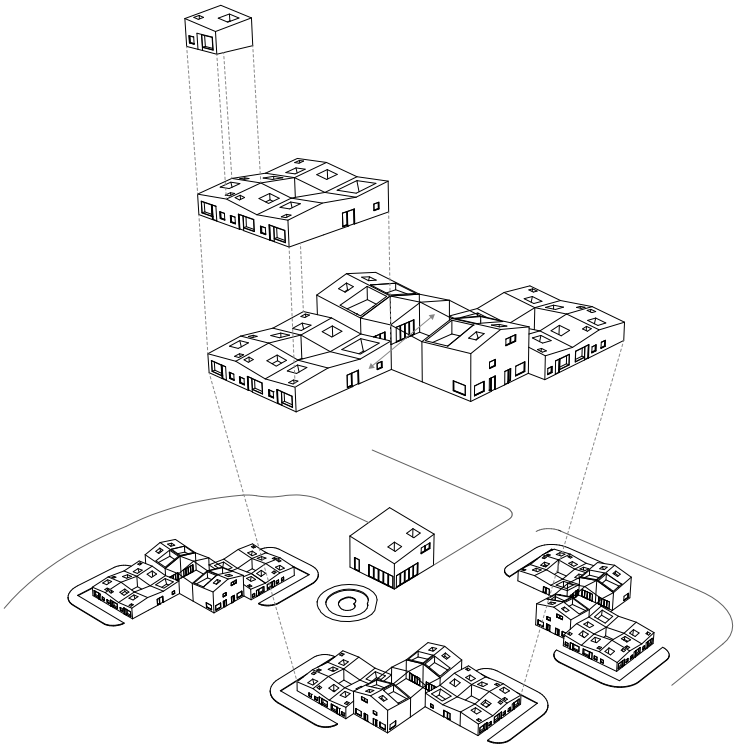
Design

Fun by the grey



Marijn Bouwman

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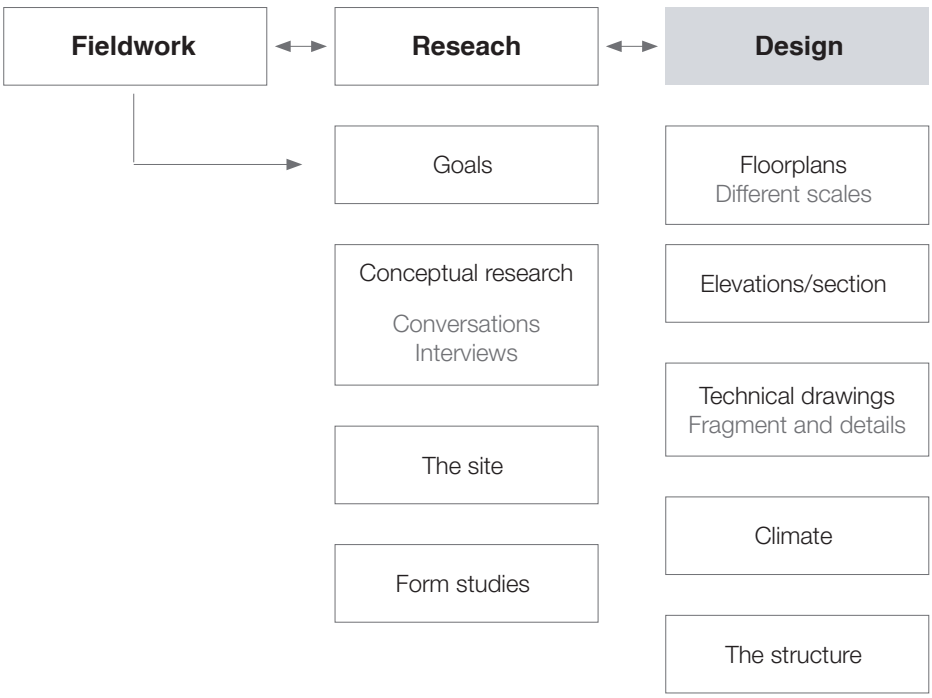
Technische Universiteit Delft
Graduation Studio Designing for care (AR3AD133)
Tutors Birgit Jürgenhake, Leeke Reinders and Jos Lafeber
First version 30 June 2019

Design

Fun by the grey

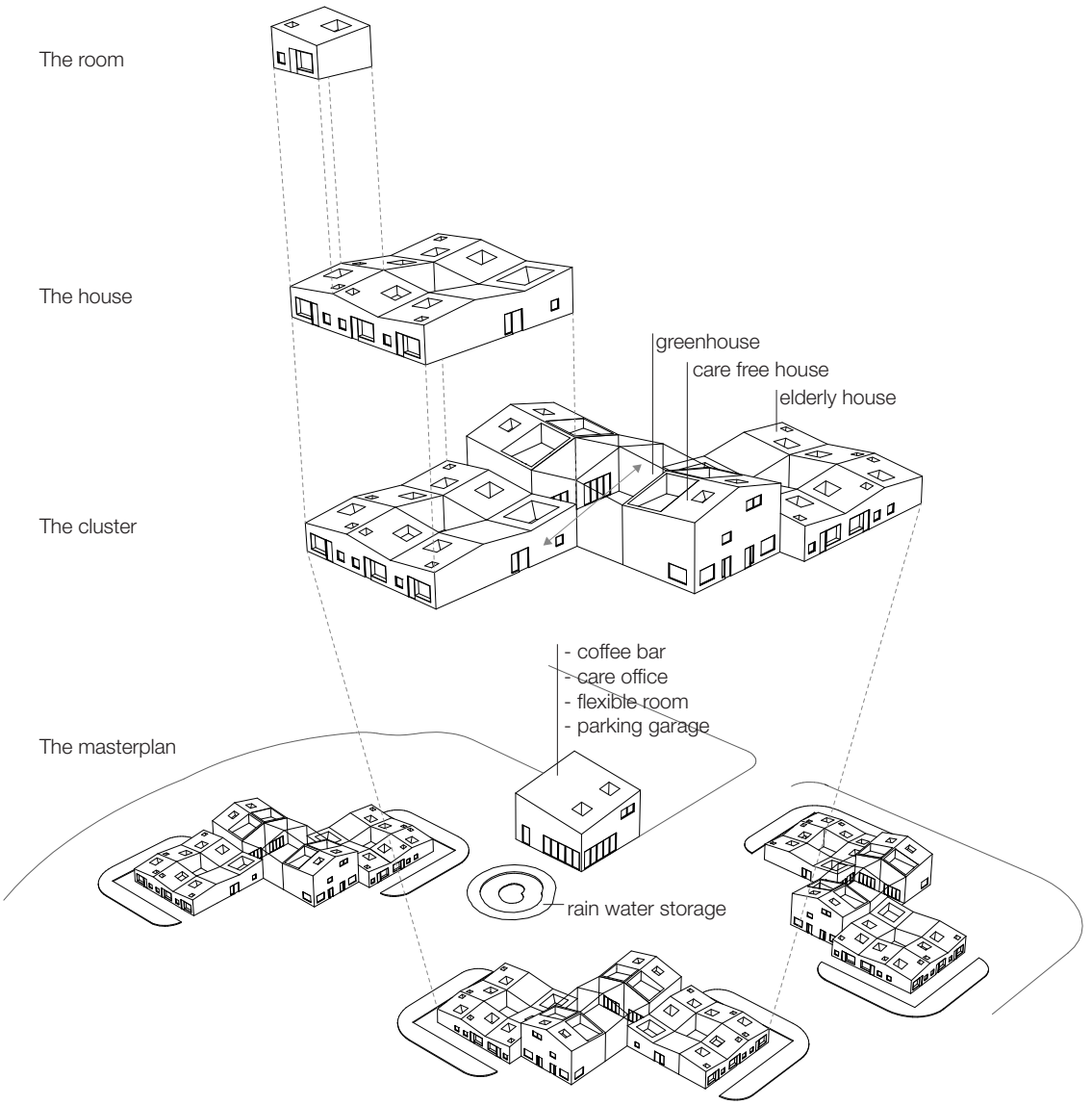
Organization

This project is subdivided into three booklets, the fieldwork, the research and the design. This booklet shows the design in drawings.



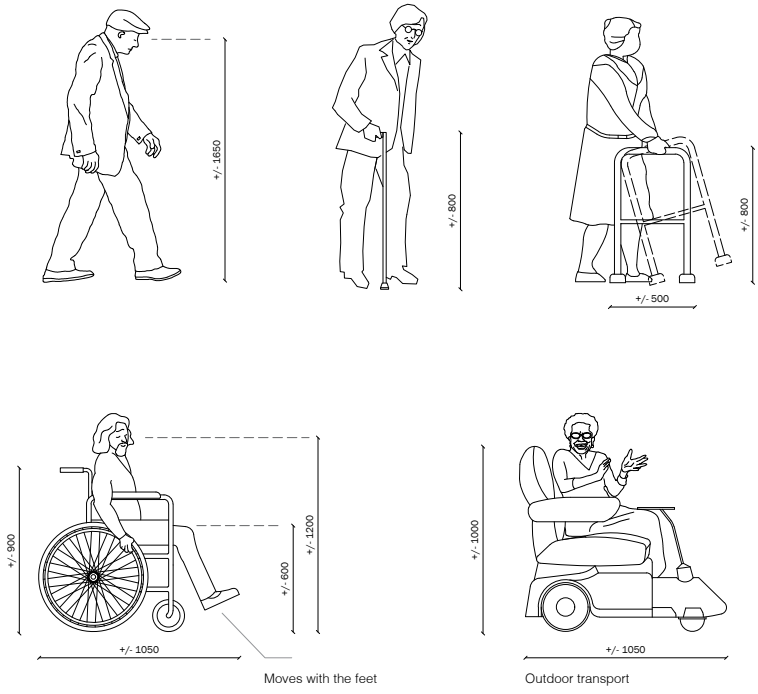
INSIDE OUT

Scales


The room
The house
greenhouse
care free house
elderly house
The cluster
- coffee bar
- care office
- flexible room
- parking garage
The masterplan
rain water storage

