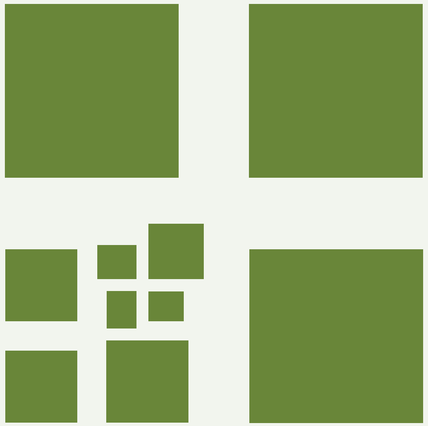


growingreciprocity

an unfinished symphony

timber for urban density

a new living environment in the minervahaven, amsterdam

research and design project
architectural wood graduation studio
2024/2025

timber revival

new possibilities for the urban scale

scalability and efficiency
through top-down organisation and standardization
for large communities

circular and dynamic architecture
lightweight biobased and de-and-remountabilility

a top-down approach to circular space creation
for the community and ecology

meaningful and fitting living environments
for the diverse members of the city

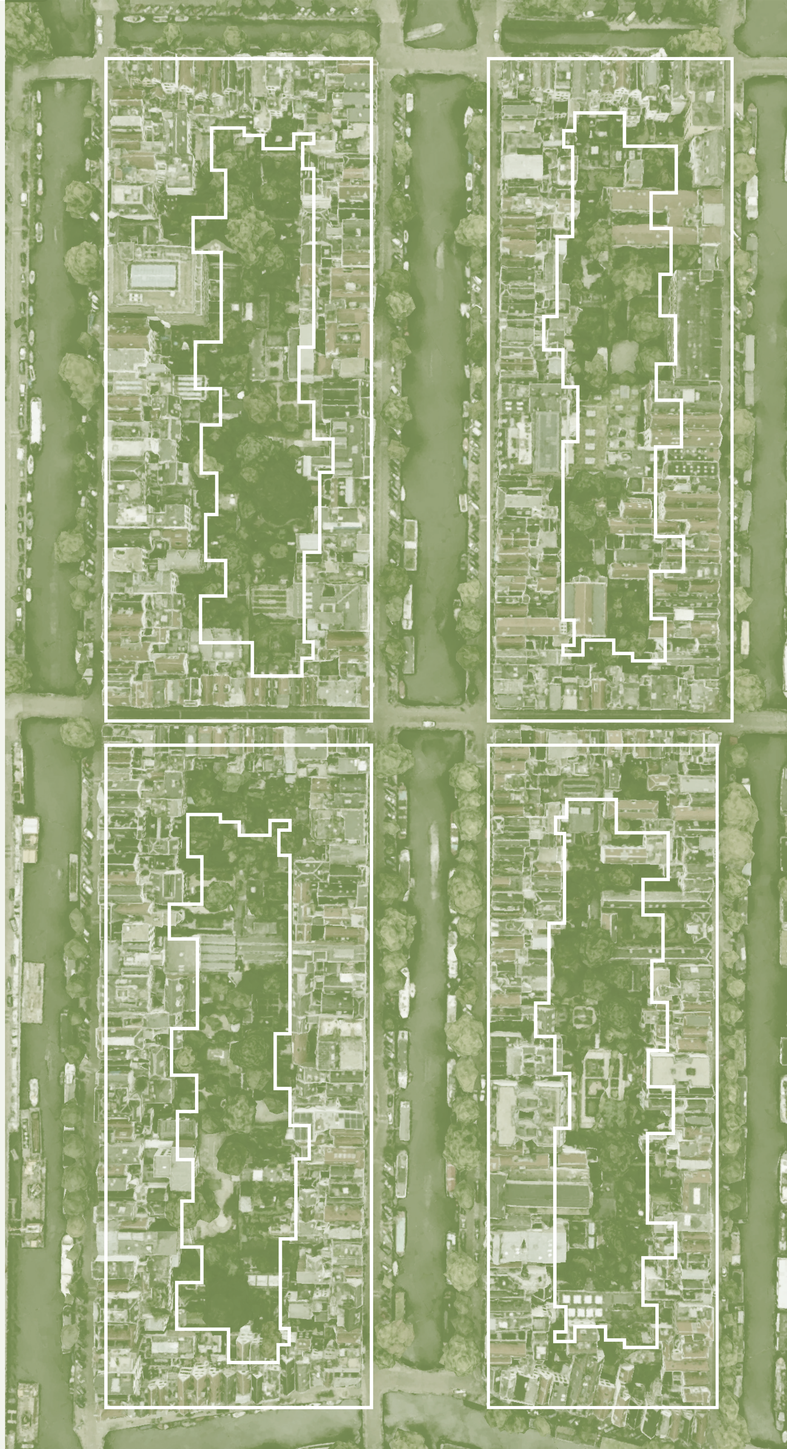
reciprocity and resilience
through bottom-up appropriation and adaptation
by members of the community and ecology

diversity and variety
through bottom-up appropriation and adaptation
by members of the community and ecology

a bottom process by the diverse members of the community and ecology

openness of an environment

the ability and agency inhabitants have to appropriate and adapt their habitat



openness : a challenge in the city

supporting scalability &
protect the common-good

land is scarce and actions of one influence the other

need for top-down organization and scalability

growing reciprocity

reseach

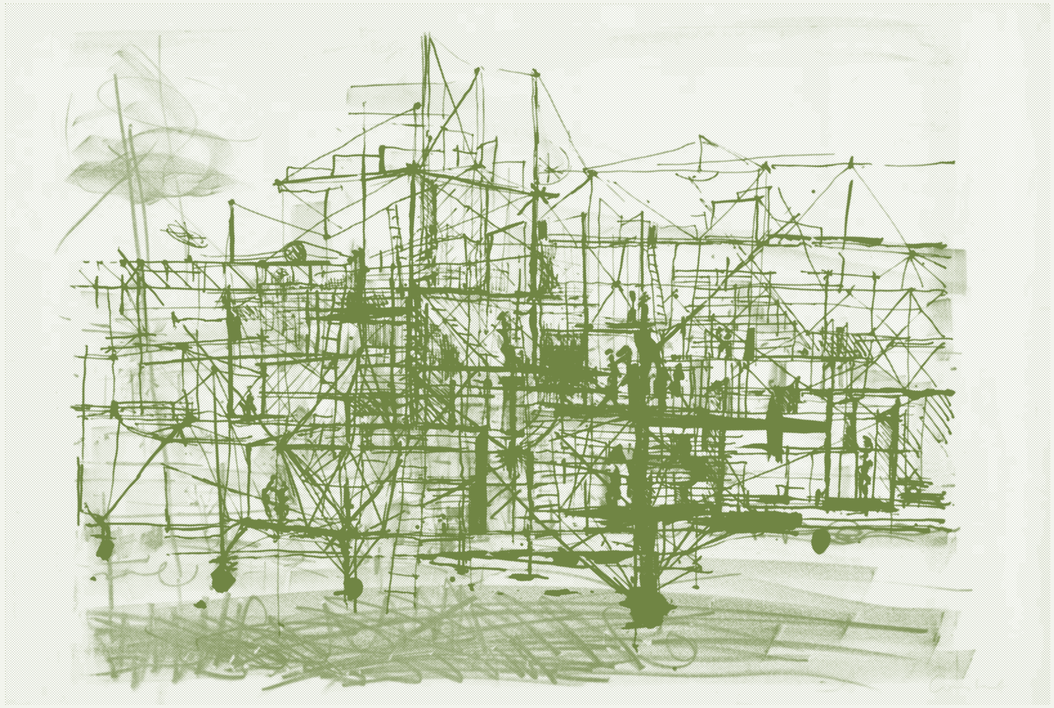
supporting openness so urban community, ecologies and
all its members have the agency and ability to change their enviroments
through time

bring together top-down organisation and scalability
to deal with the large scale and complexity of the city

and bottom-up appropriation and adaptation of space
and structure.

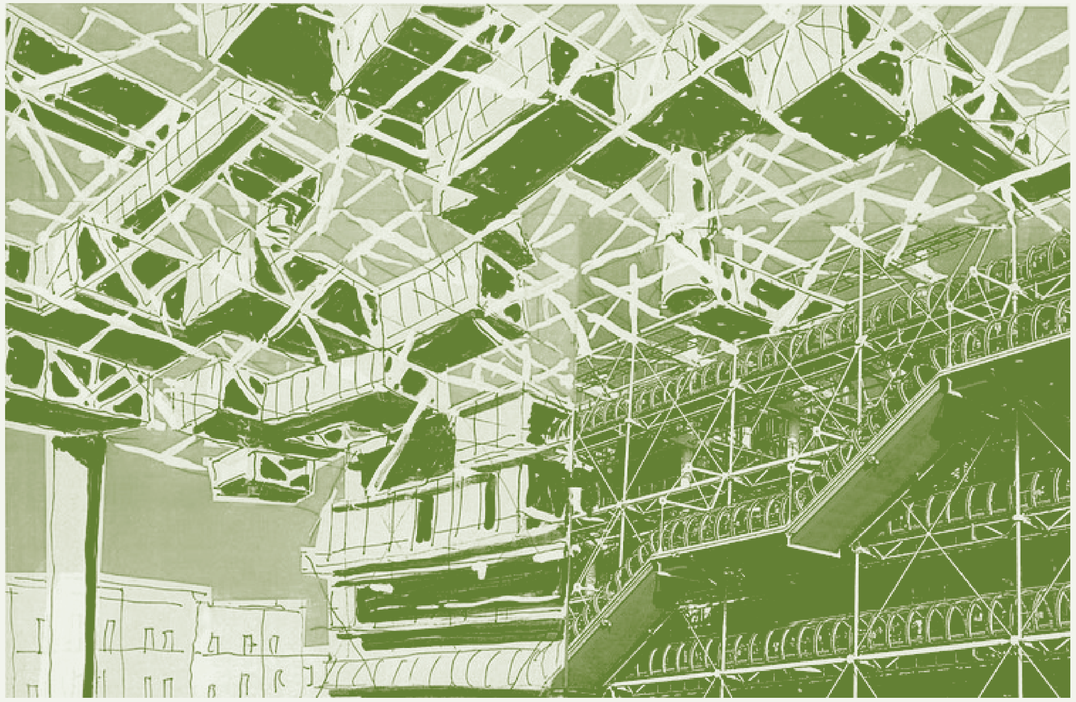
utopia of an open world

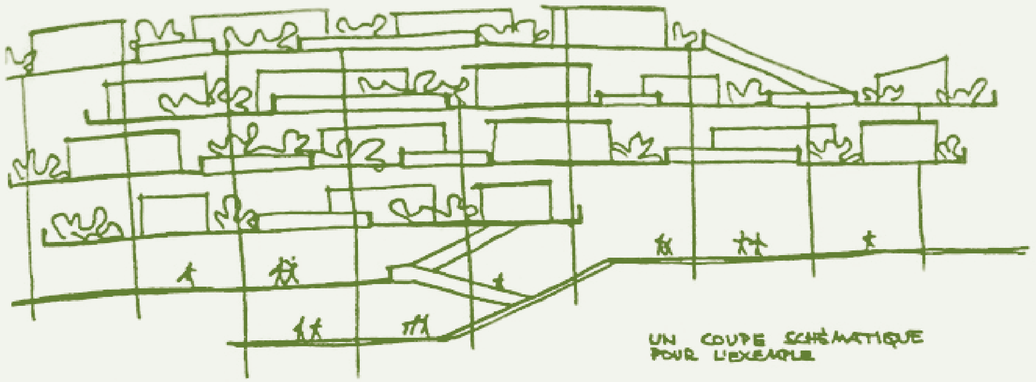
constant - new Babylon

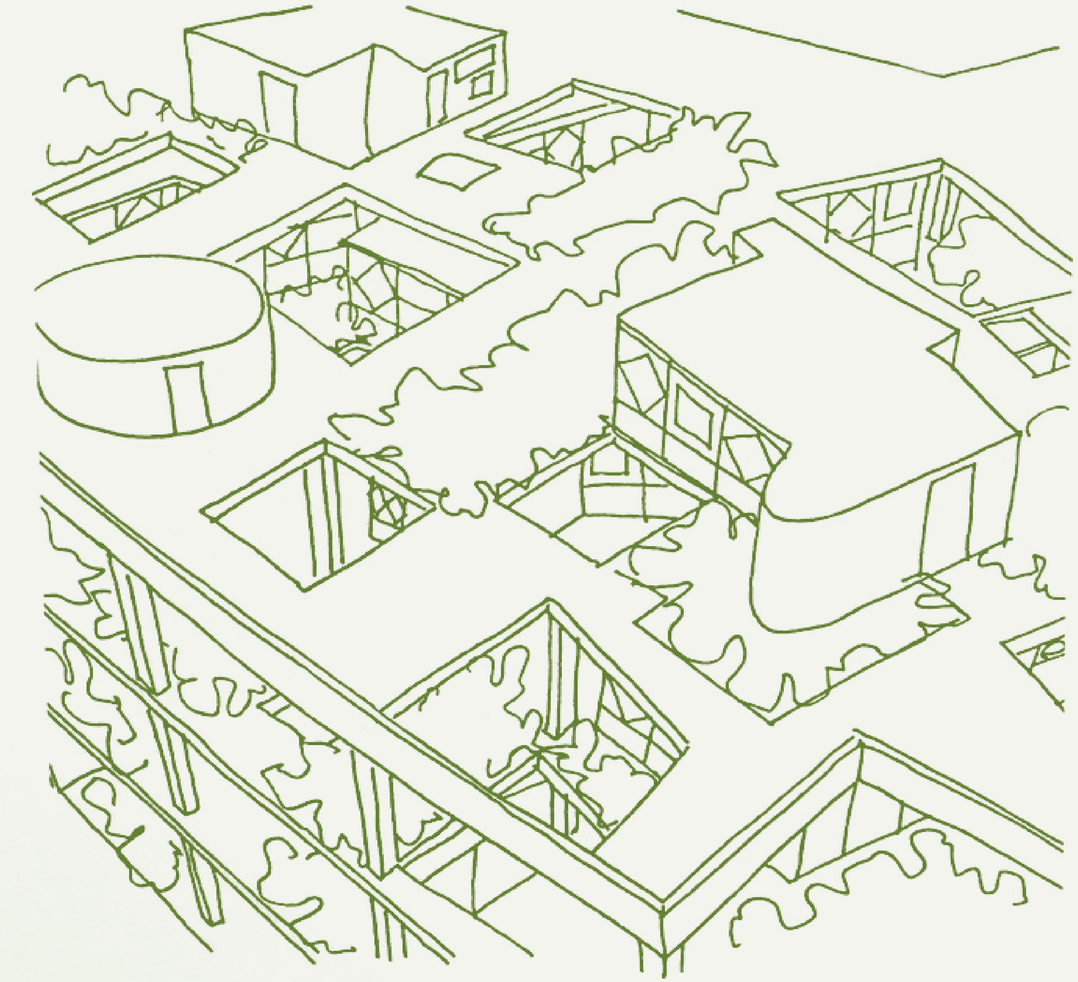


frameworks for open cities

yona friedman - ville Spatiale & mobile architecture





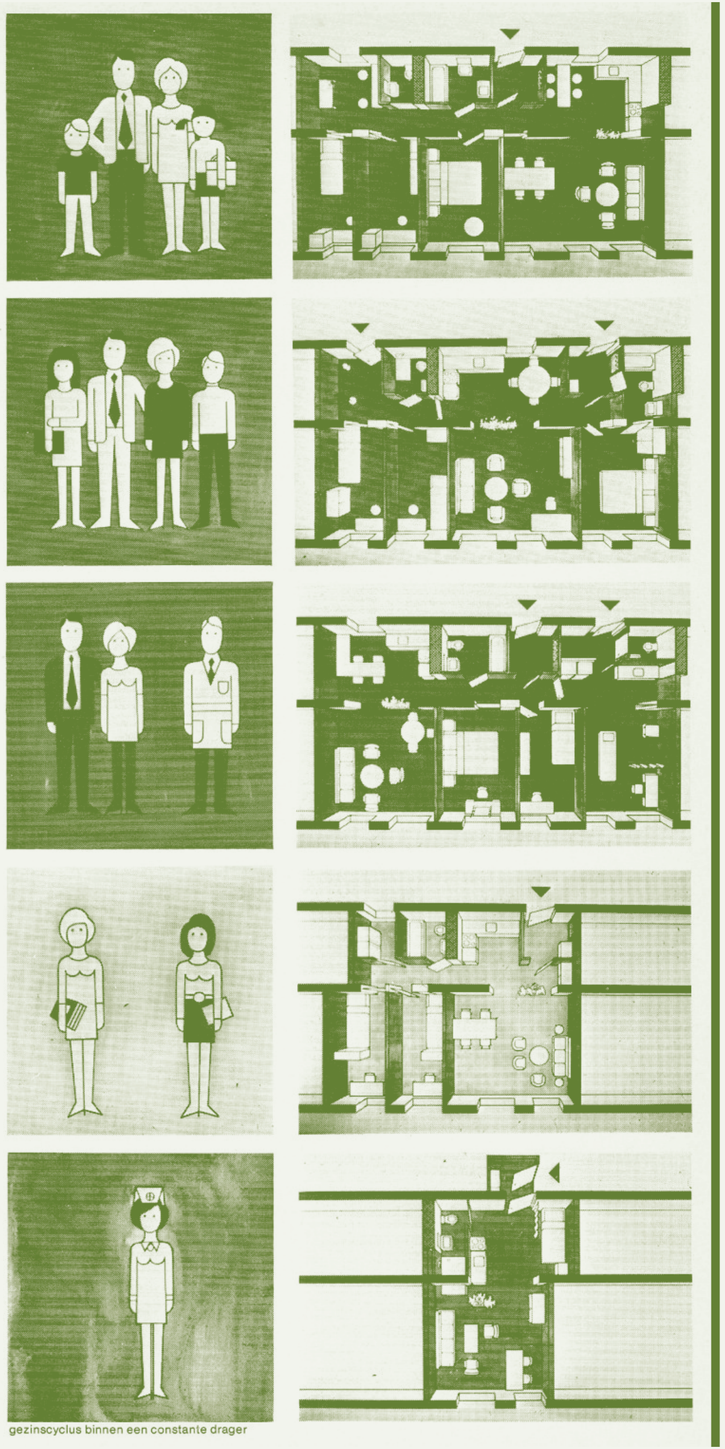


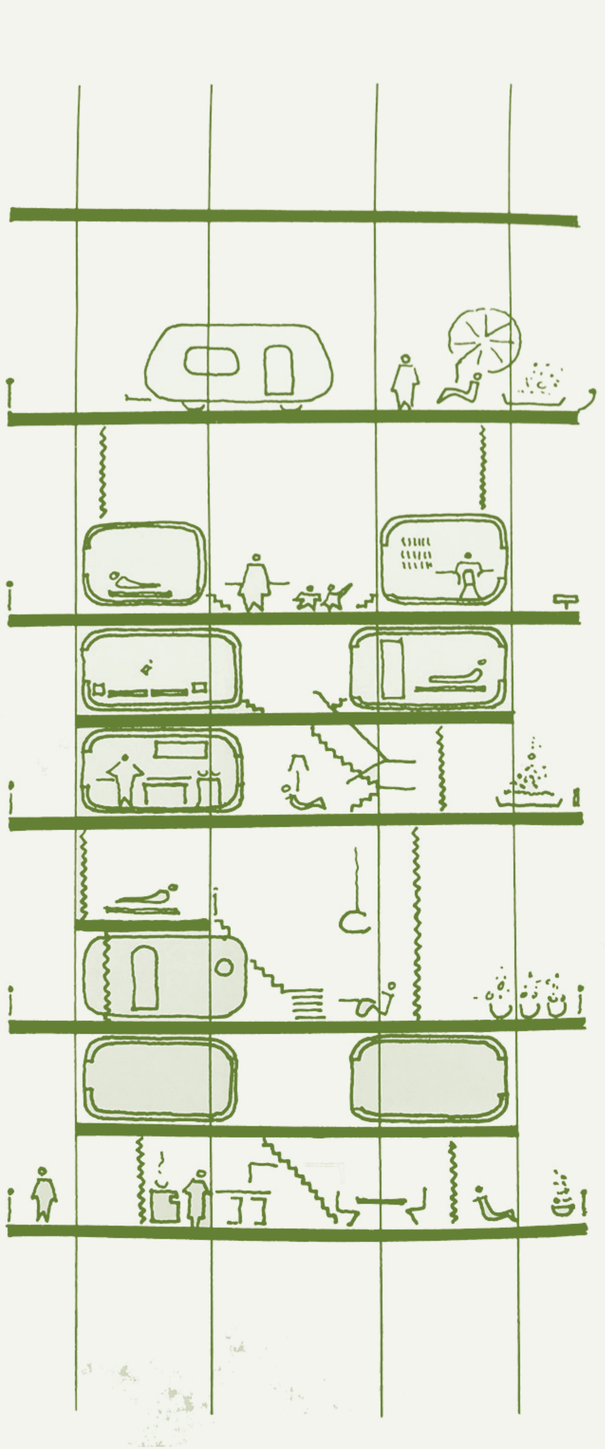
open-building : supports & infills

habraken, sar et. al.

static support for the community

dynamic infill by individuals





post-war/modern open building

lucien kroll, hertzberger, open-building.co

static concrete support

dynamic - timber - infills

stem and the web urban openness

team 10 - candilis, josic & woods

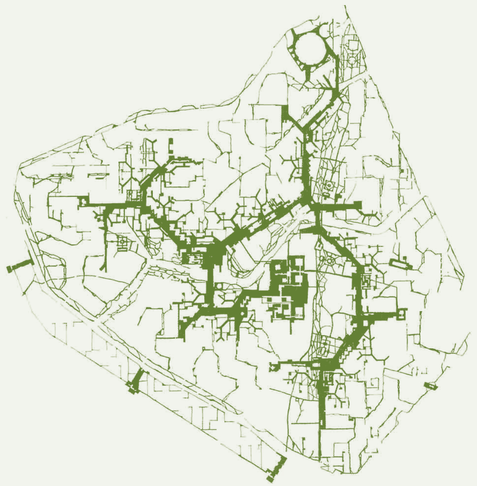
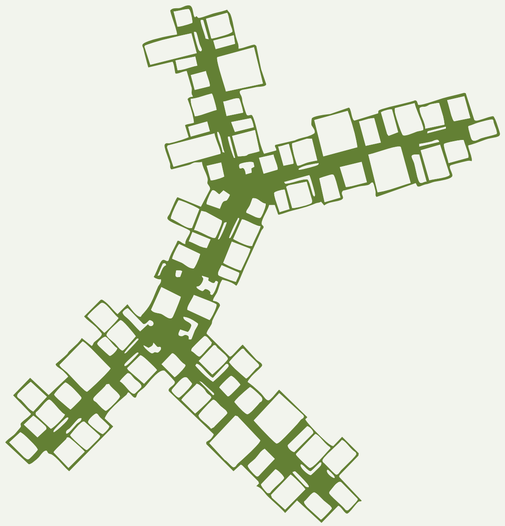
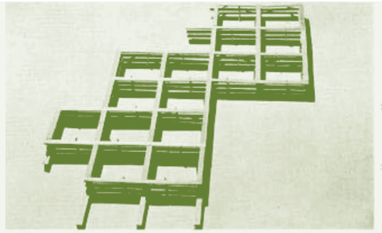
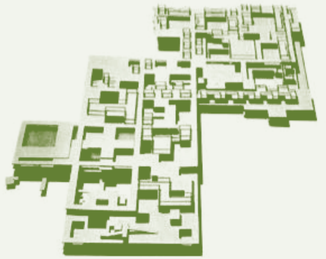
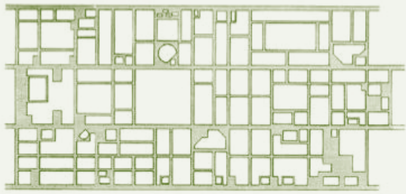


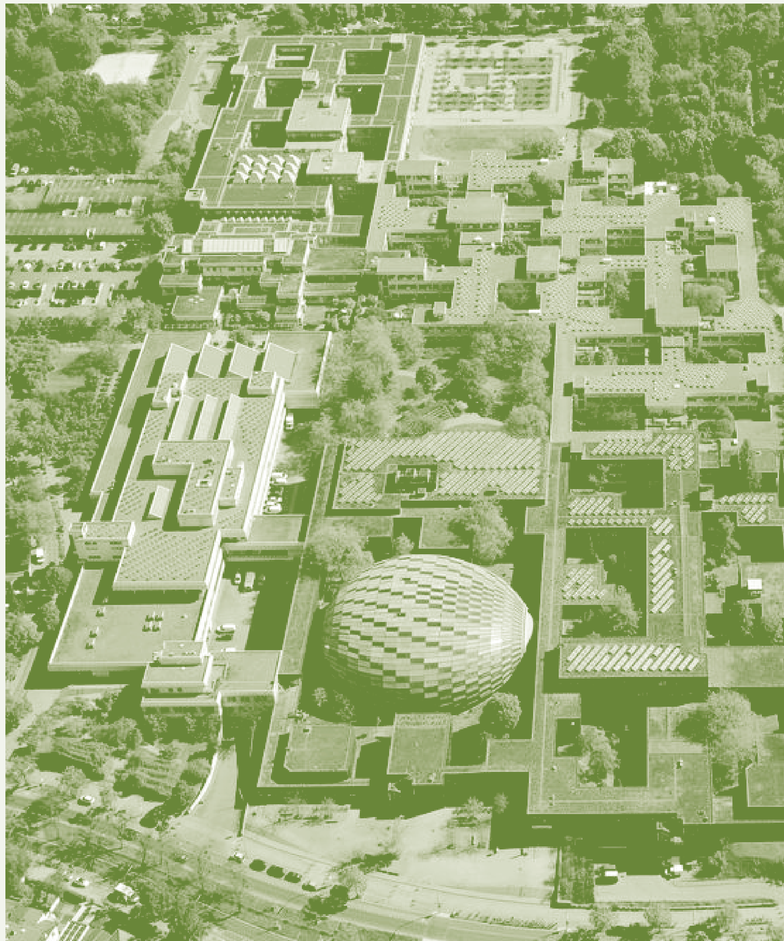
Diagram of the stem.











role of timber?

do not imitate!

new material culture and paradigms
demands reinterpretation

power of timber bridging scales

shared material on different scales creates opportunities

static / dynamic divide result of static vs dynamic material
large scale concrete vs. small scale timber

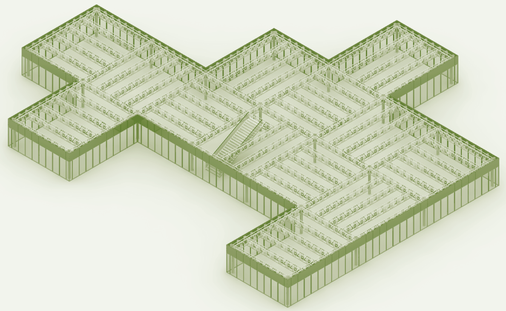
same material for top-down scalability and bottom-up
breaking with the hard divide between scales
large scale timber and small scale timber

