undisplacement

replacing houses not communities

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Master Thesis “undisplacement”
MSc. Architecture
The Faculty of Architecture and the Build Environment
Delft University of Technology
In collaboration with de Veldacademie

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master plan concept
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urban plan concept
site plan concept
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development

displacement - definition

Displacement is the forced removal of people from their homes and communities, whether by rapid catastrophes like wars and natural disasters or by gradual pressures like gentrification and urban renewal.

The result is a profound erasure of a neighborhood's identity and the fragmentation of the community that once defined it.

displaced







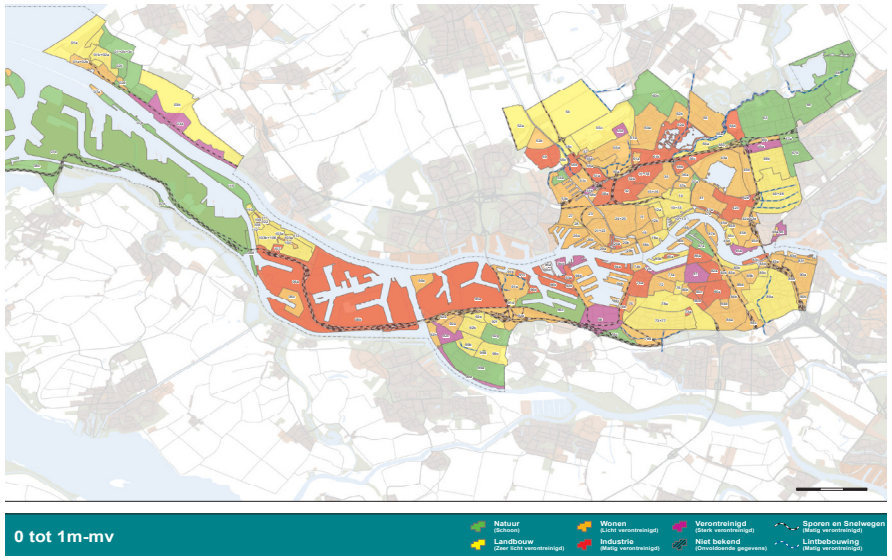


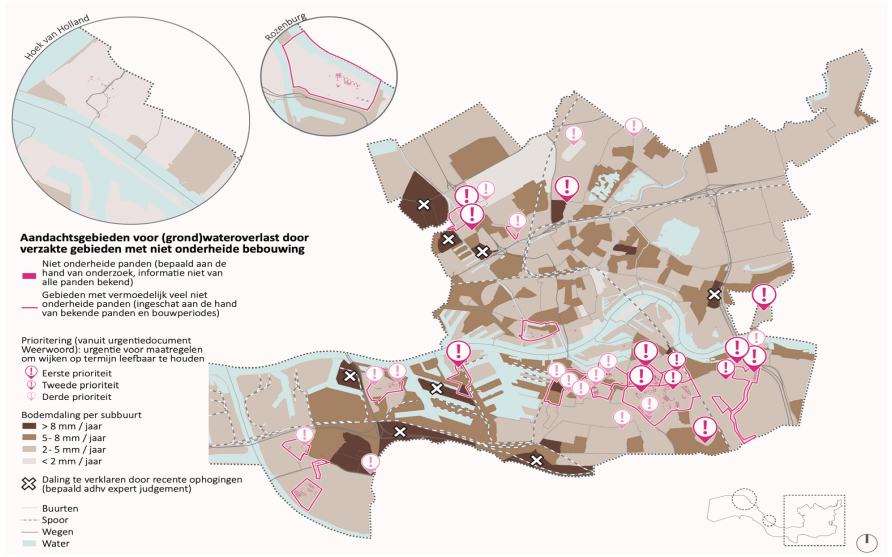
tweebosbuurt



soil




0 tot 1m-mv
Natuur
(Schoon)
Landbouw
(Zeer licht verontreinigd)
Wonen
(Licht verontreinigd)
Industrie
(Matig verontreinigd)
Verontreinigd
(Sterk verontreinigd)
Niet bekend
(Onvoldoende gegevens)
Sporen en Snelwegen
(Matig verontreinigd)
Lintbebouwing
(Matig verontreinigd)

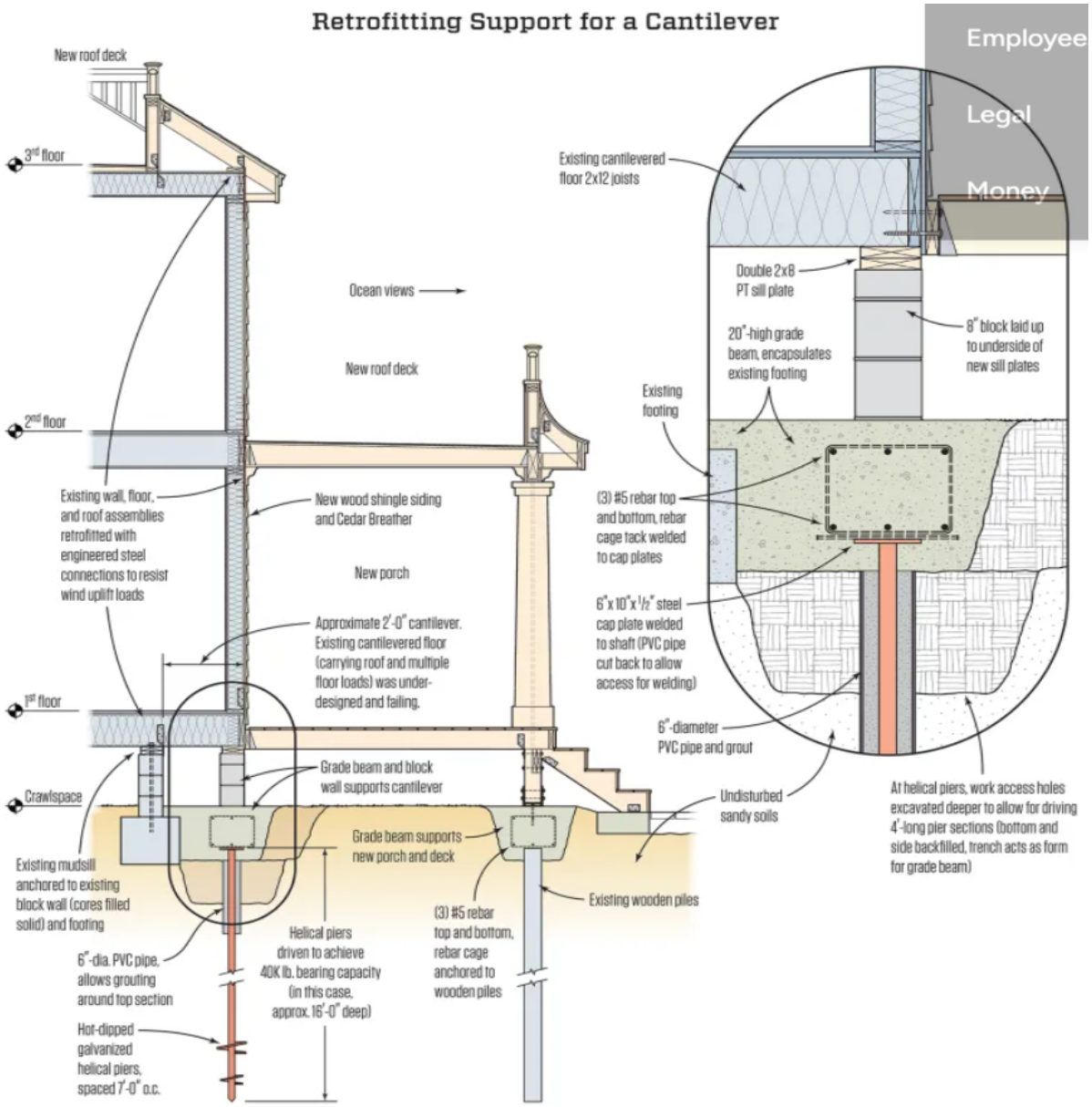

Hoek van Holland
Rozenburg
Aandachtsgebieden voor (grond)wateroverlast door verzakte gebieden met niet onderheide bebouwing
Niet onderheide panden (bepaald aan de hand van onderzoek, informatie niet van alle panden bekend)
Gebieden met vermoedelijk veel niet onderheide panden (ingeschat aan de hand van bekende panden en bouwperiodes)
Prioritering (vanuit urgentiedocument Weerwoord): urgentie voor maatregelen om wijken op termijn leefbaar te houden
Eerste prioriteit
Tweede prioriteit
Derde prioriteit
Bodemdaling per subbuurt
> 8 mm / jaar
5 - 8 mm / jaar
2 - 5 mm / jaar
< 2 mm / jaar
Daling te verklaren door recente ophogingen (bepaald adhv expert judgement)
Buurten
Spoor
Wegen
Water

cracks





retrofitting









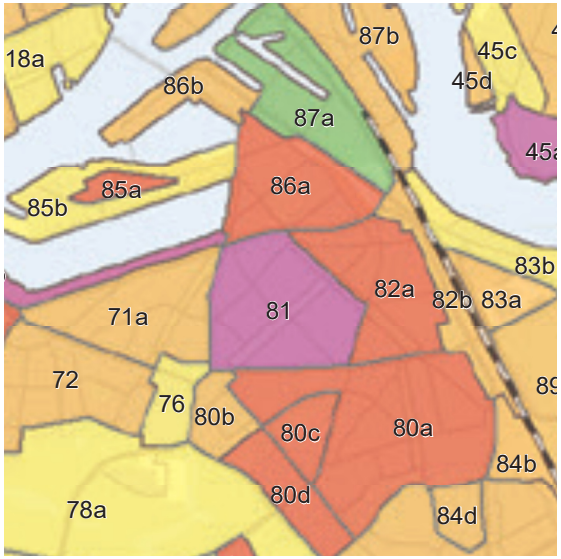


neighbourhood

bloemhof


A16
Oude Noorden
Bilderp
Oud-Crooswijk
Agniese-buurt
Provenierswijk
Rubroek
Kralingse Bos
C.S.Kwartier
Kralingen-West
Stadsdriehoek
Kralingen-Oost
Struisen-burg
Nieuwe Westen
Middel-land
Oude Westen
Cool
Rivium
Dijkzigt
Noordereiland
Feijenoord
de Esch
Nieuwe Werk
Delfshaven
Kop van Zuid
Kop van Zuid-Entrepot
Schiemond
Katendrecht
Afrikaanderwijk
Hillesluis
Tarwewijk
Bloemhof
Oud-Charlois
Carnisse
Zuid-plein
Vreewijk
Wiele-waal
Zuiderpark
Lombardijen




18a
87b
45c
45d
86b
87a
85a
86a
85b
83b
82a
82b
83a
71a
81
72
76
80b
80c
80a
84b
80d
78a
84d

press

TAGS: Feijenoord Trending Architectuur Artikel — 11 oktober 2023 16:41

In Rotterdam-Zuid in de wijk Bloemhof verdwijnen duizenden woningen langzaam onder straatniveau. In de afgelopen honderd jaar zijn huizen al 80 centimeter gezakt en het einde is nog niet in zicht. De gevolgen zijn merkbaar: scheve huizen, scheve vloeren, scheve stoepen, scheuren in gevels. Ook stank en schimmel in woningen, en wateroverlast bij hevige regen. De gemeente Rotterdam waarschuwt dat ingrijpen noodzakelijk is, alleen is nog onduidelijk hoe deze megaklus te klaren.

Bewoners die uit verzakkende wijk willen verhuizen zien de bui al hangen: 'Google maar eens op onze wijk'

Verrast, ongerust en sceptisch. Honderden woningeigenaren in de Rotterdamse wijk Bloemhof maken zich - na een alarmerende brief van de gemeente - grote zorgen over hun huizen. 'Ik maak er een paleisje van, maar hoe moet het nu verder?'

Marjolein Kooyman 14-10-23, 12:04

TAGS: Feijenoord Samenleving Wooncrisis Artikel — 19 juni 2024 17:05

De bewoners van Bloemhof willen niet akkoord gaan met de aangekondigde huurverhoging van 5,5%. Dit komt door achterstallig onderhoud en het verzakken van de woningen. Zij hebben daarom bezwaren ingediend, maar deze heeft Woonstad afgewezen. Door een miscommunicatie lijkt een deel van de mails niet aangekomen te zijn bij de desbetreffende bewoners. Daarom geeft de wooncorporatie hen twee weken extra tijd om hun bezwaar in te trekken.

Wijk met 15.000 bewoners verzakt in hoog tempo: huizen liggen nu al 80 centimeter lager

De Rotterdamse wijk Bloemhof verzakt. En niet zo'n beetje ook. Een ernstig probleem, en makkelijke oplossingen zijn er niet. 'We komen nu op een kritiek punt.'

Peter Groenendijk 10-10-23, 18:01 Laatste update: 10-10-23, 18:20

Duizenden huizen in de wijk Bloemhof zakken weg

Tech & Innovatie • 5 mei '24 10:00 • Aangepast op 5 mei '24 22:58

'Schandalig dat ze olie boren onder 70.000 Rotterdamse huizen'

Auteur: Thijs Baas

Het is schandalig dat er olie wordt geboord onder een stad als Rotterdam, in de bodem onder zeker 70.000 woningen. Dat zegt geoloog en journalist Sam Gerrits in de podcast Rotterdam in de Olie van BNR. 'Ben je wel lékker? Dat kan gewoon echt niet, ik vind het allemaal ontzettend onveilig.'

TAGS: Feijenoord Trending Wooncrisis Artikel — 26 oktober 2023 14:13

Niet alleen woningen zijn aan het wegzakken door de bodemdaling in Bloemhof, ook het riool is verzakt. Het rioleringsstelsel, dat elke 50 jaar moet worden vervangen, kan daardoor niet op de normale manier worden aangepakt. De kosten voor eventuele oplossingen, zoals het (opnieuw) funderen of omhoog brengen van verzakte woningen, zijn voor de woningeigenaren.

TAGS: Feijenoord Trending Architectuur Artikel — 11 oktober 2023 16:41

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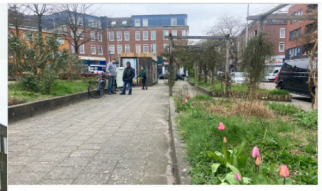



www.rijnmondnieuws.com

'TRAGE REACTIE GEMEENTE ROTTERDAM OP BODEMDALING BLOEMHOF' - Waterweg-Actueel

ROTTERDAM- De wijkraad van Bloemhof heeft opnieuw haar zorgen geuit over de aanpak van bodemdaling in de gemeente Rotterdam. In een brief

Bewoners die uit verzakkende wijk willen verhuizen zien de bui al hangen: 'Google maar eens op onze wijk'

Verrast, ongerust en sceptisch. Honderden woningeigenaren in de Rotterdamse wijk Bloemhof maken zich - na een alarmerende brief van de gemeente - grote zorgen over hun huizen. 'Ik maak er een paleisje van, maar hoe moet het nu verder?'

Marjolein Kooyman 14-10-23, 12:04



dagblad010.nl

Bloemhof heeft te maken met verzakkende bodem

Een deel van Bloemhof heeft te maken met grote verzakkingen, omdat de deels meer dan 100 jaar oude woningen niet onderheid zijn. De grootste problemen zijn in Bloemhof-Zuid, het gebied tussen Lange Hi

drimble

drimble.nl

Geen geld om woningen in slechte staat in Rotterdam-Zuid op te knappen: `Dat kan toch niet?`

Geen geld van het Rijk voor het aanpakken van woningen in Rotterdam-Zuid. Gemeenteraadsleden Diederik van Dommelen (VVD) en Co Engberts (PvdA) zijn ziedend. „Klap in het gezicht van modale Rotterdammers."‥ (2024-12-09 08:23:16)



Wijk met 15.000 bewoners verzakt in hoog tempo: huizen liggen nu al 80 centimeter lager

De Rotterdamse wijk Bloemhof verzakt. En niet zo'n beetje ook. Een ernstig probleem, en makkelijke oplossingen zijn er niet. 'We komen nu op een kritiek punt.'

Peter Groenendijk 10-10-23, 18:01 Laatste update: 10-10-23, 18:20



nos.nl

In de Rotterdamse wijk Bloemhof zakken duizenden woningen weg in de bodem

In Rotterdam-Zuid in de wijk Bloemhof verdwijnen duizenden woningen langzaam onder straatniveau. In de afgelopen honderd jaar zijn huizen al 80 centimeter gezakt en het einde is nog niet in zicht.



www.dehavenloods.nl

Vrijwel de hele wijk Bloemhof is verzakt, de huizen zakken langzaam de grond in

Rotterdam - De wijk Bloemhof zakt langzaam, maar heel zeker, de grond in. Onherroepelijk. En daar zijn géén eenvoudige oplossingen voor. Alleen maar een heel dure oplossingen. En het gaat om duizenden woningen.



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In de Rotterdamse wijk Bloemhof zakken duizenden woningen weg in de bodem

In Rotterdam-Zuid in de wijk Bloemhof verdwijnen duizenden woningen langzaam onder straatniveau. In de afgelopen honderd jaar zijn huizen al 80 centimeter gezakt en het einde is nog niet in zicht. De gevolgen zijn merkbaar: scheve huizen, scheve vloeren



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ROTTERDAM- De wijkraad van Bloemhof heeft opnieuw haar zorgen geuit over de aanpak van bodemdaling in de gemeente Rotterdam. In een brief burgemeester en wethouders herinnerde de wijkraad aan een...



www.dehavenloods.nl

Oké, de huizen in Bloemhof zakken dus langzaam de grond in, maar wat nu?

Rotterdam - Duizenden woningen in Bloemhof zakken de grond in. Vrijwel alle huizen in de wijk. Wat nu? Dat is nog onduidelijk. Maar iedereen snapt dat er geen simpele oplossingen zijn. En dat er wél iets moet gebeuren.



www.rijnmond.nl

Huurverhoging 'van de zotte', huurders willen niet meer betalen voor steeds slechtere huizen

Tocht. 's Winters koud. Kapotte ventilatie. Scheuren in plafonds en muren. Scheve vloeren. Huurders in Rotterdam-Bloemhof sommen een waslijst aan gebreken op en vinden dat die steeds met lapmiddeltjes worden opgelost. Ze vinden de aangekondigde huurverh...

foundation





weak soil





sinking







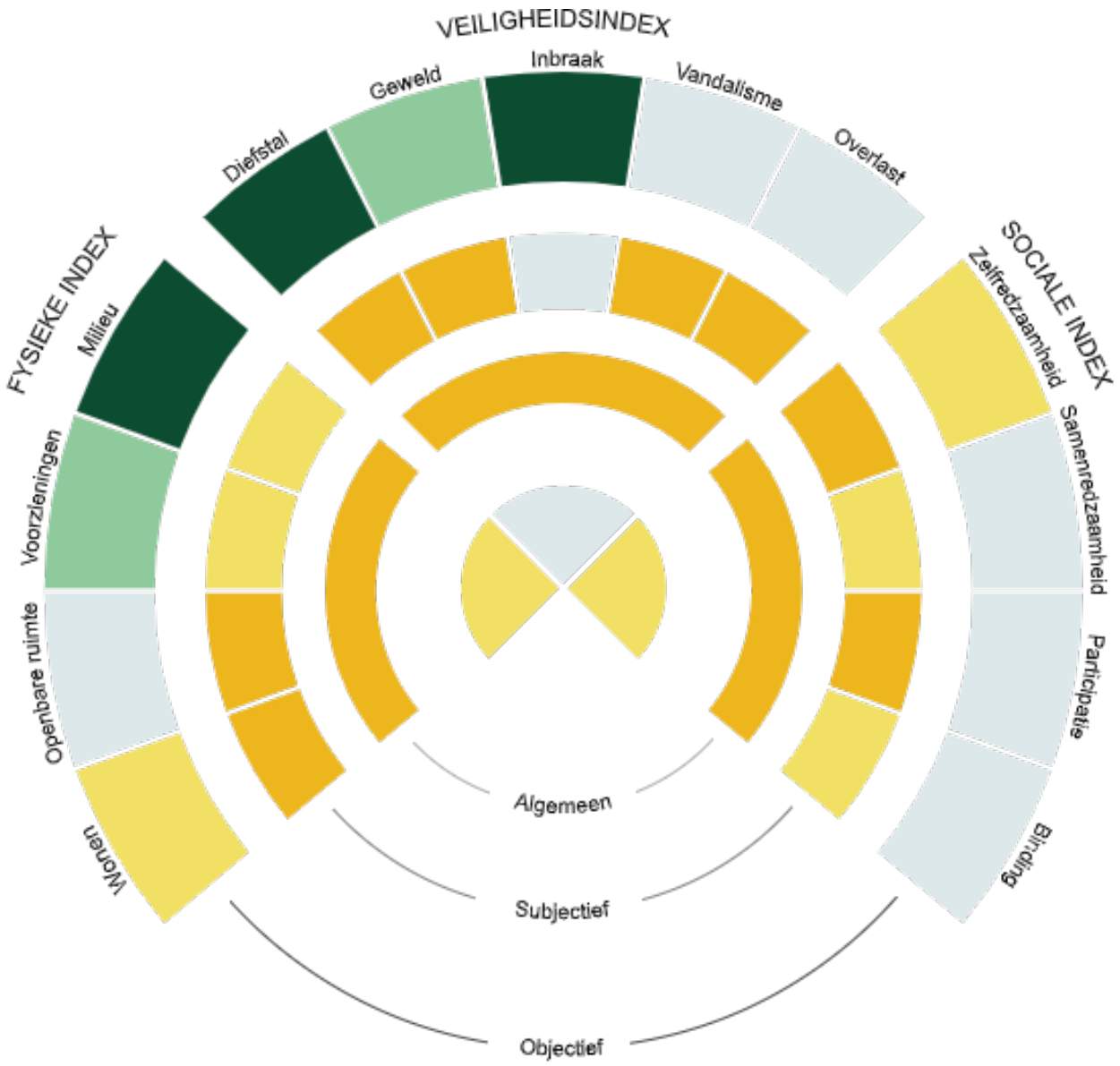


issues



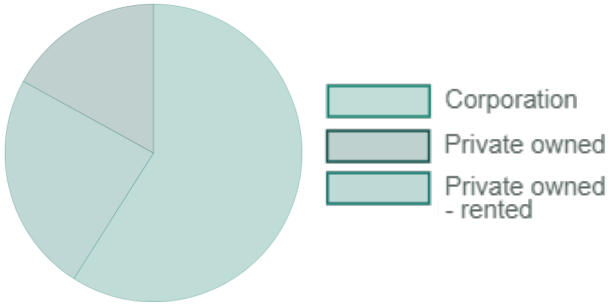

problem z
narkotykami ?
możemy pomóc !
Anonimowi Narkomani (NA) są
bezdochodową wspólnotą mężczyzn i
kobiet, dla których narkotyki stały się
głównym problemem.
Jesteśmy zdrowiejącymi uzależnionymi,
którzy spotykają się regularnie, aby
pomagać sobie nawzajem w pozostaniu
czystymi.
Nie interesuje nas, jakie narkotyki i jak
dużo ich zażywałeś, tylko co zamierzasz
zrobić ze swoim problemem i jak my
możemy Ci w tym pomóc.
Uczestnictwo w NA nie powoduje
żadnych dodatkowych zobowiązań.
Nie jesteśmy zależni od innych
organizacji, nie mamy opłat wpisowych
ani członkowskich, nie musimy
podpisywać żadnych deklaracji, ani
nikomu niczego obiecywać.
Nie jesteśmy związani z żadnymi
organizacjami politycznymi, religijnymi,
z organami ścigania, nie podlegamy
niczyjej kontroli.
Dołączyć do nas może każdy,
bez względu na wiek, rasę, orientację
seksualną, przynależność religijną
lub jej brak.
Jedynym warunkiem przynależności jest
pragnienie zaprzestania zażywania
www.anonimowinarkomani.org
najbliższy mityng
anonimowych narkomanów znajdziesz:
W KAŻDY WTOREK O GODZ. 19:30
ADRES:
OSOBY KONTAKTOWE:

safety index

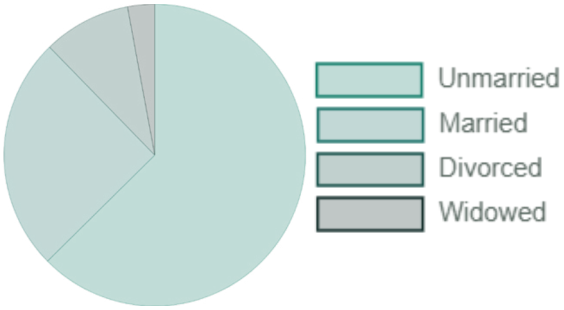


data

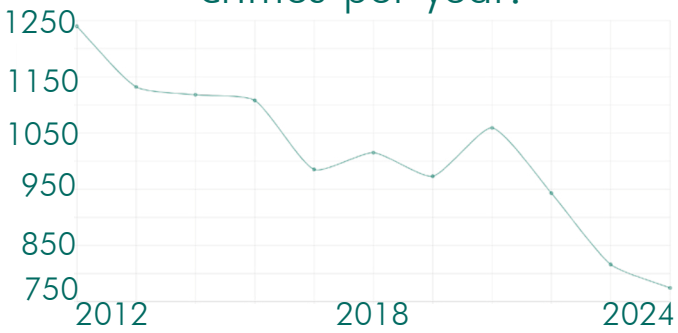
housing ownership:



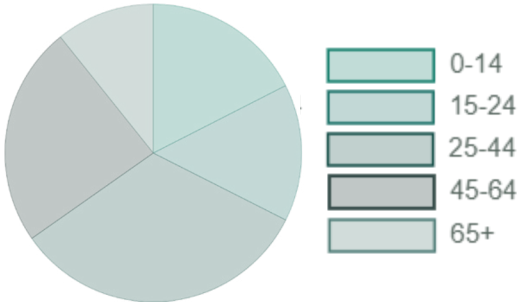
marital status:



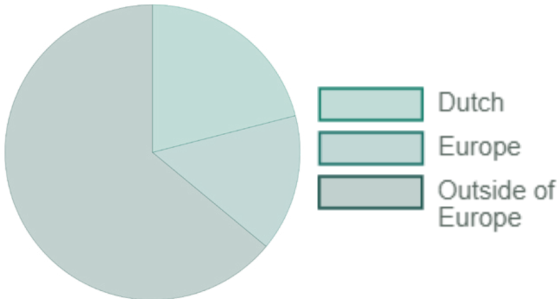
number of registered crimes per year:



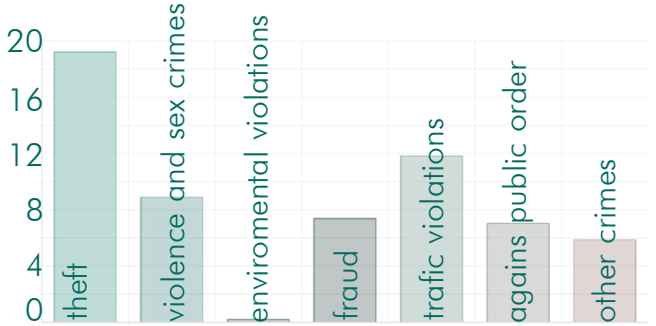
demographic composition:



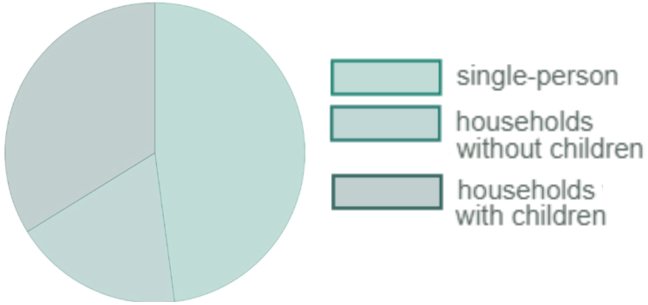
ethnic background:



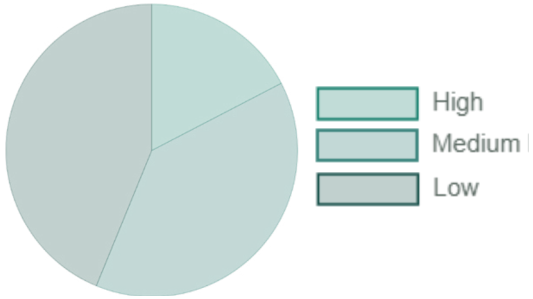
type of crimes per 1,000 inhabitants in Bloemhof in 2024:



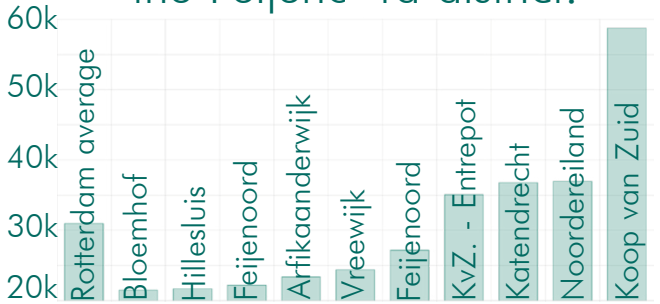
composition of households:



education background:

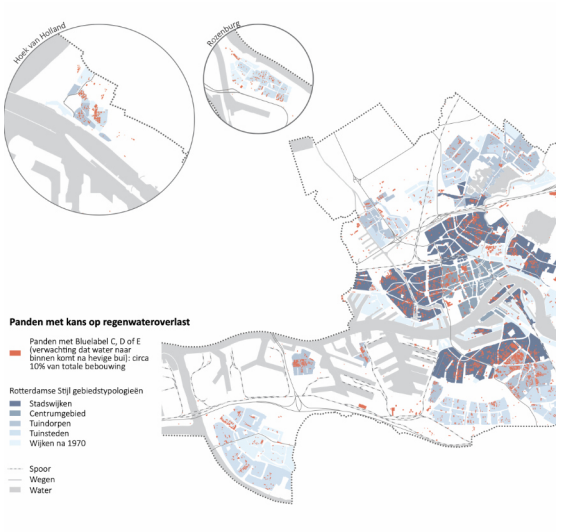


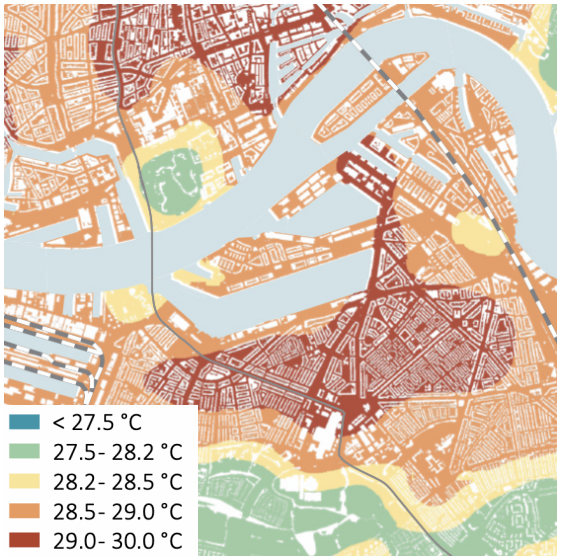
average income per year in the Feijenoord district:



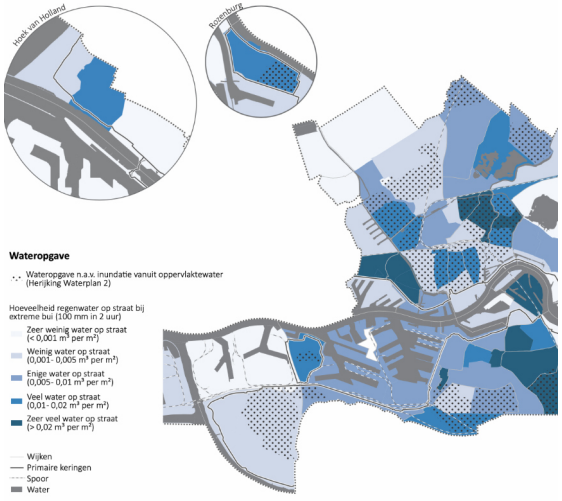
heat and water

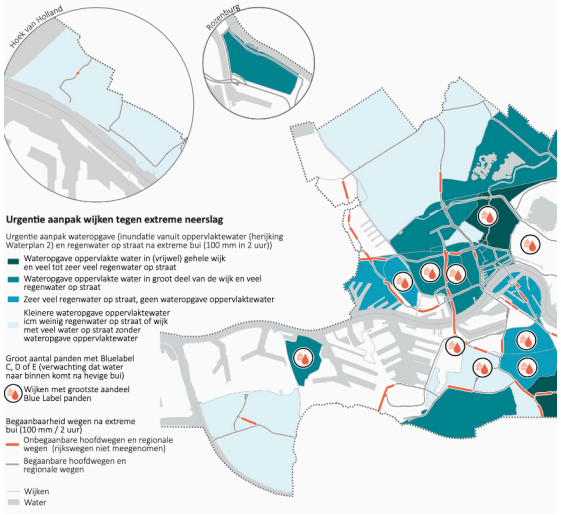




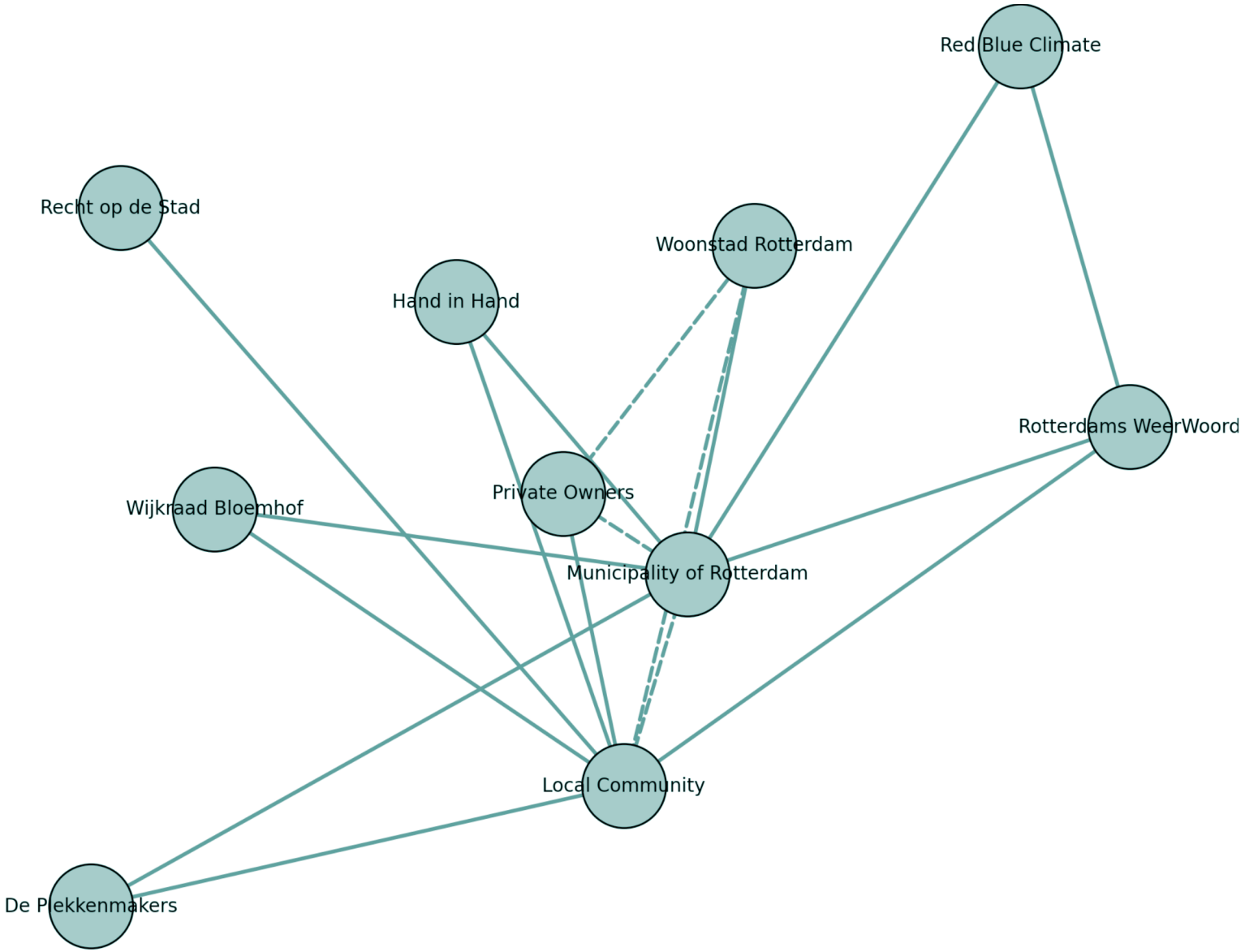








organisations







Gemeente Rotterdam

woonstad. rotterdam

neighbourhood visit

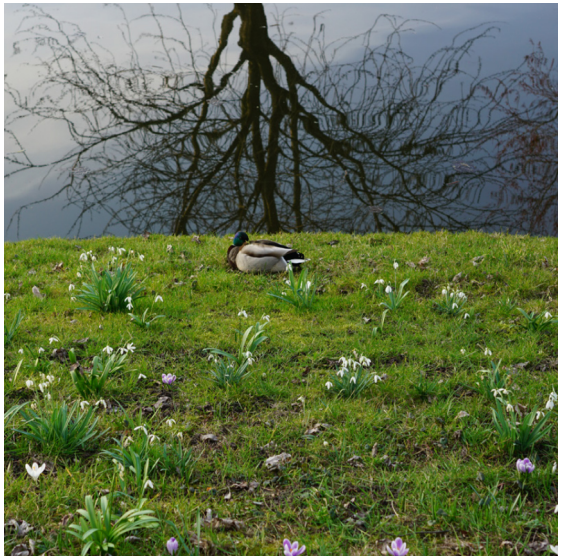
ground













particularities













existing typologies















street views





urban perspectives





demolitions





people





community



research question

How can addressing the problem of sinking buildings create opportunities for restructuring Bloemhof in line with the needs of its community?

technical needs

foundation repair

community management

foundation retrofit

plan development

housing renewal

subsoil systems

housing repair

water retention

community needs

neighbourhood safety

income stability

process transparency

dwelling ownership

more greenery

local business support

heat-stress reduction

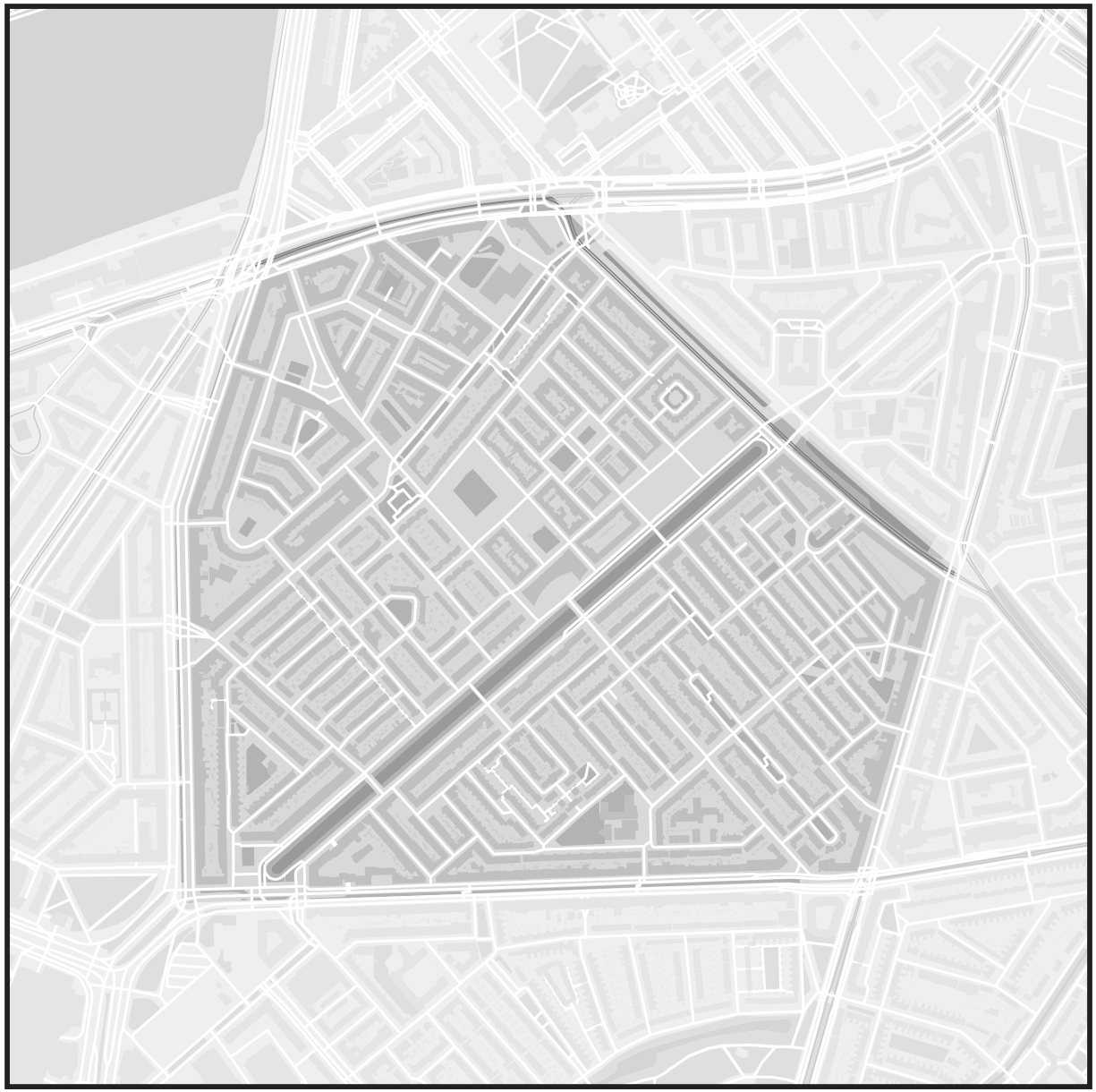
community preservation

opportunity

neighbourhood renewal
+
deep participation
=
social development

master plan concept

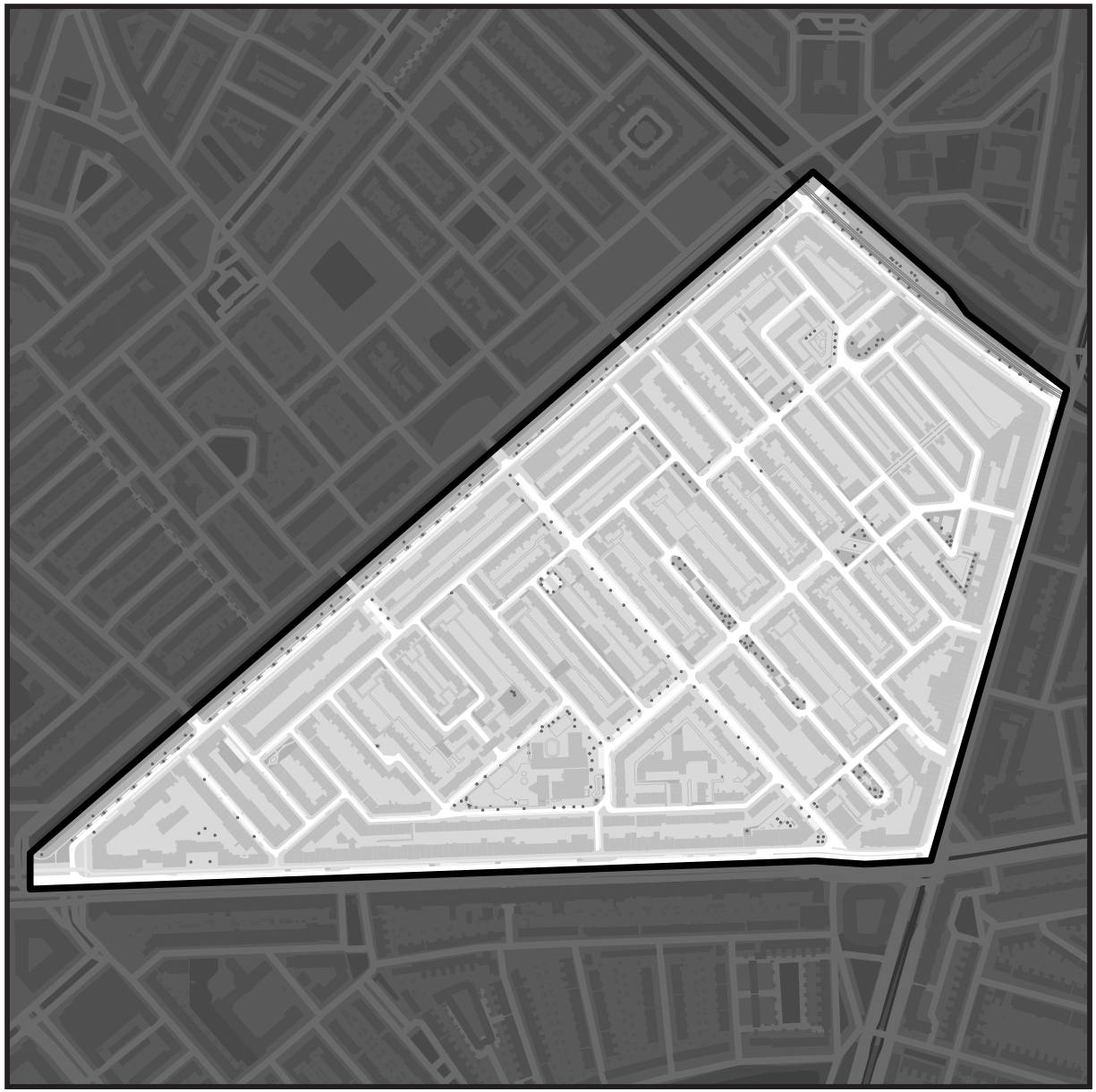
bloemhof map



legend

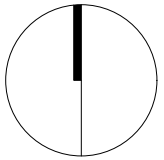
- water
- greenery
- buildings
- surface
- roads
- tram tracks
- surroundings

bloemhof zuid map

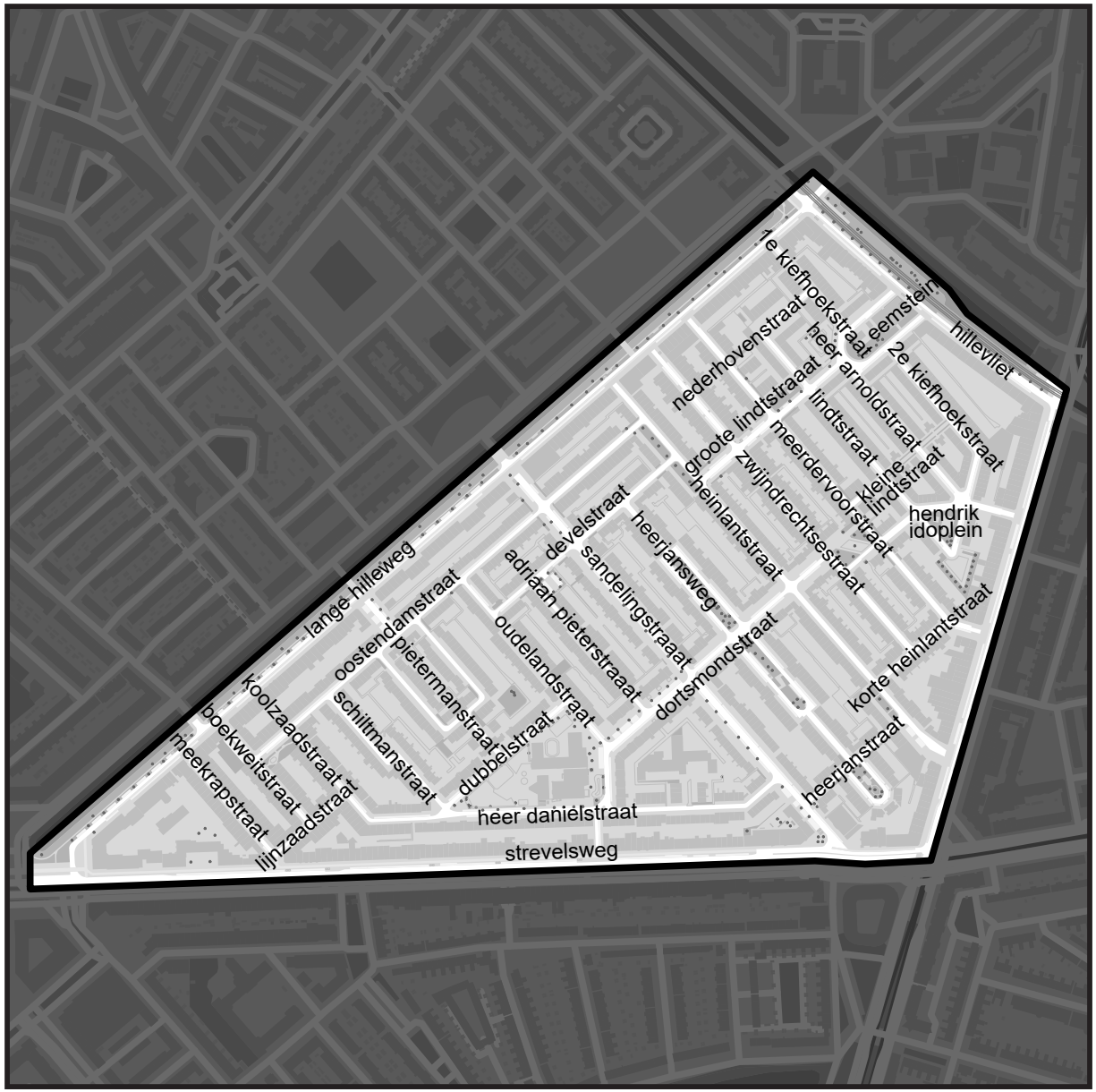


legend

- water
- greenery
- buildings
- surface
- roads
- tram tracks
- bloemhof zuid border
- trees
- surroundings



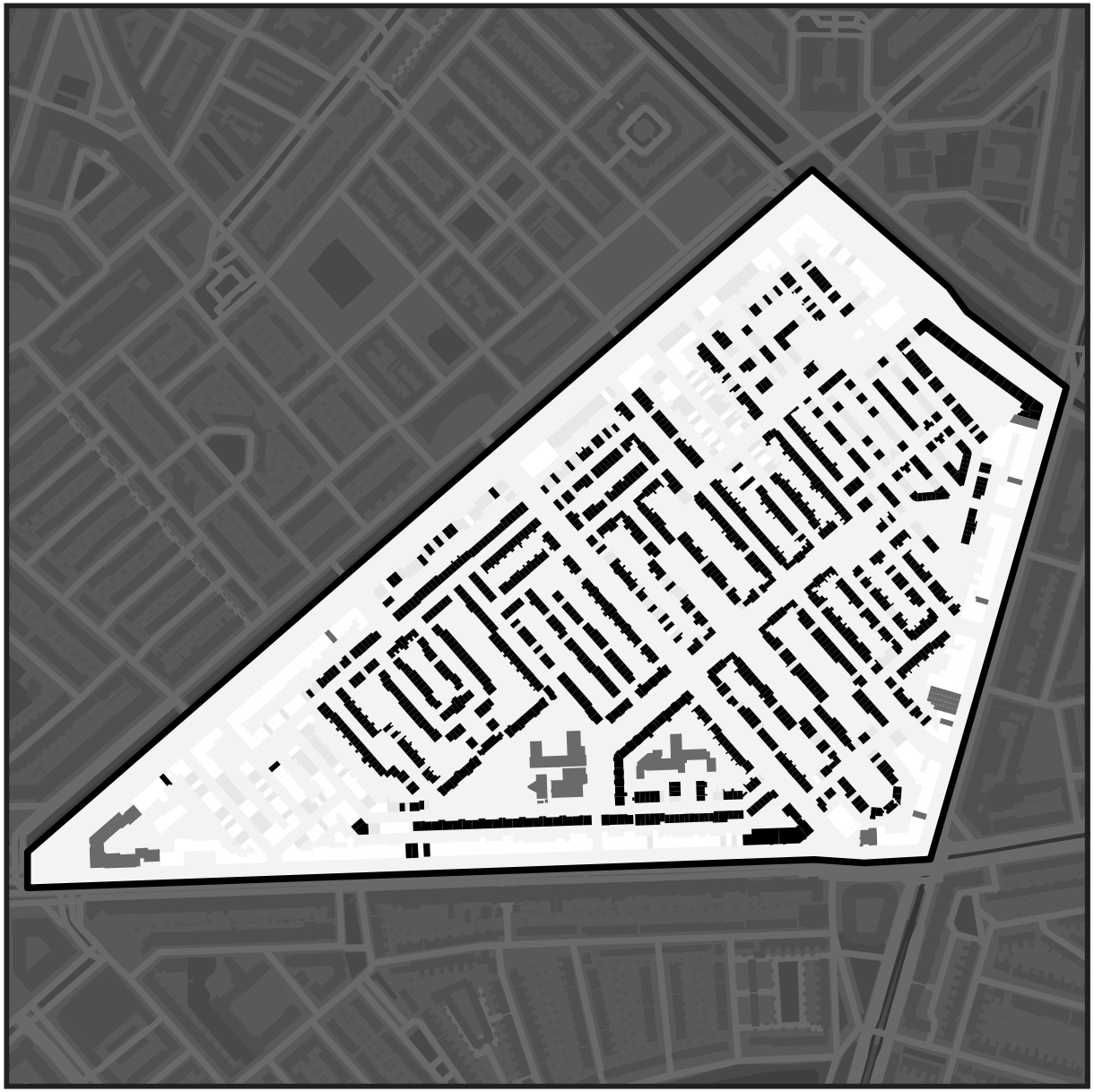
street names map



legend

- water
- greenery
- buildings
- surface
- roads
- tram tracks
- bloemhof zuid border
- trees
- surroundings

