LIGHTHOUSE

Wood Architecture. Studio Course. Final presentation.

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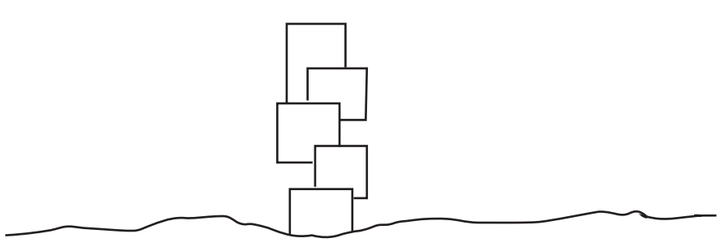
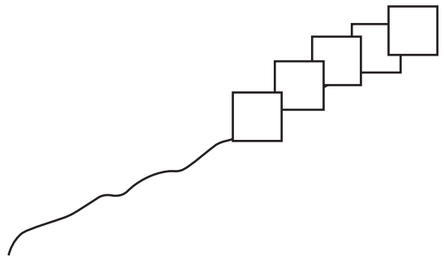
CHAIN DESIGN CONCEPT

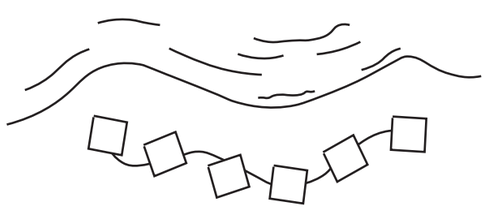
The chain is characterized by linked elements. Each element interacts with another. Each element can vary in size, shape, function. It has a capacity for flexibility and adaptability



The chain at different levels and is evident from the outside. It is a landmark on the coast



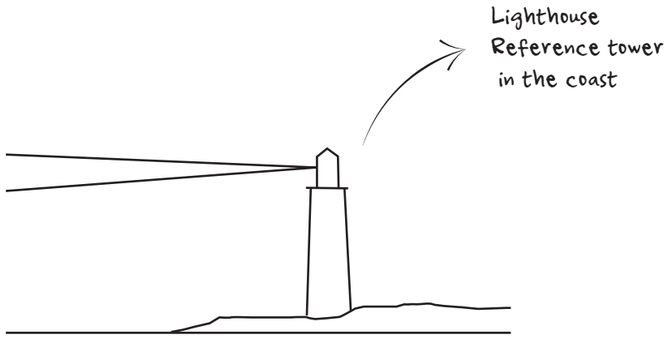
Chain volumens continue the topography in height.



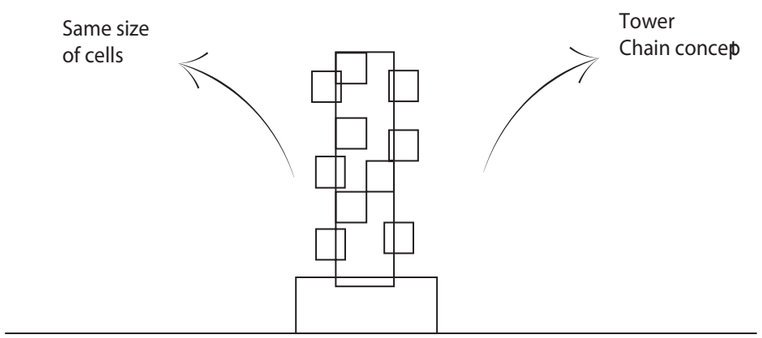
Chain with joined or separate volumes continue the coast border.

DESIGN CONCEPT

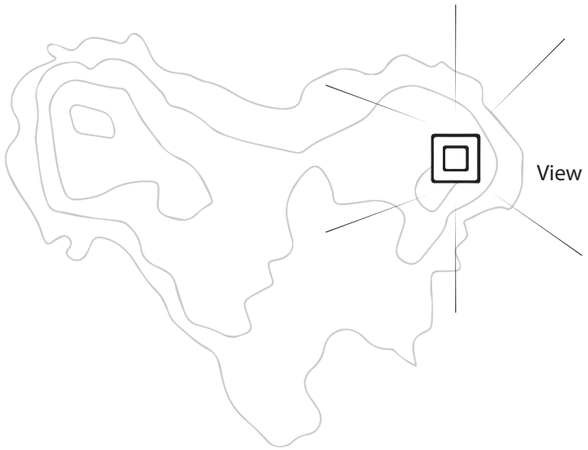
CHAIN - COAST



Landmark in the coast as the lighthouse as reference tower in this site.



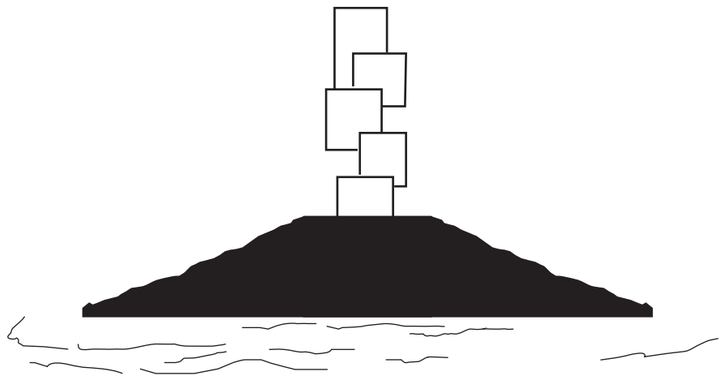
The chain grows in height, all the units with the same sizes are linked to a main element, which in this case is the core.

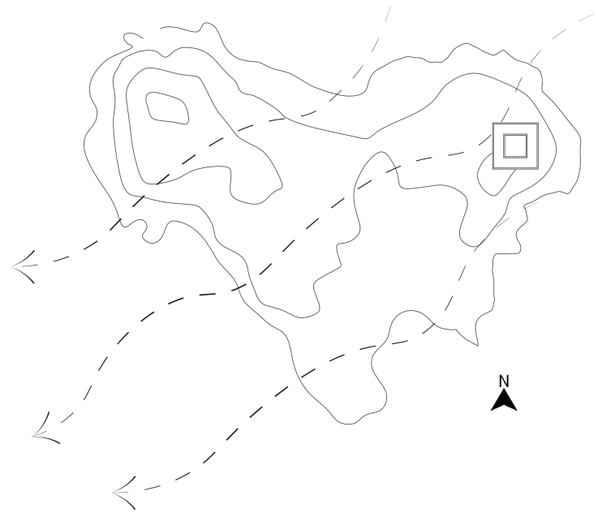


The project have a view of the coast in all the facades.

COAST SITE

INFLUENCING FACTORS





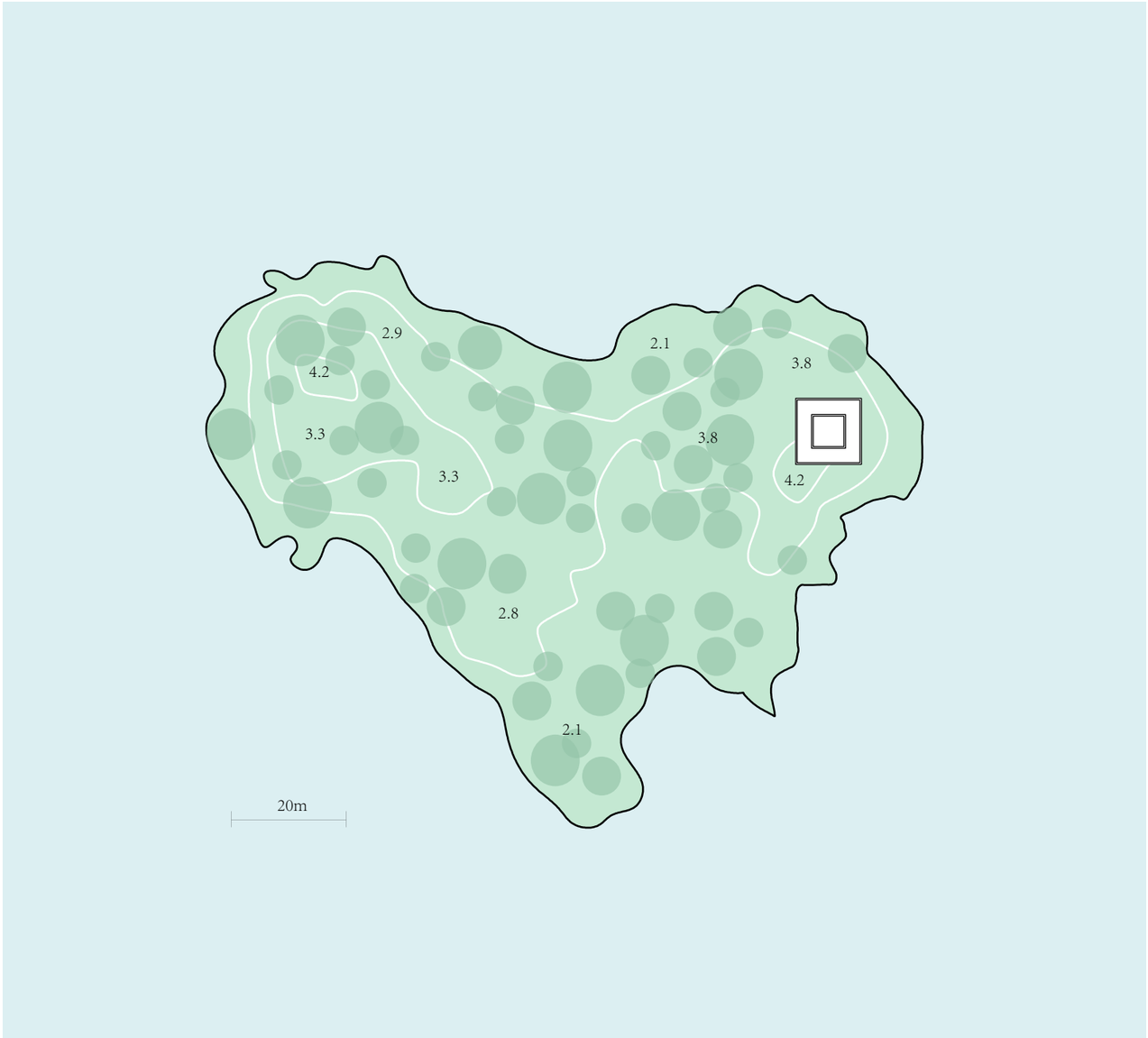
Materials island site:
Solid rock soil
Water coast.

Common rock types in Finland are orthogneiss, granite, metavolcanics and metasedimentary rocks. The rocky islet of Vanha has little vegetation.

Winds: In finland the wind comes
from the north East

The average hourly wind speed has considerable seasonal variations over the course of the year.
From September to March, speeds of over 14.8 km/h. In December, 18.0 km/hr. In June, with winds at an average speed of 11.5 km/h.

PLAN SITE



The project is located in the south of Finland, on the island called Vannha-Rantty.

