

**DIABETES AND ENDOCRINOLOGY HEALTHCARE CENTER
DESIGN IN MALANG CITY**

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FAKULTAS SAINS DAN TEKNOLOGI
UNIVERSITAS ISLAM NEGERI MAULANA MALIK IBRAHIM
MALANG
2020**

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MALANG CITY**

TUGAS AKHIR

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ABSTRACT

Diabetes and Endocrinology Healthcare Center is a health service facility that specifically handles disease complications in Diabetes, including diseases caused by excessive sugar and fat in a centralized, comprehensive and integrated in one place. The treatment carried out in this hospital is not only focused on medical treatment, but also prioritizes on the process of biophilia or non-medical treatment, for patients. The combination of medical treatment and biophilia made a breakthrough and follow-up for the Indonesian government due to the increasing rate of diabetes sufferers every year, but many people still not quite believe with conventional medical treatment. So this Diabetes Hospital is very important. Carrying the Biophilic Architecture design method, the Diabetes Hospital tries to optimize the fast-healing in patients with non-medical methods. Biophilic architecture focuses on psychotherapy and also human being that are born from nature from the earth. With this approach, patients are expected to be able to understand again and feel *Hablum Minaallah, Hablum Minannas, and Hablum Minal'alam*.

Keyword : Diabetes, Endocrinology, Clinic, Healthcare Building, Biophilic

FOREWORD

Assalamu'alaikum Wr.Wb

Alhamdulillah, we thank God SWT for all of His blessings and guidance so that the final project proposal can be completed entitled "Diabetes and Endocrinology Healthcare Center Design in Malang City". Do not forget to pray and greetings, hopefully keep being devoted to the Prophet Muhammad. In the preparation of this final project proposal, it was realized that many participated either in the form of assistance of mind, energy, time, support and so on so that they were given fluency in completing this proposal.

This final project proposal carries the design of a clinical building which is located in Malang to response an issues that occur in the community. The issue was resolved using the Biophilic Architecture approach and also using linear and branching methods that have been adapted.

The author hopes, this design proposal is able to provide guidance and also a reference to go to the next stage in the Final Project. Further improvement, the author is very open with the input and also additions and corrections from various parties, aware that this proposal still has shortcomings.

Wassalamu'alaikum Wr.Wb

Malang, April 2020

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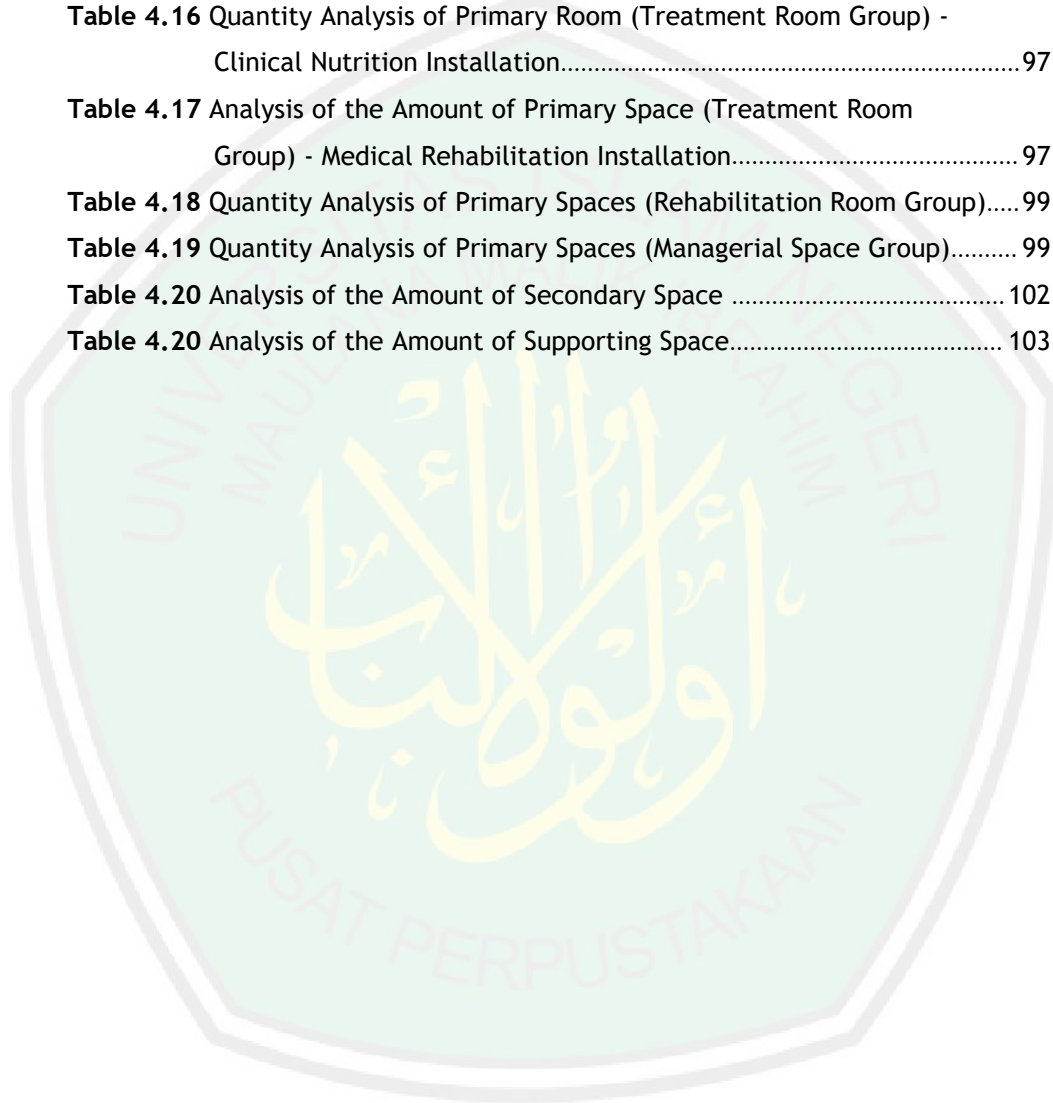
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CHAPTER 1

PREFACE

1.1 BASIC REVIEW

1.1.1 Basic Object Review

East Java is one of the provinces in Indonesia which has regencies and cities, including 29 regencies and nine cities. In the health sector, one of the targets of the East Java Health Office in 2030 is to reduce one-third of premature deaths from Non-Communicable Diseases (PTM). The priority strategy used is to focus on four main diseases that cause 60% of premature deaths, namely cardiovascular, cancer, diabetes, and lung. In 2014, the third leading cause of death in Indonesia was diabetes and its complications with a percentage of 6.7% or around 10 million people in Indonesia and 2/3 of patients did not realize that they had diabetes with an age range above 18 years (Ministry of Health Republic of Indonesia, 2014).

Malang City is one of the cities in Indonesia which is located in East Java Province and is a city that has an area of 110.06 km² and the population based on the Central Statistics Data Dispendukcapil as many as 904,570 people in January 2018 (Lampid, 2018). In 2018, there were 95,466 people suffering from diabetes in Malang City and only 53.38% were handled from the total number (Malang City Health Office, 2018).

Factors that support the increasing number of PTM, especially Diabetes can not be separated from people's lifestyles that are less healthy and more instant every day. As many as 26.1% of the population lacks physical activity, 93.5% of the population aged over 10 years consume less fruit and vegetables, 36.6% of the population aged 15 years and over smoke and 4.6% of the population over the age of 10 consume alcohol. In addition to factors from the environment with different lifestyles, there are also genetic factors as one of the causes of diabetes, which is the influence of disruption of endocrine hormones resulting in malfunctions in the formation of insulin in the patient's body.

Endocrine hormone movement is faster along with human development. At first, endocrinology was described as the study of physiology and endocrine gland disease alone, but over time, the scope of this knowledge extends to cover the study of thyroid, hypothalamus, pituitary, adrenal, pancreas, parathyroid and reproductive glands. Diabetes is considered an epidemic disease due to hormonal changes with high patient numbers and high medical costs. This shows that the scope of endocrinology must be expanded to deal with various hormonal problems (Wass, 2014: v).

As a form of handling this problem, the government has prepared a plan to prevent and control the PTM with 3 stages, namely to prevent by

controlling the environment, behavior, knowledge, and public awareness, to detect through early diagnosis or early detection. and to respond (reporting) by reporting, handling, mobilizing the community and healing actions (Ministry of Health Republic of Indonesia, 2014). These stages can be translated into 4 main activities in the field of treatment related to diabetes patients, namely promotive, preventive, curative, and rehabilitative.

From the data and also the numbers and facts contained in the field, it can be concluded that the need for special handling of diabetes and endocrinology patients so that the government can specifically control the disease and can concentrate fully on reducing the risk of death from diabetes. To deal with this, Diabetes and Endocrinology Healthcare Centers are needed, which are included in the main clinical types. Based on the calculation of the ratio of the number of diabetes clinics to the total population, the clinic is feasible to be established in the city of Malang.

1.1.2 Approach Basic Review

Humans are creatures that are very religiously complex and a way to live. Humans always collect toxins in their bodies consciously or unconsciously, stress because they always try to be the best, sometimes lifestyle and unhealthy diet patterns also affect the body and human health, especially regarding the addition of blood sugar levels (Arvay, 2018: 79).

Type 1 diabetes or diabetes mellitus (DM) is a malfunction in the process of producing insulin so that the pancreas cannot secrete insulin or if it can, only a small portion can be secreted. As a result, insulin will be deficient and Type 1 Diabetes Mellitus sufferers will require routine insulin injections. Diabetes Mellitus sufferers are 10-20% compared to Diabetes Insipidus patients which reach 80-90% of the total number of diabetes sufferers.

Diabetes Type 2 or Diabetes Insipidus (DI) is a malfunction in the metabolic process that causes an increase in the level of sugar in the human body. Handling of DM must be done immediately, to avoid the change of the disease into a heart attack, stroke, kidney failure, liver cancer that affects oxygen input into the human body. The way to speed up treatment is to bring the patient closer to nature and the soil which can naturally neutralize and relax the patient.

Yoshinori Otsuka, a diabetes professor from Japan's Hokkaido University experimented on 116 patients he handled to walk casually in the forest. The patients were divided into 2 groups, one group with short distance (1 km), and another group with longer distance (2 km). Before traveling, Professor Yoshinori took blood samples from each group to determine blood sugar levels. The results obtained from the above experiment are that after traveling in the forest for 10 minutes, the level of sugar in the patient's body decreases without

entering any medication at all. Forests and the environment can heal patients through natural conditions, physical as well as physical processes (Arvay, 2018: 80).

The above process is known as The Biophilia Effect. In Architecture, there is an approach in designing a building that is Biophilic Architecture (a theory by Stephen R. Kellert). Therefore, this approach is suitable as a theme in the design of this Diabetes and Endocrinology Healthcare Center.

The application of biophilic design by Stephen R. Kellert (2008: 102) for the health environment recommended several conditions such as:

Provision of a large window in the laying and arrangement of the room so that you can immediately see the view out clearly.

1. Provide a type of natural scenery that can reduce stress and improve healing results.
2. High sunlight output to reduce patient depression and other pain.
3. Avoid layout of the floor plan away from the window and low lighting.
4. Larger windows and facing natural scenery are needed for patients with depression, pain, and stress.
5. Provide a good garden design and suitable for patients, families (patients) and staff.
6. It is recommended to use an art installation as decoration with natural subjects in the installation.
7. Location with adequate technology for virtual interaction with nature for patients in need.

Based on Kellert's explanation above, it can be concluded that the city of Malang which is the location of this design is one of the cities that is already advanced but with a climate that is still comfortable to live in because it has a cold atmosphere and sufficient rainfall. Fresh air and natural scenery in the form of rice fields and plants are still commonly found in Malang, making it suitable for designing Diabetes and Endocrinology Healthcare Centers by taking the theme of a biophilic architecture approach.

1.1.3 Islamic Basic Review

This design is intended as an effort in assistance to fellow creatures of Allah SWT who are being tested in the form of diabetes, both Mellitus or Insipidus. Help in terms of explicit goodness in the Book of Allah, Al-Qur'an, Al-Maidah 5: 2 which means,:

"And help in helping (virtue) virtue and piety, and do not help in committing sins and transgressions. And fear Allah, verily Allah is severely tortured. "[Surah Al-Maidah 5: 2]

Jalalayn's commentary says that (Help you in good) in doing what is commanded (and piety) by leaving anything that is forbidden (and do not help you) in ta'aawanu discarded one of the two ta at its origin (in sinning) or immorality (and transgression) means going beyond the limits of God's teachings. (And fear you, Allah) You fear the punishment of His torment by obeying Him (surely Allah is severely tortured) for those who oppose Him.

Efforts to help fellow human beings can be carried out Islamic according to the rules in the Islamic Health Service. Islamic Health Services are all forms of management of medical care and nursing care activities that are framed by Islamic principles. The practice of health care is a small part of moral learning and experience (Rusdi Lamsudin, 2002). Yusuf Saleh Bazed and M. Jamaluddin Ahmad (2007: 7) mentioned that there are 4 main characteristics in Islamic services, namely: rabbaniyah, akhlaqiyah, waqi'iyah and insaniyah.

The most fundamental and distinguishing characteristic of health services that breathe Islam and non-Islam lies in its rabbaniyah character (belief and surrender of everything only to Allah SWT). While the characters of morality, waqi'iyah (flexible and not rigid) and insaniyah, are commonly applied to services in general.

The rabbaniyah character believes that God will not reduce disease without a cure for his creature. This is known from the hadiths that were raised by Abu Daud, which means,:

Abu Danda 'said that the Messenger of Allah said," Verily Allah decreases disease and medicine and He held it for every disease of its medicine, so treat you, but do not seek treatment with the unlawful ". (Narrated by Abu Daud)

From this hadith, it is known that Allah ordered his servants to keep trying to seek healing from his illness in a halal way, including returning to nature.

1.2 FORMULATION OF THE PROBLEM

From the background and identification above, several problem formulations can be obtained as follows:

1. What is the design of Diabetes and Endocrinology Healthcare Center for the health and well-being (health and well being) of the people of Malang City?
2. What is the design of Diabetes and Endocrinology Healthcare Center with a biophilic architectural approach by Stephen R. Kellert?

1.3 PURPOSE AND BENEFITS OF DESIGN

1.3.1 Purpose

The objectives of designing Diabetes and Endocrinology Healthcare Center are:

1. Produce a Diabetes and Endocrinology Healthcare Center design that suits the needs of the community or can improve the health and welfare of the people of Malang.
2. Producing a Diabetes and Endocrinology Healthcare Center design with a biophilic architecture approach that applies 6 biophilic design principles by Stephen R. Kellert

1.3.2 Benefits

The benefits of designing Diabetes and Endocrinology Healthcare Center are:

1. As a reference for a similar design that uses a biophilic approach due to some uniqueness that is not in other designs.
2. As an addition to references about a design approach that uses biophilic architecture theory by Stephen R. Kellert.
3. As an example of the application of building shadow calculations using imagery in Science and Buildings which is useful in the healing process, especially in principle number 4, namely light and space, shadow elements.

1.4 DESIGN BOUNDARIES

1.4.1 Object Boundaries

Diabetes and Endocrinology Healthcare Center is the main type of clinic, where this clinic provides specialist medical services or basic and specialist medical services (Ministry of Health Republic of Indonesia, 2014: 9). The focus of the chosen branch of the discipline is the specialist in diabetes and endocrinology. This clinic serves promotive, preventive, curative and rehabilitative measures.

1.4.2 User Boundaries

Users are patients diagnosed with type 1 and 2 diabetes mellitus, patients with type 1 and 2 diabetes mellitus and patients with diseases caused by type 1 and 2 diabetes mellitus both children, adolescents, adults, and the elderly.

Table 1.1 Patient Year Gap

NO	JENIS	RENTANG USIA
1	Kids	5-11
2	Teenage	12-25
4	Adult	26-45
3	Elderly	46-65

(Source: Depkes RI, 2009)

In addition to diabetic patients, specialist doctors are also needed to treat patients in this main clinic, namely:

1. Endocrinologist
2. Internal Medicine Specialist

1.4.3 Site Boundaries

Because the city of Malang is a city with relatively fast economic growth with a population of 904,570 people in January 2018. As discussed in the background, Diabetes patients in Malang City are high considering the changing lifestyle of the people. Malang city itself has five districts, namely Blimbing, Kedungkandang, Klojen, Lowokwaru, and Sukun. Among the five sub-districts, Sukun Sub-district is an area where there are still many rice fields. Therefore, the site chosen is Malang City, Sukun District which is suitable for the Biophilic Architecture approach and is able to answer the issues of the design of Diabetes and Endocrinology Healthcare Center.

1.4.4 Approach Boundaries

It can be drawn that this design uses the Biophilic Architecture approach as described by Stephen R. Kellert in his book Nature By Design, which takes six principles in biophilic design. These principles are:

1. Environmental features
2. Natural shapes and forms
3. Natural patterns and processes
4. Light and space
5. Place based relationships
6. Evolved human nature relationships

The applications in the theory proposed by Kellert generally have several design elements based on the biophilic approach as shown in the table.

Table 1.2 Elements and Attributes of Biophilic Design

TABLE 1-1 Elements and Attributes of Biophilic Design		
Environmental features	Natural shapes and forms	Natural patterns and processes
Color	Botanical motifs	Sensory variability
Water	Tree and columnar supports	Information richness
Air	Animal (mainly vertebrate) motifs	Age, change, and the patina of time
Sunlight	Shells and spirals	Growth and efflorescence
Plants	Egg, oval, and tubular forms	Central focal point
Animals	Arches, vaults, domes	Patterned wholes
Natural materials	Shapes resisting straight lines and right angles	Bounded spaces
Views and vistas	Simulation of natural features	Transitional spaces
Façade greening	Biomorphy	Linked series and chains
Geology and landscape	Geomorphology	Integration of parts to wholes
Habitats and ecosystems	Biomimicry	Complementary contrasts
Fire		Dynamic balance and tension
		Fractals
		Hierarchically organized ratios and scales
Light and space	Place-based relationships	Evolved human-nature relationships
Natural light	Geographic connection to place	Prospect and refuge
Filtered and diffused light	Historic connection to place	Order and complexity
Light and shadow	Ecological connection to place	Curiosity and enticement
Reflected light	Cultural connection to place	Change and metamorphosis
Light pools	Indigenous materials	Security and protection
Warm light	Landscape orientation	Mastery and control
Light as shape and form	Landscape features that define building form	Affection and attachment
Spaciousness	Landscape ecology	Attraction and beauty
Spatial variability	Integration of culture and ecology	Exploration and discovery
Space as shape and form	Spirit of place	Information and cognition
Spatial harmony	Avoiding placelessness	Fear and awe
Inside-outside spaces		Reverence and spirituality

(Source : Kellert, R Stephen, 2014 : 15)

1.5 UNIQUE OF DESIGN

Healing through nature has not been widely used in Indonesia. Though it is no longer a secret that Indonesia has great potential to carry out these natural-based healing activities. The uniqueness that is contained in the design of Diabetes and Endocrinology Healthcare Center is divided into 2, namely the uniqueness of the design and the uniqueness of the process. The uniqueness of the design can be described as:

1. Involving the potential of the tropical Malang region as a medium for healing diabetes patients by maximizing landscape design on the site. The intended elements such as water, color, animals, rooftop garden, green wall and also a dry garden in the building.
2. Utilization of the potential for sunlight, air temperature, and vegetation that supports the rapid healing process of patients.
 - a) The utilization of sunlight is done by enlarging the openings in the ward. Shadows from sunlight can also be used to attract patients' curiosity

- about the environment and trigger observations from patients. In addition to triggering curiosity, imagery can be used as one of the aesthetic elements in a building that provides the curved formation effect recommended in the principles of biophilic design.
- b) Temperature tends to be used as a factor to reduce patient discomfort so that calm can be achieved.
 - c) Vegetasi certain can increase freshness in the patient's view and become therapy for patients.
3. Using the principles in biophilic design where the building can be united with nature that causes the effects of happiness, satisfaction, and also peace of mind for patients and other users.
 4. Using a virtual interaction program for patients who cannot interact with nature directly.
 5. Landscape design that uses healing, sensory and therapeutic systems.
 6. Using art installation applications in the form of natural ornamentation in building designs to reduce stress on patients.
 7. Healthcare Center that looks and gives the impression like a healing resort.

CHAPTER II LITERATURE REVIEW

2.1 DESIGN OBJECT REVIEW

There are several definitions sourced from KBBI and also experts and other sources in describing the meaning of the 2 main syllables of this design, namely: diabetes and endocrinology, and also the healthcare center.

2.1.1 Object Review

A. Design

The design comes from the word design which means to arrange everything (before acting, doing or doing something); plan. While the design is the process, method or deed of design (KBBI).

B. Diabetes and Endocrinology

The design comes from the word design which means to arrange everything (before acting, doing or doing something); plan. While the design is the process, method or deed of design (KBBI).

- **Diabetes Melitus**

Diabetes mellitus (DM) is a chronic metabolic disorder due to the pancreas not producing enough insulin or the body cannot use the insulin produced effectively. Insulin is a hormone that regulates blood sugar balance. The result is an increase in glucose concentration in the blood (hyperglycemia) (Infodatin, 2014: 1)

Diabetes mellitus occurs due to a surge in insulin in charge of controlling blood sugar levels in the body. When these hormones can not work optimally, there will be a buildup of glucose that causes blood sugar concentrations to rise dramatically. Patients with diabetes mellitus will generally experience damage to the pancreatic system. Damage to the pancreas causes insulin levels can not be controlled normally.

- **Diabetes Insipidus**

Diabetes Insipidus is a rare disease that often causes urination with high frequency with large water content. To cover up the lack of water, patients with Diabetes Insipidus feel they really need to drink water but are released in large quantities. Diabetes Insipidus patients tend to be prone to dehydration (NIDDK, 2008: 1).

Under normal conditions, the body produces the hormone vasopressin or anti-diuretic hormone produced by the pituitary gland. Vasopressin works in the kidneys and blood vessels, to prevent loss of fluid from the body to help the kidneys absorb water. When the system is not functioning properly, people with diabetes

insipidus will experience excessive thirst because they feel the body is constantly deprived of fluids. As a result, the body is unable to accommodate the amount of excess water and immediately dispose of it into the urine in too much amount exceeds the normal limit (NIDDK, 2008: 3)

- **Endocrinology**

Endocrine is a glandular system that secretes hormones. The system involves the endocrine glands and hormones. The endocrine glands are organs that produce and secrete hormones continuously into the circulatory system. This gland has several types, namely the thyroid gland, adrenal gland and also the testicular glands, ovaries, and pancreas (Martupa, 2019: 3). In the case of Diabetes, the gland that is closely related is the pancreas gland, where it is clear that the pancreas is a gland and produces insulin.

C. Healthcare Centre

Healthcare referred to in this design is limited as a Clinic. The clinic is a health service facility that organizes individual health services that provide basic and/or specialist medical services (Ministry of Health Republic of Indonesia, 2014: 9).

Clinic in the Republic of Indonesia Republic of Indonesia Health Republic of Indonesia No. 9/2014 Article 2 states that clinics are divided into 2 namely Pratama clinics and main clinics.

- Pratama clinic as referred to in paragraph (1) letter a is a clinic that organizes basic medical services both general and specific.
- The main clinic as referred to in paragraph (1) letter b is a clinic that provides specialist medical services or basic and special medical services (Permenkes RI No 9, 2004).

From the understanding by the Republic of Indonesia Ministry of Health, this design is the main clinic where the medical services provided are specialists for Diabetes and Endocrinology. Based on clinical ownership, it is also regulated in the Republic of Indonesia Ministry of Health Republic of Indonesia No. 9 Article 4 that, :

- Clinics owned by the Government and Regional Governments must be established in accordance with statutory provisions.
- Clinics that are owned by the community who organize outpatient services can be established by individuals or business entities.

- Clinics that are owned by the community that organizes inpatient care must be established by a legal entity (Permenkes RI No. 9, 2004).

In designing the Diabetes and Endocrinology Healthcare Center, which is the main clinic for inpatients owned by the local government of Malang City. Center is an English word that can be interpreted as a center. The center is the base or which becomes the pumpkin (various matters, matters, etc.) (KBBI Online).

The conclusion that can be drawn from various etymological explanations above regarding each word is that the design of Diabetes and Endocrinology Healthcare Center is the process of designing the health center building in the form of a primary clinic with the specifications of Diabetes, both Diabetes Mellitus and Diabetes Insipidus, where Diabetes itself is caused by malfunctions from the pancreatic glands originating from the endocrine glands.

2.1.2 Architectural Object Review

Mandatory facilities contained in a clinic have also been arranged by the Republic of Indonesia Ministry of Health No. 2014 9 Article 7 concerning clinics, namely:

- A. The clinical building consists of at least:
 - Registration room / waiting room
 - Consultation room
 - Administration room
 - Medicine rooms and consumables for clinics that carry out pharmaceutical services
 - Room of action
 - Room / corner ASI
 - Bathroom / wc
 - Other rooms according to service needs

- B. In addition to the requirements referred to in paragraph (1), the Inpatient Clinic must have:
 - Inpatient rooms that meet the requirements
 - Pharmacy Room
 - Laboratory
 - Kitchen space

- C. The room as referred to in paragraph (1) and paragraph (2) must meet the technical requirements in accordance with the provisions of the legislation.
- D. The number of patient beds in the Inpatient Clinic is at least 5 (five) units and at most 10 (ten) units.

The provisions of the Ministry of Health still cover the space requirements for the main clinics that apply inpatient care and have not specifically explained the space requirements needed in this design, so based on information from the health department, space or installation needed in the Diabetes and Endocrinology Healthcare Center, are:

1. Outpatient Instalation

Outpatients Instalation has a more detailed space component. The need for the amount of space, prototype and also the function of each space will be described in the following table:

Table 2.1 Space need, Magnitude, and Function of the Outpatient Instalation (IRJ)

NO	SPACE NEEDED	MAGNITUDE	FUNCTION
1	Administration room	3 - 5 m ² /Employee	Function : 1. Registration 2. Payment User 1 1. Entry data 2
2	Access Control Room	3 - 5 m ² /Employee	Function : 1. Giving Information Resepsionis 1
3	Medical Record Room	12 - 16 m ²	Function : 1. Saving Patient Data User : 1. Medicine Record Employee
4	Check and Consultation Room	12 - 24 m ² / Room.	Function : 1. Consultation 2. 2 room needed User / room : 1. 1 doctor 2. 1 nurse 3. 1 nutrition consultant
5	Check and Consultation Room	12 - 24 m ²	Function : 1. Taking care of patient User : 1. 2 nurses
6	Lactation Room	4 - 3 m ²	Function : 1. Breastfeeding comfortably and safely

(Source : Permenkes RI No.24, 2016)

Time saver provides an overview and standards of how the layout and furniture in Outpatient Installation (IRJ) in a hospital building.

HEALTH
HOSPITAL
 Outpatient Activity



- LEGEND :**
NONMEDICAL EQUIPMENT - FIXED
 AB BOARD, CHALK
 BC BOOKCASE
 CB CABINET, STORAGE
 CO COUNTERS
 DF DRINKING FOUNTAIN
 EB LOCKERS, CLOTHES
 FA MIRROR
 JB CHART ROCK
 JC CLOTHES ROCK
 JE RACK, MAGAZINE
 JF SCREEN PROJECTION
 KB SHELVING, SUPPLY
 LA RECEPTOR, FLOOR

- LEGEND :**
NONMEDICAL EQUIPMENT - MOVEABLE
 F-86 TABLE, FOLDING
 F-88 TABLE, PROJECTION
 F-93 TABLE, UTILITY
 H-16 BUCKET, MAPPING
 H-32 HAMPER, LINES
 H-44 VACUUM CLEANER
 M-18 BENCH
 M-28 CABINET, FILM FILING
 M-34 CABINET
 M-36 CABINET, STORAGE
 M-37 CABINET, STORAGE
 M-52 PODIUM
 M-62 REFRIGERATOR
 M-66 REFRIGERATOR
 O-32 CABINET, FILING
 O-45 COMPUTER TERMINAL

- LEGEND :**
MEDICAL EQUIPMENT
 108 AUDIOMETER
 182 CABINET, DENTAL
 204 CHAIR, BLOOD-DRAWING
 212 DENTAL CHAIR
 256 DENTAL UNIT, WITH LIGHT
 316 ELECTROCARDIOGRAPH
 356 FUNDUS CAMERA, WITH TABLE
 324 POTOMOGRAPH
 538 PULMONARY FUNCTION
 SCREENER
 560 PULSE MONITOR
 604 SCALE
 608 SCALE, INFANT
 680 STOOL, FOOT
 696 STOOL, ADJUSTABLE

- LEGEND :**
MEDICAL EQUIPMENT
 716 TABLE, EXAMINING & TREATMENT
 720 TABLE, EXAMINING & TREATMENT
 728 TABLE, EXAMINING
 740 TABLE, INSTRUMENT
 762 TABLE, VISION TESTING AND
 AUDIOMETER
 776 THERMOGRAPHY UNIT
 816 VIEWER, X-RAY
 824 VISUAL DISPLAY CONSOLE
 828 VISION TESTER
 912 X-RAY, CHEST UNIT
 916 DENTAL X-RAY
 925 X-RAY, GENERATOR, CONTROL
 926 X-RAY, GENERATOR,
 TRANSFORMER

Image 2.1 Outpatient Instalation
 (Source : Time Saver)

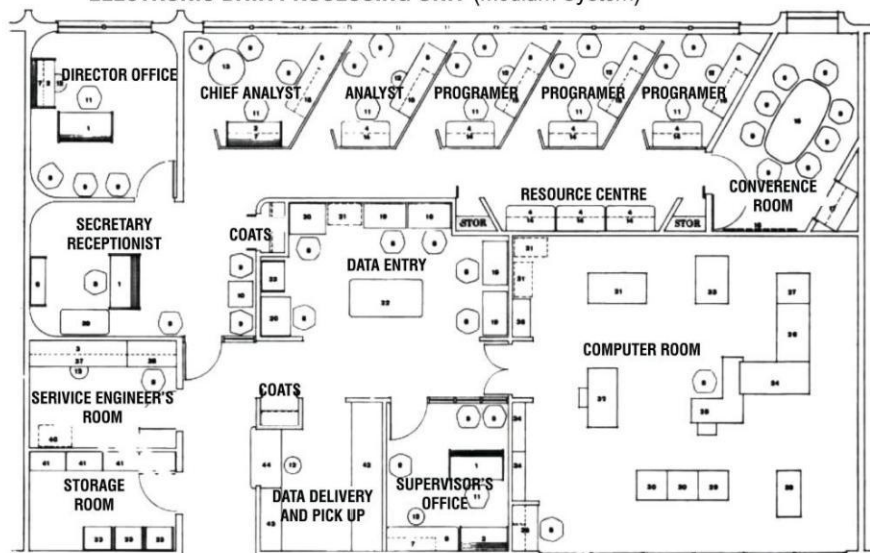
Medical record rooms in hospitals use technology-based storage, as described by the time saver in his book.

HEALTH

HOSPITAL

Emergency Activity

ELECTRONIC DATA PROCESSING UNIT (Medium System)



LEGEND :

- | | | |
|---|--|--|
| <ul style="list-style-type: none"> 1. WORK SURFACE, ROLL TOP 2. WORK SURFACE, ROLL TOP, WALL HANGING 3. WORK SURFACE, TYPEWRITER 4. WORK SURFACE, WALL HANGING 5. WORK SURFACE, SLOPED TOP 6. BIN, FILE 7. SHELF 8. CLERICAL SWIVEL CHAIR 9. ARM CHAIR, SHELL TYPE 10. TABLE, END 11. MANAGEMENT CHAIR 12. STOOL 13. TABLE 14. SHELVES 15. FILE BIN UNDER 72" WORK SURFACE 16. TABLE, CONFERENCE 17. KITCHEN, EFFICIENCY | <ul style="list-style-type: none"> 18. PROJECTOR SCREEN 19. DATA ENTRY UNITS 20. KEY PUNCH DESKS 21. UTILITY SHELF TRUCK 22. TABLE 23. LOCKER WITH DRAWERS AND SHELVES 24. PROCESSING UNIT 25. CONSOLE WORK-SHELF AND PRINTER 26. 3 DRIVE DISC STORAGE 27. 2 DRIVE DISC STORAGE 28. POWER UNIT 29. TAPE CONTROL UNIT 30. MAGNETIC TAPE FACILITY 31. CARD READ PUNVH 32. PRINTER 33. CONTROL UNIT 34. TAPE STORAGE UNITS | <ul style="list-style-type: none"> 39. WALL CAB. STORAGE UNIT 40. TOOL AND TEST EQUIPMENT CART 41. SHELF UNITS 42. BURSTER COMPLETE WITH TABLE 43. L. DECOLLATOR 44. COUNTER TOP |
|---|--|--|

Image 2.2 Medical Record Room Layout

(Source : Time Saver)

2. Inpatient Instalation

Inpatient Installation has more detailed room components. The need for the amount of space, prototype and also the function of each space will be described in the following table:

Table 2.2 Space need, Magnitude, and Function of the Inpatient Instalation

NO	SPACE NEEDED	MAGNITUDE	FUNCTION
1	Ward	Min 7.2m ² /bed	Function : 1. Rest the patient User : 1. Pasien Pembagian kelas : 2. VVIP, 1 room 3. VIP, 2 room 4. Class 1, 3 room 5. Class 2, 6 room 6. Class 3, 10 room

Table 2.2 Space need, Magnitude, and Function of the Inpatient Instalation (next)

NO	SPACE NEEDED	MAGNITUDE	FUNCTION
2	Nurses' Stations	3-5 m ² /nurses	Function : 1. Control Room User : 1. 2 Nurses
3	Check and Consultation Room	As needed	Function : 1. Consultation with the doctor User : 1. 1 Doctor Visite
4	Doctor's Office	As needed	Function : 1. Doctor's privacy User : 1. 1 doctor
5	Education Room Discussion	As needed	Function : 1. Coordinate with other health teams in an integrated manner regarding the latest health information (updating data). User : 1. All employee
6	Space Head of Inpatient Installation	As needed	Function : 1. Give privacy and appreciation to the head of the inpatient installation User : 1. 1 Nurse
7	Locker	As needed	Function : 1. Saving things User : 1. Nurses
8	Clean Linen Room	4m ²	Function : 1. Keeping the clean linen User : 1. 2 employee
9	Dirty Linen Room	4m ²	Function : 1. Keeping the dirty linen 2. Wash the dirty linen User : 1. 2 employee
10	Dirty Warehouse	As needed	Function : 1. Storage of damaged goods User : 1. -
11	Clean Warehouse	As needed	Function : 1. Stasionary saving place 2. Storage of health equipment User : 1. -
12	Patient toilet	2-3 m ²	Function : 1. Toilet 2. Cleaning User : 1. Patient
13	Visitor's Toilet	2-3 m ²	Function : 3. Toilet 4. Cleaning User : 2. Patient Family
14	Toilet Officer	2-3 m ²	Function : 5. Toilet 6. Cleaning User : 3. Employee

(Source : Permenkes RI No.24, 2016)

Table 2.2 Space need, Magnitude, and Function of the Inpatient Instalation (next)

NO	SPACE NEEDED	MAGNITUDE	FUNCTION
15	High Care Unit (HCU)	9m ² /bed	Function : 1. Intensif care 2. 4 beds User : 1. Patients with special circumstances / emergencies
16	Isolation Treatment Room	12m ² /bed	Function : 1. Place for infectious patients 2. 1 isolation room User : 1. PPatients with infectious diseases

(Source : Permenkes RI No.24, 2016)

HEALTH

HOSPITAL

Pediatric Nursing Unit



LEGEND :

- | | | | |
|-----------------------------------|-------------------------------------|-------------------------------|------------------------------------|
| 1. SINK INFANT'S CRIB | 19. LOCKERS | 37. WINDOW SEAT | 55. SHELF ABOVE |
| 2. CRIB | 20. SINK WITH SPOUT | 38. STORAGE CABINET | 56. VISION PANEL CLEAR WIRE GLASS |
| 3. ADJUSTABLE YOUTH BED | 21. CLEAR GLASS | 39. SLIDING DOORS | 57. MAYO TABLE |
| 4. ADJUSTABLE HOSPITAL BED | 22. CLEAR WIRE GLASS | 40. BOOKCASE | 58. EXAMINING LIGHT |
| 5. ROCKING CHAIR WITH ARM REST | 23. DOOR, UPPER PANEL CLEAR | 41. CONFERENCE TABLE | 59. EXAMINING TABLE |
| 6. INFANT SCALE | 24. BULLETIN BOARD | 42. MULTIPURPOSE TYPE TABLE | 60. INSTRUMENT TABLE |
| 7. SINK WITH SPOUT | 25. CUBICLE CURTAIN | 43. EXECUTIVE TYPE DESK | 61. AUTOMATIC ASCENDING TRAYVEYOR |
| 8. DEPRESSED FLOOR SINK | 26. DETENTION SCREEN | 44. WASTE RECEPABLE | 62. AUTOMATIC DESCENDING TRAYVEYOR |
| 9. MOP BUCKETS ON ROLLER CARRIAGE | 27. PORTABLE TV ON STAND | 45. FILLING CABINET | 63. DUMBWAITER |
| 10. WET-DRY VACUUM MACHINE | 28. EASY CHAIR | 46. ELECTRIC CLOCK | 64. BUILT-IN BOOKCASE |
| 11. SMALL ENCLOSED CART | 29. SOFA | 47. REFRIGERATOR | 65. LAVATORY |
| 12. ICE-MAKING MACHINE | 30. CIRCULAR TYPE CHART | 48. PNEUMATIC TUBE STATION | 66. VIEW PANEL WITH SAFETY GLASS |
| 13. LAVATORY | 31. MEDICATION CART | 49. COUNTER, OPEN BELOW | 67. VENDING MACHINES |
| 14. SINK WITH SPOUT | 32. SOILED LINEN HAMPER | 50. RECESSED DOUBLE | 68. UNDERCOUNTER REFRIGERATOR |
| 15. UTILITY SUPPLY CART | 33. CHALKBOARD | 51. GRADUATED SHELVING | |
| 16. BATHTUB, NORMAL HEIGHT | 34. PROJECTION SCREEN, ROLL-UP TYPE | 52. SINK WITH SPOUT | |
| 17. BATHTUB, PEDESTAL TYPE | 35. GRAB BAR | 53. CLINICAL SINK | |
| 18. BEDSIDE CABINET | 36. DESK WITH DRAWER | 54. ADJUSTABLE METAL SHELVING | |

Image 2.3 Inpatient Instalation

(Source : Time Saver)

3. Accident and Emergency Department (UGD)

The ER has a more detailed space component. The need for the amount of space, prototype and also the function of each space will be described in the following table:

Table 2.3 Space need, Magnitude, and Function of the UGD

NO	SPACE NEEDED	MAGNITUDE	FUNCTION
1	Triase Room	Min 25m ²	Function : 1. Pemilahan kasus kegawatan untuk menentukan kegawatan kasus dari P0-P3
2	Room P0	Min 36m ²	Function : 1. Pasien meninggal 2. Kode warna, hitam
3	Room P1	Min 36m ²	Function : 1. Cidera berat memerlukan penanganan cepat 2. Kode warna, merah
4	Room P2	Min 36m ²	Function : 1. Pasien memerlukan bantuan namun 5dengan cedera kurang berat 2. Kode warna, kuning
5	Room P3	Min 36m ²	Function : 1. Pasien dengan cidera minor 2. Kode warna, hijau
6	Action Room	Min 7.2 m ² /table	Function : 1. Melakukan tindakan ringan kepada pasien 2. Dibutuhkan 2 meja tindakan
7	Decontamination and Sterilization Room	Min 6m ²	Function : 1. Membersihkan dan mensterilkan alat-alat
8	Cito Radiology Room	Min 6m ²	Function : 1. Rongsen
9	Toilet Officer	2-3 m ²	Function : 1. Toilet 2. Cleaning User : 1. Employee
10	Patient toilet	2-3 m ²	Function : 1. Toilet 2. Cleaning User : 1. Patient
11	Locker	As needed	Function : 1. Saving things User : 1. Nurses
12	Pantry	As needed	Function : 1. Rest for the employee User : 1. UGD employee
13	Trolley Parking Space	Min 2m ²	Function : 1. Keeping trolley
14	The gurney room	Min 3m ²	Function : 1. Keeping gurney

(Source : Permenkes RI No.24, 2016)

The Emergency Department at the hospital scale has a complex layout with many types of rooms. The time saver collides the room inside the ER in great detail.

4. Pharmacy Instalation

Pharmacy installations have more detailed room components. The need for the amount of space, prototype and also the function of each space will be described in the following table:

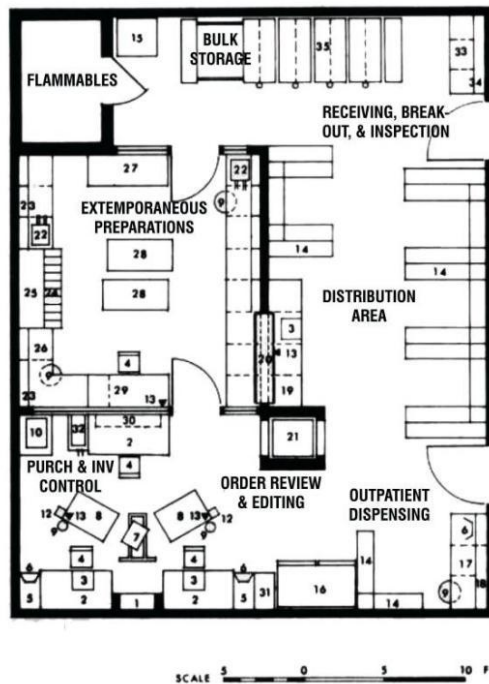
Table 2.4 Space need, Magnitude, and Function of the Pharmacy Instalation

NO	SPACE NEEDED	MAGNITUDE	FUNCTION
1	Administration room	3 - 5 m ² /Employee	Function : 1. Recapitulate patient data User : 1. Asisten apoteker 2. Apoteker 3. Drug warehouse clerk
2	Room Head of Pharmacy Installation Staff	As needed	Function : 1. Privacy of the chief pharmacy staff User : 1. 1 chief pharmacy
3	Waiting Room	1 - 1.5 m ² /people	Function : 1. Provide a place to wait for a queue User : 1. Patient 2. Patient Family
4	Pantry	As needed	Function : 1. Rest for the employee User : 1. Employee
5	Patient toilet	2-3 m ²	Function : 1. Toilet 2. Cleaning User : 1. Patient
6	Visitor's Toilet	2-3 m ²	Function : 1. Toilet 2. Cleaning User : 1. Patient Family
7	Toilet Officer	2-3 m ²	Function : 1. Toilet 2. Cleaning User : 1. Employee
8	Satellite Pharmacy Unit	Min 6m ² /asisten apoteker	Function : 1. As a reference for other diabetes clinics User : 1. 1 asisten apoteker

(Source : Permenkes RI No.24, 2016)

Standards for pharmaceutical installations are complete with hospital building references. As discussed in the time-saver, pharmaceutical installations can be divided into standards for 100 patient beds and 300 patient beds. Because this design does not cover a scale as large as a hospital, a standard 100 bed is taken.

HEALTH
HOSPITAL
 Pharmacy



LEGEND :

1. PNEUMATIC TUBE STATION
2. DESK
3. TYPEWRITER, ELECTRIC, NONMOVABLE CARRIAGE
4. CHAIR
5. FILES, INTERMEDIATE HEIGHT
6. FILES, SWINGING PANEL, STRIP INSERT TYPE
7. FILE, REVOLVING ON TWO LEVELS
8. TABLE, MOVABLE, 2 FEET BY 3 FEET
9. WASTE RECEPTACLE
10. PHOTOCOPIER
11. FILE, 2-DRAWER
12. UTILITY POLE
13. TELEPHONE
14. SHELVING, ADJUSTABLE, 12 INCHES
15. SAFE
16. REFRIGERATOR, WITH FREEZER
17. COUNTER, WITH FILE DRAWER, BINS
18. SHELVING, ADJUSTABLE, 7 INCHES
19. COUNTER, DISPENSING
20. TWO-SELF UNIT ABOVE COUNTER
21. DUMBWAITER, OPEN BOTH SIDES
22. CABINET, WALL-MOUNTED
24. BINS, ON TOP OF HOOD
25. HOOD, LAMINAR AIRFLOW, VERTICAL OR HORIZONTAL
26. COUNTER, WITH OPEN ADJUSTABLE SHELVING BENEATH
27. CART, STORAGE
28. CARTS, UTILITY
29. DESK, SMALL
30. BOOKCASE, WALL-MOUNTED
31. FILE CABINET, 5-DRAWER
32. FILE, VISIBLE INDEX TYPE
33. COUNTER, WITH ADJUSTABLE SHELVES BENEATH
34. SHELVING, WALL-MOUNTED, 9 INCHES
35. SHELVING, ADJUSTABLE, RAIL-MOUNTED

Fig. 1 Pharmacy Department in a 100-bed hospital. (From Planning for Hospital Pharmacies, DHEW Pub. No. (HRA)77.4003, U.S. Department of Health, Education, and Welfare, Washington, D.C., 1977.)

Image 2.5 Pharmacy Instalation Layout

(Source : Time Saver)

5. Laboratory Instalation

Laboratory Installation has more detailed room components. The need for the amount of space, prototype and also the function of each space will be described in the following table:

Table 2.5 Space need, Magnitude, and Function of the Laboratory Instalation

NO	SPACE NEEDED	MAGNITUDE	FUNCTION
1	Waiting Room	1 - 1.5 m ² /people	Function : 2. Provide a place to wait for a queue User : 3. Patient 4. Patient Family
2	Sampling / Receiving Room Samples	As needed	Function : 1. Receiving samples User : 1. Laboratorium employee
3	Blood bank	As needed	Function : 1. Save and organize blood reserves User : 1. Blood bank officer
4	Ruang Penyimpanan Bio Material	As needed	Function : 1. Store reagents or ingredients for inspection
5	Equipment Wash Room	As needed	Function : 1. Sterilize consumables
6	Locker	As needed	Function : 2. Saving things User : 2. Nurses

(Source : Permenkes RI No.24, 2016)

Table 2.5 Space need, Magnitude, and Function of the Laboratory Instalation (next)

NO	SPACE NEEDED	MAGNITUDE	FUNCTION
7	Pantry	As needed	Function : 1. Rest for the employee User : 1. Employee
9	Toilet Officer	2-3 m ²	Function : 1. Toilet 2. Cleaning User : 1. Employee
10	Patient toilet	2-3 m ²	Function : 3. Toilet 4. Cleaning User : 2. Patient

(Source : Permenkes RI No.24, 2016)

Time saver distinguishes laboratory coverage within the hospital into 3 types. The type that suits this design is type D with coverage of 40,000 to 75,000 tests per year.

**HEALTH
HOSPITAL
Laboratory**

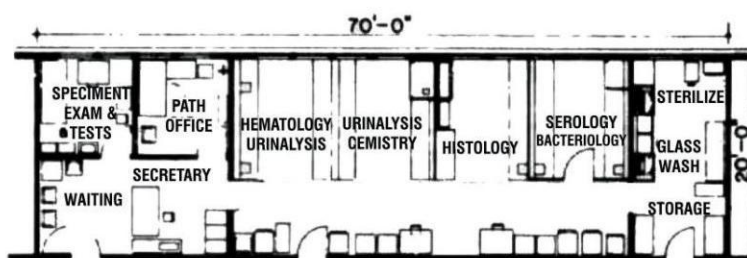


Fig. 2 Plan D alternate plan (40,000 to 75,000 tests annually)

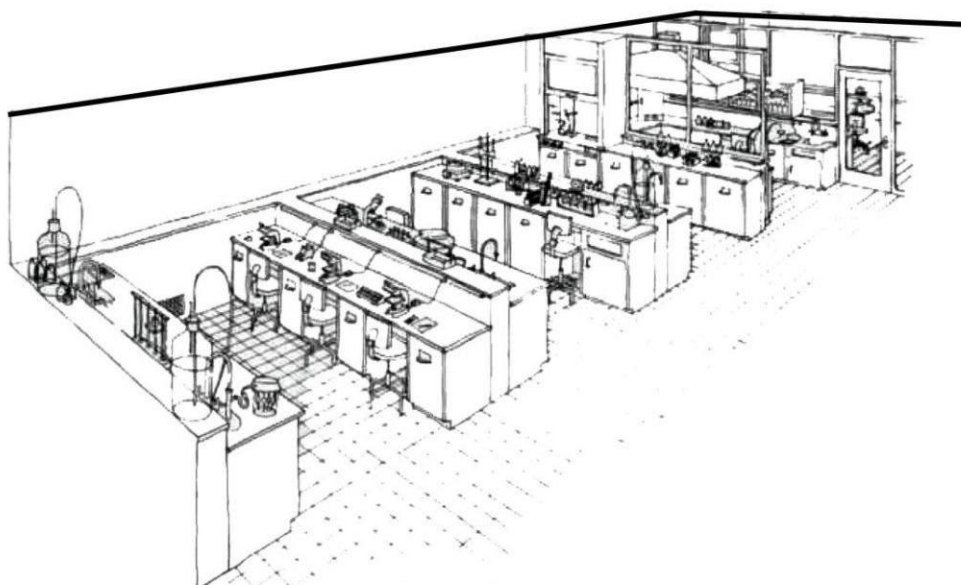


Fig. 3 Perspective view of laboratory for general hospital of 150 to 200 bed

Image 2.6 Laboratory Layout and Perspective

(Source : Time Saver)

6. Main Kitchen Instalation

The Main Kitchen Installation has more detailed room components. The need for the amount of space, prototype and also the function of each space will be described in the following table:

Table 2.6 Space need, Magnitude, and Function of the Main Kitchen Instalation

NO	SPACE NEEDED	MAGNITUDE	FUNCTION
1	Food Reception and Weighing Room	Min 16m ²	Function : 1. receive raw food ingredients
2	Wet Food Storage Room	Min 6m ²	Function : 1. Store wet food
3	Dry Foodstuff Storage Room	Min 9m ²	Function : 1. Store dry food
4	Preparation Room	Min 18m ²	Function : 1. Prep room for the clerk 2. Material preparation room
5	Processing Room	Min 18m ²	Function : 1. Food processing
6	Food Distribution / Presentation Room	Min 9m ²	Function : 1. Needed so that food is not contaminated
7	Washing room	Min 9m ²	Function : 1. Washing used cooking and food processing
8	Nutrition Trolley Storage Room	Min 6m ²	Function : 1. Store a nutrition trolley
9	Kitchen Equipment Storage Room	Min 9m ²	Function : 1. Store kitchenware
10	Personal Protective Equipment Changing Room	Min 6m ²	Function : 1. Prepare officers in the kitchen
11	Janitor	Min 4-6m ²	Function : 1. Control
12	Electric Panel Room	3 m ² (As needed)	Function : 1. Electricity condition
13	LPG Gas Regulation Room	4 m ² (As needed)	Function : 1. Conditions the state of LPG gas 2. Saving LPG gas
14	Kitchen Guard Room	Min 12m ²	Function : 1. Staff break
15	Toilet Officer	2-3 m ²	Function : 1. Toilet 2. Cleaning

(Source : Permenkes RI No.24, 2016)

7. Clinical Nutrition Instalation

The clinical nutrition instalation has more detailed room components. The need for the amount of space, prototype and also the function of each space will be described in the following table:

Table 2.7 Space need, Magnitude, and Function of the Clinical Nutrition Instalation

NO	SPACE NEEDED	MAGNITUDE	FUNCTION
1	Nutritionist Room	Min 10m ²	Function : 1. Consultation regarding the patient's diet
2	Model and Miniature Room	Min 10m ²	Function : 1. Provide a clear picture to the patient regarding the consultation carried out
3	Toilet Officer	2-3 m ²	Function : 1. Toilet 2. Cleaning

(Source : Permenkes RI No.24, 2016)

8. Medical Rehabilitation Instalation (IRM)

The medical rehabilitation instalation has more detailed room components. The need for the amount of space, prototype and also the function of each space will be described in the following table:

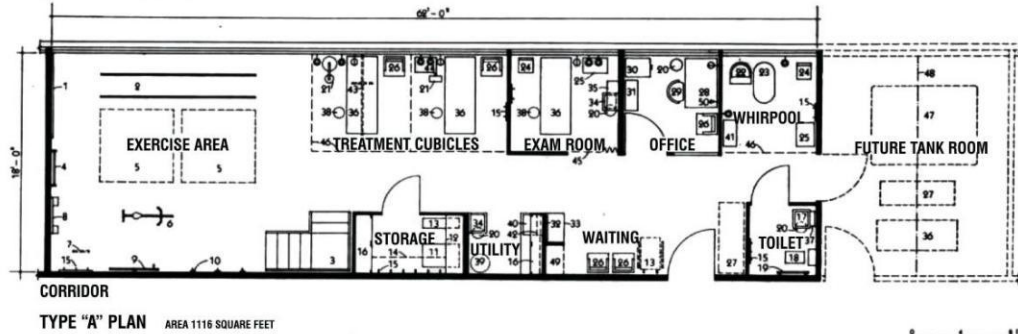
Table 2.8 Space need, Magnitude, and Function of the Medical Rehabilitation Instalation

NO	SPACE NEEDED	MAGNITUDE	FUNCTION
1	Administration room	3 - 5 m ² /Employee	Function : 3. Registration 4. Payment User 1 2. Entry data 2
2	Waiting Room	1 - 1.5 m ² /people	Function : 3. Provide a place to wait for a queue User : 5. Patient 6. Patient Family
3	Examination Room	12 - 24 m ²	Function : 1. Check the patient's condition User : 1. Rehabilitation officer
4	Active Physiotherapy Room	Min 50m ²	Function : 1. Performing active physiotherapy activities without the aid of tools but still under the supervision of officers
5	Passive Physiotherapy Room	Min 12m ² /patient's bed	Function : 1. Carry out physiotherapy activities using tools and assistance from officers
6	Warehouse	As needed	Function : 1. Storing physiotherapy tools
7	Space Head of Medical Rehabilitation Installation	As needed	Function : 1. Head room privacy
8	Pantry	As needed	Function : 2. Rest for the employee User : 2. Employee
9	Toilet Officer	2-3 m ²	Function : 3. Toilet 4. Cleaning User : 2. Employee
10	Patient toilet	2-3 m ²	Function : 5. Toilet 6. Cleaning User : 3. Patient

(Source : Permenkes RI No.24, 2016)

The focus in rehabilitation medicine installations is on the therapeutic functions offered, namely active and passive physiotherapy. Time saver discusses the need for space for therapeutic functions. This need is a standard for hospitals and will be adapted to the needs of smaller scale, namely clinics.

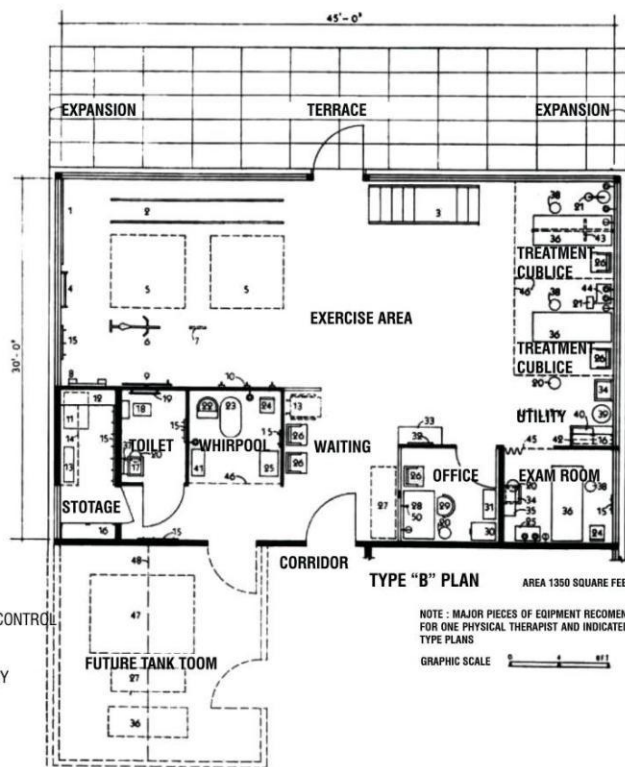
HEALTH
HOSPITAL
 Physical Therapy Department



EQUIPMENT LIST :

1. POSTURE MIRROR
2. PARALLEL BARS
3. STEPS
4. STALL BARS
5. GYM MAT
6. STATIONARY BICYCLE
7. SAYER HEAD SLING ATTACHED TO CEILING
8. PULLEY WEIGHTS
9. SHOULDER WHEEL
10. GYM MAT HOOKS
11. CART WITH OPEN SHELVES
12. OPEN SHELVES
13. WHEEL CHAIR
14. SHELF
15. WALL HOOKS
16. WALL CABINET
17. LAVATORY, GOOSENECK SPOUT
18. WATER CLOSET
19. HAND RAIL
20. WASTE PAPER RECEPTACLE
21. PORTABLE EQUIPMENT
22. ADJUSTABLE CHAIR
23. WHIRLPOOL
24. CHAIR
25. TABLE
26. CHAIR, PREFERABLE WITH ARMS
27. WHEEL STRETCHER
28. DESK
29. SWIVEL CHAIR
30. FILE CABINET
31. BOOKCASE
32. BULLETIN BOARD
33. WALL DESK (COUNTER, SHELF BELOW)
34. LAVATORY, GOOSENECK SPOUT AND FOOT CONTROL
35. WALL CABINET WITH LOCK
36. TREATMENT TABLE, STORAGE BELOW
37. MIRROR AND GLASS SHELF OVER LAVATORY
38. ADJUSTABLE STEEL
39. LAUNDRY HAMPER
40. SINK WITH DRAINBOARD
41. PARAFFIN BATH
42. GLASS SHELF OVER SINK
43. OVERBOARD TRAPEZE
44. TREE SINGLE OUTLETS
45. FOLDING DEER
46. CUBICLE CURTAIN
47. UNDER WATER EXERCISE
48. OVERHEAT LIFT
49. COAT RACK
50. TELEPHONE OUTLET

GRAPHIC SCALE 0 4 8 FT
 NOTE : MAJOR PIECES OF EQUIPMENT RECOMMENDED FOR ONE PHYSICAL THERAPIST AND INDICATED ON TYPE PLANS



NOTE : MAJOR PIECES OF EQUIPMENT RECOMMENDED FOR ONE PHYSICAL THERAPIST AND INDICATED ON TYPE PLANS
 GRAPHIC SCALE 0 4 8 FT

Image 2.7 Therapy Unit
 (Source : Time Saver)

9. General Support Facilities

The general support facilities has more detailed room components. The need for the amount of space, prototype and also the function of each space will be described in the following table:

Table 2.9 Space need, Magnitude, and Function of the General Support Facilities

NO	SPACE NEEDED	MAGNITUDE	FUNCTION
1	Board of Directors' Room	As needed	User : 1. Main directur
2	Meeting and Discussion Room (Main Hall)	As needed	User : 1. All the employee
3	Space Chief of the Medical Committee	As needed	User : 1. Specialistic doctor
4	Head of Nursing Room	As needed	User : 1. Head nurse
5	Head of Medical and Nursing Services Room	As needed	User : 1. Head of Service 2. Head of nursing
6	Chief of Finance Room	As needed	User : 1. Financial officer, accountant
7	Space Head of Medical Support Services	As needed	User : 1. Head of Pharmacy 2. Clinical nutrition head 3. Head of the public kitchen
8	Space Head of Education and Training and HR	As needed	Function : 1. Serve procedures for employees who want to continue their education and research 2. Serve apprenticeship activities User : 1. Head of Education and Training 2. Head of SDM
9	General and Operational Room	As needed	Function : 1. Planning 2. Data processing 3. TU Room (Administration)
10	SPI Room (Internal Oversight Unit)	As needed	Function : 1. Conduct an audit to see the sustainability of SOP (Standard Operating Procedure)
11	Data Archive Room	As needed	Function : 1. Maintaining the staffing file 2. Guide room 3. Archive of incoming letters
12	Visitor Waiting Room	1 - 1.5 m ² /user	Function : 1. Waiting for a queue User : 1. Visitor
13	Pantry	As needed	Function : 1. Resting place for officers User : 1. Medical rehabilitation officer
14	Employee toilet	2-3 m ²	Function : 1. Toilet 2. Cleaning User : 1. Employee
15	Visitor's toilet	2-3 m ²	Function : 1. Toilet 2. Cleaning User : 1. Visitor

(Source : Permenkes RI No.24, 2016)

2.1.3 User Review

Diabetes patients in Malang with inpatient facilities naturally require special treatment compared to outpatients. Likewise with patients who are being rehabilitated and also patients who are currently on treatment will need a different treatment.

Different experts are needed to handle any complaints or complications from Diabetes patients. As explained in the Republic of Indonesia Ministry of Health No. 2014 9 Article 11, concerning employment in the clinic, namely:

- Outpatient Clinics consist of medical staff, nursing staff, other Health Workers, and non-health workers as needed.
- Inpatient Clinic staff consists of medical staff, pharmacy staff, nursing staff, nutrition staff, health analyst staff, other Health Workers and non-health staff according to needs.
- Types, qualifications, and the number of other Health Workers and non-health workers as referred to in paragraph (1) and paragraph (2) are adjusted to the needs and types of services provided by the Clinic. (RI Ministry of Health no. 09 of 2014, Article 11)

This design is included in the Main Clinic as in the previous discussion, so that regulation is needed in the next article, namely Article 12 paragraph 2, namely, "Medical personnel in the main Clinic providing medical services consist of at least 1 (one) specialist doctor and 1 (one) a doctor as a service provider. From the regulation of the Ministry of Health, it can be concluded that the Users of Diabetes and Endocrinology Healthcare Center are:

A. Patient

1. Diabetes mellitus patients
2. Diabetes Insipidus patients

As explained in the User's boundary, the link between the biophilic approach and the age grouping of patients is the difference in design for each age group.

- Children are given a safe design by avoiding sharp corners and more attractive colors.
- Adults and the elderly, have more neutral designed rooms with lots of natural exploration elements to calm the mind.

B. Medical Power

1. General practitioner
2. Endocrinologist
3. Doctors specializing in internal medicine (Diabetes)
4. Podiatrist experts

5. Eye doctor
6. Nursing power
7. Power of health analysis
8. Pharmaceutical strength
9. Nutrition
10. Other health workers

C. Non-Health Supporting Energy

1. Administration section
2. Accounting section
3. Receptionist
4. The cleanliness section in the building
5. Landscape cleanliness section
6. Security section
7. Mechanical parts
8. The IT officer section

2.1.4 Precedent Studies

In the study of precedents related to objects, there are several aspects of building functions that must be met and studied in the precedents related to this design, these aspects are the existence of several installations needed. From these needs, precedent studies that can be drawn from each space requirement are as in the following table:

Table 2.10 Precedent Studies in Accordance with Space Needs

NO	DESIGN NEEDS	PRESEDENT STUDY
1	Outpatient Instalation	RSU Dr. Soetomo Surabaya Outpatient Instalation
2	Inpatient Instalation	RSUD Aji Batara Agung Dewa Sakti, Kutai Kartanegara atau RSUD Samboja, Inpatient Instalation
3	Emergency Unit (UGD) Instalation	UGD Karya Dharma Hospital
4	Pharmacy Instalation	Siloam Hospital Surabaya
5	Laboratory Instalation	Laboratorium Now Wakefield Based SNF (UK) Ltd.
6	Public Kitchen Instalation	RSSA Malang Nutrition Installation
7	Nutrition Instalation	RSSA Malang Nutrition Installation
8	Medical rehabilitation Instalation	Erza Lemarpe Medical Rehabilitation Centre

(Source: Personal Data)

The precedent study will discuss several aspects needed in this design. These aspects will later be used as references and references in the design and in the next chapter. These aspects include zoning, circulation and also safety lines. Zoning is related to the proportion of space in the plan. Circulation is related to the patient's travel path in the building. Safety lines related to stairs and elevators.

1) Outpatients in General Hospital Dr. Soetomo Surabaya

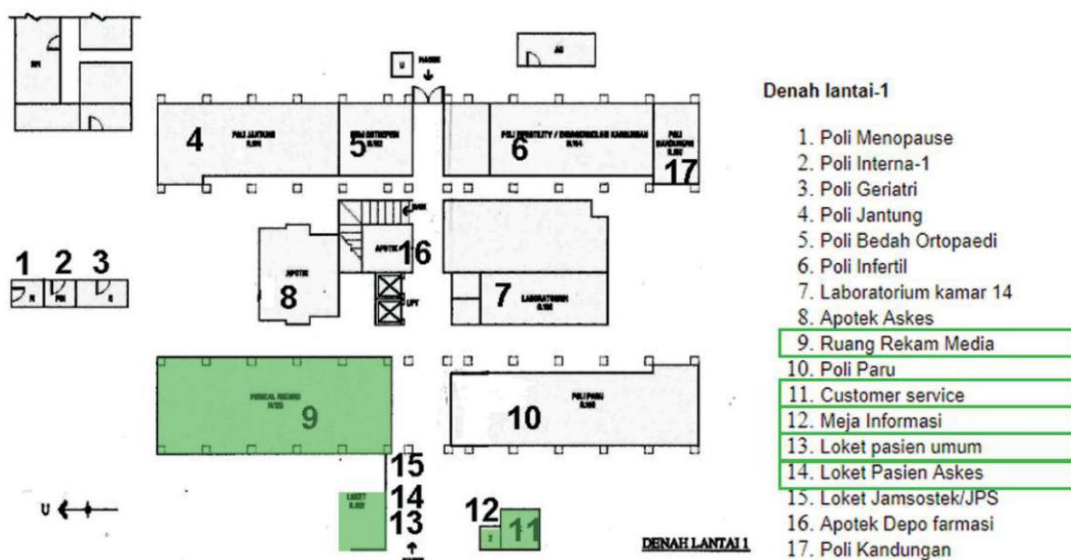


Image 2.8 : 1st Floorplant Outpatients General Hospital Dr. Soetomo Surabaya
(Source : irj3.tripod.com)

Visible proportions of medical records and customer service can be a reference. Judging from the standard size of the door is 80 cm, the amount of medical record space compared to customer service is 10 : 1 with the calculation :

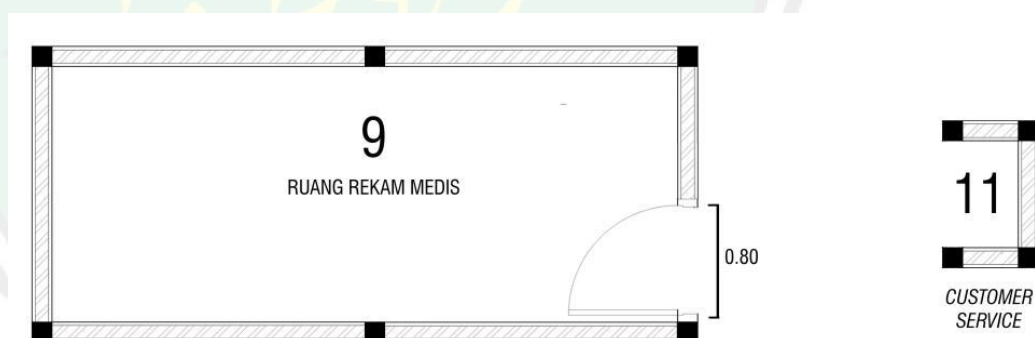


Image 2.9 Comparison of the amount of space
(Source : Personal Data)

Medical Record Room	Customer Service Room
Large : $1.8 \times 4.3 = 7.74 \text{ m}^2$	Large : $0.8 \times 1.0 = 0.8 \text{ m}^2$
7.74 m^2	0.8 m^2
9.6	1
(rounded off)	
10	1

2) Inpatients RSUD Samboja

Samboja District Hospital is a hospital in Kutai Kartanegara. This hospital is a referral hospital in East Kalimantan because the facilities are already very adequate and comprehensive. One of the excellent facilities is the Inpatient Installation which has been developed according to hospital building standards.

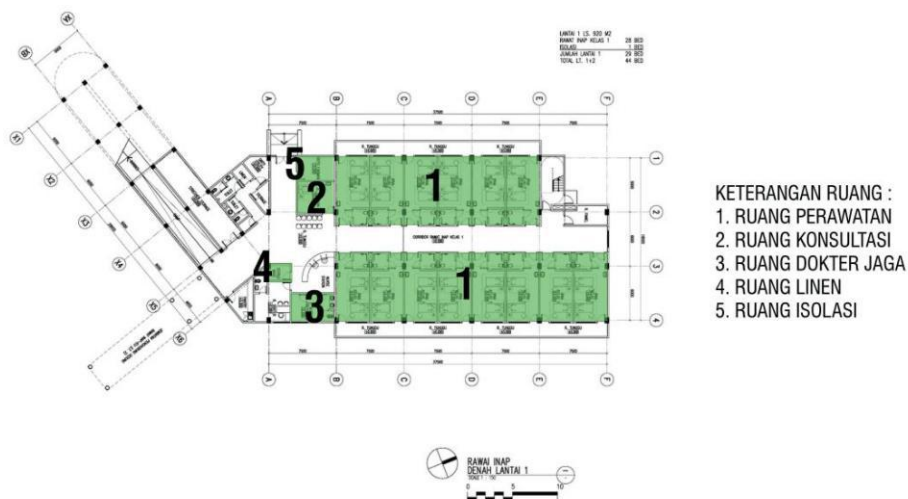


Image 2.10 1st Floorplant Inpatients General Hospital RSUD Samboja
(Sourcer : 3.bp.blogspot.com)

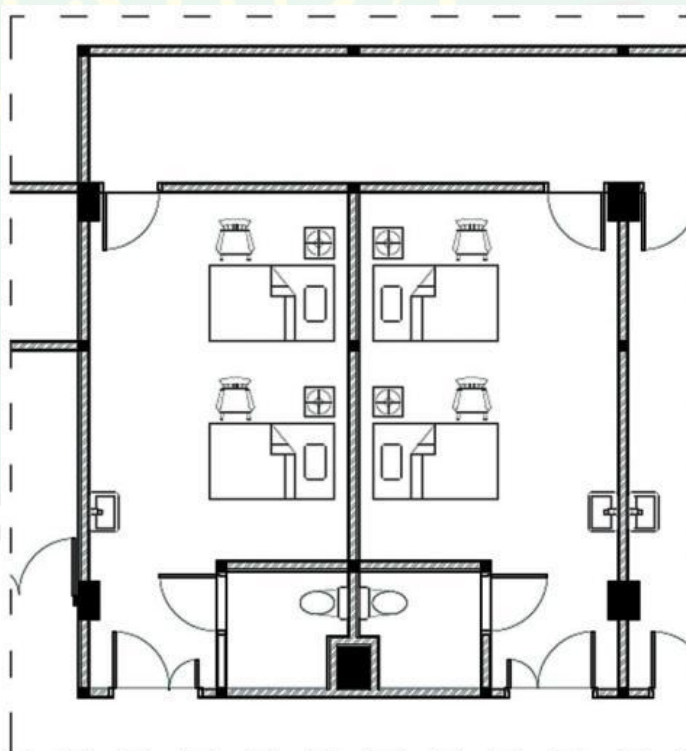


Image 2.11 1st Floorplant Inpatients
(Source : Personal Data)

From the enlargement plan of the inpatient room, it was found that one room was found:

- Two beds
- Two waiting chairs
- One sink
- One bathroom inside
- Dua small cabinet table for putting food and medicine
- Teras incorporated into one

From the division of the proportion of the room, circulation is very important so that the division of space for circulation up to 50: 50 with patient beds. The estimated amount of space in this inpatient room is 40 with a capacity of two patients.

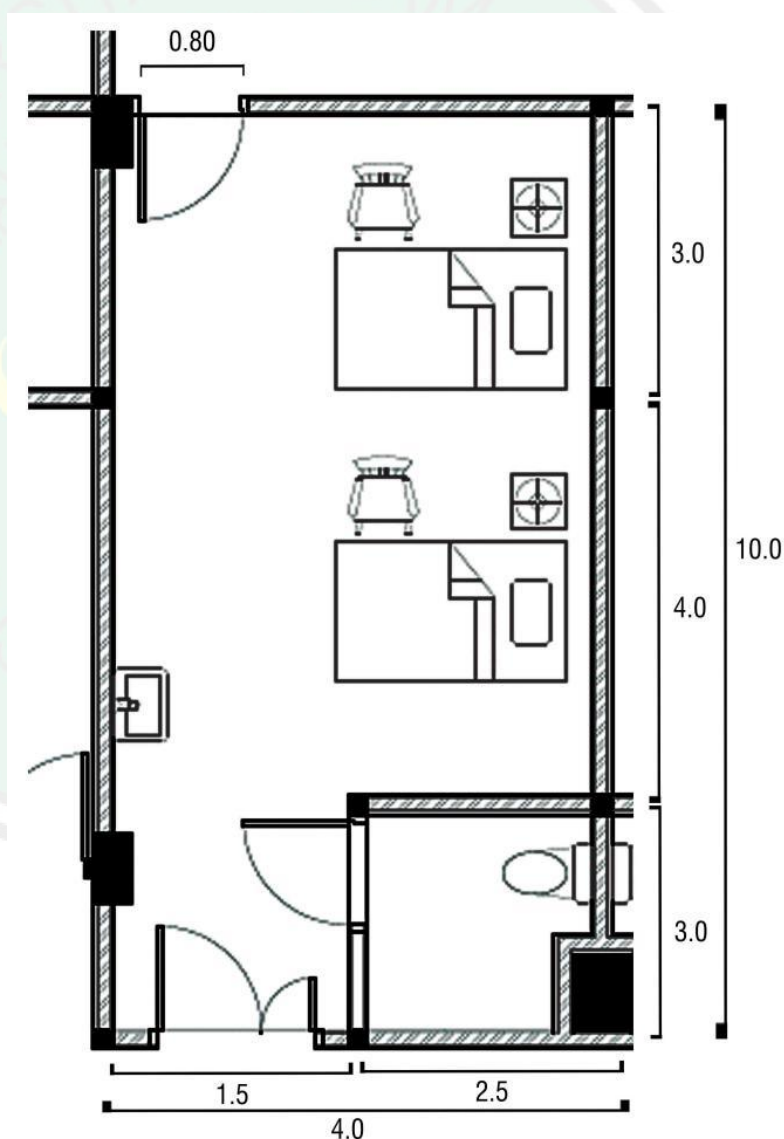


Image 2.12 1st Floorplant Inpatients Magnitude
(Source : Personal Data)

3) Accident and Emergency Department (UGD) Karya Dharma Hospital



Image 2.13 Floorplan (UGD) Karya Dharma Hospital

(Source : s3.amazonaws.com)

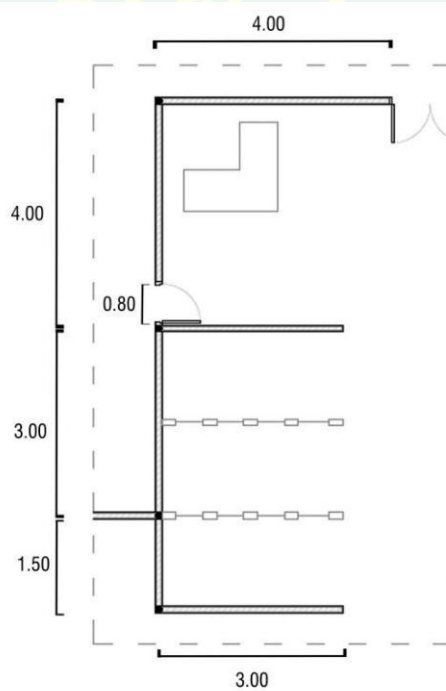


Image 2.14 Triage floorplant

(Source : Personal Data)

4) Pharmacy Instalntion at Siloam *Hospital* Surabaya

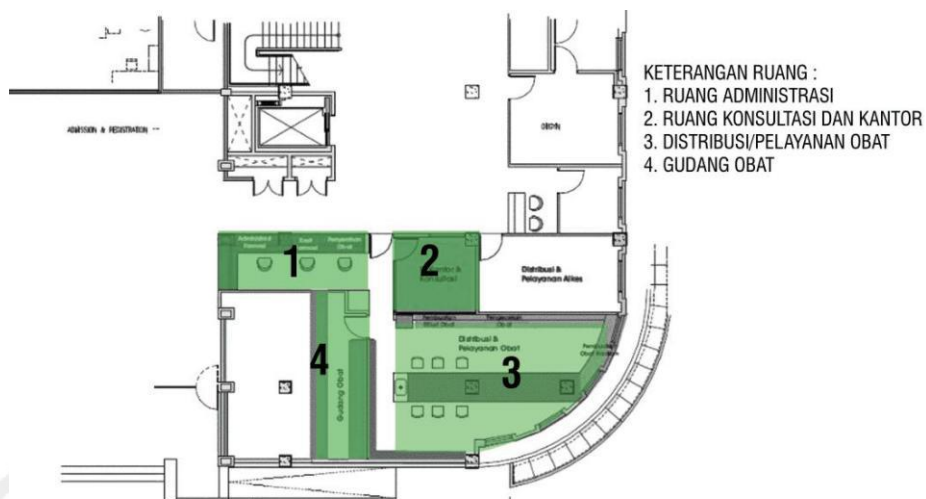


Image 2.15 Pharmacy Instalation Floorplan at Siloam *Hospital* Surabaya
(Source : repository.wima.ac.id)

From this plan, it can be studied further related to the distribution space of drug services, which is indicated by code number three on the floor plan drawing. There is one main door with four windows to connect with patients. Area-based on the door width reference obtained an area of $72.26 m^2$ with some furniture, namely:

- Six chairs
- Long table
- Sticky table

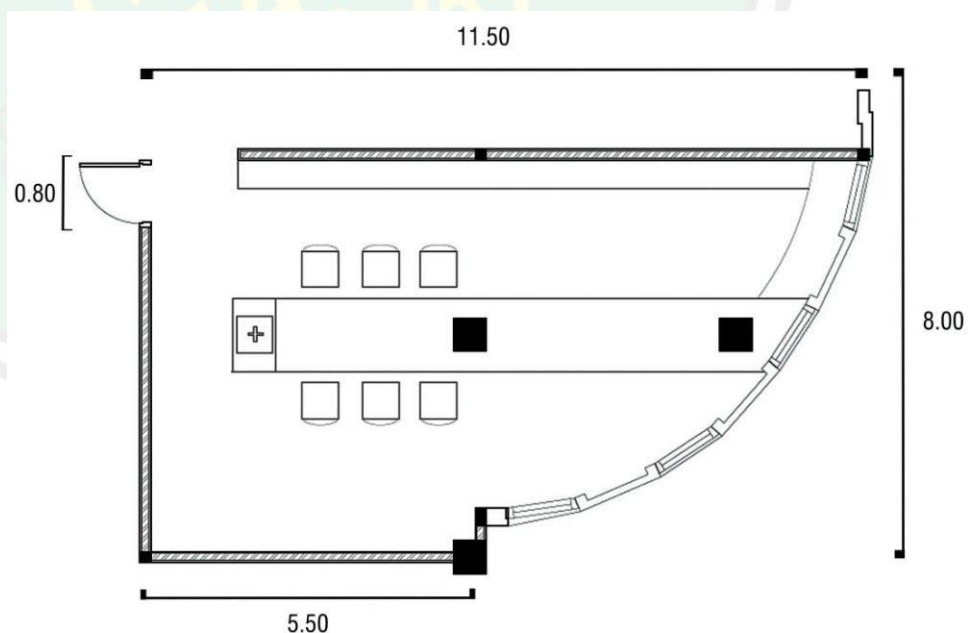


Image 2.16 Plan of distribution of drug services
(Source : Personal Data)

5) Laboratory at Now Wakefield Based SNF (UK) Ltd.



Image 2.17 Floor Plan of Laboratory Installation at Now Wakefield Based SNF (UK) Ltd.

(Source: [www. avantauk.com](http://www.avantauk.com))

The laboratory installation has a sampling and reception chamber which is the core of the laboratory installation. The room is marked by number one. Details of the space, can be translated into the following picture,:

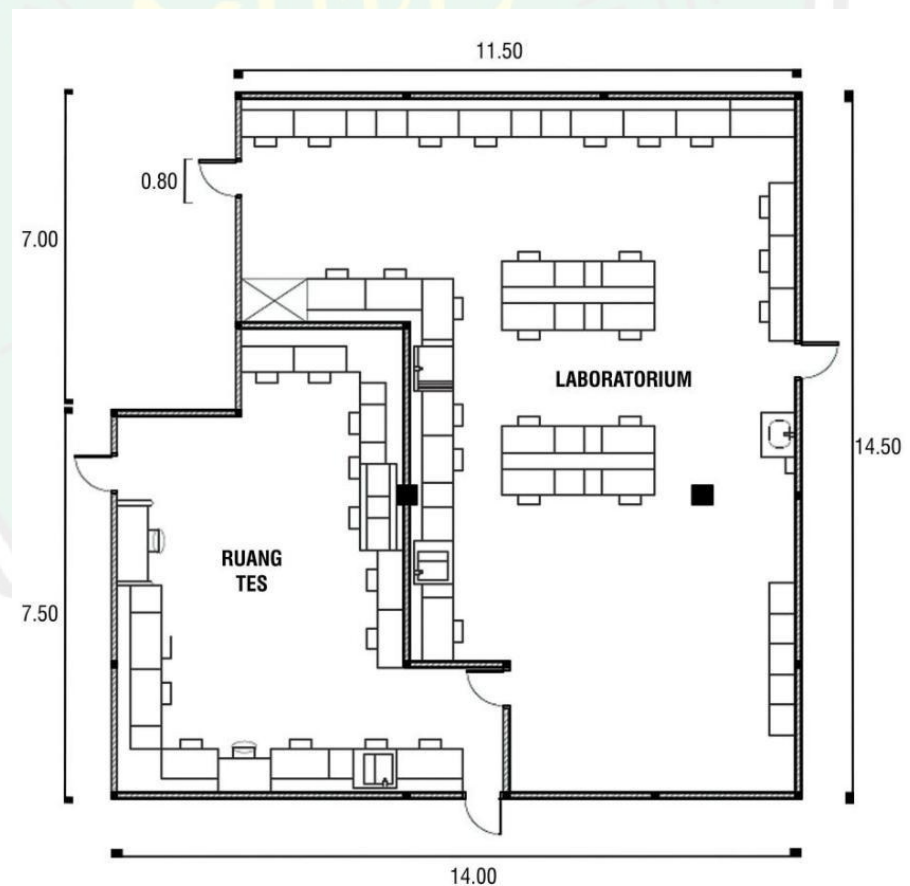


Image 2.18 Room layout for taking and receiving samples

(Source : Personal Data)

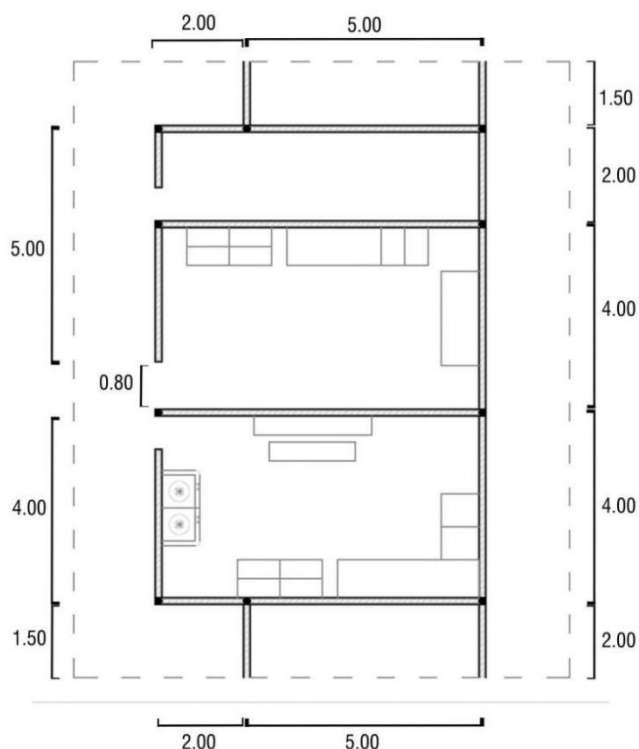


Image 2.20 Floorplan of Clinical Nutrition at RSSA Malang
(Source : Personal Data)

7) Medical Rehabilitation (IRM) Erza Lemarpe Medical Rehabilitation Centre

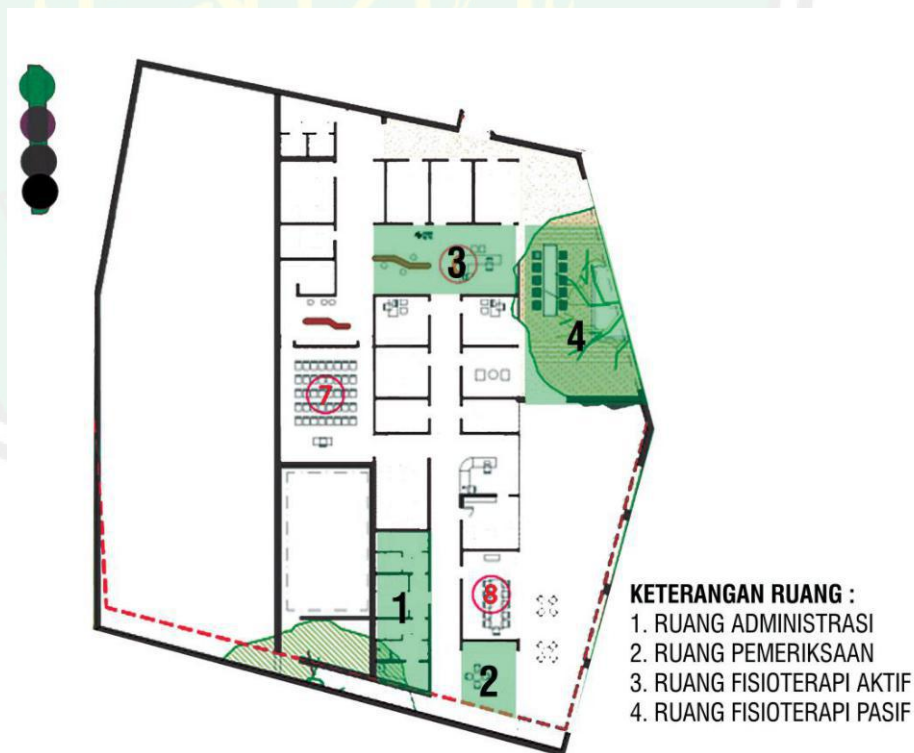


Image 2.21 Floorplan (IRM) Erza Lemarpe Medical Rehabilitation Centre
(Sumber :www .archdaily.com)

In IRM or Medical Rehabilitation Installation, there is an examination room marked with room code number two. The total area for this unit is 88, divided into two functions. This space can be learned from the placement in it, which is like the following picture.

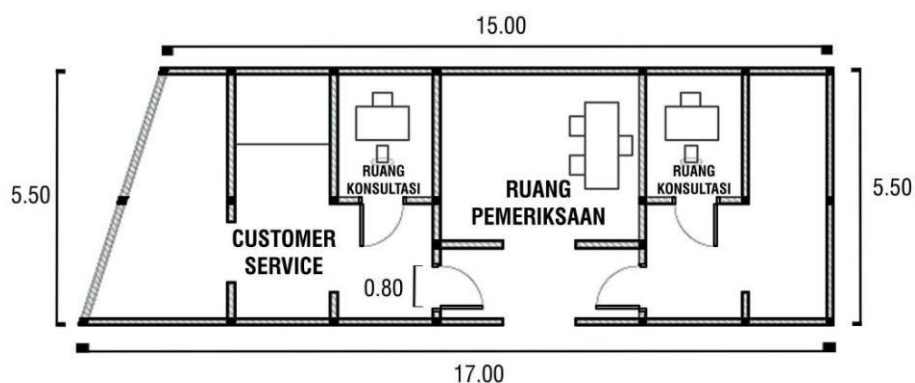


Image 2.22 Inspection room floorplan
(Source : Personal Data)

2.2 DESIGN APPROACH REVIEWS

The approach used in this design is reviewed from various aspects, starting from the definition and explanation of the approach, the study of building precedents that use the same approach and the principle of application approach in the design.

2.2.1 Definition and Explanation of the Approach

Biophilic comes from the word Biophilia. Biophilia is an inherent human tendency to connect with nature even in the modern world that continues to be important for human health and physical well-being (Wilson 1986, Kellert and Wilson 1993, Kellert 1997, 2012: 3). That explanation becomes more important because humans cannot be separated from the design. Biophilic design at any scale begins with simple questions about how the built environment affects the natural environment and how the natural environment can influence human experience (Kellert, 2008: vii)

Biophilic design or Biophilic Architecture was chosen as the approach in the design of this building because of the suitability and ability of Biophilic Architecture principles in resolving issues that occur in the design. These principles were stated by Stephen R. Kellert in 6 main principles in designing buildings with a Biophilic approach. These principles are:

1. Environmental features
2. Natural shapes and forms
3. Natural patterns and processes
4. Light and space
5. Place based relationships

6. Evolved human nature relationships

The architectural designs proposed by Kellert are related to the medical and non-medical healing process of diabetic patients. Treatment for Diabetes Mellitus and Diabetes Insipidus patients is not the same. There are differences in the handling of diabetes patients.

In Diabetes Mellitus, based on Amir Sam, 2009, insulin injection is needed along with dietary advice. The goal of treatment in Diabetes Mellitus is to mimic the physiology of insulin as closely as possible with a normal human condition. In the initial education package, diabetes patients will be provided with:

1. Knowledge/education to patients about Diabetes Mellitus (DM) to reduce excessive stress.
2. Glycerin control to determine the condition of the patient's sugar levels remain stable.
3. Monitoring and handling of other disease complications due to Diabetes Mellitus independently and handling from experts.
4. Monitoring and treatment of cardiovascular risk.

Diabetes Insipidus including rare cases and not epidemics such as Diabetes Mellitus. Diabetes mellitus (DI) is divided into 3 main focuses in the division of disease, namely Central DI, Nephrogenic DI and Dispogenic DI (Sam, 2009: 107). In practice, the three types of DI have different treatments, namely:

1. Central DI

In its treatment, using desmopressin, which is synthesized from ADH or AVP.

The practice can be:

- Giving Intramural, preferably at night rest.
- Oral administration, preferably at bedtime.
- Vaccine administration (subcutaneous injection).

2. Nephrogenic DI

In this type of DI treatment, they are:

- A low diet of sodium, steroids, and thiazides.
- If the patient is still stressed and cannot change lifestyle, then desmopressin is allowed in this case

3. Misogynous DI or Primary Polydipsia

The third type of DI is DI which attacks the patient's psychiatric disorders so that the patient cannot focus on medication and excessive stress. So it needs to divert attention.

The role of Biophilic Architecture as a bridge in the design of Diabetes and Endocrinology Healthcare Center can be seen from the patient's need to reduce stress due to being diagnosed with Diabetes Mellitus. As in Professor Yosinori Otsuka's experiment that has been presented in the previous explanation, that stress makes it difficult for patients to recover, therefore the biophilic architecture approach bridges how patients can well-be undergo treatment without stress by facilitating interaction with nature and self-monitoring through virtual interaction.

2.2.2 Precedent Study, Council HOuse 2 (CH2) Melbourne, Australia

Council House 2 or commonly known as CH2 building is a building that applies the principles of biophilic architecture. The selection of this object is based on Kellert's explanation in his book which states that this building is an example of a building that has successfully applied biophilic design in its design.

The building which was built in Melbourne Australia has several specifications according to Arch daily, 2013, namely:Architec :
DesignInc

- Location : Melbourne VIC, Australia
- Building Category : Public Administration BUilding
- Area : 12.500 m²
- Photo : Dianna Snape and David Hannah
- Contractor : George Fethers
- Client : Melbourne
- Consruction Cost : \$51M

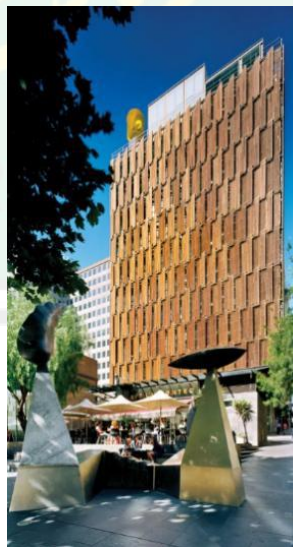


Image 2.23 CH2 Building
(Source: www.archdaily.com)

The Mayor of Melbourne has a goal to make this building a holistic building for its users. To achieve these objectives, the design used promotes more interaction between cities and nature, where both are interdependent (Arch daily, 2013). This 10-story building was praised because of the myriad of innovations and ecological designs led by Mick Pearce (Kellert, 2008: 343).

CH2 was piloted by the city of Melbourne in its mission in 2020 to achieve a pollution rate of 0% in urban and municipal areas. So far this is expected to be achieved by making special buildings that rely on passive energy systems. In this system, nature is used as a facade inspiration where climate trends, ventilation ducts are integrated with daylight and corrugated concrete floor structures (Arch daily, 2013).

One of the reasons that the government hopes that this building will succeed is because of the application of biophilic principles as stated by Kellert, 2008: 343, namely:

Table 2.11 Application of Biophilic Principles in Buildings


No	Principle Applications	Images	Information
1	<p><i>Environmental features</i></p> <p>APPLICATIONS : Use of plants as facades.</p>	 <p>(Use of balconies and plants as facades)</p>	<p>The use of balconies as access to lookout as well as a container for plant elements provides added value to the building. Plants as facade elements are able to double-function as a transitional space to reduce the temperature of the outside air when the air moves into the building. This element is in accordance with Kellert's principle number 1 namely:</p> <p>Principles of the Surrounding Environment Plant Points: "Plants are a major human need as a source of nutritional and other food-related to safety and comfort."</p> <p>Facade Reveal Points: "Buildings with facades and roofs in the form of plants give the effect of satisfaction and interest."</p>

Table 2.11 Application of Biophilic Principles in Buildings (next)



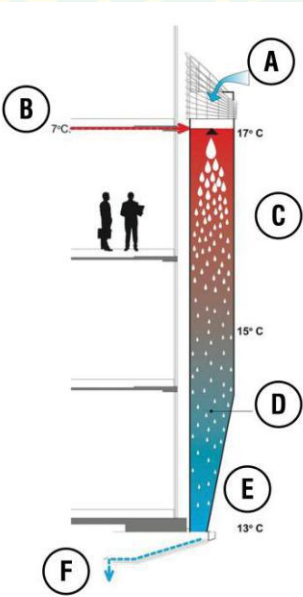
No	Principle Applications	Images	Information
2	<p><i>Environmental features</i></p> <p>APPLICATIONS : Optimized solar orientation.</p>	 <p>(Wide opening)</p>	<p>Wide openings but still cool makes this building very comfortable to use in activities. This is in accordance with Kellert's principle number 1 namely:</p> <p>Principles of the Surrounding Environment Sun Light Points: "Daylight is very much-needed in design when building a building."</p>
3	<p><i>Natural shapes and forms</i></p> <p>APPLICATIONS : The selection of natural formations of oval and circular shapes is applied to the garden design</p>	 <p>(Oval and circular shape in the garden design at Council House 2)</p>	<p>The application of natural formations is needed to stimulate the user to relax and not be stressed while in the room. Formations that are usually used in garden designs, namely:</p> <ol style="list-style-type: none"> 1. Oval 2. Circular 3. Eggs 4. Sheels
4	<p><i>Natural patterns and processes</i></p> <p>APPLICATIONS : A "shower tower" fabric that directs cold air into the retail space at ground level. Rainwater harvesting to provide stash of water used for toilet water and irrigation.</p>	 <p>(Rainwater harvesting process by shower tower)</p>	<p>AIR ENTRY (A) Air enters through the louver at the top of the shower tower along with the fall of water.</p> <p>ENTRY WATER (B) At the beginning of the cooling process, water from the phase change has a temperature of 17 C.</p> <p>EVAPORATION REFRIGERATOR (C) When waterfalls through the shower tower, the water also slightly evaporates. This process cools water droplets during the process of falling in the shower tower.</p> <p>SHOWER TOWERS (D) 5 lightweight pipes made of fabric with a height of 13 m and a diameter of 1.4 m.</p> <p>AIR OUT (E) At the end of the cooling process, water will be channeled back to the phase change material at 13 C.</p> <p>AIR OUT (F) Air entering from the cooled shower roof is used to cool the first floor.</p>

Table 2.11 Application of Biophilic Principles in Buildings (next)

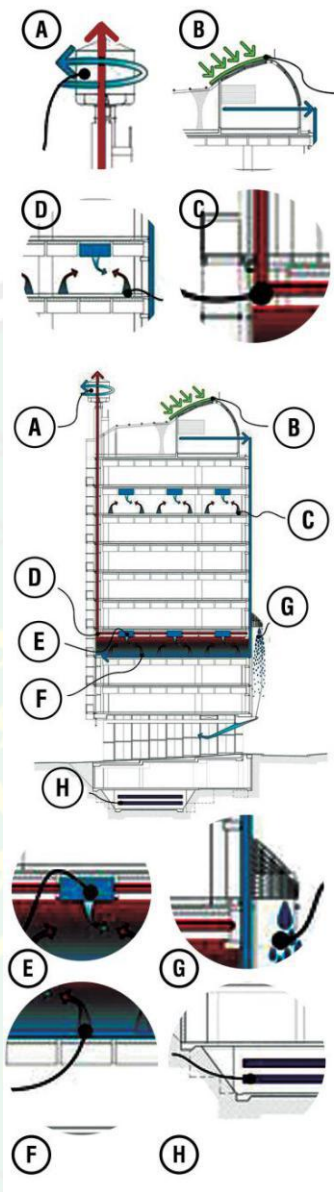
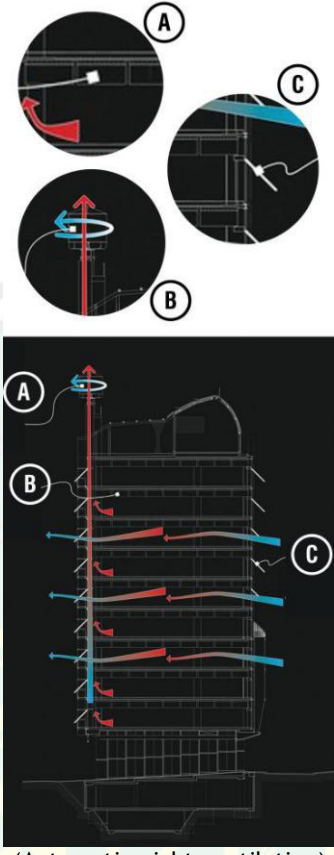
No	Principle Applications	Images	Information
5	<p><i>Natural patterns and processes</i></p> <p>APPLICATIONS : The process of power generation with wind power is carried out to maximize the natural resources that are around the building.</p>	 <p>(Wind power generation process)</p>	<p>ENERGY FROM ROOF (A) These include photovoltaic cells, hot water panels, gas power plants, and wind turbines.</p> <p>WIND TURBINE (B) Winds spin the turbines produce electricity during the daytime and help reduce heat.</p> <p>HEALTHY AIR (C) 100% outside air is supplied through vertical channels that deliver air from floor to floor.</p> <p>EXHAUST (D) A high exhaust roof ensures the total emptying of warm air in the space inside the roof.</p> <p>COOLING PANEL (E) The user experiences cooling from hot to cold radiation by cooling the hot roof.</p> <p>AIR REPLACEMENT (F) Fresh air enters at low speed through automatically controlled floor vents.</p> <p>SHOWER TOWERS (G) Falling air and water provide cold water for building floors and cold air to supply the first floor and retail cooling.</p> <p>MATERIAL PHASE CHANGE (H) Water is channeled in the phase change to be cooled again.</p>

Table 2.11 Application of Biophilic Principles in Buildings (next)

No	Principle Applications	Images	Information
6	<p><i>Light and space</i></p> <p>APPLICATIONS : <i>Sun Shading is a computer controlled louvre to neutralize the western sun</i></p>	 <p>(Laying sun shading on buildings using plants and louver)</p> <p>(A form of sunshading that also functions to insert wind into the building)</p>	<p>This building is the first office building in Australia that meets and is able to be rated 6 stars thanks to its seriousness in arranging space and buildings. Lover which is one of the important factors is controlled automatically so that it can replace air circulation in full every half hour.</p> <p>This element is in accordance with Kellert's principle number 4, namely:</p> <p>The Principle of Light and Room Natural Light Points: "Natural light affects humans in physical and psychological terms. The effect on health, productivity and happiness in the environment."</p>
7	<p><i>Place based relationships</i></p> <p>APPLICATIONS : Reuse office buildings and existing urban land</p>	 <p>(The location of the building is on land that was previously used as another building and reused as Council House 2)</p>	<p>The biophilic design supports the reuse or repair of old buildings to be more environmentally friendly and more useful.</p> <p>This element is in accordance with Kellert's principle number 1 namely:</p> <p>Principles of Place-Based Relations</p> <p>Geography Points: "A sense of security will emerge when the building environment matches the original geographic conditions."</p> <p>Historical Points: "A strong relationship between buildings and history can bring User memory."</p>

Table 2.11 Application of Biophilic Principles in Buildings (next)

No	Principle Applications	Images	Information
8	<p><i>Evolved human nature relationships</i></p> <p>APPLICATIONS : An innovative and mixed natural ventilation system which includes plant filtration, cooling of building ceilings, thermal conditions and night air</p>	 <p>(Automatic night ventilation)</p>	<p>WIND TURBIN (A) The wind brings power to the generator during the daytime</p> <p>TERMAL (B) The heat builds up inside the concrete roof when daytime activities are removed by the cold night wind.</p> <p>NIGHT CLEANING (C) When cleaning at night, ventilation automatically opens. The night air cools the space inside the building.</p>

2.2.3 Methods Used in Designing Precedent Approaches

The design process carried out in the precedent building of the Council House 2 (CH2) approach is using heuristic branching techniques. The Heuristic branching process carried out in the CH 2 design is as follows:

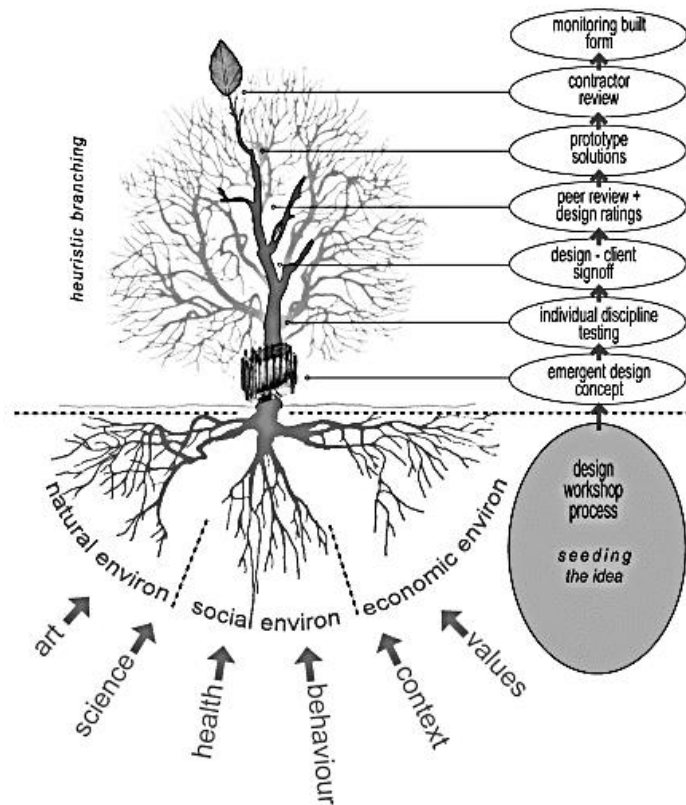


Image 2.24 Heuristic Branching Council House2
(CH 2)

(Source: Stephen Webb, 2005: 2)

From this process when elaborated it will become a series of effective design processes in designing a building with a Biophilic Architecture approach. The process is:

1. Search for Design Ideas

In designing CH2, this process is carried out by gathering experts in their respective fields, such as building art experts, building sciences, health, behavior, community context, and building values. This discussion or workshop activity raises all issues and problems as well as solutions from each of these experts so that they strengthen one another in developing a concept.

From this method, due to the lack of involvement of experts in the design of the Diabetes and Endocrinology Healthcare Center, programming was carried out to obtain the necessary data. The phases in programming are:

- Project profile
- Survey
- Studying the study of literature
- Review data related to building regulations

2. Collection of Concepts

The concept collection process is carried out because the CH2 development plan is based on many experts, not just architects. This has a good effect on the maturity of the concept where there will be no exclusion in the design. Adopting from this method, the design of Diabetes and Endocrinology Healthcare Center is not only based on the author's perspective but also conducts consultations with other experts, such as health experts. The goal is that the goals in the design are not missed and more accurate in the design process by knowing the patient's real needs.

3. Concept Testing

This process involves re-testing by the experts after the concept collection. Tests that have been matured intersect with each other so that the final result is in the form of the core of the actual needs of the CH2 design. The application of this process can be done by analyzing the data and also the issues that have been found. The analysis process is divided into 3 types, namely,:

A. Function / User Analysis

- User Analysis
- Analyze space requirements
- Zoning diagram

B. Site and Shape Analysis

- Sun's analysis
- Wind analysis
- Rain analysis
- Analysis of land requirements related to government regulations
- Access and circulation analysis
- Analyze the view and site boundaries
- Vegetation analysis

C. Building Analysis

- Utility analysis
- Structure analysis.

4. Design Ideas

At this stage, there are many alternative results from the previous concept testing process. These alternatives are discussed again to decide which is best to apply to the building. The alternative chosen is the result of joint thoughts from experts and also slices that cover all Functions so that the building is complete and not deformed as an idea.

5. Design Review

Design reviews are carried out by other experts outside the experts who are involved in the design process. In the case of CH2, the design review process was carried out by PT. Sustainability Energy Authority.

6. Prototype Testing

The prototype used in the test is carried out to determine the efficiency of the design that has been done, the test can be done by architects, interior designers and also economists. As in CH2, testing is carried out to determine the quality of the room, lighting, user behavior when working in buildings.

In the process of designing the Diabetes and Endocrinology Healthcare Center, the prototype can be carried out by surveying the same object with a visit in person to know it clearly.

7. Testing of Contractors

The introduction of design to the contractor at the beginning of the design stage makes the design more mature in order and structure so that it does not become an obstacle in design.

8. Monitoring Post-Occupied

Monitoring is carried out after 12 months the active building is used for activities. The results of post-settlement monitoring are:

- User control level
- The success of environmental quality
- How human adaptation to building design.

2.2.4 Principles of Approach Application

In biophilic design, Kellert describes a lot of design elements that are key to building success with a biophilic approach. These elements are the puppets of the 6 principles discussed in the previous discussion.

Table 2.12 Biophilic Design Principles

No	Principles	Design Elements	Explanation
1	Environmental Features	Colour	Natural colors like the color of the earth are used by designers as a good effect generator in their designs.
		Water	Water is a basic human need that is influential to calm and give a fresh effect.
		Air	Humans prefer fresh air to air that is processed and filtered.
		Sunlight	Daylight is needed in design when building a building.
		Plant	Plants are the main needs of humans as a source of nutrition and other food related to safety and comfort.
		Animal	Incorporating animals into designs is indeed very complex. Usually manifested in a representative form rather than the original form.
		Natural Material	Natural materials tend to process naturally in terms of age and strength and give more positive energy to the user.
		View and Vistas	The proportion of views out looking at nature and plants will have a positive effect as long as it is balanced and does not have a supporting effect.
		Facade Greenery	Buildings with facades and roofs in the form of plants give the effect of satisfaction and interest.
2	Natural Form and Shape	Plant motifs	The motifs that are often used are leaves, ferns, cones and bushes either literally or metaphorically.
		Column-shaped tree as support	Column-shaped tree applications can create a forest-like setting system.
		Animal motifs (especially vertebrate)	Simulation of animal life is often applied in the interior of a building. The appearance of animal features is only part, not one animal's body.
		Shell and circular	Some buildings apply the formation of shells such as bioclimatic and biomimicry designs.
		Egg, oval and circular shape	Usually applied to a garden design with a metaphor. Sometimes also used in structural elements.
		Avoid forming straight lines and right angles	Natural formations are rarely straight in line, usually turning and following the movements of nature.
		Simulation of natural formations	This formation will succeed as biophilic if it is applied into a structure, not just ornament and decoration.
3	Natural Patterns and Processes	Hole with a motif	Humans respond positively to buildings with natural formations with patterned and regular holes.
		Confined space limitation	Humans have territorial territory directly or indirectly.
		Transition space	Comfort can be achieved by giving access from one to another.
		Dynamic balance	The contrast creates a dynamic balance.
		Geometric arches	Inequality between one element and other elements is the key to success in building a biophilic landscape.
		Organized ratio and scale	Using golden ratio when designing so as not to make a scary impression for the User.
4	Light and space	Natural light	Natural light affects humans in physical and psychological terms. Its effects on health, productivity and happiness in the environment.
		Light filtered and scattered	Modifications of daylight can be applied to indoor and outdoor spaces.
		Danger and shadow	Manipulation of shadows can lead to human curiosity and exploration to move actively to find out.
		Light reflection	Examples of applications such as walls that are painted in bright and reflective colors from water
		<i>Light pools</i>	Humans tend to linger in a room that is able to accommodate this light properly because they feel safe.
		<i>Warm light</i>	Make the building feel comfortable, safe and the interior that seems inviting.
		Light as a form	This factor has positive effects such as aesthetics, imagination, exploration and a sense of discovery of new things.
		Roomy Room inside and outside	Humans prefer spaciousness in landscape design. The room that connects the room inside the building with the landscape outside.

able2.12 Biophilic Desain Principles (next)

No	Principles	Design Elements	Explanation
5	Place-Based Relations	Relationship between geography and design place	A sense of security will arise when the building environment matches the original geographical conditions.
		Local material	A positive relationship can be achieved by using local material as a utility which usually consumes less energy.
		Landscape orientation	Design related to the local environment around the building.
6	Involving Human Relations with Nature	Hope and protection	Provides a safety factor.
		Composition and complexity	Must balance a variety of designs but remain controlled so it does not cause bored and monotonous effects.
		Curious and happiness	Curiosity makes humans want to continue to explore and move to find out.
		Interest and beauty	Natural aesthetics are the strongest things that attract human attention.
		Exploration and discovery	Nature is a place to find many new things that are interesting to humans.
		Information and understanding	Intellectual satisfaction can be triggered by the existence of complex natural representations of building designs in the form and order of time.
		Fear and awe	Nature sometimes gives fear. Therefore we need a design that can provide a sense of security and awe with nature.
		Honor and spirituality	A good building is what makes a user not feel lonely and isolated and can connect feelings with buildings.

