Re-living the Concrete City

Existing Korean apartment into the Open Building principle

P5 Presentation

22nd June 2023

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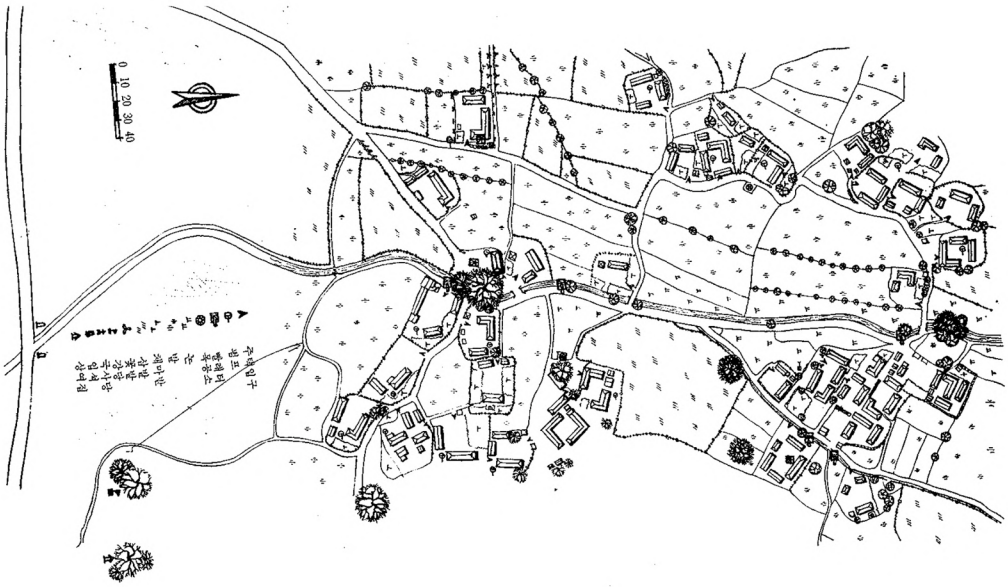
Architectural Engineering Graduation Studio 2022 / 2023
Delft University of Technology

65.4% Forested Land

The History of Apatu



Traditional Community

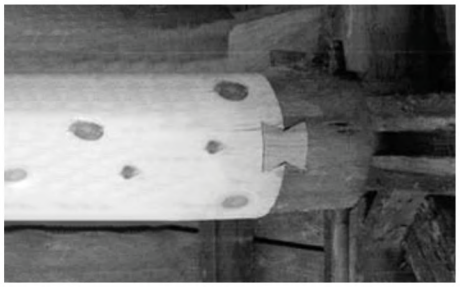
The History of Apatu

Korean Apartment, Apatu

Traditional Construction

The History of Apatu

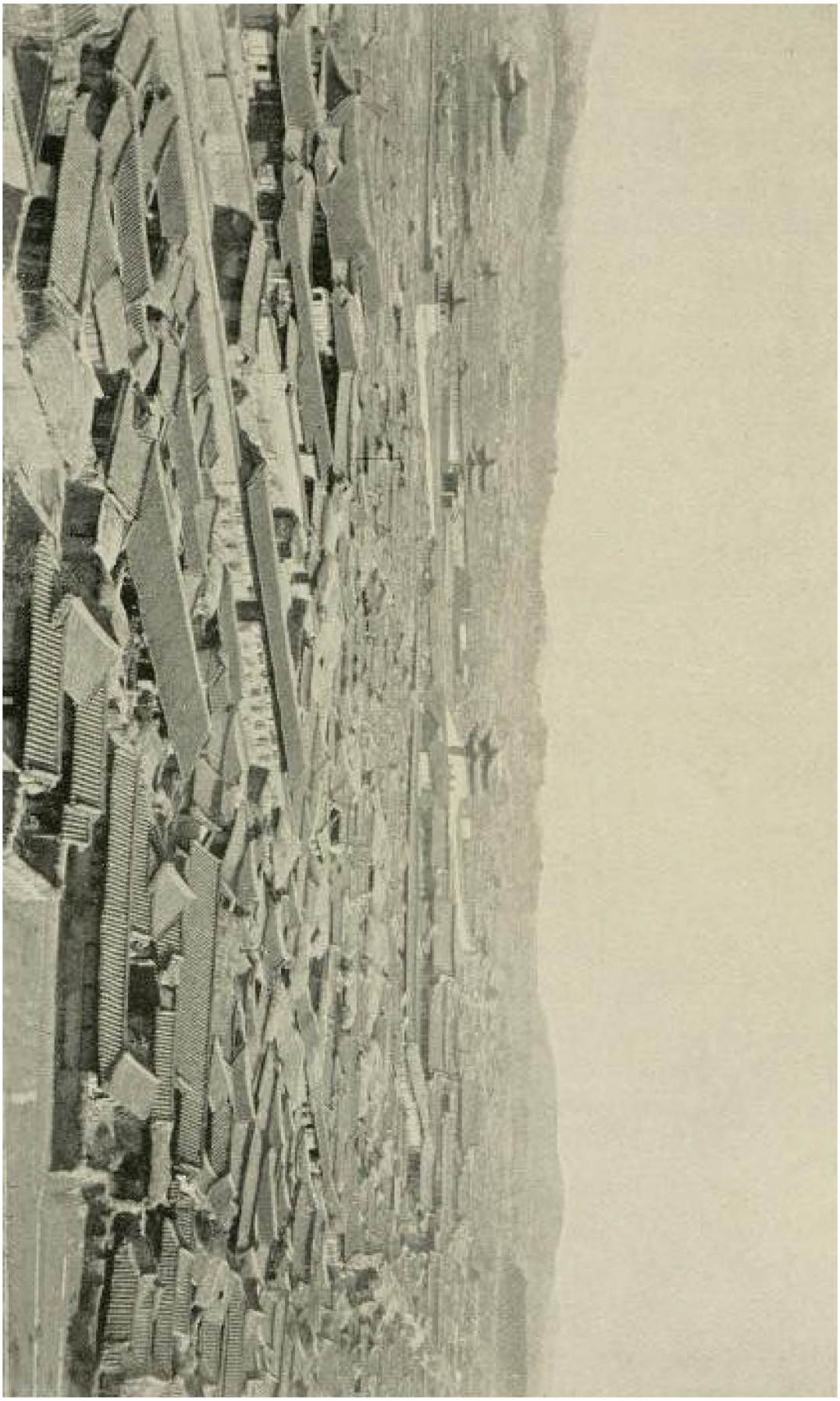
Korean Apartment, Apatu



Circular Construction

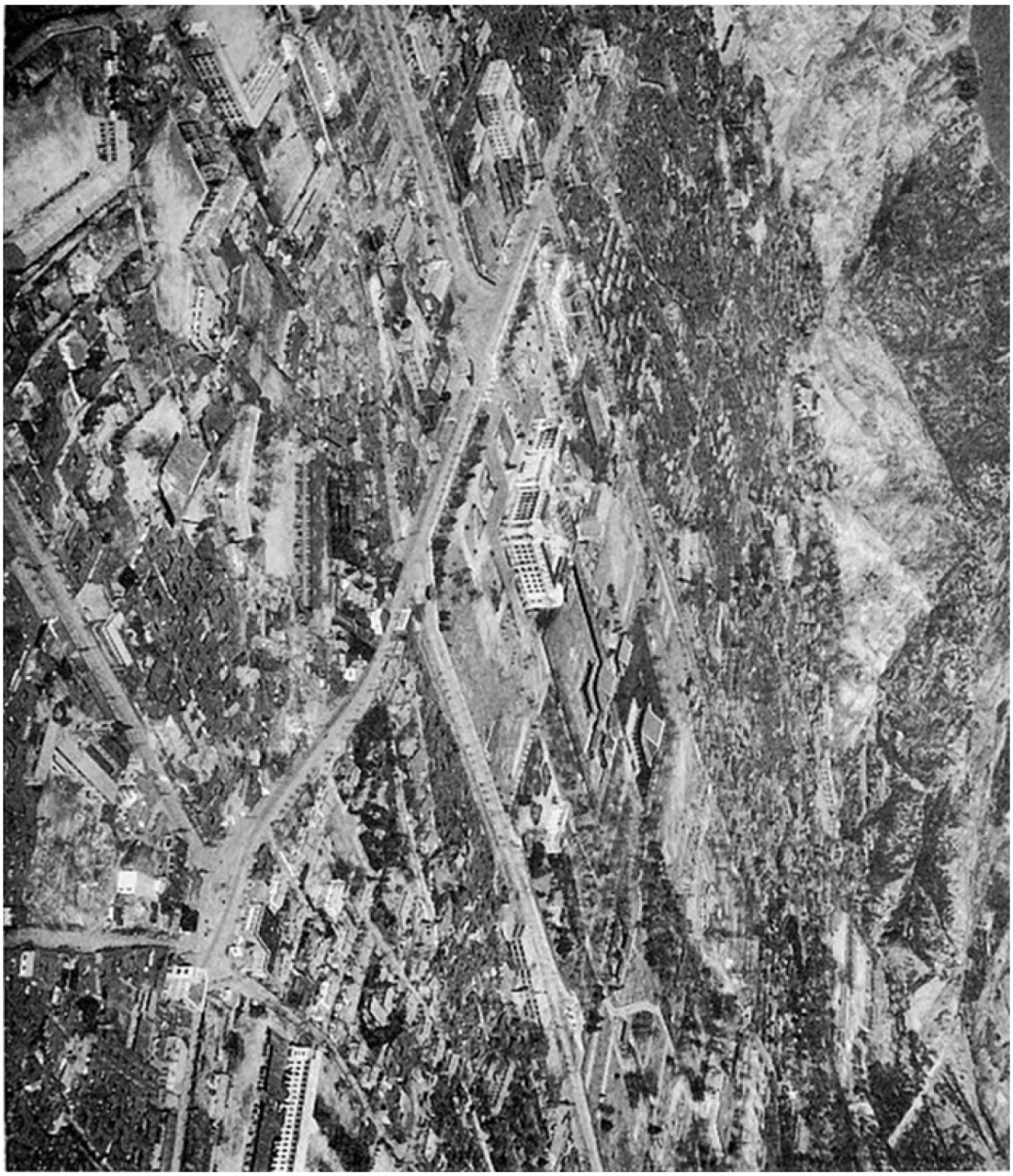
The History of Apatu

Korean Apartment, Apatu



Seoul in 1894

The History of Apatu



Seoul in 1960 (after Korean War)

The History of Apatu

High-rise Housing of Le Corbusier

The History of Apatu

Korean Apartment, Apatu

First Apartment Mapo Apatu

The History of Apatu

Korean Apartment, Apatu

Seoul in 1979

The History of Apatu

Korean Apartment, Apatu

The Death of Modern Architecture

The History of Apatu

Korean Apartment, Apatu

The Death of Modern Architecture in Korea

The History of Apatu

Korean Apartment, Apatu

Seoul in 2019

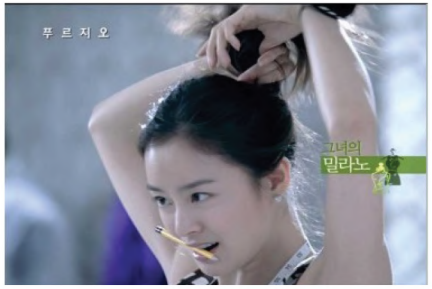
The History of Apatu

HYUNDAI

DAEWOO

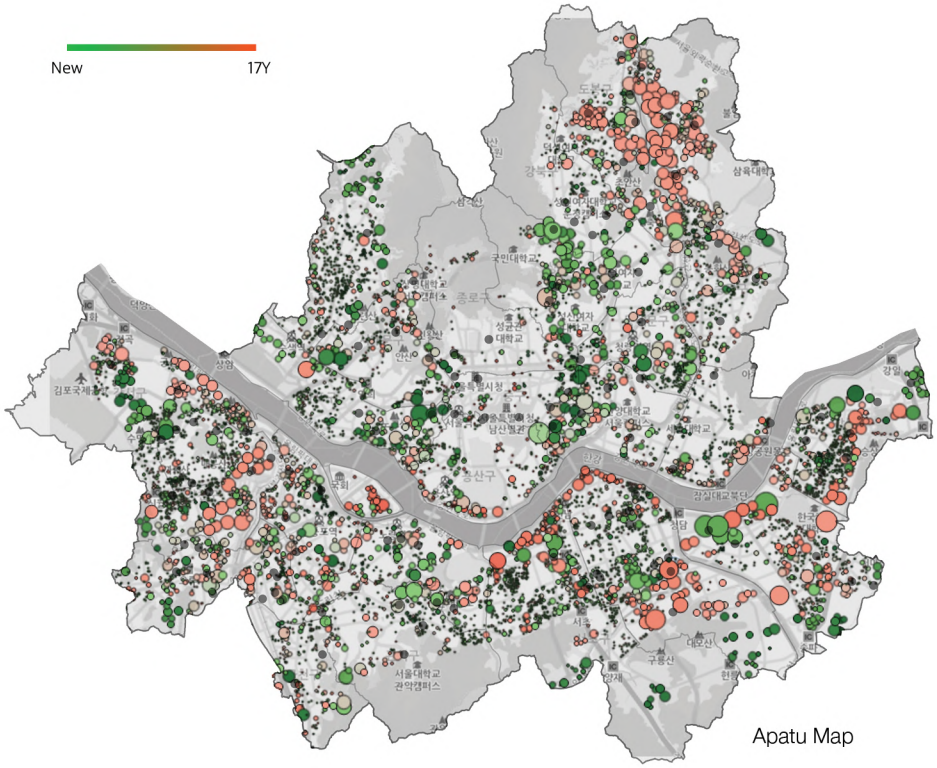
LG

SAMSUNG



Apatu as as an Object of Desire

The History of Apatu



Apatu Map

Multi Family House
14.8%

Single Family House
20.6%

Apatu
63.5%

More than 30 years
11.3%

20 to 30 years
32.6%

Less than 20 years
56.1%

Current Apatu

The History of Apatu

Reconstruction Culutre

1960s
Concrete Apartment

1990s
Demolition

1990s
Re-construction

2020s
Demolition

2020s
Re-Re-construction

Demolition & Reconstruction

Problem Statement

Mapo Apatu
1962

30
Years

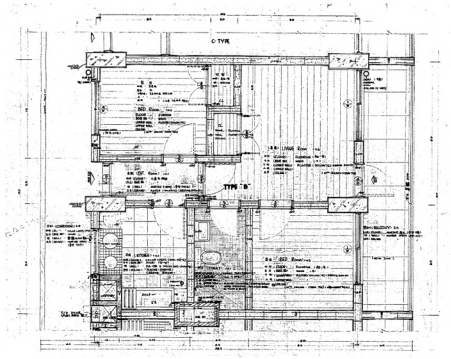
Mapo Samsung Apatu
1994

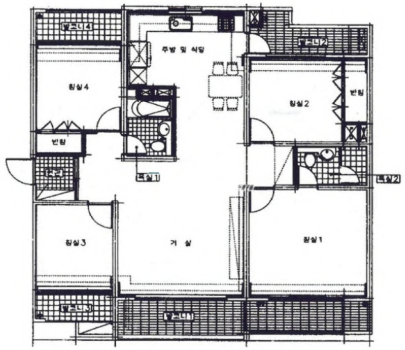
30
Years

?
2024

?

?





?

Mapo Samsung Apatu, Seoul

Context

Mapo Samsung Apatu

Re-living the Concrete City

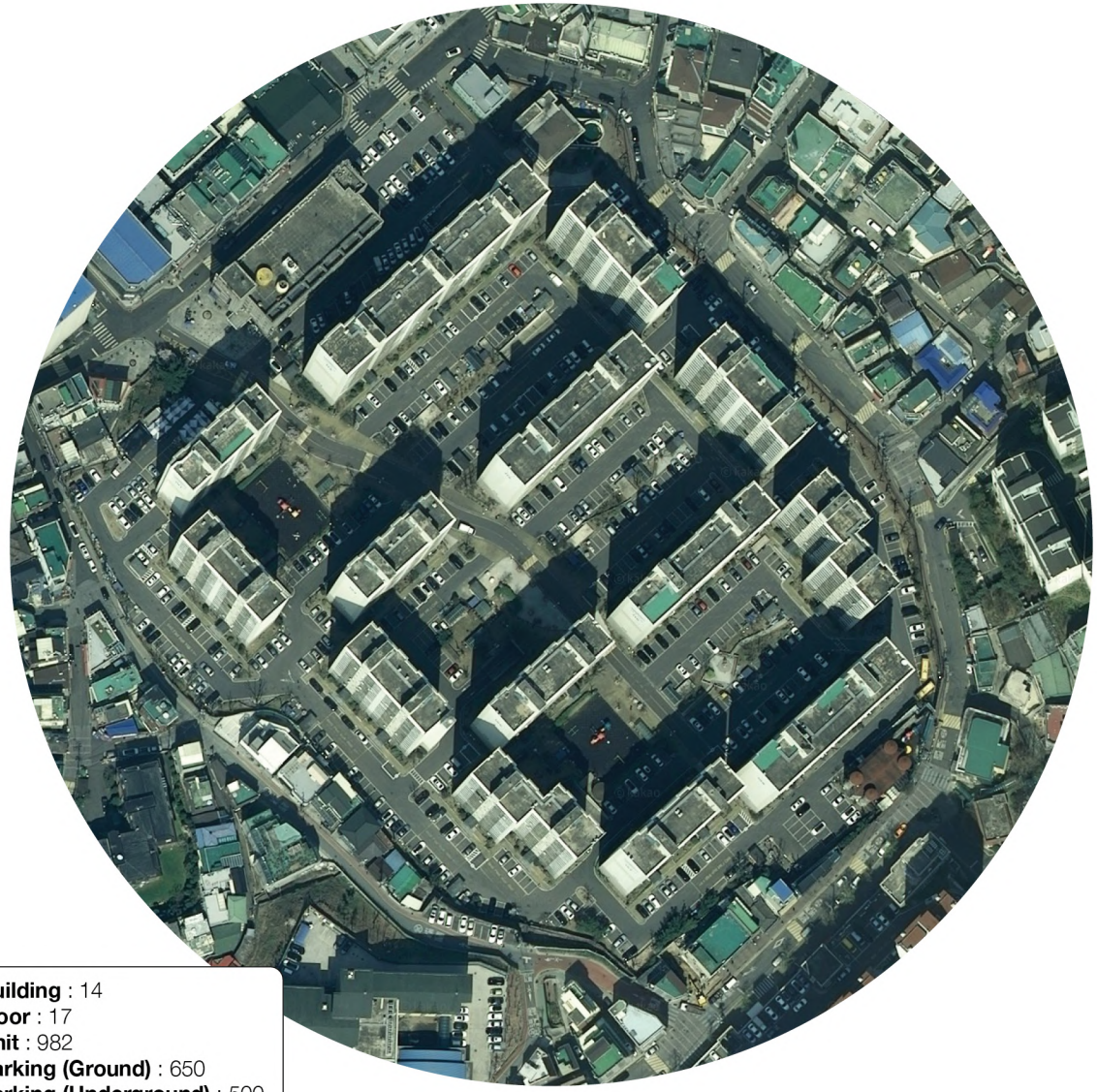
aE Studio

Mapo Samsung Apatu

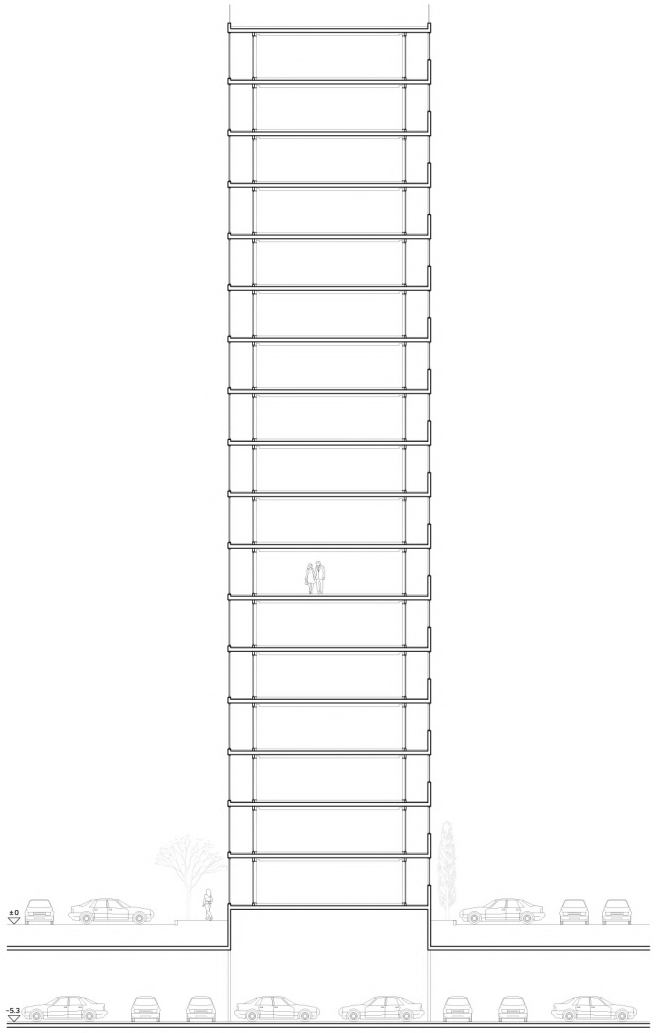
Reconstructed Mapo Apatu

Context

Mapo Samsung Apatu



Building : 14
Floor : 17
Unit : 982
Parking (Ground) : 650
Parking (Underground) : 500



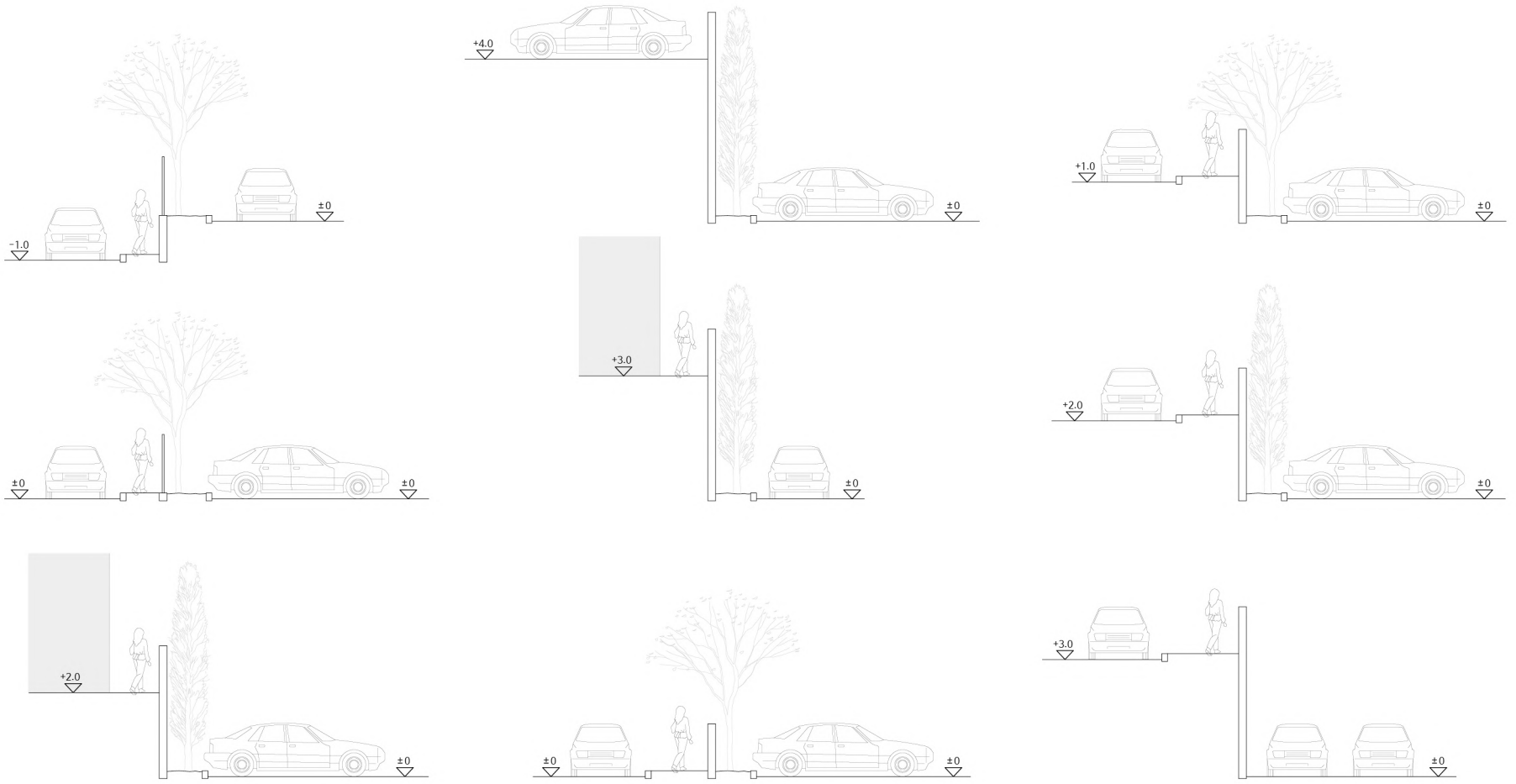
Mapo Samsung Apatu, Seoul

Context

Mapo Samsung Apatu

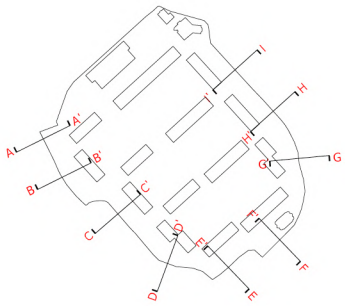
Site Condition

Context

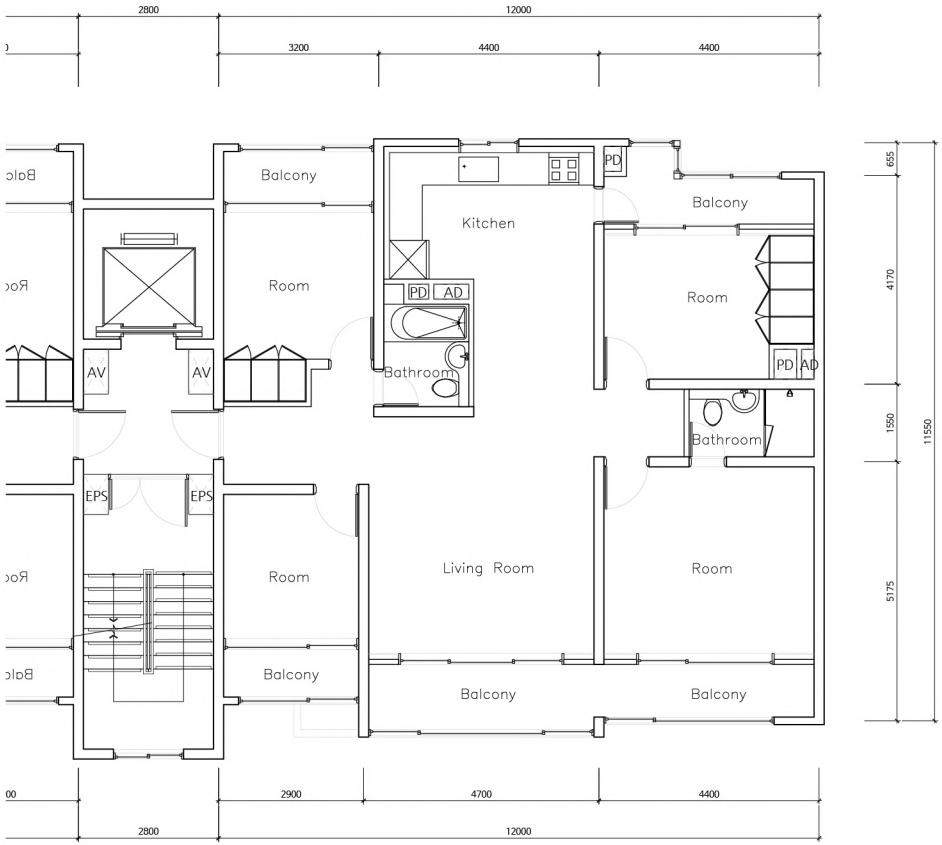


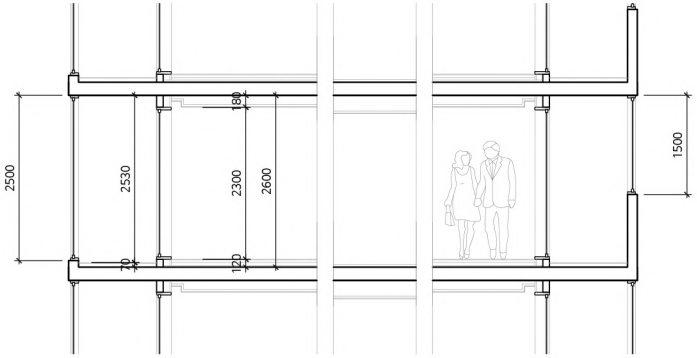
Gated Community

Context



Mapo Samsung Apatu





Floor Area
135 m^2

The average number of member
Approx. 5 (1994)
Approx. 2.6 (2021)

