APPOSITION

The state of being side by side or in close proximity.

DON VAN DEN BURG - 5545315

01
CONFLICT

02
PARADOX

03
SYSTEM

04
LANDSCAPE

05
INCLUSION

06
REVERSIBILITY

07
APPOSITION

THE CONFLICT

A landscape nobody knows what to do with.

Housing shortage

“According to ABF Research, the statistical housing shortage in the Netherlands rose to approximately **401,000** dwellings in 2024.”

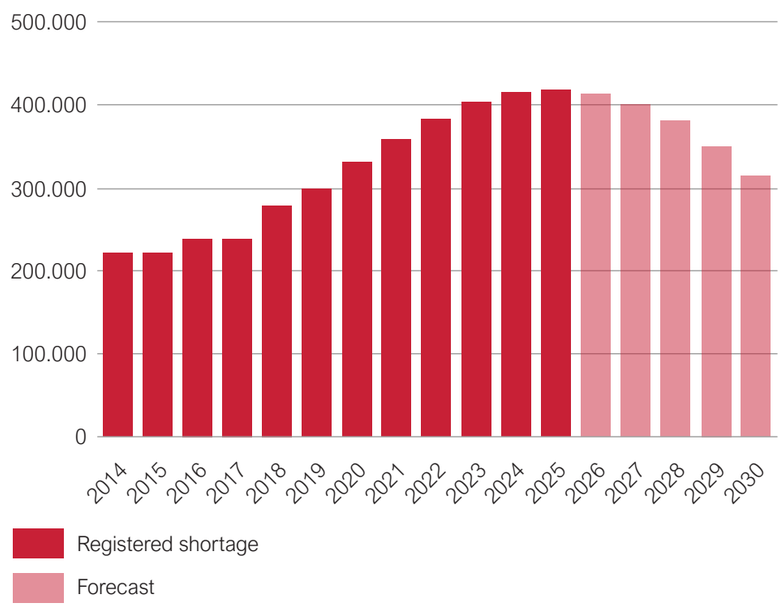


Figure 01.Development of the housing shortage in the Netherlands, 2014-2030

Housing shortage

“At the same time, the national government aims to realise 900,000 new homes by **2030**, of which approximately **247,000** are planned in the province of South Holland (ABF Research, 2024; Rijksoverheid, n.d.).”

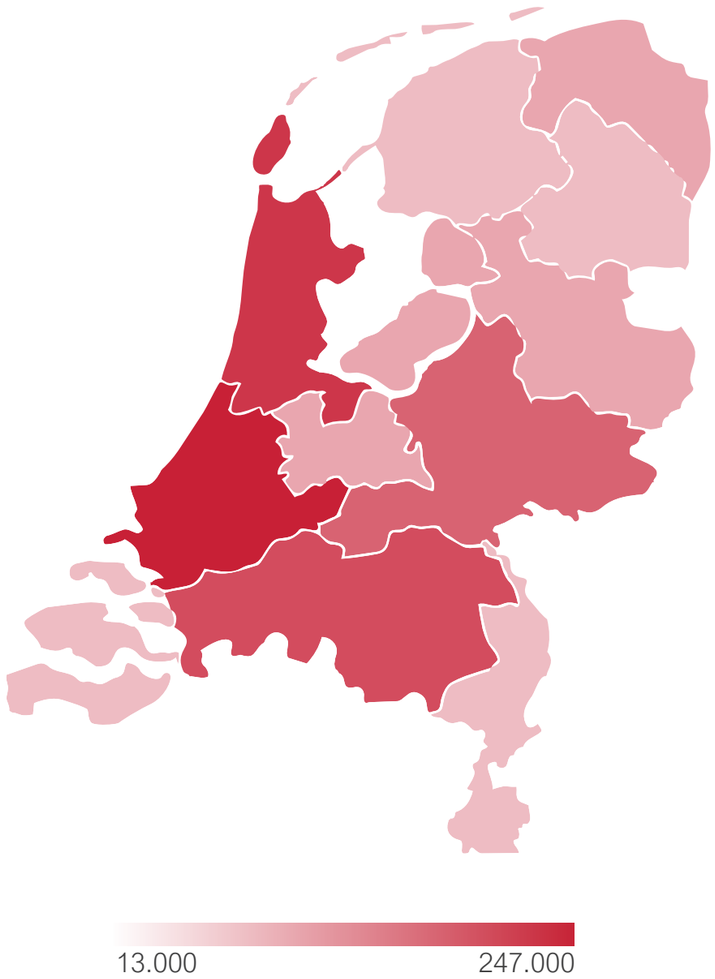


Figure 02.Distribution of homes to be built by province, 2023-2030

MIDDEN-DELFLAND



Figure 03. Built-up area map Midden-Delfland, EduGIS Atlas

MIDDEN-DELFLAND

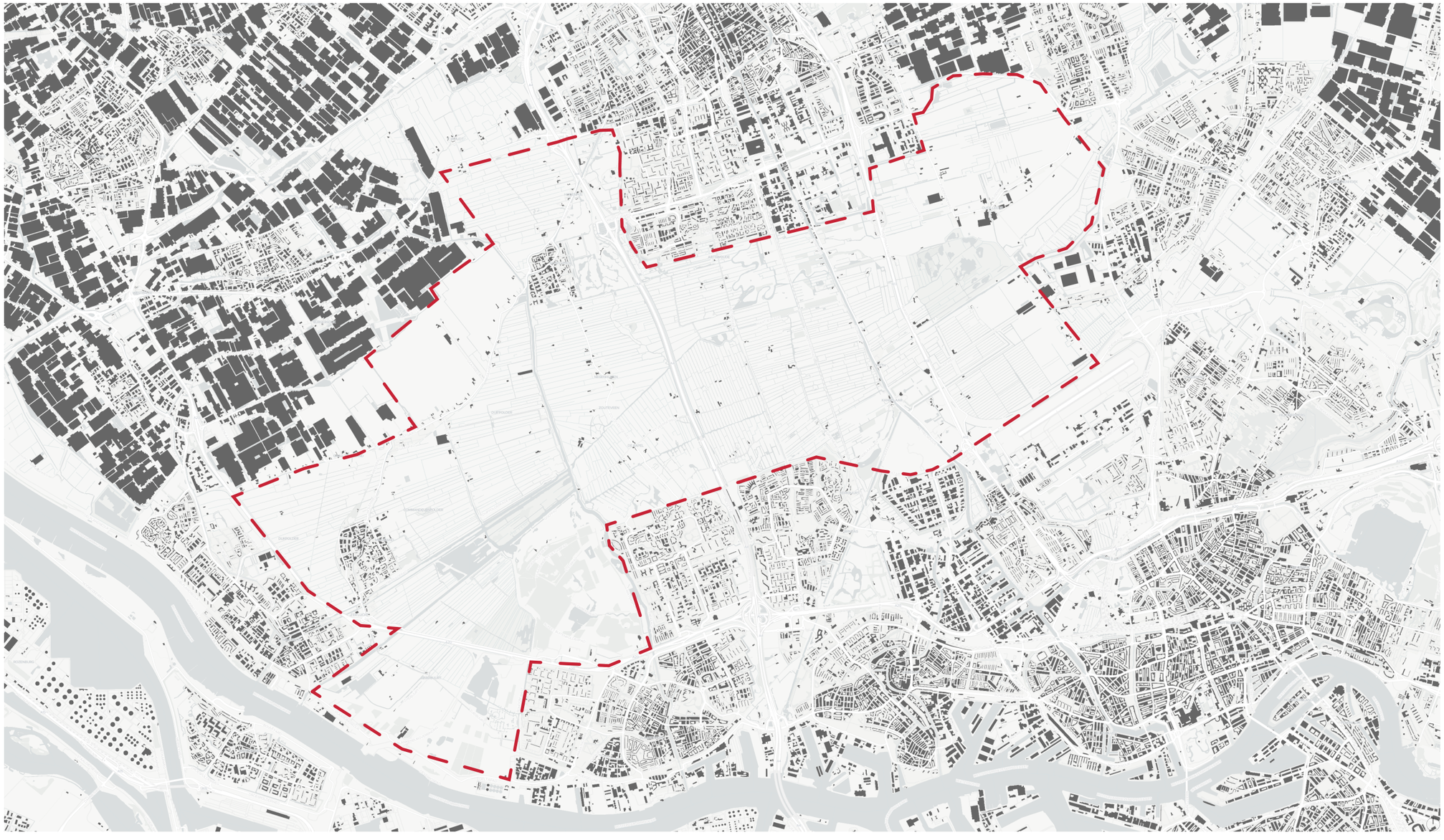


Figure 04.Built-up area map Midden-Delfland, EduGIS Atlas

MIDDEN-DELFLAND



Figure 05.Project location and 5 regions Midden-Delfland

REGIONS

Regions fitting together
like puzzle pieces,
each essential to
the whole. Each with it’s
own resource



Figure 06.Masterplan and regions

REGION 2



Figure 07.Current situation

REGION 2





Figure 08.Own pictures region 2

CONTAMINATED SOIL



Figure 09.Contaminated soil

THE PARADOX

We need housing, but the ground resists permanence.

Timeline

1992-2001

The DOP NOAB functioned as a landfill for moderately to heavily contaminated soil. During this period, approximately **2,500,000** m^3 of soil was deposited on the site.

1967-1985

The entire Oost-Abtspolder was raised from approximately NAP **-6** / **-7** metres to around NAP **+1.25** / **+2.00** metres. This was done using heavily contaminated class 4 dredged material from the Port of Rotterdam and sludge from the Overschiese Plassen.

2001-2003

After the landfill was closed, a capping construction was installed to seal the contaminated ground and create a controlled technical landscape.

Figure 10.Timeline DOP NOAB

Cross-section DOP NOAB

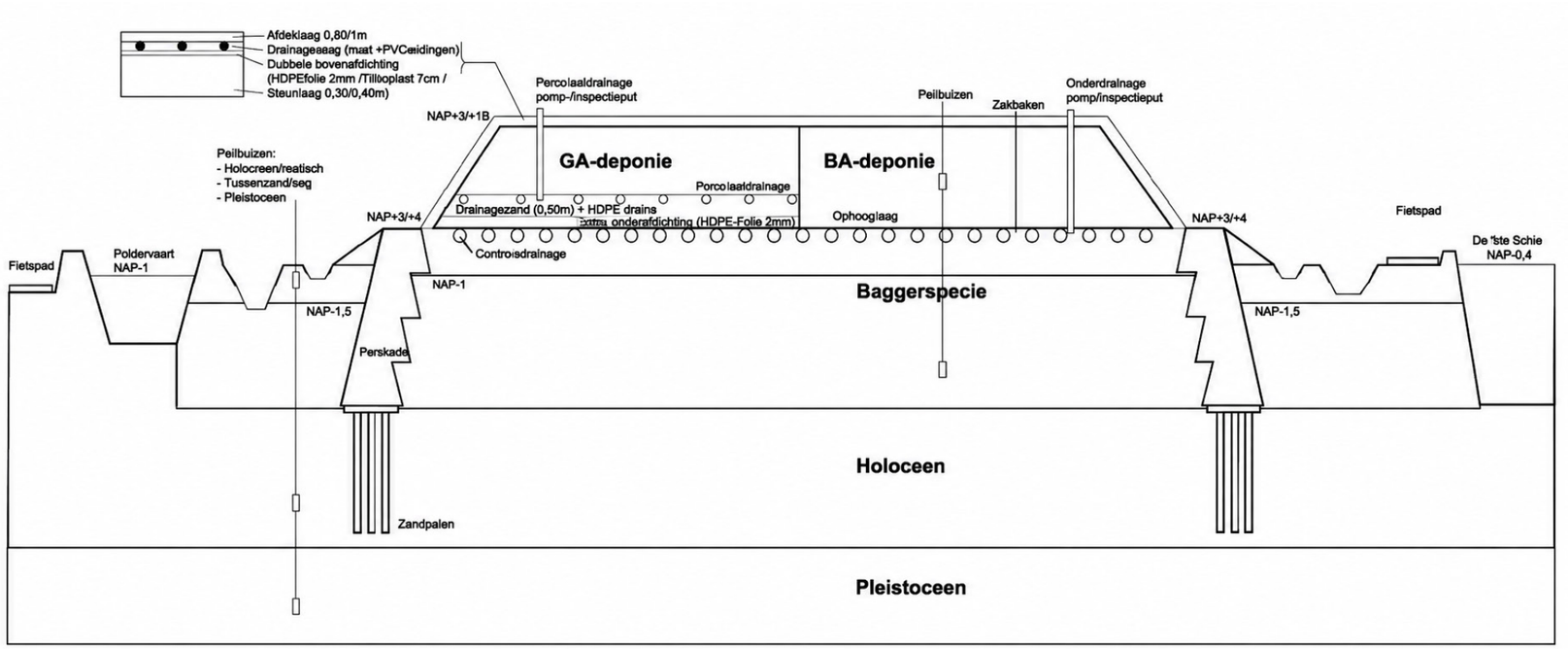


Figure 11.Cross-section structure DOP NOAB East West

RELEVANCE

“The Netherlands has approximately 250.000 sites with potentially serious soil contamination (RIVM, 2014).”

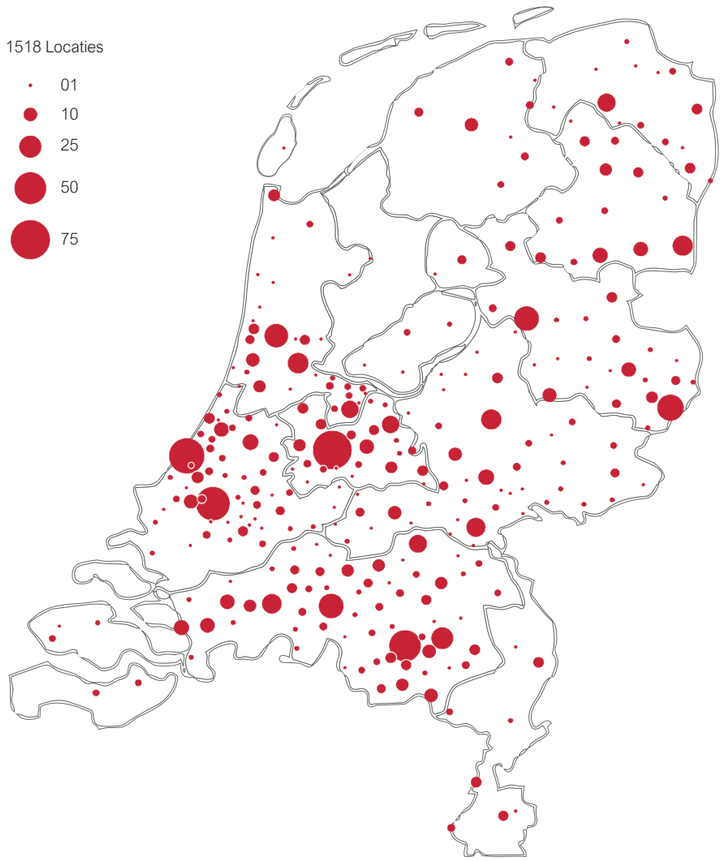
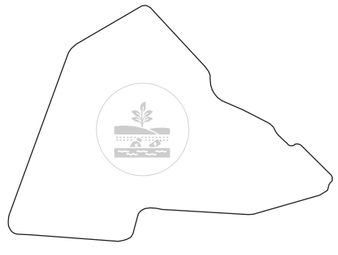


Figure 12.Soil contamination in the Netherlands 2014 RIVM

PROBLEM STATEMENT



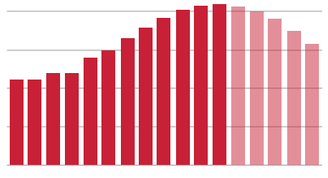
Contaminated Ground

The site cannot be treated as neutral land. Its polluted soil creates strict limits for building, digging and permanence.



A Problem Beyond the Site

The issue is not only local. It reflects a wider conflict between land scarcity, environmental damage and the need for new forms of development.



Housing Shortage

The demand for housing is increasing, while available and suitable land is becoming more limited. This creates pressure to rethink where and how we build.

Figure 13.Problems

Timeline

1992-2001

The DOP NOAB functioned as a landfill for moderately to heavily contaminated soil. During this period, approximately **2,500,000** m³ of soil was deposited on the site.

2008-Onwards

During the construction of the golf course, approximately **600,000** m³ of fill soil, sand and topsoil was added above the existing relief and the capping construction. This created landscape undulations of up to approximately 5 metres high.

1967-1985

The entire Oost-Abtspolder was raised from approximately NAP **-6** / **-7** metres to around NAP **+1.25** / **+2.00** metres. This was done using heavily contaminated class 4 dredged material from the Port of Rotterdam and sludge from the Overschiese Plassen.

2001-2003

After the landfill was closed, a capping construction was installed to seal the contaminated ground and create a controlled technical landscape.

Figure 14.Timeline DOP NOAB

DOP NOAB

A five-metre clean sand layer makes the site buildable, but it must be removed every **75** years to replace the drainage layer.

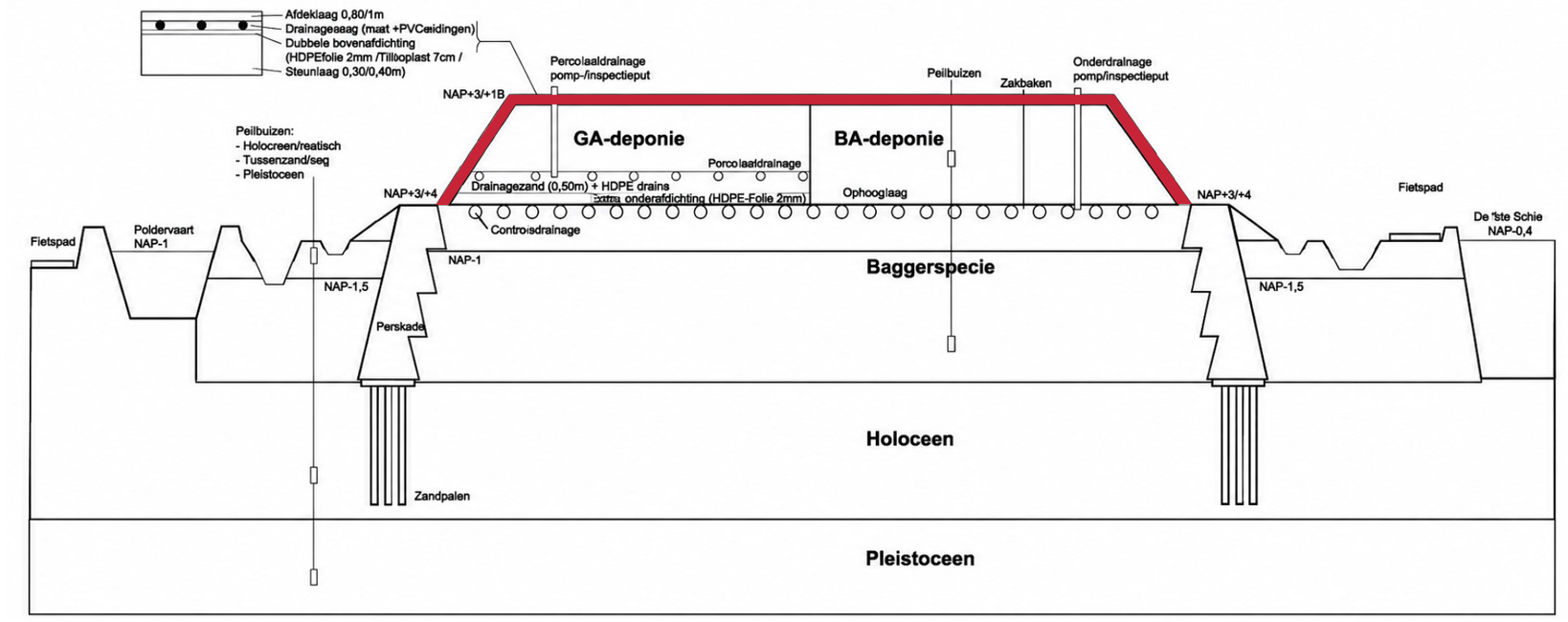
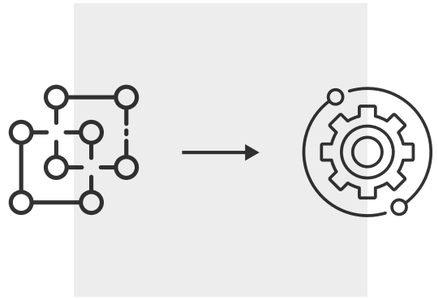


Figure 15.Sand layer, cross section structure DOP NOAB East west

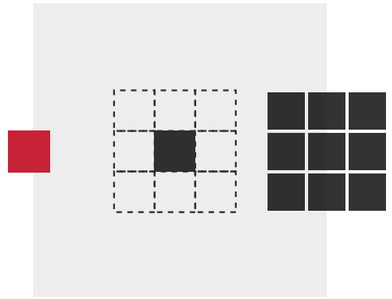
MAIN QUESTION

How can an adaptive architectural system be designed for contaminated soil, in a context where permanent construction is not a given?