Of the many elements put forward by Kellert, it cannot be separated from the provisions of health buildings by the Indonesian Ministry of Health, namely:

Table2.13 Material Criteria for Health Buildings

NO	ARCHITECTURAL ASPECT	MATERIAL CRITERIA
1	Floor Coverings	The floor must not be slippery, resistant to scratches or friction of equipment and resistant to fire.
		The floor is easy to clean, does not absorb, is resistant to chemicals and is anti-bacterial.
		The floor covering must be anti-static material, which is anti-static vinyl.
		Electrical resistance and floor covering material can change with increasing age of use and due to cleaning, therefore the level of electrical endurance of the operating room floor must be measured every month, and must meet applicable requirements.
		The surfaces of all floors should not be porous, but hard enough for cleaning with flooding and wet vacuuming.
		Floor coverings should be brightly colored and not dazzling.
		The relationship or meeting between the floor with the wall must use materials that are not angled, but curved to facilitate cleaning the floor (hospital plint).
		Plint height, maximum 15 cm.
2	Wall Coverings	The wall must be easy to clean, weather resistant, chemical resistant, not moldy and anti-bacterial.
		The wall covering must be non-porous (not containing pores) so that the wall does not store dust.
		Bright wall colors but not or not dazzling eyes.
		The connection or meeting between the wall and the wall must not be angled, but curved to facilitate cleaning and also to expedite air flow.
		Wall materials must be hard, fire resistant, waterproof, rust resistant, have no welcome (whole), and easy to clean.

Table 2.13 Material Criteria for Health Type Buildings (Next)

NO	ARCHITECTURAL ASPECT	MATERIAL CRITERIA
		<p>If walls have connections, such as panels with melamine (which are anti-bacterial and scratch resistant) or insulated panel systems, the connections between them must be sealed with anti-bacterial silicon so as to provide a seamless wall, which is easy to clean and maintain.</p> <p>Another alternative wall material is a galvanized sandwich wall, two sides painted with anti-bacterial and resistant to chemicals, with the connection between which must be sealed with anti-bacterial silicon so as to provide a wall without a connection (seamless)</p>
3	Ceiling	<p>Must be easy to clean, resistant to all weather, resistant to water, does not contain elements that can harm the patient, not moldy and anti-bacterial.</p> <p>Has a non-porous cover which is non-porous so it does not store dust.</p> <p>Brightly colored, but not dazzling User's room.</p> <p>In addition to hanging operating lights, the ceiling can also be used for installation of surgical pendants, and various hangers such as air conditioning diffuser and fluorescent lamps.</p>

(Source: Permenkes RI No.24 2016)

2.3 ISLAMIC VALUES REVIEW

In the process of designing, it cannot be separated from Islamic values that must be applied. As explained in the background, use HR review. Abu Daud.

2.3.1 Islamic Literature Review

God has never created everything on this earth without a purpose, nor a disease. Allah never created a disease without medicine and cure. Basically, all diseases do come from God and Allah also gives healing, but humans must keep trying as much as possible in order to achieve health so that worldly activities and activities that draw closer to God, are not disturbed. Disease! "Friends ask:" Disease what is that O Messenger of Allah? "He answered:" Senile. "(HR At-Tirmidzi IV / 383 No: 1961 and said:" This hadith is hasan Saheeh. "And also narrated in Saheeh Al-Jami 'No: 2930).

The way to achieve healing in medical treatment there are various origins that do not deviate from religious teachings. The treatment can be medically and alternatively. "In fact there are three cases of the antidote: drinking honey, chilling and sticking hot iron on the affected part." (HR. Bukhari). The hadith relates that the Messenger of Allah advocated natural matters when questioned about treatment by friends when friends are sick.

2.3.2 Islamic Principles Applications

From the elaboration in the Islamic literature review, it can be concluded that a natural application is highly recommended. Applications recommended by the Qur'an and Hadith in this design are:

Table 2.14 Islamic Principles Application Design

NO	ISLAMIC ASPECT	SURAH	VALUES	APPLICATION
1	<i>Rabbaniyah</i>	HR. Imam Bukhari	God does not reduce a disease without a cure. Source : http://alkarimah.or.id/allah-menurunkan-penyakit-dan-obatnya/	Applying biophilic as a means of healing by incorporating biophilic elements in the design of clinical buildings.
		Al-Maidah : 2	Helping and helping one another. Source : https://tafsirq.com/5-al-maidah/ayat-2	Providing health facilities for people suffering from Diabetes and its complications. Providing alternatives in the form of natural-based treatment to people suffering from Diabetes and its complication.
2	<i>Akhlaqiyah</i>	Al-Maidah : 77	It should not be ghuluw or excessive. Source : https://almanhaj.or.id/3435-fenomena-ghuluw-melampaui-batas-dalam-agama.html	Using the room in accordance with the function so that the benefits obtained can be maximized by utilizing the angles of a garden landscape or active physiotherapy location.
3	<i>Waqi'iyah</i>	HR. Ahmad, Ibnu Majah, dan Al-Hakim	Suggested treatment to experts who already know and learn about the disease so as not to be mistaken. Source : http://alkarimah.or.id/allah-menurunkan-penyakit-dan-obatnya/	This clinic provides a variety of expert doctors and general practitioners and nurses to support treatment activities that are in accordance with standards so that there is no health malpractice.
4	<i>Insaniyah</i>	Al-Hujurat : 13	Prompts to get to know each other fellow human beings. Source : https://dalamislam.com/landasan-agama/al-quran/ayat-tentang-pergaulan-dalam-islam	Provide a transition space design that still maintains the privacy of the user but does not make the space isolated with the User partition in the form of plants both living plants and ornamentation of perforated motifs.

CHAPTER III DESIGN METHOD

3.1 DESIGN IDEAS

Issues that occur in the community become the basis for design ideas in this design. especially the issue of people in Malang which has developed into a fast and instant city. These changes bring a bad lifestyle that triggers a health problem, namely Diabetes. In addition to health issues in the community, environmental issues are also considered and reviewed in order to get an approach that is appropriate with the design, namely Biophilic Architecture.

The design ideas proposed and planned in this design are divided into several important points, namely:

1. Utilizing the potential that exists in the city of Malang, especially in the area of Bumiaji which is still beautiful by applying biophilic architecture to the building. This method will bring up some characteristics of biophilic designs that are tailored to the needs of users and space. To achieve these targets, it is necessary to analyze the factors contained in biophilic designs such as water, color, and others.
2. Maximizing the potential of sunlight, the temperature of Malang city air by calculation using formulas in building science as explained in chapter I, the uniqueness of design.
3. Incorporate technology elements into buildings so that they support the process of virtual interaction for patients with certain limitations. The application of the technology must be adapted to the biophilic design so that it remains within the biophilic design concept and does not damage the natural atmosphere.
4. The application of design in the landscape will focus on 3 things namely healing, sensory, and therapy. There are differences in the application of the three, namely:

- **Healing**

Landscape with the concept of healing will have a specific purpose, for example, to encourage the existence of outside activities and facilitate activities that will be carried out outside. The method will vary depending on the target age type. The age of the children will be different from the healing landscape for the elderly.

- **Sensory**

Landscape with sensory concept prioritizes that human interaction will affect the surrounding landscape and vice versa. The two elements are closely related to each other.

- **Therapy or therapeutic**

Landscape with therapeutic concepts will encourage the healing process with the application of vegetation in buildings. Vegetation is considered important in health facilities where staff and patients are equally faced with certain stressful stresses.

5. Installation of plant art installation elements into buildings by using several types, such as paintings, partitions with plant motif holes, imagery with natural formations and also interior elements that resemble plants and natural elements.
6. The process of oneness with nature refers to fundamental principles that make biophilic designs effective. Direct involvement with nature can be realized in the integration of design with surrounding housing but still be limited to safety factors.

3.2 INITIAL DESIGN PROCESS

The stages of the proposed design are divided into 3 main processes, namely seeding the idea (collection of ideas), design process (final design) and final design (final design). From this process when elaborated it will become a series of effective design processes in designing a building with a Biophilic Architecture approach. The process is:

3.2.1 Gathering Ideas

Ideas are obtained by responding to issues that occur in the community related to design. The grouping of issues in the field can be divided into 3, namely,:

- **Natural Environmental Issues**

Issues from the natural environment will produce responses in the form of design and also about building technology and science.

- **Social Environmental Issues**

Issues from the social environment will produce responses on how to treat and help cure diabetic patients and will determine how to treat the patient's design.

- **Economic Issues**

The issue of economics will determine the level of design class which will later become the new economic center in society.

3.2.2 Gathering Informations (1)

The data collection process is carried out after the issue has been obtained and collected. Secondary data collection stage data that is related to data:

- RTRW Malang
- RDTR Sukun District
- Erm Minister of Health No.09 of 2014 concerning Clinics
- Literacy Books related to the object approach, Biophilic Architecture

3.2.3 Programming

Programming in this design consists of identification, objectives, limitations and methods. Each will be described as below.

A. Identification

In identifying the design, the issues related to the emergence of design have been outlined. The programming stage is the initial stage in finding an object and also specifically understanding the object being designed. In this design that is understanding about Diabetes and Endocrinology Healthcare Center, in terms of theories related to objects and approaches and also in terms of object precedents and approaches, the identification of these designs is:

- Designing Diabetes and Endocrinology Healthcare Centers for the health and well-being (health and well being) of the people of Malang by answering architectural health issues.
- Starting from the issues that occur in society, namely the issue of lifestyle changes that follow the changing times and also genetic factors that cause diabetes patients to increase, then this design is intended to address these issues from the age range of children to the elderly with different treatments from design and facilities.
- The approach used to assist in resolving the issue is Biophilic Architecture, where this approach requires humans to improve their relationship with nature. The improvement of this relationship had a good impact on both of them by applying 6 principles of biophilic architecture by Kellert.
- The Islamic Value Review focuses on the concept of helping and helping fellow humans with this healthcare center. Besides that, the advice to try to seek treatment and recovery is because God did not reduce the disease without being offered by the antidote.

B. The Purpose

The objectives in the design of the Diabetes and Endocrinology Healthcare Center are:

1. Able to accommodate the activities of patients who need help related to diabetes and its complications so that activities in healing diabetes can be maximized.
2. Able to meet the needs of users in the provision of appropriate and comfortable health facilities to be used and encourage the level of public health.

C. Boundaries

a. Object Boundaries

Diabetes and Endocrinology Healthcare Center is the main type of clinic, where this clinic provides specialist medical services or basic and specialist medical services (Ministry of Health Republic of Indonesia, 2014: 9). The focus of the chosen branch of the discipline is the specialist in diabetes and endocrinology. This clinic serves promotive, preventive, curative and rehabilitative measures.

b. User Boundaries

Users are patients diagnosed with type 1 and 2 diabetes mellitus, patients with type 1 and 2 diabetes mellitus and patients with diseases caused by type 1 and 2 diabetes mellitus both children, adolescents, adults, and the elderly.

Table 3.1 Patient Year Gap

NO	JENIS	RENTANG USIA
1	Kids	5-11
2	Teenage	12-25
4	Adult	26-45
3	Elderly	46-65

(Source: Depkes RI, 2009)

In addition to diabetic patients, it is also necessary to have a specialist doctor who treats patients in this main clinic, namely:

1. Endocrinologist
2. Internal Medicine Specialist.

c. Site Boundaries

Because the city of Malang is a city with relatively fast economic growth with a population of 904,570 people in January

2018. As discussed in the background, Diabetes patients in Malang City are high considering the changing lifestyle of the people. Malang itself has 5 districts, namely Blimbing, Kedungkandang, Klojen, Lowokwaru and Sukun. Among the five sub-districts, Sukun Sub-district is an area where there are still many rice fields. Therefore, the site chosen is Malang City, Sukun District which is suitable with the Biophilic Architecture approach and is able to answer the issues of the design of the Diabetes and Endocrinology Healthcare Center.

d. Approach Boundaries

Outline can be drawn that this design uses the Biophilic Architecture approach as explained by Stephen R. Kellert in his book entitled Nature By Design, which takes 6 principles in biophilic design. These principles are:

1. *Environmental features*
2. *Natural shapes and forms*
3. *Natural patterns and processes*
4. *Light and space Place based relationships*
5. *Evolved human nature relationships*

D. Method

User method in the design comes from the adaptation and adoption of the Heuristic Branching method by Stephen Webb, then the following adaptation is obtained:

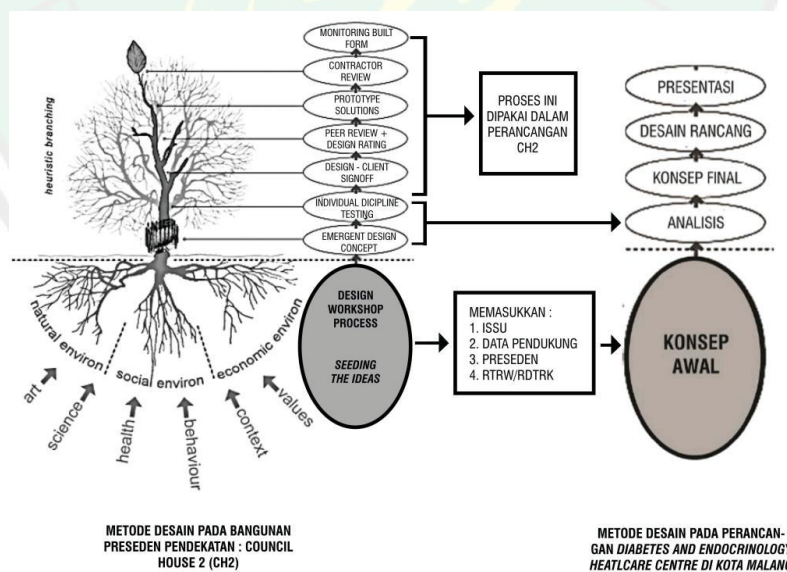


Image 3.1 Adaptation to the linear design process

(Source: Personal Data)

3.2.4 Gathering Informations (2)

Primary data collection is done to be material in the analysis which is the next stage. Collection can be done by survey and observation techniques.

A. Survey Techniques

The stages after programming are collecting primary data in the form of site survey and interviews. Site survey is conducted to obtain site data accurately and directly. The survey was conducted using a manual survey tool.

B. Observation Techniques

Using direct observation techniques and also participatory. Direct observation technique aims to obtain data in the form of types of activities undertaken by diabetic patients and their care, duration of care and stages of activities undertaken. In addition, direct observation also aims to get site location data.

Participatory observation techniques were carried out to understand the treatment atmosphere of diabetic patients directly to get conclusions and design ideas accordingly. These observations were made at the diabetes clinic and also poly disease in the hospital. The resulting data are qualitative as additional information in the design.

3.3 MAIN DESIGN PROCESS

The data processing stage is divided into 5 main stages, namely the initial concept, analysis, final concept, design design and presentation.

3.3.1 First Concept

In this stage, the data from the issues are processed and then reviewed as a whole to get a tagline that guides the design. The basic concept tagline is taken from the explanation and explanation of the existing issues. These issues are object issues, approach issues and are also associated with the integration of Islamic values.

Clinic	: promotive, prefentive, curative and rehabilitative
Healthcare	: safe, comfortable, protective, specific
Biophilic	: Back to nature, environmentally friendly
Islam	: Please help, endeavor to seek treatment, not excessive-more, respect for nature (hablum minal alam).

With the above conditions, then the initial concept of the tagline, "Synapses of Nature" emerged.

Synapses in the language of biology means to connect, connect, connection, continuity. Continuity comes from the continuous word which is

the equivalent word from continuing. Continuity has the meaning of continuing, continuous, continuous. Healing in diabetes must be carried out continuously and continuously until it reaches the desired results. Natural synapses in the concept of designing Diabetes and Endocrinology Healthcare Center, namely connecting the natural potential in healing Diabetes patients to help create a lifestyle that is prosperous (well being). With the continuity of nature, when explained in the adjustment of objects, approaches and Islam are,:

1. Object

- | | |
|-------------|---|
| a. Sinapsis | : Centralized, complete, comprehensive service starting from promotive, preventive, curative, and rehabilitative. |
| b. Nature | : Buildings that incorporate and utilize natural elements are the main points of healing. |

2. Approach

- | | |
|-------------|--|
| a. Sinapsis | : Landscape with healing, sensory and therapeutic concepts that support the patient's healing process. |
| b. Nature | : Application of biophilic design elements and biophilic design elements into buildings to bring Users closer to nature. |

3. Islamic

- | | |
|-------------|---|
| a. Sinapsis | : The process of treating rabbis, akhlaqiyah, waqi'iyah and even insaniyah. |
| b. Nature | : Getting close to nature means protecting nature so that there is no further damage. |

3.3.2 Analysis

In the analysis conducted by Stephen Webb, it is carried out after the stages of gathering all ideas into one then a study or analysis is carried out which will later become a concept in the design. The analysis carried out to get

the concept is divided into 2 namely, site selection analysis and user / user analysis.

A. User Analysis

a. User

- Number of users
- User Type
- Demands or special needs
- Character based on age
- Patient behavior
- Organization of rooms for patients

b. Activity

- Activity type
- Character of activity
- Activity flow
- Relationship between activities

c. Room needed

- Type
- amount
- The amount of space
- Number of floors and mass

d. Room needed

In the quantitative analysis of space, an element of design uniqueness is included, the quality of the room in terms of the calculation of the ideal and good natural light entry and supporting the patient's healing process. The analysis of natural light will have an effect on:

- Space type groups
- Room condition
- Relations between spaces

e. Space Organization

f. Analysis of Space and Landscape Space

g. Analysis of the shape and appearance of space

h. Structure and Utility Analysis

B. Site Selection Analysis

a. Environment Analysis

- Climate analysis
- Regulatory analysis
- Achievement analysis
- Circulation analysis
- Noise analysis
- Building orientation analysis

- Analysis of building utilities
- b. Site Zoning
- c. Analysis of Mass and Landscape Space

3.3.3 Final Concept

From the analysis data, conclusions will be generated which will then become a concept in the design. The concept is,:

- Basic concepts
- Tread concept
- Space Concept
- Structure Concept
- Utility Concepts

3.3.4 Design

The design stage is the stage of finalization of the concept. This stage is in the form of work on all architectural drawings. The rendering process uses Sketch Up, Lumion and also post rendering using Photoshop. These architectural drawings are:

- Site plan
- Layout plan
- Floor plan
- Visible
- Piece
- Details

3.3.5 Presentation

The design presentation is done after all the above stages have been fulfilled. To maximize the delivery of information about the object being designed, the presentation uses several objects, namely:

- Aprep (Architecture Presentation)
- Study mockups
- Animated video

3.4 Schematic Design Stage

The design stage that already explained before will be sum into a info-graphic schematic design stage below.

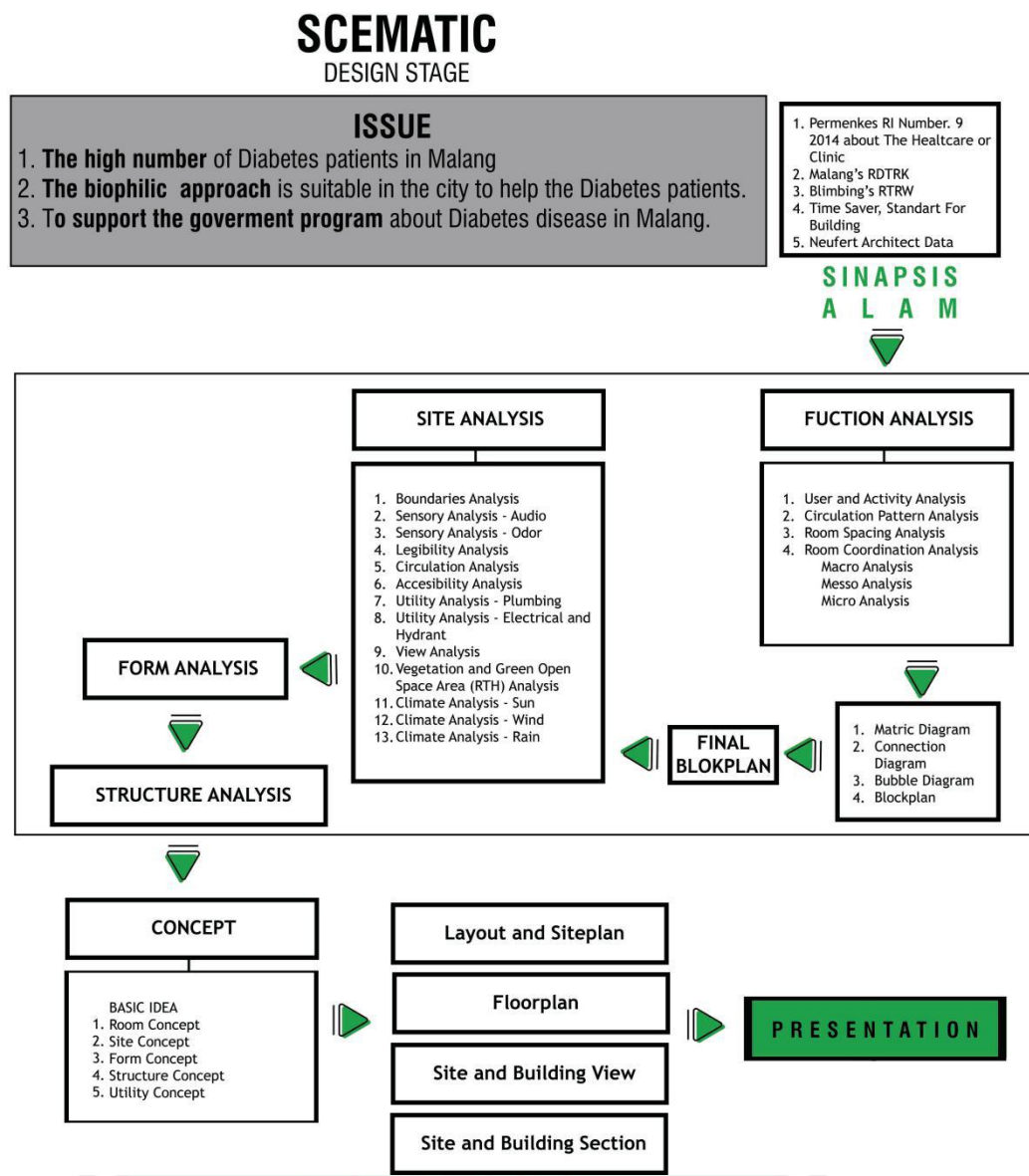


Image 3.2 Schematic Design Stage
(Source : Personal Data)

CHAPTER IV
ANALYSIS AND DESIGN SCHEMATIC

4.1 AREA ANALYSIS AND SITE DESIGN

The location of the design of Diabetes and Endocrinology Heat Care Center was proposed to be established in the city of Malang. The location of Malang is examined from the distribution of hospitals that serve poly. Poly in here is intended service regarding internal medicine including diabetes and endocrinology treatment. The hospital as depicted on the poly distribution map in treating Diabetes.

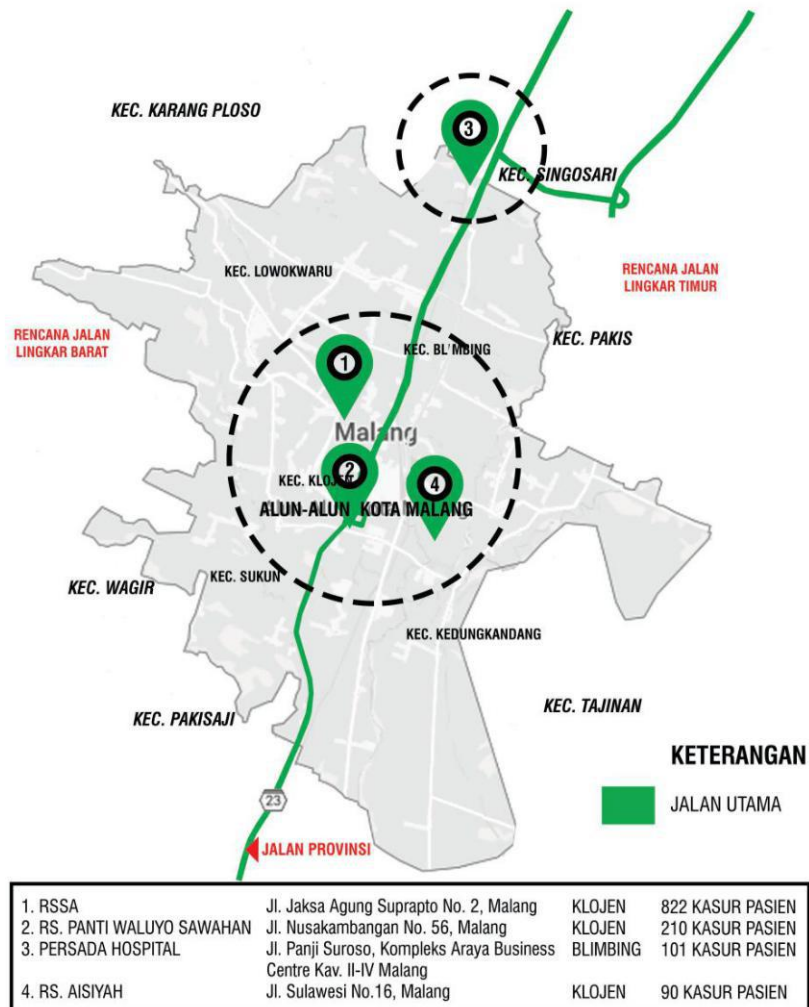


Image 4.1 Map of hospitals with Internal Poly services

(Source : Personal Data)

On the map of the distribution, it can be seen that three hospitals are in Klojen, and one hospital is in Blimbing. The distribution is centered in the center of Malang City, namely the District of Klojen. One hospital, Persada Hospital, is located in Blimbing in the Araya residential area. The three hospitals in Klojen

have a scale of coverage from the bottom to the top while the one in Blimbing, namely Persada, only covers the upper classes.

From the above explanation, it will be examined by regional analysis. Analysis of the area can be divided into design area data, socio-cultural surrounding communities, terms, and location of object provisions, regional spatial planning policies and location maps.

4.1.1 Design Area Data

The climate conditions in Malang City during 2018 recorded an average temperature ranging from 22.0 ° C to 24.8 ° C. While the maximum temperature reaches 31.4 ° C and a minimum temperature of 17.2 ° C. The average humidity ranges from 66% -83%, with a maximum humidity of 98% and a minimum of 19%. Malang City follows changes in the 2nd round of climate, dry season and rainy season like other regions in Indonesia.

Rainfall from the observation of Karangploso Climatology Station is relatively high during 2018 at the beginning and end of the year. The highest rainfall occurred in December, reaching 533 mm³, which occurred for 18 days. While the next highest rainfall occurred in March which recorded 495 mm³ with several rainy days totaling 20 days. Based on BMKG data, wind speeds in Malang City vary from morning to night. On average in the morning 28km / hour from the southeast, in the afternoon 19 km / h is still from the southeast and at night 9 km / hour changes from the west.

To create a diabetes management center, it requires a strategic location and is suitable especially with the approach used, namely Biophilic Architecture. One barometer that can be used is related to good air quality for the patient's healing process.

4.1.2 Social Culture Communities Around the Location

The social culture of the community in Malang City related to the design of the Diabetes and Endocrinology Healthcare Center can be viewed from two aspects, namely the issue of the condition of the patient or sufferer and second is the financial issue. Both of these things affect each other, where the condition of awareness and health of patients is usually caused by the patient's finances. Data from the Indonesian Ministry of Health states that 2/3 of diabetics do not realize that they have diabetes. This can be seen in the following diagram, :



Image 4.2 Level of Public Awareness

(Source : Personal Data)

The data can be a benchmark that public awareness of the disease is still low, only 1/3 are aware, the rest are not aware. This has something to do with the financial issues of the people of Malang City. Financial impact on clean and healthy living behavior which will then impact on awareness in treatment.

TINGKAT KESADARAN PERILAKU HIDUP SEHAT
MENURUT DINKES KOTA MALANG TAHUN 2015

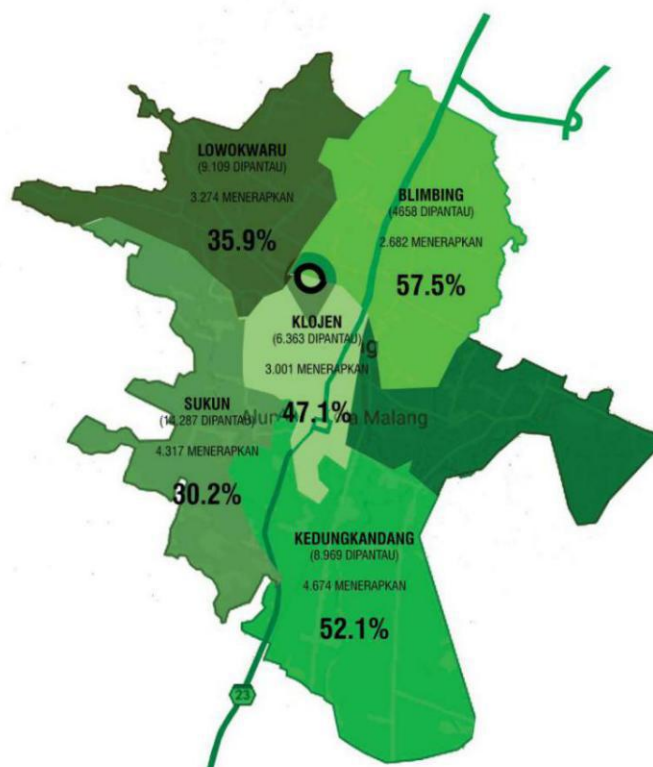


Image 4.3 Level of Awareness of Healthy Lifestyle

(Source : Personal Data)

From the pictures, it is known that when sorted by the level of public awareness in healthy living, Blimbing becomes a superior district. Followed by Kedungkandang, Klojen, Lowokwaru and also Sukun.

4.1.3 Terms and Conditions for Locating Objects

Terms and conditions for the location of the construction of health buildings are stipulated in the Republic of Indonesia Minister of Health Regulation No.24 of 2016 Regarding Technical Requirements for Hospital Buildings and Infrastructure. These regulations are:

- Being in an environment with clean air and a quiet environment.
- Free from undue noise and atmospheric pollution coming from various sources.
- Not on the edge of a slope.
- Not close to the foot of a mountain that is prone to landslides.
- Not near creeks, rivers or bodies of water that erode the foundation.
- Not above or close to an active fault line.
- Not in tsunami prone areas.
- Not in flood-prone areas.
- Not in the typhoon zone.
- Not in a storm-prone area.
- Not near the transmitter station.
- Not in a high-voltage air-conduction zone.

These requirements can be permitted with a map of floods and landslides in Malang. Broadly speaking, it is concluded from the data of the Regional Disaster Management Agency (BPBD) of Malang City, the following images will be obtained:

LOKASI BANJIR DAN TANAH LONGSOR

MENURUT BPBD KOTA MALANG TAHUN 2015-2017



Image 4.4 Location of floods and landslides in Malang City

(Source : Personal Data)

The location with the most landslides is Kedung-stable and the most flooded location is Blimbing. Regarding security, areas with red and blue marks are avoided in the selection of design locations.

In terms of the biophilic approach, it is expected that the location has suitable land for the planting process and also the development of plants that help the healing process. The type of soil in Malang is fertile upland soils with Alluvial types.

PETA JENIS TANAH DI KOTA MALANG MENURUT BBBWS/DAS BRANTAS

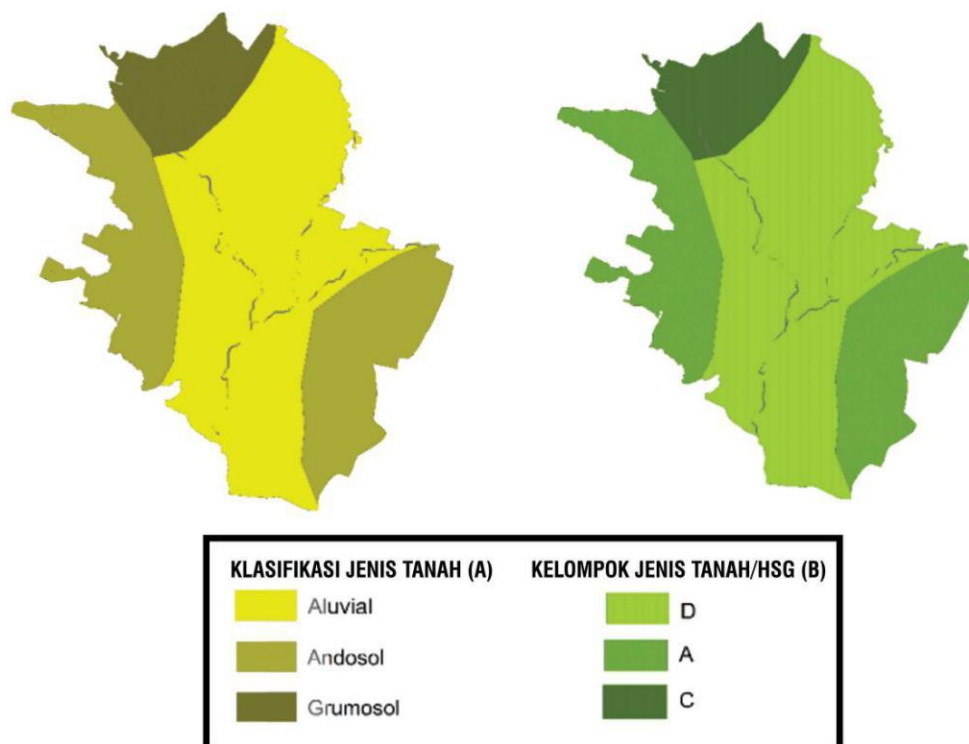


Image 4.5 Map of soil type classification and soil type groups based on HSG (Hidrologic Soil Group)

(Source : Personal Data)

Alluvial land is found in the northern, central and southern cities of Malang, in Blimbing, Klojen and part of Kedungkandang and a small part of Sukun. The land in Kedungkandang and Most of Sukun is Andosol land where this land is less fertile. Tanah Grumosol is located in Lowokwaru.

4.1.4 Regional Spatial Policy

This design is planned for the regional scale of East Java and its surroundings, so in the selection of its location must be in accordance with the zoning of the city, namely Malang. Based on Malang City Regulation No. 04 of 2011 article 57 paragraph (1) concerning the distribution of the development zone of public facilities, especially health services, namely:

- Maintaining the location of existing hospitals.
- Develop hospitals / health centers in sub. North Malang and East Malang.

- Developing health centers in each sub-district of the city and sub-health centers in each scale of the urban area.

The data clearly mentions point B, namely the development of the health center in the northern and eastern Malang. North Malang is the Blimbing District and East Malang is the Kedungkandang District.

DAERAH PERUNTUKAN FASILITAS KESEHATAN MENURUT PERDA KOTA MALANG TAHUN 2004 NO.57

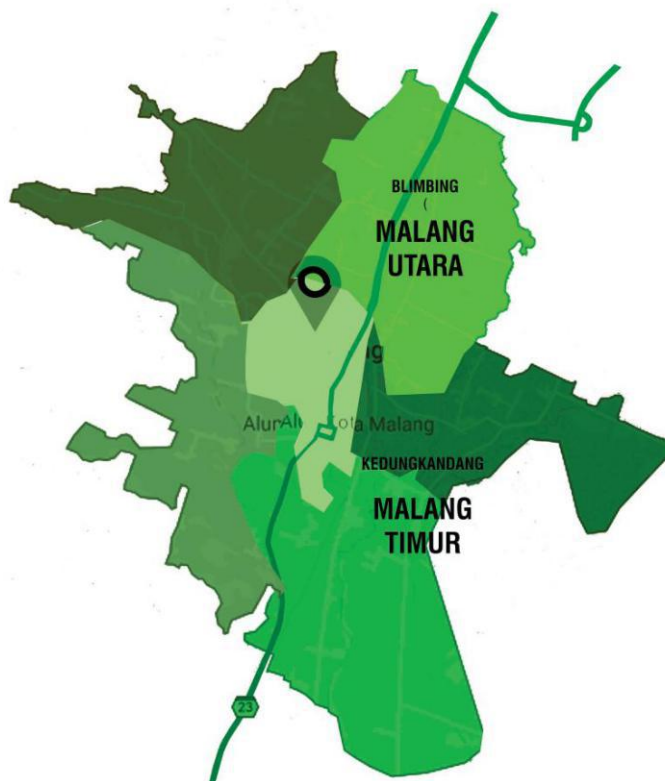


Image 4.6 North Malang and East Malang

(Source : Personal Data)

4.1.5 Conclusion of the Site Study

From the various site studies above, several conclusions and design proposals are related to the results of the study. The study makes a slice diagram of suitable site selection.

LAYERING KESIMPULAN
DARI HASIL KAJIAN PEMILIHAN KAWASAN

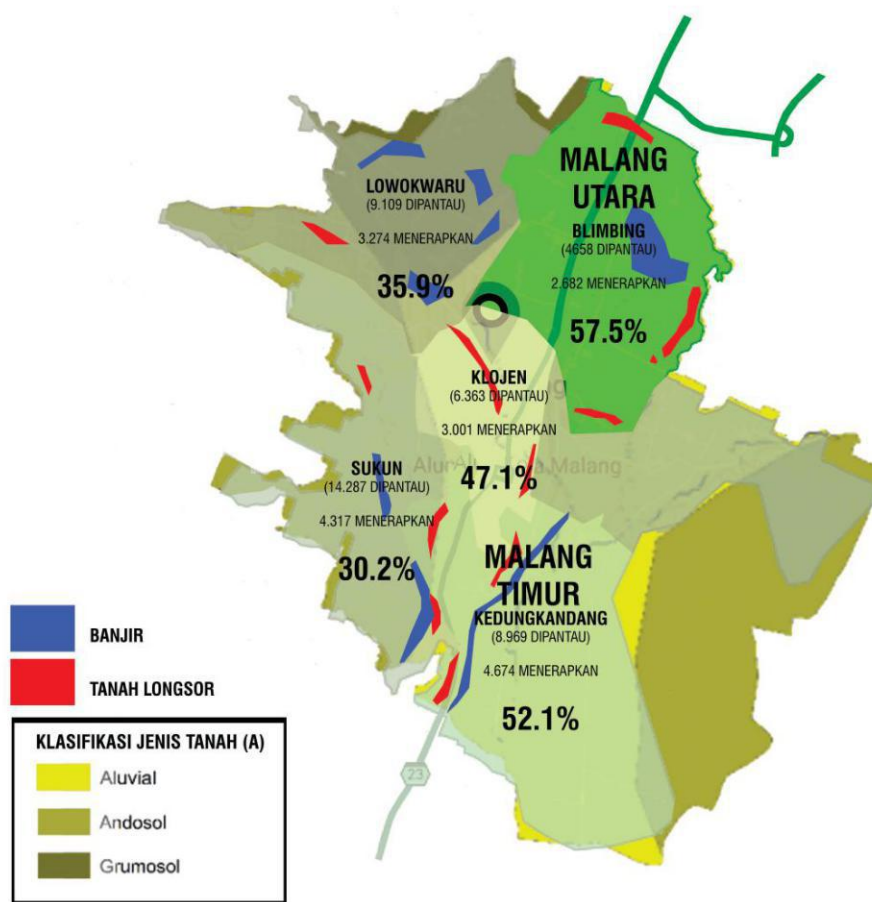


Image 4.7 Conclusion of The Layering

(Source : Personal Data)

From the diagram above, it can be seen that the sub-district with slices covering all studies is the Blimbing sub-district. Blimbing sub-district is one of the sub-districts in Malang that implements activities like planting, such as the jargon carried by the sub-district, Blimbing Sinam. Blimbing Sinam is universally known as "Green and Clean" this can be demonstrated by the emergence of many thematic villages with nuanced and environmentally sound in the Blimbing District area, such as: Glintung Go Green, Colorful Villages, 3D Villages, Organic Villages etc. Environmentally thematic theme has not only been able to change the face of the village and the mindset of its people, but also can bring social effects in the region.

Blimbing has an allotment of areas divided into several regions. This design uses areas for trade and services marked in pink on the designation map of the Blimbing District, Malang.

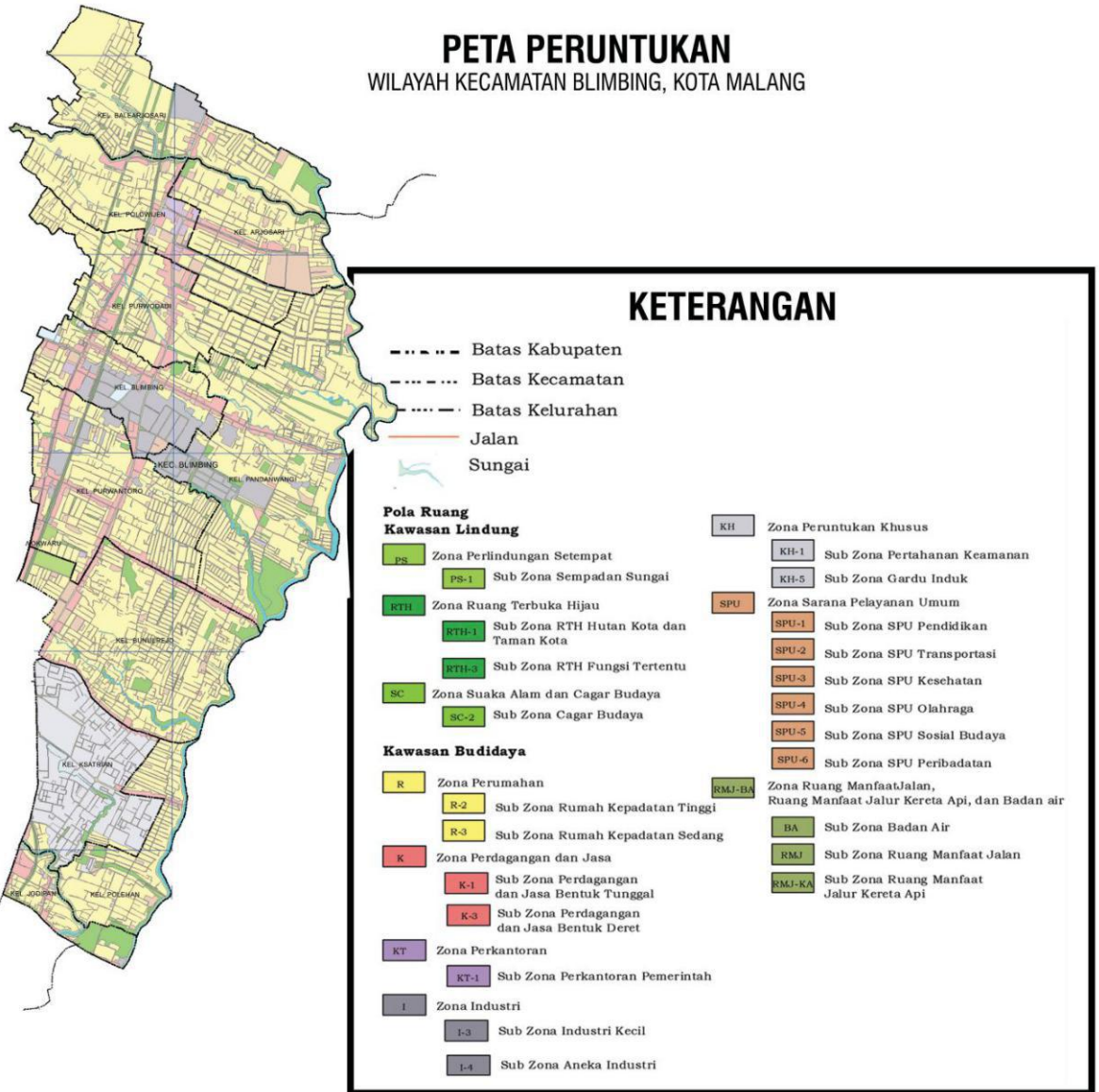


Image 4.8 Map designation of the area
(Source : si-petarung.malangkota.go.id)

4.1.6 Location Map and Site Documentation

From all the studies conducted above, it can be concluded that the chosen location for design is on Jl. Sunandar Priyo Sudarmo, Purwanto, Blimbing, Malang City as a site for the design of Diabetes and Endocrinology Healthcare Center.

In the location map and site documentation, the design location data will be described. The site data include site location, site

size, boundaries, access and circulation, demographics, site conditions and topography.

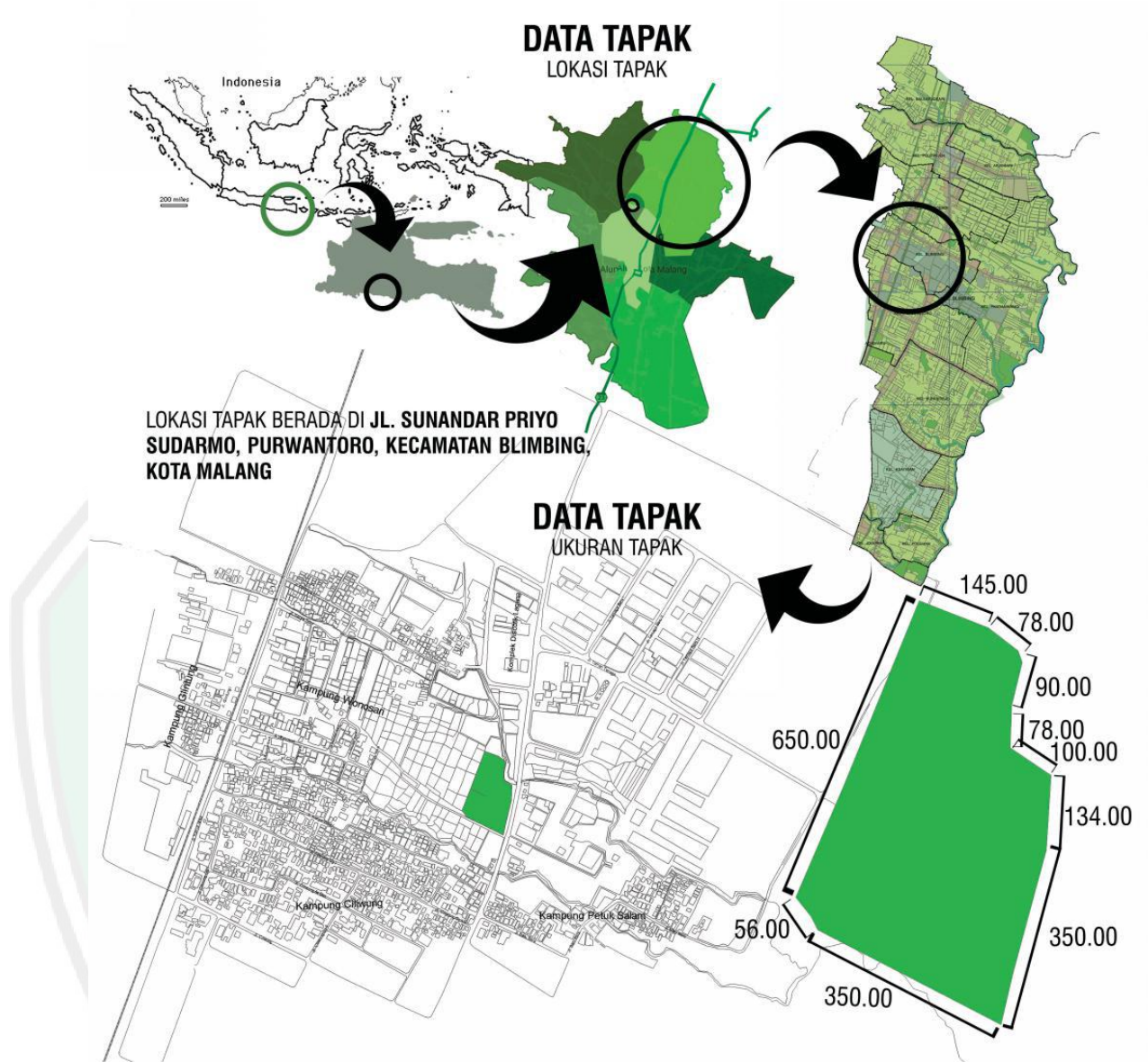


Image 4.9 Site Data - Location and Size

(Source : Personal Data)

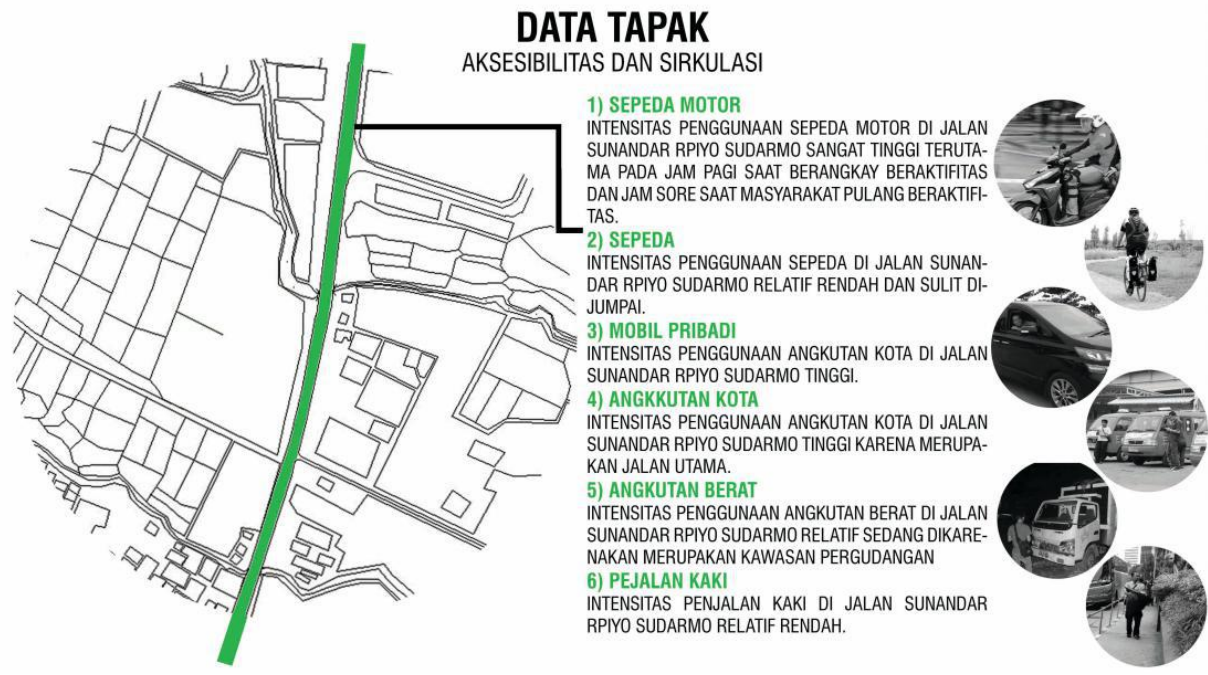
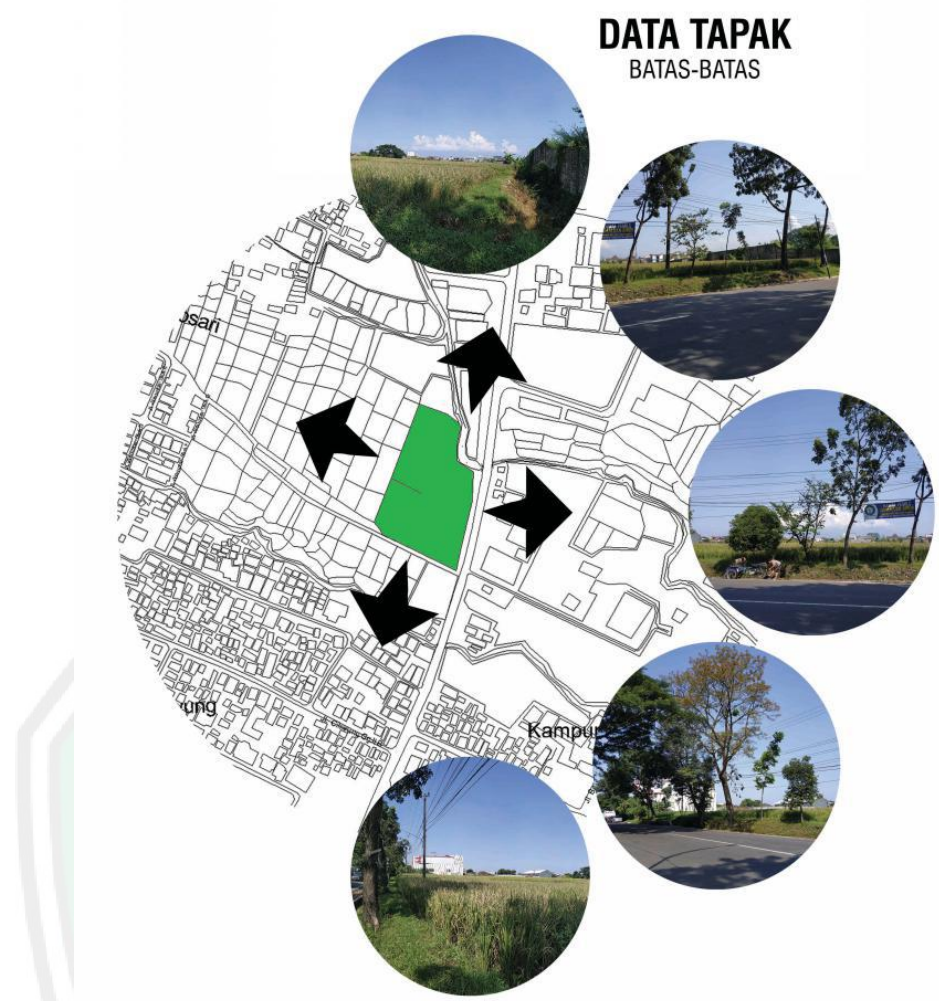


Image 4.10 Site Data - Limits, Circulation and Accessibility

(Source : Personal Data)

According to RDTRK, Blimbing District as a service sub-region which has building regulations in its area, namely:

- KDB : 70%
- GSB : 10 m
- TLB : 1-5 floor
- KLB : 0,7 - 1.2



Image 4.11 Site Data - Conditions Around the Site

(Source : Personal Data)

4.2 DESIGN ANALYSIS

The design analysis in chapter four refers to the design stage scheme in chapter three, where the scheme has many stages in the analysis. The stages are site analysis, site zoning, analysis of land use and landscape space (1), analysis of users and activities, analysis of light calculations and space organization.

4.2.1 Function Analysis

In a health center design, many things must be considered, starting from the user, spatial requirements, spatial criteria, spatial organization and also the existing conditions in the site. Before leaving the site analysis and entering into the User and activity analysis, the analysis that is in between is the Function analysis.

Function analysis is divided into three, namely primary function, secondary function and tertiary function. The function analysis that emerges from this design will be explained in more detail in the following diagram.

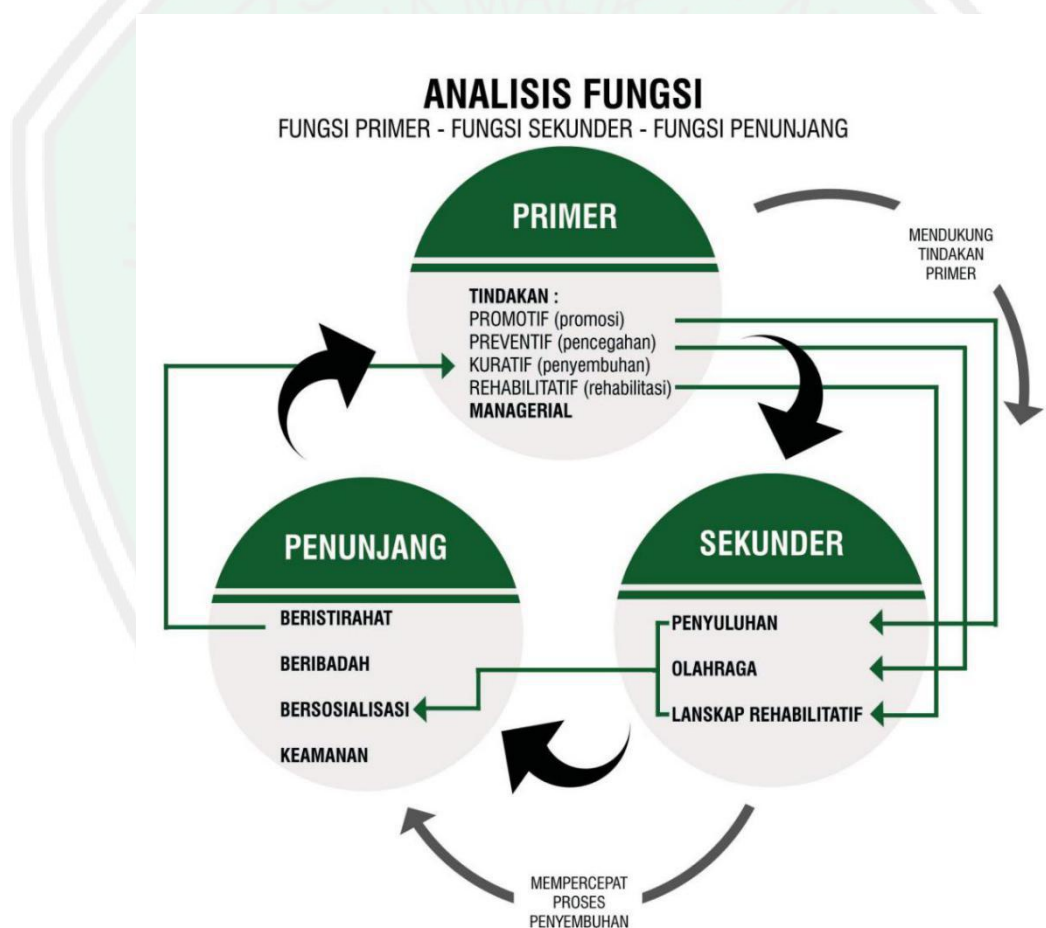


Image 4.12 Function Analysis

(Source: Personal Analysis)

From the analysis of these functions, obtained several functions that have been divided into primary, secondary and tertiary. From this grouping, obtained sources in analyzing users and activities.

A. User Analysis and User Activity

The user and activity analysis is sourced from the previously performed Function analysis, namely primary, secondary and tertiary. In the User analysis, the types of activities, Users and space requirements that must be fulfilled are described.

Table 4.1 Primary User Function Analysis and Activities - Promotion

PRIMARY FUNCTION		AKTIVITY	USER	ROOM NEEDS	BASIC REVIEW
FUNCTION	TYPE				
PLACE TO DO TREATMENT	Promotion	Counseling	Employee	Control Room	NAD
			Presenters	Rest Room	NAD
			Employee	Lobby	NAD
			Local Society	Sitting Lobby	NAD
			Employee	Resepsionist	NAD
			Local Society	Hall	NAD
			Employee	Employee Toilet	NAD
			Presenters		NAD
			Local Society	Public Toilet	NAD
			Employee	Janitor	NAD
			Local Society	Indoor Garden	NAD
Local Society	Outdoor Garden	NAD			

KET :
 KEBUTUHAN OBJEK
 KEBUTUHAN TEMA

Table 4.2 Analysis of User Primary Function and Activity - Prevention

PRIMARY FUNCTION		AKTIVITY	USER	ROOM NEEDS	BASIC REVIEW
FUNCTION	TYPE				
PLACE TO DO TREATMENT	Prevention	Sports	Local Society	Open sport field	NAD
				Shelter	NAD

KET :
 KEBUTUHAN OBJEK

Table 4.3 Analysis of User Primary Function and Activity - Treatment

PRIMARY FUNCTION		AKTIVITY	USER	ROOM NEEDS	BASIC REVIEW		
FUNCTION	TYPE						
PLACE TO DO TREATMENT	Treatment	Outpatient Instalation or (IRJ)	Registration	Patient	Administration Room	NAD	
			Payment	Patient			
			Insert IRJ Patient Data	IRJ Administration Employee			
			Waiting	IRJ Patient	Main Lobby		NAD
			Provide Information	IRJ Administration Employee	Access Control Room		DEPKES RI
			Saving the patient data	IRJ Medical REcord Employee	Medical Record Room		DEPKES RI

KET :
 KEBUTUHAN OBJEK

Table 4.3 Analysis of User Primary Function and Activity - Treatment (Next)

PRIMARY FUNCTION							
FUNCTION	TYPE	AKTIVITI		USER	ROOM NEEDS	BASIC REVIEW	
PLACE TO DO TREATMENT	Treatment	Outpatient Instalation or (IRJ)	Check and consult Patient complaints	The doctor on duty	Room Periksa dan Konsultasi	NAD	
				The nurses on duty			
				Nutrition Consultant			
			Take light action on Patients	The nurses on duty	Room Tindakan (Ringan)	DEPKES RI	
			Breastfeeding	Pregnant mother	Room Laktasi	Permenkes No. 15 (2013)	
			Control cleanliness	Employee	Janitor	NAD	
			Access to vertical circulation	Employee	Shaf	NAD	
			Calm down	Patient	Indoor Garden	NAD	
			Calm down	Patient	Outdoor Garden	NAD	
			Inpatient Instalation	Payment	Employee	Administration Room	NAD
				Waiting	Patient	Waiting Room	NAD
				Resting and recovering body condition	Patient	VVIP	DEPKES RI
						VIP	
						Class 1	
		Class 2					
		Maintain patient safety and security		Nurse	Nurse Stasi Room	DEPKES RI	
					Consult Patient conditions	Doctor visite	Consultation Room
		Rest		The doctor on duty	Doctor's Office	Assumption	
		Coordination		Nurse	The doctor on duty	Education Room Discussion	Interview
					The doctor on duty and Visite Doctor		
					Head Nurse		
		Rest		Head Nurse	Head room for Inpatient Instalation	Assumption	
		Keeping things		Nurse	Locker	Assumption	
		Keep clean linen	Cleaning Service	Clean Linen Room	DEPKES RI		
		Store dirty linen temporarily	Cleaning Service	Dirty Linen Room	DEPKES RI		
		Mencuci linen kotor					
		Save damaged goods	Employee	Dirty Warehouse	DEPKES RI		
		Stationary	Cleaning Service	Clean Warehouse	DEPKES RI		
Store medical devices							
Dispose of water and cleanse yourself	Visitor	Employee Toilet	NAD				

KET :
 KEBUTUHAN OBJEK
 KEBUTUHAN TEMA

Table 4.3 Analysis of User Primary Function and Activity - Treatment (Next)

PRIMARY FUNCTION		AKTIVITI		USER	ROOM NEEDS	BASIC REVIEW
FUNCTION	TYPE					
PLACE TO DO TREATMENT	Treatment	Inpatient Instalation	Dispose of water and cleanse yourself	Patient	Toilet Patient	NAD
			Taking care	Patients with more intensive needs	HCU (<i>High Care Unit</i>)	DEPKES RI
			Isolate	Patients with infectious diseases	Room Nursean isolasi	DEPKES RI
			Control cleanliness	Employee	Janitor	NAD
			Access to vertical circulation	Employee	Shaf	NAD
			Playing	Kinderganten Patient	Indoor Garden	Assumption
			Calm Down	Patient	Outdoor Garden	Assumption
			Pray	Patient	Prayer room	Assumption
		Emergency Instalation or UGD	Sorting the gravity of cases from P0 - P3	Nurse	Triase Room	DEPKES RI
			Place the patient who died	Patient	Room P0	Interview
			Placing Patient with severe injuries and requires quick treatment	Patient	Room P1	Interview
			Placing Patients who need help but with less severe injuries	Patient	Room P2	Interview
			Patients with minor injuries	Patient	Room P3	Interview
			Take light action on Patients	Patient Nurse	Action Room	DEPKES RI
			Clean and sterilize tools	Nurse	Decontamination and Sterilization room	DEPKES RI
			X-rayed	Employee Patient	Radiologi Cito Room	NAD
			Dispose of water and cleanse yourself	Employee	Employee Toilet	NAD
			Dispose of water and cleanse yourself	Normal physical patient	Normal Toilet	NAD
				Patients with special needs	Disability Toilet	
			Storing goods	Employee	Locker	NAD
			Rest	Employee	Pantry	NAD
			Save a trolley	-	Trolley Room Parking	DEPKES RI
			Save the gurney	-	Gurney room	DEPKES RI
			Control cleanliness	Employee	Janitor	NAD
			Access to vertical circulation	Employee	Shaf	NAD
			Calming down	Patient	Indoor Garden	Assumption
			Calming down	Patient	Outdoor Garden	Assumption

KET :
 KEBUTUHAN OBJEK
 KEBUTUHAN TEMA
 KEBUTUHAN KEISLAMAMAN

Table 4.3 Analysis of User Primary Function and Activity - Treatment (Next)

PRIMARY FUNCTION		AKTIVITY	USER	ROOM NEEDS	BASIC REVIEW	
FUNCTION	TYPE					
PLACE TO DO TREATMENT	Treatment	Pharmacy Installation	Recording Patient data that refer drugs	Asisten apoteker apoteker	Administration Room	NAD
			Rest	Head of Pharmacy	Pharmacy Installation Room Head Staff	NAD
			Waiting for medicine	Patient	Waiting room	DEPKES RI
				Patient's Family		
			Waiting for medicine	Patient	Indoor Garden	Assumption
			Rest	Employee	Pantry	NAD
			Dispose of water and cleanse yourself	Employee	Employee Toilet	NAD
				Patient	Public Toilet	NAD
			Dispose of water and cleanse yourself	Employee	Employee Toilet	NAD
			Receive referrals from other diabetes clinics	Asistent apoteker	Satellite Pharmacy Unit	DEPKES RI
		Control cleanliness	Employee	Janitor	NAD	
		Access to vertical circulation	Employee	Shaf	NAD	
		Laboratory Installation	Waiting for a queue	Patient	Patient Waiting Room	DEPKES RI
			Take samples for research	Laboratory Employee	Room for Taking / Receiving Samples	Assumption
			Receive samples for research			
			Save blood stock	Blood Bank Employee	Blood bank	Assumption
			Coordinate blood stock			
			Storing reagents	-	Bio Material Storage Room	Assumption
			Sterilize consumables	-	Room Wash Equipment	DEPKES RI
			Storing goods	Laboratory Employee	Locker	Assumption
				Blood Bank Employee		
			Rest	Laboratory Employee	Pantry	Assumption
				Employee bank darah		
			Dispose of water and cleanse yourself	Employee	Employee Toilet	NAD
			Dispose of water and cleanse yourself	Employee	Employee Toilet	NAD
			Dispose of water and cleanse yourself	Normal physical patient	Normal Toilet	NAD
		Patients with special needs		Disabilitay Toilet	NAD	
		Control cleanliness	Employee	Janitor	NAD	
		Access to vertical circulation	Employee	Shaf	NAD	

KET :
 KEBUTUHAN OBJEK
 KEBUTUHAN TEMA

Table 4.3 Analysis of User Primary Function and Activity - Treatment (Next)

PRIMARY FUNCTION		AKTIVITI	USER	ROOM NEEDS	BASIC REVIEW	
FUNCTION	TYPE					
PLACE TO DO TREATMENT	Treatment	Main Kitchen Installation	Receive complete food ingredients	Employee	Food Reception and Weighing Room	DEPKES RI
			Weighing food ingredients			
			Store wet food ingredients	Employee	Wet Food Storage Room	DEPKES RI
			Store dry foodstuffs	Employee	Dry Food Storage Room	DEPKES RI
			Prepare	Employee	Preparation room	DEPKES RI
			Prepare food ingredients			
			Food processing	Employee	Processing Room	DEPKES RI
			Store ready food	Employee	Food Distribution / Presentation Room	DEPKES RI
			Washing used cooking utensils	Employee	Washing Room	DEPKES RI
			Processing food ingredients			
			Access to vertical circulation	Employee	Shaf	DEPKES RI
			Worship (Only kitchen employees)	Patient	Special Mushola	NAD
			Store a nutrition trolley	Employee	Nutrition Trolley Storage Room	DEPKES RI
			Store kitchenware	Employee	Kitchen Equipment Storage Room	DEPKES RI
PLACE TO DO TREATMENT	Treatment	Clinical Nutrition Installation	Consult the Patient diet	Nutrition Consultant	Space Nutritionist	DEPKES RI
				Patient		
			Demonstrate the results of the consultation	Nutrition Consultant	Model and Miniature Room	Assumption
			Dispose of water and cleanse yourself	Employee	Employee Toilet	NAD
		Patient Relaxation	Patient	Vertical Garden	Assumption	
		Medical Rehabilitation Installation or (IRM)	Refer to IRM	Patient	Administration Room	NAD
			Waiting for a queue	Patient	Patient Waiting Room	DEPKES RI
			Check Patient's condition	Employee	Patient examination room	NAD
			Do physiotherapy	Patient	Active Physiotherapy Room	Assumption
			Do physiotherapy	Patient	Passive Physiotherapy Room	Assumption

KET :
 KEBUTUHAN OBJEK
 KEBUTUHAN TEMA

Table 4.3 Analysis of User Primary Function and Activity - Treatment (Next)

PRIMARY FUNCTION		AKTIVITI		USER	ROOM NEEDS	BASIC REVIEW
FUNCTION	TYPE					
PLACE TO DO TREATMENT	Treatment	Medical Rehabilitation Installation or (IRM)	Store physiotherapy tools	Employee	Gudang	DEPKES RI
			Rest	IRM Head	Head Room	Assumption
			Rest	Employee	Pantry	Assumption
			Dispose of water and cleanse yourself	Employee	Toilet Employee	NAD
			Dispose of water and cleanse yourself	Normal physical patient	Normal Toilet	NAD
				Patients with special needs	Disability Toilet	
			Control cleanliness	Employee	Janitor	NAD
Access to vertical circulation	Employee	Shaf	NAD			

KET :
 KEBUTUHAN OBJEK

Table 4.4 Analysis of User Primary Function and Activity - Rehabilitation

PRIMARY FUNCTION		AKTIVITI		USER	ROOM NEEDS	BASIC REVIEW
FUNCTION	TYPE					
PLACE TO DO TREATMENT	Rehabilitation	Landscape	Natural treatment	Patient	Healing Landscape	Assumption
					Sensory Landscape	Assumption
					Therapy Landscape	Assumption

KET :
 KEBUTUHAN OBJEK
 KEBUTUHAN TEMA

Table 4.5 Analysis of User Primary Functions and Activities - Managers

PRIMARY FUNCTION		AKTIVITI		USER	ROOM NEEDS	BASIC REVIEW
FUNCTION	TYPE					
MANEGERIAL	Administra-tor	Rest	Set the course of activities	President Director	Board of Directors' Room	Assumption
		Have a discussion				
		Rest	Specialist doctor	Chief of the Medical Committee's office	Assumption	
		Rest	Head Nurse	Head of nursing room	Assumption	
		Rest	Head Service	Head of Medical and Nursing services	Assumption	
		Rest	Head Nurse			
		Manage finances	Financial officer	Chief financial room	Assumption	
		Manage finances	Accountant			

KET :
 KEBUTUHAN OBJEK

Table 4.5 Analysis of User Primary Functions and Activities - Managers (Next)

PRIMARY FUNCTION		AKTIVITY	USER	ROOM NEEDS	BASIC REVIEW
FUNCTION	TYPE				
MANEGERIAL	Administra-tor	Rest	Chief of pharmacy	Chief of Medical Support Services Room	Assumption
		Rest	Chief of nutrition clinic		
		Rest	Chief of public kitchen		
		Employee service	Chief of education and training	Chief of education and training Room	Assumption
		Apprenticeship activities services	Chief of SDM		
		Arrange correspondence	Employee	General and Operational Room	Assumption
		Oversee activities	Supervisor	SPI Room or (Internal Oversight Unit)	Assumption
		Store archive globally	Archives clerk	Data Archive Room	Assumption
		Waiting	Visitor	Waiting room for visitors	Assumption
		Rest	Managerial employee	Pantry	Assumption
		Dispose of water and cleanse yourself	Managerial employee	Employee Toilet	NAD
		Dispose of water and cleanse yourself	Visitor	Visitor Toilet	NAD
		Control cleanliness	Employee	Janitor	NAD
		Access to vertical circulation	Employee	Shaf	NAD
Pray	Patient	Public Mushola	Assumption		

KET :
 KEBUTUHAN OBJEK
 KEBUTUHAN TEMA

Table 4.6 Analysis of Secondary User Functions and Activities

PRIMARY FUNCTION		AKTIVITY	USER	ROOM NEEDS	BASIC REVIEW	
FUNCTION	TYPE					
SUPPORTING	Promotion	Implement a healthy life	Employee	Green Space or RTH	NAD	
			Managerial			
			Patient			
			Keep the environment clean	Employee	TPS or Garbage dump	NAD
				Patient	The point of disposing of garbage	NAD
	Prevention	Prevention of total paralysis	Patient	Sports park	NAD	
	Treatment	Maintain security	Security	Indoor security post	NAD	
Rehabilitation	Socialize	Patient	communal space	NAD		

KET :
 KEBUTUHAN OBJEK
 KEBUTUHAN TEMA

Table 4.7 Analysis of User Supporting Functions and Activities

PRIMARY FUNCTION		AKTIVITY	USER	ROOM NEEDS	BASIC REVIEW
FUNCTION	TYPE				
ACCOMMODATE	Rest	Rest	Employee	Space to rest according to function and position	NAD
			Managerial		
			Patient		
	Pray	Worship for Islam	Employee	Mushola	NAD
			Managerial		
Socialize	Socialize	All User	Outdoor Park	NAD	
Security	Maintain security	Security	Security POst	NAD	

KET :
 KEBUTUHAN OBJEK
 KEBUTUHAN TEMA
 KEBUTUHAN KEISLAMAN

From the data analysis of the Users and activities above, the User classification conclusions found in the design of the Diabetest and Endocrinology Healthcare Center. The classification is illustrated in the chart below, namely:

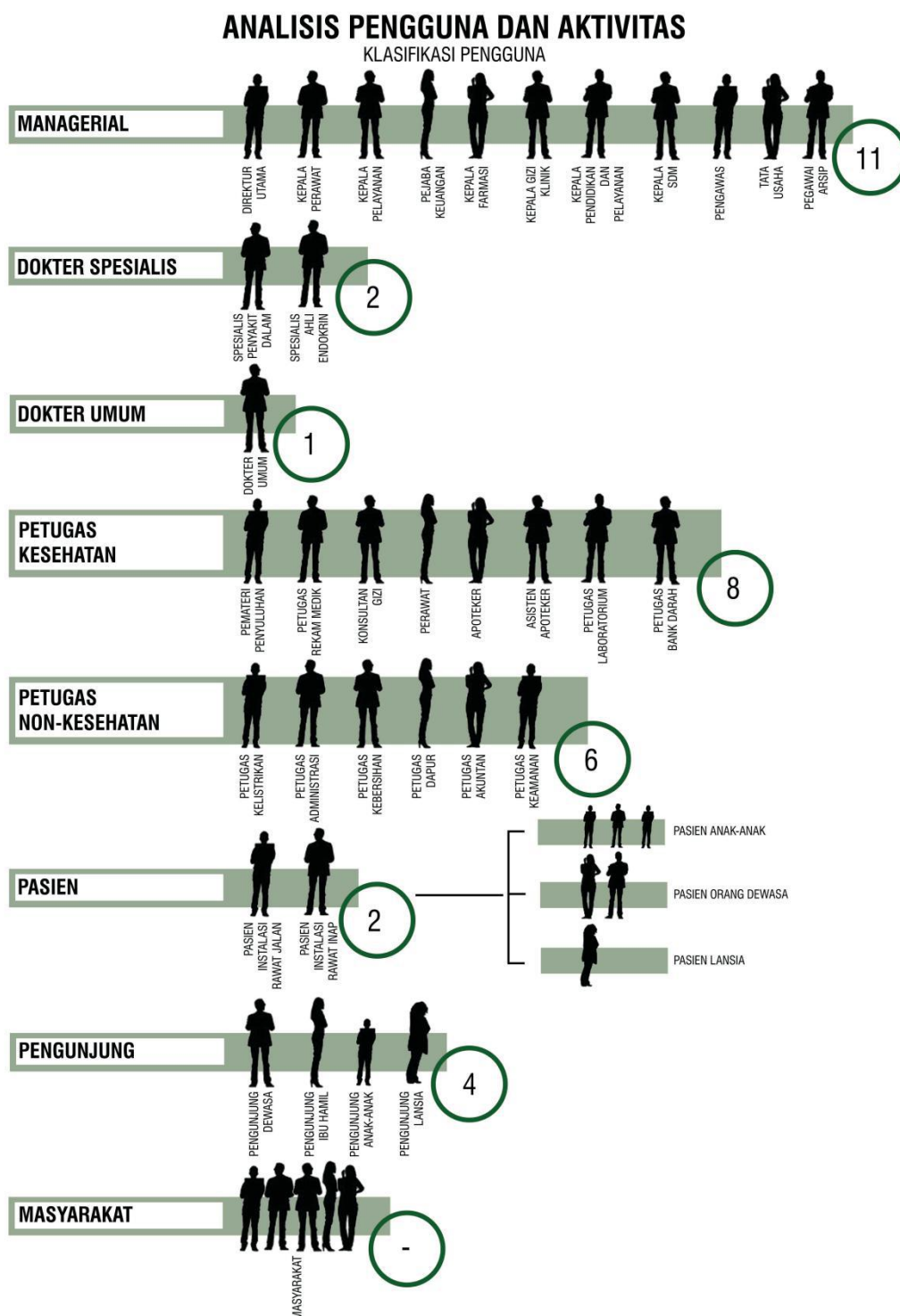
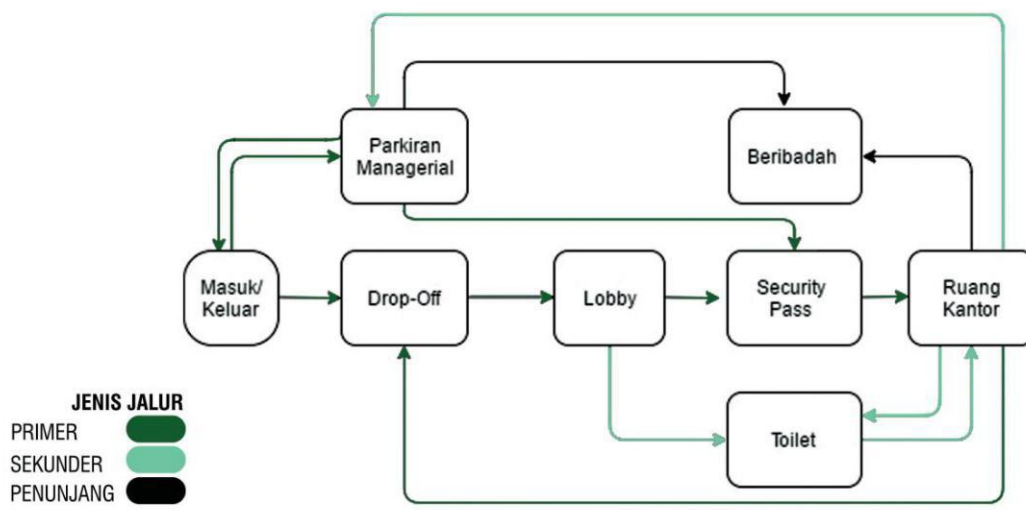


Image 4.13 User Classification
(Source : Personal Analysis)

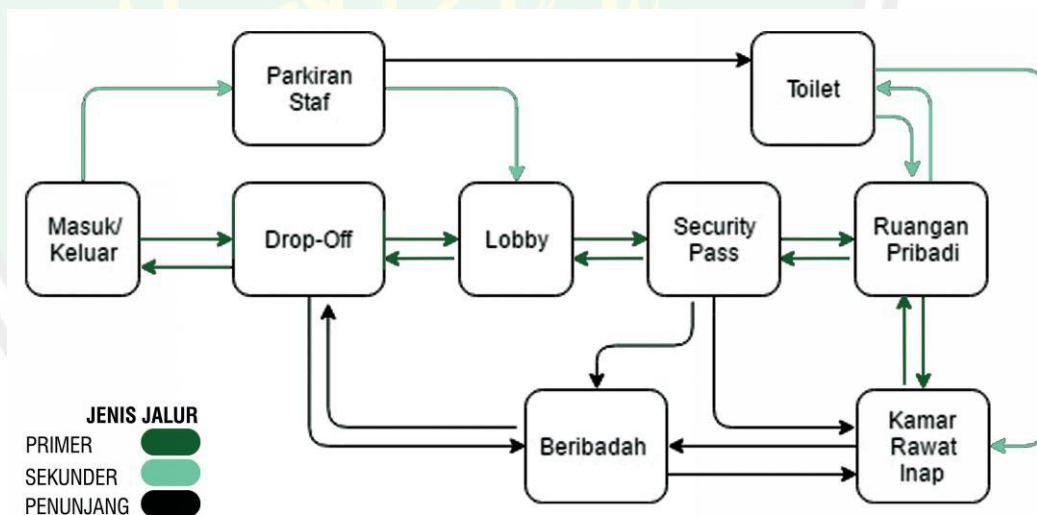
B. Circulation Pattern Analysis

User circulation patterns that can be elaborated and analyzed in this design are divided based on the analysis of activities carried out by each group of Users. User circulation patterns are:

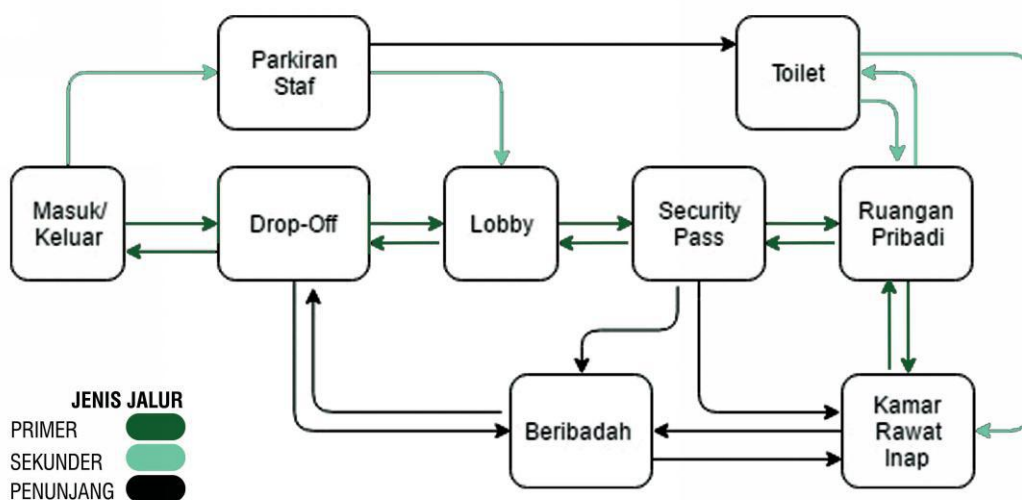
A. Managerial Circulation Pattern



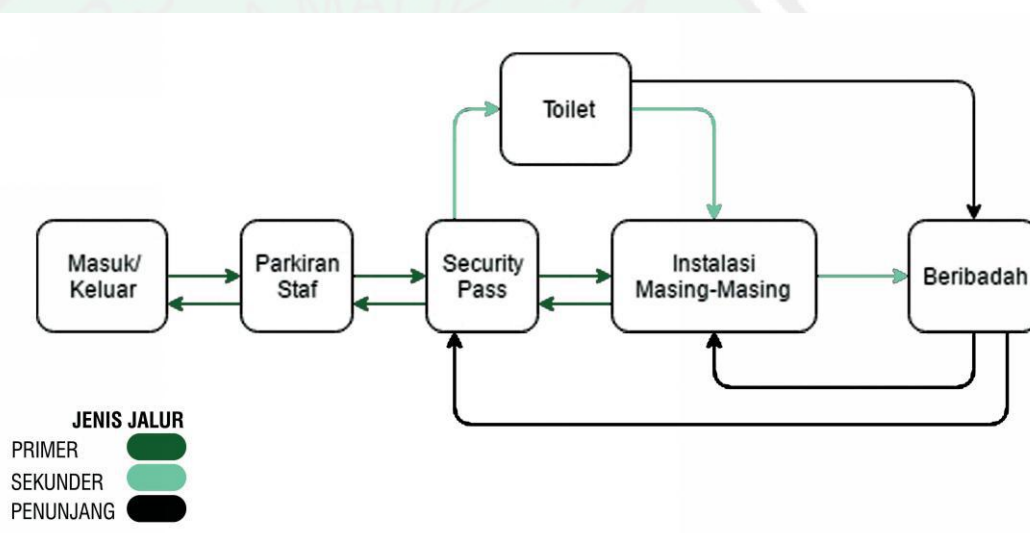
B. Specialist Doctor Circulation Pattern



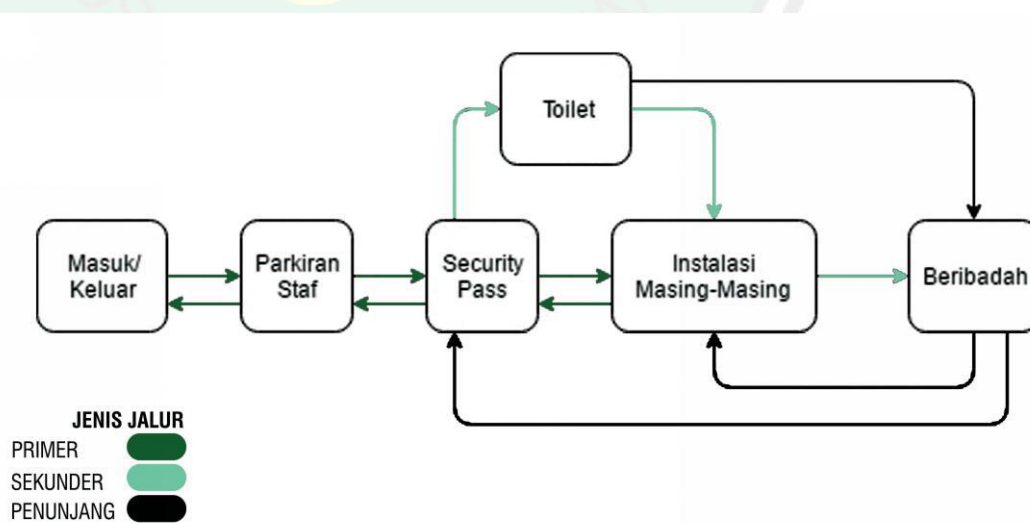
C. Doctor Circulation Pattern



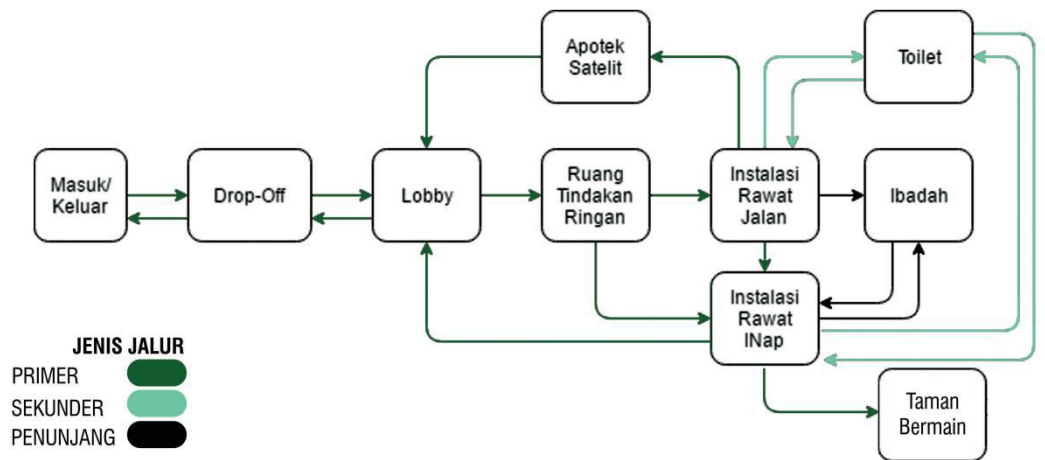
D. Health Employee Circulation Pattern



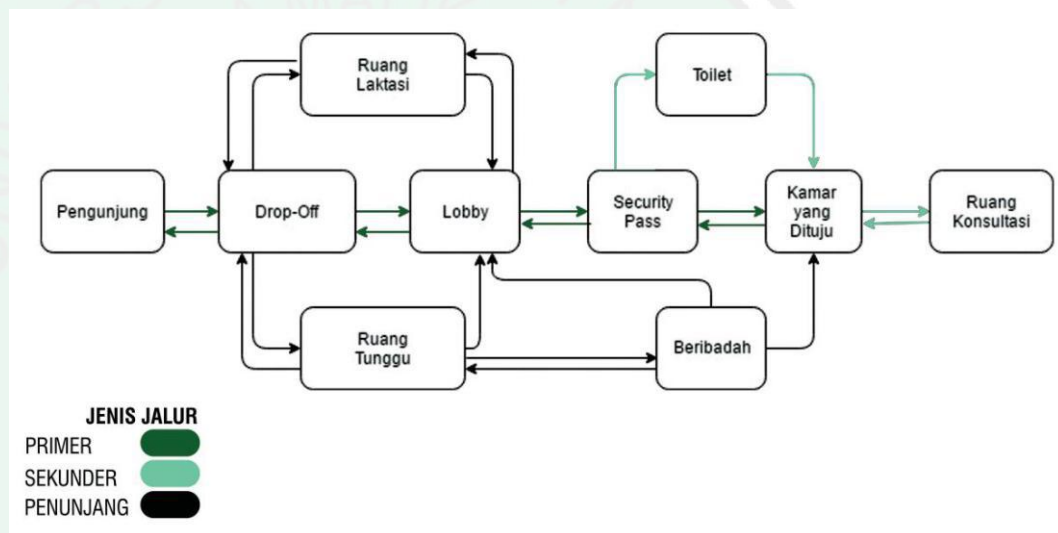
E. Non-Health Employee Circulation Pattern



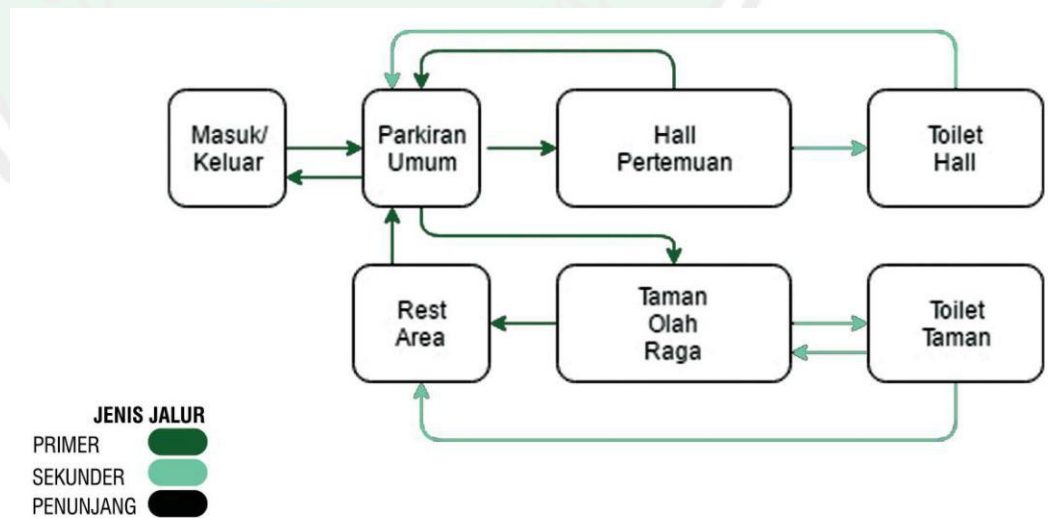
F. Patient Circulation Pattern



G. Visitor Circulation Pattern



H. Local Society Circulation Pattern



C. Analysis of the Amount of Space

From User classification data, space requirements and activities, it can be analyzed again to get the amount of space needed by Users with activities in such a way. In each primary, secondary and supporting function, there are different space requirements which will be described in the following analysis.

Tables within the scope of the primary function, differentiated by group promotion, prevention, treatment and rehabilitation. The following table is an analysis of the amount of space by group space for promotional activities.

Table 4.8 Analysis of the Amount of Primary Space (Promotional Space Group)

NO	NAMA RUANG	STANDAR RUANG (M ² /ORANG)	KAPASITAS (ORANG)	LUAS (M ²)	JUMLAH UNIT	KEBUTUHAN PERABOT	SIRKULASI	SUMBER DATA	TOTAL (M ²)
1	Ruang kontrol petugas	1.5	5	7.5	1	Meja, kursi, almari penyimpanan alat	-	NAD	7.5
2	Ruang istirahat pemateri	1.5	5	7.5	1	Meja, sofa, <i>mini pantry</i>	-	NAD	7.5
3	Lobby	1.5	250	375	1	Pot bunga, <i>signage</i>	-	NAD	375
4	<i>Sitting Lobby</i>	1.5	250	375	1	Sofa, kursi, meja	-	NAD	375
5	Resepsionis	3,5 m ² /petugas	2	7	1	Meja, kursi, lemari berkas/arsip, safety box	-	DEPKES RI	7
6	Auditorium	1.5	1.000	1.500	1	Meja, sofa, kursi, <i>soundsystem</i>	-	NAD	1.500
7	Toilet petugas	2	10	20	4	Kloset, wastafel	-	NAD	20
8	Toilet umum	2	100	200	10	Kloset, wastafel	-	NAD	200
9	Janitor	1.5	1	1.5	1	Perabot : Almari peralatan kebersihan = 0,5 x 2 = 1 m ²	Sirkulasi : 1,5 x 100% = 1,5 m ²	ASUMSI	4
10	Taman Indoor	2	100	200	1	Perabot : Pot bunga = 0,5 x 0,5 x 10 = 2,5 m ² Kursi taman = 1,25 x 0,45 x 10 = 5,625 m ² Tempat sampah = 0,45 x 0,34 x 5 = 0,765 m ² = 0,8 m ²	Sirkulasi : 200 x 50% = 100 m ²	ASUMSI	308,9
11	Taman Outdoor	3	1.000	3000	1	Perabot : Kursi taman = 1,25 x 0,45 x 20 = 11,25 m ² = 11,3 m ² Tempat sampah = 0,45 x 0,34 x 10 = 1,53 m ² = 1,5 m ²	Sirkulasi : 3.000 x 50% = 1.500 m ²	ASUMSI	4.512,8
TOTAL KEBUTUHAN BESARAN RUANG (M²)									7.317,2

Ket :

NAD : Neufert Architect Data

DEPKES RI : Departemen Kesehatan Republik Indonesia

The following table is an analysis of the amount of space by group space for prevention activities.

Table 4.9 Analysis of the Amount of Primary Space (Preventive Space Group)

NO	NAMA RUANG	STANDAR RUANG (M ² /ORANG)	KAPASITAS (ORANG)	LUAS (M ²)	JUMLAH UNIT	KEBUTUHAN PERABOT	SIRKULASI	SUMBER DATA	TOTAL (M ²)
1	Taman olahraga	3	100	300	1	Perabot : Alat olahraga = 50 m ² (asumsi total) Tempat sampah = 0,45 x 0,34 x 10 = 1.53 m ² = 1,5 m ²	Sirkulasi : 300 x 100% = 300 m ²	ASUMSI	651,5
2	Shelter	1.5	100	150	10	Perabot : Shelter 1,5 x 2 = 3 m ²	Sirkulasi : 300 x 100% = 300 m ²	ASUMSI	453
TOTAL KEBUTUHAN BESARAN RUANG (M²)									1.104,5

The following table is an analysis of the amount of space by group space for treatment activities.