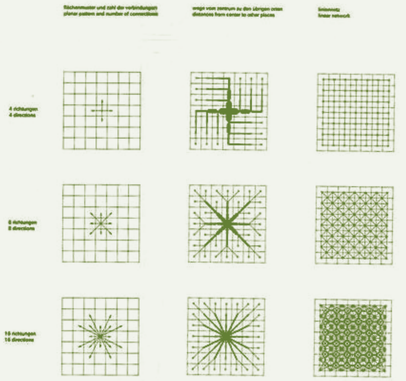
adaptability throught recursive principles

fritz haller - usm haller & totale stadt

systematic approach to changing form and structure

reoccorring patterns and material based
principles through all scales

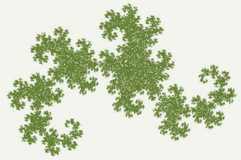




fractal patterns recursive principles in nature

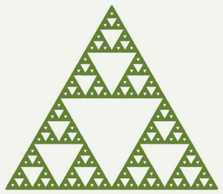
mandelbrott - fractal geometry

©Pardesco 2022

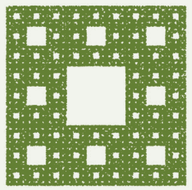


Dragon curve

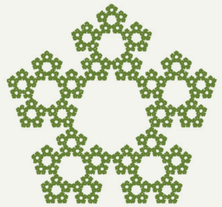
Barnsley-Fern



Sierpinski triangle

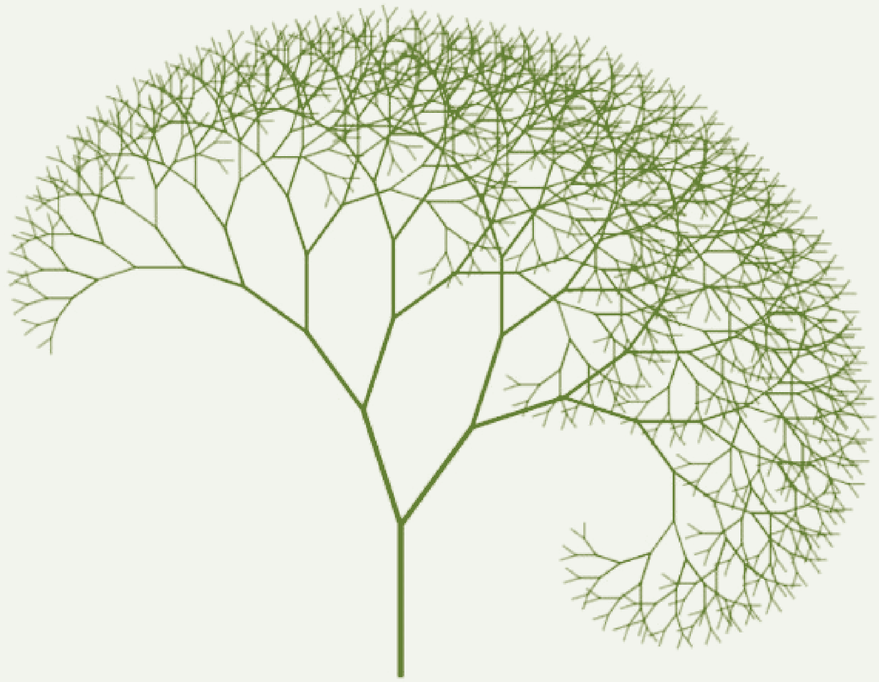


Sierpinski carpet



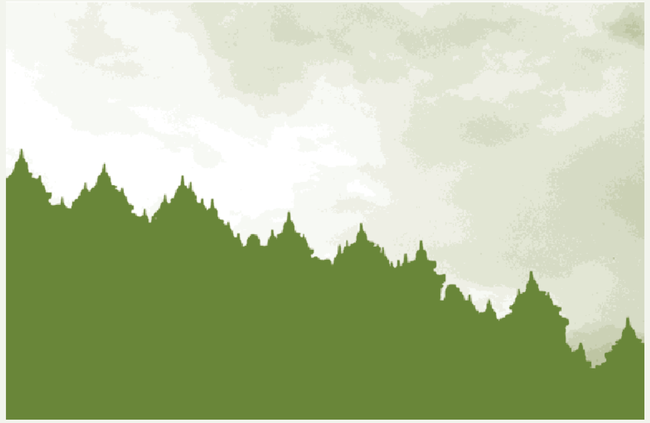
Sierpinski pentagon

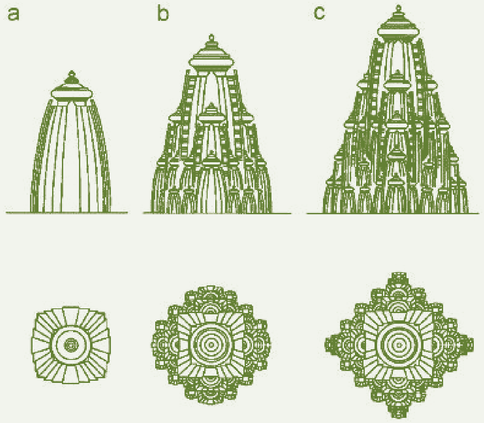
tree fractal

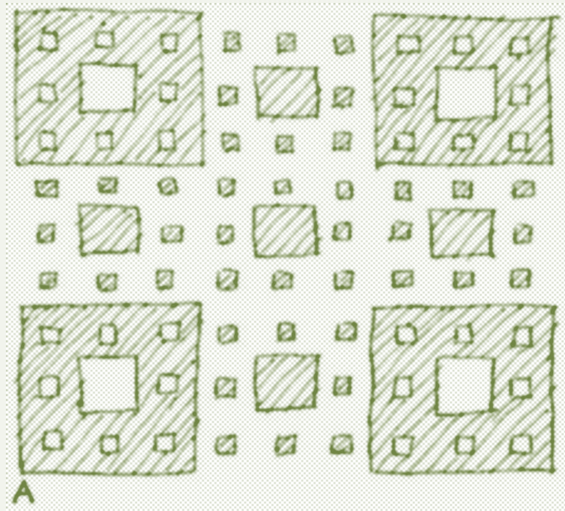


fractal patterns in architecture

christoffer alexander & niko salingaros

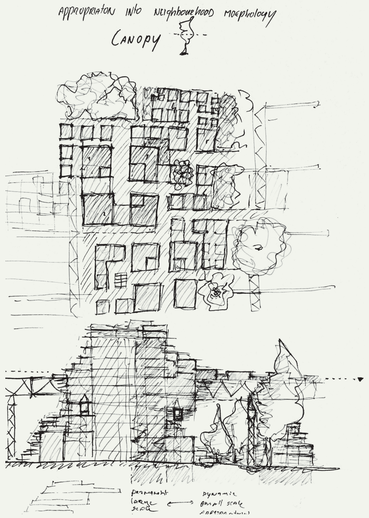


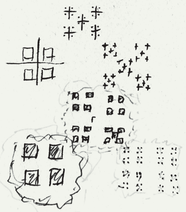


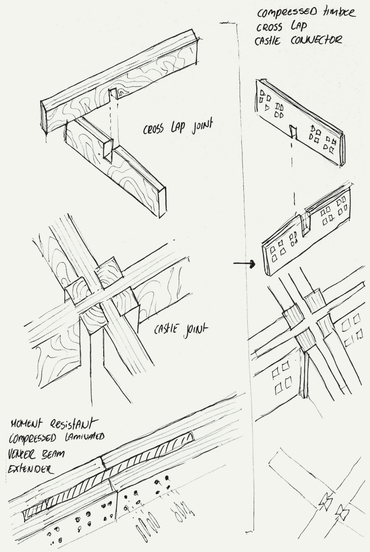


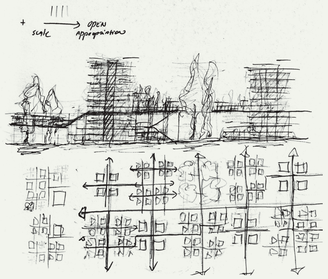
searching for order within complexity

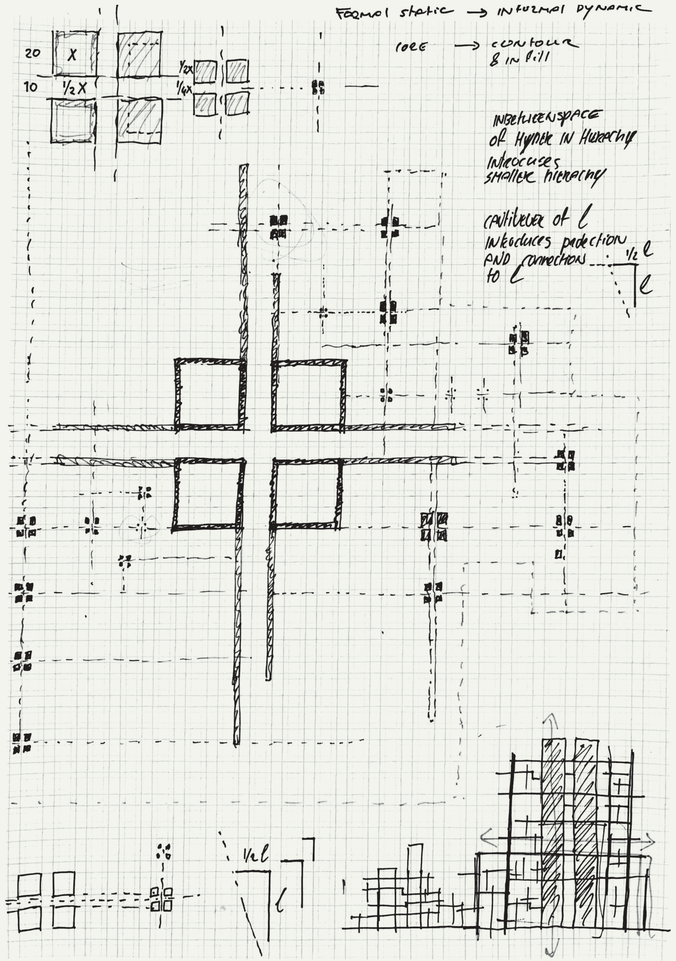
against anarchy and difficulty of decision making

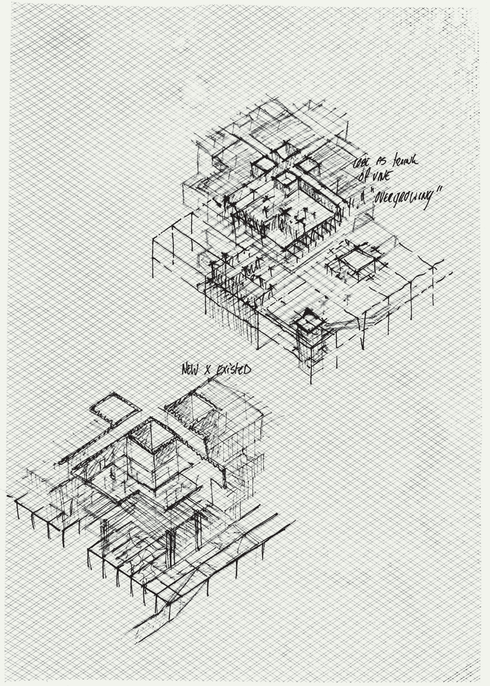


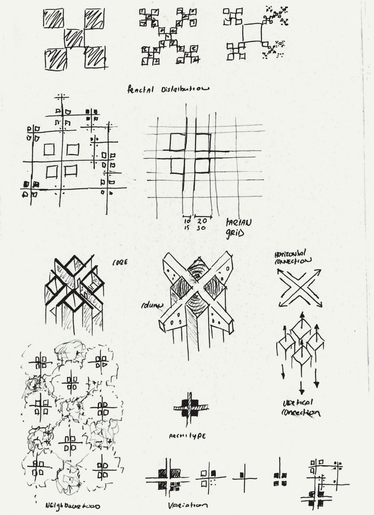


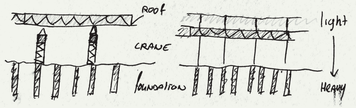


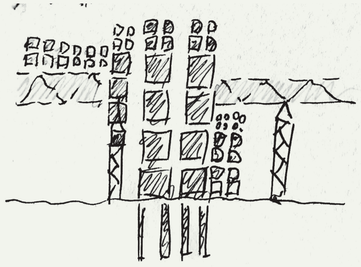










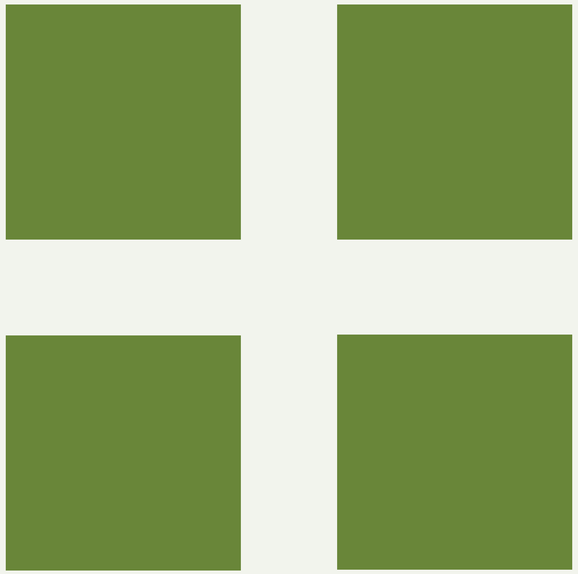


the spine & the cell

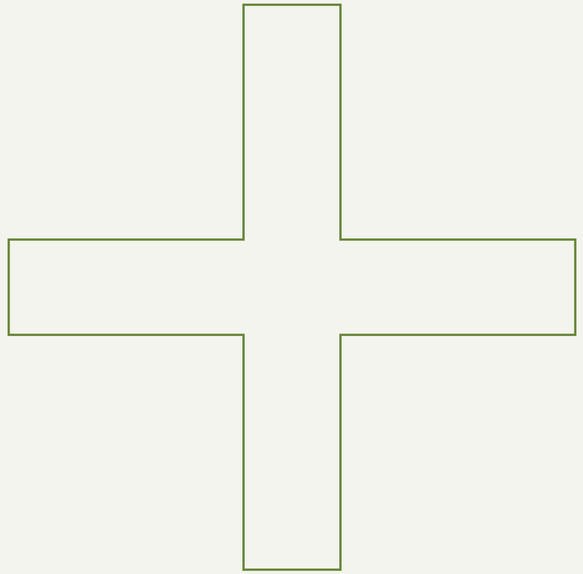
a fractal based methodology for designing and organising openness within the complexity of dense and dynamic cities through space and time.

cell^{0}

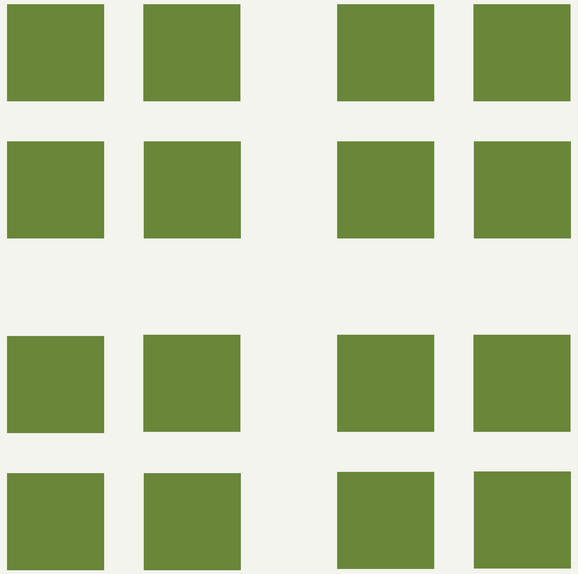
cells^{-1}



spine^{0}

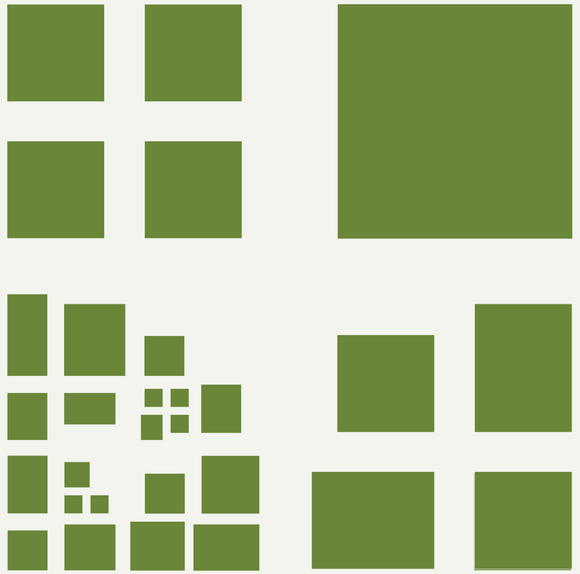


cells^{-2}



fractal

simplicity & scalability

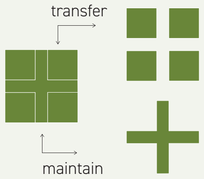


complexity & openness

principle and rules

dependencies, temporalities, agency, negotiation

agency

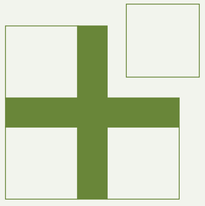


A community which divides a cell into smaller cells:

Transfers agency to smaller groups of that community
To enhance openness - the agency to appropriate and adapt ones own environment

Maintains agency over the spine
To maintain the common-good and enhance scalability

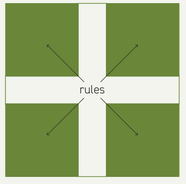
depedencies



A spine is independent of a cell.
A cell should be able to change or taken away entirely without affecting the spine. Appropriation and adaptation of a cell should not influence the common-good of the larger cell.

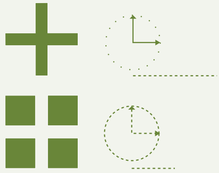
Cells aim to be independent of the spine.
Independence improves adaptability. As not only the smallest cells need to be adaptable the spines also need to adapt when there are to much interdependencies this ability decreases.

rules



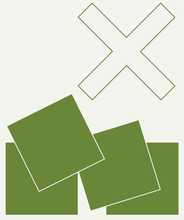
The control group of the spine - which divided the larger cell into smaller ones - sets rules to protect the common good and maintain openness.
The aim is to limit the rules so the control group to improve agency and freedom of adaptability within the cell. Enough rules to maintain the common-good, but not to much to provide agency.

temporalities

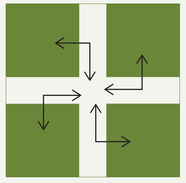


The spine represents a longer time frame supports scalability and protect the common-good

The cells represent a shorter time frame and provides agency to appropriate and adapt

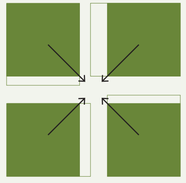


Cells will aways be dependent on the spine on way or another.
Due to the hierarchy of space, structure, infra-structure and social organization this is unavoidable when aiming for openness in a scalable manner



Dependency of a cell on the larger cell is distributed through the spine,
To avoid cells within the same fractal to be dependent on each other, which would decrease openess.

negotiation



When the one in control wants to appropriate or adapt outside of the cell, or break the rules they need to negotiate with the larger community in control of the spine.
As other cells are dependent on the spine negotiation is needed to protect he common-good.

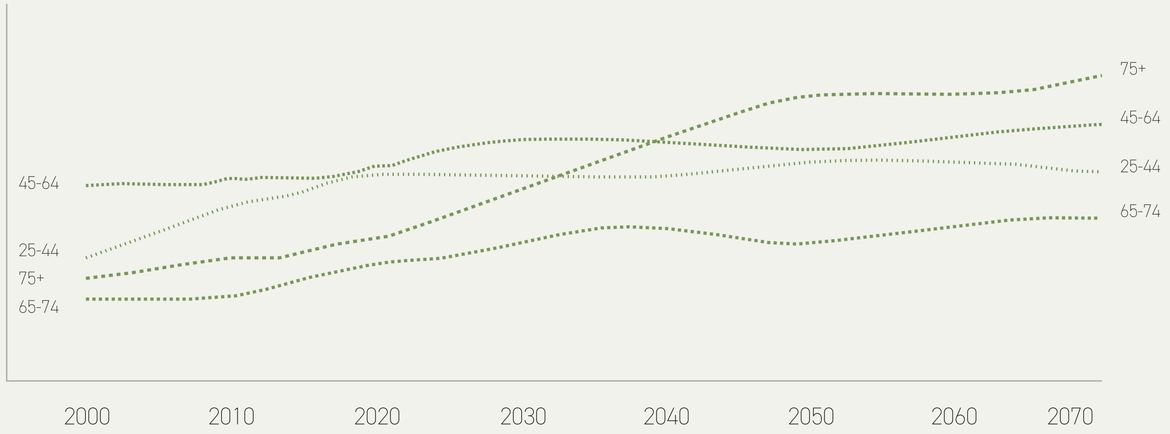
cell⁰
the city

municipality of amsterdam

cell⁰ the city of amsterdam

in control of the municipality

represents the diverse and growing community

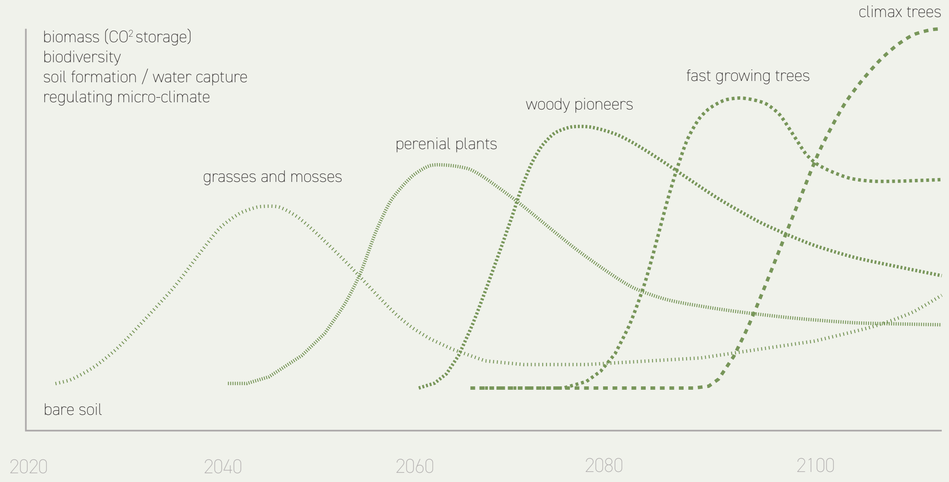


cultural evolution of demographic in amsterdam © CBS - Huishoudensprognose Amsterdam 2021-2070

cell⁰ the city of amsterdam

in control of the municipality

and ecology.....



natural evolution - forest succession without intervention

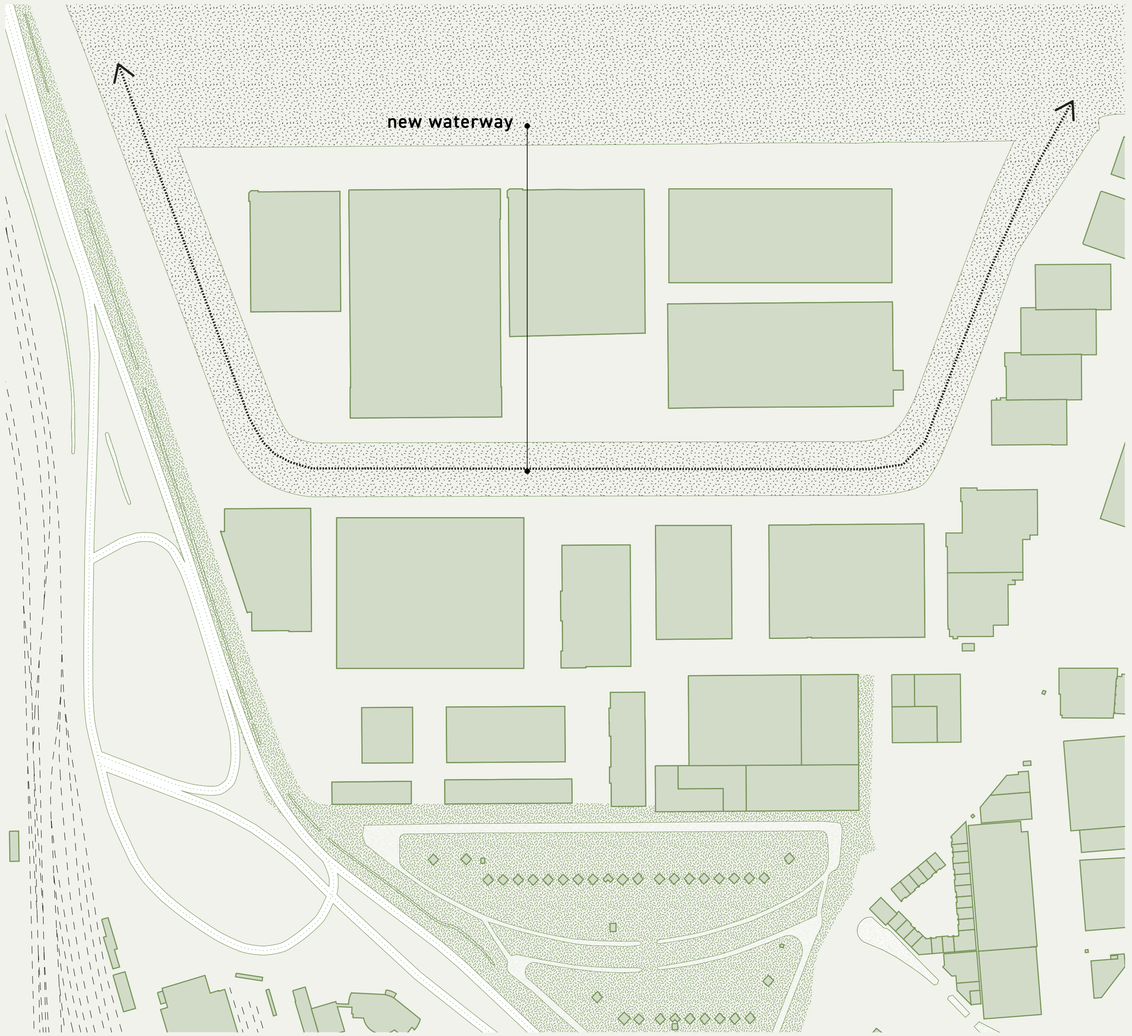
cell⁰ the city of amsterdam, de minervahaven

in control of the municipality

warehouse area minervahaven
part of city - cell⁰

spine[0] the city of amsterdam, de minervahaven

in control of the municipality to protect the common-good and support the community and ecology



warehouse area minervahaven
part of city - cell[0]

spine[0] the city of amsterdam, de minervahaven

interventions to protect the common-good and support the community and ecology

warehouse area minervahaven
part of city - cell[0]

spine[0] the city of amsterdam, de minervahaven

interventions to protect the common-good and support the community and ecology

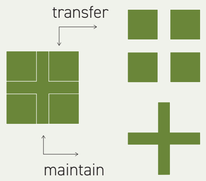
warehouse area minervahaven
part of city - cell[0]

fractal[1] division into plots in de minervahaven

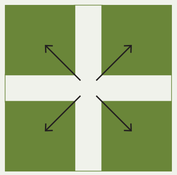
transfering agency to smaller groups of the community and setting rules for appropriation

