sawala rasa



A Design of

Difable Training and Community Center

for Circular Economy in Sumur Bandung, Bandung City with Inclusive Architectural Approach

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I declare the work that contained in this Final Architectural Design Studio Project report is my work, not an existing work of someone else. For any material that has not originated by me, I certify the sources have been properly and fully acknowledged in the text

I sincerely declare that this statement is true and submit it to the Department of Architecture at the Islamic University of Indonesia to be used for educational and publication purposes.

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Yogyakarta, 20th of August 2025



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Desain Pusat Pelatihan dan Komunitas Difabel untuk Ekonomi Sirkular di Sumur Bandung, Kota Bandung dengan Pendekatan Arsitektur Inklusif

A Design of Difable Training and Community Center for Circular Economy in Sumur Bandung, Bandung City with Inclusive Architectural Approach

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foreword **page.**

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project **title.**

A Design of Difable Training and Community Center
for Circular Economy in Sumur Bandung, Bandung City
with Inclusive Architectural Approach

Difable Training & Community Center

Difable Training & Community Center is an inclusive, adaptive space that empowers individuals with disabilities through skill-building, social interaction, and career development. It supports various impairments—visual, hearing, speech, and physical—by integrating universal and multi-sensory design principles to ensure safety, comfort, and independence while fostering community connection and personal growth.

Circular Economy

The center functions as a community-based hub for sustainable waste management by offering upcycling workshops and training programs tailored to difabled individuals. By tapping into circular economy potentials, it promotes environmental responsibility, economic opportunities, and inclusive participation in addressing Bandung's urban waste challenges through hands-on education and practical initiatives.

Inclusive Architectural Approach

The architectural approach emphasizes accessibility through sensory-rich environments that cater to diverse needs. It integrates tactile, auditory, and visual cues into barrier-free layouts, enhancing user experience while promoting equity. Multi-sensory design fosters inclusive spatial engagement, enabling difabled individuals to navigate, interact, and participate independently and meaningfully in all center activities.

Sumur Bandung

Located in the dense urban fabric of Sumur Bandung, the project responds to the area's limited inclusive public spaces by reimagining a community center that reflects local identity and needs. The design incorporates Sundanese spatial values and ethics, creating a socially rooted, culturally respectful space that strengthens both urban resilience and community empowerment.

judul **proyek.**

Desain Pusat Pelatihan dan Komunitas Difabel
untuk Ekonomi Sirkular di Sumur Bandung,
Kota Bandung dengan Pendekatan Arsitektur Inklusif

Pusat Pelatihan dan Komunitas Difabel

Pusat Pelatihan & Komunitas Difabel adalah ruang inklusif dan adaptif yang memberdayakan individu dengan disabilitas melalui pengembangan keterampilan, interaksi sosial, dan pengembangan karier. Tempat ini mendukung berbagai keterbatasan - penglihatan, pendengaran, bicara, dan fisik - dengan mengintegrasikan prinsip-prinsip desain universal dan multi-indera untuk memastikan keamanan, kenyamanan, dan kemandirian sambil mendorong hubungan komunitas dan pertumbuhan pribadi.

Ekonomi Sirkular

Pusat ini berfungsi sebagai pusat berbasis komunitas untuk pengelolaan sampah yang berkelanjutan dengan menawarkan lokakarya daur ulang dan program pelatihan yang disesuaikan untuk individu dengan disabilitas. Dengan memanfaatkan potensi ekonomi sirkular, pusat ini mempromosikan tanggung jawab lingkungan, peluang ekonomi, dan partisipasi inklusif dalam mengatasi tantangan sampah perkotaan Bandung melalui pendidikan langsung dan inisiatif praktis.

Pendekatan Arsitektur Inklusif

Pendekatan arsitekturnya menekankan aksesibilitas melalui lingkungan yang kaya sensorik yang memenuhi beragam kebutuhan. Pendekatan ini mengintegrasikan sentuhan, pendengaran, dan isyarat visual ke dalam tata letak yang bebas hambatan, sehingga meningkatkan pengalaman pengguna sekaligus mempromosikan kesetaraan. Desain multi-indera mendorong keterlibatan spasial yang inklusif, memungkinkan individu penyandang disabilitas untuk menavigasi, berinteraksi, dan berpartisipasi secara mandiri dan bermakna dalam semua aktivitas pusat.

Sumur Bandung

Berlokasi di kawasan perkotaan Sumur Bandung yang padat, proyek ini menjawab keterbatasan ruang publik inklusif di daerah tersebut dengan menata ulang pusat komunitas yang mencerminkan identitas dan kebutuhan lokal. Desainnya menggabungkan nilai-nilai dan etika tata ruang Sunda, menciptakan ruang yang berakar secara sosial dan menghormati budaya yang memperkuat ketahanan kota dan pemberdayaan masyarakat.

abstract.

Bandung is a city that continues to strive for inclusivity, especially for people with disabilities. The empowerment of difabled individuals in Bandung still faces challenges, particularly in access to inclusive public spaces and skill-building opportunities. One strategy to address this is through the development of a training and community center that supports their potential, especially in the field of circular economy. With a center that applies an inclusive multi-sensory architectural approach, it is hoped this facility can create a safe, accessible, and empowering environment connected to the local context.

Keywords: Difable Empowerment, Training Center, Inclusive Architecture, Multi-Sensory Design, Circular Economy.

abstrak.

Bandung merupakan kota yang terus berupaya untuk mewujudkan inklusivitas, terutama bagi penyandang disabilitas. Pemberdayaan penyandang disabilitas di Bandung masih menghadapi tantangan, terutama dalam hal akses terhadap ruang publik yang inklusif dan kesempatan untuk mengembangkan keterampilan. Salah satu strategi untuk mengatasi hal ini adalah melalui pengembangan pusat pelatihan dan komunitas yang mendukung potensi mereka, terutama di bidang ekonomi sirkular. Dengan pusat pelatihan yang menerapkan pendekatan arsitektur multisensori yang inklusif, diharapkan fasilitas ini dapat menciptakan lingkungan yang aman, mudah diakses, dan memberdayakan yang terhubung dengan konteks lokal.

Kata Kunci: Pemberdayaan Difabel, Pusat Pelatihan, Arsitektur Inklusif, Desain Multi-Sensorik, Ekonomi Sirkular.

design premise.

Bandung is a city committed to becoming more inclusive, particularly for people with disabilities. However, inequality in access to public facilities and limited career opportunities for difabled individuals remain significant challenges. Meanwhile, the circular economy—especially in waste management—offers untapped potential. The Indonesian government continues to encourage inclusive development and environmental sustainability. A Difable Training and Community Center functions as a facility to empower individuals with disabilities through skill-building, especially in circular economy, while promoting social integration. Through inclusive architecture, this center accommodates various needs and abilities, ensuring accessibility, comfort, and independence. The integration of Sundanese cultural values further strengthens a sense of belonging, reflecting the social richness of Bandung. With this approach, the design not only addresses inclusivity and sustainability but also supports Bandung's vision as a disable-friendly and culturally-rooted city.

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introduction.

01.

design problem **study.**

Status Quo of **Disabilities in Indonesia**



Lack of Inclusivity and Services for people with disabilities

The lack of inclusivity for people with disabilities remains a pressing issue in many societies. Public facilities, workplaces, and educational institutions are not designed to accommodate their needs, limiting their access to essential services and opportunities. This inaccessibility leads to significant inequality, preventing individuals with disabilities from fully participating in social and economic activities.

According to the **Central Statistics Agency (BPS)**, there were **22.5 million people** with disabilities in Indonesia in 2020, while the **National Socioeconomic Survey (Susenas)** in the same year recorded **28.05 million.** Despite this large population, access to adequate facilities remains insufficient, with many public spaces, transportation systems, and infrastructures failing to meet accessibility standards, thereby restricting their rights and independence.

So far, there are already regulations governing the rights of people with disabilities, but the actual implementation is lacking.



No Regulatory Compliance Despite its Existence

In Indonesia, regulations regarding disability-friendly facilities for inclusive cities are outlined in **Law No. 8 of 2016 on Persons with Disabilities.** This law defines four **key indicators of an inclusive city: participation, availability of services for disability rights, efforts to fulfill these rights, and the inclusive attitudes and culture of the city's residents.** An inclusive city is required to provide services, facilities, programs, and infrastructure that ensure the rights of people with disabilities are upheld. Under this law, there are 22 fundamental rights of persons with disabilities that must be fulfilled, ranging from accessibility and education to employment and healthcare.

However, despite the existence of these regulations, their implementation remains insufficient. Many cities still lack adequate infrastructure and inclusive policies to support individuals with disabilities. In practice, accessibility to buildings, public facilities, services, and programs remains a significant challenge, preventing people with disabilities from fully participating in daily life. The gap between regulations and real-world execution highlights the urgent need for stronger enforcement and greater commitment from both the government and society to create truly inclusive urban environments.

Bandung City's Projection
to be A Disable-Friendly City

Bandung City's Projection to be A Disable-Friendly City can be seen from various regulations that have been stipulated in local regulations:

- Regional Regulation number 2 of 2018 concerning the management and organization of education: Persons with disabilities have the right to receive compulsory education for nine years
- Regional regulation number 1 of 2020: The right to disability-friendly health services and health insurance
- Regional regulation number 14 of 2018: Facilities and infrastructure of buildings and places of worship that must be disability and elderly friendly
- Regional regulation number 4 of 2018: Employers are obliged to hire at least 1 percent of friends with disabilities from workers or laborers employed in the company
- Regional regulation number 15 of 2015: The implementation of social welfare for persons with disabilities which includes social rehabilitation, social security, social protection, and social empowerment.

Ridwan Kamil, the mayor of Bandung from 2013 to 2018, has proclaimed Bandung as a City of Inclusion. This commitment was planned to be supported by the issuance of a mayoral regulation (perwal) on disability. However, until now the regulation has not been issued.

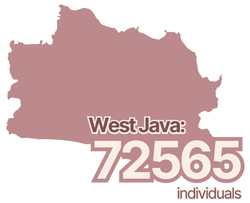
"Pemkot Bandung ingin mencapai bersama tujuan pembangunan berkelanjutan dengan memberikan dorongan untuk melibatkan secara aktif dan kolaboratif penyandang disabilitas dalam prosesnya,"

Head of the Bandung City Social Service (Dinsos),
Sony Bakhtiyar.



Bandung City's
Significant Numbers of People with Disabilities

Based on data from the **Population Administration Information System (SIAK)** as of December 2022, the number of people with most disabilities in





This significant population highlights the **urgent need** for inclusive infrastructure and **services** to support their daily activities and **ensure equal opportunities**. However, despite this large number, **accessibility issues** remain a major concern in several areas, limiting mobility and participation in public life.

According to the data from **Number of People with Disabilities per Sub-district in Bandung City (2021)**, of the 30 sub-districts in Bandung City, the 4 sub-districts with the most significant numbers are:

- Sumur Bandung with the total of 162 people
- Babakan Ciparay with the total of 353 people
- Batununggal with the total of 332 people
- Coblong with the total of 341 people

Wilayah Kecamatan	Jumlah Penyandang Disabilitas per Kecamatan di Kota Bandung (Jiwa)									
	Tunanetra (Buta)	Tunarungu (Tuli)	Tunawicara (Bisu)	Tunarungu-Wicara (Bisu Tuli)	Tunadaksa (Cacat Tubuh Fisik)	Tunagrahita (Keterbelakangan Mental)	Tunalaras (Eks Sakit Jiwa)	Cacat Eks Sakit Kusta	Cacat Ganda (Cacat Fisik-Mental)	Orang yang Dipasung
	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021
Kota Bandung	481	442	416	272	1.270	1.129	361	2	218	3
Sumur Bandung	14	10	3	3	55	42	34	-	1	-
Babakan Ciparay	65	32	43	2	86	96	17	-	12	-
Batununggal	30	10	27	10	86	99	58	-	12	-
Coblong	18	30	27	12	88	105	36	-	25	-

Table 1.1
Number of Disabilities per Sub-district
Source: Pemutakhir Data Potensi Kelurahan, 2021

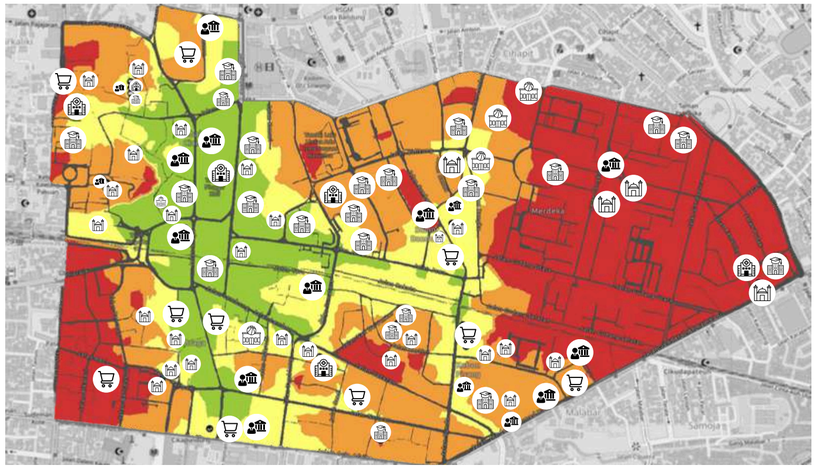


Figure 1.1
Map of Fulfillment of Accessibility Rights of Persons with Disabilities
Source: Dilans Indonesia, 2024
https://dilansindonesia.org/disability-story-map/

Legend:

- *Not Fulfilled*
- *Less Fulfilled*
- *Fulfilled*
- *Well Fulfilled*

Government Institution
Merdeka Administrative Office, West Java Language Center

Educational Institution
SD Patra Komala, SMK Kartika, SMK Kartika, SD Soka, etc.

Sport & Recreational Facility
Siliwangi Tennis Gymnasium, Siliwangi Stadion, Siliwangi Golf

Worship Facilities
Baiturrahman Mosque, Salib Suci Church, Hayya Alal Falah Mosque, etc.

Health Facilities
Pratama Kamuning Clinic, RSU Bungsu, Netra Eye Specialist Clinic, etc.

Market Facilities
Indomaret, Circle K, Kosambi Market, Yogya Sunda, etc.

Bandung City's
Lack of Inclusive Facilities

The disability story map on one of subdistrict in Bandung city made by DILANS Indonesia shows that there are still so many regions which is not accessible for people with disabilities, both in terms of infrastructure or rights fulfillment from public facilities.

This is particularly concerning given that open data from Bandung indicates a high concentration of people with disabilities in Bandung City. The disparity between the number of people with disabilities and the availability of accessible infrastructure highlights the pressing need for improvements in urban planning and public services to create a more inclusive environment.



Figure 1.2
News about Difables' Potentials
Source: detikJabar, Bandung Bergerak, 2023.

Difables'
High Interest in Skills of Arts & Crafts

Despite these limitations, interest in the arts among people with disabilities in Sumur District remains high. Various news reports and articles have highlighted their strong passion and talent for creative expression, demonstrating their ability to produce meaningful artistic works. However, the **lack of dedicated platforms and facilities for them to develop and showcase their skills remains a significant barrier.** Without proper support, many talented individuals struggle to gain recognition and opportunities in the arts.

Bandung City's
Lack of Inclusive Career Opportunities

Limited career opportunities for people with disabilities remain a significant issue due to both infrastructural barriers and societal stigma. **Many companies hesitate to hire individuals with disabilities, often due to misconceptions about their capabilities rather than actual job requirements.** Additionally, inadequate accessibility in workplaces further restricts their chances of securing and maintaining employment. Beyond physical barriers, negative societal attitudes continue to be the biggest obstacle, as many still perceive people with disabilities as less competent, making it even harder for them to enter and thrive in the workforce.

> *What **untapped resources***
> possess the potential to enhance the *independence* of individuals with disabilities and effectively address their *interests and needs?*

The 25-hectare landfill is a waste hub for the surrounding cities and areas, including West Java's capital of Bandung, one of the country's most populous cities. The Bandung city administration has estimated that 80 percent of the 1,500 tonnes of waste generated daily by the city are transported to Sarimukti. The landfill in Cipatat, West Bandung regency receives around 3,000 cubic meters of trash each day from Bandung city, Cimahi city, West Bandung regency and Bandung regency.

West Java administration secretary, **Herman Suryatman**, said that "No one should run away from responsibility. We must all be responsible according to our respective duties, both at the provincial and regency and city levels,"

Landfill Overcapacity and **Waste Emergency**


ANN ASIA NEWS NETWORK BRINGING ASIA CLOSER

May 11, 2025

Menu

Indonesia's Bandung landfill on the verge of overcapacity

City administration has estimated that 80 percent of the 1,500 tonnes of waste generated daily by the city are transported to Sarimukti. At this rate, there will be no space left at the landfill by the end of the year, says an official.



Part of Bandung **Government's Plan**

The Department of Environment and Sanitation of the Bandung City is currently utilizing the **strategic plan of the Office of Sanitation and Landscaping for Bandung City for the period 2021 – 2026.** The plan which is orienting to 5 years forward consist of **2 programs**; **regional waste system development and management** and **waste management program.**

However, the planning and development efforts of the Bandung City Environment and Sanitation Service are still restricted to the implementation of programs that are essentially the same as those of the past, including the transportation of garbage from the community to TPA Sarimukti Bandung TPA. In an attempt to manage garbage in the City of Bandung, the Bandung City Environment and Sanitation Service has not, thus, demonstrated any innovation or development. ***(Kushendar et al., 2023)*** Thus, leaving room for improvements and innovations.

Nine zero-waste city models throughout Indonesia (**Bandung City**, Bandung Regency, Cimahi, Sumedang, Purwakarta, Karawang, Gresik, Denpasar and Gianyar) organized by **Alliance for Zero Waste Indonesia** (AZWI) cover a population of more than 478,000 people with an average of **40% waste segregation compliance rate, up to an 88% in the best cases, which is by far the highest in the country.** In total, these zero waste models have the potential to reduce organic waste sent to landfill by 6,500 tons per year. In a recent report, YPBB and GAIA found that a city-scale zero waste implementation in Bandung is four times more climate-effective than incineration.



Progressive **Zero Waste Program**

"What if **waste** was perceived as the **greatest untapped resource?"**

What kind of feasible **Waste Management Strategy** *can we offer?*

circular **economy.**

The circular economy is defined as an economic system aimed at eliminating waste and the continual use of resources by creating closed-loop processes that emphasize **3R Concept**; reducing, reusing, and recycling materials instead of following a traditional linear "take-make-dispose" model ***(Siregar et al., 2023;, Valverde & Avilés-Palacios, 2021).*** It aims to generate economic growth by maintaining the value of products, materials and resources in the economy for as long as possible, thereby minimizing social and environmental damage.

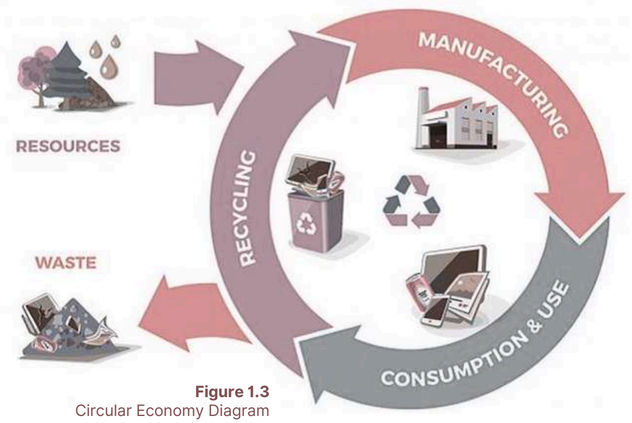


Figure 1.3
Circular Economy Diagram
Source: Siregar et al., 2023.

These five sectors—**wholesale and retail trade, textiles, construction, electronics and electrical equipment, and food and beverage**—are vital to Indonesia's economy. In the context of a circular economy training center, the focus is on upcycling inorganic waste from four sectors: retail, textiles, construction, and electronics. While the food and beverage sector primarily produces organic waste, the training center will prioritize inorganic materials, which are more durable and versatile for reuse—such as packaging, textiles, construction debris, and e-waste—supporting sustainable skill-building and product innovation for people with disabilities.

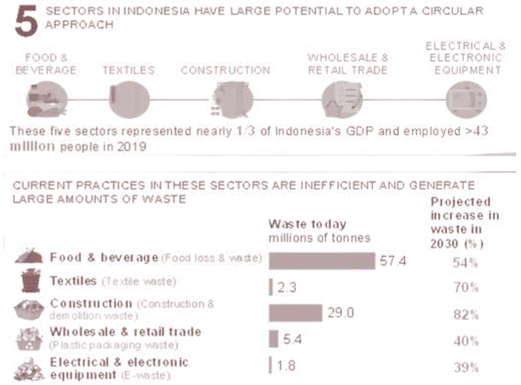


Figure 1.4
5 Potential Sectors for Circular Economy Diagram
Source: Siregar et al., 2023.

existing resources & **condition.**

Despite still not having focused on circular economy in general if compared to the other residential subdistricts in Bandung, Babakan Ciamis has several local resources for the circular economy which are potential to be developed and be the focused aspects for the locals empowerment, especially those with disabilities. A waste bank called Bakcis (Babakan Ciamis) is located near the site, involving only a 5 minutes transport time. The site is also surrounded by residences with inhabitants that are aware enough of zero waste and waste sorting. Therefore, this location is potential to look out for the circular economy potential.



Figure 1.5
Distance from the site to the BSB
Source: Google Earth, 2025.

Bank Sampah Bakcis
Jl. Babakan Ciamis, RT.02/RW.03, Babakan Ciamis, Kec. Sumur Bandung, Kota Bandung, Jawa Barat 40117

In addition, there is also a zero waste community based in Bandung, but not specifically in Babakan Ciamis. This community also runs a regular waste bank. The community is called "Bank Sampah Bersinar" or BSB.

workshop **products.**

Based on the five potential sectors for circular economy by using 3R concept and the existing progressive local communities with specific programs and activities related to circular economy field and zero waste management, the types of the specific workshop activities that can be conducted in the building are:

No	Sector	Product	Material	Community
1	Food & Beverage	Aromatic Candle Plant pots, decorative lights, and other decorations	Liquid waste of greywater & used cooking oil, PET beverage bottles for milk or soda	Jelantah4Change, Zero Waste Indonesia
2	Textile	Upcycled totebag, Accessories, Scented dry concrete	Fabric scraps, defective garments, offcuts	Setali Indonesia Guna Olah Limbah
3	Construction	Scented dry concrete	Concrete scraps, sawdust, recycled aggregate	Conture Concrete Lab
4	Wholesale & Retail Trade	Upcycled bricks, Bags or wallets	Fragments of ceramics, glass, metal, packaging materials (plastic, cardboard), unsold goods	Rebricks Zero Waste Indonesia
5	Electrical & Electronic Equipment	Decorations and accessories	Printed Circuit Board, plastic case, copper wires, aluminum heatsinks	EWasteRJ

Table 1.2
Workshop Products
Source: Author, 2025.

The workshop requires essential machines and tools to support upcycling activities, including an **electric stove and heat-resistant pan** for melting materials, **PET bottle cutters**, and **a small industrial oven**. For textile work, disability-friendly **sewing machines**, **overlock machines,** and **fabric pressing tools** are needed. Plastic packaging can be transformed using a **plastic press and heat press machine**, while ceramic or metal waste can be processed using **tile cutters and grinders**. These tools enable participants to safely and efficiently transform various types of inorganic waste into valuable products, fostering inclusive skill development within a circular economy framework.



Aromatic Candle
from used cooking oils

Decorated Pots
from PET bottles waste



Upcycled Totebags
from textile waste

Scented Dry Concrete
from textile waste-mixed aggregate



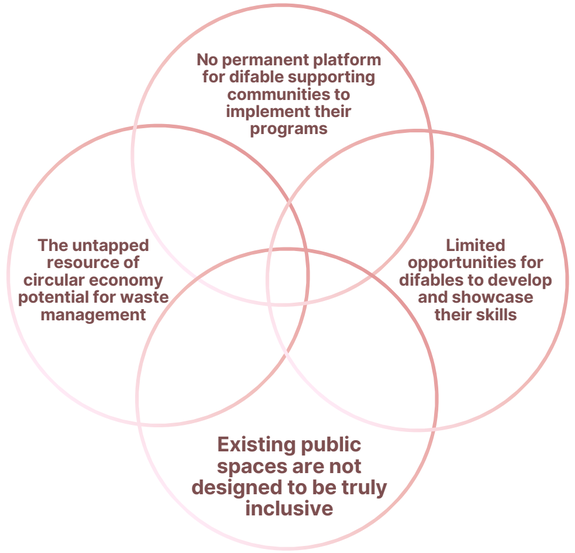
Upcycled Bricks
from fragments of materials

Upcycled Wallet
from fragments of materials



Decorations & Accessories
from electronic waste components

the missing **piece.**



Difable Training and Community Center, *providing an inclusive environment where they can access circular economy skill development programs, career opportunities, and a supportive community that fosters empowerment and independence*

Bandung currently lacks a **dedicated platform where communities supporting people with disabilities** can effectively implement their programs. **Existing public spaces are not designed to be truly inclusive,** making it difficult for difabled individuals to participate in social and professional activities. Additionally, there are **limited opportunities for them to develop and showcase their skills, resulting in untapped potential and barriers to career growth.** This gap highlights the urgent need for a specialized T**raining & Community Center for Difabled Individuals,** providing an inclusive environment where they can access skill development programs, career opportunities, and a supportive community that fosters empowerment and independence.

Figure 1.6
Missing Piece Diagram
Source: Siregar et al., 2023.

problem **mapping.**

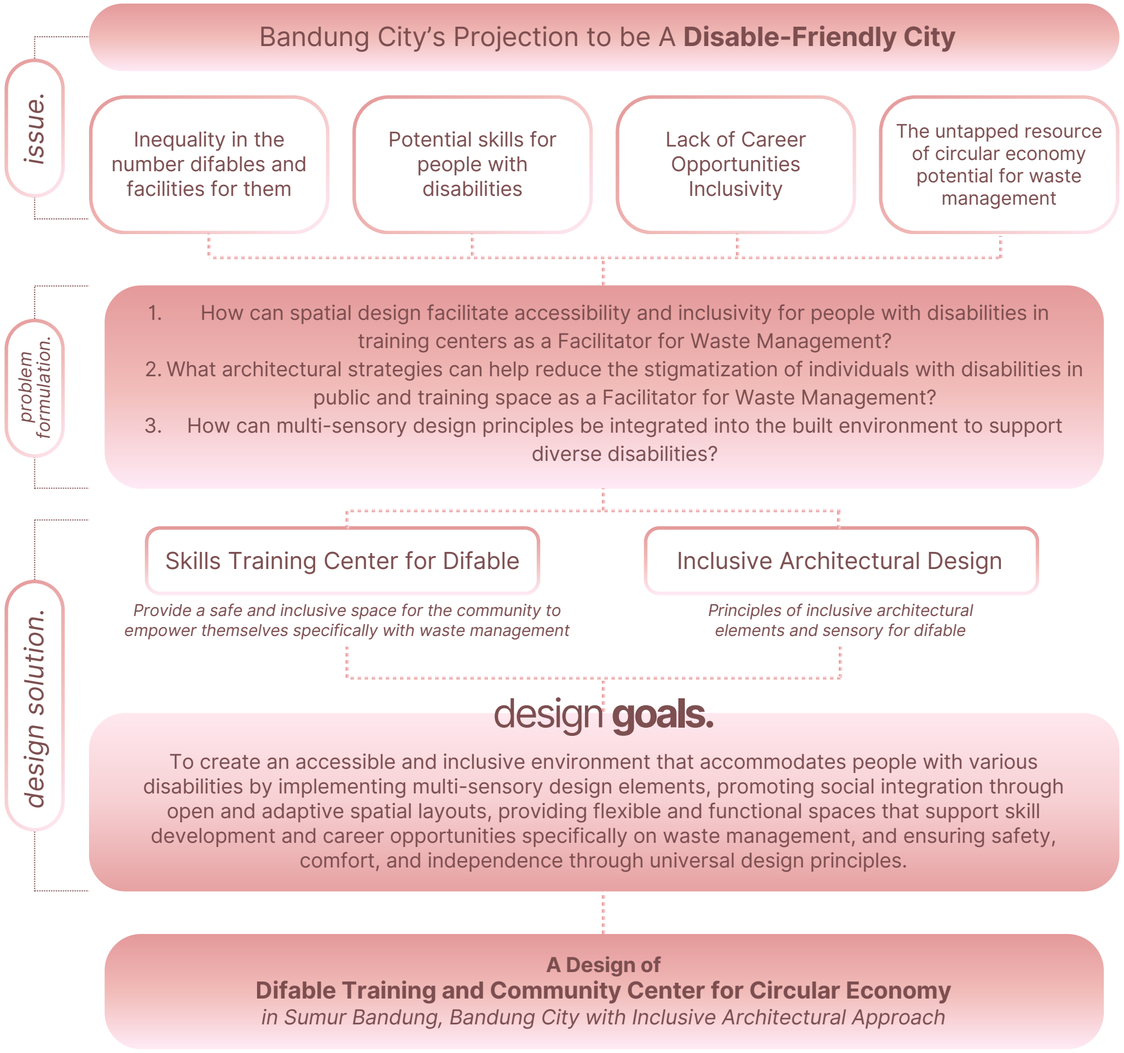


Figure 1.7
Problem Mapping Diagram
Source: Author, 2025.

goals & **objectives.**

goal.

The goal of designing the Inclusive Training and Community Center for Difabled Individuals is to create a **universally accessible and inclusive environment** that supports people with diverse disabilities through inclusive architectural strategies. This center serves as a flexible, multi-purpose space that fosters empowerment through skill development in circular economy, promotes career opportunities, and encourages social interaction—while addressing stigmatization and emphasizing cultural sensitivity, safety, and independence for difabled individuals in Bandung City.

objectives.

1. ***Prioritizing Accessibility and Inclusivity*** – The design ensures a universally accessible environment that addresses physical, sensory, cognitive, and social needs by integrating inclusive architecture and adaptive spatial layouts, specifically supporting individuals with visual, hearing, speech, and physical impairments.
2. ***Providing Difabled-Friendly Facilities and Programs*** – The center will include flexible, multi-purpose spaces such as workshop rooms, a sensory garden, and counseling zones to facilitate skill development in circular economy, promote career opportunities, and encourage community participation.
3. ***Creating a Functional and Culturally Rooted Environment*** – By incorporating barrier-free circulation, interactive multi-sensory elements, and Sundanese ethical values (Silih Asih, Silih Asah, Silih Asuh), the design fosters a safe, empowering space where difabled individuals can thrive socially, intellectually, and professionally.

design **limitation.**

planning limitation.

The design of the **Difable Training & Community Center for Circular Economy in Sumur Bandung,** Bandung City will include several key spaces, such as a **sensory garden for public interaction**, **workshop rooms** for waste crafts, **counseling rooms** for private discussions and peer-to-peer support programs, a **multi-purpose hall** for community events, **a micro library** to archive documents of the NGO, and a **gallery** to showcase and sell the crafts production. The **primary challenge** in this planning process is **ensuring optimal space efficiency** within the site while maintaining full accessibility in **accordance with disability-friendly design standards.** The implementation of universal accessibility principles, such as barrier-free circulation, multi-sensory elements, and assistive facilities, will be a crucial aspect to create an environment that is truly inclusive, functional, and empowering for all users.

user limitation.

As an open public space, the design is made for all types of users. However, for a more in-depth design specification and comprehensive level, the **design strategy** will focus on **two disability classifications; the movement impaired** who use **crutches and wheelchairs,** and **the sensory impaired** who include **sight, hearing, and speech impaired.**



site limitation.

The design location is on Jl. Wastukencana, Babakanciamis, Sumur Bandung Subdistrict, Bandung City. The selected site area is about 3240 m2.

metho**dology**

inclusive **architecture.**

This approach combines universal accessibility with multi-sensory experiences to create inclusive environments that cater to diverse abilities and perceptions. It is designed to be universally accessible and barrier-free while engaging multiple senses, including sight, sound, touch, smell, and movement. Additionally, it supports neurodiversity and promotes sensory inclusivity, ensuring a welcoming space for all individuals.

data collection **method**

primary **data.**

Primary data was collected using field observation and interviews with disability communities in Bandung. Primary data collected in the form of existing sites and issues experienced by the community.

secondary **data.**

Secondary data collection was conducted by doing literature review and mapping the region. Secondary data collection was conducted to obtain regional statistical data related to disabilities.

design approach **method.**

The design approach is carried out after observation and literature review which then found the design problem. The design involves community-based and human-centered approach in designing a skills training center that implies the inclusive architecture. This design includes:

01

Design a skills training center as a Facilitator for Waste Management for disabilities that is in accordance with the principles of inclusive architecture in Bandung city

02

A design that responds to the surrounding site and creates an inclusive experience

03

Design a building that suits the needs of diffable's activities and behavior inside the building.

04

Building design that prioritizes the the use of renewable materials by minimizing the use of excessive carbon emissions so as to create a sustainable building.

Figure 1.8
Methodology Diagram
Source: Author, 2025.

design **hypothesis.**

A Design of Difable Training and Community Center
for Circular Economy in Sumur Bandung, Bandung City with Inclusive Architectural Approach

A difable training and community center serves as both a community empowerment platform and a support for people with disabilities, addressing the lack of accessible opportunities and empowerment for their independence. Highlighting the circular economy training programs as the untapped resource in Bandung City that can be improved a lot. Despite existing regulations like Law No. 8 of 2016 and the presence of progressive communities of disabilities and zero waste, people with disabilities still struggle with career limitations and a lack of permanent platforms to showcase their talents.

This center would provide a safe space where disabled and non-disabled individuals can collaborate, fostering inclusivity through shared artistic expression. By offering accessible facilities, workshops about waste management, and career opportunities, it would empower people with disabilities while also raising public awareness and challenging misconceptions. More than just a training center, this design would encourage meaningful interactions between people with and without disabilities, promoting a more inclusive and supportive society in Bandung.

Figure 1.9
Problematique Diagram
Source: Author, 2025.

problem**atique.**

A Design of
Difable Training and Community Center for Circular Economy
in Sumur Bandung, Bandung City

non-architectural **problems.**

- The ongoing and worsening stigmatization of people with disabilities
- Lack of Career Opportunities Inclusivity in Bandung

architectural **problems.**

- Lack of inclusive public space and facilities for difables
- The absence of platform to empower the potential skills for people with disabilities

problem **formulation.**

How can spatial design facilitate accessibility and inclusivity in training centers while incorporating architectural strategies to reduce the stigmatization of individuals with disabilities and integrating multi-sensory design principles to support diverse needs?

problem **limitation.**

The skills will not be specified, but rather flexible and multi-purpose spaces.
The types of disabilities are focused on visual impaired, hearing impaired, speech impaired, and physically disabled.

approach: **inclusive architecture.**

a design approach that ensures spaces are both universally accessible and enriched with multi-sensory elements to enhance the experience for all users.

design **goals.**

To create an accessible and inclusive environment that accommodates people with various disabilities by implementing multi-sensory design elements, promoting social integration through open and adaptive spatial layouts, providing flexible and functional spaces that support skill development and career opportunities, and ensuring safety, comfort, and independence through universal design principles.

Matrix of Design Thinking:
By Bryan Lawson

Table 1.3
Matrix of Design Thinking
Source: Author, 2025.

Matrix of Design Thinking	Practical	Formal	Symbolic	Radical
Regulation	**Bandung City Regional Regulation Number 15 of 2019 concerning Protection and Fulfillment of the Rights of Persons with Disabilities** **Article 58 paragraph (1)** The City Government may cooperate with business entities and the community in providing accessibility. **Public Buildings (Article 51)** Must provide access, doors, stairs, elevators, parking lots, special toilets, drinking places, emergency warnings, and signs.	**Bandung City Regional Regulation Number 15 of 2019 concerning Protection and Fulfillment of the Rights of Persons with Disabilities** **Article 60 paragraphs (1), (2), (3), and (4):** The Municipal Government and the private sector shall empower persons with disabilities according to their variety and degree. **Article 22:** Mentioning the right to social welfare which includes social rehabilitation, social security, social empowerment, and social protection.	**Bandung's Projection to be a Disabled-friendly City** **Bandung City Regional Regulation Number 15 of 2019** **Article 4 paragraph (1):** Rights of persons with disabilities such as the right to life, freedom from stigma, privacy, justice, and legal protection. **Article 26 paragraphs (1) and (2):** Empowerment is carried out through skills improvement, mentoring, providing access, and business assistance. **Article 10 paragraphs (1) and (2):** The right of persons with disabilities to obtain employment, entrepreneurship, and cooperatives.	**Regional Regulation (Perda) of Bandung City Number 14 of 2018 concerning building construction** **Article 85** Every building and its environment must fulfill the requirements of convenience in accordance with the principles of Universal Design at the construction stage. **Article 86** Describes the principles of Universal Design, including equitable use of space, easy access without barriers, and safety for all users.
User *Difables & Non-Difables*	The design should consider ease of use and comfort for them in carrying out their daily activities while also consider the well being of users.	A Difable Training Centre for circular economy that take into account local cultural elements which can help identify and maintain the cultural heritage of Sunda.	The sense of cultural pride and identity with representations that reflect Sundanese culture and the community's sense of belongings and values	Community adaptation to internalize the skills and self-empowerment specifically in waste management Design that can facilitate active participation in decision-making and implementation of inclusive architecture
Client *DILANS Indonesia*	The design should consider regulatory compliance with what had been stated in the regional and mayor's regulation related to inclusive architecture	A training center for disabilities that can cater the untapped resource of circular economy in the context of Bandung city	A place to be a symbol of inclusivity and empowering practices for disabilities, also the supporting facilities for the region's current projection to be a disabled-friendly city	Encourage to cater all kinds of disabilities to embrace them all without differentiating them
Designer	Responsible for creating efficient and sustainable design solutions, while work closely with the local community to understand their needs and aspirations and ensure that the center design reflects their values and interests	Creates aesthetically and visually appealing design solutions by ensuring that the center design respects and enriches its cultural and natural context	The use of representations and symbols in the design to express the creative ideas and philosophy behind the inclusive skills training center while promoting environmental awareness and nature protection	Implement innovative designs and build relationships with communities to support their participation in design and implementation processes, while encouraging experimentation and adaptation in inclusive architecture practices.

excellency, originality, **& novelty.**

No	Title	Institution	Lesson Learnt	Similarity	Difference
1	Perancangan Community Learning Center Dengan Pendekatan Inclusive Design di Yogyakarta	Universitas 'Aisyiyah Yogyakarta	Perancangan community center yang inklusif untuk disabilitas	• Similar design approach • Similar building typology	• Different location • Different focus on users target
2	Community Center for the Blind and Visually Impaired	Institut Teknologi Sepuluh Nopember	Designing a community center that applies inclusive architectural design innovations specifically for blind and visually impaired people	• Similar building typology • Similar inclusive design innovation s strategy	• Different approach • Several differences in building function • Different Location
3	Perancangan Art Community Center di Bantul yang berfokus Pada Penyandang Difabel dengan Pendekatan Human-Centered Design	Universitas Islam Indonesia	Designing an art community center that applies inclusive architectural design innovations.	• Disability issues and design goals • Almost similar building typology	• Different approach • Different location • Several differences in building function
4	Penerapan Falsafah Sunda Pada Perancangan Performing Arts Center Melalui Pendekatan Intangible Metaphor Architecture Di Kota Baru Parahyangan	Institut Teknologi Nasional Bandung	Application and interpretation of philosophical culture into architectural design.	• Sunda culture implement ation	• Different approach • Different typology • Different location • Several differences in building function

Table 1.4
Excellency, Originality, & Novelty
Source: Author, 2025.

problem **study.**

02.

site context & **analysis.**

site **location.**

Sumur Bandung Subdistrict, Bandung City.



Figure 2.1
Site Map
Source: Open Street Map

The design site is located at **Jl. Wastukencana, Babakanciamis, Sumur Bandung Subdistrict, Bandung City (6°54'35.7"S 107°36'32.6"E),** with a total area of approximately 3240 m². The site is relatively spacious and the surrounding sidewalks are accessible, and it benefits from proximity to public facilities, and a residential neighborhood, making it an ideal location for an inclusive community space.

Why Sumur Bandung? This location was recommended by DILANS Indonesia, as the provider to necessary data to ensure accessibility and inclusivity align with national standards. The site was chosen due to its central and strategic position for highly populated by individuals with disabilities yet a lack of facilities that meet regulatory accessibility standards. Additionally, there is an ongoing plan to establish the Sumur Bandung Inclusive District Platform, further supporting the need for an inclusive training and community center.

site **existing.**

view to the site.





The site is a vacant land in a residential area. Many wild plants are inside the land.

surrounding & street view.









Figure 2.2
Street Views
Source: Google Maps, Author, 2025

S.W.O.T **analysis.**

strength.