Table 4.10 Quantity Analysis of Primary Spaces (Treatment Room Group) - IRJ or Outpatient Instalation

A OUTPATIENTS INSTALATION OR IRJ									
NO	NAMA RUANG	STANDAR RUANG (M ² /ORANG)	KAPASITAS (ORANG)	LUAS (M ²)	JUMLAH UNIT	KEBUTUHAN PERABOT	SIRKULASI	SUMBER DATA	TOTAL (M ²)
1	Ruang Administrasi	3,5 m ² /petugas	2	7	1	Meja, kursi, lemari berkas/arsip, safety box	-	DEPKES RI	7
2	Ruang Tunggu Utama	1.5	50	75	1	Sofa, kursi, meja	-	NAD	75
3	Ruang Pengendalian Akses	5	2	10	1	Meja kerja, kursi kerja, lemari arsip, telepon, intercom, komputer personal	-	DEPKES RI	10
4	Ruang Rekam Medis	16m ² / 1000 Kunjungan	2	16	1	Meja, kursi, lemari arsip, komputer	-	DEPKES RI	16
5	Ruang Periksa dan Konsultasi	24m ² /Poli	3	7.5	1	Kursi dokter, meja konsultasi, 2 kursi hadap, lemari alat periksa dan obat, tempat tidur periksa, tangga <i>roolstool</i>	-	DEPKES RI	7.5
6	Ruang Tindakan (Ringan)	24m ² /Poli	-	24	1	Lemari alat periksa dan obat, tempat tidur periksa, tangga <i>roolstool</i>	-	DEPKES RI	24

Ket :

NAD : *Neufert Architect Data*

DEPKES RI : Departemen Kesehatan Republik Indonesia

Table 4.10 Quantity Analysis of Primary Spaces (Treatment Room Group) - IRJ or Outpatient Instalation (Next)

A OUTPATIENTS INSTALATION OR IRJ									
NO	NAMA RUANG	STANDAR RUANG (M ² /ORANG)	KAPASITAS (ORANG)	LUAS (M ²)	JUMLAH UNIT	KEBUTUHAN PERABOT	SIRKULASI	SUMBER DATA	TOTAL (M ²)
7	Ruang Laktasi	2	5	10	1	Meja, sofa	-	Permenkes No. 15 (2013)	10
8	Janitor	1.5	1	1.5	1	Perabot : Almari peralatan kebersihan = 0,5 x 2 = 1 m ²	Sirkulasi : 1,5 x 100% = 1,5 m ²	ASUMSI	4
9	Shaf	1	1	1	4	-	-	NAD	4
10	Taman Indoor	2	50	100	1	Perabot : Pot bunga = 0,5 x 0,5 x 10 = 2,5 m ² Kursi taman = 1,25 x 0,45 x 10 = 5,625 m ² = 5,6 m ² Tempat sampah = 0,45 x 0,34 x 5 = 0,765 m ² = 0,8 m ²	Sirkulasi : 100 x 50% = 50 m ²	ASUMSI	158,9
11	Toilet Petugas	2	9	18	2	Kloset, wastafel	-	NAD	18
12	Toilet umum	2	50	100	4	Kloset, wastafel	-	NAD	100
TOTAL KEBUTUHAN BESARAN RUANG (M²)									434,4

Ket :

NAD : Neufert Architect Data

DEPKES RI : Departemen Kesehatan Republik Indonesia

PERMENKES : Peraturan Menteri Kesehatan

Table 4.11 Analysis of the Amount of Primary Room (Treatment Room Group) - Inpatient Installation

B INPATIENTS INSTALATION									
NO	NAMA RUANG	STANDAR RUANG (M ² /ORANG)	KAPASITAS (ORANG)	LUAS (M ²)	JUMLAH UNIT	KEBUTUHAN PERABOT	SIRKULASI	SUMBER DATA	TOTAL (M ²)
1	Ruang Administrasi	3,5 m ² /petugas	2	7	1	Meja, kursi, lemari berkas/arsip, safety box	-	DEPKES RI	7
2	Ruang Tunggu Utama	1.5	52	78	1	Sofa, kursi, meja	-	NAD	78

Ket :

NAD : Neufert Architect Data

DEPKES RI : Departemen Kesehatan Republik Indonesia

Table 4.11 Analysis of the Amount of Primary Room (Treatment Room Group) - Inpatient Installation (Next)

B INSTALASI RAWAT INAP									
NO	NAMA RUANG	STANDAR RUANG (M ² /ORANG)	KAPASITAS (ORANG)	LUAS (M ²)	JUMLAH UNIT	KEBUTUHAN PERABOT	SIRKULASI	SUMBER DATA	TOTAL (M ²)
3	Kamar VVIP	7.2/ tempat tidur + perabot (menyesuaikan)	1	36	2	AC, tempat tidur (1), kamar mandi dalam, <i>bedside cabinet</i> , kulkas, kursi tunggu, <i>overbed table</i> , meja tv, almari pakaian, dispenser, meja, sofa, LED TV 47", Bed penunggu, telepon, ruang keluarga, 1 set meja makan, <i>mini pantry</i> .	-	DEPKES RI	72
4	Kamar VIP	7.2/ tempat tidur + perabot (menyesuaikan)	1	24	2	AC, tempat tidur (1), kamar mandi dalam, <i>bedside cabinet</i> , kulkas, kursi tunggu, <i>overbed table</i> , meja tv, almari pakaian, dispenser, meja, sofa, LED TV 47", tempat tidur penunggu, telepon, <i>mini pantry</i>	-	DEPKES RI	48
5	Kamar Kelas 1	7.2/ tempat tidur	2	14.4	5	AC, tempat tidur (2), kamar mandi dalam (2), <i>bedside cabinet</i> (2), kulkas, kursi tunggu (4), TV (2)	-	DEPKES RI	108
6	Kamar Kelas 2	7.2/ tempat tidur	2	14.4	7	AC, tempat tidur (2), kamar mandi dalam, <i>bedside cabinet</i> (2), kursi tunggu (4)	-	DEPKES RI	151,2
7	Kamar Kelas 3	7.2/ tempat tidur	3	21.6	7	AC, tempat tidur (3), kamar mandi dalam, <i>bedside cabinet</i> (3), kursi tunggu (6)	-	DEPKES RI	226,8
8	Ruang Stasi Perawat	5	2	10	1	Meja, kursi, lemari arsip, lemari obat, intrcom untuk memantau pasien	-	DEPKES RI	11,5
9	Ruang Konsultasi	3	2	6	1	Perabot : Lemari = 1 x 0,5 = 0,5 m ² Meja = 1 x 0,5 = 0,5 m ² Kursi = 1 x 0,5 = 0,5 m ²	Sirkulasi : 6 x 100% = 6 m ²	ASUMSI	13.5
10	Ruang Dokter Jaga	6	1	6	1	Perabot : Tempat tidur = 7.2 m ² Sofa = 1,22 x 2,10 = 2,562 m ² = 2,6 m ² Lemari = 1 x 0,5 = 0,5 m ² Meja = 1 x 0,5 = 0,5 m ² Kursi = 1 x 0,5 = 0,5 m ² Wastafel = 0.5 x 0.5 = 0,25 m ²	Sirkulasi : 6 x 50% = 3 m ²	ASUMSI	20,55
11	Ruang Pendidikan Diskusi	1.5	7	10.5	1	Perabot : Lemari = 1 x 0,5 = 0,5 m ² Meja rapat = 4 x 2 = 8 m ² Kursi = 0,5 x 0,5 x 7 = 1,75 m ²	Sirkulasi : 10,5 x 50% = 5,25 m ²	WAWAN CARA	26

Ket :

DEPKES RI : Departemen Kesehatan Republik Indonesia

Table 4.11 Analysis of the Amount of Primary Room (Treatment Room Group) - Inpatient Installation (Next)

B INSTALASI RAWAT INAP									
NO	NAMA RUANG	STANDAR RUANG (M ² /ORANG)	KAPASITAS (ORANG)	LUAS (M ²)	JUMLAH UNIT	KEBUTUHAN PERABOT	SIRKULASI	SUMBER DATA	TOTAL (M ²)
12	Ruang Kepala Instalasi Rawat Inap	6	1	6	1	Perabot : Sofa = 1,22 x 2,10 = 2,562 m ² = 2,6 m ² Lemari = 1 x 0,5 = 0,5 m ² Meja = 1 x 0,5 = 0,5 m ² Kursi = 1 x 0,5 = 0,5 m ²	Sirkulasi : 6 x 50% = 3 m ²	ASUMSI	13,1
13	Loker	4	7	28	1	Perabot : Almari penyimpanan = 1 x 0,5 x 7 = 3,5 m ² Tempat duduk panjang = 3 x 0,5 x 2 = 3 m ²	Sirkulasi : 28 x 20% = 3 m ²	ASUMSI	35
14	Ruang Linen Bersih	Min. 4	2	8	1	Almari kaca penyimpanan linen	-	DEPKES RI	8
15	Ruang Linen Kotor	Min. 4	2	8	1	Keranjang linen kotor, mesin cuci,	-	DEPKES RI	8
16	Gudang Kotor	Min. 6	1	6	1	Rak penyimpanan peralatan kebersihan	-	DEPKES RI	6
17	Gudang Bersih	Min. 6	1	6	1	Rak penyimpanan peralatan kantor	-	DEPKES RI	6
18	Toilet Petugas	2	7	18	2	Kloset, wastafel	-	NAD	18
19	Toilet umum	2	52	100	4	Kloset, wastafel	-	NAD	100
20	HCU (<i>High Care Unit</i>)	9 m ² /tempat tidur	1	9	1	Tempat tidur pasien, lemari, <i>nurse call</i>	-	DEPKES RI	9
21	Ruang Perawatan isolasi	12 m ² /tempat tidur	1	12	1	Tempat tidur pasien, lemari, <i>nurse call</i>	-	DEPKES RI	12
20	Janitor	1.5	1	1.5	1	Perabot : Almari peralatan kebersihan = 0,5 x 2 = 1 m ²	Sirkulasi : 1,5 x 100% = 1,5 m ²	ASUMSI	4
22	Shaf	1	1	1	4	-	-	NAD	4.8
23	Taman <i>Indoor</i> - Taman bermain anak-anak	2	52	104	1	Perabot : Alat permainan = 8,1 m ² Tempat sampah = 0,45 x 0,34 x 5 = 0,765 m ² = 0,8 m ²	Sirkulasi : 104 x 50% = 52 m ²	ASUMSI	164,9
24	Taman <i>Outdoor</i>	3	52	156	1	Perabot : Kursi taman = 1,25 x 0,45 x 20 = 11.25 m ² = 11,3 m ² Tempat sampah = 0,45 x 0,34 x 10 = 1.53 m ² = 1,5 m ²	Sirkulasi : 156 x 50% = 78 m ²	ASUMSI	246,8
25	Mushola Khusus	1.5	50	75	1	Perabot : Sajadah = 1,1 x 0,5 x 50 = 27,5 m ²	Sirkulasi : 75 x 50% = 37,5 m ²	ASUMSI	140
TOTAL KEBUTUHAN BESARAN RUANG (M ²)									1.547,15

Ket :

NAD : *Neufert Architect Data*

DEPKES RI : Departemen Kesehatan Republik Indonesia

Table 4.12 Analysis of the Amount of Primary Space (Treatment Room Group) - ER or UGD

C									
EMERGENCY ROOM (UGD)									
NO	NAMA RUANG	STANDAR RUANG (M ² /ORANG)	KAPASITAS (ORANG)	LUAS (M ²)	JUMLAH UNIT	KEBUTUHAN PERABOT	SIRKULASI	SUMBER DATA	TOTAL (M ²)
1	Ruang Triase	Min. 25	2	25	1	-	-	DEPKES RI	25
2	Ruang P0	9 m ² /tempat tidur	1	9	1	Tempat tidur pasien	-	DEPKES RI	9
3	Ruang P1	9 m ² /tempat tidur	3	9	1	Tempat tidur pasien	-	DEPKES RI	27
4	Ruang P2	9 m ² /tempat tidur	3	9	1	Tempat tidur pasien	-	DEPKES RI	27
5	Ruang P3	9 m ² /tempat tidur	3	9	1	Tempat tidur pasien	-	DEPKES RI	27
6	Ruang Tindakan Non Bedah	Min. 36	4	36	1	Tempat tidur pasien, Peralatan tindakan non bedah	-	DEPKES RI	36
7	Ruang Dekontaminasi dan Sterilisasi	Min. 6	1	36	1	Shower dan sink, lemari alat dekontaminasi	-	DEPKES RI	36
8	Ruang Radiologi Cito	Min. 6	1	36	1	Mobile X-ray, mobile ECG, apron timbal, automatic film processor dan film viewer	-	DEPKES RI	36
9	Toilet Petugas	2	6	12	1	Kloset, wastafel	-	NAD	12
10	Toilet Umum	2	17	34	1	Kloset, wastafel	-	NAD	34
11	Toilet Disabilitas	4	17	68	1	Kloset, wastafel	-	NAD	68
12	Ruang Loker	1.5	7	10,5	1	Perabot : Almari penyimpanan = 1 x 0,5 x 7 = 3,5 m ² Tempat duduk panjang = 3 x 0,5 x 2 = 3 m ²	Sirkulasi : 10,5x 20% = 2,1 m ²	ASUMSI	19,1
13	Pantry	1.5	7	10,5	1	Perabot : Kitchen Set = 0,6 x 2 = 1,2 m ² Kursi = 0,5 x 0,5 x 4 = 1 m ²	Sirkulasi : 10,5x 20% = 2,1 m ²	ASUMSI	14,8
14	Ruang Parkir Troli	2/troli	5 troli	10	1	Troli	-	DEPKES RI	10
15	Ruang Brankar	3/brankar	5 brankar	15	1	Tempat tidur pasien	-	DEPKES RI	15
16	Janitor	1.5	1	1.5	1	Perabot : Almari peralatan kebersihan = 0,5 x 2 = 1 m ²	Sirkulasi : 1,5 x 100% = 1,5 m ²	ASUMSI	4
17	Shaf	1	1	1	4	-	-	NAD	4.8

Ket :

NAD : Neufert Architect Data

DEPKES RI : Departemen Kesehatan Republik Indonesia

Table 4.12 Analysis of the Amount of Primary Space (Treatment Room Group) - ER or UGD (Next)

C EMERGENCY ROOM (UGD)									
NO	NAMA RUANG	STANDAR RUANG (M ² /ORANG)	KAPASITAS (ORANG)	LUAS (M ²)	JUMLAH UNIT	KEBUTUHAN PERABOT	SIRKULASI	SUMBER DATA	TOTAL (M ²)
18	Taman Indoor	2	23	46	1	Perabot : Pot bunga = 0,5 x 0,5 x 10 = 2,5 m ² Kursi taman = 1,25 x 0,45 x 10 = 5,625 m ² = 5,6 m ² Tempat sampah = 0,45 x 0,34 x 5 = 0,765 m ² = 0,8 m ²	Sirkulasi : 46 x 50% = 23 m ²	ASUMSI	77,9
19	Taman Outdoor	3	23	69	1	Perabot : Kursi taman = 1,25 x 0,45 x 20 = 11,25 m ² = 11,3 m ² Tempat sampah = 0,45 x 0,34 x 10 = 1,53 m ² = 1,5 m ²	Sirkulasi : 69 x 50% = 34,5 m ²	ASUMSI	116,3
TOTAL KEBUTUHAN BESARAN RUANG (M²)									598,9

Table 4.13 Analysis of the Amount of Primary Space (Treatment Room Group) - Pharmacy Installation

D INSTALASI FARMASI									
NO	NAMA RUANG	STANDAR RUANG (M ² /ORANG)	KAPASITAS (ORANG)	LUAS (M ²)	JUMLAH UNIT	KEBUTUHAN PERABOT	SIRKULASI	SUMBER DATA	TOTAL (M ²)
1	Ruang Administrasi	3,5 m ² /petugas	2	7	1	Meja, kursi, lemari berkas/arsip, safety box	-	DEPKES RI	7
2	Ruang Kepala Staff Instalasi Farmasi	6	1	6	1	Perabot : Sofa = 1,22 x 2,10 = 2,562 m ² = 2,6 m ² Lemari = 1 x 0,5 = 0,5 m ² Meja = 1 x 0,5 = 0,5 m ² Kursi = 1 x 0,5 = 0,5 m ²	Sirkulasi : 6 x 50% = 3 m ²	ASUMSI	13,1
3	Ruang Tunggu	1.5	10	15	1	Sofa, kursi, meja	-	NAD	15
4	Taman Indoor	2	15	30	1	Perabot : Pot bunga = 0,5 x 0,5 x 10 = 2,5 m ² Kursi taman = 1,25 x 0,45 x 10 = 5,625 m ² = 5,6 m ² Tempat sampah = 0,45 x 0,34 x 5 = 0,765 m ² = 0,8 m ²	Sirkulasi : 30 x 50% = 15 m ²	ASUMSI	53,9

Ket :

NAD : Neufert Architect Data

DEPKES RI : Departemen Kesehatan Republik Indonesia

Table 4.13 Analysis of the Amount of Primary Space (Treatment Room Group) - Pharmacy Installation (Next)

D INSTALASI FARMASI									
NO	NAMA RUANG	STANDAR RUANG (M ² /ORANG)	KAPASITAS (ORANG)	LUAS (M ²)	JUMLAH UNIT	KEBUTUHAN PERABOT	SIRKULASI	SUMBER DATA	TOTAL (M ²)
5	Pantry	1.5	7	10,5	1	Perabot : Kitchen Set = 0,6 x 2 = 1,2 m ² Kursi = 0,5 x 0,5 x 4 = 1 m ²	Sirkulasi : 10,5x 20% = 2,1 m ²	ASUMSI	14,8
6	Toilet Petugas	2	6	12	2	Kloset, wastafel	-	NAD	12
7	Toilet Umum	2	10	20	4	Kloset, wastafel	-	NAD	20
8	Toilet Disabilitas	4	10	40	4	Kloset, wastafel	-	NAD	40
9	Gudang Obat	36	1	36	1	Lemari/rak	-	DEPKES RI	36
10	Janitor	1.5	1	1.5	1	Perabot : Almari peralatan kebersihan = 0,5 x 2 = 1 m ²	Sirkulasi : 1,5 x 100% = 1,5 m ²	ASUMSI	4
11	Shaf	1	1	1	4	-	-	NAD	4.8
TOTAL KEBUTUHAN BESARAN RUANG (M²)									104,8

Ket :

NAD : *Neufert Architect Data*

DEPKES RI : Departemen Kesehatan Republik Indonesia

Table 4.14 Analysis of the Amount of Primary Space (Treatment Room Group) - Laboratory Installation

E INSTALASI LABORATORIUM									
NO	NAMA RUANG	STANDAR RUANG (M ² /ORANG)	KAPASITAS (ORANG)	LUAS (M ²)	JUMLAH UNIT	KEBUTUHAN PERABOT	SIRKULASI	SUMBER DATA	TOTAL (M ²)
1	Ruang Tunggu Pasien	1.5	10	15	1	Sofa, kursi, meja	-	NAD	15
2	Ruang Pengambilan/ Penerimaan Sampel	9	1	9	1	Perabot : Meja = 1 x 0,5 = 0,5 m ² Kursi = 1 x 0,5 x 2 = 1 m ² Lemari (jarum suntik dan pipetnya, container urin, timbangan, tensimeter) = 2 x 0,5 = 1 m ²	Sirkulasi : 9 x 50% = 4,5 m ²	ASUMSI	16

Ket :

NAD : *Neufert Architect Data*

Table 4.14 Analysis of the Amount of Primary Space (Treatment Room Group) - Laboratory Installation(Next)

E									
INSTALASI LABORATORIUM									
NO	NAMA RUANG	STANDAR RUANG (M ² /ORANG)	KAPASITAS (ORANG)	LUAS (M ²)	JUMLAH UNIT	KEBUTUHAN PERABOT	SIRKULASI	SUMBER DATA	TOTAL (M ²)
3	Bank Darah	1.5	2	3	1	Perabot : Meja = 1 x 0,5 = 0,5 m ² Kursi = 1 x 0,5 x 2 = 1 m ² Kulkas = 2 x 1 x 2 = 4 m ² Freezer = 2 x 1 x 2 = 4 m ² Lemari = 2 x 0,5 = 1 m ²	Sirkulasi : 3 x 50% = 1,5 m ²	ASUMSI	15
4	Ruang Penyimpanan <i>Bio Material</i>	9	1	9	1	Perabot : Meja = 1 x 0,5 = 0,5 m ²	Sirkulasi : 3 x 50% = 1,5 m ²	ASUMSI	13,5
5	Ruang Cuci Peralatan	9	1	9	1	Rak, kulkas, freezer	-	DEPKES RI	9
6	Ruang Loker	4	5	20	1	Perabot : Almari penyimpanan = 1 x 0,5 x 7 = 3,5 m ² Tampat duduk panjang = 3 x 0,5 x 2 = 3 m ²	Sirkulasi : 20 x 20% = 4 m ²	ASUMSI	30,5
7	Pantri	1.5	7	10,5	1	Perabot : Kitchen Set = 0,6 x 2 = 1,2 m ² Kursi = 0,5 x 0,5 x 4 = 1 m ²	Sirkulasi : 10,5 x 20% = 2,1 m ²	ASUMSI	14,8
8	Toilet Petugas	2	6	12	2	Kloset, wastafel	-	NAD	12
9	Toilet Umum	2	10	20	4	Kloset, wastafel	-	NAD	20
10	Toilet Disabilitas	4	10	40	4	Kloset, wastafel	-	NAD	40
11	Janitor	1.5	1	1.5	1	Perabot : Almari peralatan kebersihan = 0,5 x 2 = 1 m ²	Sirkulasi : 1,5 x 100% = 1,5 m ²	ASUMSI	4
12	Shaf	1	1	1	4	-	-	NAD	4,8
TOTAL KEBUTUHAN BESARAN RUANG (M²)									194,6

Ket :

NAD : *Neufert Architect Data*

DEPKES RI : Departemen Kesehatan Republik Indonesia

Table 4.15 Quantity Analysis of Primary Spaces (Treatment Room Group) - Main Kitchen Installation

F INSTALASI DAPUR UTAMA									
NO	NAMA RUANG	STANDAR RUANG (M2/ORANG)	KAPASITAS (ORANG)	LUAS (M2)	JUMLAH UNIT	KEBUTUHAN PERABOT	SIRKULASI	SUMBER DATA	TOTAL (M2)
1	Ruang Penerimaan Dan Penimbangan Bahan Makanan	+16	1	20	1	Rak bahan-bahan makanan, timbangan kapasitas 20-300 kg, kereta angkut, pembuka botol, penusuk beras, pisau, kontainer, troli, alat penguji kualitas telur, lemari arsip, APAR	-	DEPKES RI	20
2	Ruang Penyimpanan Bahan Makanan Basah	Min. 6	1	6	1	Freezer, kulkas, container bahan makanan, timbangan kapasitas 20-200 kg, kereta angkut, pengusir tikus elektrik	-	DEPKES RI	6
3	Ruang Penyimpanan Bahan Makanan Kering	Min.9	1	9	1	Freezer, kulkas, container bahan makanan, timbangan kapasitas 20-200 kg, kereta angkut, pengusir tikus elektrik	-	DEPKES RI	9
4	Ruang Persiapan Peralatan Dapur	Min.18	1	18	1	Meja kerja/persiapan, bangku kerja, meja daging, mesin sayuran, bak cuci piring persegi, pisau, mesin pamarut kelapa, blender, bak cuci, cobek/uleman, mixer, timbangan	-	DEPKES RI	18
5	Ruang Pengolahan dan Memasak Makanan	Min.18	1	18	1	Kompor, gas elpiji, kompor listrik, alat memasak, timbangan, meja kerja, bangku, bak cuci, kereta dorong, kereta warmer	-	DEPKES RI	18
6	Ruang Pembagian / Penyajian Makanan	Min.9	1	8	1	Meja pembagi, bangku, alat makan, rak piring susun, kertas label, alat tulis	-	DEPKES RI	9
7	Ruang Cuci	Min.9	1	8	1	Alat pencuci mekanik dan pencuci manual	-	DEPKES RI	9
8	Mushola Khusus	1,5	5	7,5	1	Perabot : Sajadah = 1,1 x 0,5 x 50 = 27,5 m2	Sirkulasi : 7,5 x 50% = 3,75 m2	ASUMSI	38,75
9	Ruang Penyimpanan Troli Gizi	Min. 6	1	6	1	sabun colek, sikat, lap/kain, serok air	-	DEPKES RI	6
10	Ruang Penyimpanan Peralatan Dapur	Min.9	1	9	1	Lemari perkakas dapur khusus, rak perkakas dapur, meja, kursi	-	DEPKES RI	9
11	Janitor	1.5	1	1.5	1	Perabot : Almari peralatan kebersihan = 0,5 x 2 = 1 m2	Sirkulasi : 1,5 x 100% = 1,5 m2	ASUMSI	4
12	Shaf	1	1	1	4	-	-	NAD	4,8
TOTAL KEBUTUHAN BESARAN RUANG (M2)									151,55

Ket :

NAD : Neufert Architect Data

DEPKES RI : Departemen Kesehatan Republik Indonesia

Table 4.16 Quantity Analysis of Primary Room (Treatment Room Group) - Clinical Nutrition Installation

G INSTALASI GIZI KLINIK									
NO	NAMA RUANG	STANDAR RUANG (M ² /ORANG)	KAPASITAS (ORANG)	LUAS (M ²)	JUMLAH UNIT	KEBUTUHAN PERABOT	SIRKULASI	SUMBER DATA	TOTAL (M ²)
1	Ruang Nutrisionis	+10	1	12	1	Meja, kursi, komputer, rak buku		DEPKES RI	12
2	Ruang Peraga dan Miniatur	1.5	2	3	1	Perabot : Alat peraga = 3 x 4 = 12 m ²	Sirkulasi : 2x 100% = 2 m ²	ASUMSI	17
3	Toilet Petugas	2	6	12	2	Kloset, wastafel	-	NAD	12
4	Instalasi <i>vertical garden</i>	2	1	2	2	Perabot : Instalasi = 0,5 x 3 = 1,5 m ²	Sirkulasi : 2x 200% = 4 m ²	ASUMSI	9,5
TOTAL KEBUTUHAN BESARAN RUANG (M²)									50,5

Ket :

NAD : *Neufert Architect Data*

DEPKES RI : Departemen Kesehatan Republik Indonesia

Table 4.17 Analysis of the Amount of Primary Space (Treatment Room Group) - Medical Rehabilitation Installation

H INSTALASI REHABILITASI MEDIK (IRM)									
NO	NAMA RUANG	STANDAR RUANG (M ² /ORANG)	KAPASITAS (ORANG)	LUAS (M ²)	JUMLAH UNIT	KEBUTUHAN PERABOT	SIRKULASI	SUMBER DATA	TOTAL (M ²)
1	Ruang Administrasi	3,5 m ² /petugas	2	7	1	Meja, kursi, lemari berkas/arsip, safety box	-	DEPKES RI	7
2	Ruang Tunggu Pasien	1.5	10	15	1	Sofa, kursi, meja	-	NAD	15
3	Ruang Pemeriksaan	12-25 m ²	2	12	1	Kursi dokter, meja konsultasi, 2 kursi hadap, lemari alat periksa dan obat, tempat tidur periksa, tangga <i>roolstool</i>	-	DEPKES RI	12
4	Ruang Fisioterapi Aktif	Min. 50m ²	10	50	1	<i>Treadmil, parallel bars, ergocycle, exercise bicycle</i> dan peralatan senam lainnya	-	DEPKES RI	50
5	Ruang Fisioterapi Pasif	Min. 12 m ² / tempat tidur traksi	5	60	1	Tempat tidur periksa, unit traksi, alat stimulasi elektrik, <i>microwave diathermy, ultraviolet quartz</i> , dan peralatan fisioterapi lainnya	-	DEPKES RI	60

Ket :

DEPKES RI : Departemen Kesehatan Republik Indonesia

Table 4.17 Analysis of the Amount of Primary Space (Treatment Room Group) - Medical Rehabilitation Installation (Next)

H INSTALASI REHABILITASI MEDIK (IRM)									
NO	NAMA RUANG	STANDAR RUANG (M ² /ORANG)	KAPASITAS (ORANG)	LUAS (M ²)	JUMLAH UNIT	KEBUTUHAN PERABOT	SIRKULASI	SUMBER DATA	TOTAL (M ²)
6	Gudang Peralatan IRM	1.5	1	1.5	1	Perabot : Lemari = 0,5 x 3 x 3 = 4,5 m ²	Sirkulasi : 1.5x 200% = 3 m ²	ASUMSI	9
7	Ruang Kepala IRM	6	1	6	1	Perabot : Sofa = 1,22 x 2,10 = 2,562 m ² = 2,6 m ² Lemari = 1 x 0,5 = 0,5 m ² Meja = 1 x 0,5 = 0,5 m ² Kursi = 1 x 0,5 = 0,5 m ²	Sirkulasi : 6 x 50% = 3 m ²	ASUMSI	13,1
8	Pantri	1.5	5	7,5	1	Perabot : Kitchen Set = 0,6 x 2 = 1,2 m ² Kursi = 0,5 x 0,5 x 4 = 1 m ²	Sirkulasi : 7,5x 20% = 1,5 m ²	ASUMSI	11,2
9	Toilet Petugas	2	6	12	2	Kloset, wastafel	-	NAD	12
10	Toilet Umum	2	10	20	4	Kloset, wastafel	-	NAD	20
11	Janitor	1.5	1	1.5	1	Perabot : Almari peralatan kebersihan = 0,5 x 2 = 1 m ²	Sirkulasi : 1,5 x 100% = 1,5 m ²	ASUMSI	4
12	Shaf	1	1	1	4	-	-	NAD	4,8
TOTAL KEBUTUHAN BESARAN RUANG (M²)									218,1

Ket :

NAD : Neufert Architect Data

DEPKES RI : Departemen Kesehatan Republik Indonesia

The total area of space needed for the treatment room group can be summarized as follows :

Outpatient Instalation	=	434,40 m ²
Inpatients Instalation	=	1.547,15 m ²
Emergency Room Instalation	=	598,90 m ²
Pharmacy Instalation	=	104,80 m ²
Laboratory Instalation	=	194,60 m ²
Public Kitchen Instalation	=	151,55 m ²
Clinical Nutrition Instalation	=	50,50 m ²
Medic rehabilitation Instalation	=	218,10 m ²
TOTAL		3.518,10 m²

The following table is an analysis of the amount of space by group space for rehabilitation activities.

Table 4.18 Quantity Analysis of Primary Spaces (Rehabilitation Room Group)

NO	NAMA RUANG	STANDAR RUANG (M ² /ORANG)	KAPASITAS (ORANG)	LUAS (M ²)	JUMLAH UNIT	KEBUTUHAN PERABOT	SIRKULASI	SUMBER DATA	TOTAL (M ²)
1	Lanskap <i>healing</i>	4	50	200	1	Perabot : Kursi taman = 1,25 x 0,45 x 20 = 11.25 m ² = 11,3 m ² Tempat sampah = 0,45 x 0,34 x 10 = 1.53 m ² = 1,5 m ²	Sirkulasi : 200 x 100% =200 m ²	ASUMSI	412,8
2	Lanskap <i>sensory</i>	4	50	200	1	Perabot : Kursi taman = 1,25 x 0,45 x 20 = 11.25 m ² = 11,3 m ² Tempat sampah = 0,45 x 0,34 x 10 = 1.53 m ² = 1,5 m ²	Sirkulasi : 200 x 100% =200 m ²	ASUMSI	412,8
3	Lanskap <i>therapy</i>	4	50	200	1	Perabot : Kursi taman = 1,25 x 0,45 x 20 = 11.25 m ² = 11,3 m ² Tempat sampah = 0,45 x 0,34 x 10 = 1.53 m ² = 1,5 m ²	Sirkulasi : 200 x 100% =200 m ²	ASUMSI	412,8
TOTAL KEBUTUHAN BESARAN RUANG (M²)									1.238,4

The following table is an analysis of the amount of space by group space for managerial activities.

Table 4.19 Quantity Analysis of Primary Spaces (Managerial Space Group)

NO	NAMA RUANG	STANDAR RUANG (M ² /ORANG)	KAPASITAS (ORANG)	LUAS (M ²)	JUMLAH UNIT	KEBUTUHAN PERABOT	SIRKULASI	SUMBER DATA	TOTAL (M ²)
1	Ruang Direksi	1,5	1	1,5	1	Perabot : Meja = 1 x 0,5 = 0,5 m ² Kursi = 1 x 0,5 = 0,5 m ² Sofa = 1,22 x 2,10 = 2,562 m ² = 2,6 m ² Lemari arsip = 1 x 0,5 = 0,5 m ²	Sirkulasi : 5,6 x 50% = 2,8 m ²	ASUMSI	8,4
2	Ruang Rapat dan Diskusi (Hall Utama)	1,5	17	25,5	1	Perabot : Lemari = 1 x 0,5 x 2 = 1 m ² Meja rapat = 4 x 2 x 3 = 24 m ² Kursi = 0,5 x 0,5 x 17 = 4,25 m ²	Sirkulasi : 25,5 x 50% = 12,75 m ²	ASUMSI	67,5
3	Ruang Kepala Komite Medis	1,5	4	6	1	Perabot : Meja = 1 x 0,5 x 4 = 2 m ² Kursi = 1 x 0,5 x 4 = 2 m ² Lemari arsip = 1 x 0,5 x 4 = 2 m ²	Sirkulasi : 12 x 50% = 6 m ²	ASUMSI	18
4	Ruang Kepala Keperawatan	1,5	1	1,5	1	Perabot : Meja = 1 x 0,5 = 0,5 m ² Kursi = 1 x 0,5 = 0,5 m ² Lemari arsip = 1 x 0,5 = 0,5 m ²	Sirkulasi : 3 x 100% = 3 m ²	ASUMSI	6

Table 4.19 Quantity Analysis of Primary Spaces (Managerial Space Group) (Next)

NO	NAMA RUANG	STANDAR RUANG (M ² /ORANG)	KAPASITAS (ORANG)	LUAS (M ²)	JUMLAH UNIT	KEBUTUHAN PERABOT	SIRKULASI	SUMBER DATA	TOTAL (M ²)
5	Ruang Kepala Pelayanan Medik dan Keperawatan	1,5	2	3	1	Perabot : Meja = 1 x 0,5 x 2 = 1 m ² Kursi = 1 x 0,5 x 2 = 1 m ² Lemari arsip = 1 x 0,5 x 2 = 1 m ²	Sirkulasi : 6 x 50% = 3 m ²	ASUMSI	9
6	Ruang Kepala Keuangan	1,5	2	3	1	Perabot : Meja = 1 x 0,5 x 2 = 1 m ² Kursi = 1 x 0,5 x 2 = 1 m ² Lemari arsip = 1 x 0,5 x 2 = 1 m ²	Sirkulasi : 6 x 50% = 3 m ²	ASUMSI	9
7	Ruang Kepala Pelayanan Penunjang Medik	1,5	3	4,5	1	Perabot : Meja = 1 x 0,5 x 3 = 1,5 m ² Kursi = 1 x 0,5 x 3 = 1,5 m ² Lemari arsip = 1 x 0,5 x 3 = 1,5 m ²	Sirkulasi : 4,5 x 50% = 2,25 m ²	ASUMSI	11,25
8	Ruang Kepala Bagian Pendidikan dan Pelatihan dan SDM	1,5	2	3	1	Perabot : Meja = 1 x 0,5 x 2 = 1 m ² Kursi = 1 x 0,5 x 2 = 1 m ² Lemari arsip = 1 x 0,5 x 2 = 1 m ²	Sirkulasi : 6 x 50% = 3 m ²	ASUMSI	9
9	Ruang Umum dan Operasional	1,5	1	1,5	1	Perabot : Meja = 1 x 0,5 = 0,5 m ² Kursi = 1 x 0,5 = 0,5 m ² Lemari arsip = 1 x 0,5 = 0,5 m ²	Sirkulasi : 3 x 100% = 3 m ²	ASUMSI	6
10	Ruang SPI (Satuan Pengawasan Internal)	1,5	1	1,5	1	Perabot : Meja = 1 x 0,5 = 0,5 m ² Kursi = 1 x 0,5 = 0,5 m ² Lemari arsip = 1 x 0,5 = 0,5 m ²	Sirkulasi : 3 x 100% = 3 m ²	ASUMSI	6
11	Ruang Arsip Data	1,5	1	1,5	1	Perabot : Meja = 1 x 0,5 = 0,5 m ² Kursi = 1 x 0,5 = 0,5 m ² Lemari arsip = 1 x 0,5 = 0,5 m ²	Sirkulasi : 3 x 100% = 3 m ²	ASUMSI	6
12	Ruang Tunggu Pengunjung	1.5	10	15	1	Sofa, kursi, meja	-	NAD	15
13	Pantri	1.5	17	25,5	1	Perabot : Kitchen Set = 0,6 x 2 = 1,2 m ² Kursi = 0,5 x 0,5 x 4 = 1 m ²	Sirkulasi : 25,5 x 20% = 5,1 m ²	ASUMSI	32,8
14	Toilet Pegawai	2	17	34	2	Kloset, wastafel	-	NAD	34
15	Toilet pengunjung	2	20	40	4	Kloset, wastafel	-	NAD	56

Ket :

NAD : Neufert Architect Data

Table 4.19 Quantity Analysis of Primary Spaces (Managerial Space Group) (Next)

NO	NAMA RUANG	STANDAR RUANG (M2/ORANG)	KAPASITAS (ORANG)	LUAS (M2)	JUMLAH UNIT	KEBUTUHAN PERABOT	SIRKULASI	SUMBER DATA	TOTAL (M2)
16	Janitor	1.5	1	1.5	1	Perabot : Almari peralatan kebersihan = $0,5 \times 2 = 1 \text{ m}^2$	Sirkulasi : $1,5 \times 100\% = 1,5 \text{ m}^2$	ASUMSI	4
17	Shaf	1	1	1	4	-	-	NAD	4,8
18	Mushola Khusus	1,5	50	75	1	Perabot : Sajadah = $1,1 \times 0,5 \times 50 = 27,5 \text{ m}^2$	Sirkulasi : $75 \times 50\% = 37,5 \text{ m}^2$	ASUMSI	140
TOTAL KEBUTUHAN BESARAN RUANG (M2)									442,75

Ket :

NAD : Neufert Architect Data

The total area of space needed for primary space can be concluded as follows,:

Promotion Room Group	=	7.317,20 m ²
Prevention Room Group	=	1.104,50 m ²
Treatment Room Group	=	3.518,10 m ²
Rehabilitation Room Group	=	1.238,40 m ²
Managerial Room Group	=	442,75 m ²
TOTAL		13.620,95 m²

Table in the scope of the secondary function there are six rooms, namely green space, polling stations, waste disposal points, sports parks, indoor security posts and communal spaces. The space requirements will be analyzed in the following Table:

Table 4.20 Analysis of the Amount of Secondary Space

NO	NAMA RUANG	STANDAR RUANG	KAPASITAS	LUAS (M2)	JUMLAH UNIT	KEBUTUHAN PERABOT	SIRKULASI	SUMBER DATA	TOTAL (M2)
1	RTH	30%	-	-	-	Kebutuhan RTH : 30% X 13.620,95 m2 = 4.086,285 m2 = 4.086,3 m2	-	-	4.086,3
2	TPS	Dimensi 10-50 m2 /150-200 jiwa	300 orang	60	1	Tempat parkir truk sampah, tempat penyimpanan peralatan, pos sampah	-	BSN	60
3	Titik membuang sampah (di luar ruangan)	1 set /20 m2	-	0.5	204	Kebutuhan titik sampah : = 4.086,3 m2 : 20 = 204 titik	-	ASUMSI	102
4	Taman olahraga	3m2 /orang	100 orang	300	1	Perabot : Alat olahraga = 50 m2 (asumsi total) Tempat sampah = 0,45 x 0,34 x 10 = 1,53 m2 = 1,5 m2	Sirkulasi : 300 x 100% = 300 m2	ASUMSI	651,5
5	Pos keamanan <i>indoor</i>	1,5	2 orang	3	3	Perabot : Meja = 1 x 0,5 x 3 = 1,5 m2 Kursi = 1 x 0,5 x 3 = 1,5 m2 Lemari arsip = 1 x 0,5 x 3 = 1,5 m2	Sirkulasi : 9 x 50% = 4,5 m2	ASUMSI	18
6	Ruang komunal	1,5	4 orang	6	10	Perabot : Meja bulat = 1 x 1,5 x 10 = 15 m2 = 15 m2 Kursi = 0,5 x 0,5 x 4 x 10 = 40 m2 = 40 m2	Sirkulasi : 60 x 100% = 60 m2	ASUMSI	115
7	Parkiran bus	11,4 x 2,5 / <i>single decker bus</i>	5 bus	142,5	1	<i>Signage</i> , pembatas parkiran	Sirkulasi : 142,5 x 100% = 142,5 m2	ASUMSI	285
8	Parkiran mobil	2,5 x 6 / <i>mini to standar car</i>	150 mobil	2.250	1	<i>Signage</i> , pembatas parkiran	Sirkulasi : 2.250 x 100% = 2.250 m2	ASUMSI	4.500
9	Parkiran motor	12 x 0,8 / <i>standar motor</i>	300 motor	2.880	1	<i>Signage</i> , pembatas parkiran	Sirkulasi : 2.880 x 100% = 2.880 m2	ASUMSI	5.760
TOTAL KEBUTUHAN BESARAN RUANG (M2)									15.577,8

Ket :

BSN : Badan Standarisasi Nasional

Table within the scope of supporting functions, distinguished by space for resting, prayer room, open park and outdoor security post. The space requirements will be analyzed in the following table:

Table4.21 Analysis of the Amount of Supporting Space

NO	NAMA RUANG	STANDAR RUANG	KAPASITAS	LUAS (M2)	JUMLAH UNIT	KEBUTUHAN PERABOT	SIRKULASI	SUMBER DATA	TOTAL (M2)
1	Ruang untuk beristirahat sesuai dengan Function dan jabatan	-	-	-	-	-	-	-	-
2	Mushola	1,5	50	75	1	Perabot : Sajadah = 1,1 x 0,5 x 50 = 27,5 m2	Sirkulasi : 75 x 50% = 37,5 m2	ASUMSI	140
3	Taman Terbuka	-	-	-	-	-	-	-	-
4	Pos Keamanan	1,5	2 orang	3	3	Perabot : Meja = 1 x 0,5 x 3 = 1,5 m2 Kursi = 1 x 0,5 x 3 = 1,5 m2 Lemari arsip = 1 x 0,5 x 3 = 1,5 m2	Sirkulasi : 9 x 50% = 4,5 m2	ASUMSI	18
TOTAL SPACE NEEDED (M2)									158

The total area of space needed to design this object according to the specified function is:

Primer Space	=	13.620,95 m2
Secondary Space	=	15.577,8 m2
Supporting Space	=	158,00 m2
TOTAL		29.356,75 m2
Green Space (Which counts)		14.301,2 m2
Total Land Built (Clean)		15.055,55 m2
	=	1,5 ha

The total area of available land is 3.5 ha. So that in land use, the following will occur:

Land area	=	3,5 ha
Object Needs (Clean)	=	1,5 ha
REST OF LAND		2,0 ha
Green Space Available	=	2,0 ha

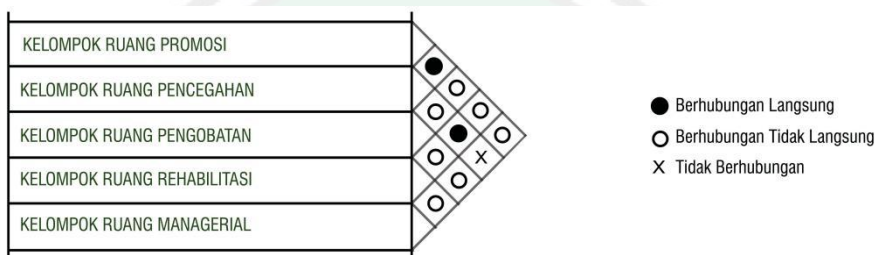
D. Space Relations Analysis

From the spatial data, it will be reprocessed in the analysis of spatial relations to find out the interrelationships between spatial forms and determine zonation in outline. Spatial relationship analysis is carried out in macro, meso and micro forms.

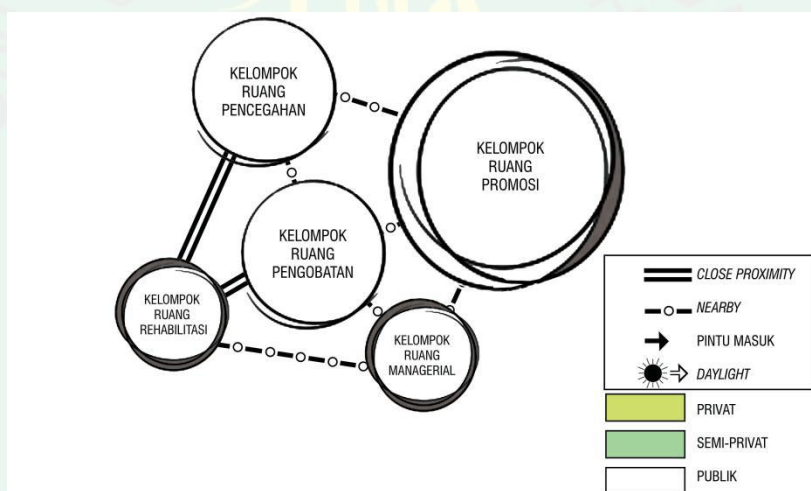
A. Macro Analysis

Macro analysis discusses the interrelationship of primary space groups which.

Matrix Diagram



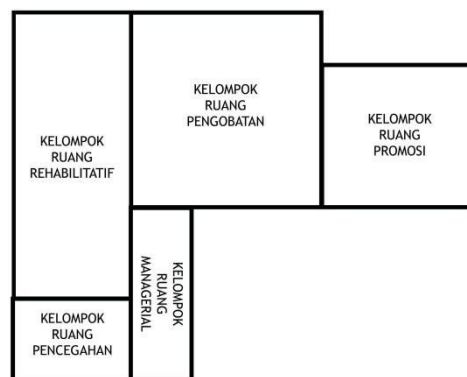
Linkages Diagram



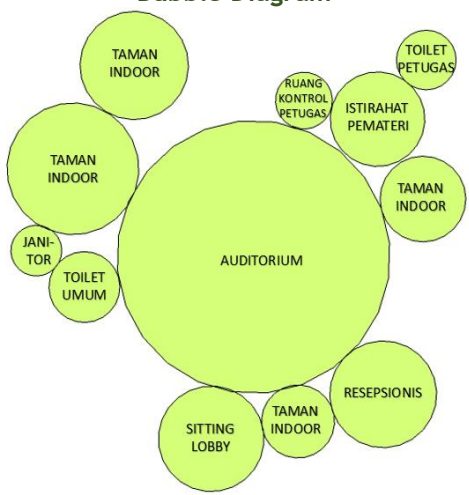
Bubble Diagram



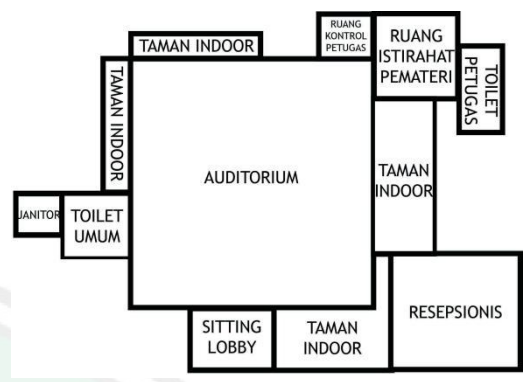
Blockplan



Bubble Diagram

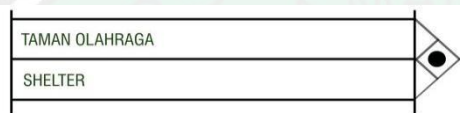


Blockplan



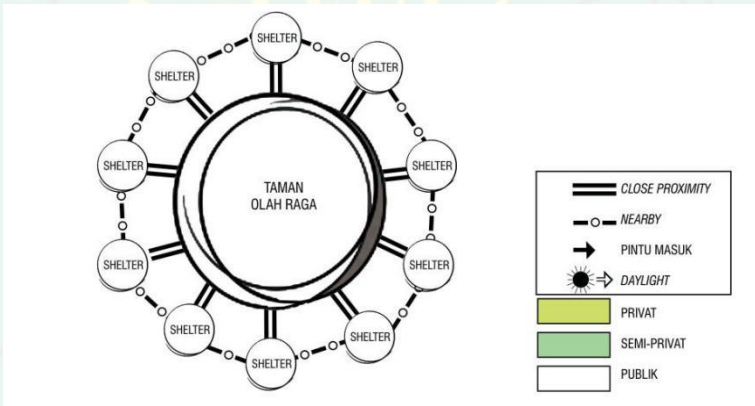
● Zonasi Pencegahan

Matrix Diagram

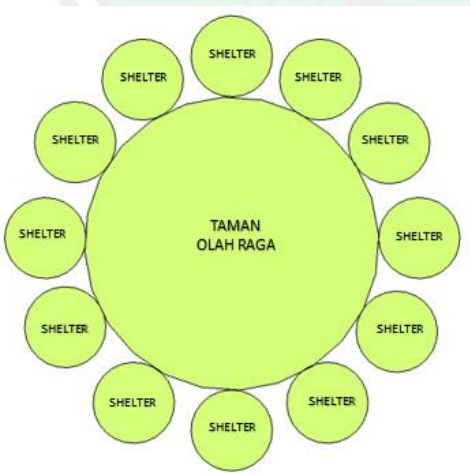


- Berhubungan Langsung
- Berhubungan Tidak Langsung
- × Tidak Berhubungan

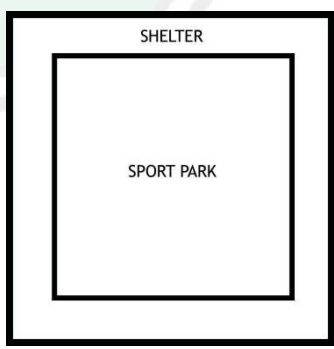
Linkages Diagram



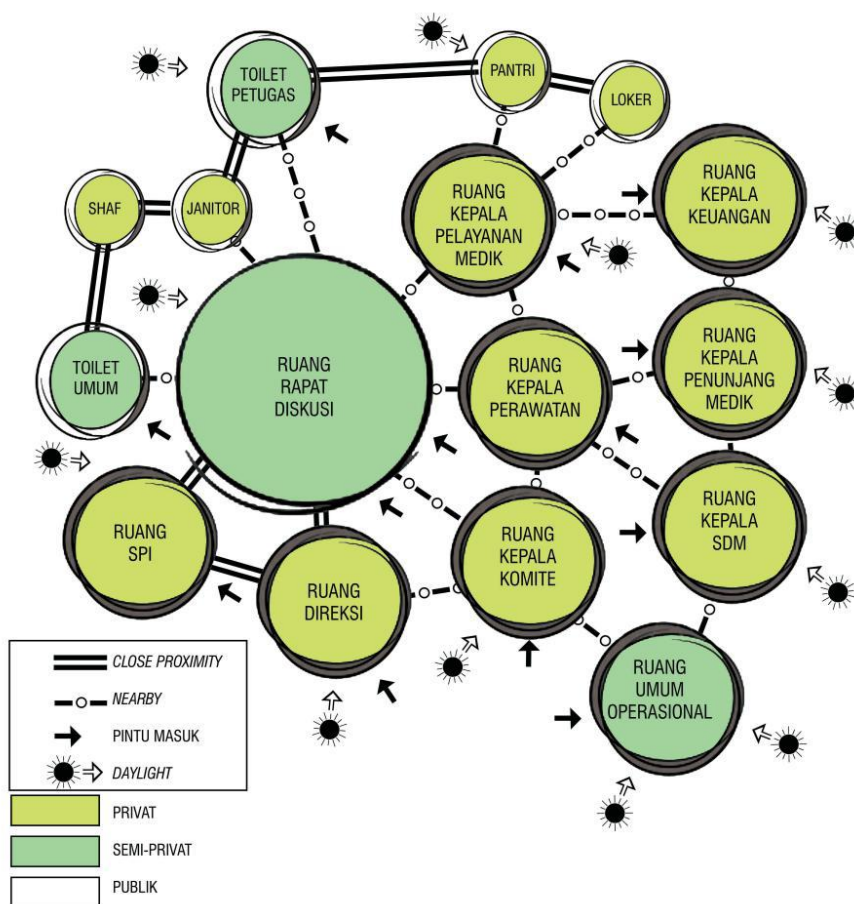
Bubble Diagram



Blockplan



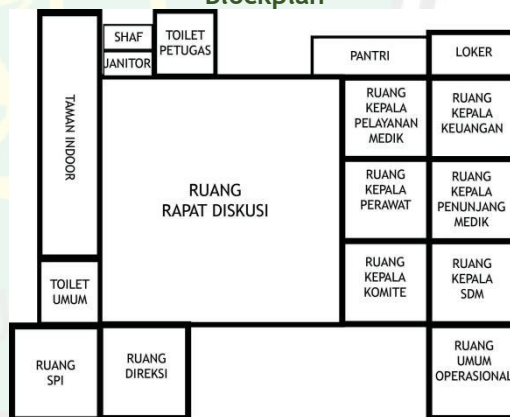
Linkages Diagram



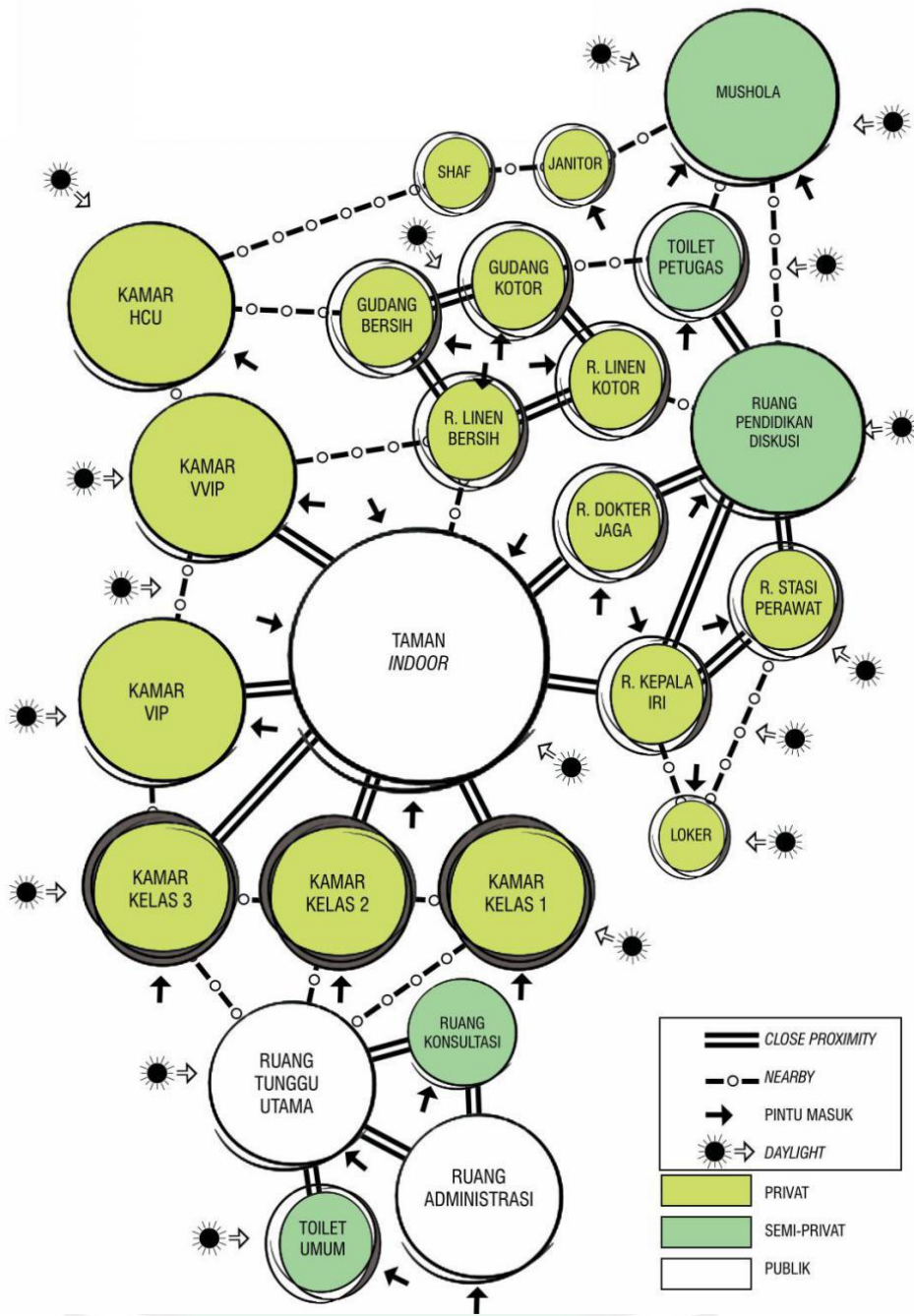
Bubble Diagram



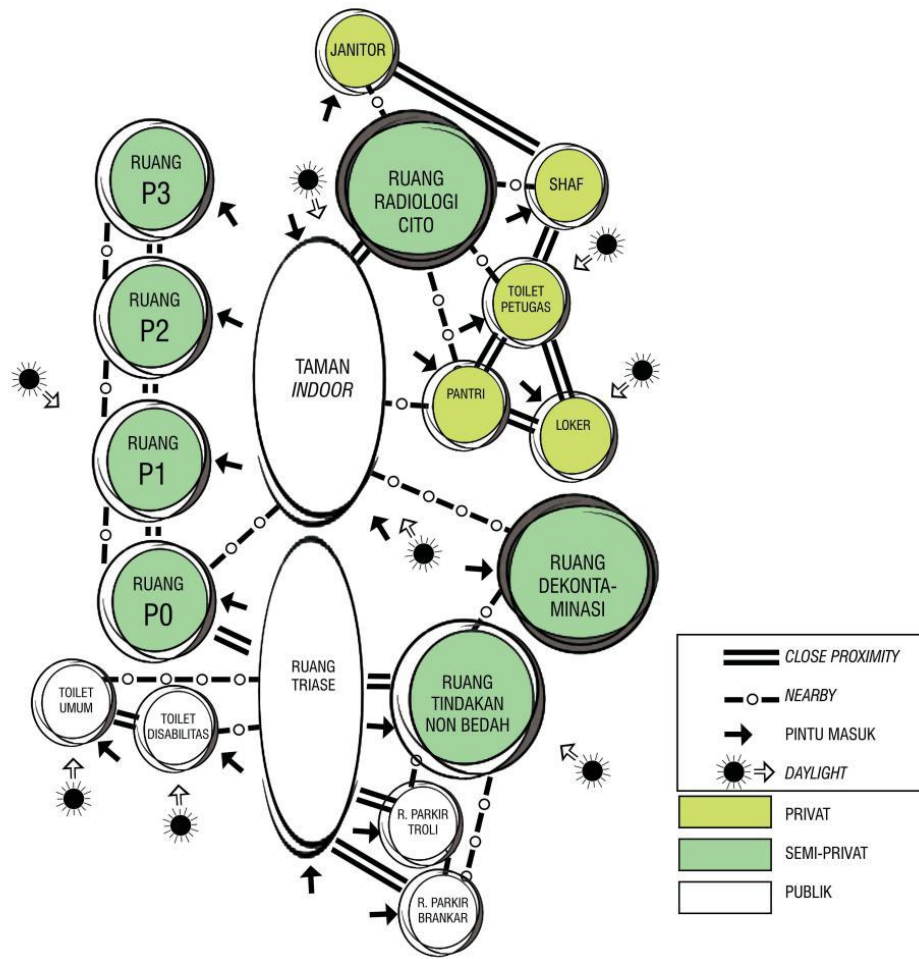
Blockplan



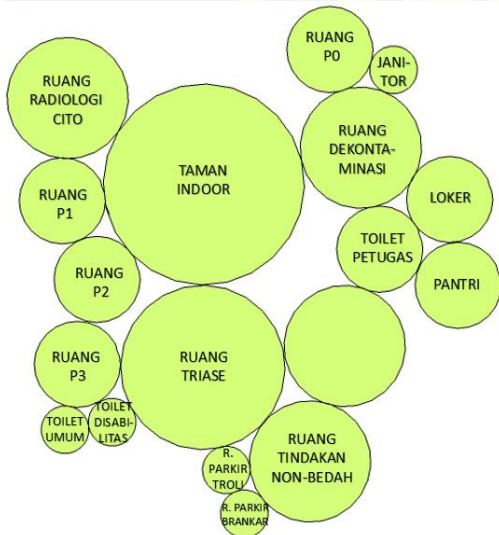
Linkages Diagram



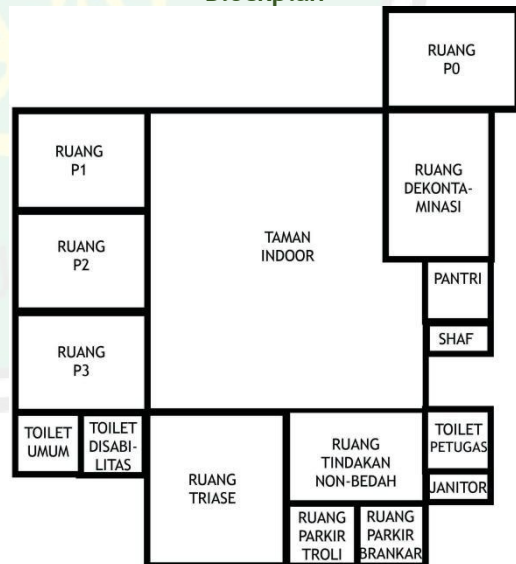
Linkages Diagram



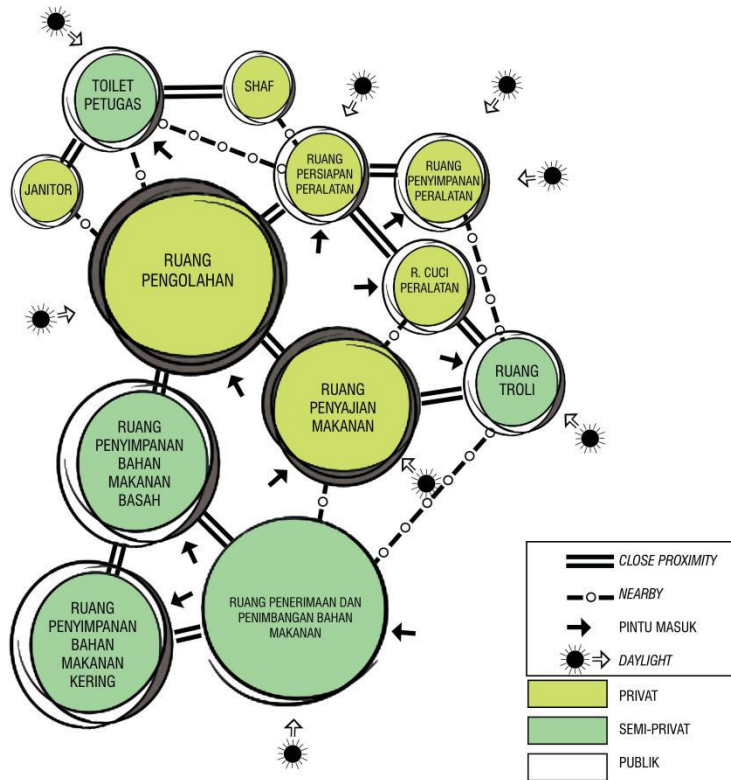
Bubble Diagram



Blockplan



Linkages Diagram



Bubble Diagram



Blockplan



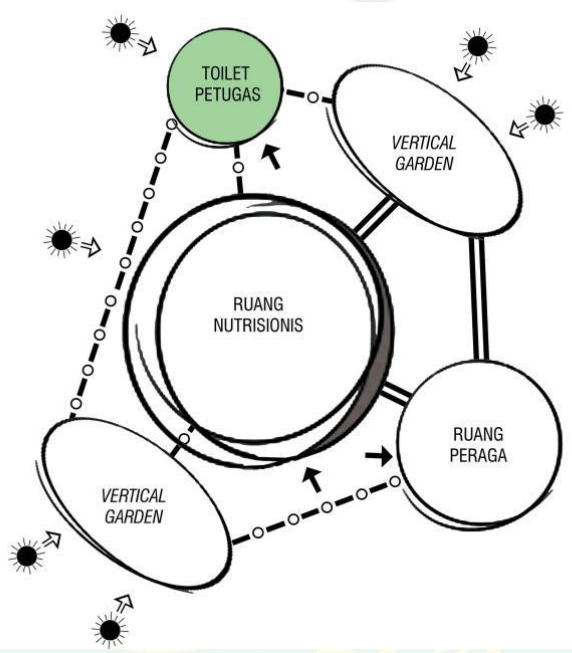
● Clinical Nutrition Instalation

Matrix Diagram

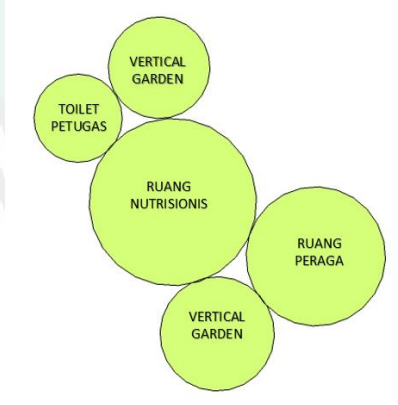
RUANG NUTRISIONIS	●
RUANG PERAGA DAN MINIATUR	○
TOILET PETUGAS	●
INSTALASI VERTICAL GARDEN	○

- Berhubungan Langsung
- Berhubungan Tidak Langsung
- X Tidak Berhubungan

Linkages Diagram



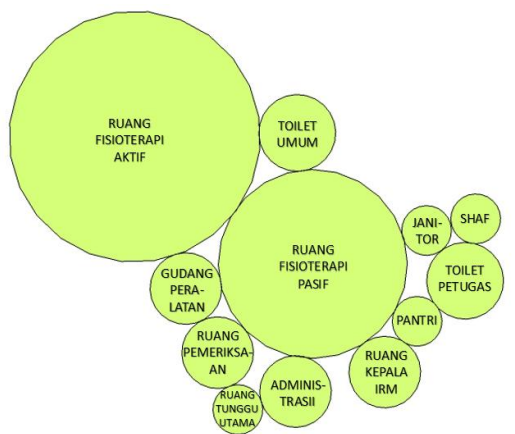
Bubble Diagram



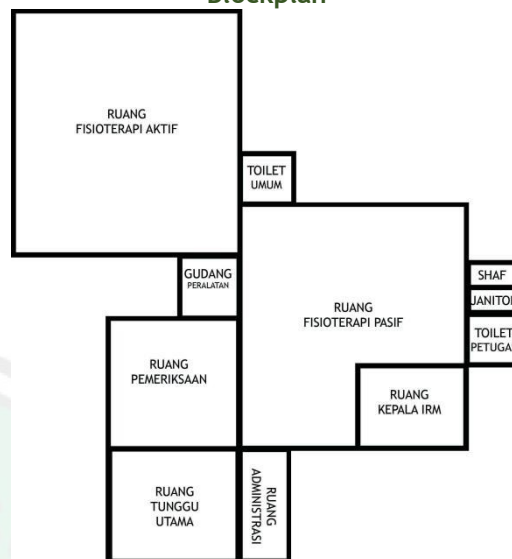
Blockplan



Bubble Diagram

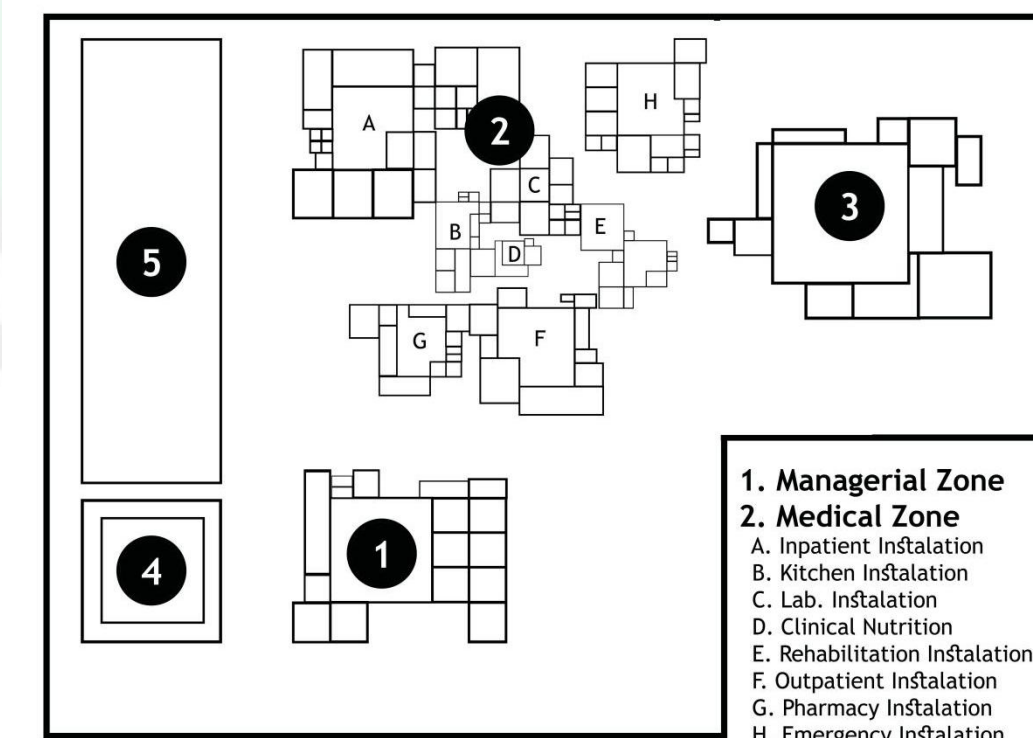


Blockplan



From the data analysis of the spatial relationship, it is concluded that the Blockplan of the site as needed Function.

Final Blockplan



- 1. Managerial Zone**
- 2. Medical Zone**
 - A. Inpatient Instalation
 - B. Kitchen Instalation
 - C. Lab. Instalation
 - D. Clinical Nutrition
 - E. Rehabilitation Instalation
 - F. Outpatient Instalation
 - G. Pharmacy Instalation
 - H. Emergency Instalation
- 3. Promotif Zone**
- 4. Preventif Zone**
- 5. Rehabilitaion Zone**

St. Sunandar Priyo Sudarmo

4.2.2 Site Analysis

Site analysis included many aspect to be analysis with the principle of biophilic itself. The analysis covers so many design idea and proposal based on the principle mentioned before.

A. Boundaries Analysis

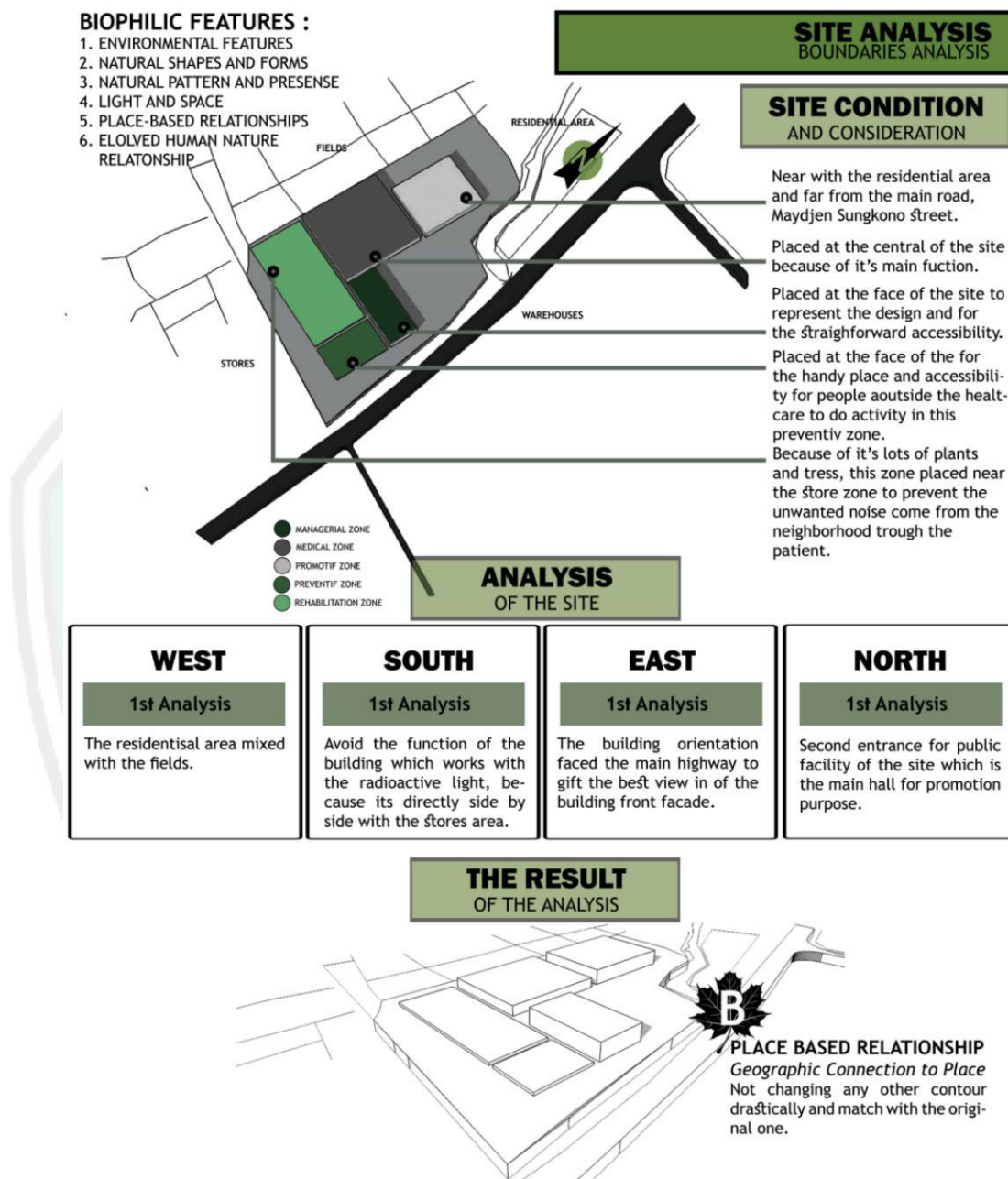


Image 4.14 Site Analysis - Boundaries Analysis
 (Source : Personal Analysis)

B. Sensory Analysis - Audio

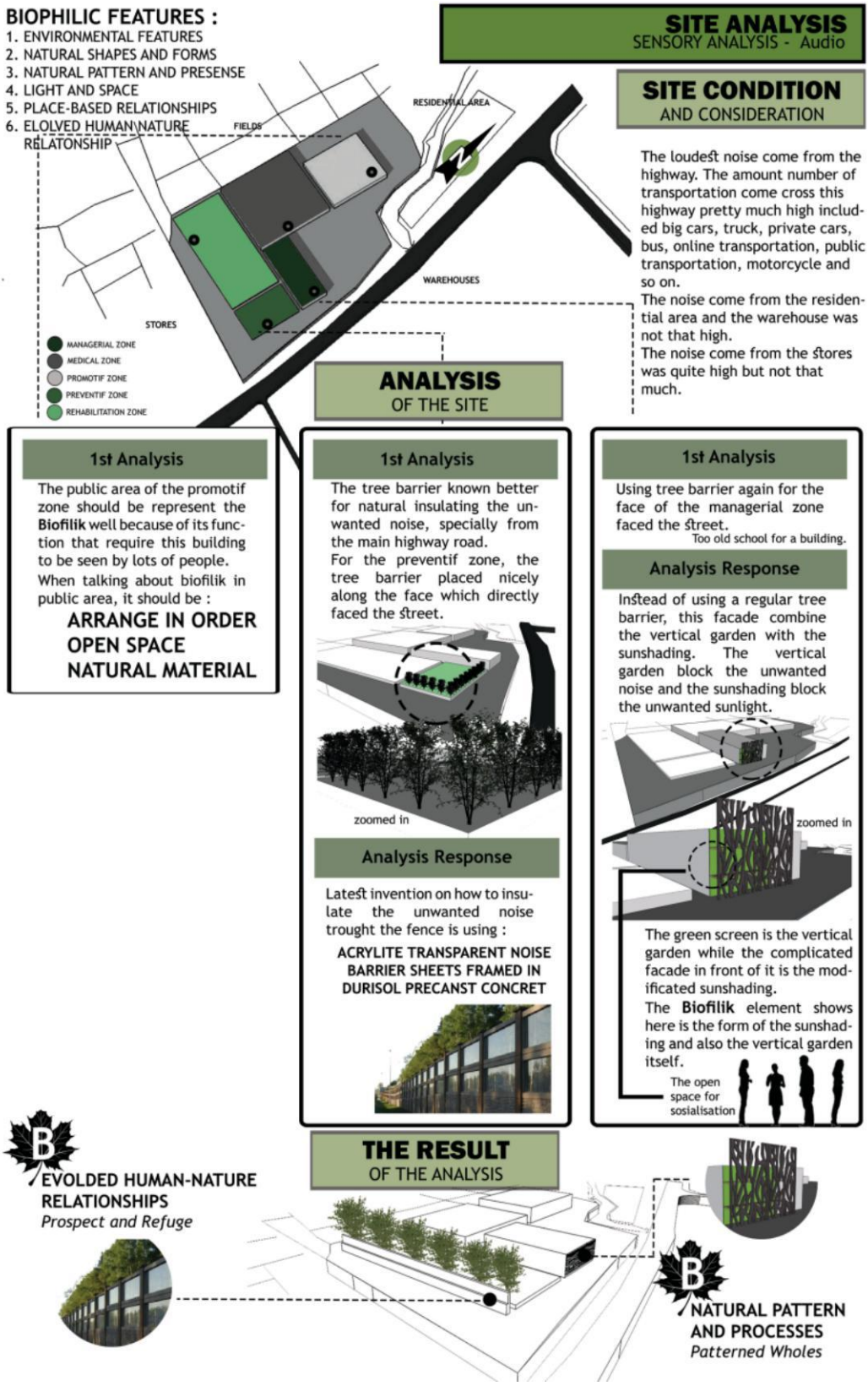


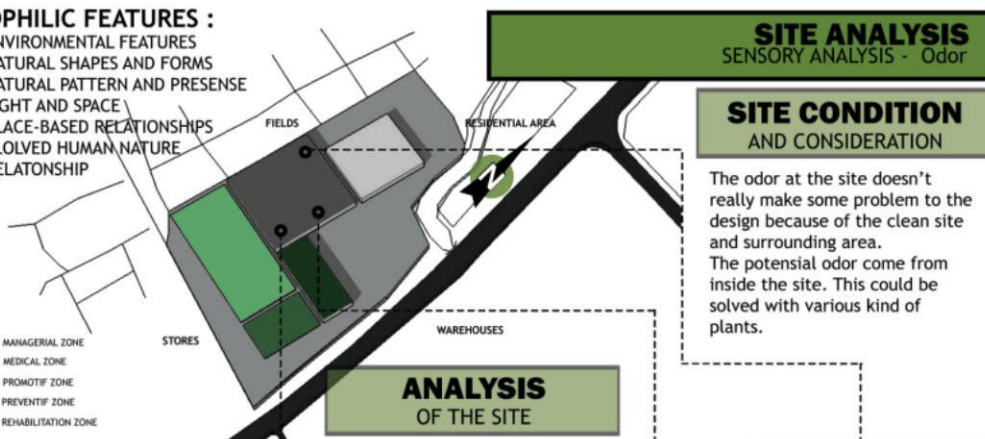
Image 4.15 Site Analysis - Sensory Analysis - Audio (Source : Personal Analysis)

C. Sensory Analysis - Odor

BIOPHILIC FEATURES :

1. ENVIRONMENTAL FEATURES
2. NATURAL SHAPES AND FORMS
3. NATURAL PATTERN AND PRESENCE
4. LIGHT AND SPACE
5. PLACE-BASED RELATIONSHIPS
6. EVOLVED HUMAN NATURE RELATIONSHIP

- MANAGERIAL ZONE
- MEDICAL ZONE
- PROMOTIF ZONE
- PREVENTIF ZONE
- REHABILITATION ZONE



<p>ON THE SITE</p> <p>1st Analysis</p> <p>To created the freshness which is support the passion to be cured, so the small park placed along the main road inside the site.</p> <p>Analysis Response</p> <p>If the park placed on the two side, this option will be cut the road space. So another option is to maintenance only one side.</p> <p>Analysis Response</p> <p>Along the park, the hallway finished with stone material for the pedestrian. The canopy and public chair placed at some point of the park. The tress placed also at the park to be the natural shelter.</p>	<p>INSIDE THE BUILDING</p> <p>1st Analysis</p> <p>E Pharmacy Instalation</p> <p>The pharmacy instalation identic with the sense of medicine which some people can't take it normaly. So the plant placed surrounding the instalation to keep the odor inside.</p> <p>Analysis Response</p> <p>The plant that can be used are roses to get rid of the "spirit of place" of the pharmacy instalation because of the meditation aroma.</p> <p>Analysis Response</p> <p>Vertical garden used automatic system to maintenance the soil moisture to spread the water to the vertical garden plant.</p>	<p>INSIDE THE BUILDING</p> <p>1st Analysis</p> <p>At the inpatient instalation, placed long grasses and the green planting type. This kind of methode created the aroma "sense of place" which raises the willingness to recover sooner.</p> <p>Analysis Response</p> <p>To feel the aroma of the long grassed plant, the park should be provide the pedestrian way for the patient who want to feel the nature inside the building.</p>	<p>INSIDE THE BUILDING</p> <p>1st Analysis</p> <p>The emergency instalation should be separated because of the aroma of the blood. Some people can't take this aroma normally, so this can be solved by planting some roses and the bushes.</p> <p>Analysis Response</p> <p>The trees should be arranged properly with the park.</p>
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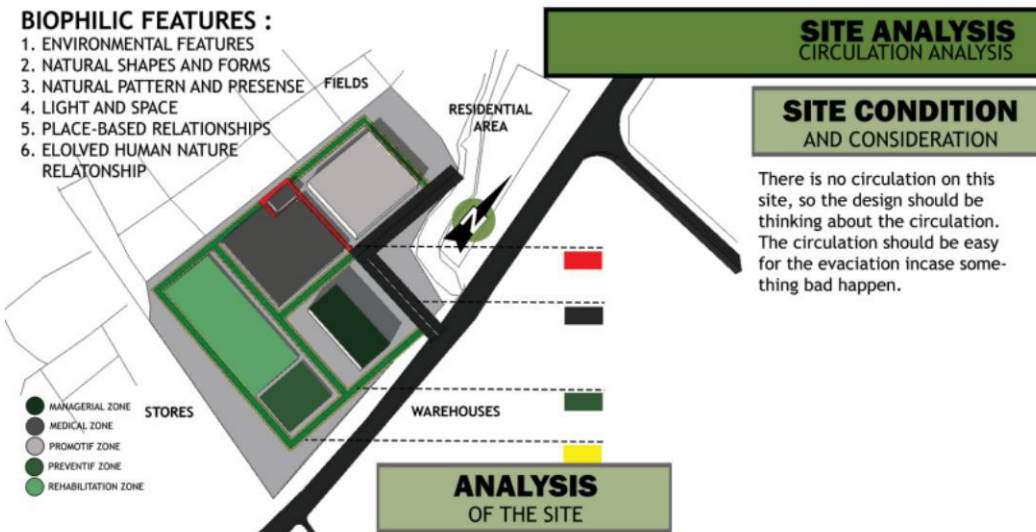


Image 4.16 Site Analysis - Sensory Analysis - Odor (Source : Personal Analysis)

D. Circulation Analysis

BIOPHILIC FEATURES :

1. ENVIRONMENTAL FEATURES
2. NATURAL SHAPES AND FORMS
3. NATURAL PATTERN AND PRESENCE
4. LIGHT AND SPACE
5. PLACE-BASED RELATIONSHIPS
6. EVOLVED HUMAN NATURE RELATIONSHIP



SITE CONDITION AND CONSIDERATION

There is no circulation on this site, so the design should be thinking about the circulation. The circulation should be easy for the evacuation incase something bad happen.

1st Analysis

Looking at the regular hospital, the ambulance car get it's own lane because the urgency. So on this site, the red line intended to be the ambulance lane.

A circle is for the entrance of this emergency facility.
B is where the mortuary placed on P0. its placed at the corner for the easiest and the fastest circulation so it doesn't disturb the other patient activity.

1st Analysis

As in the previous analysis, this main circulation width up to 10 meters for 2 lane.

Analysis Response

At the centre of the main street, placed a boulevard, a sculpture and mini garden and also water element to represent biofilik.

1st Analysis

The green lane supposed to be 5 meters street for backdoors circulation of each building.

1st Analysis

People need pedestrian who can make them feel safe when walking at it and also disability friendly. So the width reach 1,5 meters contain :

- People walking lane
- Yellow line for the blind disability.
- Pedestrian barrier from street.
- Small garden instalation.

Analysis Response

Sometimes Malang had some hot climate too, so the pedestrian need something like canopy on some spot.

THE RESULT OF THE ANALYSIS

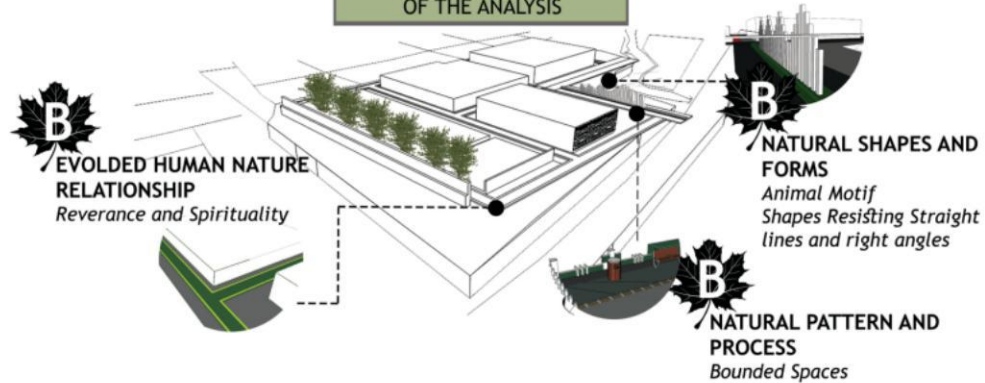


Image 4.17 Site Analysis - Circulation Analysis (Source : Personal Analysis)

E. Accessibility Analysis

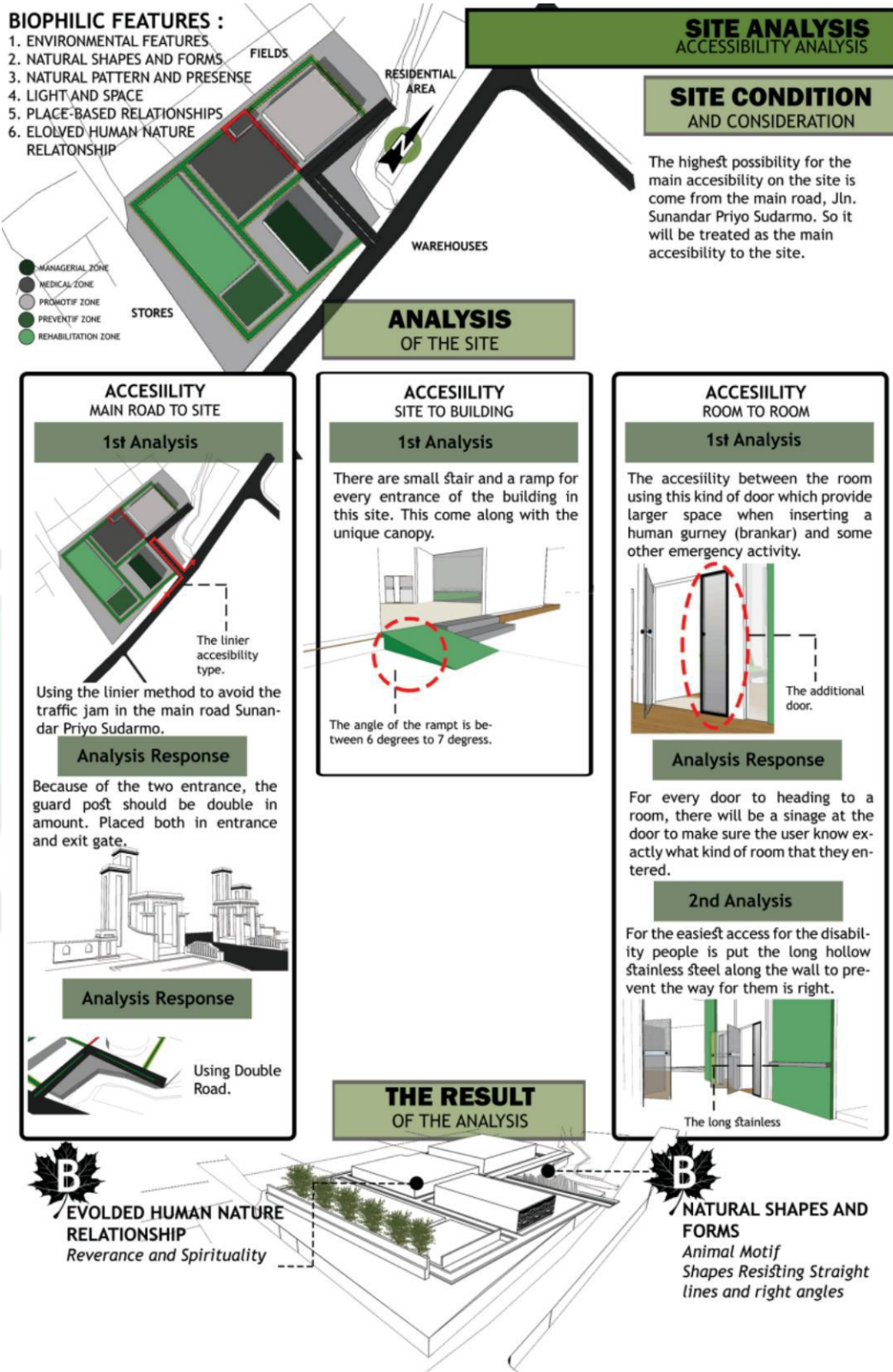
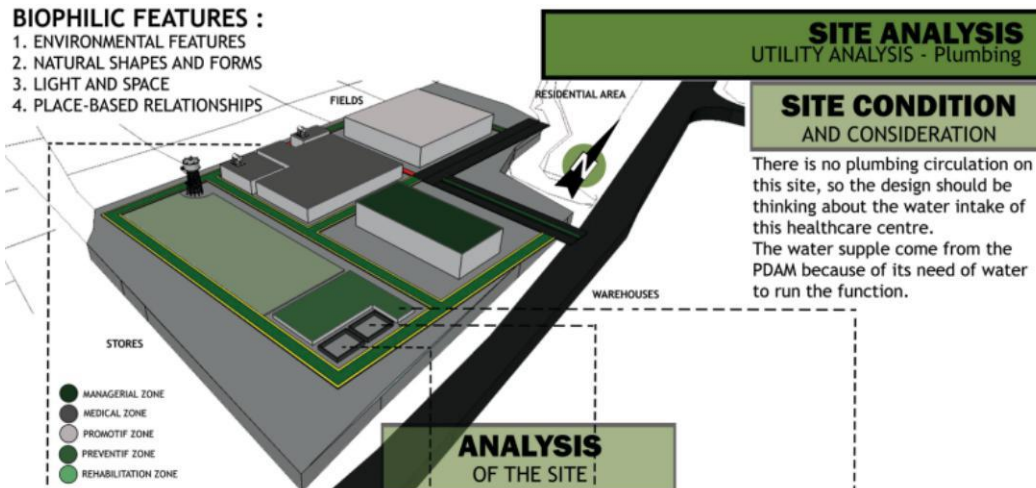


Image 4.18 Site Analysis - Accessibility Analysis (Source : Personal Analysis)

F. Utility Analysis - Plumbing

BIOPHILIC FEATURES :

1. ENVIRONMENTAL FEATURES
2. NATURAL SHAPES AND FORMS
3. LIGHT AND SPACE
4. PLACE-BASED RELATIONSHIPS



<p>CLEAN WATER</p> <p>1st Analysis</p> <p>The site having a central water tank which provide clean water all across the building on the site.</p>	<p>WASTE WATER</p> <p>1st Analysis</p> <p>The waste water divided into two different waste, grey water and black water. This healthcare centre using Biofilter Up-flow (A) technology to processing the waste.</p>	<p>MEDICAL LIQUID WASTE</p> <p>1st Analysis</p> <p>Medical liquid waste can't be processing together with the regular waste. It is because of different bacteria or chemical that maybe contained in the waste. Laboratory waste collected individually, but the other medical waste can be processing through the Biofilter Aerob - Anaerob. (B)</p>	<p>RAINWATER</p> <p>1st Analysis</p> <p>Rainwater in this site processing through the SPAH (<i>Sistem Pemanfaatan Air Hujan</i>) or The Rainwater Utilization System.</p>
<p>2nd Analysis</p> <p>The inpatient instalation and the emergency instalation need their own small water tank because of it;s function.</p>	<p>(A) Processing Diagram of the Waste Water with The Biofilter Anaerobic "Up Flow"</p> <p>(B) Processing Diagram of the Medical Liquid Waste with The Biofilter Aerob - Anaerob</p>		<p>2nd Analysis</p> <p>The rainwater can be used as the main source of the retention pond of the site. The water plant can be added to the pond due to the aesthetic and the need of curiosity for the patient.</p>

THE RESULT OF THE ANALYSIS

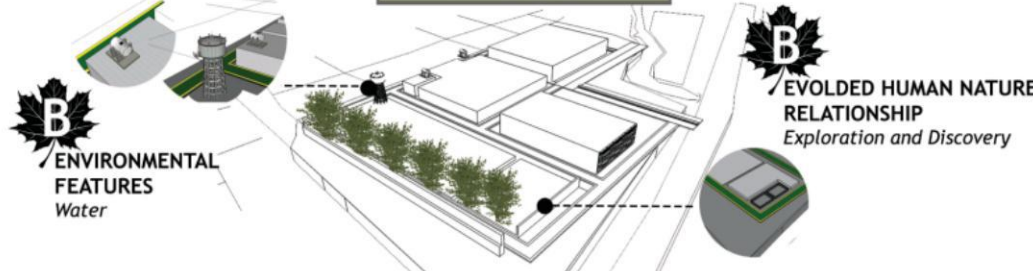
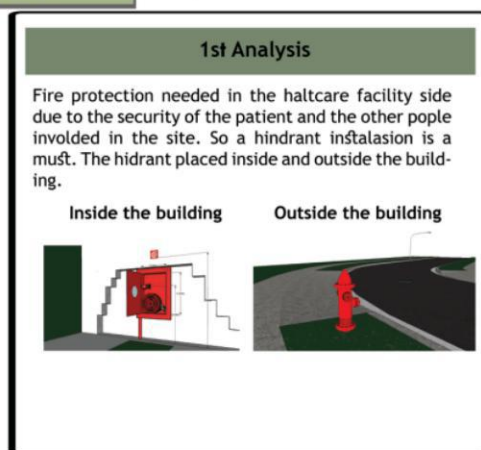
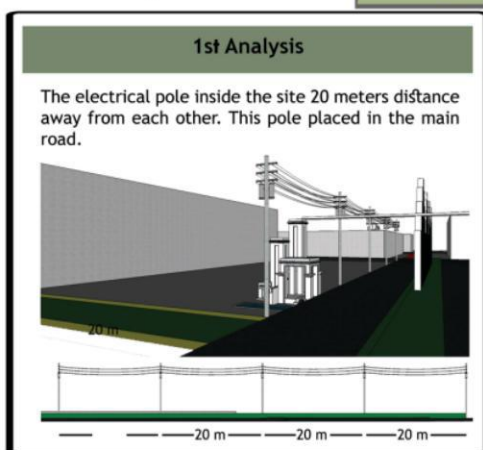
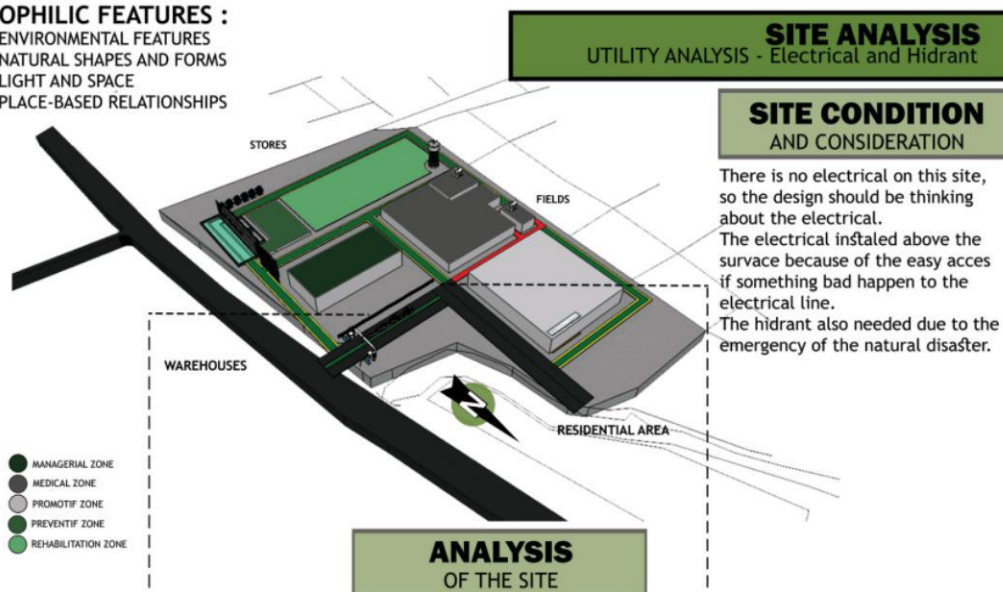


Image 4.19 Site Analysis - Utility Analysis - Plumbing (Source : Personal Analysis)

G. Utility Analysis - Electrical and Hydrant

BIOPHILIC FEATURES :

1. ENVIRONMENTAL FEATURES
2. NATURAL SHAPES AND FORMS
3. LIGHT AND SPACE
4. PLACE-BASED RELATIONSHIPS



THE RESULT OF THE ANALYSIS

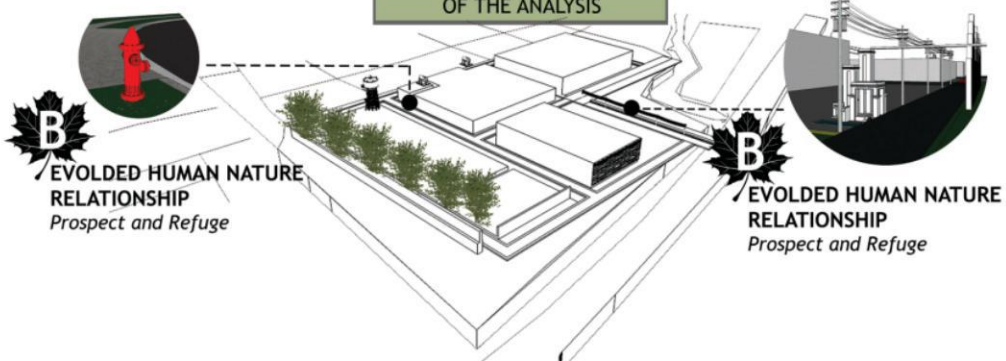
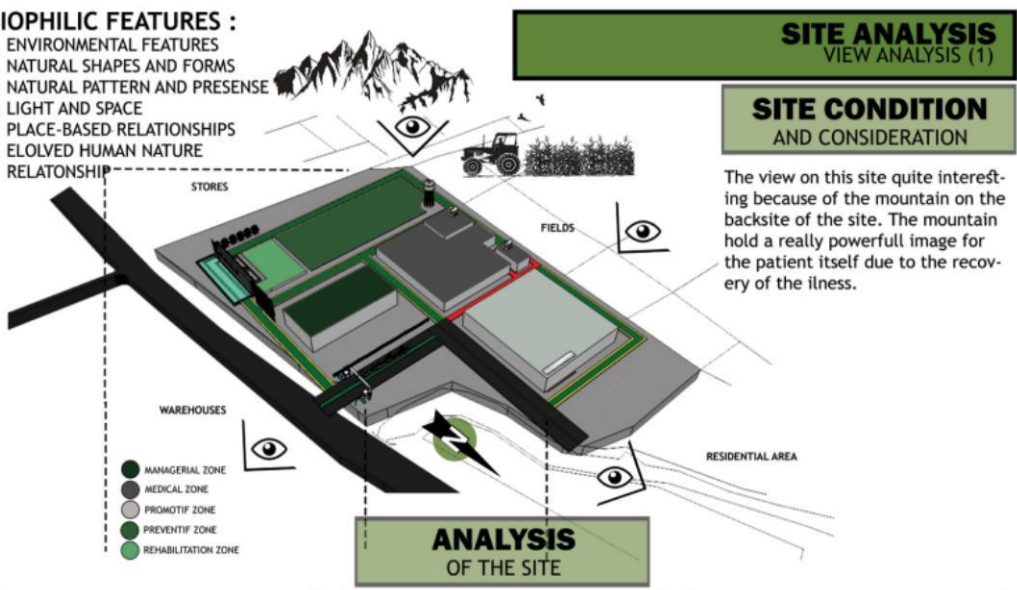


Image 4.20 Site Analysis - Utility Analysis - Electrical and Hydrant (Source : Personal Analysis)

H. View Analysis (1)

BIOPHILIC FEATURES :

1. ENVIRONMENTAL FEATURES
2. NATURAL SHAPES AND FORMS
3. NATURAL PATTERN AND PRESENCE
4. LIGHT AND SPACE
5. PLACE-BASED RELATIONSHIPS
6. EVOLVED HUMAN NATURE RELATIONSHIP



SITE ANALYSIS VIEW ANALYSIS (1)

SITE CONDITION AND CONSIDERATION

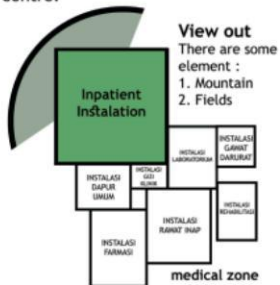
The view on this site quite interesting because of the mountain on the backside of the site. The mountain hold a really powerfull image for the patient itself due to the recovery of the illness.

ANALYSIS OF THE SITE

EKSTERIOR

1st Analysis

The inpatient inslatation placed at the corner of the medical zone which directly faced the view of the mountain. This may help the patient to easily get the view of the nature when staying at this healthcare centre.



View out
There are some element :
1. Mountain
2. Fields

Analysis Response

There is a terrace at the backyard of the inpatient instalation. This open space provide fresh air and half private public space for the inpatient.



LIGHT AND SPACE
Inside-Outside Spaces

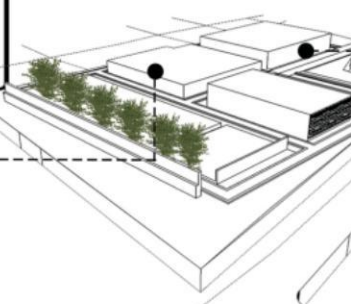
EKSTERIOR

1st Analysis

View in (A)
There are some element :
1. Front gate
2. Security posts
3. Sclucture
4. The building name
5. The pond

View in (B)
There are some element :
1. Side gate
2. Security posts
3. Building facade

THE RESULT OF THE ANALYSIS



INTERIOR

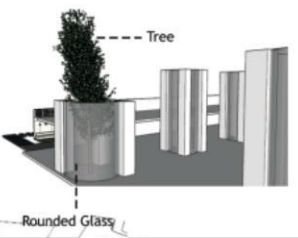
1st Analysis

The clear outside view provide by the clear glass as the wall. The wood element as the floor cover also make the building more natural.



Analysis Response

Insert the real trees inside the building interior to give the serenity feels to the patient and also feels better.



ENVIRONMENTAL FEATURES
Plants

Image 4.21 Site Analysis - View Analysis (1)
(Source : Personal Analysis)

I. View Analysis (2)

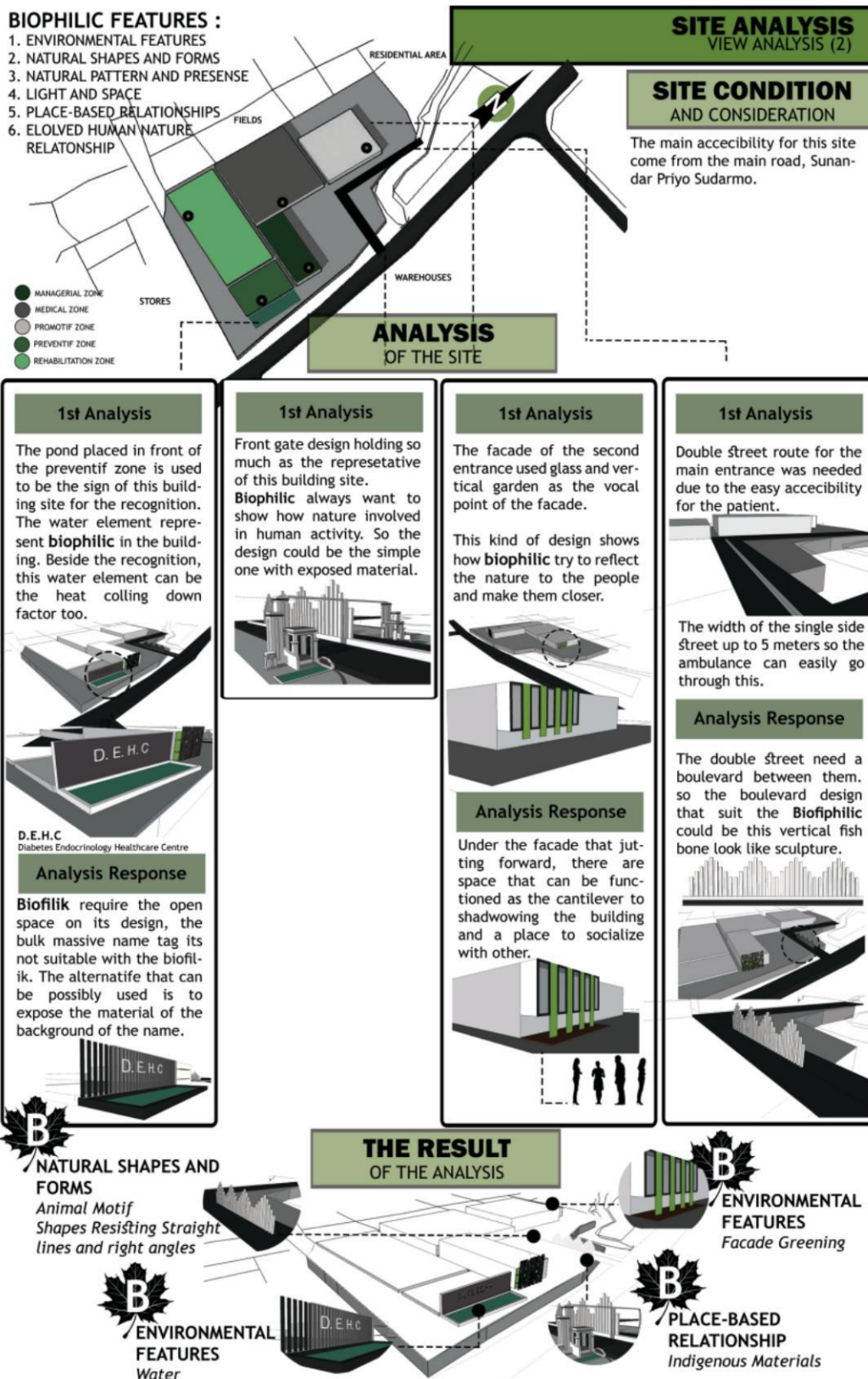


Image 4.22 Site Analysis -View Analysis (2)
(Source : Personal Analysis)

J. RTH (Green Space) Analysis - Vegetation and Open Space

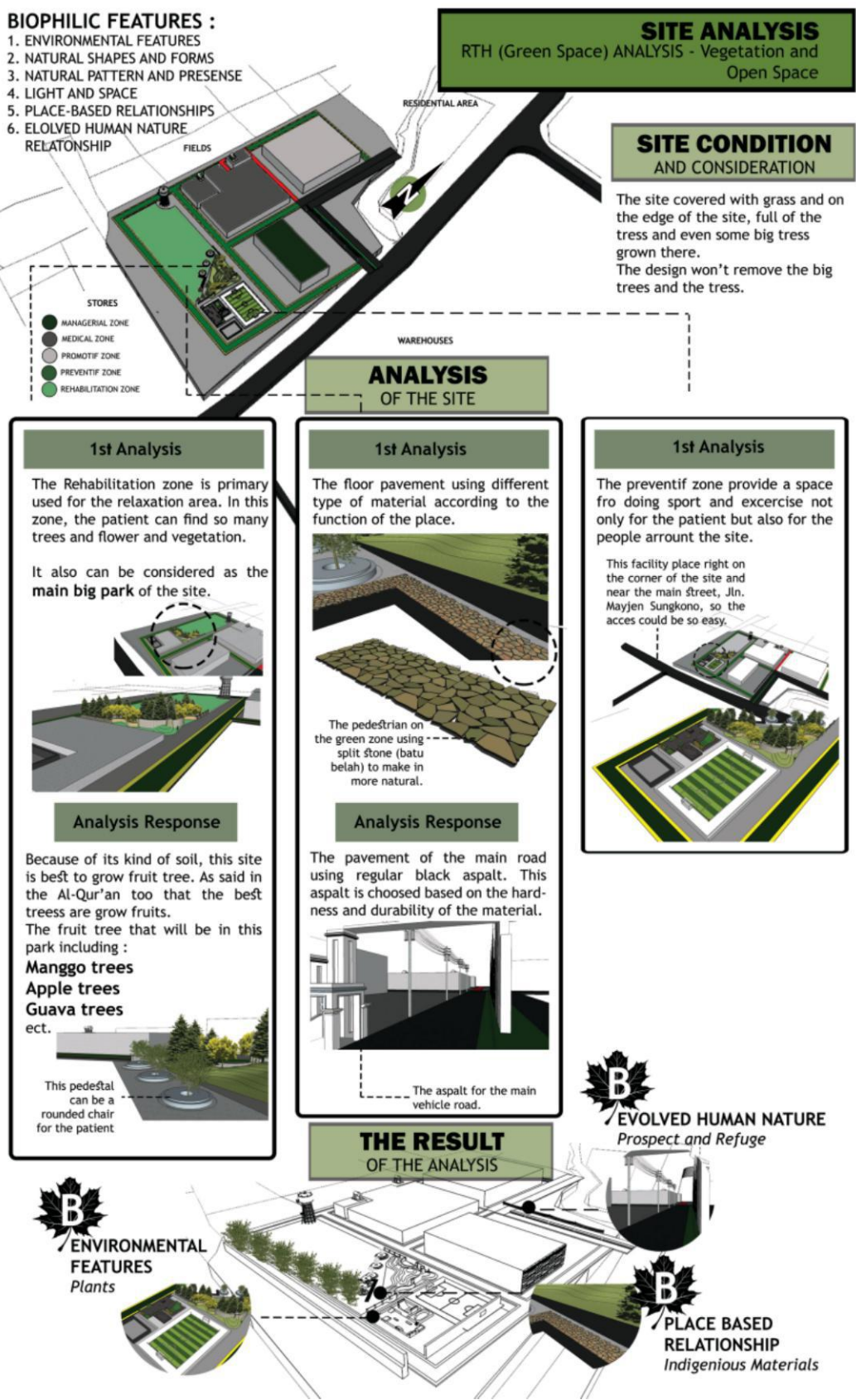


Image 4.23 Site Analysis - RTH (Green Space) Analysis - Vegetation and Open Space (Source : Personal Analysis)

K. RTH (Green Space) Analysis - Healing Garden Design



L. RTH (Green Space) Analysis - Sensory Garden Design

BIOPHILIC FEATURES :

1. ENVIRONMENTAL FEATURES
2. NATURAL SHAPES AND FORMS
3. NATURAL PATTERN AND PRESENCE
4. LIGHT AND SPACE
5. PLACE-BASED RELATIONSHIPS
6. ELOLVED HUMAN NATURE RELATIONSHIP

SITE ANALYSIS
RTH (Green Space) ANALYSIS - Sensory Garden Design

ANALYSIS OF THE SITE

SENSORY GARDEN

The sensory garden provide semi active activity. The reason is to make the patient in good condition and feeling good and avoiding stress. Sensory garden component include some supporting element :

1. Sport fields
2. Exercise space
3. Small-thick bushes

THE APPLICATION

The application of sensory park can be **sport garden**. The patient can be freely do anything here such us exercise, running, or just slow walk.

Sport Fields

Water Element

Small-thick Bushes

THE RESULT OF THE ANALYSIS

SENSORY GARDEN
To fill the empty with green space.

SITE CONDITION AND CONSIDERATION

The site covered with grass and on the edge of the site, full of the tress and even some big tress grown there. The design won't remove the big trees and the tress.

1st Analysis

The biofilik itself trying to make the building and the landcape in a **synergize each other**. Not just blending.

● The trees orginized nicely into the building so it become an entity.

Analysis Response

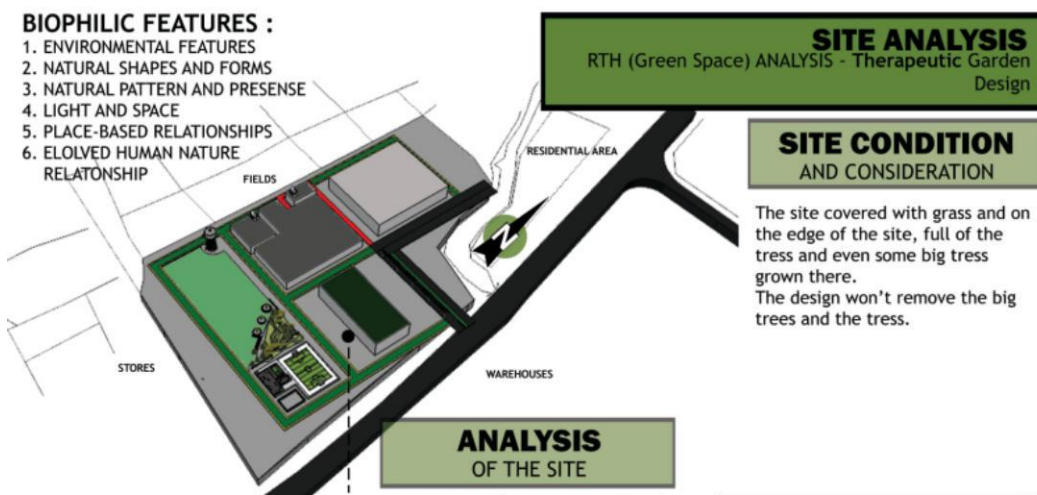
Maintenance and protecting the existing trees of the site is a must, so he trees should be pre-serving during the construction process to make the natural look of the landscape.

Image 4.25 Site Analysis - RTH (Green Space) Analysis - Sensory Garden Design (Source : Personal Analysis)

M. RTH (Green Space) Analysis - Therapeutic Garden Design

BIOPHILIC FEATURES :

1. ENVIRONMENTAL FEATURES
2. NATURAL SHAPES AND FORMS
3. NATURAL PATTERN AND PRESENCE
4. LIGHT AND SPACE
5. PLACE-BASED RELATIONSHIPS
6. EVOLVED HUMAN NATURE RELATONSHIP



SITE CONDITION AND CONSIDERATION

The site covered with grass and on the edge of the site, full of the tress and even some big tress grown there. The design won't remove the big trees and the tress.

ANALYSIS OF THE SITE

THERAPEUTIC GARDEN

Thick Planted Trees

The sensory garden provide semi active activity. The reason is to make the patient in good condition and feeling good and avoiding stress.

Flyover

Sensory garden component include some supporting element :

1. Sport fields
2. Exercise space
3. Small-thick bushes

Ground Based Way

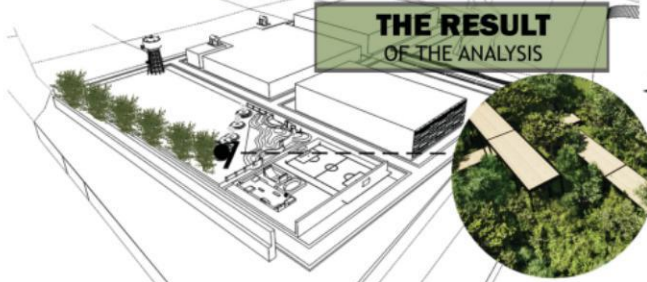
THE APPLICATION

The application of sensory garden can be **sport garden**. The patient can be freely do anything here such us exercise, running, or just slow walk.

1st Analysis

1st garden design is the main "biophilic" park on this site. Its located at the **south direction** of the site. People with diabetes disease, should be walked more than normal people. The research by the Professor in Japan said that the suitable lanskap design for the Diabetes patient is like in the forest.

So the main park would be a **therapeutic "mini forest" garden** . Due to the minimal space, the design require the **overpass ways** for the patients and still needed the **pedestrian way base on ground area**.



B

THERAPEUTIC GARDEN

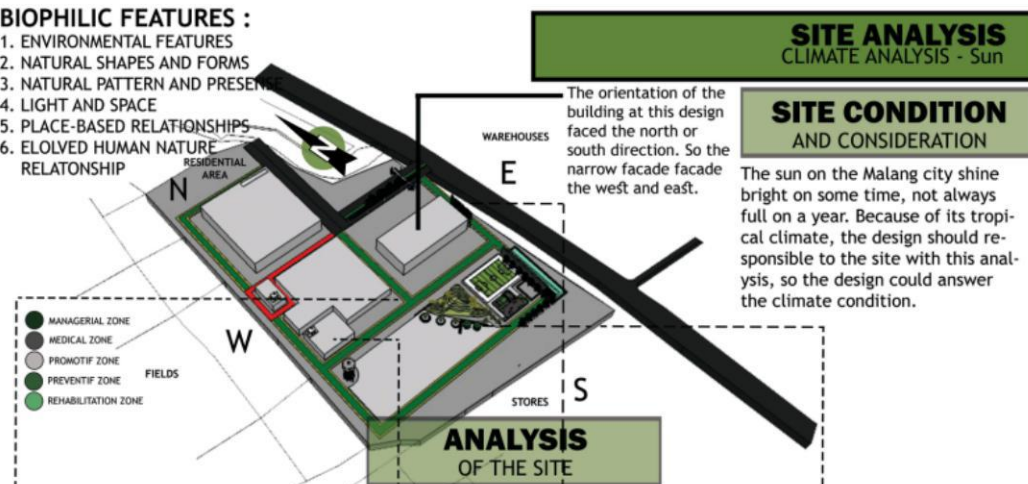
To inform the biophilic to other environment.

Image 4.26 Site Analysis - RTH (Green Space) Analysis - Therapeutic Garden Design (Source : Personal Analysis)

N. Climate Analysis - Sun

BIOPHILIC FEATURES :

1. ENVIRONMENTAL FEATURES
2. NATURAL SHAPES AND FORMS
3. NATURAL PATTERN AND PRESEN
4. LIGHT AND SPACE
5. PLACE-BASED RELATIONSHIPS
6. ELOLVED HUMAN NATURE RELATIONSHIP



<p>1st Analysis</p> <p>The jogging track or pedestrian way at the rehabilitation zone designed in endless circular loop.</p> <p>Jogging Track</p> <p>Some patient maybe just want to take a slow walking on this jogging track and take a rest. So along the jogging track, there are some spot instaled by a canopy.</p> <p>Analysis Response</p> <p>The canopy can also protect the patient from unwanted or unhealthy sun at the unconditional weather.</p>	<p>1st Analysis</p> <p>Inpatient installation</p> <p>The green zone is the inpatient stayed room. It is located on the west and east side so directly touched by the sun to support the healing process.</p> <p>Analysis Response</p> <p>On the inpatient stayed room, this open window can be a way for the patient to feel the nature outside.</p>	<p>1st Analysis</p> <p>The sunshading formed in the unique plant form making a different style of building.</p> <p>This unique form can attract people to explore more about this building.</p> <p>Analysis Response</p> <p>This kind of windows used in this healthcare centre having a caopy to protect the windows from the sun and the rain.</p> <p>Type 1</p> <p>Type 2</p>	<p>1st Analysis</p> <p>The public space using this kind of canopy for the shading.</p> <p>The canopy form mimic the form of the real tree to make the patient calm.</p> <p>2nd Analysis</p> <p>The roof using "light pool roof" method to make sure the sun get trough the building efficiently.</p>
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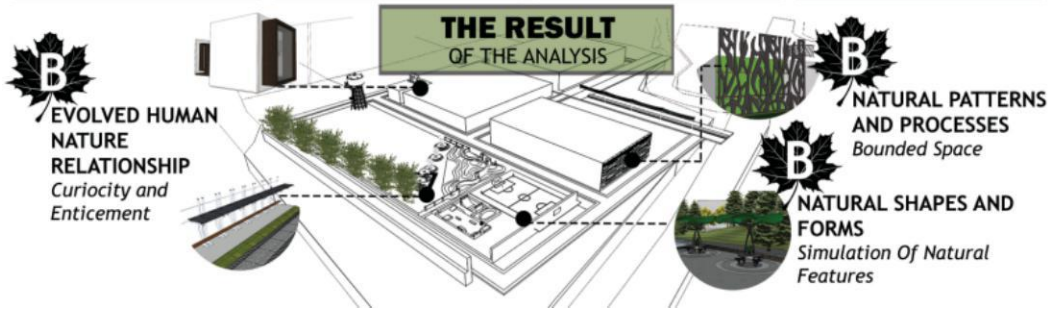


Image 4.27 Site Analysis - Climate - Sun
(Source : Personal Analysis)

O. Climate Analysis - Wind

BIOPHILIC FEATURES :

1. ENVIRONMENTAL FEATURES
2. NATURAL SHAPES AND FORMS
3. NATURAL PATTERN AND PRESENCE
4. LIGHT AND SPACE
5. PLACE-BASED RELATIONSHIPS
6. EVOLVED HUMAN NATURE RELATIONSHIP

- MANAGERIAL ZONE
- MEDICAL ZONE
- PROMOTIF ZONE
- PREVENTIF ZONE
- REHABILITATION ZONE

SITE ANALYSIS
CLIMATE ANALYSIS - Wind

SITE CONDITION
AND CONSIDERATION

The wind blow in this site quite low because of the site location in the middle of the city. According to the biophilic, the wind could be the one of the aspect to make the patient for curing.

ANALYSIS
OF THE SITE

1st Analysis

The form of the building mass is changed due to the wind flow. The wind itself moving from the south to the north.

Before Changed

After Changed

It is also work on the rounded shape building. The shape making a good wind flow to all of the building surface.

The wind forced the building into multi-mass. It is because the smaller the mass, the more positive area on the building can be touched by the wind flow.

Analysis Response

On the southeast side, place a tree barrier to break the wind into a nice wind flow.

1st Analysis

Sometimes the wind bring the dust and the heat from the outside site. So the solution that might be suitable is to placed the secondary skin for the southeast and northeast facade.

Analysis Response

The falling water installed on the secondary skin to cool down the heat of the building through the wind.

Falling water

The hot air

Cooled down air

Bring the water element

1st Analysis

On some spot at the medical zone that located at between another building, placed a windcatcher to maximize the wind to enter the building.

