

FINAL ARCHITECTURAL DESIGN STUDIO

DESIGN OF NGETEH VISITOR CENTRE WITH ECO-ARCHITECTURAL APPROACH IN NGLINGGO VILLAGE, KULON PROGO

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ARCHITECTURE



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Korea Architectural Accrediting Board



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**DESIGN OF NGETEH VISITOR CENTRE WITH ECO-ARCHITECTURAL APPROACH IN
NGLINGGO VILLAGE, KULON PROGO**

**PERANCANGAN PUSAT PENGUNJUNG NGETEH DENGAN PENDEKATAN ARSITEKTUR
EKOLOGIS DI DESA NGLINGGO, KULON PROGO**

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VALIDATION SHEET

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VILLAGE, KULON PROGO

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AUTHOR GREETINGS

Assalamualaikum Wr. Wb.

Praise the presence of Allah SWT, The One and Only God for the abundance of grace, His gift, and His power so the preparation of the final architectural design studio report titled "Design of Ngeteh Visitor Centre with Eco-Architecture Approach in Nglinggo Village, Kulon Progo" can be completed. The author realizes that the process of drafting and implementing of this report can be done inseparable from the support of many parties, therefore the author wants to express appreciation and gratitude to:

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The author is fully aware that this work has not been fully perfect, therefore all constructive criticism and suggestions for the perfection of Final Architectural Design Studio are highly expected. Hopefully this Final Architectural Design Studio can be usefull for the author and all of us.

Yogyakarta, 1st August 2022

Author,



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STATEMENT OF AUTHENTICITY

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s a work of autho's idea with input from supervisor and juries except the work mentioned in the reference and there is no help from any other party either in whole or in part in the process of making it. The final result of this work was handed over to the Department of Architecture, Islamic University of Indonesia for use for educational and publication purposes, but the intellectual property rights are still owned by the author.

Yogyakarta, 1st August 2022

Author,

A pink rectangular stamp with a QR code and the text "METERAI ELEKTRONIK 10000 SEPULUH RIBU RUPIAH" is placed over the author's signature. The signature is written in black ink.

Hanifah Hestyas Khumaira

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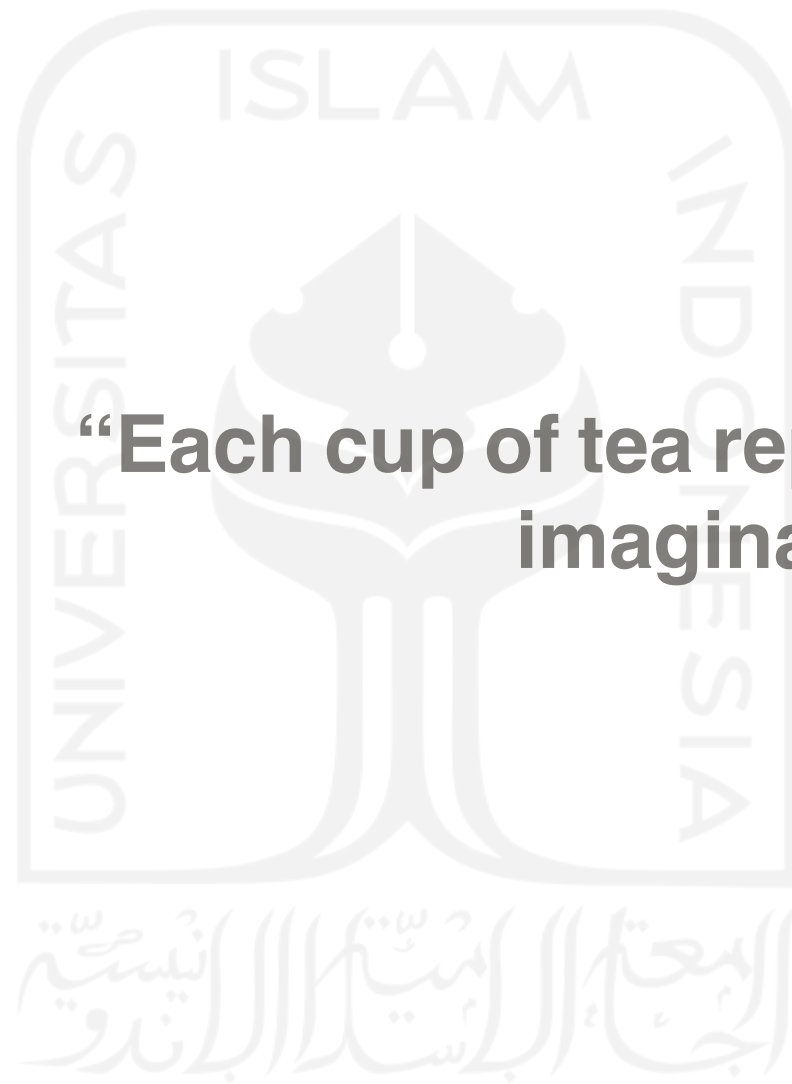
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**“Each cup of tea represents an
imaginary voyage”**

Catherine Douzel

DESIGN PREMISE

Nglinggo Village is the only local tea producer village in Yogyakarta. The Village is also a tourism village. But unfortunately, amid the increasing demand tea in the world, the tea industry in Indonesia was weakened. This has an impact in Nglinggo Village where tea cultivation land has been reduced. This is very unfortunate, because although tea in Yogyakarta does not have a lot of production, tea has been absorbed into a tradition in the Kraton and in the community so that its existence must still be maintained. In Nglinggo Village, people start to develop local tea production. Unfortunately, there is no supporting facility that can promote local tea to the wider community. In fact, considering the potential of the village which has the potential for recreational and educational tourism.

This Visitor Centre with eco-architectural approach is designed to maintain the tea community in Nglinggo with still maintaining their connection with environment ecosystem. The design provides facilities for tourism to get know more about the tea and also facilities for tea producing community to stimulate social interaction between the community and with people from outside. So that it can trigger the development of Nglinggo local tea in terms of knowledge, interests, and culture. This is expected to create more sustainable environment and community.

01

CHAPTER 01

Background

Mind Map

Problem Formulation

Design Method

Design Framework

Originality and Novelty



INGLINGGO VILLAGE: THE ONLY VILLAGE THAT PRODUCE THEIR OWN TEA IN YOGYAKARTA

Picture 1:1 Nglinggo Tea Garden
Source : [google.com](https://www.google.com), 2022

Nglinggo Tourism Village, was located in Samigaluh, Kulonprogo. This village is famous for its tea garden tours with beautiful panoramas. Located in the highland area of Menoreh Hill, this village offers mountain views with tea gardens as one of the characteristics of the village.

The village were formed starts during Mataram Islam parted into two. And Raden Mas Antawirya, or well known as Pangeran Diponegoro from Kasultanan Ngayogyakarta Hadiningrat searching for strategic place for guerrilla war strategy to fight againts the colonial. He assigned his 3 men, Ki Linggo Manik, Ki Dalem Tanu, dan Ki Gagak Roban. They explore menoreh hills area, and found a strategic place to stay, and the place was named after

one of the assigned-men, and so called Nglinggo (from Ki Linggo Manik). With the precence of trustworthy men, settlement start to grow there. And the trustworhy men keep educate people to live in more harmonious way.

During the colonial period, Dusun Nglinggo functioned as a refugee shelter, and also served as a guerrilla base. During the Dutch and Japanese occupations, the refugees never experienced hunger because of the large number of sugar palm plants that became food subsidies to supply the needs of the refugees in the hamlet.

But, during Japanese colonial, this village were robbed and people starts to struggle for their live. Fortunately,



Picture 1.2 Nglinggo Tea Product
Source : gooogle.com, 2022

the community still has a lot of sugar palm plants that grow as people's food when there is no other food left at that time.

After It started on 1990, where the government assigned 70 people to Plantation Service of Kulon Progo decided to plant tea tree in Nglinggo, because they occupied for the minimum dpl height for the tea tree cultivation (above 800 dpl). Later, the landscape inviting the visitors and the village slowly grows into tourism village.

From this tea garden, Kulonprogo produces most original tea products in Yogyakarta that have their own taste,



Mas Bajil also told that the way to drink the tea in Nglinggo is different. Unlike using rock sugar, or usual sugar, the tea was enjoyed with gula aren that also produced by their villagers.

“Nglinggo has its own way to drink tea. The tea was made without adding sugar, and drink it with aren sugar that also made in the village. The sugar was eat first before drink the tea”



Picture 1.3 Sangit Tea produced by Nglinggo
Source : [google.com](https://www.google.com), 2022



THE WEAKENING FROM TEA INDUSTRY IN INDONESIA

According to an article from roaming.kompas.com, Rohayanti, a tea expert from PT Research Perkebunan Nusantara (RPN) said that the trend of dimming Indonesia's tea industry cannot be separated from the increasingly sluggish national tea production. After ever reaching its peak in 2003, with production figures reaching 169,821 tons, national tea production has decreased and has stagnated at around 150,000 tons since 2007. Even in 2012, national tea production only reached around 143,000 tons. In 2015, tea production fell below 140,000, which was only 132,616 tons. However, the Ministry of Agriculture is optimistic that Indonesia's tea production can reach above 140,000 tons in the future. This optimism was realized in 2017 where national tea production reached more than 140,000. However, this figure fell again in 2019 where Indonesian tea production only reached 129,832 tons.

Some of the causes of the weakening of the tea industry in Indonesia include:

- 1 The conversion of plantation land causes the land area to decrease,** as well as its production. This can happen first, because of a project that passes through tea plantations, so the land area is reduced. This happened to the Jakarta-Bandung high-speed rail project that passed through the Mandalawangi Maswati tea plantation, West Java. Second, because land owners are interested in commodities that have a higher selling price than tea.

Picture 1.4 Inside tea factory
Source : [google.com](https://www.google.com), 2022

2 The lack of plant rejuvenation and also this condition is exacerbated by the situation where most smallholder tea plantations have tea plant populations that do not comply with technical standards, namely a minimum of 10,000 tea trees per hectare.

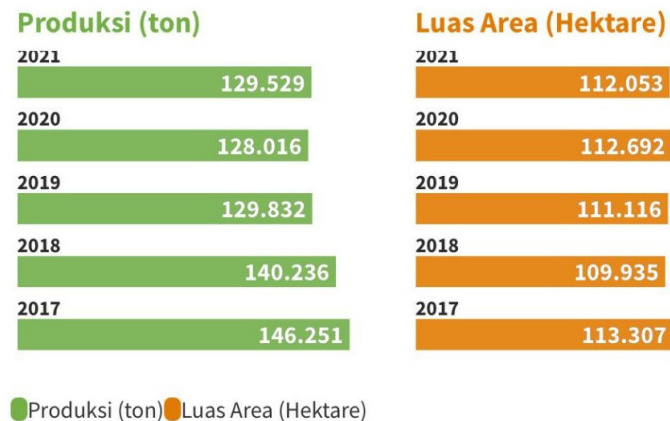
3 VAT tax on plantations increased to 10%. With the value added tax, the offer price will increase. If commodity prices in other countries remain constant, then commodity prices in Indonesia will tend to be more expensive due to VAT. With higher prices, commodity exports will decline. A similar condition occurs in coffee commodities. As a result, Indonesian tea prices are increasingly uncompetitive. This shows that the taxation scheme does not support the development of the Indonesian tea industry.

4 Public interest in tea is declining. Based on data from the Central Statistics Agency (BPS), tea consumption in Indonesia in 2010 was 0.69 kilograms per capita per year. This figure then fell to 0.18 kg/cap/year in 2015. Fortunately, this figure improved in 2018, where tea consumption in Indonesia could touch 0.35 kg/cap/year.

In addition, the performance of local tea in exports also weakened. From 105,581 tons in 2000 to 49,038 tons in 2018. The average decline is 3.1 percent per year. In fact, this is inversely proportional to the world's tea consumption, which according to the FAO (Food and Agriculture Organization), in the past year has increased by 4.5% every year. Not to mention that the government still provides customs taxes on tea imports which are still very low, making tea import very easy. This seriously threatens the local tea market.

Total Produksi dan Luas Area Perkebunan Teh di Indonesia

Source: Kementerian Pertanian

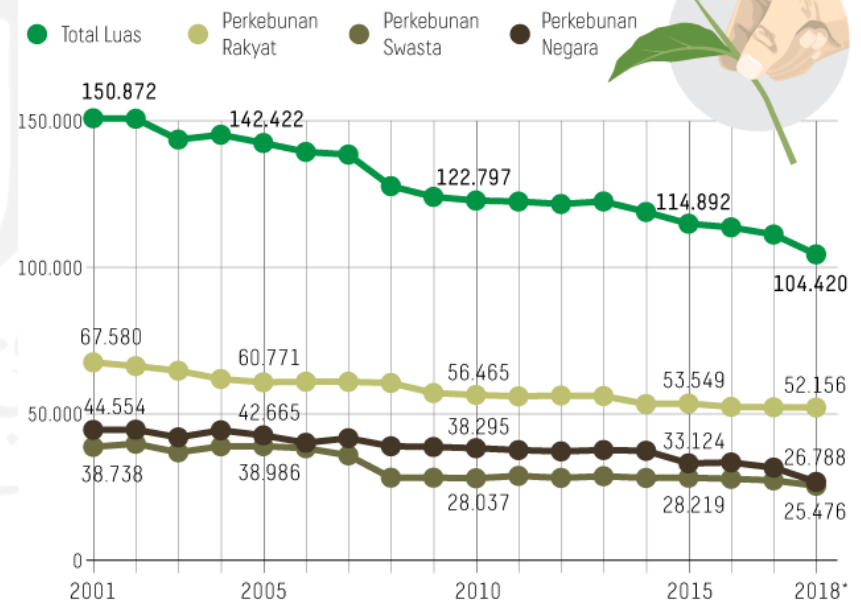


GoodStats

Picture 1.5 Total tea production graph and tea garden area (2017-2021)

Source : goodstats.id, 2022

Luas Lahan Perkebunan Teh Indonesia (Ha)



Sumber: Badan Pusat Statistik (Statistik Teh Indonesia 2018); Diolah oleh Litbang Kompas/DDY

*Data Sementara
INFOGRAFIK: ANDRI

Picture 1.6 Total tea plantation area in Indonesia (2001-2018)

Source : kompas.com, 2022

TEA : START TO LOOSE THEIR FAME IN MARKET

As time goes by, it can clearly be seen how the existence of tea through taverns and cafes. Where the innovation of the contemporary drink menu in coffee is far more than that of tea and buyers are more interested in coffee-based menus. According to Lokadata data published by Good News from Indonesia, coffee consumption in Indonesia is recorded at 0.66 ounces/capita/month while tea consumption is only 0.24 ounces/capita/month.

In response to the state of tea production and productivity in Indonesia, several proposals have finally surfaced as a step to revitalize the national tea industry. From the official page of the Ministry of Industry (Kemen Perin), a number of these steps are described, namely:

1. Cessation of conversion of productive tea lands in zone 1 of tea agro-climate.
2. Organizing tea owned by people's plantations with People's Owned Enterprises (BUMR) to partner with Large Private Plantations (PBS) and State Large Plantations (PBN).
3. Increase tea exports.
4. The movement of national tea consumption to fiscal incentives to support the national tea industry.



Picture 1.7 Coffee as tea competitor
Source : [google.com](https://www.google.com), 2022



THE FUTURE EFFECTS OF THE 'TEA INDUSTRY THREAT' TO NGLINGGO VILLAGE

Threats to this problem have occurred since 2015 in Nglinggo Village. Where in 2015, the decline in tea land in Nglinggo village is quite ironic. Initially the tea plantations in Girimulyo and Samigaluh sub-districts were 700 hectares, now there are only 136 hectares (current data 2021 : 136.5 hectares). However, only 55 hectares are productive. This happens because farmers are attracted to other commodities that have higher selling prices.

It is possible that in the next few years, if it is still in the same condition, the gardens and tea producers in Nglinggo Village, which produce their tea with own characteristics, will also decrease. Moreover, the industry was still in the form of home industry. Likewise, tourism that relies on tea as its main characteristic will lose its identity. And

the tourism of the village no longer special.

With the increasing price of tea and its reduced in availability, tea tradition in society that reflects kinship is also threatened to faded as well.

In fact, seeing the potential that exists, Nglinggo has a high potential to maintain tea as the identity of his village, and also the tea tradition in general in Jogja. The raw materials that already exist, and their production done locally can produce products that are not found anywhere else. However, there is no space that can really maintain and introduce this product to the wider community.

To maintain the tea industry in Nglinggo, we need a place that can maintain tea commodities and traditions with education and recreation to at least introduce the product to the wider community.

Picture 1.8 Tea packaging process in Teh Ki Suko, Nglinggo
Source : Teh Ki Suko Archive, 2022

Picture 1.9 Student visit from South Korea in Nglinggo
Source : Teh Ki Suko Archive, 2022

TEH KISUKO : EMPOWERING LOCAL NGLINGGO TEA COMMUNITY

Teh Ki Suko existence in Nginggo Village by Pak Sukohadi offers promising future for tea community. He developed a local factory that produces tea with various flavors which in the process empowers local residents such as buying tea prices higher than the factory price, the tea process is done by local residents, until the packaging process is also done by local residents. The tea garden landscape is also planned by Mr. Sukohadi so that he can invite tourists so that tourism activities in Nginggo Village can become additional income for local residents. In the tourism sector, tourism workers employ local youth.

The development of tea in Nginggo Village, apart from inviting tourists, also invites academics and researchers. One of the reasons is because the tea products developed have high levels of anti-oxidants (37%), and are also 100% organic. This is the result of dedicated research by the management of Teh Ki Suko themselves. In that way, Mr. Sukohadi also hopes to introduce tea as a health drink in the community and the development of tea in Nginggo can be even greater as his desire to have a mini laboratory so that research activities on tea can continue.



Sukohadi

Head of Teh Ki Suko

*Picture 1.10 Mr. Interview with Mr. Sukohadi
Source : Author, 2022*

TYPE OF TEA PRODUCED BY KI SUKO TEA

Yellow Tea

- Fruity and distinct after-taste and pleasing aroma
- Yellow tea have same benefits as green tea.

Teh Sangrai Menoreh

- The process through 'roast' the tea for about 1 day
- Should be done in open space
- Have distinct aroma



Picture 1.11 Several products from Teh Ki Suko
Source : google.com, 2022

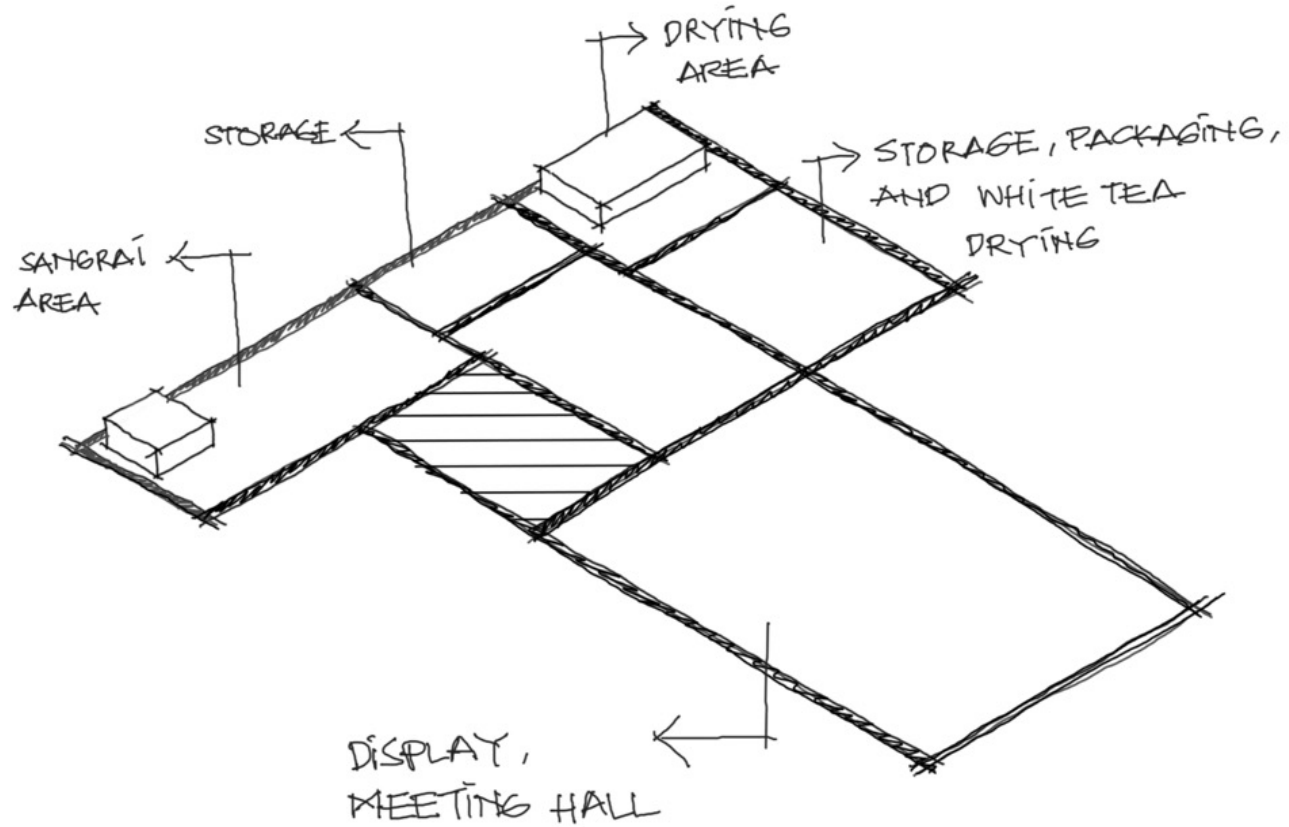
Green Tea

- High anti-oksident
- Distinct smell
- The most best seller product

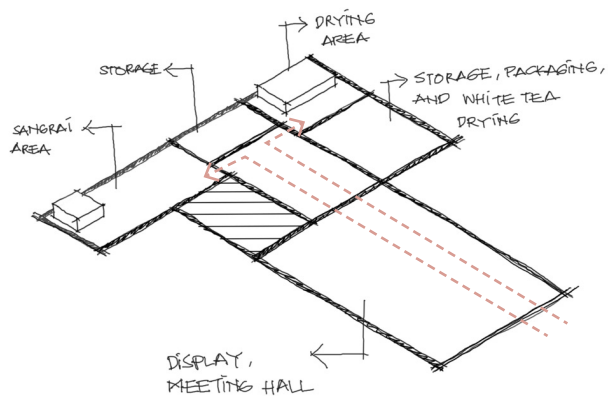
White Tea

- White Tea From Ki Suko is made from high-grade tea leaves and handpicked before sunrise before processed promptly

PRODUCING SCHEME

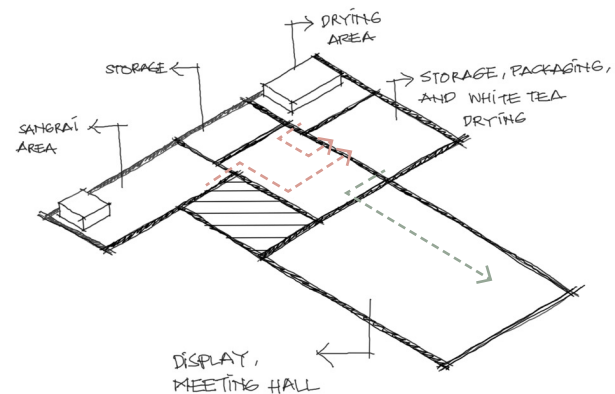


1



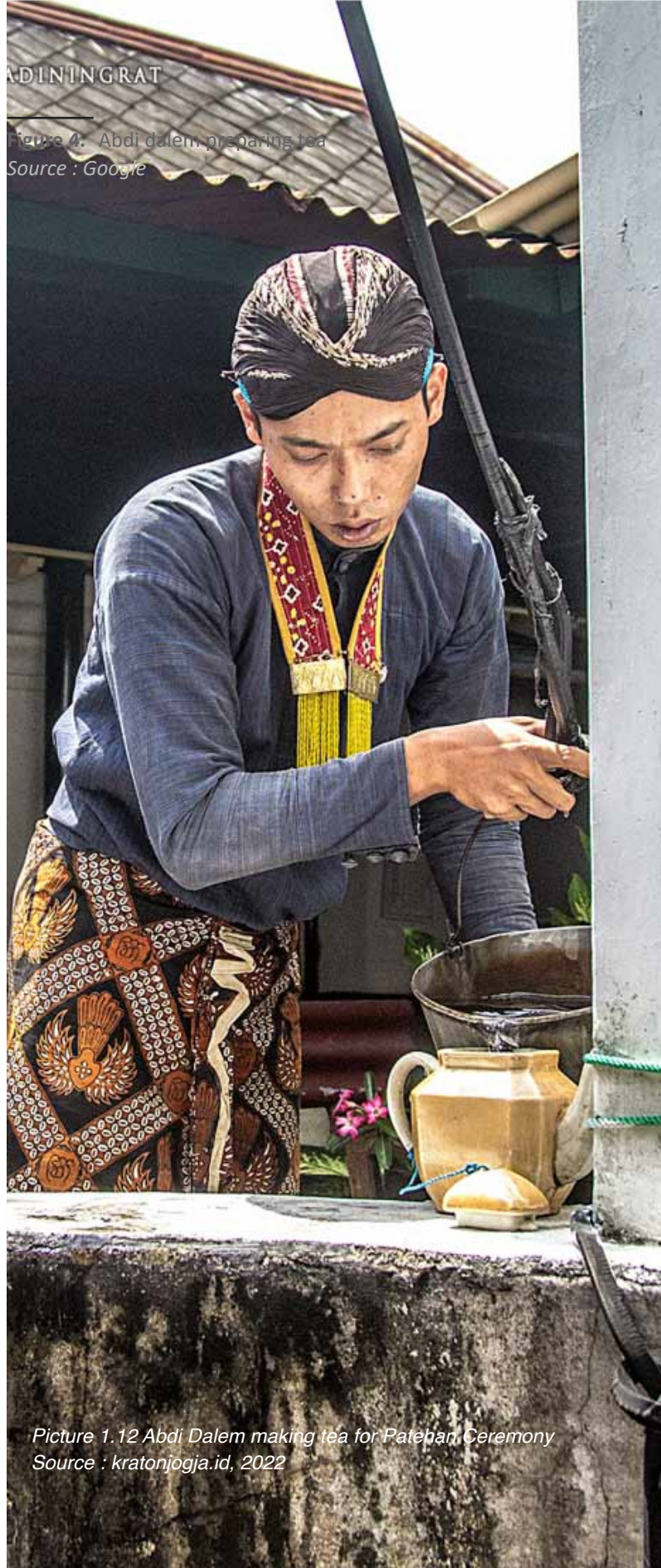
Tea from garden directly to drying process
(sangrai station for sangrai tea)

2



After drying and fermentation, goes to storage
and packaging and display

Figure 4: Abdi dalem preparing tea
Source : Google



Picture 1.12 Abdi Dalem making tea for Patehan Ceremony
Source : kratonjogja.id, 2022

TEA AND ITS CULTURE IN YOGYAKARTA

Yogyakarta was famous for “City of Tradition” (Kota Budaya) due to rich In the Kraton’s own culture, tea has long been the king’s drink. There is a tradition of drinking tea itself called the Patehan tradition. Usually done every 6 am, 11 pm, and 4 pm. Patehan means to present a show or drink to the Sultan. The Patehan ceremony has been going on since the Kraton Jogja was established. The name Patehan is taken from a gedhong located on the south side of Ward Srimanganti, namely Gedhong Patehan. In carrying out this ceremony, there are separate rules and procedures. The Patehan procession is carried out by 5 female courtiers who are called “keparak”. The five people who brought food to Patehan had different names and assignments. The five keparaks run concurrently and sequentially according to their positions.

1. Those who are in the front row are called Songsong, who are in charge of carrying an umbrella to cover the keparak who carry Klemuk. In order of rank, the Songong chief has the lowest rank.
2. Keparak Klemuk is in charge of carrying klemuk or jugs made of copper as a place for water taken from the sacred well in Gedhong Patehan. The position held by Keparak Klemuk is the highest among the other four principals.
3. Behind the keparak Klemuk, there is a keparak who is in charge of carrying a tray containing 2 teapots filled with tea covered with a white cloth, called Sebintang.



4. Keparak in the last row is in charge of carrying a kettle filled with hot water. The masters brought the drinks that were processed in Gedhong Patehan to the Heritage Building.

This Patehan tradition is still carried out today even when Sultan is not in the Kraton complex. For now, tea is more preservation and as an offering. The Patehan ceremony is not always the same, if there is a Grand Ceremony, such as weddings, Ngabekten, and others, then there are differences in the presentation procedures.

From this matter, we can understand that patehan and drinking tea itself is one of traditional culture Yogyakarta that contain not only enjoying tea itself, but have a deep meaning. And a culture should be preserved from generation to generation.



As the effort to preserve the culture of Patehan, Kraton Museum open the process of tea making by assigned abdi dalem for visitors. People, in this case, tourist, also can enjoy the experience of Patehan exclusively in Royal Ambarukmo Hotel that be held every Friday with fee Rp250.000,00 along with Jemparingan activity (archery).

Picture 1.13 Abdi Dalem serving tea for Patehan Ceremony
Source : kratonjogja.id, 2022

Picture 1.14 Patehan Ceremony experience for public in Ambarukmo Plaza Hotel
Source : google.com, 2022



Picture 1.14 Celebrating World Tea Day in Kraton
Source : kratonjogja.id, 2022

Kraton Yogyakarta also held tea ceremony during World Tea Day, which celebrated every 21st May by afternoon tea event. The aim of the ceremony is to GKR Bendera, Penghageng KHP Nitya Budaya responded and opened directly this activity as an effort to maintain tradition as well as invite the wider community to be able to enjoy tea as part of a treat with a strong historical taste.

Meanwhile tea as a regular drink, tradition of drinking tea is the Special Region of Yogyakarta. In Jogja, the tea ceremony has its own philosophy, in addition to building family intimacy, it also reflects the personality and knowledge of the host which includes life goals, ways of thinking, religion, appreciation, and ceremonial. Among the Javanese people, tea drinks are known as Nasgitel (panas, legi, kenthel- hot, sweet and thick). To reach the thick consistency, the tea that used are tubruk tea (teh tubruk).

SITE BACKGROUND, CURRENT CONDITION, AND FUTURE PLANNING

NGLINGGO TOURISM VILLAGE

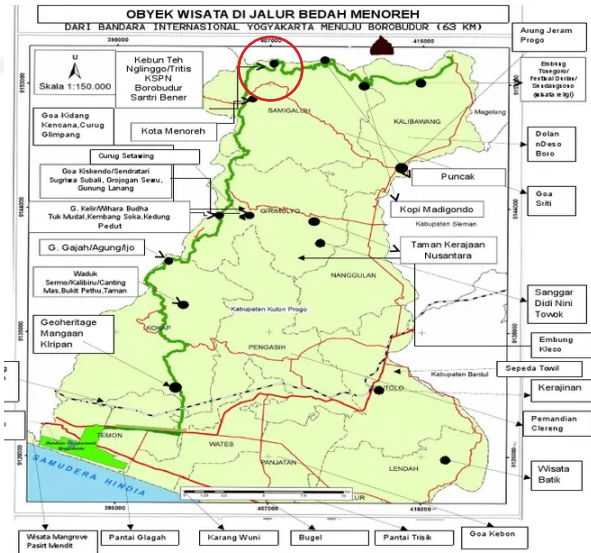
“The spirit of the construction of Jalan Bedah Menoreh is to dissect poverty, dissect culture, to dissect tourism in order to boost the economic growth of the community.”- Head of the Kulon Progo DPUPKP, Gusdi Hartono

Nglinggo Village is one of the tourism area in Bedah Menoreh Route. Bedah Menoreh is a project to make connection street between Bo-robudur National Tourism Strategic Area (KSPN) to the southern part of the Kulon Progo (airport). Bedah Menoreh also aims to support the development of the Menoreh tourist area as a buffer area, where there are three themes in the development of this area, namely ecotourism, cultural tourism, and adventure tourism. Unfortunately, currently the poverty rate in the Bukit Menoreh area is still very high, especially with the COVID-19 pandemic. The sub-districts in the Menoreh Hill area are Kokap, Girimulyo, Samigaluh, and Nanggulan.

Member of DPRD Kulonprogo Regency, Special Region of Yogyakarta, Wisnu Prasetya said that it happens because Bedah Menoreh in the tourism sector, is not optimal. There are several tourist destinations that have not been fully exploited. Nglinggo Village is one of them.

Inagurated in 2004, Nglinggo as tourism village was developed slowly. From only tea plantation as the main attraction, the tourist attraction was developed such as such as gardu pandang, offroad, photo spot, camping, and restaurant. According to Mas Bajil, local people that works on tourism field in Nglinggo, the focus of development in Nglinggo is education tourism.

Unfortunately, the visitors of Nglinggo Village was decreasing years by years. n 2019, visitors in Desa Wisata Nglinggo are counted up to 56.651 visitors in a year. The number are decreased in 2020, where visitors of Kebun Teh Nglinggo and Desa Wisata Nglinggo, Kulon Progo was 52.910 visitors. Unfortunately in 2021, the number of tourist are keep decreasing up to 44.568 visitors in a year.



Picture 1.14 Tourism object around Bedah Menoreh Route
Source : scribd.com, 2022

Tourism	Visitor number		
	2019	2020	2021
Nglinggo Tourism Village	56.651	52.910	44.568

Table 1.1 Number of visitors in Nglinggo Tourism Village from 2019-2021
Source : Kulon Progo Dalam Angka 2019-2021 processed by Author, 2022

UNFORTUNATE CONDITION : WEAKENING TOURISM ACTIVITIES



The tourism in this village is decreasing by the time. One of the reason is because of the Tumpeng Menoreh. Because of that, people just passed by our village and just go to the Tumpeng Menoreh. It's such unfortunate. Even the impact of pandemic is not as severe as this. Many people still come here during pandemic. Recent situation, it's like in the past you could get 500,000, now it's hard even to get 100,000.

Ibu Tatik

Tavern owner and tea garden owner

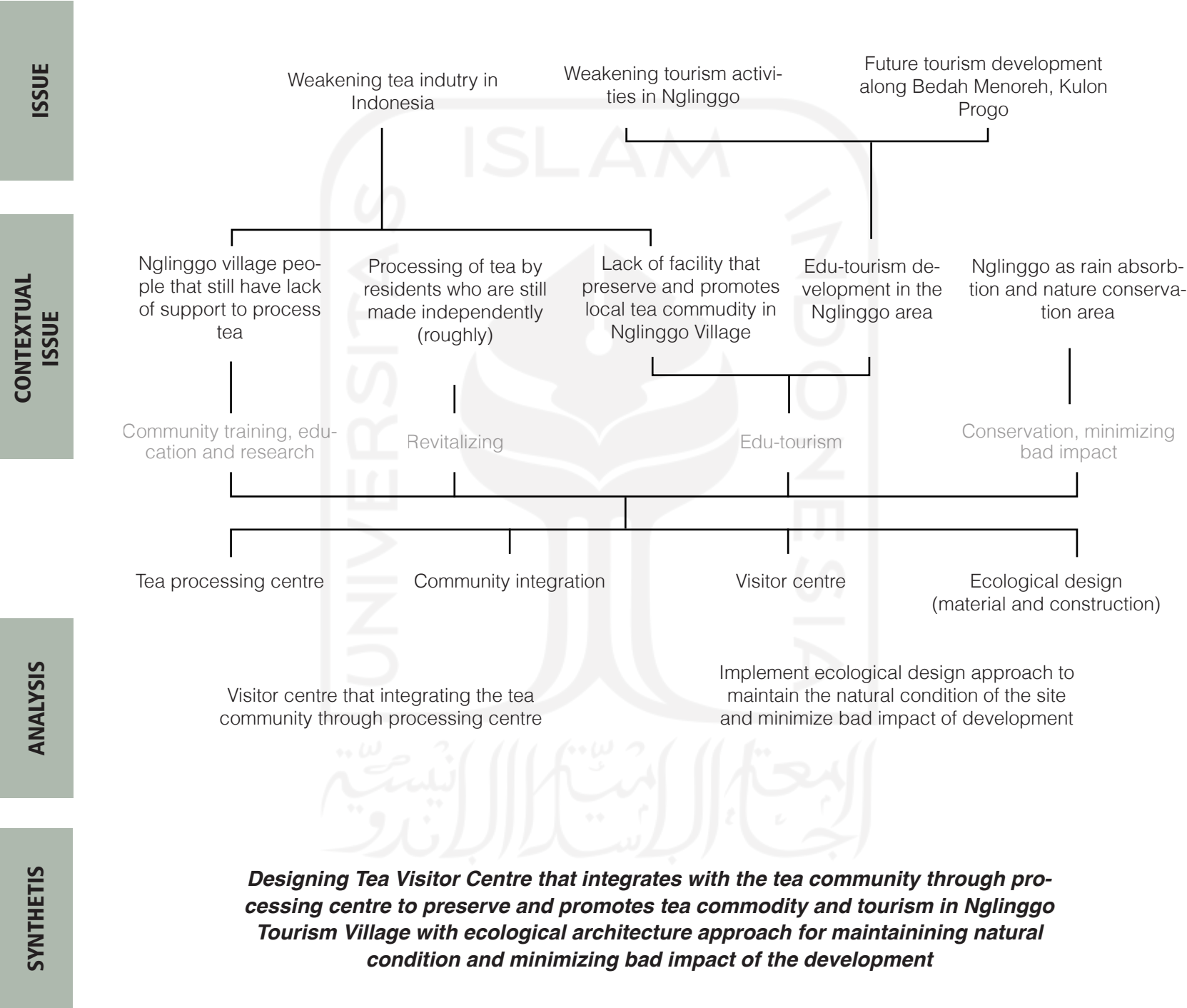
Tourists before the pandemic in Nglinggo could reach thousands every day. Like it could be quite a local income. But during a pandemic like this, it's pretty quiet here. So the tea that used to be sold out to tourists, is now selling online.

Pak Sukohadi

Head of Teh Ki Suko



MIND MAPPING



PROBLEM FORMULATION

Based on the background that explained above, the problem formulation that obtained are :

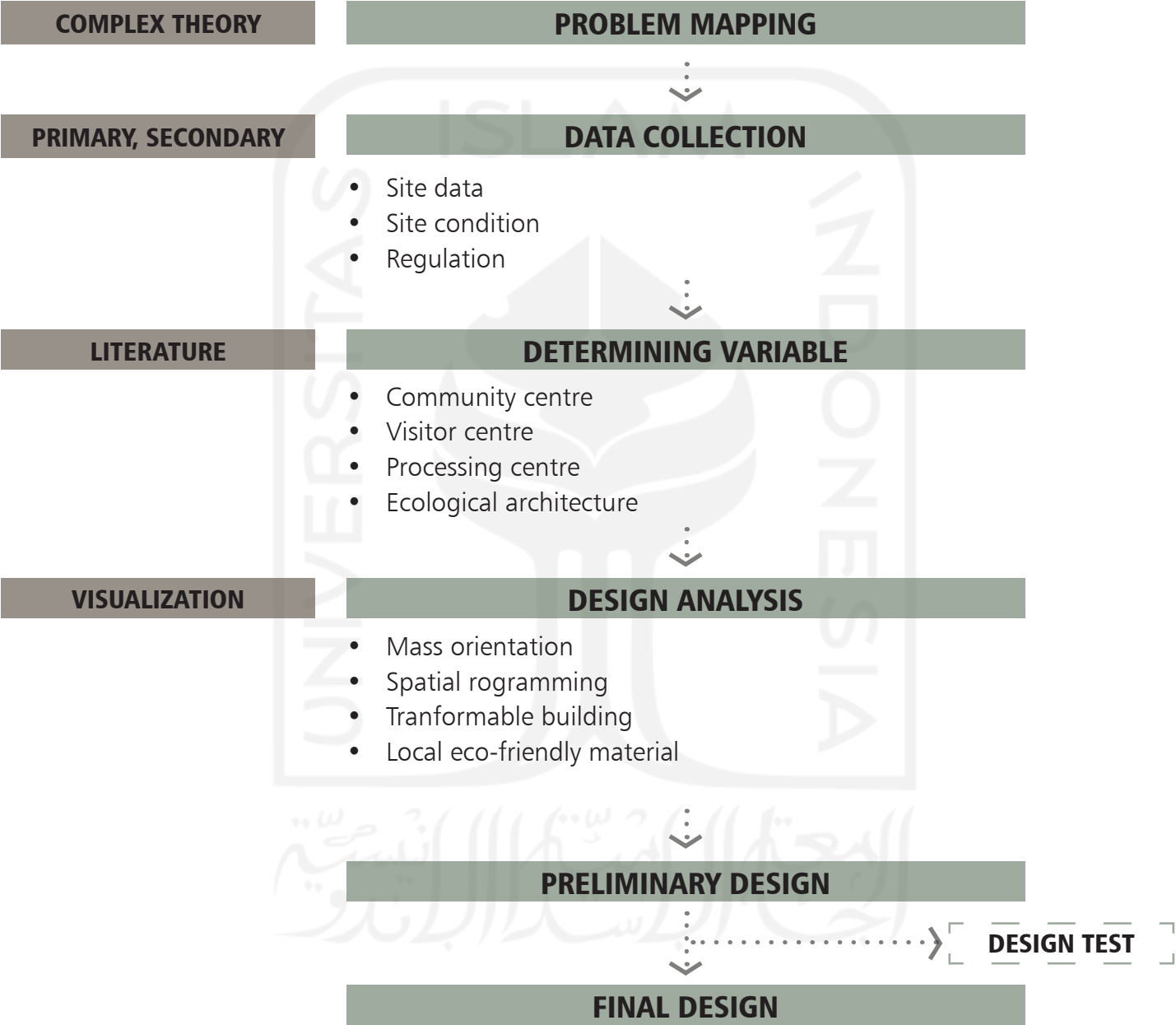
GENERAL PROBLEM

How to design Tea Visitor Centre that integrates with processing centre that implement ecological architecture approach?

SPECIFIC PROBLEM

1. How to design the building mass and spatial planning of the building by responding to highlight the integration between tourism and community?
2. How to design the building so that it can maximize water absorption and prevent landslide?
3. How to design the building in ecological friendly structure to reduce damage on site?

DESIGN METHOD



DESIGN FRAMEWORK

GENERAL PROBLEM	
SPECIFIC PROBLEM	
LITERATURE STUDY	
SYNTHESIS	

How to design Tea Community and Visitor Centre that integrates with processing centre that implement ecological architecture approach?