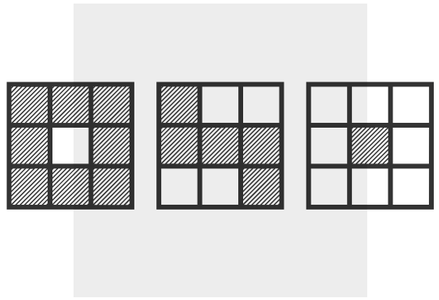
AMBITIONS



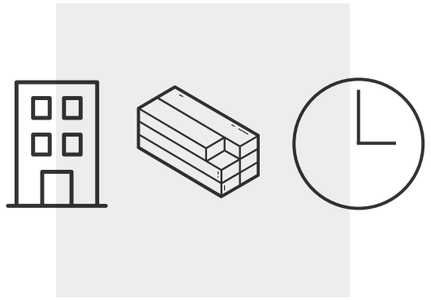
Architecture conceived as a system rather than an object



Ability to place, relocate, combine, and remove elements



Support for both individual and collective configurations



Building as a resource for the future

Figure 16.Ambitions

FROM OBJECT TO SYSTEM

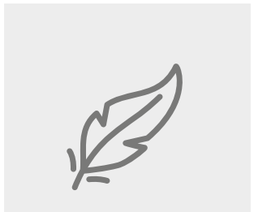
Designing for change instead of permanence

Modular architecture



Site condition

Contaminated ground
5 m clean sand layer
Drainage replacement every **75** years



Design requirement

No permanent foundation
No pile foundation
Lightweight and demountable



Modular response

Build off-site
Place lightly
Remove without impact

Figure 17.From Ground Constraint to Modular Strategy

1 component



3 Components, **1** module



The functional core



The open layout



The basic module

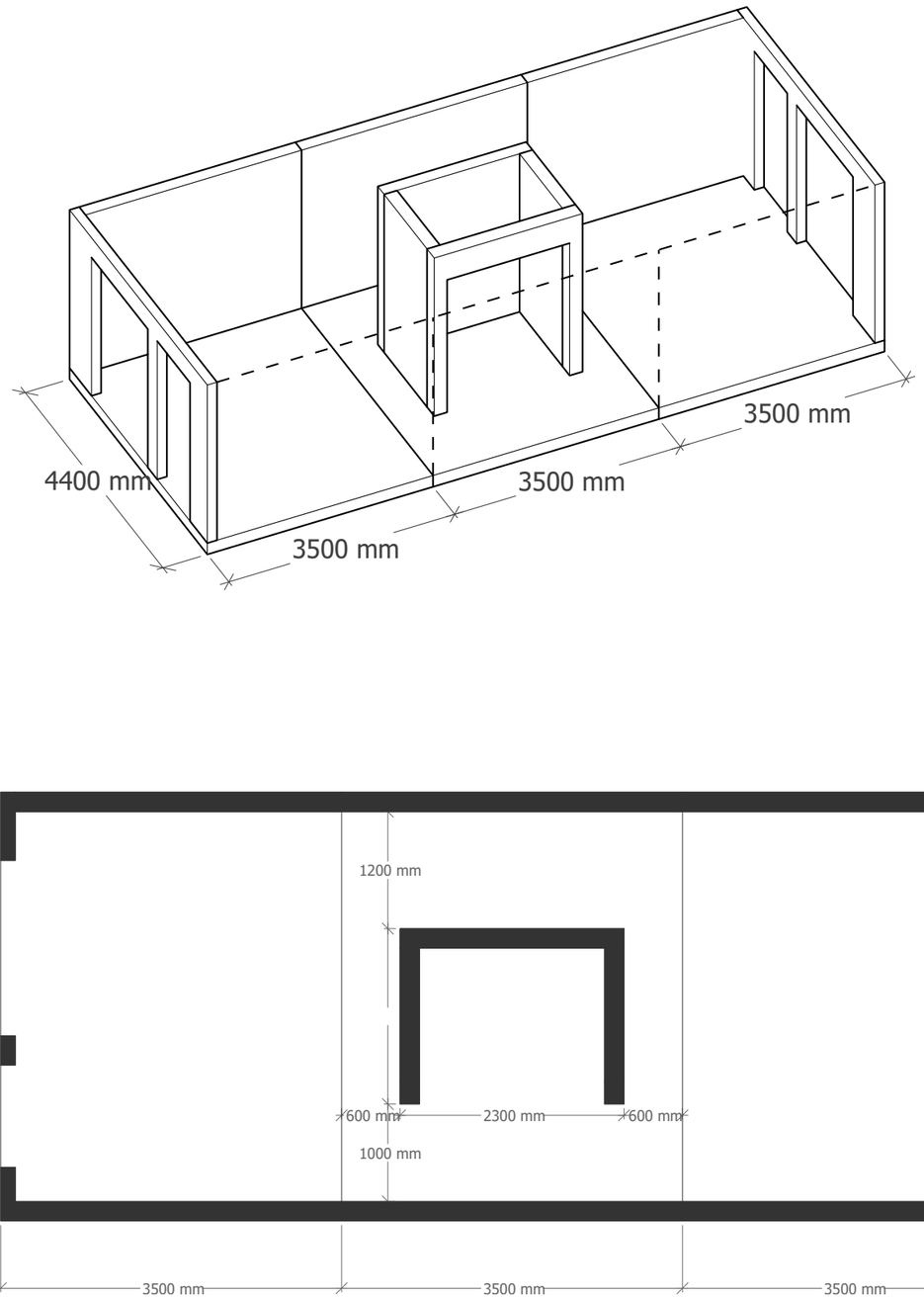


Figure 18.Isometric drawing and floorplan 1 module

One module

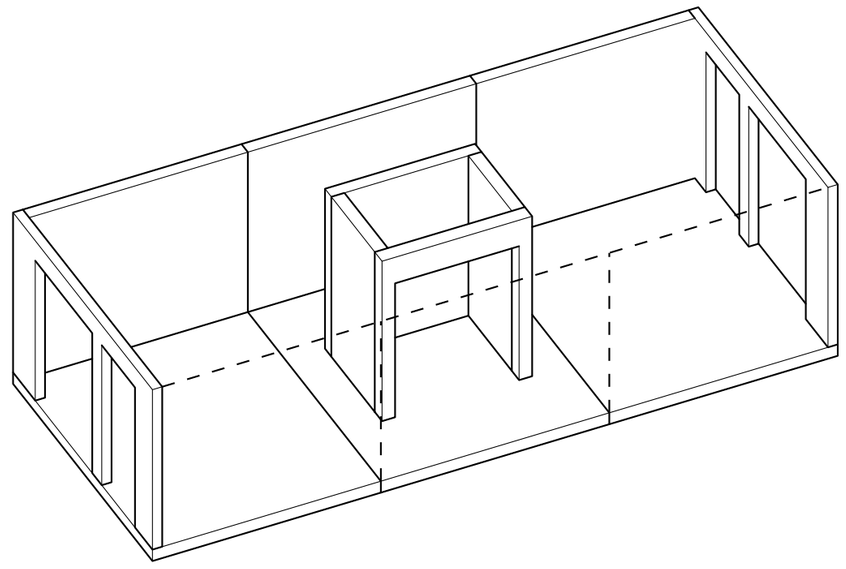


Figure 19.Isometric drawing one module

Combining modules

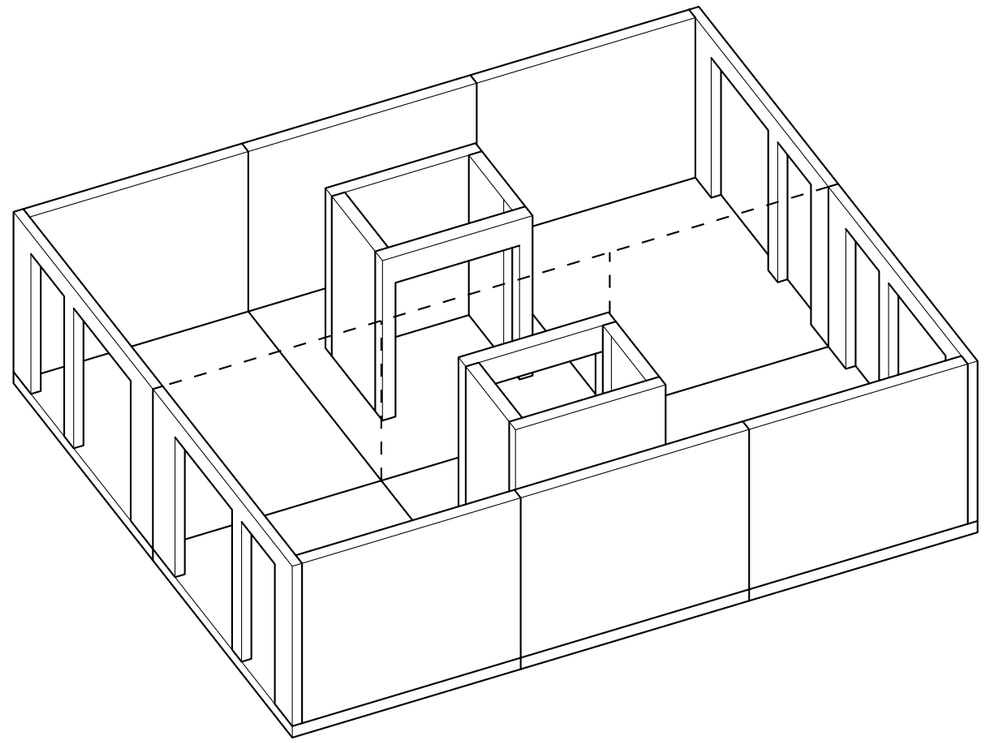
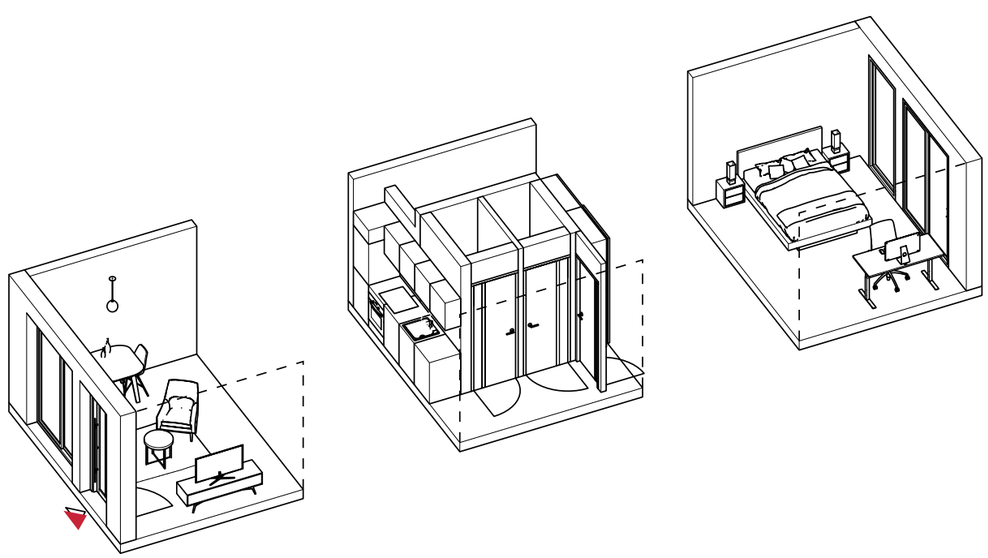
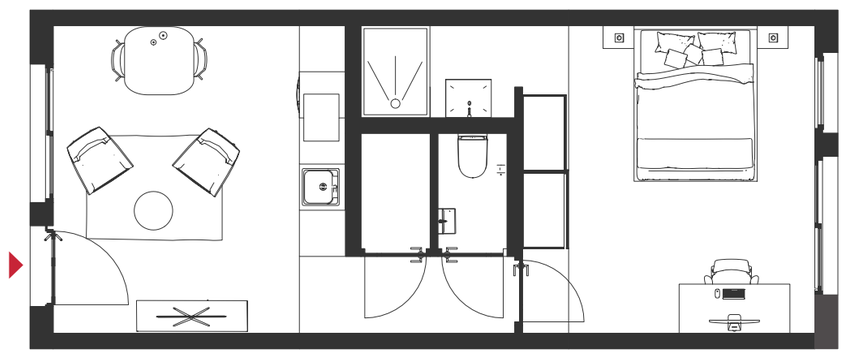
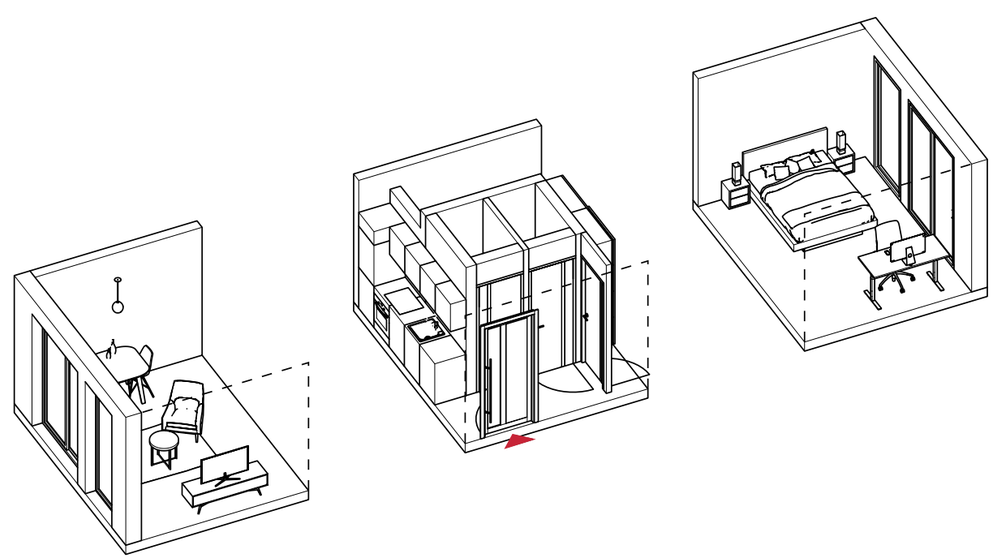


Figure 20.Isometric drawing 2 modules

Access variations







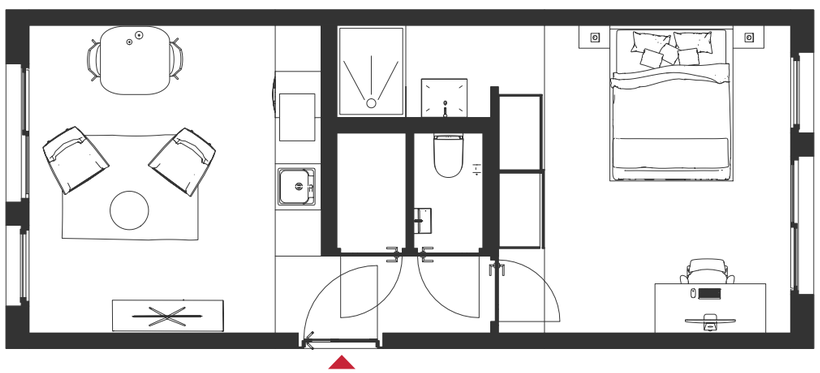
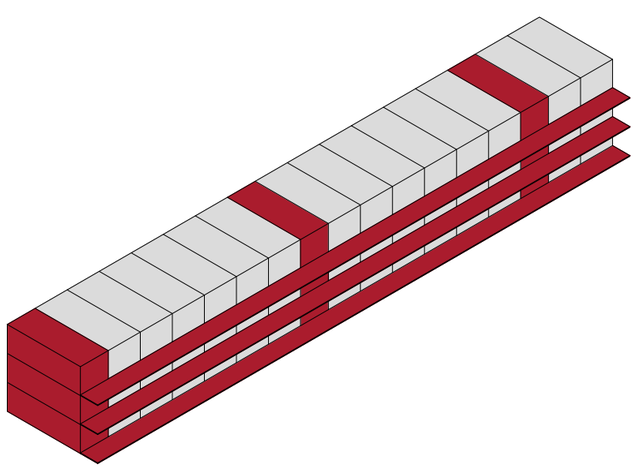
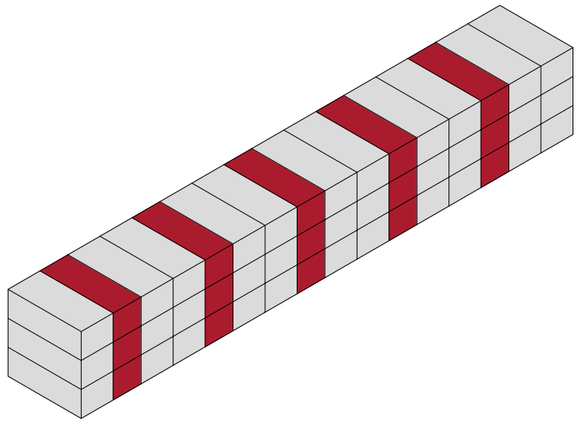


Figure 21.Isometric drawings and floorplans modules

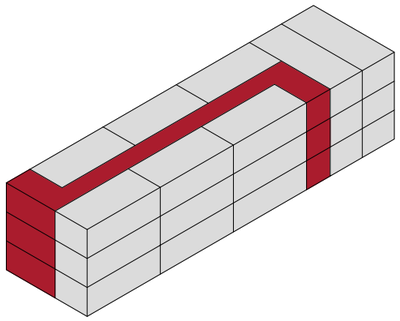
3 Typologies



Gallery



Portico



Corridor

Figure 22. 3 typologies

FROM SYSTEM TO LANDSCAPE

Building with the logic of the site.



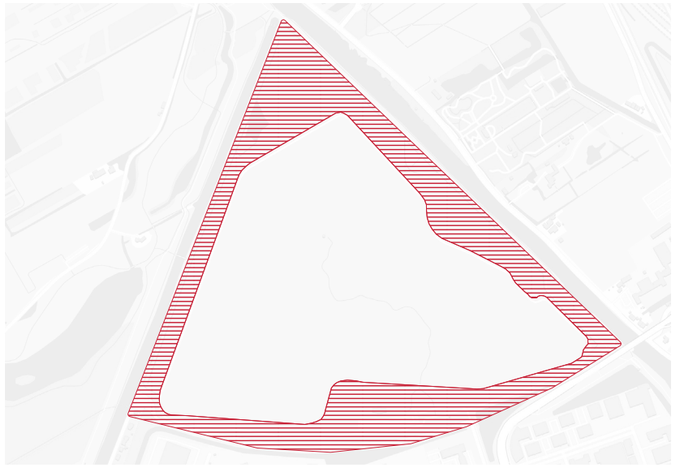
Figure 23.Contaminated soil

Reading the site, shaping the system



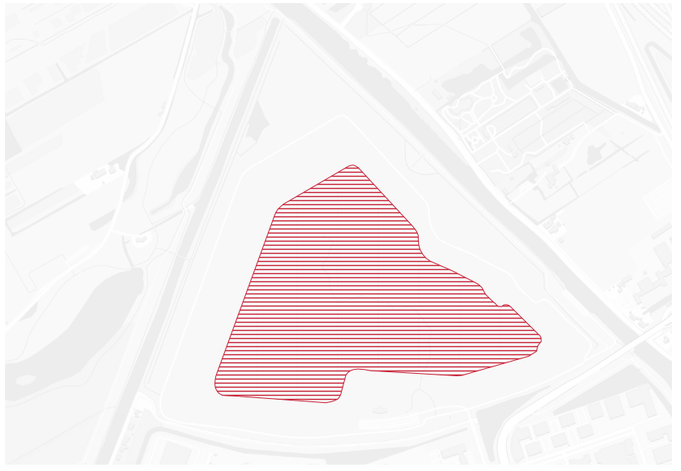
Topography as Structure

Height differences
Buildings follow ground
Enhancing view



Strengthening the Green Edge

Landscape buffer
Unbuilt zone
Ecological reinforcement



Preserving the Open Core

Spatial openness
Landscape identity
Future accessibility

Figure 24.Key design principles for the site strategy

Configuration logic

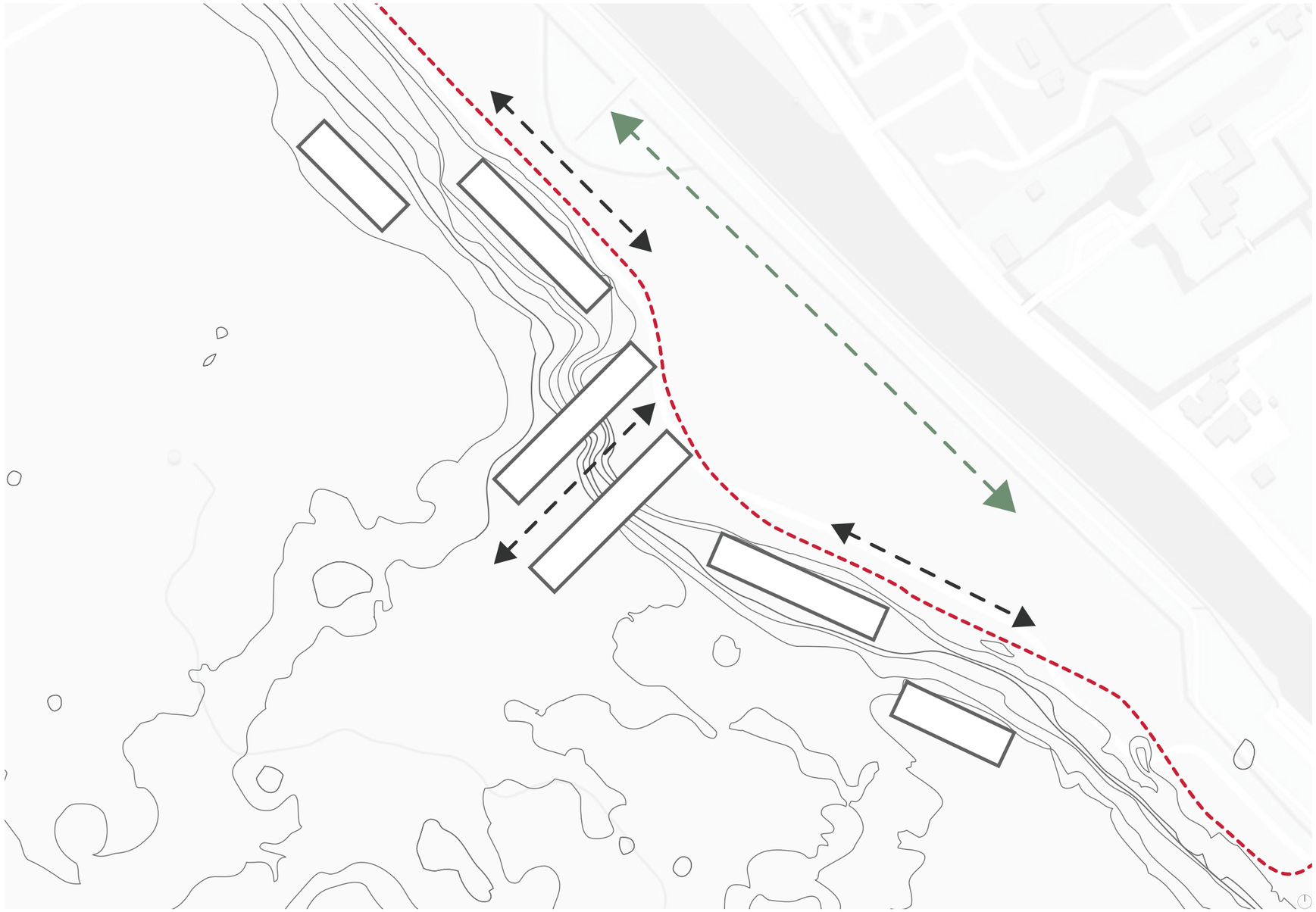


Figure 25.Design principles applied to the building configuration

Situated building configurations



Figure 26.six-building configuration on the site

Repeating the logic across the triangle



Figure 27.Repetition of the six-building configuration across the entire site

28 residential buildings
478 dwellings
1,050 residents

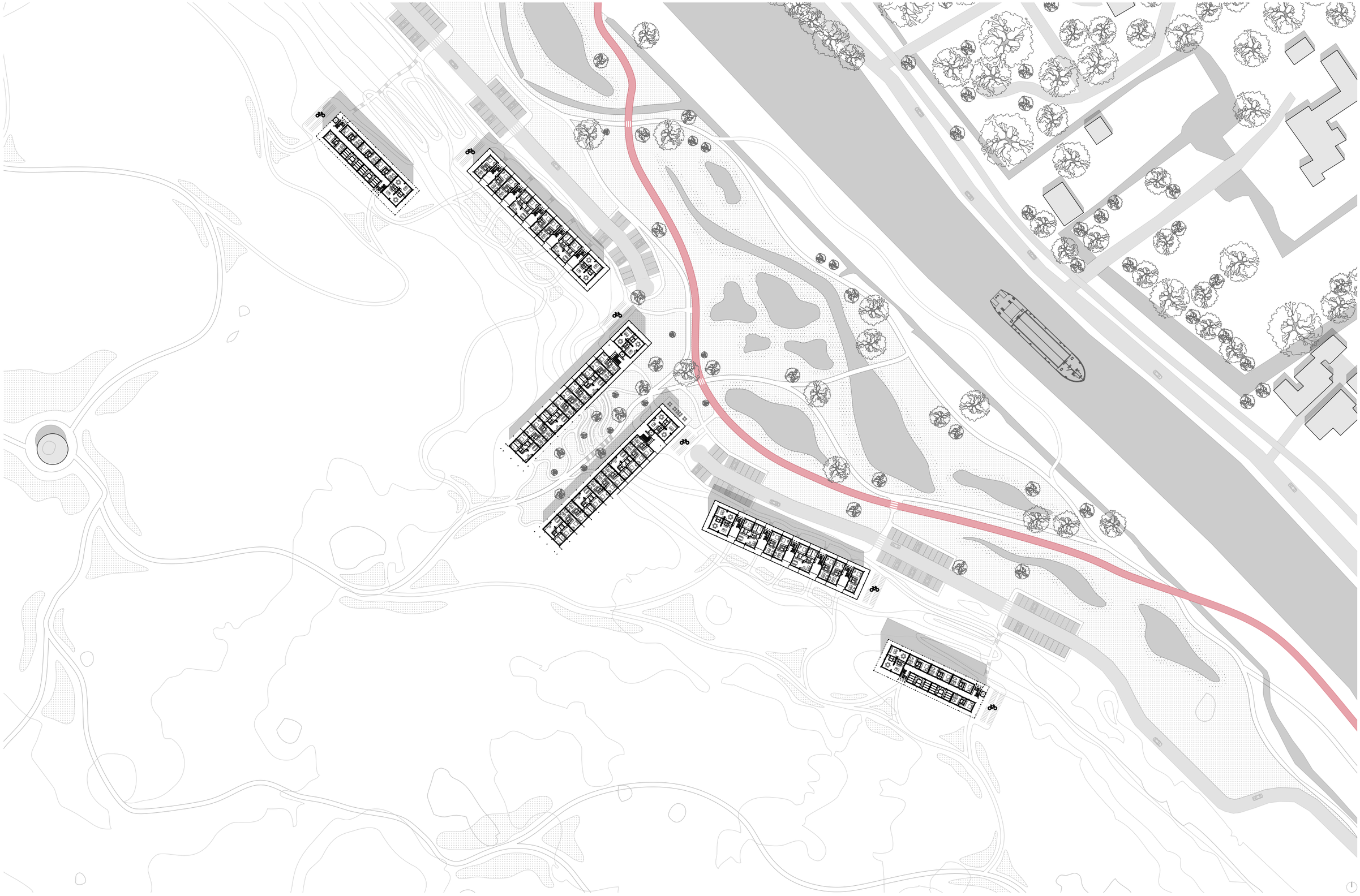
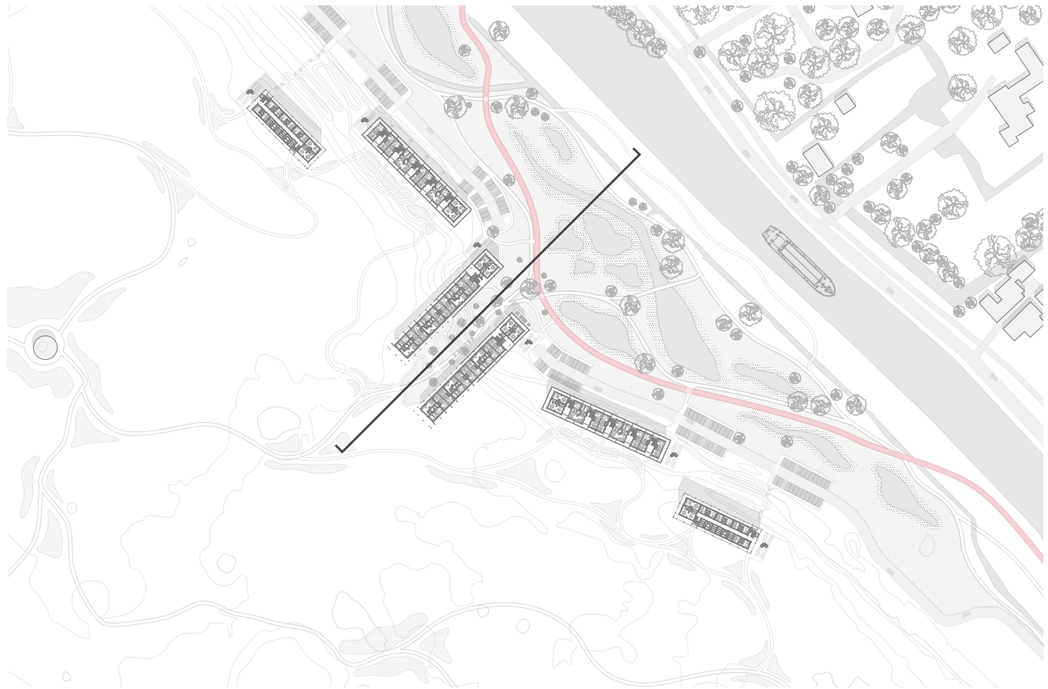


Figure 28.Situation 1:1000 Scaled

Urban section



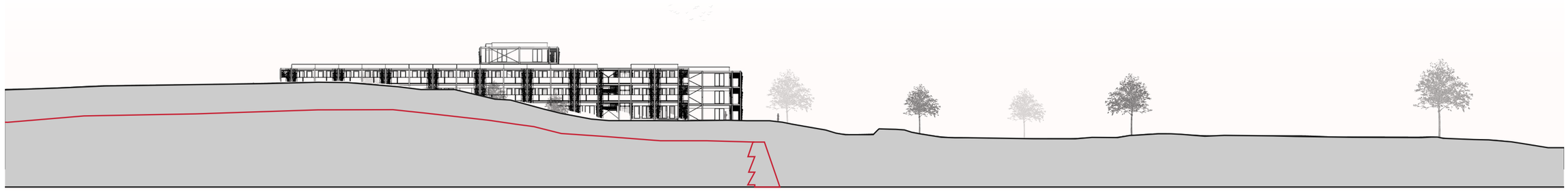


Figure 29.Urban section

LIFE INSIDE THE SYSTEM

An ecology of inclusion.