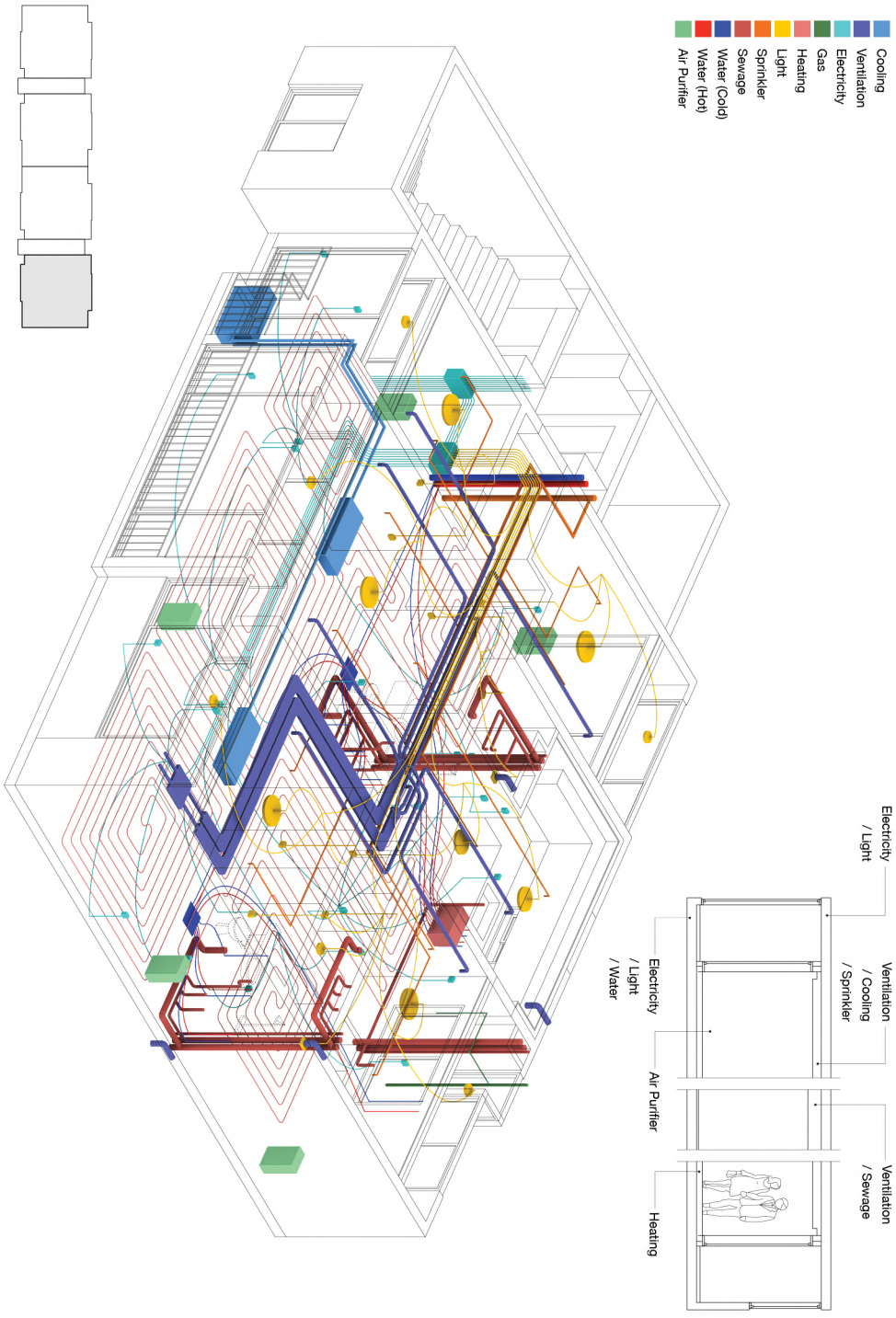
Apatu Unit

Context

Bearing Wall

Context

Mapo Samsung Apatu



Existing Installation

Context

Mapo Samsung Apatu

Installation in the Concrete ***Context***

After Placing Concrete

Context

No place

Demolished
210,988

Reconstructed
344,546

Lack of Parking

1992	1997	2005	2014	2022
5M	10M	15M	20M	25M

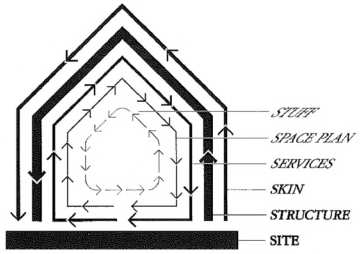
Bearing Wall

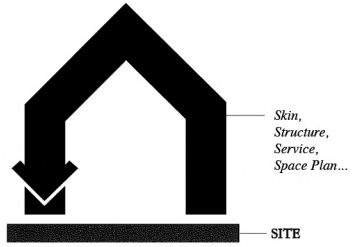
1970
5.2

1995
3.7

2020
2.3

Deterioration





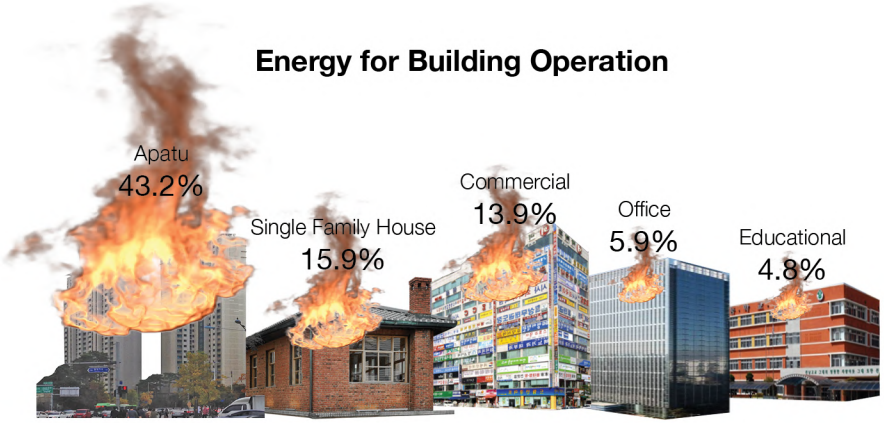
The Cause of Problem

Problem Statement

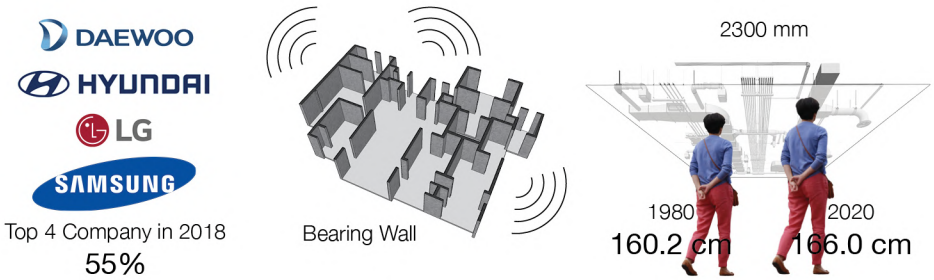
Waste from Demolition

CO2 from Reconstruction

Energy for Building Operation



Supply Oriented Design



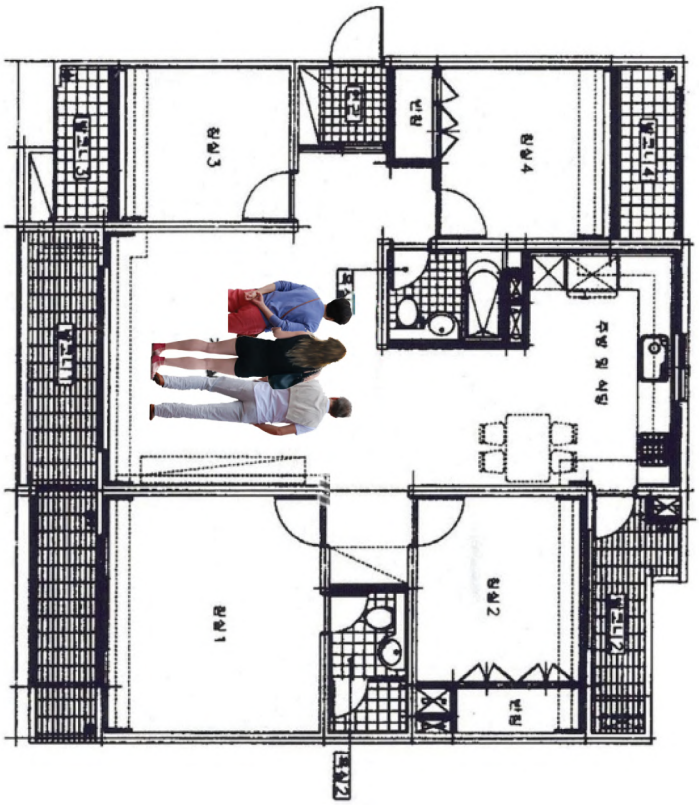
The Effect of Problem

Problem Statement

Apatu as Open Building

Existing

Design Objective



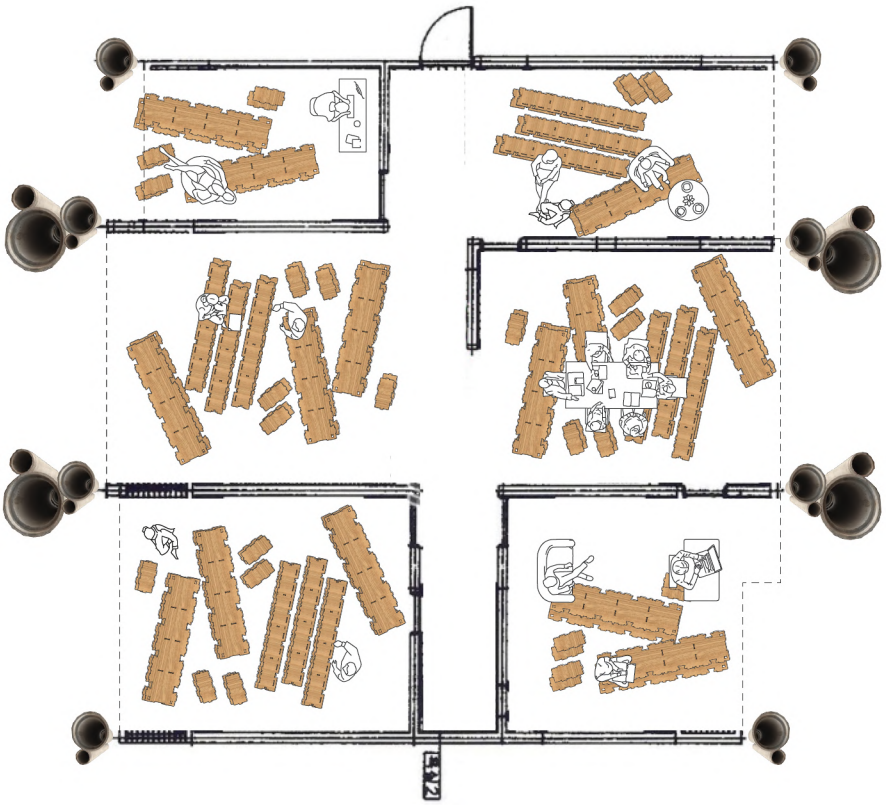
Vertical Infrastructure

Design Objective

Apatu as Open Building

Democritized Construction

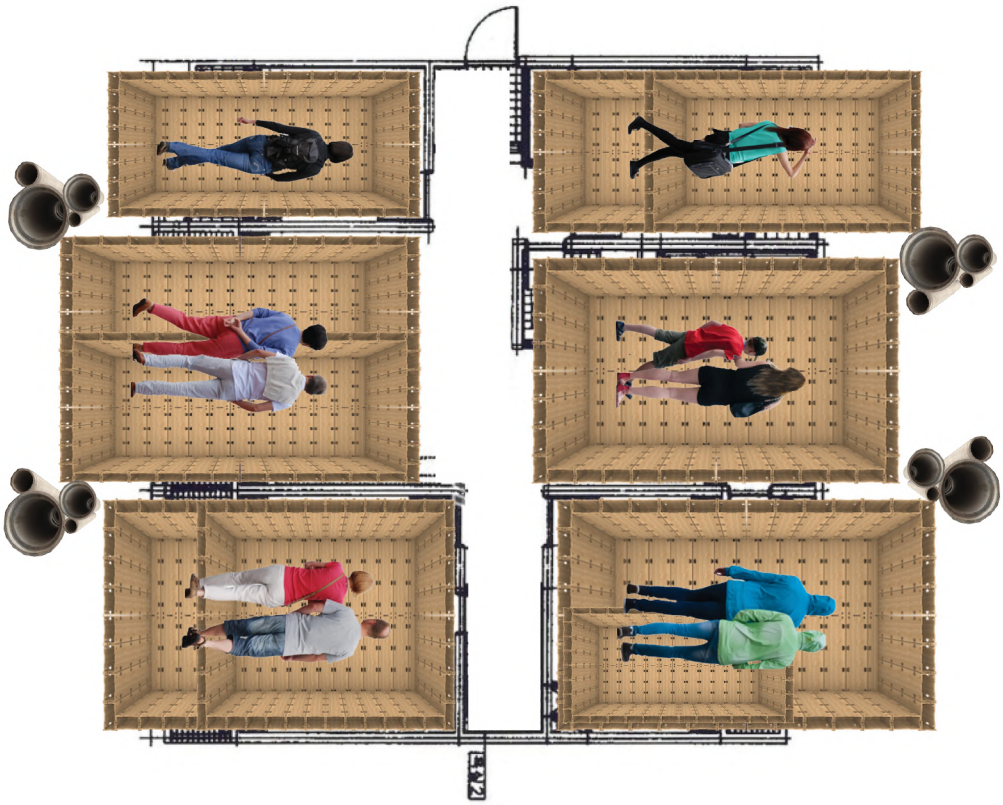
Design Objective



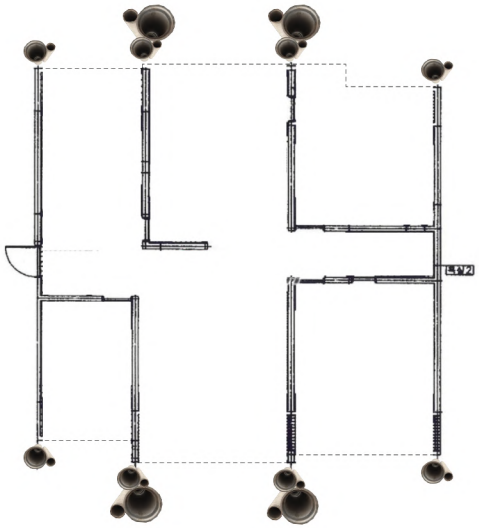
Apatu as Open Building

New Way of Housing Supply

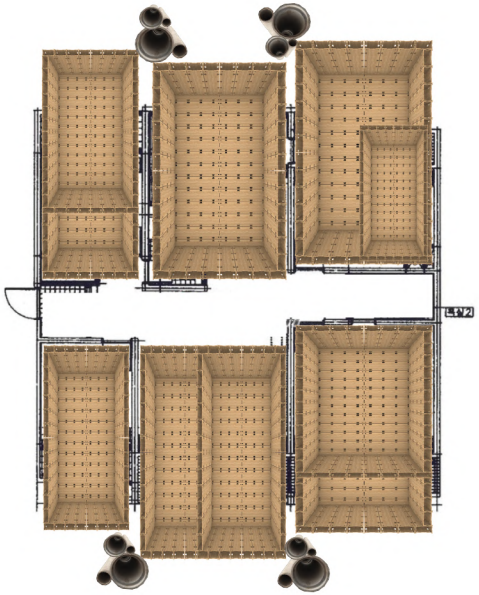
Design Objective



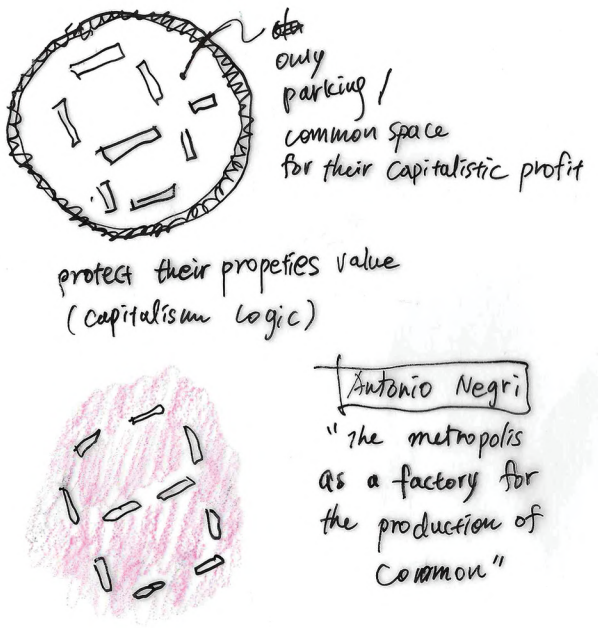
Design



Service



Infill

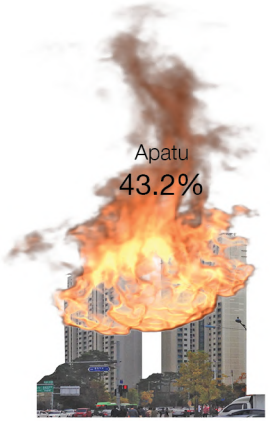


Community

3 Topics

Design Concept

Design

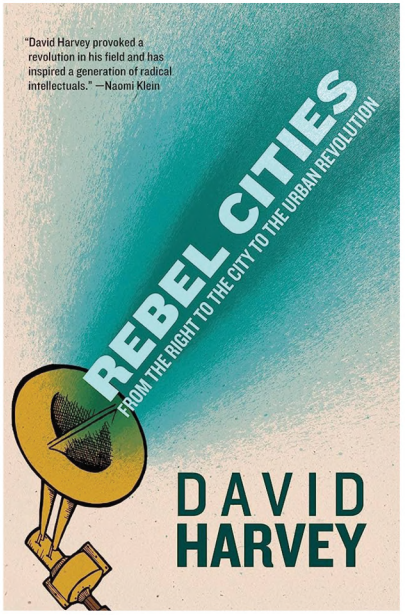


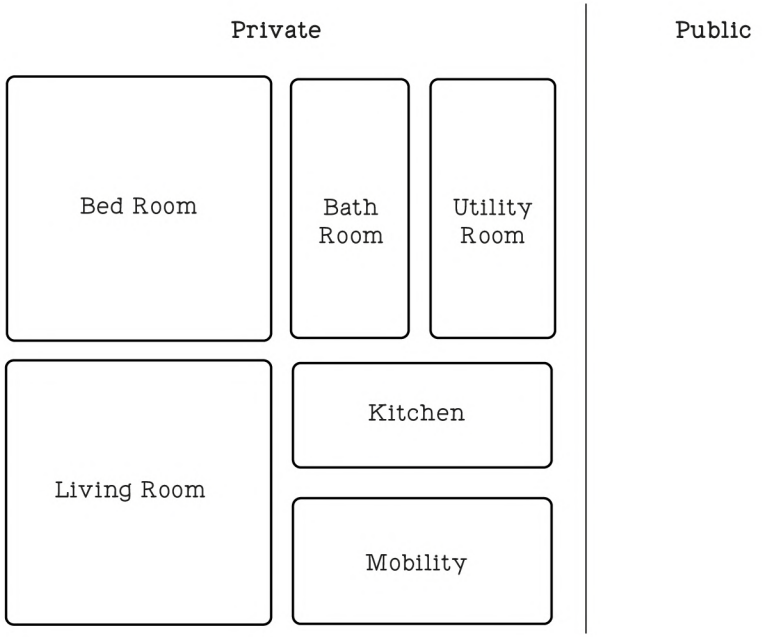
Apatu
43.2%

Construction
44.5%

Construction
47%

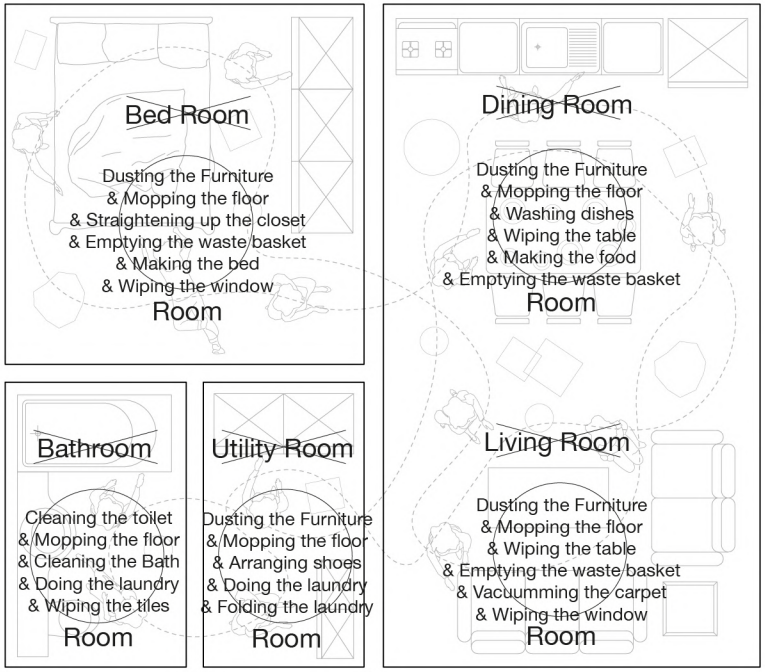
2022
25M

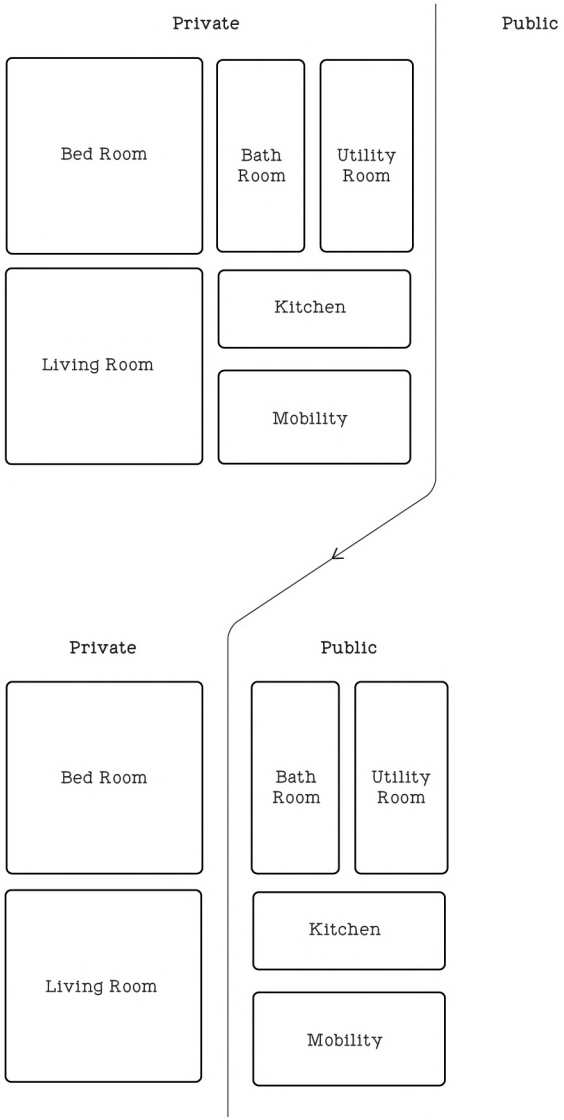




Tragedy of the Common

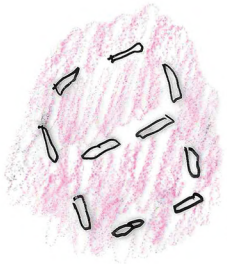
Design Concept

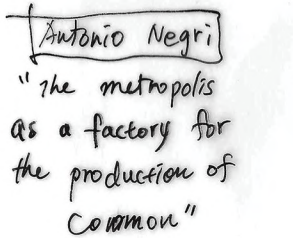