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NARRATIVE CONCEPT

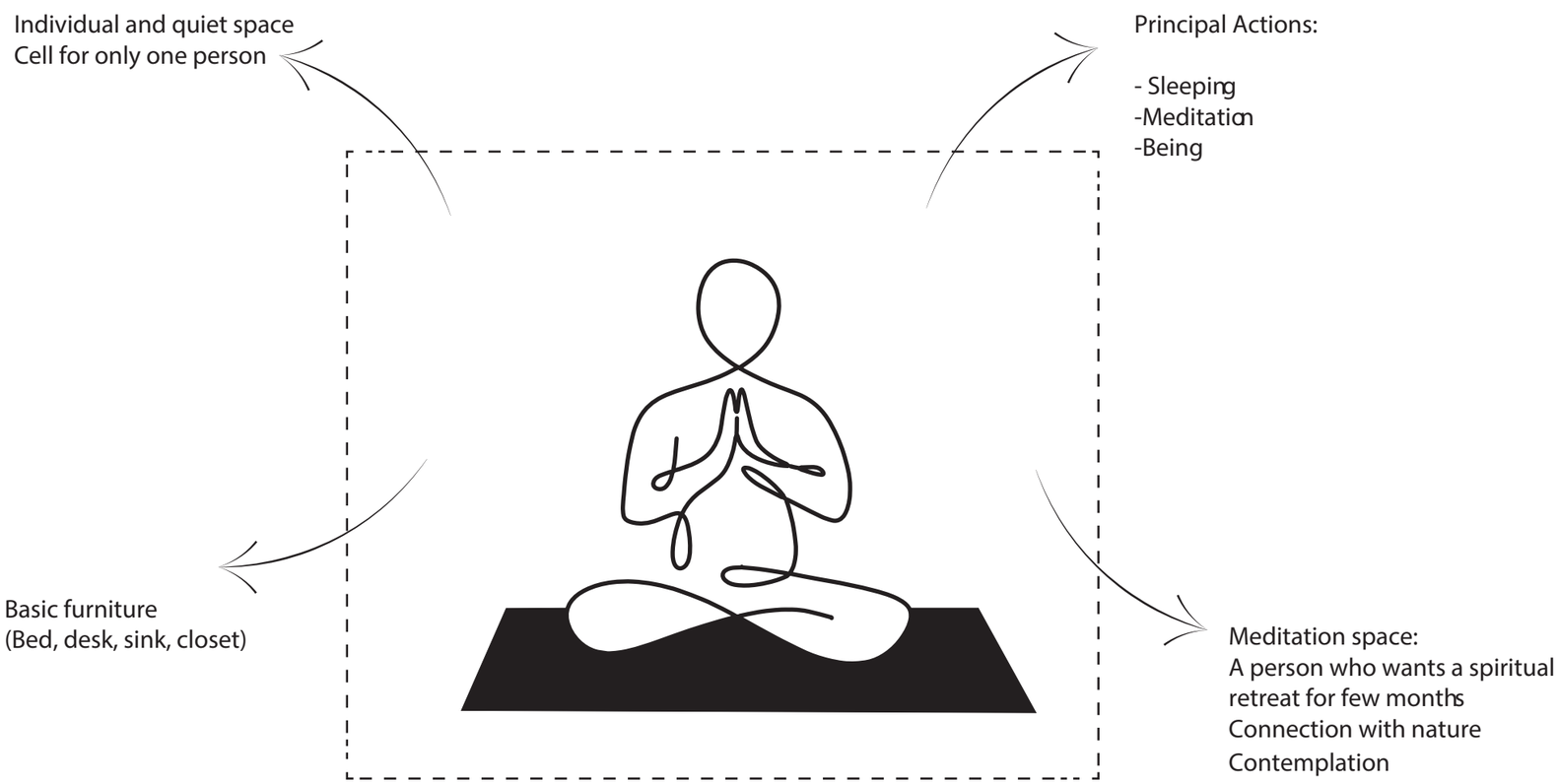
CHAIN CONCEPT - COAST SITE

The project tries to examine the relationship between spatial characters and the spirituality of the users.
The representation of a narrative: people who tired of urban life travel a long way to find a mysterious meditation house. After scaling different cell levels of meditation, they finally come into the top viewing cell in the middle of the coast and step into their inner world. This project hopes to find a space where one can touch his inner self, or feel himself as an independent being.

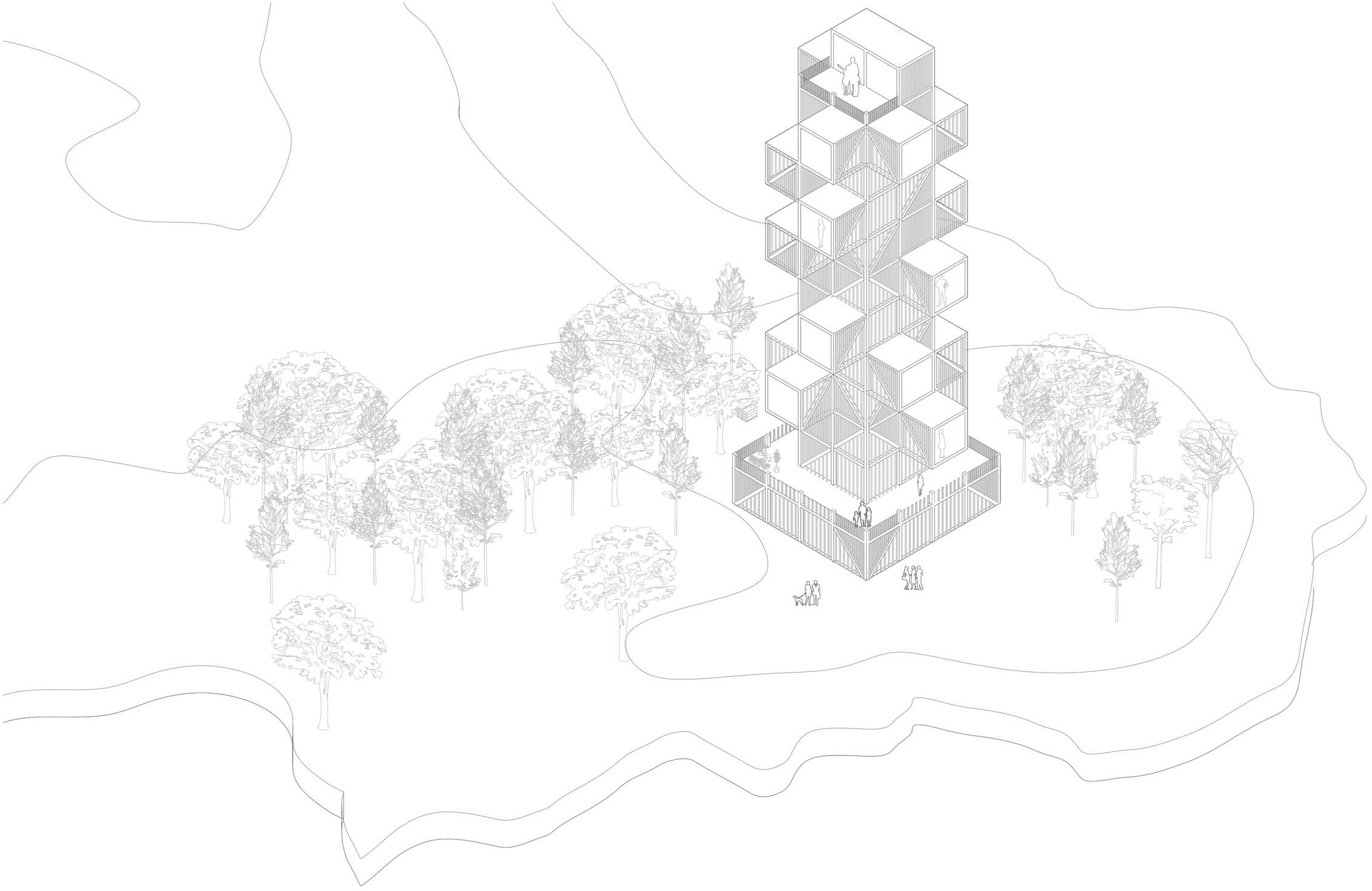
When one feels tired or disturbed by excessive external information, this place can be his own paradise which provide safety and peace.

DESIGN TARGET

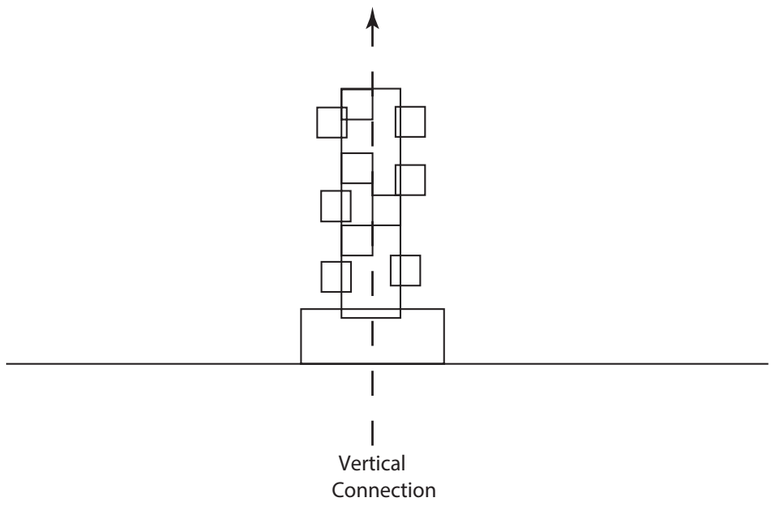
IN THE CONTEXT OF THE NARRATIVE



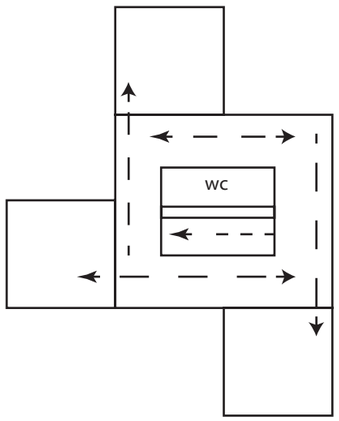
MAIN DRAWING



DESIGN PRINCIPALS



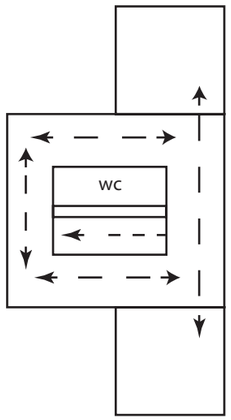
The core connects the project vertically with the circulation to access the units.

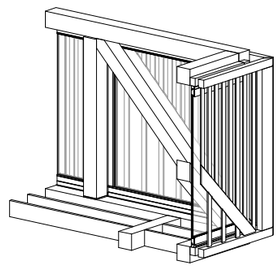


Circulation around the central core
that allows access to the different units

2 units minimum per level / 3 units maximum per level

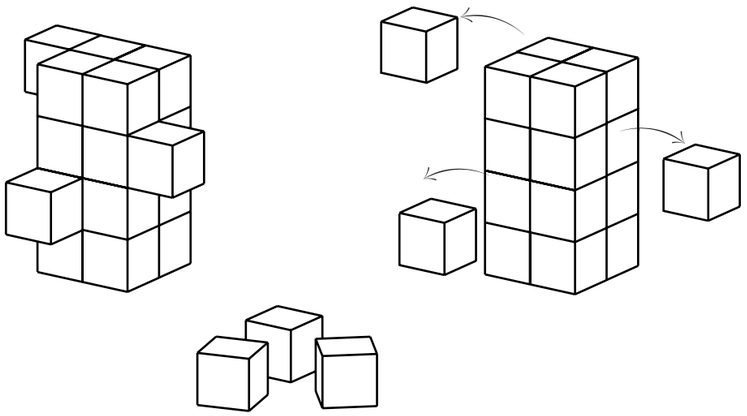
Basic need (Toilets) in all the levels



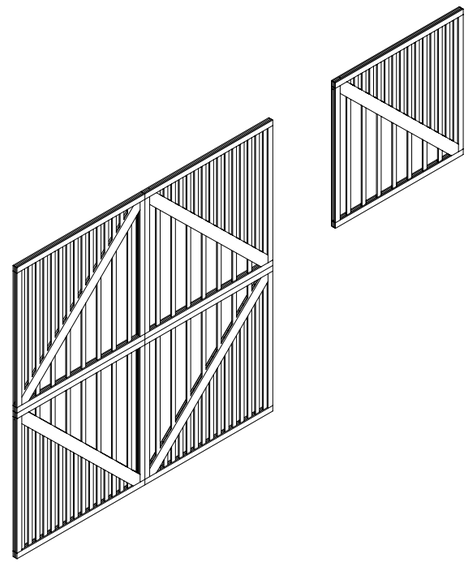


The core has a double façade. A first glass façade that protects from wind and weather. A second facade made out of wooden slats which displays the structure of the building to the outside.

DESIGN PRINCIPALS

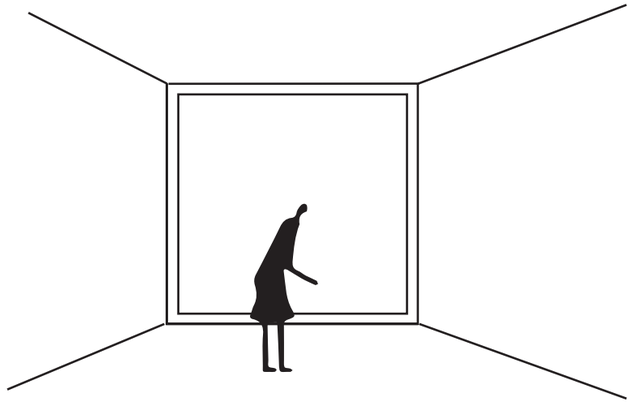


Units that can be attached to or removed from the structure if it’s neccesary

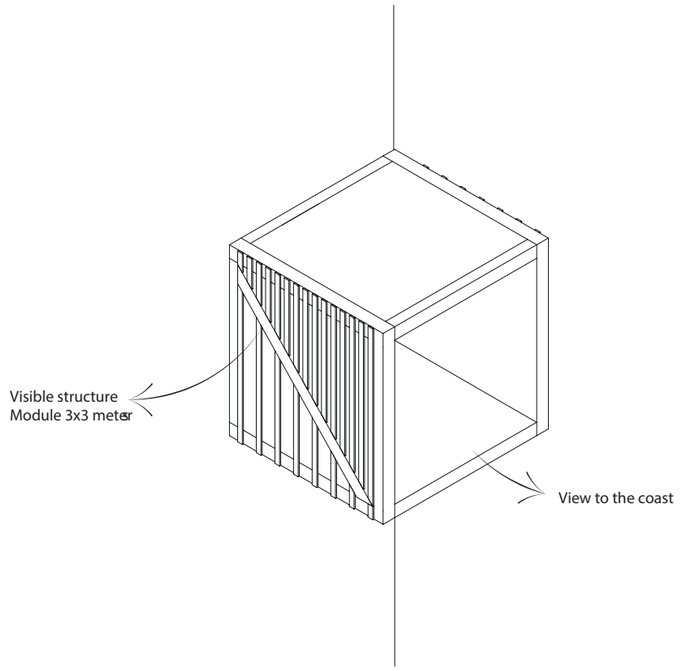


This facade panel is used on the core and on the units. It can be used on the core when the units are removed. Allowing flexibility and adaptability to the project.