- 1.How to design the building mass and spatial planning of the building by responding to highlight the integration between tourism and community?
- 2. How to design the building so that it can maximize water absorption and prevent landslide?
- 3. How to design the building in ecological friendly structure to reduce damage on site?

visitor centre typology

tea processing centre
typology

transformable building

eco-friendly material

Designing Tea Visitor Centre that integrates with the tea community through tea processing centre to preserve and promotes tea commodity and tourism in Nglinggo Tourism Village with ecological architecture approach for maintaining natural condition and minimizing bad impact of the development

EXCELENCY, ORIGINALITY AND NOVELTY

The design of the visitor centre with an ecological architecture approach has been done by some party. But the The issues and focus on the project differ from each other from the author's proposed title. To avoid plagiarism in the process of preparing reports and planning, these are some of the references used:

- 01** Perancangan Pusat Komunitas Hortikultura Perkotaan di Jember dengan Pendekatan Arsitektur Ekologis
- | | |
|--------------------|--|
| Approach | Ecological |
| Author | Almas Adrian |
| Year | 2020 |
| Similiarity | Approach |
| Differences | The process and implementation of the approach and typology are different. Where here, mostly focused on the horticultura activity and technology. |

- 02** Design of Eco-Edu Forest Visitor Center in Bunder National Reserve, Playen, Gunungkidul by Environmental Design Approach
- | | |
|--------------------|---|
| Approach | Ecological |
| Author | Sofiana Estiningtyas |
| Year | 2021 |
| Similiarity | Approach and Typology |
| Differences | The type of approach that were chosen to design is different. As well the typology development also have different concept and purpose. |
- 03** Yogyakarta Batik Visitor Center dengan Metode Infill Design dan Adaptive Reuse di Kawasan Njeron Beteng
- | | |
|--------------------|----------------------------------|
| Approach | Adaptive Reuse dan Infill Desain |
| Author | Kartikya Ishlah Utami |
| Year | 2018 |
| Similiarity | Building Typology |
| Differences | Approach |

02

CHAPTER 02

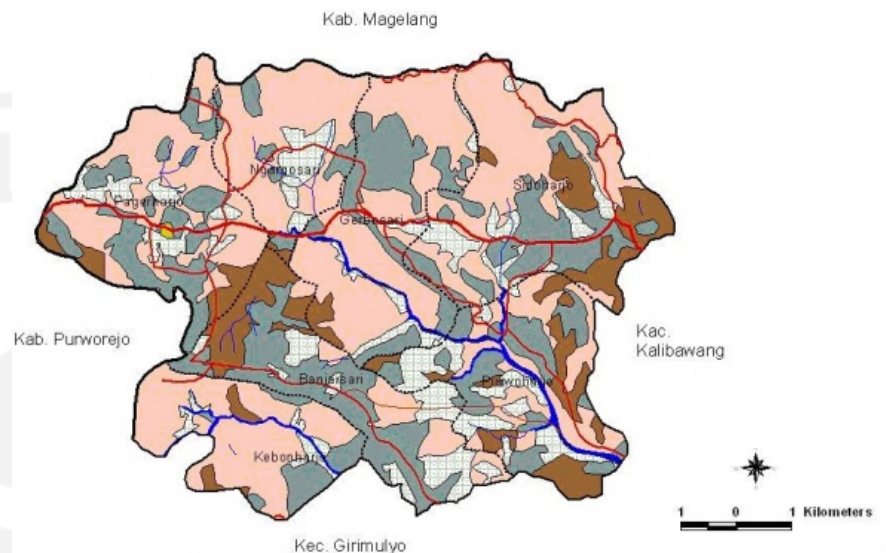
Site Analysis Study
Typological Studies
Design Approach Studies
The Philosophy of Tea
Precedent Studies

SAMIGALUH DISTRICT, KULON PROGO



KETERANGAN :

- Jalan Lingkungan/Des
- Jalan kabupaten
- Jalan Propinsi
- Sungai/ling. shp
- Batas Desa
- Batas Kecamatan
- Batas Propinsi
- Industri pertanian
- Kampung
- Kebun campuran
- Perairan darat
- Persawahan
- Tegalan/ladang



Samigaluh District was located on the north west part of Kulon Progo that have total area of 5.806,82 ha. The area was divided by seven village namely Kebonharjo, Banjarsari, Pagerharjo, Ngargosari, Gerbosari, Sidoharjo and Purwoharjo.

The majority of Samigaluh District is located in the Menoreh Hills area, and is directly adjacent to Central Java. The geographical conditions of Samigaluh District include:

1. To the north is Magelang Regency, Central Java.
2. To the west is Purworejo Regency, Central Java.
3. To the south is Girimulyo District; and
4. To the east is Kalibawang District

Picture 2.1 Kulon Progo Map

Source : RDTR Kulon Progo 2012-2035, 2022

Picture 2.2 Map of Samigaluh

Source : RDTR Kulon Progo 2012-2035, 2011

SITE ANALYSIS STUDY

EXISTING AND SURROUNDING CONDITION

**NGLINGGO TOURISM
VILLAGE TEA GARDEN
AREA**

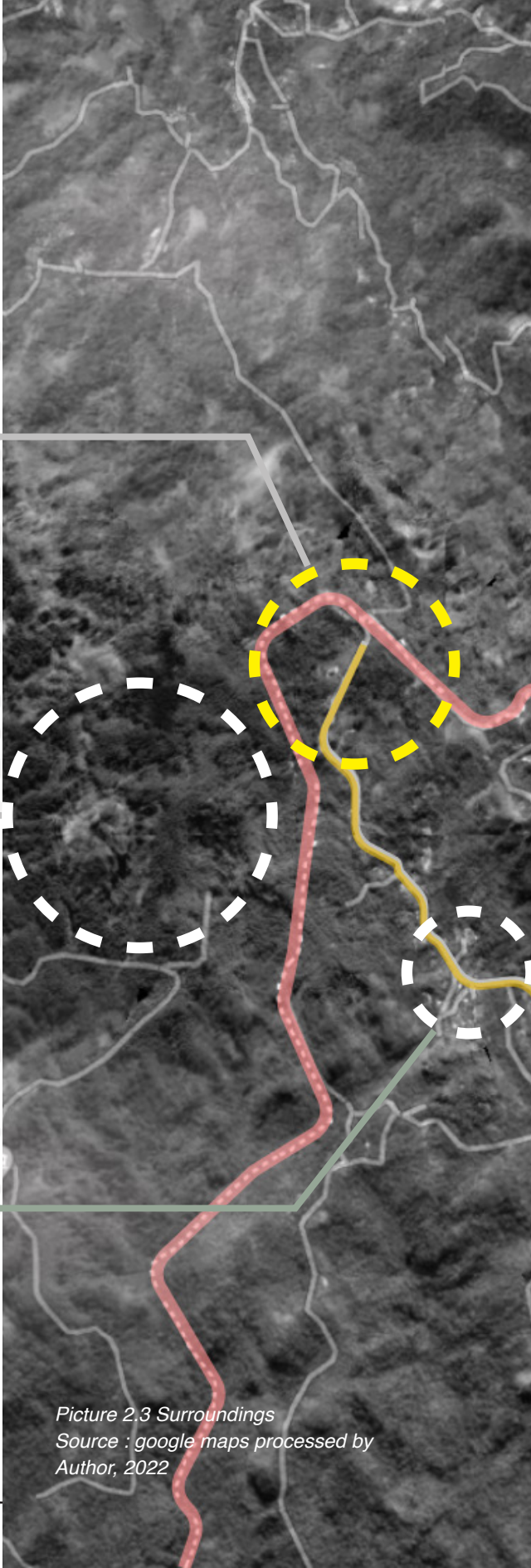


**BOROBUDUR HIGHLAND
PROJECT AREA**

Magelang Gov. mega tourism project to develop Borobudur Tourism Strategic Area that expected to finish 2025



**LOCKET OF NGLINGGO
TOURISM**



Picture 2.3 Surroundings
Source : google maps processed by
Author, 2022



DAERAH ISTIMEWA YOGYAKARTA
AND JAWA TENGAH BORDER



MAIN ACCESS TO NGLINGGO
TEA GARDEN

Jl. Kebun Teh Nglinggo

One of the access to Borobudur Highland Project (Magelang Gov. mega tourism project that expected to finish 2025). The route currently has a winding, narrow, and quite steep route



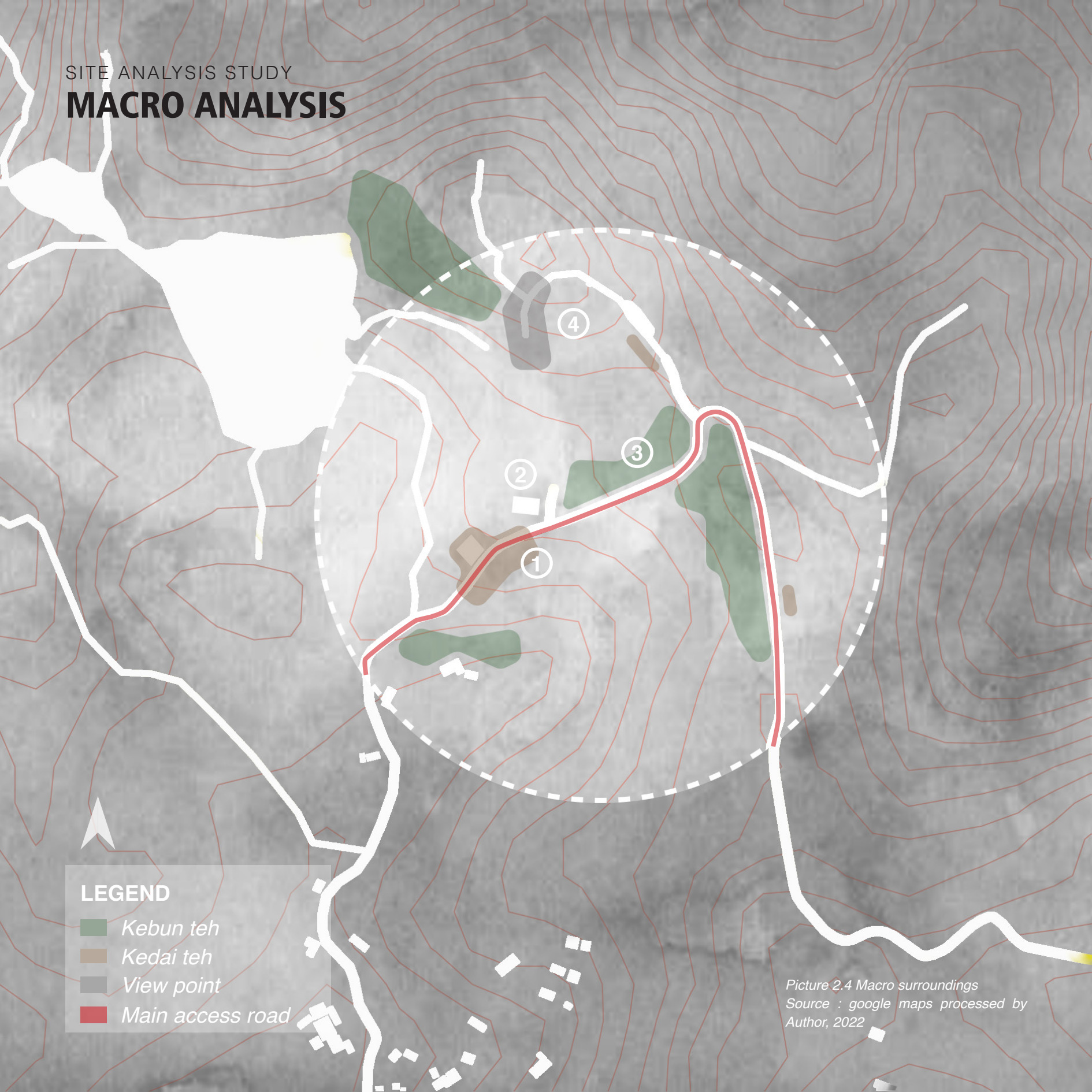
BEDAH MENOREH ROUTE

Jl. Samigaluh - Plono

Route project that will connect Borobudur Tourism Area (KSPN) to Yogyakarta International Airport.

SITE ANALYSIS STUDY

MACRO ANALYSIS



Picture 2.4 Macro surroundings
Source : google maps processed by
Author, 2022



① **PARKING AREA, MUSHOLLA, AND FOOD STALLS**

This area become parking area especially for cars. In parking lots, there is musholla and food stalls



② **TEH KISUKO**

A tea business owned by a tea farmer group Tegal Subur farmer group. Building consist of meeting area and production



③ **TEA GARDEN**

A tea business owned by a tea farmer group Tegal Subur farmer group. Building consist of meeting area and production



④ **VIEW POINT**

Located at highest point of the hill, the view point offers great view of Menoreh Hills, forests, and tea garden on its top

SITE ANALYSIS STUDY

SITE PROFILE

The site was maximize the 'centre' function of the village. Where Teh Ki Suko production house is the main 'power' of tea industry in Nglinggo. Beside that, the area also integrates the community, tourism, and context really well.





Parking Lot

This parking lot is for stopping visitors (cars or motorbikes) so they can enjoy the tourist area on foot

Musholla

The musholla was for public, but the size is quite small with only around 4 x 4 sqm. The condition is also not quite appropriate for prayer

Food Stall

Still located around parking lot, the food stall offers various food for the visitors. The building was built in a semi-permanent building.



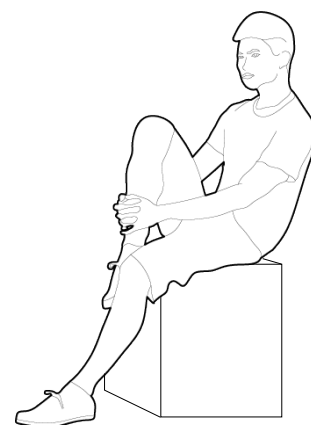
Ki Suko Tea Production

Two story building that consist of production where they produce the signature tea, hall as meeting room and display, and musholla on second floor, and musholla on second floor was managed by local tea community



Tea Shop

Small shop that sold the experience of tasting local tea produced in Nglinggo for the visitors. The shop was non-permanent, built using timber. Unfortunately not functioned again.

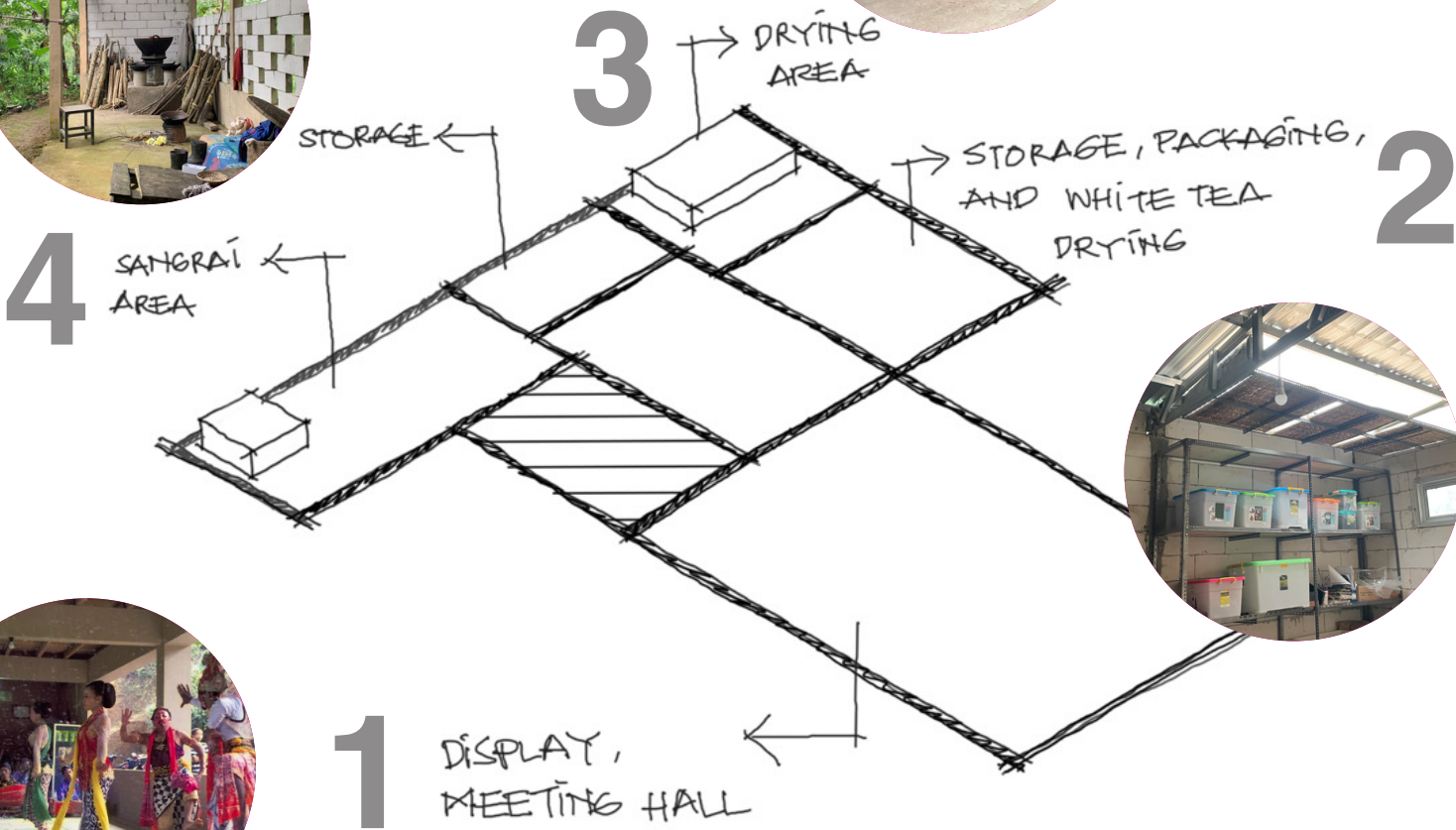


Inside Teh Ki Suko Production House

Sangrai area should be semi-open to prevent sangit smell to the tea



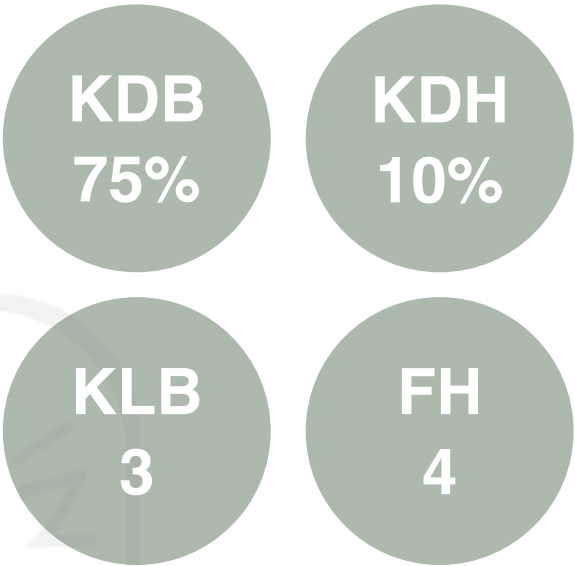
The drying process (oksidation/fermentation also done here)



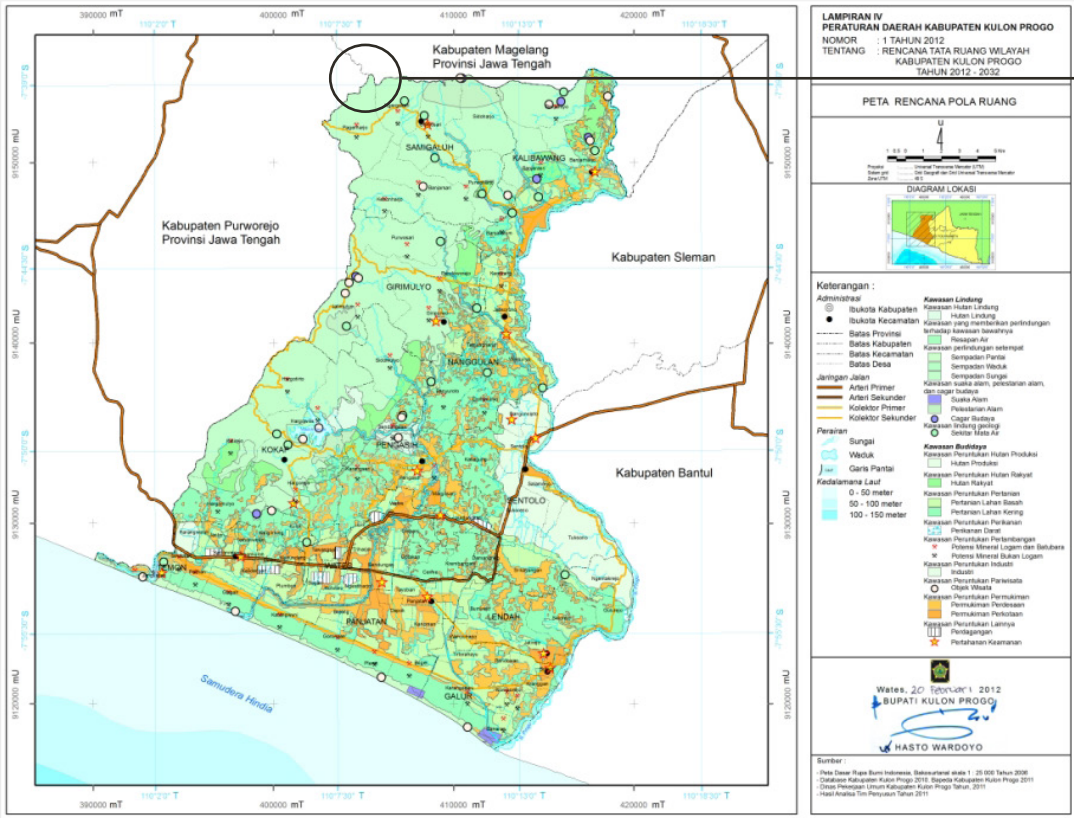
The processing centre Teh Ki Suko was managed by local community. The tools inside the processing centre was self-made by the locals and also by their own research.

Based on Regulation of the Regent of Kulon Progo Number 20 of 2021 concerning Building and Environmental Plan of Kulon Progo Regency, there are several building code that should be fulfilled. Stated on Article 13, the several building codes for trade and services area :

KDB	Max. 75%
KDH	Min 10%
KLB	3
Floor Height	Max. 4 floors



Meanwhile, based on RDTR Kulon Progo, the site was included as area that still should be preserved.

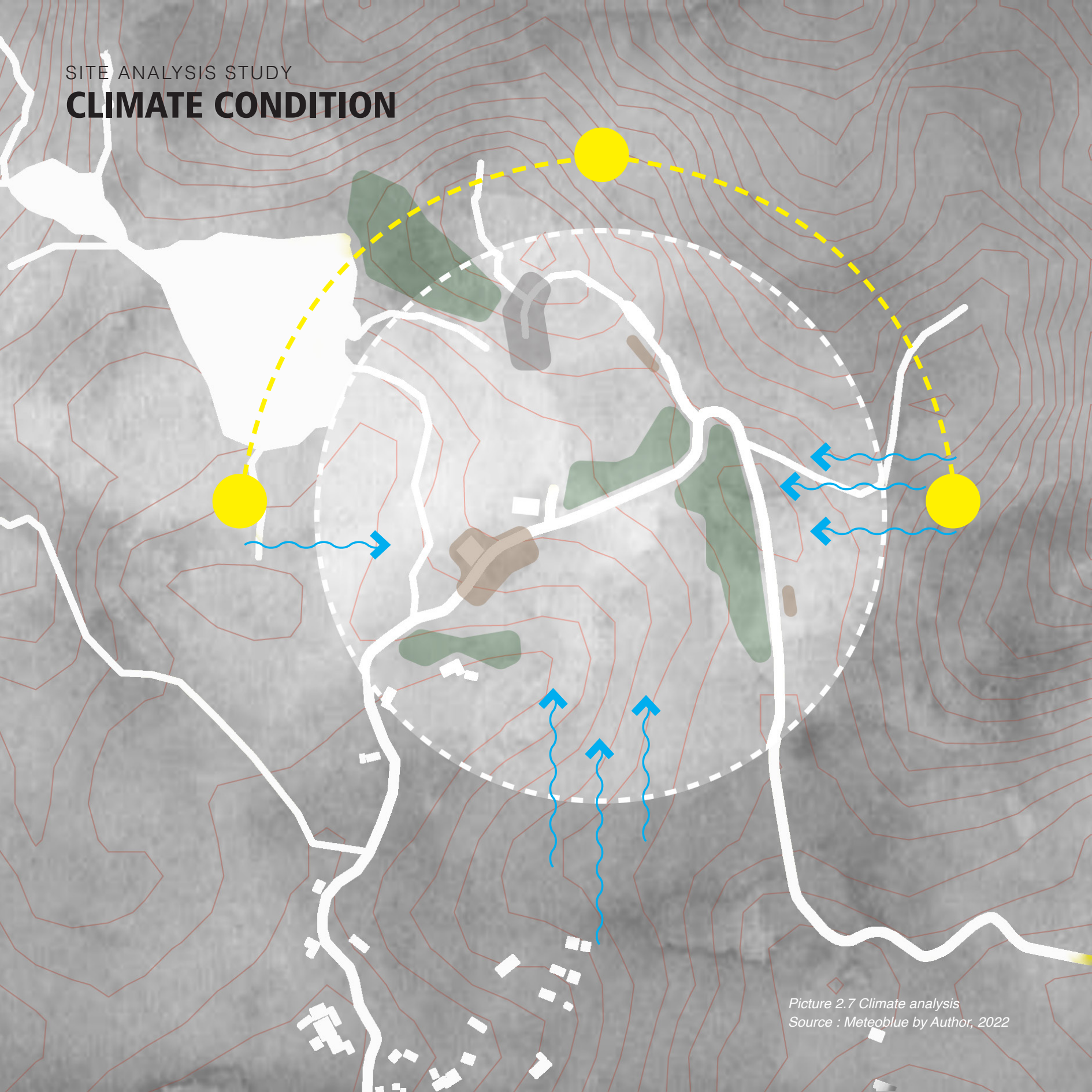


- According to Article 37 paragraph 3b, natural tourism parks for tracking, hashing, hanging kites, panoramas, and tea agrotourism are located in Suroloyo, Menoreh Mountains, Samigaluh District, which are included in a nature conservation area.
- Water catchment area

Picture 2.6 Map of protected areas RDTR Kulon Progo 2012-2035
Source : RDTR Kulon Progo 2012-2035, 2022

SITE ANALYSIS STUDY

CLIMATE CONDITION



Picture 2.7 Climate analysis
Source : Meteoblue by Author, 2022

SITE ANALYSIS STUDY

SITE VIEW

Potential view could be utilized to attract visitors to the building



VISITOR CENTRE

According to the General Guidebook for Tourism Villages (2012), a visitor center is a place where tourists can get a variety of general to specific information about the location or place they visit, either in the form of maps, books or other information media.

According to The role of Visitor Centres in UNESCO Designated Sites (2018), the core function in developing visitor centre are :

1. Information

Provide information concerning the value of the site (to facilitate its understanding and appreciation), and facilitating the site visit (service, schedule, itinerary, etc)

2. Education

Visitor Centres able to influence the behaviour of visitors, both during the visit. In this case, Visitor Centre facilitates to increase the understanding, appreciation, and conserving-behaviour of the heritage and the surrounding environment.

3. Accessibility

Centres can play a key role in facilitating real and virtual access to the sites. This may include measures to support mobility, overcome physical barriers, enjoy virtual reconstructions, as well as to promote access through a complementary recreational, gastronomic, or cultural offer.

More generally, accessibility functions should be intended in the broader sense to facilitate information access to numerous audiences, with diverse intellectual needs, aiming at stimulating curiosity and contributing to a positive experience.

Moreover, UNESCO in The role of Visitor Centres in UNESCO Designated Sites (2018) also analyzed challenges and opportunities to further expand the Centres' role. Those opportunities are :

1. Interfacing

The Centres' multiple scope of action permits them to act as meeting points between locals and visitors. Interpretation, educational and visitors' management strategies are effective approaches to connecting these main audiences and to strengthening mutual appreciation and empathy.

2. Integrating

Providing the opportunity for their greater involvement in relevant socio-economic dynamics as supporter for local development. Visitor centre must be fully integrated into the respective site management system, and be involved regularly in the related planning processes.

3. Inspiring

Through heritage interpretation, awareness raising and education for sustainable development, as well as by posing themselves as role models for responsible practices, Visitor Centres have an enormous potential to in-

spire positive changes.

According to Philip L. Pearce (2004) in *The Functions and Planning of Visitor Centers in Regional Tourism* there are “Four Plus” or four additional features of the visitor center function, namely:

1. Promotion Function

This function refers to the active role of the region, city or region in promoting its tourism. Basically this function plays a role in stimulating tourism demand in order to increase the income of a region. Through this function, the visitor center can provide real and reliable sources of information and guarantee the quality of the information services provided.

2. Orientation and Visit Enhancement Functions

The second function is to see the quality of the experience/impression given to visitors. This quality is supported by efforts to provide a form of display, suggest new locations or tourist attractions, and in general provide information to visitors about the features of the area they visit.

3. Control and Filtering Function

In this function, the visitor center plays a role in controlling the flow of visitors/tourists who come so that their resources and arrangements remain under the control of an area. The visitor center acts as the entrance and becomes the point (center) to exercise control over visitors/tourists who come to an area.

4. Substitution Function

The substitution function is also referred to as a substitute function where the visitor center can be a substitute for a tourist attraction, or at least the visitor center is one of the tourist attractions of a certain area.

5. Function Plus (Additional)

This function is an additional function of the “Four Plus” visitor center function. In this plus (addition-

al) function, the visitor center can act as a facility for the community for various local arts, culture and social appreciation activities. It can be said, the function of the visitor center in this case is as a symbol of an area and the tourism potential that exists is the reason for the existence of a visitor center.

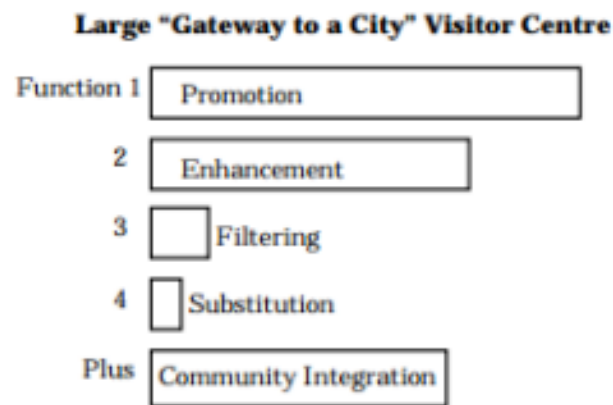
Based on the “Four Plus” function that has been described, Philip L. Pearce (2004) made a comparison chart of the values of each of these functions to identify the location of a visitor center. The diagram shows that the identification of the location of each visitor center has a different “Four Plus” function value.

1. Large Visitor Center

The first classification is the visitor center in the large category, where this visitor center is the main gate of the information center in a city. This visitor center is usually located in the center of a city which is the center point of the city’s services. At this level visitor center, the promotion function, the function of increasing visits and the plus function are the functions that must be prioritized in planning a visitor center.

2. Small Visitor Center

This visitor center is located one level after the previous visitor center, usually in an area after the regional/city level,

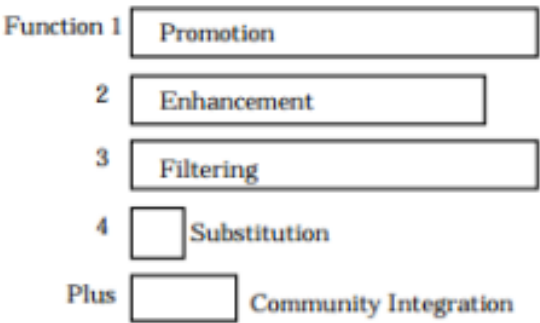


for example: sub-region or district. This visitor center has a role to be a tourist information center that promotes the area. At this level of the visitor center, the promotion function, visitor enhancement function and filtering function are functions that must be prioritized.

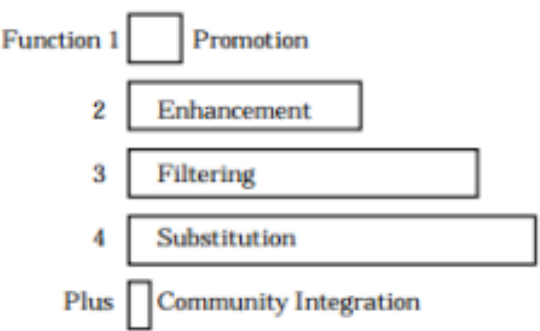
3. Visitor Center at Fragile Cultural/Historical Site

The third classification is a visitor center which is a special category for a particular tourist attraction. This visitor center acts as an information center that specifically promotes and informs the attraction of the tourist attraction. At this level of the visitor center, the functions of increasing visits, filtering functions and substitution functions are functions that must be prioritized.

Smaller Visitor Centre along a Scenic Highway



Visitor Centre at Fragile Cultural/Historical Site



VISITOR CENTRE - SMALL VISITOR CENTRE

The small visitor center has the main aim to promote the tourism. Thus visitor center can be a means of supporting tourism for visitors/tourists, as well as being useful for the community to show off their potential. Flanagan (1996) in Louisa and Wiyatiningsih (2017) said that Visitor Center means for social interaction between local residents. This social interaction can be a means to maintain the original culture of the local community and show it to tourists. Louisa and Wiyatiningsih (2017) also continue that the visitor center must have a style or design that reflects the characteristics of the local area, so that it can become an icon for the area. In addition, the visitor center can also be a source of pride for the surrounding community, due to the use of local materials and the expertise of local residents involved in the construction process (Lane, 1991; Moscardo, 1998; Louisa and Wiyatiningsih, 2017).

Yale (1991) in Woodward (2008) stated that there are no particular visitor centre could be design with various size, forms, with the content that can be vary considerably vary. She summary if visitor center main functions that should do one or more of the following :

- Provide information, orientation, and interpretation
- Offer retail opportunities
- Provide basic services
- Provide accomodation for site managers

Woodward (2008) in his paper “Visitor Center and Spirit of Place” conclude that the positive of built community center in a place are :

- Encourage greater engagement with cultural and natural heritage sites
- Support (and sometimes drive) local economic and community development
- Directly support resource protection
- Add real value to the visitor experience

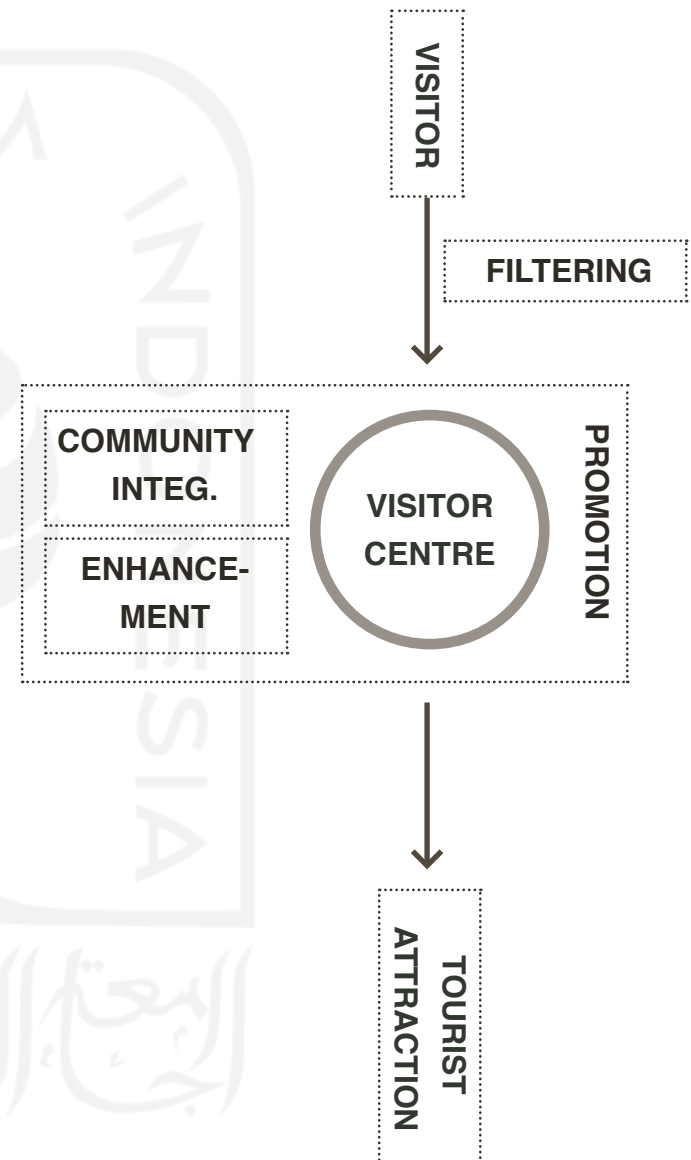
But besides that, there are downside of visitor centre that built in some ‘important’

area :

- Create local competition, displacing activity and income from existing heritage sites in the area, and from other businesses such as cafes and shops that can actually contribute to the 'spirit of place' in that destination in the first instance.
- Overload the site's carrying capacity and thus degrade the resource
- Overload the organisation's capacity to deliver its statutory responsibilities – too much time is spent managing the centre and not, for instance, on conservation or research activities

Yet, as long as there are people who are looking for a little more insight into the natural and cultural heritage, visitor center would be the perfect solution.

Therefore, small visitor center definition according Pearce (2004) if we relate it with Woodward (2008) statement of the downside of visitor centre, the promotion, enhancement, and community integration should not displacing the activity and income from the existing area, in this case Nglinggo Village, where the existing already contribute the spirit of place in Nglinggo. It also means that the substitution function in the visitor centre should not be dominating. Second, where the entire design should not degrade the resource and pay attention not only in the centre, but also pay attention to the surrounding.



Development Opportunity	Space Accomodation	Functions						
		Infor- mation	Educa- tion	Acces- sibility	Promo- tion	En- hance- ment	Filter- ing	Commu- nity Inte- gration
Interfacing	Processing centre		v		v	v		v
	Tea walking			v	v	v		
Integrating	Souvenir shop, restau- rant (retail)				v		v	v
Inspiring	Gallery, workshop	v	v		v	v	v	

ECOLOGICAL ARCHITECTURE

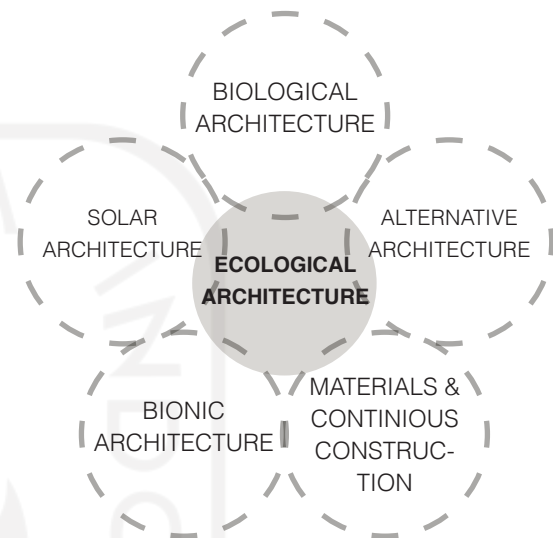
Cowan and Ryn (1996) define ecological architecture as a form of engagement and partnership towards the nature. Ecological design offers three critical strategies to avoid loss, First is conservation, where typical conservation can be in the form of recycling material, built dense community to preserve agriculture land, where it could slow the rate for some resources getting worse. But, conservation only, could not lead a design to be sustainable.

Second is regeneration, which means regenerate deeply wounded environment. Is also in the form of active restoration of degraded ecosystem and communities. It is a form of healing and renewal that have high chance to harmonizing the culture and nature.

Last, stewardship is a quality of care in our relations with other living creatures and with the landscape. Stewardship is maintains natural resources by spending it sparingly and invest wisely.

The explanation above that explained about how ecological design should be a holistic system. As what Frick (2007) in his book stated that ecological architecture contains parts of biological architecture (humanitarian architecture that pays attention to the health of residents), alternative architecture, solar architecture (related to the utilization and processing of solar energy), bionic architecture (civil engineering and construction that pays attention to natural development), and sustainable development.

In the case of visitor centre, the site still mostly filled with vegetations and has sloppy area, it is important to consider more in materials and continious construction, and in order to prevent demolish local vegetation and avoid landslide.



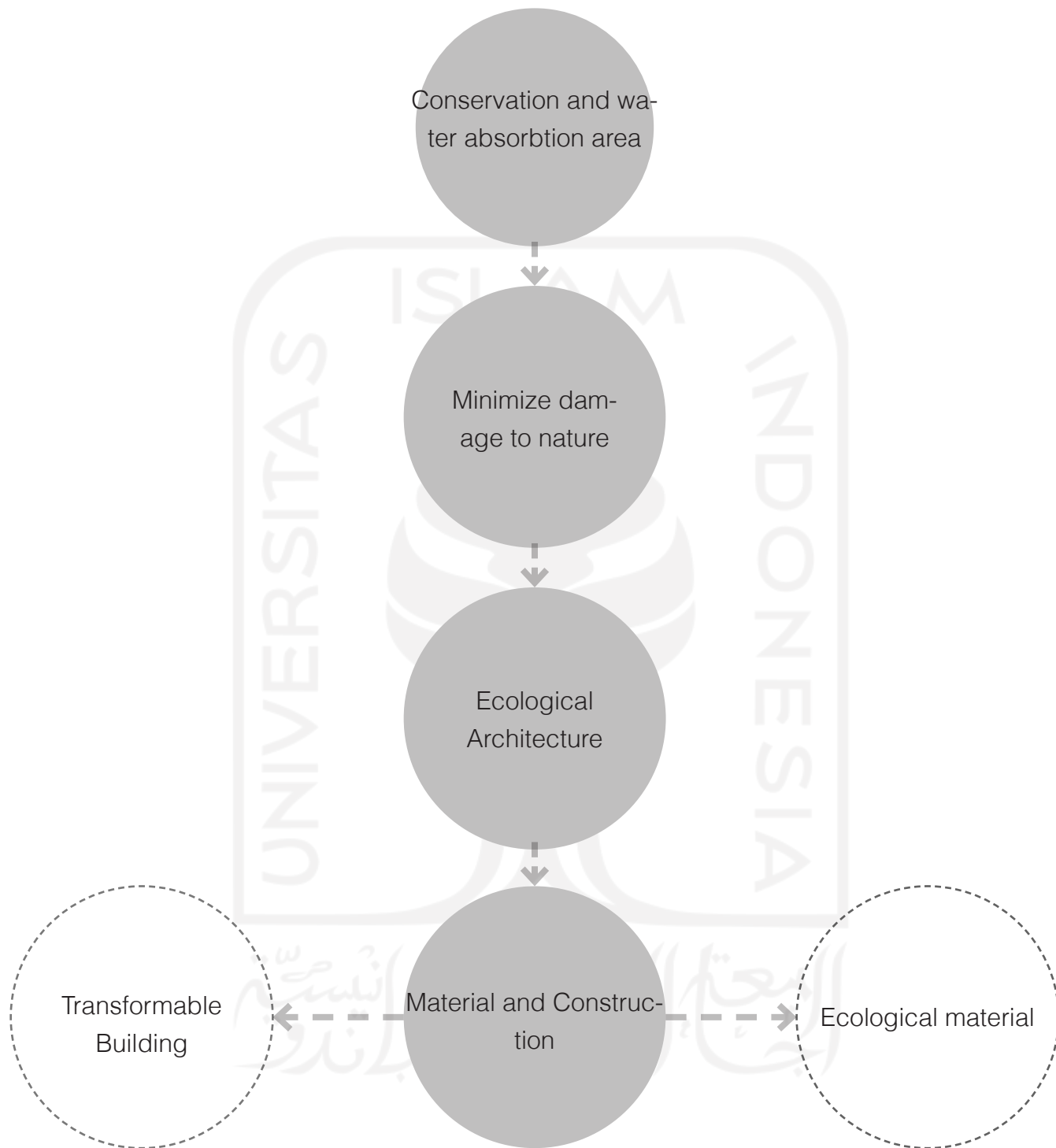


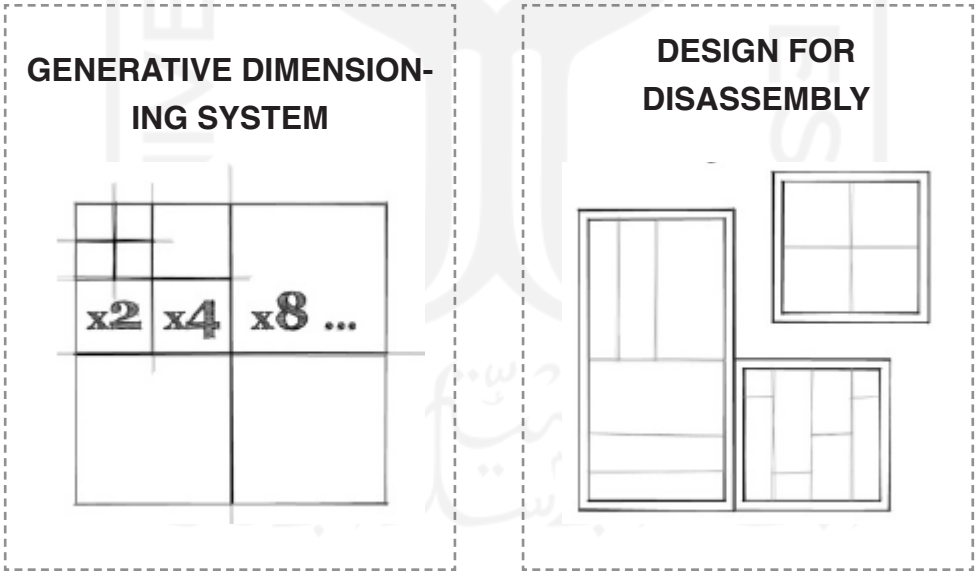
Figure 2.1 Mind Map of Ecological Architecture Approach implementation on design
Source : Author, 2022

DESIGN APPROACH STUDIES

TRANSFORMABLE BUILDING

The idea of transformable building departs from an unsustainable development problem. Where a building designed to be 60 years old underwent changes and was demolished in its 25th year (Tros et al, 1999; Galle and Temmerman, 2013). These problems indicate a gap between the technical and functional ranges. This is highly unsustainable from an environmental and economic point of view. Where if this continues, development activities involving carbon emissions will be carried out more frequently. If the building cannot survive as planned, it will suffer financial losses. Thus all energy, material and financial resources spent in development are lost.