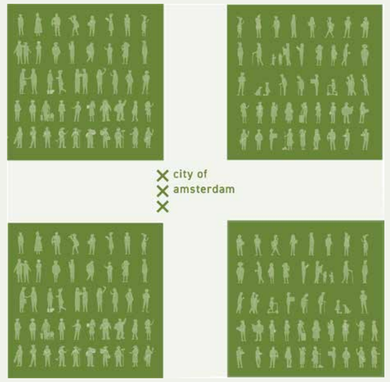
for appropriating & adaptation

agency



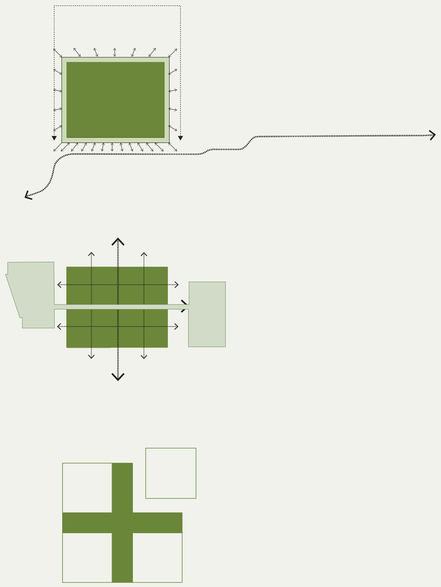
rules

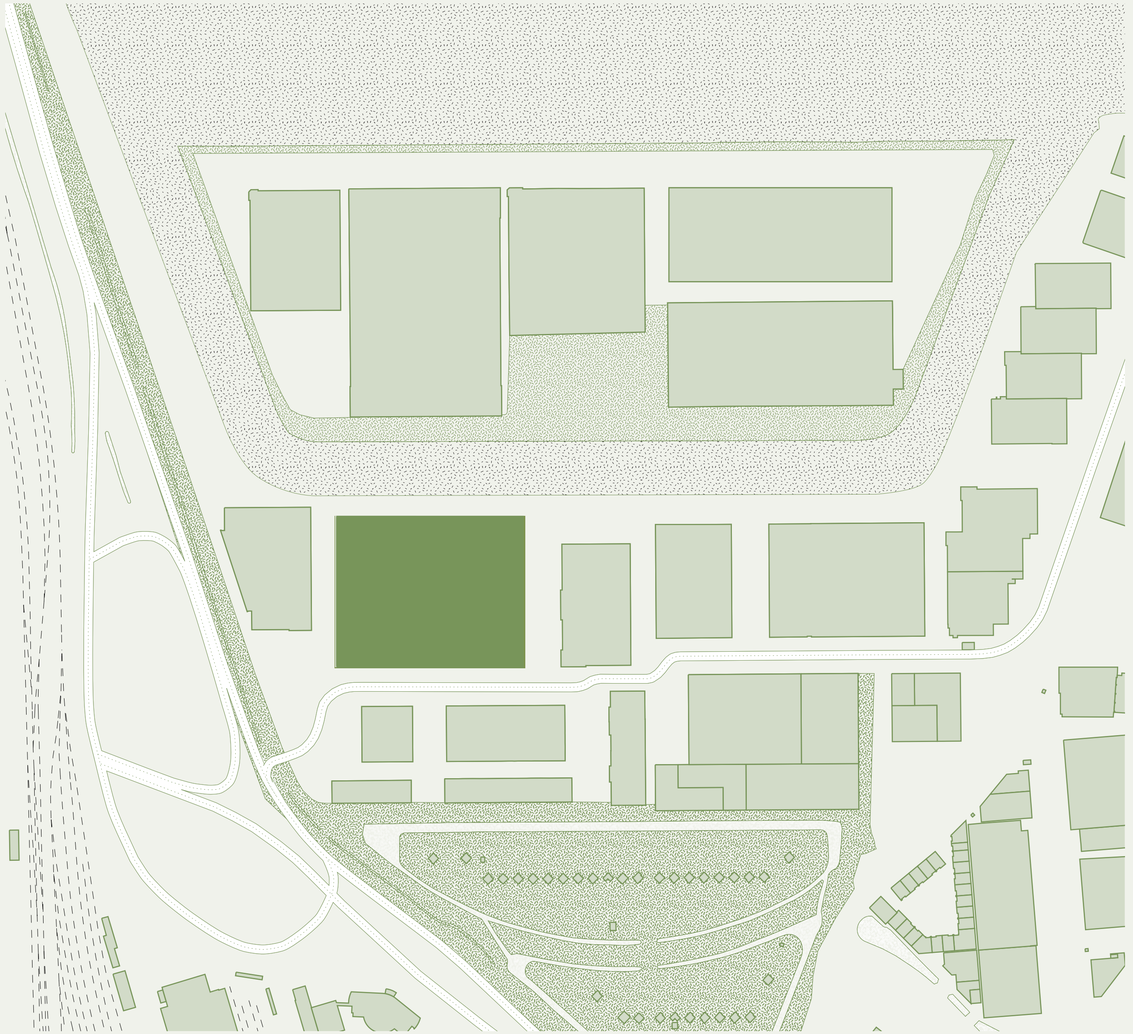


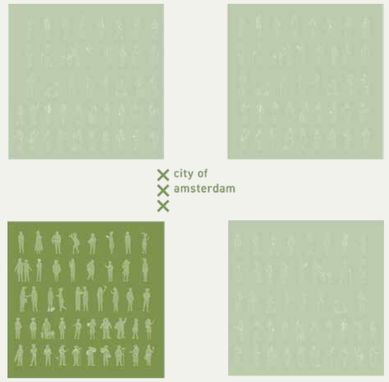


fractal[1] city to neighbourhood

transfering agency to smaller groups of the community and setting rules for appropriation





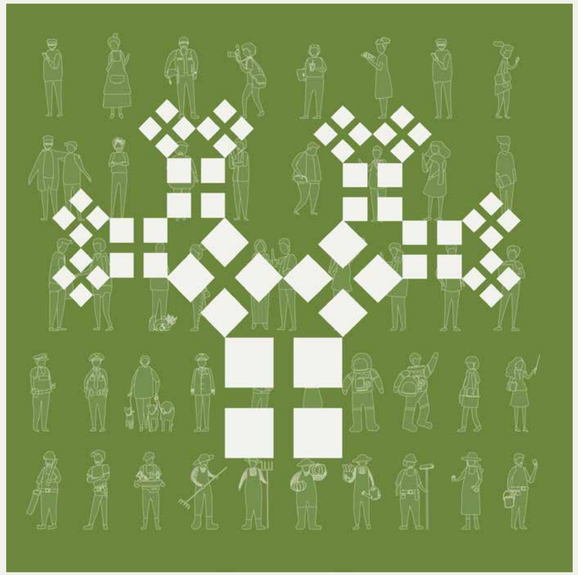


warehouse area minervahaven
part of city - cell[0]

cell^2

the neighborhood

“de olijfboom buurt”



common land trust

“de olijfboom”

cell[1] de olijfboombuurt

represents the evolving community and ecology in the neighborhood

agency entity

CLT: Common Land Trust

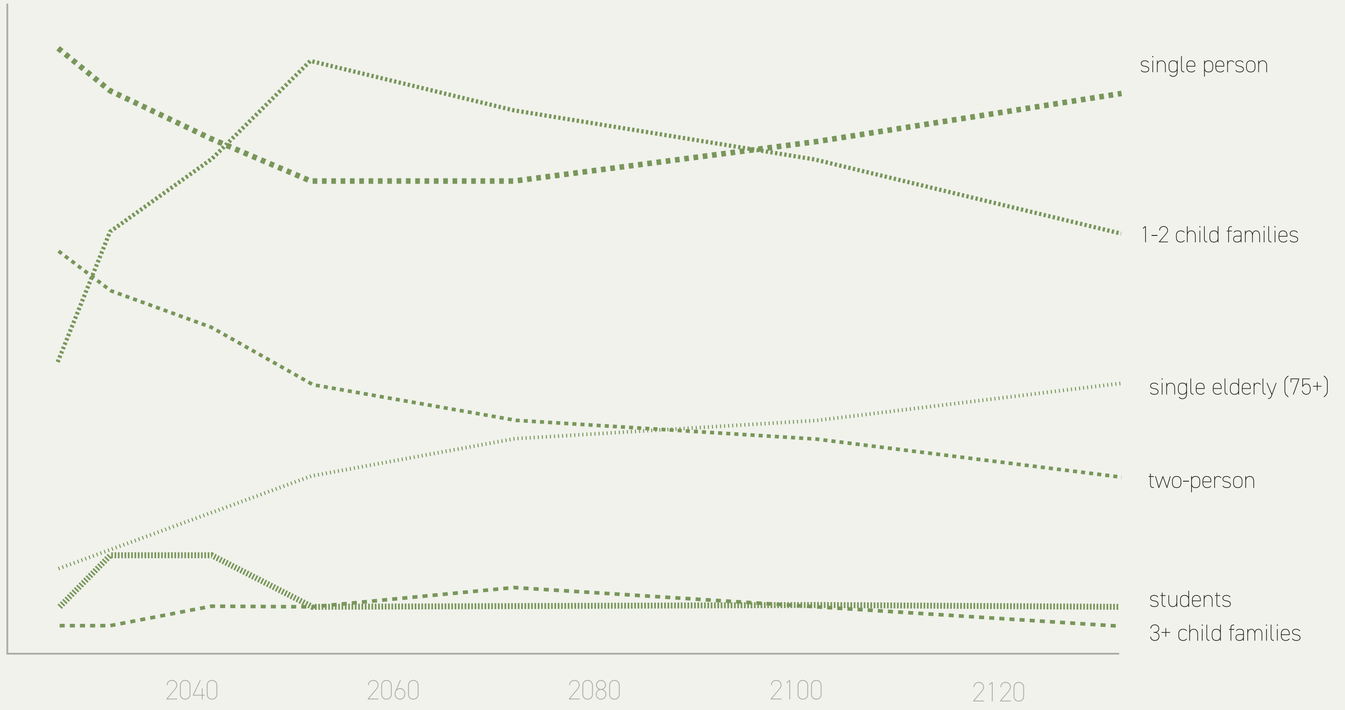
A legal entity with several stakeholders like a housing-coorporation, housing/building co-ops and private parties partnering with a main developer, architects and landscape architects.

Represents:
The interests of its stakeholders which on its turn represent the interest on the inhabitants of the neighborhood.

Follows the rules:
Stated for appropriation and adaptation of cell[1] set by the municipality as stated in the previous section

Negotiates with and mediates between:
The municipality and its stakeholders

Agency and Ownership:
The CLT does not own the land but leases it through erfpacht. This gives them agency but avoids full control to avoid speculation or rights which are in the way of the common good in the long term.

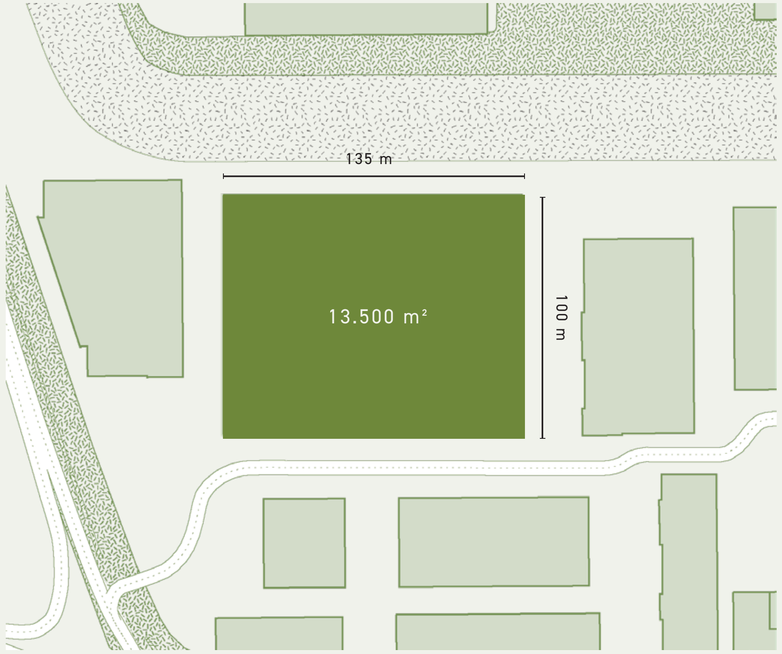


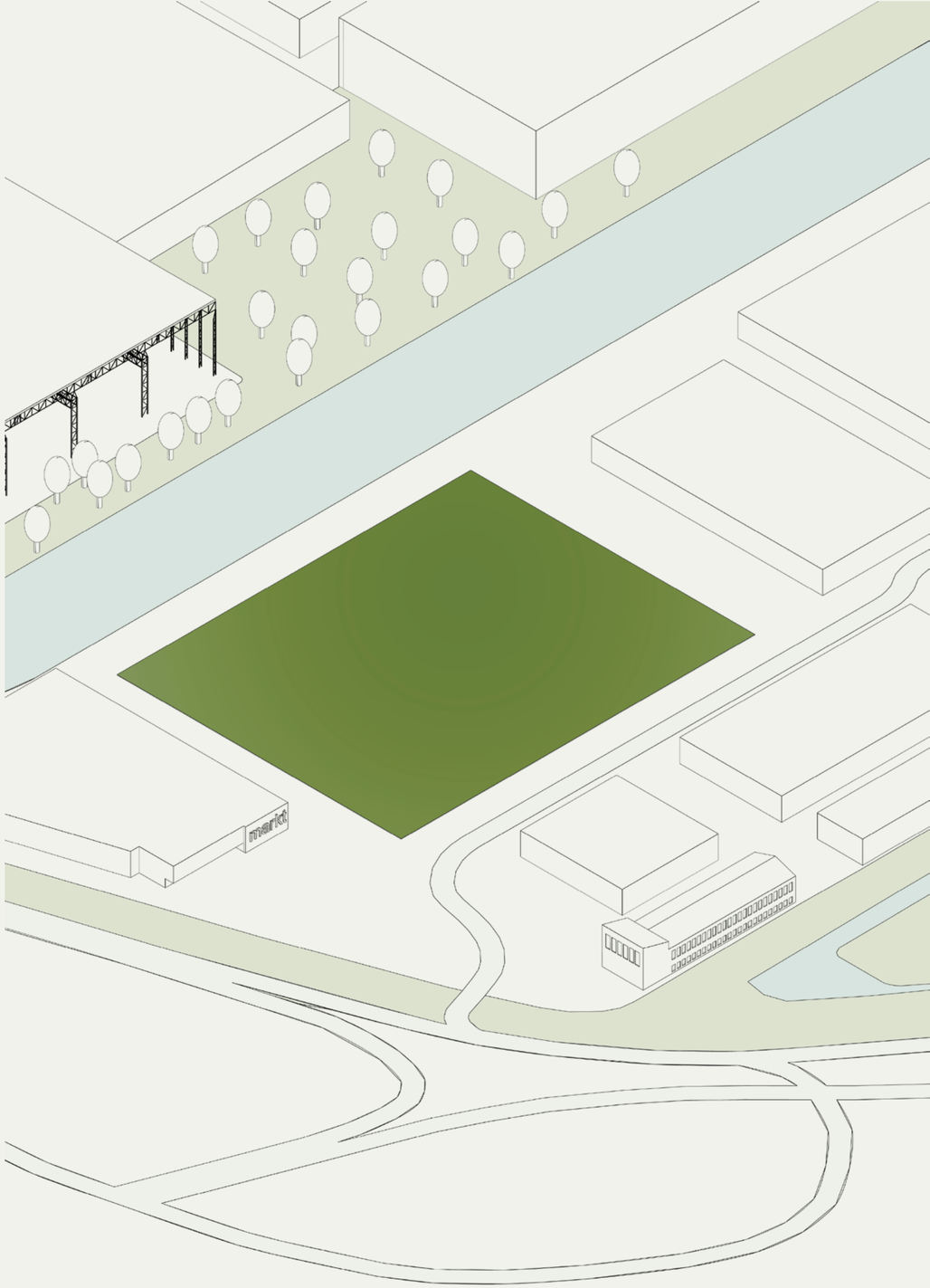
scenario for new neighborhood in minervahaven : demographic development prognosis when starting with single and two-person households.

based on data houthavens, ijburg en demography (MRA) forcast of amsterdam (MRA) and Netherlands (CBS)

cell[1] de olijfboombuurt

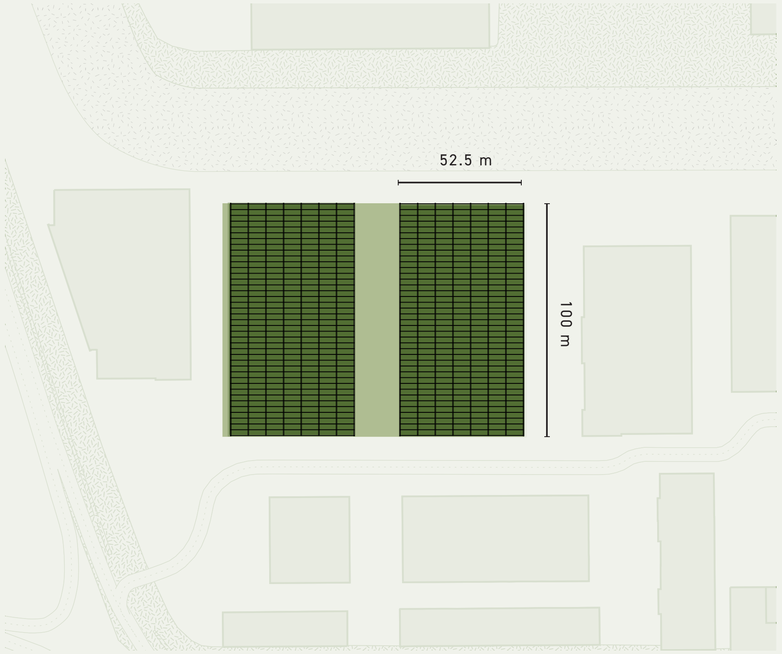
the location





cell[1] de olijfboombuurt

the existing structure

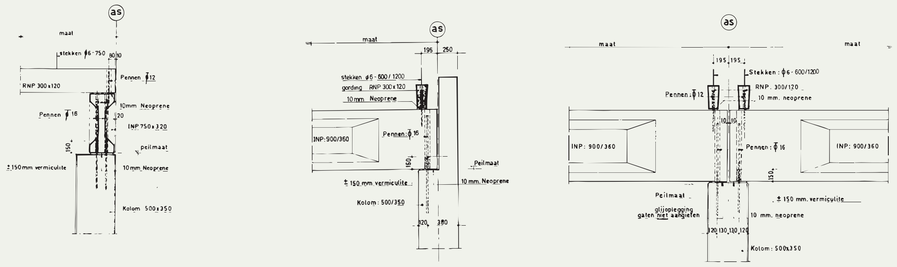


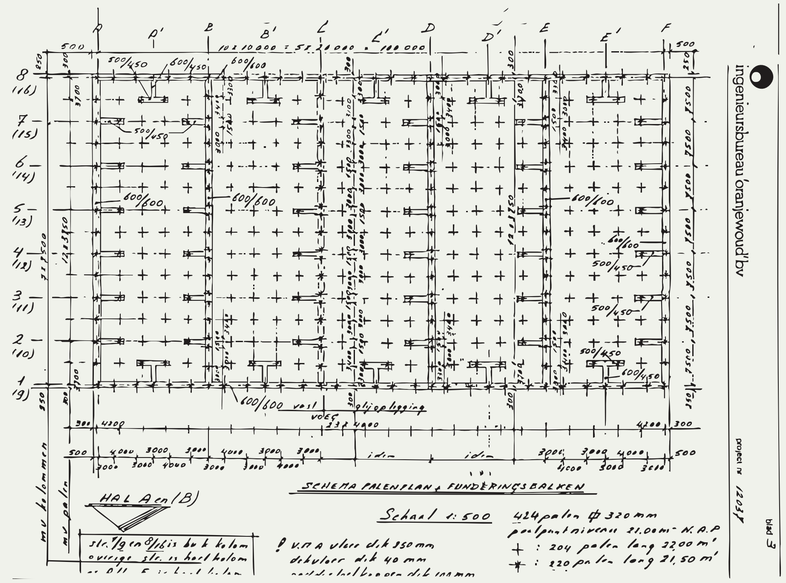
cell[1] neighbourhood

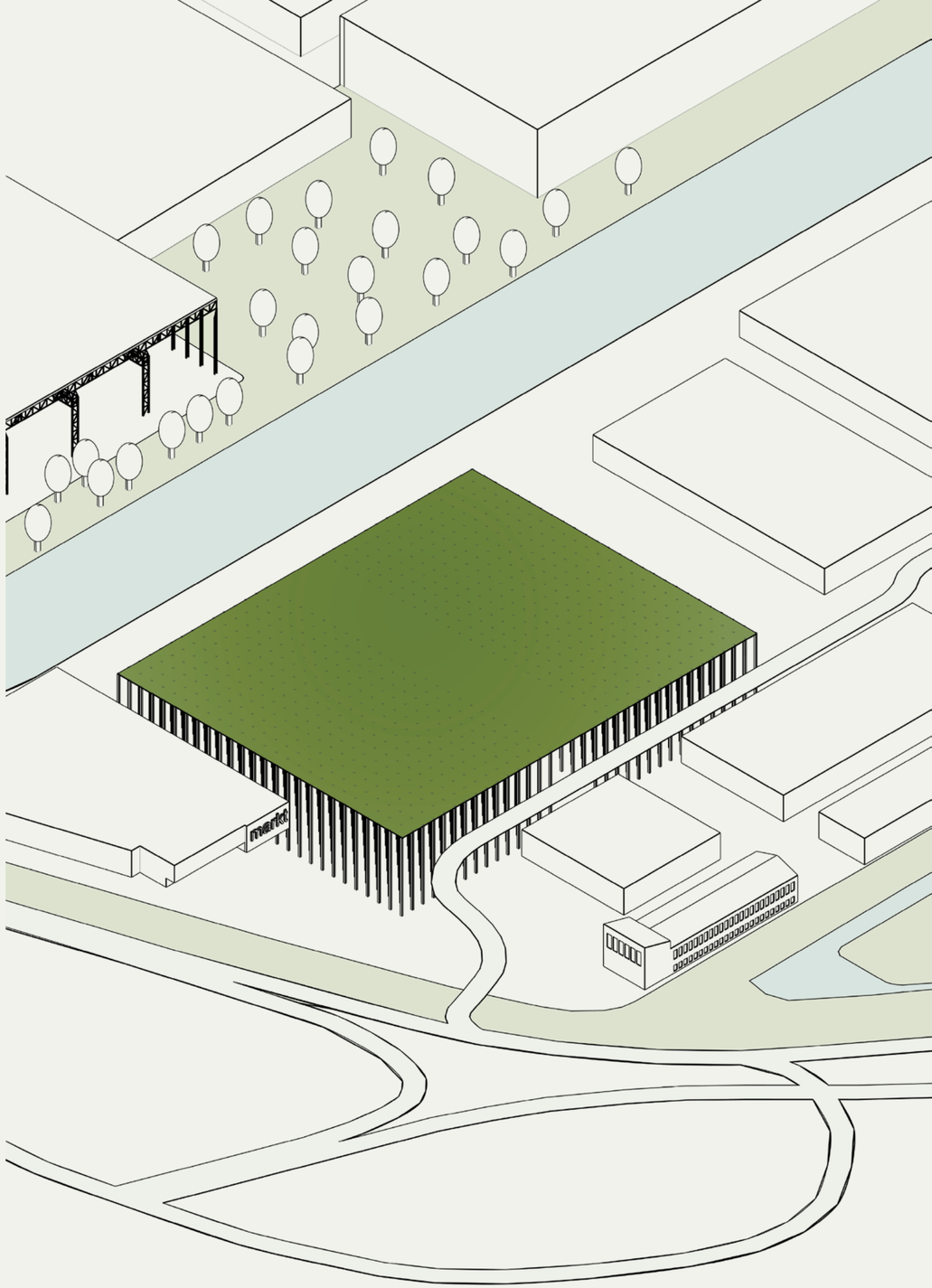
agency to appropriate and adapt by the comm[illegible] and trust