The wind catcher

Wind opening

Partition

Wind

Air inflow

Air outflow

Tower

Ventilated space

Induced air current

THE RESULT
OF THE ANALYSIS

B ENVIRONMENTAL FEATURES
Views and Viŝtas

B ENVIRONMENTAL FEATURES
Views and Viŝtas

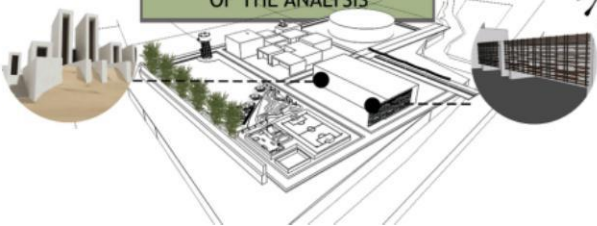
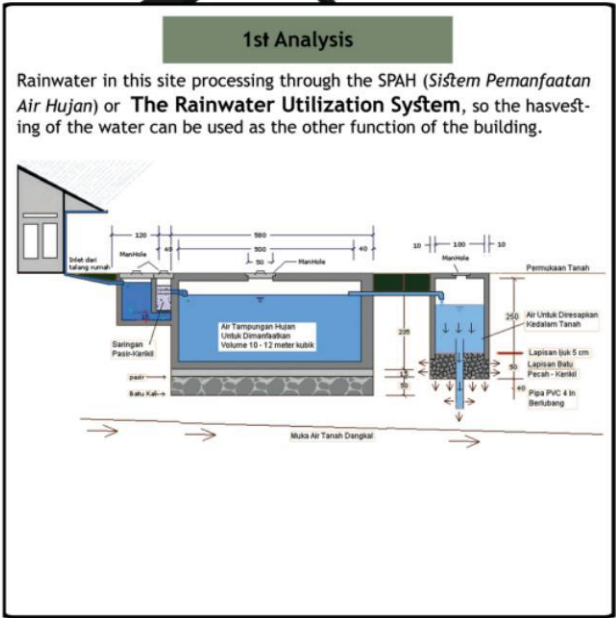
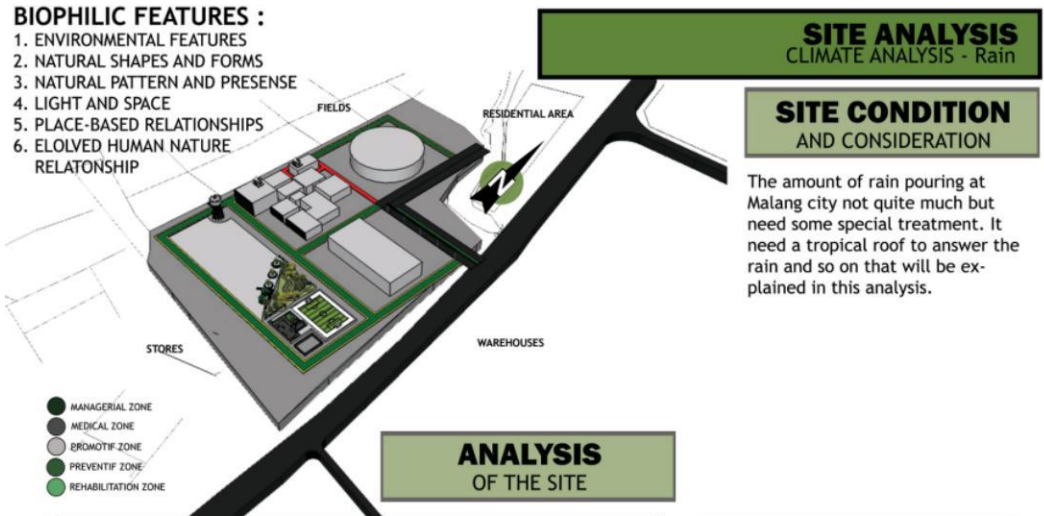


Image 4.28 Site Analysis - Climate - Wind
(Source : Personal Analysis)

P. Climate Analysis - Rain

BIOPHILIC FEATURES :

1. ENVIRONMENTAL FEATURES
2. NATURAL SHAPES AND FORMS
3. NATURAL PATTERN AND PRESENCE
4. LIGHT AND SPACE
5. PLACE-BASED RELATIONSHIPS
6. ELOVED HUMAN NATURE RELATIONSHIP



THE RESULT
OF THE ANALYSIS

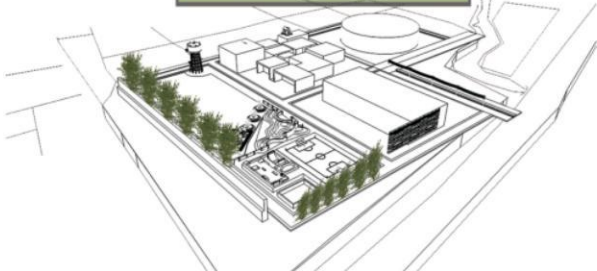


Image 4.29 Site Analysis - Climate - Rain (Source : Personal Analysis)

4.2.3 Form Analysis

Form analysis discussing about the form of the building with the result from the site analysis and function of this health-care centre.

A. Form Analysis - Blockplan as Base of The Form

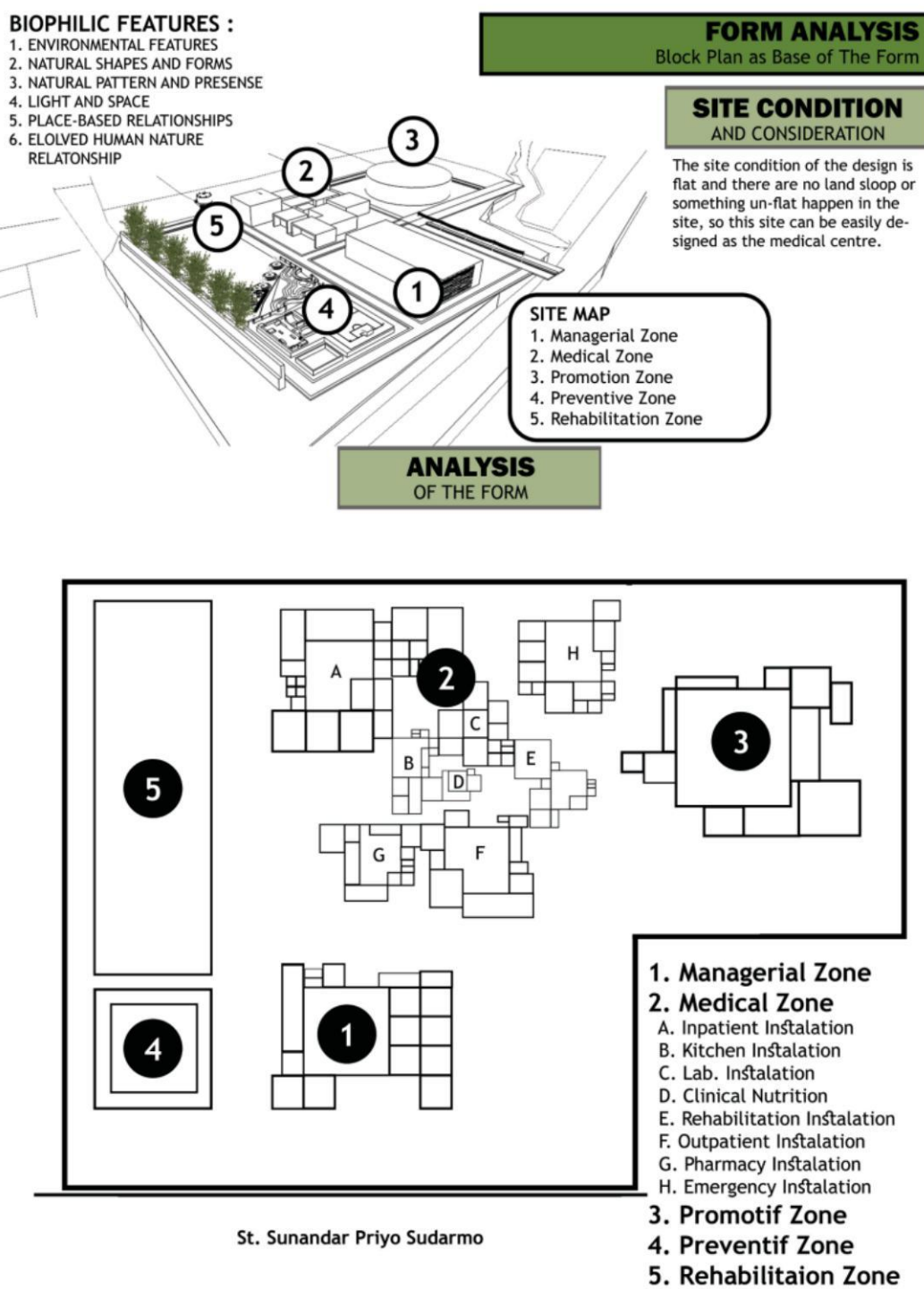
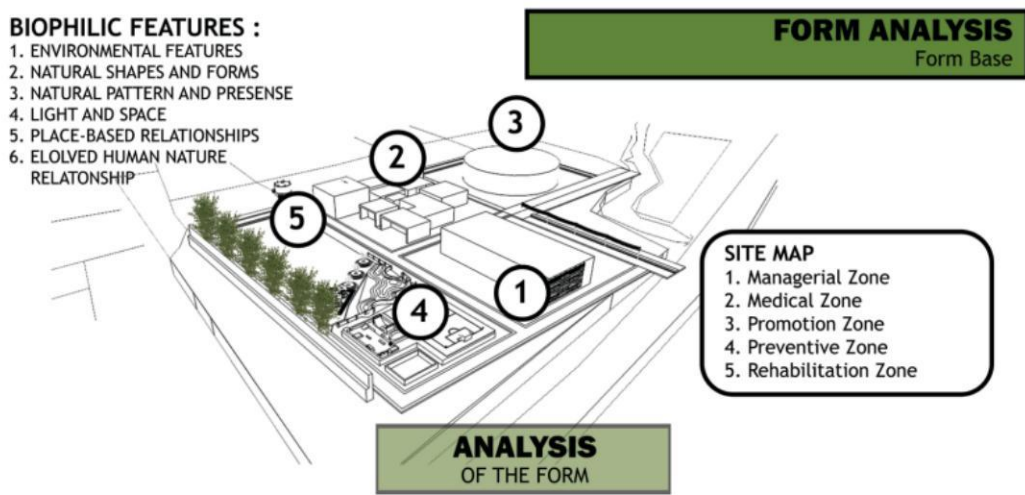


Image 4.30 Form Analysis - Blockplan as Base of The Form
(Source : Personal Analysis)

B. Form Analysis - Form Base



Biophilic required some element for the form. The element that applied to analyze this design is **ATTRACK THE CURIOSITY** of the user specially for the patients of this diabetes and endocrinology healthcare centre.

From the previous analysis which is site analysis, there come some result that affect the form of this design. The affected form will be summarizred below :

Circulation and Utility

The analysis made the form of medical zone become three part.

Climate - Wind

The analysis made the form of medical zone become "BANGUNAN MASA BANYAK".

Sensory Park Design

The analysis made the form of medical zone become synergize with the nature of the landscape. The cubicle shape (yellow colour) help the building blend with the nature.

The promotion zone becoming round shaped building because of it's functiin as a hall too. The blockplan that made before on the function analysis changed into rounded blokplan to make sure it fits on the new shape of promotion zone.

Climate - Rain

The analysis made the roof of the form become green roof.

Image 4.31 Form Analysis - Form Base
(Source : Personal Analysis)

C. Form Analysis - Form Explanation

BIOPHILIC FEATURES :

1. ENVIRONMENTAL FEATURES
2. NATURAL SHAPES AND FORMS
3. NATURAL PATTERN AND PRESENCE
4. LIGHT AND SPACE
5. PLACE-BASED RELATIONSHIPS
6. EVOLVED HUMAN NATURE RELATIONSHIP

FORM ANALYSIS
Form Explanation

ANALYSIS
OF THE FORM

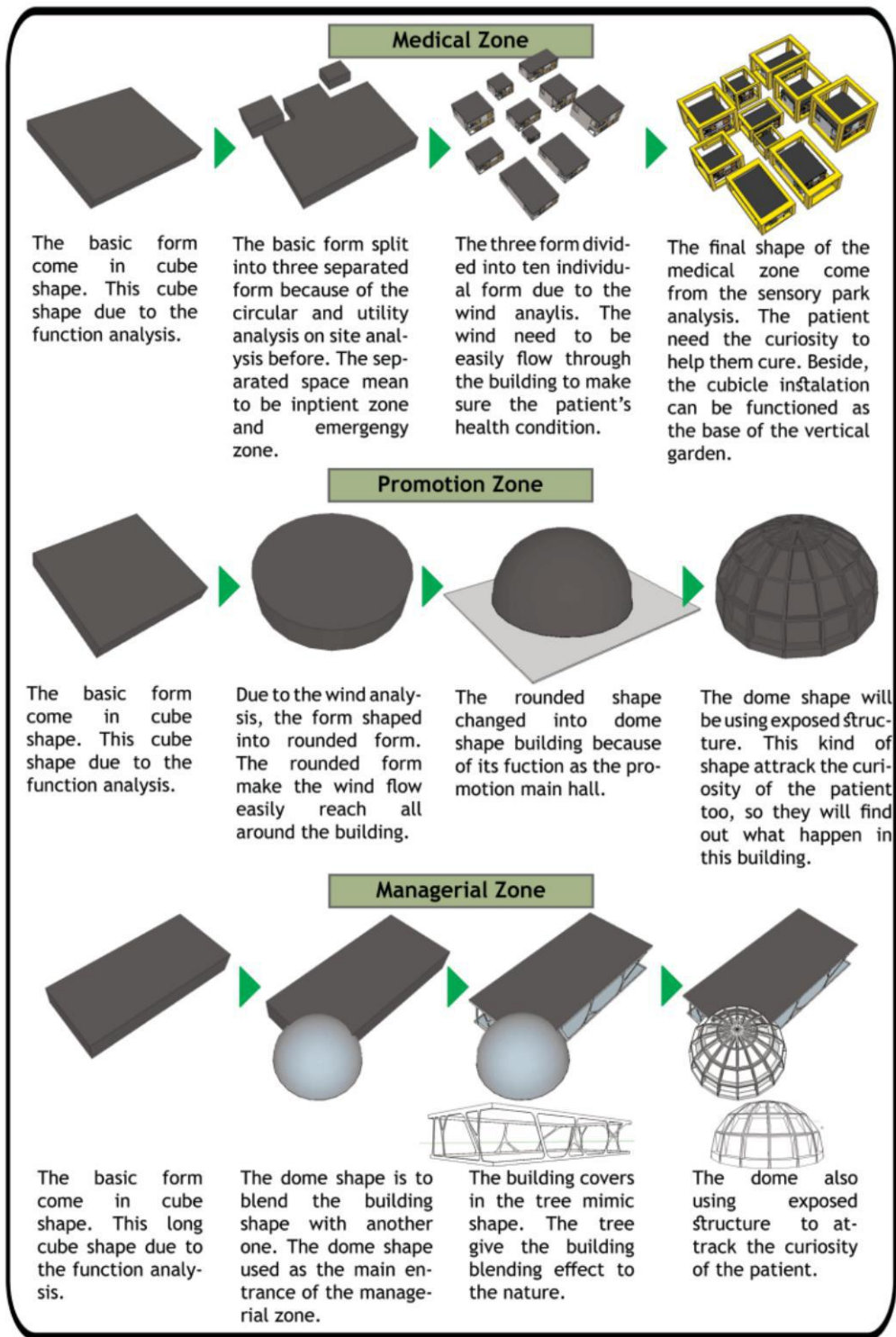


Image 4.32 Form Analysis - Form Explanation
(Source : Personal Analysis)

4.2.4 Structure Analysis

Structure analysis discussing about the structure of the building with the data from the analysis before.

A. Structure Analysis - Upper Structure

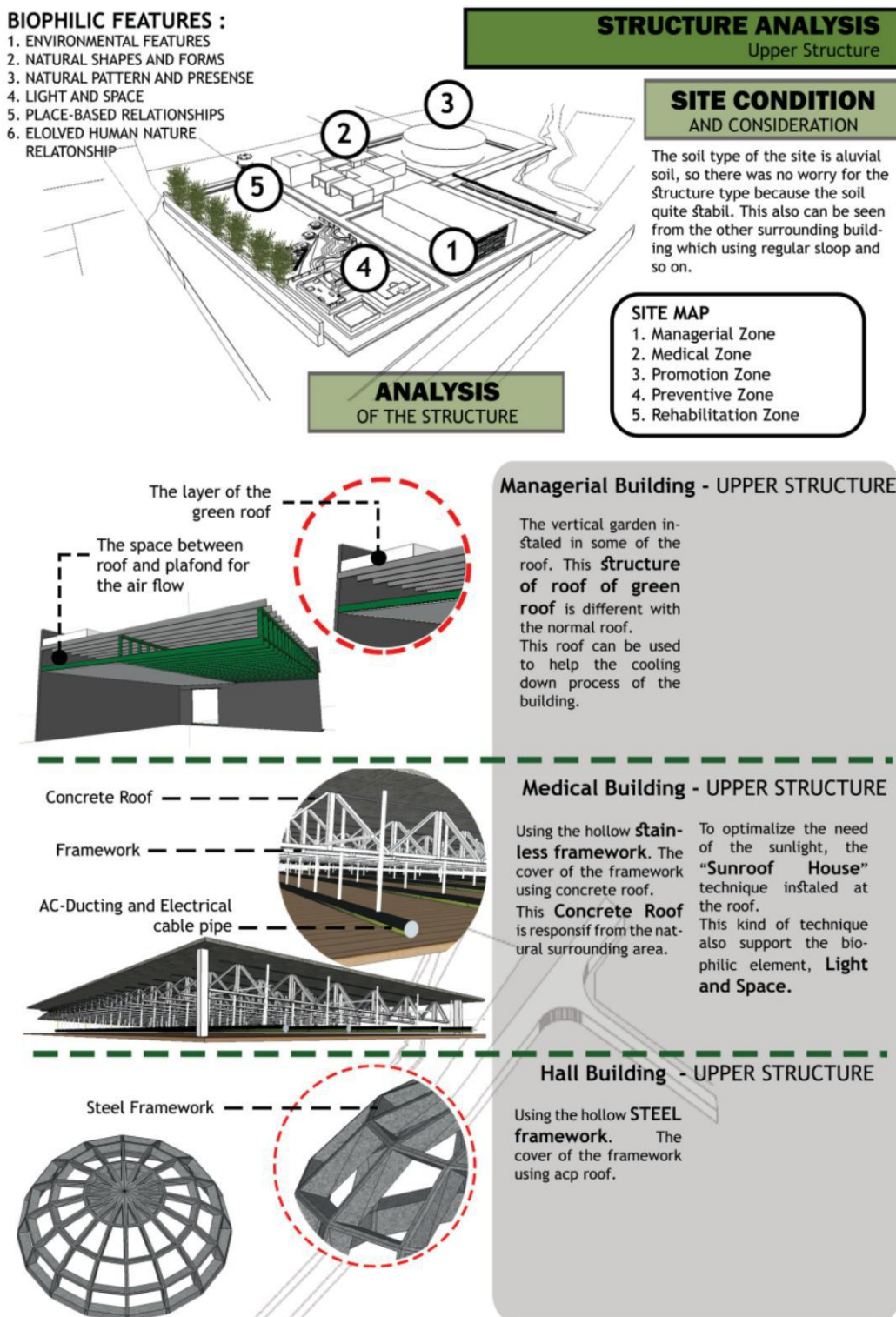
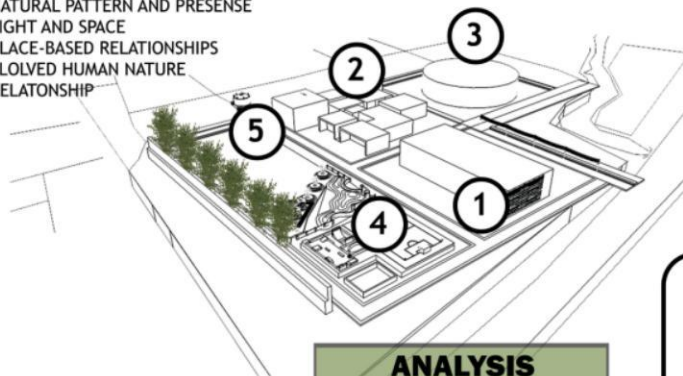


Image 4.33 Structure Analysis - Upper Structure
(Source : Personal Analysis)

B. Structure Analysis - Middle Structure

BIOPHILIC FEATURES :

1. ENVIRONMENTAL FEATURES
2. NATURAL SHAPES AND FORMS
3. NATURAL PATTERN AND PRESENCE
4. LIGHT AND SPACE
5. PLACE-BASED RELATIONSHIPS
6. ELOVED HUMAN NATURE RELATONSHIP



STRUCTURE ANALYSIS

Middle Structure

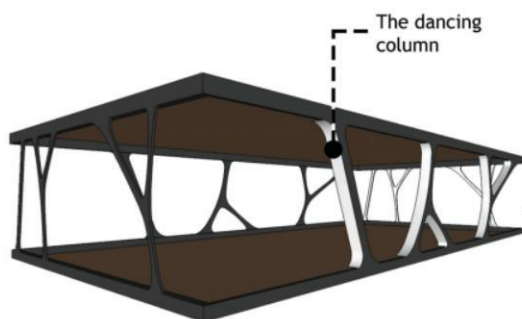
SITE CONDITION AND CONSIDERATION

The soil type of the site is aluvial soil, so there was no worry for the structure type because the soil quite stabil. This also can be seen from the other surrounding building which using regular sloop and so on.

SITE MAP

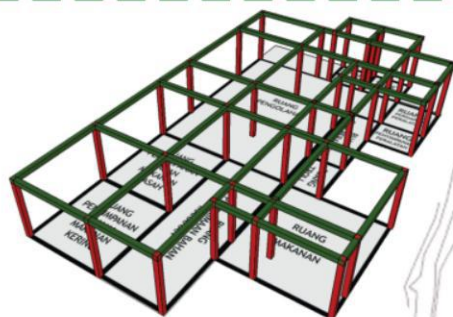
1. Managerial Zone
2. Medical Zone
3. Promotion Zone
4. Preventive Zone
5. Rehabilitation Zone

ANALYSIS OF THE STRUCTURE



Managerial Building - MIDDLE STRUCTURE

Managerial Zone using some unique structure like in zaha hadid design in "The dancing column".



Medical Building - MIDDLE STRUCTURE

The column here using regular column and beam according to the room arrangement to the blockplan.

The column shaped into various kind, such us :

1. Regular rectangular
2. Tree shape



Hall Building - MIDDLE STRUCTURE

There is no middle structure for this promotion zone because it using some wide spread dome structure.

The room inside the dome using regular column and tree look like column.

Image 4.34 Structure Analysis - Middle Structure
(Source : Personal Analysis)

CHAPTER V

CONCEPT

5.1 BASIC CONCEPTS

The previous basic concept that used in designing this Diabetes and Endocrinology Health-care Centre come from the tag-line, “**Natural Synapses**”. Natural synapses itself come from the issue that this kind of diseases can be cured by the natural process beside the need of green space in the city. This tag-line also selected based on the biophilic meaning that can be seen from the Islamic world view which is “bring back the human natural tendency to the nature”.

The tag-line that used in the function, site, form and structure analysis seems like having some problem occurred along the analysis. The problem mostly come from the “urban” thing because this site having a small area and in the middle of the city. So the tag-line has been improved as “**Natural Urban Synapses**”.

Natural urban synapses talk about how the biophilic design can survive in the middle of the urban or city. The successful biophilic design is the design that can make the nature seem natural in the middle of some place that not natural. To make this design concept, the tag-line generate some **keywords**, such as :

1. **Natural Connection**
2. **Trees inside the City**
3. **Synapses Landscape**
4. **Urban Nature Landscape**
5. **Open Space**
6. **Building Greenery**
7. **Optimize Small Space for Greenery**
8. **Well-being Design**

The sub-concept that explained about the detail of biophilic concept can be seen below :

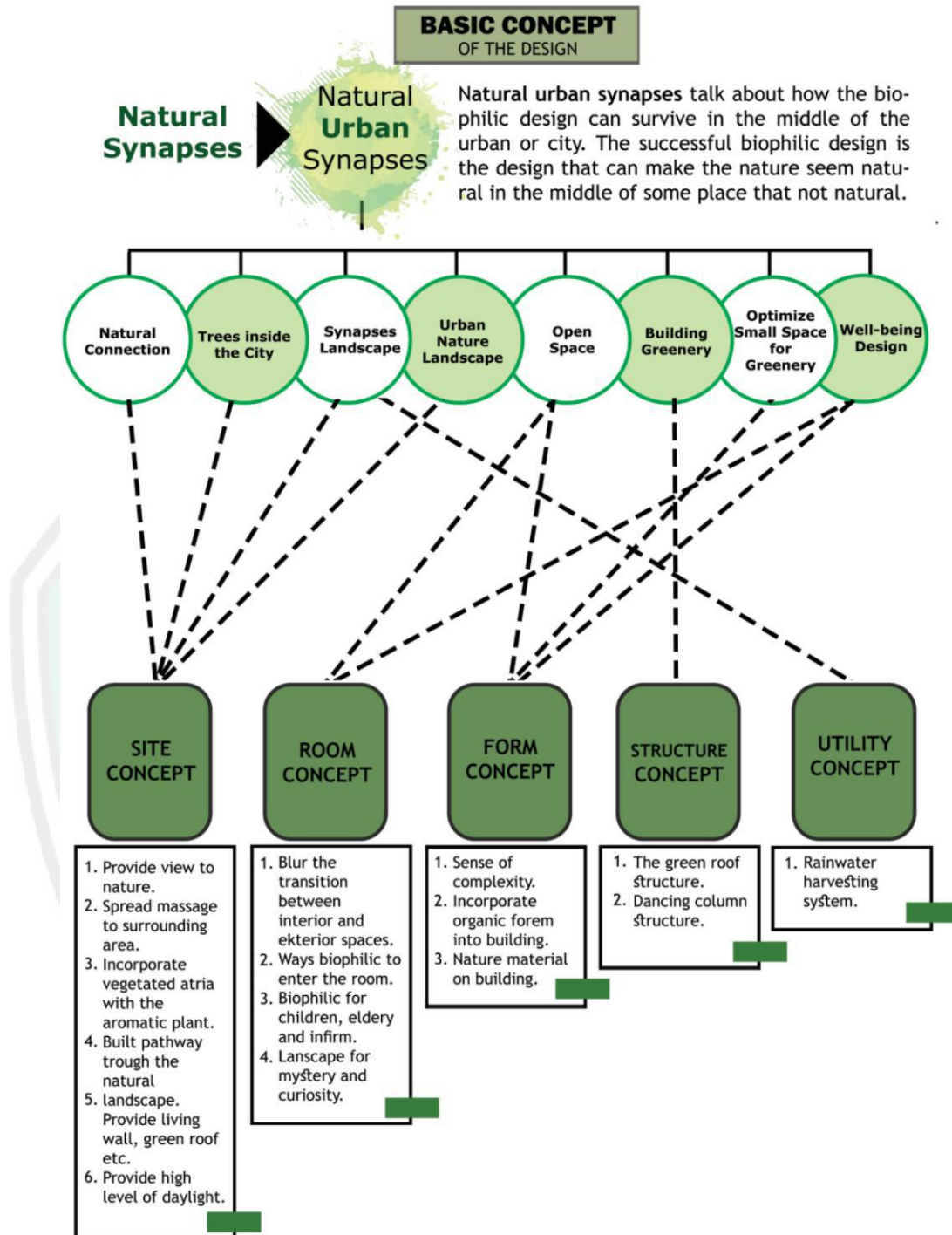


Image 5.1 Basic Concept (Source : Personal Data)

The other elements that show how biophilic effected the design explained below :

5.1.1 Site Concept

The site concept is the summary of the site analysis with some technical and specific way to solve the problem. The site concept divided into six part according to the site analysis.

A. Boundaries Concept

The main idea of the boundaries analysis are, : “Provide view to nature and response to the surrounding area to get the design message.”

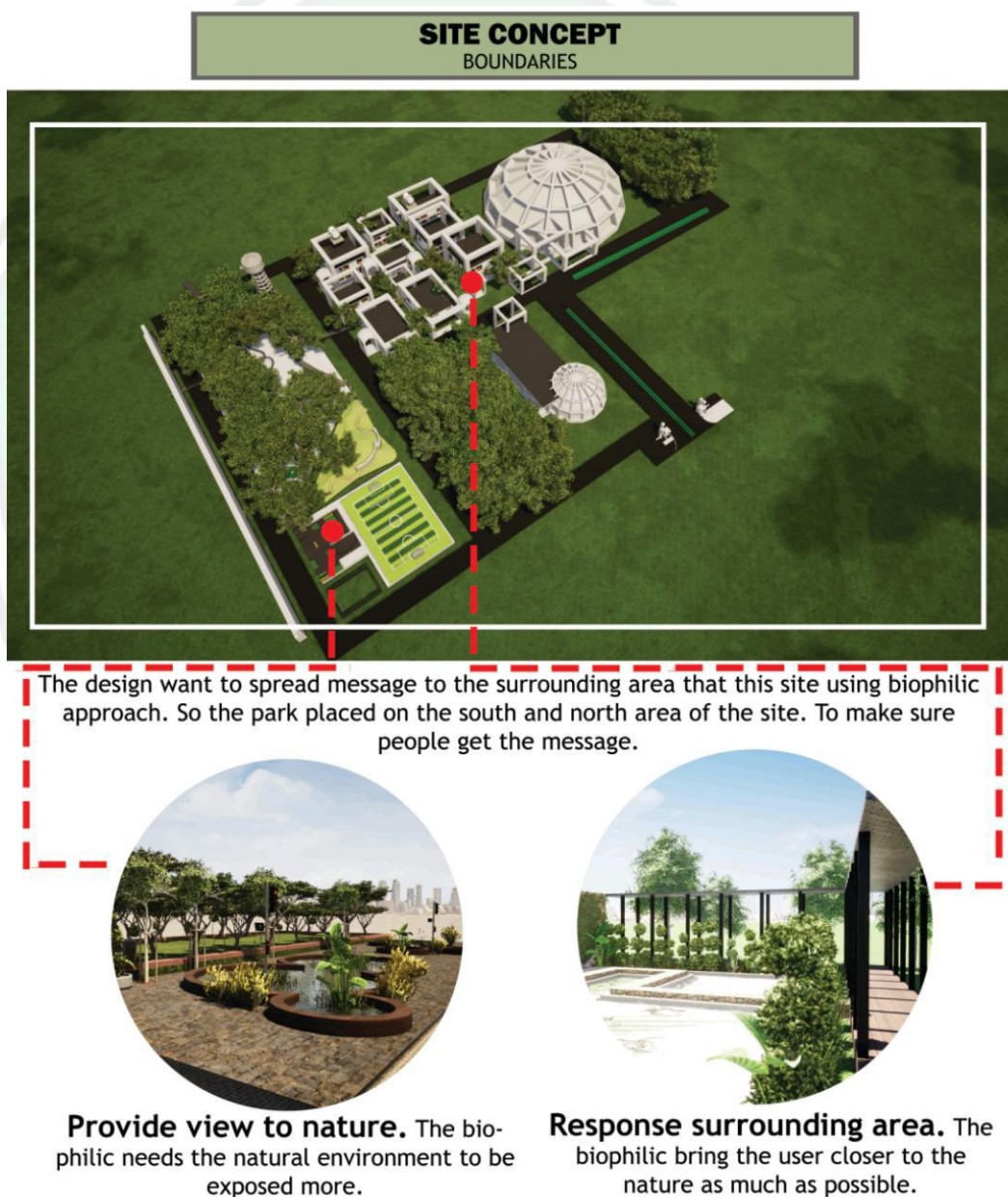
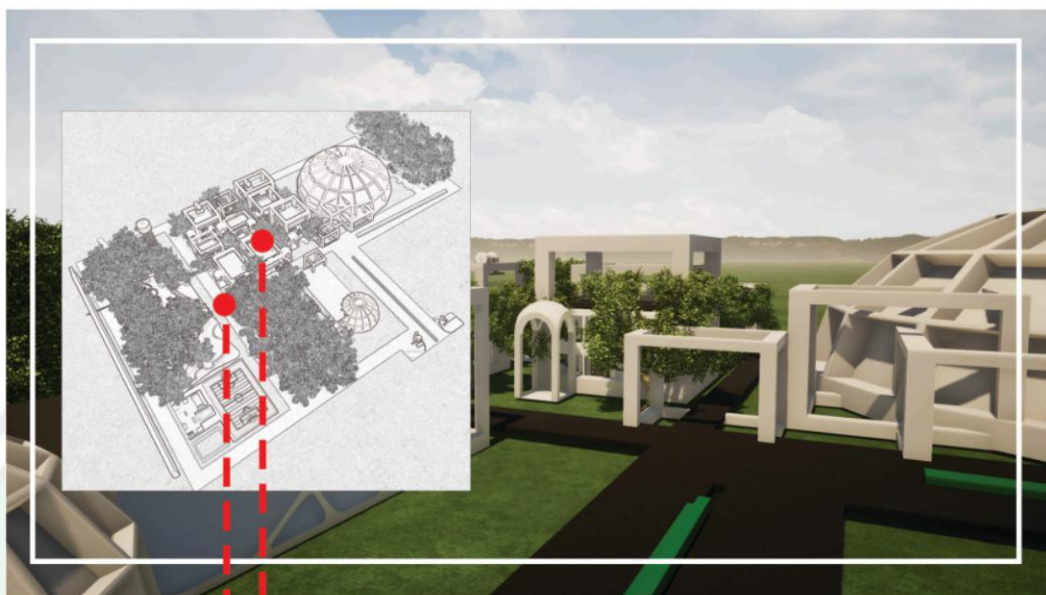


Image 5.2 Site Concept - Boundaries Concept
(Source : Personal Data)

B. Sensory Concept

The main idea of the sensory analysis are, : “Incorporate vegetated atria and interior planting bed with the aromatic plant, such as flowers and trees.”

SITE CONCEPT
SENSORY (Audio and Odor)



Incorporate vegetated area with aromatic plant. The fresh aroma come from the various trees on the lanskap. The trees spread the aroma to the patient and the other user.



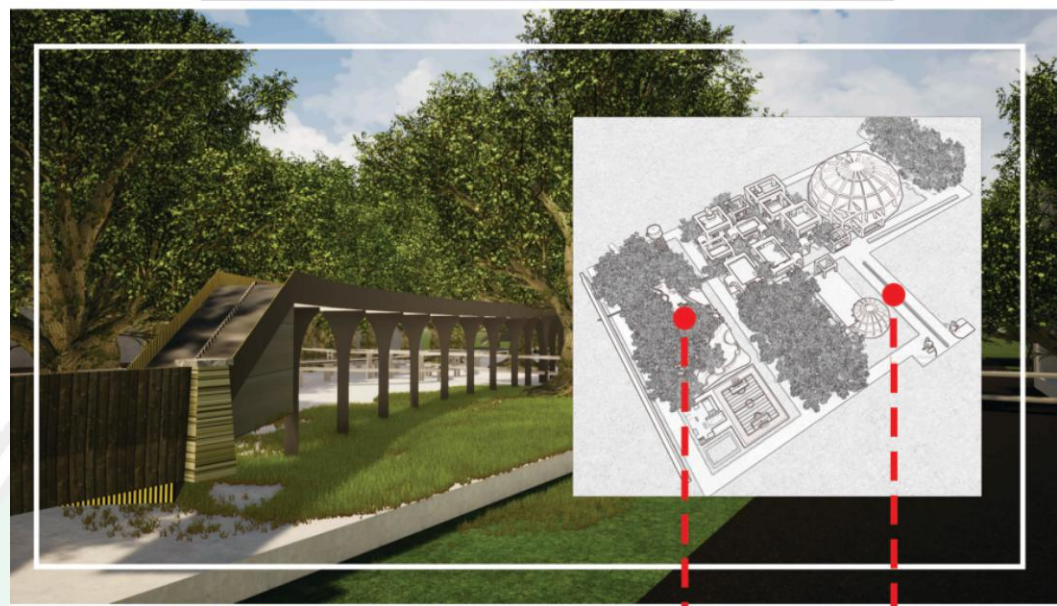
Incorporate vegetated area with aromatic plant. The roses also choosed for coloring the lanskap of the building. Roses doesn't have strong fragrance but smell good.

Image 5.3 Site Concept - Sensory Concept
(Source : Personal Data)

C. Circulation and Accessibility Concept

The main idea of the circulation and accessibility analysis are, : “Build pathway through naturalized and landscape area and blur the transition between interior and exterior spaces.”

SITE CONCEPT
CIRCULATION AND ACCESSIBILITY



Build pathway trough naturalized landscape. The circulation and the accessibility from user to the nature can be represented by the **flyover pedestrian way** through the various garden. Beside the flyover, the **ground based pedestrian way** also provided to add the space for user in this garden.

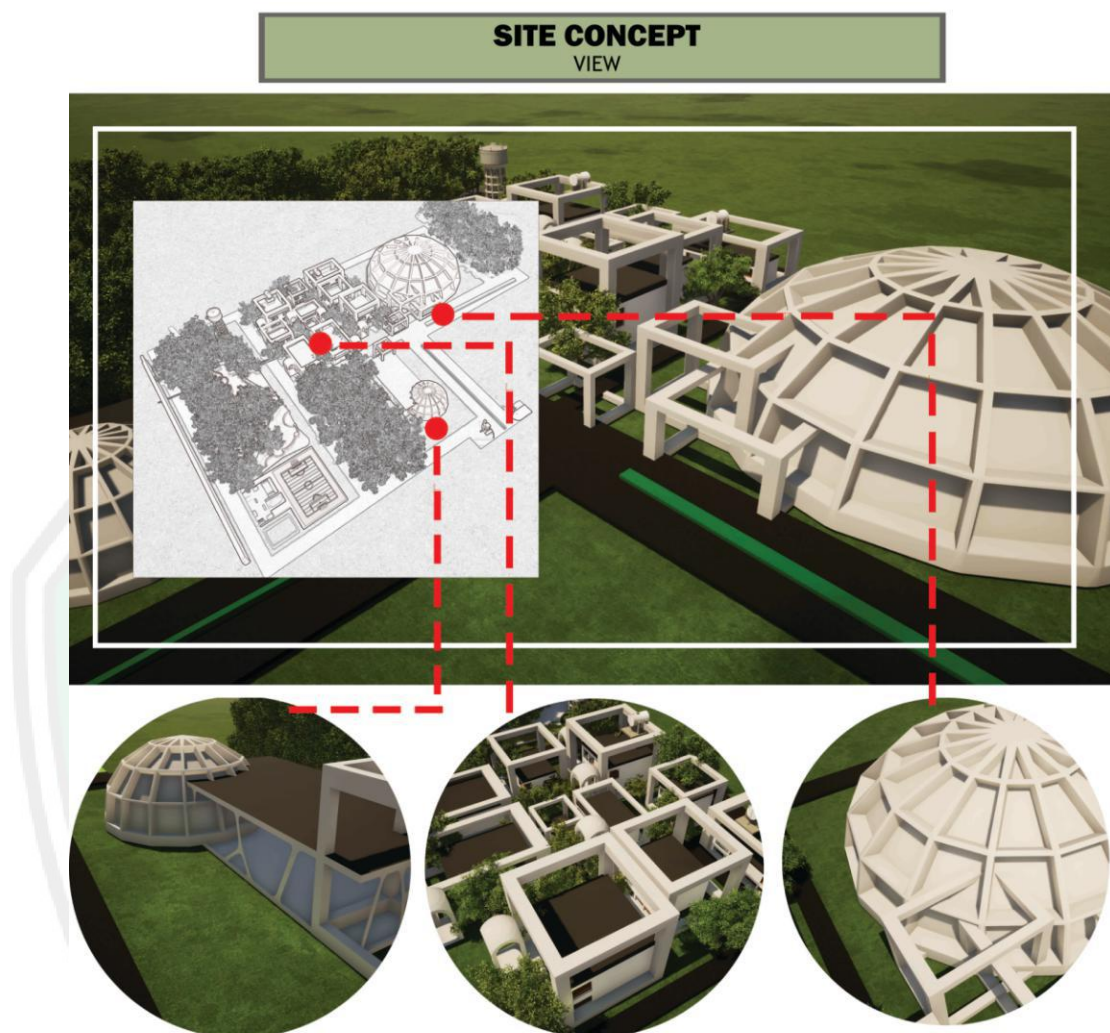


Blur the transition between nature and inner space. The circulation and the accessibility from user to the building can be seen by the main road inside the site that provide large amount of street incase of emergency activity on the building.

Image 5.4 Site Concept - Circulation and Accessibility Concept
(Source : Personal Data)

D. View Concept

The main idea of the view analysis are, : “Create a sense of complexity - yet order- in building design to attract the user, visually.”



Create a sense of complexity. The complexity in order make the user curiosity to explore more about the building and make them more active.

Image 5.5 Site Concept - View Concept
(Source : Personal Data)

E. RTH (Green Space) Concept

The main idea of the RTH (Green space) analysis are, :
 “Provide planting and pleasing, natural setting around the building, replace impervious landscape surfaces with diverse native plantings, provide living wall of building facade, green roof, water element on the site. ”

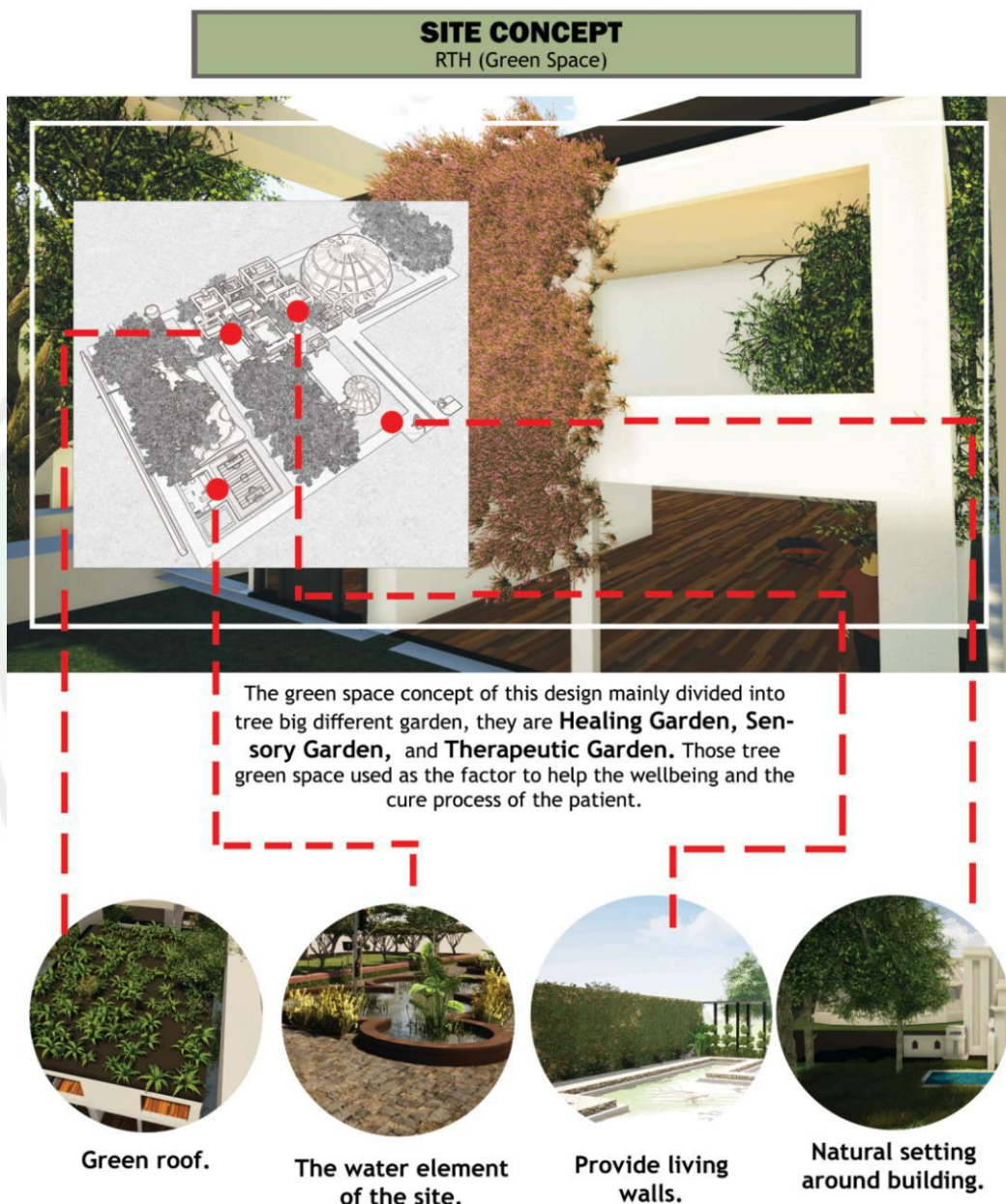
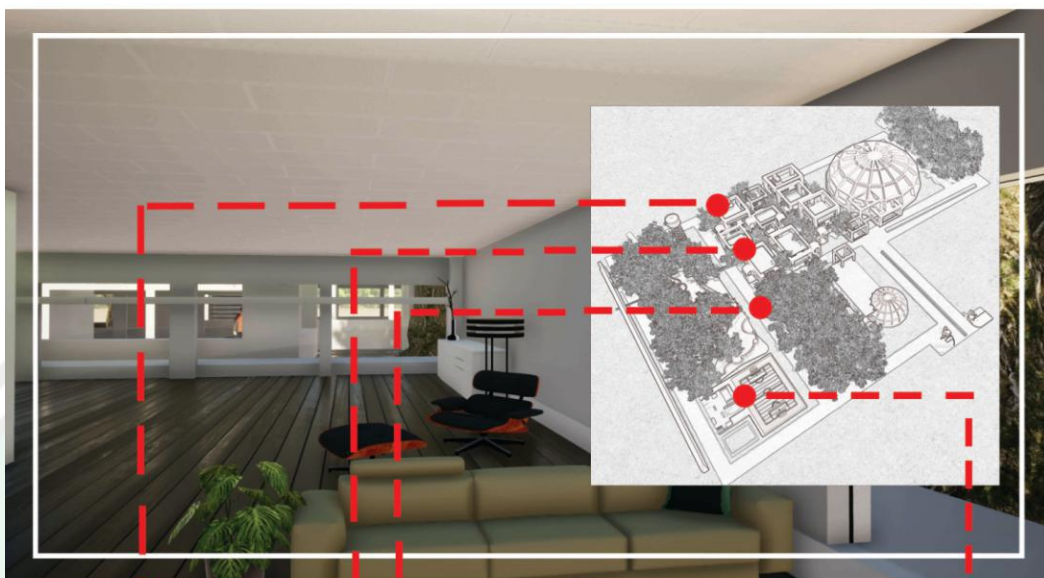


Image 5.6 Site Concept - RTH (Green Space) Concept
 (Source : Personal Data)

F. Climate Concept

The main idea of the Climate analysis are, : “Provide high level of daylight, avoid interference with key sight-lines, provide operable windows, reuse the rainwater harvesting to help the design saving the water intake. ”

SITE CONCEPT
Climate (Sun, Wind and Rain)



The biophilic design meet the climate will be more focused on the sun, or daylight used in the building. The daylight should be reach the deep of the building.



High level of daylight.



Operable windows.



The clear sight-lines.



The retention ponds.

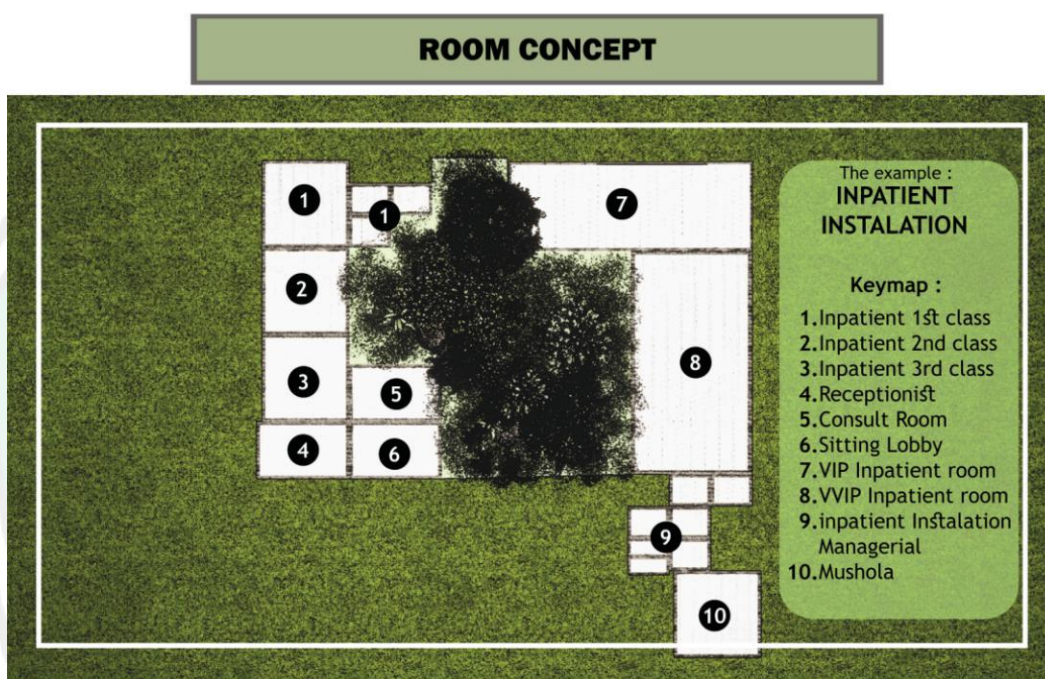
Image 5.7 Site Concept - Climate Concept
(Source : Personal Data)

5.1.2 Room Concept

The room concept is the summary of the function analysis with some technical and specific way to solve the problem. The function analysis generate some keyword for the room concept, they are :

- A. Seeks ways to integrate biophilic design into an entity room.
- B. Address biophilic design with all buildings, but especially those for children, the elderly, and the infirm.
- C. Design landscape and buildings for a sense of mystery.

The keyword can be explained in one example from the **Medical Zone**, inpatient installation.



The room organization on this inpatient instalation require biophilic aspect as the vocal point of the design. Views of natural scenes are particularly important for **calming children** and instilling in them an appreciation of nature. For the elderly and infirm, natural scenes can **erase discomfort** and promote healing.

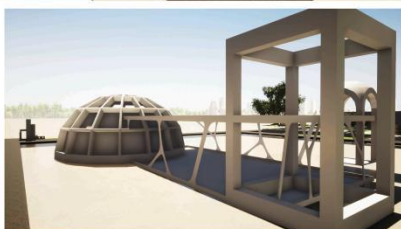
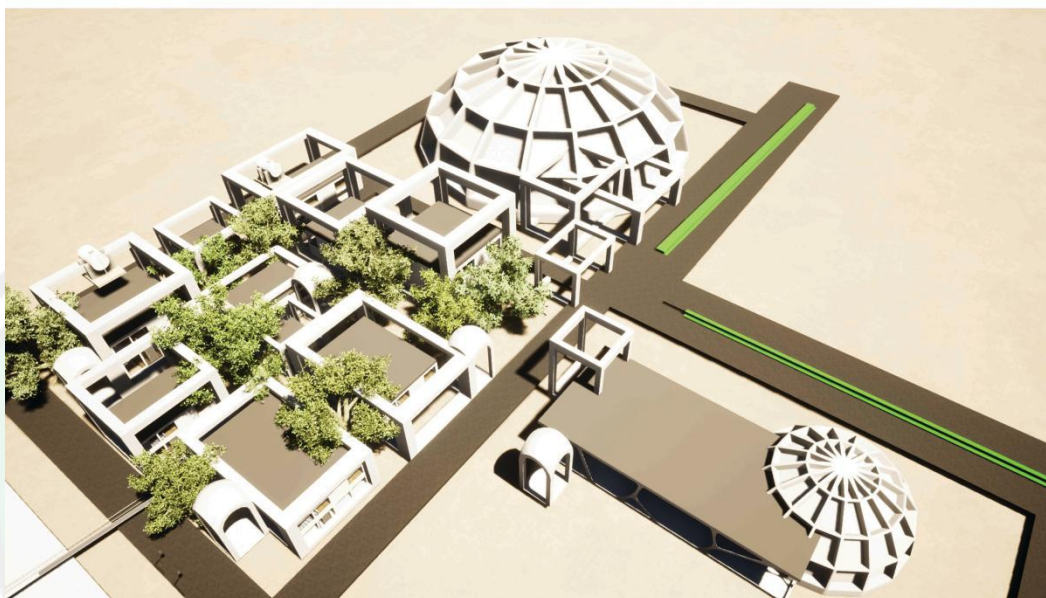
Image 5.8 Room Concept in Medical Zone - Inpatient Installation
(Source : Personal Data)

5.1.3 Form Concept

The form concept is the summary of the form analysis with some technical and specific way to solve the problem and integrate with the biophilic element. The form analysis also generate some specific keyword :

- A. Incorporate organic forms into buildings.
- B. Provide nature material in the building.

FORM CONCEPT



DESCRIPTION :

The form of this design is to incorporate the organic element to the design. This design provide :

1. Column mimic the **brances of the tree**
2. The dome mimic the shape of the **shell**

Image 5.9 Form Concept
(Source : Personal Data)

5.1.4 Structure Concept

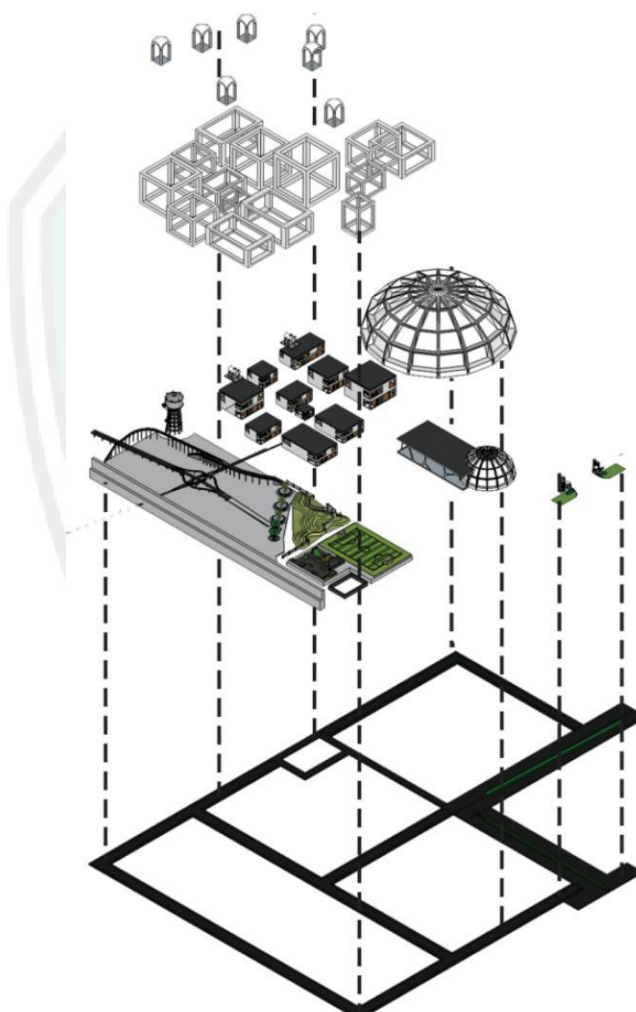
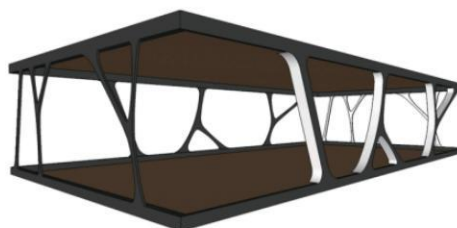
The structure concept is the summary of the structure analysis with detail technical application in the design structure. The structure concept of biophilic doesn't really generate keyword for the concept but the concept explained about detailed technique.

STRUCTURE CONCEPT

Structure Concept and Additional Material Concept

DESCRIPTION :

The structure of this design that match the biophilic approach is the sahep of the column that used in the managerial building. The column using the **‘Dancing Column’** for the middle structure.



DESCRIPTION :

The structure of this design using some special technique according to biophilic. The main structure can't be interrupted by biophilic, but the **material** can be adapted from the biophilic design.

A. THE UPPER MATERIAL

Grass is a must in this design, also the roof garden and the sun shading for the building. The kind of plants that used for the roof garden are, : lavender, daylily, grass, lamb's ear and goldfame honeysuckle.

B. THE MIDDLE MATERIAL

The column and the beam maybe in a normal shape but the material of making them can be swich into biophilic friendly, such as wood, unfinish concrete, even natural trees.

C. THE LOWER MATERIAL

The foundation can't be integrated with biophilic element. But on the built process of this healthcare centre, the foundation may not destry or ruin the existing tree on the site.

Image 5.10 Structure Based on Biophilic

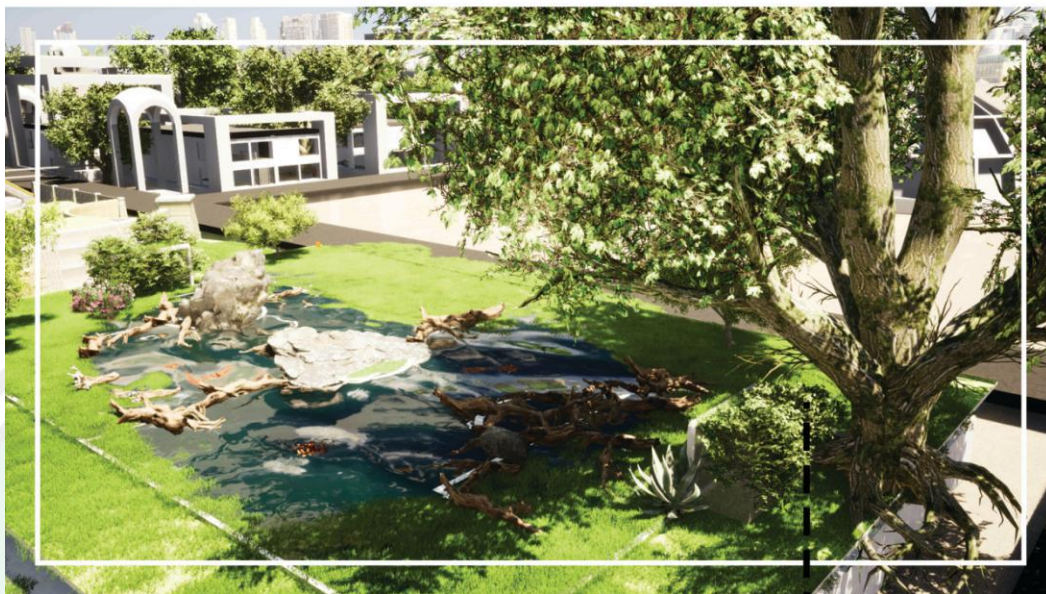
(Source : Personal Data)

5.1.5 Utility Concept

The utility concept is the summary of the utility analysis with detail technical and specific way to solve the problem and integrate with the biophilic element. The form analysis also generate specific keyword :

1. Rainwater harvesting system

UTILITY CONCEPT



DESCRIPTION :

The utility integrated with the lanskap in this design require the **retention pond and the rainwater harvesting system** that having some advantages, such as :

1. As the water of healing garden element
2. As the soil natural water tank
3. Avoid the drought of the site
4. Maintenance and protect the tree water supply

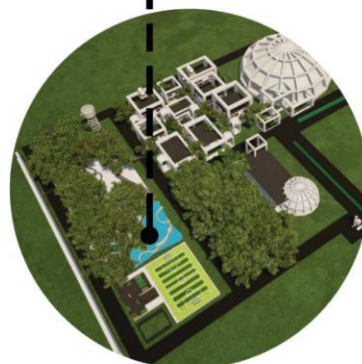


Image 5.12 Utility Concept

(Source : Personal Data)

CHAPTER VI DESIGN EXPLANATION

6.1 ARCHITECTURE CONCEPT

This chapter mainly explain the design that has been making from the analysis and the concept. The sub subject contain basic concept explanation as a reminder and the second contain the explanation the changes that made during the drawing process.

6.1.1 Architecture Basic Concep

The previous basic concept that used in designing this Diabetes and Endocrinology Health-care Centre come from the tag-line, “**Natural Synapses**”. Natural synapses itself come from the issue that this kind of diseases can be cured by the natural process beside the need of green space in the city. This tag-line also selected based on the biophilic meaning that can be seen from the Islamic world view which is “bring back the human natural tendency to the nature”.

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7. **Optimize Small Space for Greenery**
8. **Well-being Design**

The sub-concept that explained about the detail of biophilic concept can be seen below :

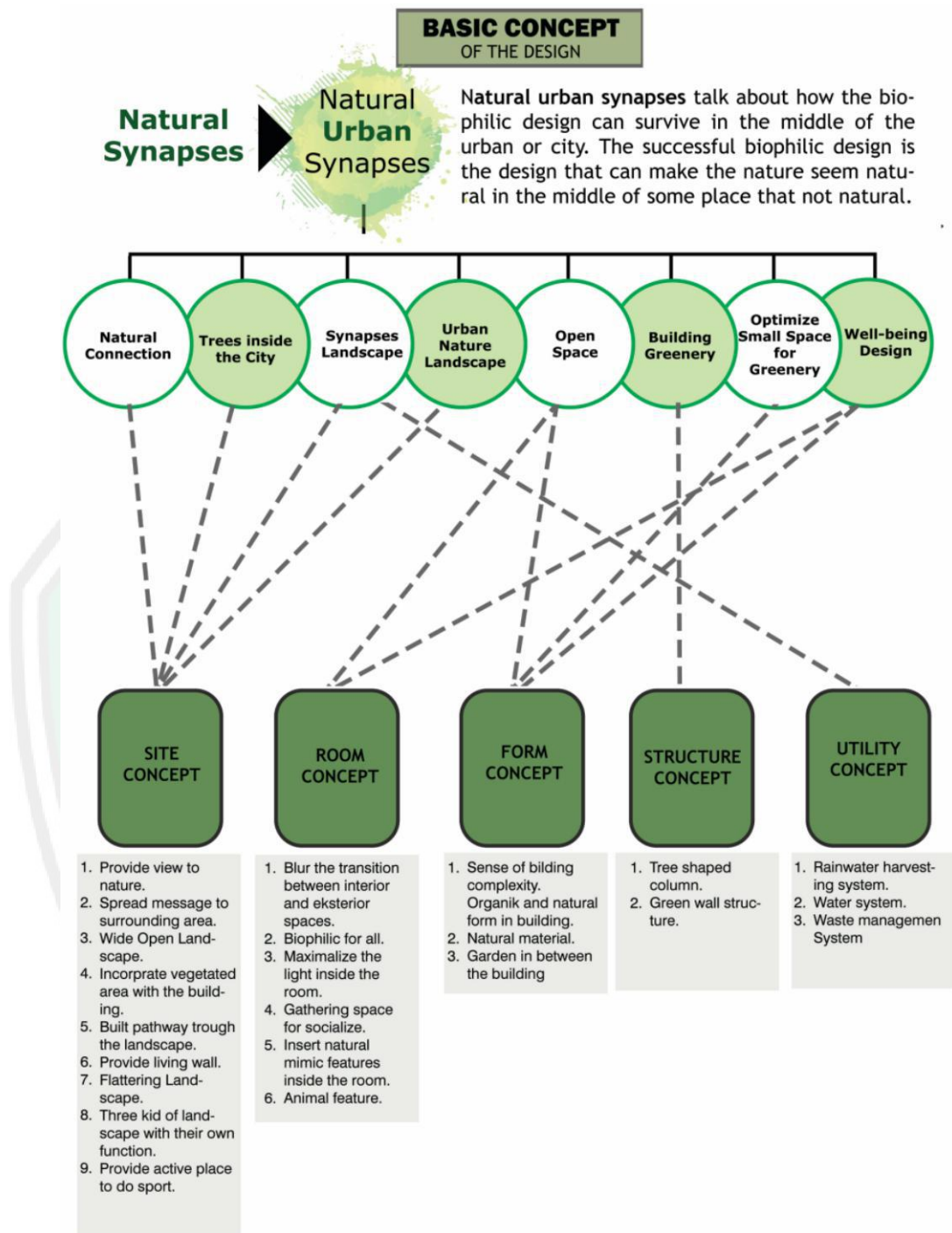


Image 6.1 Basic Concept (Source : Personal Data)

6.1.2 Design's Change or Improvement

The previous basic concept that used in designing this Diabetes and Endocrinology Health-care Centre has been change due to the drawing needs. The change will be explain below.

A. Site Concept

In the previous site concept, the sport field come in square and bulk. But in the new drawing come into triangle as basic shape and more dinamic compared to the previous concept.

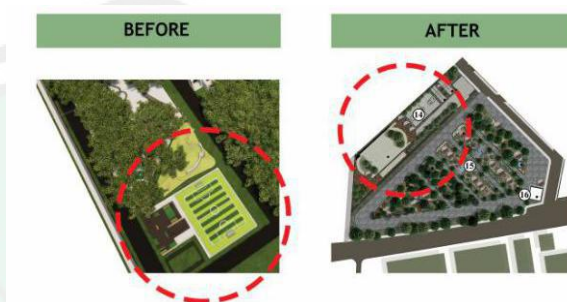


Image 6.2 Site Concept Changing
(Source : Personal Data)

B. Room Concept

There was not much changing in the room concept. The open space still be the main concern on the drawing.

C. Form Concept

In the form concept, there are some change due to the climate and the structure. The roof that in designed before was a flat roof known as 'atap dag'. During the drawing and another consideration, this roof doesn't suitable for the design, so changed into **Skillion and Lean-to** roof. The other change that the masive bulking column change into smaller shape supporting the roof type.



Image 6.3 Form Concept Changing
(Source : Personal Data)

D. Structure Concept

There are not many changes on the structure, but the gathering dome that previously shaped like a half cut ball, change into a tube shape with match the roof of the another building.



Image 6.4 Structure Concept Changing
(Source : Personal Data)

E. Utility Concept

The utility concept is perfectly not changed into the drawing process and having some improvement due to the backdoor and the accessibility of the patients.

6.2 BIOPHILIC APPLIED ON DESIGN

This chapter mainly explain that biophilic design applied in building can be break down from the basic concept on the previous explanation. The basic concept itself contain five group of concept. Each concept contain general application for this healthcare center according biophilic principles. The concepts are :

- A. Site Concept
- B. Room Concept
- C. Form Concept
- D. Structure Concept
- E. Utility Concept

Next is the infographic explanation about biophilic application in the design with small image represented that later on will be detailed in the next paper point.

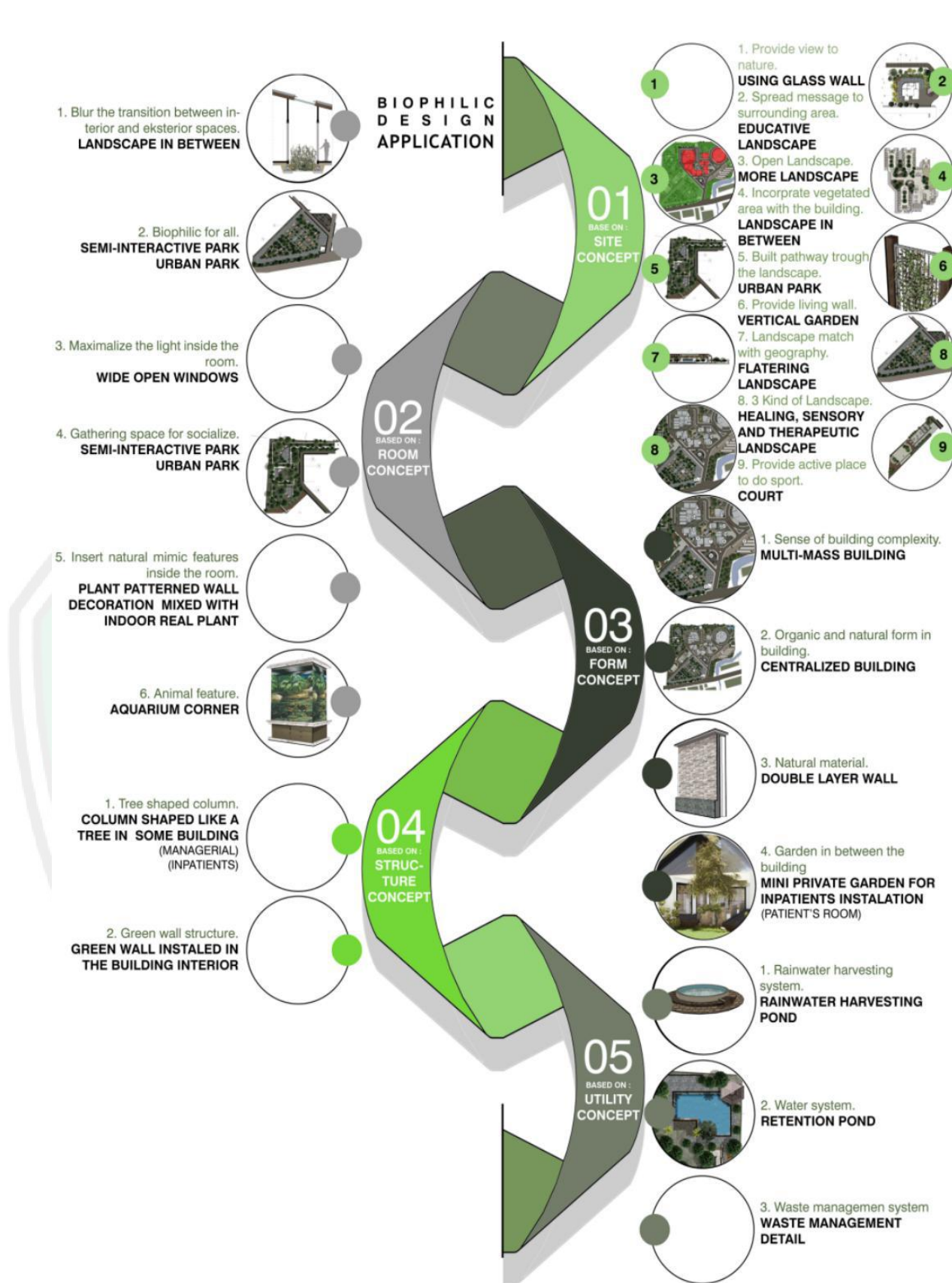


Image 6.5 Biophilic Principles Application

(Source : Personal Data)

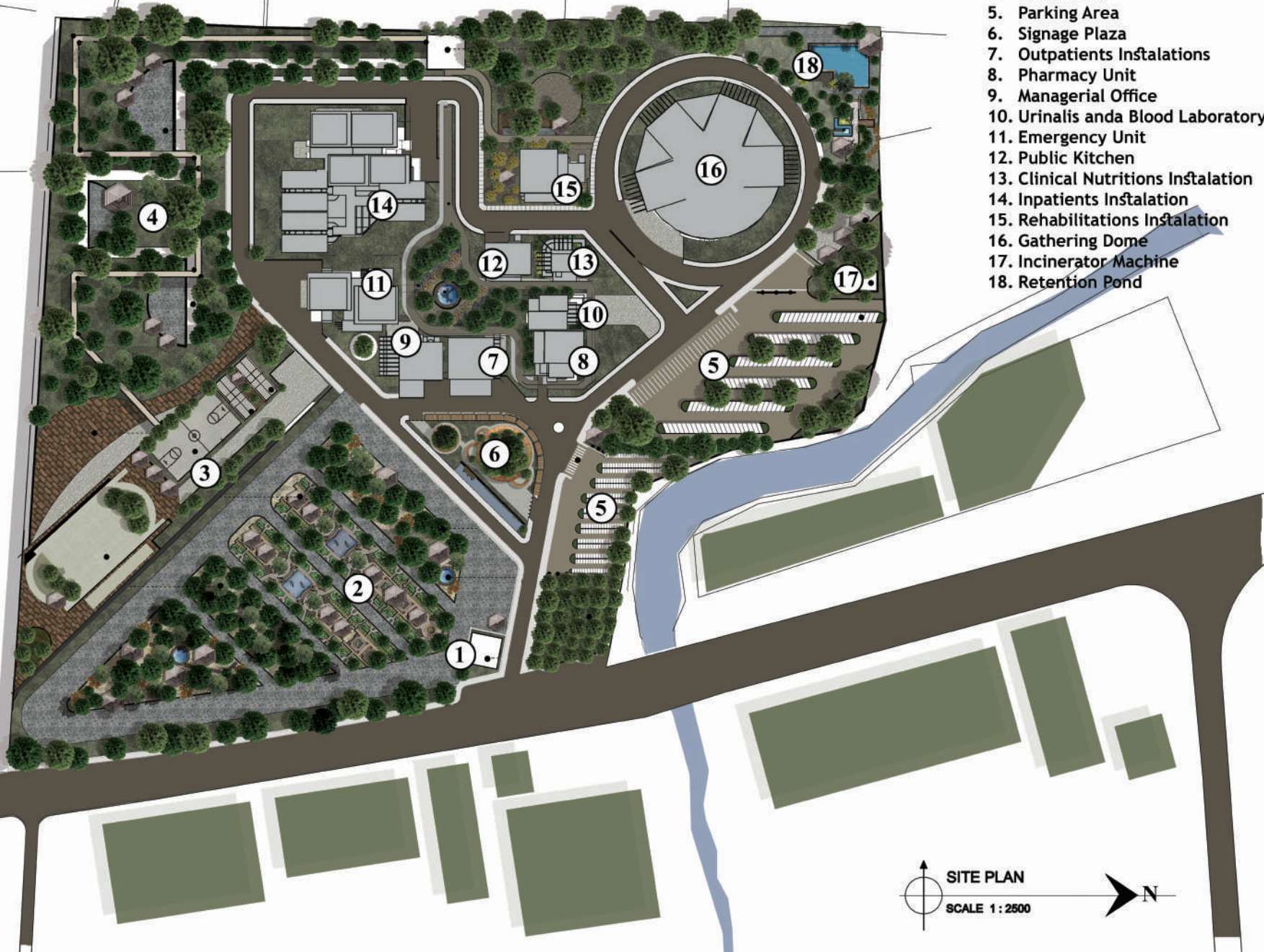
6.3 DESIGN RESULT

This chapter mainly showing the design drawing, consist some image supporting the main drawing. The design result include architectural drawing and Detail Engineering Design.

1.	Site Plan	Image Number	1
2.	Layout Plan	Image Number	2
3.	Site View	Image Number	3
4.	Site Section	Image Number	4
5.	Architectural Drawing of the Floor Plan	Image Number	5 - 14
6.	Architectural Drawing of the Building View	Image Number	15 - 24
7.	Architectural Drawing of the Building Section	Image Number	25 - 34
8.	Building Interior Perspective	Image Number	35 - 39
9.	Building Exterior Perspective	Image Number	40 - 44
10.	Site Perspective	Image Number	45 - 46
11.	Floorplan Tile Detail	Image Number	47 - 56
12.	Landscape Detail	Image Number	57 - 65
13.	Architectural Detail	Image Number	66 - 71
14.	Waste Management Detail	Image Number	72 - 81
15.	Airing Method Detail	Image Number	82 - 92
16.	Lighting Detail	Image Number	93 - 98
17.	DED Floorplan	Image Number	1 - 10
18.	DED View	Image Number	11 - 20
19.	DED Section	Image Number	21 - 30
20.	DED Plumbing	Image Number	31 - 40

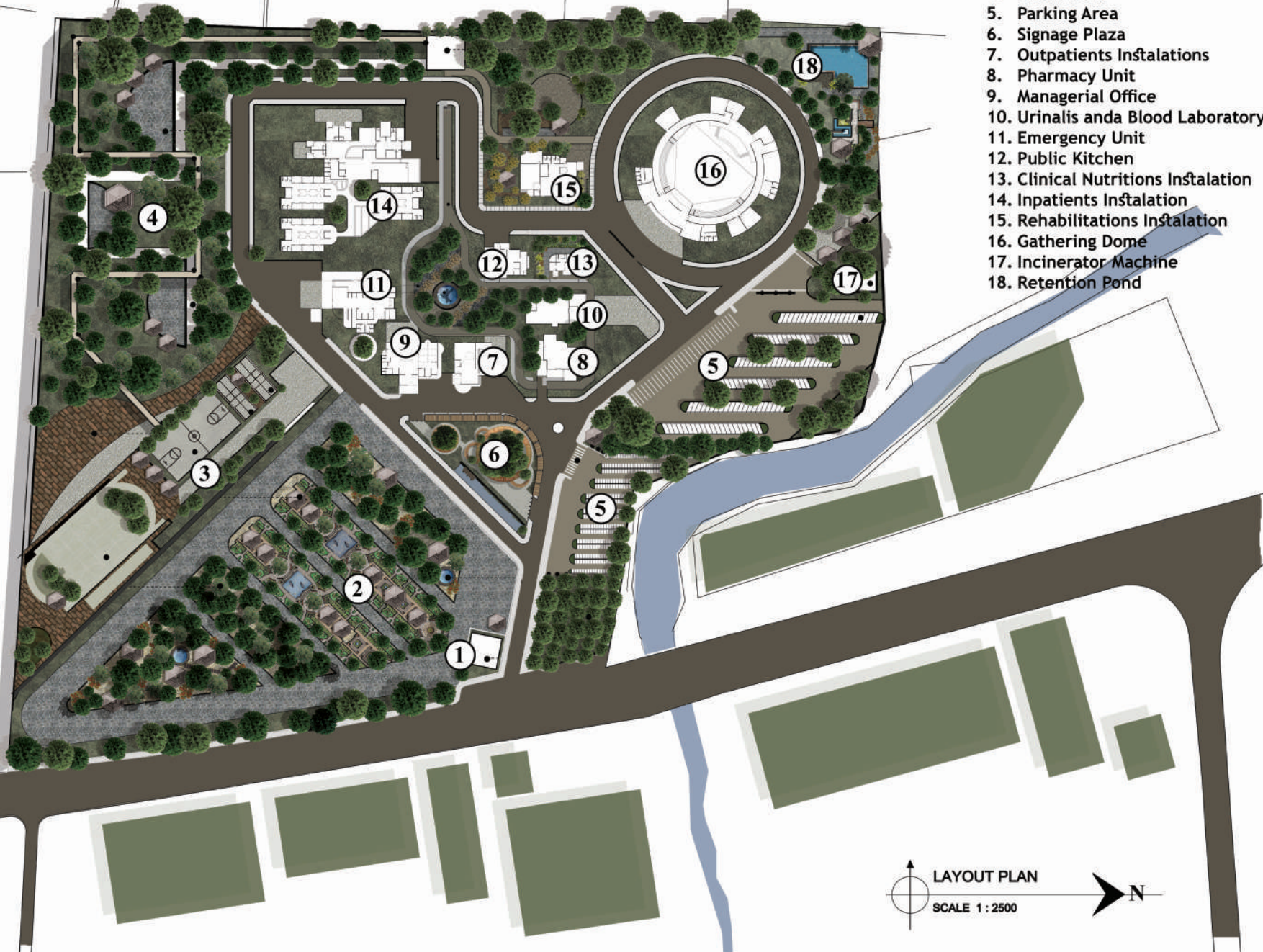
LEGENDA

1. Security Post
2. Semi Interactive Park
3. Court
4. Urban Park
5. Parking Area
6. Signage Plaza
7. Outpatients Instalations
8. Pharmacy Unit
9. Managerial Office
10. Urinalis anda Blood Laboratory
11. Emergency Unit
12. Public Kitchen
13. Clinical Nutritions Instalation
14. Inpatients Instalation
15. Rehabilitations Instalation
16. Gathering Dome
17. Incinerator Machine
18. Retention Pond



LEGENDA

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LAYOUT PLAN

SCALE 1 : 2500





**SITE VIEW
NORTH VIEW**
SCALE 1:2000



**SITE VIEW
EAST VIEW**
SCALE 1:2000

PROJECT TITLE

DIABETES AND ENDOCRINOLOGY
HEALTHCARE CENTER DESIGN
IN MALANG CITY

STUDENT NAME

QURROTA AYUN

STUDENT NUMBER

16660113

LECTURES GUIDE

PRIMA KURNIAWATY M. SI.
ALDRIN YUSUF FIRMANSYAH M.T.

IMAGE TITLE

SECTION

BUILDING NAME

SITE SECTION

IMAGE SCALE

1 : 2000

IMAGE NUMBER :

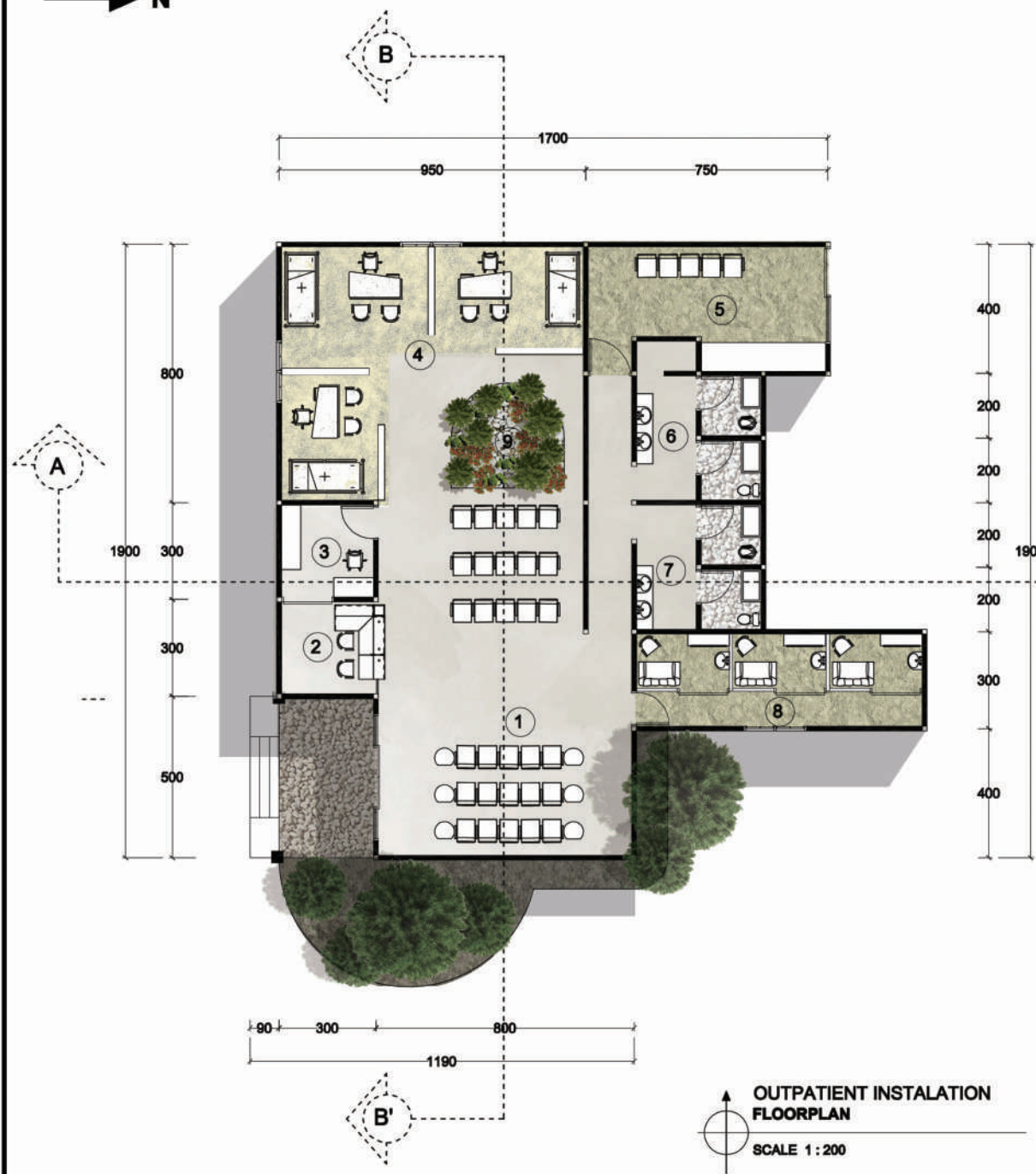
04



SITE SECTION
A - A' SECTION
SCALE 1 : 2000



SITE SECTION
B - B' SECTION
SCALE 1 : 2000

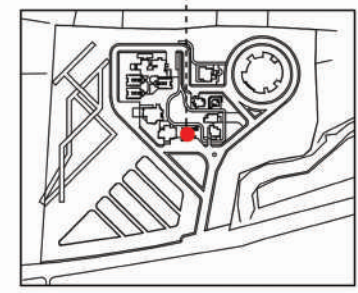


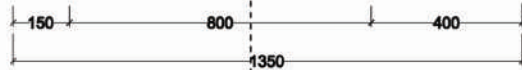
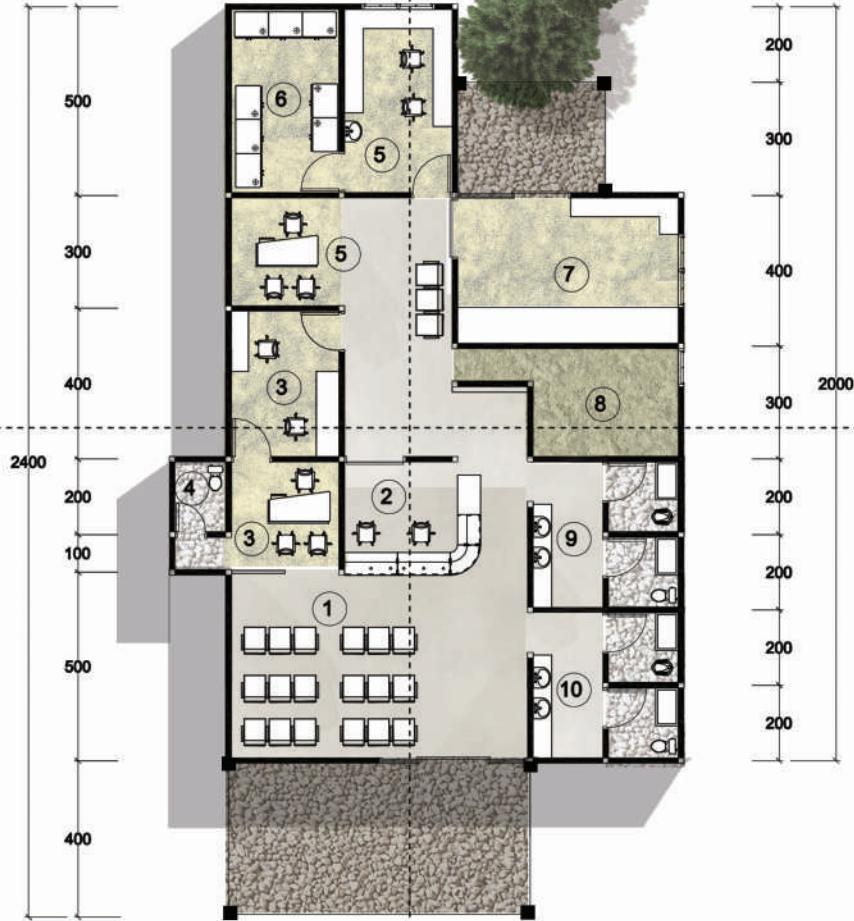
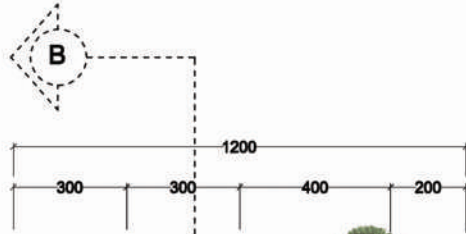
OUTPATIENT INSTALATION
FLOORPLAN
SCALE 1 : 200

LEGENDA

1. Waiting Lobby
2. Receptionist
3. Medical Record Room
4. Action Room
5. Employee's Restroom
6. Woman's Toilet
7. Men's Toilet
8. Lactation/ Nursery Room
9. Indoor Garden

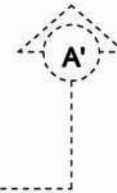
KEYPLAN



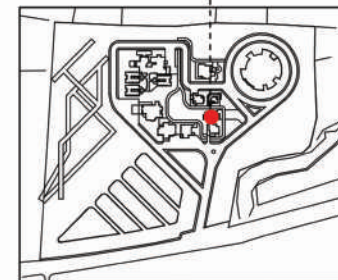


LEGENDA

1. Waiting Lobby
2. Receptionist
3. Urinalis
4. Toilet
5. Blood Checking
6. Blood Bank
7. Biomaterial Keeping Room
8. Pantry and Restroom
9. Woman's Toilet
10. Men's Toilet

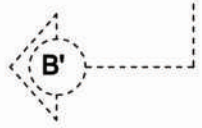
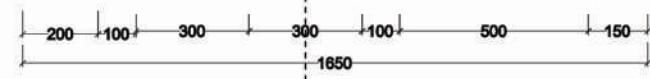
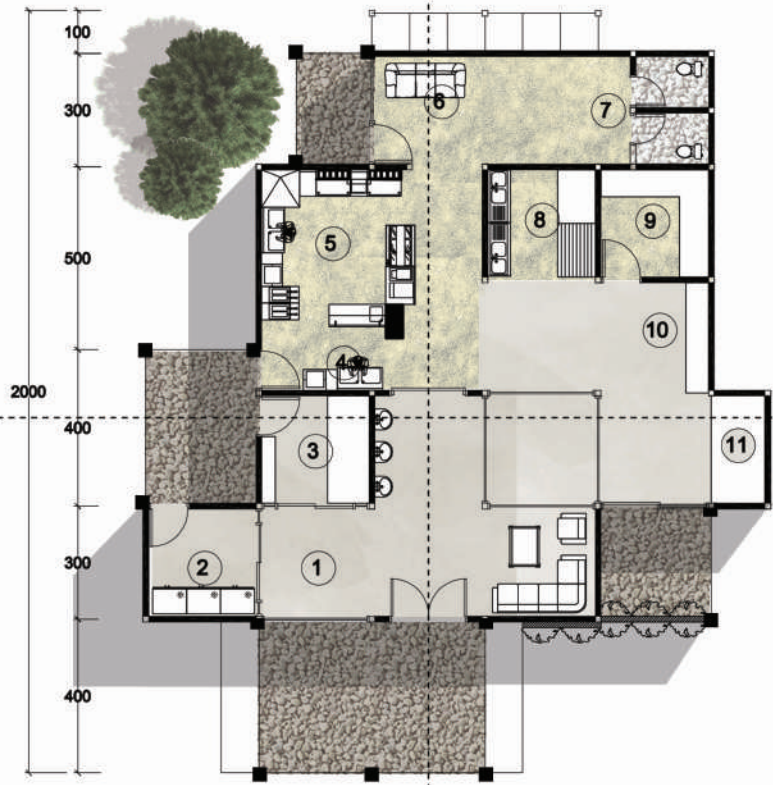
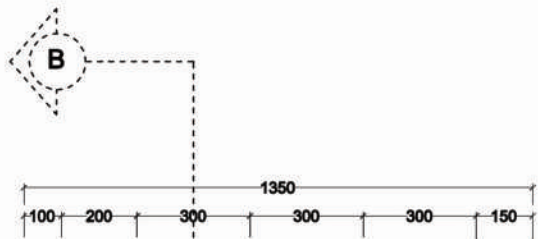


KEYPLAN



URINALIS AND BLOOD LABORATORY INSTALATION FLOORPLAN

SCALE 1 : 200

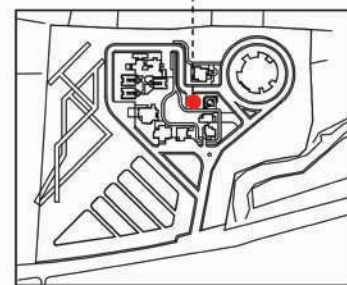


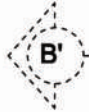
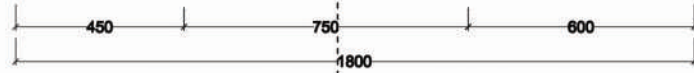
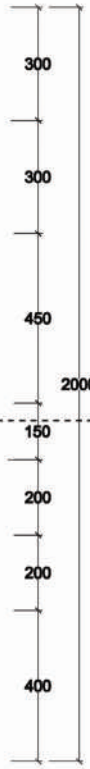
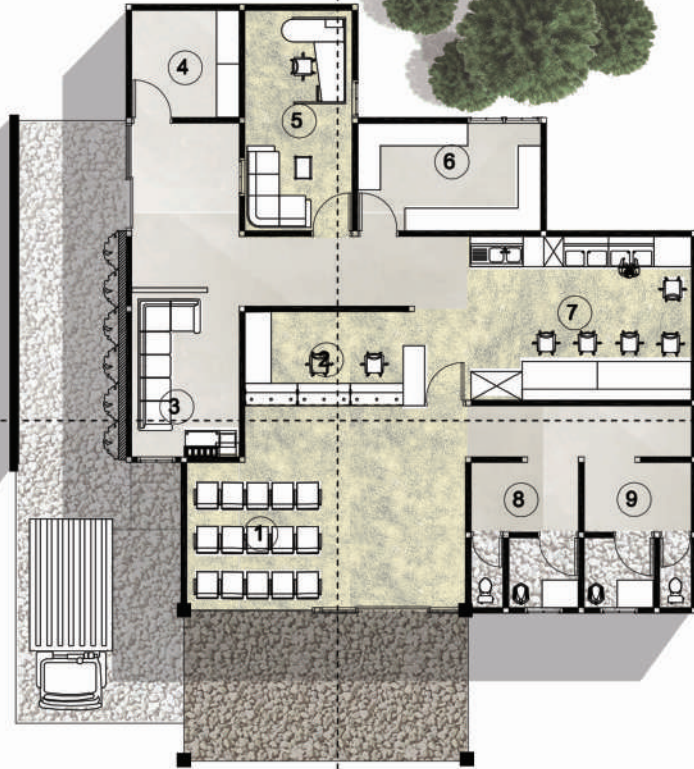
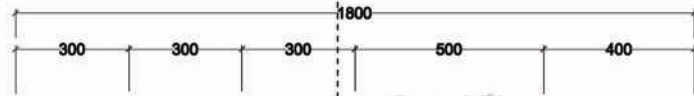
**PUBLIC KITCHEN INSTALATION
FLOORPLAN**
SCALE 1:200

LEGENDA

1. Food Receiving and Weighing Room
2. Wet Food Storage
3. Dry Food Storage
4. Ingredient Cleaning Spot
5. Food Processing Room
6. Rest Room
7. Public Toilet
8. Equipment Washing Room
9. Equipment Storage Room
10. Trolley Room
11. Food Presentation and Distribution Room

KEYPLAN





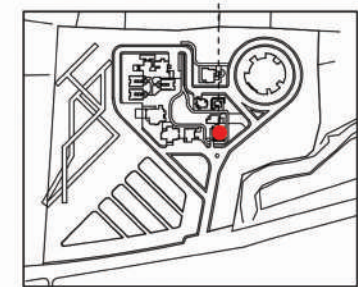
PHARMACY INSTALATION FLOORPLAN

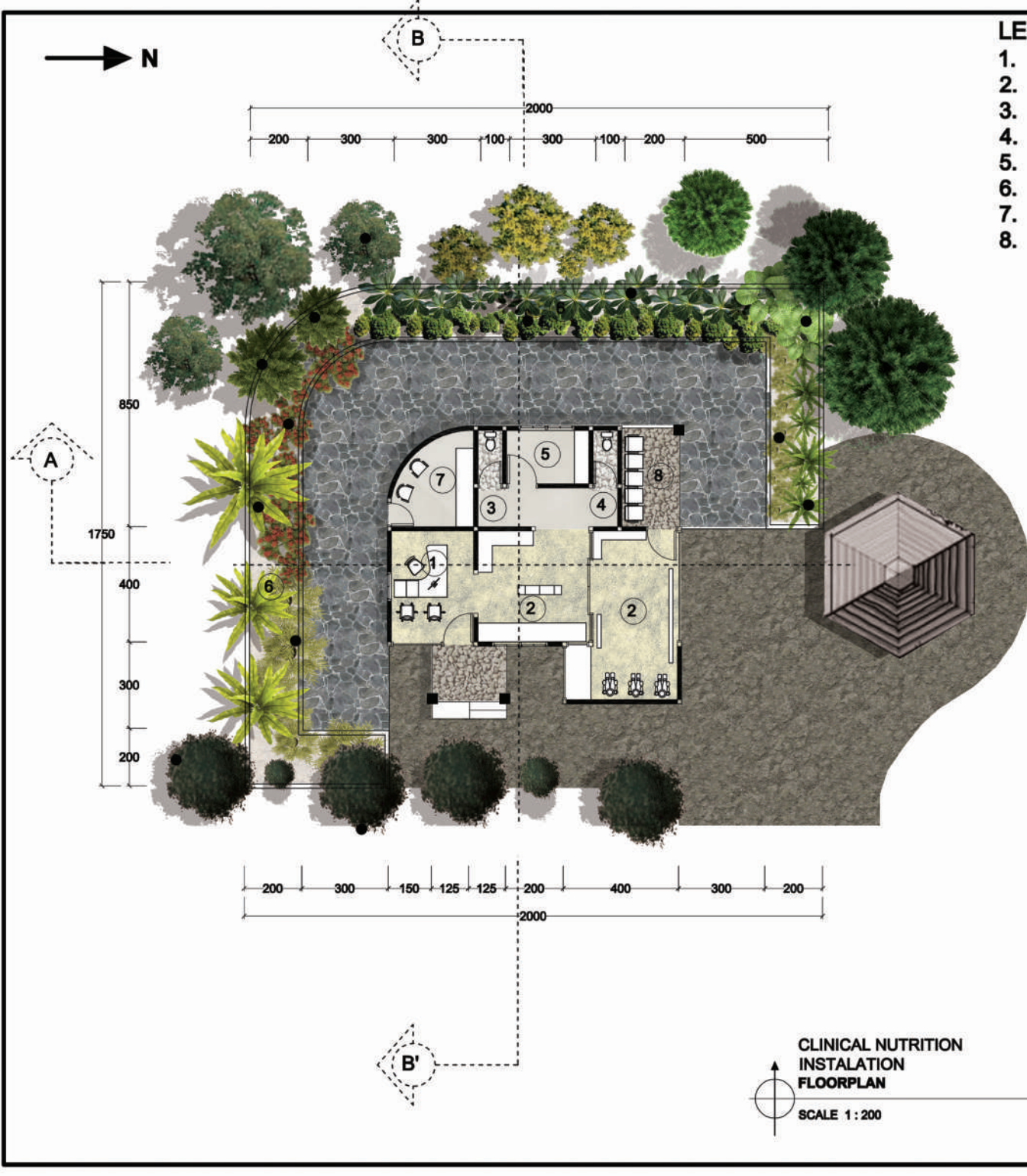
SCALE 1 : 200

LEGENDA

- 1. Waiting Lobby
- 2. Receptionist
- 3. Pantry
- 4. Storage
- 5. Chief Of Pharmacy's Room
- 6. Druif warehouse
- 7. Compounding Medicine Room
- 8. Men's Toilet
- 9. Woman's Toilet

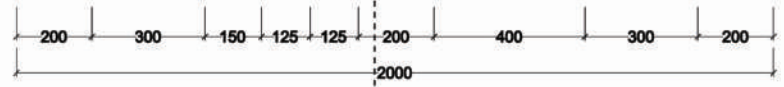
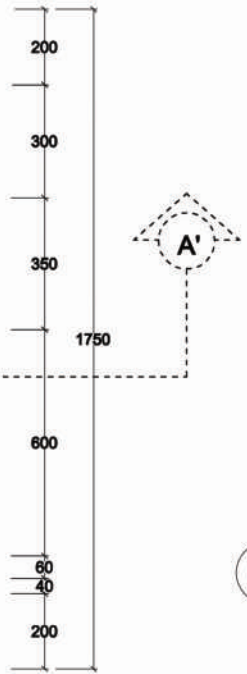
KEYPLAN





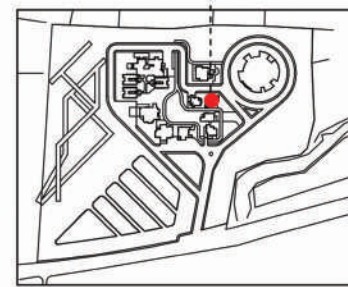
LEGENDA

- 1. Nutrisionist Room
- 2. Model and Miniature Room
- 3. Woman's Toilet
- 4. Men's Toilet
- 5. Storage
- 6. Example Plant Display (For Diabetes)
- 7. Planting Equipment's Storage
- 8. Second Entrance Door



CLINICAL NUTRITION
INSTALLATION
FLOORPLAN
SCALE 1 : 200

KEYPLAN



Diabetes and
Endocrinology
Healthcare Center

UNIVERSITAS ISLAM NEGERI
MAULANA MALIK IBRAHIM
Jln. Gajeyana No.50 Malang

ARCHITECTURE ENGINEERING

PROJECT TITLE
DIABETES AND ENDOCRINOLGY
HEALTHCARE CENTER DESIGN
IN MALANG CITY

STUDENT NAME
QURROTA AYUN

STUDENT NUMBER
16660113

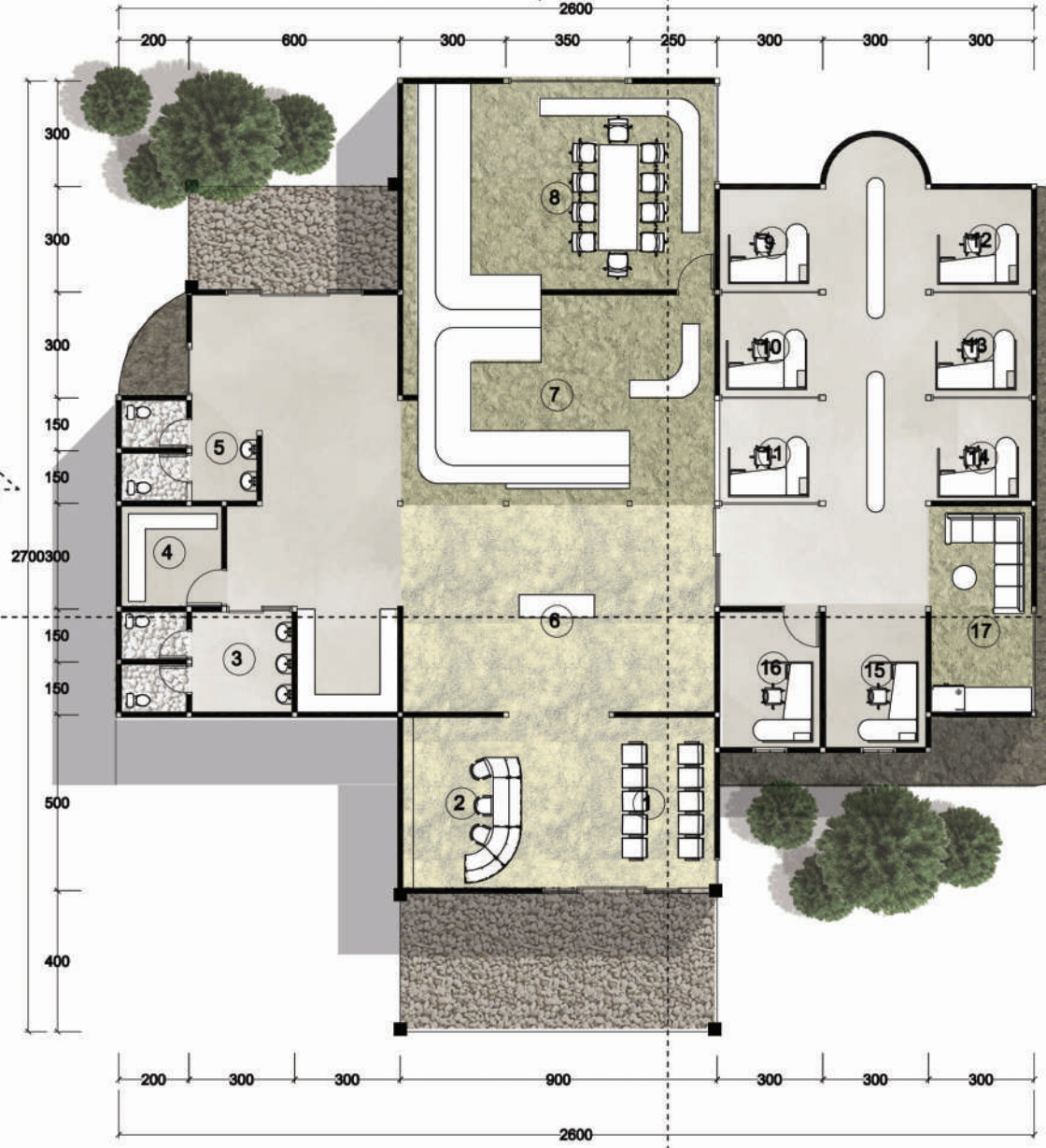
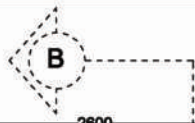
LECTURES GUIDE
PRIMA KURNIAWATY M. SI.
ALDRIN YUSUF FIRMANSAH M.T.

IMAGE TITLE
FLOOR PLAN

BUILDING NAME
CLINICAL NUTRITIONS
INSTALLATION

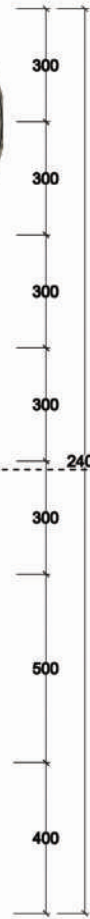
IMAGE SCALE
1 : 200

IMAGE NUMBER :
09

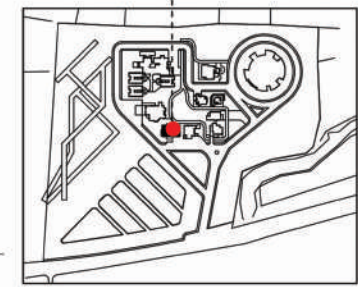


LEGENDA

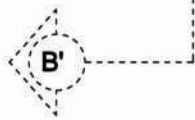
1. Waiting Lobby
2. Receptionist
3. Woman's Toilet
4. Service Room
5. Men's Toilet
6. Mini Managerial's Hall (Exhibition Space)
7. Lounge (VIP Waiting Room)
8. Meeting Room
9. Chief of Human Resource's Room
10. Chief of Nurse's Room
11. Chief of Commite's Room
12. Chief of Medical Service's Room
13. Chief of Financial's Room
14. Chief of Medical Support's Room
15. Chief of General Operasion's Room
16. Director's Room
17. Pantry



KEYPLAN

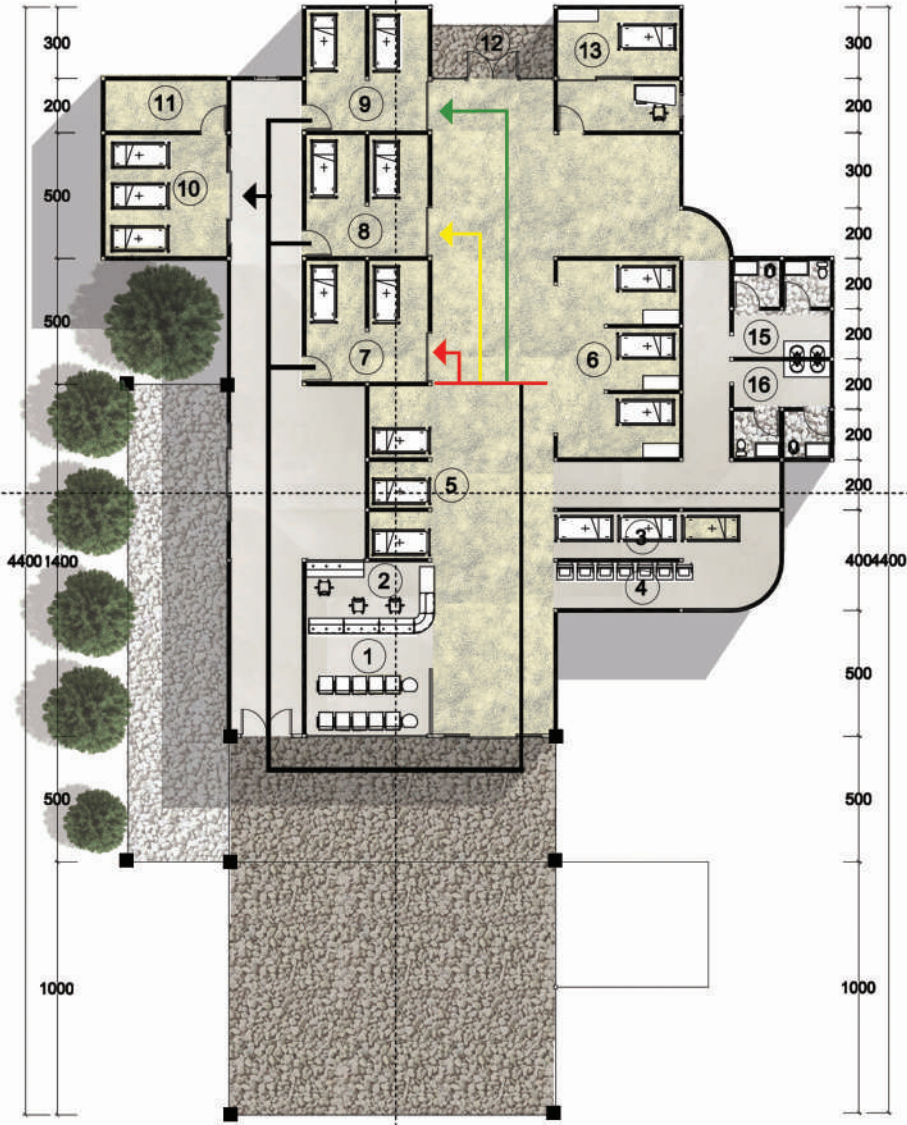


MANAGERIAL FLOORPLAN
SCALE 1 : 200









500 300 250 250 2800 500 500 200 100 100 100



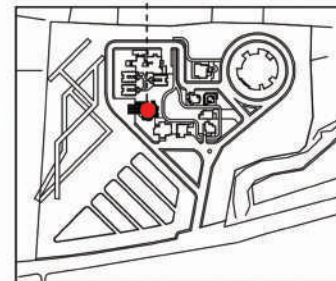
100 400 1300 500 400 100 2800

LEGENDA

- 1. Waiting Lobby
- 2. Receptionist
- 3. Gurney Parking Room
- 4. Trolley Parking Room
- 5. Triage Room
- 6. Non-Surgical Procedure Room
- 7. P1 Room
- 8. P2 Room
- 9. P3 Room
- 10. P0 Room
- 11. Storage For P0
- 12. Backdoor Exit
- 13. Decontamination and Sterilization Room
- 14. Woman's Toilet
- 15. Men's Toilet

-  Patient requires immediate treatment.
-  Patient is stable at the moment and is not in any immediate danger but will require observation.
-  Patient who will require medical treatment at some point, once more critical injuries have been treated.
-  For those who are already deceased.