1. The location is near the highly populated area of people with disabilities
2. Strategic location that can be accessed easily from the main highway
3. The location is surrounded by other public facilities to facilitate user mobility from one place to another

opportunity.

1. In line with the vision of Sumur Bandung, which is projected to become a pilot project for the Sumur Bandung Inclusive District Platform.
2. Can function as an open green space not only for disabilities but also other communities

weakness.

1. The site is located at intersection of highways, potentially create noises
2. The site is surrounded by tall buildings, which reduces the inviting and inclusive ambience

threats.

1. The location in the center of the city was a challenge in designing, thus the design needs a unique selling point to attract investors

Figure 2.3
SWOT Diagram
Source: Author, 2025.

building **regulation.**

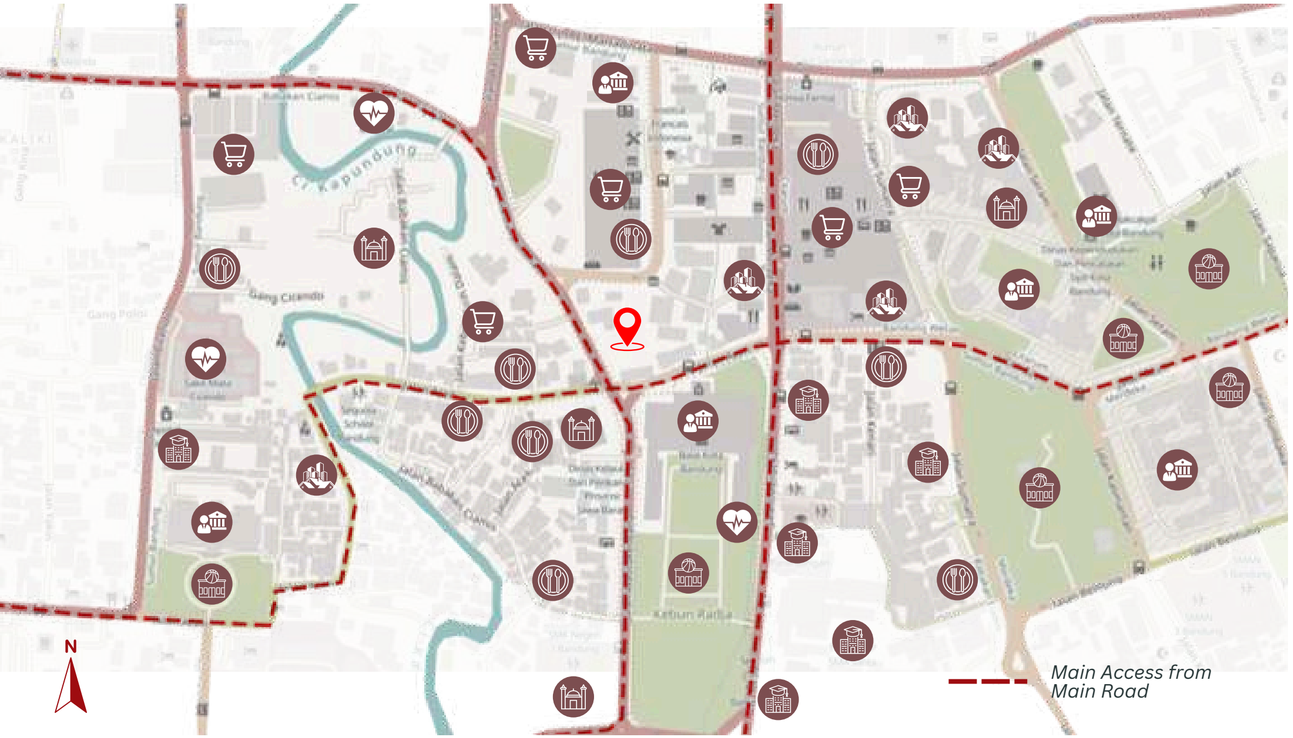
according to Bandung City Regional Regulation 5 of 2022 about Bandung City Regional Spatial Plan Year 2022-2042

General provisions **of zoning of public facility areas and social facilities**

BCR	FAR	GAR	Setback
60%	**2.4**	**20%**	**2m**
maximum for low-rise buildings which is at most 3 (three) floors	or 3 (three) times the BCR value	minimum for low-rise buildings which is at most 3 (three) floors	for buildings facing a local or neighborhood street

Figure 2.4
Building Regulation Diagram
Source: Author, 2025.

site accessibility & **surrounding.**



Government/Corporate Institution
Balai Kota Bandung, Diskominfo Bandung, Gedung Pakuan, Bandung City Mayor Office, Disdukcapil Bandung

Educational Institution
Parahyangan Catholic University, SDN 113 Banjarsari, Pasundan University, SLBN Cicendo

Sport & Recreational Facility
Balai Kota Bandung Park, Ade Irma Suryani Traffic Garden, GOR and Saparua Park, Pakuan Building City Park

Residential Facility
La Grande Merdekan Tamansari Apartment, Oakwood Merdeka Bandung, Santika Hotel Bandung, Janevalla Bandung, Aryaduta Bandung, Little Mykonos

Worship Facilities
Al-Ukhuwwah Great Mosque, GPIB Bethel Bandung, Al Hiro Mosque, Siliwangi Mosque

Market Facilities
Istana BEC Bandung, Bandung Indah Plaza, Exsport Space, Honda Bandung Center

FnB Facilities
Oharang BBQ, Lawson Purnawarman, Coffee shops, Small Stalls

Health Facility
Cicendo Eye Hospital, Sakura Medical, Puskesmas Balai Kota Bandung

Figure 2.5
Site Surrounding Diagram
Source: Author, 2025.

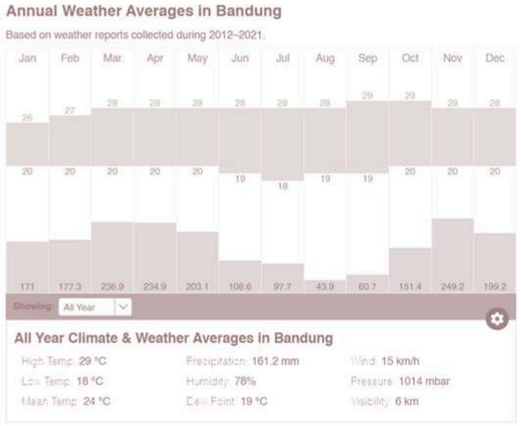
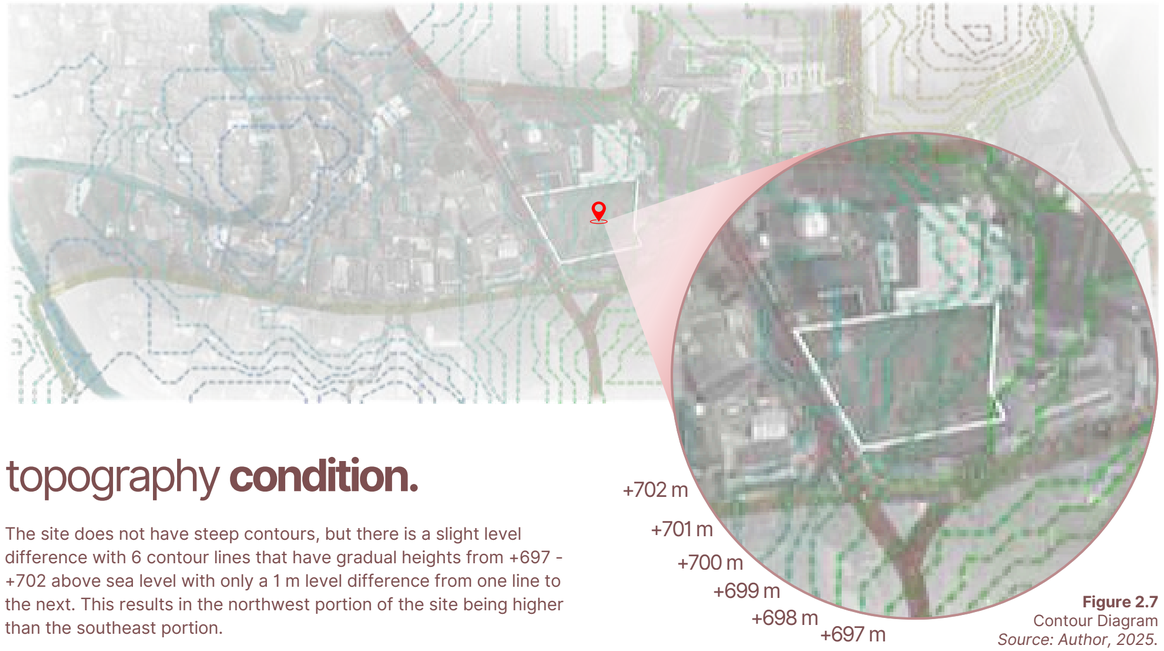


Figure 2.6
Climate Analysis
Source: Custom Weather, 2025.

climate **analysis.**

Bandung has a tropical climate with an average high temperature of 29°C. The hottest month in Bandung is October, while January is the coldest month. The highest rainfall also occurs in November. Relative humidity in the area is high throughout the year, reaching 78%. Air pressure in Bandung hovers around 1014 mbar, and visibility averages 6 kilometers. The area experiences a significant rainy season, with annual rainfall reaching around 1933.9 mm.



topography **condition.**

The site does not have steep contours, but there is a slight level difference with 6 contour lines that have gradual heights from +697 - +702 above sea level with only a 1 m level difference from one line to the next. This results in the northwest portion of the site being higher than the southeast portion.

Figure 2.7
Contour Diagram
Source: Author, 2025.

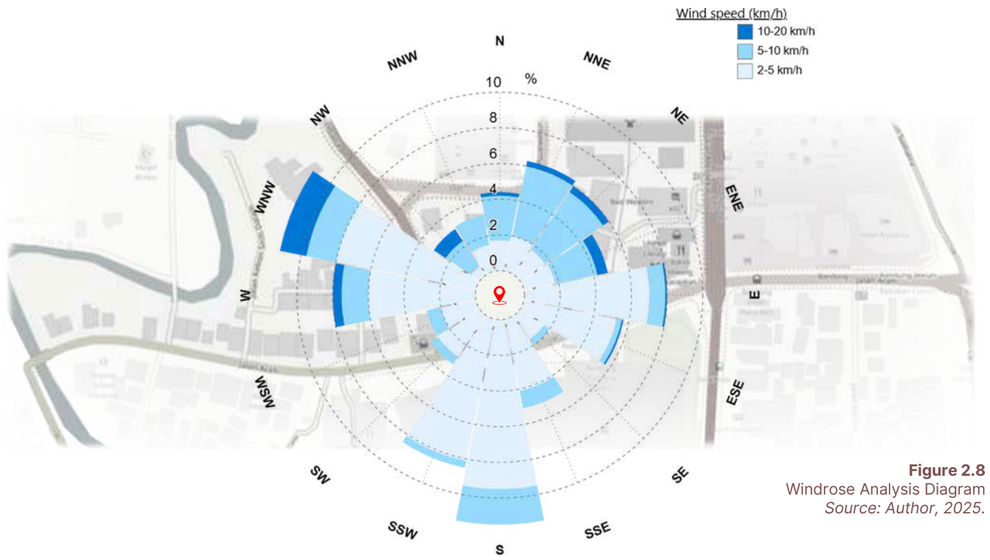


Figure 2.8
Windrose Analysis Diagram
Source: Author, 2025.

windrose **analysis.**

Based on the analysis of wind direction and speed in the diagram above, winds with a strength of 2-5 km/h blow the strongest from the South, then Northwest, and East. Meanwhile, winds whose strength ranges from 5-10 km/h come more from the North-East and a little from the South, although the frequency is not as frequent as the previous strength. Meanwhile, winds that are quite strong tend to come from the Northwest, although rarely.

It can be concluded that the most frequent and ideal winds for natural ventilation in building design tend to come from the **South**, then **Northwest**, and **East**.

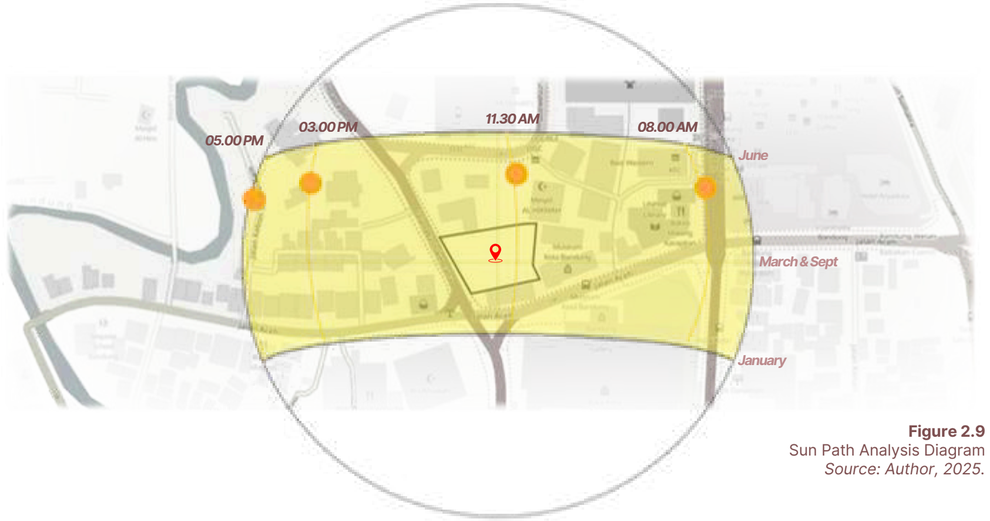


Figure 2.9
Sun Path Analysis Diagram
Source: Author, 2025.

sun path **analysis.**

The sun at 8 o'clock will cast a shadow from the East that is about 1m long. At 11.30am, the sun is right in the center so it casts no shadow. At 3pm, a shadow appears from the west which is the same length as the morning. It is different at 5 o'clock which has a shadow of approximately 5 m in length.

In December-January, the sun will move more towards the south of the site, in contrast to June which is more towards the north of the site. Whereas in March and September, the sun will move exactly straight in the center of the building.

site **condition.**

Existing Condition of the Site.

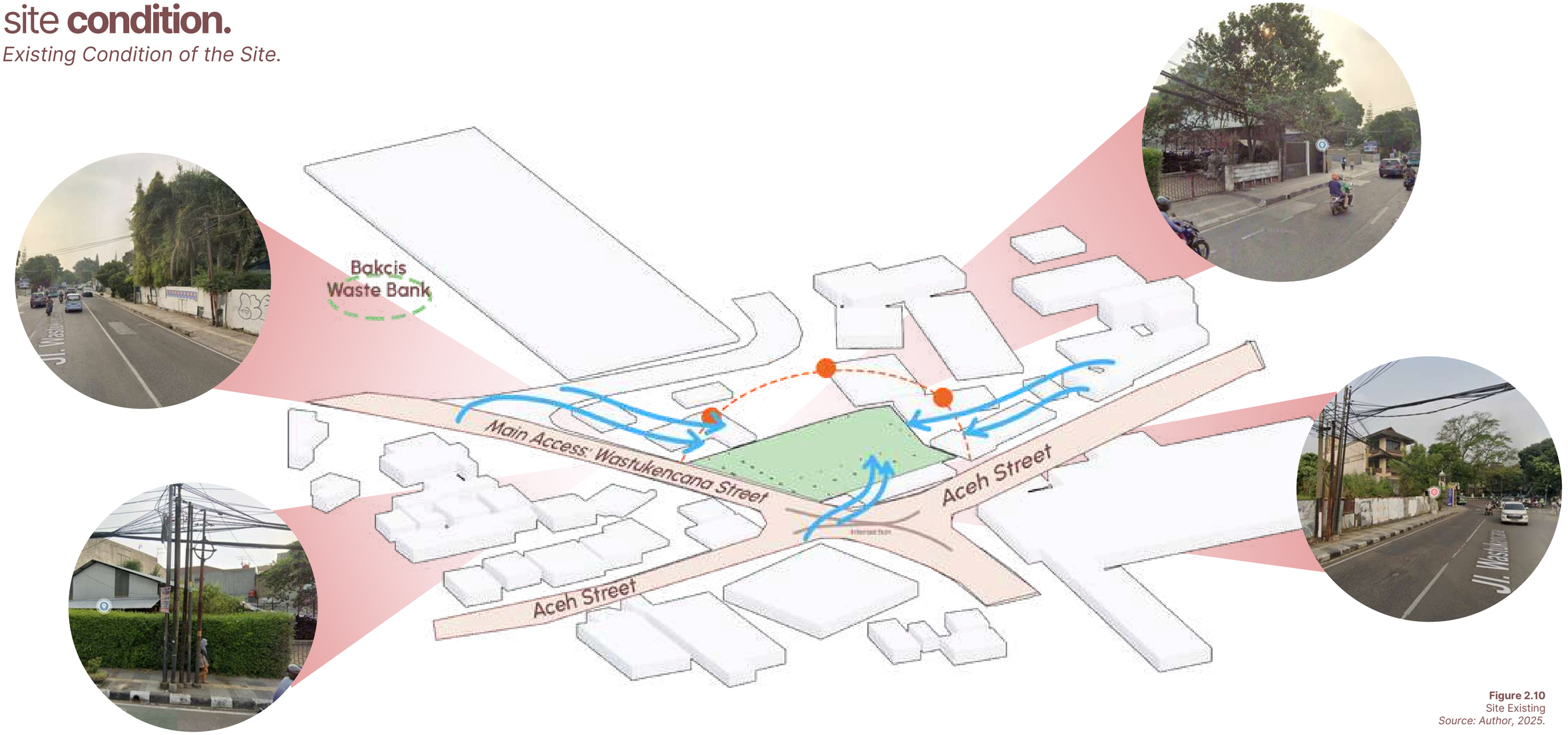


Figure 2.10
Site Existing
Source: Author, 2025.

building typology **study.**

inclusive **public space.**

Inclusive Public Spaces refer to spaces or areas that can be accessed, used and enjoyed by everyone, regardless of age, gender, physical ability, social background or economic status. Inclusive public spaces are designed to ensure that every individual, including marginalized groups such as people with disabilities, children, the elderly, and minority groups, feel welcome and have equal opportunities to participate in social, cultural, and political activities.

At the city level, social inclusion provides an environment where individuals and social groups feel they belong to the larger whole, have access to 'commons' and are free to fully engage in collective affairs. As cities grow and densify, access to well-designed and pleasant public spaces is becoming an increasingly important asset.

Characteristics of a Public Space according to **UN-Habitat (2015), on Global Public Space Toolkit: From Global Principles to Local Policies and Practice:**

- Are the physical web and support for the movement and the stationing of people and means of transport, from which the vitality of the city depends.
- Host market and accessible commercial activities in fixed premises, public venues and other services (collective and not, public and private), in which the socio economic dimension of the city is always expressed.
- Offer precious opportunities for recreation, physical exercise and regeneration for all such as parks, gardens, public sports facilities.
- Help promote education and culture such as museums, public libraries.
- Are places of individual and collective memory, in which the identity of the people is mirrored and finds sustenance, growing in the knowledge that they are a community.
- Promote conviviality, encounter and freedom of expression.
- Are an integral and meaningful part of the urban architecture and landscape, with a determinant role in the overall image of the city.



Figure 2.11
Inclusive Public Space
Source: ArchDaily

difable **training center.**

The Difable Training Center is a facility dedicated to providing education, training, and support to individuals with disabilities (difable). Its goal is to increase the level of awareness, diligence, and participation of people with disabilities in various aspects of life, including as education, employment, and social life. This training center typically offers programs that are tailored to each student's needs, such as work-related skills training, physical rehabilitation, assistive technology training, and psychological and social support.

Additionally, the Difable Training Center works to promote awareness and understanding by ensuring that individuals with disabilities have equal access to resources and opportunities. This organization frequently collaborates with the government, non-governmental organizations (NGOs), and the private sector to create inclusive environments. ***(World Health Organization (WHO), 2011)***

Characteristics of Difable Training Center:

- Structured Training Program
  - Provides job skills training, such as handicrafts, computers, or small businesses.
- Facility Accessibility
  - Design disability-friendly buildings and facilities, such as ramps, elevators, and accessible toilets.
- Assistive Technology Support
  - The use of assistive devices and technology to facilitate learning and training.
- Individualized Approach
  - Programs tailored to the needs and abilities of each individual.
- Psychological and Social Support
  - Counseling and emotional support to help people with disabilities face social challenges.
- Partnership with Stakeholders:
  - Collaboration with government, NGOs, and the private sector to create employment and education opportunities.



Figure 2.12
Difable Training Center
Source: ArchDaily



Figure 2.13
Community Center
Source: ArchDaily

community **center.**

A community center is a physical space or facility designed to provide various services, programs, and activities for the local community. Community center serves as a place to gather, learn, interact, and develop one's own or a group's potential. Its goals are to improve social interaction, raise living standards, and encourage active community participation in local development.

Generally speaking, community centers offer a variety of programs, such as non-formal education, skills training, arts and cultures activities, health services, social interaction, and recreational activities. These facilities are frequently provided by the government, non-governmental organizations (NGOs), or the general public and can be tailored to the specific needs of the community being served.

Characteristics of Community Center:

- Multifunctional Services:
  - Provides a wide range of services and programs that include education, health, recreation, and social support.
- Open Access for All:
  - Designed to be accessible to all community members, including vulnerable groups such as children, the elderly, and people with disabilities.
- Community Participation:
  - Encourages active community involvement in program planning, management, and implementation.
- Adequate Facilities:
  - Have multipurpose spaces, such as meeting rooms, sports halls, libraries, and recreation areas.
- Community Based:
  - Programs and services are tailored to the needs, culture, and characteristics of the local community.
- Sustainability:
  - Managed with the principles of sustainability, in terms of financial, social and environmental aspects.

design approach **study.**

literature **review.**

on design approach | Inclusive Architecture

Inclusive Architecture Design

Inclusive architecture is an approach that makes an environment better in response to human diversity. According to the Minister of PUPR Regulation (2017) No. 14 of 2017, universal design is the design of buildings and facilities that can be used by all people together without the need for adaptation or special treatment.

From 1994 to 1997, the Center for Universal Design conducted a research and demonstration project funded by the U.S. Department of Education's National Institute on Disability and Rehabilitation Research (NIDRR). (Pratiwi, 2015) The project was titled "Studies to Further the Development of Universal Design" . One of the activities of the project was to develop a set of universal design guidelines. Which are:

1- Equitable Use

The design is useful and marketable to people with diverse abilities. Guidelines:

- Provide the same means of use for all users: identical whenever possible; equivalent when not.
- Avoid segregating or stigmatizing any users.
- Make provisions for privacy, security, and safety equally available to all users.
- Make the design appealing to all users.

2- Flexibility in Use

The design accommodates a wide range of individual preferences and abilities. Guidelines:

- Provide choice in methods of use.
- Accommodate right- or left-handed access and use.
- Facilitate the user's accuracy and precision.
- Provide adaptability to the user's pace.

3- Simple and Intuitive Use

Use of the design is easy to understand, regardless of the user's experience, knowledge, language skills, or current concentration level. Guidelines:

- Eliminate unnecessary complexity.
- Be consistent with user expectations and intuition.
- Accommodate a wide range of literacy and language skills.
- Arrange information consistent with its importance.
- Provide effective prompting and feedback during and after task completion.

4- Perceptible Information

The design communicates necessary information effectively to the user, regardless of ambient conditions or the user's sensory abilities. Guidelines:

- Use different modes (pictorial, verbal, tactile) for redundant presentation of essential information.
- Maximize "legibility" of essential information.
- Differentiate elements in ways that can be described (i.e., make it easy to give instructions or directions).
- Provide compatibility with a variety of techniques or devices used by people with sensory limitations.

5- Tolerance for Error

The design minimizes hazards and the adverse consequences of accidental or unintended actions. Guidelines:

- Arrange elements to minimize hazards and errors: most used elements, most accessible; hazardous elements eliminated, isolated, or shielded.
- Provide warnings of hazards and errors.
- Provide fail-safe features.
- Discourage unconscious action in tasks that require vigilance.

6- Low Physical Effort

The design can be used efficiently and comfortably and with a minimum of fatigue. Guidelines:

- Allow user to maintain a neutral body position.
- Use reasonable operating forces.
- Minimize repetitive actions.
- Minimize sustained physical effort.

7- Size and Space for Approach and Use

Appropriate size and space is provided for approach, reach, manipulation, and use regardless of user's body size, posture, or mobility. Guidelines:

- Provide a clear line of sight to important elements for any seated or standing user.
- Make reach to all components comfortable for any seated or standing user.
- Accommodate variations in hand and grip size.
- Provide adequate space for the use of assistive devices or personal assistance.

literature **review.**

on design approach | Inclusive Architecture Standards

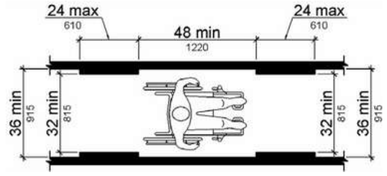
International Standard:
Inclusive architecture based on ADA (Americans with Disabilities Act) standards refers to the design of buildings and environments that are accessible and usable by everyone, including those with different types of disabilities.

National Standard:
Regulation of the Minister of Public Works and Public Housing No. 14/PRT/M/2017 Year 2017 on Building Facilities Requirements

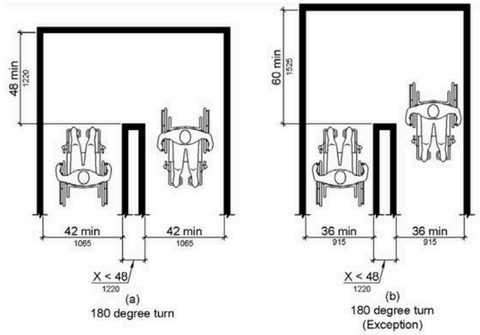
ADA Standards

Movement

The clear width of walking surfaces shall be 36 inches (915 mm) minimum.



Clear Width at Turn. Where the accessible route makes a 180 degree turn around an element which is less than 48 inches (1220 mm) wide, clear width shall be 42 inches (1065 mm) minimum approaching the turn, 48 inches (1220 mm) minimum at the turn and 42 inches (1065 mm) minimum leaving the turn.



Regulation of the Minister of Public Works and Public Housing

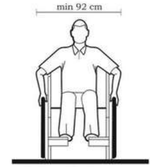
Movement



Gambar 1.7. Jangkauan ke samping menggunakan tongkat



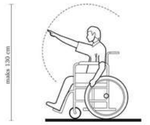
Gambar 1.8. Jangkauan ke depan menggunakan tongkat



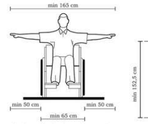
Gambar 1.15. Lebar pengguna kursi roda



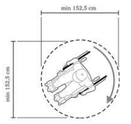
Gambar 1.11. Jangkauan ke samping pengguna kursi roda



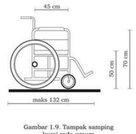
Gambar 1.12. Jangkauan ke depan pengguna kursi roda



Gambar 1.13. Jangkauan ke samping menggunakan 2 tangan pengguna kursi roda



Gambar 1.14. Diameter manuver pengguna kursi roda



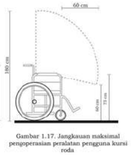
Gambar 1.9. Tampak samping kursi roda umum



Gambar 1.10. Tampak depan kursi roda umum

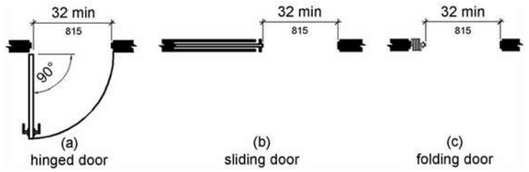


Gambar 1.16. Jangkauan perletakan benda/peralatan oleh pengguna kursi roda



Gambar 1.17. Jangkauan maksimal pengoperasian peralatan pengguna kursi roda

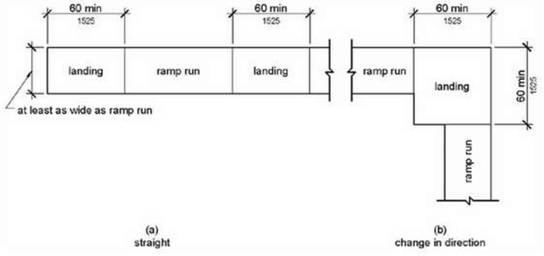
Doorway



Ramps

Table 405.2 Maximum Ramp Slope and Rise for Existing Sites, Buildings, and Facilities

Slope[1]	Maximum Rise
Steeper than 1:10 but not steeper than 1:8	3 inches (75 mm)
Steeper than 1:12 but not steeper than 1:10	6 inches (150 mm)



Elevators

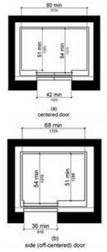
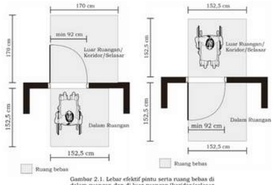


Table 407.4.1 Elevator Car Dimensions

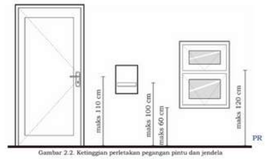
Door Location	Minimum Dimensions: Door Clear Width	Inside Car, Side to Side	Inside Car, Back Wall to Front Return	Inside Car, Back Wall to Inside Face of Door
Centered	42 inches (1065 mm)	80 inches (2030 mm)	51 inches (1295 mm)	54 inches (1370 mm)
Side (off-centered)	36 inches (915 mm)[1]	68 inches (1725 mm)	51 inches (1295 mm)	54 inches (1370 mm)
Any	36 inches (915 mm)[1]	54 inches (1370 mm)	80 inches (2030 mm)	80 inches (2030 mm)
Any	36 inches (915 mm)[1]	60 inches (1525 mm)[2]	60 inches (1525 mm)[2]	60 inches (1525 mm)[2]

1. A tolerance of minus 5/8 inch (16 mm) is permitted.
2. Other car configurations that provide a turning *space* complying with 304 with the door closed shall be permited.

Doorway

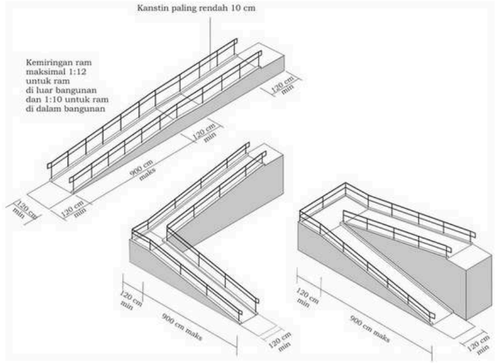


Gambar 2.1. Lebar efektif pintu serta ruang bebas di dalam ruangan dan di luar ruangan/koridor/selasar

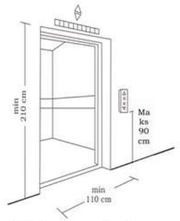


Gambar 2.2. Ketinggian perletakan pegangan pintu dan jendela

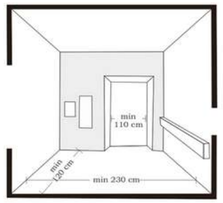
Ramps



Elevators

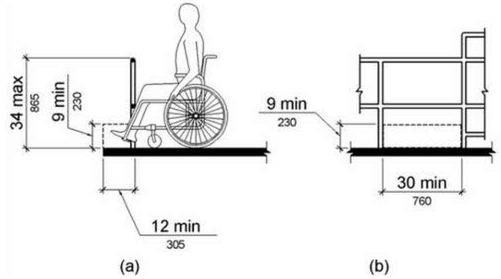


Gambar 2.63. Detail ruang luar lif penumpang



Gambar 2.62. Detail ruang dalam lif penumpang

Railings



Guiding Blocks

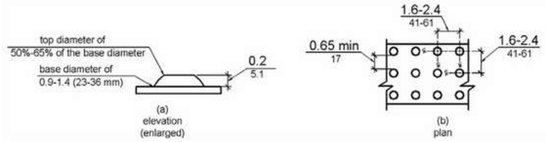


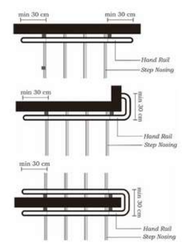
Figure 705.1
Size and Spacing of Truncated Domes

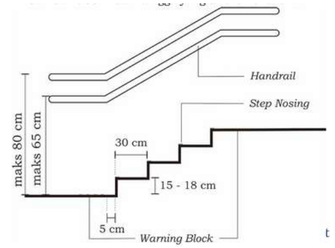
Signage visibility

Table 703.5.5 Visual Character Height

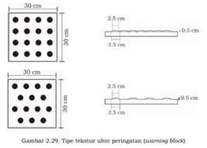
Height to Finish Floor or Ground From Baseline of Character	Horizontal Viewing Distance	Minimum Character Height
40 inches (1015 mm) to less than or equal to 70 inches (1780 mm)	less than 72 inches (1830 mm)	5/8 inch (16 mm)
	72 inches (1830 mm) and greater	5/8 inch (16 mm), plus 1/8 inch (3.2 mm) per foot (305 mm) of viewing distance above 72 inches (1830 mm)
Greater than 70 inches (1780 mm) to less than or equal to 120 inches (3050 mm)	less than 180 inches (4570 mm)	2 inches (51 mm)
	180 inches (4570 mm) and greater	2 inches (51 mm), plus 1/8 inch (3.2 mm) per foot (305 mm) of viewing distance above 180 inches (4570 mm)
greater than 120 inches (3050 mm)	less than 21 feet (6400 mm)	3 inches (75 mm)
	21 feet (6400 mm) and greater	3 inches (75 mm), plus 1/8 inch (3.2 mm) per foot (305 mm) of viewing distance above 21 feet (6400 mm)

Railings

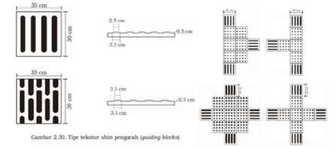




Guiding Blocks

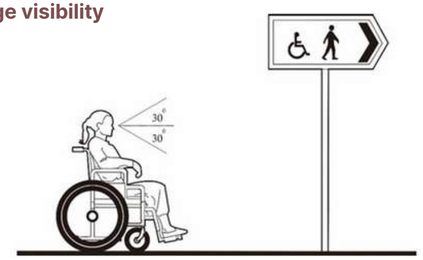


Gambar 2.29. Tipe tekstur ubin peringatan (*warning block*)



Gambar 2.30. Tipe tekstur ubin pengarah (*guiding blocks*)

Signage visibility



Gambar 3.73. Perletakan rambu sesuai jarak dan sudut pandang

Table 2.1
Inclusive Architecture Guidelines
Source: Americans with Disabilities Act, Regulation of the Minister of Public Works and Public Housing

literature **review.**

on design approach | Multi-Sensory Architecture

Multi-Sensory Architecture

Multi-sensory architecture is an approach that extends beyond the dominance of vision, engaging all the human senses—sight, hearing, touch, smell, taste, and even the body's orientation in space. **Juhani Pallasmaa** argues that modern architecture has become primarily visual, neglecting the rich sensory experiences that create a deeper connection between the body, space, and the environment

Characteristics of Multi-Sensory Architecture:

- **Integration of Multiple Senses –** It engages vision, sound, touch, smell, and even taste, rather than focusing solely on visual experience.
- **Emphasizes Hapticity –** All senses, including vision, are considered extensions of the sense of touch. Surfaces and materials are designed to encourage touch, offering sensations of warmth, texture, and materiality.
- **Emotional and Spatial Connection –** Multi-sensory architecture is about the "transactions between body, imagination, and environment". Spaces can evoke personal memories and emotions through a fusion of sensory experiences.
- **Encourages Peripheral Perception –** Good architecture incorporates both focused and peripheral vision. Peripheral vision creates an immersive experience, whereas an overemphasis on frontal, focused vision leads to sensory detachment.
- **Recognition of Bodily Movement –** Movement through space is considered part of the design experience. Architectural design should recognize the "muscular and haptic plasticity" of the human body.
- **Atmospheric Quality –** The experience of architecture is influenced by sounds, shadows, light distribution, and texture. A well-designed space can evoke intimacy and warmth through sensory elements.
- **Material Authenticity –** Materials should have a strong tactile presence rather than being solely smooth or reflective. This includes textures that invite touch and are comfortable for the body

Standards of Multi-Sensory Architecture:

- **Balance Between Senses –** Avoid over-reliance on sight (ocularcentrism) and instead integrate all sensory modalities into the experience of space.
- **Use of Light and Shadow –** Light should not be excessive or uniform but should create depth, atmosphere, and spatial articulation.
- **Acoustic Considerations –** Sound should be integrated into spatial design, whether through echoes, sound absorption, or materiality.
- **Tactile and Haptic Qualities –** Materials should be chosen based on their tactile interaction with the human body. Textures and surface finishes should invite touch and enhance spatial experience.
- **Spatial Orientation and Movement –** Spaces should allow for dynamic interaction, enabling users to experience architecture through movement rather than static observation.
- **Emotional and Existential Experience –** Architecture should create a sense of belonging and self-awareness, enhancing the user's connection with the environment



Figure 2.14
Multi-Sensory Architecture
Source: ArchDaily

design excellency **analysis.**

what is **disability?**

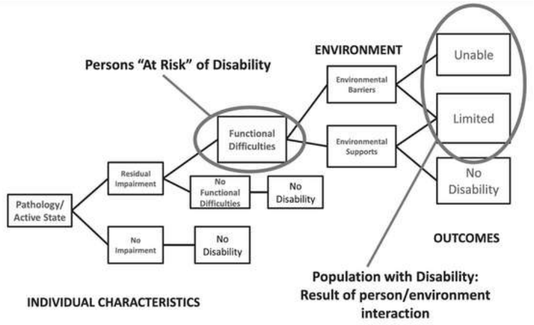


Figure 2.15
Disability Process
Source: Altman, 2013

The term "disability" in English, refers to a disability that has been present since birth or is permanent **(Chodzirin, 2013)**. In Indonesian and English, the term "cacat" is mainly used to describe conditions of inability, weakness, helplessness, damage, and other negative connotations such as blindness, deafness, physical or mental disability, and the term "cacat" itself is a pejorative word. Impaired refers to without or missing, while defective refers to damaged. Similarly, disability means inability **(Fuad, 2010)**.

classifying **disabilities.**

Quoting from Altman (2013), there are 4 types of disability measurement; **movement, sensory, cognitive, and emotional.** Based on the data from ***bandungkota.bps.go.id,*** people with disabilities are tunanetra (blind), tunarungu (deaf), tunawicara (mute), tunarungu-wicara (deaf-mute), tunadaksa (physical disability), tunagrahita (mental retardation), tunalaras (ex-mental illness), ex-leprosy, and dual disability (physical-mental disability).

01 Movement
(hands, feet, fingers, body, movement etc.)

- Tunadaksa (physical disability)
- Ex-leprosy (often causes movement disorders)
- Dual disability (if physical disability is involved)

02 Sensory
(sight & hearing)

- Tunanetra (blind)
- Tunarungu (hard of hearing)
- Tunawicara (mute, related to hearing & communication impairment)
- Tunarungu-wicara (deaf-mute)

03 Cognitive
(memory & concentration)

- Tunagrahita (mental retardation)
- Dual disability (if mental & cognitive impairment is involved)

04 Emotional
(*emotions, anxiety, depression, etc.)*

- Tunalaras (former mental illness, often associated with emotional disturbance)

disabilities needs **assessment stages.**

Based on a study conducted by **Rosyadi (2022)**, there are three stages of assessment regarding disability needs:

01 Rehabilitation.
A recovery process for individuals with serious illnesses or disabilities to achieve optimal physical, psychological, and social abilities.

Typology: Hospital, Therapy Center, Physiotherapy Clinic, or Psychosocial Recovery Center

02 Community Empowerment.
An effort to build community capabilities by encouraging participation, awareness, and potential development to improve their social conditions.

Typology: Disability Skills Training Center, Inclusive Public Spaces, or Community Center

03 Independence.
The ability to live independently, make decisions, and carry out Activity of Daily Living (ADL) without dependence on others.

Typology: Inclusive & Accessible Housing, Commercial & Workplace Areas, or Accessible Public Transportation & Infrastructure

"For a more comprehensive design, the review and analysis of building typologies and precedents will focus on the **Community Empowerment** stage."

disabilities needs **for empowerment.**

Individuals with disabilities experience life through a **unique lens shaped by their personal journey** of learning and adaptation. From an early age or the moment they acquire a disability, they often face stigma, discrimination, and exclusion from public spaces, education, and employment. **Despite these challenges,** they develop resilience and self-awareness, choosing to **navigate life through strength and identity rather than limitations.** Addressing their needs and rights must be a priority to dismantle systemic barriers and enable their full participation in society.

