RESEARCH & DESIGN

take aways & references

Important input for the design were the ‘take aways’ that emerged from the research report. The most important are shown below. In addition, the plan analysis of the Miss Sargfabrik and Tietgen Kollegiet brought me a number of design tools that are used in the design.

- A variety of housing types is desired to overcome different lifestyles.
- A small, affordable, but full-fledged dwelling, with on top of that shared facilities (laundry, car, guestroom, living room, garden).
- Small groups of people with similar life patterns.
- An adaptable dwelling, to make it future-proof.
- Balance between privacy and shared facilities.

Tietgen Kollegiet
Each dwelling cluster has its own collective facilities. The garden is public.

Miss Sargfabrik
Wide galleries that function as outdoorspace for the dwellings. At the same time it is the transition zone between private and collective space.
C O N C E P T

c o l i v i n g

This building is about living together and being involved with your fellow residents and immediate environment. By introducing transition zones - the zone between the private and public domain - and sightlines, the building stimulates social interaction and commonality.
TARGET GROUP

keyworkers

Each city needs key workers; people who are essential for society, such as teachers, caregivers and police. A well-known problem is that these people can hardly find an affordable home in the city of Amsterdam, close to their work. These key workers, consisting of one and two person households, will be the future residents of this co living building at the Minervahaven.

Ineke (49), single. Works as a chemistry teacher at a secondary school. She has an average income. Her house is a place for relaxation, but she also needs a place to work.

Simone (35) and Bart (37), married, no children. Average two-income household. Both working in healthcare; nurse and ambulance staff. They both have to deal with irregular working hours. They look for company in their direct living environment, but also look for a good place to sleep during daytime.

Michiel (32), single, average income. Works as a nurse. A real ‘people person’; he likes to chat with everybody. Has irregular working hours, so he needs a dark and silent place to sleep.

Camilla (50), divorced, her son (25) lives away from home. She works with the police and has an average income. She likes it when her son comes by now and then. She regularly works during the night; so social security, visibly and access are important to her.

Pieter (28) and Johan (35), average two-income household, working in education. Are happy among people. Need some space to work at home.
Sightline to both water sides of the Minervahaven pier. The height of the volumes differs in order to blend in with the existing building volumes.

The volume is opened towards the water. Also light is coming in the middle of the volume.

The volume is horizontally divided in two parts; the ‘heavy’ lower part and the ‘light’ upper part. Setbacks emphasise the difference in materialisation and atmosphere. The lower part refers to the history of the place, as if it has always been there.

The shape of the volume refers to the industrial history of the Minervahaven.
CONTEXT

Minervahaven
CONTEXT
sun & shadows

21 Maart
9.00
14.00
18.00

21 Juni

21 December
access
main staircase and lift (1st escape route)
+ galleries and stairs (2nd escape route)

private | collective | public
living room, study, laundry, guest room

sun | wind

Building mass
2 atmospheres (brick and wood)
Type A 16x  
49 m²

Type A (corner) 4x  
57 m²

Type B 16x  
64 m²  
(height 3500 or 2700 mm)

Type B (corner) 2x  
72 m²  
(height 3500 or 2700 mm)

Type C 18x  
52 m²  
(+12m² expanding option dwelling)

Type C (corner) 2x  
64 m²  
(+17m² expanding option dwelling)

Type D 13x  
39 m²

Type D (corner) 2x  
50 m²

Type E 5x  
34 m²

44 + 34 dwellings = 78 dwellings

Total area private dwellings  
4021 m²

Total area collective spaces  
(living, laundry, guest room, study)  
456 m²  
(6 m² per dwelling extra)

Private/Collective proportion  
90% is private, 10% collective
The garage is light and clear, especially where the shared electric cars and bikes are.

1. Technical area
2. Waste bins
3. Bicycle parking
4. Electric bicycles and cars
5. Storage
“On the ground floor is the place where I and other residents work. Sometimes we play a movie or have a meeting in our small theatre.”

6. Main entrance
7. Study/home theatre
8. Living room
9. Collective courtyard
10. Public square
Based on the design tools (the transition zone and clustering of dwellings and shared facilities) I found in the plan analysis of the Miss Sargfabrik and the Tietgen Kollegiet.
“When my son is over, he can sleep in our shared guest room”

11. Laundry room
12. Guest room
"The laundry room is shared, so you don't need a machine for yourself."

11. Laundry room
12. Guest room
“We have a bench and plants on the gallery in front of our house, this gives it a personal touch. We love to sit there, because of the interaction with neighbours.”
"When I am sitting in front of my house, I enjoy the view over the water and the company of my neighbours"
"In summer our living space is expanded by opening the folding doors."