Domestic Labour

Design Concept

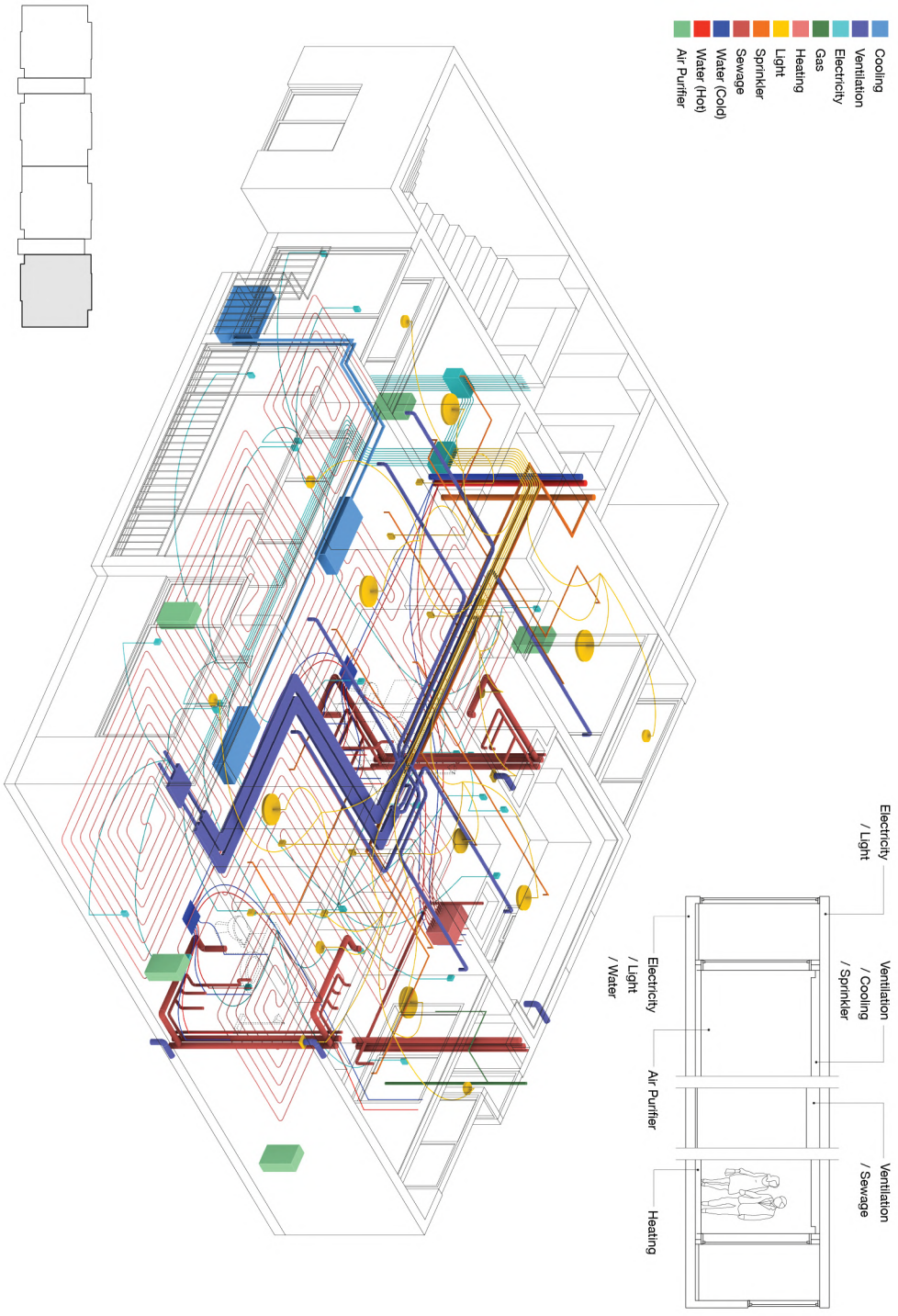




Sharing & Circular Economy

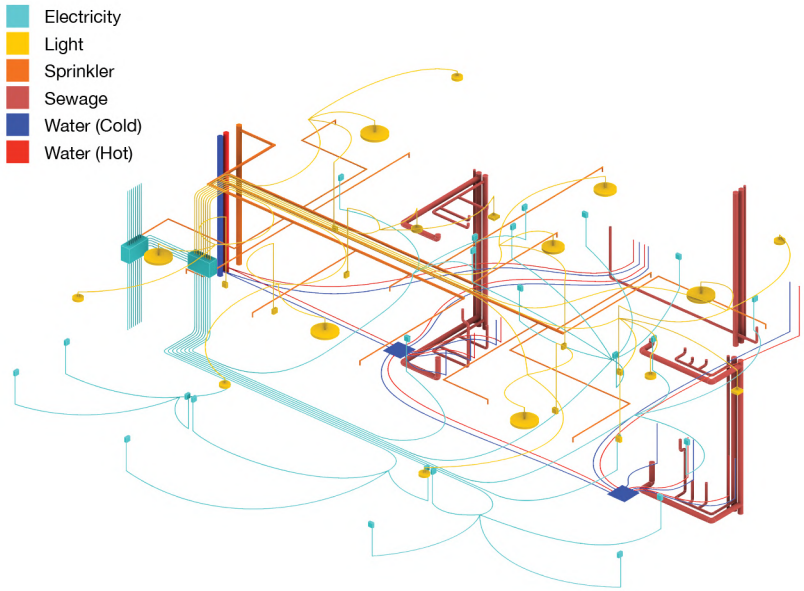
Design Concept

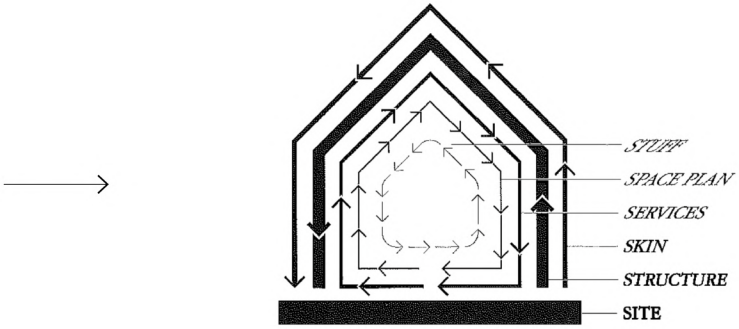
New Installation for Flexibility

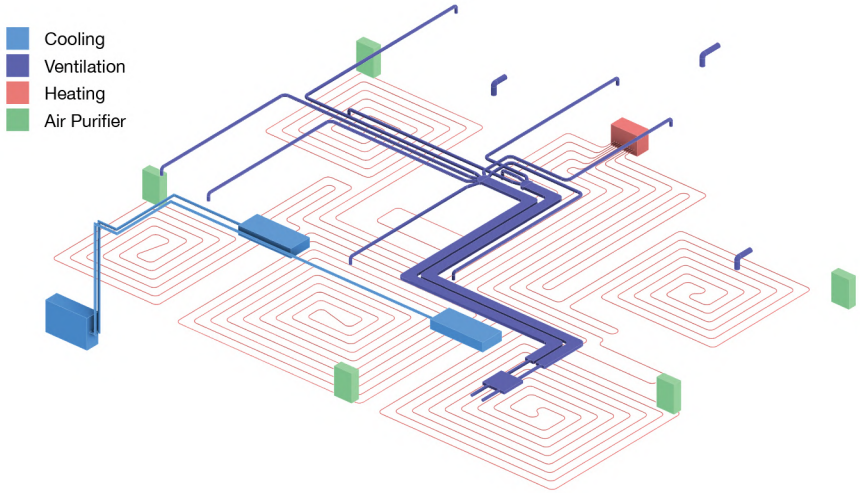


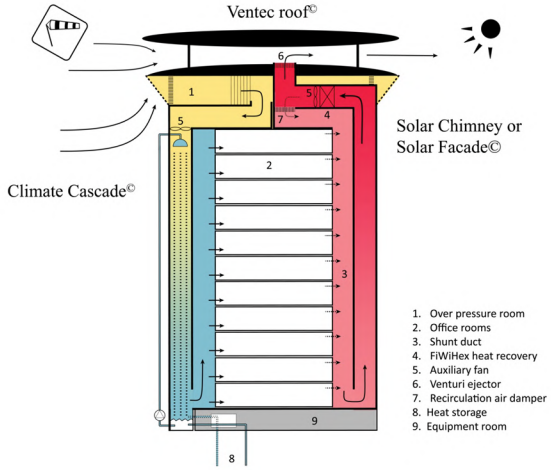
Existing Service

Thematic Research





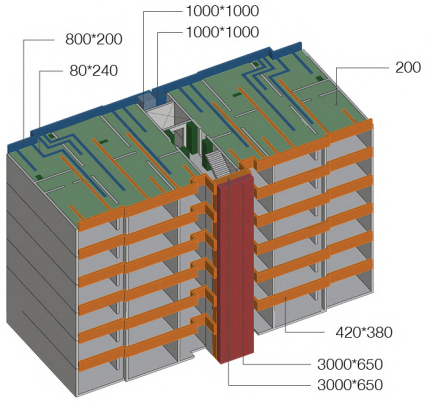
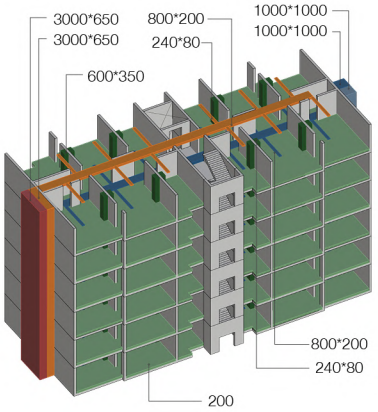
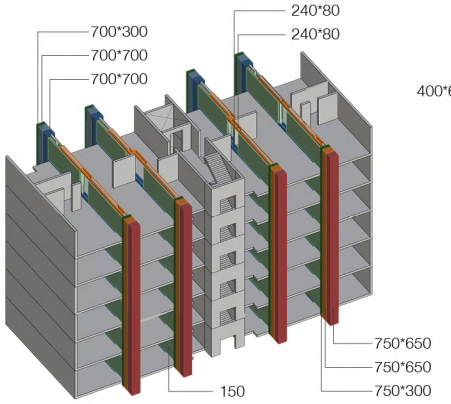
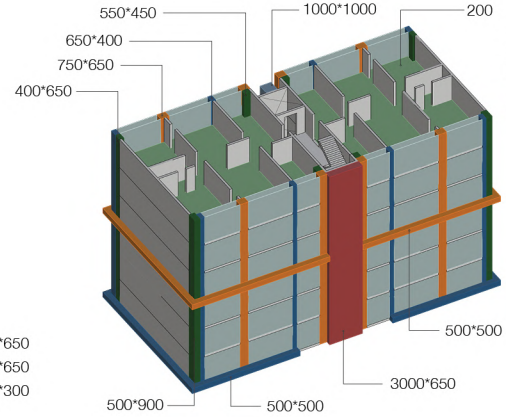




Existing and New

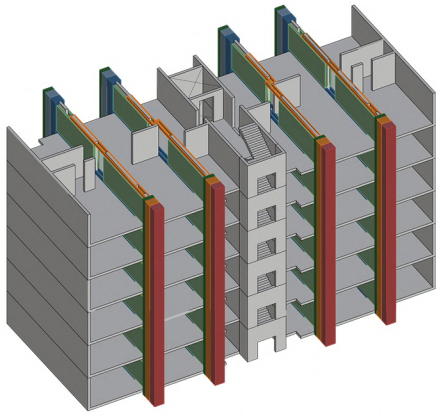
Thematic Research

New Installation for Flexibility

	Option 1 De-centralized	Option 2 Centralized	Option 3 Wall	Option 4 Facade
				
EWF Vertical Shaft	Façade (Core)	Façade (Side)	Façade	Façade (Core)
EWF Horizontal Shaft	Façade (Apartment)	Floor, Ceiling	Wall	Façade (New)
EWF Duct	Ceiling	Floor, Ceiling	-	-
Service Shaft	Existing	Interior	Façade	Façade (New)
Installation	Ceiling	Ceiling, Floor	Wall	Floor

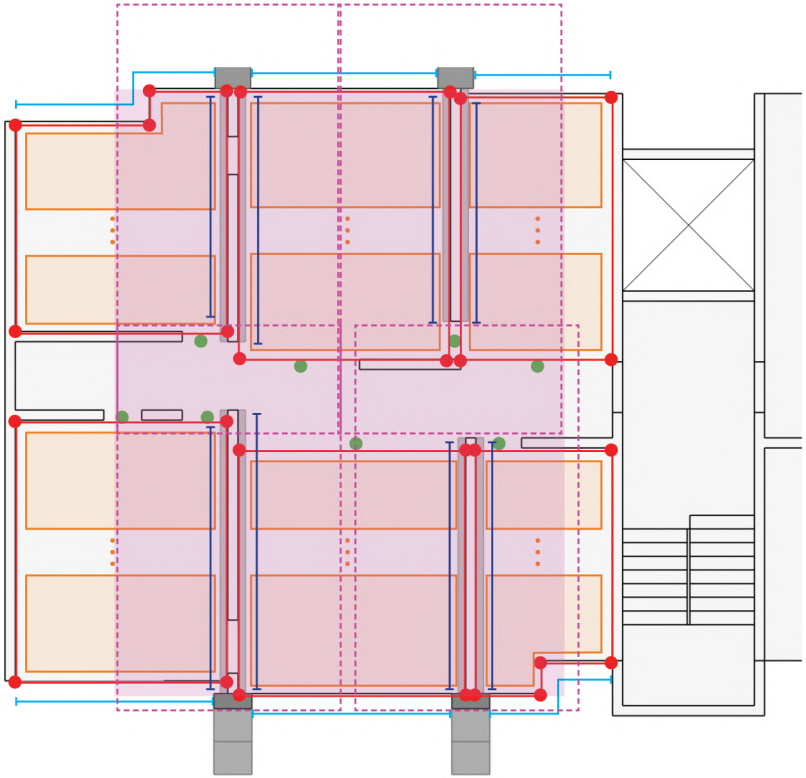
Installation Layout Options

Thematic Research



Wall

- EWF vertical Shaft : Facade
- EWF horizontal Shaft : Wall
- EWF Pipe : -
- Service Shaft : Facade
- Installation : Wall



Adaptability

Circulation
Weight 1

Form Neutrality
Weight 2

Ceiling Height
Weight 3

Floor Area
Weight 1

Variability

Opening Size
Weight 3

Housing unit
Weight 3

Wet space area
Weight 3

Maintanance
Weight 2

Construction

Amount of Material
Weight 1

Diversity of Infill Method
Weight 2

Surface Area of Service
Weight 2

Climate Performance
Weight 1

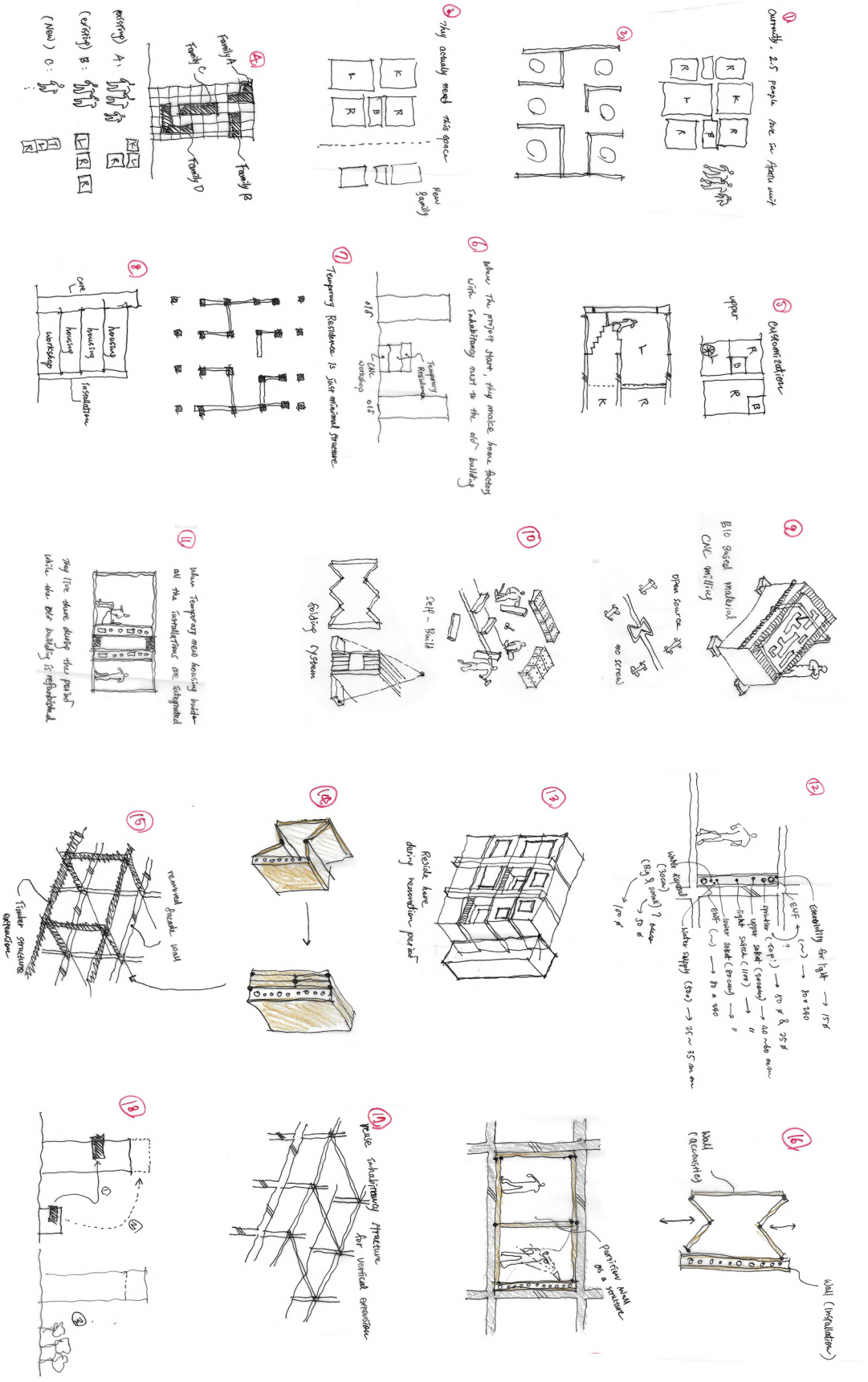
Total Score : 79

Option 3

Thematic Research

Existing and New Installation (Option 3)

