



NEO PMC

GENERAL HOSPITAL

Designing the Transformation of
Permata Medical Center Hospital from
Type D to Type C with a Healing
Environment Approach

A BOOK BY **AHMAD FAUZI ARIFIN**
1951229

SUPERVISOR
Ar. Agus Setiawan, S.T., M.Arch.,
IAI., GP



ARCHITECTURE
UNIVERSITAS ISLAM INDONESIA





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Hospital from Type D to Type
C with a Healing
Environment Approach*



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VALIDITY SHEET

Final Architecture Design Studio Entitled:

Designing the Transformation of Permata Medical Center Hospital from Type D to Type C
with a Healing Environment Approach

NEO PERMATA MEDICAL CENTER HOSPITAL

General Type C Hospital

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Student's Identification:

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Has been evaluated and agreed on:

14 & 22 August 2025

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Designing the Transformation of Permata Medical Center Hospital from Type D to Type C
with a Healing Environment Approach

Student's Full Name:

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Student's Identification:

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FINAL REPORT QUALITY:
~~Fair~~, Good, ~~Excellent~~*) Please circle one

THEREFORE,
RECOMMENDATION AS A REFERENCE FOR FUTURE FINAL PROJECTS:
RECOMMENDED/~~NOT RECOMMENDED~~*) PLEASE CIRCLE ONE

Yogyakarta, August 22 2025
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Ar. Agus Setiawan, S.T., M.Arch., IAI, GP

STATEMENT OF ORIGINALITY

I hereby declare that my final project, entitled “Designing the Transformation of Permata Medical Center Hospital from Type D to Type C with a Healing Environment Approach“, is my own original work, except for those works cited as references, and has been produced without the assistance of any other party, either in whole or in part. I also declare that there is no conflict of intellectual property rights over this work and grant the Department of Architecture, Universitas Islam Indoneisa, the right to use it for educational and publication purposes.

Yogyakarta, August 22 2025
Author,



Handwritten signature of Ahmad Fauzi Arifin.

Ahmad Fauzi Arifin

FOREWORDS

Assalamualaikum Warahmatullahi Wabarakatuh,
May peace, mercy, and blessings of Allah be upon you.

All praise and gratitude are due to Allah SWT, who has bestowed His infinite grace, guidance, and blessings, and may peace and salutation be upon our noble Prophet Muhammad SAW. With His permission, this Final Project report entitled **“Designing the Transformation of Permata Medical Center Hospital from Type D to Type C with a Healing Environment Approach”** has been successfully completed.

Through this acknowledgment, the author wishes to sincerely express appreciation and gratitude to all parties who have contributed to the completion of this work:

- 1.To Allah SWT, who has granted health, ease, and countless blessings that enabled the author to complete this final project.
- 2.To the author’s beloved parents, Mr. Ahmad Zainal Arifin and Mrs. Susilo Hartati, for their continuous encouragement, unconditional love, support, mentorship, and endless prayers throughout every step of this journey.
- 3.To the author’s dear sister and closest companions, Nabila Hanifia Arifin and Vanya Putri Damayanti, for their encouragement and presence through both challenges and joyful moments of this process.
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- 5.To Mrs. Ir. Etik Mufida, M.Eng. and Dr.-Ing. Putu Ayu Pramanasari A., S.T., M.A., as the examiners, for their valuable input and constructive criticism which greatly improved the quality of this final project.
- 6.To the author’s extended family (cousins, uncles, and aunts) for their continuous encouragement, prayers, and support.
- 7.To fellow companions and colleagues (Arul, Kancen, Akmal, Ghazy, Agung, Cesario, Hafidz, Mbus, Idho, Rudy, Rauni, and Yazid) and to the entire family of KMA, DCIM, HMA, and KREMA LEM U, who have provided assistance and companionship throughout the academic journey, as well as to peers from the classes of 2019, 2020, and 2021 for their collective support and motivation.
- 8.To close friends, TEJE (MAHASIBUK), for their encouragement and moral support during the writing of this final project.
- 9.To fellow advisees, Darrel, Hanan, and Indra, for their support, collaboration, and motivation throughout this process.

The author is fully aware that this report, in terms of structure, language, and presentation, is still far from perfect. Therefore, constructive criticism and suggestions are most welcome to improve future works. May the knowledge and effort invested in this report not be in vain, but rather bring benefit to readers.

Wassalamualaikum Warahmatullahi Wabarakatuh,
And may the peace, mercy, and blessings of Allah also be upon you.

Yogyakarta, August 22 2025
Author,



Ahmad Fauzi Arifin

ABSTRACT

This architectural design project addresses the critical shortage of healthcare infrastructure in Indramayu Regency by proposing the comprehensive transformation of Permata Medical Center (PMC) from an outdated Type D facility into a regulatory-compliant Type C hospital. The redesign is fundamentally centered on a Healing Environment approach, aiming to enhance patient recovery outcomes and staff well-being while optimizing operational functionality. The design process was informed by a mixed-methodology, incorporating a Post-Occupancy Evaluation (POE) of the existing facility, contextual site and climate analysis, a review of local disease prevalence, and precedent studies of successful healing-focused hospitals.

The proposed architectural solution features a 'Twin Tower' concept that bifurcates the building mass to create a central, landscaped healing garden, which serves to maximize natural light and cross-ventilation. This configuration optimizes spatial planning with clearly delineated circulation for public, private, and service flows, improving operational efficiency and infection control. Key design interventions were validated through environmental simulations, including daylighting (DIALUX) and airflow (CFD) analyses, to prove their effectiveness in achieving thermal and visual comfort. The development strategy is also financially validated, projecting a 6.8-year payback period on an estimated IDR 89.9 billion investment. In conclusion, by integrating Evidence-Based Design principles, this project provides a viable blueprint for a modern, sustainable, and humane healthcare facility that addresses Indramayu's infrastructure gap and establishes a new paradigm for restorative hospital architecture in the region.

Keywords: Evidence-Based Design (EBD), Healing Environment, Healthcare Architecture, Transformation Design, Type C Hospital.

ABSTRAK

Proyek perancangan arsitektur ini menjawab kelangkaan infrastruktur kesehatan yang kritis di Kabupaten Indramayu dengan mengusulkan transformasi komprehensif Rumah Sakit Permata Medical Center (PMC) dari fasilitas Tipe D yang sudah usang menjadi rumah sakit Tipe C yang sesuai dengan regulasi. Perancangan ulang ini secara fundamental berpusat pada pendekatan Healing Environment (Lingkungan Penyembuhan), yang bertujuan untuk meningkatkan hasil pemulihan pasien dan kesejahteraan staf sekaligus mengoptimalkan fungsionalitas operasional. Proses perancangan didasarkan pada metodologi campuran, yang mencakup Evaluasi Pasca-Huni (POE) pada fasilitas eksisting, analisis tapak dan iklim kontekstual, tinjauan prevalensi penyakit lokal, dan studi preseden dari rumah sakit berkonsep penyembuhan yang telah berhasil.

Solusi arsitektur yang diusulkan menampilkan konsep 'Menara Kembar' yang membagi massa bangunan untuk menciptakan taman penyembuhan (healing garden) di bagian tengah, yang berfungsi untuk memaksimalkan cahaya alami dan ventilasi silang. Konfigurasi ini mengoptimalkan perencanaan tata ruang dengan sirkulasi yang terdefinisi secara jelas untuk alur publik, privat, dan servis, sehingga meningkatkan efisiensi operasional dan pengendalian infeksi. Intervensi desain utama divalidasi melalui simulasi lingkungan, termasuk analisis pencahayaan (DIALUX) dan aliran udara (CFD), untuk membuktikan efektivitasnya dalam mencapai kenyamanan termal dan visual. Strategi pengembangan ini juga divalidasi secara finansial, dengan proyeksi periode pengembalian investasi (payback period) selama 6,8 tahun dari estimasi investasi sebesar Rp 89,9 miliar. Kesimpulannya, dengan mengintegrasikan prinsip-prinsip Desain Berbasis Bukti (Evidence-Based Design), proyek ini menyediakan cetak biru yang layak untuk fasilitas kesehatan yang modern, berkelanjutan, dan humanis, yang menjawab kesenjangan infrastruktur di Indramayu serta menetapkan paradigma baru bagi arsitektur rumah sakit restoratif di kawasan tersebut.

Kata Kunci: *Evidence-Based Design (EBD), Healing Environment, Arsitektur Kesehatan, Transformasi Design, Hospital Tipe C*

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00 DESIGN PREMISE

The transformation of Permata Medical Center Hospital from a Type D to a Type C facility requires a design approach that not only meets the upgraded medical service standards but also prioritizes patient well-being. In this process, the Healing Environment approach serves as a fundamental strategy to create spaces that support both physical and psychological healing.

The design will focus on:

- Capacity and Facility Enhancement – Adjusting spatial requirements and medical equipment to comply with Type C hospital standards.
- Implementation of Healing Environment – Integrating design elements such as natural lighting, green spaces, proper air circulation, and patient-friendly materials.
- Optimization of Circulation Flow – Ensuring the efficient movement of patients, medical staff, and visitors to enhance service quality.

Through this transformation, Permata Medical Center Hospital aims to not only fulfill the technical requirements of a Type C hospital but also improve patient recovery experiences and overall healthcare efficiency.



"If a builder builds a house for someone, and does not construct it properly, and the house which he built falls in and kills its owner, then that builder shall be put to death."

Hamurabi's code

Chapter 01

INTRODUCTION

Project Title	Lesson Learned	Difference
Design of a Cancer Hospital with a Healing Environment Approach in Manado Authors: Imanuel Happy Poka, Moh Fachruddin Suharto, Debbie A. J. Harimu Year: 2023	This study proposes a new cancer hospital in Manado, integrating Healing Environment design to address the psychological needs of cancer patients. The "Therapeutic Forest" concept incorporates forest-like environments to promote healing and well-being.	This project involves designing a new specialized cancer hospital with Healing Environment elements from the ground up, focusing on creating a therapeutic environment for cancer patients.
The Application of Healing Architecture Concept in Type C Regional Hospital, Karanganyar Regency, Central Java Authors: Mushadik, Rita Laksmitasari Rahayu Year: 2023	This research applies healing architecture principles, including Healing Environment design, to a Type C regional hospital. It emphasizes landscape integration and natural elements to improve patient recovery and staff well-being.	This study focuses on applying healing architecture principles, including Healing Environment design, to a Type B regional hospital, emphasizing landscape integration and natural elements.
Identifikasi Penerapan Healing Environment Design pada Interior Rumah Sakit Authors: Raden Roro Monica Synthia Permata Dewi, Yusita Kusumarini, Anik Rakhmawati Year: 2018	This study identifies applicable Healing Environment design patterns in hospital interiors to create a healing environment. It analyzes 14 patterns and determines the suitability of each within hospital settings.	This research identifies suitable Healing Environment design patterns for hospital interiors, focusing on creating a healing environment through interior design elements.

01 TITLE DESCRIPTION

Designing the Transformation of Permata Medical Center Hospital from Type D to Type C with a Healing Environment Approach

TITLE DESCRIPTION:

- **DESIGN PLANNING**

Design planning is a goal-oriented process that guides problem-solving activities through programming, conceptualization, and implementation. It involves three key stages: identifying the problem, determining problem-solving methods, and executing the solution.

- **TRANSFORMATION**

The transformation of a hospital involves upgrading its classification by improving facilities, expanding services, and meeting higher regulatory standards. The shift from Type D to Type C requires increasing medical staff, enhancing infrastructure, and providing specialized healthcare services such as internal medicine, surgery, pediatrics, and obstetrics. This process also includes optimizing patient care through better technology, service capacity, and sustainable design approaches like Healing Environment design, which integrates natural elements to promote healing and well-being.

- **HEALING ENVIRONMENT DESIGN**

Healing Environment design is an architectural approach that seeks to reconnect people with nature by integrating natural elements into built environments. This design philosophy emphasizes the use of natural light, organic materials, vegetation, and views of nature to enhance occupants' well-being and comfort. By fostering a connection to the natural world, Healing Environment design aims to reduce stress, improve cognitive function, and promote overall health.

CONCLUSION OF THE TITLE DESCRIPTION

Berdasarkan penjelasan di atas, maka dapat disimpulkan bahwa, **“Designing the Transformation of Permata Medical Center Hospital from Type D to Type C with a Healing Environment Approach”**. The transformation of a hospital from Type D to Type C requires a structured approach that integrates design planning, infrastructure development, and Healing Environment design. Through systematic problem-solving, design planning ensures effective upgrades in medical services, staff capacity, and facility standards. Healing Environment design enhances this transformation by incorporating natural elements to promote healing, reduce stress, and improve overall well-being. Together, these principles create a more efficient, sustainable, and patient-centered healthcare environment.

02 BACKGROUND

PROJECT LOCATION

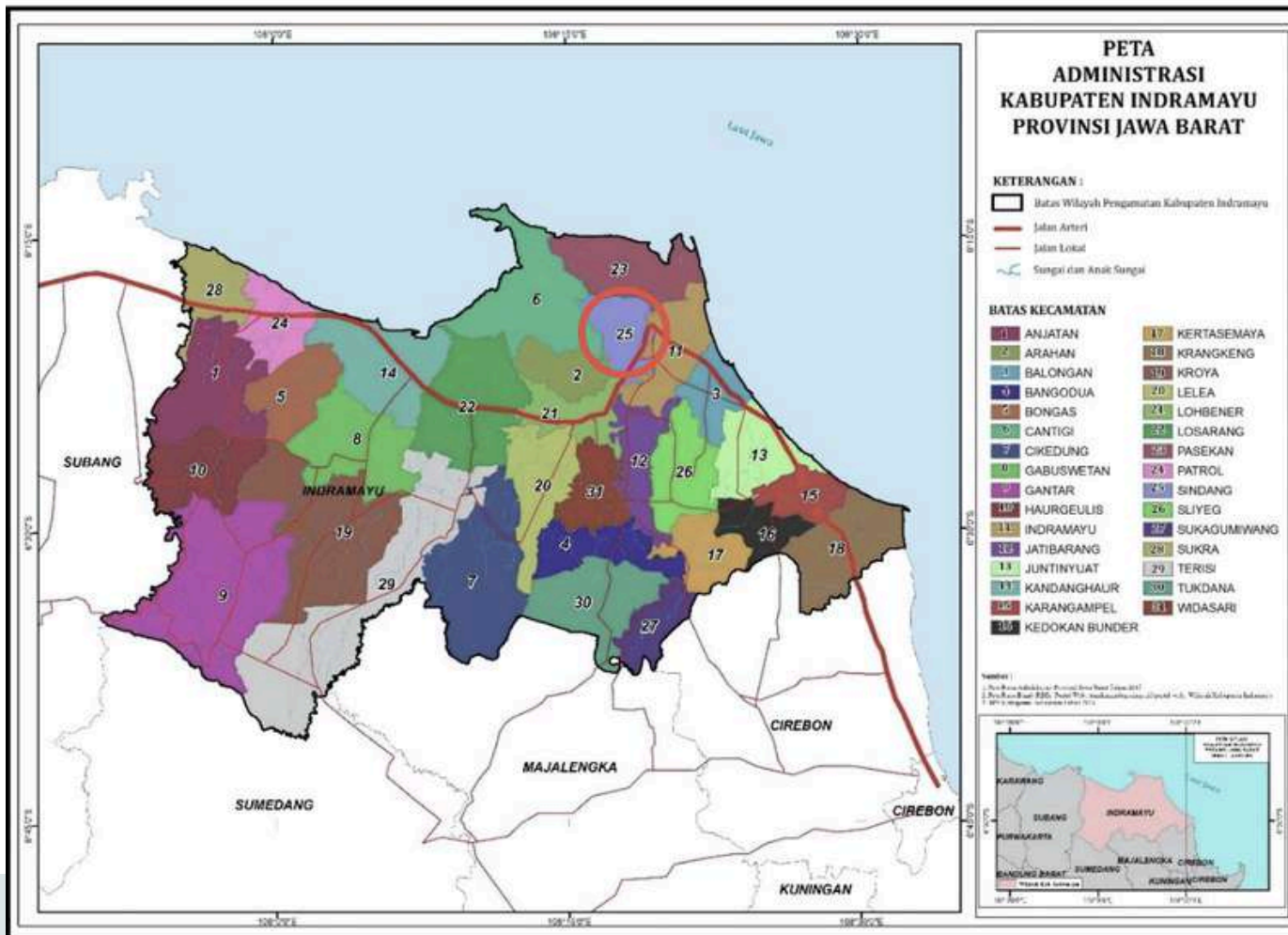


IMAGE 1.1 : ADMINISTRATION MAP OF INDRAMAYU, WEST JAVA

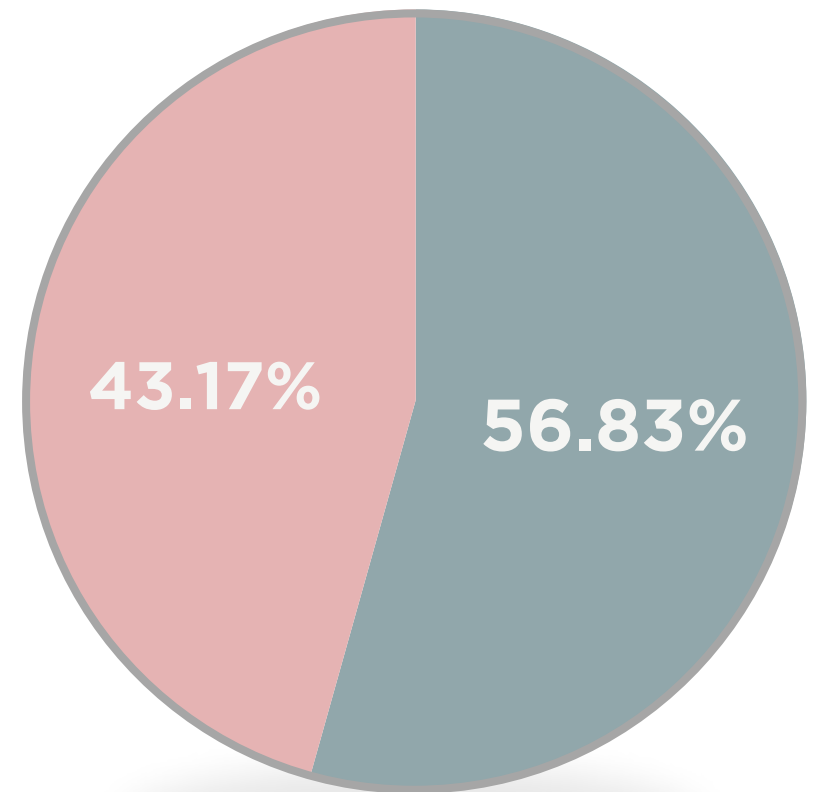
Source: Indramayu Central Bureau of Statistics

Indramayu Regency is an administrative region in West Java Province, Indonesia, with Indramayu as its capital. While Indramayu serves as the government center, the most densely populated and economically active area is Jatibarang. The regency is bordered by the Java Sea to the north, Cirebon Regency to the southeast,

The Scope of this study is divided into the study area and the planning area. The study area encompasses the entire Indramayu Regency and its relationship with other regions within its broader regional context. The planning area is specifically focused on the designated site for the development of Permata Medical Center Hospital in Indramayu.

Projected Hospital Bed Needs in 2035

Based On 1:1000 People Ratio in Indramayu

**56.83%****2,858 Required
Bed in 2035****43.17%****1,440 Existing Hospital
Bed in 202****IMAGE 1.2 : INDRAMAYU HOSPITAL
BED CAPACITY DIAGRAM 2023**

Source: Author Calculation according FS of PMC Hospital.

According to Feasibility Study of PMC General Hospital The population growth rate in Indramayu continues to rise, According to data from the Central Bureau of Statistics (Badan Pusat Statistik) of Indramayu Regency, By the end of 2024, People had increased to 1,950,000, reflecting a growth of 230,813 people. Consequently, the population growth rate for Indramayu Regency between 2018 and 2024 was 2.42%.

Despite ongoing development across multiple sectors within Indramayu Regency, the availability of hospital beds remains below the World Health Organization's recommended ratio of 1 bed per 1,000 residents. As of 2025, with an estimated population of 1,997,190, the regency accommodates only 1,440 hospital beds, distributed across 13 general hospitals and one specialized hospital, resulting in a deficiency of approximately 557 beds.

the total population is projected to reach approximately **2.86 million by 2035 based on master projection**. To meet the ideal bed-to-population ratio, the region would require a minimum of **2,534 hospital beds by that year, indicating a projected shortfall of around 1,094 beds** if no infrastructural interventions are made. In this context, the proposed reclassification and capacity enhancement of the Pasar Minggu Community (PMC) Hospital is of strategic significance. Such an upgrade could play a critical role in bridging the healthcare infrastructure gap, improving competitive service provision, and advancing the overall quality and accessibility of healthcare services in Indramayu Regency.

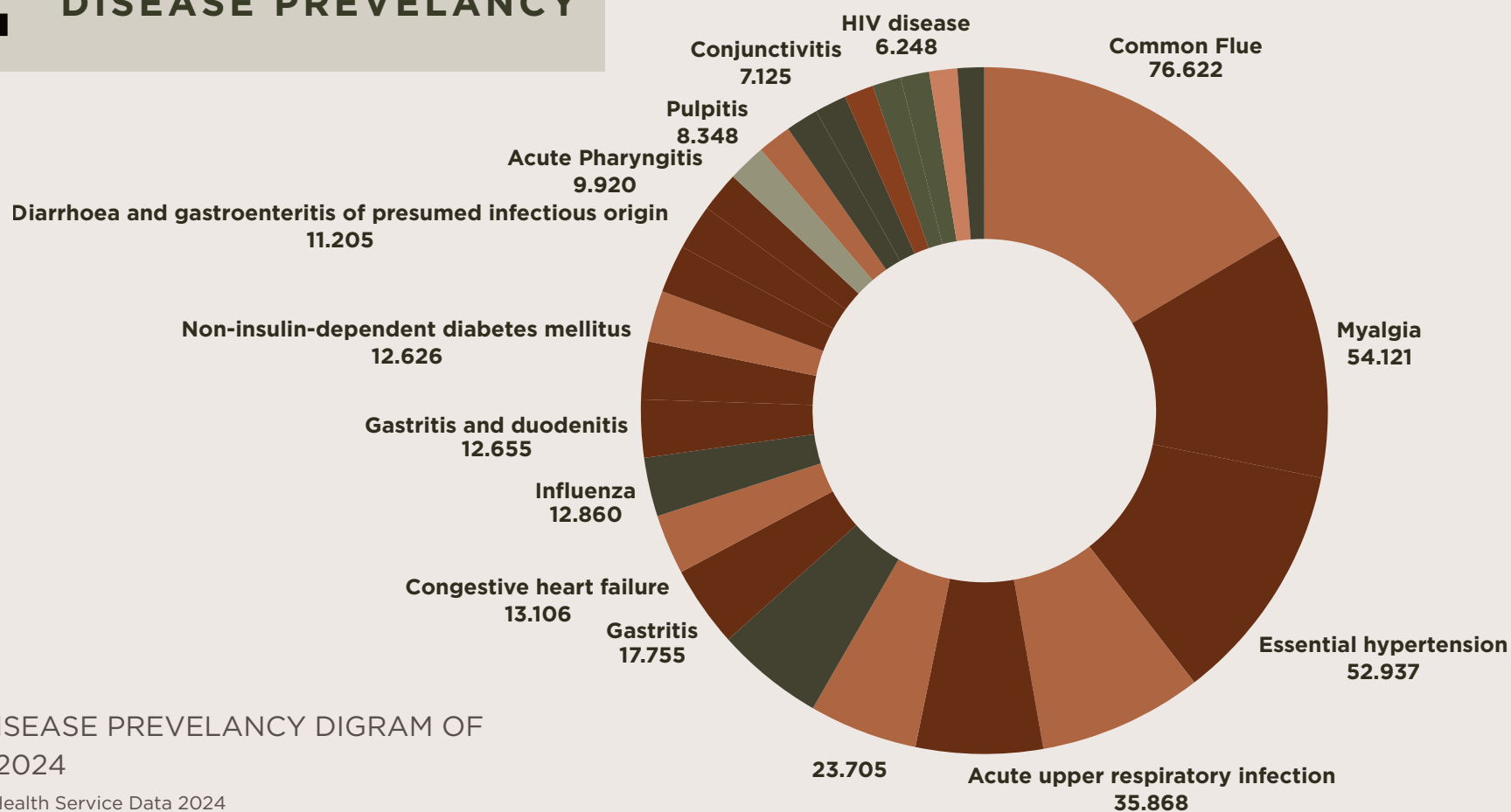
No	Hospital Name	Type	OWNERSHIP	BED CAPACITY	Class
1	RS PMC Indramayu	General	Private	65	D
2	MM Indramayu Hospital	General	Private	88	C
3	Irhamna Maternity and Children's Hospital	Specialized	Private	35	D
4	RSUD Indramayu	General	Regional Government	364	B
5	Pertamina Balongan Hospital	General	State-Owned (BUMN)	50	D
6	Sentra Medika Langut Hospital	General	Private	100	C
7	RSUD Pantura M.A. Sentot Patrol	General	Regional Government	153	C
8	Bhayangkara Hospital Indramayu	General	Military/Police	100	C
9	Zam-Zam Muhammadiyah Islamic Hospital Jatibarang	General	Community-Based Organization	50	D
10	Mitra Plumbon Indramayu Hospital	General	Private	206	B
11	RSUD Mursid Ibnu Syafiuddin	General	Regional Government	103	C
12	Syahid Al Irsyad Hospital	General	Community-Based Organization	26	D
13	Mitra Plumbon Patrol Hospital	General	Private	100	C
TABLE 1.3 Hospital Distribution Data In Indramayu Source: Indramayu Health Profile 2023.			Total Bed Capc.	1440	

Indramayu Regency has 13 hospitals, mostly general hospitals, with only one specialized facility, Irhamna Maternity and Children's Hospital. Ownership is divided among private (7), regional government (3), community-based (2), and state-owned (1) hospitals. Most hospitals have achieved Paripurna accreditation, except Syahid Al Irsyad Hospital, reflecting strong healthcare quality and patient safety standards.

Most Hospitals in Indramayu are Class C (6), serving as referral centers with limited specialized care, while Class D (4) hospitals provide basic services with smaller capacities. With no Class A hospitals, patients requiring tertiary care must seek treatment outside the region. Upgrading RS PMC to Class C is not only essential to meet bed capacity needs but also strategically important for competitiveness. As the only private Class C hospital within a 5-kilometer radius in its district, RS PMC will strengthen its position and expand its healthcare services.

02

BACKGROUND DISEASE PREVELANCY



**IMAGE 1.4 : DISEASE PREVELANCY DIGRAM OF
INDRAMAYU 2024**

Source: Indramayu Health Service Data 2024

GENERAL PRACTITIONER, INTERNAL MEDICINE

The high prevalence of Cardiology-related diseases such as **ESSENTIAL HYPERTENSION** and **CONGESTIVE HEART FAILURE** highlights the need for early detection of non-communicable diseases (NCDs). Similarly, **Gastroenterological** disorders such as **DYSPEPSIA**, **GASTRITIS**, and **DIARRHOEA AND GASTROENTERITIS** reflect issues related to sanitation and dietary habits. Both categories of diseases can be managed by **General Practitioners and Internal Medicine Specialists**.

PULMONARY SPECIALIST, ENT

Upper respiratory tract infections, including **COMMON FLU**, **ACUTE PHARYNGITIS**, **INFLUENZA**, and **ACUTE UPPER RESPIRATORY INFECTIONS**, reflecting high exposure to environmental and lifestyle factors. These diseases can be managed by **Pulmonologists and ENT Specialists**.

In addition to the aforementioned specialist doctors, the presence of anesthesiologists, radiologists, and clinical pathologists is essential to support a more comprehensive healthcare service

DENTIST, CONSERVATIVE DENTISTRY SPECIALIST, ORTHODONTIST

In dental and oral health, the high incidence of **PULP NECROSIS**, **PULPITIS**, and **PERIAPICAL ABSCESS** underscores the need for improved dental care services. Expanding the number of specialists in Oral and Maxillofacial Surgery, Conservative Dentistry and Pediatric Dentistry is essential to enhancing the quality of care.

OPHTHALMOLOGIST

DERMATITIS, **CONJUNCTIVITIS**, and **SKIN INFENCITONS** indicate that dermatological diseases remain a public health concern in tropical environments.

DERMATOLOGIST

DERMATITIS, **CONJUNCTIVITIS**, and **SKIN INFENCITONS** indicate that dermatological diseases remain a public health concern in tropical environments.

DISEASE PREVELANCY

No	CODE	Disease Name (English)	Specialist Doctors	Total
1	J00	Common Flue	General Practitioner, ENT Specialist	76.622
2	M79.1	Myalgia	General Practitioner, Physical Medicine & Rehabilitation Specialist	54.121
3	I10	Essential (primary) hypertension	General Practitioner, Internal Medicine Specialist (Cardiology)	52.937
4	J06.9	Acute upper respiratory infection, unspecified	General Practitioner, ENT Specialist	35.868
5	K30	Dyspepsia	General Practitioner, Internal Medicine Specialist (Gastroenterology)	27.737
6	J06	Acute upper respiratory infections of multiple and unspecified sites	General Practitioner, ENT Specialist	23.705
7	K00.6	Disturbances in tooth eruption	Dentist, Orthodontist	23.552
8	K29.7	Gastritis, unspecified	General Practitioner, Internal Medicine Specialist (Gastroenterology)	17.755
9	I50.0	Congestive heart failure	Internal Medicine Specialist (Cardiology)	13.106
10	J11	Influenza, virus not identified	General Practitioner, ENT Specialist	12.860
11	K29	Gastritis and duodenitis	Internal Medicine Specialist (Gastroenterology)	12.655
12	E11	Non-insulin-dependent diabetes mellitus	Internal Medicine Specialist (Endocrinology)	12.626
13	A09	Diarrhoea and gastroenteritis of presumed infectious origin	General Practitioner, Internal Medicine Specialist (Gastroenterology)	11.205
14	L30	Other dermatitis	Dermatologist	10.473
15	J02	Acute pharyngitis	General Practitioner, ENT Specialist	9.920
16	K04.1	Necrosis of pulp	Dentist, Conservative Dentistry Specialist	8.813
17	K04.0	Pulpitis	Dentist, Conservative Dentistry Specialist	8.348
18	L02	Cutaneous abscess, furuncle, and carbuncle	General Practitioner, Surgeon	7.387
19	H10	Conjunctivitis	General Practitioner, Ophthalmologist	7.125
20	H25	Senile cataract	Ophthalmologist	6.968
21	F20	Schizophrenia	Psychiatrist	6.409
22	G43	Migraine	General Practitioner, Neurologist	6.251
23	B20	HIV disease	Internal Medicine Specialist (Infectious Diseases)	6.248
24	G44	Other headache syndromes	Neurologist	6.127
25	K04.7	Periapical abscess without sinus	Dentist, Oral & Maxillofacial Surgeon	5.844

TABLE 1.2 Demographic spread of diseases in Indramayu at recent time
Source: Indramayu Health Service Data 2024

The Improvement of the Human Development Index (HDI)

The Human Development Index (HDI) measures human well-being through health, education, and living standards. Life expectancy, a key health indicator, improves with lower maternal and infant mortality rates, achieved through better maternity services and public health awareness (UNDP, 2023).

Indonesia faces high maternal mortality, ranking third in Southeast Asia (Pan African Medical Journal, 2024). To enhance maternal and child health (MCH), Indramayu must accelerate MCH facility development, aligning with WHO’s Sustainable Development Goals (SDGs) as a global benchmark for healthcare quality and accessibility.

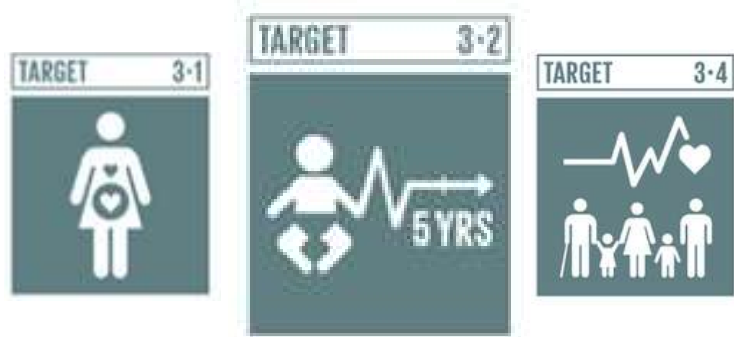


Image 1.4 SDG Target on Maternal and Child Health
Source: sdgs.bappenas.go.id

Sustainable Development Goal (SDG) 3 aims to ensure healthy lives and well-being for all, emphasizing the reduction of maternal and child mortality. The World Health Organization (WHO) targets a global maternal mortality ratio below 70 per 100,000 live births and aims to end preventable neonatal and under-five deaths by 2030. Neonatal mortality should not exceed 12 per 1,000 live births, and under-five mortality should be below 25 per 1,000 live births (WHO, 2023). Achieving these goals requires equitable healthcare access, improved maternal and neonatal care, and stronger healthcare systems.

Indicator	SDG Target 2030	Data In Indramayu
Maternal Mortality Ratio (MMR)	≤ 70 per 100,000 live births	85,4 per 100,000 live births
Neonatal Mortality Rate (NMR)	≤ 7 per 1,000 live births	7,5 per 1,000 live births
Infant Mortality Rate (IMR)	≤ 12 per 1,000 live births	7,9 per 1,000 live births
Under-Five Mortality Rate (U5MR)	≤ 25 per 1,000 live births	7,5 per 1,000 live births

Table 1.3 Comparison of SDG Targets and Maternal and Child Health Conditions in Indramayu
source: *Indramayu Health Profile 2023*

Indramayu’s Maternal Mortality Ratio (85.4/100,000) exceeds the SDG target (≤70), highlighting the need for better maternal care. Neonatal Mortality Rate (7.5/1,000) slightly surpasses the SDG limit (≤7), requiring improved prenatal and neonatal services. Infant (7.9/1,000) and Under-Five Mortality Rates (7.5/1,000) are below SDG targets but still demand continued pediatric and immunization efforts. While child mortality shows progress, urgent improvements in maternal healthcare and public awareness are needed to meet SDG 2030 goals.

02

Hospital Design as an Approach to Enhancing Patient Recovery and Healthcare Workers' Well-being



Image 1.5 : ally wallace Coloured windows panel,art installation to show how desprate the patient in hospital
Source:Grampian Hospitals Art Trust. (n.d.). The healing environment.

Hospitals are ideally designed to serve as healing environments for patients and as healthy workplaces for medical staff. However, the design and environmental conditions of hospitals can significantly influence the health and well-being of their users.

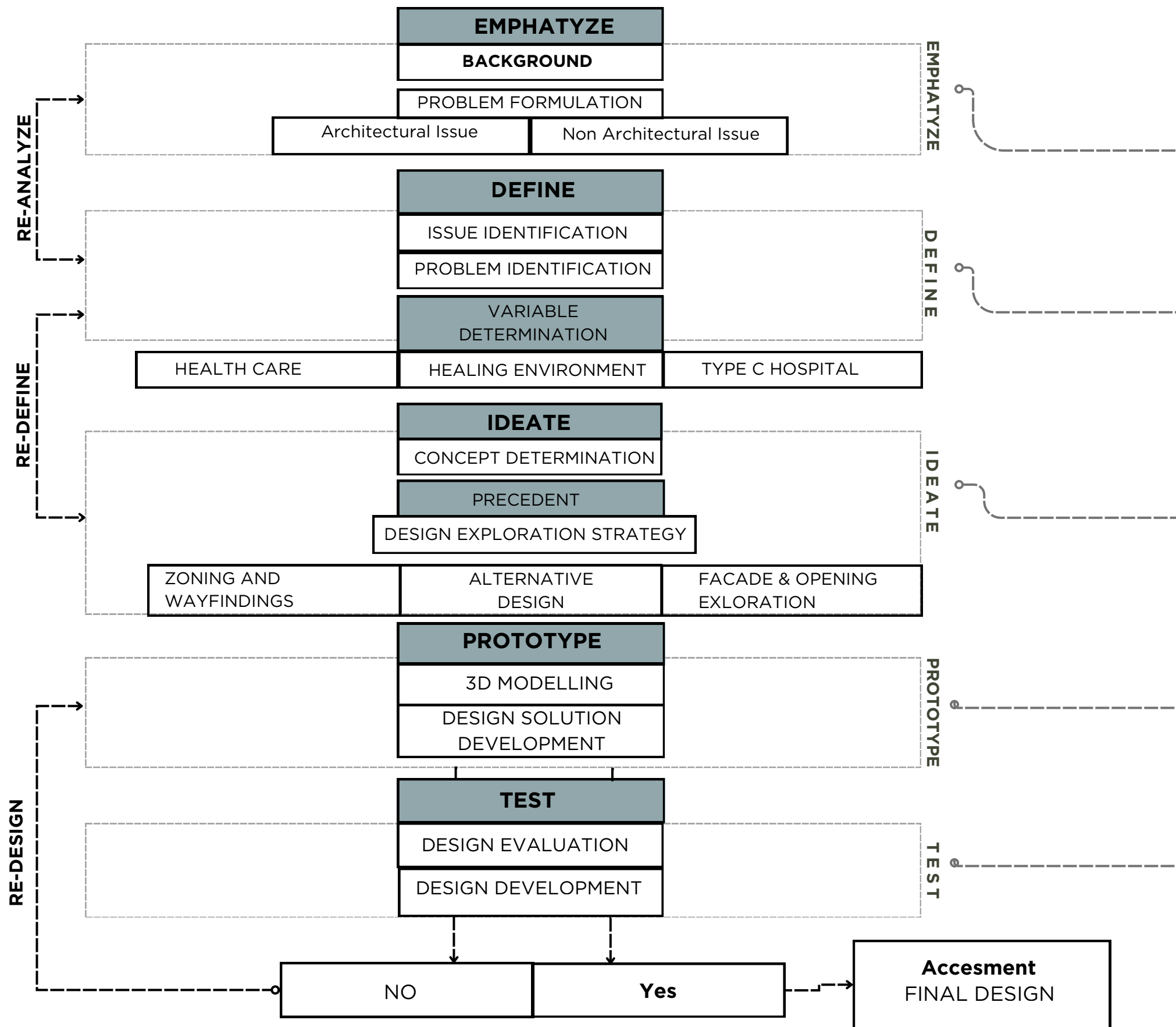
Hospitals should provide a healing environment for patients and a healthy workspace for medical staff. However, poor design Such as artificial lighting, inadequate ventilation, and excessive noise—can negatively impact recovery and staff performance (Joseph, 2006; Ulrich et al., 2008). A well-designed hospital integrates natural light, proper air circulation, and noise control to create a comfortable atmosphere. Research shows that elements like green spaces and ergonomic work areas improve healthcare outcomes and reduce stress levels (Verderber & Fine, 2000; Zimring & Reizenstein, 1980).

Medical staff face challenges due to non-ergonomic designs, inefficient circulation, and lack of rest areas, leading to fatigue and burnout. Studies indicate that improving hospital layouts and integrating healing environment principles—such as daylight optimization and better air quality—can enhance both patient recovery and staff efficiency (Alimoglu & Donmez, 2005; Ulrich et al., 2008).

To address these challenges, hospital design must adopt a more health-centered approach, such as the Healing Environment concept, which emphasizes the integration of natural elements, access to daylight, and the optimization of air quality and acoustics. Implementing these design principles can contribute to a more conducive environment for both patient recovery and staff efficiency.

03

DESIGN HYPOTHESIS
PROBLEM RESOLUTION METHOD



DESIGN HYPOTHESIS

MATRIX OF DESIGN THINKING

DT Phase	Key Activities	Application in Design	Validation Methodology
EMPATHIZE	Understanding the needs of patients, medical staff, and hospital operations.	Reviewing existing studies on Health Care issue in Indramayu, and the needs of upgrade to Type C hospital transformation.	Literature Review, Regulation Review (Permenkes, WHO, ASHRAE, etc.)
DEFINE	Identifying spatial, environmental, and Operational gaps in upgrading from Type D to Type C.	Analyzing hospital zoning, functional relationships, and required medical spaces based on Type C regulations.	Regulation Review & Comparative Analysis with case studies of similar hospitals.
IDEATE	Developing spatial strategies for a Healing Environment with EBD principles.	Creating preliminary Zoning plans, Wayfinding strategies, daylighting optimization, and ventilation design.	3D Modeling & Computational Simulations
PROTOTYPE	Testing design concepts through environmental and operational simulations.	Assessing daylighting efficiency, ventilation effectiveness, and thermal comfort in proposed designs.	DIALux (Lighting), CFD (Ventilation & Airflow).
TEST	Evaluating how the design meets Type C requirements and Healing Environment principles.	Measuring compliance with standards (Type C Hospital Guideline) and performance improvements in patient comfort, safety, and efficiency.	Simulation Analysis & Performance Metrics Comparison (before vs. after transformation).

Table 1.4 Lawson Design Thinking Table

source: Author

03

DESIGN HYPOTHESIS

PROBLEM STATEMENT

NON ARCHITECTURAL ISSUE

- **Indramayu** faces a shortage of hospital beds, with only 1,440 available out of the estimated 1,997 needed, leaving a gap of 557 beds.
- **Indramayu** must improve healthcare facilities to support specialists, enhance disease management, and boost the Human Development Index.

ARCHITECTURAL ISSUE

- **The hospital's** infrastructure lacks support for Type C spatial, functional, and technical needs.
- The absence of **natural elements** and a **Healing Environment** may hinder recovery, increase stress, and reduce staff performance.
- **Balancing Healing Environment principles** with medical efficiency and operational standards is a major design challenge.

PROBLEM FORMULATION

- **How can the transformation of Permata Medical Center Hospital** from Type D to Type C be effectively designed using Healing Environment principles to enhance patient well-being, optimize hospital functionality, and comply with healthcare regulations?

PROBLEM LIMITATION

- **The Design Project explores Healing Environment** design in patient rooms, waiting areas, and healthcare spaces.
- **The transformation must meet Type C hospital standards**, ensuring compliance and efficiency.
- **The study focuses on** spatial planning, natural integration, and sustainability while ensuring operational efficiency.

DESIGN GOALS

- **To create a hospital** that fosters healing and well-being through Healing Environment principles.
- **To align the hospital's** infrastructure with Type C functional and spatial requirements.
- **To design a sustainable hospital** integrating nature, efficiency, and modern care.

Leads
To

METHODE

HEALING ENVIRONMENT DESIGN APPROACH

Healing Environment design is an architectural concept that integrates natural elements, daylight, and greenery into built environments to enhance human well-being and health. Studies have shown that Healing Environment principles can reduce stress, improve patient recovery times, and create a more comfortable and healing-focused hospital atmosphere. In the context of healthcare architecture, Healing Environment design is used to establish a strong connection between nature and hospital spaces while ensuring functional efficiency and adherence to medical standards.

DATA COLLECTION METHOD

Primary data was collected through field observations and direct interviews with the hospital owners and administrators at Permata Medical Center Hospital. This data collection aimed to analyze the existing spatial conditions, operational challenges, and user experiences within the current Type D hospital setup. Additionally, field observations were conducted to supplement the existing architectural drawings, which will subsequently be developed further.

Secondary data collection involved literature reviews on Healing Environment design applications in healthcare settings, case studies of hospitals that have successfully implemented similar approaches, and an analysis of regulatory requirements for Type C hospitals in Indonesia. Additionally, hospital design guidelines and medical facility standards were reviewed to ensure compliance.

DESIGN APPROACH METHOD

The design approach is carried out after thorough observations and literature reviews, identifying key architectural challenges in transforming Permata Medical Center Hospital from Type D to Type C. This process integrates a typological and thematic design strategy that emphasizes Healing Environment principles. The design includes:

1. Integration of Healing Environment Elements – Implementing natural lighting, indoor gardens, and green courtyards to enhance the healing environment.
2. Optimized Spatial Planning – Redesigning hospital layouts to improve functionality, efficiency, and patient circulation while ensuring regulatory compliance.
3. Sustainable and Healing-Focused Design – Utilizing eco-friendly materials, improved ventilation, and nature-based aesthetics to create a hospital that supports well-being.
4. Enhancing Patient and Staff Experience – Designing spaces that reduce stress, promote relaxation, and improve the overall healthcare experience for patients, visitors, and medical personnel.

03

DESIGN HYPOTHESIS

MATRIX OF DESIGN THINKING

Perspective	Practical Thinking	Formal Thinking
Regulation	Permenkes No. 24/2016 & No. 3/2020 on the technical standards for Type C Hospitals. • Minimum space requirements • Outpatient/inpatient service facilities. • Basic building & utility standards	Permenkes No. 3/2020 on spatial zoning, circulation systems, and functional service areas in hospitals. • Functional zoning (medical, support, public). • Clean/dirty circulation separation. • Patient, visitor & logistics flow
END USERS	Addressing user needs through thermal comfort, natural lighting, and functional spatial organization to support recovery.	Establishing clear spatial hierarchy, intuitive circulation, and accessible layouts in alignment with hospital upgrading standards from Type D to Type C.
CLIENT	Optimizing spatial efficiency and operational cost-effectiveness to support the hospital's upgrade from Type D to Type C.	Enhancing the hospital's visual identity and architectural language to reflect a trustworthy and professional healthcare institution.
ARCHITECT	Designing based on Healing Environment parameters and Type C hospital standards to improve functionality and user comfort.	Developing spatial layouts inspired by precedents such as KTPH and JIH, and designing a façade that conveys wellness and institutional growth.

Table 1.4 Lawson Design Thinking Table
source: Author

Symbolic Thinking

Permenkes No. 3/2020 promotes responsive care to local needs and human-centered healthcare services.

- Emphasis on culturally sensitive and community responsive services.
- Spaces for worship & social interaction

Cultivating a sense of trust, cultural familiarity, and spiritual comfort through contextual and symbolic design elements.

Establishing the hospital as a symbol of compassionate healthcare rooted in local values and cultural familiarity.

Employing symbolic elements such as natural motifs, calming color palettes, and culturally familiar forms to foster trust and emotional connection.

Radical Thinking

Permenkes No. 3/2020 supports environmentally friendly hospitals, energy efficiency, and alignment with sustainable development principles.

- Green hospital principles.
- Renewable energy use.
- Natural lighting & ventilation.
- Efficient water & waste management

Creating restorative environments through innovative spatial strategies that enhance sensory healing, emotional well-being, and sustainable transformation.