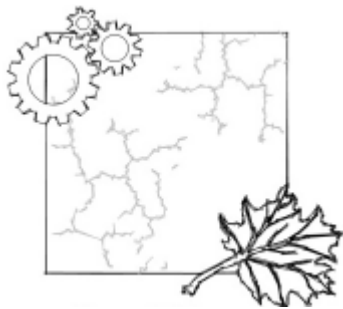
From there, H. Henderickx and H. Vanwalleghem came up with the idea of a transformable building that aims to minimize the technical and functional span of a building. The two concepts held in transformable building are:



TRANSFORMABLE BUILDING

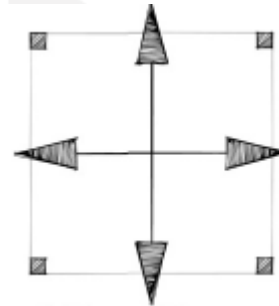
Four Time-dependent Design

There are four points that have major implications for a building's ability to respond changing demands or its resistance to them. They create a framework for analyzing numerous approaches to the design strategy 'transformable building' (Temmerman, 2013).



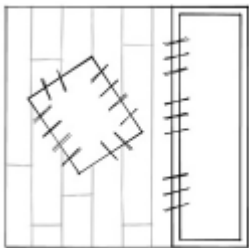
Durability

It is important for components are keep in shape during use, disassembly, handling or transport. Durability takes an important role



Versatility

Simply by their generic qualities, such as a straightforward accessibility, bright illumination or generous space plan buildings can respond to multiple requirements and house many functions



Management

Accurate monitoring of the users' needs and an according allocation guarantees an efficient use of the available facilities.



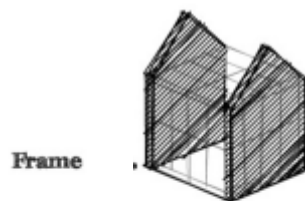
Socio-cultural value

Requirements of users or standards, a building's functional lifespan is also determined by the 'sociocultural value.

Transformable Construction Types

The kit-of-parts system is a special form of prefabrication. Where a prefabricated system is usually permanently connected, but in this case it can be disassembled (Howe et al., 1999; Galle and Temmerman, 2013).

Temmerman adapted and developed the Leupen professor's thesis 'Frame and Generic Space, a study of the process of occupancy which can be transformed from a permanent form' into his four kit-of-part system.



Base-building Type

- Permanent load bearing structure
- Additional core/bracing are indispensable
- Mostly applied in highrise building
- Durability in material
- Versatile floor plan with transformable infill
- Skin and technical services are demountable and compatible system

Structural Wall Type

- Permanent durable load bearing structure
- Buttress walls guarantee overall stability, more likely grow in depth
- Suitable for terraced house
- Durability in material
- Building skin, plan, service, and access can be built in transformable way
- Demand low management, but enhance customisation

Frame



Frame & infill



Frame



Frame & infill



FacadeType

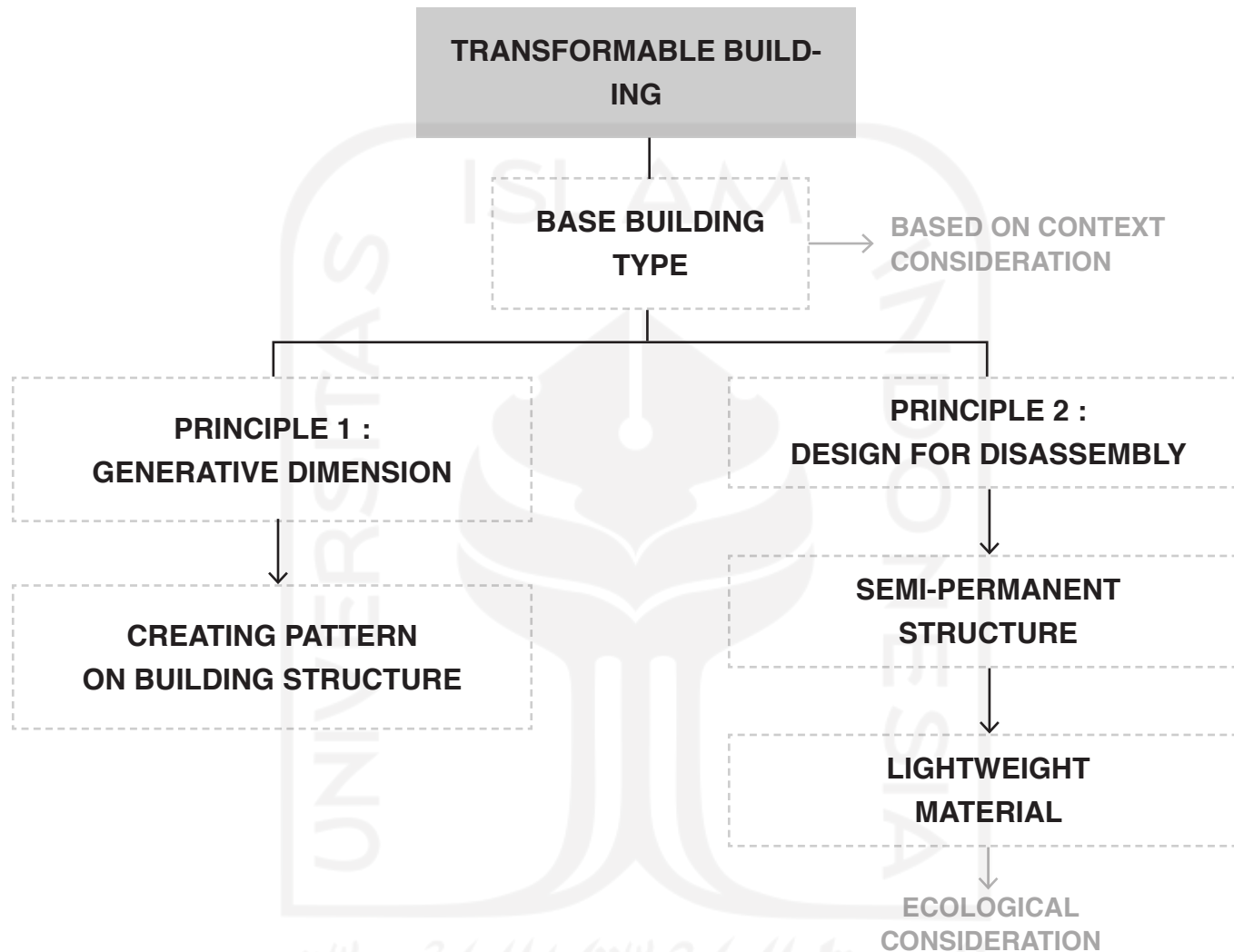
- More durability in facade material
- Self-supporting facade
- Versatile space within the volume it enclose
- Sub-structure are transformable,
- Sub-structure, skin, access, spaces, can be stand independently from the skin
- Lightweight kit-of-parts system can constitute space plan and services.
- Beneficial to gain cultural value

Structural Service Core Type

- Durable material starts from its empty base
- Considering vertical service core to constitute the frame for a transformable fit-out
- Sets high requirements to the building's demountable (transformable) structure (including load bearing), space plan and skin
- Offers three dimensions of versatility and 'endless' extensibility

From the several Transformable types above, the base building type will be chosen. This is due to the consideration of how Indonesia is located, which is a country against the earthquake, so the main structure must be considered to be the strongest. Thus, the Structural Service Core Type was not chosen because the building was not developed vertically (it has a maximum height that is classified as a low-rise building), so its use will be less effective.

Base-Building Type as the selected type of transformable building must adapt the initial principles of transformable building, namely the generative dimensioning system and design for disassembly.



On first principle, the load bearing structure have to implement generative dimensioning system. Which means the structure could be multiplied to form larger mass.

On the second principle, design for assembly, it can be interpreted that the structure will be a semi-permanent structure (the on of the day, it could be disassembled easier)and the use of the material is not in the form of heavy material. So here the material to be used must be light so that it can realize the point in this second principle.

ECOLOGICAL BUILDING MATERIALS

Heinz Frick (1998) in his book *The Science of Building Materials*, classifies building materials based on the use of raw materials and the level of transformation (change of physical form) that occurs in their cycle. The classifications are :

1. Regeative material

Plant and animal organic building materials that can be applied directly without transformation. Examples: wood, rattan, rumba, reeds, animal skins, etc. This building material has a natural life cycle so it has the ability to cultivate, therefore the cycle is closed. So it has relatively no negative impact ecologically. Its use also only requires a small amount of energy.

2. Reusable natural building materials

Organic materials are not from living creatures that can be directly applied to buildings. Such as: clay, sand, natural stone, etc. This building material is renewable, but can be used repeatedly with a simple process.

3. Reusable artificial building materials

This classification of building materials is building materials obtained as waste, scrap, garbage, dregs, and so on from industrial companies in the form of packaging materials, used cars, used car tires, sawdust, pieces of synthetic materials, glass, zinc, or cloth.

4. Natural building materials that undergo simple transformation changes

Materials whose raw materials come from nature, then undergo processing which results in changes in the form (transformation) of the material. Examples: clay bricks, clay tiles, ceramics, metal from metal ores, zinc, glass from quartz sand, etc.

5. A building material that undergoes several degrees of transformational change

This type of building material is a material that uses fossil raw materials (petroleum, charcoal, gas). The resulting materials are synthetic materials such as: plastic, epoxy, polycarbonate, PVC, etc. Synthetic materials are materials that are considered not ecologically good

To apply ecological building materials to transformable building structures, materials that have the following characteristics are needed:

1. The application is easy to disassemble
2. Has a good lifespan and durability (especially on permanent parts of the building)
3. The use of materials that can be recycled or biodegradable is preferred.

Therefore, the materials in classification point 1,2,3, and 4 are able to be used with consideration above.

The selection of materials are important in developing the ecological design. Immature considerations of building materials could lead into complex problems of global warming. The selection of materials in developing environmental friendly building can be seen from the role of materials manifested in three stages of development, namely pre-building, building operation, to post-building or so called the building material cycle (Syahriah, 2016).

There are three regulations about green building related to building material cycle in Indonesia : Minister of Environment Regulation, Regulation of the Minister of Public Works, and GBCI (Green Building Council Indonesia). The comparison between those three regulations related to the building material cycles are shown in table on side :

CRITERIA	MATERIAL BUILDING LIFE CYCLE		
	PRE-BUILDING	BUILDING OPERATION	POST-BUILDING
Minister of Environment Regulation	<ul style="list-style-type: none">• Ecolabel building material• Local building material	<ul style="list-style-type: none">• Using non-ozone-depleting materials in buildings	
Regulation of the Minister of Public Works	<ul style="list-style-type: none">• Using materials efficiently and carefully to reduce unused material left• Using environmentally friendly raw materials and production processes• Prioritize use local processed materials that are easily obtained around the project area• Accurately scheduling material procurement to reduce storage		<ul style="list-style-type: none">• Prepare a sorting area and organize waste management to place the remaining material from the project implementation before being reused and/or recycled.• Using a construction material supplier who is willing to bring/take back the packaging, pallets, and unused or residual materials generated by the products they provide.

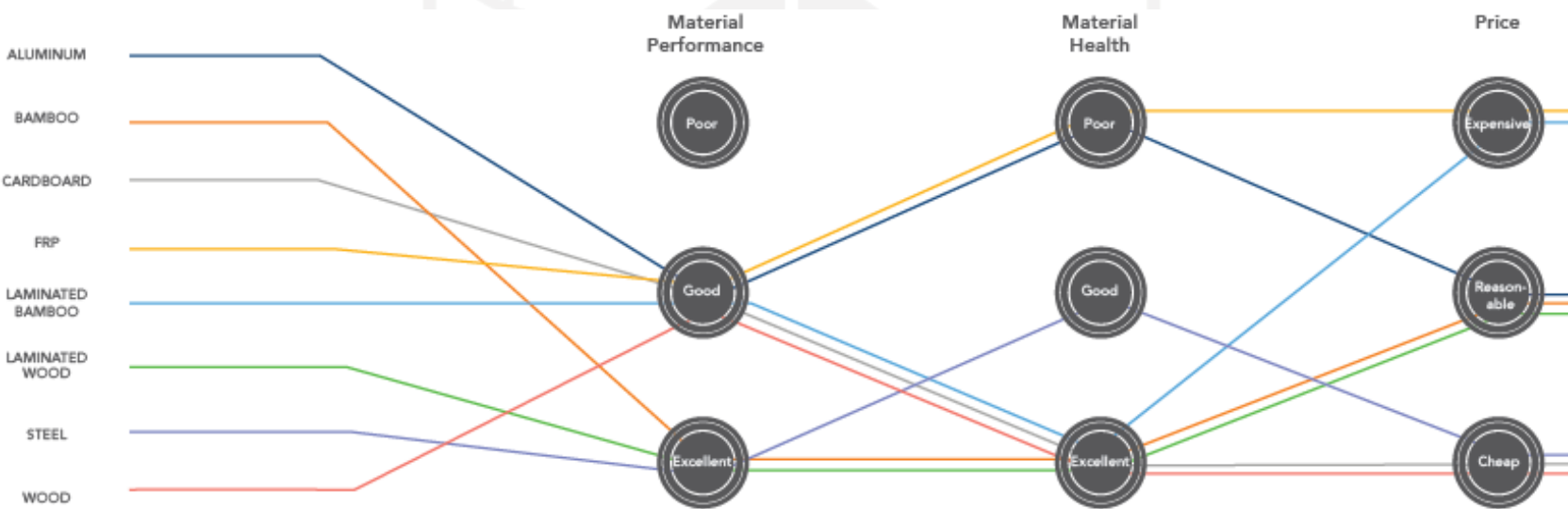
CRITERIA	MATERIAL BUILDING LIFE CYCLE		
	PRE-BUILDING	BUILDING OPERATION	POST-BUILDING
			<ul style="list-style-type: none">• Encourage material reuse for project offices, construction workers' beds and warehouses• Encourage reuse of construction tools such as concrete moulds, scaffolding, and other tools
GBCI	<ul style="list-style-type: none">• Building and material reuse• Environmentally friendly material• Certified wood• Prefab material• Regional material	<ul style="list-style-type: none">• Fundamental refrigerant• Non ODS usage	

Based on the three regulations applied in Indonesia that outlined on the table above, we can understand that the point of ecological material on each stage are:

1. Pre-Building : Using local material
2. Building Operation : Using non-ozone-depletion material
3. Post Building : Able to be reused or recycled

ECOLOGICAL BUILDING LIGHTWEIGHT STRUCTURE MATERIALS

Lightweight material was chosen as the main structural material due to its lightweight nature so that it can create an environmental friendly structure on the site. The use of lightweight materials as a structure will of course require lightweight and strong materials to be the main structure. Borges (2017) conducted research on several lightweight materials that can be used as the main structure with consideration of material performance, material health, and its cost value. The results are as follows:



Material Performance
Density (kg/m3)
Flexural Strength - MoR (Mpa)
Strength-to-weight ratio (MoR/density)
Young's Modulus - MoE (GPa)
Compressive Strength (Mpa)
Tensile Strength (Mpa)
Thermal Conductivity (W/m.oC)

Material Health
Embodied Energy (MJ/kg)
CO2 footprint (kg/kg)
Water Usage (l/kg)
Recycle fraction current supply (%)
Combust for Energy Recovery (yes/no)
Biodegradable (yes/no)
Renewable Content (%)

From the Borges's results above, the consideration of lightweight materials as follows :

1. Metal/Alloys

Steel : Excelent materials performance with cheap price. Unfortunately material health included good because still high in carbon footprint but can be recycled and need less water than wood.

Aluminium : Good material performace, with quite poor material health and higher price than steel. It resulting aluminium was not really recommended as alternative structural materials.

2. Composites

FRC : Good materials performance but poor material health and expensive in price. This made FRC materials were not recommended for structural materials. Thus most of them use for aerospace materials

Cardboard : Good material performance, excelent material health and cheap price. It shows that cardboard can be good alternative for the lightweight structure. But, other consideration that should not be forgotten was about the flammable characteristic of cardboard.

3. Natural Materials

Wood : Good materials performance, excelent material health, with cheap price same results as cardboard. But unfortunately, wood diverse in various materials around the world.

Bamboo : had excelent structural performance, excelent material health, and a reasonable price As a result, bamboo has risen to the top of the list of temporary building alternatives. Other aspects, maintanance must be considered.

4. Engineered Materials

Laminated Timber : had excellent structural performance, excellent material health and reasonable price. Similar to the ranking of bamboo, laminated wood sits at the top ranking of alternative solutions for temporary structures. The type of species, wood treatment and lamination process can influence the performance of laminated wood.

Laminated Bamboo : had good structural performance, excellent material health and expensive price. Laminated bamboo is a relatively new product that is very sustainable, but that it is still expensive in the market.

From the material considerations above, it can be concluded that steel and laminated timber have good structural performance related with durability, strength, and etc. But, material health of steel were still considered producing carbon footprint during the construction, as well the material was not from the renewable content raw materials, thus laminated timber was the best option for the lightweight material alternatives

THE PHILOSOPHY OF TEA

Tea is one of the most widely used beverages in the world. Several countries in the world have a history that is closely related to tea even from thousands of years ago and developed into traditions and cultures.

According to Suwarni Widjaja, in Rianti (2018), the original philosophy of tea was in the form of water, tea, and utensils, because tea was born from these three elements. But other than that tea reflects the meaning of life which has a sweet and bitter taste. In the manufacturing process, it also reflects life which contains a sequence of processes. With that too, Bambang Doyo Suprpto, expressed patience as well as one of the philosophies contained in tea.

In Javanese culture, which generally makes tea as a banquet, it has a meaning other than building family intimacy, it also reflects the personality and knowledge of the host which includes life goals, ways of thinking, religion, awards, and ceremonies.

Thus, the tea philosophy is defined in 3 points:

- It consists of three main components, namely water, the tea itself, and the equipment
- Reflecting the bitter and sweet life processes
- Become a symbol of familiarity to know and find out in-depth information



PRECEDENT STUDIES

PRECEDENT STUDY

CARLTON MARSHES VISITOR CENTRE, UK



Project Carlton Marshes Visitor Centre
Year 2019
Architect Cowper Griffith Architects

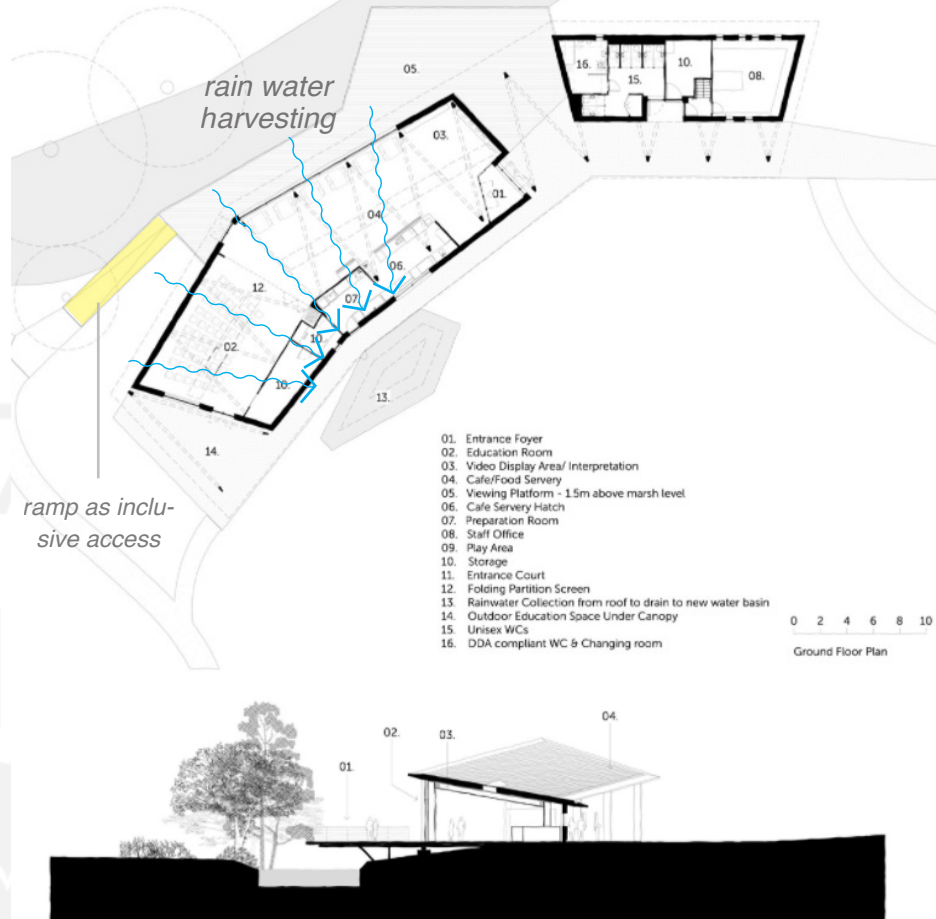
The visitor centre was located in Carlton Marshes, Lowestoft. Mostly man-made, these habitats have developed over hundreds of years of traditional management and now host specialised wildlife. Community engagement, inclusive access, and low energy were very important components of the design of the Centre. The new centre is a flagship building for the Trust that will have a dual role being both a visitor gateway and an education centre, a space to encourage more people to learn about the Broads unique landscape and wildlife. They encourage people to learn the landscape and

LESSON LEARNT

wildlife by :

- Education room
- Large opening that able to showcase the wildlife
- Cafeteria
- Souvenir shop
- Large opening that able to showcase the wildlife

Design that built in wild life, they try to use minimal energy and water by water preservation (rain harvesting, building elevation) maximum natural lighting, the building also use eco-friendly glulam material.



PRECEDENT STUDY

BOH VISITOR CENTRE, MALAYSIA



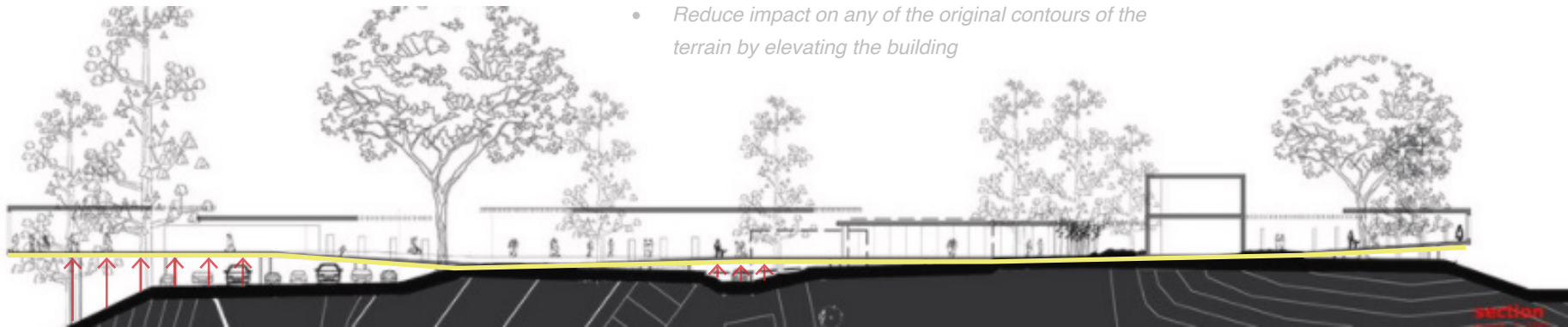
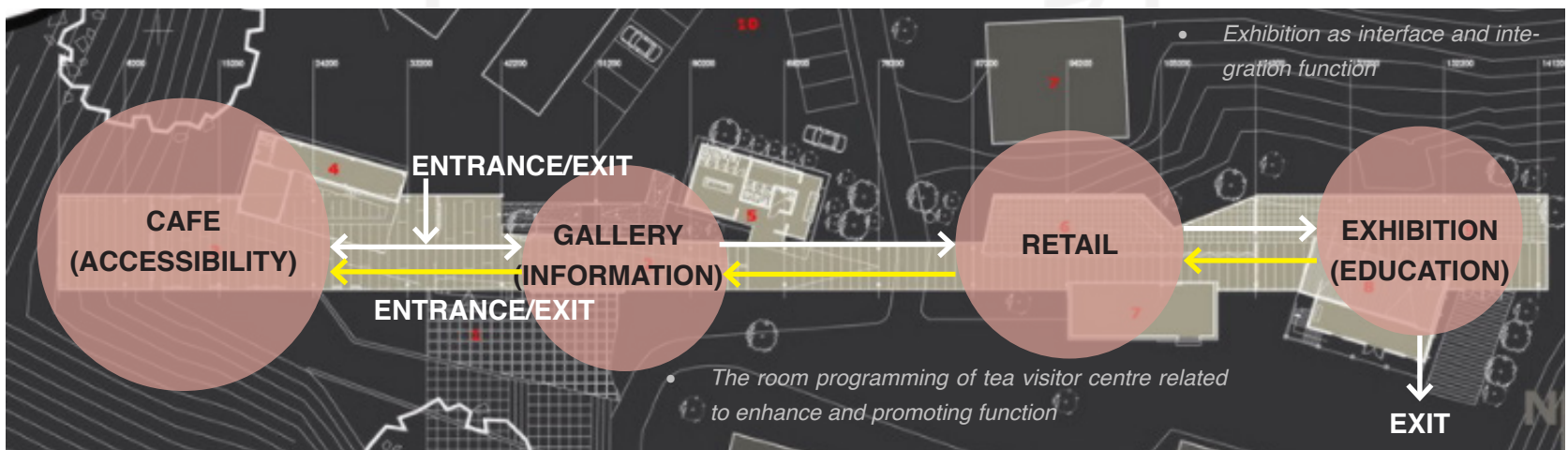
Project BOH Visitor Centre
Year 2008
Architect ZLG Design

The BOH Visitor Center will provide visitors to the estate opportunities to view and appreciate the landscape. This “building” would not only address the Owner and operator’s requirements to meet certain sales targets, it was also there to house the existing tea shop and improve the visitor facilities

Source :

<https://www.archdaily.com/6062/boh-visitor-center-zlg-design>

LESSON LEARNT



- The Visitor Center is naturally ventilated building with a minimum need for any mechanical ventilation or air conditioning. It has extensive daylight penetration to reduce contrast between outside and inside lighting conditions and to allow for maximum external awareness.

RUMAH ATSIRI INDONESIA, TAWANGMANGU



Project Rumah Atsiri Indonesia
Year 2018
Architect Timgita + studio-kita

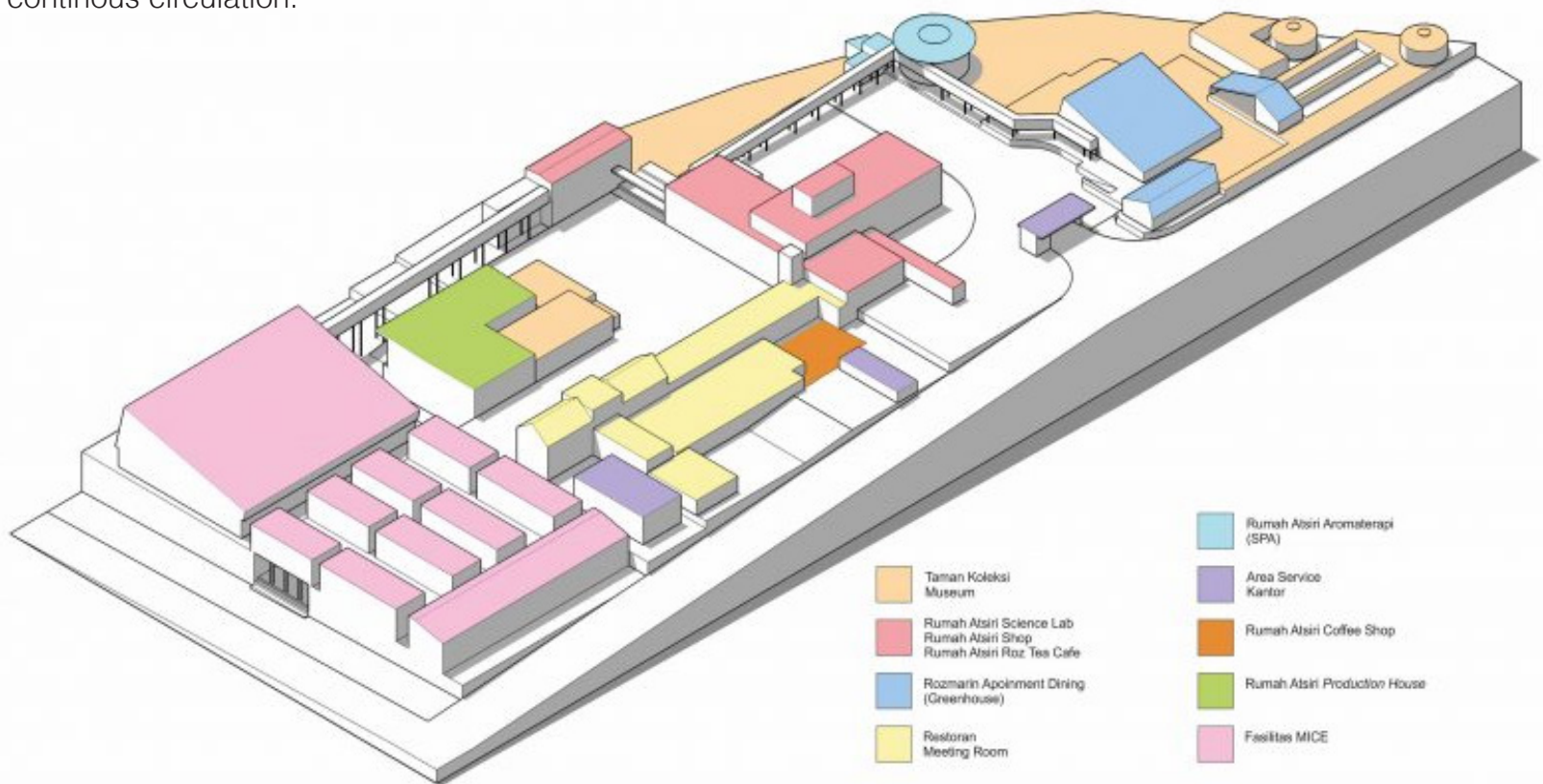
Rumah Atsiri Indonesia, is famous for its edu-recreation related to the atsiri oil production (essential oil). The building consist of garden, museum, workshop area, production area, restaurant, laboratory, and display. Currently, they add villa to offers visitors to experience the atsiri production in exclusive way.



LESSON LEARNT

Rumah Atsiri Indonesia as recreational place that could 'raise' the name of atsiri oil. They give many options for visitors to enjoy the essential oil by give thorough experience from the form raw ingredients (atsiri plants that could be find in every side of the landscape), process (by museum, workshops, and laboratory), and finished product (showroom and restaurant). And they present it in continous circulation.

It makes visitors able to indroduct by giving torough understanding of the atsiri oil product.



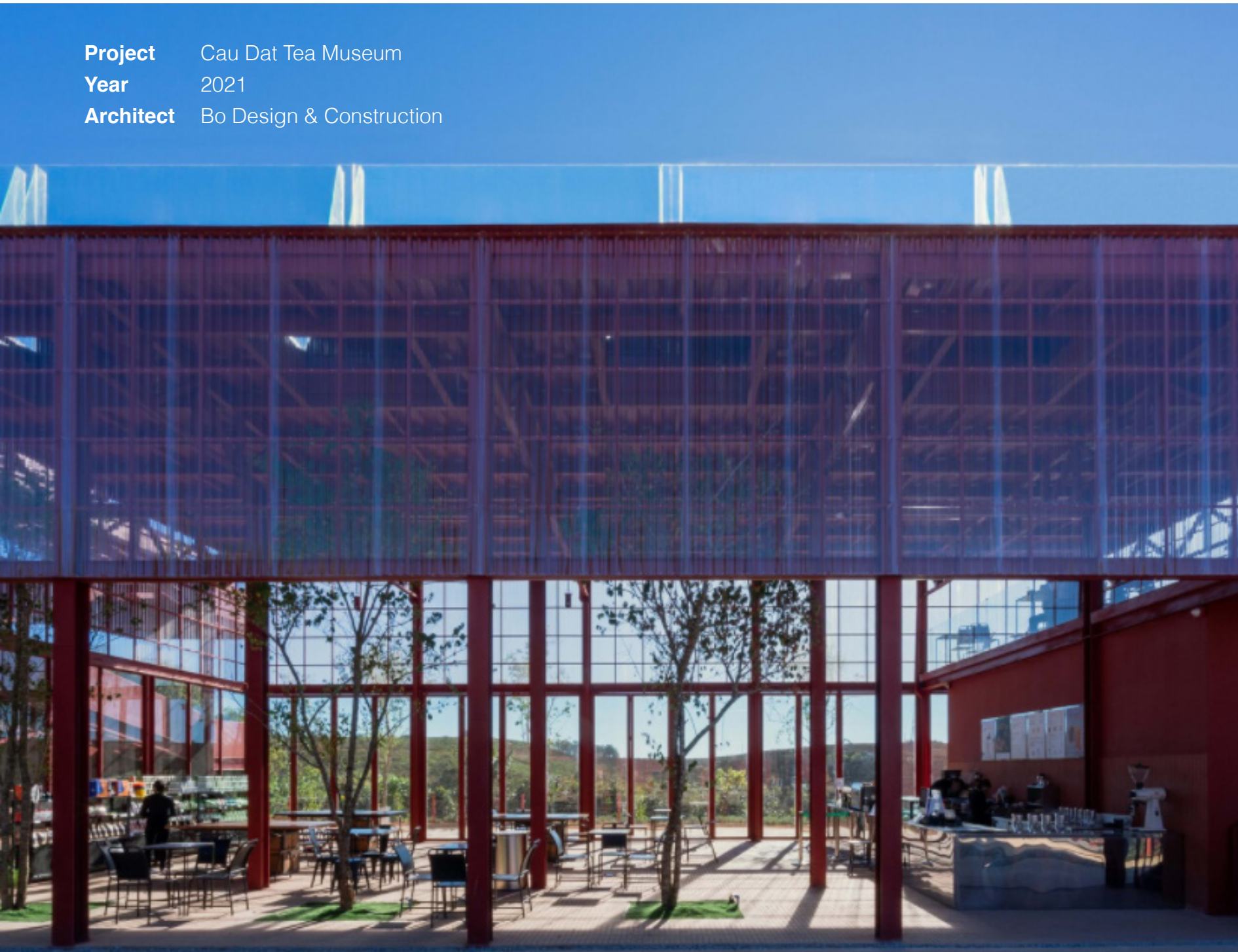
Source :

<https://rumahatsiri.com/architecture>

PRECEDENT STUDY

CAU DAT TEA MUSEUM, VIETNAM

Project Cau Dat Tea Museum
Year 2021
Architect Bo Design & Construction



Source :

<https://www.archdaily.com/974215/cau-dat-tea-museum-bo-design-and-construction>

1. Entrance
2. Guest welcome area
3. Cau Dat human & nature
4. Cau Dat history
5. Cau Dat's tea art installation
6. Art media visual
7. Theater
8. Tea testing & waiting area
9. The Bistro
10. Tea leaf drying yard
11. Tea manufacture & storage
12. Tea packaging
13. Cau Dat coffee introduction house
14. Tea garden
15. Persimmon garden & kids play-yard
16. Car park

Introduce tea by story telling (from the making process) to the final product in the bistro and introduction house

Built in 1929 by French, and located in Xuân Trng Town, Vietnam with 1.2 hectares area, Cut Tea Department was the first place to have a large tea factory in south-east Asia. Now it's transformed into Tea Museum and offers a variety of facilities for tea, as well as a new destination for Vietnamese youth. This includes tea hills, opening up for a tea manufactory with a tea culture exhibition, art installation spaces, and a cafe bistro for visitors.

LESSON LEARNT

The building is able to preserve the tea production as the village has and past tea culture in Vietnam to youth by a modern style of building and have a circulation sequence that is in accordance with the tea production order.

KARURA FOREST RESERVE, NAIROBI

Project Karura Forest Reserve
Year Competition, 2014
Architect Boogertman + Partners Architects



Elevated floor for maximize water to absorption to the ground. They also minimize cut and fill

The building will function mainly as a forest and nature conservation education and resource centre to promote environmental conservation and protection. Its location, surrounded by a rich natural ecosystem, offers unique recreational and educational potential for Nairobi dwellers to enjoy, understand and stay in touch with their natural heritage right on their own doorstep. Karura Forest to inform people of the history and the value of the forest as well as temporary exhibition space, an e-library, auditorium and conference rooms as well as management and administrative offices, a storage facility, cafeteria and eco-gift shop.

Source :

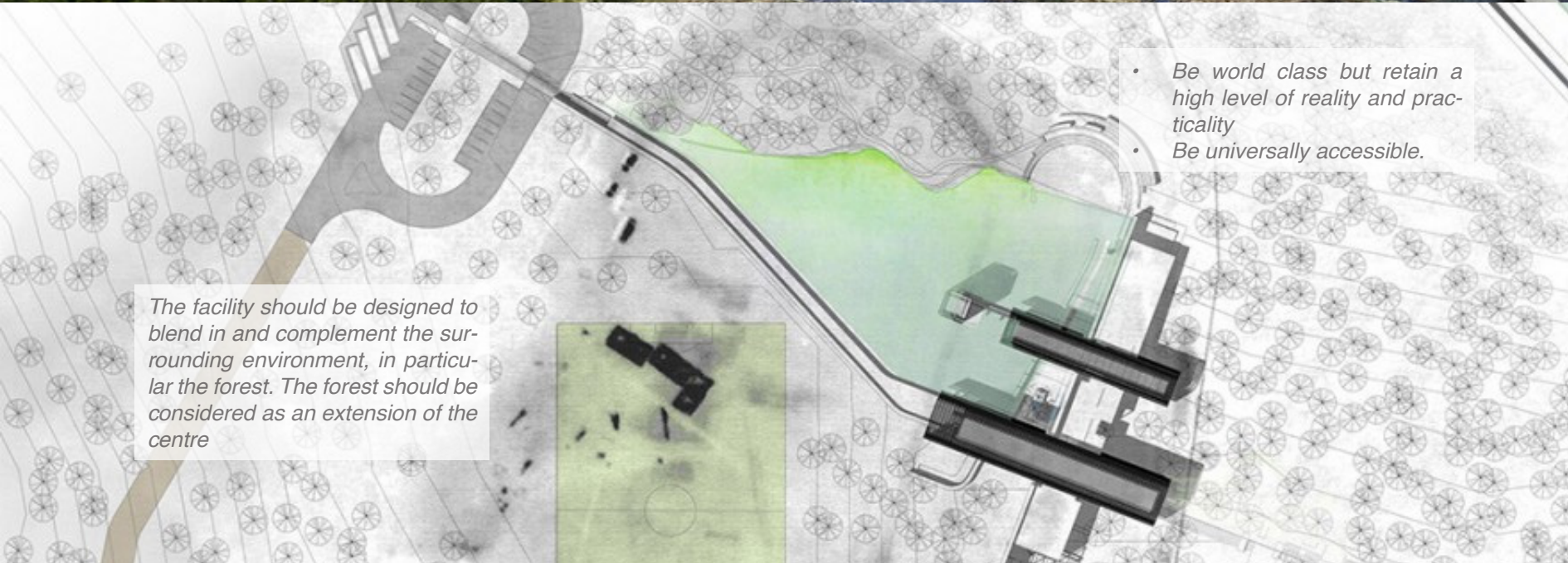
<https://www.designindaba.com/articles/creative-work/heart-forest>

LESSON LEARNT



Minimize the carbon footprint by using materials with low environmental impacts. The timber boxes made of ECO-WOOD recycled timber.