FIFTH FLOOR
1:250
WEST FAÇADE
1:250
CROSS SECTIONS
1:250
“On the ground floor is our Starbucks at home; here we read the newspaper or have a chat with other residents. Sometimes we invite family and friends over for a party.”
Dwelling

1:100 | type A | 49m²
DWELLING
axonometry | type B | 64 m²
“This dwelling has a bedste, which makes it possible to sleep more easily during daytime.”
DWELLING
axonometry | type C | 51 - 64 m²
"Most dwellings here are relatively small, but spacious because of the height. Perfect for me, because it is much more affordable"
DWELLING
axonometry | type D | 39 m²
DWELLING

1:100 | type E | 34 m²
DWELLING
axonometry | type E | 34 m²
Steel construction

Steel columns and beams
Prefabricated concrete floors
Height = 1/30 * l = 1/30 * 6 = 0.2 m
Column = l/25 = 6/25 = 0.24 m

Stability

CLT: stability through clamping
Concrete: reinforced walls and facade elements + stiff core (walls main staircase and lift)

Cross Laminated Timber (CLT)

Floors 2/3/4
prefabricated CLT walls and floors

Concrete

Garage + floors 0/1
Prefabricated walls and facade elements
Prefabricated floors (Breedplaatvloer)
Reinforced beams in garage
CONSTRUCTION
principle
Heating & cooling

Heat pump water-water (using water of harbour)
Low temperature floor heating (winter)
Floor cooling (summer)
CLIMATE principles

Hot water & ventilation

- **Hot water**: heat pump boiler in each house, that uses heated exhaust air (WTW).
- **Dimensions heat pump boiler (100L, 2pers.) = 1.20x0.5x0.5 m**
- **Shower water heat recovery installation (WTW shower drain, Technea Joulia inline)**
- **Natural ventilation (DURO self-regulating and pre-heating ventilation grills)**
- **Central mechanical exhaust (extraction boxes on the roof)**
196 solar panels (angle of 25°, monocristalline black)
Residual heat of the solar panels, can be used as an addition to the heating system of the building.
1650*1000 (dimensions)
Sun protection glass is used.
Water system

Water is collected, filtered (helophyte filter) and stored. This water is used for flushing toilets, washing machines and outside watertap (50% saving on drinking water). Therefore two systems are needed, one for drinking water and one for household water. Main water drain is inside the building (Geberit Pluvia, negative pressure system).

Water storage tank: 30-40 m³ per building (2 tanks on each side) (Neonline rainwater tank). The dimensions are based on (1) the characteristics and square meters of the roof surface, (2) the average annual rainfall in the Netherlands, (3) the water that gets lost, (4) the efficiency of the filter and (5) a factor 0.06.

Roof surface: 800m²
Annual rainfall Amsterdam: 1000m³
Rainfall on the roof: 800*1000/720m³
Part of that is lost (80%) 656m³
Efficiency of filter (85%): 490m³
Factor 0.06: 30m³

It is important to note that the tank should not be too large. Occasionally it must overflow, in order to change the water. The helophyte filters are located on both sides of the building and are each 175-200m².
SUSTAINABILITY
living consciously

People who live in a building like this, are probably socially concerned and have chosen a certain lifestyle. A building that is about sharing and social/environmental responsibility fits with the target group.

Dwellings:
- Smaller dwellings/households
- Sharing common spaces/utensils
- Good insulation
  - Triple glass
  - LED
  - Energy saving lift Otis

Materials:
- From the Netherlands (bricks/wood)
- Low maintenance
- Long lifespan (modified Dutch wood)
- Frog brickwork (less bricks are needed)
- Warm appearance
- Link to the history of the Minervahaven

Sharing:
- Electric cars
- Electric bikes
- Common rooms (laundry room, guest room, living room, study, garden)
- Social contact

Dwellings:
1. Prefabricated concrete wall and floor, a steel pin is sticking out.

2. A crane is used to place the prefab walls. The steel pin fits into a slot in the wall. By pouring this slot, a firm connection is made.

3. The prefab concrete slab floors (breedplaatvloer), are placed on the wall.

4. The floor is poored.

5. When the concrete floor is cured, the Cross Laminated Timber (CLT) wall can be placed. The dimensions of these elements are 2800x7800.

6. On top of the CLT load bearing wall, the CLT floors are placed. These elements are 2600x5400.

7. Then the next CLT load bearing wall can be placed.

8. When the load bearing walls and floors are in place, the prefab façade elements of CLT and concrete (2800x5200) are attached with steel corners.