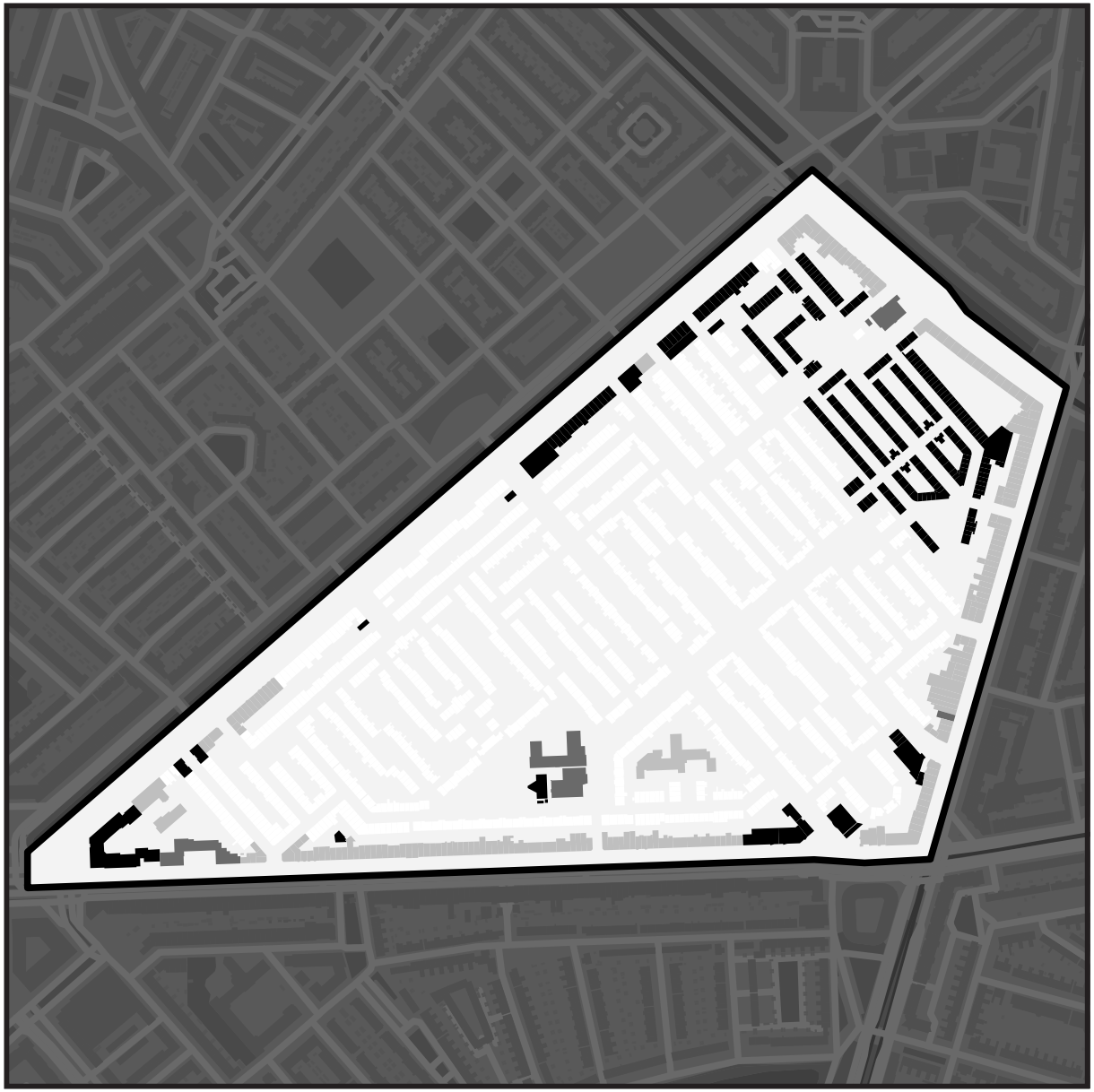
ownership map



legend

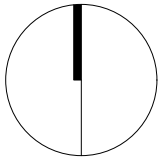
- owned by coorporation
- owned by municipality
- privately owned, rented
- privately owned
- surface
- bloemhof zuid border
- surroundings

foundation map

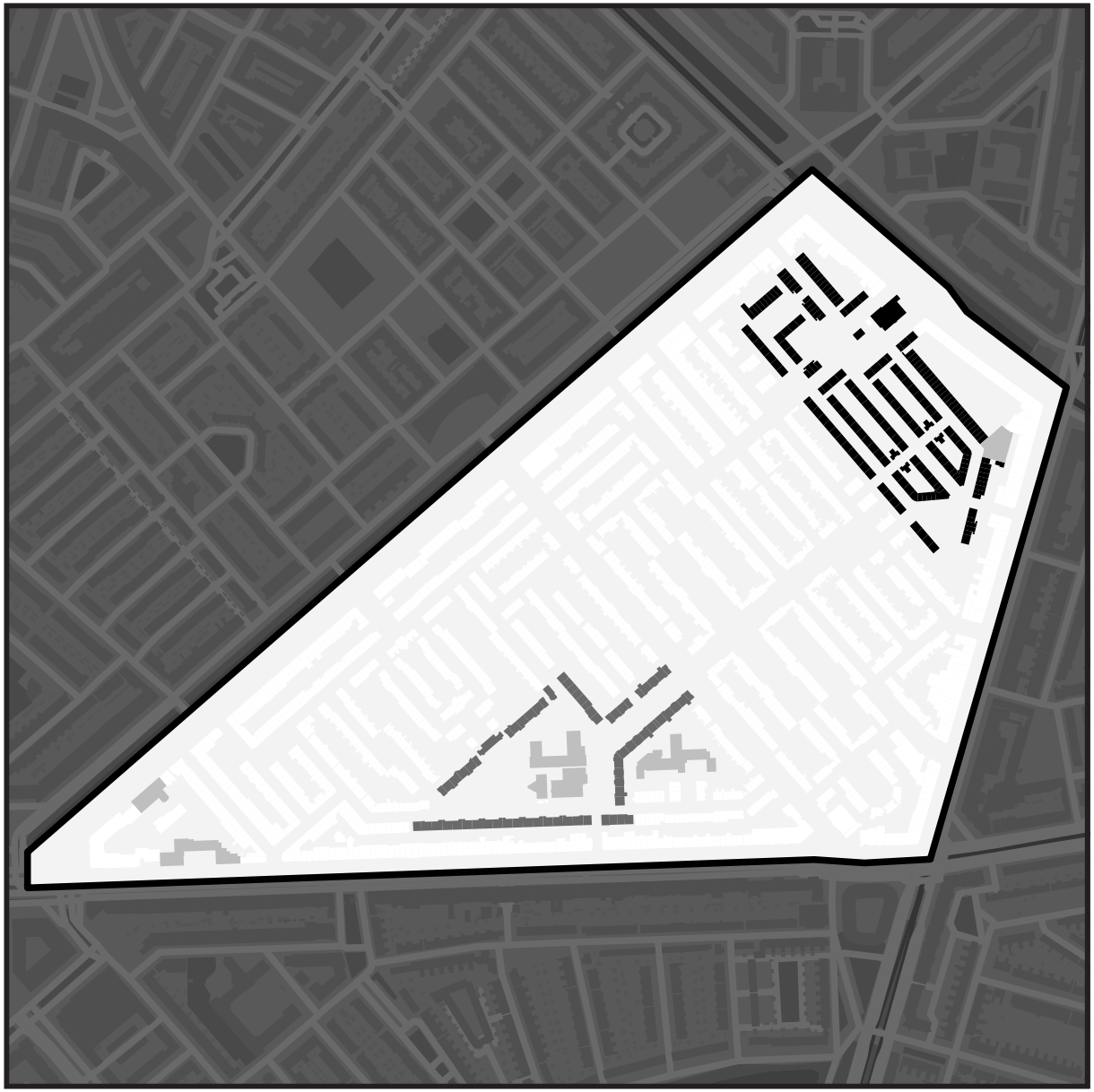


legend

- concrete piles
- wood piles, good condition
- wood piles, bad condition
- lack of foundation
- surface
- bloemhof zuid border
- surroundings

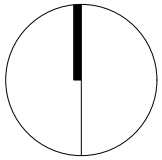


monument map

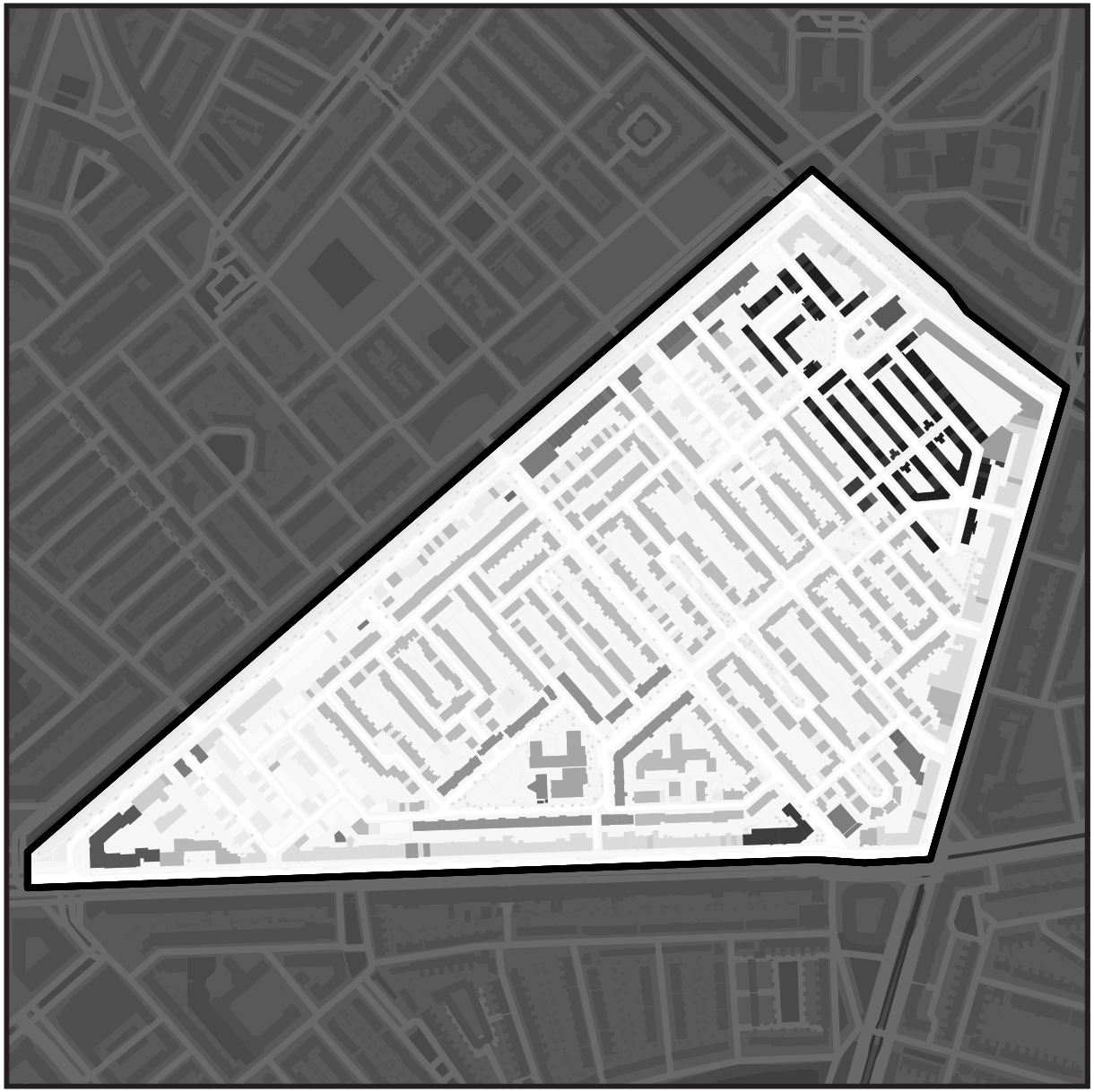


legend

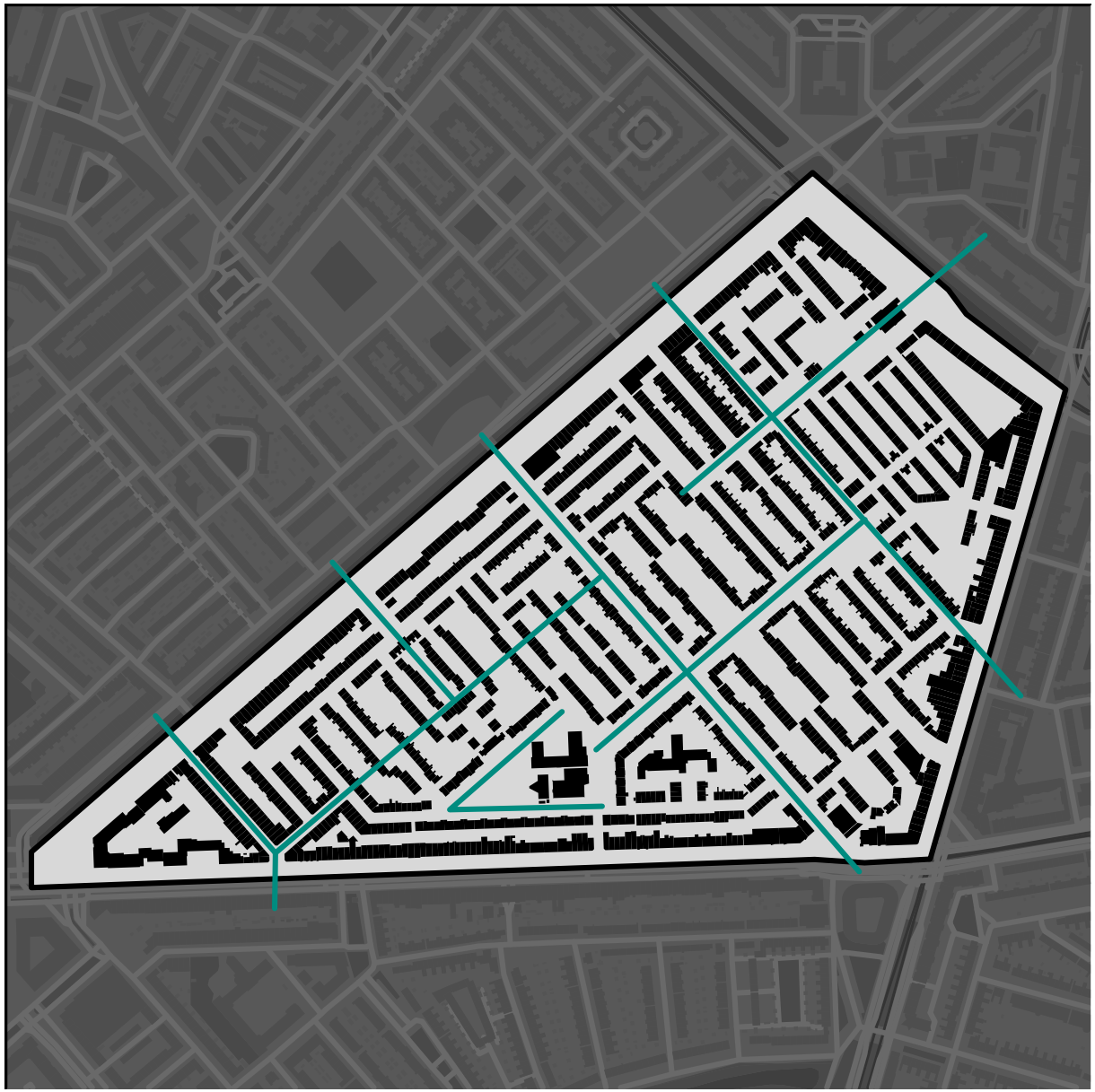
- rijksmonument
- gemeentelijk monument
- high importance
- no monument status
- surface
- bloemhof zuid border
- surroundings



overlay map

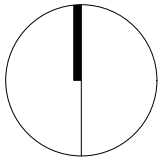


master plan concepts - axis

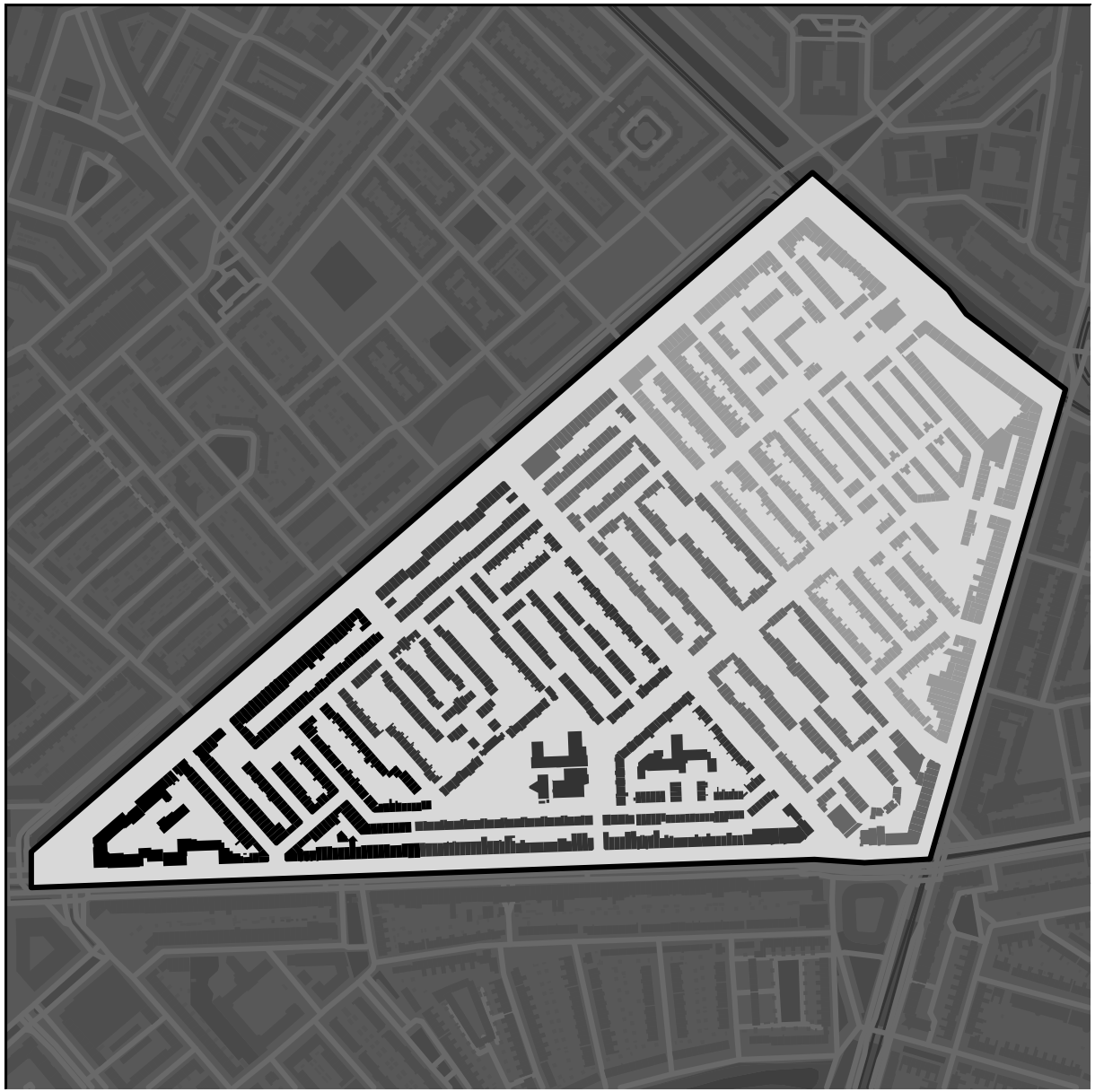


legend

- buildings
- surface
- main axis idea
- bloemhof zuid border
- surroundings

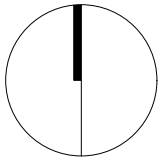


master plan concepts - height



legend

- 8-6 floors
- 6-4 floors
- 5-3 floors
- 4-2 floors
- surface
- bloemhof zuid border
- surroundings

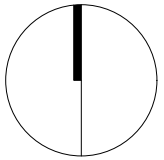


master plan concepts - demolition

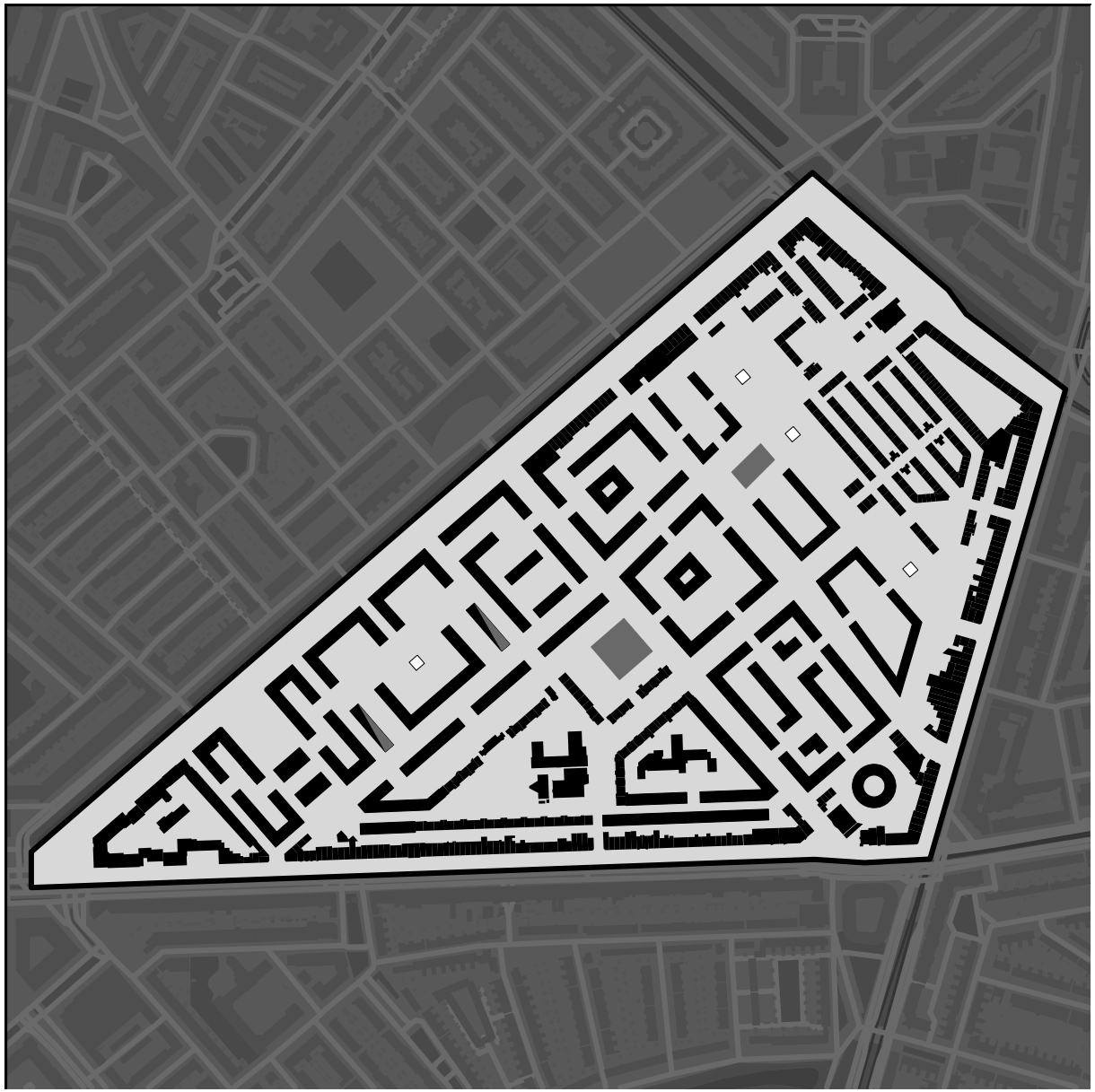


legend

- good foundations, save
- fix foundations, monument
- try not to demolish
- demolish
- surface
- bloemhof zuid border
- surroundings

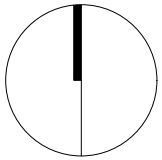


final master plan



legend

- buildings
- surface
- main axis idea
- bloemhof zuid border
- surroundings

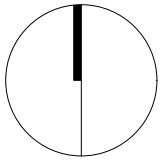


final master plan usage

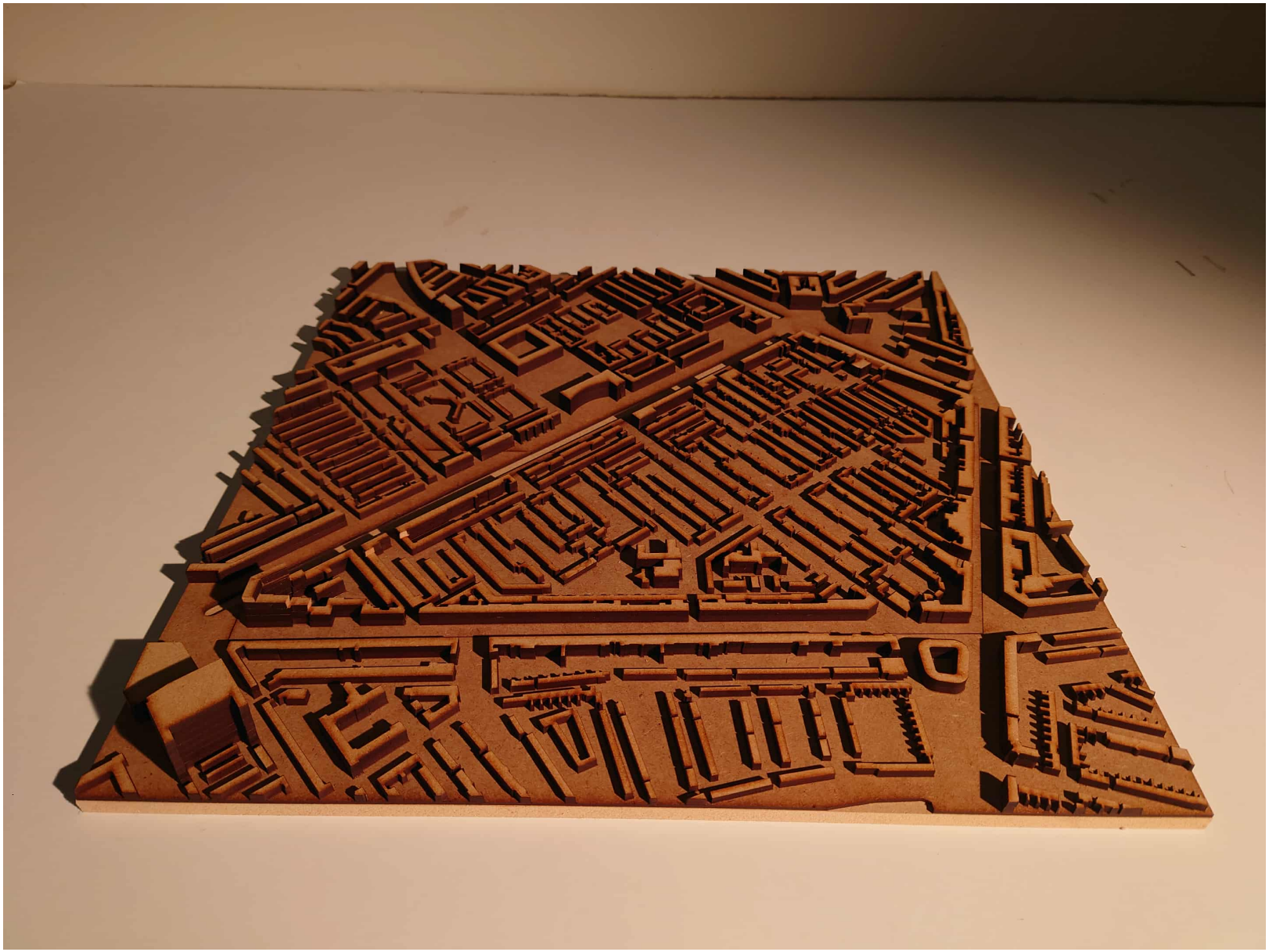


legend

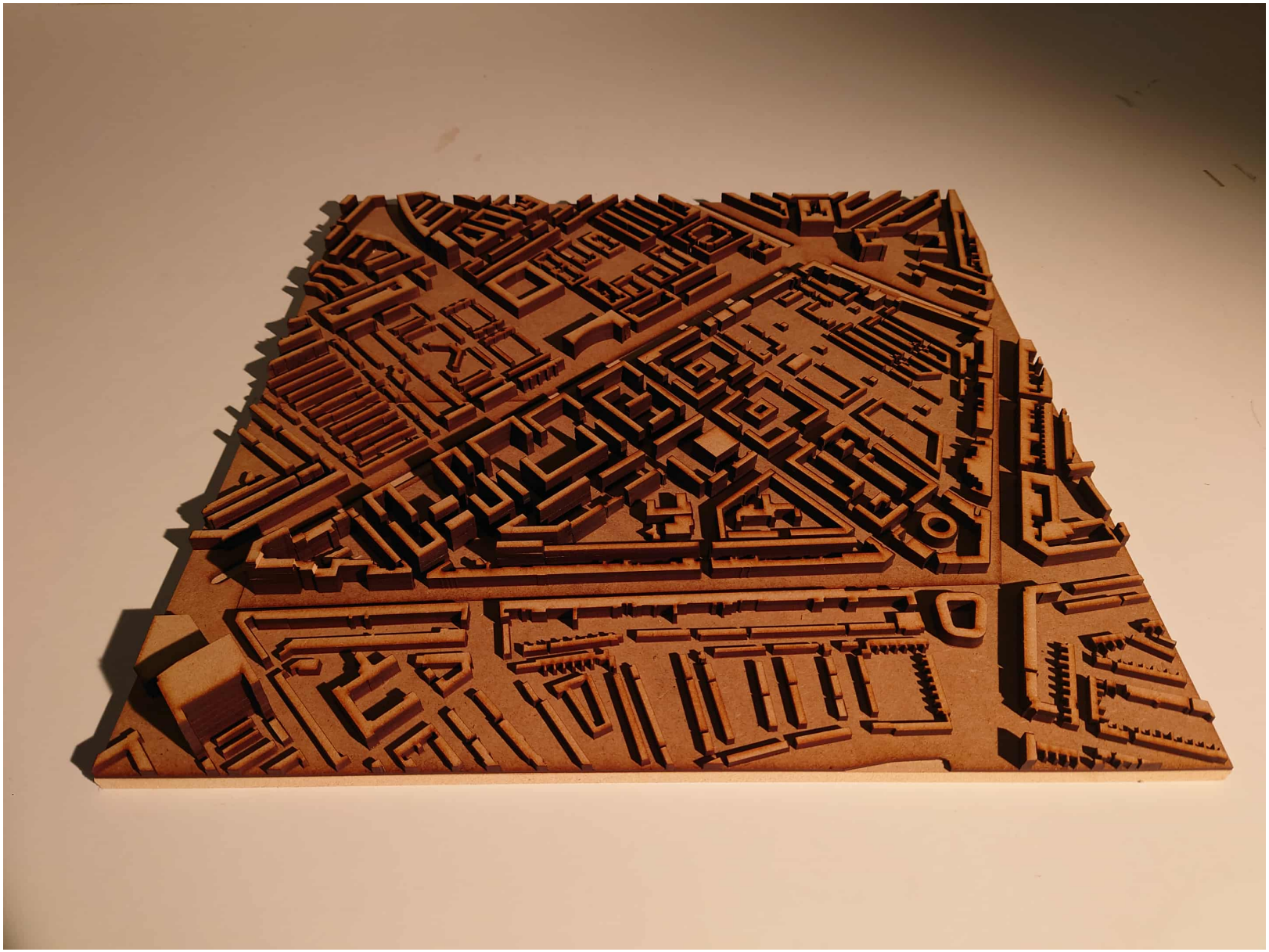
- buildings
- commercial/parking
- surface
- pavilions
- paths
- streets
- roads
- bloemhof zuid border
- surroundings



master plan view - before



master plan view - after



undisplacement

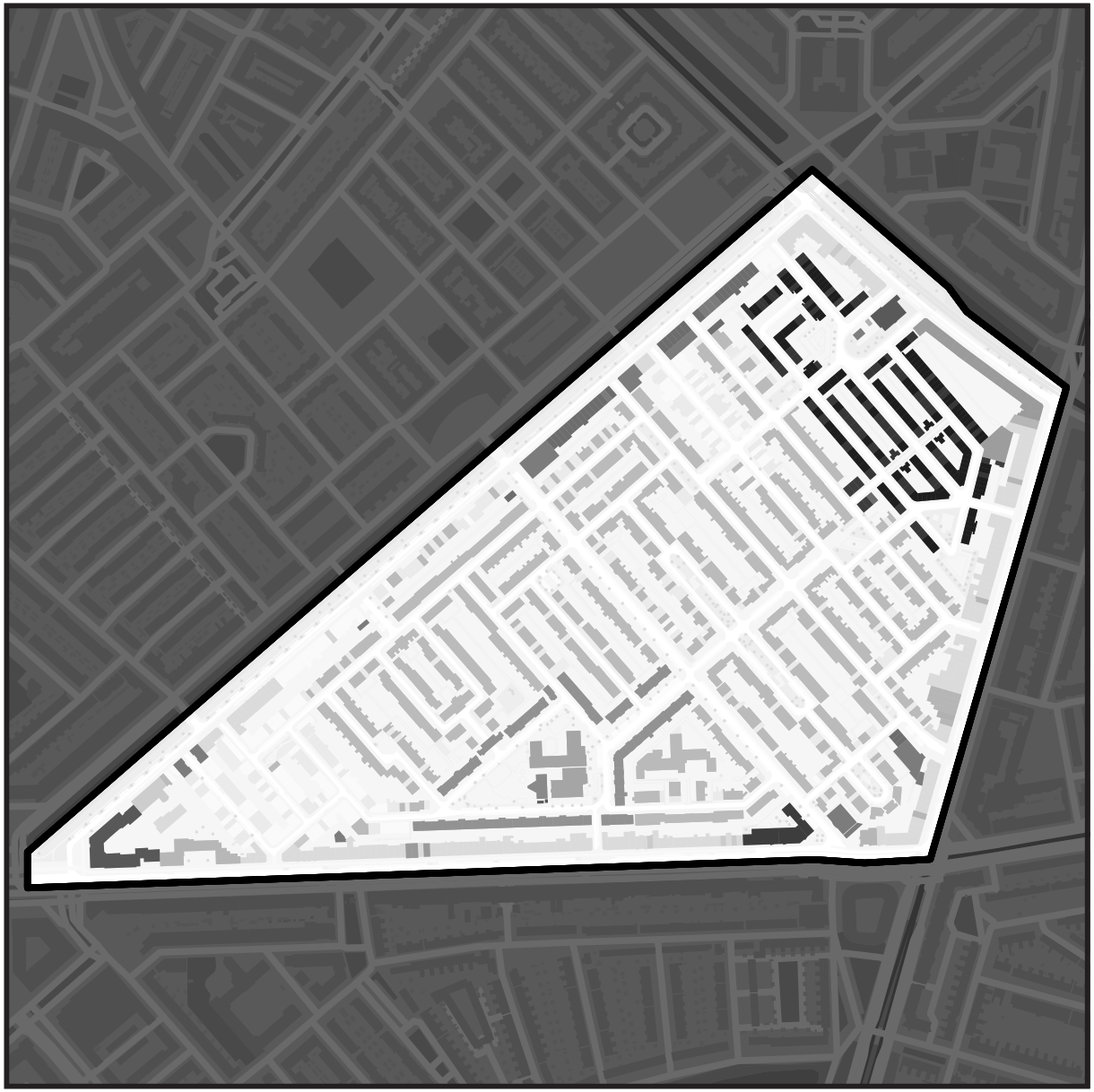
undisplacement - definition

Undisplacement refers to maintaining or restoring people's original place, status, and way of life without being permanently uprooted.

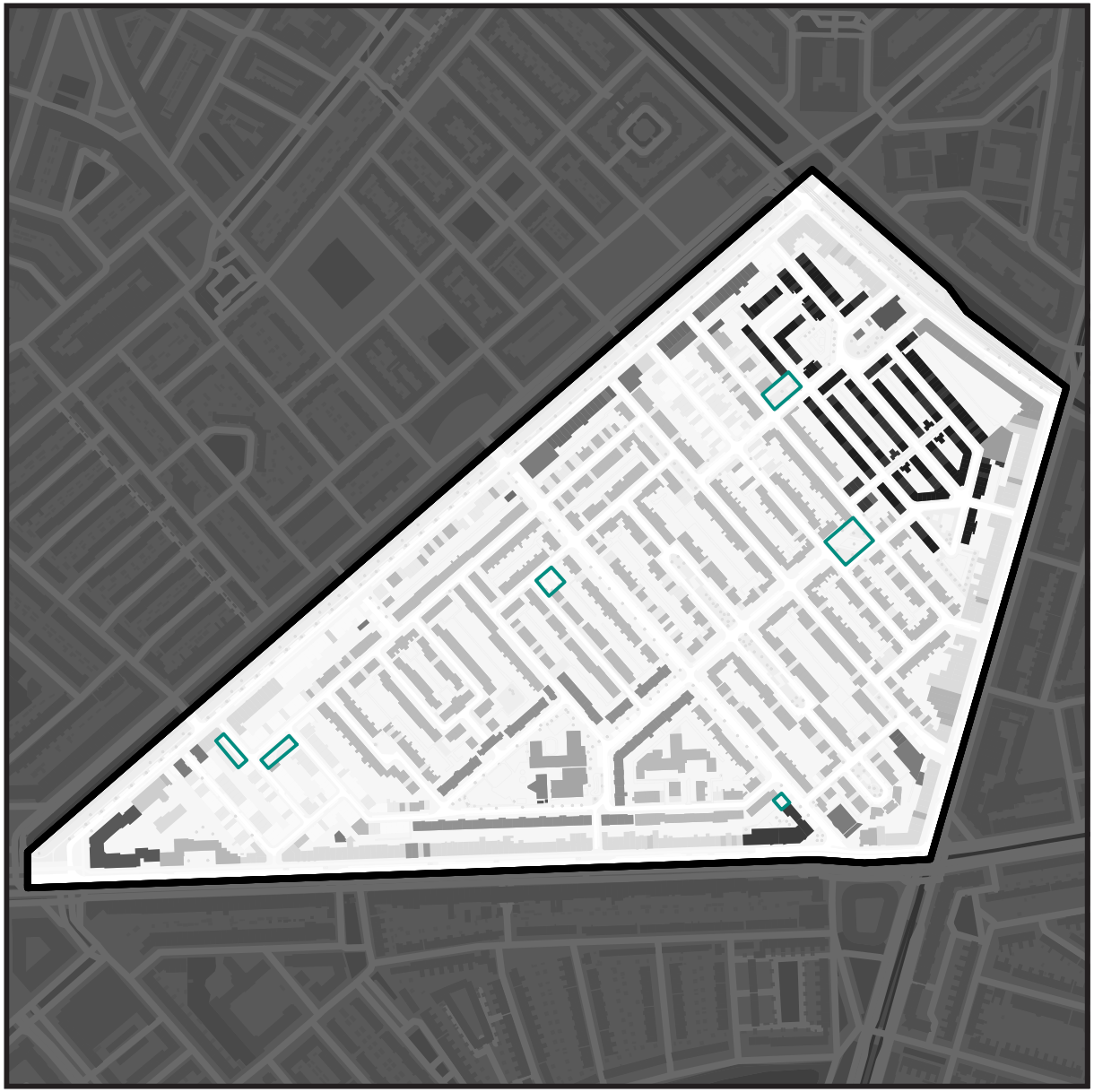
It includes both preventing forced removal and supporting the return of displaced individuals or communities to their homes with access to resources, social networks, and cultural heritage.

The concept emphasizes preserving identity and integrity while addressing root causes of displacement and enabling sustainable recovery.

overlay map reminder



site possibilities



starting site



undisplacement process 01



legend

- water
- greenery
- existing buildings
- surface
- roads
- trees
- bloemhof zuid border
- surroundings
- starting site

undisplacement process 02



legend

- water
- greenery
- existing buildings
- surface
- roads
- trees
- bloemhof zuid border
- surroundings
- demolition
- new construction
- new buildings

undisplacement process 03



legend

- water
- greenery
- existing buildings
- surface
- roads
- trees
- bloemhof zuid border
- surroundings
- demolition
- new construction
- new buildings

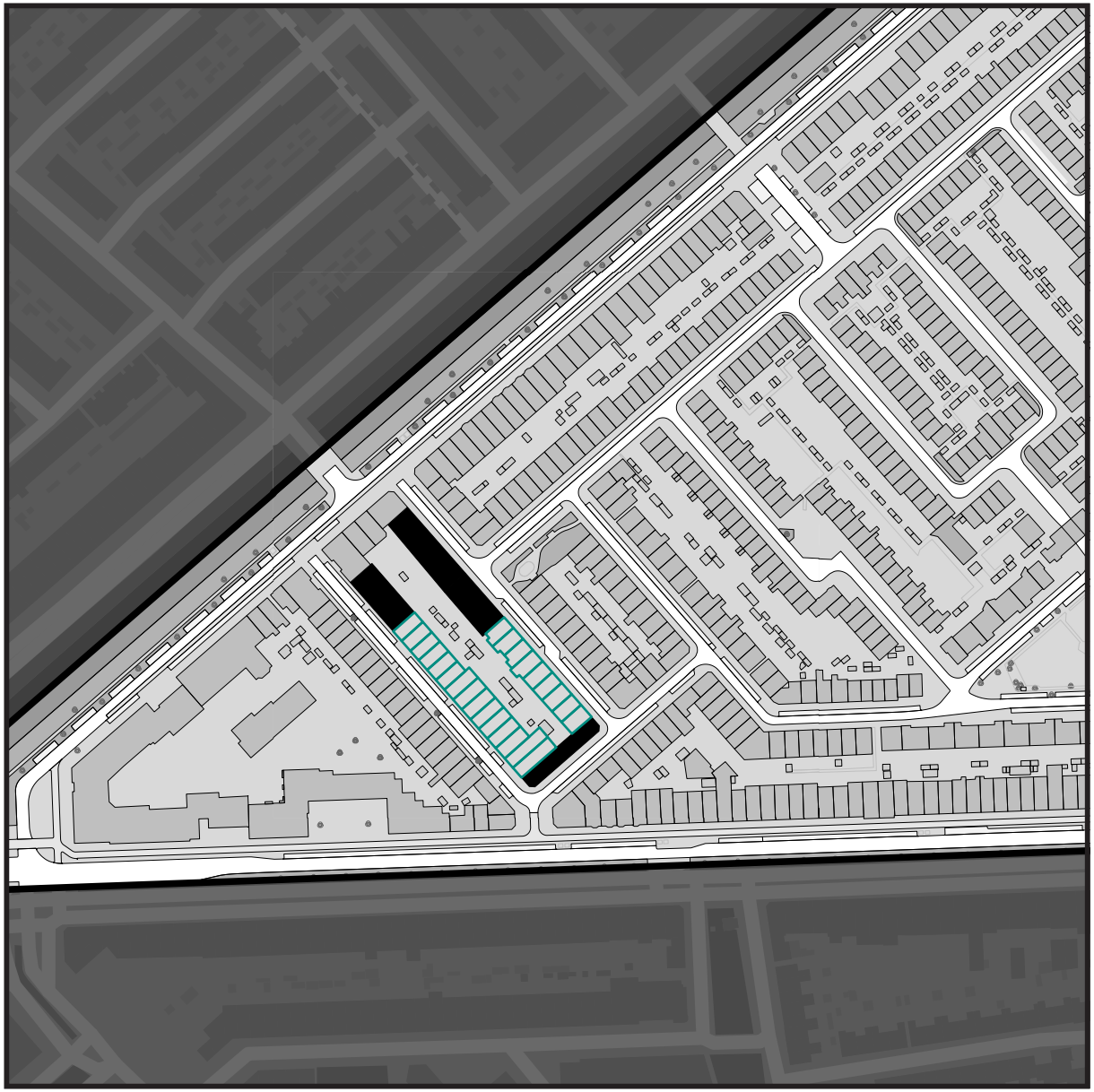
undisplacement process 04



legend

- water
- greenery
- existing buildings
- surface
- roads
- trees
- bloemhof zuid border
- surroundings
- demolition
- new construction
- new buildings

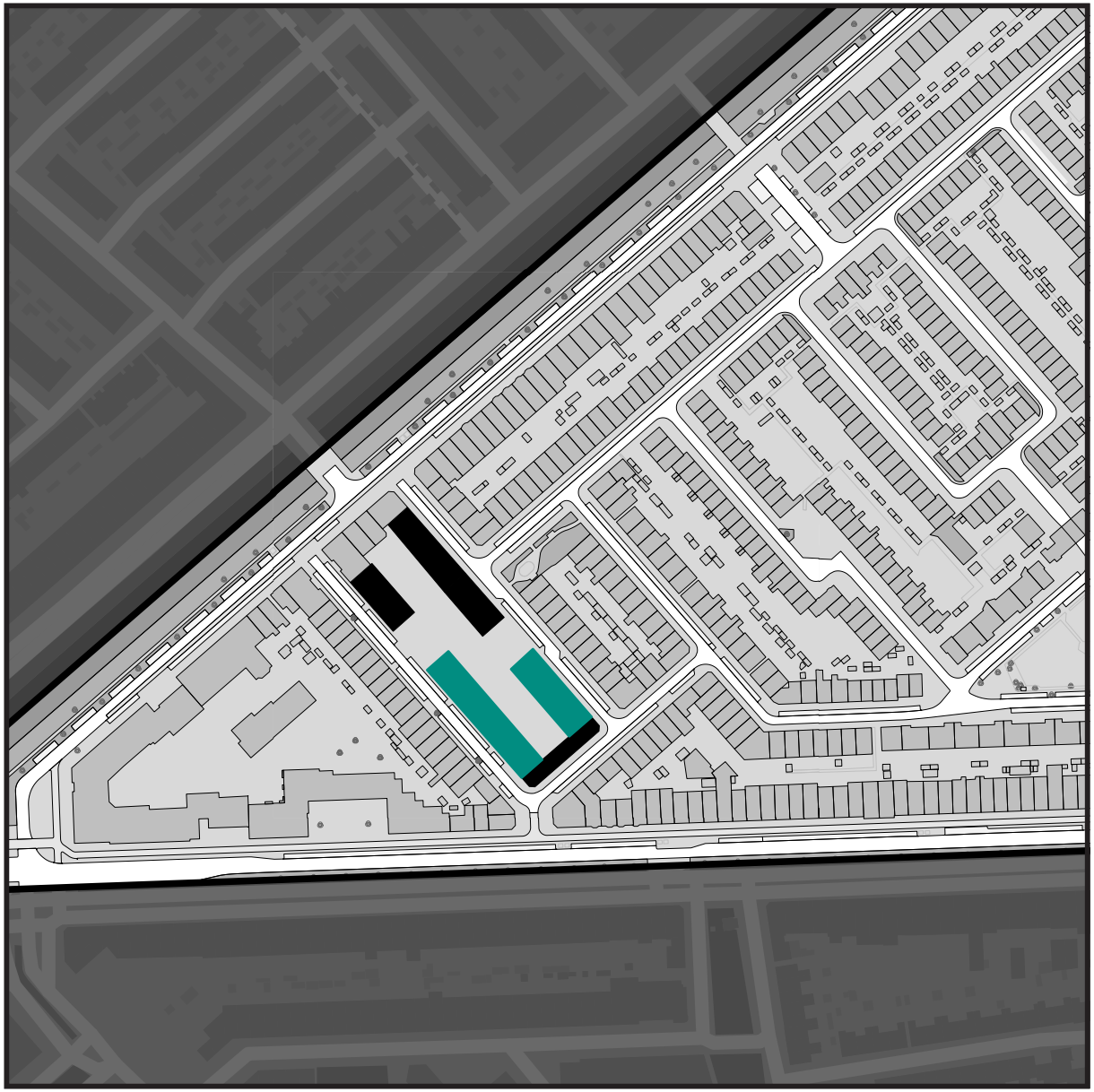
undisplacement process 05



legend

- water
- greenery
- existing buildings
- surface
- roads
- trees
- bloemhof zuid border
- surroundings
- demolition
- new construction
- new buildings

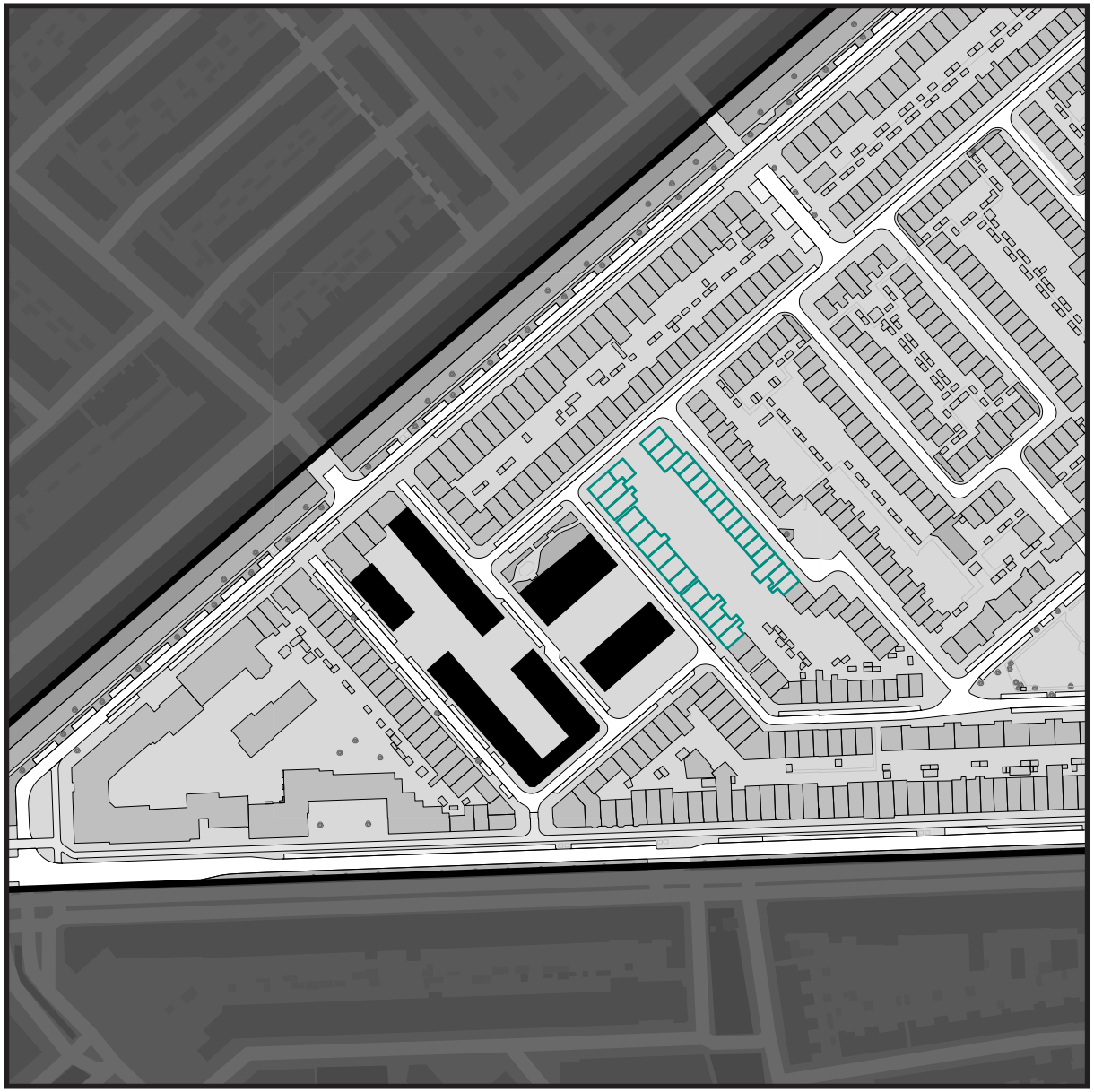
undisplacement process 06



legend

- water
- greenery
- existing buildings
- surface
- roads
- trees
- bloemhof zuid border
- surroundings
- demolition
- new construction
- new buildings