Water conservation pond to harvest the rain on built area



The facility should be designed to blend in and complement the surrounding environment, in particular the forest. The forest should be considered as an extension of the centre

- *Be world class but retain a high level of reality and practicality*
- *Be universally accessible.*

OSULLOC TEA MUSEUM, JEJU



Project OSULLOC TEA MUSEUM
Year 2012
Architect Mass Studies

Osulloc Tea Museum located in a scenic landscape of Seogwang Dawon, its main attraction being the tea farm, is located in Jeju Island, at a mid-mountain level, in a gotjawal. The building consist of The Osulloc Tea Museum, Tea Stone, Innisfree, and the Innisfree Annex

INSIDE THE TEA MUSEUM



1. Tea Cup Gallery

Displaying tea cup from three Korean Dynasty (Juseon Era) conveying history, spirit, and tradition of Korean tea



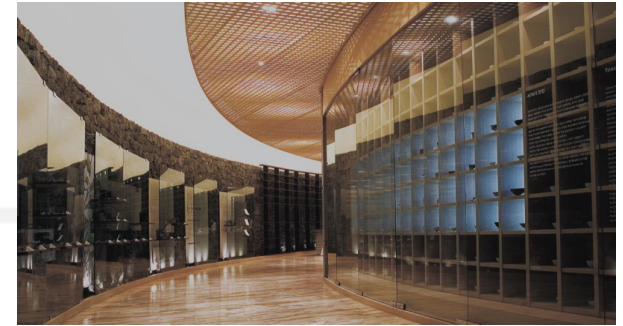
3. Brand Story

Space with unique experience where visitors could experience beautiful devotion that AmorePacific already put into the renaissance of tea culture in Jeju



4. Space for Roasted Tea

The process of roasting the tea that freshly harvested from the garden was appreciated by the visitors



2. Tea Cup of The World

Displaying tea cup from all over the world represent the value of tea from East to West. Including Japan, China, and Europe where tea is parts of their history



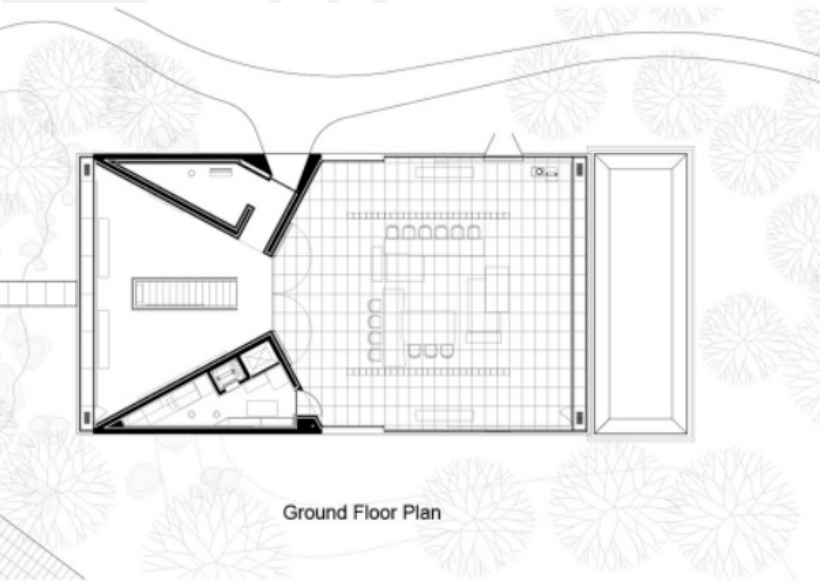
5. Tea Store

Visitor could tasting tea in various dish directly

LESSON LEARNT

The presentation of tea to the visitors, how they give story about tea in Jeju

TEA STONE FOR EXCLUSIVE TEA EXPERIENCE



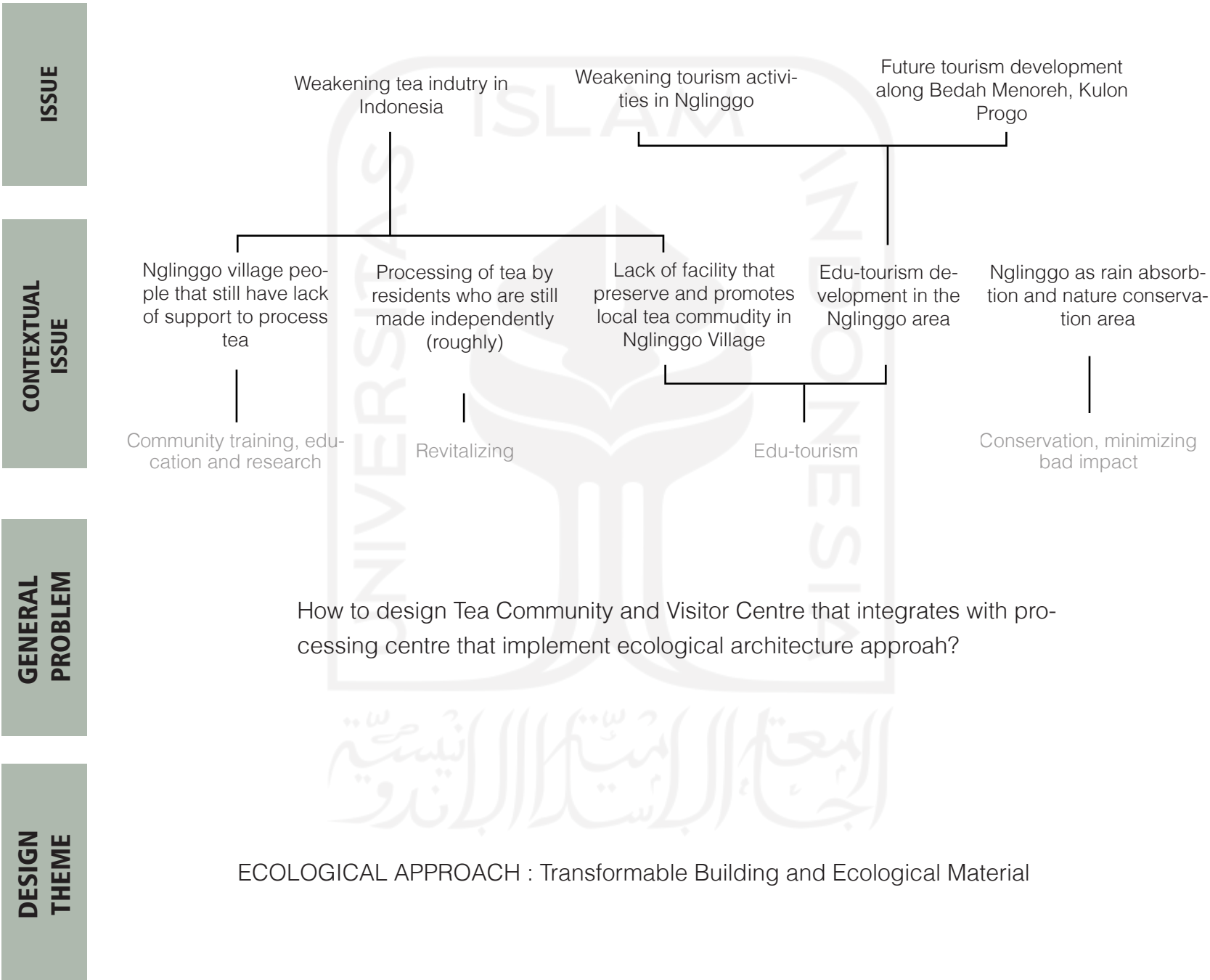
“Tea Stone was designed to help Korean tea tradition take root in Jeju Island. Resembling an inkstone with an inkstick, both of which were the basis of the spiritual assets of Korean ancestors for a long time, its appearance epitomizes its intention to foster and perfect Korea’s traditional tea culture that encompasses the tradition of Korea and Korea of today.”

Source :

<https://www.osulloc.com/kr/en/museum>

https://www.archdaily.com/486207/osulloc-tea-house-pavilions-mass-studies/5321eac-8c07a8042fc000083-osulloc-tea-house-pavilions-mass-studies-ground-floor-plan-tea-stone?next_project=no

DESIGN ISSUES MAP





03

DESIGN ANALYSIS

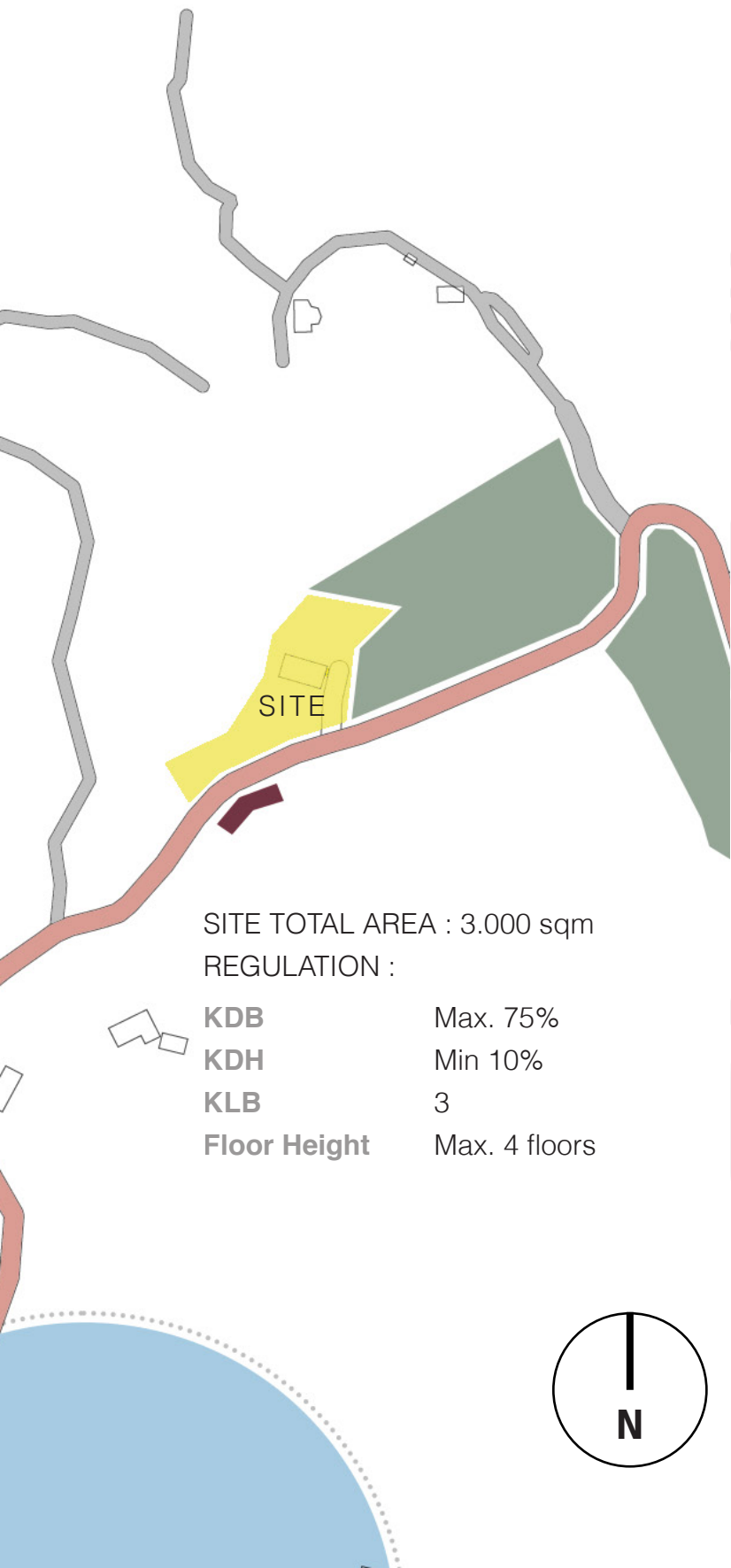
- Site Area Analysis
- Building Function Analysis
- Concept Exploration
- Exploration on Visitor Centre Typology
- Building Transformation
- Activities Flow Analysis
- Space Analysis
- Property Size
- Space Programming
- Transformable Building and Ecological Material Analysis

ANALYSIS

SITE AREA ANALYSIS

The designated site has total area of 3.066 sqm with the main function included as trade and services. Based on the regulation, the maximum floor area (KDB) will be 75% of the total area and green area minimum 10% of the total site area.

KDB	$75\% \times 3.000 = 2.250 \text{ sqm}$
KDH	$10\% \times 3.000 = 300 \text{ sqm}$



BUILDING FUNCTION ANALYSIS

The function of the building as a visitor center in this building has a role that not only accommodates visitors but also includes the community to be empowered together at the same time. So that the users of this building consist of three groups, namely:

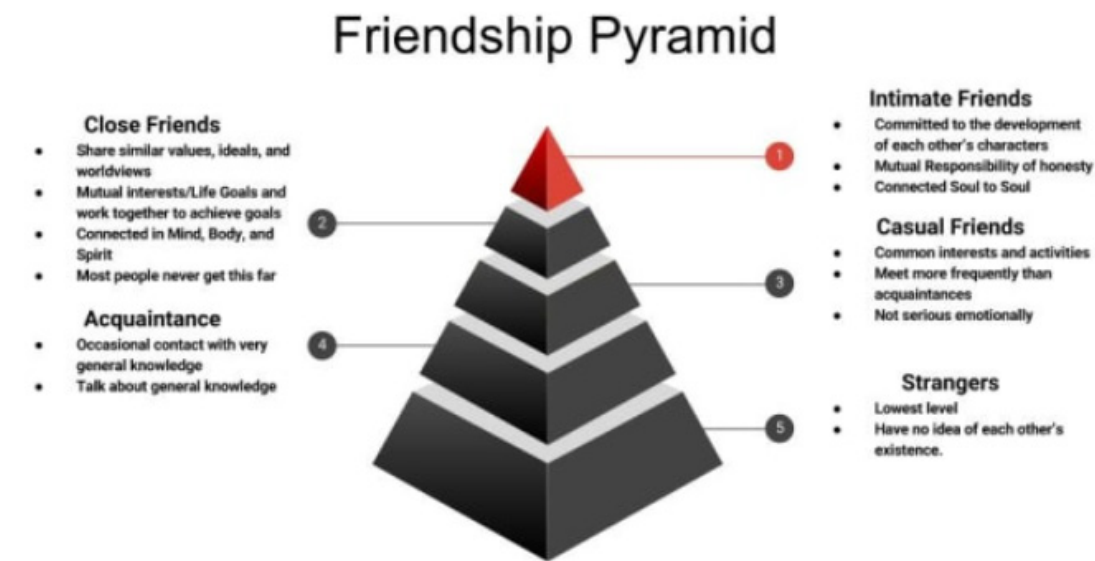
1. Visitors
2. Management
3. Community



VISITOR CENTRE SPATIAL FLOW ANALYSIS

Based on the context, Ngeteh Visitor center was functioned as small visitor center than enhance the value of promotion, filtering, ehancement, and community integration. Meanwhile addition point from local community was to introduce and promotes tea as a commudity.

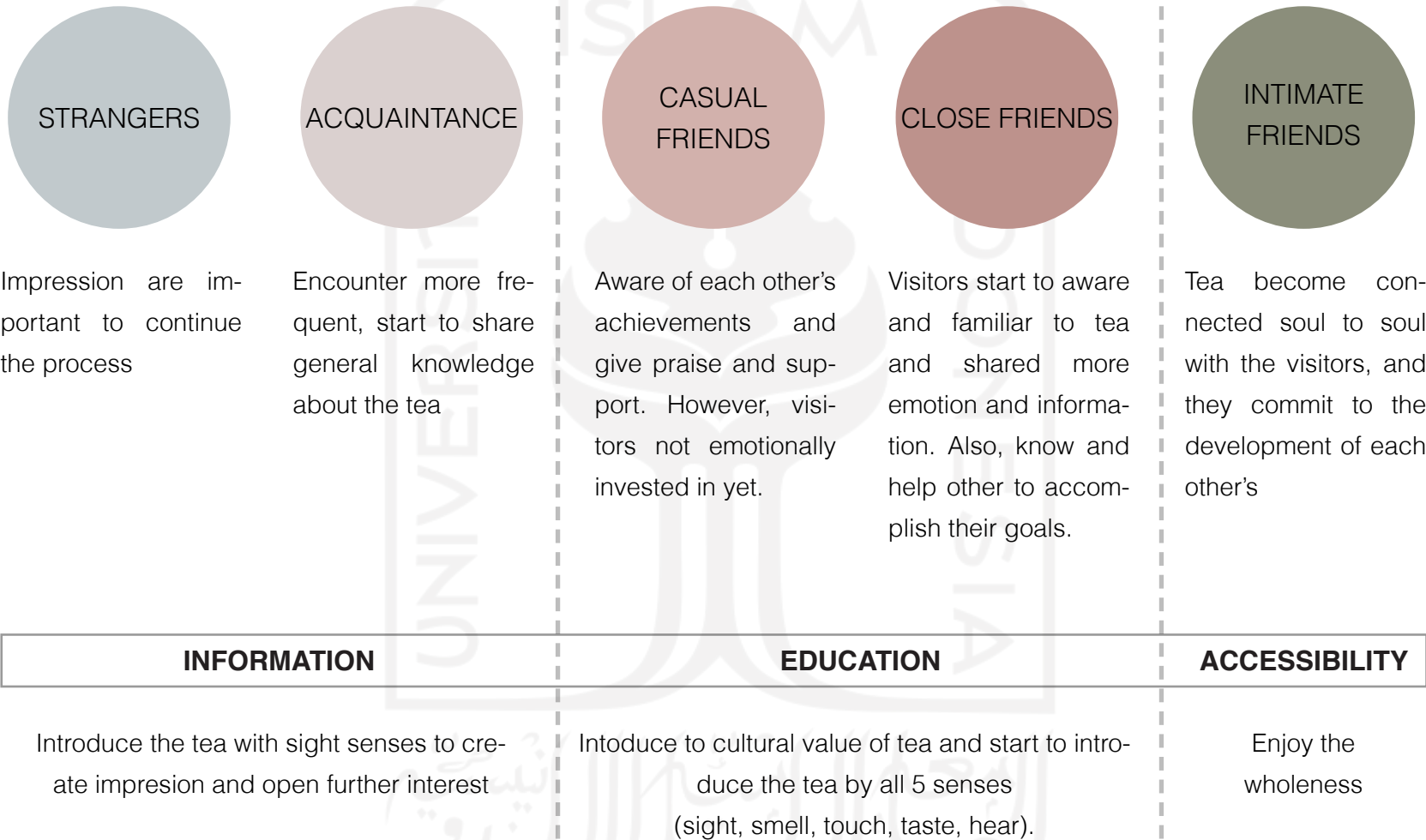
Thus, the philosophy of tea in Java was to built the familiarity/intimacy/friendship between guest and host. Meanwhile Dr. Myles Munroe adapted from Waiting and Dating, there are 5 stages of friendship :

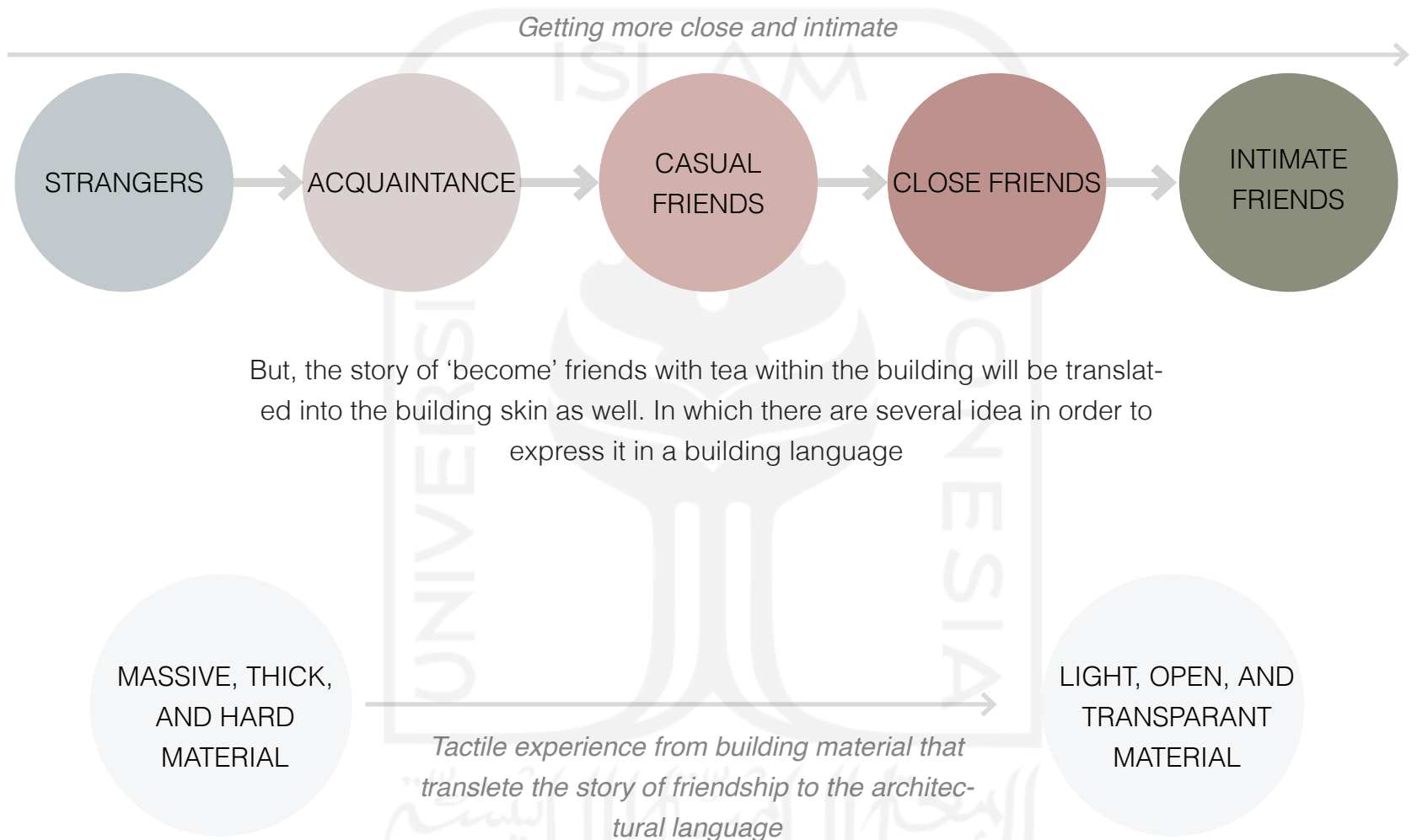


Ngeteh Visitor center as a media of promotion and enhancement will act as tea to build a 'familiarity' between visitors and the tea itself (in terms of regional and community contexts). This is done by generating the process into a space.

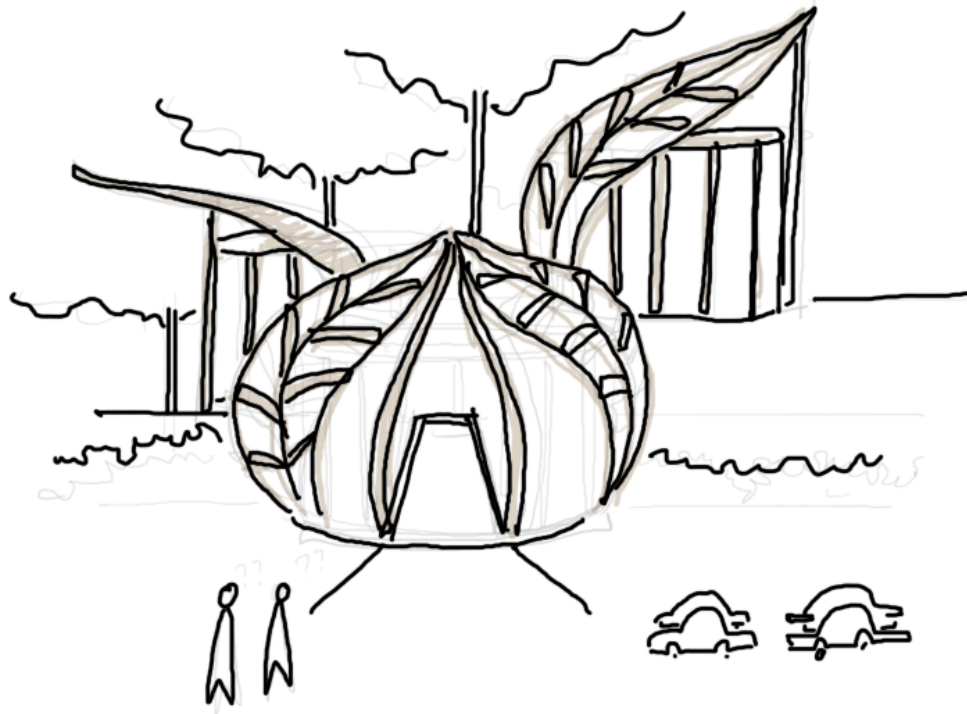
The stages of friends value were adapted into three main spatial function of visitor centre, namely : information, education, and accessibility.

THE STORY LINE





CONCEPT EXPLORATION



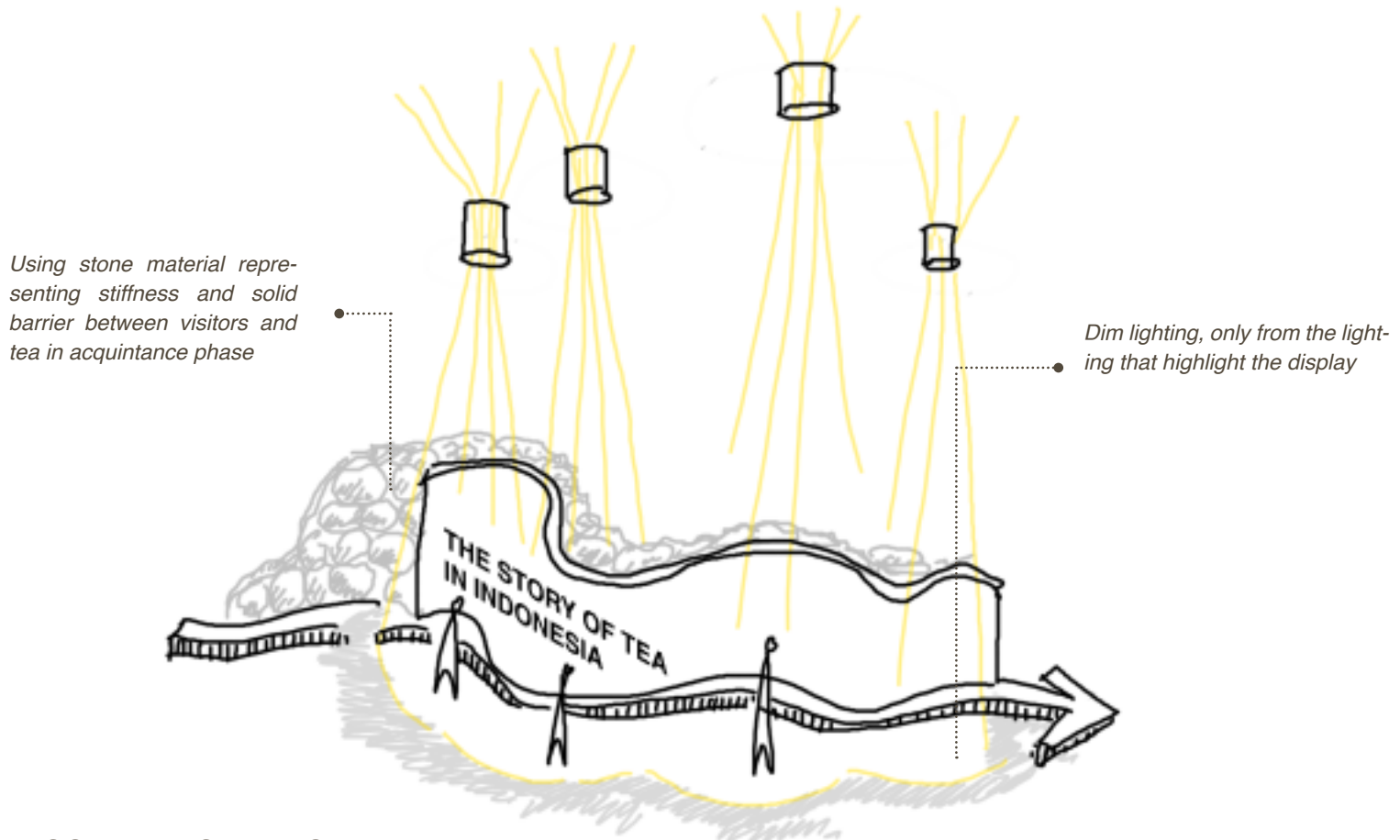
1 STRANGER PHASE FIRST ENCOUNTER

Strangers means the lowest stage of friendship where defined by lack awareness of each others. But the birth of friendship was depend on the first impression of each others.

Thus, in this case, stranger phase between visitor and tea starts from all the way to Nglinggo up to the

parking lot. But the first impression will decide wether they will continue the friendship or not. In this case the role of **building facade is important to give the strong first impression** that will make visitors interested to continue their friendship towards the tea. Here, massiveness was also choosed to represent how friendship starts with awkwardness.

CONCEPT EXPLORATION

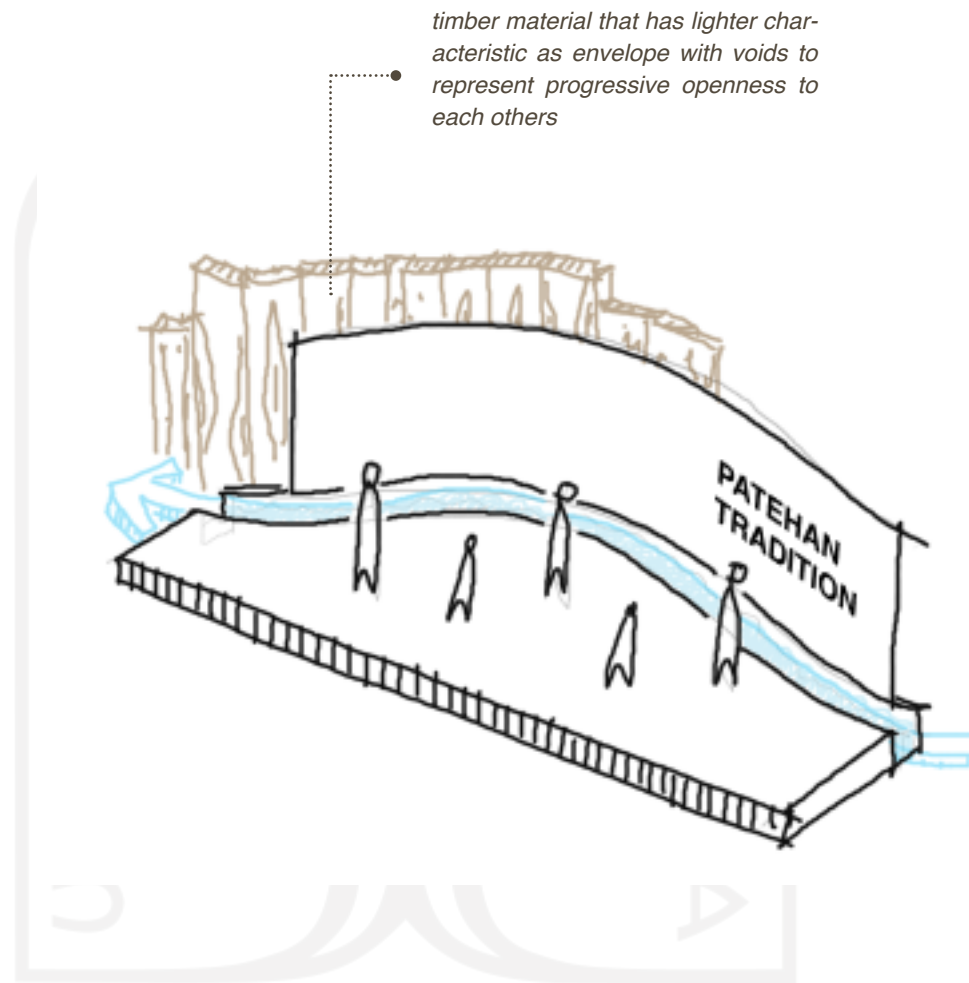


2 ACQUINTANCE PHASE EARLY RECOGNITION IN TEA GALLERY

Visitors had the opportunity to meet for the first time through the general topic of tea. This is through the story of tea in Indonesia - the country where visitors are now. Through this general sharing, visitors start to rising awarness and ready to continue to the deeper insight about tea.

The darkness of the room only highlight important topic that visitors could relate. **Stone as a material that will be use to represent the stiffness and solid gap between visitors and tea.**

CONCEPT EXPLORATION



3 CASUAL FRIEND

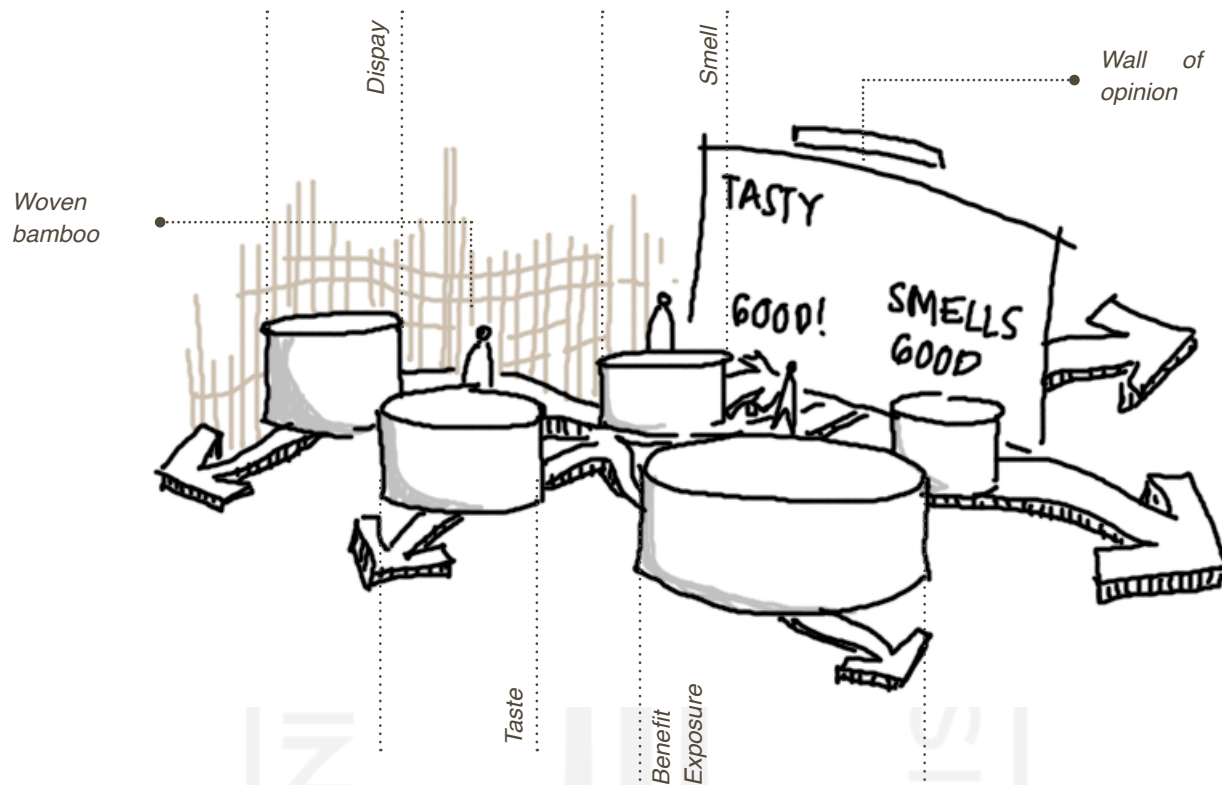
CULTURE RECOGNITION IN AUDIO VISUAL ROOM

General knowledge of tea brings the friendship into next step to become casual friend. After more frequent meeting, the visitors in this opportunity was able to understand deeper value of tea in the specific cultural scope.

The friendship that start with solid and strong stiff-

ness will turned into warm welcome that will represent through lighter **eco-materials, timber, that has warm tone and could brings the nature inside.**

Another main element of tea, water, were also introduce through the audio experiences.



4

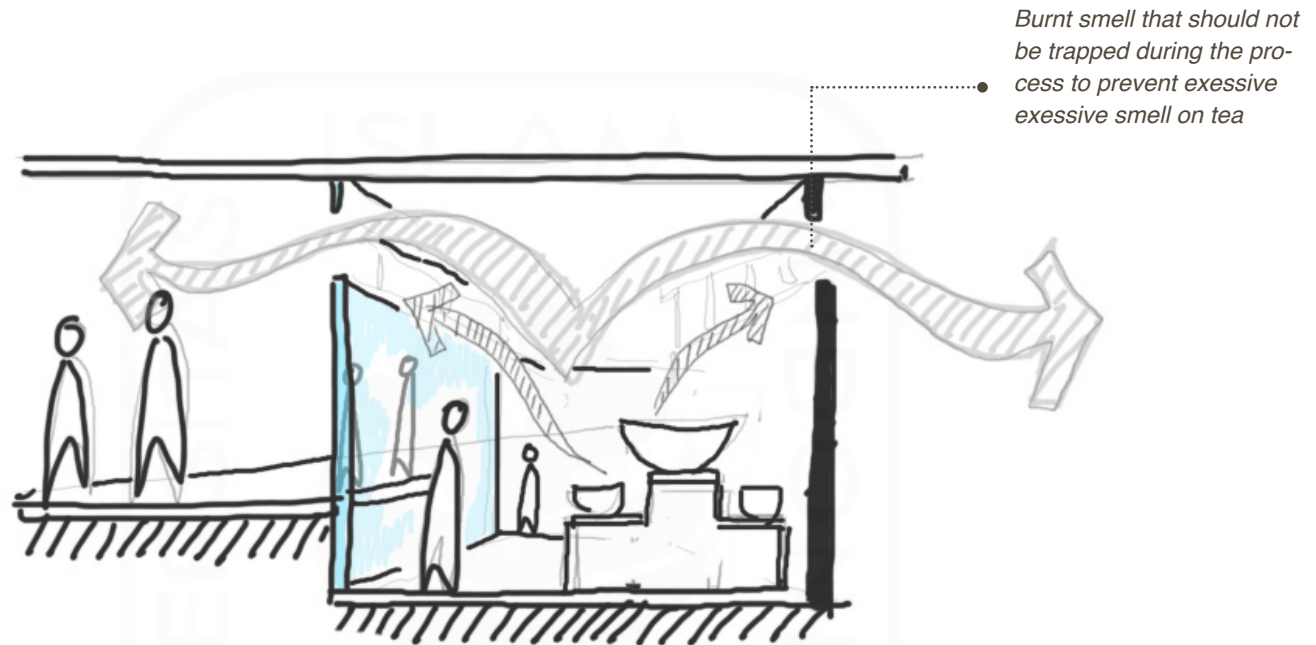
CLOSE FRIEND PHASE

STIMULATE EMOTIONAL CONNECTION IN NGLINGGO GALLERY

The cultural recognition brings visitors closer closer with tea. To make it to close friend phase, stimulating the connection of emotion were through the senses exploration of tea where visitors able to experience the in more deeper value. The result was confession through wall of opinion that communicated from visitors emotion.

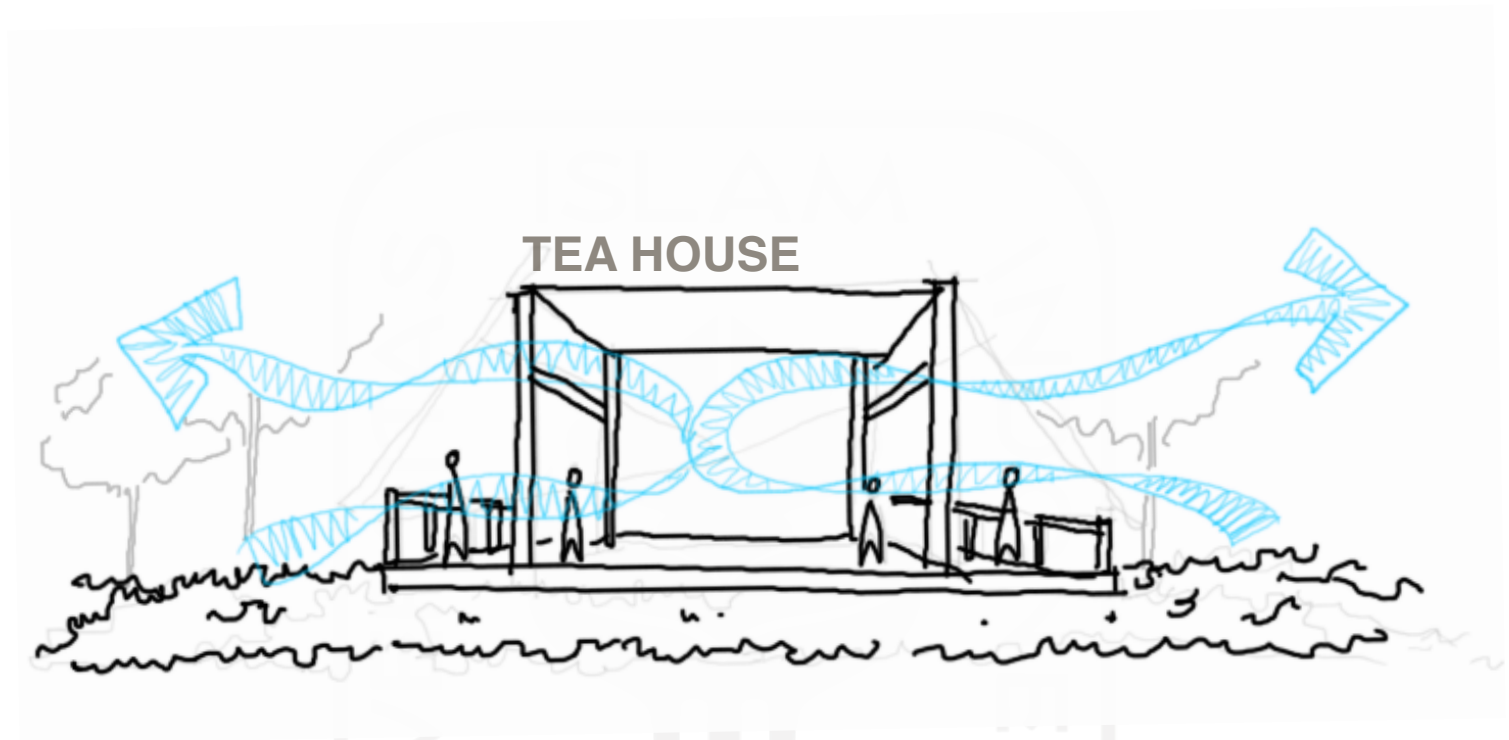
The room will be **dominated with woven bamboo that repret the flexibility and less barrier between tea and visitors. It also still represent the warmth between two side in close friend relationship.**

CONCEPT EXPLORATION



5 CLOSE FRIEND CONTEMPLATING THE ENTIRE PROCESS THROUGH OBSERVATION DECK

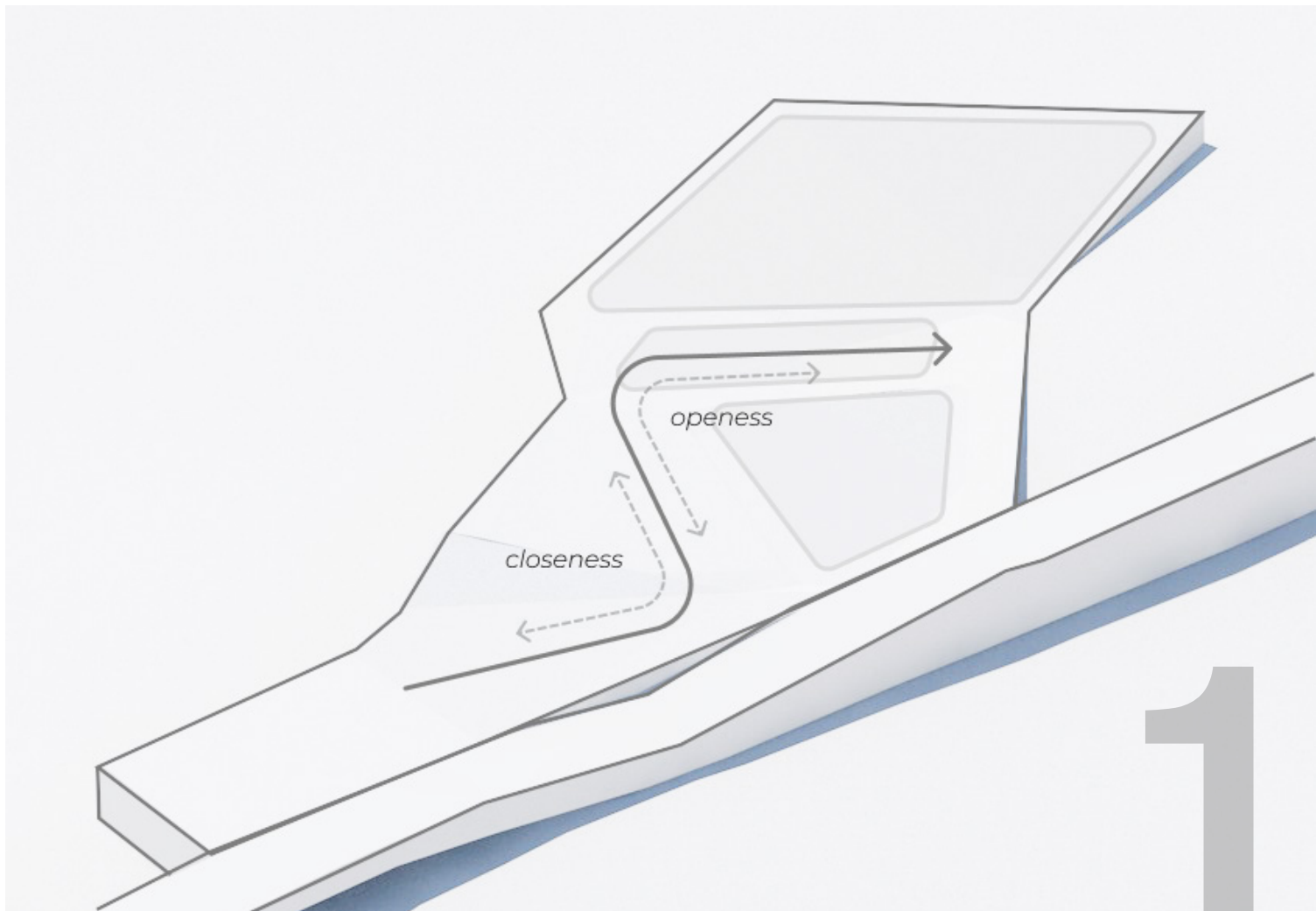
After stimulating visitors's emotion next experience is to understand deeper about how the tea was made from scratch. This also followed by the hint of 'sangrai smell' during the process that will be found while enjoying sangit tea on the end of the experiences



6 INTIMATE FRIENDS ENJOY THE WHOLENESS

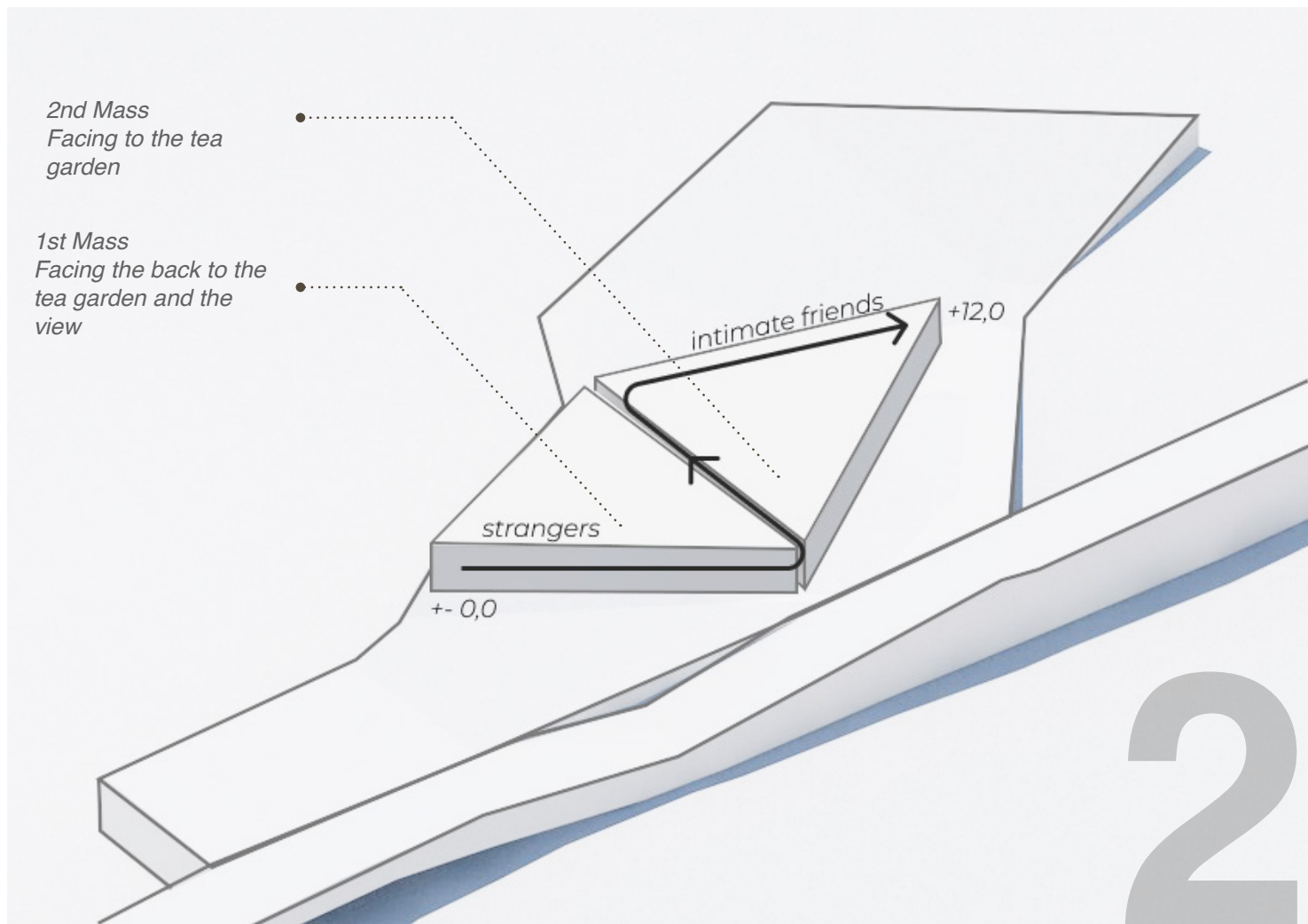
Finally, in the end of the journey, they could enjoy the whole experience of tea from tasting, smelling, and enjoy the surrounding as well with minimum barrier between visitor and the surrounding.

