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External examiner: André Mulder

Reviving the Rural.

Exploring the new models of **regenerative communal living**,
and the potential of **regional forestry** paired with **advancements in timber construction**
for economic and social revival of the European countryside

Rural areas make up 93% of Poland's territory
and 40% of population lives there.



Challenges of contemporary countryside



Monocultural Farming

rapid degradation of vast areas of soil and global ecosystem
and urgent need for alternatives



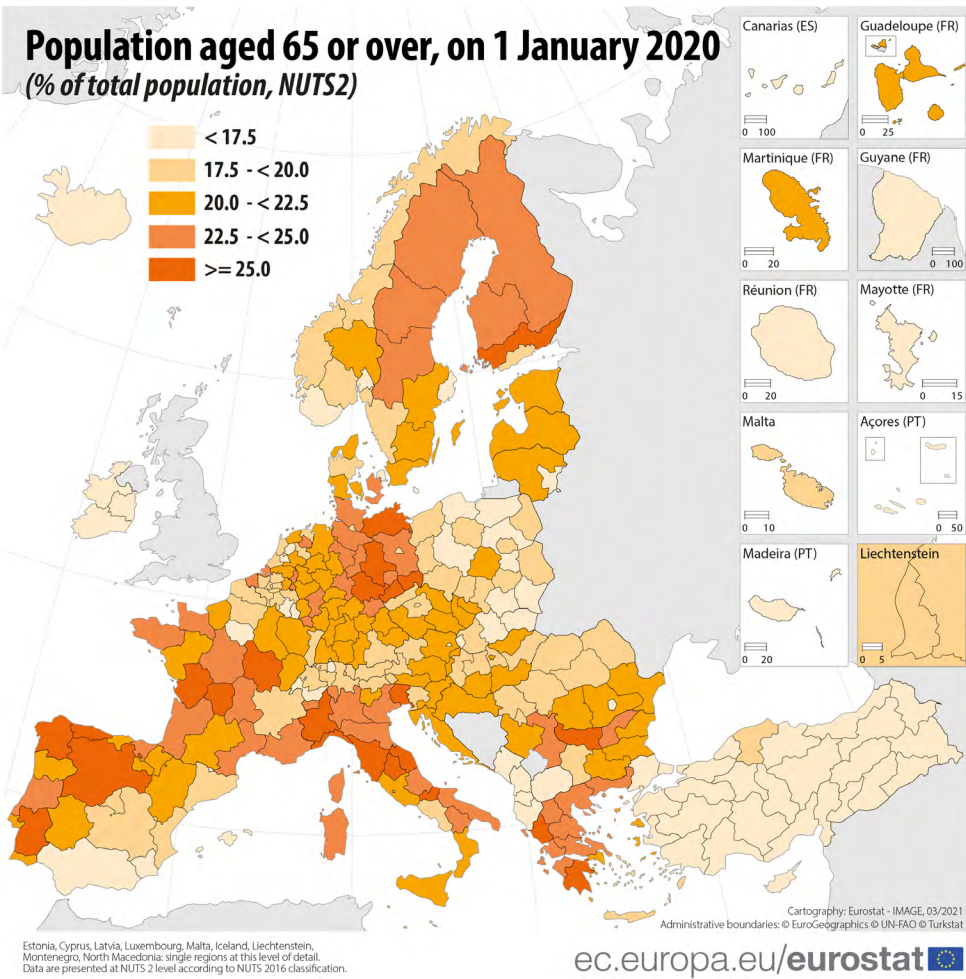
Challenges of contemporary countryside



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Rural depopulation & ageing communities
a global demographical problem for most of European
Union, magnified in the rural areas.



Challenges of contemporary countryside



Monocultural Farming

rapid degradation of vast areas of soil and global ecosystem and urgent need for alternatives



Rural depopulation & ageing communities

a global demographical problem for most of European Union, magnified in the rural areas.



Relevance & economic perspectives

need for diversifying economical activities for all ages going beyond farming

The inevitability of Total Urbanization must be questioned, and the countryside must be rediscovered as a place to resettle, to stay alive; enthusiastic human presence must reanimate it with new imagination.

- Rem Koolhaas, AMO Countryside - A Report

Budachów, Poland
photographed by the author



Potential of contemporary countryside

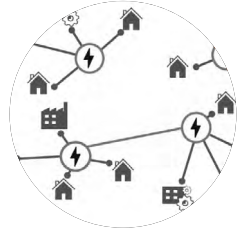


Decentralised energy supplier

European energy transition towards decentralised and sustainable sources where rural areas will play important role



Potential of contemporary countryside



Decentralised energy supplier

European energy transition towards decentralised and sustainable sources where rural areas will play important role



Management and production of renewable natural resources

both forestry and farming by-products could generate value for construction sector in a bio-based economy.



Potential of contemporary countryside



Decentralised energy supplier

European energy transition towards decentralised and sustainable sources where rural areas will play important role



Management and production of renewable natural resources

both forestry and farming by-products could generate value for construction sector in a bio-based economy.



Culture, Tourism & Education

Are both big potential for diversifying economical activities and attracting investment while creating value



A right moment for change



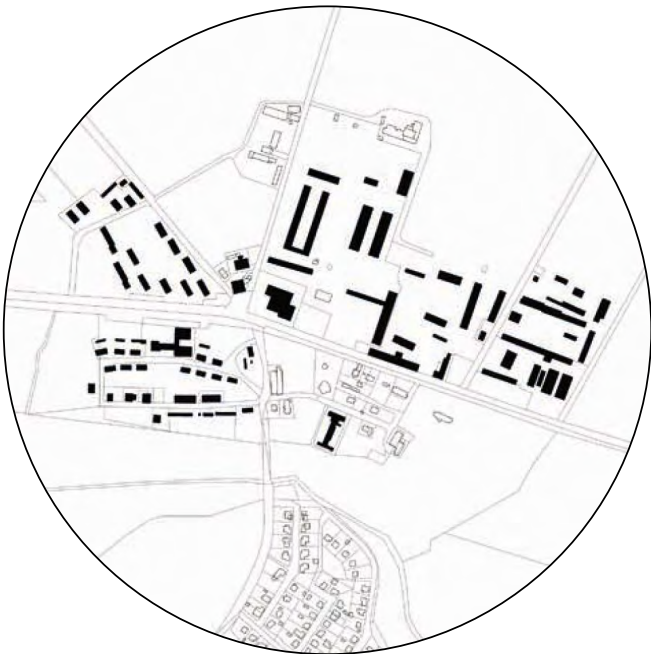
A snapshot from Polish pavilion of 17th Venice Architecture Biennale
- "Trouble in Paradise" How will we live together? by PROLOG+1

Evolution of the countryside

early-capitalist
countryside



socialist
countryside



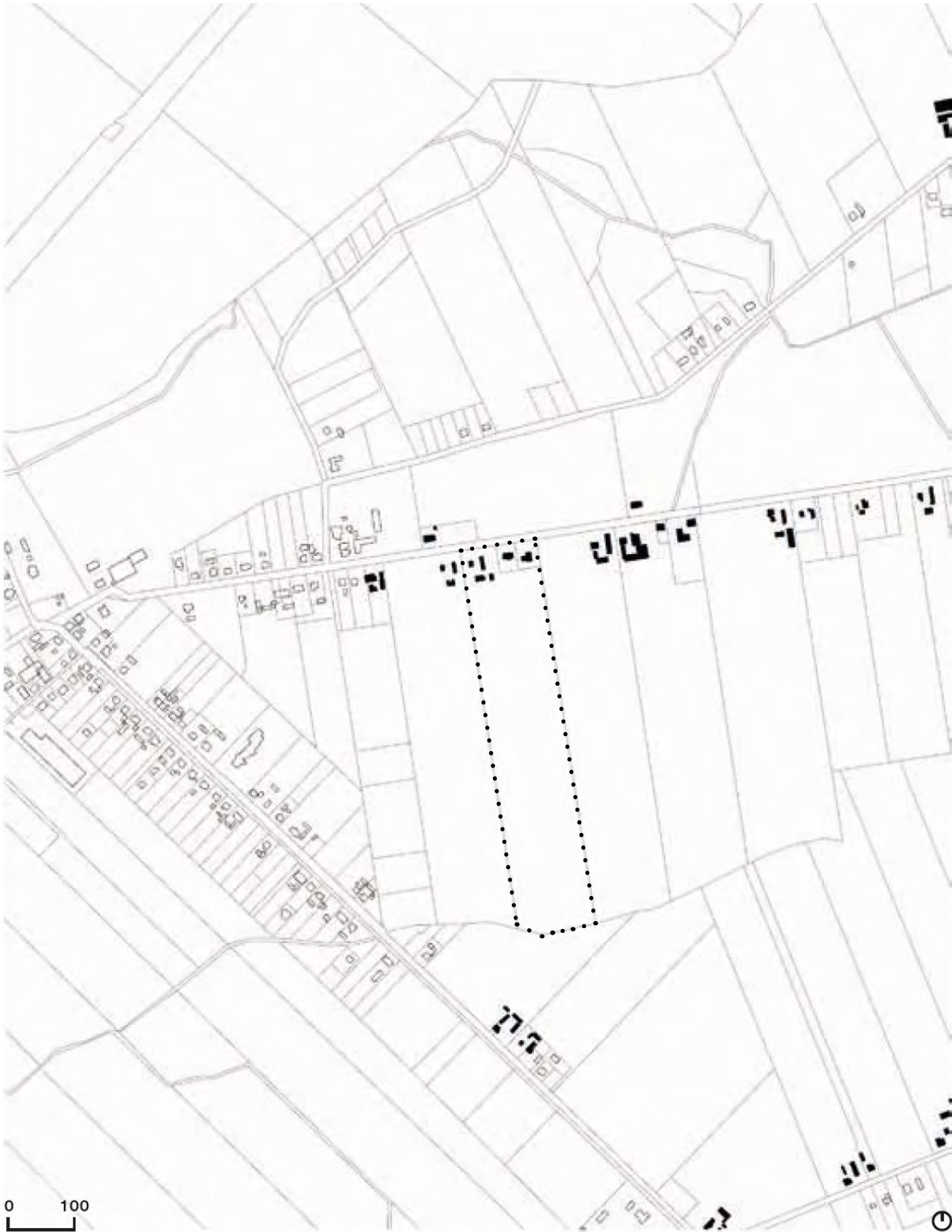
late-capitalist
countryside



Early capitalist countryside

1918-1939

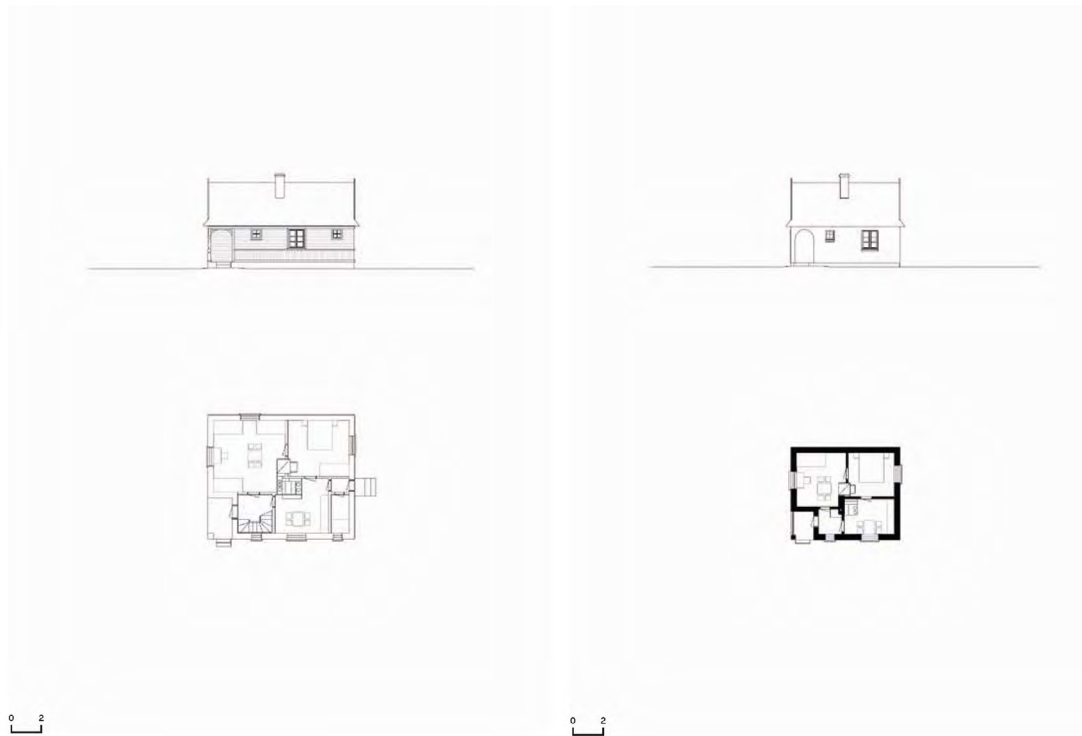
territory:



settlement:



dwelling:



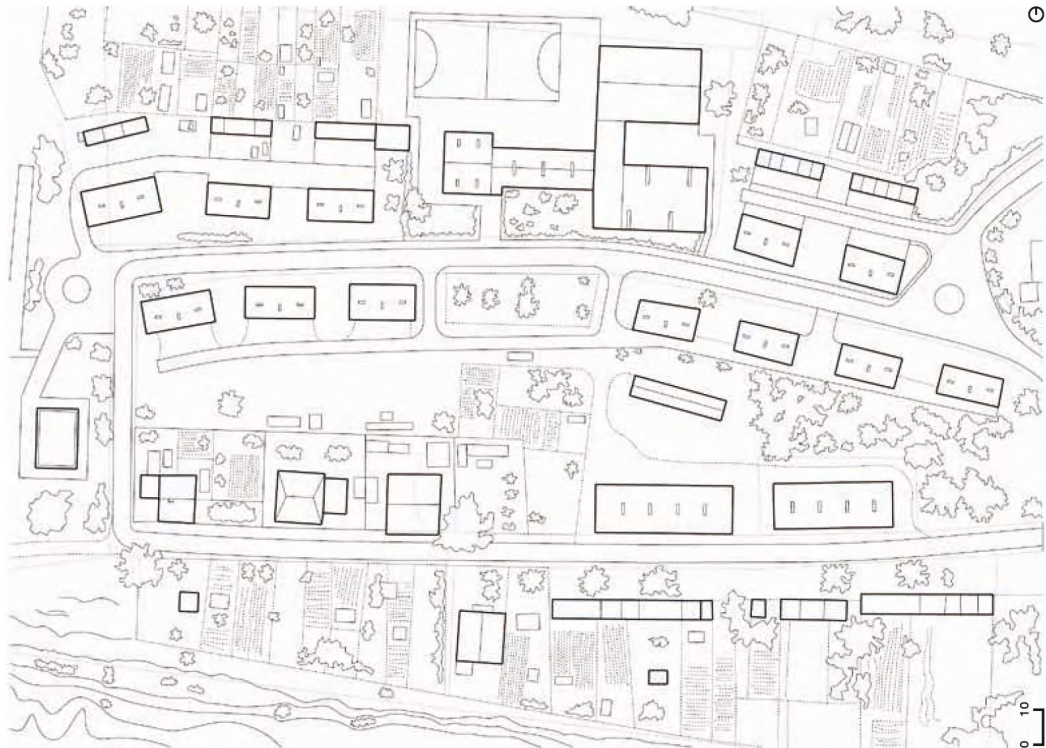
Socialist countryside

1945-1990

territory:



settlement:



dwelling:



Late capitalist countryside

1995-2020

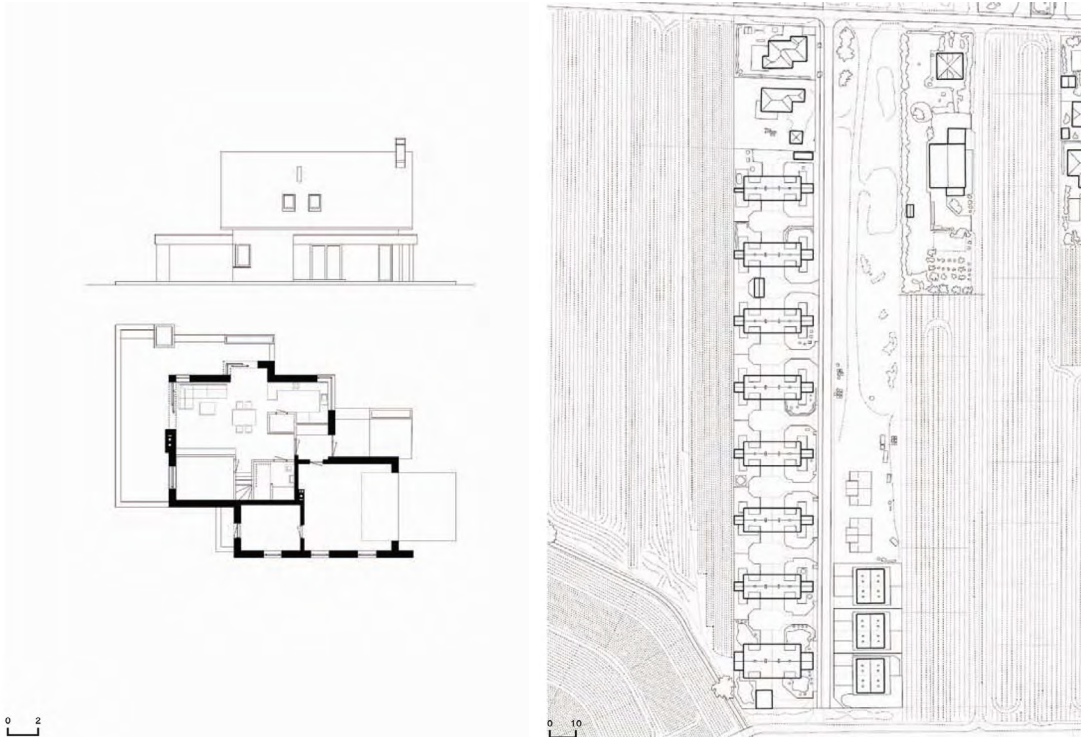
territory:



settlement:



dwelling:

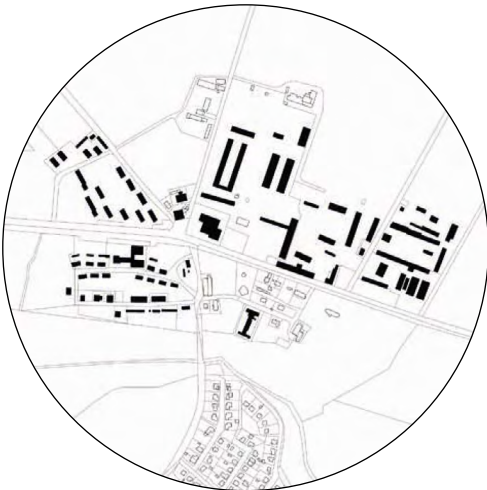


Design project objective

early-capitalist
countryside



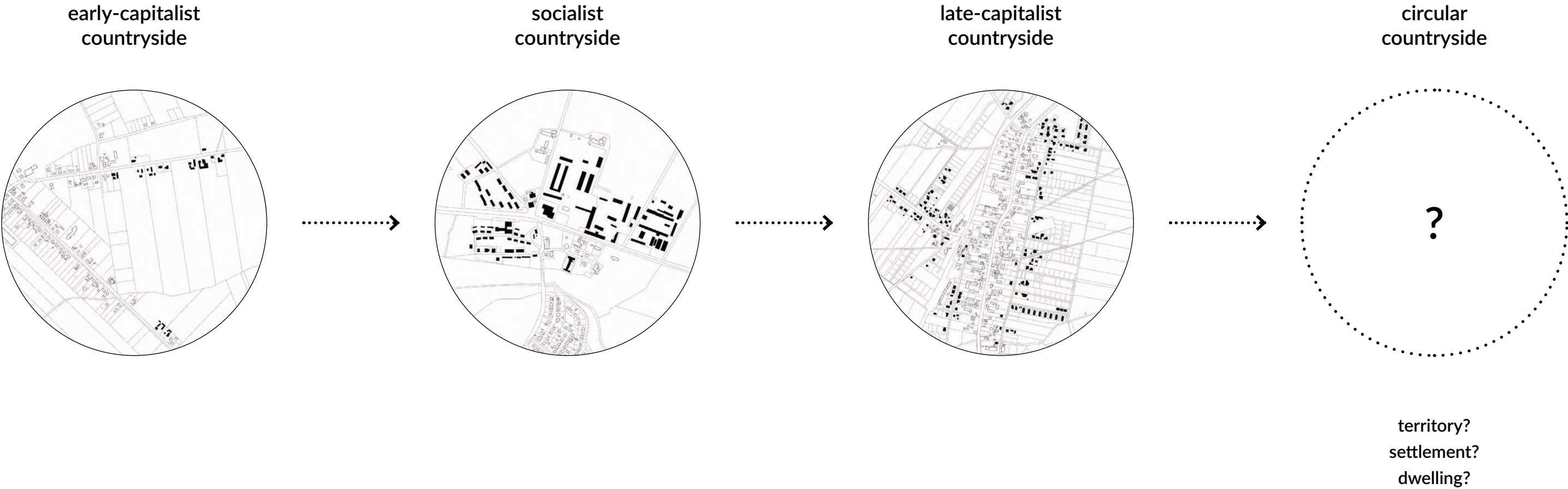
socialist
countryside



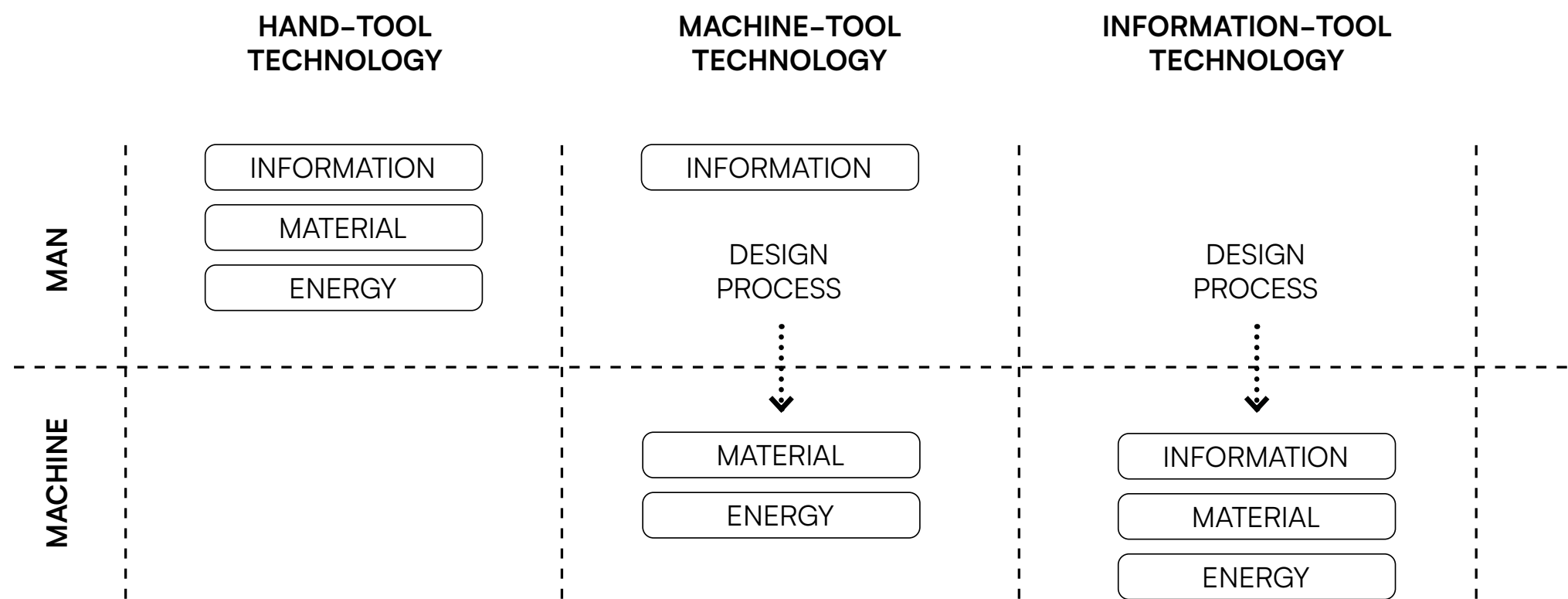
late-capitalist
countryside



Design project objective



Thematic research paper

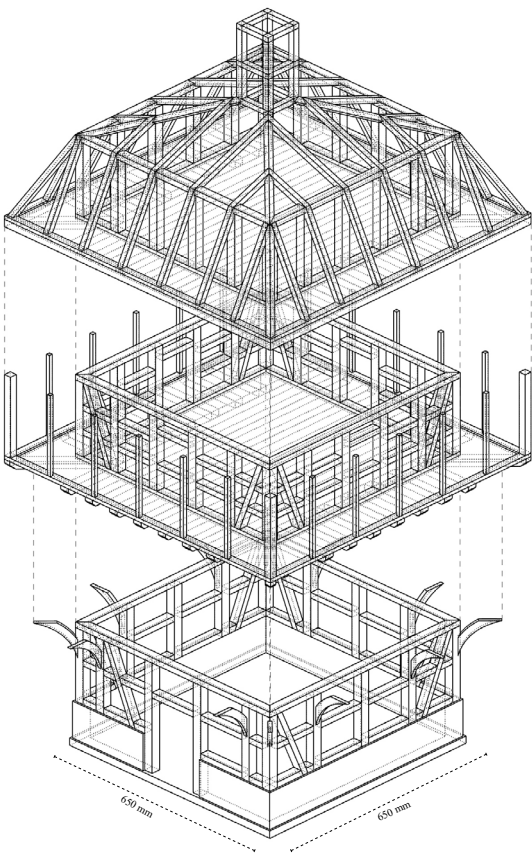
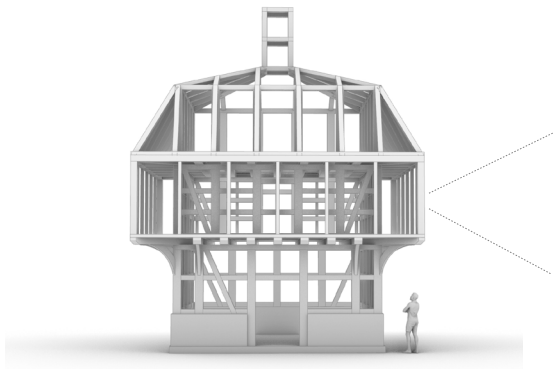


Thematic research paper

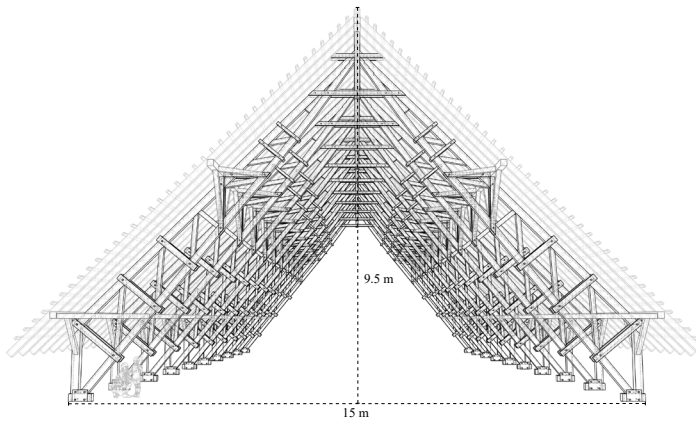
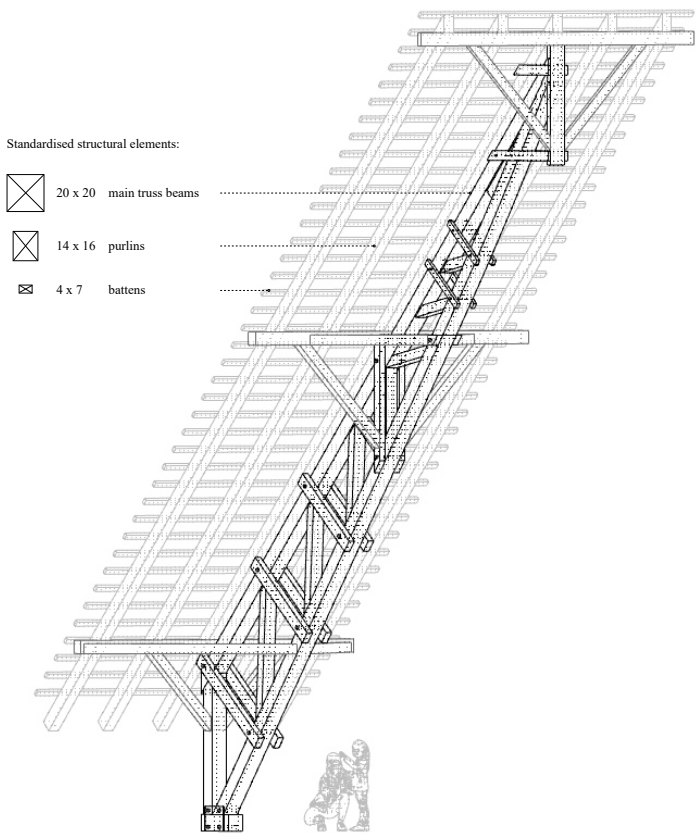
How the advancements in manufacturing processes and design workflows could inform a new circular tectonic language of contemporary timber architecture?



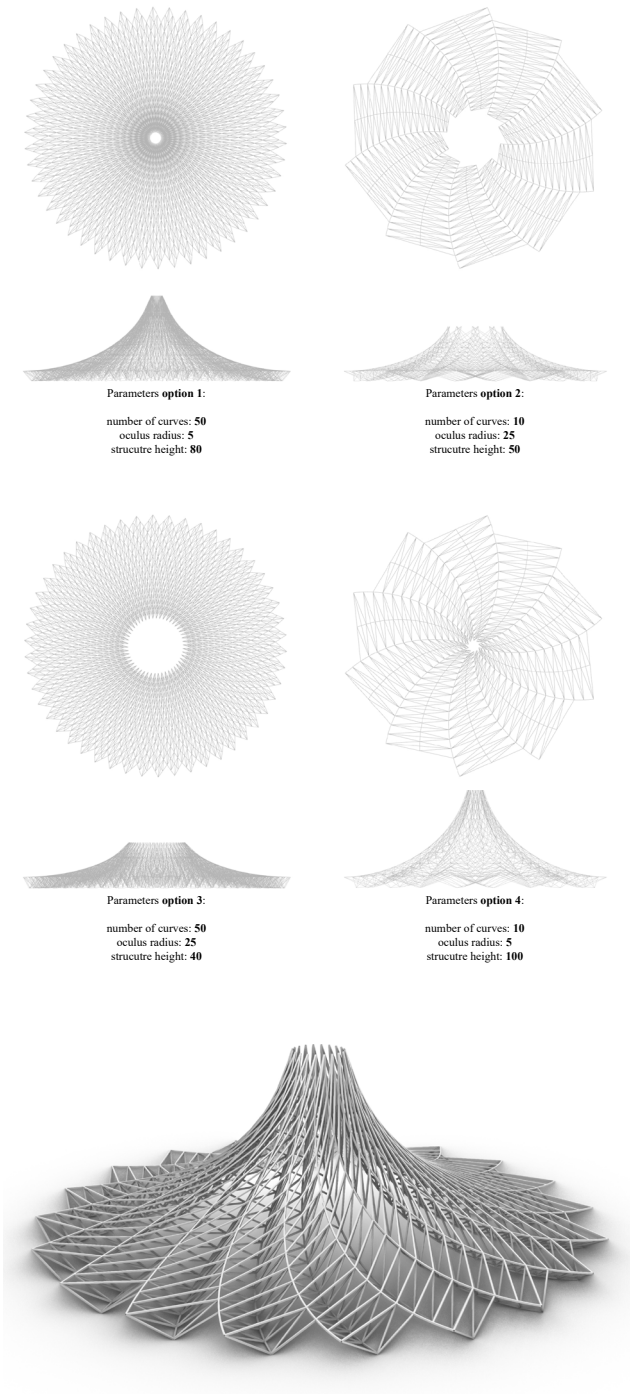
Thematic research paper



HAND-TOOL
TECHNOLOGY



MACHINE-TOOL
TECHNOLOGY



INFORMATION-TOOL
TECHNOLOGY

Thematic research paper

Tools of manufacturing:



Roman Jack Plane, Pompei 79 A.D. and a Roman Axe head ca. 500-200 BC. (source: Goodman, 1964)

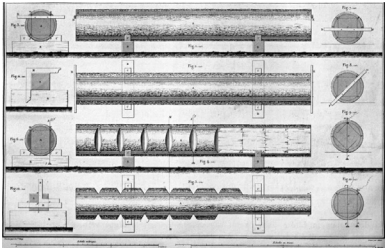


Diagram showcasing how trunk is turned into a beam (source: Emy 1841)



A carpenter using an axe in a proces pictured on the infographic above (source: Goodman, 1964)

Tools of design communication:

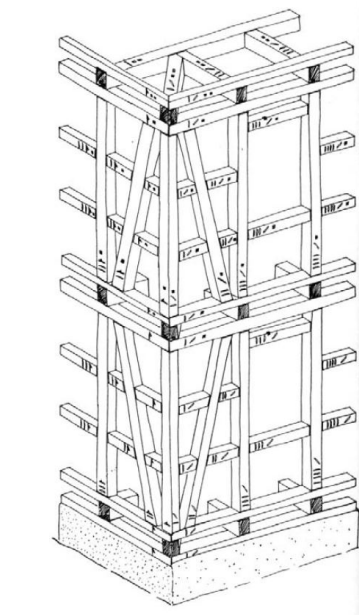
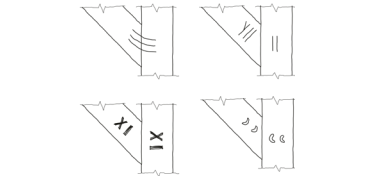


Diagram showing assembled timber frame highlighting reference joinery marks (source: Weiss 1991, s.84)

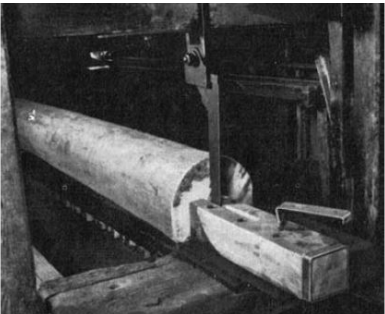


Examples of joinery marks and corresponding structural elements (drawn by an author)

Tools of manufacturing:

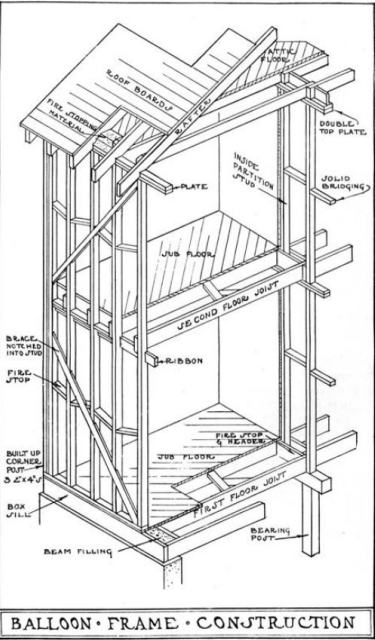


Industrialised timber workshop factory line, New Albany, Indiana USA (source: Kelly 1951)

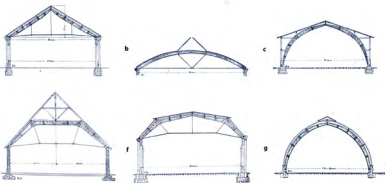


An example of an early frame saw cutting log into dimensioned timber (source: Finsterbush 1987)

Tools of design communication:

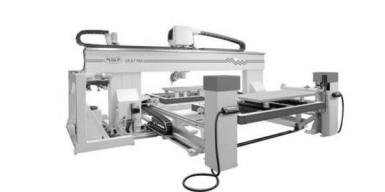


An infographic presenting standardised Ballon Frame construction system (source: Holman 1929)

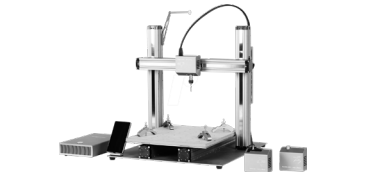


Extract from the catalogue of glulam roof solutions byt company of Otto Hetzer (source: Muller, 2000)

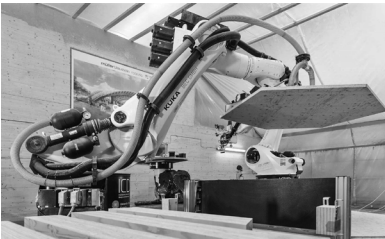
Tools of manufacturing:



5-axis industrial CNC machine by Maka (www.maka.com, access: 05.01.2022)

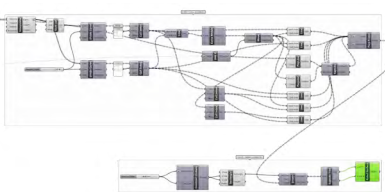


Affordable table-size Snapmaker 2.0 with 3-axis CNC module (snapmaker.com, access: 05.01.2022)

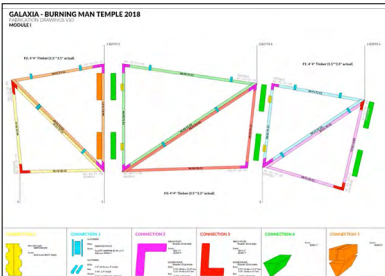


KUKA industrial robotic arm handling pieces of plywood for numerically-controlled fabrication (kuka.com, access: 05.01.2022)

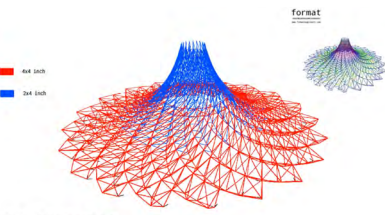
Tools of design communication:



A fragment of grasshopper definition used to manipulate input geometry parameters (recreated by an author)



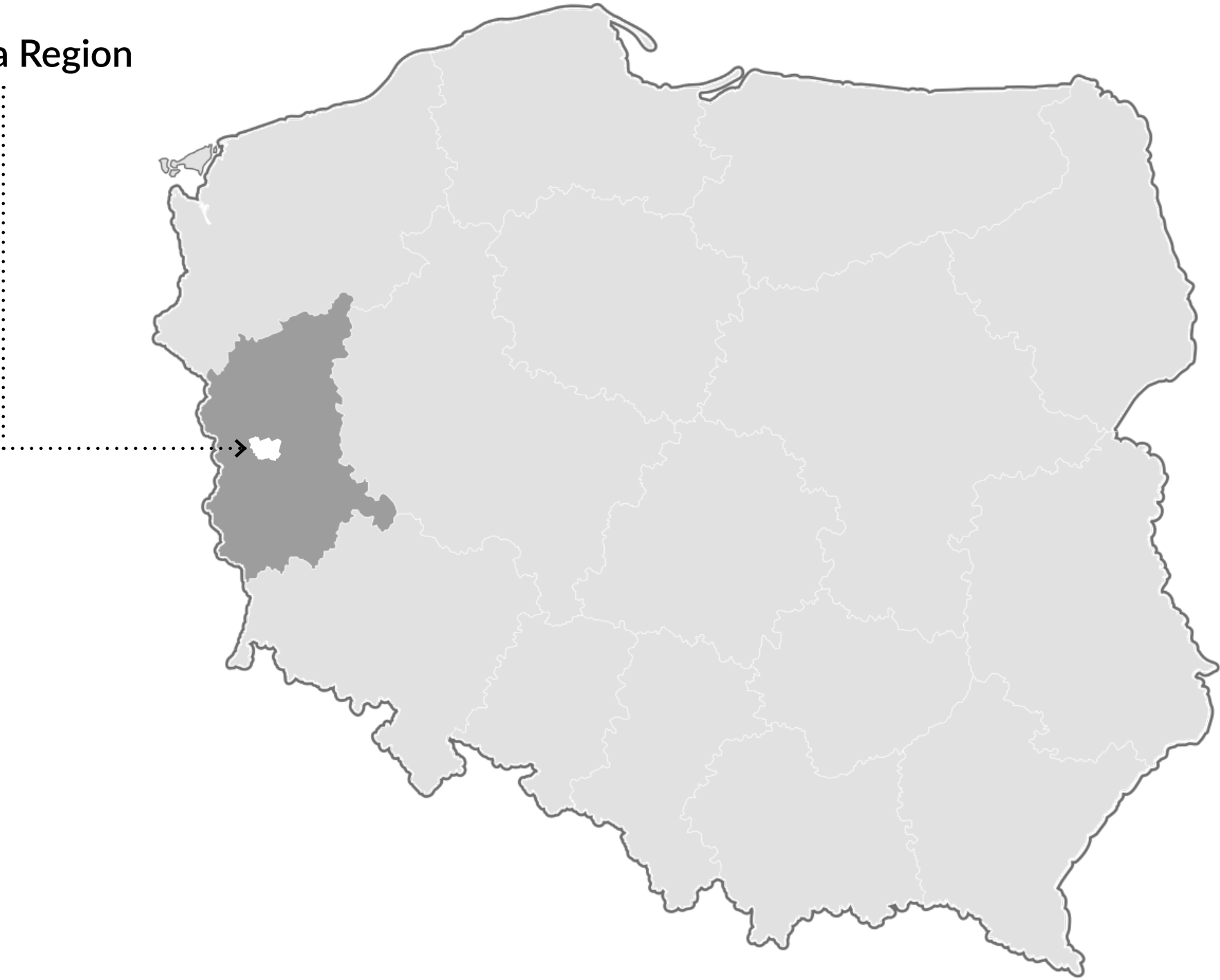
An assembly guide sheet of a single element of a space frame with exact join instruction (formatengineers.com, access: 05.01.2022)



Parametric model adapted by engineers specifying distributin of 4x4's and 2x4's to optimise the structure (formatengineers.com,

Local context

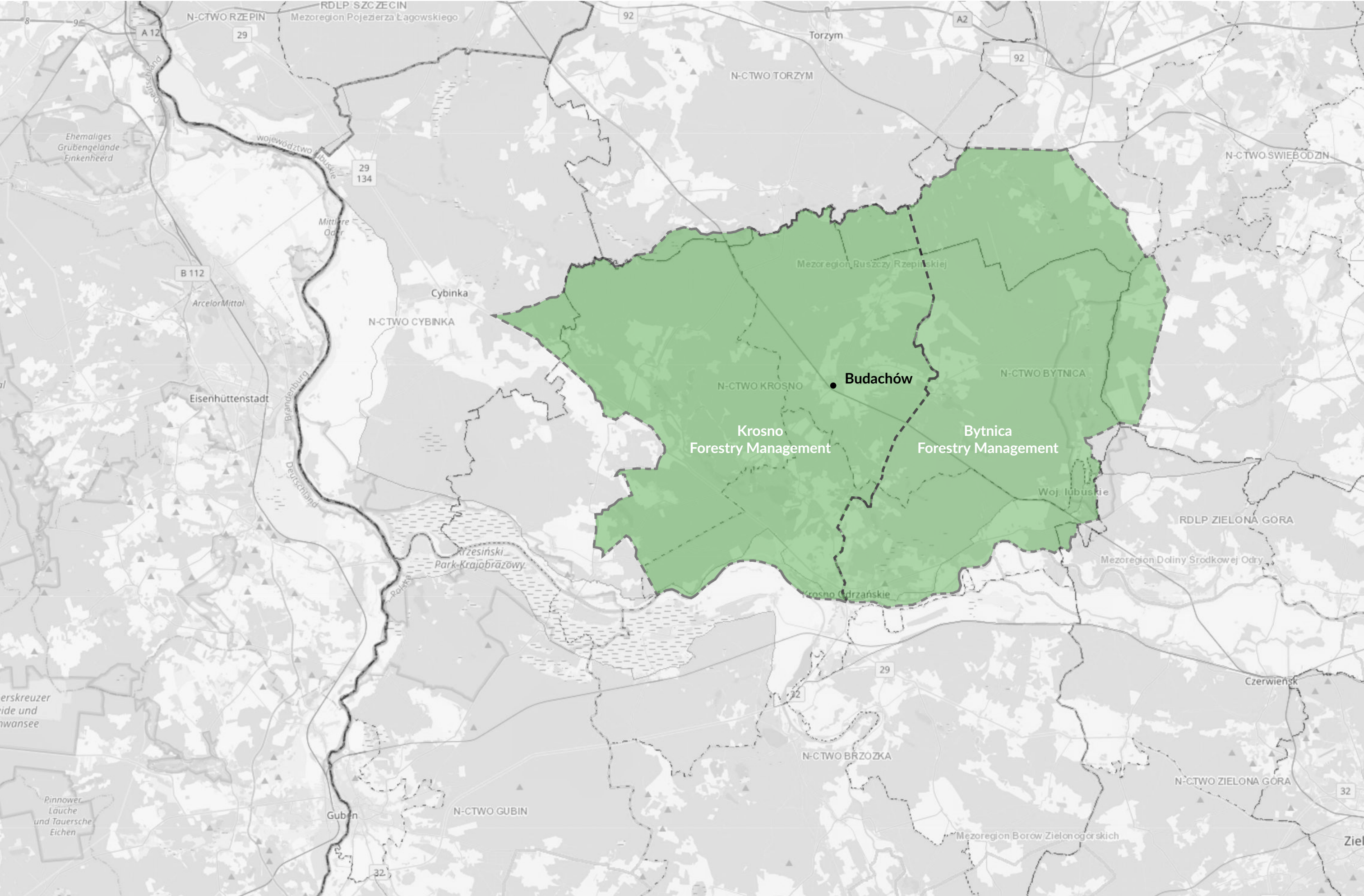
Bytnica Region



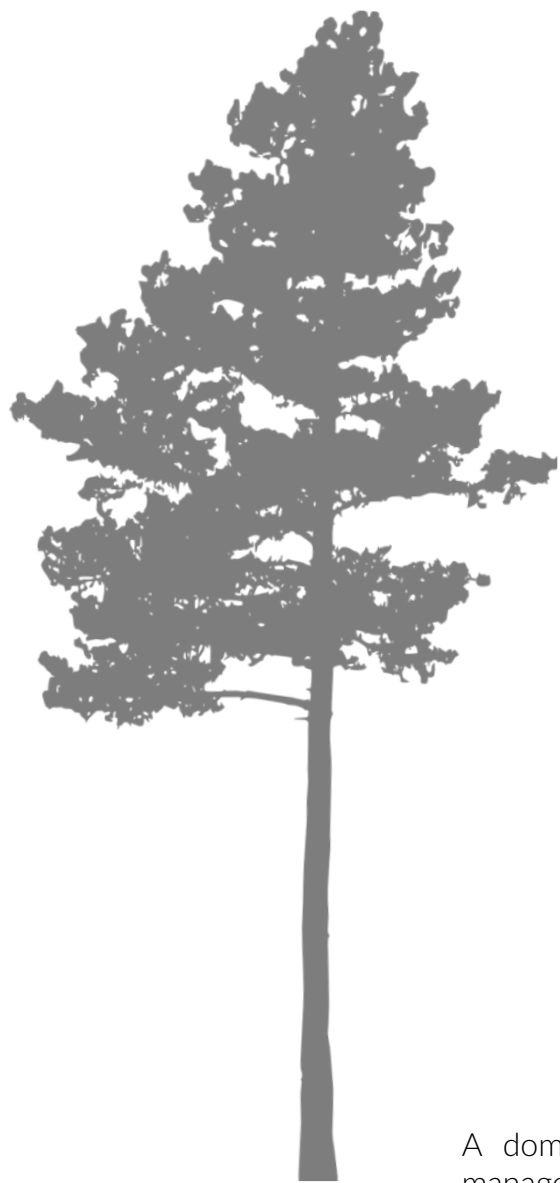
Local context



Local context



Local context



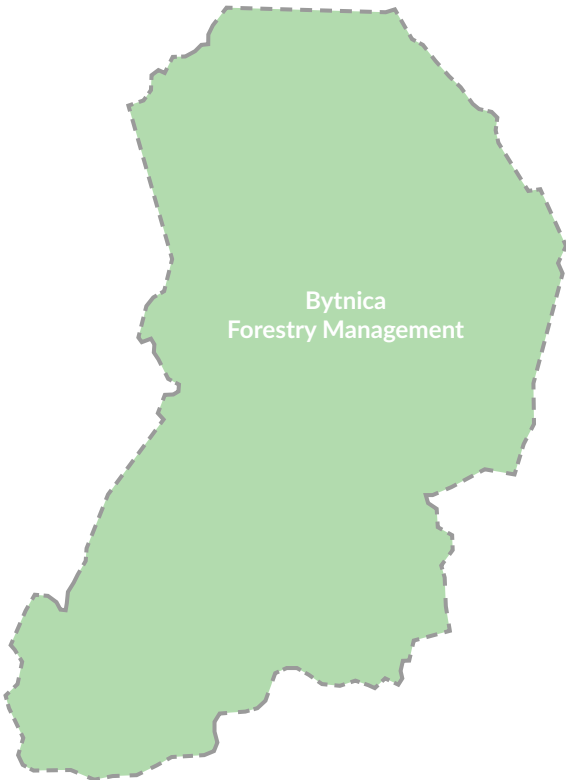
data source: zielonagora.lasy.gov.pl

A dominant specie in both forestry management estates is common pine with total share of around 87%



Forest cover: **72%**
Area: **21 307 ha** (213 km²)

Acquisition of wood is estimated at approximately **79 000 m³** annually which is around 55% of annual gain.



Forest cover: **80%**
Area: **19 172 ha** (191 km²)

Acquisition of wood is estimated at approximately **73 819 m³** annually which is around 55% of annual gain.



State owned forests manage 77% of all forests in Poland and cover 90% of demand for wood in Poland and all state-owned forests are **PEFC certified** - ensuring a long term sustainable sourcing of raw material.

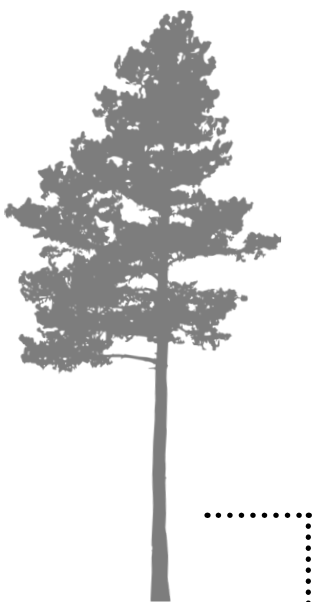
The annual sustainable sourcing just from those two estates supplies around 150 000 m³ annually and it could be nearly doubled.

To give a sense of scale this amount could be turned into 2 500 timber framed homes in the region. Every year. Currently in Europe only around 1/3 of total harvested timber goes to building industry.

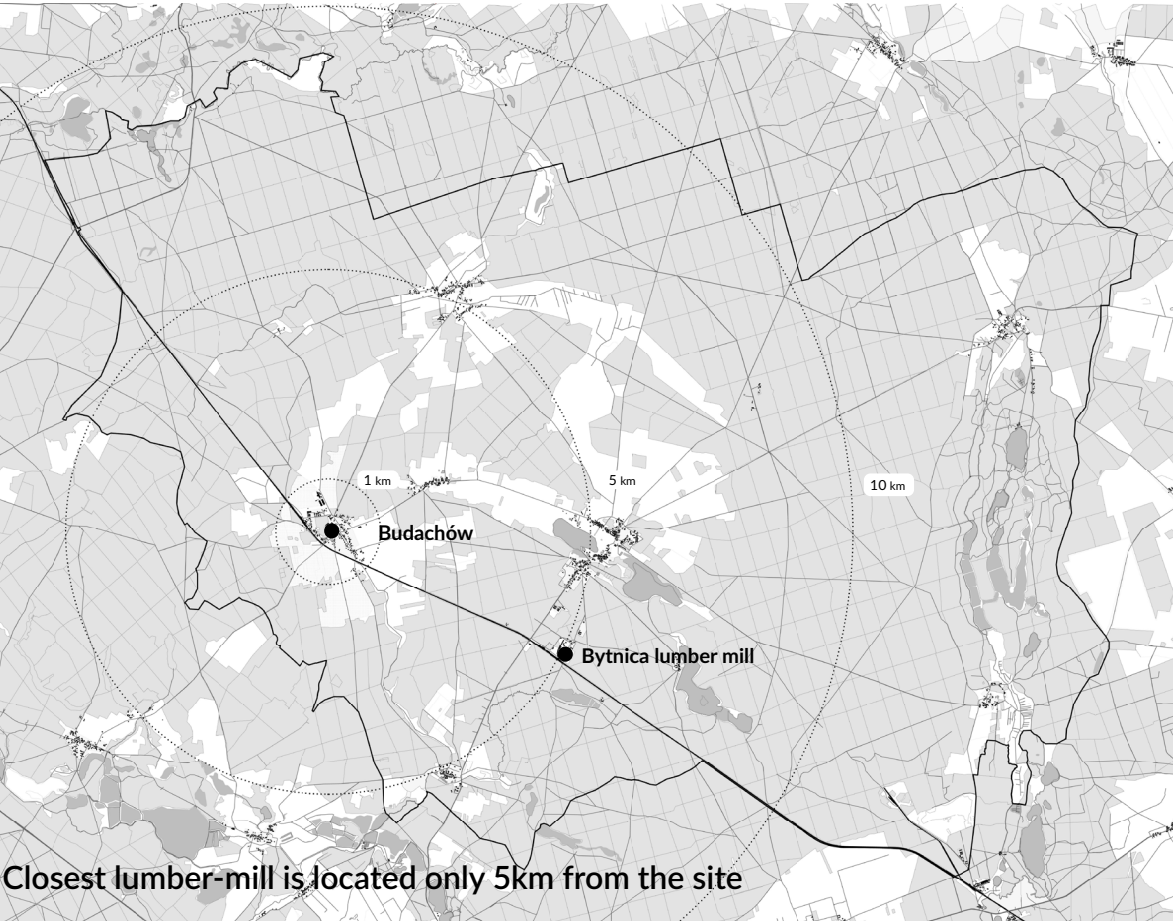
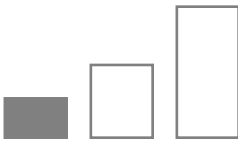
Manufacturing potential