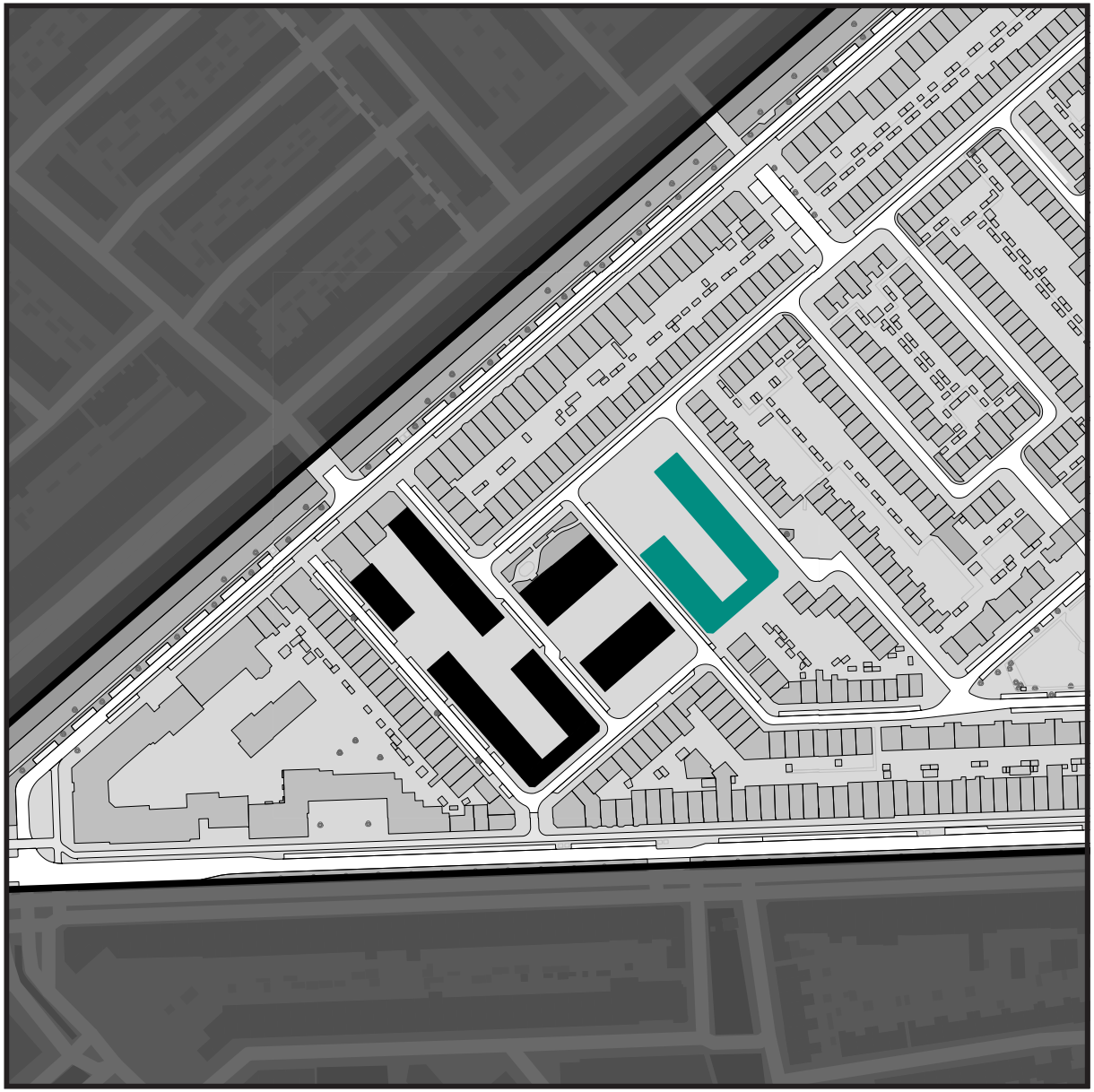
undisplacement process 07



legend

- water
- greenery
- existing buildings
- surface
- roads
- trees
- bloemhof zuid border
- surroundings
- demolition
- new construction
- new buildings

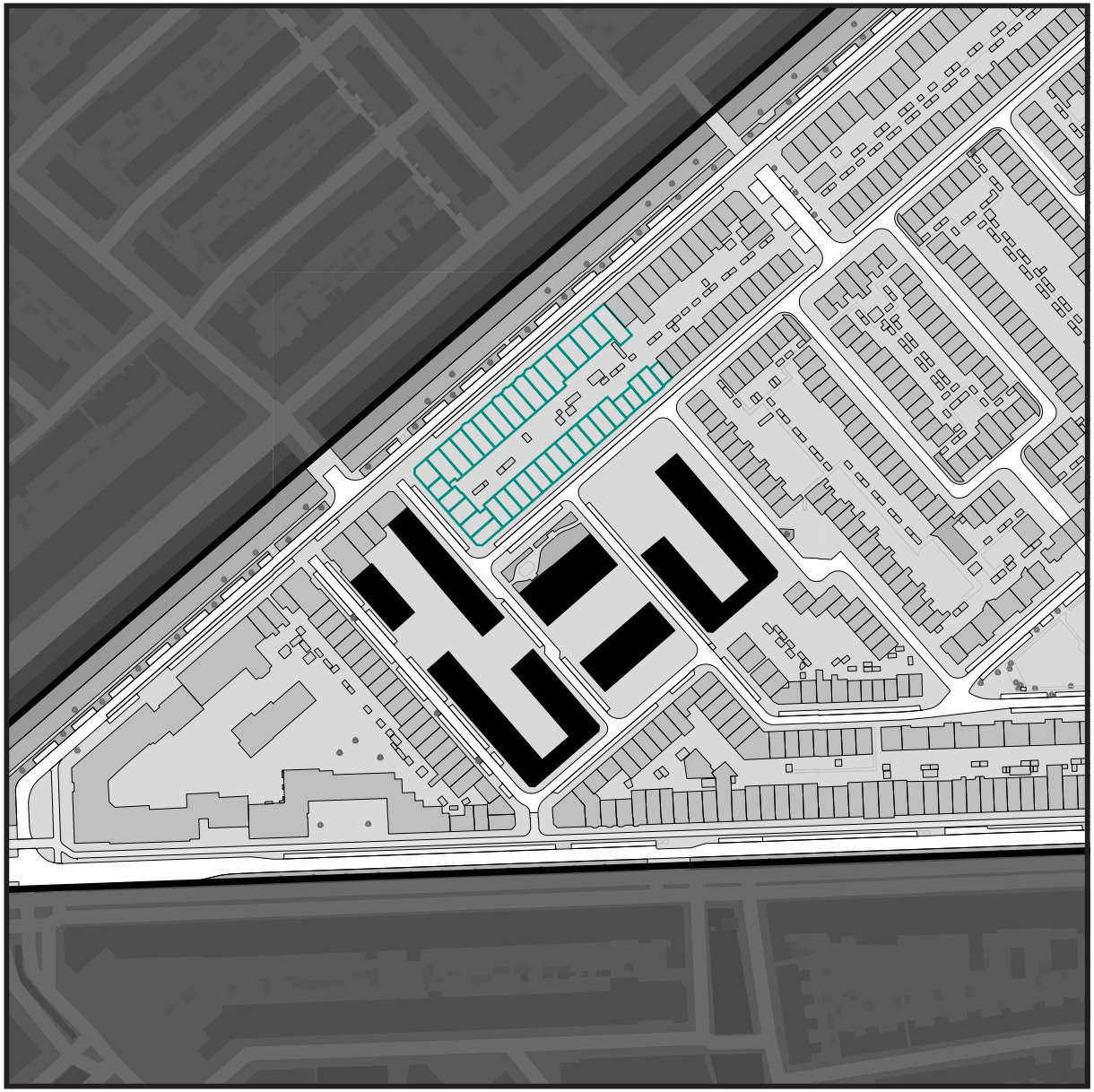
undisplacement process 08



legend

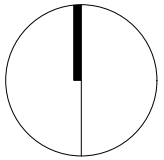
- water
- greenery
- existing buildings
- surface
- roads
- trees
- bloemhof zuid border
- surroundings
- demolition
- new construction
- new buildings

undisplacement process 09

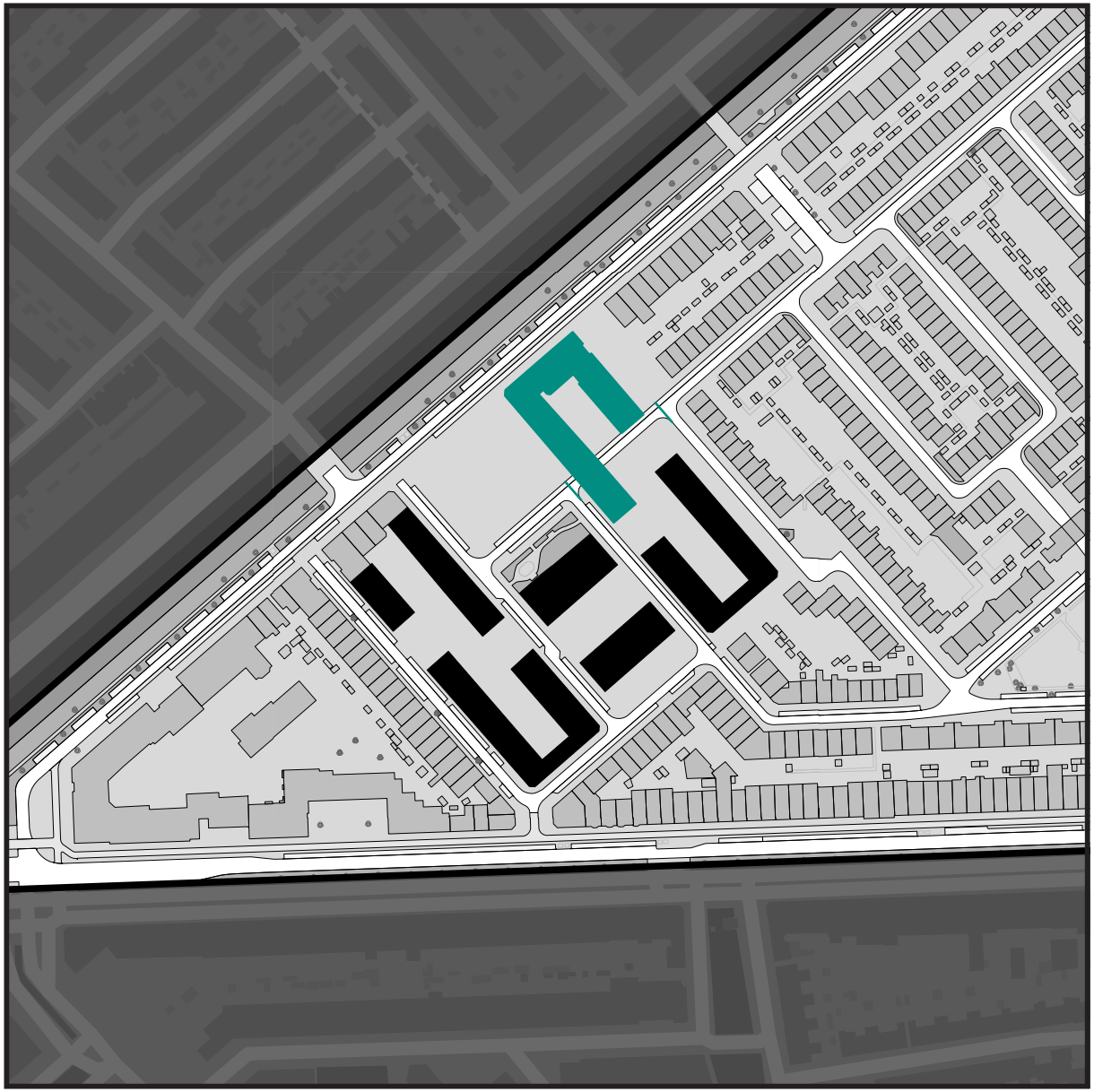


legend

- water
- greenery
- existing buildings
- surface
- roads
- -
- bloemhof zuid border
- surroundings
- demolition
- new construction
- new buildings



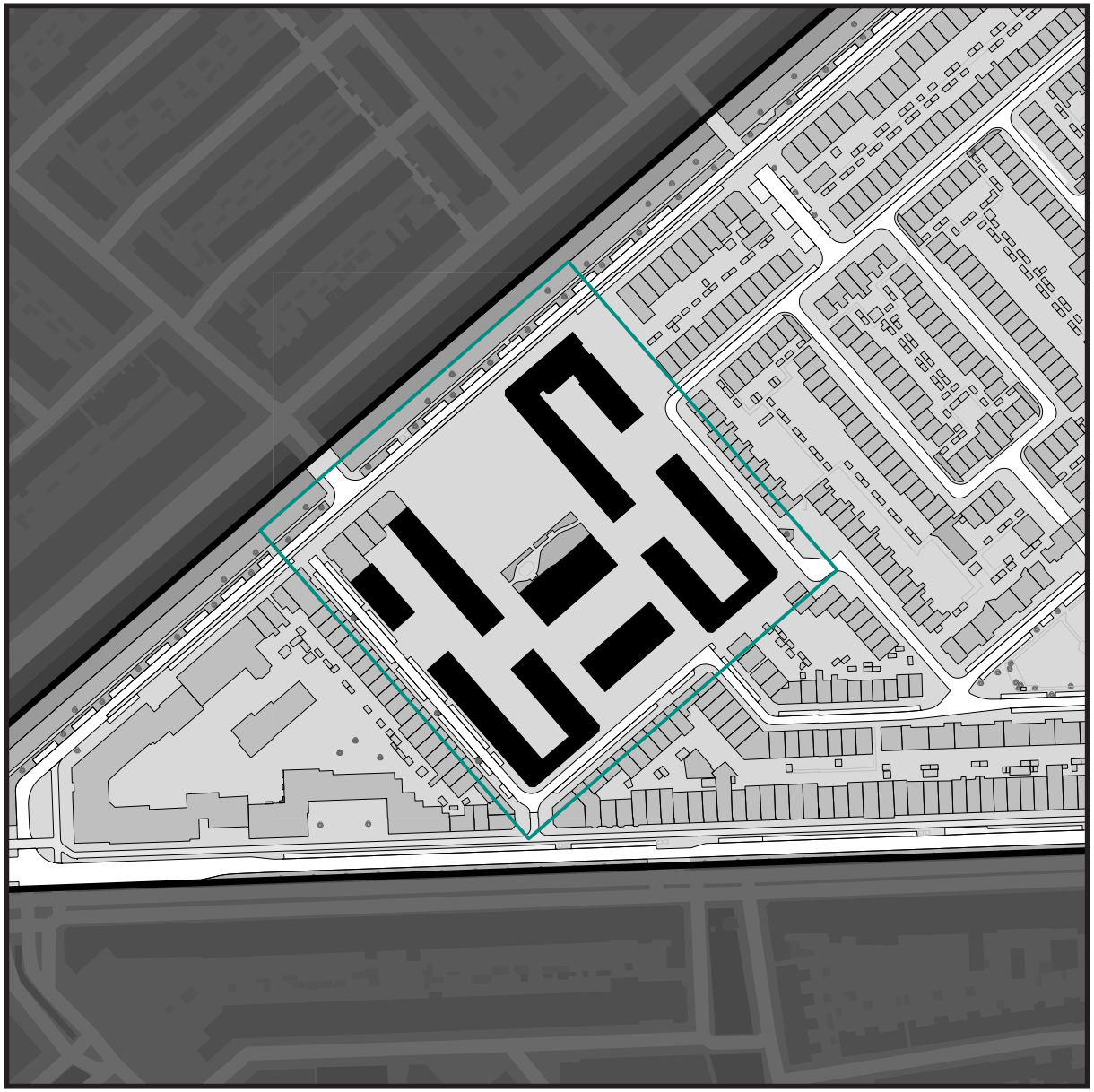
undisplacement process 10



legend

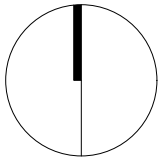
- water
- greenery
- existing buildings
- surface
- roads
- trees
- bloemhof zuid border
- surroundings
- demolition
- new construction
- new buildings

undisplacement process 11

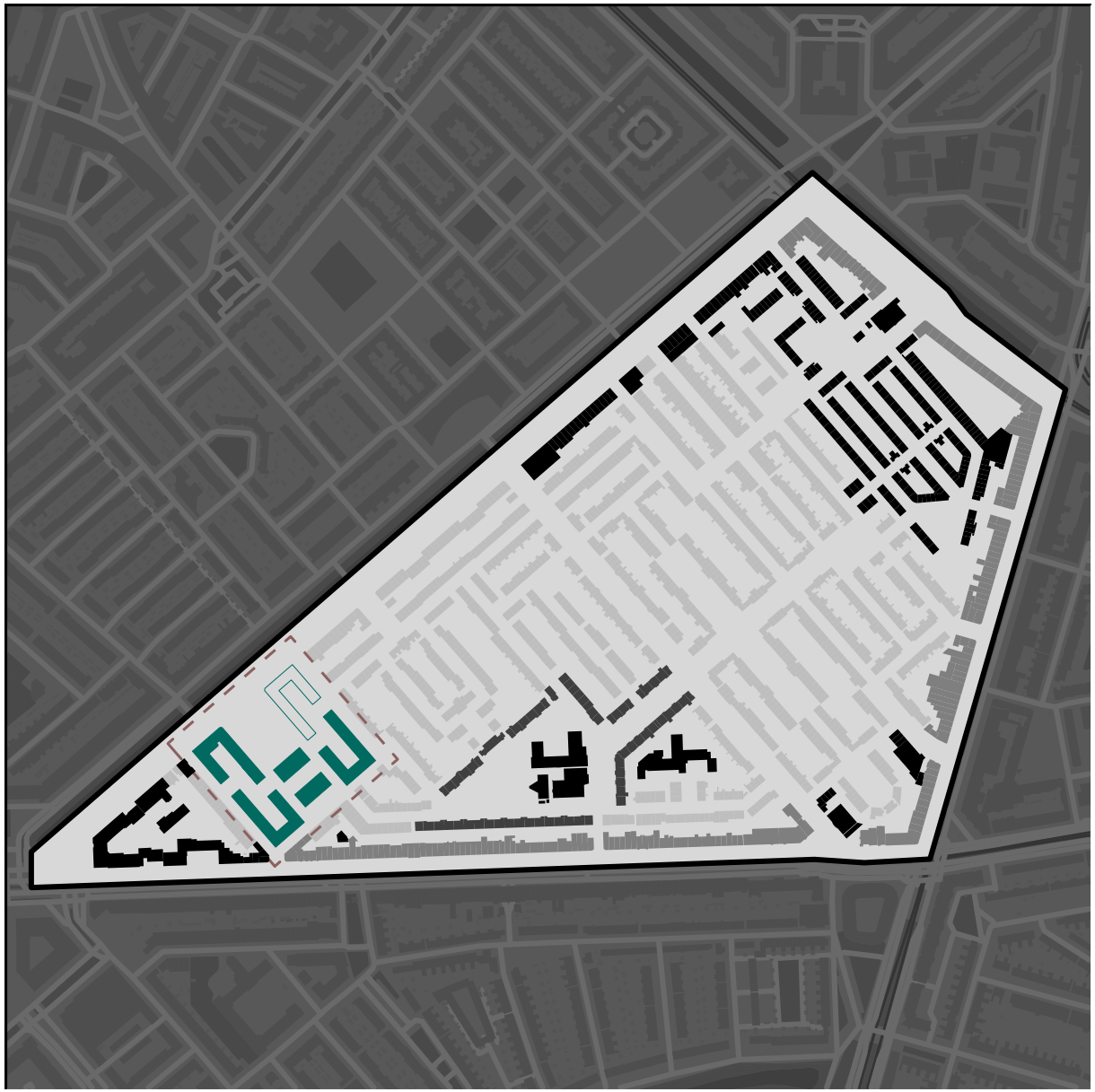


legend

- water
- greenery
- existing buildings
- surface
- roads
- trees
- bloemhof zuid border
- surroundings
- site plan boundary
- new buildings

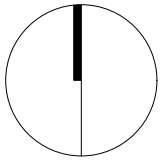


undisplacement on urban scale 01

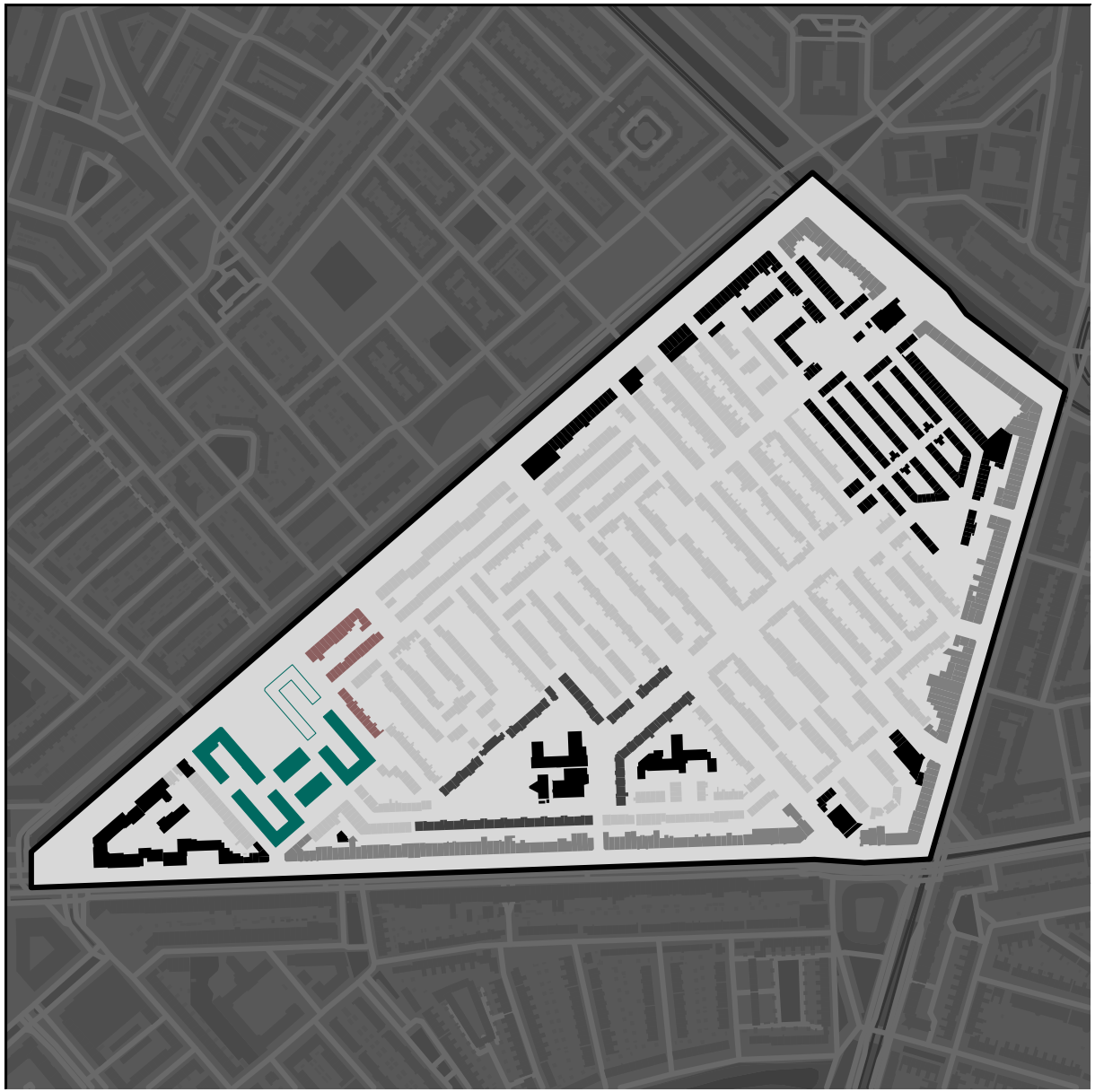


legend

- good foundations, save
- fix foundations, monument
- try not to demolish
- demolish
- surface
- bloemhof zuid border
- surroundings
- demolition
- new construction
- new buildings
- site plan boundary

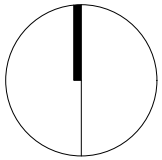


undisplacement on urban scale 02

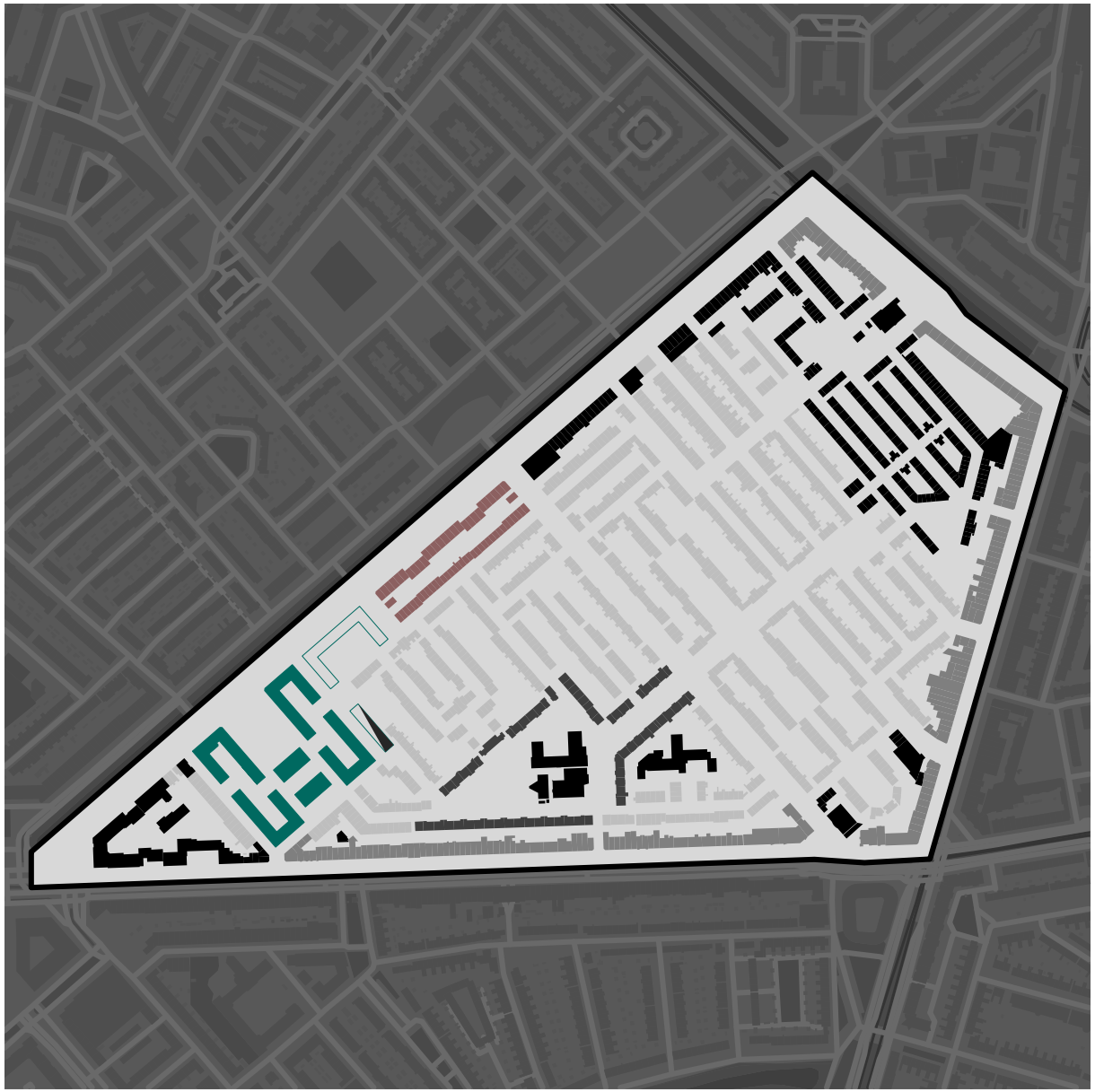


legend

- good foundations, save
- fix foundations, monument
- try not to demolish
- demolish
- surface
- bloemhof zuid border
- surroundings
- demolition
- new construction
- new buildings

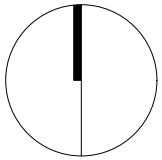


undisplacement on urban scale 03

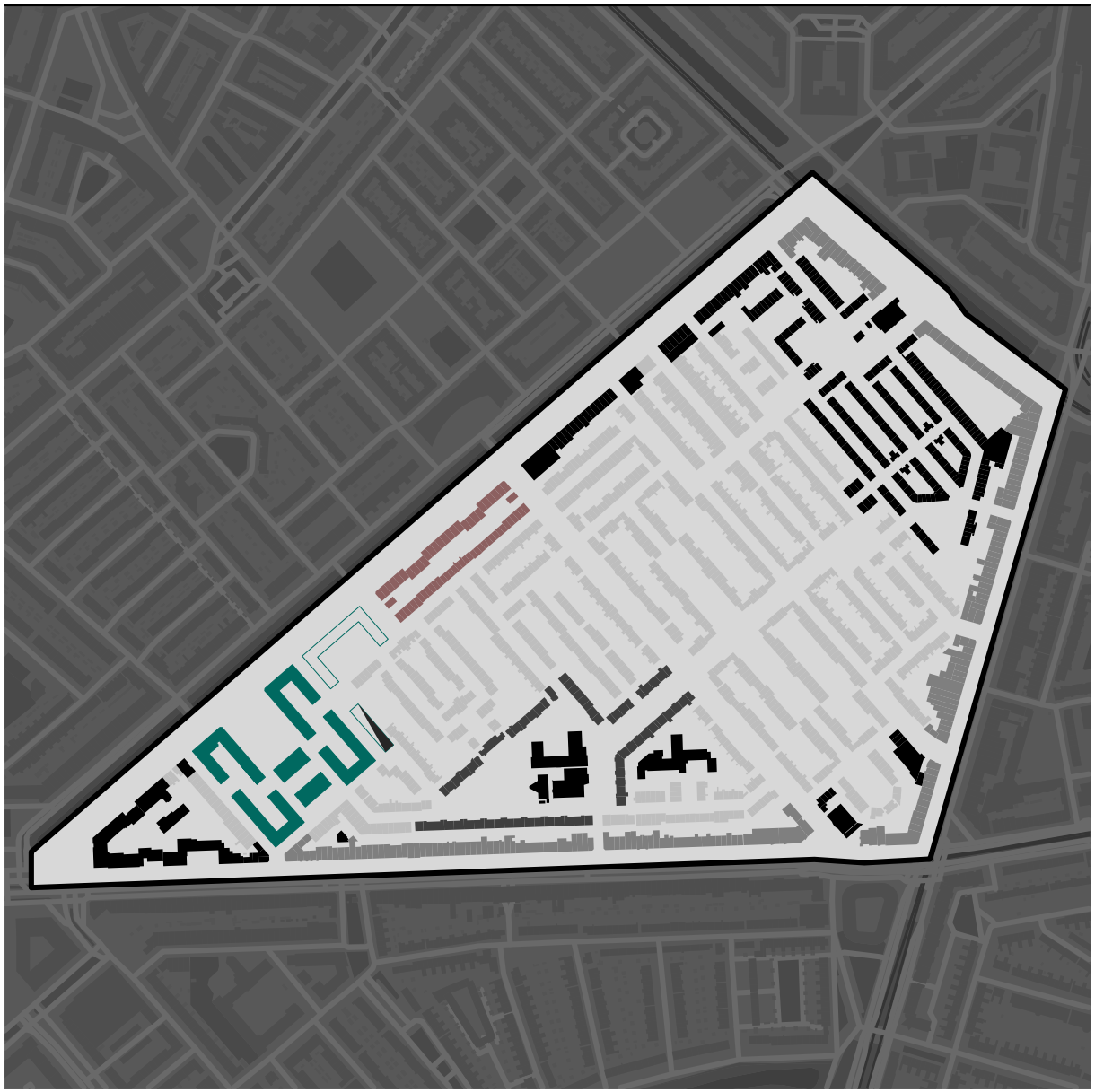


legend

- good foundations, save
- fix foundations, monument
- try not to demolish
- demolish
- surface
- bloemhof zuid border
- surroundings
- demolition
- new construction
- new buildings

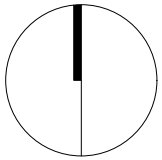


undisplacement on urban scale 04

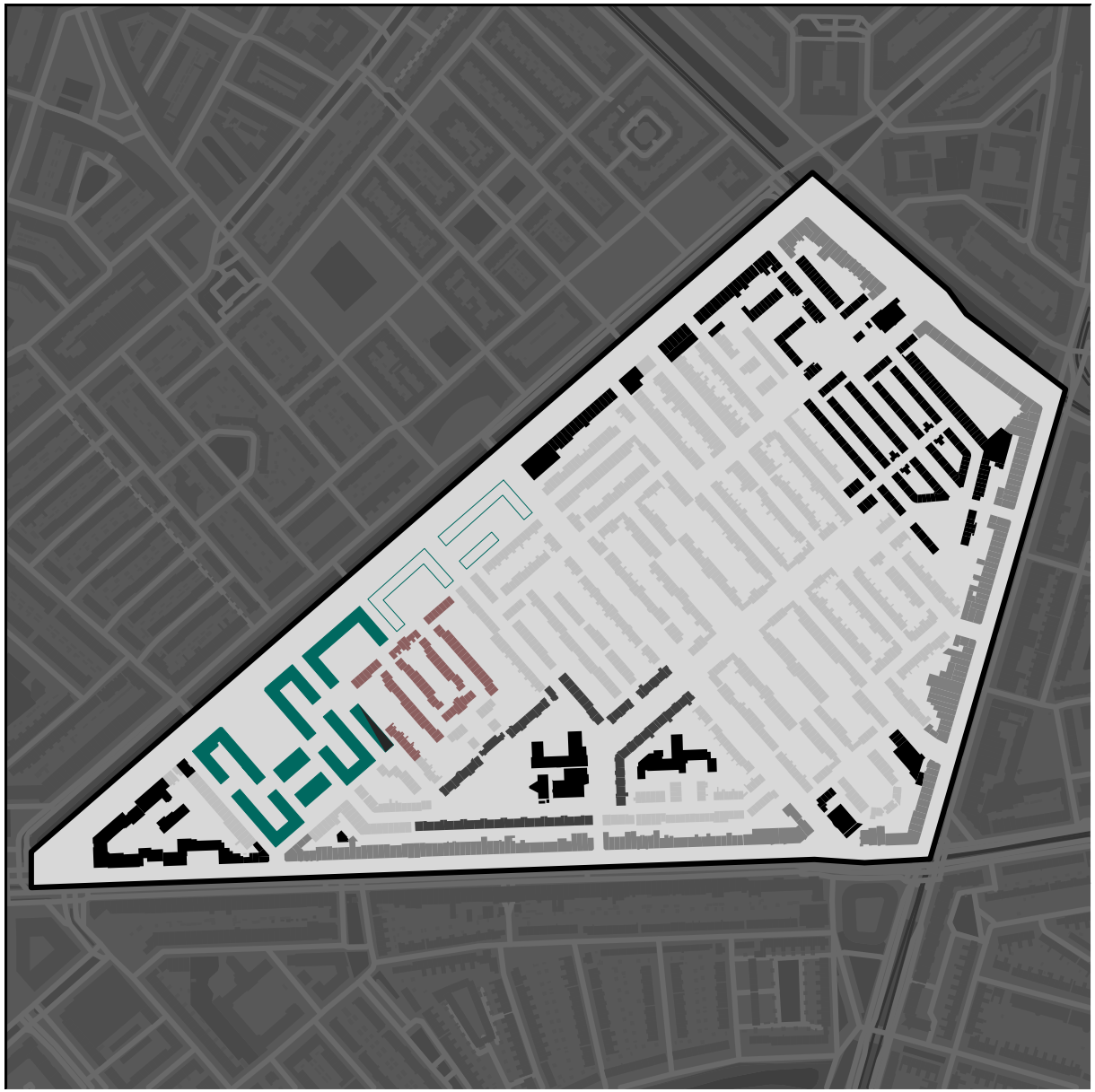


legend

- good foundations, save
- fix foundations, monument
- try not to demolish
- demolish
- surface
- bloemhof zuid border
- surroundings
- demolition
- new construction
- new buildings

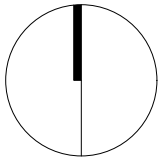


undisplacement on urban scale 05

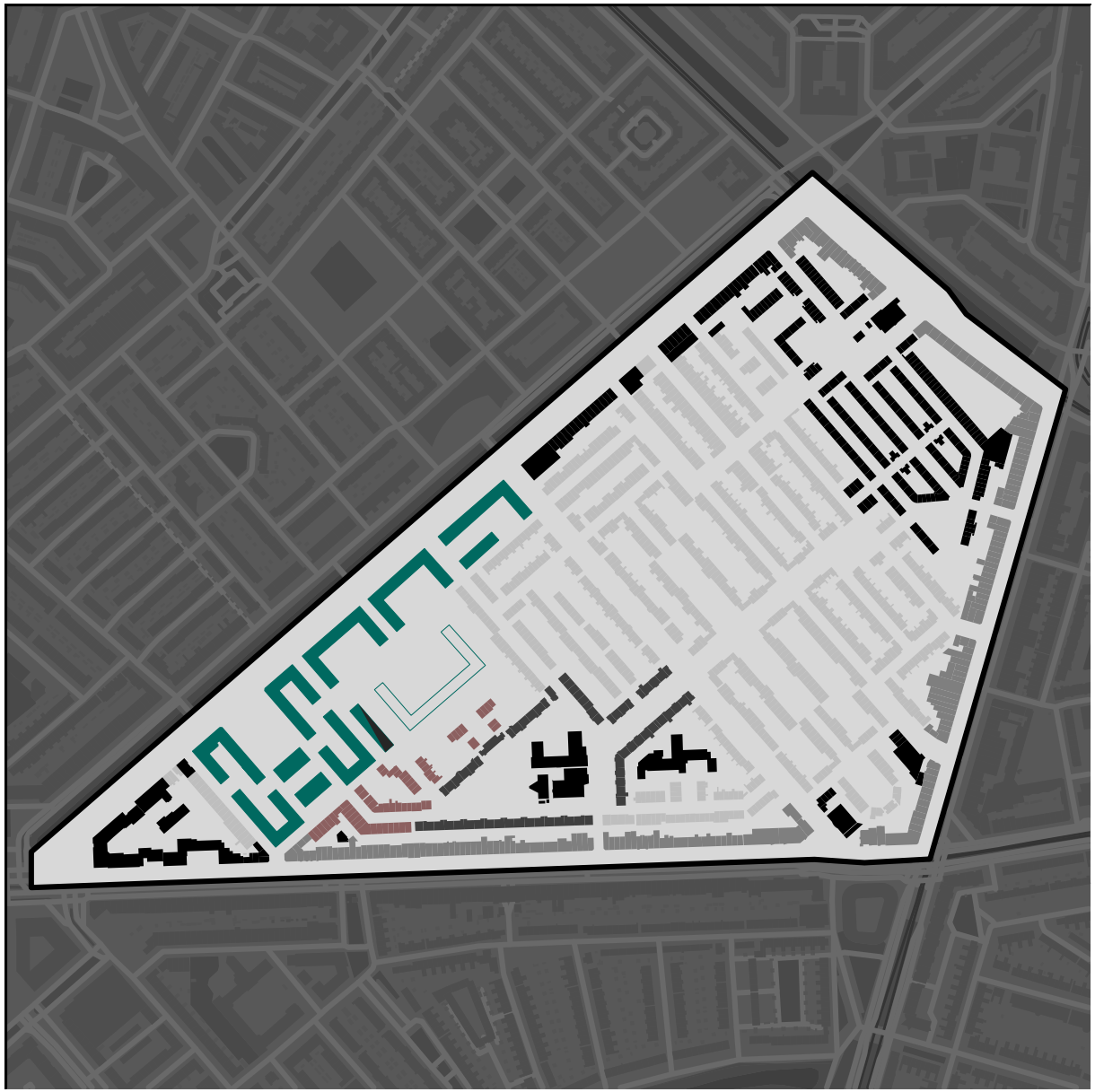


legend

- good foundations, save
- fix foundations, monument
- try not to demolish
- demolish
- surface
- bloemhof zuid border
- surroundings
- demolition
- new construction
- new buildings

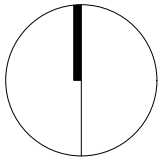


undisplacement on urban scale 06

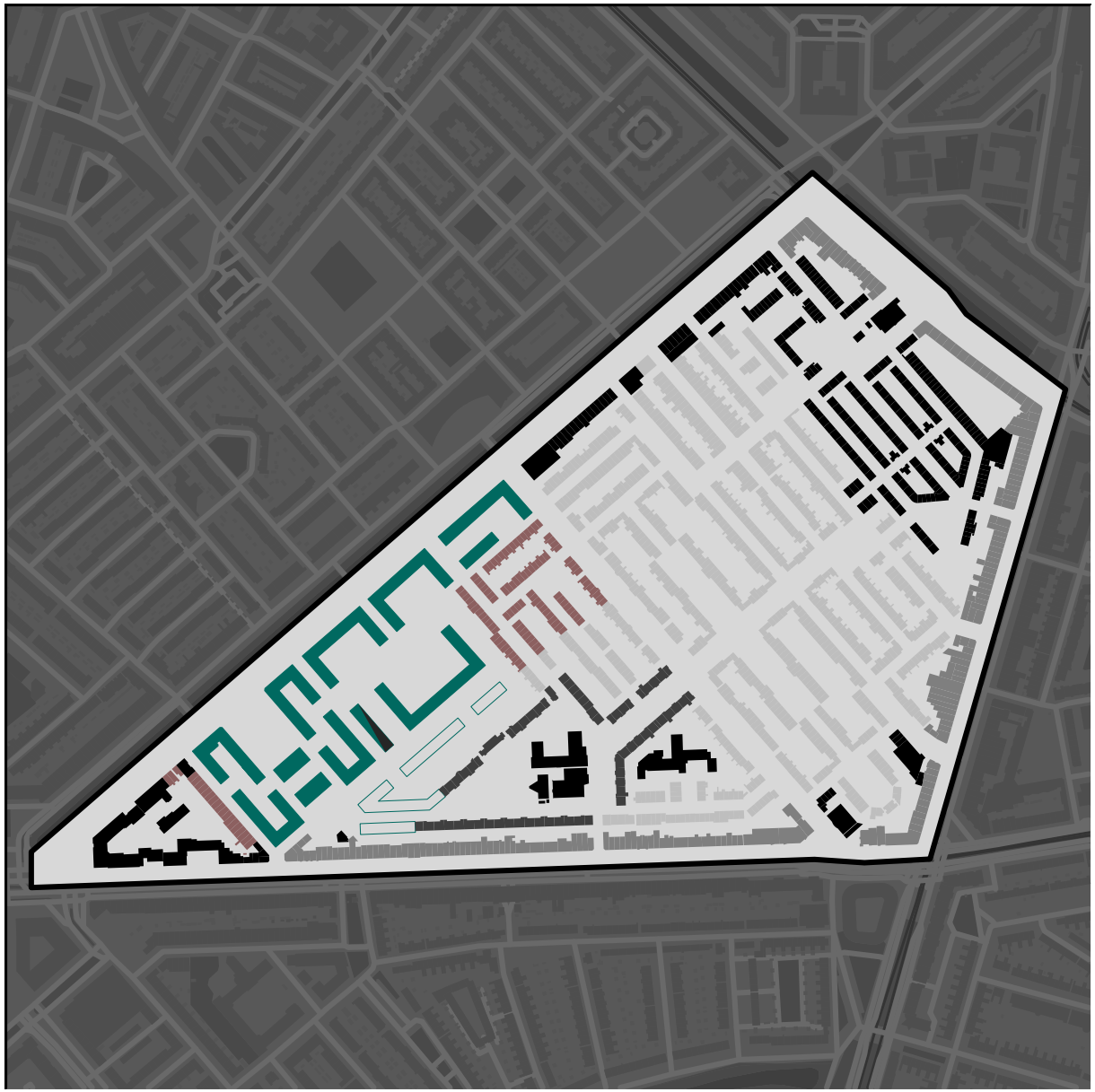


legend

- good foundations, save
- fix foundations, monument
- try not to demolish
- demolish
- surface
- bloemhof zuid border
- surroundings
- demolition
- new construction
- new buildings

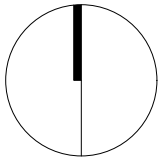


undisplacement on urban scale 07

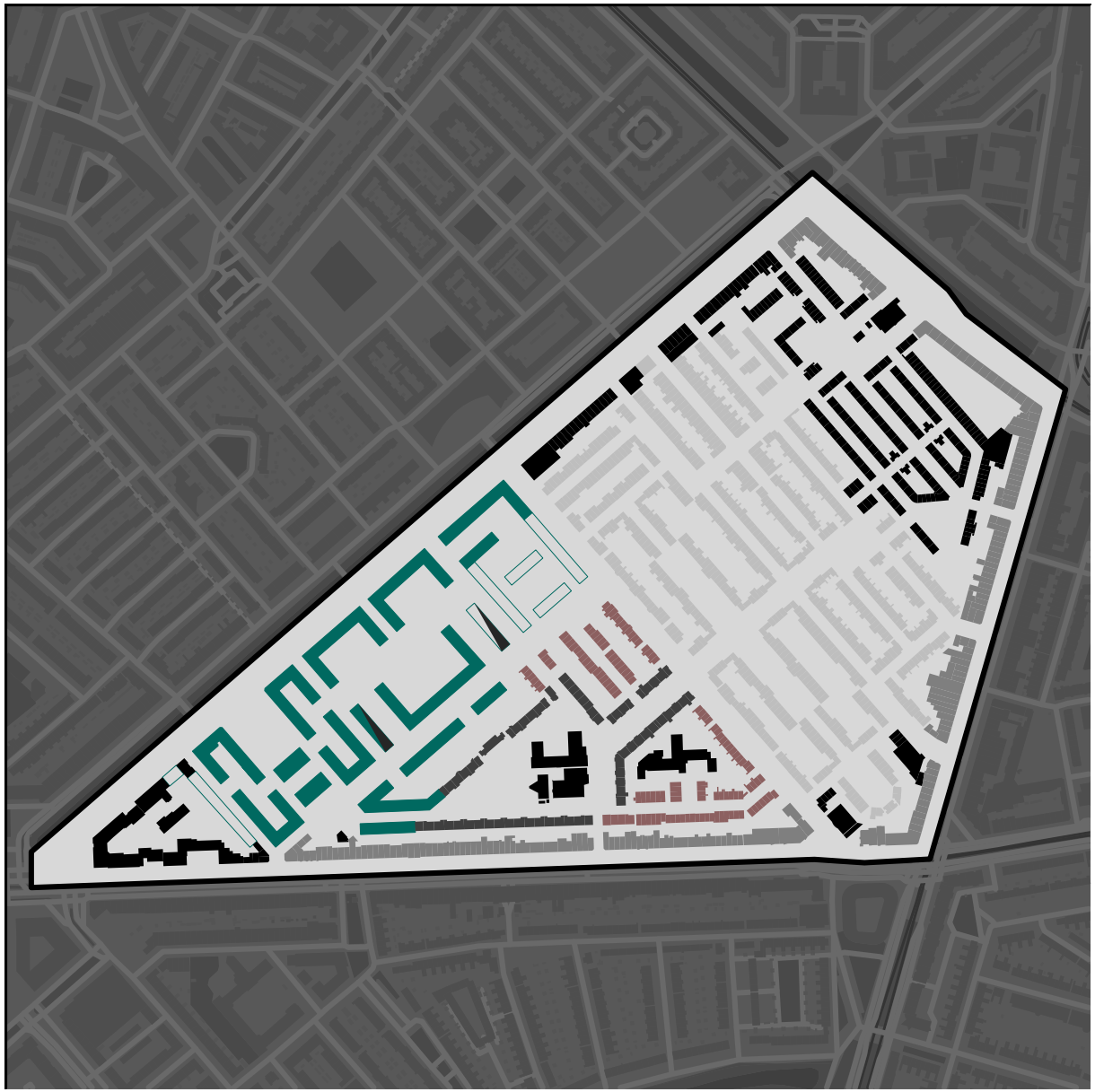


legend

- good foundations, save
- fix foundations, monument
- try not to demolish
- demolish
- surface
- bloemhof zuid border
- surroundings
- demolition
- new construction
- new buildings

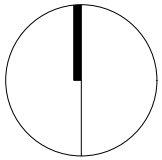


undisplacement on urban scale 08

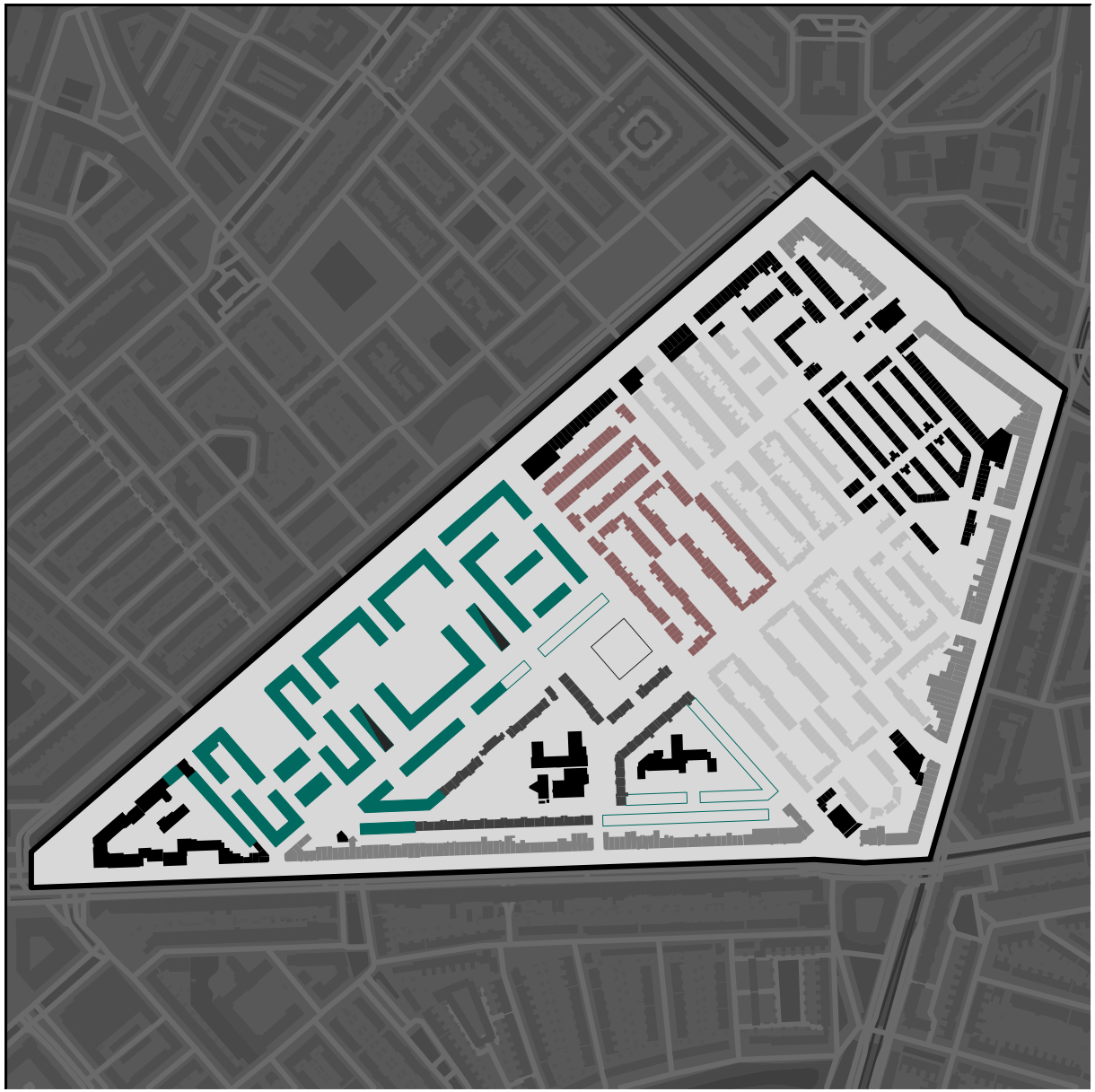


legend

- good foundations, save
- fix foundations, monument
- try not to demolish
- demolish
- surface
- bloemhof zuid border
- surroundings
- demolition
- new construction
- new buildings