cell[1] de olijfboombuurt

the existing structure

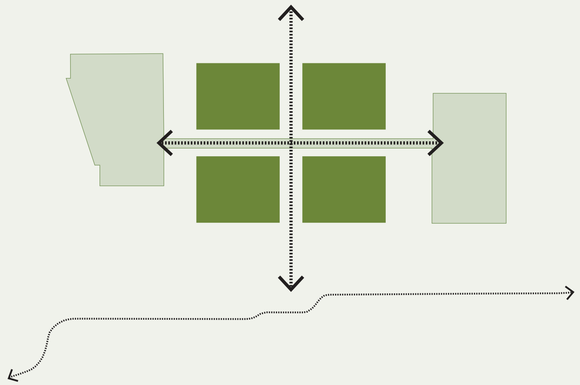


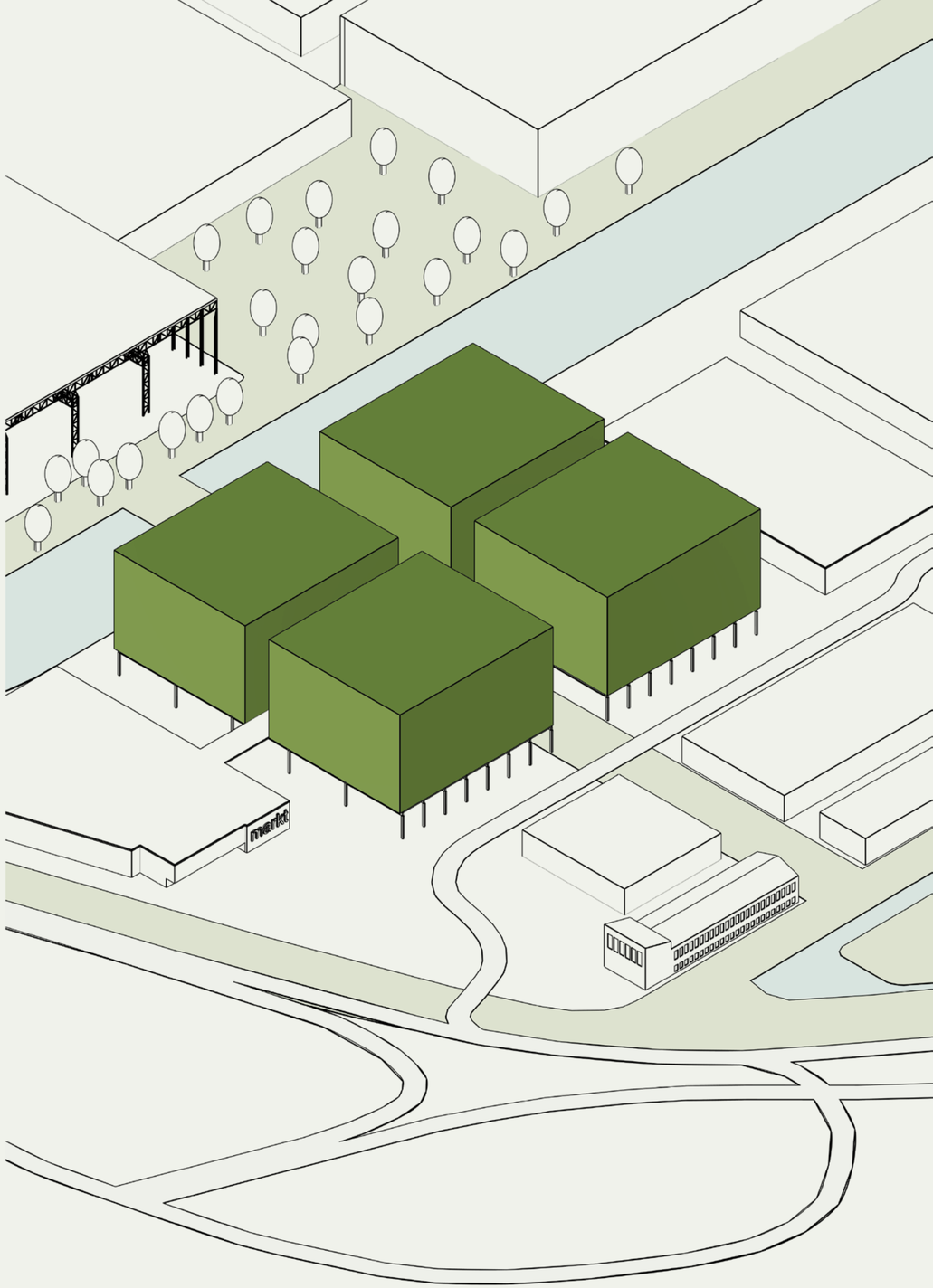




fractal² olijfboombuurt to buurtkwartieren

interventions to protect the common-good

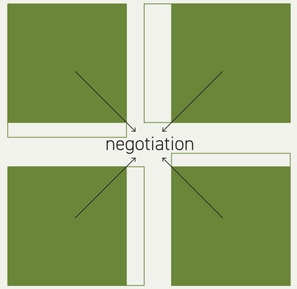




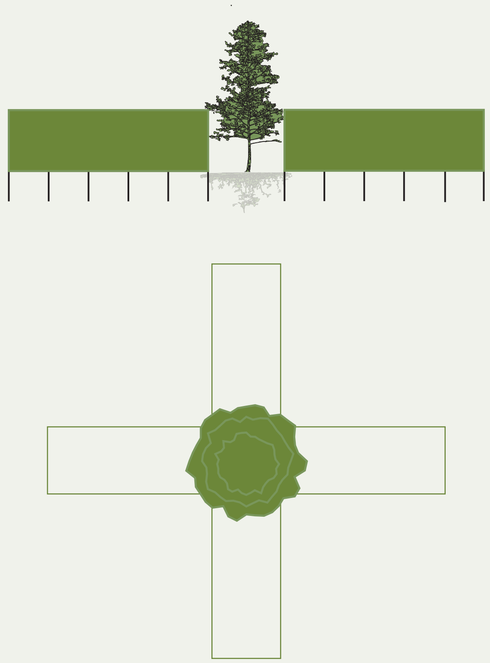
spine[1] neighborhood to quarters

interventions to protect the common-good

negotiation



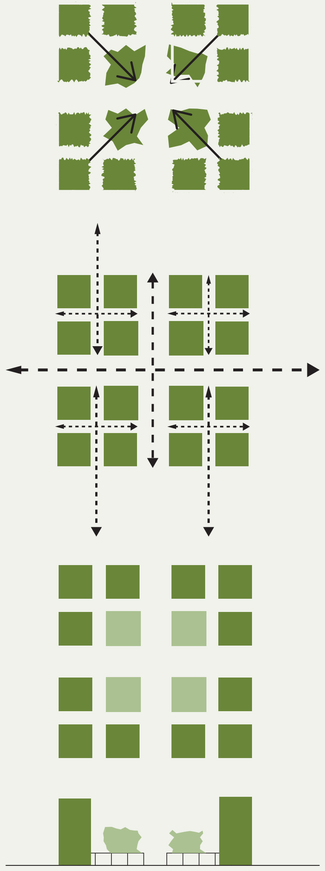
hard vs soft boundries

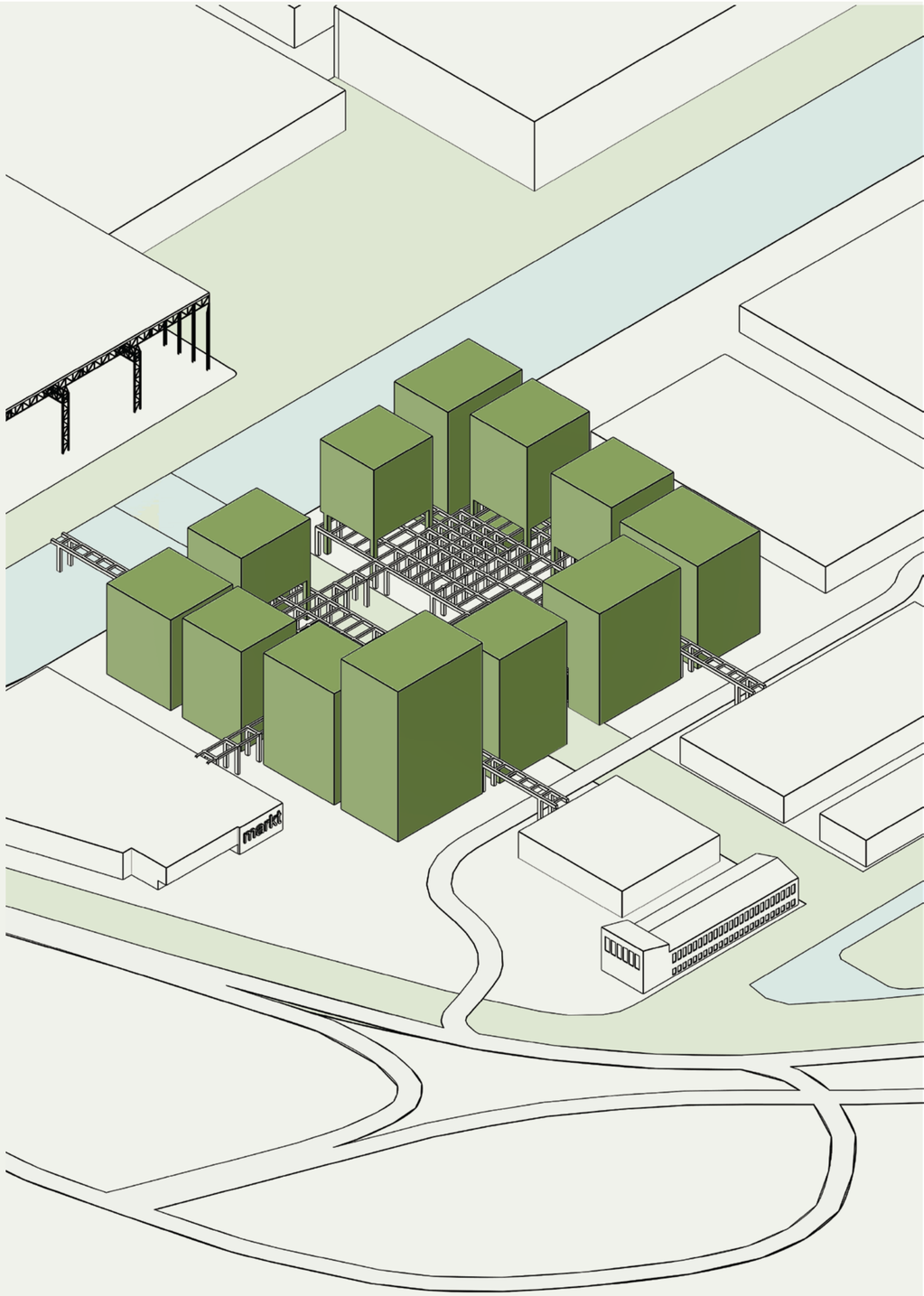


soft-boundries manifest openness

fractal³ quarters to building plots

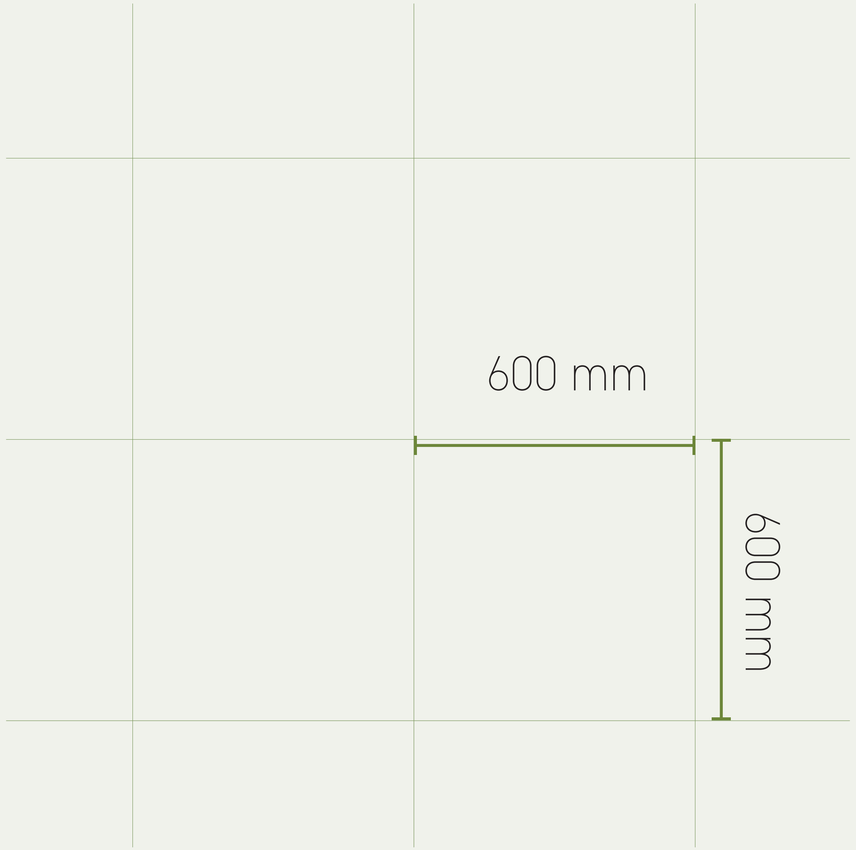
infrastructure, density and light





fractal³ quarters to building plots

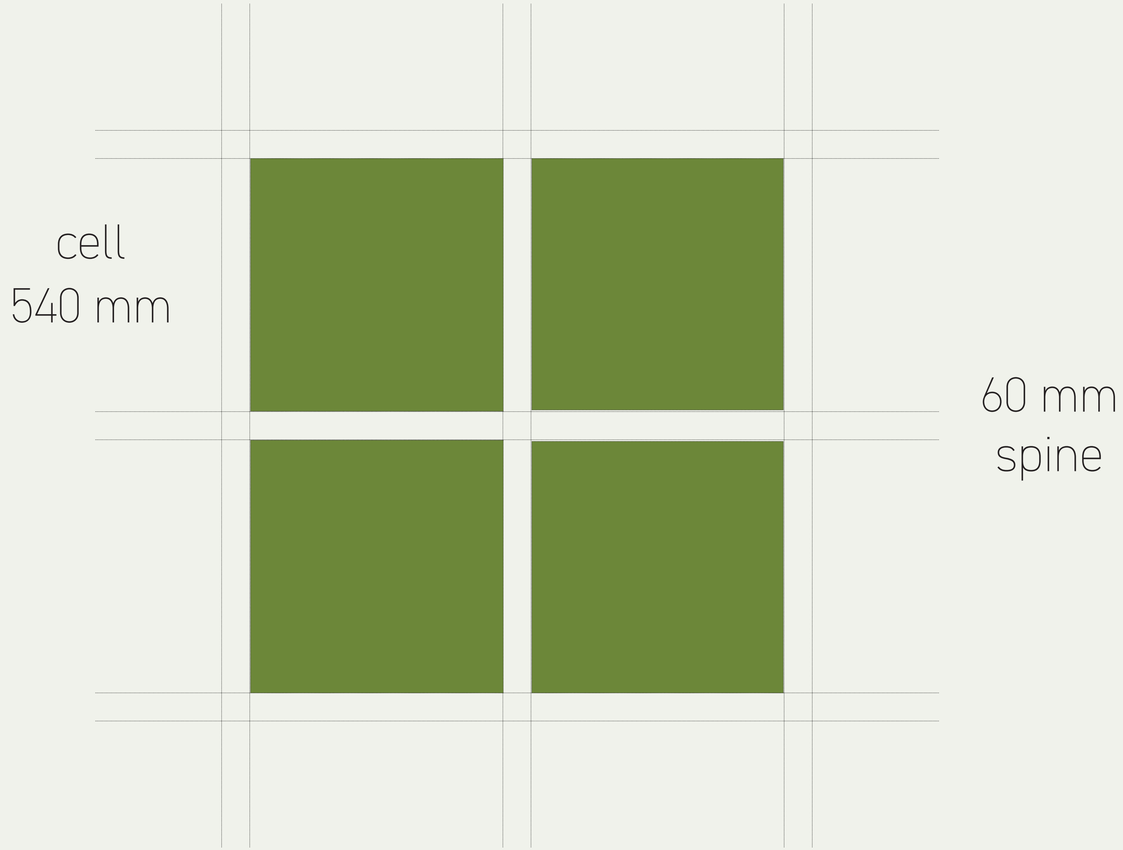
rules and tools to support openness on a nieghborhood scale



shared grid for compatibility

fractal[4] quarters to buildings

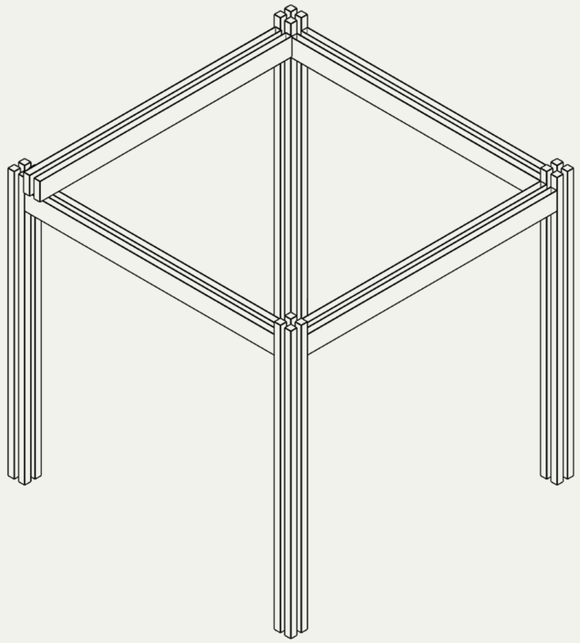
rules and tools to support openness on a nieghborhood scale

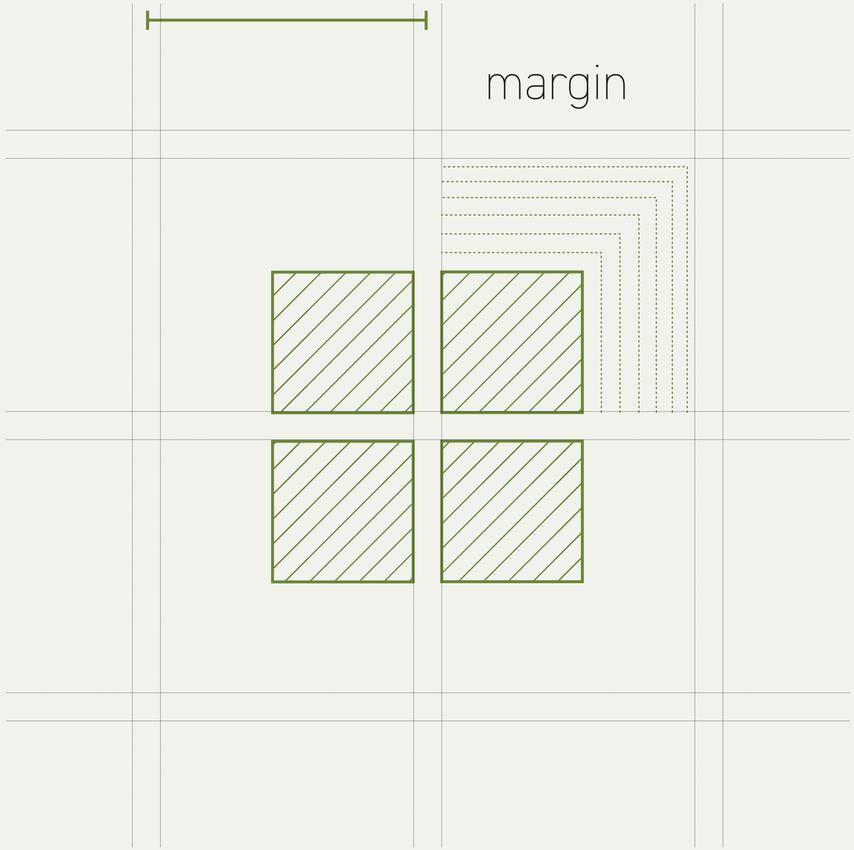


spine and cell principle for openness

fractal[4] quarters to buildings

rules and tools to support openness on a nieghborhood scale





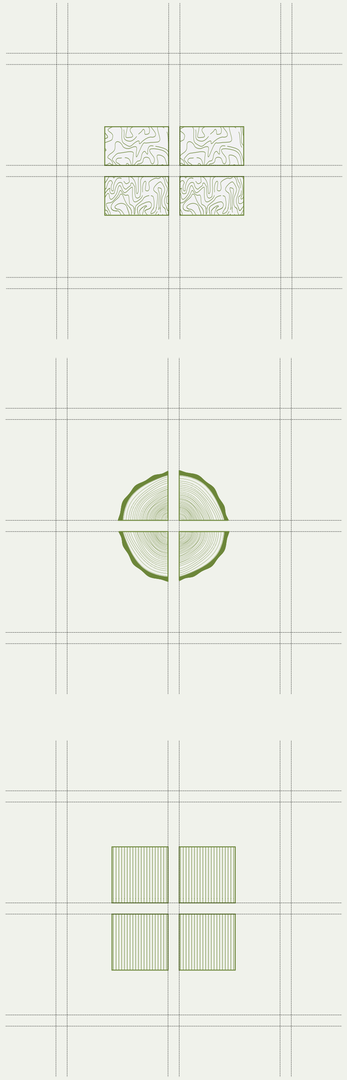
structure

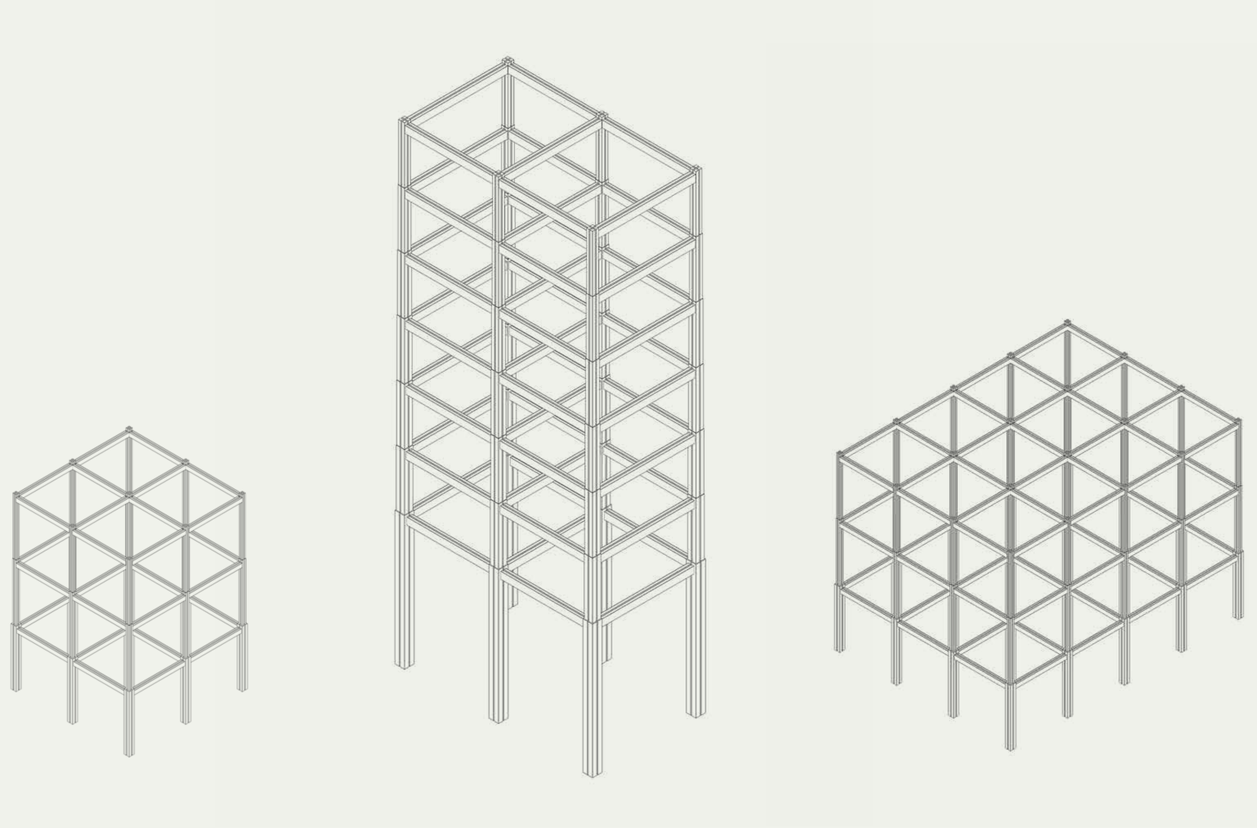
member

assembly principal

fractal[4] quarters to buildings

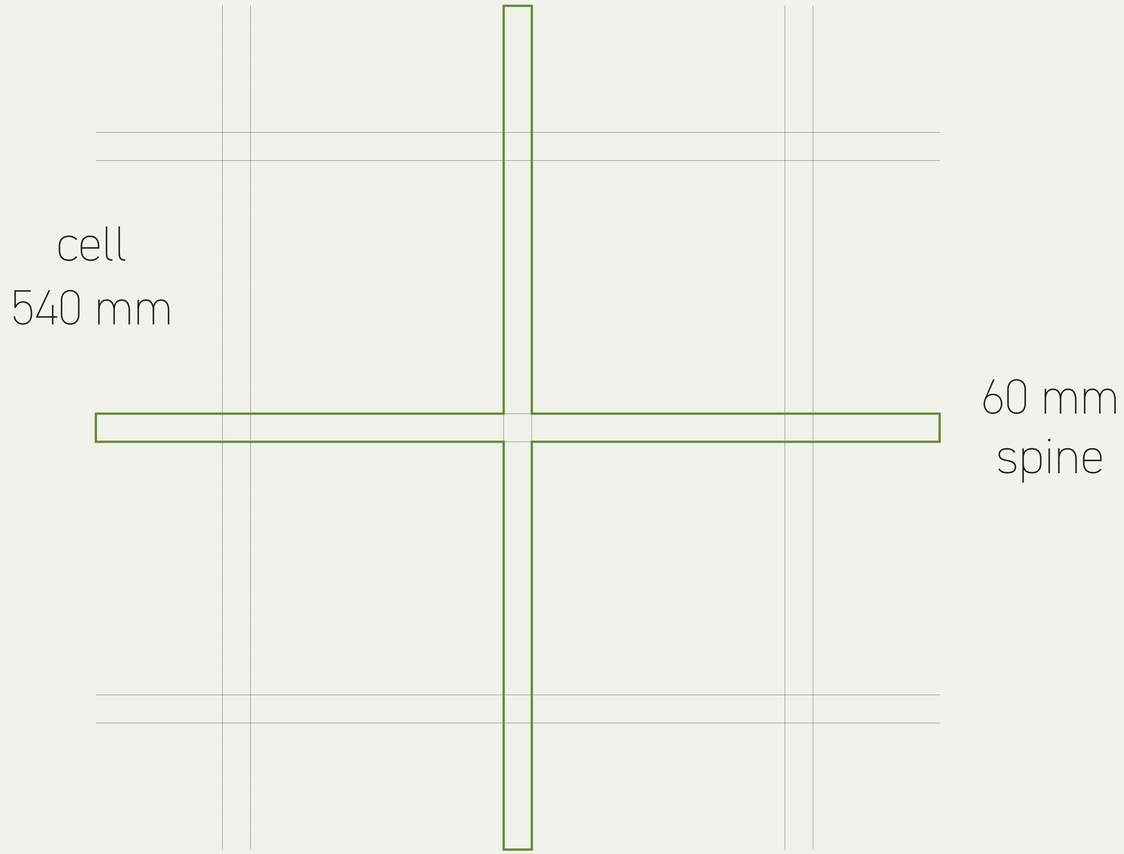
rules and tools to support openness on a neighborhood scale





fractal⁴ quarters to buildings

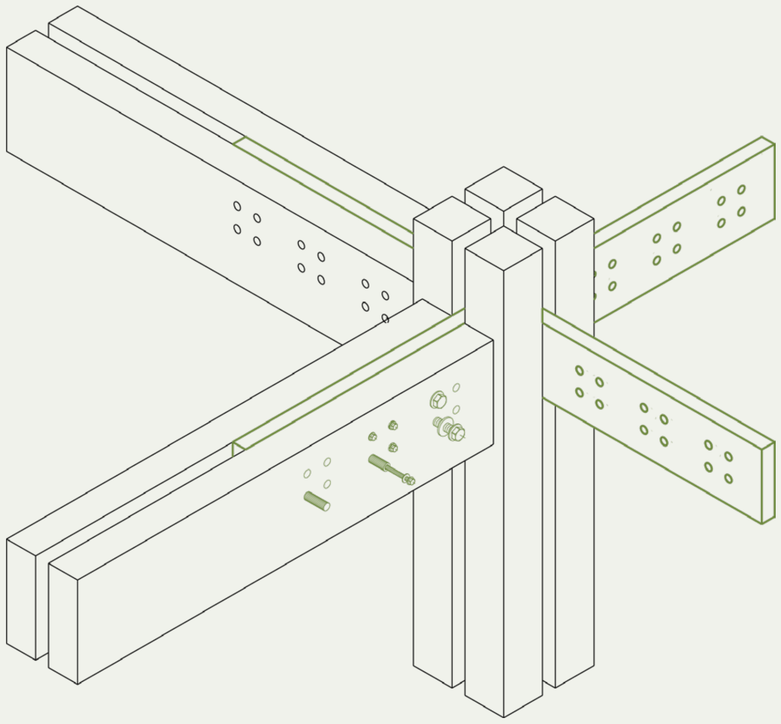
rules and tools to support openness on a neighborhood scale