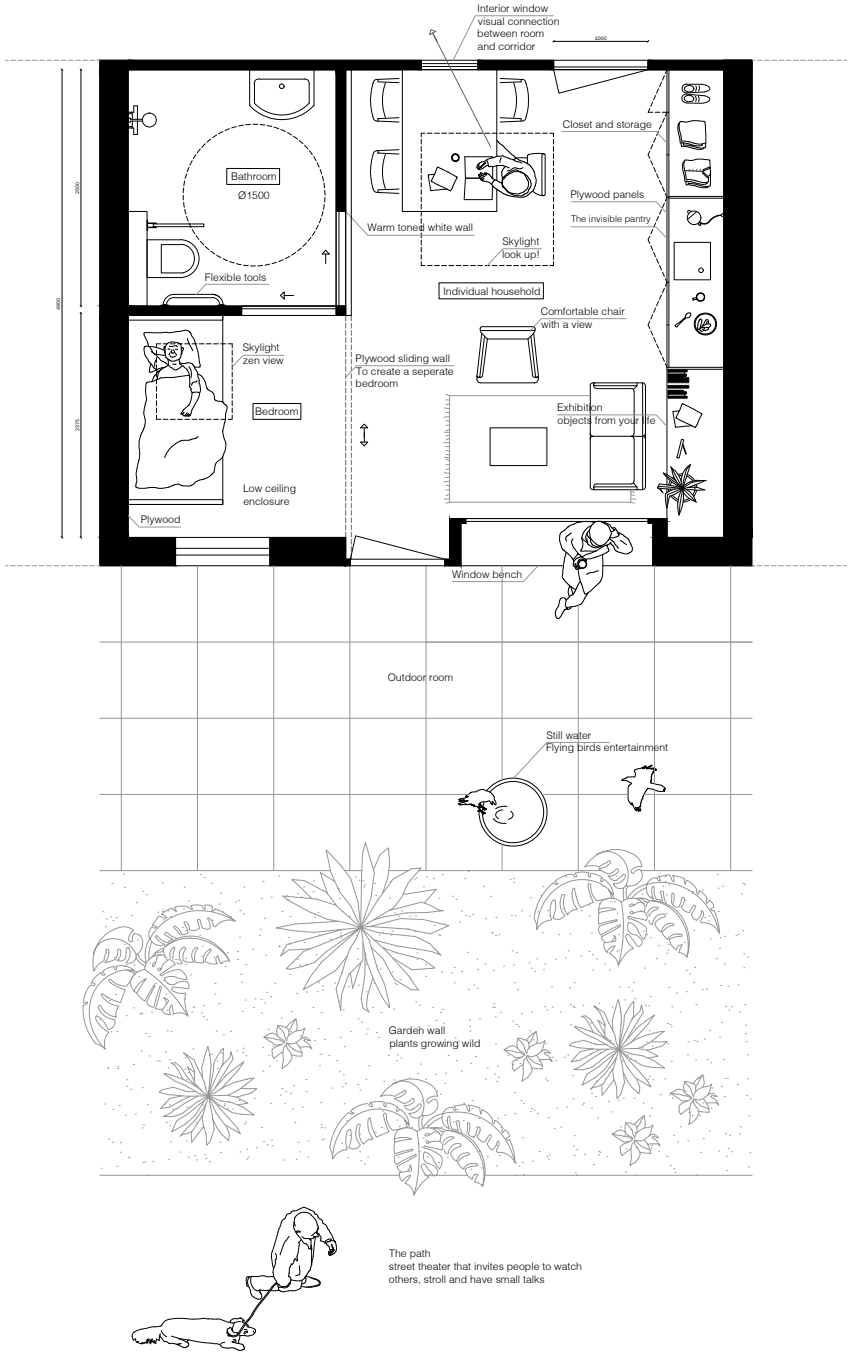
The target group

Elderly



Haak, A.J.H. (2005). *De Menselijke Maat*. Delft University Press

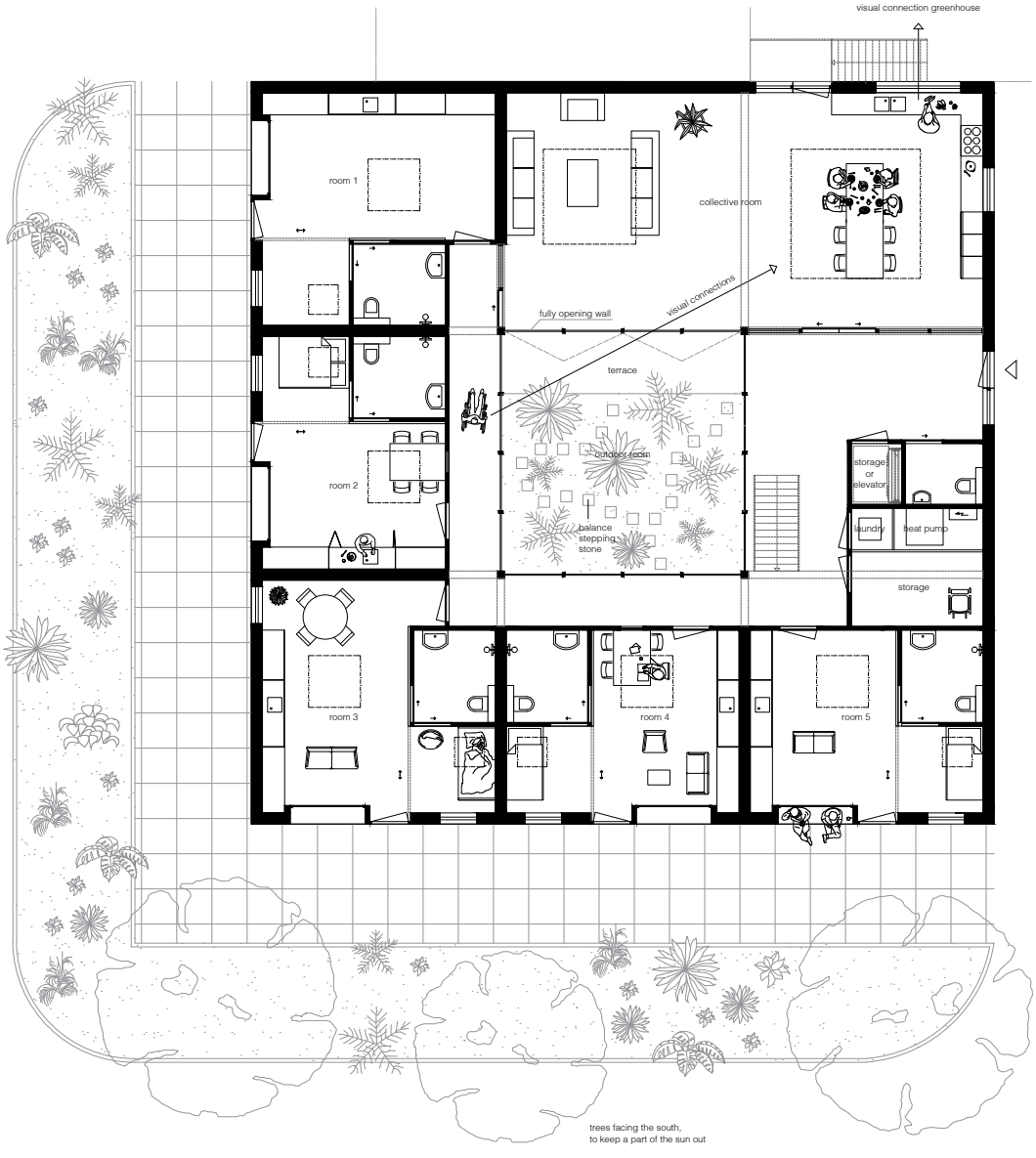
The individual room


Interior window
visual connection
between room
and corridor
1000
Closet and storage
Bathroom
Ø1500
Plywood panels
The invisible pantry
Warm toned white wall
Skylight
look up!
Flexible tools
Individual household
Comfortable chair
with a view
Skylight
zen view
Plywood sliding wall
To create a seperate
bedroom
Bedroom
Exhibition
objects from your life
Low ceiling
enclosure
Plywood
Window bench
Outdoor room
Still water
Flying birds entertainment
Garden wall
plants growing wild
The path
street theater that invites people to watch
others, stroll and have small talks

1 m

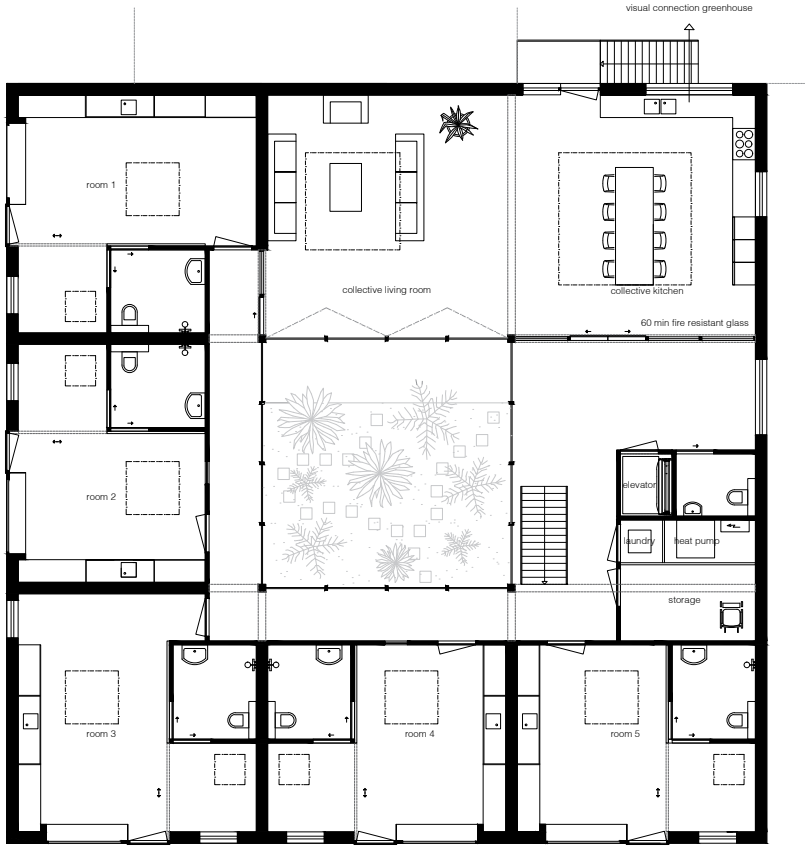
The senior collective living

The ground floor


visual connection greenhouse
room 1
collective room
fully opening wall
visual connections
terrace
outdoor room
room 2
balance stepping stone
storage or elevator
laundry
heat pump
storage
room 3
room 4
room 5
trees facing the south, to keep a part of the sun out
1 m