KEYPLAN

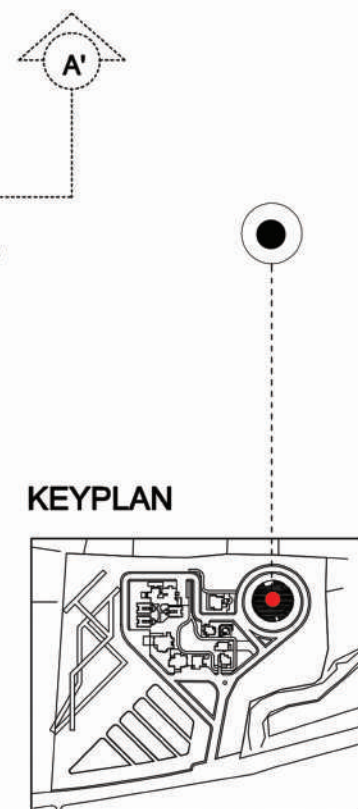
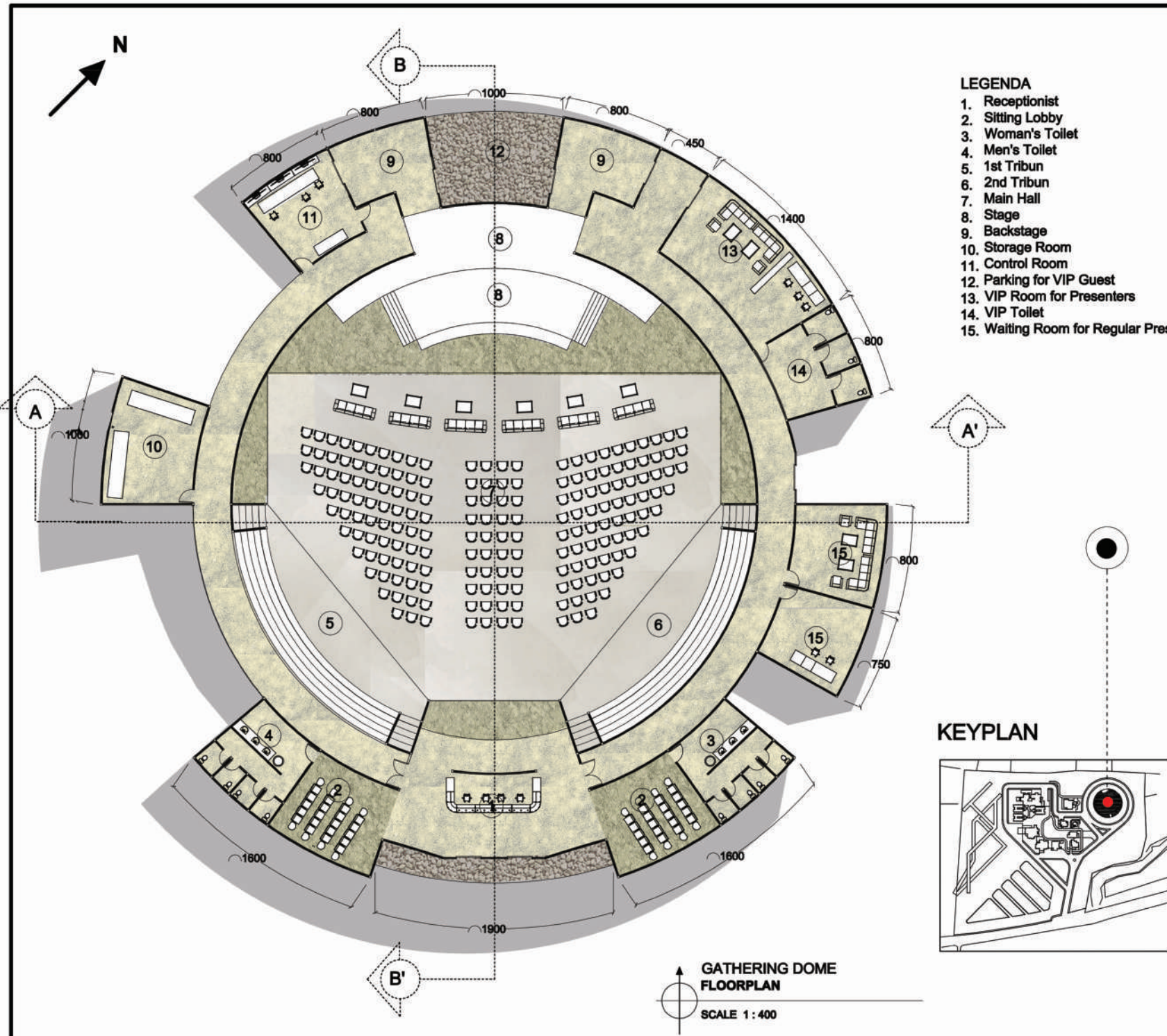


EMERGENCY UNIT FLOORPLAN

SCALE 1 : 300

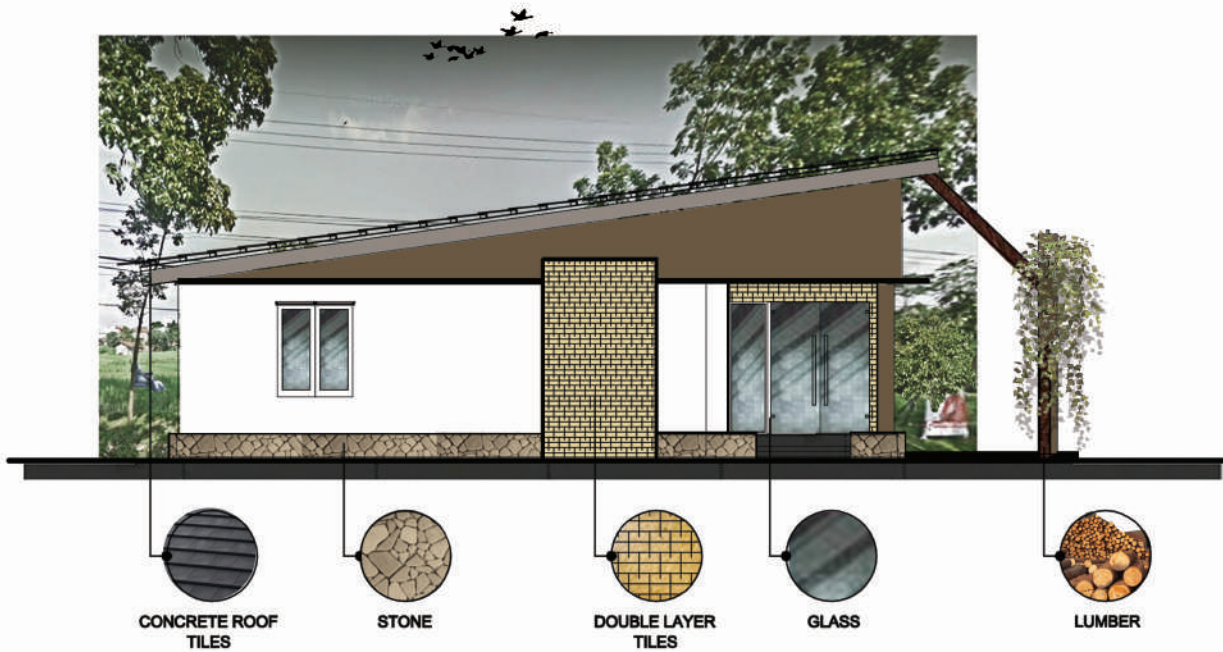
LEGENDA

1. Receptionist
2. Sitting Lobby
3. Woman's Toilet
4. Men's Toilet
5. 1st Tribun
6. 2nd Tribun
7. Main Hall
8. Stage
9. Backstage
10. Storage Room
11. Control Room
12. Parking for VIP Guest
13. VIP Room for Presenters
14. VIP Toilet
15. Waiting Room for Regular Presenters

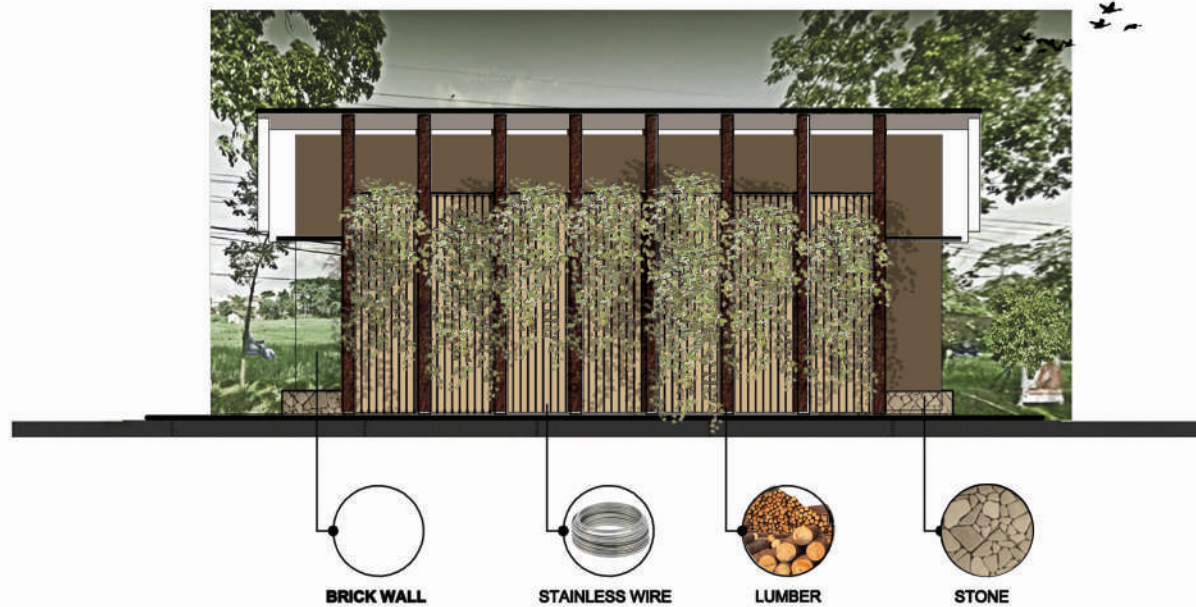


GATHERING DOME FLOORPLAN

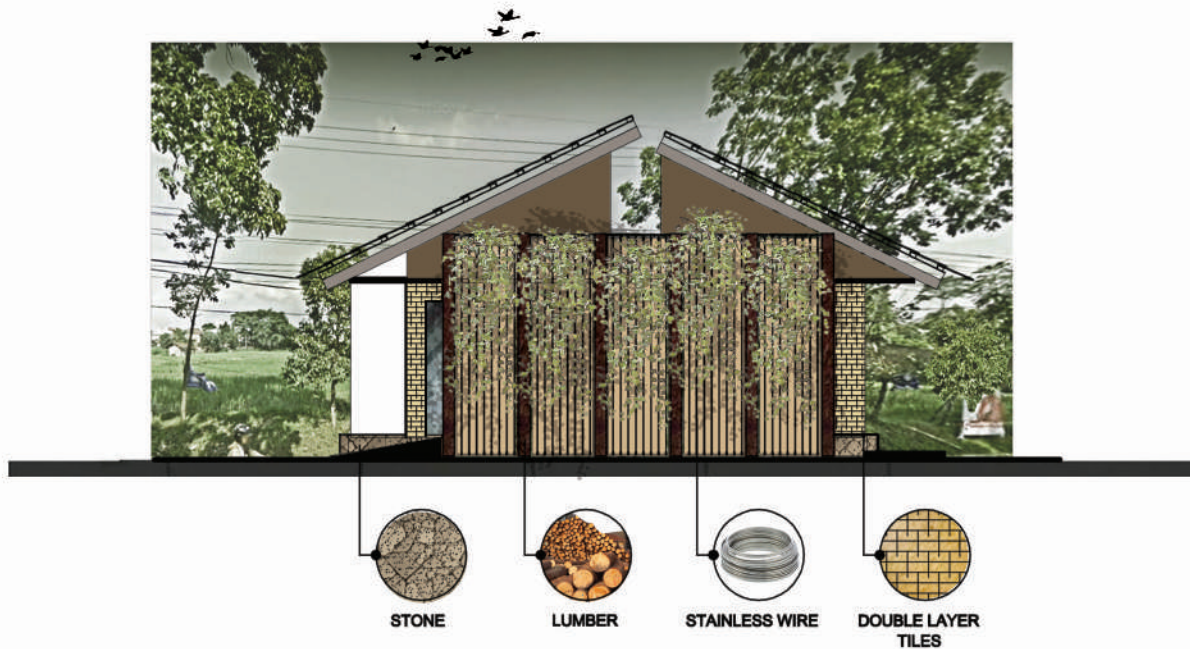
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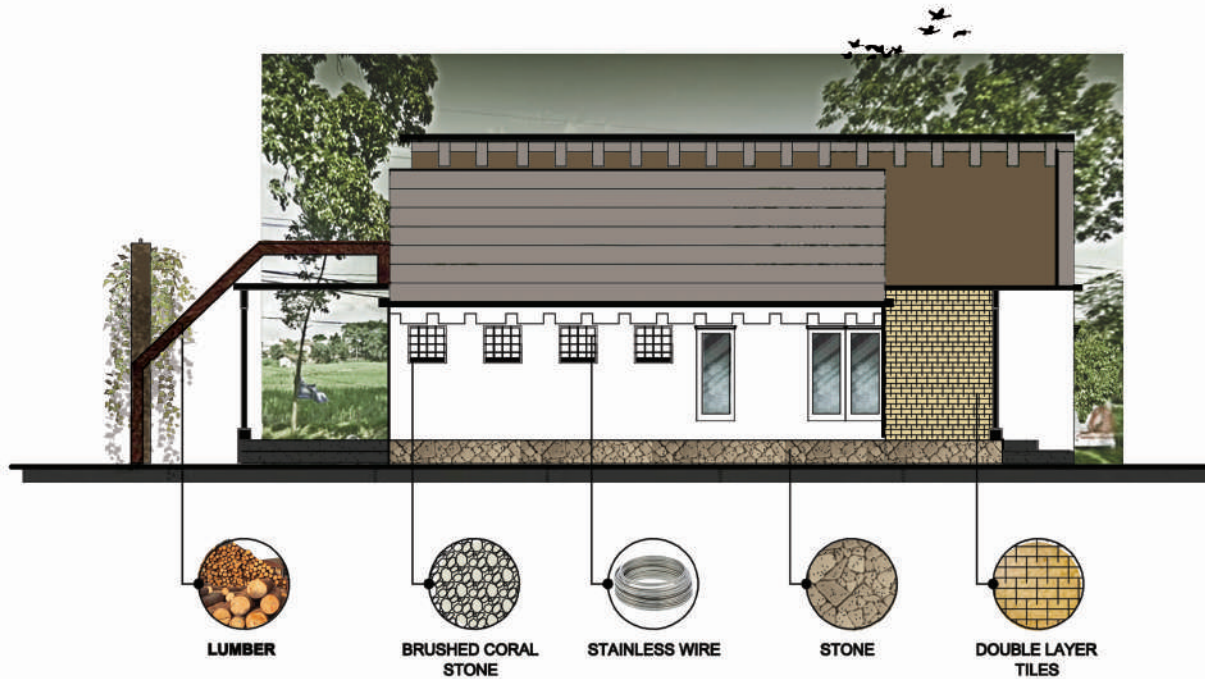
OUTPATIENT INSTALATION
SOUTH VIEW
SCALE 1 : 200



OUTPATIENT INSTALATION
EAST VIEW
SCALE 1 : 200



URINALIS AND BLOOD
LABORATORY INSTALATION
NORTH VIEW
SCALE 1 : 200



URINALIS AND BLOOD
LABORATORY INSTALATION
WEST VIEW
SCALE 1 : 200

PROJECT TITLE

DIABETES AND ENDOCRINOLOGY
HEALTHCARE CENTER DESIGN
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STUDENT NAME

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LECTURES GUIDE

PRIMA KURNIAWATY M. SI.
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IMAGE TITLE

VIEW

BUILDING NAME

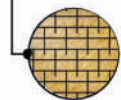
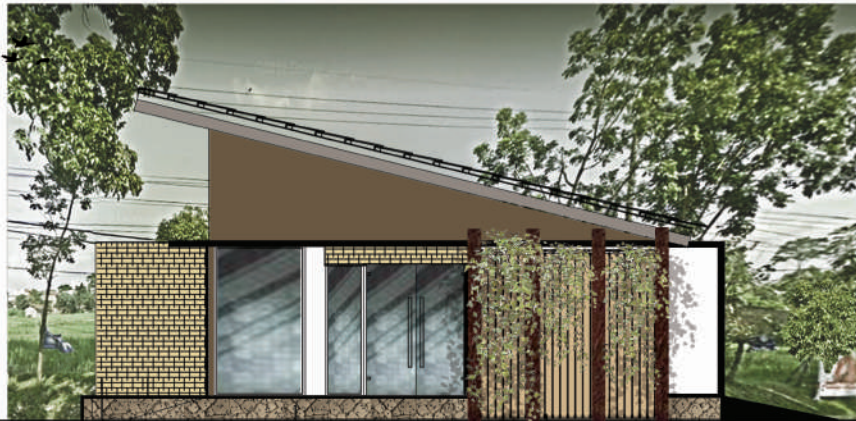
PUBLIC KITCHEN
INSTALATION

IMAGE SCALE

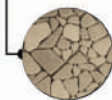
1 : 200

IMAGE NUMBER :

17



DOUBLE LAYER
TILES



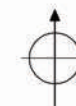
STONE



STAINLESS WIRE



LUMBER

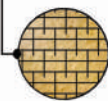


PUBLIC KITCHEN INSTALATION
SOUTH VIEW

SCALE 1 : 200



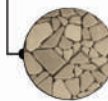
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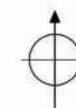
DOUBLE LAYER
TILES



GLASS



STONE

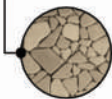


PUBLIC KITCHEN INSTALATION
WEST VIEW

SCALE 1 : 200



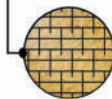
LUMBER



STONE



GLASS



DOUBLE LAYER TILES



PHARMACY INSTALATION EAST VIEW

SCALE 1 : 200



CONCRETE ROOF-TILE



STAINLESS WIRE



LUMBER



STONE



TEMPERED LAMINATE GLASS



PHARMACY INSTALATION SOUTH VIEW

SCALE 1 : 200



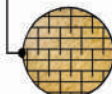
LUMBER



STONE



STONE



DOUBLE LAYER
TILES

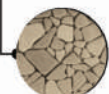


CLINICAL NUTRITION INSTALATION
EAST VIEW

SCALE 1 : 200



LUMBER



STONE

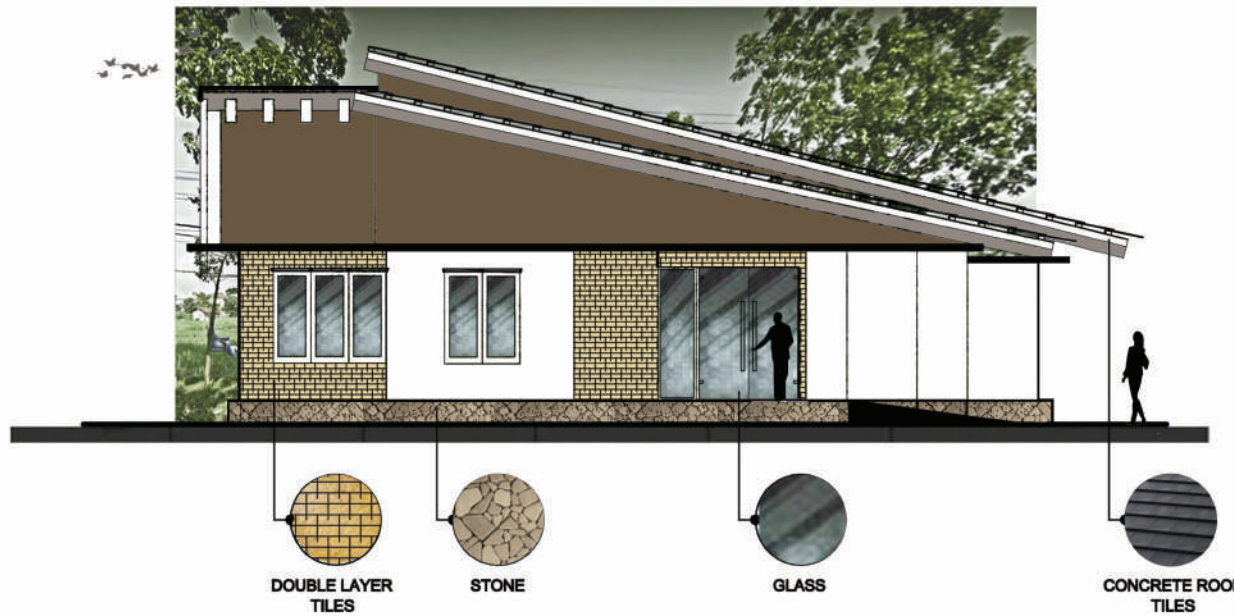


STAINLESS WIRE

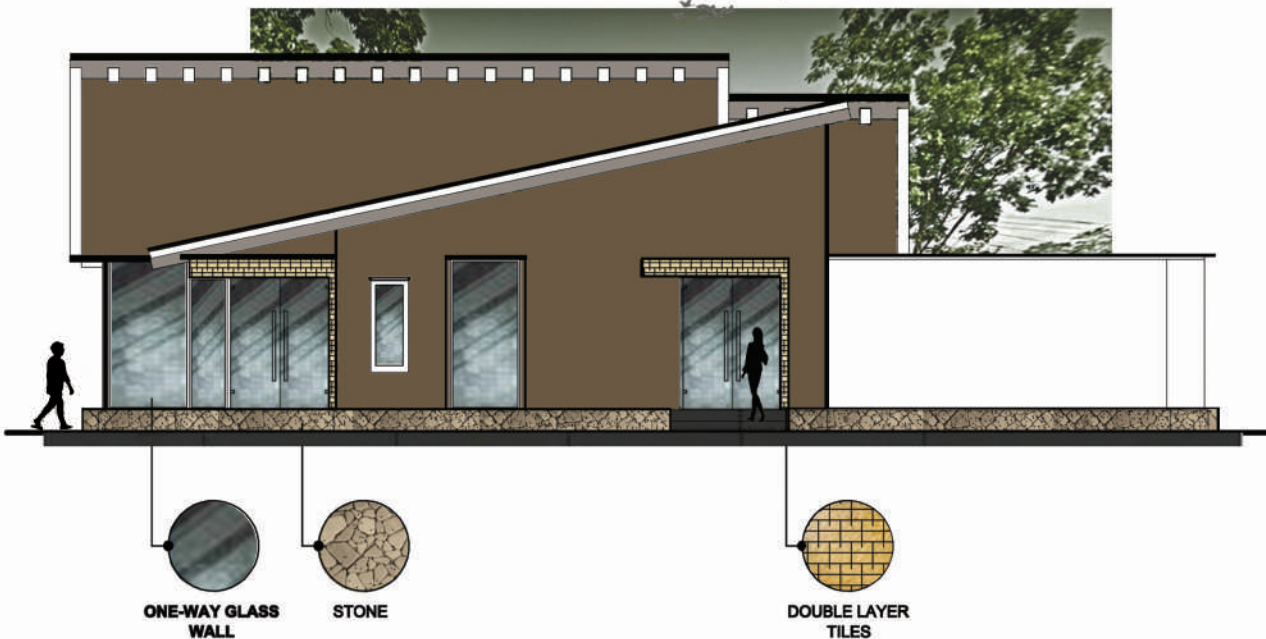


CLINICAL NUTRITION INSTALATION
SOUTH VIEW

SCALE 1 : 200



REHABILITATION INSTALATION
NORTH VIEW
SCALE 1 : 200



REHABILITATION INSTALATION
EAST VIEW
SCALE 1 : 200

PROJECT TITLE

DIABETES AND ENDOCRINOLOGY
HEALTHCARE CENTER DESIGN
IN MALANG CITY

STUDENT NAME

QURROTA AYUN

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LECTURES GUIDE

PRIMA KURNIAWATY M. SI.
ALDRIN YUSUF FIRMANSYAH M.T.

IMAGE TITLE

VIEW

BUILDING NAME

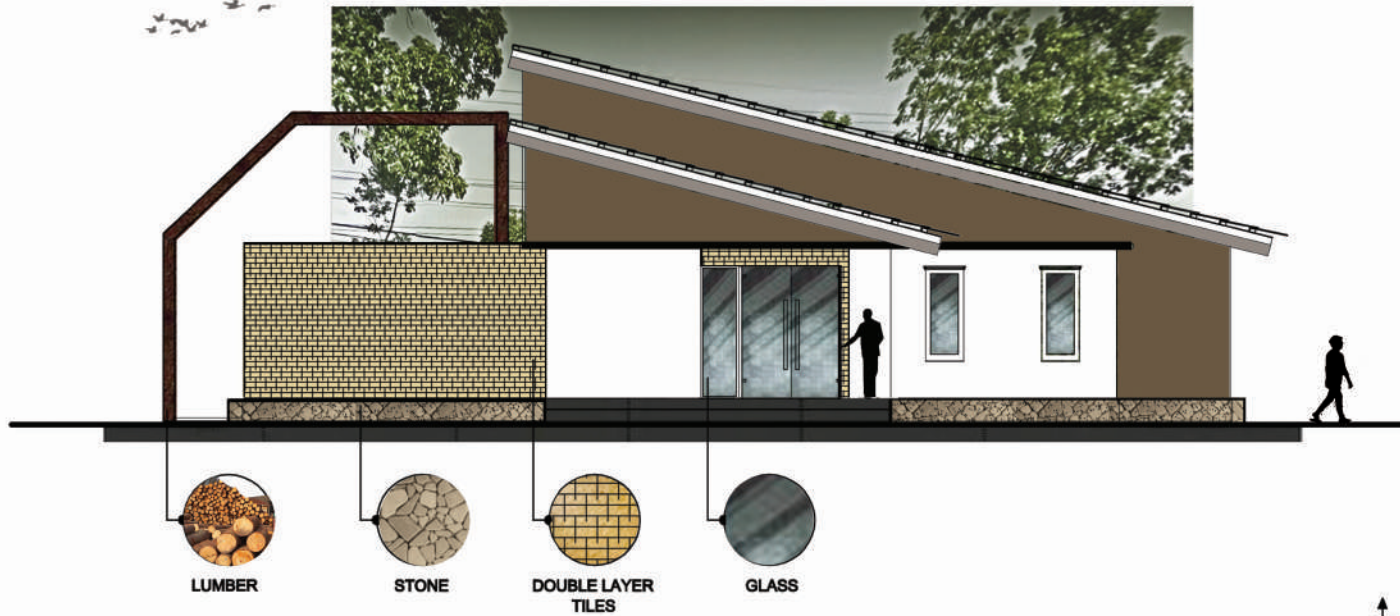
MANAGERIAL
OFFICE

IMAGE SCALE

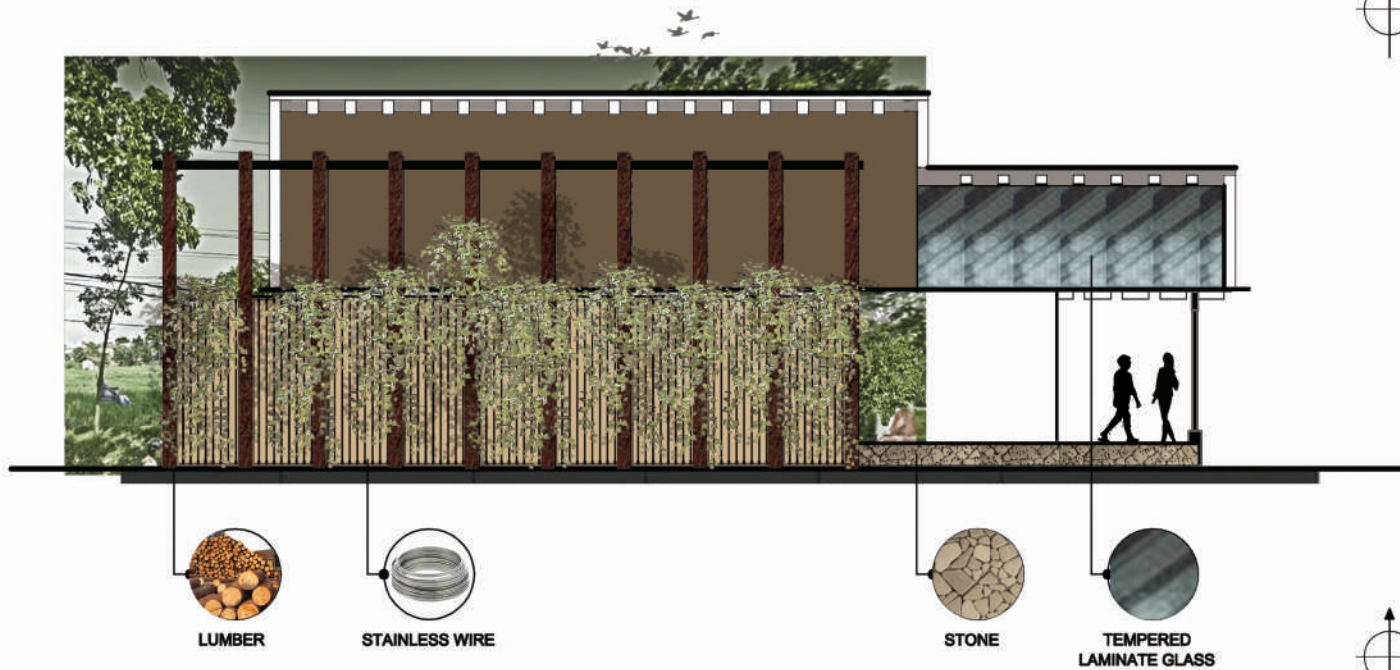
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IMAGE NUMBER :

21



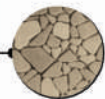
MANAGERIAL OFFICE
EAST VIEW
SCALE 1 : 200



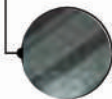
MANAGERIAL OFFICE
SOUTH VIEW
SCALE 1 : 200



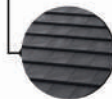
LUMBER



STONE



GLASS



CONCRETE ROOF-TILE



TEMPERED LAMINATE GLASS



EMERGENCY UNIT SOUTH VIEW

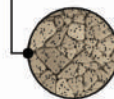
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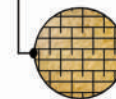
LUMBER



STAINLESS WIRE



STONE

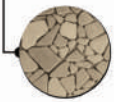
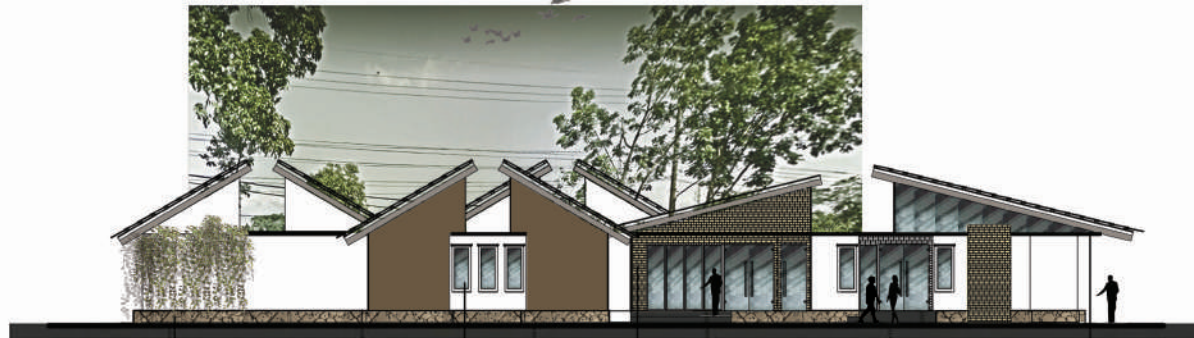


DOUBLE LAYER TILES



EMERGENCY UNIT EAST VIEW

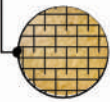
SCALE 1 : 200



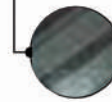
STONE



GLASS



DOUBLE LAYER
TILES

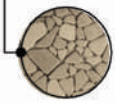


TEMPERED
LAMINATE GLASS

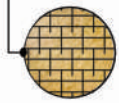


INPATIENT INSTALATION
EAST VIEW

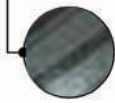
SCALE 1:400



STONE



DOUBLE LAYER
TILES



GLASS



CONCRETE ROOF
TILE



INPATIENT INSTALATION
NORTH VIEW

SCALE 1:400



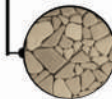
LUMBER



GLASS



STAINLESS WIRE

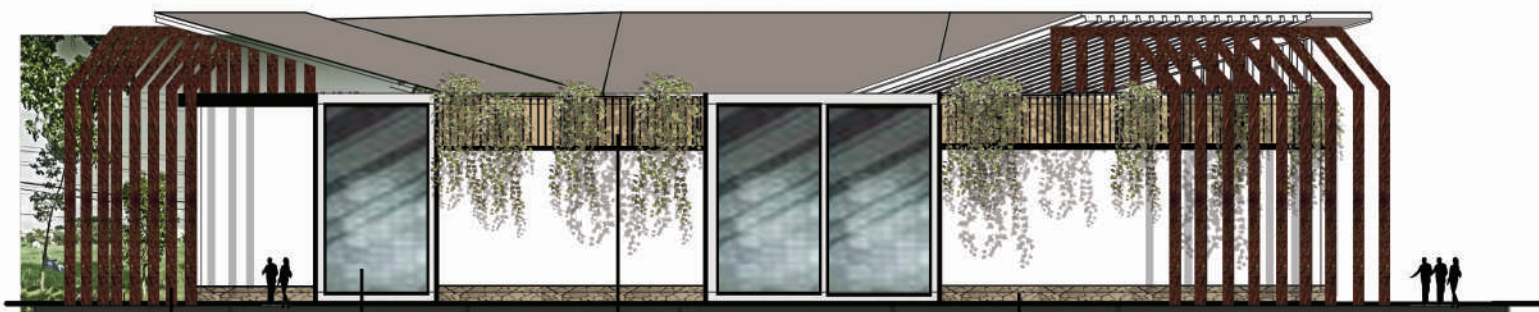


STONE

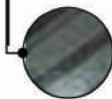


GATHERING DOME
EAST VIEW

SCALE 1 : 400



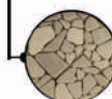
LUMBER



GLASS



STAINLESS WIRE



STONE



GATHERING DOME
NORTH VIEW

SCALE 1 : 400



↑
OUTPATIENT INSTALATION
A - A' SECTION
SCALE 1 : 200



↑
OUTPATIENT INSTALATION
B - B' SECTION
SCALE 1 : 200



+800
+400
0,00

URINALIS AND BLOOD
LABORATORY INSTALATION
A - A' SECTION
SCALE 1 : 200



+800
+400
0,00

URINALIS AND BLOOD
LABORATORY INSTALATION
B - B' SECTION
SCALE 1 : 200



+800
+400
0,00

PUBLIC KITCHEN INSTALATION
A - A' SECTION
SCALE 1 : 200



+800
+400
0,00

PUBLIC KITCHEN INSTALATION
B - B' SECTION
SCALE 1 : 200



PHARMACY INSTALATION
A - A' SECTION
SCALE 1 : 200



PHARMACY INSTALATION
B - B' SECTION
SCALE 1 : 200



+700
+400
0,00

CLINICAL NUTRITION
INSTALATION
A - A' SECTION

SCALE 1 : 200




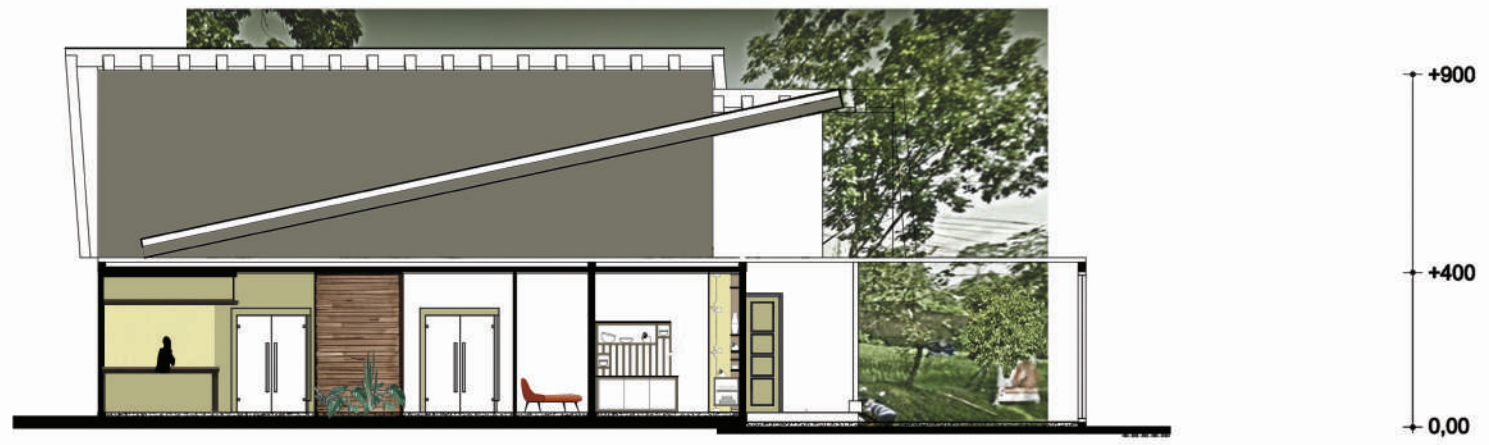
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CLINICAL NUTRITION
INSTALATION
B - B' SECTION

SCALE 1 : 200



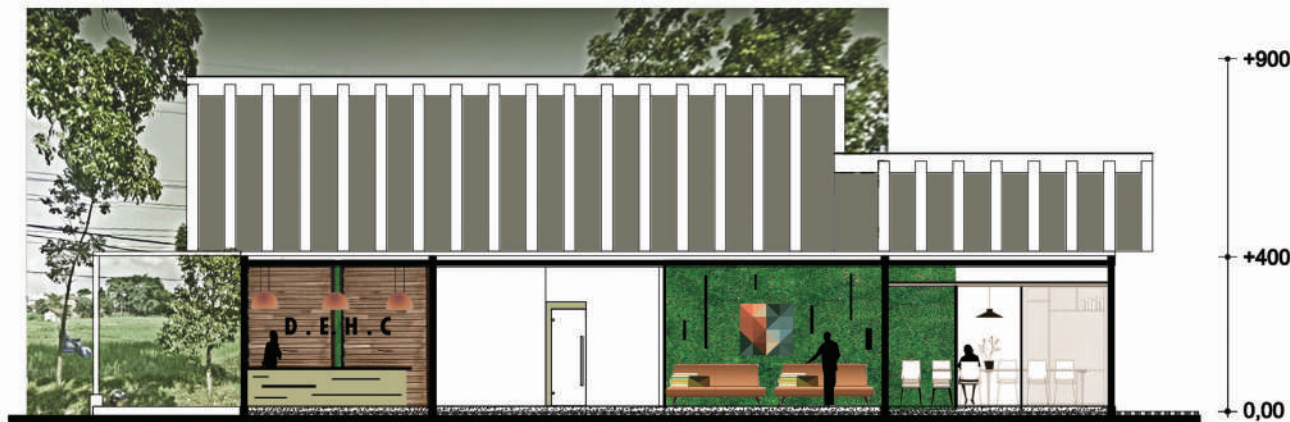

**REHABILITATION INSTALATION
A - A' SECTION**
 SCALE 1 : 200




**REHABILITATION INSTALATION
B - B' SECTION**
 SCALE 1 : 200



MANAGERIAL
A - A' SECTION
SCALE 1 : 200



MANAGERIAL
B - B' SECTION
SCALE 1 : 200



EMERGENCY UNIT
A - A' SECTION
SCALE 1 : 200



EMERGENCY UNIT
B - B' SECTION
SCALE 1 : 200

PROJECT TITLE

DIABETES AND ENDOCRINOLOGY
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ALDRIN YUSUF FIRMANSYAH M.T.

IMAGE TITLE

A-A' SECTION
B-B' SECTION

BUILDING NAME

INPATIENTS
INSTALATION

IMAGE SCALE

1 : 400

IMAGE NUMBER :

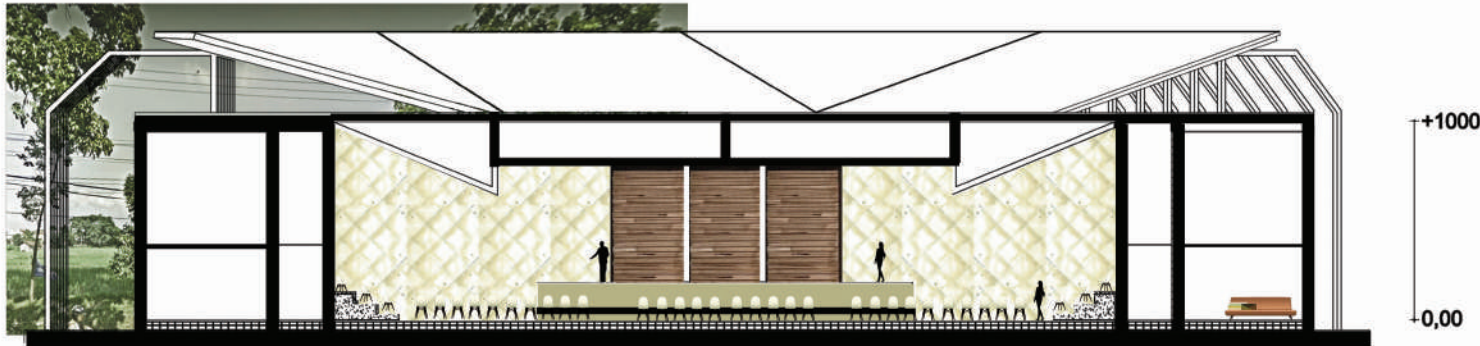
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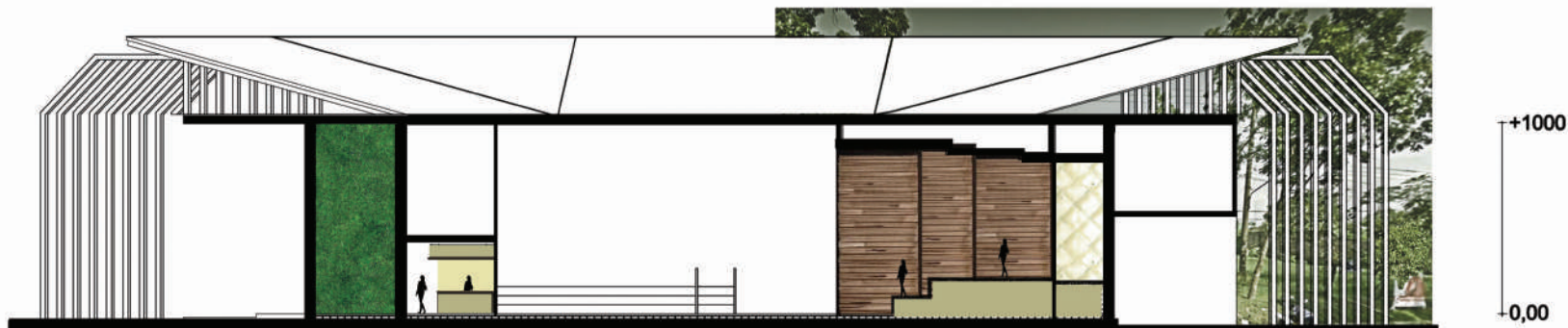
INPATIENT INSTALATION
A - A' SECTION
SCALE 1 : 400



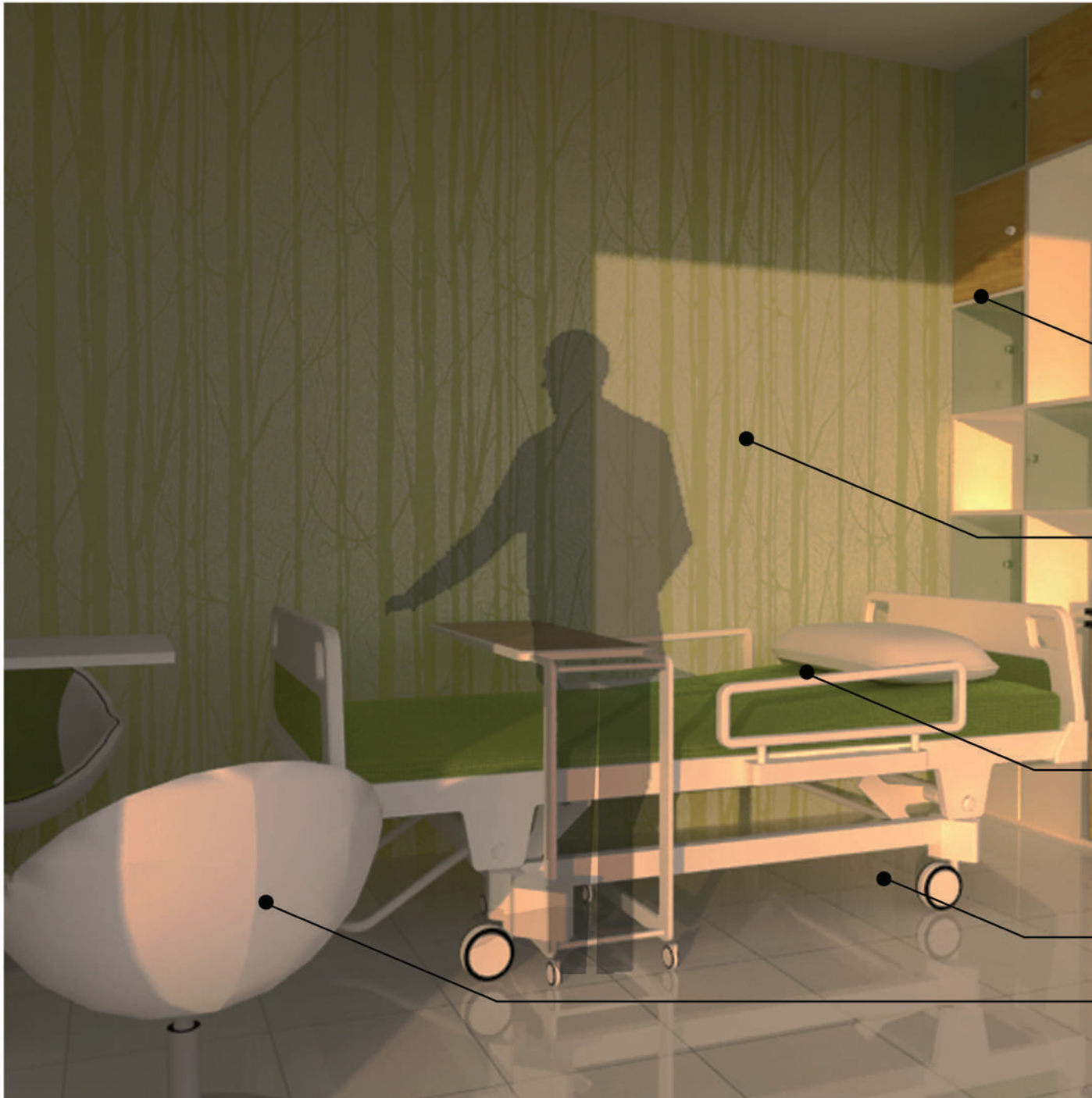
INPATIENT INSTALATION
B - B' SECTION
SCALE 1 : 400



GATHERING DOME
A - A' SECTION
SCALE 1 : 400



GATHERING DOME
B - B' SECTION
SCALE 1 : 400



Storage Cupboard
(Finishing wood patterned HPL
and white plain HPL)



Wall
(Finishing wood patterned
Antiseptic wallpaper)



Patient's Bed

Floor
(50 cm x 50 cm plain Antiseptic
Hospital Tile)

Doctor's Chair



Wall
(Finishing Nippon Paint white
wall paint Elastex Waterproff)

Wall
(Finishing 50 cm x 50 cm Tile)



Wall
(Finishing 50 cm x 50 cm Marmer
Patterned Tile)



Toilet

Floor
(Finishing 50 cm x 50 cm
Antislip Tile)





Upper Receptionist
(Finishing Marmer Patterned Light Grey HPL)



Wall
(Finishing Nippon Paint Light Grey wall paint)

Name Tag
(Finishing 50 cm x 50 cm Marmer Patterned Tile)



Front Chair
(Finishing wood patterned HPL)



Floor
(50 cm x 50 cm plain Antiseptic Hospital Tile)



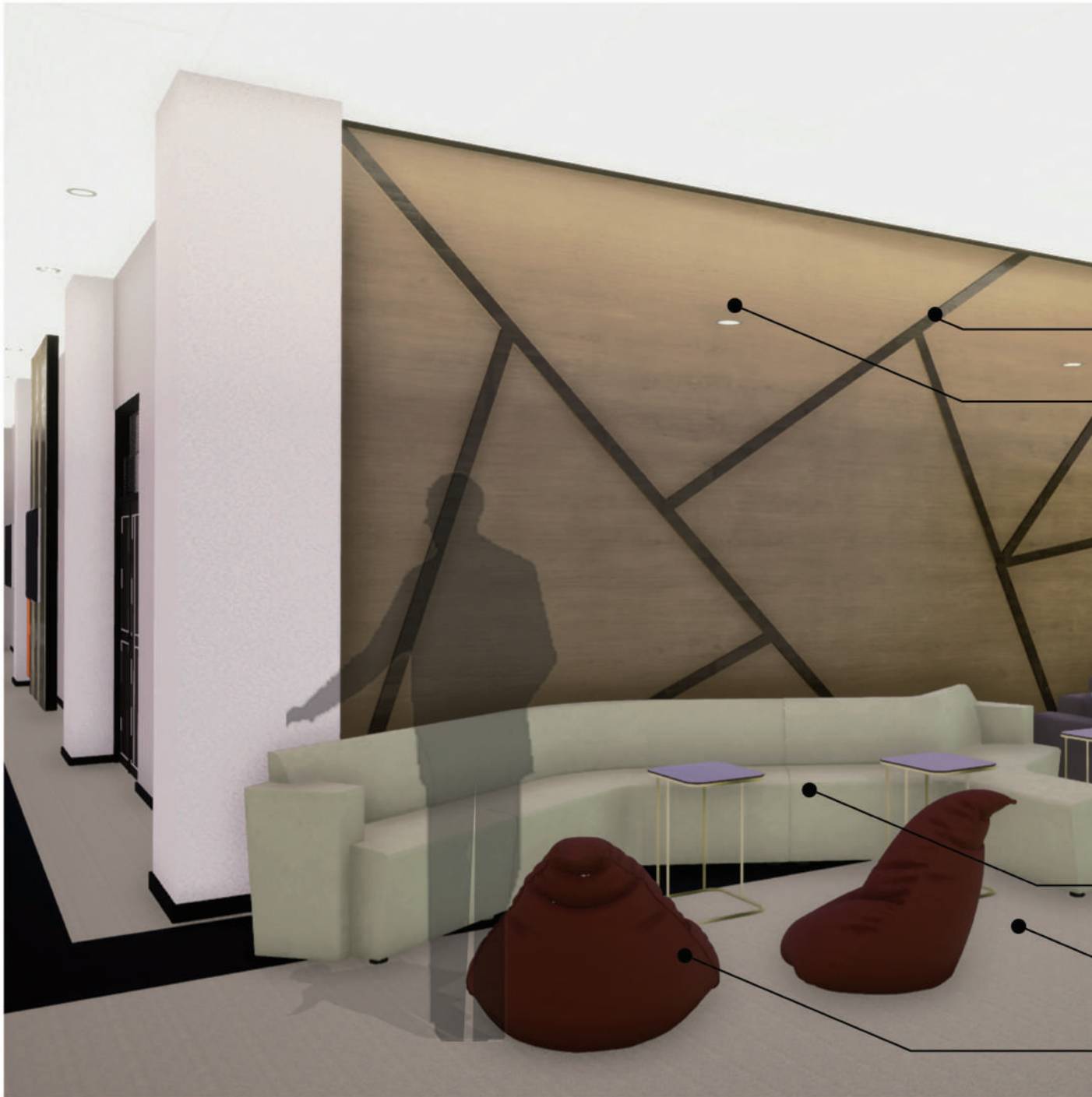
Wall
(Finishing plain Antiseptic wallpaper)

Curtain
(Antiseptic plastic hospital curtain)

Inpatients Backdrop
(Finishing plain Dark Brown HPL)

Patient's Bed

Floor
(Antiseptic Hospital Vynil Wood Patterned)



Lounge Backdrop
(Finishing plain Dark Brown HPL)

Lounge Backdrop
(Finishing plain Light Brown HPL)

Sofa

Floor
(Anti-bactory plain hospital vynil)

Couch



Concrete Roof
(Moenir Flat type in Dark Grey)

Laminated Glass
(10 mm Asahi Translucent Laminated Glass)

Gypsum Ceiling
(Saint Gobain Gyproc Plain Gypsum Board 12.5 mm)

Sunblast Door Glass
(White Figured Glass)

Stainless Low-cut Fence
(Anti-bactory laminated coat)

Outdoor Couch
(Wood and Outdoor Fabric Material)

**Outdoor Parquet
Anti-bactory Floor**
(Wood Pattern Grasswood 10,2 cm x 90 cm x 12 cm)



Concrete Roof
(*Moerir Flat* type in Dark Grey)

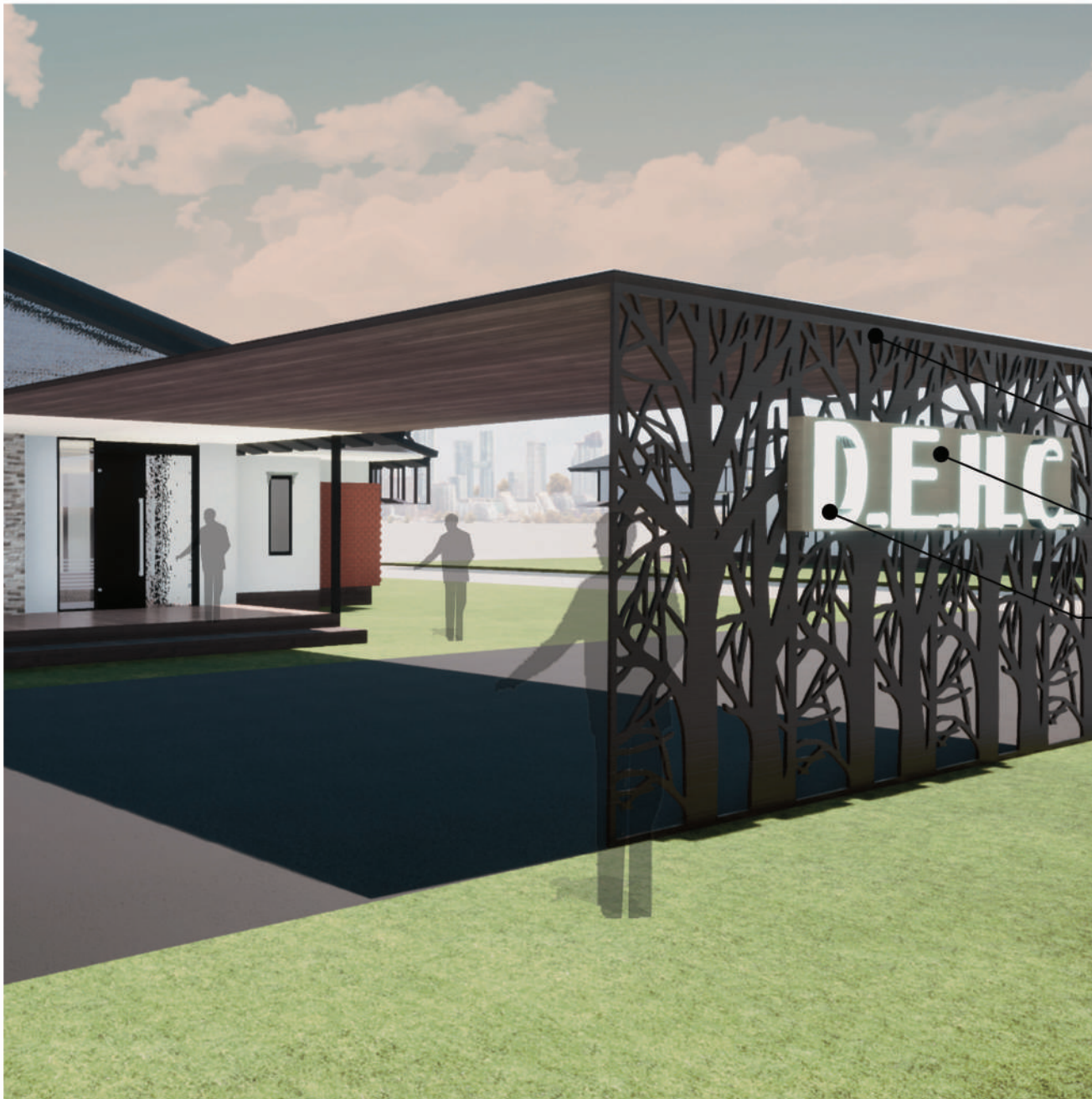
Laminated Glass
(10 mm Asahi Translucent Laminated Glass)

Teak Lumber (Kayu Jati)
(Shaped into rectangle column Fin-ishing Outdoor PU Acrilic)

Sunblast Door Glass
(White Figured Glass)

**Outdoor Parquet
Anti-bactory Floor**
(Wood Pattern Grasswood 10,2 cm x 90 cm x 12 cm)

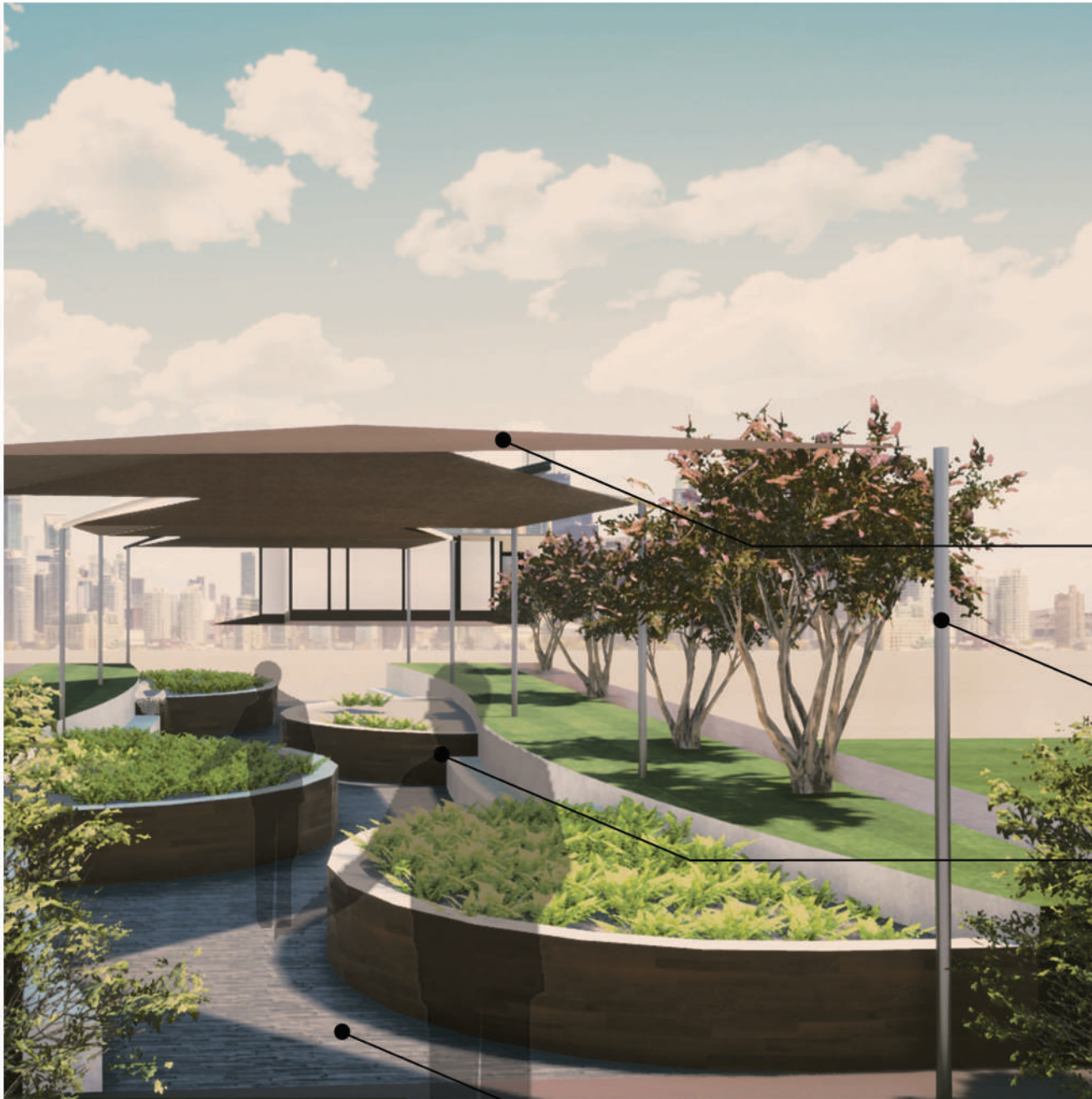
Concrete Structure



Playwood
 (9 mm Coated with Waterproff
 Bworn Paint)

Multiplex
 (9 mm Finished with Wood
 Patterned HPL coated Whit
 Waterproff)

Neon 3D Words
 (Acrylic with Warm White
 Lamp Inside)

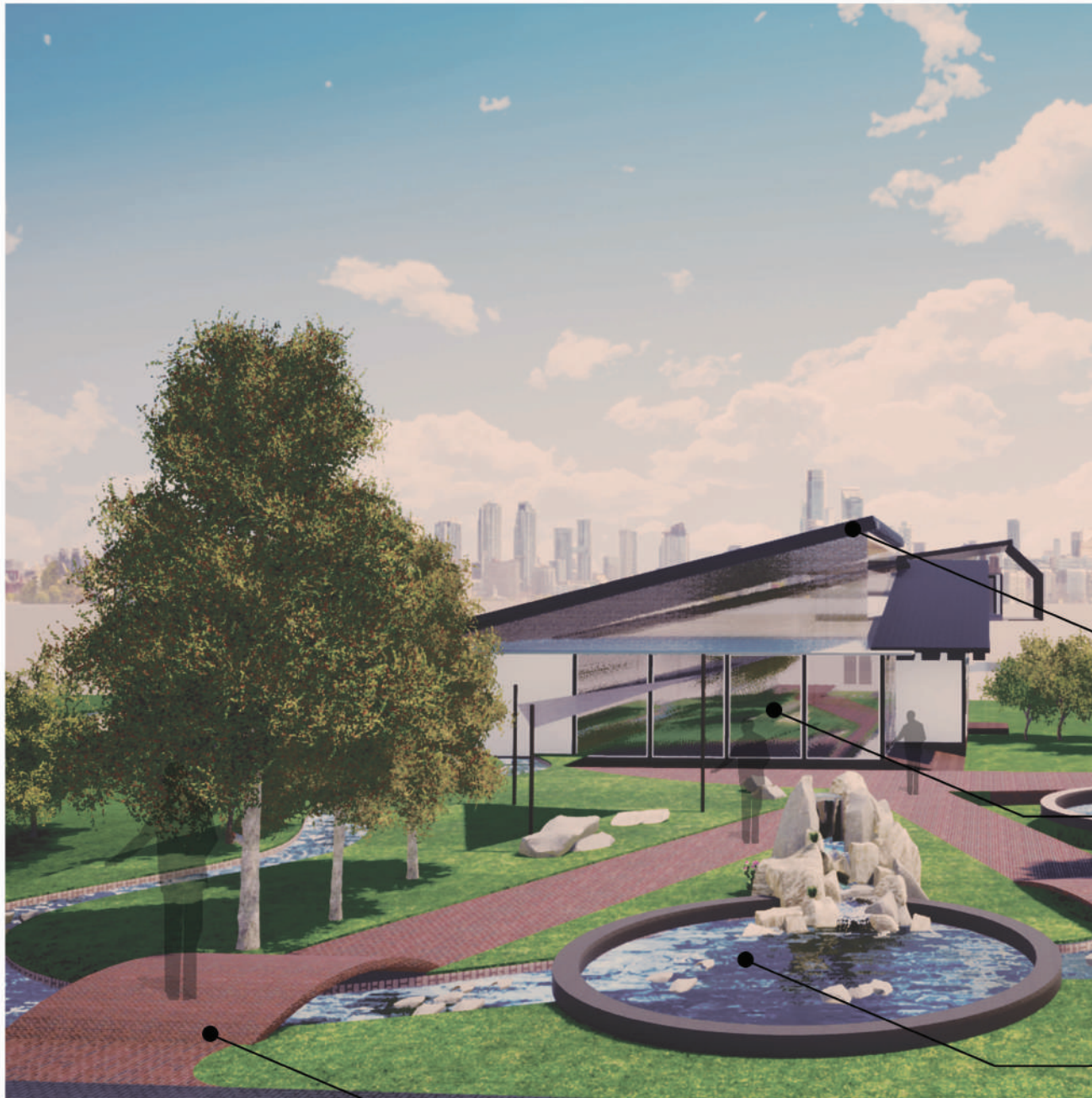


Tarp Tent
(1 mm Canvas Material in Brown Shade)

Tend Column
(5 cm Diameter in size, Stainless Steel Material)

Outdoor Parquet
(Wood Pattern Grasswood 10,2 cm x 90 cm x 12 cm)

Stone Footpath
(Stone)



Concrete Roof
(Moenir Flat type in Dark Grey)

Laminated Reflected Glass
(5 mm Asahi Translucent Laminated Glass)

Pond

Brick Stone
(Red colour)

PROJECT TITLE

DIABETES AND ENDOCRINOLOGY
HEALTHCARE CENTER DESIGN
IN MALANG CITY

STUDENT NAME

QURROTA AYUN

STUDENT NUMBER

16660113

LECTURES GUIDE

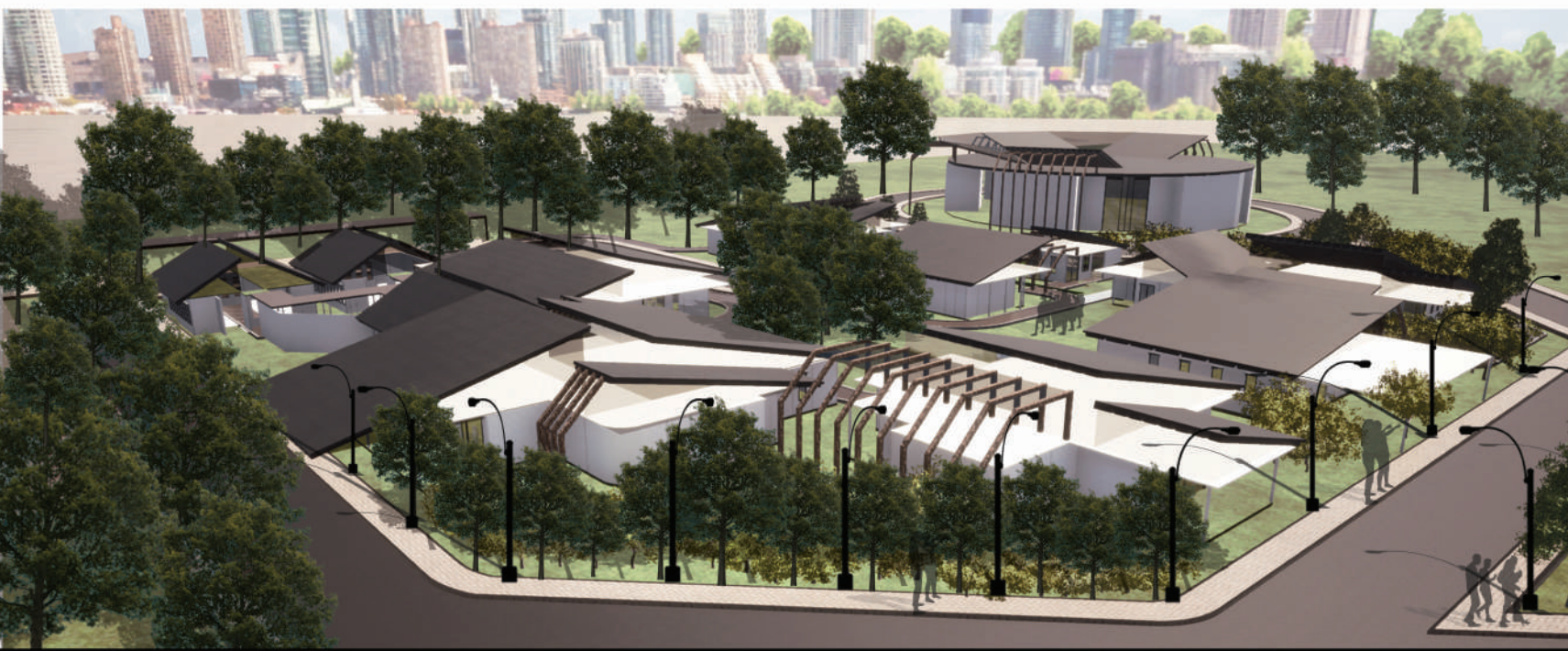
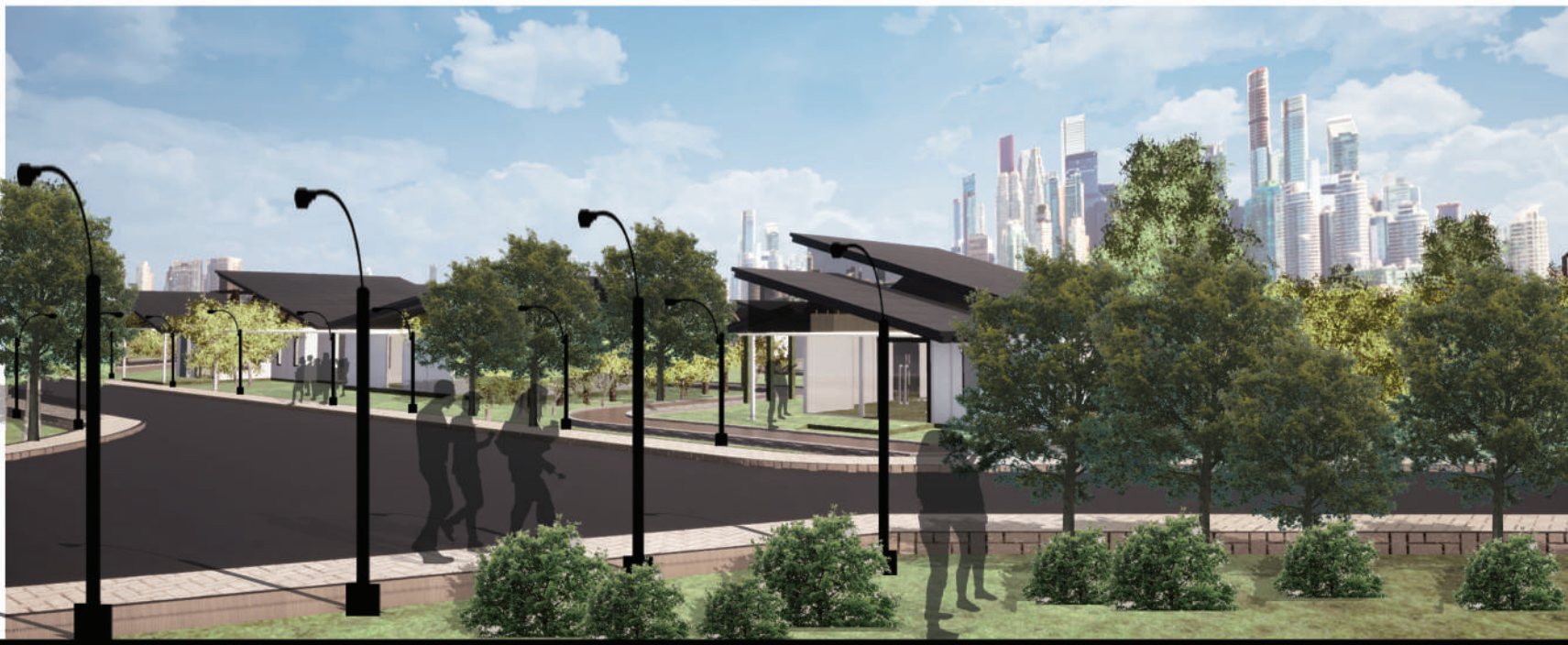
PRIMA KURNIAWATY M. SI.
ALDRIN YUSUF FIRMANSYAH M.T.

IMAGE TITLE

SITE PERSPECTIVE

IMAGE NUMBER :

45





PROJECT TITLE

DIABETES AND ENDOCRINOLOGY
HEALTHCARE CENTER DESIGN
IN MALANG CITY

STUDENT NAME

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16660113

LECTURES GUIDE

PRIMA KURNIAWATY M. SI.
ALDRIN YUSUF FIRMANSYAH M.T.

IMAGE TITLE

SITE PERSPECTIVE

IMAGE NUMBER :







46

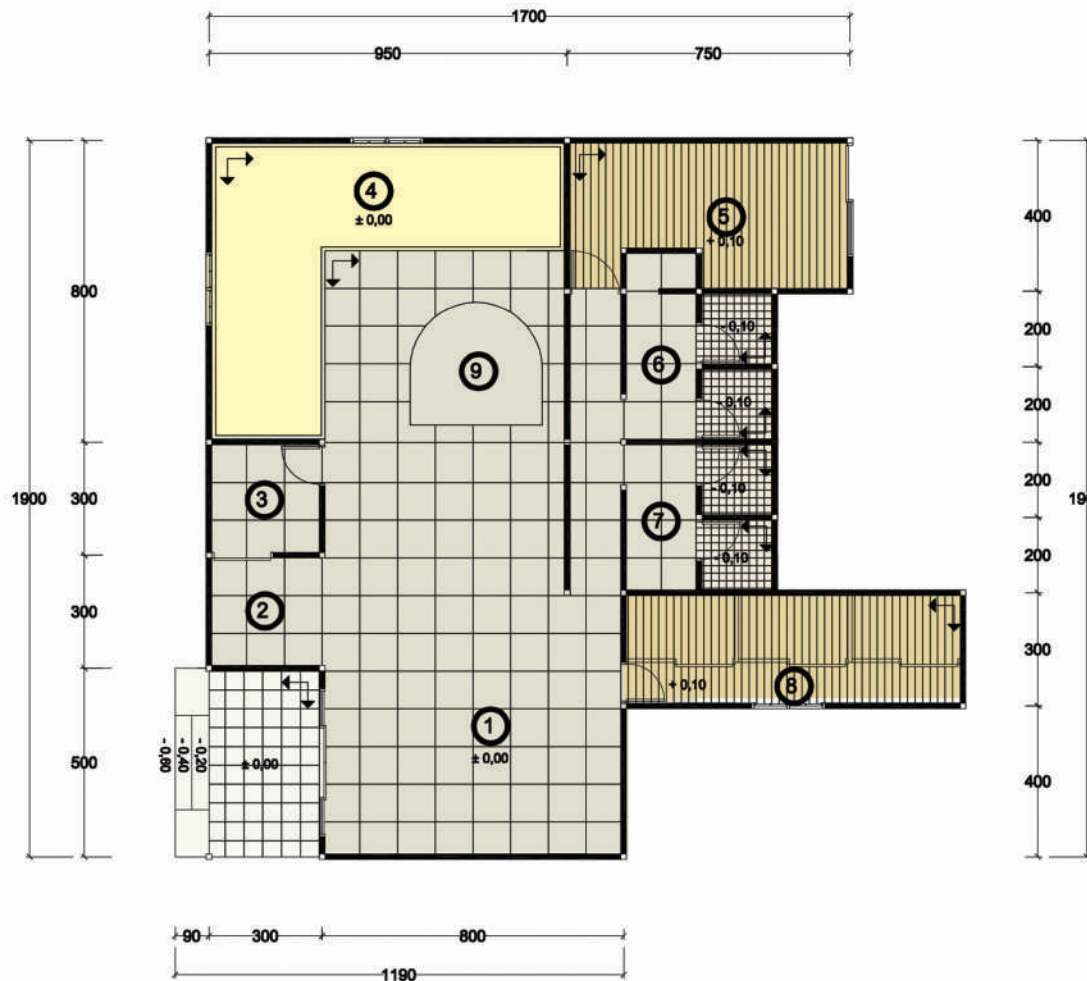


LEGENDA

1. Waiting Lobby
2. Receptionist
3. Medical Record Room
4. Action Room
5. Employee's Restroom
6. Woman's Toilet
7. Men's Toilet
8. Lactation/ Nursery Room
9. Indoor Garden

LEGENDA

-  Textured Tile 20 cm x 20 cm
-  Antibactory Wooden Motif Hospital Vinyl
-  Non-Slippery Plain Motif Tile 50 cm x 50 cm
-  Non-Slippery Plain Motif Tile 100 cm x 100 cm
-  Anyrbactory Plain Motif Hospital Vinyl
-  Start Point









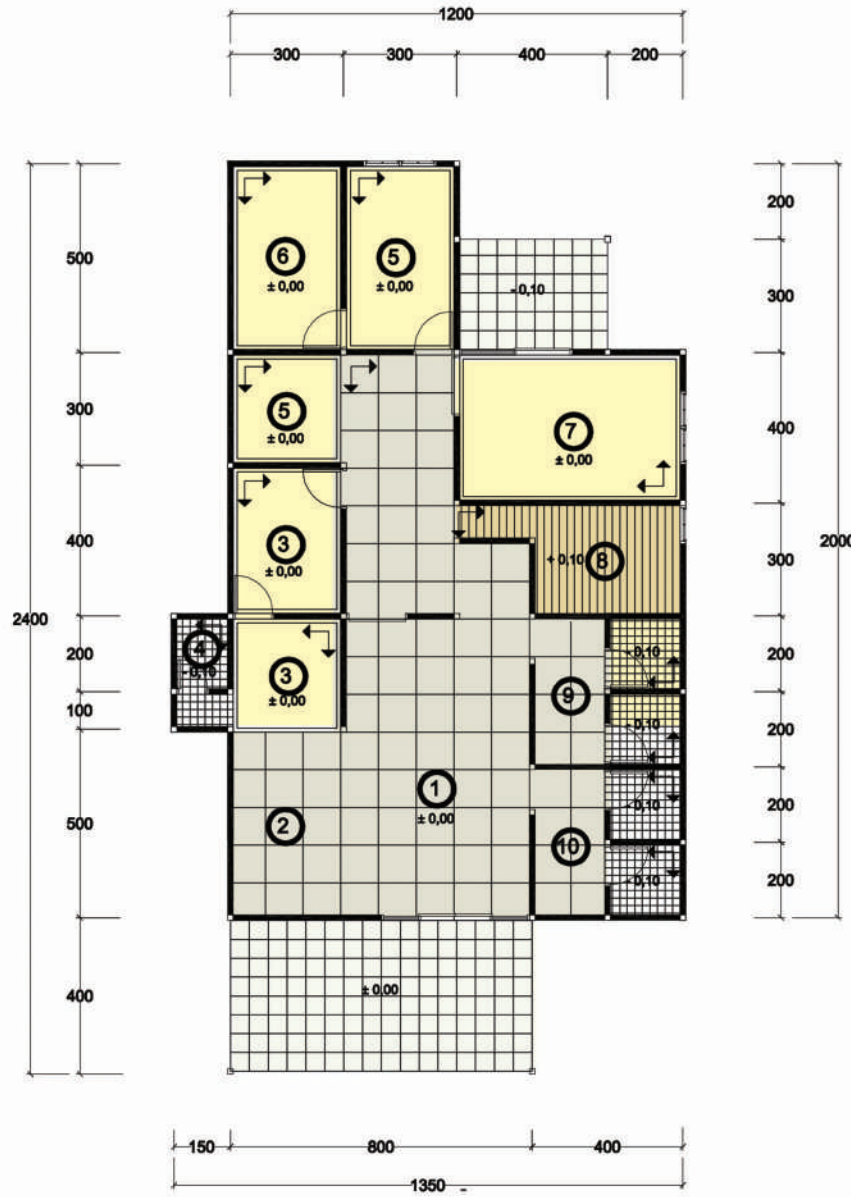
OUTPATIENT INSTALATION
FLOOR-TILE DETAIL
SCALE 1 : 200

LEGENDA

1. Waiting Lobby
2. Receptionist
3. Urinalis
4. Toilet
5. Blood Checking
6. Blood Bank
7. Biomaterial Keeping Room
8. Pantry and Restroom
9. Woman's Toilet
10. Men's Toilet

LEGENDA

-  Textured Tile 20 cm x 20 cm
-  Antibactory Wooden Motif Hospital Vinyl
-  Non-Slippery Plain Motif Tile 50 cm x 50 cm
-  Non-Slippery Plain Motif Tile 100 cm x 100 cm
-  Antibactory Plain Motif Hospital Vinyl
-  Start Point


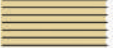






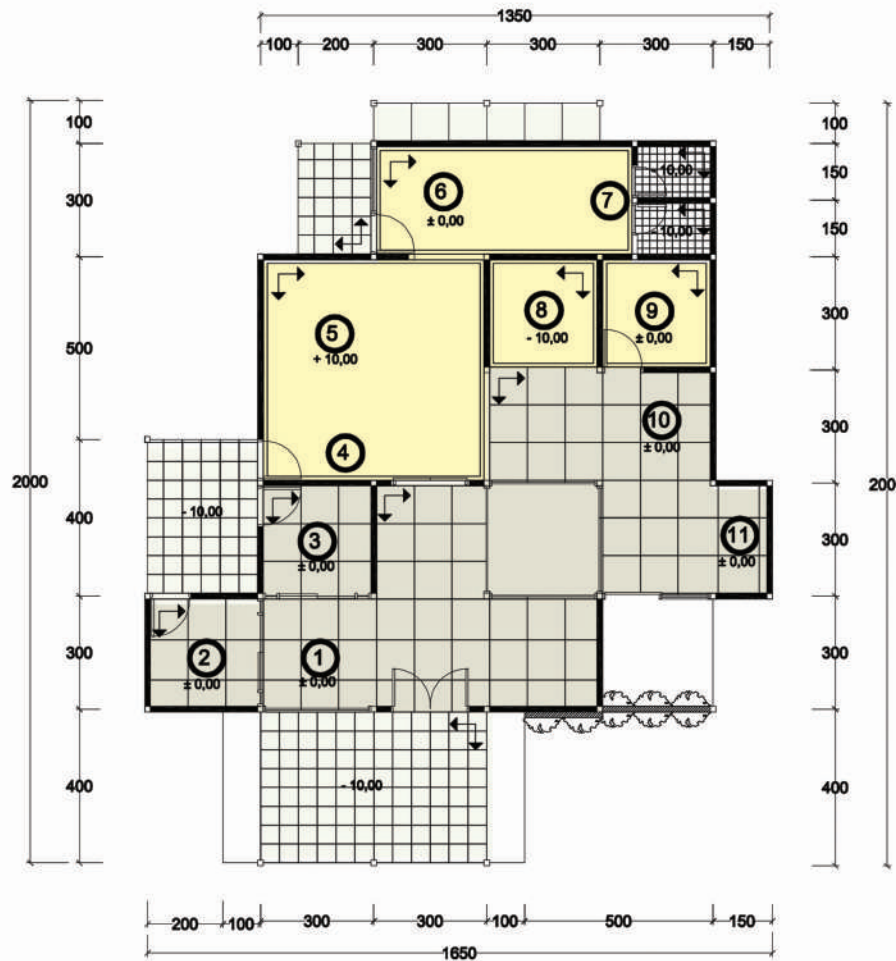
URINALIS AND BLOOD LABORATORY INSTALATION FLOOR-TILE DETAIL
SCALE 1 : 200

LEGENDA

1. Food Receiving and Weighing Room
2. Wet Food Storage
3. Dry Food Storage
4. Ingredient Cleaning Spot
5. Food Processing Room
6. Rest Room
7. Public Toilet
8. Equipment Washing Room
9. Equipment Storage Room
10. Trolley Room
11. Food Presentation and Distribution Room

LEGENDA

-  Textured Tile 20 cm x 20 cm
-  Antibactory Wooden Motif Hospital Vinyl
-  Non-Slippery Plain Motif Tile 50 cm x 50 cm
-  Non-Slippery Plain Motif Tile 100 cm x 100 cm
-  Anrybactory Plain Motif Hospital Vinyl
-  Start Point









PUBLIC KITCHEN INSTALATION
FLOOR-TILE DETAIL

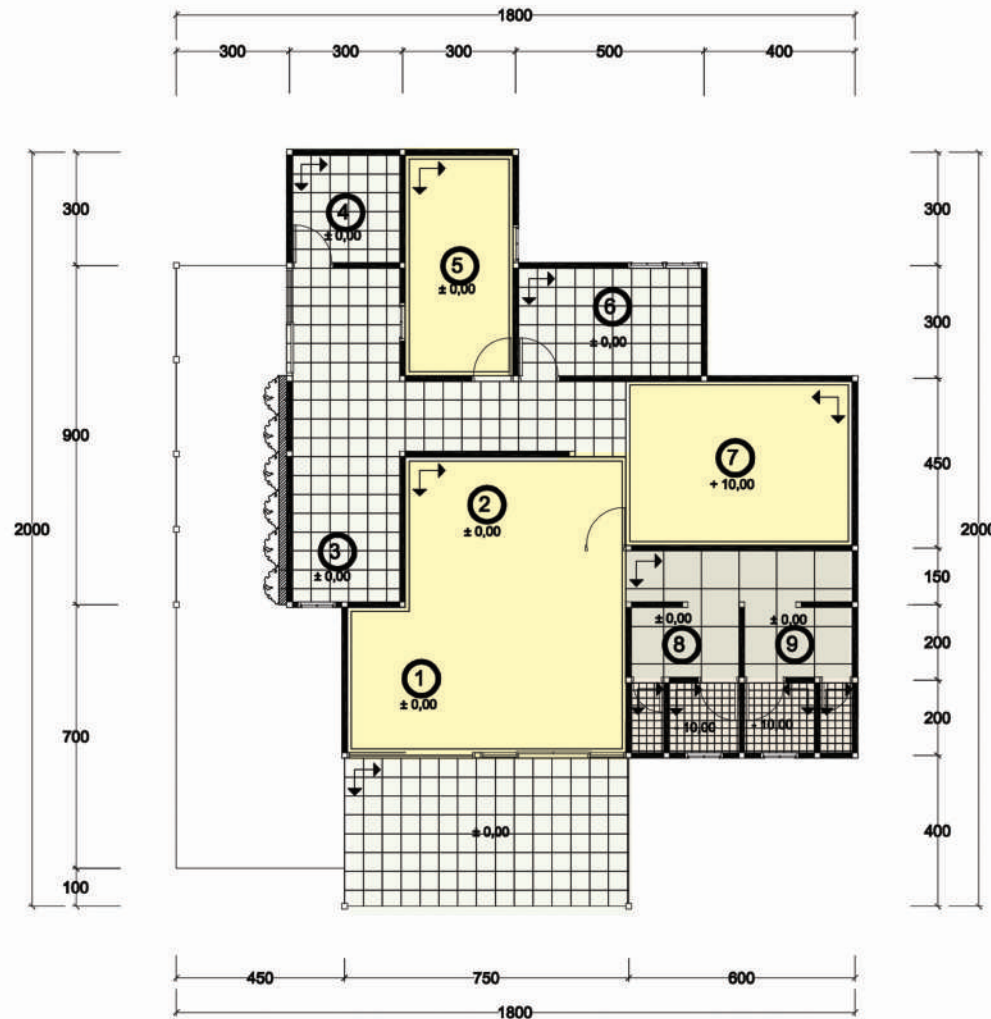
SCALE 1 : 200

LEGENDA

1. Waiting Lobby
2. Receptionist
3. Pantry
4. Storage
5. Chief Of Pharmacy's Room
6. Druf warehouse
7. Compounding Medicine Room
8. Men's Toilet
9. Woman's Toilet

LEGENDA

-  Textured Tile 20 cm x 20 cm
-  Antibactory Wooden Motif Hospital Vinyl
-  Non-Slippery Plain Motif Tile 50 cm x 50 cm
-  Non-Slippery Plain Motif Tile 100 cm x 100 cm
-  Annybactory Plain Motif Hospital Vinyl
-  Start Point


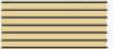






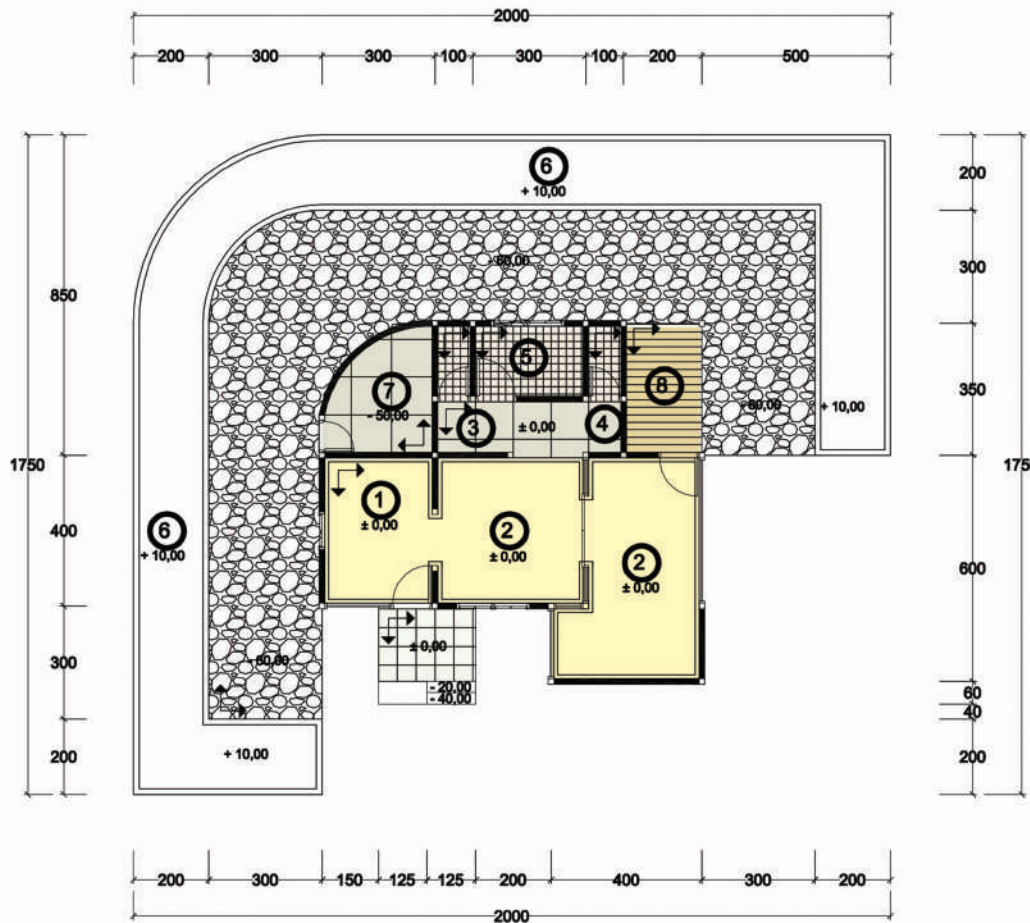
PHARMACY INSTALATION FLOOR-TILE DETAIL
SCALE 1 : 200

LEGENDA

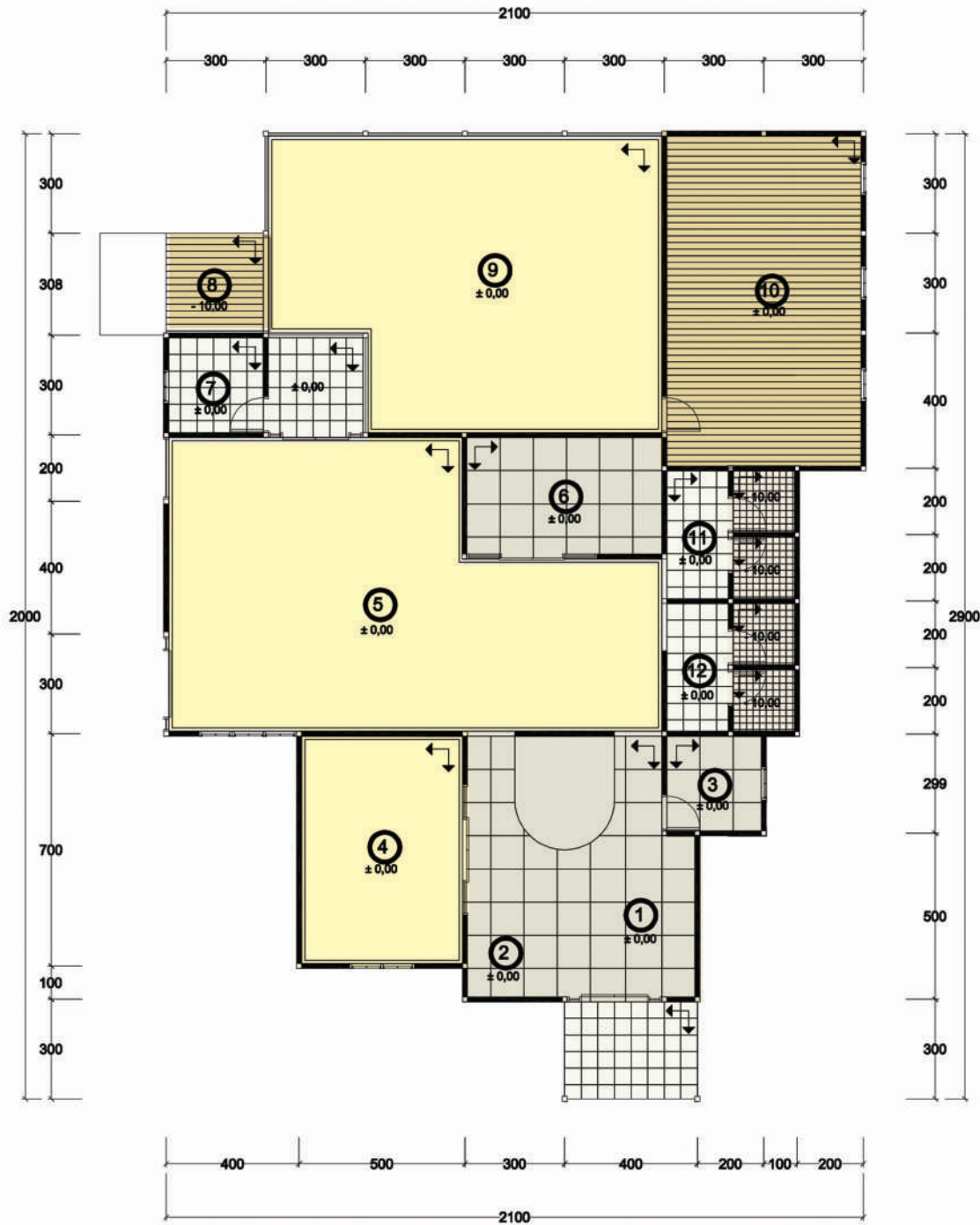
1. Nutritionist Room
2. Model and Miniature Room
3. Woman's Toilet
4. Men's Toilet
5. Storage
6. Example Plant Display (For Diabetes)
7. Planting Equipment's Storage
8. Second Entrance Door

LEGENDA

-  Textured Tile 20 cm x 20 cm
-  Antibactory Wooden Motif Hospital Vinyl
-  Non-Slippery Plain Motif Tile 50 cm x 50 cm
-  Non-Slippery Plain Motif Tile 100 cm x 100 cm
-  Anrybactory Plain Motif Hospital Vinyl
-  Start Point




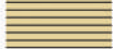




CLINICAL NUTRITION
INSTALATION
FLOOR-TILE DETAIL
SCALE 1 : 200



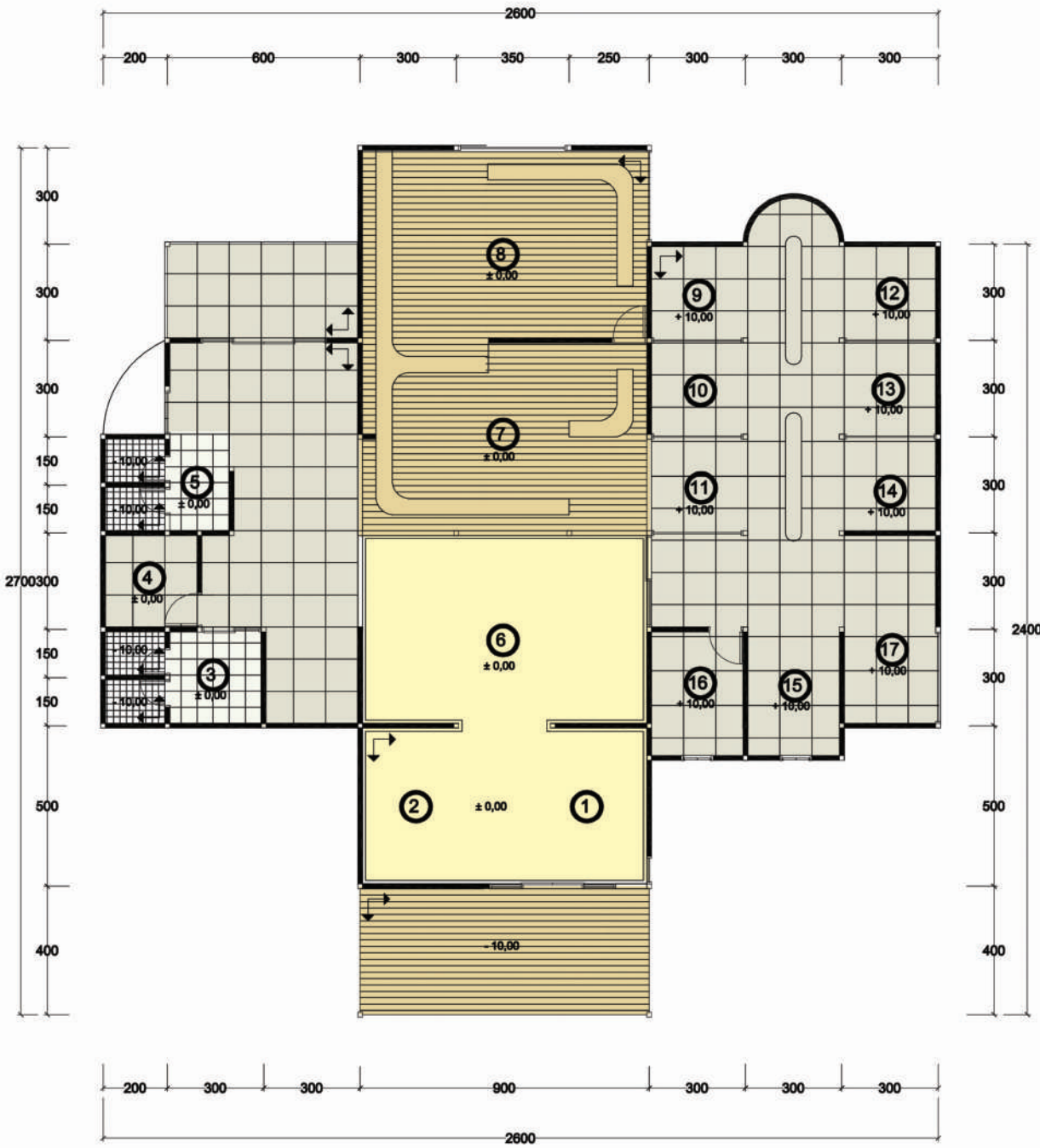
LEGENDA

1. Waiting Lobby
2. Receptionist
3. Chief Of Instalation's Room
4. Checking Room
5. Pasive Psysiotherapy Area
6. Pasive Psysiotherapy Area (Massage Room)
7. Storage
8. Backdoor Emergency Exit
9. Active Psysiotherapy Area
10. Active Psysiotherapy Area (Private Aerobic Room)
11. Woman's Toilet
12. Men's Toilet

LEGENDA

-  Textured Tile 20 cm x 20 cm
-  Antibactory Wooden Motif Hospital Vinyl
-  Non-Slippery Plain Motif Tile 50 cm x 50 cm
-  Non-Slippery Plain Motif Tile 100 cm x 100 cm
-  Anrybactory Plain Motif Hospital Vinyl
-  Start Point


REHABILITATION INSTALATION
 FLOOR-TILE DETAIL
 SCALE 1 : 200

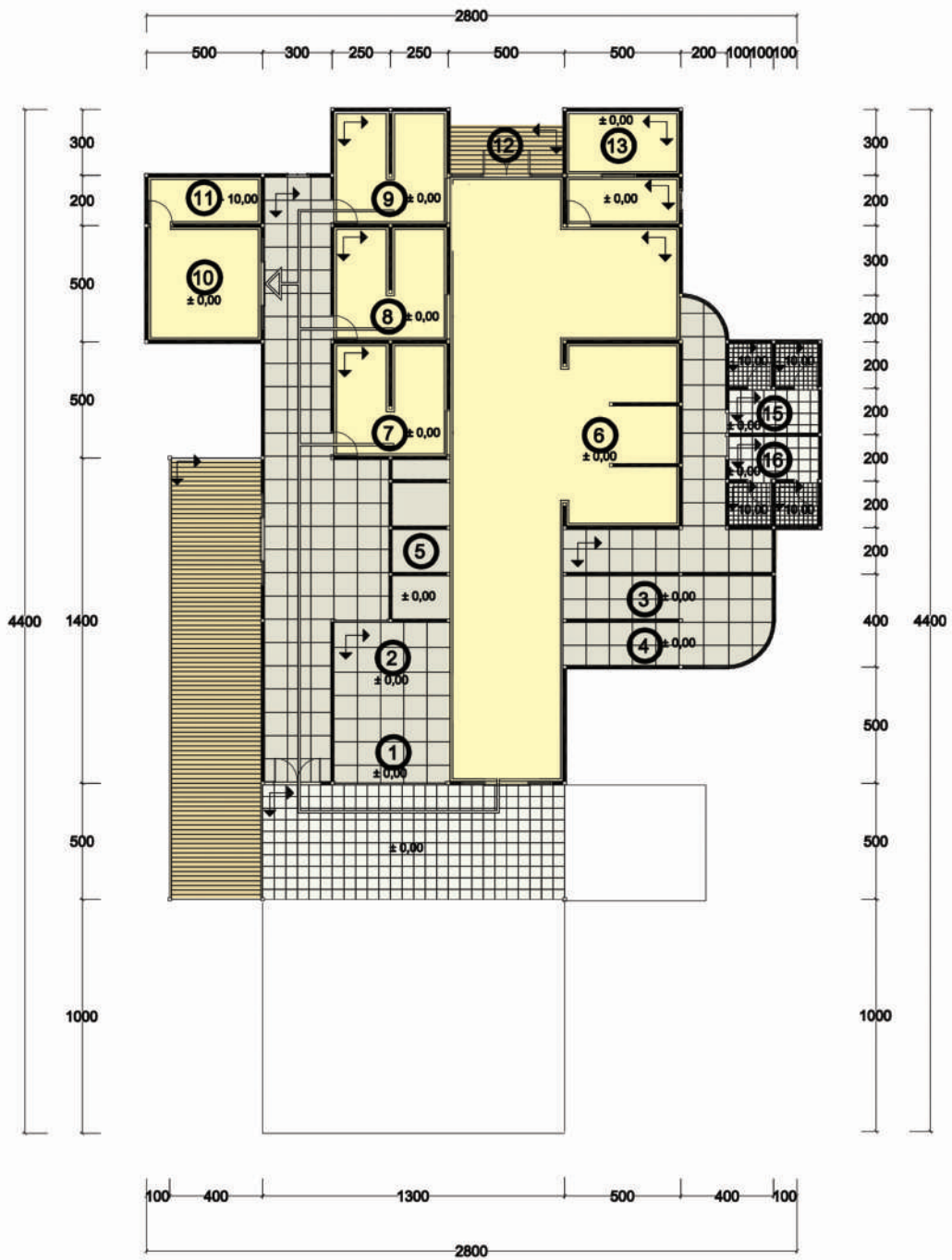


LEGENDA

1. Waiting Lobby
2. Receptionist
3. Woman's Toilet
4. Service Room
5. Men's Toilet
6. Mini Managerial's Hall (Exhibition Space)
7. Lounge (VIP Waiting Room)
8. Meeting Room
9. Chief of Human Resource's Room
10. Chief of Nurse's Room
11. Chief of Commite's Room
12. Chief of Medical Service's Room
13. Chief of Financial's Room
14. Chief of Medical Support's Room
15. Chief of General Operasion's Room
16. Director's Room
17. Pantry

LEGENDA

-  Textured Tile 20 cm x 20 cm
-  Antibactory Wooden Motif Hospital Vinyl
-  Non-Slippery Plain Motif Tile 50 cm x 50 cm
-  Non-Slippery Plain Motif Tile 100 cm x 100 cm
-  Annybactory Plain Motif Hospital Vinyl
-  Start Point



LEGENDA

1. Waiting Lobby
2. Receptionist
3. Gurney Parking Room
4. Trolley Parking Room
5. Triage Room
6. Non-Surgical Procedure Room
7. P1 Room
8. P2 Room
9. P3 Room
10. P0 Room
11. Storage For P0
12. Backdoor Exit
13. Decontamination and Sterilization Room
14. Woman's Toilet
15. Men's Toilet

LEGENDA







-  Textured Tile 20 cm x 20 cm
-  Antibiary Wooden Motif Hospital Vinyl
-  Non-Slippery Plain Motif Tile 50 cm x 50 cm
-  Non-Slippery Plain Motif Tile 100 cm x 100 cm
-  Antibiary Plain Motif Hospital Vinyl
-  Start Point

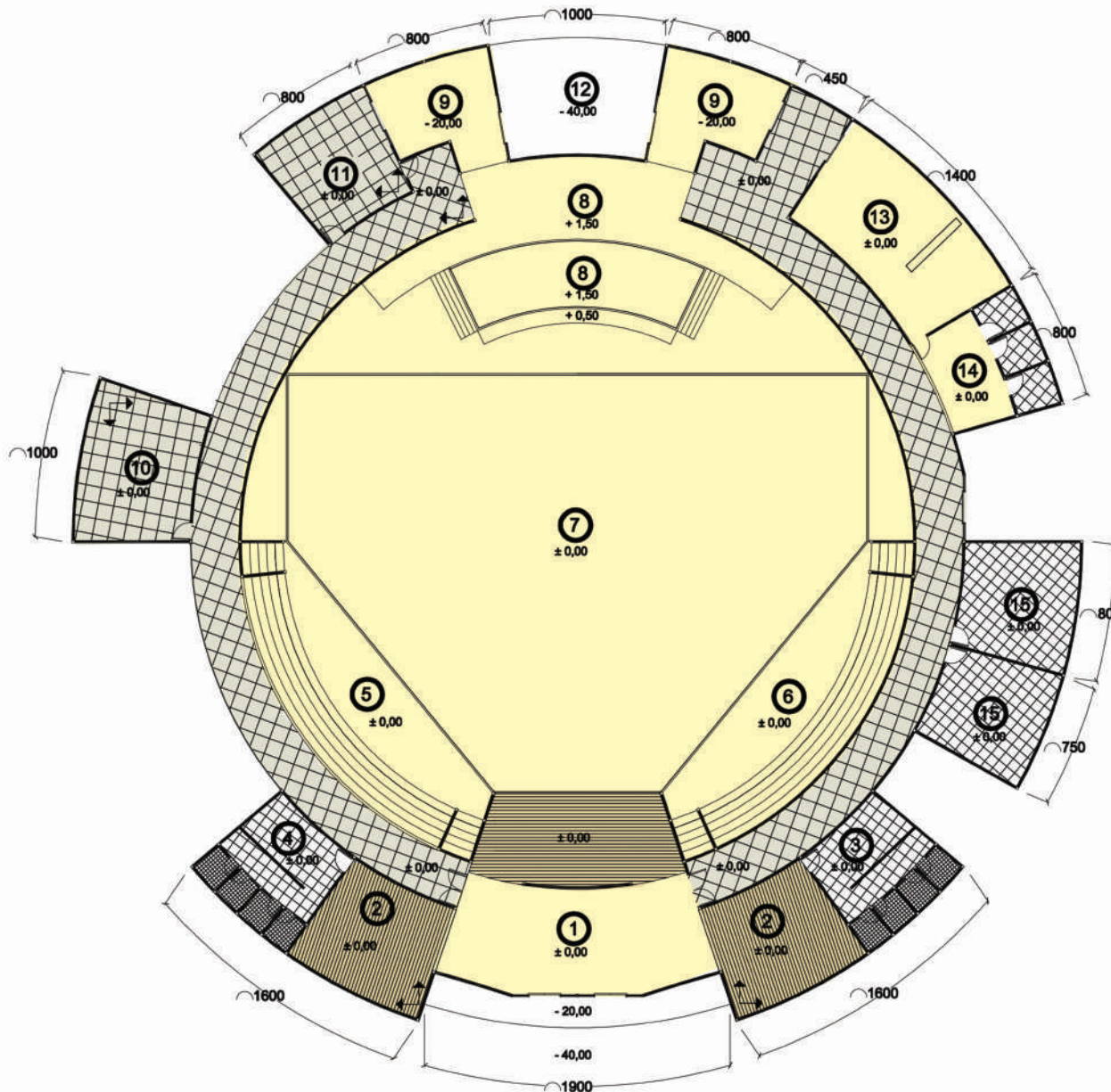
EMERGENCY UNIT FLOOR-TILE DETAIL
SCALE 1:300

LEGENDA

1. Receptionist
2. Sitting Lobby
3. Woman's Toilet
4. Men's Toilet
5. 1st Tribun
6. 2nd Tribun
7. Main Hall
8. Stage
9. Backstage
10. Storage Room
11. Control Room
12. Parking for VIP Guest
13. VIP Room for Presenters
14. VIP Toilet
15. Waiting Room for Regular Presenters