Disability often leads to financial hardship due to medical costs, limited education access, and fewer job opportunities—making self-sufficiency difficult. Stories like Irene's, who relies on family support, highlight the urgent need for inclusive development. Empowerment requires removing workplace discrimination, ensuring accessible infrastructure, and providing equal access to health, education, and social services. Community-Based Rehabilitation (CBR) guidelines joins the development and human rights aspects of disability. The guidelines:

- promote the need for inclusive development for people with disabilities in the mainstream health, education, social, and employment sectors;
- emphasize the need to promote the empowerment of people with disabilities and their family members;
- through the provision of practical suggestions, position CBR as a tool that countries can use to implement the Convention on the Rights of Persons with Disabilities.

"I don't know what to do for my mum. She is my earthly god. My family has been so supportive and helpful. They carry or feed me when I cannot. They have paid my bills. They have cared and loved me...I don't think [I will have children] unless when God does a miracle. I am very expensive to maintain, so **how can I maintain my family?** -Irene, a diffable in Bandung."

participatory *approach*

Pergerakan Disabilitas dan Lanjut Usia (DILANS) Indonesia

Pergerakan Disabilitas dan Lanjut Usia (DILANS) Indonesia as declared in Bandung on 3 December 2021 to coincide with International Disability Day, legalized as a member-based association organization through the Decree of the Minister of Law and Human Rights of the Republic of Indonesia, domiciled in Bandung City.

The interview with the president of DILANS Indonesia, Pak Farhan, took place on Tuesday, March 11, 2025. Pak Farhan gave an overview of the programs that are being implemented by DILANS in collaboration with many stakeholders. DILANS showed several videos to illustrate the state of accessibility and inclusiveness in Sumur Bandung Sub-district, which arguably does not meet inclusiveness design standards. Mr. Farhan also provided input on what data can be developed, especially with the data already owned by DILANS to create a more comprehensive and targeted design.



In Sumur Bandung, there is an initiative to create the **Sumur Bandung Inclusive District Platform.** DILANS also explained the roadmap for the past 3 years regarding this project. Currently, it is still collecting data and working on the automation of data updates using AI, as well as collaboration with other stakeholders who can realize the design of this SBIDP.

DILANS also collaborates with several universities such as geodesy engineering in collecting data that can be used to consider the realization of the design later. DILANS has also received a funding grant from FORD, thanks to their efforts and consistency in processing data and surveys. This is explained through 3 lessons learned from DILANS' 1st FORD Grant based on Impacts, Findings, and Follow Up.

Figure 2.16
Participatory Approach with DILANS
Source: Author, 2025

participatory *approach*

Bandung Independent Living Center (BILiC)

Bandung Independent Living Center, better known as BILiC, is a non-governmental organization of people with disabilities or Difable People Organization (DPO) which has the basic concept of the Independent Living movement or independence for people with disabilities. It was established 17 years ago, precisely on August 23, 2003. The programs in BILiC, of course, are in accordance and in line with advocacy and paralegal activities.

BILiC has **3 programs**; the first, of course, is in line with **advocacy and paralegal** activities. The programs being developed are **Peer Support (PS)** and **Independence Assistant (Asisten Kemandirian/AK).** This service is an important basis or foundation in the Independent Living Philosophy, where people with disabilities are considered professionals in terms of their disability. People with disabilities know and understand their needs, therefore they have the right to determine themselves.



BILiC's office is located in **Cipamokolan, Rancasari,** Bandung City. Its function is used for administrative events or internal coordination, because the scale is small and simple. It is more of a conversion from a house to an office of a non-government organization.

Figure 2.17
Participatory Approach with BiLiC
Source: Author, 2025



Pak Taufiq (Secretary)

Interview Result

Berapa jumlah ragam disabilitas yang ada di Bandung? Apakah ada data terbaru atau tren peningkatan tertentu?
Data disabilitas di Bandung masih belum terintegrasi dengan baik. Tiap lembaga, dinas, atau komunitas mempunyai datanya sendiri dan semuanya berbeda-beda. Tapi pihak BILiC mengatakan bahwa ragam disabilitas di Bandung yang paling banyak adalah disabilitas fisik, dengan total 3102 jiwa.

Bagaimana kondisi aksesibilitas fasilitas publik di Bandung bagi penyandang disabilitas?
Kondisi aksesibilitas dan fasilitas publik masih sangat jauh dari kata baik. Masih sangat banyak daerah di Bandung yang sama sekali tidak aksesibel; tidak ada ramp, guiding block, ditutupi kios pedagang ilegal di trotoar, dsb.

Dinas atau lembaga apa yang bertanggung jawab dalam pengembangan keterampilan dan kesejahteraan penyandang disabilitas di Bandung?
Dinas Sosial, sih. Tapi juga dibantu stakeholder-stakeholder lainnya agar perancangan kota ramah disabilitas ini bukan hanya regulasi saja.

Menurut BILiC, apakah lebih baik desain difokuskan untuk beberapa jenis disabilitas tertentu atau tetap mencoba mengakomodasi semua jenis?
Kalau mau inklusif, ya dicakupkan semua ragam disabilitas yang ada. Karena kalau sudah inklusif, pasti bisa digunakan juga oleh masyarakat yang tergolong rentan; seperti lansia, ibu hamil, hingga anak-anak.

Adakah rekomendasi lokasi di Bandung yang strategis untuk pembangunan fasilitas ini?
Yang direkomendasikan, sih di Sumur Bandung,ya. Karena di daerah sana memang sedang dijadikan pilot project untuk daerah yang ramah disabilitas. Karena tidak mudah untuk langsung mengimplementasikan perencanaan yang ramah disabilitas di Bandung. Nah, yang terlibat dalam pilot project itu adalah mahasiswa dan volunteer, serta komunitas DILANS Indonesia.



Figure 2.18
Participatory Approach with BiLiC
Source: Author, 2025

design precedents **study.**

School for Blind and Visually Impaired Children

SEAlab

School for the blind and visually impaired children in Gandhinagar is designed for children from remote villages and towns in Gujarat and professors eager to offer them a better education and opportunities in society. This school is designed to be navigated with the help of more than one of the five senses:

- **Sight:** The contrast of light and shadow or contrasting colors and surfaces. Specific skylights and openings are designed to create contrasting areas with light and shade.
- **Hearing:** The sound of the voice or the walking steps changes according to the echo produced in the spaces. The design attributes different heights and widths to areas of corridors and classrooms so that children can recognize them by sound.
- **Smell:** Courtyards, located next to the classroom and connected to the corridor, have aromatic plants and trees, which help in the navigation of the building.
- **Touch:** The material and textures of the walls and floor, with smooth and rough surfaces, guide the students throughout the spaces.



Figure 2.19
School for Blind and Visually Impaired Children
Source: ArchDaily

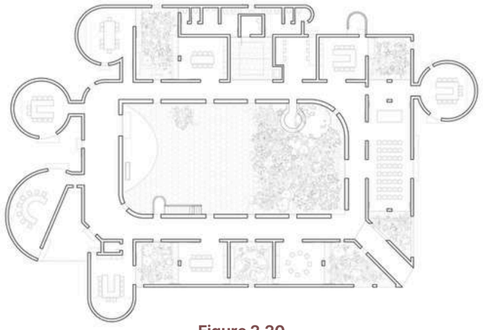


Figure 2.20
School for Blind and Visually Impaired Children Floor Plan
Source: ArchDaily

Lessons Learnt.

- The use of special classroom entry vestibules is complemented by a high roof that has skylights, creating clear light flares.
- Contrasting colors are used on doors, furniture, and electrical panels to make it easier for students to navigate.
- Classrooms are provided with indirect light from private gardens and skylights.
- Each area, including classrooms, corridors, and gardens, is labeled with Braille.
- The flooring in the building uses City Stone as the main material, which is divided into two types of textures to cue visitors. Rough City Stone is used at the entrance to the classrooms, while the rest of the spaces are given smooth City Stone.
- It has five different stucco textures, which are strategically applied to help with location recognition. The corridor uses a horizontal texture on its long side and a vertical texture on its short side, while the central courtyard has a semi-curved texture.



Figure 2.21
School for Blind and Visually Impaired Children
Source: ArchDaily

design **precedents.**

building typology | spatial function | experience

inclusive public space

Silk Tree Deaf Friendly Urban Park

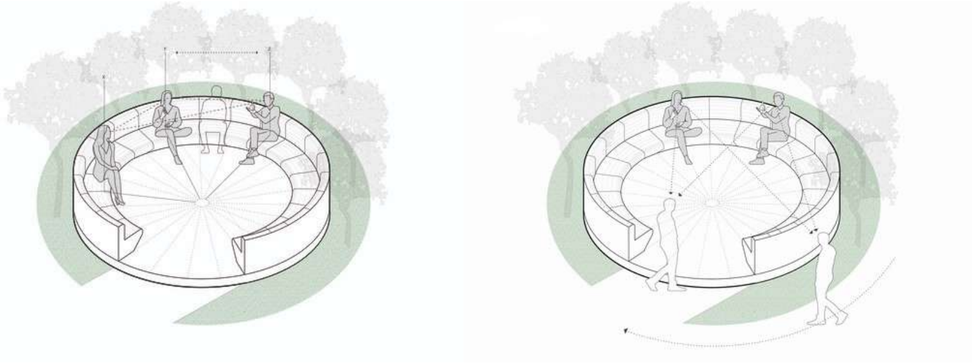
Ashrafi & Zad

A small urban park adjacent to Tehran's Sports Federation for the Deaf and Hard of Hearing. **This practice identified an opportunity to bring awareness to Tehran's Deaf community and offer inclusive public amenities in the neighborhood.**

Silk Tree Park is the first public domain area in Tehran designed in accordance with spatial guidelines for deaf and HOH individuals. The Park is part of a larger initiative on behalf of the municipality to create more public spaces that are inclusive of all physical abilities. The design was premised around how responding to special needs can enrich the design, and how the design of natural and built environments can foster playful interaction and empathy between people from all walks of life.



Figure 2.22
Silk Tree Deaf Friendly Urban Park
Source: ArchDaily



Lessons Learnt.

- The design is based on how responding to special needs can enrich design, and how the design of **natural and built environments can foster playful interaction and empathy between people from different backgrounds.**
- The design of the **rounded seating** spaces vary in radius, ranging from 2.80 meters to 5.50 meters, which **allows for safe and comfortable visual dialogue** for individuals with hearing impairments.
- The **lightweight and rounded design of the parasol** with a stem whose corners are designed to reduce visual distractions. Adjustment of roof height and size that **balances light and shadow,** so that high light and shadow contrast does not interfere with visual legibility.
- Accessibility for users with physical impairments is represented by **flat and accessible surfaces** for wheelchair users and those with walking difficulties. There are two flat areas designed for casual sports such as **volleyball and mini soccer, as well as an area for children to ride bikes and skates.**

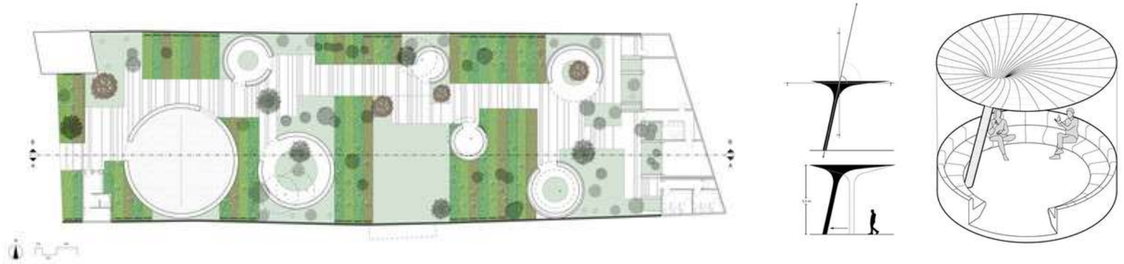


Figure 2.23
Seating Area Diagram
Source: ArchDaily

design **precedents.**

spatial function | building technology

schools/training center

Hazelwood School

Alan Dunlop Architect Limited

Hazelwood is a **school for children and young people,** aged 2 to 18, who are **blind and deaf – "dual sensory impaired".** Architecturally, it is a new type of project. Many of the school's children are physically handicapped and all have a degree of cognitive impairment. Together they represent the most acutely disabled children on the City of Glasgow's education role. They will need lifetime support. The designer was determined to create **a school which would support the needs of the children and the aspirations of their parents, a place of safety and ambition that would free the teacher and inspire the child.**

The design of the **games room, trampoline area, and hydrotherapy pool provide children with opportunities to explore, expand their skills, and gain confidence** through engaging in relatively independent activities.



Figure 2.24
Hazelwood School
Source: ArchDaily

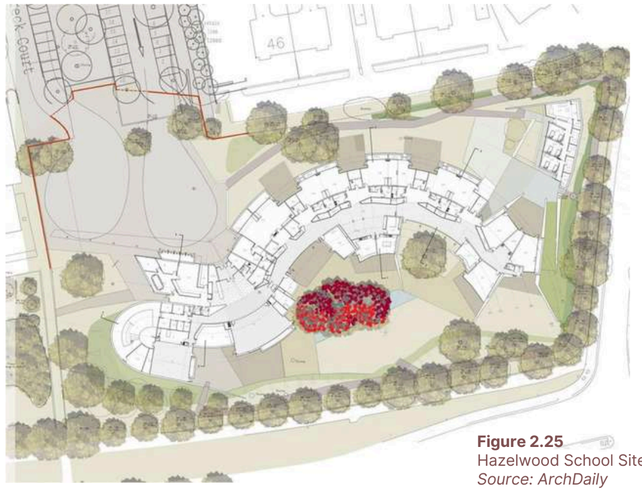


Figure 2.25
Hazelwood School Site Plan
Source: ArchDaily

Lessons Learnt.

- **Trail Rail;** a cork-lined storage wall that doubles as a guide for children to navigate the school with greater freedom and independence that has a warm feel and provides tactile markers or cues
- Use of high-level **clerestory glazing to maximize daylight and reduce external visual distractions**, which can cause loss of concentration in visually impaired students.
- Use of **contrasting and neutral colors** as visual indicators of transition and storage spaces.
- To **reduce the impact of traffic noise** near Hazelwood, most classrooms are located **along the northern edge** of the quiet location and more temporary spaces to the south.
- **Acoustic ceilings** are detailed in all teaching spaces to reduce the reverberation of higher volumes.



Figure 2.26
Hazelwood School
Source: ArchDaily

Musholm Extension
AART Architects

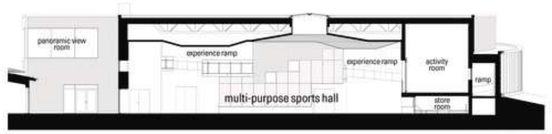
AART architects together with the Danish muscular dystrophy foundation has extended the resort by designing a new multi-purpose hall and 24 holiday homes.

The multi-purpose hall is an example of how AART architects have integrated accessibility as a creative element to inspire and challenge users. Based on close dialogue with current and future users, the Danish practice has created such novel ideas as a 100 metre 'experience ramp', that winds its way around the hall, offering a wealth of activity zones and culminating in a viewing room from where Musholm's location overlooking the sea and scenic landscape is revealed.

Instead of erasing differences, they make space for a range of experiences, giving any visitor regardless of handicap the opportunity to engage in physical activities and extend their own boundaries," explains Anders Tyrrestrup, partner at AART architects.



Figure 2.27
Musholm Extension
Source: ArchDaily



MUSHOLM / MULTI-PURPOSE SPORTS HALL / SECTION

Lessons Learnt.

- The design of the activity staircase with landings and recreation zones takes visitors to the top of the plateau where wheelchair users can participate in activities such as trying out the **climbing ladder or the world's first cable lift for wheelchair users.**
- The use of **100 metre 'experience ramp',** that winds its way around the hall, offering a wealth of activity zones and culminating in a viewing room from where Musholm's location overlooking the sea and scenic landscape is revealed.
- The **material usage** at the holiday homes adapt to the landscape and existing buildings and at the same time, **the circular gesture provides shelter in the open landscape and accentuates a sense of community. The interaction with the scenic surroundings is underlined by the consistent use of wood.**

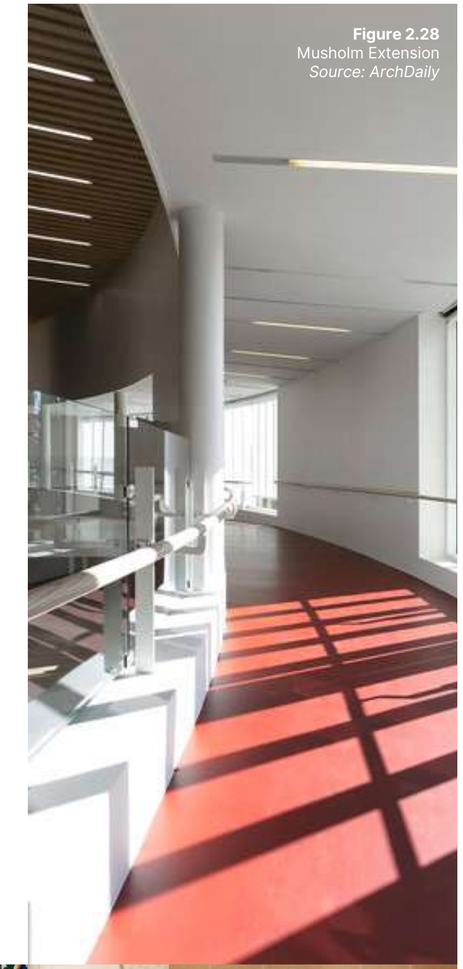


Figure 2.28
Musholm Extension
Source: ArchDaily





Figure 2.29
Ed Roberts Campus
Source: ArchDaily

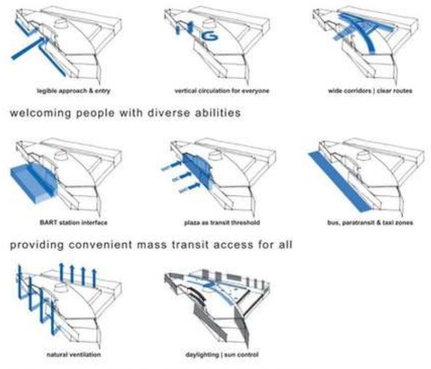
Ed Roberts Campus
Leddy Maytum Stacy Architects

A highly accessible, **centralized place where the disabled can access services such as vocational training, education, housing and benefits assistance, and fitness and health support.** The design far exceeds the accessibility requirements of the Americans with Disabilities Act. At the heart of the building is a monumental helical ramp to the second floor, prominently placed behind the glazed facade facing the main entry plaza.

The two-story building includes offices, exhibition space, community meeting rooms, a childcare center for children with disabilities, a fitness center, job training facilities, and a café. The campus is designed to present a distinct civic presence celebrating the values of its partner organizations, with an exterior materials palette of sandblasted concrete, stucco, and sustainably harvested Ipê wood shade screens. To the east and south, the building's mass responds to the residential scale of the surrounding neighborhood. A semicircular main entry plaza serves as a drop-off and gathering place as well as a transit plaza for bus, tax, bicycle, and BART riders. A subgrade structure provides parking for staff and visitors and connects directly to the BART station concourse via a new public elevator.

Lessons Learnt.

- The concept of **universal design** is implemented in various design elements:
  - The **Monument Helical Ramp:** Located at the center of the building, this monumental helical ramp connects the first floor with the second floor. It is easily accessible and located behind the glass facade facing the main plaza.
  - **Wide Corridors:** The **7-foot wide** corridors make it easy for wheelchair users.
  - **Automatic Doors:** Automatic doors and touchless building system controls.
  - **Accessible Restrooms:** Restrooms designed for a wide range of abilities.
  - **Large Elevators:** Large elevators with special controls for wheelchair users.
  - **Wayfinding System:** Easy-to-follow wayfinding system with the help of acoustic features, high-contrast flooring, and different floor textures.
- Use of **recycled, sustainably harvested, and rapidly renewable materials,** which allows the building to be constructed in an environmentally safe manner.
- **Indoor Air Quality:** Non-toxic finishes and filtered outdoor air circulation to address the needs of individuals with chemical sensitivities.





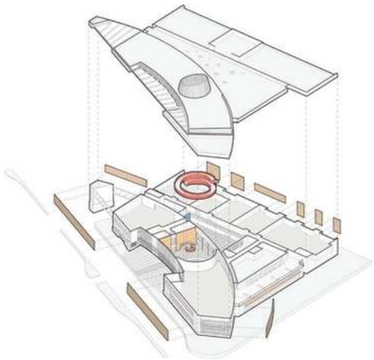


Figure 2.30
Ed Roberts Campus
Source: ArchDaily



Figure 2.30
Our Dream Indonesia
Source: Our Dream Indonesia

Our Dream Indonesia

Located in the Cigadung area of Bandung, Our Dream Indonesia provides a **comfortable atmosphere and cool air, creating an optimal environment** for various activities. A diverse range of learning experiences is offered, categorized into **three main programs: boarding**, where participants stay overnight; **full-day**, which includes a full day of activities; and **half-day**, which focuses on specific additional activities. The approach is based on **three key concepts: Functional**, where **skills are developed to support daily life** according to age, ability, and needs; **Integrated, ensuring all curriculum aspects work together** to optimize children's growth; and **Teamwork, emphasizing collaboration among various parties** as the key to success and consistency in supporting children with special needs.



Lessons Learnt.

- The facilities and spatial functions used are good, but have not applied the principles of universal design as a whole.
- These facilities include:
  - Boarding: Accommodation and full assistance for children with special needs.
  - Learning Classes: Classrooms designed to meet curriculum requirements.
  - Sports Facilities: Physical activities to support children's health and abilities.
  - Individual Therapy: Therapy tailored to each child's specific challenges and needs.
  - Outing: Regular learning experiences combined with environmental and social exposure.
  - Periodic Review: Children's progress reports provided to parents or guardians every three and six months.
  - Additional Routine Activities and Learning: Gardening, health check-ups, swimming, painting, vaccination, cooking, music, multimedia, and field trips.
- There is no texture and control of incoming light to guide and help the visually impaired move independently, or the use of acoustic ceilings to help the deaf.



Figure 2.31
Our Dream Indonesia
Source: Our Dream Indonesia

design *problem* **summary.**

The Inclusive Training & Community Center for Difabled Individuals in Sumur Bandung, Bandung City, addresses the lack of inclusive public spaces and limited career opportunities for people with disabilities, particularly in the context of sustainable waste management. The design focuses on individuals with visual, hearing, speech, and physical impairments, offering a safe, adaptive, and empowering environment through inclusive multi-sensory architecture.

Accessibility is ensured through universal design features such as barrier-free circulation, tactile guides, and assistive-friendly spatial layouts. Inclusive, flexible spaces—such as a sensory garden, upcycling workshop, multi-purpose training room, counseling area, and inclusive café—support skill development, independence, and community engagement. Multi-sensory design elements enrich the user experience, ensuring intuitive, safe navigation.

Rooted in Sundanese ethics (Silih Asih, Silih Asah, Silih Asuh), the center reflects local values while promoting social equity and environmental responsibility. It serves as both a functional facility and a catalyst for inclusive, culturally grounded urban development in Bandung.

03.

design problem **solving**

room **programming.**

user and activity based analysis.

Table 3.1
Room Programming
Source: Author, 2025

No	User	Activities	Room Requirement	Properties
1	Visitors of difable (Movement and Sensory Impaired) and non-difable (volunteers or event participants)	Interacting, socializing, relaxing	Open Sensory Space	Public
2		Holding seminar, discussion, volunteers meeting	Seminar Hall	Semi-Public
3		Crafting, ideating, producing from sorted waste	Workshop room	Semi-Public
5		Displaying, exhibiting, selling products	Gallery	Public
6		Sorting usable waste materials	Waste Sorting Room	Semi-Public
7		Archiving data and files as a public databank	Micro Library	Public
8		Peer to peer support activity, deep-talking	Counseling rooms	Private
10	Management staffs, employees, collaborating NGOs staffs	Managing, administrating, working	Office	Private
11		Internal coordinating, discussion	Meeting room	Private
12		Storing cleaning tools	Janitor room	Private
13		Controlling CCTV	Control room	Private
14		Wastewater treatment	WWTP area	Private
15		Electricity power controlling	Generator room	Private
16	All Users	Serving, sharing information, welcoming visitors	Receptionist	Public
17		Waiting, connecting area	Lobby	Public
18		Storing items and materials	Storage room	Private
19		Praying, worshipping	Mushola	Private
		Refreshments, Business boost	Cafetaria	Public
20		Urinating, defecating, hygienizing	Lavatories for difable	Public
21		Urinating, defecating, hygienizing	Lavatories (for male)	Public
22		Urinating, defecating, hygienizing	Lavatories (for female)	Public
23		Loading, unloading items and connecting areas	Loading dock area	Semi-Public
24		Parking, circulating	Parking area (for car)	Public
25		Parking, circulating	Parking area (for motorcycle)	Public
26		Mobilizing, transferring between floors	Lift	Public
27		Mobilizing, transferring between floors	Ramp	Public

room requirement & characteristic based analysis.

Table 3.2
Room Requirements & Characteristics
Source: Author, 2025

No	Room Requirement	Room Characteristic		
		Generic Users	Movement Impaired Users	Sensory Impaired Users
1	Open Sensory Space	relaxing ambience	circulable mobilizing area	stimulating sensory design elements, facilitating & sociable seating layout
2	Seminar Hall	spacious, acoustic controlled	provisions of wheelchair or crutches inside	textured trail for guide, adequate sunlight
3	Workshop rooms	has multiple compartments, co-learning ambience	adjustable tables and chairs, circulable mobilizing layout	braille and audio devices provided, sunlight control for sight comfort
4	Gallery	open access, spacious and clear users circulation	wheelchair eye-level display, circulable mobilizing area	braille and audio devices, textured trails, sunlight control
5	Waste Sorting Room	connected to loading dock area, sufficient wind circulation ventilated	circulable mobilizing path, hand-rails featured	textured trail for guide, contrasting colors on sorting compartments
6	Micro Library	semi-public access, smooth airflow to keep archives from getting damp	adjustable seating, hand-rails featured	braille and audio devices, textured trails, sunlight control, contrasting colors for shelves and areas distinction
7	Counseling space	private ambience, acoustic soundproofing control	circulable mobilizing path, hand-rails featured	calming & stimulating sensory elements, textured trail for guide, adequate sunlight
8	Office	open office layout for easier coordination, acoustic and sunlight control	adjustable tables and chairs, circulable mobilizing layout	textured trail for guide, adequate sunlight
9	Meeting room	private access, acoustic soundproofing control, tools for presentation	adjustable tables and chairs, circulable mobilizing layout	acoustic and sunlight control for comfortable discussion
10	Cafetaria	has multiple compartments, inviting ambience	circulable mobilizing path, hand-rails featured	braille and audio devices, textured trails, sunlight control
11	Janitor room	organized layout for cleaning tools storing, sufficient wind circulation ventilated	hand-rails featured, reachable shelves, sufficient for wheelchair rotation	textured trail for guide, adequate sunlight
12	Control room	private access, wind circulation and sunlight control	circulable mobilizing path, hand-rails featured	braille and audio devices provided, sunlight control for sight comfort
13	WWTP area	restricted area, utility-focused	sufficient wheelchair rotation area	clear signage with braille provided
14	Generator room	restricted access, safety signage	reachable panels, sufficient wheelchair rotation area	visual and audible warning systems on emergencies
15	Receptionist	strategic placement for easier user flow, welcoming ambience	lowered counter section, easy wheelchair access	braille signage, clear lighting, visual cue systems
16	Lobby	spacious for waiting and moving, high ceiling for wind ventilating	seating with backrest and arm support, wide turning radius	acoustic design to reduce echo, tactile surfaces, visual & braille signage
17	Storage room	access-controlled, wind circulation and sunlight control, adjacent to loading dock	reachable shelves, adequate aisle width	labeled storage with braille, contrasting colors for visibility
18	Mushola	private ambience for focused worshipping, soundproofing acoustic control	sufficient space for wheelchair rotation and praying mat	adequate sunlight control

No	Room Requirement	Room Characteristic		
		Generic Users	Movement Impaired Users	Sensory Impaired Users
19	Lavatories for difable	accessible for all users, clear signage	wide doors, grab bars, space for maneuvering, lower sink	braille signage, non-slip floors, clear lighting
20	Lavatories (for male)	sufficient to facilitate numbers of users, clear signage	-	-
21	Lavatories (for female)	sufficient to facilitate numbers of users, clear signage	-	-
22	Loading dock area	connected access to waste sorting and storage rooms, restricted access	non-slip surface, handrails, ample turning area	textured trail for guide, sunlight control for sight comfort
23	Parking area (for car)	sufficient to facilitate numbers of users, clear flow signage	accessible access from the lot to the building entrance	guiding block usage, clear signage
24	Parking area (for motorcycle)	sufficient to facilitate numbers of users, clear flow signage	wider lane from the generic standard, accessible access from the lot to the building entrance	guiding block usage, clear signage
25	Lift	sufficient to facilitate numbers of users, strategic placement consideration	wide entrance, low button panel, emergency support	audible floor announcements
26	Ramp	sufficient slope ratio, not only functional but also experiential	side rails, non-slip finish	textured surface for guidance

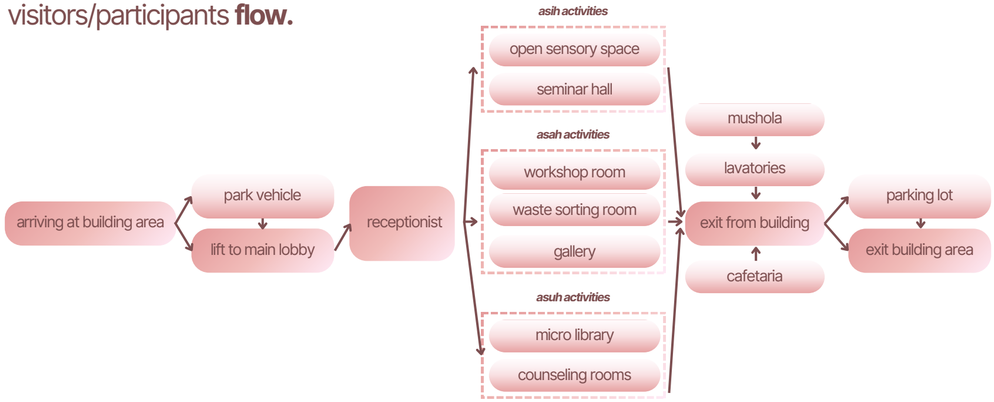
This table outlines the rooms required to support various workshop activities while addressing the specific needs of two main user groups: movement-impaired individuals (wheelchair and crutches users) and sensory-impaired individuals (those with hearing, sight, or speech impairments). Each room is tailored to accommodate accessibility, safety, and comfort—ensuring features such as wide circulation spaces, visual and tactile cues, proper lighting, and low-noise environments. By aligning spatial functions with user needs, the design fosters inclusivity and enables all participants to engage meaningfully in the activities.

user & activity **flow.**

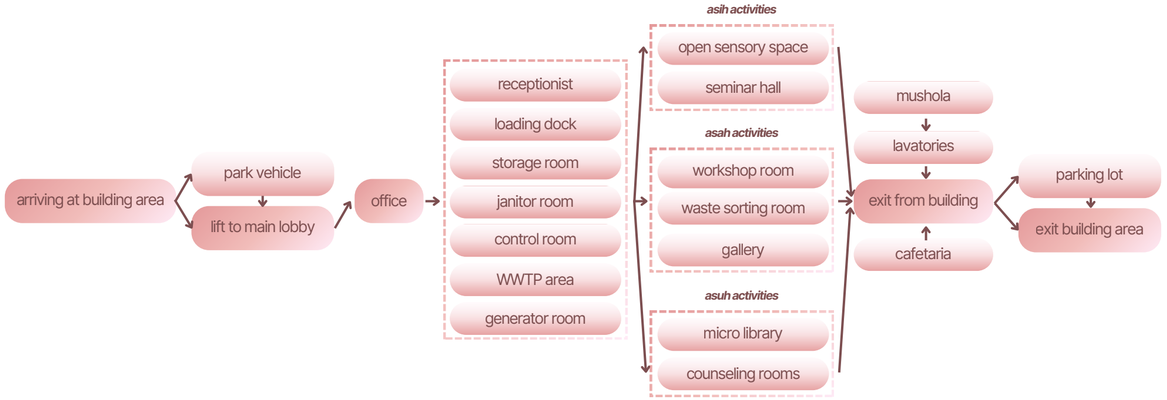
*user **based analysis.***

Figure 3.1
User & Activity Flow
Source: Author, 2025

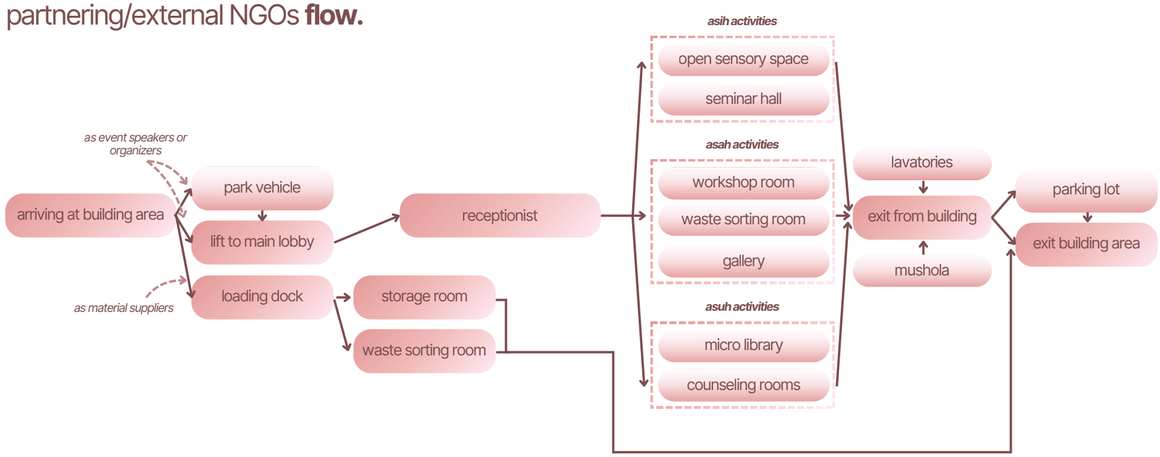
visitors/participants **flow.**



employees & operational staffs **flow.**



partnering/external NGOs **flow.**



design **aspirations & criterias.**

accessible, inclusive, empowering, sustainable.

Exploration of the building mass requires measurable parameters and matrices to determine which form is most suitable and ideal with the design aspirations that have been discussed from the background. Based on initial researches and interviews with the client, there are 4 design aspirations; accessible, inclusive, empowering, and sustainable.

Design Aspirations	Variable	Parameter	Design Criterias
Accessible	Circulation and wayfinding	Ramp gradient, door width, tactile guide paths	**Physical & cognitive accessibility**
	Sensory cues	Braille signage, sound cues, contrasting colors	
Inclusive	Social interaction zones	Shared seating areas, activity nodes, safe environment	**Chance of interaction**
	Cultural expression	Integration of Sundanese elements	**Sense of belonging**
Empowering	Skill-building infrastructure	Workshop rooms, production units	**Skill development programs**
	Independent learning spaces	Resources for empowering	
Sustainable	Waste management	Upcycling activities	**Long-term management**
	Material selection	Use of renewable materials or even upcycled materials	
	Passive design strategies	Natural lighting, cross ventilation	

Table 3.2
Design Aspirations & Criterias
Source: Author, 2025

initial **concept diagram.**

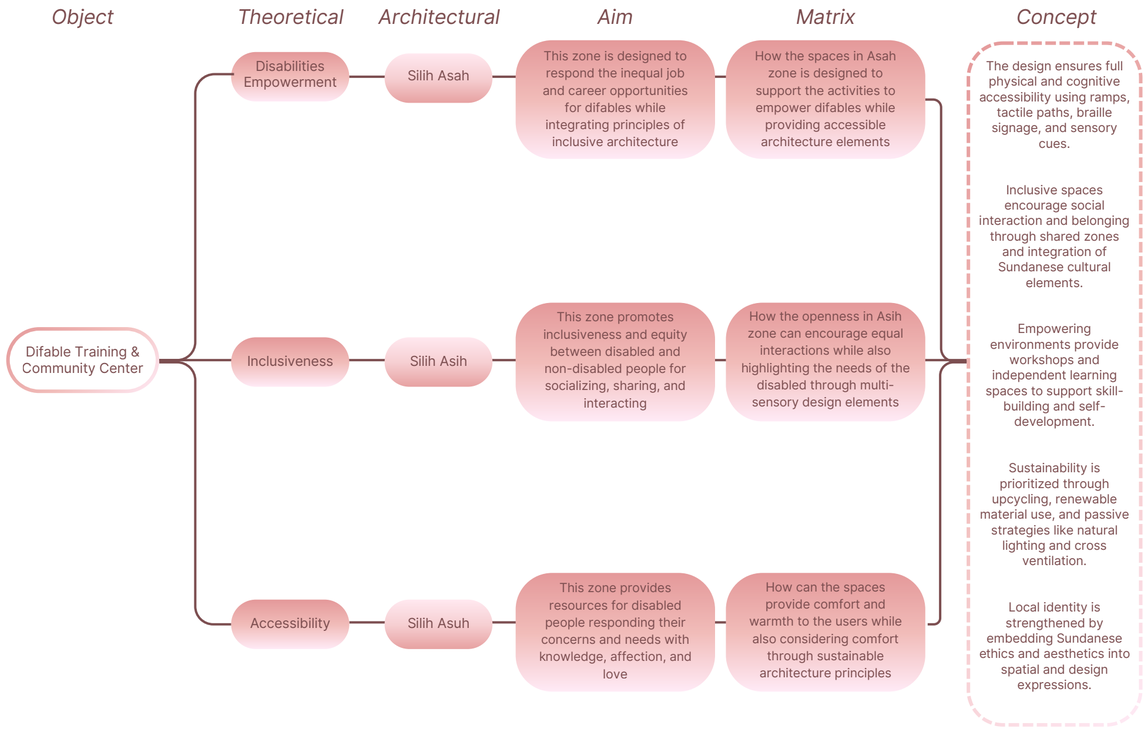


Figure 3.2
Initial Concept Diagram
Source: Author, 2025

design **concept.**
aspects integration ***planning.***



Figure 3.3
Aspects Integration
Source: Author, 2025

This diagram illustrates a design concept integrating inclusive architecture for difable individuals with local spatial principles and Sundanese ethics. It emphasizes sensory-accessible environments and zoning based on sacred to public space divisions (Buana Nyuncung to Buana Larang). It also incorporates structured training programs, inclusive public spaces, and social support, grounded in the values of Silih Asih, Silih Asah, and Silih Asuh. Together, these aspects guide the development of an empowering, culturally rooted difable training and community center.

activities ***conceptual diagram.***

silih
asih.

activities: space for interaction between difable and non-difable.
room required: open sensory garden, multi-purpose hall

silih
asah.

activities: waste management training activities for skill empowerment.
room required: workshop rooms, gallery.

silih
asuh.

activities: supporting and nurturing difable with resources and knowledge.
room required: counseling space, micro library.

The Tri-Silas—Silih Asih, Silih Asah, and Silih Asuh—are Sundanese values emphasizing mutual love, learning, and care. They foster empathy, intellectual growth, and nurturing guidance, forming the moral foundation of a compassionate and interconnected society that values respect, knowledge-sharing, and collective well-being.

design **concept.**
spatial character ***based.***

Rooted in Culture, Designed for Inclusion and Empowerment

Combining Sundanese architecture and culture, the design of the center is inclusive and can empower people with disabilities and answer all their needs both in terms of activities and functionality. This can be seen from 2 things; spatial planning that is based on the cosmological belief of Sundanese architecture, and the provision of activities for users that are in line with the 3 core philosophical moral principles that underlie the interaction and socialization of Sundanese society.

Sundanese Tritangtu-based Spatial Planning Concept

The making of the traditional or vernacular architecture is generally qualified by the cosmological awareness of the people, architecture as the smallest model of cosmological relationships between humans, nature and their creator is made not just a matter of functional space needs, but as a means of devotion to the religiosity of its people.

Sundanese society is synonymous with farmers who cultivate rice on highly contoured land. They have a strong belief in the “supernatural” so that their level of awareness is so high in maintaining the universe and its contents. These conditions directly make Sundanese society a three-pattern society. In the Three Pattern society, harmony occurs with the existence of the middle world as a unifier between the upper and lower worlds. This culture is also seen in traditional Sundanese houses.

The general division of space in Sundanese houses according to Martinus D's research (2011) is divided as follows:

1. Front room, called emper or tepas or golodog.
2. The middle room, called middle imah or patengahan
3. Side room, called pangkeng or room
4. The back room, consisting of: (a) kitchen/pawon, (b) place to store rice/padaringan.

