun jendela rangka alumunium (lantai 1 dan 2)	34,2	m2	Rp	738.000,00	Rp 25.239.600,00
VI	PEKERJAAN AKSESORIS PINTU DAN JENDELA						
	1	Kunci pintu 2 slaag (lantai 1 dan 2)	15	bh	Rp	293.400,00	Rp 4.401.000,00
	2	Kunci pintu KM/WC (lantai 1 dan 2)	20	bh	Rp	114.900,00	Rp 2.898.000,00
	3	Engsel pintu standard 4 inchi (lantai 1 dan 2)	35	bh	Rp	47.300,00	Rp 1.655.500,00
	4	Engsel jendela standard 3 inchi (lantai 1 dan 2)	26	bh	Rp	27.900,00	Rp 725.400,00
	5	Grendel pintu double	36	bh	Rp	95.500,00	Rp 3.438.000,00
	6	Grendel jendela (lantai 1 dan 2)	26	bh	Rp	83.500,00	Rp 2.171.000,00
	10	Kaca polos 5mm (lantai 1 dan 2)	103,8	m2	Rp	117.000,00	Rp 12.144.600,00
	11	GFRC	393		Rp	660.000,00	Rp 259.380.000,00
	12	ACP	1202		Rp	650.000,00	Rp 781.300.000,00
	13	Curtain Wall	2.277,50	m2	Rp	1.400.000,00	Rp 3.188.500.000,00
VII	PEKERJAAN PENGECATAN						
	1	Dinding cat tembok kualitas baik (lantai 1 dan 2)	1691		Rp	74.040,00	Rp 125.201.640,00
	2	Plafond cat tembok kualitas sedang (lantai 1 dan 2)	2276		Rp	54.540,00	Rp 124.133.040,00
	3	Plafond ramin cat melamik (lantai 1 dan 2)	2276		Rp	50.425,00	Rp 114.767.300,00
	4	Listplank cat minyak (lantai 1 dan 2)	1691		Rp	73.850,00	Rp 124.880.350,00
	6	Kusen cat minyak (lantai 1 dan 2)	10		Rp	73.850,00	Rp 738.500,00
	8	Daun pintu cat minyak (lantai 1 dan 2)	15,5		Rp	73.850,00	Rp 1.144.675,00
	9	Daun jendela cat minyak (lantai 1 dan 2)	34,2		Rp	73.850,00	Rp 2.525.670,00
Jumlah					Rp		7.664.245.075,00

Table 9. Building Cost Estimation
Source : Author's Exploration

Recapitulation Building Cost Estimation

No.	Work Description	Amount	Total Amount
I	Preparation	5 %	Rp1.094.892.154
II	Archititectural Work	30 %	Rp7.664.245.075,00
III	Structural Work	35 %	Rp6.569.352.921
IV	MEP Work	20 %	Rp4.379.568.614
V	Landscape Work	10 %	Rp2.189.784.307

Total Amount = Rp21.897.843.071
PPN 12% = Rp2.627.741.168,52
Amount = Rp24.525.584.240,00

Total Amount = $\frac{\text{Archititectural Work Cost}}{\text{Presentage Archititectural Work}}$

Total Amount = $\frac{\text{Rp7.664.245.075,00}}{35\%} = 21.897.843.071$

Preparation 5%

5% X 21.897.843.071 = 1.094.892.154

Structural 30%

30% X 21.897.843.071 = 6.569.352.921

MEP 20%

20% X 21.897.843.071 = 4.379.568.614

Landscape 10%

10% X 21.897.843.071 = 2.189.784.307

PPN 12%

12% X 21.897.843.071 = 2.627.741.168,52

Payback Periode

Revenue From Terminal

Platform Ticket : Some terminals impose retribution for the use of waiting rooms or platforms. For example, Terminal Tirtonadi in Solo raised the retribution rate for passenger waiting room (platform) services in 2016. Setting the rate at IDR 2,000 per passenger and assuming an average of 400 passengers per day:

400 Passangers X Rp2.000 = Rp800.000 /day

Parking Fees : Parking charges can be applied to vehicles entering the terminal area. For example, some regions set parking fees for inter-provincial city buses at Rp2,000 per entry.

Assume there are 50 vehicles per day with a tarif of Rp2,000.

50 Vehicles X Rp2.000 = Rp100.000/day

Kiosk Rental: Kiosk rental rates at terminals vary depending on location and facilities.

5 Small Kiosk Rental price: IDR 500,000 per month

Amount : 5 X Rp500.000 = Rp2.500.000/month (Rp83.333/day)

2 Big Tenant = Rp30.000.000/month/tenant

Amount : 2 X Rp30.000.000 = 60.000.000/month (Rp2.000.000/day)

Revenue From Exhibition

Admission : Exhibition admission prices may vary. For example, the National Museum of Indonesia charges Rp25,000 for adults. sets a similar rate and targets 100 visitors per day:

100 Visitors X Rp25.000 = Rp2.500.000/day

Exhibition Space Rental: Exhibition space rental rates vary depending on location and facilities. To illustrate, some event spaces in Semarang offer rental rates of around Rp750,000 per hour.

exhibition space is rented out for 8 hours per day:

8 hour X Rp750.000 = Rp6.000.000/day

Revenue From Additional Facilities

Rental Display in Waiting Room: Provide display areas in the terminal lounge for rent to advertisers or businesses. Rates can be adjusted based on the size and location of the display. There are 10 display slots at Rp1,000,000 per month:

10 slots X Rp1.000.000 = 10.000.000 / month (Rp333.333/day)

Payback Period Calculation

Revenue Source	Income/day
Platform Ticket	Rp800.000
Parking Fee	Rp100.000
Small Kiosk Rent	Rp83.000
Big Tenant Rent	Rp2.000.000
Ticket Exhibition	Rp2.500.000
Exhibition Space Rental	Rp6.000.000
Display Space Rental	Rp333.333
Daily Total Revenue	Rp11.816.666

Annual income

Rp11.816.666 X 365 = **Rp4.312.083.090**

Estimated Operational Costs

Employee Salary

Terminal Manager: IDR 8,000,000
Exhibition Manager: IDR7,000,000
Administration Staff (2 people × Rp4,000,000): IDR8,000,000
Security Officer (4 people × Rp3,500,000): IDR14,000,000
Cleaning Officer (3 people × Rp3,000,000): IDR9,000,000
Total Salary: IDR46,000,000/month

Utilities (Electricity, Water, Internet, etc.)