The senior collective living

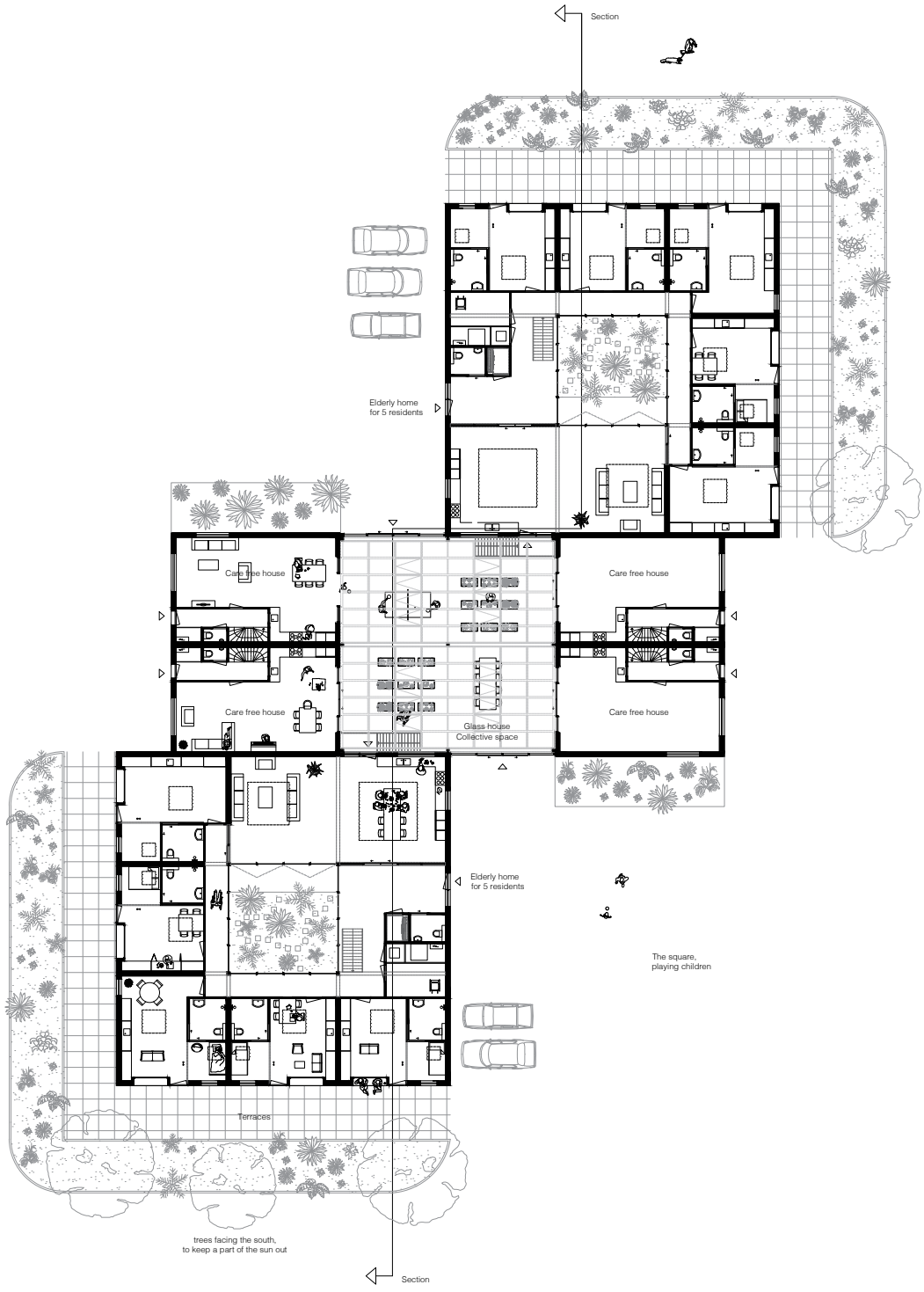
The first floor


visual connection greenhouse
room 1
collective living room
collective kitchen
60 min fire resistant glass
room 2
elevator
laundry
heat pump
storage
room 3
room 4
room 5

1 m

The cluster

Clusters of senior collective livings, care free livings and a greenhouse


Section
Elderly home
for 5 residents
Care free house
Care free house
Care free house
Care free house
Glass house
Collective space
Elderly home
for 5 residents
The square,
playing children
Terraces
trees facing the south,
to keep a part of the sun out
Section
2 m

The masterplan

Hilversum

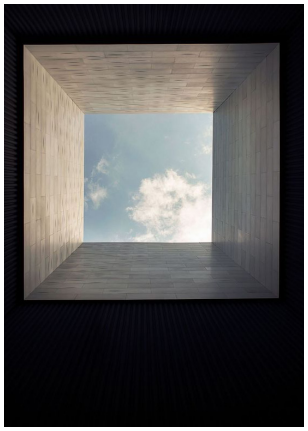
The Boombergpark
Delivery of goods
Private terraces
on the street
Visual connection
to the greenhouse
P
Collective building
Parking garage
Care office
Flexible room
Coffee bar
Terrace
Promenade
Invite people to watch others and to stroll
Natural rainwater storage
Benches
Flowers growing
wild
Square with
playing children
Garden wall
Trees facing the south
Tree full of birds
Benches
Pedestrian path,
A path where elderly can safely wander
Senior living
Care free living
Greenhouse
Collective building
6 m