While the architectural structure of the Sundanese house is also divided into three parts, namely:

1. Bottom section (Kolong)
2. Middle part (Patengahan)
3. The upper part (Para/Lalangit)

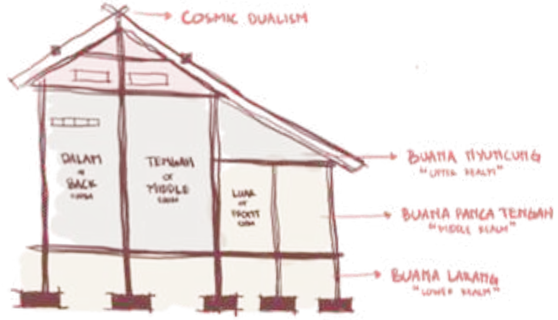


Figure 3.4
Tritangtu Principle
Source: Author, 2025

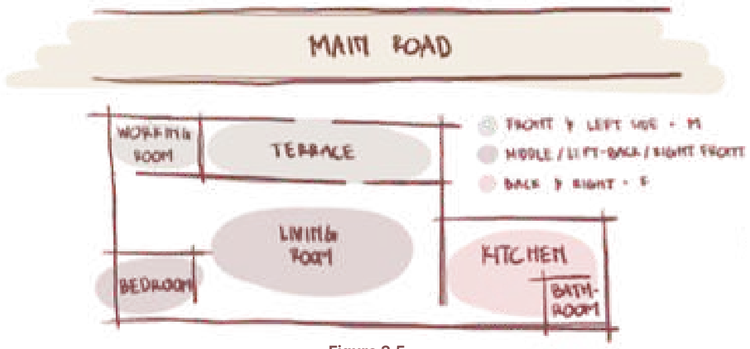


Figure 3.5
Tritangtu Principle
Source: Author, 2025

Traditional Sundanese houses have a spatial division plan that distinguishes the front, back, side and rear areas. The space in front serves to receive guests or interact with the community. The middle room is used as a connecting area that can be accessed by all users but is not as open as the front. The side rooms which are usually used for rooms have more private characteristics, just like the back which is used for internal activities such as cooking, washing, or putting things in the house. Roughly speaking, this is how the implementation of this concept on the selected site looks like.

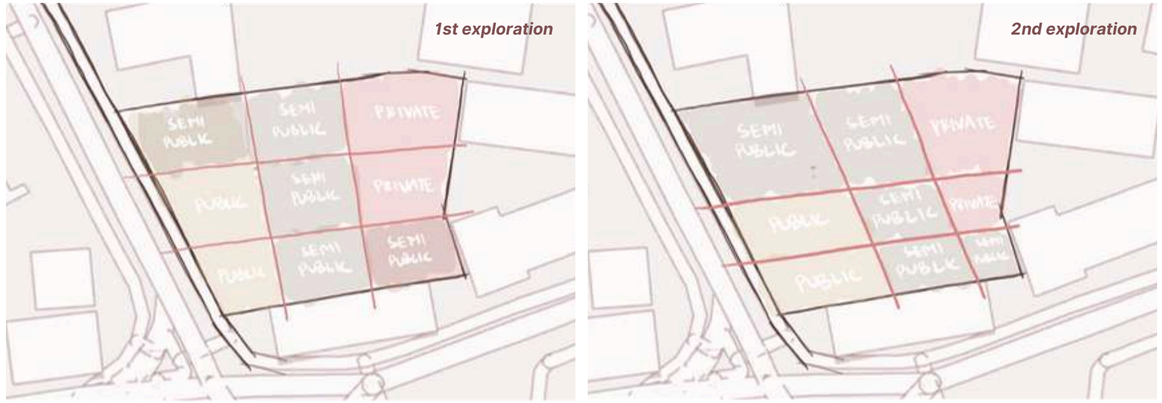


Figure 3.6
Tritangtu Based Zoning Exploration
Source: Author, 2025

Sundanese Trisilas-based Building Function Concept

The Tri-Silas—***Silih Asih, Silih Asah, Silih Asuh***—are **core principles** of Sundanese philosophy that emphasize mutual care, learning, and guidance. These values shape social interactions and community life, reflecting the deep-rooted wisdom of the Sundanese people. The word ***silih***, meaning **"mutual" or "reciprocal",** underscores the transformative nature of these principles, fostering social harmony and interconnectedness. The Tri-Silas serve as moral foundations that guide individuals in building a compassionate, knowledgeable, and nurturing society. (Fathurraziqin & Anita, 2024)



Figure 3.7
Silih Asih
Source: Unsplash

Silih Asih represents **sincere love and affection** among individuals. It encourages people to treat one another with kindness, empathy, and respect, fostering a harmonious and caring community. The value of asih can be implemented in various aspects of life, such as the dedication of an individual to do or behave with sincere affection; a father who works hard to make his family at home happy, or a policeman who works enthusiastically so that the community can live in harmony. In achieving the goal of a harmonious life, the value of asih is indispensable because each individual has their own perceptions and beliefs so that it requires equalizing perceptions between one party and another, this is where the value of asih can also be seen.

Function	Publicity	Space	Standard	Unit	Capacity	Quantity	Subtotal	Circulation	Total Area
Asih	Public	Open Sensory Space	4.0	m2/per person	100	1	400	20%	480
	Semi-Public	Seminar Hall	3.0	m2/per person	60	1	180	20%	216
	Public	Lobby	3.0	m2/per person	30	1	90	20%	108
	Public	Receptionist	4.0	m2/per person	6	1	24	20%	28.8
				Total					**832.8**

Table 3.4
Silih Asih Room Programming
Source: Author, 2025

Figure 3.8
Silih Asah
Source: Unsplash



02
silih asah.

Silih Asah emphasizes the importance of **mutual learning and intellectual growth,** where individuals exchange knowledge, broaden their perspectives, and enhance both cognitive and spiritual wisdom. This principle reflects the Sundanese belief in lifelong learning and the continuous improvement of human qualities. Aspects that illustrate the value of asah can be seen from how a person has a vision of life and vision of their respective missions, or when there is an addition of knowledge as a tool to reach their goal. Asah supports individuals to think creatively and innovatively in order to develop knowledge either personally or in general. According to Fathurraziqin & Anita (2024), the value of asah also means that it does not deny the need for funds. For example, in community life, there are individuals who attend paid school activities to gain knowledge and share knowledge with each other.

Function	Publicity	Space	Standard	Unit	Capacity	Quantity	Subtotal	Circulation	Total Area
Asah	Semi-Public	Workshop Area	4.0	m2/per person	20	1	80	20%	96
	Semi-Public	Waste Sorting Room	4.0	m2/per person	10	1	40	20%	48
	Private	Office	4.0	m2/per person	20	1	80	20%	96
	Private	Meeting room	3.0	m2/per person	10	1	30	20%	36
	Semi-Public	Loading dock area	3.0	m2/per person	10	1	30	20%	36
				Total					**312**

Table 3.5
Silih Asah Room Programming
Source: Author, 2025

Table 3.6
Silih Asuh Room Programming
Source: Author, 2025

Figure 3.9
Silih Asuh
Source: Unsplash



03
silih asuh.

Silih Asuh embodies the act of **guiding and nurturing others** with patience and care. It entails leadership, protection, and support to help individuals achieve collective well-being. (Alhafizh et al., 2021) Asuh symbolizes equality; every individual has the same level or position and is not differentiated. For example, in society, all individuals are entitled to human rights and protection of their human rights. Asuh also means justice or refers to the ability to value the qualities of one individual with those of another. In addition, asuh means the kindness and sincerity of an individual's heart towards others, in helping others for example.

Function	Publicity	Space	Standard	Unit	Capacity	Quantity	Subtotal	Circulation	Total Area
Asuh	Public	Micro Library	4.0	50	1	200	20%	240	50
	Private	Counseling room	3.0	2	3	18	20%	21.6	2
	Public	Gallery	4.0	30	1	120	20%	144	30
	Public	Cafetaria	4.0	20	1	80	20%	96	20
	Public	Parking area (for car)	18.0	17	1	306	20%	367.2	17
	Public	Parking area (for motorcycle)	3.8	60	1	228	20%	273.6	60
	Private	Mushola	2.0	10	1	20	20%	24	10
	Public	Lavatories for difable	4.0	1	4	16	20%	19.2	1
	Public	Lavatories (for male)	19.5	5	4	390	20%	468	5
	Public	Lavatories (for female)	16.0	5	4	320	20%	384	5
	Private	Nursery room	3.0	2	2	12	20%	14.4	2
	Public	Lift	4.0	15	1	60	20%	72	15
	Public	Ramp	20.0	5	1	100	20%	120	5
				Total					**2244**

To complement the main functions of the building, several additional service rooms are needed to support building operations and maintenance, such as:

Function	Space	Standard	Unit	Capacity	Quantity	Subtotal	Circulation	Total Area
Services	Storage room	3.0	m2/per person	4	1	12	20%	14.4
	Janitor room	3.0	m2/per person	1	2	6	20%	7.2
	CCTV & Control room	4.0	m2/per person	5	1	20	20%	24
	WWTP area	3.0	m2/per person	4	1	12	20%	14.4
	Generator & Chiller room	3.0	m2/per person	2	1	6	20%	7.2
	Electrical Room	3.0	m2/per person	2	1	6	20%	7.2
	Panel & Trafo Room	3.0	m2/per person	2	1	6	20%	7.2
	Condensation room	2.0	m2/per person	2	1	4	20%	4.8
			Total					**86.4**

Considering the total numbers of disabled people from the previous calculation, the building will be able to accommodate **200 visitors** of disabled and non-disable people**.** More specific details can be seen from the table by differentiating the types of activities which is based of tri-silas philosophy.

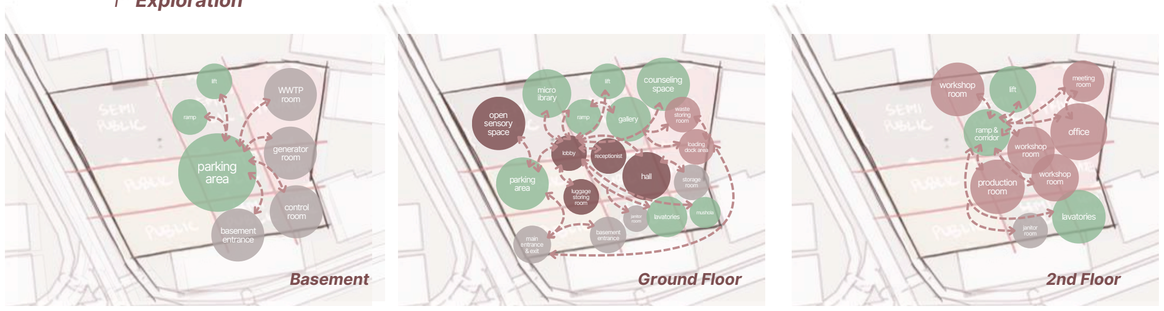
Function	Total Area (m2)
Asih	832.8
Asah	312
Asuh	2244
Services	86.4
Total	**3475.2**

Table 3.7
Room Programming
Source: Author, 2025

implementation on zoning **exploration.**

By considering and combining the two philosophical and cosmological concepts of traditional Sundanese architecture, further space exploration was conducted. There are several alternatives that can meet the criteria of the needs and characteristics of each room, both from the level of publicity and activities that will occur in the room.

1st Exploration



This exploration focuses on the functional spaces within the building, while the parking lot and open sensory spaces share the front of the building. This circulation is **good for the mobility** of disabled users as they get off the vehicle. However, this configuration of the public open space for both disabled and non-disabled users.

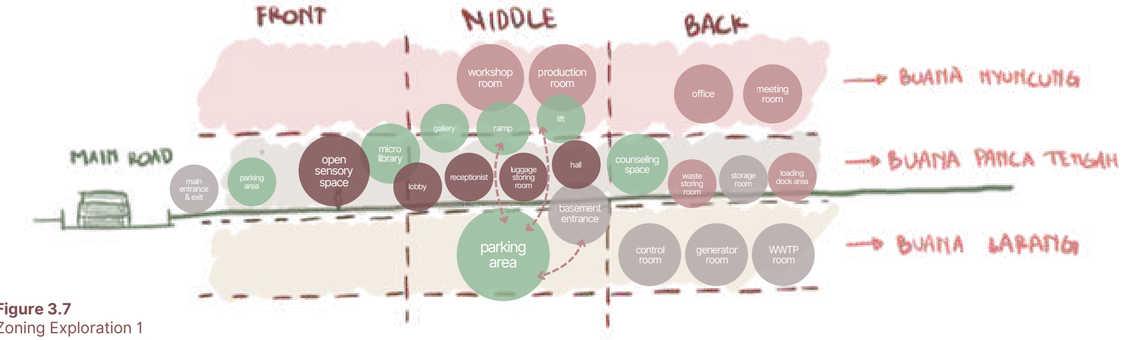
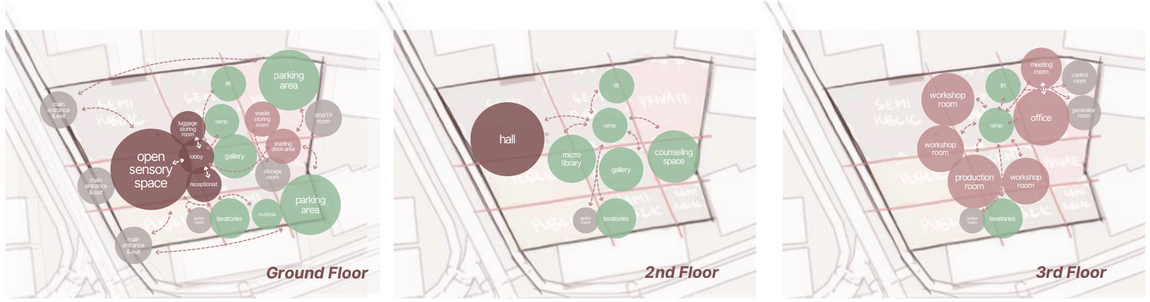
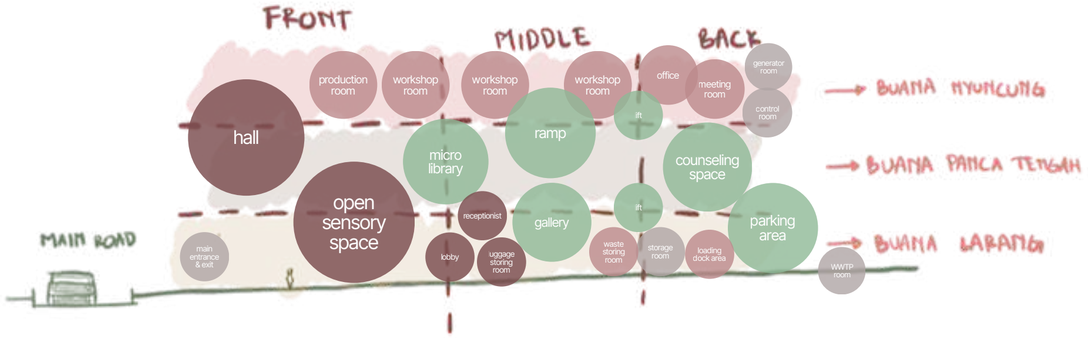


Figure 3.7
Zoning Exploration 1
Source: Author, 2025

2nd Exploration



Asih Zone Asah Zone Asuh Zone Services

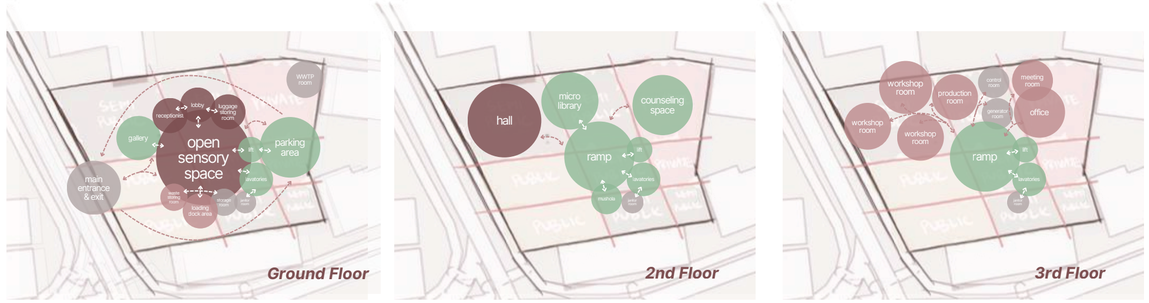


The second exploration depicts the main activities centered on the open sensory space. This **promotes the value of being inclusive and inviting** to users as there is no boundary between the roadway and the building inside. In addition, the **ramp** not only serves as a mobility facility, but also provides **a multi-sensory experience** for users.

Figure 3.8
Zoning Exploration 2
Source: Author, 2025

3rd Exploration

The third exploration emphasizes the center of activity in the open public space as well, but the difference is that the space is configured right in the middle of the building, as the central point of user circulation when wanting to access various rooms in the building. This circular configuration will create a sense of enclosure throughout the building, contrary to the narrative of inclusivity which tends to mean that there are no boundaries above black and white.



Asih Zone Asah Zone Asuh Zone Services

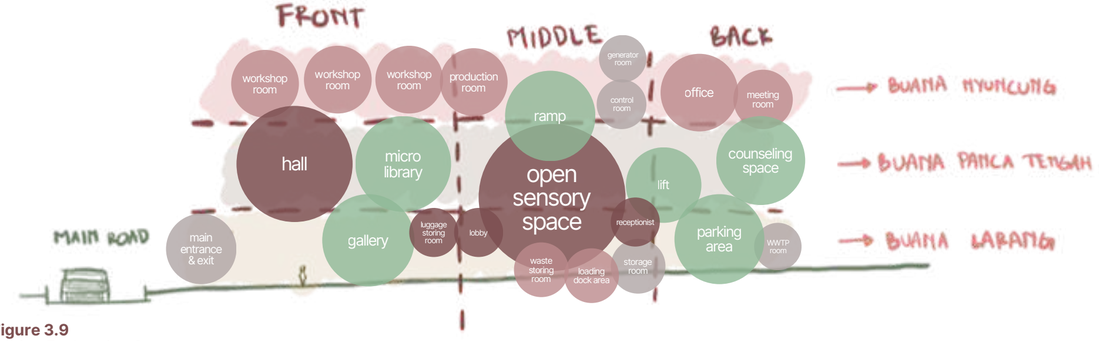
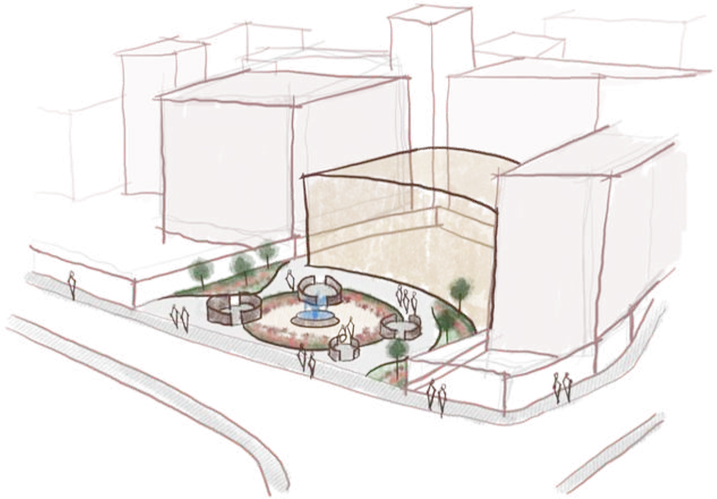


Figure 3.9
Zoning Exploration 3
Source: Author, 2025

design **concept.**

Inclusive Architecture-Based Principles

open **& inviting space.**

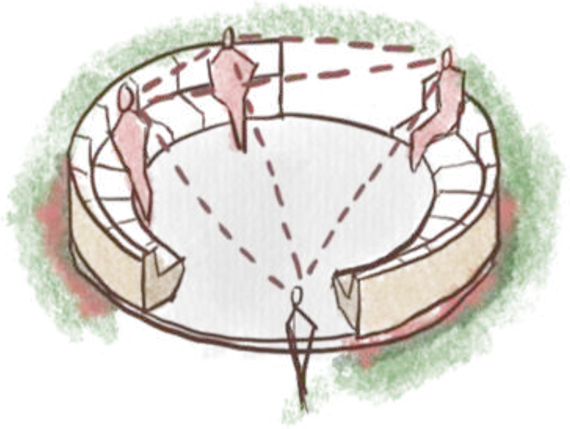


As public spaces around the world continue to evolve, architecture plays an increasingly central role in shaping how communities connect, reflect, and create shared meaning. Nowadays, disability is viewed no longer as a (physical or mental) characteristic of the individual, but as resulting from the interaction between individual and unadapted (social or physical) environment. The open and inviting space will encourage people to come and interact with each other inside the space. Such spaces also break down the boundaries that exist between disabled and non-disabled users, as they have a shared space without any stigma or bad perception for either party.

The urban setting of the site also emphasizes the urgency of using the concept of open and inviting spaces. Sidewalks that are already accessible and inclusive can support an open ambience. With this concept, the ramp directly connected to the outside of the design area becomes a connector between the two spaces, leading to the area on the 2nd floor which is also an open sensory space. This kind of sloping roofscape invites public access and offers expansive city views of Bandung city.

Figure 3.10
Open Space Concept
Source: Author, 2025

difable-friendly **seating area.**



Based on the behavior of users with disabilities when they interact and socialize, the shape of the place and space also affects their comfort. Linear seating layout will complicate communication between one speaker and the other because they cannot see each other, nor hear the sound that is reflected and centered in the middle. So this design concept uses a circular shape where all users, regardless of impairment can hear and see their interlocutors comfortably. This configuration avoids users from having their voices scattered when communicating, especially if the background noises are busy considering the site is located in the middle of the city and directly connected to the highway.

This circular configuration also has no elevation difference, so wheelchair users can also use this public space. The circular line is also broken in the middle on both sides to emphasize a public and inclusive feel where all users can use it without exception.

Figure 3.11
Circular Seating Concept
Source: Author, 2025

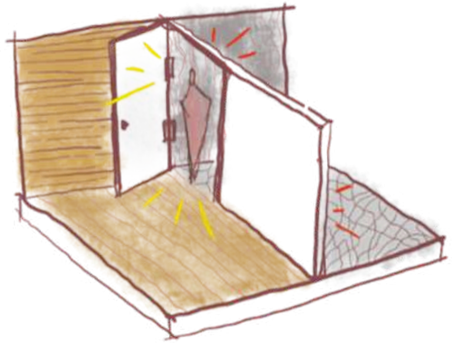
design **concept.**

Multi-Sensory Architecture-Based Principles

In haptic and tactile perception, the stimuli rely on material (texture, temperature, density) and space characteristics (form, place, orientation, length). We can sensate the haptic actively (active touching), passively (tactile touch or being touched without any preceding action) or dynamically (touch by means of a tool). With tactile materials, users can move very easily from one tactile point in the building to the other. Like this they'll never be on a place where you won't know where they are in the building.

active **haptic.**

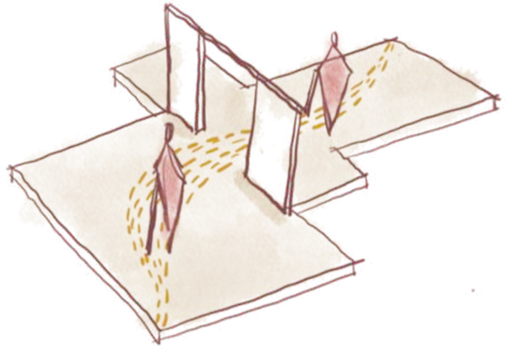
Material Transition Between Spaces.



The use of different materials can give a different impression of space in terms of texture, temperature, and characteristics. For example, the use of concrete material gives a cold and firm impression, in contrast to the opposite where wood gives a warm and homey impression. In contrast to stone which gives a strong and hard impression, glass and other transparent materials give the impression of a smooth, borderless space and connect two different spaces.

Figure 3.12
Material Transition Concept
Source: Author, 2025

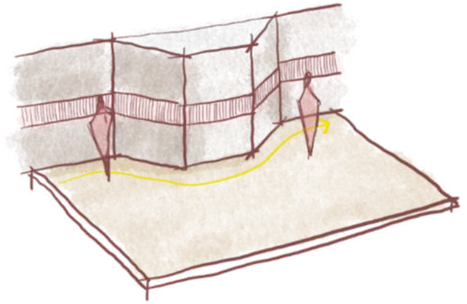
Pattern as Guiding Path.



In addition to the use of conventional guiding blocks, another way to create a guide for users with disabilities is to use tactile patterns that guide users to move from one space to another. This concept also helps users to recognize the spaces and paths through the building. Materials that are embossed, textured, and contrasting in color but not dangerous are suitable for the implementation of this design concept. Such a concept also adds to the aesthetic value of the design elements.

Figure 3.13
Pattern as Path Concept
Source: Author, 2025

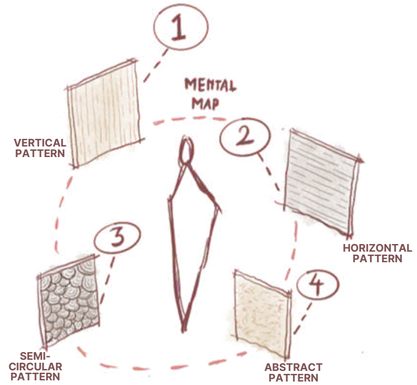
Trail Rail.



Trail rails with textured materials integrated along walls serve as active haptic guides in multisensory architecture. By intentionally touching these surfaces, users—especially those with sensory impairments—can navigate corridors and rooms with greater confidence. The unique textures help form spatial memory and orientation through touch, offering cues about direction or transitions between zones. This tactile system enhances independence while adding a functional design element that supports inclusive and intuitive movement within the built environment.

Figure 3.14
Trail Rail Concept
Source: Author, 2025

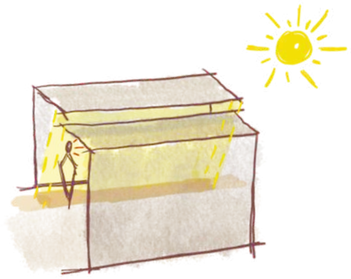
Distinctive Patterns on Material Surfaces.



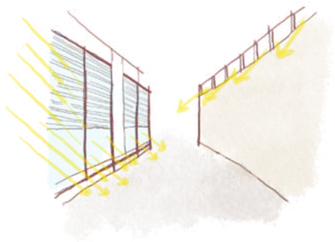
Different patterns on embossed textures—such as vertical, horizontal, semi-circular, or abstract forms—can help users identify and distinguish spaces through touch. These tactile cues support users, especially those with visual or sensory impairments, in understanding spatial context and orientation. Each pattern can signal a specific function or transition within the environment, creating a non-visual language that enhances wayfinding, accessibility, and the overall sensory richness of the architectural experience.

Figure 3.15
Distinctive Patterns Concept
Source: Author, 2025

Lighting.

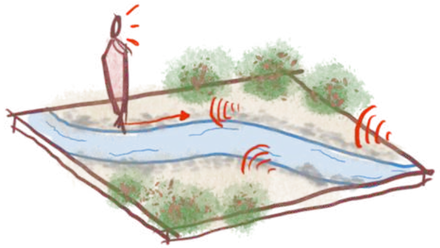


A ceiling design with linear skylights allows natural sunlight to stream in, creating a subtle directional guide within the space. The changing intensity and angle of light throughout the day help users intuitively sense orientation and movement. This use of natural light enhances spatial awareness while also bringing warmth and visual rhythm to the interior environment. It merges functionality with aesthetic appeal in an inclusive architectural approach.



Natural lighting enters from both the top and bottom, while a secondary skin at the center acts as a filter to reduce glare. This design enhances visual comfort, especially for users with sensory impairments, by softening harsh light and creating a balanced, inclusive lighting environment.

Sound.



Natural sounds can stimulate users' sensory perception and enhance spatial experience. The sound of flowing water and the gentle rustling of grass create a calming, immersive atmosphere that supports emotional well-being and orientation, especially for individuals with sensory impairments. These elements introduce a soothing rhythm and connection to nature within the built environment.

Figure 3.16
Lighting as Path Concept
Source: Author, 2025

Figure 3.17
Lighting Concept
Source: Author, 2025

Figure 3.18
Sound as Guide Concept
Source: Author, 2025

Vegetation.

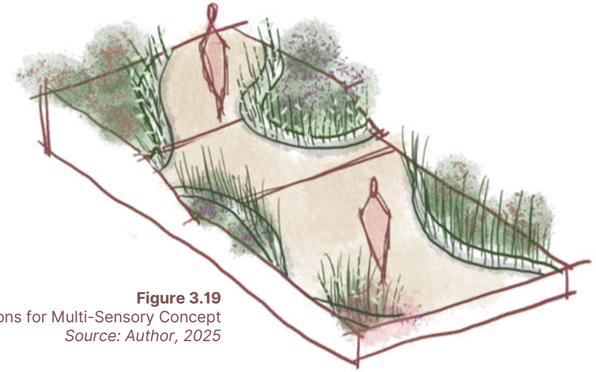


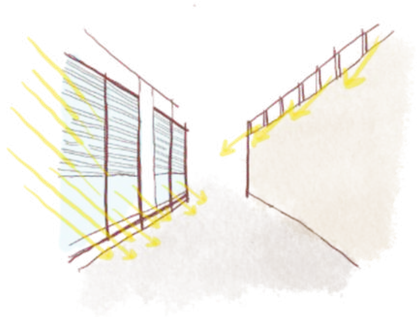
Figure 3.19
Sensory Vegetations for Multi-Sensory Concept
Source: Author, 2025

Various types of vegetation are planted along pathways to serve as natural guides while stimulating the senses. Grouped based on their light and wind needs, the plants create a sensory-rich environment. Users can explore the space through passive haptic strategies, experiencing different textures, scents, and spatial cues simply by walking past the greenery.

Senses	Plants	Type
Smell	Lavender, Rosemary, Agastache, Bee Balm	Aromatic herbs and flowers
Touch	Lamb's Ear, Lavender	Soft-textured and velvety-leaved plants
Hear	Rustling leaves of tall grass	Sound-responsive ornamental grasses

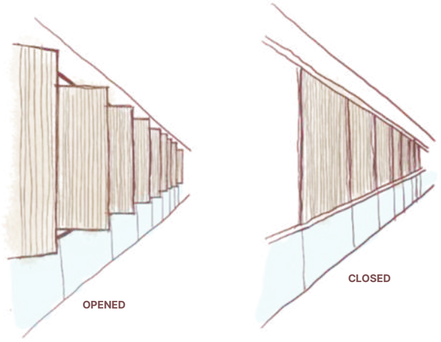
Table 3.8
Types of Vegetation
Source: Author, 2025

Building Opening & Envelope Schematic Concept



The building corridor features openings on both sides, creating a well-ventilated and naturally lit space. The right side consists of floor-to-ceiling glass walls, softened by a secondary skin that filters direct sunlight. On the left, higher-placed openings allow daylight to enter without causing glare, ensuring visual comfort for users. This thoughtful arrangement balances openness and protection, enhancing user experience through controlled lighting and a strong indoor-outdoor connection.

Figure 4.10
Building Opening Concept
Source: Auhor, 2025



The building envelope features a flexible secondary skin installed on east- and west-facing openings. Designed to adapt to changing sunlight conditions, this adjustable layer allows users to control the amount of light entering the building. By reducing heat gain and glare during peak sun hours, it enhances indoor comfort while maintaining a strong visual connection to the outside. This system supports energy efficiency and spatial adaptability throughout the day.

Figure 4.11
Building Envelope Concept
Source: Auhor, 2025

Sundanese Expression: Building Envelope

The Kawung motif consists of four ellipses (often forming a cross or diamond shape) that radiate from a center. This radiating symmetry is more than just an aesthetic choice — it mirrors the idea of interconnectedness and reciprocity among individuals within a society.

The Kawung motif, with its symmetrical and repeating oval shapes, reflects the Sundanese philosophy of “silih asah, silih asih, silih asuh”—mutual learning, compassion, and care. Each element in the pattern symbolizes how individuals in a community support one another intellectually, emotionally, and morally. The balanced geometry represents harmony, unity, and ethical discipline, aligning with Sundanese values of living in peace with others and nature. Kawung thus becomes more than decoration—it’s a visual embodiment of communal ethics and spiritual balance in Sundanese culture.

The implementation of patterns as secondary skins and railings will give a strong Sundanese feel to the building's visuals, adding design value in response to local elements and a sense of belonging for its users.

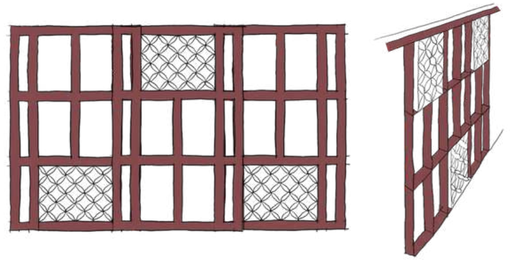


Figure 4.12
Railing with Kawung Pattern
Source: Auhor, 2025

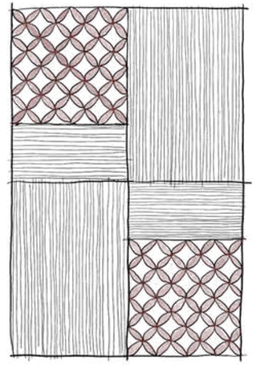


Figure 4.13
Secondary Skin with Kawung Pattern
Source: Auhor, 2025

design **concept.**

Workshop Activities for Empowerment.

By integrating thoughtful architectural design with carefully planned programming, the design prioritizes not only functionality but also dignity and empowerment for its users. Waste management is strategically incorporated as a key component, promoting sustainability and environmental responsibility within the community. This space serves as a hub for learning, collaboration, and innovation, fostering open dialogue and supporting independence for people with disabilities. Ultimately, the center seeks to enrich the broader cultural landscape by championing inclusivity and social progress.

No	Room	Activities	Equipments
1	Fabrication & Assembly Room	- Sewing tote bags, making accessories (textile & e-waste) - Crafting with packaging waste (plastic wrappers, cardboard, food packaging) - Disassembling small electronics for decorative items	- Disability-friendly **sewing machines** (hand-pedal/auto) - **Overlock machines** - Fabric pressing tools - Soldering kits, wire cutters, small pliers - **Modular workbenches** (adjustable height)
2	Heavy Material Room	- Processing concrete scraps and sawdust - Mixing scented concrete using textile waste - Creating molds for upcycled products	- **Mold stations** and **drying racks** - Sawdust and fabric aggregate storage - Hand tools for shaping and finishing - Vibration dampening **mats**
3	Plastic Processing & Melting Room	- Cutting and pressing PET bottles - Heat-pressing plastic waste - Melting used cooking oil into candles	- PET bottle cutters - **Plastic press machine** - **Heat press machine** - **Electric stove and heat-resistant pans** - Candle molds, fragrance oils

Table 3.9
Workshop Activities Concept
Source: Author, 2025

fabrication & **assembly room.**

This room supports creative reuse of textile and e-waste through sewing, crafting, and disassembly activities. It is equipped with disability-friendly sewing and overlock machines, fabric pressing tools, and soldering kits. Adjustable modular workbenches enhance accessibility and comfort. The room is ideal for making tote bags, accessories, and decorative items using packaging waste and small electronics.

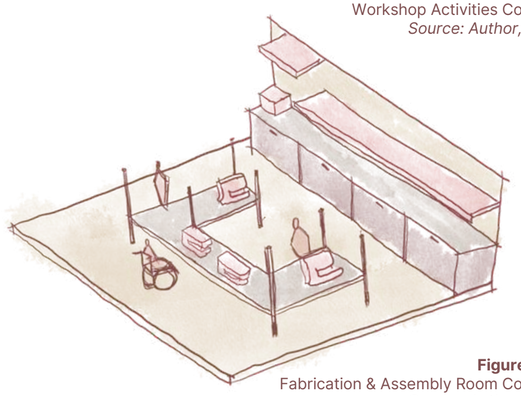
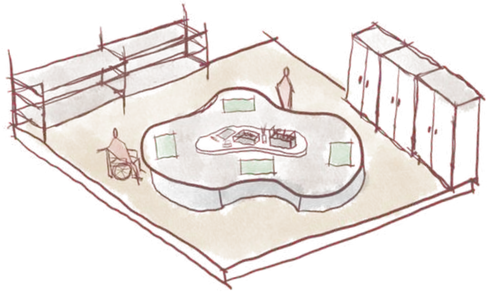


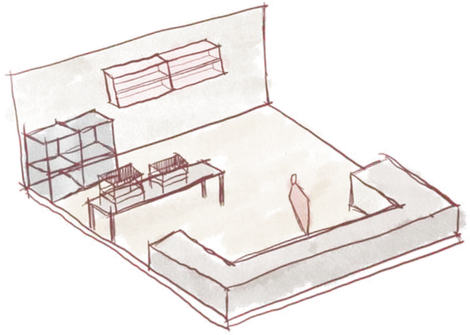
Figure 3.23
Fabrication & Assembly Room Concept
Source: Author, 2025

heavy **material room.**



Designed for processing tougher materials, this room focuses on concrete and sawdust reuse. Activities include mixing scented concrete with textile waste and crafting molds for upcycled products. Equipped with mold stations, drying racks, and vibration-dampening mats, it also stores aggregates and provides hand tools for shaping. It's ideal for sustainable building material experimentation.

plastic **processing & melting room.**



This room handles plastic and oil-based waste transformation. Activities include cutting and pressing PET bottles, heat-pressing plastic, and melting used cooking oil into candles. Equipped with plastic and heat press machines, PET cutters, and electric stoves with heat-resistant pans, it supports safe and innovative upcycling. Candle molds and fragrance oils are also available for product customization.

Figure 3.24
Heavy Material Room Concept
Source: Author, 2025

Figure 3.25
Plastic Processing & Melting Room Concept
Source: Author, 2025

04.

design analysis & **respond**

design **exploration.**

1st Exploration

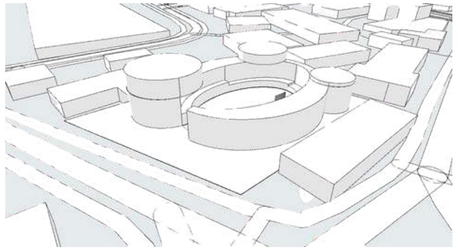
The exploration features a clear and spacious open sensory space that **offers an inviting ambience, encouraging interaction and relaxation.** Its design promotes a warm, welcoming atmosphere ideal for communal activities. However, the **structure suffers from a bulky mass that overwhelms its surroundings**, with interior layouts that limit user engagement and comfort. Additionally, the **ramp**—though present—**lacks functional integration,** restricting accessibility and failing to support inclusive movement throughout the space.



Figure 4.1
1st Exploration
Source: Author, 2025

2nd Exploration



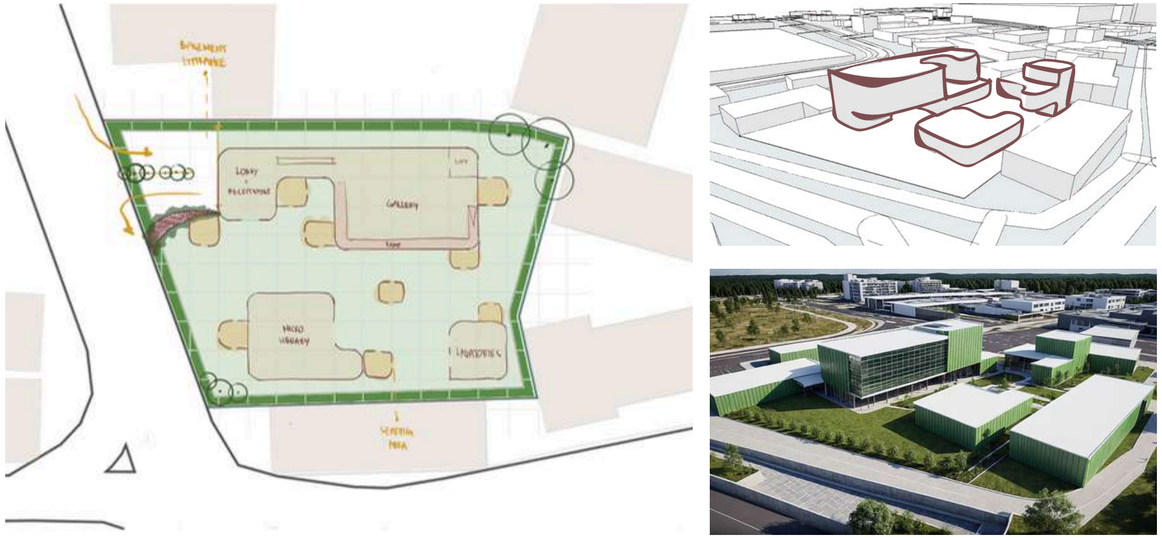




This exploration has its building centers its activities around a **lively courtyard, fostering community interaction and natural light flow.** A monumental helical ramp serves as a striking architectural feature, offering a dynamic spatial experience. However, the **overall mass of the building feels imposing**, creating a sense of heaviness. Additionally, the **secluded entrance diminishes the sense of openness and inclusivity**, making the approach feel less welcoming and potentially hindering accessibility for a broader range of users.