Terminal: IDR15,000,000/month (10% Income)
Exhibition: IDR10,000,000/month (10% Income)
Total Utilities: IDR25,000,000/month

Maintenance and Care

Maintenance of buildings, air conditioning, lifts, and public facilities: IDR10,000,000/month

Maintenance and Care

Maintenance of buildings, air conditioning, lifts, and public facilities: IDR10,000,000/month

Other (insurance, licence, marketing, incidental)

Estimation: IDR5,000,000/month

Total Monthly Operational Costs:

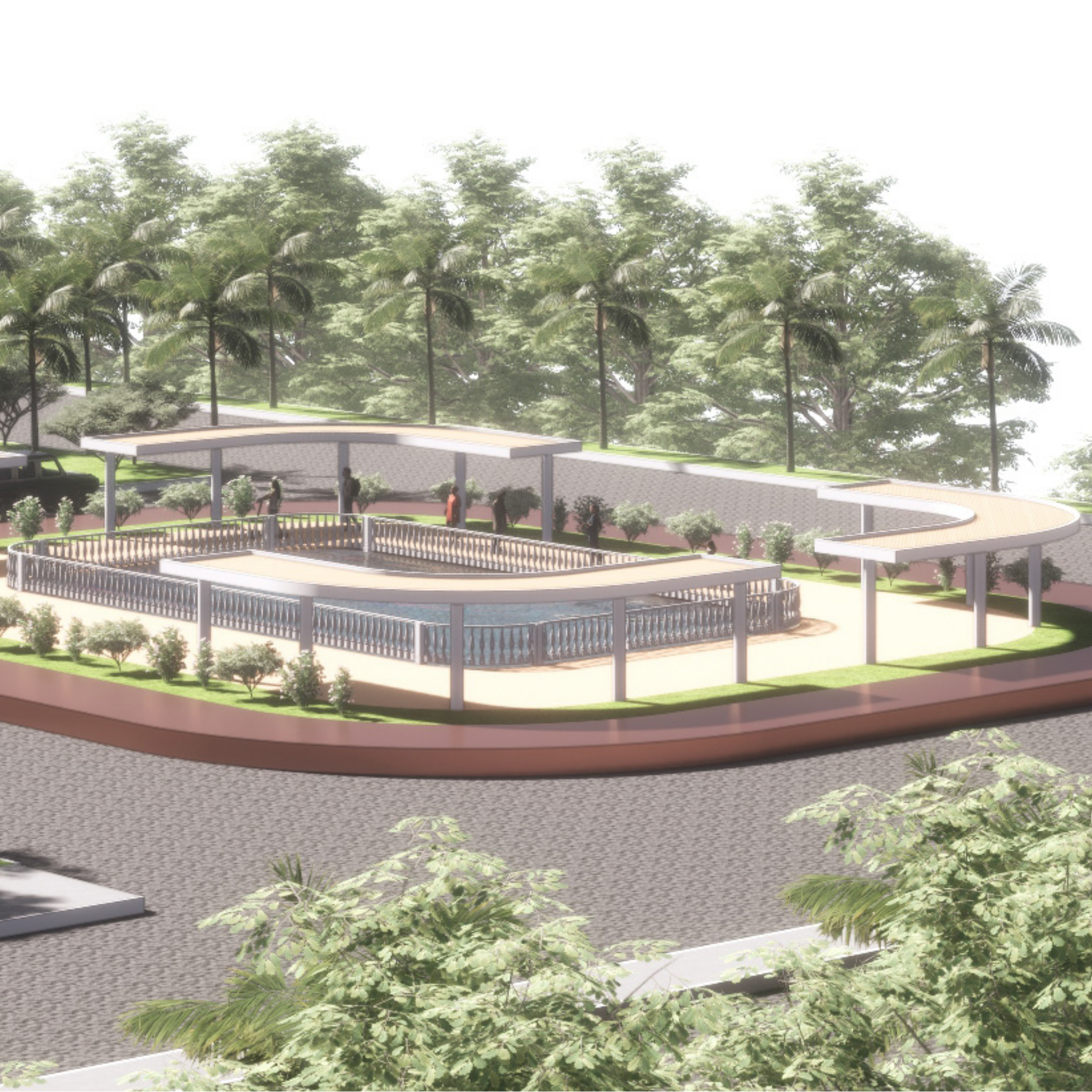
Rp46.000.000 + Rp25.000.000 + Rp10.000.000 + Rp5.000.000 = **Rp86.000.000**
Rp86.000.000 × 12 = Rp1.032.000.000