Currently there are no manufacturers of engineered timber in Poland and all such components are imported. Most of the lumber mills provide products such as:

- firewood
- construction timber
- roof trusses
- boarding
- flooring



value



Closest lumber-mill is located only 5km from the site



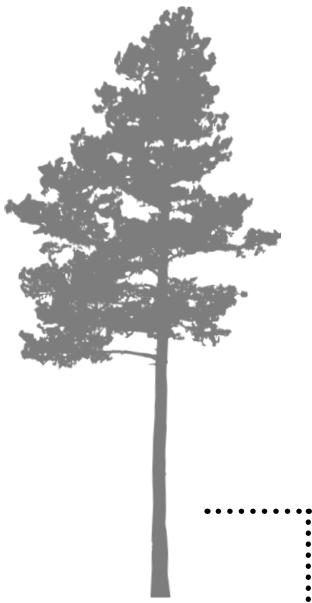
source: google Earth satellite image

Manufacturing potential

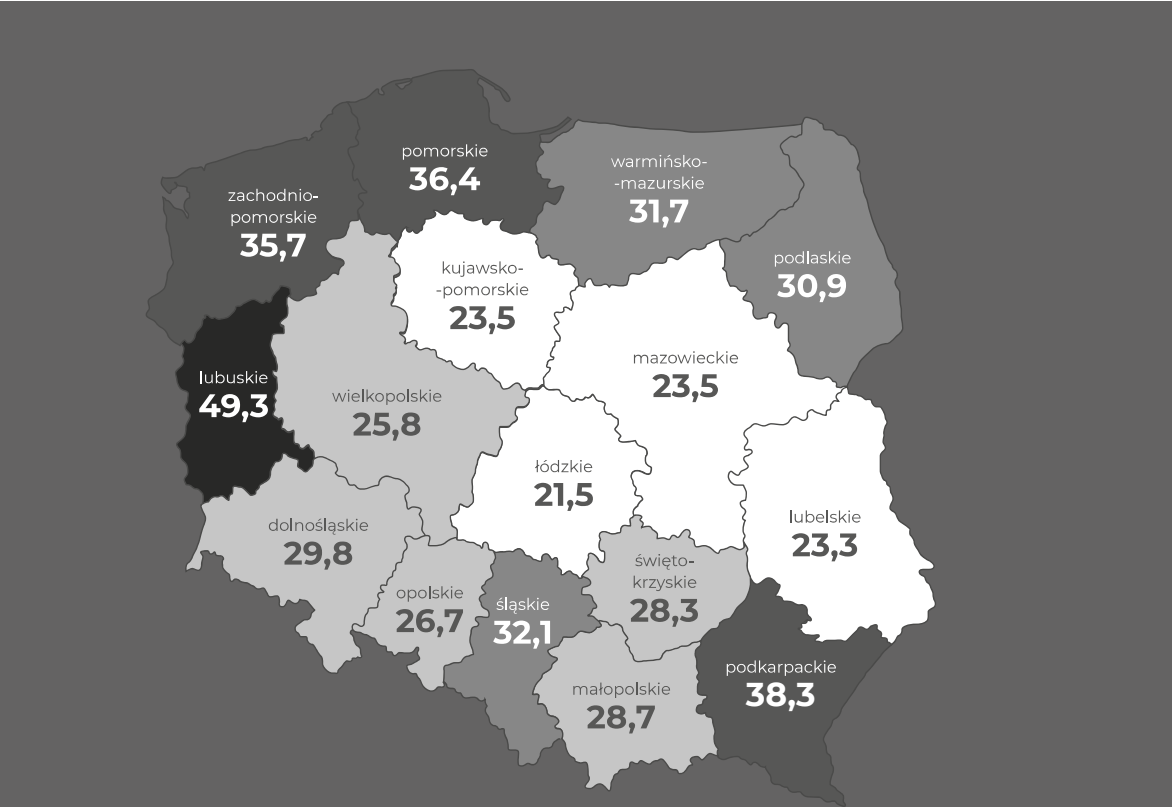
However this is changing and a big opportunity for places like this one to advance their manufacturing potential.

PDD company has just received a € 3,000,000 grant at the end of 2021 from the National Center for Research and Development **for the development of CLT technology production line from Polish pine** and popularisation of multistorey timber construction in Poland.

source: pddsa.com.pl



value 



source: Raport o stanie lasw w Polsce 2020 - State of Polish forestry report 2020 - Lasy Państwowe



source: google Earth satellite image

Manufacturing potential



material sourced locally
completely demountable
biodegradable
poor thermal performance



material sourced globally
wet-connections requiring demolition
mostly artificial
better thermal performance

Manufacturing potential

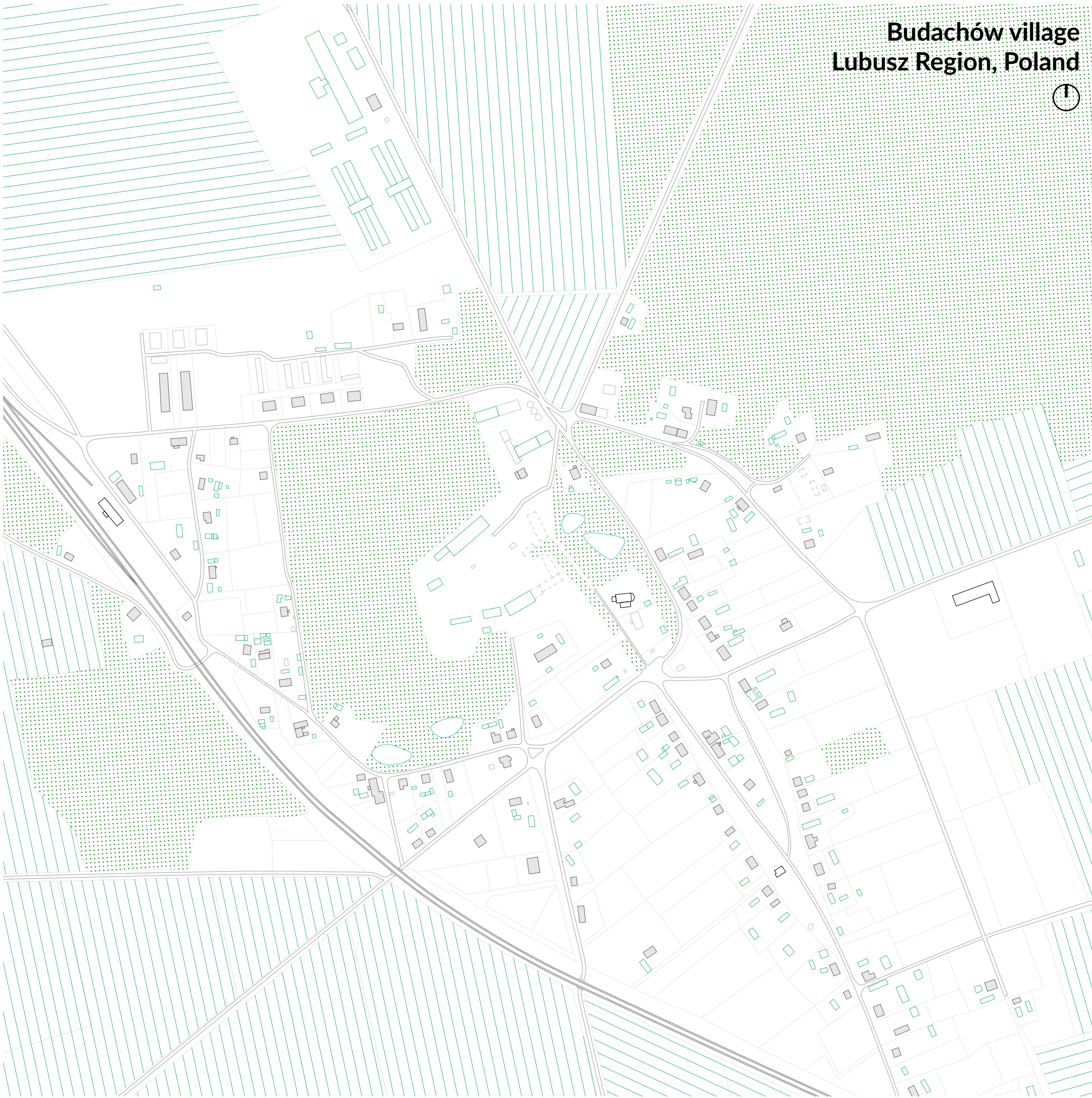
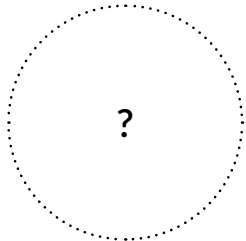


material sourced locally
completely demountable
biodegradable
poor thermal performance

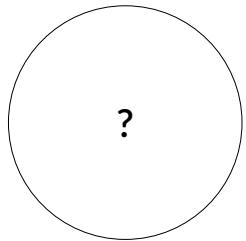


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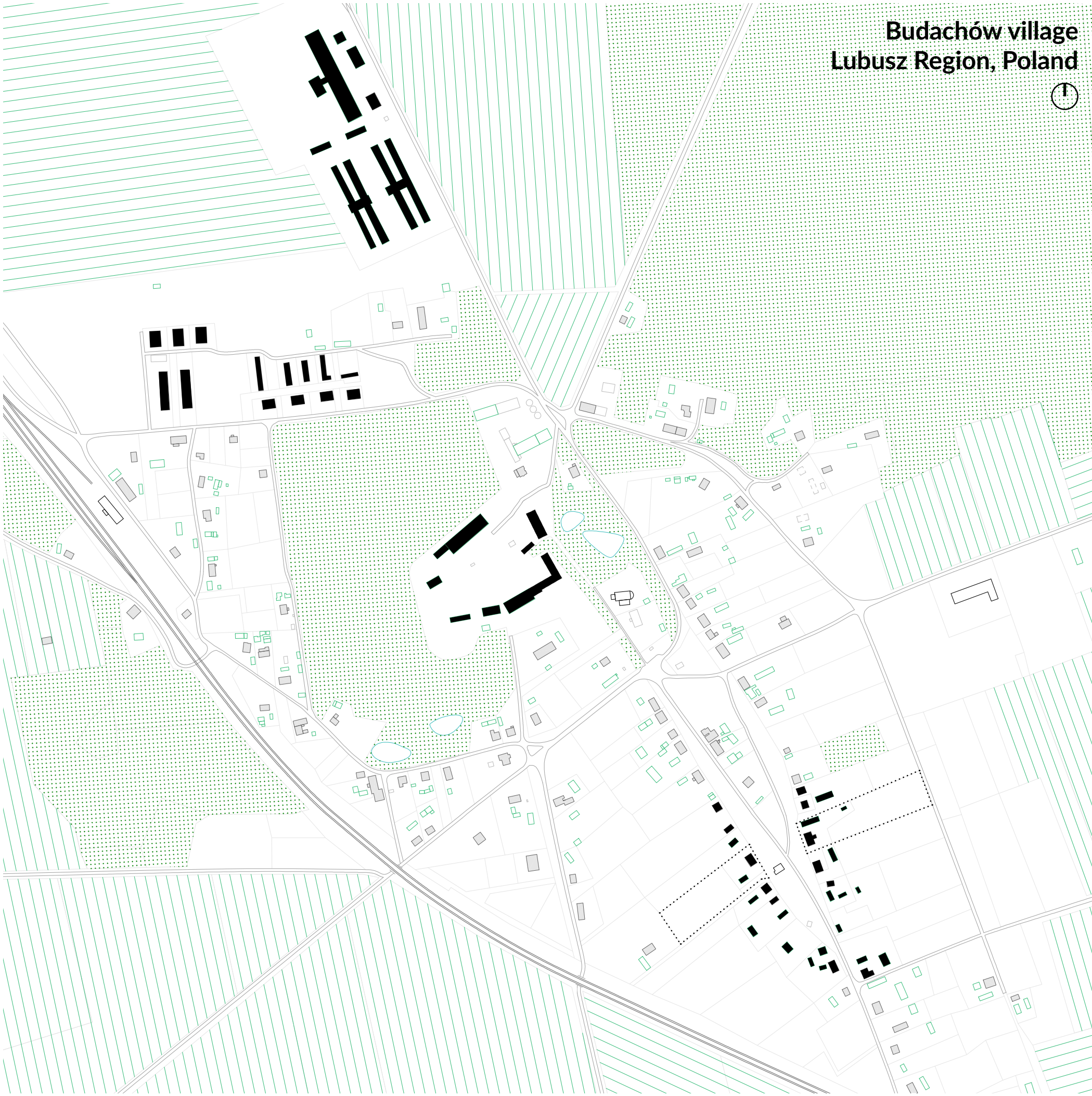
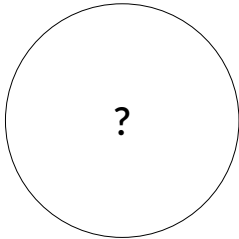
Project objectives



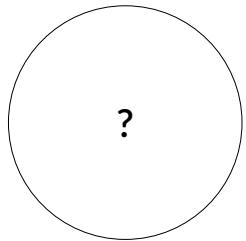
Project objectives



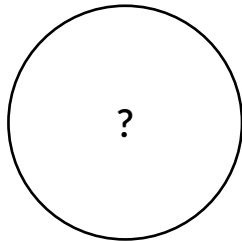
Project objectives



Project objectives



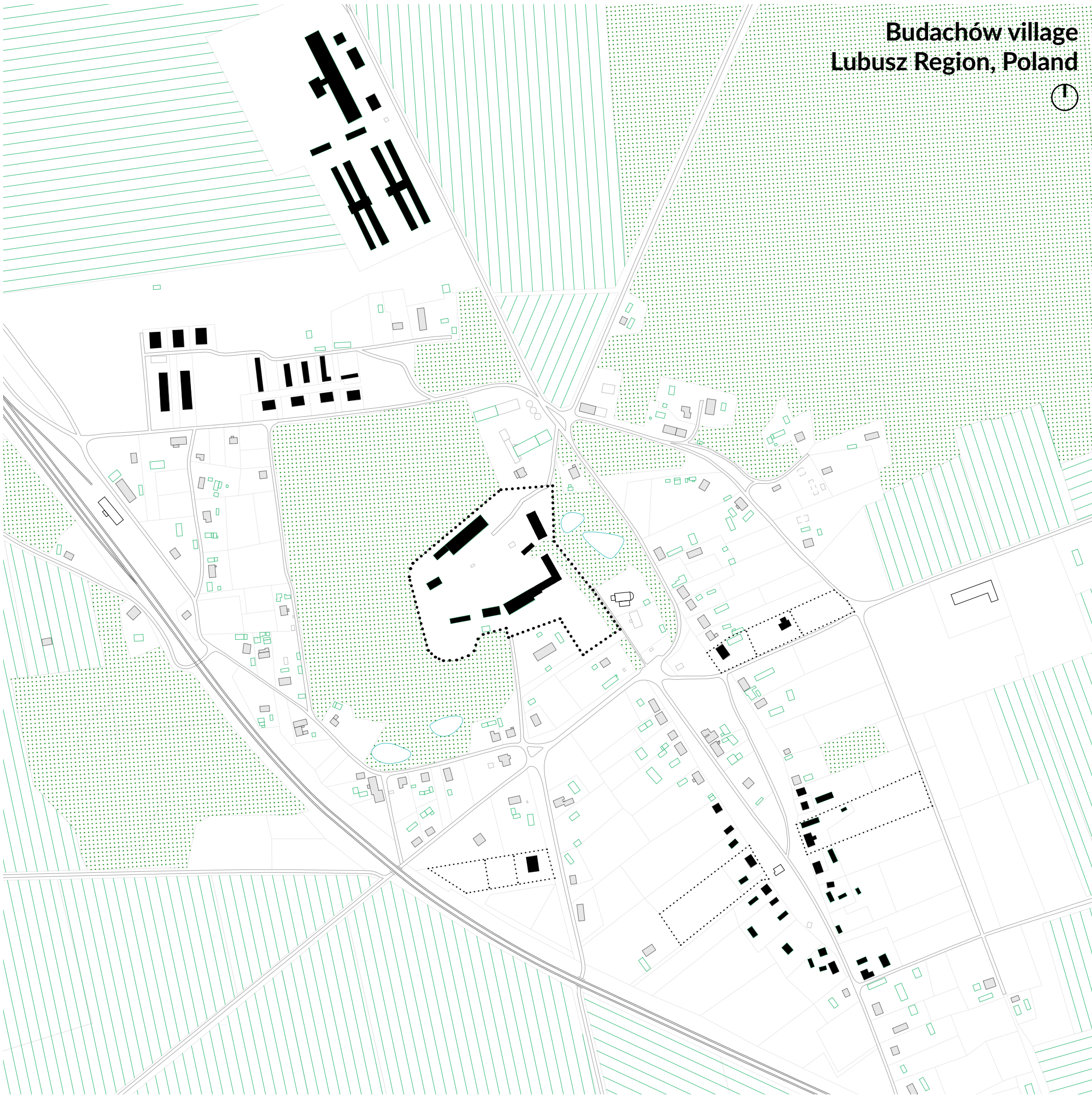
Project objectives



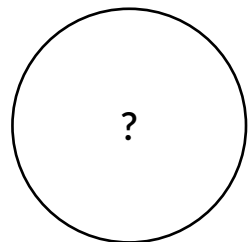
What is the future of the countryside development in a new circular economy?

How can we adapt the former state owned agricultural farm areas to revitalise local communities and meet the challenges of new economy?

How rural areas responsible for majority of resource produciton could set a precedent for new patterns of resource consumption?