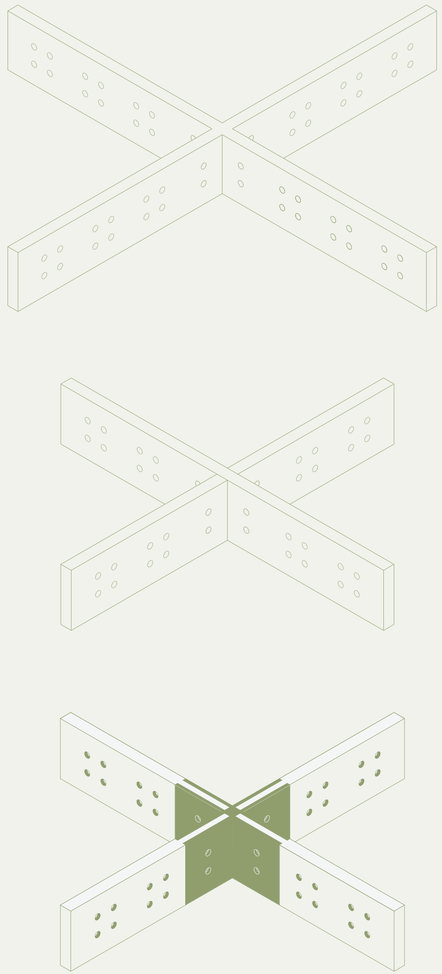


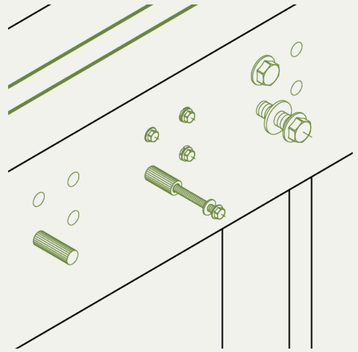
spine and cell principle for openness

fractal[4] quarters to buildings

rules and tools to support openness on a nieghborhood scale

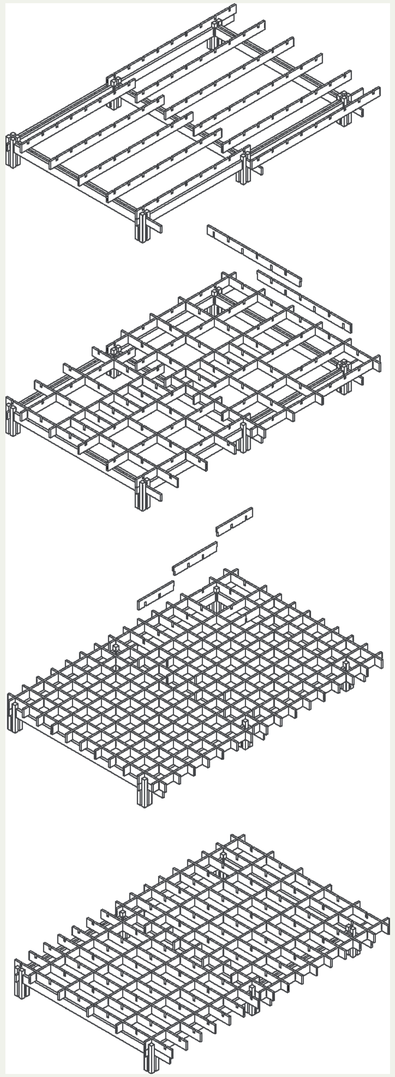






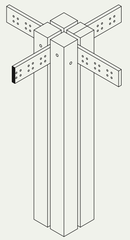
fractal[4] quarters to buildings

rules and tools to support openness on a nieghborhood scale



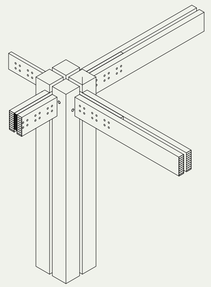
fractal[4] quarters to buildings

shared systems, rules and tools to support openness on a nieghborhood scale



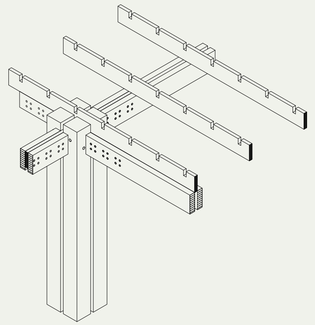
assembly principal

shared systems, rules and tools to support openness on a nieghborhood scale



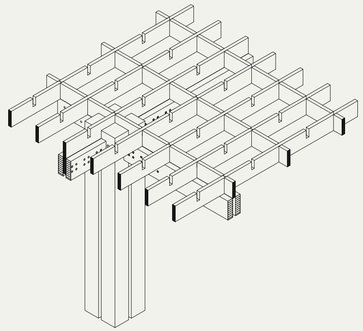
assembly principal

shared systems, rules and tools to support openness on a nieghborhood scale



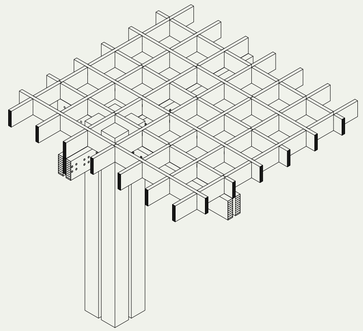
assembly principal

shared systems, rules and tools to support openness on a nieghborhood scale



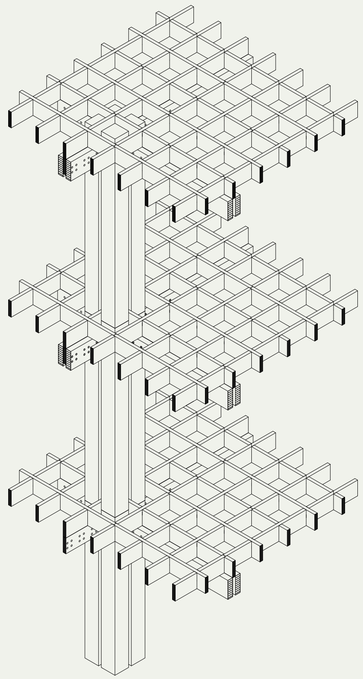
assembly principal

shared systems, rules and tools to support openness on a nieghborhood scale



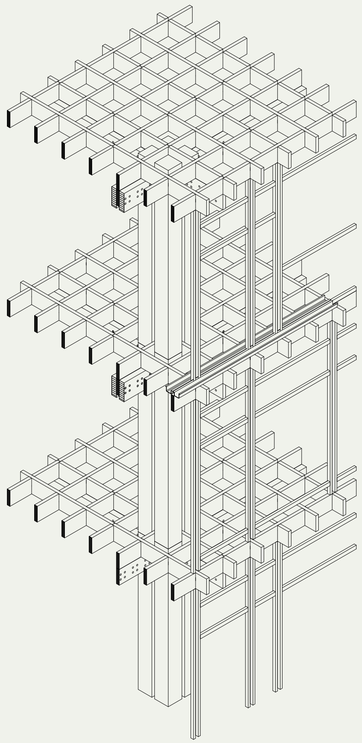
assembly principal

shared systems, rules and tools to support openness on a nieghborhood scale



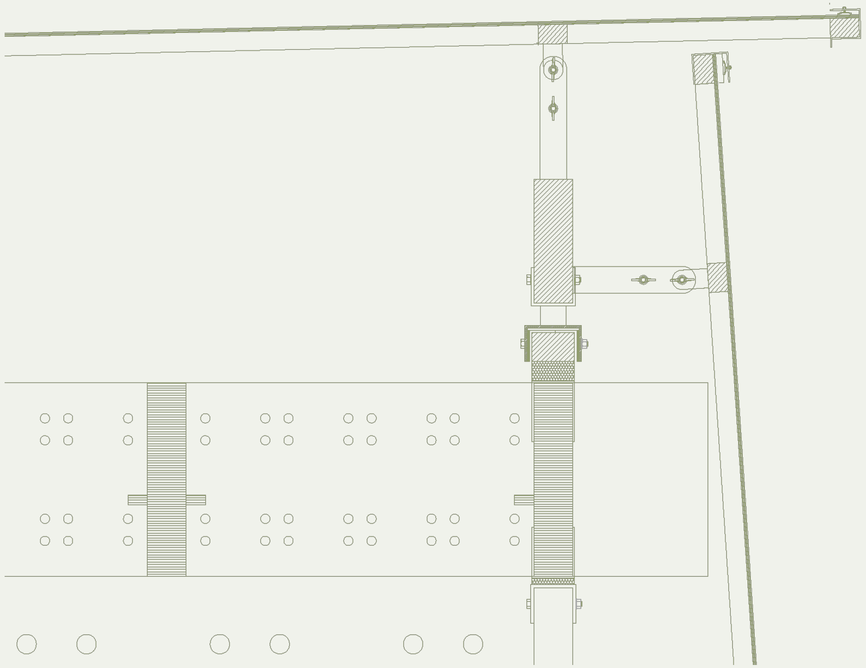
assembly principal

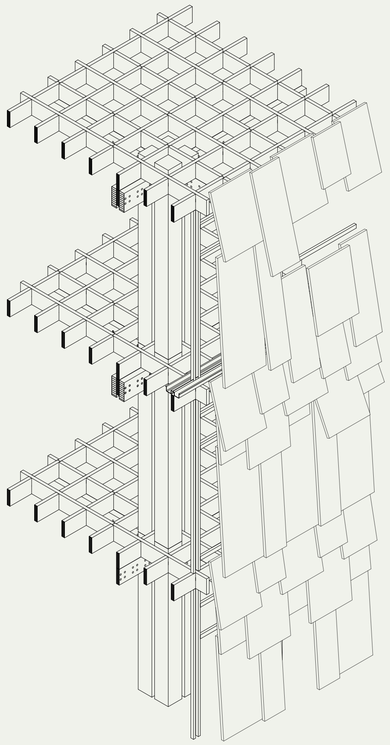
shared systems, rules and tools to support openness on a nieghborhood scale

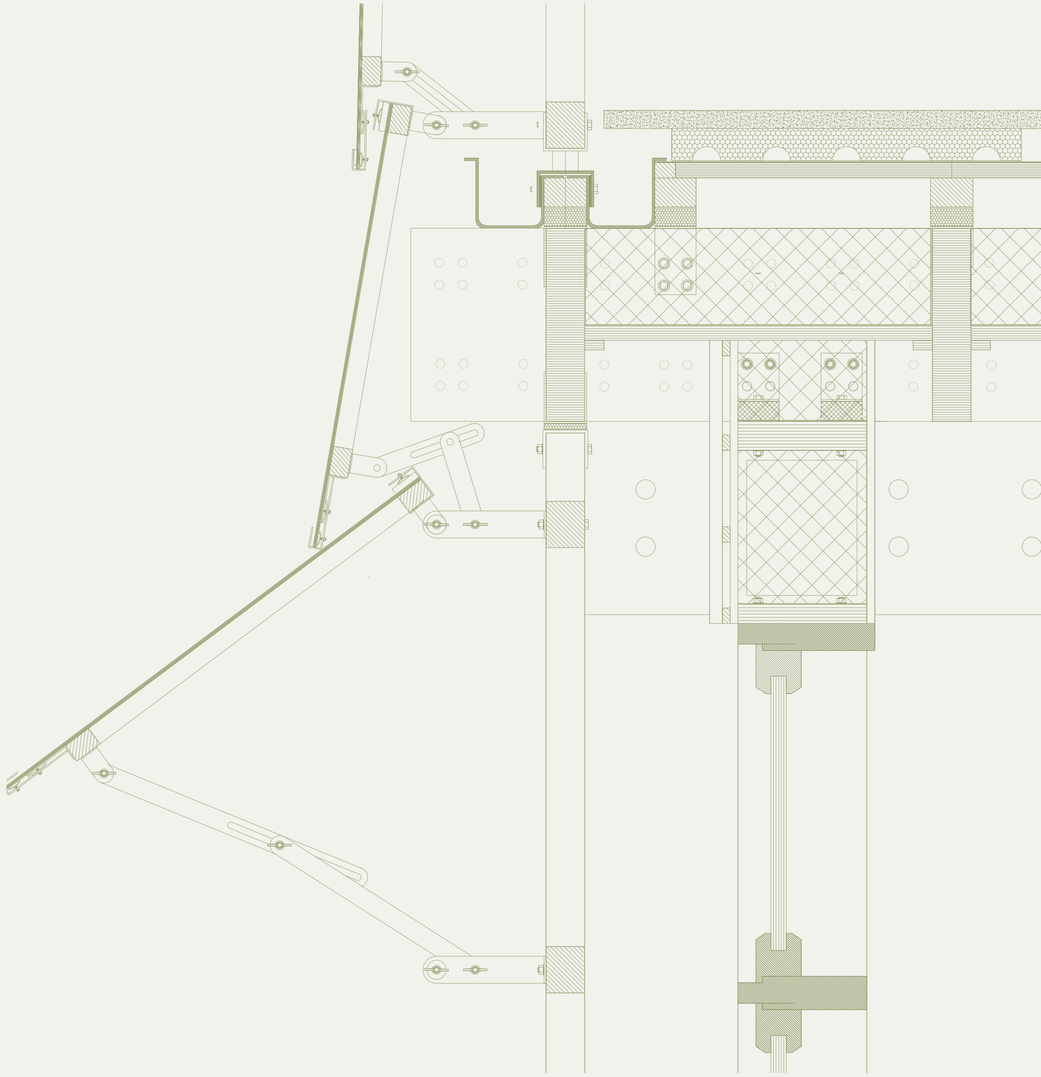


assembly principal

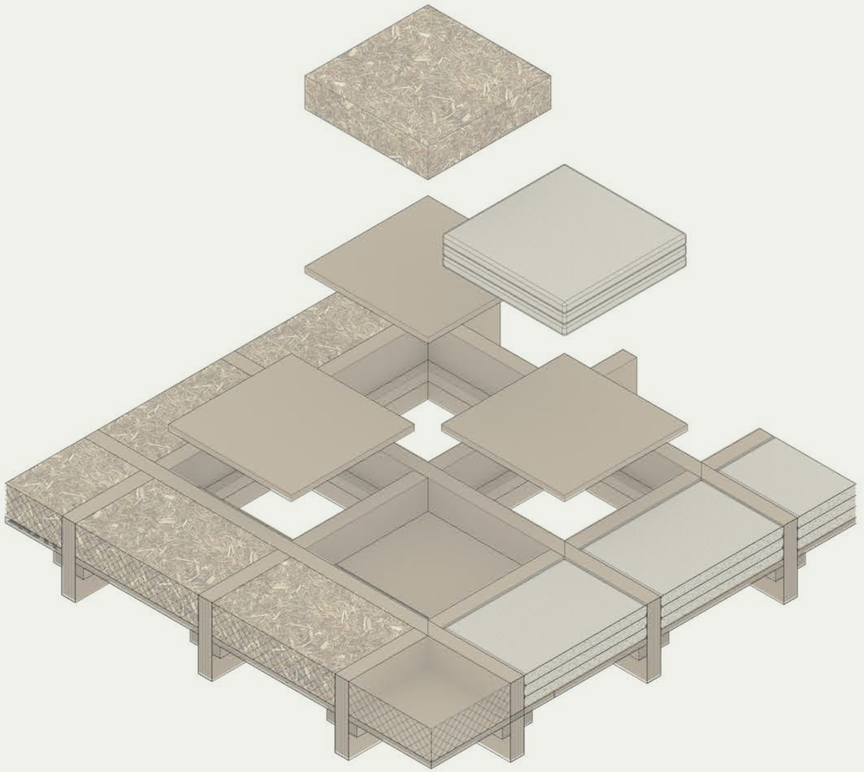
shared systems, rules and tools to support openness on a nieghborhood scale