Figure 4.2
2nd Exploration
Source: Author, 2025

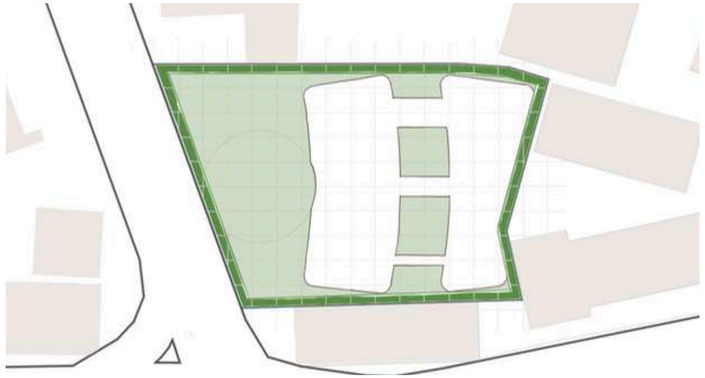
3rd Exploration



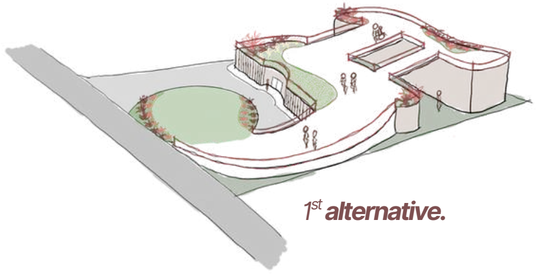
The exploration presents strong potential for lifted open spaces and innovative façade technology, complemented by **generous open and green areas** that enhance environmental quality. These features suggest a forward-thinking, sustainable design. However, the space and form feel indifferent, **reducing its sense of inclusivity and user connection**. The ramp offers limited functionality, and **numerous corners constrain movement**, making navigation less intuitive and potentially challenging for users with mobility needs.

Figure 4.3
3rd Exploration
Source: Author, 2025

4th Exploration



This exploration **promotes independence** by **encouraging users to explore and discover their surroundings**, helping them build a mental map of the space. Varying widths, volumes, and light qualities on each side guide movement and stimulate spatial awareness. The use of **circular gestures fosters a sense of community and inclusion.** The spacious front part of the building can be used for the open multi-sensory space with no boundaries with the outside of the building.



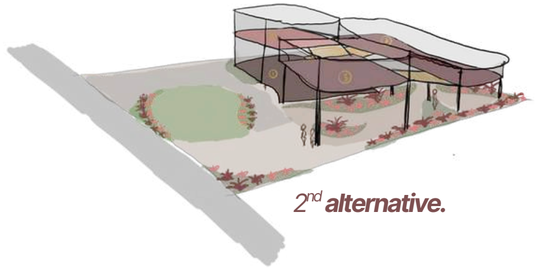


Figure 4.4
4th Exploration
Source: Author, 2025

AI **exploration.**

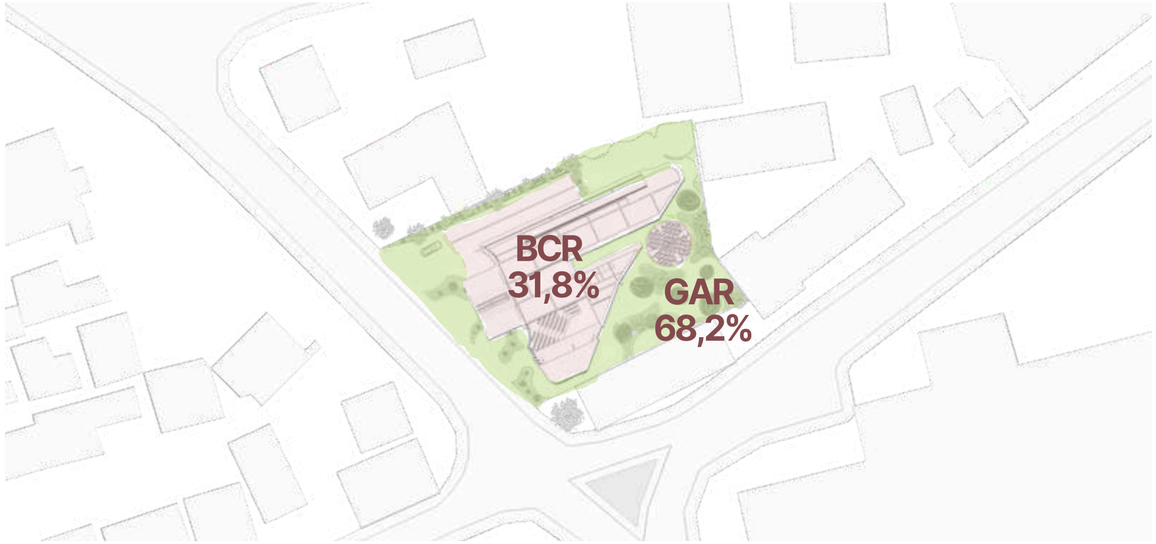


Using AI, the fourth exploration was entered into the prompt. The prompted image was in an urban setting, with an open green space at the front of the building, as well as an area directly connected to the outside street or pedestrian.

Figure 4.5
4th Exploration AI Generated Images
Source: PromeAI, 2025

property **size.**

according to Bandung City Regional Regulation 5 of 2022 about Bandung City Regional Spatial Plan Year 2022-2042



Total Area: 3240 m2 **BCR: 1030 m2=31,8% (max 60%= 1944 m2)** **GAR: 1779 m2=68,2% (more than 20%)**

General provisions **of zoning of public facility areas and social facilities**

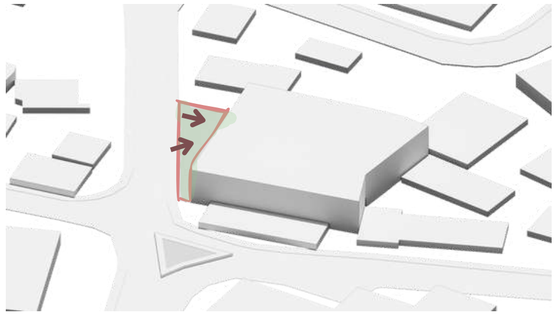
BCR	FAR	GAR	Setback
60%	2.4	20%	2m
maximum for low-rise buildings which is at most 3 (three) floors	or 3 (three) times the BCR value	minimum for low-rise buildings which is at most 3 (three) floors	for buildings facing a local or neighborhood street

Figure 4.6
Regulatory Compliance Diagram
Source: Auhor, 2025

massing **concept.**

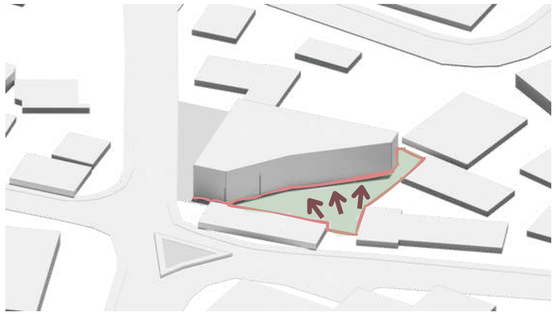
Mass Transformation.

The building massing considers several aspects of the design, including: direct connection and access to the pedestrian, reponding to the wind and sun direction, as well as complying with the regulations.The triangular shape developed from the building mass is also a response to the local context, namely the existing site located at a road intersection, creating a curved shape that is in harmony with the shape of the roads near the site.



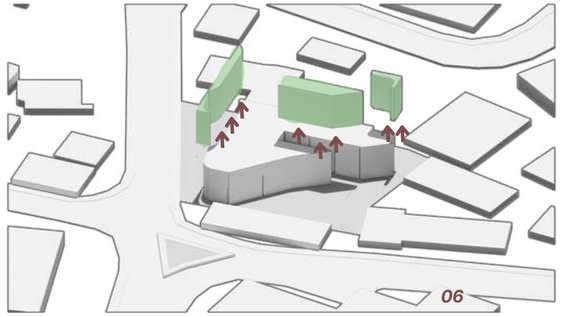
01

Existing Site
Making open space at front to create an inviting ambience of the building



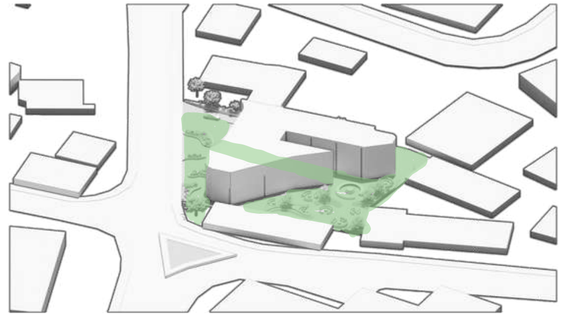
02

Site Analysis Response
Pulling 2m on every side for setbacks and apply the direction of wind and sunlight



03

Cutting the Mass
Adjusting to each room's needs for building enclosure, and to reduce the bulkiness

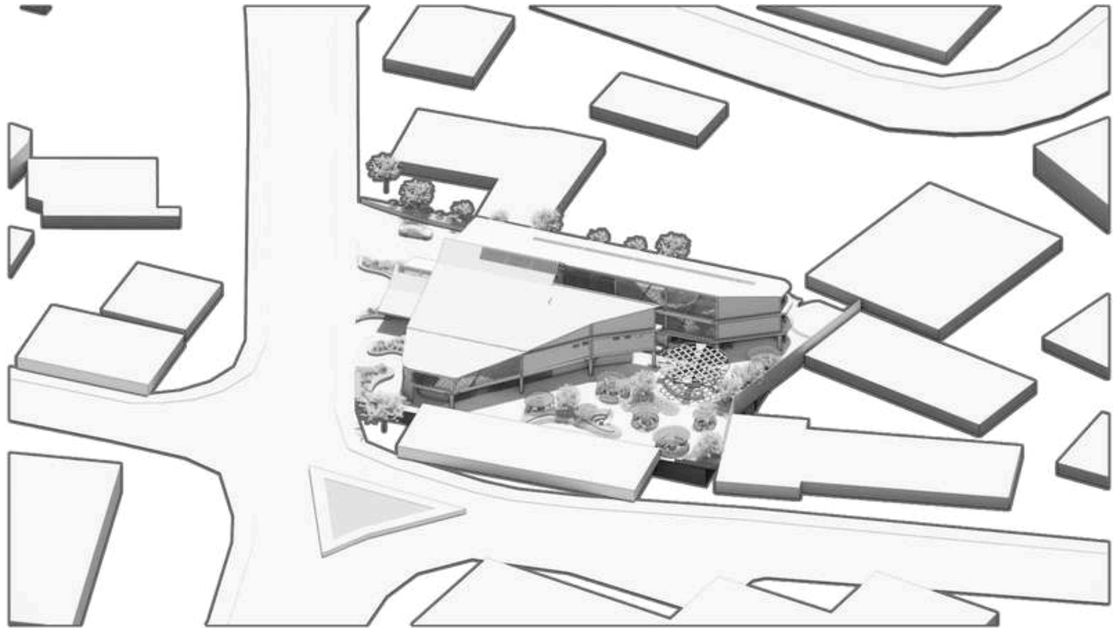


04

Landscape Spatial Planning
Increase the inclusiveness by creating seamless connection and transition between indoor and outdoor (landscaping) area at the back of the building.

Figure 4.7
Building Mass Transformation Diagram
Source: Auhor, 2025

Figure 4.7
Building Mass Transformation Diagram
Source: Auhor, 2025



05

Adding building enclosure and envelope
Taking the site response considerations into account.

design **description.**

05.

zoning **response.**

Tritangtu-Based Spatial Planning

From this section, it can be seen that the rooms that are on **public-level** activities – gallery, micro library, and open sensory space, are located on the **ground floor.** Reflected as the **Buana Larang** level. This placement supports the idea of **promoting inclusivity**, where all users, both disabled and non-disabled people, can **interact and love each other** openly with no differentiations.

Rooms with **Semi-public** ambience – Workshop area & seminar hall, are located on the **2nd floor** as well as in the **Panca Tengah** section, as a representation of the interconnection between public and private parts, in accordance with the philosophy of Sundanese architecture.

Whereas rooms with **private** activities – counseling rooms, office, & meeting room are placed on the **third floor** or **Buana Nyuncung**, which represents Female and Privacy. This is because the activities held there require a focused ambience and minimal distractions, and have exclusive access for certain users only.

Buana Nyuncung
"PRIVATE"

Buana Panca Tengah
"SEMI-PUBLIC"

Buana Larang
"PUBLIC"

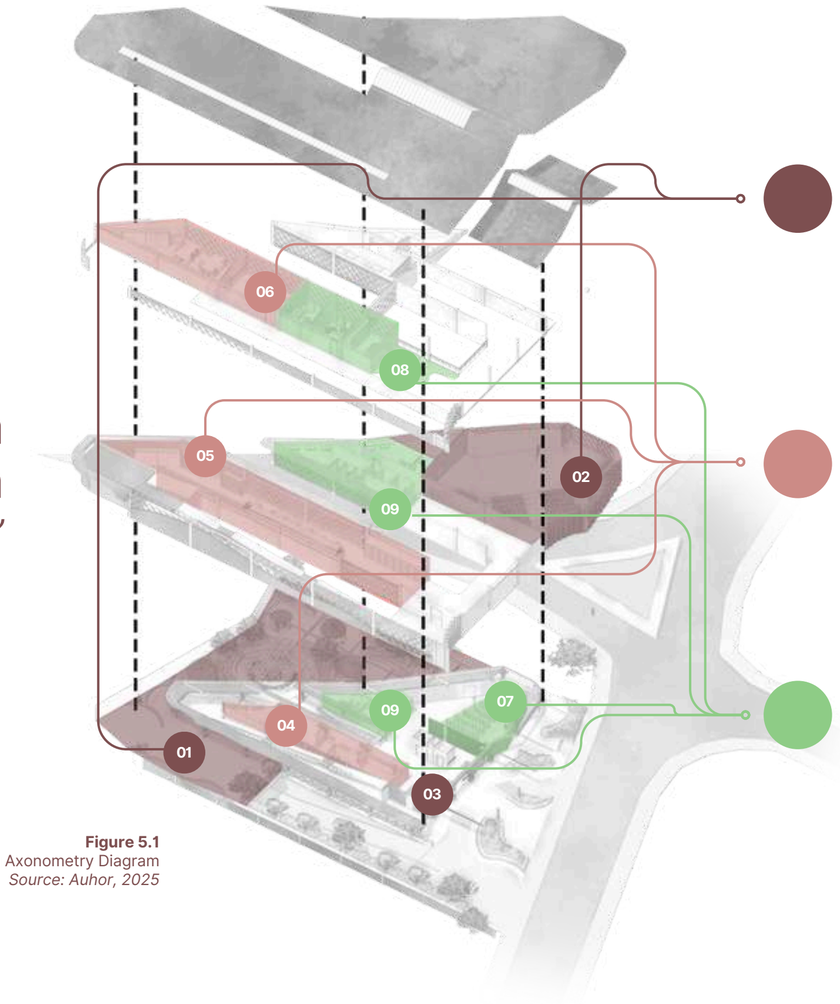


Figure 5.1
Zoning Axonometry Diagram
Source: Auhor, 2025

activity **programming.**

Trisilas-Based Concept

Asih	
01	Open Sensory Space
02	Seminar Hall
03	Lobby & Receptionist

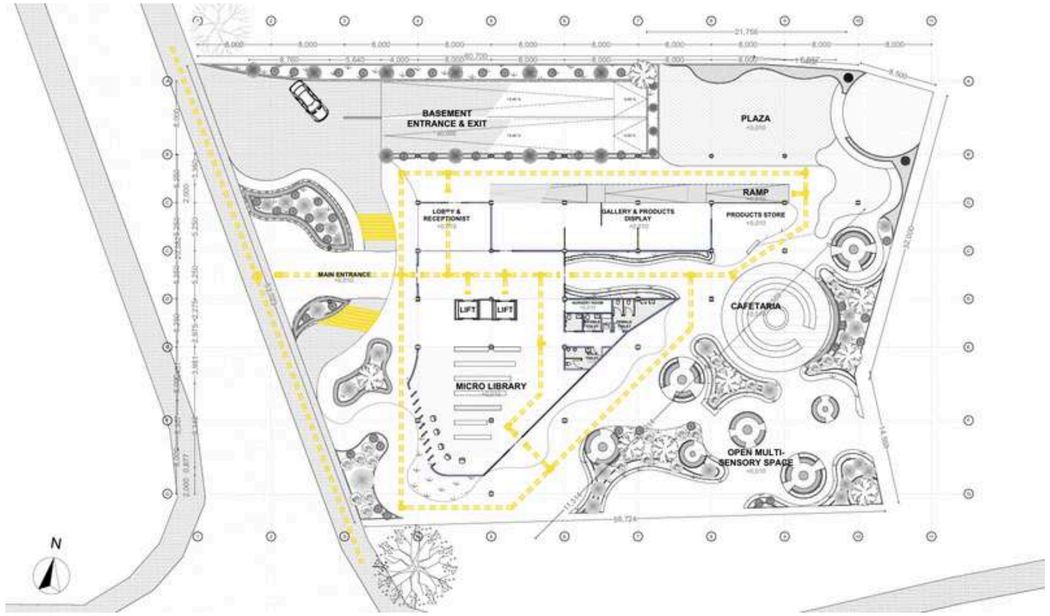
Asah	
04	Workshop room
05	Gallery & Store
06	Office & Meeting Room

Asuh	
07	Micro Library
08	Counseling rooms
09	Lavatories

Table 5.1
Trisilas Rooms
Source: Author, 2025

Sundanese expression:
Tritangtu & Trisilas

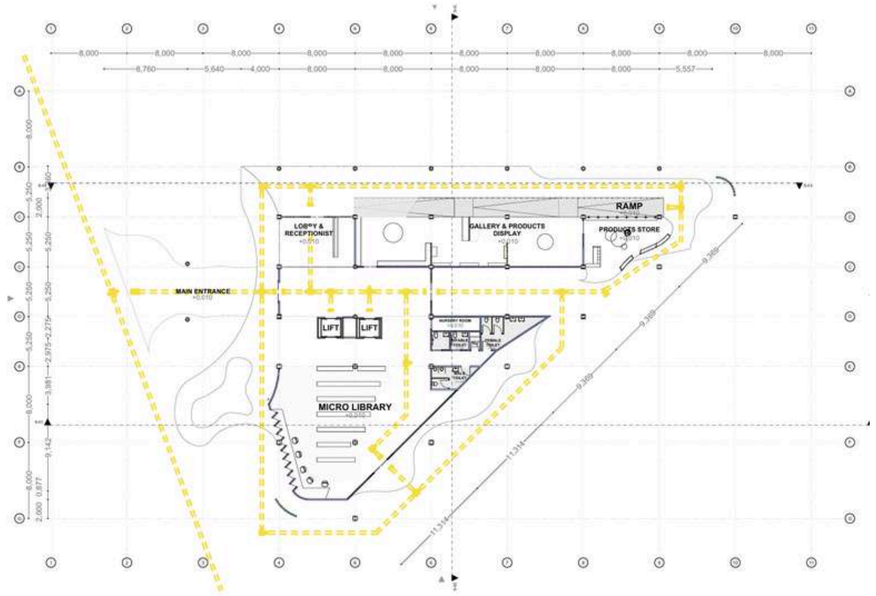
site **plan.**



This site plan illustrates a well-organized, inclusive layout integrating functional zones and green spaces. The building is centrally placed, connected by an accessible ramp and circulation paths (highlighted in yellow) that guide users seamlessly across the site. Key areas include a plaza for gatherings, a café, and an open multi-sensory space for engagement and relaxation. The basement entrance and exit are strategically located for smooth access, while landscaped zones soften the urban environment, enhancing both aesthetics and user experience. The design emphasizes accessibility, interaction, and harmony with the surrounding context.

Figure 5.2
Site Plan
Source: Auhor, 2025

floor plans: **ground floor.**



The ground floor plan showcases an accessible and functional layout, integrating key spaces like the micro library, workshop areas, and a product store. A central ramp system connects all zones, ensuring inclusivity for users with diverse mobility needs. Circulation paths are clearly defined for easy navigation, while strategic placement of amenities supports interaction and engagement.

Figure 5.3
Ground Floor Plan
Source: Auhor, 2025

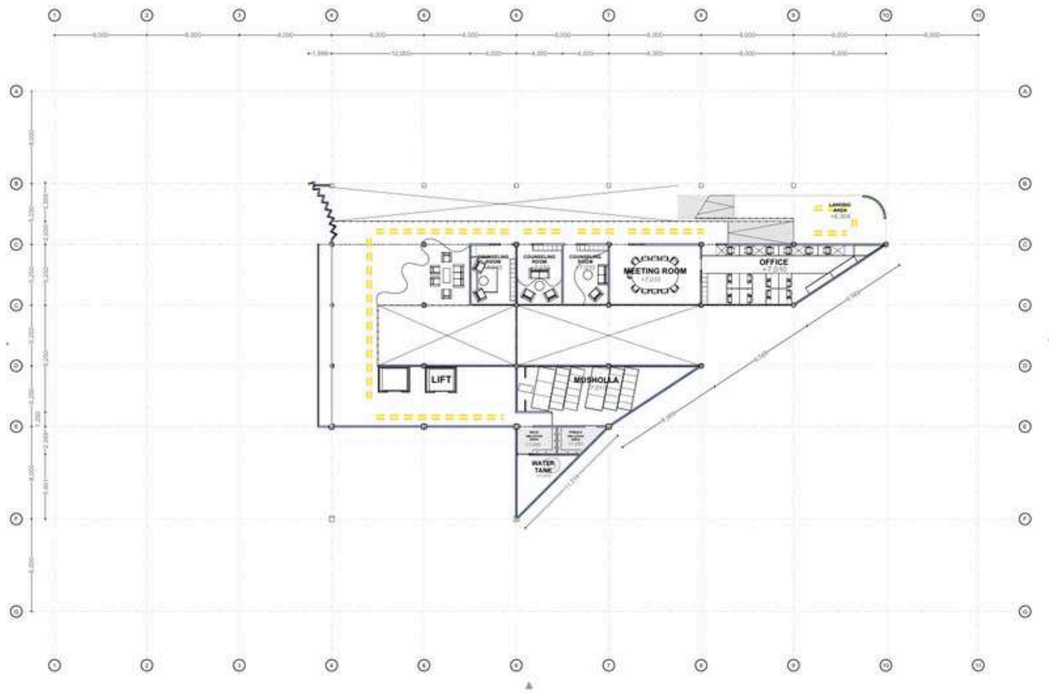
floor plans: **first floor.**



The first floor plan features a seamless circulation with an accessible ramp connecting spaces like the seminar hall, workshop areas, and product gallery. This floor supports collaborative activities and events, providing both learning and display areas. Clear zoning ensures easy navigation for all users, emphasizing inclusivity and interaction.

Figure 5.4
First Floor Plan
Source: Auhor, 2025

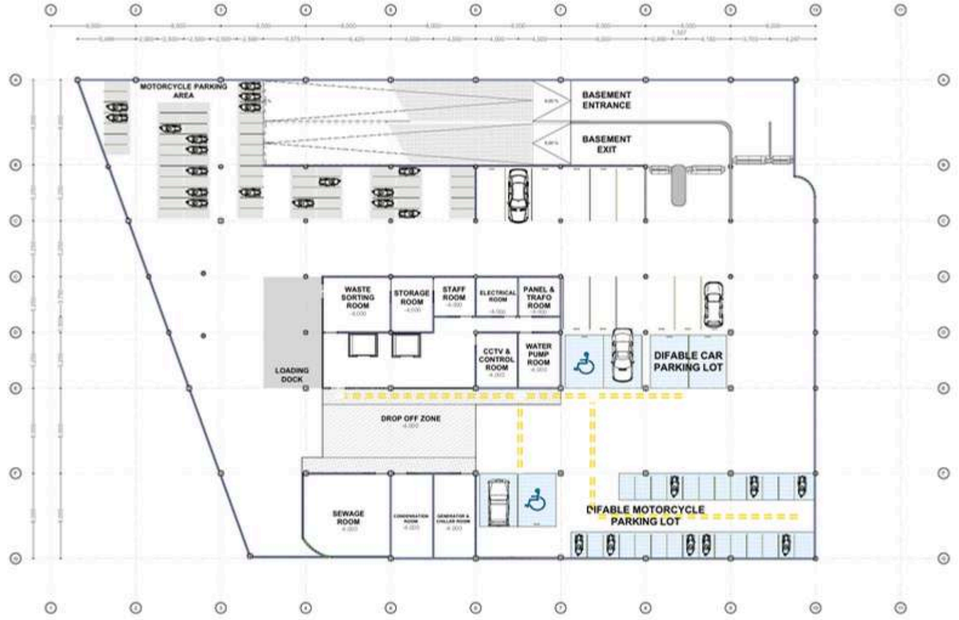
floor plans: **second floor.**



The second floor plan is designed for smaller, focused activities with meeting rooms, training areas, and discussion spaces. Its layout supports privacy and concentration while still being accessible via ramp and lift. This floor fosters empowerment by offering spaces for skill-building, learning, and independent development.

Figure 5.5
Second Floor Plan
Source: Auhor, 2025

floor plans: **basement.**



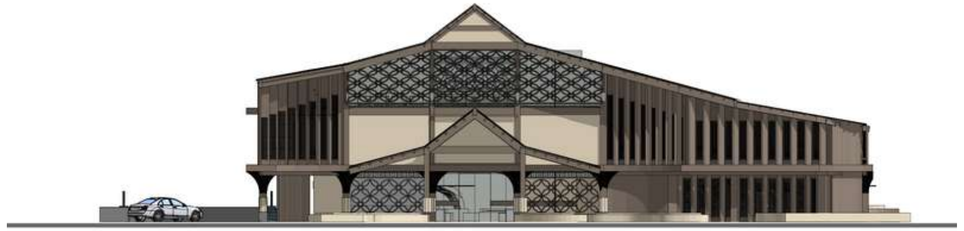
The basement plan prioritizes accessibility and efficiency, featuring parking areas for cars and motorcycles, including dedicated spaces for difable users. It houses essential service rooms like the sewage and pump rooms, loading areas, and a drop-off zone, ensuring smooth operations without disrupting the main building functions above.

Figure 5.6
Basement Floor Plan
Source: Auhor, 2025

elevations: **east & west.**



West Elevation.



East Elevation.

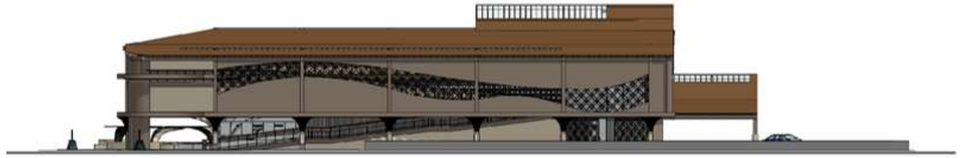
The east and west elevations showcase a reinterpretation of traditional Sundanese roof forms with wide eaves and Kawung-patterned secondary skin panels. These elements create shading, cultural identity, and architectural depth, blending local heritage with modern design while maintaining harmony with the urban Bandung context.

Figure 5.7
West & East Elevation
Source: Auhor, 2025

elevations: **north & south.**



South Elevation.

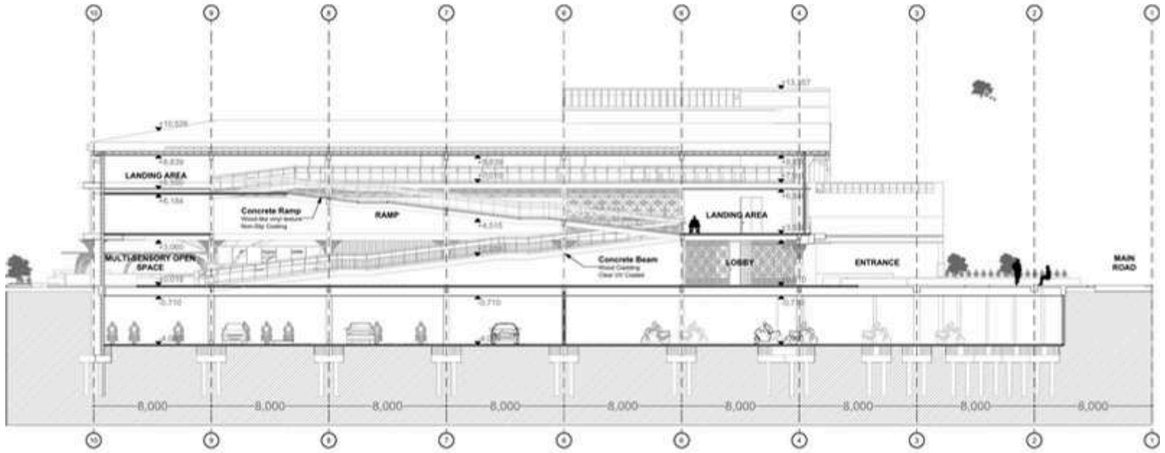


North Elevation.

The north and south elevations reveal a dynamic building envelope where the pitched roof sweeps into a subtle curving form, softening the structure's profile. This curve is mirrored on the opposite side, creating visual balance and fluidity. Kawung-patterned panels punctuate the façade, blending shading function with cultural expression. The layered materials and rhythmic openings provide depth and texture, while the wide eaves offer protection from rain and sun, reinforcing the building's harmony with its tropical Bandung context.

Figure 5.8
North & South Elevation
Source: Auhor, 2025

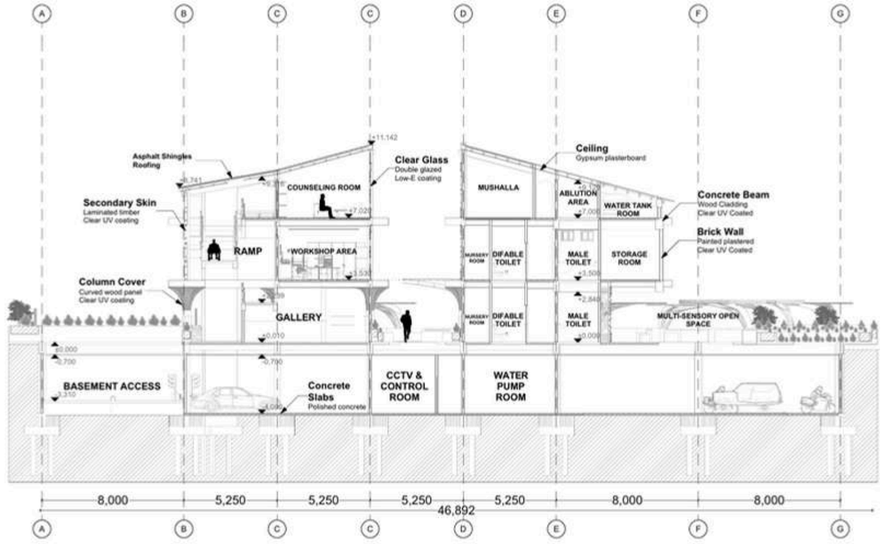
section: **site section.**



This site section reveals the building's multi-level design, elevated on a stilt structure with deep concrete foundations, enhancing resilience against floods and earthquakes. The central accessible ramp seamlessly connects all floors, supported by spacious landing areas for ease of use. Natural light and ventilation flow through openings, while the basement accommodates parking and services without disrupting upper-level activities. The section demonstrates how functionality, accessibility, and structural integrity are integrated into a cohesive, inclusive design.

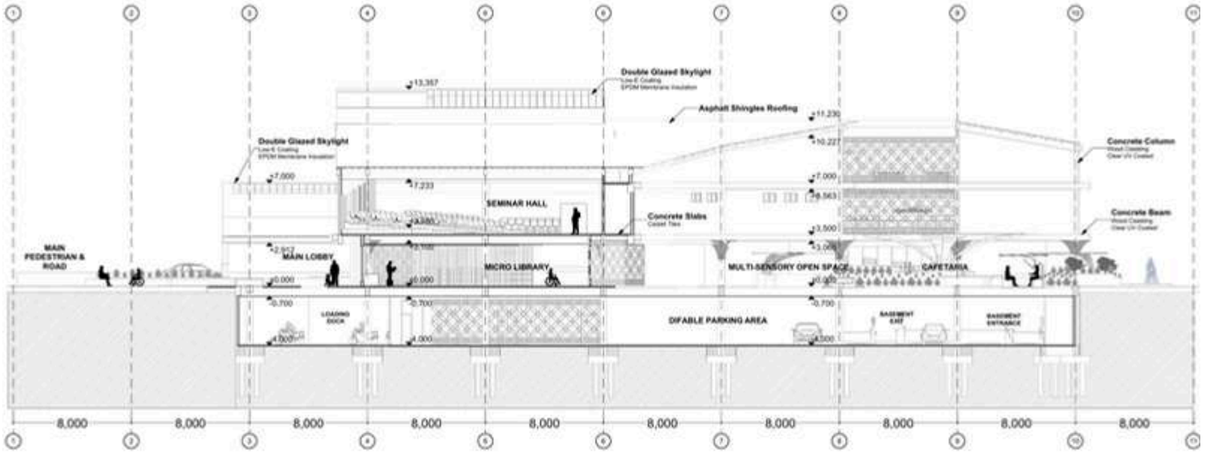
Figure 5.9
Site Section
Source: Auhor, 2025

section: **building sections.**



The first section highlights the building's layered spatial arrangement, with ramps seamlessly connecting multiple floors for full accessibility. Light-filled galleries, workshop rooms, and public areas benefit from strategic openings, while the stilt structure and deep foundations enhance resilience. The section also illustrates the integration of the secondary skin and Kawung-pattern shading, balancing cultural expression with passive cooling strategies.

Figure 5.10
Building Section 01
Source: Auhor, 2025



The second section showcases the building's inclusive core, featuring a seminar hall, multi-function open space, and cafeteria—all connected by clear circulation paths. The basement level provides accessible parking and service areas, while skylights and double-glazed roofing above draw in natural light, ensuring a comfortable, energy-efficient environment.

Figure 5.11
Building Section 02
Source: Auhor, 2025

structure **system.**

Structural Details.

This structural diagram illustrates the building's core framework, combining concrete columns, composite curved wood panels, and a robust bored pile foundation for stability. Shear walls reinforce lateral strength, while detailed connections highlight how traditional materials are adapted with modern construction methods. The integration of steel, reinforced concrete, and wood creates a balance between durability and aesthetic warmth, ensuring the structure supports accessibility and inclusivity while responding to Bandung's seismic and soil conditions.

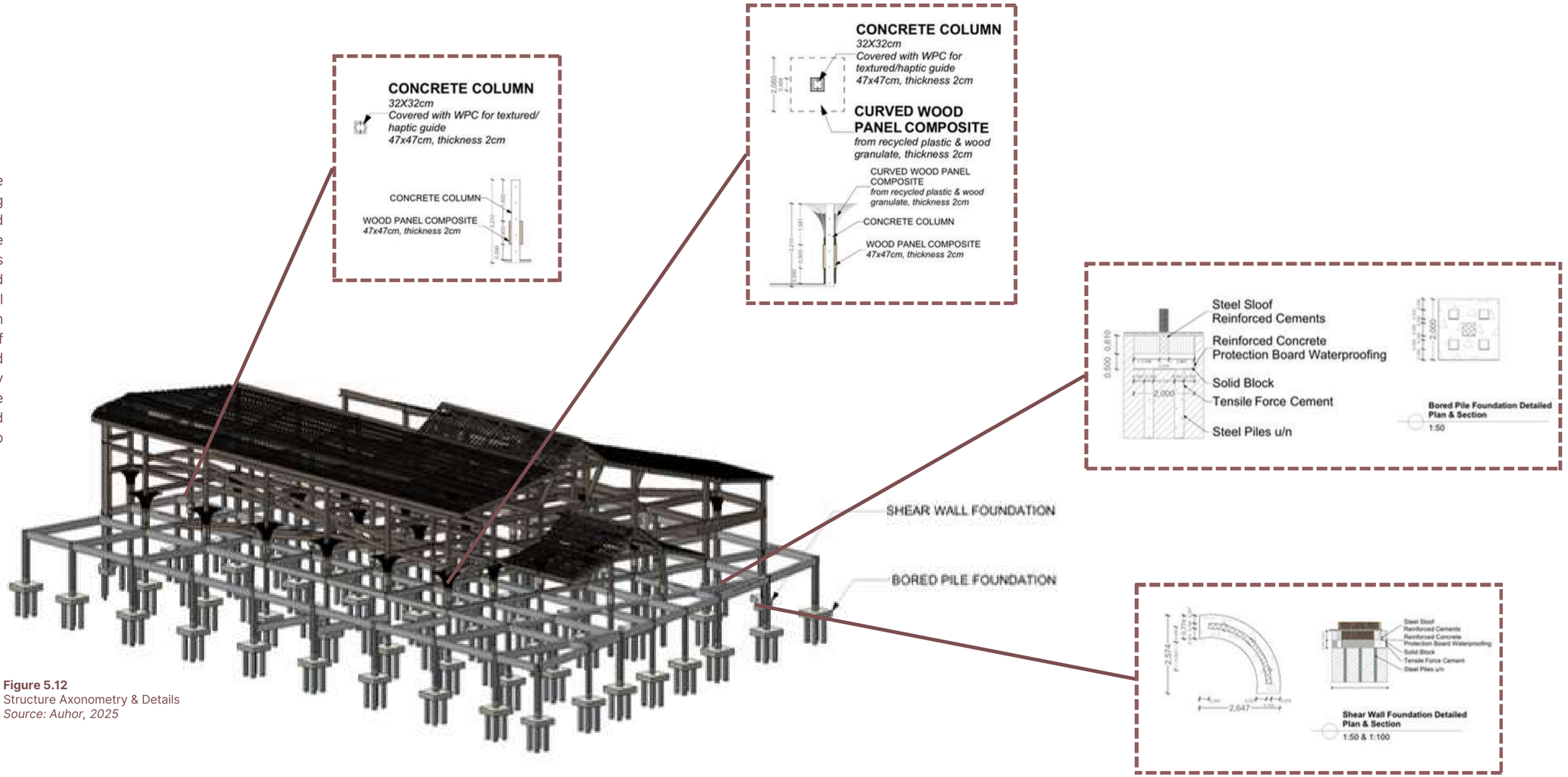


Figure 5.12
Structure Axonometry & Details
Source: Auhor, 2025

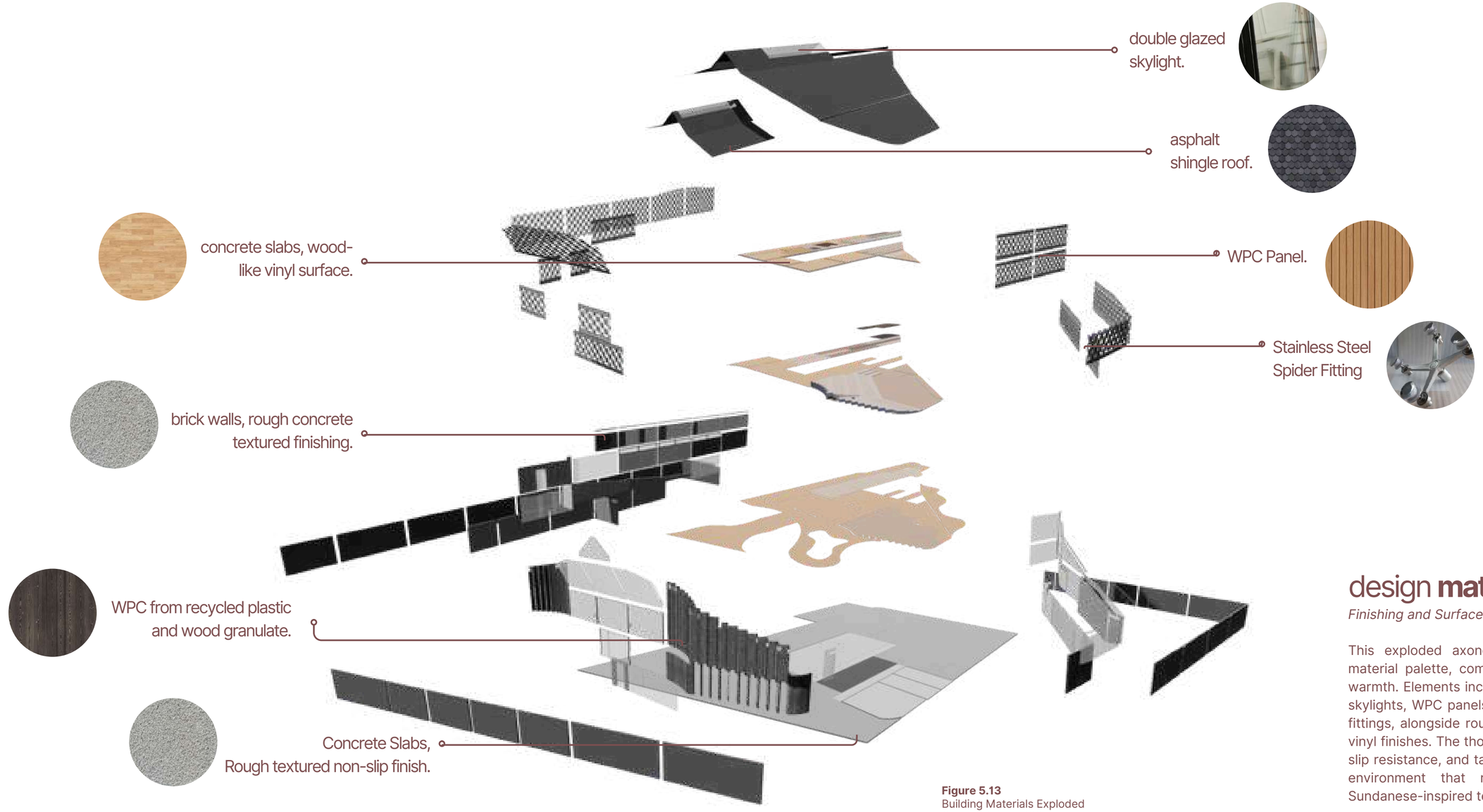


Figure 5.13
Building Materials Exploded
Source: Auhor, 2025

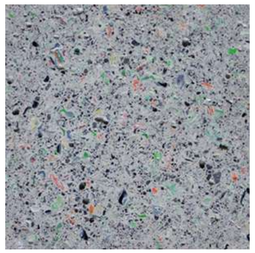
design **materials.**

Finishing and Surfaces.