DESIGN PRINCIPALS



One large window that allows to contemplate the landscape of the coast.



The units have a structure visible from the outside and a large window.

GUIDELINES BUILDING

- Meditation building
- Landmark in the coast
- Building for short stay of users
- Common areas on the ground floor (laundry, kitchen, lobby, toilet)
- Basic need in all the levels (sanitary rooms)

Structure

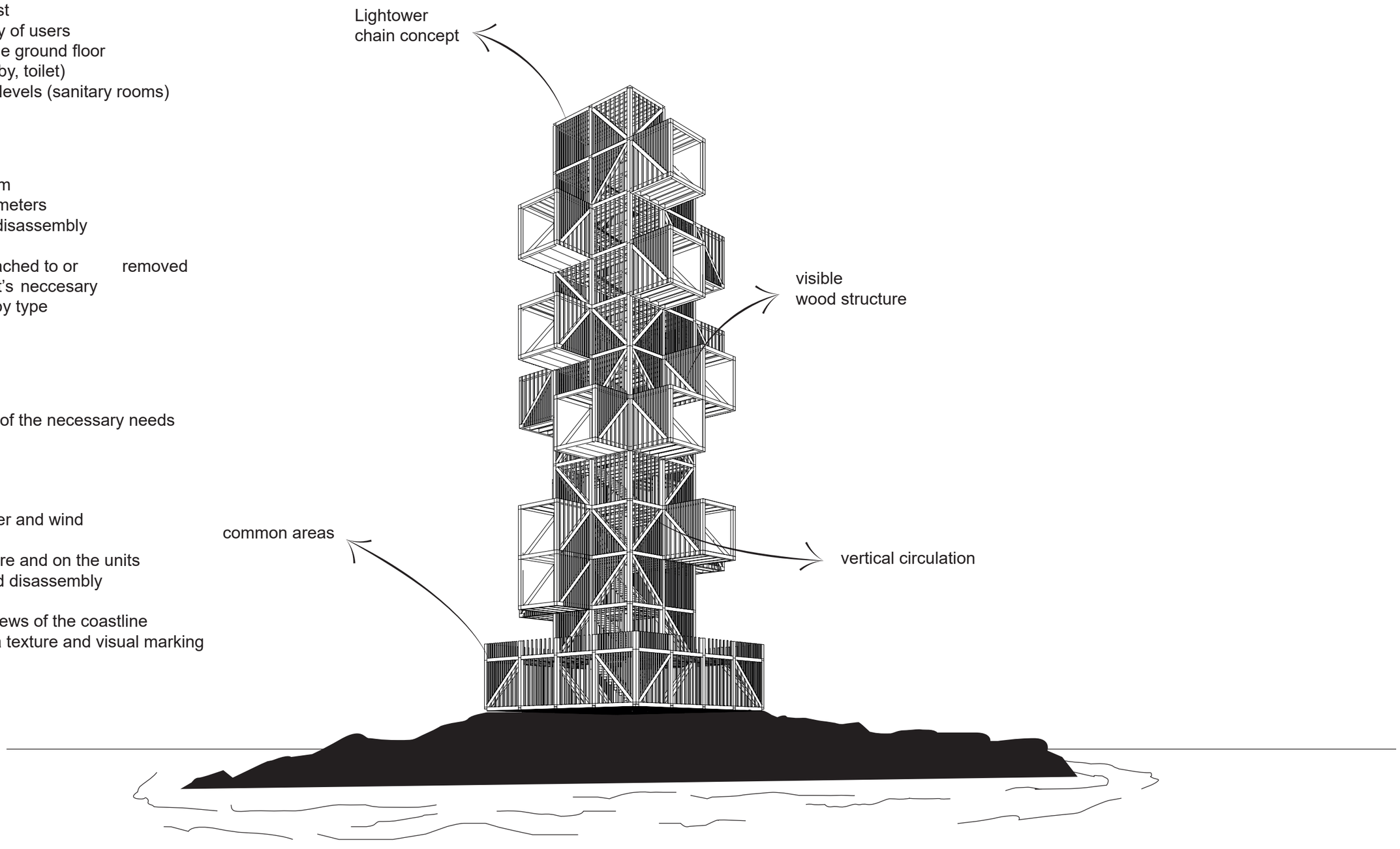
- Wood modular system
- Square grid 3.3x3.3 meters
- Easy assembly and disassembly
- Prefabricated units
- Units that can be attached to or removed from the structure if it's neccesary
- designed to recycle by type

Core

- vertical circulation
- serves as a provider of the necessary needs

Facade

- prodects from weather and wind
- reusable cladding
- panel used on the core and on the units
- flexible assembly and disassembly
- double facade
- translucent, allows views of the coastline
- strips that generate a texture and visual marking to the core

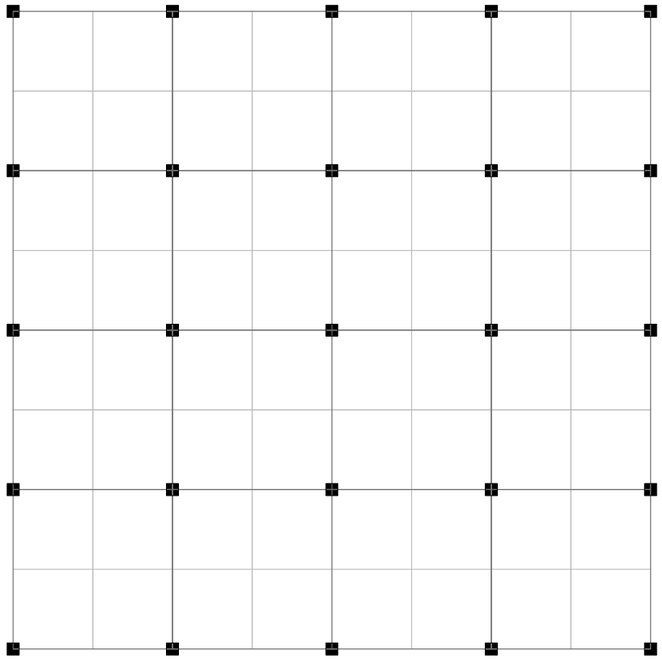


energy concept
material
enviromental concept

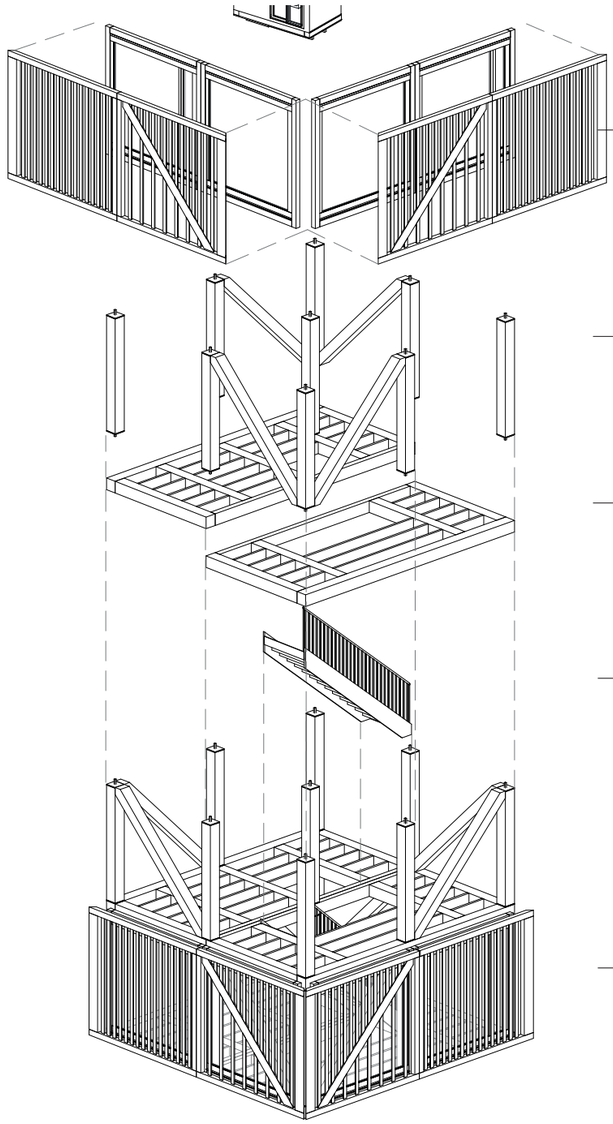
- **UNIT**

STRUCTURAL SYSTEM

THE GRID



- Wood modular system
- Square grid 3.3 x 3.3 meters
- Easy assembly and disassembly
- The structure for core and the units is the same