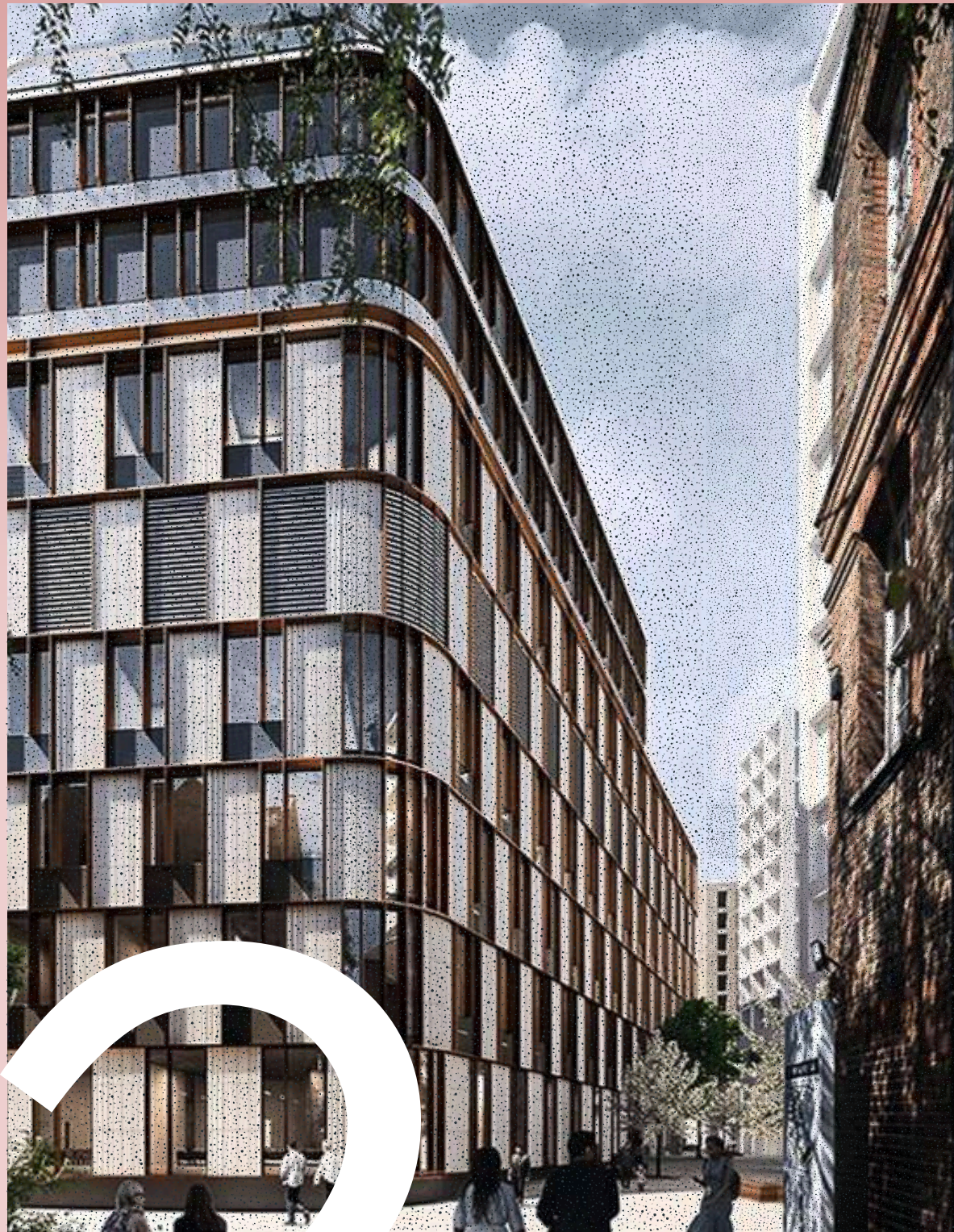
Driving transformation through a healing-centered service model that integrates sustainable management and inclusive community engagement.

Applying Evidence-Based Design and integrating local materials and green systems to promote long-term sustainability and meaningful transformation from Type D to Type C.

04 CONCLUSION OF THE CHAPTER

Conclusion of Chapter 1

- The re-design of Permata Medical Center from a Type D to a Type C hospital is necessary to accommodate a 150-bed capacity and meet regional healthcare demands.
- Key issues identified include limited hospital bed availability, increasing disease prevalence, and the importance of maternal and child healthcare in Indramayu.
- Hospital design is positioned as a strategy to enhance patient recovery, staff well-being, and service efficiency.
- The design hypothesis connects healthcare challenges with evidence-based design and design thinking methods.
- Problem statements and methodology provide a structured foundation for guiding the design process.
- The project's originality and novelty lie in integrating healing environment principles with site and user context as well as regulatory standards.
- This chapter establishes the conceptual framework for the research, leading to Chapter 2 which explores typology studies, design approaches, and contextual analyses.



Chapter 02

Design Approach and Resolution

"A doctor can bury his mistakes, but an architect can only advise his clients to plant vines."

Frank Lloyd Wright



01 Study Of Builind Typology HOSPITAL BUILDING

DEFINITION OF HOSPITAL

A hospital is a healthcare institution that provides inpatient care for a specific duration. According to the Kamus Besar Bahasa Indonesia (Indonesian Dictionary), a hospital is a facility that provides medical care and services for individuals experiencing various health issues. Hospitals are generally established based on regional needs by healthcare organizations (both for-profit and non-profit), insurance bodies, charitable organizations, or religious foundations.

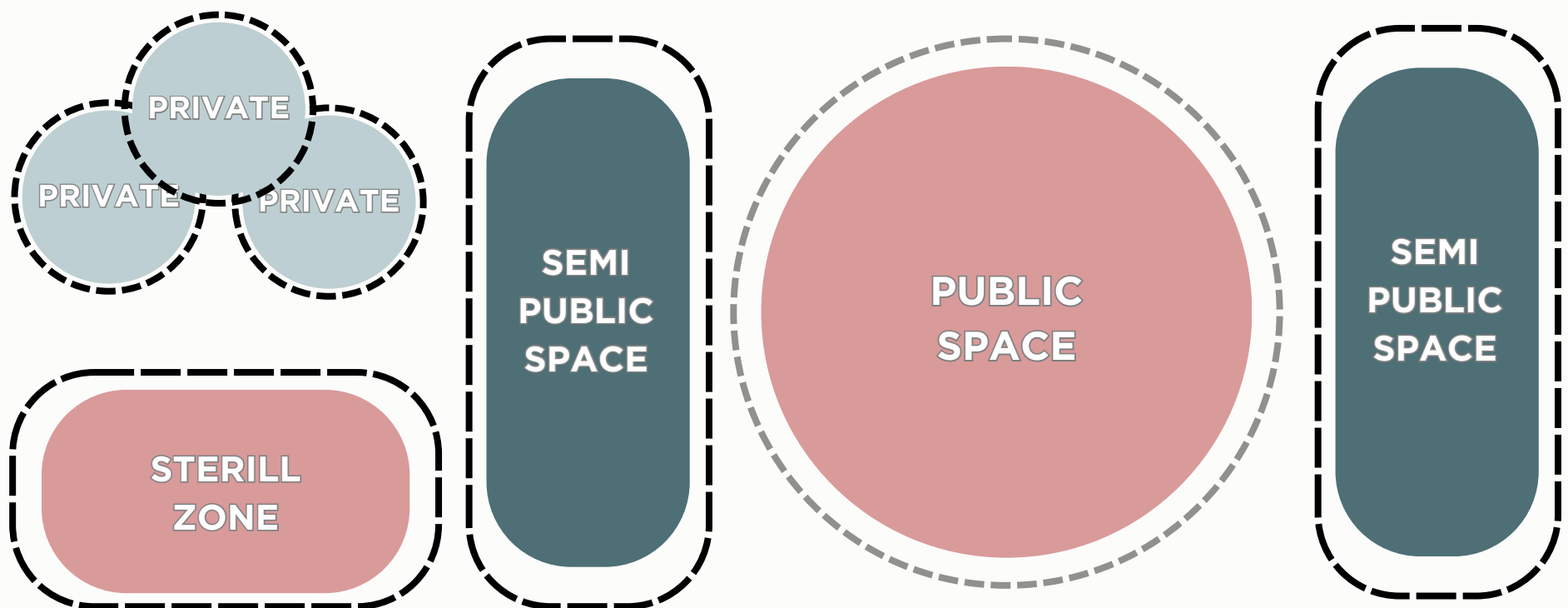
Hospitals consist of several key components, including patients, staff, and various departments such as the Emergency Unit (UGD), Intensive Care Unit (ICU), Surgical Unit, Radiology Unit, and more. The primary objective of a hospital is to offer comprehensive healthcare services, including prevention, diagnosis, treatment, and rehabilitation.

ORGANIZATION AND SPATIAL PLANNING

The hospital layout is generally divided into several main zones:

- **Public Zone:** Includes the reception area, lobby, waiting rooms, polyclinics, and pharmacies.
- **Semi-Public Zone:** Comprises laboratories, radiology units, and diagnostic facilities.
- **Private Zone:** Encompasses inpatient wards, Intensive Care Units (ICUs), and operating rooms.
- **Sterile Zone:** Consists of surgical installations and isolation rooms.
- **Service Zone:** Includes pharmaceutical installations, laundry facilities, and medical waste management

Hospital circulation must ensure the separation of patient, medical staff, and logistics pathways to enhance efficiency and minimize the risk of infection (PT. Global Rancang Selaras, 2010)



Study Of Builind Typology

PRIMARY CIRCULATION IN HOSPITALS

An effective hospital circulation design must separate patient, visitor, and service pathways to enhance operational efficiency, ensure patient safety, and improve user experience. Implementing these circulation standards guarantees optimal movement and functionality within the hospital environment.

GENERAL CIRCULATION

Facilitates movement for outpatients, visitors, and medical staff throughout daily hospital operations.

- Must include a clear wayfinding system to reduce confusion among users.
- Primary corridors should be **wide* and comfortable***, ensuring smooth pedestrian flow and accessibility.

Main hospital corridor width	Minimum 2.5 meters
Wayfinding system	Must be clear and structured
Distance from main entrance to waiting area	≤ 30 meters



Image 2.3 : Wayfinding On Hospital
Source: bravurampl.com

Image 2.2 illustrates a well-structured circulation layout that promotes accessibility, safety, and comfort for various users. The design is based on Type C Hospital Guidelines, ensuring compliance with hospital infrastructure standards.

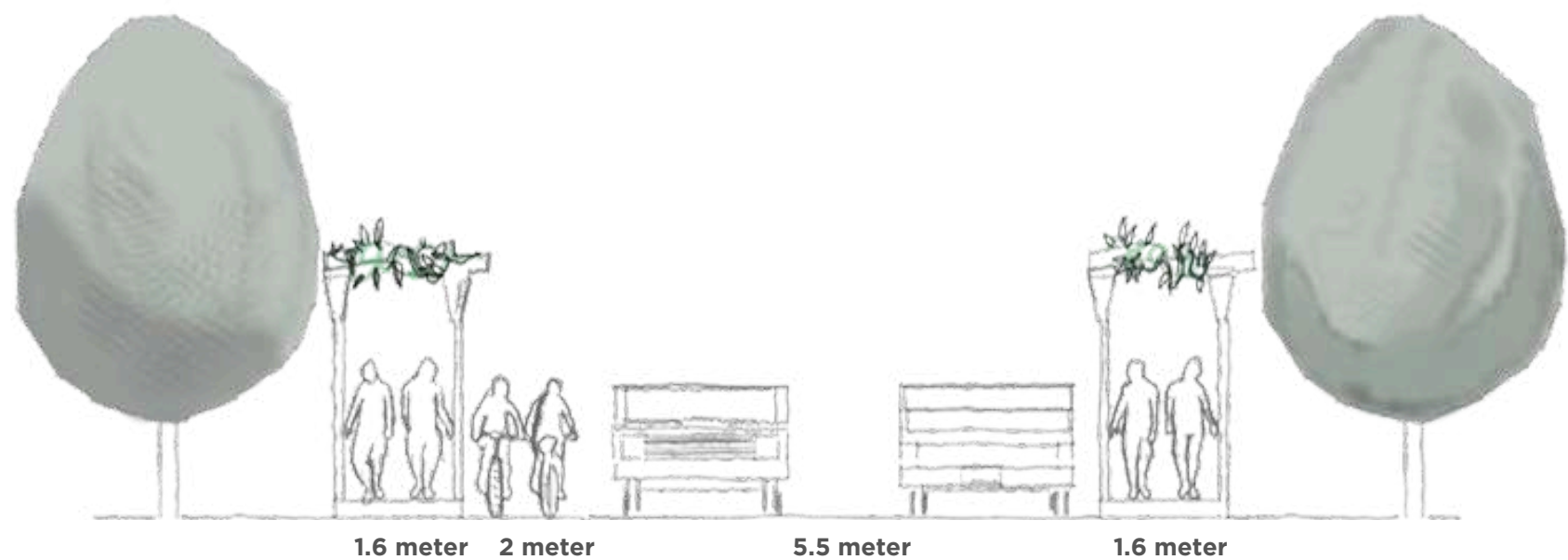


Image 2.2 : Sketch of Integrated Access Design for padestrian,Bycycle,and Vechile in the Hospital.

Source: Author's Drawing Based on Type C Hospital Guide Lines

EMERGENCY CIRCULATION

Dedicated for the rapid transport of critical patients from ambulances to the Emergency Department (ED), operating rooms, or Intensive Care Units (ICU) (Kunders, 2004, p. 154).

- Must feature exclusive pathways separate from general circulation to prevent delays in medical response (Miller & Swensson, 2002, p. 53).
- Requires direct access to resuscitation areas and an efficient emergency evacuation system (McCullough, 2010, p. 102).

TABLE 2.2 Emergency Exit

Key Parameters	Recommended Standards
Corridor width leading to EMERGENCY DEPARTMENT	Minimum 2.4 meters
Ambulance drop-off distance to ED entrance	≤ 10 meters
Evacuation route distance to emergency exits	≤ 32 meters
Maximum spacing between emergency staircases	≤ 45 meters

SERVICE CIRCULATION

Designed for the transport of hospital logistics, including medical supplies, linens, food, and hazardous waste disposal (Allison, 2018, p. 87).

- Must be completely separate from patient and visitor pathways to prevent contamination risks (Kunders, 2004, p. 154).
- Requires dedicated access points for storage rooms, laundry facilities, and waste disposal areas (McCullough, 2010, p. 112).

TABLE 2.3 Emergency Exit

Key Parameters	Recommend ed Standards
Width of logistics distribution pathways	Minimum 2 meters
Ambulance drop-off distance to ED entrance	Must be fully segregated
Dedicated access to kitchen, laundry, and waste facilities	Specified in hospital zoning plans

01 Study Of Builind Typology

Primary Facilities in Hospitals

INPATIENT ROOMS

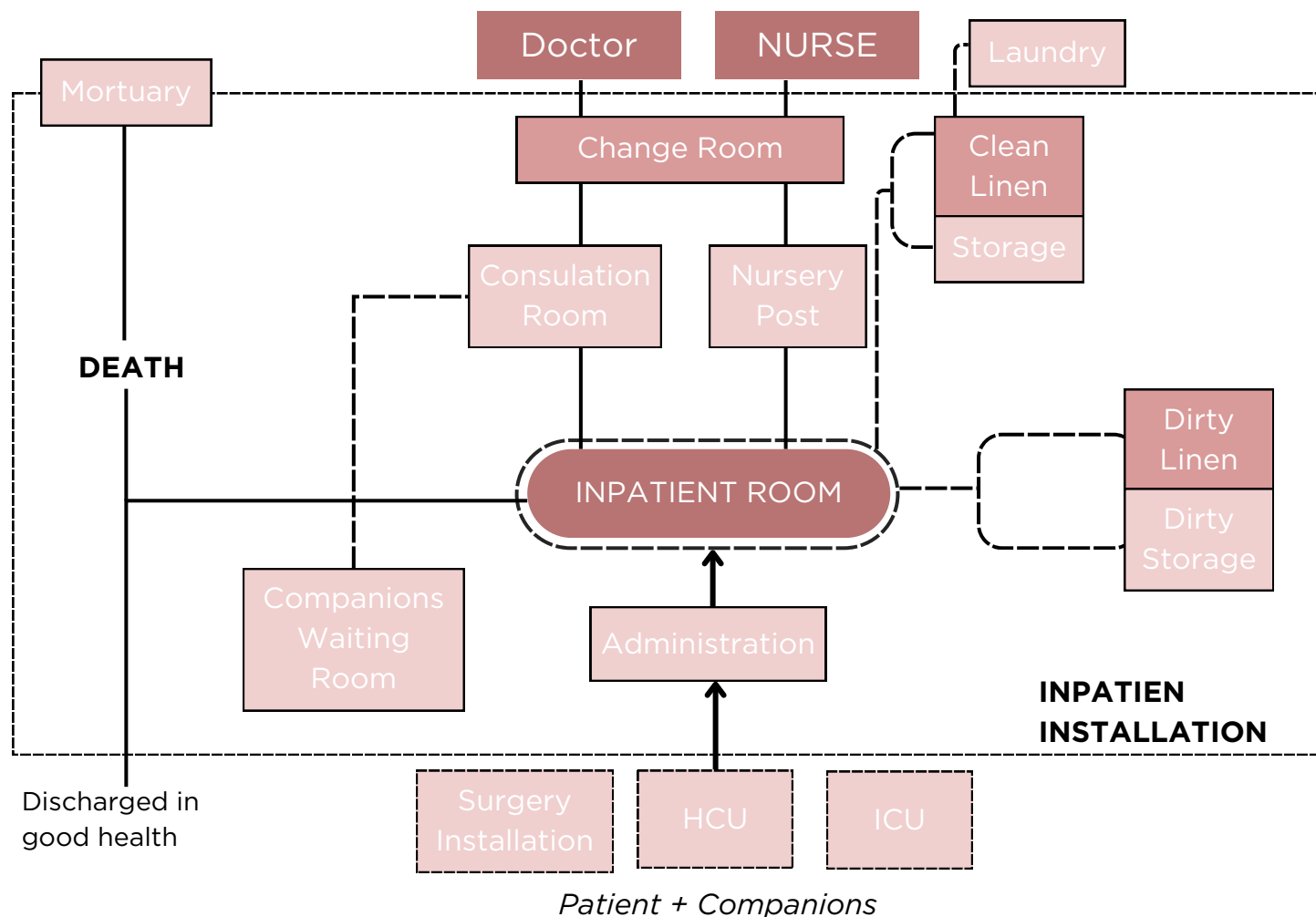


Image 2.4 : INPATIENT ROOM INSTALLATIONS DIAGRAM
Source: Author's Drawing Based on Type C Hospital Guide Lines

OVERVIEW

An inpatient room is a designated space within a hospital where patients receive continuous medical care and monitoring for at least one night or longer (World Health Organization [WHO], 2020). These rooms are specifically designed to provide a safe and comfortable environment for patient recovery while ensuring accessibility to medical staff and necessary treatments (American Hospital Association [AHA], 2021).

PATIENT FLOW

- Patients entering the inpatient room come from Registration & Administration.
- Patients who recover and are discharged exit through the Waiting Room for Companions.
- Deceased patients are transferred to the Mortuary (Morgue).

TABLE 2.4 TYPE INPATIENT ROOM

ROOM TYPE	DESCRIPTION	STANDARD ROOM SIZE (APPROX.)
General Ward	Shared by multiple patients (e.g., 4-6 beds per room). Cost-effective but offers less privacy.	5 – 7 m ² per bed
Semi-Private Room	Shared by 2 patients, usually with a partition. Balances affordability and privacy.	10 – 15 m ² per bed
Private Room	Single occupancy room with enhanced comfort and privacy. Often chosen by patients seeking better personal space.	15 – 25 m ² per room
Isolation Room	Used for patients with infectious diseases or weakened immune systems. Equipped with special ventilation and strict infection control protocols.	≥ 20 m ² per room
Intensive Care Unit (ICU) Room	For critically ill patients requiring constant monitoring and life support. Equipped with advanced medical devices, such as ventilators and heart monitors.	15 – 20 m ² per bed
Pediatric Inpatient Room	Specially designed for children and infants. Includes child-friendly decor, toys, and space for parents to stay.	12 – 18 m ² per room

Inpatient rooms play a critical role in hospital infrastructure by ensuring efficient medical treatment, patient safety, and comfort. Proper classification and design of these rooms contribute to optimal healthcare delivery and improved patient outcomes.

IMAGE 2.5, 2.6, 2.7,2.8:
JIH INPATIENT CLASS
Source: RS JIH SOLOs

Study Of Builind Typology

Primary Facilities in Hospitals

PRICE AND FACILITIES (RS JIH SOLO).



VIP CLASS

The room is equipped with one bathroom, four patient beds, a 40-inch LED TV, a telephone, a companion bed, a wardrobe, an overbed table, a waiting chair, a bedside cabinet, and air conditioning, ensuring patient comfort and functionality.

Price Range: start from Rp700.000

SEMI PRAVE-CLASS 1

The room features one bathroom, two patient beds, a 40-inch LED TV, a telephone, a companion bed, a wardrobe, an overbed table, a waiting chair, a bedside cabinet, and air conditioning, providing a comfortable and functional environment for patients.

Price Range: start from Rp450.000



GENERAL WARD-CLASS 2

The room is equipped with one bathroom, four patient beds, a 40-inch LED TV, a telephone, a companion bed, a wardrobe, an overbed table, a waiting chair, a bedside cabinet, and air conditioning, ensuring patient comfort and functionality.

Price Range: start from Rp300.000

GENERAL WARD CLASS 3

The room is equipped with one bathroom, six patient beds, a 40-inch LED TV, a telephone, a companion bed, a wardrobe, an overbed table, a waiting chair, a bedside cabinet, and air conditioning to ensure patient comfort and convenience.

Price Range: start from Rp200.000

01 Study Of Builind Typology

HOSPITAL Classification

REQUIREMENTS OF TYPE C HOSPITAL

The classification of hospitals in Indonesia is regulated under Health Regulation No. 3 of 2020 on Hospital Classification and Licensing, which establishes a structured system for hospital categorization based on service capabilities, facilities, and human resources. Hospitals in Indonesia are classified into general hospitals (Rumah Sakit Umum/RSU) and specialized hospitals (Rumah Sakit Khusus/RSK).

General hospitals are further divided into four types: Type A, Type B, Type C, and Type D. Type A hospitals provide the most comprehensive medical services, including subspecialty care in all medical disciplines, and serve as referral centers. Type B hospitals offer a broad range of specialty services but have fewer subspecialty departments than Type A. Type C hospitals, which are district-level referral hospitals, must provide at least four essential specialty services: internal medicine, surgery, obstetrics & gynecology, and pediatrics. Lastly, Type D hospitals offer basic medical services and act as primary referral centers for patients requiring higher levels of care.

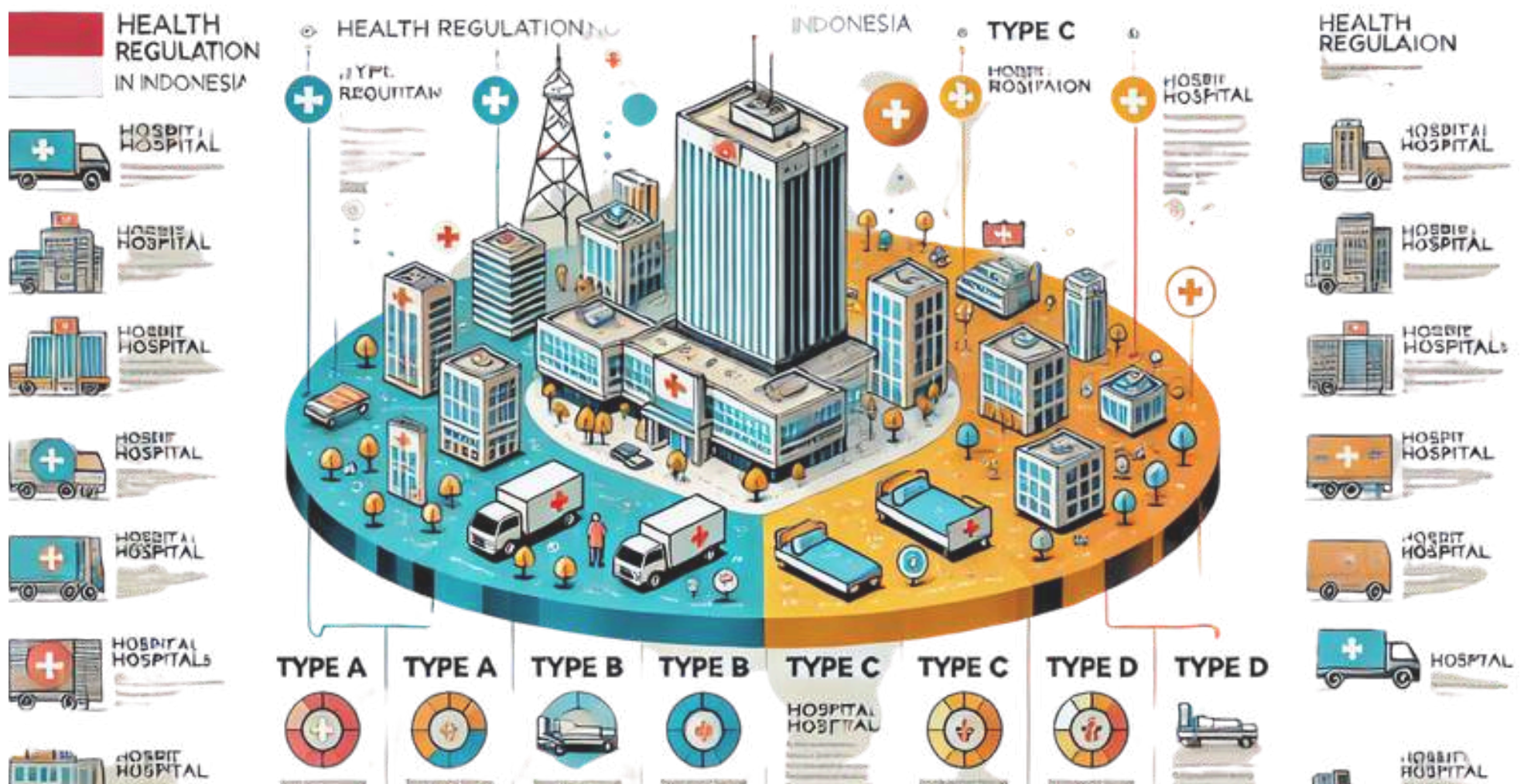


Image 2.9 : HOSPITAL TYPE DIAGRAM
Source: Author's Generated Visualisation on PROME AI

01

Study Of Builind Typology
HOSPITAL Type C
Parameters of Design

TABLE 2.5 REQUIREMENTS OF TYPE C HOSPITAL

No.	Room	Minimum Ratio / Requirement	Regulation / Reference
	Inpatient Ward	≥ 100 beds	Ministry of Health Regulation (Permenkes) No. 3/2020
	KRIS	Minimum 40% from total beds	
	Operating Theatres (ORs)	1 OR per 30–50 beds → Minimum 3–5 ORs	WHO Surgical Care Manual; Permenkes 24/2016
	Intensive Care Unit (ICU)	10% of total beds → approx. 10–15 beds (6% general ICU + 4% NICU/PICU)	WHO Critical Care Guidelines
	Emergency Department (ED)	Must include triage, resuscitation, observation, isolation, and minor OR	WHO, Permenkes No. 3/2020
	Outpatient Clinic (Polyclinic)	At least 4 core specialties (Internal Medicine, Surgery, Pediatrics, ObGyn)	Permenkes No. 3/2020

01 Study Of Design Approach

HEALING ENVIRONMENT

DEFINITION OF HEALING ENVIRONMENT

A healing environment in architecture refers to the intentional design of physical spaces that promote recovery, well-being, and emotional comfort for users, particularly in healthcare settings. This approach integrates evidence-based design strategies that emphasize natural light, access to nature, acoustic comfort, intuitive spatial organization, and the psychological impact of color and material choices. By addressing both the physical and emotional needs of patients, families, and staff, healing environments seek to reduce stress, enhance mood, and ultimately improve clinical outcomes.

The architectural approach to healing environments goes beyond mere aesthetics; it focuses on creating spaces that are restorative, inclusive, and human-centered. This includes designing for sensory stimulation (sight, sound, smell, touch, and sometimes taste), ensuring accessibility, and promoting autonomy and privacy.

THE ROLE OF EVIDENCE-BASED DESIGN (EBD) IN HEALTHCARE FACILITIES

The evidence-based design (EBD) approach plays a crucial role in the design of healthcare facilities that support the healing process. McCullough (2010) asserts that evidence-based design enables architects to incorporate scientifically proven principles in creating spaces that foster patient recovery (pp. 28-32).

Several key EBD principles applied in hospital design include:

- Utilization of natural lighting to reduce energy consumption and enhance patients' circadian rhythms (McCullough, 2010, p. 76).
- Noise reduction through appropriate acoustic materials to minimize patient stress levels (McCullough, 2010, p. 89).
- Improved natural ventilation to promote a healthier indoor environment (McCullough, 2010, p. 112).



IMAGE 2.10 : BIOPHILIC HOSPITAL
Source: Pinterest

**TABLE 2.6 : RECOMMENDED STANDARDS
FOR HEALING ENVIRONMENT VARIABLES**

NO	PARAMETER	VARIABLE	RECOMMENDED STANDARD
1	NATURAL LIGHTING	Natural light intensity in patient rooms	300-500 lux
		Ratio of natural to total lighting	At least 50% of total lighting
2	VENTILATION AND AIR CIRCULATION	Air velocity in patient rooms	0.25 - 0.5 m/s
		CO ₂ concentration in patient rooms	Maximum 600 ppm
		Relative humidity	40% - 60% RH
3	WAYFINDING AND NAVIGATION	Maximum distance to an information point	≤ 15 meters
		Letter size for signage	Minimum 10 cm letter height
4	HEALING GARDENS & GREEN SPACES	Ratio of green space to total hospital area	Minimum 20%
		Vegetation density (trees per 100 m ²)	Minimum 3 trees/100 m ²
		Maximum seating distance from a water feature	≤ 5 meters

Hospital Renovation Strategies to Enhance the Healing Environment

Murphy and Ricks (2016) examined strategies for renovating existing hospitals to improve the quality of the healing environment. Several key approaches can be implemented to achieve this goal, including:

- Enhancing wayfinding systems to create a more intuitive navigation experience for patients and visitors (Murphy & Ricks, 2016, p. 39).
- Redesigning inpatient rooms to provide greater privacy and improve patient comfort (Murphy & Ricks, 2016, p. 75).
- Optimizing natural lighting through the strategic placement of windows to enhance patient well-being (Murphy & Ricks, 2016, p. 102).

01

Study Of Design Approach HEALING ENVIRONMENT



Image 2.11 : Healing garden that focus on walking and seating spaces
Source: Pinterest

In hospitals that adopt a healing environment approach, one of the most essential elements is the integration of natural components to support the recovery process. Among these, the implementation of a Healing Garden or Therapeutic Garden plays a significant role. The following is a preliminary study I have compiled as a foundational reference for the subsequent design phase.

DEFINITION OF HEALING GARDEN

A healing garden is a specially designed garden that offers therapeutic benefits through multisensory experiences. It functions not only as a green space, but also as a setting for emotional, psychological, and spiritual restoration. It is important to recognize that healing is not synonymous with curing. As Marcus (2007) asserts, a garden cannot mend a broken leg or cure cancer; however, it can provide a range of significant therapeutic benefits, including:

FUNCTION

- a. Facilitating stress reduction**, which in turn helps the body achieve a more balanced physiological state.
- b. Supporting patients in activating their innate capacity** for self-healing.
- c. Assisting individuals in achieving emotional calm** in the face of incurable medical conditions.
- d. Offering a setting for healthcare staff to conduct physical therapy**, horticultural therapy, and other forms of therapeutic activity.
- e. Providing a restorative space** where employees can momentarily relieve occupational stress.
- f. Creating a welcoming and comfortable environment** where patients and visitors can engage in meaningful social interaction outside the clinical atmosphere.



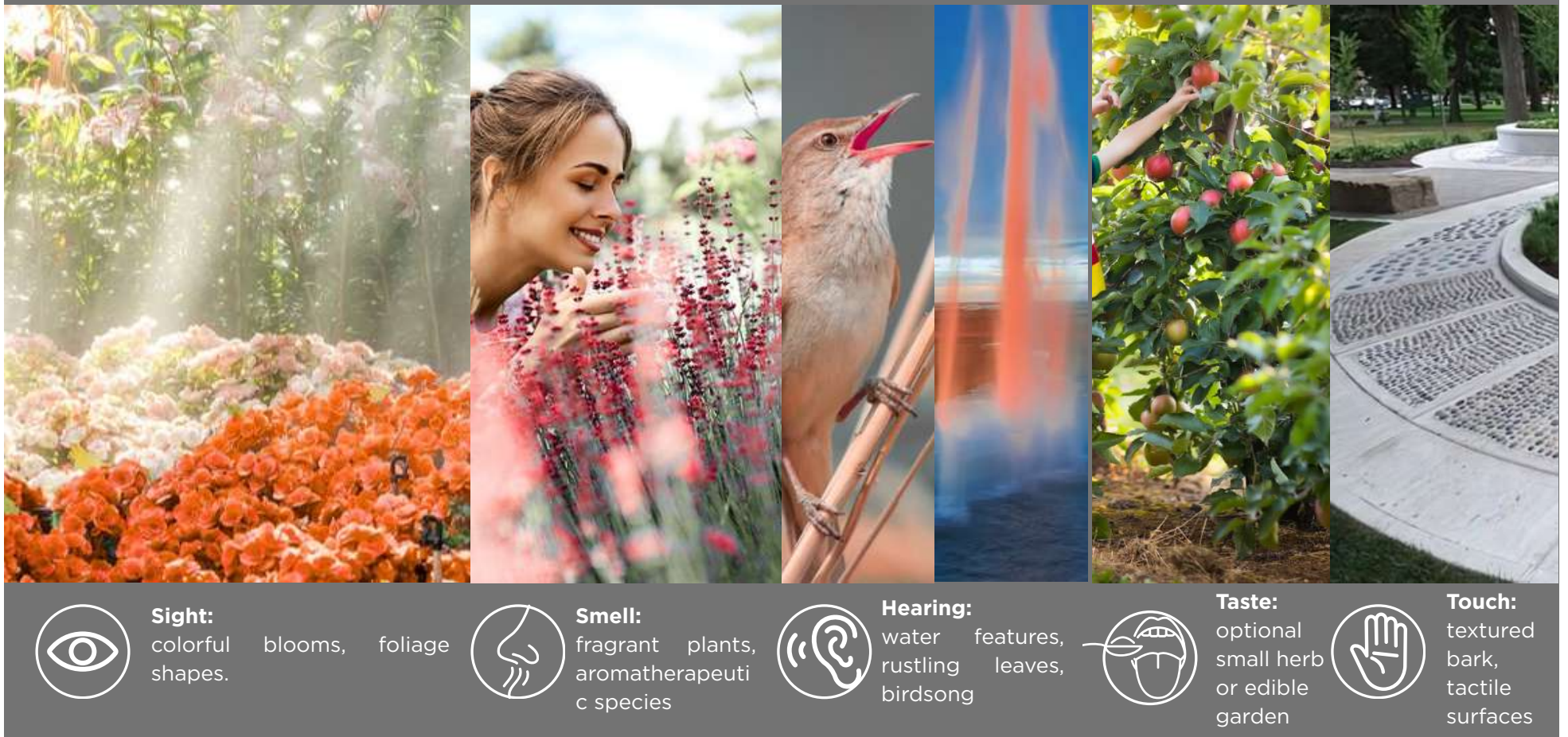
Image 2.12 : Healing garden with teksured pathway,gajebo,P&G.
Source: Pinterest



Image 2.13 : Water Pond as Part Of Healing Garden
Source: Pinterest

5 KEY DESIGN PRINCIPLE

5 SENSES GARDEN



1. Sight

Application:

Incorporation of colorful flowering plants (e.g., Plumeria, Michelia champaca)

Visually soothing landscapes with natural elements and balanced compositions

Variation in leaf textures and plant forms to enhance visual richness

2. Sound

Application:

- The sound of trickling water through fountains or reflective ponds
- Plants such as bamboo or Wodyetia bifurcata (foxtail palm) that rustle pleasantly in the wind
- Trees that attract birds, contributing to natural ambient sounds

3. Smell

Application:

- Fragrant plants like Michelia champaca (champaca) and Nyctanthes arbor-tristis (night jasmine)
- The deliberate placement of scent-producing plants along pathways to evoke calming olfactory responses.

Image 2.14 : diagram key principle design of 5 senses of senses in healing garden

Source: Authors

4. Touch

Application:

Use of natural surfaces such as smooth stones, wooden benches, or barefoot walking paths over grass

Plants with varied tactile qualities, such as fuzzy, waxy, or textured leaves
Interactive zones featuring sensory walls or therapeutic sand and soil areas for touch therapy

5. Taste

Application:

Edible gardens featuring safe-to-consume herbs like mint, lemongrass, or basil, offering patients an opportunity to engage with healing plants through supervised tasting

Fruit-bearing trees (e.g., guava, citrus) or medicinal plants such as Phaleria macrocarpa (crown of god), included with clear labeling for educational or therapeutic purposes

02 PRECEDENT STUDIES

Khoo Teck Puat Hospital (KTPH)

Yishun, Singapore
CPG Consultants
2010

Singapore's Khoo Teck Puat Hospital (KTPH) might well be the most biophilic hospital in Asia. In no other healthcare institution of this scale are elements of form, space and landscape so explicitly tied to the goal of human well-being—the very definition of biophilic design.

The KTPH competition brief, from the onset, asked that the new hospital ought to be a 'healing environment'.

That brief set in motion a biophilic quest that expanded into five principles:

- Sight, visual access to greenery and water;
- Smell, selection of scented plants;
- Sound of falling water;
- Diversity of plants, birds and butterflies;
- Community, public space situated within blue-green areas.



IMAGE 2.15 : 5 SENSES
PRINCIPLES OF BIOPHILIC QUEST
IN KHOO TECK PUAT

Source: Author

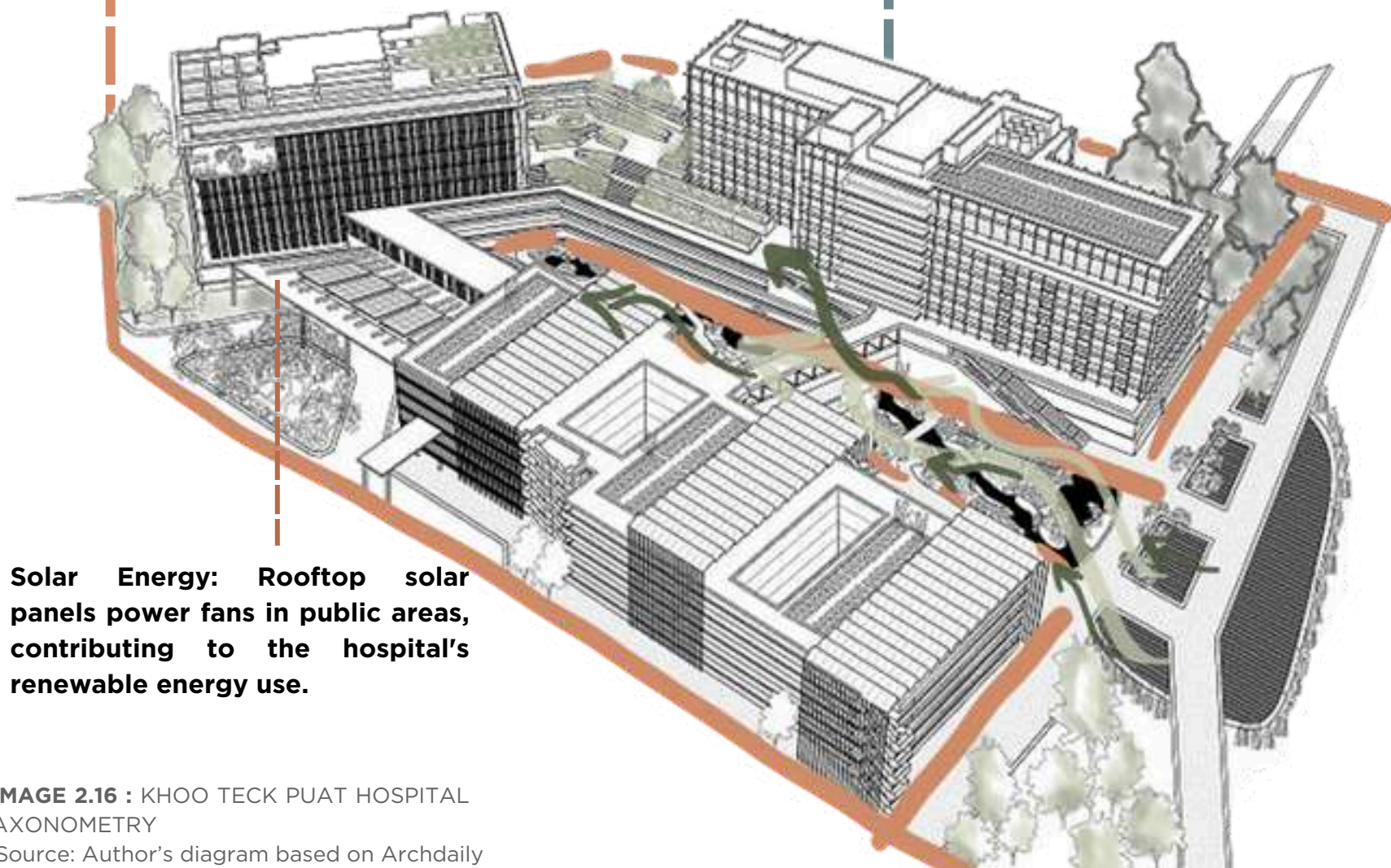
IMAGE 2.15 : KHOO TECK PUAT HOSPITAL
Source: Archdaily

KTPH Showed V-shaped configuration of blocks, delineating a central court. The 'V' opened to the north, letting in breezes that first skim over an existing storm-water pond adjacent to the hospital site. To tap into this natural airflow, the envelope of the buildings had to calibrate permeability and shade.

The design ensures natural light, ventilation, and views without glare or rain exposure. It cuts energy costs by **50% and enables natural ventilation in 40% of the floor area.**

The Green plot ratio of KTPH - an indicator of how much greenery there is in a development - is 3.92; in other words, the total surface area of horizontal and vertical greenery combined is almost four times the size of the land that the hospital sits on. This is remarkable for a development in a dense urban setting. **In post-occupancy measurements, the microclimate of this court was some 2 °C cooler than spaces just outside the hospital.**

Each rooftop garden provides an engaging and educational space. The Specialist Outpatient Clinic Block hosts **100 fruit tree species, 50 vegetable species, and 50 herb species**, maintained by community volunteers.



Solar Energy: Rooftop solar panels power fans in public areas, contributing to the hospital's renewable energy use.

IMAGE 2.16 : KHOO TECK PUAT HOSPITAL
AXONOMETRY
Source: Author's diagram based on Archdaily

02

PRECEDENT STUDIES

Pondok Indah Bintaro Jaya Hospital

TYPE B HOSPITAL

Jakarta, Indonesia

Architects: Silver Thomas Hanley

Area: 38549 m²

Year: 2018

OVERVIEW

Pondok Indah - Bintaro Jaya Hospital is a private healthcare facility with a capacity up to 230 beds. The hospital's design **integrates the principles of health, well-being, and community**, forming part of a larger urban ecosystem featuring green corridors, commercial zones, and residential facilities.

- The 10-story development consists of four levels of inpatient units, three levels designated for diagnostics and treatment, one level allocated for staff departments, and two levels dedicated to back-of-house operations and underground parking facilities.

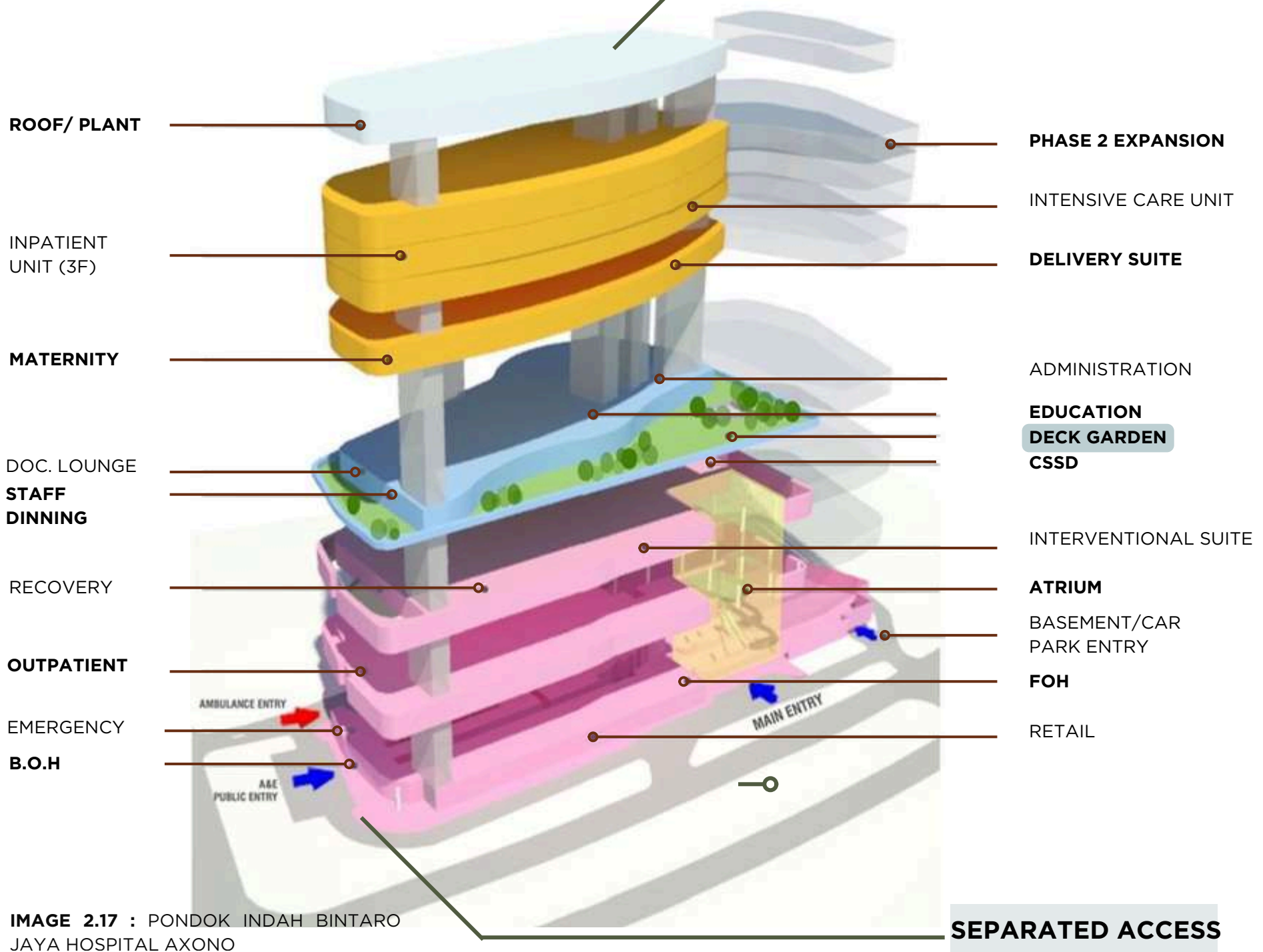


IMAGE 2.17 : PONDOK INDAH BINTARO JAYA HOSPITAL AXONO

Source: Author's diagram based on Archdaily

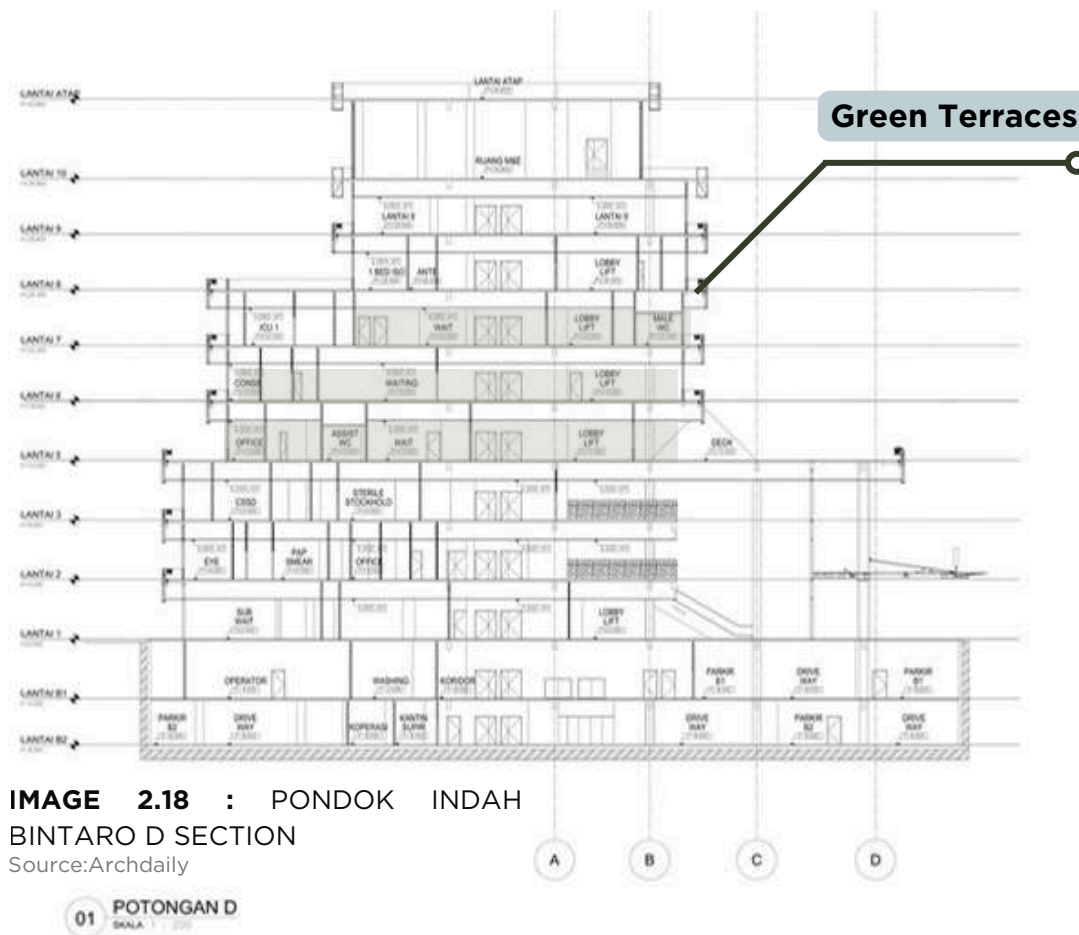


IMAGE 2.18 : PONDOK INDAH BINTARO D SECTION
Source: Archdaily

HEALING ENVIRONMENT FEATURES:

- Maximized natural light and ventilation.
- Green roofs and landscaped views integrated into patient rooms.
- Quiet spaces and natural materials to create a relaxing atmosphere.