Rp4.312.083.090 – Rp1.032.000.000 = **Rp3.280.083.090**

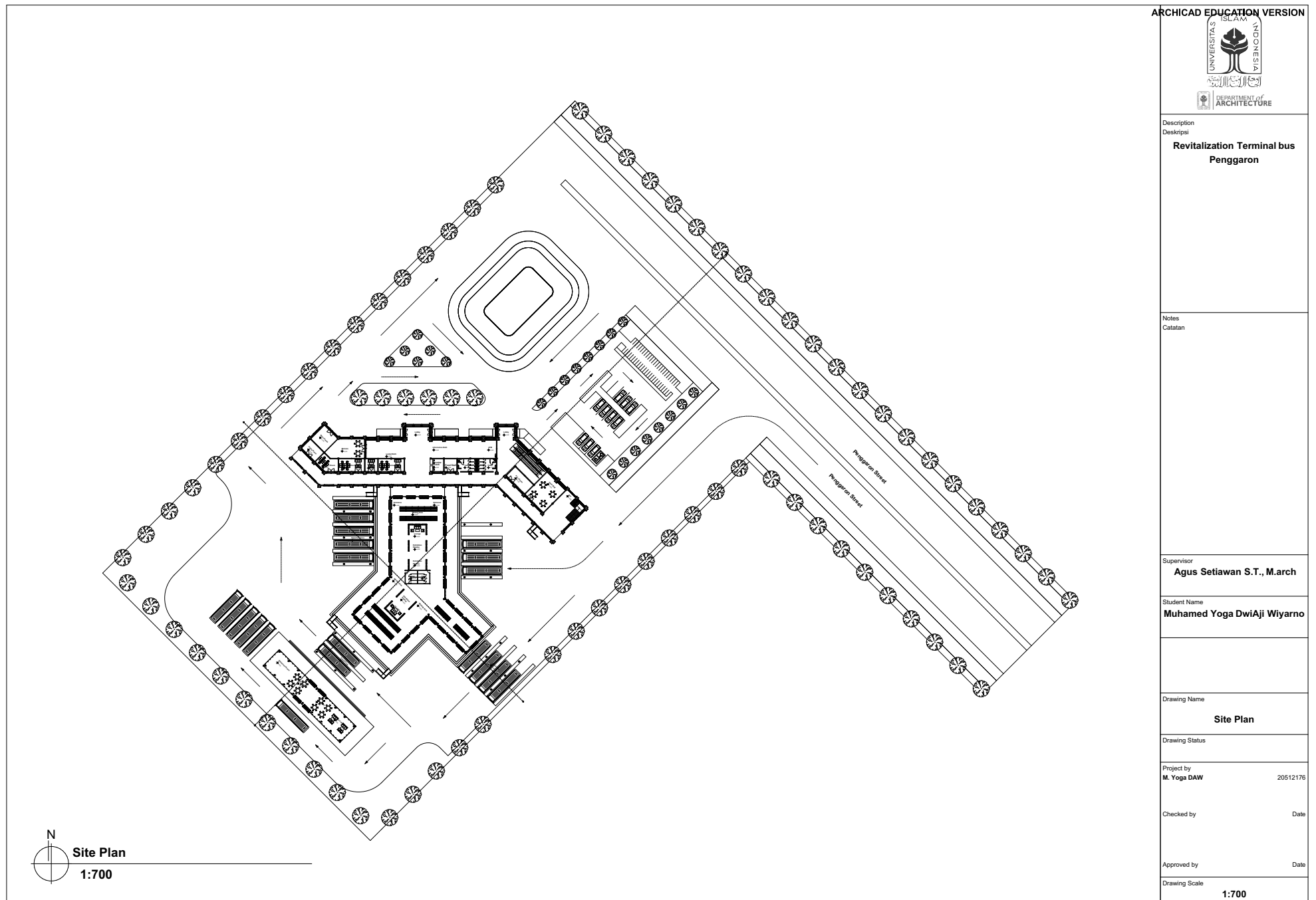
Payback Period

$$\frac{\text{Rp24.525.584.240}}{\text{Rp3.280.083.090}} = 7,5 \text{ Year}$$

05 *Design Evaluation*



Site Plan Zone



Providing

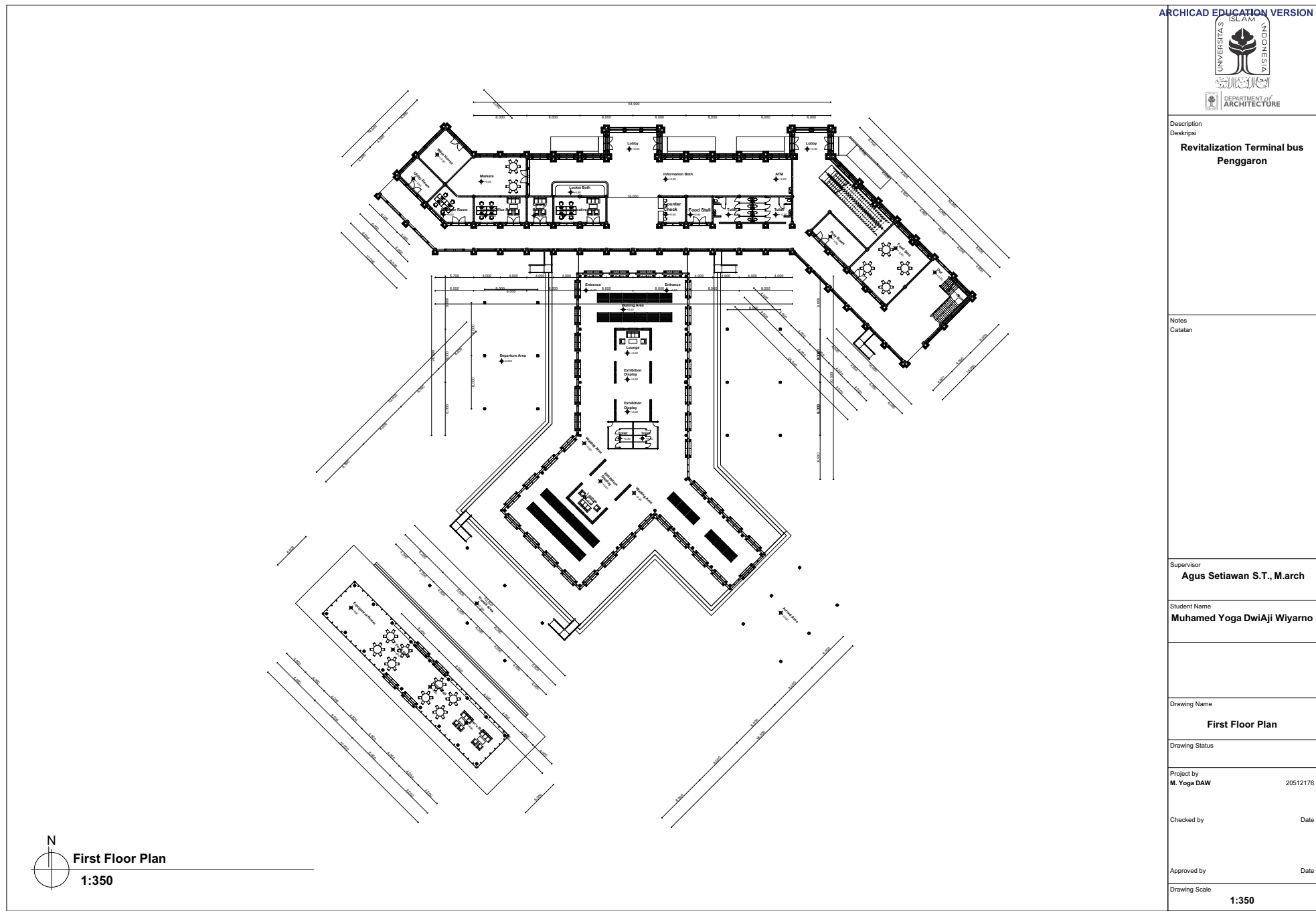
4 Peron for Arrival

2 Peron for Transit Feeder Transportation

5 peron for Departure

Area 5 Bus Parking Area

First Floor Plan Revision



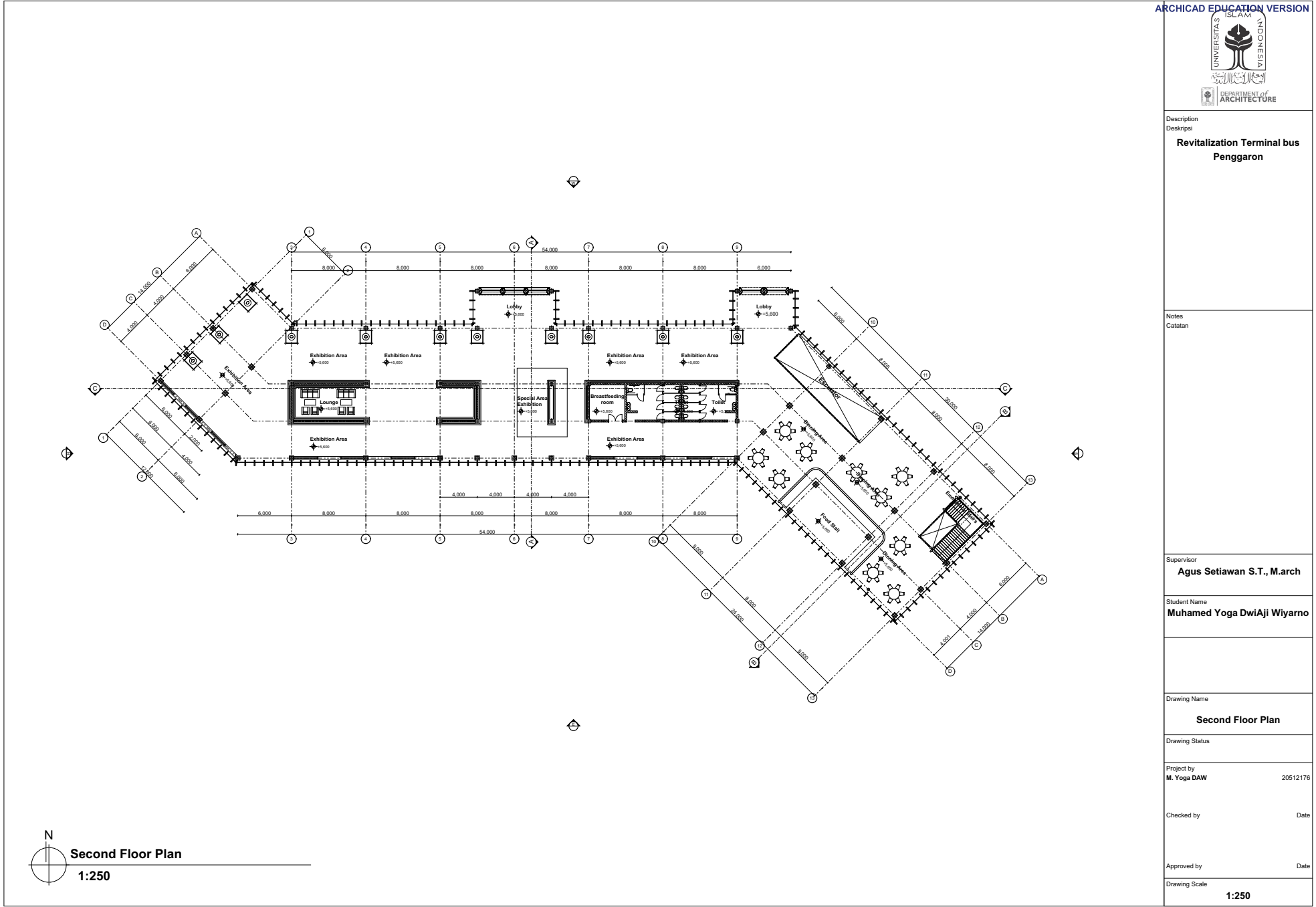
Providing

Ramp for Dissabilities more efficien with length 7,2 m

Lavatory for Dissabilities

Lavatory on Waiting Area

Front First Floor Plan Revision