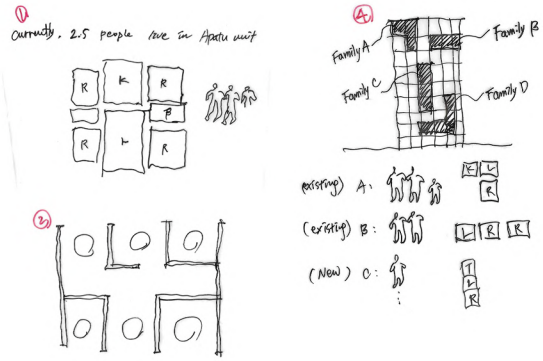
Thematic Research

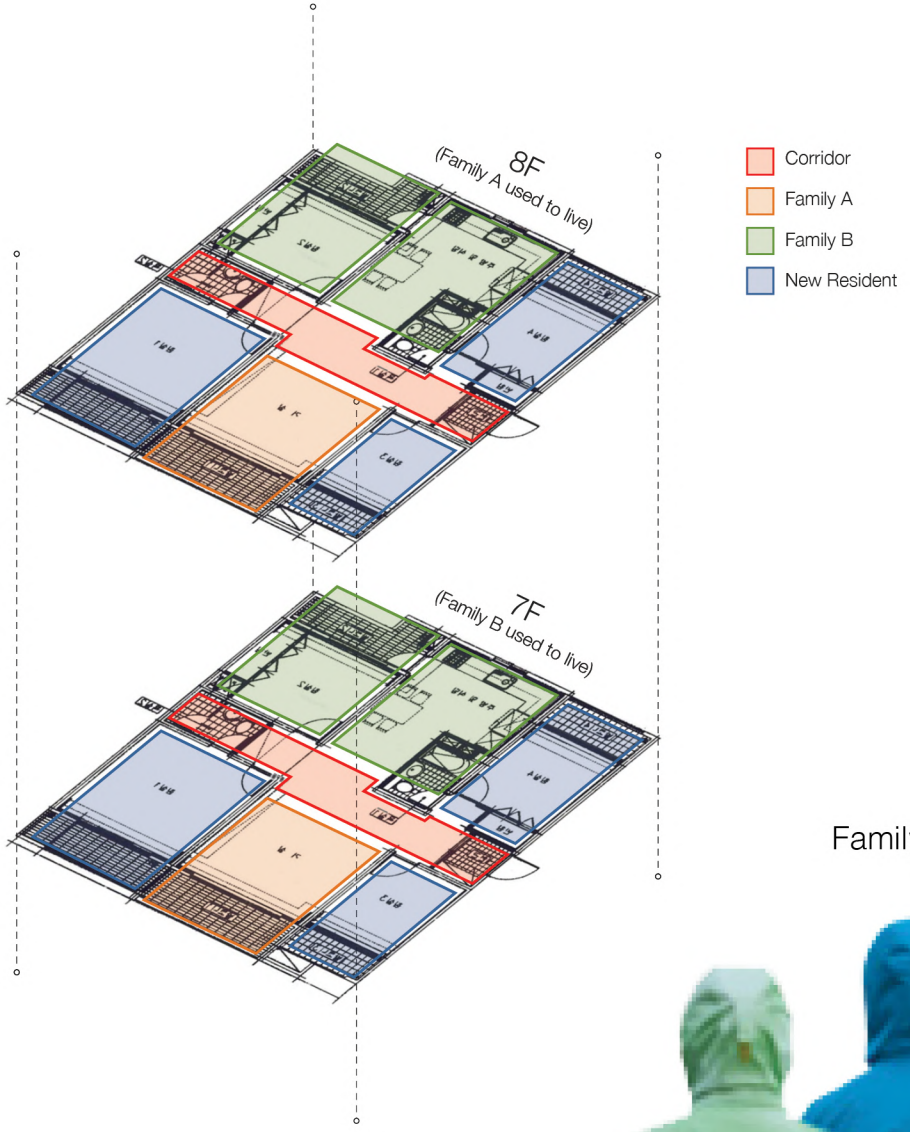


Reconstruction Process

Design Concept

Design



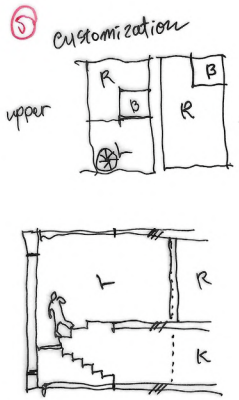


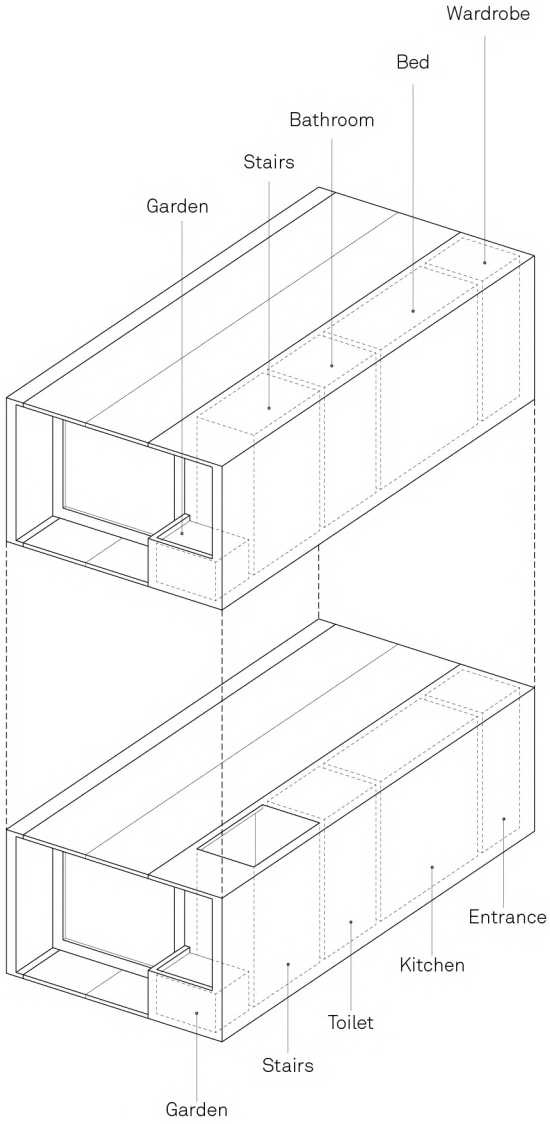
Family A

Family B

Negotiation

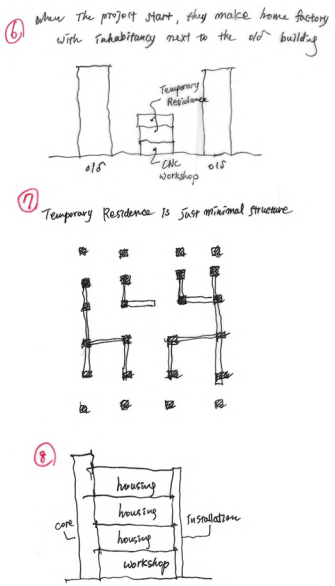
Design Concept





Customization

Design Concept

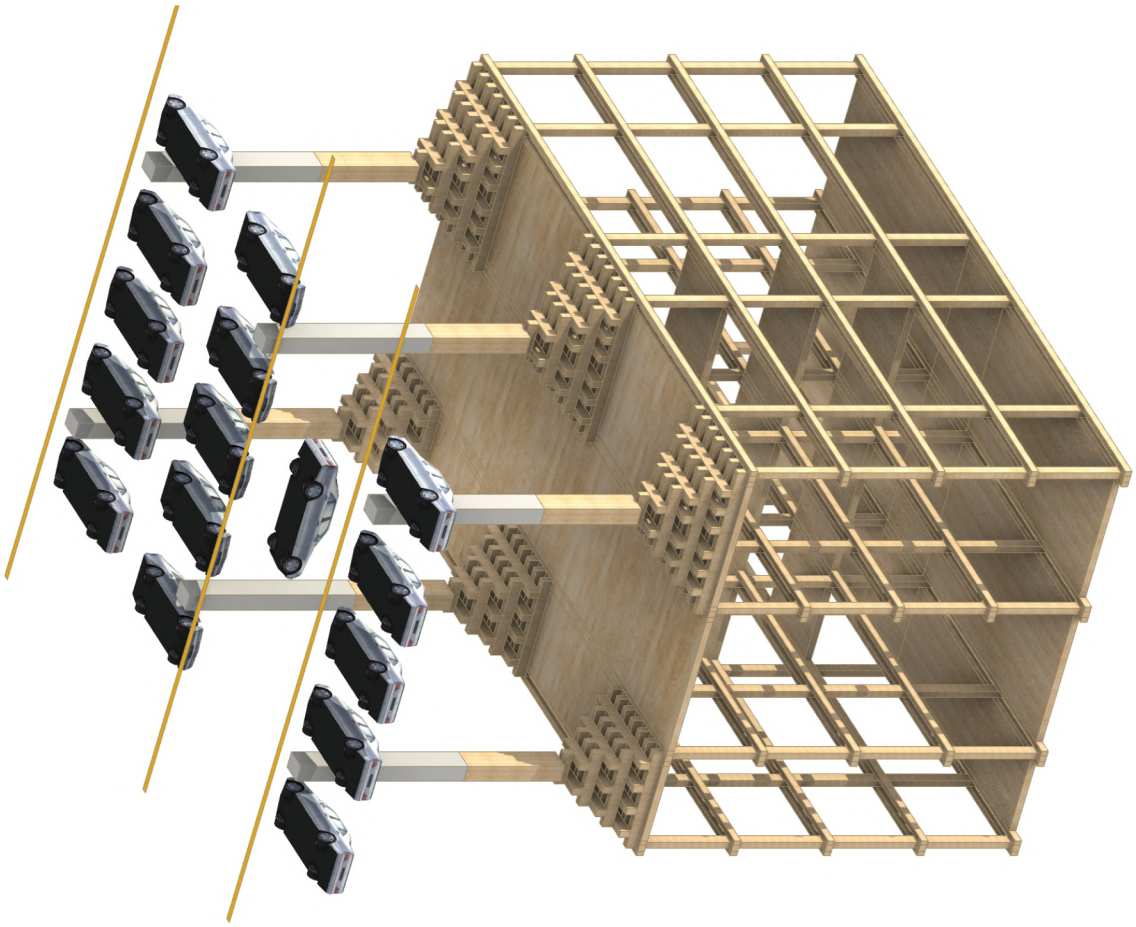


Temporary Structure

Design Concept

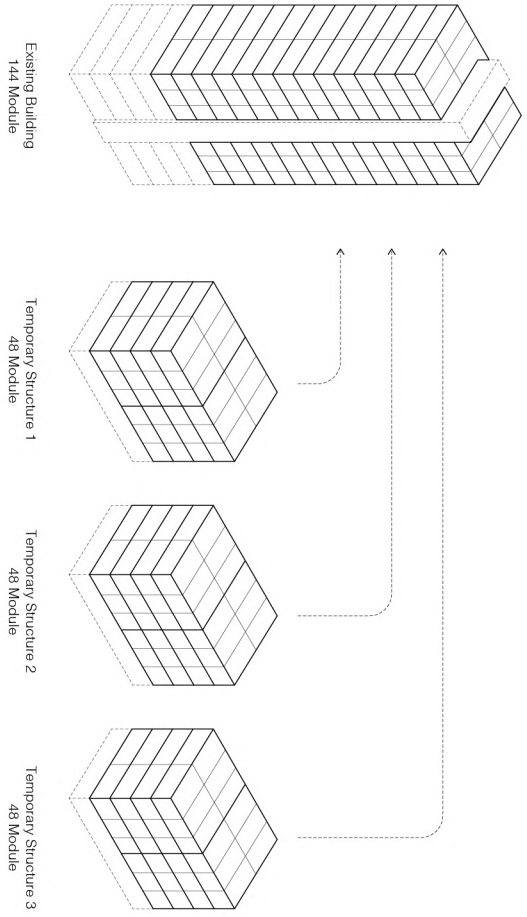
Temporary Structure

Design Concept



Temporary Structure

Design Concept



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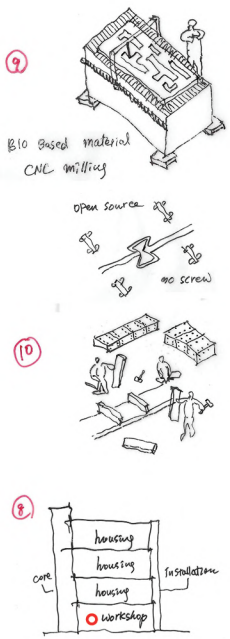
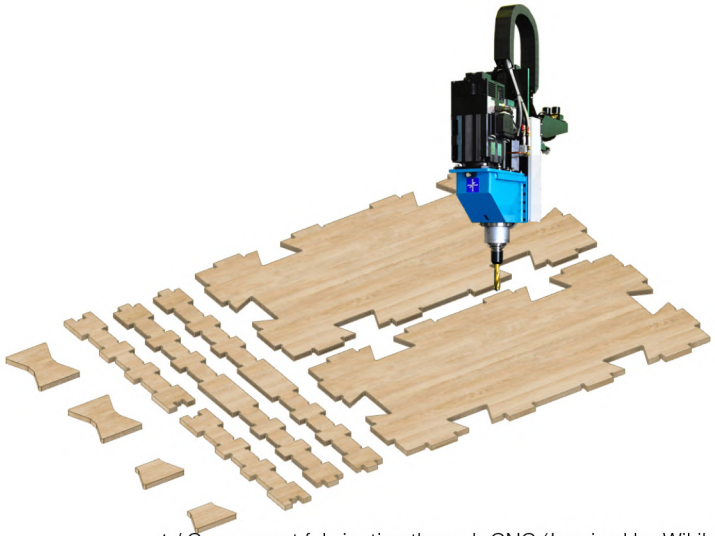
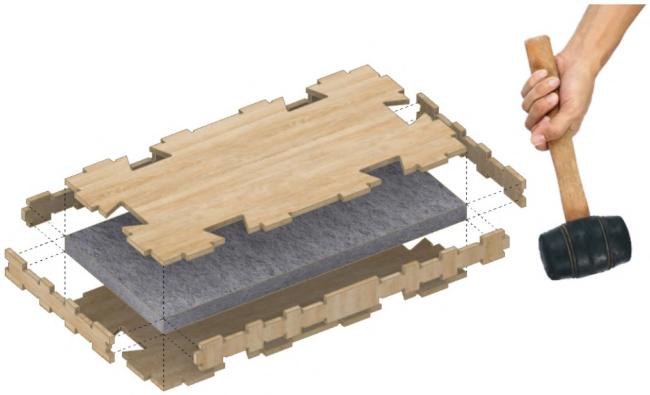


CNC Workshop

Design Concept



1 / Component fabrication through CNC (Inspired by Wikihouse)



2 / Module assembly with Sound insulation

3 / Two modules connection

4 / Wall connection

Open Source

Design Concept

Design

Building Module

Design Concept

Self-build

Design Concept

Self-build Process

Design Concept

Self-build Process

Design Concept

Self-build Process

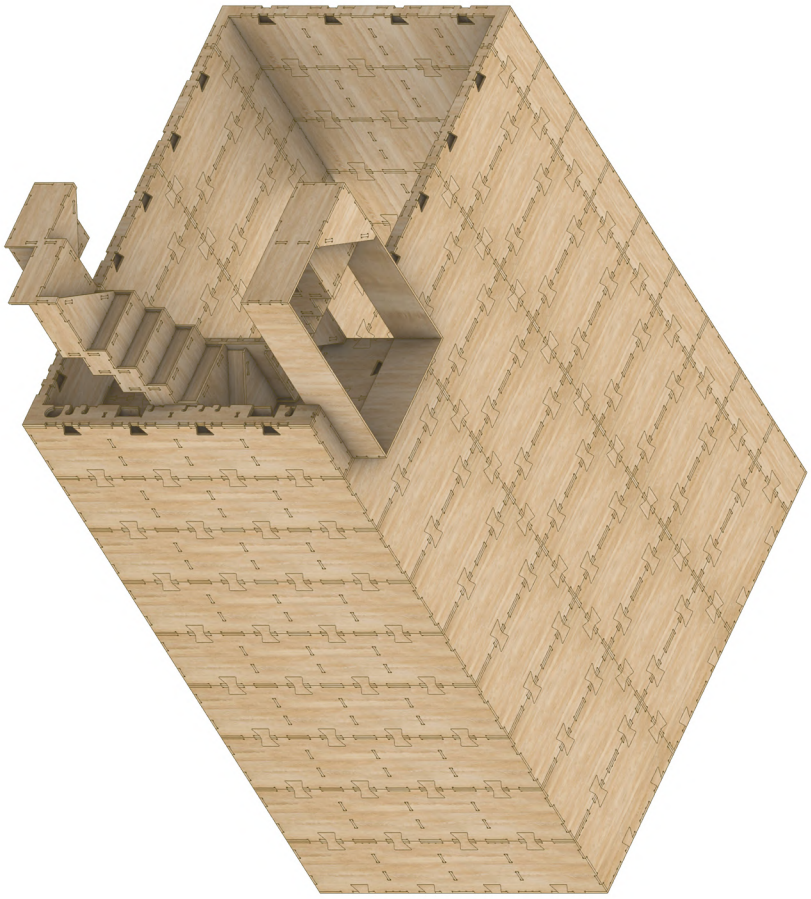
Design Concept

Self-build Process

Design Concept

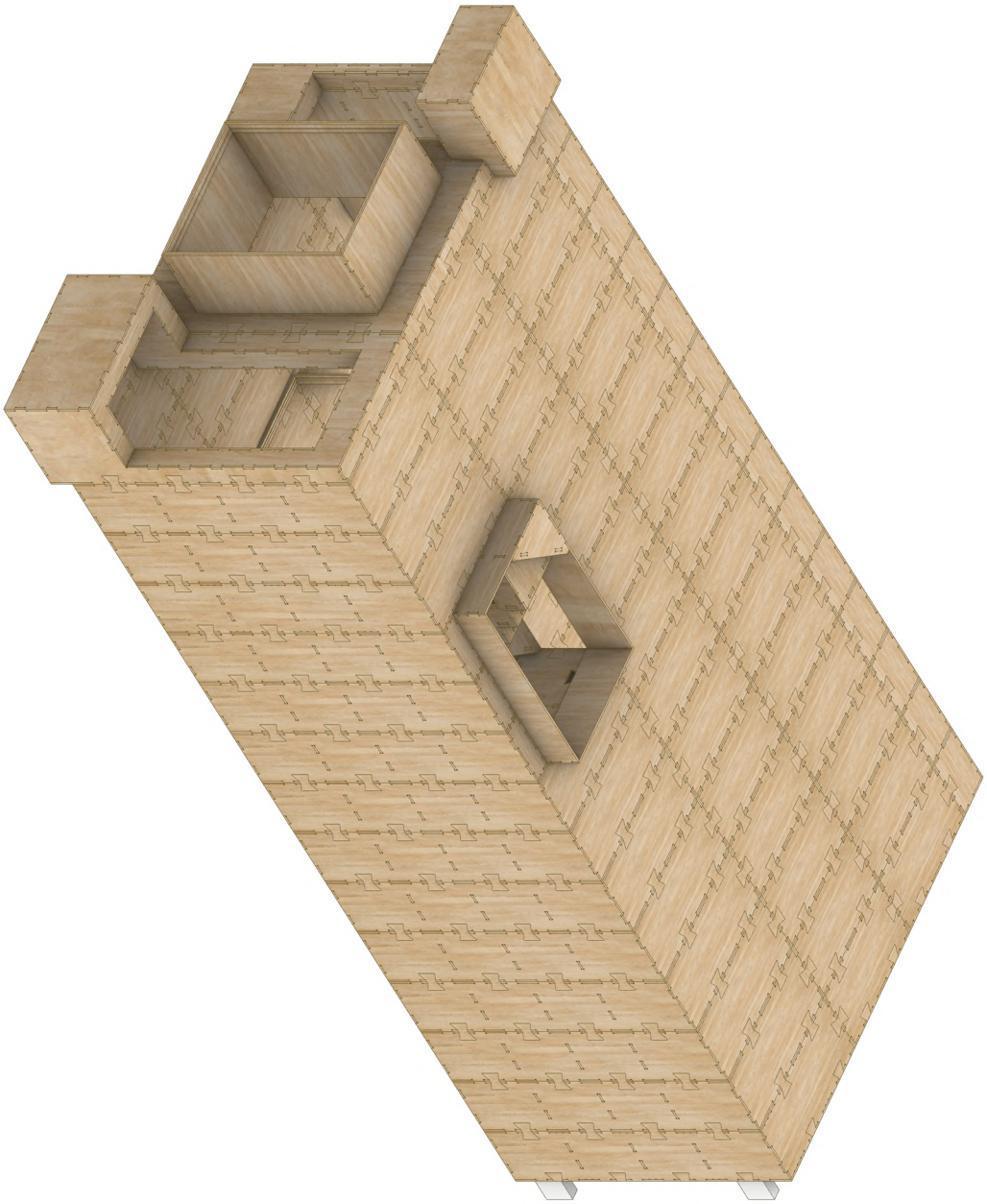
Self-build Process

Design Concept



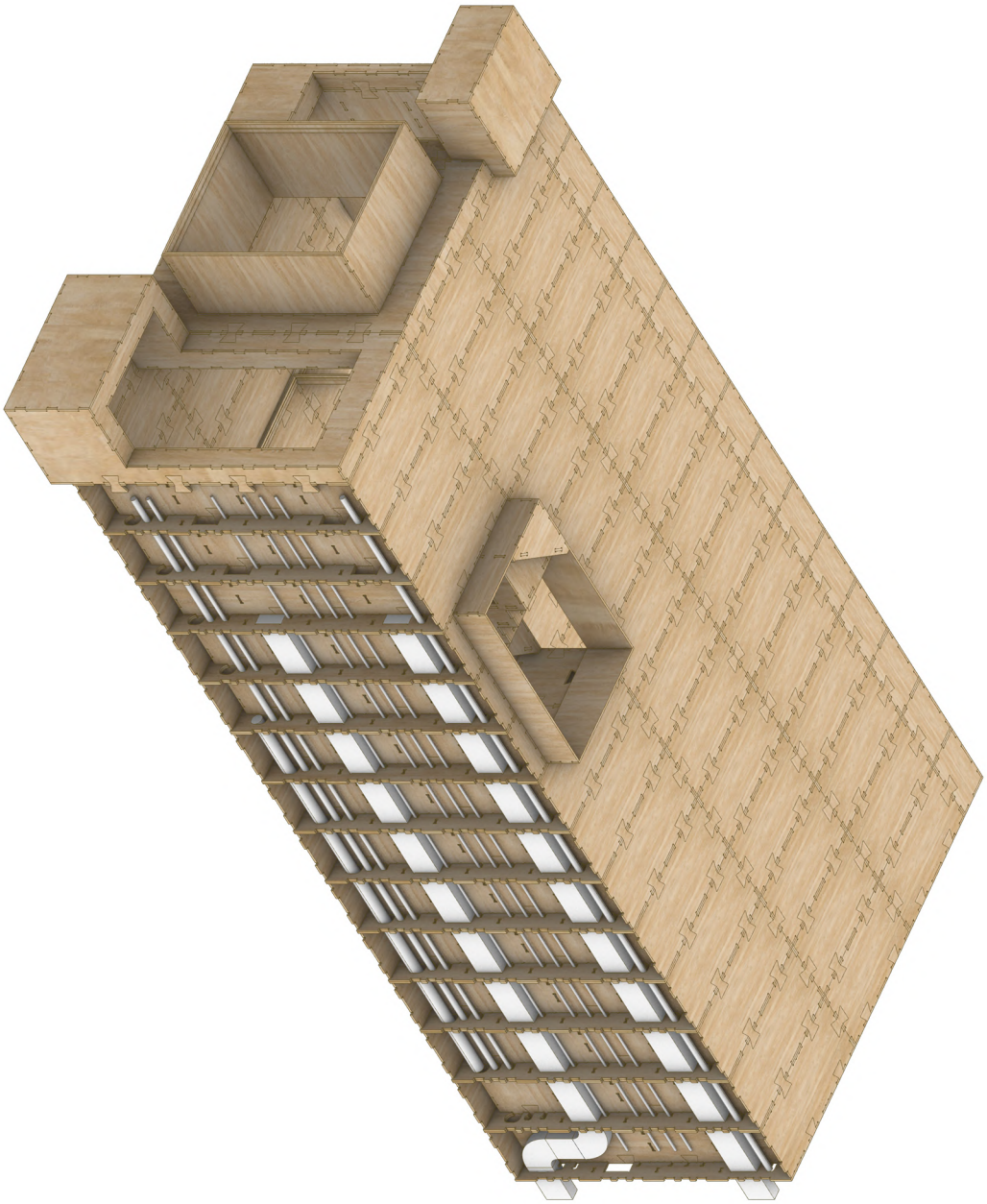
Self-build Process

Design Concept



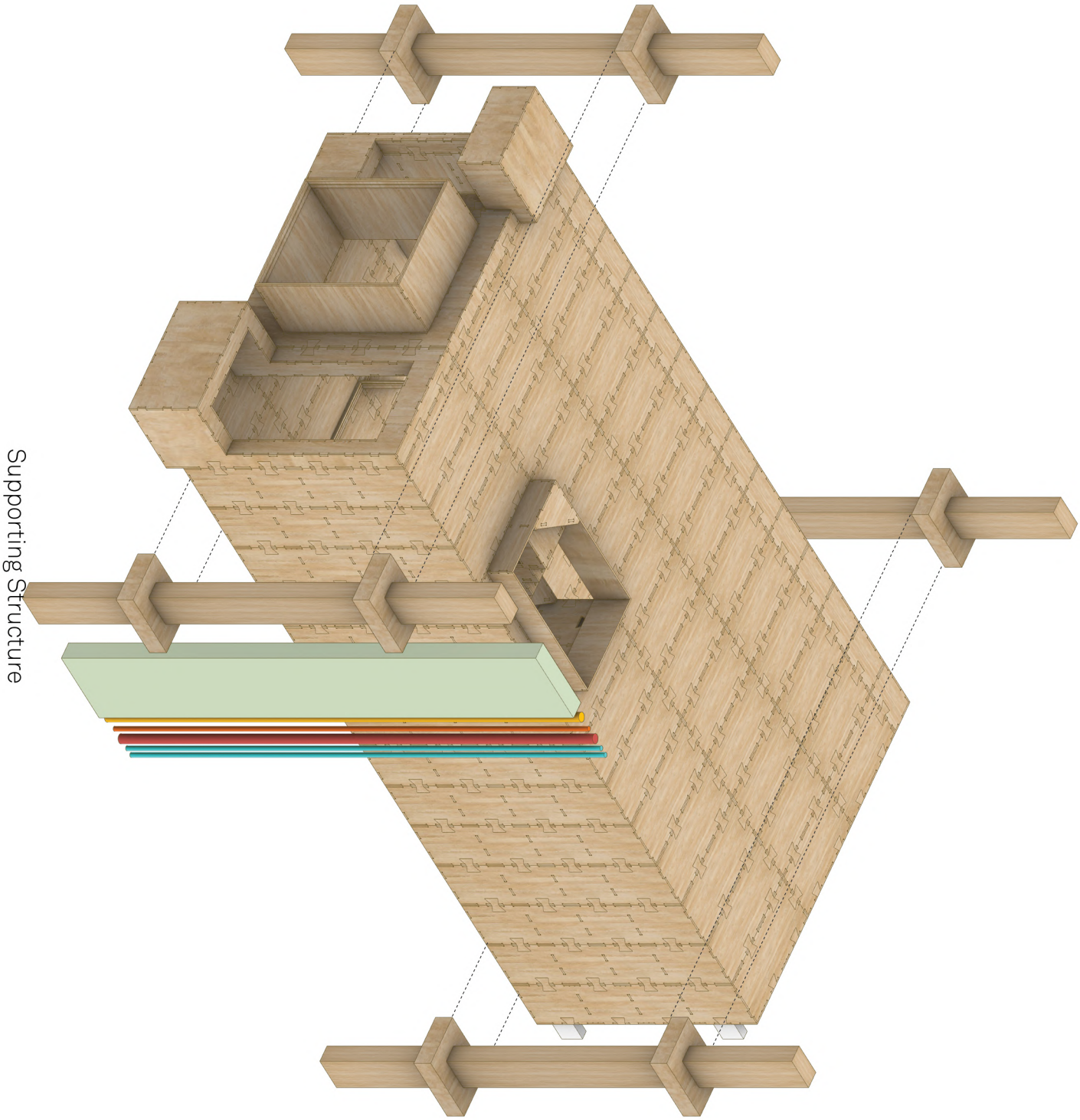
Self-build Process

Design Concept



Self-build Process

Design Concept



Supporting Structure

Design Concept

wieland

EASY **PLUG & PLAY** SOLUTIONS FOR ELECTRICAL RETAILERS/DIY STORES.

+ Chaining of gesis® multiple sockets possible
+ Power taps can be placed in any position
+ Modular installation

APPLICATION

In electrical retail outlets and DIY stores, larger electrical loads are required in a variety of ever-changing areas, such as shelves, sections, and recesses. Sockets also have to be made available flexibly.

SOLUTIONS

- Industrially prefabricated system components
- Prefabricated gesis® system distributors with connection cable and flat cable adapter
- Local fuse protection and pluggable outputs to the shelves
- Energy distribution as per IEC 61535 as part of the fixed installation

ADVANTAGES

- Fast, easy, and safe installation
- High functional reliability due to defined, symmetrical structures
- Easy adjustment to change load centers
- Modifications at the socket level can be done by electrically trained staff

INFRASTRUCTURE CABLING

The retail space is supplied via flexible 5G10 mm² flat cables. This markedly reduces the cabling required and provides unlimited energy within the area.

SYSTEM DISTRIBUTORS

Our system distributors secure energy supply with locally fused gesis® outputs. New load centers can be created by additional system distributors at any time.

DEVICE SOCKETS

Our sockets with gesis® connection are simply pluggable and secure energy supply to end devices. They are also available with optional fine surge protection.