ARCHITECTURAL CONCEPT:

- Inspired by Southeast Asian terraced rice fields.
- Features sculptural inpatient towers with green terraces and overhanging panels that reduce heat gain and enhance energy efficiency.

SUSTAINABILITY & INNOVATION:

- Energy-efficient design reduces energy costs by 50%.
- 40% of the hospital area is designed for natural ventilation.

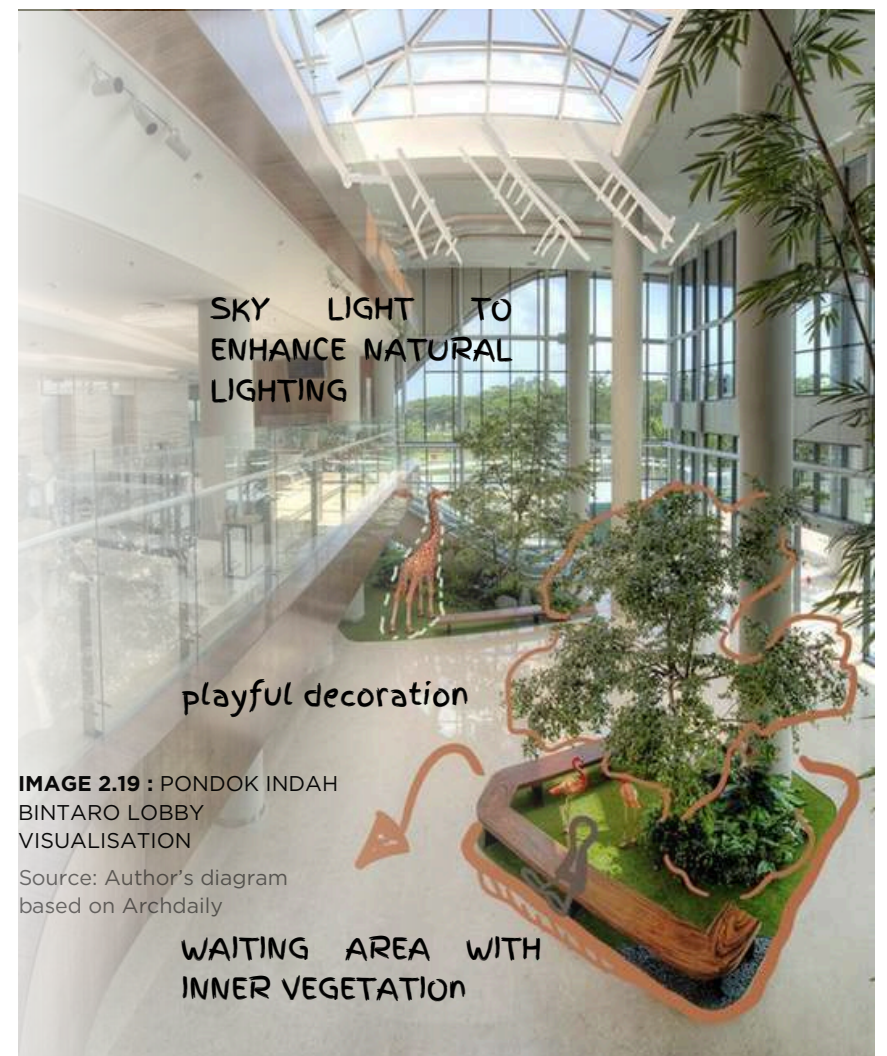


IMAGE 2.19 : PONDOK INDAH BINTARO LOBBY VISUALISATION

Source: Author's diagram based on Archdaily

02

PRECEDENT STUDIES JIH HOSPITAL SOLO



IMAGE 2.20 : RS JIH SOLO FRONT VISUALISATION
Source: Gmaps

OVERVIEW

JIH Solo Hospital is classified as a Type C hospital and is equipped with adequate medical facilities. The hospital has a total bed capacity, comprising 10 VVIP/Super VIP beds, 35 VIP beds, 40 Class I inpatient beds, 10 ICU beds (without ventilators), and 10 isolation beds.

SITE PLAN

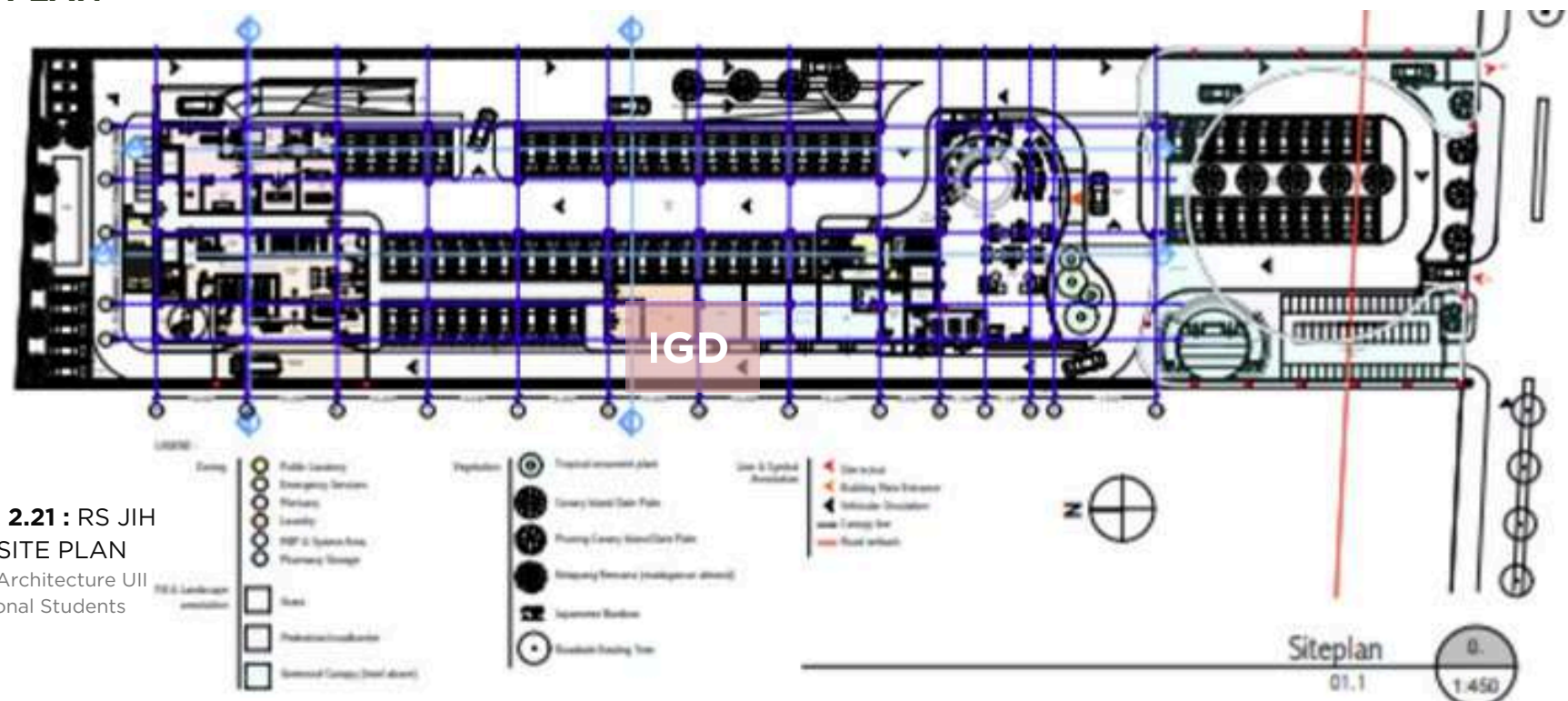


IMAGE 2.21 : RS JIH SOLO SITE PLAN
Source: Architecture UII Professional Students

CIRCULATION

In the site plan, it is evident that vehicle entry and exit points are located on the southern side of the hospital. Circulation is categorized into three distinct flows:

1. General Entry Flow: Visitors enter through the designated drop-off area, After drop-off, visitors and patient companions can park their vehicles either in the ground floor parking area or in the rear parking lot of the hospital
2. Emergency Circulation: which provides direct access for emergency patients requiring immediate medical attention (Emergency Circulation) via the Emergency Department (ED) drop-off zone.
3. Service Circulation: The service circulation is centrally positioned to facilitate logistical and operational movement within the hospital, ensuring an efficient and organized flow of support services.

02 PRECEDENT STUDIES

Oriel Moorfields Eye Health Center

Based on data from Perkins & Will, the Oriel Moorfields Eye Health Centre exemplifies how healthcare architecture can strike a balance between contemporary aesthetics and sensitivity to historical surroundings through thoughtful material selection and facade composition..

A prominent feature of the project's modern character is the use of light-colored curtain walling that dominates the primary elevation. This glazing strategy emphasizes lightness and transparency while ensuring ample daylight penetration into the interior spaces without compromising thermal performance.

To establish contextual harmony with the surrounding Victorian brick buildings, the facade incorporates bronzed aluminum fins and louvres, as well as ribbed ceramic tiles. These materials offer both functional and aesthetic contributions: the aluminum fins act as solar shading devices, reducing heat gain and glare, while also introducing vertical rhythm and texture to the facade. Meanwhile, the ribbed ceramic tiles provide visual depth and subtly reference the traditional detailing of the local built environment.

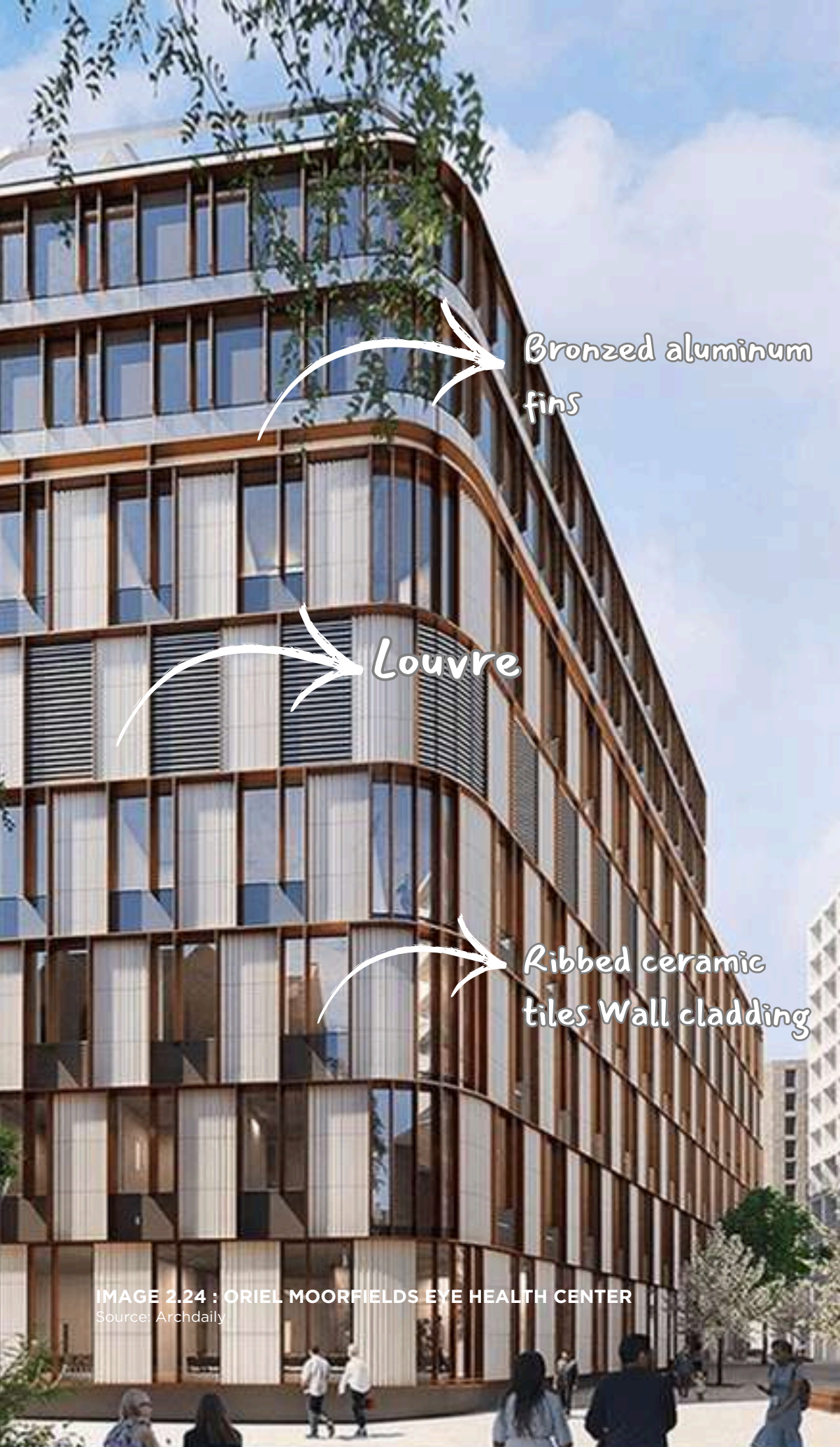
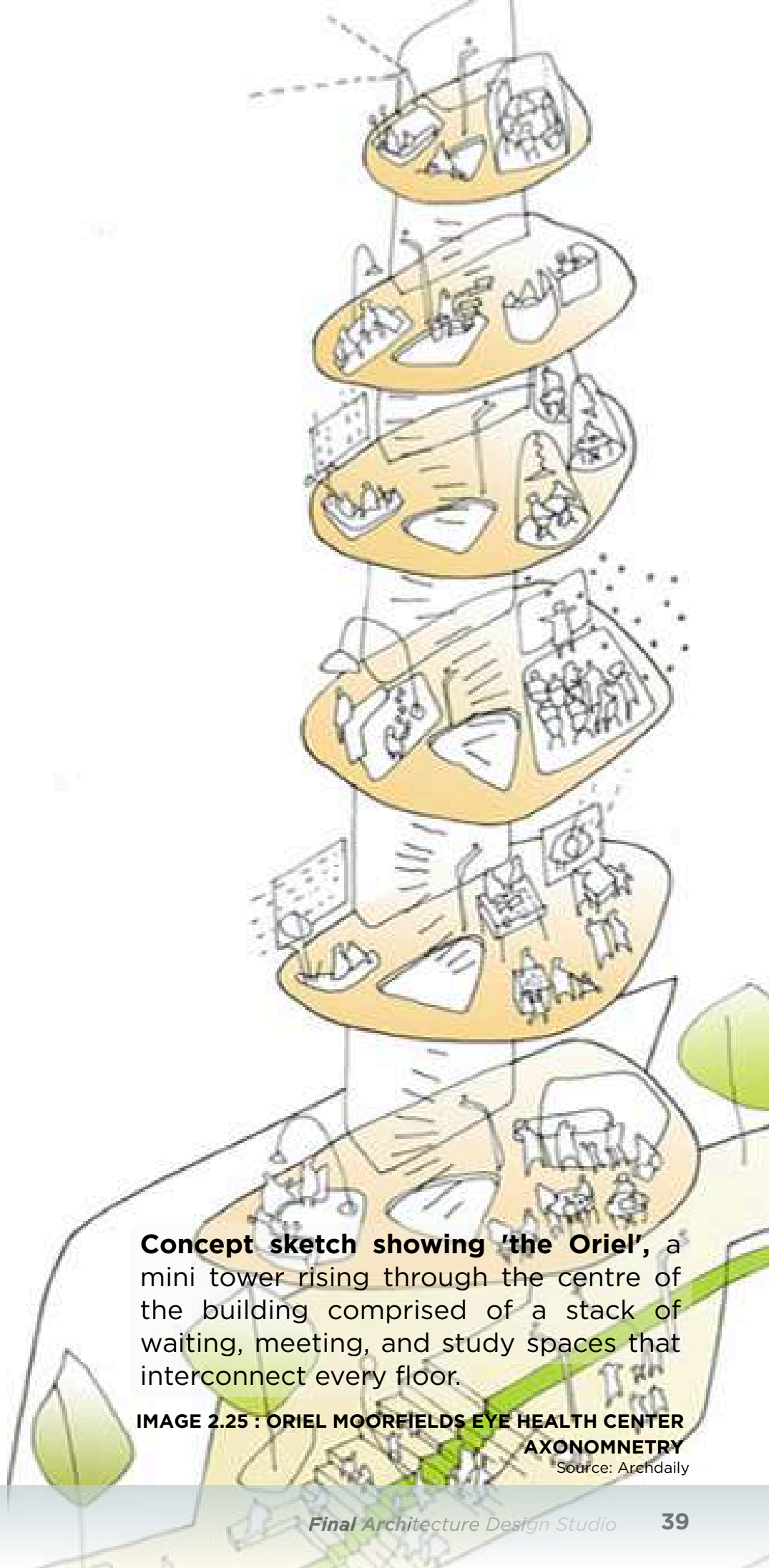


IMAGE 2.24 : ORIEL MOORFIELDS EYE HEALTH CENTER
Source: Archdaily

Key Elements of Modernity:

1. **The dominant curtain wall** introduces transparency and a lightweight visual quality, aligning with contemporary design principles.
2. **Bronzed aluminum fins and louvres** serve as passive solar controls while reinforcing a crisp vertical façade expression.
3. **Ribbed ceramic tiles add material** richness and contextual reference without compromising the building's modern clarity.

This precedent illustrates how modern materials and facade systems can be leveraged to both enhance energy performance and respect architectural context. The project serves as a relevant reference for contemporary healthcare facilities in tropical or mixed-climate settings, where daylight optimization, passive shading, and contextual sensitivity are critical design considerations.

A hand-drawn concept sketch of a building facade. It features a central vertical stack of five circular platforms, each representing a floor. These platforms are interconnected by a series of lines, suggesting a central core or elevator shaft. Each platform contains various icons representing different functions: a person at a desk, a group of people in a meeting, and a person reading. The platforms are surrounded by a grid of rectangular panels, some of which are shaded to represent windows or louvers. The overall style is a loose, conceptual line drawing with some color washes in yellow and green.

Concept sketch showing 'the Oriel', a mini tower rising through the centre of the building comprised of a stack of waiting, meeting, and study spaces that interconnect every floor.

IMAGE 2.25 : ORIEL MOORFIELDS EYE HEALTH CENTER
AXONOMNETRY
Source: Archdaily

03 Contextual Study

SITE ANALYSIS

Messo Surrounding Analysis



SITE REGULATION

SITE

11378 sqm

BCR

60%

FAR

3x

GBC

20%

BUILDING HEIGHT

40 meters (+/- 10-12 Floor)

According to Indramayu's spatial planning regulations, this site allows for a maximum Building Coverage Ratio (BCR) of approximately 60%, The Floor Area Ratio (FAR) permitted ranges from 3 to 5, based on land-use designation and zoning regulations. (RDTRK Indramayu,2023)

SURROUNDING

Currently, the site benefits from unobstructed views of agricultural fields and rice paddies, providing a high-quality visual experience for occupants. However, given the ongoing urbanization trends, these open landscapes may gradually be replaced by built structures in the future. Consequently, the architectural design should incorporate internal visual amenities, such as inner courtyards, rooftop gardens, or healing gardens, to maintain an optimal visual environment and offer psychological benefits to building users.

Contextual Study

SITE ANALYSIS



Image 2.27 : Wind Speed Analysis

Source: Gearth and Meteoblue

WIND SPEED ANALYSIS

OVERVIEW

As illustrated in the wind rose diagram, provides insights into prevailing wind directions and speed variations throughout the year. The primary wind flow is observed from the Southwest (SW) towards the Northeast (NE), indicating a dominant wind pattern in this direction. This suggests that buildings and open spaces should be strategically designed to optimize natural ventilation while mitigating potential wind-related discomfort.

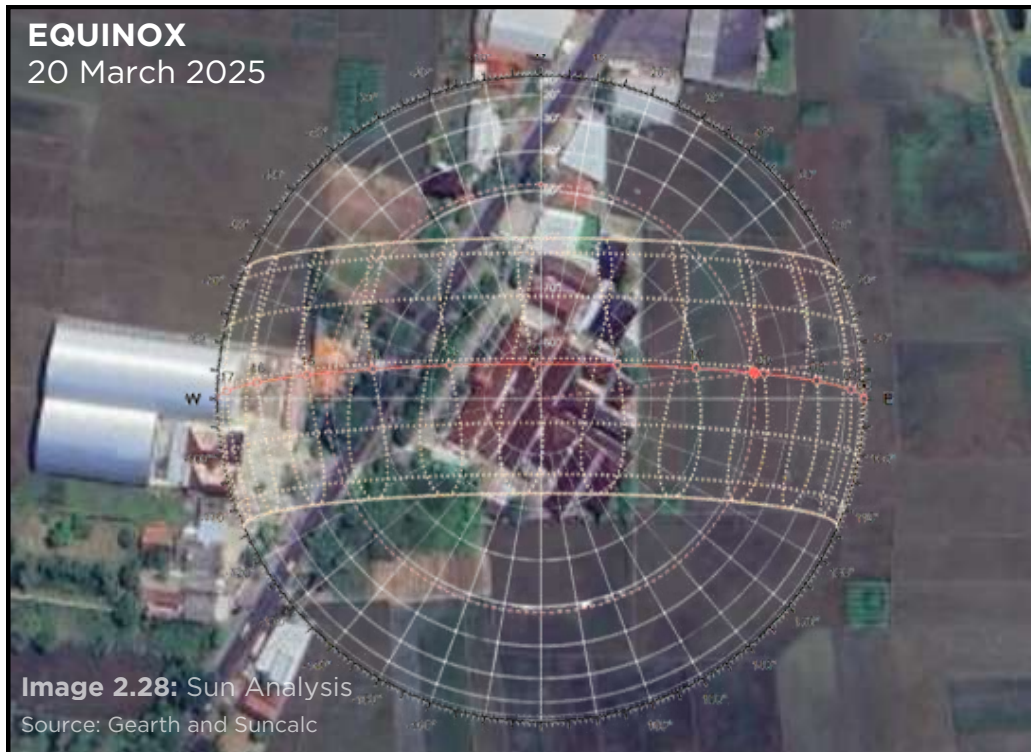
WIND SPEED PATTERNS

The site experiences wind speeds ranging from less than < 0.56 m/s to approximately 30 km/h, with the majority of occurrences falling within the 5-20 km/h range. Stronger winds, exceeding 20 km/h, are less frequent but should still be considered in structural and environmental planning.

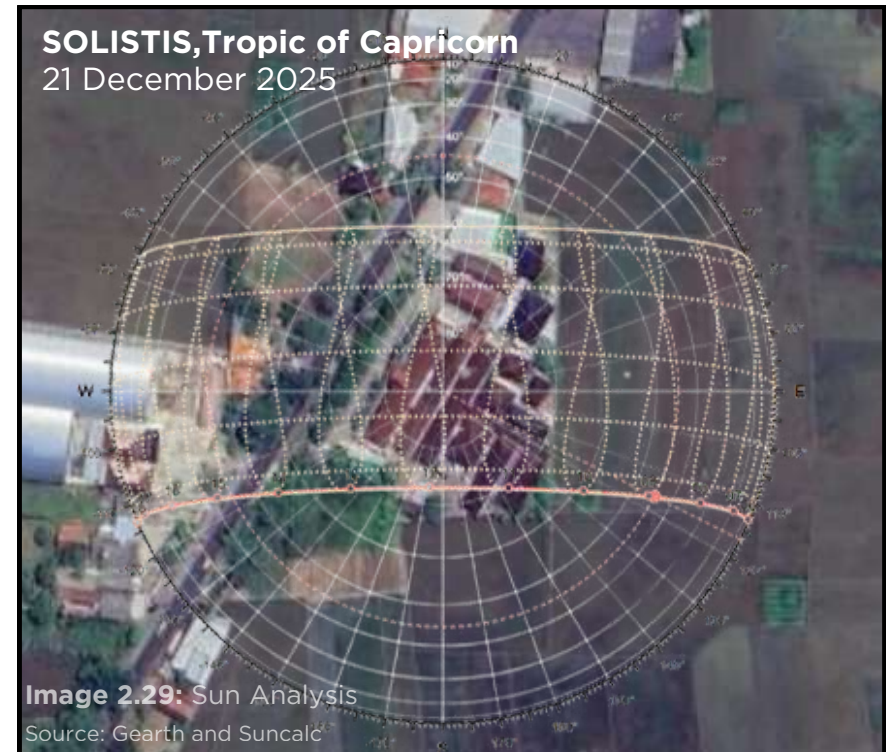
Design Considerations

1. **Natural Ventilation** - The SW-NE wind pattern can be utilized to enhance passive cooling strategies, reducing the reliance on mechanical ventilation.
2. **Building Orientation** - Openings and facades should be positioned to capture dominant winds while minimizing exposure to strong gusts.
3. **Wind Barriers & Landscaping** - Trees, vegetation, and perforated screens can serve as natural windbreaks to moderate excessive wind speeds, particularly in pedestrian and outdoor areas.
4. **Structural Integrity** - Roofs, façades, and lightweight structures should be designed to withstand occasional strong wind gusts.

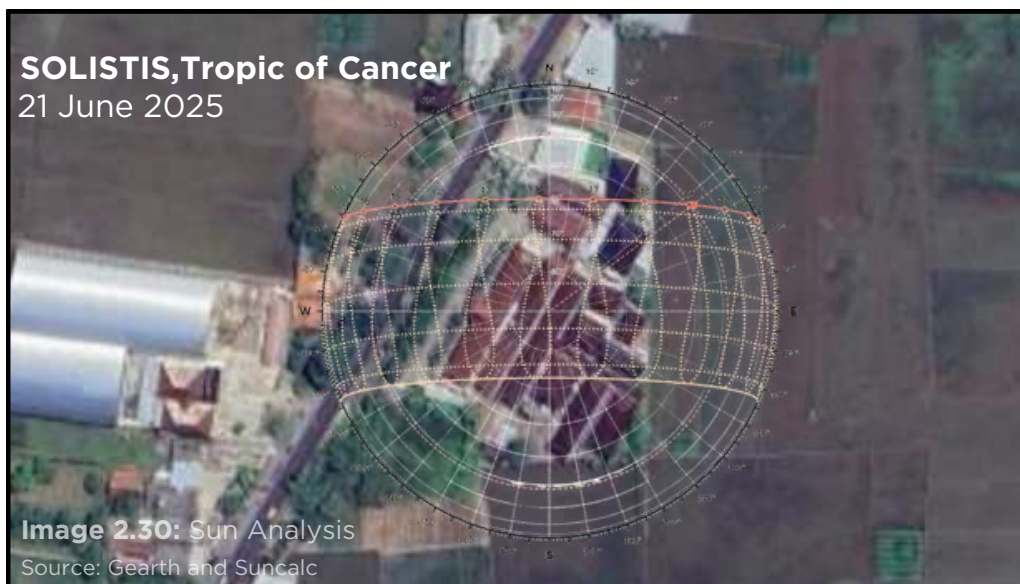
03 Contextual Study SUN ANALYSIS



In equinox Solar altitude at noon is approximately **90°**, meaning the sun is **directly overhead**, minimizing the length of shadows.



The sun takes a lower path, with a maximum altitude of **~66°** at noon. Shadows are longer compared to the summer solstice, reducing solar heat gain on north-facing facades.



The sun follows a higher trajectory, reaching its peak altitude of **~87°** at noon. Longer daylight hours lead to increased solar radiation, requiring effective shading devices, particularly on east- and west-facing facades.

Facade Optimization

- **North-South Orientation:** Buildings should prioritize north-south alignment to reduce excessive heat gain from low-angle morning and afternoon sun.
- **East & West Facade Shading:** Use vertical louvers, perforated screens, and greenery to minimize direct solar exposure.

Shading Strategies

- **Overhangs & Canopies:** Fixed horizontal shading devices (such as deep overhangs) can be incorporated to block high-angle sun during midday.
- **Operable Shading:** Adjustable external blinds or louvers can regulate sunlight penetration based on seasonal variations.

Contextual Study

TEMPERATURES AND PRECIPITATION

TEMPERATURES AND PRECIPITATION

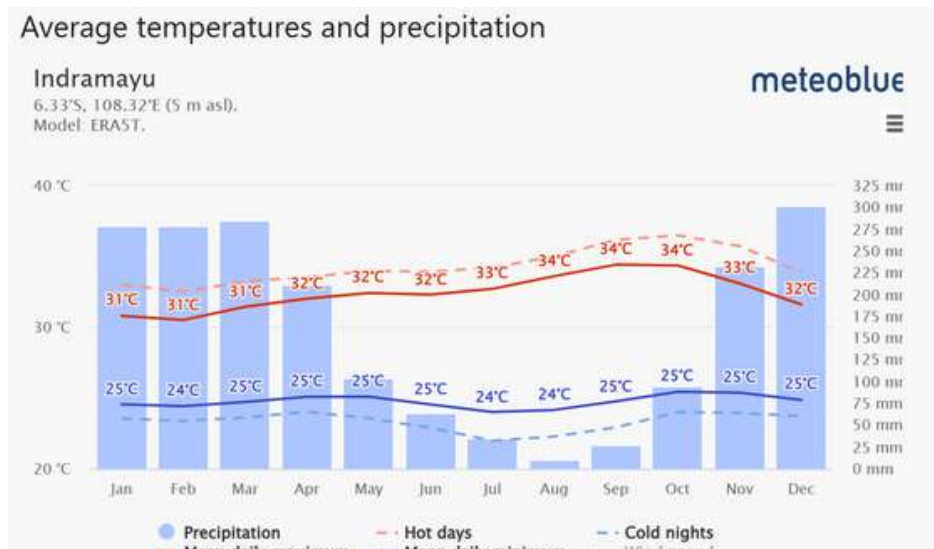


Image 2.31: Temperatures and Precipitation Data

Source: <https://www.meteoblue.com>

CLIMATIC CHARACTERISTICS

Indramayu experiences a tropical monsoon climate, characterized by high annual temperatures and seasonal variations in precipitation. Based on the provided data:

- **Temperature Trends:**
 - The mean daily maximum temperature ranges from 31°C to 34°C throughout the year.
 - The mean daily minimum temperature remains relatively stable at 24°C to 25°C, indicating consistently warm nights.
- **Precipitation Patterns:**
 - The wet season occurs from November to April, with monthly precipitation exceeding 150 mm.
 - The dry season spans from May to October, with rainfall dropping below 30 mm per month.
 - Rainfall peaks between December and February, indicating the strongest monsoon influence.
- **Rainy Days Distribution:**
 - During the wettest months, more than 20 days per month experience rainfall.
 - In the drier months (July to September), rain occurs on fewer than 5-10 days per month.

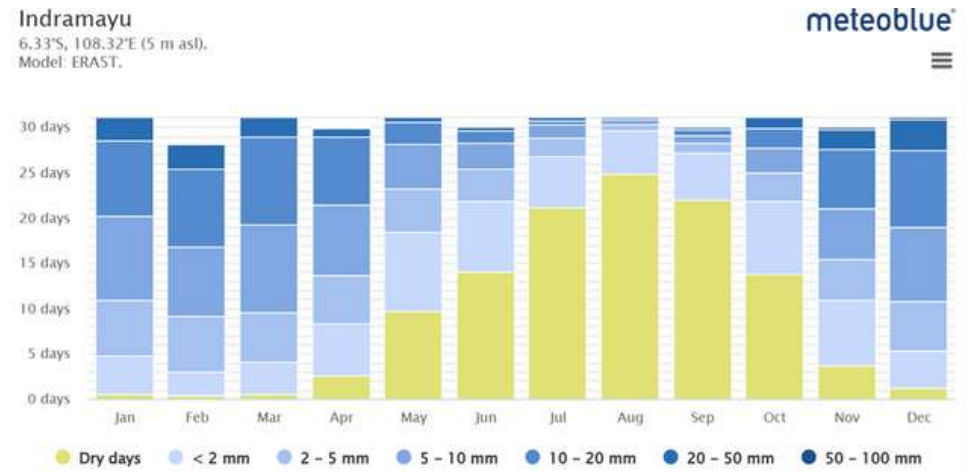


Image 2.32 Temperatures and Precipitation Data

Source: <https://www.meteoblue.com>

RAINWATER MANAGEMENT

- **Rainwater Harvesting:** Implement roof catchment systems to collect and store rainwater for non-potable use (e.g., irrigation, cooling).
- **Permeable Surfaces:** Use permeable pavements and green infrastructure to enhance water infiltration and reduce urban flooding.
- **Material Considerations**
- **Weather-Resistant Materials:** Use moisture-resistant finishes, such as fiber cement boards, treated wood, and coated metals to withstand prolonged exposure to rain.
- **Durable Roofing:** Select corrugated metal sheets, clay tiles, or green roofs for improved longevity and insulation.

03 Contextual Study

POST OCCUPATION EVALUATION

POST OCCUPATION EVALUATION

Following the collection of baseline building data, the next step in this project involved conducting an analysis of the existing hospital building using the Post Occupancy Evaluation (POE) approach. This analysis was carried out independently by the author due to the unavailability of POE data from both the PMC Hospital management and the hospital's Feasibility Study (FS) document. The evaluation aims to assess how well the existing hospital building meets functional requirements, user comfort, and operational efficiency. Without this data, the construction industry will unknowingly continue to make the same mistakes, wasting time and money.

Main Objectives of POE in Hospital Buildings (based on RIBA documents and Pathways to POE):

- To reduce the performance gap between design intentions and actual building use.
- To improve energy efficiency and thermal comfort within patient care areas.
- To understand user perceptions and experiences, such as patient stress levels, staff satisfaction, and the comfort of waiting areas.
- To support decision-making for renovations or the development of future hospital facilities based on empirical data.

The METHOD OF Post Occupancy Evaluation:

- **Interviews with key stakeholders** of the hospital, such as the owner or operational manager, to gather insights regarding building performance, functionality, and user satisfaction.
- **Structures and Building Ages**
- **Environmental Comfort Simulation**, utilizing tools such as Dialux (for lighting analysis) and Computational Fluid Dynamics (CFD) software (for thermal and airflow simulation), to evaluate indoor environmental quality and comfort within the existing facility.

Interviews with
key stakeholders

Building
Comfort
Simulation

Structure and
Building Ages

Architectural
aspect and
Circulation

INTERVIEW PARAMETERS

MANAGER

- Operational efficiency
- Technical and infrastructural challenges
- Service upgrading strategy for Type C standards
- Sustainability in hospital management
- Circulation systems (patients, staff, visitors)
- Indoor environmental quality (air and lighting)
- Capacity expansion planning
- Effectiveness of navigation (wayfinding) systems

USER

- Service accessibility experience
- Comfort related to temperature, lighting, and noise
- Wayfinding clarity
- Comfort of waiting areas
- Cleanliness and quality of environment
- Accessibility to supporting facilities
- Psychological impact of hospital design on recovery

STAFF

- Quality and efficiency of workspace
- Adequacy of supporting facilities (staff rest areas)
- Ventilation and lighting quality
- Ease of movement between service units
- Infrastructure improvement needs
- Communication and coordination systems between department

03 P.O.E INTERVIEW



Image 2.33 Interview dr. Zainal as the Manager of the PMC Hospital Indramayu
source: Author

THE INITIAL INTERVIEW, TYPE D TO TYPE C WITH PROJECTED FUTURE AS TYPE B

conducted prior to the formulation of the design brief, revealed the strategic intent to develop a Type C hospital with the potential for future reclassification to Type B by the projected period of 2040-2045. ***With this consideration the Directur Concludes the inpatient capacity expansion will be towards to 150 beds.***



Image 2.34 2nd Interview with dr. Zainal for the Confirmation of analysis of the issue and Existing user analysis.
source: Author

THE SECOND INTERVIEW, CONFIRMATION OF ISSUE ANALYSIS AND EXISTING USER ANALYSIS.

Conducted after the design brief stage, confirmed the content of Chapters 1 and 2 and validated the revised existing site plan based on findings from the initial field survey. Additional questions were addressed regarding the hospital's original construction timeline and the spatial comfort of existing facilities, based on user experience.

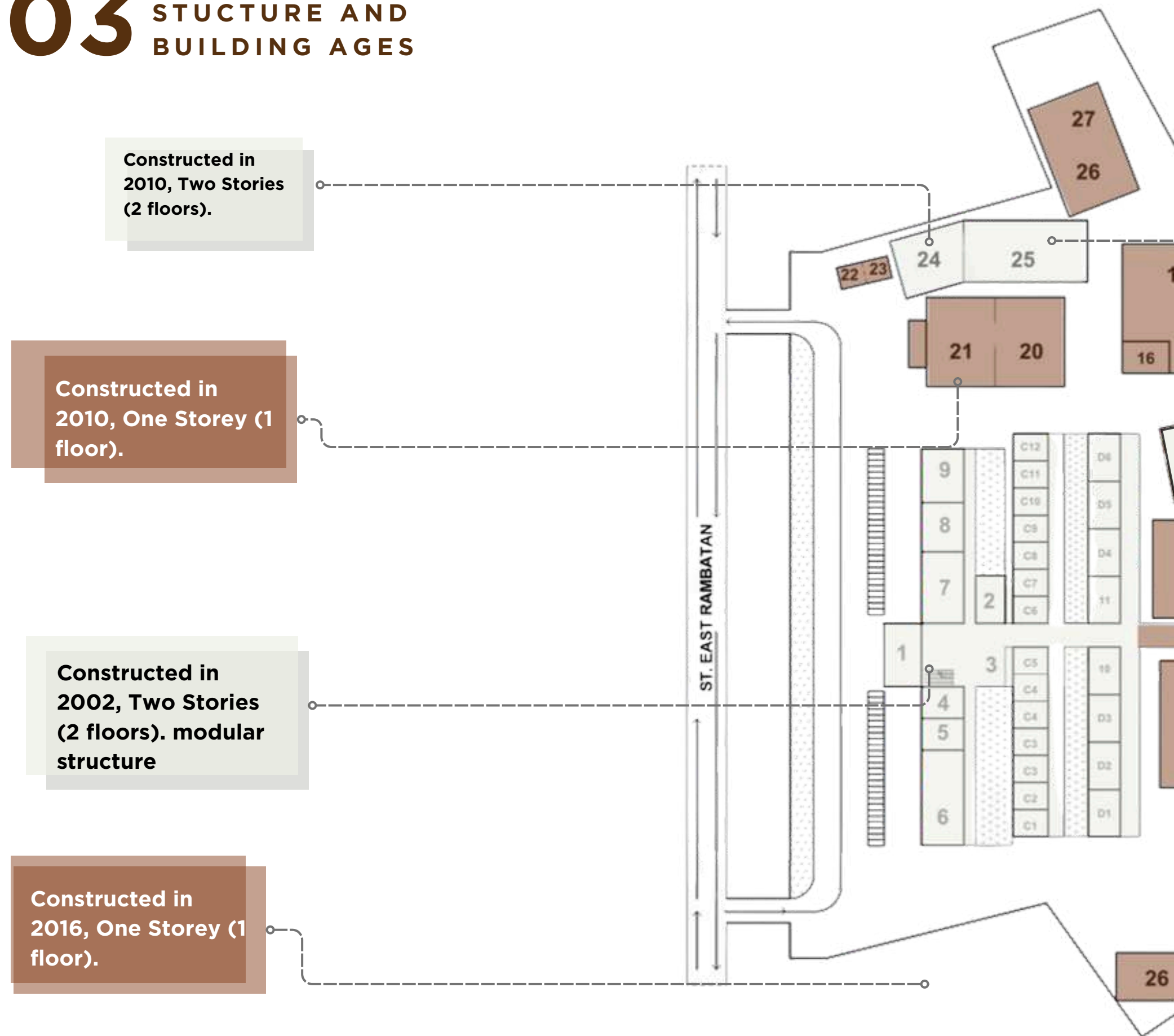


Image 2.35 PMC land Expansion Planning
source: FS PMC HOSPITAL 2023

PMC LAND EXPANSION PLANNING

During this stage, the hospital expressed a tentative plan to expand the site area to approximately 3.5 hectares in anticipation of Type B classification. However, this expansion has not been supported by formal feasibility studies. In response to these constraints, I was assigned to develop a design proposal that is more cost-efficient while still accommodating potential future growth.

03 Existing Building STRUCTURE AND BUILDING AGES



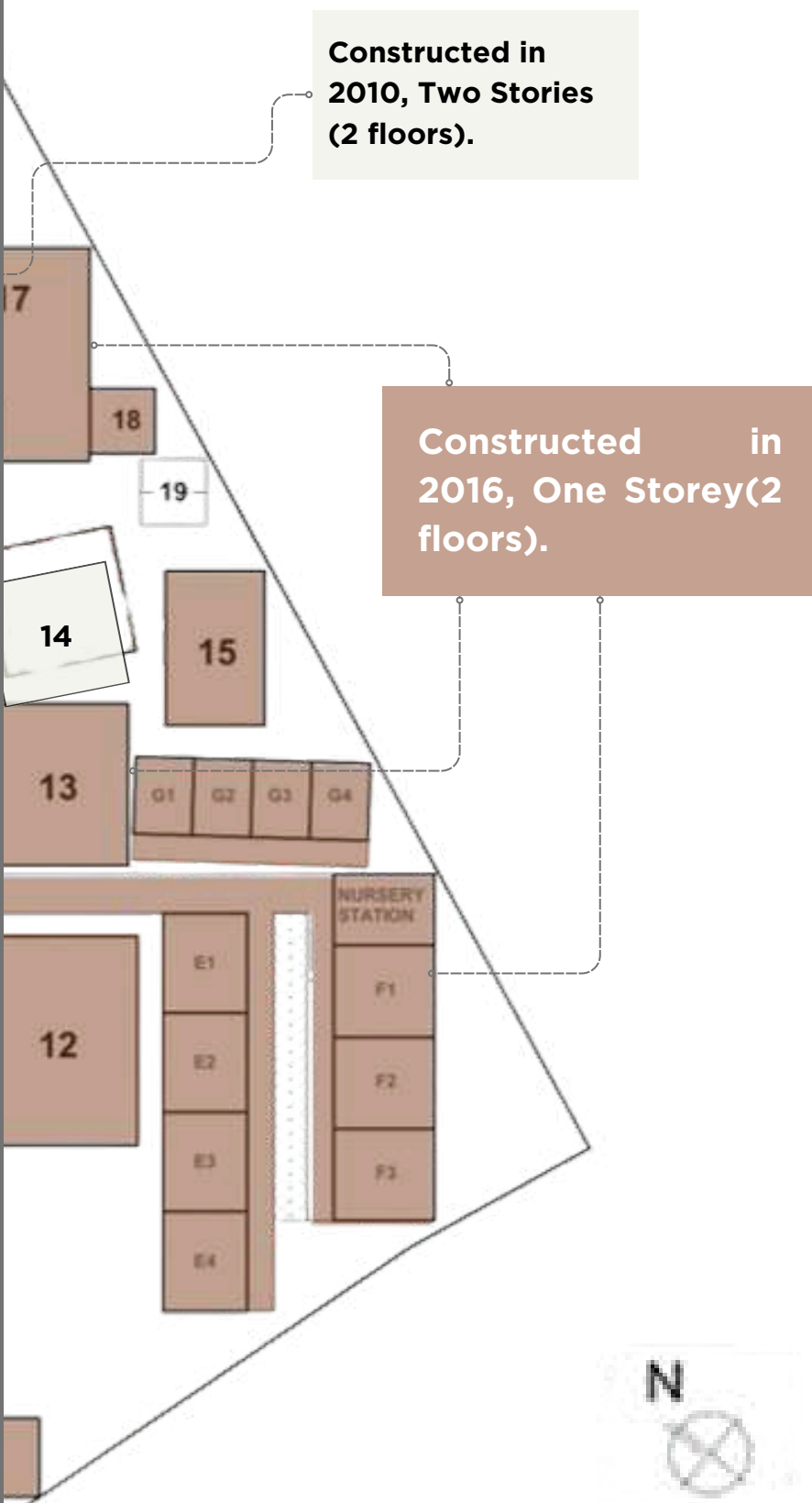


Image 2.36 PMC HOSPITAL EXISTING BLOCKPLAN CONDITION
 source: Author Re-drawing based on FS PMC HOSPITAL 2023

ANALYSIS OF EXISTING BUILDING STRUCTURE AND AGE

In evaluating the potential of existing structures within the site, building height (number of stories) should be prioritized over construction year. Multi-story buildings offer better vertical development potential and flexibility in future spatial planning—crucial qualities for healthcare facilities. As Abbaszadeh et al. (2013) highlight, vertical structures contribute to efficient land use and better circulation, making them suitable for hospital retrofitting.