BUILDING TRANSFORMATION



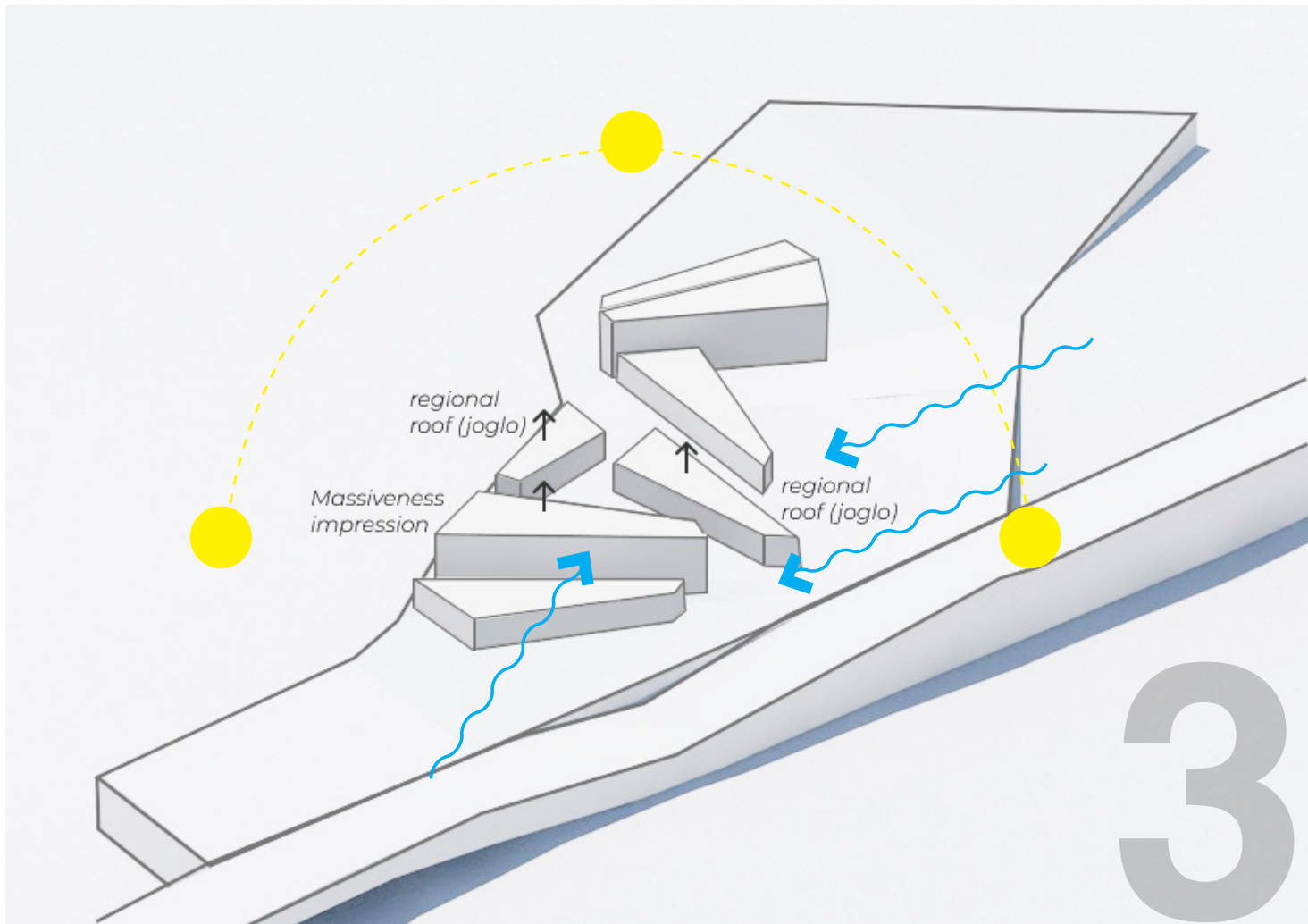
MAIN IDEA

The idea of friendship was from relation that closed to each others became open to each other following the elevation of the site from lowest to highest



MAIN FORM

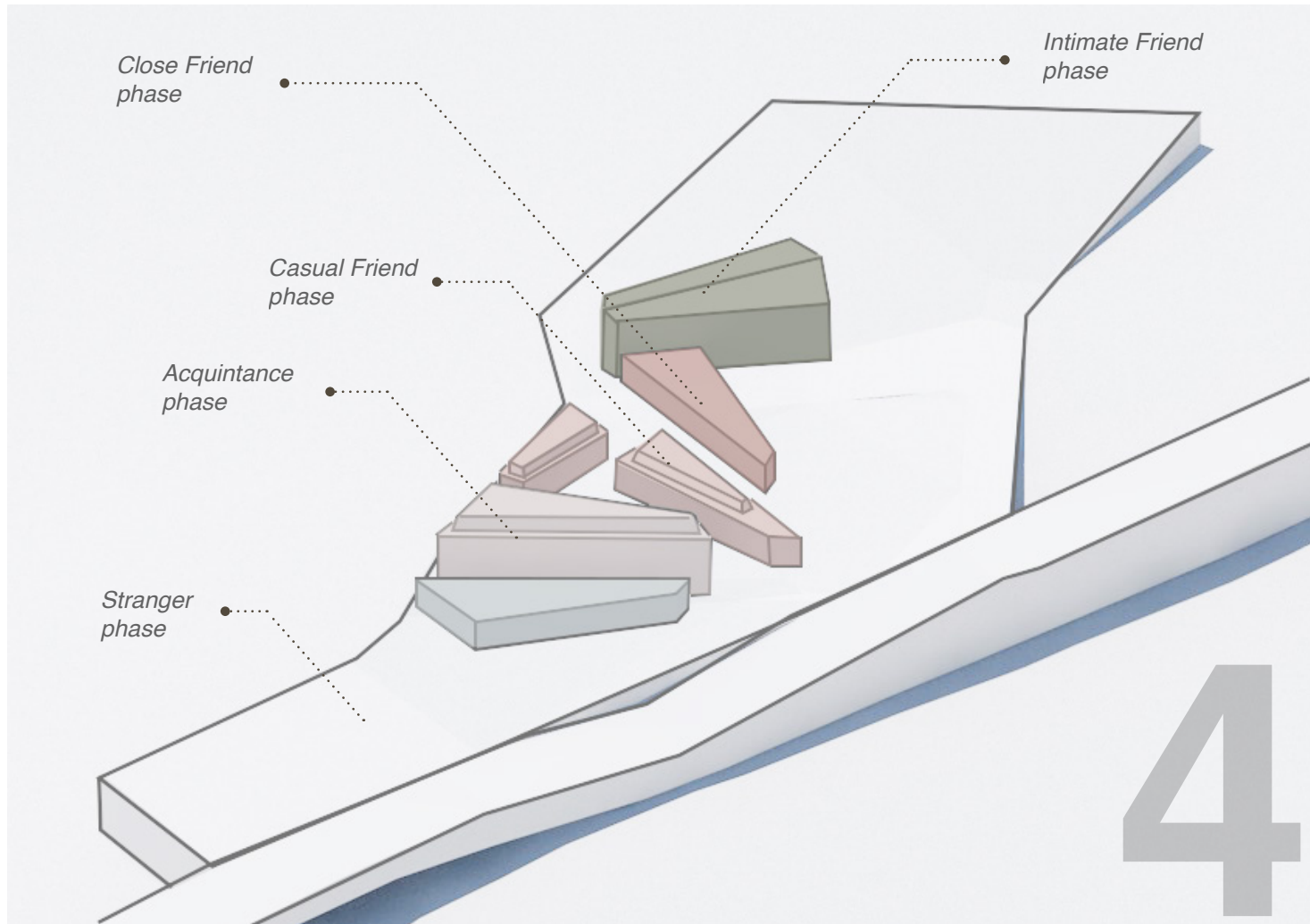
Two triangular mass insisted to represent the progress of closeness to openness. These form shape was taken from the site outline direction. It will continue to create the circulation of the visitors adapted to the mass



TRAPEZOID PATTERN

The two mass then divided into several masses that defining several spaces based on the concept as visitor experience. This phase also include consideration of climatic response where the orientation of wind are welcomed by every mass, and maximizing natural lighting by make adequate opening on required space.

Trapezoid pattern was made following the site outline to implement generative design based on transformable building pirinciple.



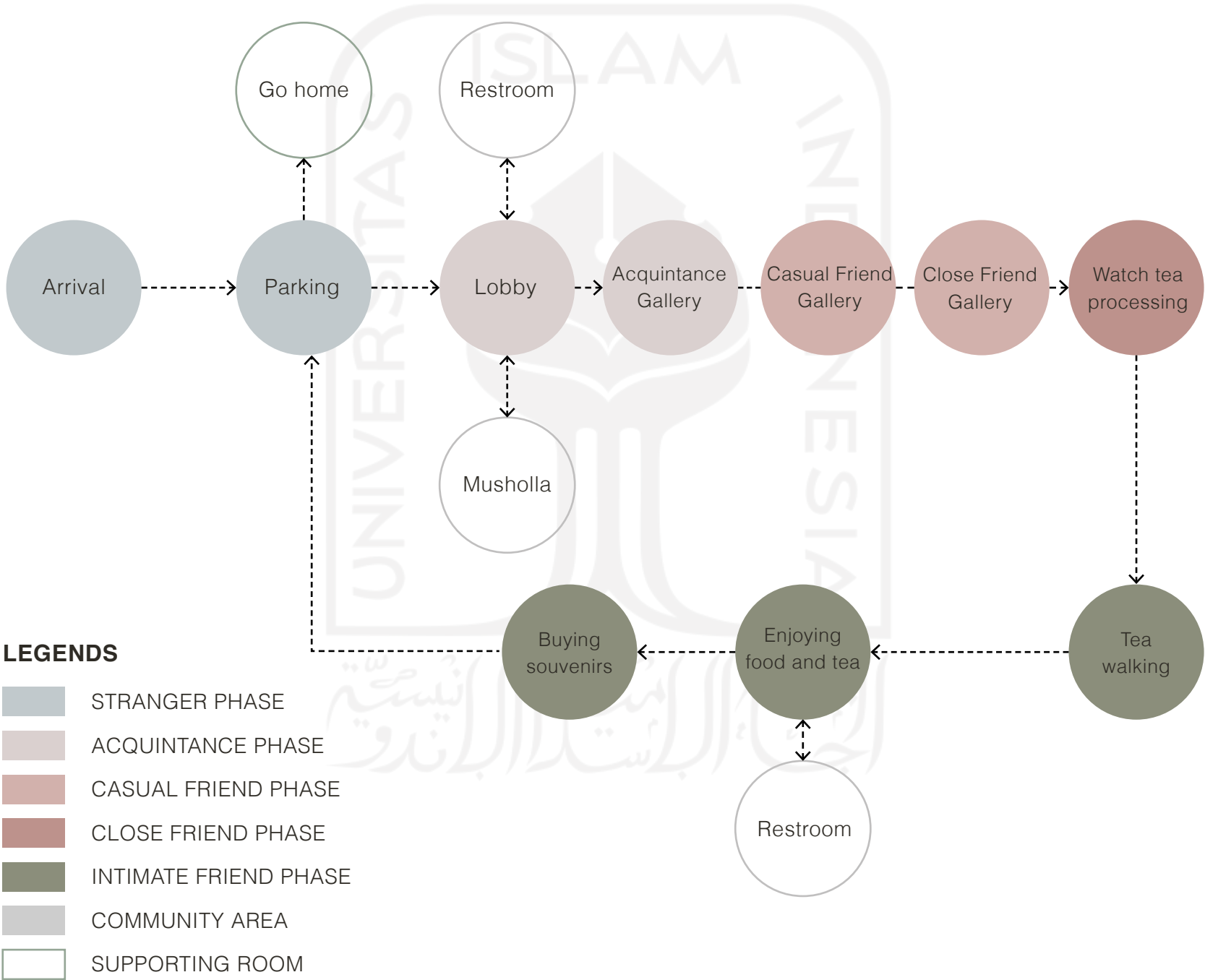
FINAL FORM

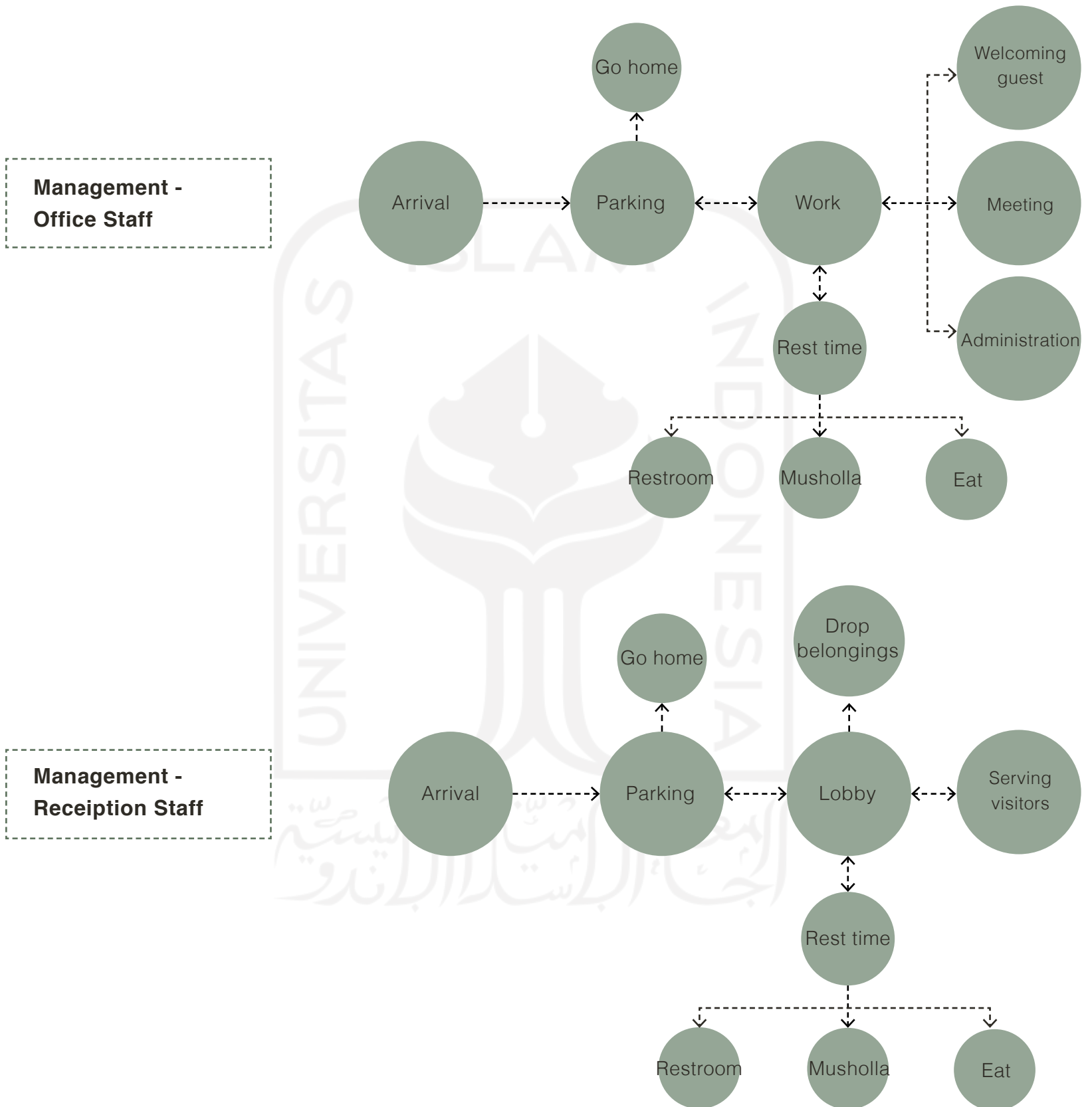
The roof for several building adapted to be inline with the concept.

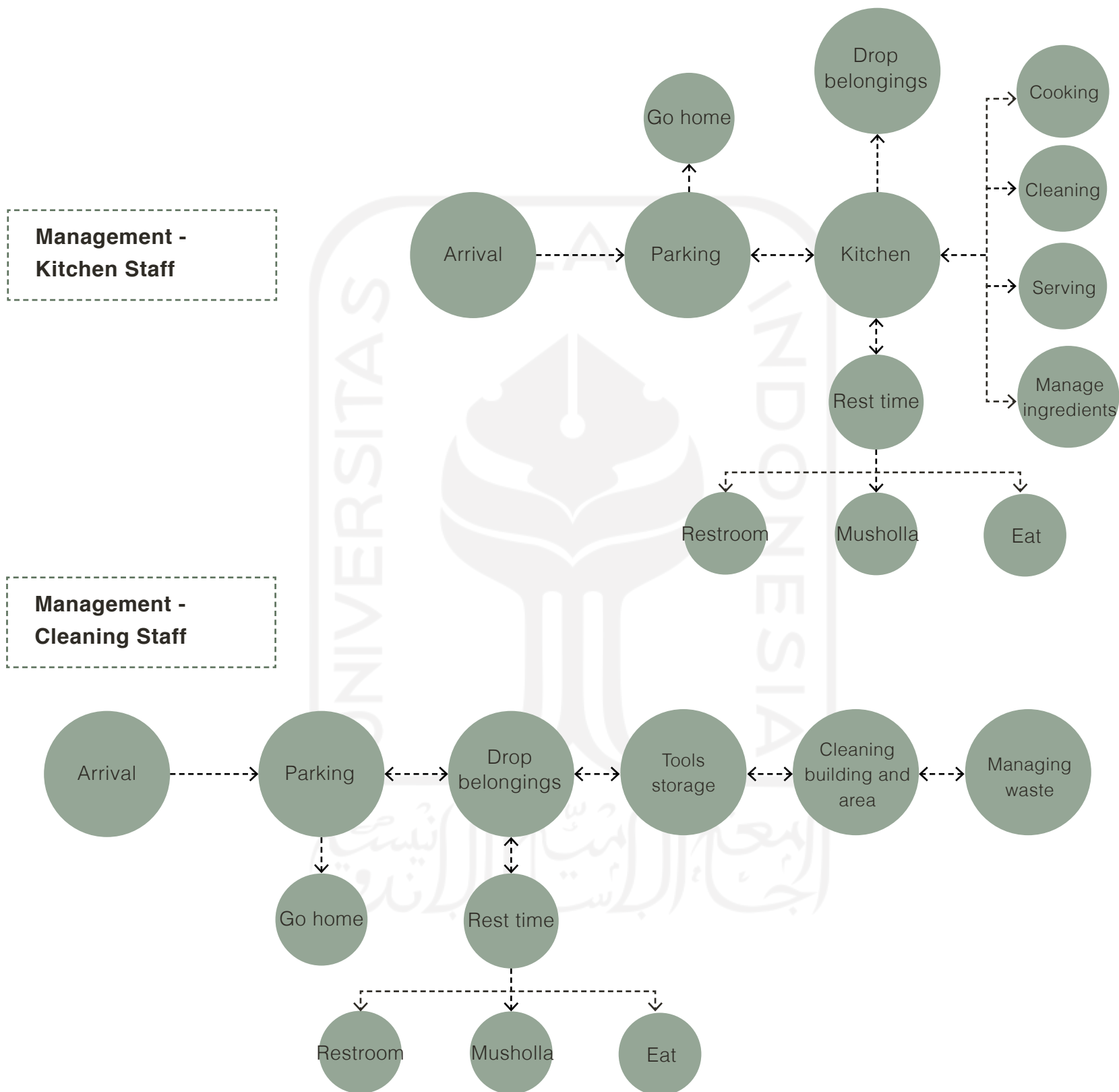
The final form will consist of several pavillion/building that are representing each phases of friendship between visitors and tea. Starting from strangers that start from lowest elevation and become intimate friends at the final step in the highest elevation

ACTIVITIES FLOW ANALYSIS

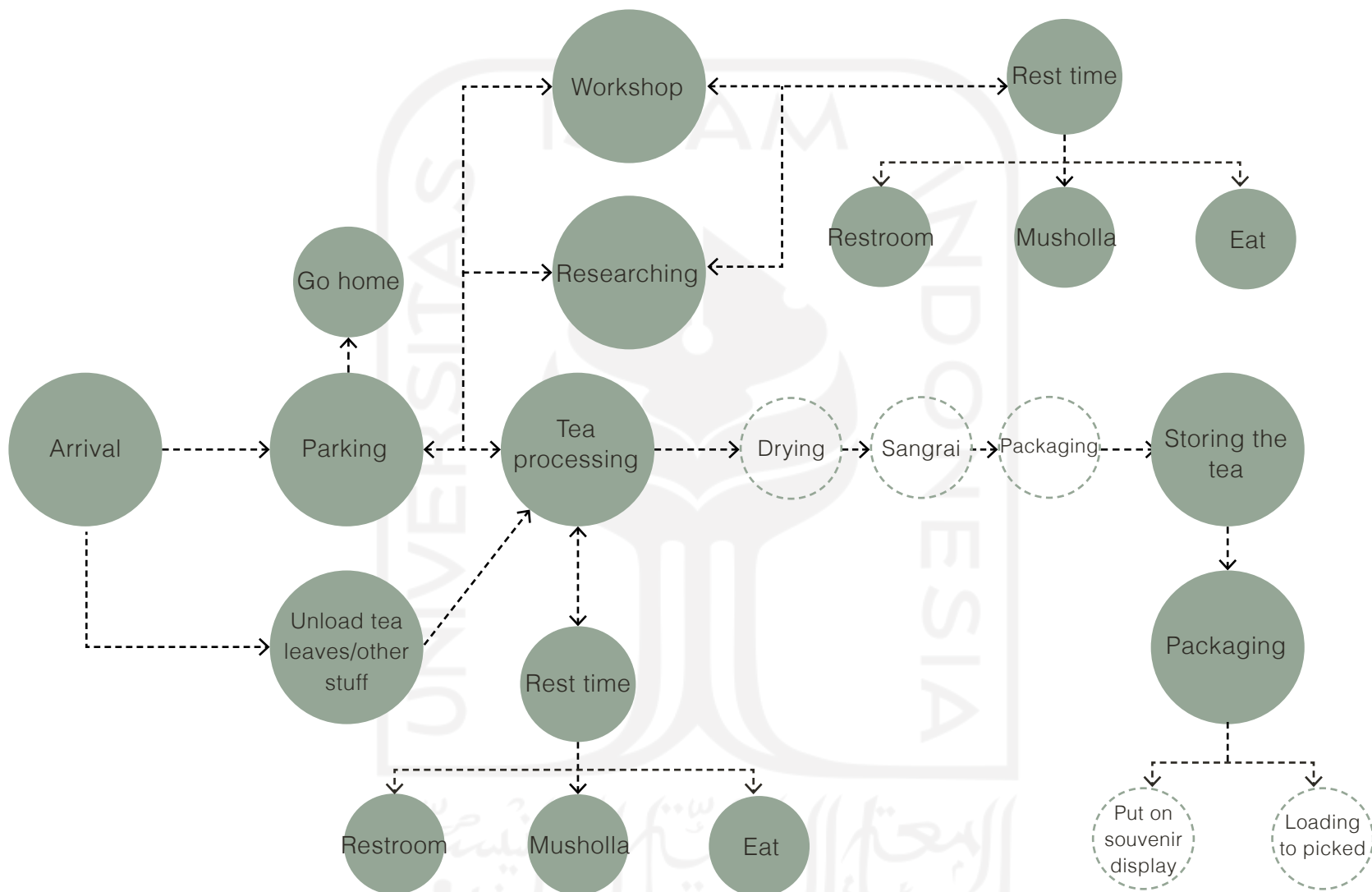
Visitors







Community



SPACE ANALYSIS

Information

Activities	Character	Spesific functions	Accomodation
Understanding brief information about the site	Public, open greeting	Giving information and education about tea and the existing site	Information centre/Lobby

Education

Activities	Character	Spesific functions	Accomodation
Observing/ collecting information	Interactive, slow movement, inclusive	Giving information and education about tea and the existing site	Gallery, audio visual room
Research	Private, serious	Research activities (observation, Studying	Laboratory
Workshop	Conductive, semi-private	Discussion, presentation, group activities	Workshop room
Watch tea processing	Open, transparant	Educate the visitors about how the tea will be made	Observation deck

Acessibility

Activities	Character	Spesific functions	Accomodation
Selling/buying local goods (including local tea)	Public, open, interesting, inclusive	Displaying local goods to the visitors	Souvenir shop
Selling/buying food and baverages (including local tea)	Public, open, interesting, inclusive, comfortable	Eating, tea experience	Tea house & Cafeteria
Tea walking	Open, pict-worthy, interesting	Walking around the tea garden, appreciate tea farmers	Walking deck

Tea Community Area

Activities	Character	Spesific functions	Accomodation
Tea processing	Wide, could be displayed to the visitors	Drying, sangrai	Processing centre
Sharing/Presentation	Open, inclusive	Sharing knowledge to the specific visitors	Workshop room

Management and Community Services

Activities	Character	Spesific functions	Accomodation
Cleaning	Private	Storing cleaning appliances	Cleaning storage
Cooking	Private	Preparation, frying, grill, washing	Kitchen
Working	Private	Office work, meeting, greeting guest	Office, meeting room, guest room
Drop belongings	Private	Dropping belongings before going to work	Locker room

Visitor Service

Activities	Character	Spesific functions	Accomodation
Doing biological business	Private, clean, comfortable	Complete biological business	Toilet (rest room)
Praying	Private, clean, comfortable	Praying (sholat)	Musholla, ablution area

ANALYSIS

PROPERTY SIZE

Function	Space	Standard	Capac-ity	Quantity	Total Area (sqm)
Information Area	Information Centre/Lobby	1.5 sqm/person	2	1	3
	Office	2 sqm/person	8		16
	Locker Room	12 sqm			12
	Janitor	6 sqm		1	6
	Total				37
	Circulation (40%)				51,8

6,84%

of entire building

Function	Space	Standard	Capac-ity	Quantity	Total Area (sqm)
Education	Gallery	2 sqm/person	75	1	150
	Laboratory	1.5 sqm/person	10	1	15
	Workshop room	1.5 sqm/person	15	1	22.5
	Observation deck	1.5 sqm/person	15	1	22.5
	Total				210
	Circulation (40%)				294

38,80%

of entire building

Function	Space	Standard	Capacity	Quantity	Total Area (sqm)
Accessibility	Souvenir Shop	2 sqm/person	10	1	20
	Tea House and cafeteria	3 sqm/person	20	1	60
	Kitchen	16 sqm		1	16
	Storage	6 sqm		1	6
	Total				102
	Circulation (40%)				142,8

18,85%

of entire building

Function	Space	Standard	Capacity	Quantity	Total Area (sqm)
Tea Community Area	Processing Centre	50 sqm (existing)		1	50

6,50%

of entire building

Function	Space	Standard	Capacity	Quantity	Total Area (sqm)
Parking	Car parking	12.5 sqm	10		125
	Motorcycle parking	1.5 sqm	30		45
	Total				170
	Circulation (30%)				221

29,00%

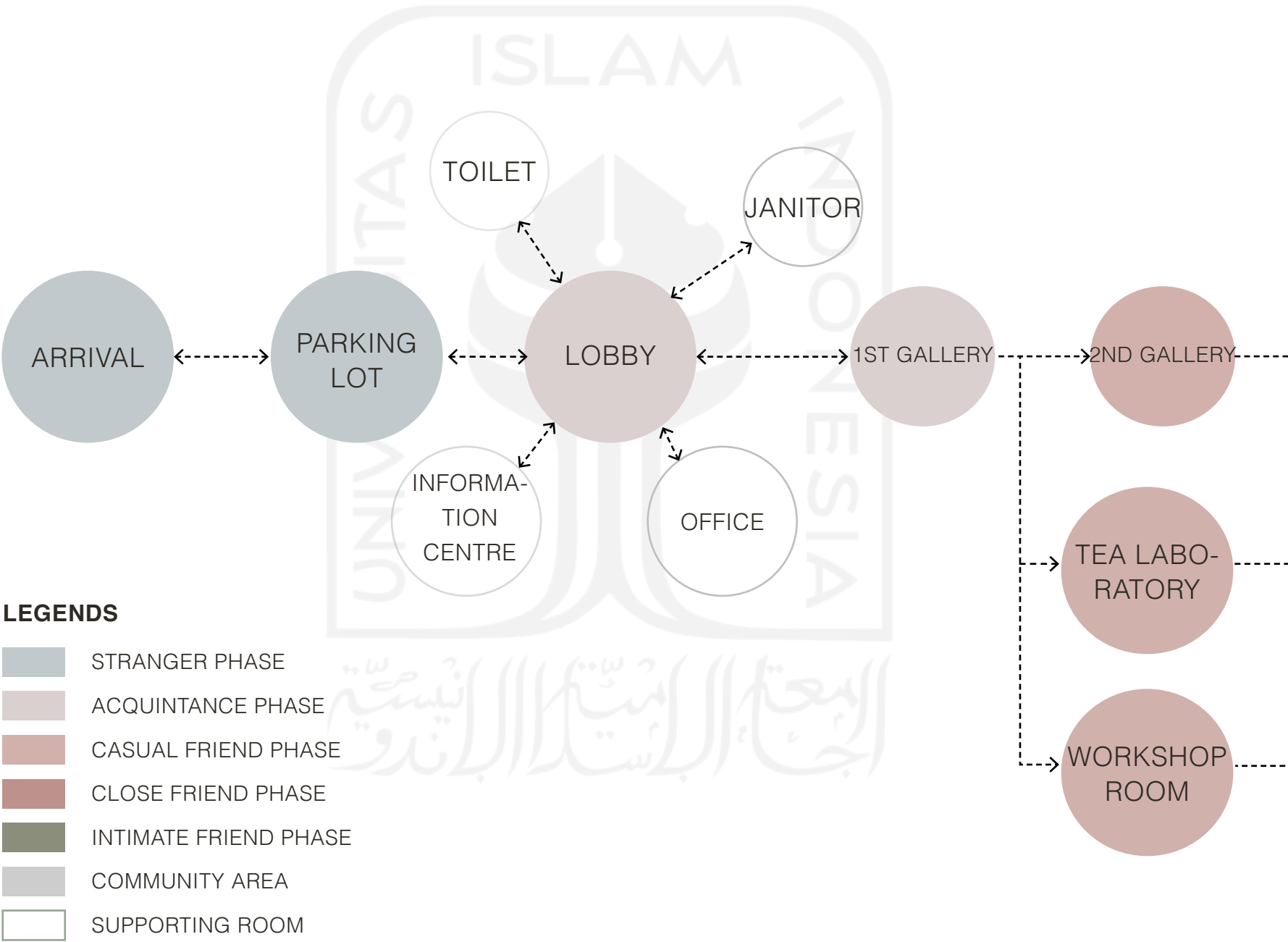
of entire building

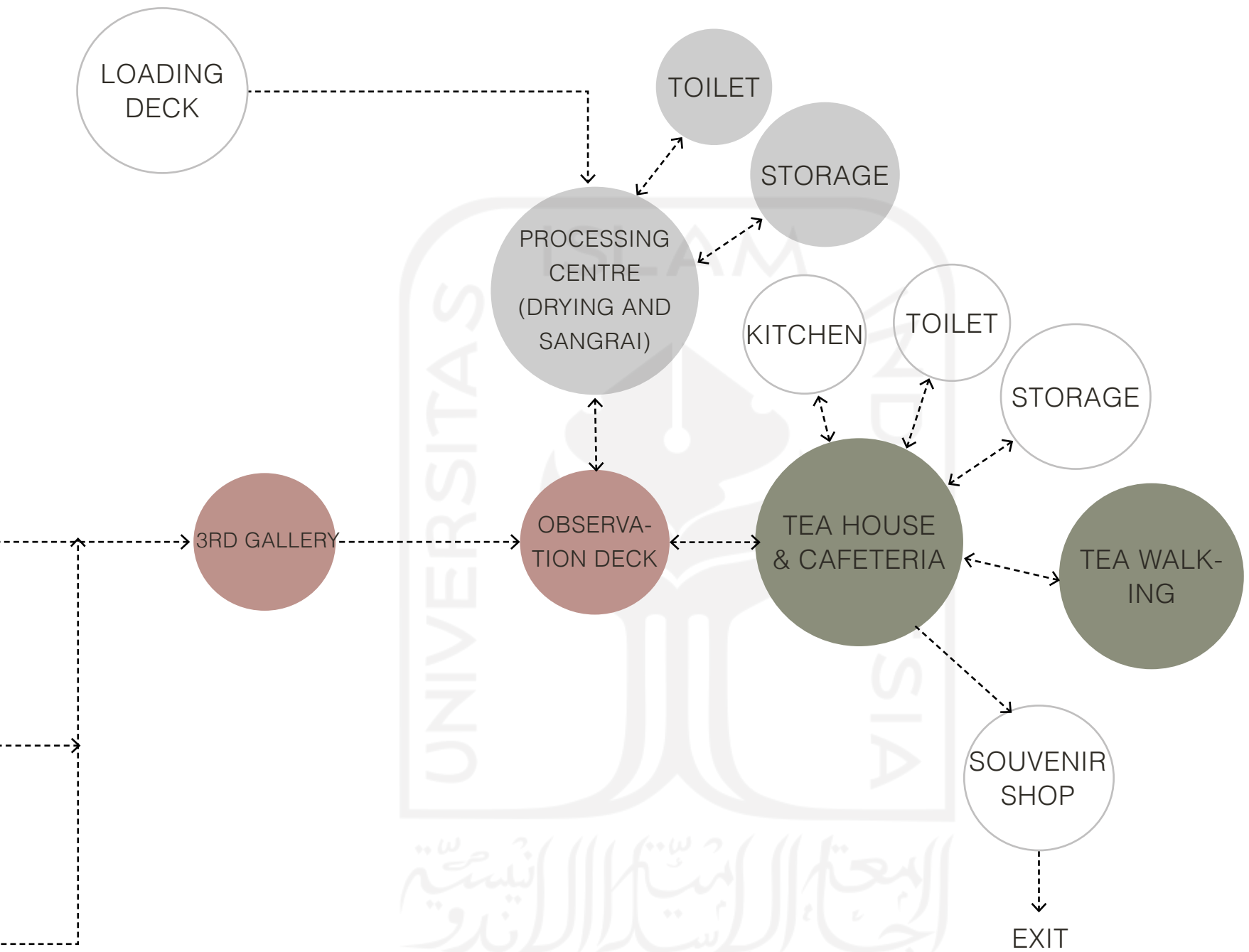
Function	Space	Standard	Capac- ity	Quantity	Total Area (sqm)
Service	Toilet	1.5 sqm/person	4	3	18
	Musholla	1.5 sqm/person	8	1	12
	Ablution	1 sqm/person	2	2	4
	Security	1.5 sqm/person	2	1	3
	Ticketing	1.5 sqm/person	2	1	3
	Total				40
	Circulation (20%)				48

6,30%
of entire
building

100%
757,6 SQM
Total area

SPACE PROGRAMMING





ANALYSIS

SPATIAL PLACEMENT ANALYSIS



TRANSFORMABLE BUILDING AND ECOLOGICAL MATERIAL ANALYSIS

Frame



Frame & infill



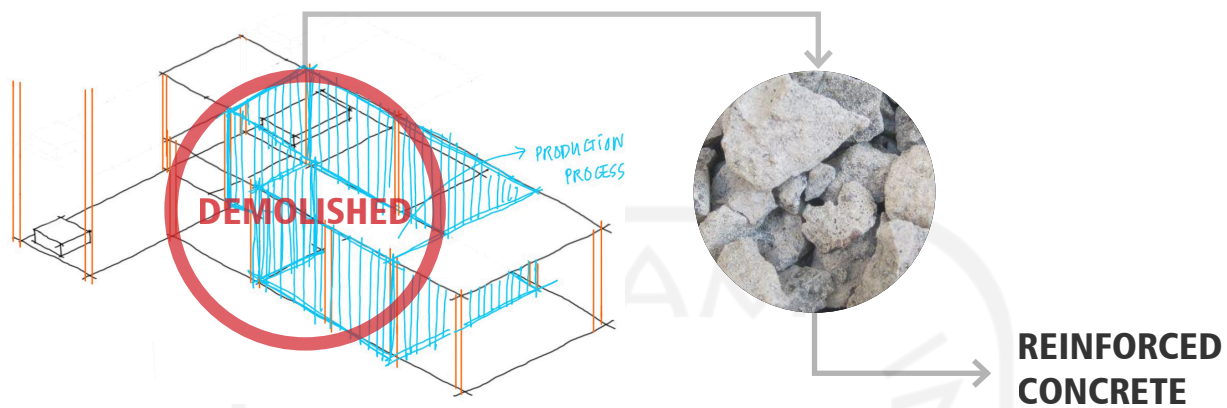
Base-building Type

- Permanent load bearing structure
- Additional core/bracing are indispensable
- Mostly applied in highrise building (but still applicabel in lowrise)
- Durability in material
- Versatile floor plan with transformable infill
- Skin and technical services are demountable and compatible system

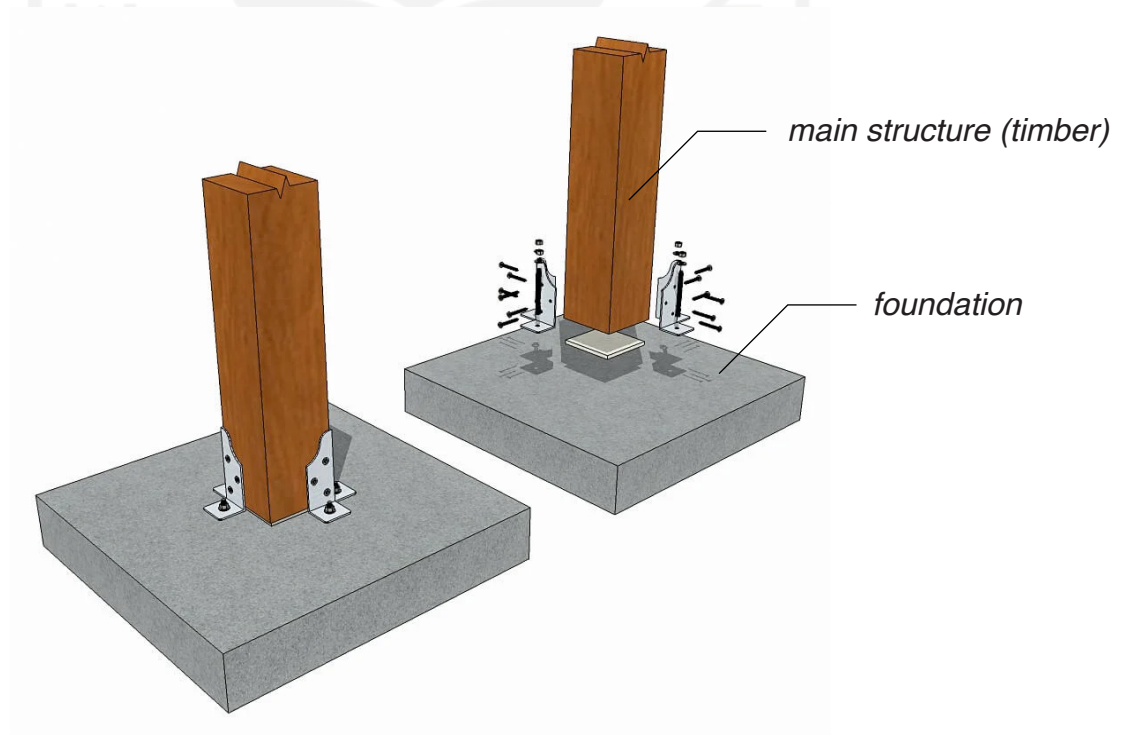
<https://timberframehq.com/tag/post-base/>



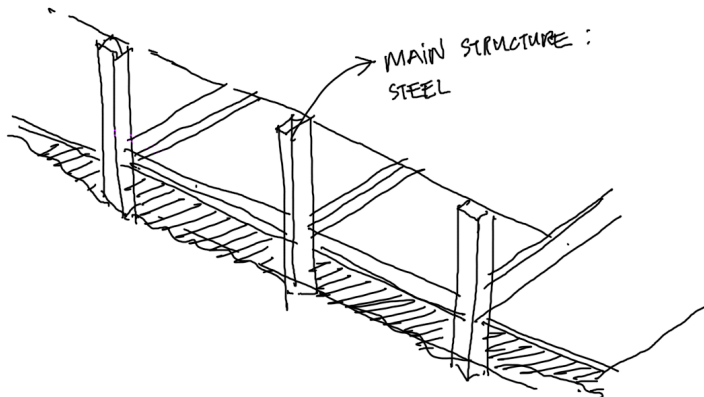
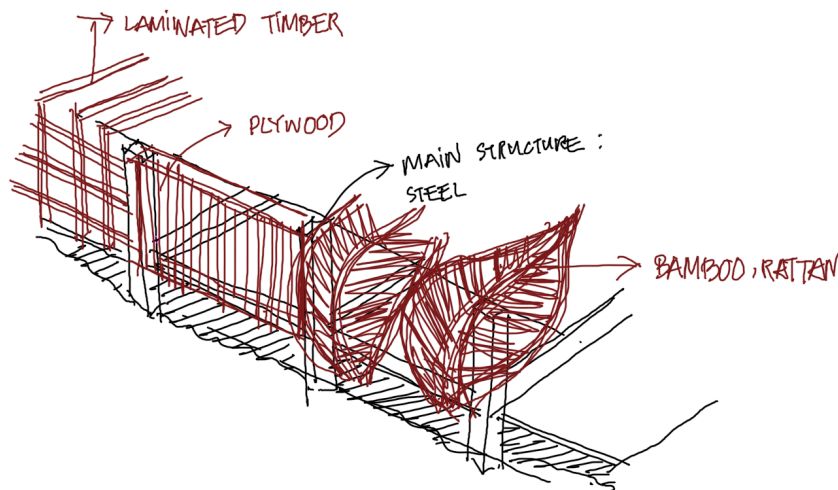
Base-building Type	Ecological Material
<ul style="list-style-type: none">• Permanent load bearing structure (durable material for structure)• Skin and technical services are demountable and compatible system	Lightweight materials
	Organic materiiaals



Meanwhile, the existing building, processing centre would be demolished and recycled to become an aggregate that will be mixed to the concrete for building foundation.