The village

‘Old people everywhere’
A growing sysytem

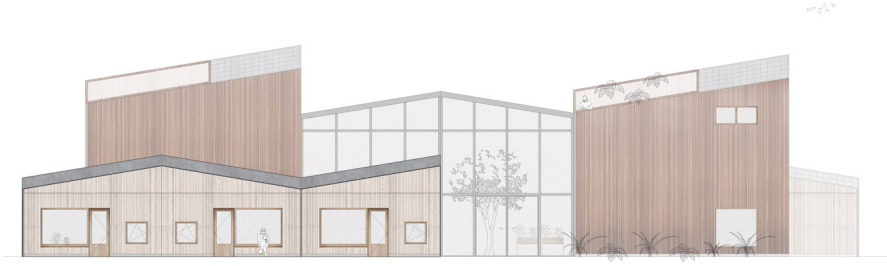
18 m

Material portrait



One or two floors

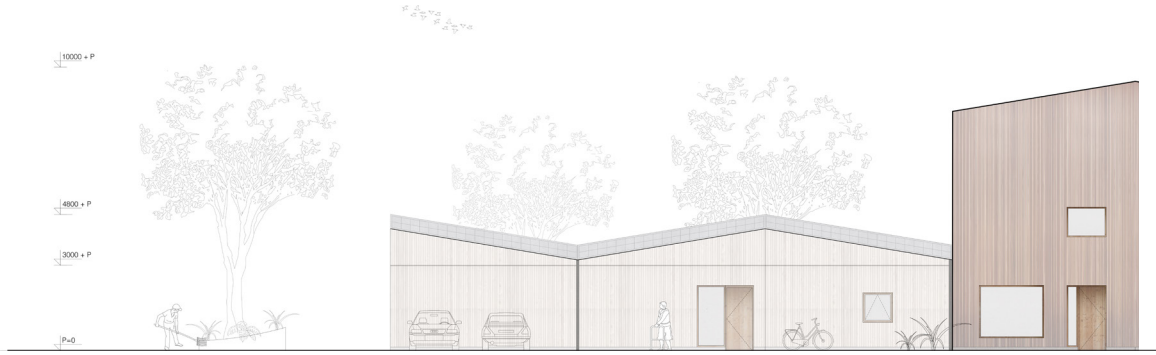
The elderly house can be extended



Elevation, 1 floor

Elevation, 2 floors

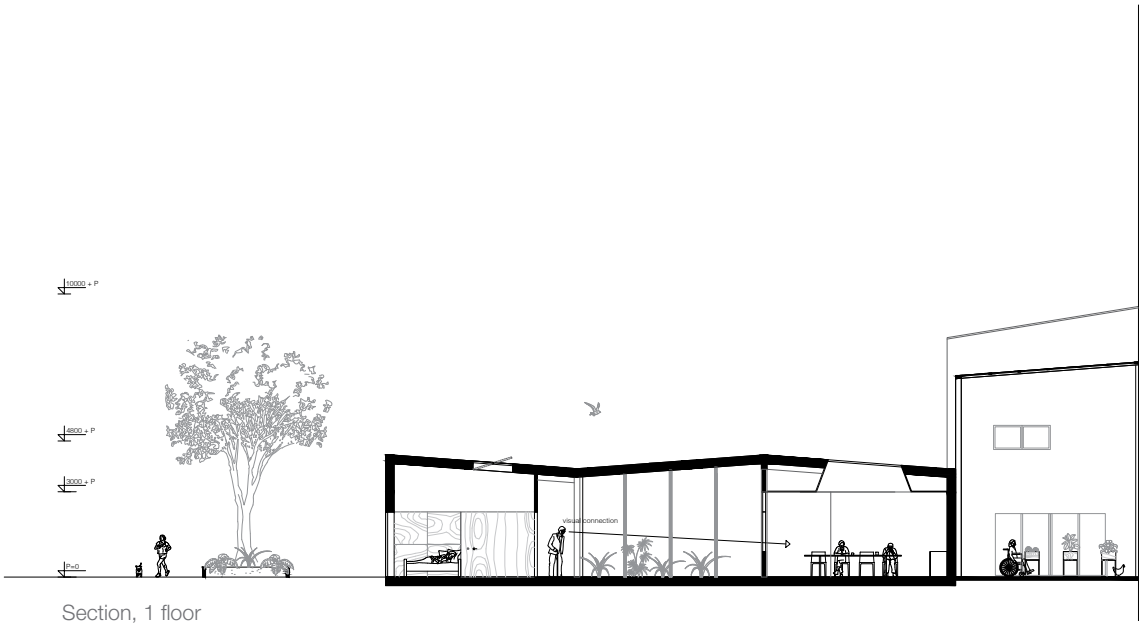
1 m



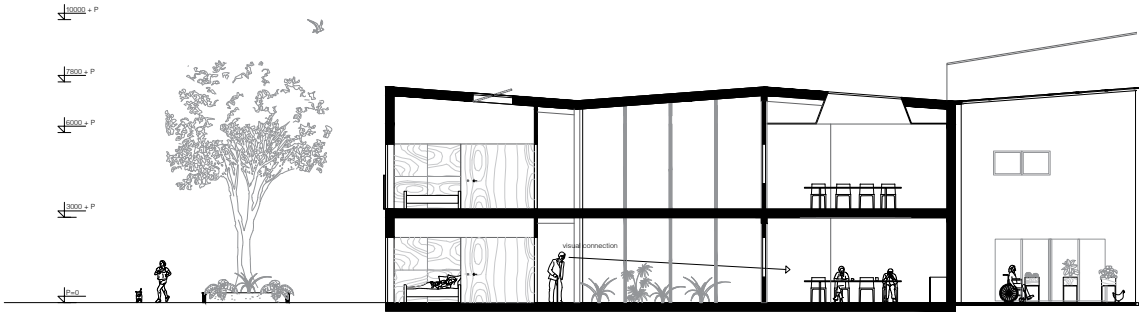
Elevation, 1 floor

Elevation, 2 floors

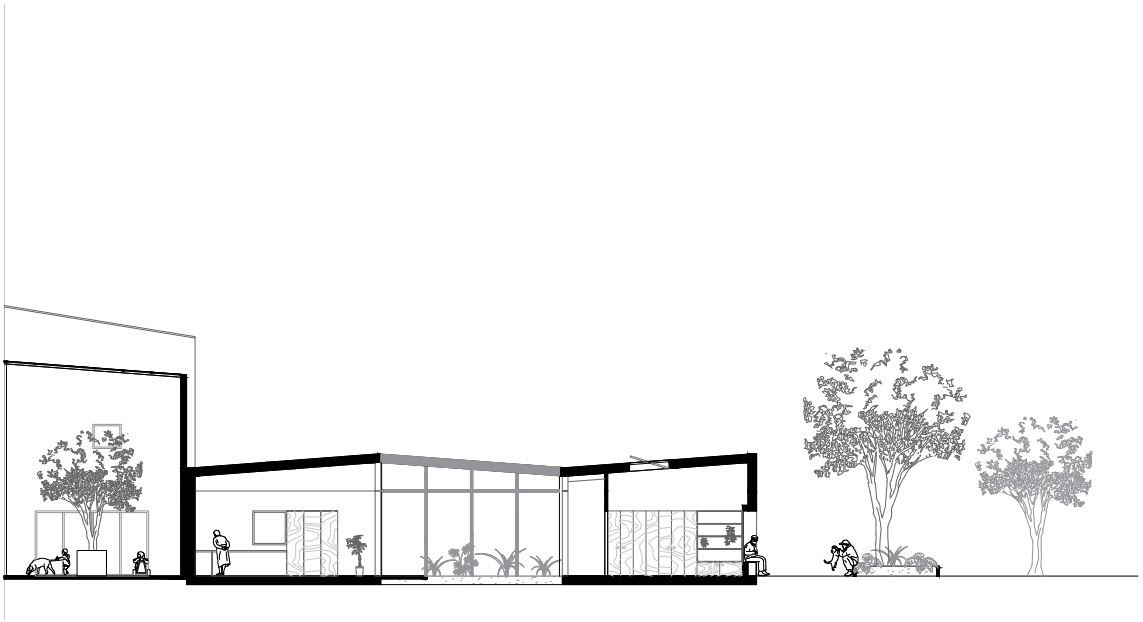
1 m

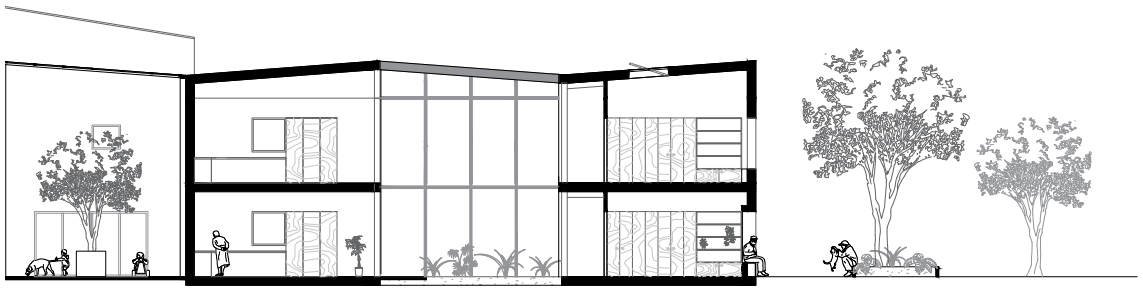


Section, 1 floor

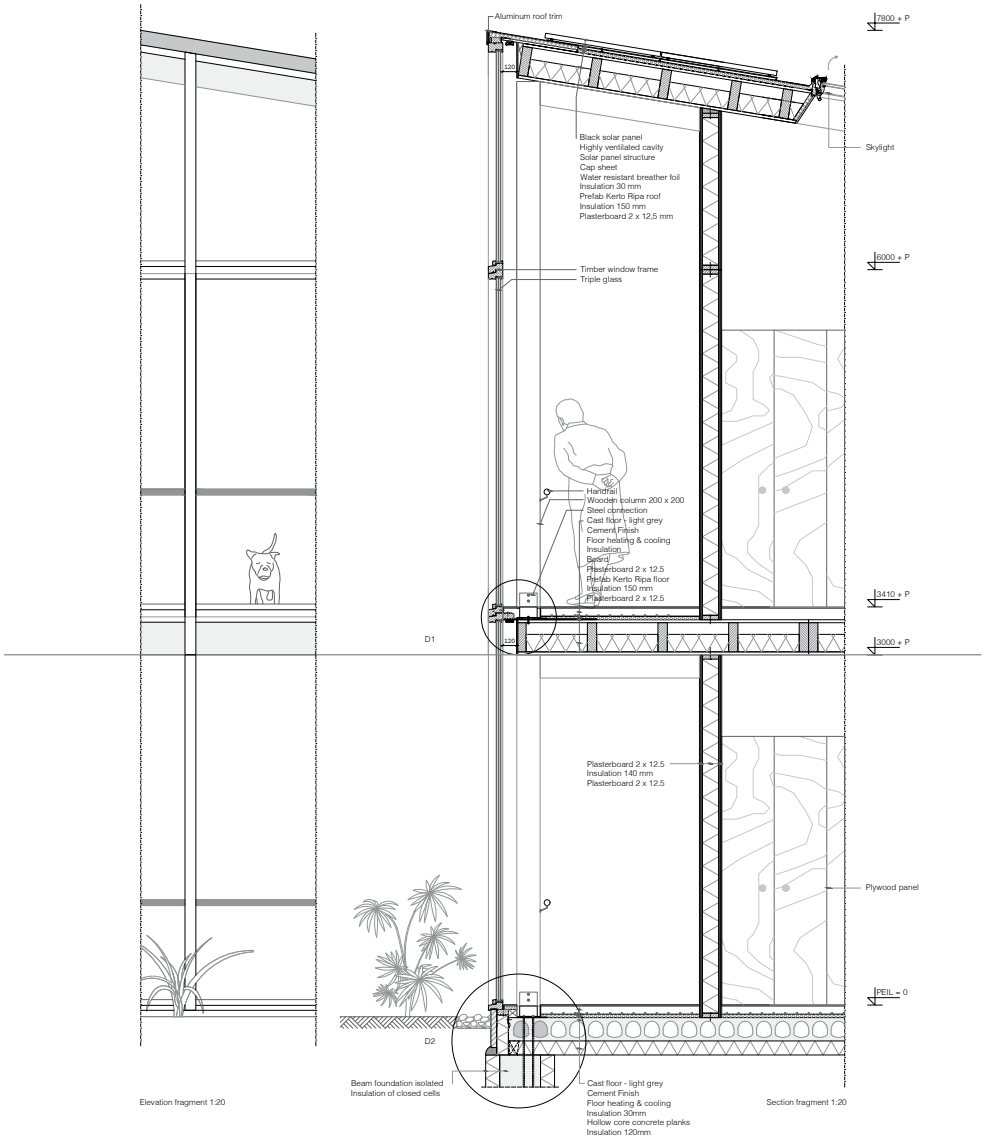


Section, 2 floors



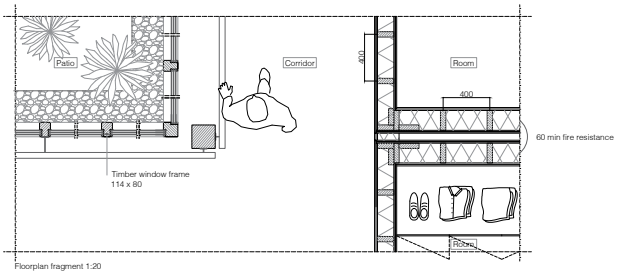


1 m

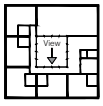


Elevation fragment 1:20

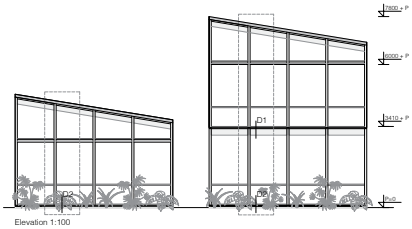
Section fragment 1:20



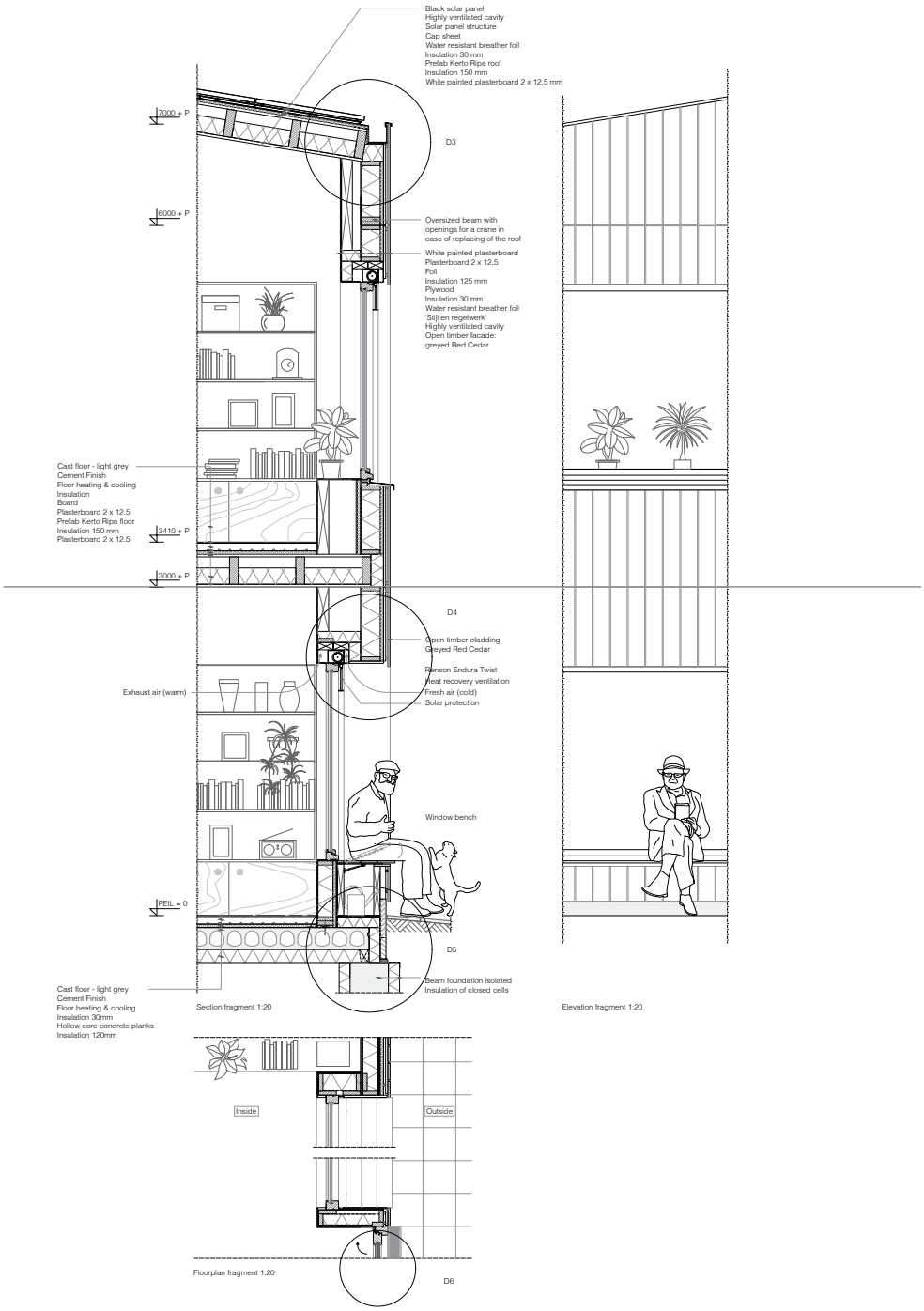
Floorplan fragment 1:20



Floorplan 1:500

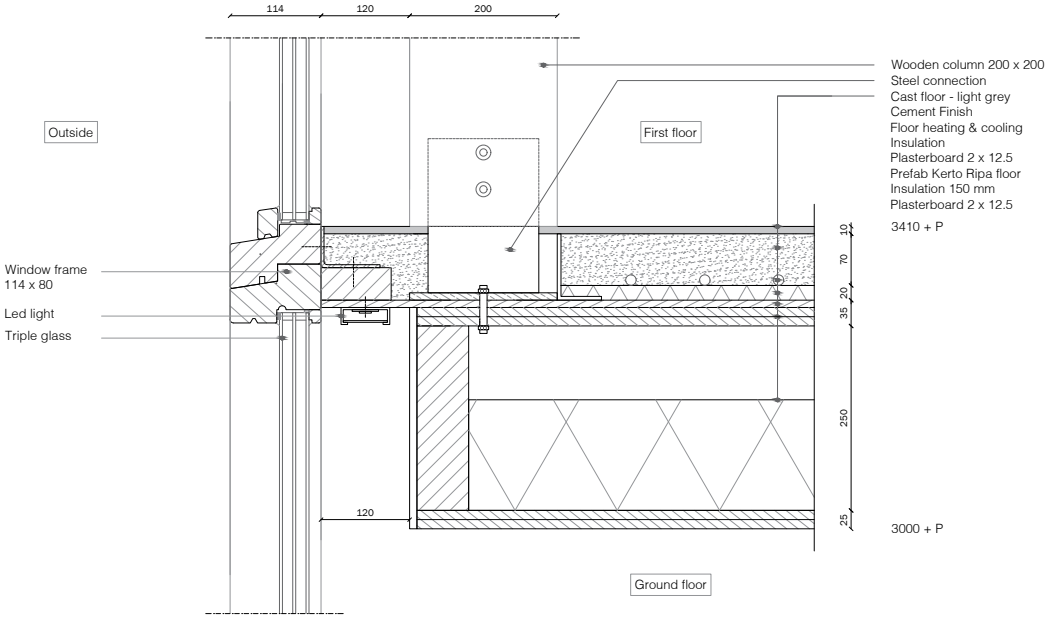


Elevation 1:100


Black solar panel
Highly ventilated cavity
Solar panel structure
Cap sheet
Water resistant breather foil
Insulation 30 mm
Prefab Kerto Ripa roof
Insulation 150 mm
White painted plasterboard 2 x 12,5 mm
7000 + P
D3
6000 + P
Oversized beam with
openings for a crane in
case of replacing of the roof
White painted plasterboard
Plasterboard 2 x 12,5
Foil
Insulation 125 mm
Plywood
Insulation 30 mm
Water resistant breather foil
'Stijl en regelwerk'
Highly ventilated cavity
Open timber facade:
greyed Red Cedar
Cast floor - light grey
Cement Finish
Floor heating & cooling
Insulation
Board
Plasterboard 2 x 12.5
Prefab Kerto Ripa floor
Insulation 150 mm
Plasterboard 2 x 12.5
3410 + P
3000 + P
D4
Open timber cladding
Greyed Red Cedar
Renson Endura Twist
Heat recovery ventilation
Fresh air (cold)
Solar protection
Exhaust air (warm)
Window bench
PEIL = 0
D5
Beam foundation isolated
Insulation of closed cells
Cast floor - light grey
Cement Finish
Floor heating & cooling
Insulation 30mm
Hollow core concrete planks