Plug & Play Installation

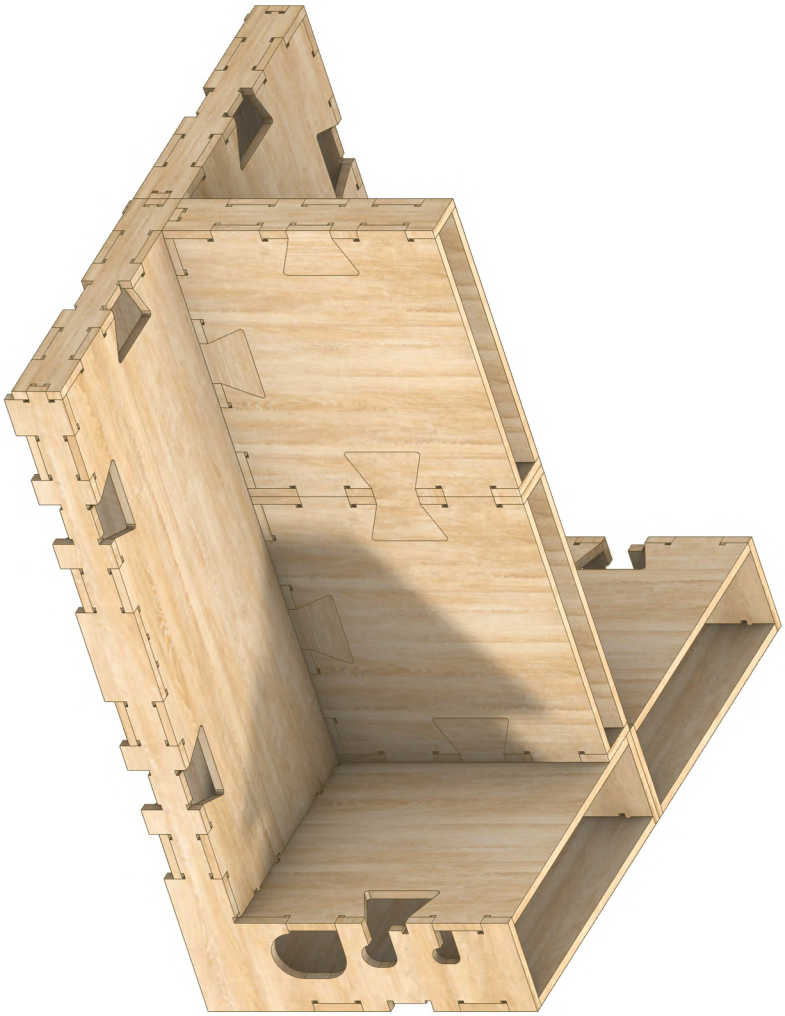
Design Concept

Partition Wall Joint

Design Concept

Partition Wall Joint

Design Concept



Partition Wall Joint

Design Concept

Partition Wall Joint

Design Concept

Partition Wall Joint

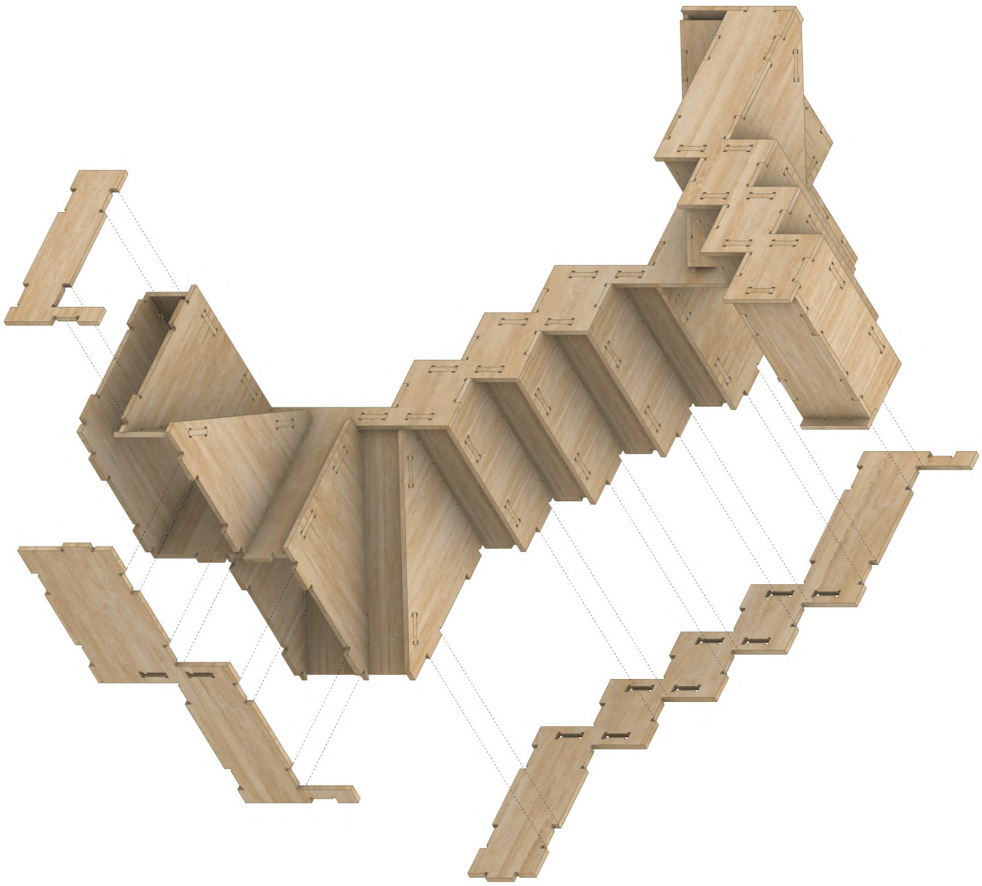
Design Concept

Partition Wall Joint

Design Concept

Stairs

Design Concept



Housing Module

Design Concept

Temporary Housing

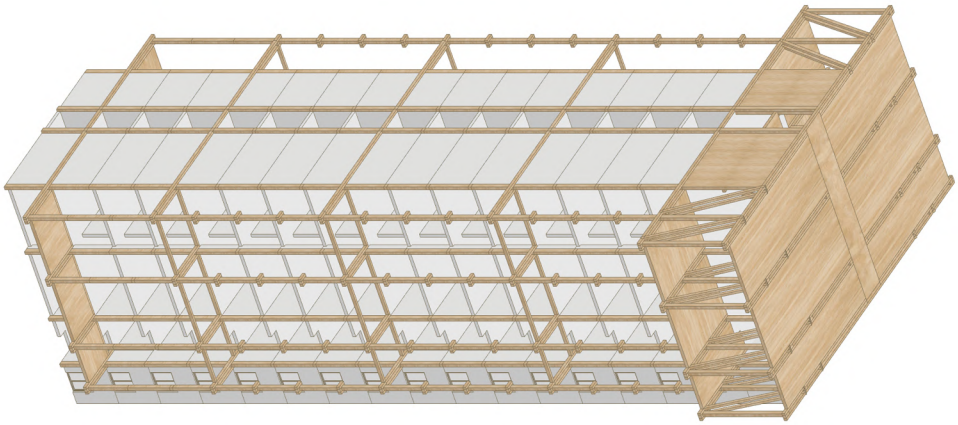
Design Concept

Temporary Housing

Design Concept

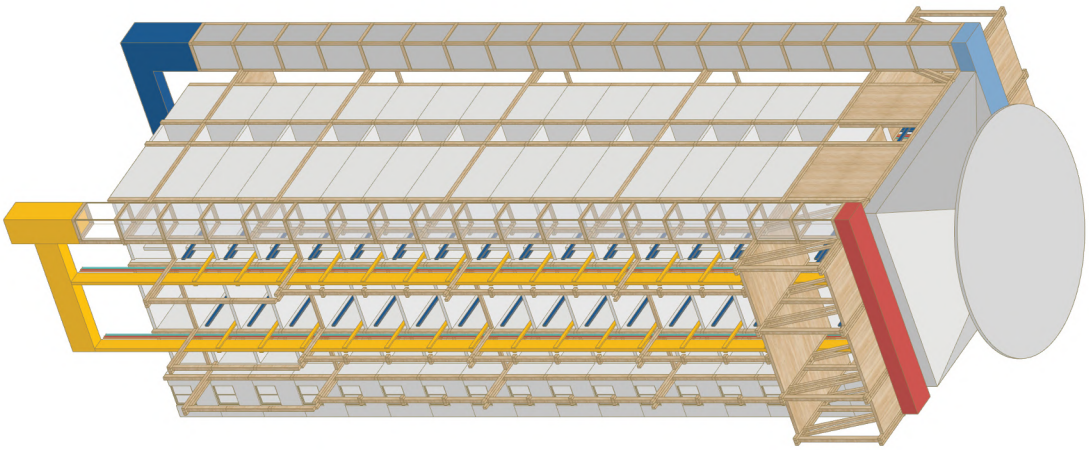
Existing Apartment Renovation

Design Concept



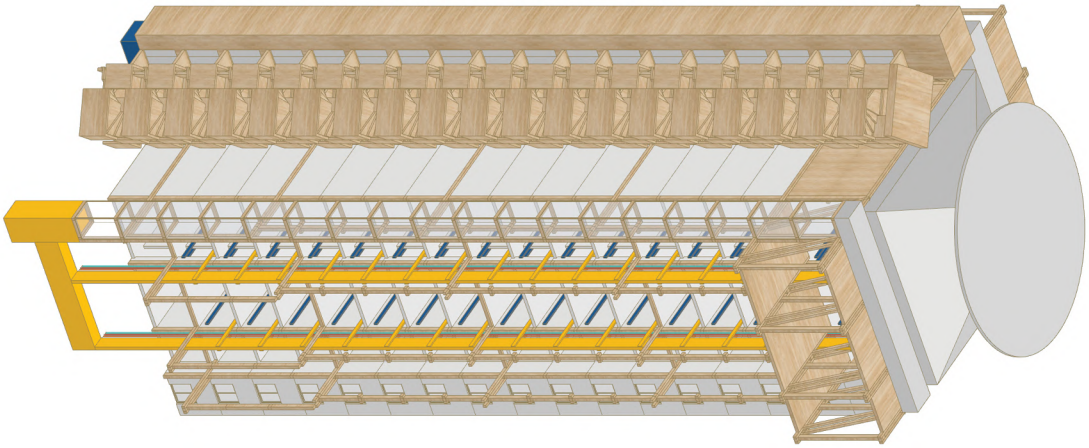
Existing Apartment Renovation

Design Concept



Existing Apartment Renovation

Design Concept

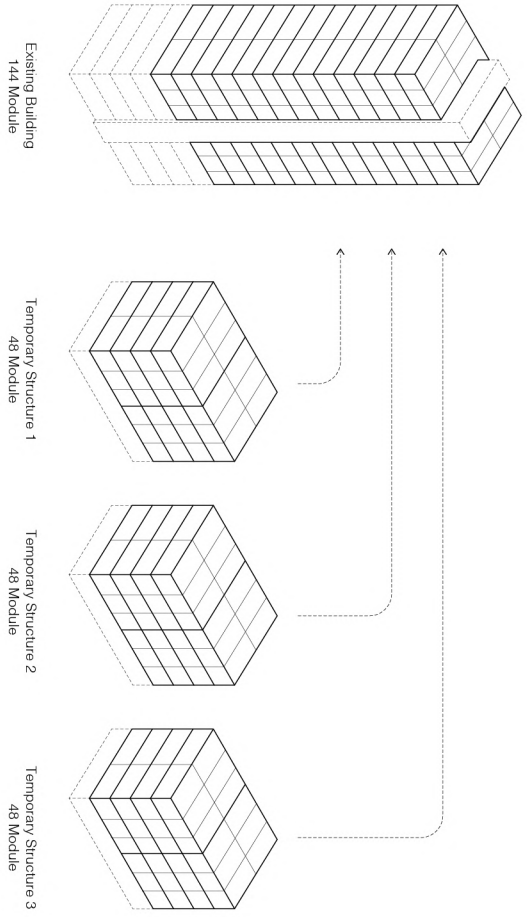


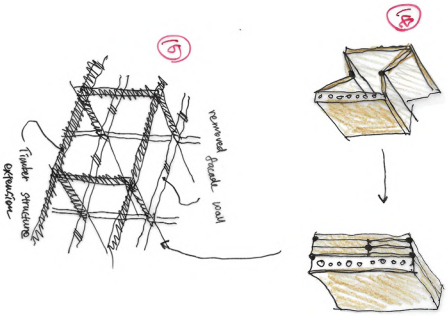
Moving

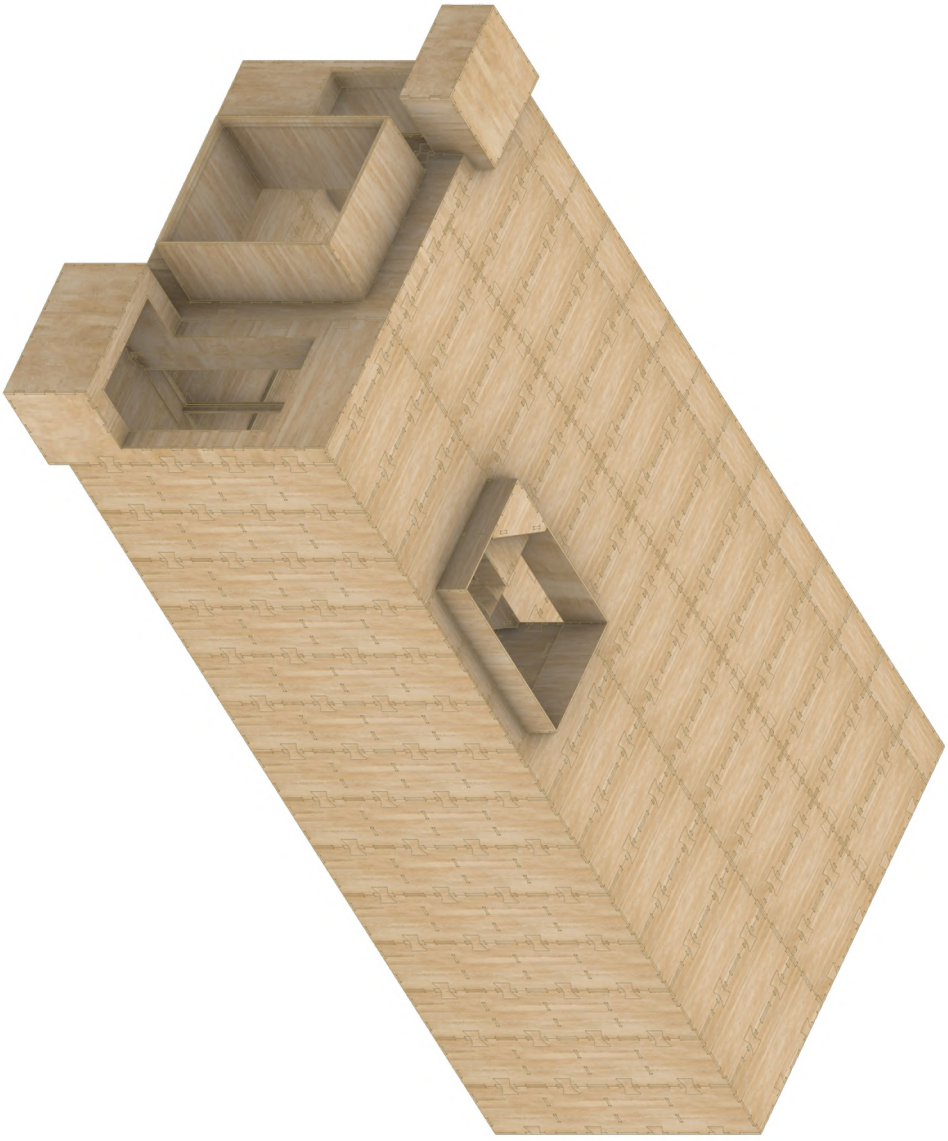
Design Concept

144 Module Moving

Design Concept

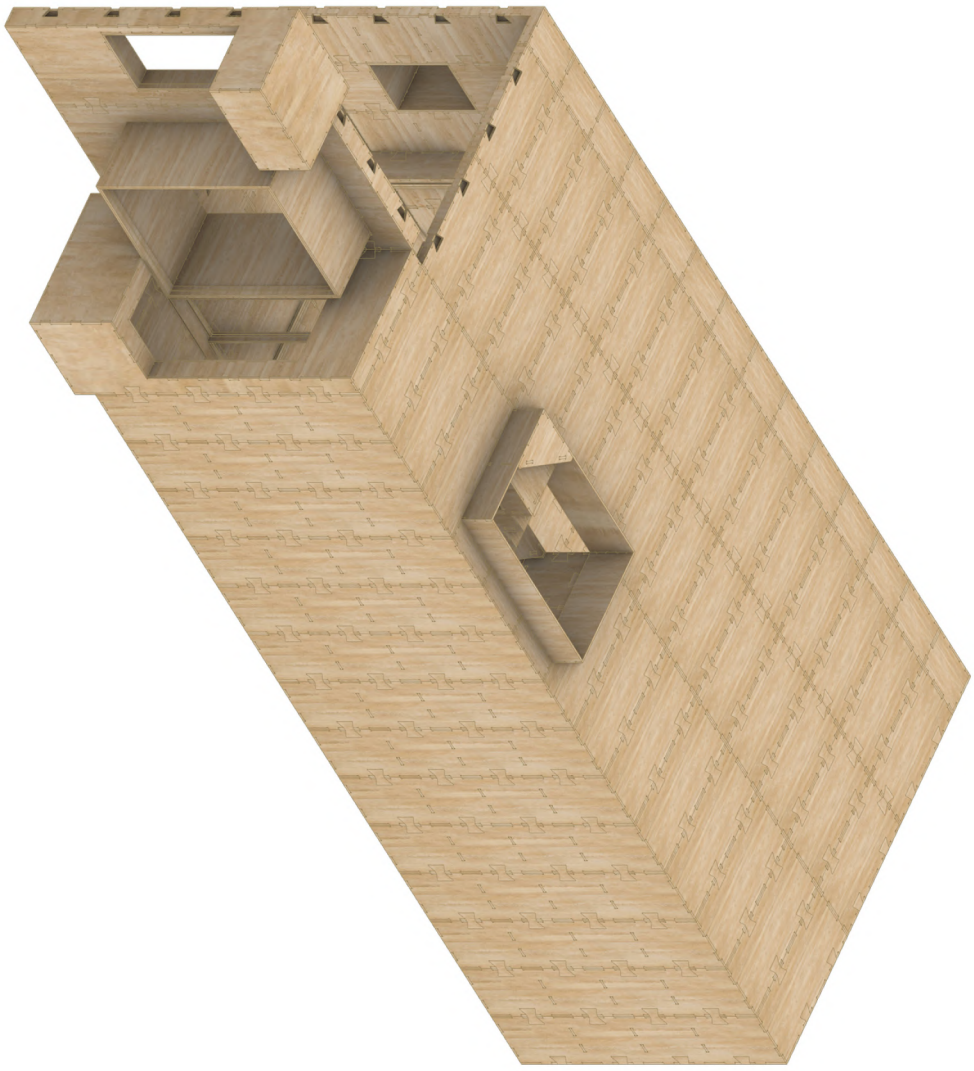






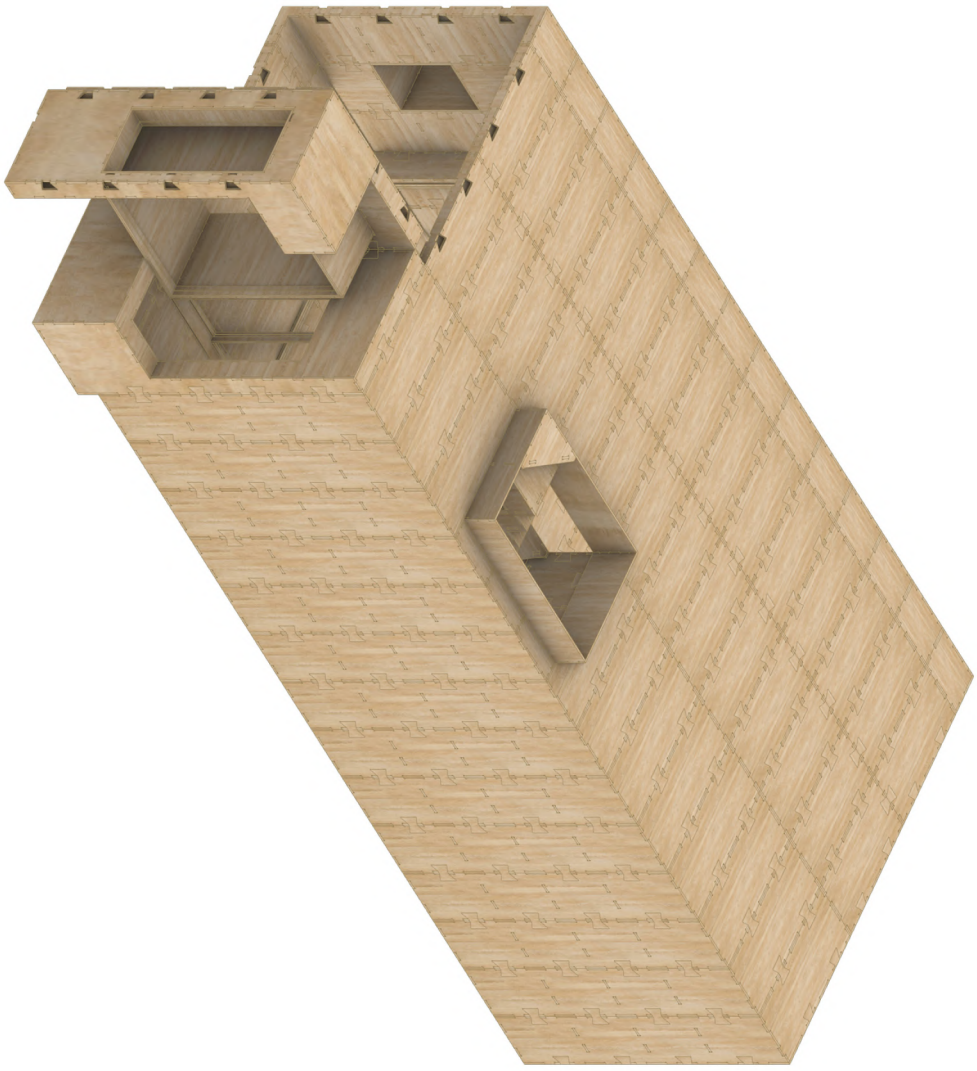
Folding

Design Concept



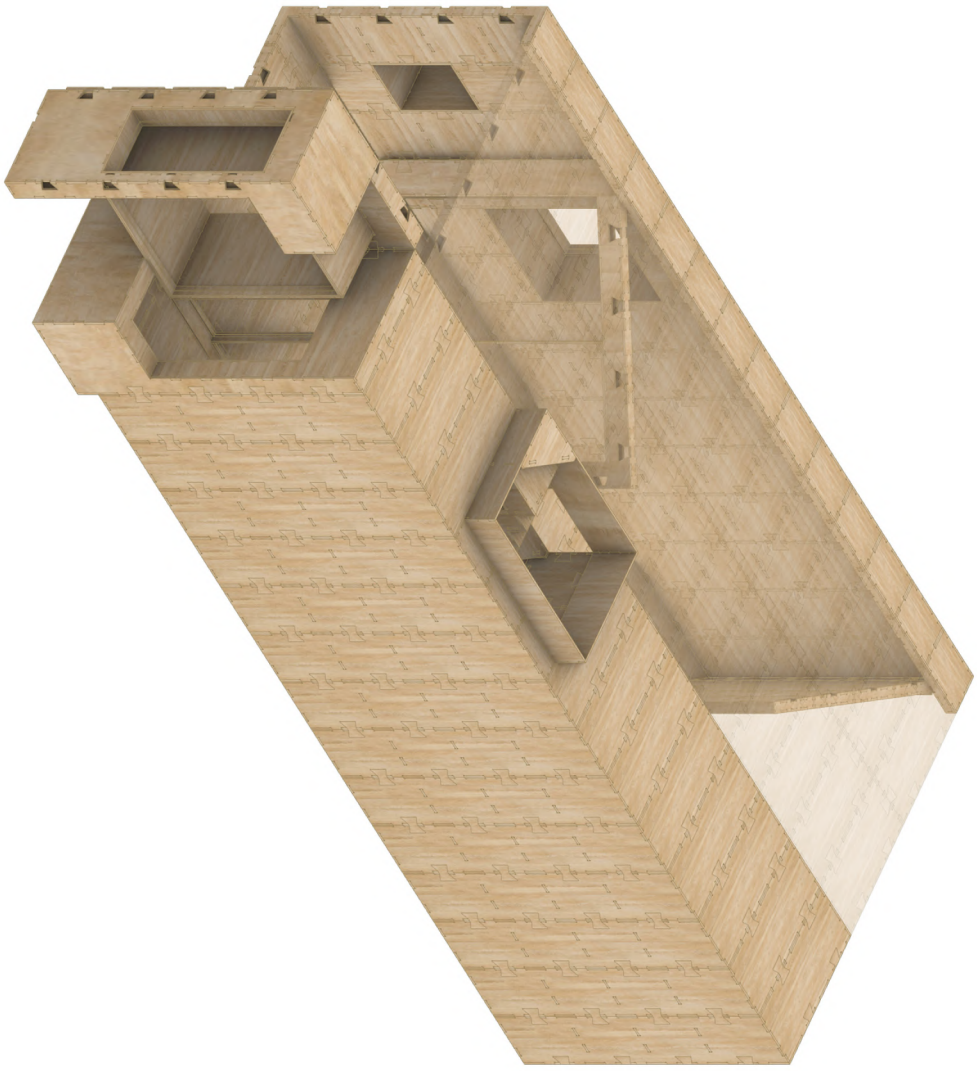
Folding

Design Concept



Design Concept

Folding

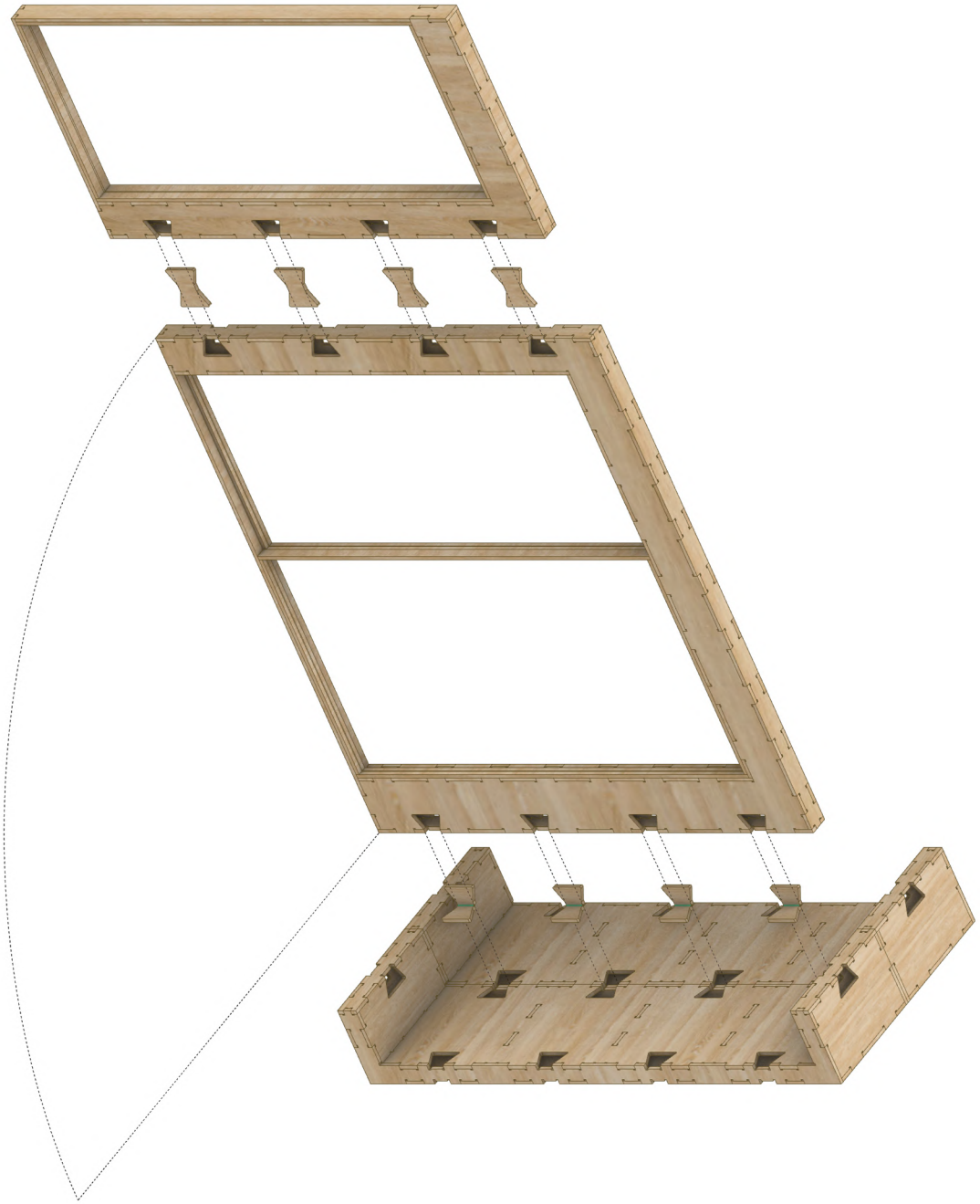


Folding

Design Concept

Design Concept

Folding



Design Concept

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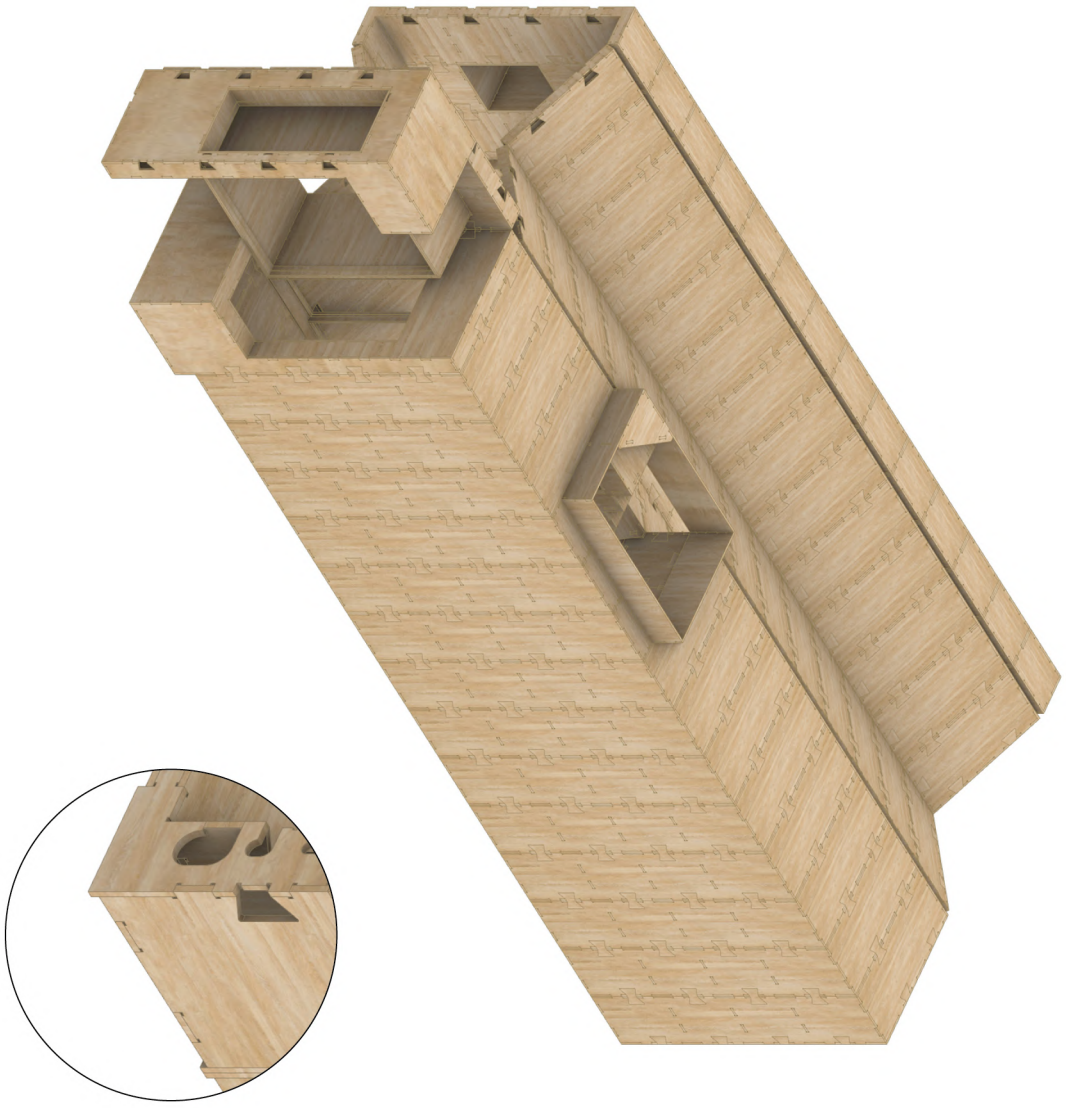
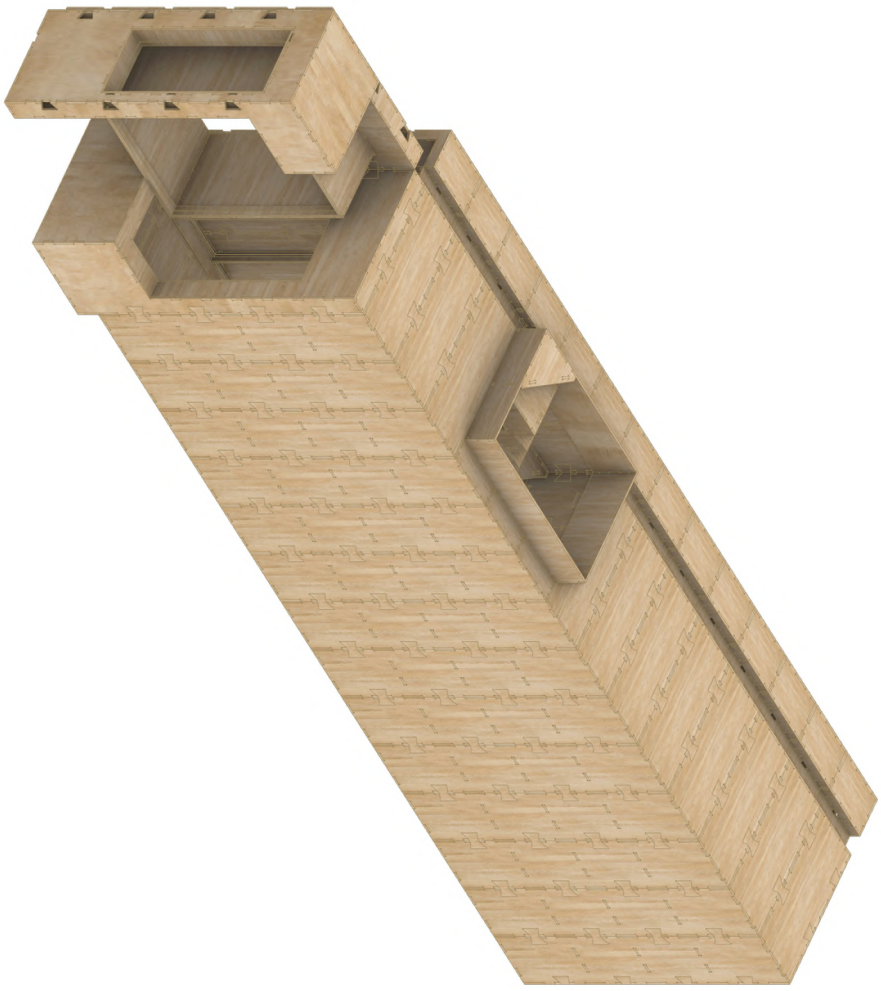


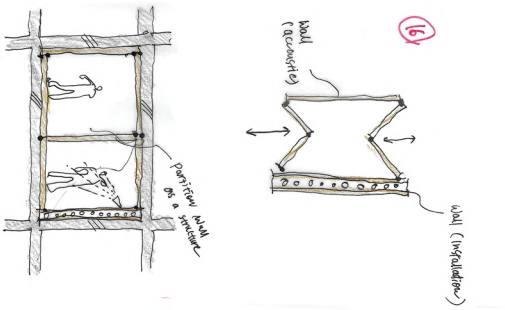
Folding