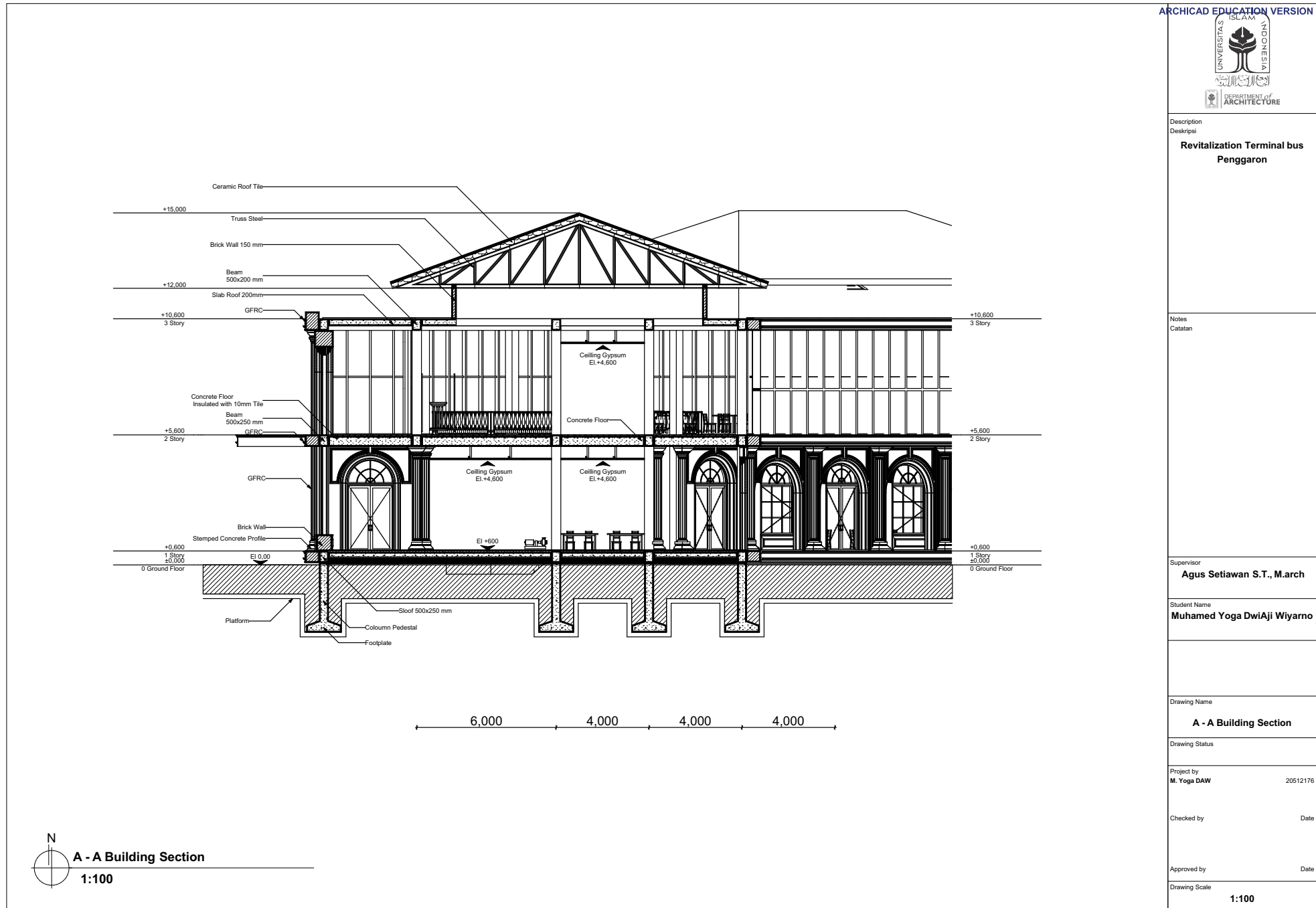


Providing

Lavatory for Dissabilities

Lactation Room

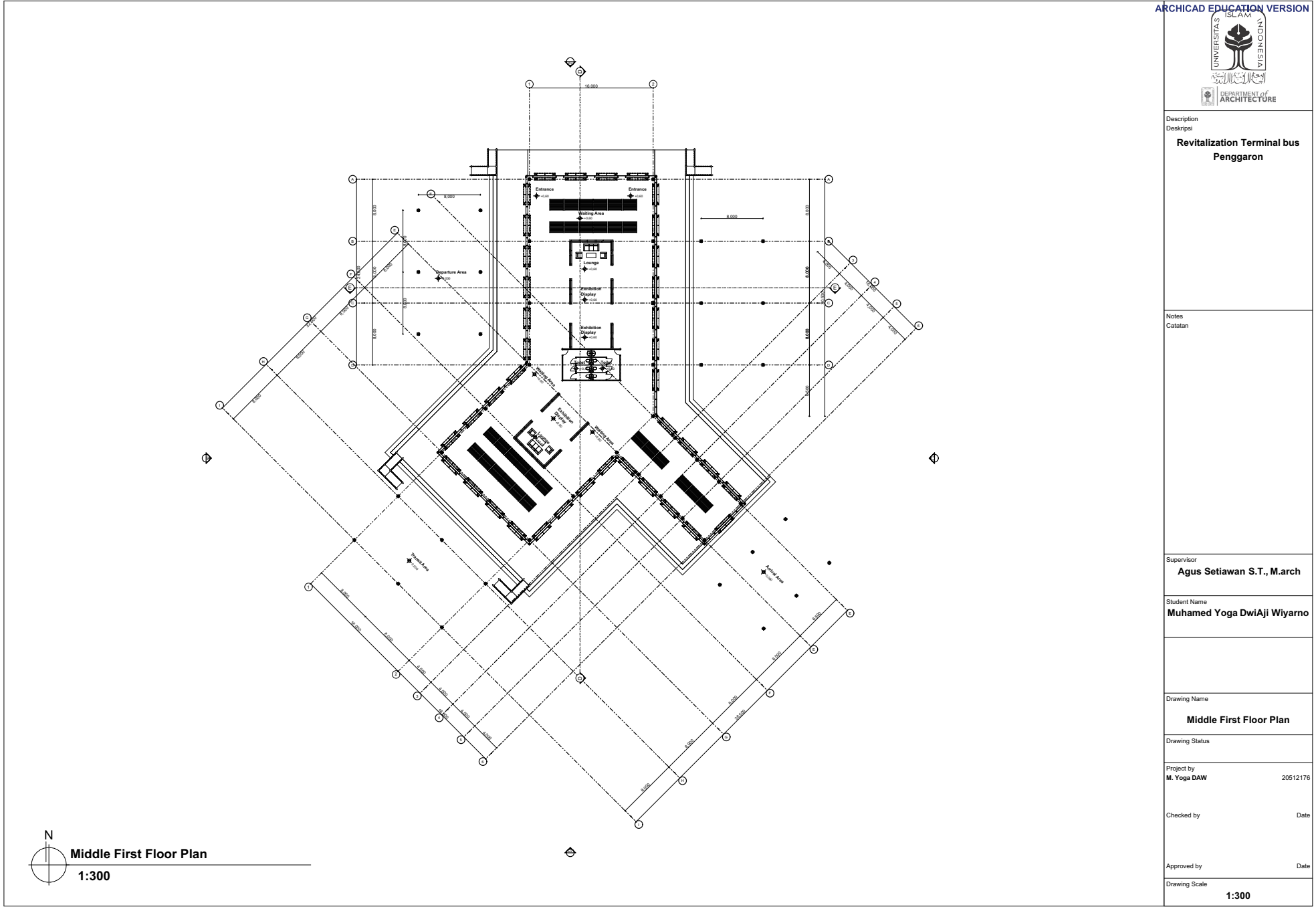
Section A-A Revision



The use of Steel Convetional For truss material

Remove the beam under the roof

Middle First Floor Plan Revision



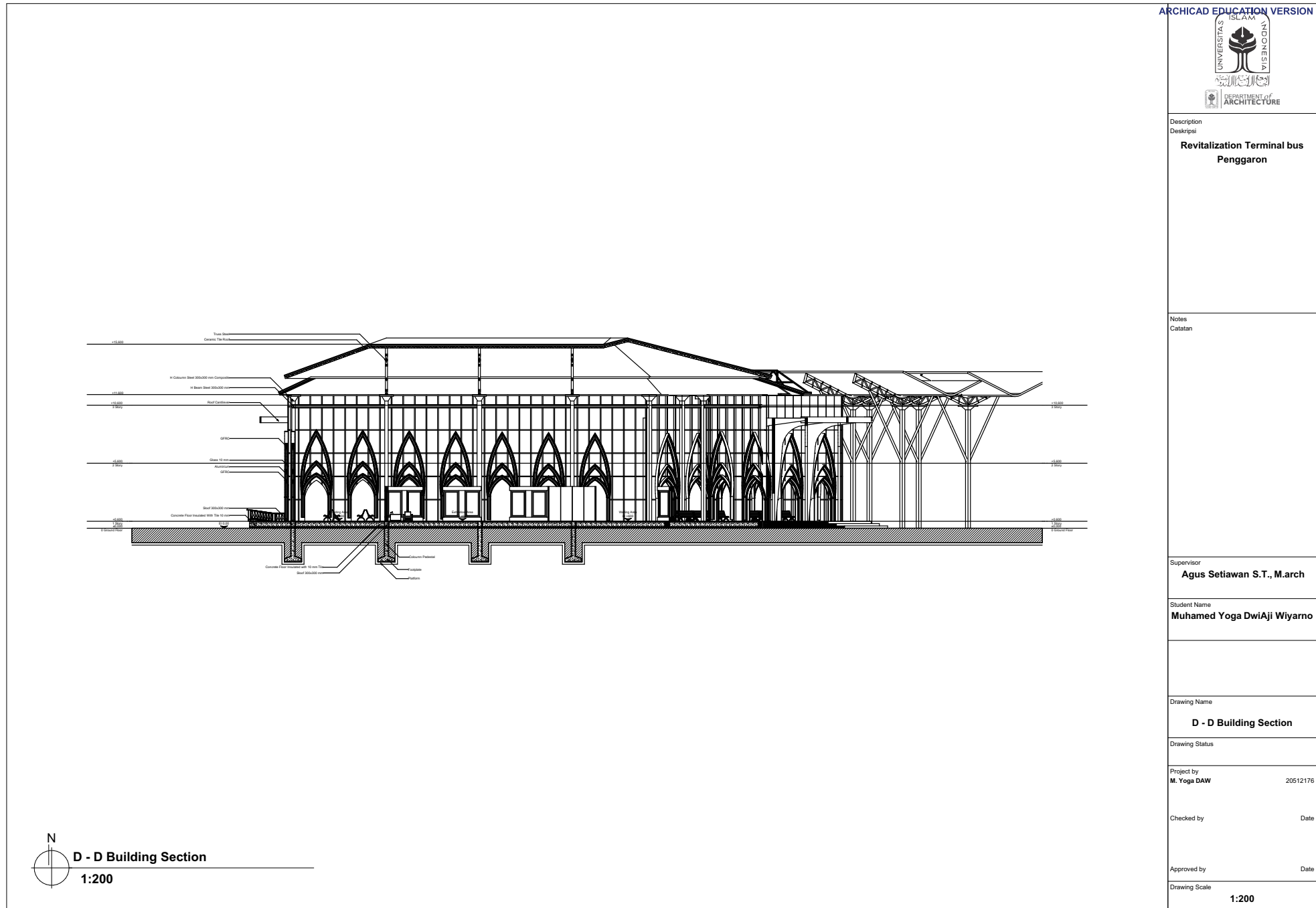
The Changess of layout Waiting area

Bench capacity is 50% of the total passengers 240

Providing Lavatory on Waiting Area

Give more Space for Exhibition Area

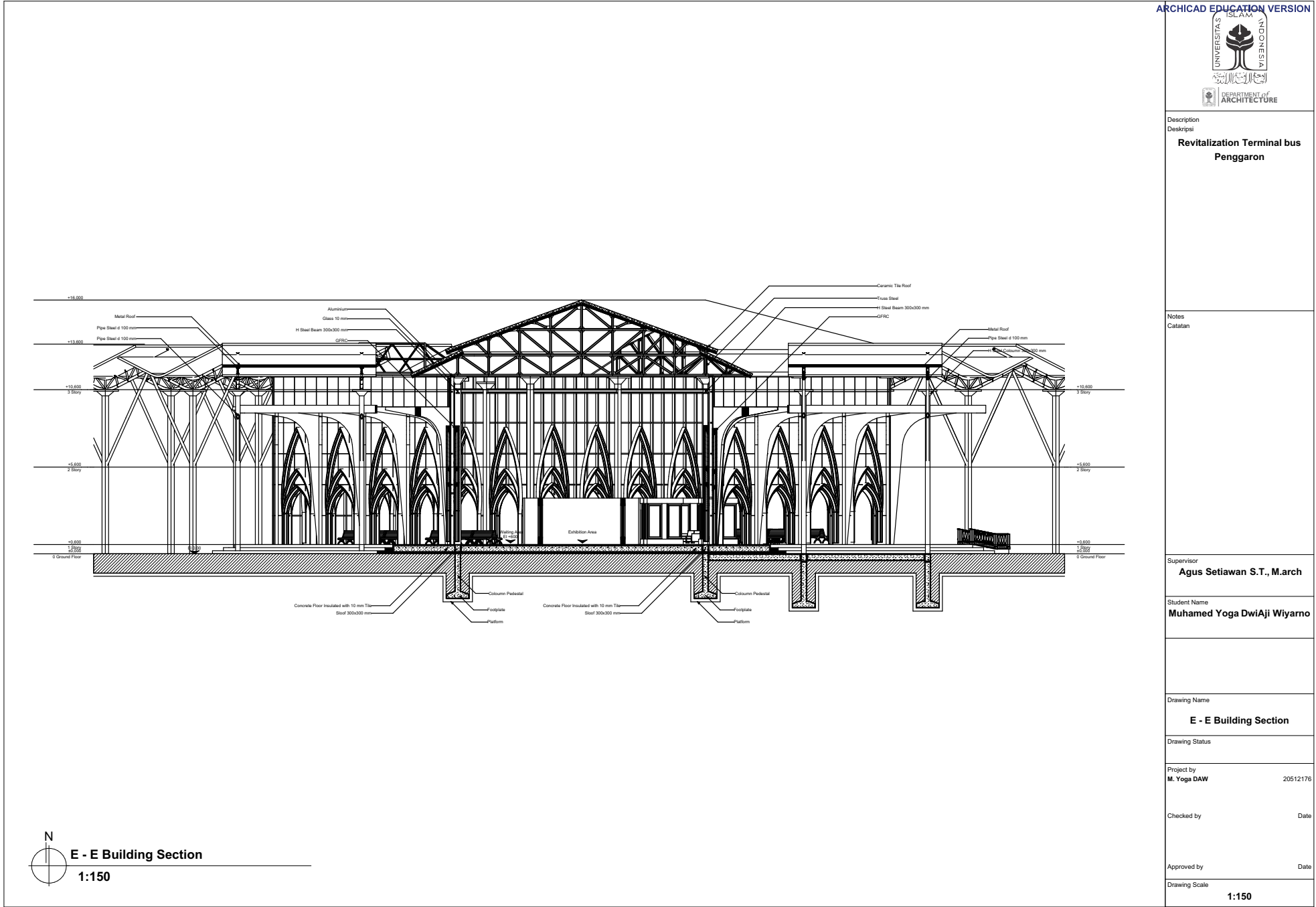
Section D-D Revision



The use of Steel Convetional For truss material