According to Abbaszadeh et al. (2013), vertical efficiency in healthcare facilities can significantly reduce land use while improving internal circulation. Furthermore, multi-story buildings tend to have stronger structural integrity, making them more suitable for retrofitting or performance upgrades in terms of thermal comfort and daylighting (UN-Habitat, 2020).

Identified two-story buildings on the site include:

- Buildings constructed in 2002 (Blocks 1-11)
- Selected buildings from 2010 (Blocks 25, 27)
- Buildings constructed in 2016

Although some of these buildings are relatively old, such as those from 2002, they remain viable for further evaluation through Post Occupancy Evaluation (POE) due to their structural potential and functional adaptability.

CONSTRUCTION YEAR AS A SUPPORTING PARAMETER

Construction Year as a Supporting Parameter The year of construction provides initial insight into technical condition, possible architectural degradation, and maintenance requirements.

DESIGN IMPLICATIONS AND DEVELOPMENT STRATEGY

The development strategy for the hospital complex should prioritize:

- Two-story buildings with strong structural integrity for future vertical expansion.
- Structures with retrofit potential, regardless of age.
- Evaluation of passive performance (natural lighting, ventilation, thermal comfort) as a determining factor for reuse.

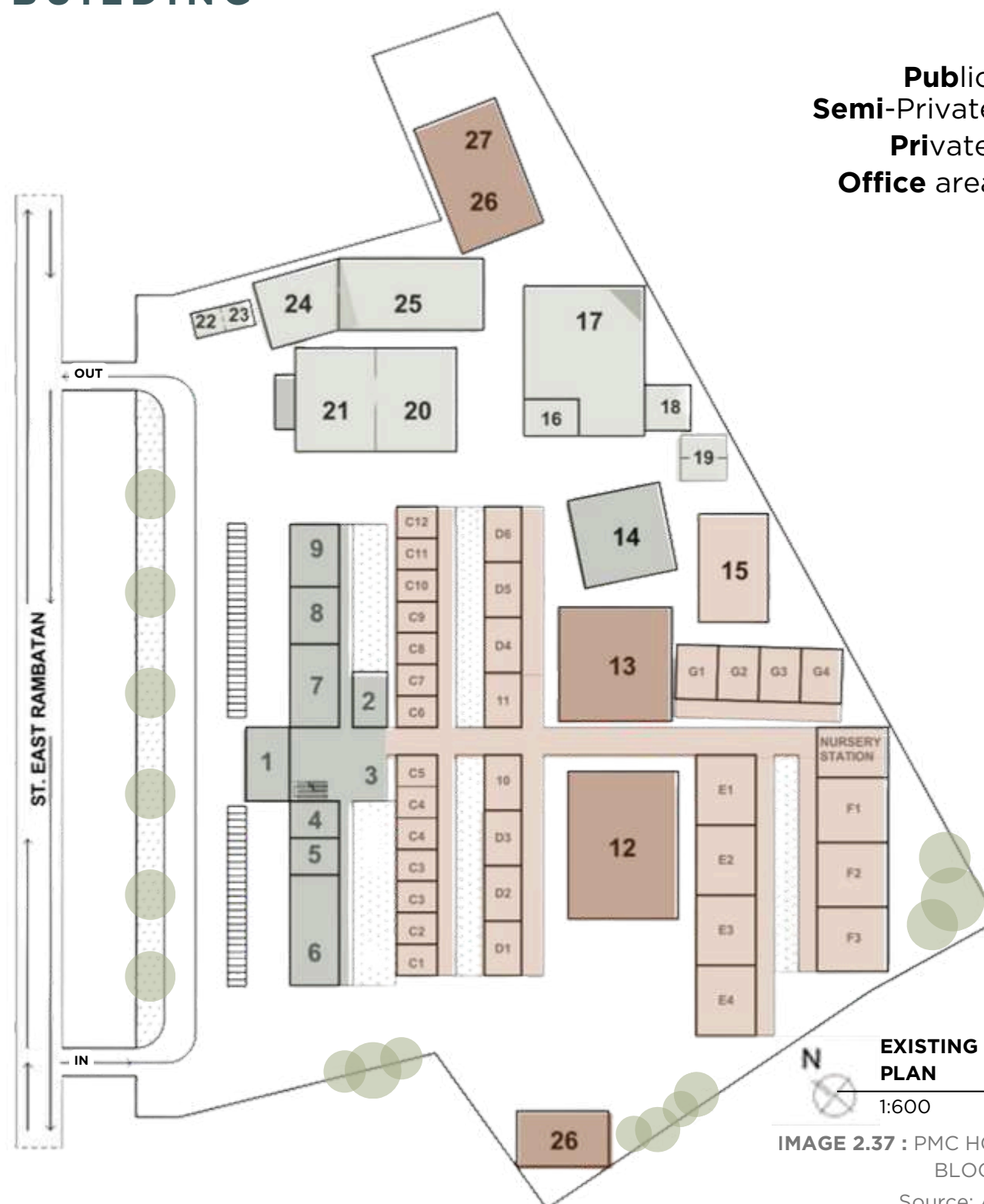
This approach aligns with the principles of sustainable design, which emphasize maximizing the use of existing resources while minimizing waste from demolition activities (Reddy, 2014).

03^{P.O.E} EXISTING BUILDING

LEGEND

1. Entrance & Drop-Off
2. Front Office
3. Waiting Room
4. Dental Clinic Room
5. Surgery Clinic Room
6. Emergency Department (ED)
7. Internal Medicine Clinic
8. Pediatric Clinic
9. Obstetrics and Gynecology (Ob-Gyn) Clinic
10. Delivery Room
11. Laboratory
12. Operating Room (Surgery Room)
13. Radiology Department and Physiotherapy
14. Mosque (Prayer Room)
15. Isolation Room
16. Director's Office
17. Hall
18. Wastewater Treatment Plant (WWTP)
19. Ambulance Garage
20. Generator Room
21. Cashier & Pharmacy
22. Nutrition Department & Kitchen
23. Public Restroom
24. Generator Room (second, if distinct)
25. Neonatal Intensive Care Unit (NICU) and Pediatric Intensive Care Unit (PICU), with administrative offices above
26. Hospital Mortuary

Public
 Semi-Private
 Private
 Office area



EXISTING BLOCK PLAN

1:600

IMAGE 2.37 : PMC HOSPITAL BLOCK PLAN

Source: Author's

Overview

Permata Medical Center General Hospital, a privately owned hospital under PT. Pancuran Mas, was established on November 15, 2005. Initially, the hospital occupied a land area of 6,924 m² with a building size of 2,970.7 m², located in Penyindangan Wetan Blok A, Sindang District, Indramayu Regency.

Over the years, from 2005 to 2015, the hospital expanded its land area to **6,924 m²** and increased its building size to **3,216.75 m²**. Additionally, it has completed the construction of inpatient facilities, **now accommodating a total of 65 beds**.

03 Existing Building

SPATIAL AND NATURE CONNECTION

SPATIAL CONDITION

The spatial analysis of Permata Medical Center Hospital indicates a relatively well-structured zoning, with public areas located on the western side and private zones situated further inward. However, based on interviews with the management, the separation between semi-private and private zones remains insufficiently defined—particularly in transitional areas such as the laboratory and radiology department, which are positioned too close to general circulation paths.

The lack of separation between patient circulation and public areas results in excessive exposure of medical activities, compromising both patient privacy and comfort. A reconfiguration of zoning and circulation patterns is essential to create a more secure, calm, and human-centered healing environment.

VISUAL CONNECTION TO NATURE

Although the central courtyard is physically accessible and centrally located within the hospital layout, its potential as a therapeutic design element remains significantly underutilized. Currently, the courtyard lacks visual and physical integration with surrounding patient care areas, making it function more as a passive open space rather than an active contributor to healing

However, in the existing configuration, the courtyard fails to provide meaningful interaction with the built environment. Without intentional design strategies such as framed views, inviting pathways, shaded seating, or sensory planting the space does not support the psychological and emotional well-being of its users.



IMAGE 2.38 : PMC HOSPITAL INPATIENT CORRIDOR EXISTING CONDITION
Source: Author's Field Survey

ARCHITECTURAL STYLE



IMAGE 2.40 : PMC HOSPITAL
EXISTING FACADE CONDITION

Source: Author's

Functional Modern with Tropical Response

Based on field observations, the existing RSU Permata Medical Center building adopts a simple modern tropical architectural style with a predominant utilitarian character. This is reflected in the use of gable roofs, exposed column structures, basic finishing materials, and semi-outdoor corridor circulation configurations.

BUILDING MASS : SIMPLE, SYMMETRICAL, MODULAR

Designed primarily to meet basic medical functions. The building façade is designed in a modular manner with a strong emphasis on function, while aesthetic elements and architectural character remain underexplored. This design approach is considered suboptimal in supporting a human-centered and healing-oriented hospital concept, thus presenting a significant potential for a more contextual and empathetic redesign.



IMAGE 2.41 : PMC HOSPITAL OUTPATIENT
CORRIDOR EXISTING CONDITION

Source: Author's

Soothing Colors and Materials

Dominant use of cream and turquoise results in a dull and cold spatial atmosphere. Neutral and warm color palettes promote a sense of safety, comfort, and emotional balance.



IMAGE 2.42 : PMC HOSPITAL OUTPATIENT CORRIDOR EXISTING CONDITION



STANDARD MATERIALS

Standard materials such as plastered walls, glass panels, ceramic finishes, and aluminum frames are utilized.

TROPICAL CLIMATE RESPONSE

There are modest attempts to respond to the tropical climate through natural ventilation, standard window openings, and overhangs/canopies.

ABSENCE OF AESTHETICAL VALUE

Aesthetic elements such as natural materials, local ornamentation, or iconic architectural forms are largely absent.

Potential for Strengthening Visual Identity

- 1.The simplicity of the existing style offers a significant opportunity for the development of a stronger architectural identity.
- 2.A healing environment approach can be introduced to enhance spatial quality, create a more human-centered atmosphere, and reinforce the hospital's visual identity.

03 P.O.E NATURAL LIGHTING SIMULATION

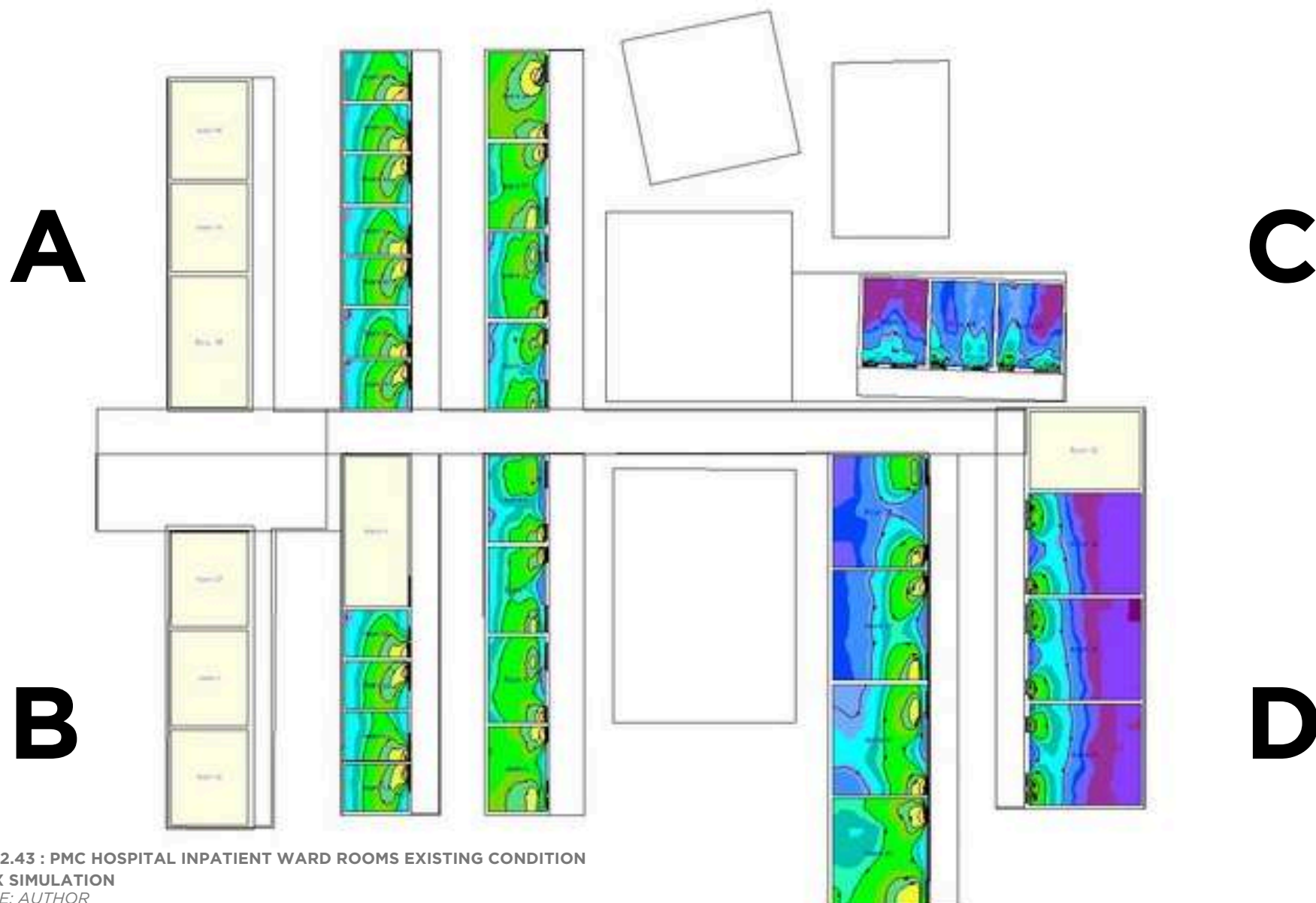
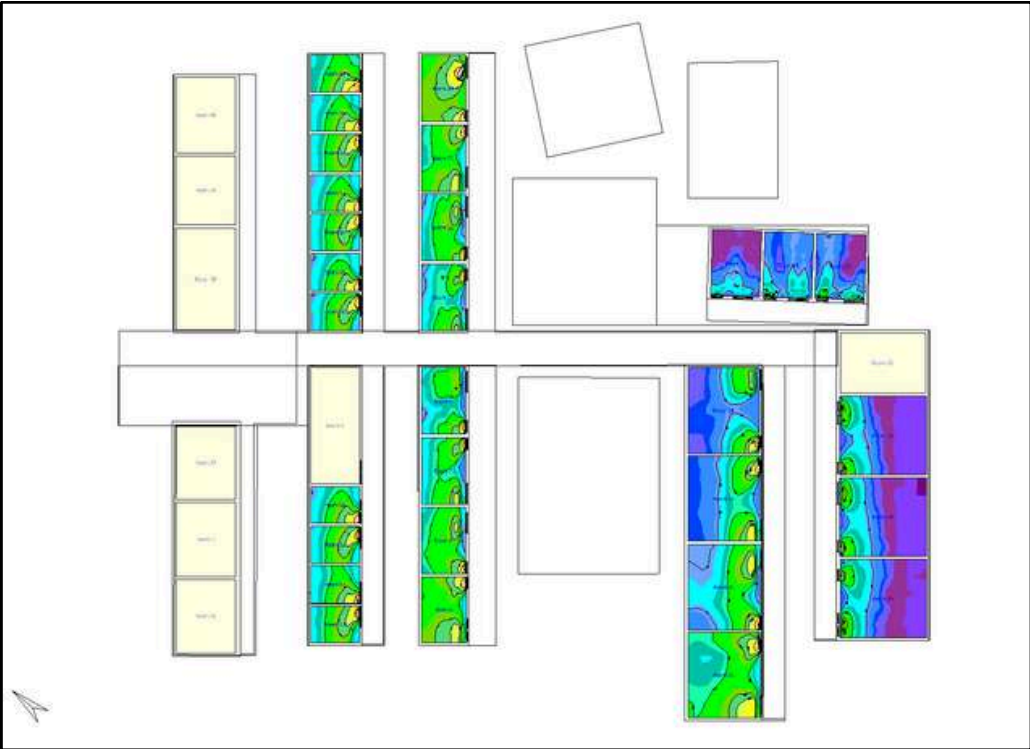


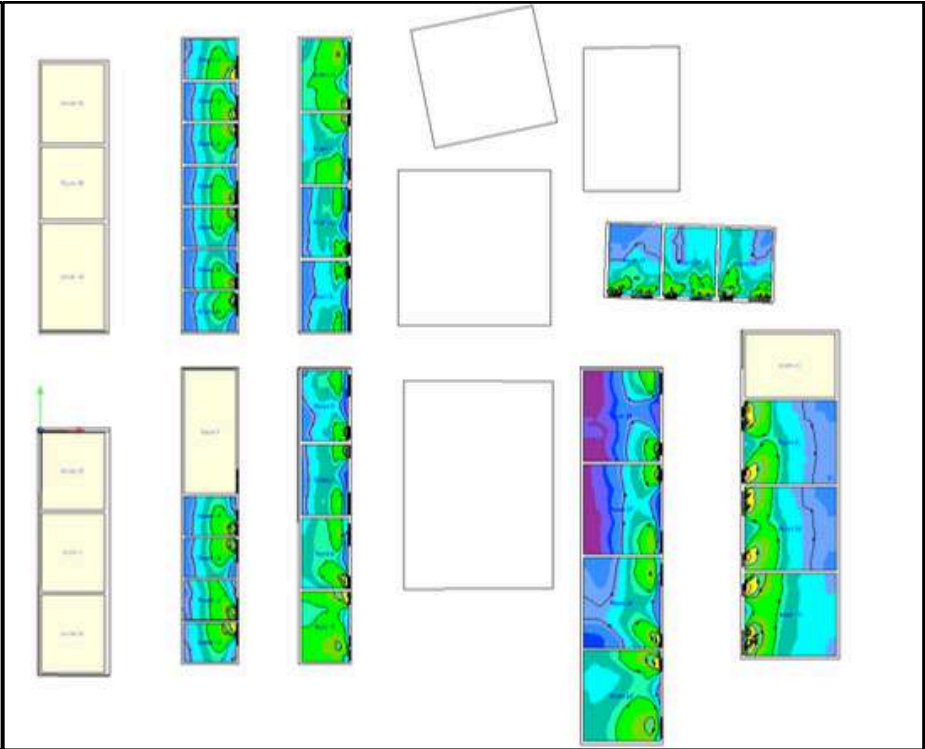
IMAGE 2.43 : PMC HOSPITAL INPATIENT WARD ROOMS EXISTING CONDITION
DIALUX SIMULATION
SOURCE: AUTHOR

This diagram illustrates the results of a Dialux simulation conducted to assess natural lighting conditions within the existing layout of PMC Hospital Indramayu. The simulation was performed on multiple zones of the building, labeled A to D, during equinox conditions (20 March and 25 September 2025) at various times of the day (09:00 and 15:00). The color gradient indicates the daylight illuminance levels in lux, with green to yellow areas representing optimal lighting (ranging between 200-750 lux), while blue and violet tones suggest insufficient daylight levels below 50 lux, and red/orange zones indicate excessive light intensity, possibly causing glare. Zones A and B generally show better daylight penetration due to their orientation and proximity to openings. Conversely, sections C and D display lower daylight exposure, particularly during the afternoon, indicating the need for artificial lighting or design intervention.

EQUINOX
20 March 2025,09:00 am



EQUINOX
20 March 2025,15:00 pm



EQUINOX
25 September 2025,9:00 am



IMAGE 2.44, 2.45, 2.46 : PMC HOSPITAL
INPATIENT WARD ROOMS EXISTING
CONDITION DIALUX SIMULATION
SOURCE: AUTHOR

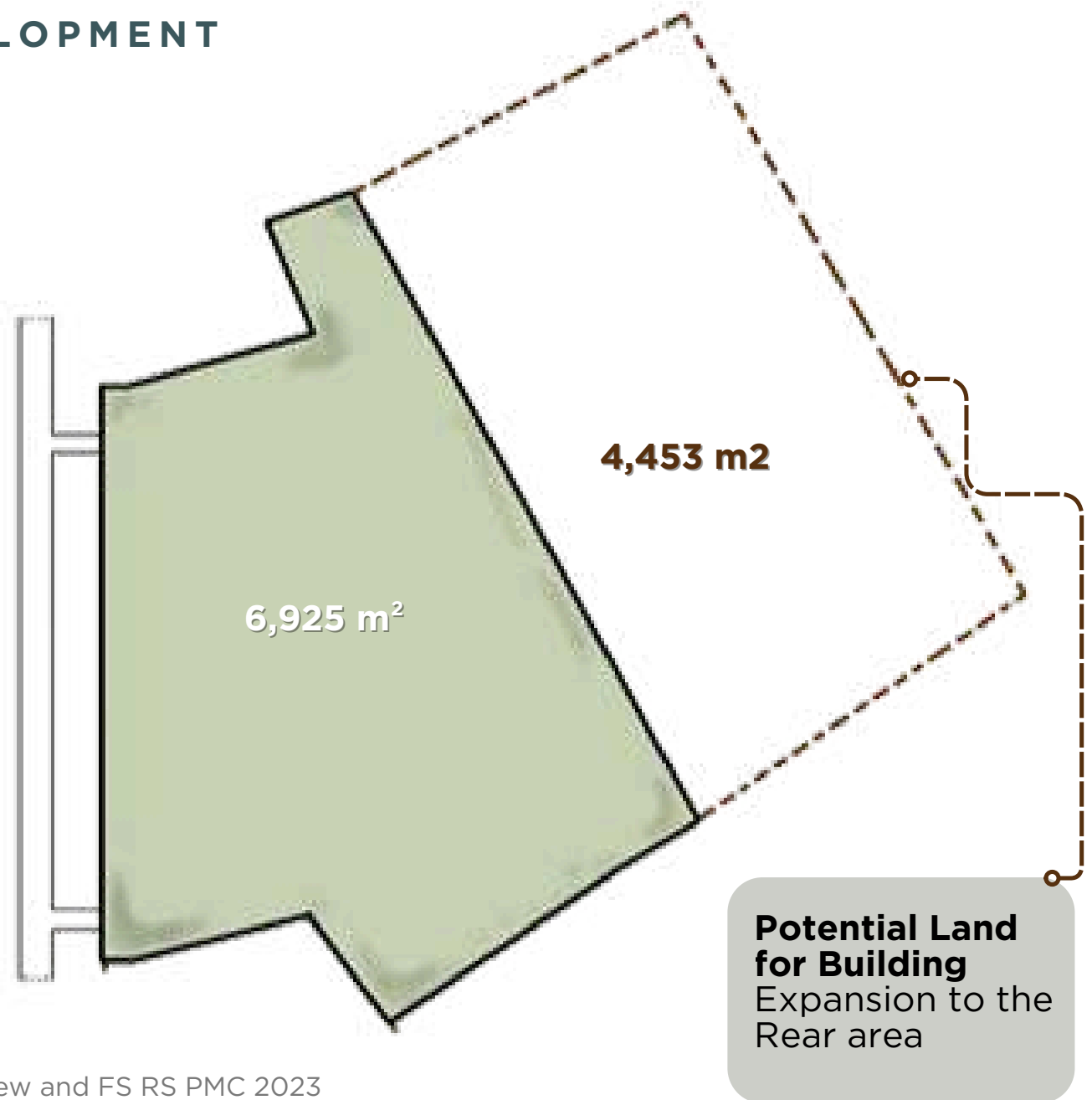


IMAGE 2.47 : MAP OF ALTERNATIVE DEVELOPMENT STRATEGY

Source: Author analysis based on interview and FS RS PMC 2023

1. Expansion Potential

Based on the PMC Hospital Feasibility Study (2023) and Post Occupancy Evaluation (POE) interviews, RS PMC plans to expand from 6,925 m² to 3.5 hectares.

This expansion is aimed at future development into a Type B hospital by 2040–2045.

However, the land acquisition has not been finalized, making the plan still tentative.

2. Ideal Land Requirement Analysis

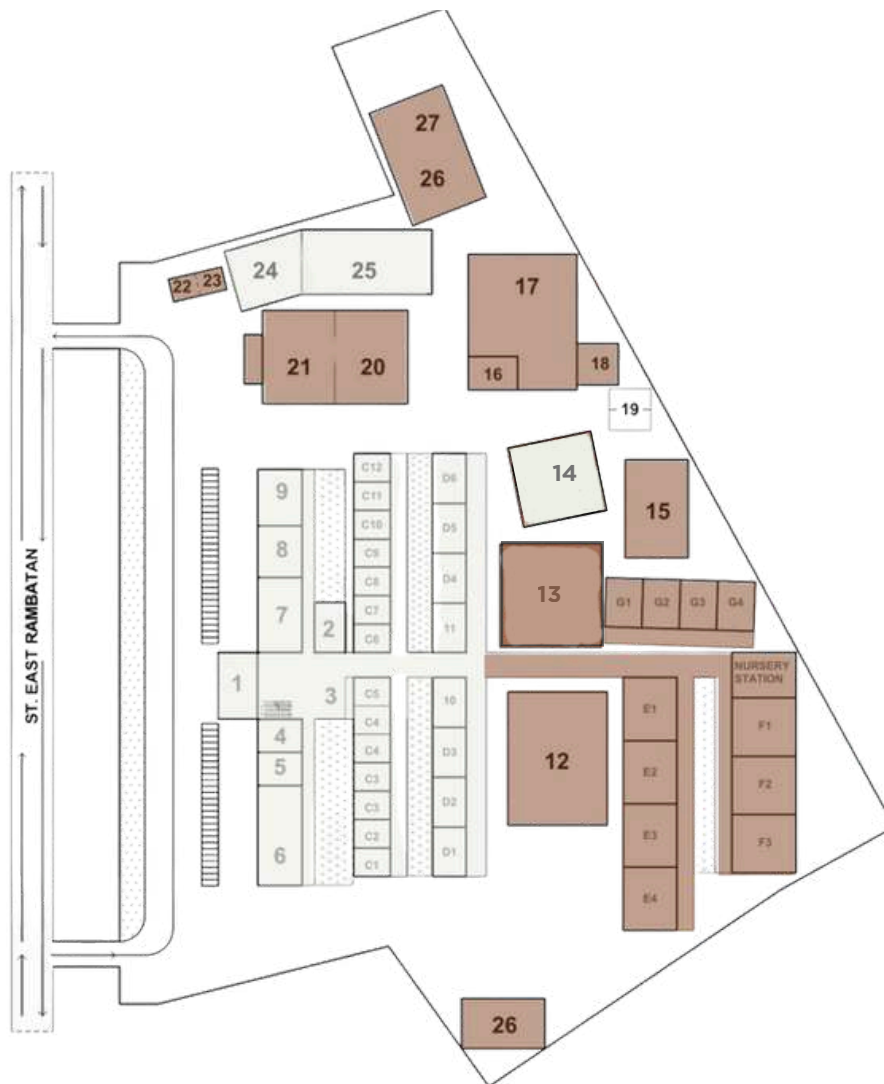
For a projected capacity of 200 beds, with a standard area of 120 m² per bed, the total building requirement is ±24,000 m².

Assuming a FAR (Floor Area Ratio) of 2.5, the ideal land requirement would be around 1–1.2 hectares.

Therefore, expanding to 3.5 hectares may be considered excessive and potentially inefficient in terms of land use. A large site without corresponding improvements in circulation, natural ventilation, and daylighting could fail to improve hospital quality.

3. Alternative Expansion Strategy

Based on a quick calculation of 120 m² per bed, the final strategy is to optimize land use by demolishing outdated single-story buildings that lack comfort and natural lighting, especially in inpatient areas. This opens potential space at the rear, identified through rice field plot grids and verified by ATR/BPN land use maps, ensuring a strategic and legal redevelopment approach.



Demolished
Retained Area

IMAGE 2.48 : MAP OF BUILDINGS TO BE RETAINED AND DEMOLISHED

Source: Author analysis

HOSPITAL QUICK CALCULATION	Unit(Sqm)	Percentage
SITE	11378	10,000%
BCR(60%)	6827	6,000%
FAR (2,5x)	28445	
GBC(20%)	2276	2,000%
RULE OF THUMB RS QUICK CALCULATION OF RS TYPE C	18000	6,328%
RULE OF THUMB RS QUICK CALCULATION OF RS TYPE C	24000	8,437%

03

Contextual Study USERS ANALYSIS

USER NEEDS

Based on the analysis, patients require a healing environment, specialized care, and accessibility. Medical staff need efficient workflows and a healthy work environment. Management must ensure Type C compliance and operational efficiency, while visitors seek comfort and easy access.



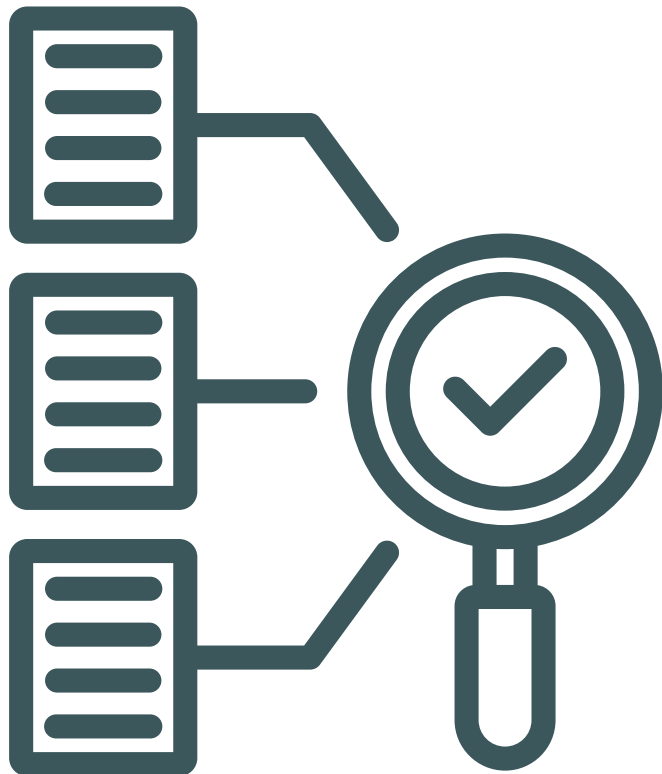
1. PATIENTS: HEALING, COMFORT & COMPREHENSIVE CARE

- Healing Environment: Natural views, daylight access, green spaces.
- Privacy: Standardized inpatient rooms, soundproofing.
- Accessibility: Elderly- and disability-friendly pathways, clear navigation.
- Comprehensive Care: Expanded specialist services (Pulmonary, ENT, Ophthalmology, Dermatology, Pathology) to enhance diagnosis and treatment.
- Support Facilities: Comfortable waiting areas, complementary therapies.



2. MEDICAL STAFF: EFFICIENCY & WELL-BEING

- Optimized Workflow: Strategic layout, separated circulation.
- Healthy Work Environment: Proper ventilation, natural lighting.
- Safety & Hygiene: Antibacterial materials, sterile air circulation.



3. MANAGEMENT: COMPLIANCE & EFFICIENCY

- Type C Standards: Facilities and services meeting regulations.
- Operational Efficiency: Energy-saving design, easy maintenance.
- Spatial Flexibility: Modular, adaptable spaces.



4. VISITORS: COMFORT & ACCESSIBILITY

- Comfortable Waiting Areas: Green spaces, reading corners, noise reduction.
- Easy Access: Ample parking, digital wayfinding.

HEALTH CARE

PERSONEL

Type of Healthcare Personnel	Number
General Practitioners	4
Specialist Doctors	7
Midwife	1
Nurses	9
Pharmacist	1
Assistant Pharmacist	1
Pharmacy Technician	2
Medical Laboratory Analyst	1
Radiographers	3
Medical Records Officers	2
Nutritionist	1
Total	35

TABLE 2.7 : PMC HOSPITAL TYPE OF HEALTHCARE PERSONNEL

Source: Company Profile PMC Hospital Indramayu

PMC Hospital has a well-structured healthcare workforce, but minor adjustments, such as increasing nursing, diagnostic, and pharmaceutical staff, could enhance service delivery and efficiency. This would improve patient outcomes and ensure smoother hospital operations.

Based on the prevalence analysis of diseases in Indramayu, RS PMC needs to expand its medical staff by incorporating additional specialists to enhance healthcare services. The required specialists include Pulmonary Specialists, ENT Specialists, Ophthalmologists, Dermatologists, and Pathologists. Strengthening the hospital’s specialist capacity will improve service quality, facilitate faster diagnosis, and ensure more effective patient care.

HEALTH CARE

FACILITIES

PMC Hospital offers comprehensive medical services through various facilities. The inpatient services include Class 3 with 12 beds, Class 2 with 10 beds, Class 1 with 3 beds, VIP with 6 beds, VVIP with 4 beds, and Super VIP with 3 beds. The hospital provides a 24-hour emergency department and outpatient clinics specializing in internal medicine, surgery, and dentistry. Maternity services accommodate both normal and complicated deliveries, supported by operating rooms for general surgery and obstetrics. Additionally, intensive care units (ICU and NICU) ensure critical care for patients. The hospital is equipped with radiology services, including X-ray and ultrasound, alongside a 24-hour pharmacy and a clinical laboratory, ensuring continuous medical support.

04 REFORMULATION OF THE DESIGN PROBLEM

STRATEGIC ARCHITECTURAL PLAN

Following an in-depth site analysis and Post-Occupancy Evaluation (POE)—including user interviews, surveys, architectural assessments, natural daylight simulation using Dialux, and structural analysis based on the 2003 building code—it was determined that the core issues of the design remain largely unchanged. However, in order to address the design challenges more effectively, a substantial reformulation is necessary. This reformulation aims to articulate the design problems more precisely and strategically, thereby allowing them to be resolved through an informed and methodical architectural approach.

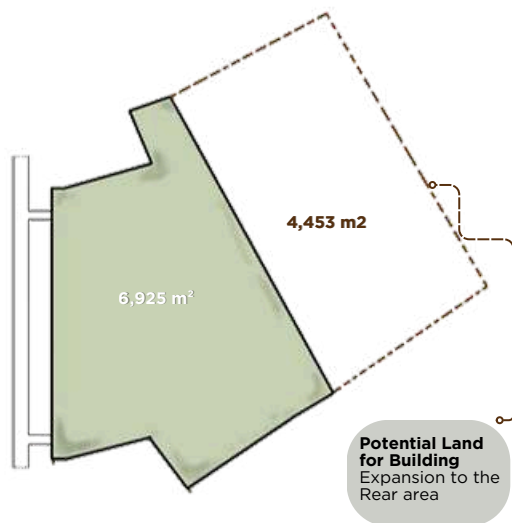


Image 2.49 : Map of Alternative development strategy

Source: Author analysis

1. Modern and Sustainable Architectural Development

The architectural development is oriented towards a modern paradigm that integrates spatial efficiency, simplicity of form, and the application of sustainable materials. In this context, "modern" refers not only to aesthetic qualities but also to the pursuit of functional clarity, adaptability, and environmental responsiveness. Emphasis is placed on material efficiency, lifecycle performance, and the integration of green technologies as a response to contemporary challenges in healthcare design, particularly energy consumption, resource optimization, and user well-being.

2. Integration of Green Open Space as a Healing Element

• Transformation of Existing Open Areas into Healing Gardens

Interstitial and underutilized open spaces within the existing hospital layout are reimagined as healing gardens. These areas serve as therapeutic landscapes designed to enhance the mental and emotional well-being of patients, staff, and visitors through interaction with nature, thereby reinforcing the hospital's healing environment.

• Improvement of Natural Daylighting and Privacy in Inpatient Rooms

Inpatient areas that currently lack adequate openings are to be reconfigured to improve natural daylight penetration, enable passive ventilation, and enhance visual privacy. These improvements are expected to elevate the spatial quality and contribute significantly to patient recovery outcomes.

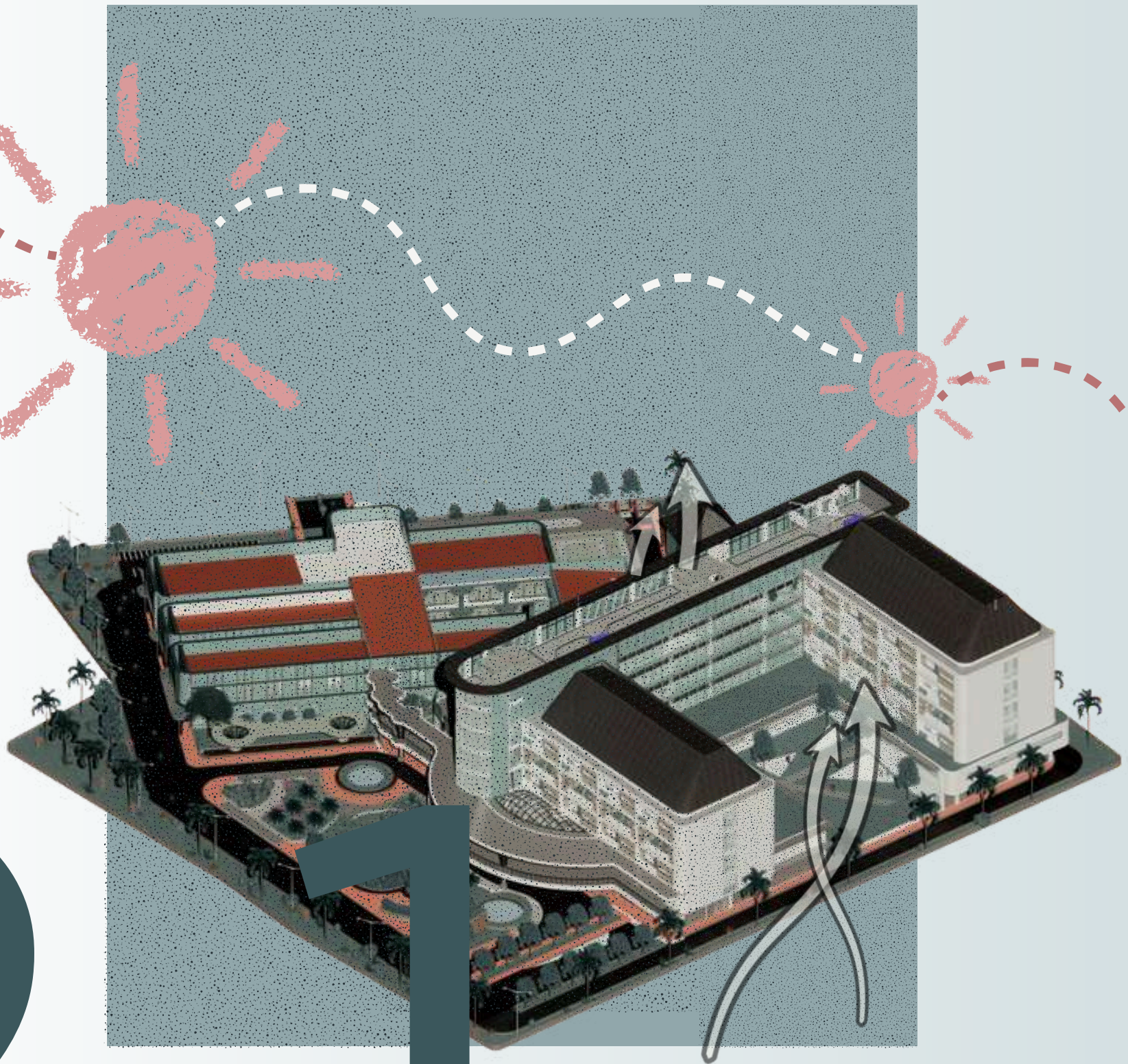
3. Optimization of Limited Land for Complex Programmatic Needs

• Introduction of a Compact and Vertical Building Mass

To respond to increasingly complex spatial requirements within a limited site, a new compact, vertically-oriented building mass is proposed. This structure will centralize core medical services and inpatient wards, allowing for efficient vertical circulation, zoning, and functional integration.

• Demolition of Obsolete Structures

Existing structures that are structurally inadequate (limited to one floor), outdated in function, or misaligned with the long-term development goals are proposed for demolition. This strategy aims to maximize site potential and allocate land for more suitable and resilient architectural interventions in the future.



Chapter 2.1

Concept And Schematic Design

"There are 360 degrees, so why stick to one? Design is about possibilities —"

ZAHA HADID

01

Initial design overview

PROPERTY SIZE

A. PUBLIC & ADMINISTRATIVE AREAS

No	Space Type	Standard Area (m ² /unit)	Total Units	Area Before Circulation (m ²)	Area After Circulation (m ²)	Source
1	Lobby & Reception	80	1	80	96	Neufert
2	Patient Waiting Area	1.5 m ² /person	80 people	120	144	Type C Hospital Guidelines
3	Registration & Cashier	50	1	50	60	Neufert
4	Administration & Management	3.5 m ² /staff	30 staff	105	126	Type C Hospital Guidelines
5	Medical Records Room	0.8 m ² /bed	190 beds	152	182.4	Type C Hospital Guidelines
TOTAL					608,4	1,76%

C. Medical Support Areas

No	Space Type	Standard Area (m ² /unit)	Total Units	Total Area (m ²)	Source
14	Radiology	3 m ² /bed	5 devices	570	Type C Hospital Guidelines
15	Laboratory	3 m ² /bed	7 functions	570	Type C Hospital Guidelines
16	Pharmacy	0.6 m ² /bed	5 areas	114	Type C Hospital Guidelines
17	Rehabilitation Therapy	150	1	150	Neufert
18	Nutrition & Food Services	3 m ² /bed	190 beds	570	Type C Hospital Guidelines
Total				1974	5,70%

B. MEDICAL SERVICE AREAS					
No	Space Type	Standard Area (m ² /unit)	Total Units	Total Area (m ²)	Source
6	Emergency Department	1.5 m ² /bed			Type C Hospital Guidelines
7	Outpatient Clinics	1.5 m ² /bed			Type C Hospital Guidelines
8a	Inpatient Standard (Class 1,2,3)	50 m ² /bed	95 beds (50%)	4,75	Type C Hospital Guidelines
8b	VIP Inpatient Rooms	100 m ² /bed	76 beds (40%)	7,6	Type C Hospital Guidelines
8c	Isolation Rooms	50 m ² /bed	19 beds (10%)	950	Type C Hospital Guidelines
9	Operation Room Installation	237,5	4	950	Type C Hospital Guidelines
10	Maternity Ward	120	1	120	Neufert
11	ICU	25 - 35 m ² /bed	10 beds	250 - 350	Type C Hospital Guidelines
12	NICU/PICU	20 m ² /bed	10 beds	200	Neufert
13	Isolation Room	25 m ² /bed	6 beds	150	Type C Hospital Guidelines
TOTAL				14620	42,23%

D. ANCILLARY FACILITIES & PARKING					
No	Space Type	Standard Area (m ² /unit)	Total Units	Total Area Before Circulation (m ²)	Source
19	Prayer Room (Mushola)	1 m ² /person	100 people	100	Neufert
20	Canteen	1.5 m ² /person	80 people	120	Neufert
21	Multipurpose Hall	150	1	150	Neufert
22	Staff & Nurse Dormitory	6 m ² /person	50 people	300	Type C Hospital Guidelines
23	Parking (1.5-2x bed capacity)	2 SRP/BED	190 beds	5700	Type C Hospital Guidelines
TOTAL				6370	18,40%

03

Initial design overview

PROPERTY SIZE

SUMMARY		
Category	Total Area (m²)	Percentage of FAR (20,775 m²)
Public & Administrative Areas	608,4	1,76%
Medical Service Areas	14620	42,23%
Medical Support Areas	1974	5,70%
Ancillary Facilities & Parking	6370	18,40%
Total Building Area	23572	68,09%

TABLE 2.8 : PMC HOSPITAL
PRELIMINARY PROPERTY SIZE
Source: neufret and Indonesia Type C Hospital Guidelines

CONCLUSION

The space requirements and property size table is developed based on Type C Hospital classification standards, disease prevalence analysis, and the assumption of near-maximum bed capacity for this hospital type. The analysis indicates that approximately 31.91% of the FAR remains available, allowing for the allocation of 20% green open space in the future, the expansion of additional facilities if needed, or even an upgrade to a low-tier Type B Hospital in the future.