Insulation 120mm
Section fragment 1:20
Elevation fragment 1:20
Inside
Outside
Floorplan fragment 1:20
D6
7600 + I
6000 + I
3000 + I
I + 0
D3
D4
D5
D6
Floorplan 1:500
View
Elevation 1:100
- Solar panels
Dimension: 1,650 x 0,992 m
Power 300 Wp
- Roof of one unit:
6,6 x 6,6 = 43,5 m2
24 solar panels on top of one unit
- Roof of the house:
Total of 8 units
24 solar panels x 8 units = 192 solar panels
- The amount of energy that is produces in one house
192 solar panels x 300 Wp = 57.600 Kwh per year
- Average energy use of a household with 5 persons = +/- 5000Kwh per year
When the units are expanded to two floor, there is +/- 10.000Kwh per year needed. The transparant solar panels on the roof of the glass house provides +/- 28.000 Kwh per year. This is shared with 6 households in one cluster, so 4.670 for each household. The two floors of the elderly house need 3.773 Kwh solar energy that is stored somewhere else per year extra.
Angle of the roof: 20°

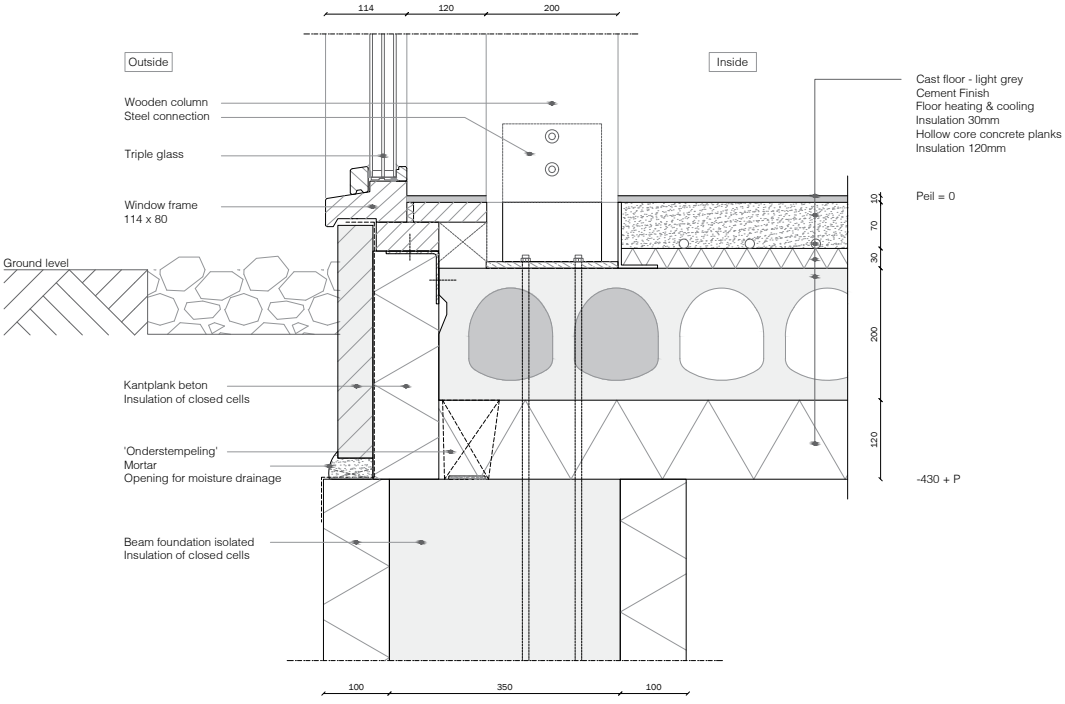
Detail 1

Connection of the floor and facade


114
120
200
Outside
First floor
Ground floor
Window frame
114 x 80
Led light
Triple glass
Wooden column 200 x 200
Steel connection
Cast floor - light grey
Cement Finish
Floor heating & cooling
Insulation
Plasterboard 2 x 12.5
Prefab Kerto Ripa floor
Insulation 150 mm
Plasterboard 2 x 12.5
3410 + P
3000 + P
10
70
20
35
250
25
120

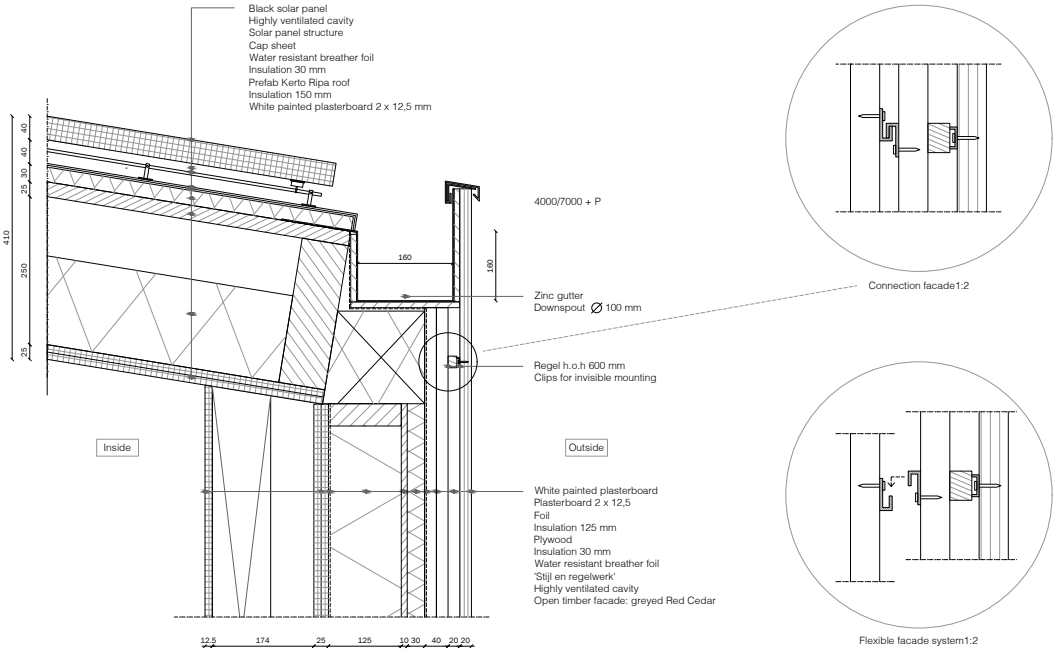
Detail 2

Connection of the floor and foundation


114
120
200
Outside
Inside
Wooden column
Steel connection
Triple glass
Window frame
114 x 80
Ground level
Kantplank beton
Insulation of closed cells
'Onderstempeling'
Mortar
Opening for moisture drainage
Beam foundation isolated
Insulation of closed cells
Cast floor - light grey
Cement Finish
Floor heating & cooling
Insulation 30mm
Hollow core concrete planks
Insulation 120mm
Peil = 0
-430 + P
10
70
30
200
120
100
350
100