Project objectives



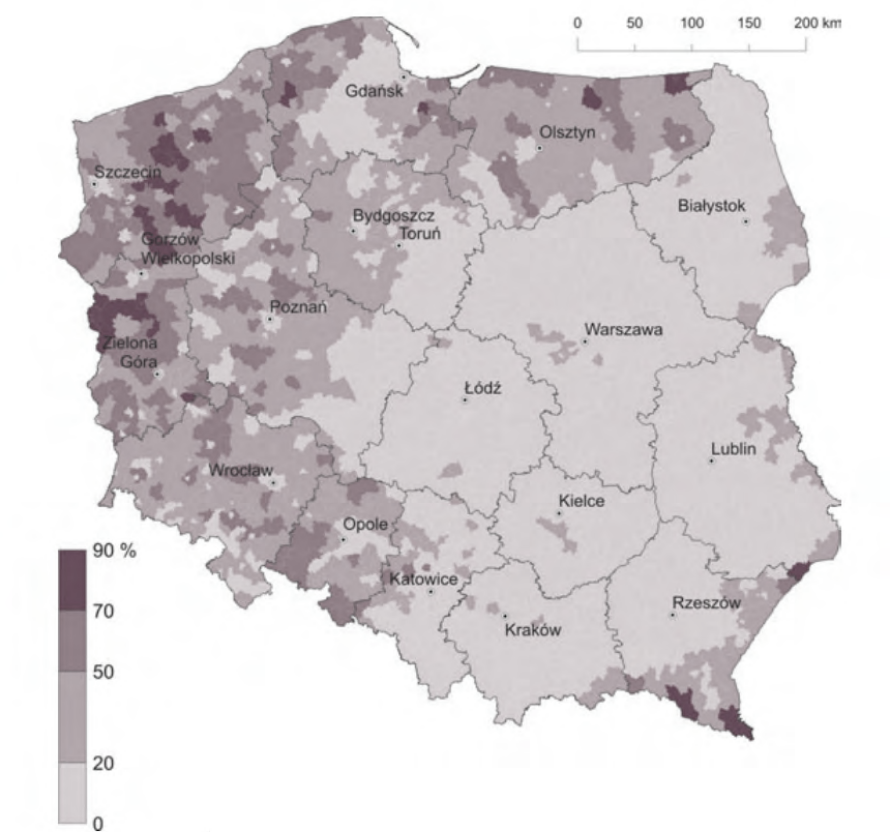
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Project objectives



The share of agricultural land under the control of state-owned farms in 1989.
Source: IGiPZ Polish Academy of Science

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former state-owned agricultural farm (PGR) in Wleżanka

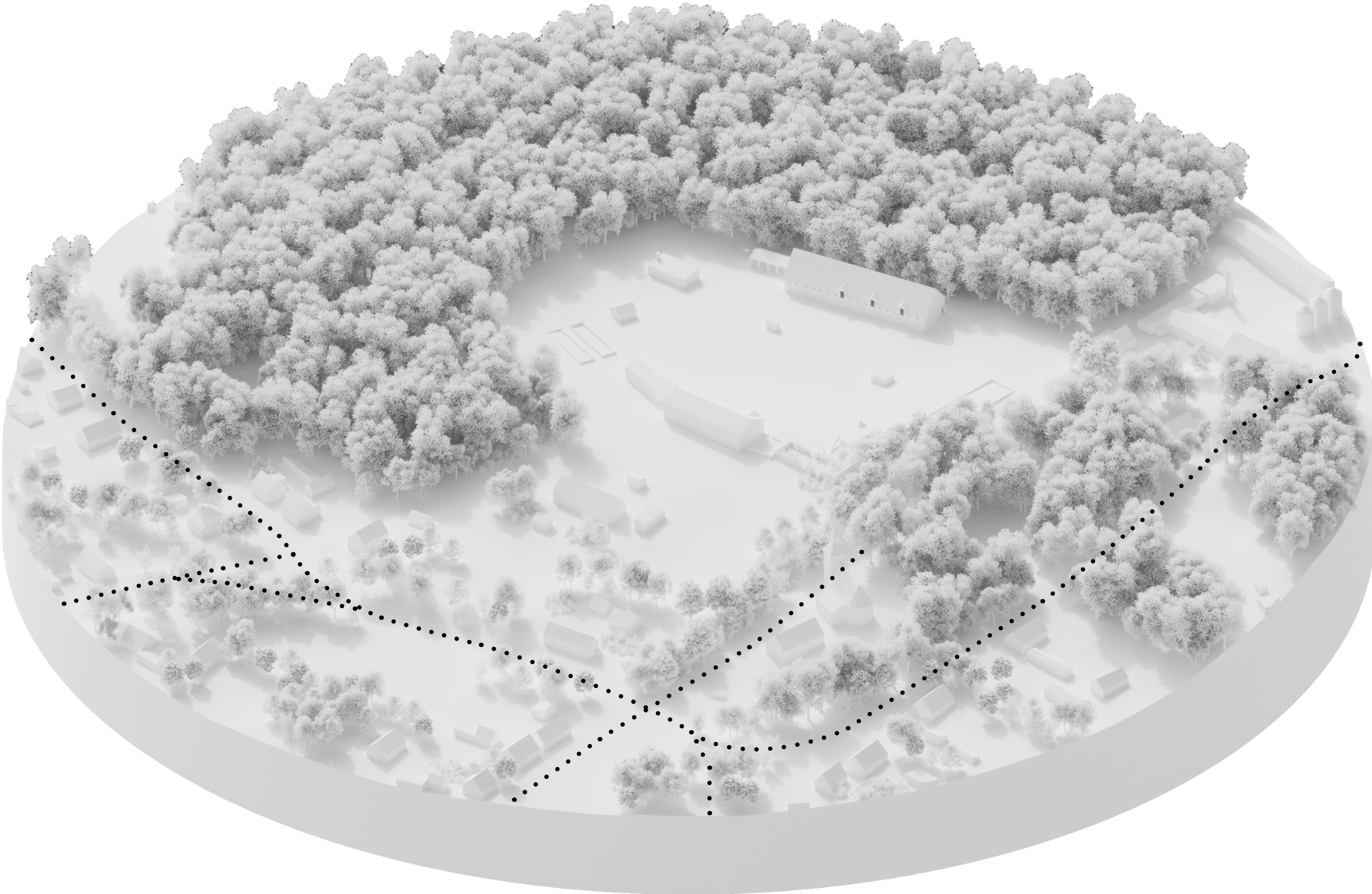


former state-owned agricultural farm (PGR) in Mysłakowice

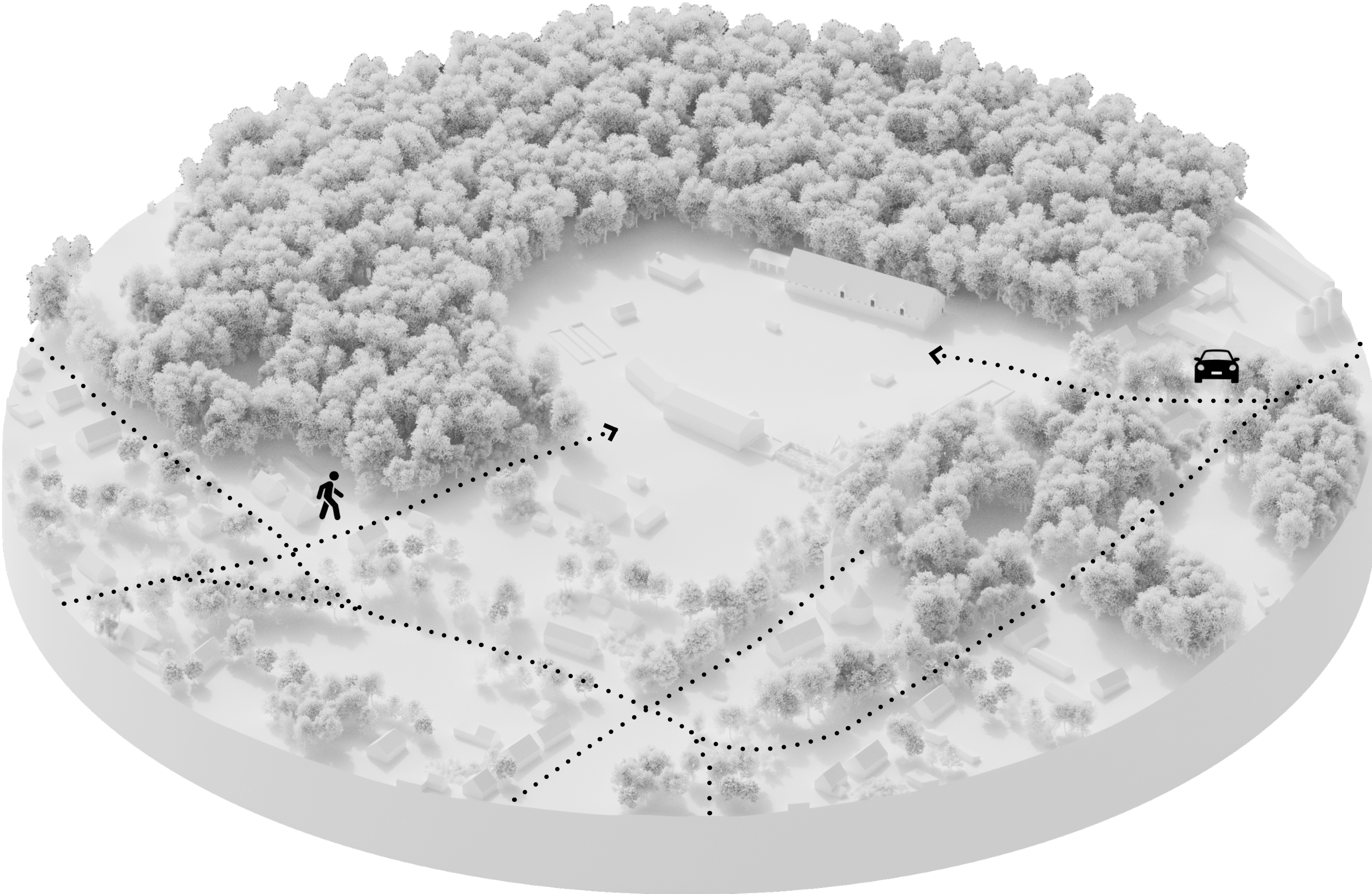


former state-owned agricultural farm (PGR) in Kietrz

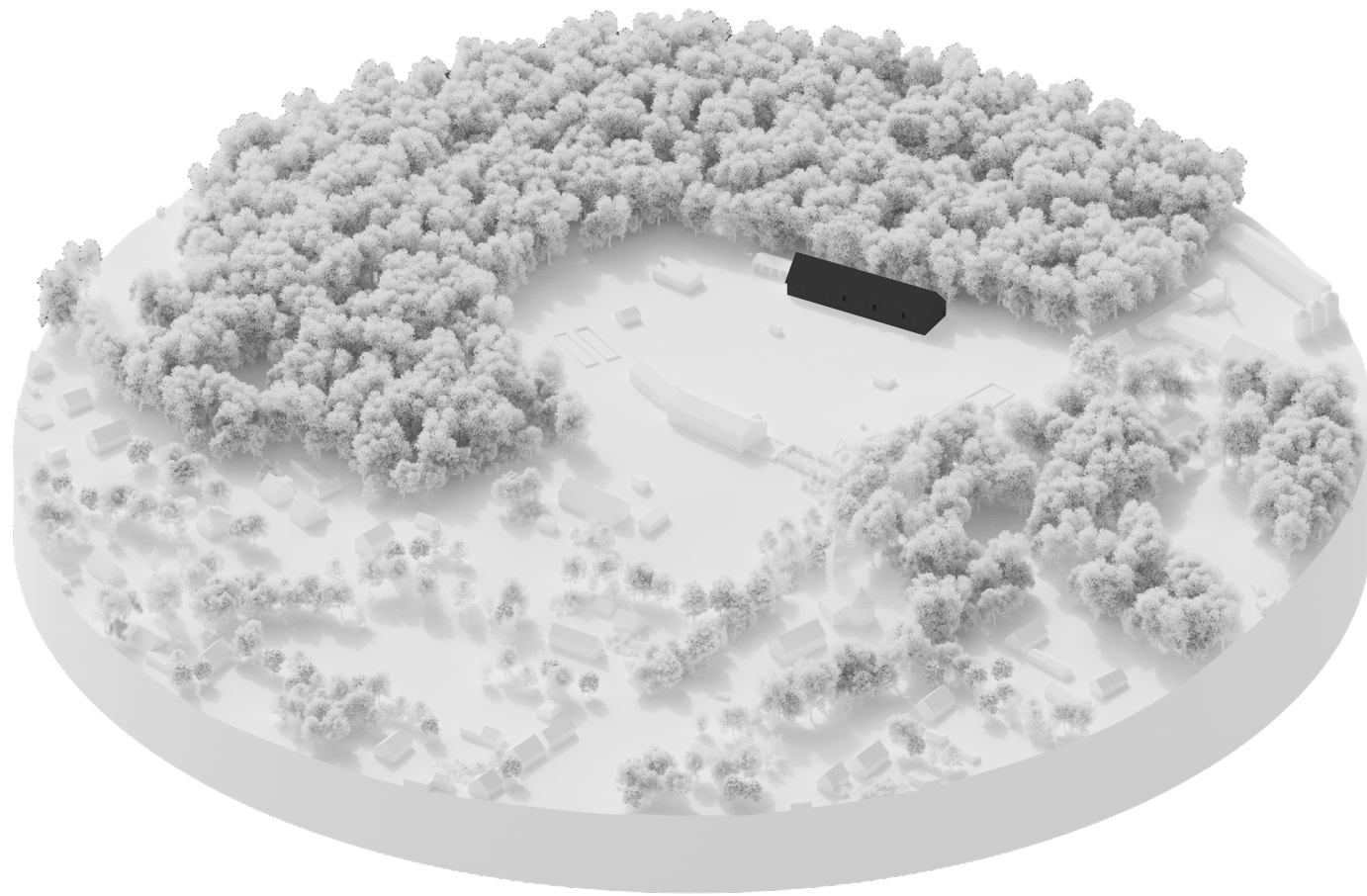
Site analysis



Site analysis



Site analysis | What it is...

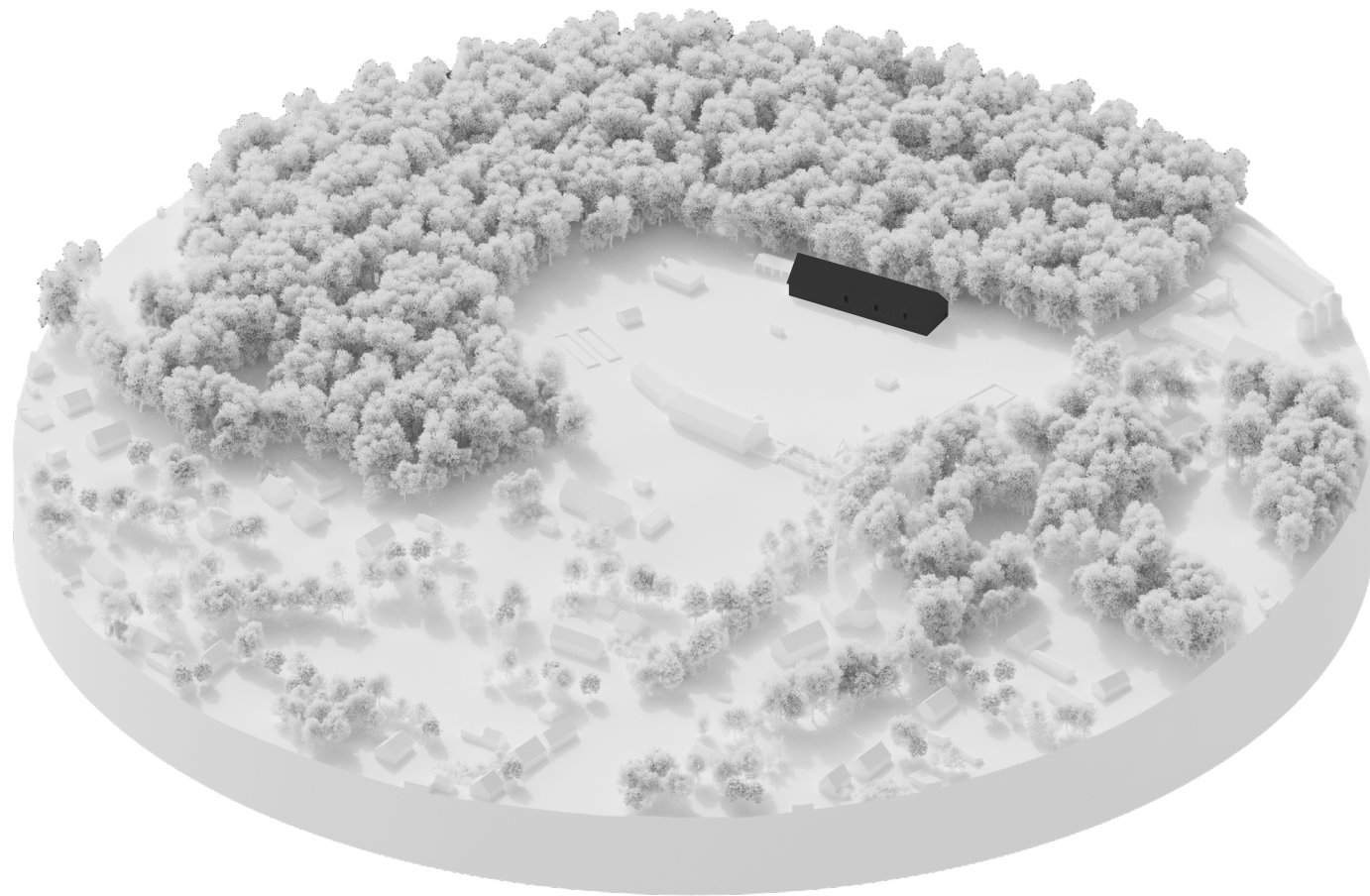


Granary Barn

Built in XVIII century an early industrial granary barn - a masonry structure topped with an impressive pitched roof providing an unobstructed 15 m long span and covering an area of 850m²



Site analysis | What it is...