Triple glazing in wood frame panel
Facade wood frame panel

Structural columns and diagonals

Timber wood structure floor

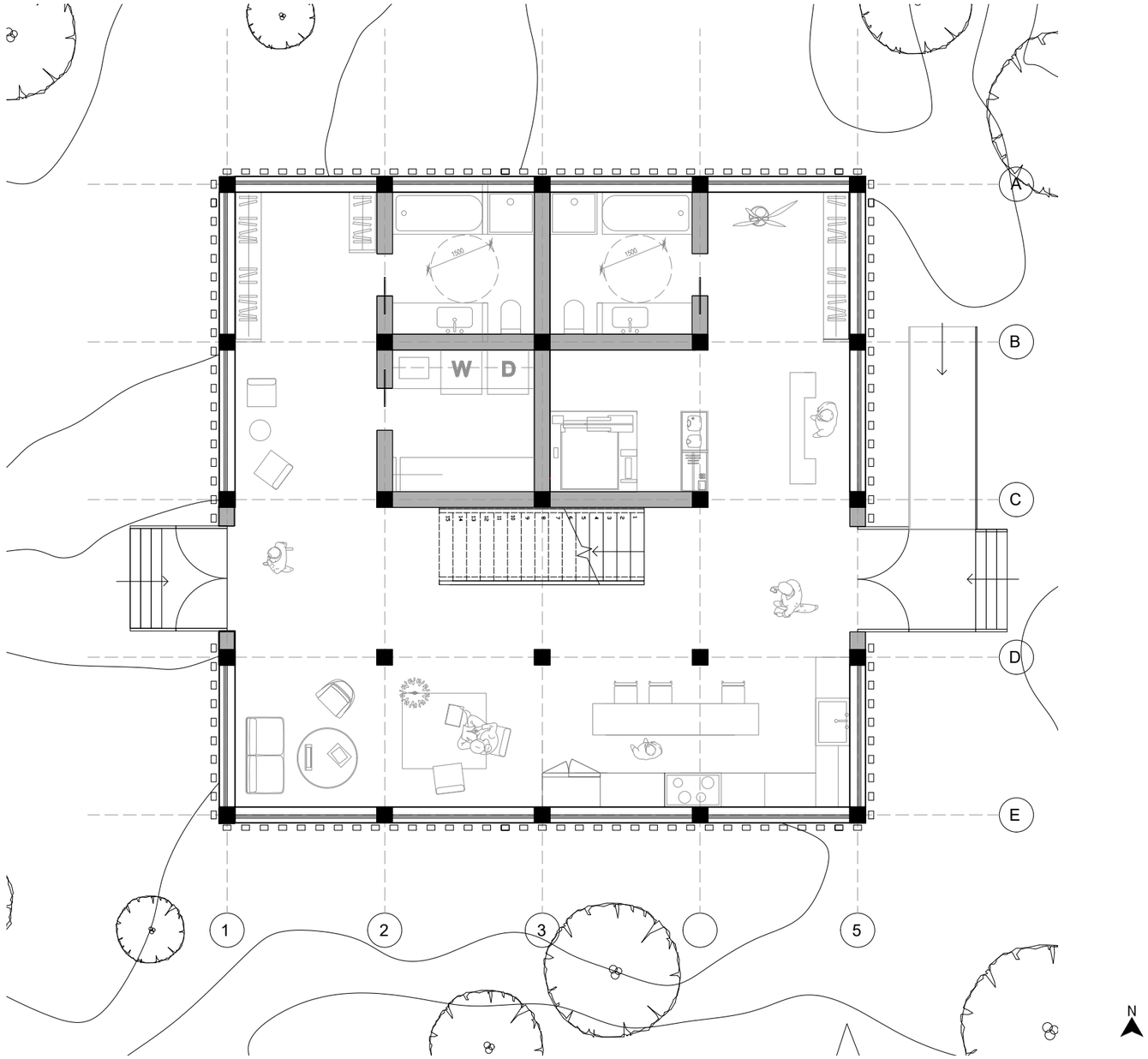
Stairs

Components for the core

PLAN - GROUND FLOOR

SCALE: 1: 100

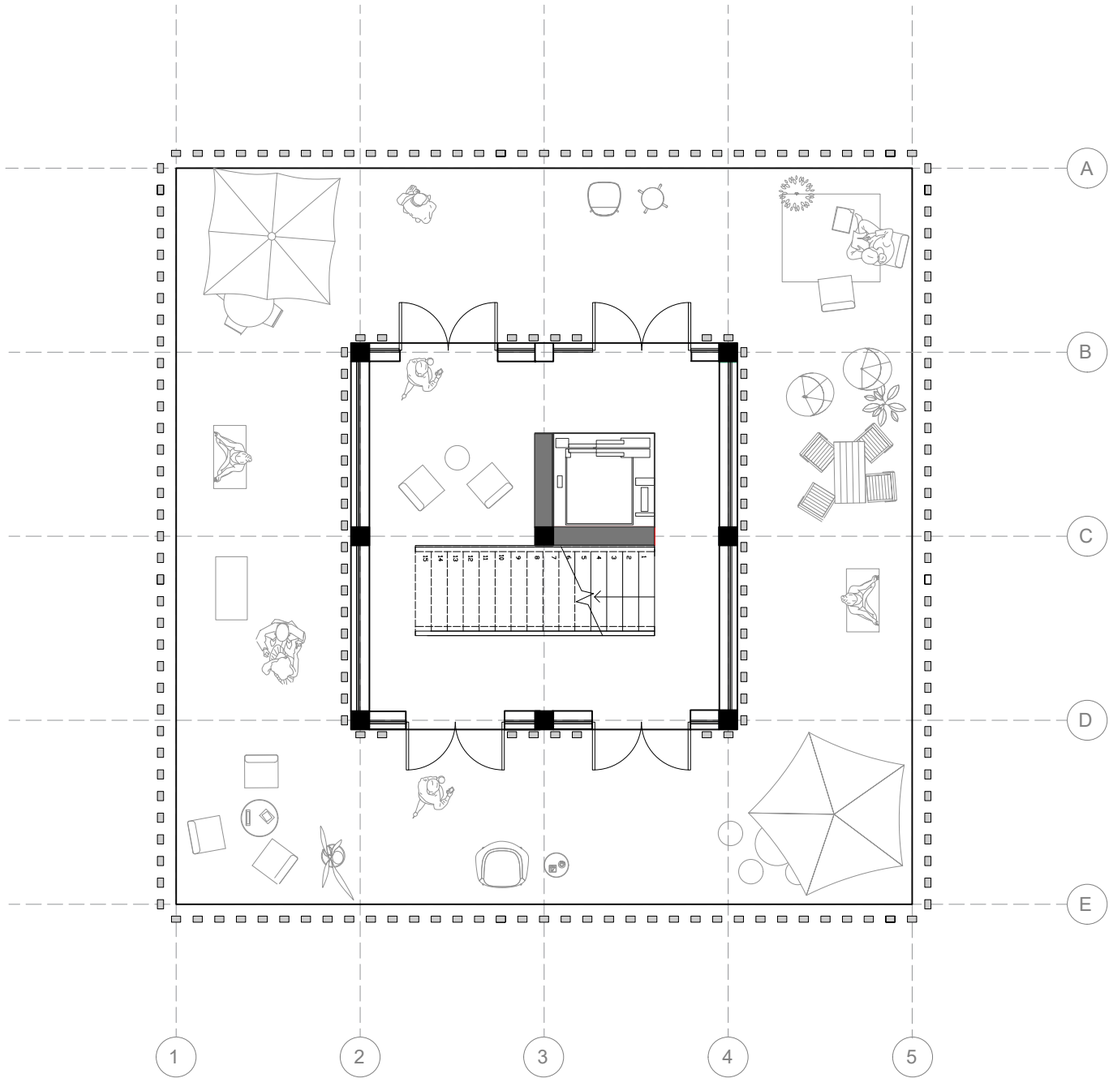
The ground floor contains the basic functions for the people who live in the building. Lobby, kitchen, bathrooms, lockers room, laundry, living room.



PLAN - FIRST FLOOR

SCALE: 1: 100

The first floor is a common area (living room) with a view of the coast and an outdoor terrace.



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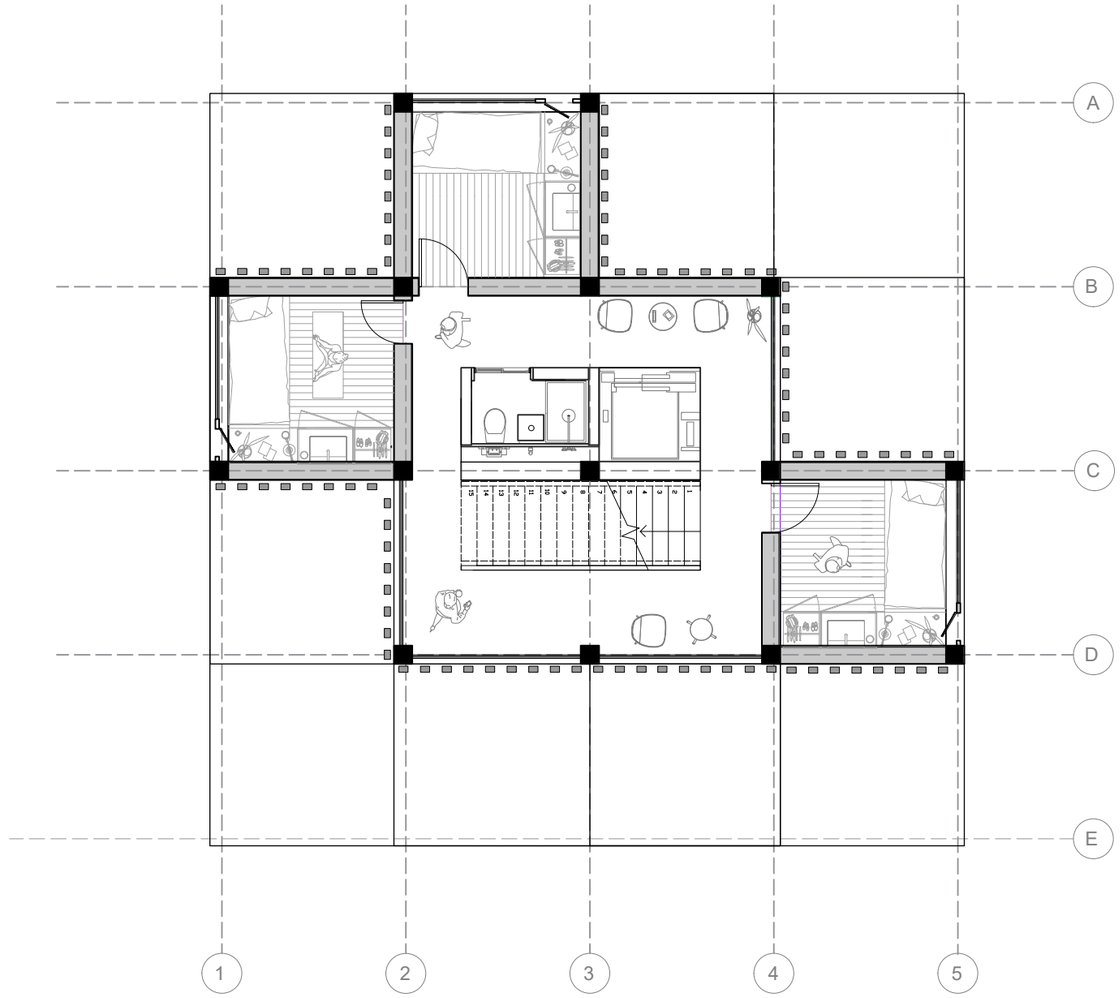
PLAN - GROUND FLOOR

VARIATION OF A STANDARD FLOOR PLAN
SCALE: 1: 100



Each level has bathrooms, a circulation around the core,
maximum three units or minimum two per level.

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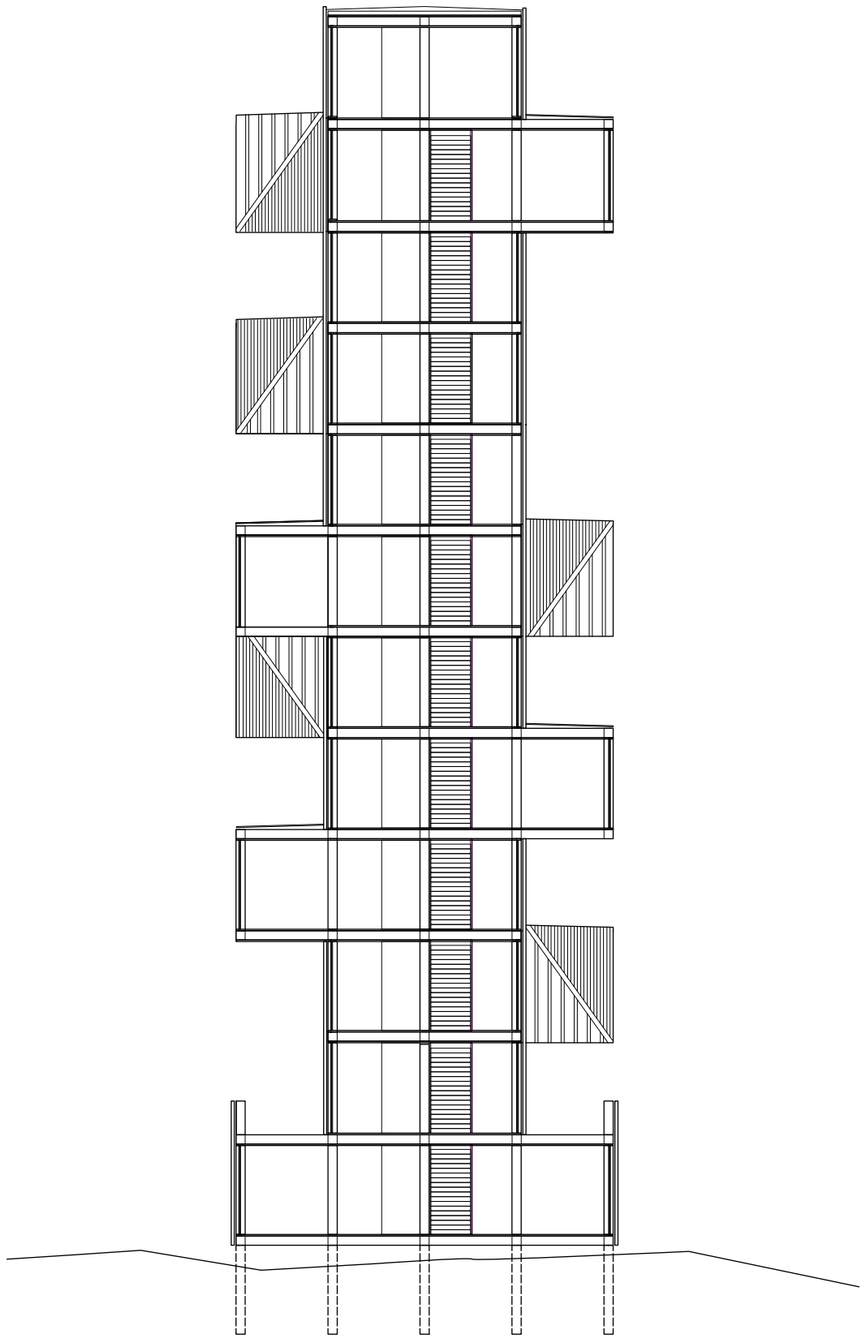
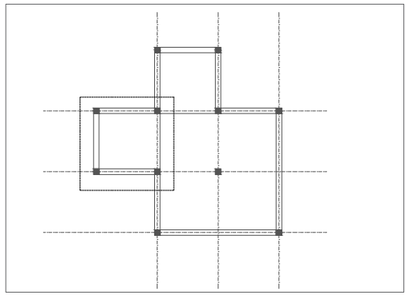
SECTION BUILDING