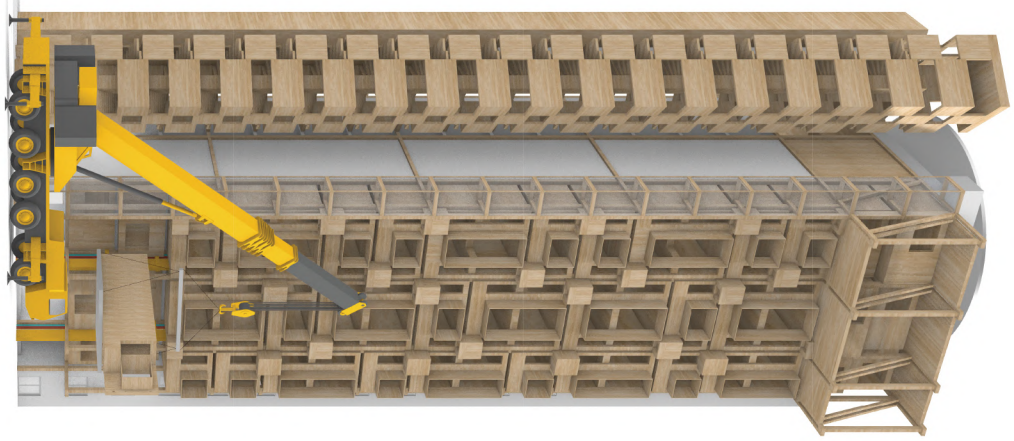
Design Concept

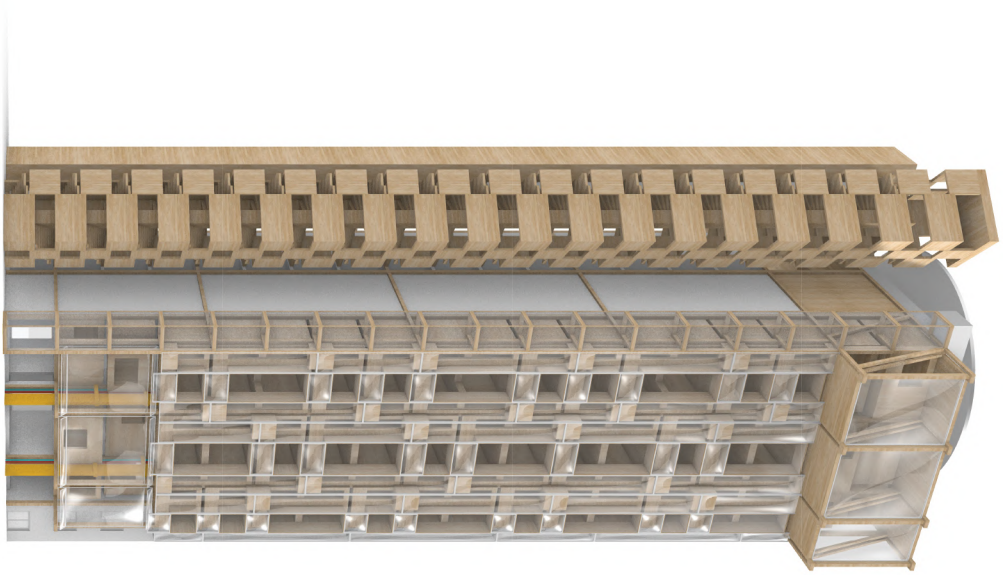
Design Concept

Folding

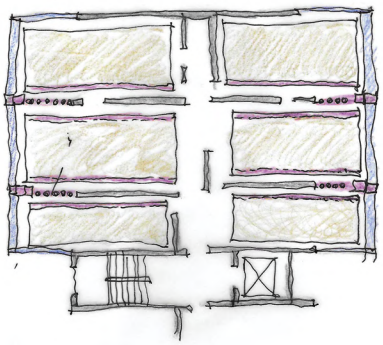


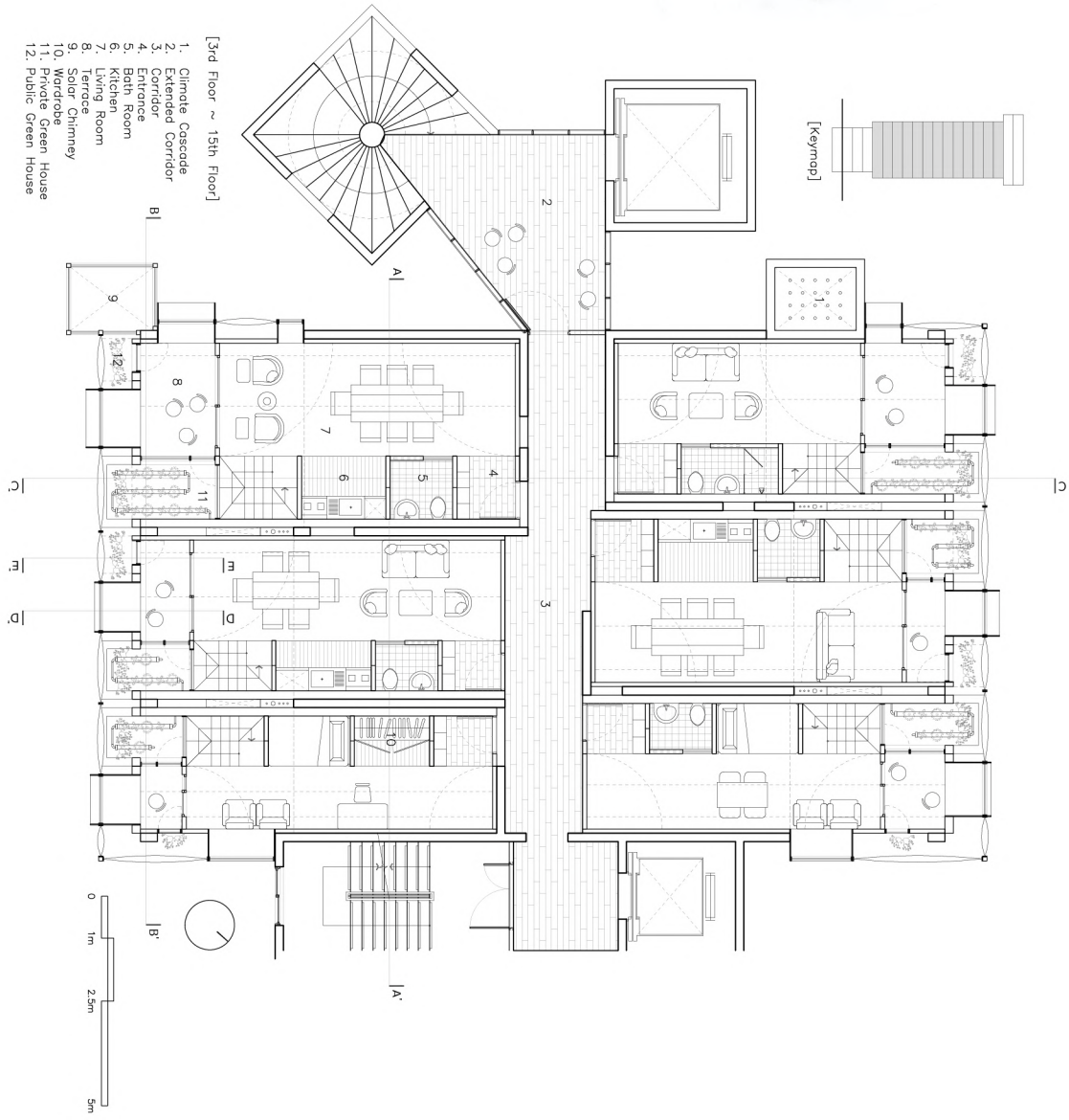






Moving
Design Concept





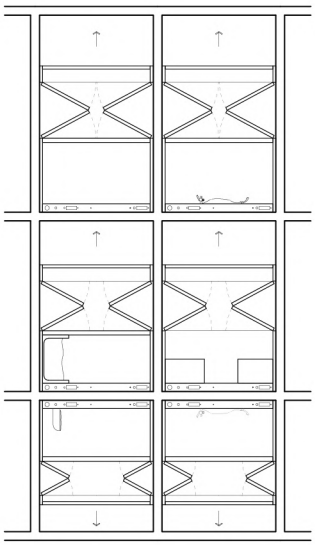
Plan

Design Concept

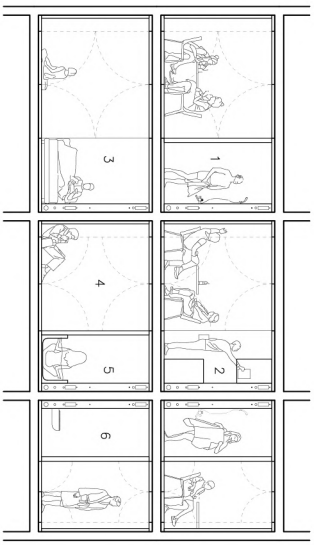
Section

Design Concept

[Folding Section]

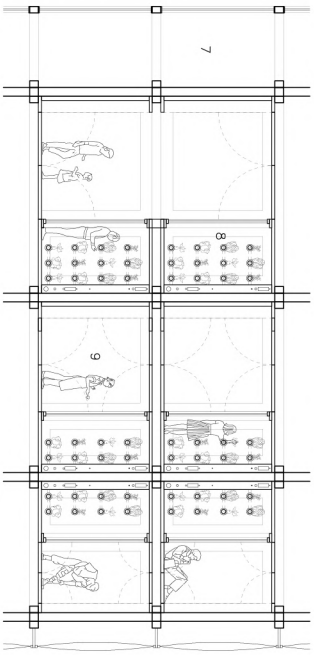


[A–A' Section]

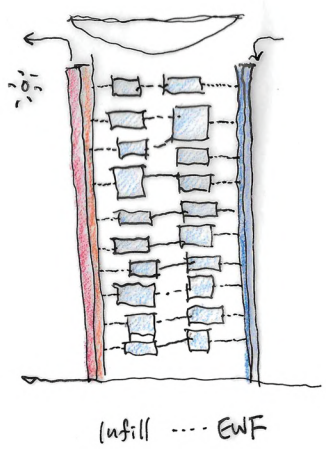


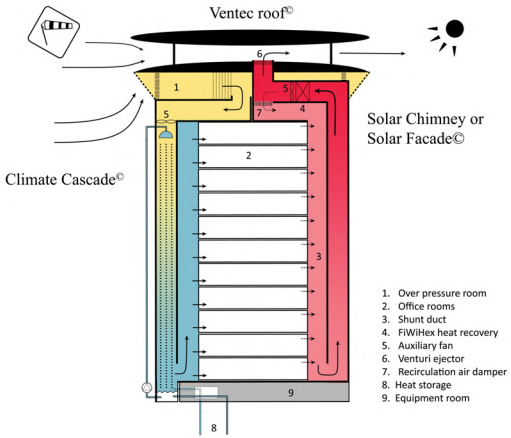
[B–B' Section]

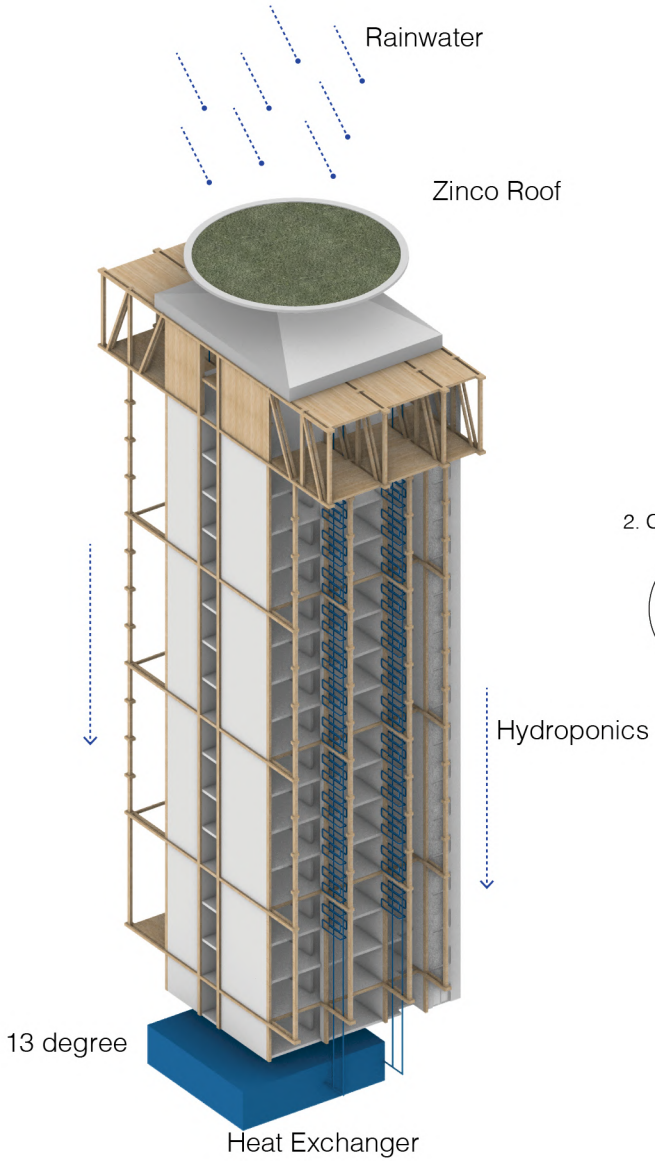
1. Bath Room
2. Kitchen
3. Bed Room
4. Living Room
5. Bath Room
6. Toilet
7. Solar Chimney
8. Green House
9. Terrace

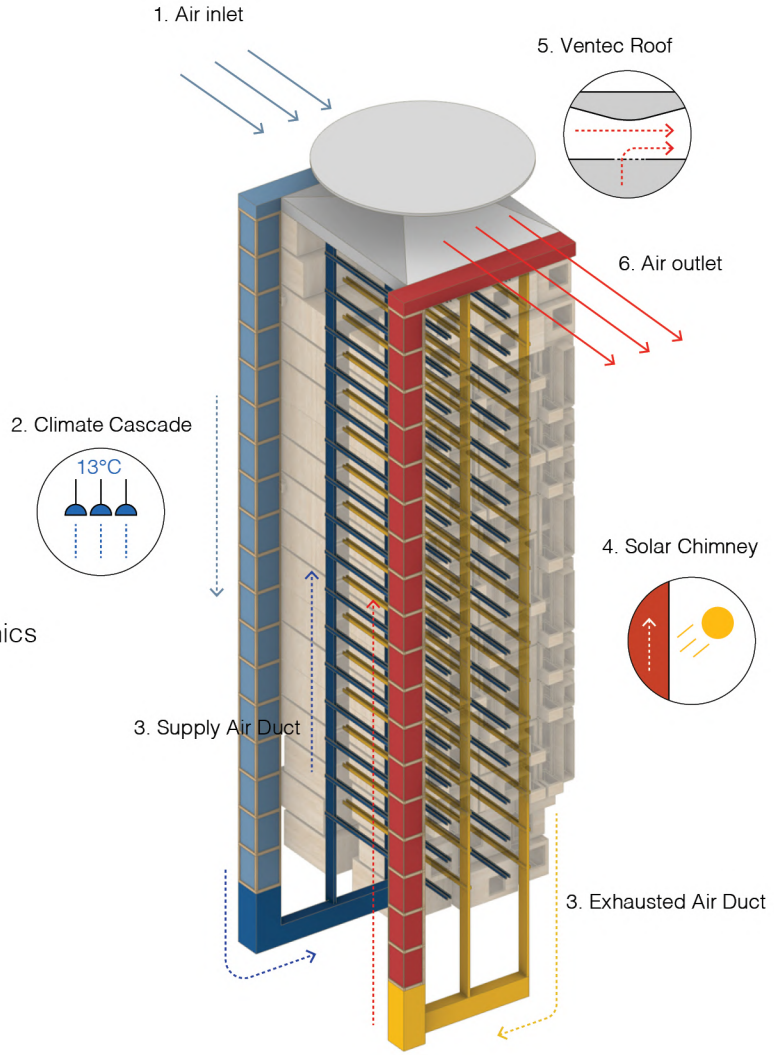


Design



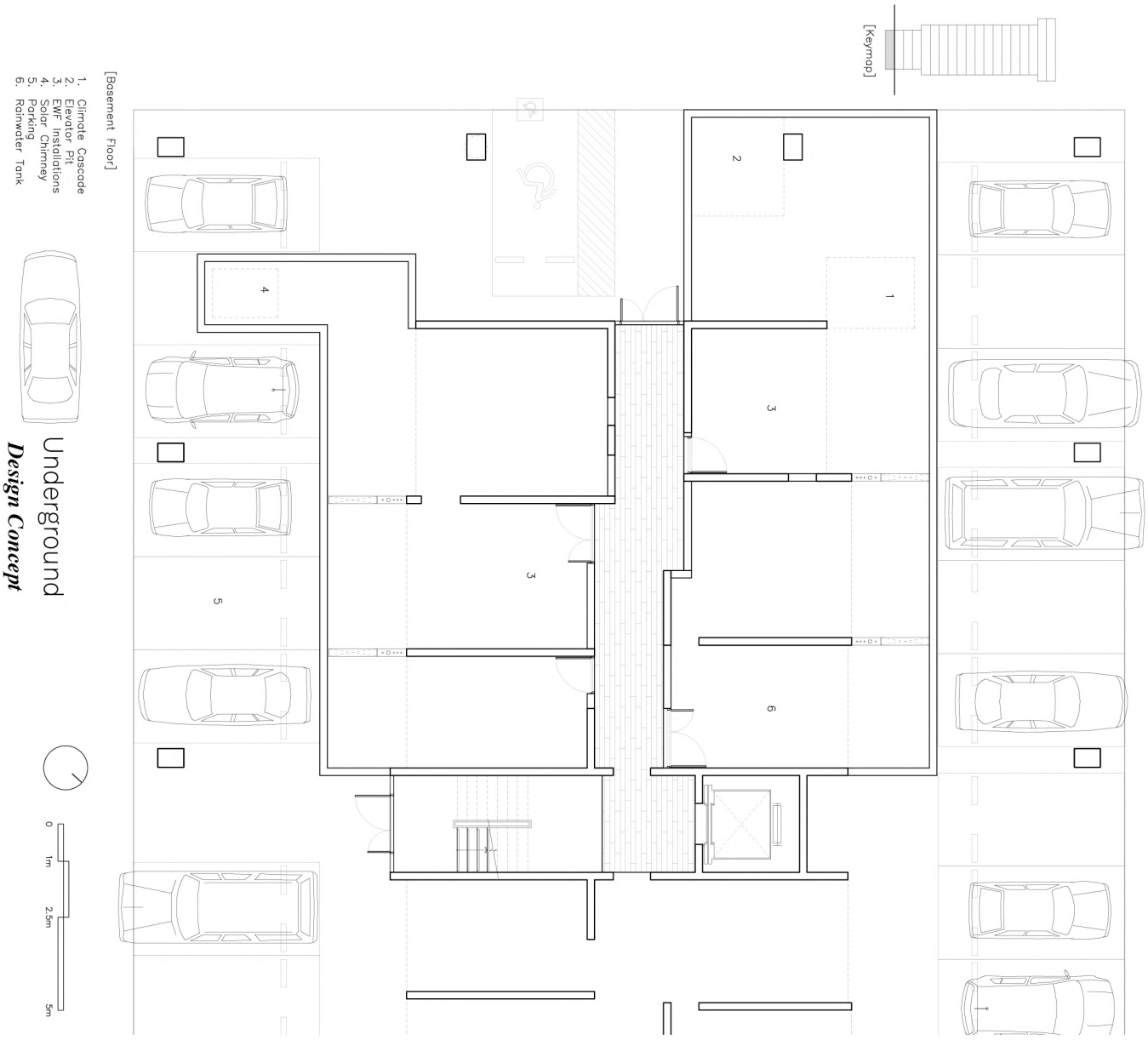


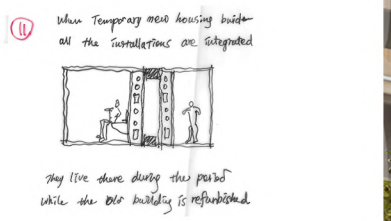


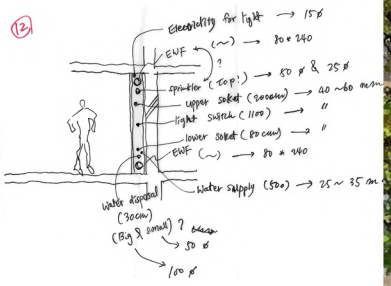


Rain Water & EWF Concept

Design Concept

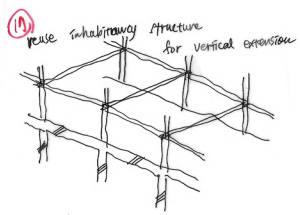

[Keymap]
[Basement Floor]
1. Climate Cascade
2. Elevator Pit
3. EWF Installations
4. Solar Chimney
5. Parking
6. Rainwater Tank
Underground
Design Concept
0
1m
2.5m
5m

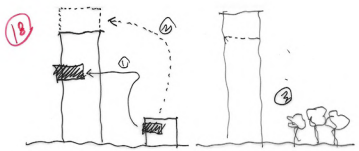




Process Repeat

Design Concept





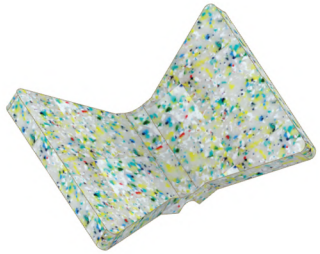
Reuse for Vertical Extension

Design Concept

Making Community

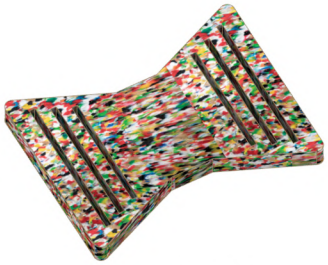
Design Concept

Waste plastics generated in apartment can be recycled as materials for buildings.