03 Initial Design

ZONING DIAGRAM

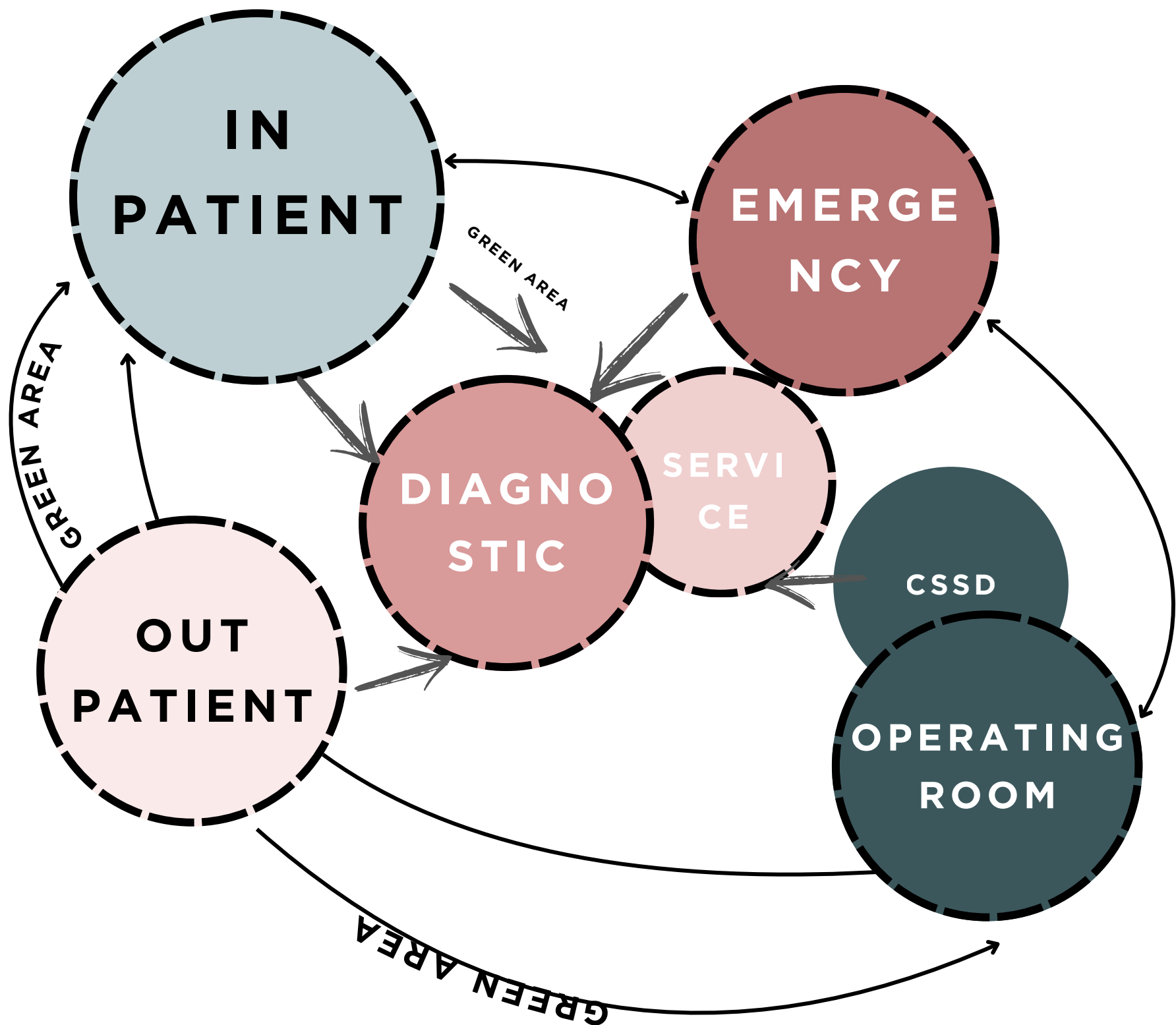


IMAGE 2.50 : HOSPITAL BASIC
ZONING DIAGRAM

Source: Author's drawing

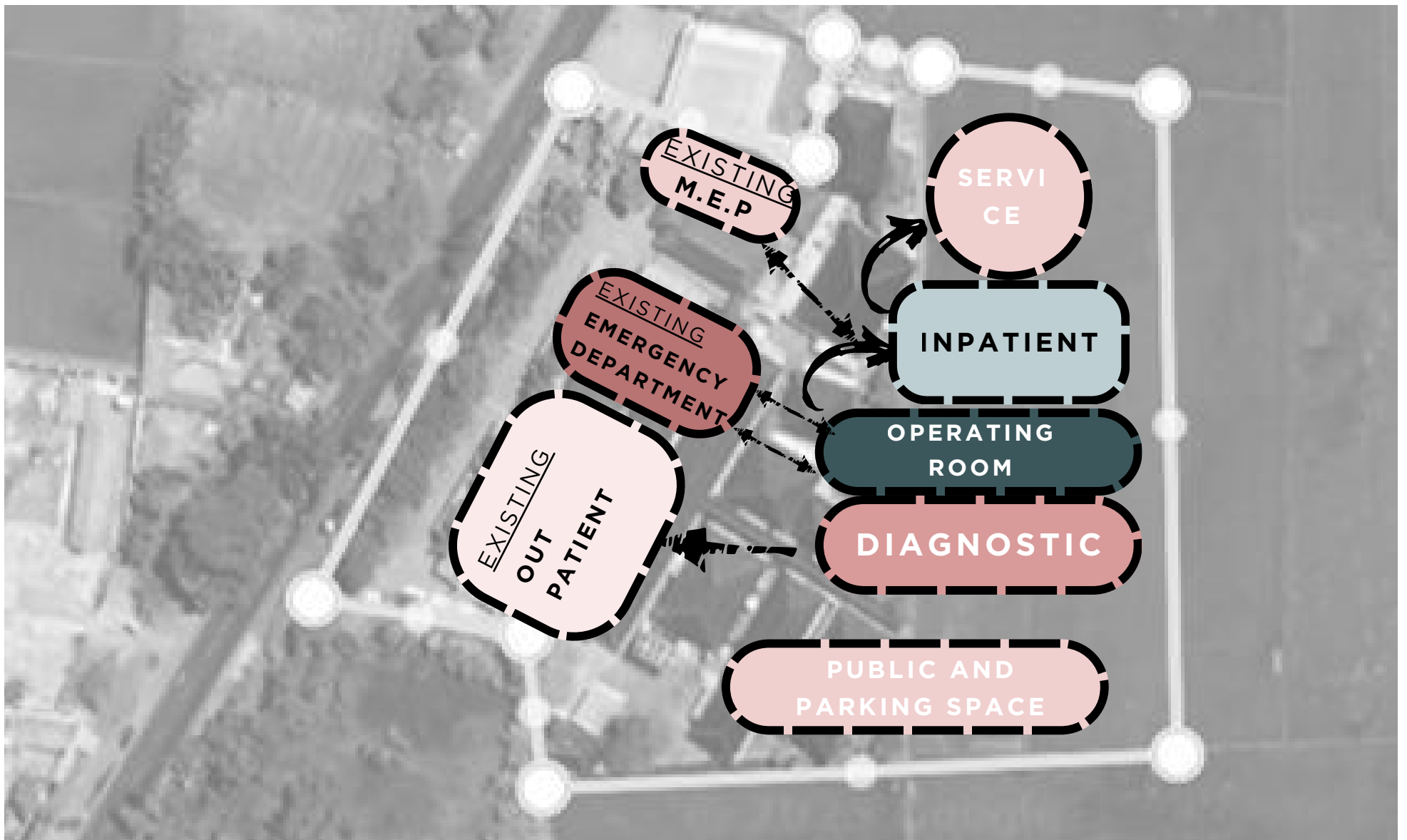


IMAGE 2.51 : ZONING DIAGRAM

Source: Author's drawing and google earth

diagram illustrates the Macro zoning strategy for the hospital's key functions. The Inpatient Area is centrally located for efficient access from the Emergency, Operating Room, and Diagnostic zones. Outpatient services are placed on the opposite side to reduce congestion.

The Diagnostic zone acts as a central hub, connecting all major departments. The Operating Room is directly linked to both Emergency and CSSD to ensure sterile and responsive surgical flow. Green areas are integrated between zones to support healing and create a calming environment for patients.

01

Initial Design

BUILDING MASS ALTERNATIVE

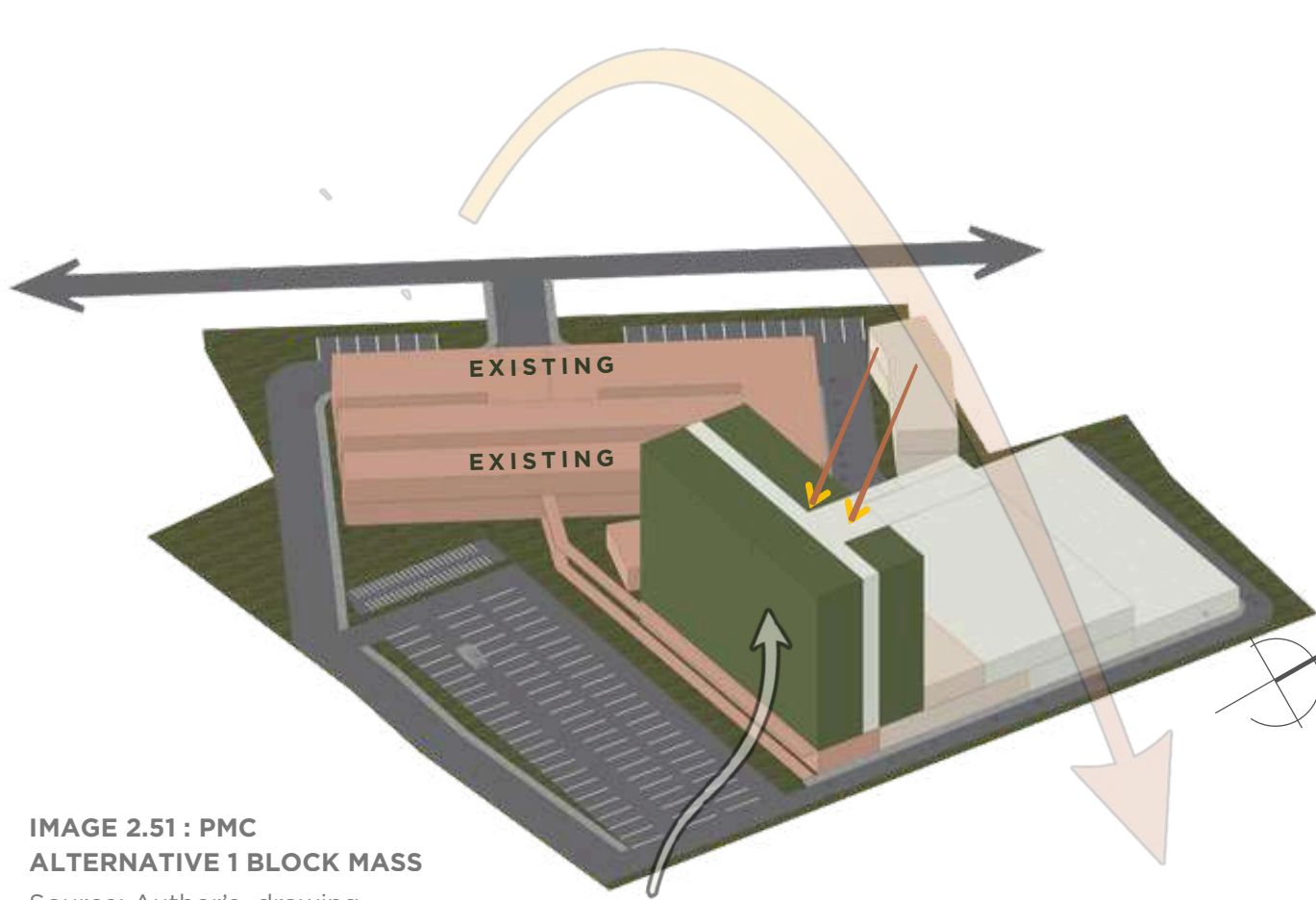


IMAGE 2.51 : PMC
ALTERNATIVE 1 BLOCK MASS

Source: Author's drawing

Alternative 1 – Compact Monolithic

PUBLIC	SEMI PUBLIC	INPATIENT	PRIVATE	SERVICE
--------	-------------	-----------	---------	---------

CONCEPT

The inpatient unit is oriented toward the north, forming a single, compact tower. The medical support podium is integrated with the site's shape to maximize the building coverage ratio.

ADVANTAGE

- Efficient land use through compact design.
- Infrastructure such as ramps and elevators require less space.

DISADVANTAGE

- Limited airflow and natural lighting inside the building.
- The monolithic shape tends to feel rigid, and the tower has high density

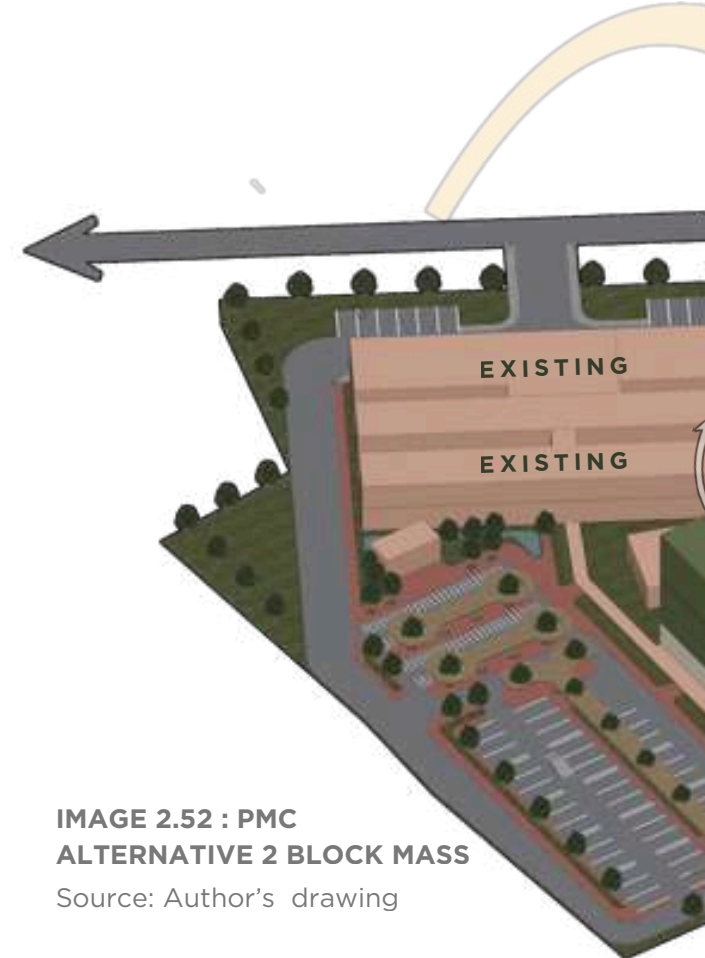


IMAGE 2.52 : PMC
ALTERNATIVE 2 BLOCK MASS

Source: Author's drawing

Alternative 2-Open Layout

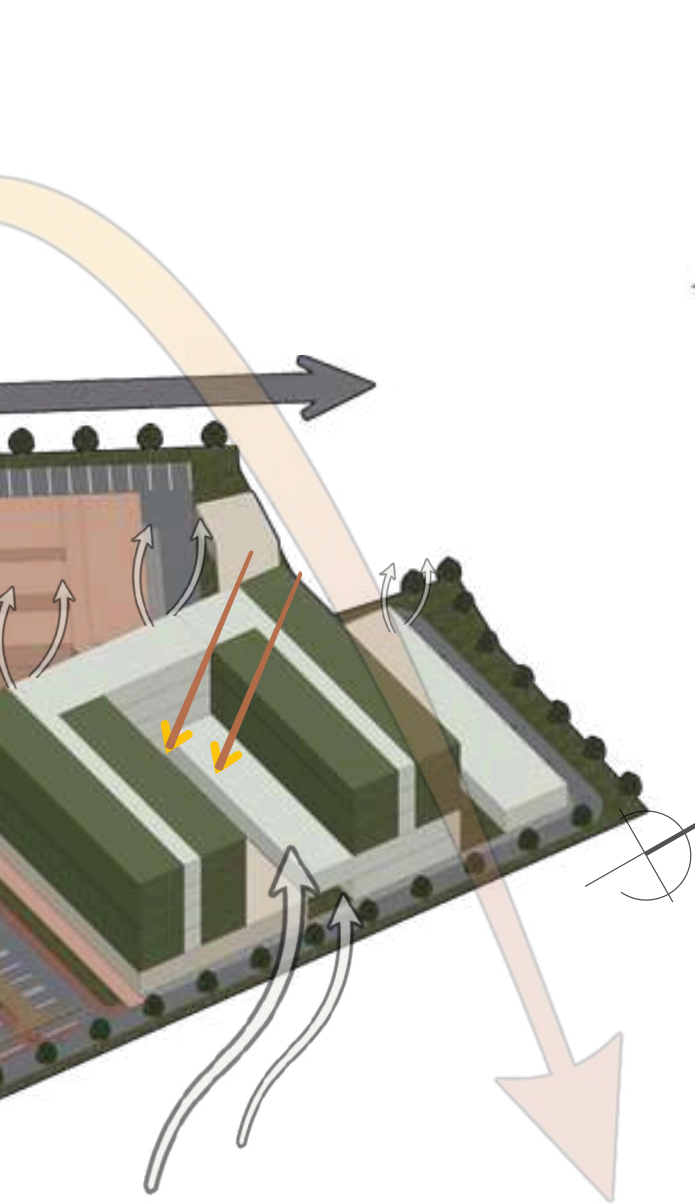
PUBLIC	SEMI PUBLIC	INPATIENT	PRIVATE	SERVICE
--------	-------------	-----------	---------	---------

CONCEPT

Still oriented to the north, the building mass is divided into two separate blocks with a gap between them. This gap allows more natural light and air, and creates space for a healing garden.

ADVANTAGE

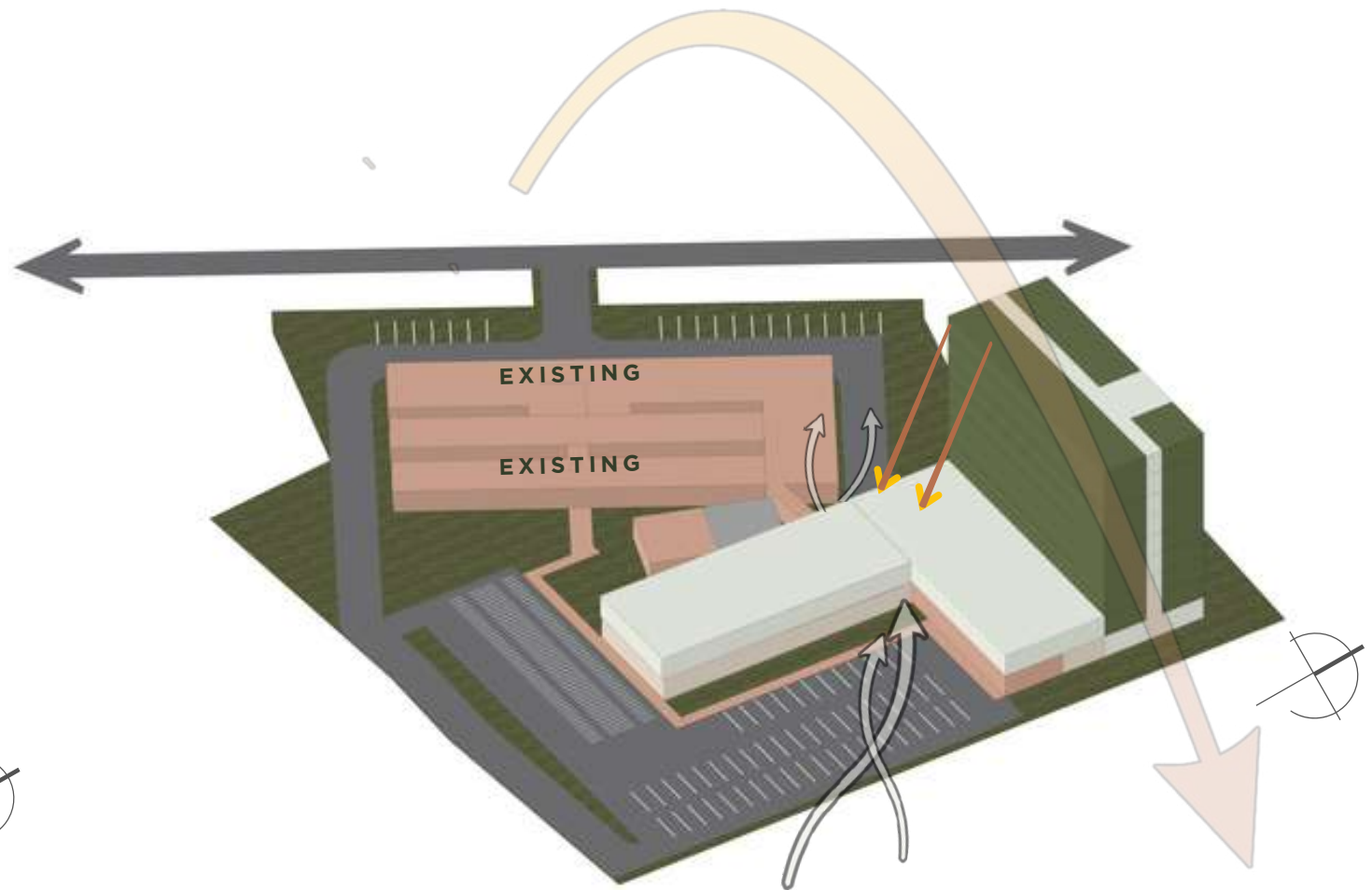
- Compact yet environmentally responsive design.
- Good airflow and natural lighting.
- Reduced heat transfer due to split masses.
- Less pressure on vertical circulation.



- The two-tower concept provides a flexible structural strategy that facilitates future vertical expansion. This configuration allows additional floors to be added

DISADVANTAGE

- More complex and expensive infrastructure due to separated building volumes.
- Two towers require more utilities and support systems.



Alternative 3-Slim Massing

PUBLIC	SEMI PUBLIC	INPATIENT	PRIVATE	SERVICE
--------	-------------	-----------	---------	---------

IMAGE 2.53 : PMC
ALTERNATIVE 3 BLOCK MASS

Source: Author's drawing

CONCEPT

The building is designed as a slim volume that combines service and inpatient areas into one mass. This improves the efficiency of mechanical, electrical, and plumbing (MEP) systems.

ADVANTAGE

- High efficiency of utility systems due to centralized functions.
- Shorter circulation between different functional areas.

DISADVANTAGE

- Increased thermal gain due to the building's massing orientation towards sun-exposed façades
- Possibility of overlapping functions affecting acoustic and spatial quality.

01

Initial Design

BUILDING MASS HEAT TRANSFER SIMULATION

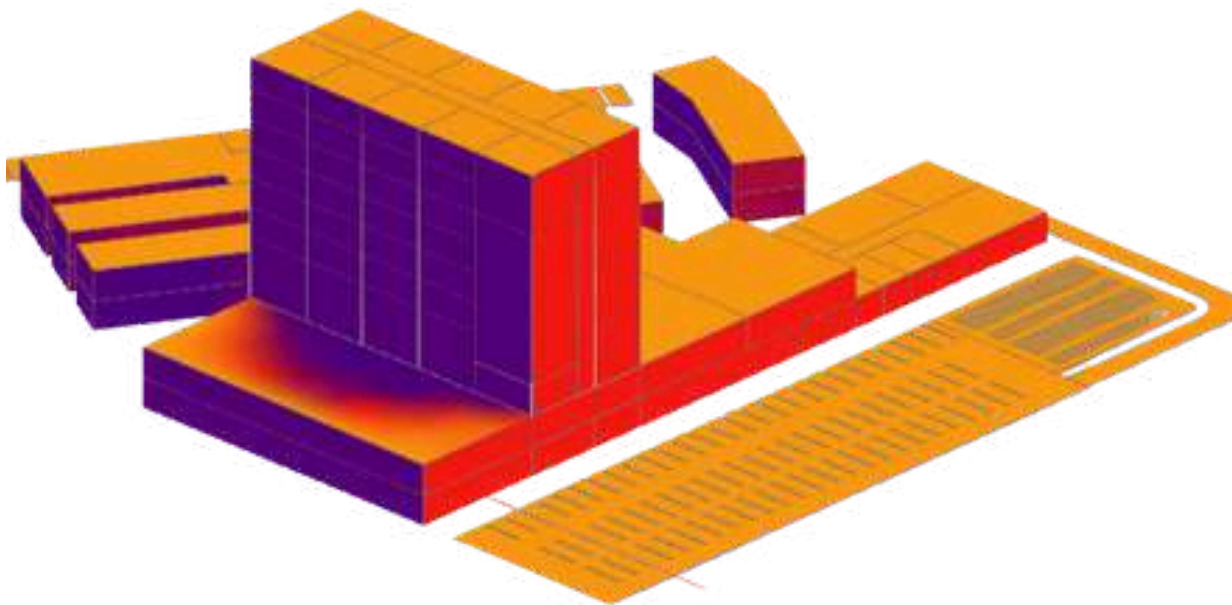


IMAGE 2.54 : PMC 3 ALTERNATIVE
FORM IT SIMULATION

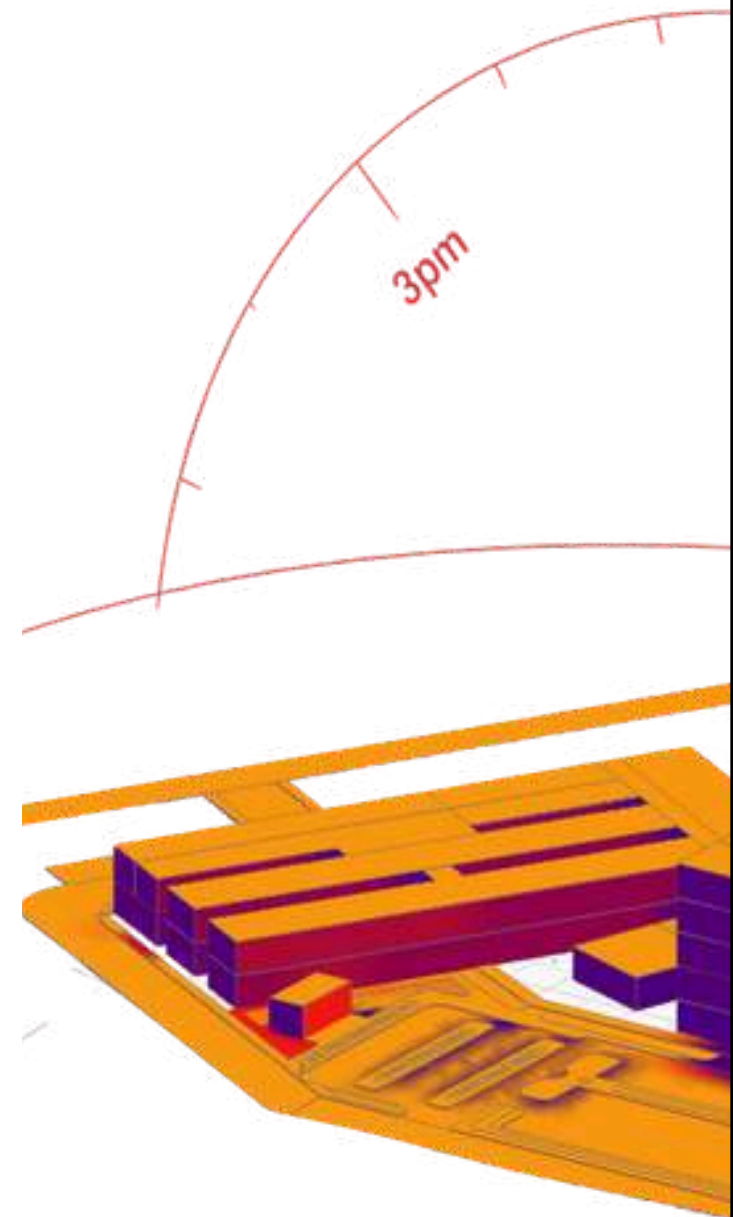
Source: Author's drawing

Wh/sq m



Range: Month - Jun Method: Peak

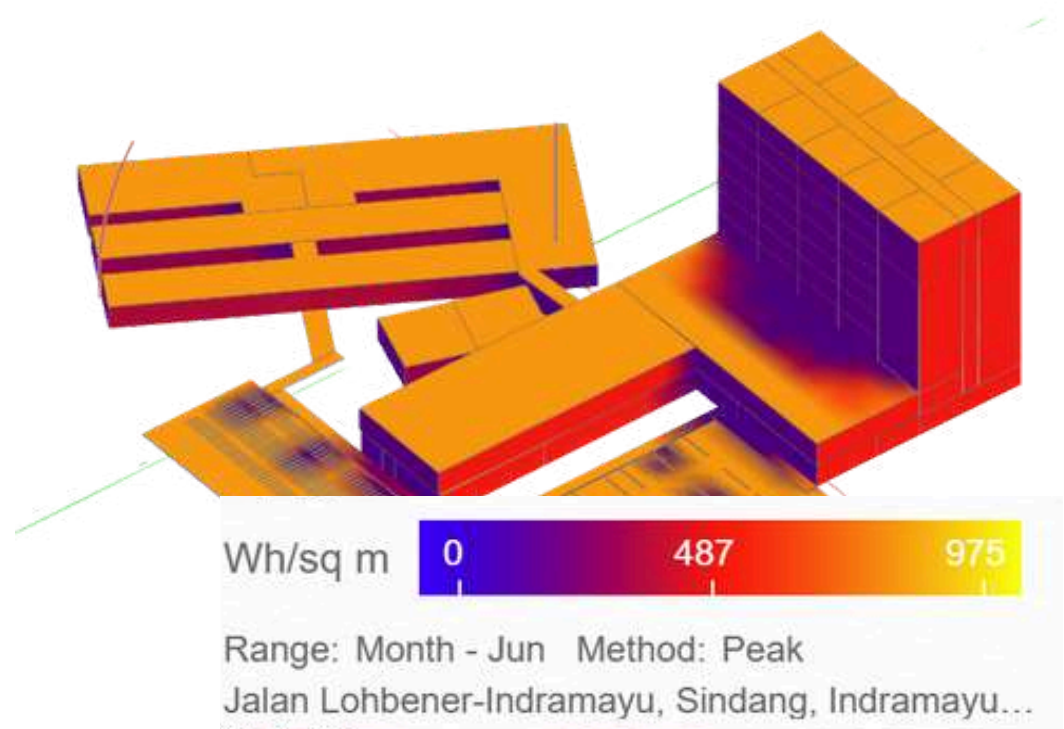
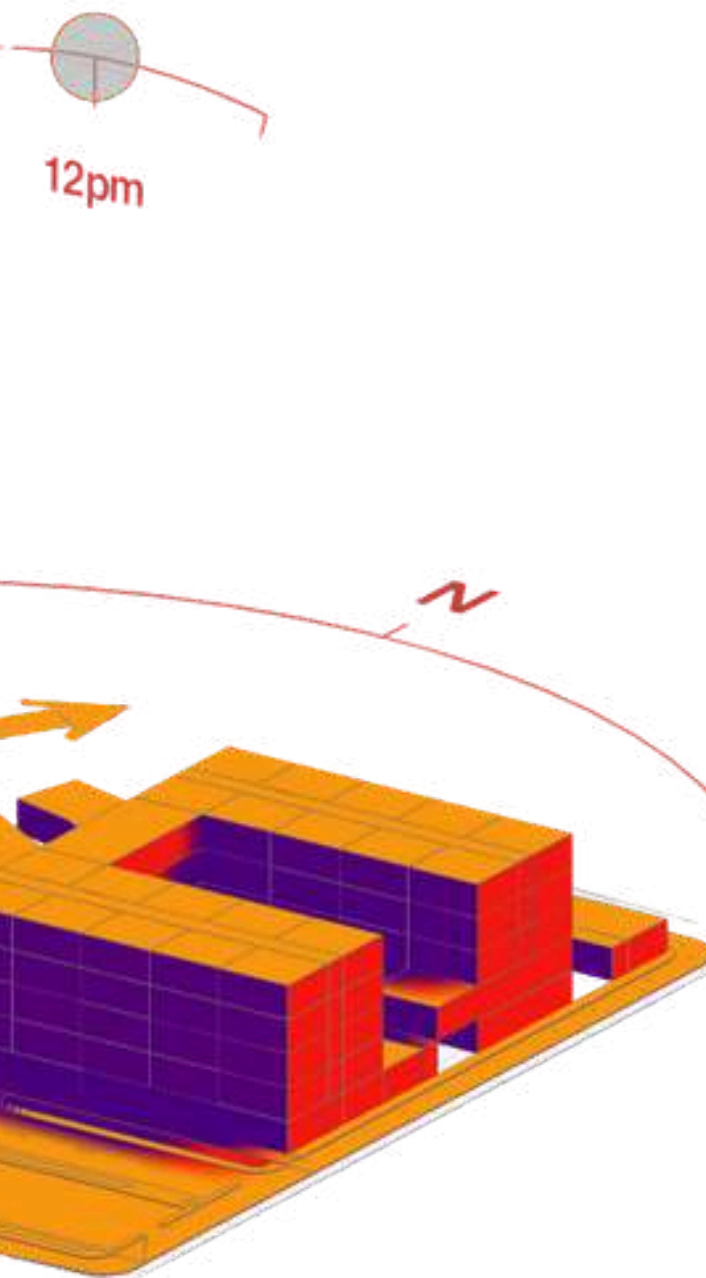
Jalan Lohbener-Indramayu, Sindang, Indramayu...



Alternative 1 – Compact Monolithic

Alternative 2-Open Layout

Based on previous comparisons, Alternative 2: Open Layout was chosen for its stronger alignment with Healing Environment principles—offering better spatial flow, daylight access, and patient comfort. The heat transfer simulation (measured in Wh/m^2 , indicating solar heat gain per square meter) further supports this decision. This layout shows lower and more evenly distributed heat gain, which suggests improved thermal performance. Although this option may involve higher construction costs, its energy-saving potential makes it a promising long-term investment for sustainable hospital development.



ut (chosen Alternative)

Alternative 3-Slim Massing

01

INITIAL DESIGN CHOSEN ALTERNATIVE

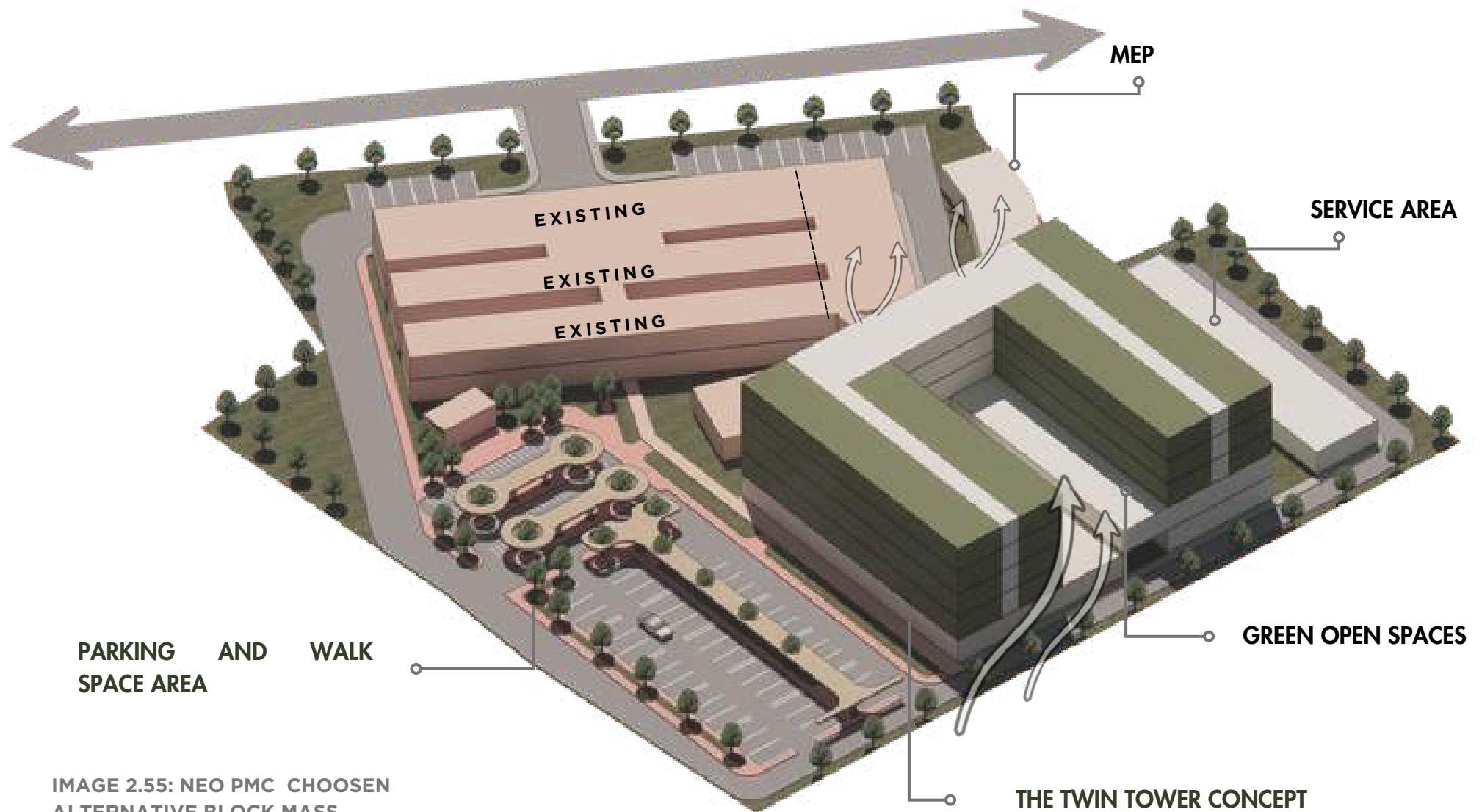


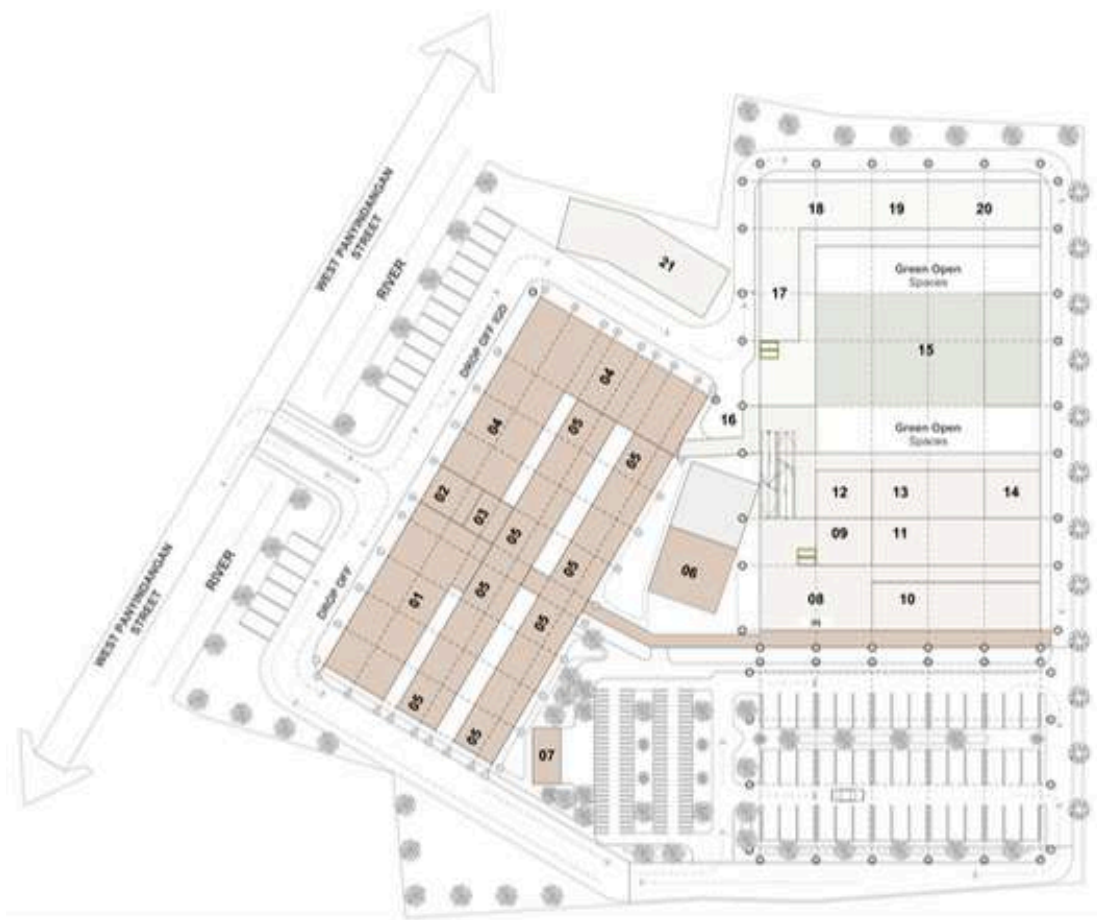
IMAGE 2.55: NEO PMC CHOSEN ALTERNATIVE BLOCK MASS

Source: Author's drawing

DESCRIPTION

In this phase, the selected design emphasizes functional integration, connectivity between areas, and environmental sustainability. The building mass adopts the Twin Tower Concept, where two main masses form a central courtyard that acts as a green open space, allowing for natural lighting, cross ventilation, and serving as a therapeutic area for both patients and visitors.

The perspective view showcases the Twin Tower configuration, creating an open green space in the center that functions as a healing garden and improves the overall spatial quality. The service and MEP (Mechanical, Electrical, Plumbing) areas are located at the rear of the complex to avoid interference with the main patient and visitor circulation.



Legend

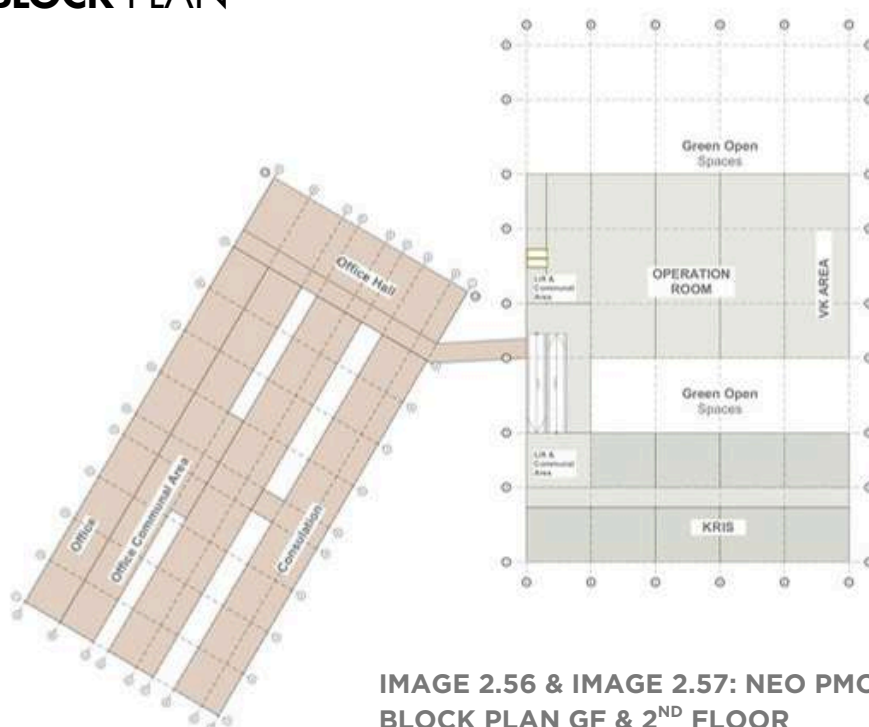
1. Lobby
2. Pharmacy Storage
3. Pharmacy Store
4. Intensive Care Units
5. Outpatient
6. Mosque
7. Caffee
8. Inpatient Lobby
9. Laboratorium
10. Radiology
11. Toilet
12. Mart
13. Canteen
14. VK
15. Loading Dock
16. Storage
17. CSSD
18. Staff Room
19. Kitchen
20. STP and GENSET

Legend

1. Lobby
2. Pharmacy Storage
3. Pharmacy Store
4. Intensive Care Units
5. Outpatient
6. Mosque
7. Caffee
8. Inpatient Lobby
9. Laboratorium
10. Radiology
11. Toilet
12. Mart
13. Canteen
14. VK
15. Loading Dock
16. Storage
17. CSSD
18. Staff Room
19. Kitchen
20. STP and GENSET



BLOCK PLAN



The placement of the main functional areas considers the circulation flow of patients, staff, and visitors, ensuring efficiency and avoiding overlap. The parking and vehicular access are placed at the front and sides of the site to allow direct access to the main lobby and outpatient area.

The layout of the second floor continues the principle of functional efficiency and user comfort. Key areas such as the operating rooms and supporting spaces are positioned to have direct access to inpatient areas and sterile zones, minimizing contamination risks and enhancing treatment flow.

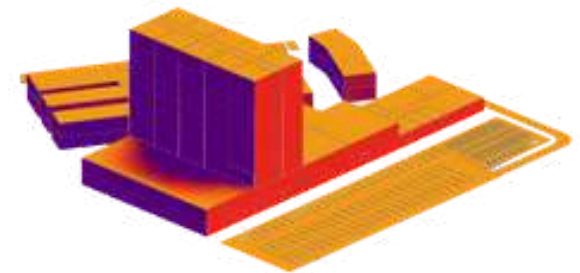
BLOCK PLAN 2ND FLOOR

IMAGE 2.56 & IMAGE 2.57: NEO PMC
BLOCK PLAN GF & 2ND FLOOR
Source: Author's drawing

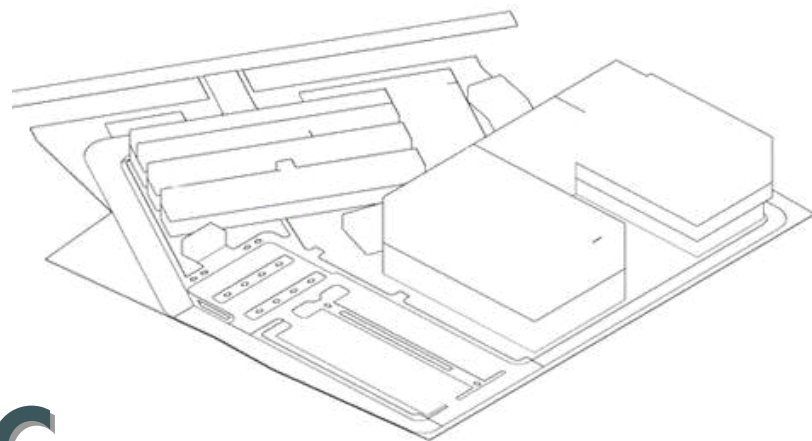
01 Initial Concept DESIGN TRANSFORMATION



Create building mass, size, and orientation to effectively accommodate programmatic functions and respond to site conditions.

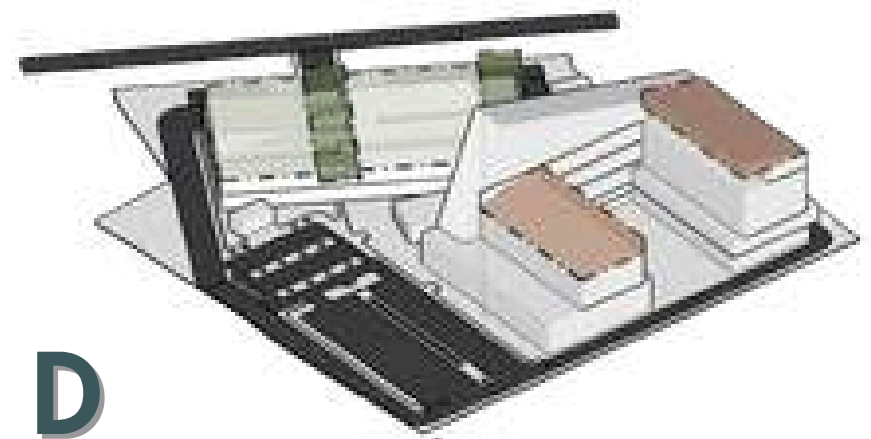


Wh/sq m 0 487 975
Range: Month - Jun Method: Peak
Jalan Lohbener-Indramayu, Sindang, Indramayu



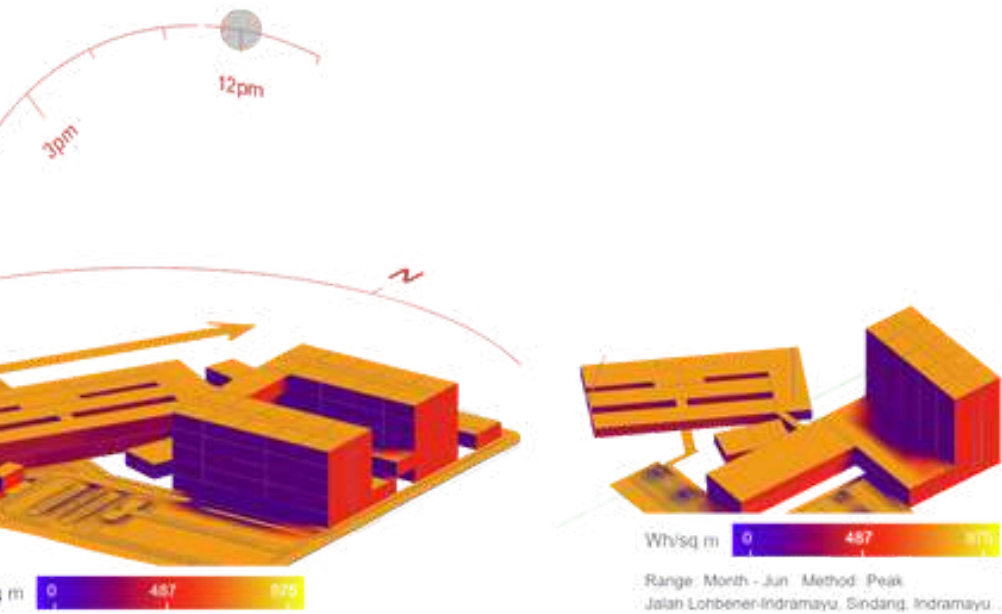
C CHOSEN ALTERNATIVE WITH U SHAPE BUILDING

A U-shaped building forms a central healing garden, optimizing natural light and ventilation while providing a therapeutic green open space.