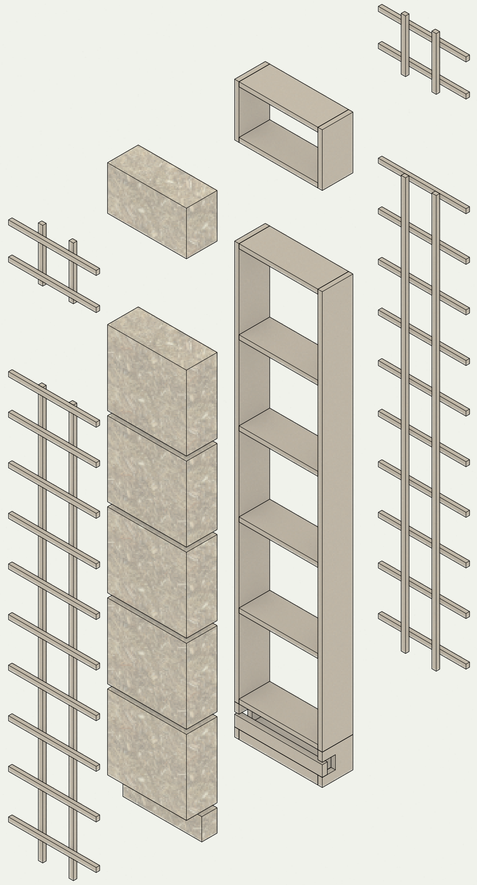


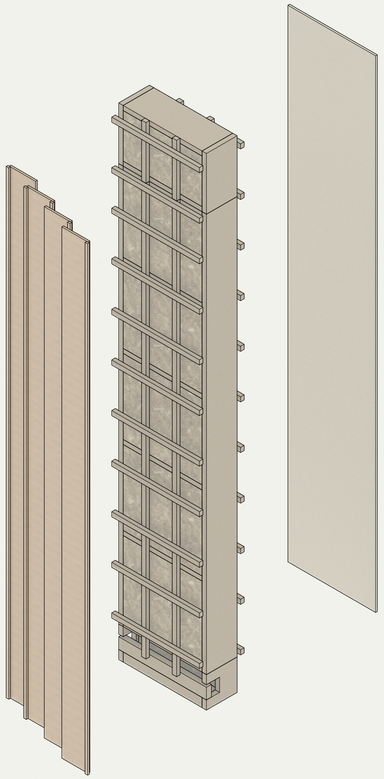


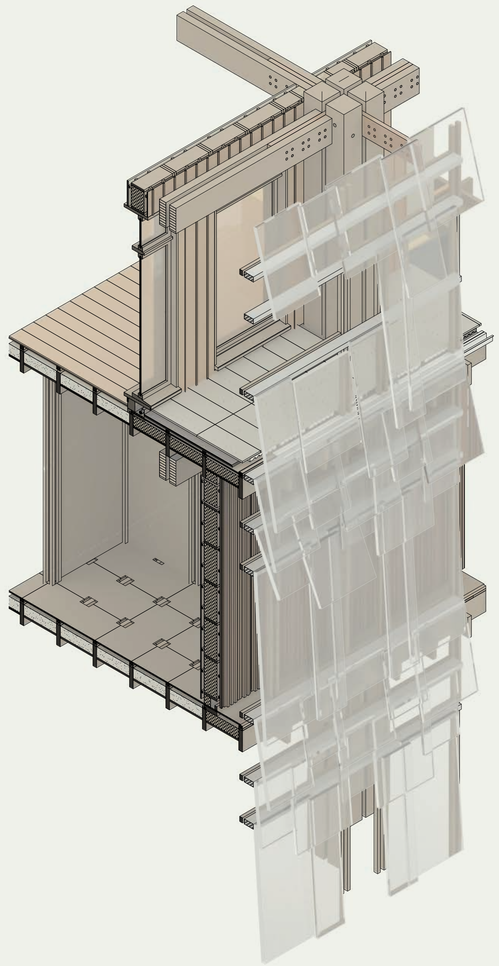


assembly principal



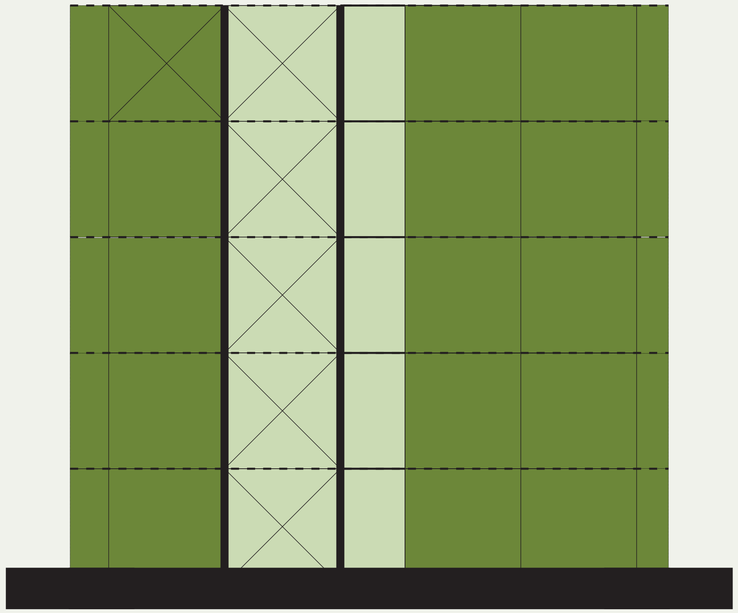


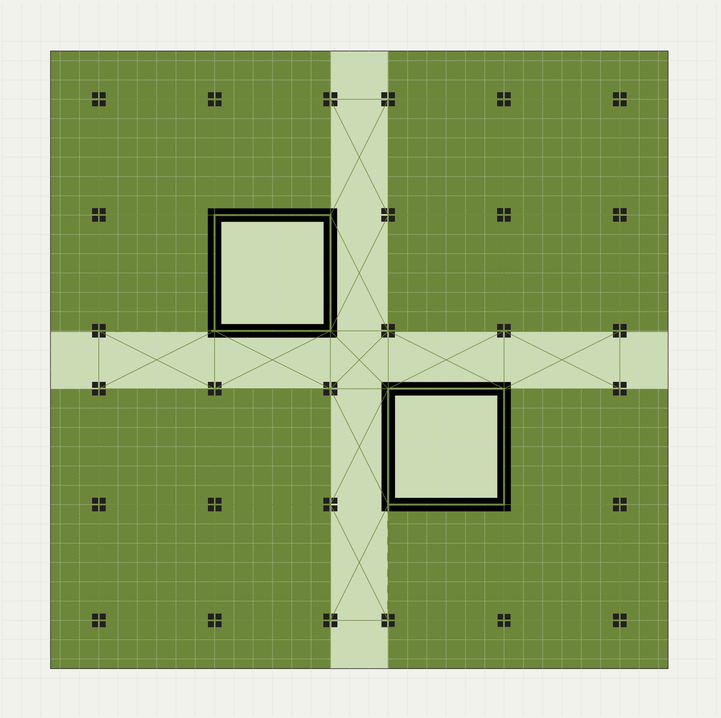




fractal[4] quarters to buildings

rules and tools to support openness on a nieghborhood scale

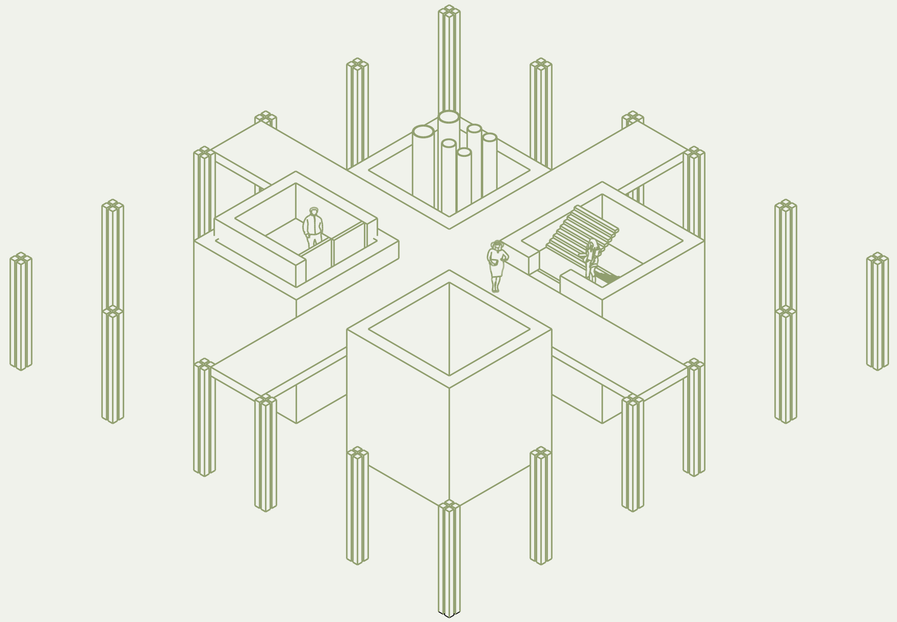




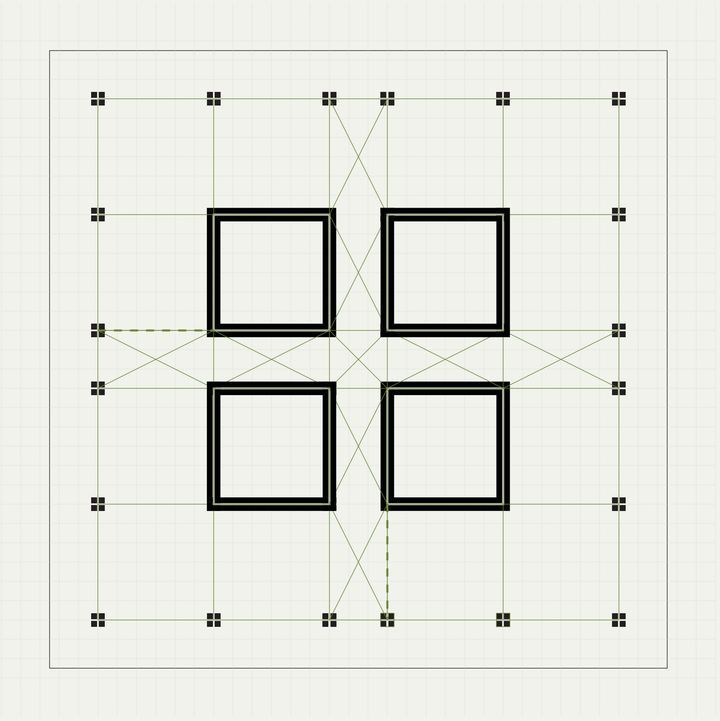
fractal[4] quarters to buildings

rules and tools to support openness on a nieghborhood scale

principal



axo floorlevel

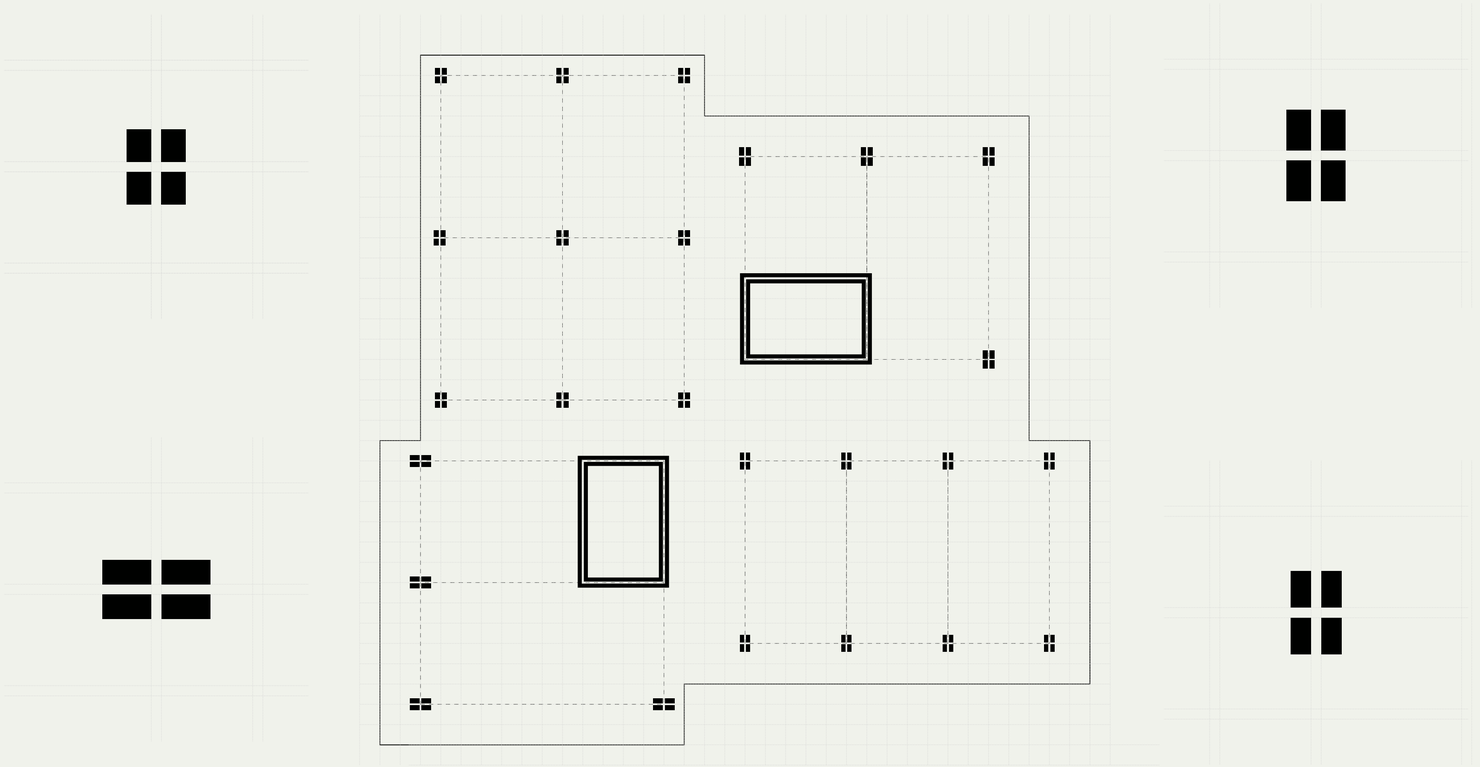


structural floorplan

fractal[4] quarters to buildings

rules and tools to support openness on a nieghborhood scale

appropriaton | variation



fractal[4] quarters to buildings

rules and tools to support openness on a nieghborhood scale

compatibility | aligning structure of spines and cells

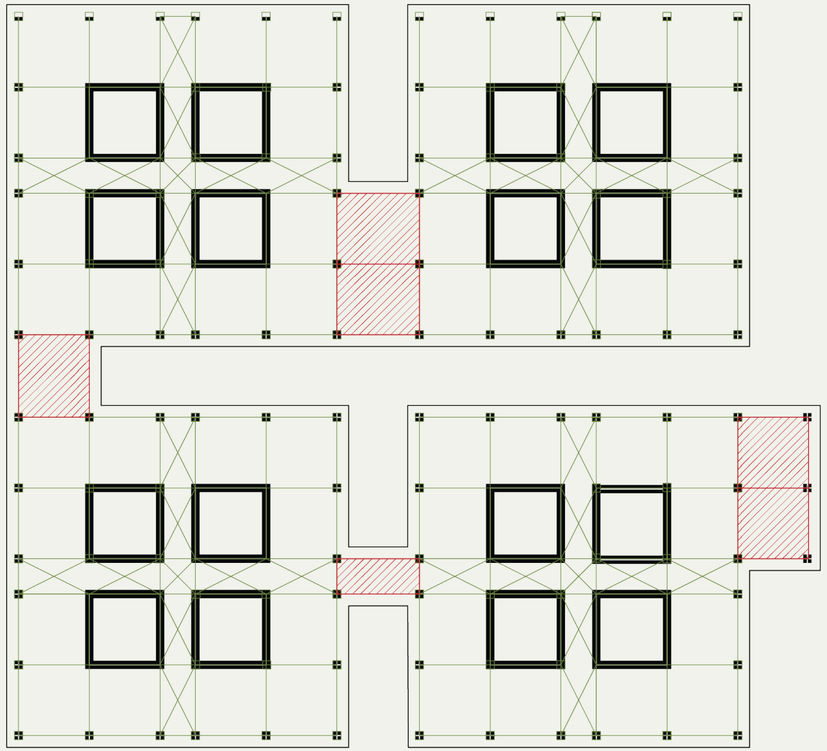
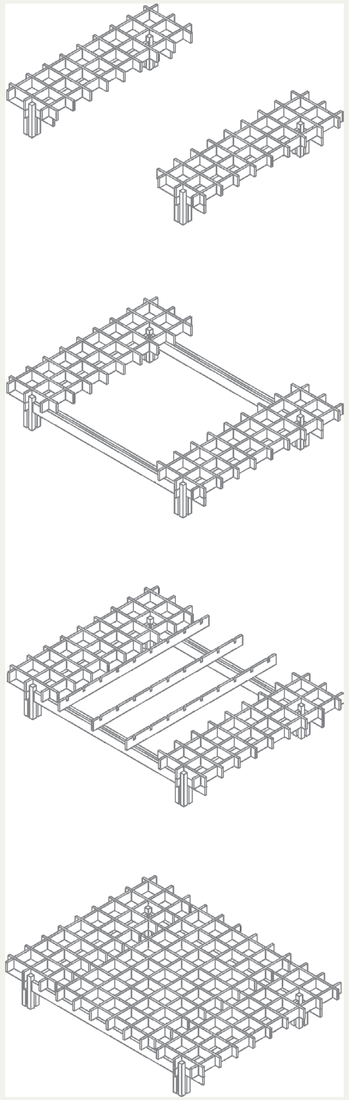
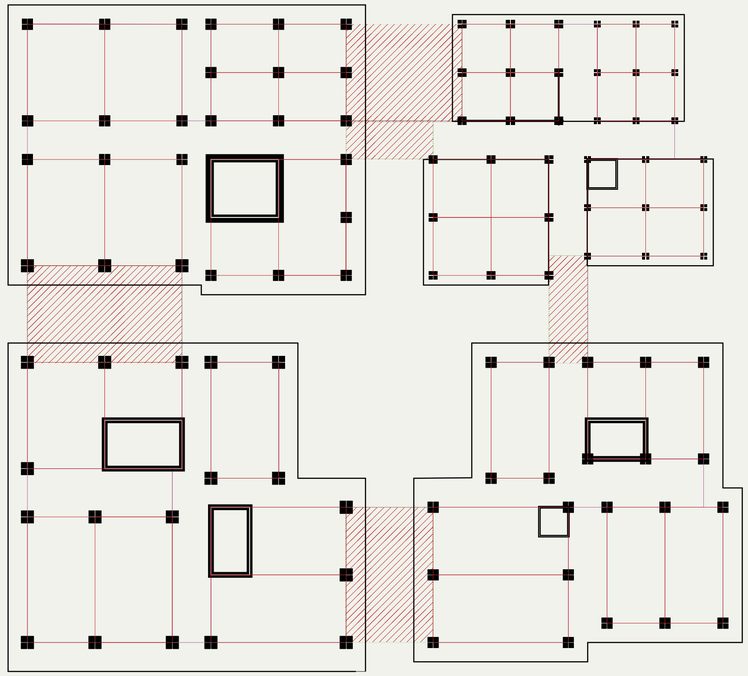


diagram of compatible cluster

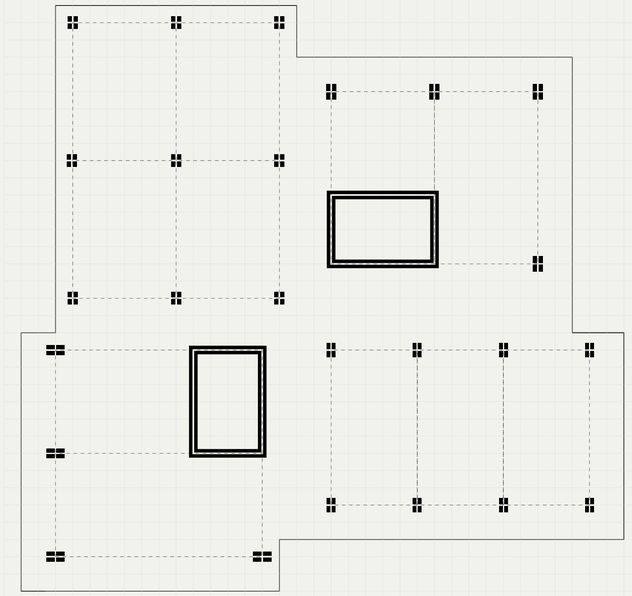


fractal[4] quarters to buildings

rules and tools to support openness on a nieghborhood scale



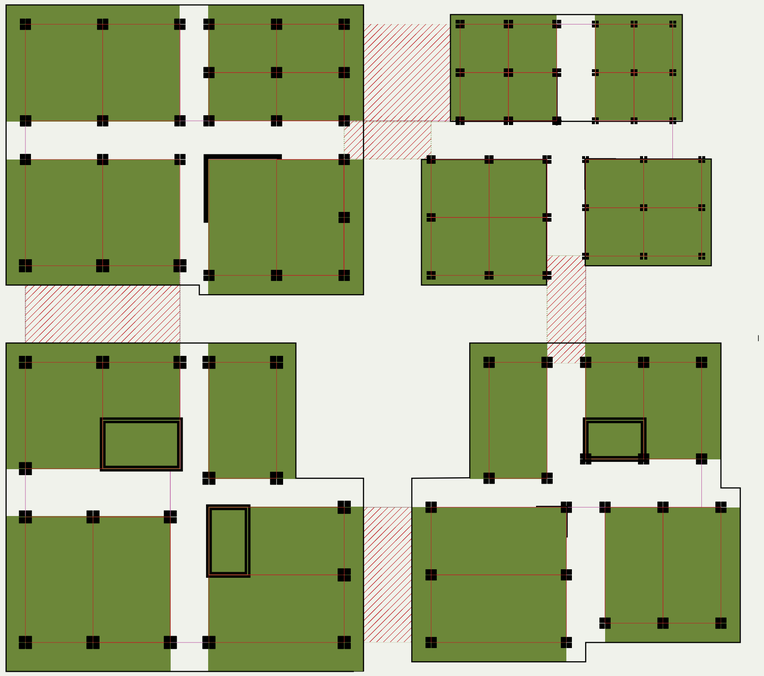
variation of compatible cluster



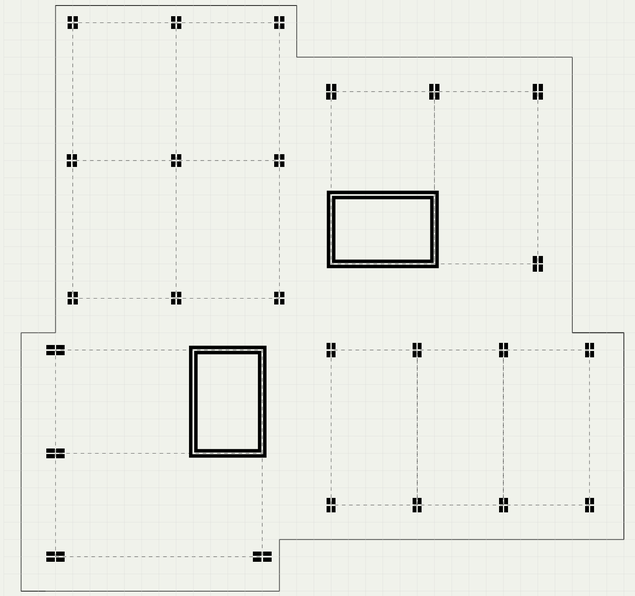
structural floorplan

fractal[4] quarters to buildings

rules and tools to support openness on a nieghborhood scale



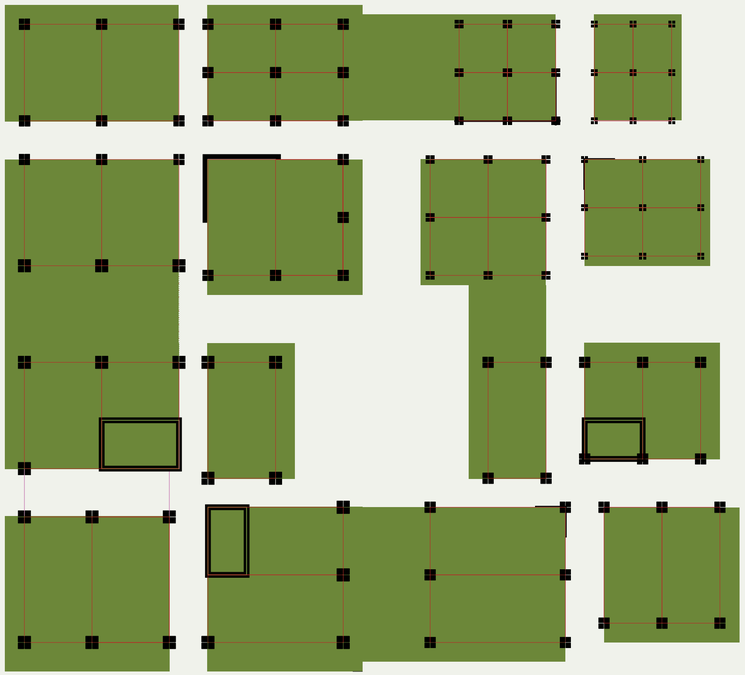
variation of compatible cluster



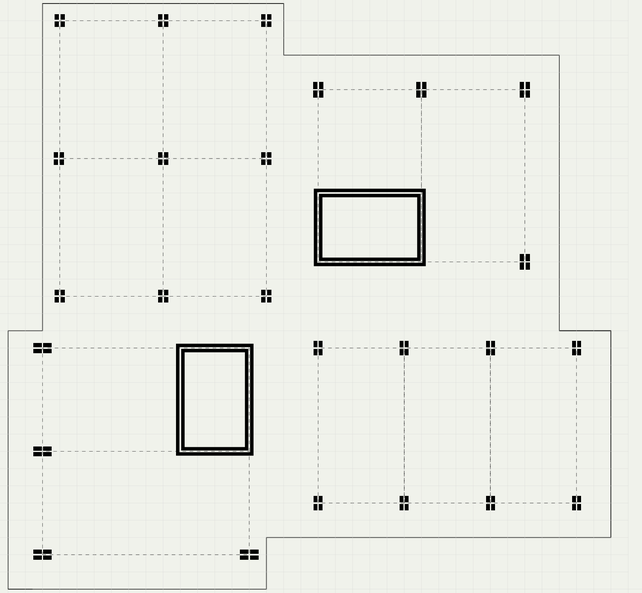
structural floorplan

fractal⁴ quarters to buildings

rules and tools to support openness on a nieghborhood scale



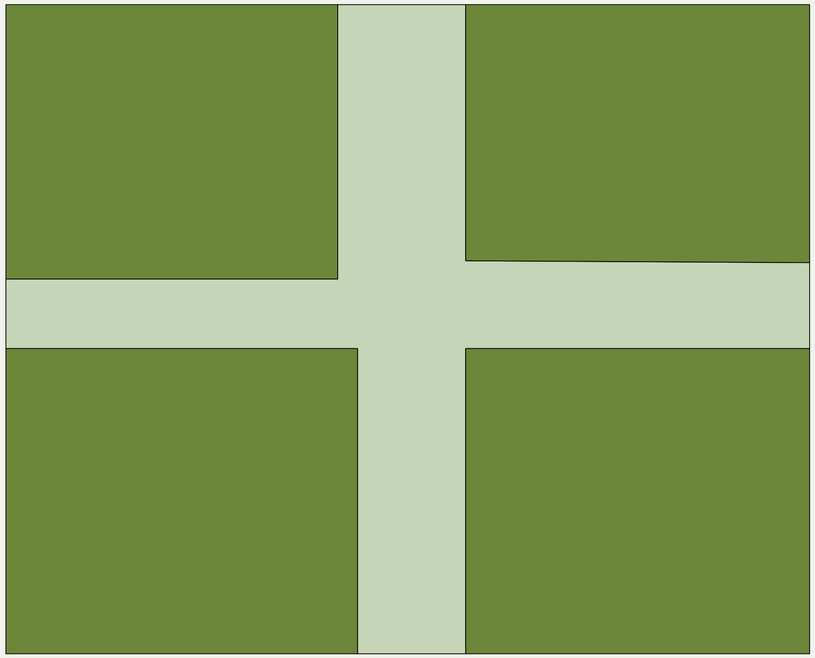
variation of compatible cluster



structural floorplan

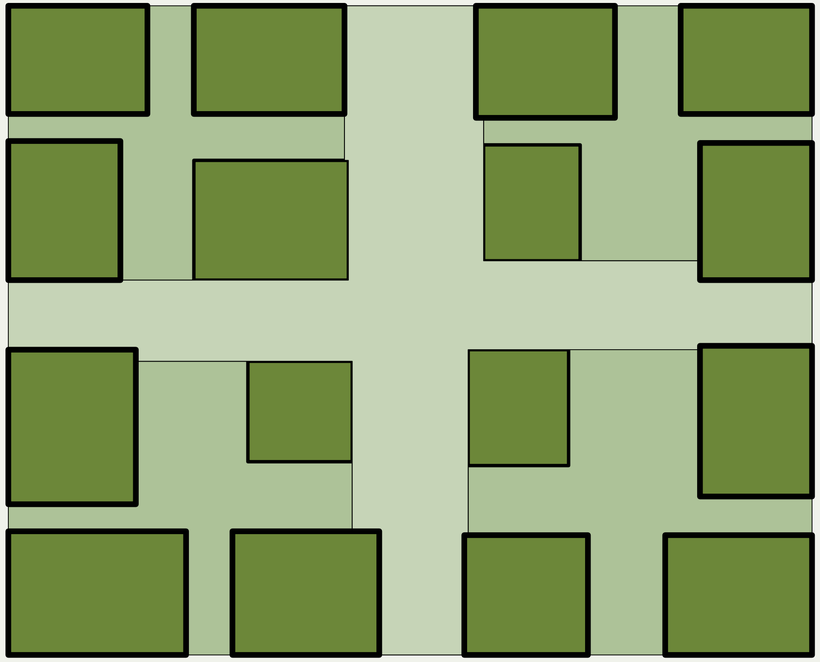
hard boundries on the contours of the neighborhood

surrounded by municipality spine



more openness in the neighborhood

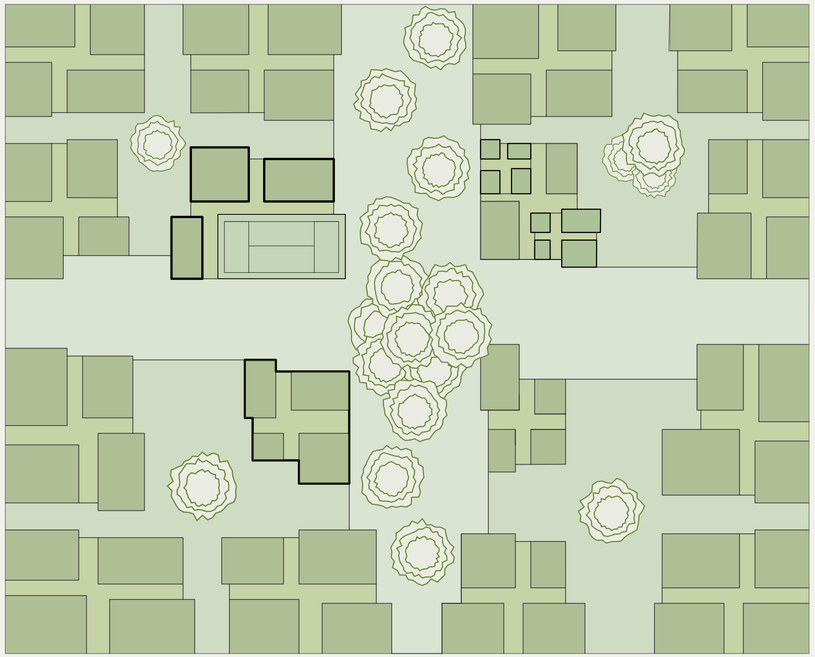
spine in control of the whole neighborhood



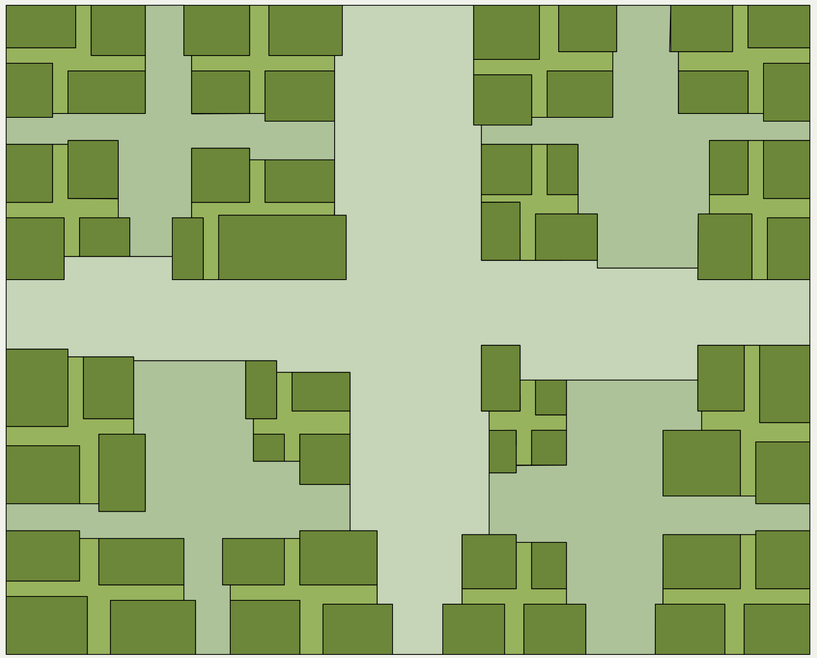
more openness in the neighborhood

spine in control of smaller communities

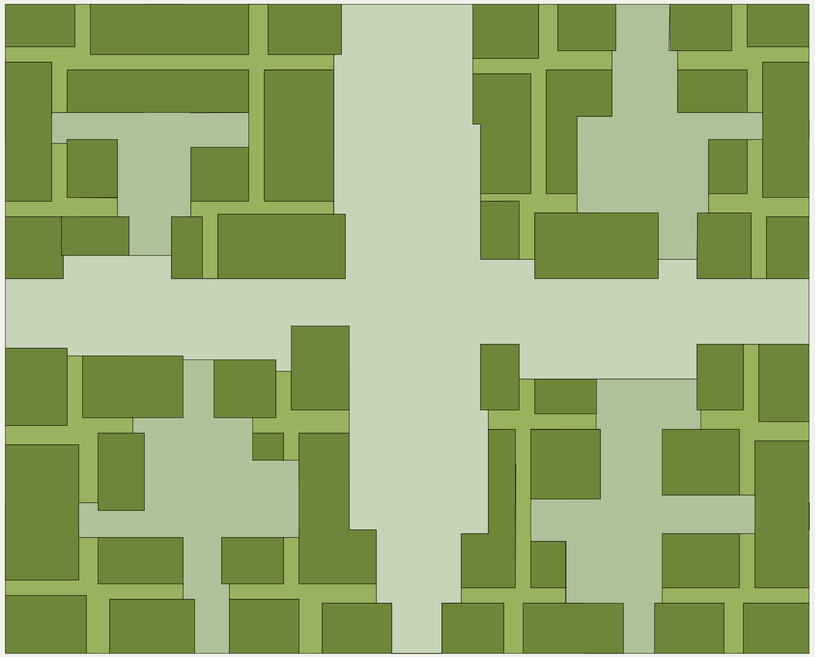
scalability: high density in the contours