This exploded axonometric highlights the building's layered material palette, combining functional durability with aesthetic warmth. Elements include asphalt shingle roofing, double-glazed skylights, WPC panels from recycled plastic, and stainless-steel fittings, alongside rough-textured concrete slabs and wood-like vinyl finishes. The thoughtful selection emphasizes sustainability, slip resistance, and tactile variety, creating an inclusive and safe environment that reflects both modern practicality and Sundanese-inspired textures.

waste **material usage.**

textured concrete mixed with waste materials.



Derived from ocean-bound plastic waste, this texture features plastic collected from the seas. The shredded plastic is incorporated into the concrete mixture, creating a **distinctive texture** with varying **playful color accents.**



Crafted from a blend of concrete and recycled plastic bottle caps. The bottle caps are shredded and treated to guarantee a sterile and safe raw material. Incorporating plastic bottle waste not only **reduces the overall weight** but also introduces captivating **terrazzo-like visual elements.**



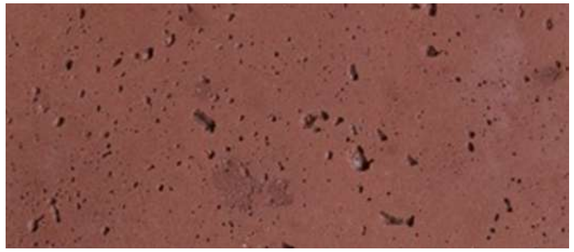


Figure 5.14
Waste Materials Concept
Source: Concrete Conture Lab, 2025

Crafted from the incorporation of **cigarette butt waste** into the concrete mixture. The cigarette butt waste undergoes hydrothermal treatment, resulting in a sterile, fiber-like material that replaces conventional fibers in the concrete mix. This unique addition not only creates an **intriguing texture** but also features tiny air bubble holes on the surface.

Wood Panel Composite from Recycled Plastic & wood granulate.



Figure 5.15
Waste-based WPC Material
Source: Turku et al., 2018

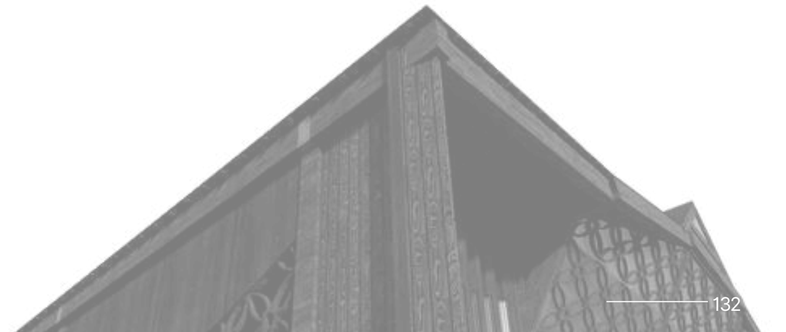
Using Wood Panel Composite (WPC) from recycled plastic and wood granulate offers a sustainable, low-maintenance, and inclusive solution for the building. Its durability withstands Bandung's humid climate, while its slip-resistant, splinter-free surface ensures safety for all users, including those with disabilities. By incorporating recycled materials, WPC reduces environmental impact and supports upcycling initiatives, aligning with the project's goals of sustainability and cultural responsibility while maintaining a warm, natural aesthetic for an inviting atmosphere.

Paper Wool Insulation from old newspaper.



Figure 5.16
Waste-based Insulation Material
Source: Jensen and Alfieri, 2021

Paper wool insulation made from old newspapers provides an eco-friendly and efficient thermal solution for the building. It enhances energy efficiency by maintaining comfortable indoor temperatures while reducing reliance on mechanical cooling or heating. Lightweight yet effective, this recycled material aligns with sustainability goals, minimizes waste, and supports circular economy practices. Its natural composition also offers sound absorption, creating quieter, more inclusive spaces suitable for learning, social interaction, and relaxation for all users, including those with disabilities.



interior **perspective.**

Regarding the concept of flowing and fluidity are applied through the spatial arrangement of the building. Through the entrance visitors and the one who already visited before could choose and start their own journey, whether to starts from the gallery, straight to the workshop area, gather at the open multi-sensory garden, or visit the micro library.

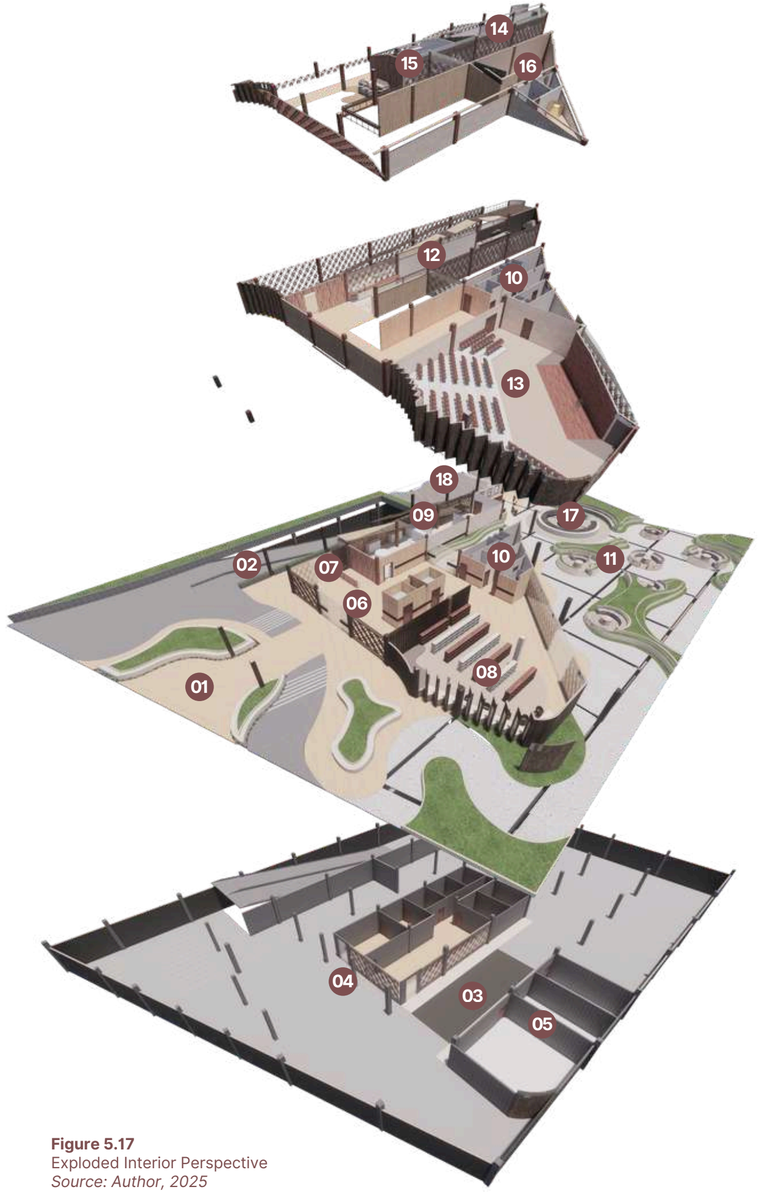


Figure 5.17
Exploded Interior Perspective
Source: Author, 2025

LEGEND:

01 Main entrance
02 Basement Access
03 Drop off area
04 Loading dock
05 Service rooms
06 Lobby
07 Receptionist
08 Micro Library
09 Gallery & Store
10 Lavatories & Nursery room
11 Open Multi-sensory space
12 Workshop area
13 Seminar Hall
14 Office & meeting room
15 Counseling rooms
16 Mushala
17 Cafetaria
18 Open plaza

Sundanese expressions: **spatial planning and design elements.**

The design concept will be based on spatial planning that uses Sundanese architectural principles and philosophy, namely Silih Asih, Silih Asah, and Silih Asuh.



01

silih-asih : **inclusiveness.**

multi-sensory **open space.**

Sensories stimulating design.

This is a place where users can interact and socialize regardless of their differences. This space incorporates the senses of sight, hearing, touch, and smell to stimulate the senses of users with disabilities. The multi-sensory principles were applied to the texture for the surfaces materials, the pathways, the vegetation, even to the placement planning so that each elements would not obstruct the view for any users, specifically wheelchair and cane users.

Figure 5.18
Open Multi-Sensory Space
Source: Author, 2025



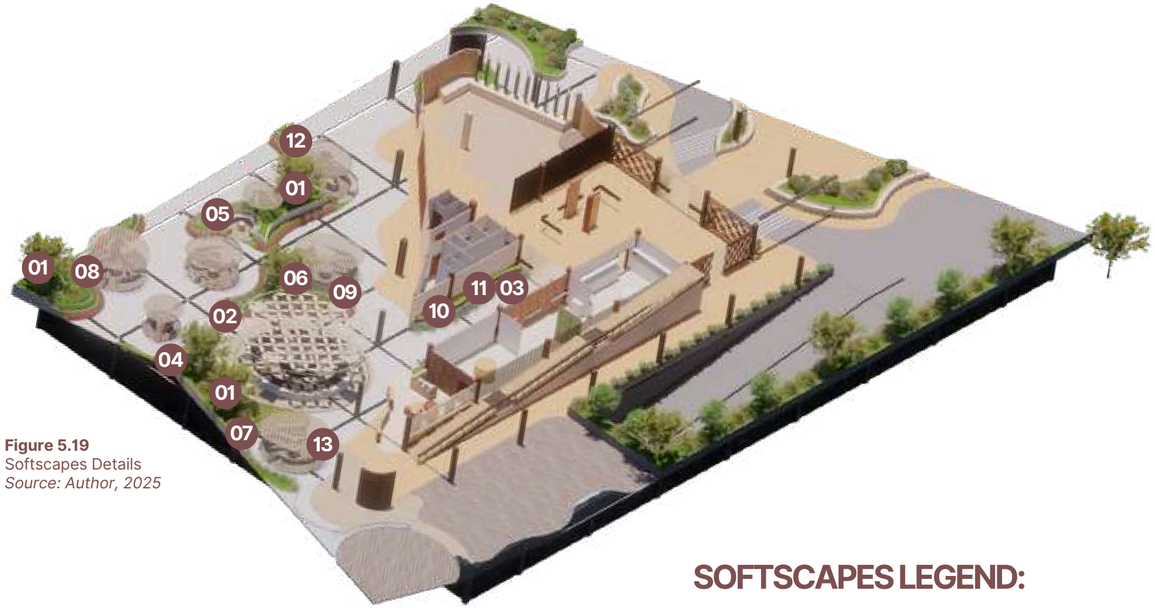


Figure 5.19
Softscapes Details
Source: Author, 2025

SOFTSCAPES LEGEND:

01 Tabebuya tree
02 Fountain grass
03 Lavender
04 Rosemary
05 Lemongrass
06 Mint
07 Lamb's ear
08 Sage
09 Lemon balm
10 Bee balm
11 Zinnias
12 Coleus
13 Marigold

The open space features a variety of aromatic and textured plants, such as lavender, rosemary, and lemongrass, arranged around seating and activity zones. The softscapes aim to stimulate multiple senses, supporting inclusive and therapeutic experiences. With strategic placement of greenery like tabebuya trees and fountain grass, the design enhances accessibility and creates a calm, nature-driven environment ideal for relaxation and social interaction.

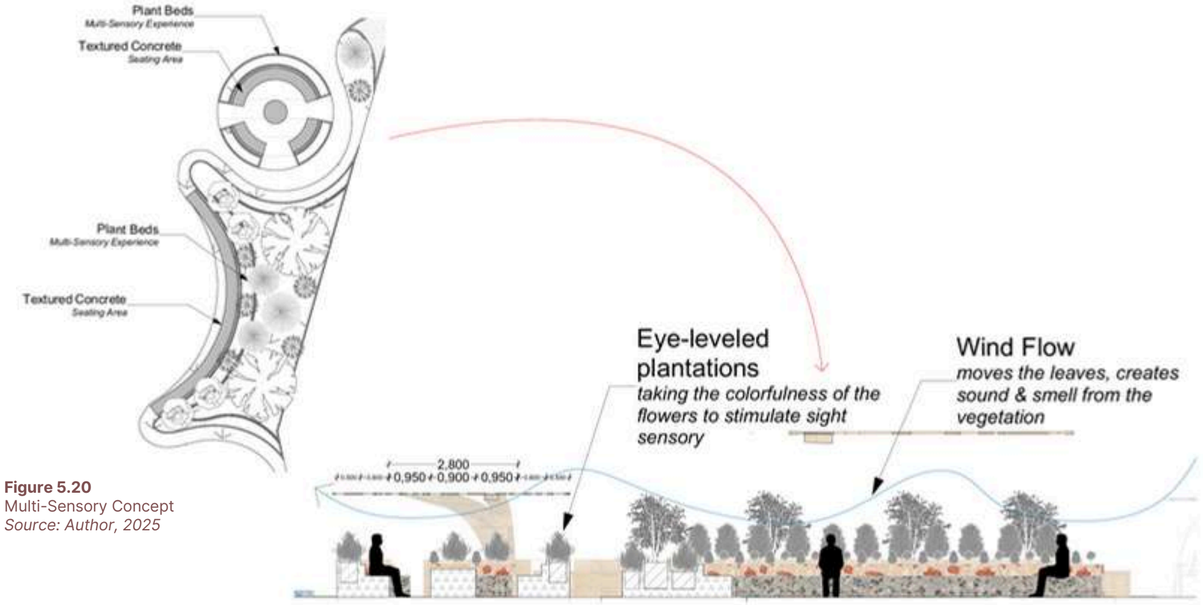
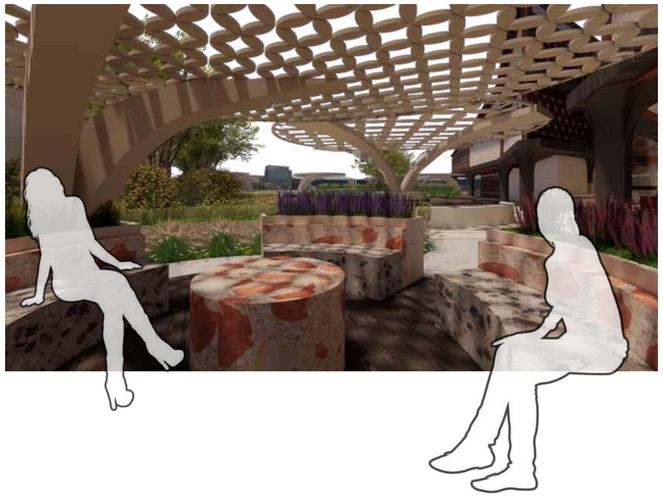


Figure 5.20
Multi-Sensory Concept
Source: Author, 2025

design **details.**

Multi-Sensory Space.

This illustration showcases a thoughtfully designed multisensory garden with vegetation arranged at eye level, making it accessible for wheelchair and cane users. Aromatic, colorful, and textured plants are strategically placed to stimulate touch, sight, smell, and hearing, enhancing the sensory experience for users with visual or auditory impairments. The circular seating arrangement promotes inclusive interaction by maintaining an ideal conversation distance, particularly for people with limited mobility or hearing impairments, ensuring everyone can engage comfortably in communal activities.



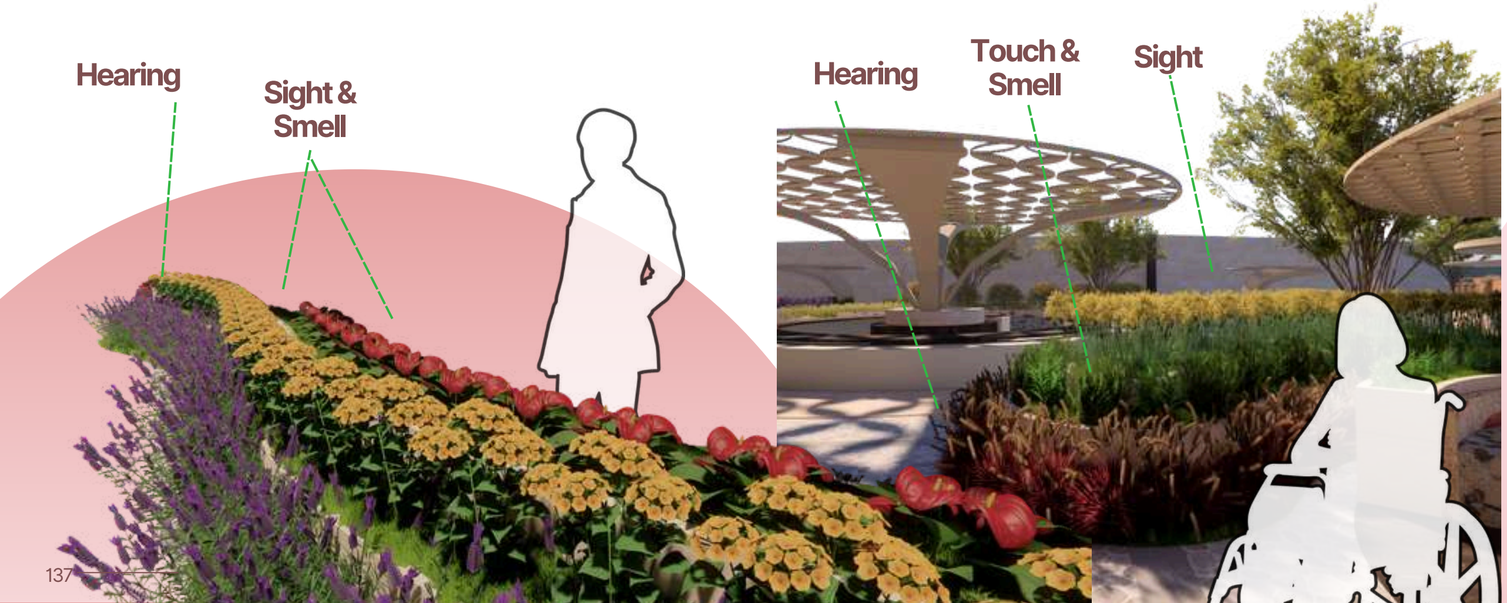




Figure 5.20
Multi-Sensory Concept
Source: Author, 2025

design **details.**

Hardscapes and Irrigation System Details.

This section illustrates the use of permeable hardscape materials—exposed aggregate concrete, wood composite decking, and resin-bound gravel—each allowing water infiltration to support a rainwater harvesting system. Rainwater seeps through these surfaces and is directed to an underground tank via a filtration and drainage system. The stored water is then distributed through a drip irrigation system embedded beneath the soil. This system is ideal for the design because it delivers water directly to plant roots with minimal evaporation, reduces water waste, and ensures accessibility by keeping the surface dry and safe for all users, including wheelchair and cane users.

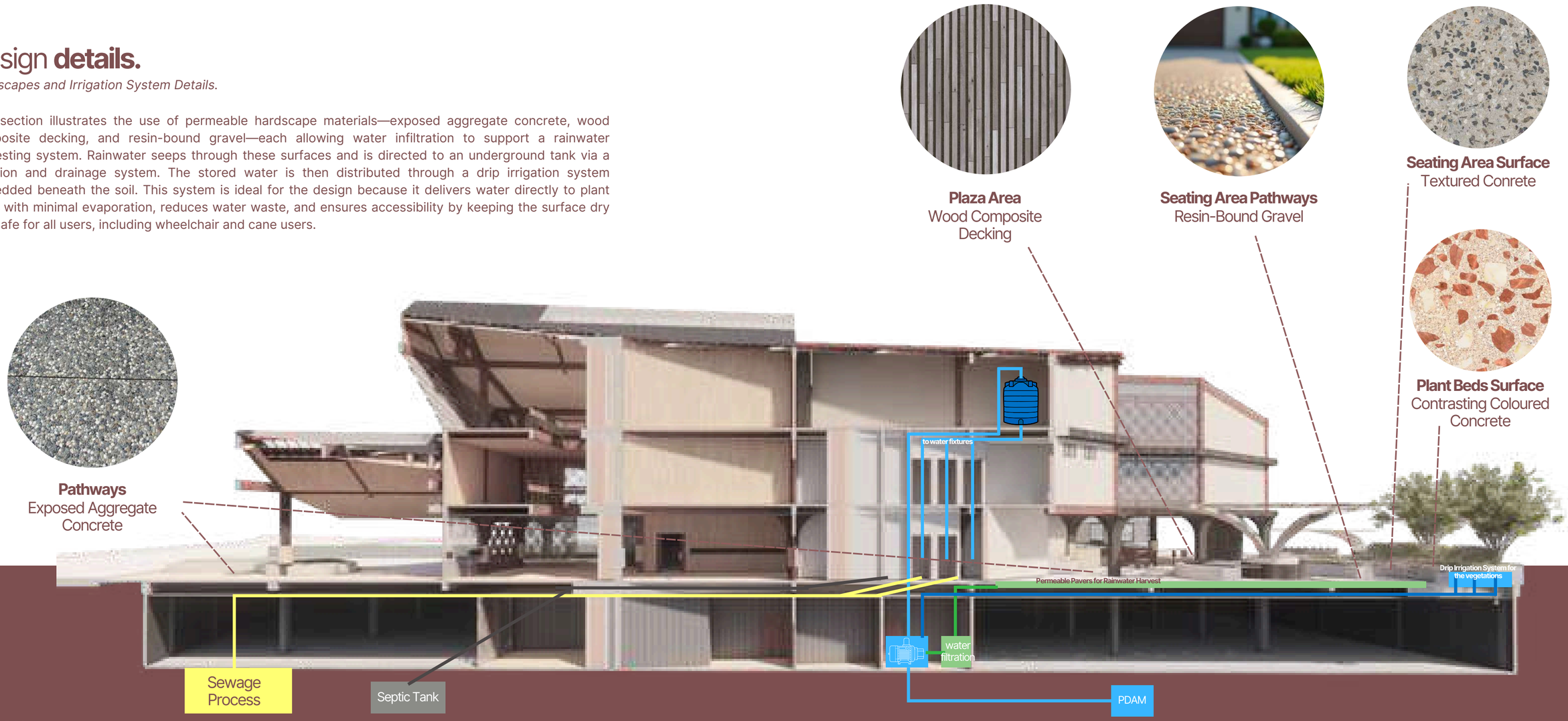


Figure 5.21
Hardscapes and Irrigation System Details
Source: Author, 2025

multisensory open space **concept.**

kinds of stimulated senses.

01 Smell

- Raised herb beds
- Scents for relaxing ambience

02 Hearing

- Water fountain
- Rustling of tall grass
- Crunchy gravel
- Soft mulch

03 Touch

- Guided plant touching
- Textured foliages
- Rough and smooth hardscapes materials

04 Sight

- Mix colorful flowers
- High-contrast flower beds (yellow/purple, blue/orange)
- Pathway Edging Painted with contrasting colors

No	Plants	Senses	Feel/Texture	Color	Contrasting	Medium	Bandung Context
1	Lavender	Smell	Calming	Purple	☑	Well-drained flower beds or large pots	Good for sunny and cool area
2	Rosemary	Smell	Sharp herbal aroma	Green with small pale blue flowers	☐	Pots or garden beds, needs sun and drainage	Low maintenance herb, strong aroma, drought tolerant
		Touch	Spiky				
3	Marigold	Sight	Contrasting Bright color	Bold orange/yellow flowers	☑	Soil beds or large pots	Suitable for tropical climate, repels insects
		Smell	Musky but not sweet				
4	Lamb's Ear	Touch	Soft, velvety leaves	Silver-grey foliage	☐	Raised beds or well-drained ground soil	- Survives mild chill, full sun, and partial shade in Bandung - Grows low, ideal along pathways for touch guidance
5	Fountain Grass	Hearing	Rustling, feathery grass	Purple or reddish plumes	☑	Ground soil, borders	Drought-tolerant and fits well in ornamental urban spaces
		Sight	Contrasting Bright color				
6	Mint	Smell	Refreshing menthol aroma	Green	☐	Pots or contained beds (it spreads aggressively)	- Grows rapidly in Bandung's moist climate - Can be planted in waist-level beds for ease of access
		Touch	Rough leaves				
7	Coleus	Sight	Contrasting Bright color	Red, pink, yellow	☑	Flower beds, shaded borders, or large pots	- Shade-loving plant perfect for under canopy areas - Can grow low for easy visual scanning from wheelchairs
8	Lemongrass/Serai	Smell	Citrusy scent when brushed	Pale green	☐	Large pots or soil beds	Can grow low in tropical highland like Bandung
		Hearing	Rustling from the sharp-edged grassy blades				
9	Sage	Smell	Earthy scent	Grayish-green foliage	☐	Raised soil beds, large pots	Thrives in well-drained soil with moderate sun
		Touch	Velvety				
10	Basil	Smell	Aromatic scent when brushed	Bright green leaves	☐	Pots or small soil beds	Grows well in warm, humid climates like Bandung.
		Touch	Smooth, tender leaves		☐		
11	Bee Balm	Smell	Sweet, minty scent	Bright red/pink/purple blooms	☑	Soil beds with partial sun	Though it prefers temperate zones, it can adapt to Bandung's highland microclimate with filtered sun and good moisture.
		Sight	Contrasting Bright color				
12	Zinnias	Sight	Contrasting Bright color	Vibrant red, orange, pink, yellow	☑	Flower beds or medium pots	Zinnias are heat-tolerant and love sun
13	Lemon Balm	Smell	Mild lemon scent	Light green foliage	☐	Pots or garden beds	Adapts well to Bandung's cool, moist urban environment

Table 5.2
Plantation Findings
Source: Author, 2025

multisensory open space **concept.**

kinds of vegetation.

Vegetation Placement

Front/Lower Row



Lavender



Rosemary



Fountain Grass



Lemongrass/Serai

Middle Row



Mint



Lamb's Ear



Sage



Lemon Balm

Back/Upper Row



Bee Balm



Zinnias



Coleus



Marigold

Figure 5.22
Multi-Sensory Vegetations Concept
Source: Author, 2025



The placement of multi-sensory vegetation like this takes into account the eye level of users with disabilities, as well as the range of touch for sensory perception. In addition, the size and direction of the wind are also considered so that the plants can be moved by the hearing sense. Plants with hearing sensory features need to be placed where the wind is not blocked by other design elements. However, given their relatively large size, hearing sensory plants are not placed in the middle or upper rows, as they could obstruct visibility and disturb users in the seating area.

seminar **hall.**

Inclusive design.

The layout features stepped seating to maintain clear sightlines, with designated areas for wheelchair users integrated along circulation paths. The stage is unelevated for better accessibility but defined by a distinct material. Acoustic performance is enhanced with insulated walls and ceilings, using sustainable materials like wood panel composites from recycled plastic and paper-wool insulation from old newspapers. The ceiling incorporates gypsum for sound control, and the floor is finished with carpet tiles for comfort and acoustic dampening. This space prioritizes universal access, environmental responsibility, and sensory comfort.

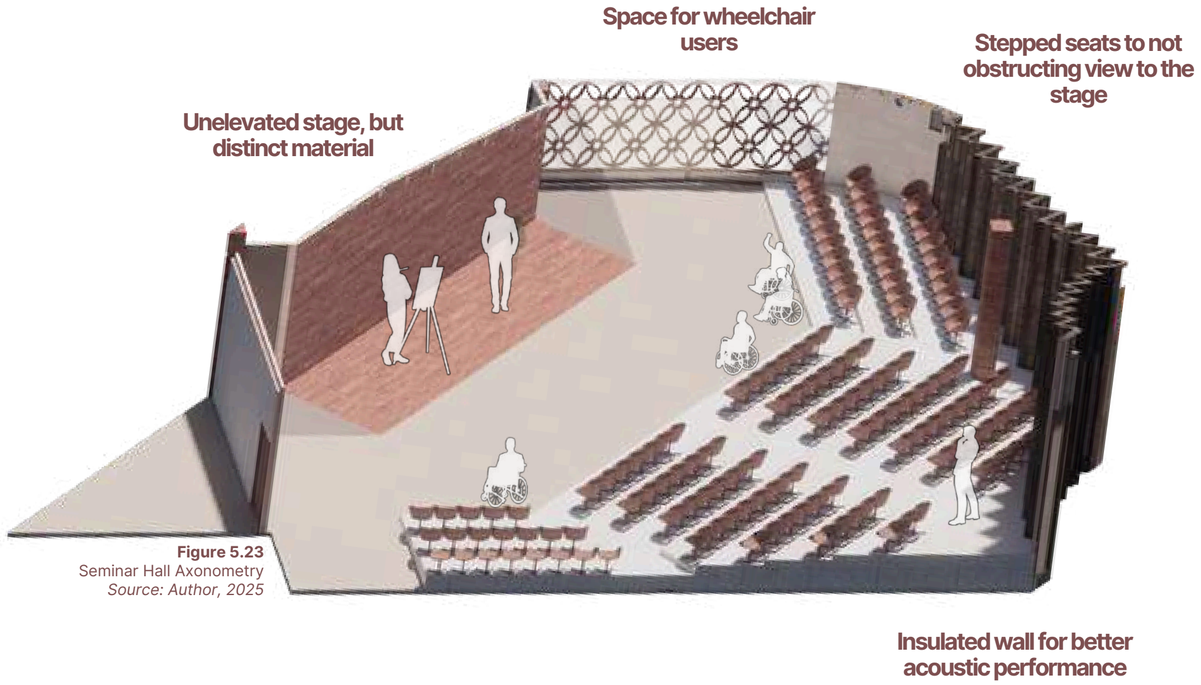
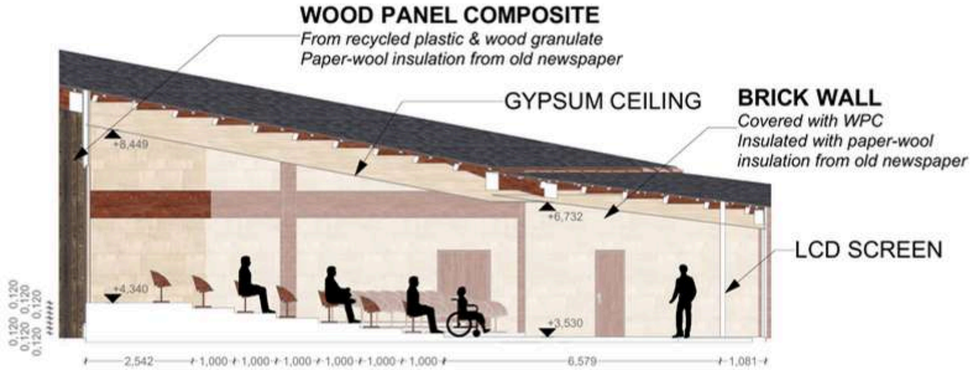


Figure 5.23
Seminar Hall Axonometry
Source: Author, 2025



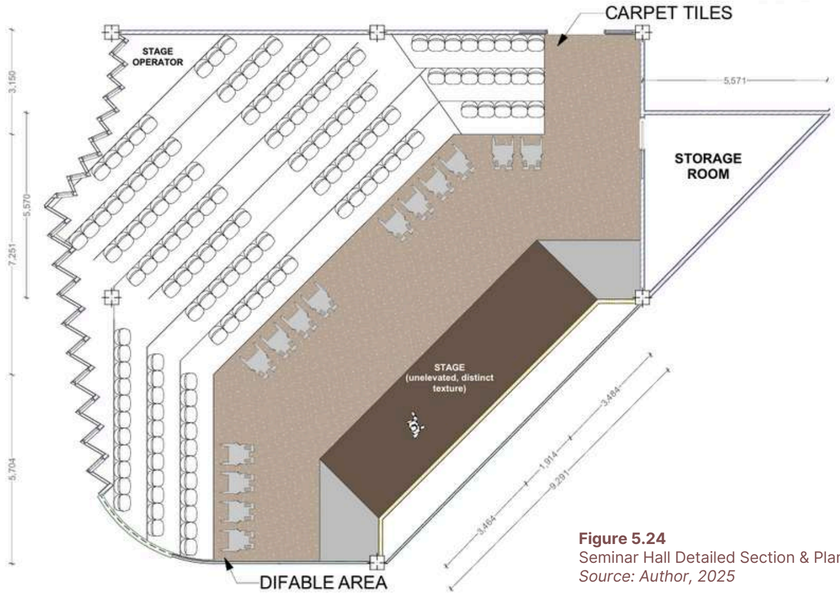


Figure 5.24
Seminar Hall Detailed Section & Plan
Source: Author, 2025



02 silih asah: empowering.

workshop **area.**

User-based design.

As an inclusive workshop or training space designed to accommodate users with varying physical abilities, the layout ensures clear wheelchair circulation, with calculated spatial allowances and accessible pathways. Adjustable-height tables support ergonomic use for both standing and seated users, including those in wheelchairs. Material differentiation on the floor and walls aids visually impaired users in navigating the space through tactile and ambient cues. Clerestory-like openings provide natural light while preventing direct glare, creating a comfortable working environment. This thoughtful design promotes functionality, inclusivity, and sensory accessibility in a productive, user-friendly setting.

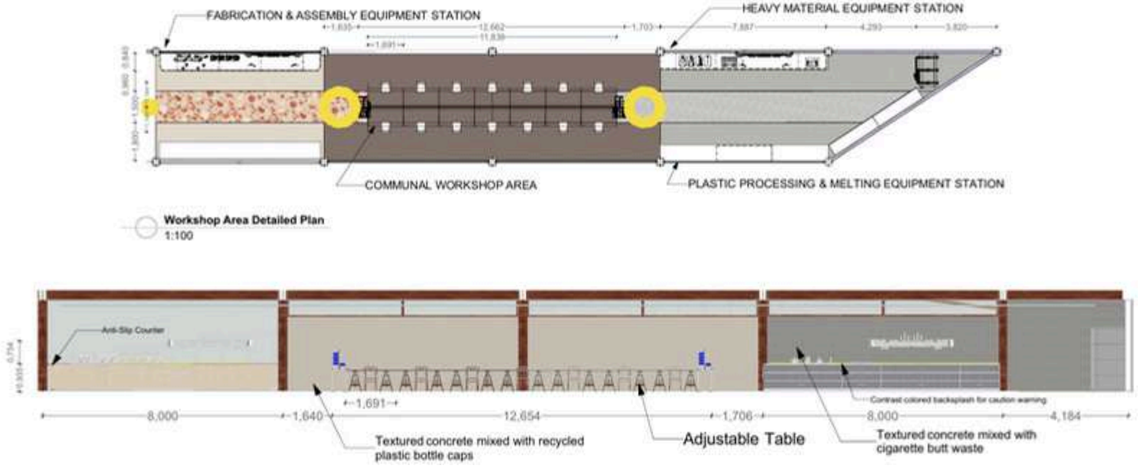


Figure 5.25
Workshop Area Detailed Section & Plan
Source: Author, 2025

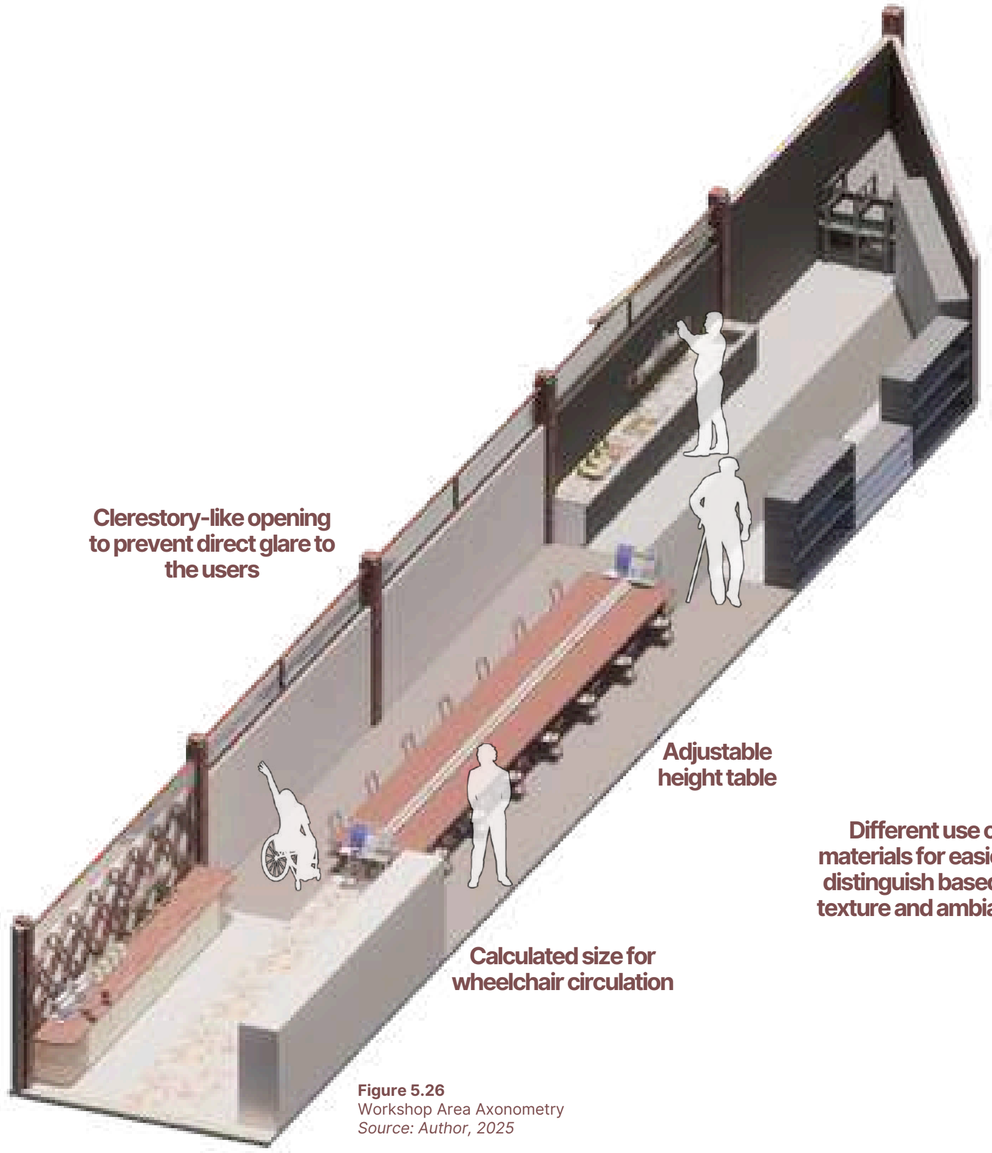


Figure 5.26
Workshop Area Axonometry
Source: Author, 2025

gallery & products **display area.**

This image presents a detailed plan and elevation of a gallery and product display area designed with inclusivity in mind. The layout incorporates rubber tiles with tactile patterns to guide visually impaired users along a sensory trail. The space features defined zones for display, separated by wooden partitions for spatial clarity. Finishes such as brick walls with terracotta tiles add tactile and visual variation, aiding orientation. LCD panels and display shelves are strategically placed at accessible heights to accommodate all users, creating an engaging, inclusive environment for showcasing products and crafts.