Figure 30.Ground floor gallery

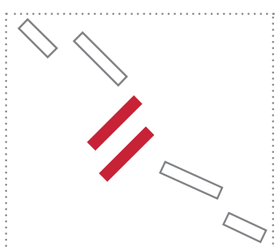




Figure 31.Ground floor gallery cafe

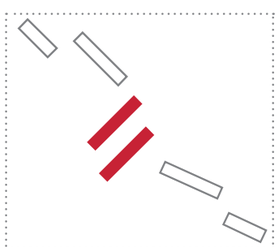




Figure 32.First floor gallery

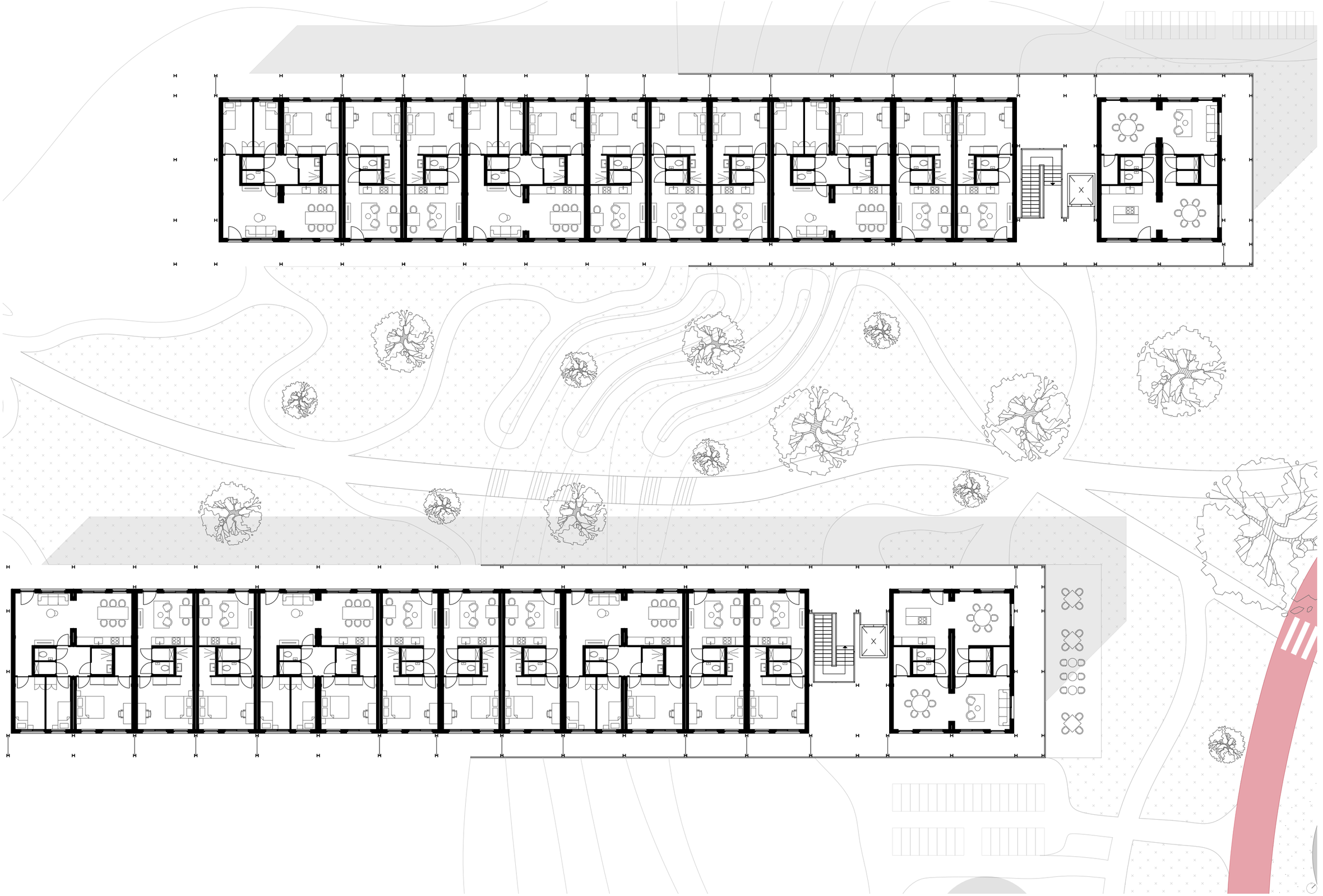


Figure 33.Second floor gallery



Figure 34.Second floor gallery acces

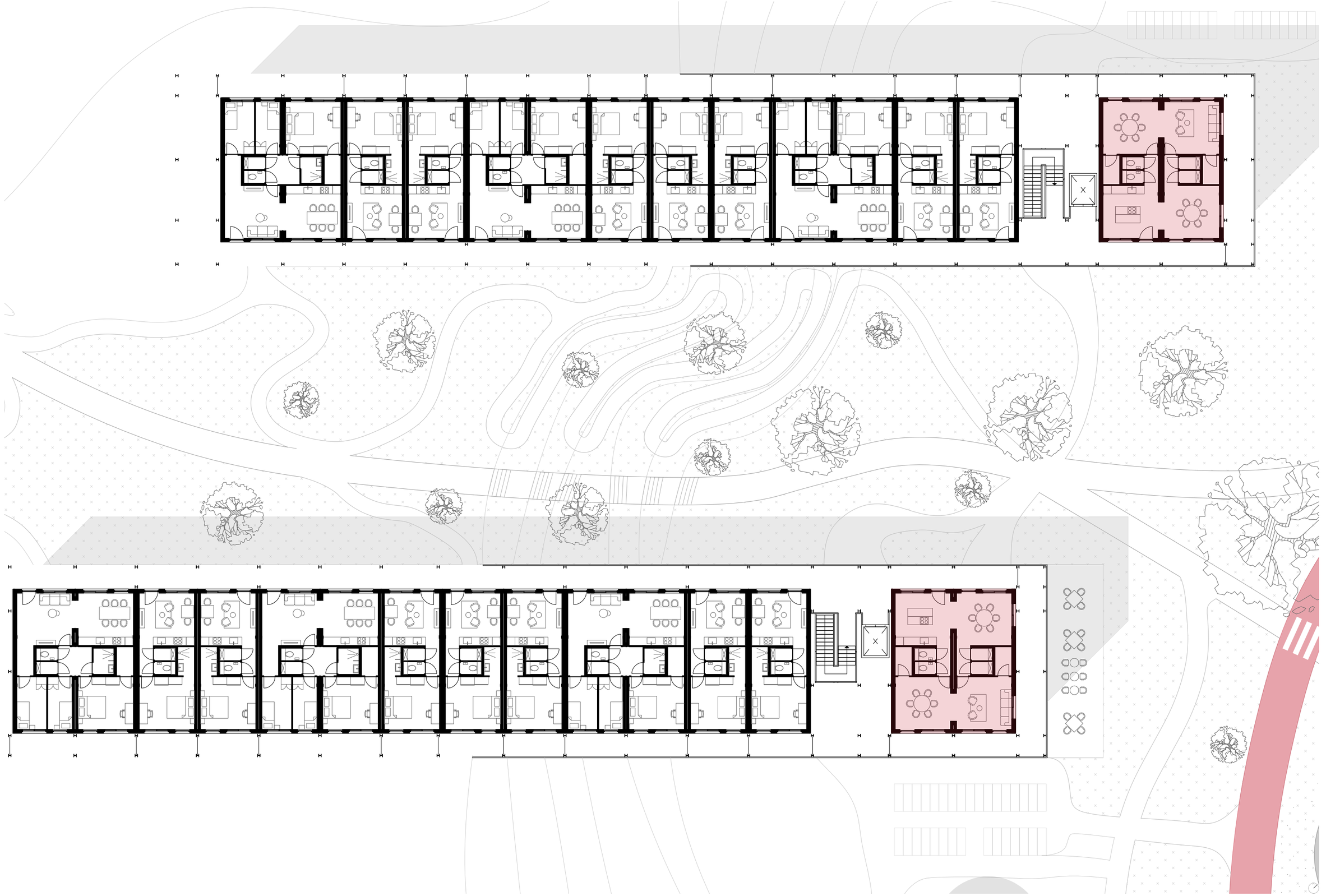


Figure 35.Second floor gallery community spaces

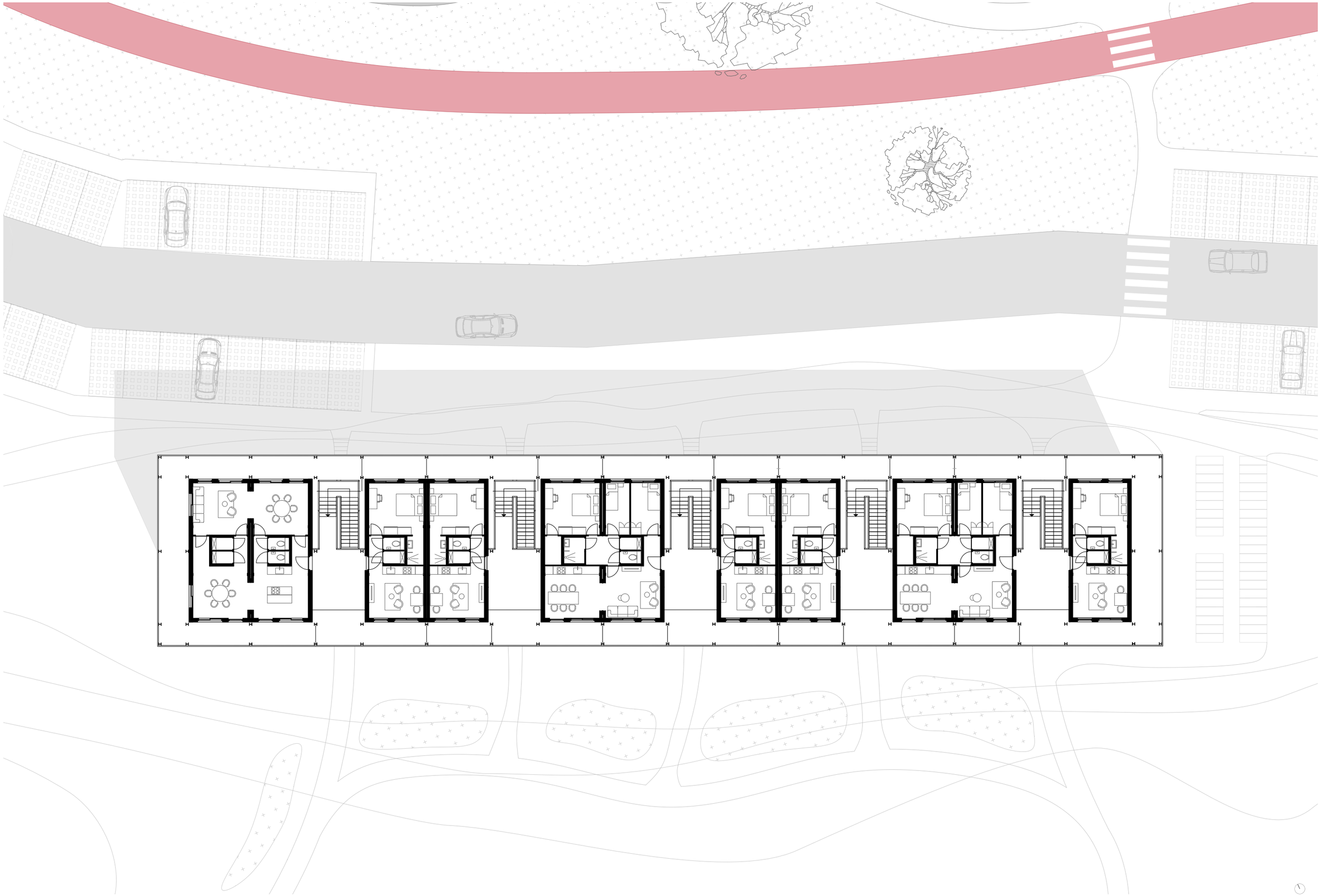


Figure 36.Second floor portico

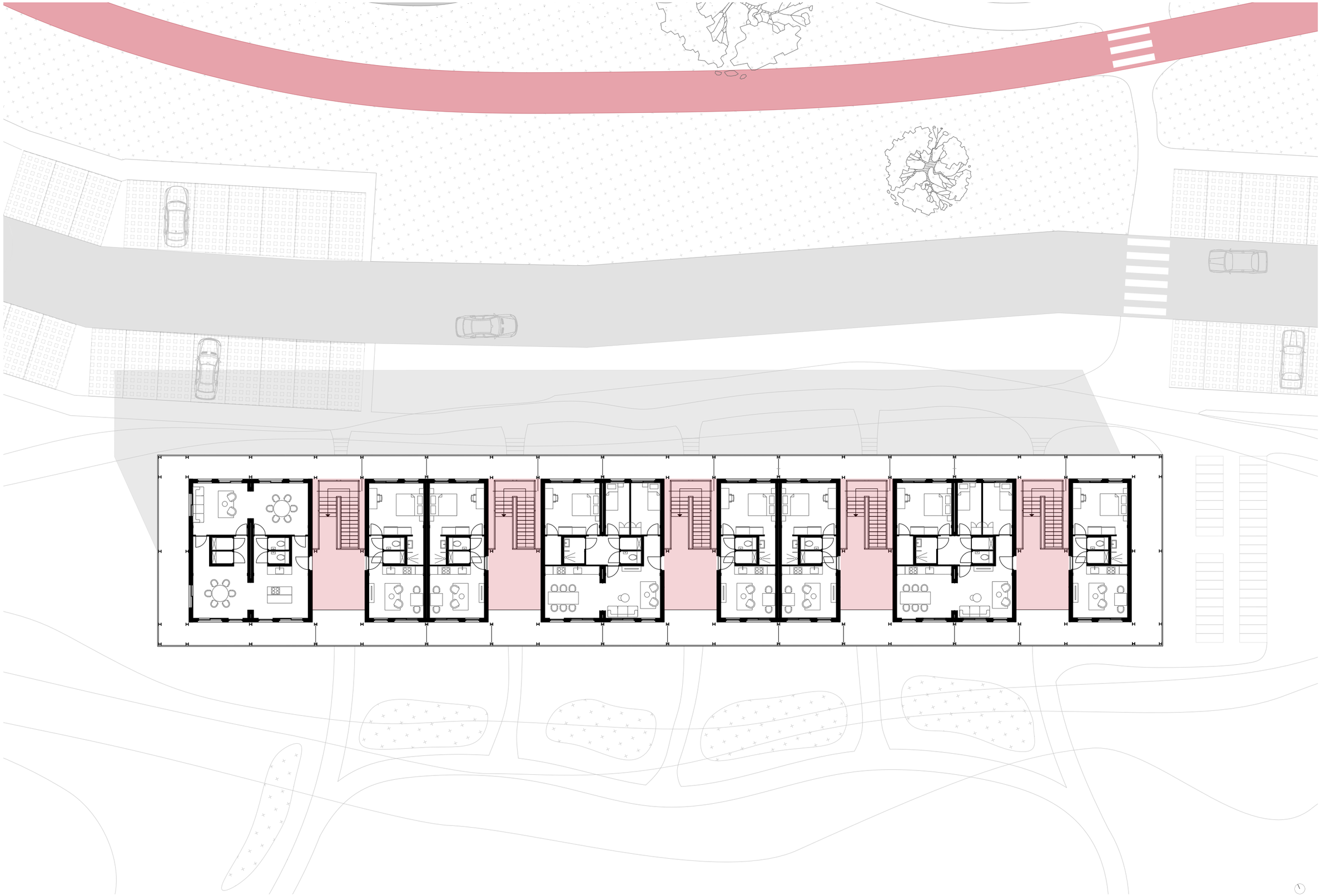


Figure 37.Second floor portico access

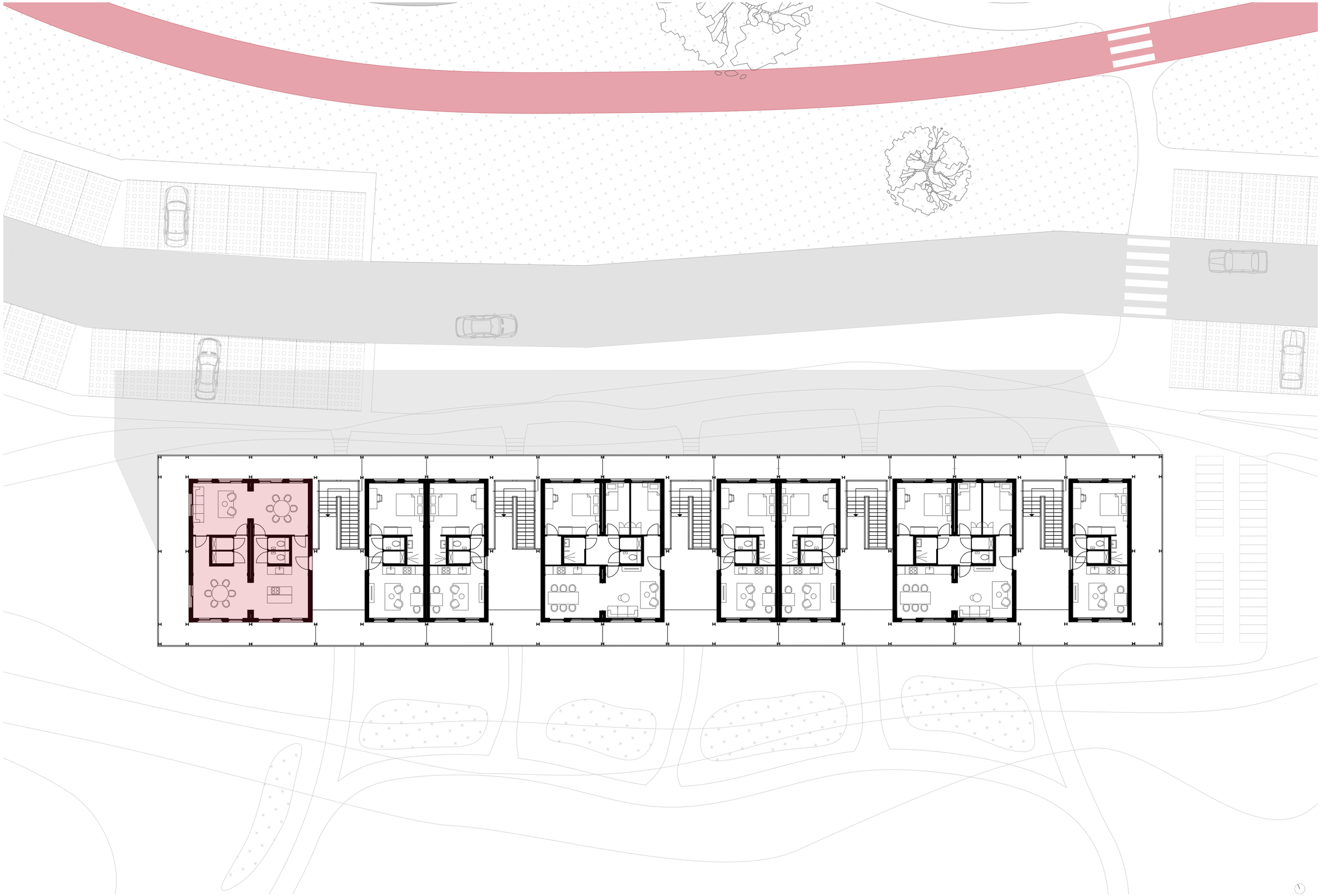


Figure 38.Second floor portico community space

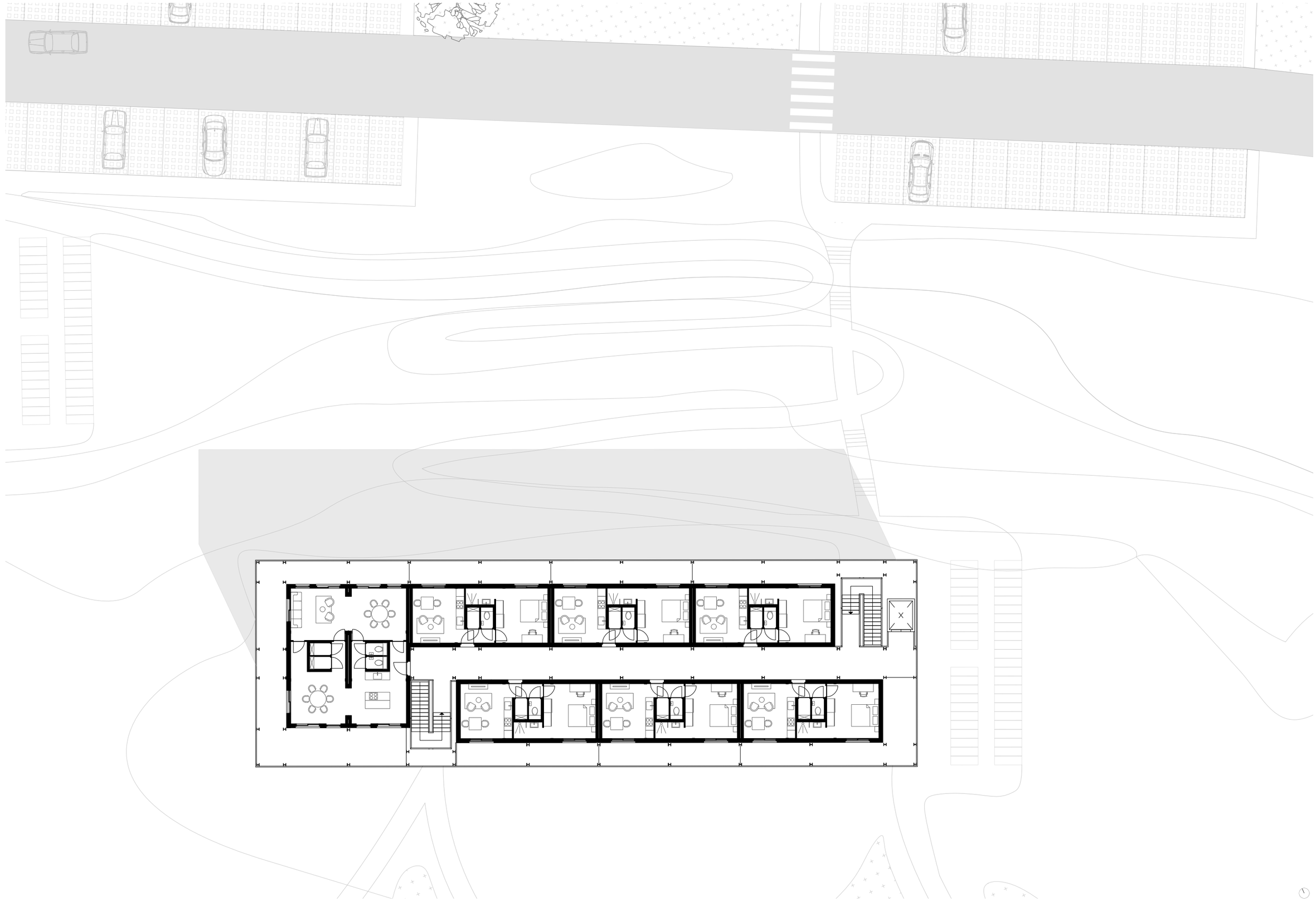


Figure 39.Second floor corridor

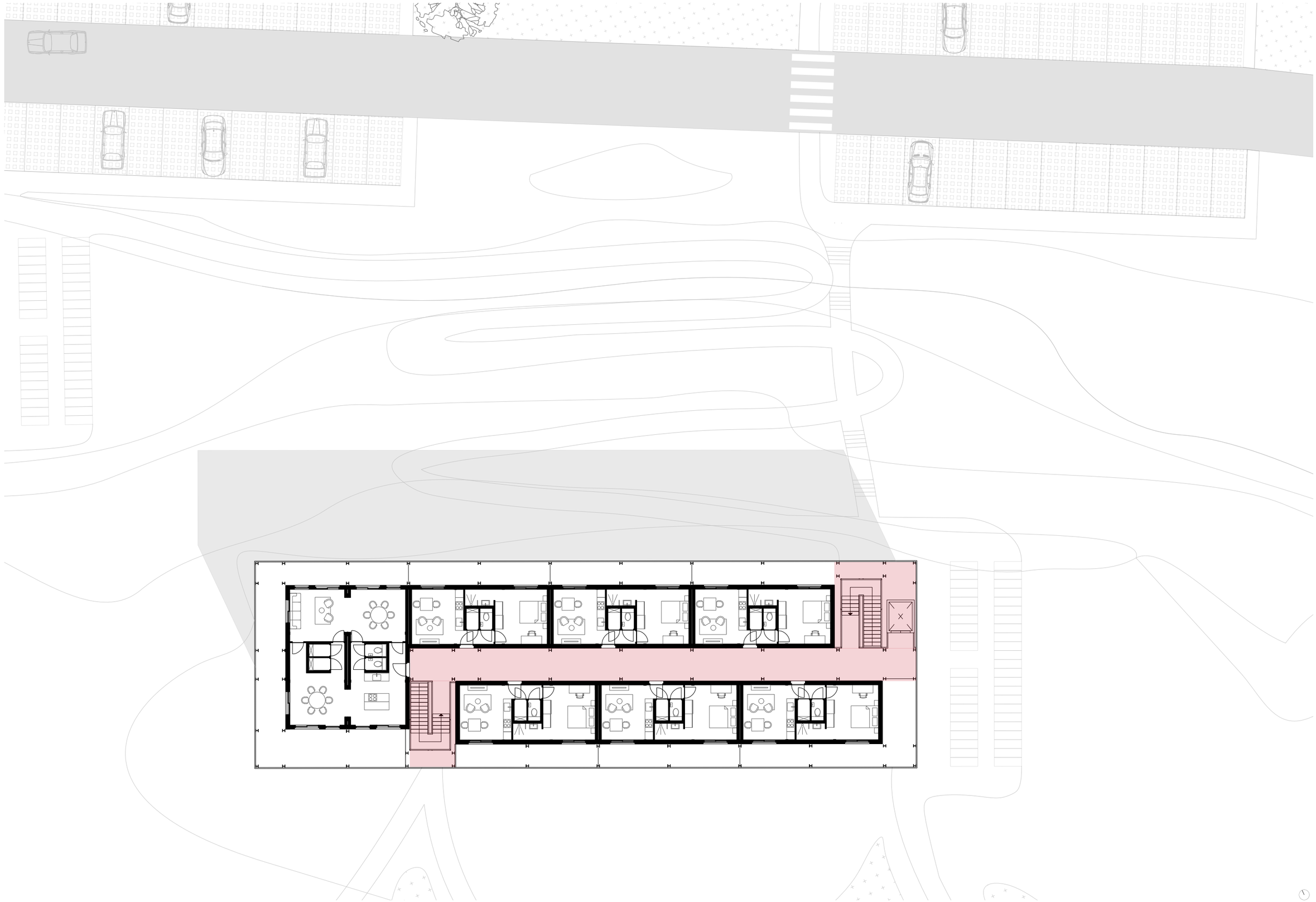


Figure 40.Second floor corridor access

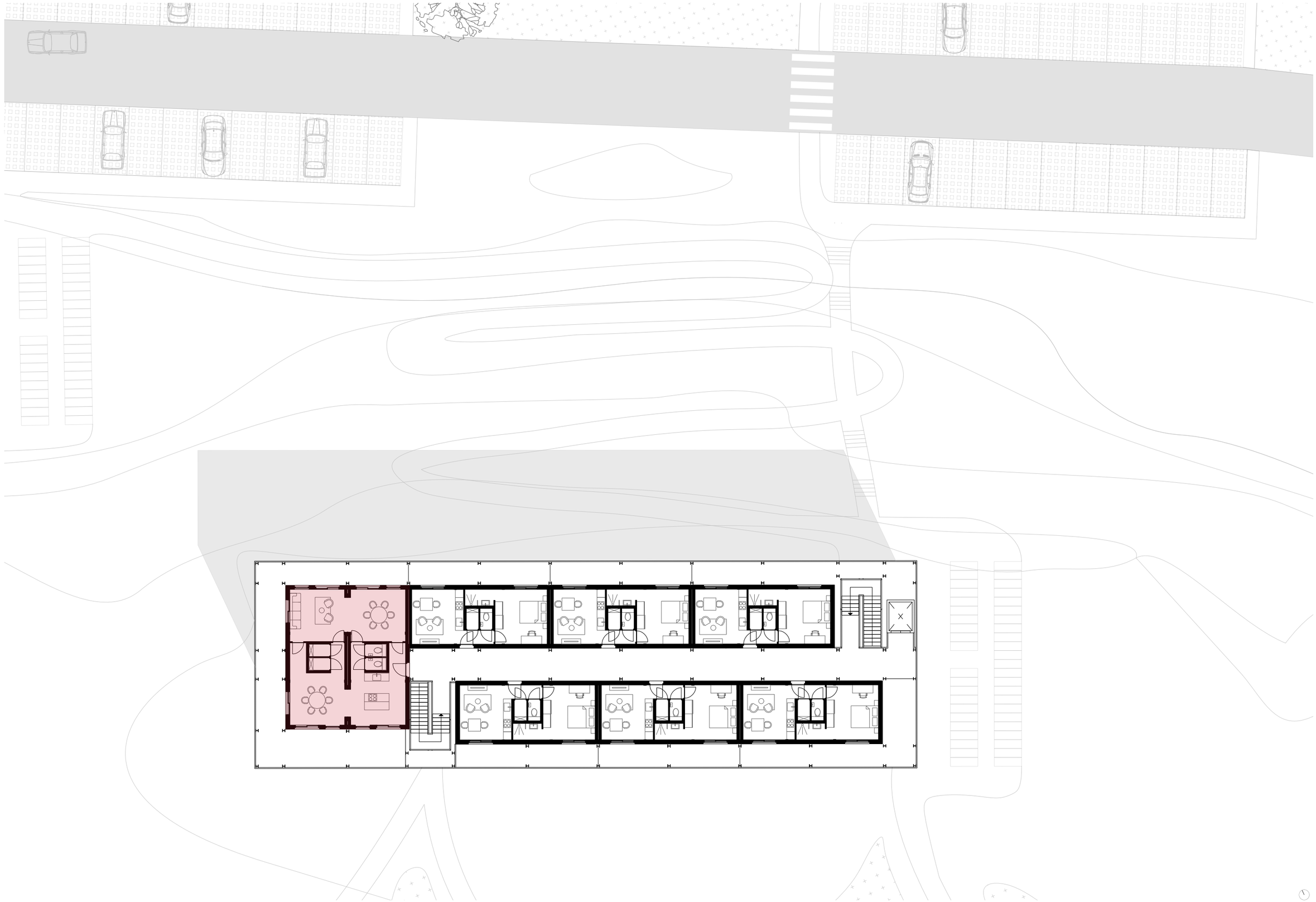


Figure 41.Second floor corridor community space

A Mixed Residential Community

- **Seasonal workers**
  Temporary residents who need affordable, practical and well-connected housing.

- **Starters**
  Young adults entering the housing market and looking for compact, affordable homes.

- **Single-person households**
  Residents living independently in small, efficient apartments.

- **Small households**
  Couples or small families of three to four people who need a living space.

REVERSIBLE ARCHITECTURE

A building designed for uncertain ground.