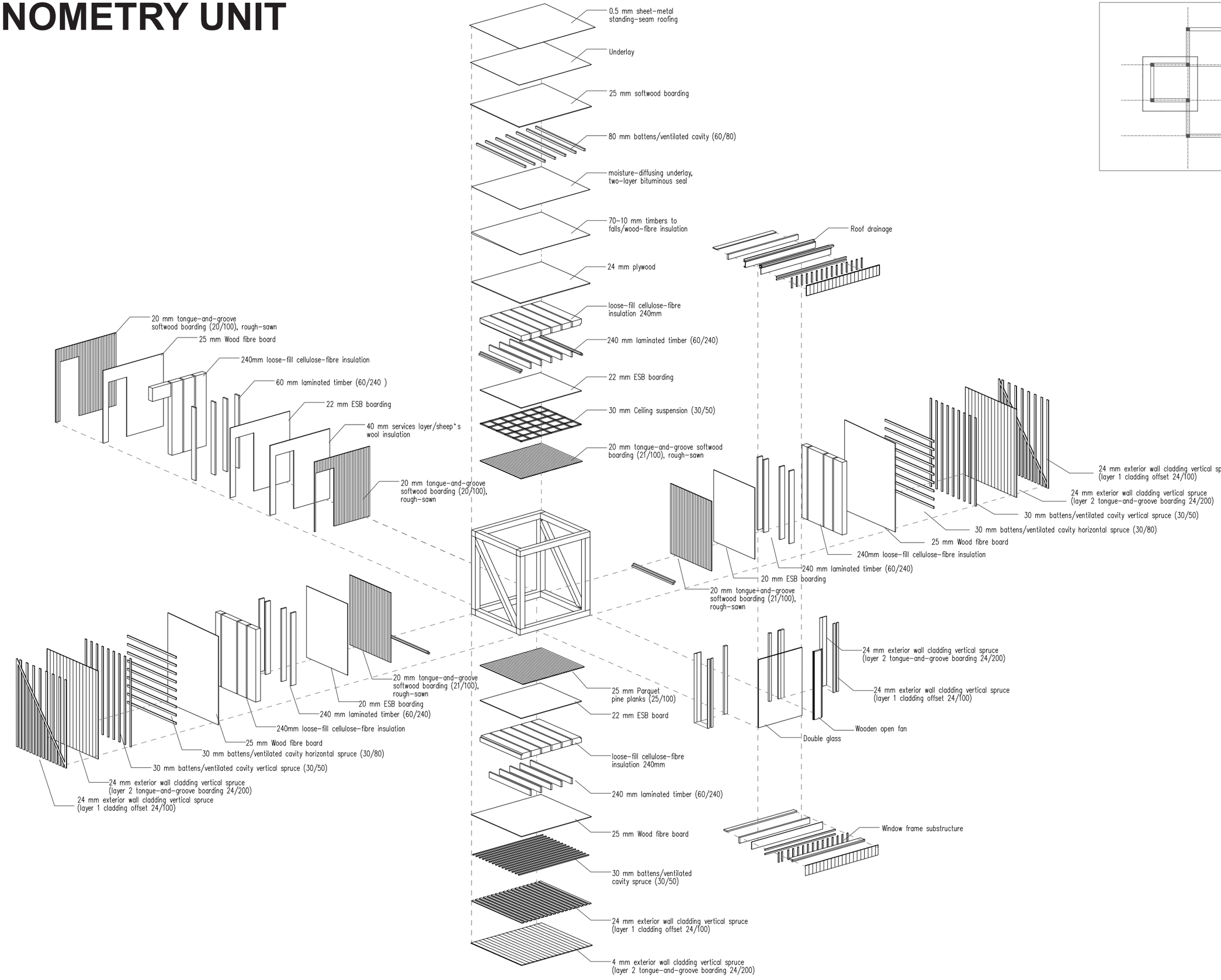
SCALE: 1: 100

Scale: 1: 200



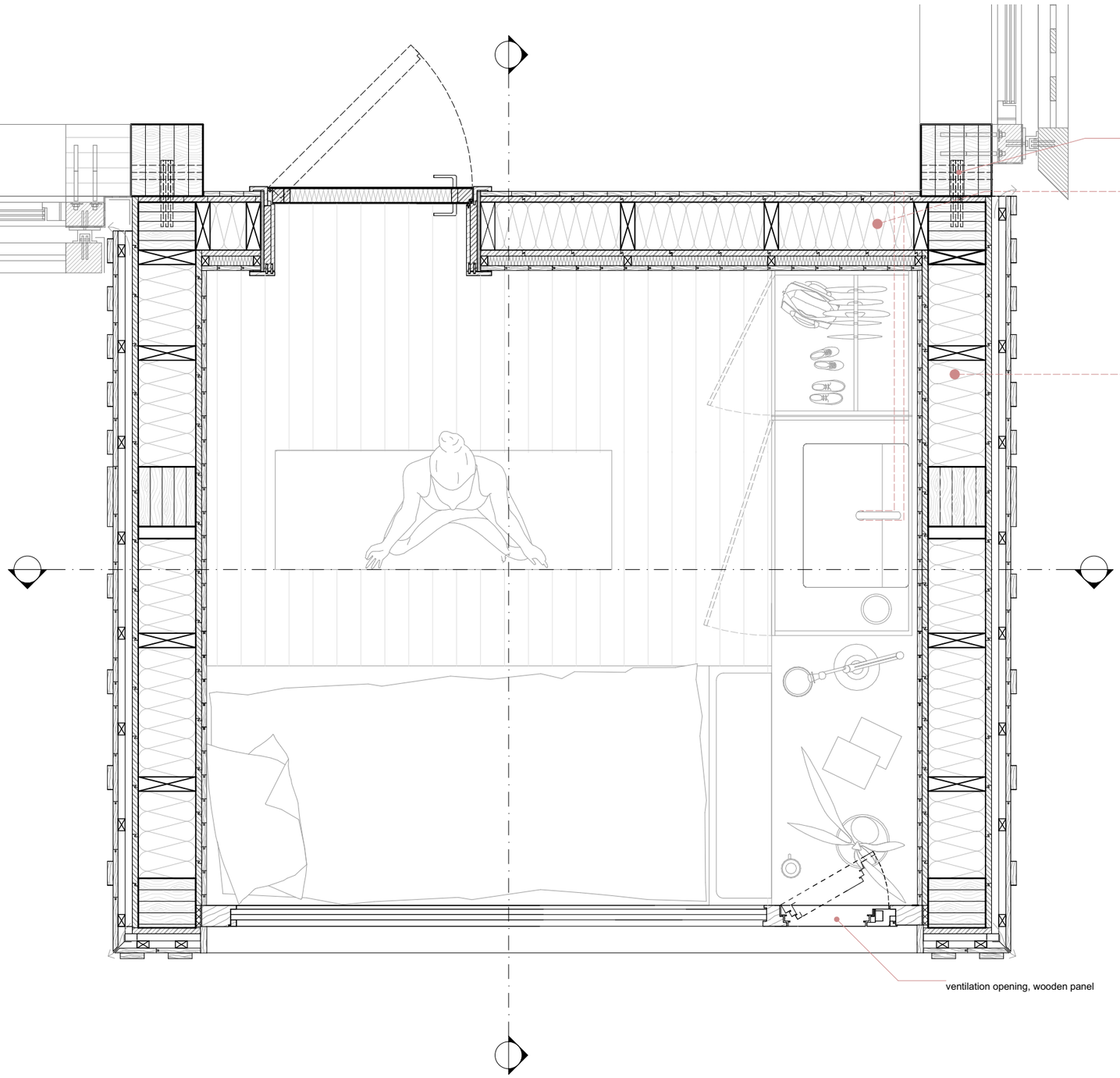
AXONOMETRY UNIT

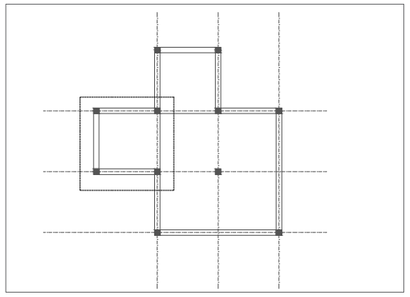




UNIT PLAN

SCALE: 1: 20





Wall Unit - Core

Unit

20 mm	tongue-and-groove softwood boarding (20/100), rough-sawn
40 mm	services layer/sheep's wool insulation
25 mm	GFM board, airtight
60 mm	laminated timber (60/240) with loose-fill cellulose-fibre insulation between
25 mm	GFM board
20 mm	tongue-and-groove softwood boarding (20/100), rough-sawn

Core

Wall Construction Unit

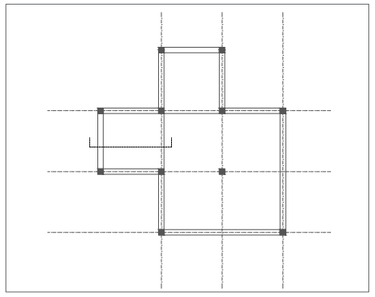
Outside

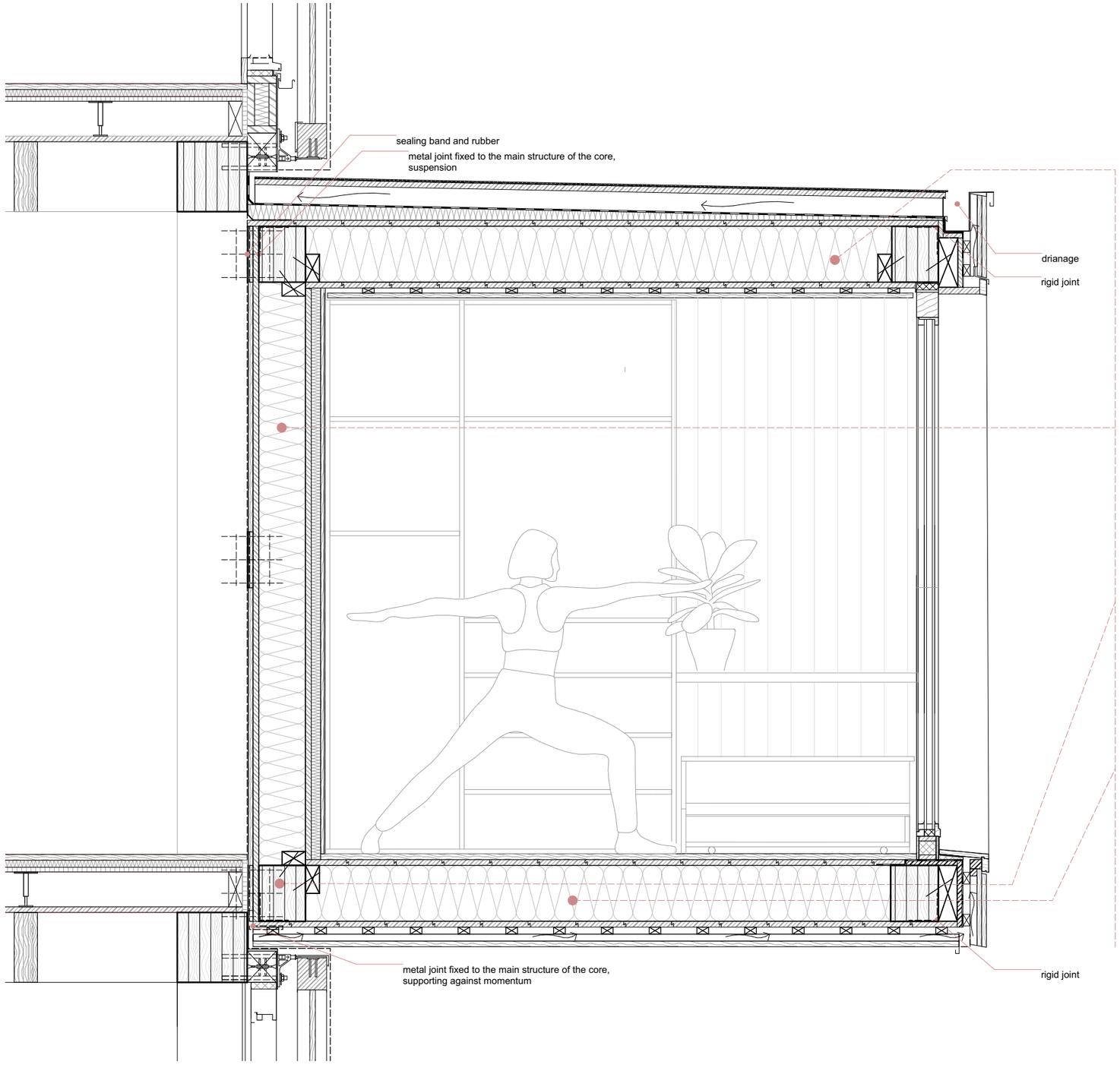
24 mm	exterior wall cladding vertical spruce - (layer 1 cladding offset 24/100)
24 mm	exterior wall cladding vertical spruce - (layer 2 tongue-and-groove boarding 24/200)
30 mm	battens/ventilated cavity vertical spruce (30/50)
30 mm	battens/ventilated cavity horizontal spruce (30/80)
25 mm	GFM board
240 mm	laminated timber (60/240) with loose-fill cellulose-fibre insulation between
25 mm	GFM board, airtight
20 mm	tongue-and-groove boarding (21/100), rough-sawn