TRANSFORMABLE BUILDING ANALYSIS



the idea of square module for each space

Basic shape were chosen to be explored in order to make the dimension in more simple way

- The permanent structure use steel material to fulfill the durability function for the structure. Steel material able to be reuse/recycle. Meanwhile oncrete will consume more carbon footprint.
- The skin using organic material (light, aesthetic, flexible, bio-degradable). The material also easier to be applied for modular component for demountable function.

ANALYSIS

ECOLOGICAL MATERIAL ANALYSIS IN LIGHTWEIGHT MATERIAL

Based on the three regulations applied in Indonesia that outlined on the table above, we can understand that the point of ecological material on each stage are:

- 1. Pre-Building : Using local material and eco-label material
- 2. Building Operation : Using non-ozone-depletion material
- 3. Post Building : Able to be reused or recycled

From the conclusions of the literature above, the next step is to analyze what ecological materials will be used in the building.

BUILDING MATERIALS	APPLICATION	MATERIAL BUILDING LIFE CYCLE		
		PRE-BUILDING	BUILDING OPERA-TION	POST-BUILDING
Laminated timber	Structure	<ul style="list-style-type: none">Produced less than 1000 km* away from site (Sampoerna Kayu)	<ul style="list-style-type: none">Easy to be constructed (prefab)	<ul style="list-style-type: none">DecomposedRe-used
Stone	Wall	<ul style="list-style-type: none">Produced less than 1000 km* away from site	<ul style="list-style-type: none">Common construction technique in IndonesiaEasy maintenanceLong lifetime	<ul style="list-style-type: none">Could be reuseGrinded into cement
Roof shingles	Roof cover	<ul style="list-style-type: none">Produced less than 1000 km* away from siteRe-use	<ul style="list-style-type: none">Long lifetimeEasy maintenance	<ul style="list-style-type: none">DecomposedRe-used

BUILDING MATERIALS	APPLICATION	MATERIAL BUILDING LIFE CYCLE		
		PRE-BUILDING	BUILDING OPERATION	POST-BUILDING
Woven bamboo	Building skin	<ul style="list-style-type: none"> Produced less than 1000 km away from site* 	<ul style="list-style-type: none"> Long lifetime Medium maintenance 	<ul style="list-style-type: none"> Decomposed Burned and the ashes are reabsorbed by plant roots
Glugu wood	Openings, roof structure	<ul style="list-style-type: none"> Produced less than 1000 km away from site* 	<ul style="list-style-type: none"> Long lifetime Medium maintenance 	<ul style="list-style-type: none"> Decomposed Re-used
Paving block	Hardscape	<ul style="list-style-type: none"> Produced less than 1000 km away from site* 	<ul style="list-style-type: none"> Long lifetime Low maintenance 	
Glass	Opening	<ul style="list-style-type: none"> Produced less than 1000 km away from site* 	<ul style="list-style-type: none"> Long lifetime Low maintenance 	<ul style="list-style-type: none"> Melted into new glass Re-used
Concrete	Foundation	<ul style="list-style-type: none"> Produced less than 1000 km away from site* 	<ul style="list-style-type: none"> Took a quite of time to complete the foundation structure (unlike prefab) Long lifetime Low maintenance 	<ul style="list-style-type: none"> Crushed and made into a mixture
Timber slab	Slab	<ul style="list-style-type: none"> Produced less than 1000 km away from site* 	<ul style="list-style-type: none"> Easy application Long lifetime 	<ul style="list-style-type: none"> Decomposed Re-used

* Based on GBCI parameters on local materials

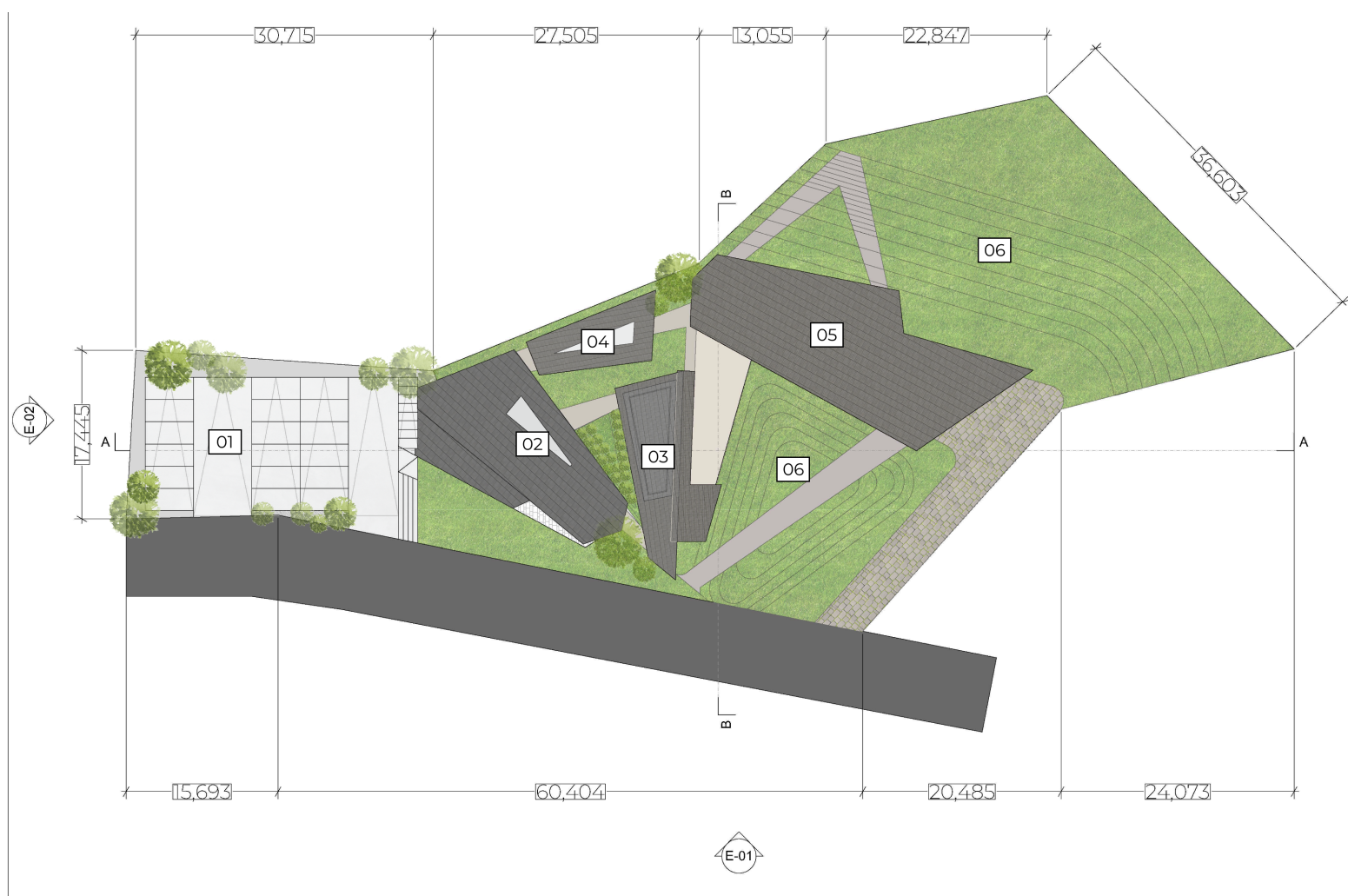
04

SCHEMATIC DESIGN

Concept & Schematic Design of Site
Concept & Schematic Design of Building
Concept & Schematic Design of Structural System
Concept & Schematic Design of Facade
Concept & Schematic Design of Interior
Concept & Schematic Design of Water Utility System
Concept & Schematic Design of Barrier-Free Access
Concept & Schematic Design of Evacuation Access
Visualisation

DESIGN DEVELOPMENT

SITE PLAN



LEGENDS

- | | |
|---|--|
| 1. Parking Lot | 4. Workshop |
| 2. Front Building
(Lobby, Office, 1st Gallery) | 5. Back Building
(3rd Gallery, Observation Deck,
Processing Centre, Tea House) |
| 3. 2nd Gallery | 6. Tea Garden |

The building was consist of 4 main buildings namely the front building, workshop pavillion, 2nd Gallery pavillion, and processing centre building (back building). The arrangement of the building was following the concept--the story of friendship as well as the circulation of the visitors to experience the whole story of tea.

3rd FLOOR

Tea House
Tea Walking
Toilet

2nd FLOOR

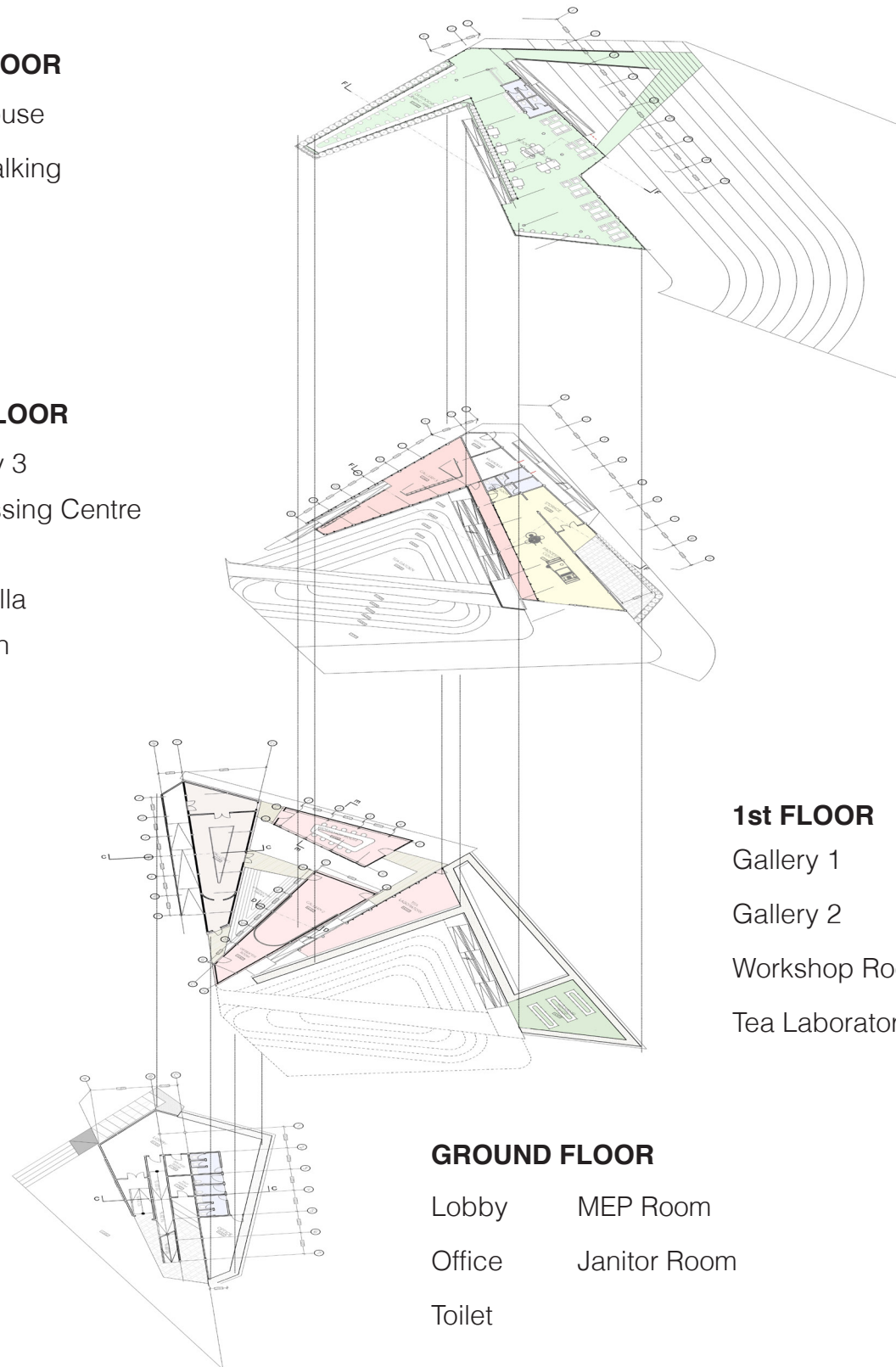
Gallery 3
Processing Centre
Toilet
Musholla
Kitchen

1st FLOOR

Gallery 1
Gallery 2
Workshop Room
Tea Laboratory

GROUND FLOOR

Lobby MEP Room
Office Janitor Room
Toilet

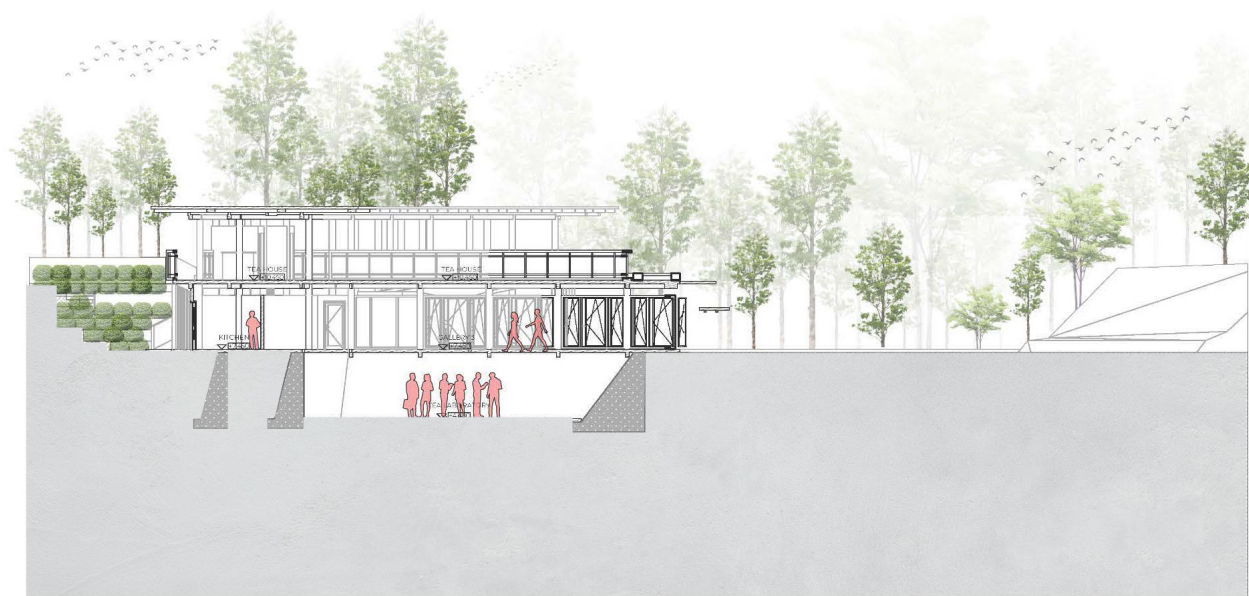


DESIGN DEVELOPMENT
ELEVATION



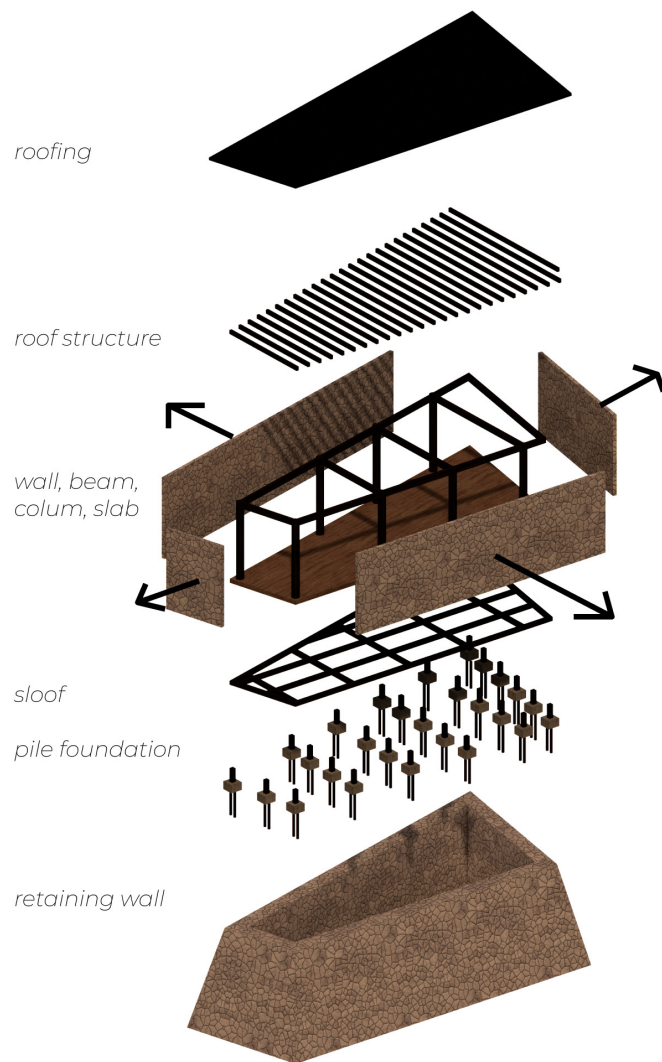
DESIGN DEVELOPMENT

SECTION



TRANSFORMABLE BUILDING STRUCTURE

APPROACH APPLICATION



An ecological approach that encourages the use of a semi-permanent structural system so that it can be dismantled. This minimizes damage to the site until one day the building is no longer functioning.

In the building there are 2 main types of construction that can be seen from the foundation, which mainly uses a wooden pile foundation so that it does not permanently damage the site.

While the second is the use of a retaining wall as well as a foundation because it utilizes a retaining wall that holds soil in some parts of the site.

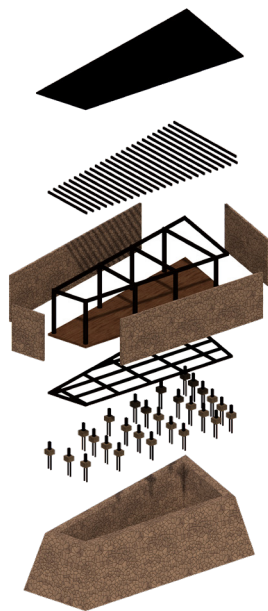
These two foundation did not applied fully on each pavillion, but several building rather use mixed foundation--half pile foundation, half retaining wall (especially at the processiong centre building)

Yet the main foundation will be still the pile foundation that applied on the most of the building

The generative dimension pricipal implemented bymaking the 'trapezoid' pattern in all building that following the edges of the site. The pattern makes the structure to be generative and adaptable on site wether to be extended or reduce.

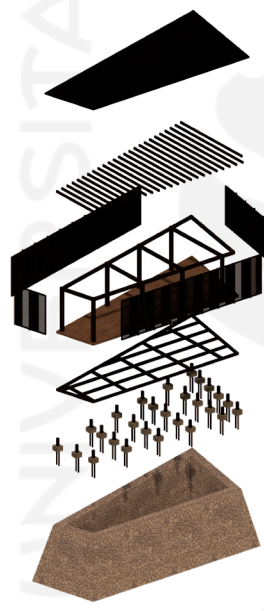
ECOLOGICAL STRUCTURE AND MATERIAL x STORY OF FRIENDSHIP IN BUILDING FACADE SCENARIO

Each phase of friendship represented in different building envelope that goes lighter in mass as they go to intimate phase.



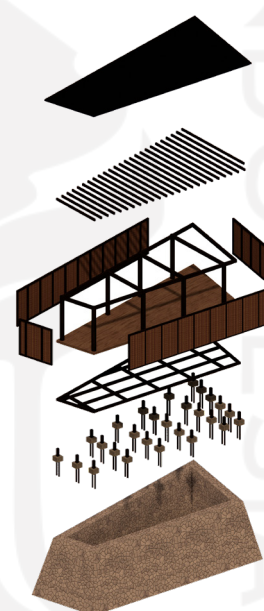
AQUAINTANCE

Represented through solid stone wall materials



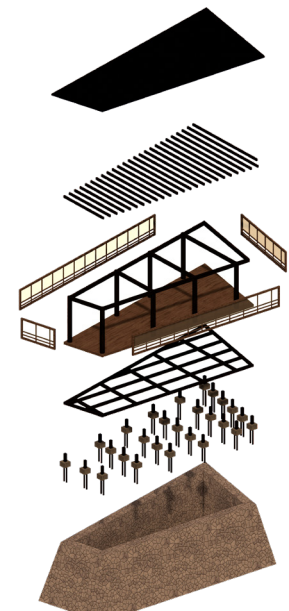
CASUAL FRIEND

Represented through voided timber



CLOSE FRIEND

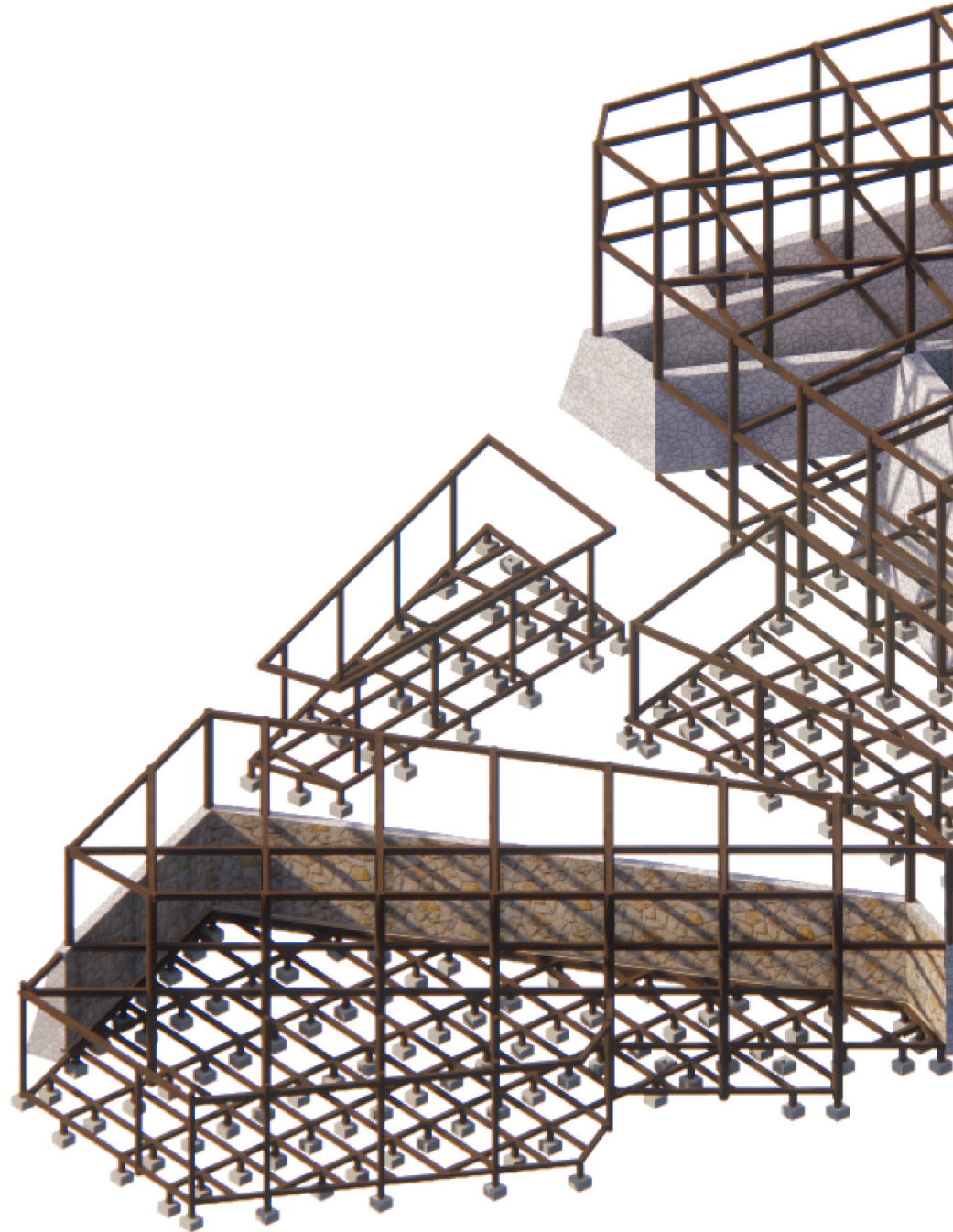
Represented through woven bamboo panel

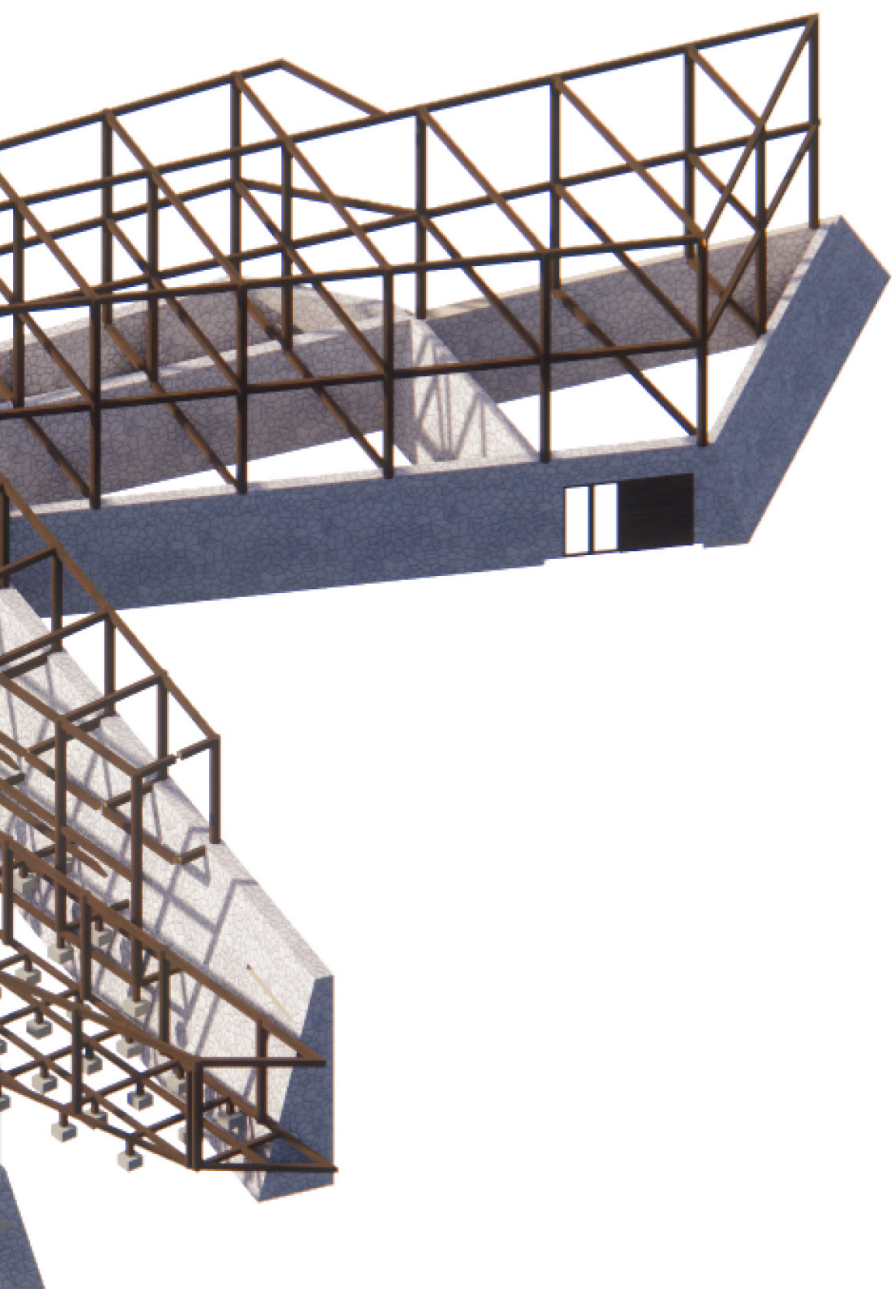


INTIMATE FRIEND

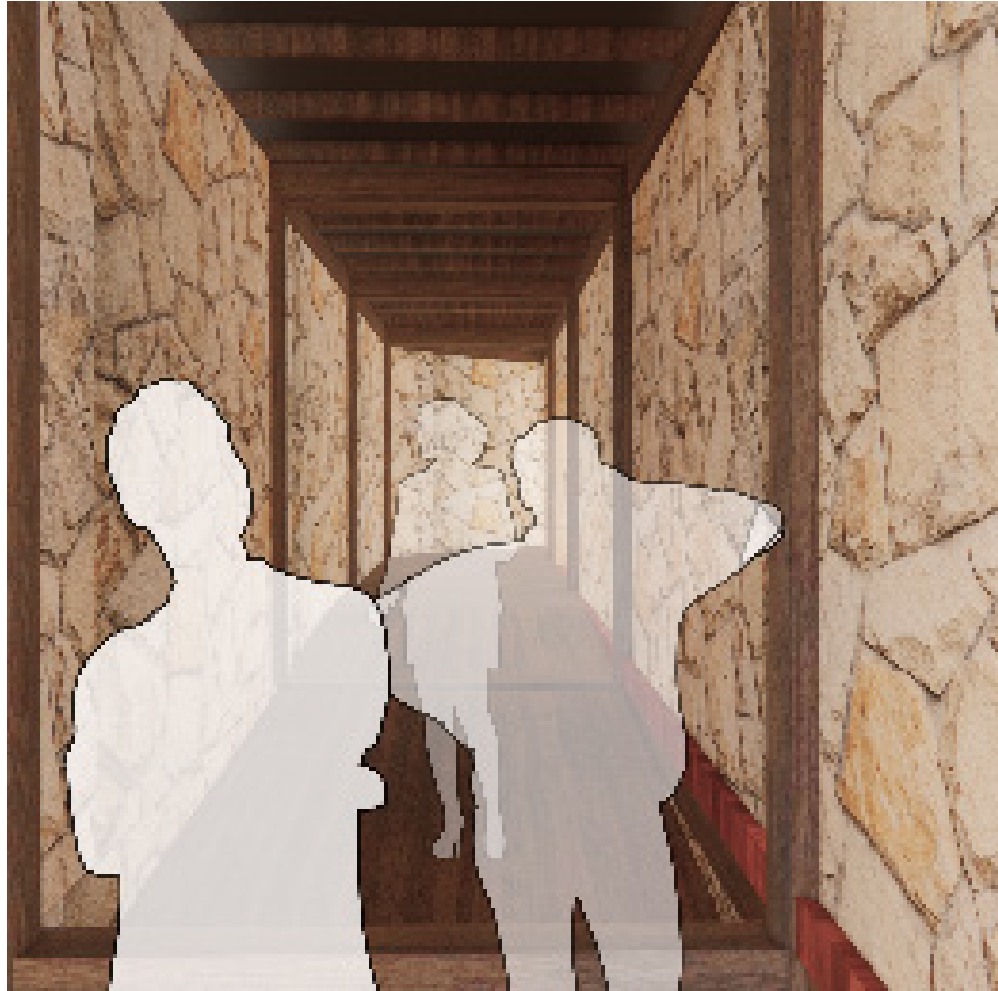
Represented through imber-glass railing

TRANSFORMABLE BUILDING STRUCTURE APPROACH APPLICATION



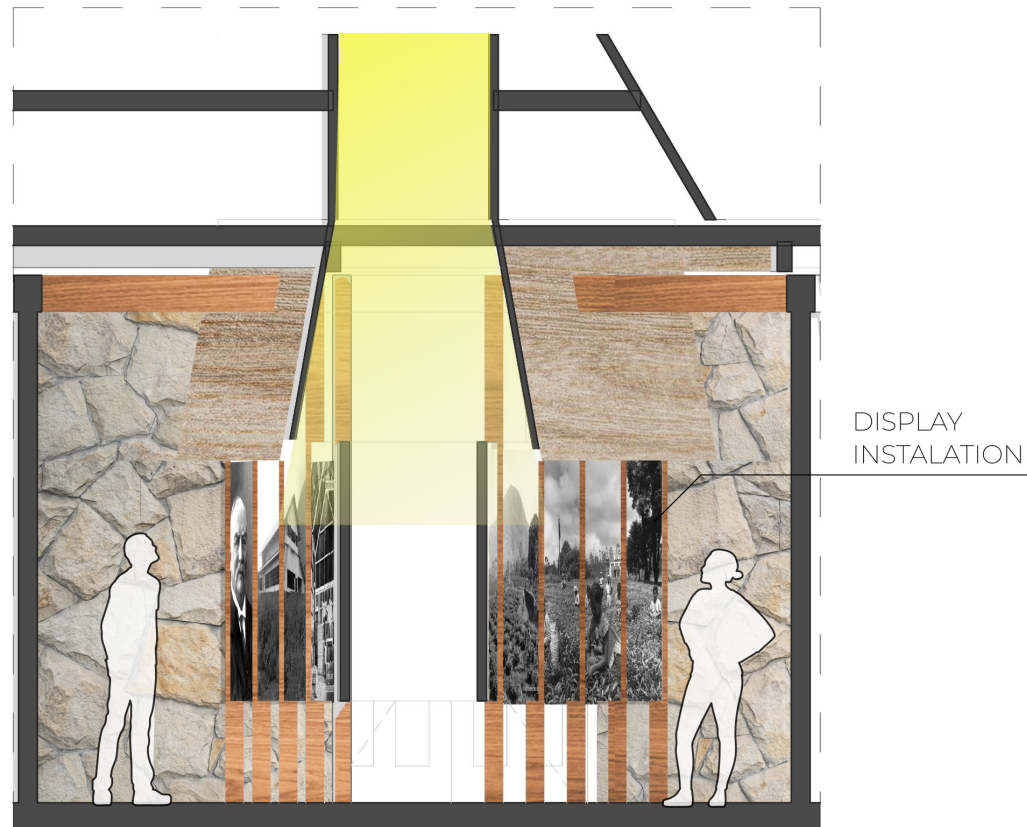


STRANGER PHASE : ENTRANCE



The massive preception was made through the early phase of the building by using stone cladding materials to represent the awkwardness between visitors and tea itself

AQUINTANCE PHASE : 1ST GALLERY



In this gallery will be showing the story of tea from the beginning to the visitors, which is the story of tea in Indonesia by display story that lighten by the lighting that only focused on the display.

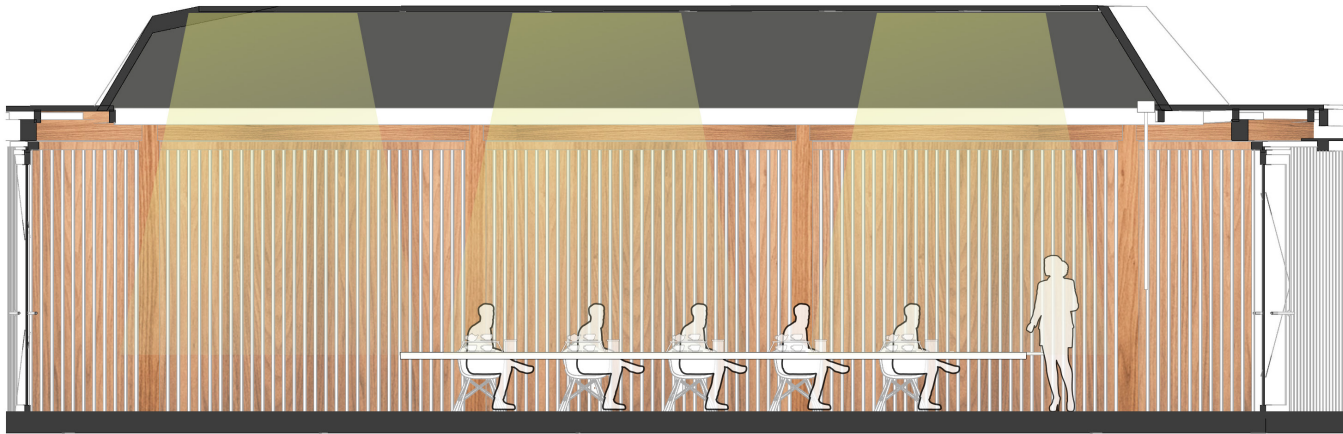
CASUAL FRIEND PHASE : GALLERY 2



In this audio-visual room, visitors would be able to experience closer to the regional cultural context of tea culture in Yogyakarta that is known as Patehan Culture. Through the screen that surrounds the room, it will offer the real experience of Patehan Culture.

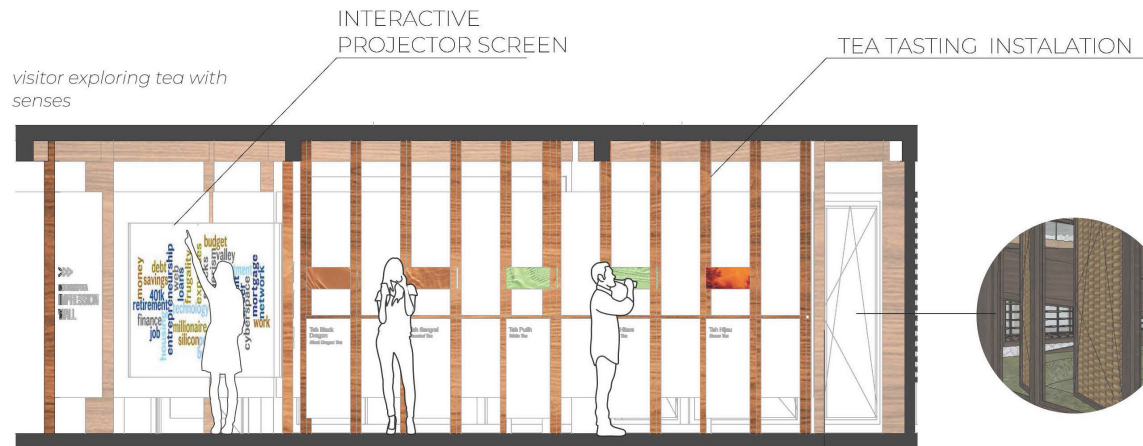
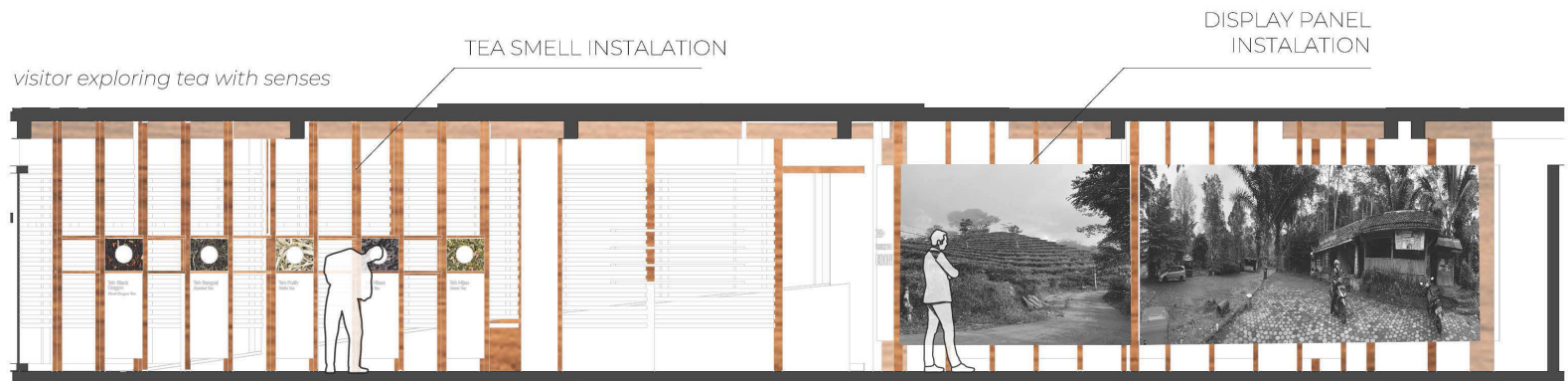
The envelope of this phase is using a void timber panel that represents the progress of lightness from becoming strangers and acquaintances. The location of regionality is also implemented in this Gallery and is represented also on its roof.