Hinge

Socket



Sewage / Duct Grill

Switch

Light / Sprinkler

Water Pipes

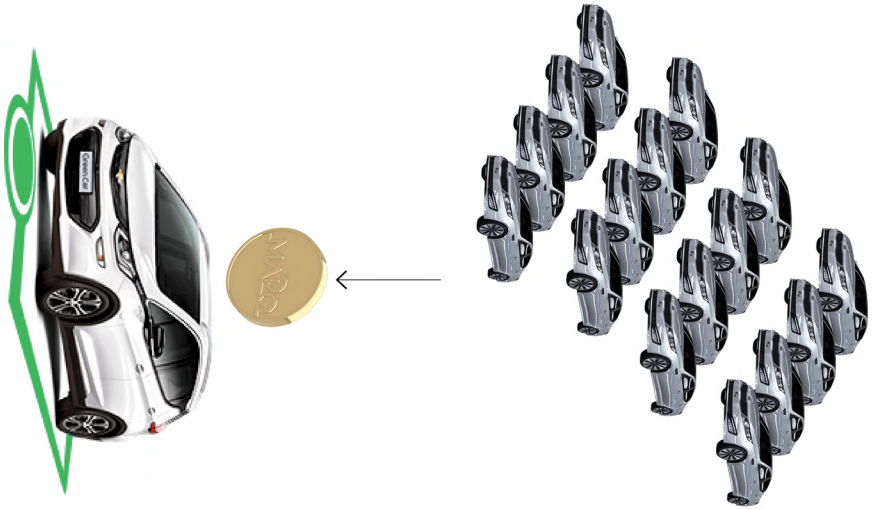
Hydroponics

Plastic Upcycling

Design Concept

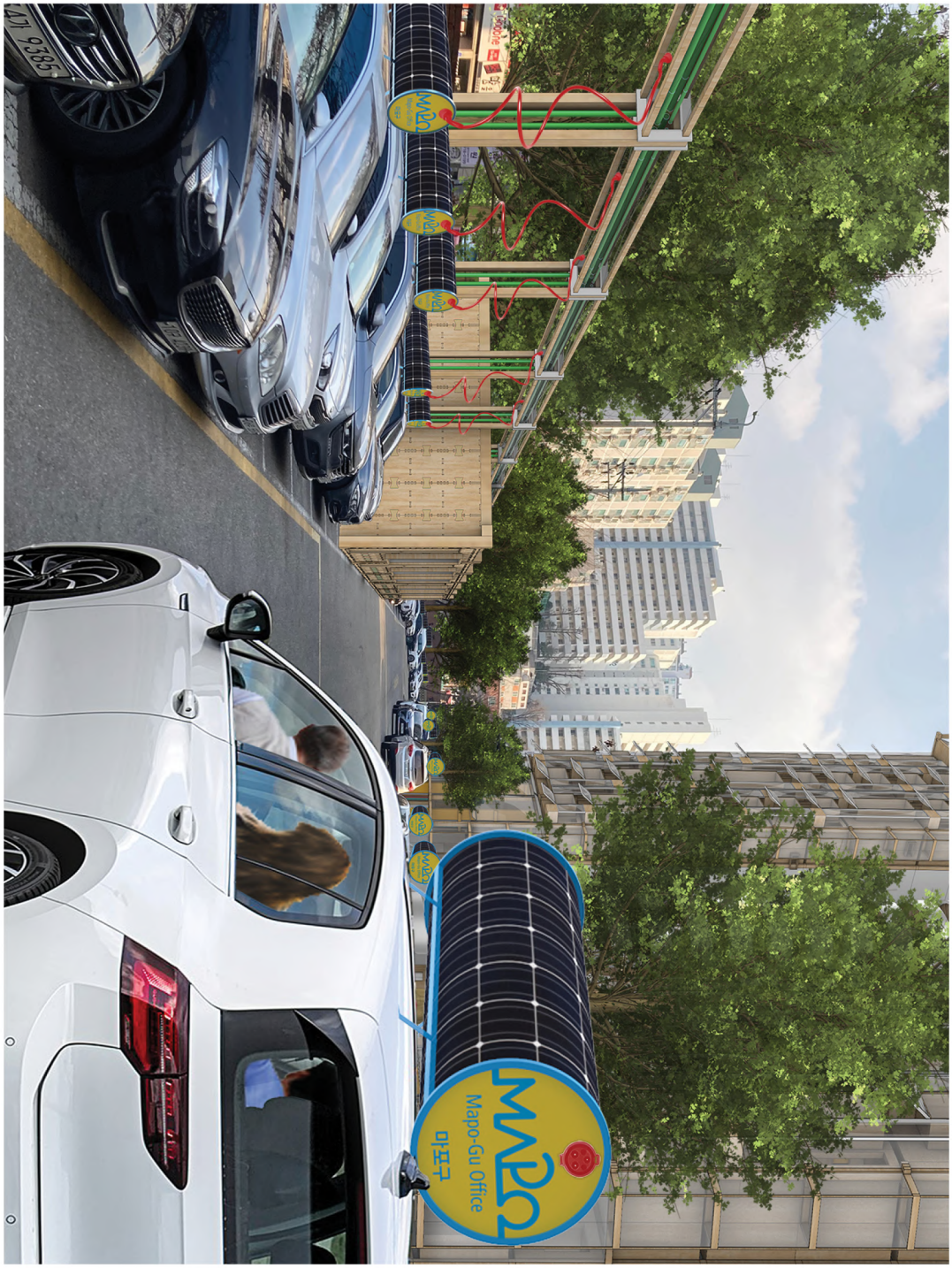
Sharing Car

Design Concept



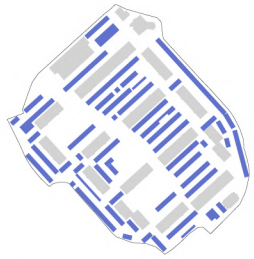
Sharing Car

Design Concept

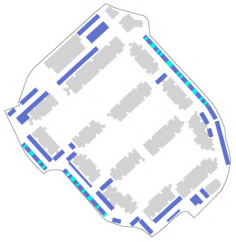


Site Plan

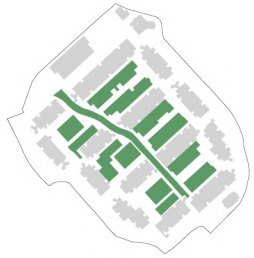
Design Concept



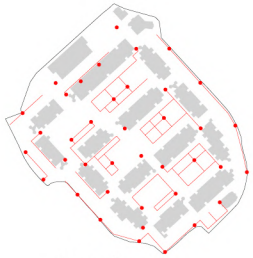
Existing Ground Level Parking



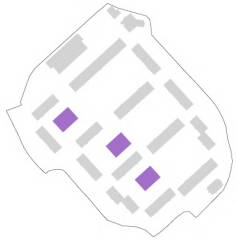
Reduced Parking area by introducing Sharing Car system



Reuse existing parking areas into vegetable garden



Location of Ground level service pipes



Location of Temporary Structure with CNC workshop

Location of Sharing culture center with recycling place

Traditional Community

Design Concept

Kimchi

Design Concept

Ingredients

Design Concept

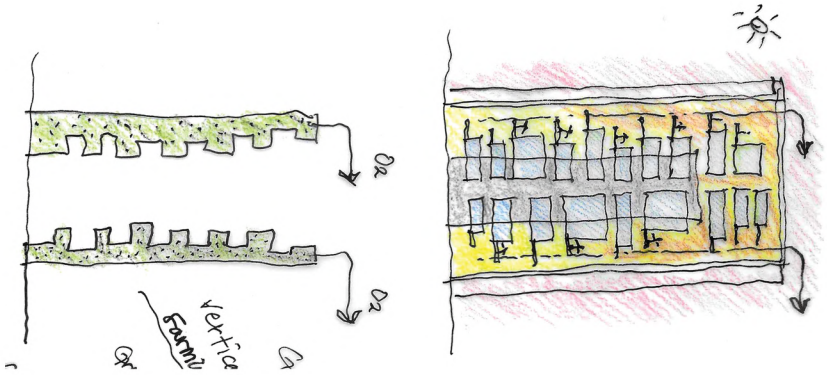
Flowers

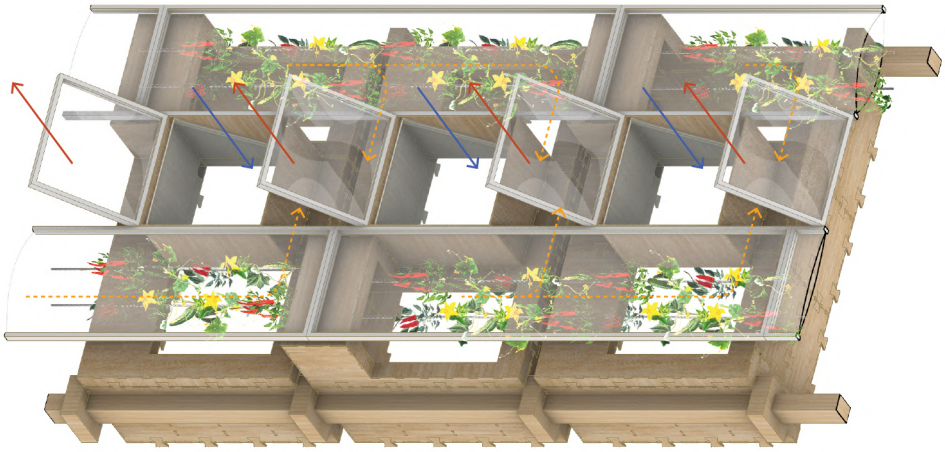
Design Concept

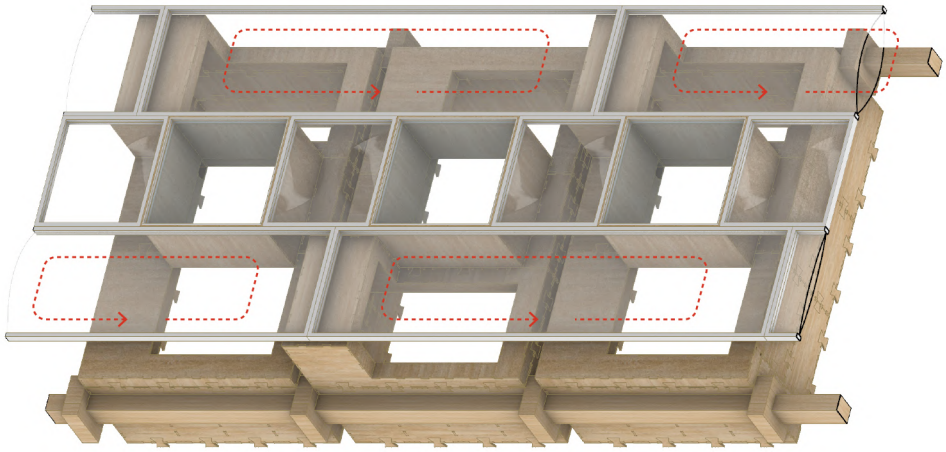
Seeding
Flowering
Harvesting
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Kimchi Calendar
Design Concept

Section

Design Concept





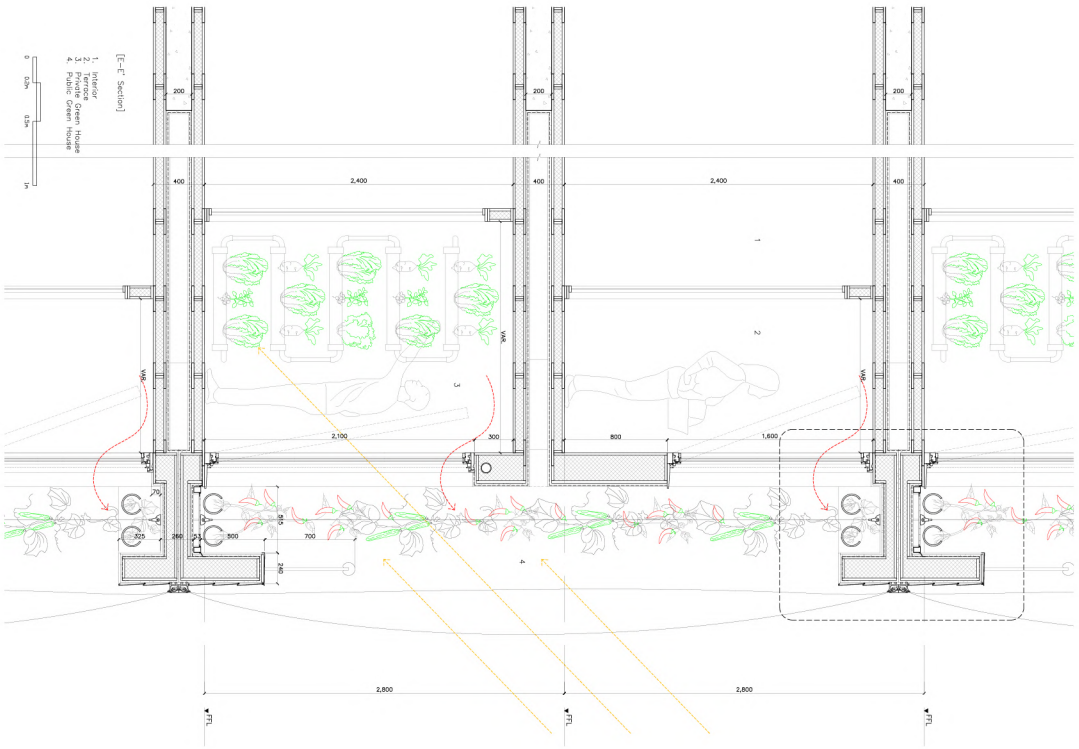


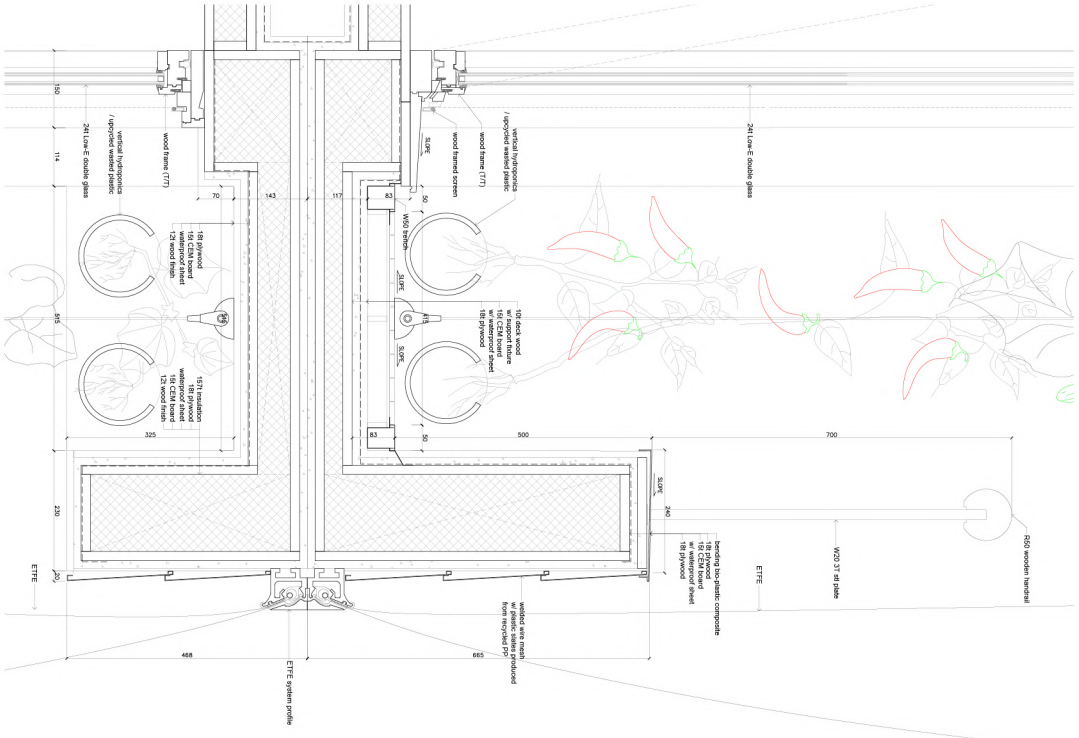
Vegetable for Building Climate

Design Concept

Vegetable Sharing

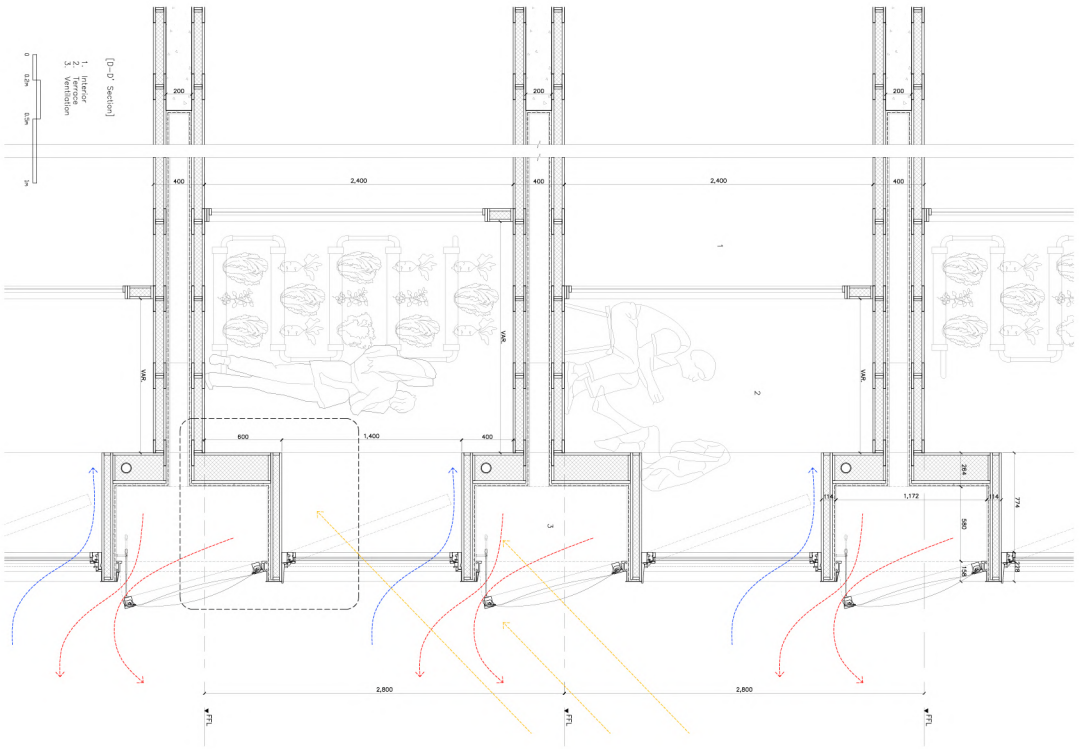
Design Concept

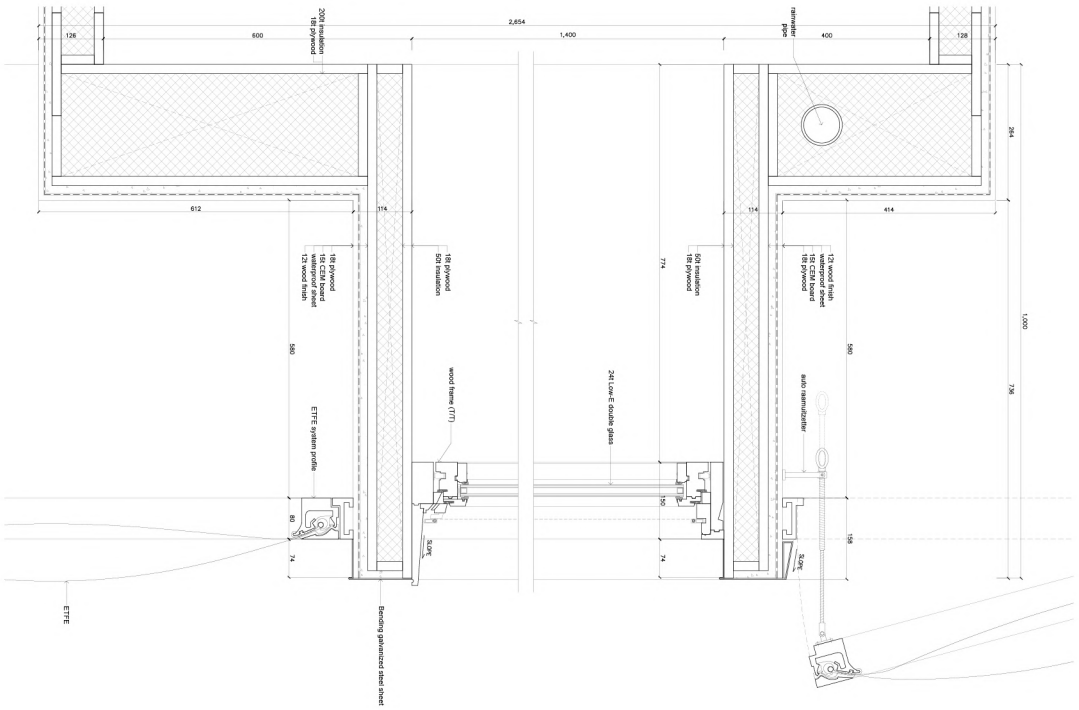




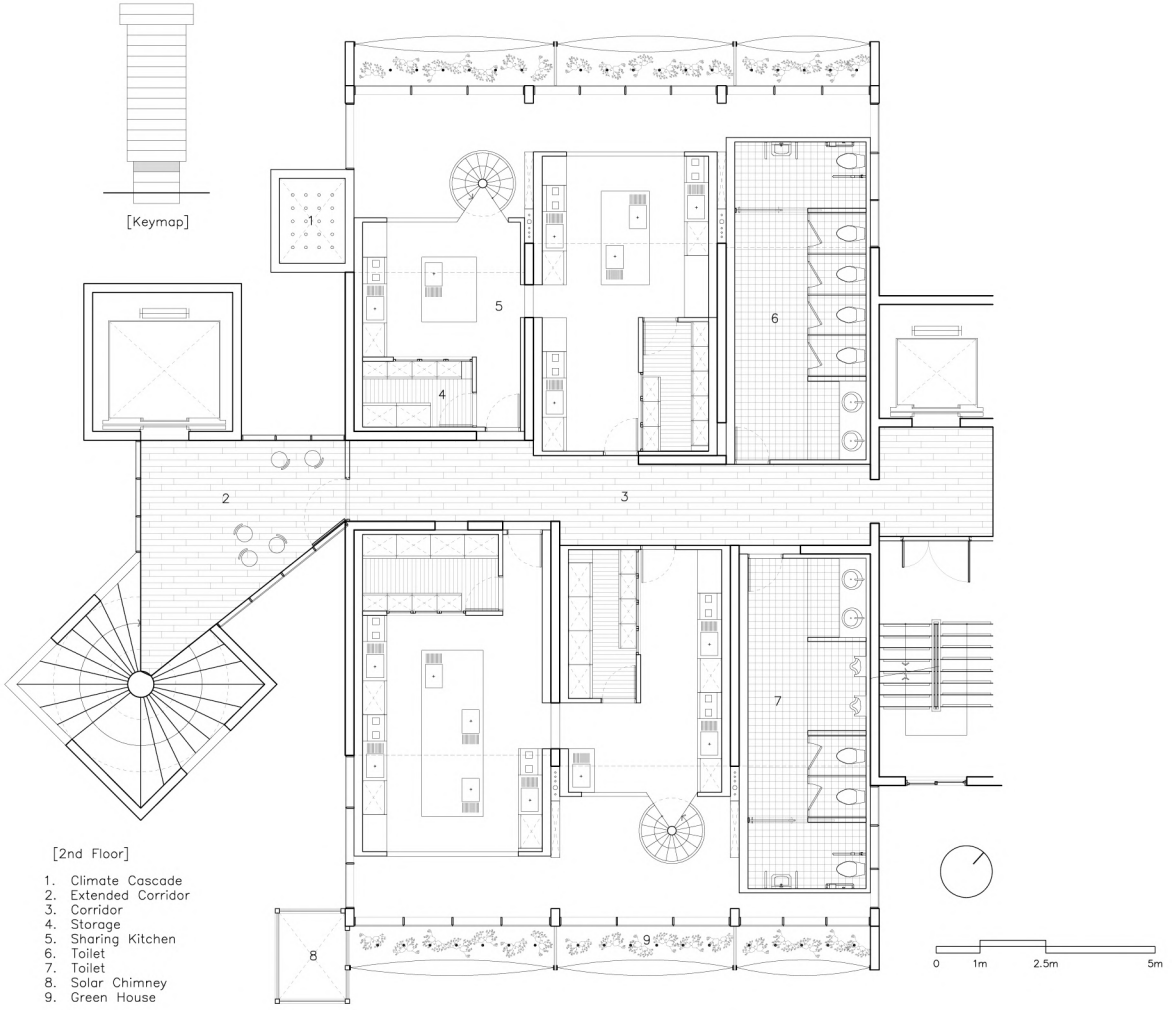
Ventilation

Design Concept





Interior
Design Concept



[2nd Floor]