Inside

UNIT SECTION A-A´

SCALE: 1: 20





Roof Structure Unit

Upside

0.5 mm	sheet-metal standing-seam roofing
	Underlay
25 mm	softwood boarding
80 mm	battens/ventilated cavity (60/80)
	moisture-diffusing underlay, two-layer bituminous seal
70 - 10 mm	timbers to falls/wood-fibre insulation
25 mm	GFM board
240 mm	laminated timber (60/240) with
	loose-fill cellulose-fibre insulation between
25 mm	GFM board, airtight
30 mm	ceiling suspension (30/50)
20 mm	tongue-and-groove softwood boarding (21/100), rough-sawn

Downside

Wall Unit - Core

Unit

20 mm	tongue-and-groove softwood boarding (20/100), rough-sawn
40 mm	services layer/sheep's wool insulation
25 mm	GFM board, airtight
60 mm	laminated timber (60/240) with
	loose-fill cellulose-fibre insulation between
25 mm	GFM board
20 mm	tongue-and-groove softwood boarding (20/100), rough-sawn

Core

Floor Construction Core

Upside

25 mm	Parquet
30 mm	wood-fibre impact-sound insulation
20 mm	softboard slabs
140 mm	subfloor layer
25 mm	GFM board
240 mm	laminated timber

Downside

Floor Construction Unit

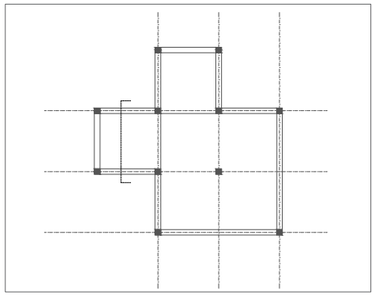
Inside

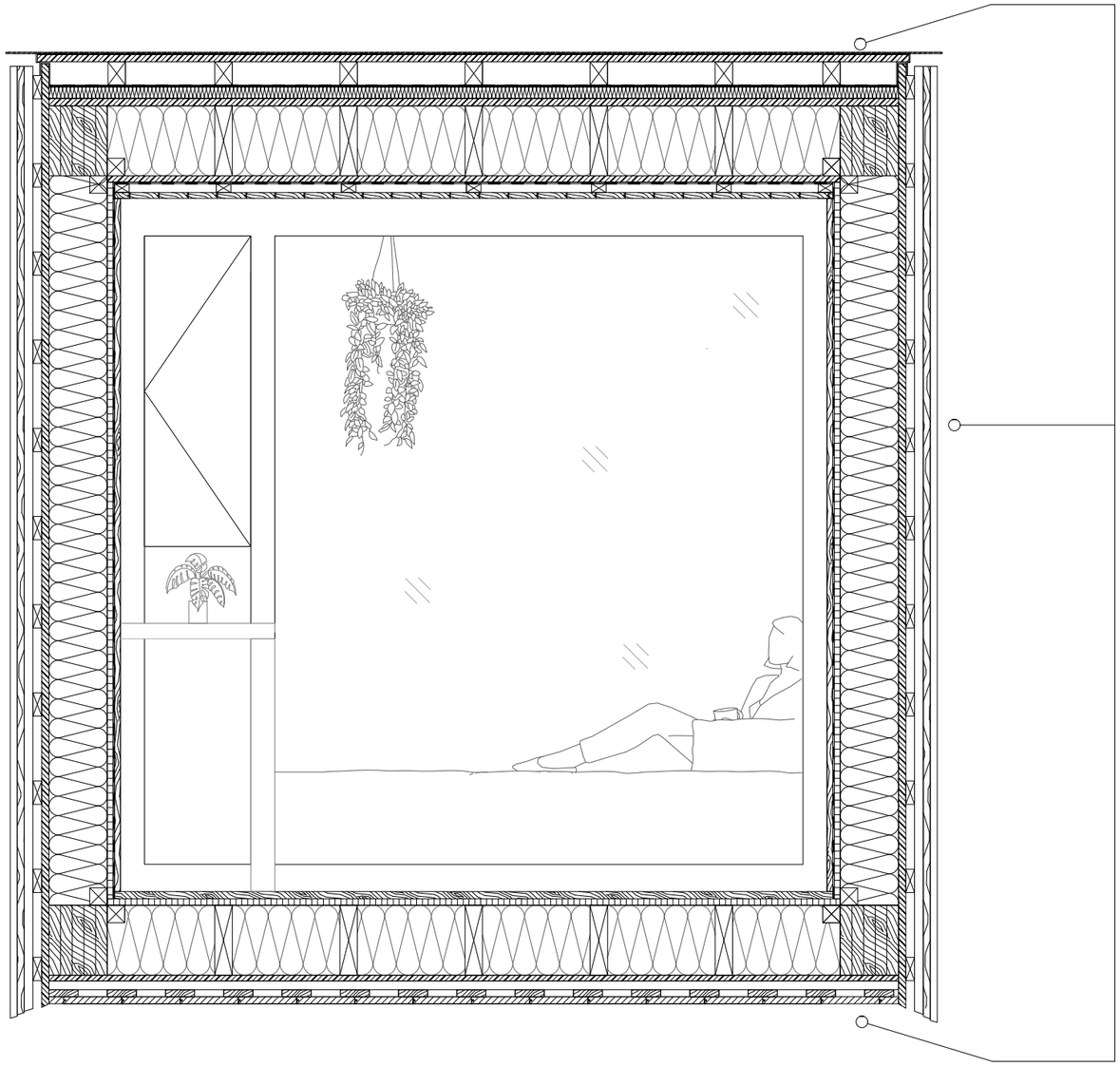
25 mm	Parquet pine planks (25/100)
25 mm	GFM board, airtight
240 mm	laminated timber (60/240) with
	loose-fill cellulose-fibre insulation between
25 mm	GFM board
30 mm	battens/ventilated cavity spruce (30/50)
24 mm	exterior wall cladding vertical spruce - (layer 1 cladding offset 24/100)
24 mm	exterior wall cladding vertical spruce - (layer 2 tongue-and-groove boarding 24/200)

Outside

UNIT SECTION B-B´

SCALE: 1: 20





Roof Construction Unit

Upside

0.5 mm sheet-metal standing-seam roofing
Underlay
25 mm softwood boarding
80 mm battens/ventilated cavity (60/80)
moisture-diffusing underlay, two-layer bituminous seal
70 - 10 mm timbers to falls/wood-fibre insulation
25 mm GFM board
240 mm laminated timber (60/240) with
loose-fill cellulose-fibre insulation between
25 mm GFM board, airtight
30 mm Ceiling suspension (30/50)
20 mm tongue-and-groove softwood boarding (21/100), rough-sawn

Downside

Wall Construction Unit

Outside

24 mm	exterior wall cladding vertical spruce - (layer 1 cladding offset 24/100)
24 mm	exterior wall cladding vertical spruce - (layer 2 tongue-and-groove boarding 24/200)
30 mm	battens/ventilated cavity vertical spruce (30/50)
30 mm	battens/ventilated cavity horizontal spruce (30/80)
25 mm	GFM board
240 mm	laminated timber (60/240) with loose-fill cellulose-fibre insulation between
25 mm	GFM board, airtight
20 mm	tongue-and-groove boarding (21/100), rough-sawn

Inside

Floor Construction Unit

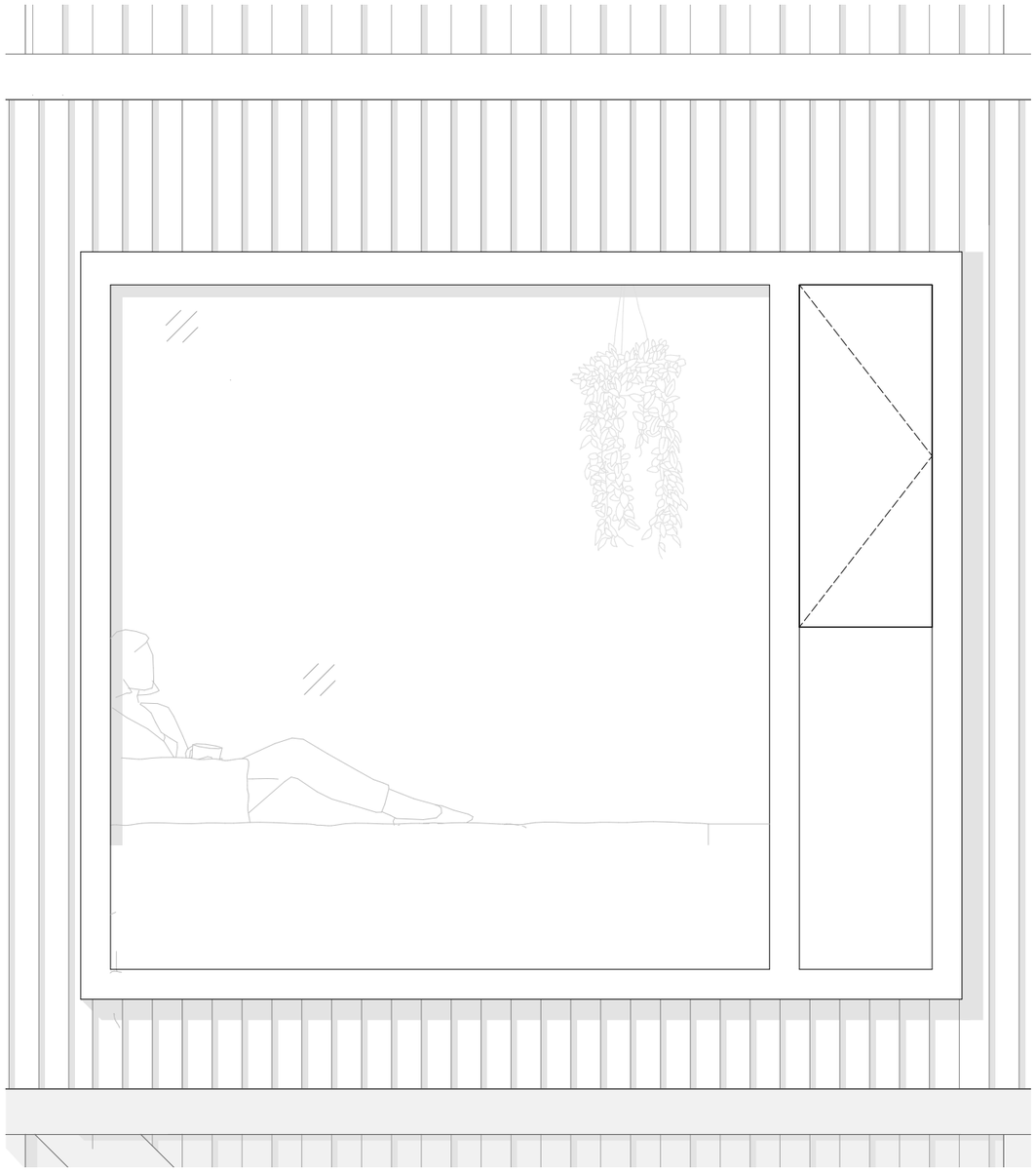
Inside

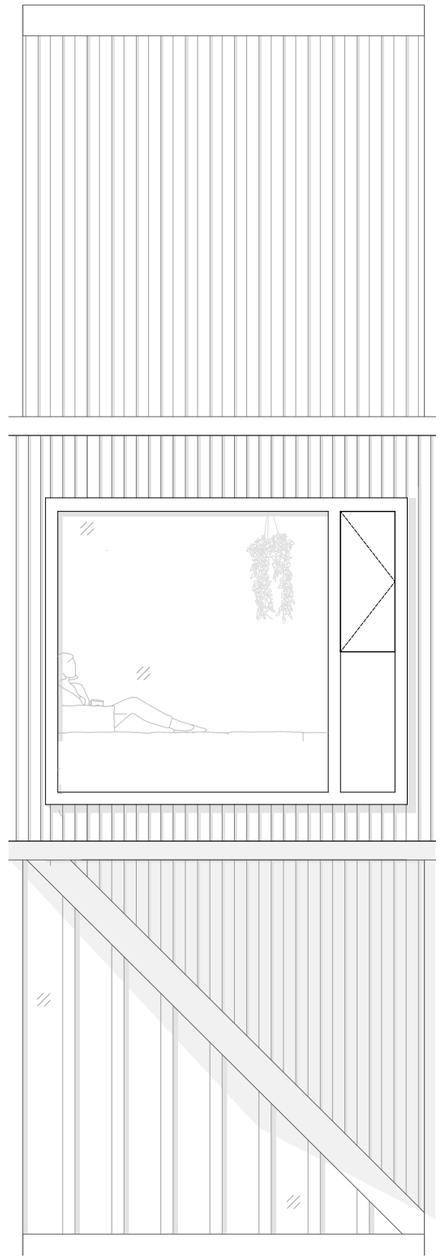
25 mm Parquet pine planks (25/100)
25 mm GFM board, airtight
240 mm laminated timber (60/240) with
loose-fill cellulose-fibre insulation between
25 mm GFM board
30 mm battens/ventilated cavity spruce (30/50)
24 mm exterior wall cladding vertical spruce - (layer 1 cladding offset 24/100)
24 mm exterior wall cladding vertical spruce - (layer 2 tongue-and-groove boarding 24/200)