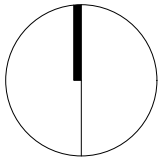


undisplacement on urban scale 09

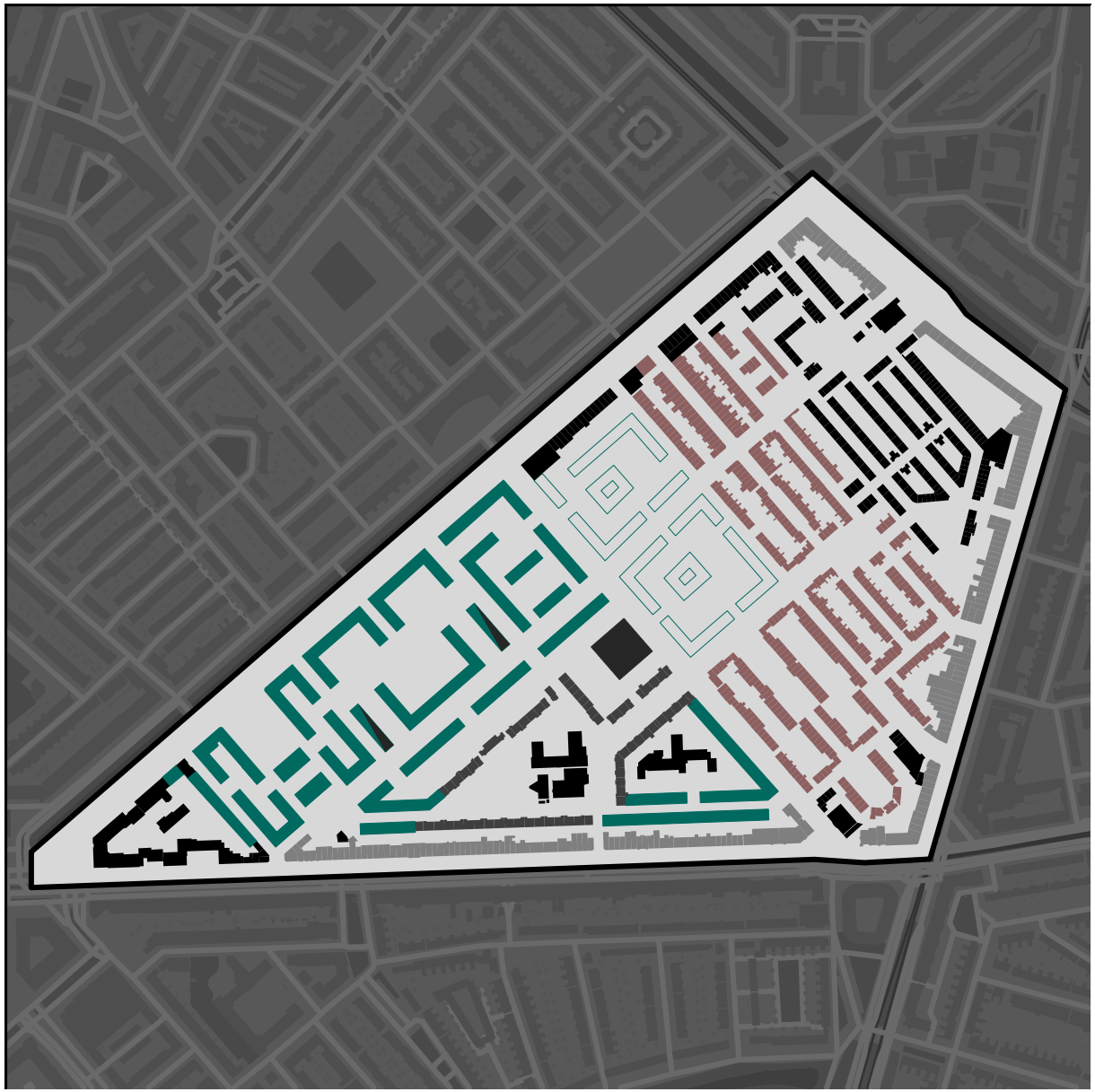


legend

- good foundations, save
- fix foundations, monument
- try not to demolish
- demolish
- surface
- bloemhof zuid border
- surroundings
- demolition
- new construction
- new buildings

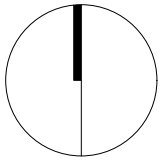


undisplacement on urban scale 10

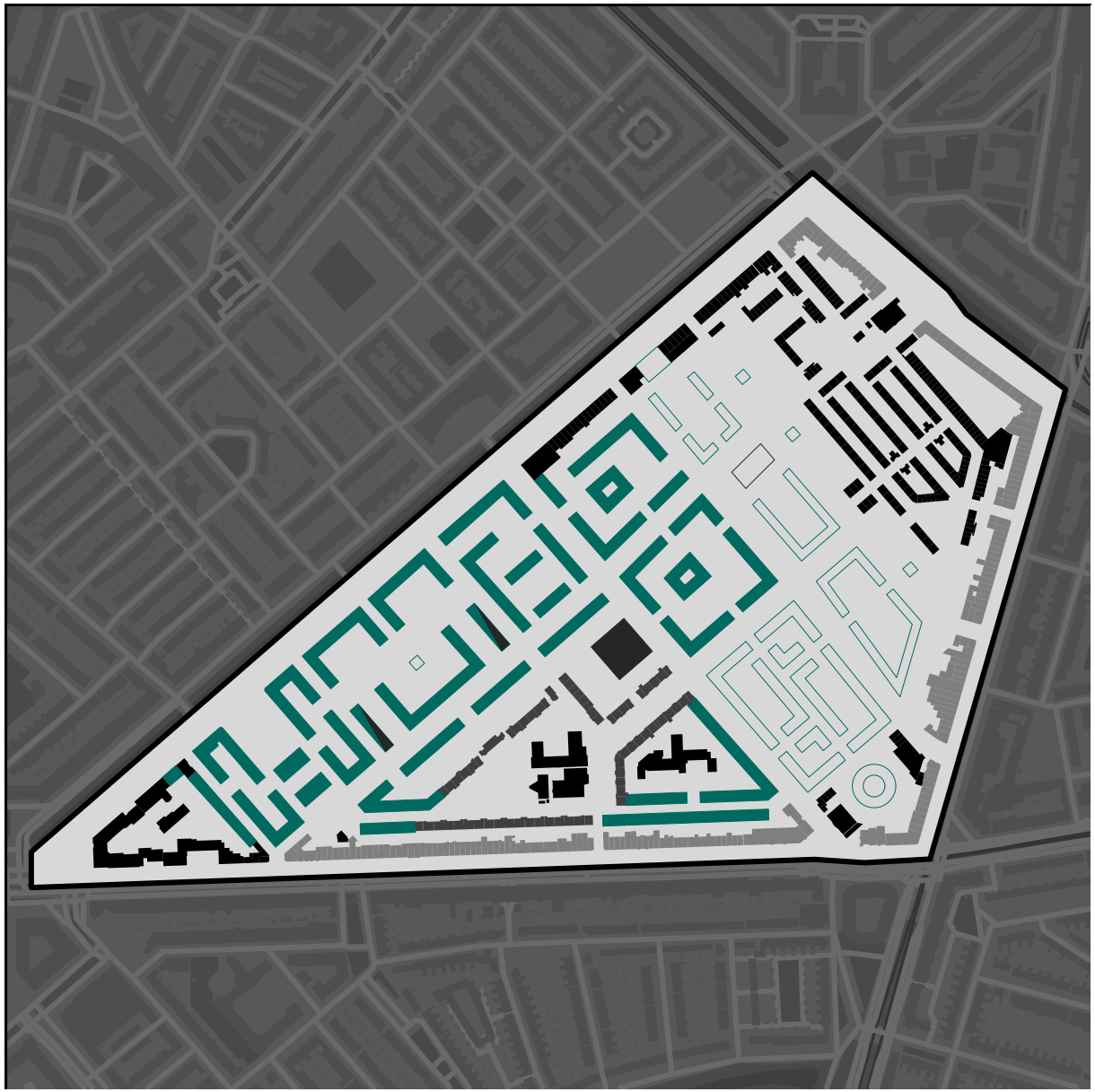


legend

- good foundations, save
- fix foundations, monument
- try not to demolish
- demolish
- surface
- bloemhof zuid border
- surroundings
- demolition
- new construction
- new buildings

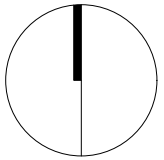


undisplacement on urban scale 11

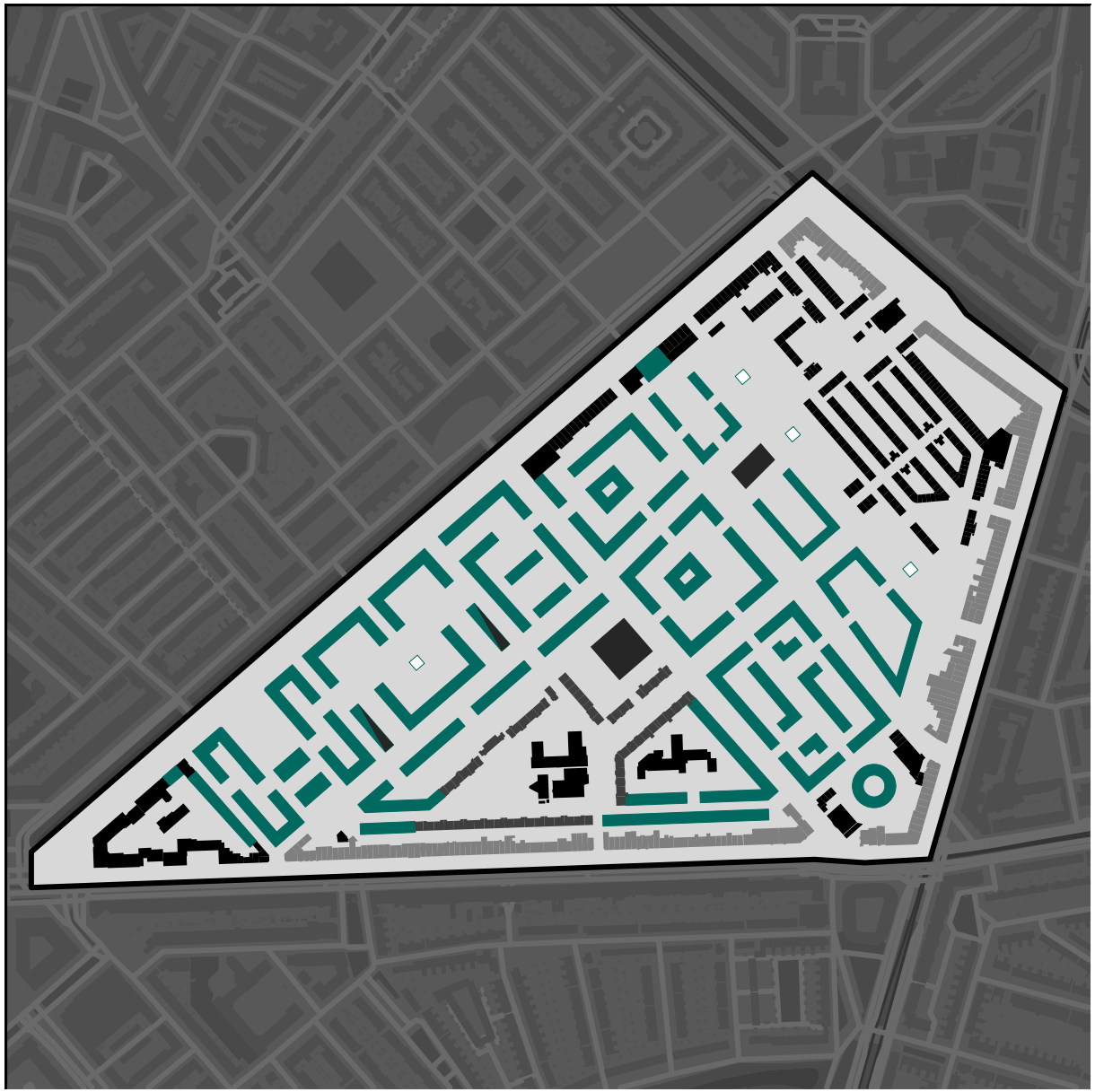


legend

- good foundations, save
- fix foundations, monument
- try not to demolish
- demolish
- surface
- bloemhof zuid border
- surroundings
- demolition
- new construction
- new buildings

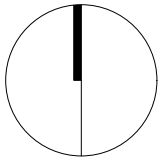


undisplacement on urban scale 12



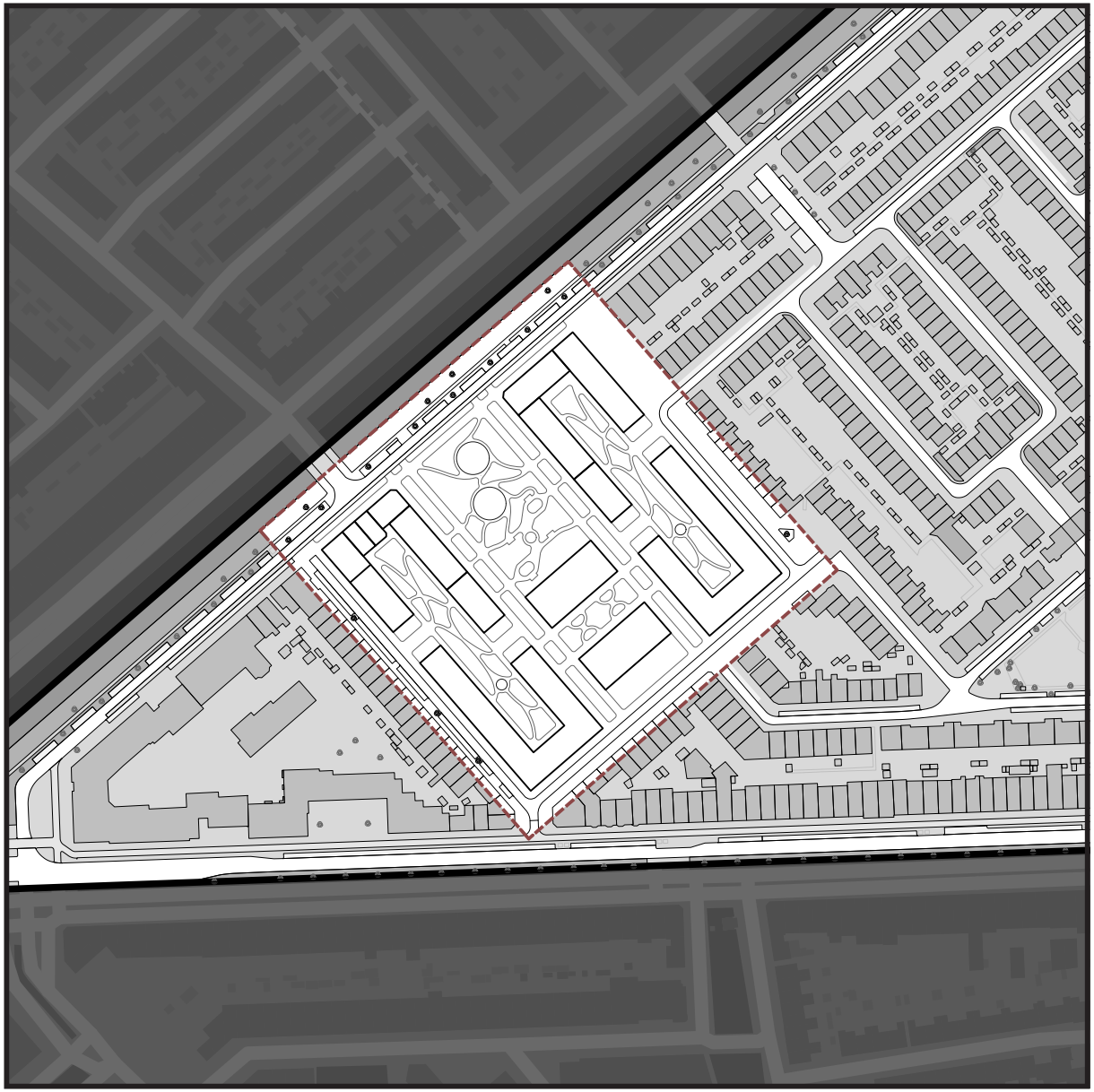
legend

- good foundations, save
- fix foundations, monument
- try not to demolish
- demolish
- surface
- bloemhof zuid border
- surroundings
- demolition
- new construction
- new buildings
- pavilions



urban plan concept

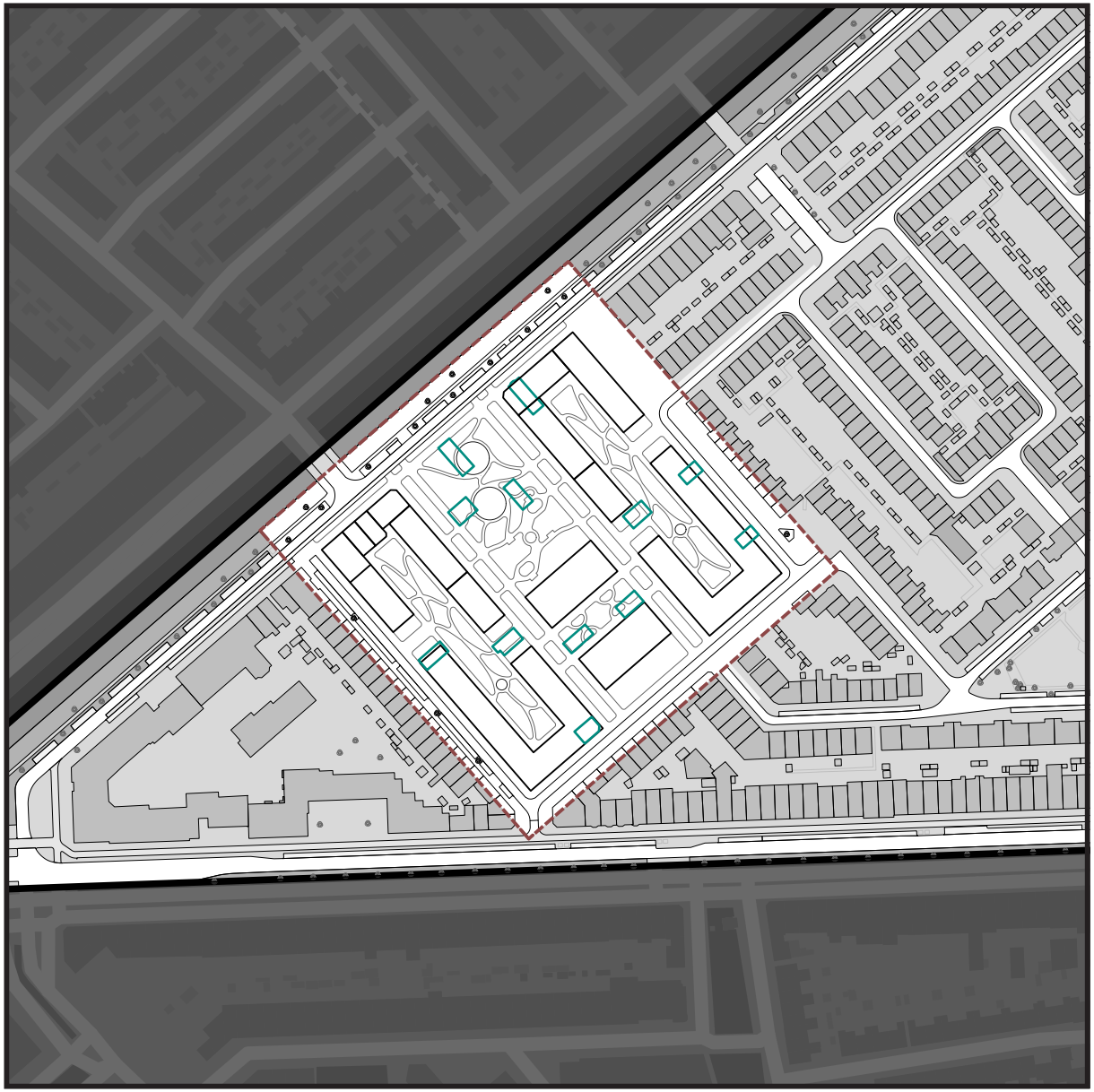
initial urban plan idea



legend

- water
- greenery
- existing buildings
- surface
- roads
- trees
- bloemhof zuid border
- surroundings
- site plan boundary
- new buildings

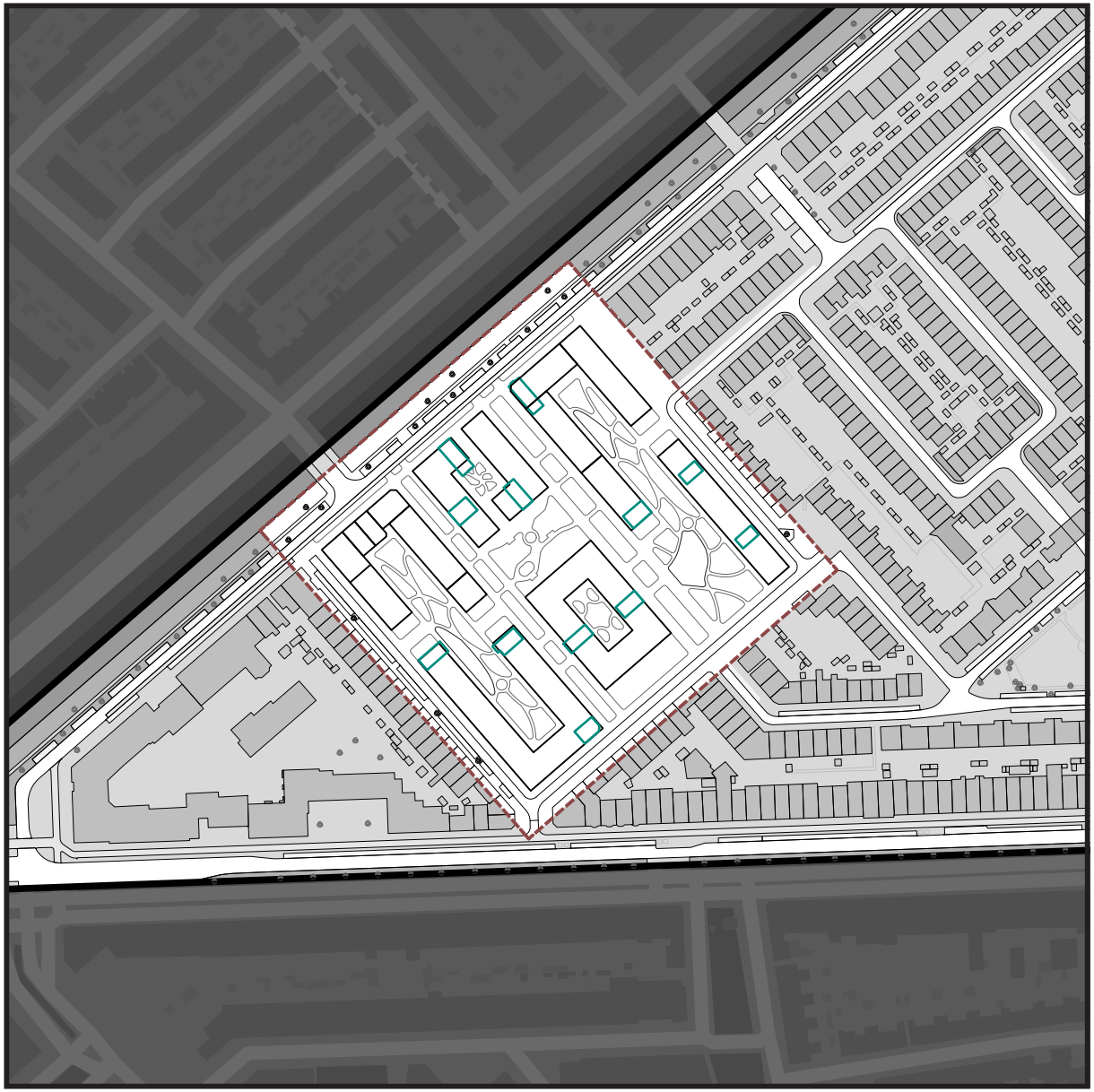
saving houses - opting out



legend

- water
- greenery
- existing buildings
- surface
- roads
- trees
- bloemhof zuid border
- surroundings
- site plan boundary
- new buildings
- buildings to save
- plan draft

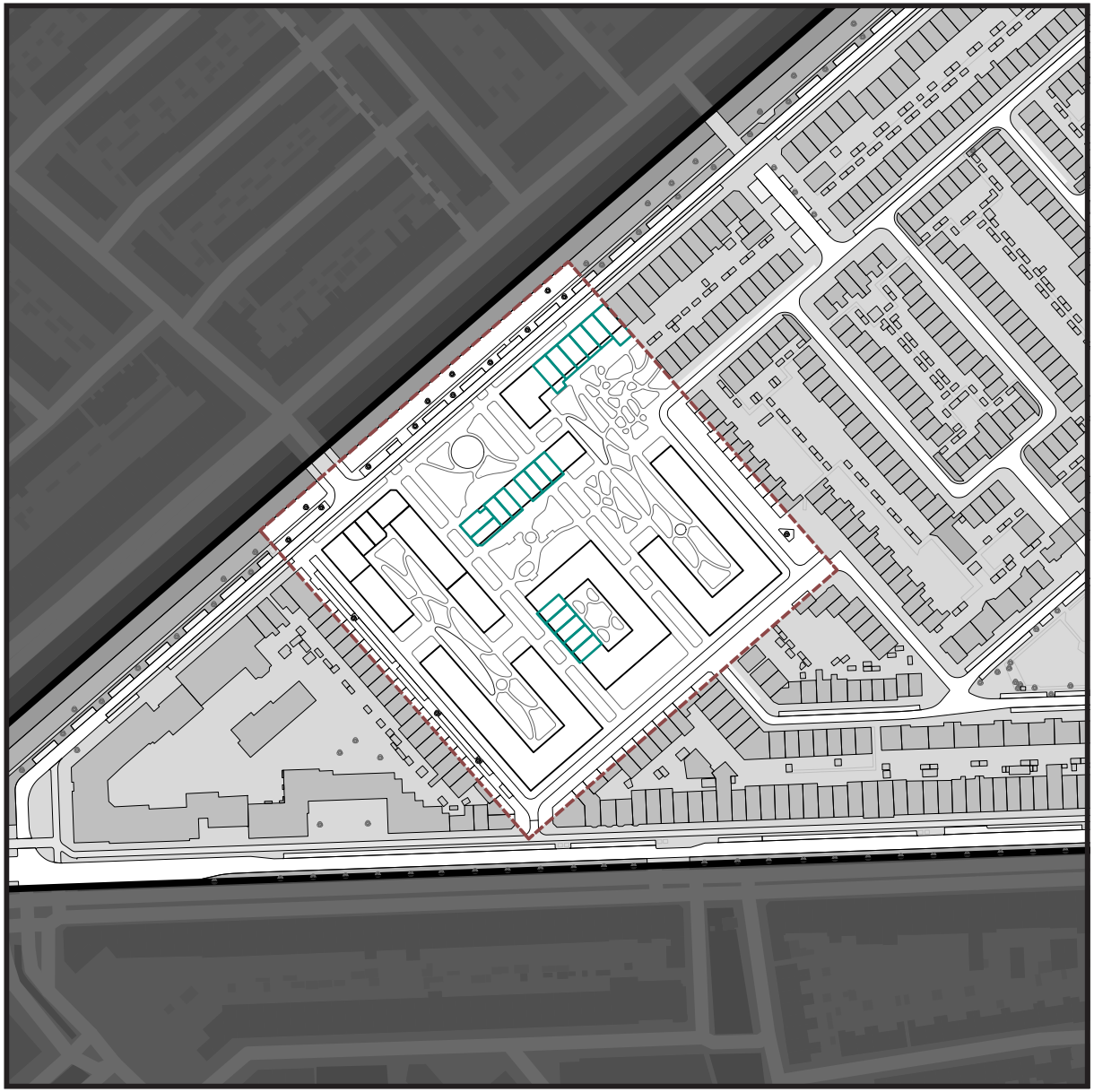
saved houses option 01



legend

- water
- greenery
- existing buildings
- surface
- roads
- trees
- bloemhof zuid border
- surroundings
- site plan boundary
- new buildings
- buildings to save
- plan draft

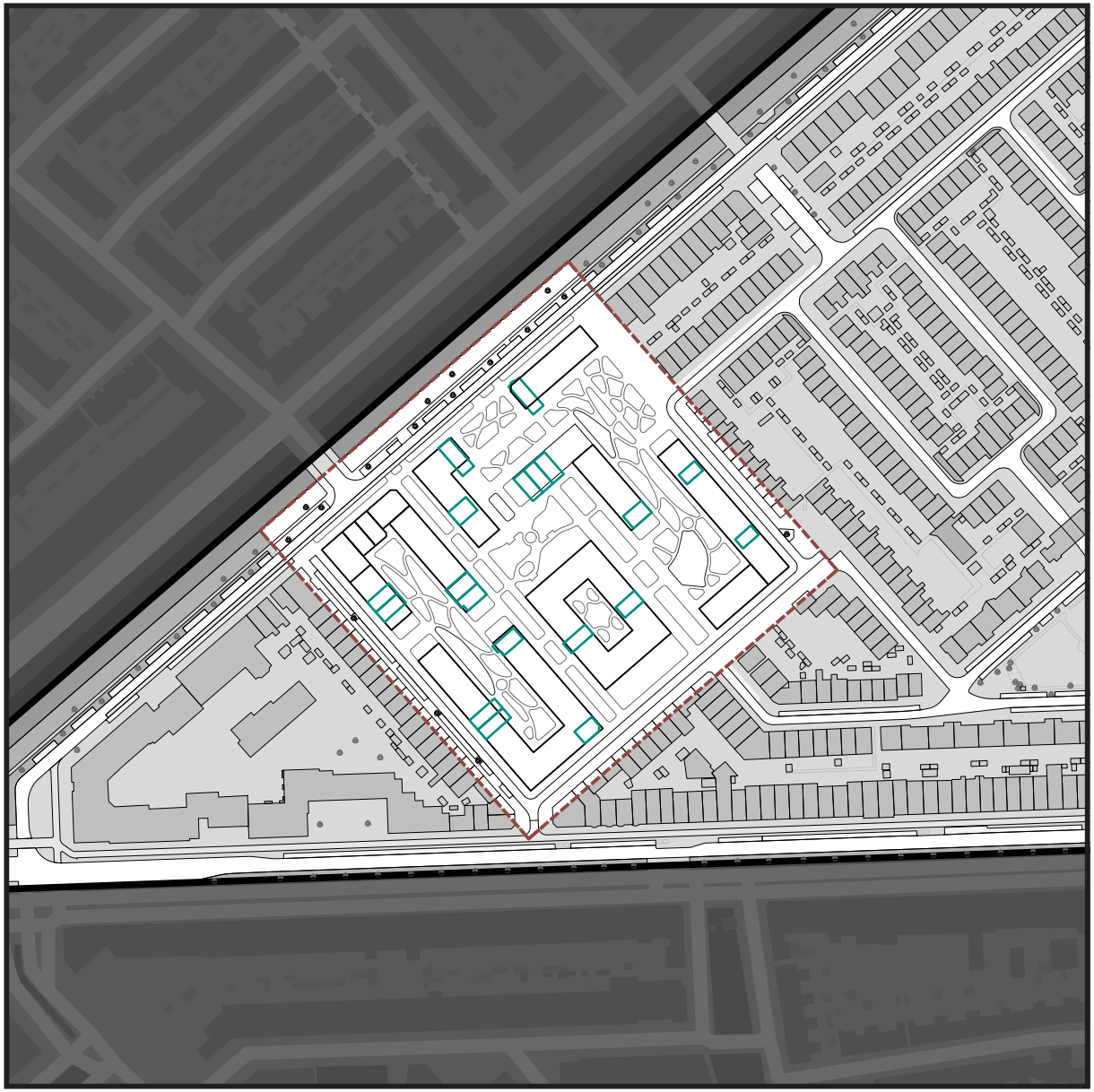
saved houses option 02



legend

- water
- greenery
- existing buildings
- surface
- roads
- trees
- bloemhof zuid border
- surroundings
- site plan boundary
- new buildings
- buildings to save
- plan draft

saved houses option 03



legend

- water
- greenery
- existing buildings
- surface
- roads
- trees
- bloemhof zuid border
- surroundings
- site plan boundary
- new buildings
- buildings to save
- plan draft

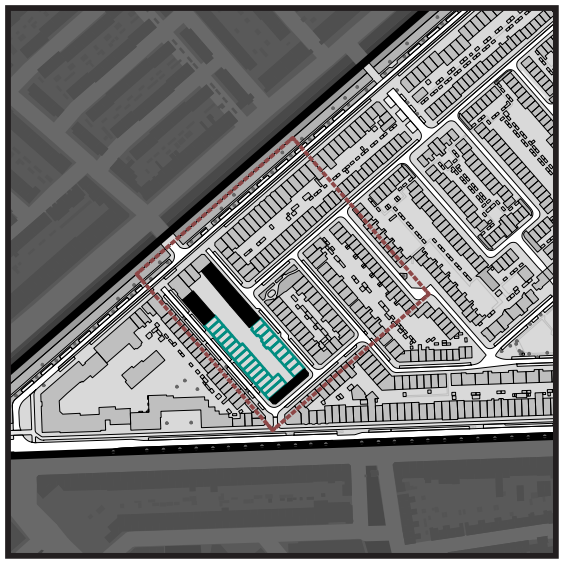
urban plan undisplacement process 01





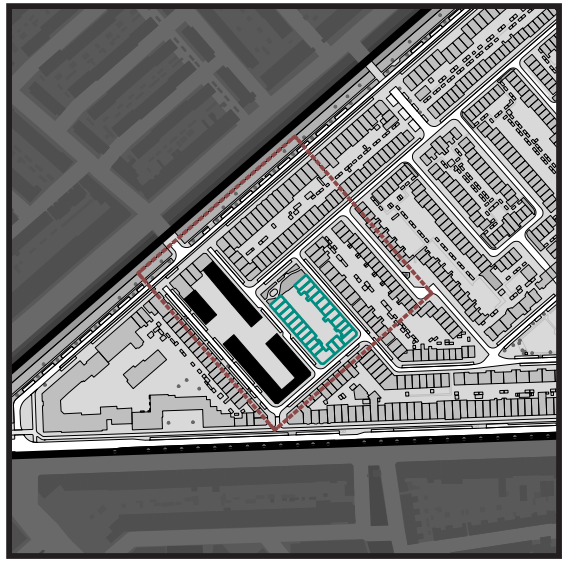


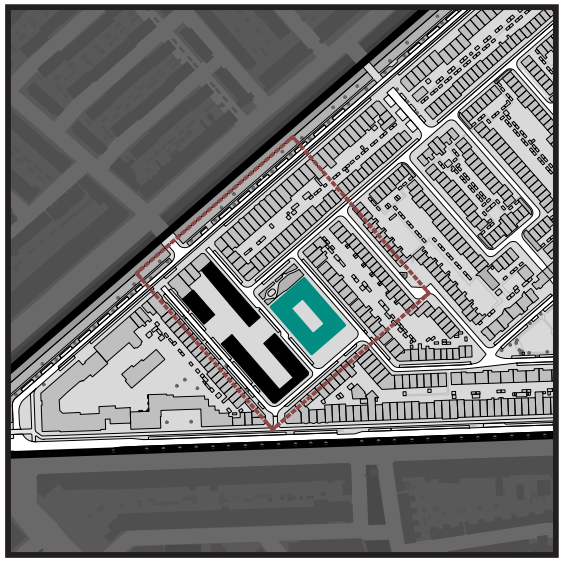


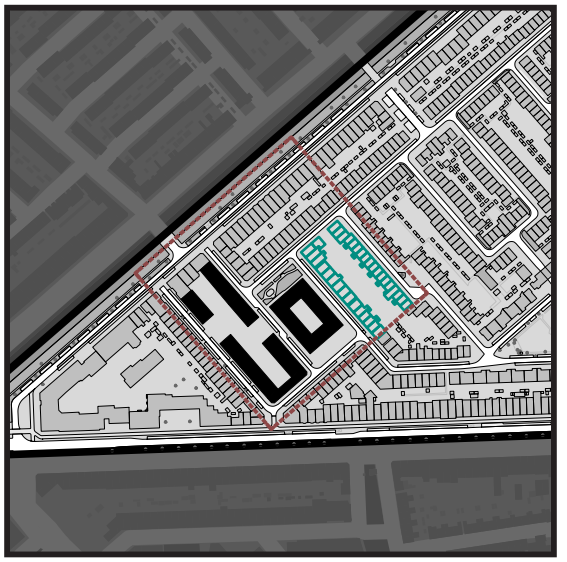


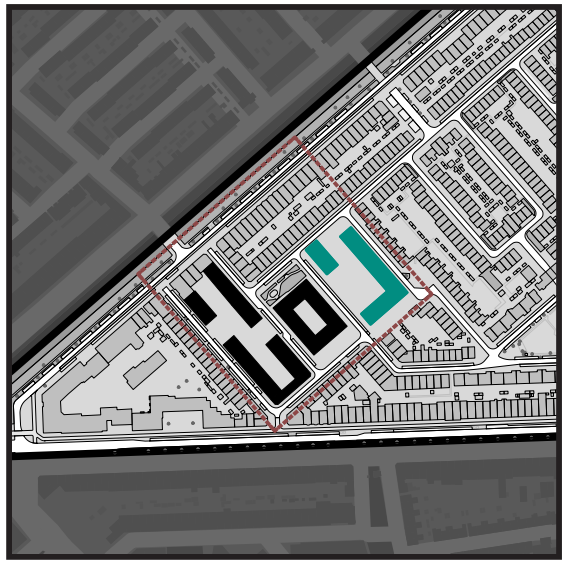


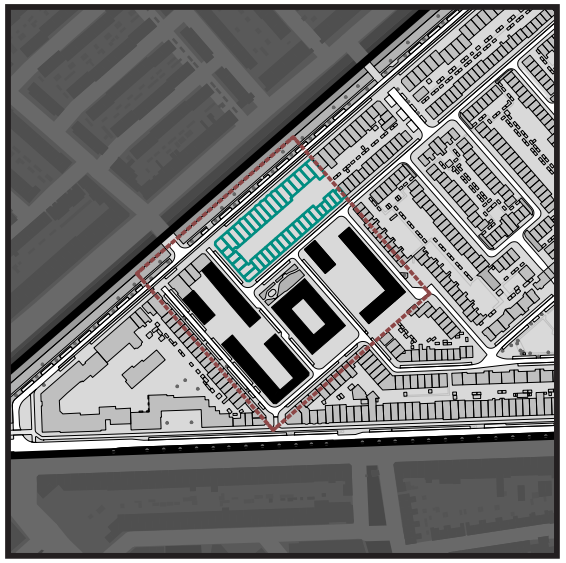
urban plan undisplacement process 02

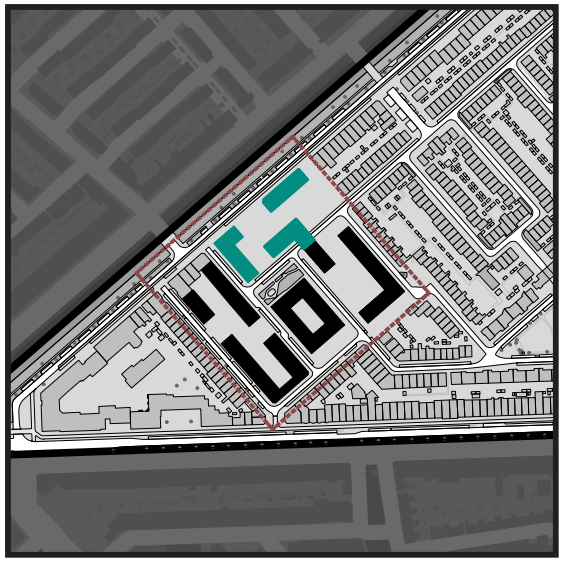




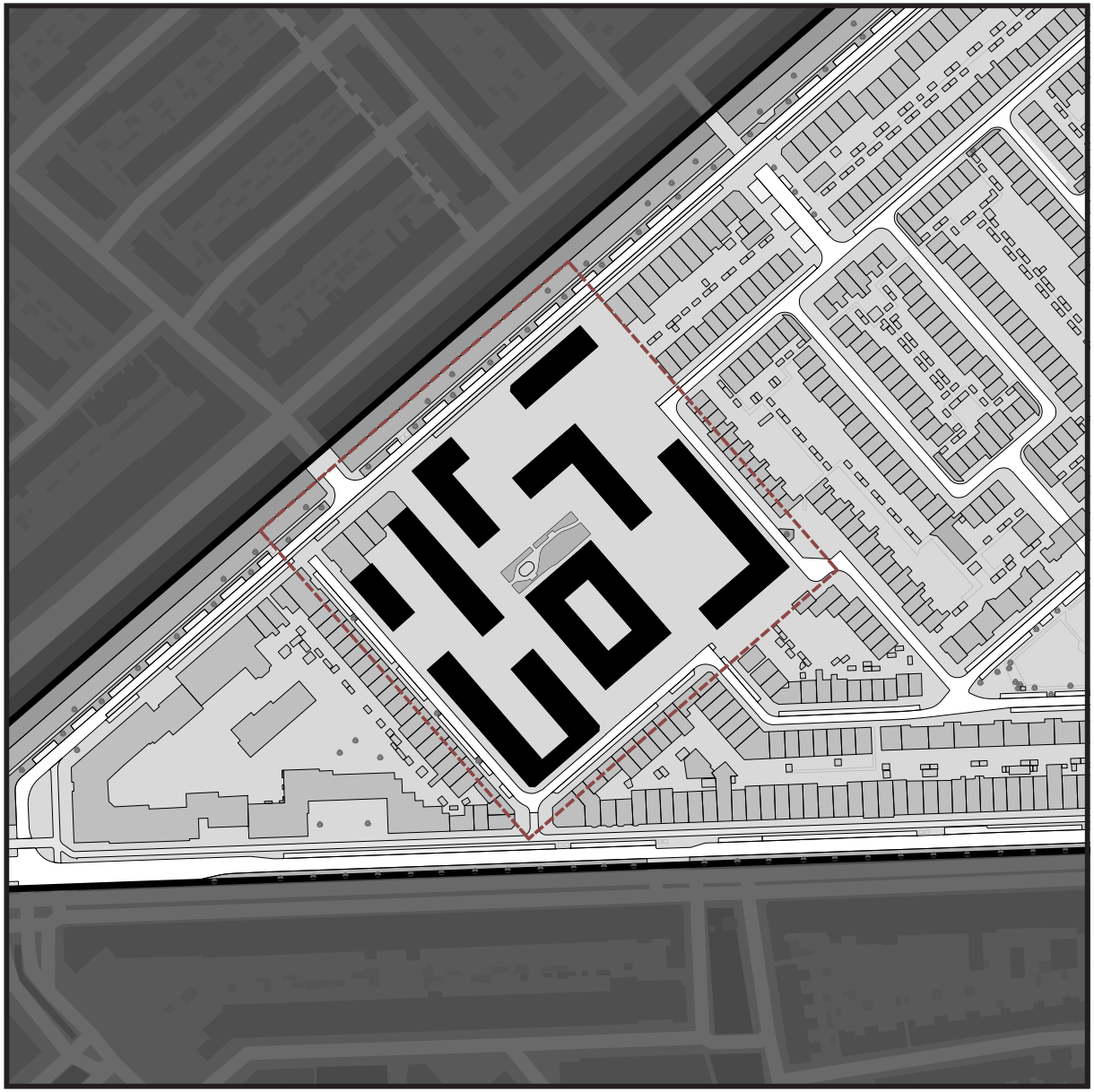








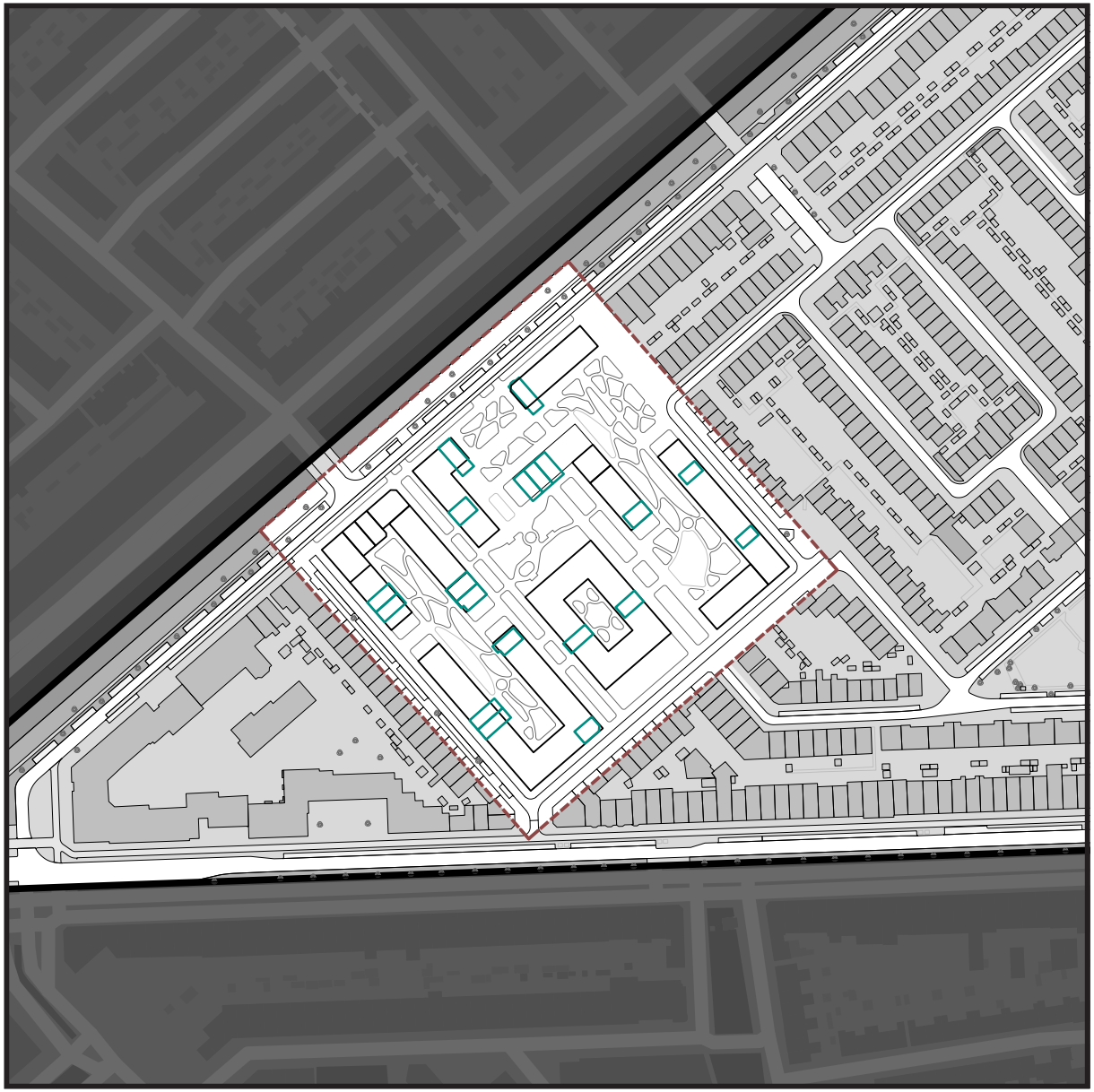
urban plan final building arrangement



legend

- water
- greenery
- existing buildings
- surface
- roads
- trees
- bloemhof zuid border
- surroundings
- site plan boundary
- new buildings

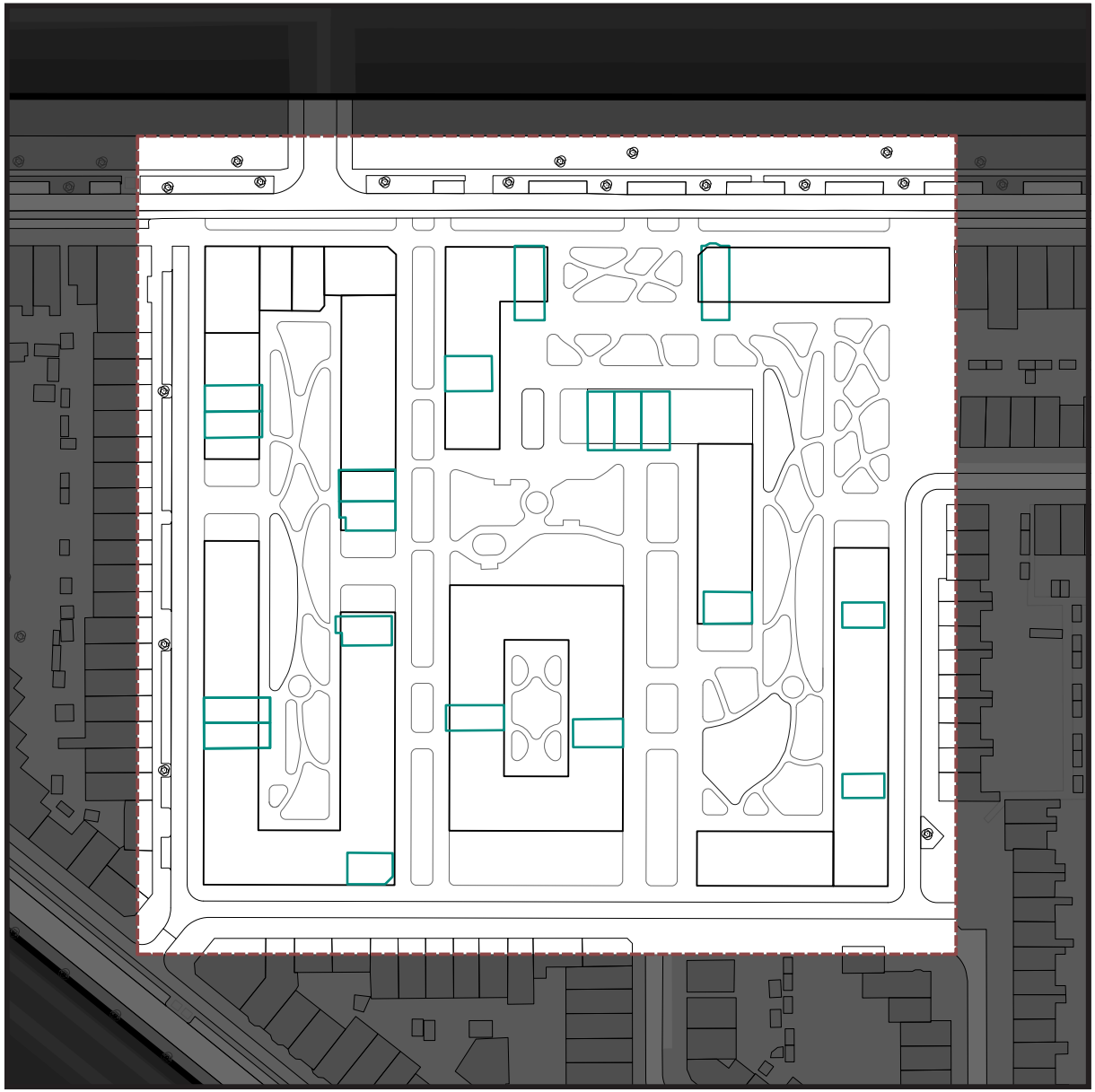
initial urban plan - re-arrangement



legend

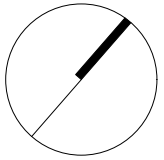
- water
- greenery
- existing buildings
- surface
- roads
- trees
- bloemhof zuid border
- surroundings
- site plan boundary
- new buildings
- buildings to save
- plan draft

initial urban plan - re-arrangement zoom in

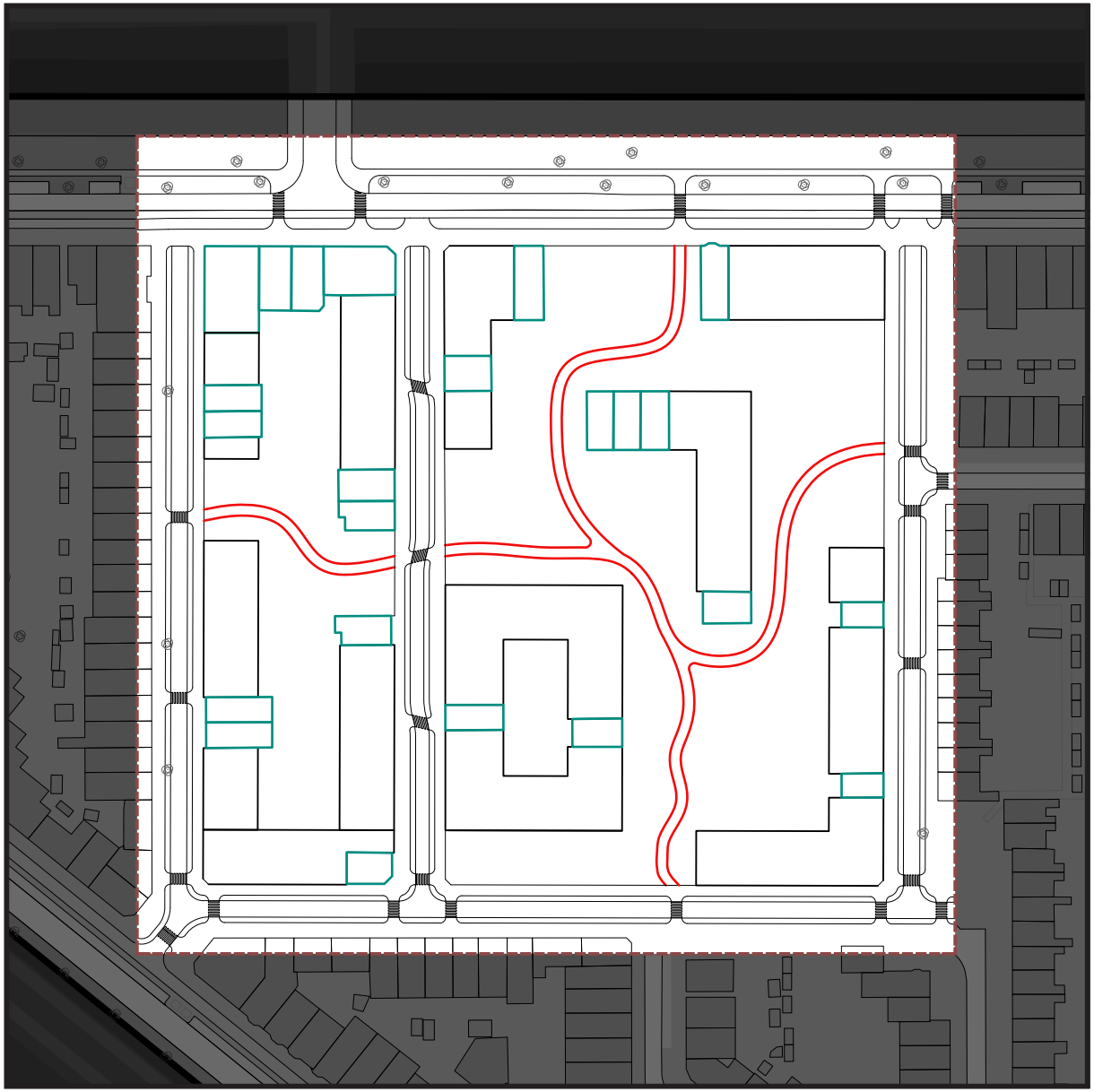


legend

- bloemhof zuid border
- surroundings
- site plan boundary
- new buildings
- buildings to save
- plan draft