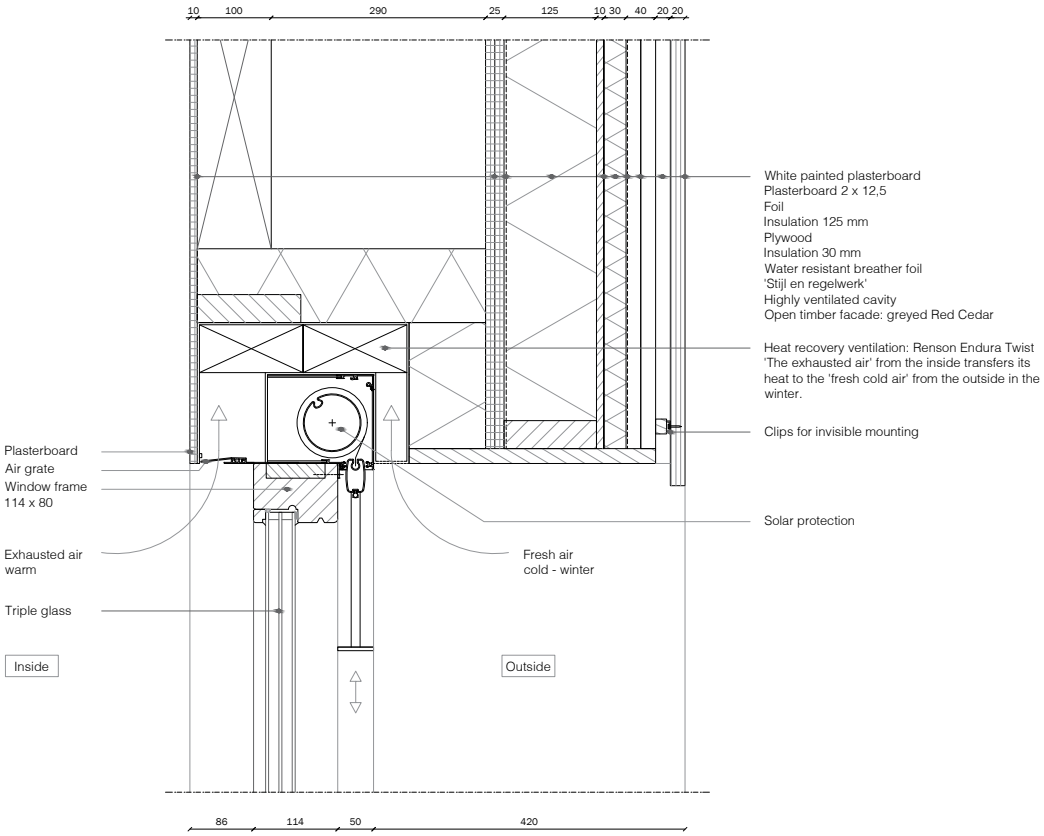
Detail 3

Connection of the roof and facade


Black solar panel
Highly ventilated cavity
Solar panel structure
Cap sheet
Water resistant breather foil
Insulation 30 mm
Prefab Kerto Ripa roof
Insulation 150 mm
White painted plasterboard 2 x 12,5 mm
4000/7000 + P
Zinc gutter
Downspout ∅ 100 mm
Regel h.o.h 600 mm
Clips for invisible mounting
Inside
Outside
White painted plasterboard
Plasterboard 2 x 12,5
Foil
Insulation 125 mm
Plywood
Insulation 30 mm
Water resistant breather foil
'Stijl en regelwerk'
Highly ventilated cavity
Open timber facade: greyed Red Cedar
410
40
40
30
25
250
25
160
160
12,5
174
25
125
10
30
40
20
20
Connection facade1:2
Flexible facade system1:2

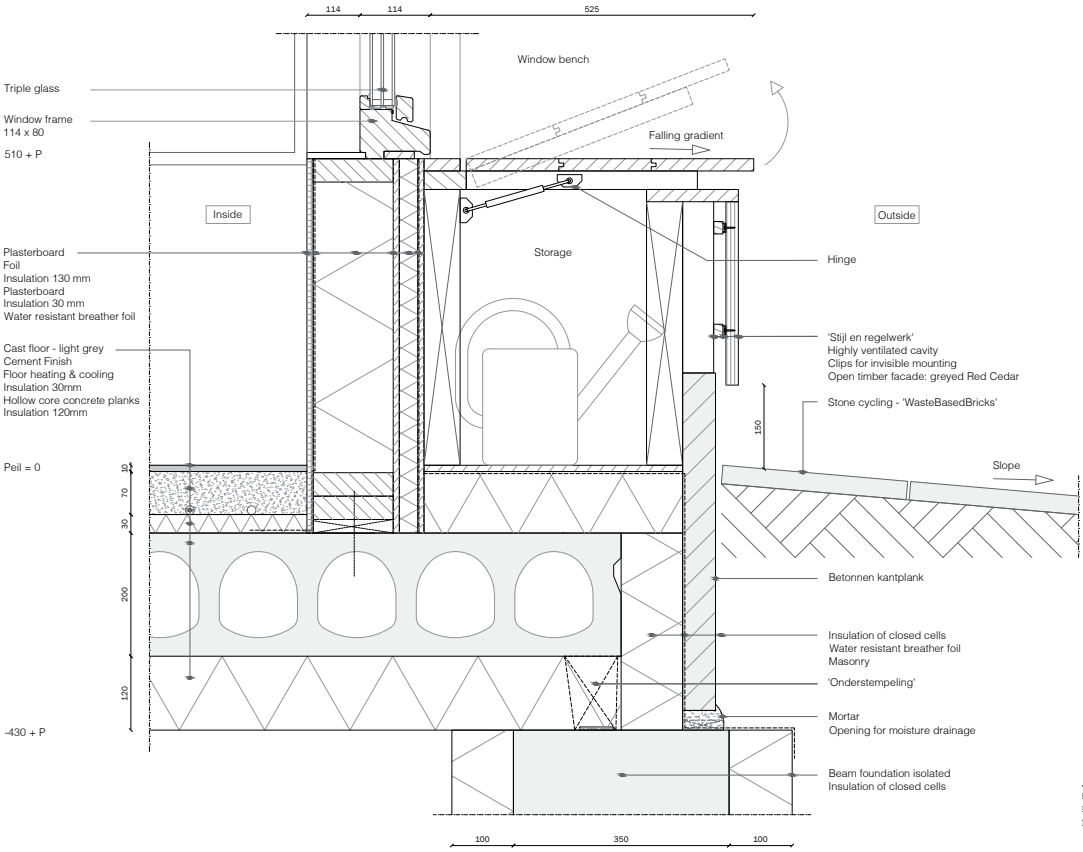
Detail 4

Connection of the window and the facade


10
100
290
25
125
10
30
40
20
20
White painted plasterboard
Plasterboard 2 x 12,5
Foil
Insulation 125 mm
Plywood
Insulation 30 mm
Water resistant breather foil
'Stijl en regelwerk'
Highly ventilated cavity
Open timber facade: greyed Red Cedar
Heat recovery ventilation: Renson Endura Twist
'The exhausted air' from the inside transfers its heat to the 'fresh cold air' from the outside in the winter.
Clips for invisible mounting
Solar protection
Plasterboard
Air grate
Window frame
114 x 80
Exhausted air
warm
Triple glass
Fresh air
cold - winter
Inside
Outside
86
114
50
420