1. Climate Cascade
2. Extended Corridor
3. Corridor
4. Storage
5. Sharing Kitchen
6. Toilet
7. Toilet
8. Solar Chimney
9. Green House

Kitchen

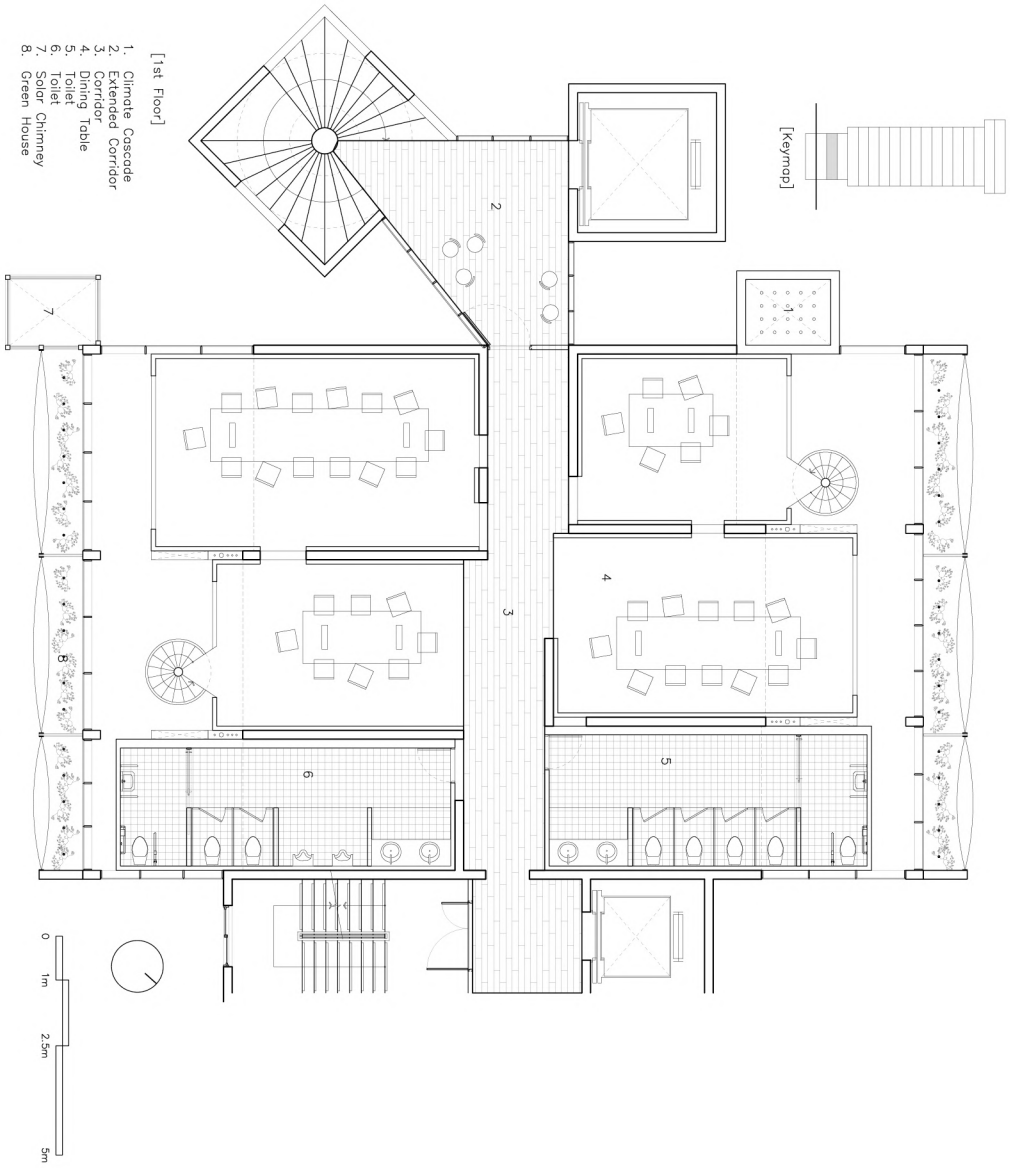
Design Concept

Kitchen

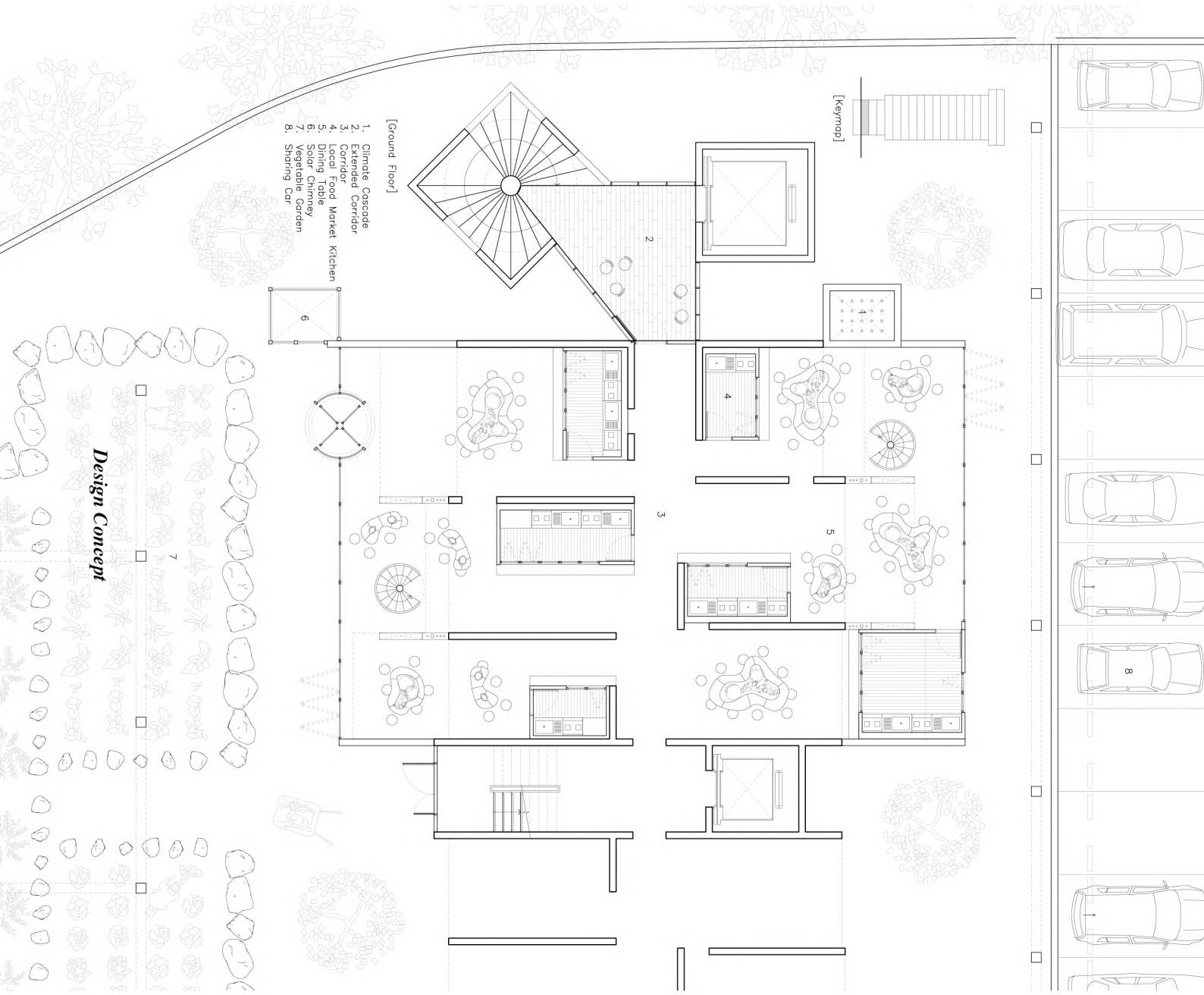
Design Concept

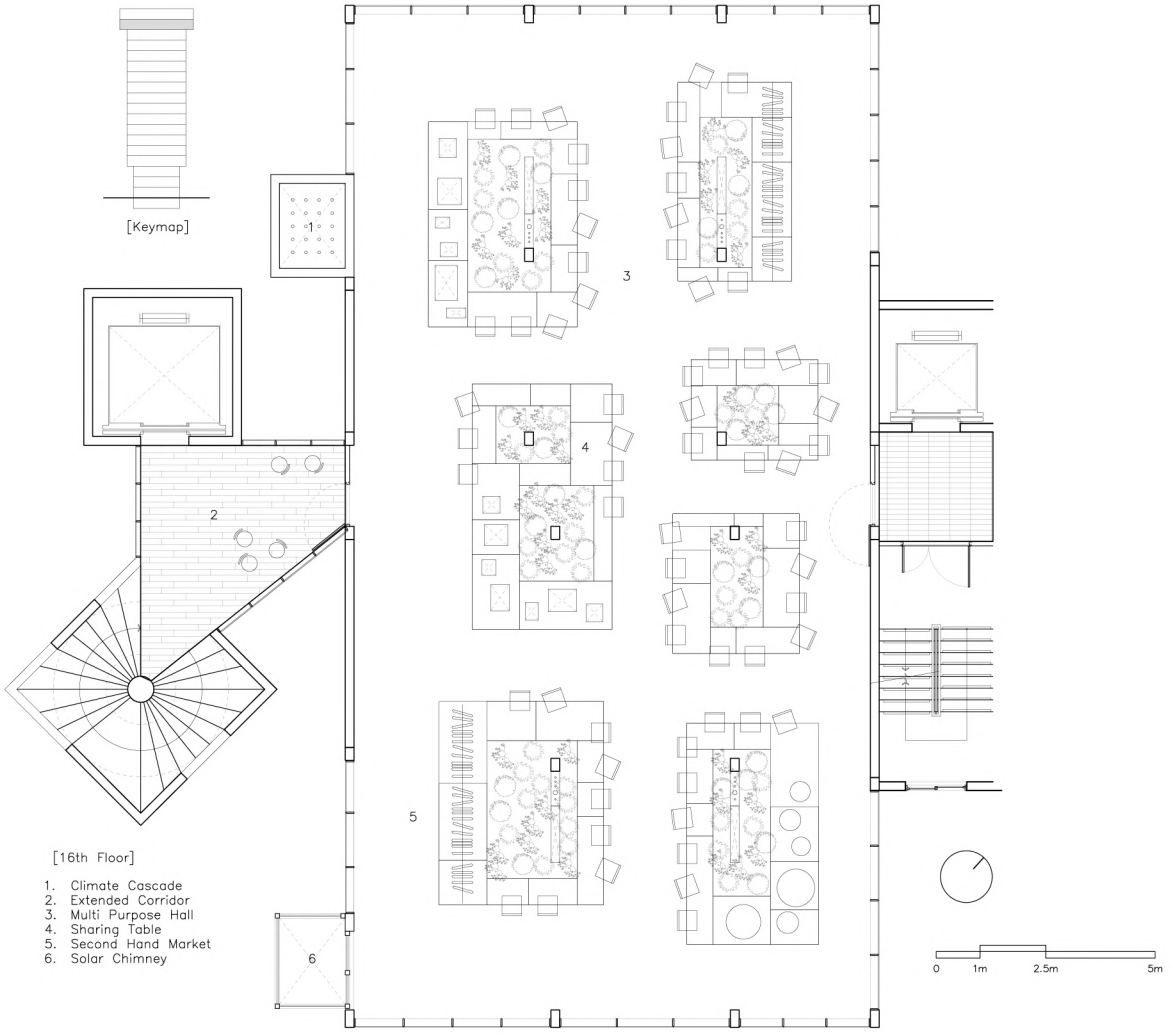
Dining Space

Design Concept



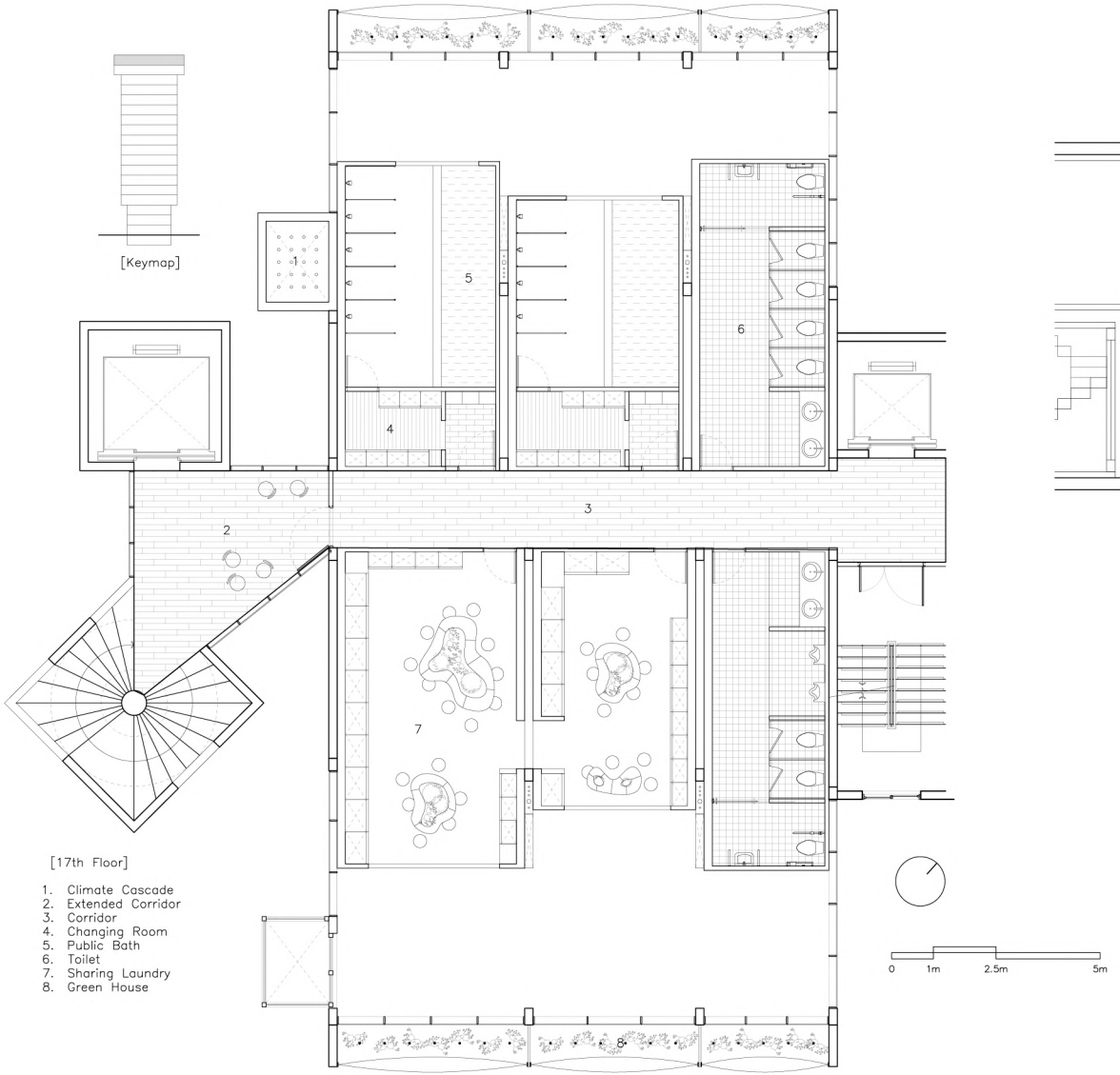
Design

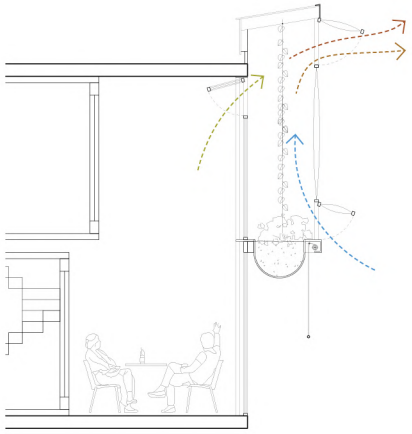

[Ground Floor]
1. Climate Cascade
2. Extended Corridor
3. Corridor
4. Local Food Market Kitchen
5. Dining Table
6. Solar Chimney
7. Vegetable Garden
8. Sharing Car
[keymap]
Design Concept



Multi Purpose Hall

Design Concept





Sharing Laundry & Bath

Design Concept

Infill Replacement in the Future

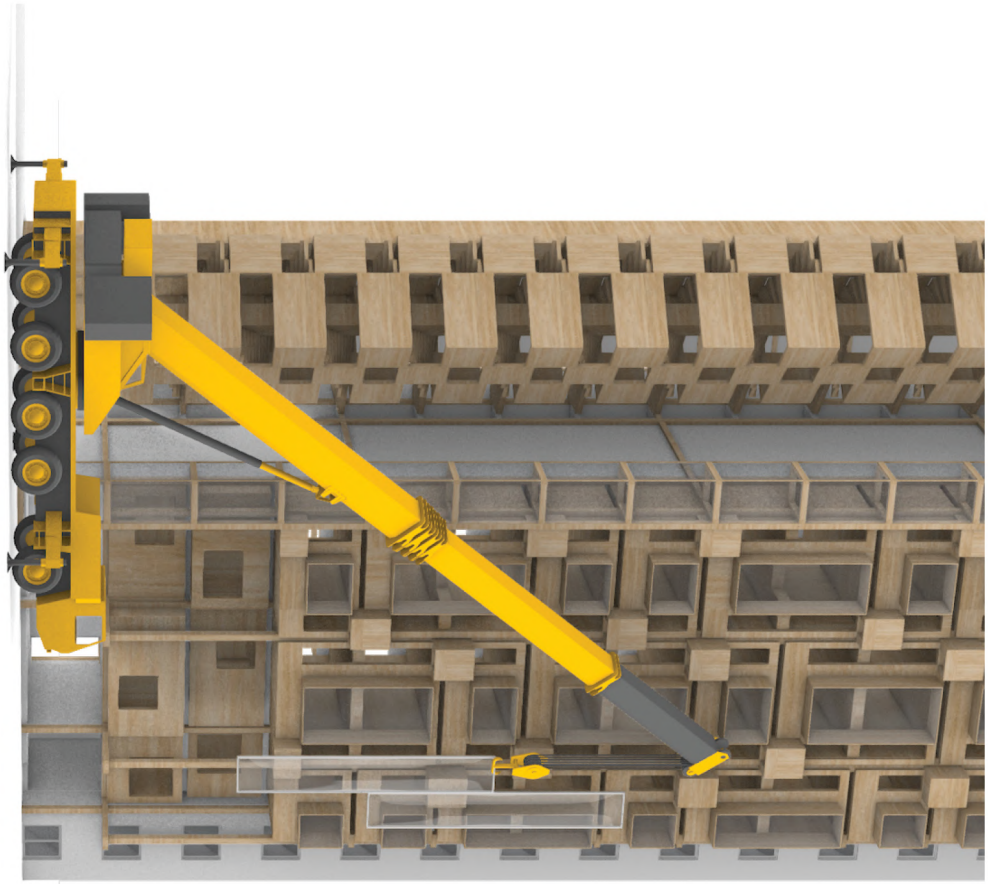
Design Concept

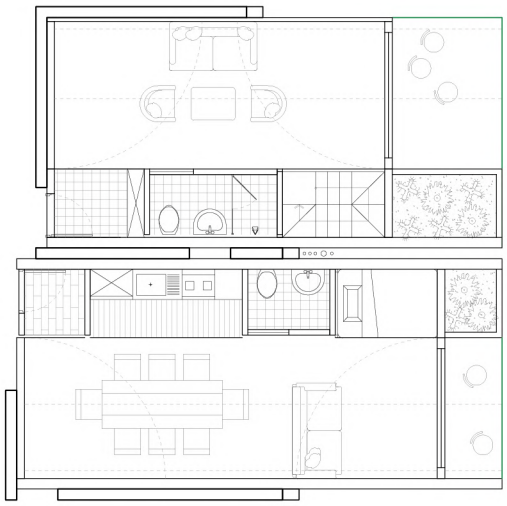
Installation Replacement in the Future

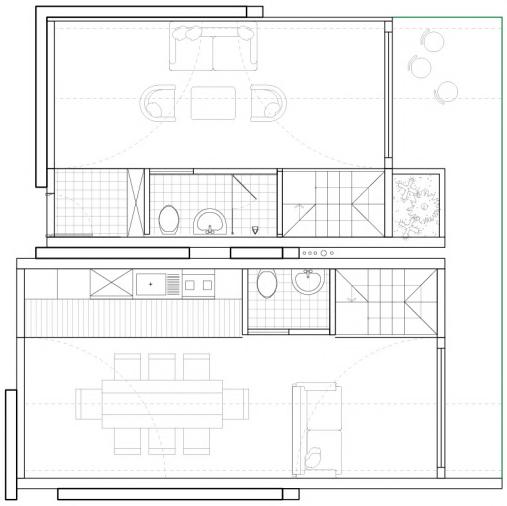
Design Concept

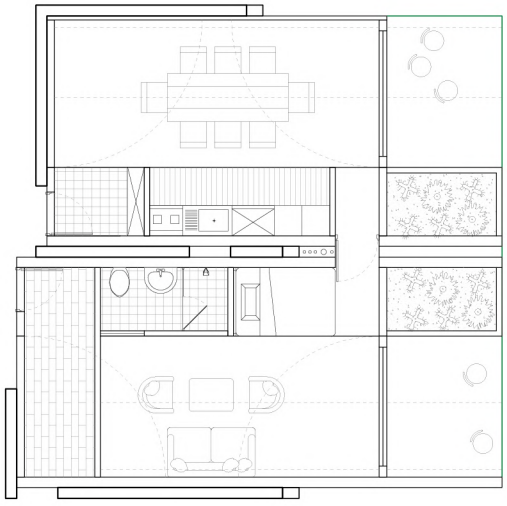
Skin Replacement in the Future

Design Concept







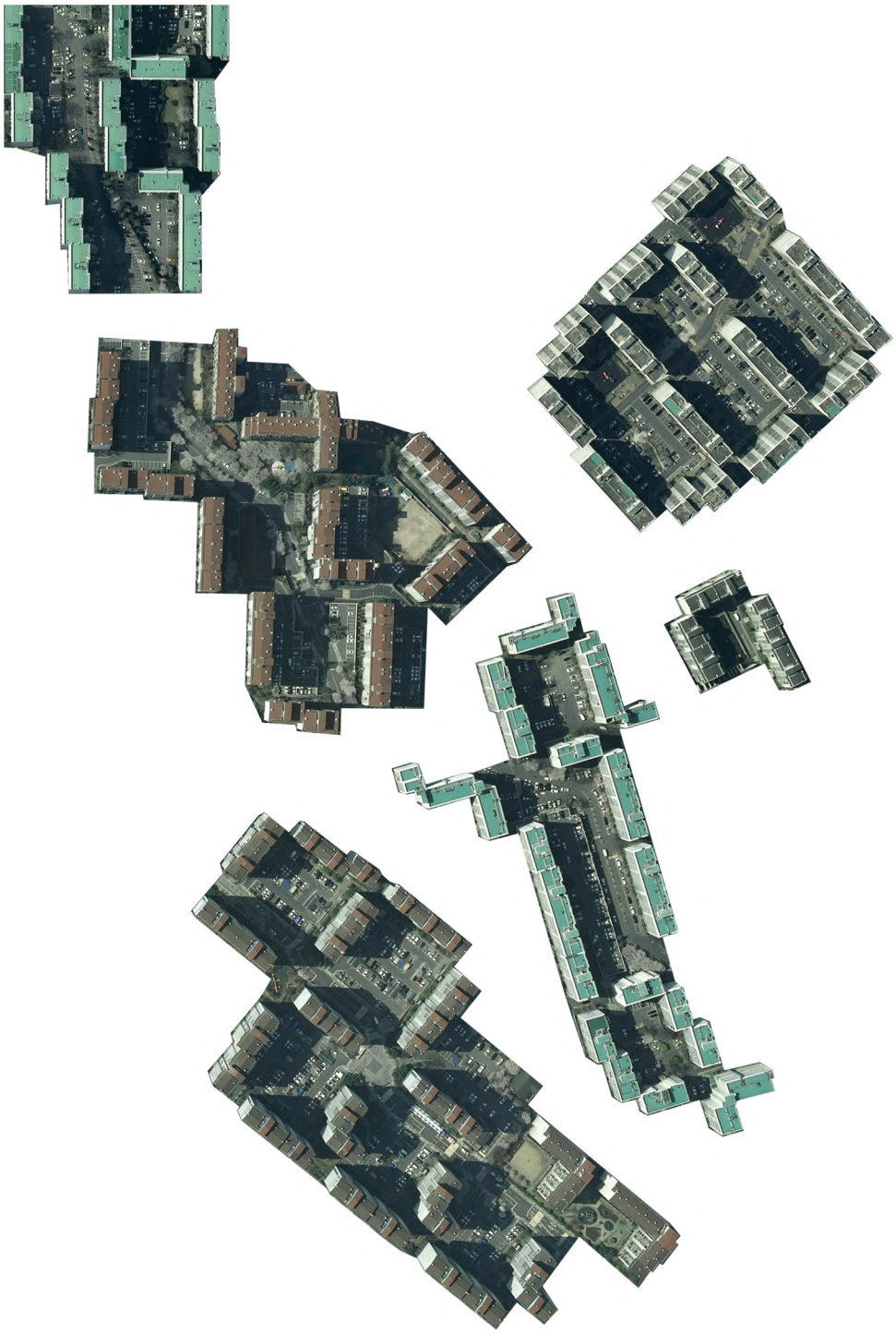


Space Modification

Design Concept

Other Apatu Complex

Design Concept



Other Apatu Complex

Design Concept

Reconstructed Other Apatu Complex

Design Concept

Reconstructed Other Apatu Complex Community

Design Concept

Archipelago
Design Concept