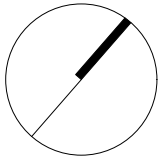


urban plan walking path



legend

- bloemhof zuid border
- surroundings
- site plan boundary
- new buildings
- buildings to save
- landscape track

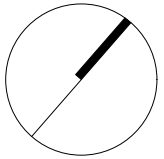


urban plan concept

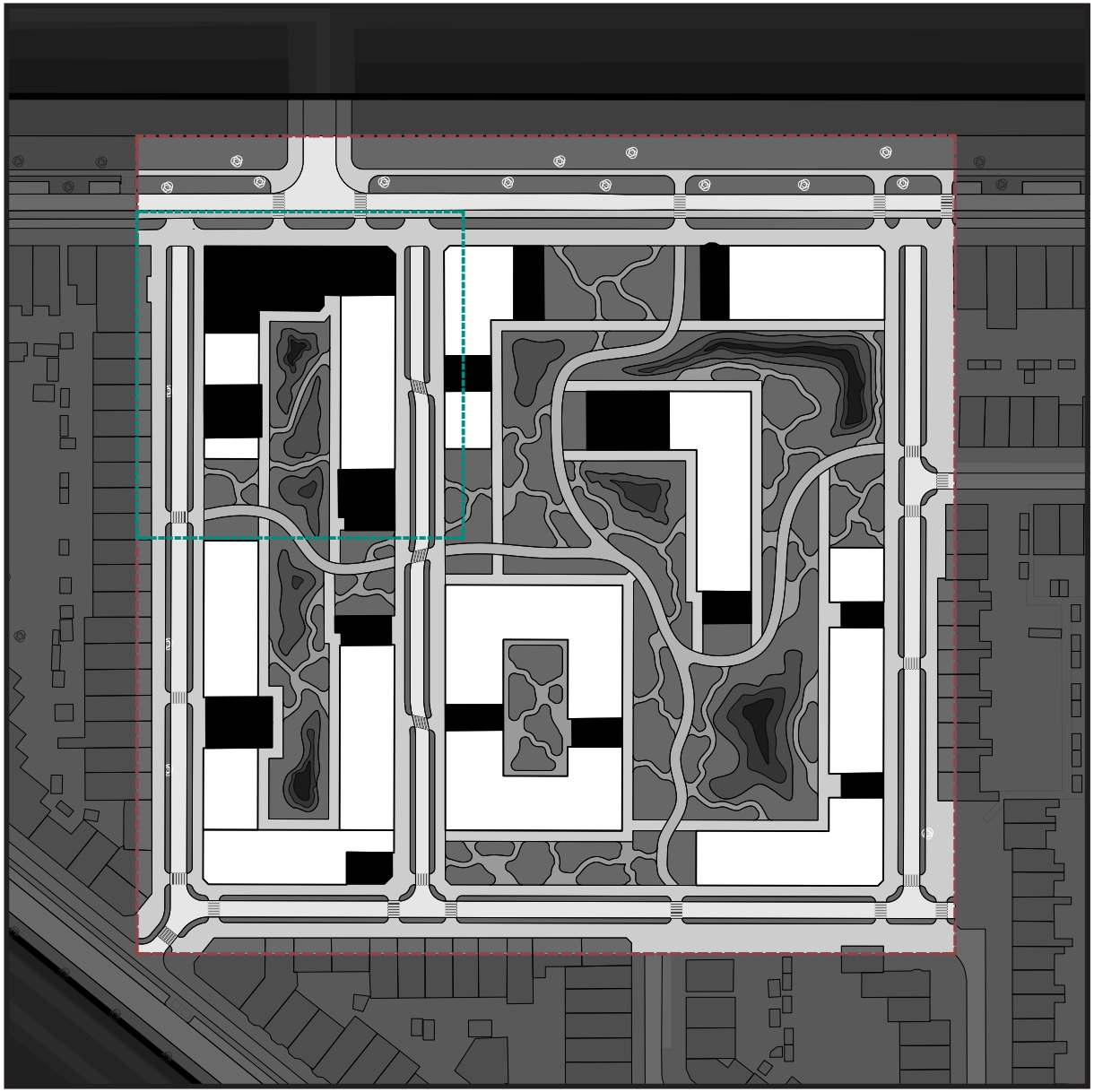


legend

- bloemhof zuid border
- surroundings
- site plan boundary
- new buildings
- saved buildings
- water
- max water
- wetland
- grass
- paths
- landscape track
- pavement
- road

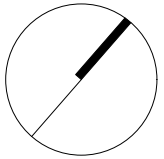


urban plan concept - design site



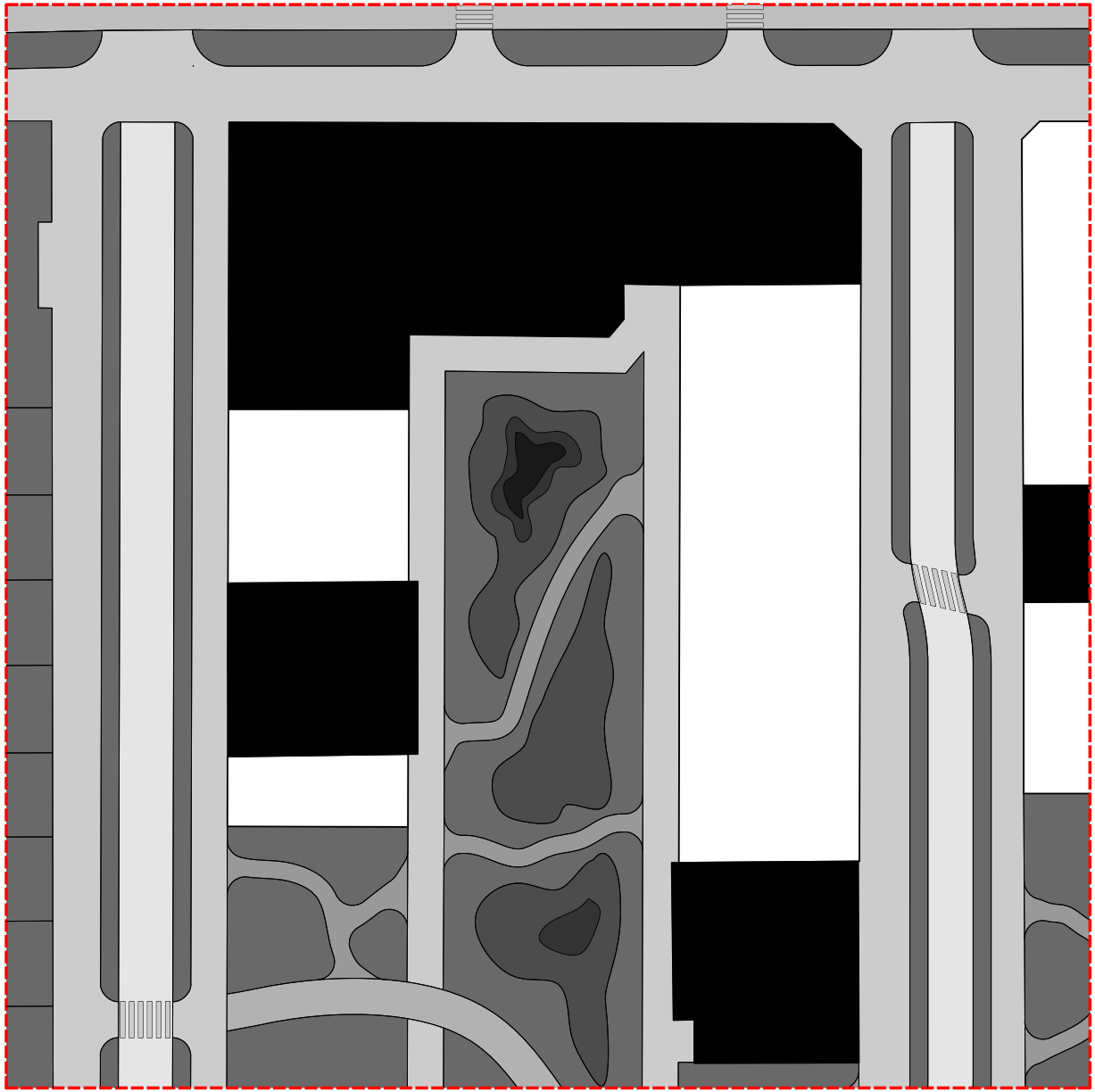
legend

- bloemhof zuid border
- surroundings
- site plan boundary
- new buildings
- saved buildings
- water
- max water
- wetland
- grass
- paths
- landscape track
- pavement
- road



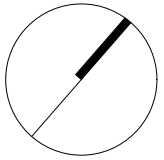
site plan concept

site plan area



legend

- site plan boundary
- new buildings
- saved buildings
- water
- max water
- wetland
- grass
- paths
- landscape track
- pavement
- road

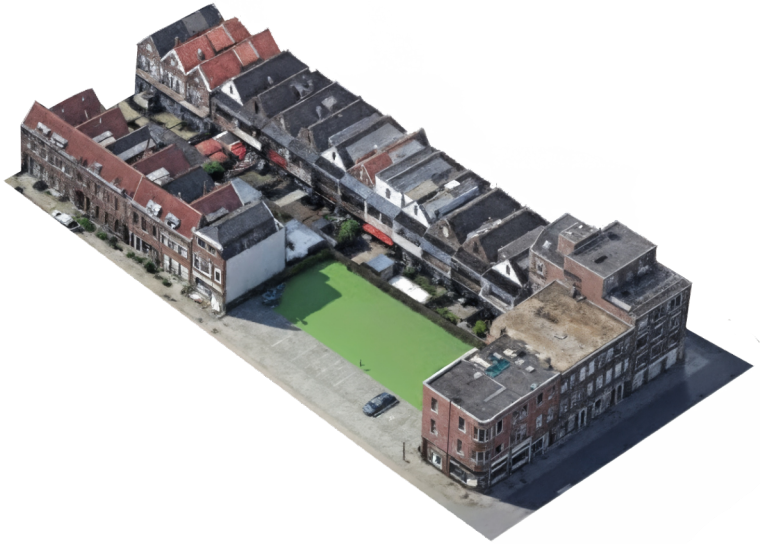


site plan existing situation



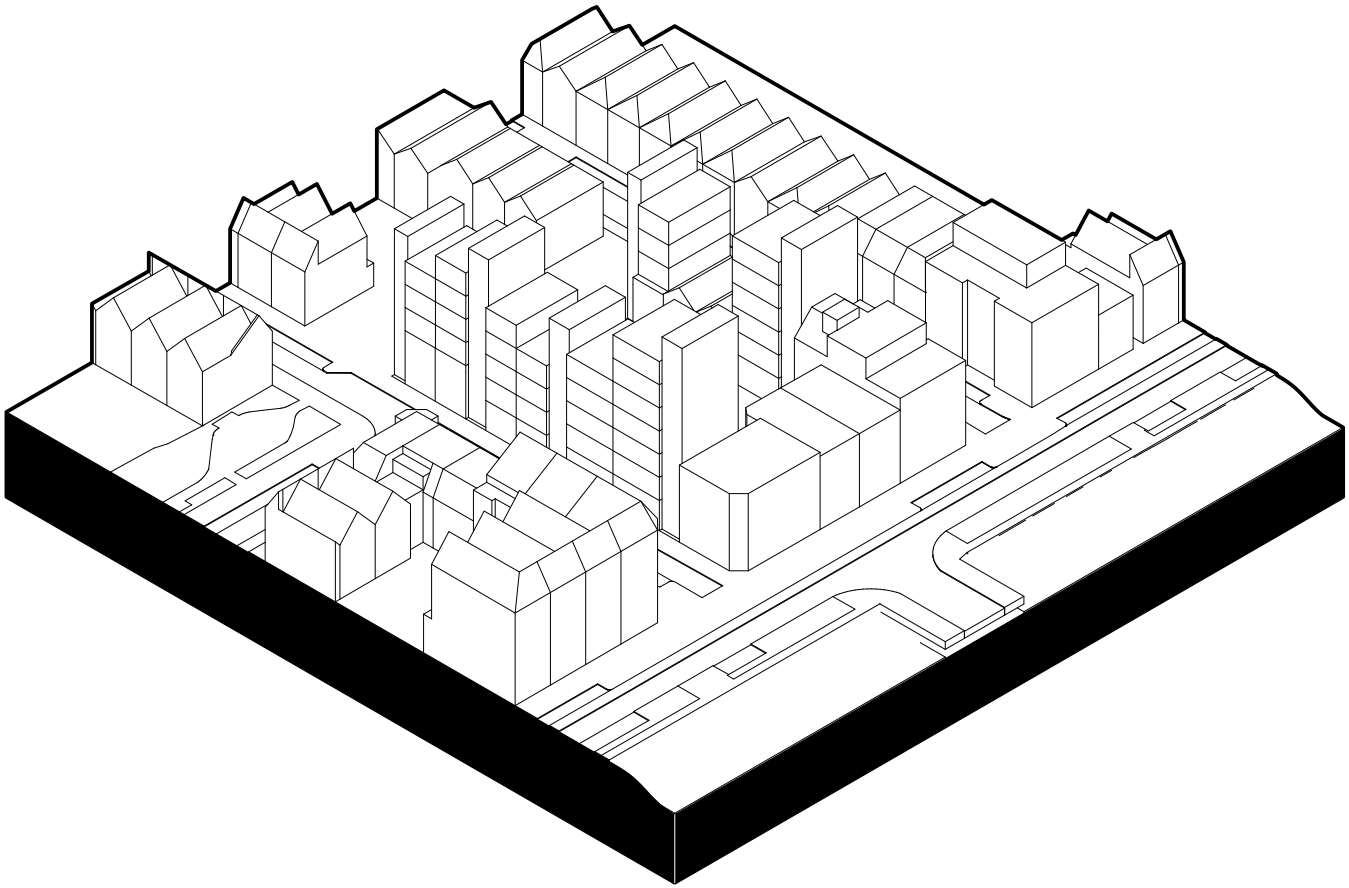
site photos



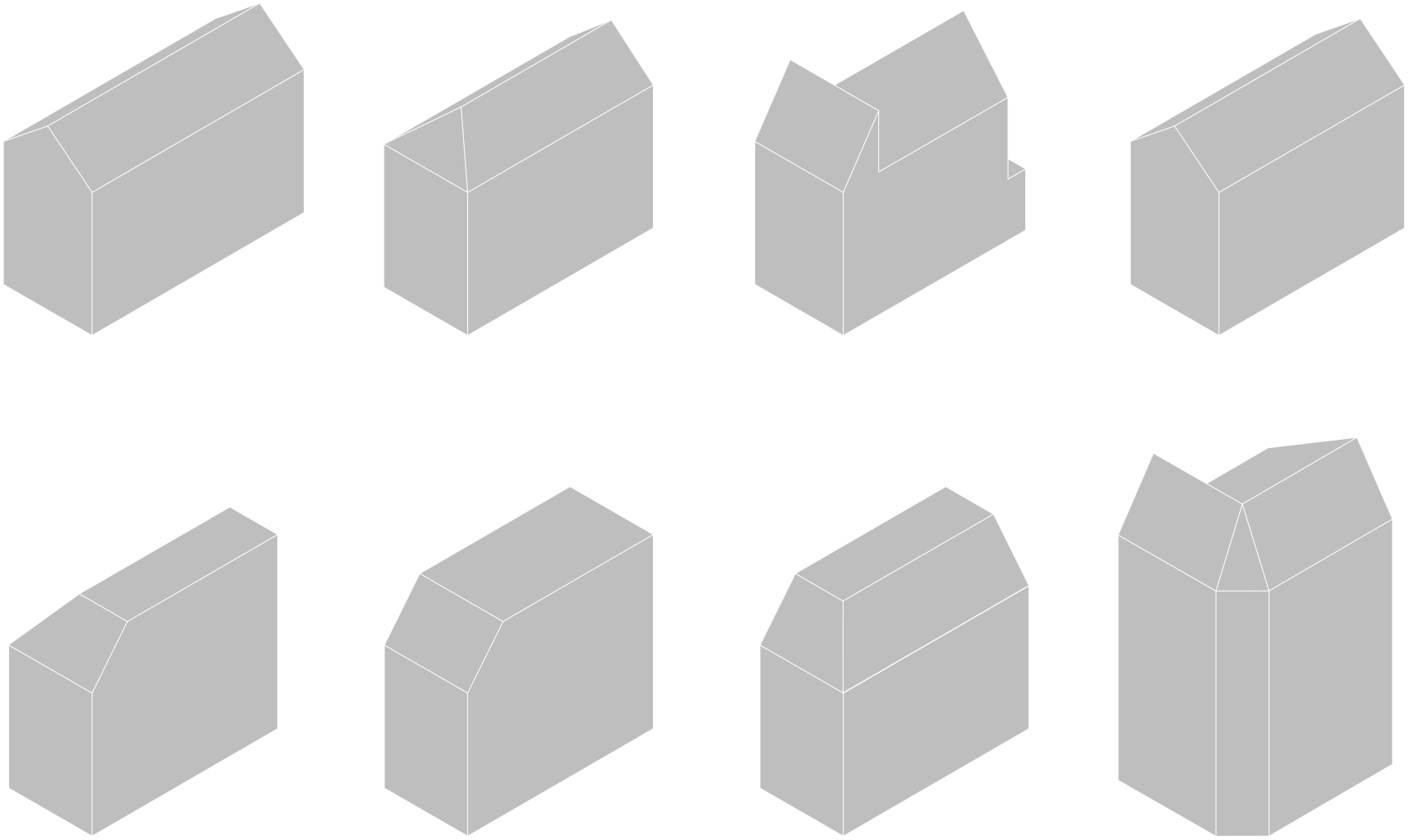




site plan - buildings

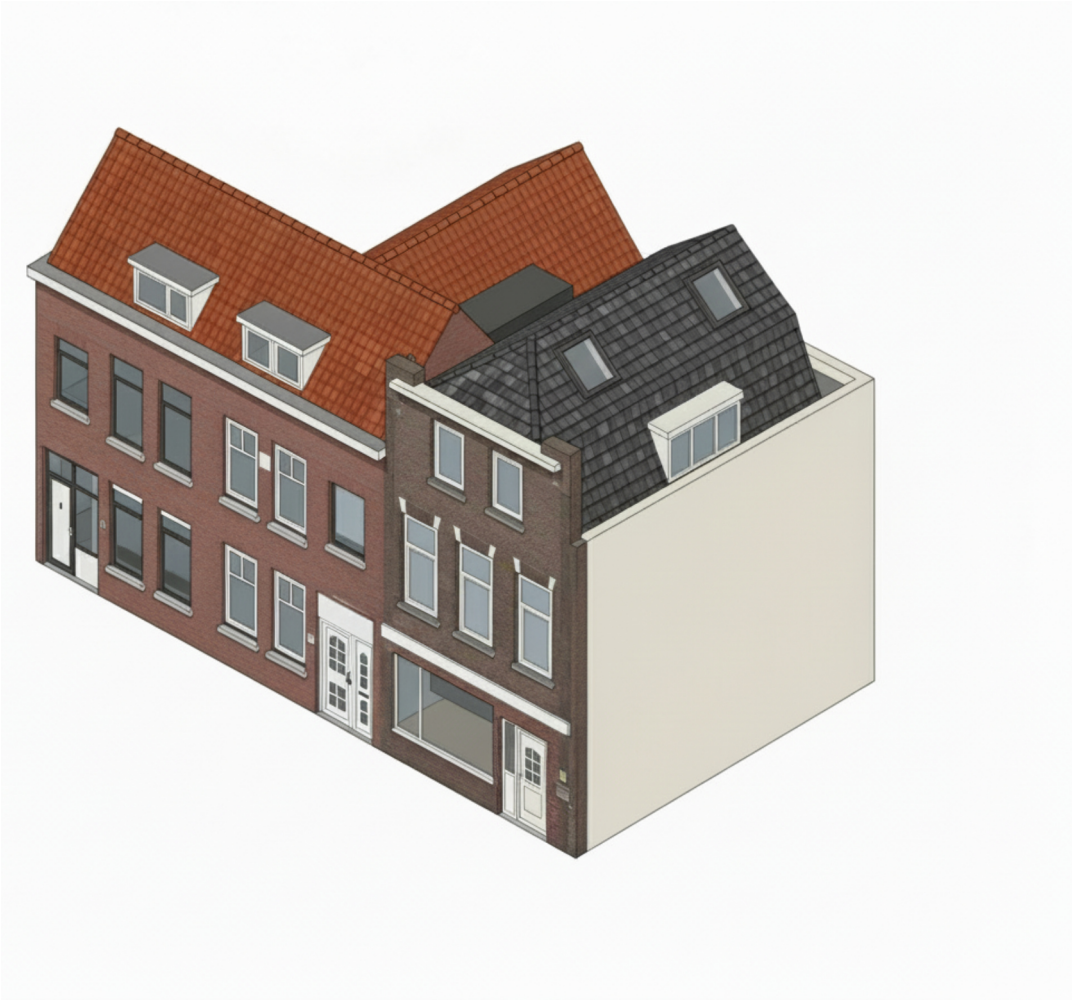


building types introduction

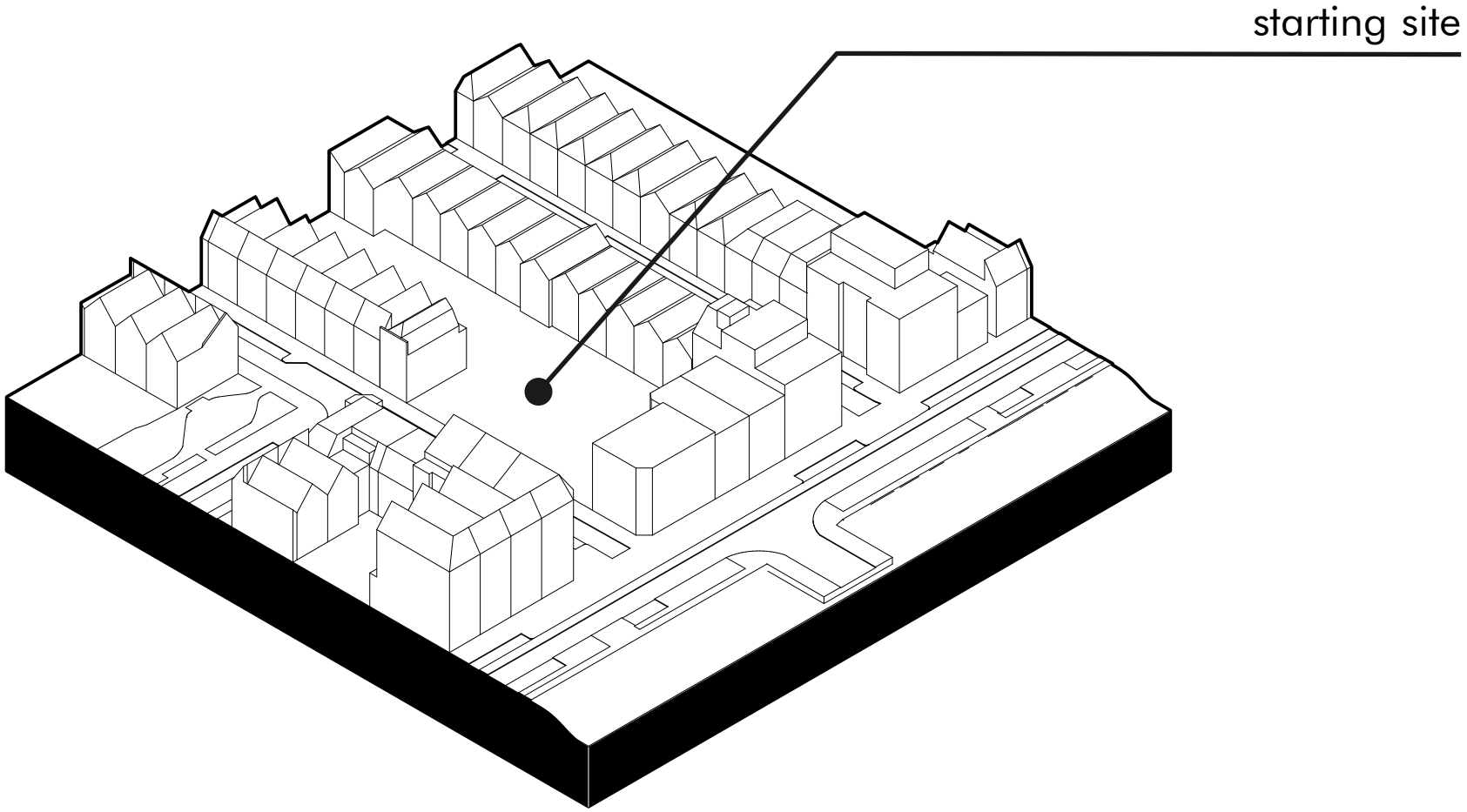


site construction hub

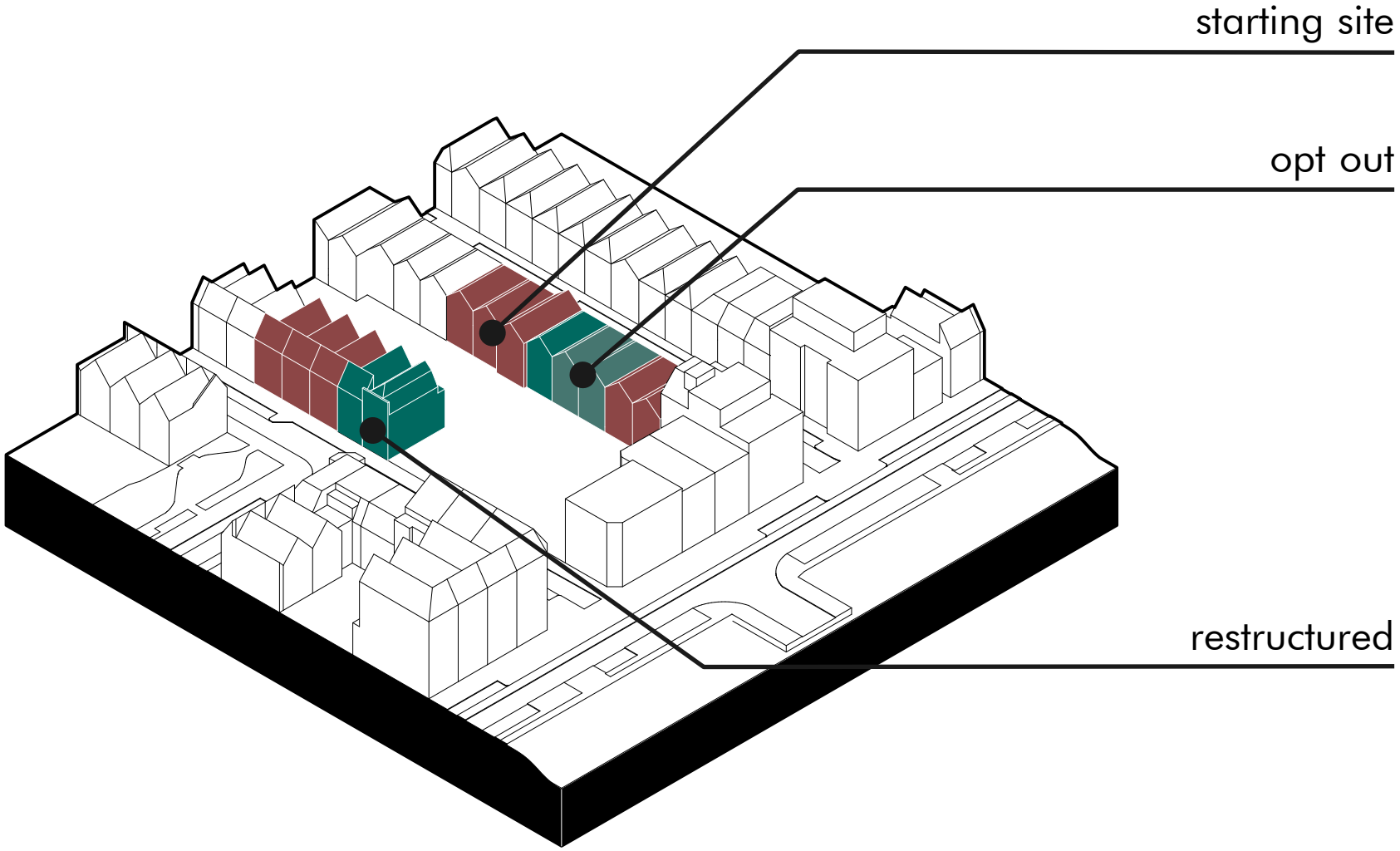




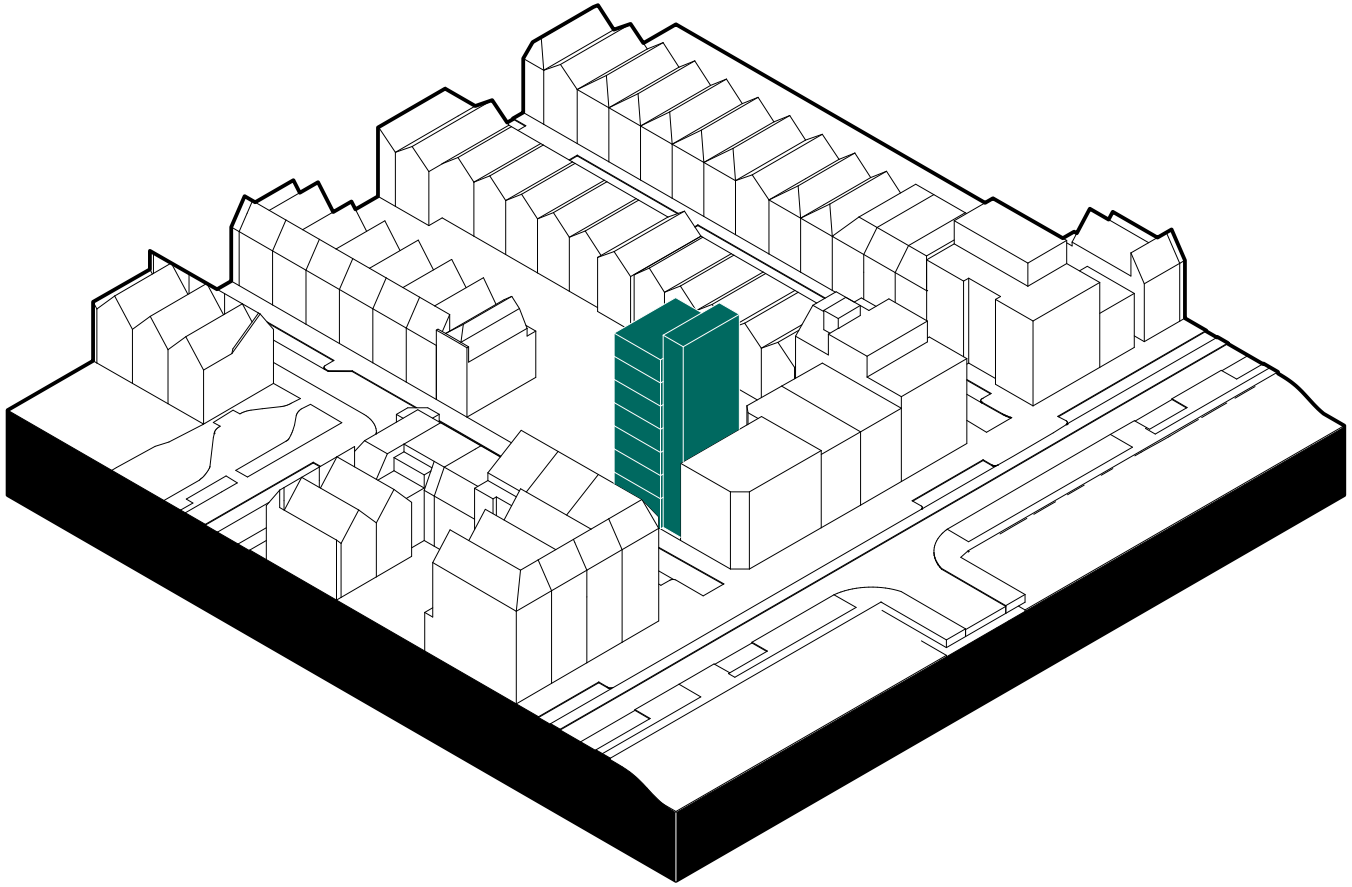
site existing state



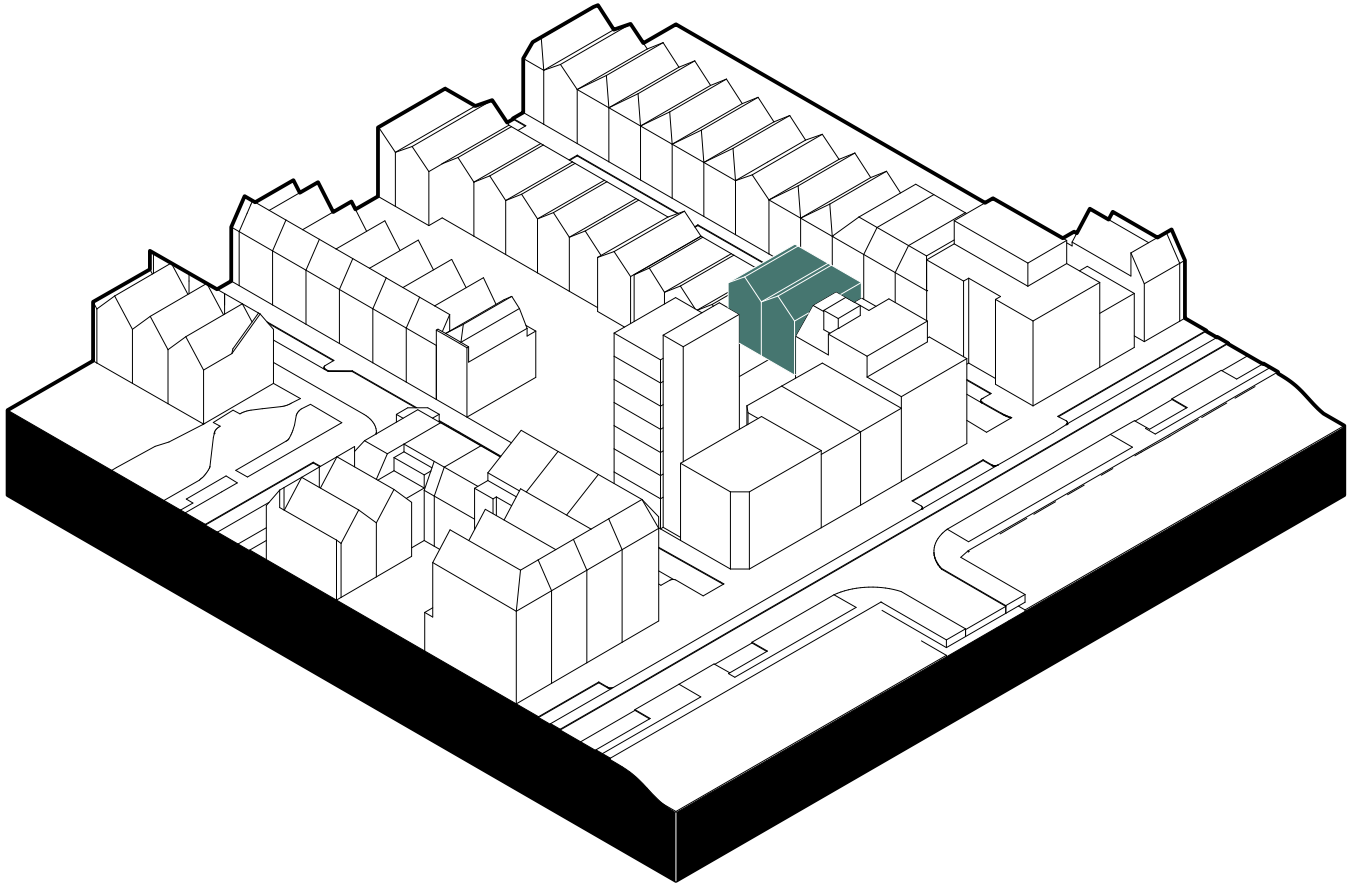
demoliton plan



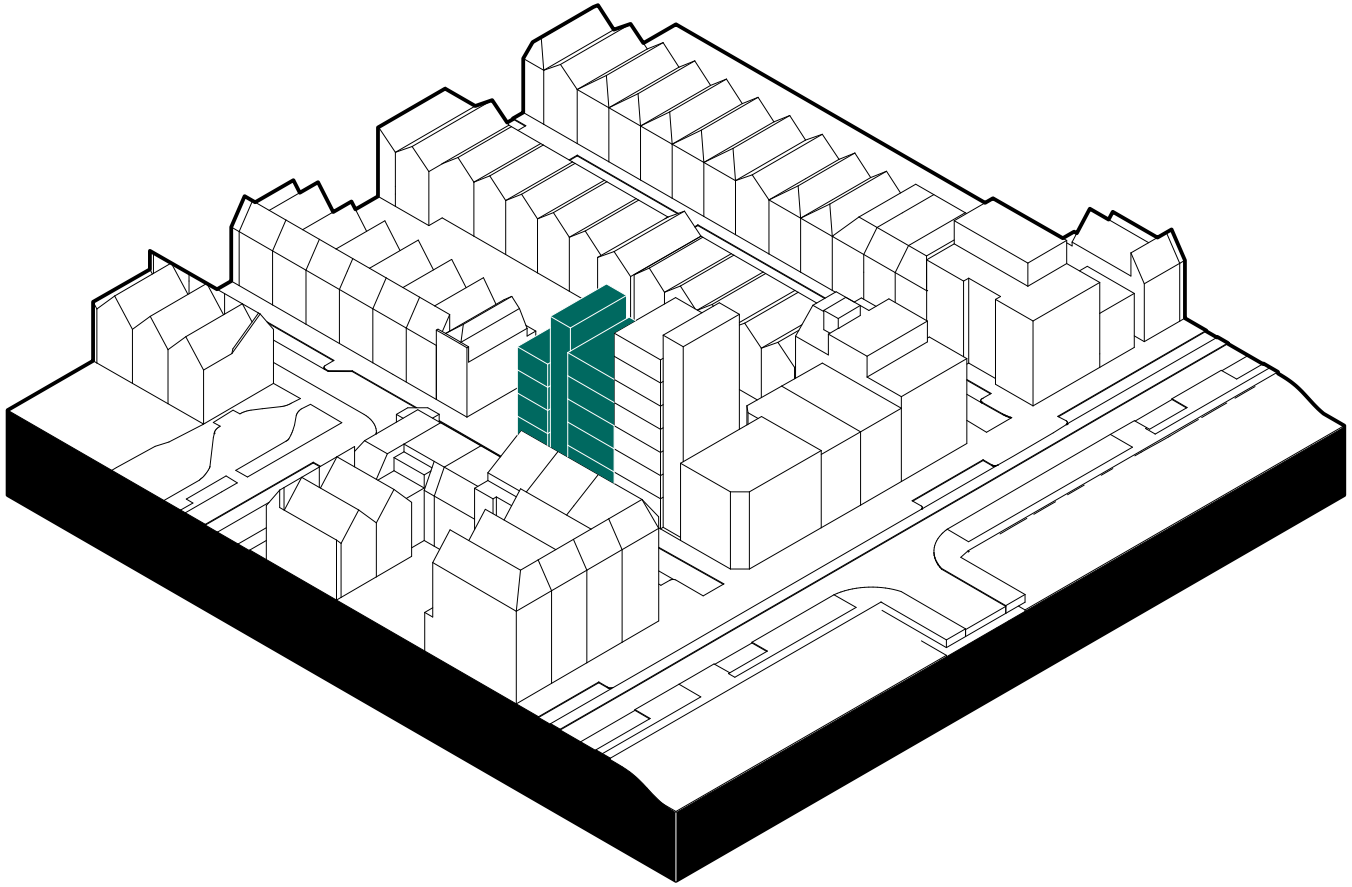
site phasing 01



site phasing 02



site phasing 03



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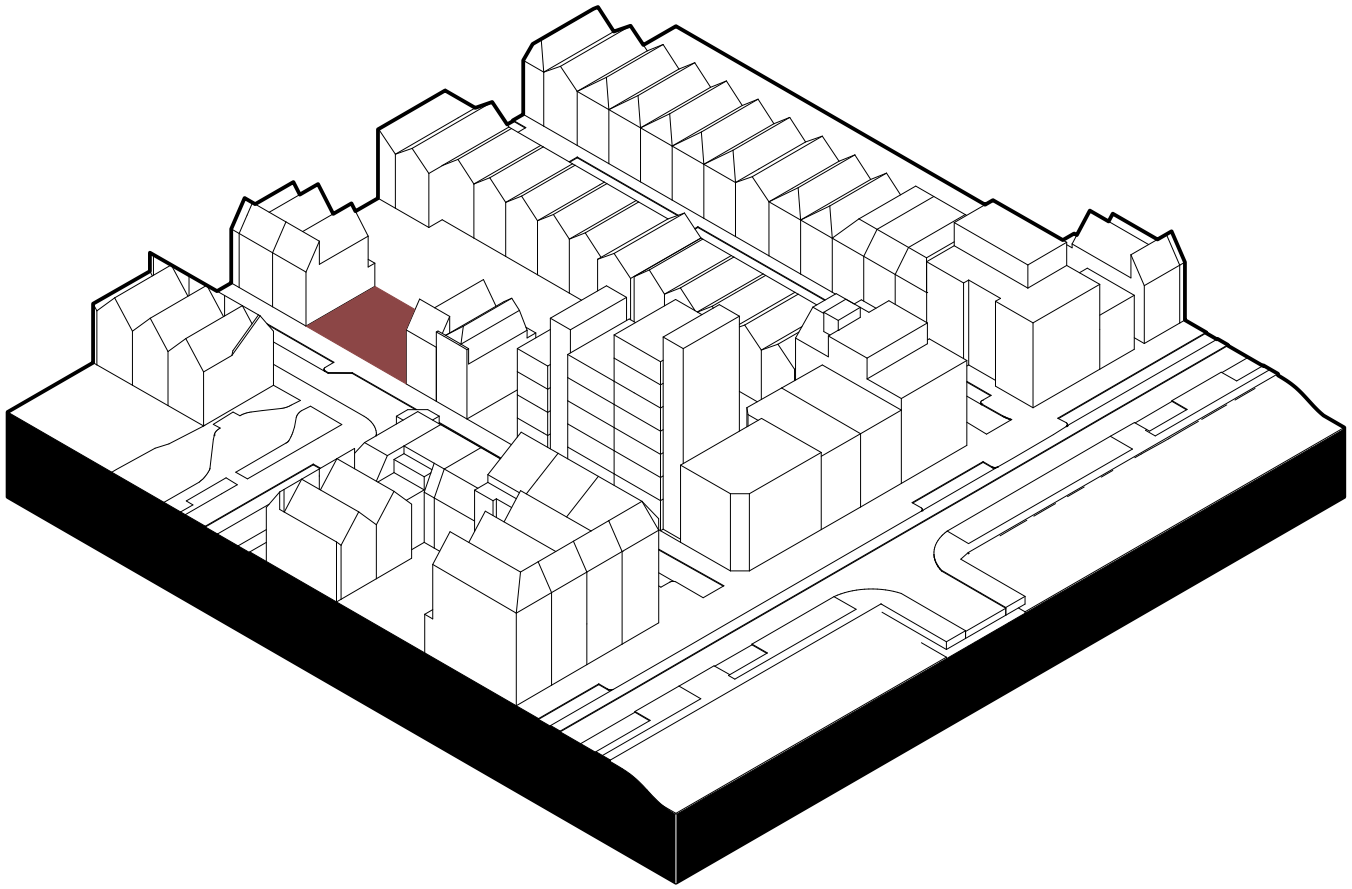
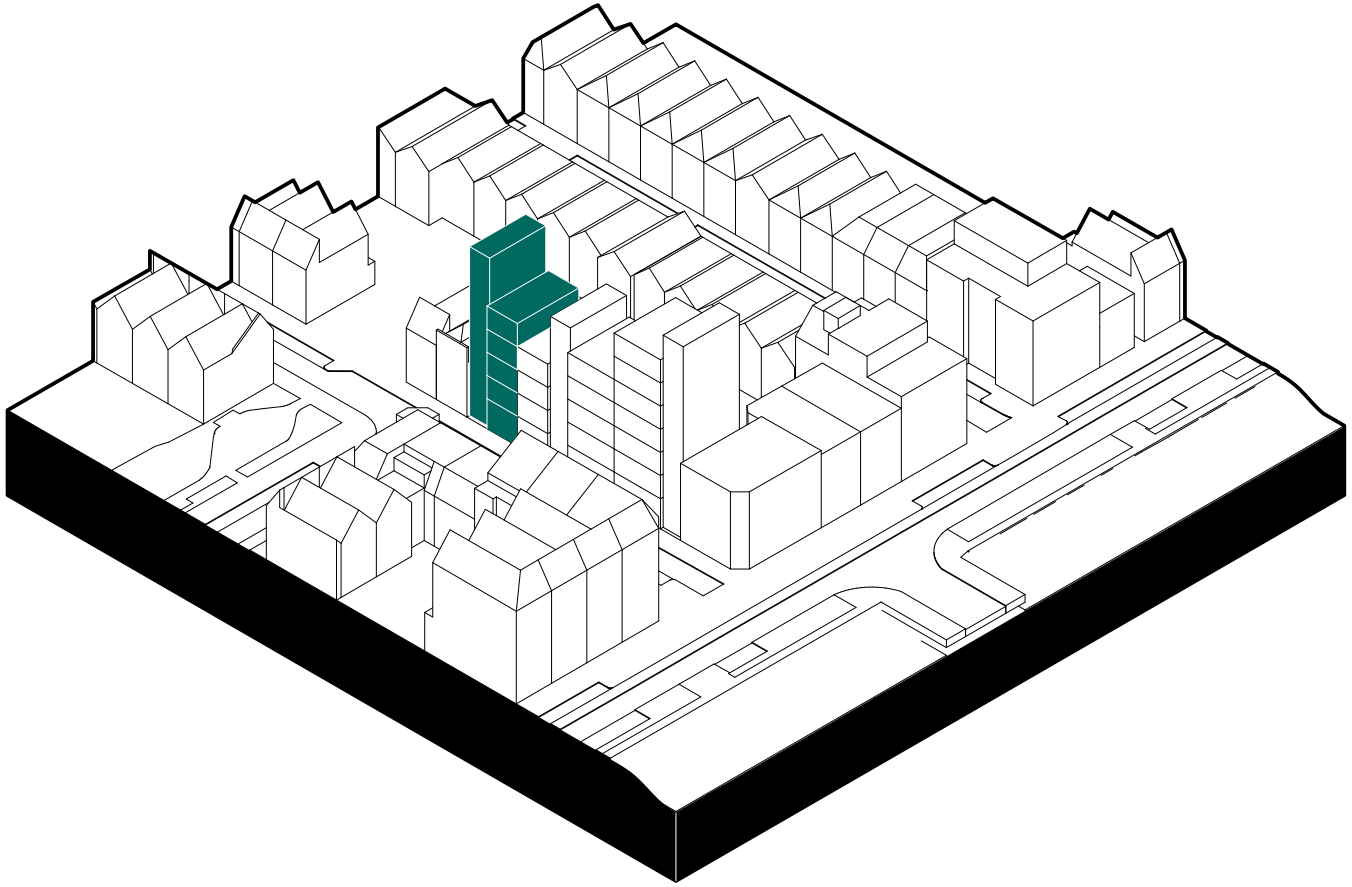


site phasing 05



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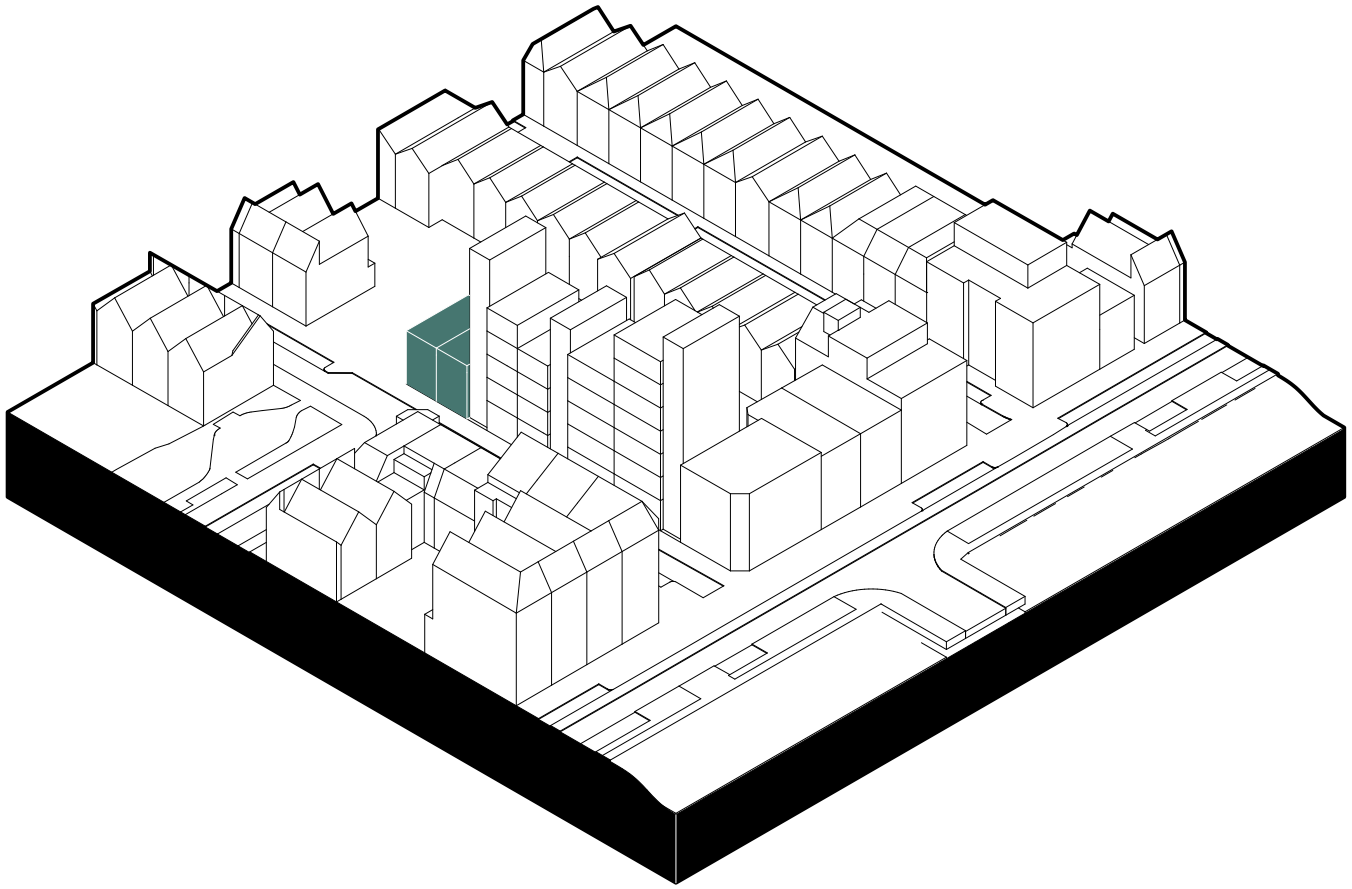