high openness in the courtyard



variation through agency within the cells



adaptation through negotation with the spine

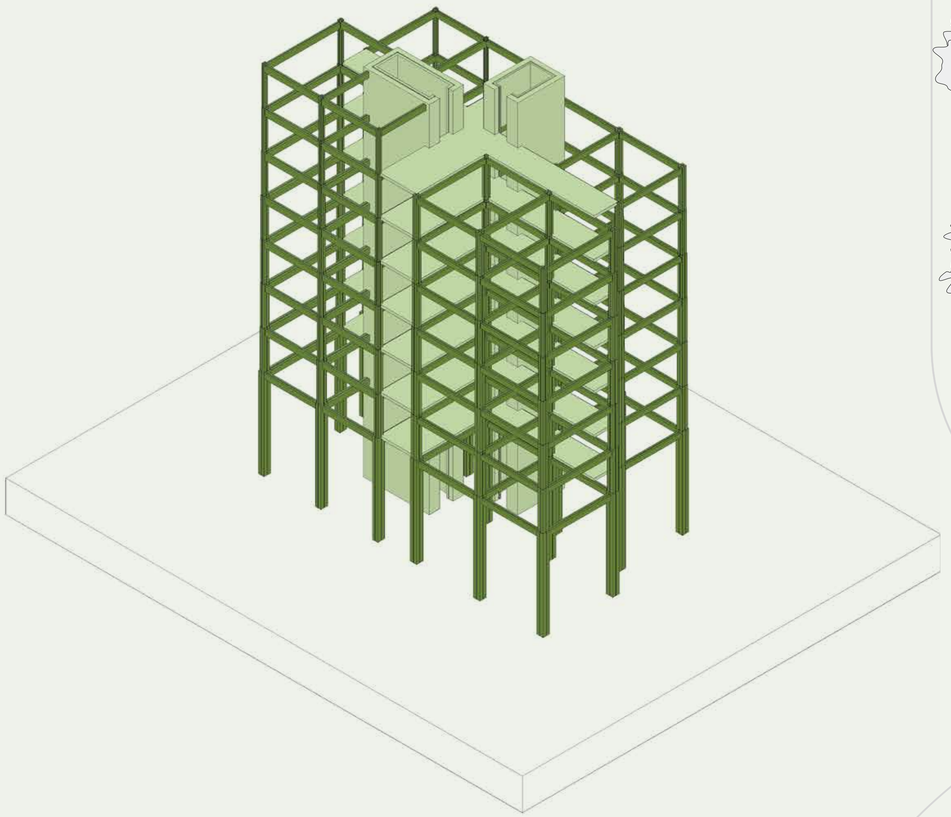
cell^3

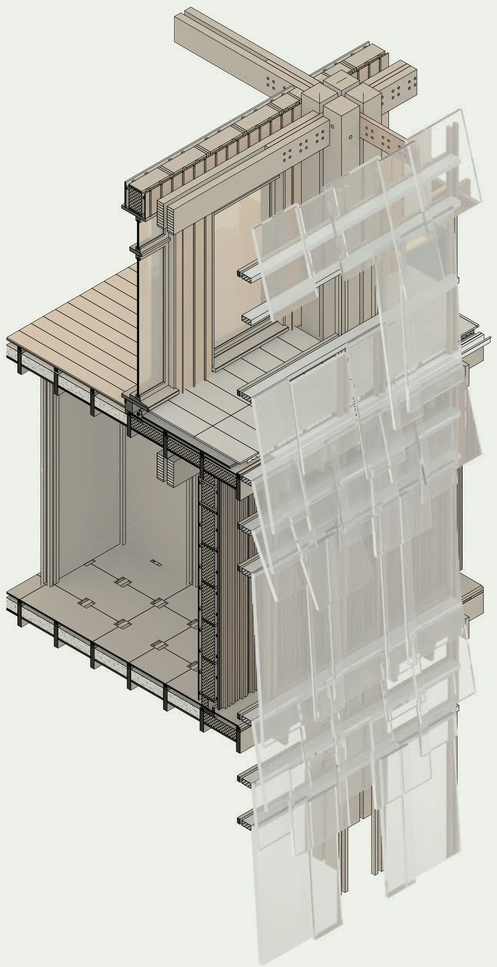
the building

in control of a
housing co-op

cell[5] building

in control of the housing-coop

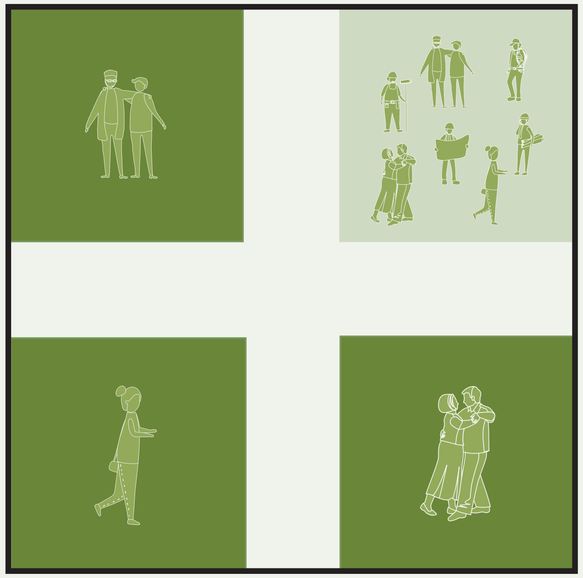




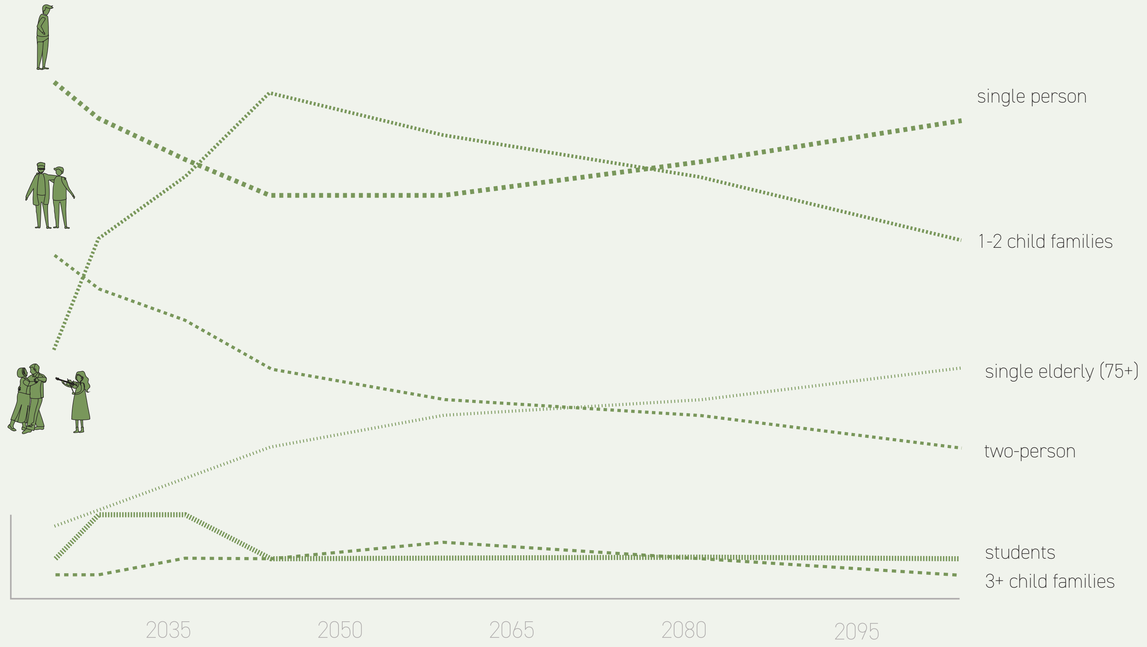
olivia's cell
3th floor of the

cell[4] living spaces

in control of the households



living spaces



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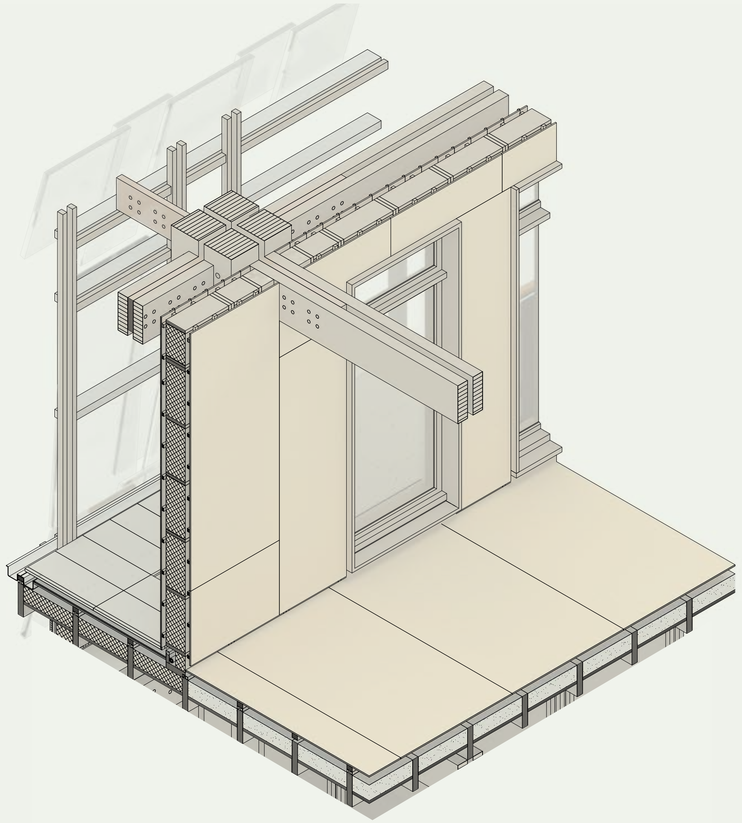
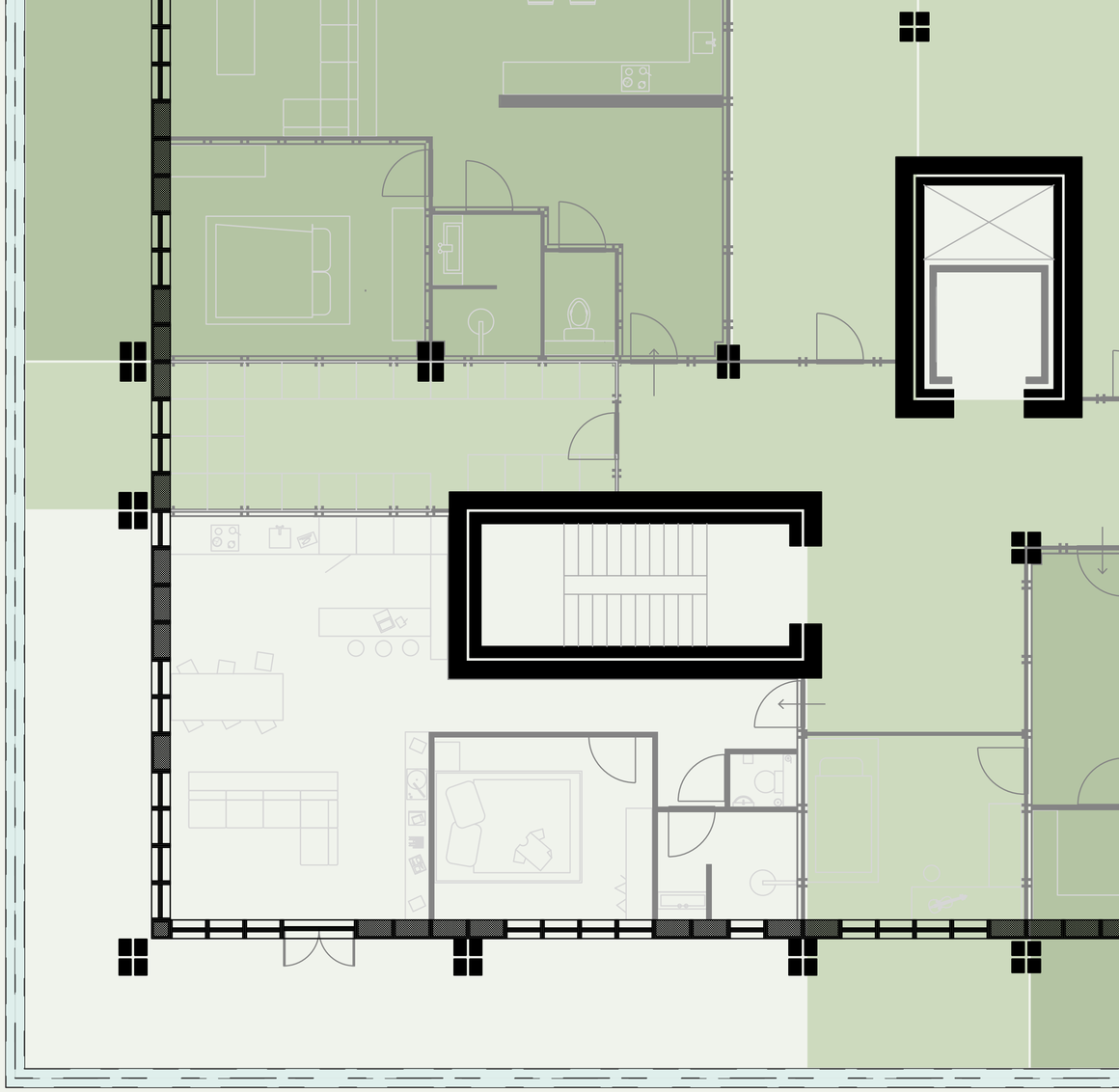
cell[4] living paces
in control of the households



olivia | 23 yld

became a stakeholder of the housing coop as she could just afford this and decides to put OSB on the floor and walls on which she puts some simple walls. Buys a second hand kitchen, which is just like the bathroom placed besides the spine to connect to the pipes which runs there.

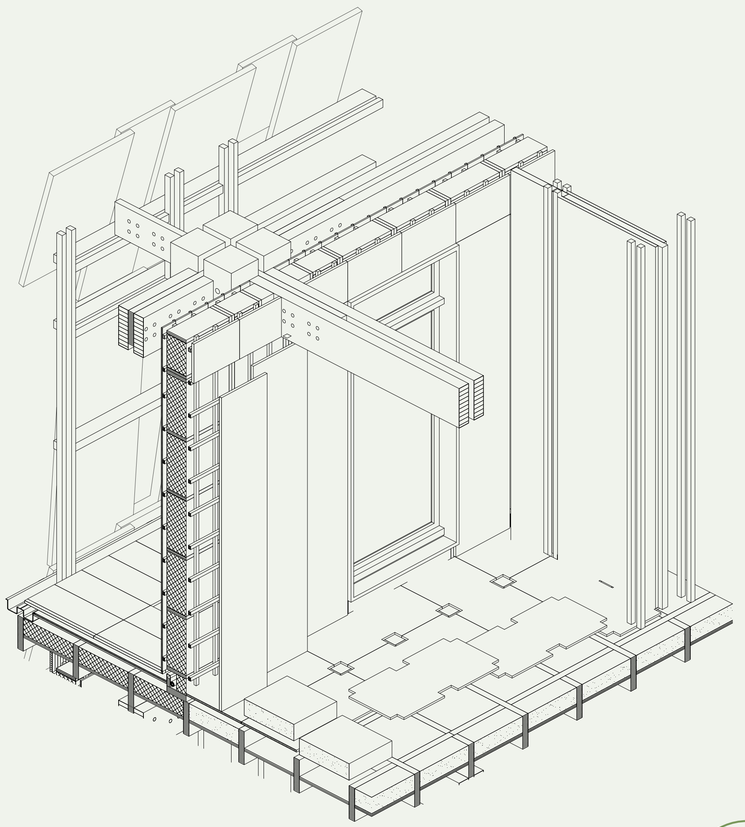


olivia's cell
3th floor of the

olivia's apartment
3th floor of the
49 m^2 interior space

cell[5] living paces

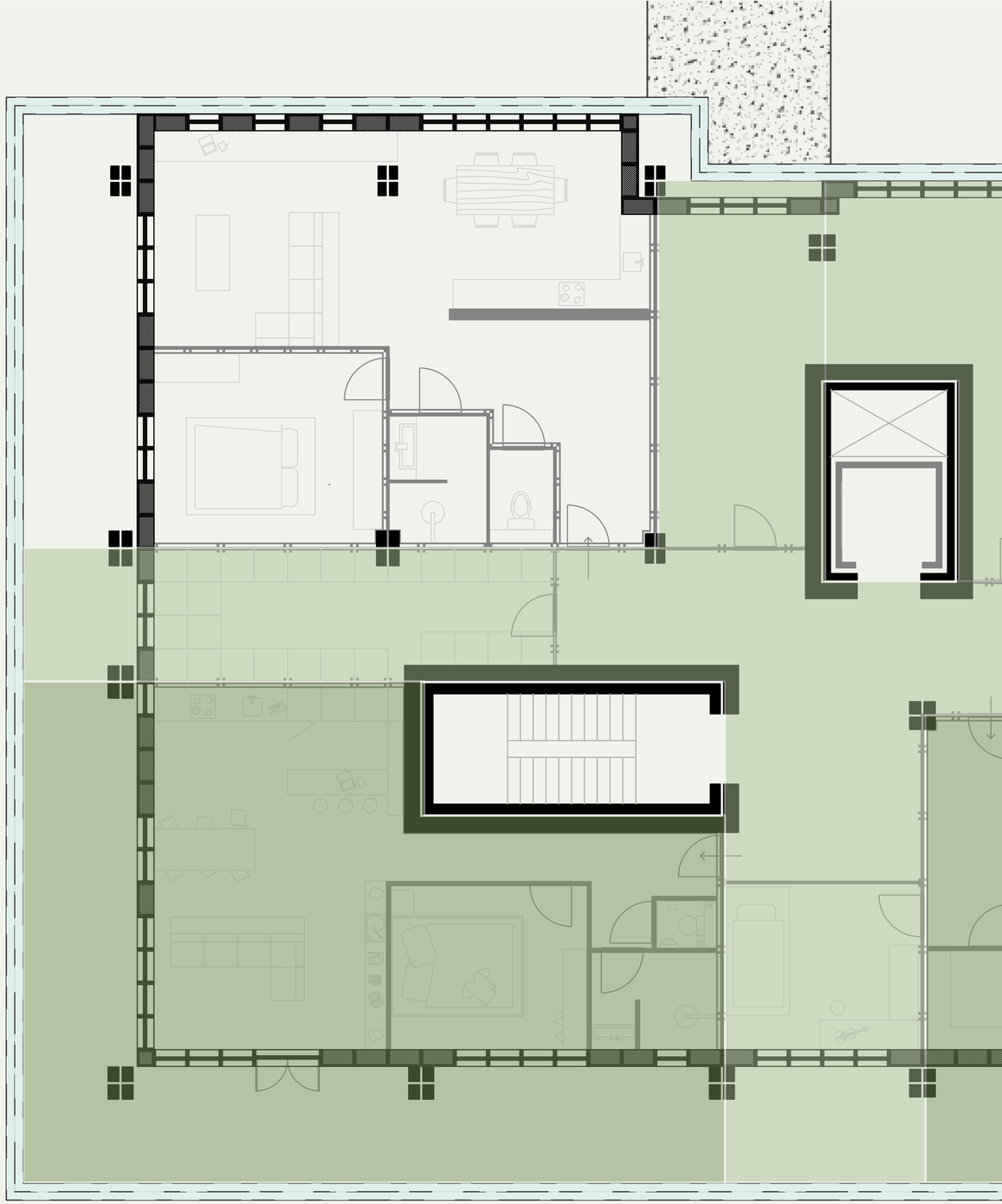
in control of the households



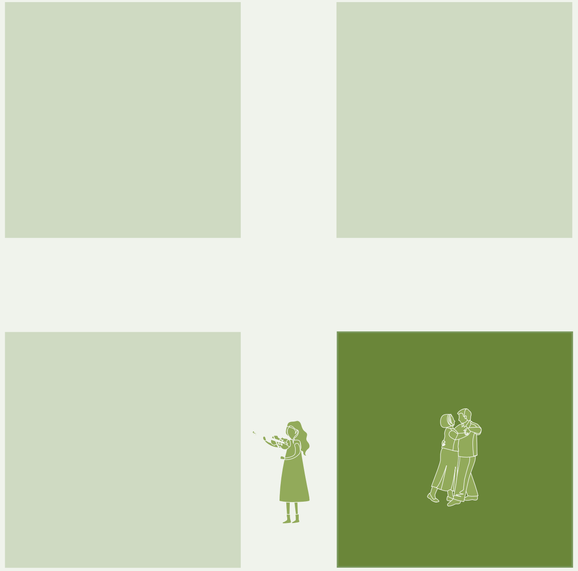
Max and Imad
29 & 31 yld

Imad was a pioneer in the housing-coop. They decided to use the adaptable wall and floor system for the area. They like a plastered wall so they use clay-boards of 600mm on their walls which they don't need to plaster but can just paint, so they can change things if they want to.

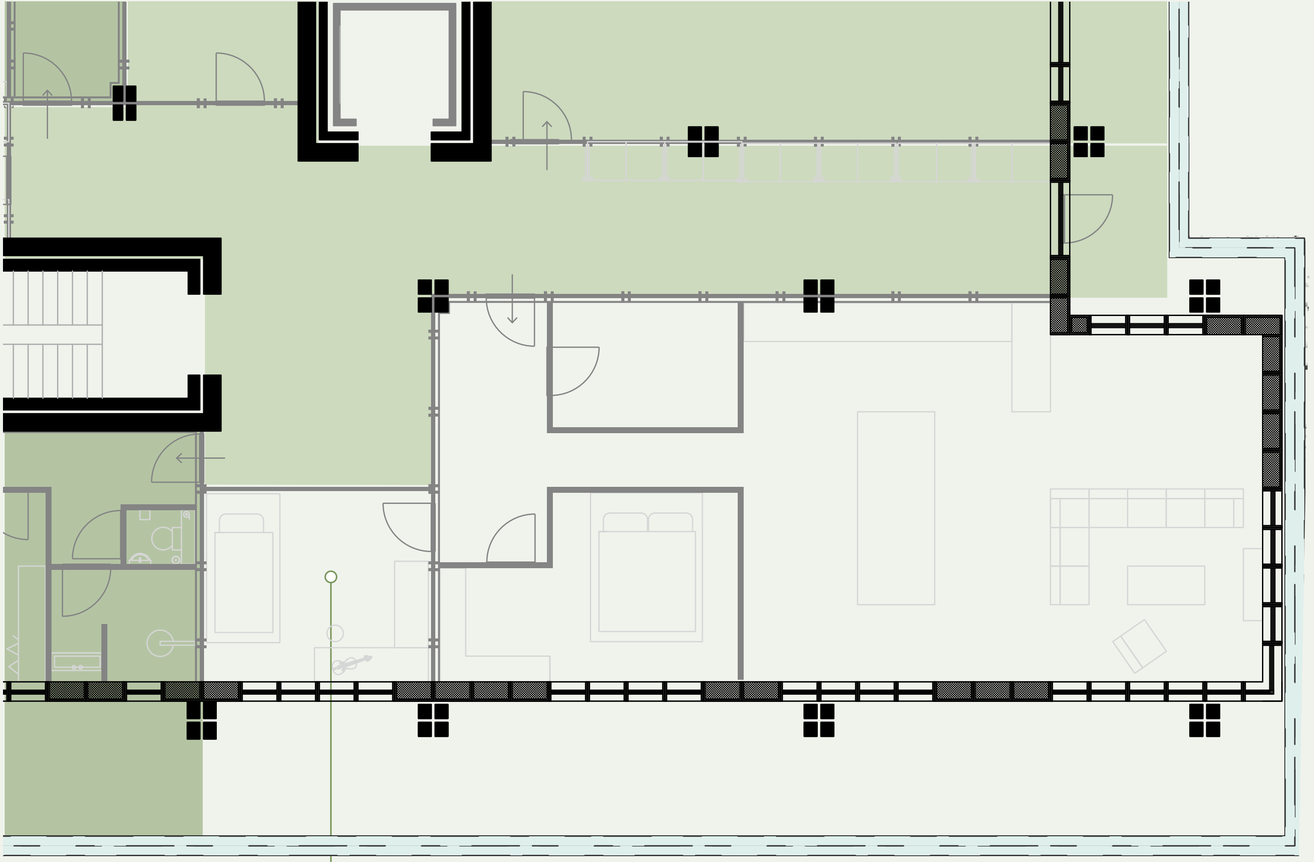
max' and imad's appartment
3th floor of the
65 m^2 interior space
88 m2 cell space



cell^{4} + spine^{3}



living spaces

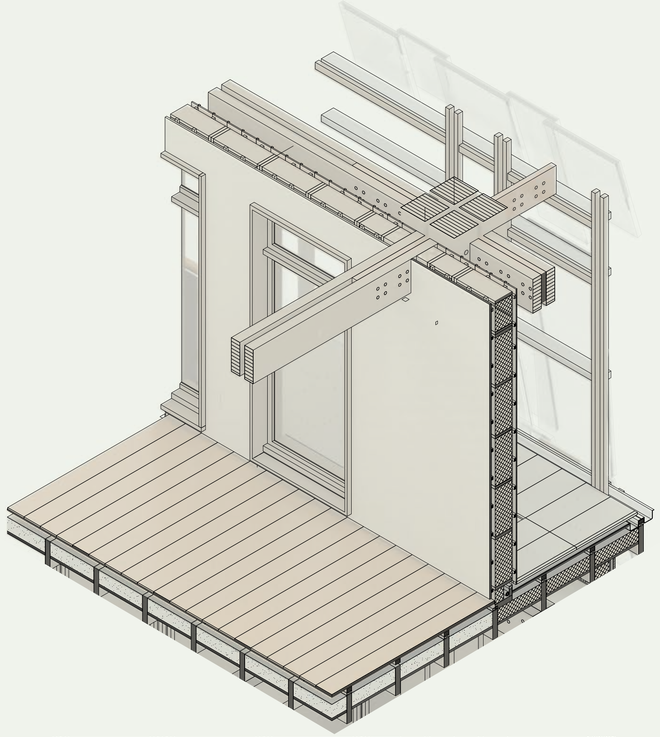


Maria & Abel
49 & 51 yld

Ivanka (42), Joost (56) and daughter. Their son already moved out and now their former house got to big. So They discuss with the architect in resident to design their space. They negotiated with the housing-coop to lease a space in the spine for their daughter Anna, they can lease this space at least until she moves out. Everyone in the housing-coop will benefit from these earnings.

Mina 15 yld

Anna's space has to be build using the adaptable system with larch wood finishing, so it can be used again in the future.