CASUAL FRIEND PHASE : WORKSHOP ROOM



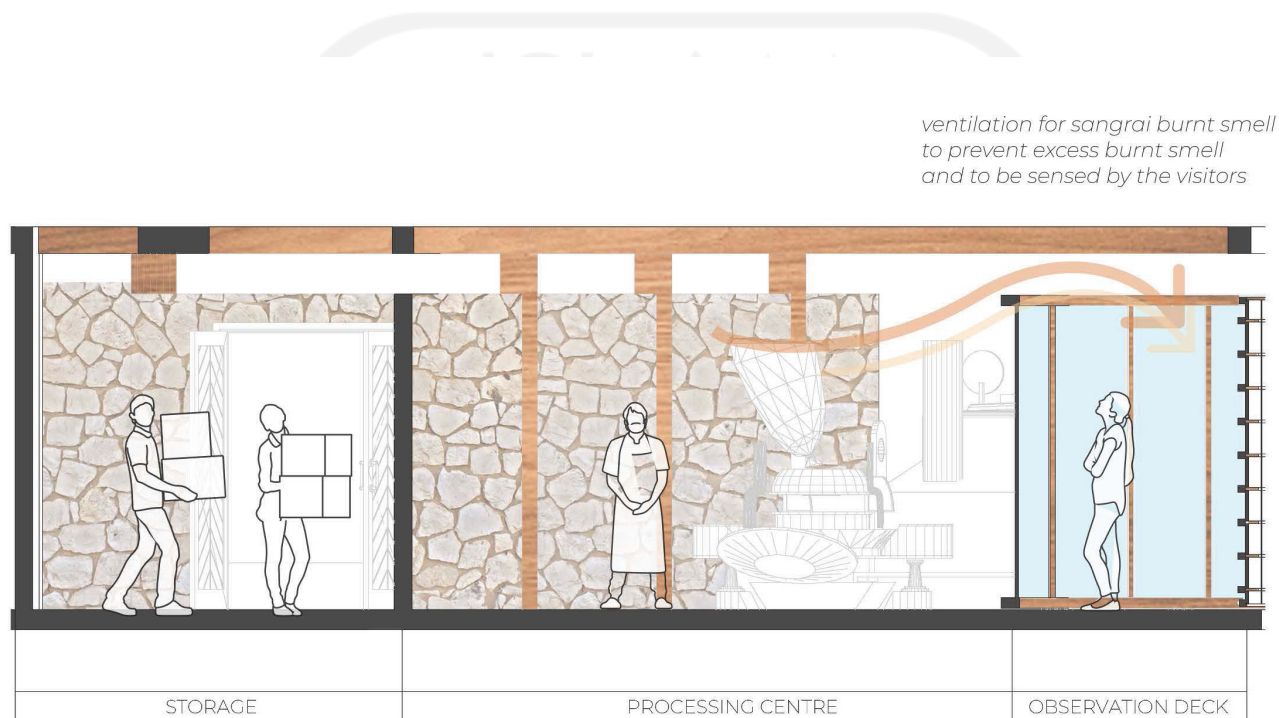
Workshop room as a place where visitors/community would share any knowledge about tea. It could become place for sharing but also could be as place to learn/practicing to drink tea for the visitors. The envelope also use the same panel with Gallery 2, as it is the same phase. The natural lighting to support the activity in the whole room with the roof that also mimicking the regionality in this phase.

CLOSE FRIEND PHASE : 3RD GALLERY



As final gallery that represent close friend, in this space, visitors would be able to explore and get to know the tea with their senses

CLOSE FRIEND PHASE : OBSERVATION DECK



Visitor gain emotional connection through knowing the background how the tea was made directly from the start through observation deck that give access to see the process how tea made directly in processing centre. They also could smell the roasted tea as Nglinggo signature tea.

CLOSE FRIEND PHASE : TEA HOUSE AND TEA WALKING

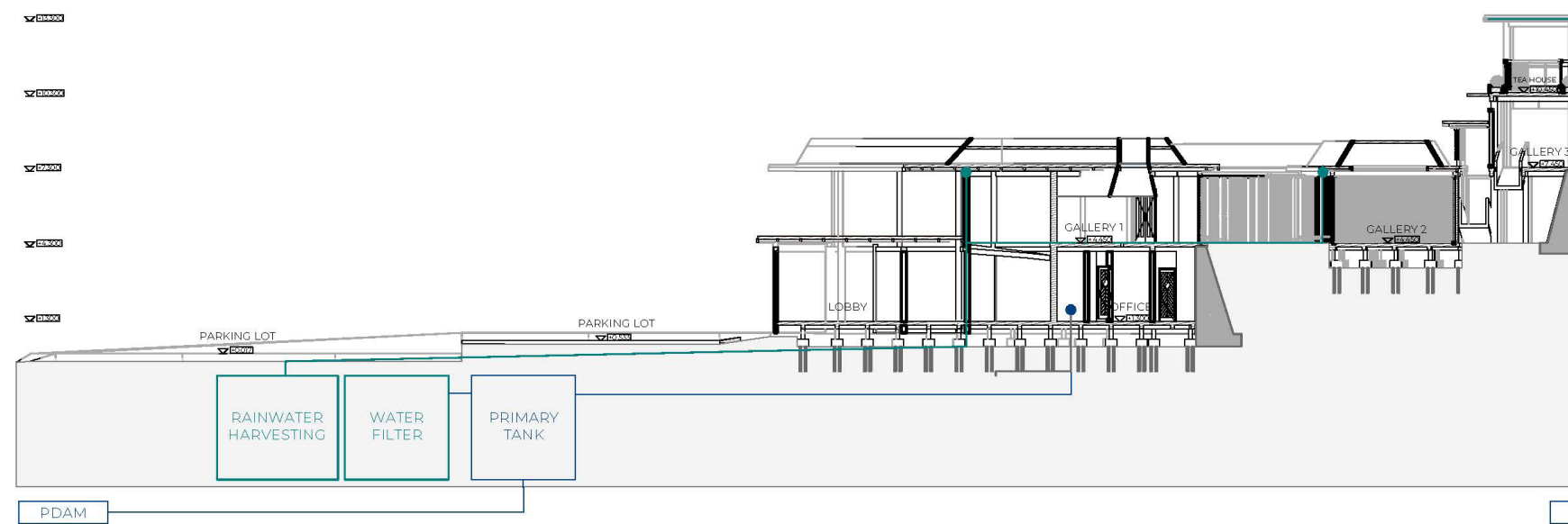


Enjoying the tea thoroughly side by side with the tea garden with minimum barrier to each others. The visitors also could access the tea garden from the tea house through tea walking, so intimate phase could reach the closer connection between the visitors and tea itself.



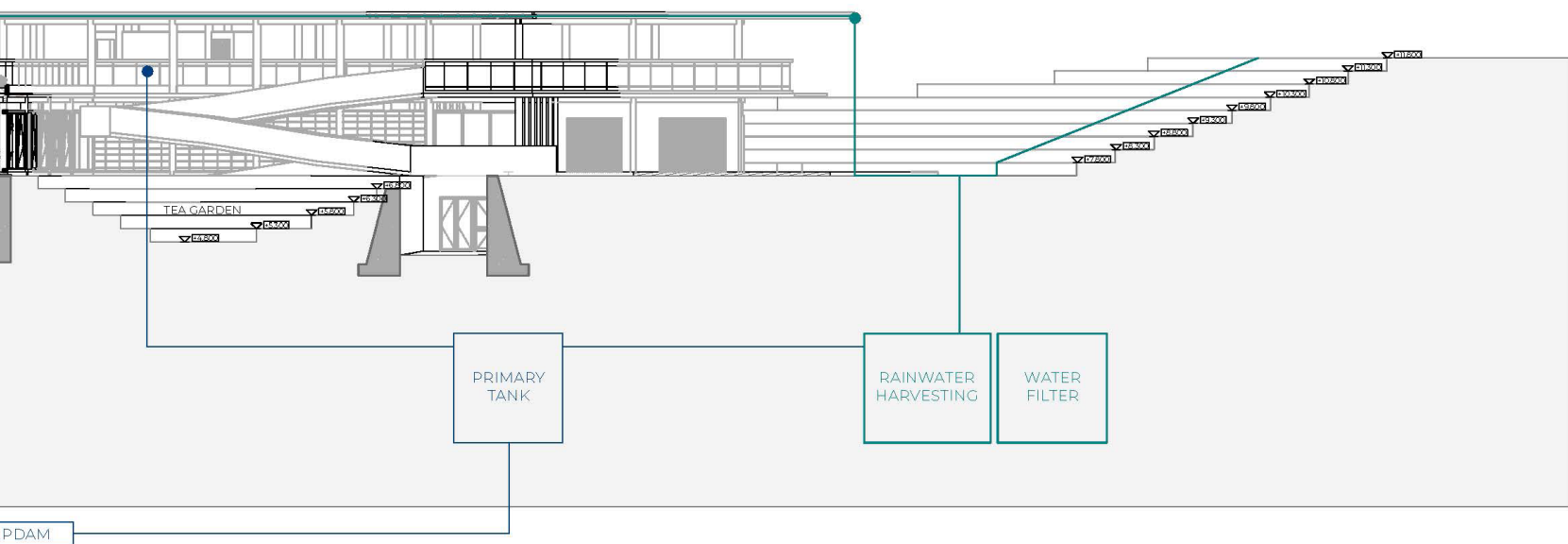
DESIGN DEVELOPMENT

WATER DISTRIBUTION SCHEME



LEGENDS

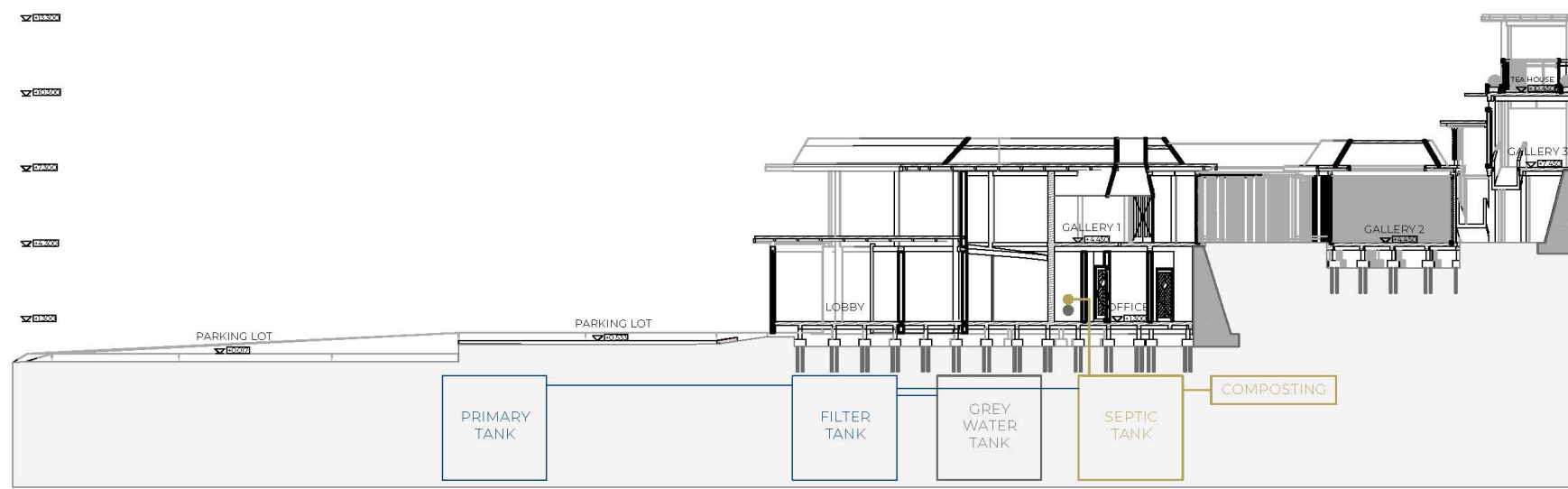
- Clean Water Pipe
- Rain Water Pipe
- Clean Water Feature
- Rain Water Gutter



اچانگالستان

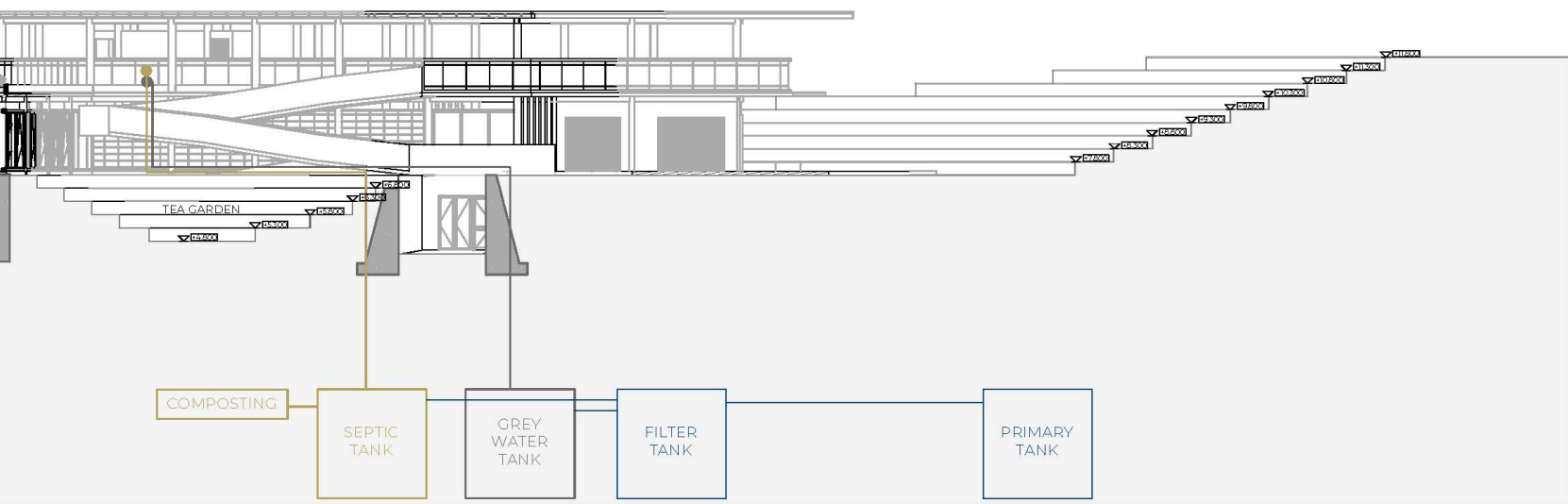
DESIGN DEVELOPMENT

WATER DISTRIBUTION SCHEME



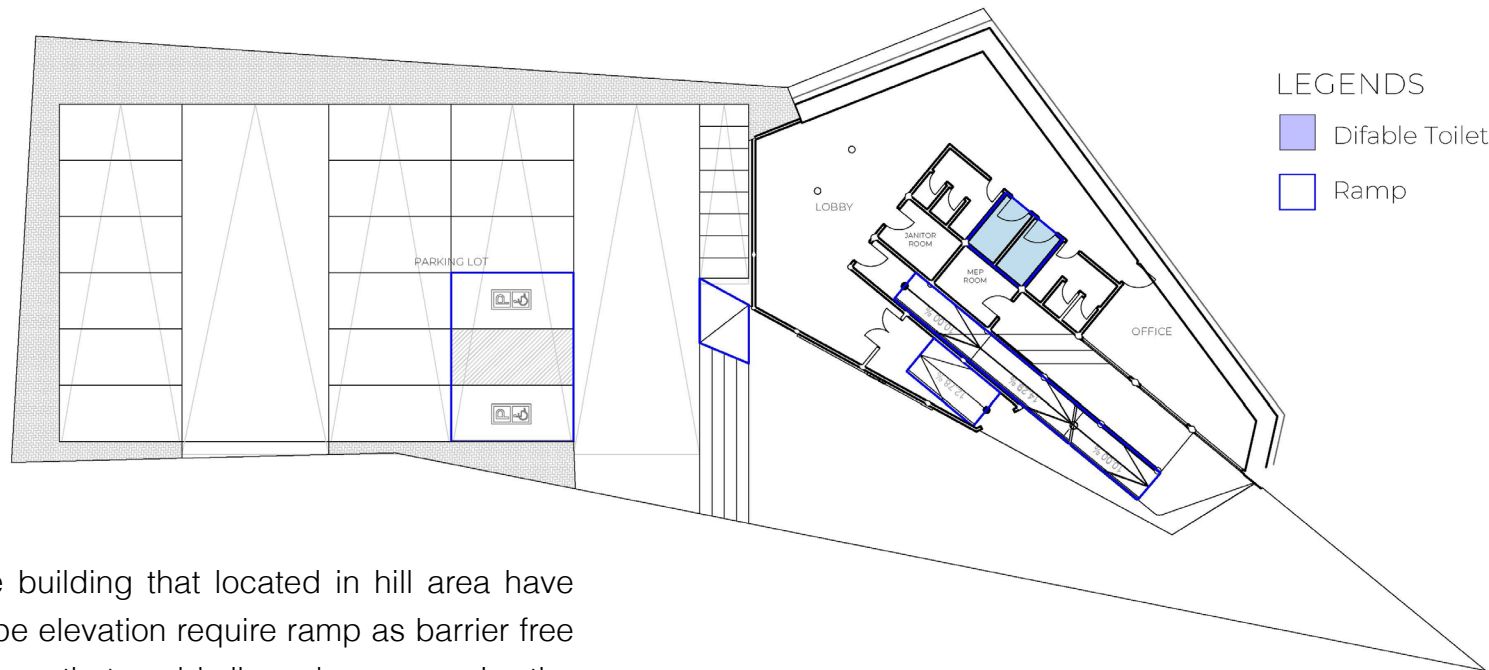
LEGENDS

- Clean Water Pipe
- Rain Water Pipe
- Clean Water Feature
- Rain Water Gutter



الجنة البستانية

BARRIER-FREE ACCESS

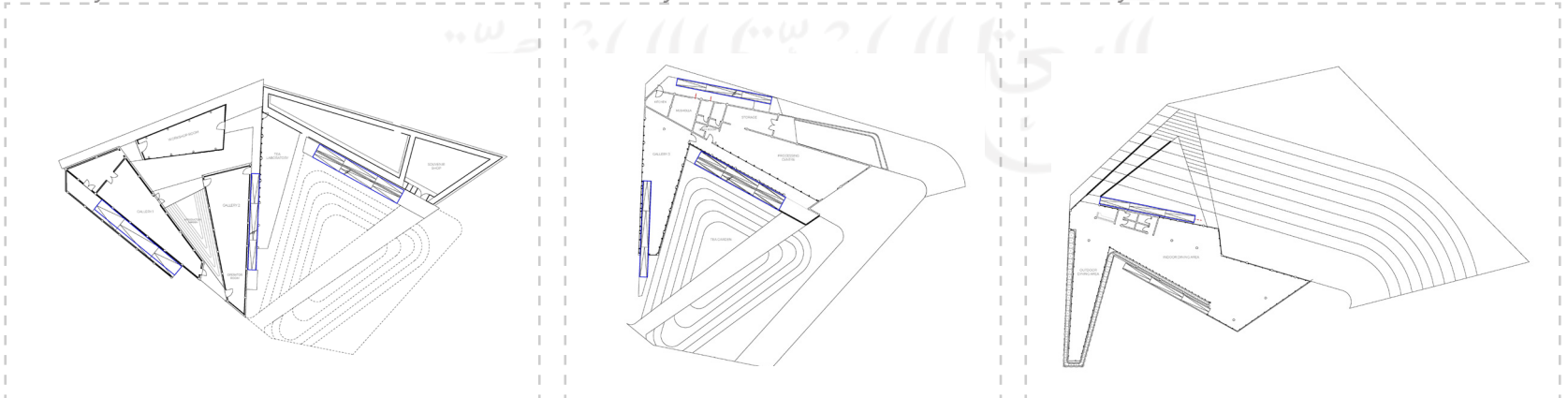


The building that located in hill area have slope elevation require ramp as barrier free access that could allowed anyone enjoy the building without any barriers. The facility of parking and toilet also not forget to be designed on the building.

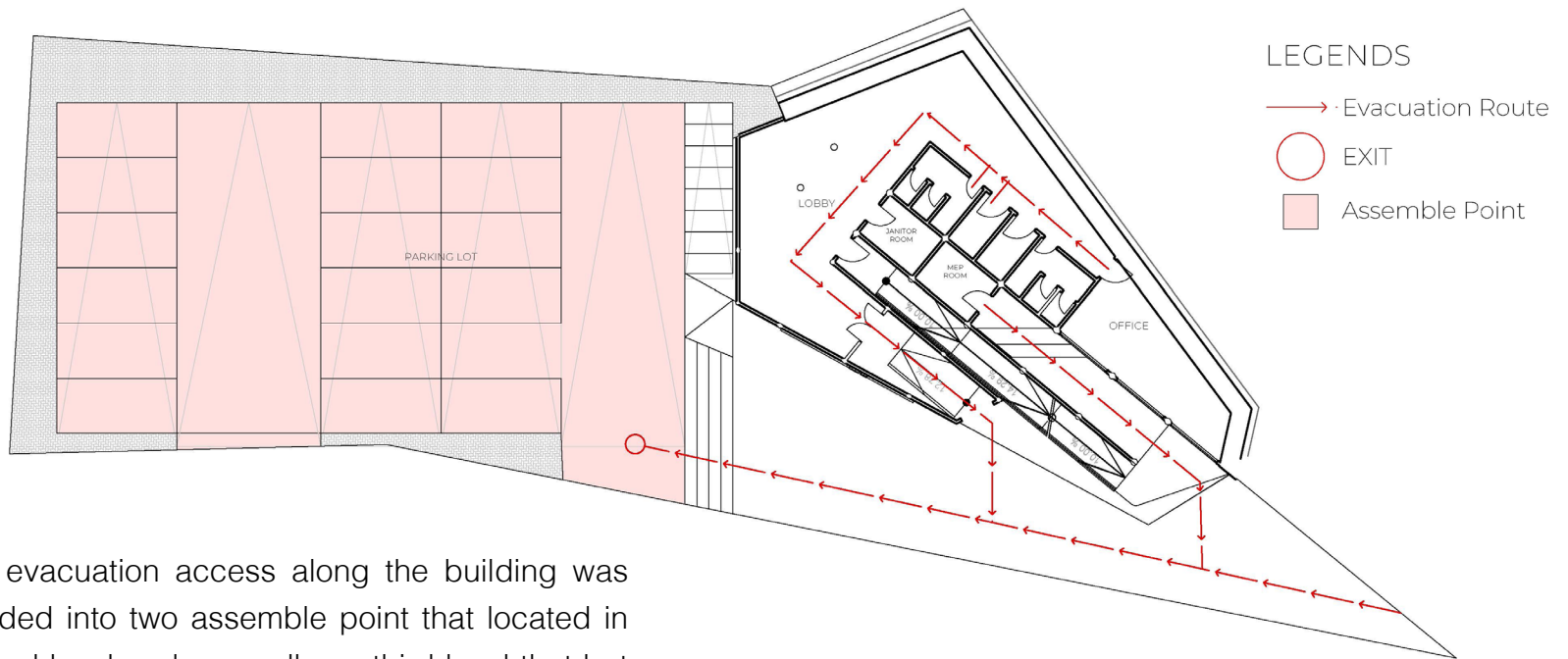
1st story

2nd story

3rd story



EVACUATION ACCESS

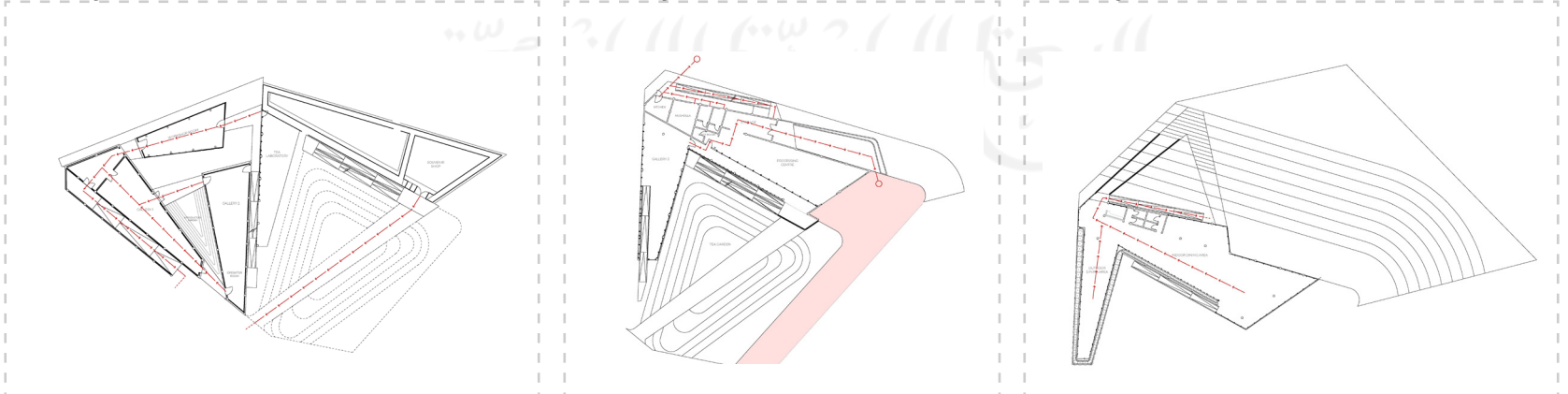


The evacuation access along the building was divided into two assemble point that located in ground level and secondly on third level that bot able to contain mass of people with below 50 meter distance.

1st story

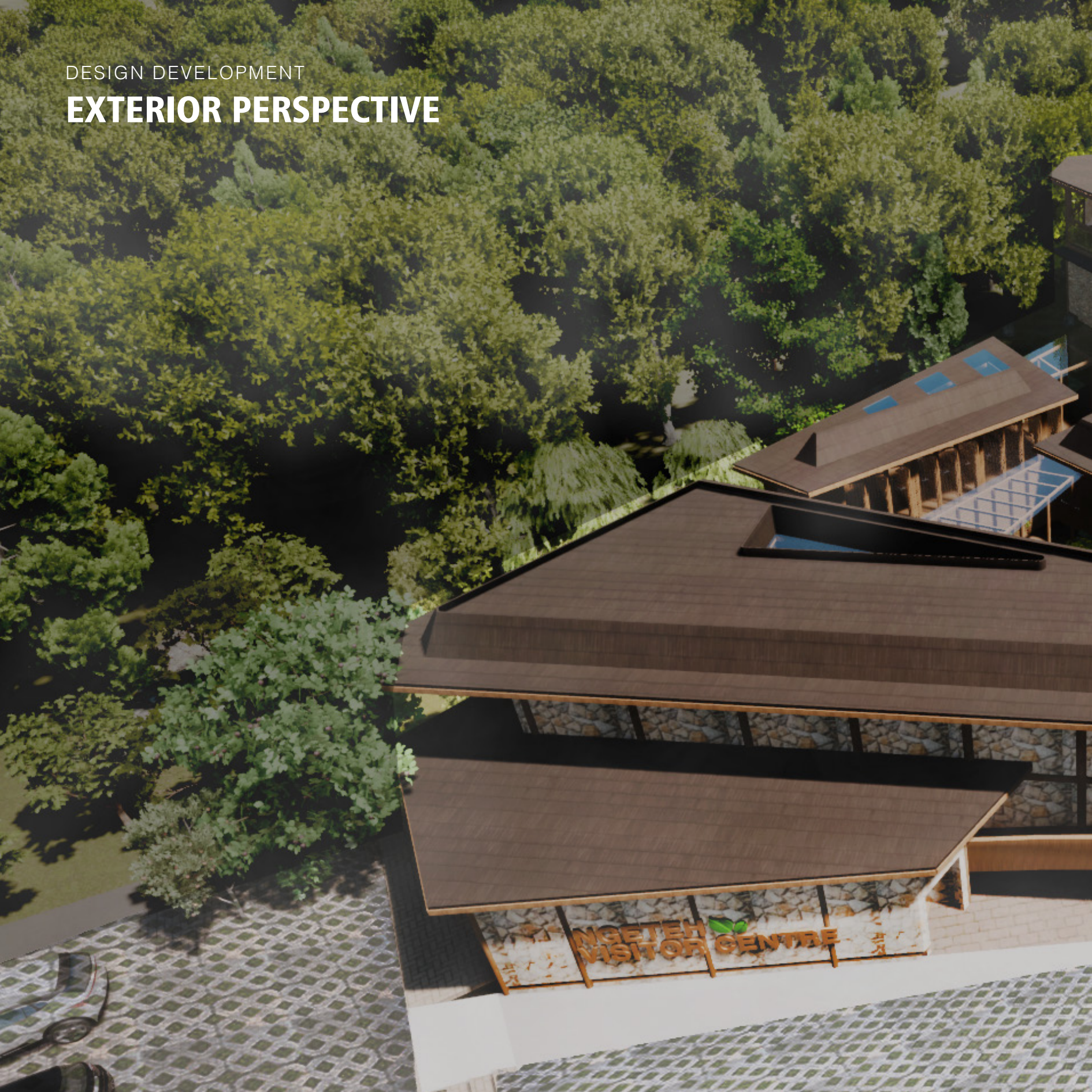
2nd story

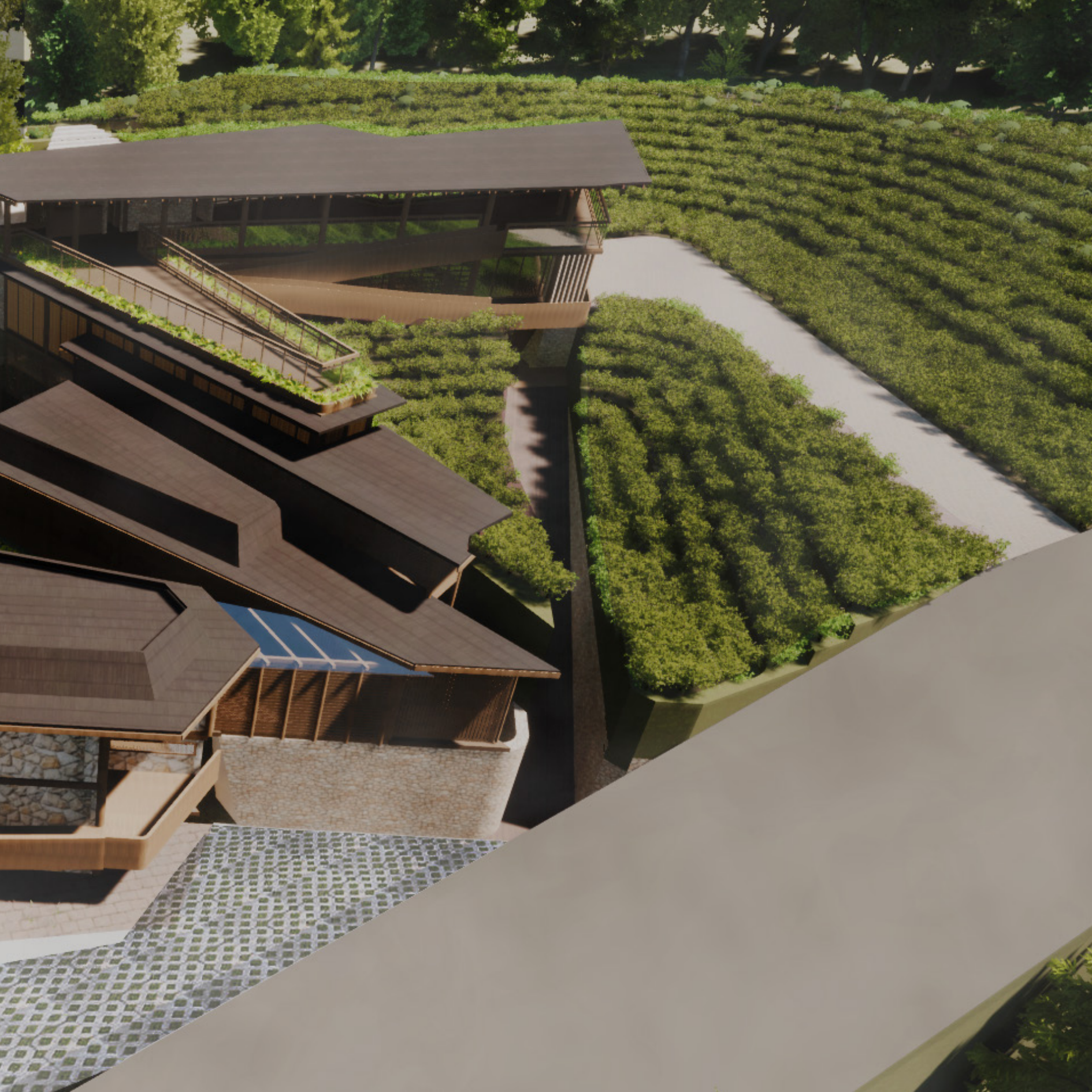
3rd story



DESIGN DEVELOPMENT

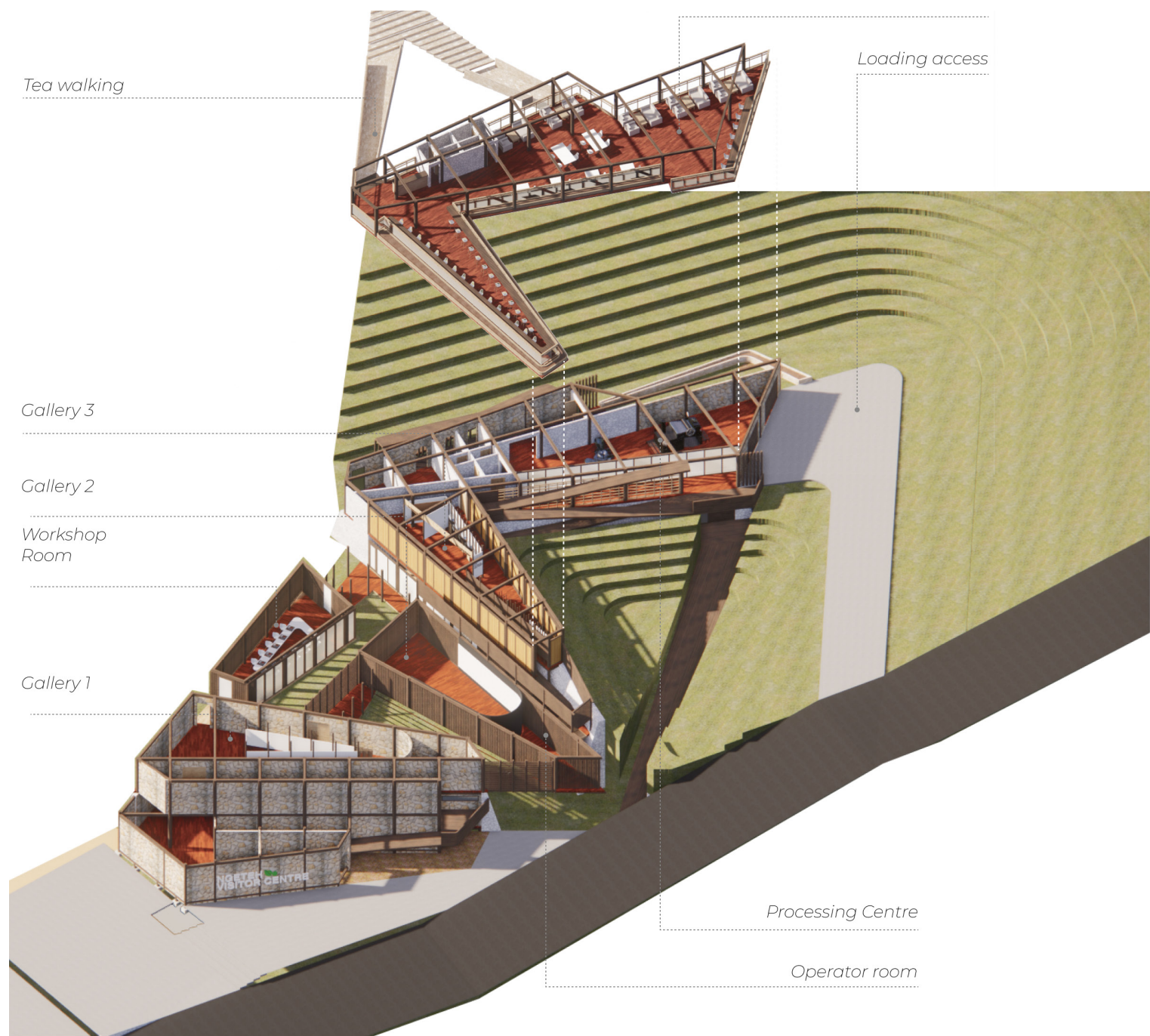
EXTERIOR PERSPECTIVE





DESIGN DEVELOPMENT

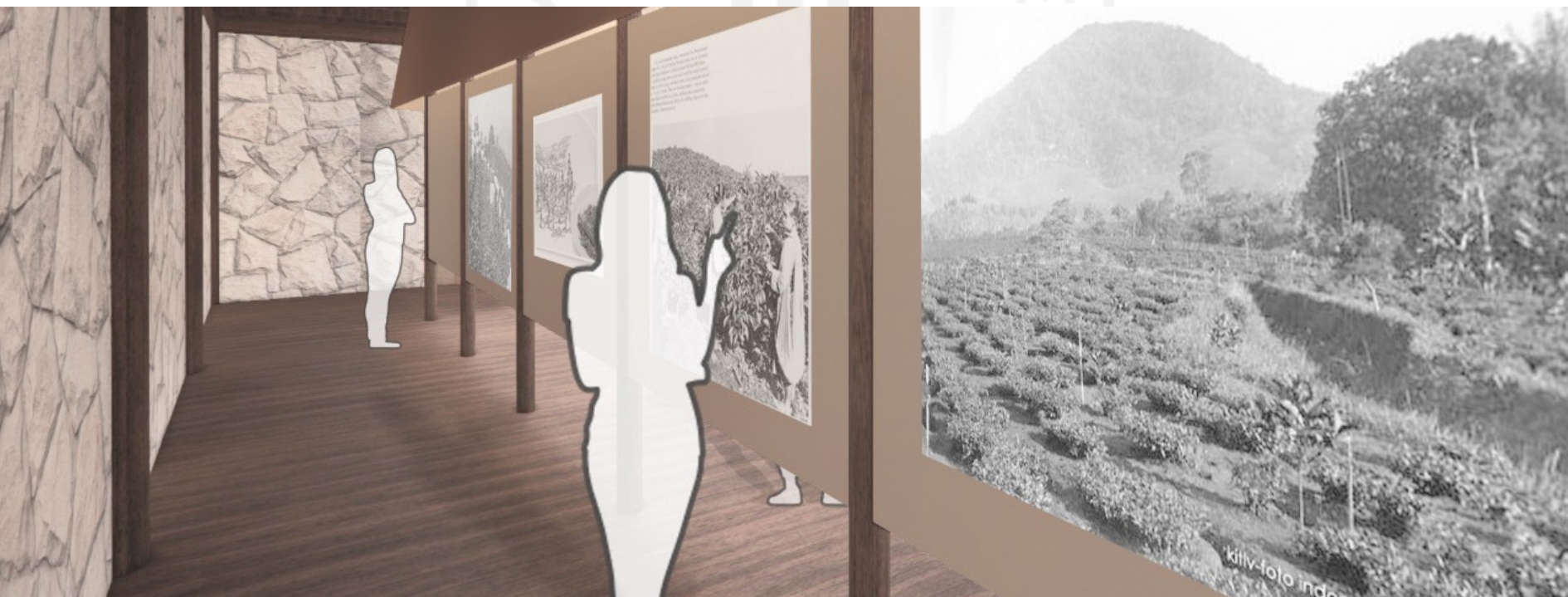
SPACE ARRANGEMENT



ENTRANCE



1ST GALLERY



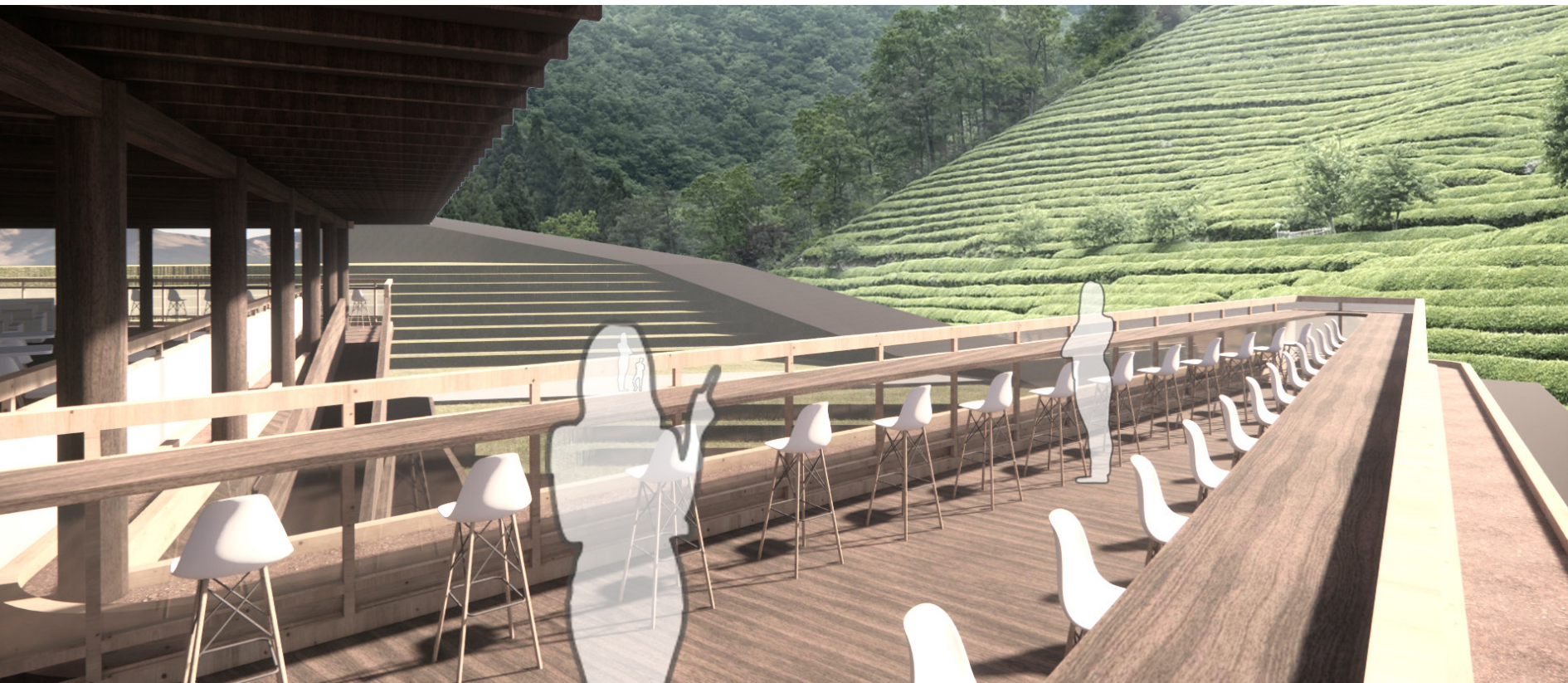
3RD GALLERY : TEA TASTING STATION



3RD GALLERY : INTERACTIVE SCREEN



TEA HOUSE



TEA WALKING



05

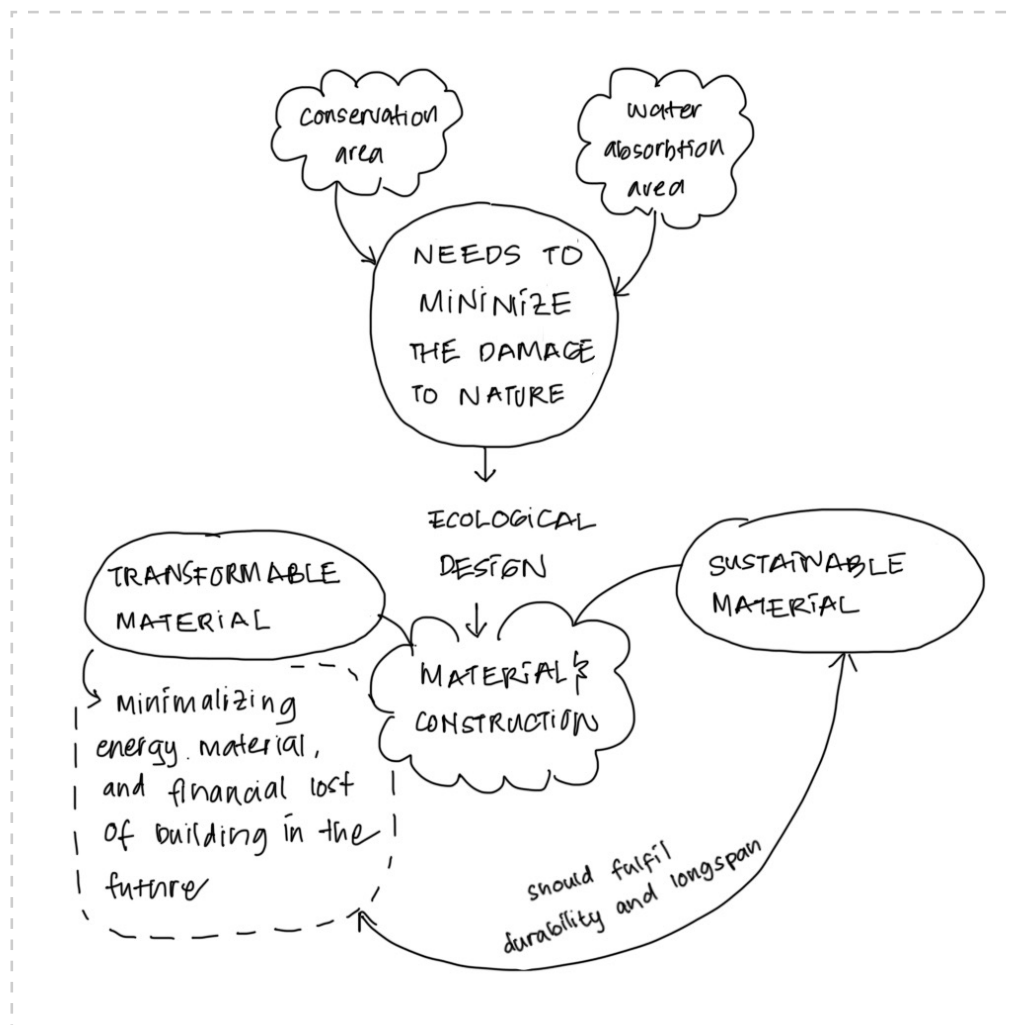
DESIGN EVALUATION

ARGUMENT ON ECOLOGICAL APPROACH
EVALUATION ON ECOLOGICAL STRUCTURE
ON ECOLOGICAL APPROACH
EVALUATION ON APPLOCATION OF THE STO-
RY OF FRIENDSHIP CONCEPT
EVALUATION AND ARGUMENT OF INTIMATE
FRIEND PHASE SPACE

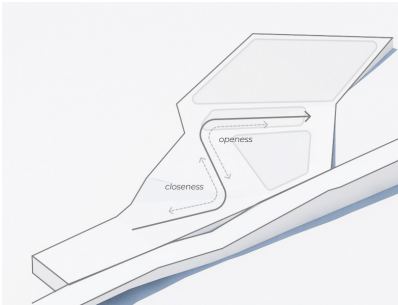
Based on the evaluation results, there are some parts responded by jury and supervisor. This improvement is expected to be a better design reference for readers.