Front Elevation and Section



Figure 42.Front elevation and vertical section 1:48 scaled



Figure 43.Horizontal isometric section



Figure 44.Isometric section 1:48 scaled

Steel from Noord-West

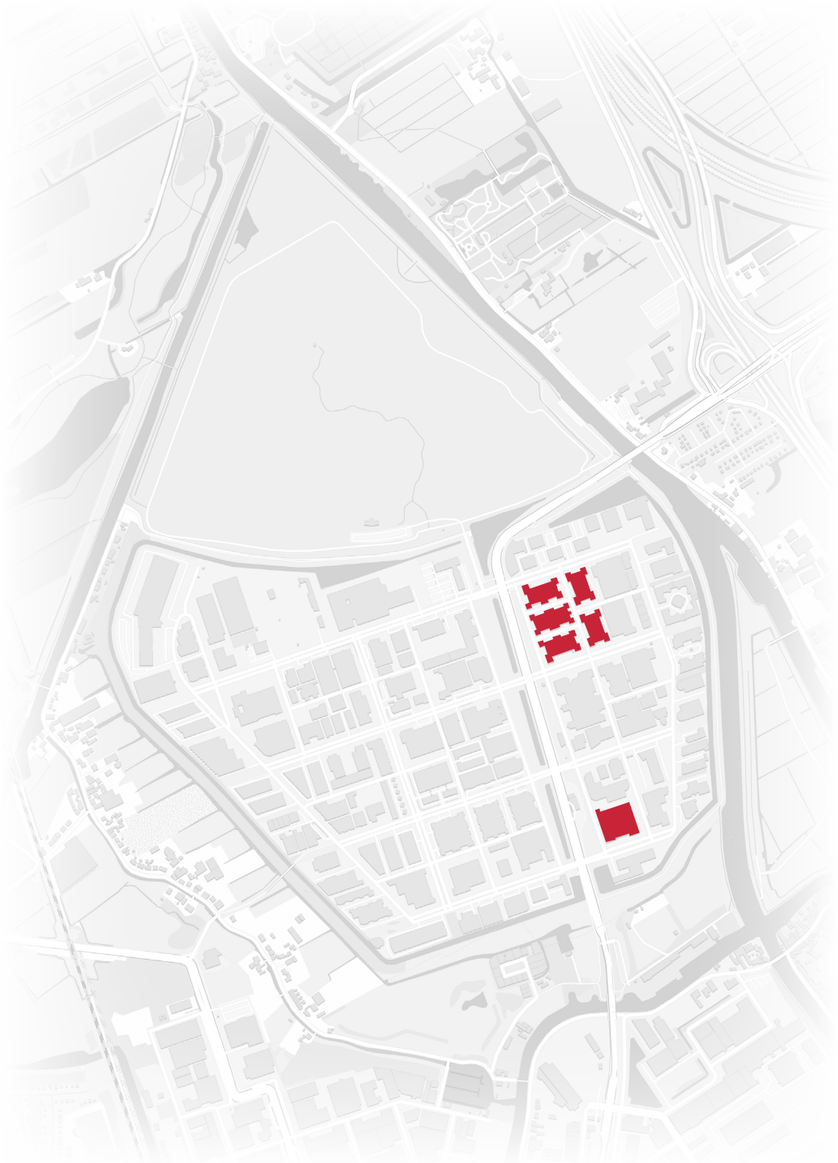


Figure 45.Steel from donor buildings

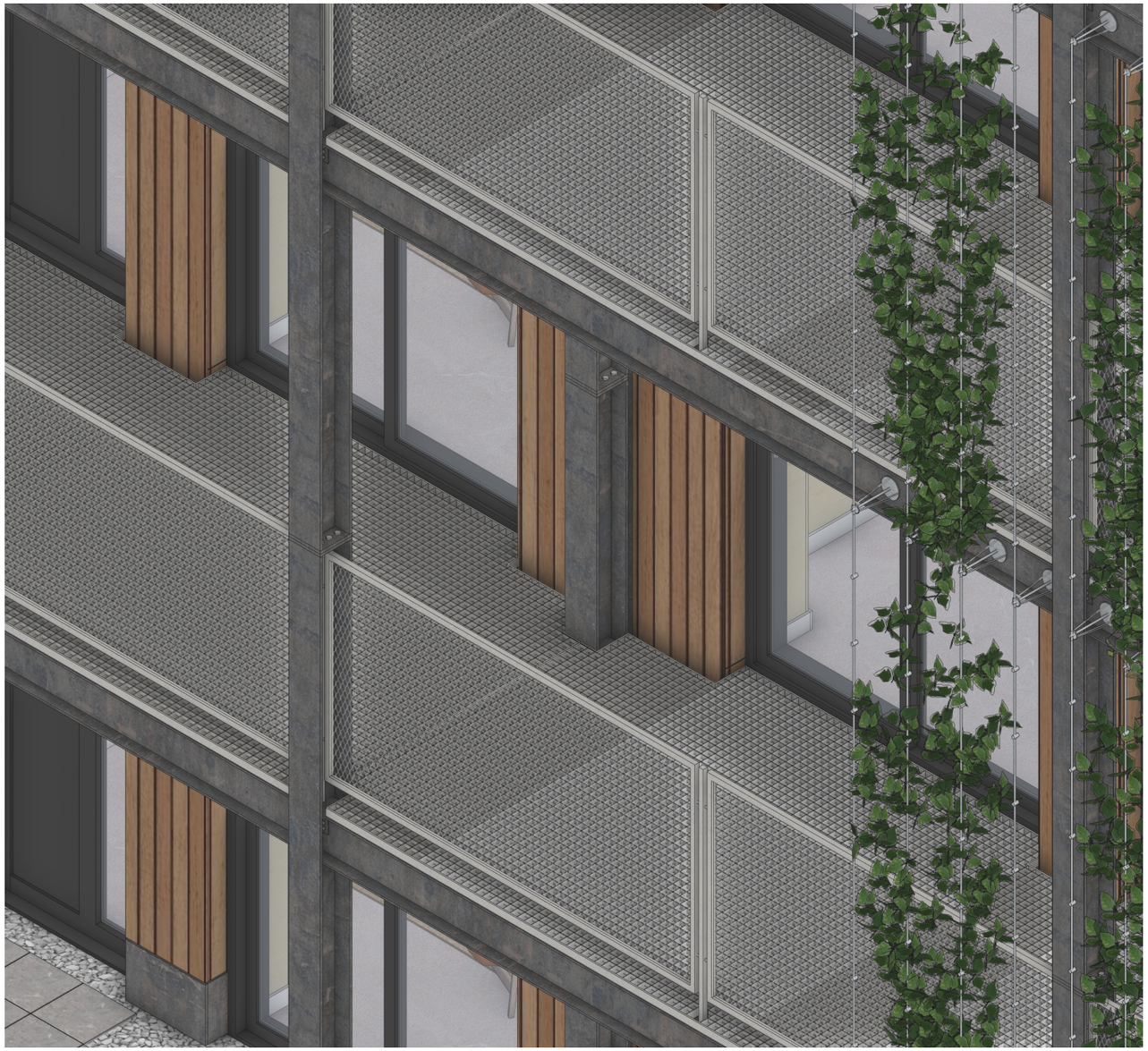


Figure 46.Steel connection detail

Assembly

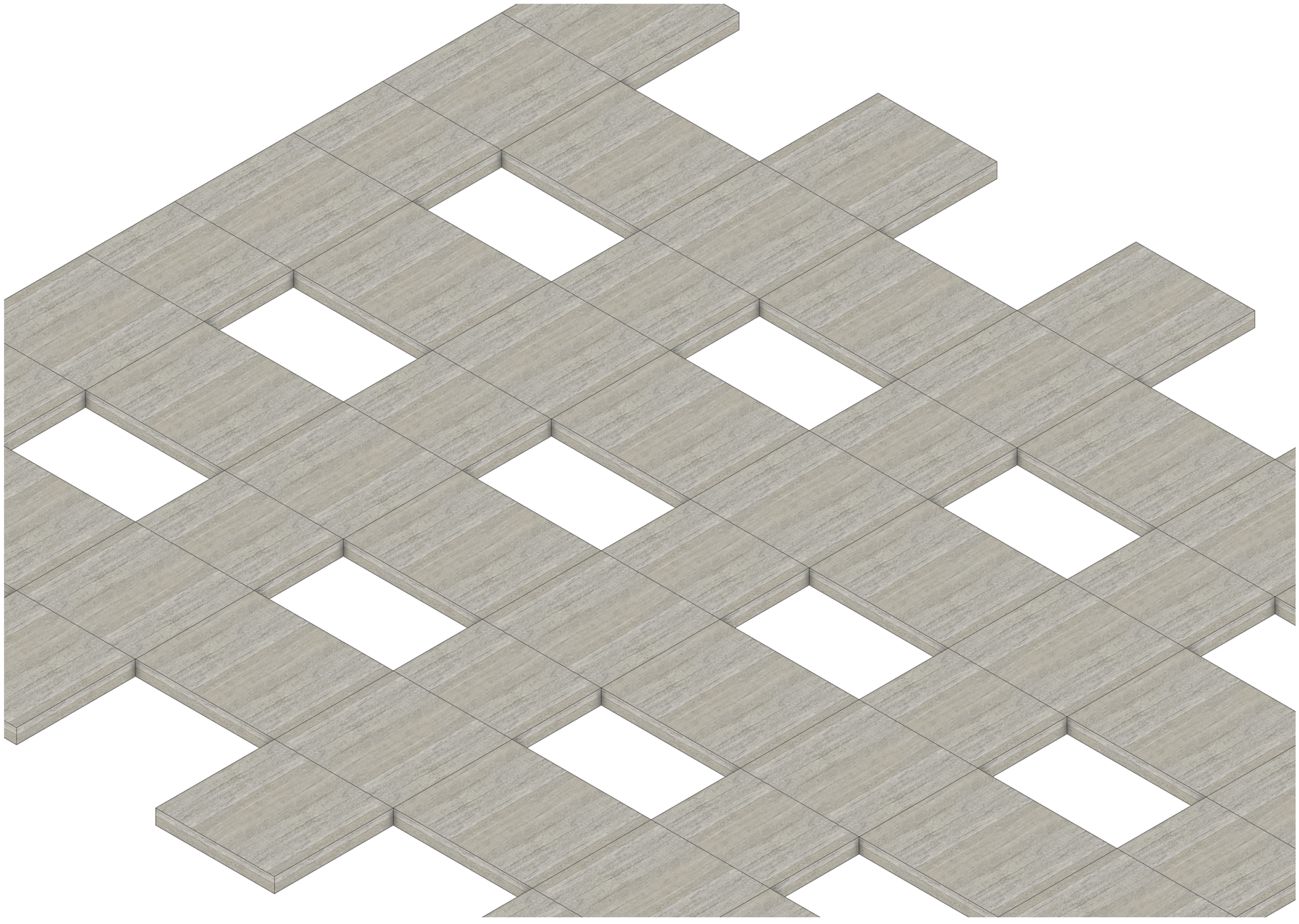


Figure 47.Isometric assembly

Assembly

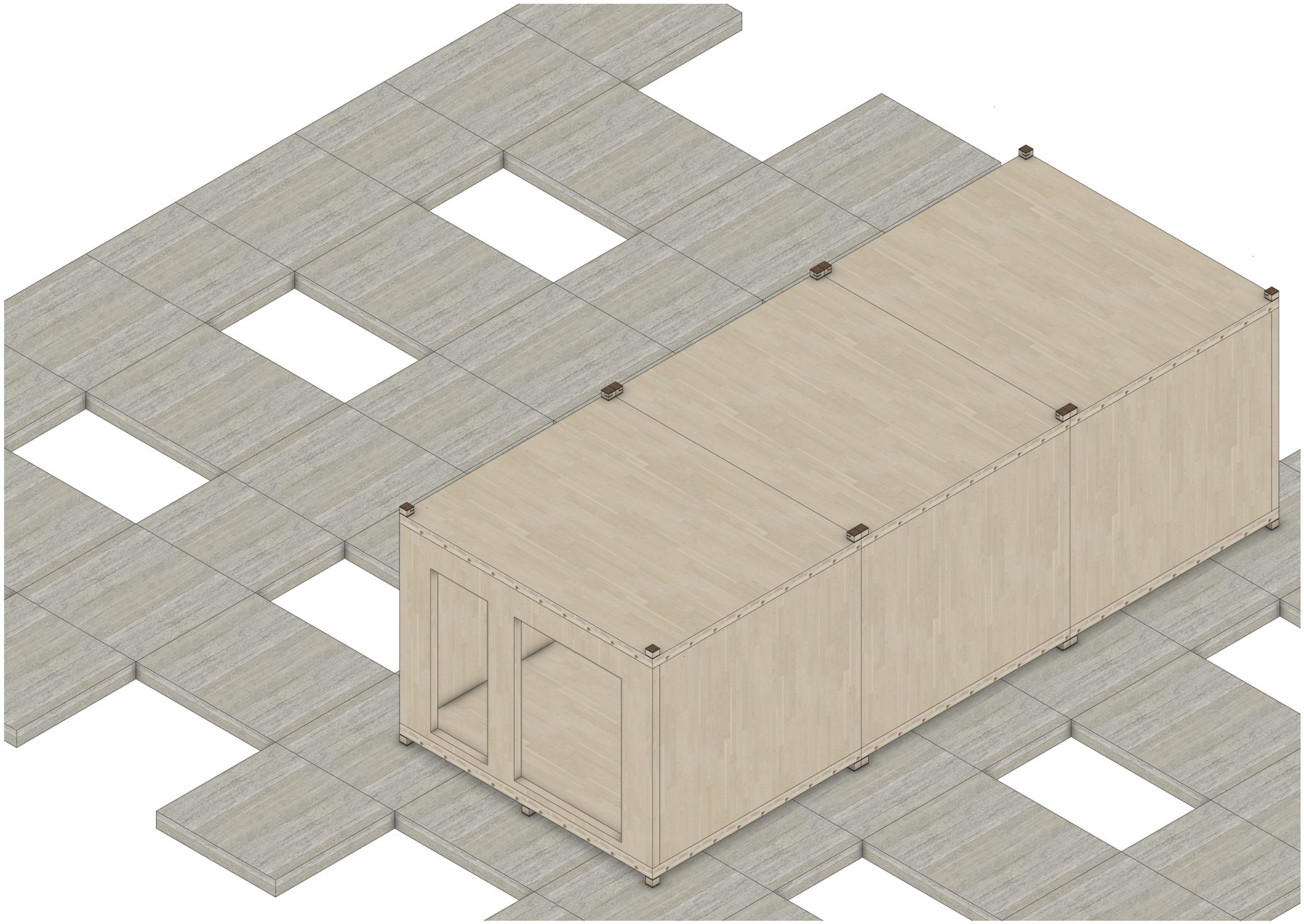


Figure 48.Isometric assembly

Assembly

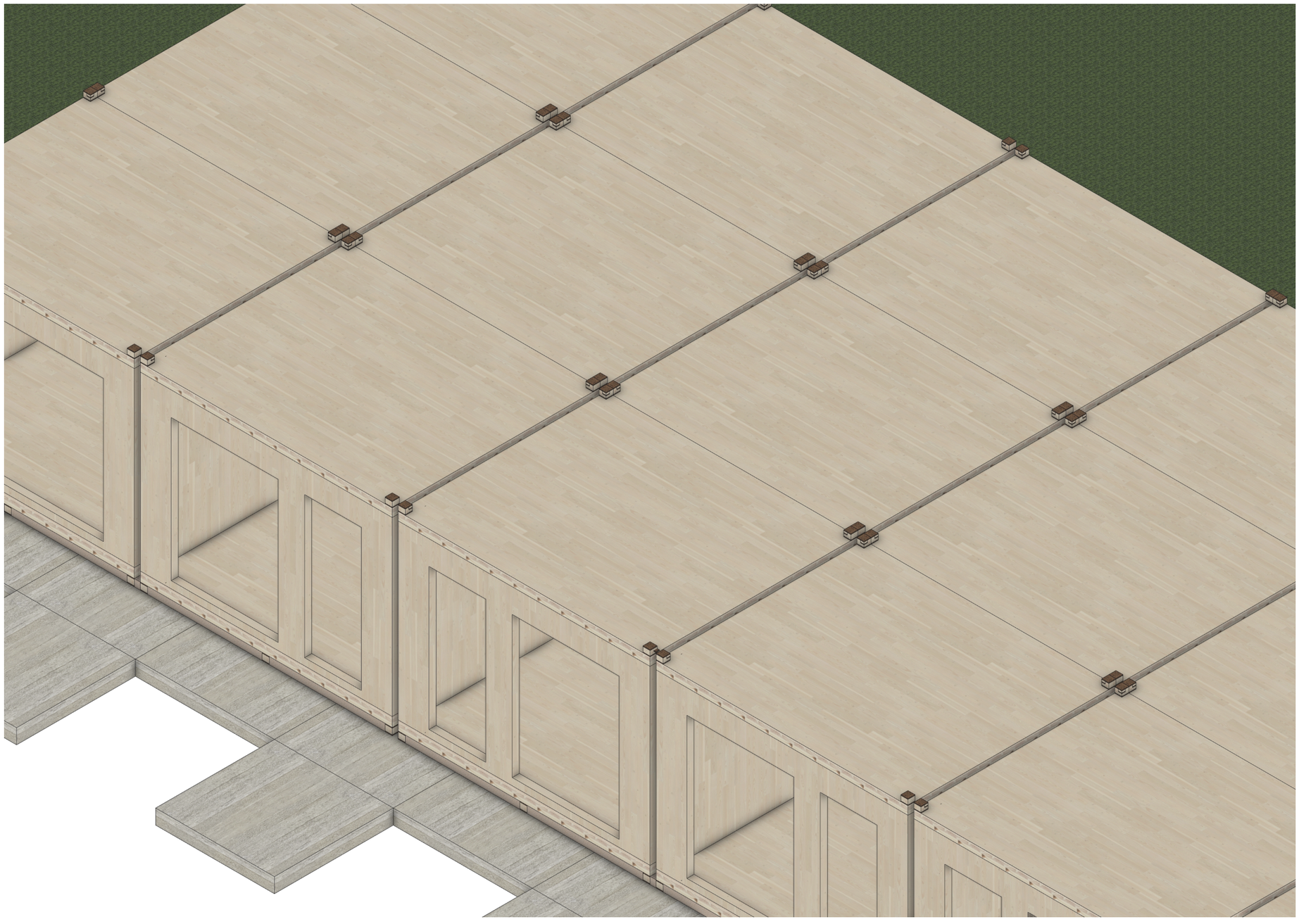


Figure 49.Isometric assembly

Assembly

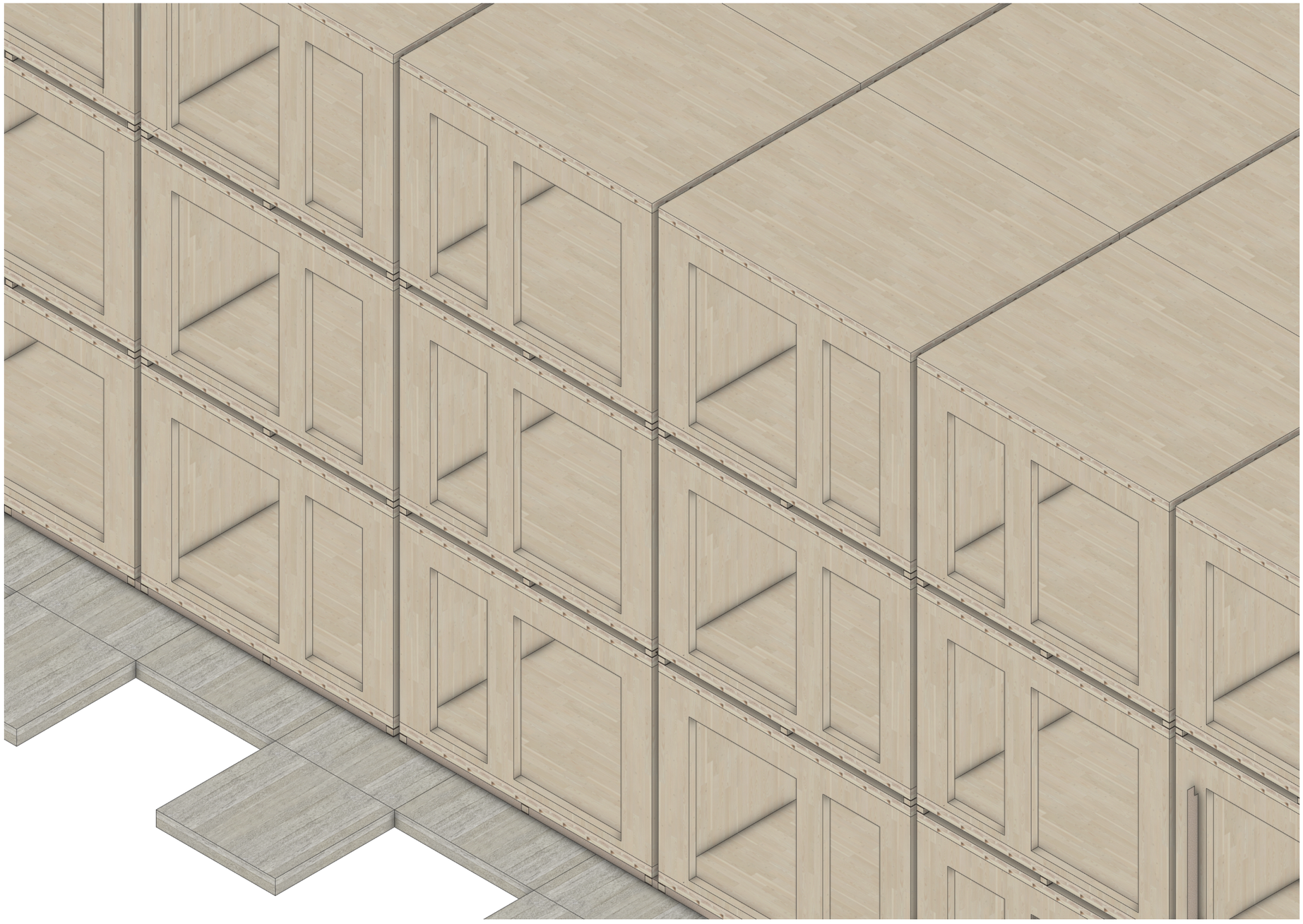


Figure 50.Isometric assembly

Assembly

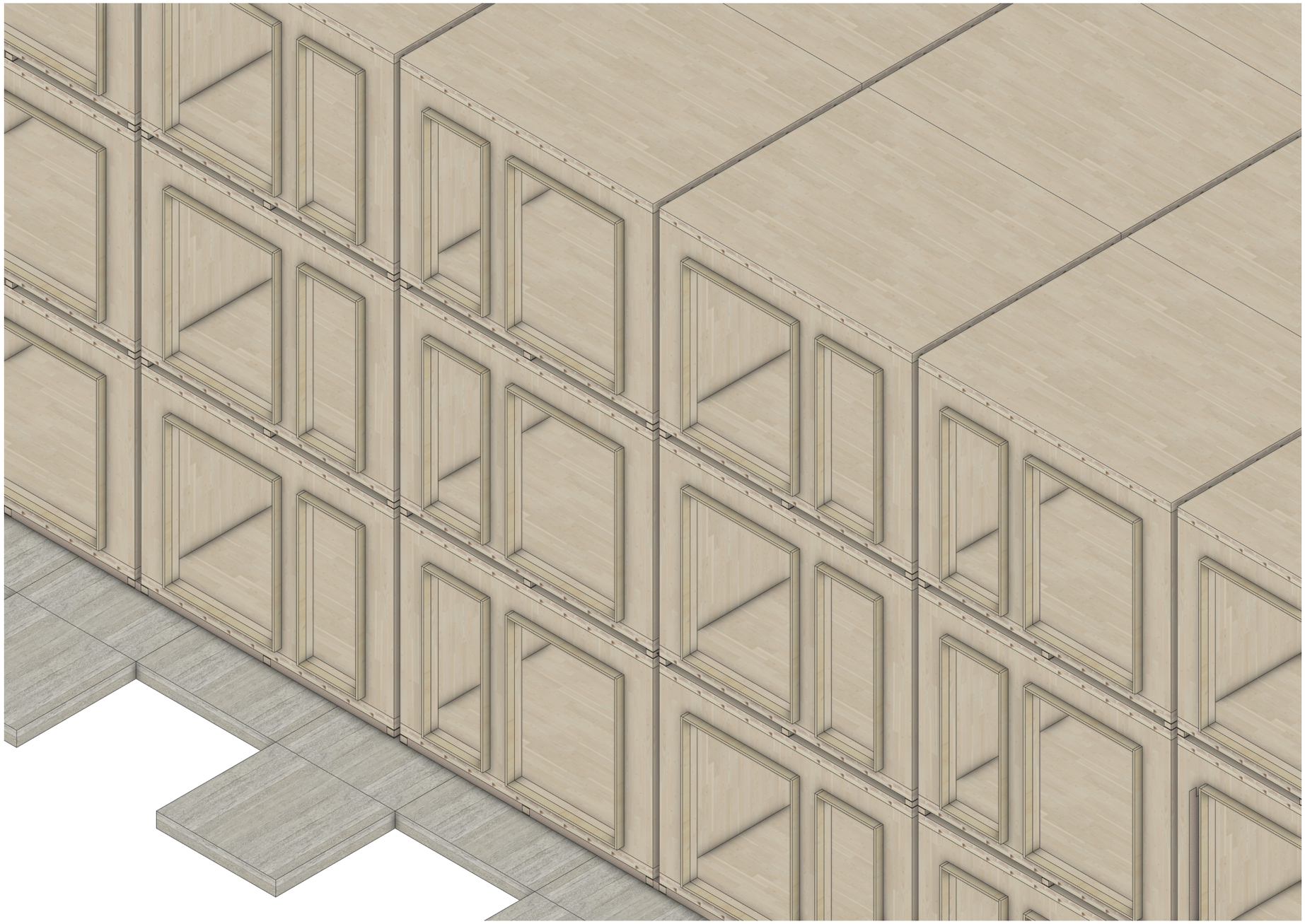


Figure 51.Isometric assembly

Assembly

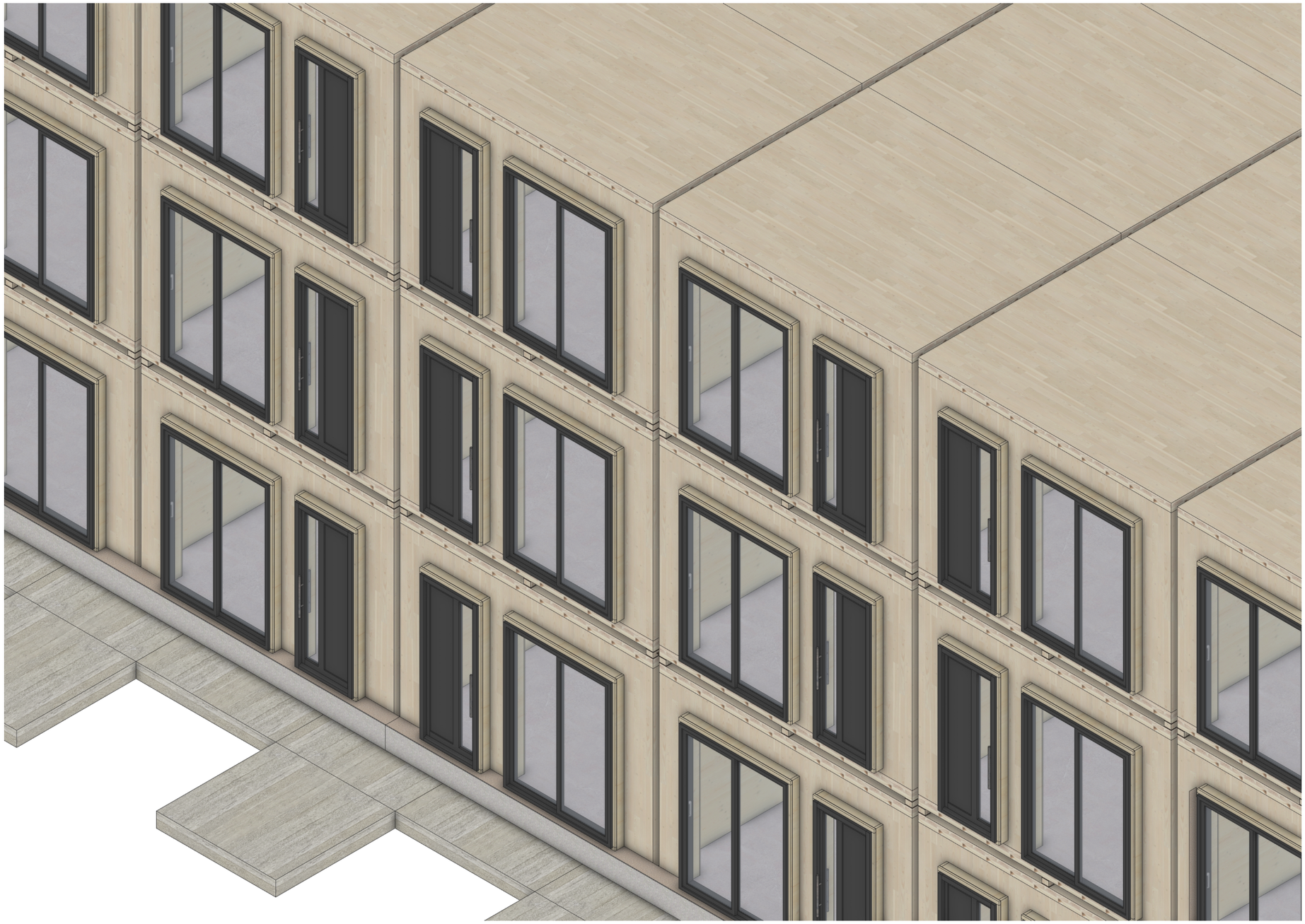


Figure 52.Isometric assembly

Assembly



Figure 53.Isometric assembly

Assembly

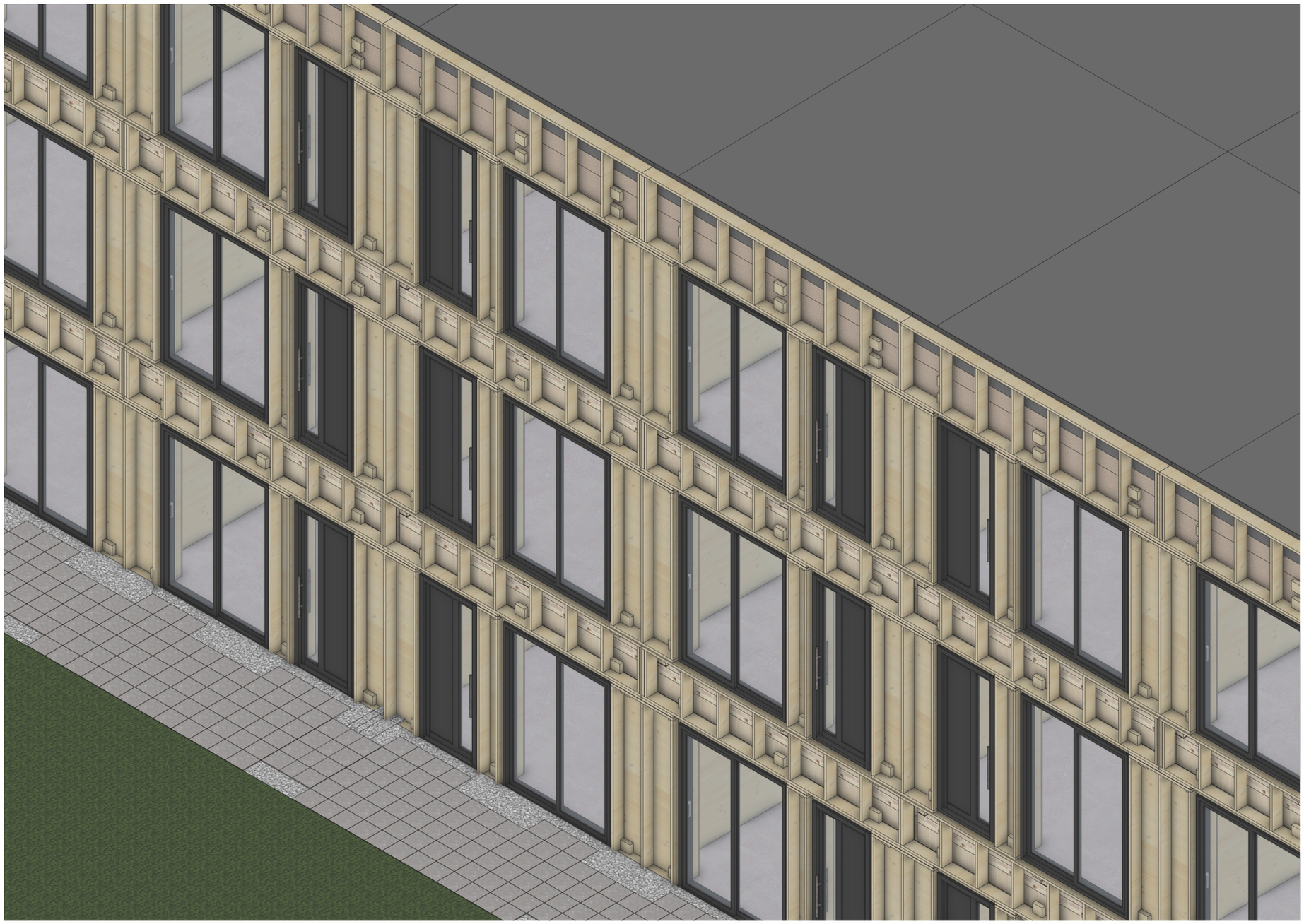


Figure 54.Isometric assembly

Assembly

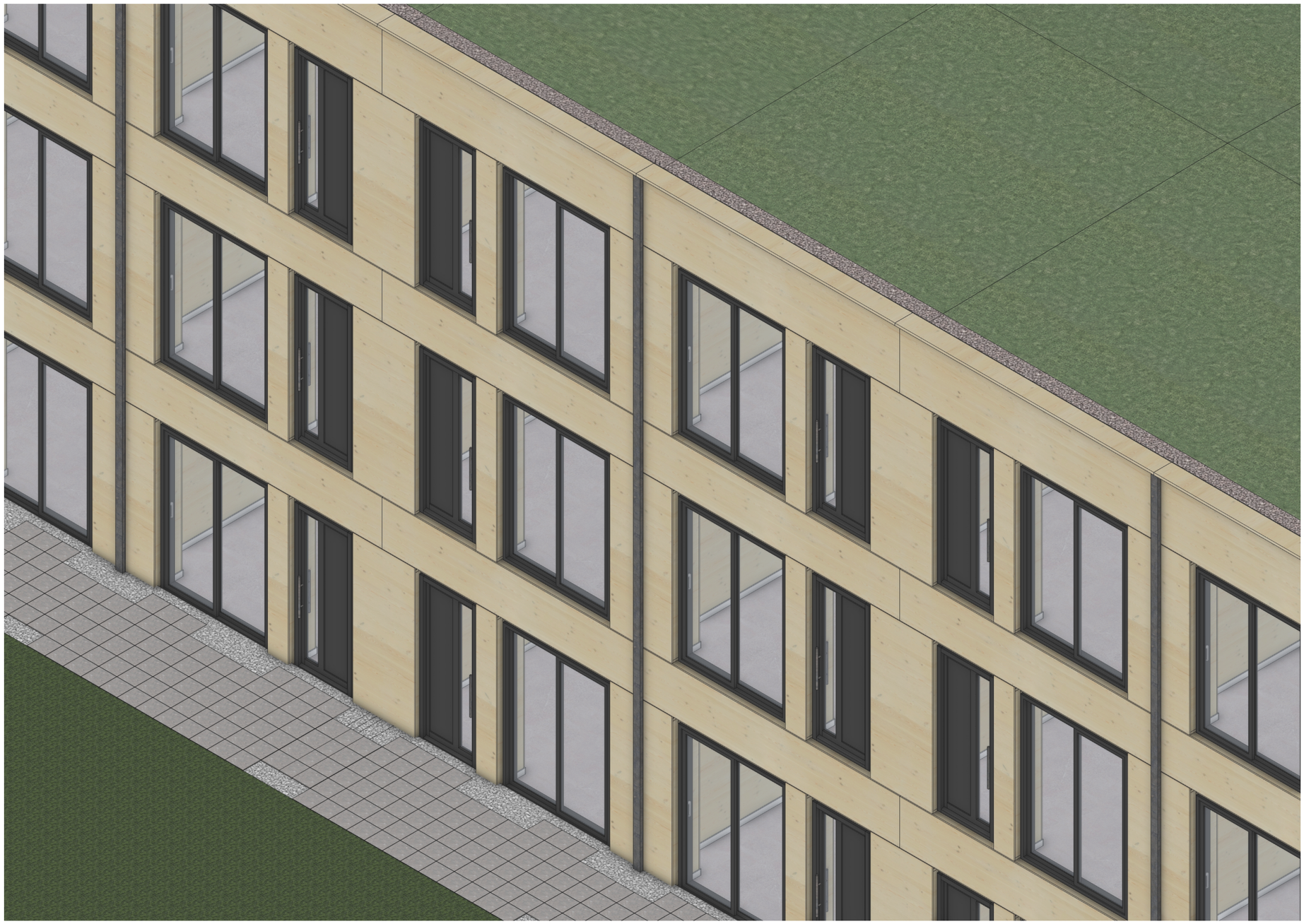


Figure 55.Isometric assembly

Assembly



Figure 56.Isometric assembly

Assembly



Figure 57.Isometric assembly

Assembly



Figure 58.Isometric assembly

Assembly

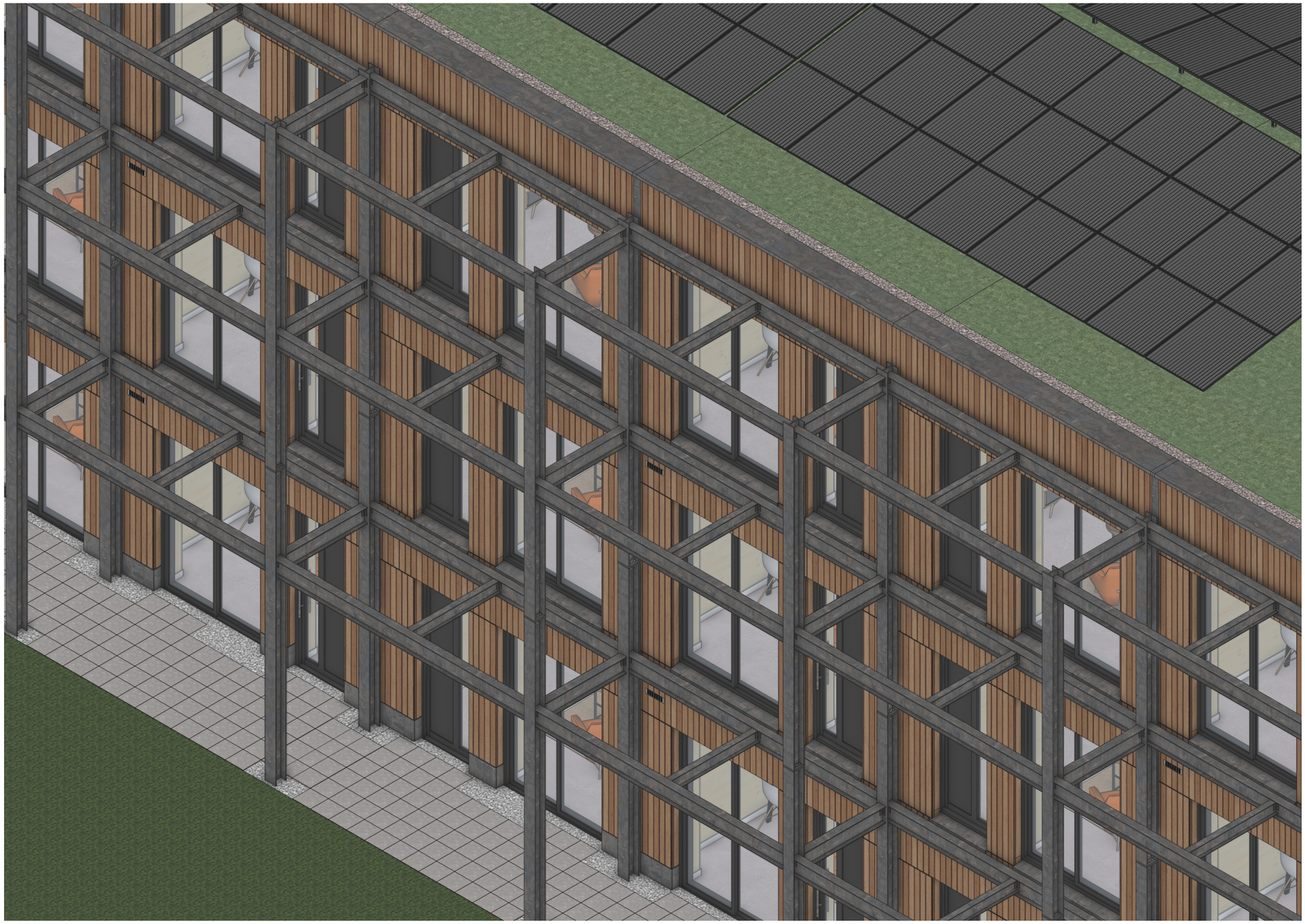


Figure 59.Isometric assembly

Assembly

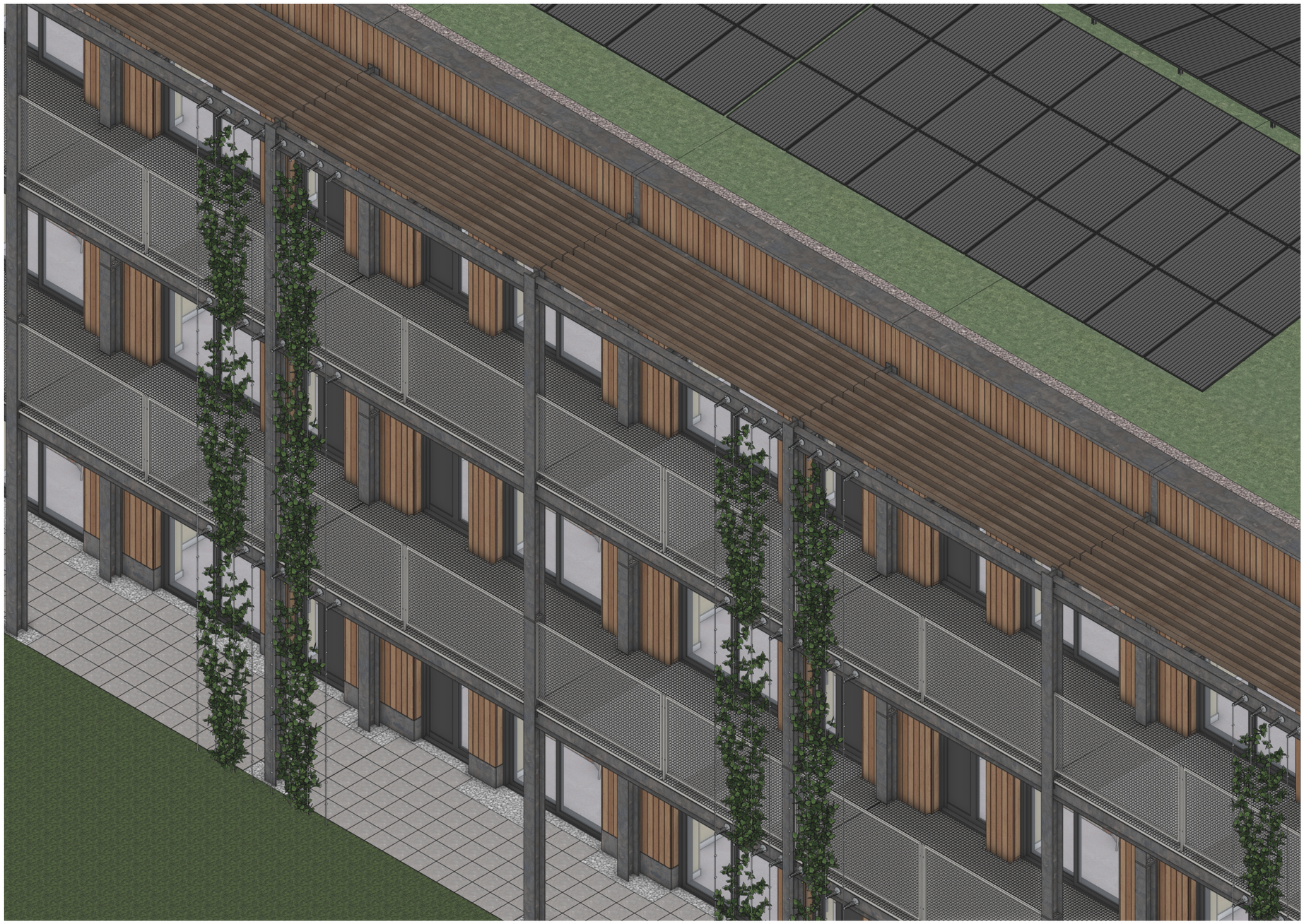
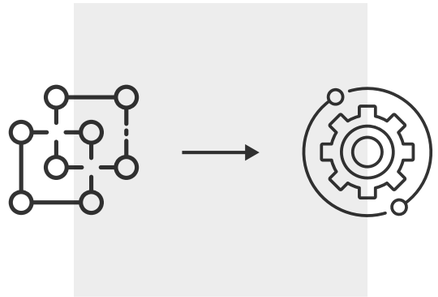


Figure 60.Isometric assembly