9. Stelkozijnen, sills and windowframes are placed. Then the insulation is attached.

10. Façade cladding is applied on site: brickwork, prefab lintels and timber slats.

11. Finally the balustrades are attached.
D E T A I L H 1
1 : 5

Frogged brickwork + (doorstrijken voegen) coarse joints (more anchors are needed than usual)

Facade:

- Stucco 10
- Prefab concrete wall 250
- Insulation Rockwool (Rc 5.5) 170
  (Fixation: cavity ties)
- Water-proof foil
- Ventilated cavity 30
- Brick (Wienerberger 210x105x50) 50

Separating wall

- Stucco 10
- Prefab concrete wall (Load bearing) 250
- Stucco 10

Aluminum doors (MethermoXL, Metglas)
Triple glass + sunblocking foil

Powdercoated steel balustrade
Separating wall:
- Stucco: 10
- Plaster board: 12.5
- Steel frame wall + insulation: 50
- Air gap: 10
- Cross Laminated Timber (CLT 5s): 140
- Cross Laminated Timber (CLT 3s): 140
- Air gap: 10
- Steel frame wall + insulation: 50
- Plaster board: 12.5
- Stucco: 10

Facade:
- Stucco: 10
- Plaster board: 12.5
- Z-profile (installations): 43
- Damp-proof layer: 10
- Steel frame wall + insulation: 50
- Air gap: 10
- Cross Laminated Timber (CLT 3s): 140
- Air gap: 10
- Steel frame wall + insulation: 50
- Plaster board: 12.5
- Stucco: 10

Aluminum sliding doors (MethermoXL, Metaglas)
- Triple glass + sunblocking foil

Wooden framework:
- Wooden mullions + slats (vertical): 175+25
- Wooden mullions (vertical): 50
- Wooden transoms (horizontal): 28
- Wooden slats (Platowood Spruce/Vuren): 22

(Platonised wood: hydrothermal modification)
Facade:

- Stucco 10
- Plaster board 12.5
- Z-profile (room for installations) 43
- Damp-proof layer
- Cross Laminated Timber (CLT 3s) 100
- Insulation Rockwool (Rc 5.5) 175
- Vertical wooden mullions 175 x 30
- Waterproof foil (DPC)
- Vertical wooden mullions 25
- Wooden transoms (horizontal) 28 x 50
- Vertical wooden slats (Platowood Spruce/Vuren) 22 x 66
- (Platonised wood: hydrothermal modification)

Separating floor:

- Floor finish 20
- Fermacell board 12.5
- Egaline 2
- Variokomp (dry floor heating system) 18
- Impact sound insulation 30
- PE foil
- Cross Laminated Timber floor (CLT 5s) 180
- Z-shaped profile and insulation (installations) 40
- Plaster board 12.5
- Stucco 10

Aluminum sliding doors (MethermoXL, Metaglas)
Triple glass + sunblocking foil
Aluminum sill
### Separating wall:

<table>
<thead>
<tr>
<th>Material</th>
<th>Thickness</th>
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<tbody>
<tr>
<td>Plinth</td>
<td>12</td>
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<tr>
<td>Stucco</td>
<td>10</td>
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<tr>
<td>Plaster board</td>
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</tbody>
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### Separating floor:

- **Floor finish**: 20
- **Fermacell board**: 12,5
- **Egaline**: 2
- **Variokomp (dry floor heating system, Fermacell board)**: 18
- **Impact sound insulation**: 30
- **PE foil**: 50
- **Screed**: 50
- **Concrete floor slab/breedplaatvloer (reinforced precast core)**: 260
- **Stucco**: 10
Balcony

- Brick strips/tiles: 20
- Glue: 2
- Wedi building board: 40
- Waterproof layer: 115
- Tapered insulation PIR: 115
- Concrete floor slab/breedplaatvloer (reinforced precast core): 160
- Stucco: 10

Prefabricated concrete element with bricks. Attached to floor with steel shackles.
Facade:
- Stucco: 10
- Prefab concrete wall: 100
- Insulation Rockwool (Rc 5,5): 170
- Ventilated cavity: 10
- Brick: 50

Separating floor:
- Floor finish: 20
- Fermacell board: 12,5
- Egaline: 2
- Variokomp: 18
- (dry floor heating system, Fermacell board)
- Impact sound insulation: 30
- PE foil: 50
- Screed: 50
- Concrete floor slab/breedplaatvloer: 260
- (reinforced precast core)
- Stucco: 10
IMPRESSION

courtyard
IMPRESSION

public square
IMPRESSION
dwelling interior
IMPRESSION
dwelling interior