Providing Roof on Deletation Area

Section E-E Revision



The use of Steel Convetional For truss material

Providing Roof on Deletation Area

Pedestrian Walkway

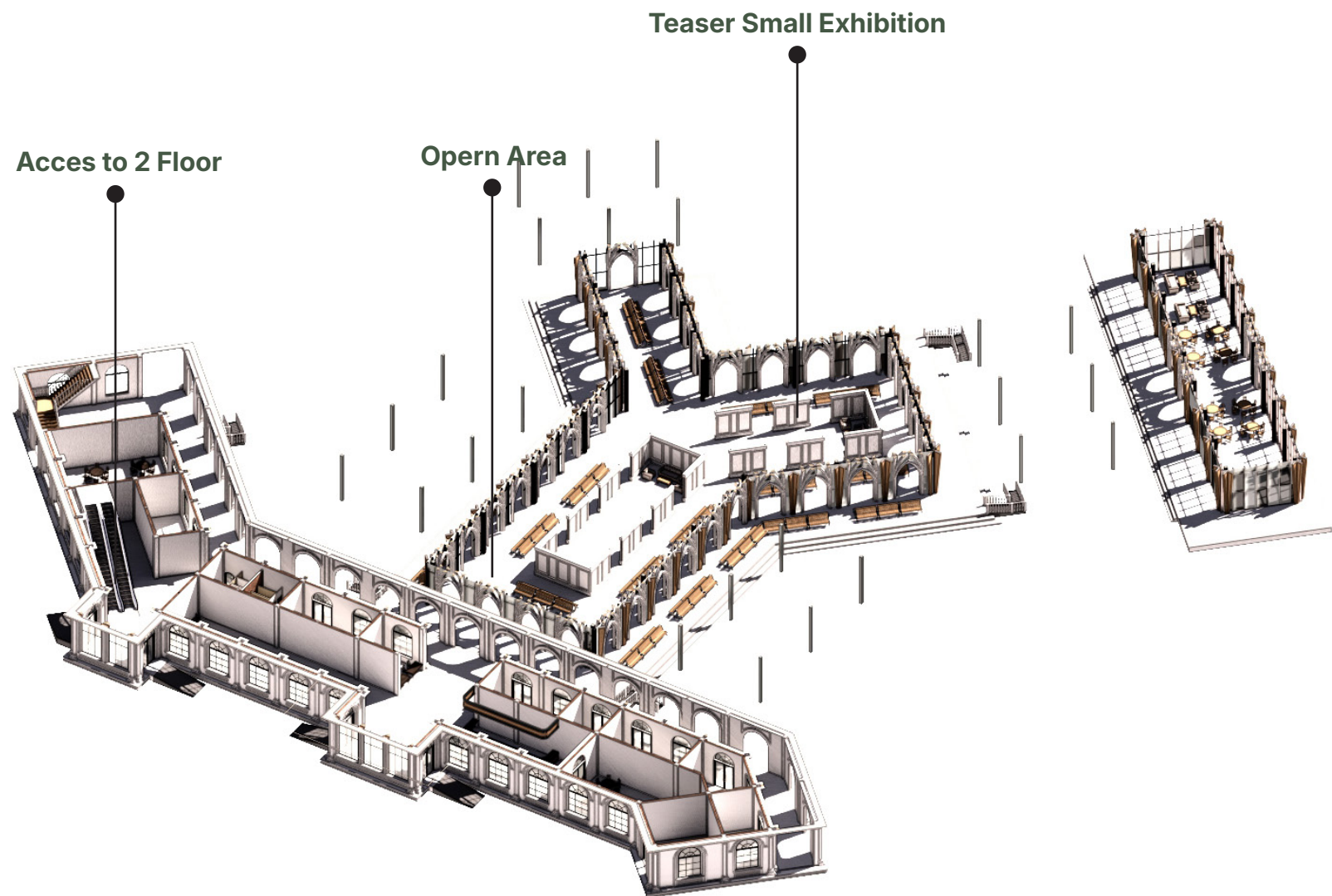


The design of the 300-metre pedestrian walkway to Penggaron Terminal prioritises comfort and aesthetics with elements of shading, lighting and vegetation. Shaded areas use simple canopies to protect from heat and rain, and pergolas with vines such as bougainvillea. Night lighting uses street lamps with warm light and floor lamps along the path to create a safe and cosy atmosphere. Vegetation consists of shade trees such as