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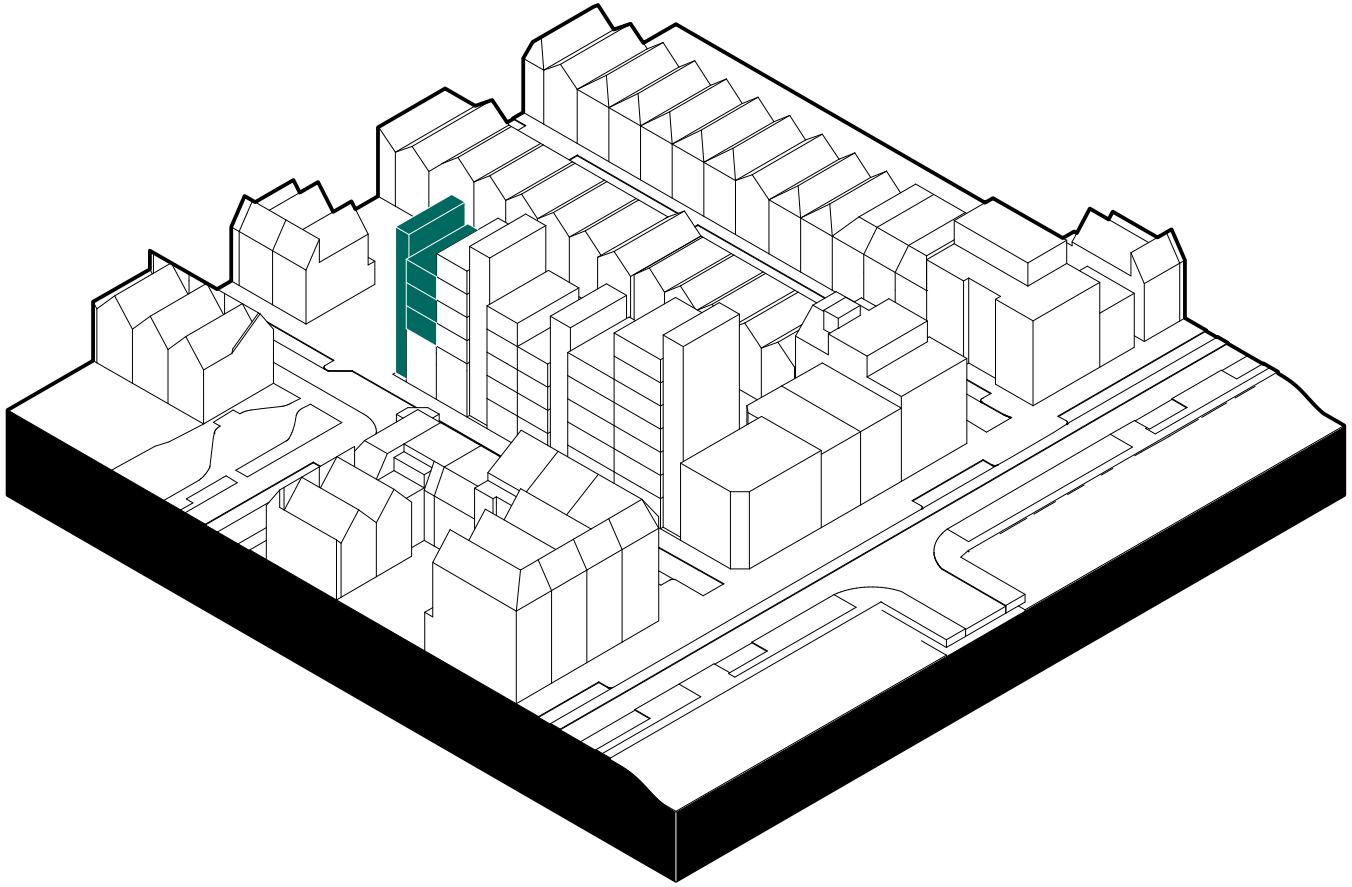
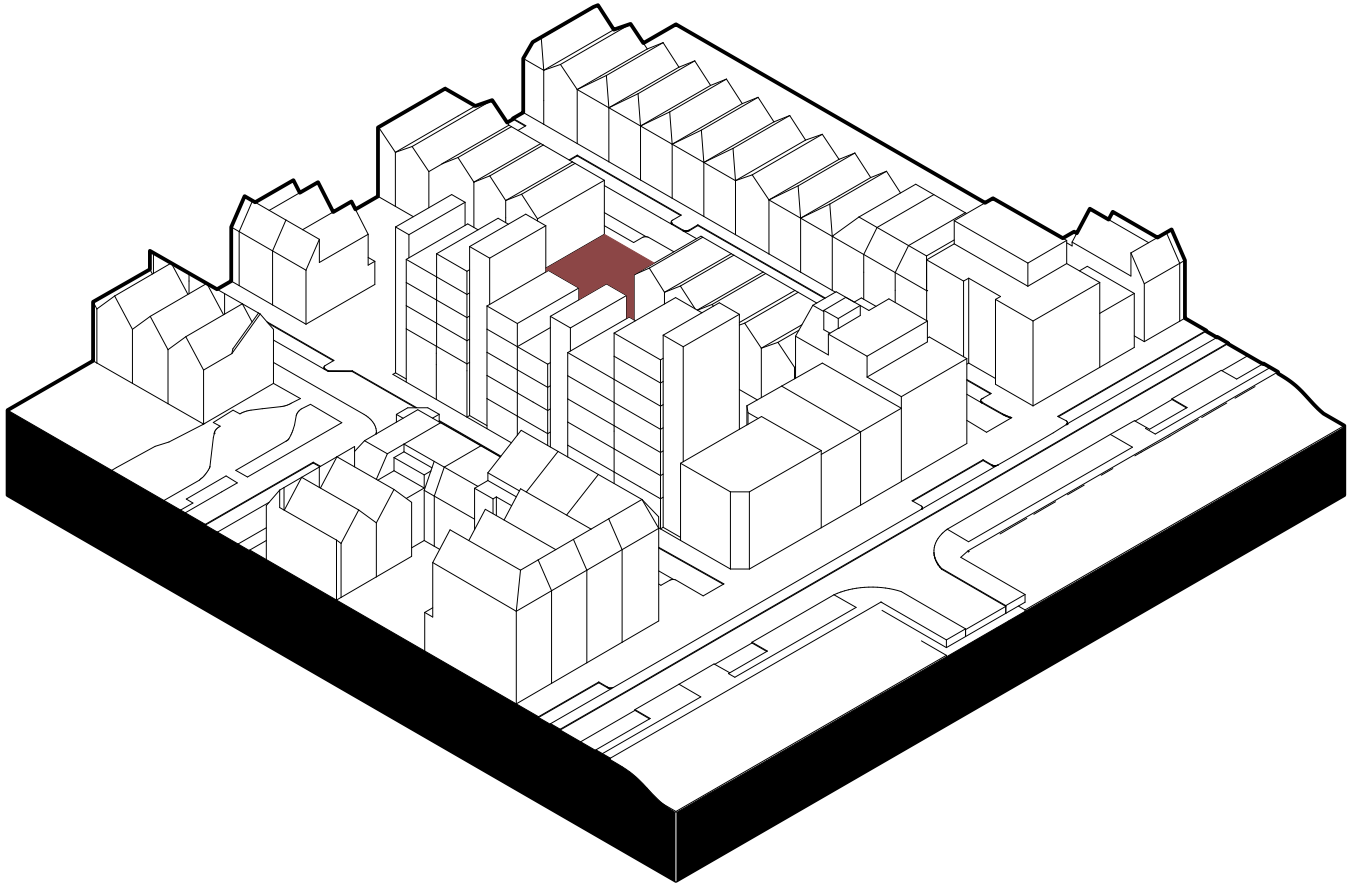
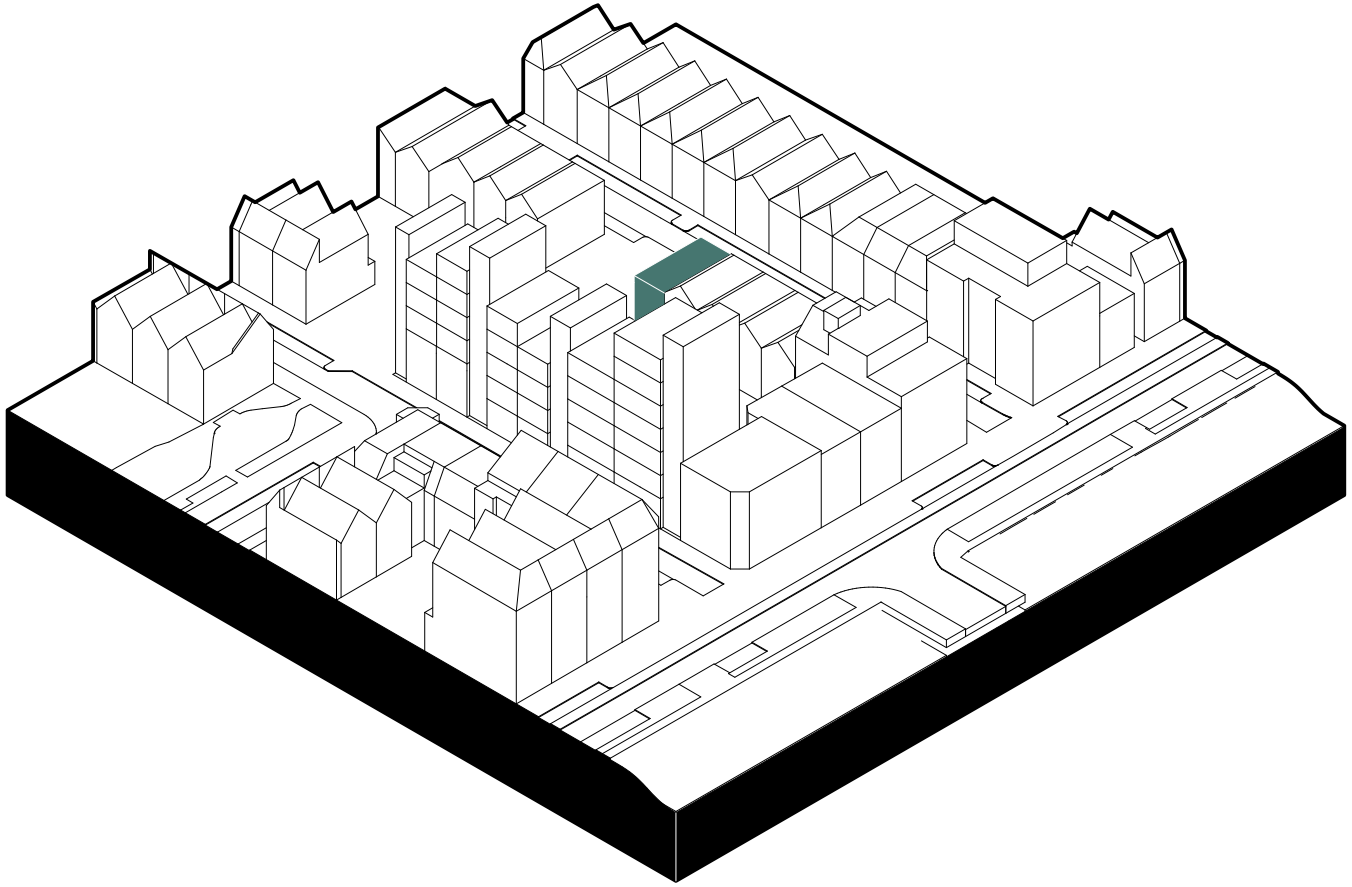


site phasing 08



site phasing 09



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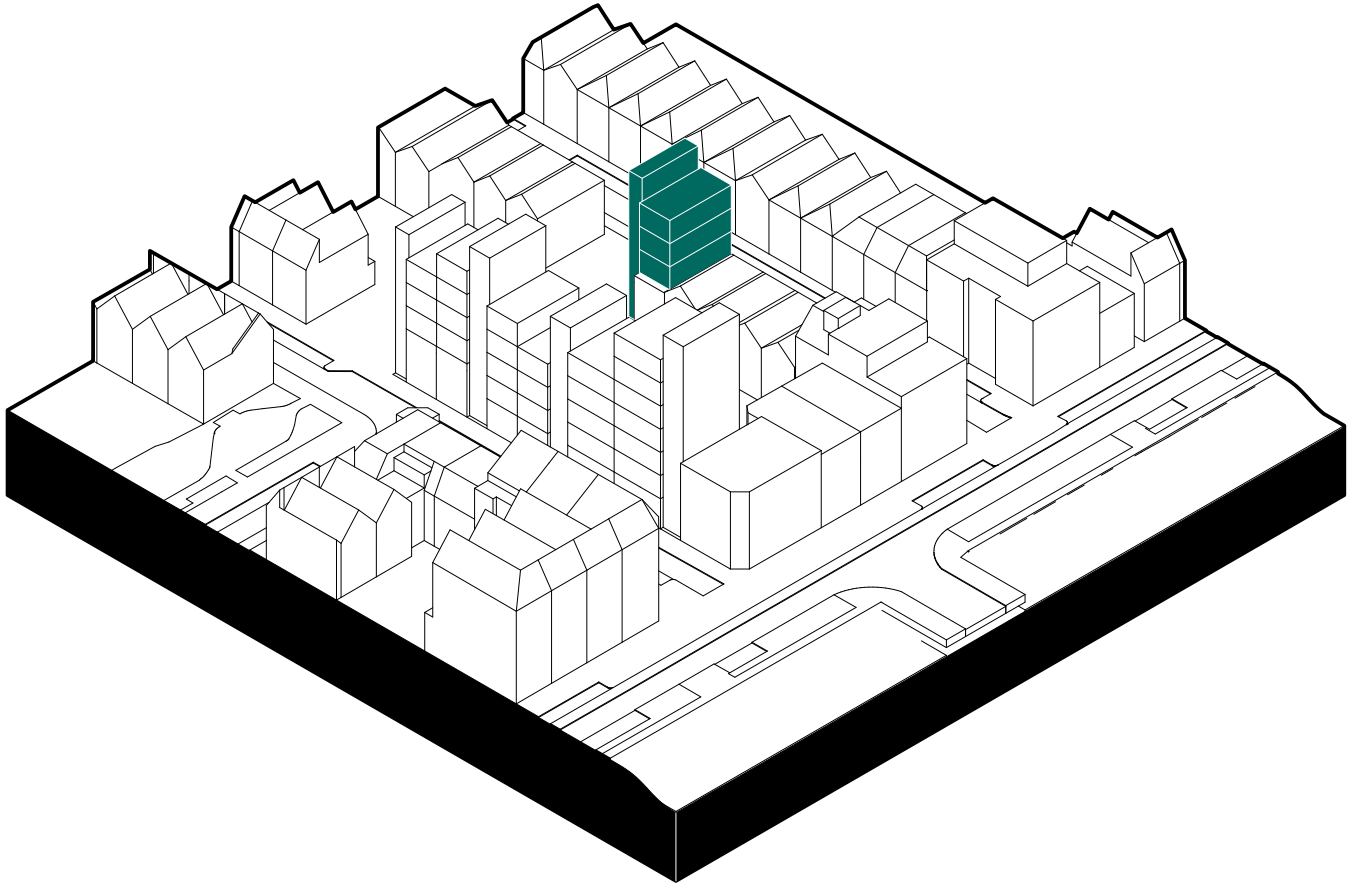
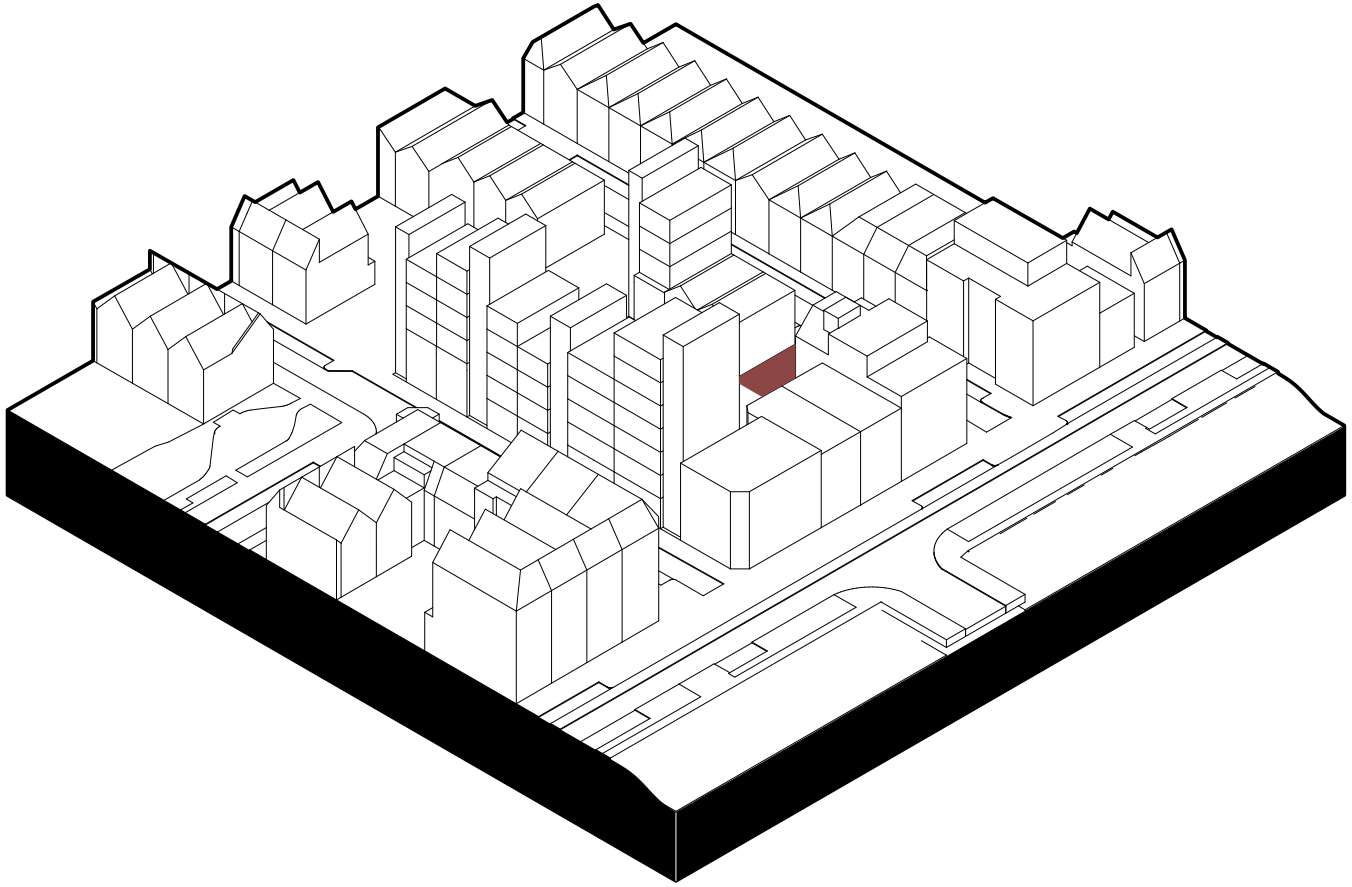
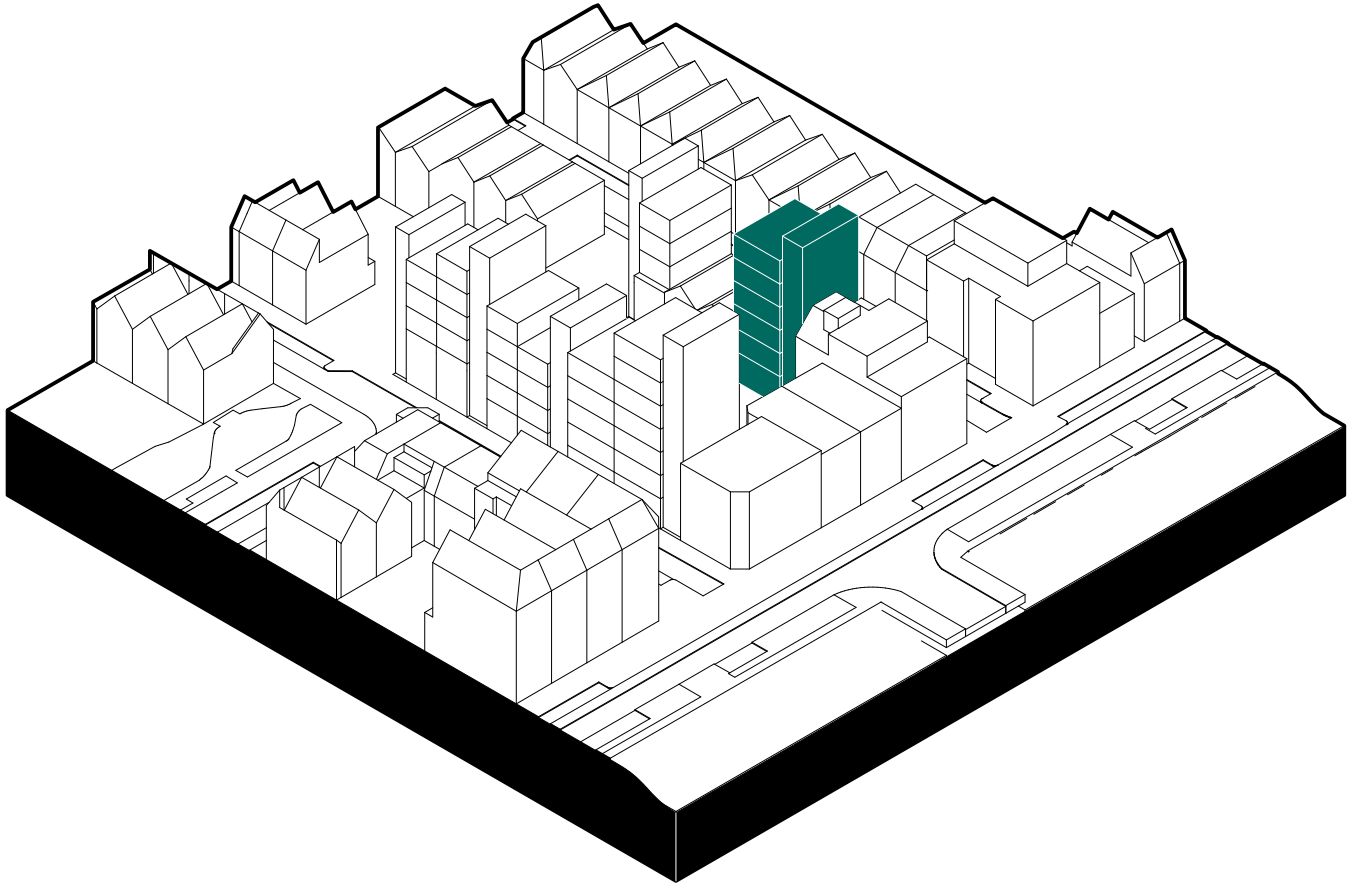


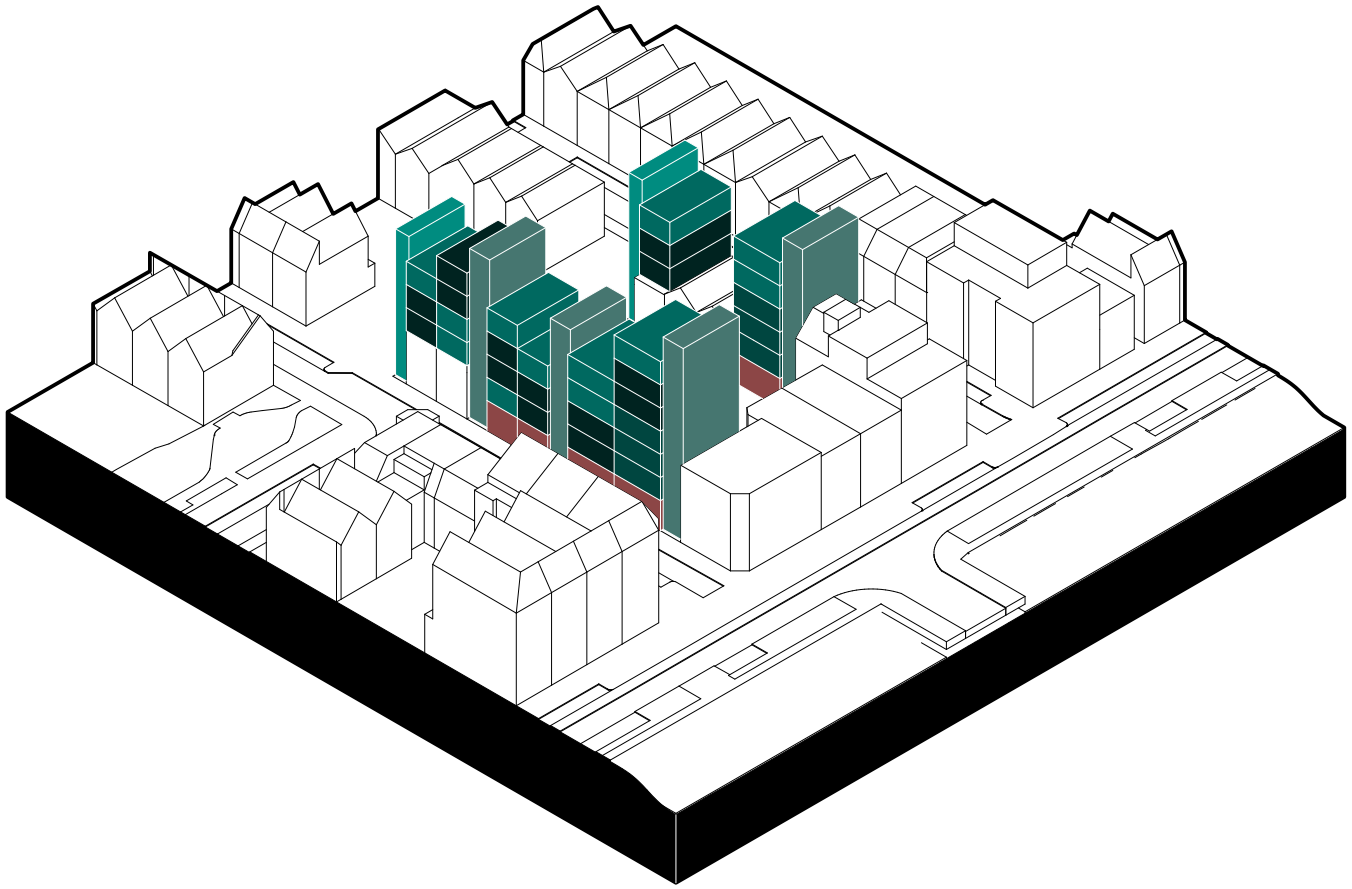
site phasing 11



site phasing 12



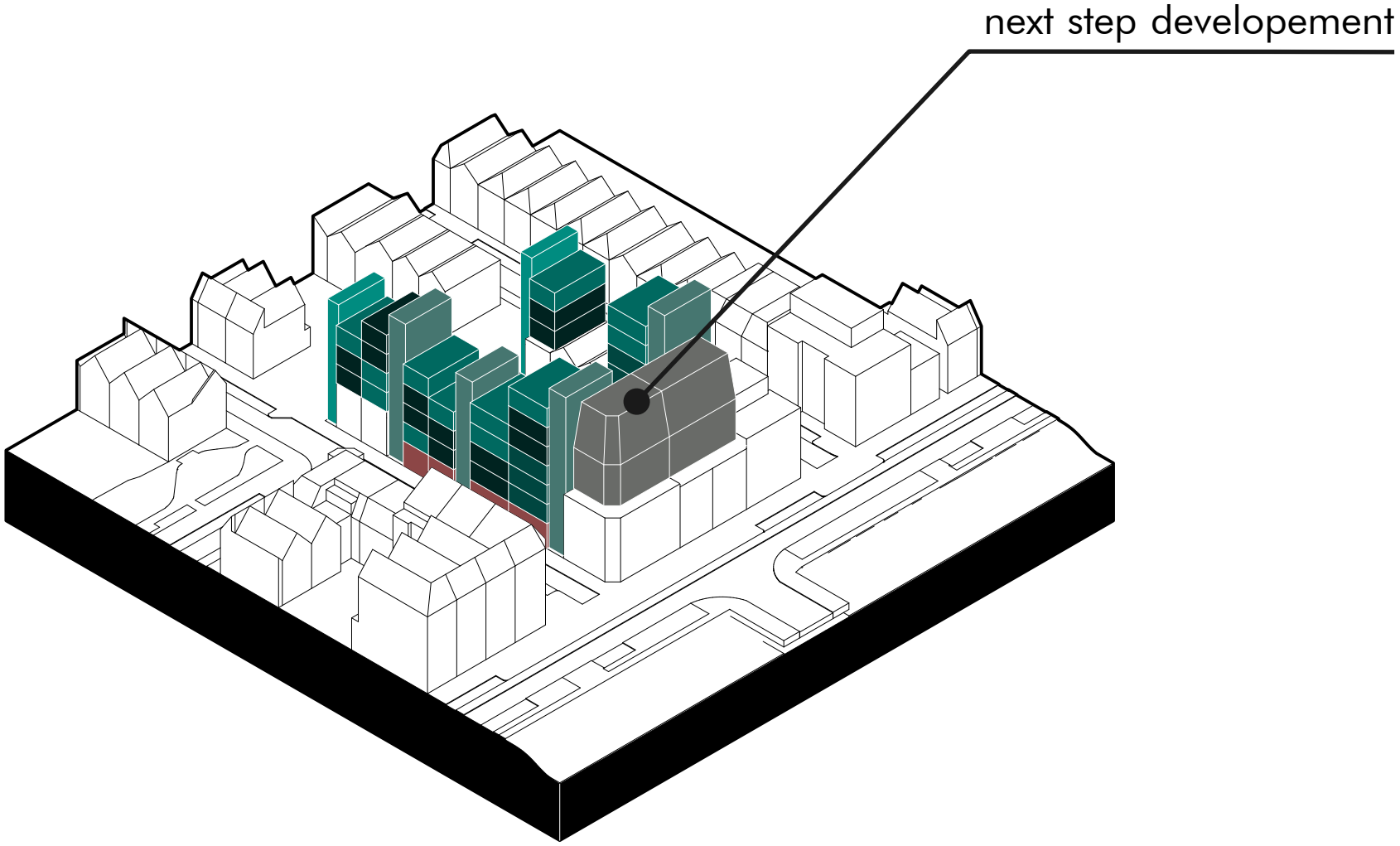
function plan



types

- services
- wide
- narrow
- 1 floor
- 1,5 floor
- 2 floors

future development



site landscaping





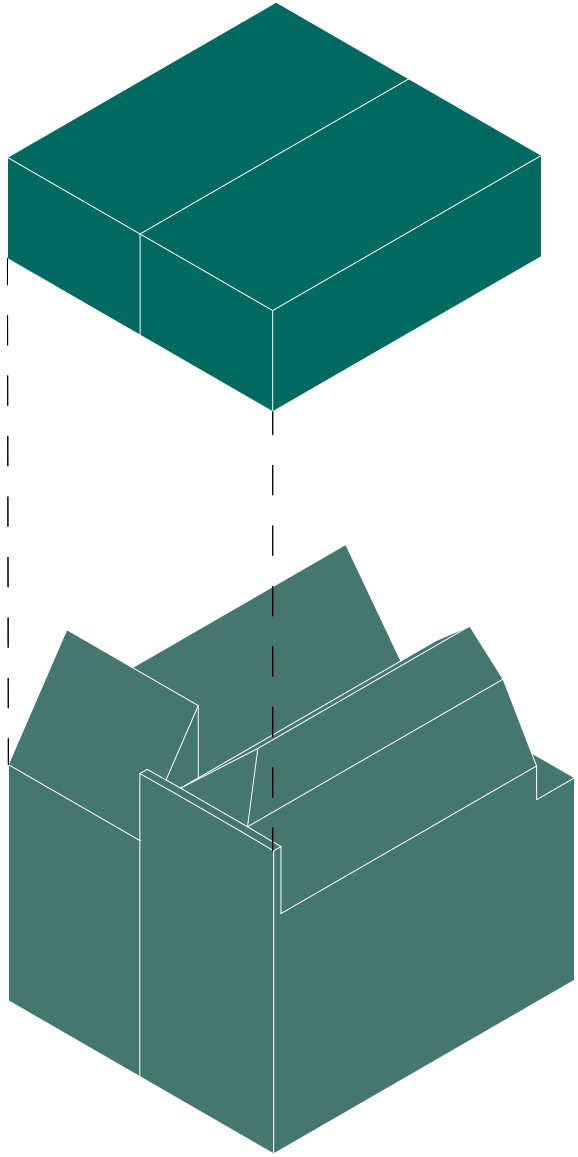
site landscaping

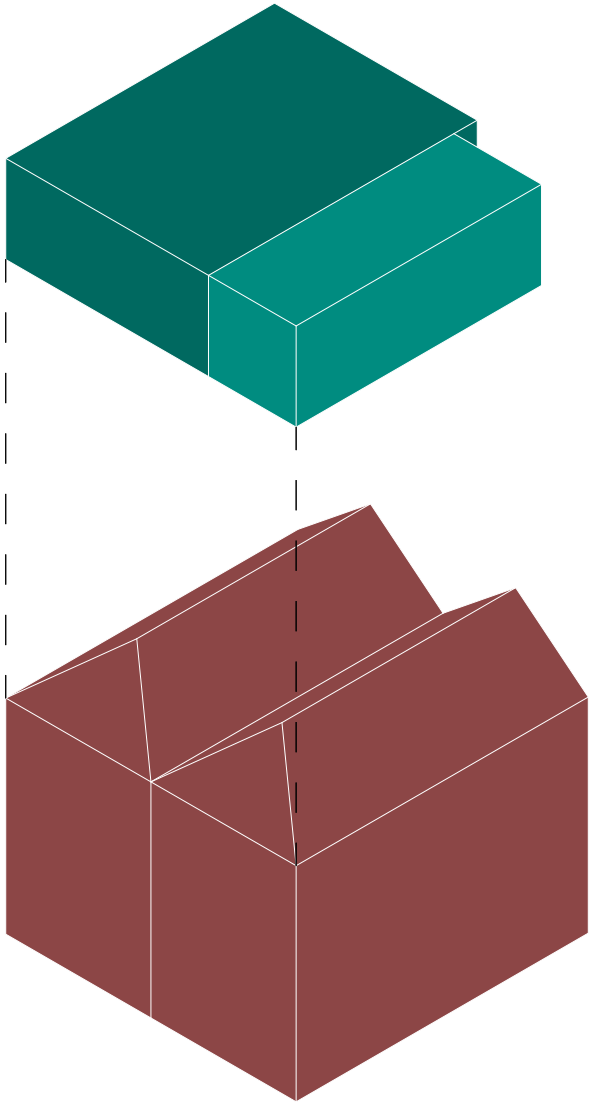




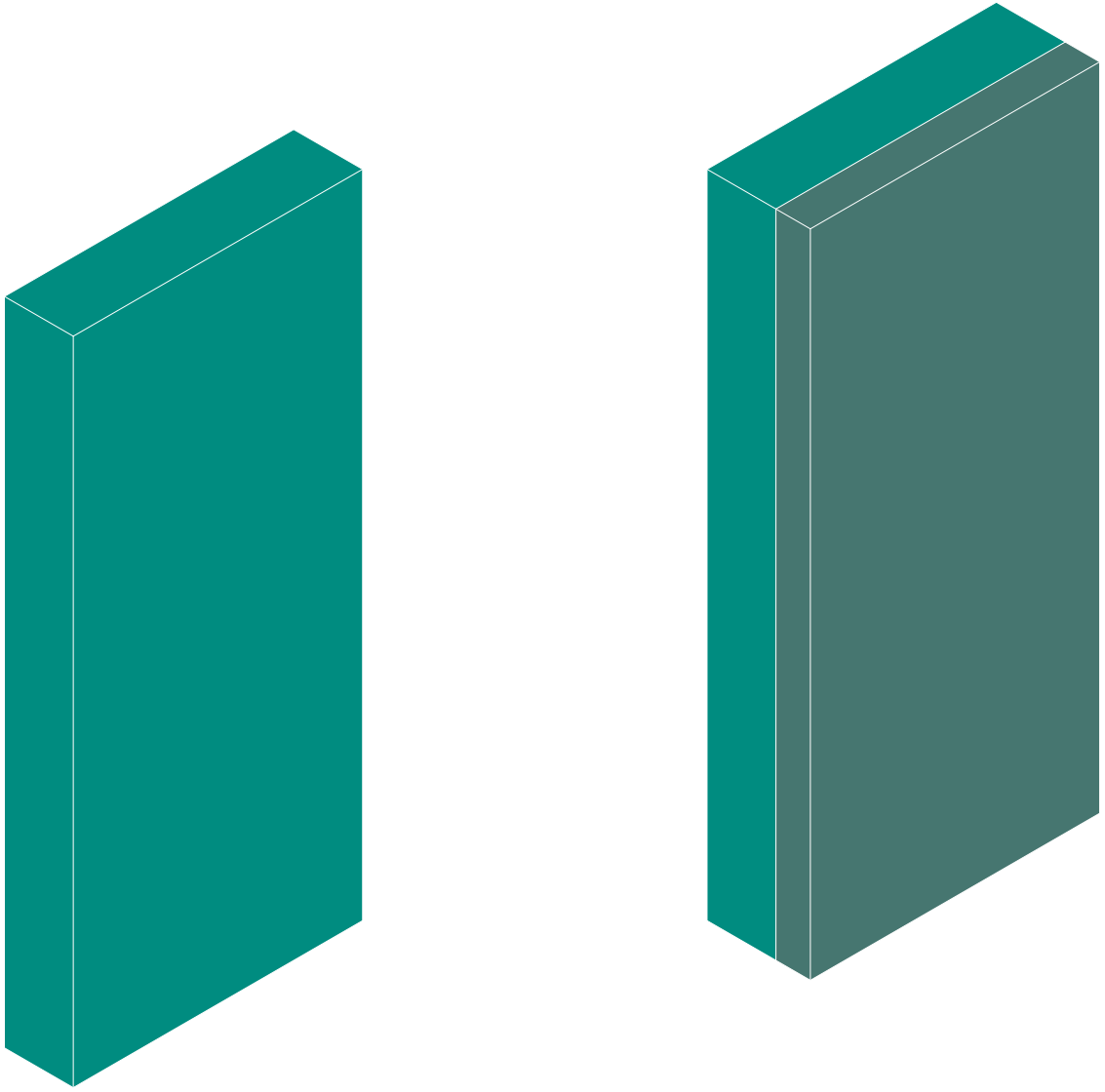
building types

house types

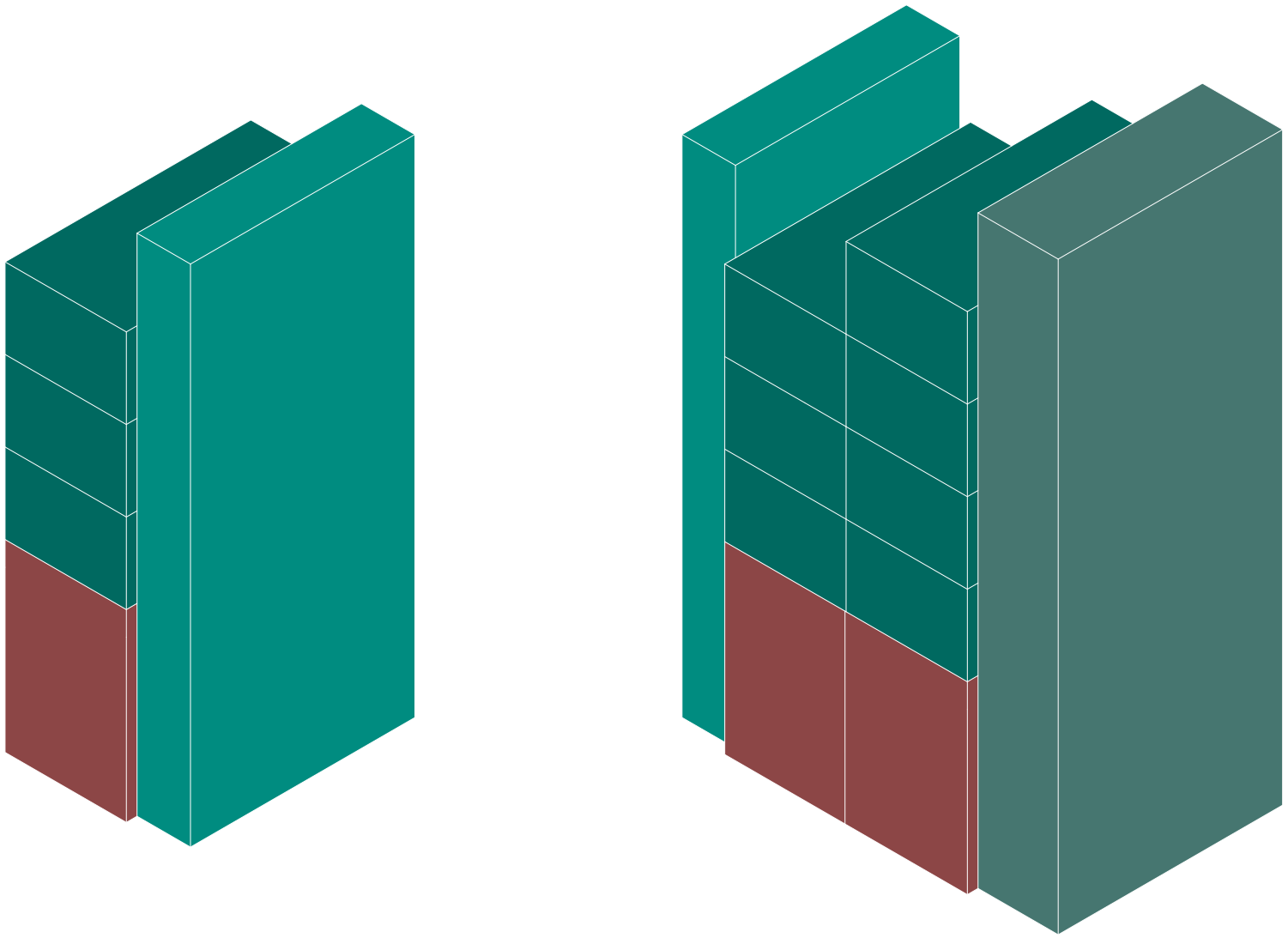




staircase types

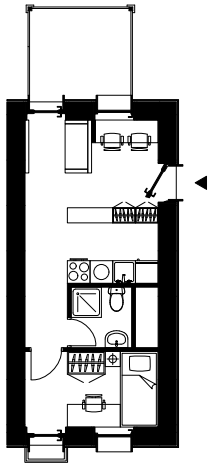


over the building

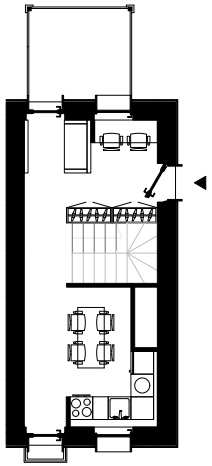


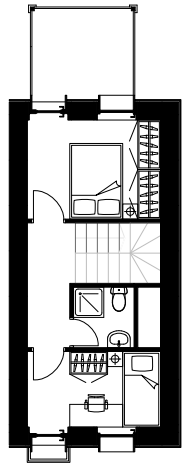
type 1 plans

apartment type 1



apartment type 2



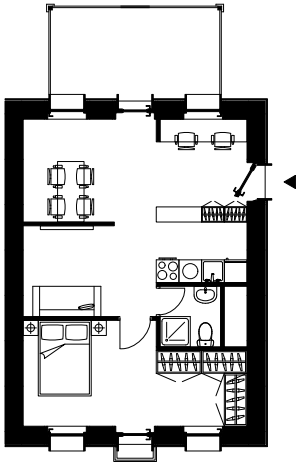


scale 1:200

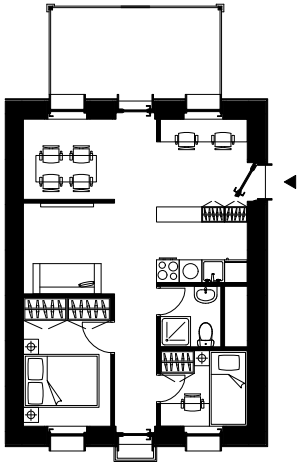
0m 2.5m 5m 10m

type 2 plans 01

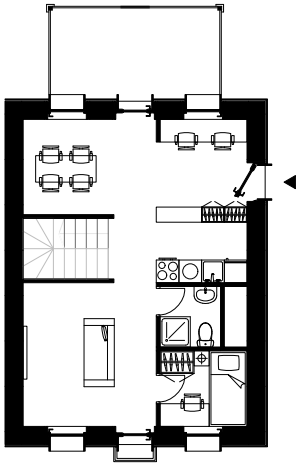
apartment type 3

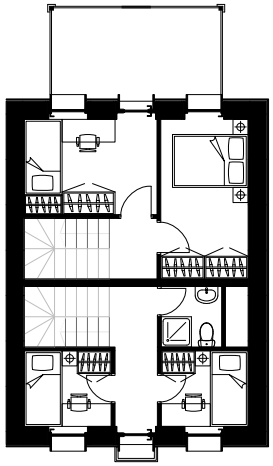


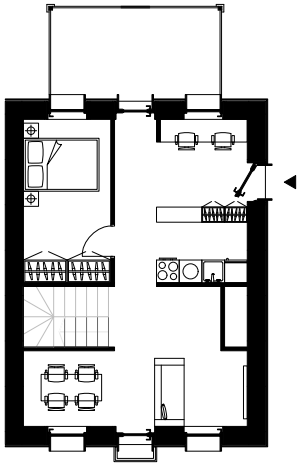
apartment type 4



apartment type 5





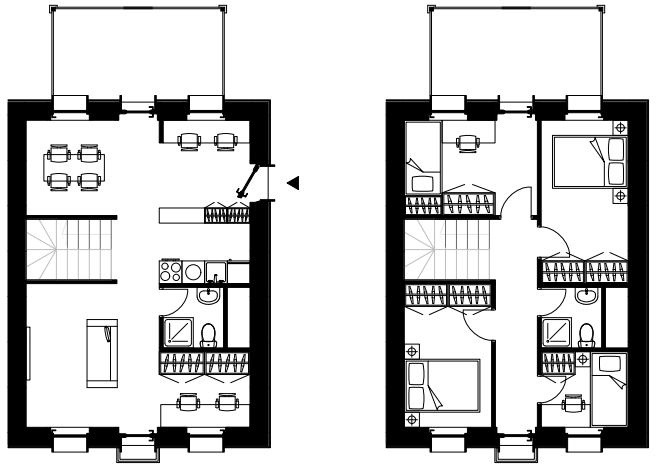


scale 1:200

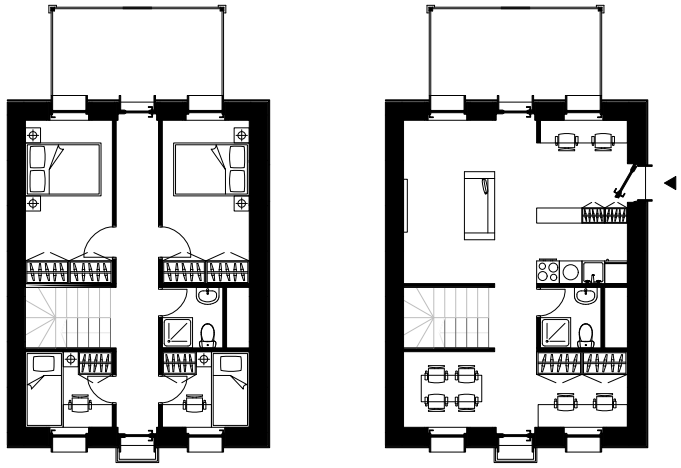
0m 2.5m 5m 10m

type 2 plans 02

apartment type 6



apartment type 7

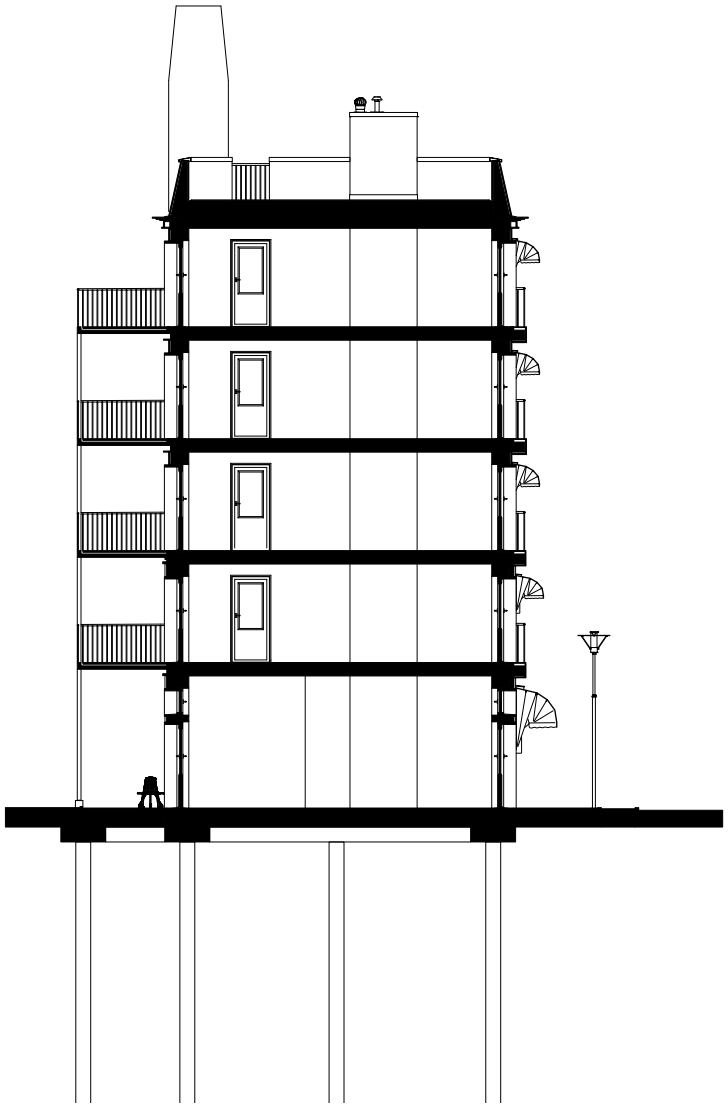


scale 1:200

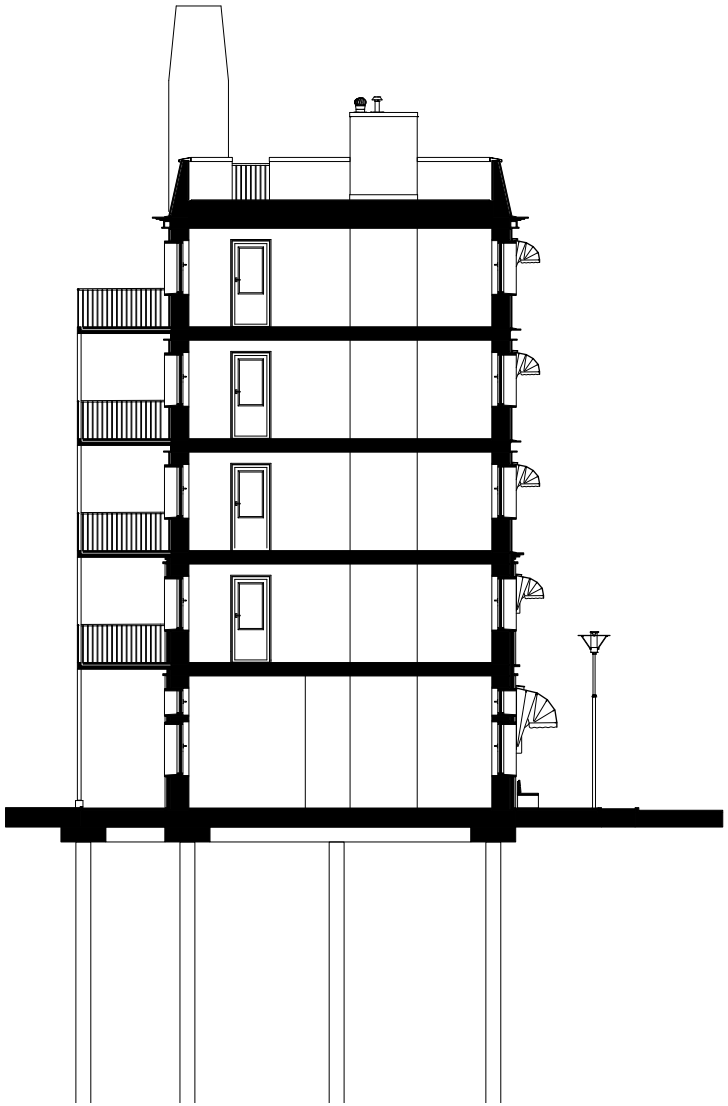
0m 2.5m 5m 10m

types sections 1

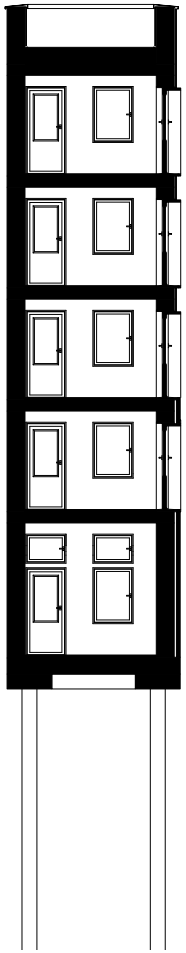
section long 1



section long 2



section short 1

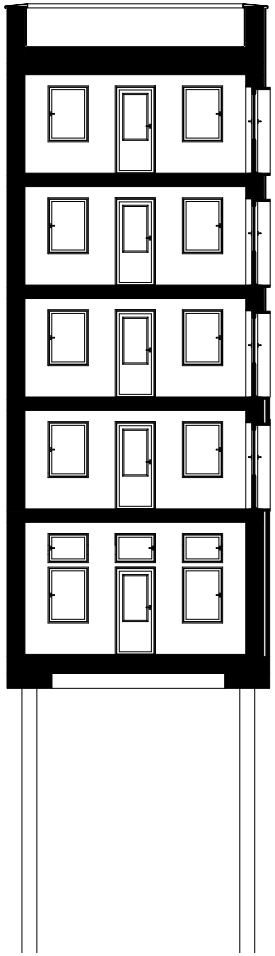


scale 1:200

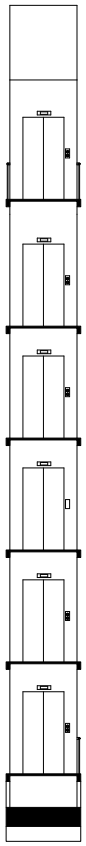
0m 2.5m 5m 10m

types sections 2

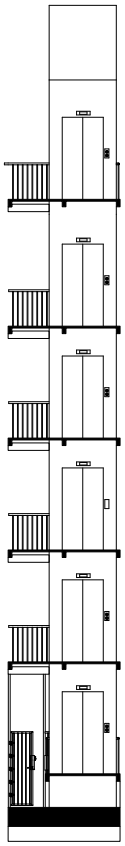
section short 2



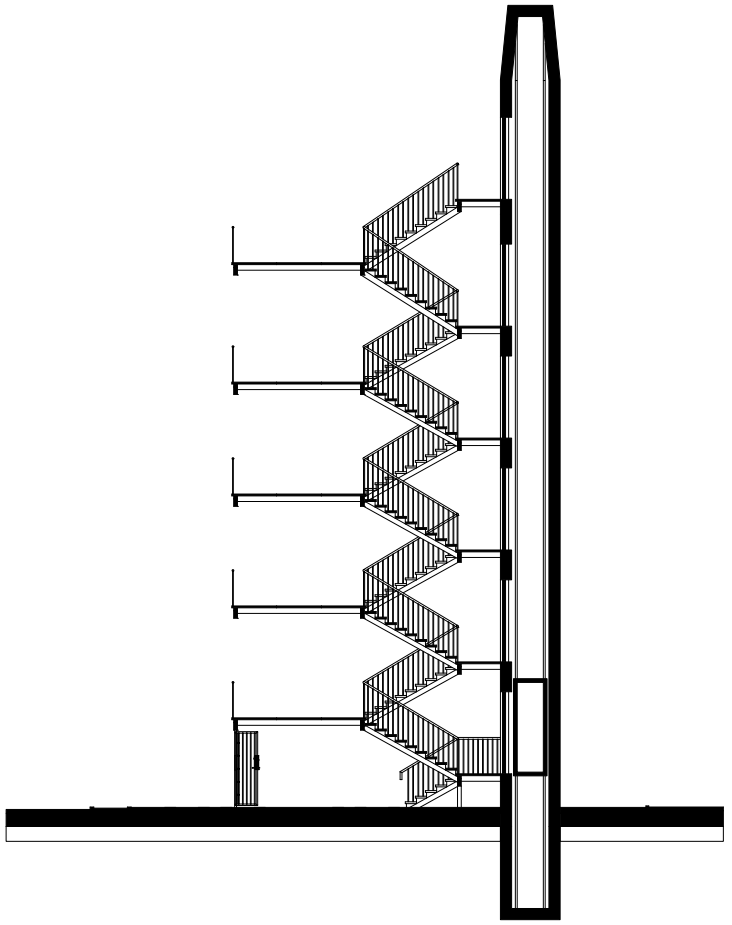
section stairs 1



section stairs 2



section stairs 3



scale 1:200

0m 2.5m 5m 10m

construction

inspiration- material cultures





inspiration- lendager and henning larsen





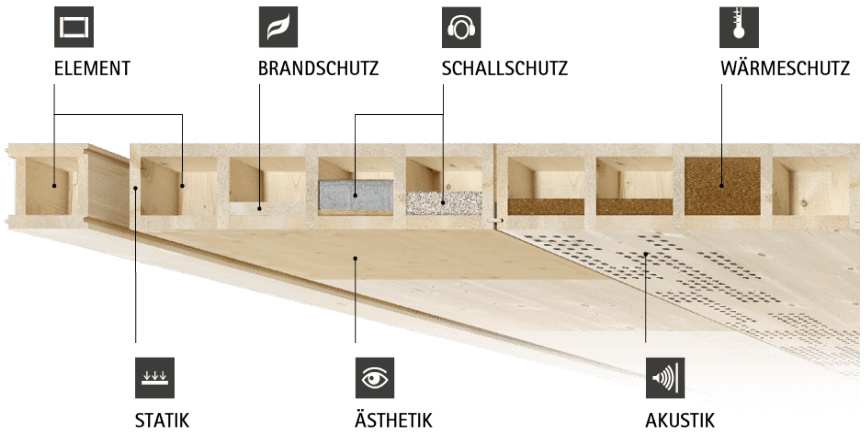








combination



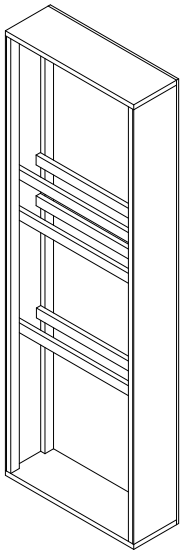




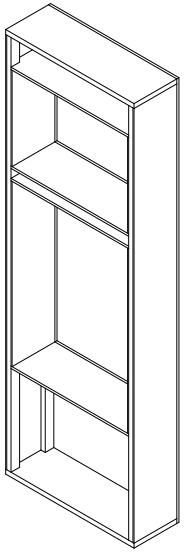


components

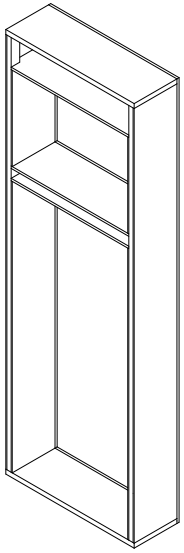
ground floor wall components:



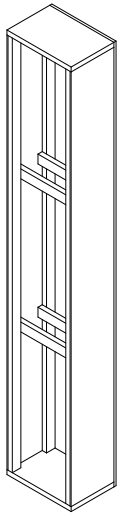
wide component:
d - 420mm
w - 1200mm
h - 3600mm



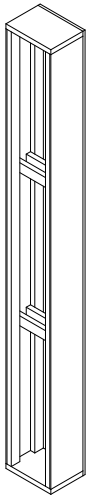
window component:
d - 420mm
w - 1200mm
h - 3600mm



door component:
d - 420mm
w - 1200mm
h - 3600mm

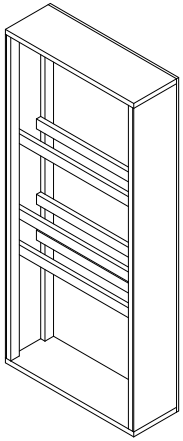


narrow component:
d - 420mm
w - 600mm
h - 3600mm

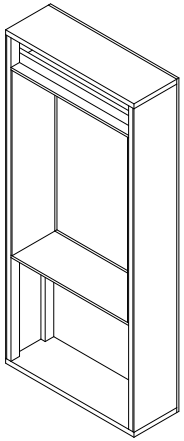


corner component:
d - 320mm
w - 420mm
h - 3600mm

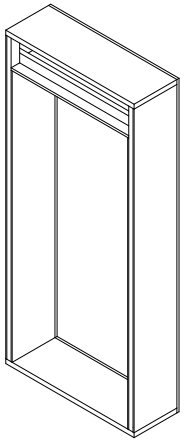
regular floor wall components:



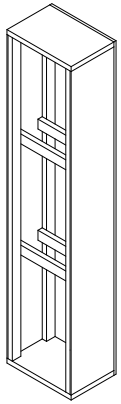
wide component:
d - 420mm
w - 1200mm
h - 2700mm



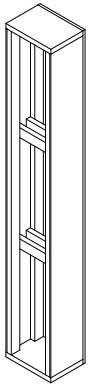
window component:
d - 420mm
w - 1200mm
h - 2700mm



door component:
d - 420mm
w - 1200mm
h - 2700mm



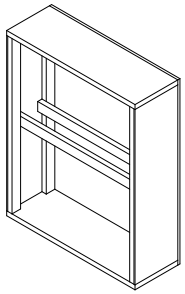
narrow component:
d - 420mm
w - 600mm
h - 2700mm



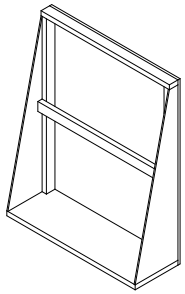
corner component:
d - 320mm
w - 420mm
h - 2700mm

components

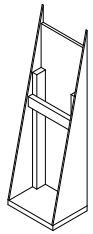
roof wall modules:



side component:
d - 420mm
w - 1200mm
h - 1500mm

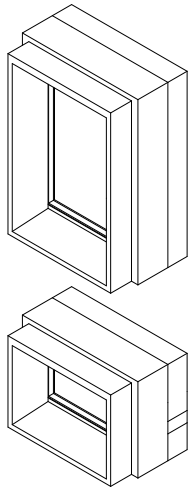


front component:
d - 420mm
w - 1200mm
h - 1500mm



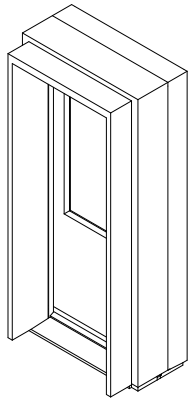
corner component:
d - 320mm
w - 420mm
h - 3600mm

fenestration modules:



window component:
d - 660mm
w - 1080mm
h - 1500mm

small window:
d - 660mm
w - 1080mm
h - 780mm



door component:
d - 660mm
w - 1080mm
h - 2360mm

components

lignatur floor components:

balcony element:
depth - 1000mm
width - 3800mm
height - 240mm

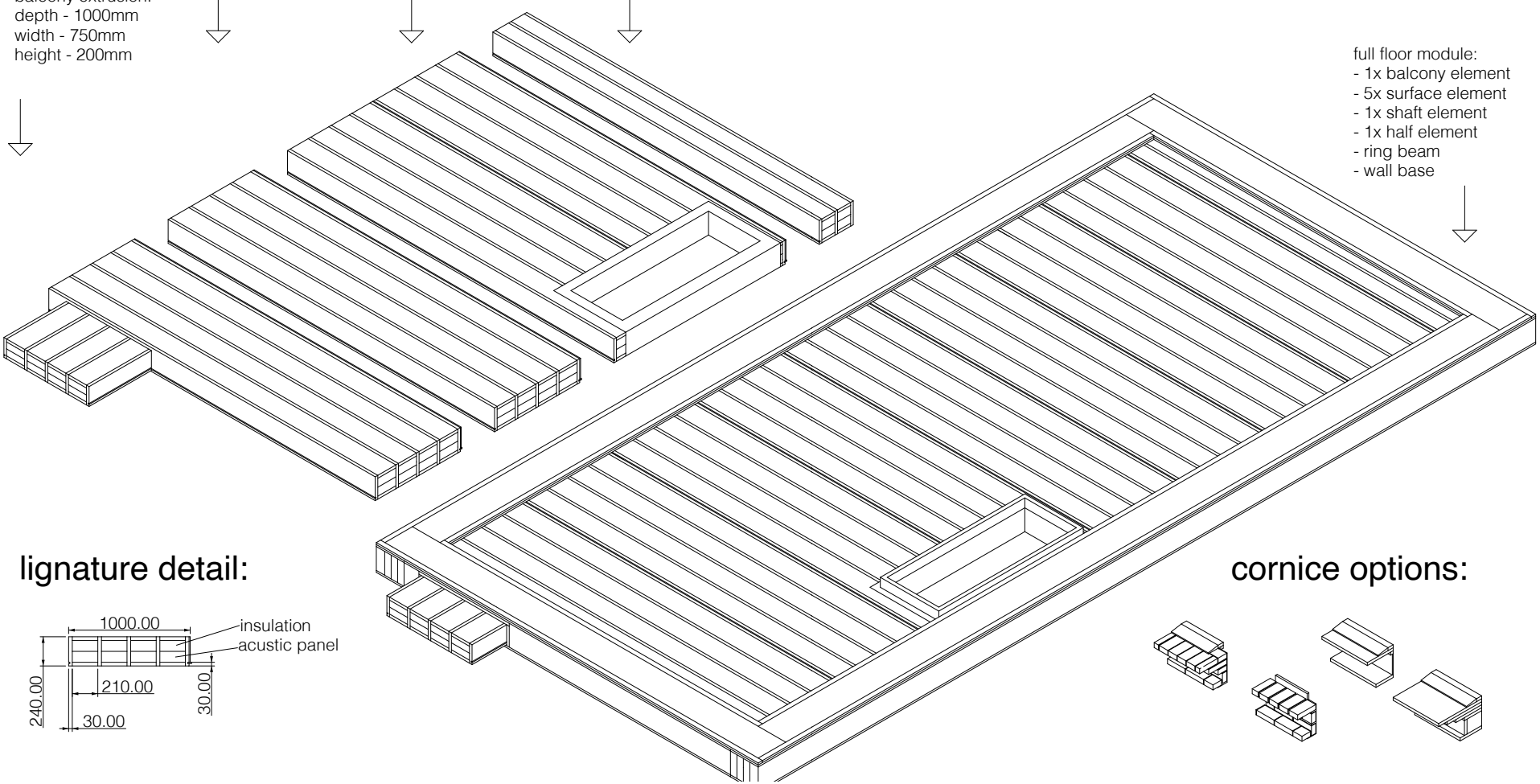
balcony extrusion:
depth - 1000mm
width - 750mm
height - 200mm

surface element:
depth - 1000mm
width - 3800mm
height - 240mm

shaft element:
depth - 2000mm
width - 3800mm
height - 240mm
includes pipes

half element:
depth - 500mm
width - 3800mm
height - 240mm

full floor module:
- 1x balcony element
- 5x surface element
- 1x shaft element
- 1x half element
- ring beam
- wall base



lignature detail:

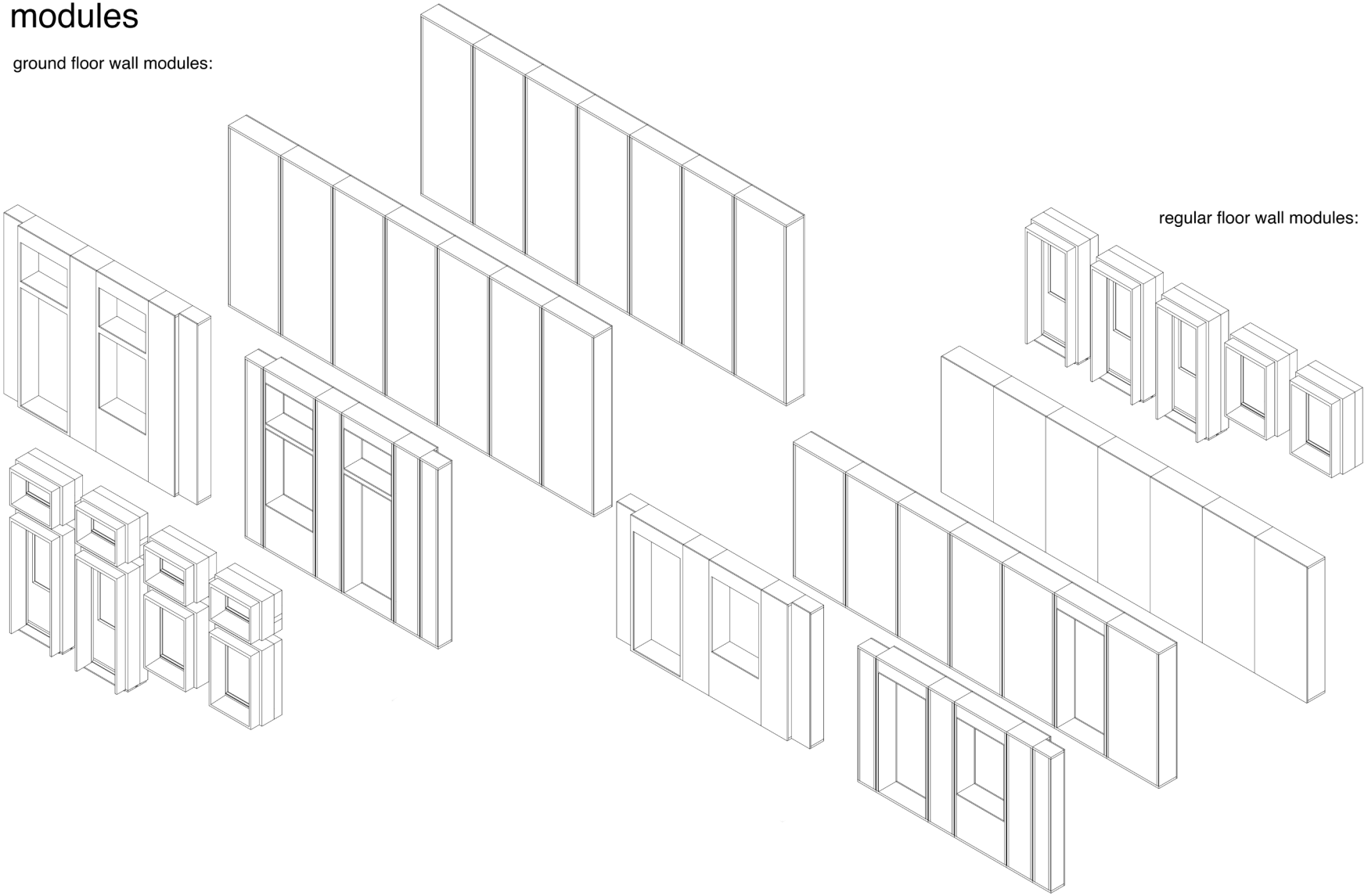
cornice options:

modules

modules

ground floor wall modules:

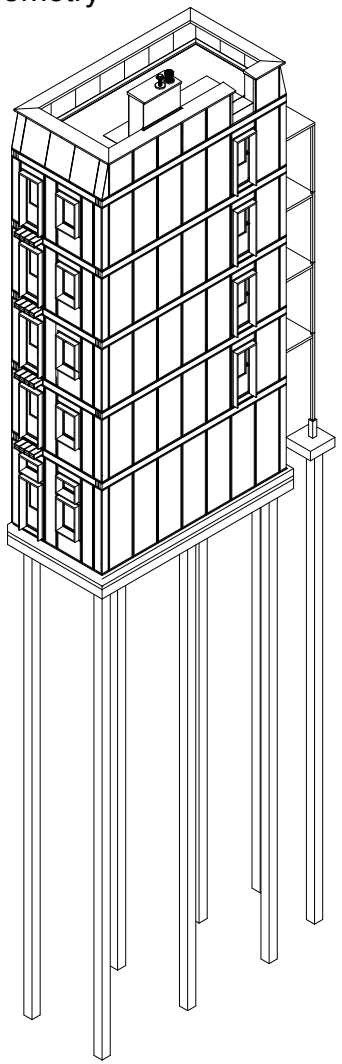
regular floor wall modules:



structure isometry

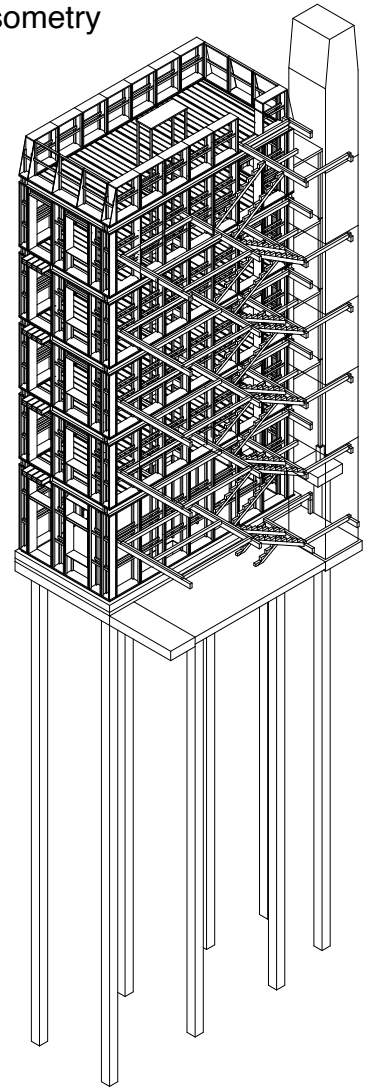
wall core isometry

scale 1:100
0m 1m 3m



skeleton isometry

scale 1:100
0m 1m 3m

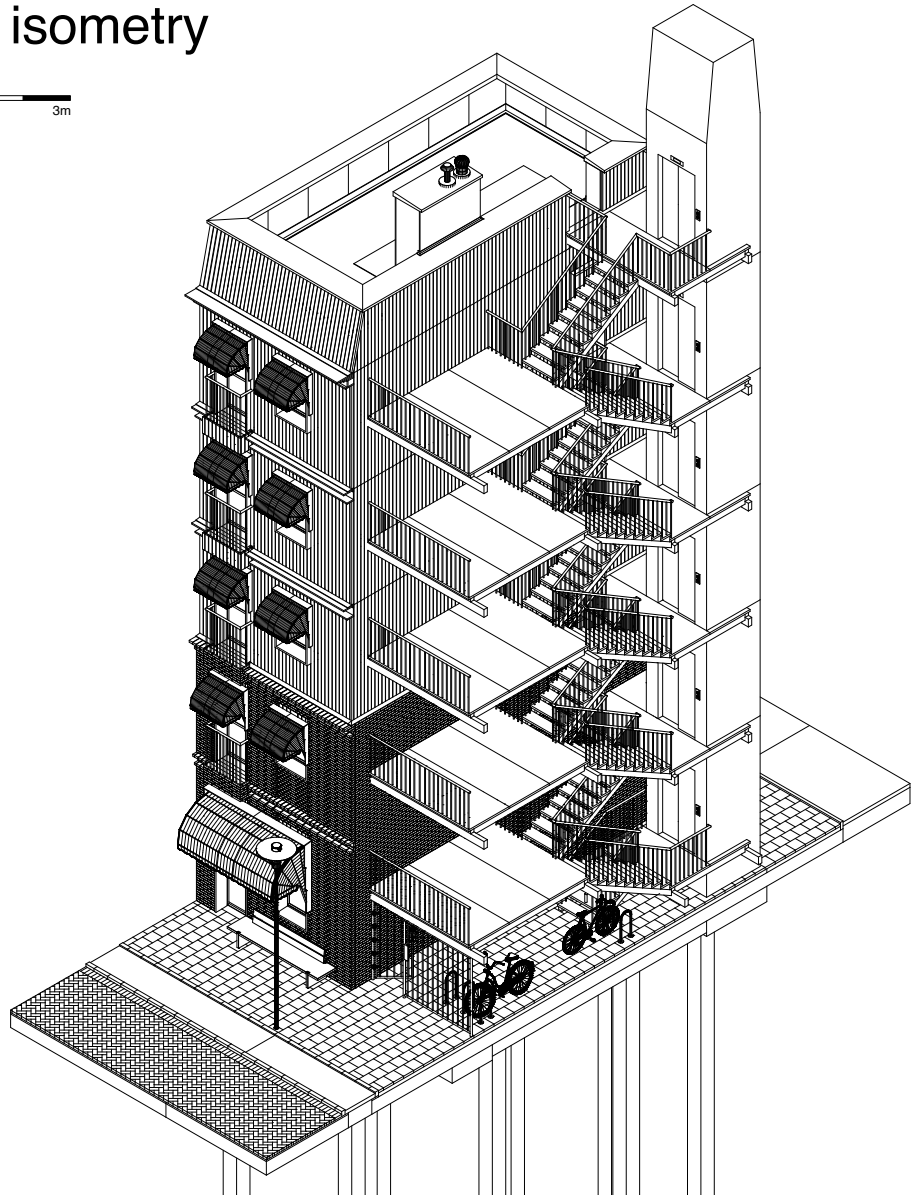


unit isometry

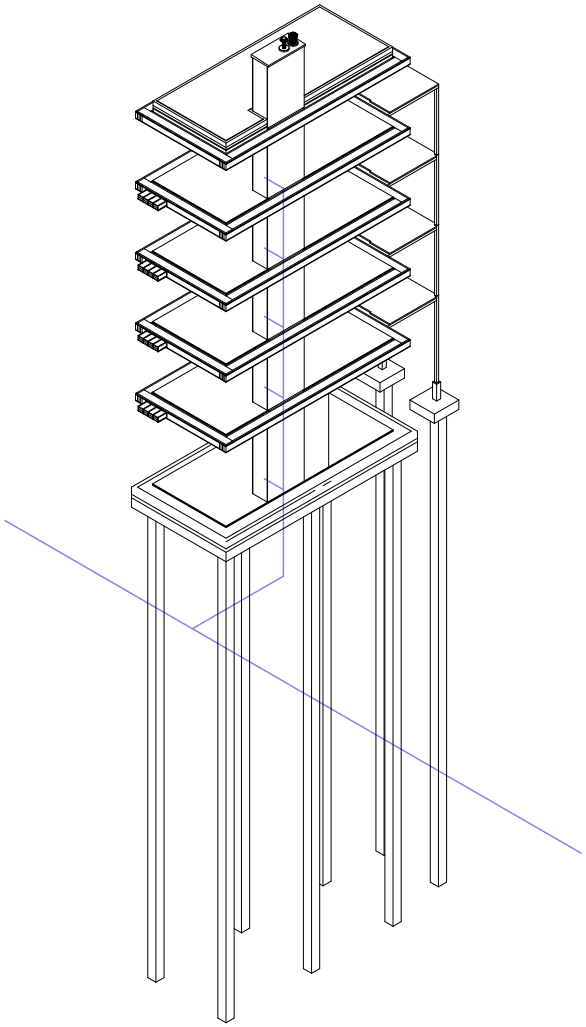
full isometry

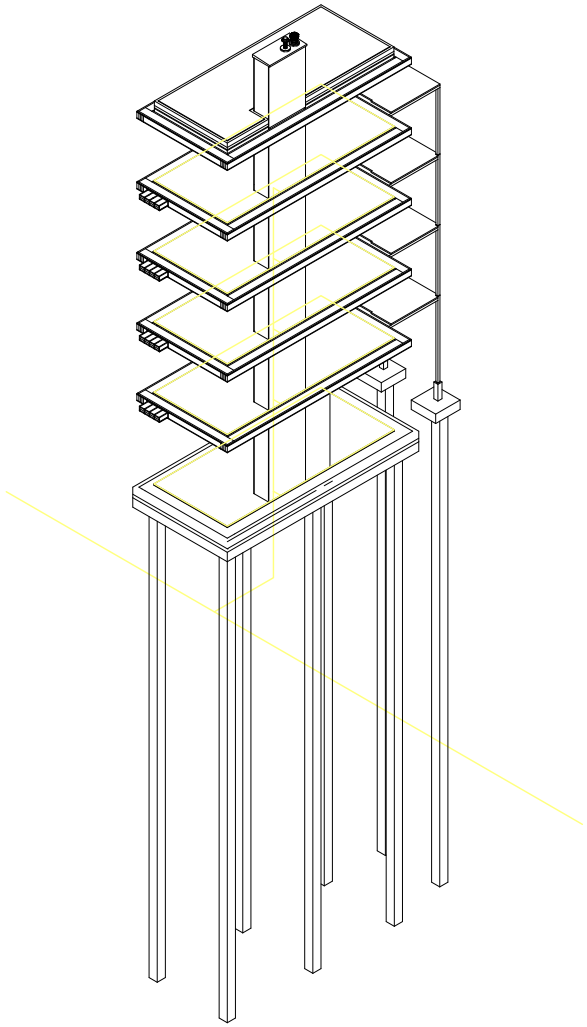
scale 1:100

0m 1m 3m

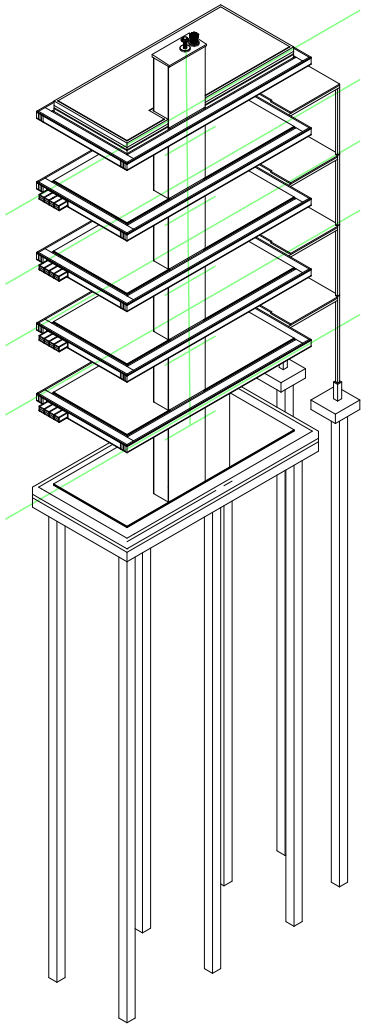


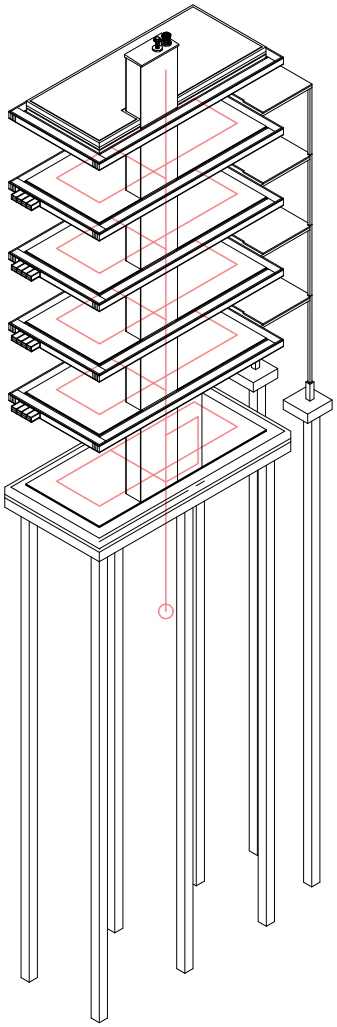
water -electricity



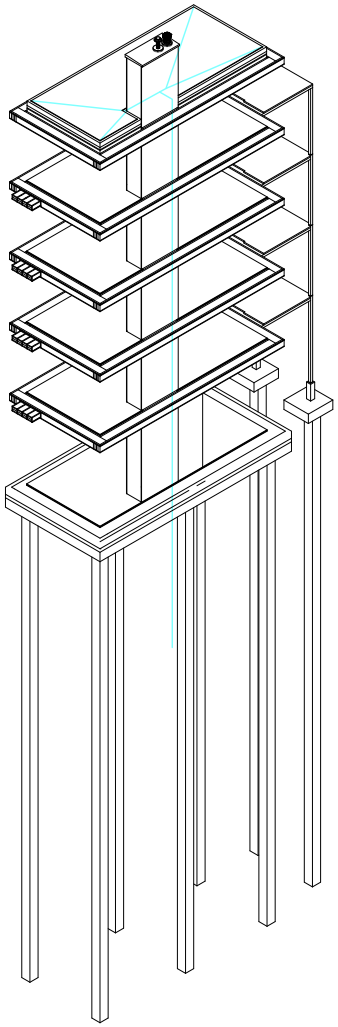


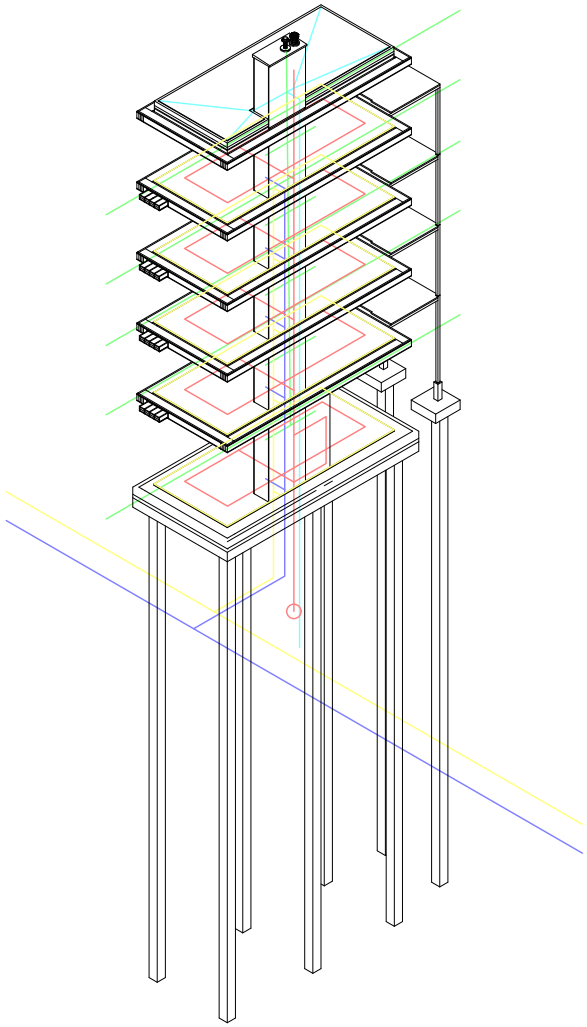
ventilation - heating



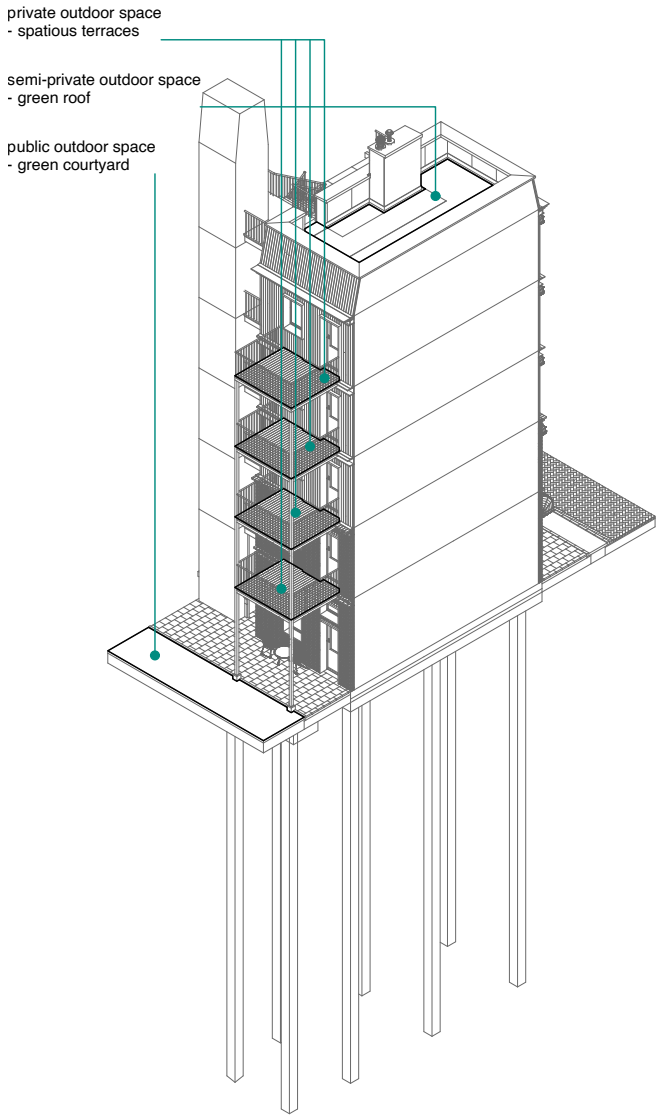


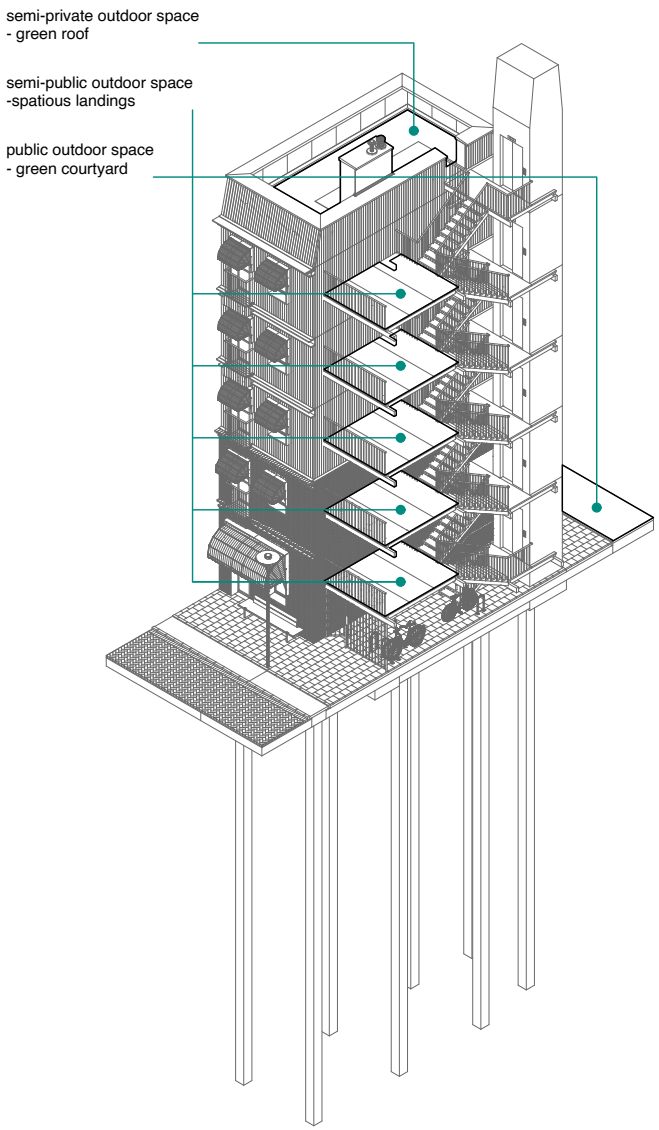
r a i n - s y s t e m



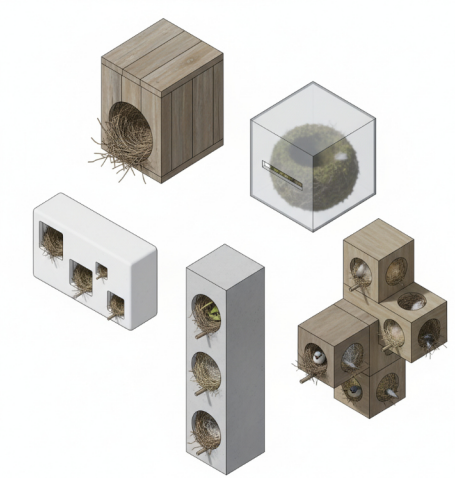


greenery - privacy



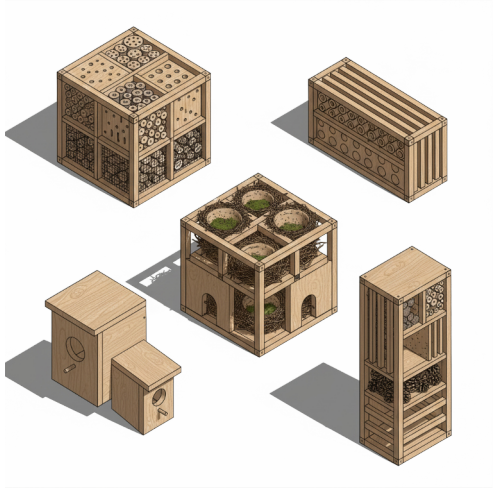


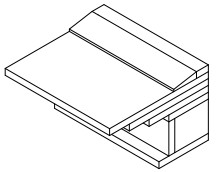
cornices - nests

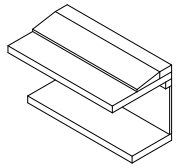


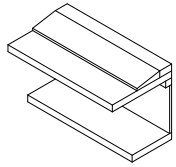


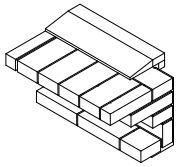


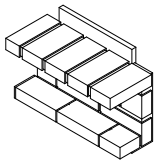


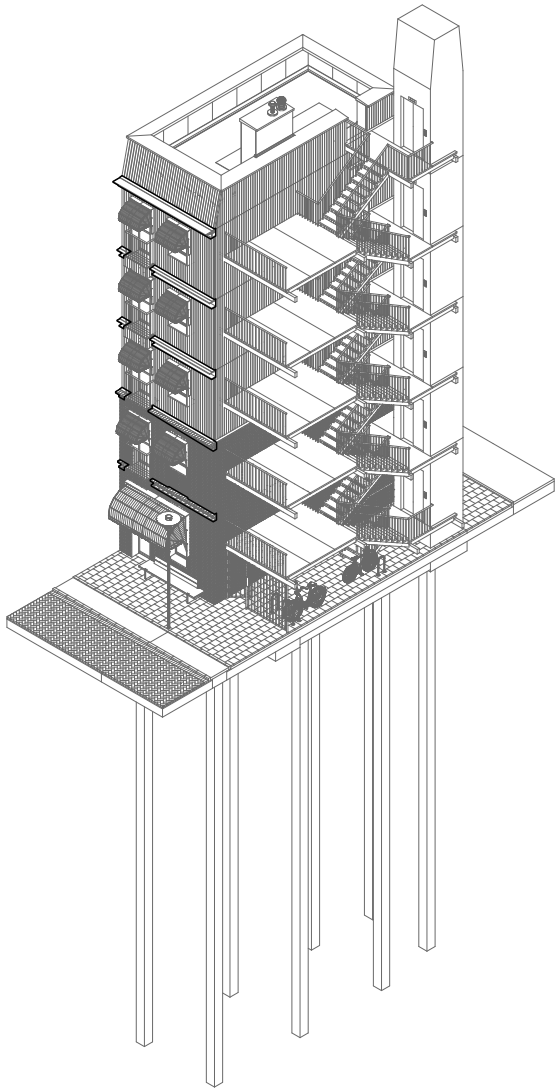








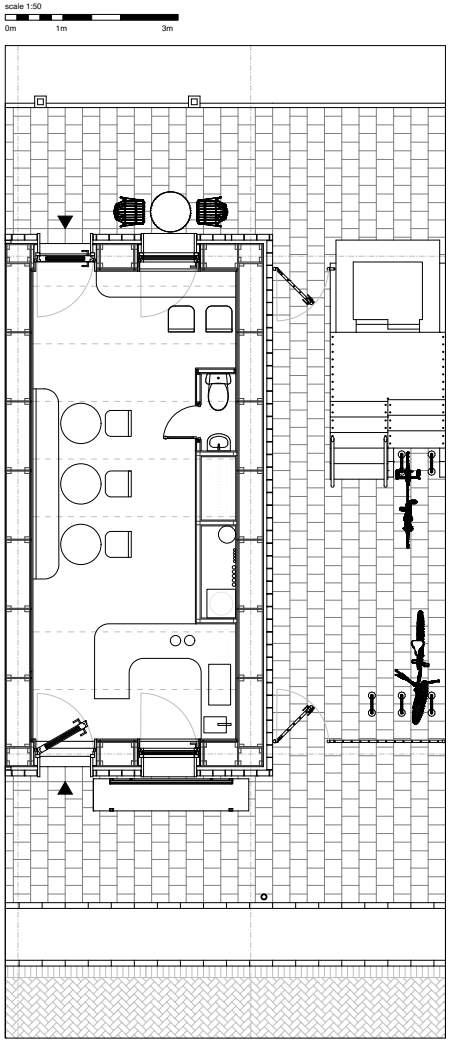




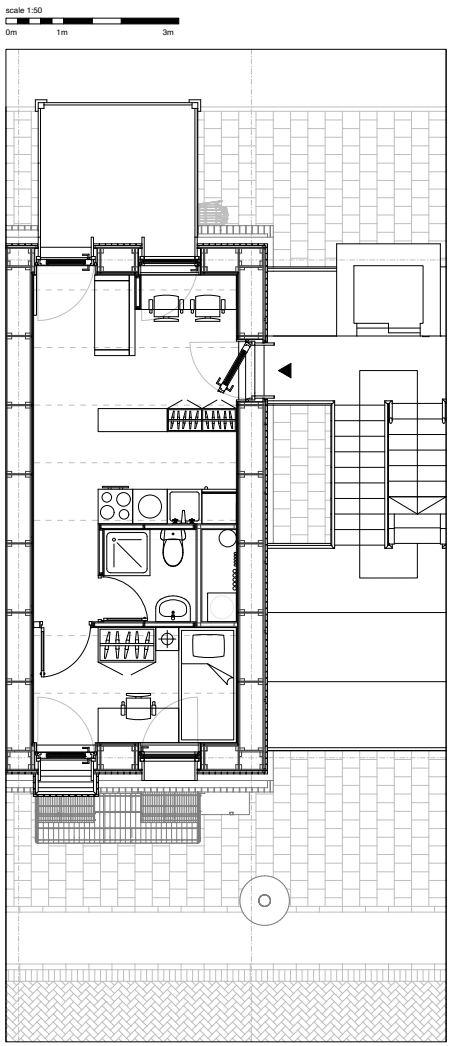
details

1:20 plans

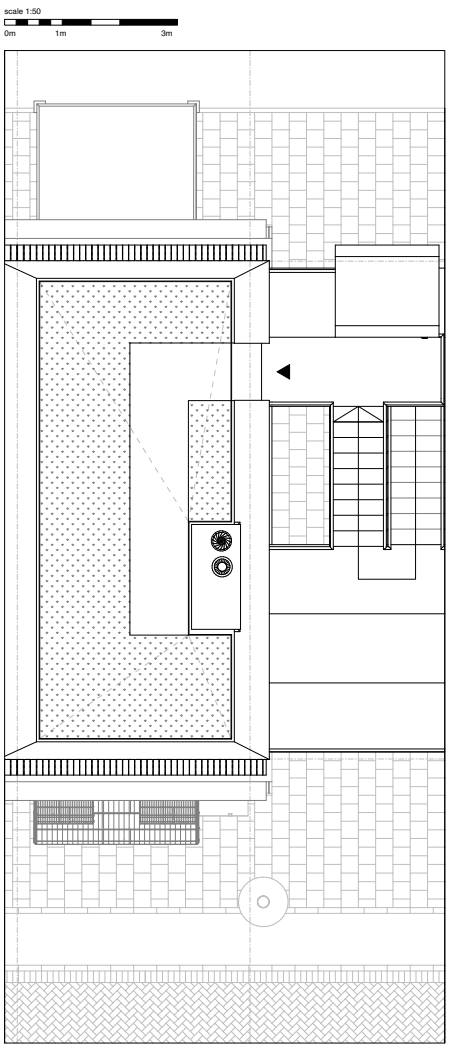
ground floor



upper floor

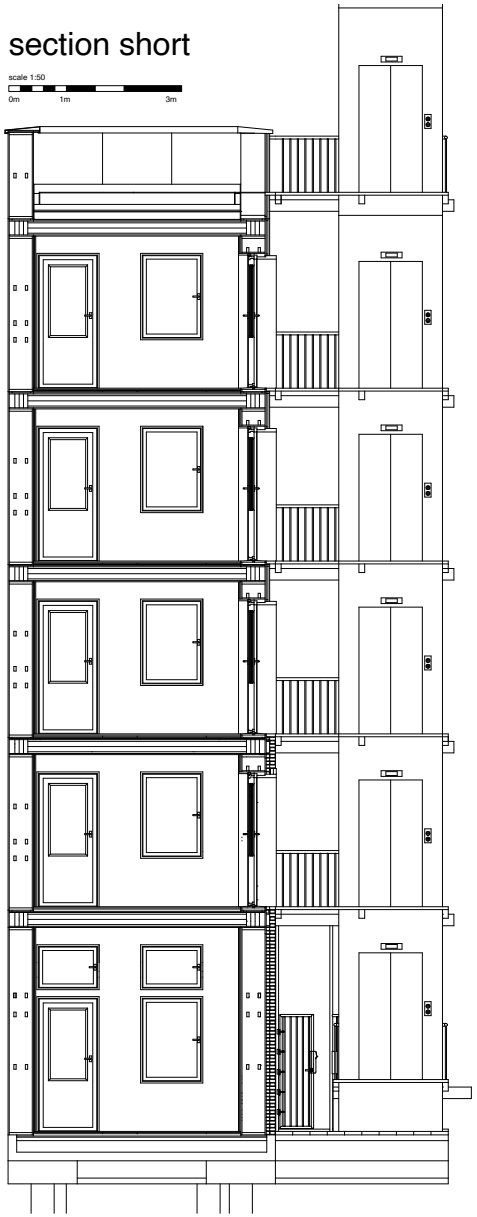


roof

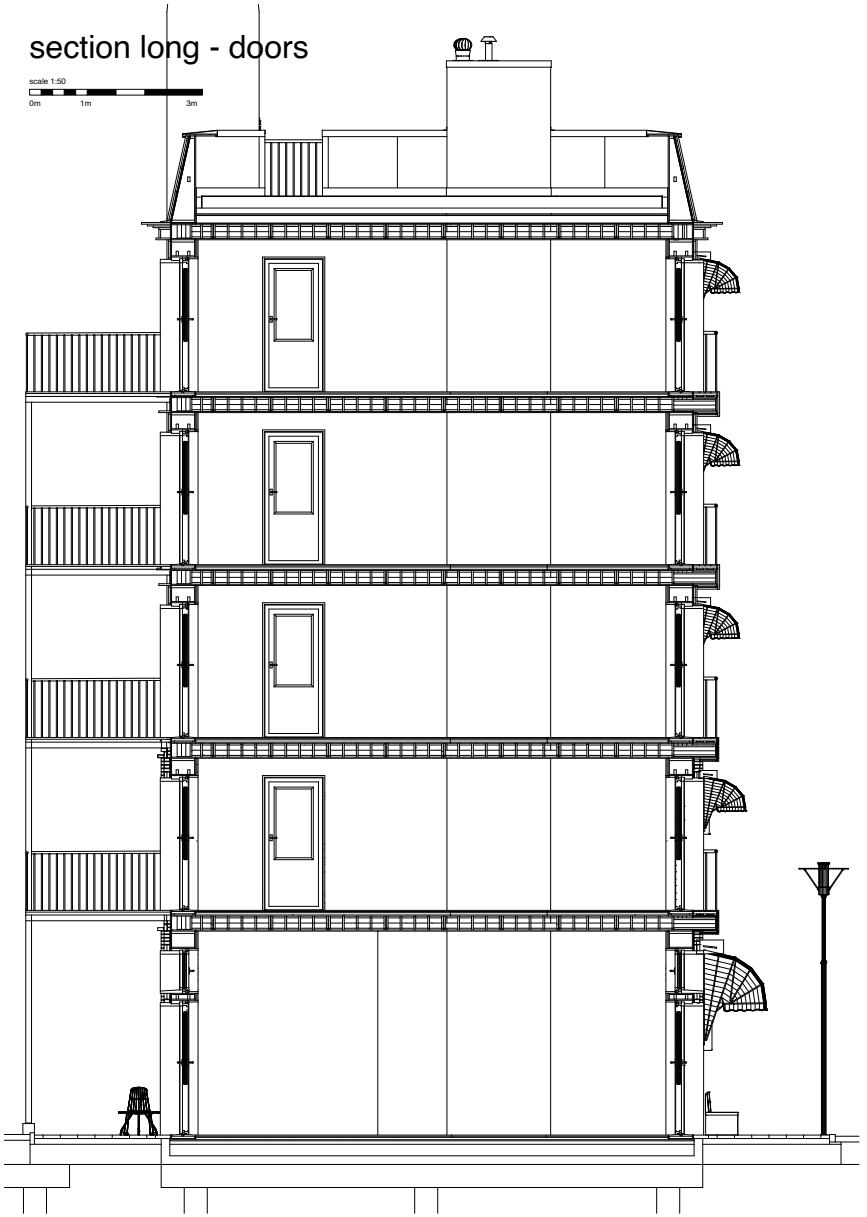


1:20 sections

section short

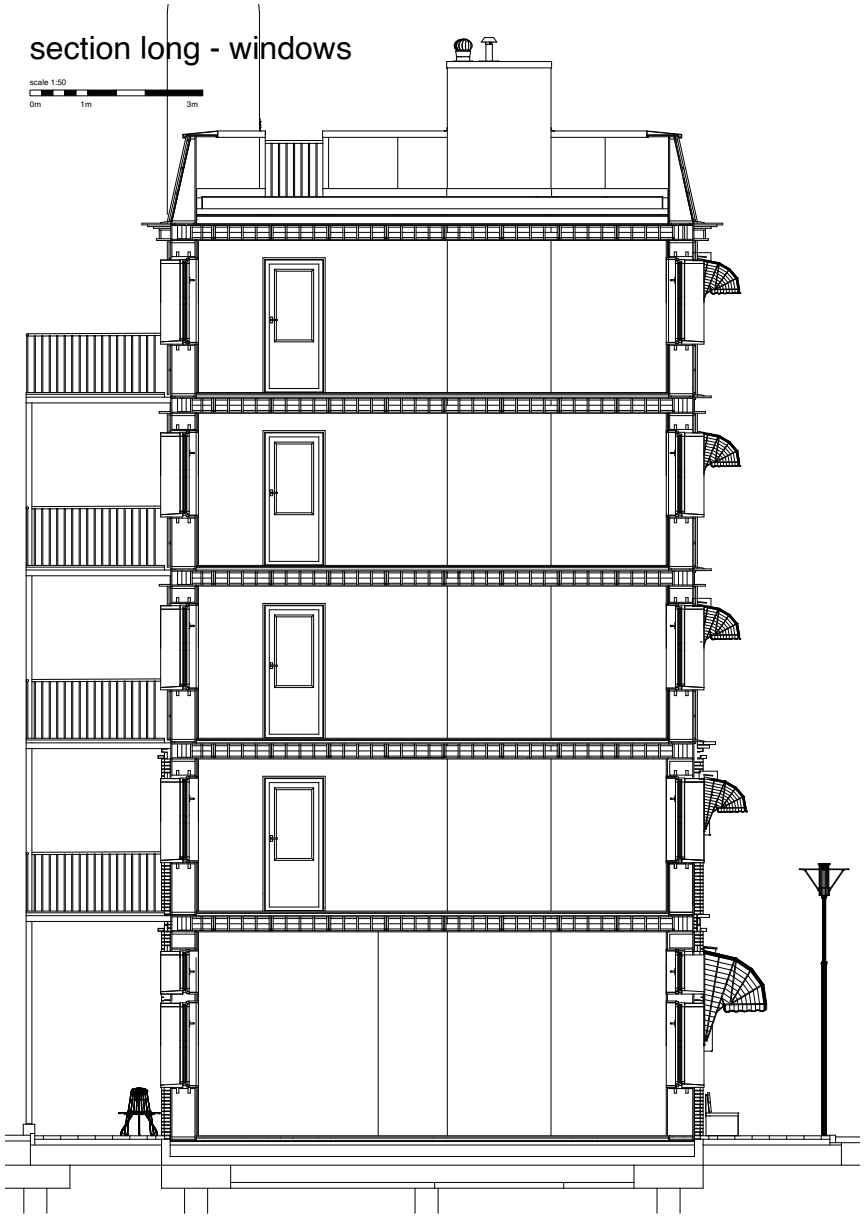


section long - doors

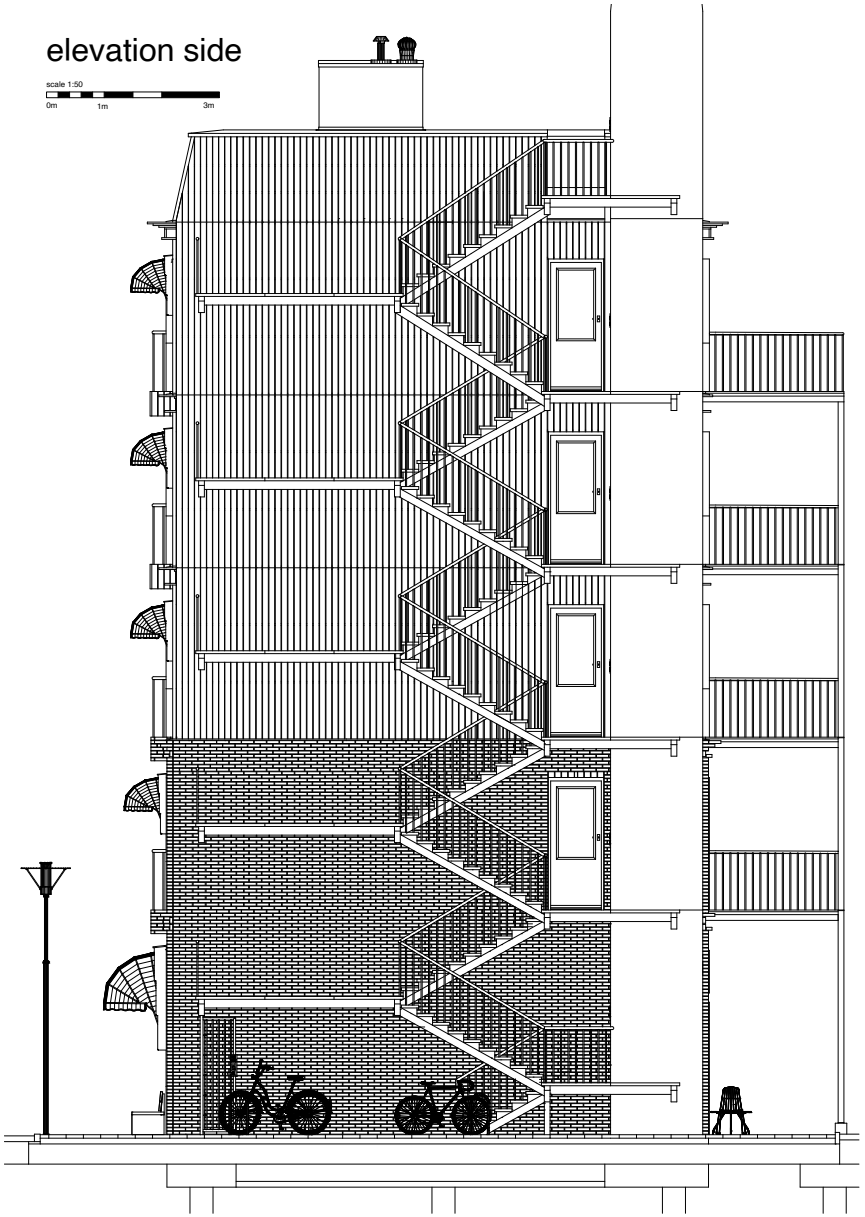


1:20 section and elevation

section long - windows

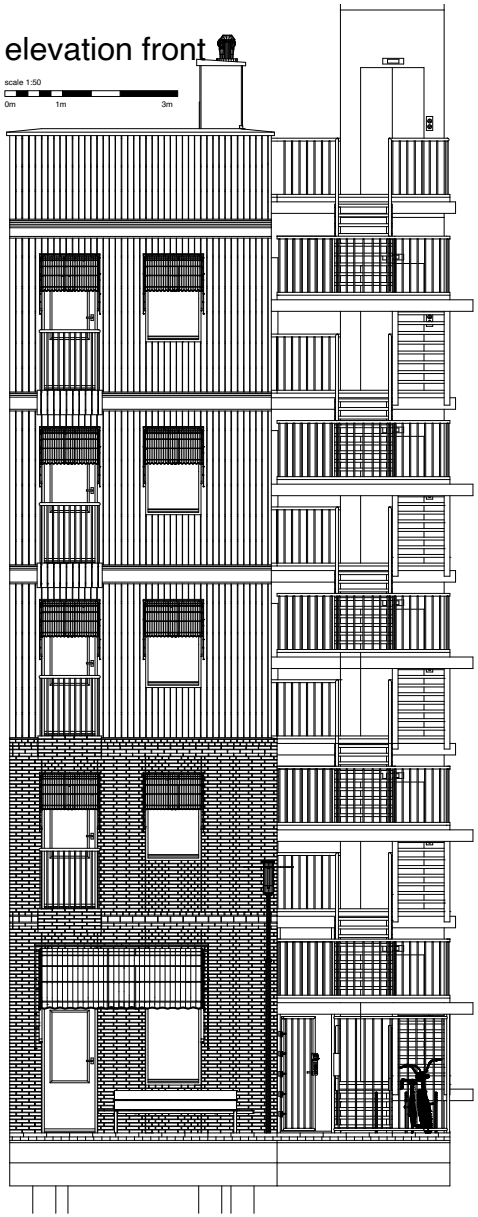


elevation side

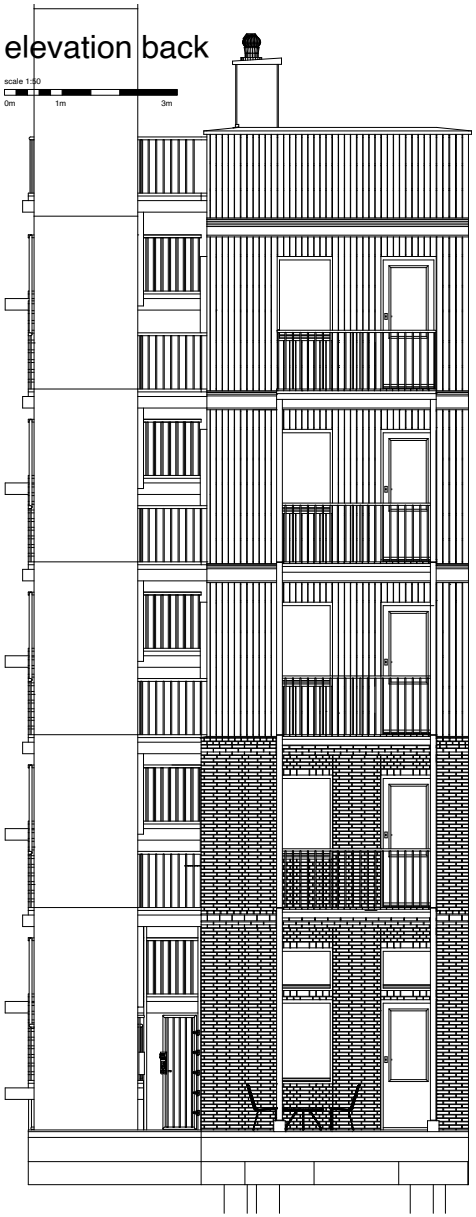


1:20 elevations

elevation front

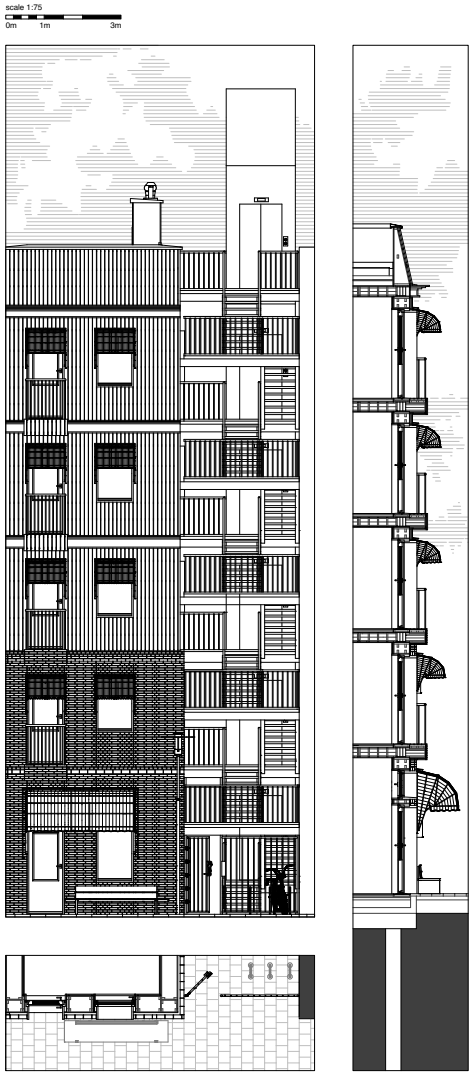


elevation back



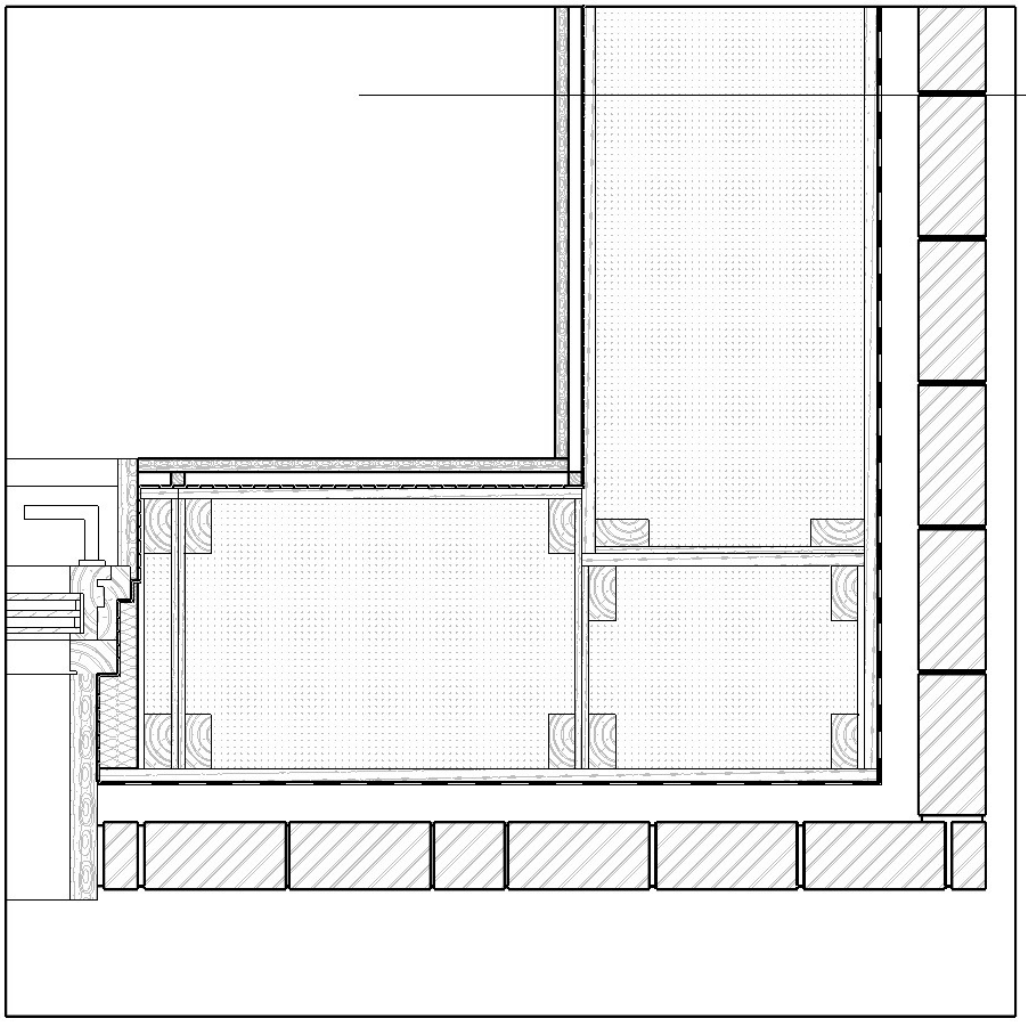
1:20 set

detail overview



1 : 5

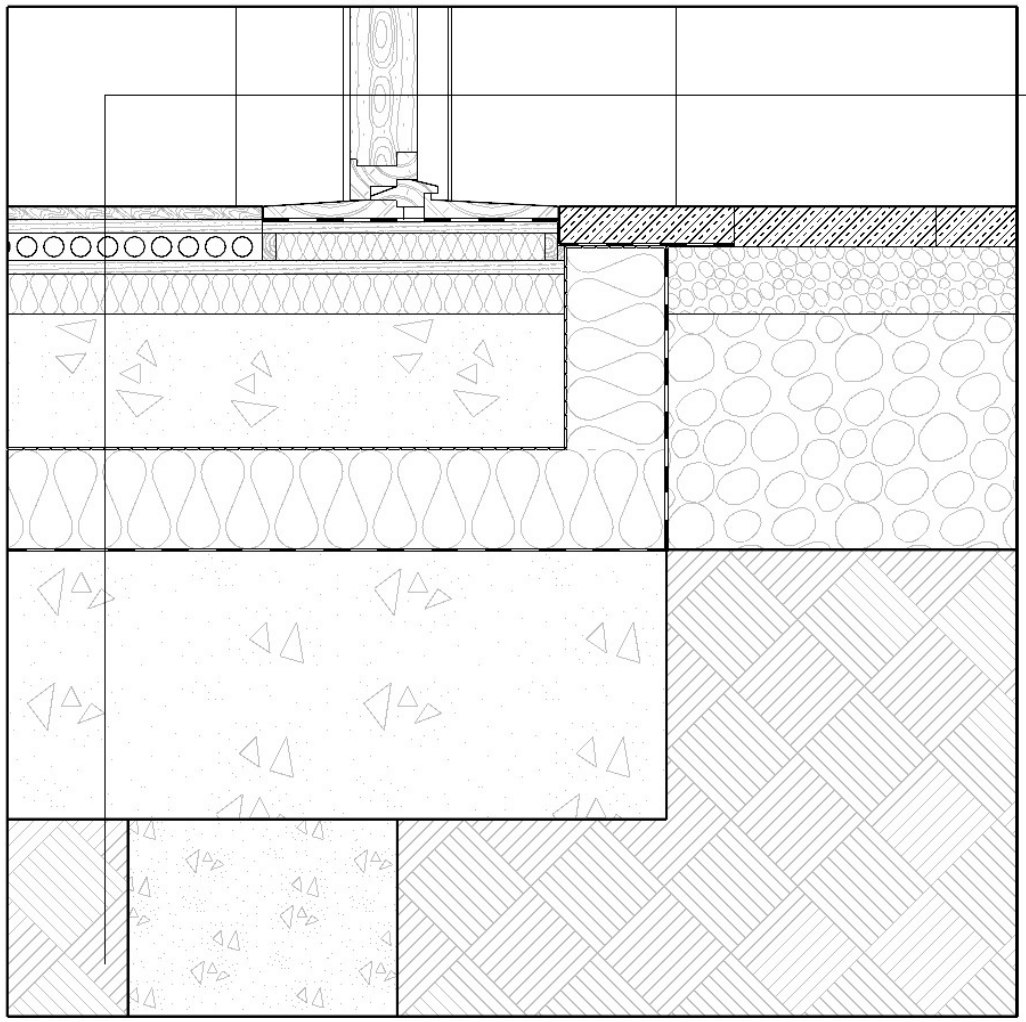
plan detail



wall - brick:
- plywood finish
- electrical cavity
- vapor barrier
- straw box element
- osb sheating
- waterproof layer
- cavity
- brick facade

1 : 5

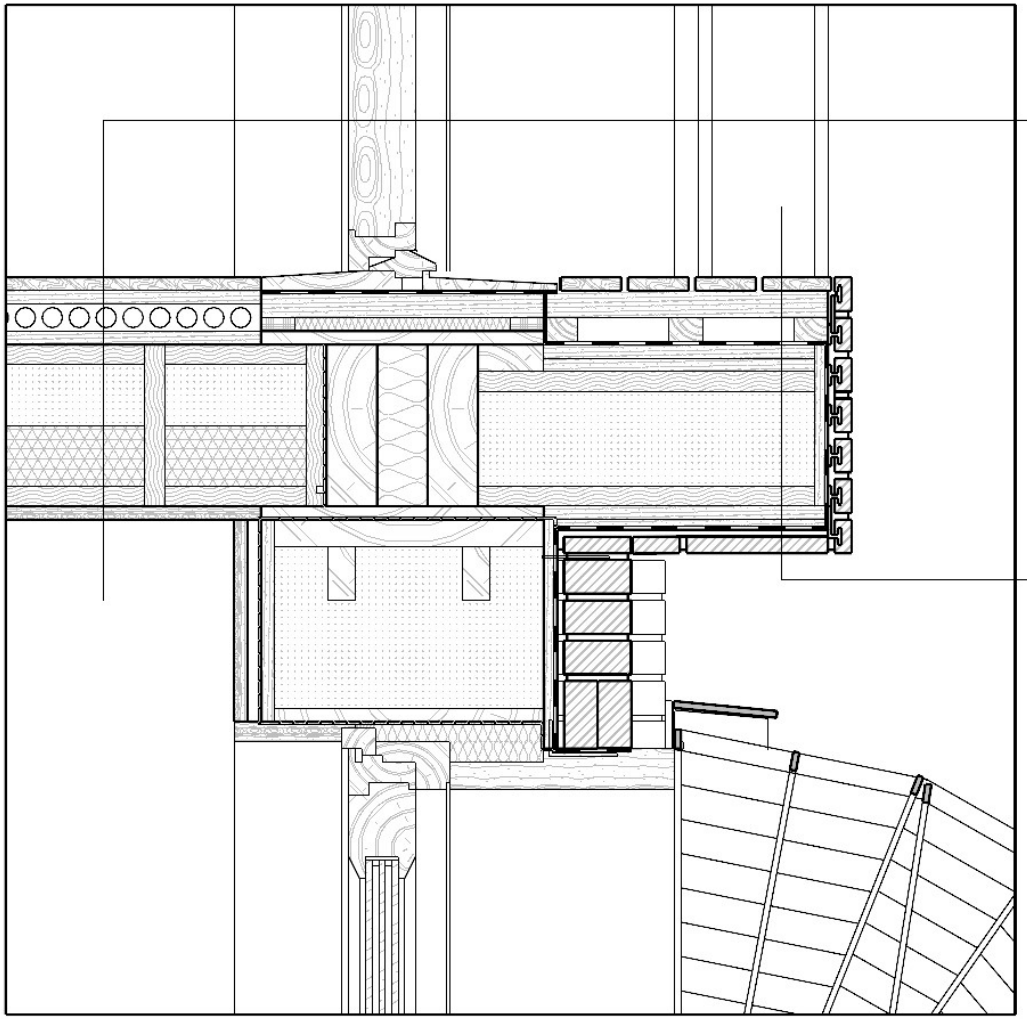
foundation detail



ground floor:
- plywood finish
- plywood base
- floor heating
- wood fiber
- rockwool insulation
- concrete base
- vapour barrier
- rockwool insulation
- waterproof layer
- foundation ring
- foundation pile

1 : 5

floor detail

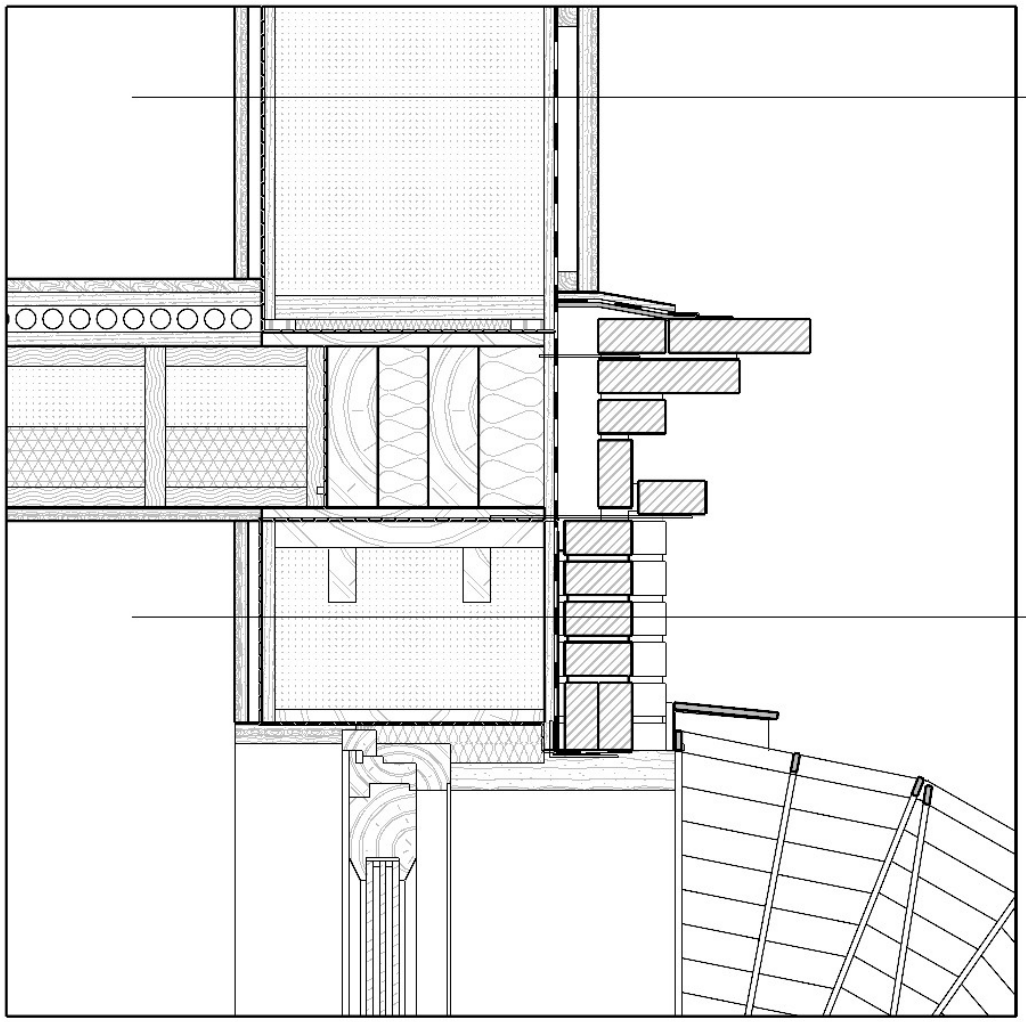


floor:
- plywood finish
- plywood base
- floor heating
- wood fiber
- lignatur element with insulation and acoustic infill
- plywood finish

balcony:
- wooden planks
- perpendicular wooden battens
- waterproof layer
- osb sheating
- wood fiber
- lignatur element with insulation infill
- osb sheating
- waterproof layer
- rails with brick panels

1 : 5

cornice detail

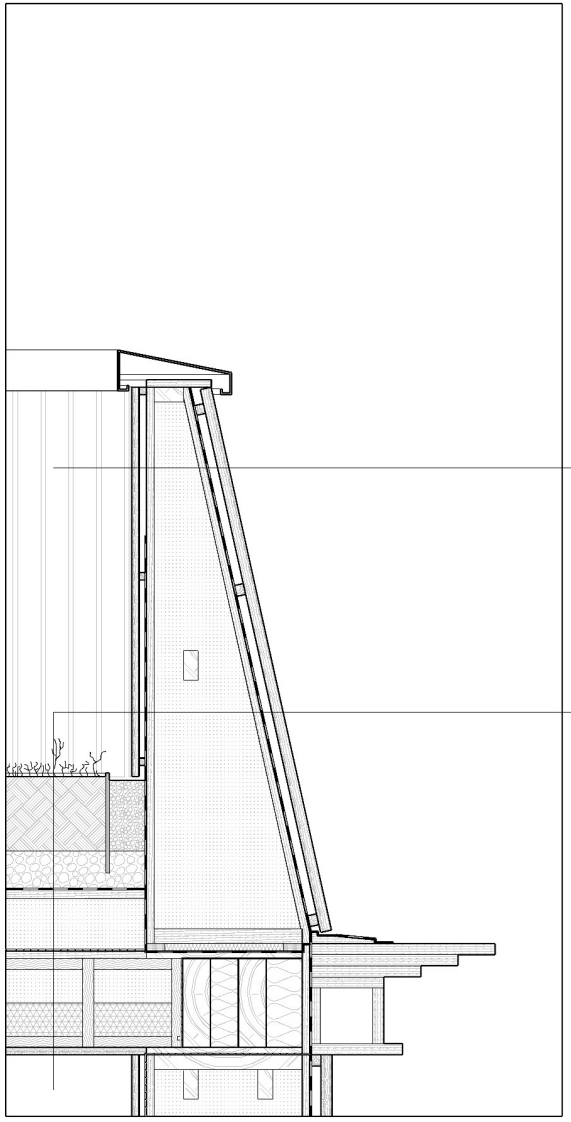


wall wood:
- plywood finish
- electrical cavity
- vapor barrier
- straw box element
- osb sheating
- waterproof layer
- studs
- reclaimed wood facade

wall - brick:
- plywood finish
- electrical cavity
- vapor barrier
- straw box element
- osb sheating
- waterproof layer
- cavity
- brick facade

1 : 5

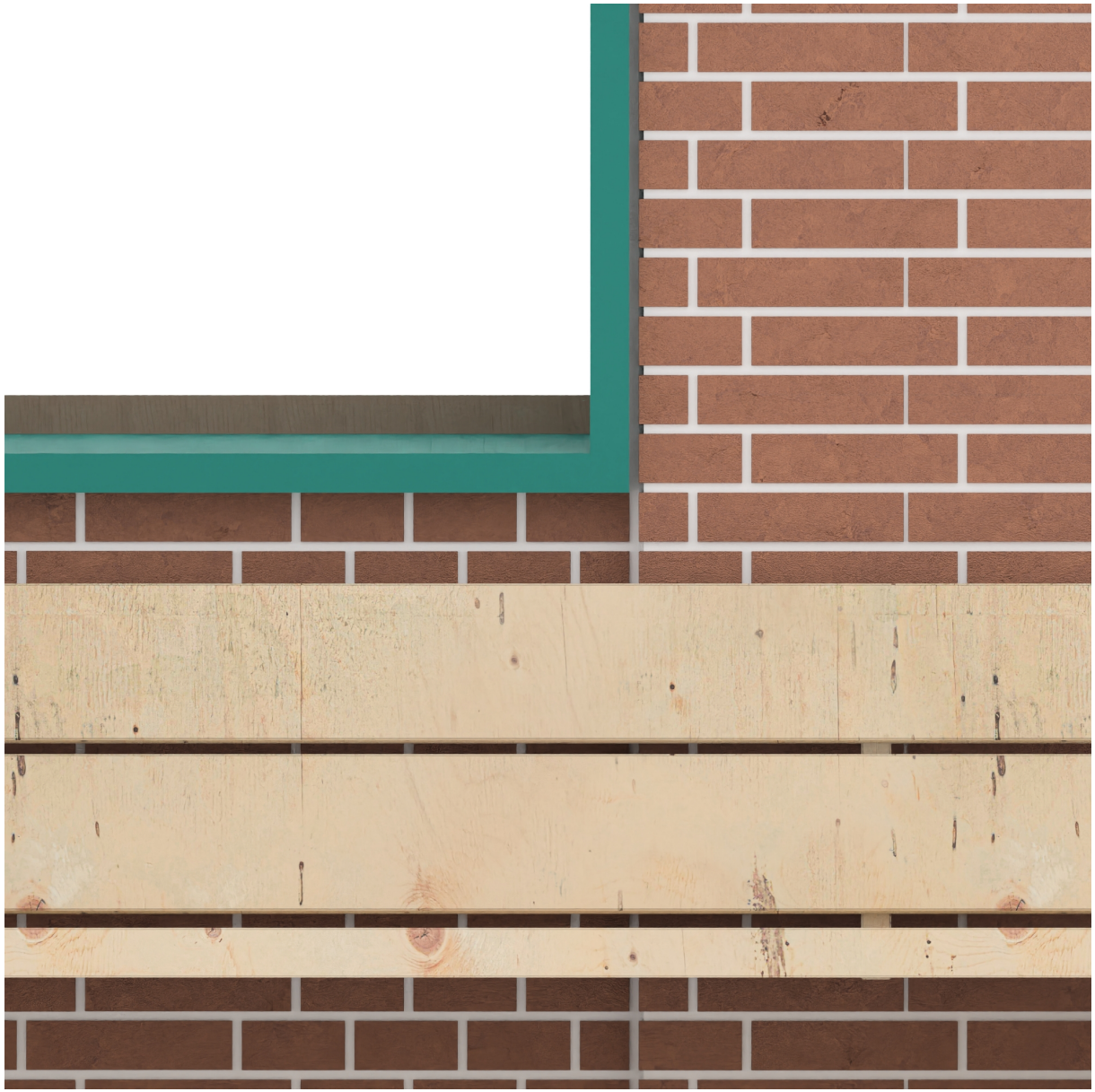
roof detail



wall - wood:
- plywood finish
- electrical cavity
- vapor barrier
- straw box element
- osb sheating
- waterproof layer
- studs
- reclaimed wood facade

roof:
- grass
- soil
- gravel
- waterproof layer
- osb sheating
- straw insulation
- vapor barrier
- wood fiber
- lignatur element
with insulation
and acoustic infill
- plywood finish

materiality - brick re-use



materiality - reclaimed wood



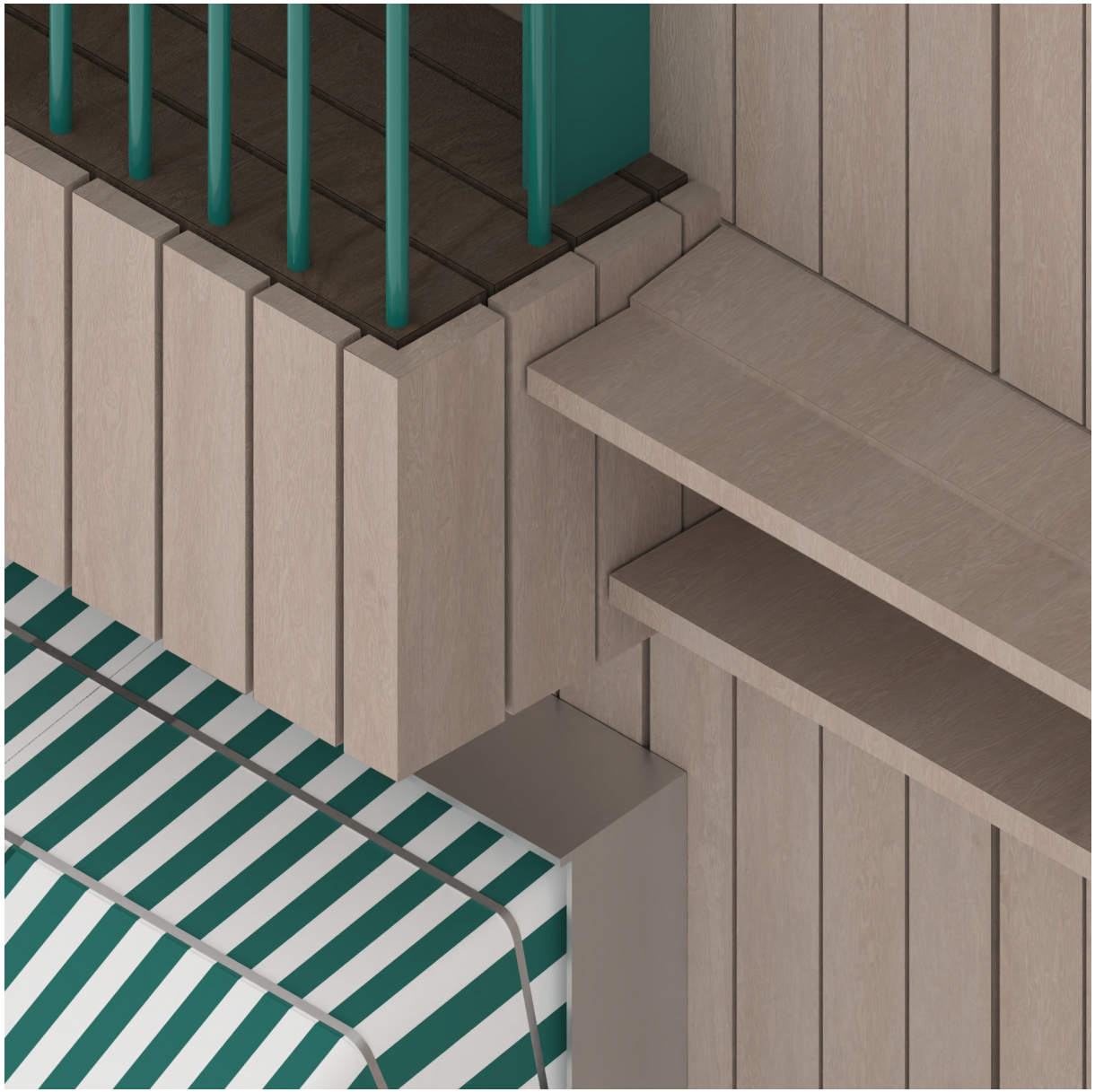
materiality - awnings



materiality - facade details 1



materiality - facade details 2



carbon footprint

	this development	traditional option
floors	lignatur floor ≈ 9 $kgCO_2e/m^2$ | 54 kg/m^2	concrete slab (200 mm) ≈ 90 $kgCO_2e/m^2$ | 480 kg/m^2
walls	compressed straw panel ≈ 4 $kgCO_2e/m^2$ | 30 kg/m^2	brick wall ≈ 32 $kgCO_2e/m^2$ | 200 kg/m^2
roof	green roof (20 cm soil) ≈ 24 $kgCO_2e/m^2$ | 240 kg/m^2	conventional flat roof ≈ 30 $kgCO_2e/m^2$ | 70 kg/m^2
facade	reclaimed brick + timber ≈ 1 $kgCO_2e/m^2$ | 210 kg/m^2	new brick + timber ≈ 33 $kgCO_2e/m^2$ | 210 kg/m^2
foundations	deep concrete piles ≈ 180 $kgCO_2e/m^2$ | 960 kg/m^2	deep concrete piles ≈ 180 $kgCO_2e/m^2$ | 960 kg/m^2

element	CO_2e (kg)	weight (kg)
floors	2 359.8	14 158.8
walls / façade	4 352.4	72 924
roof	1 048.8	10 488
foundations	7 866	41 952
total	15 627 $kgCO_2e$	139 522 kg

element	CO_2e (kg)	weight (kg)
floors	23 598	125 856
walls / façade	11 308.8	70 680
roof	1 311	3 059
foundations	7 866	41 952
total	43 083.8 $kgCO_2e$	241 547 kg

this construction method reduces embodied CO_2 by **~64%** and material weight by **~42%**

price

	this development	traditional option
floors	€66 /m²	€95 /m²
walls	€92 /m²	€207 /m²
roof	€270 /m²	€213 /m²
facade	€109 /m²	€287 /m²
foundations	€345 /m²	€345 /m²
average total	≈ €882 /m²	≈ €1 147 /m²

this development has ~**23%** lower average cost per m² than the traditional build, biggest savings are **walls** and **façades**

back to community needs

safety

income

stability

transparency

greenery

heat-stress

community

businesses, lights

baugruppe

social contract

participation

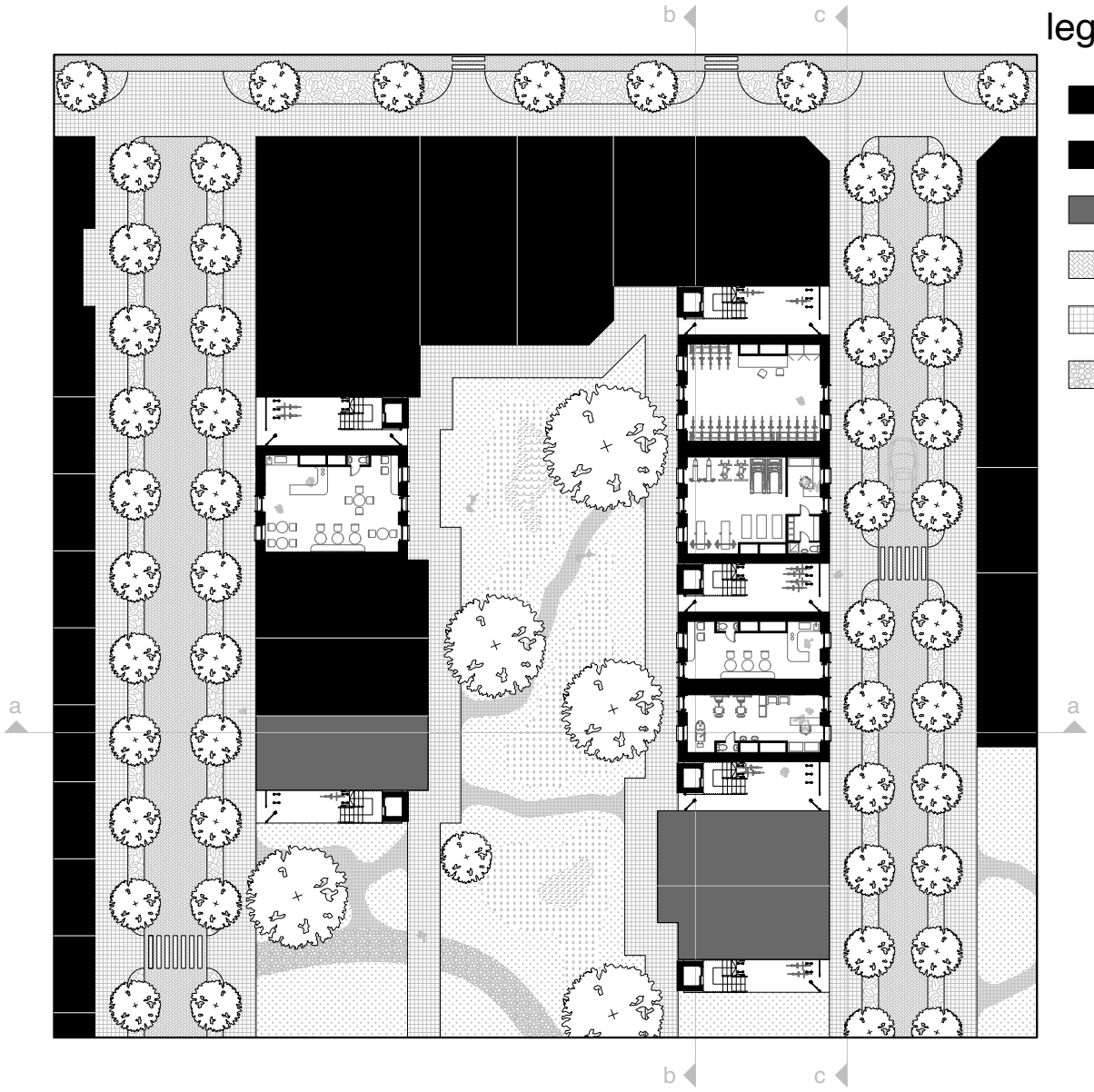
new master plan

landscape design

undisplacement

development

ground floor site plan



legend

- plan cut
- existing buildings not redeveloped
- existing buildings redeveloped
- road
- pavement
- landscape track
- paths
- hedges and bioswales
- grass and plans
- wetlands
- swamps
- water

N

scale 1:250

0m 2.5m 5m 10m

fourth floor site plan



legend

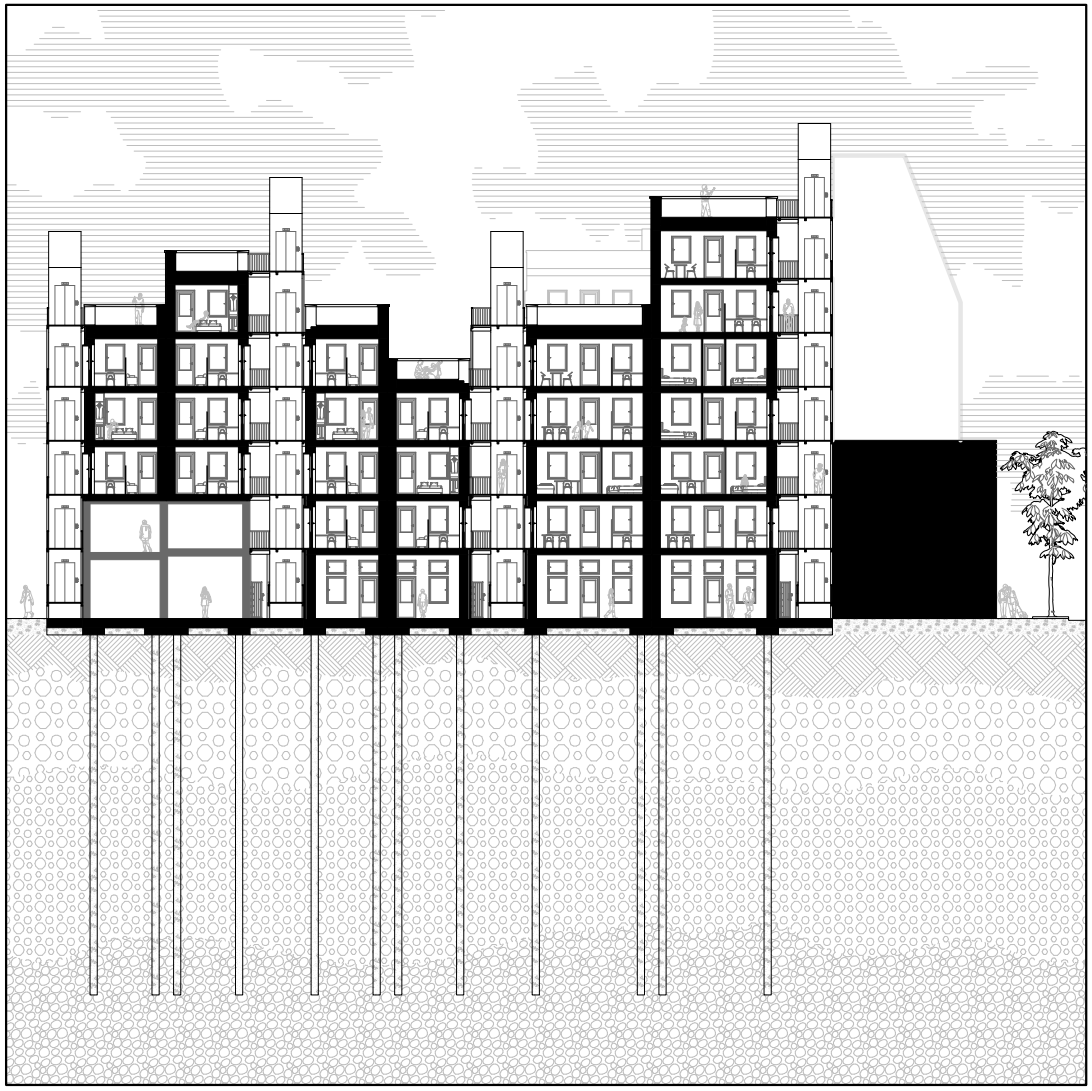
- plan cut
- existing buildings view not redeveloped
- existing buildings view redeveloped
- road
- pavement
- landscape track
- paths
- hedges and bioswales
- grass and plans
- wetlands
- swamps
- water

N

scale 1:250

0m 2.5m 5m 10m

long section



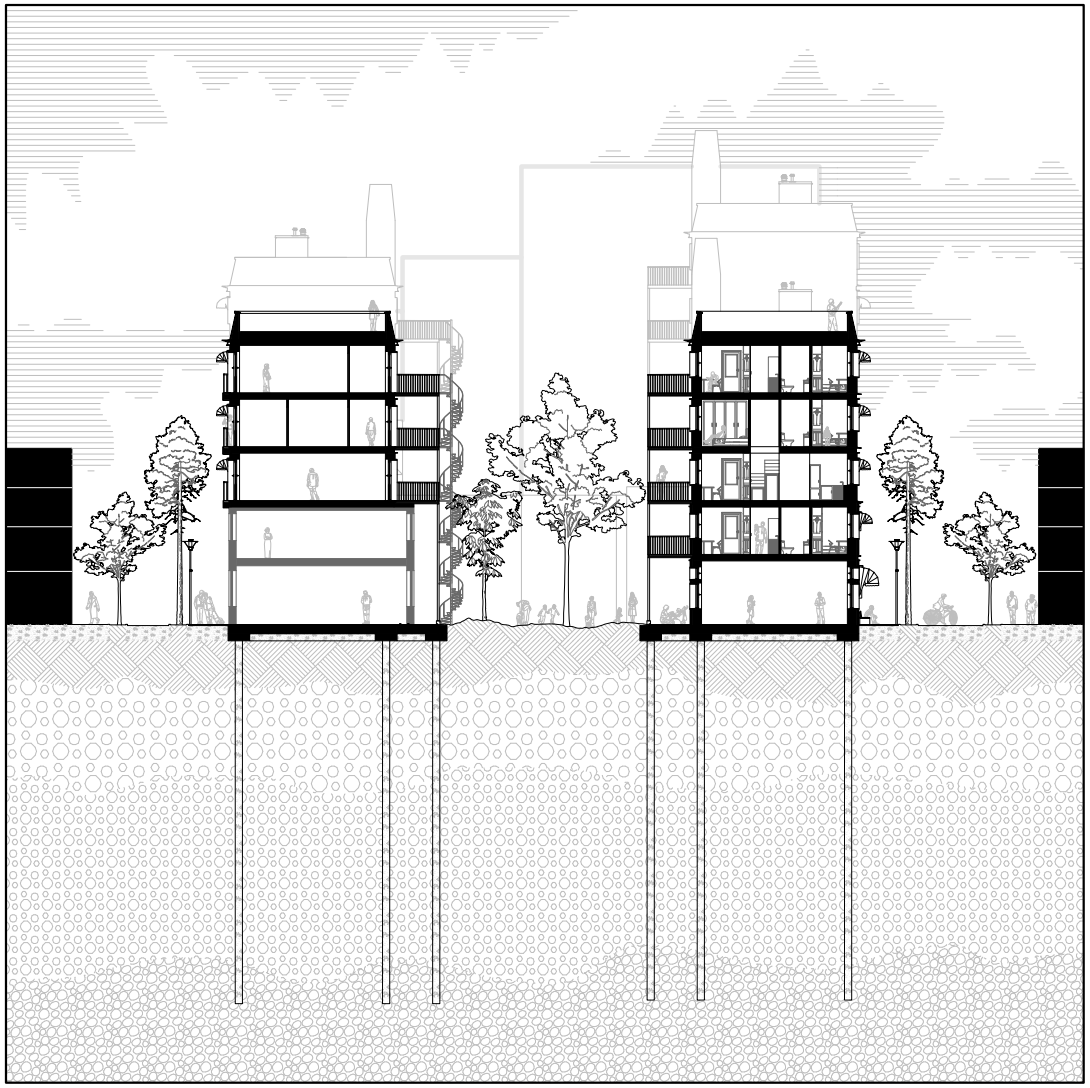
legend

- section cut
- existing buildings not redeveloped
- existing buildings redeveloped
- background buildings
- future developement
- interior view
- road infrastrusture
- foundation piles
- weak soil
- soft soil
- medium soil
- hard soil

scale 1:250

0m 2.5m 5m 10m

short section



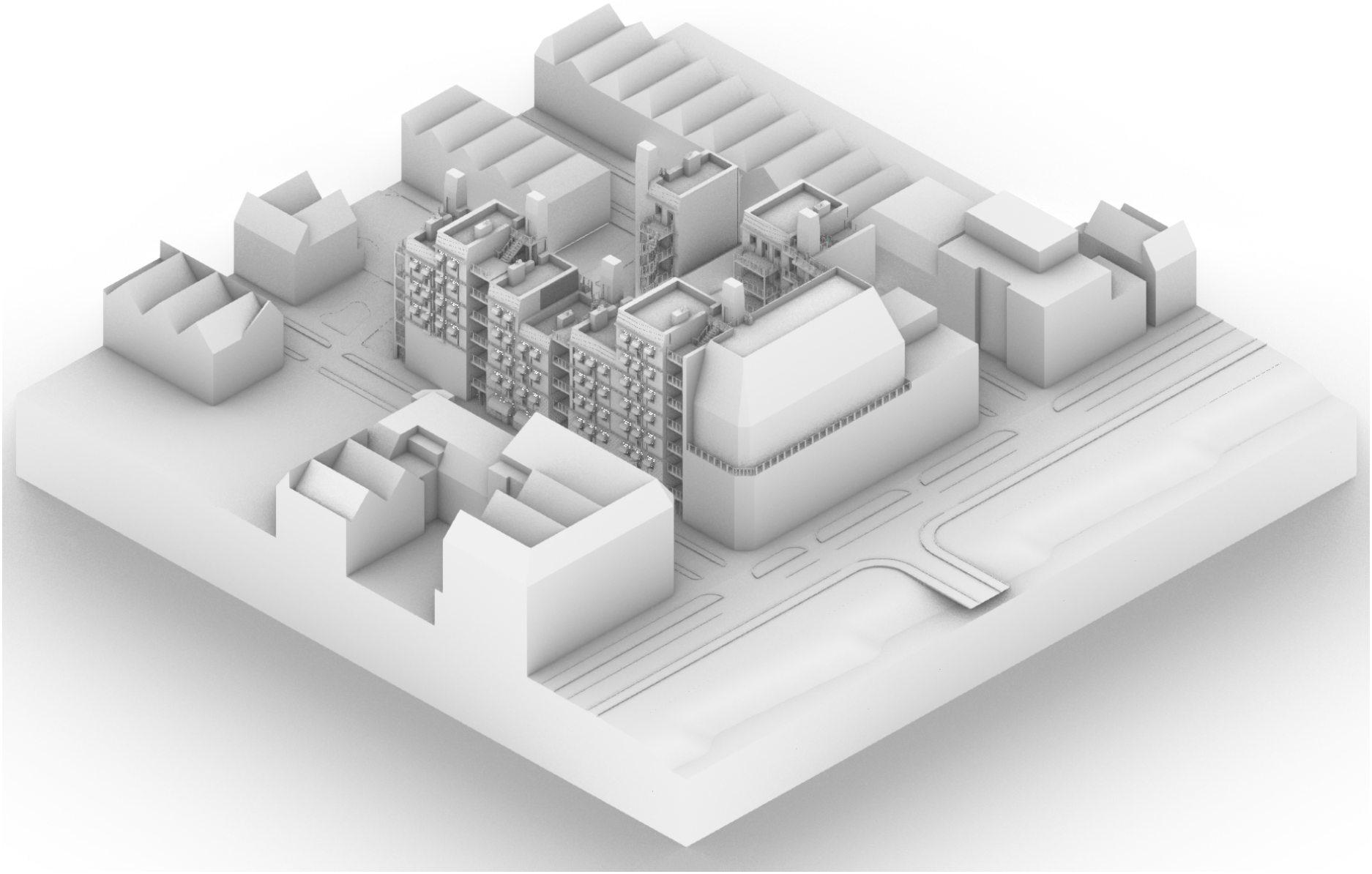
legend

- section cut
- existing buildings not redeveloped
- existing buildings redeveloped
- background buildings
- future developement
- interior view
- road infrastrusture
- foundation piles
- weak soil
- soft soil
- medium soil
- hard soil

scale 1:250

0m 2.5m 5m 10m

final isometry 01



final isometry 02