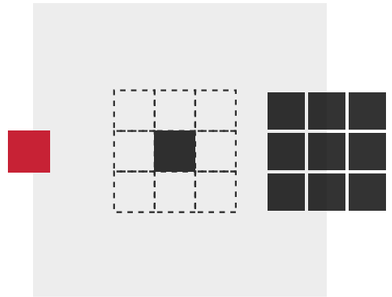
APPOSITION

Architecture beside uncertainty.

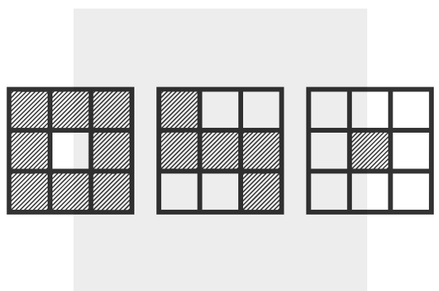
APPOSITION



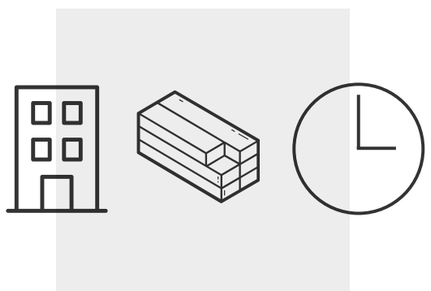
Architecture as a system
Layered and adaptable
Full residential quality



Reversible
Relocate, combine and remove
Change without demolition



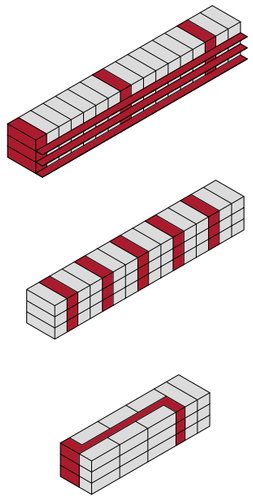
Flexible configurations
Individual and collective living
Adaptable to changing needs

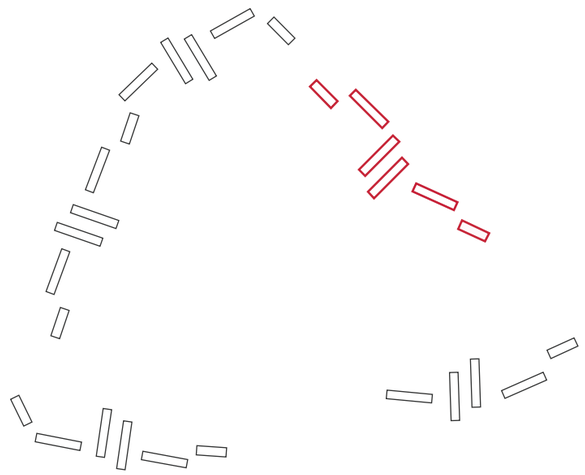


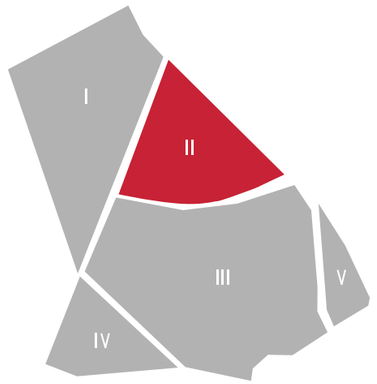
A future resource
Repairable and reusable
Building as a material bank

Figure 61.Conclusion









Through apposition, small separate elements are placed together to form larger structures without becoming permanent.
This creates an adaptive, reversible architectural system for contaminated soil.



Figure 62.Render Apposition



Figure 63.Render Apposition

APPOSITION

The state of being side by side or in close proximity.

MIDDEN-DELFLAND

Plan Zones Urbaines Sensibles - ZUS

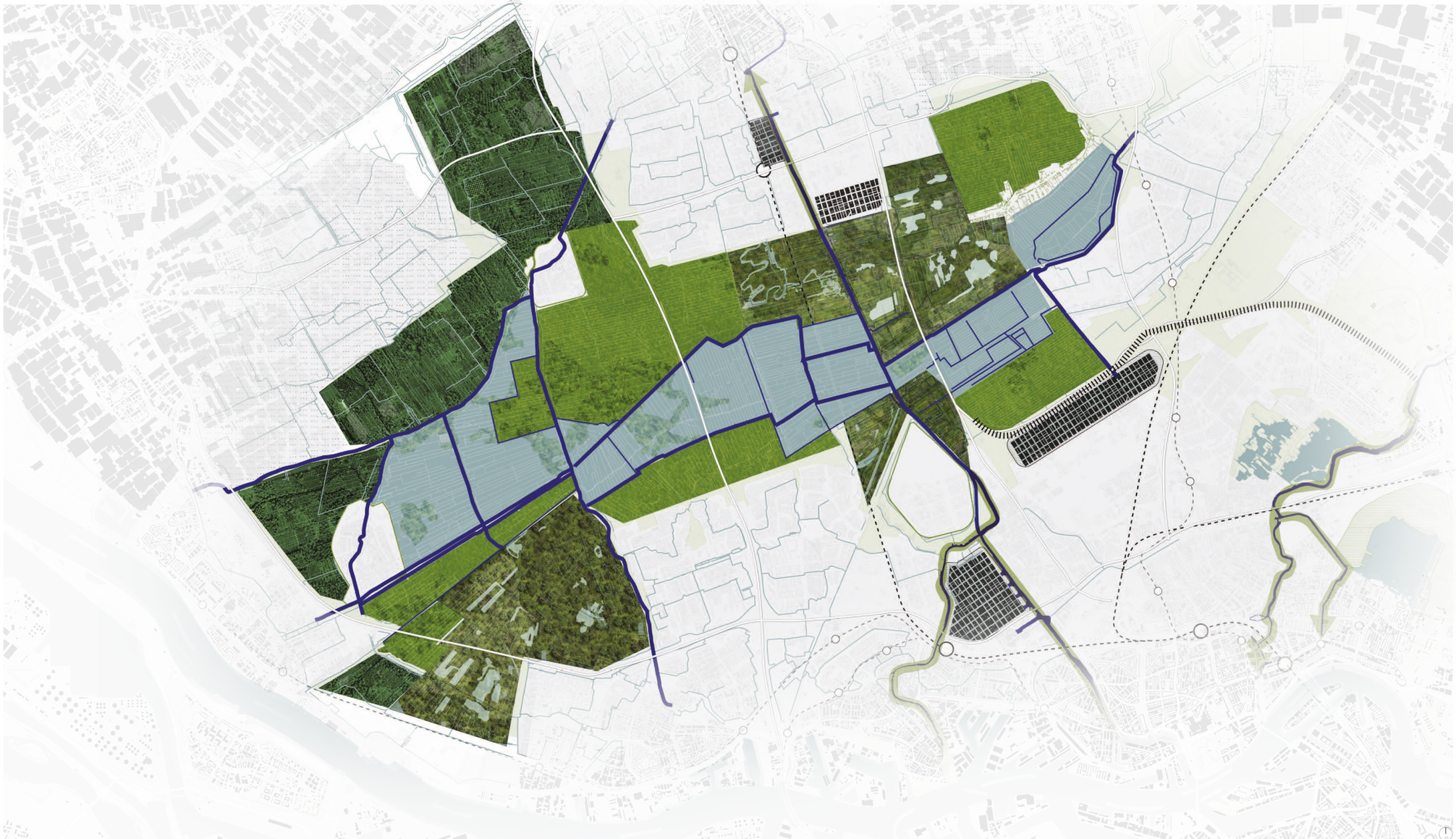


Figure 64.Visionmap ZUS

MIDDEN-DELFLAND

Plan Bijzonder Provinciaal Landschap - BPL



Figure 65.Analysis map BPL

MIDDEN-DELFLAND

ZUS and BPL



Figure 66.Diagram ZUS & BPL combined

MIDDEN-DELFLAND

Entrance III

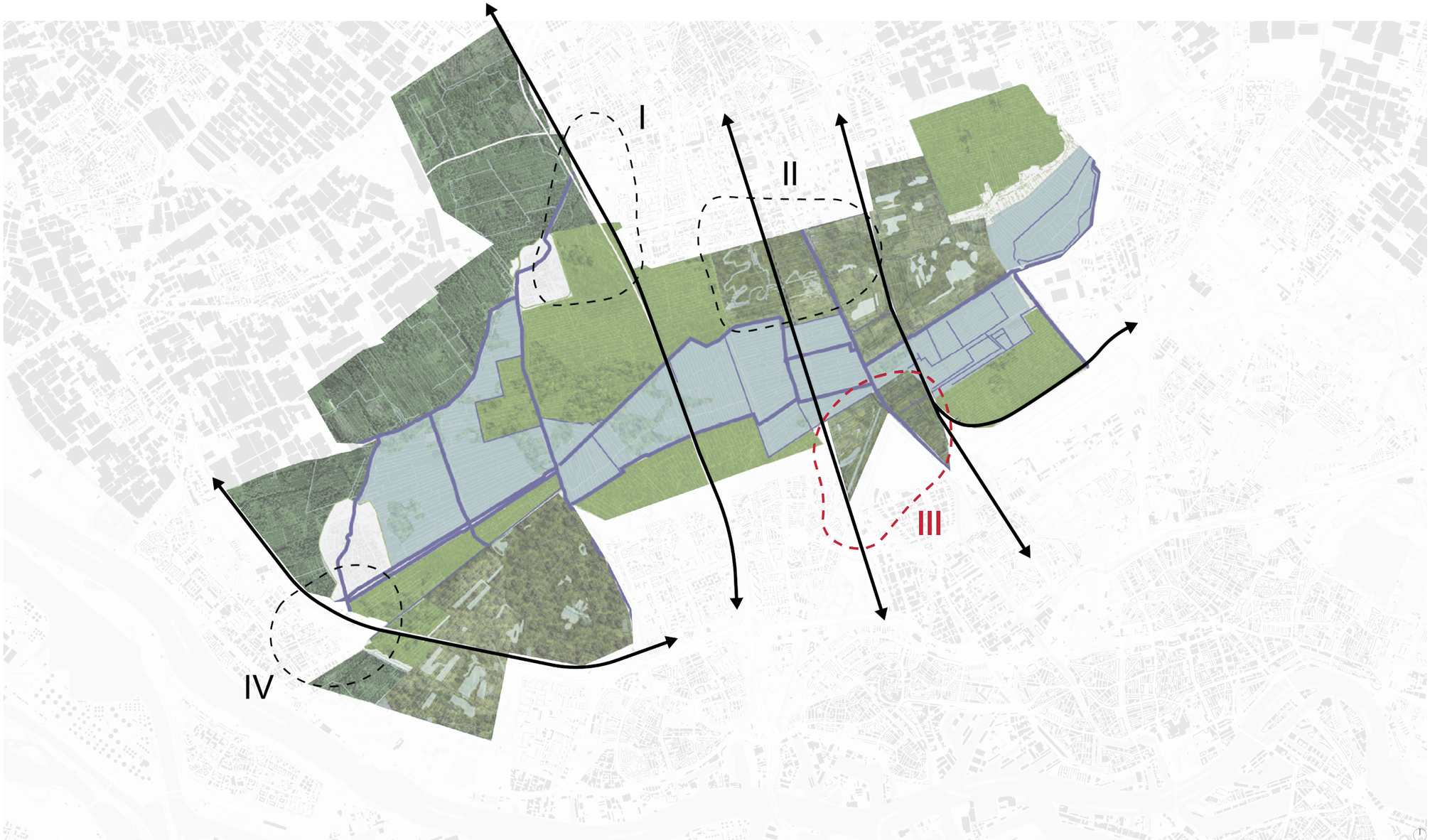


Figure 67.Diagram ZUS & BPL combined

MIDDEN-DELFLAND