LEGENDA

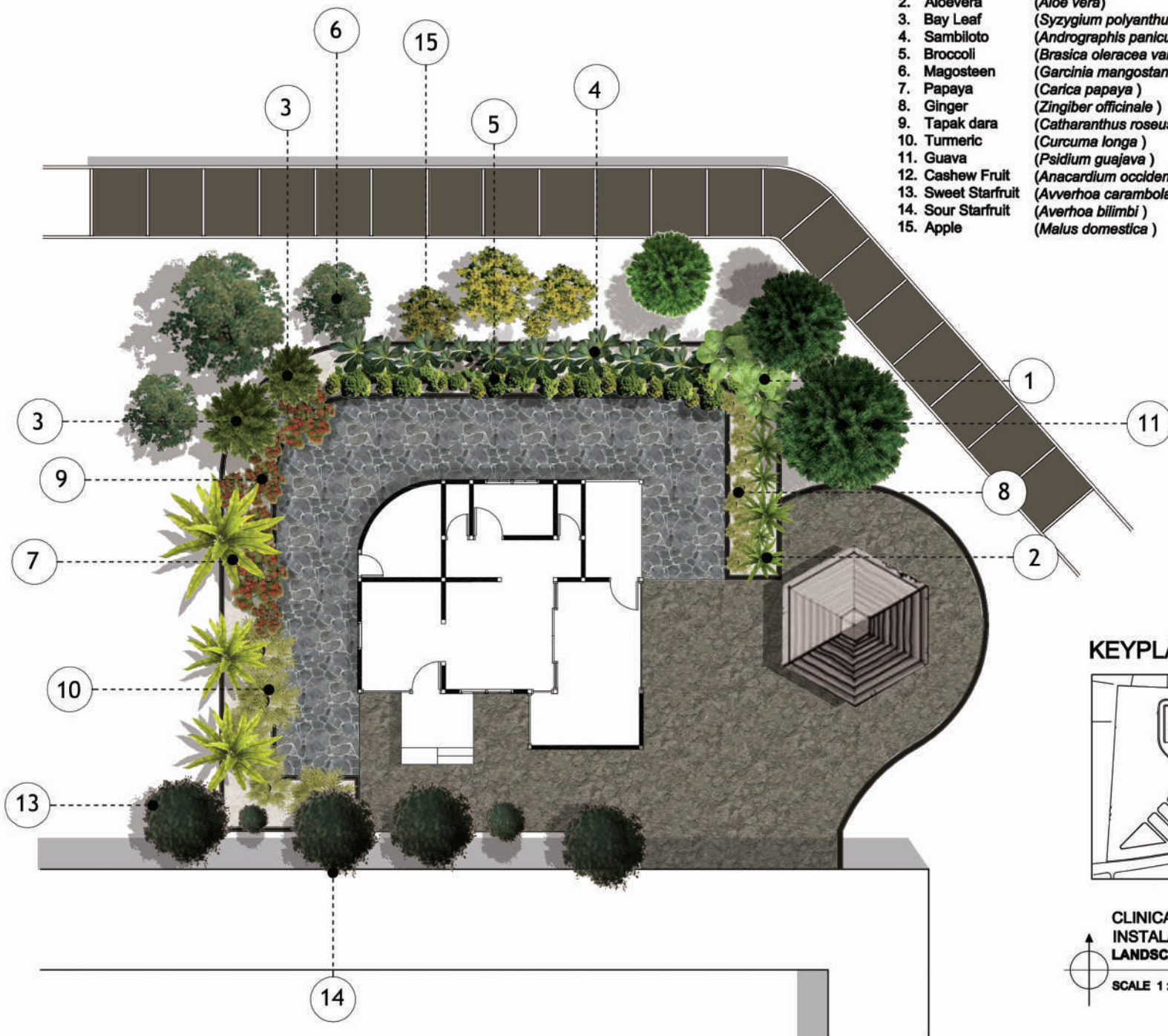
-  Textured Tile 20 cm x 20 cm
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-  Antibactory Plain Motif Hospital Vinyl
-  Start Point



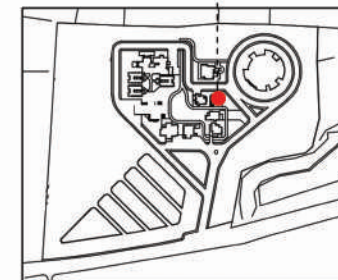
GATHERING DOME
FLOOR-TILE DETAIL
SCALE 1 : 400

LEGENDA

- | | | |
|---------------------|--|------------------------|
| 1. Bitter Melon | (<i>Momordica charantia</i>) | <i>Pare</i> |
| 2. Aloe vera | (<i>Aloe vera</i>) | <i>Lidah Buaya</i> |
| 3. Bay Leaf | (<i>Syzygium polyanthum</i>) | <i>Daun Salam</i> |
| 4. Sambiloto | (<i>Andrographis paniculata</i>) | <i>Sambiloto</i> |
| 5. Broccoli | (<i>Brasica oleracea var. italica</i>) | <i>Brokoli</i> |
| 6. Magosteen | (<i>Garcinia mangostana</i>) | <i>Manggis</i> |
| 7. Papaya | (<i>Carica papaya</i>) | <i>Pepaya</i> |
| 8. Ginger | (<i>Zingiber officinale</i>) | <i>Jahe</i> |
| 9. Tapak dara | (<i>Catharanthus roseus</i>) | <i>Tapak Dara</i> |
| 10. Turmeric | (<i>Curcuma longa</i>) | <i>Kunyit</i> |
| 11. Guava | (<i>Psidium guajava</i>) | <i>Jambu Biji</i> |
| 12. Cashew Fruit | (<i>Anacardium occidentale</i>) | <i>Jambu Monyet</i> |
| 13. Sweet Starfruit | (<i>Avverhoa carambola</i>) | <i>Belimbing Manis</i> |
| 14. Sour Starfruit | (<i>Averhoa bilimbi</i>) | <i>Belimbing Asam</i> |
| 15. Apple | (<i>Malus domestica</i>) | <i>Apel</i> |



KEYPLAN



CLINICAL NUTRITION
INSTALATION
LANDSCAPE DETAIL

SCALE 1 : 200

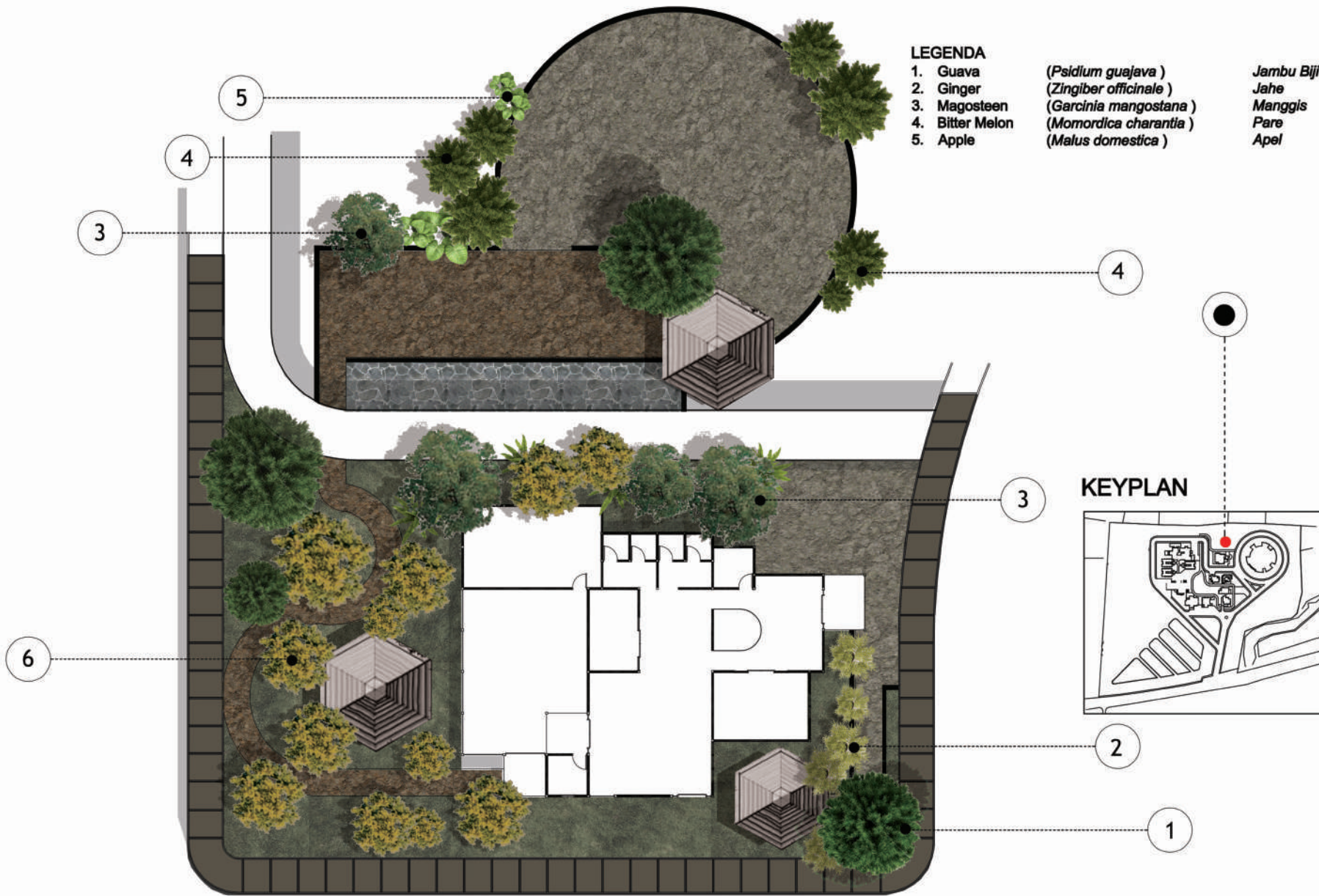


LEGENDA

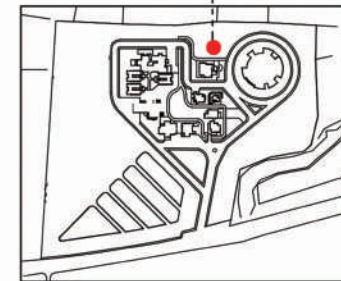
1. Guava
2. Ginger
3. Magosteen
4. Bitter Melon
5. Apple

- (Psidium guajava)*
(Zingiber officinale)
(Garcinia mangostana)
(Momordica charantia)
(Malus domestica)

- Jambu Biji*
Jahe
Manggis
Pare
Apel



KEYPLAN

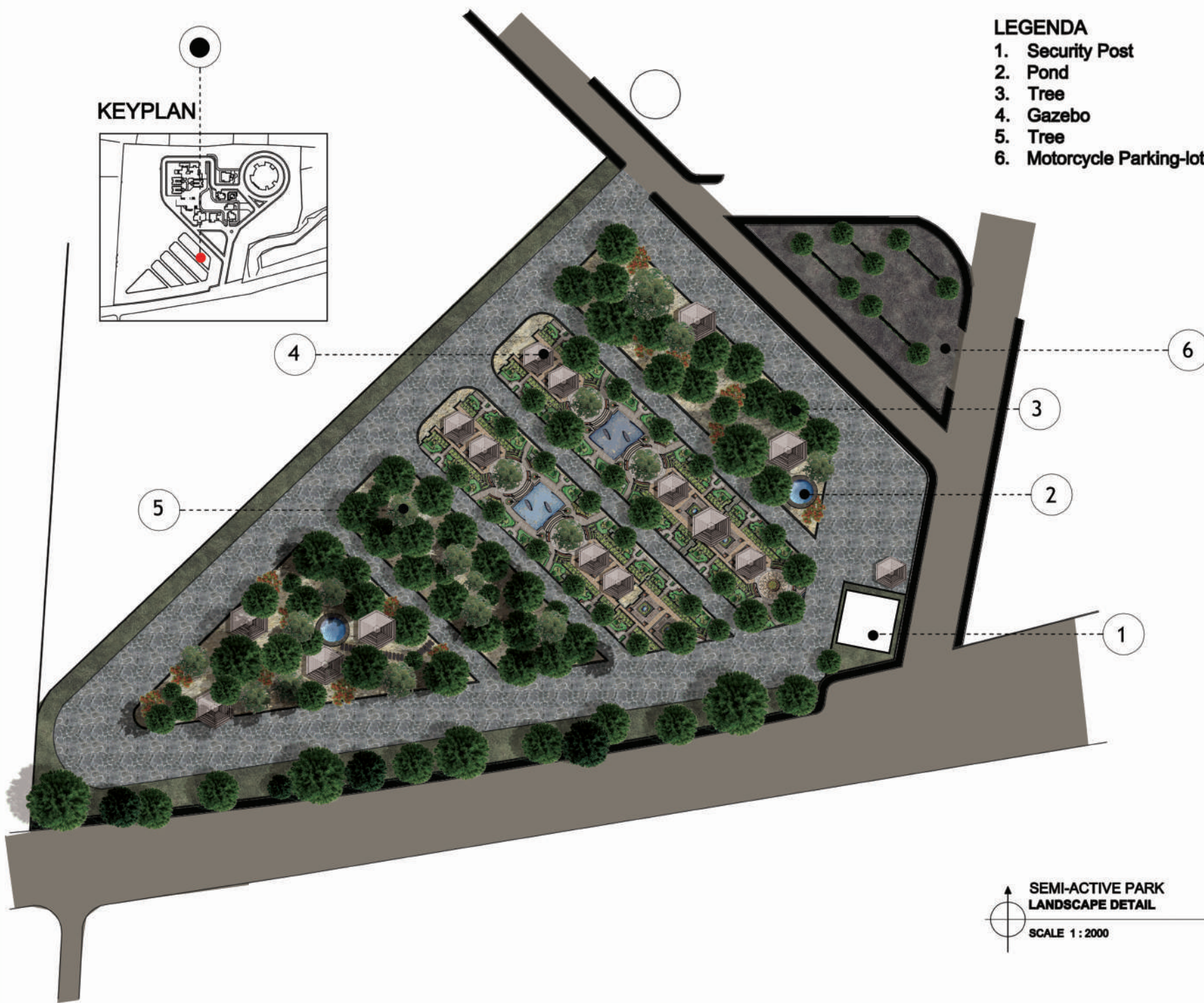
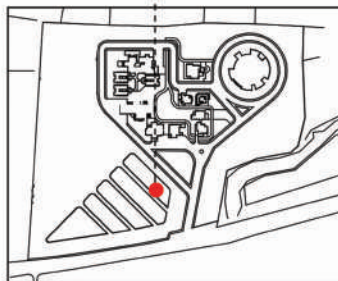


REHABILITATION INSTALATION
LANDSCAPE DETAIL
SCALE 1 : 400

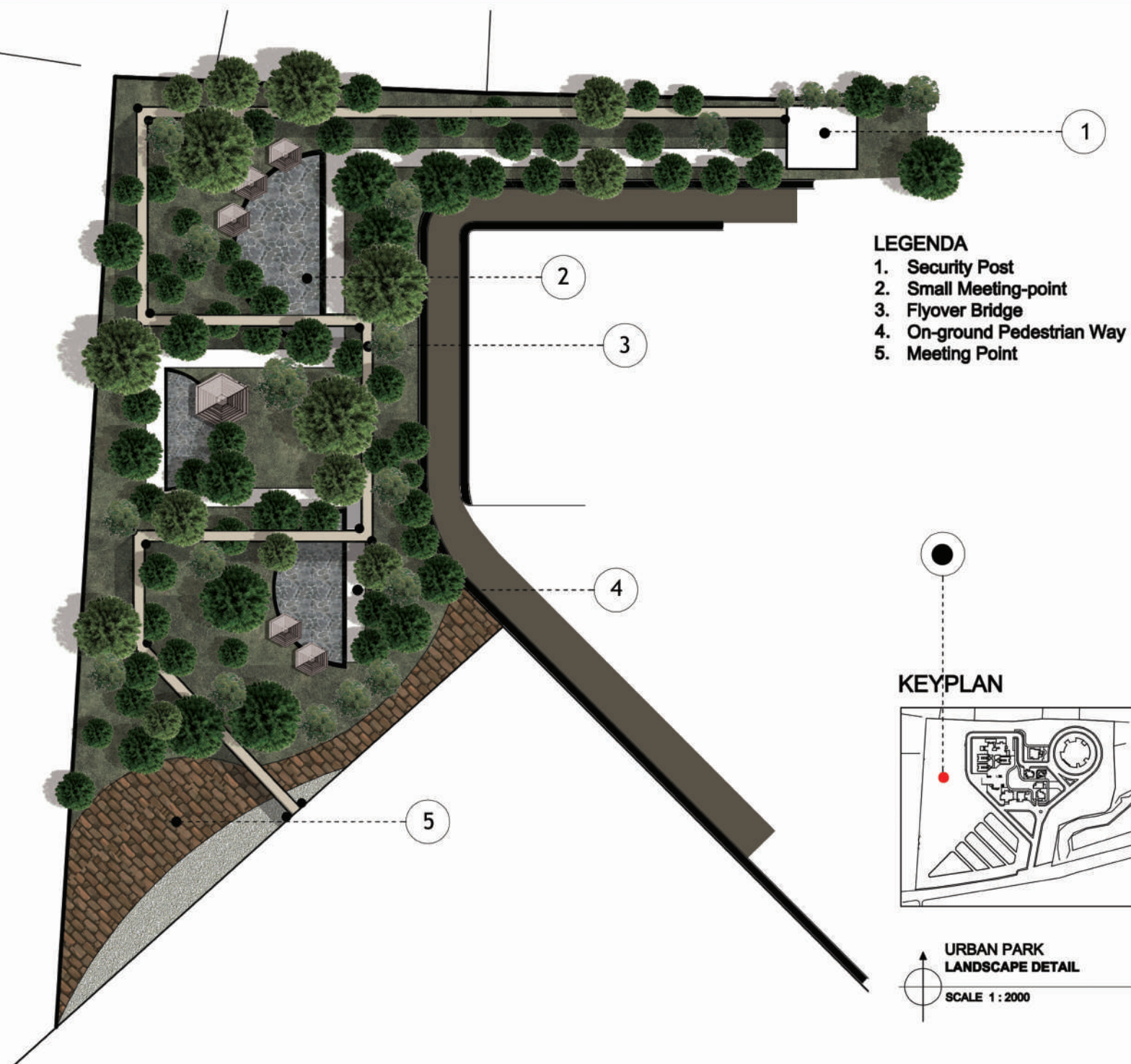
LEGENDA

1. Security Post
2. Pond
3. Tree
4. Gazebo
5. Tree
6. Motorcycle Parking-lot

KEYPLAN



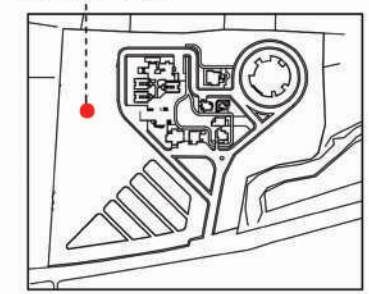
**SEMI-ACTIVE PARK
LANDSCAPE DETAIL**
SCALE 1 : 2000



LEGENDA

- 1. Security Post
- 2. Small Meeting-point
- 3. Flyover Bridge
- 4. On-ground Pedestrian Way
- 5. Meeting Point

KEYPLAN

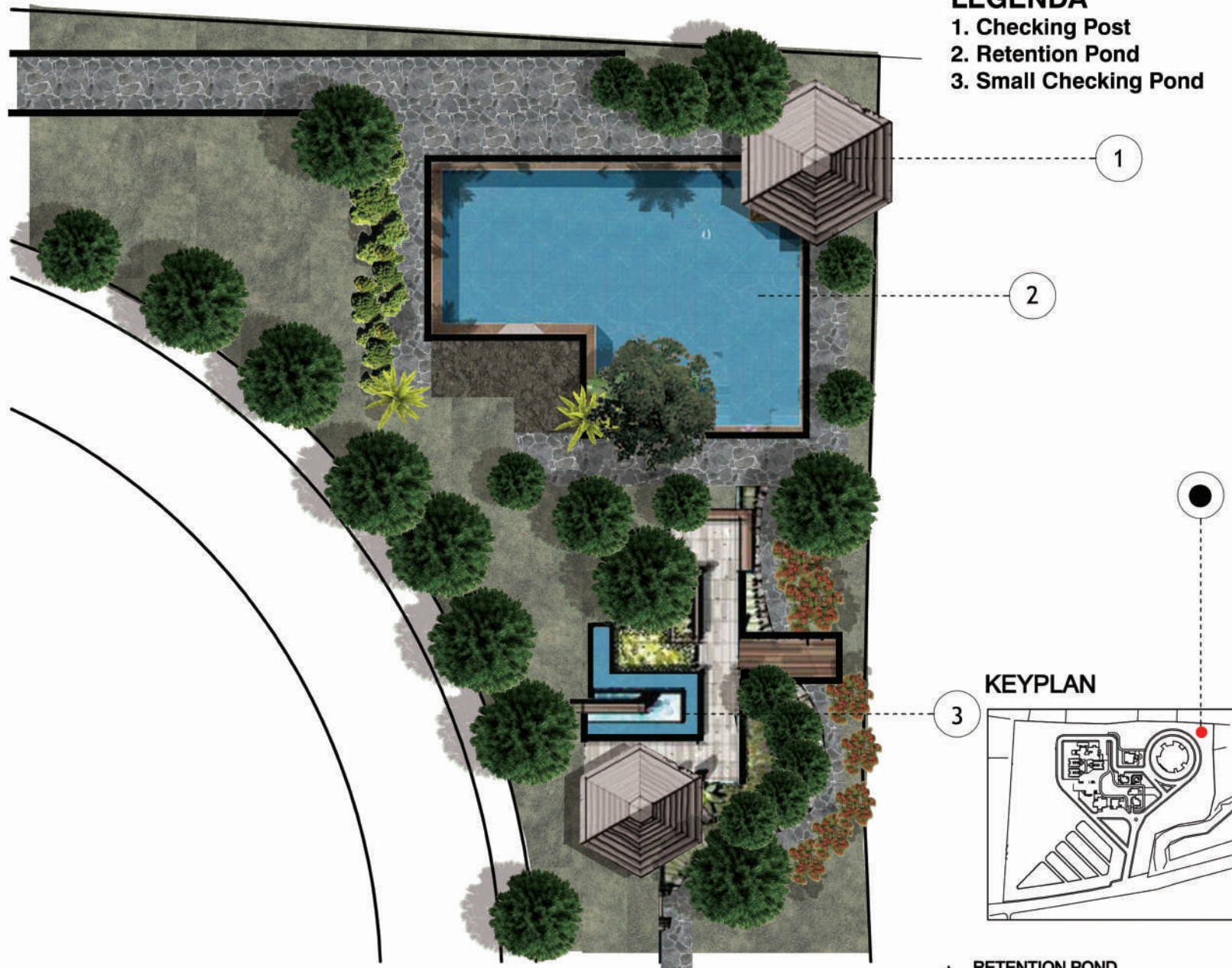


URBAN PARK
LANDSCAPE DETAIL

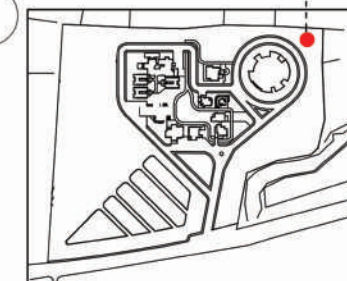
SCALE 1 : 2000

LEGENDA

1. Checking Post
2. Retention Pond
3. Small Checking Pond



KEYPLAN

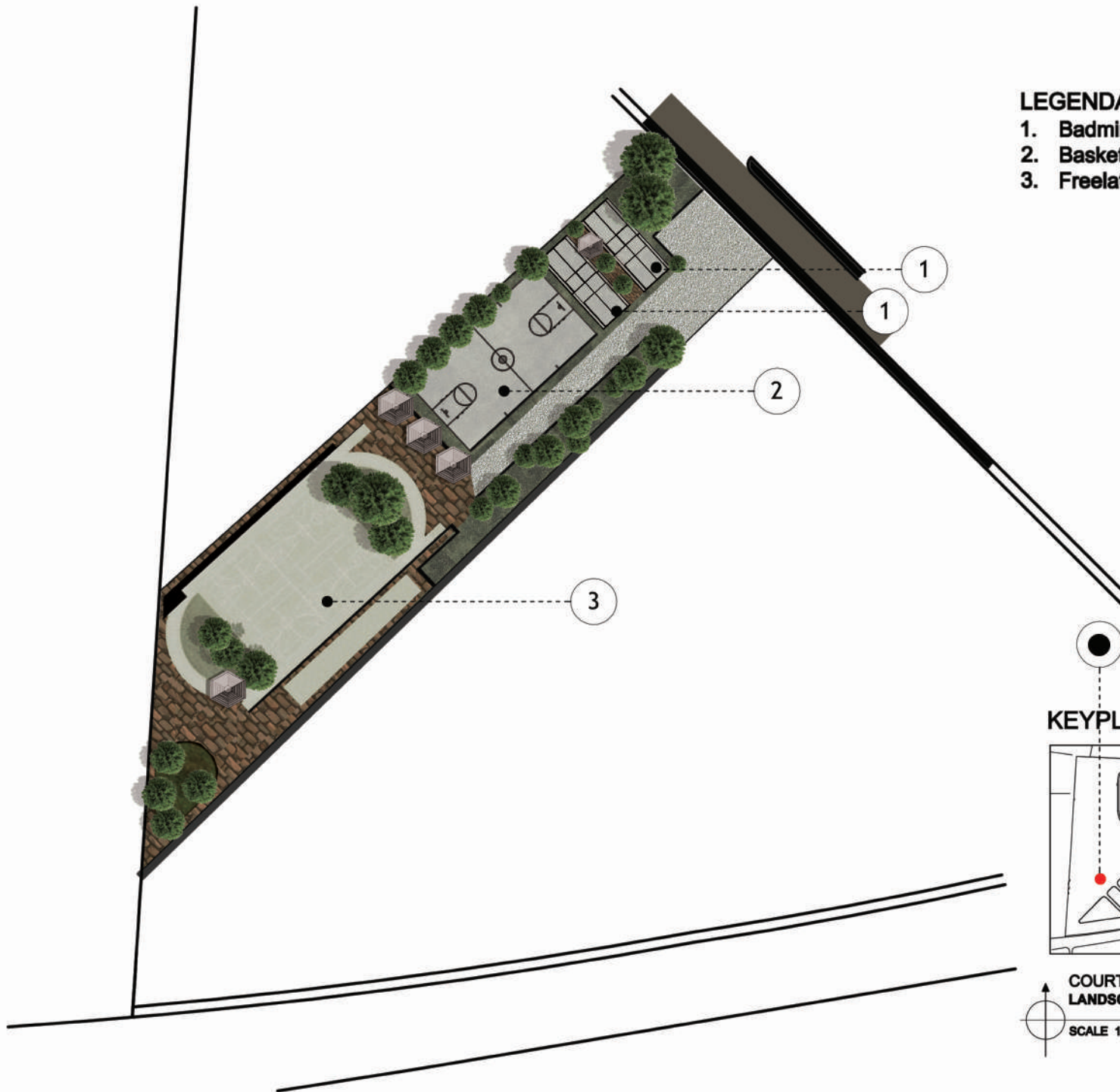


**RETENTION POND
LANDSCAPE DETAIL**

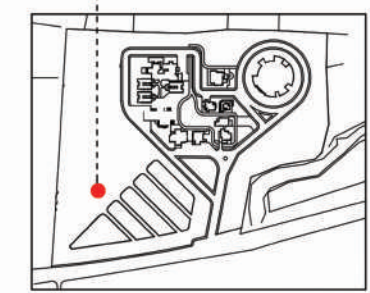
SCALE 1 : 400

LEGENDA

1. Badminton Court
2. Basket-Ball Court
3. Freelatic field



KEYPLAN

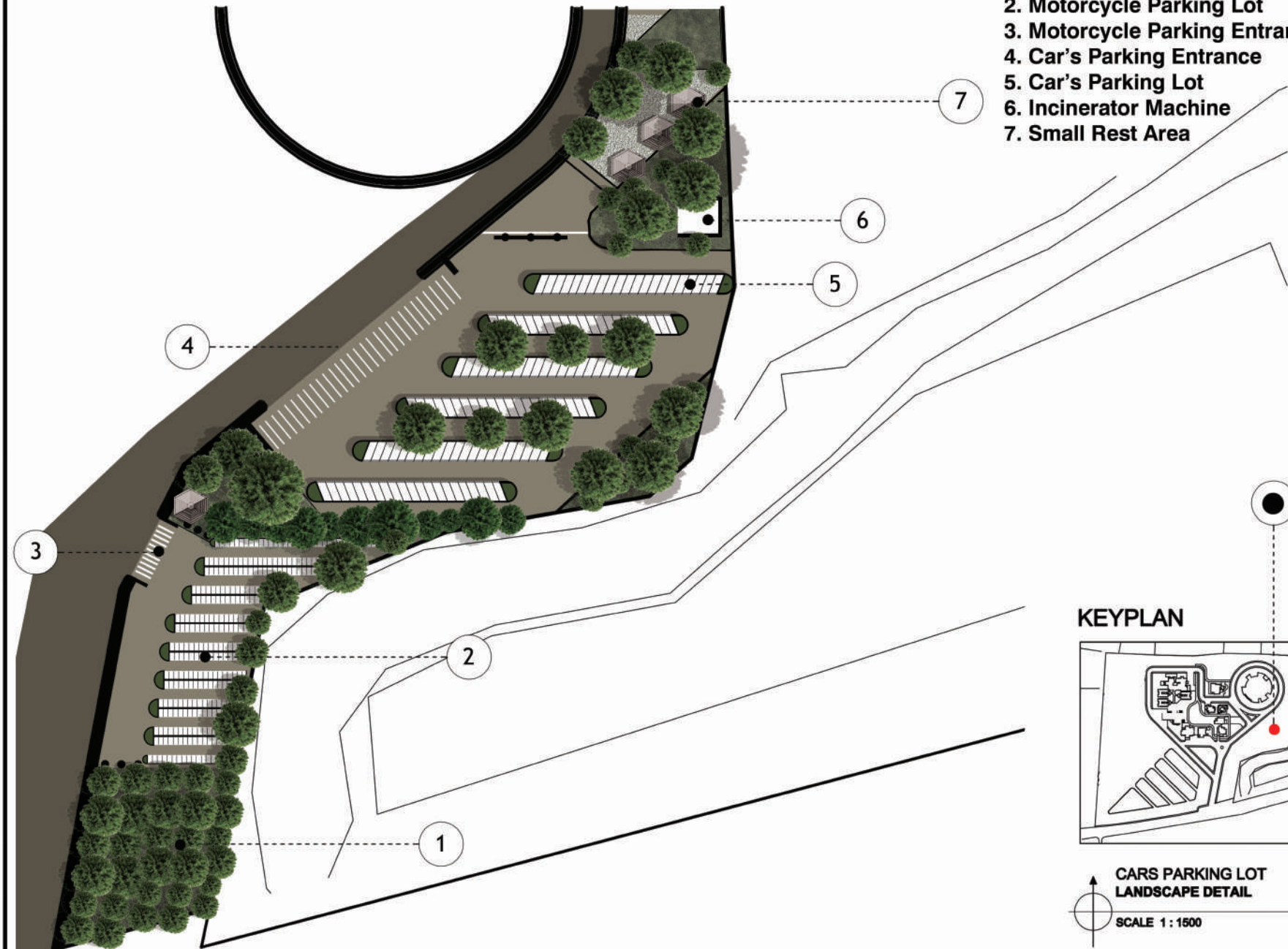


COURT LANDSCAPE DETAIL

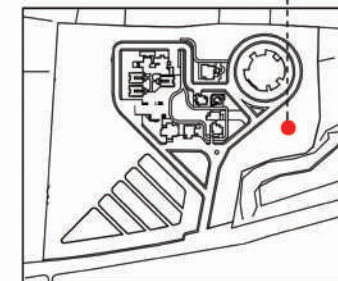
SCALE 1 : 1000

LEGENDA

1. Trees Barrier
2. Motorcycle Parking Lot
3. Motorcycle Parking Entrance
4. Car's Parking Entrance
5. Car's Parking Lot
6. Incinerator Machine
7. Small Rest Area



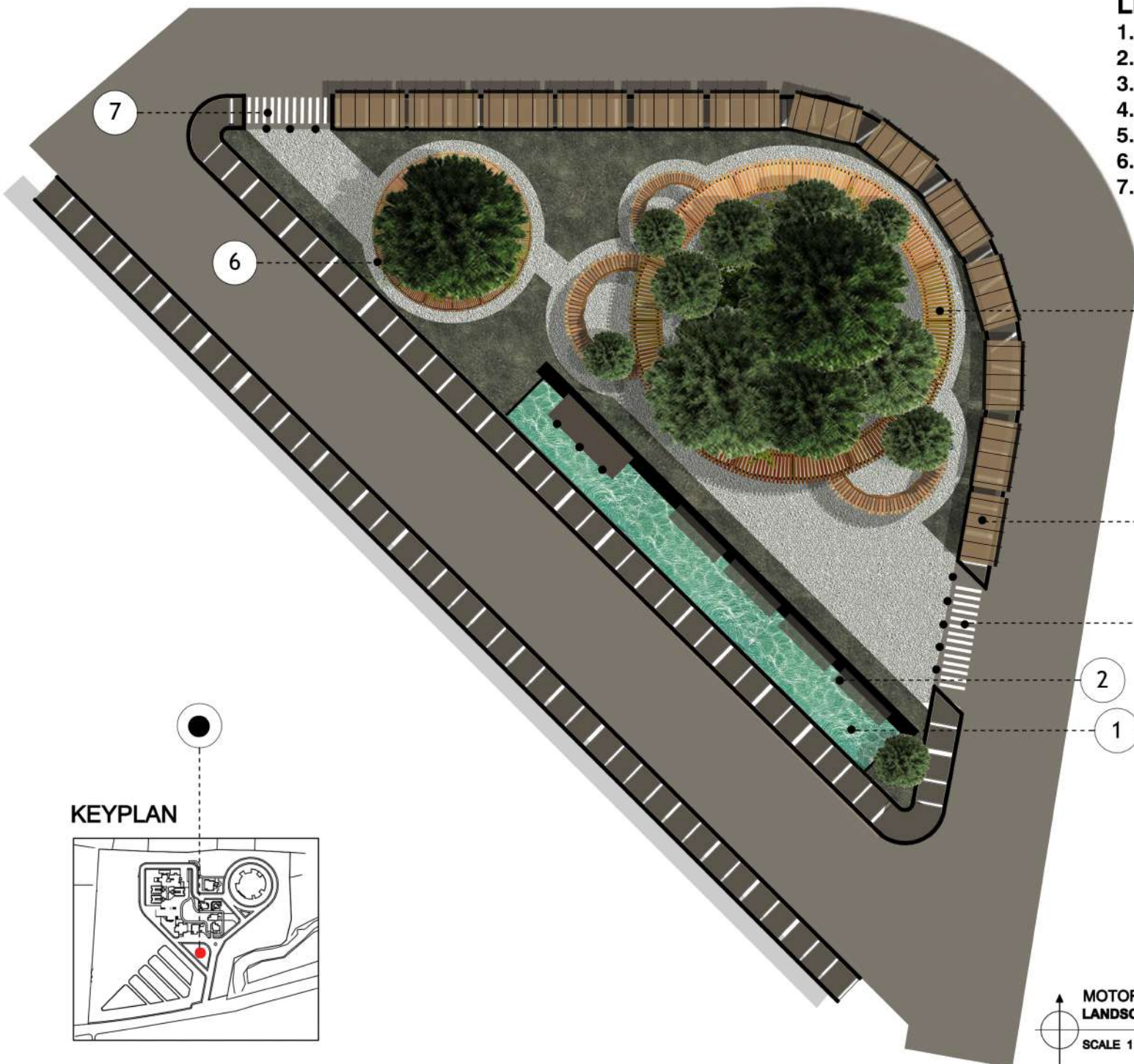
KEYPLAN



CARS PARKING LOT
LANDSCAPE DETAIL
SCALE 1 : 1500

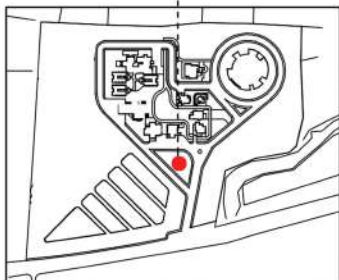
LEGENDA

1. Signage Pond
2. 3D D.E.H.C. Sinage
3. 1st Entrance
4. Canopy
5. Meeting Point
6. Park Bench
7. 2nd Entrance



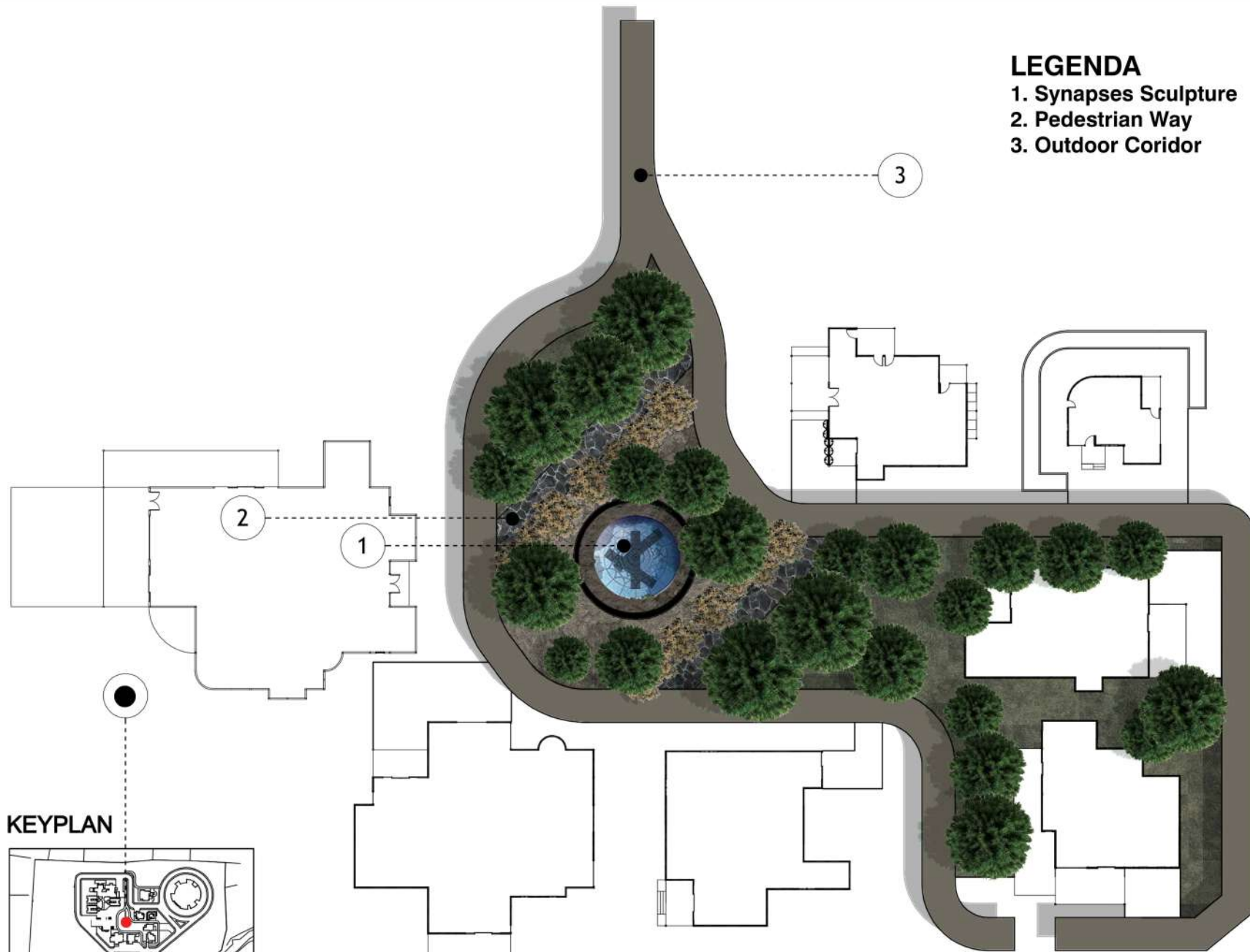
MOTORCYCLE PARKING LOT
LANDSCAPE DETAIL
SCALE 1 : 400

KEYPLAN

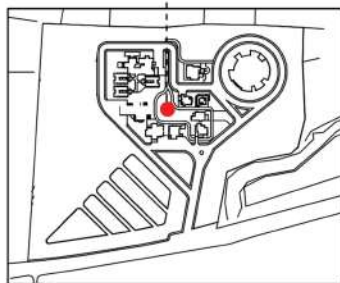


LEGENDA

1. Synapses Sculpture
2. Pedestrian Way
3. Outdoor Corridor

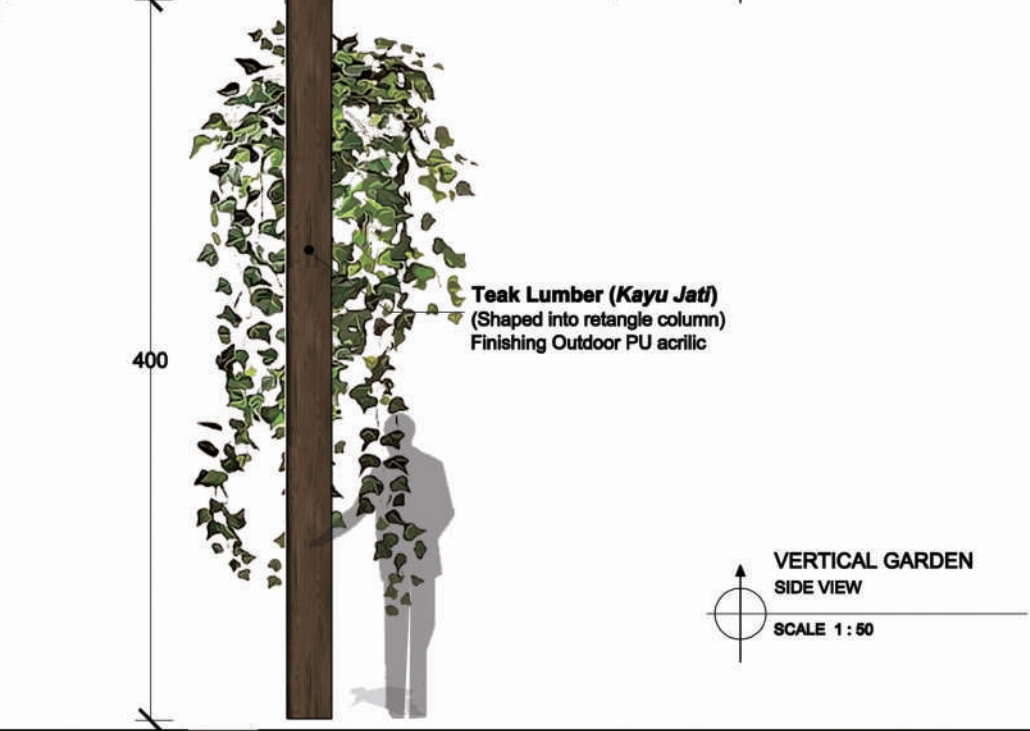
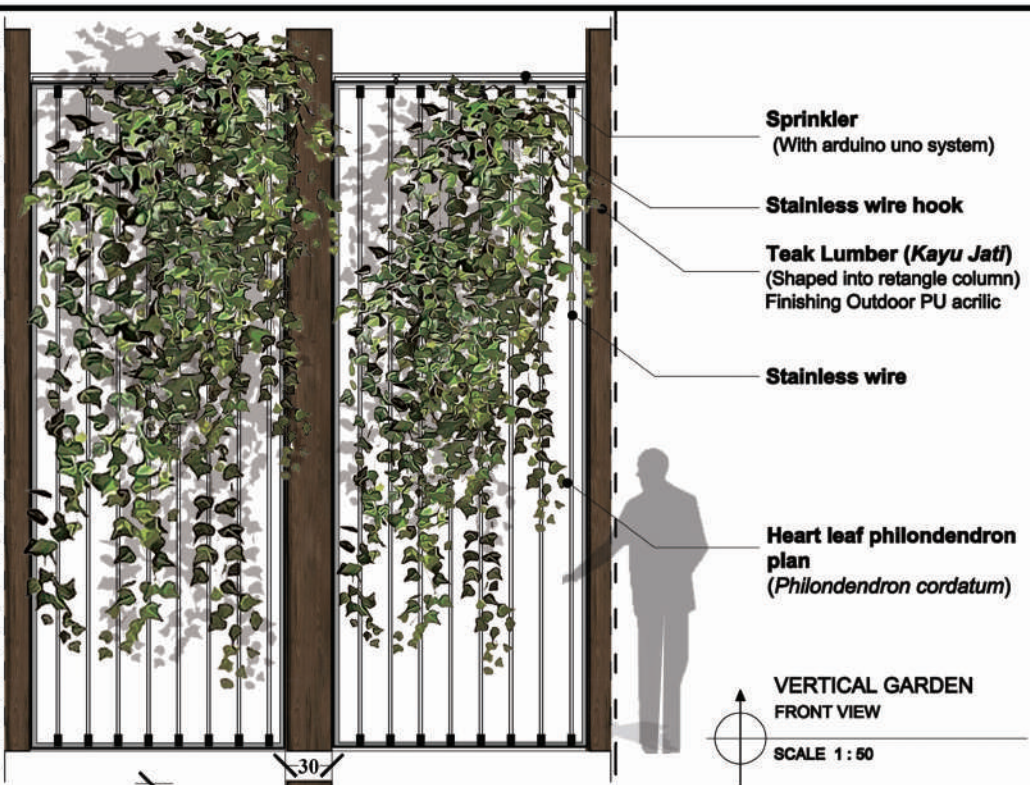


KEYPLAN



SYNAPSES-SCULPTURE GARDEN
LANDSCAPE DETAIL

SCALE 1 : 600



APPLIED AT :

1. Unimals and Blood Laboratory Instalation
2. Pharmacy Instalation
3. Managerial Office
4. Outpatien Instalation
5. Public Kitchen Instalatin
6. Clinical Nutrition Instalation



PROJECT TITLE

DIABETES AND ENDOCRINOLGY
HEALTHCARE CENTER DESIGN
IN MALANG CITY

STUDENT NAME

QURROTA AYUN

STUDENT NUMBER

16660113

LECTURES GUIDE

PRIMA KURNIAWATY M. SI.
ALDRIN YUSUF FIRMANSYAH M.T.

IMAGE TITLE

ARCHITECTURE DETAIL
(BIOPHILIC APPROACH)

BASED ON THE 1ST PRINCIPLE :

ENVIRONMENTAL
FEATURES

NAME

VERTICAL GARDEN

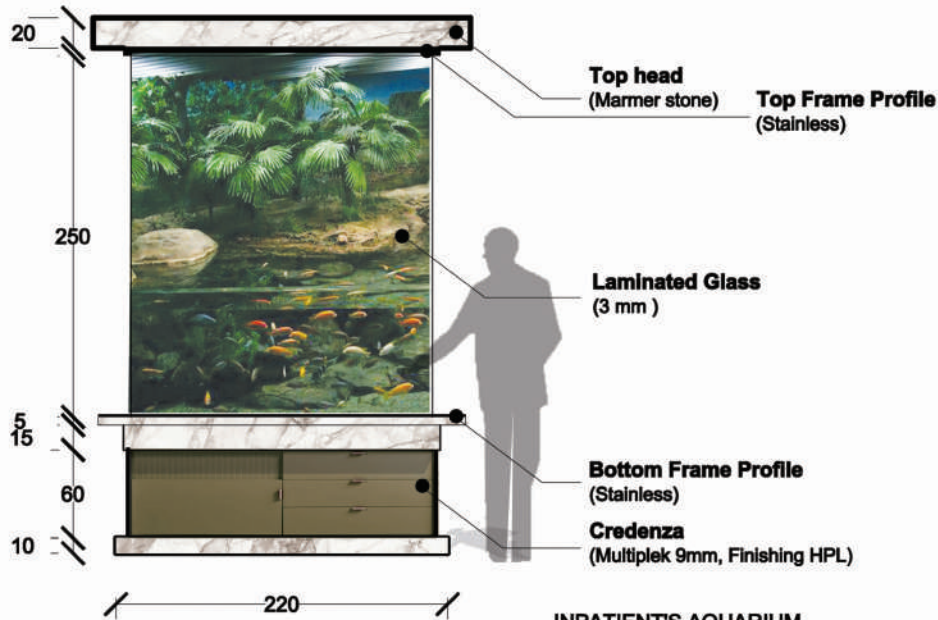
IMAGE SCALE

1 : 50

IMAGE NUMBER :

66

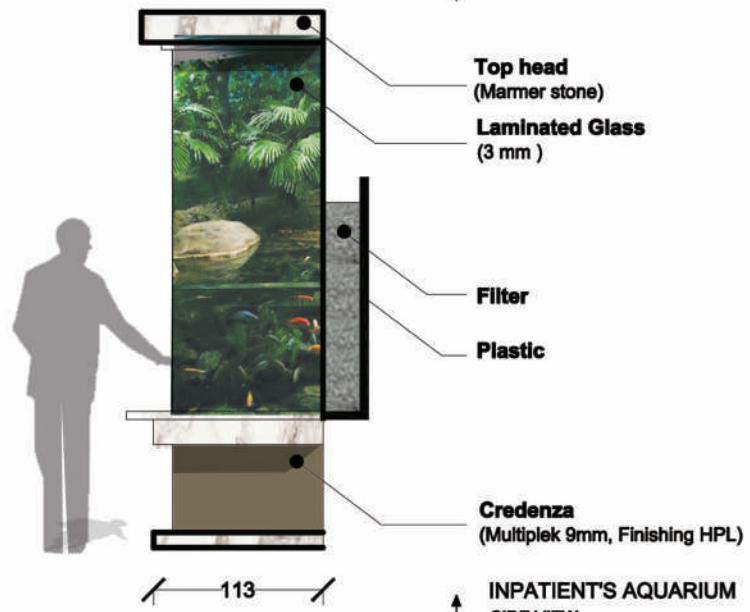
APPLIED AT :
1. Inpatient Instalation



INPATIENT'S AQUARIUM
FRONT VIEW
SCALE 1 : 50

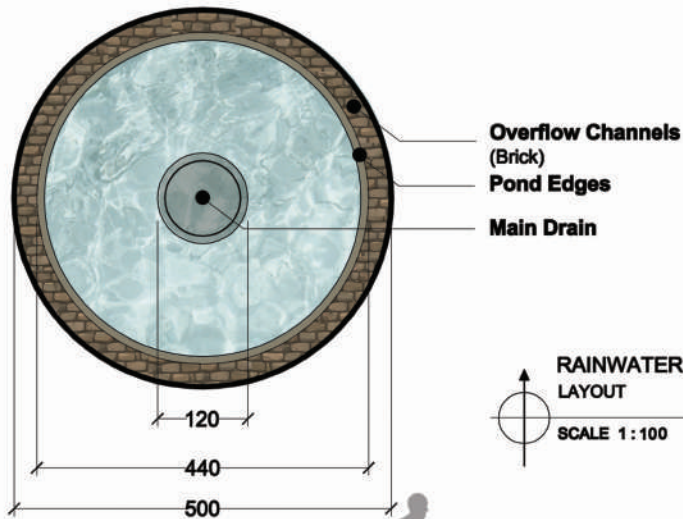


INPATIENT'S AQUARIUM
PERSPECTIVE

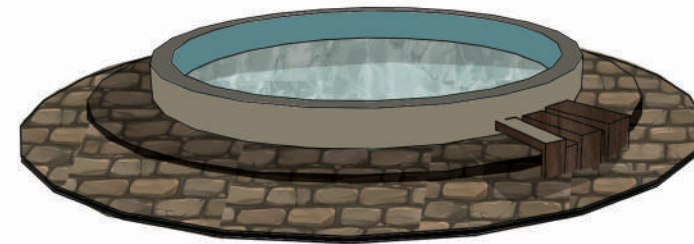


INPATIENT'S AQUARIUM
SIDE VIEW
SCALE 1 : 50

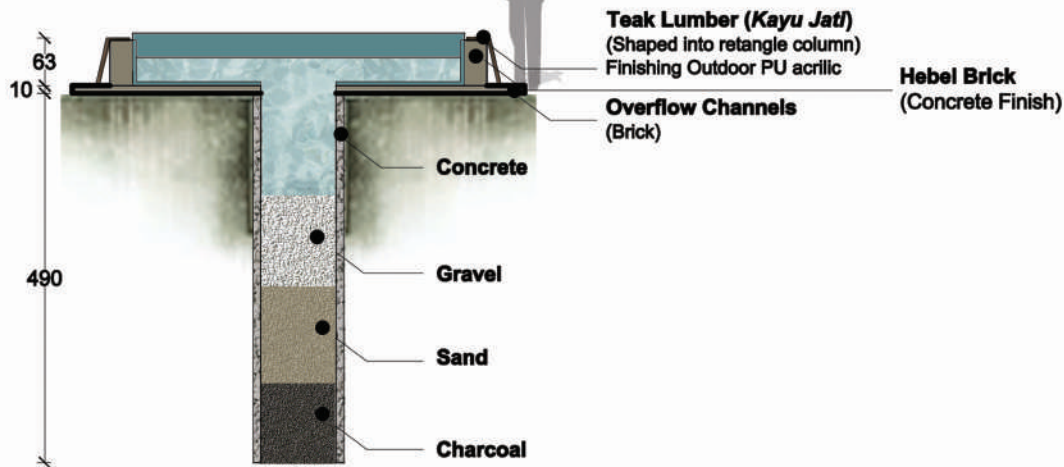
APPLIED AT :
1. Semi-Interaktive Park



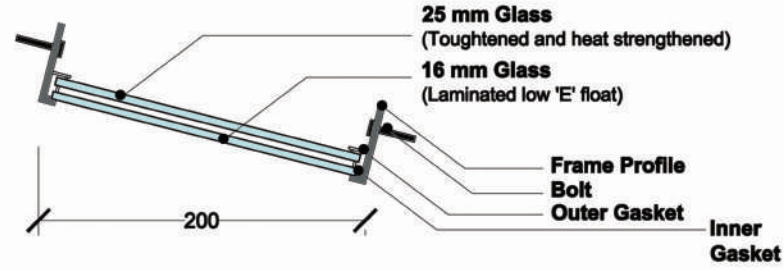
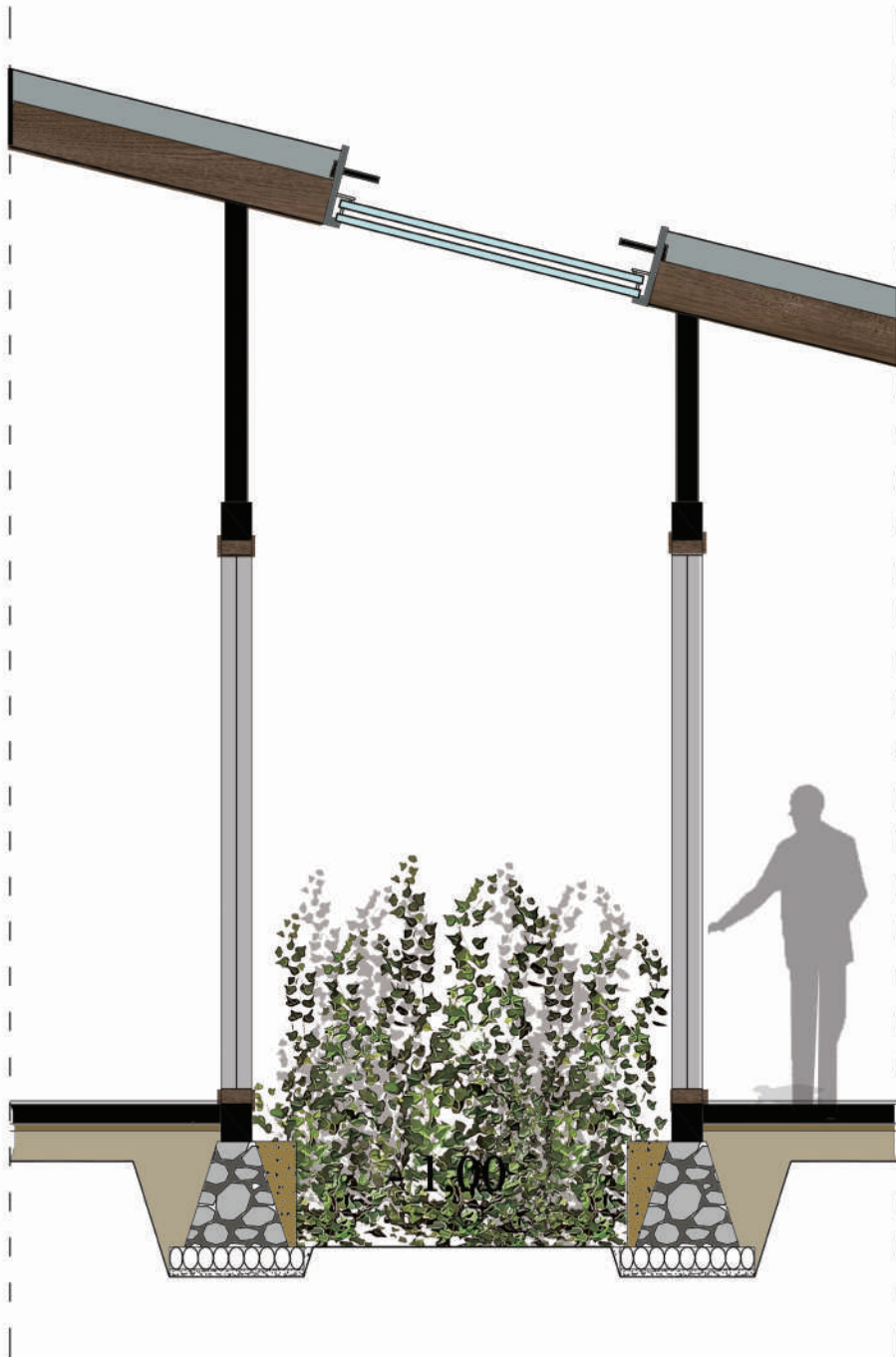
RAINWATER HARVESTING POND
LAYOUT
SCALE 1:100



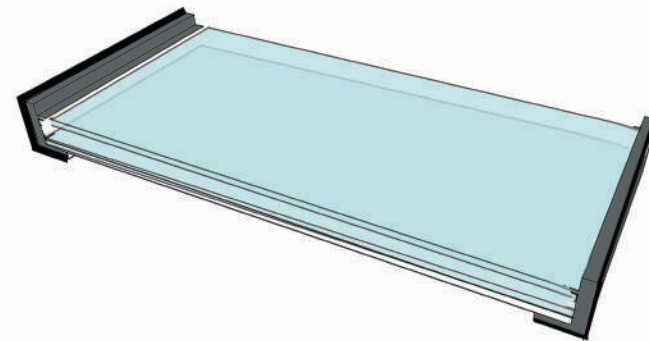
RAINWATER HARVESTING POND
PERSPECTIVE



RAINWATER HARVESTING POND
A - A' SECTION
SCALE 1:100



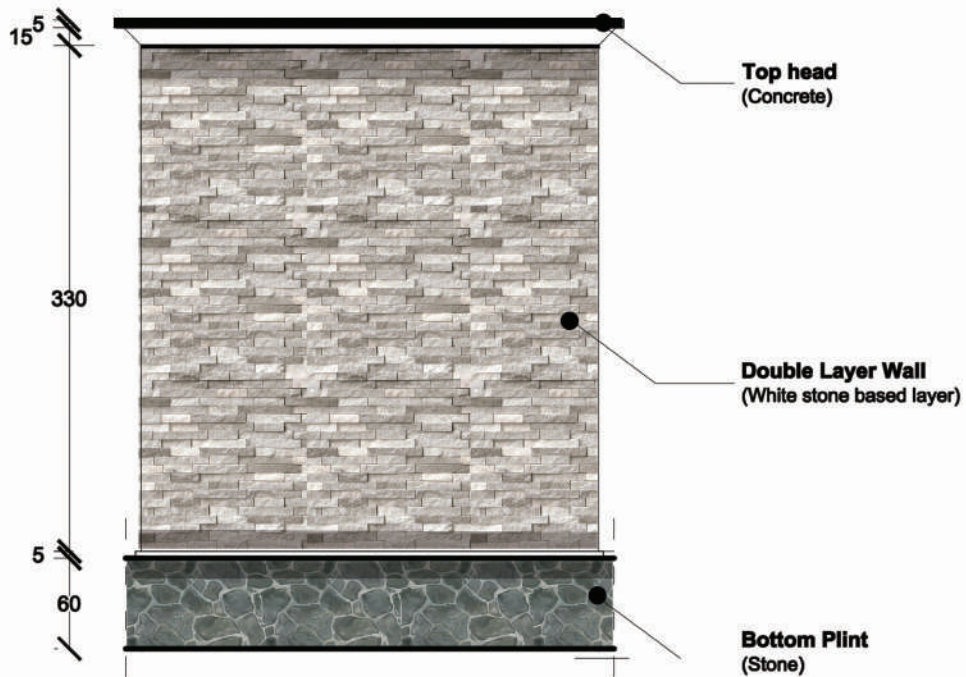
GLASS ROOFLIGHT
DETAIL PART
SCALE 1 : 50



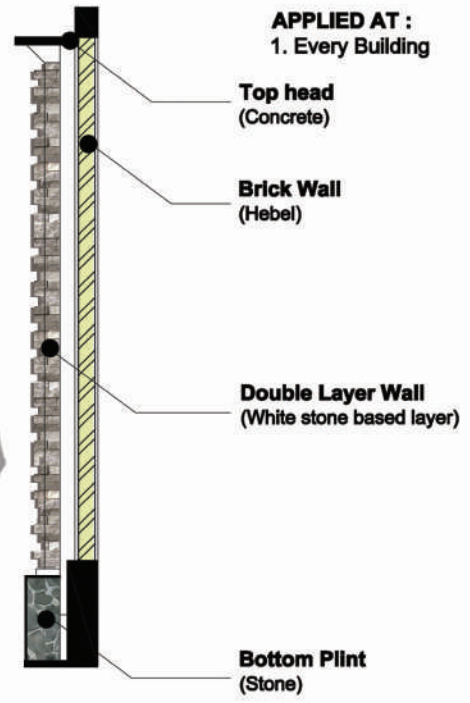
GLASS ROOFLIGHT
PERSPECTIVE

GLASS ROOFLIGHT
SIDE VIEW
SCALE 1 : 50

APPLIED AT :
1. Public Kitchen Instalation
2. Inpatient Instalation
3. Rehabilitation Instalation

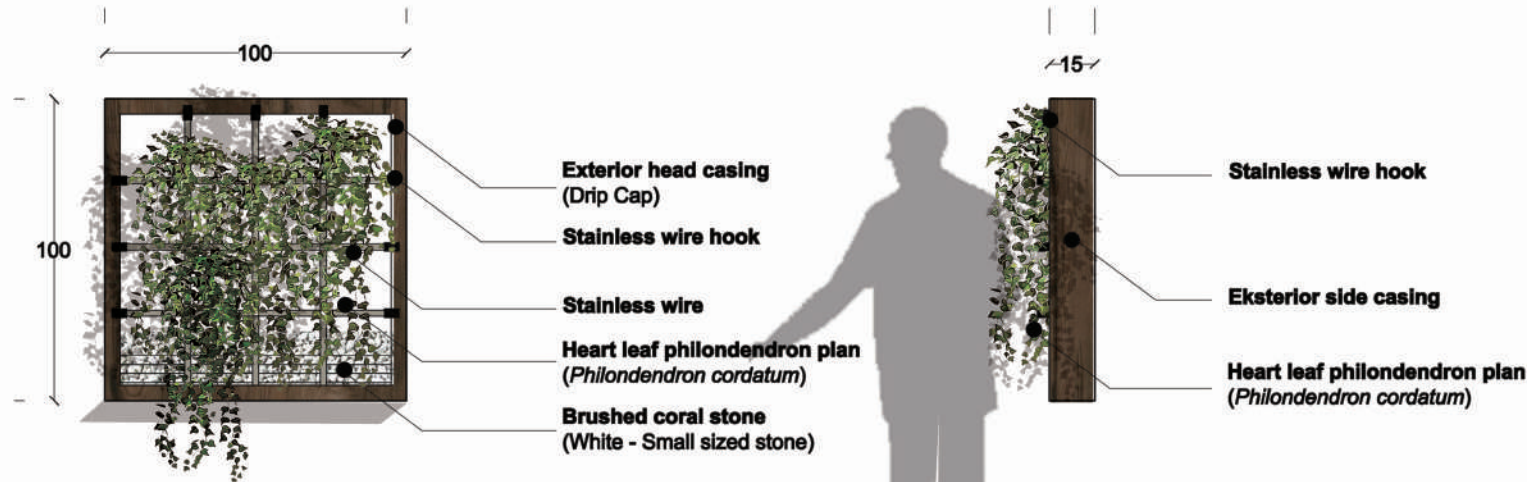


DOUBLE LAYER WALL
FRONT VIEW
SCALE 1 : 50



DOUBLE LAYER WALL
SIDE VIEW
SCALE 1 : 50

APPLIED AT :
1. Every window at the bathroom in the building

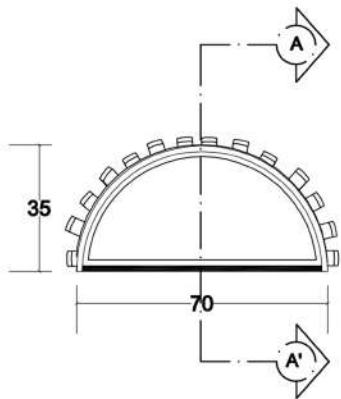


PLANT FILTERED VENTILATION
FRONT VIEW
SCALE 1 : 25

PLANT FILTERED VENTILATION
SIDE VIEW
SCALE 1 : 25

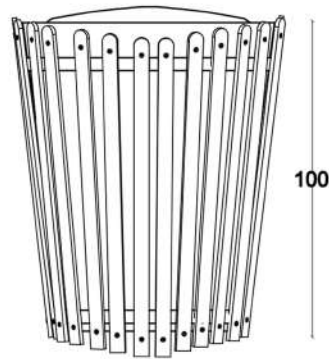


PLANT FILTERED VENTILATION
PERSPECTIVE



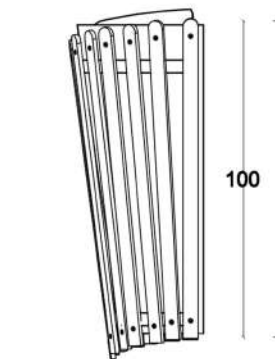
INDOOR GARBAGE BIN PLAN

SCALE 1:25



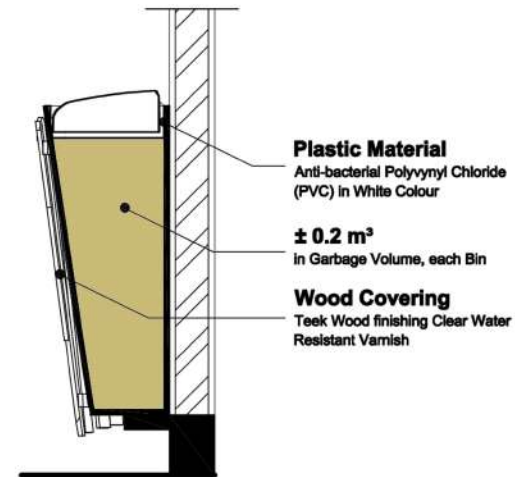
INDOOR GARBAGE BIN FRONT VIEW

SCALE 1:25



INDOOR GARBAGE BIN SIDE VIEW

SCALE 1:25



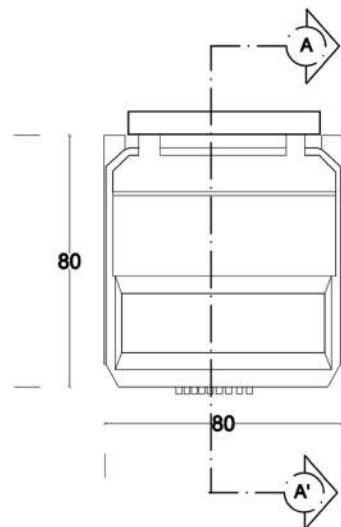
Plastic Material
Anti-bacterial Polyvinyl Chloride (PVC) in White Colour

$\pm 0.2 \text{ m}^3$
In Garbage Volume, each Bin

Wood Covering
Teak Wood finishing Clear Water Resistant Varnish

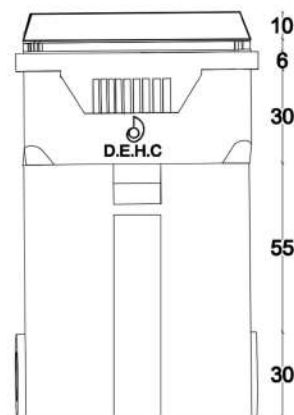
INDOOR GARBAGE BIN A - A' SECTION

SCALE 1:25



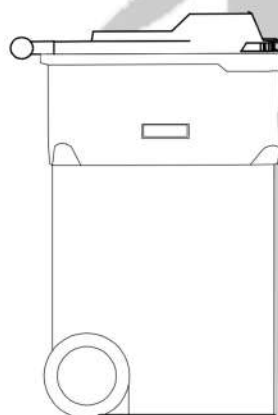
OUTDOOR GARBAGE BIN PLAN

SCALE 1:25



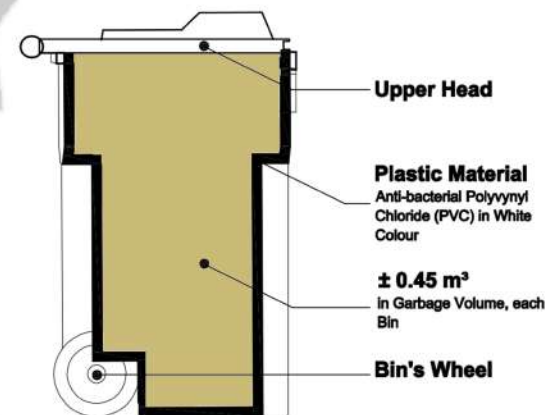
OUTDOOR GARBAGE BIN FRONT VIEW

SCALE 1:25



OUTDOOR GARBAGE BIN SIDE VIEW

SCALE 1:25



Upper Head

Plastic Material
Anti-bacterial Polyvinyl Chloride (PVC) in White Colour

$\pm 0.45 \text{ m}^3$
In Garbage Volume, each Bin

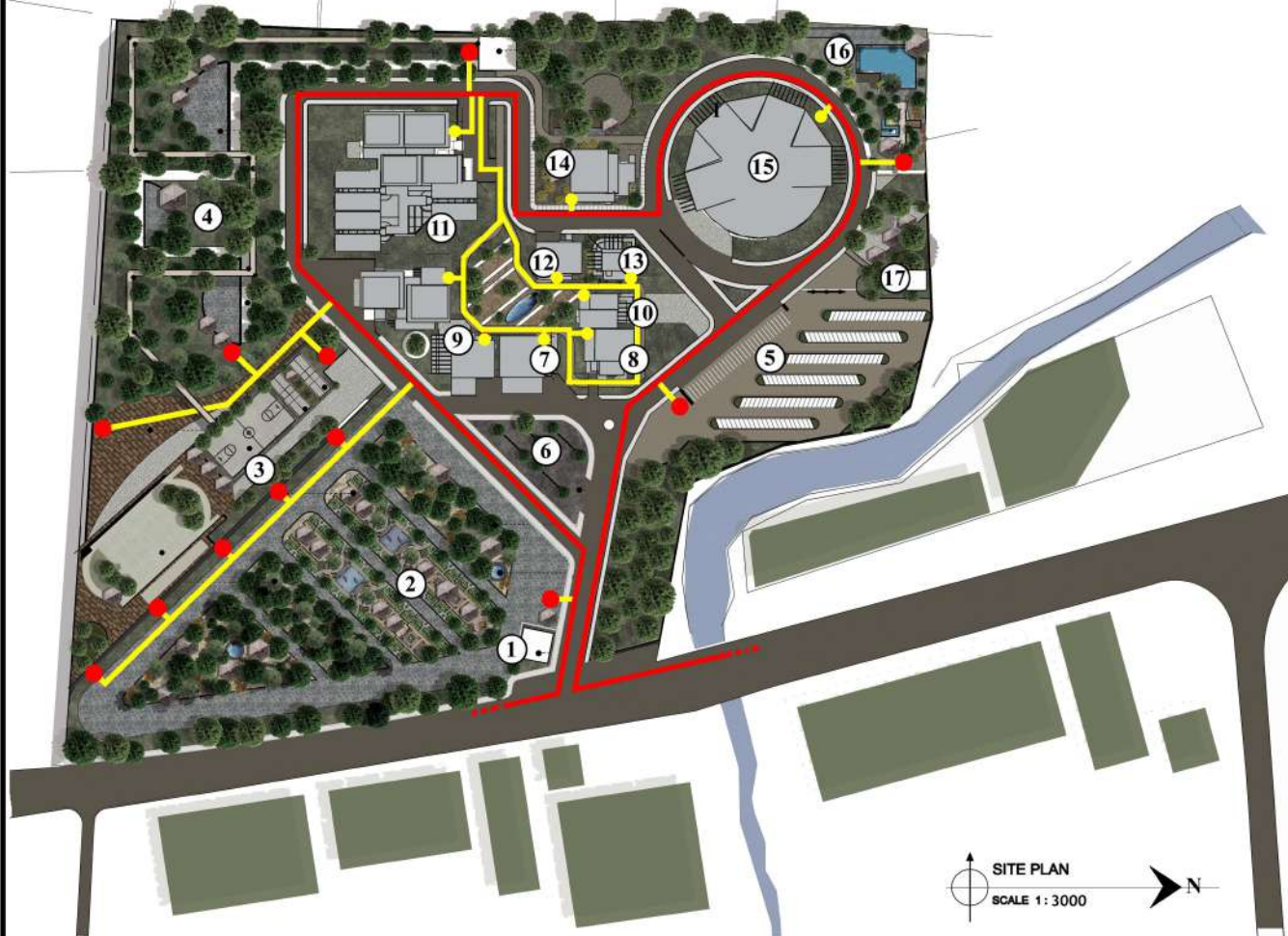
Bin's Wheel

OUTDOOR GARBAGE BIN A - A' SECTION

SCALE 1:25

LEGENDA

1. Security Post
2. Semi Interactive Park
3. Court
4. Urban Park
5. Cars Parking Lot
6. Motorcycle Parking Lot
7. Outpatients Instalations
8. Pharmacy Unit
9. Managerial Office
10. Urinalis anda Blood Laboratory
11. Emergency Unit
12. Public Kitchen
13. Clinical Nutritions Instalation
14. Inpatients Instalation
15. Rehabilitations Instalation
16. Gathering Dome
17. Incinerator Machine
18. Retention Pond

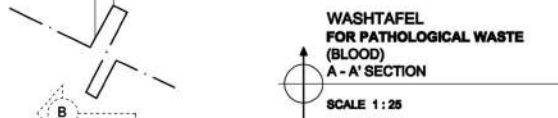
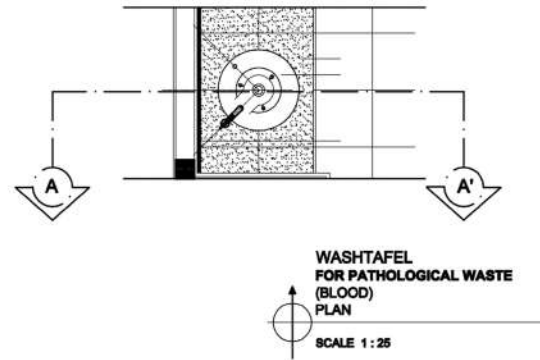
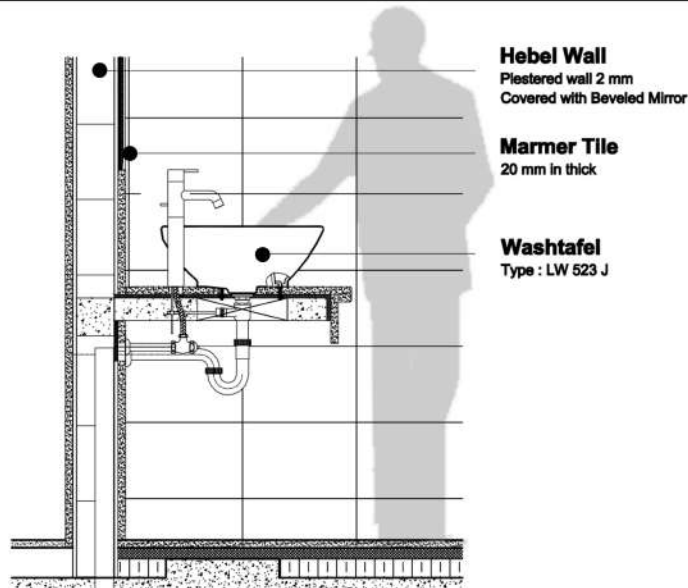


● Outdoor garbage bin placed point.

● Backdoor or Raredoor of the building which used to be pick-up point for the indoor waste from the indor garbage bin.

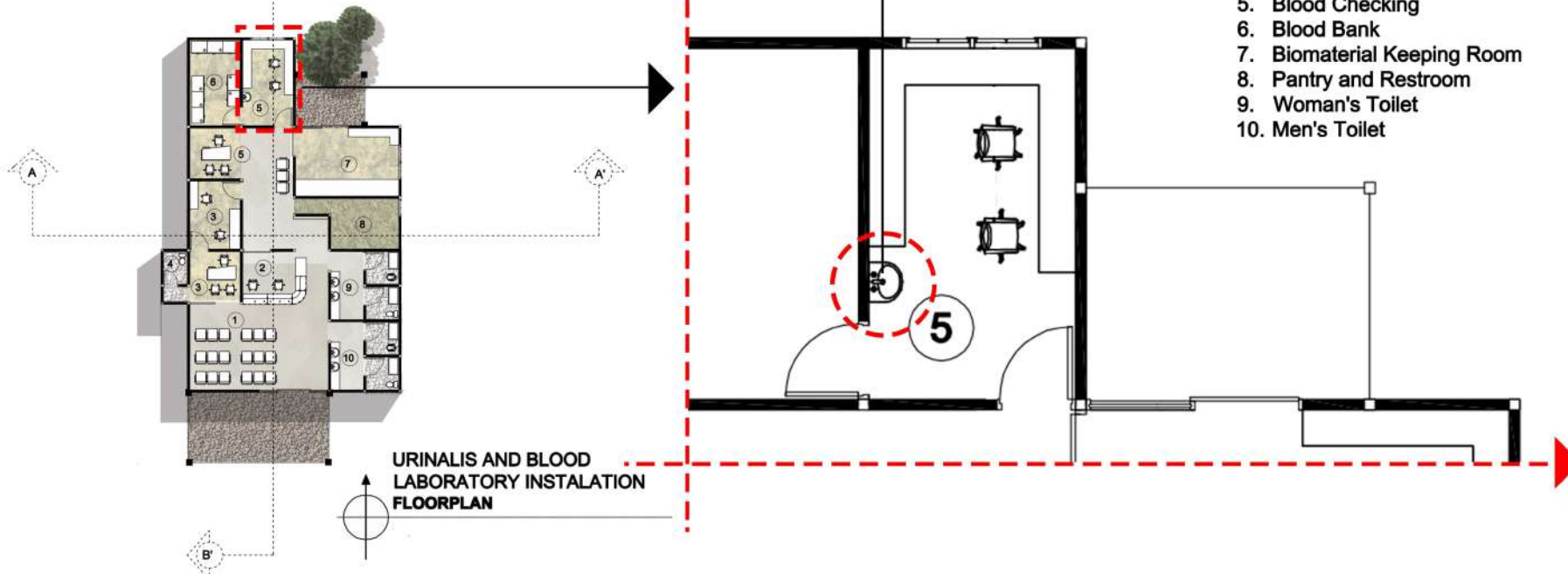
— Main line for the garbage truck.

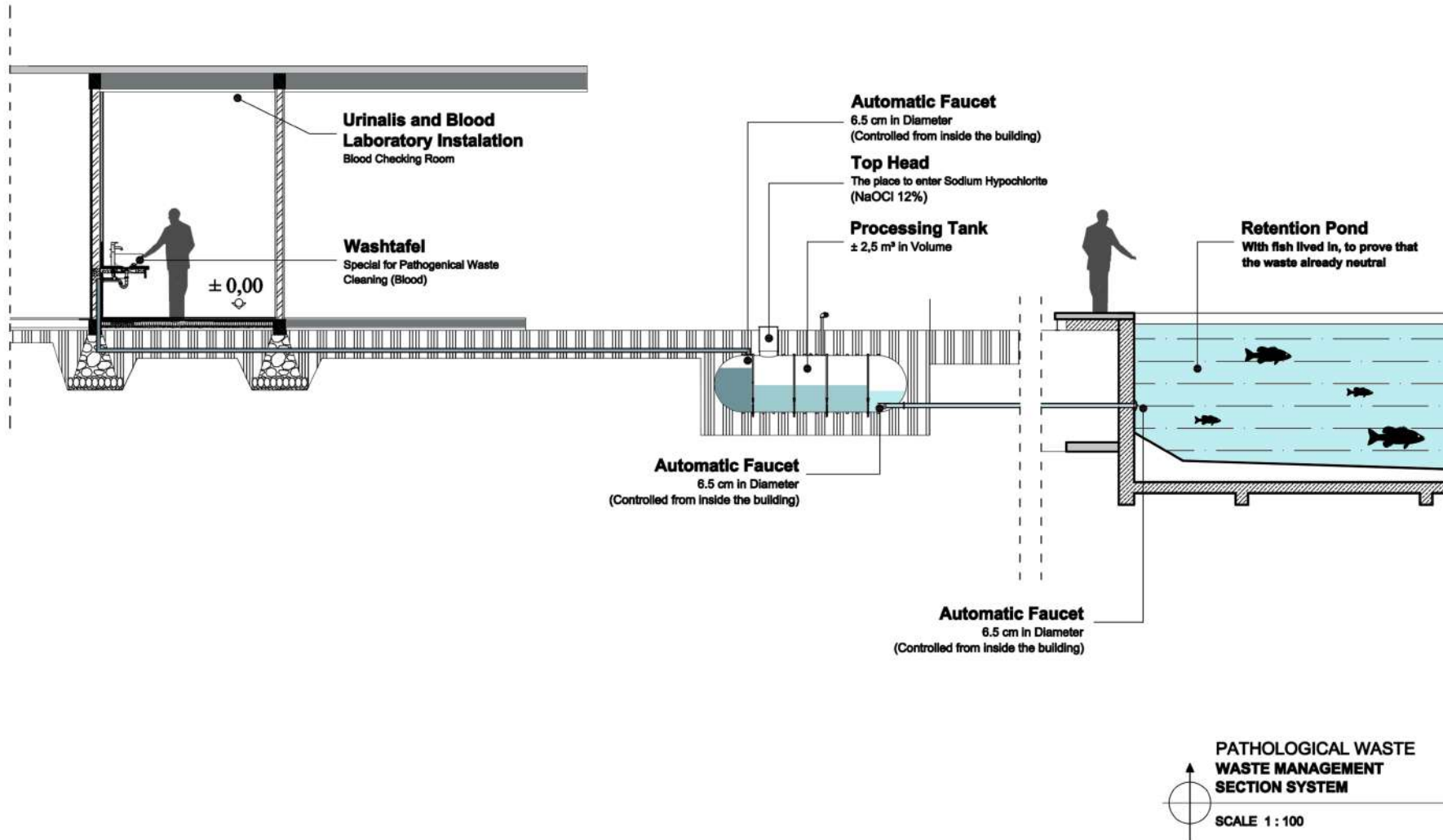
— The employe of the garbage management line to pick-up the garbage and bring to the garbage truck.



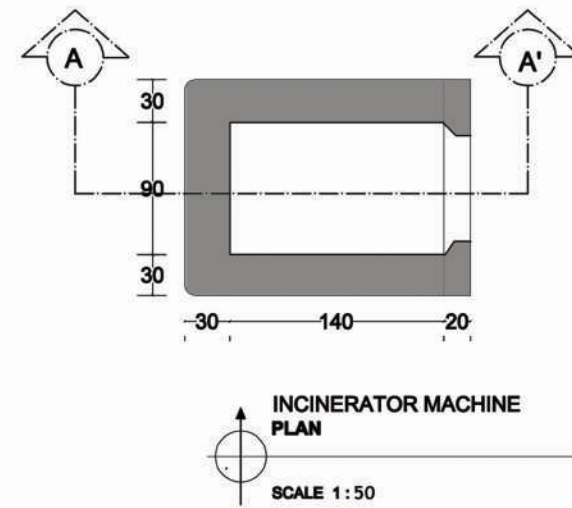
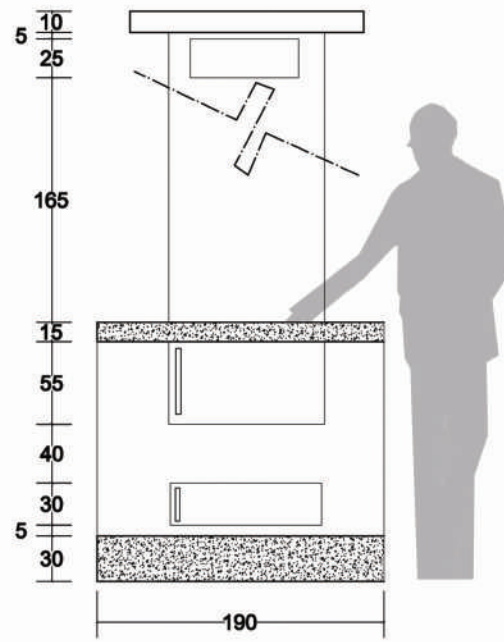
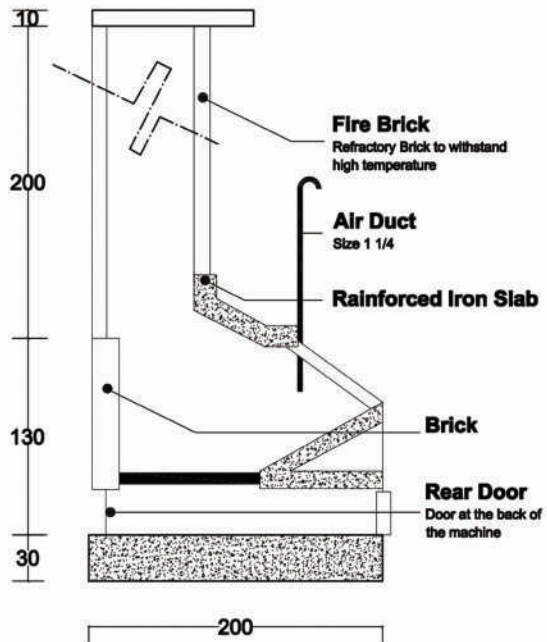
LEGENDA

1. Waiting Lobby
2. Receptionist
3. Urinalis
4. Toilet
5. Blood Checking
6. Blood Bank
7. Biomaterial Keeping Room
8. Pantry and Restroom
9. Woman's Toilet
10. Men's Toilet



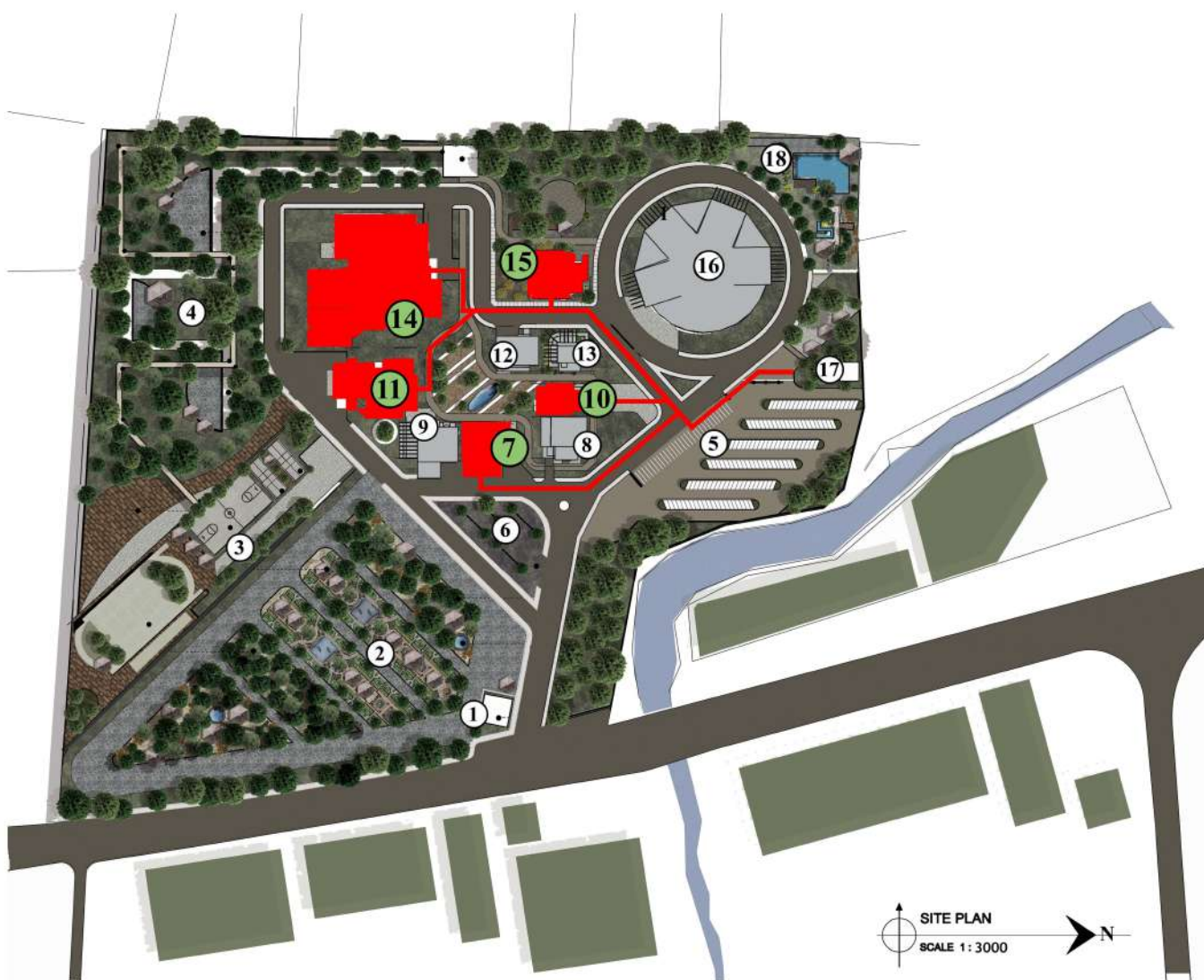


PATHOLOGICAL WASTE WASTE MANAGEMENT SECTION SYSTEM
SCALE 1 : 100



17 Incinerator Machine LOCATION





LEGENDA

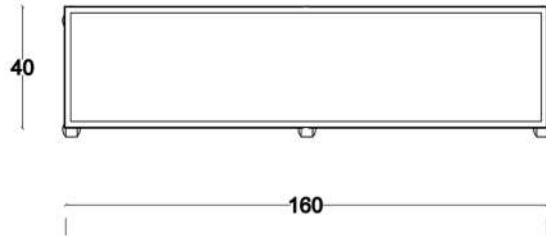
1. Security Post
2. Semi Interactive Park
3. Court
4. Urban Park
5. Cars Parking Lot
6. Motorcycle Parking Lot
7. Outpatients Instalations
8. Pharmacy Unit
9. Managerial Office
10. Urinalis anda Blood Laboratory
11. Emergency Unit
12. Public Kitchen
13. Clinical Nutritions Instalation
14. Inpatients Instalation
15. Rehabilitations Instalation
16. Gathering Dome
17. Incinerator Machine
18. Retention Pond

- Building that mostly contributed in the amount of the infectious and contagious medical waste.
- The Line to the Incinerator Machine

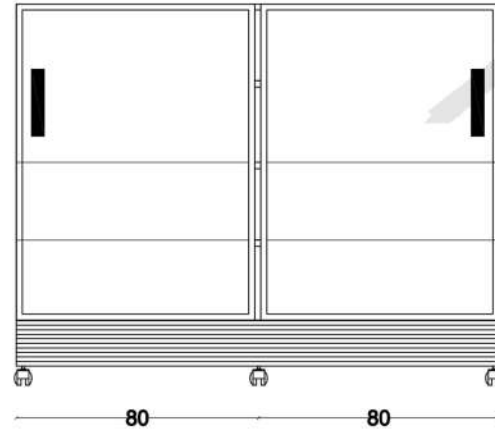
SITE PLAN
SCALE 1:3000

INFORMATION :

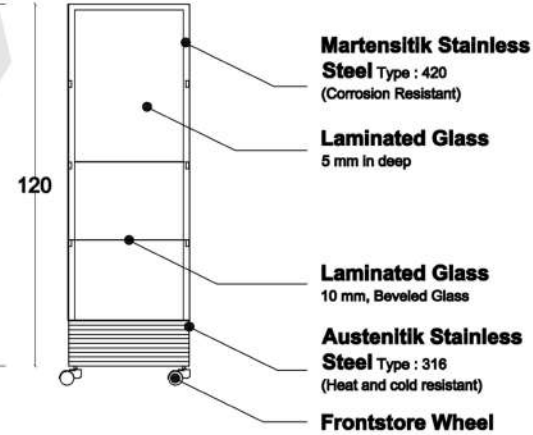
FOR THE UN-EXPIRED DRUG LEFT FROM THE PATIENT, IT WILL BE RETURNED TO THE DRUG WAREHOUSE AT THE PHARMACY INSTALLATION AND PLACED IN THE SPECIAL FRONTSTORE, SO IT DOES'T MIXED UP WITH THE NEW DRUG



FRONTSTORE FOR UN-EXPIRED PHARMACY WASTE PLAN
SCALE 1 : 25



FRONTSTORE FOR UN-EXPIRED PHARMACY WASTE FRONT VIEW
SCALE 1 : 25



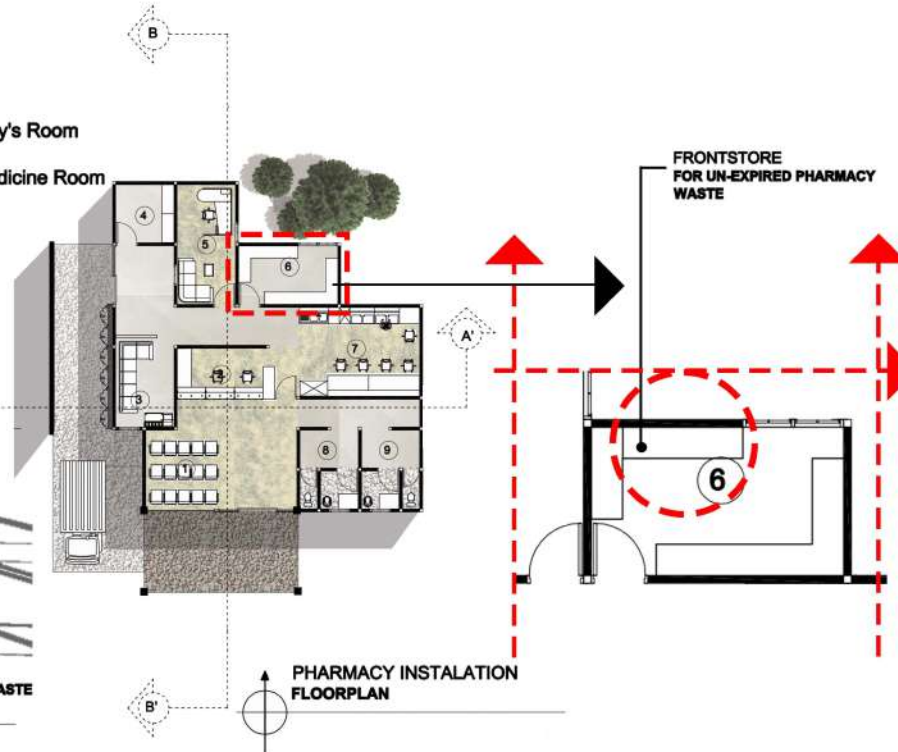
FRONTSTORE FOR UN-EXPIRED PHARMACY WASTE SIDE VIEW
SCALE 1 : 25



FRONTSTORE FOR UN-EXPIRED PHARMACY WASTE PERSPECTIVE

LEGENDA

1. Waiting Lobby
2. Receptionist
3. Pantry
4. Storage
5. Chief Of Pharmacy's Room
6. Drug warehouse
7. Compounding Medicine Room
8. Men's Toilet
9. Woman's Toilet



PHARMACY INSTALLATION FLOORPLAN

INFORMATION :

FOR THE **EXPIRED DRUG**, THE DRUG WILL BE BURNED INTO THE INCINERATOR MACHINE OR RETURNED TO THE FACTORY IF THE SITE DOESN'T HAVE SUCH AS INCINERATOR MACHINE.



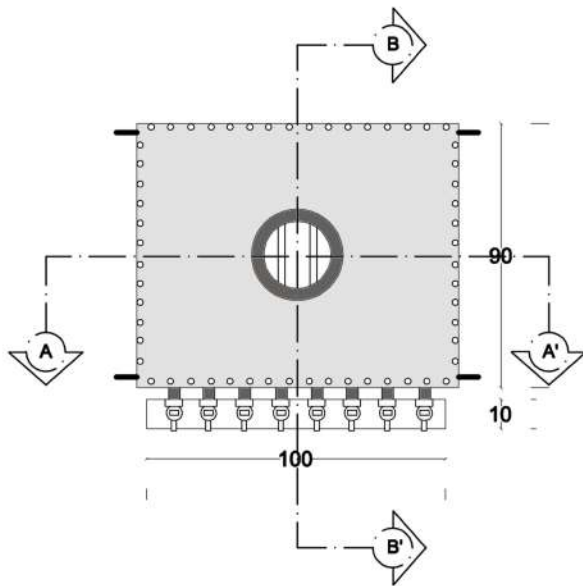
LEGENDA

1. Security Post
2. Semi Interactive Park
3. Court
4. Urban Park
5. Cars Parking Lot
6. Motorcycle Parking Lot
7. Outpatients Instalations
8. Pharmacy Unit
9. Managerial Office
10. Urinalis anda Blood Laboratory
11. Emergency Unit
12. Public Kitchen
13. Clinical Nutritions Instalation
14. Inpatients Instalation
15. Rehabilitations Instalation
16. Gathering Dome
17. Incinerator Machine
18. Retention Pond

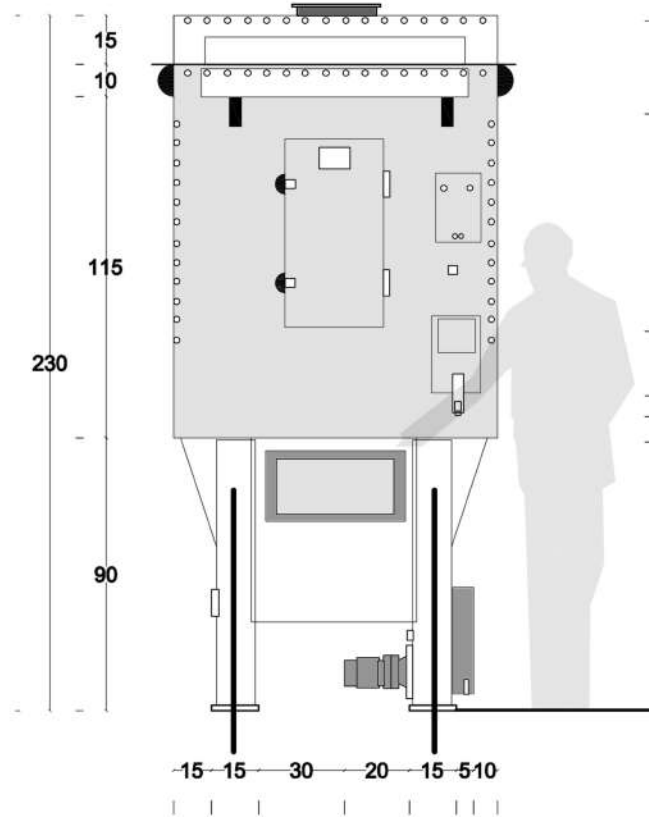
■ Pharmacy Instalation

— The line to go to the incinerator machine for burning the medical waste that already expired or out of the date

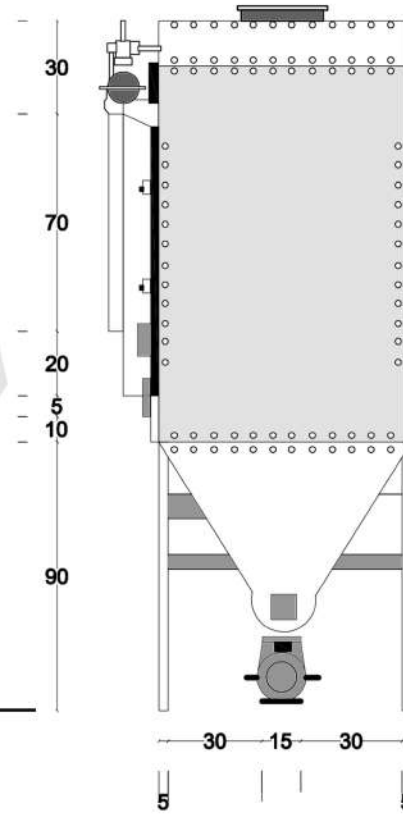
SITE PLAN
SCALE 1: 3000



APCE
(AIR POLLUTION CONTROL EQUIPMENT)
PLAN
SCALE 1:25



APCE
(AIR POLLUTION CONTROL EQUIPMENT)
A - A' SECTION
SCALE 1:25



APCE
(AIR POLLUTION CONTROL EQUIPMENT)
B - B' SECTION
SCALE 1:25

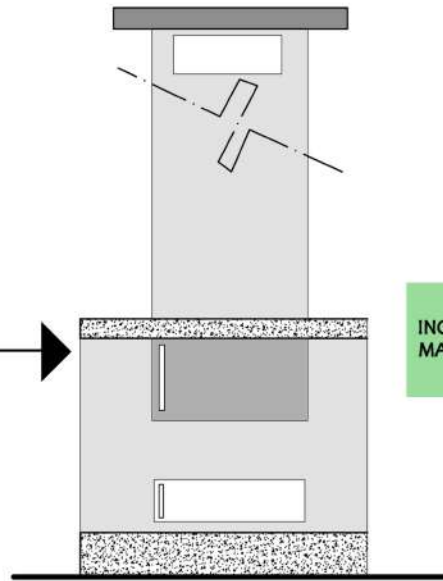
GASSES WASTE

FROM THE :
Inpatient Insulation
Rehabilitation Instalation
Emergency Unit

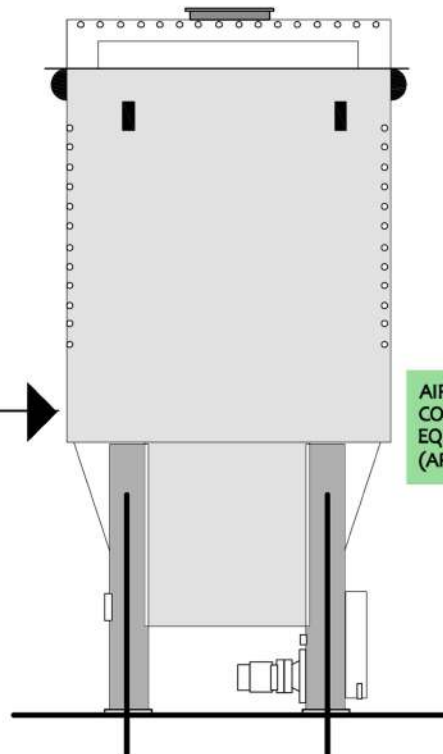
NOT EXPLOSIVE
GASSES WASTE



EXPLOSIVE GASSES
WASTE

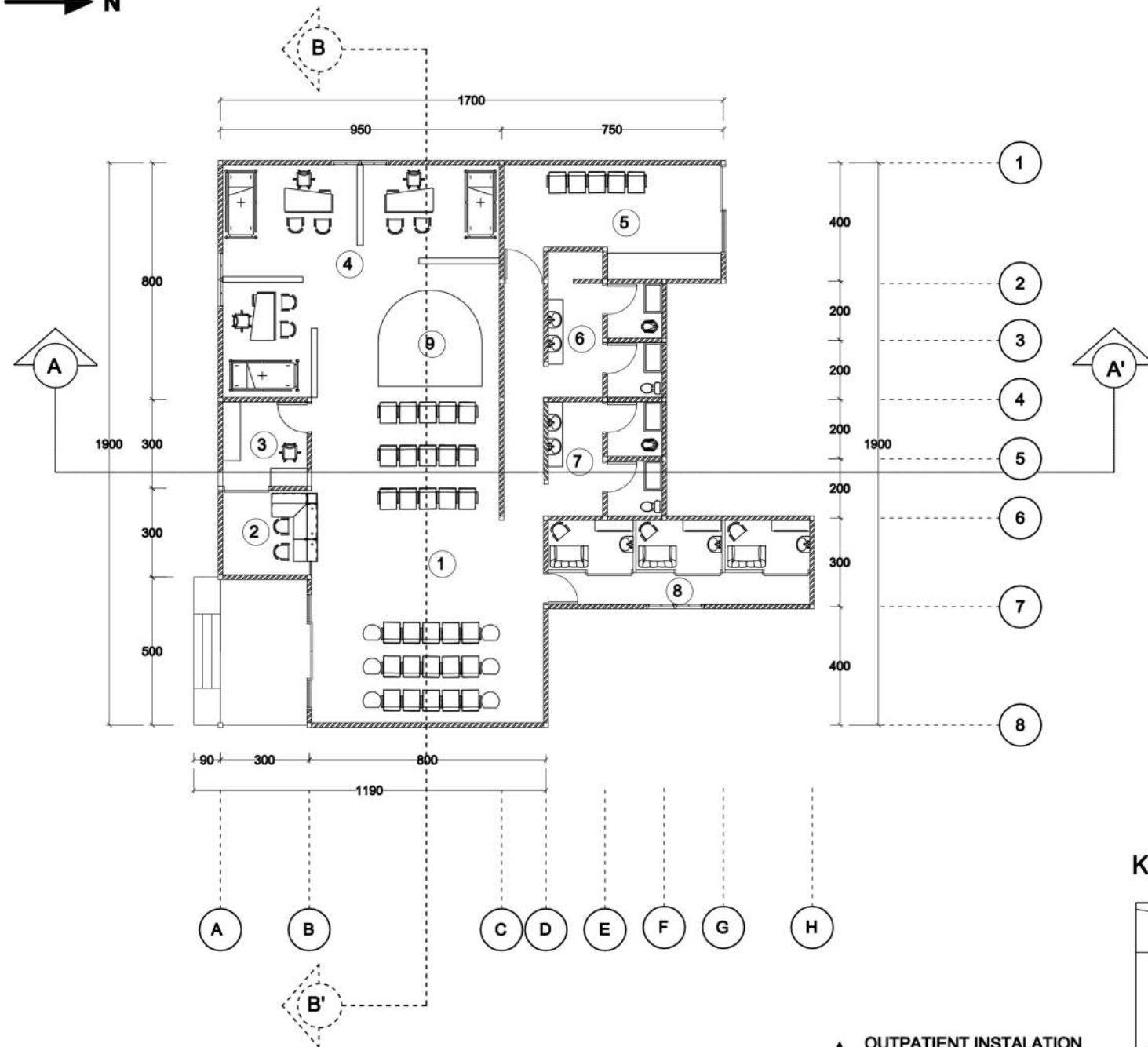


INCINERATOR
MACHINE



AIR POLUTION
CONTROL
EQUIPMENT
(APCE)

RELEASED
TO THE AIR



LEGENDA

1. Waiting Lobby
2. Receptionist
3. Medical Record Room
4. Action Room
5. Employee's Restroom
6. Woman's Toilet
7. Men's Toilet
8. Lactation/ Nursery Room
9. Indoor Garden



UNIVERSITAS ISLAM NEGERI
MAULANA MALIK IBRAHIM
Jln. Gajeyana No.50 Malang

ARCHITECTURE ENGINEERING

PROJECT TITLE

DIABETES AND ENDOCRINOLOGY
HEALTHCARE CENTER DESIGN
IN MALANG CITY

STUDENT NAME

QURROTA AYUN

STUDENT NUMBER

16660113

LECTURES GUIDE

PRIMA KURNIAWATY M. SI.
ALDRIN YUSUF FIRMANSAH M.T.

IMAGE TITLE
DETAIL ENGINEERING DESIGN

FLOOR PLAN

BUILDING NAME

**OUTPATIENTS
INSTALATION**

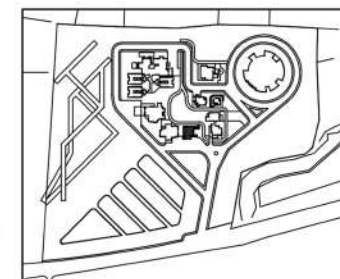
IMAGE SCALE

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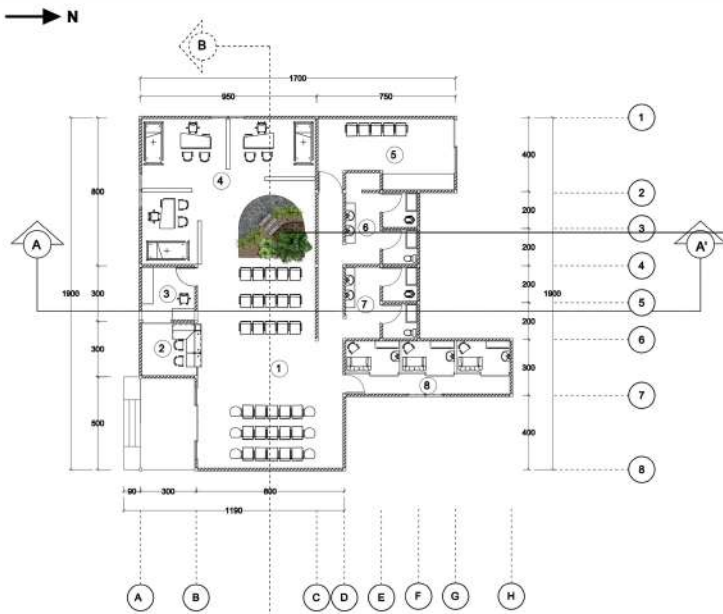
IMAGE NUMBER :

01

KEYPLAN



**OUTPATIENT INSTALATION
FLOORPLAN**
SCALE 1 : 200



**OUTPATIENT INSTALATION
FLOORPLAN**

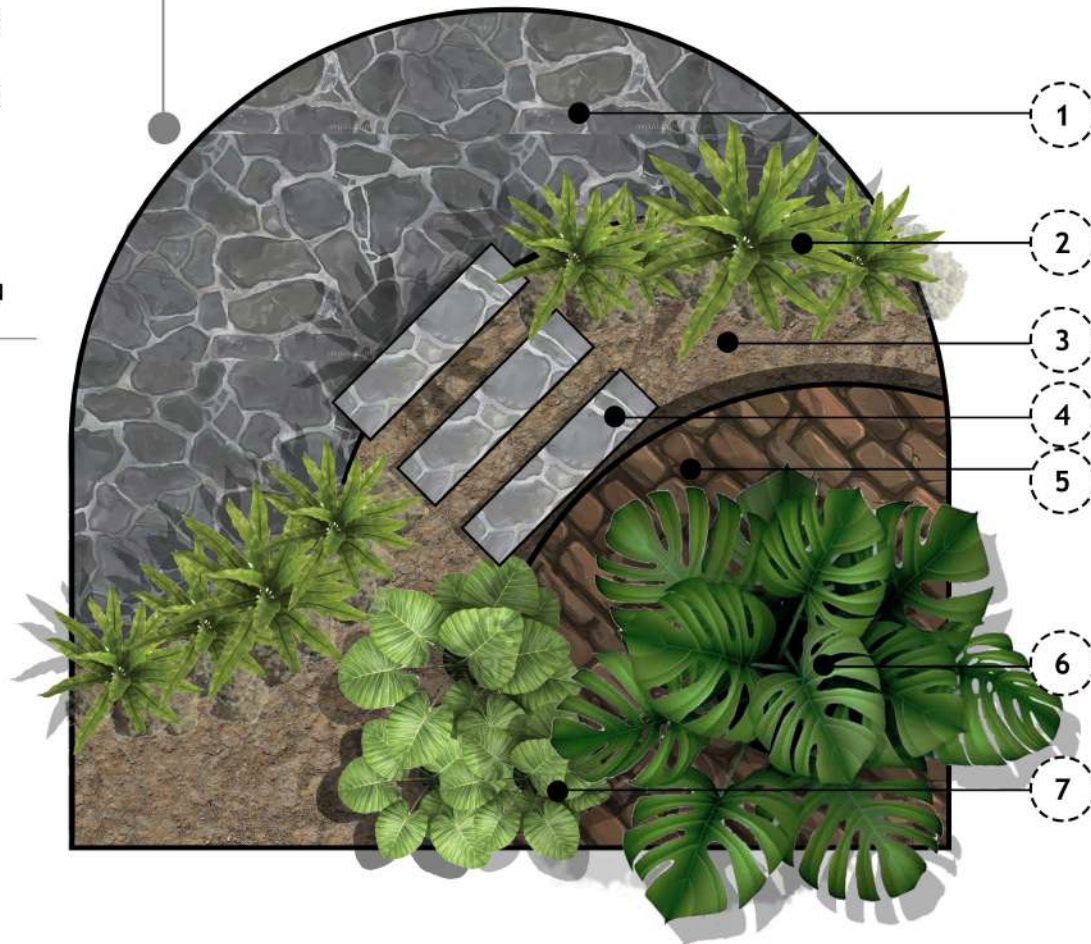
SCALE 1 : 400

LEGENDA

1. Waiting Lobby
2. Receptionist
3. Medical Record Room
4. Action Room
5. Employee's Restroom
6. Woman's Toilet
7. Men's Toilet
8. Lactation/ Nursery Room
9. Indoor Garden

LEGENDA

1. Textured stone floor
2. Spider Plant
3. Brushes brown coral floor
4. Pedestrian way
5. Brick floor
6. Monstera plant
7. Philodendron plant



**OUTPATIENT INSTALATION
INDOOR GARDEN**
SKALA 1 : 30

PROJECT TITLE

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HEALTHCARE CENTER DESIGN
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STUDENT NAME

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PRIMA KURNIAWATY M. SI.
ALDRIN YUSUF FIRMANSYAH M.T.