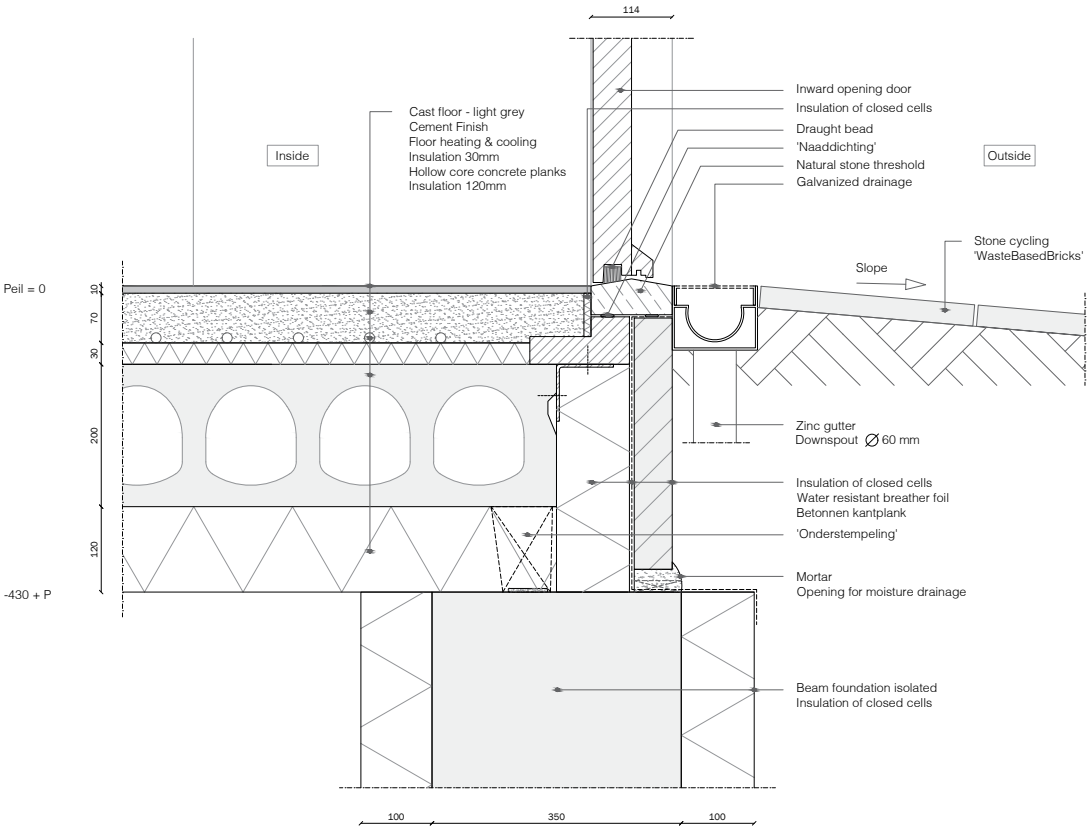
Detail 5

Connection of the window, floor and foundation

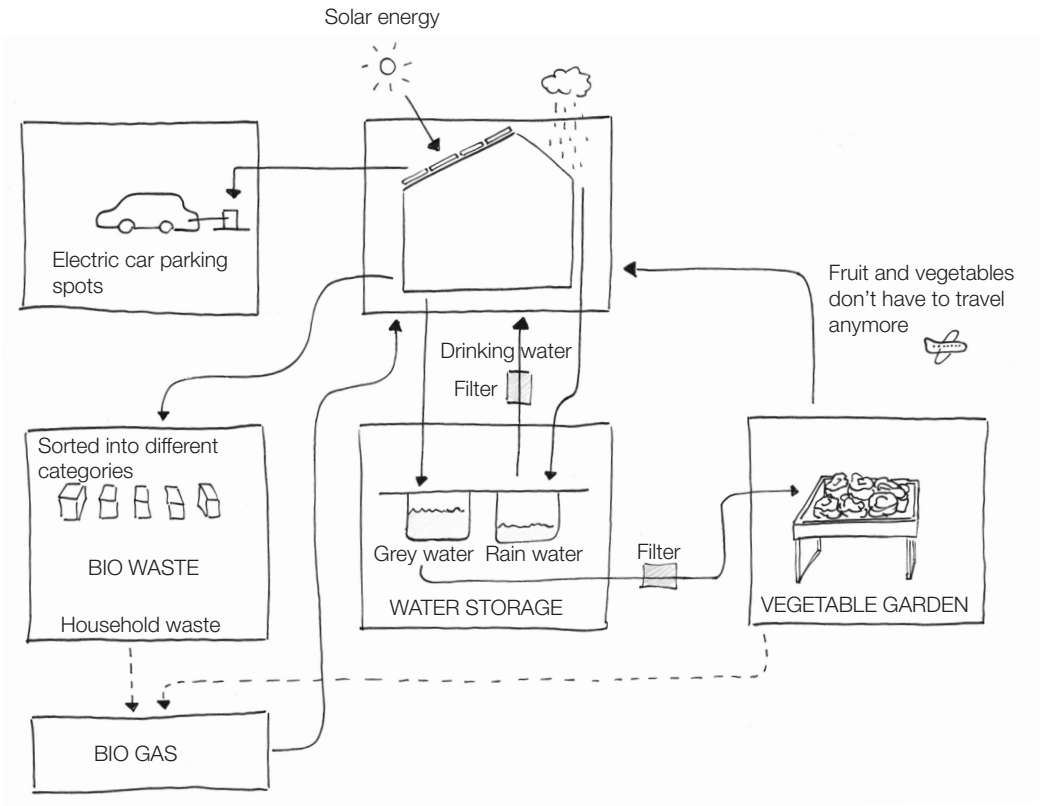

114
114
525
Window bench
Triple glass
Window frame
114 x 80
510 + P
Falling gradient
Inside
Outside
Storage
Plasterboard
Foil
Insulation 130 mm
Plasterboard
Insulation 30 mm
Water resistant breather foil
Hinge
'Stijl en regelwerk'
Highly ventilated cavity
Clips for invisible mounting
Open timber facade: greyed Red Cedar
Cast floor - light grey
Cement Finish
Floor heating & cooling
Insulation 30mm
Hollow core concrete planks
Insulation 120mm
Stone cycling - 'WasteBasedBricks'
150
Slope
Peil = 0
10
70
30
200
120
Betonnen kantplank
Insulation of closed cells
Water resistant breather foil
Masonry
'Onderstempeling'
Mortar
Opening for moisture drainage
-430 + P
Beam foundation isolated
Insulation of closed cells
100
350
100

Detail 6

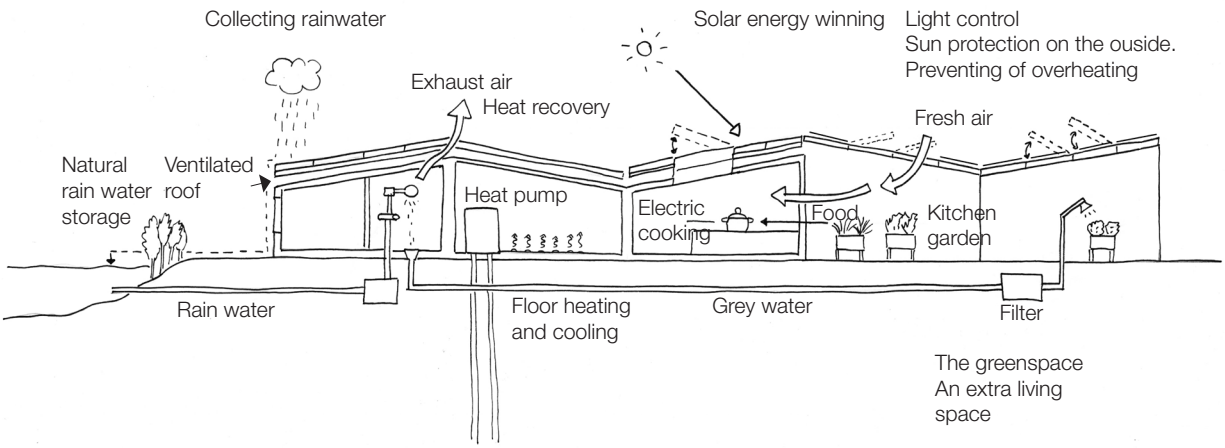
Connection of the door, floor and foundation


114
Inward opening door
Insulation of closed cells
Draught bead
'Naaddichting'
Natural stone threshold
Galvanized drainage
Cast floor - light grey
Cement Finish
Floor heating & cooling
Insulation 30mm
Hollow core concrete planks
Insulation 120mm
Inside
Outside
Stone cycling
'WasteBasedBricks'
Slope
Peil = 0
10
70
30
200
120
-430 + P
Zinc gutter
Downspout ∅ 60 mm
Insulation of closed cells
Water resistant breather foil
Betonnen kantplank
'Onderstempeling'
Mortar
Opening for moisture drainage
Beam foundation isolated
Insulation of closed cells
100
350
100

Climate concept

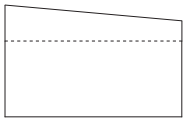

Solar energy
Electric car parking spots
Fruit and vegetables don't have to travel anymore
Drinking water
Filter
Sorted into different categories
BIO WASTE
Household waste
Grey water
Rain water
Filter
WATER STORAGE
VEGETABLE GARDEN
BIO GAS

Climate and installations


Collecting rainwater
Solar energy winning
Light control
Sun protection on the ouside.
Preventing of overheating
Exhaust air
Heat recovery
Fresh air
Natural
rain water
storage
Ventilated
roof
Heat pump
Electric
cooking
Food
Kitchen
garden
Rain water
Floor heating
and cooling
Grey water
Filter
The greenspace
An extra living
space

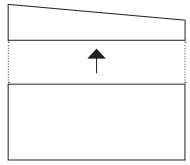
Structure concept

Demountable system
Expansion of the floors



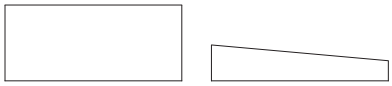
start

The ground floor



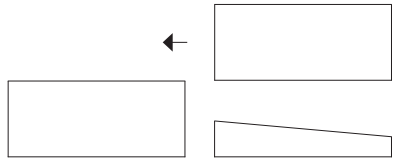
step 1

Remove the demountable roof



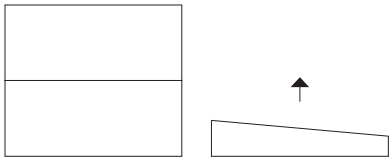
step 2

Temporary storage of the roof



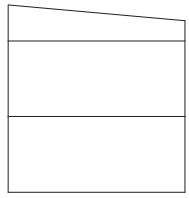
step 3

A new floor is added



step 4

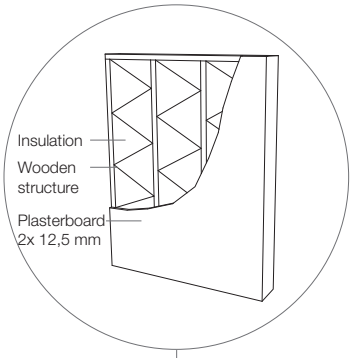
Place the roof on top of the floors

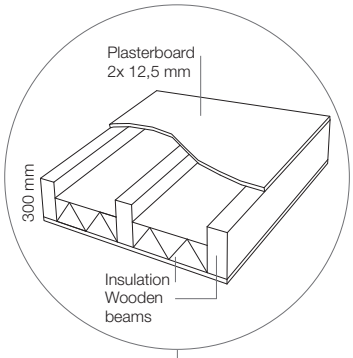


final product

Two floors

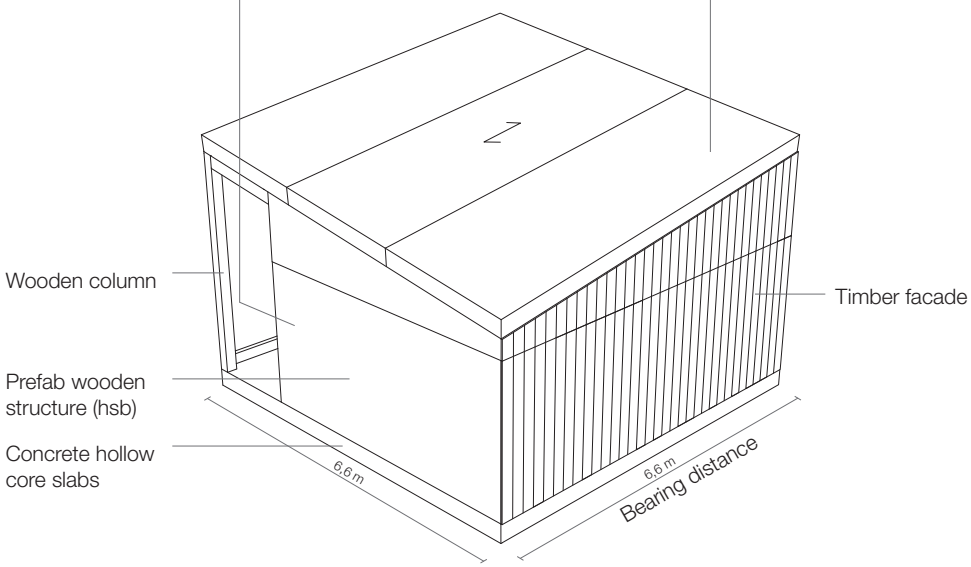
One unit



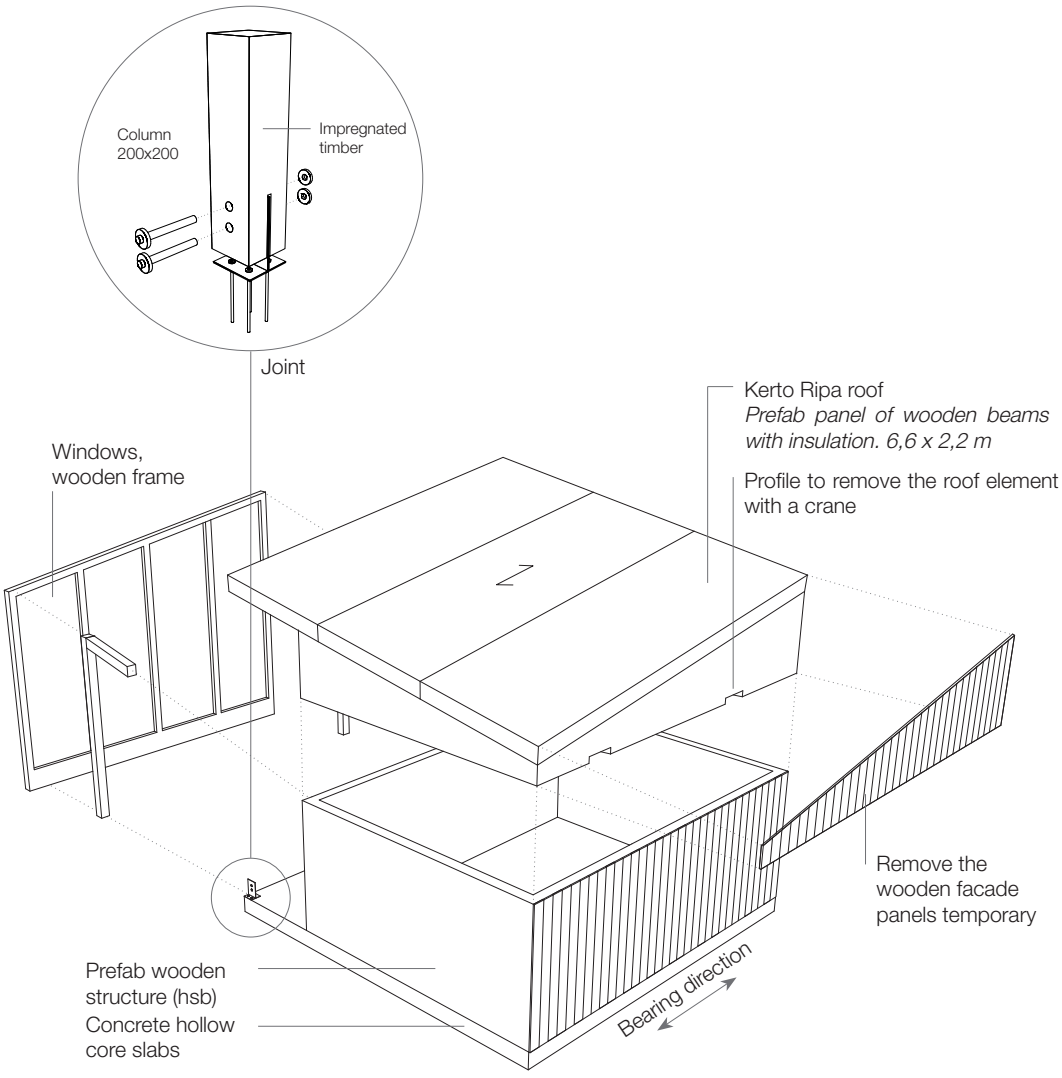


Prefab wooden structure (hsb)