De Schieknoop - entrance III



Figure 68.Buildings Schieknoop

PROBLEM DEFINITION

De Schieknoop - entrance III

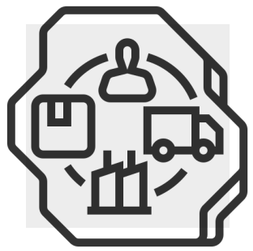


Figure 69.Problem diagram

AMBITIONS



Interwoven landscape
and urban systems



Local building
resource chain



Circular strategies

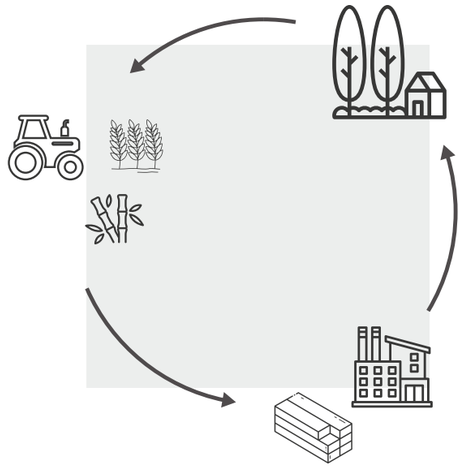


Soft & fluid boundaries

Figure 70. Masterplan Ambitions

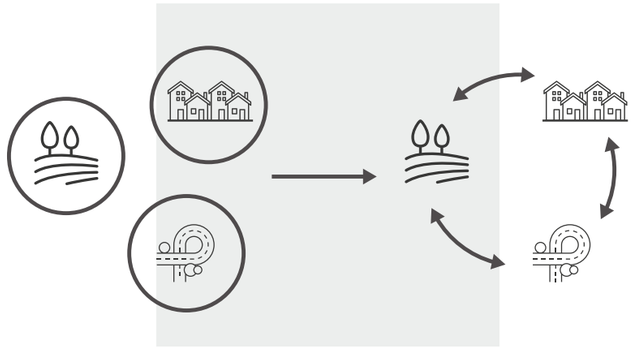
RESOURCEDRIVEN THINKING

Design principles



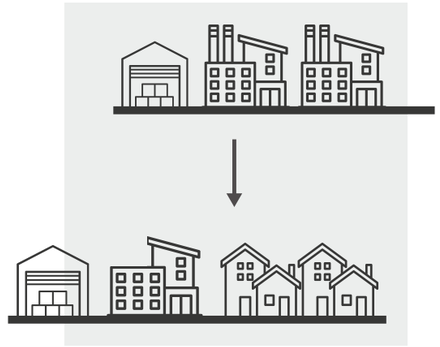
Midden-Delfland as a productive landscape

The productive cycle becomes the framework for urban growth



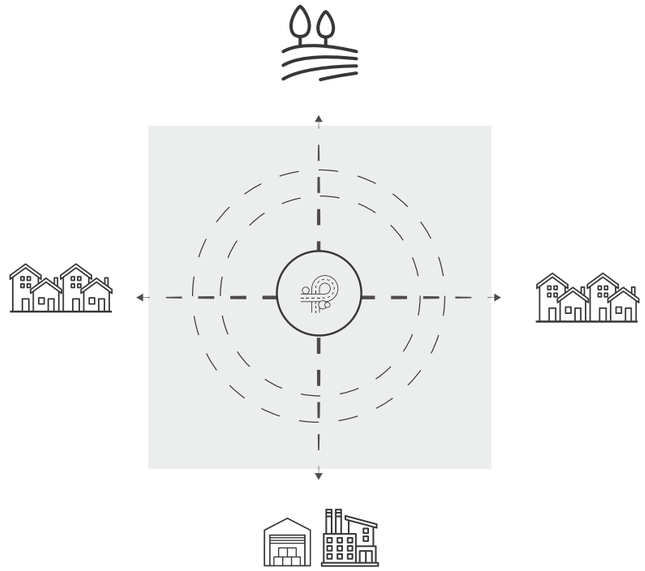
Cultivating Genius Loci

Distinct identities emerge across sub-areas, reinforcing collective dependency



Introducing urban vitality

Monofunctional areas are transformed into mixed and active environments



Infrastructure as a connecting framework

Infrastructure plays a leading role in weaving and connecting sub-areas

Figure 71.Masterplan design principles

SPATIAL FRAMEWORK

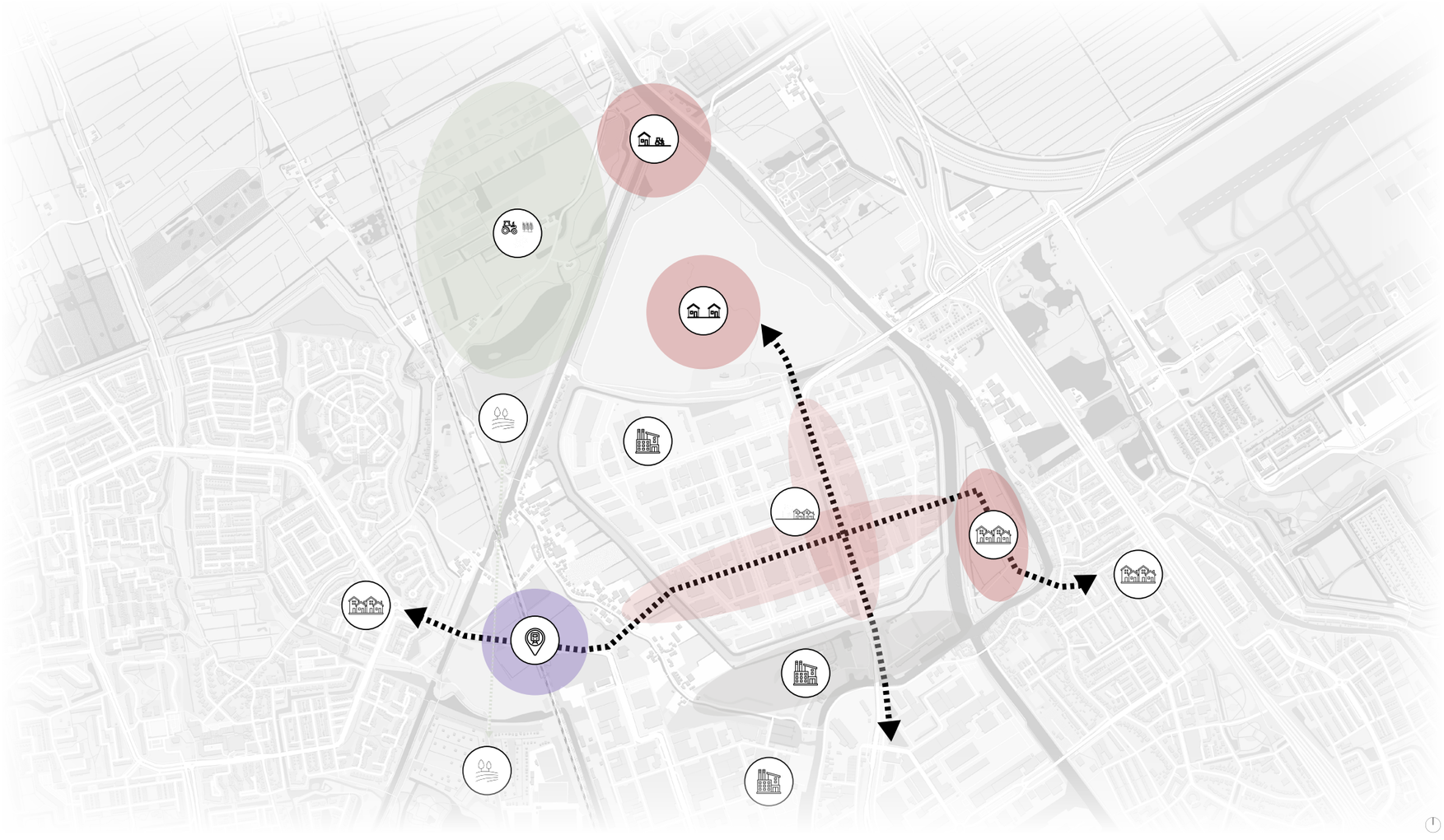


Figure 72.Spatial framework concept

A demountable building strategy makes it possible to transport a building in a limited number of parts and assemble it quickly on site. This creates flexibility in form, scale and location, without fixing the architecture permanently to one place.