IMAGE TITLE
DETAIL ENGINEERING DESIGN

FLOOR PLAN

BUILDING NAME

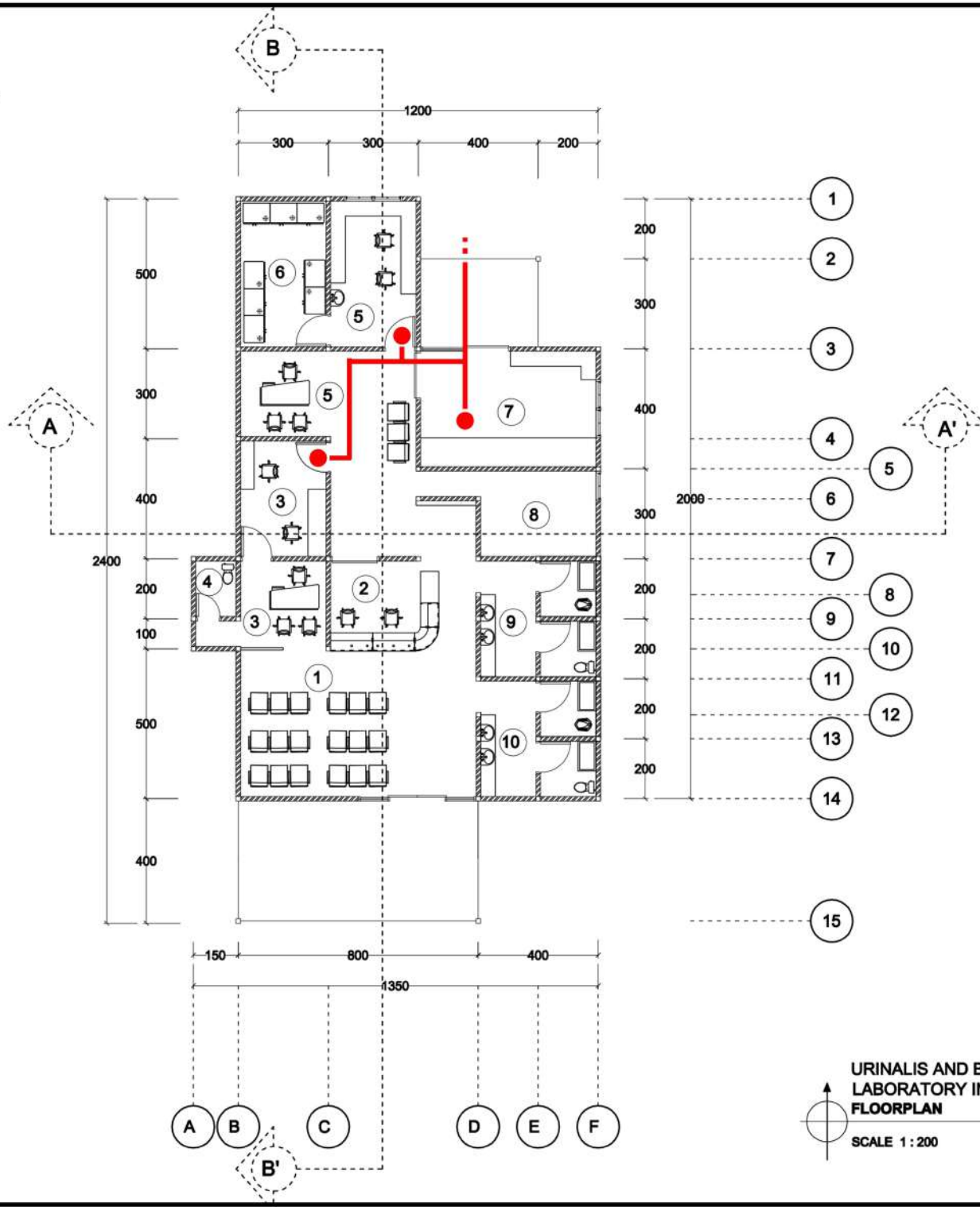
**OUTPATIENTS
INSTALATION**

IMAGE SCALE

1 : 200

IMAGE NUMBER :

01_B



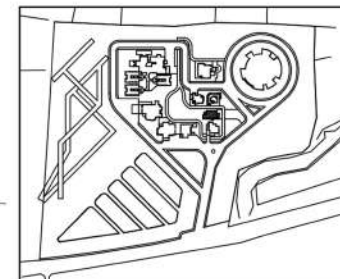
LEGENDA

1. Waiting Lobby
2. Receptionist
3. Urinalis
4. Toilet
5. Blood Checking
6. Blood Bank
7. Biomaterial Keeping Room
8. Pantry and Restroom
9. Woman's Toilet
10. Men's Toilet

LEGENDA

- Medical solid waste line
- Waste pick point door

KEYPLAN



URINALIS AND BLOOD
LABORATORY INSTALATION
FLOORPLAN

SCALE 1 : 200



UNIVERSITAS ISLAM NEGERI
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IMAGE TITLE
DETAIL ENGINEERING DESIGN

FLOOR PLAN

BUILDING NAME

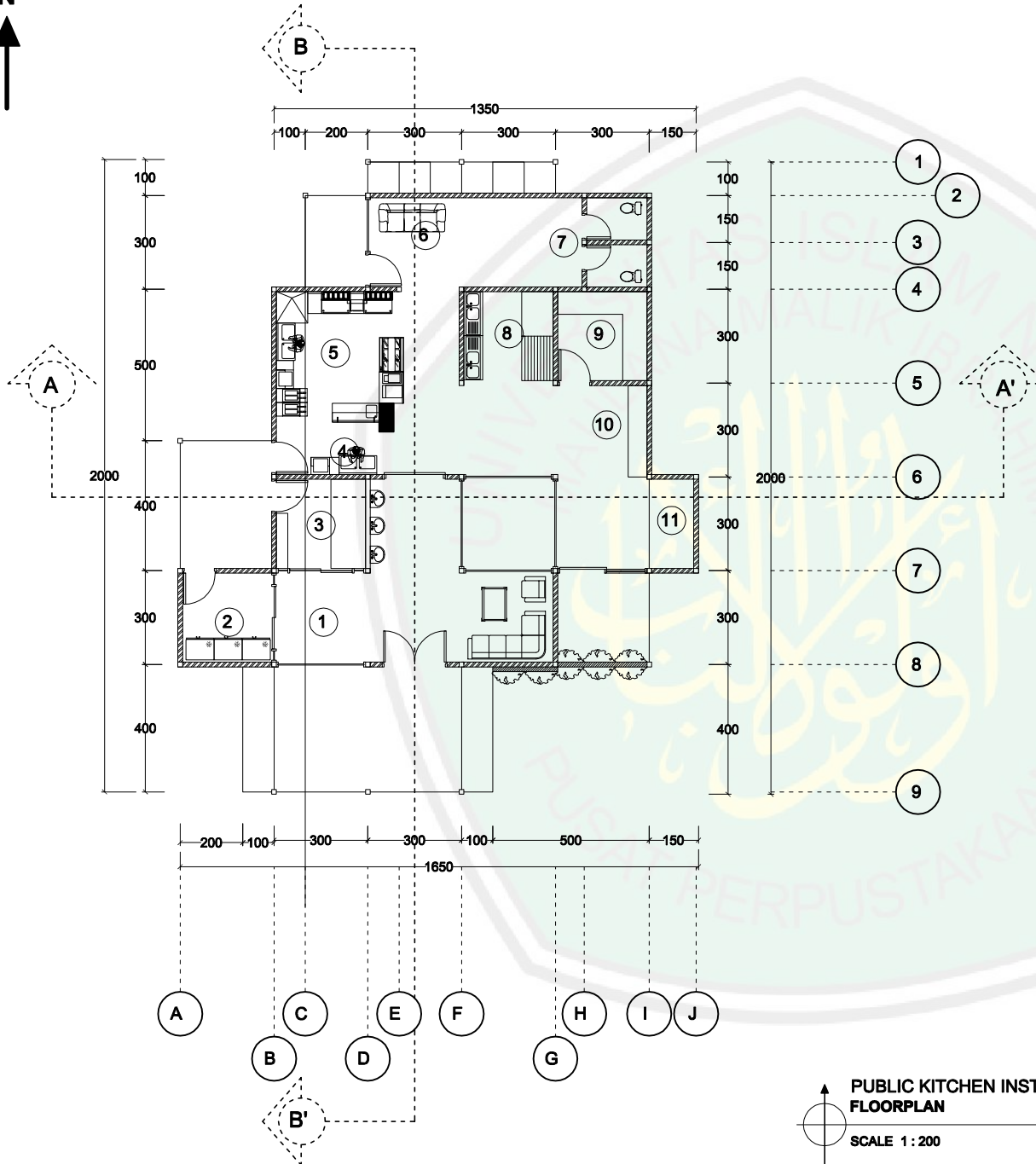
URINALIS AND BLOOD
LABORATORY
INSTALATION

IMAGE SCALE

1 : 200

IMAGE NUMBER :

02



LEGENDA

1. Food Receiving and Weighing Room
2. Wet Food Storage
3. Dry Food Storage
4. Ingredient Cleaning Spot
5. Food Processing Room
6. Rest Room
7. Public Toilet
8. Equipment Washing Room
9. Equipment Storage Room
10. Trolley Room
11. Food Presentation and Distribution Room



Diabetes and
Endocrinology
Healthcare Center

UNIVERSITAS ISLAM NEGERI
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Jln. Gajayana No.50 Malang

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STUDENT NAME

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PRIMA KURNIAWATY M. SI.
ALDRIN YUSUF FIRMANSYAH M.T.

IMAGE TITLE
DETAIL ENGINEERING DESIGN

FLOOR PLAN

BUILDING NAME

PUBLIC KITCHEN
INSTALATION

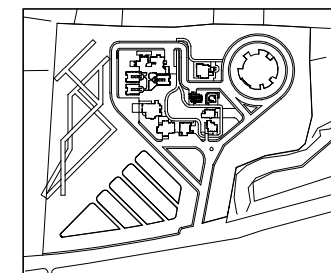
IMAGE SCALE

1 : 200

IMAGE NUMBER :

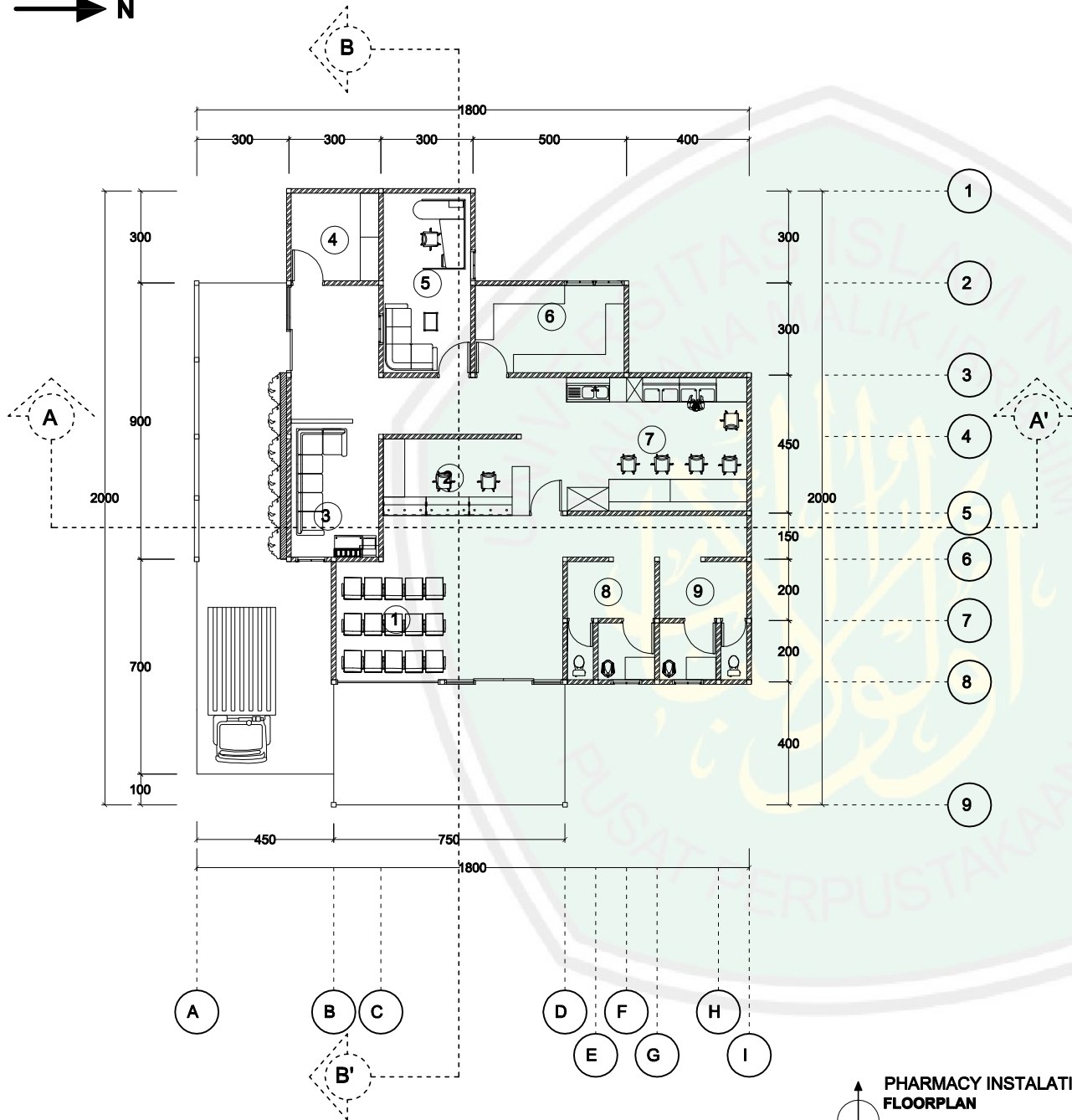
03

KEYPLAN



PUBLIC KITCHEN INSTALATION
FLOORPLAN

SCALE 1 : 200



LEGENDA

1. Waiting Lobby
2. Receptionist
3. Pantry
4. Storage
5. Chief Of Pharmacy's Room
6. Druf warehouse
7. Compounding Medicine Room
8. Men's Toilet
9. Woman's Toilet



UNIVERSITAS ISLAM NEGERI
MAULANA MALIK IBRAHIM
Jln. Gajayana No.50 Malang

ARCHITECTURE ENGINEERING

PROJECT TITLE

DIABETES AND ENDOCRINOLOGY
HEALTHCARE CENTER DESIGN
IN MALANG CITY

STUDENT NAME

QURROTA AYUN

STUDENT NUMBER

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LECTURES GUIDE

PRIMA KURNIAWATY M. SI.
ALDRIN YUSUF FIRMANSYAH M.T.

IMAGE TITLE
DETAIL ENGINEERING DESIGN

FLOOR PLAN

BUILDING NAME

**PHARMACY
INSTALATION**

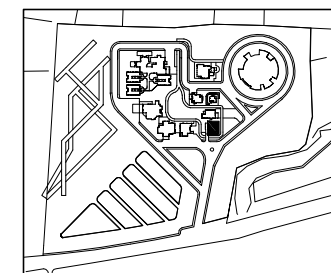
IMAGE SCALE

1 : 200

IMAGE NUMBER :

04

KEYPLAN



**PHARMACY INSTALATION
FLOORPLAN**
SCALE 1 : 200

LIBRARY OF MAULANA MALIK IBRAHIM STATE ISLAMIC UNIVERSITY OF MALANG



LEGENDA

1. Nutritionist Room
2. Model and Miniature Room
3. Woman's Toilet
4. Men's Toilet
5. Storage
6. Example Plant Display (For Diabetes)
7. Planting Equipment's Storage
8. Second Entrance Door



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Jln. Gajayana No.50 Malang

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STUDENT NAME
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STUDENT NUMBER
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LECTURES GUIDE
PRIMA KURNIAWATY M. SI.
ALDRIN YUSUF FIRMANSYAH M.T.

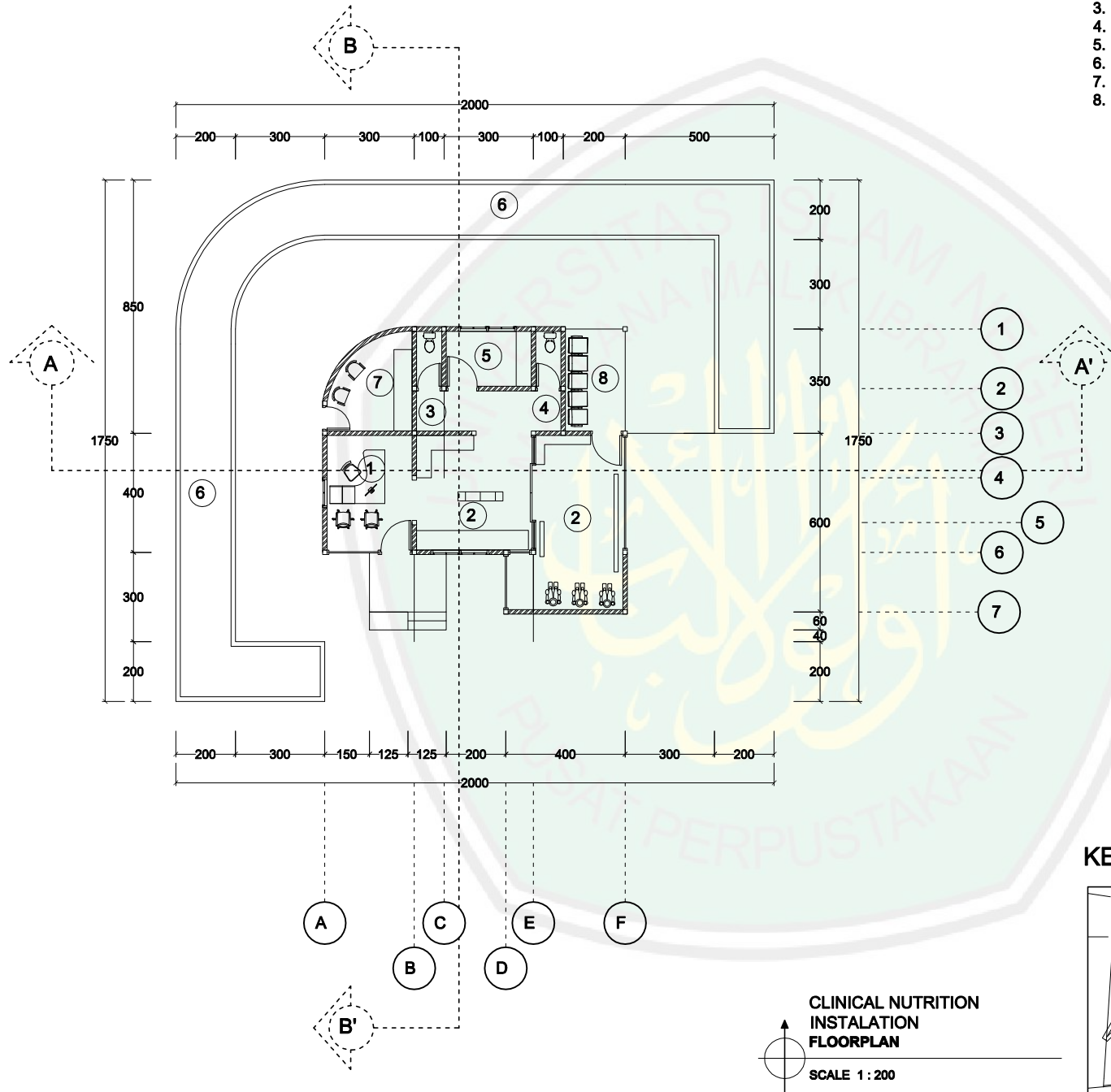
IMAGE TITLE
DETAIL ENGINEERING DESIGN
FLOOR PLAN

BUILDING NAME
CLINICAL NUTRITIONS
INSTALATION

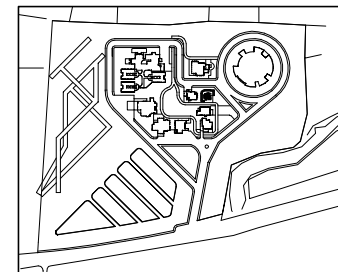
IMAGE SCALE
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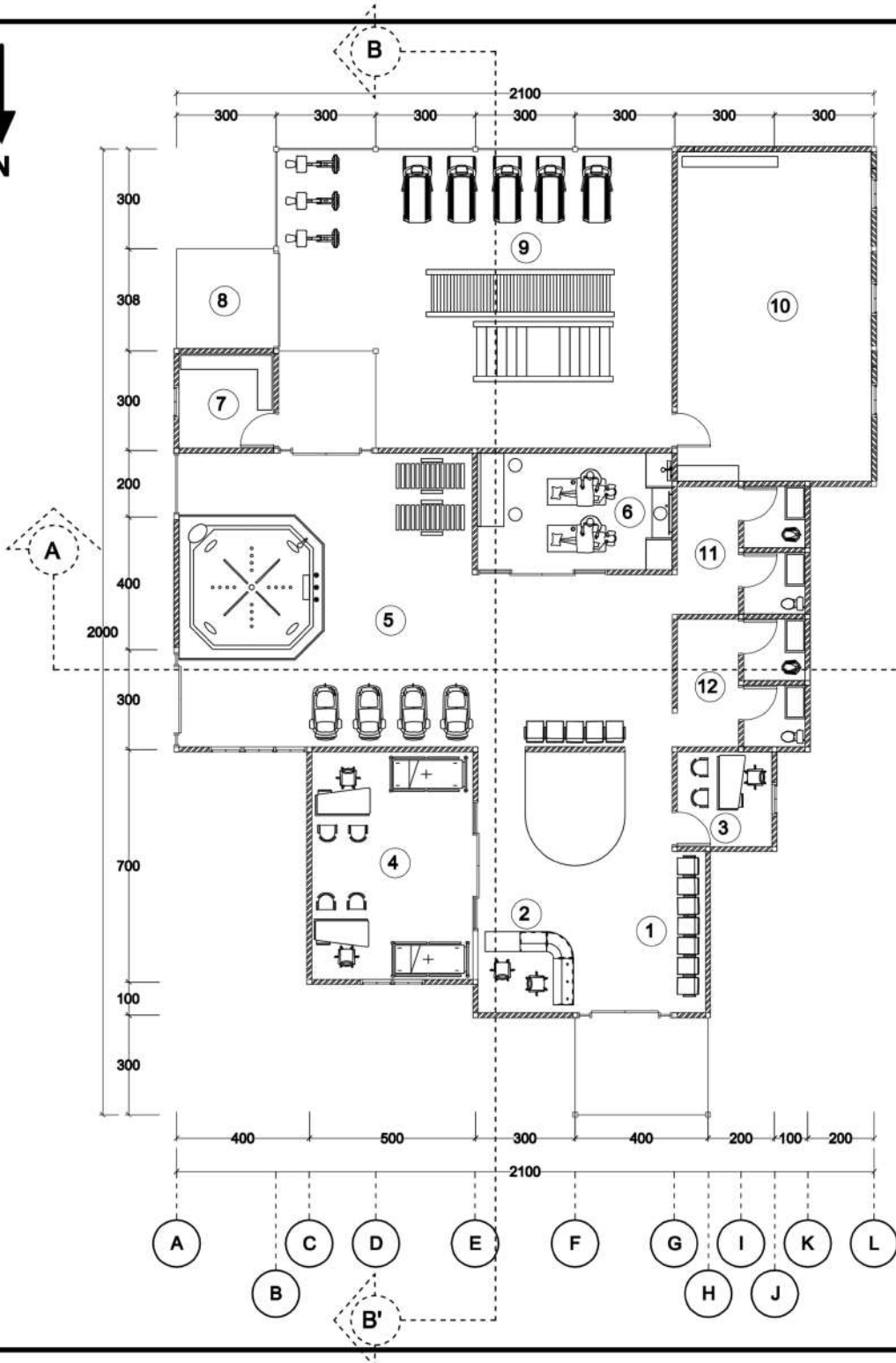
05



KEYPLAN

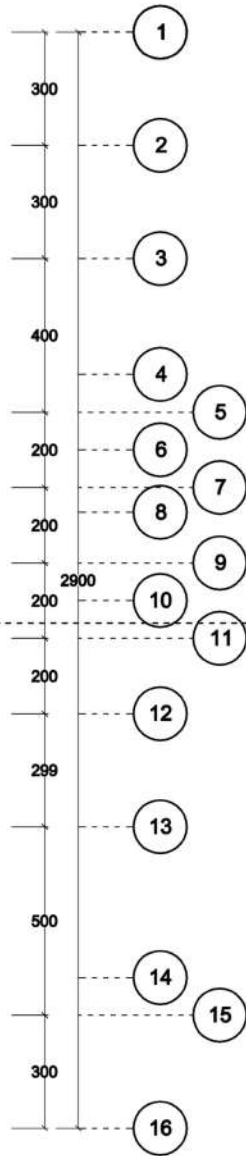


CLINICAL NUTRITION
INSTALATION
FLOORPLAN
SCALE 1 : 200

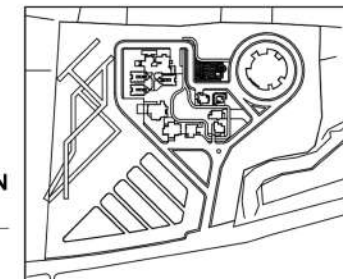


LEGENDA

1. Waiting Lobby
2. Receptionist
3. Chief Of Instalation's Room
4. Checking Room
5. Pasive Psiotherapy Area
6. Pasive Psiotherapy Area (Massage Room)
7. Storage
8. Backdoor Emergency Exit
9. Active Psiotherapy Area
10. Active Psiotherapy Area (Private Aerobic Room)
11. Woman's Toilet
12. Men's Toilet



KEYPLAN



REHABILITATION INSTALATION FLOORPLAN

SCALE 1 : 200

PROJECT TITLE

DIABETES AND ENDOCRINOLGY HEALTHCARE CENTER DESIGN IN MALANG CITY

STUDENT NAME

QURROTA AYUN

STUDENT NUMBER

16660113

LECTURES GUIDE

PRIMA KURNIAWATY M. SI.
ALDRIN YUSUF FIRMANSYAH M.T.

IMAGE TITLE
DETAIL ENGINERING DESIGN

FLOOR PLAN

BUILDING NAME

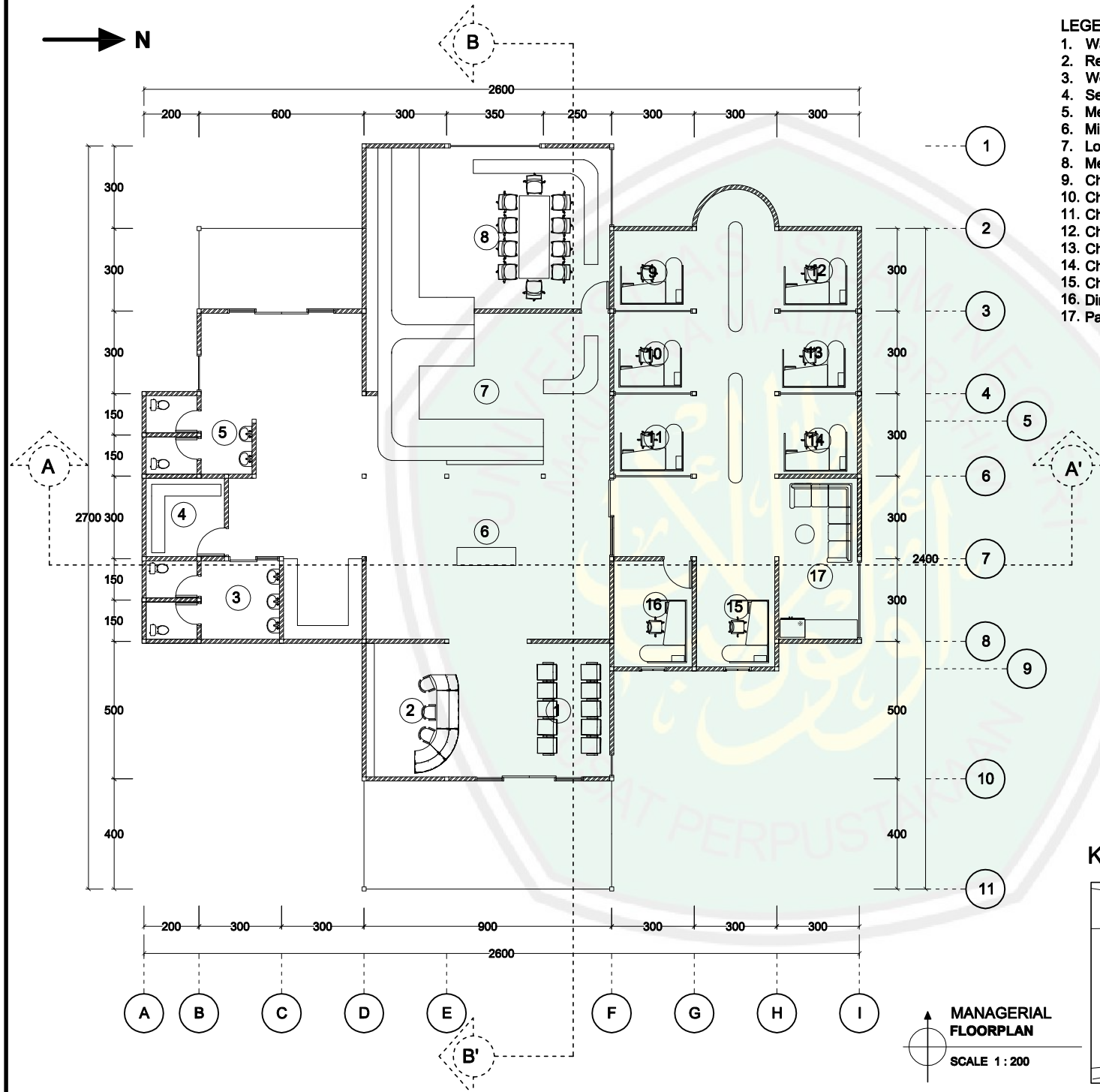
REHABILITATION INSTALATION

IMAGE SCALE

1 : 200

IMAGE NUMBER :

06



LEGENDA

1. Waiting Lobby
2. Receptionist
3. Woman's Toilet
4. Service Room
5. Men's Toilet
6. Mini Managerial's Hall (Exhibition Space)
7. Lounge (VIP Waiting Room)
8. Meeting Room
9. Chief of Human Resource's Room
10. Chief of Nurse's Room
11. Chief of Commite's Room
12. Chief of Medical Service's Room
13. Chief of Financial's Room
14. Chief of Medical Support's Room
15. Chief of General Operasion's Room
16. Director's Room
17. Pantry



UNIVERSITAS ISLAM NEGERI
MAULANA MALIK IBRAHIM
Jln. Gajeyana No.50 Malang

ARCHITECTURE ENGINEERING

PROJECT TITLE

DIABETES AND ENDOCRINOLGY
HEALTHCARE CENTER DESIGN
IN MALANG CITY

STUDENT NAME

QURROTA AYUN

STUDENT NUMBER

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PRIMA KURNIAWATY M. SI.
ALDRIN YUSUF FIRMANSYAH M.T.

IMAGE TITLE
DETAIL ENGINEERING DESIGN

FLOOR PLAN

BUILDING NAME

MANAGERIAL

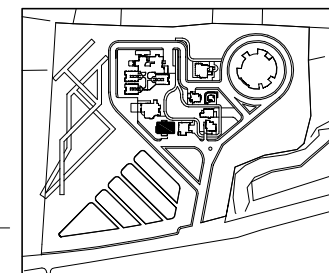
IMAGE SCALE

1 : 200

IMAGE NUMBER :

07

KEYPLAN



**MANAGERIAL
FLOORPLAN**

SCALE 1 : 200





LEGENDA

1. Waiting Lobby
2. Receptionist
3. Gurney Parking Room
4. Trolley Parking Room
5. Triage Room
6. Non-Surgical Procedure Room
7. P1 Room
8. P2 Room
9. P3 Room
10. P0 Room
11. Storage For P0
12. Backdoor Exit
13. Decontamination and Sterilization Room
14. Woman's Toilet
15. Men's Toilet



UNIVERSITAS ISLAM NEGERI
MAULANA MALIK IBRAHIM
Jln. Gajayana No.50 Malang

ARCHITECTURE ENGINEERING

PROJECT TITLE

DIABETES AND ENDOCRINOLOGY
HEALTHCARE CENTER DESIGN
IN MALANG CITY

STUDENT NAME

QURROTA AYUN

STUDENT NUMBER

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PRIMA KURNIAWATY M. SI.
ALDRIN YUSUF FIRMANSHYAH M.T.

IMAGE TITLE DETAIL ENGINEERING DESIGN

FLOOR PLAN

BUILDING NAME

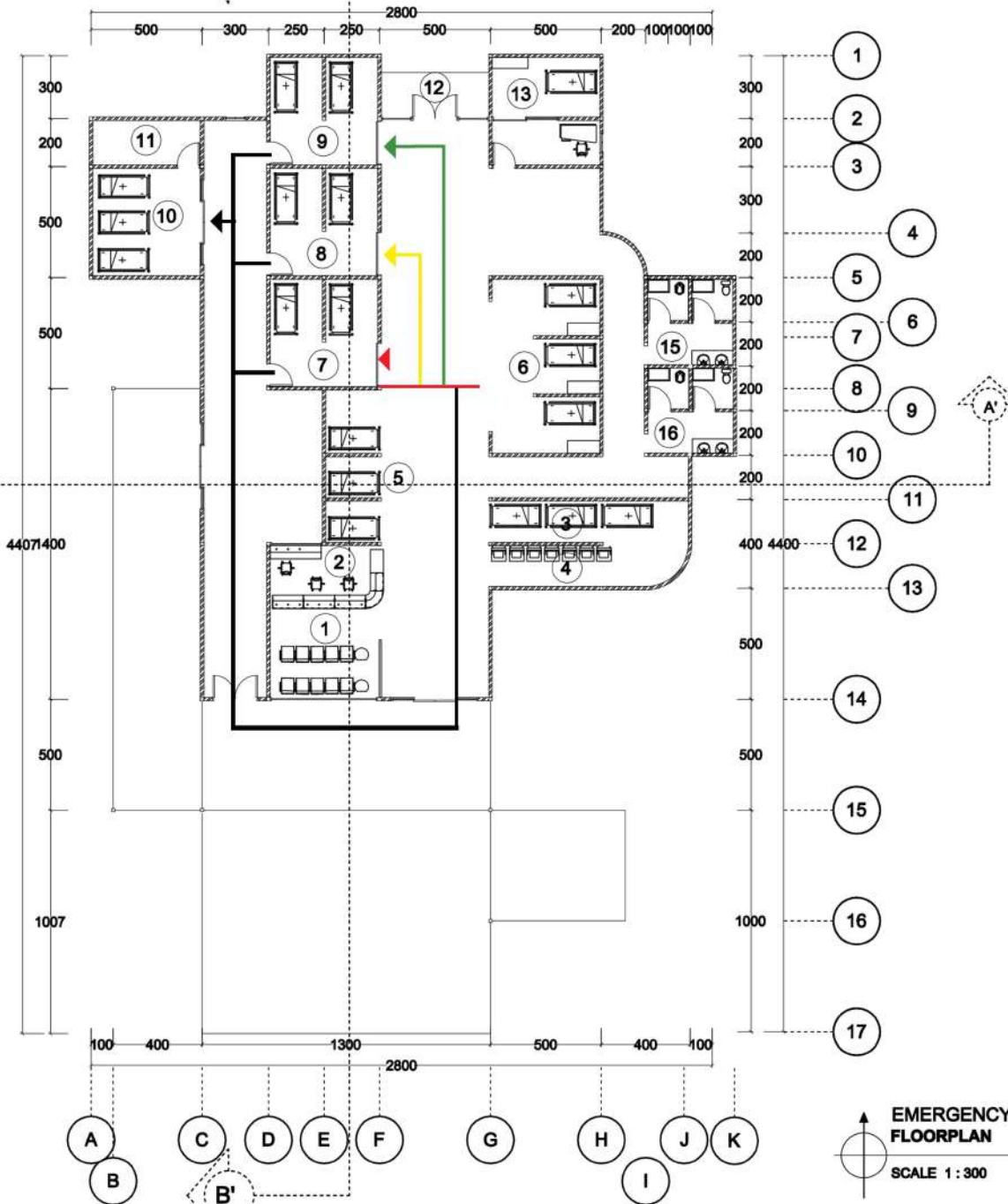
EMERGENCY UNIT

IMAGE SCALE

1 : 300

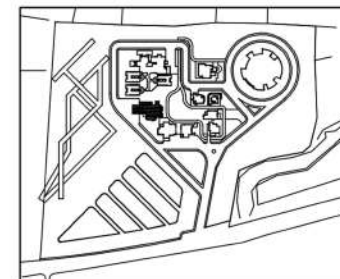
IMAGE NUMBER :

08



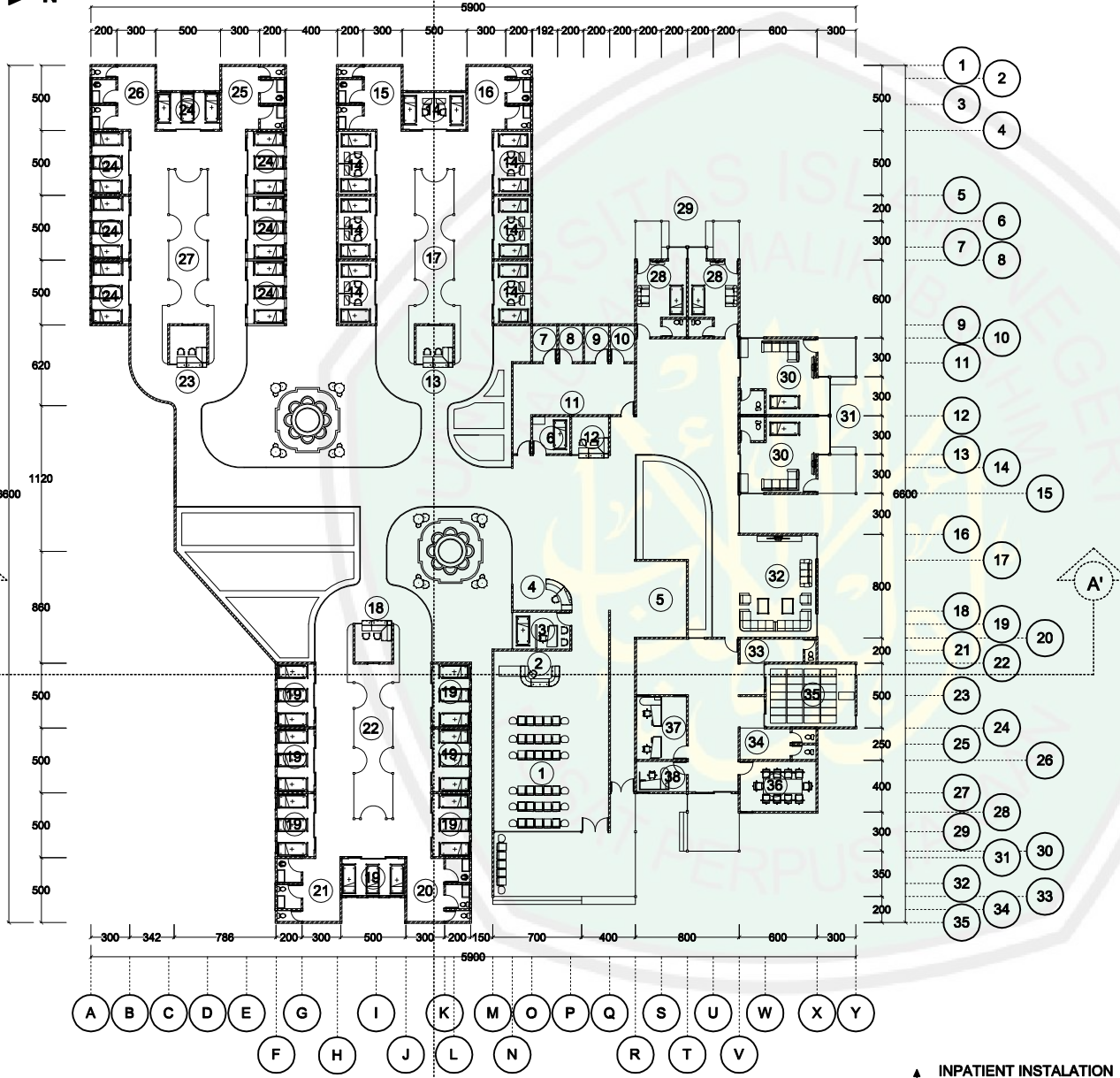
- Patient requires immediate treatment.
- Patient is stable at the moment and is not in any immediate danger but will require observation.
- Patient who will require medical treatment at some point, once more critical injuries have been treated.
- For those who are already deceased.

KEYPLAN



EMERGENCY UNIT FLOORPLAN

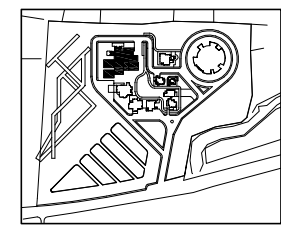
SCALE 1 : 300



LEGENDA

1. Waiting Lobby
2. Receptionist
3. Consultation's Room
4. Security Check
5. Patient's With Gurney's Check Point's Room
6. HCU
7. VIP and VVIP Nurse Station
8. Dirty Storage
9. Dirty Linen Room
10. Clean Storage
11. Clean Linen Room
12. Washing Dirty Linen
13. 1st Class Nurse Station
14. 1st Class Room
15. 1st Class Woman Toilet
16. 1st Class Men's Toilet
17. 1st Class Mini Garden
18. 2nd Class Nurse Station
19. 2nd Class Room
20. 2nd Class Woman Toilet
21. 2nd Class Men's Toilet
22. 2nd Class Mini Garden
23. 3rd Class Nurse Station
24. 3rd Class Room
25. 3rd Class Woman Toilet
26. 3rd Class Men's Toilet
27. 3rd Class Mini Garden
28. VIP Room
29. VIP Private Garden
30. VVIP Room
31. VVIP Private Garden
32. Lounge for VIP and VVIP
33. Men's Toilet
34. Woman's Toilet
35. Mushola (Pray Room)
36. Education and Discussion Room
37. Chief of Instalation's Room
38. Doctor's Office

KEYPLAN



INPATIENT INSTALATION FLOORPLAN
SCALE 1 : 500



Diabetes and Endocrinology Healthcare Center
UNIVERSITAS ISLAM NEGERI MAULANA MALIK IBRAHIM
Jln. Gajayana No.50 Malang

ARCHITECTURE ENGINEERING

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LECTURES GUIDE
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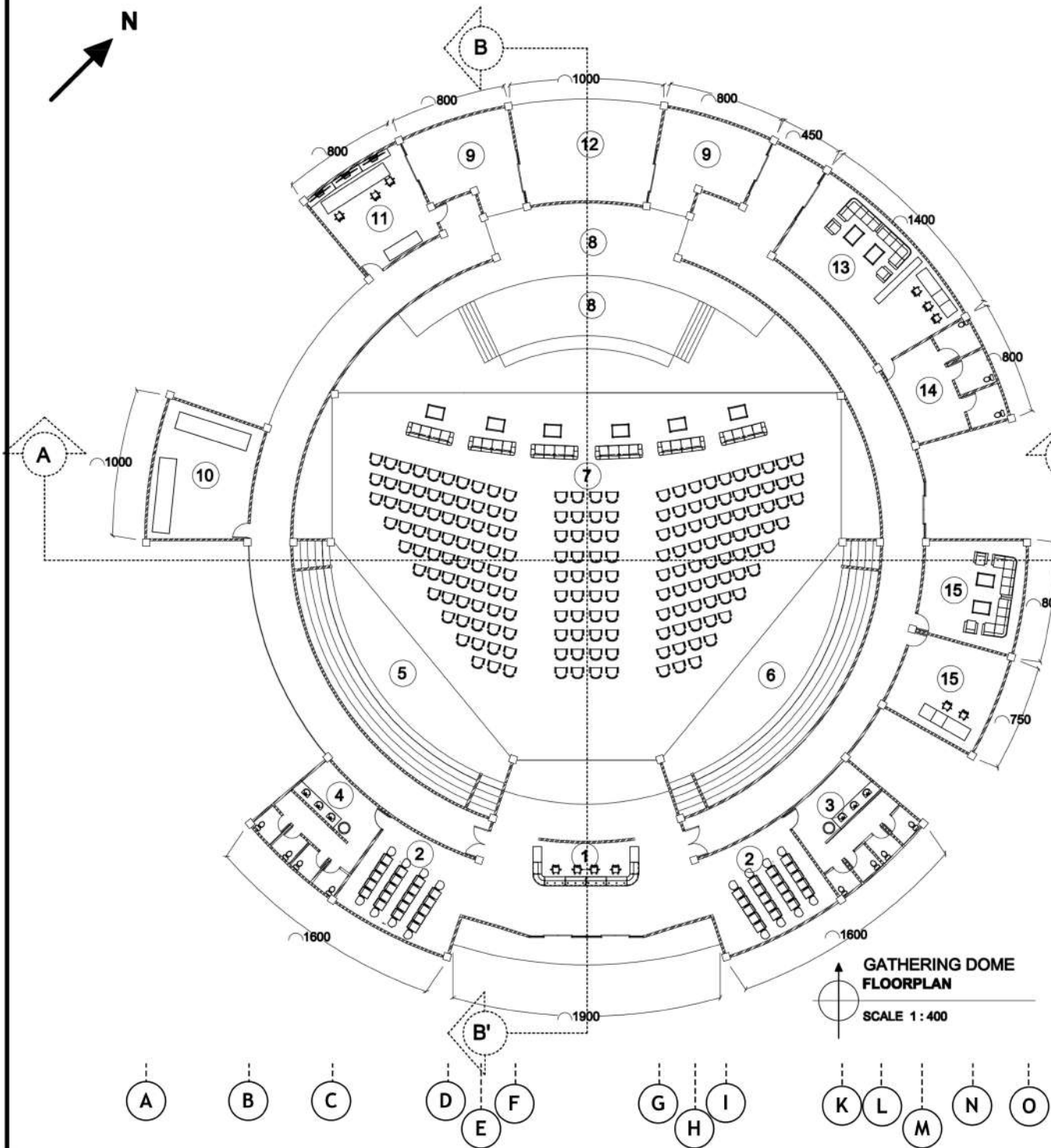
IMAGE TITLE
DETAIL ENGINEERING DESIGN
FLOOR PLAN

BUILDING NAME
INPATIENTS INSTALATION

IMAGE SCALE
1 : 500

IMAGE NUMBER :
09

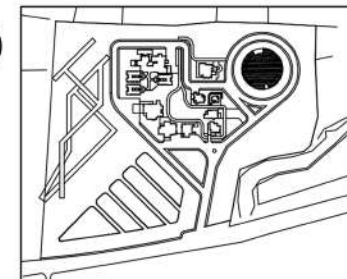
LIBRARY OF MAULANA MALIK IBRAHIM STATE ISLAMIC UNIVERSITY OF MALANG

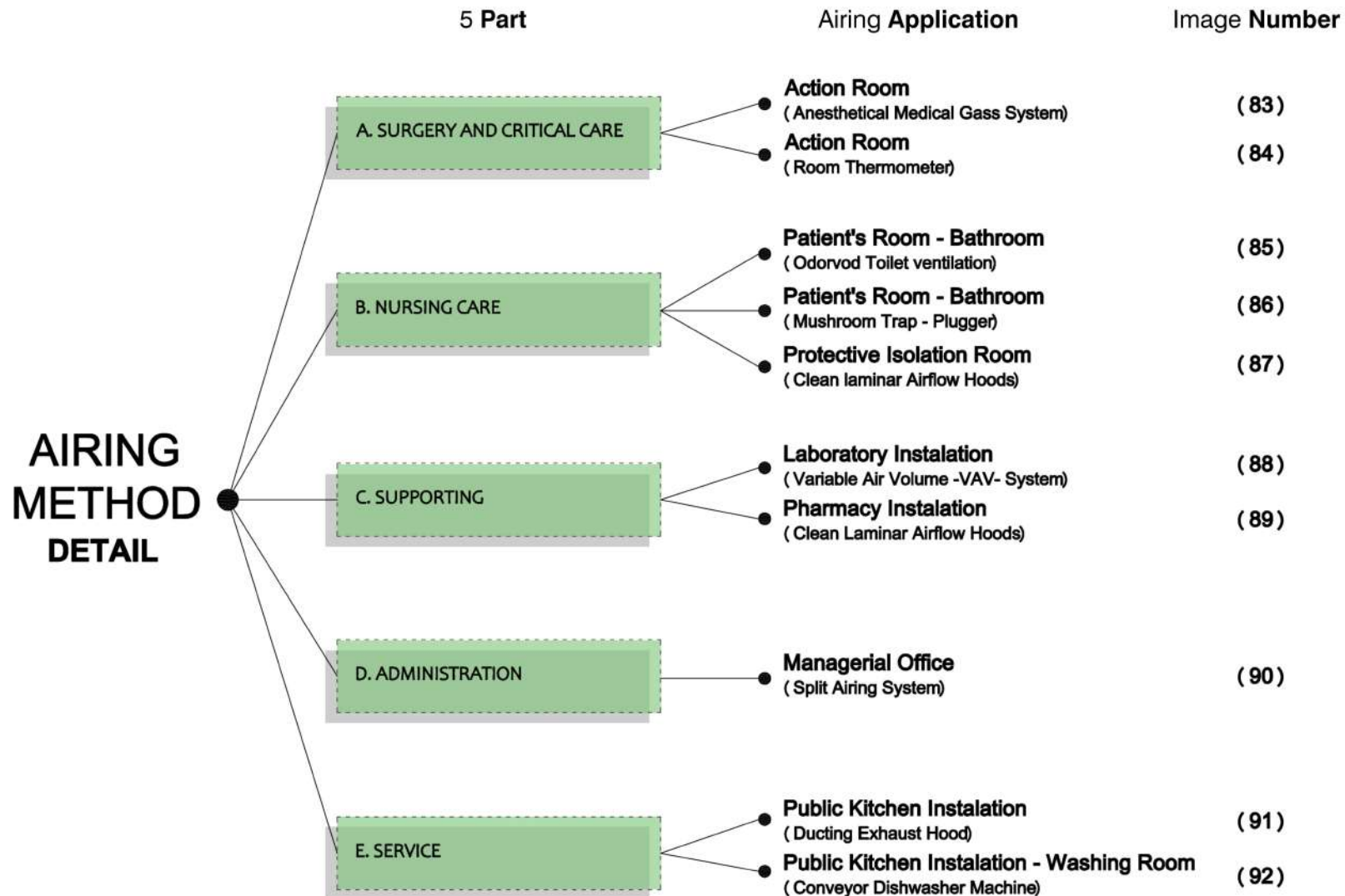


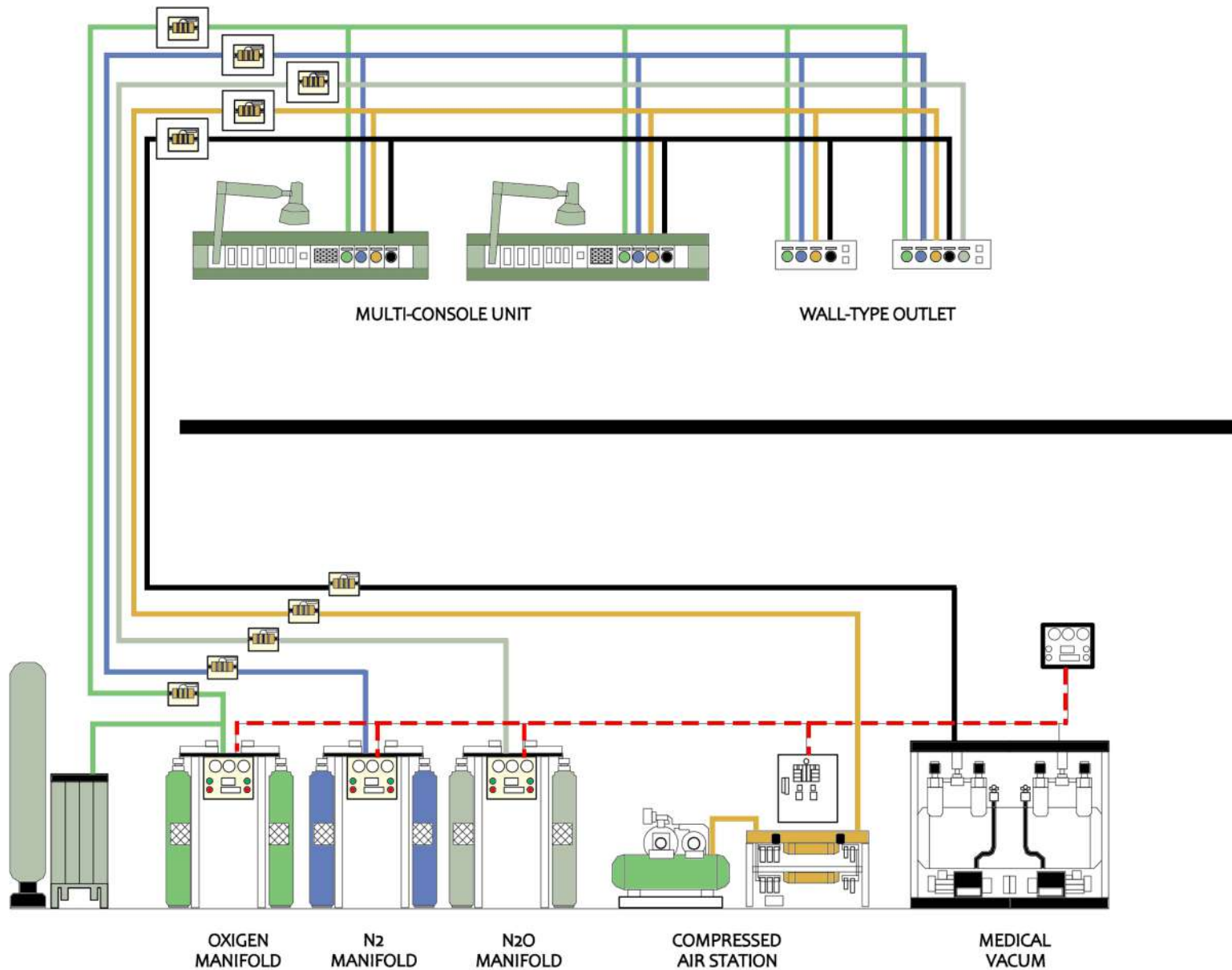
GATHERING DOME FLOORPLAN
SCALE 1 : 400

LEGENDA

1. Receptionist
2. Sitting Lobby
3. Woman's Toilet
4. Men's Toilet
5. 1st Tribun
6. 2nd Tribun
7. Main Hall
8. Stage
9. Backstage
10. Storage Room
11. Control Room
12. Parking for VIP Guest
13. VIP Room for Presenters
14. VIP Toilet
15. Waiting Room for Regular Presenters



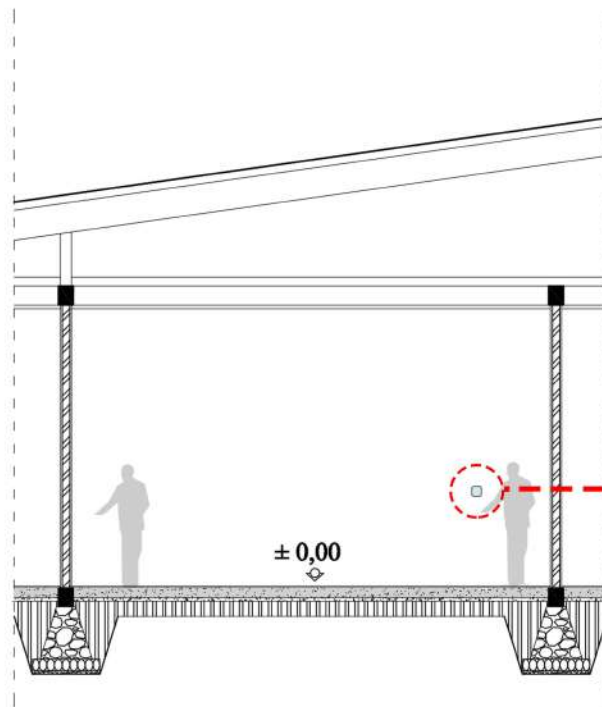




INFORMATION

This kind of room is susceptible to **airborne bacterial contamination** in an average of 8 - 12 hours each day. To reduce the anesthetic gasses waste, the room need this **special anesthetic vacuum**.

ACTION ROOM
AIRING METHOD DETAIL
ANESTHETICAL MEDICAL GAS SYSTEM
SCALE -



ACTION ROOM AIRING METHOD DETAIL ROOM THERMOMETER
SCALE 1 : 100



HM 16 Thermo hygrometer

Temperature measurement range: 0°C to +50°C
Accuracy of the measurement:
± 1°C (0°C to +40 °C)
± 2°C (40°C to +50 °C)

Humidity measurement range: 20% to 95%
Accuracy of the measurement:
± 5% RH (40% to 80%)
± 8% RH (20°C to 40% and 80% to 95%)

Displays maximum/minimum temperature and humidity

Smiley display

- ☺ = 20-25°C, 30-60% humidity (ideal)
- ☹ = any temperature, <30% humidity (dry)
- ☹☹ = any temperature, >60% humidity (wet)

°C / °F can be set

Large, easy-to-read display

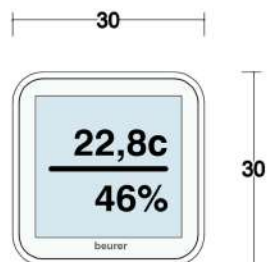
Fold-out stand and hook for wall fastening

INFORMATION

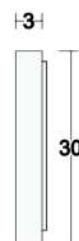
This room needed the indoor thermometer to measure the temperature and the humidity.

The **suitable temperature** will be around **20c - 24c**

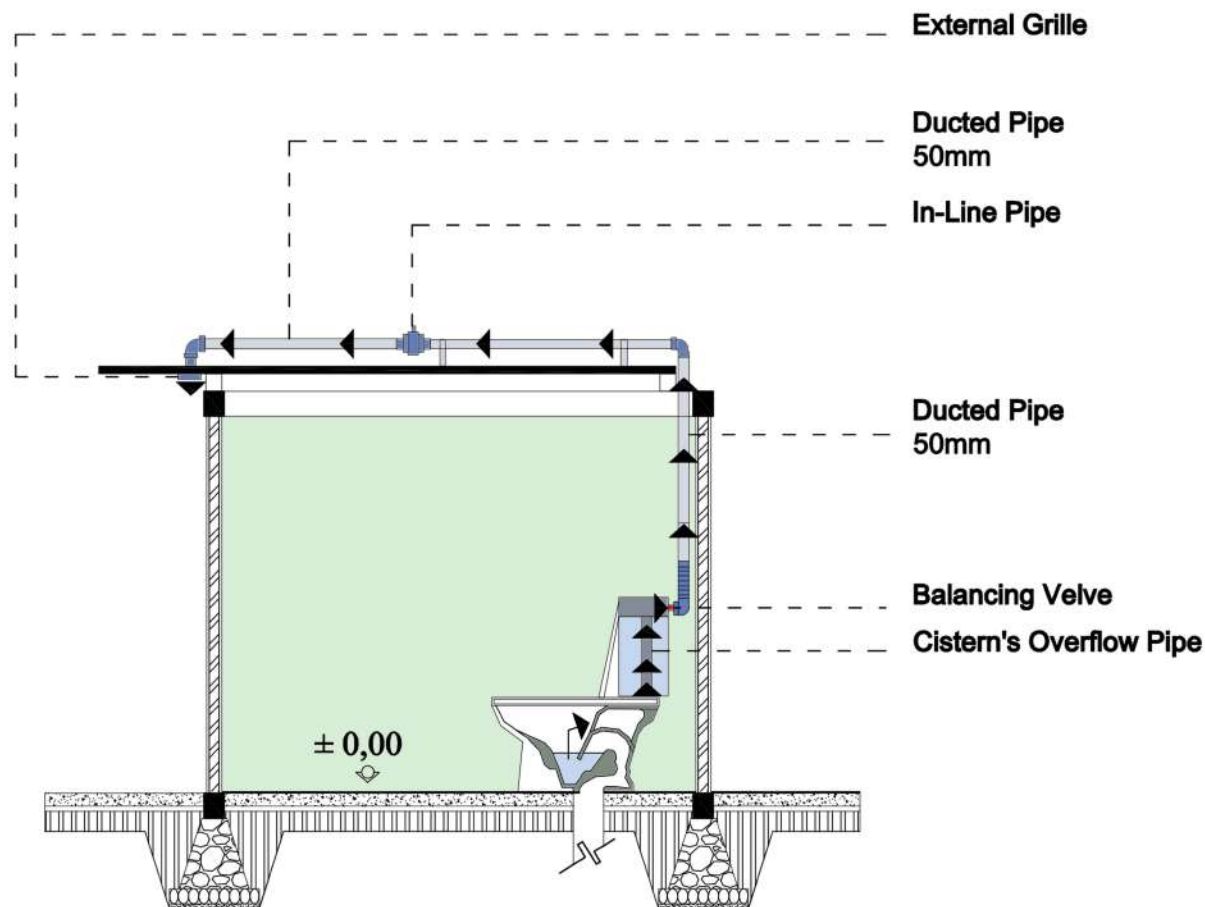
The **suitable humidity** will be around **50% - 60%**



ROOM THERMOMETER AIRING METHOD DETAIL FRONT VIEW
SCALE 1 : 10



ROOM THERMOMETER AIRING METHOD DETAIL SIDE VIEW
SCALE 1 : 10



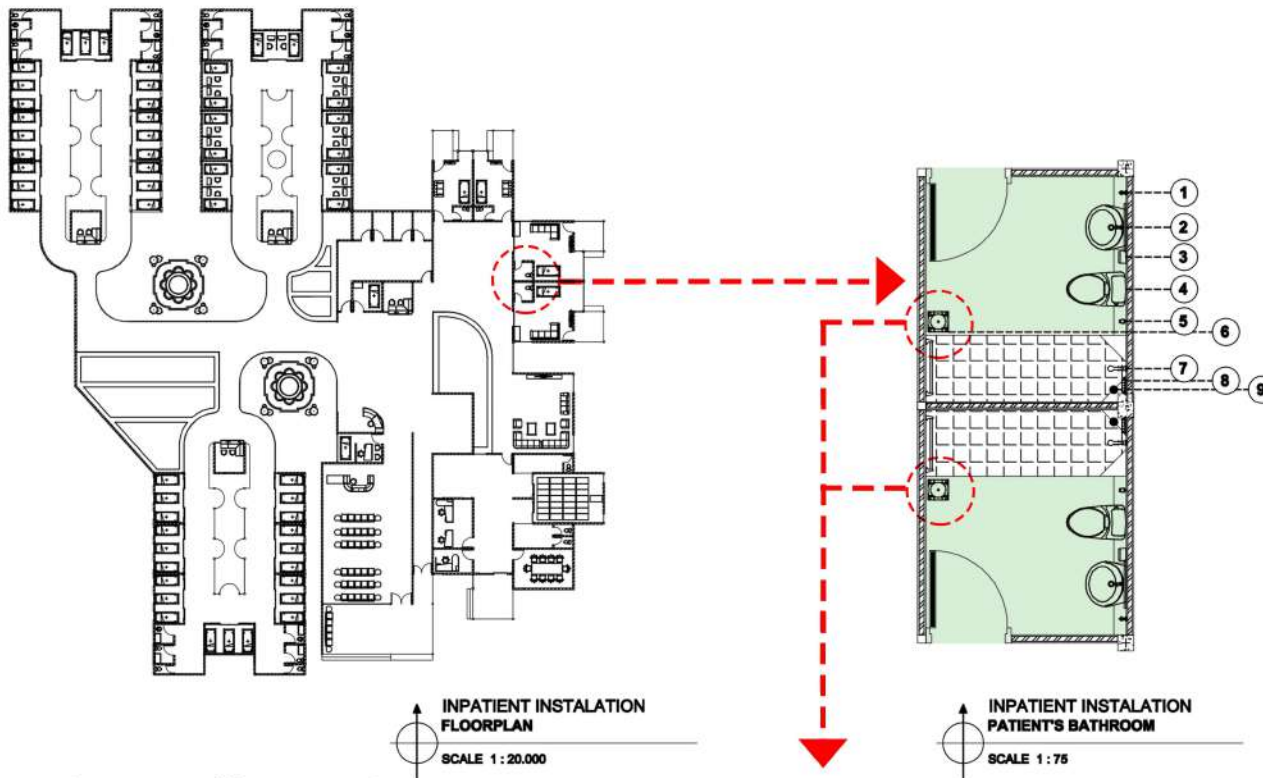
PATIENT'S ROOM
AIRING METHOD DETAIL
ODORVOC TOILET VENTILATION
SYSTEM KIT



SCALE 1 : 75

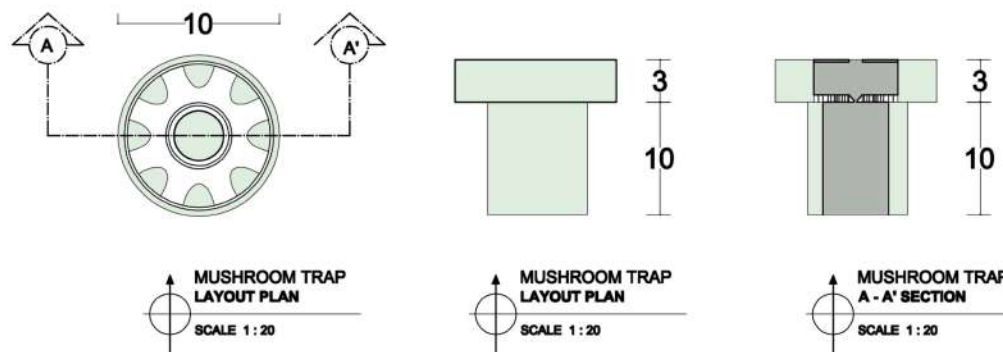
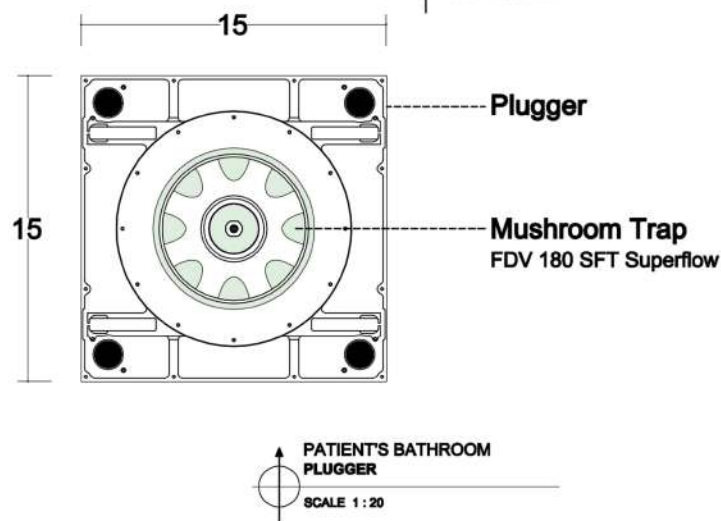
INFORMATION

Patient's room need the toilet ventilation in the bathroom. This type of **odorvoc toilet ventilation** help to reduce the bad smell of the bathroom.



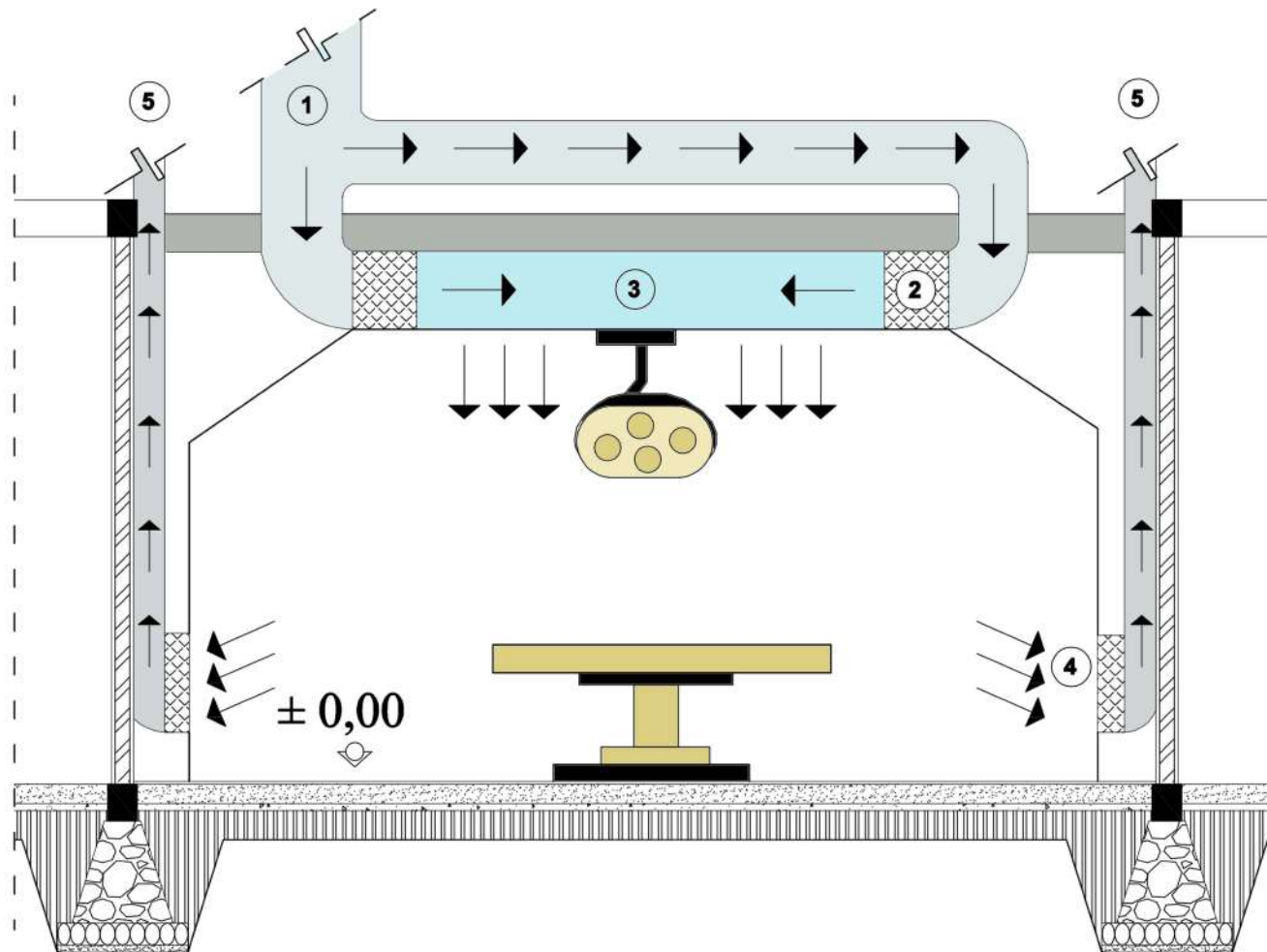
LEGENDA

1. Faucet
2. Washtafel
3. Toilet paper and basket
4. Toilet
5. Toilet water spray
6. Plunger
7. Bathtub faucet
8. Small bath equipment holder
9. Bathtub plunger



INFORMATION

Odor control can be applied in the plunger of the bathroom. There is one tool called by **mushroom trap**. This tool is **Mushroom Trap FDV 150 GIS**. This can hold back the rats, chocoaches, odor from the waste tank, and bugs in particular size.



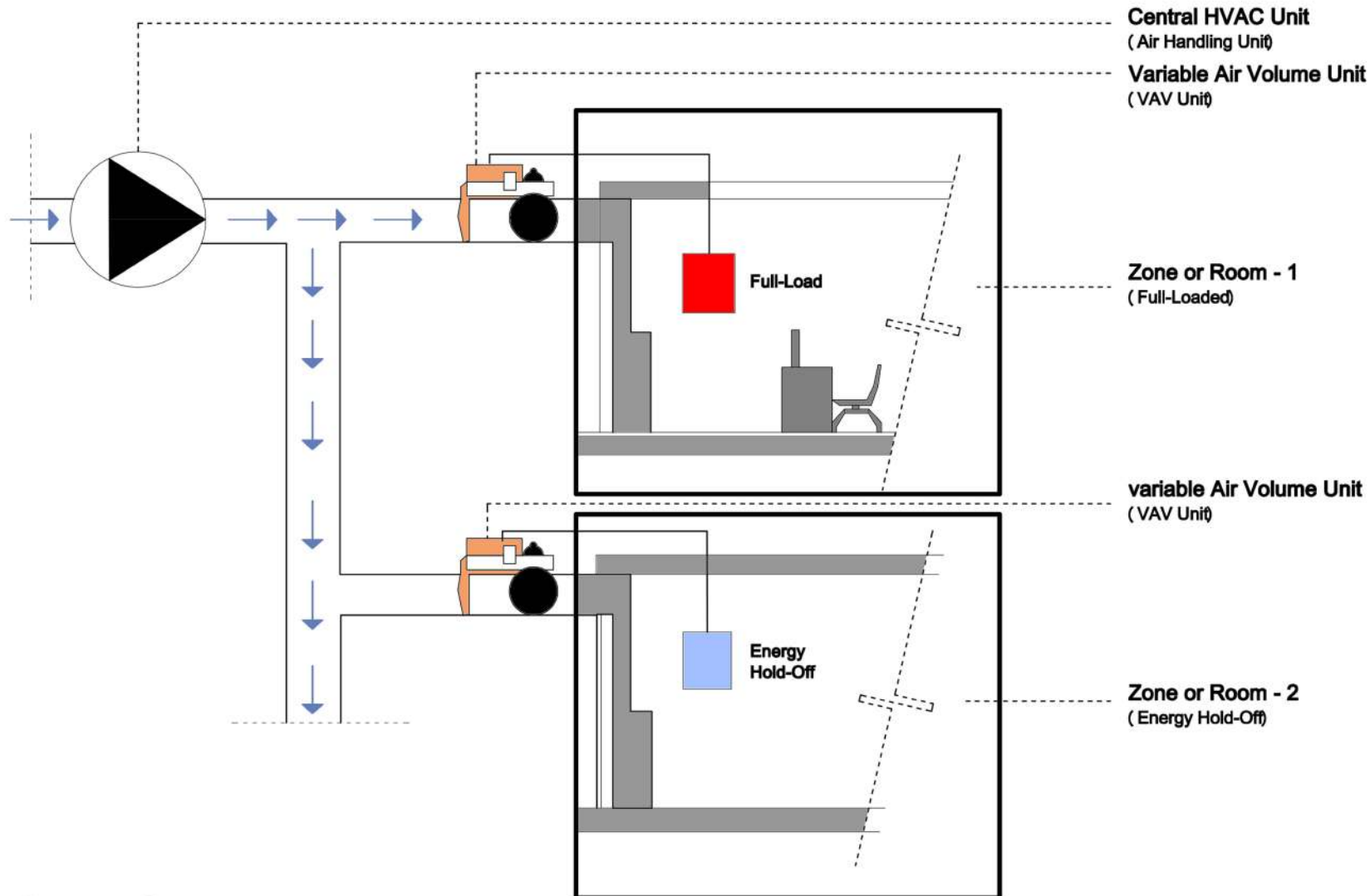
LEGENDA

1. Air In-take
2. Filter
3. Filtered air
4. Filter Out-take
5. Out Pipe

INFORMATION

The **Clean Laminar AirFlow Hoods System** makes sure that the air on the isolation unit doesn't contaminate the other room and filtered into safe air and pump directly up high outside the installation.

PROTECTIVE ISOLATION UNIT
CLEAN LAMINAR AIRFLOW HOODS
SCALE 1:50



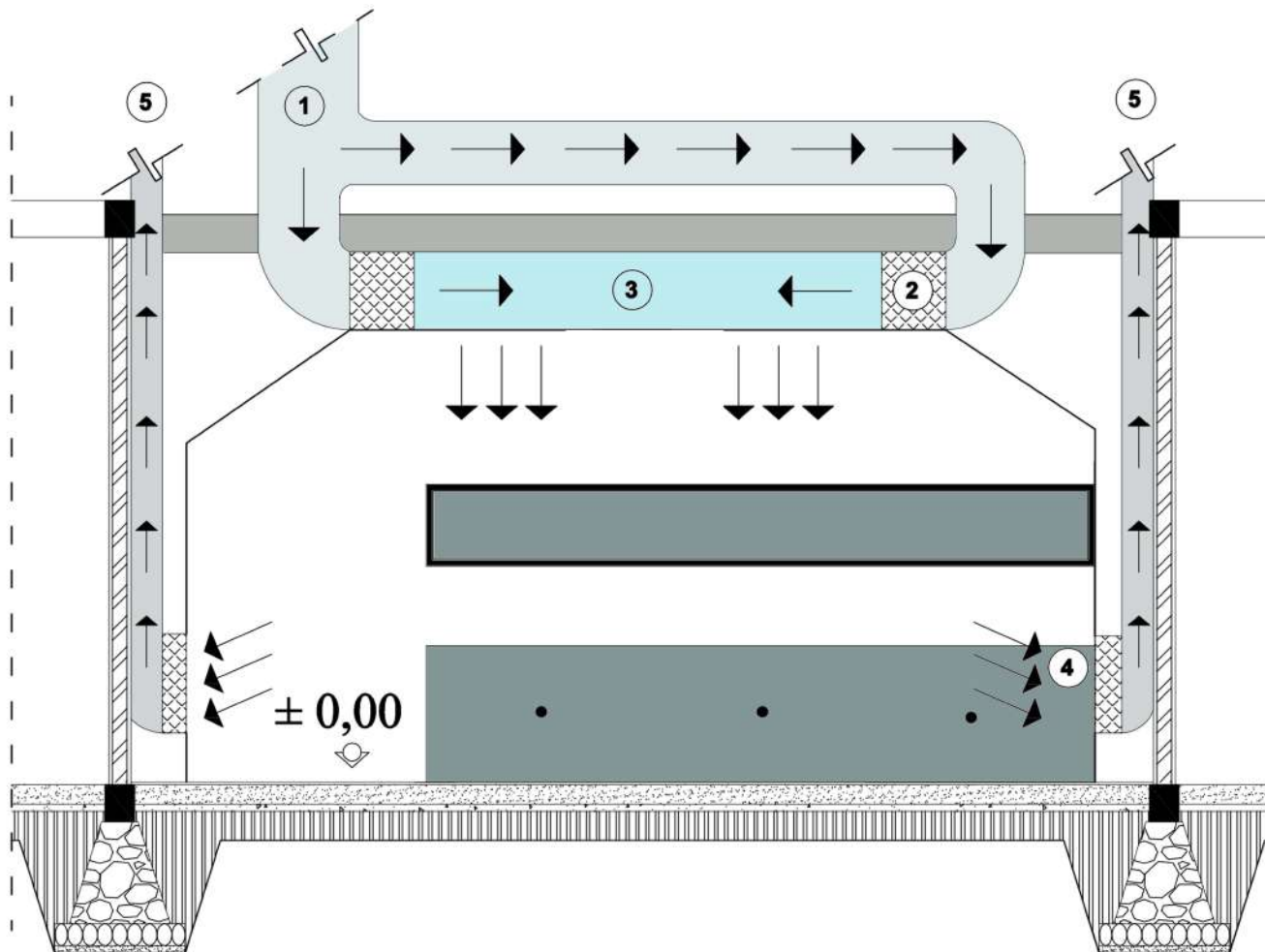
INFORMATION

VAV airing system in one of the HVAC system. This one is using a VAV unit to make parts of the airing zone. This VAV using in the laboratory as the part to keep one room cooler or one room hotter than the other.

LABORATORIUM
AIRING METHOD DETAIL
VARIABLE AIR VOLUME (VAV) SYSTEM



SCALE -



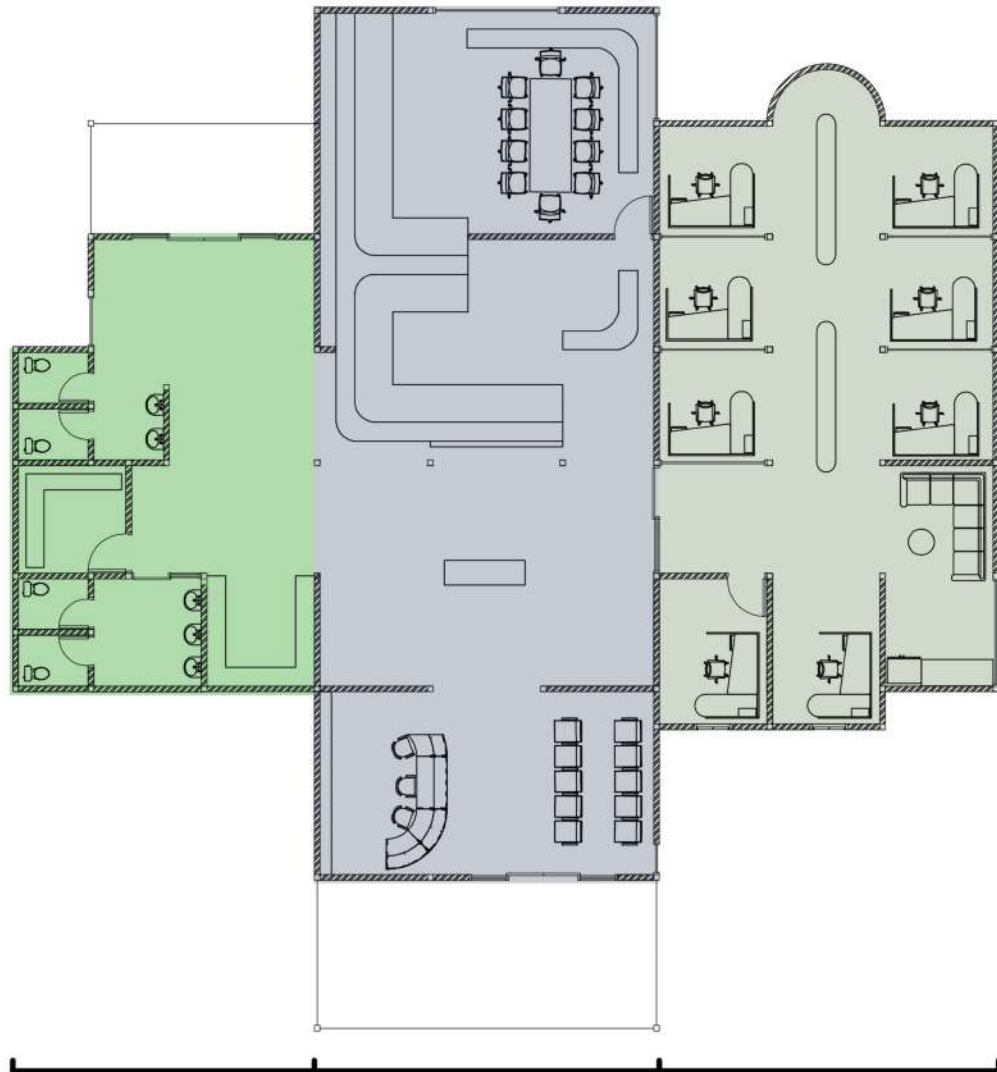
LEGENDA

1. Air In-take
2. Filter
3. Filtered air
4. Filter Out-take
5. Out Pipe

INFORMATION

The **Clean Laminar AirFlow Hoods System** makes sure that the air on the compounding medicine doesn't contaminate the other room and is filtered into safe air and pumped directly up high outside the installation.

PHARMACY - MEDICAL COMPOUNDING
CLEAN LAMINAR AIRFLOW HOODS
SCALE 1:50



Supporting Zone
(Natural Airing Method)

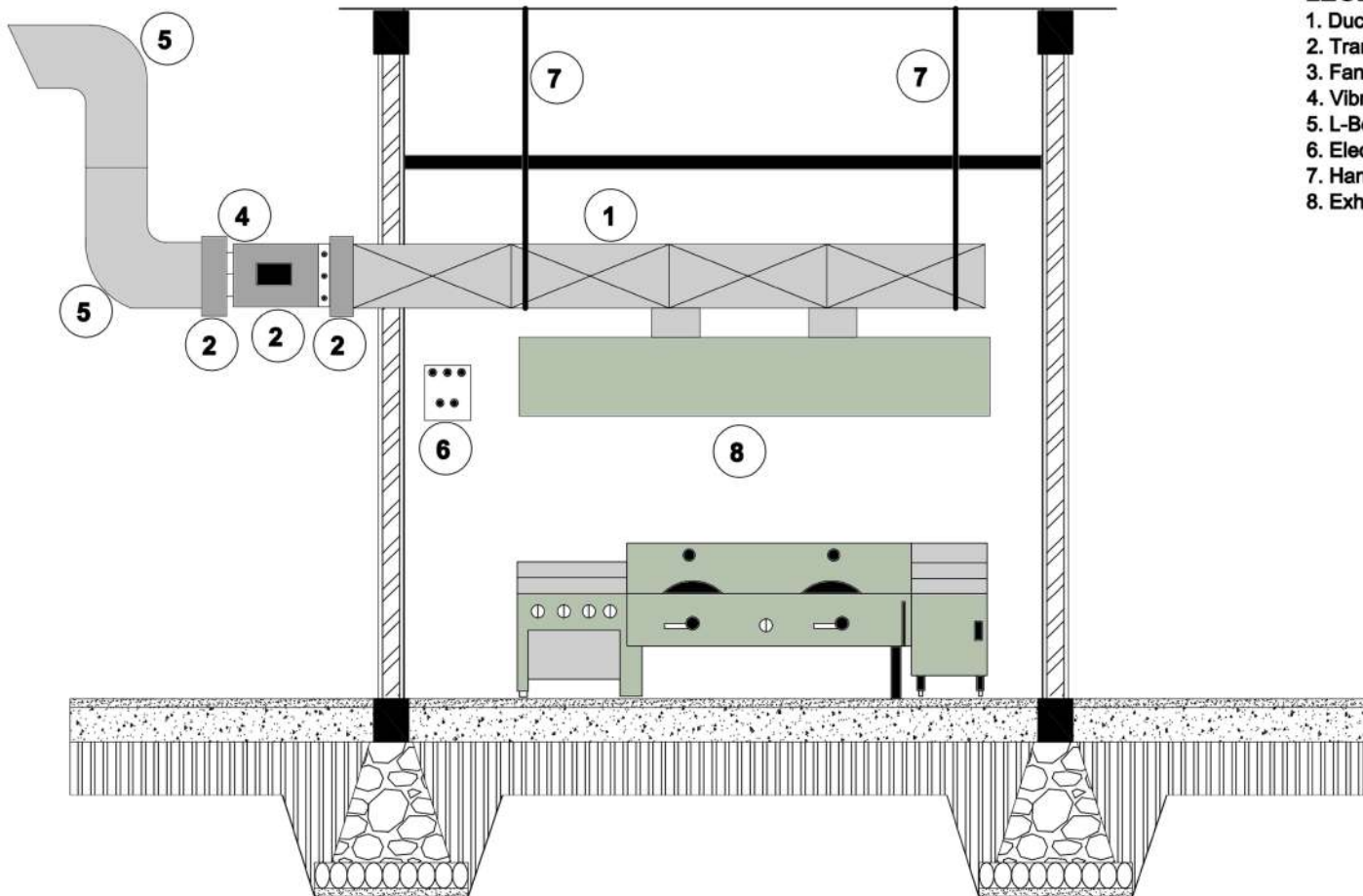
Public Zone
(Natural Airing Method)
(VAV System)

Private Zone
(VAV System)

MANAGERIAL OFFICE
AIRING METHOD DETAIL
SPLIT-FOCUS AIRING SYSTEM
SCALE 1 : 200

LEGENDA

1. Ducting BJLS 0,6 mm
2. Transmition Fan
3. Fan Machine
4. Vibrating Damping Carpet
5. L-Bow Ducting BJLS
6. Electrical Control Panel
7. Hanger
8. Exhaust Hood

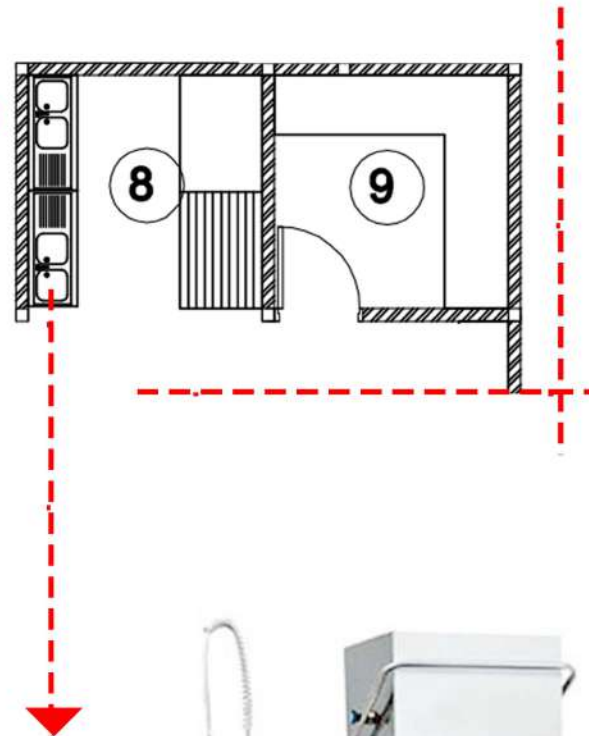
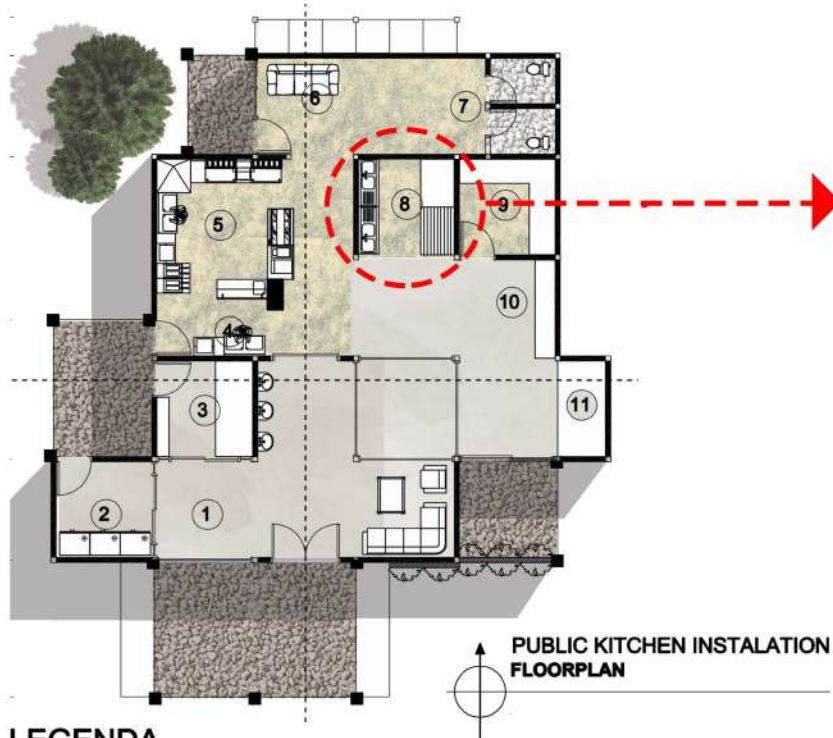


**PUBLIC KITCHEN INSTALATION
AIRING METHOD DETAIL
DUCTING EXHAUST HOOD**

SCALE 1:50

INFORMATION

Public Kitchen Instalation need the **Ducting Exhaust Hood** to make the 'latent heat' disappears. Laten heat is energy released or absorbed by a body or a thermodynamic system during a constant-temperature process.



LEGENDA

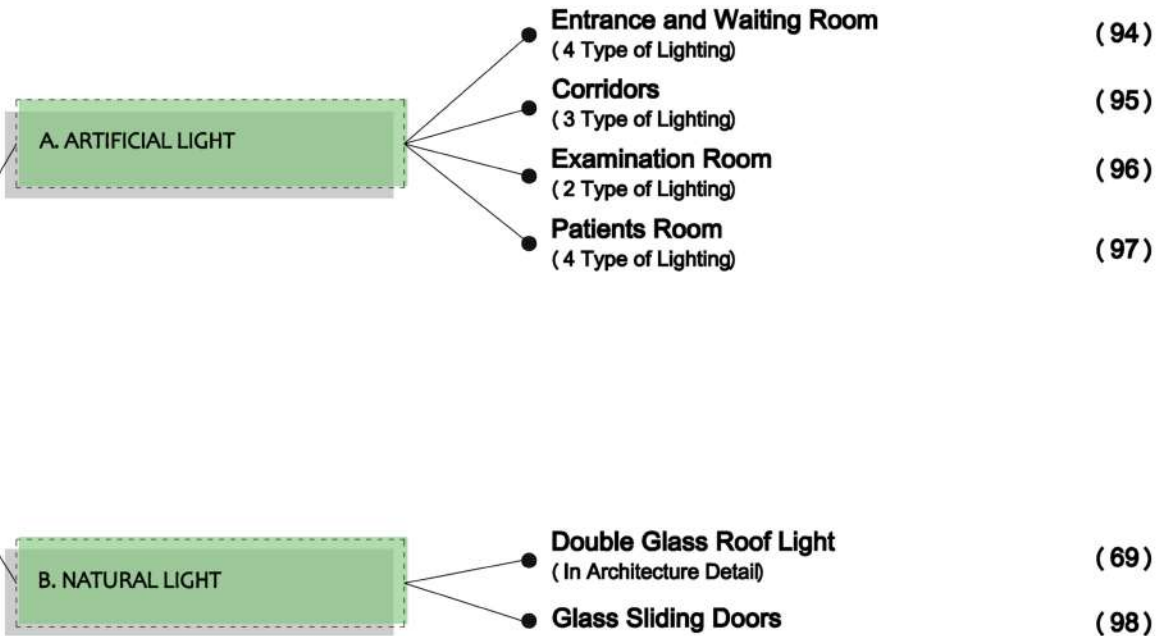
1. Food Receiving and Weighing Room
2. Wet Food Storage
3. Dry Food Storage
4. Ingredient Cleaning Spot
5. Food Processing Room
6. Rest Room
7. Public Toilet
8. Equipment Washing Room
9. Equipment Storage Room
10. Trolley Room
11. Food Presentation and Distribution Room

INFORMATION

To provide the better hygiene for the kitchen equipment, the **Conveyor Dishwashes Machine** used as the main dishwasher in the instalation. The airborne can't be contaminates the equipment because this diswasher use some red light to maintain the hygiene.

**PUBLIC KITCHEN INSTALLATION
AIRING METHOD DETAIL
CONVEYOR DISHWASHER MACHINE**
SCALE -

LIGHTING DESIGN DETAIL

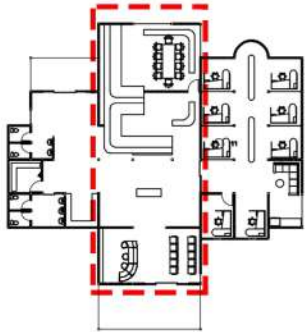


LIGHTING DESIGN DETAIL
INFOGRAPHIC

SCALE -

BUILDING THAT HAVE ENTRANCE AND WAITING LOBBY

1. Outpatients Instalation
2. Urinals and Blood Laboratory Instalation
3. Pharmacy Instalation
4. Rehabilitation Instalation
5. Managerial Office
6. Emergency Unit
7. Inpatients Instalation
8. Gathering Dome



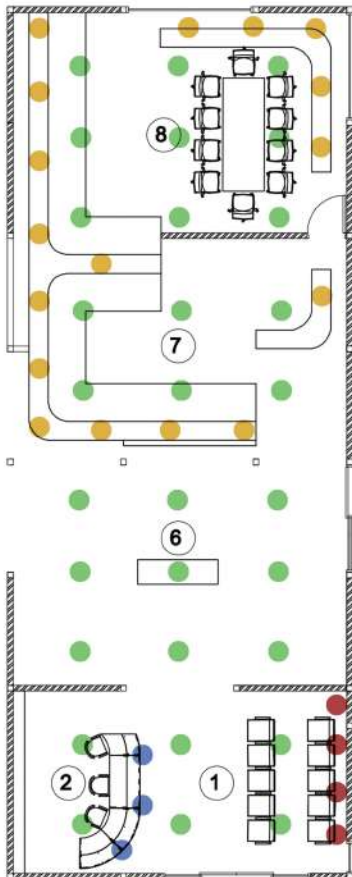
ARTIFICIAL LIGHT ENTRANCE APPLICATION (EXAMPLE) MANAGERIAL OFFICE FLOORPLAN

SCALE 1 : 600



LEGENDA

1. Waiting Lobby
2. Receptionist
3. Woman's Toilet
4. Service Room
5. Men's Toilet
6. Mini Managerial's Hall (Exhibition Space)
7. Lounge (VIP Waiting Room)
8. Meeting Room
9. Chief of Human Resource's Room
10. Chief of Nurse's Room
11. Chief of Commite's Room
12. Chief of Medical Service's Room
13. Chief of Financial's Room
14. Chief of Medical Support's Room
15. Chief of General Operasion's Room
16. Director's Room
17. Pantry



LEGENDA

- Type A Lighting
- Type B Lighting
- Type C Lighting
- Type D Lighting

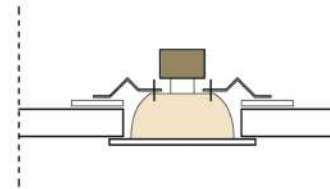
ARTIFICIAL LIGHT ENTRANCE APPLICATION (EXAMPLE) MANAGERIAL OFFICE LOBBY

SCALE 1 : 200



TYPE :

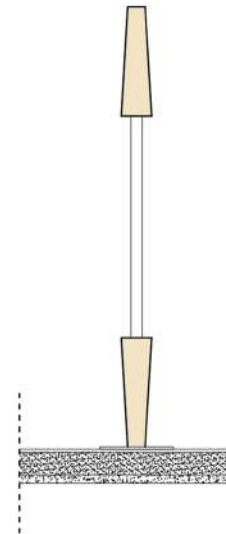
A



General Lighting
Stable colour performance and good colour rendering

TYPE :

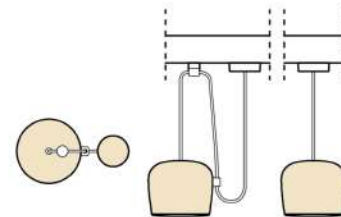
B



Suspended Above The Counter
Gracefull slim pendant with a shiny mirror coating

TYPE :

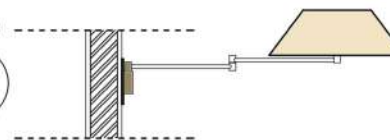
C



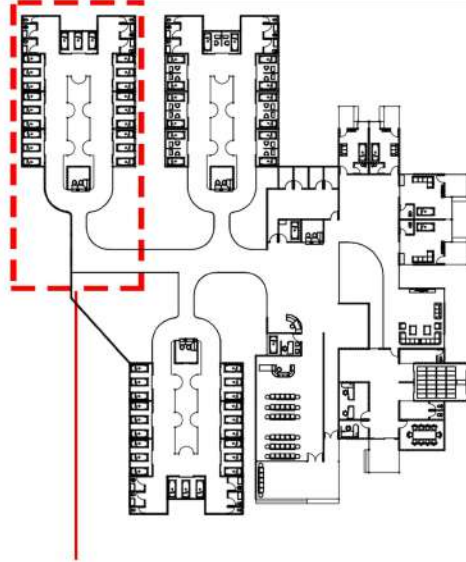
Accent Lighting Backwall
Good colour consistency and high colour rendering for extra sparkle and low energy consumptions.

TYPE :

D



Wall Mounted
The free-move lamp's joint, allow modular lighting units of different dimmentions and brightness.

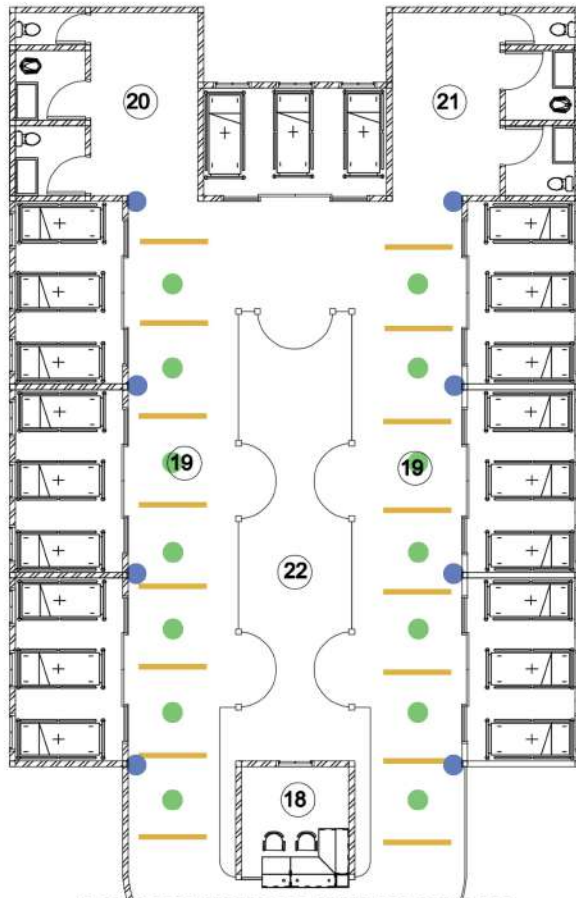


BUILDING THAT HAVE CORRIDORS :

1. Inpatients Instalation
2. Emergency Unit
3. Gathering Dome

ARTIFICIAL LIGHT CORRIDORS APPLICATION (EXAMPLE) INPATIENTS INSTALATION FLOORPLAN

SCALE 1 : 1000



LEGENDA

13. 1st Class Nurse Station
14. 1st Class Room
15. 1st Class Woman Toilet
16. 1st Class Men's Toilet
17. 1st Class Mini Garden
18. 2nd Class Nurse Station
19. 2nd Class Room
20. 2nd Class Woman Toilet
21. 2nd Class Men's Toilet
22. 2nd Class Mini Garden

23. 3rd Class Nurse Station
24. 3rd Class Room
25. 3rd Class Woman Toilet
26. 3rd Class Men's Toilet
27. 3rd Class Mini Garden

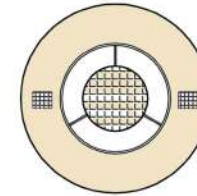
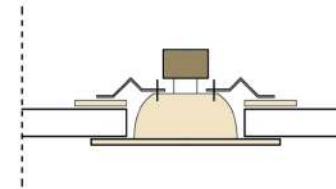
LEGENDA

- Type A Lighting
- Type B Lighting
- Type C Lighting

ARTIFICIAL LIGHT CORRIDORS APPLICATION (EXAMPLE) INPATIENTS ROOMS CORRIDORS

SCALE 1 : 200

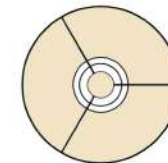
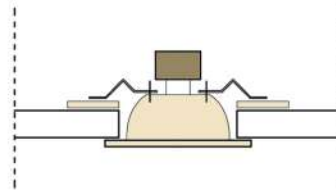
TYPE :



Sensor Lighting

Advanced occupancy control and daylight regulations with separated window and corridor algorithms.

TYPE :



Accent Lighting Wall

High quality accent light due to dedicated LED reflector system.

Good colour consistency.

TYPE :

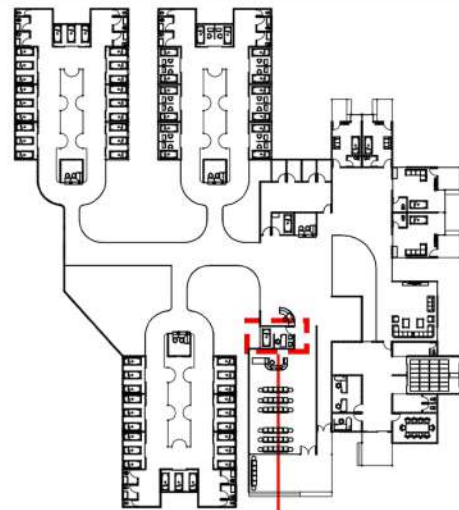


Alcove

Excellent output of white or solid colour light.

Multiple options for design felxibility.

LED system means energy-efficiency, easy instalation and long lifetime.



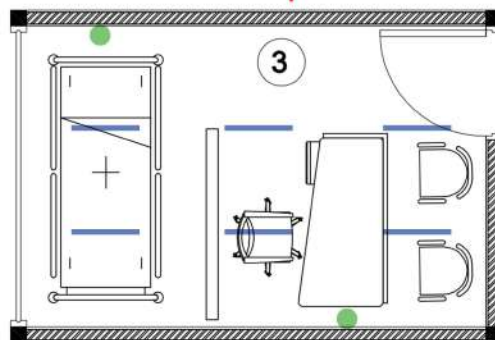
BUILDING THAT HAVE EXAMINATION ROOM :

1. Inpatients Instalation
2. Outpatients Instalation
3. Rehabilitation Instalation
4. Emergency Unit

ARTIFICIAL LIGHT EXAMINATION ROOM APPLICATION (EXAMPLE) INPATIENTS INSTALATION FLOORPLAN



SCALE 1 : 1000



LEGENDA

1. Waiting Lobby
2. Receptionist
3. Consultation's Room
4. Security Check
5. Patien's With Gurney's Check Point's Room

LEGENDA

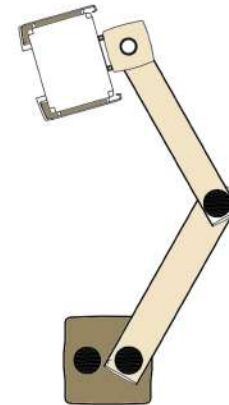
- Type A Lighting
- Type B Lighting

ARTIFICIAL LIGHT EXAMINATION ROOM APPLICATION (EXAMPLE) CONSULTATION ROOM



SCALE 1 : 50

TYPE :



Examination Light

Illuminance, Low level :
25,000 lux (46 cm)

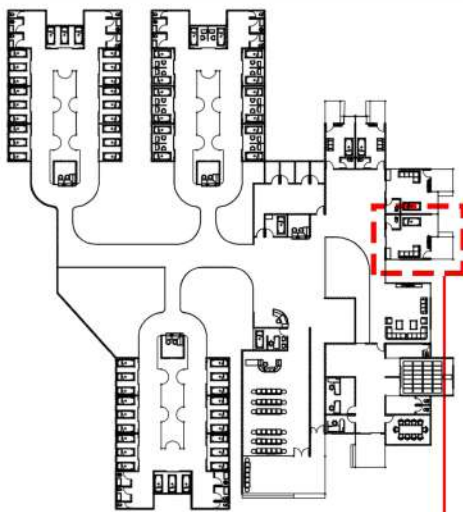
Illuminance, High level :
50.000 lux (46 cm)

TYPE :



Examination Light / Dynamic Panel

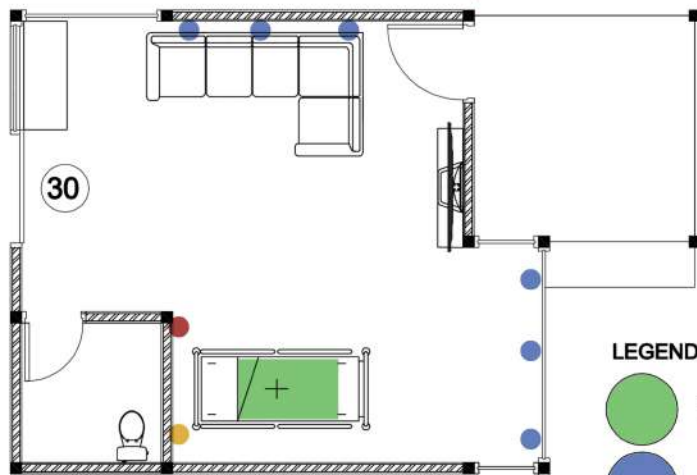
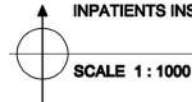
Resecessed unit consisting of general lighting needed for examination and treatment in combination with a mood panel to show dynamic content.