palms and ketapang kencana, complemented by mini gardens and potted plants at several points. Pedestrian paths use natural stone or paving blocks with simple geometric patterns, accompanied by a good drainage system. Seating in vegetated areas and outdoor art installations add visual interest, while informative signage facilitates navigation.

Landscaping Area



This pond garden design will be the main attraction for pedestrians entering and exiting Penggaron Terminal. The pond is surrounded by a pedestrian path with shading areas in the form of simple canopies or large trees that provide natural shade. Vegetation around the pond uses tropical ornamental plants, such as lotus in the pond and shade plants such as palms or ketapang kencana around it. Night lighting uses minimalist garden lights with warm-coloured LEDs that reflect on the water surface, creating a calm and aesthetically pleasing atmosphere. Natural stone or paving block pathways surround the pond, with seating in shaded areas for visitors to rest while enjoying the view. This design combines elements of water, green and light to create an attractive and cosy atmosphere.

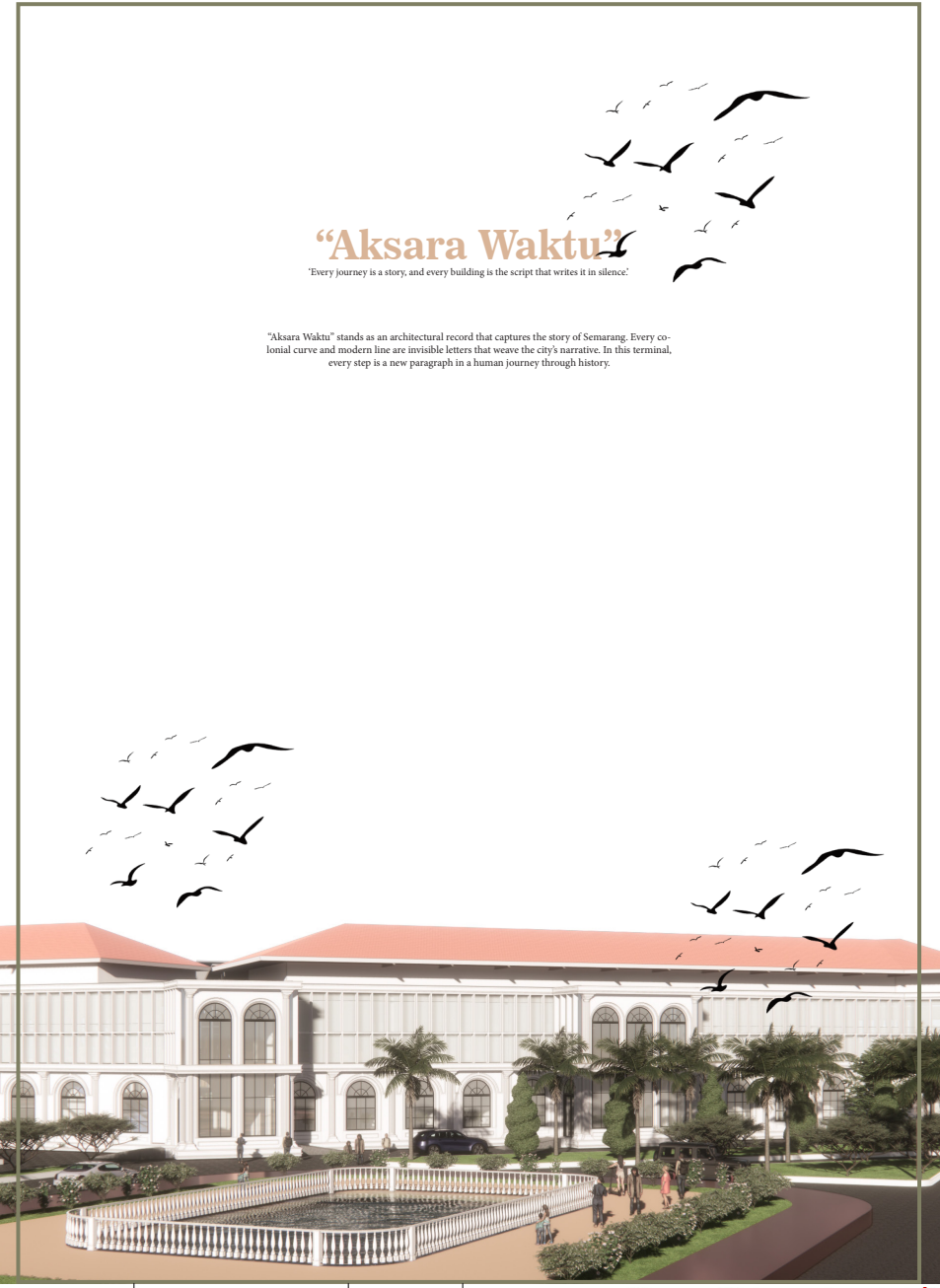
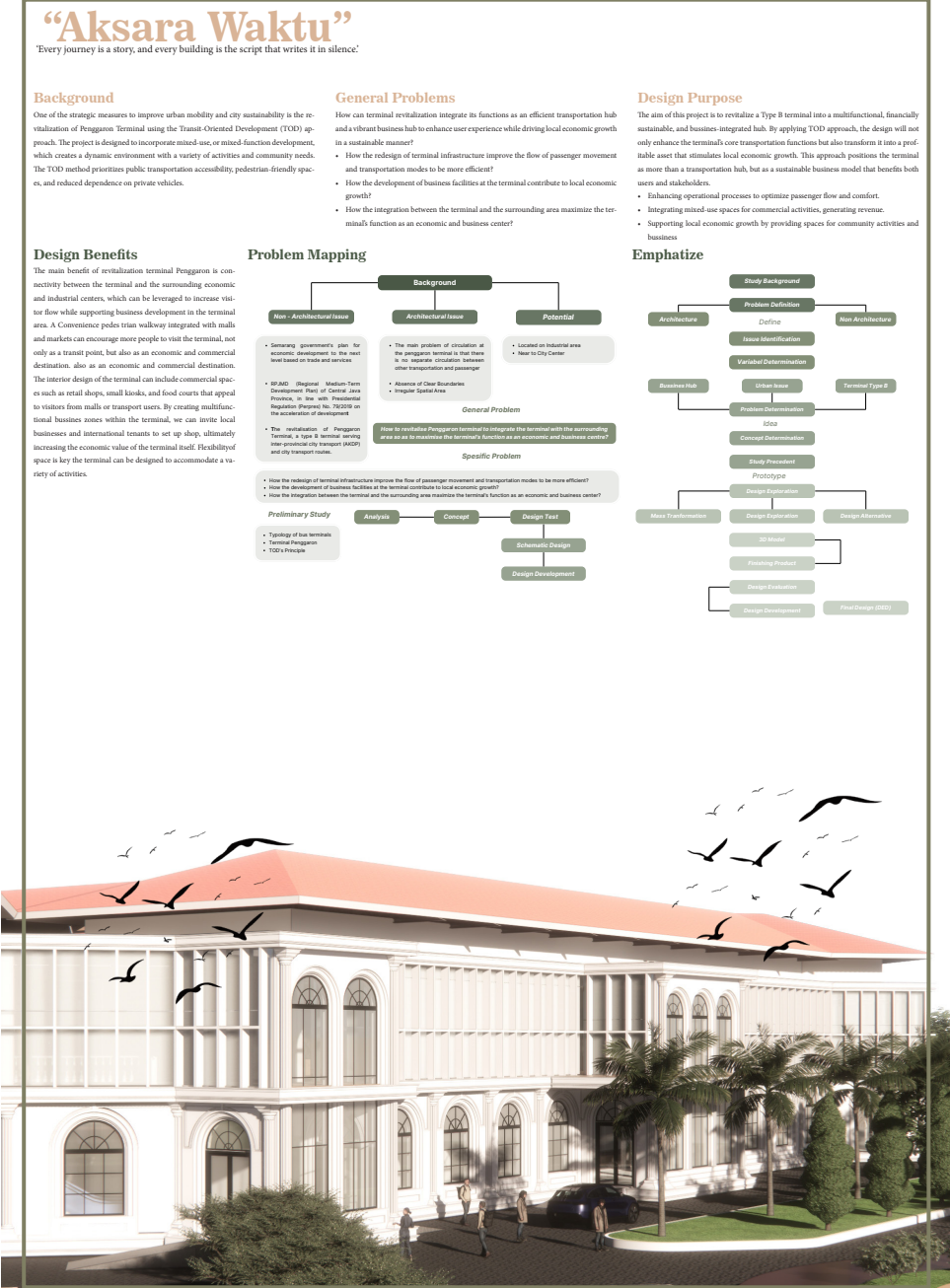