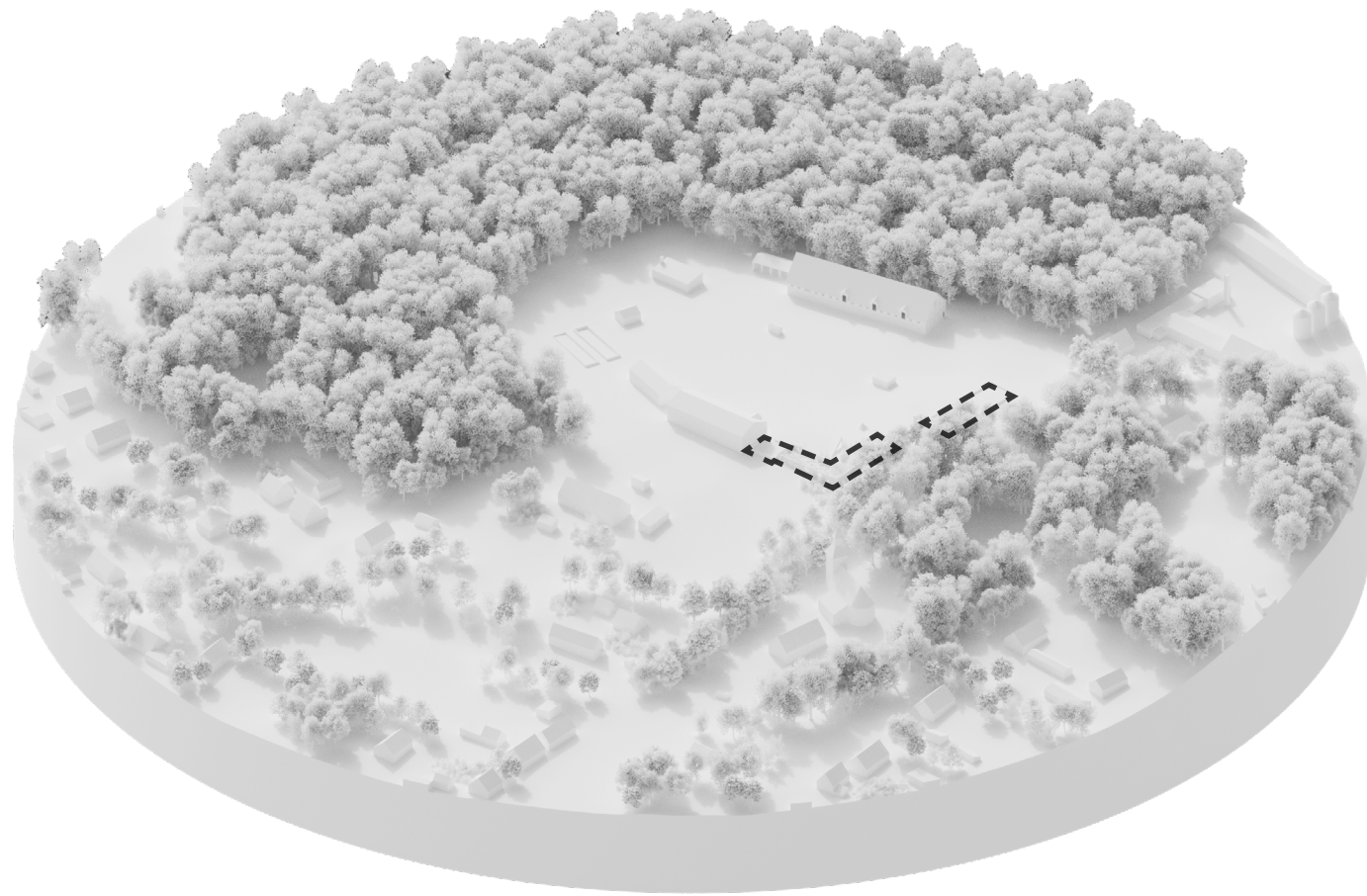


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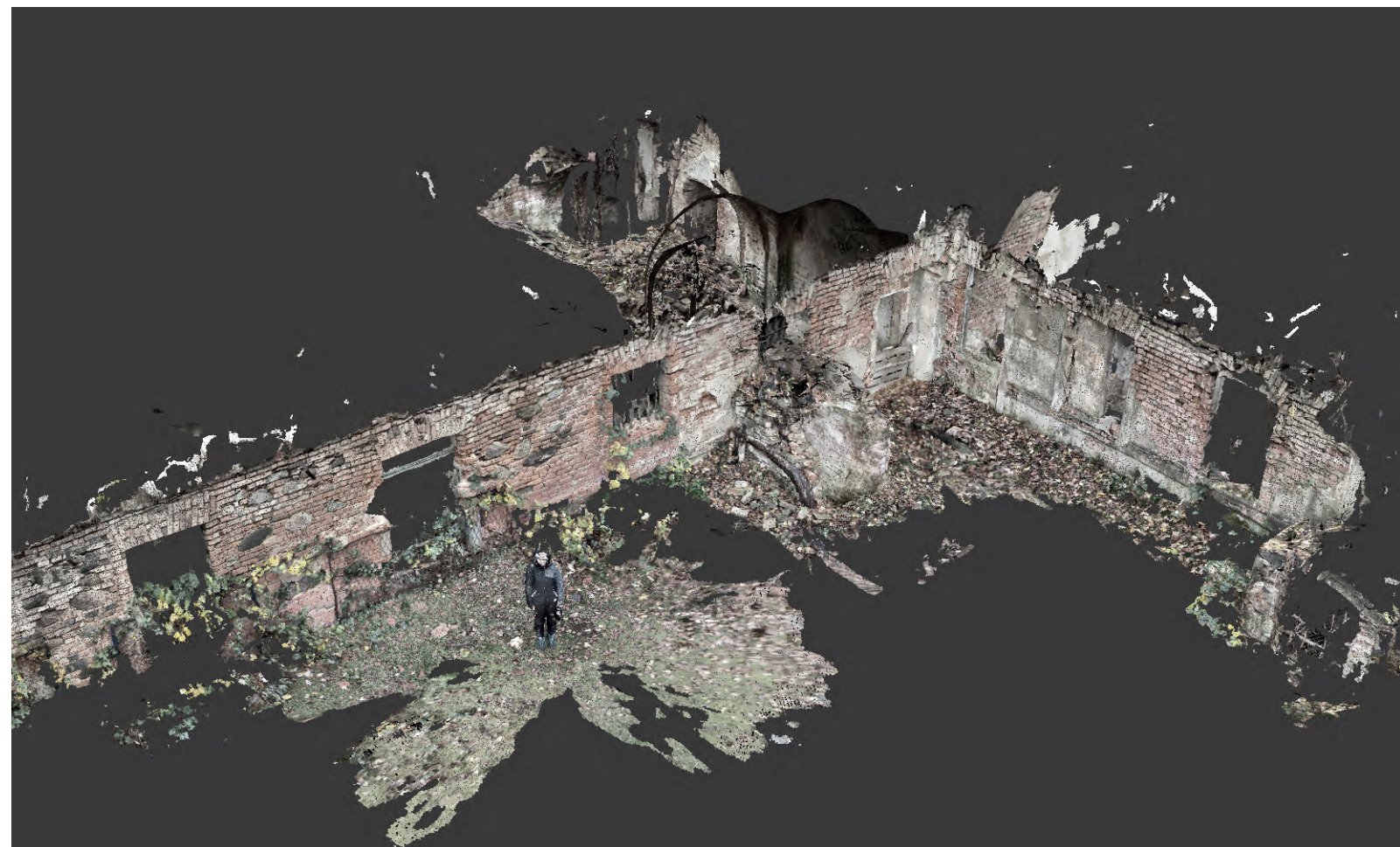


Site analysis | What it is...

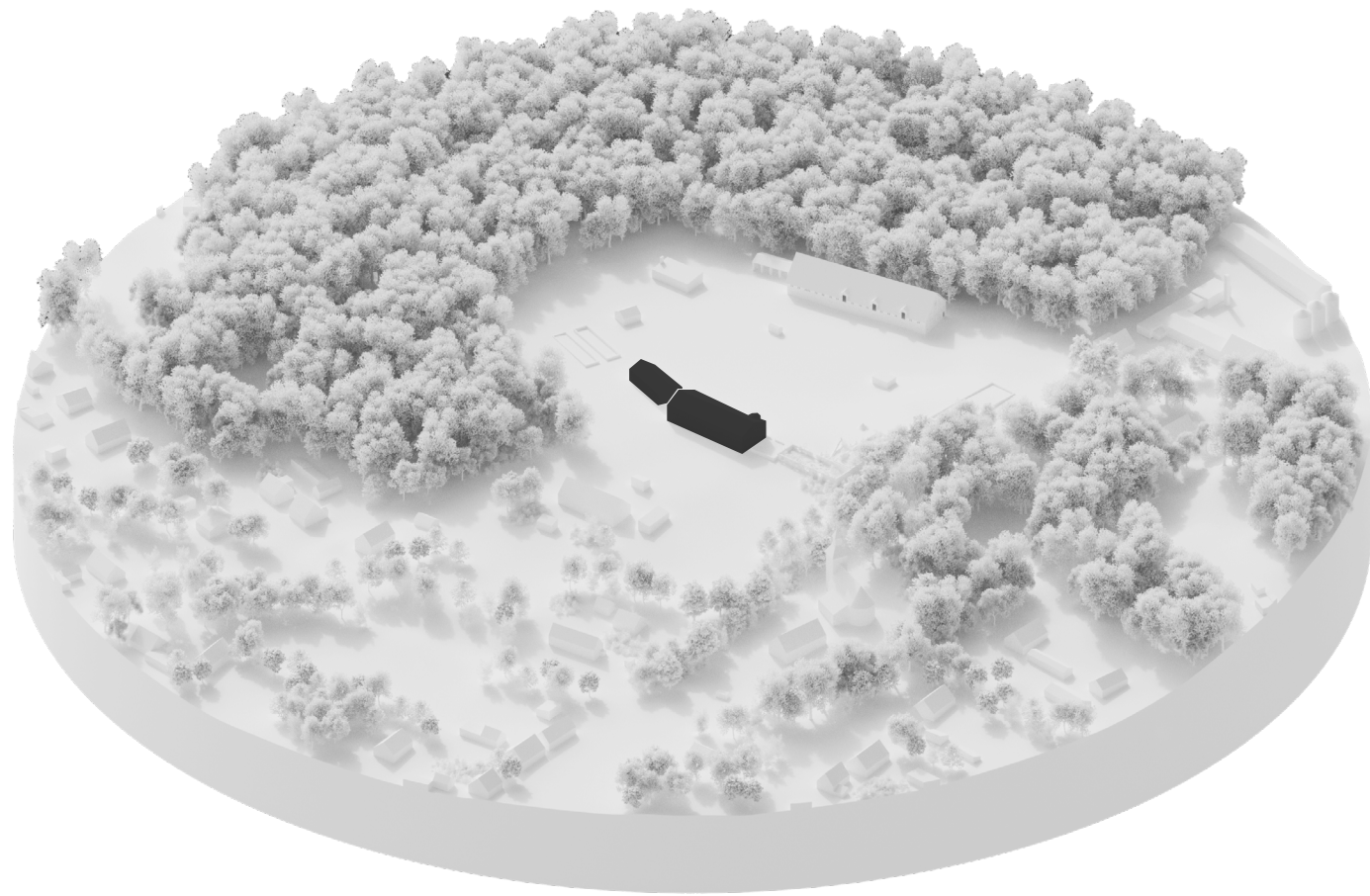


Ruins of a former manor house

Ruins of a former masonry manor house. Currently only the ground level walls with cellars remained on site, and are completely overtaken by nature.



Site analysis | What it is...

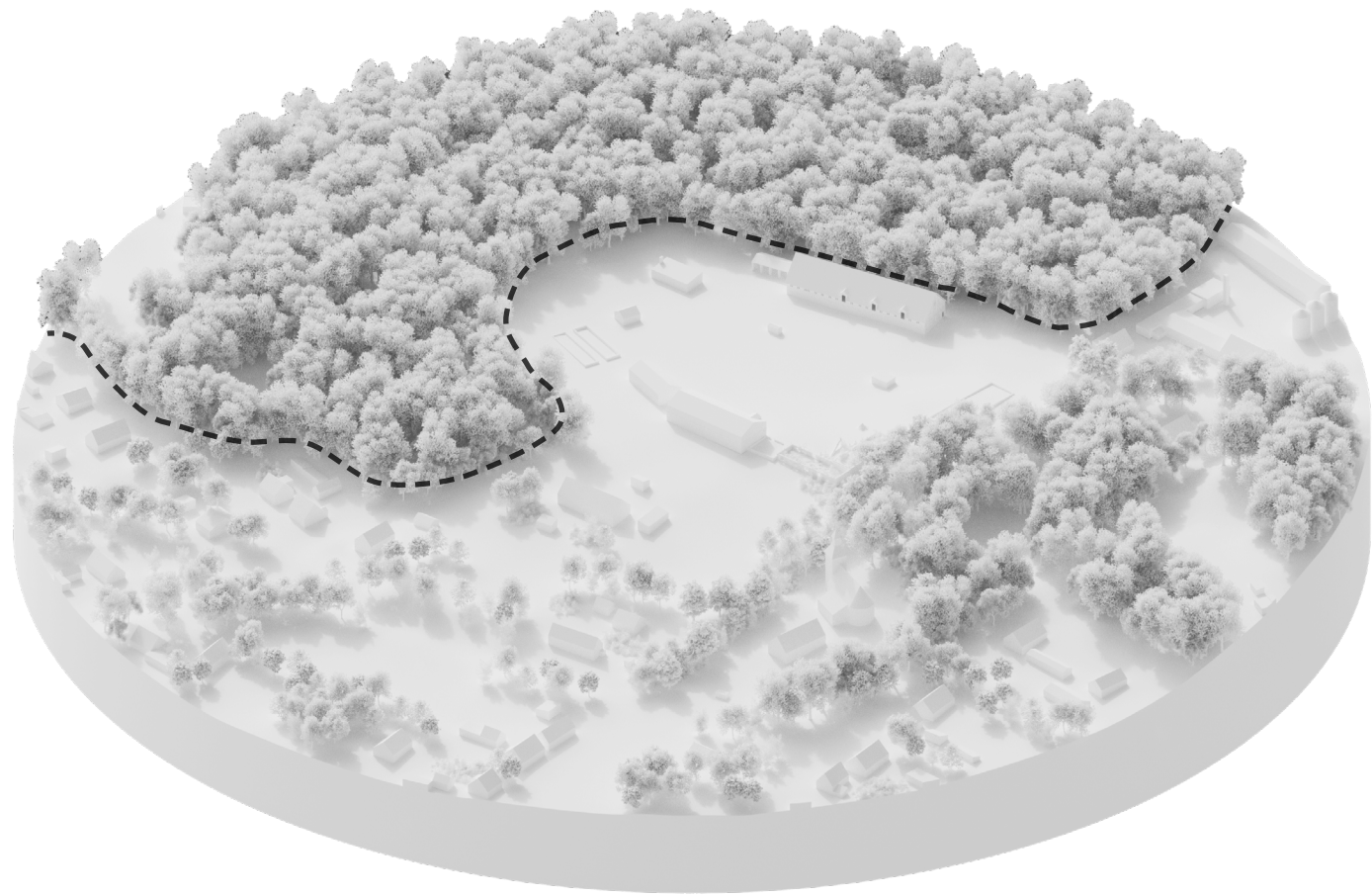


Outbuilding and warehouse

Brick masonry structures, part of the former folwark assembly now also prepared for demolition due to structural concerns. Brick could be salvaged or parts of the walls reused in a new proposal.



Site analysis | What it is...

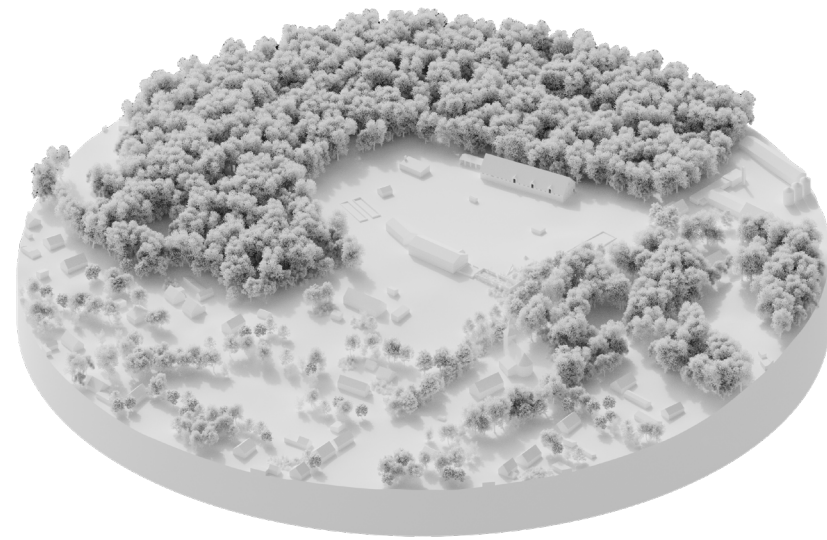


Former community leisure park

A park surrounding the site is ecologically significant area protected under Natura 2000. Historically used to be an active recreational area surrounding Folwark and this function could be reinstated.