1. ARGUMENT ON ECOLOGICAL APPROACH

The main focus of ecological approach especially on material construction is mainly to minimizing the damage on site pre-, during, and post construction.

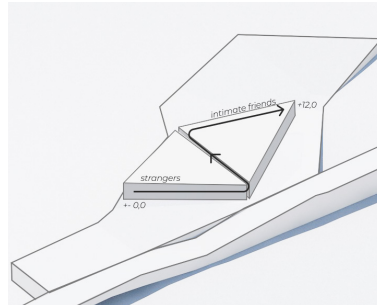


The consideration of climatic response was in this stage, where the giant mass was breakdown to several mass that arranged like picture shown. Beside the concept that strengthen in this mass arrangement, the climate also take part in the consideration.



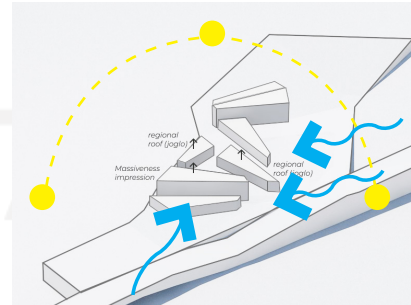
THE MAIN IDEA

The idea of friendship was from relation that closed to each others became open to each other following the elevation of the site from lowest to highest



MAIN FORM

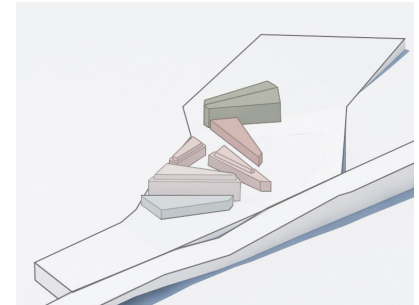
Two triangular mass insisted to represent the progress of closeness to openness. These form shape was taken from the site outline direction. It will continue to create the circulation of the visitors adapted to the mass



TRAPEZOID PATTERN

The two mass then divided into several masses that defining several spaces based on the concept as visitor experience. This phase also include consideration of climatic response where the orientation of wind are welcomed by every mass, and maximizing natural lighting by make adequate opening on required space.

Trapezoid pattern was made following the site outline to implement generative design based on transformable building principle.

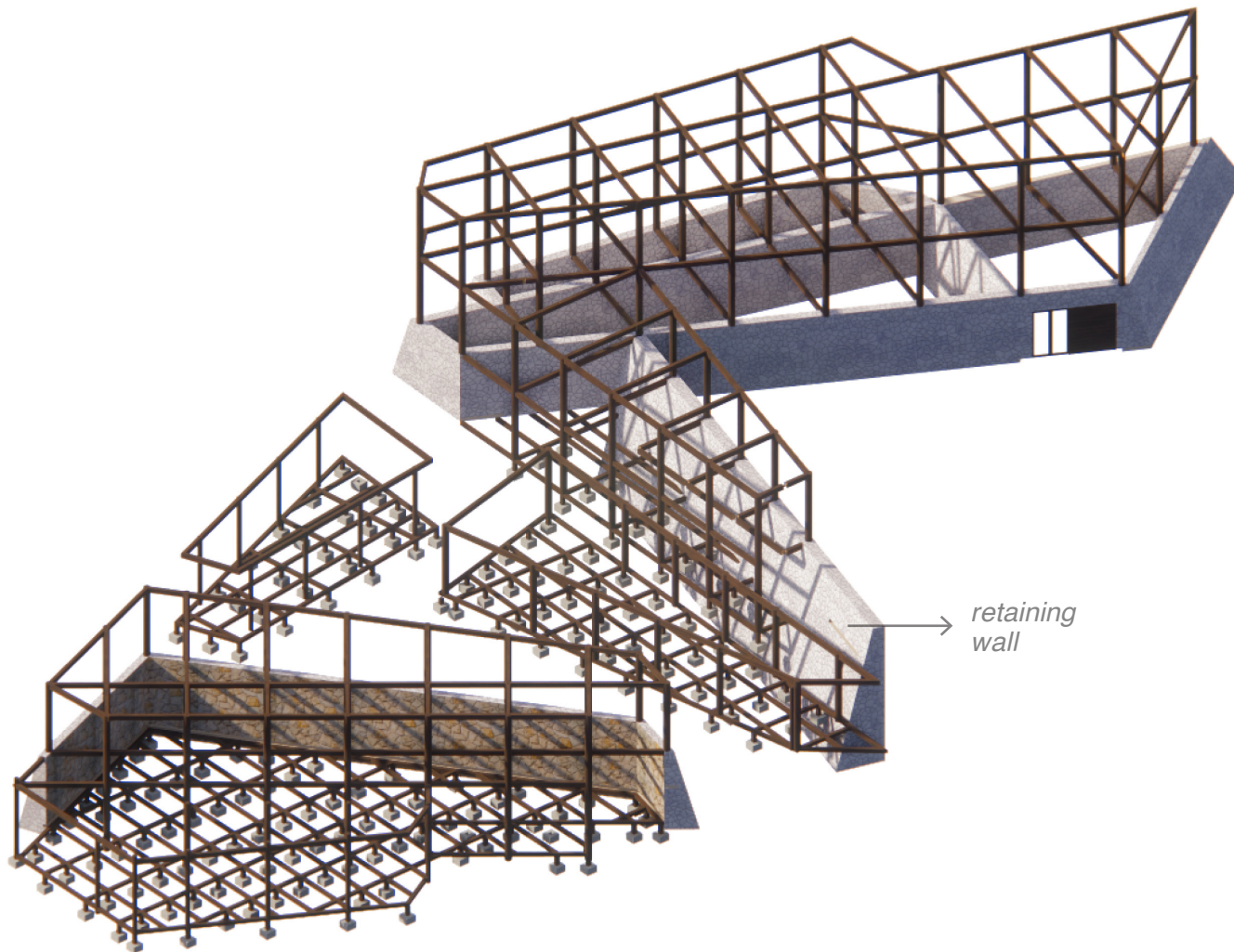


FINAL FORM

The roof for several building adapted to be inline with the concept.

The final form will consist of several pavillion/building that are representing each phases of friendship between visitors and tea. Starting from strangers that start from lowest elevation and become intimate friends at the final step in the highest elevation

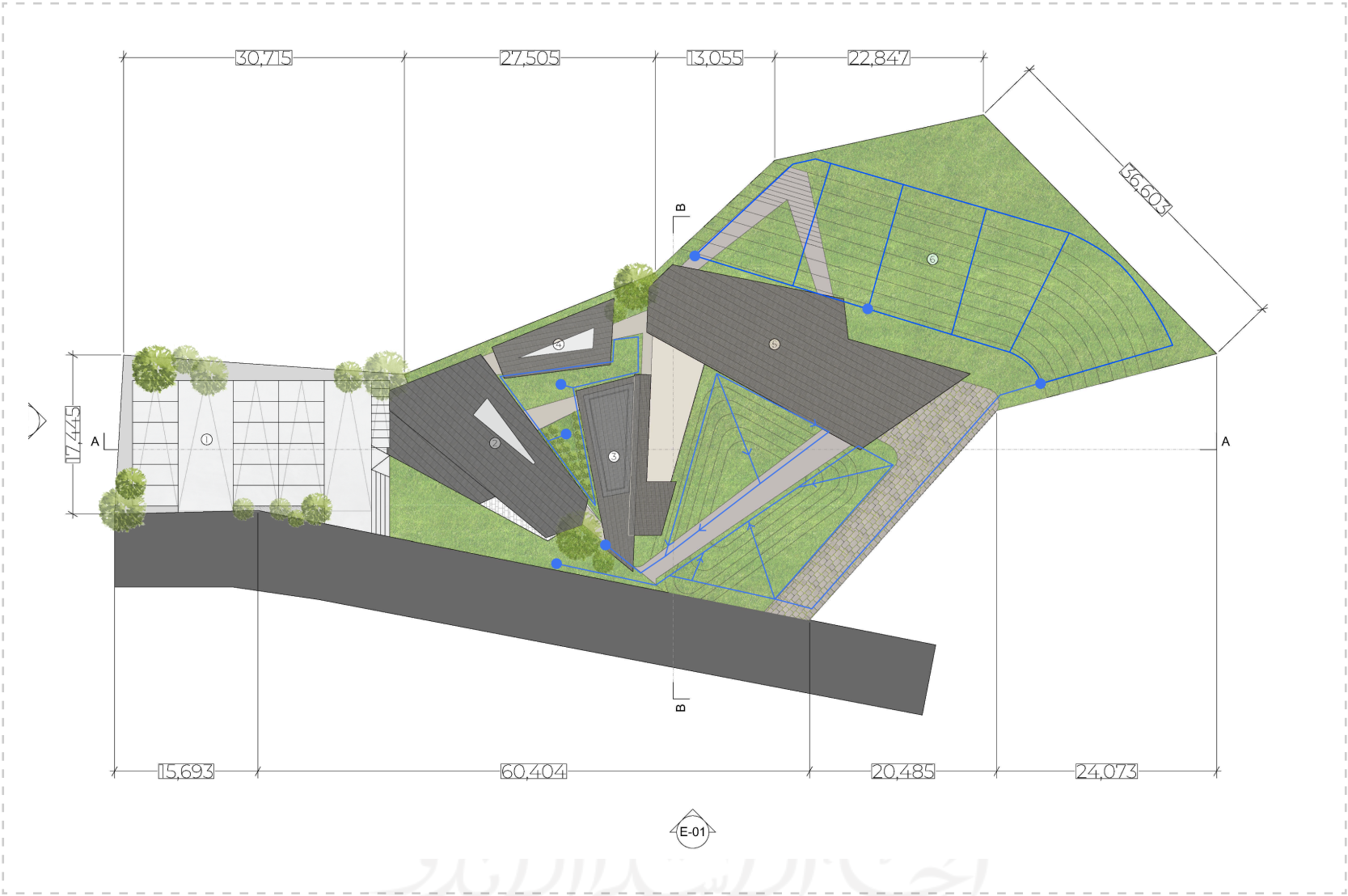
2. EVALUATION ON ECOLOGICAL STRUCTURE AS ECOLOGICAL APPROACH



The use of retaining wall as transformable building construction as ecological approach was aim to get the benefits of space availability that could be made by the stone retaining wall instead of tilt house. It help the building to spare some space to important function such as laboratory that took important parts for developing tea community.

But, retaining wall could give damage to block the water way around the site. It may caused another problem that could happen on site. Thus, the need of designing water way is important to prevent unwanted damage.

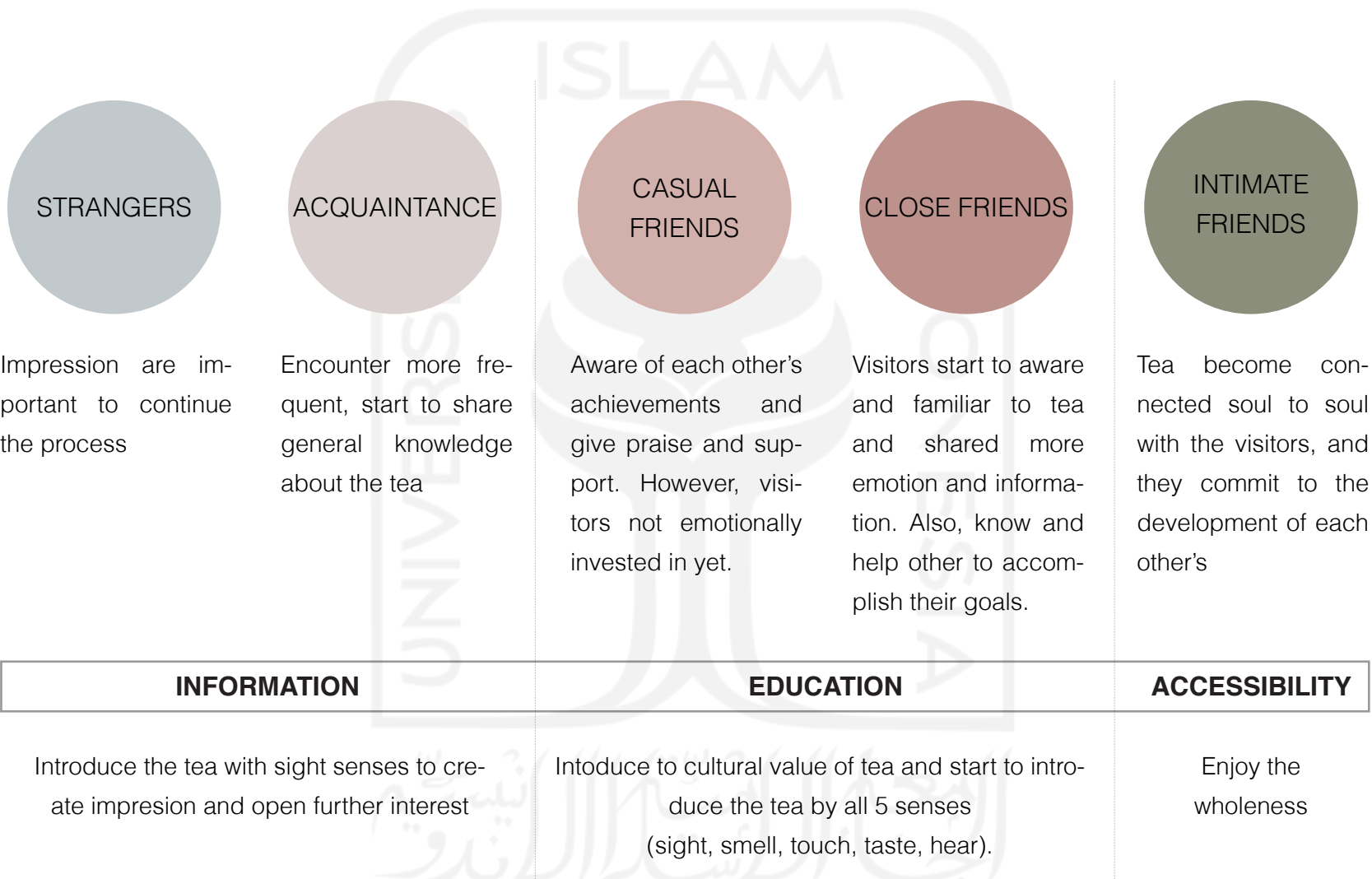
Thus, in order to manage the water way, the water way would be designed as below :



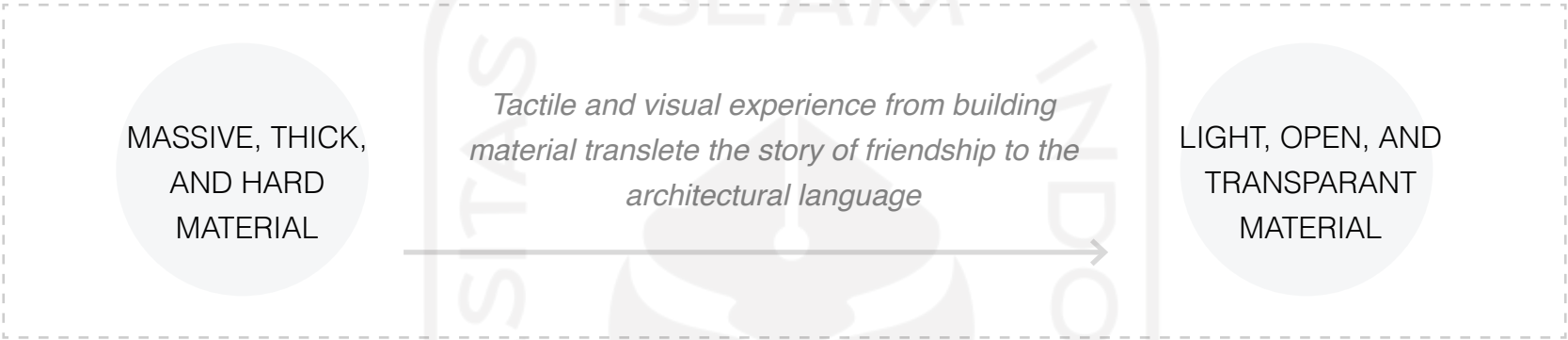
Water was directed as the direction of the terrain to the rain water well in order to conserve the water on site.

3. EVALUATION ON APPLICATION OF THE STORY OF FRIENDSHIP CONCEPT

The aim of applying the concept is to develop friend relationship between visitors and tea in relation with the ecological approach. Thus, the concept is to focus only to built the progressive friends connection (getting know between visitors and tea).



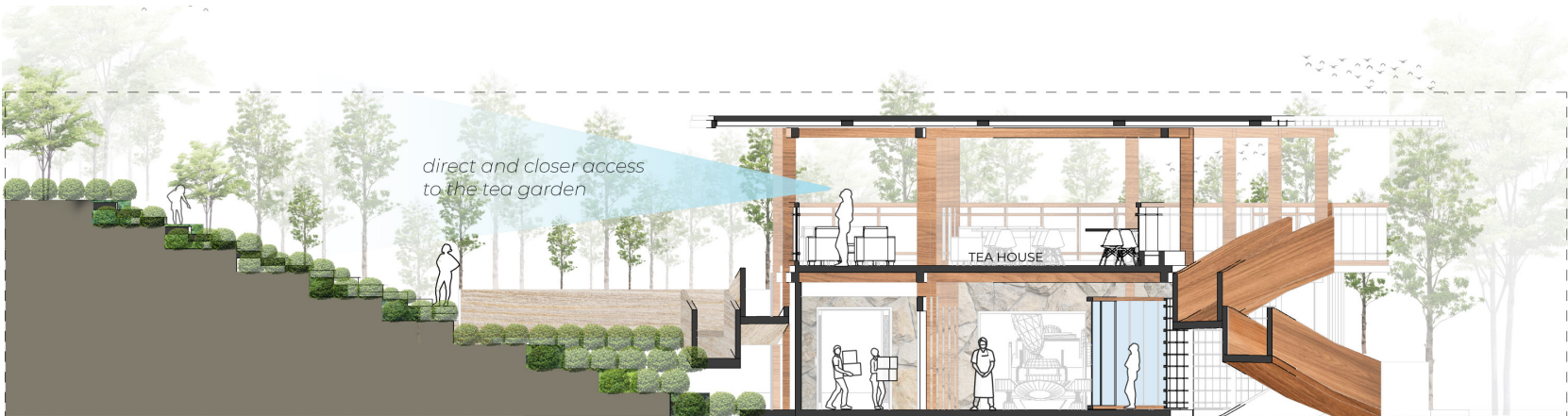
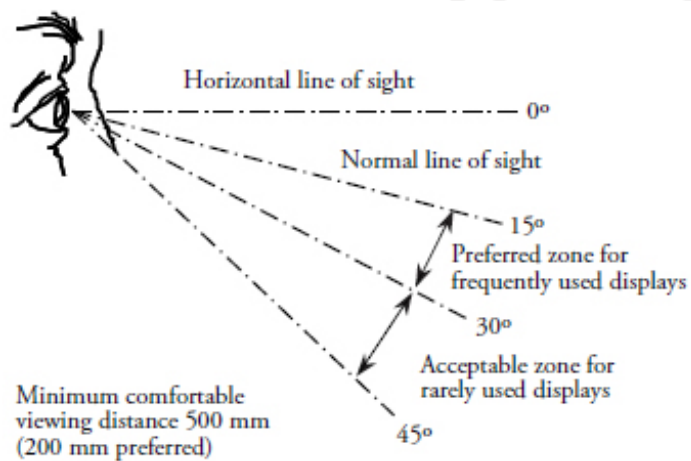
The representation phases of friendship from strangers through massive materials and less opening to intimate phase that represented with openness was the idea to represent personal (individual) response while experience the phases itself. From close themselves from stranger, to open up themselves with someone they already being closed with.



The main parameter to represent this is the existing tea garden that located on the north part of the site. As they go more intimate, they finally could enjoy tea garden and the tea after passing several phases of friendship.



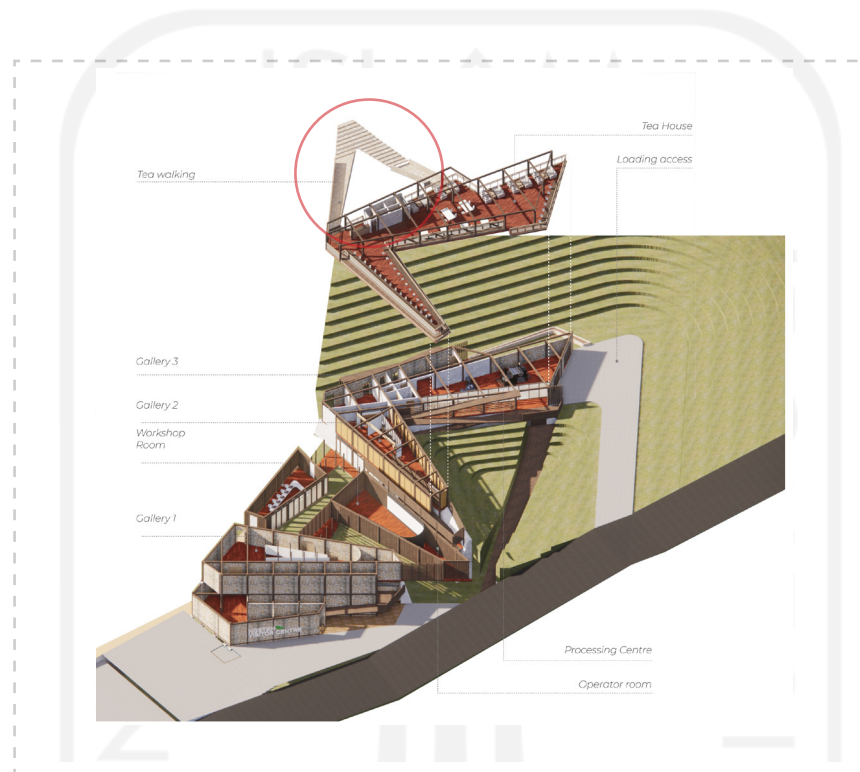
4. EVALUATION AND ARGUMENT OF INTIMATE FRIEND PHASE SPACE



In intimate friend phase, important value is that people was able enjoy the view of tea garden. Meanwhile, the evaluation by the jury is the design especially in this phase in ergonomically speaking, people would be more comfortable to enjoy maximum horizontal line angle and below. Meanwhile, the design especially on the tea house was exceed the view comfort of the visitors to enjoy the view of entire existing tea garden. There are still parts of view that above the comfort angle that makes the view was not able to be enjoyed maximumly.



Yet, the aim of intimate friend phase is not highlight to see entire view of the tea garden, but to enjoy themselves within the tea garden. So author concepting that horizontal angle view to normal angle sight to tea garden was enough to communicate that the visitors was standing with tea garden around them. And in order to enjoy the entire garden thoroughly, visitors able to access the tea wading that could direct them to tea garden up to highest point, that could give them access to the entire view of the tea garden and building as it in line with the concept, where as they go higher, they going to get entire.



06 THESIS REFERENCES

REFERENCES

Adrian, Almas (2021). Perancangan Pusat Komunitas Hortikultura Perkotaan di Jember dengan Pendekatan Arsitektur Ekologis. Yogyakarta : Universitas Islam Indonesia

Frick, H., & Suskiyatno, F. B. (2007). Dasar-Dasar Arsitektur Ekologis. Yogyakarta : Penerbit Kanisius.

Halim, G.T., et al. (2021). PERANCANGAN BUKU TENTANG TRA DISI PATEHAN DI KRATON JOGJAKARTA. Universitas Kristen Petra Surabaya

Galle, W., & Tammerman, N. d. (2013). Multiple design approaches to transformable building: construction typologies. Contribution of Sustainable Building to Meet EU 20-20-20 Targets, 783 -790.

Louisa, D., & Wiyatiningsih. (2017, November). VISITOR CENTER DALAM KONTEKS LASEM: SARANA INTERAKSI SOSIAL PUSAT INFORMASI WISATA. ENERGI EFFICIENT FOR SUSTAINABLE LIVING, 189-195

Pearce, P. 2004. The functions and planning of visitor centres in regional tourism. Journal of Tourism Studies.

Ryn, S., & Cowan, S. (2007). Ecological Design. Washington : Island Press.

UNESCO. (2018). The role of Visitor Centres in UNESCO Designated Sites. Report of the first Regional Workshop for Europe

07 ATTACHMENT



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SURAT KETERANGAN HASIL CEK PLAGIASI

Nomor: 1866421481/Perpus./10/Dir.Perpus/IV/2022

Bismillaahirrahmaanirrahiim

Assalamualaikum Wr. Wb.

Dengan ini, menerangkan Bahwa:

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DR-ING
Fakultas / Prodi : Teknik Sipil dan Perencanaan/ Arsitektur
Judul Karya Ilmiah : DESIGNING NGETEH VISITOR CENTRE IN NGLINGGO
VILLAGE, KULON PROGO WITH ECO- ARCHITECTURAL
APPROACH

Karya ilmiah yang bersangkutan di atas telah melalui proses cek plagiasi menggunakan **Turnitin** dengan hasil kemiripan (*similarity*) sebesar **6 (Enam) %**.

Demikian Surat Keterangan ini dibuat untuk dapat dipergunakan sebagaimana mestinya.

Wassalamualaikum Wr. Wb.

Yogyakarta, 7/4/2022
Direktur



Joko S. Prianto, SIP., M.Hum

DESIGN OF NGETEH VISITOR CENTRE WITH ECO-ARCHITECTURAL APPROACH IN NGLINGGO VILLAGE, KULON PROGO

Nglinggo Village is the only local tea producer village in Yogyakarta. The Village is also a tourism village. But unfortunately, amid the increasing demand tea in the world, the tea industry in Indonesia was weakened. This has an impact in Nglinggo Village where tea cultivation land has been reduced. This is very unfortunate, because although tea in Yogyakarta does not have a lot of production, tea has been absorbed into a tradition in the Kraton and in the community so that its existence must still be maintained. In Nglinggo Village, people start to develop local tea production. Unfortunately, there is no support facility that can promote local tea to the wider community. In fact, considering the potential of the village which has the potential for recreational and educational tourism.

This Visitor Centre with eco-architectural approach is designed to maintain the tea community in Nglinggo with still maintaining their connection with environment ecosystem. The design provides facilities for tourism to get know more about the tea and also facilities for tea producing community to stimulate social interaction between the community and with people from outside. So that it can trigger the development of Nglinggo local tea in terms of knowledge, interests, and culture. This is expected to create more sustainable environment and community.



DEPARTMENT OF
ARCHITECTURE

FINAL ARCHITECTURAL DESIGN STUDIO TITLE

Design of Ngeteh Visitor Centre with Eco-Architectural Approach
in Nglinggo Village, Kulon Progo

SUPERVISOR

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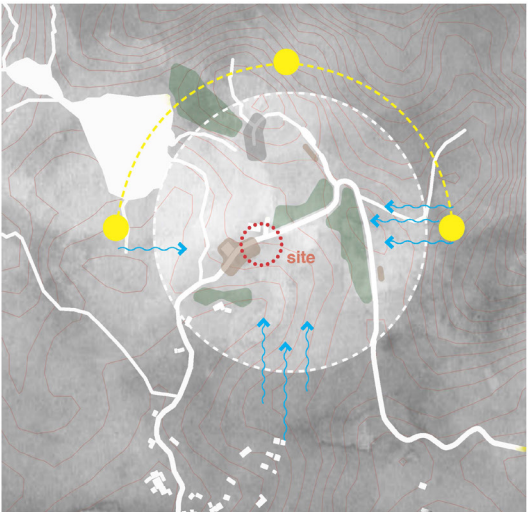
STUDENT'S NAME

Hamidah Hestiyas Khumaira

STUDENT'S NUMBER

18512040

SITE LOCATION



SOCIO-CONTEXT OVERVIEW
PATEHAN TRADITION

Yogyakarta as a city under Kasultanan Ngayogyakarta Kingdom, has strong cultural value. And Patehan as a tea culture was included as cultural activity that still preserved by the kingdom. Mainly the tradition was done by assigned abdi dalem, and serve it to the king. But beside that, Patehan also conducted in several ceremony.



SOCIO-CONTEXT OVERVIEW
NGLINGGO TEA COMMUNITY

As the factory no longer take the tea leaves from Nglingo Tea Farmers, Mr. Sukohadi as entrepreneur take a move to make local tea, named Teh Ki Suko, with visitors as the main target. The tea was invented and developed by independent research and they are proven to have good quality of tea. The signature tea in Nglingo is the Sangrai (roasted) Tea.



BUILDING TYPOLOGY
SMALL VISITOR CENTRE

This type of visitor centre fit to implemented due to the location in an area after the regional/city level. This visitor center has a role to be a tourist information center that promotes the area. At this level of the visitor center, the promotion function, visitor enhancement function and filtering function are functions that must be prioritized.

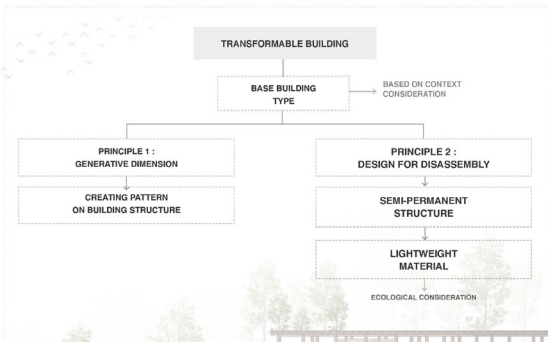


ECO-ARCHITECTURAL
APPROACH

TRANSFORMABLE BUILDING

On first principle, the load bearing structure have to implement generative dimensioning system. Which means the structure could be multiplied to form larger mass. Thus making pattern as the solving to reach the goals of the approach

On the second principle, design for assembly, it can be interpreted that the structure will be a semi-permanent structure (the on of the day, it could be disassembled easier)and the use of the material is not in the form of heavy material. So here the material to be used must be light so that it can realize the point in this second principle.



ECO-ARCHITECTURAL
APPROACH

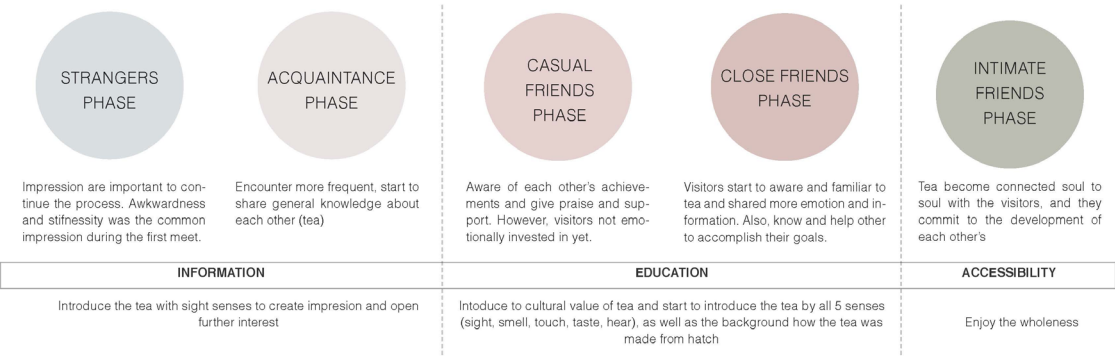
ECOLOGICAL MATERIAL

- Main consideration of ecological material :
1. Pre-Building : Local made material
 2. Building Operation : Using non-ozone-depletion material
 3. Post Building : Able to be reused or recycled

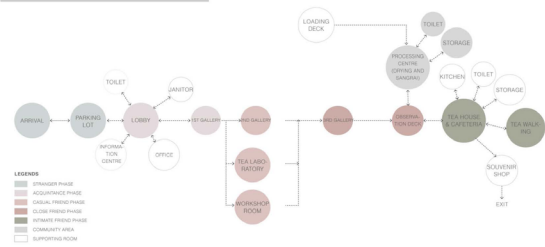




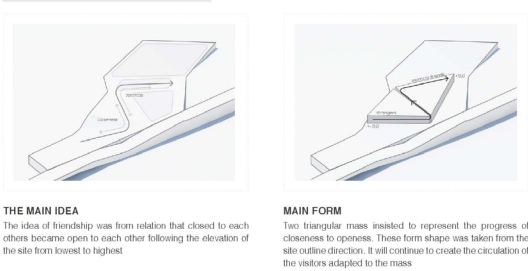
CONCEPT OVERVIEW
THE STORY OF FRIENDSHIP



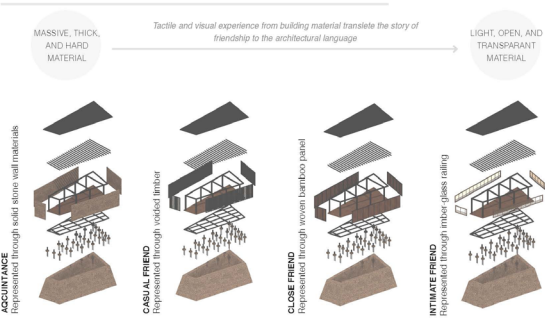
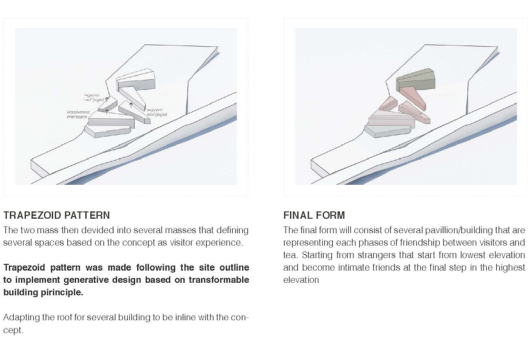
SPACE PROGRAMMING



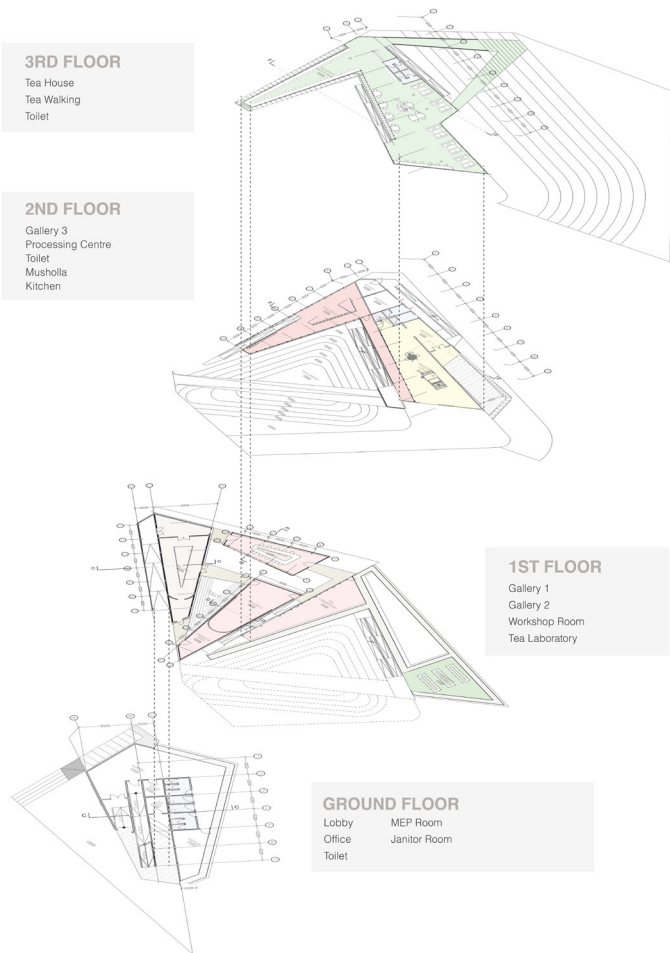
THE TRANSFORMATION



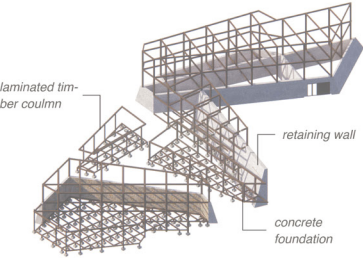
ECOLOGICAL MATERIAL x STORY OF FRIENDSHIP



The building was consist of 4 main buildings namely the front building, workshop pavillion, 2nd Gallery pavillion, and processing centre building (back building). The arrangement of the building was following the concept--the story of friendship as well as the circulation of the visitors to experience the whole story of tea.



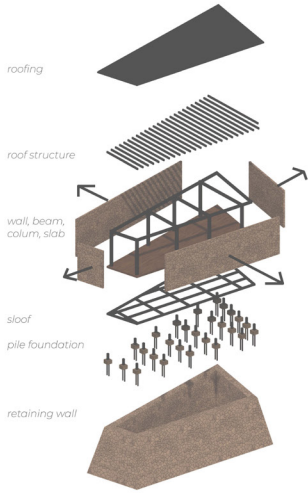
SCHEMATIC STRUCTURE



In the building there are 2 main types of construction that can be seen from the foundation, which mainly uses a wooden pile foundation so that it does not permanently damage the site.

While the second is the use of a retaining wall as well as a foundation because it utilizes a retaining wall that holds soil in some parts of the site.

These two foundation did not applied fully on each pavillion, but several building rather use mixed foundation--half pile foundation, half retaining wall (especially at the processing centre building).



The generative dimension pricipal implemented by making the 'trapezoid' pattern in all building that following the edges of the site. The pattern makes the structure to be generative and adaptable on site wether to be extended or reduce.





STRANGER PHASE : ENTRANCE

The massive preception was made through the early phase of the building by using stone cladding materials to represent the stiffness between visitors and tea itself. Did not have any view as clue between each other, and dim lighting representing how clueless they are.

AQUQUINTANCE PHASE : 1ST GALLERY

In this gallery will be showing the story of tea from the beginning to the visitors, which is the story of tea in Indonesia by display story that lighten by the lighting that only focused on the display. The materials still using stone that still representing the awkwardness between each others



CASUAL FRIEND PHASE : 2ND GALLERY

In this audio-visual room, visitors would able to experience closer to the regional cultural context of tea culture in Yogyakarta that known as Patehan Culture. Through the screen that spread surround the room will offer the realm experience of Patehan Culture

The envelope of this phase is using void timber panel that representing the progress of lightness from becoming strangers and acquaintance. The location of regionality also implemented in this Gallery and represented also on its roof

CLOSE FRIEND PHASE : 3RD GALLERY

As final gallery that represent close friend, in this space, visitors would be able to explore and get to know the tea with their senses



INTIMATE FRIEND PHASE : TEA HOUSE AND TEA WALKING

Enjoying the tea thoroughly as the final stage, side by side with the tea garden with minimum barrier to each others. The visitors also could access the tea garden from the tea house through tea walking, so intimate phase could reach the closer connection between the visitors and tea itself.



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한국건축기록보존회
Korea Architectural Recording Board



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