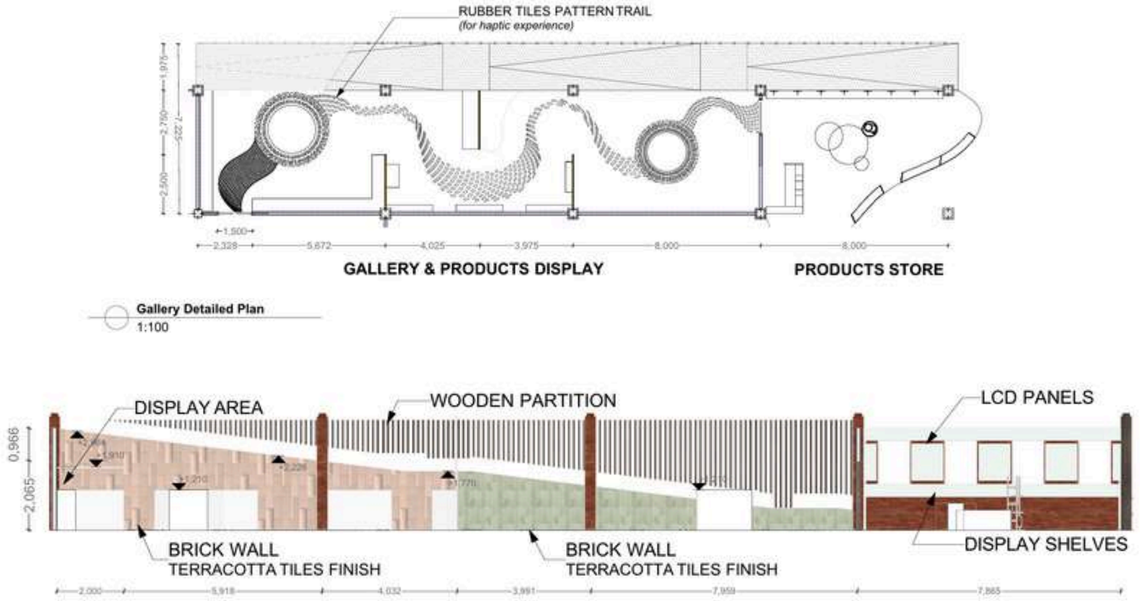


Figure 5.27
Gallery Detailed Section & Plan
Source: Author, 2025

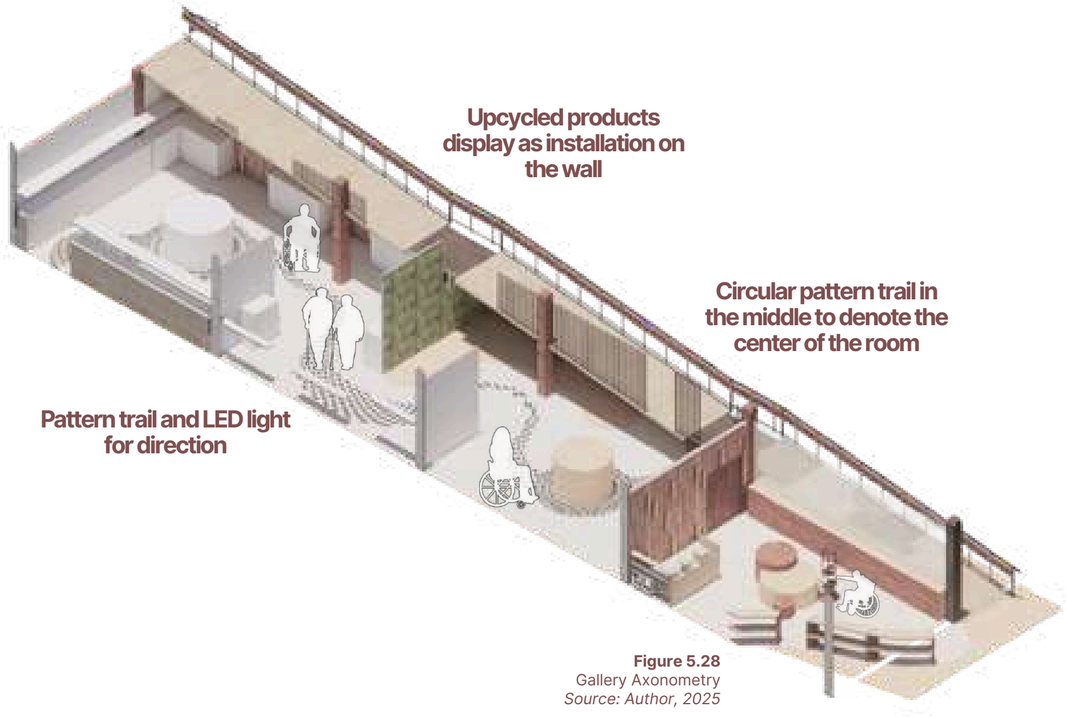


Figure 5.28
Gallery Axonometry
Source: Author, 2025

The room serves as an inclusive interior layout designed to guide users through tactile and visual cues. A pattern trail with integrated LED lights offers directional assistance, while a central circular motif indicates the room's focal point. Wall-mounted displays made from upcycled products highlight sustainability and creativity. The space supports intuitive navigation for visually impaired users and encourages environmental awareness through its material choices and interactive design elements.







Figure 5.29
Gallery Interior
Source: Author, 2025

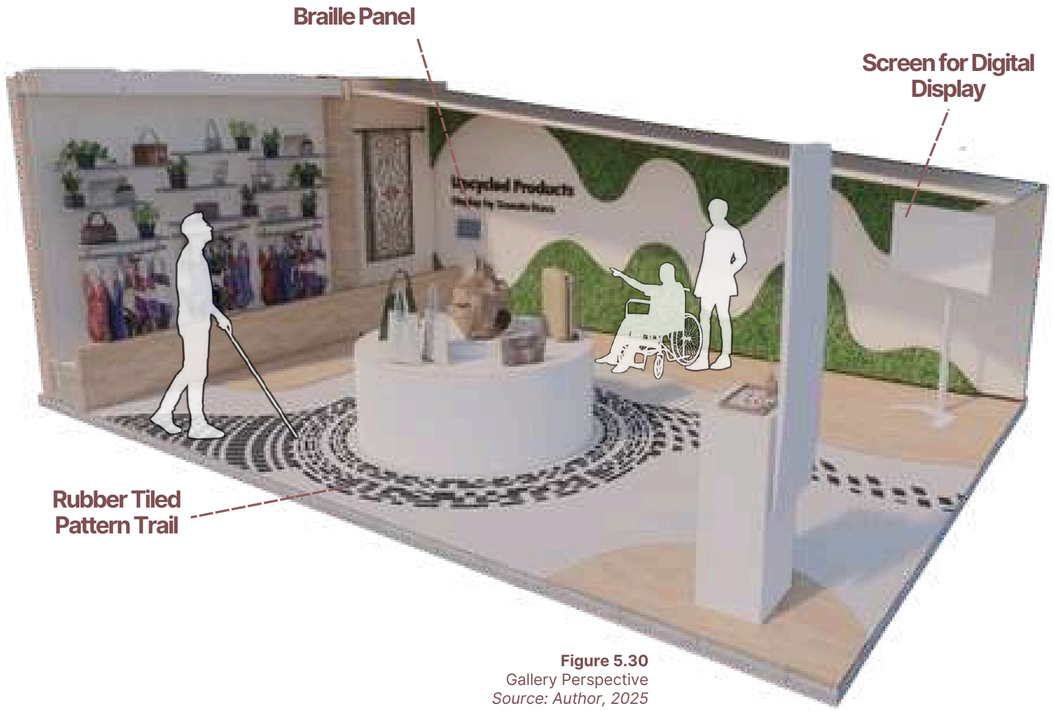


Figure 5.30
Gallery Perspective
Source: Author, 2025

This upcycled products gallery display combines sustainability with inclusivity by featuring accessible design elements for disabled visitors. Braille panels provide tactile information, while rubber-tiled pattern trails guide visually impaired users safely through the space. Screens for digital displays ensure engaging, multi-sensory learning about upcycled crafts. The warm interior, natural materials, and clear circulation foster an inviting environment that celebrates creative reuse while empowering difabled individuals to participate fully in the experience.



This product store allows visitors to purchase the upcycled items they discovered in the exhibition. Large educational monitors highlight sustainability themes like plastic reduction, encouraging informed buying. The spacious layout offers clear pathways, helping all users, including those with visual or mobility challenges, to move comfortably and explore the displays.



Accessible shelving heights and wide circulation zones ensure wheelchair users can easily reach products and navigate the store independently. Warm wood textures and abundant daylight create a welcoming atmosphere that celebrates local craftsmanship while promoting eco-conscious consumer choices in an inclusive setting.

Figure 5.31
Products Store Interior
Source: Author, 2025

office & **meeting room.**

The room is designed as an inclusive indoor workspace designed with universal accessibility standards. Pathways and door widths have been carefully calculated to ensure smooth and safe wheelchair circulation throughout the space. A tactile trail rail runs along the walls, featuring contrasting textures and colors to guide visually impaired users by both touch and sight. The layout offers a spacious and organized environment with accessible seating arrangements, promoting independence and comfort for all users regardless of physical ability. The thoughtful combination of spatial dimensions and sensory cues enhances navigation and usability for everyone.

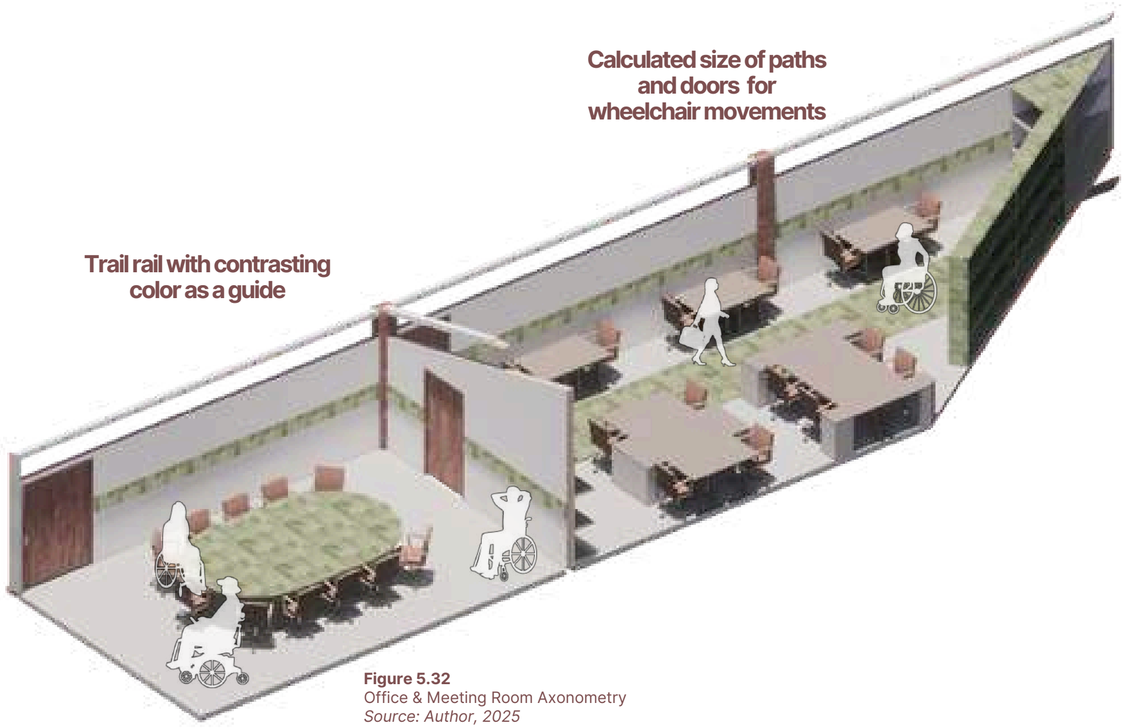


Figure 5.32
Office & Meeting Room Axonometry
Source: Author, 2025





Figure 5.33
Office & Meeting Room Interior
Source: Author, 2025



03 silih asuh: equity in **accessibility.**

counseling **rooms.**

Each counseling room is designed with different materials and finishes to create distinct ambiences that can cater to various user needs—whether calming, stimulating, or neutral. This approach supports emotional comfort and personal preference during therapy sessions. A secondary skin facade filters natural light, reducing glare while maintaining visibility and thermal comfort. The adjacent waiting area includes accessible seating and clear circulation paths, ensuring ease of movement for all users, including those with mobility aids.

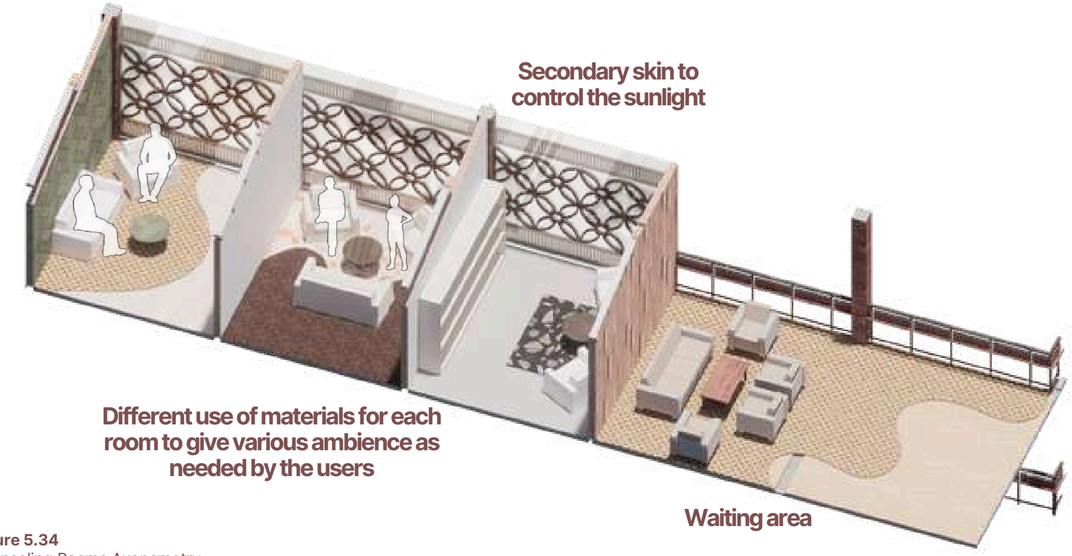
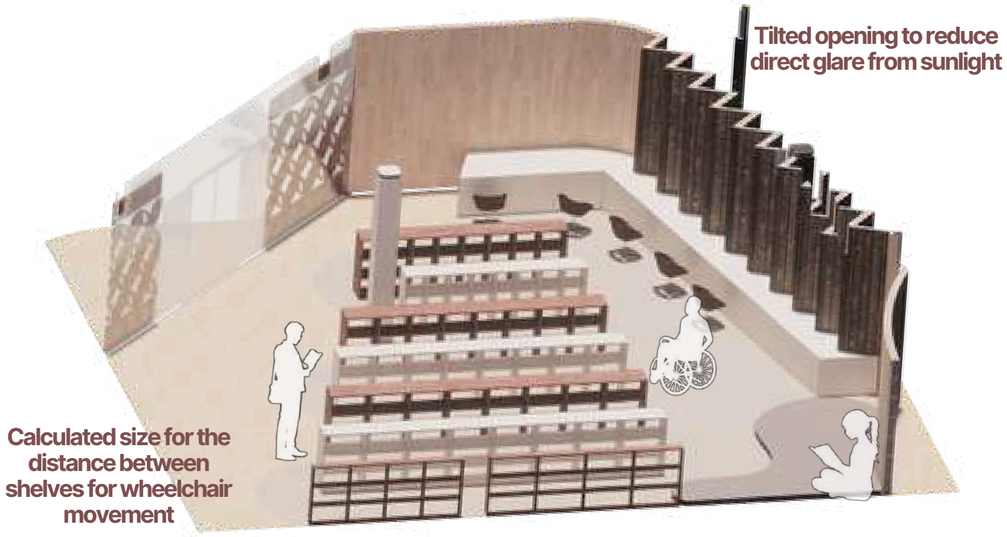


Figure 5.34
Counseling Rooms Axonometry
Source: Author, 2025

micro **library.**



The shelves are spaced with calculated distances to ensure smooth wheelchair circulation. A reading nook and floor seating area accommodate different user preferences. To enhance visual comfort, tilted window openings reduce direct sunlight glare, creating a pleasant reading environment. The use of warm, natural materials adds a calming ambiance, making the space welcoming for all users, including those with sensory sensitivities or mobility challenges.

Figure 5.35
Micro Library Axonometry
Source: Author, 2025

lavatories **details.**

The layout includes a male toilet, female toilet, accessible toilet (difable), janitor room, and a nursery room, efficiently arranged to accommodate diverse user needs. The floor plan utilizes a triangular site, maximizing space with clear zoning and dimensions. The elevation on the right illustrates the interior finishes and fixtures of each room, highlighting accessibility and functionality. This thoughtful design ensures inclusivity, hygiene, and comfort, following universal design principles and efficient spatial organization.

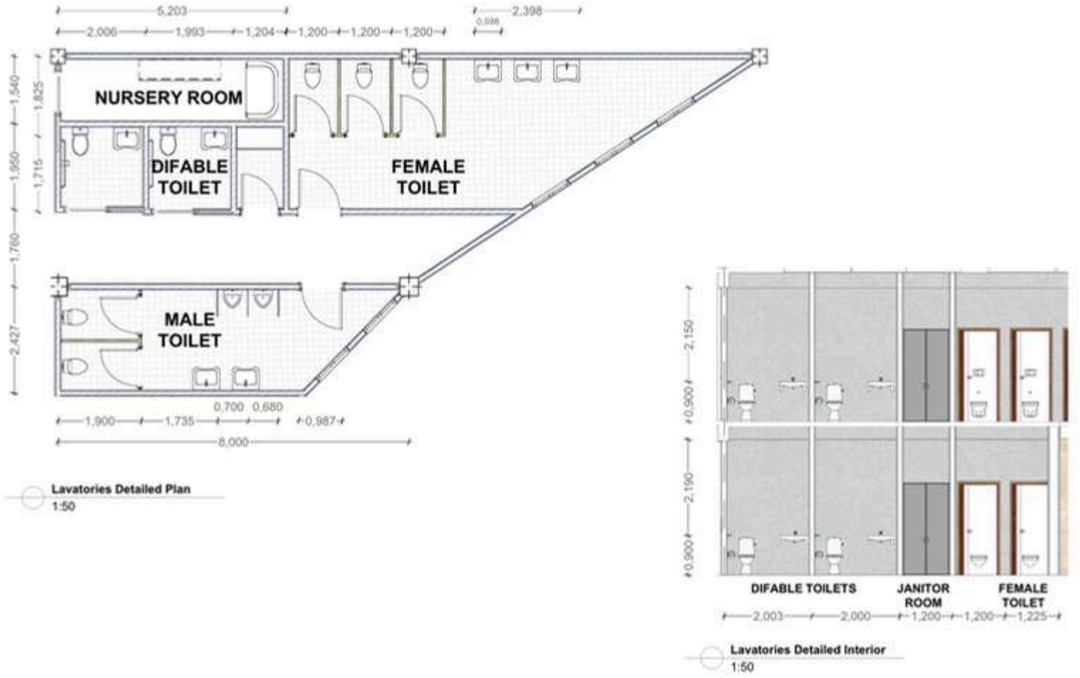


Figure 5.36
Lavatories Detailed Plan & Section
Source: Author, 2025

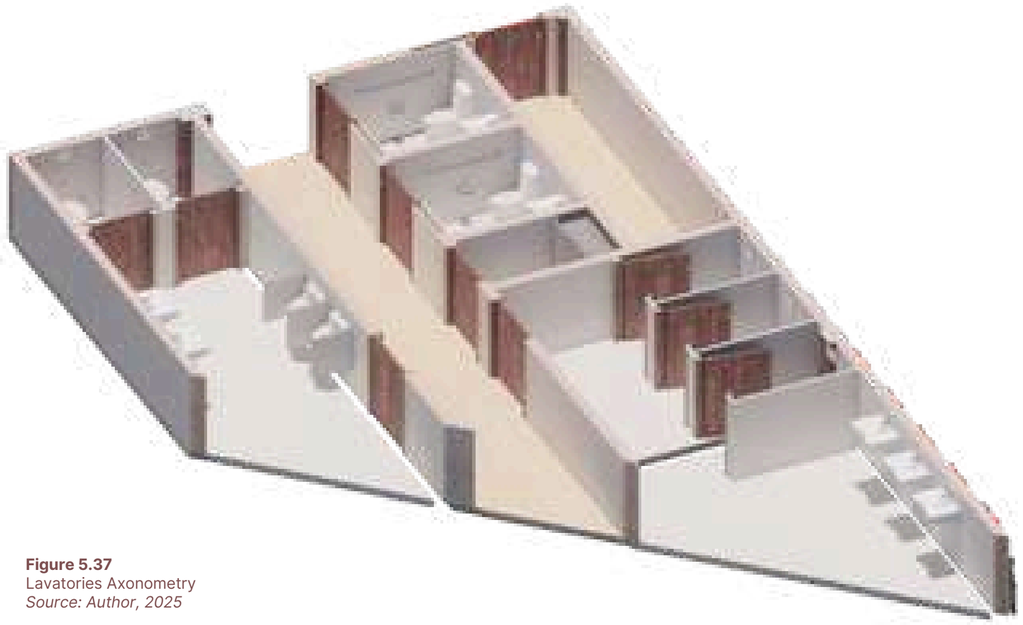


Figure 5.37
Lavatories Axonometry
Source: Author, 2025

vertical **mobility.**

Ramp & Lift for Barrier Free Design and Emergency Evacuation Schemes.

This diagram illustrates a vertical mobility system integrating ramps and lifts for barrier-free design and emergency evacuation. The exploded axonometric view showcases multiple building levels connected by vertical circulation cores. Yellow shafts indicate lifts, while orange dashed lines represent ramps, ensuring accessibility for all users. An emergency assembly point is clearly marked on the ground level, connected by a red evacuation route.

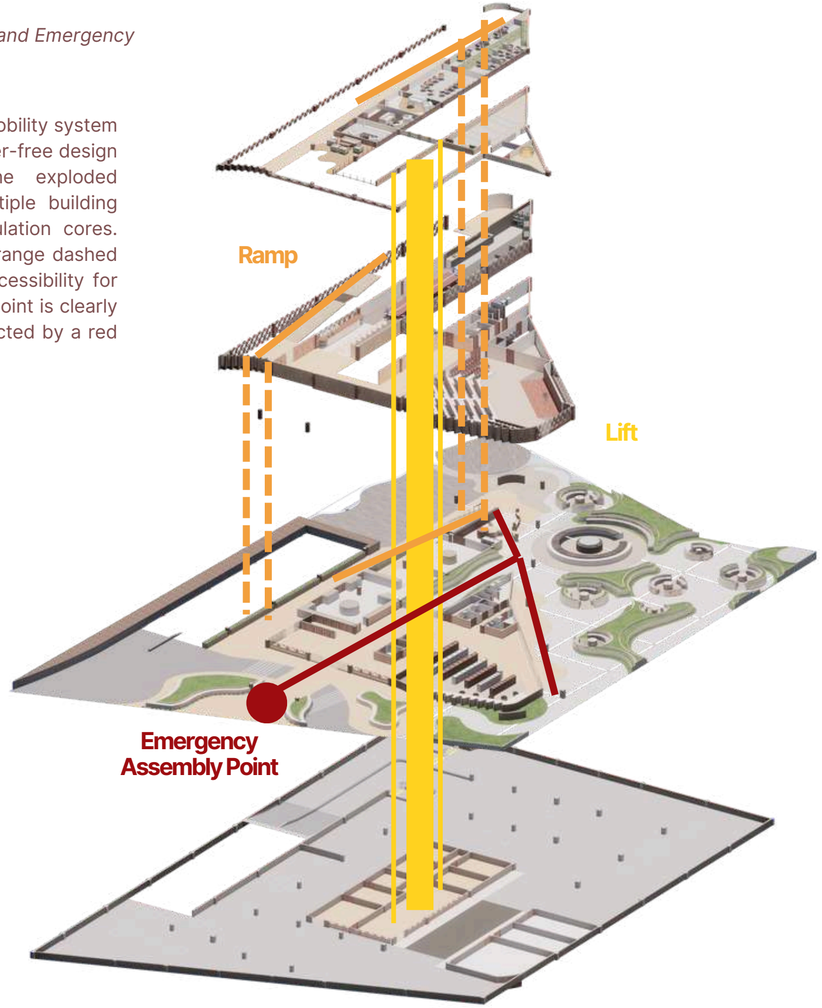


Figure 5.38
Vertical Accessibility Diagram
Source: Author, 2025

passive **design.**

Passive cooling and heat control scheme.

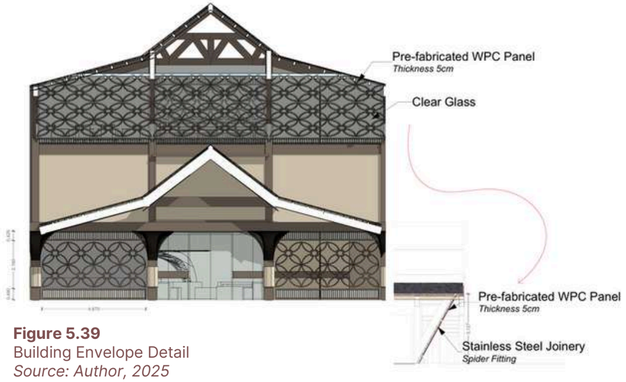
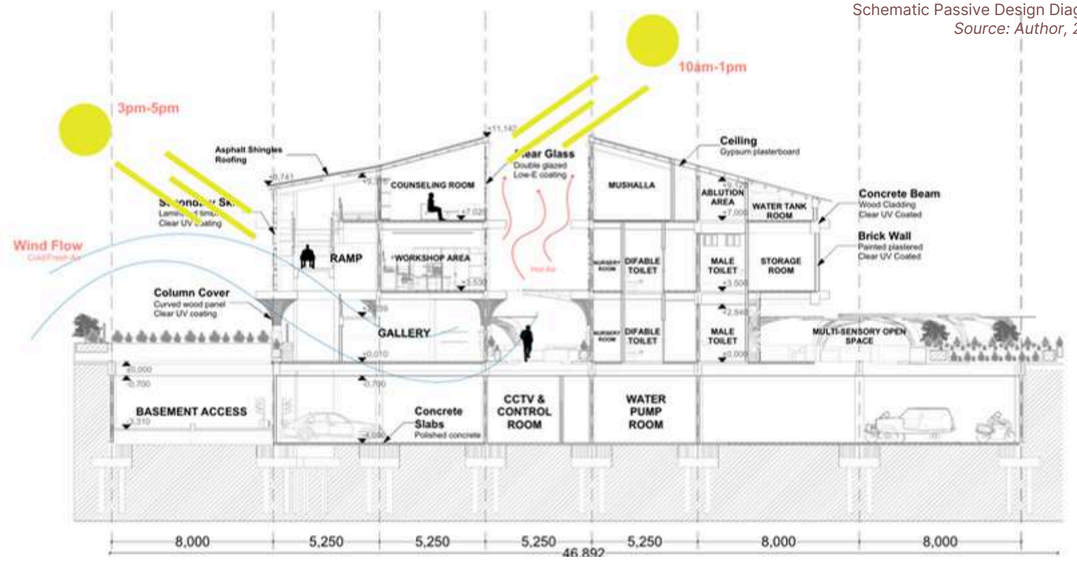


Figure 5.39
Building Envelope Detail
Source: Author, 2025

The passive design features a Kawung-patterned secondary skin, which functions as a sun-shading element to reduce heat gain while incorporating cultural identity. The building also includes a centrally located atrium, which facilitates natural air circulation by allowing hot air to rise and escape, drawing in cooler air from the lower levels. The diagram highlights how sunlight enters at different times of the day (10am–5pm and 3pm–5pm) and how wind flows are optimized through openings and voids, contributing to energy-efficient thermal comfort.

Figure 5.40
Schematic Passive Design Diagram
Source: Author, 2025



passive **design.**

Sloped vernacular roof.

Sundanese roofs are known for their dynamic forms and wide eaves that provide effective **protection from rain** and **natural shading**. This traditional concept can be reinterpreted using **lightweight steel or laminated wood** to suit modern construction. When applied to the building, the roof design must also consider the amount of natural light required indoors. Balancing shading and daylight penetration is essential to maintain interior comfort while preserving the aesthetic and functional values of the Sundanese architectural heritage.

By using a sloped roof, rainwater can flow into the gutters on the roof and then be channeled into a water filtration system, where it can be reused for watering plants in the multi-sensory open space.

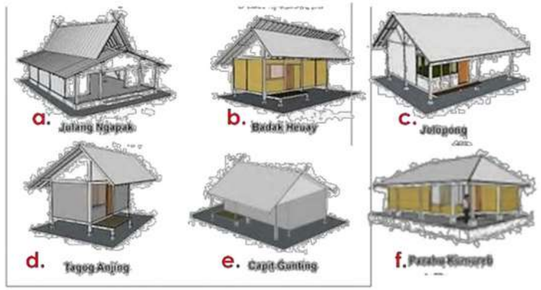


Figure 5.41
Types of Sundanese Roof
Source: Maknun et al., 2016

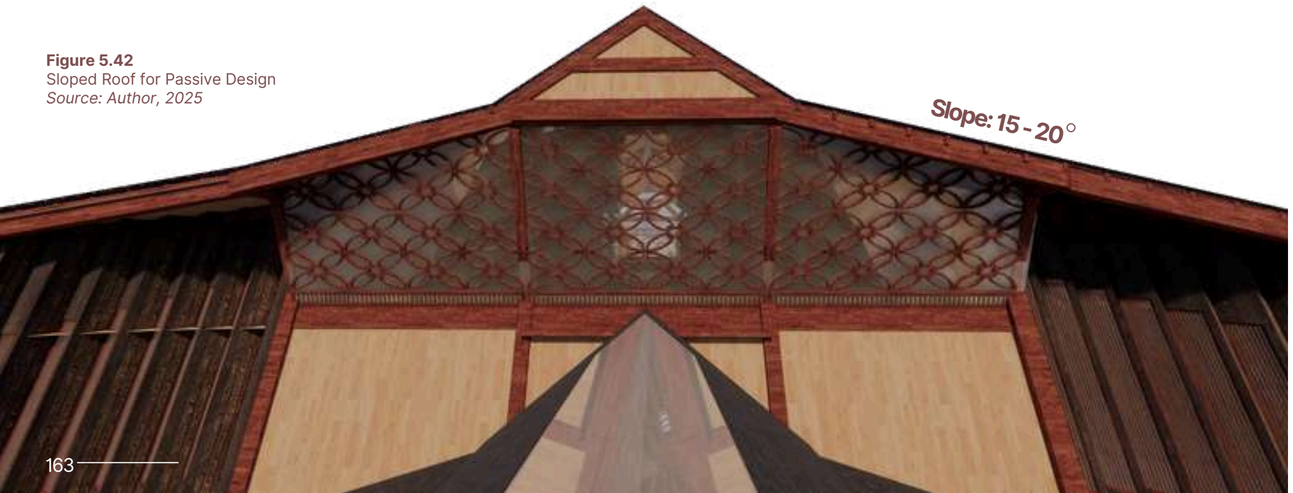


Figure 5.42
Sloped Roof for Passive Design
Source: Author, 2025

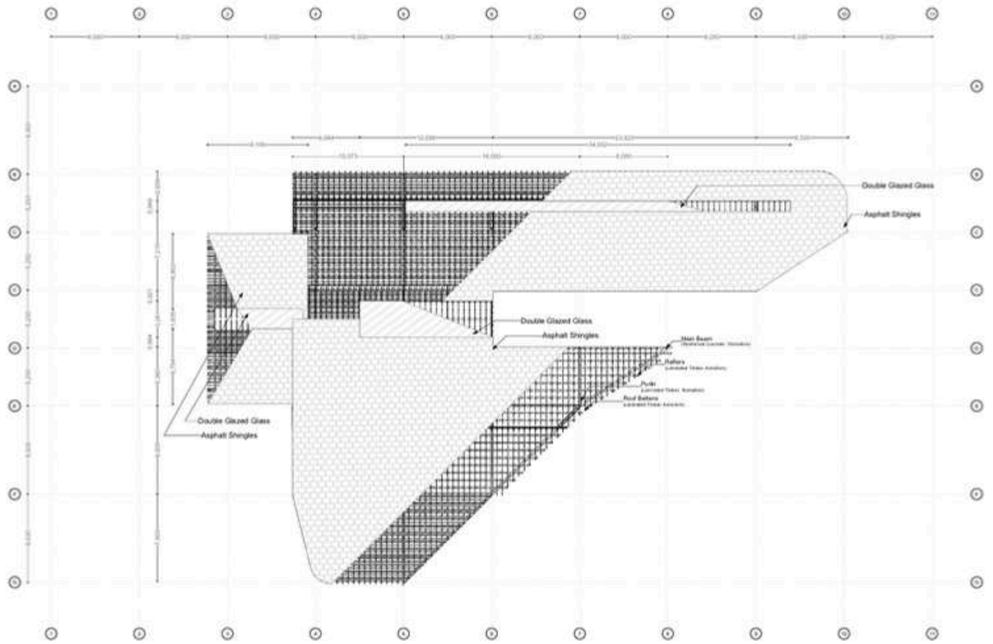


Figure 5.43
Roof Plan
Source: Author, 2025

This architectural roof plan displays a dynamic, angular structure composed of double-glazed glass panels and asphalt shingles. The layout integrates sloped surfaces and skylight features, enhancing natural lighting and insulation. Gridlines and dimensions provide precise spatial references, while material annotations indicate the thoughtful use of modern roofing systems. The design balances aesthetics and performance within a complex geometric form.

building infrastructure **scheme.**

Water Infrastructure.

This exploded axonometric diagram illustrates a building's water infrastructure system. It highlights the vertical distribution of clean water (blue), rainwater (green), grey water (yellow), and black water (black) across multiple floors. These systems are channeled through a centralized core leading to a septic tank and drainage process at the basement level. The green dashed line indicates rainwater harvesting integrated with the landscape. This approach ensures efficient water management and sustainability throughout the building.

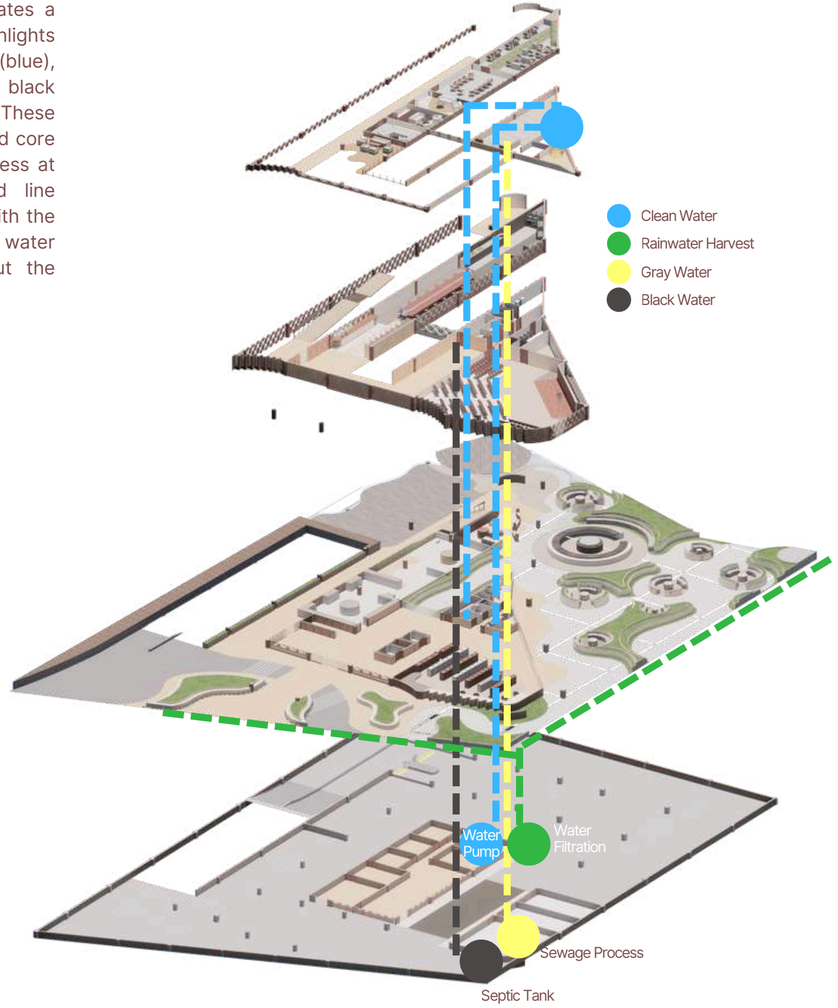


Figure 5.44
Water Infrastructure Diagram
Source: Author, 2025

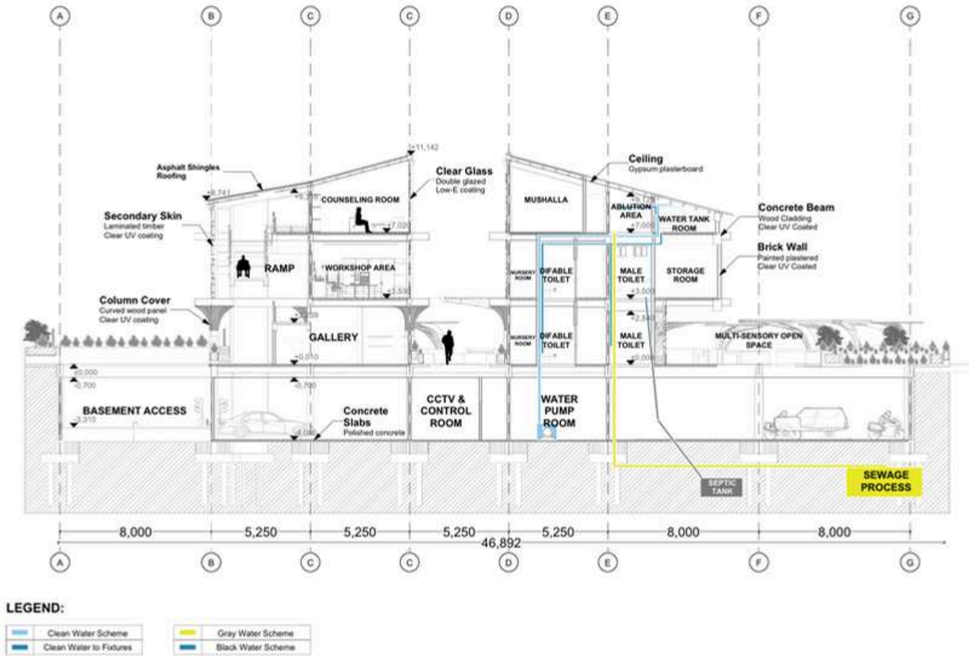


Figure 5.45
Water Infrastructure Section Scheme
Source: Author, 2025

The sectional drawing provides a detailed view of the water infrastructure across the building. It shows how clean water is supplied to upper floors, while grey and black water are directed downward for treatment. Rainwater is collected through roof catchment areas and stored underground. The integration of septic tanks, water tanks, and drainage pipes is clearly illustrated, supporting sustainable water use and waste management practices in the architectural design.

electricity **scheme.**

The exploded axonometric view illustrates the electricity distribution system across the building. Power is sourced from PLN (Indonesia's national electricity provider) and distributed vertically through the structure. Yellow lines indicate electrical conduits that supply lighting, outlets, and systems on each floor. Key components like transformers and distribution boards are strategically placed to ensure reliable and efficient energy flow throughout the building.