The design of the terminal embraces a multifunctional concept by combining transport areas and art exhibition spaces. On the first floor, the passenger waiting area is integrated with a small exhibition area designed as an introduction or teaser for the main exhibition on the second floor. The area uses minimalist displays with focal lighting to highlight the artworks, without distracting passengers. Materials such as clear glass and light wood panels are used to demarcate the area without creating a sense of enclosure, so that it still feels open and connected to the waiting area. Information about the exhibition on the second floor is conveyed through digital signage and interactive art installations, drawing passengers' attention to explore further. The design creates a dynamic terminal atmosphere, combining transport functions with cultural experiences.

06 *Attachment*



Architecture Presentation Board



Architecture Presentation Board

Site Plan Development

Location

Jl. Brigjen Sudarto, Kelurahan Pedurungan Kidul, Kota Semarang

Area

29.850 m²

Status

Program terminal is an asset owned by the Central Java Provincial Government.

Source : Sholahudin

Design Transformation

Conceptual Circulation for Terminal

Schematic First Floor Plan

Schematic Second Floor Plan

First Floor Plan

1. Entrance
2. Entrance Exhibition
3. Out
4. Locket Area
5. Information Area
6. Restroom
7. Small Food stall
8. Security Post
9. Administrative Office
10. Security Room
11. Manager's Room
12. Manager's room
13. Utility Room
14. Warehouse
15. Big Tenant
16. Priv Room
17. Small Food Stall
18. Escalator
19. Stairs
20. Entrance Waiting Area
21. Display Area Exhibition
22. Display Area II
23. Waiting Area
24. Departure Trans Semarang
25. Departure AKAP/AKDP
26. Arrival
27. Transit Area
28. Driver's Room

Second Floor Plan

1. Main Lobby
2. Lobby entrance
3. Escalator
4. Stairs
5. Dining Area
6. Big Tenant
7. Restroom
8. Lactation room
9. Special Exhibition Area I
10. Special Exhibition II
11. Lounge
12. Exhibition

Building III plan

1. Main Entrance
2. Waiting Area
3. Display Exhibition I
4. Display Exhibition II
5. Waiting Area Arrival
6. Outdoor Waiting Area
7. Departure AKAP/AKDP
8. Departure Trans Semarang
9. Arrival
10. Transit Area
11. Ramp

Name: Mohamed Syiqi Dwi Adi Wijayanto

NIM: 20121278

Project Title
Revitalization Program Bus Station: Leveraging Strategic Planning to Transform the Area into a Thriving Business Hub

Lecture
Agus Setiawan, S. T., M. arch., IAI, IDP

Lecturer Examiner
Dr. Ing Puji Aya Pratiwi, A., ST., M.A. Hub
Ika Nidha, S., M. Eng

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CAMERA ACCORD

WITNESS

The architectural drawings for the 'Revitalization of the Old Building' project are presented in a grid layout. The top row features the North, West, and East elevations of the building, which has a long, symmetrical facade with a central gabled section and multiple arched windows. The second row shows the South elevation and a B-B building section. The third row includes a detailed A-A building section and a schematic building envelope diagram. The fourth row contains detail facade drawings for different window types. The fifth row shows another detail facade drawing. The bottom row consists of six interior renderings, including a large hall with a high vaulted ceiling, a staircase, and various rooms with large windows and arched doorways. The drawings are labeled with 'North Elevation', 'West Elevation', 'East Elevation', 'South Elevation', 'B-B Building Section', 'A-A Building Section', 'Schematic Building Envelope', 'Detail Facade', and 'Interior Renderings'.

North Elevation

West Elevation

East Elevation

South Elevation

B-B Building Section

A-A Building Section

Schematic Building Envelope

Detail Facade

Detail Facade

Interior Renderings

Project Title
Revitalization of the Old Building - Integrating Strategic Planning to

Lecture
Arts Settlements, S. E. 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785,

3D Model Scale 1:100



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Nama : Muhamed Yoga DwiAji Wiyarno
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Pembimbing : Agus Setiawan., S.T., M.Arch
Fakultas / Prodi : Teknik Sipil dan Perencanaan/ Arsitektur
Judul Karya Ilmiah : Revitalization Penggaron Bus Station: Leveraging Strategic Plan- ning to Transforming the Area into a Thriving Business Hub.

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Wassalamualaikum Wr. Wb.

Yogyakarta, 1/31/2025

Direktur



Muhammad Jamil, SIP.

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