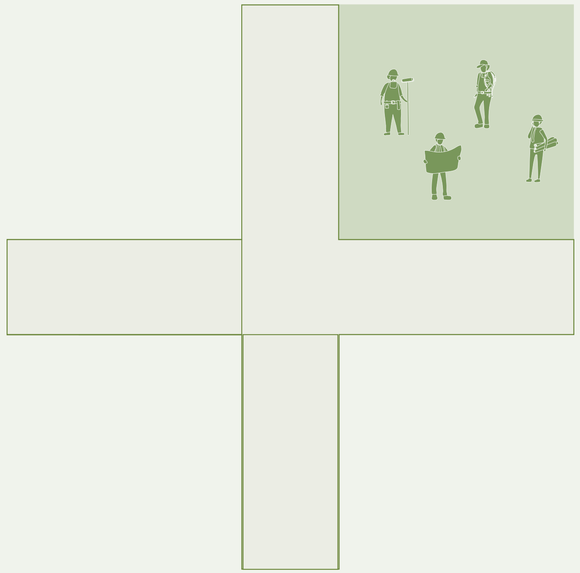
Mara, Abel & Anna's apartment

65 m^2 interior space
110 m^2 cell space
11 m^2 - 30 tiles in the spine

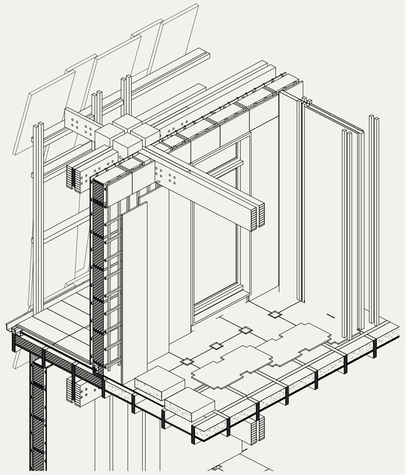
cell[4] communal spaces

in control of the housing-coop

spine[3] + cell[4]

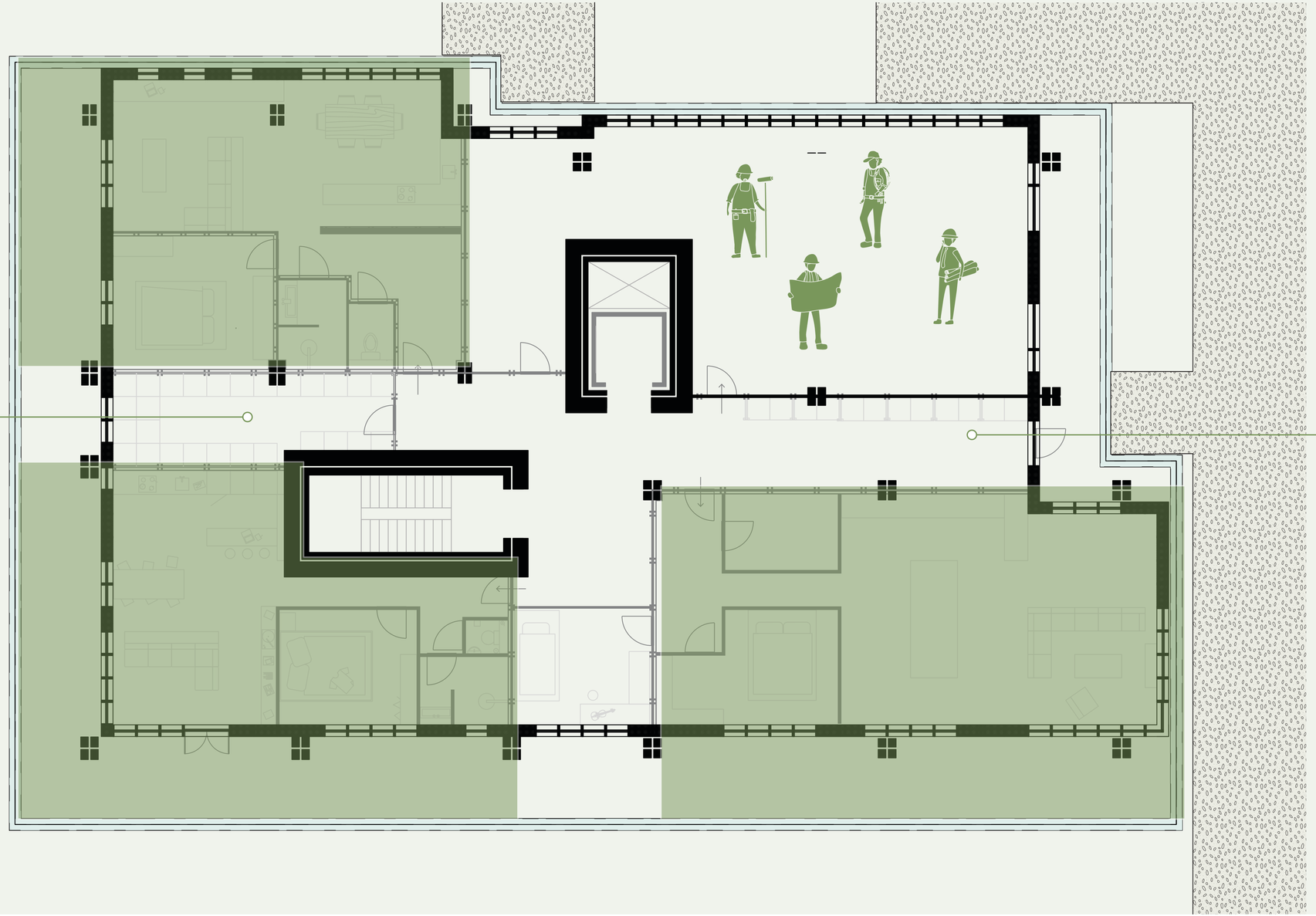


shared spaces



collective laundry space 16m²

Together they decided to use one of the spaces in the spine as a washing area. On the floor above they have another purpose for this space so two others will use this space. They share the lease of the 28 tiles. Some want some extra storage here so they will lease these tiles separately.



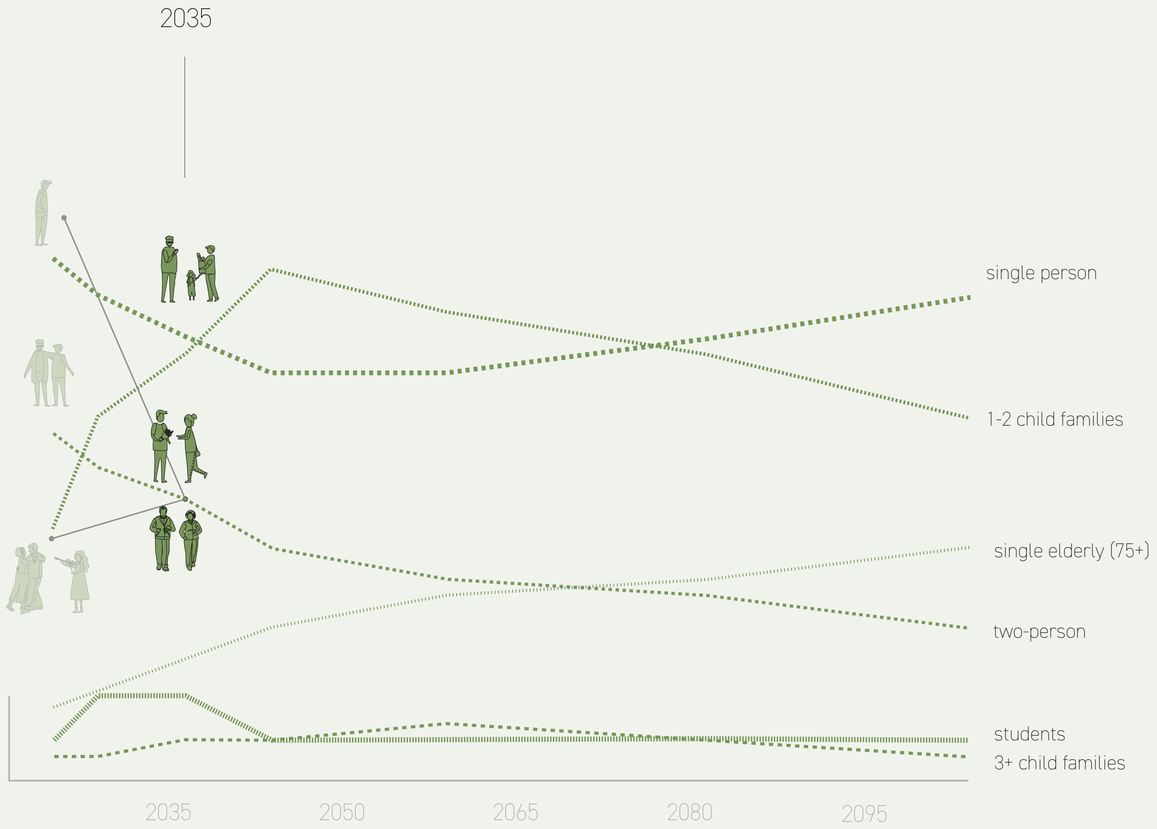
communal space

This cell is being kept in control of the housing-coop, just like the spine. Together they discus that they will keep it open for everyone who is still working on their interiors.

They didn't make a division wall between the spine is being kept open do people from other buildings

fire escape

The spine space opposite to the staircase has to be maintained in case of fire. They need at least 90cm wide coridor. For now they use the adaptable 600x600 system for a shelving unit. People can lease the tiles in here but for now they use it to share tools



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olivia & loek | 23 yld

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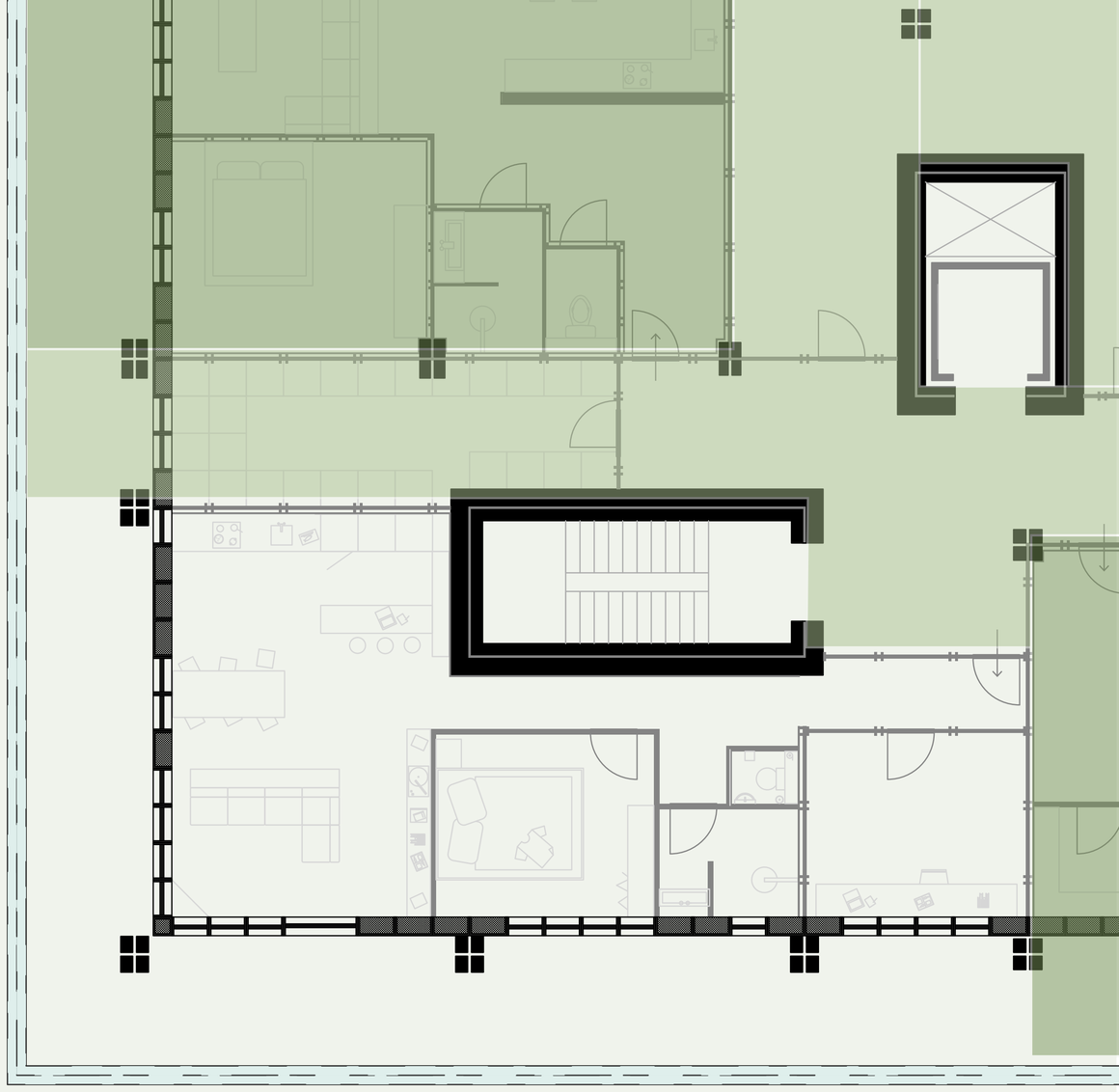
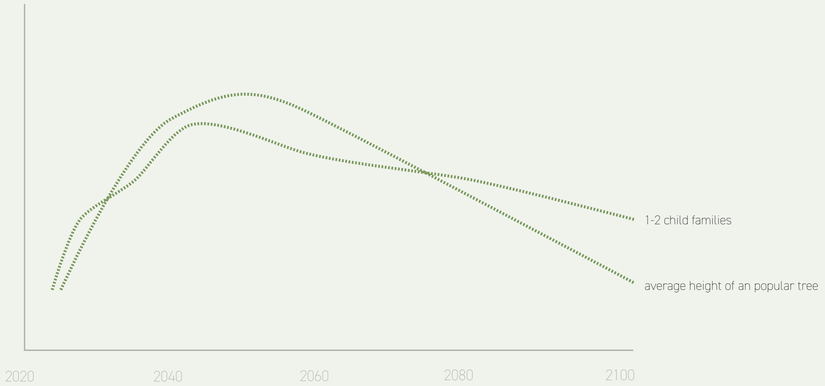
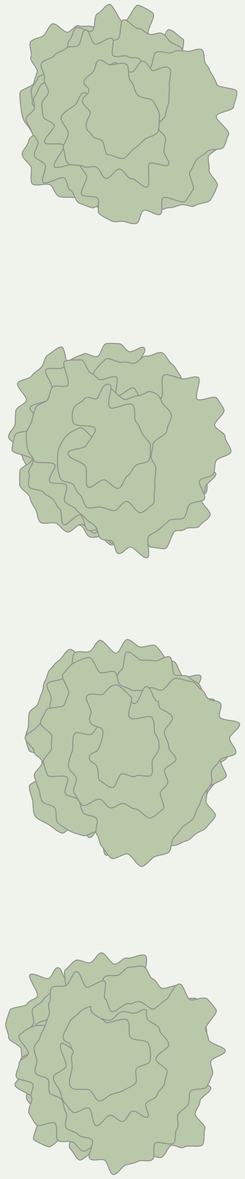
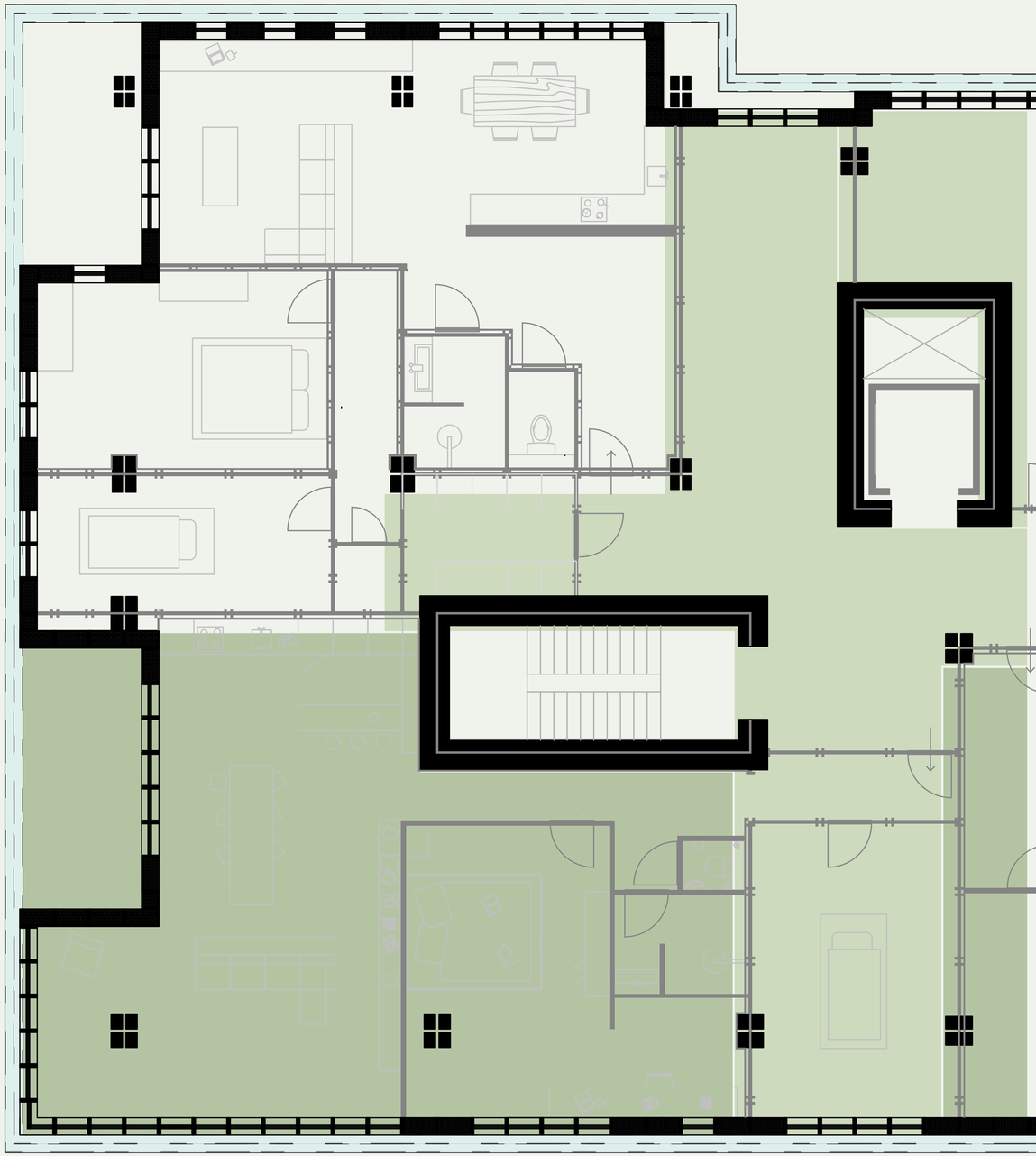


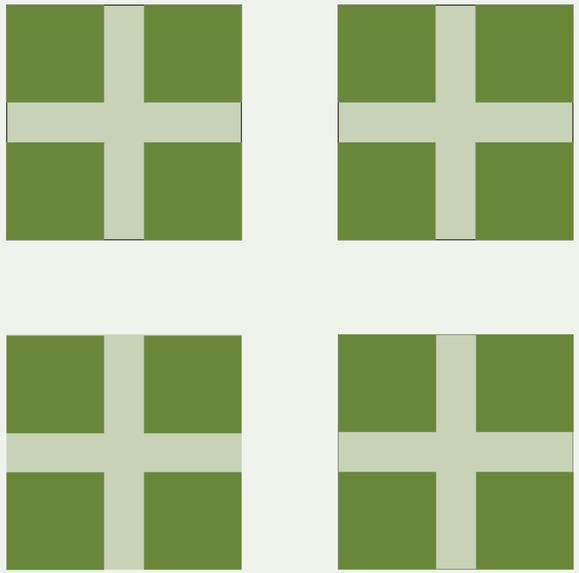
alnus
alder


1-2 child families
average height of an popular tree
2020
2040
2060
2080
2100

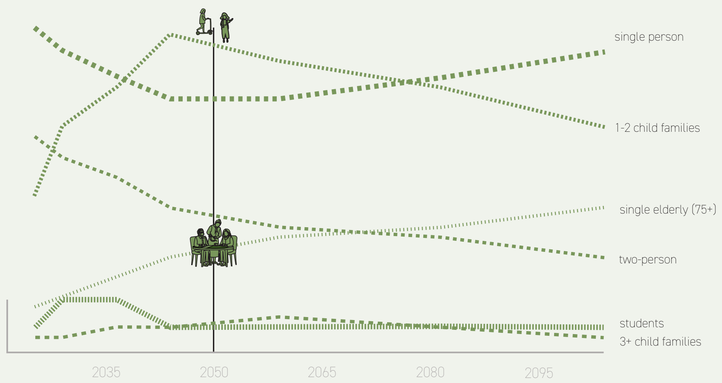




cell^3



neighbourhood quarter



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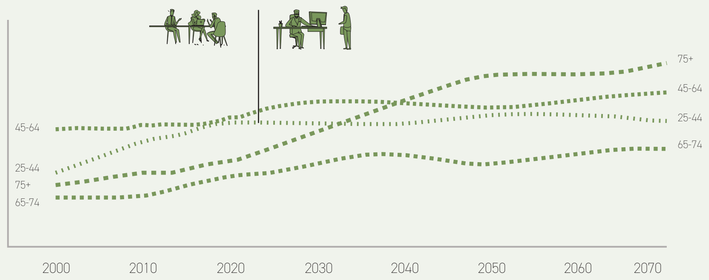
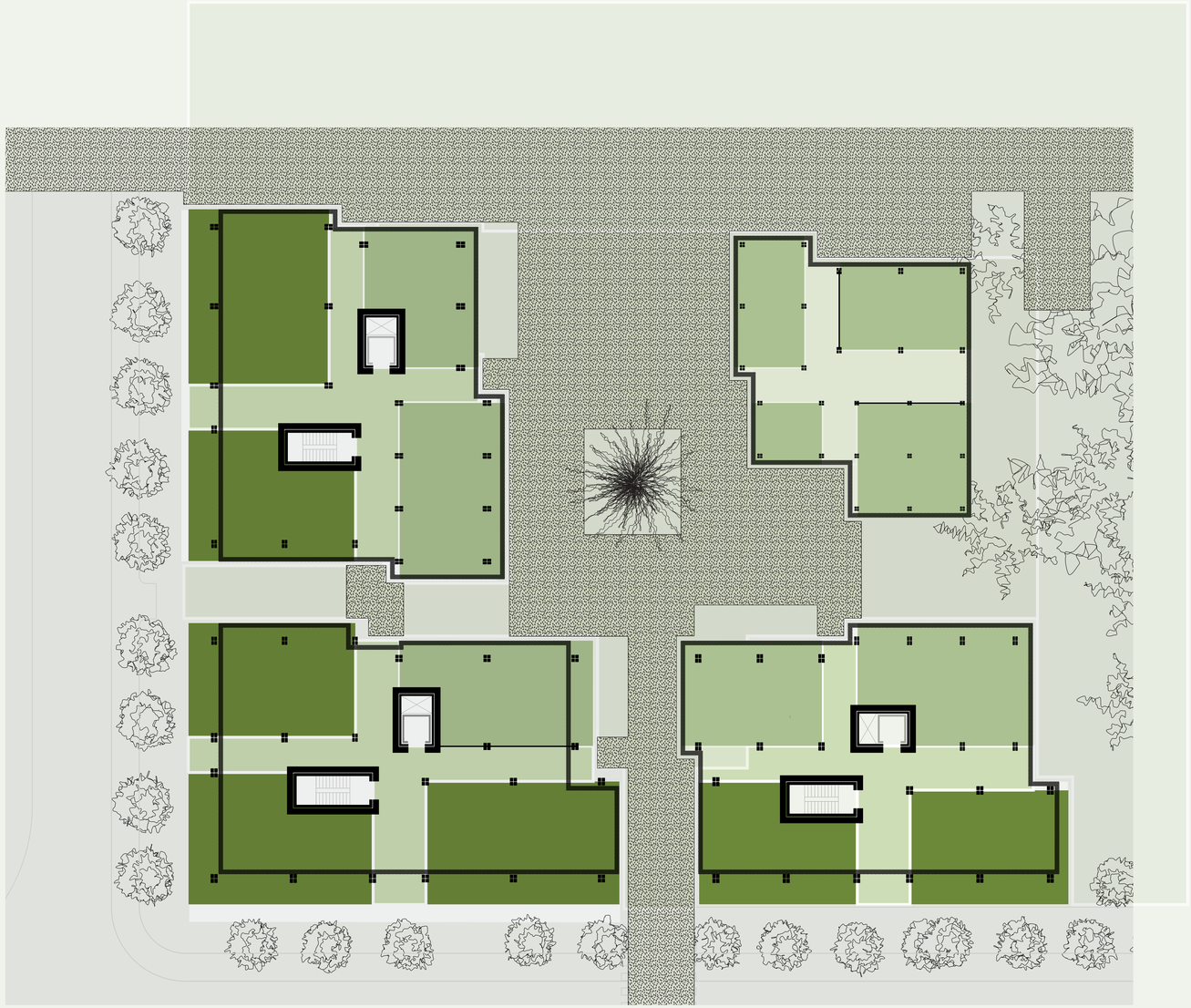
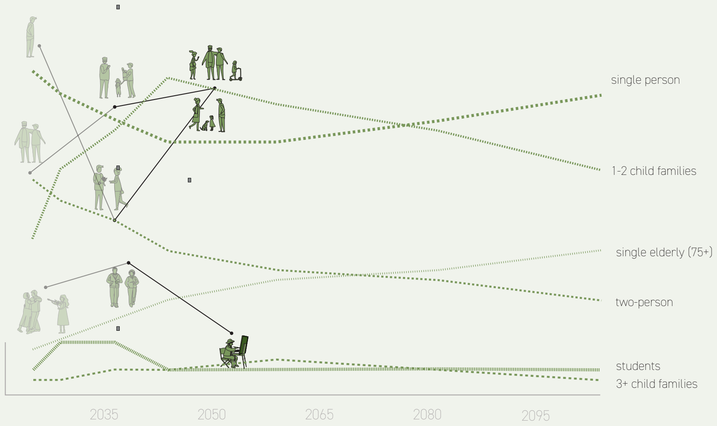


prognosis household development © CBS - Huishoudensprognose Amsterdam 2021-2070





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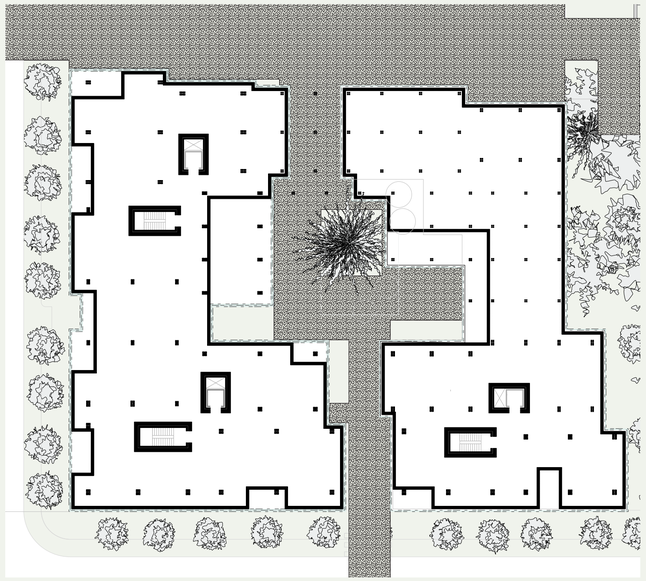

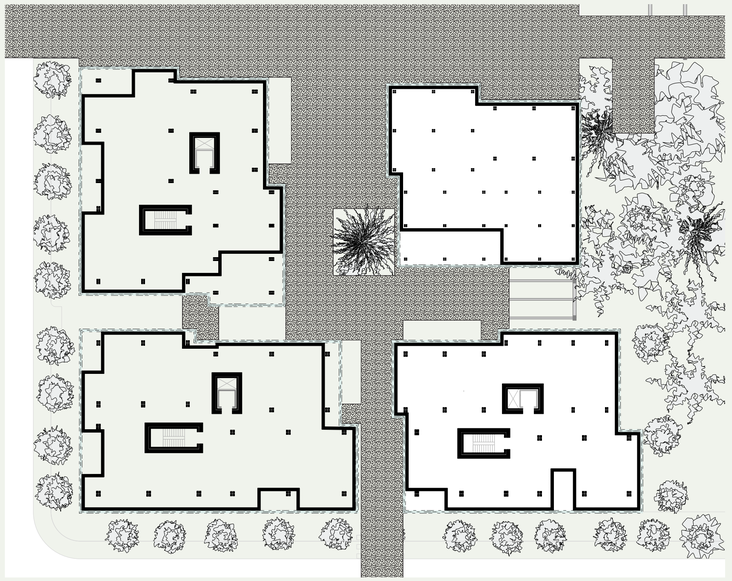

reflection

thank you