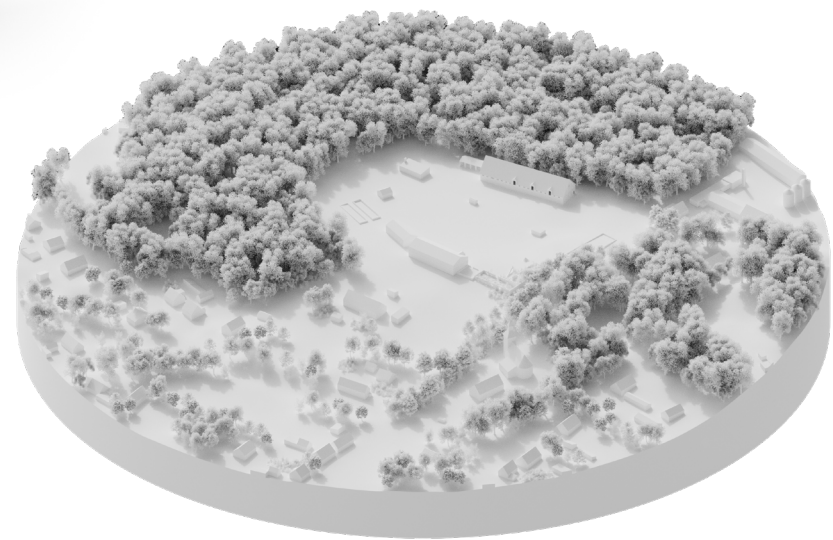
Concept proposal



Concept proposal: users



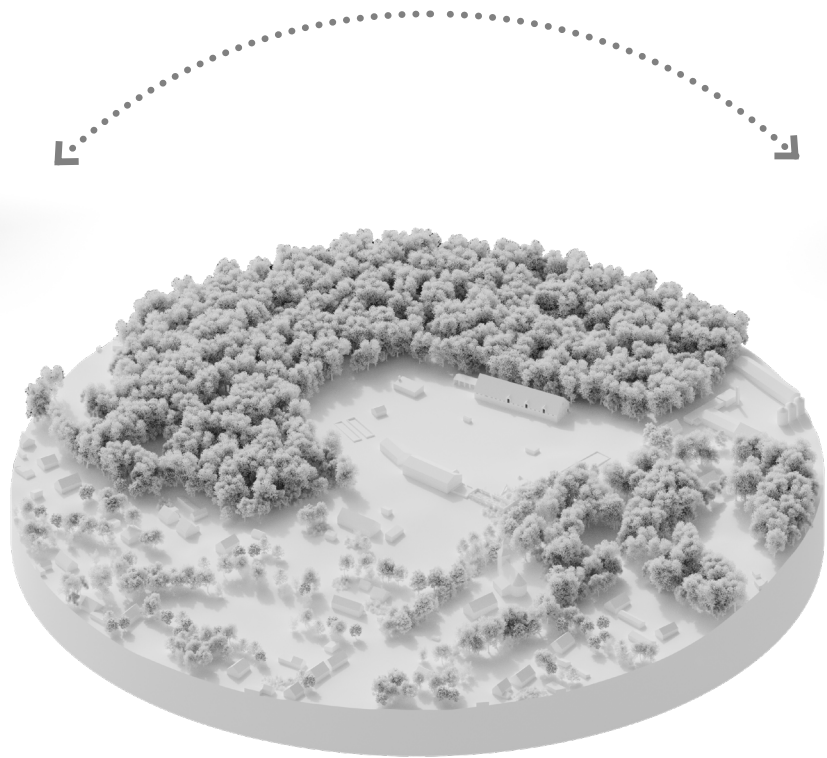
SENIORS



Concept proposal: users

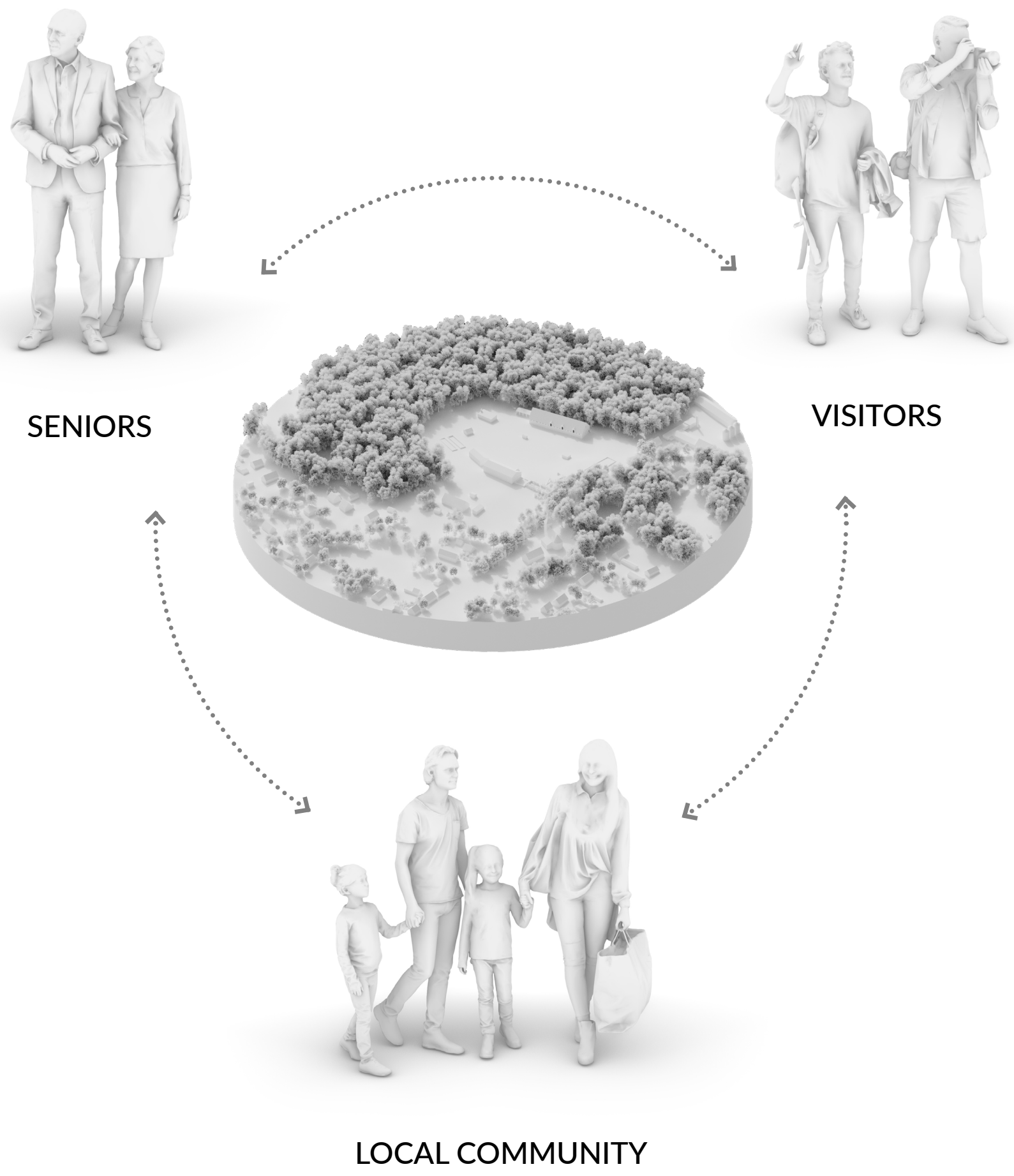


SENIORS



VISITORS

Concept proposal: users



Concept proposal: users

daily custodians/keepers
knowledge & experience
sense of purpose and belonging

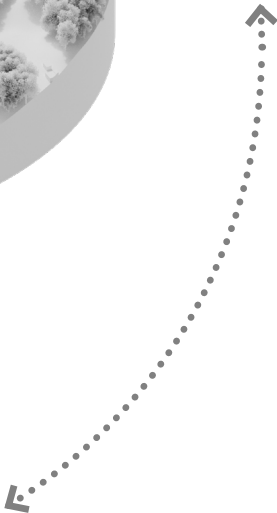
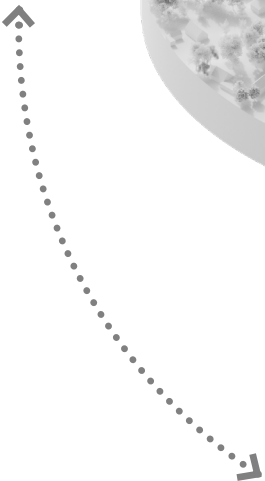
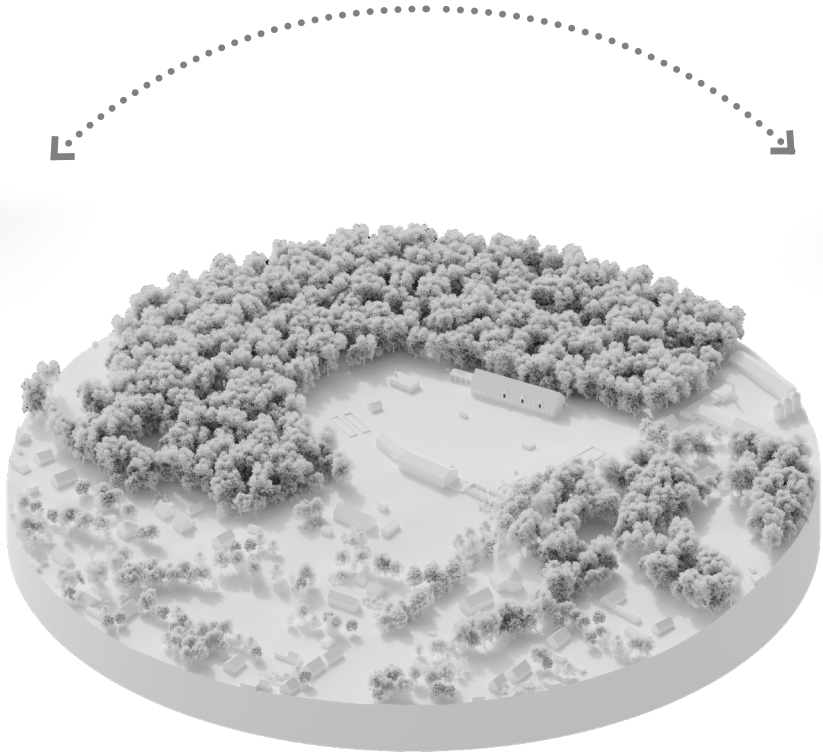


SENIORS

recreation & exploration
education & learning
culinary experiences
vibrancy & opportunities



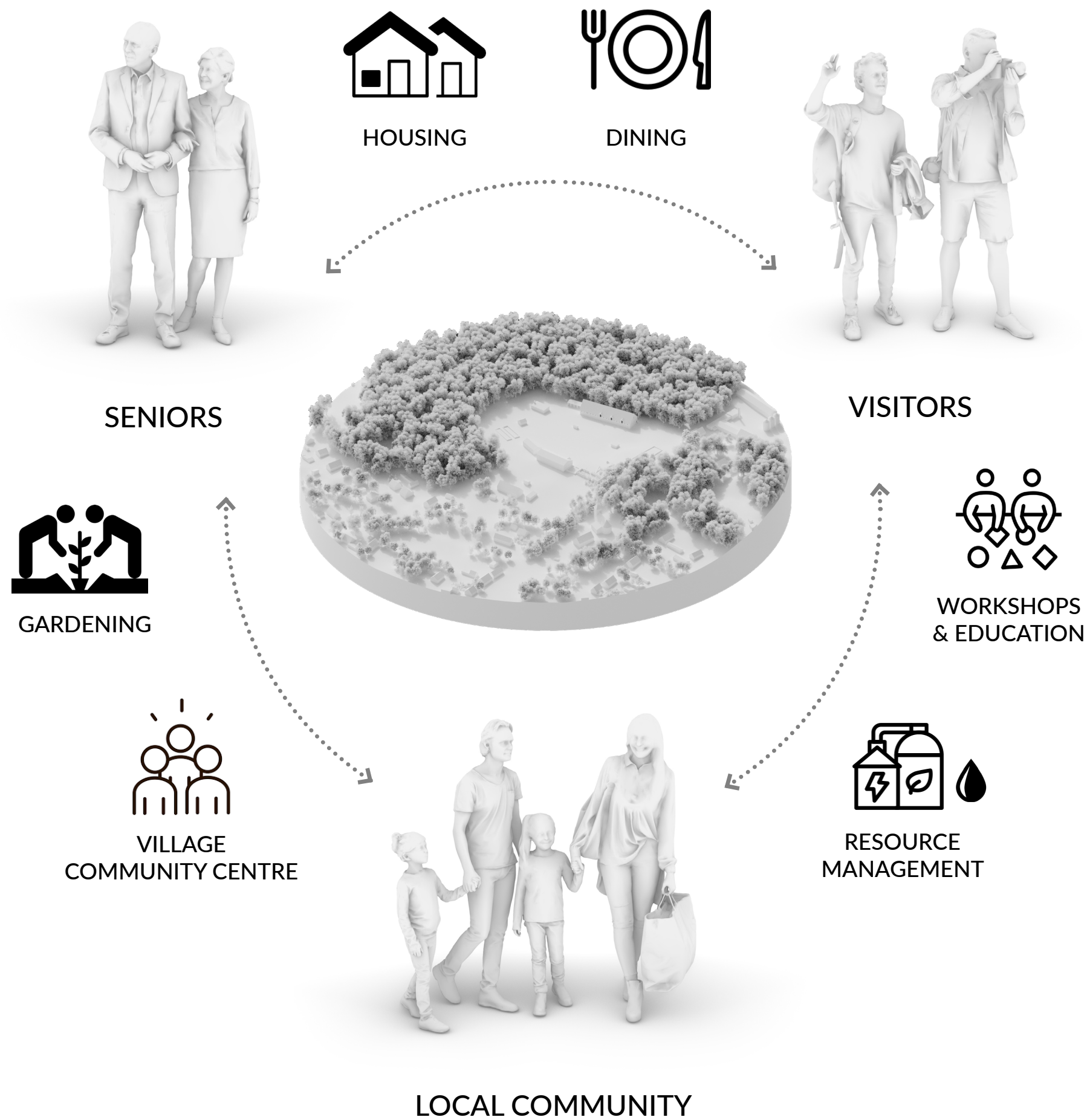
VISITORS



new central public space
fresh & local food supply
jobs & entrepreneurial opportunities
in new economy