BUILDING THAT HAVE PATIENTS ROOM :

1. Inpatients Instalation

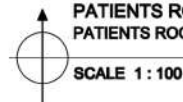
ARTIFICIAL LIGHT
PATIRNTS ROOM APPLICATION
INPATIENTS INSTALATION FLOORPLAN



LEGENDA
28. VIP Room
29. VIP Private Garden
30. VVIP Room
31. VVIP Private Garden

LEGENDA
● Type A Lighting
● Type B Lighting
● Type C Lighting
● Type D Lighting

ARTIFICIAL LIGHT
PATIENTS ROOM APPLICATION
PATIENTS ROOM



TYPE :
A

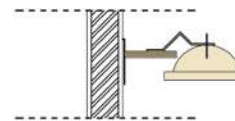


Dynamic White Light

Ceiling modules that provide daylight rhythm with varying light levels and warmer or cooler light.

Used as well as the examination light for staff.

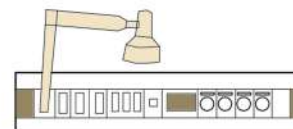
TYPE :
B



Ambient Light

LED based colored light line in cove opposite the bed, that can also provide orientation light at night.

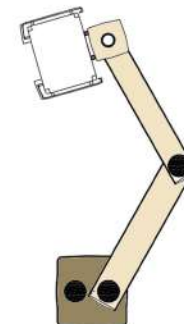
TYPE :
C



Reading Light

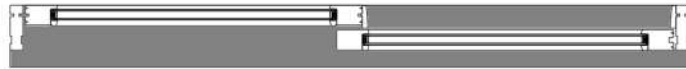
Attached with the wall type gasses multi-console unit outlet

TYPE :
D



Patients Control

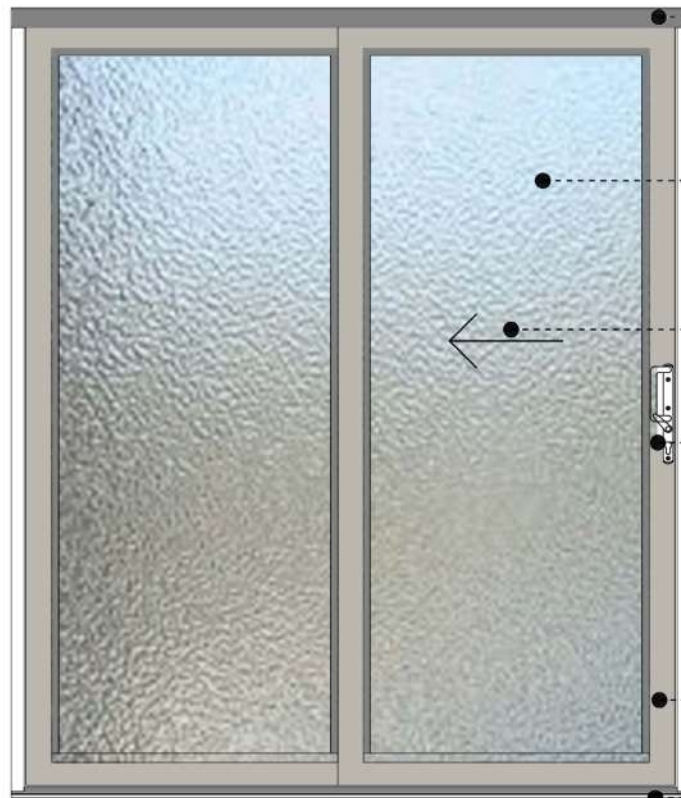
Providing choice for the patients of 3 pre-set light colour for the cove, as well as reading light dimming control.



NATURAL LIGHT
GLASS SLIDING DOORS
PLAN
SCALE -



NATURAL LIGHT
GLASS SLIDING DOORS
SECTION
SCALE -



NATURAL LIGHT
GLASS SLIDING DOORS
ELEVATION
SCALE -

Top Head
(Metal Material)

Glass door
(10 mm in deep safety glass)

The door moving direction

Door Handle
(Stainless Steel material)

Door frame
(Metal material)

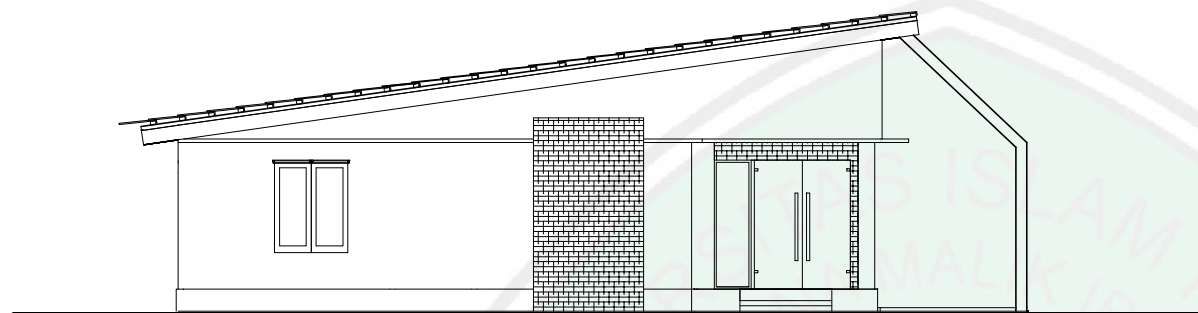
Trail

**BUILDING THAT HAVE SLIDING
DOORS :**

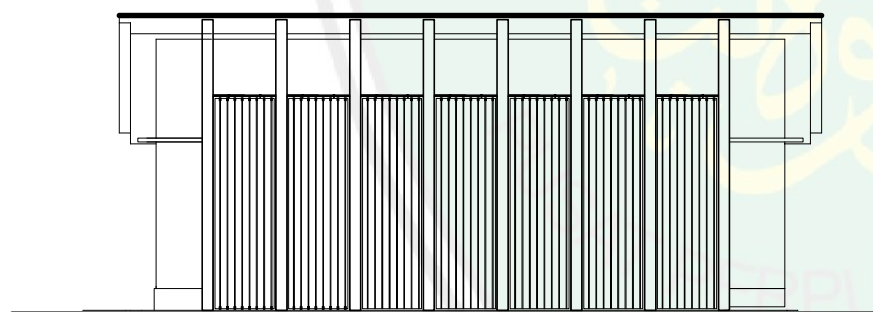
1. Outpatients Instalation
2. Urinalis and Blood Laboratory Instalation
3. Pharmacy Instalation
4. Rehabilitation Instalation
5. Managerial Office
6. Emergency Unit
7. Inpatients Instalation
8. Gathering Dome
9. Public Kitchen Instalation
10. Clinical Nutrition Instalation

SLIDING DOORS PROVIDE :

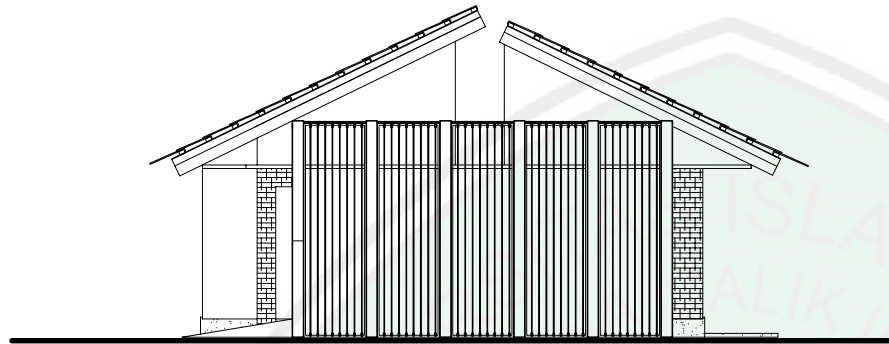
1. Energy efficiency
2. **BLUR THE INDOOR-OUTDOOR
TRANSITION**
3. Safety
4. Security
5. Space Saving
6. **NATURAL LIGHT**
7. **Environmental Friendly**
8. **GREAT GLAZING**
9. Style



↑
OUTPATIENT INSTALATION
SOUTH VIEW
SCALE 1 : 200

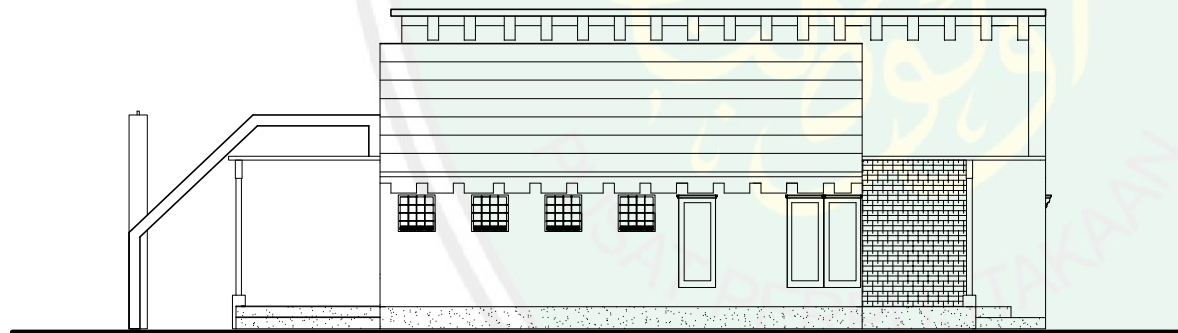


↑
OUTPATIENT INSTALATION
EAST VIEW
SCALE 1 : 200



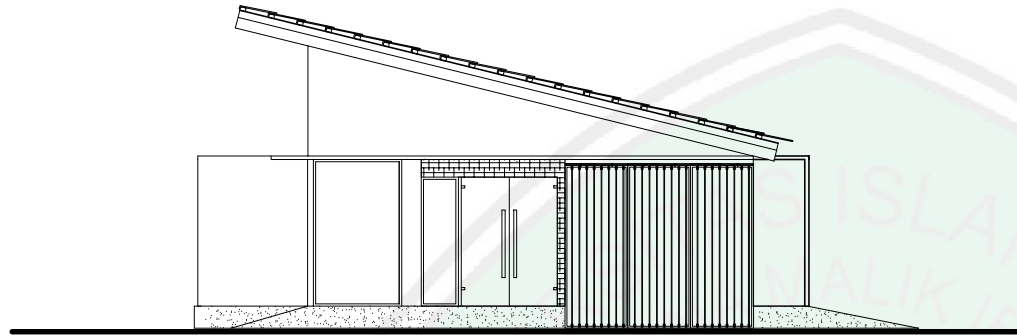
URINALIS AND BLOOD
LABORATORY INSTALATION
NORTH VIEW

SCALE 1 : 200

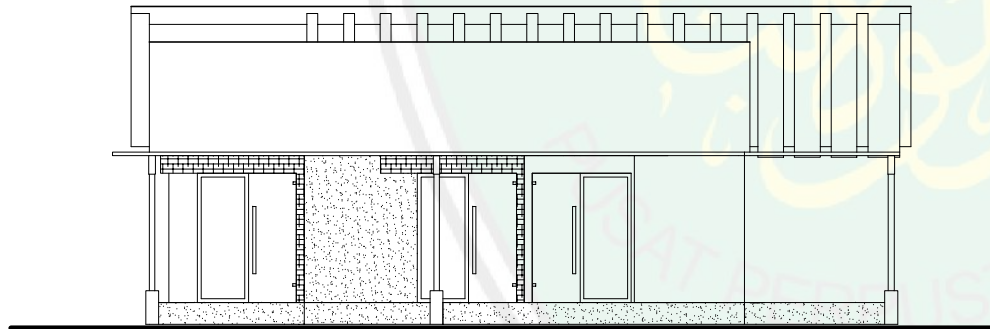


URINALIS AND BLOOD
LABORATORY INSTALATION
WEST VIEW

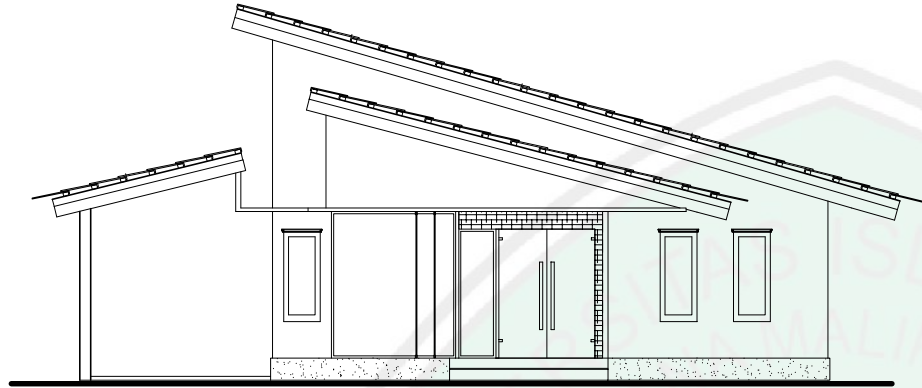
SCALE 1 : 200




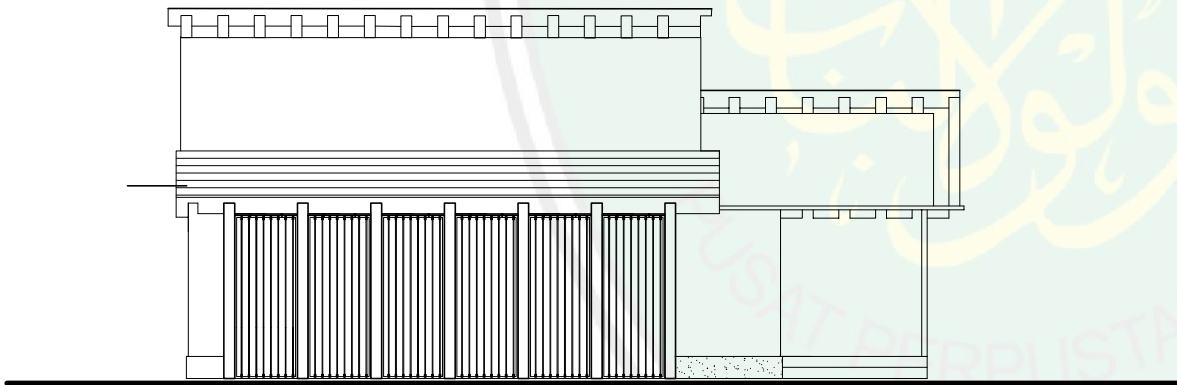

**PUBLIC KITCHEN INSTALATION
SOUTH VIEW**
 SCALE 1 : 200





**PUBLIC KITCHEN INSTALATION
WEST VIEW**
 SCALE 1 : 200



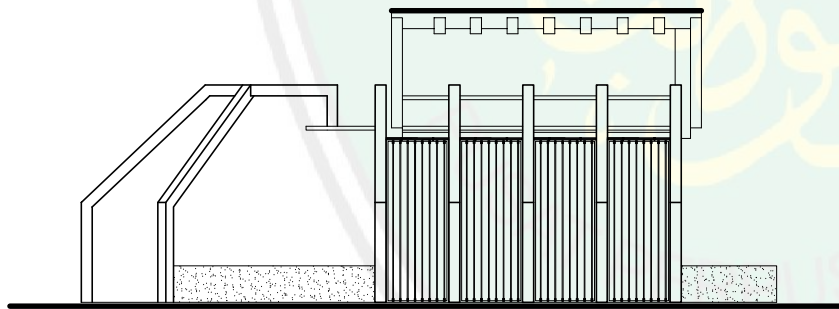

**PHARMACY INSTALATION
EAST VIEW**
 SCALE 1 : 200



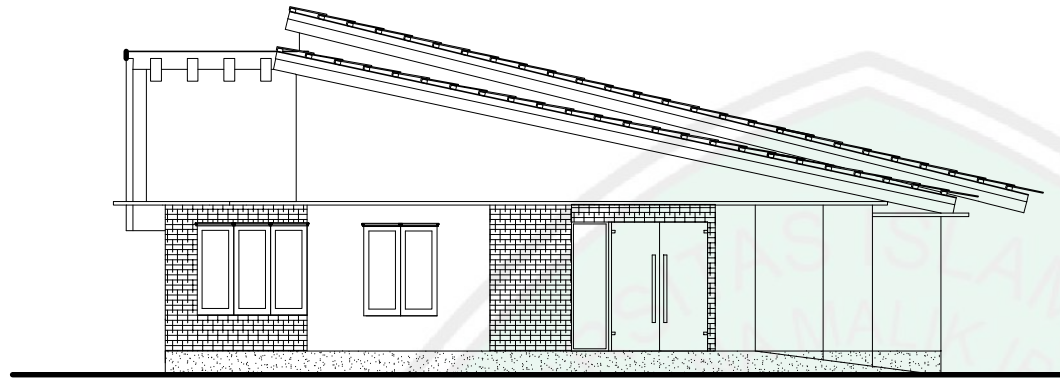

**PHARMACY INSTALATION
SOUTH VIEW**
 SCALE 1 : 200




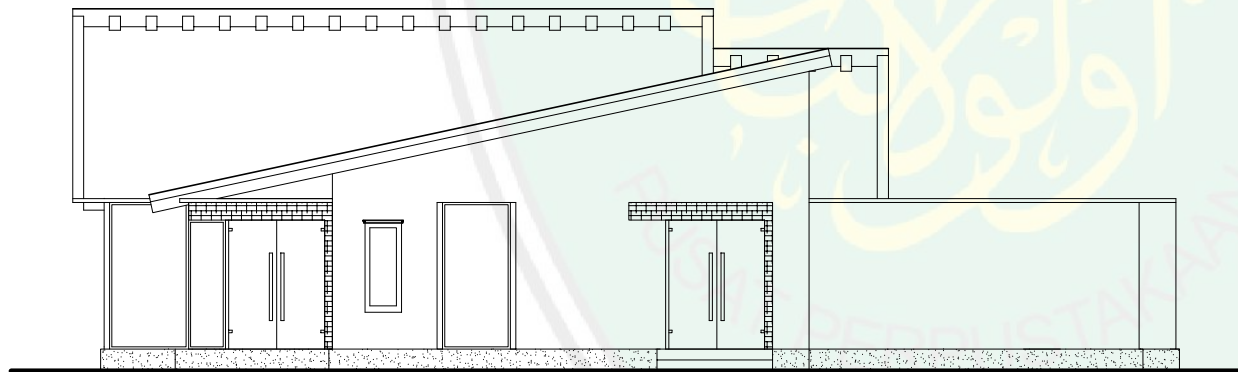
CLINICAL NUTRITION INSTALATION
 EAST VIEW
 SCALE 1 : 200




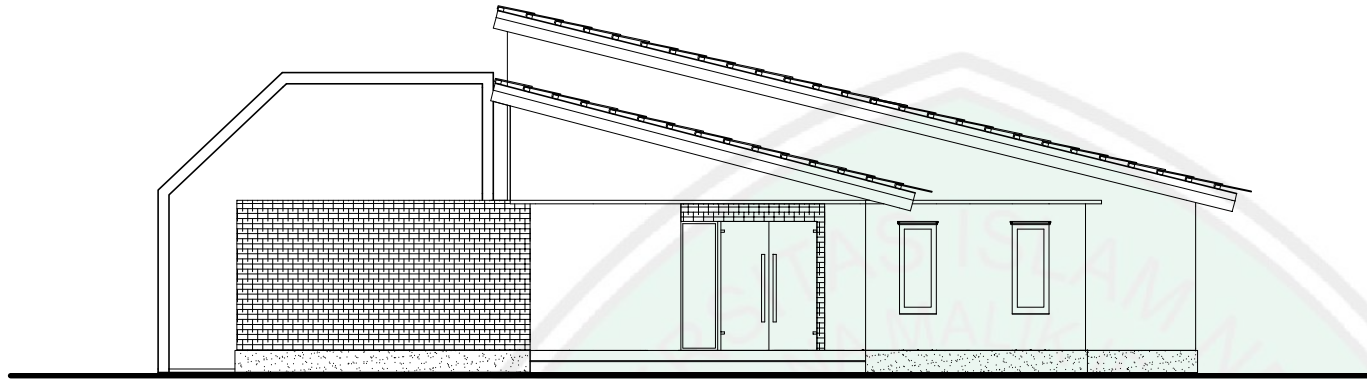
CLINICAL NUTRITION INSTALATION
 SOUTH VIEW
 SCALE 1 : 200



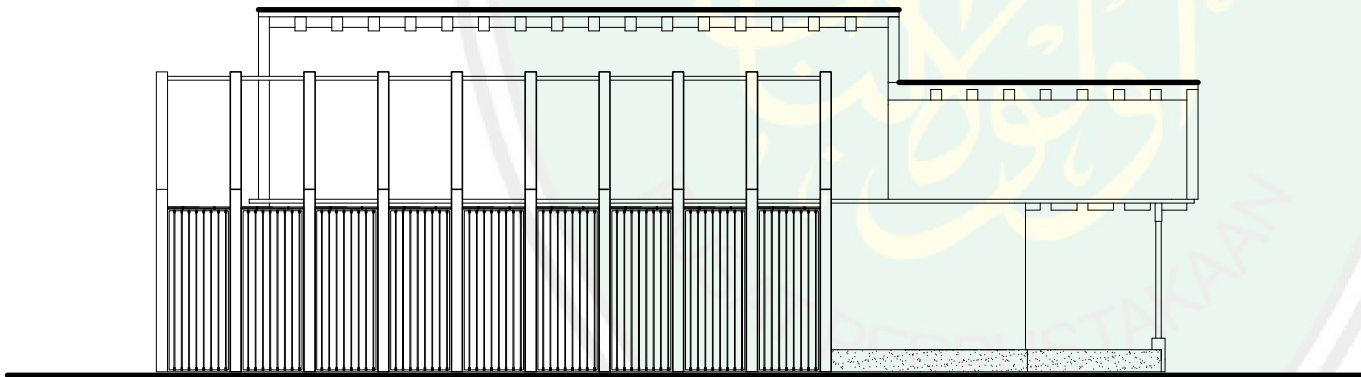

**REHABILITATION INSTALATION
NORTH VIEW**
 SCALE 1 : 200




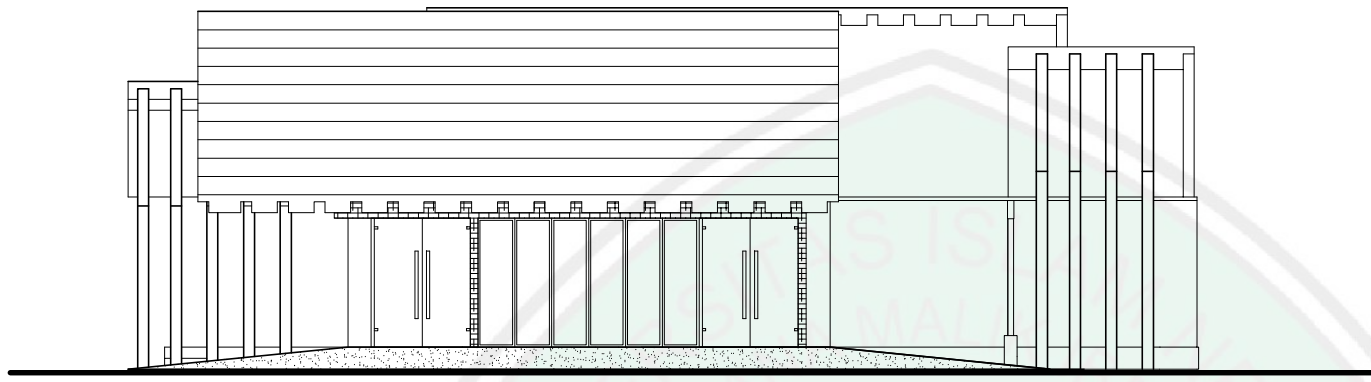

**REHABILITATION INSTALATION
EAST VIEW**
 SCALE 1 : 200



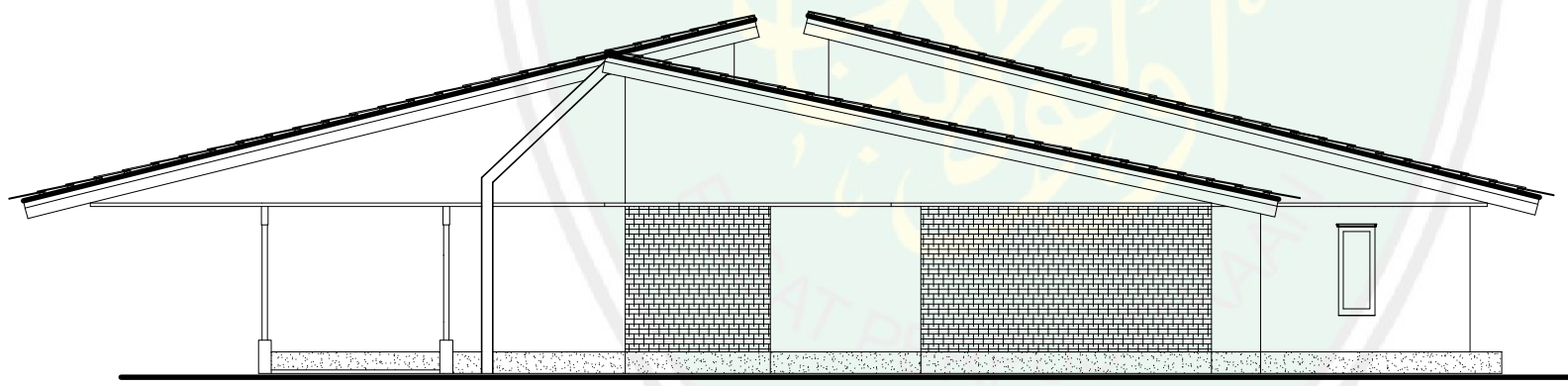

**MANAGERIAL OFFICE
EAST VIEW**
 SCALE 1 : 200




**MANAGERIAL OFFICE
SOUTH VIEW**
 SCALE 1 : 200

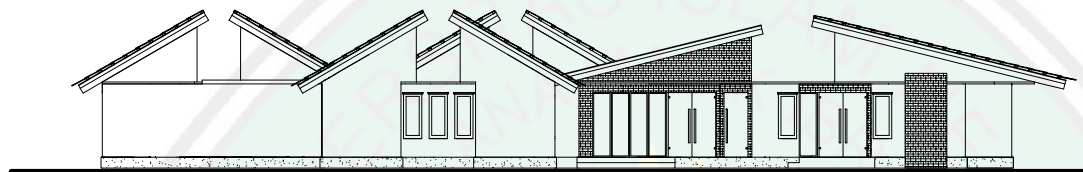


↑ **EMERGENCY UNIT
SOUTH VIEW**
SCALE 1 : 200

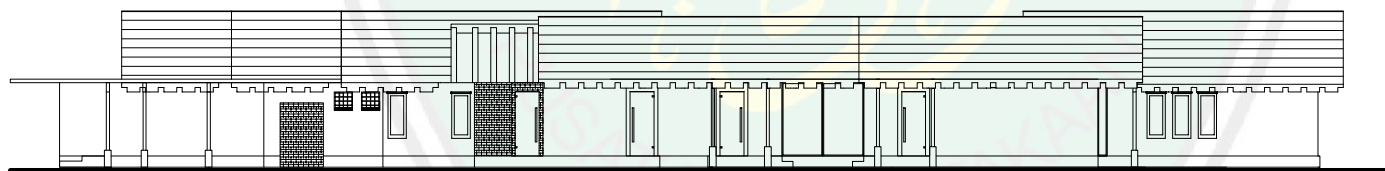


↑ **EMERGENCY UNIT
EAST VIEW**
SCALE 1 : 200

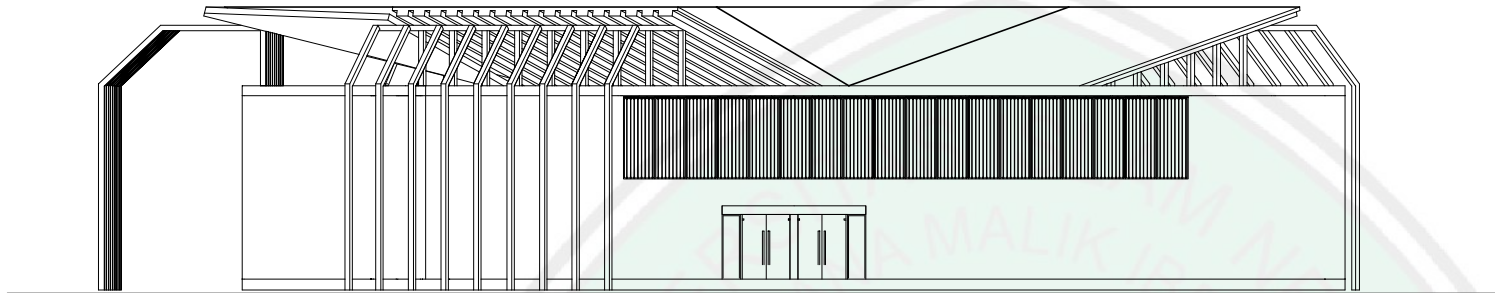
LIBRARY OF MAULANA MALIK IBRAHIM STATE ISLAMIC UNIVERSITY OF MALANG



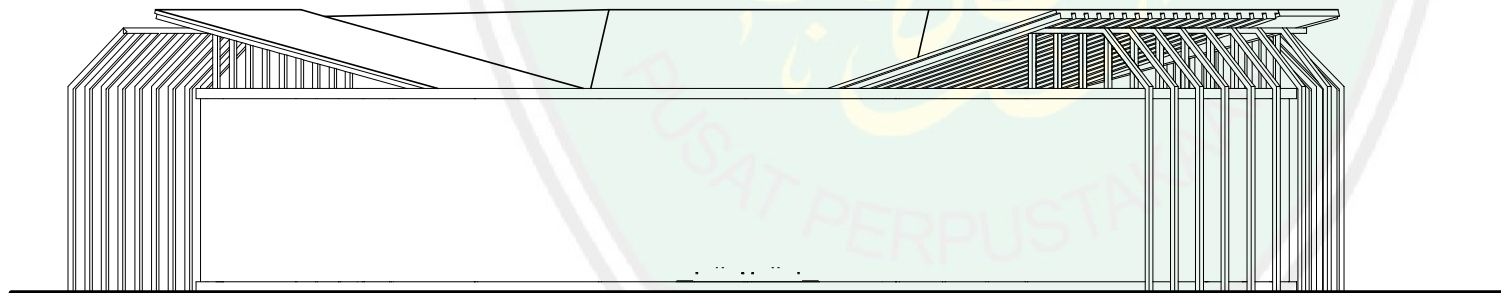
INPATIENT INSTALATION
EAST VIEW
SCALE 1 : 400



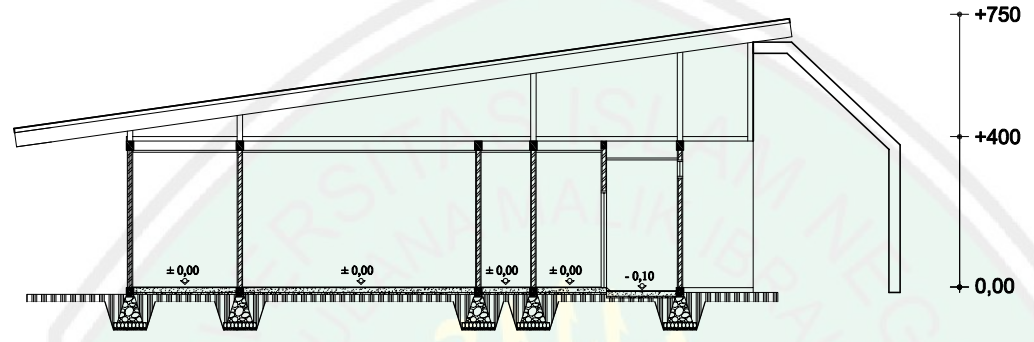
INPATIENT INSTALATION
NORTH VIEW
SCALE 1 : 400



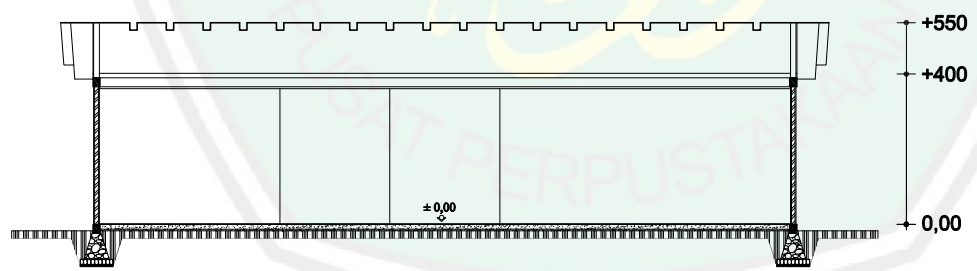
GATHERING DOME
EAST VIEW
SCALE 1 : 400




GATHERING DOME
NORTH VIEW
SCALE 1 : 400

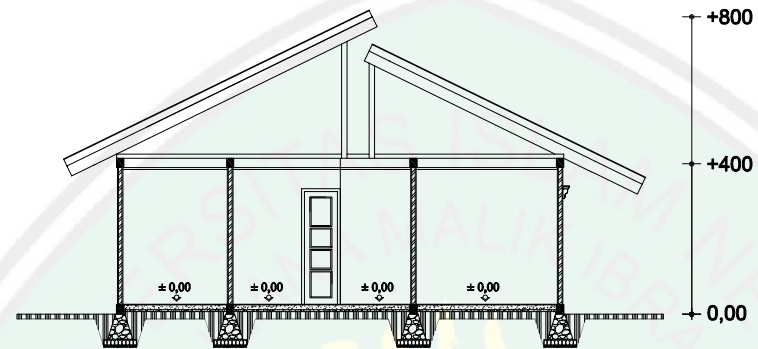



**OUTPATIENT INSTALATION
A - A' SECTION**
 SCALE 1 : 200

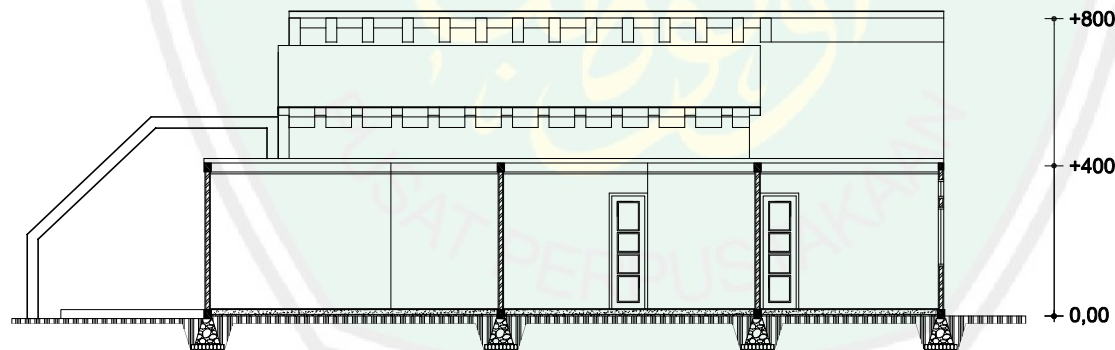



**OUTPATIENT INSTALATION
B - B' SECTION**
 SCALE 1 : 200

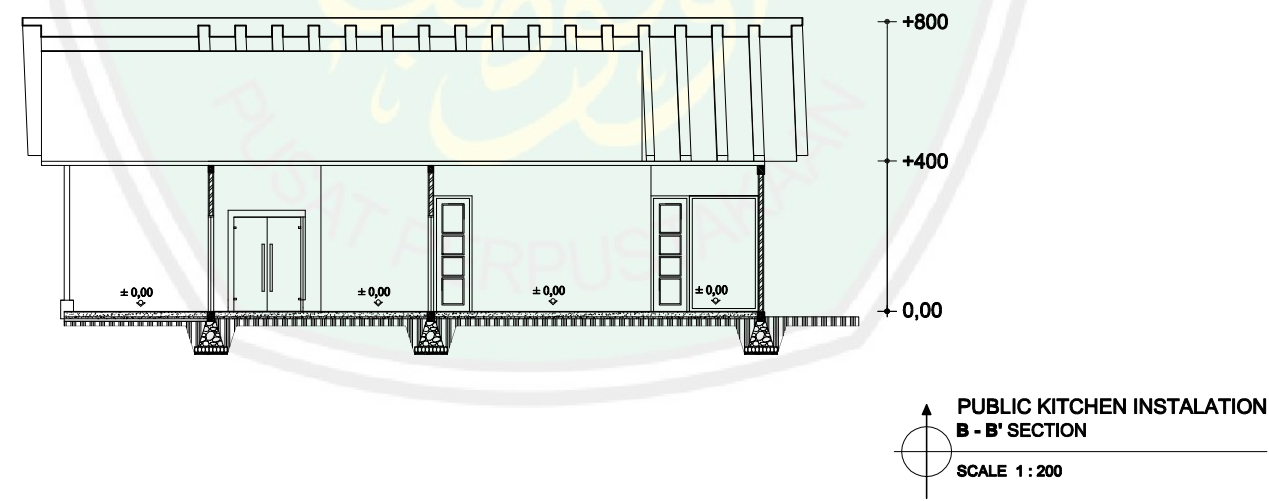
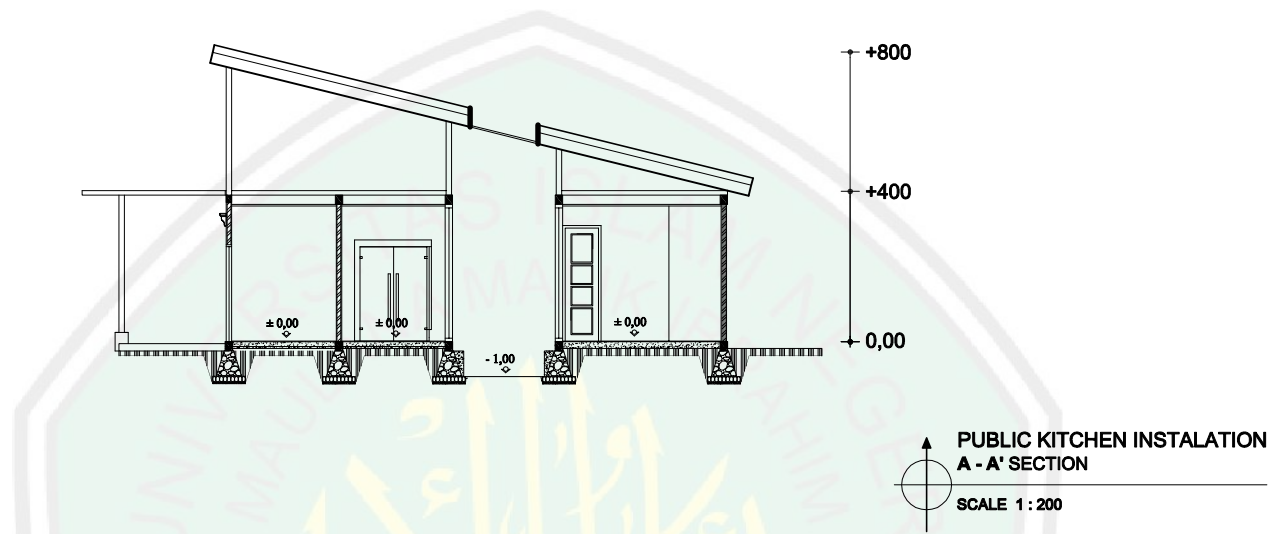
LIBRARY OF MAULANA MALIK IBRAHIM STATE ISLAMIC UNIVERSITY OF MALANG

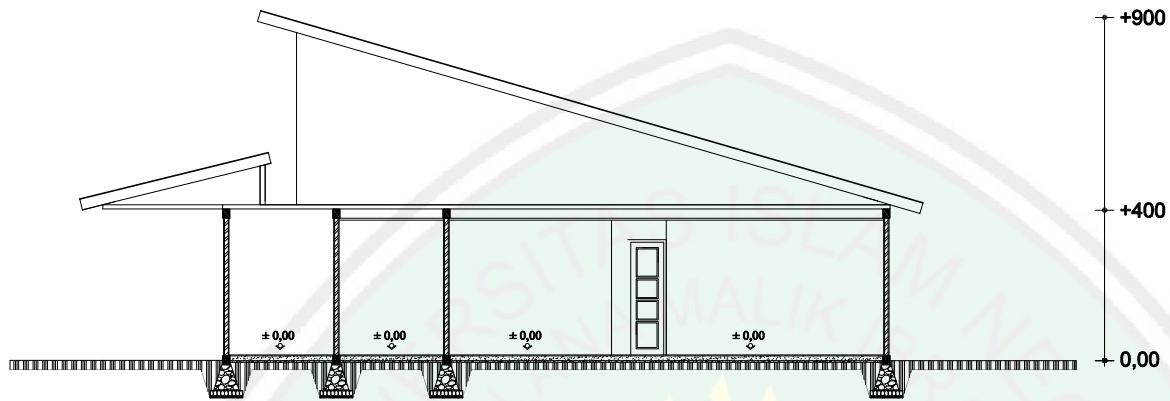



URINALIS AND BLOOD
LABORATORY INSTALATION
A - A' SECTION
SCALE 1 : 200

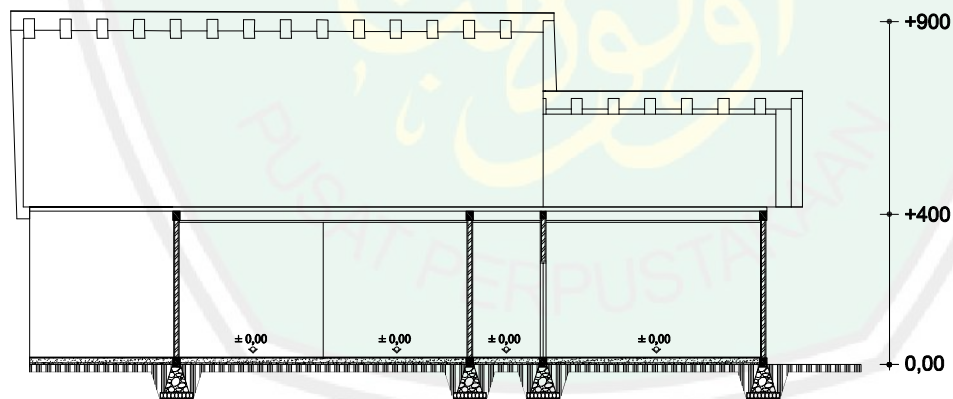



URINALIS AND BLOOD
LABORATORY INSTALATION
B - B' SECTION
SCALE 1 : 200

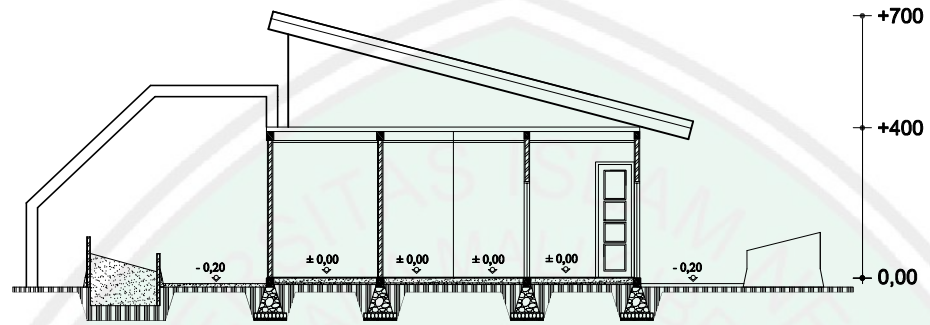





**PHARMACY INSTALATION
A - A' SECTION**
 SCALE 1 : 200

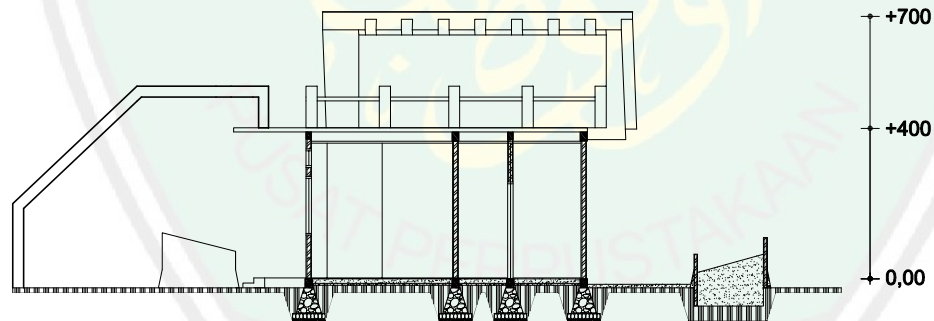



**PHARMACY INSTALATION
B - B' SECTION**
 SCALE 1 : 200



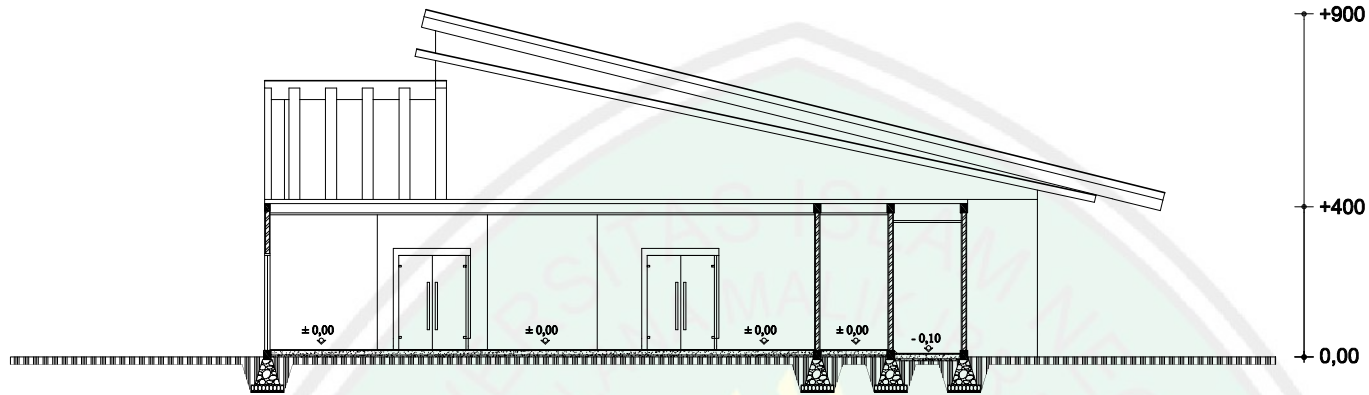
CLINICAL NUTRITION
INSTALATION
A - A' SECTION

SCALE 1 : 200

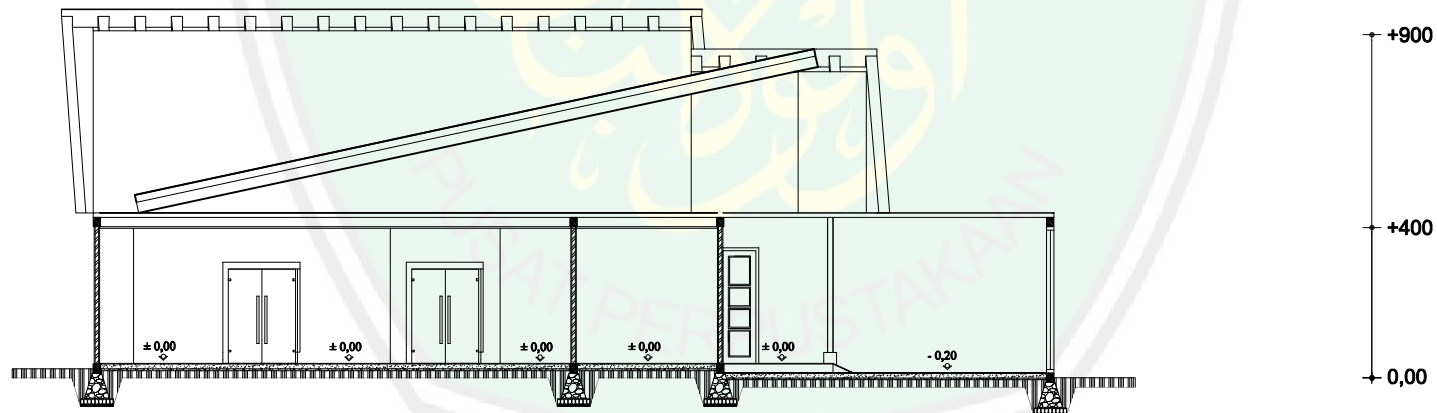


CLINICAL NUTRITION
INSTALATION
B - B' SECTION

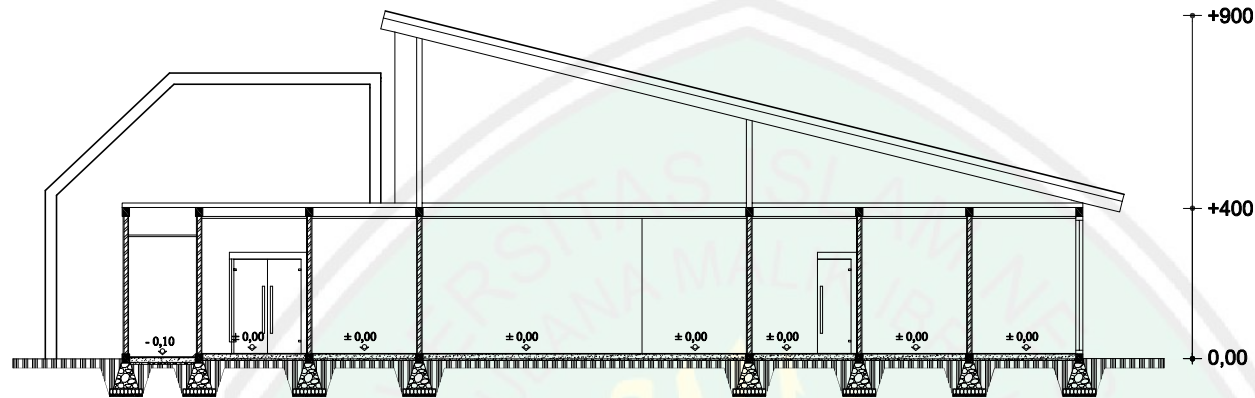
SCALE 1 : 200



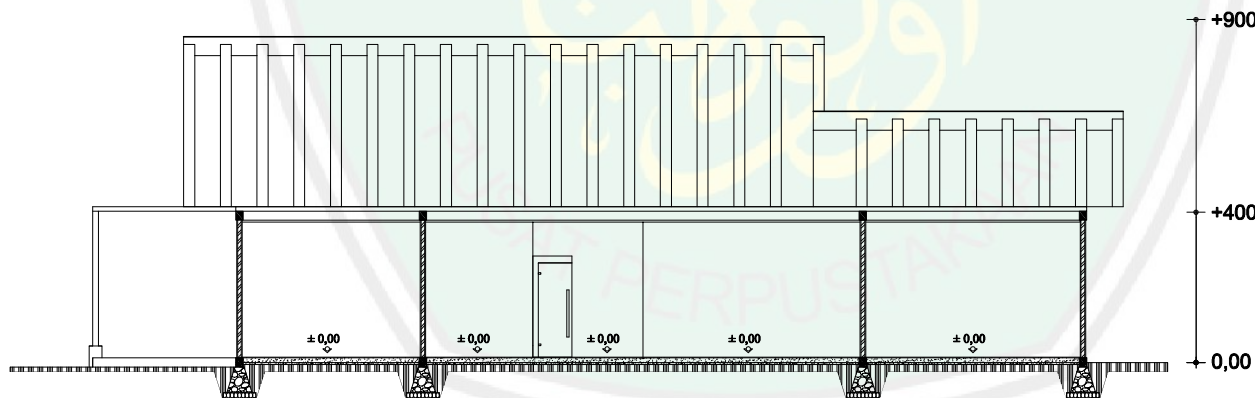
REHABILITATION INSTALATION
A - A' SECTION
 SCALE 1 : 200



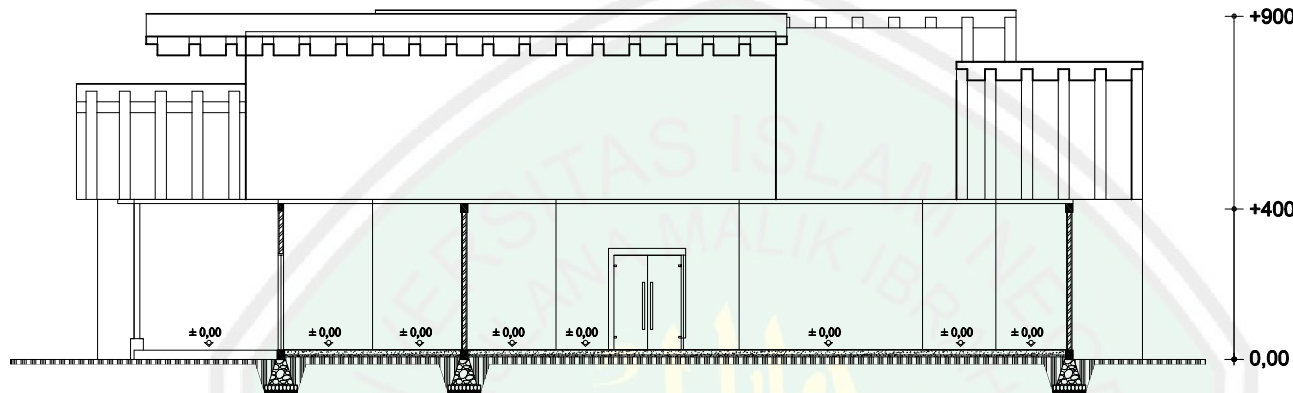
REHABILITATION INSTALATION
B - B' SECTION
 SCALE 1 : 200




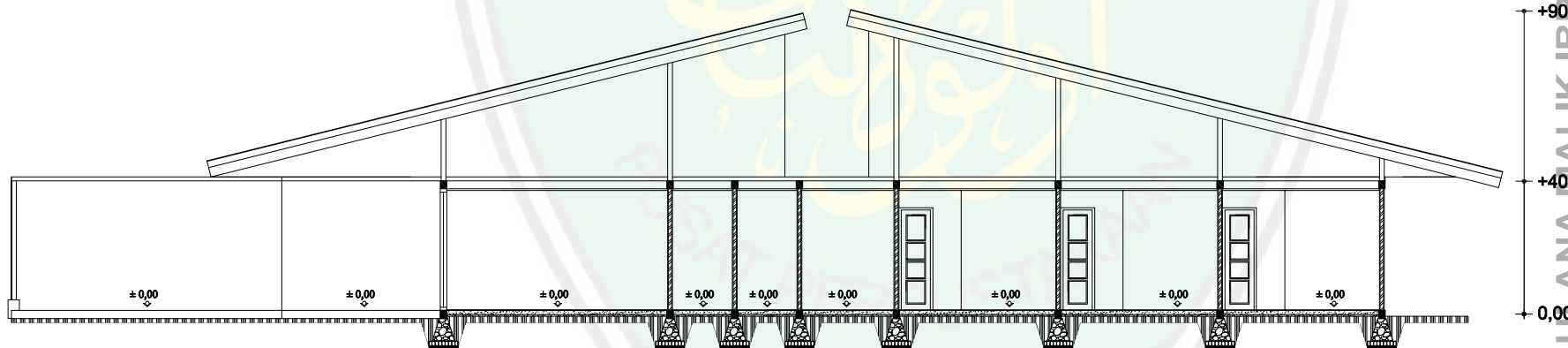
**MANAGERIAL
A - A' SECTION**
SCALE 1 : 200




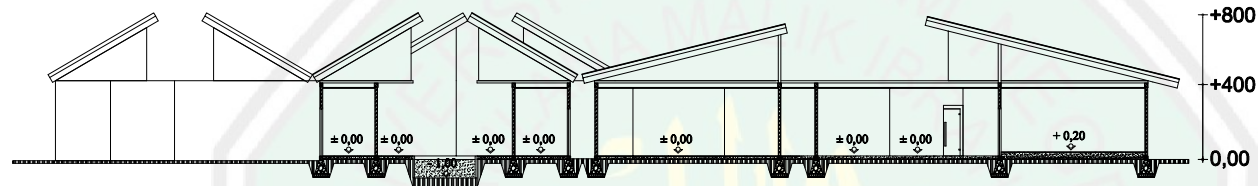
**MANAGERIAL
B - B' SECTION**
SCALE 1 : 200



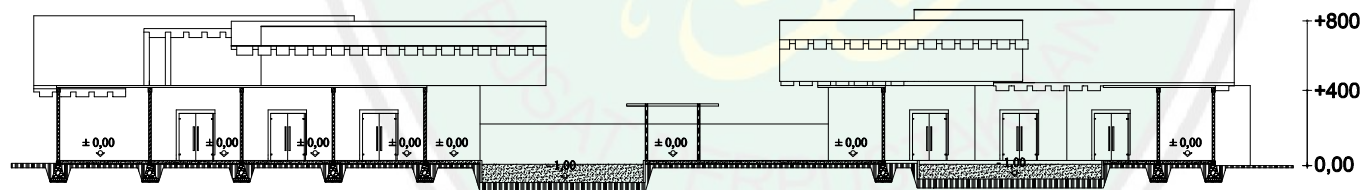

**EMERGENCY UNIT
A - A' SECTION**
 SCALE 1 : 200



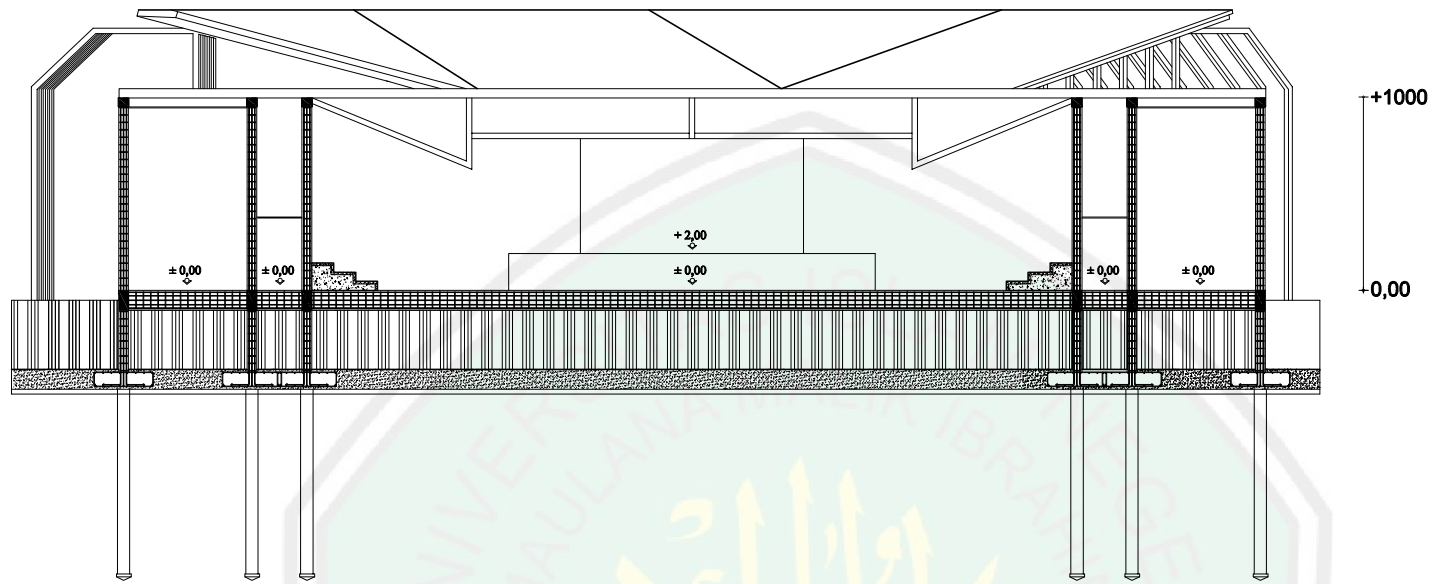

**EMERGENCY UNIT
B - B' SECTION**
 SCALE 1 : 200



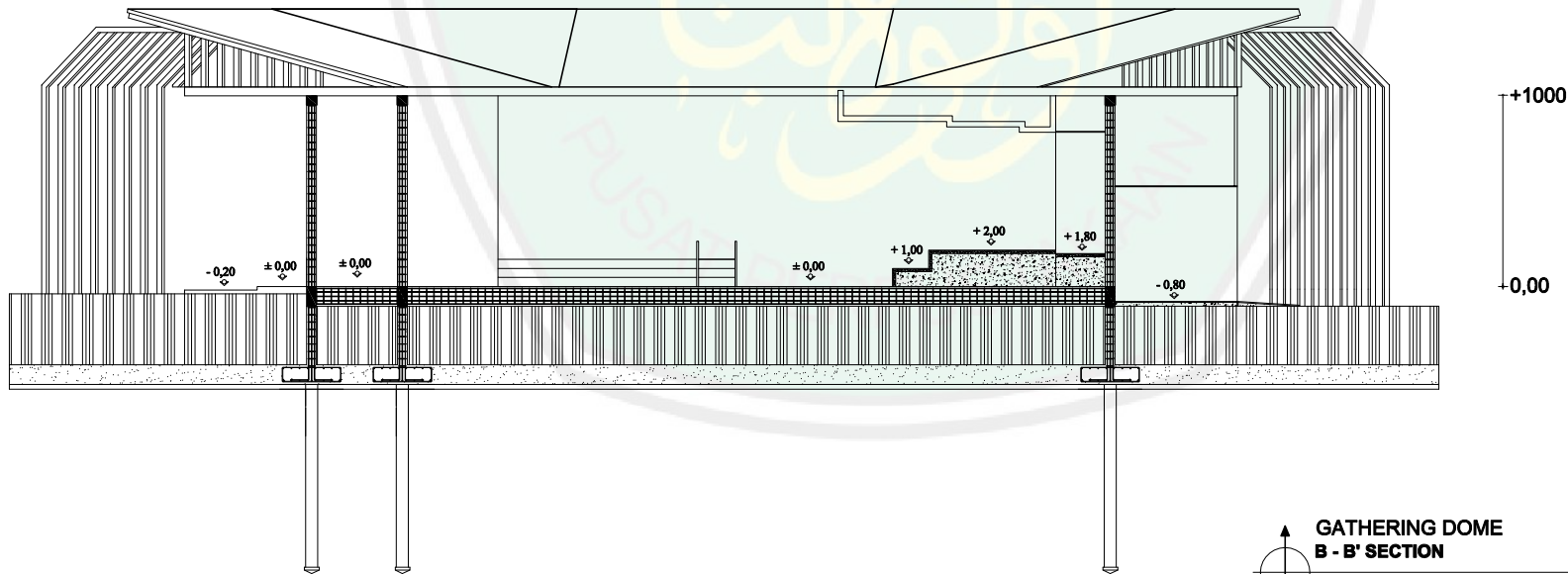
INPATIENT INSTALATION
A - A' SECTION
SCALE 1 : 400



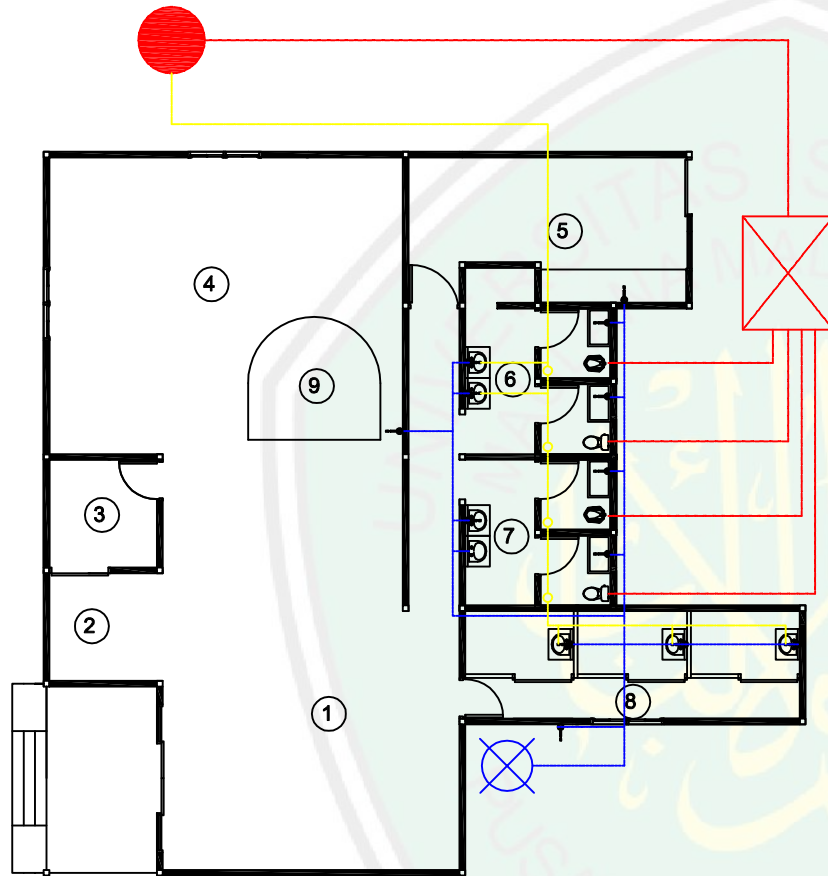
INPATIENT INSTALATION
B - B' SECTION
SCALE 1 : 400



GATHERING DOME
A - A' SECTION
SCALE 1 : 400

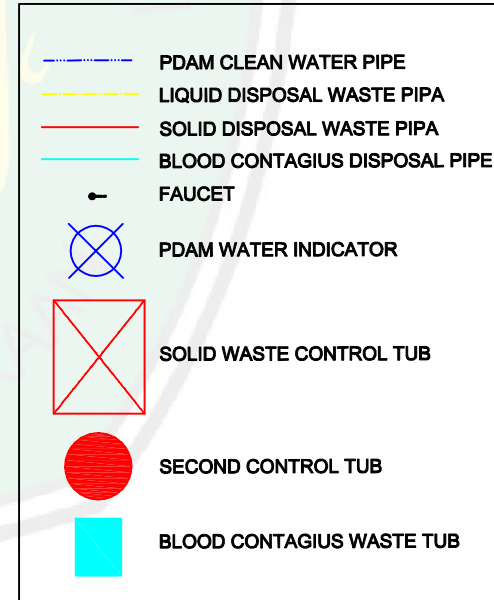


GATHERING DOME
B - B' SECTION
SCALE 1 : 400



LEGENDA

1. Waiting Lobby
2. Receptionist
3. Medical Record Room
4. Action Room
5. Employee's Restroom
6. Woman's Toilet
7. Men's Toilet
8. Lactation/ Nursery Room
9. Indoor Garden



OUTPATIENT INSTALLATION
PLUMBING INSTALATION

SCALE 1 : 200



Diabetes and
Endocrinology
Healthcare Center

UNIVERSITAS ISLAM NEGERI
MAULANA MALIK IBRAHIM
Jln. Gajeyana No.50 Malang

ARCHITECTURE ENGINEERING

PROJECT TITLE

DIABETES AND ENDOCRINOLGY
HEALTHCARE CENTER DESIGN
IN MALANG CITY

STUDENT NAME

QURROTA AYUN

STUDENT NUMBER

16660113

LECTURES GUIDE

PRIMA KURNIAWATY M. SI.
ALDRIN YUSUF FIRMANSAH M.T.

IMAGE TITLE

DETAIL ENGINEERING DESIGN

PLUMBING

BUILDING NAME

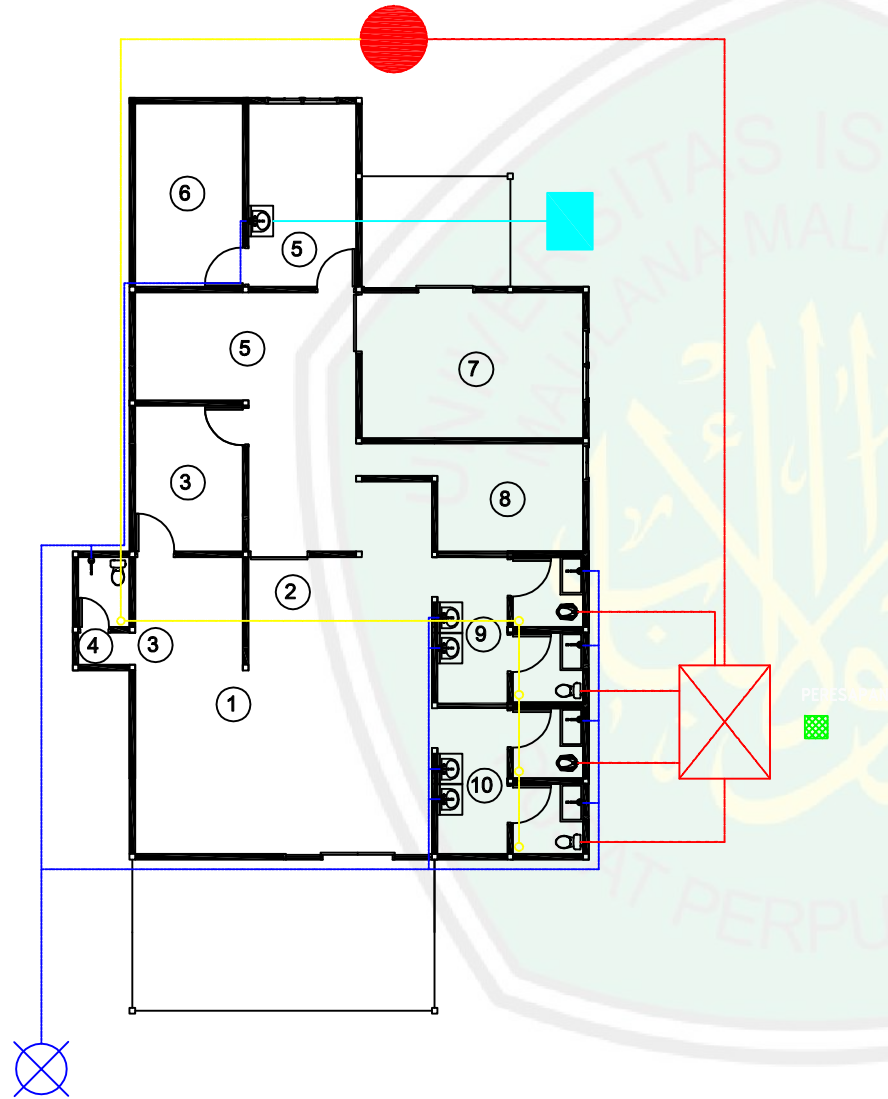
OUTPATIENTS
INSTALATION

IMAGE SCALE

1 : 200

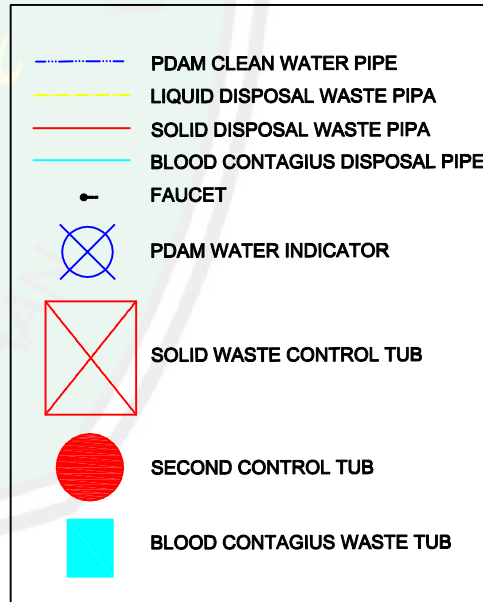
IMAGE NUMBER :

31



LEGENDA

1. Waiting Lobby
2. Receptionist
3. Urinalis
4. Toilet
5. Blood Checking
6. Blood Bank
7. Biomaterial Keeping Room
8. Pantry and Restroom
9. Woman's Toilet
10. Men's Toilet

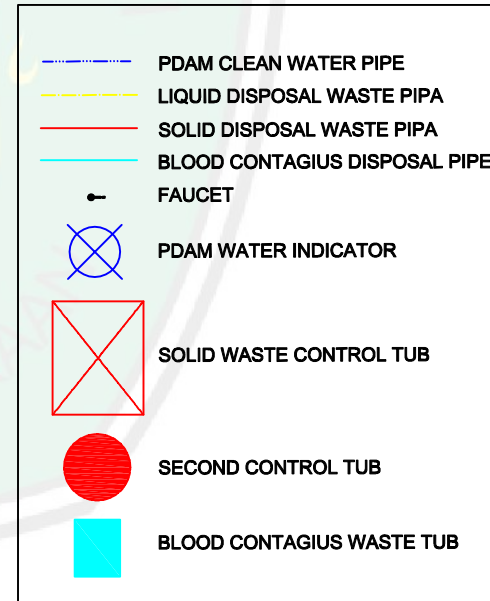
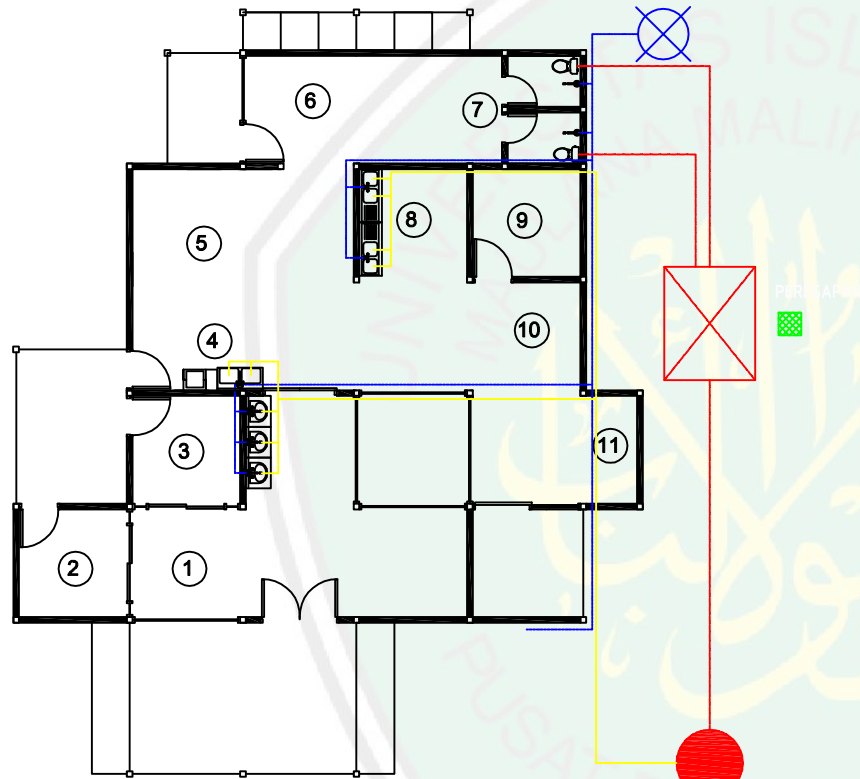


URINALIS AND BLOOD
LABORATORY INSTALATION
PLUMBING INSTALATION
SCALE 1 : 200



LEGENDA

1. Food Receiving and Weighing Room
2. Wet Food Storage
3. Dry Food Storage
4. Ingredient Cleaning Spot
5. Food Processing Room
6. Rest Room
7. Public Toilet
8. Equipment Washing Room
9. Equipment Storage Room
10. Trolley Room
11. Food Presentation and Distribution Room



**Diabetes and
Endocrinology
Healthcare Center**

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IMAGE TITLE

DETAIL ENGINEERING DESIGN

PLUMBING

BUILDING NAME

PUBLIC KITCHEN
INSTALATION

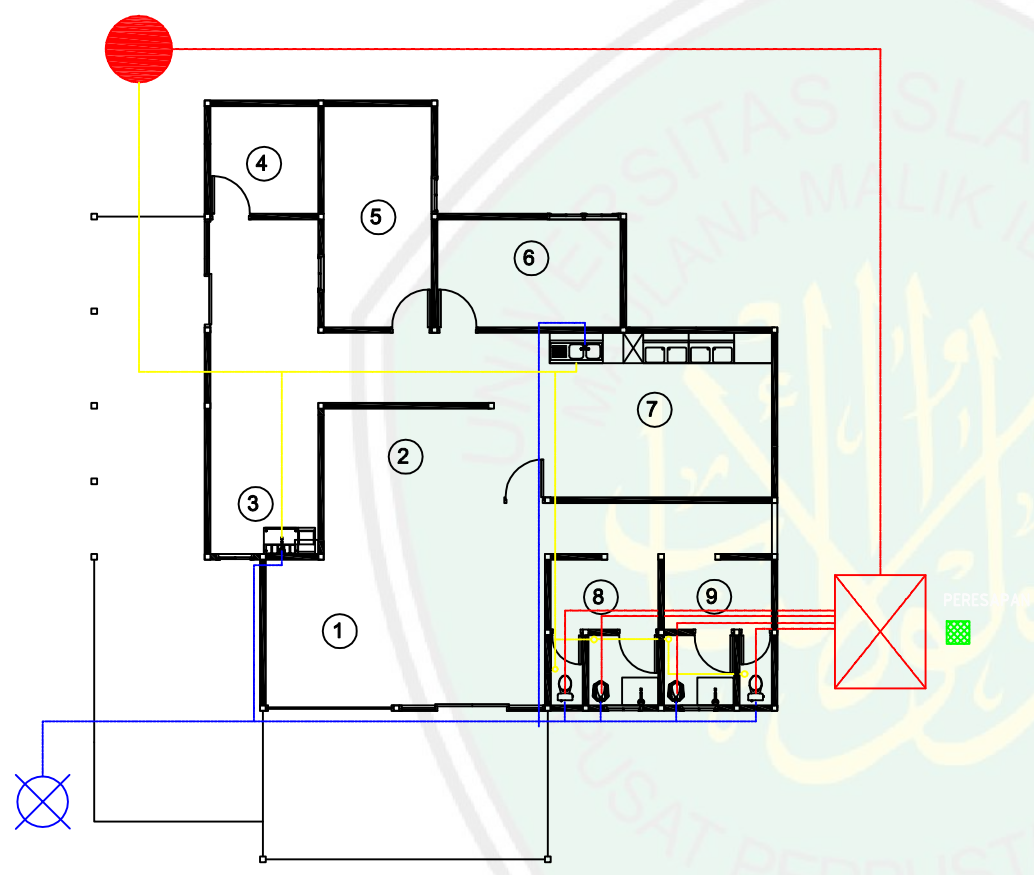
IMAGE SCALE

1 : 200

IMAGE NUMBER :

33

LIBRARY OF MAULANA MALIK IBRAHIM STATE ISLAMIC UNIVERSITY OF



- LEGENDA**
- 1. Waiting Lobby
 - 2. Receptionist
 - 3. Pantry
 - 4. Storage
 - 5. Chief Of Pharmacy's Room
 - 6. Druf warehouse
 - 7. Compounding Medicine Room
 - 8. Men's Toilet
 - 9. Woman's Toilet

	PDAM CLEAN WATER PIPE
	LIQUID DISPOSAL WASTE PIPA
	SOLID DISPOSAL WASTE PIPA
	BLOOD CONTAGIUS DISPOSAL PIPE
	FAUCET
	PDAM WATER INDICATOR
	SOLID WASTE CONTROL TUB
	SECOND CONTROL TUB
	BLOOD CONTAGIUS WASTE TUB

**PHARMACY INSTALATION
PLUMBING INSTALATION**
SCALE 1 : 200



**Diabetes and
Endocrinology
Healthcare Center**

**UNIVERSITAS ISLAM NEGERI
MAULANA MALIK IBRAHIM**
Jln. Gejeyana No.50 Malang

ARCHITECTURE ENGINEERING

PROJECT TITLE
DIABETES AND ENDOCRINOLGY
HEALTHCARE CENTER DESIGN
IN MALANG CITY

STUDENT NAME
QURROTA AYUN

STUDENT NUMBER
16660113

LECTURES GUIDE
PRIMA KURNIAWATY M. SI.
ALDRIN YUSUF FIRMANSYAH M.T.

IMAGE TITLE
DETAIL ENGINEERING DESIGN

PLUMBING

BUILDING NAME

PHARMACY
INSTALATION

IMAGE SCALE
1 : 200

IMAGE NUMBER :

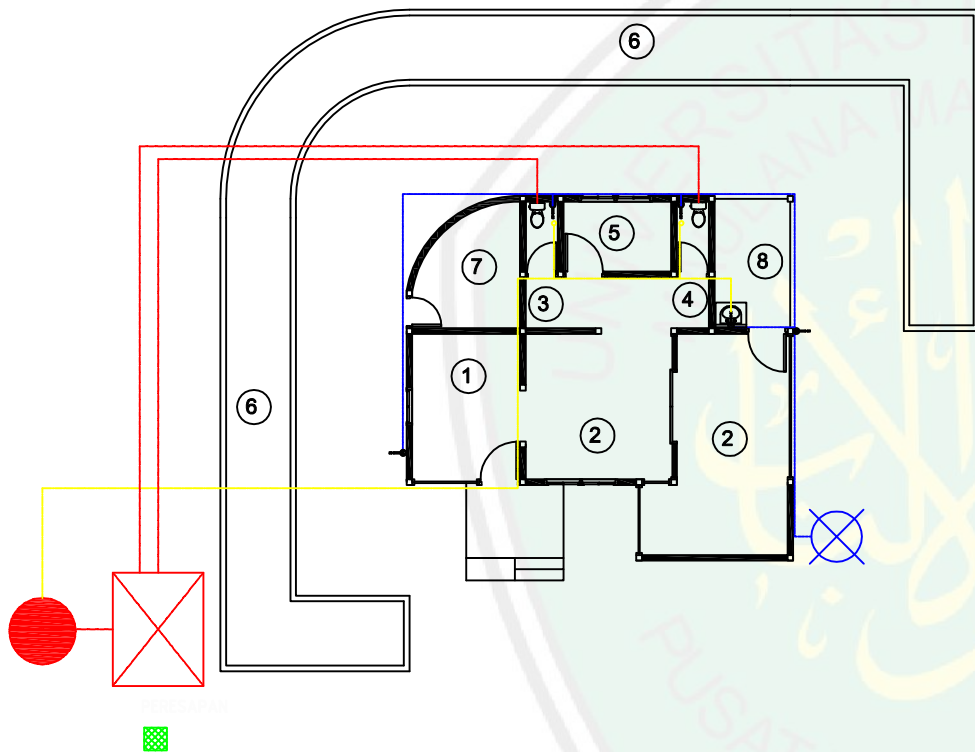
34

LIBRARY OF MAULANA MALIK IBRAHIM STATE ISLAMIC UNIVERSITY OF



LEGENDA

- 1. Nutritionist Room
- 2. Model and Miniature Room
- 3. Woman's Toilet
- 4. Men's Toilet
- 5. Storage
- 6. Example Plant Display (For Diabetes)
- 7. Planting Equipment's Storage
- 8. Second Entrance Door



	PDAM CLEAN WATER PIPE
	LIQUID DISPOSAL WASTE PIPA
	SOLID DISPOSAL WASTE PIPA
	BLOOD CONTAGIUS DISPOSAL PIPE
	FAUCET
	PDAM WATER INDICATOR
	SOLID WASTE CONTROL TUB
	SECOND CONTROL TUB
	BLOOD CONTAGIUS WASTE TUB

CLINICAL NUTRITION
INSTALATION
PLUMBING INSTALATION
SCALE 1 : 200



UNIVERSITAS ISLAM NEGERI
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IMAGE TITLE
DETAIL ENGINEERING DESIGN

PLUMBING

BUILDING NAME

CLINICAL NUTRITIONS
INSTALATION

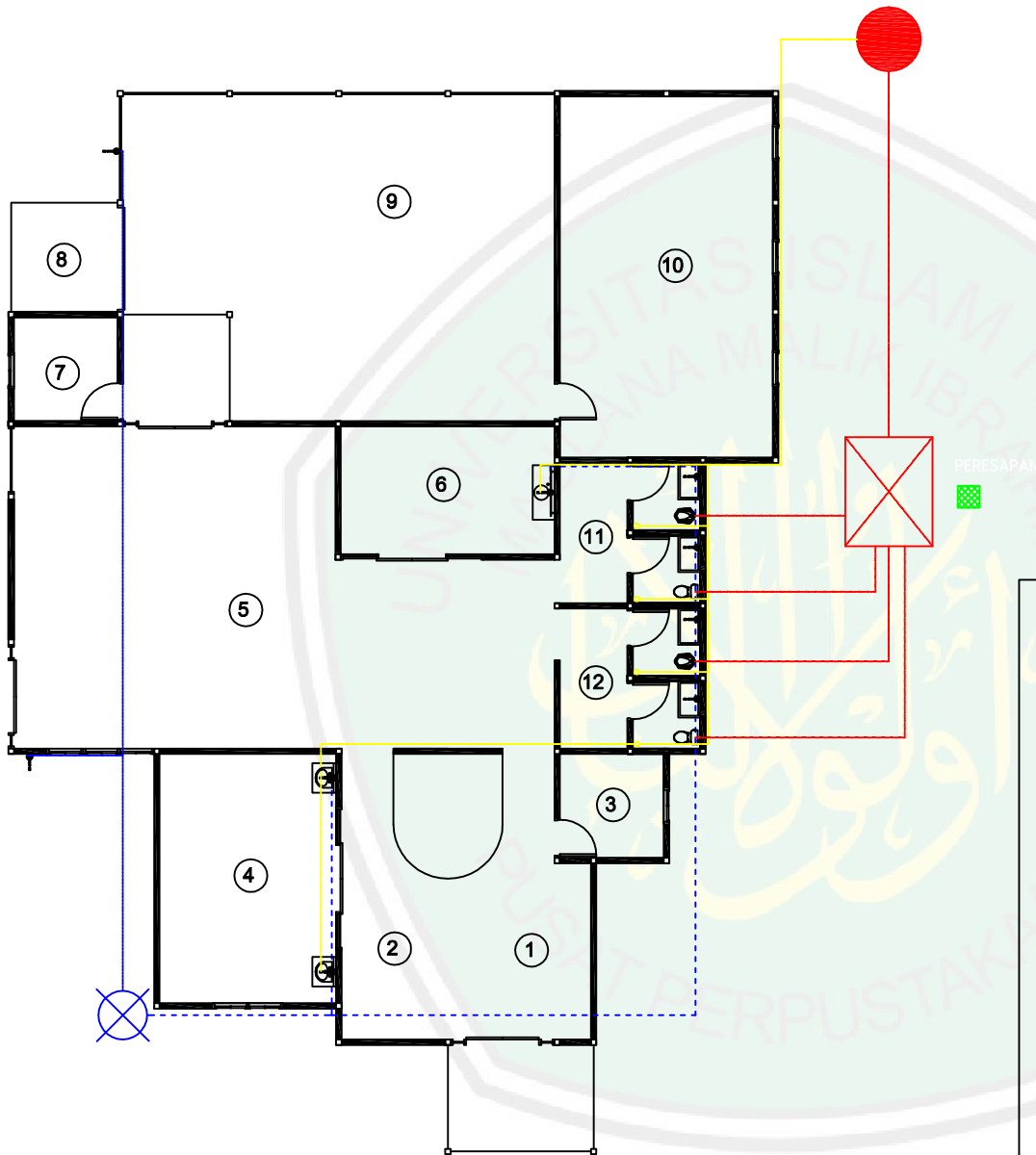
IMAGE SCALE

1 : 200

IMAGE NUMBER :

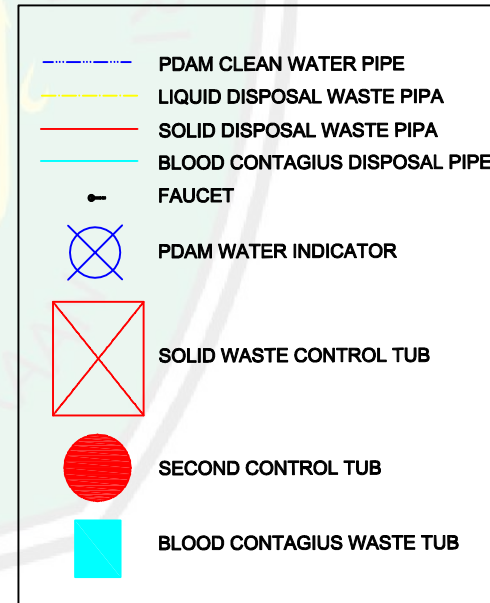
35

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LEGENDA

1. Waiting Lobby
2. Receptionist
3. Chief Of Instalation's Room
4. Checking Room
5. Pasive Psysiotherapy Area
6. Pasive Psysiotherapy Area (Massage Room)
7. Storage
8. Backdoor Emergency Exit
9. Active Psysiotherapy Area
10. Active Psysiotherapy Area (Private Aerobic Room)
11. Woman's Toilet
12. Men's Toilet



REHABILITATION INSTALATION
PLUMBING INSTALATION
SCALE 1 : 200



**Diabetes and
Endocrinology
Healthcare Center**

UNIVERSITAS ISLAM NEGERI
MAULANA MALIK IBRAHIM
Jln. Gejeyana No.50 Malang

ARCHITECTURE ENGINEERING

PROJECT TITLE

DIABETES AND ENDOCRINOLGY
HEALTHCARE CENTER DESIGN
IN MALANG CITY

STUDENT NAME

QURROTA AYUN

STUDENT NUMBER

16660113

LECTURES GUIDE

PRIMA KURNIAWATY M. SI.
ALDRIN YUSUF FIRMANSYAH M.T.

IMAGE TITLE
DETAIL ENGINEERING DESIGN

PLUMBING

BUILDING NAME

REHABILITATION
INSTALATION

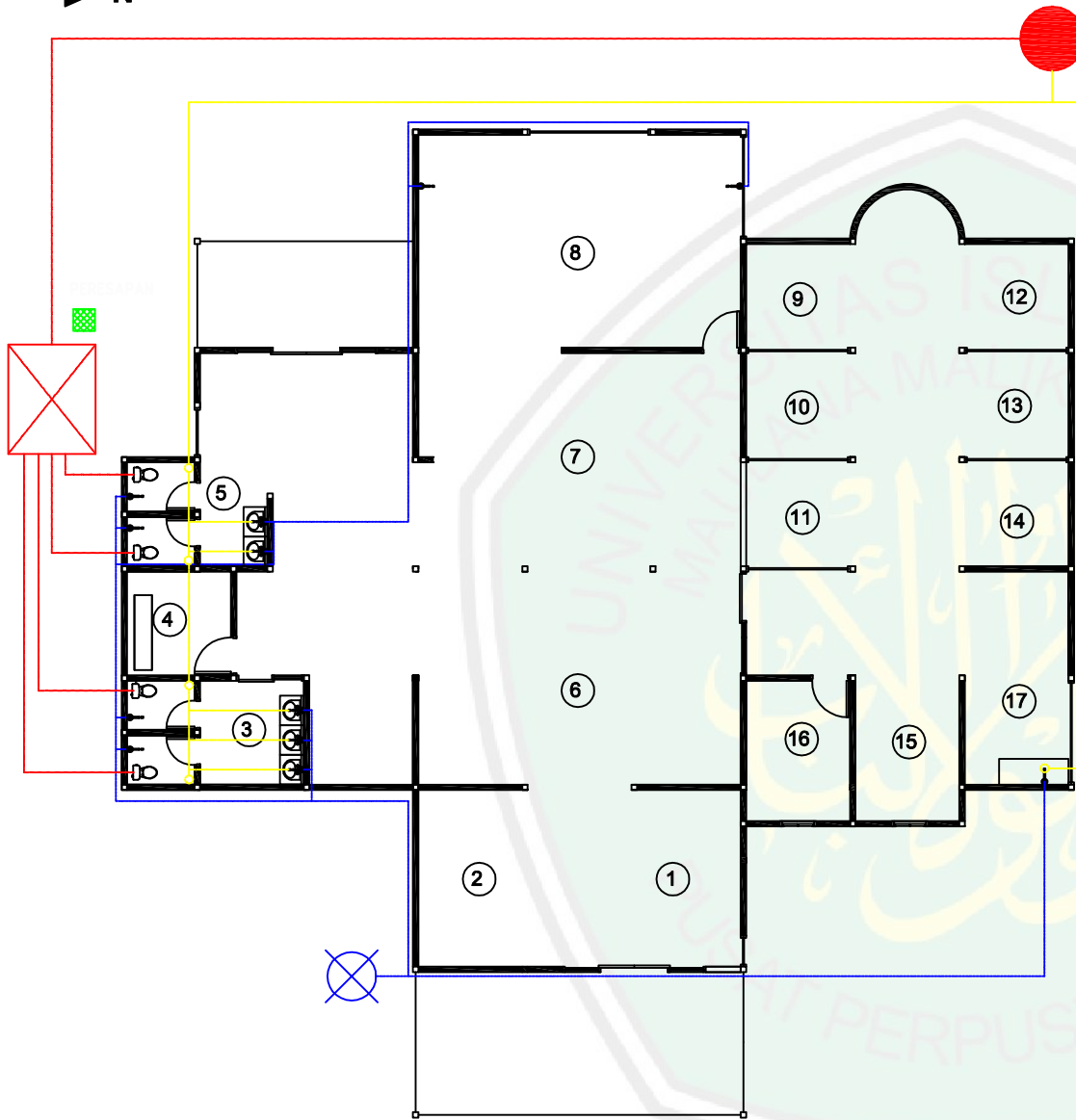
IMAGE SCALE

1 : 200

IMAGE NUMBER :

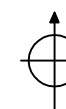
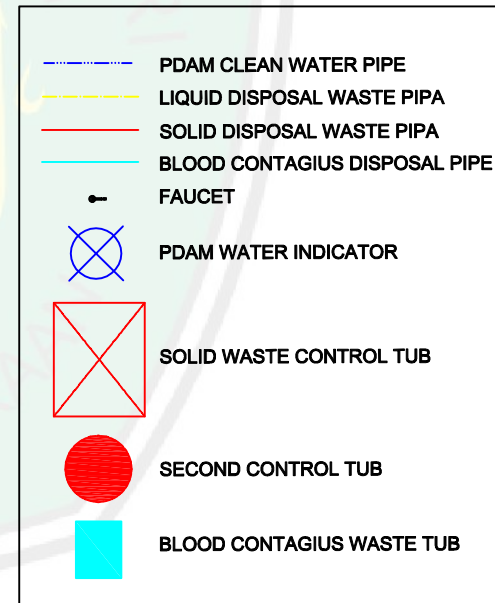
36

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LEGENDA

1. Waiting Lobby
2. Receptionist
3. Woman's Toilet
4. Service Room
5. Men's Toilet
6. Mini Managerial's Hall (Exhibition Space)
7. Lounge (VIP Waiting Room)
8. Meeting Room
9. Chief of Human Resource's Room
10. Chief of Nurse's Room
11. Chief of Commite's Room
12. Chief of Medical Service's Room
13. Chief of Financial's Room
14. Chief of Medical Support's Room
15. Chief of General Operasion's Room
16. Director's Room
17. Pantry



**MANAGERIAL OFFICE
PLUMBING INSTALATION**

SCALE 1 : 200

PROJECT TITLE

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ALDRIN YUSUF FIRMANSYAH M.T.

**IMAGE TITLE
DETAIL ENGINEERING DESIGN**

PLUMBING

BUILDING NAME

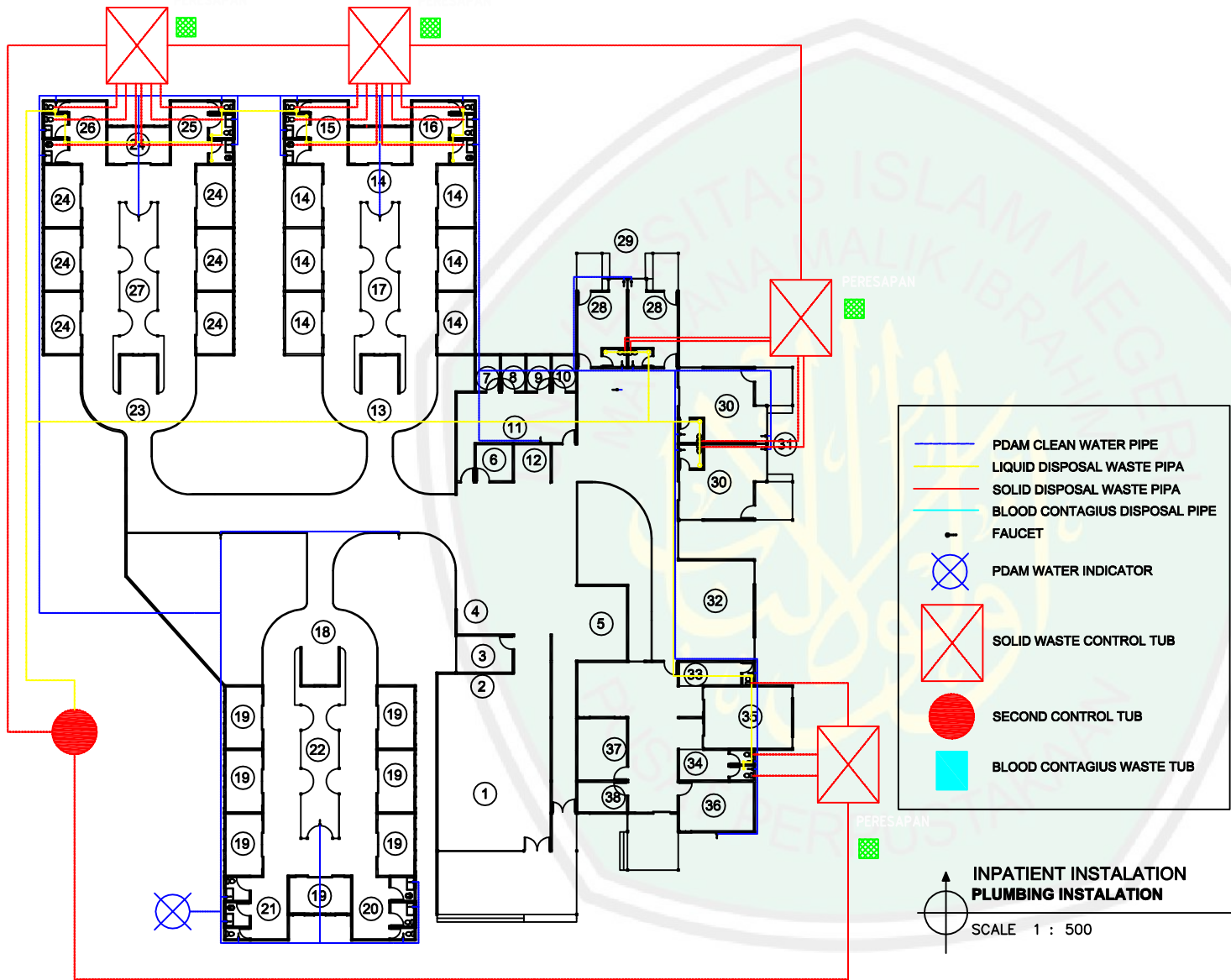
MANAGERIAL

IMAGE SCALE

1 : 200

IMAGE NUMBER :

37



LEGENDA

1. Waiting Lobby
2. Receptionist
3. Consultation's Room
4. Security Check
5. Patien's With Gurney's Check Point's Room
6. HCU
7. VIP and VVIP Nurse Station
8. Dirty Storage
9. Dirty Linen Room
10. Clean Storage
11. Clean Linen Room
12. Washing Dirty Linen
13. 1st Class Nurse Station
14. 1st Class Room
15. 1st Class Woman Toilet
16. 1st Class Men's Toile
17. 1st Class Mini Garden
18. 2nd Class Nurse Station
19. 2nd Class Room
20. 2nd Class Woman Toilet
21. 2nd Class Men's Toilet
22. 2nd Class Mini Garden
23. 3rd Class Nurse Station
24. 3rd Class Room
25. 3rd Class Woman Toilet
26. 3rd Class Men's Toilet
27. 3rd Class Mini Garden
28. VIP Room
29. VIP Private Garden
30. VVIP Room
31. VVIP Private Garden
32. Lounge for VIP and VVIP
33. Men's Toilet
34. Woman's Toilet
35. Mushola (Pray Room)
36. Education and Discussion Room
37. Chief of Instalation's Room
38. Doctor's Office



Diabetes and Endocrinology Healthcare Center

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PRIMA KURNIAWATY M. SI.
ALDRIN YUSUF FIRMANSYAH M.T.

IMAGE TITLE

DETAIL ENGINEERING DESIGN

PLUMBING

BUILDING NAME

INPATIENTS INSTALATION

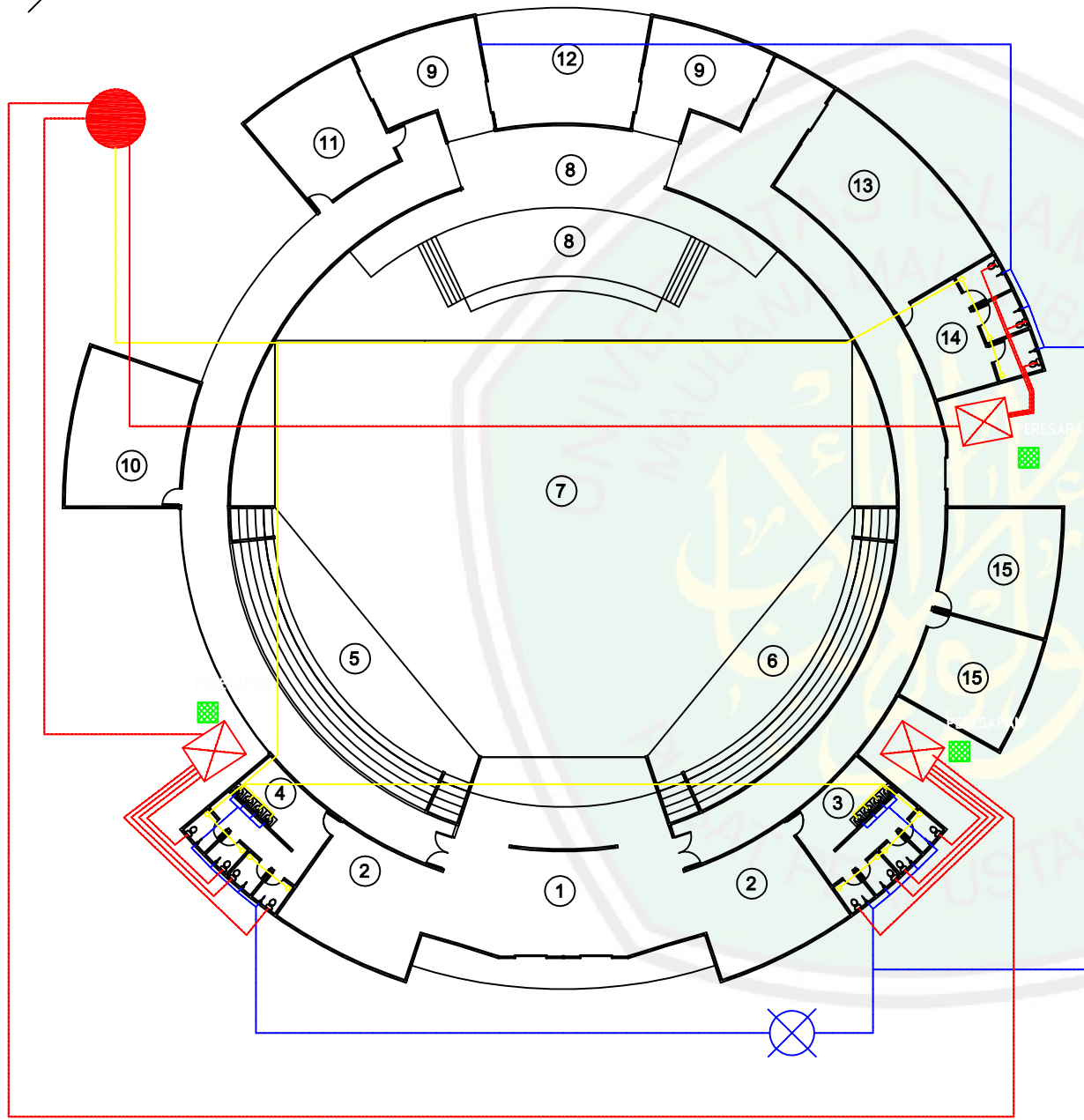
IMAGE SCALE

1 : 500

IMAGE NUMBER :

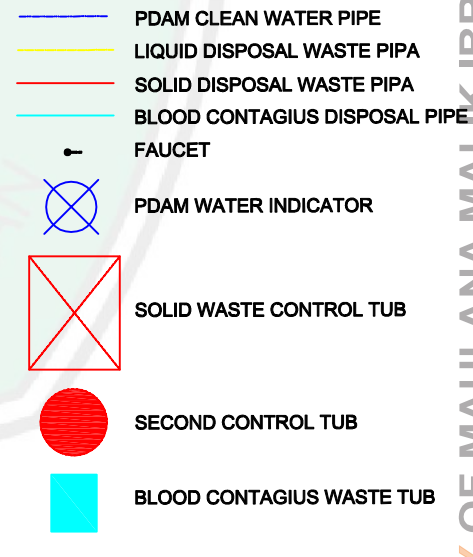
39

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LEGENDA

1. Receptionist
2. Sitting Lobby
3. Woman's Toilet
4. Men's Toilet
5. 1st Tribun
6. 2nd Tribun
7. Main Hall
8. Stage
9. Backstage
10. Storage Room
11. Control Room
12. Parking for VIP Guest
13. VIP Room for Presenters
14. VIP Toilet
15. Waiting Room for Regular Presenters



**GATHERING DOME
PLUMBING INSTALATION**
SCALE 1 : 400



Diabetes and Endocrinology Healthcare Center
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LECTURES GUIDE
PRIMA KURNIAWATY M. SI.
ALDRIN YUSUF FIRMANSYAH M.T.

IMAGE TITLE
DETAIL ENGINEERING DESIGN

PLUMBING

BUILDING NAME
GATHERING DOME

IMAGE SCALE
1 : 400

IMAGE NUMBER :
40

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CHAPTER VI

CONCLUTIONS AND SUGGESTIONS

1.1 CONCLUTIONS

The high number of diabetes patient in Malang city at the point of 95.466 in January 2018 caused by the behaviour of the people lifestyle such as lacks of psysical activity and consuming junk food make the number increasing every year. The goverment tried to control this increased number with 4 stages of action. The action are promotive, preventive, curative and rehabilitative.

Yoshinori Otsuka, a diabetes professor from Japan's Hokkaido University experimented on 116 patients he handled to walk casually in the forest. The result shows the patients that connect more with the forest had a better condition. This better condition caused by the effect, named Biophilia Effect.

Architect called the effect by Biophilic Approach, that also used in this Diabetes and Endocrinology Healtcare Center design. The principles that this design used was Biophilic Principles by Stephen R. Kellert, which has 6 main principles as mentioned in the previous chapter. The principles lead the design in to some specific requirement because of the type of design (healthcare building).

The design concept that refers both to the biophilic requirement and healthcare building requirement lead to the main basic concept called by “**Natural Urban Synapses**”. This basic concept mostly focused on how the biophilic principle mixed with the healthcare requirement, can survive in the middle of a crowded city of Malang. The basic concept affected the site concept, room concept, form concept, structure concept and also the utility concept. All in one design to provide a better healthcare center for diabetes patients.

The design result, according to the biophilic approach, that represent this Diabetes and Endocrinology Healthcare Center are :

- a) Three different kind of landscape (Healing, Sensory and Therapeutic).
- b) The retention ponds, connect the waste management with the biophilic principles.
- c) The plant filtered windows provide better air to the building.
- d) Aquarium corner inside the patients room combine the biophilic principle with the patient's pscology, makes them relax.
- e) Landsacpe in between each building makes the nature closer to the user.

1.2 SUGGESTIONS

From the first chapter until the last chapter, this paper trying to figure out how to match both of the requirement as one solid design. The percentage of how far the requiremet applied in this design, according to the writer, both can be seen in the diagram below :



Image 7.1 Design Implementation According to the Healthcare Building Requirement (Source : Personal Data)

The preventive action having the lowest score because of the writer lacks of the literature of actual diabetes center that manage the preventive action beside the counseling. So for the next person who interested in this type of design using biophilic, the writer suggest to look more about the diebetes preventive action on an actual diabetes center across the world.

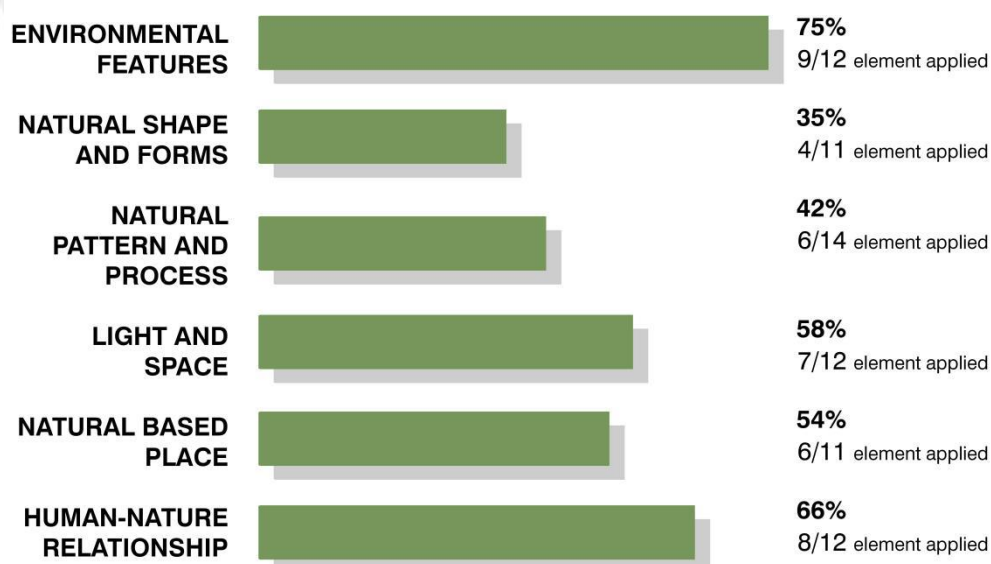


Image 7.2 Design Implementation According to the Biophilic Principles Requirement (Source : Personal Data)

This diagram mainly shows that the writer only used the biophilic element that can be possibly mixed with the healthcare building requirement without any deep reserach on each element that has been picked out and only focus on some element. The suggestion to the next paper that likely using Biophilic as an approach, should understand more about which element on the biophilic principle that match their building type requirement on a deep research. So hopefully the design will have many unique answer to the issue and shows the biophilic more.



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