D FACADE OPTIMIZATION

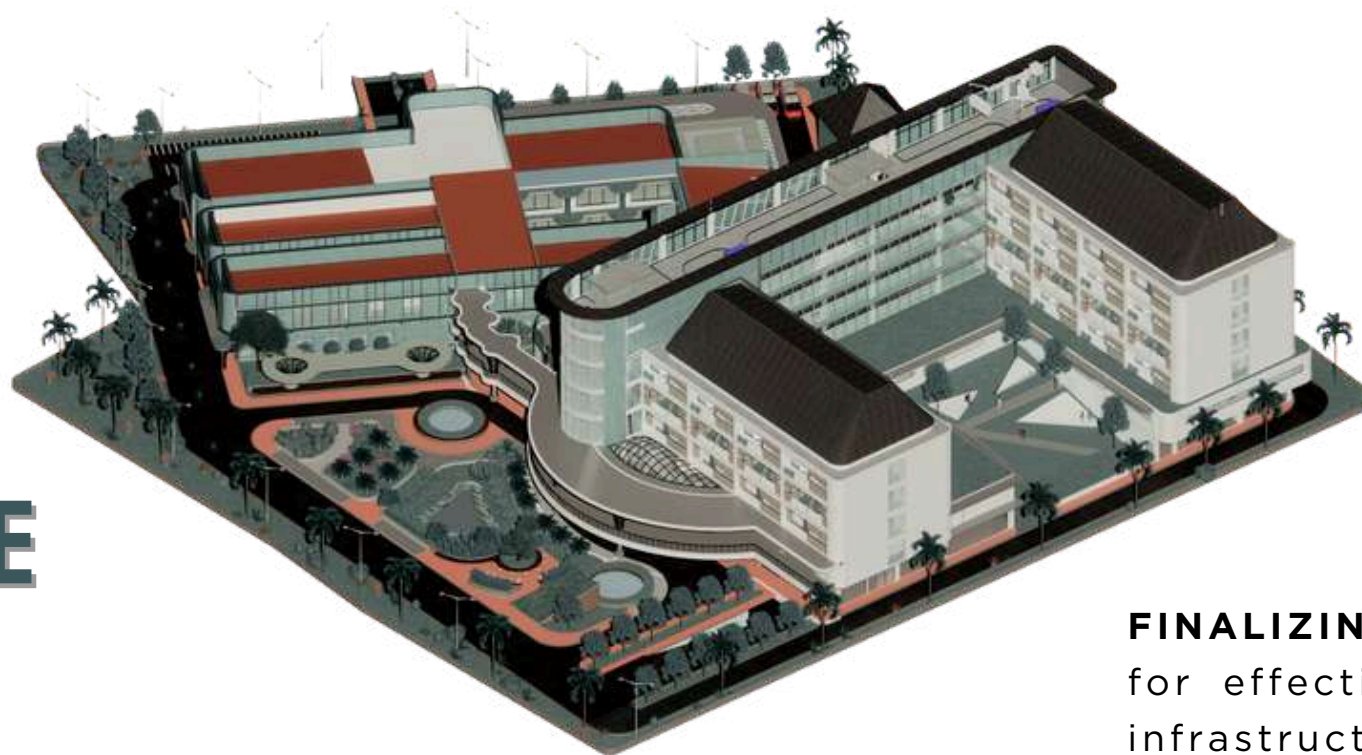
Based on solar simulation, facade openings are precisely calibrated to enhance thermal performance.



B

ALTERNATIVE SIMULATION TO ACHIEVE COST EFFECTIVE DESIGN

This simulation compares the heat transfer effectiveness of alternative building shapes to identify the most energy-efficient and cost-effective design.



E

FINALIZING THE DESIGN

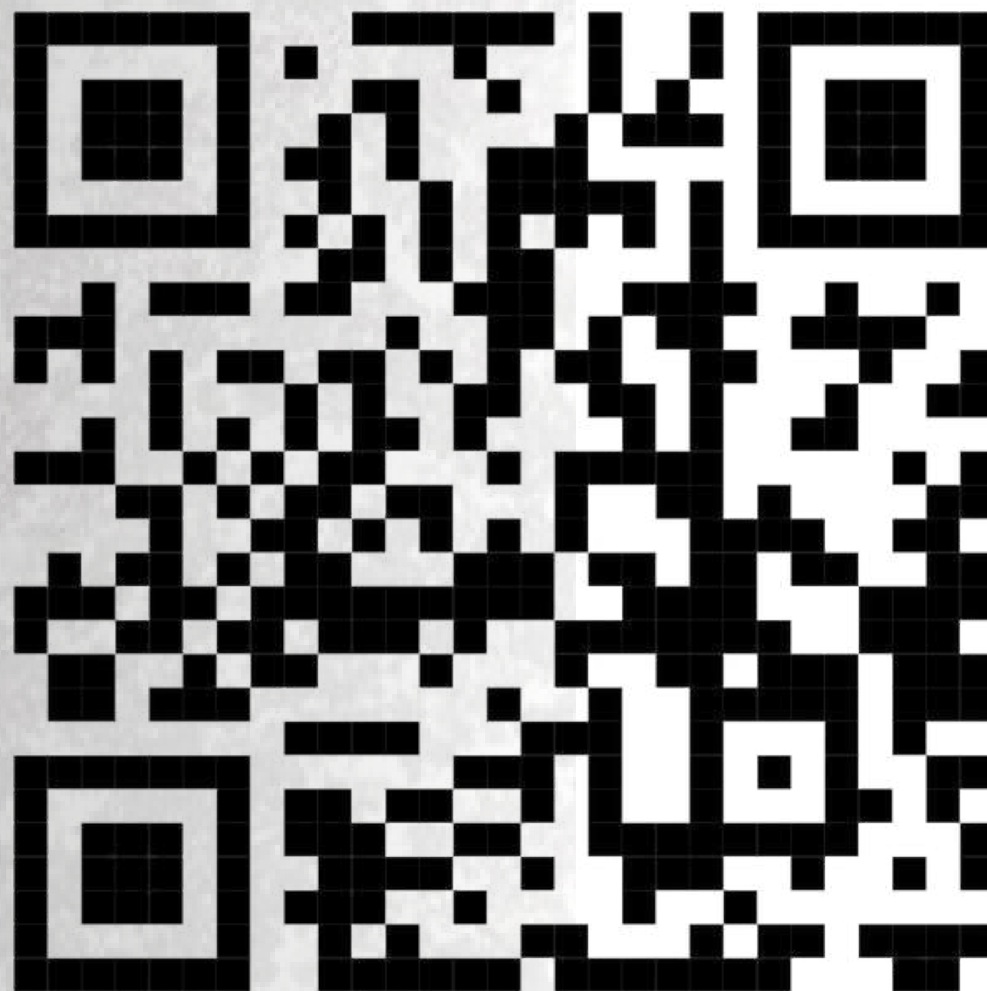
for effective space planning and infrastructure integration. AND
BRANDING OF PMC as it's the
color and shape chosement

**IMAGE 2.58: NEO PMC FORM
TRANSFORMATION DIAGRAM**
Source: Author's drawing



NEO PMC
GENERAL HOSPITAL

SCAN HERE!



DETAILED ENGINEERING DESIGN

PLEASE USE THIS WISELY JUST AS THE ACADEMIC
REFERENCES

[https://drive.google.com/drive/folders/1FWjyXRFqBRXGnFgT9-6uiJH6b-NMlt0h?
usp=sharing](https://drive.google.com/drive/folders/1FWjyXRFqBRXGnFgT9-6uiJH6b-NMlt0h?usp=sharing)

OR YOU CAN USE THE LINK



Chapter 03

Design Results and Discussion

"Architecture begins where engineering ends."

Walter Gropius

01

SPATIAL CONCEPT
SITUATION PLAN



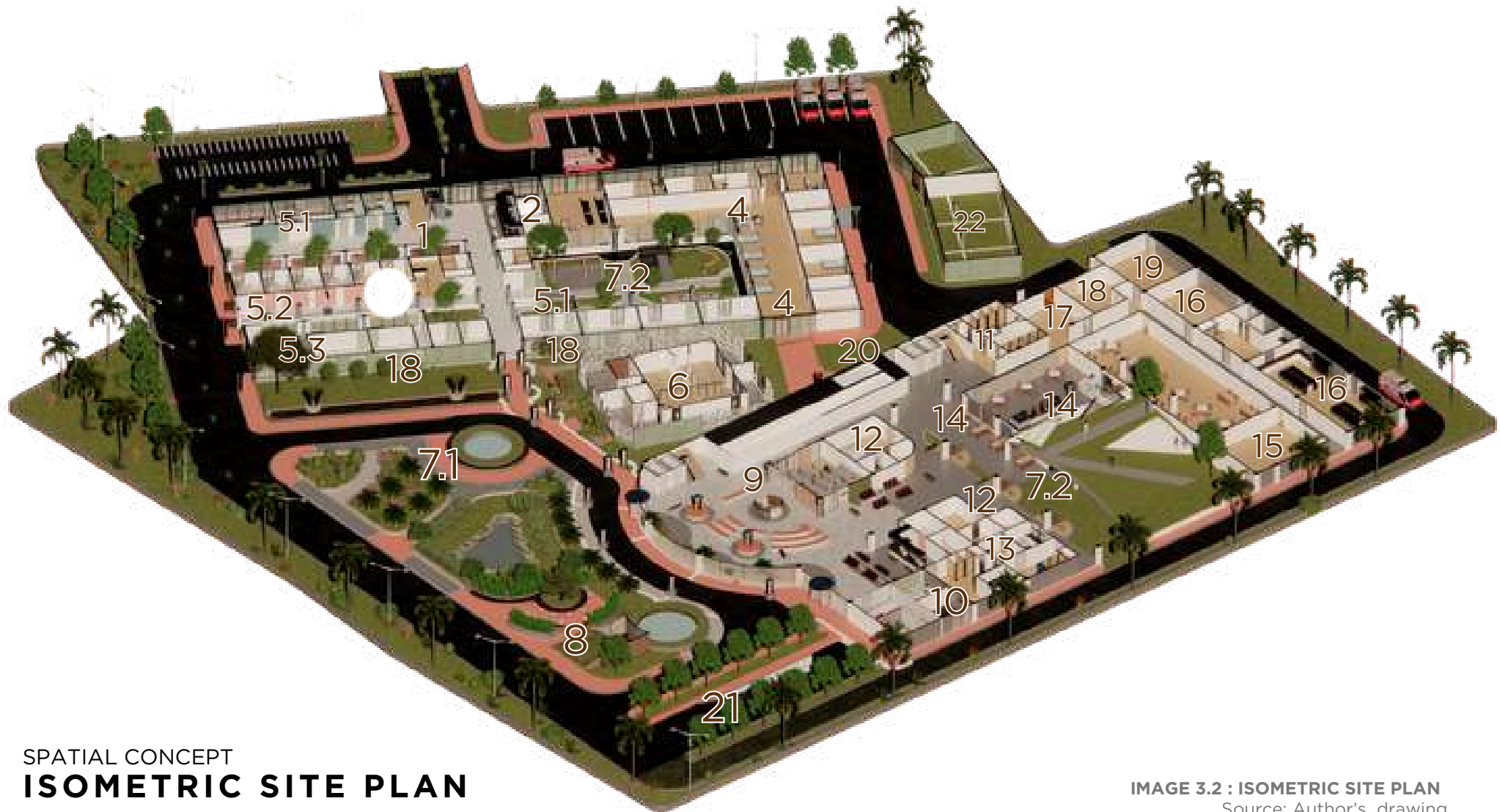
Source: Author's drawing and google earth
IMAGE 3.1 : SITUATION PLAN

This situation plan shows the PMC Hospital redesign site in Indramayu. Located along West Panyindangan Street, it has direct community access and is surrounded by residential and commercial areas. To the east, wide rice fields offer open views that inspire a calm, healing design. Green areas and smaller village roads connect the hospital seamlessly to the neighborhood.

the site is bordered by expansive Rice Fields (02), a dominant feature of the local landscape. Our redesign approach is to embrace this setting, using the open vistas to inform a design that promotes a tranquil and healing atmosphere. The plan also maps existing dedicated Green Areas (04) and smaller Village Roads (07), which provide secondary, more intimate access points for residents and help integrate the hospital campus with the neighborhood's existing network.

01

SPATIAL CONCEPT ISOMETRIC SITE PLAN



SPATIAL CONCEPT ISOMETRIC SITE PLAN

- | | | |
|-------------------------------|-------------------------|-----------------------------------|
| ① Lobby / Outpatient Entrance | ⑧ Cafe | ⑪ Lavatory |
| ② Pharmacy Storage | ⑨ MCU & Inpatient Lobby | ⑫ Radiology |
| ③ Medical Archive | ⑩ Medical Check Up | ⑬ Laboratory |
| ④ Emergency Department | | ⑭ Cafeteria (Indoor / Outdoor) |
| ⑤ Outpatient | | ⑮ Staff Rest Area and Canteen |
| ⑤.1 General Outpatient | | ⑯ Service Area |
| ⑤.2 Dental Outpatient | | ⑰ Mortuary |
| ⑤.3 Infectious Outpatient | | ⑱ Pharmacy |
| ⑥ Mosque | | ⑲ Medical Archive |
| ⑥.1 Outdoor Ablution Area | | ⑳ Loading Dock |
| ⑥.2 Mosque | | ㉑ STP and Electrical Machine Room |
| ⑦ Garden | | ㉒ Water Pond |
| ⑦.1 Healing Garden | | ㉓ Basement Access |
| ⑦.2 Green Garden | | |

IMAGE 3.2 : ISOMETRIC SITE PLAN
Source: Author's drawing

01 DEVELOPMENT SCENARIO

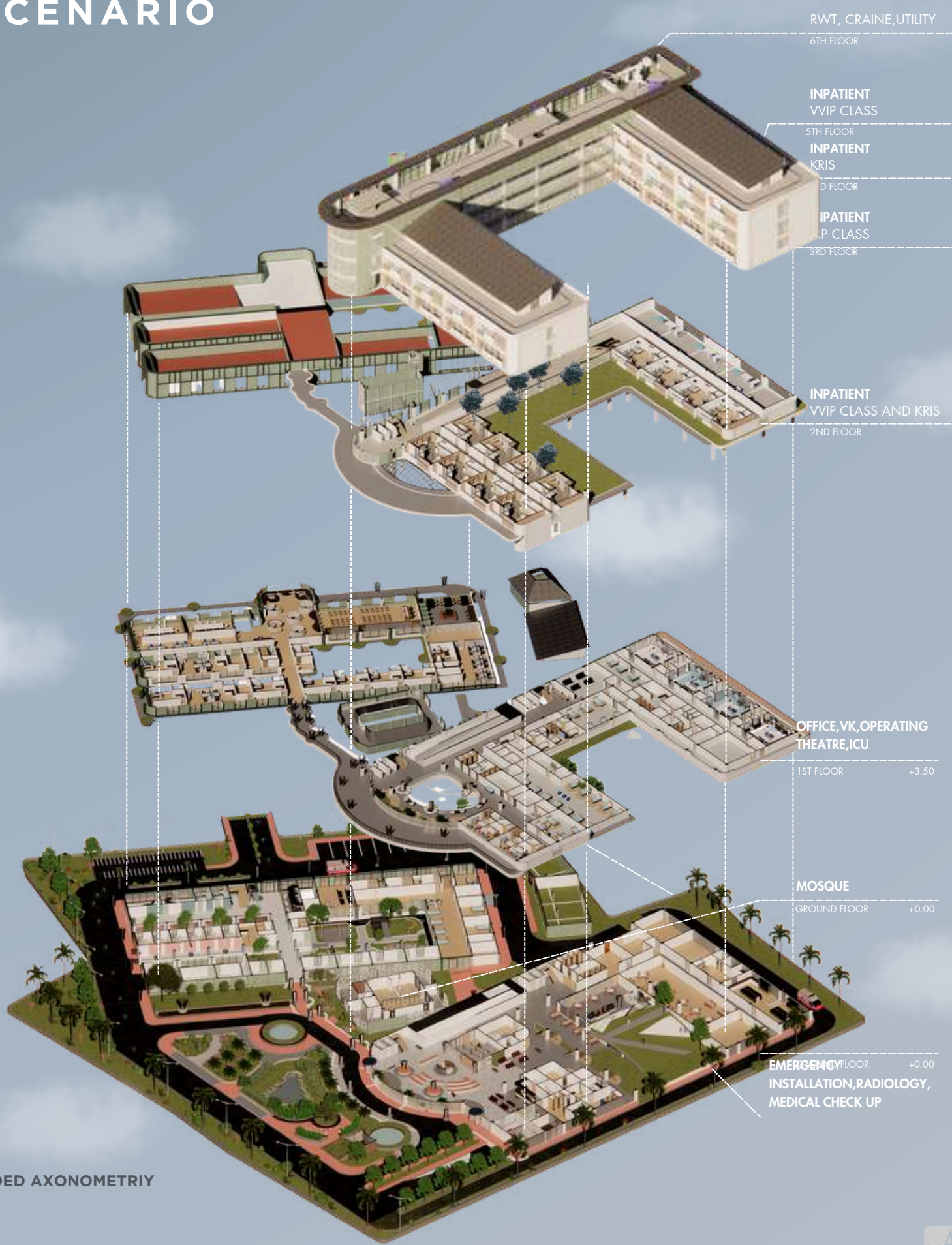


IMAGE 3.2 : SITE EXPLODED AXONOMETRIY
Source: Author's drawing

Building Component	Function	Floors	Total Area (m ²)	Efficiency
Existing Building	Type D Hospital	2	3,217	46.46%
NEW BUILDING	TYPE C Hospital	7	18,600	163.47%

OLD SITE

NEW SITE

BUILDING CODE

SITE

6924 sqm

SITE

11378 sqm

FAR

2.5x

BCR

60%

GBC

20%

INPATIENT WARDS

65 bed

155 beds

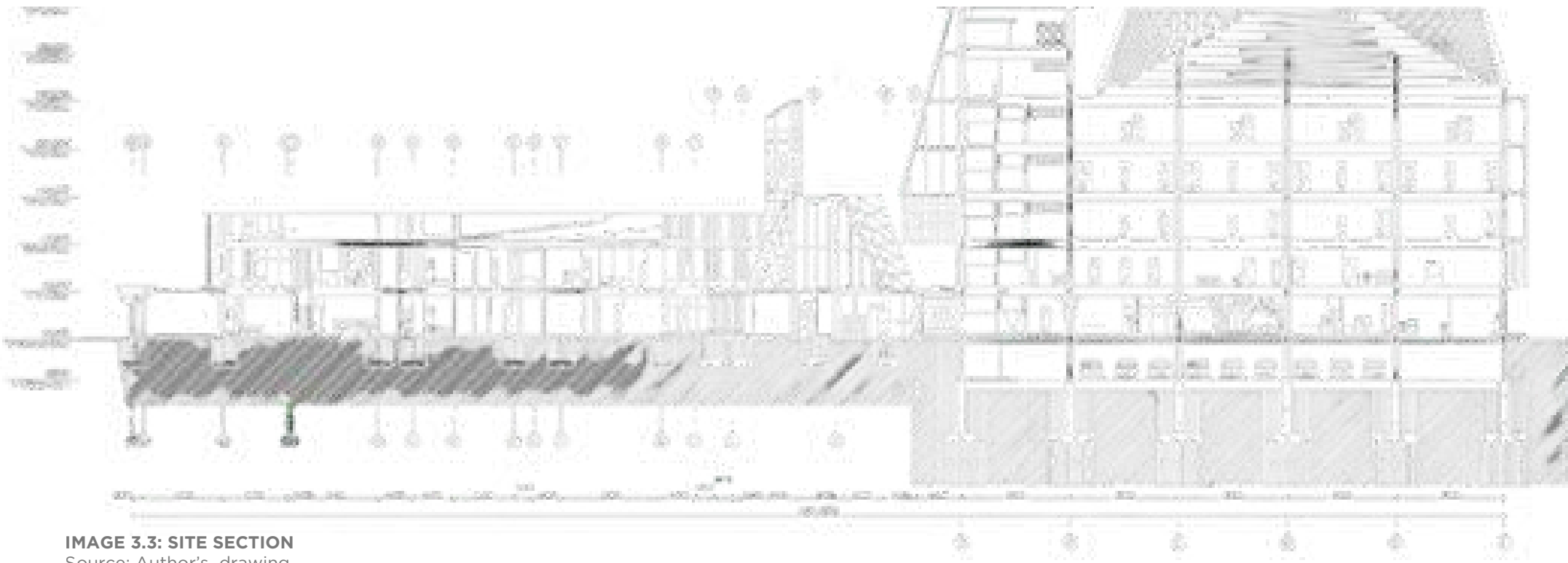


IMAGE 3.3: SITE SECTION
Source: Author's drawing

No.	Description	Details	Total (Rp)
A	INITIAL INVESTMENT		89.970.491.353
A.1	New Building Construction	Based On Cost Estimation	35.690.603.703
A.2	Existing Building Construction	Based On Cost Estimation	18.589.283.947
A.3	Hospital Equipemnt	Simmiliar With The Building	35.690.603.703

C	ANNUAL COST & PROFIT PROJECTION	Details	Unit	Rate / Tariff (IDR)	Total (Rp)
C.1	Total Annual Revenue				Rp32.907.750.000,00
C.2	Annual Operating Costs	(Assumption of 70% of Revenue)		60%	Rp19.744.650.000,00
C.3	ANNUAL NET PROFIT	(Revenue - Costs)			Rp13.163.100.000,00

D	INVESTMENT RETURN ANALYSIS				
D.1	Total Initial Investment	See Total A			Rp89.970.491.353,00
D.2	Annual Net Profit	See C.3			Rp13.163.100.000,00
D.3	PAYBACK PERIOD	(Investment / Net Profit)	Years		6,835,053,396
D.4	PAYBACK PERIOD (Detail)	(6 yearsdan 0,8x 12 month)	Years And Month		6 Years and 10 Month

BCE GLOBAL EXISTING BUILDING RENOVATION PMC Hospital Indramayu						
Standard Building Cost						
Existing Building	Building Function	Area (m2)	Building Function Index	Floor Count Index	Indramayu Base Price (*HSGBN-35% (Existed Strcture and foundation Estimation))	Total Estimated Cost
First Storey	Outpatient	993,675	1,100	1,000	Rp2.892.500,00	Rp3.161.625.431,25
	Emergency	280,111	1,500	1,000	Rp2.892.500,00	Rp1.215.331.601,25
	Mosque	18,868	1,000	1,000	Rp2.892.500,00	Rp545.756.900,00
	Power House	182,098	1,000	1,250	Rp2.892.500,00	Rp658.398.081,25
Second Storey	Office,Hall	1,273,424	1,140	1,090	Rp2.892.500,00	Rp4.576.966.645,99
	Sub Total	2,917,988			Total Cost	Rp10.158.078.659,74

This page presents a global cost estimation for the existing PMC Hospital renovation, breaking down expenses into two main categories. The Standard Building Cost for renovating a total area of 2,917.988 m² is estimated at Rp10,158,078,659.74. This calculation is based on a unit price for Indramayu and includes a significant 35% cost reduction, as the renovation will reuse the building’s existing primary structure.

The Non-Standard Building Cost details additional expenses for components not covered in the standard calculation. Calculated as percentages of the total construction cost, these items include specialized equipment such as AC, lifts, and gensets, as well as architectural components like interior furnishings, facade protection, and the Wastewater Treatment Plant (WWTP). This provides a comprehensive overview of all anticipated renovation expenses.

Non Standard Building Cost					
No.	Component	Percentage (%)	Plan (%)	Physical Construction Cost (Rp)	Amount (Rp)
1	Air Conditioning Equipment	7-15%	9%	10.158.078.659,742	Rp812.646.292,78
2	Elevator & Escalator	8-14%	8%	10.158.078.659,742	Rp812.646.292,78
3	Sound System	2-4%	2%	10.158.078.659,742	Rp203.161.573,19
4	Telephone and PABX	1-3%	0%	10.158.078.659,742	Rp0,00
5	IT Installation	6-11%	6%	10.158.078.659,742	Rp609.484.719,58
6	Electrical (including Genset)	7-12%	10%	10.158.078.659,742	Rp1.015.807.865,97
7	Fire Protection System	7-12%	10%	10.158.078.659,742	Rp1.015.807.865,97
8	Special Lightning Rod System	1-2%	1%	10.158.078.659,742	Rp101.580.786,60
9	WWTP (Wastewater Treatment Plant)	1-2%	1%	10.158.078.659,742	Rp101.580.786,60
10	Interior (including Furniture)	15-25%	0%	10.158.078.659,742	Rp0,00
11	Medical Gas	2-4%	2%	10.158.078.659,742	Rp406.323.146,39
12	Termite Protection	1-3%	1%	10.158.078.659,742	Rp101.580.786,60
13	Deep Foundation	7-12%	0%	10.158.078.659,742	Rp0,00
14	Disabled Facilities	3-5%	3%	10.158.078.659,742	Rp304.742.359,79
15	Environmental Facilities & Infrastructure	3-8%	5%	10.158.078.659,742	Rp507.903.932,99
16	Quality Improvement	Max 30%	20%	10.158.078.659,742	Rp2.031.615.731,95
17	Permits Other Than PBG	Max 1%	0%	10.158.078.659,742	Rp0,00
18	Land Preparation and Maturation	Max 3.5%	2%	10.158.078.659,742	Rp203.161.573,19
19	Fulfillment of Green Building Requirements	Max 9.5%	5%	10.158.078.659,742	Rp507.903.932,99
20	Utility Connection	Max 2%	2%	10.158.078.659,742	Rp203.161.573,19
	Sub Total				Rp8.939.109.220,57
	Price Per Meter				Rp6.544.642,36

AIR CONDITIONING COST

The operational costs for air conditioning and artificial lighting can be significantly reduced due to the implementation of cross ventilation strategies and the incorporation of open corridors within the outpatient department. This passive design approach not only decreases energy demand but also positively influences the hospital’s Break-Even Point (BEP).

MEDICAL GAS

expenditures on medical gas systems are minimized, as the medical functions within Building 1 account for only 50% of the total utilization compared to the overall facility.

DISABLED FACILITIES

Regarding accessibility, the most critical provisions for persons with disabilities are concentrated in restrooms and in the ramps provided at each building level transition.

HEALING ENVIRONMENT

the adoption of a healing environment approach entails additional investment, particularly in site development and landscape treatment, to ensure that the design fully supports restorative and therapeutic qualities.

01

SPATIAL CONCEPT AND REVENUE

MAIN HOSPITAL FACILITIES

OUTPATIENT & EMERGENCY INSTALLATION

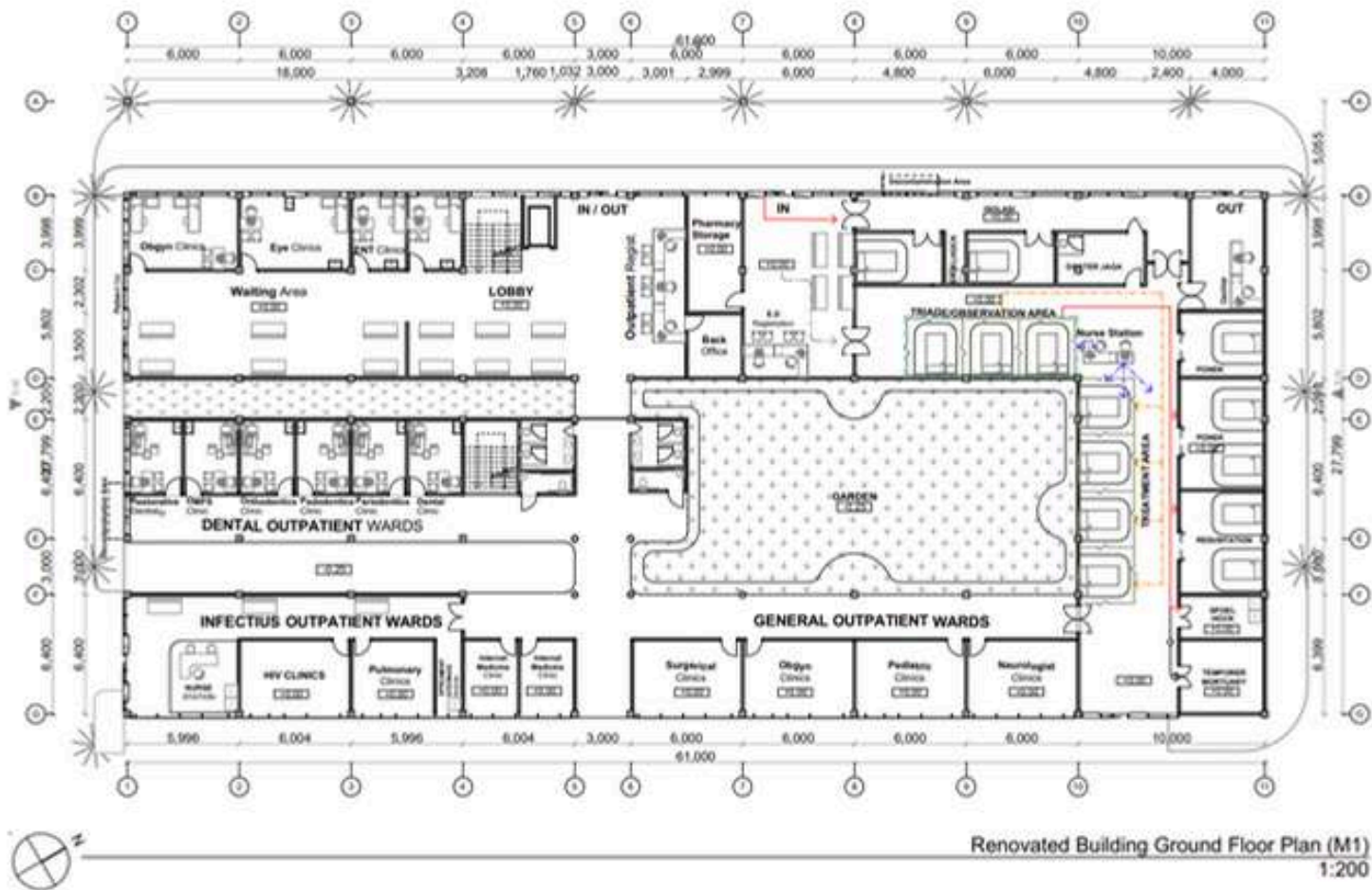


IMAGE 3.4: RENOVATED BUILDING GF PLAN

Source: Author's drawing

The outpatient facility includes a total of 15 consultation rooms. Among them, 6 are designated for specialist services, requiring larger room dimensions. Additionally, 3 infectious outpatient rooms are spatially separated and supported by a dedicated drop-off zone.

This configuration introduces 10 additional outpatient rooms compared to the existing layout, enhancing service capacity and infection control.

The Emergency Department at PMC Hospital adopts a structured triage zoning system—**Red, Yellow, and Green**—to efficiently manage patient flow and clinical urgency. The **Red Zone is designated for critical, life-threatening cases requiring immediate resuscitation**; the **Yellow Zone handles urgent conditions needing prompt medical intervention**; and the **Green Zone serves non-critical patients with minor ailments**. This zoning enhances the department's responsiveness, reduces treatment delays, and aligns with global emergency care standards.

B	ANNUAL REVENUE PROJECTION	Details	Unit	Anual Patient Volume	Rate / Tariff (IDR)	Total (Rp)
B.2	Outpatient	(15 Patient/Outpatient, 280 hari)	Patient	67.2	Rp80.000,00	Rp5.376.000.000,0
B.6	IGD (Emergency)	(15 pasien/hari, 365 hari)	Patient	5.475	Rp150.000,00	Rp821.250.000,00

OUTPATIENT VISUALIZATION

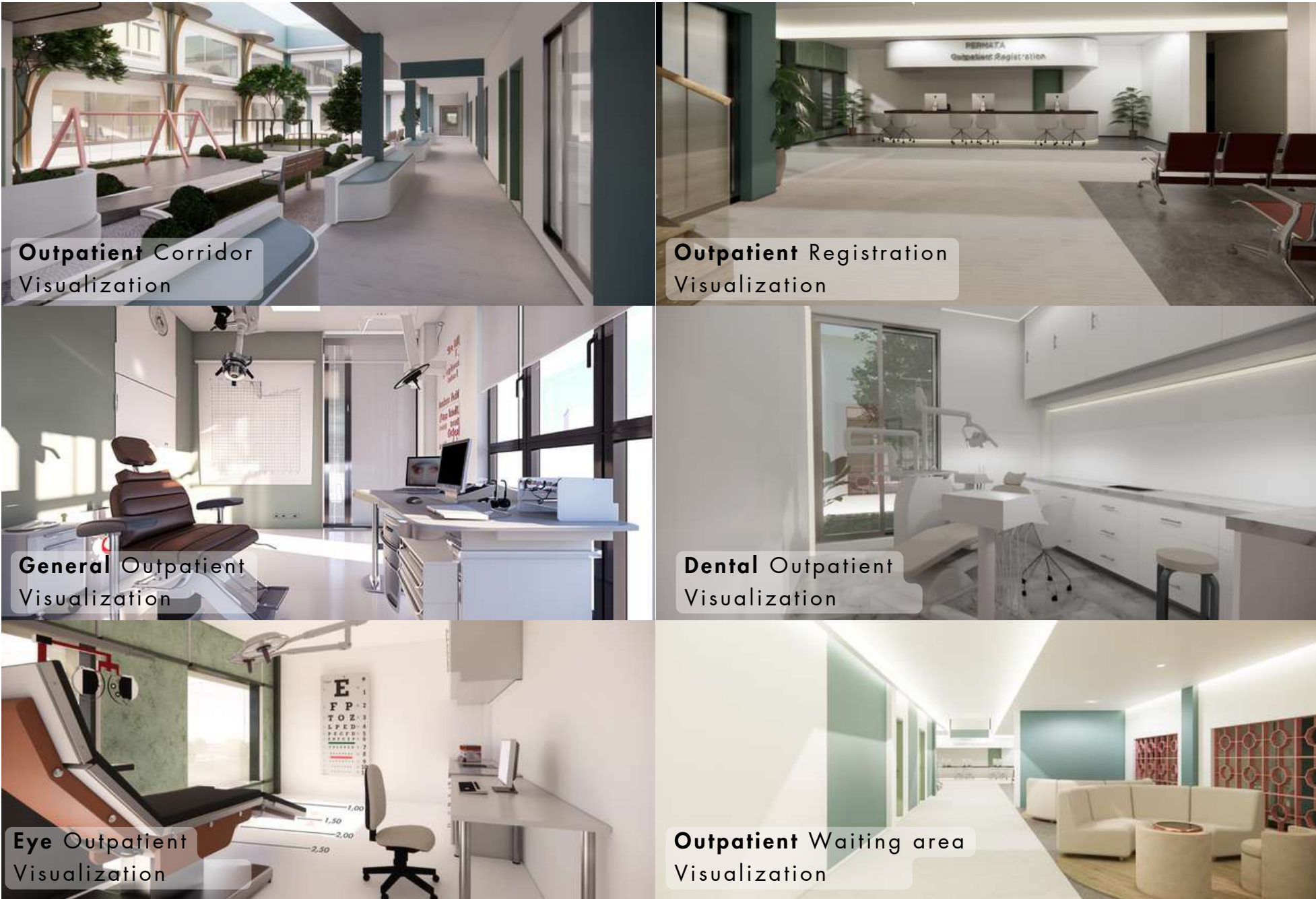


IMAGE 3.5: VISUALISATION OF OUTPATIENT
Source: Author's drawing

The outpatient facilities at PMC Hospital are designed with a modern, patient-centered approach that focuses on comfort, functionality, and a strong connection to nature. The patient journey begins in a professional and organized registration area, leading to comfortable, lounge-like waiting rooms that create a welcoming atmosphere. Circulation is facilitated through bright, semi-outdoor corridors that are open to a central green courtyard, providing abundant natural light and a calming, therapeutic environment for patients and visitors.

The clinical spaces are equally well-considered, offering a range of services from general consultations to specialized care in dedicated dental and eye clinics. Each examination room is depicted as spacious and functional, equipped with modern medical technology to support staff and ensure a high standard of care. A consistent feature across all clinics is the presence of large windows, which provide natural daylight and views, reinforcing the hospital's commitment to creating a healing environment for both patients and healthcare professionals.

01

SPATIAL CONCEPT AND REVENUE

MAIN HOSPITAL FACILITIES

OPERATING ROOM INSTALLATION

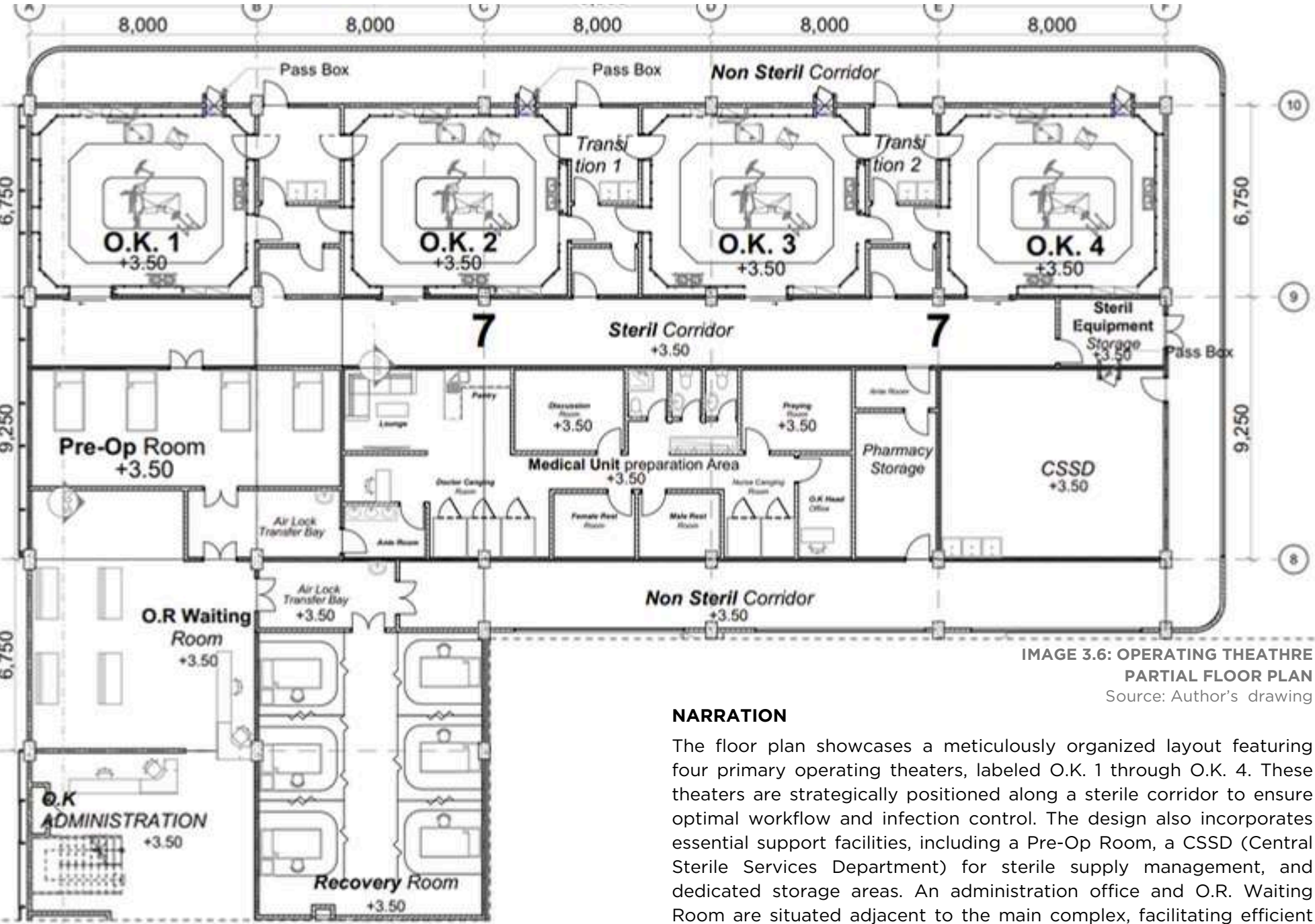


IMAGE 3.6: OPERATING THEATRE
PARTIAL FLOOR PLAN
Source: Author's drawing

NARRATION

The floor plan showcases a meticulously organized layout featuring four primary operating theaters, labeled O.K. 1 through O.K. 4. These theaters are strategically positioned along a sterile corridor to ensure optimal workflow and infection control. The design also incorporates essential support facilities, including a Pre-Op Room, a CSSD (Central Sterile Services Department) for sterile supply management, and dedicated storage areas. An administration office and O.R. Waiting Room are situated adjacent to the main complex, facilitating efficient management and patient flow.

ANNUAL OPERATING THEATHER REVENUE

B	ANNUAL REVENUE PROJECTION	Details	Unit	Anual Patient Volume	Rate / Tariff (IDR)	Total (Rp)
B.4	Operating Theater (OK)	(1 Operation/OK, 280 days)	Operation	1.12	Rp5.000.000,00	Rp5.600.000.000,00

OPERATING ROOM SCHEMATIC SECTION

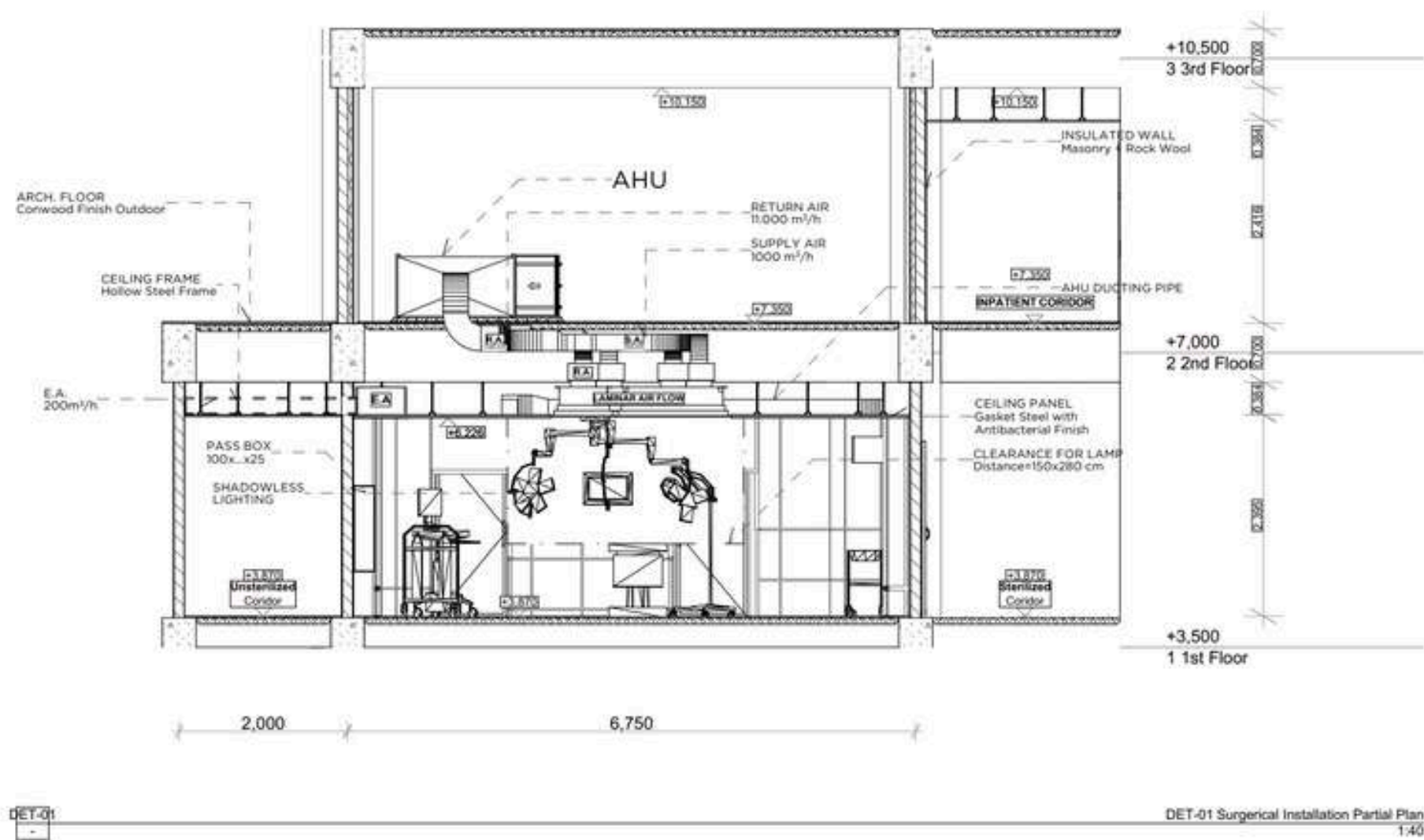


IMAGE 3.7: OPERATING THEATHRE
PARTIAL SECTION
Source: Author’s drawing

A revenue projection table is also included, outlining the financial potential of this facility. Based on the four operating theaters running for 280 days a year, the hospital anticipates accommodating 1,120 operations annually. With a projected tariff of IDR 5,000,000 per operation, the Operating Theatre is forecasted to generate significant revenue, highlighting its importance as a core functional and financial component of the hospital

A cross-section view provides further insight into the vertical design, illustrating the integration of critical infrastructure such as the Air Handling Unit (AHU) located above the main theaters. This placement is crucial for maintaining the stringent air quality standards required in a surgical environment.

01

SPATIAL CONCEPT AND REVENUE

MAIN HOSPITAL FACILITIES

INPATIENT WARDS ROOM AXONOMETRIC VISUALIZATION



MINIMALIST WINDOW

The front façade features minimalist windows to maintain privacy while still allowing small amount daylight in. All windows are set at patient eye level, so patients can easily see outside. This helps them feel more connected to nature and supports healing.

KRIS-ROOM 4 BED (54m2)

Total Capacity 104 BED

IMAGE 3.8 INPATIENT WARDS
AXONOMETRY

Source: Author’s drawing

ANGLED WALL

Some walls are slightly tilted at around 60 degrees to let in a soft amount of natural light. This angled design helps reduce glare and heat, while still bringing daylight into the space in a gentle, controlled way.

VIP ROOM 1 BED

(27m2)

Total Capacity 34 bed

LARGE WINDOWS

On the sides, larger windows are placed strategically behind balconies, providing both shade and filtered light to reduce heat gain—especially important in tropical climates.