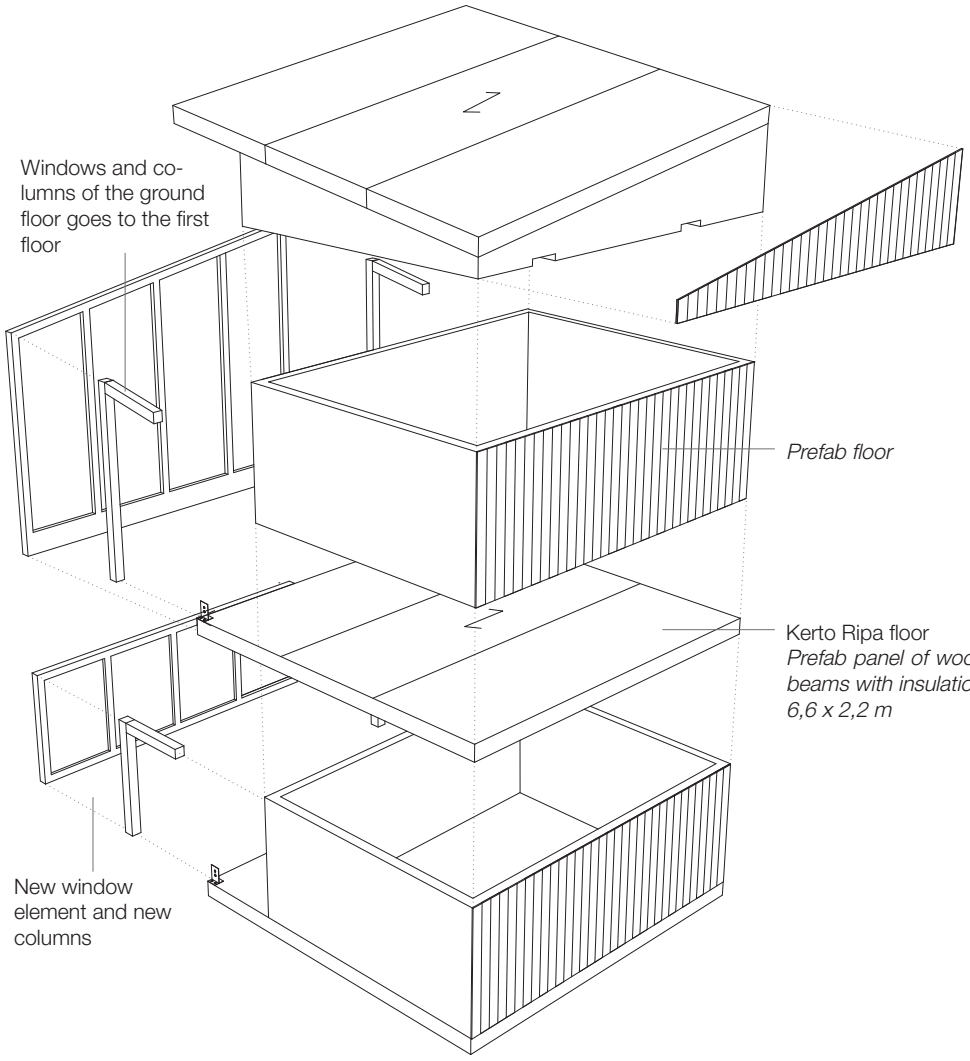
Kerto Ripa roof
Prefab panels of wooden beams with insulation
6,6 x 2,2 m



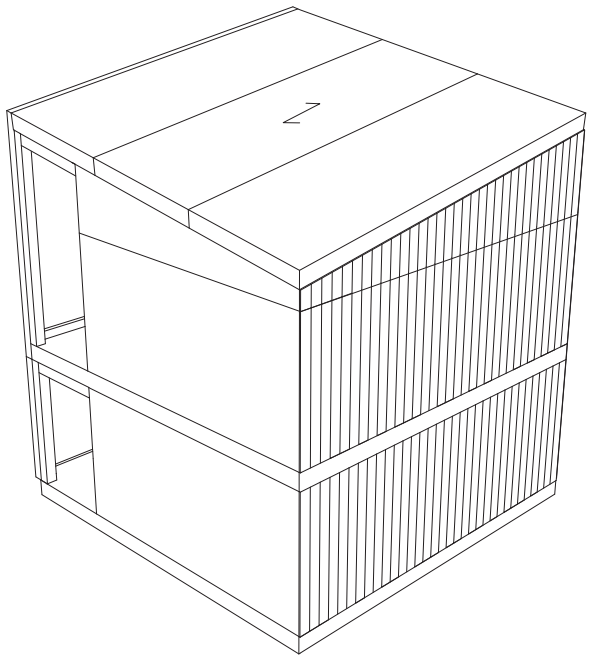
Demountable system


Column
200x200
Impregnated
timber
Joint
Windows,
wooden frame
Kerto Ripa roof
Prefab panel of wooden beams with insulation. 6,6 x 2,2 m
Profile to remove the roof element
with a crane
Remove the
wooden facade
panels temporary
Prefab wooden
structure (hsb)
Concrete hollow
core slabs
Bearing direction

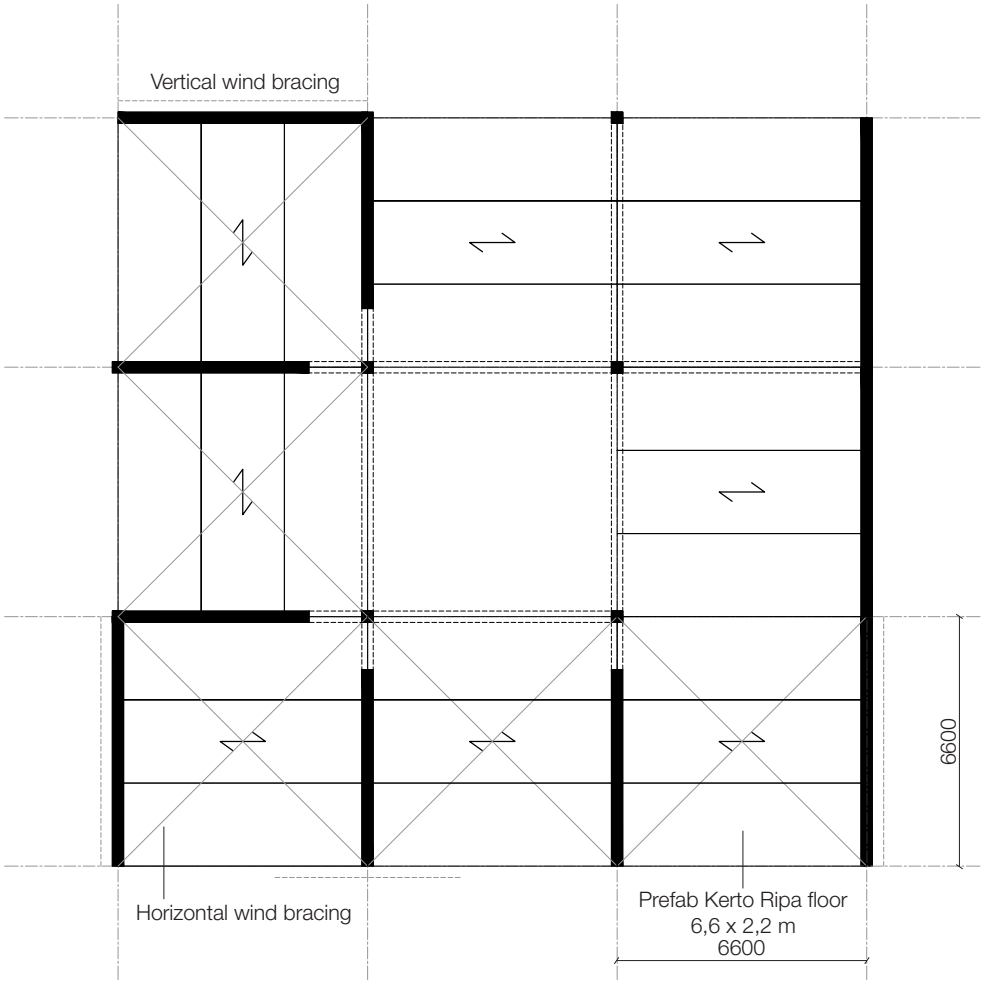
The new unit is added


Windows and co-
lumns of the ground
floor goes to the first
floor
Prefab floor
Kerto Ripa floor
Prefab panel of wooden
beams with insulation
6,6 x 2,2 m
New window
element and new
columns

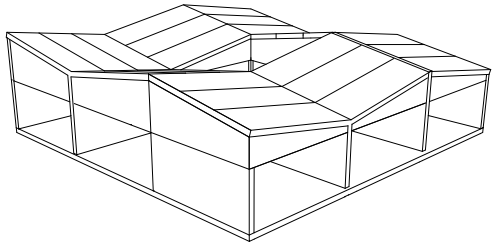
Two units



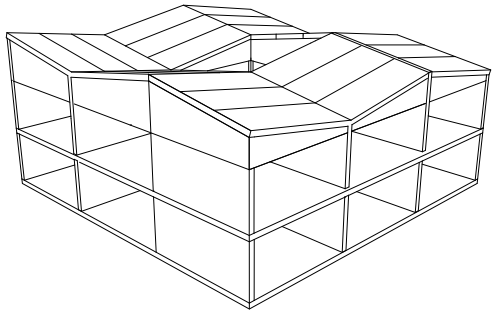
Structure in floorplan


Vertical wind bracing
6600
Horizontal wind bracing
Prefab Kerto Ripa floor
6,6 x 2,2 m
6600

The structure



One floor



Two floors