Robert Kronenburg - Flexible Architecture

Maximum Occupation Scenario

106 residential buildings
1,600 dwellings
2,800 residents

Maximum Occupation Scenario

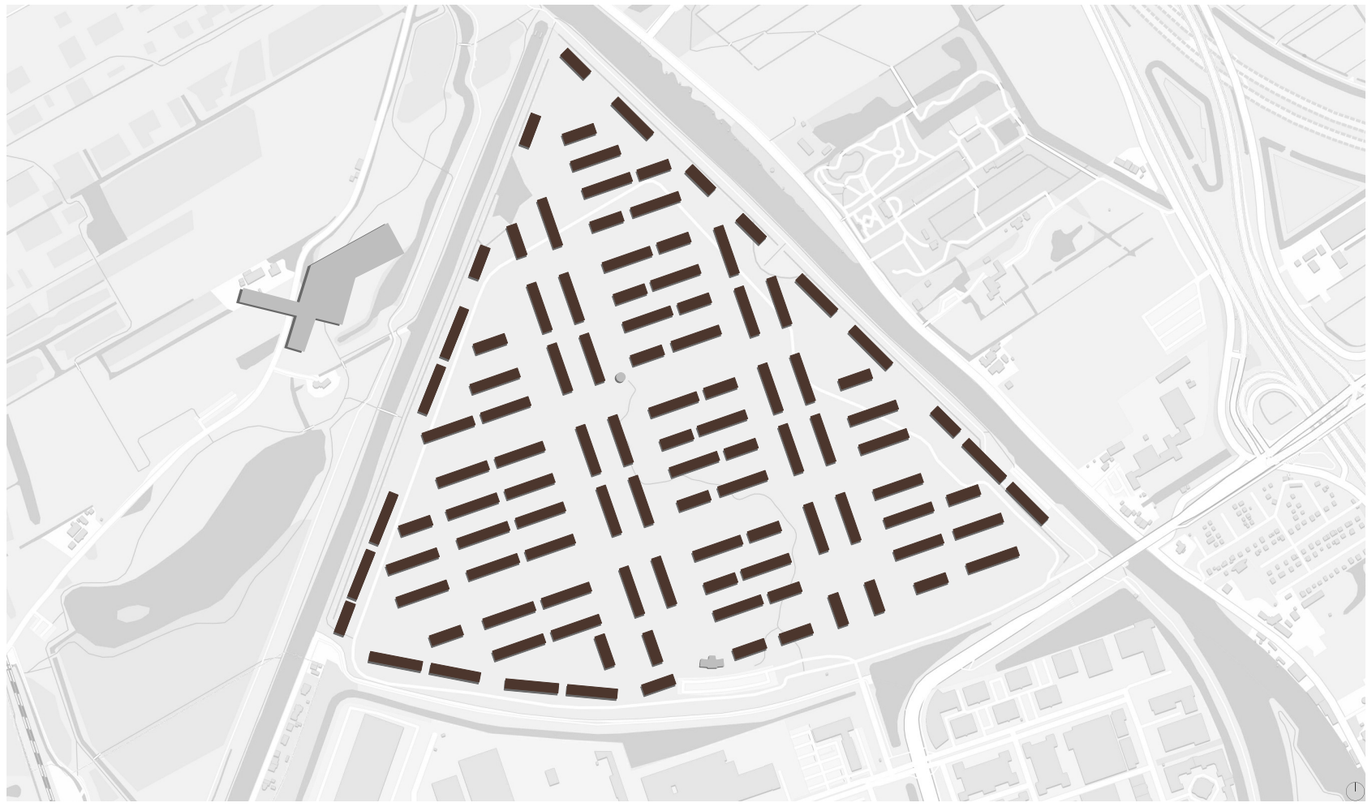


Figure 73.Maximum building capacity within the site configuration

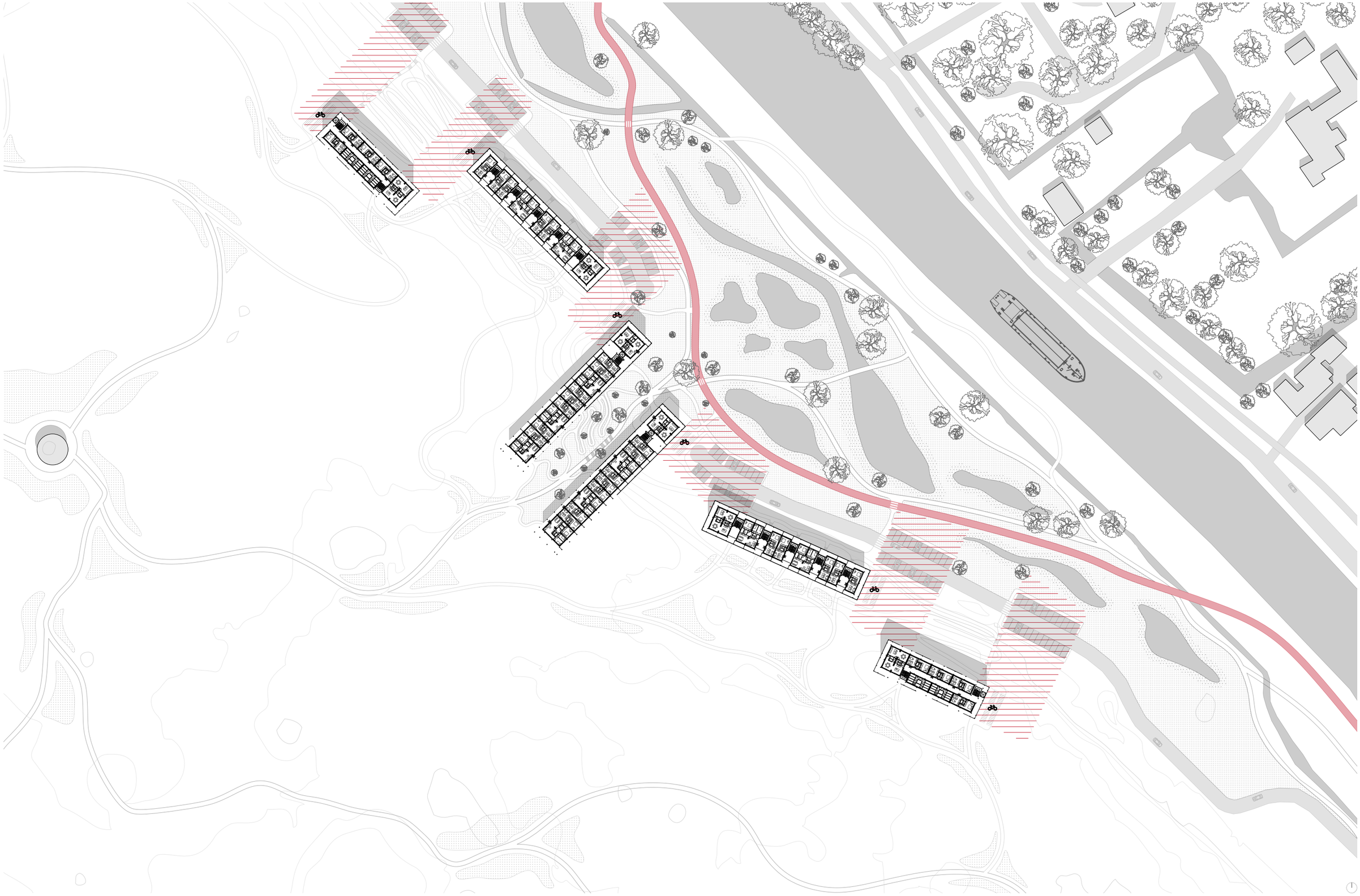
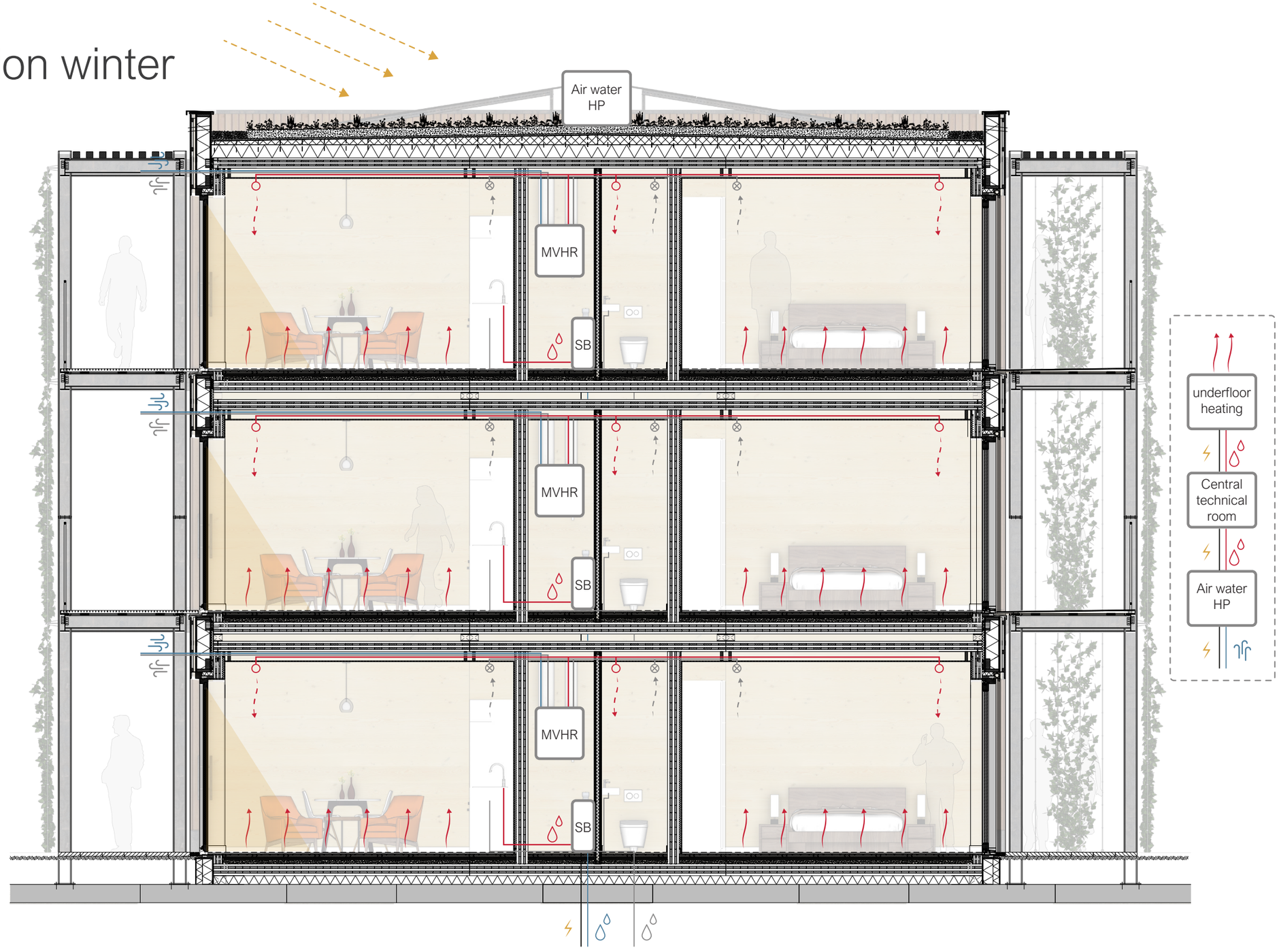


Figure 74.Parking solutions situation 1:1000 scaled

Climate section winter

- **Photovoltaic panels**
  PV panels on the roof generate renewable electricity.
- **Green roof**
  Improves the microclimate around the solar panels and supports rainwater retention.
- **Green façade**
  Reduces wind exposure and supports winter thermal comfort.
- **Central air-to-water heat pump (HP)**
  Central air-to-water heat pump for low-temperature heating
- **Type D ventilation with heat recovery (MVHR)**
  Mechanical air supply and exhaust with heat recovery
- **Winter solar**
  Large windows allow winter sun to enter the apartment, providing passive solar gain and reducing heating demand.
- **Salt boiler (SB)**
  Compact salt-based thermal battery for domestic hot water storage.
- **Underfloor heating**
  Dry Litotherm floor with integrated pipes for winter heating

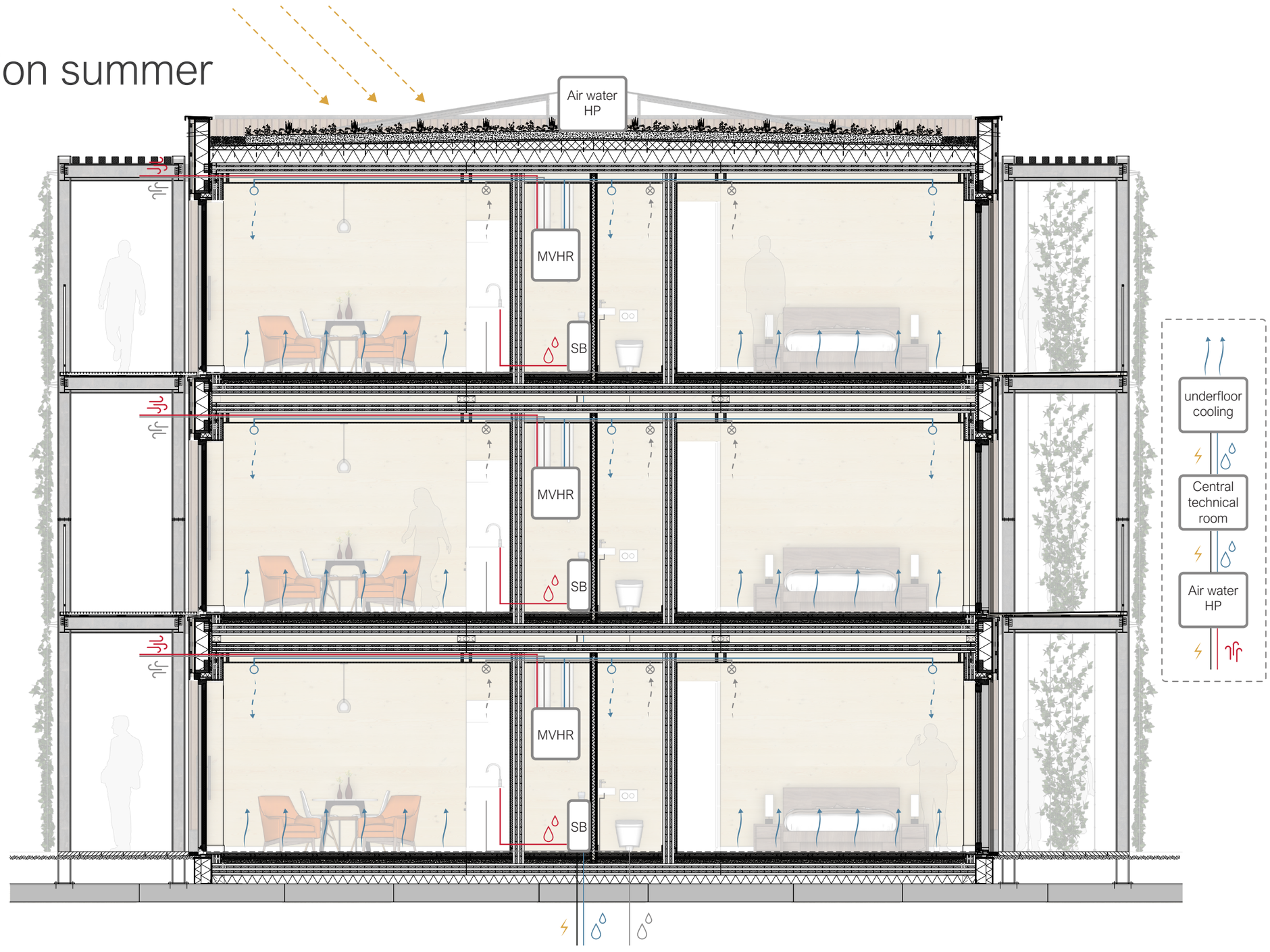


- **Service core**
  The kitchen, bathroom and technical systems are concentrated within a compact service core, allowing efficient stacking and clear installation routes.
- **Fire-rated shaft**
  The vertical service shaft is enclosed with fire-rated construction, and all service penetrations are sealed to maintain compartmentation between apartments.
- **Reversible construction**
  The building is designed as a reversible system, using timber, dry floor build-ups and demountable connections to allow future adaptation or dismantling.
- **Roof as technical layer**
  The roof combines energy generation and building services, integrating PV panels, heat pump units and maintenance access in one technical zone.
- **Low-impact foundation**
  The use of stelcon slabs minimises permanent intervention in the ground and supports the temporary character of the building system.
- **Dry floor system**
  The dry Litotherm screed contains the underfloor heating pipes without using a wet poured screed. This supports reversibility and reduces construction weight.

Figure 75.Climate section winter

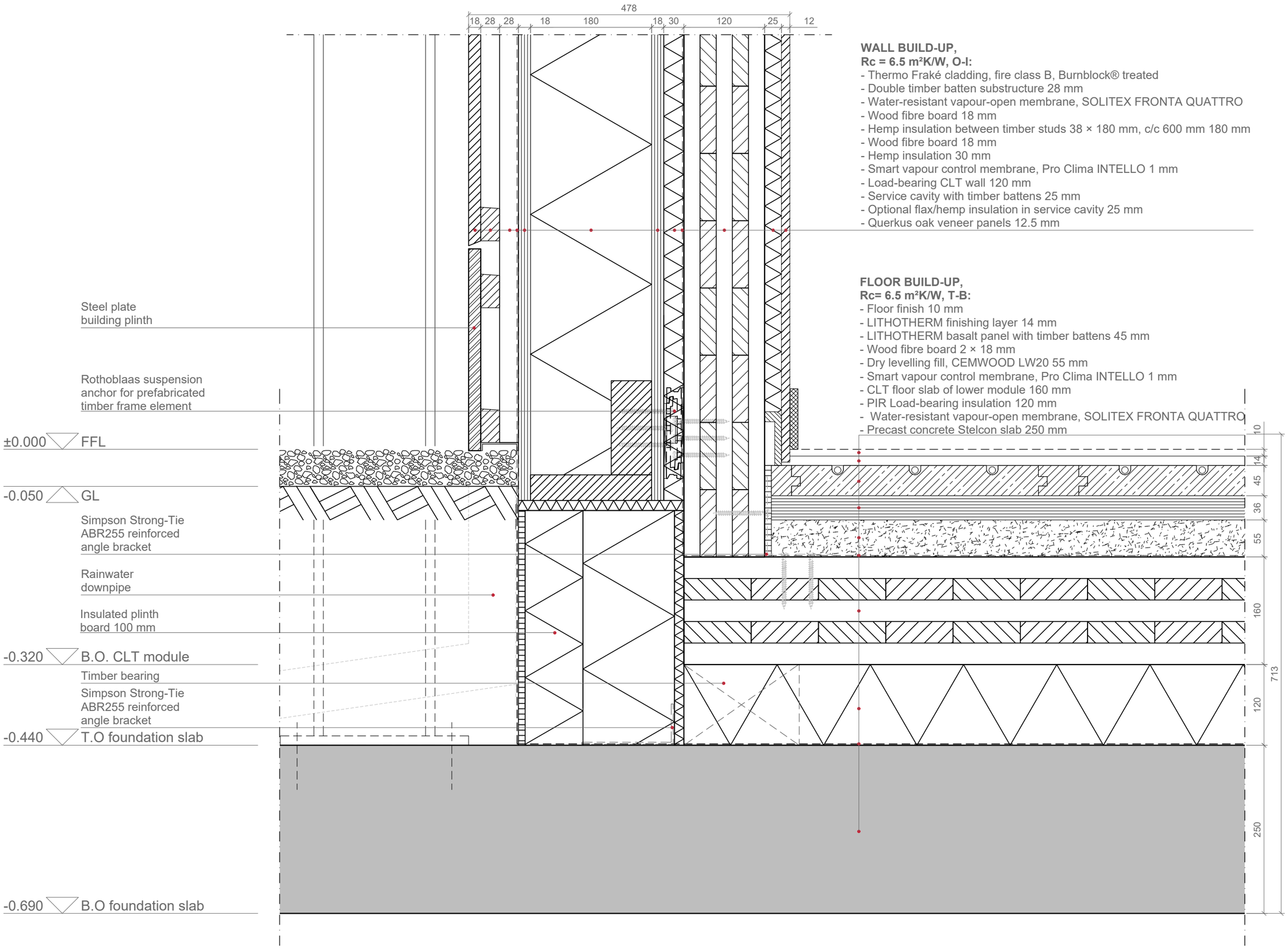
Climate section summer

- **Photovoltaic panels**
  PV panels on the roof generate renewable electricity, especially during periods of high solar radiation.
- **Green roof**
  Vegetation cools the roof surface, improves the microclimate around the solar panels and supports rainwater retention.
- **Green façade**
  Vegetation on the façade reduces heat gain, cools the building surface and supports biodiversity.
- **Central air-to-water heat pump (HP)**
  During summer, the heat pump can operate in reverse mode, it supplies cooled water to the floor system, allowing the apartments to be gently cooled.
- **Type D ventilation with heat recovery (MVHR)**
  In summer, the ventilation system can use a bypass mode. Cooler fresh air can enter the apartment without being warmed by the outgoing indoor air.
- **Solar shading**
  Integrated external screens reduce direct solar radiation before it reaches the façade. This limits overheating and improves indoor comfort during warm periods.
- **Salt boiler (SB)**
  Compact salt-based thermal battery for domestic hot water storage.
- **Underfloor cooling**
  Dry Litotherm floor with integrated pipes summer cooling.