VVIP-ROOM 1 BED

54m2)

Total Capacity 21 bed

B	ANNUAL REVENUE PROJECTION	Details	Unit	Anual Patient Volume	Rate / Tariff (IDR)	Total (Rp)
B.1	Inpatient Services	(Based on 55% BOR, 365 days)				Rp18.870.500.000,00
	- KRIS	104	Bed-days	20.878	Rp400.000,00	Rp8.351.200.000,00
	- VIP	34	Bed-days	6.826	Rp800.000,00	Rp5.460.400.000,00
	- VVIP	21	Bed-days	4.216	Rp1.200.000,00	Rp5.058.900.000,00

INPATIENT WARDS ROOM INTERIOR VISUALISATION

KRIS-ROOM 4 BED (54m²)

The KRIS room is a practical and efficient shared ward that balances functionality with patient dignity. Each bed is spaced at 1.5 meters to ensure privacy, enhanced by a custom-designed wood-textured light box above, which also serves as a curtain holder. The design ensures that even in a modest setting, patients benefit from ample daylight, controlled lighting, and a clear sense of individual space.



VIP ROOM 1 BED (27m²)

A calm and private atmosphere defines the VIP room. The single-bed setting emphasizes patient comfort with warm materials and a direct connection to natural light. The wood-textured ceiling element functions both as an ambient light source and curtain support, creating a cohesive and soothing spatial experience.



VVIP-ROOM 1 BED (54m²)

Elegantly spacious, the VVIP room delivers a high-end healing experience. The room includes private seating and large windows that bathe the space in natural light. The signature wood-textured light box provides gentle illumination while doubling as a curtain rail—blending visual warmth with functional elegance for a premium inpatient environment.

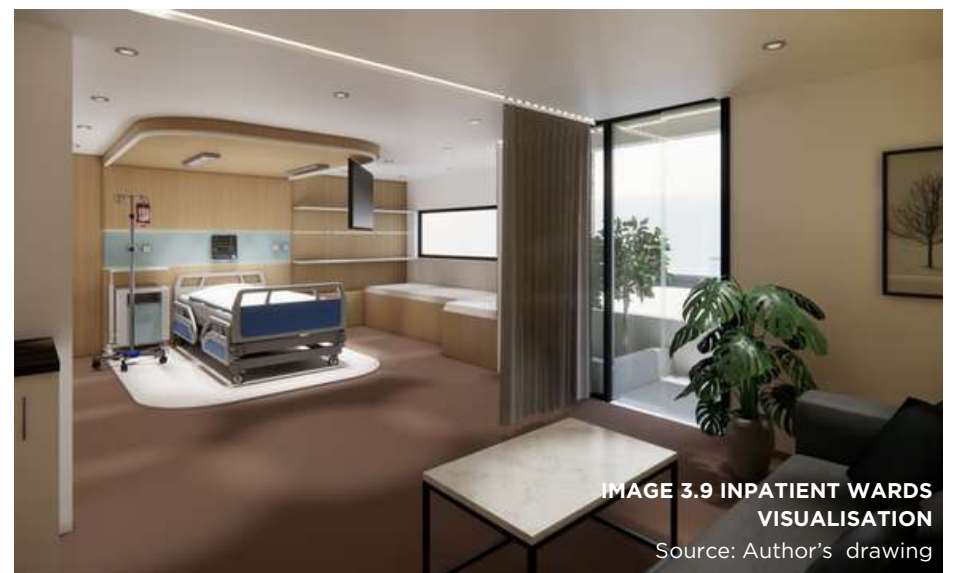
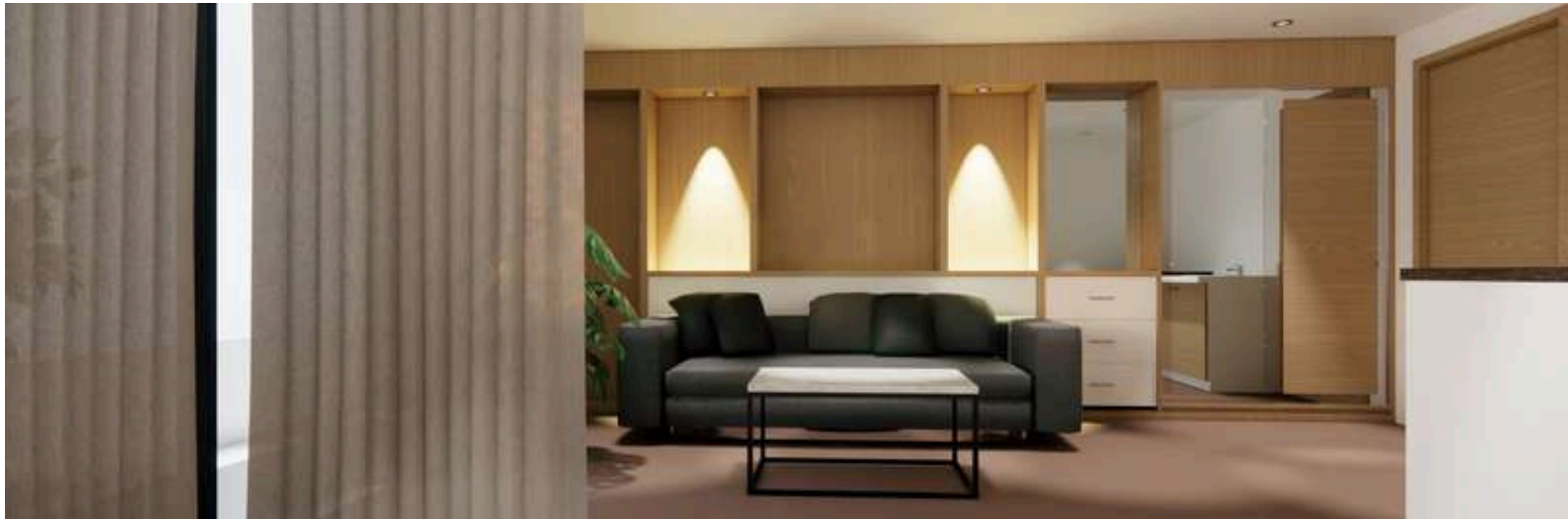


IMAGE 3.9 INPATIENT WARDS
VISUALISATION
Source: Author's drawing



**IMAGE 3.8 VVP INPATIENT WARDS
VISUALISATION**

Source: Author's drawing

01 SPATIAL CONCEPT AND REVENUE

MAIN HOSPITAL FACILITIES

MEDICAL CHECK UP



MEDICAL Check Up Registration
CRYSTAL SHIELD| IDR 480,000

Tier 1: Crystal Shield (Foundational Package)

Positioning: Serves as the entry-level offering for fundamental health screening.

- Clinical Scope: Includes a personal consultation with a General Practitioner and essential laboratory screenings (Complete Blood Count, Blood Sugar, Cholesterol, Uric Acid).
- Experiential Component: Integrates a value-added hospitality element in the form of a complimentary beverage at the facility's Health Canteen post-examination.



ECG test at pmc medical center
SAPPHIRE GUARD| IDR 1,350,000.

Tier 2: Sapphire Guard (Intermediate Package)

Positioning: Designed for a demographic requiring more proactive and in-depth health monitoring, such as active professionals.

- Clinical Scope: Encompasses all services from the Crystal Shield tier, with the addition of cardiological screening (ECG) and comprehensive liver and kidney function analysis.
- Experiential Component: Features an upgraded experience that includes a premium breakfast and exclusive access to the hospital's "Healing Garden" for relaxation.



Therapeutic Walk at PMC Healing Garden
DIAMOND LEGACY| IDR 2,950,000

Tier 3: Diamond Legacy (Premium Package)

Positioning: Represents the most comprehensive service for consumers seeking maximal diagnostic assurance and holistic care.

- Clinical Scope: Includes all preceding services, further enhanced with an in-depth consultation with a Specialist, advanced diagnostic imaging (Abdominal Ultrasound), and a "Priority Pathway for Advanced Care" which guarantees expedited access to surgical facilities if required.
- Experiential Component: Culminates in a personalized lunch with a nutritionist consultation and a guided relaxation session, positioning the service as a comprehensive wellness day

PACKAGE AND SERVICE

To address a diverse market for preventative healthcare, a strategic, tiered service model was developed for the Medical Check-Up (MCU) facility. This model consists of three distinct packages designed to cater to varying levels of consumer needs and price points. The packages are designated as 'Crystal Shield' for foundational screening, 'Sapphire Guard' for an intermediate level of proactive monitoring, and 'Diamond Legacy' for the most comprehensive diagnostic experience.

The pricing for these packages establishes a clear value ladder, with the Crystal Shield offered at IDR 480,000, the Sapphire Guard at IDR 1,350,000, and the Diamond Legacy at IDR 2,950,000. For the purpose of creating a stable and conservative annual revenue forecast, a blended average rate is applied. An average tariff of IDR 1,000,000 per patient was established as a reasonable median value within this price range. This figure assumes a balanced distribution of patient selections across the three tiers and serves as the primary rate for calculating the overall revenue potential of the MCU unit.

MCU ANUAL REVENUE CALCULATION

B	ANNUAL REVENUE PROJECTION	Details	Unit	Anual Patient Volume	Rate / Tariff (IDR)	Total (Rp)
B.3	Medical Check-Up (MCU)	(5 patient/days, 280 days)	Patient	1,400	Rp1.000.000,00	Rp1.400.000.000,00

The financial projection operates on an assumption of 280 working days per year with an average daily volume of 5 patients. This results in a total annual patient volume of 1,400 individuals utilizing the MCU services. To calculate the total revenue, a blended average tariff of IDR 1,000,000 per patient is applied. This average rate accounts for the mix of patients choosing between the three available packages: the entry-level Crystal Shield (IDR 480,000), the intermediate Sapphire Guard (IDR 1,350,000), and the premium Diamond Legacy (IDR 2,950,000). By multiplying the annual patient volume (1,400) with the average tariff, the total projected annual revenue for the Medical Check-Up unit is

02 Validation of a Design Approach Based on the Healing Environment Concept



HEALING GARDEN

The Five Senses Garden integrates carefully selected plants and tactile design elements to create a multisensory healing experience. Visually, vibrant flowers such as Zinnia, Plumeria, Bougainvillea spectabilis, and Licuala grandis enhance emotional well-being and orientation. Aromatic species like Polianthes tuberosa and Michelia champaca reduce stress and promote relaxation, while the gentle rustle of palm trees and the sound of the fountain establish a calming acoustic background. Edible and medicinal plants—guava, citrus, Phaleria macrocarpa, mints, and lemongrass—strengthen the connection between health, taste, and nature. For touch, smooth stone pathways, textured brick paving, soft grass, and shaded rest areas introduce tactile variety and comfort. Together, these elements transform the garden into a therapeutic landscape that supports recovery, relaxation, and holistic well-being.

“Healing begins when all senses come alive.”

5 SENSES GARDEN

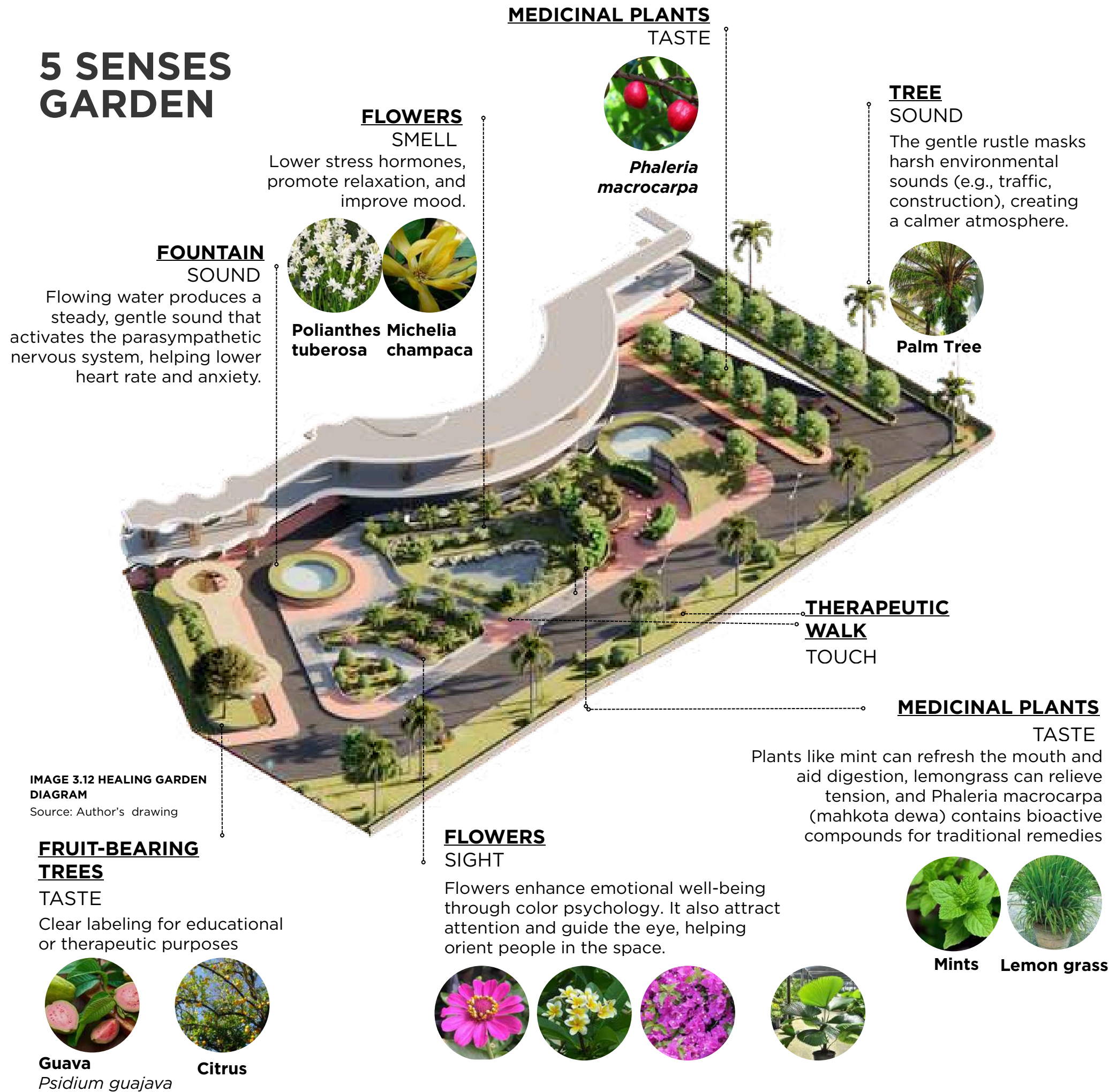
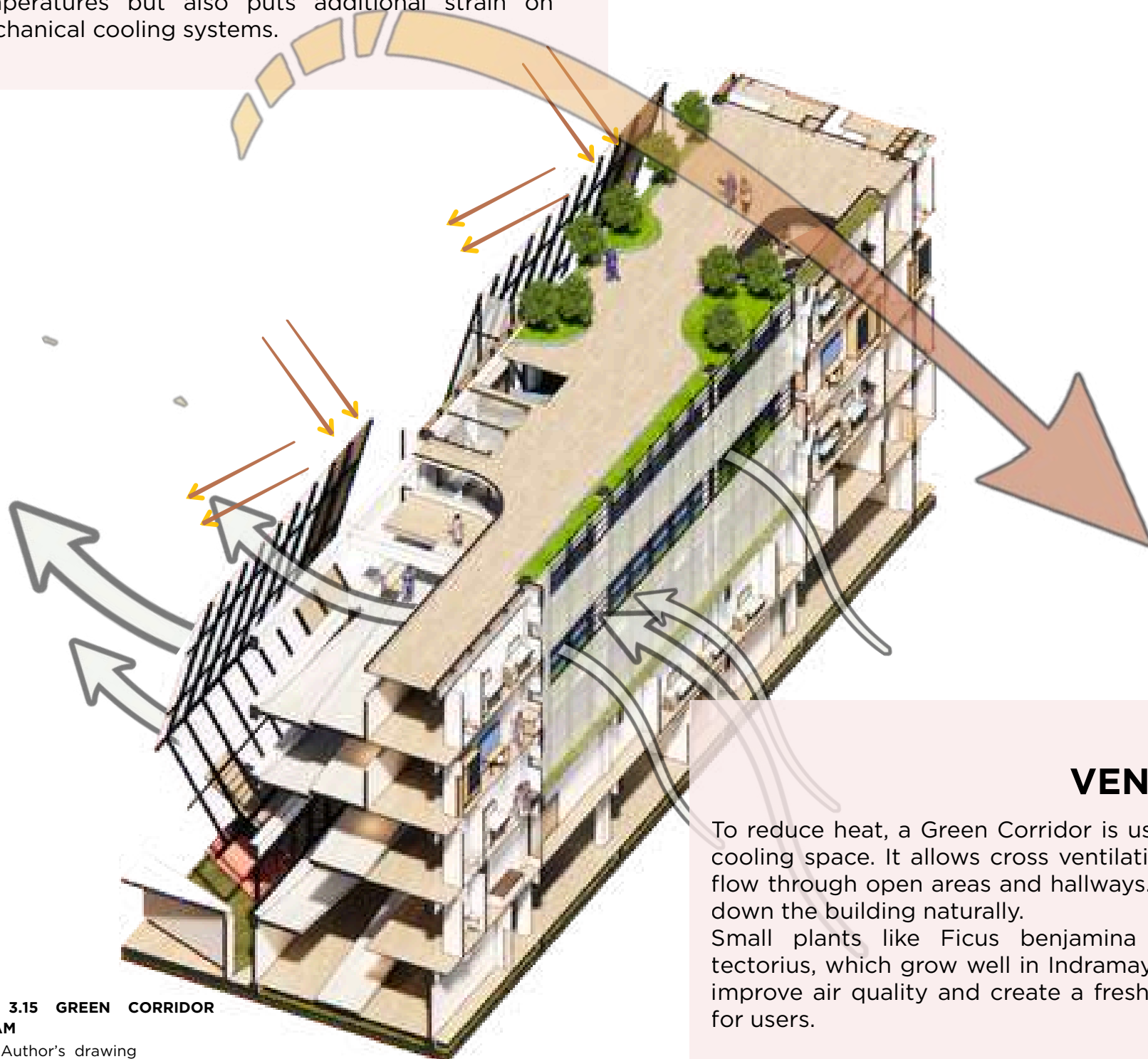


IMAGE 3.12 HEALING GARDEN DIAGRAM
Source: Author's drawing

02 Validation of a Design Approach Based on the Healing Environment Concept

GREEN CORRIDOR

One of the main challenges in the building's design is the massive west-facing orientation, which results in excessive solar heat gain during the afternoon. This condition not only increases internal temperatures but also puts additional strain on mechanical cooling systems.



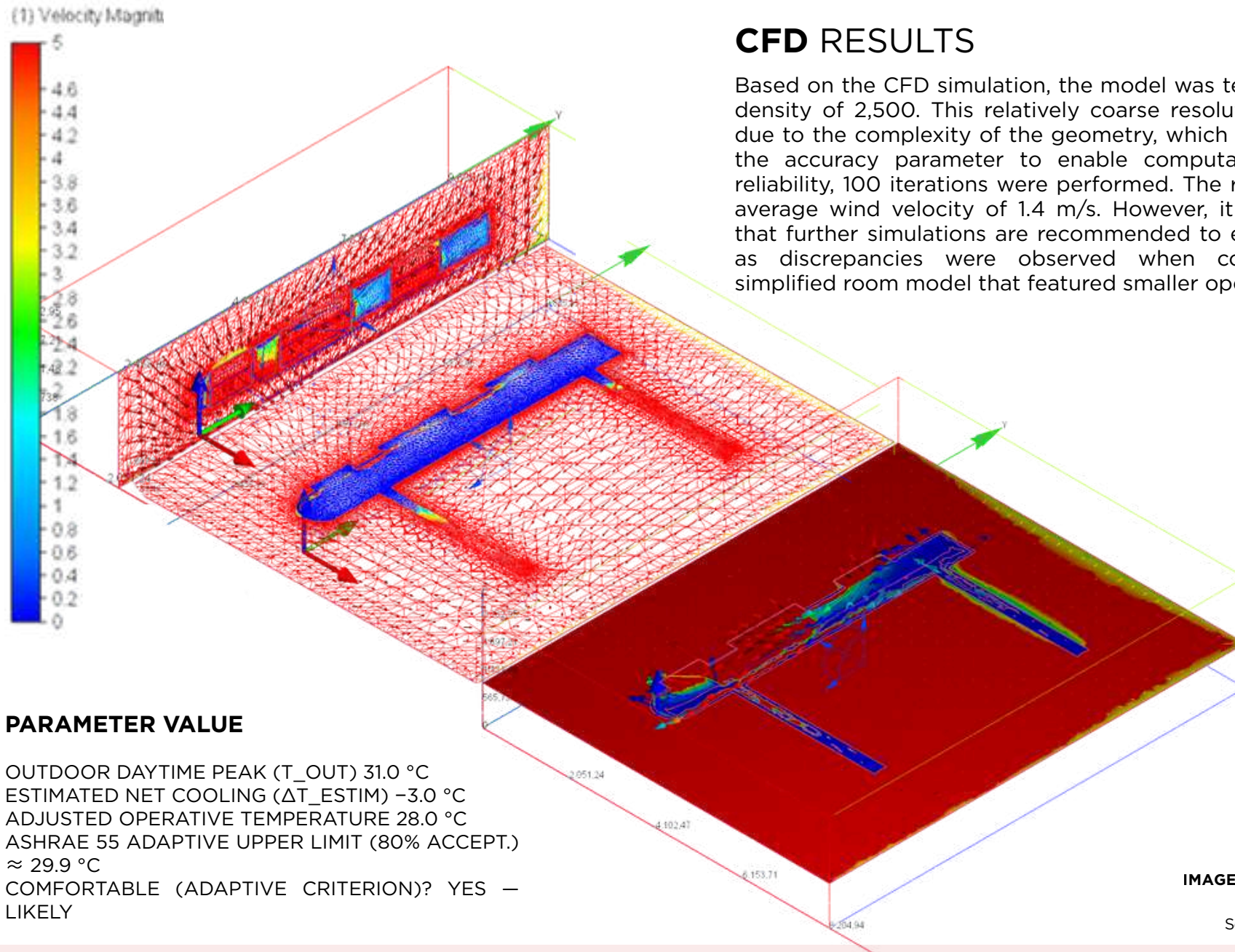
CROSS VENTILATION

To reduce heat, a Green Corridor is used as a passive cooling space. It allows cross ventilation, letting wind flow through open areas and hallways. This helps cool down the building naturally.

Small plants like *Ficus benjamina* and *Pandanus tectorius*, which grow well in Indramayu, are added to improve air quality and create a fresh, calming space for users.

IMAGE 3.15 GREEN CORRIDOR DIAGRAM

Source: Author's drawing



PLANT AS MECHANICAL COOLING

The simulation results indicate an average indoor wind velocity of **1.4 m/s, which corresponds to an equivalent cooling effect of approximately -3.0 °C on operative temperature**, based on established correlations between air speed and thermal comfort in tropical climates (Givoni, 1998; Szokolay, 2004). When combined with vegetation, the contribution of shading from twenty *Ficus benjamina* trees (canopy coverage ≈ 393 m²) reduces mean radiant temperature by an additional -0.34 °C, while evapotranspiration from grassed areas (≈ 674 m²) provides further cooling of about -0.65 °C.

Conversely, the extensive paved surfaces (≈ 1,900 m²) introduce a heat penalty of +0.96 °C. Altogether, these passive strategies yield an estimated net reduction of approximately -3.0 to -3.2 °C in operative temperature across the Green Corridor. This demonstrates how vegetation and surface treatment function as a form of “mechanical cooling,” reinforcing the effectiveness of plants as integral elements of healing-oriented design.

02 Validation of a Design Approach Based on the Healing Environment Concept

INPATIENTWARDS ROOM COMFORT SIMULATION

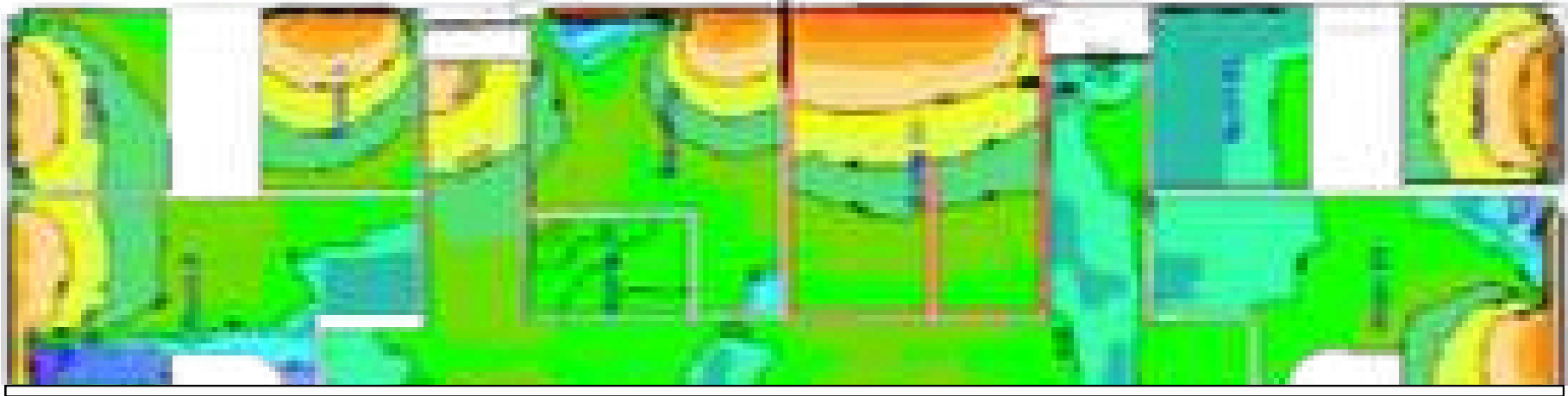
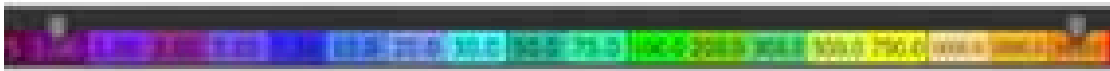


IMAGE 3.13 DIALUX VVIP
INPATIENT WARDS SIMULATION
Source: Author's drawing



DIALUX SIMULATION on VVIP room

Based on the DIALUX Evo simulation results, the design for the VVIP inpatient rooms (54 m² per room) successfully exceeds the initial target for daylighting performance. The analysis shows that the floor area achieving an illuminance level between 300-500 Lux surpasses the 55% target across the total ground area of 162 m². This outcome is attributed to the calculated reflection factors of the interior surfaces.

BUILDING SHAPE Related To Wind

As outlined in Chapter 2, one aspect of the Healing Environment is achieving natural light intensity in patient rooms between 300-500 lux, with a minimum of 50% of the floor area reaching this level. The DIALux Evo simulation of the VVIP inpatient rooms (54 m² each, total 162 m²) shows illuminance predominantly in the 300-750 lux range, with more than 55% of the floor area meeting the 300-500 lux target. This performance, supported by the calculated reflection factors of interior surfaces, confirms that the VVIP rooms not only meet but exceed the required parameters for natural lighting comfort.

PARAMETERS TO ACHIVE	
Air velocity in patient rooms	0.25 - 0.5 m/s

PARAMETERS TO ACHIVE

300-500 Lux	Illuminance
50%	Floor Area Ration

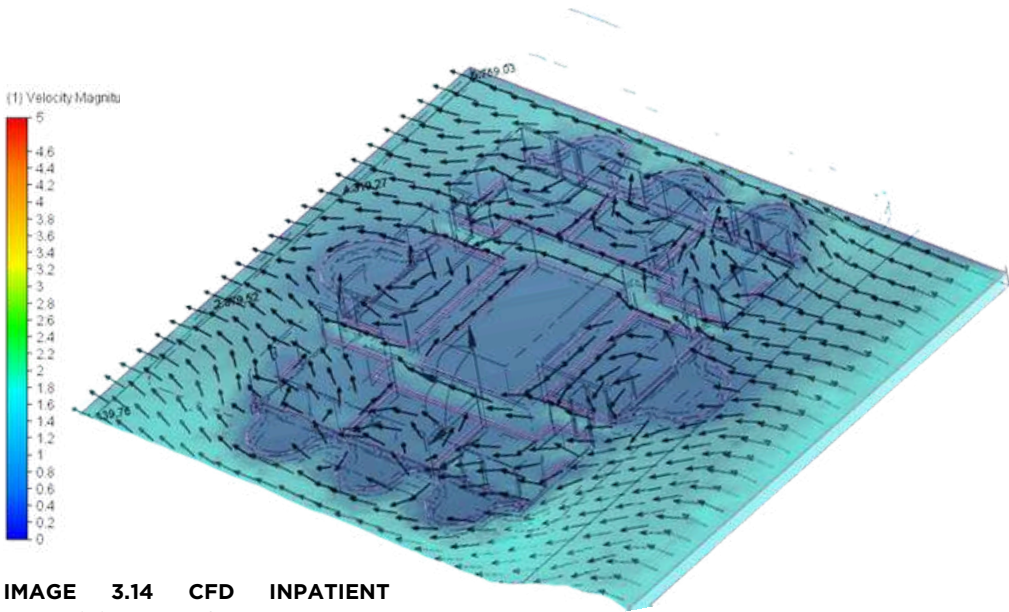
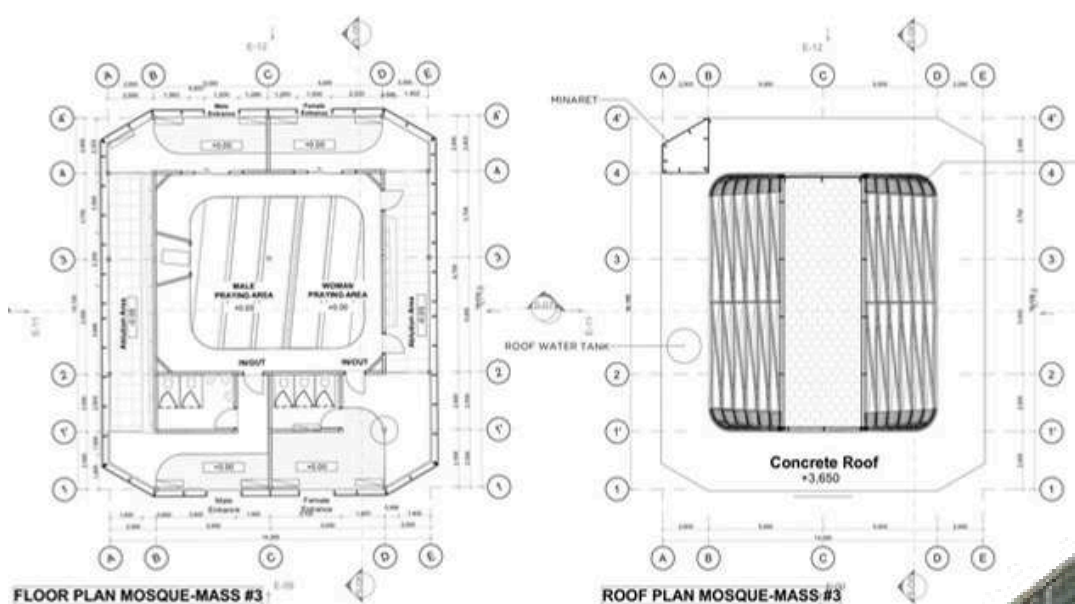


IMAGE 3.14 CFD INPATIENT WARDS SIMULATION
Source: Author's drawing

03 SPATIAL CONCEPT SECONDARY HOSPITAL FACILITIES

MOSQUE



**IMAGE 3.17 MOSQUE FLOOR
PLAN AND ROOF PLAN**

Source: Author's drawing

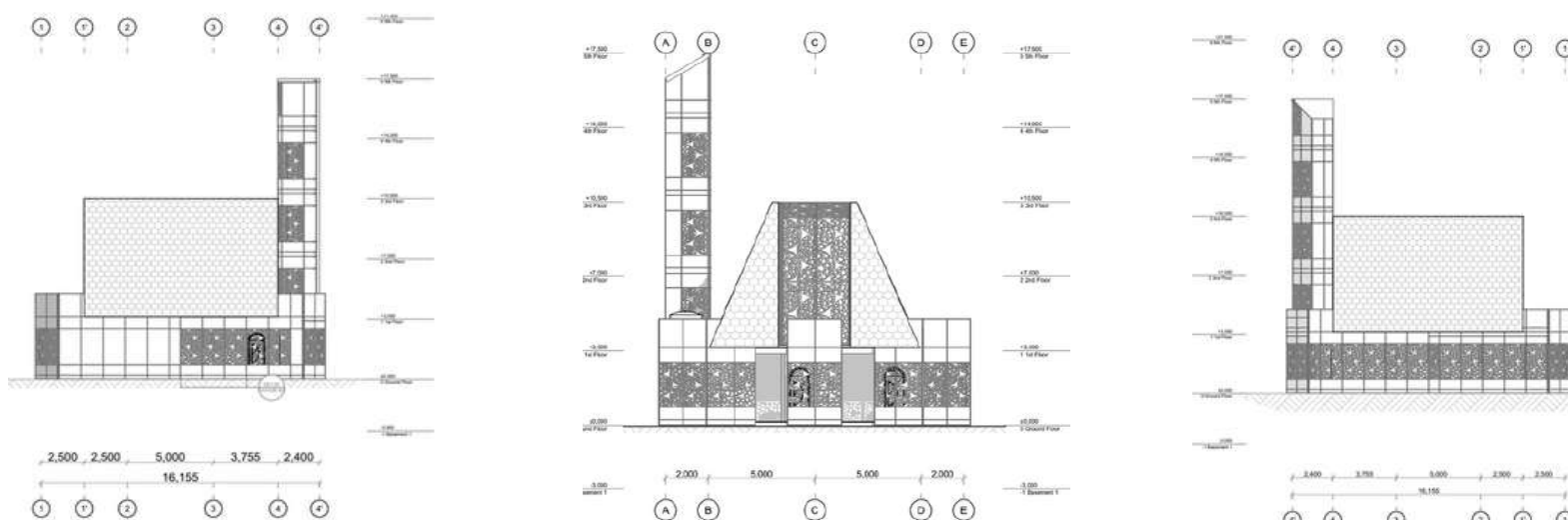
OVERVIEW

The mosque is designed with two separate access routes for male and female worshippers, accommodating a total capacity of up to 100 individuals. Natural openings are incorporated to optimize daylighting and ventilation, employing Voronoi-patterned rosters. The Voronoi motif was selected for its strong association with the concept of a healing environment, as it embodies organic forms that harmoniously integrate with the surrounding natural context.



**IMAGE 3.18 MOSQUE
AXONOMETRIC RENDER**

Source: Author's drawing



**IMAGE 3.19 MOSQUE
ELEVATION**

Source: Author's drawing

03

SECONDARY FACILITY THE LOBBY



The spatial layout is designed to convey a sense of openness, ensuring the area never feels cramped even during peak hours. This is achieved through a circular circulation pattern that creates an uninterrupted flow, enhanced by a central void extending up to the second floor. The void is crowned with a skylight, allowing natural light to cascade through the space and further amplifying the feeling of spaciousness.



Designed as the welcoming heart of the hospital, the lobby blends functionality with aesthetics to create a space that is easy to navigate, visually engaging, and safe for all visitors.

SIGNAGE

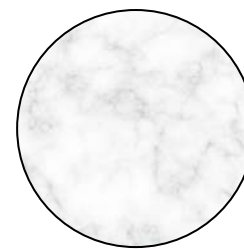
CLEAR WAYFINDING

Strategic placement of signage at key intersections ensures visitors can move through the hospital without confusion. The layout emphasizes intuitive “entrance easier” navigation, reducing stress for patients and guests.

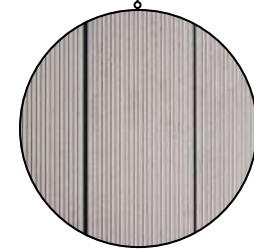
TREE STRUCTURE

NATURAL ACCENT

A striking tree-shaped decorative structure serves as a visual focal point, bringing a sense of nature and warmth into the clinical environment, while subtly reinforcing the hospital’s healing concept.



**PORCELAIN TILES WITH A
MARBLE-LIKE FINISH**



**WOOD PLASTIC COMPOSITE
WOOD-LIKE FINISH**

MATERIAL

ELEGANT, SAFE, AND BUDGET-FRIENDLY

The finishes use safe and cost-effective imitation materials: porcelain tiles with a marble-like finish to avoid possible allergies from natural stone, and high-quality engineered Wood Plastic Composite and Con-Wood for a warm appearance without the maintenance of real wood.

**IMAGE 3.19 INPATIENT LOBBY
VISUALISATION**
Source: Author's drawing

03 SPATIAL CONCEPT SECONDARY HOSPITAL FACILITIES



IMAGE 3.19 INPATIENT LOBBY
VISUALISATION
Source: Author's drawing

SMALL GARDEN BETWEEN
WAITING AREAS

INPATIENT LOBBY

Enhance comfort and maintain a clear, cohesive experience, the waiting area integrates thoughtful design elements that are both **functional and visually pleasant.**

RESTORATIVE TOUCH

Pocket gardens in front of seating zones to refresh the atmosphere, bring greenery indoors, and reduce stress for patients and visitors while they wait.



IMAGE 3.20 VK WAITING AREA

Source: Author's drawing

VK WAITING AREA

SIMILAR DESIGN LANGUAGE

CONSISTENCY FOR EASY RECOGNITION

The interior maintains a consistent design style throughout, preventing confusion and ensuring visitors feel oriented no matter which area they are in.

MODULAR DESIGN

FLEXIBLE AND EFFICIENT

The use of modular components allows the space to adapt to changing needs, whether for additional seating, displays, or amenities, without disrupting the overall aesthetic.

03 SPATIAL CONCEPT SECONDARY HOSPITAL FACILITIES

HOSPITAL OFFICE

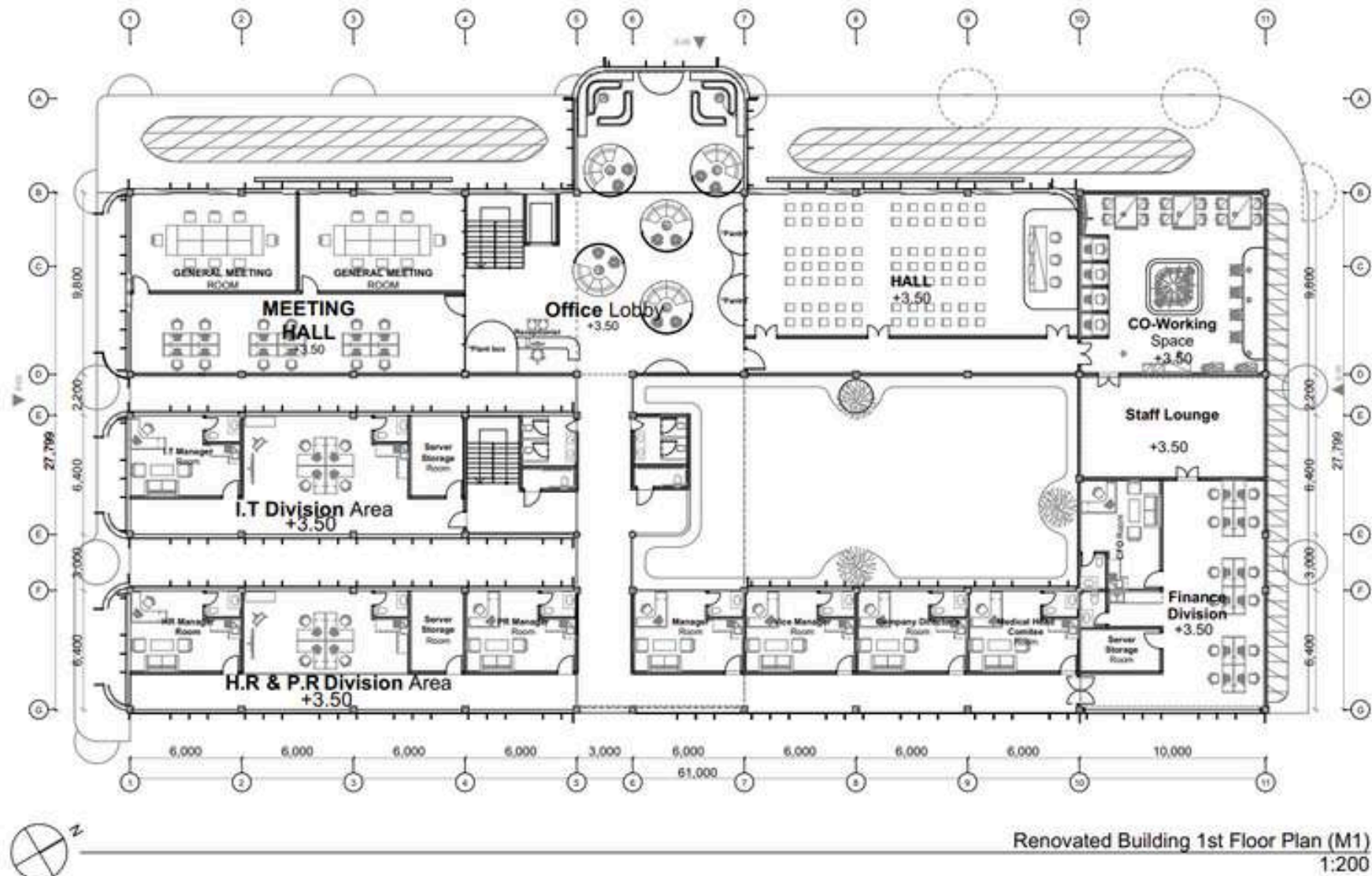


IMAGE 3.21 RENOVATED BUILDING 1ST FLOOR PLAN - HOSPITAL OFFICE

Source: Author's drawing

Overview

In designing the office space for PMC, our primary goal was to move beyond a conventional corporate layout and create a truly convenient and holistic environment for our dedicated team. The first-floor plan was meticulously organized to balance productivity with well-being. We have designated specific zones for focused work, such as the H.R., I.T., and Financial divisions, alongside more dynamic, collaborative areas. The inclusion of a central hall, a co-working space, and a dedicated staff lounge is a deliberate choice to foster interaction, community, and moments of rest throughout the demanding workday.

The vision is to materializes in a healing work environment, designed to support the mental wellness of our staff at PMC. We integrated natural elements like greenery and warm materials into our workspaces to create an atmosphere that is both calming and creatively stimulating. This concept extends to our open outdoor areas, which serve as sanctuaries for staff, doctors, and even patients to interact and rest. As a tangible commitment to their well-being, we also included a modern gym as a convenient outlet for stress relief and physical activity, because we believe that investing in our team is an investment in the very heart of the organization itself.

**VISUALISATION OF HEALING ENVIRONMENT
ELEMENTS FOR THE CO WORKERS**



03 SPATIAL CONCEPT SECONDARY HOSPITAL FACILITIES

OUTPATIENT CORRIDOR

INTEGRATED GREEN SPACE & PLAY AREA



The corridor connects seamlessly with a lush garden and a children's playground, offering a refreshing view and a safe space for young patients to play. Adjacent waiting areas allow parents to comfortably supervise their children while remaining close to the clinic.

IMAGE 3.23 INTEGRATED GREEN SPACE & PLAY AREA

Source: Author's drawing



IMAGE 3.24 INTERMEDIARY SPACE
Source: Author's drawing

Soundscape & Visual Serenity

A gently bubbling fish pond introduces soothing water sounds and calming visuals. Its placement also serves a functional role, acting as a sound buffer to reduce playground noise before it reaches the Emergency Unit and outpatient rooms.

03 SPATIAL CONCEPT SECONDARY HOSPITAL FACILITIES

SIDE REVENUE STRATEGIES

Convinient Store

In addition to the Main Pharmacy, the hospital includes a Convenient Store for supplements and health-related products. Strategically designed for easy access, it allows patients and visitors to obtain essential wellness items with ease. The store offers vitamins, dietary supplements, personal care, and preventive health products that complement medical services. Its layout prioritizes practicality and visibility, supporting efficient circulation while reinforcing the hospital's commitment to holistic care and healthier lifestyles.

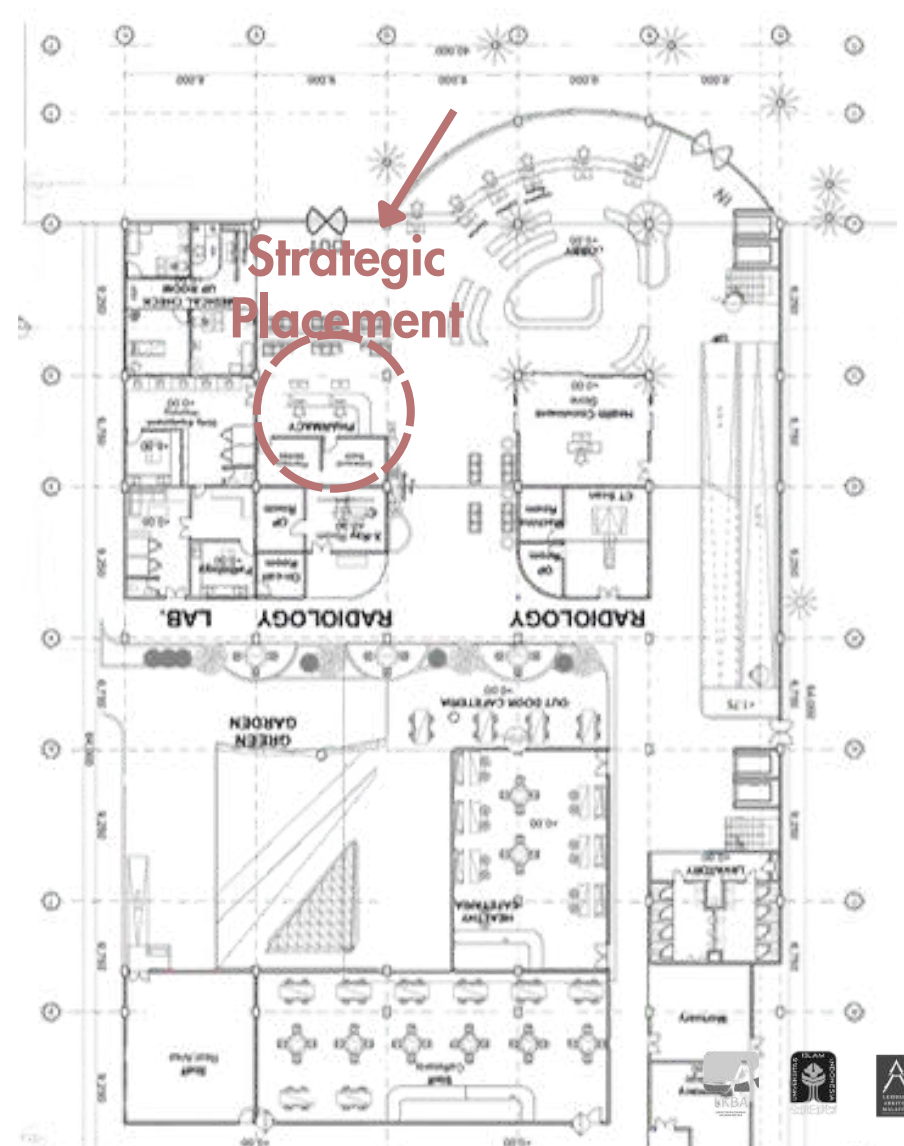


IMAGE 3.26 : CONVINIENT STORE
VISUALIZATION
Source: Author's drawing



IMAGE 3.27 : HEALTHY DRINK SHOP
Source: Author's drawing

Healthy Cafeteria



IMAGE 3.28 : HEALTHY CAFETERIA
Source: Author's drawing

Healthy Drink Shop

The Healthy Drink Shop is envisioned as a refreshing social hub within the hospital complex, offering natural beverages that support hydration, recovery, and preventive health. Positioned adjacent to the Healing Garden, it also functions as a resting space for patients and visitors undergoing therapy, allowing them to pause, recharge, and enjoy a calming atmosphere. Surrounded by greenery, shaded seating, and natural materials, the shop encourages relaxation and informal interaction, while reinforcing the hospital's broader commitment to holistic care and healthy living.