Outside

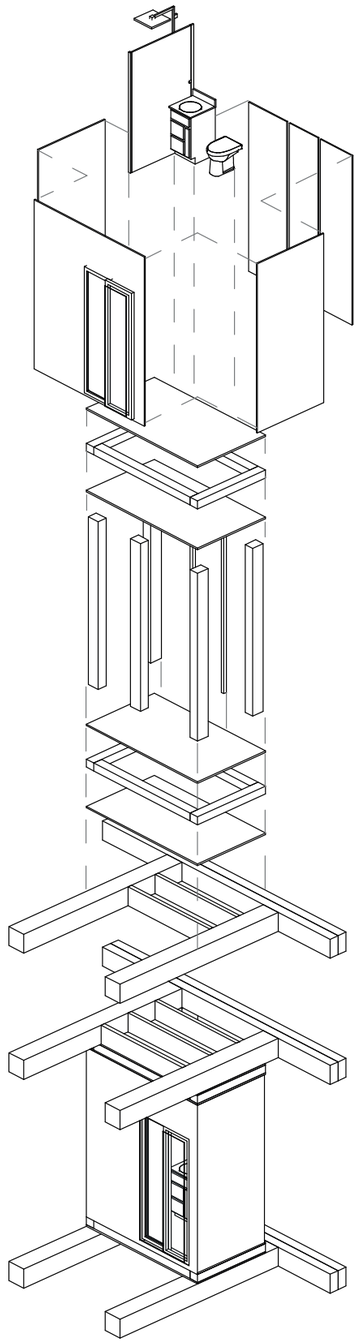
UNIT FACADE

SCALE: 1: 20 AND 1:50





AXONOMETRY CORE



Sanitary fittings

Enclosure Wall panels

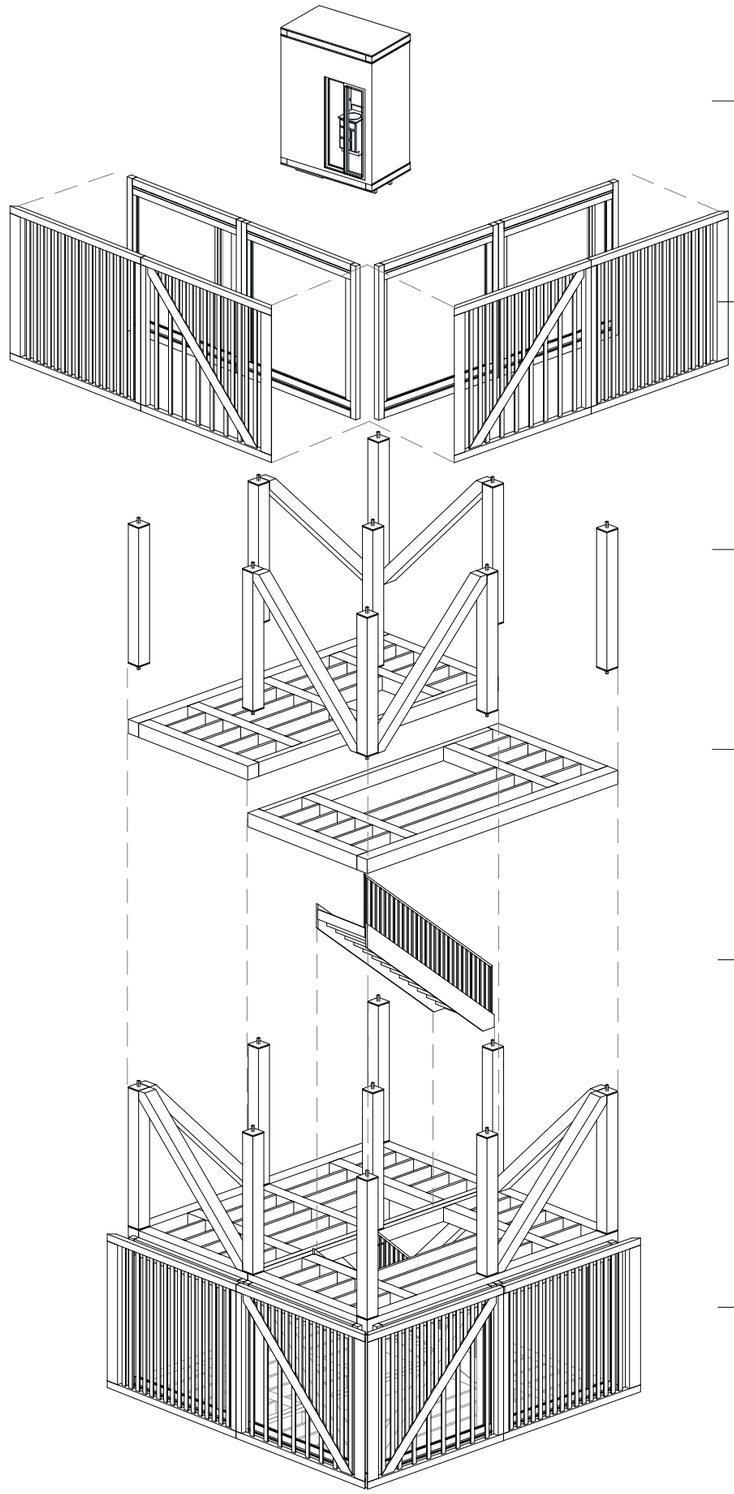
Ceiling structure

Column wood structure

Wood structure floor

Main core structure

Components for the Toilet box



Toilet box

Triple glazing in wood frame panel
Facade wood frame panel

Structural columns and diagonals

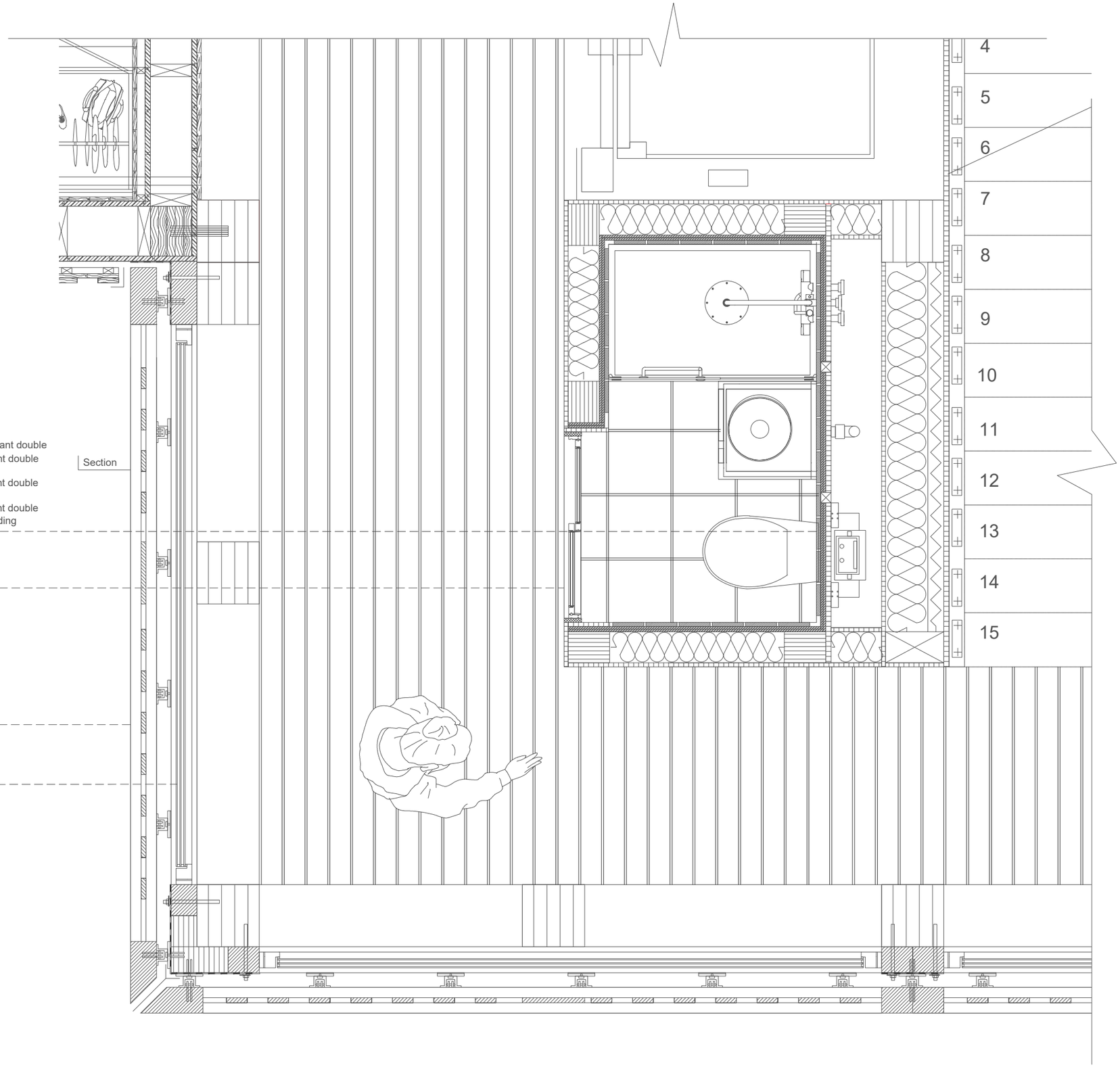
Timber wood structure floor

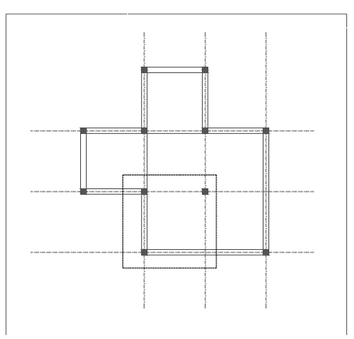
Stairs

Components for the core

CORE PLAN

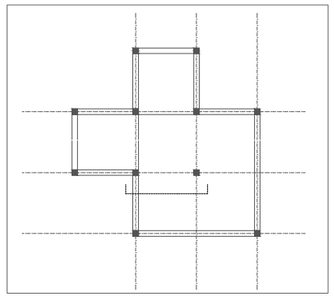
SCALE: 1: 20

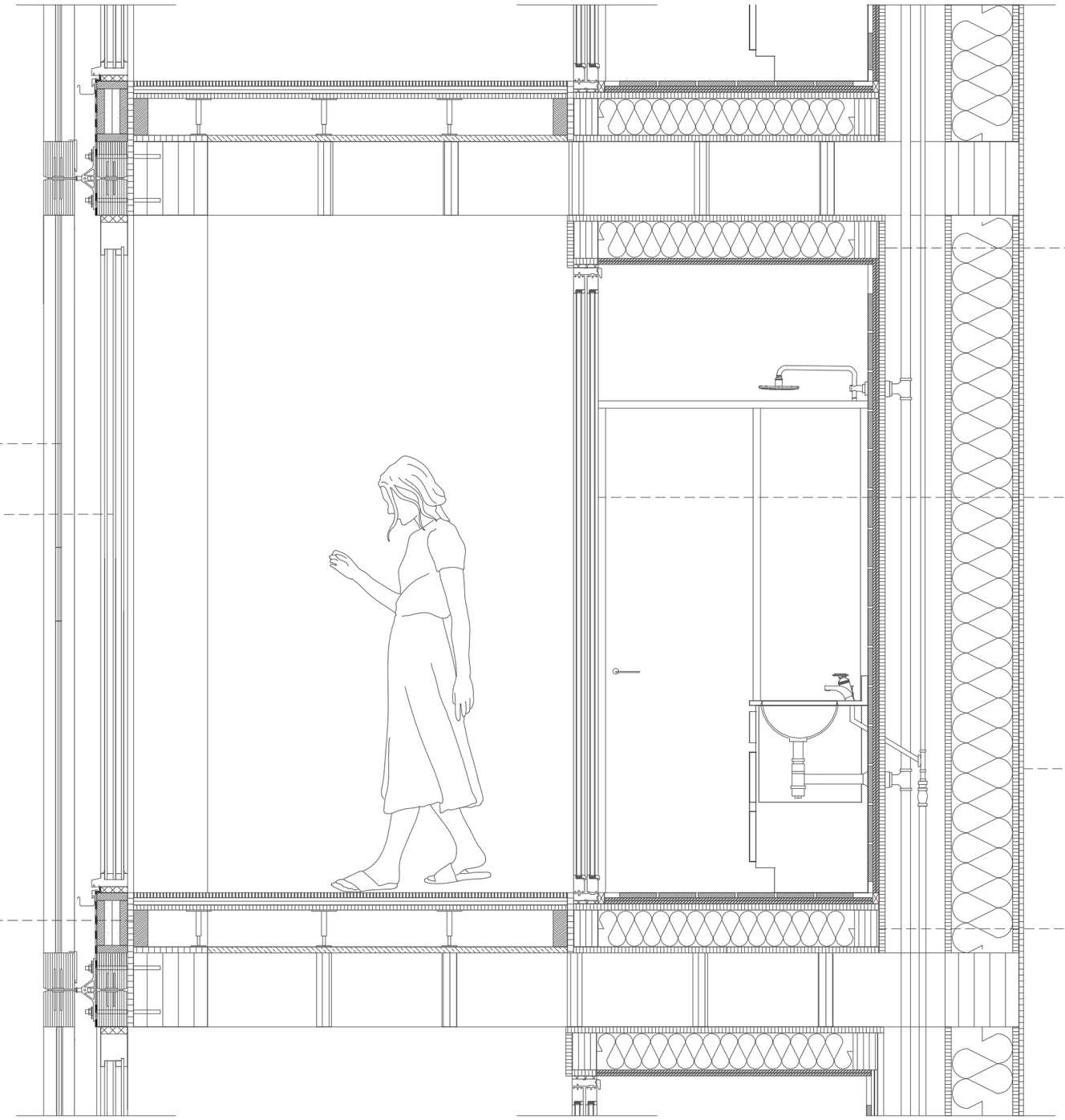




CORE SECTION

SCALE: 1: 20





prefabricated facade element
Timber frame 150 / 150 mm
100/ 24 mm wood-fir strips

prefabricated facade Panel
Triple glazing in
timber frame

Floor core
20 mm Parquet
30 mm wood-fibre impact-sound insulation
20 mm softboard slabs
150 mm subfloor layer
25 mm GFM board
300 mm laminated timber

ceilling
25 mm plywood
150 mm thermal insulation
25 mm gypsum plaster board water resistant double

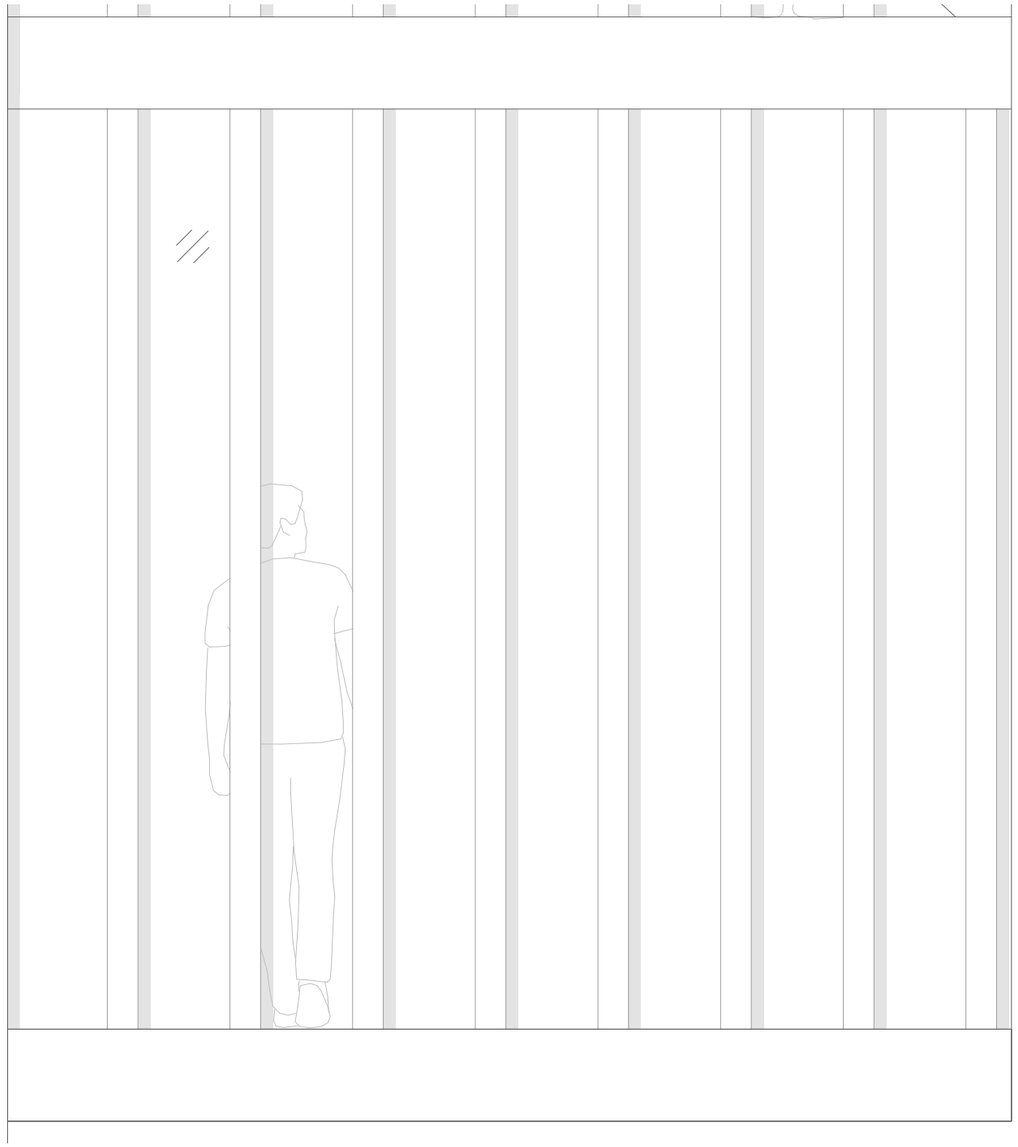
Door bathroom:
40 mm Sliding door with double glazing
in wood frame

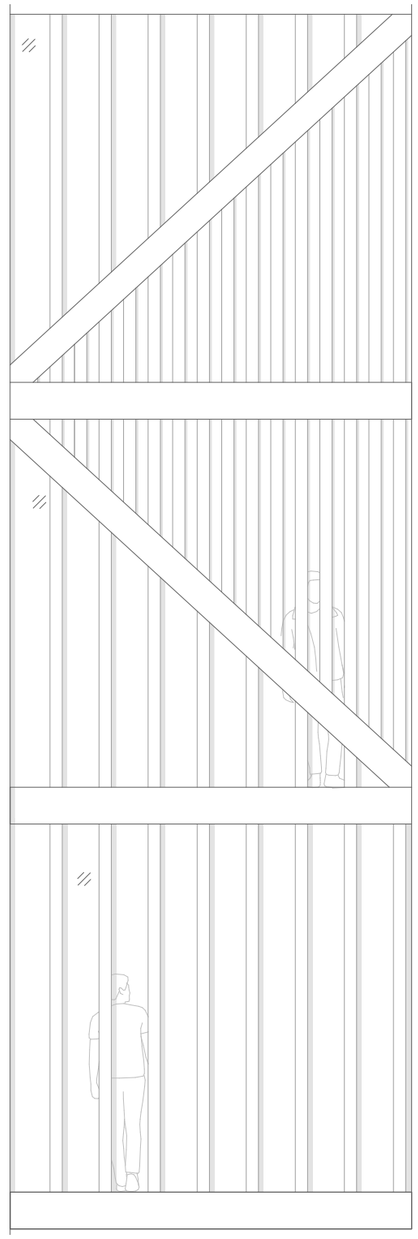
wall partition, bathroom, stairs:
10 mm tile
25 mm gypsum plaster board water resistant double
25 mm gypsum plaster board, fire resistant double
250 mm service layer
25 mm gypsum plaster board, fire resistant double
250 mm thermal insulation
25 mm gypsum plaster board, fire resistant double
20 mm tongue and groove softwood boarding

Floor toilet
20 mm tile
25 mm gypsum plaster board water resistant double
25 mmGFM board, airtight
150mm timber loose-fill cellulose-fibre insulation between
25 mm plywood
300 mm laminated timber

CORE FACADE

SCALE: 1: 20 AND 1:50

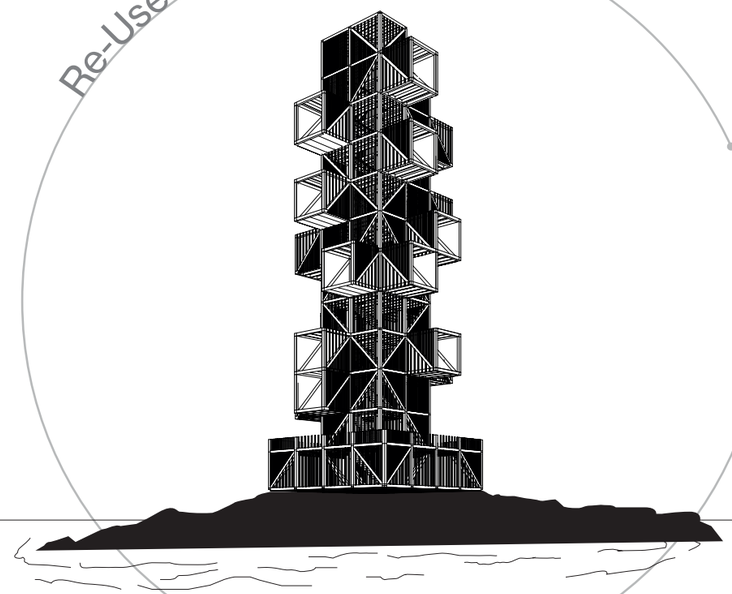




LIFE CYCLE CONCEPT

Maintaining the Building

Re-Use - Reassamble- Recycle