- **Service core**
  The kitchen, bathroom and technical systems are concentrated within a compact service core, allowing efficient stacking and clear installation routes.
- **Fire-rated shaft**
  The vertical service shaft is enclosed with fire-rated construction, and all service penetrations are sealed to maintain compartmentation between apartments.
- **Reversible construction**
  The building is designed as a reversible system, using timber, dry floor build-ups and demountable connections to allow future adaptation or dismantling.
- **Roof as technical layer**
  The roof combines energy generation and building services, integrating PV panels, heat pump units and maintenance access in one technical zone.
- **Low-impact foundation**
  The use of stelcon slabs minimises permanent intervention in the ground and supports the temporary character of the building system.
- **Dry floor system**
  The dry Litotherm screed contains the underfloor heating pipes without using a wet poured screed. This supports reversibility and reduces construction weight.

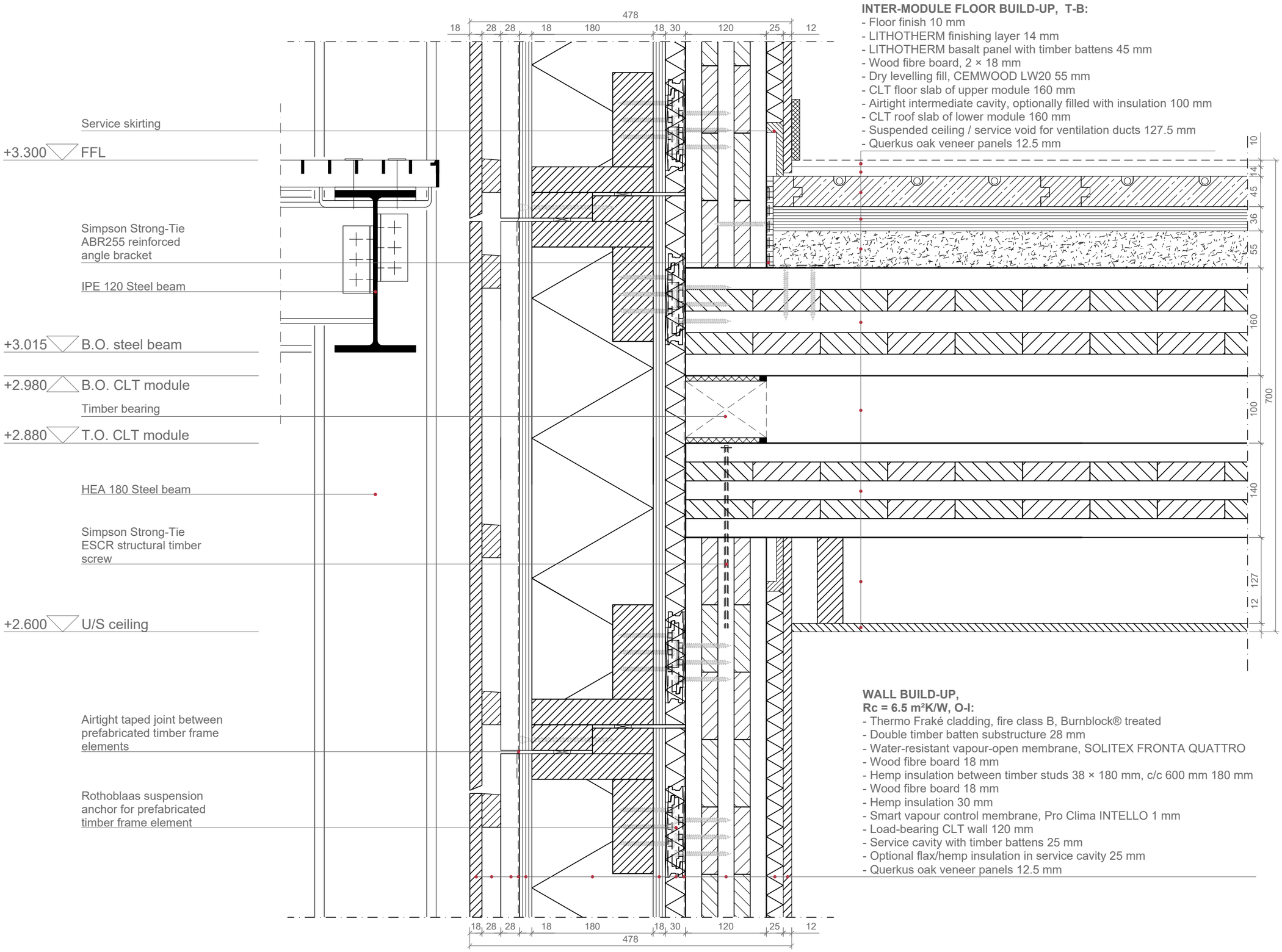
Figure 76.Climate section summer



WALL BUILD-UP,
Rc = 6.5 m²K/W, O-I:
- Thermo Fraké cladding, fire class B, Burnblock® treated
- Double timber batten substructure 28 mm
- Water-resistant vapour-open membrane, SOLITEX FRONTA QUATTRO
- Wood fibre board 18 mm
- Hemp insulation between timber studs 38 × 180 mm, c/c 600 mm 180 mm
- Wood fibre board 18 mm
- Hemp insulation 30 mm
- Smart vapour control membrane, Pro Clima INTELLO 1 mm
- Load-bearing CLT wall 120 mm
- Service cavity with timber battens 25 mm
- Optional flax/hemp insulation in service cavity 25 mm
- Querkus oak veneer panels 12.5 mm

FLOOR BUILD-UP,
Rc= 6.5 m²K/W, T-B:
- Floor finish 10 mm
- LITHOTHERM finishing layer 14 mm
- LITHOTHERM basalt panel with timber battens 45 mm
- Wood fibre board 2 × 18 mm
- Dry levelling fill, CEMWOOD LW20 55 mm
- Smart vapour control membrane, Pro Clima INTELLO 1 mm
- CLT floor slab of lower module 160 mm
- PIR Load-bearing insulation 120 mm
- Water-resistant vapour-open membrane, SOLITEX FRONTA QUATTRO
- Precast concrete Stelcon slab 250 mm

Figure 77.Ground floor detail 1:5 scaled 90%



INTER-MODULE FLOOR BUILD-UP, T-B:
- Floor finish 10 mm
- LITHOTHERM finishing layer 14 mm
- LITHOTHERM basalt panel with timber battens 45 mm
- Wood fibre board, 2 × 18 mm
- Dry levelling fill, CEMWOOD LW20 55 mm
- CLT floor slab of upper module 160 mm
- Airtight intermediate cavity, optionally filled with insulation 100 mm
- CLT roof slab of lower module 160 mm
- Suspended ceiling / service void for ventilation ducts 127.5 mm
- Querkus oak veneer panels 12.5 mm

WALL BUILD-UP,
Rc = 6.5 m²K/W, O-I:
- Thermo Fraké cladding, fire class B, Burnblock® treated
- Double timber batten substructure 28 mm
- Water-resistant vapour-open membrane, SOLITEX FRONTA QUATTRO
- Wood fibre board 18 mm
- Hemp insulation between timber studs 38 × 180 mm, c/c 600 mm 180 mm
- Wood fibre board 18 mm
- Hemp insulation 30 mm
- Smart vapour control membrane, Pro Clima INTELLO 1 mm
- Load-bearing CLT wall 120 mm
- Service cavity with timber battens 25 mm
- Optional flax/hemp insulation in service cavity 25 mm
- Querkus oak veneer panels 12.5 mm

Figure 78.Module-to-Module Connection 1:5 detail scaled 90%

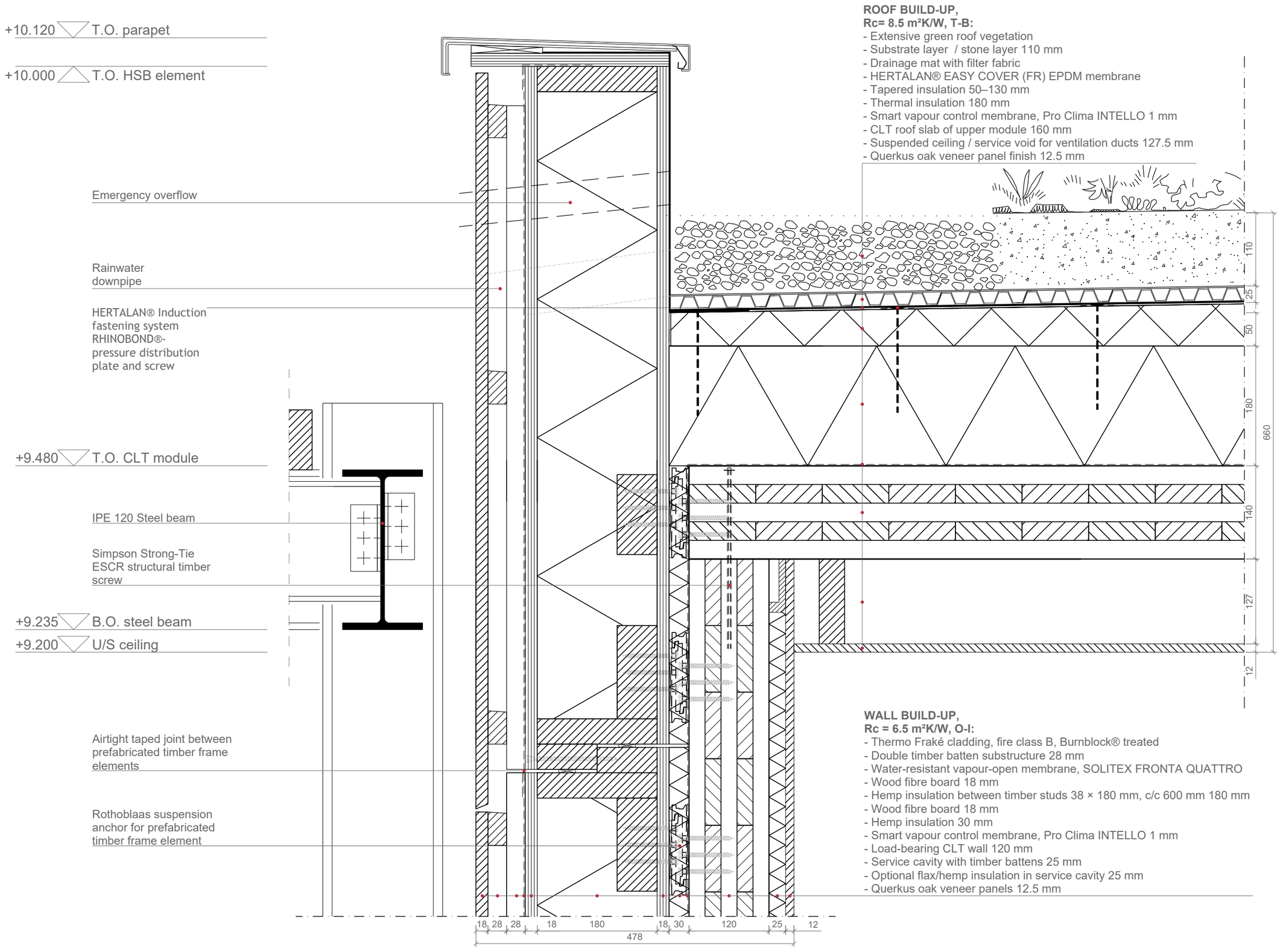


Figure 79.Roof detail 1:5 scaled 90%

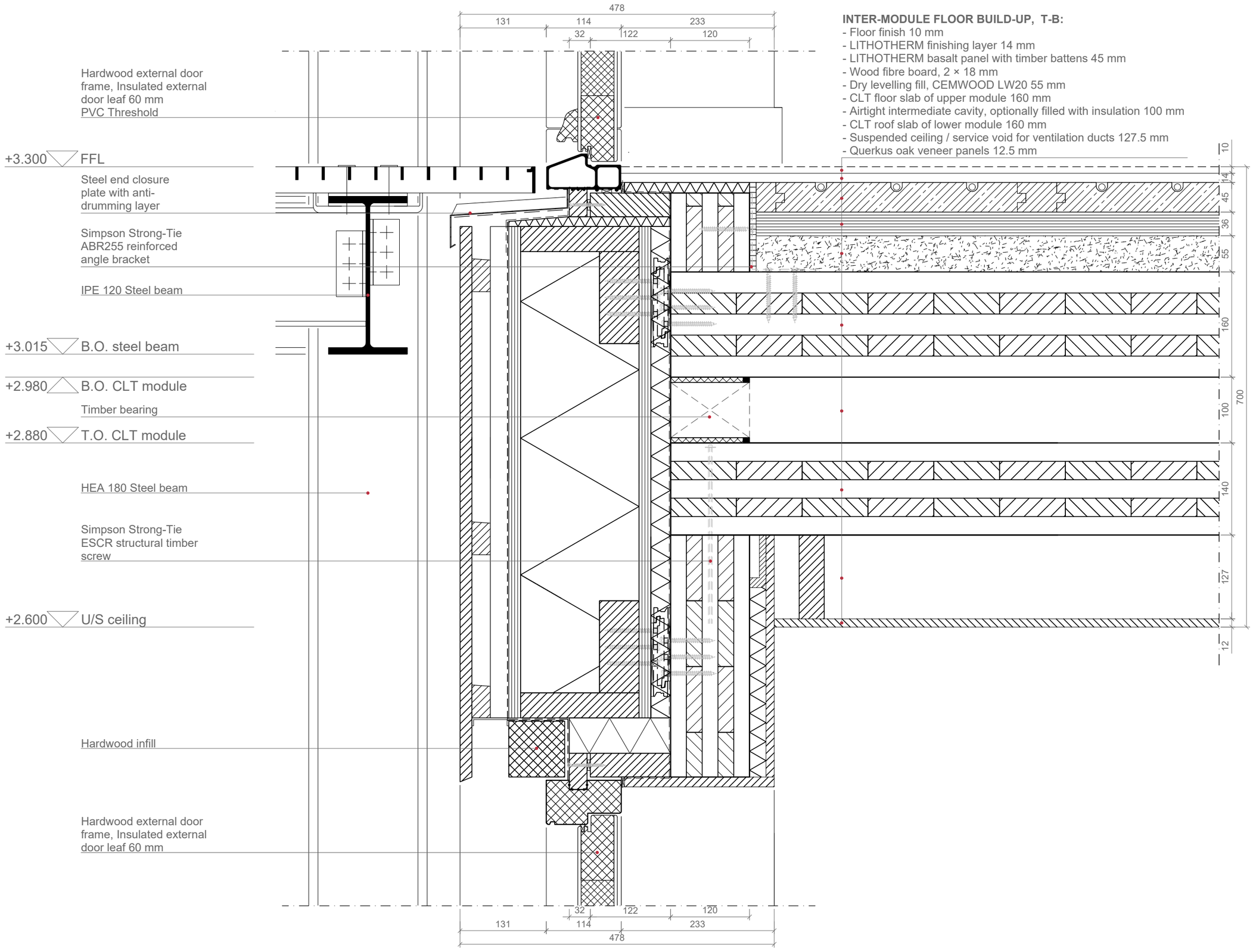
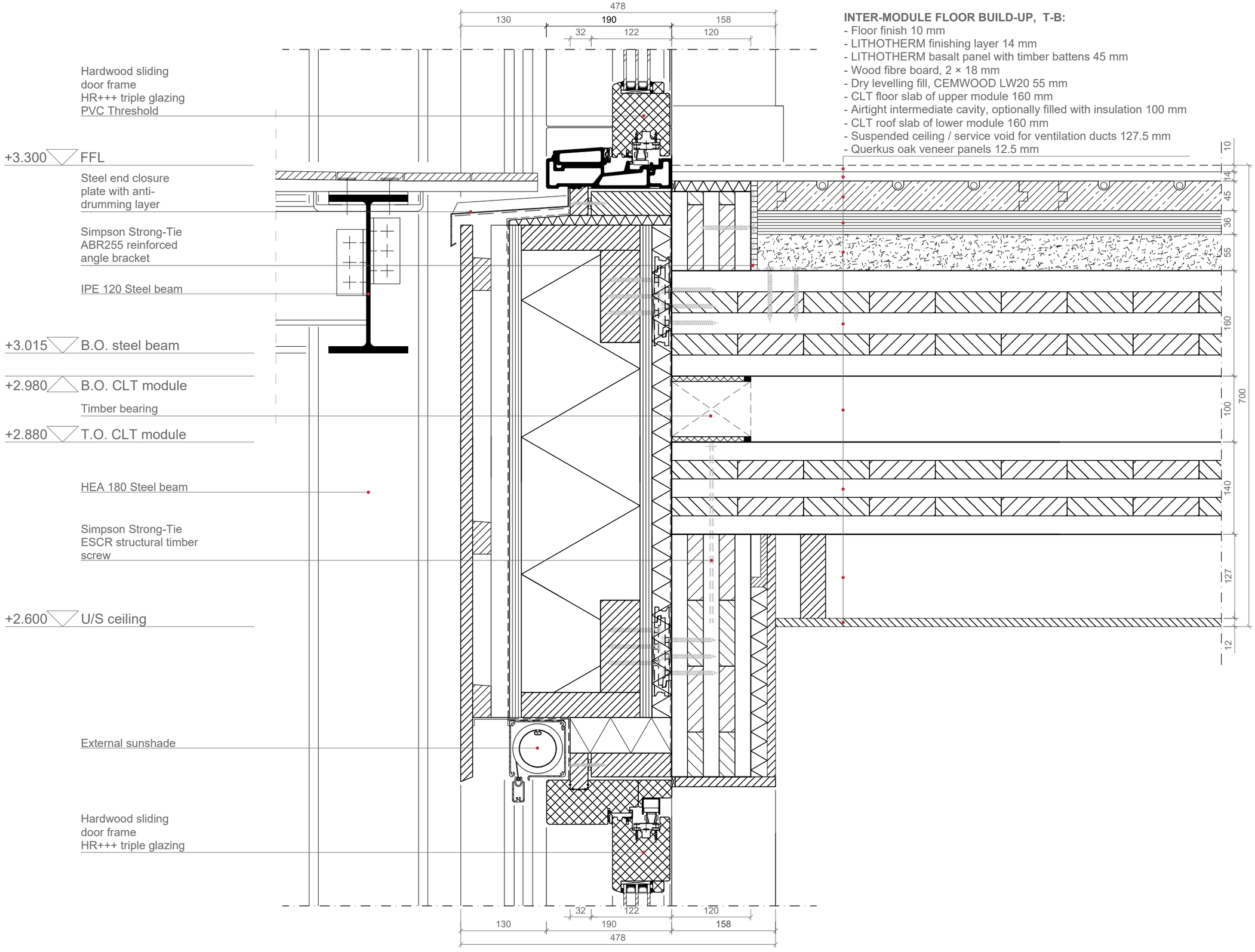
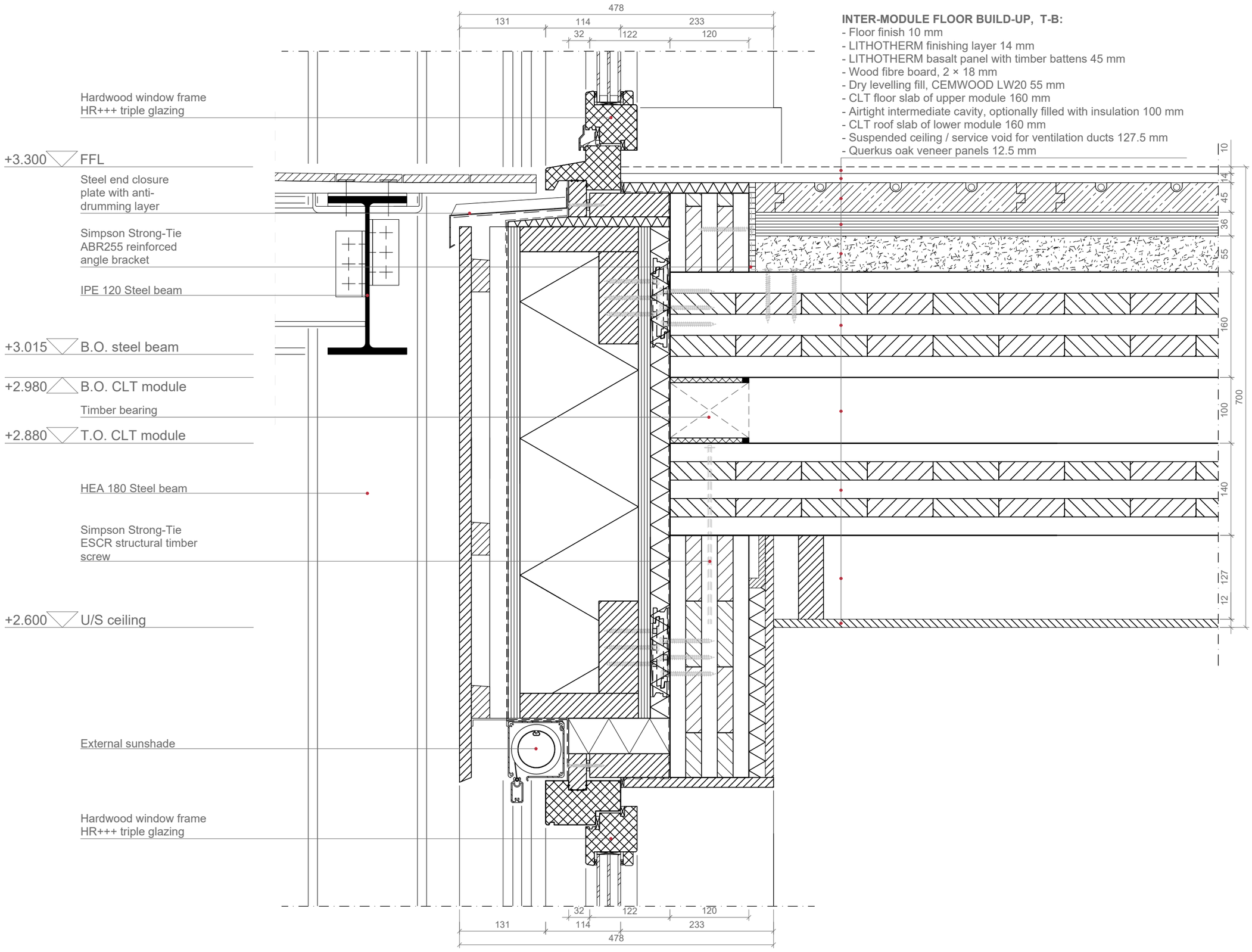


Figure 80.Entrance door detail 1:5 scaled 90%



INTER-MODULE FLOOR BUILD-UP, T-B:
- Floor finish 10 mm
- LITHOTHERM finishing layer 14 mm
- LITHOTHERM basalt panel with timber battens 45 mm
- Wood fibre board, 2 × 18 mm
- Dry levelling fill, CEMWOOD LW20 55 mm
- CLT floor slab of upper module 160 mm
- Airtight intermediate cavity, optionally filled with insulation 100 mm
- CLT roof slab of lower module 160 mm
- Suspended ceiling / service void for ventilation ducts 127.5 mm
- Querkus oak veneer panels 12.5 mm

Figure 81.Sliding door detail 1:5 scaled 90%



INTER-MODULE FLOOR BUILD-UP, T-B:
- Floor finish 10 mm
- LITHOTHERM finishing layer 14 mm
- LITHOTHERM basalt panel with timber battens 45 mm
- Wood fibre board, 2 × 18 mm
- Dry levelling fill, CEMWOOD LW20 55 mm
- CLT floor slab of upper module 160 mm
- Airtight intermediate cavity, optionally filled with insulation 100 mm
- CLT roof slab of lower module 160 mm
- Suspended ceiling / service void for ventilation ducts 127.5 mm
- Querkus oak veneer panels 12.5 mm

Figure 82.Window detail 1:5 scaled 90%

Section



Figure 83.Section 1:32 scaled