As a complement to a healthy lifestyle, the Healthy Cafeteria offers a selection of fresh and nutritious meals. Integrated with our medical check-up services, this space is part of an attractive wellness package—providing comfort and inspiring better eating habits for a healthier body.

04 Infrastructure Scheme

WATER DISTRIBUTION

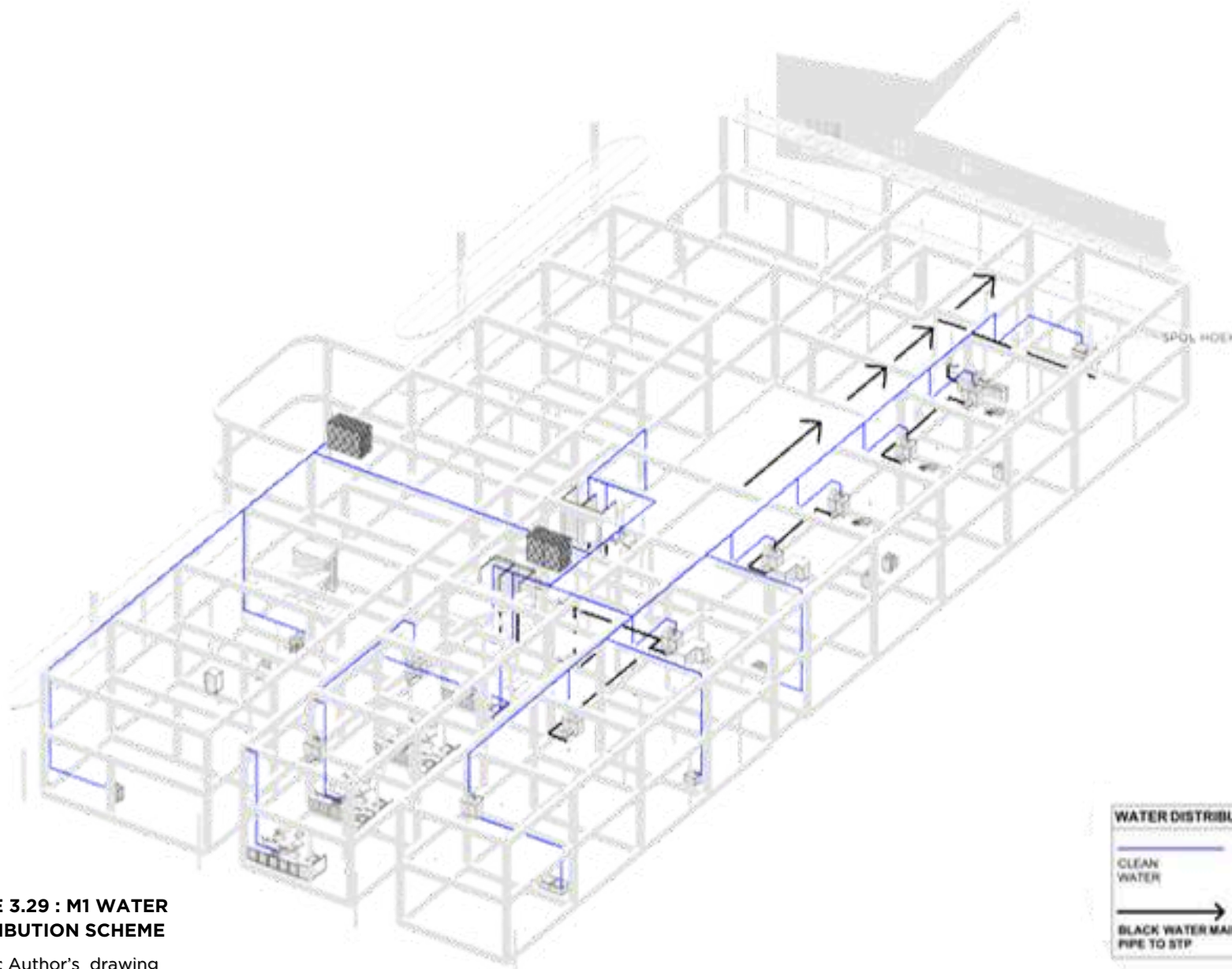


IMAGE 3.29 : M1 WATER DISTRIBUTION SCHEME

Source: Author's drawing

For a hospital with 150 occupants (patients and staff), the estimated total daily water demand is approximately 120,000 liters (120 m³), based on standard guidelines. Roof water tanks are typically designed to store 30–50% of daily usage as a buffer, with the main supply coming from a ground reservoir.

Therefore, a total rooftop storage of around 48,000 liters (48 m³) is recommended, divided equally between two towers—each with a capacity of 24,000–30,000 liters. A main underground reservoir of at least 100,000 liters is also advised.

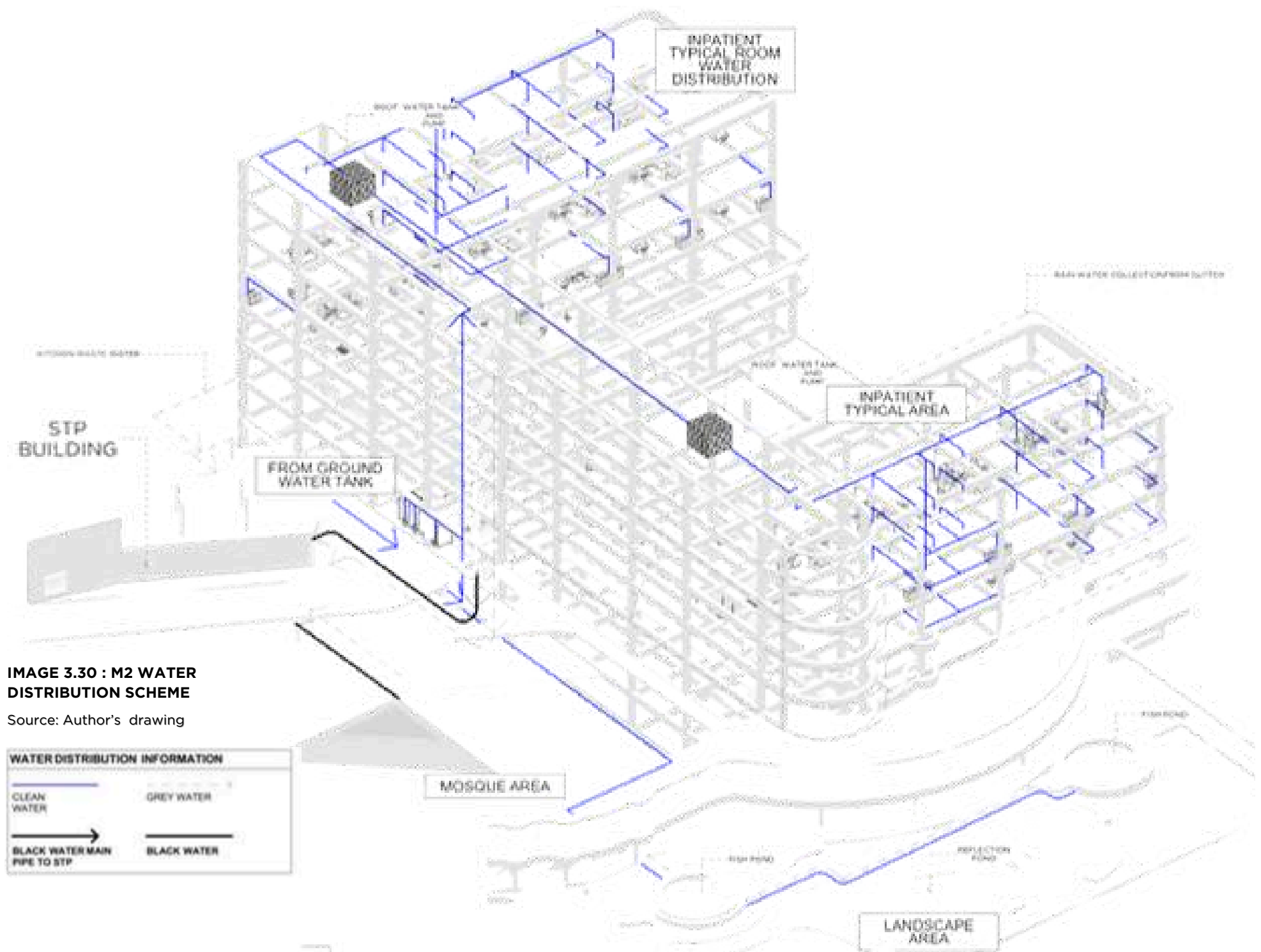
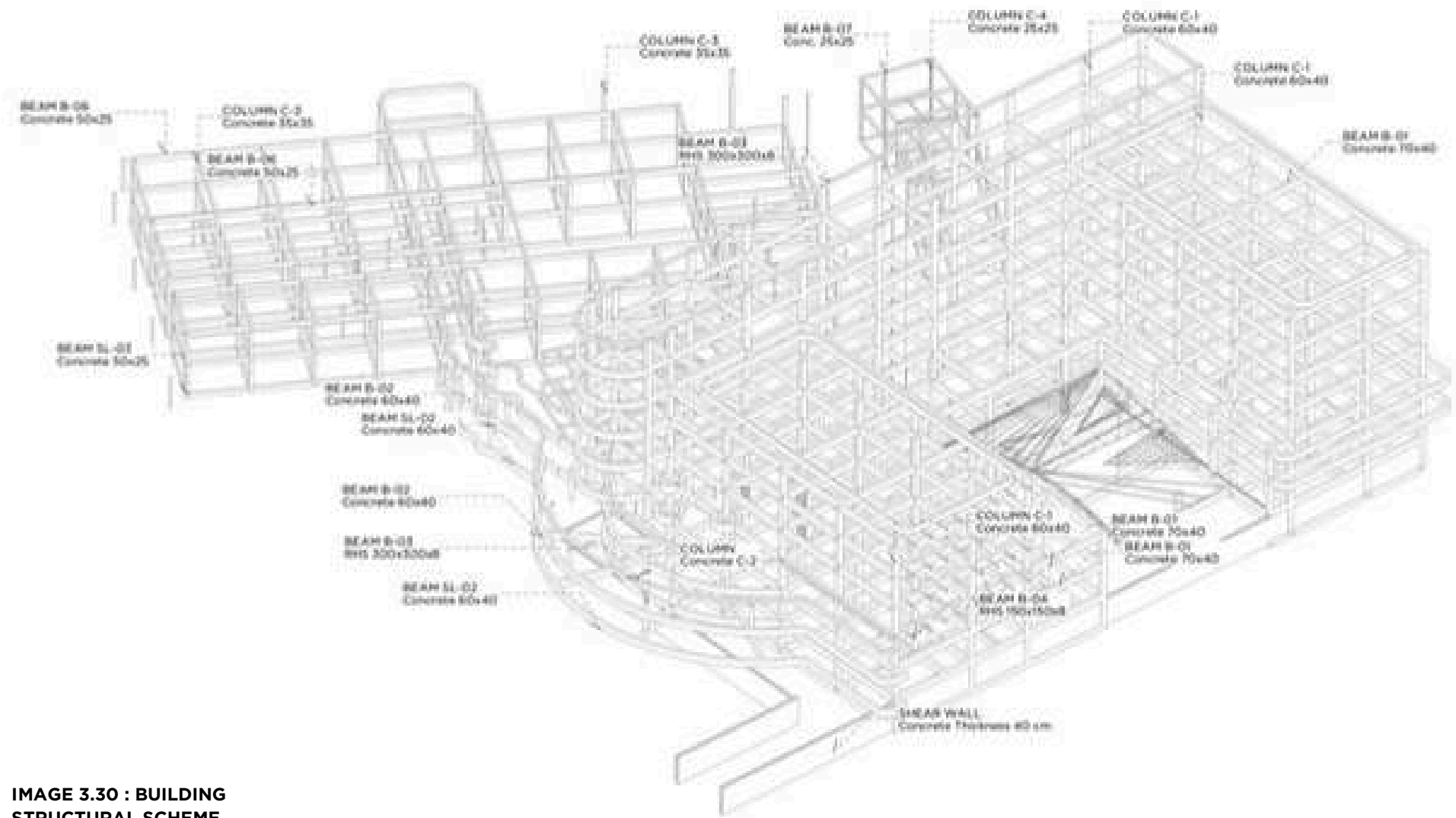


IMAGE 3.30 : M2 WATER DISTRIBUTION SCHEME
 Source: Author's drawing

COMPONENT	CAPACITY
Daily water demand (total)	±120,000 liters (120 m³)
Roof tank per tower (2 units)	24,000-30,000 liters (24-30 m³)
Main ground reservoir	≥100,000 liters (≥100 m³)

03 STRUCTURAL ENGINEERING STRUCTURAL DESIGN SCHEMATIC



**IMAGE 3.30 : BUILDING
STRUCTURAL SCHEME**

Source: Author's drawing

MASS 1 - Renovated Building

This volume utilizes a lighter structural grid to 6 meter, suitable for spaces such as administrative zones and supporting functions. The structural members are composed of:

- Columns with cross-sectional dimensions of 35 x 35 cm
- Beams measuring 50 x 25 cm

This configuration reflects a structural strategy aimed at optimizing material efficiency for areas with lower structural loads.

MASS 2- Medical Center

The structural system of the second massing utilizes a grid configuration of 6.75 x 8 meters and 9.25 x 8 meters. This planning approach facilitates efficient spatial organization, particularly for inpatient rooms, operating theaters, and hospital corridors, which typically require generous circulation space with an average width of 2.5 meters.

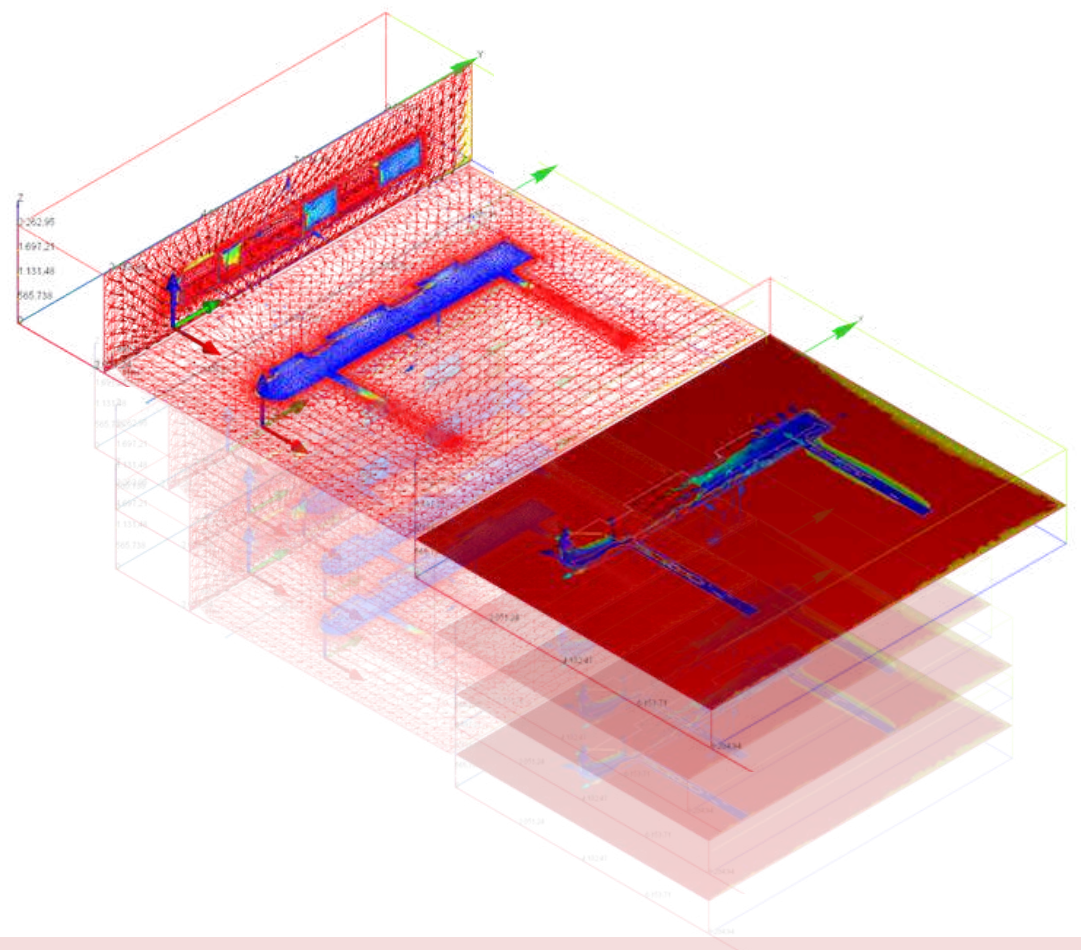
The structural elements in this building include columns measuring 60 x 40 cm and beams measuring 70 x 40 cm. These dimensions are derived from the general structural principle where the beam depth is approximately 1/12 of the span. For an 8-meter span, the calculation yields:

$1/12 \times 8 \text{ m} = 0.67 \text{ m}$, which justifies the use of a 70 cm beam depth for optimal structural performance.

Chapter 04

DESIGN EVALUATION

Designing the Transformation of Permata Medical Center Hospital from Type D to Type C with a Healing Environment Approach



DESIGN BRIEF

No	Supervisor/Examiner	Evaluative Feedback	Response/Solution	Page Ref.
1	Ar. Agus Setiawan, S.T., M.Arch., IAI, GP	To analyze the existing building, a Post Occupancy Evaluation (P.O.E.) must be conducted using appropriate parameters	Conducted a P.O.E. using parameters including user comfort, natural lighting, spatial efficiency, and flow of movement	p. 44-58
2	Ir. Etik Mufida, M.Eng.	The issue of bed shortages in Indramayu must be backed by source data; the projection should span 10 years from 2025	Incorporated 2025–2035 projections using public health planning documents and data from the Feasibility Study Of PMC Hospital	p. 3-4
3	Dr.-Ing. Putu Ayu Pramanasari A., S.T., M.A.	The vision for redesigning the old hospital is unclear; a design thinking diagram based on Lawson is needed	Added a design thinking matrix referencing Bryan Lawson’s theory to support and clarify the design vision and strategy	p. 16-17, p. 61

02 CUMULATIVE REVIEW

COMPREHENSIVE DESIGN

No	Supervisor/Examiner	Evaluative Feedback	Response/Solution	Page Ref.
1	Ar. Agus Setiawan, S.T., M.Arch., IAI, GP	Explore the potential for a new building with a semi-basement for service areas; utilize attic and flat roofs for functional optimization	Redesign includes semi-basement for dirty services (laundry, mortuary, nutrition); attic reused for admin offices; roof revised to mix types	p. 80-81
2	Ir. Etik Mufida, M.Eng.	Roof structure design is inefficient; parking layout does not meet standards; Medical Check-Up (MCU) room needs to be added, Mosque Revision	Revised roof structure for spatial efficiency; adjusted parking design according to SNI standards; added dedicated MCU facility	p. 80-81, p. 98,
3	Dr.-Ing. Putu Ayu Pramanasari A., S.T., M.A.	Main lobby should reflect the hospital's upgraded image; add café and rooftop garden; improve landscape and retained spaces	Enlarged lobby, added café in waiting area, designed rooftop healing garden; enhanced landscape concept and revised outpatient seating	p. 80-81, p. 86, p. 93-94, 99-102

FINAL DEFENSE

No	Supervisor/Examiner	Evaluative Feedback	Response/Solution	Page Ref.
1	Ar. Agus Setiawan, S.T., M.Arch., IAI, GP	1. Justify how the Healing Environment design ensures low-cost maintenance. 2. Justify the function of interior aesthetics beyond visual appeal.	1. Design Simulation regarding heat transfer. Using durable, low-maintenance materials reduces long-term operational costs. 2. Interior aesthetics serve biophilic functions, reducing stress and improving well-being.	p.70-72, p. 100, p.118
2	Ir. Etik Mufida, M.Eng.	1. Compare investment costs of conventional vs. Healing Environment building designs. 2. Cite journal evidence on Healing Environment's impact on thermal comfort.	1. Healing Environment: higher initial cost, but better long-term ROI. 2. CFD Simulation and Journals prove vegetation improves perceived and actual thermal comfort.	p. 84-85 ,p. 95-97
3	Dr.-Ing. Putu Ayu Pramanasari A., S.T., M.A.	1. In-Efficient Hip Roof Design for the Medical Center 2. Un-Aproprate Main Pharmacy Size in the medical center	1. Redesigning the medical center's roof focuses on achieving efficiency in relation to existing infrastructure while maintaining coherence with the overall design aesthetics. 2. pharmacy is reconfigured to ensure appropriate sizing and to enhance functionality, resulting in improved operational performance.	p. 116-117

03 CUMULATIVE REVIEW RESPOND

IN-EFFICIENT HIP ROOF DESIGN FOR THE MEDICAL CENTER UN-APPROPRIATE MAIN PHARMACY SIZE IN THE MEDICAL CENTER

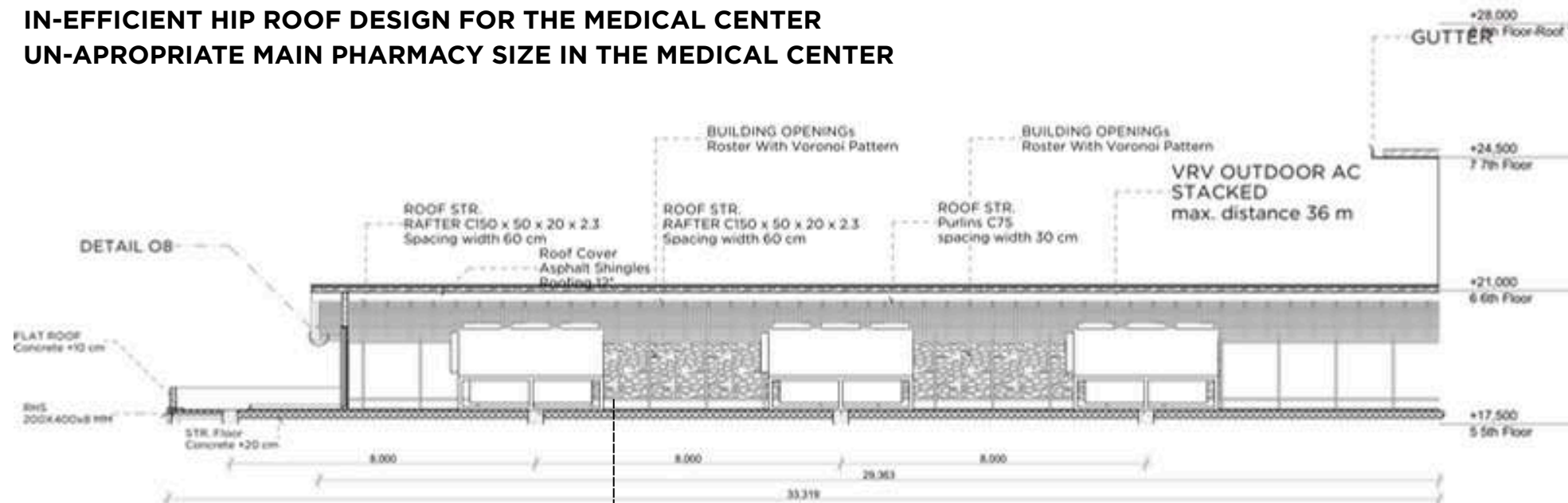


IMAGE 4.1 : M2 PARTIAL ROOF SECTION

Source: Author's drawing

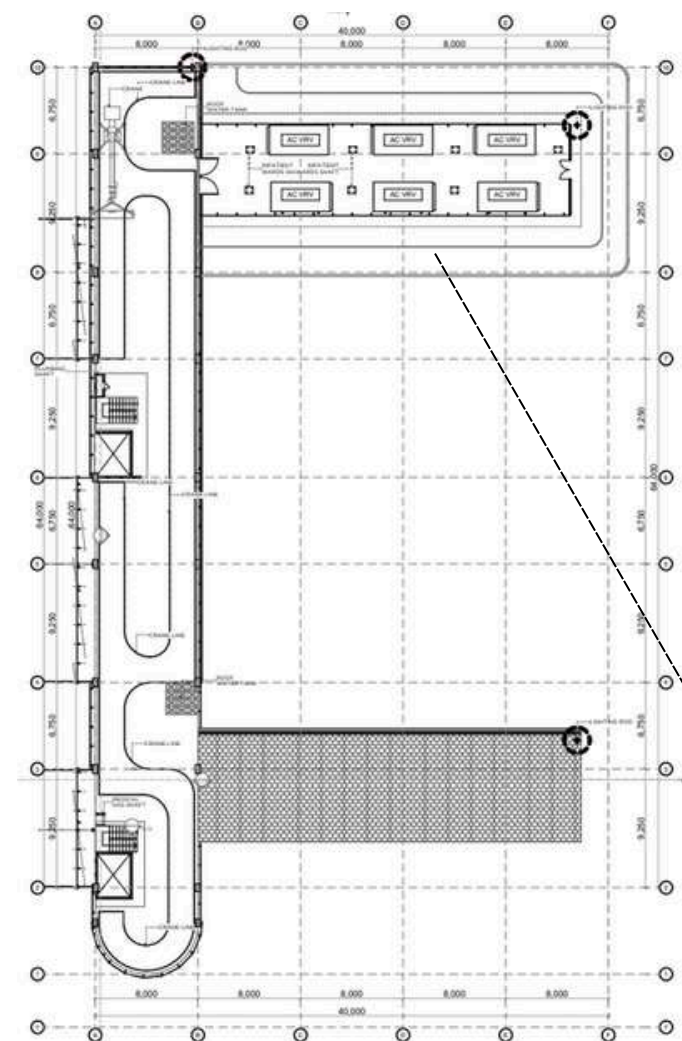


IMAGE 4.3: M2 ROOFTOP PLAN

Source: Author's drawing

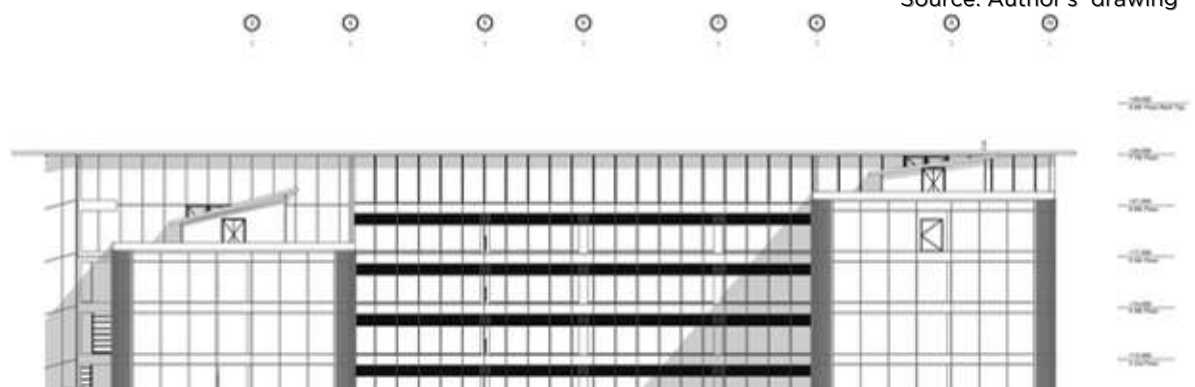


IMAGE 4.2 : M2 EAST ELEVATION

Source: Author's drawing

As depicted in the East Elevation, the complete roof form is spatially efficient, occupying a height equivalent to only 1 to 1.3 stories. This low-profile configuration provides adequate clearance for the outdoor AC units to ventilate effectively, aided by integrated rosters.

The previously monolithic roof area has been bifurcated into two distinct functional zones. One section is a dedicated mechanical space, enclosed by a slant roof, which houses the VRV system for each tower. The adjacent section features a flat roof, engineered to serve as a modular base for a gondola system. This integrated design facilitates streamlined facade maintenance, thereby reducing operational costs and reliance on external technicians.

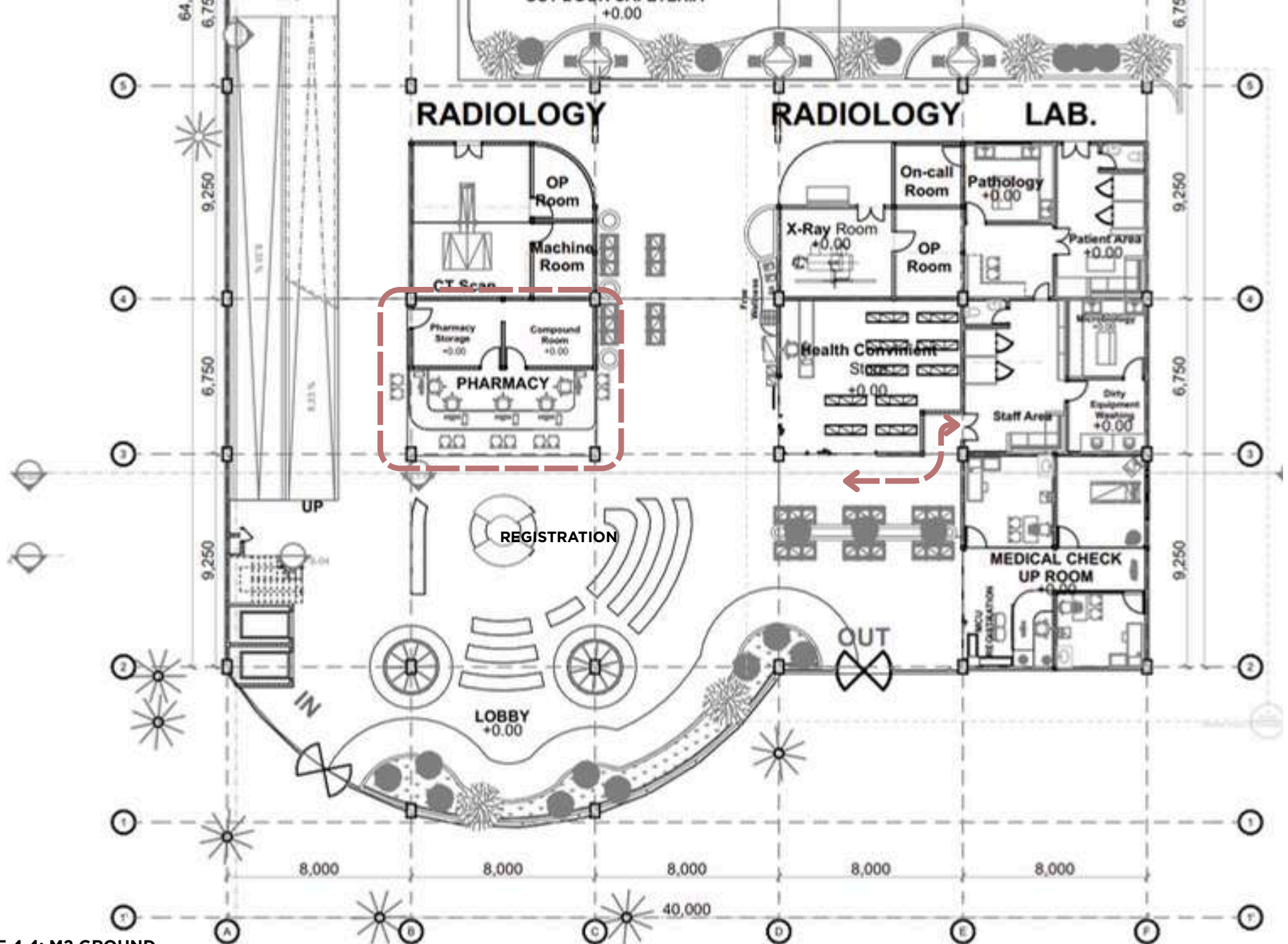


IMAGE 4.4: M2 GROUND FLOOR PLAN
Source: Author's drawing

UN-APPROPRIATE MAIN PHARMACY SIZE IN THE MEDICAL CENTER

In the revised layout I prepared, adjustments concern not only the scale of the pharmacy but also its relocation to integrate with a health convenience store. This change facilitates staff ingress and egress to the laboratory and separates the crowding caused by pharmacy queues. Consequently, the pharmacy has been moved closer to the registration area so that adjacent functions—such as payment processing—can be performed more easily. In addition, the pharmacy's service capacity has been increased: where there were previously two queue lines, there are now five. Three of these are primarily dedicated to cashiering and medication handover, while two are kept on standby to address complaints or other issues, yet can be redeployed as cashier stations when necessary.

03 CUMULATIVE REVIEW RESPOND

JUSTIFY THE FUNCTION OF INTERIOR AESTHETICS BEYOND VISUAL APPEAL.



IMAGE 4.5: TREE STRUCTURE AS THE ARTICULATION OF THE SEATING PLACE

Source: Author's drawing

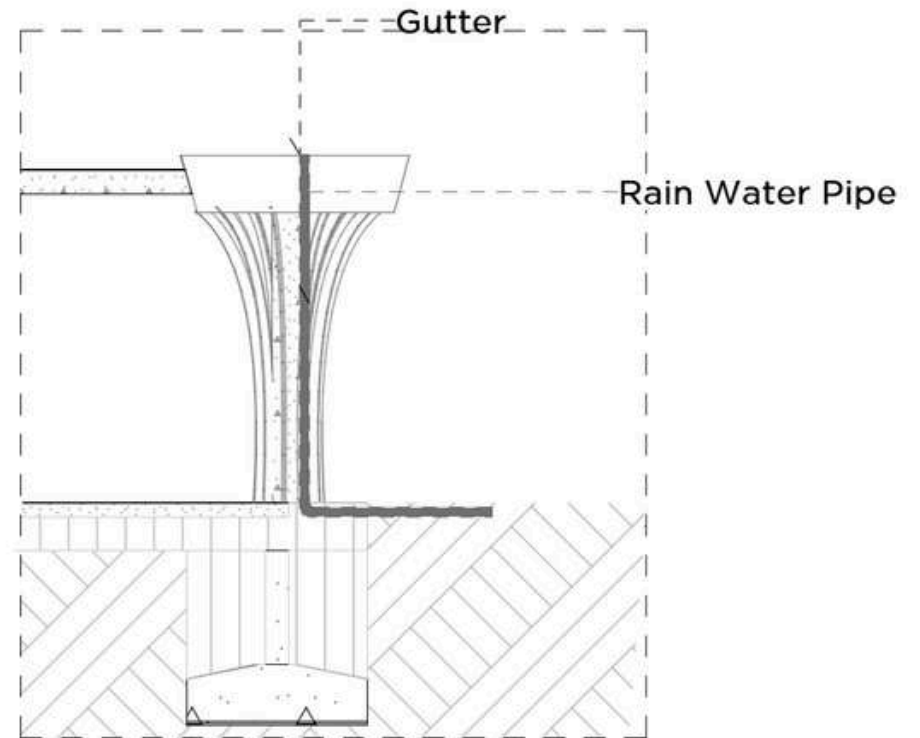
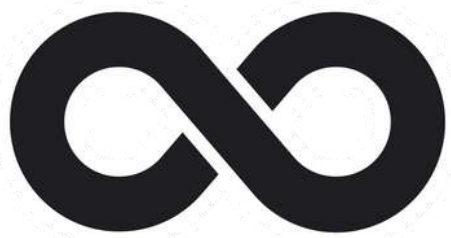


IMAGE 4.6: TREE STRUCTURE USE TO HIDE THE RAIN WATER PIPE

Source: Author's drawing

FUNCTIONAL JUSTIFICATION OF THE ARCHITECTURAL TREE STRUCTURE BEYOND ITS AESTHETIC CONTRIBUTION, THE TREE STRUCTURE IS CONCEIVED AS A MULTI-FUNCTIONAL ARCHITECTURAL ELEMENT THAT PERFORMS SEVERAL KEY ROLES WITHIN THE DESIGN:

1. **Spatial Articulation and Wayfinding** The structure functions as a primary spatial organizing element. Its vertical presence and overhead canopy establish a distinct zone and a clear focal point within the larger volume, creating a sense of place and defining a more intimate area beneath it.
2. **Biophilic and Phenomenological Enhancement** As a direct application of biophilic design principles, the arboreal form establishes a symbolic and tangible connection to nature.
3. **Integration of Building Systems** The structure serves as an integrated conduit for essential building services. Its trunk and branches are designed to discreetly house and distribute mechanical, electrical, and plumbing (MEP) systems. This includes concealing HVAC ducting for air distribution, embedding ambient and focused light fixtures, and incorporating acoustic paneling to modulate sound within the open-plan space.



APPENDIX & BIBLIOGRAPHY

Designing the Transformation of Permata Medical Center Hospital from Type D to Type C with a Healing Environment Approach





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Bismillahirrahmaanirrahiim

Assalamualaikum Wr. Wb.

Dengan ini, menerangkan Bahwa:

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Fakultas / Prodi : Teknik Sipil dan Perencanaan/ Arsitektur
Judul Karya Ilmiah : Designing the Transformation of Permata Medical Center Hospital from Type D to Type C with a Healing Environment Approach

Karya ilmiah yang bersangkutan di atas telah melalui proses cek plagiasi menggunakan **Turnitin** dengan hasil kemiripan (*similarity*) sebesar **9 (Sembilan) %**.

Demikian Surat Keterangan ini dibuat untuk dapat dipergunakan sebagaimana mestinya.

Wassalamualaikum Wr. Wb.

Yogyakarta, 8/6/2025
Direktur



Muhammad Jamil, SIP.

IMAGE 5.1: STATEMENT LETTER OF PLAGIARISM CHECK

Source: Perpustakaan UII

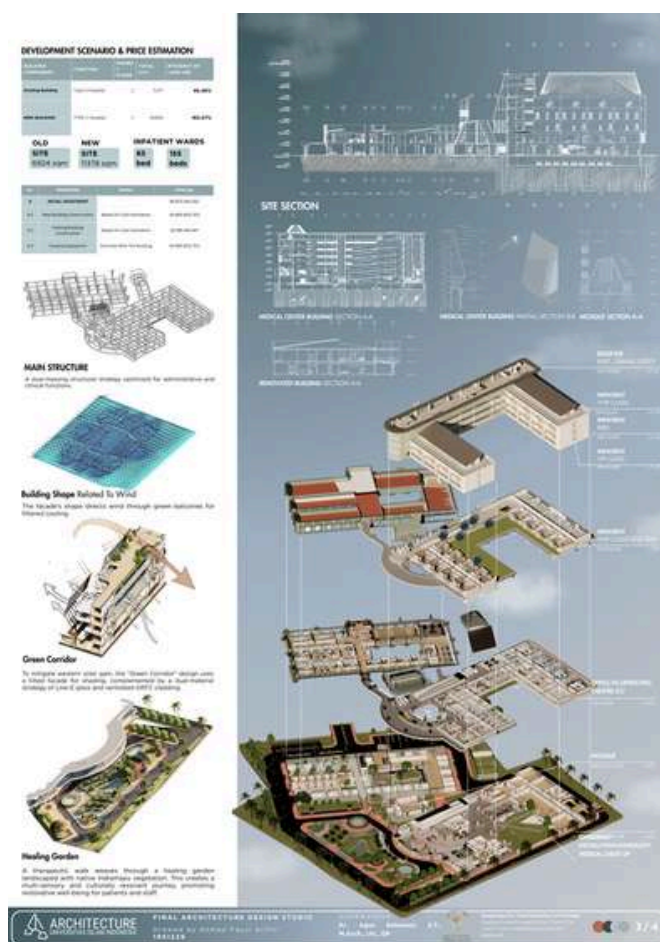
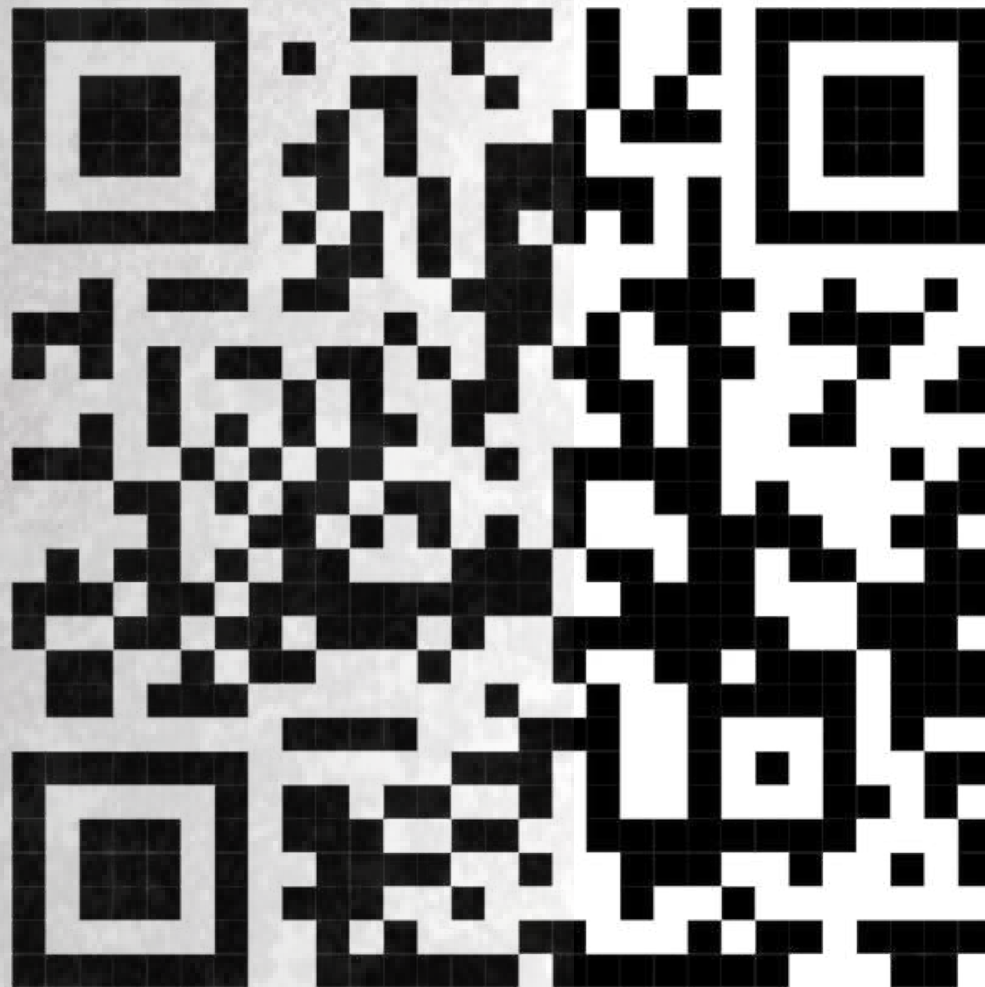


IMAGE 5.2: ARCHITECTURAL PRESENTATION BOARD
Source: author



SCAN HERE!



**IMAGE 5.3: BARCODE OF NEO
PMC'S DED**
Source: author

DETAILED ENGINEERING DESIGN

PLEASE USE THIS WISELY JUST AS THE ACADEMIC
REFERENCES

[https://drive.google.com/drive/folders/1FWjyXRFqBRXGnFgT9-6uiJH6b-NMlt0h?
usp=sharing](https://drive.google.com/drive/folders/1FWjyXRFqBRXGnFgT9-6uiJH6b-NMlt0h?usp=sharing)

OR YOU CAN USE THE LINK



Serving Love Healing Environment

Indramayu , West Java

About Us

At NEO PMC General Hospital, we are committed to providing high-quality healthcare services with advanced medical technology and a team of dedicated professionals. Our mission is to ensure the well-being of our patients with compassionate and comprehensive care.

The project transforms Permata Medical Center from a Type D to a Type C hospital to address Indramayu's urgent bed shortage. Adopting a **Healing Environment** approach with a Twin Tower layout and central healing garden, it improves natural light, air circulation, and infection control enhancing both patient recovery and staff well-being. Backed by a financially sound plan with a **6.8-year** payback period, it sets a benchmark for modern, humane healthcare facilities.

Excellent Services

- ✓ Emergency Installation 24/7
- ✓ 16 Outpatient with Specialist
- ✓ Inpatient Care
- ✓ Medical Check Up
- ✓ Healing Garden
- ✓ Van Khamer
- ✓ Surgery
- ✓ Healthy Cafeteria

24/7 Medical Care

0821 9509 8346

Room Types

Medical Check Up

CRYSTAL SHIELD IDR 480,000

ECG test

SAPPHIRE GUARD IDR 1,350,000

Therapeutic Walk

DIAMOND LEGACY IDR 2,950,000

KRIS Inpatient Room

IDR 400,000,00

Standard inpatient room under Presidential Regulation, practical and efficient shared ward that balances functionality with patient dignity. Comfortable, equal, and affordable.

VIP Room

IDR 600,000,00

Exclusive room with cohesive and soothing spatial experience. Greater privacy, premium design, and family services.

VVIP Room

IDR 1,100,000,00

Top-tier comfort with a spacious private room, living area, family stay space, highest healing experience, and full premium services.

Your Health is Our **Priority**



Expert medical care for the whole family

Hospital Map

- Lobby / Outpatient Entrance
- Pharmacy Storage
- Medical Archive
- Emergency Department
- Outpatient
 - General Outpatient
 - Dental Outpatient
 - Infectious Outpatient
- Mosque
 - Outdoor Ablution Area
 - Mosque
- Garden
 - Healing Garden
 - Green Garden
- Cafe
- MCU & Inpatient Lobby
- Medical Check Up

- ✓ Modern Facilities
- ✓ Expert Doctors & Nurses
- ✓ Healing- Environment Approach

- Lavatory
- Radiology
- Laboratory
- Cafeteria (Indoor / Outdoor)
- Staff Rest Area and Canteen
- Service Area
- Mortuary
- Pharmacy
- Medical Archive
- Loading Dock
- STP and Electrical Machine Room
- Water Pond
- Basement Access

Serving Love Healing Environment

IMAGE 5.4: NEO PMC FLYER

Source: author



IMAGE 5.5: ARCHITECTURAL MAQUETTE 1:250

Source: author



IMAGE 5.6: FINAL DEFENSE EXAM

Source: author

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CHAPTER 1: INTRODUCTION

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About the book

This book is a reflection of the thoughts, ideas, and technical explorations developed during Author's undergraduate studies. It's hoping that the works serves not only as a stepping stone toward designing hospitals across Indonesia and beyond but also as a meaningful contribution to the broader discourse on healthcare architecture. More than just an academic document, may this book inspire fellow designers exploring similar typologies, expand perspectives on healing environments, and contribute to the pursuit of more humane and sustainable hospital design.