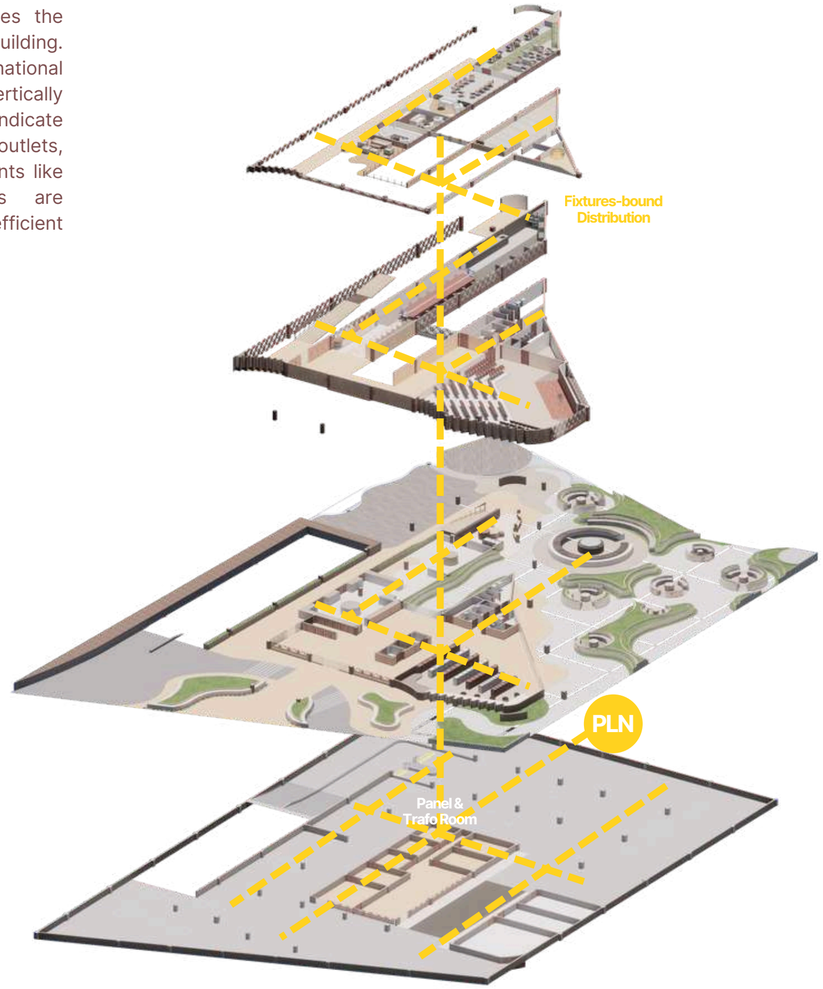


Figure 5.46
Electricity Infrastructure Diagram
Source: Author, 2025

barrier free **details.**

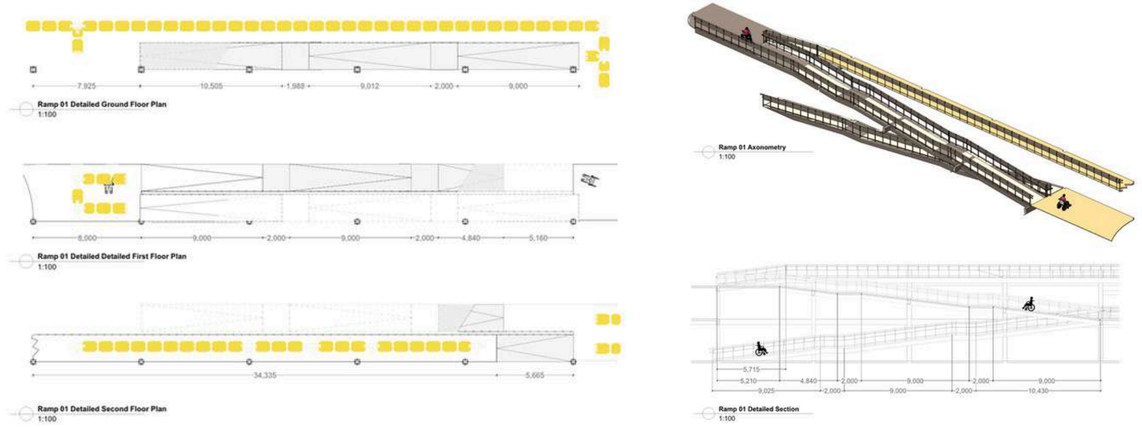


Figure 5.47
Ramps Details
Source: Author, 2025

This diagram highlights detailed drawings of barrier-free access elements, including ramps, tactile paving, and elevation gradients. Top and side views demonstrate compliance with universal design standards, ensuring ease of movement for people with disabilities. The perspective drawing shows a sloped ramp integrated into the landscape, promoting accessibility while blending aesthetically with the architectural context.

Presenting,

sawala rasa





Basement Access.



Pathway to open space.



Main Entrance.



Sight sensory stimulation on the pathway to the open space.



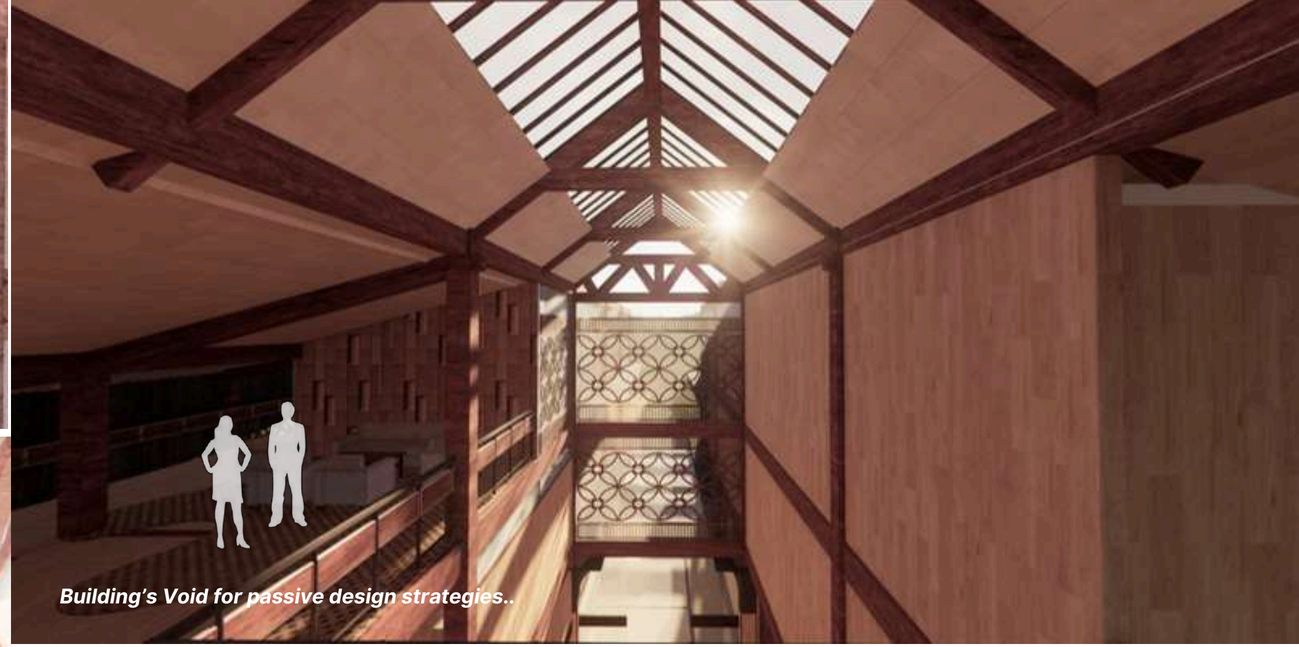
Main entrance with speed bumper for safetiness.



Seating area for inclusive socialization.



Textile and plastic waste equipment station.



Building's Void for passive design strategies..



Crafting area at the workshop area.



Main ramp for vertical accessibility.



Station for putting heavy equipments, dry racks, and storage.



Gallery and Products display.



Micro Library.



Counseling room.

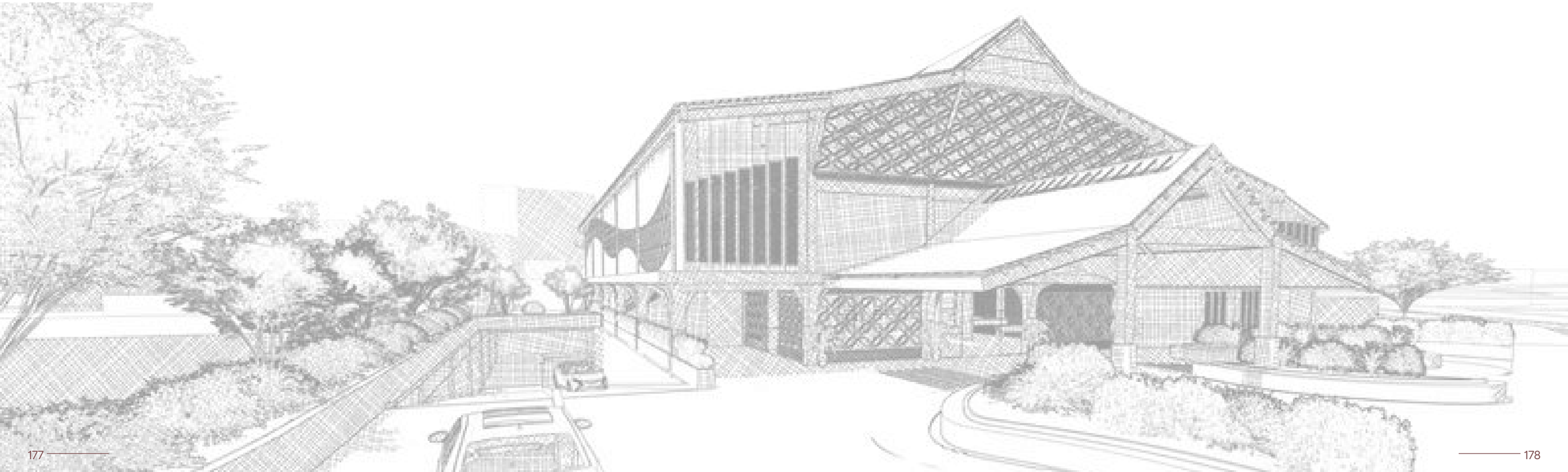


Seminar hall.

summary.

The Difable Training and Community Center in Sumur Bandung is an inclusive architectural project designed to empower individuals with disabilities through skill-building, especially in the field of circular economy. By integrating multi-sensory and universal design principles, the center ensures accessibility, independence, and meaningful participation for users with movement or sensory impairments. It incorporates Sundanese cultural values and sustainable strategies such as waste upcycling and passive design to create a space that is not only functional and inclusive, but also contextually and environmentally responsive.

This design successfully addresses the core problems identified—namely, the lack of inclusive public spaces, limited career opportunities for difabled individuals, and the untapped potential of circular economy in Bandung. Through its thoughtful spatial programming, inclusive features, and strong cultural integration, the center provides a much-needed permanent platform for empowerment, learning, and social interaction, helping to fulfill both regulatory mandates and community aspirations toward a more inclusive and sustainable urban future.



design **proof & evaluation.**

Parameters and Design Implementation

Based on the analysis and design response described earlier, the proof and evaluation of the design will refer to the design aspirations and criterias, namely:

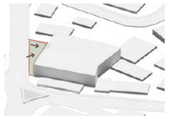
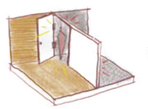
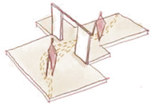
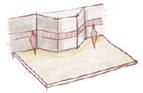
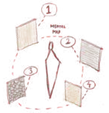
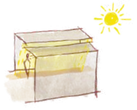
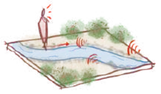
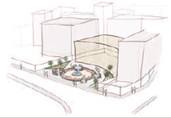
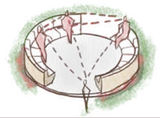
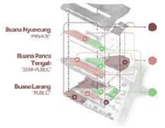
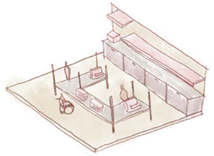
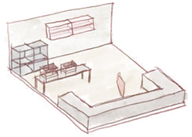
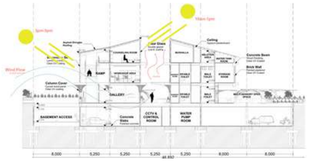
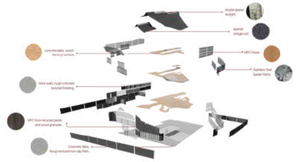
Design Aspirations	Variable	Parameter	Design Criterias	Design Implementation
Accessible	Circulation and wayfinding	Ramp gradient, door width, tactile guide paths	**Physical & cognitive accessibility**	      
	Sensory cues	Braille signage, sound cues, contrasting colors		
Inclusive	Social interaction zones	Shared seating areas, activity nodes, safe environment	**Chance of interaction**	 
	Cultural expression	Integration of Sundanese elements	**Sense of belonging**	  
Empowering	Skill-building infrastructure	Workshop rooms, production units	**Skill development programs**	  
	Independent learning spaces	Resources for empowering		
Sustainable	Waste management	Upcycling activities	**Long-term management**	 
	Material selection	Use of renewable materials or even upcycled materials		
	Passive design strategies	Natural lighting, cross ventilation		

Table 5.3
Design Proof & Evaluation
Source: Author, 2025

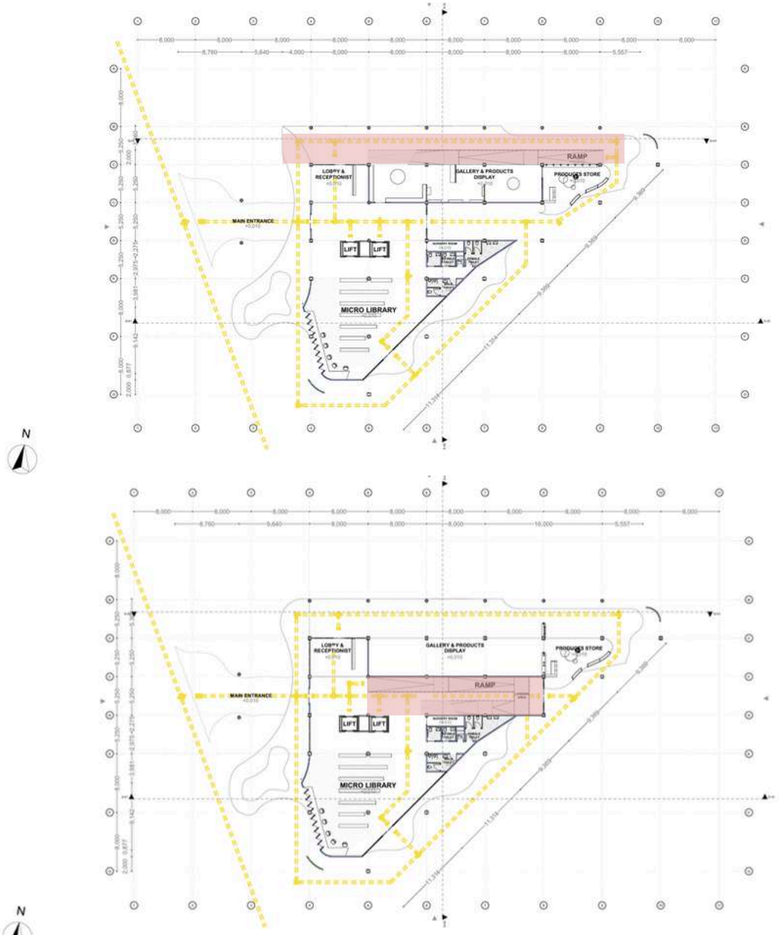
design
evaluation.

06.

ramp placement **alternative.**

integrating the ramps into the design.

The placement of the ramp was commented to not be placed at the outer side of the design. Instead, fulfilling the universal design paradigm, it is recommended to make it as the part of the interior design. It is to consider the behavior of the users as well; whether they will use and choose the ramp over the elevator or not. This comment leads the author to design another alternative placement of the ramp.



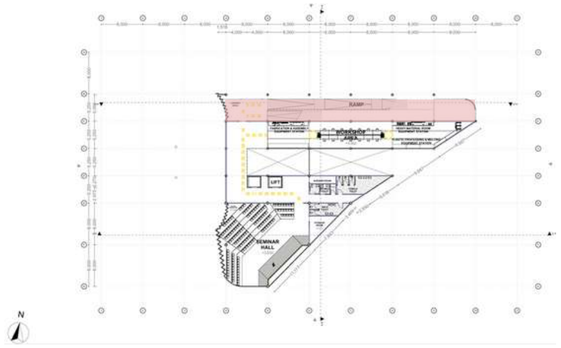
Before

The ramp is placed along the outer edge of the building, creating accessibility but visually separating it from the main circulation. This placement risks making the ramp feel secondary and less integrated with user flow, potentially discouraging use in favor of the elevator.

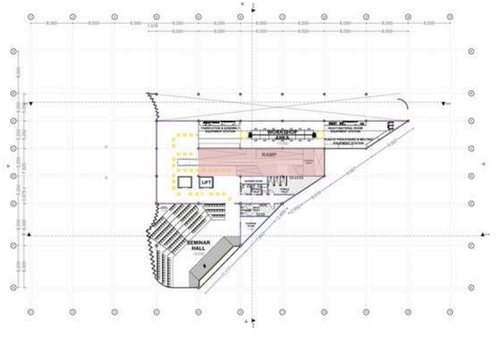
After

The ramp is repositioned within the interior, directly connected to primary circulation spaces. This integration enhances inclusivity, aligns with universal design principles, and ensures users naturally engage with the ramp as an equal option, promoting independence and accessibility for all.

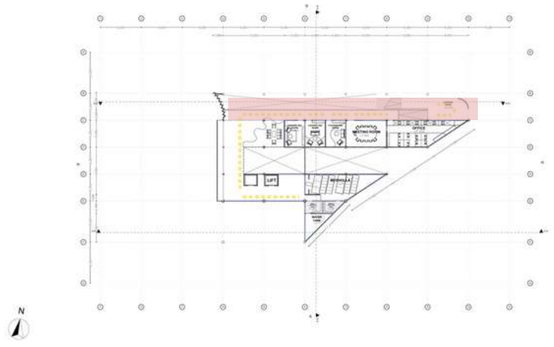
Figure 6.1
Ramp Placement Alternative on Floor Plans
Source: Author, 2025



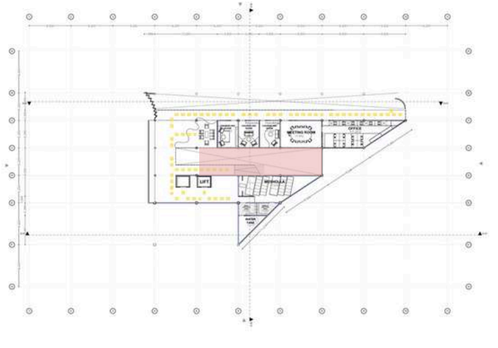
Before: 1st Floor



After: 1st Floor



Before: 2nd Floor



After: 2nd Floor

> *The design has shown the use of light as a guiding element for the visually impaired person. However, the duality of elevator and ramp still creates* ***'separation'*** *instead of a unified or* ***universal design.***
>
> *(Prof. Dr.-Ing. Ir. Ar. Ilya Fadjar Maharika, MA., IAI. & Mrs. Arif Budi Sholihah, S.T., M.Sc., Ph.D)*



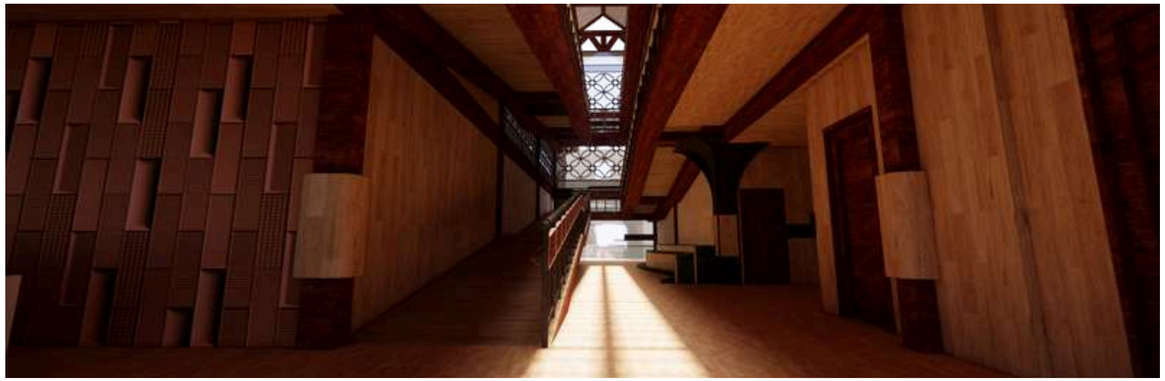
Previous Ramp Placement: At the Northern Side of the Building

The previous ramp placement at the northern side of the building provided accessibility but remained detached from the building's central flow. While functional, it risked being overlooked by users who preferred more integrated circulation, making the ramp less effective as part of the overall inclusive design strategy.



Previous Middle Part of the Building: Sensory Pathway to the back side

The previous middle part of the building was designed as a sensory pathway to the back side, creating a unique experience through light, textures, and nature. While visually and sensorially rich, it prioritized atmosphere over accessibility, limiting its contribution to circulation and functional movement within the building.



Revised Ramp Placement: At the Middle Side of the Building

This configuration integrates accessibility within the main circulation, not neglecting the natural lighting haptic experience from the skylight as a guiding path for visually impaired users. It makes the ramp more visible and usable, encouraging inclusivity by aligning with universal design principles, ensuring users naturally choose the ramp as part of their daily movement inside the building.



Figure 6.2
Ramp Placement Alternative on Render
Source: Author, 2025

Revised Northern side of the Building: Wider Space to be utilized for Gallery & Products Store

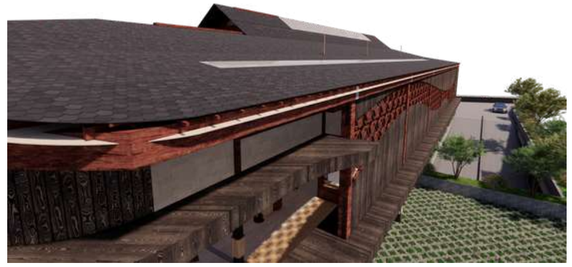
The revised northern side of the building transforms into a wider, multifunctional space that accommodates a gallery and product store. This adjustment optimizes the area by replacing the ramp with commercial and exhibition functions, providing opportunities for showcasing upcycled products and supporting economic empowerment within the inclusive community center.

> *The design should consider the tropical climate at Bandung city. The roof should have **shading**/overhang to prevent excessive **sunlight** and **rainwater** from coming into the building.*
>
> *(Mrs. Arif Budi Sholihah, S.T., M.Sc., Ph.D & Prof. Dr.-Ing. Ir. Ar. Ilya Fadjar Maharika, MA., IAI.)*

shading **design.**

response to the tropical climate of Bandung, Indonesia.

As a response to the tropical climate in Bandung, the design was revised to include extended roof shading. This adjustment aims to minimize the amount of direct sunlight entering the building, reducing glare that can disturb users, particularly those with visual impairments. The shading also helps regulate indoor temperatures, preventing overheating during the day while improving overall thermal comfort. Additionally, the roof overhang provides protection from heavy rainfall, ensuring water does not easily enter through openings or disrupt circulation spaces.

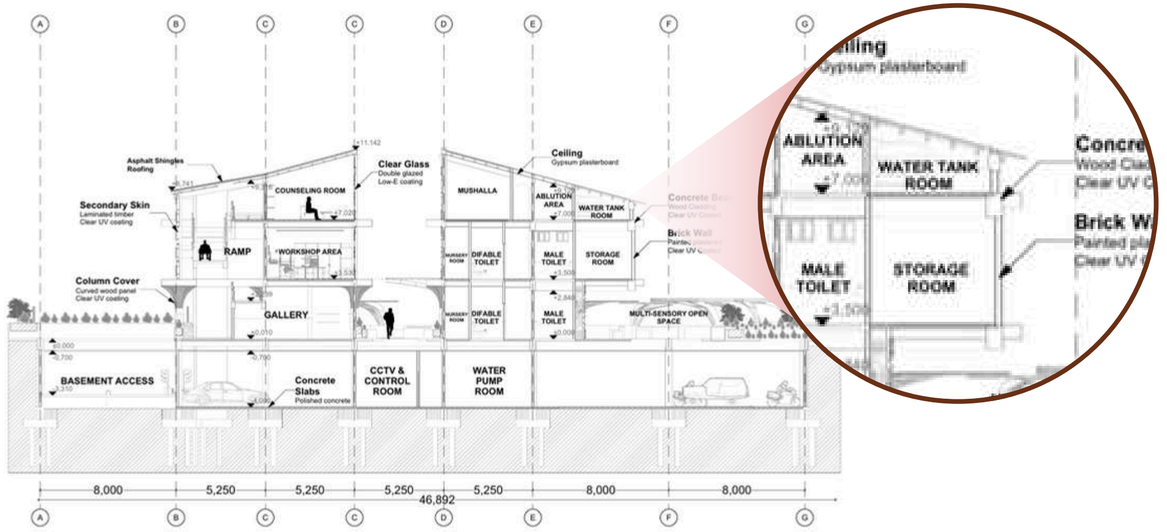


Before

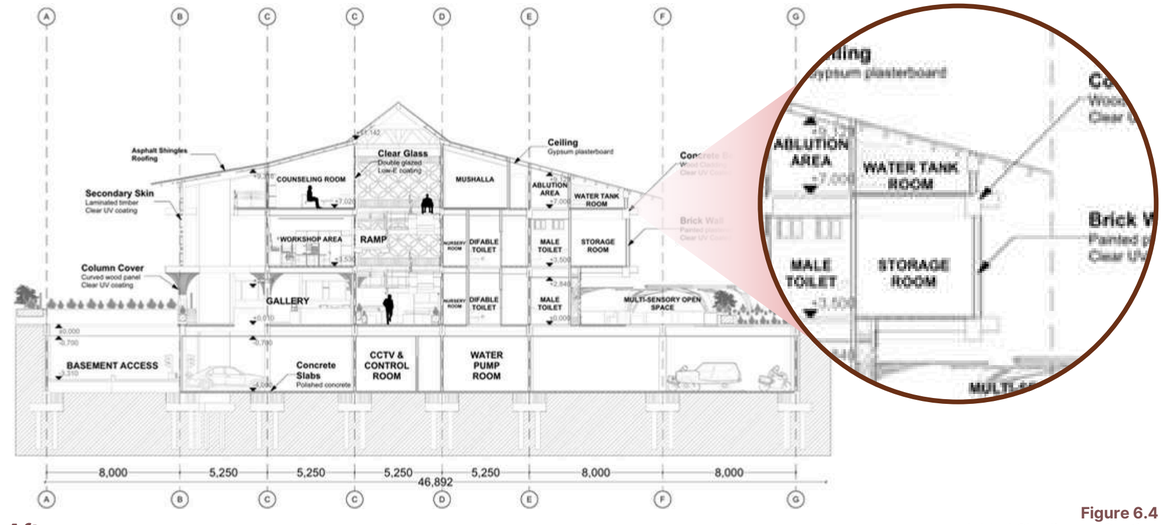


After

Figure 6.3
Added Shading on Render
Source: Author, 2025



Before



After

Figure 6.4
Added Shading on Section
Source: Author, 2025

building coverage ratio **calculation.**

including the basement into the Building Coverage Ratio (BCR) calculation.

The basement previously was not calculated as part of the BCR, and was designed only considering the setbacks of the site. The examiner advised that the basement should be calculated as part of the BCR, thus should be aligned with the building shape and size.

The author re-checks the regional regulation and create alternative for the basement. Yet, for regulations in Bandung City, no explicit provisions regarding basements have been found in publicly available RDTR documents, local regulations, or local government regulations. The author acknowledges that the basement design does not align with the standard BCR regulations due to her limited knowledge on this matter; however, she is committed to learning from this mistake and ensuring better compliance with applicable regulations in her future design projects.

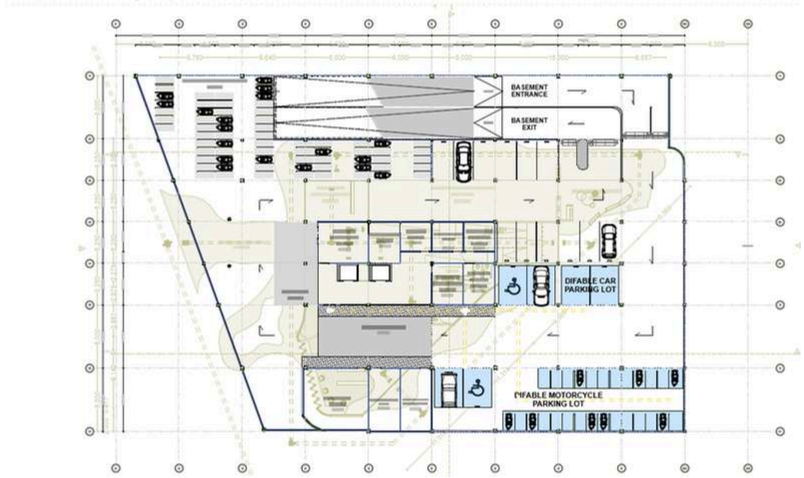


Figure 6.5
Basement Floor Plan
Source: Author, 2025

> *"The **calculation of BCR** needs to be reviewed. The basement took almost 98% of the site, making it opposing the **local regulation.***
>
> *(Prof. Dr.-Ing. Ir. Ar. Ilya Fadjar Maharika, MA., IAI. & Dr.-Ing. Putu Ayu Pramanasari A., S.T., M.A.)"*

07. attach**ments.**

plagiarism **check result.**

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Bismillaahirrahmaanirrahiim

Assalamualaikum Wr. Wb.

Dengan ini, menerangkan Bahwa:

Nama	: Zahra Zakiyah
Nomor Mahasiswa	: 21512194
Pembimbing	: Dr.-Ing. Putu Ayu Pramanasari A., S.T., M.A.
Fakultas / Prodi	: Teknik Sipil dan Perencanaan/ Arsitektur
Judul Karya Ilmiah	: A Design of Difable Training and Community Center for Circular Economy in Sumur Bandung, Bandung City with Inclusive Architectural Approach

Karya ilmiah yang bersangkutan di atas telah melalui proses cek plagiasi menggunakan **Turnitin** dengan hasil kemiripan (*similarity*) sebesar **3 (Tiga) %.**

Demikian Surat Keterangan ini dibuat untuk dapat dipergunakan sebagaimana mestinya.

Wassalamualaikum Wr. Wb.

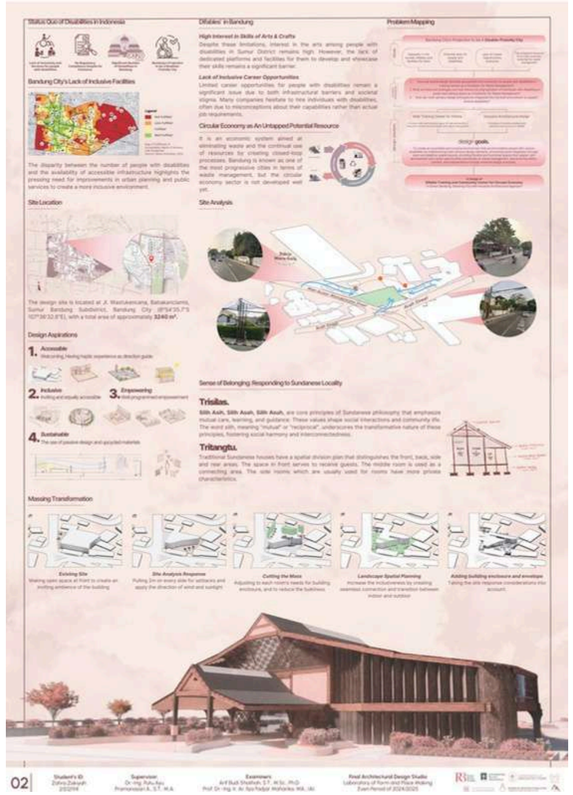
Yogyakarta, 8/19/2025
Direktur

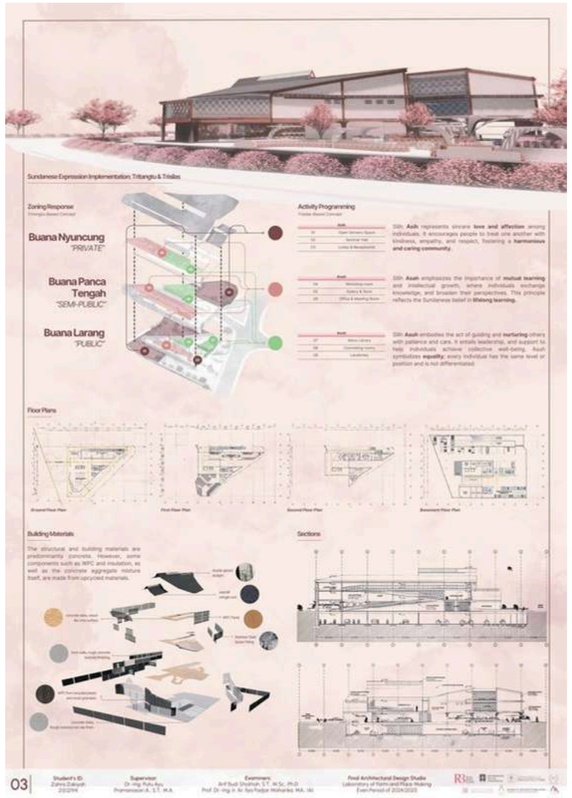
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DIREKTORAT PERPUSTAKAAN
YOGYAKARTA

Muhammad Jamil, SIP.

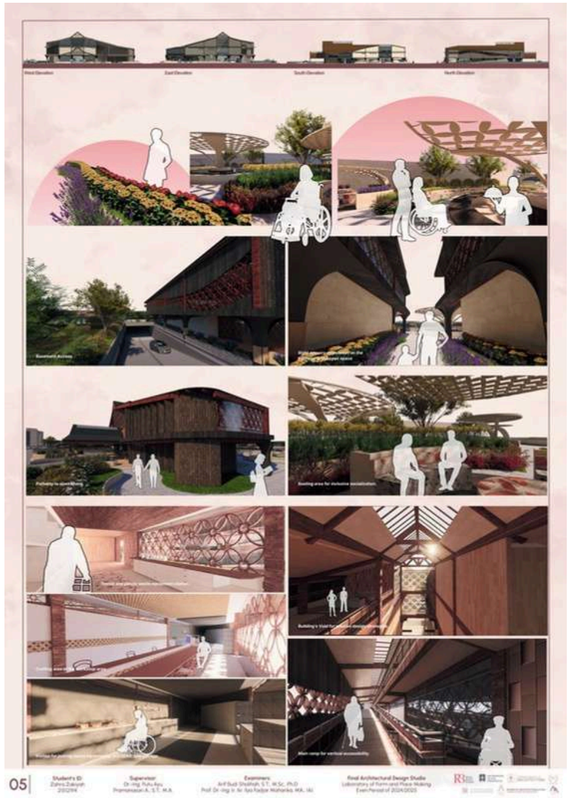
architectural **presentation board.**

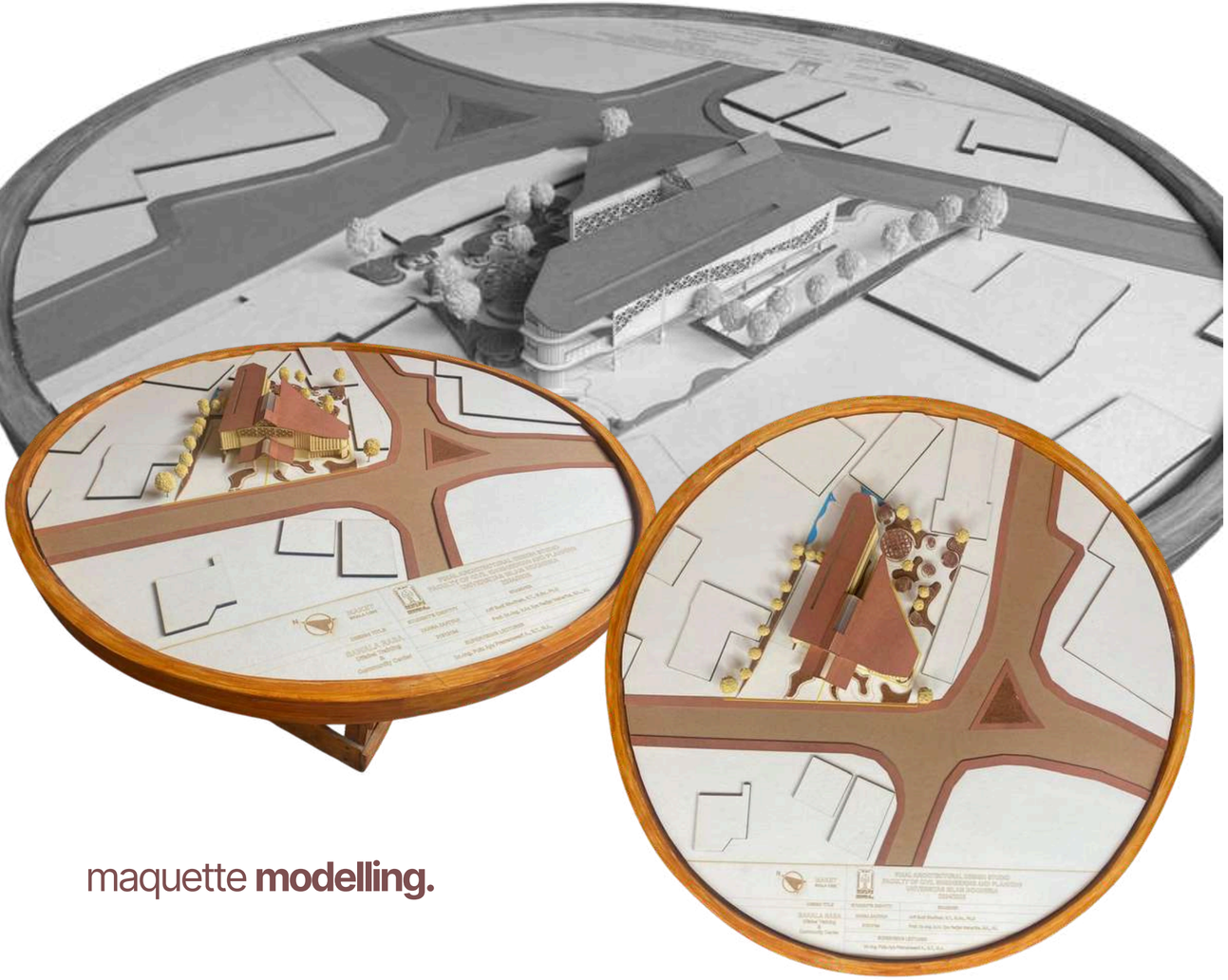





Sundanese Expression Implementation: Tritangtu & Tritallas
Zoning Response
Buana Nyuncung
"PRIVATE"
Buana Panca Tengah
"SEMI-PUBLIC"
Buana Larang
"PUBLIC"
Activity Programming
Floor Plans
Building Materials
Sections
03
Student's ID
Zahra Zakiyah
2322114
Supervisor
Dr.-Ing. Putu Ayu
Prameswari A., S.T., M.A.
Examiners
Arif Budi Sholihah, S.T., M.Sc., Ph.D
Prof. Dr.-Ing. Ir. Ibn Fadjar Mahanika, MA., IAI
Final Architectural Design Studio
Laboratory of Form and Place Making
Even Period of 2024/2025

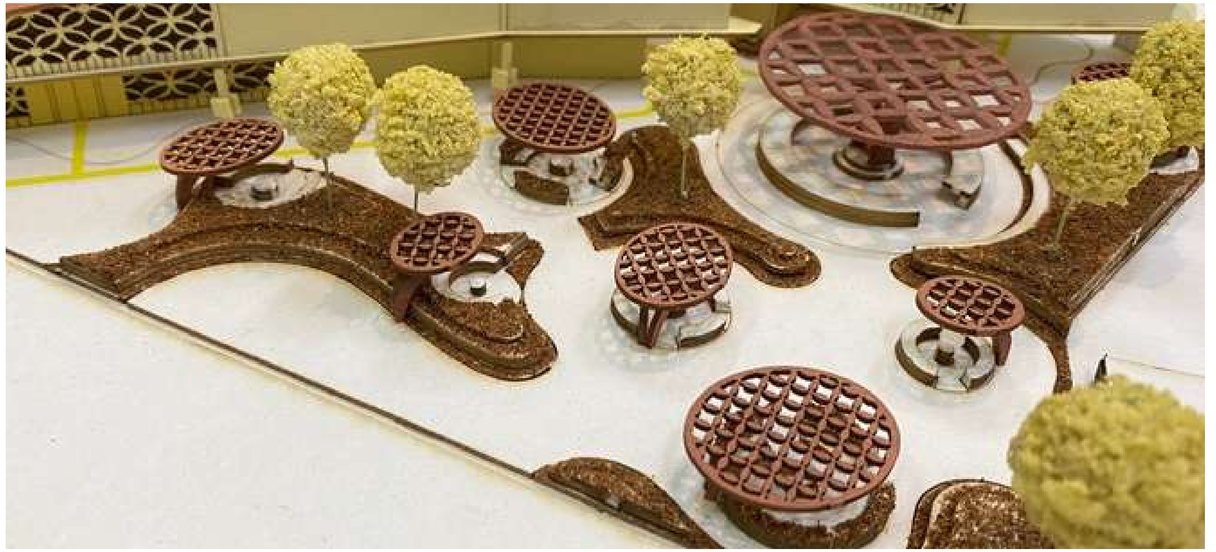

01 silih asih : inclusiveness.
Open Multi-Sensory Space
SOFTSCAPES LEGEND:
HARDSCAPES AND IRRIGATION SYSTEM
02 silih asah: empowering.
Workshop Area
gallery & products display area
office & meeting room
03 silih asuh: equity in accessibility.
Counseling Rooms
Micro Library
04
Student's ID
Zahra Zakiyah
2322114
Supervisor
Dr.-Ing. Putu Ayu
Prameswari A., S.T., M.A.
Examiners
Arif Budi Sholihah, S.T., M.Sc., Ph.D
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05
Student's ID
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Prof. Dr.-Ing. Ir. Ibn Fadjar Mahanika, MA., IAI
Final Architectural Design Studio
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Even Period of 2024/2025



maquette **modelling.**





design
documents.

Scan the QR to see detailed drawings.



references.

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