Minimized grey energy

Low tech energy building concept

Planning and Constructing

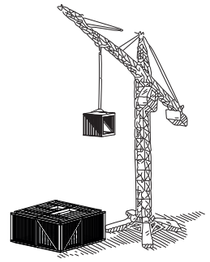
Design to Recycle and Re-Use

Design to Reassemble

LIFE CYCLE CONCEPT

60 - 140 years
before construction

first year



sustainably managed forest → **logging** → **transport** → **reuse as product or material** → **transport** → **construction on site in short time due prefabrication**

minimum age for trees to be grubbed up
pine 80 - 140 years
spruce 80 - 120 years
birch 60 - 80 years

production , drying and processing from individual components

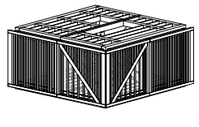
prefabrication from building elements (units, sanitary facilities ect.)

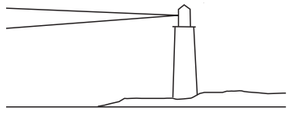
transport

reuse as product/material

use of building and maintaining

reuse as product or material ← **disassemble of core** ← **use of core as landmark and maintaining** ← **disassemble of units**





~ 100 - 150 years after constructing

~ 150 years after constructing

~ 100 years after constructing

1 - 100 years after constructing

LIFE CYCLE CONCEPT

Maintaining the Building

first year

Maintenance requirements are focused on cleaning activities and periodic inspections

2-20 years

Fully developed operating and maintenance system to operate the building. Focusing on small repairs.

20 - 50 years

focusing on bigger repairings and exchange specific building elements. Focus on the maintenance of all critical systems.

50 year +

preventative maintenance and focus on the maintenance of all critical systems.

Facade
cladding spruce, recycled
through re-use pre-greyed, brushed before fixing, Regular visual inspection and repairing every 5 years

Building Services
Depending on the service latest visual inspection every second year

Furniture
continuous maintenance and repair, exchange every 30 years

Structure
regular visual inspection

Infrastructure
modernization of the infrastructure every 30 years