LOCAL COMMUNITY

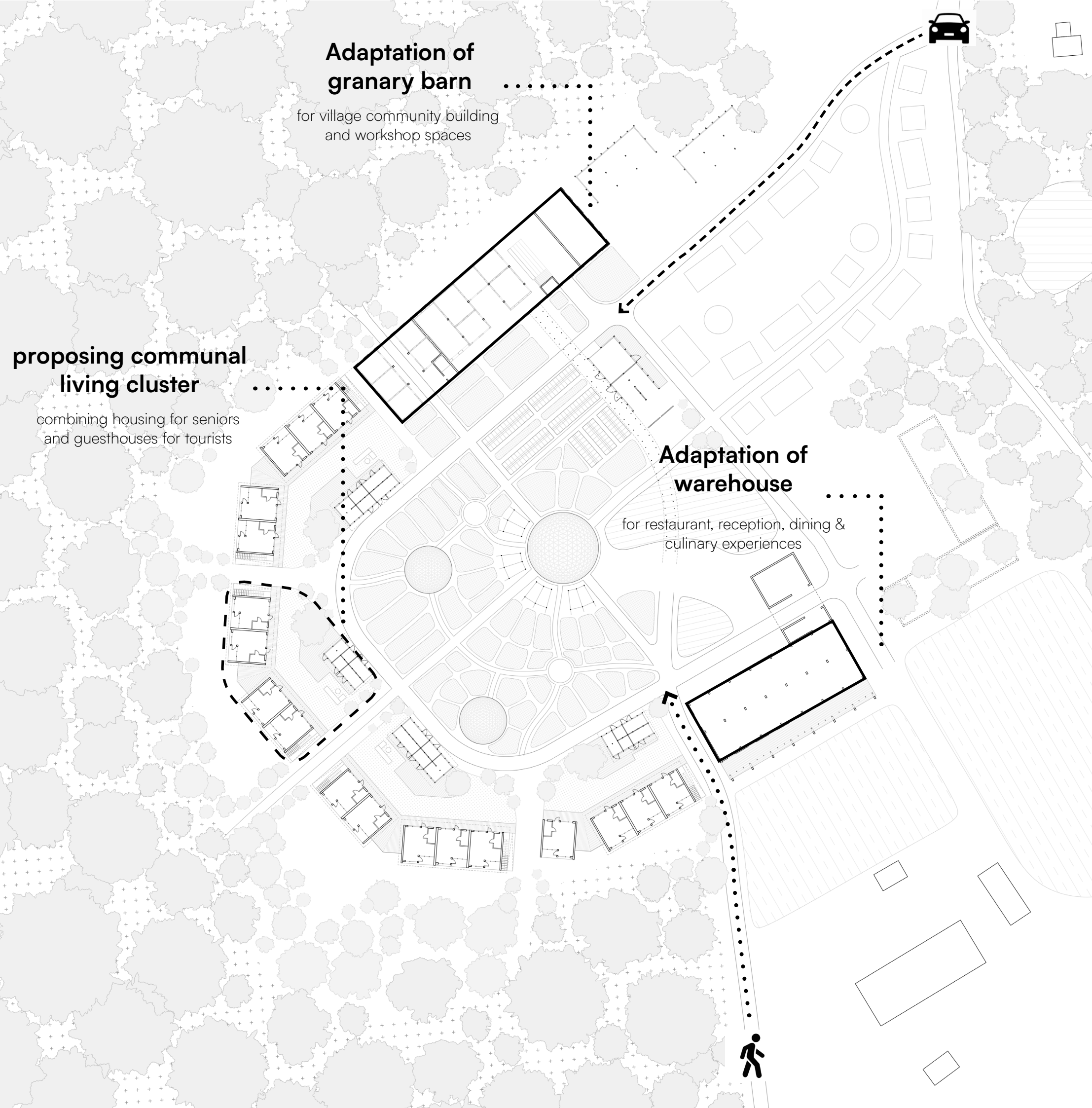
Concept proposal: users + programme



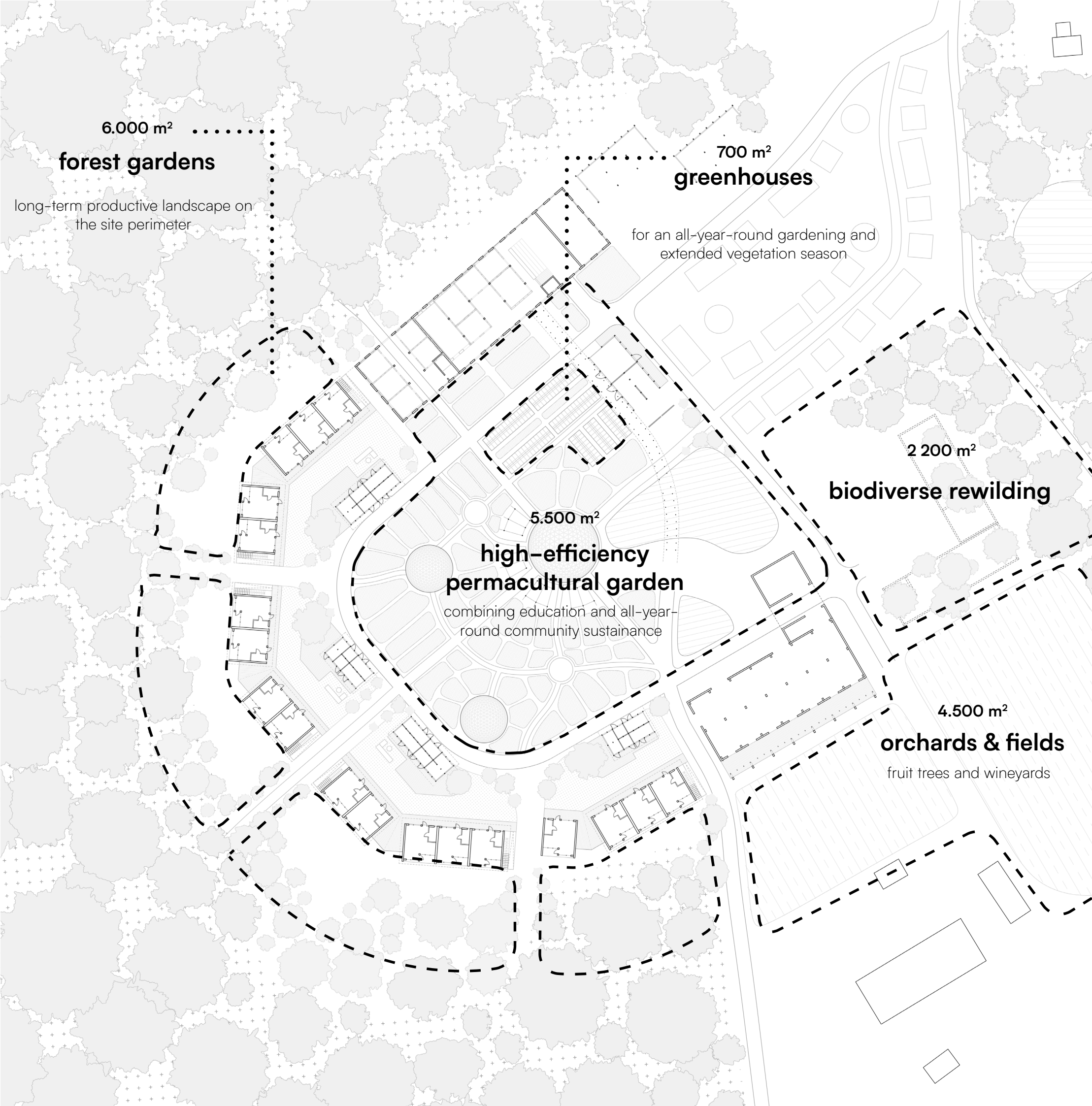
Programme



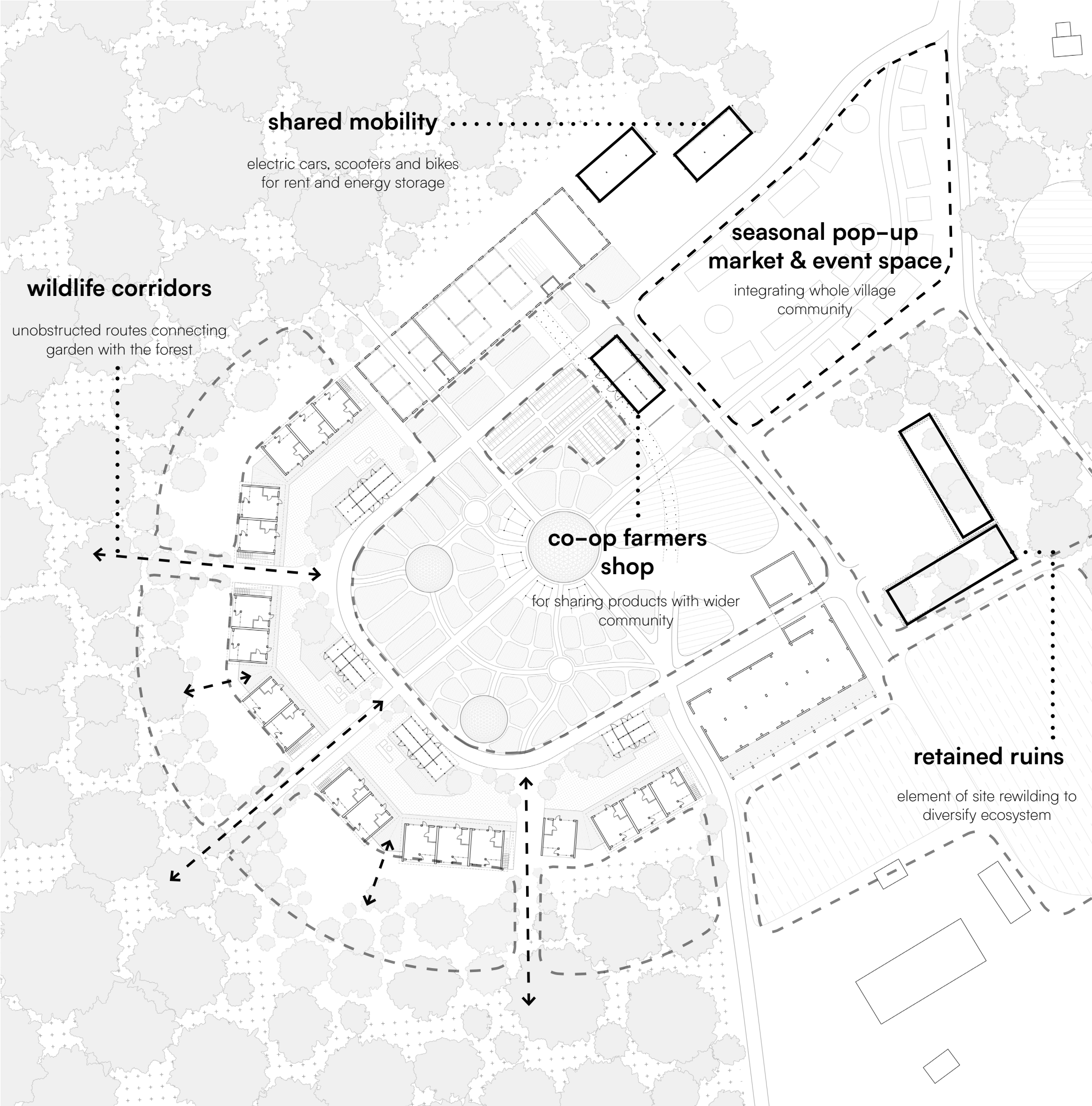
Masterplan proposal



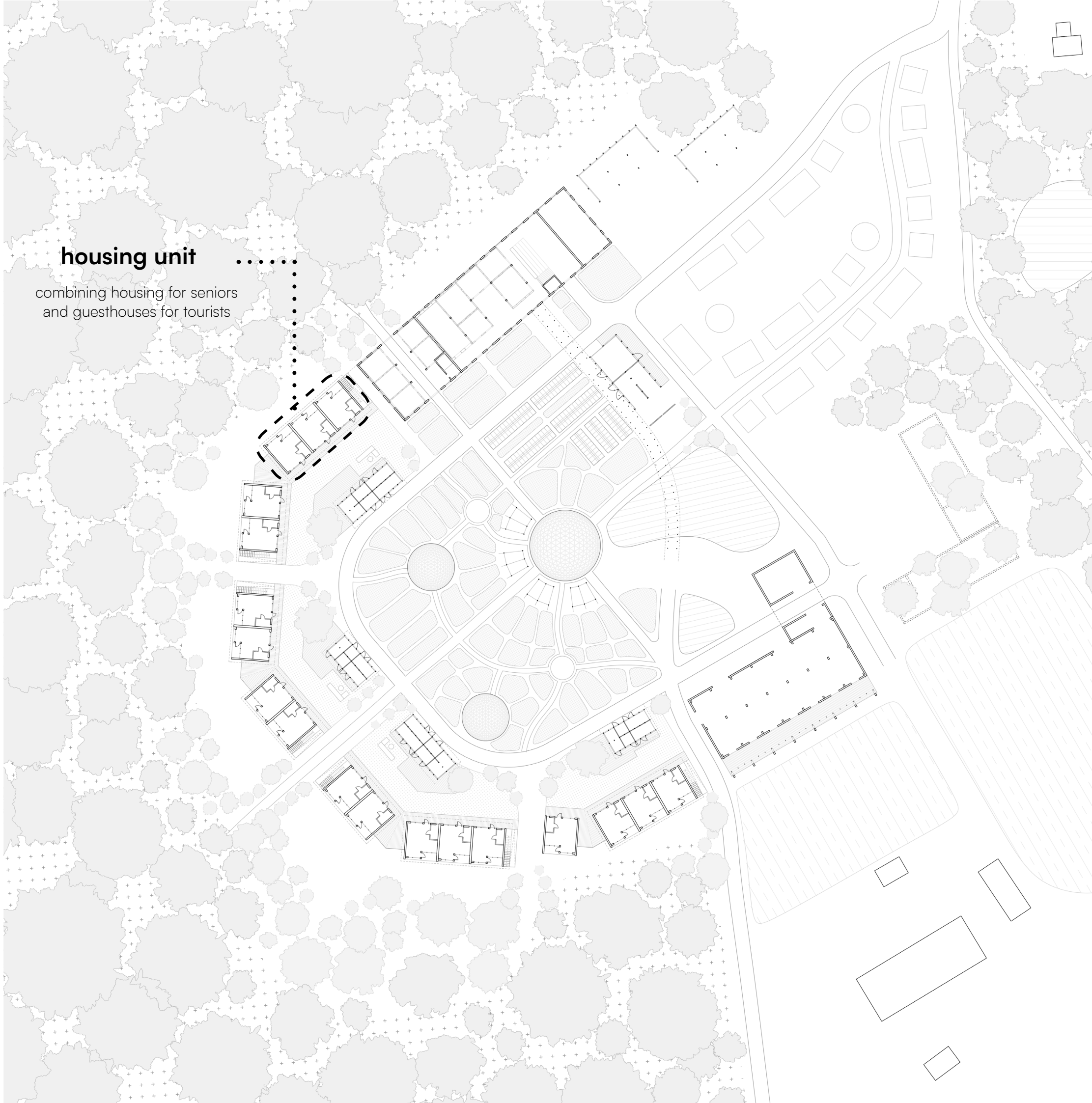
Masterplan proposal



Masterplan proposal



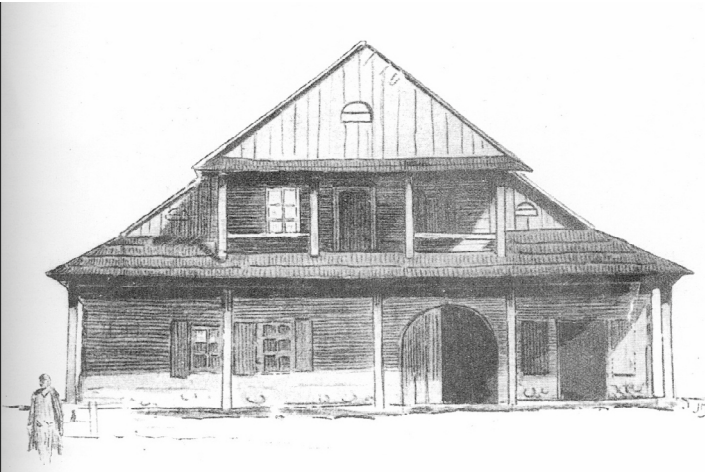
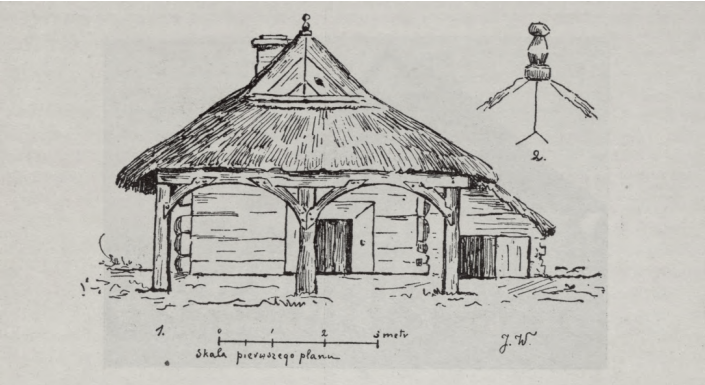
Masterplan proposal



housing unit

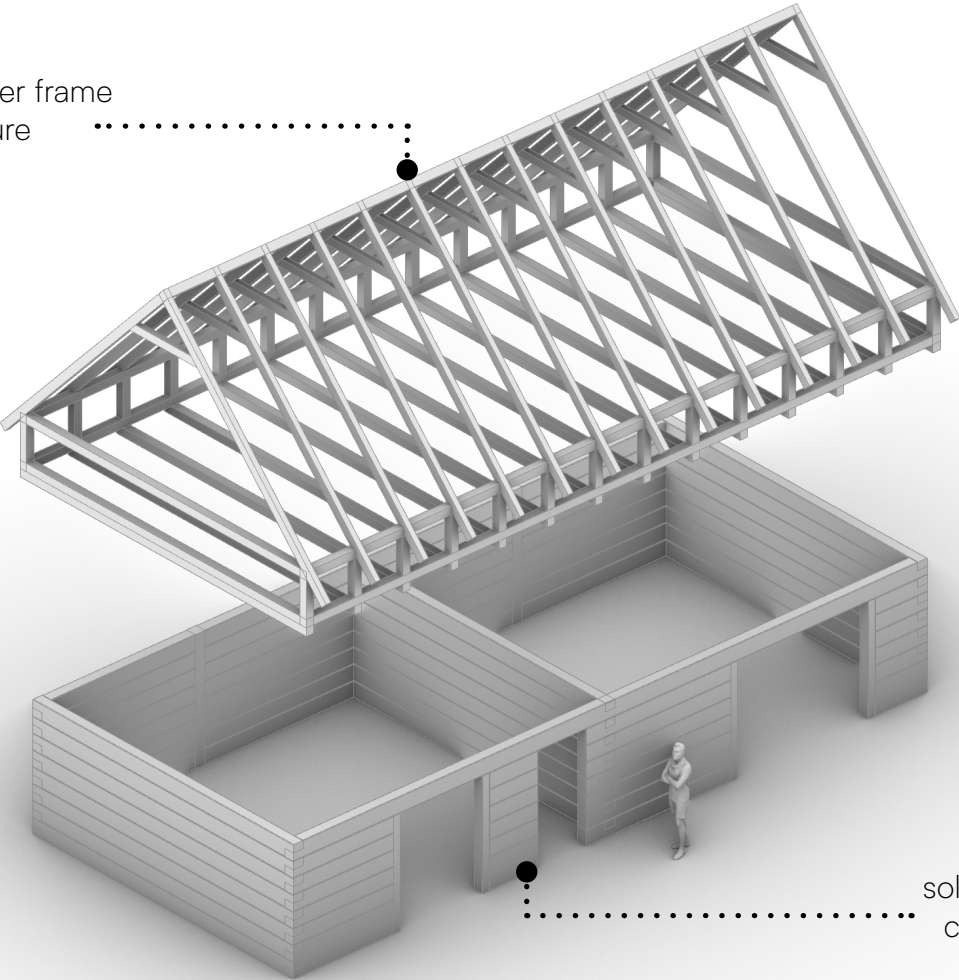
combining housing for seniors
and guesthouses for tourists

Housing unit



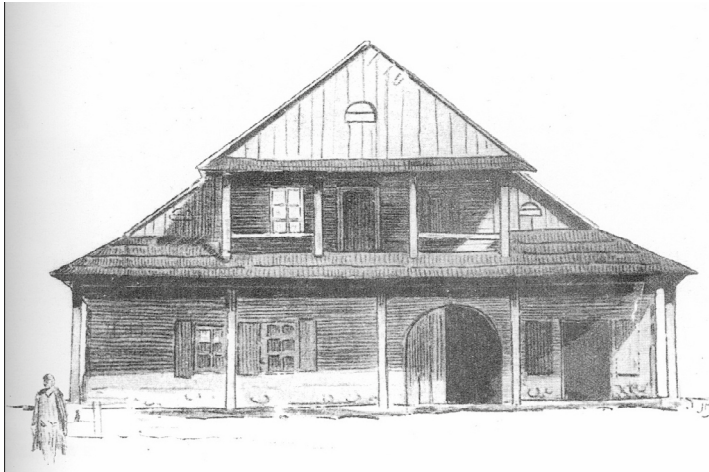
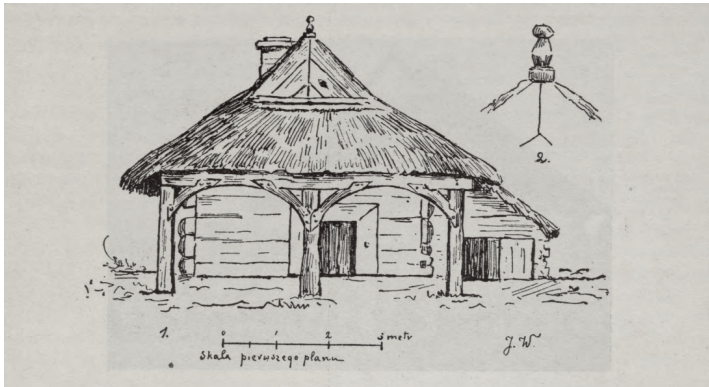
Housing unit

cantilevered timber frame
roof structure

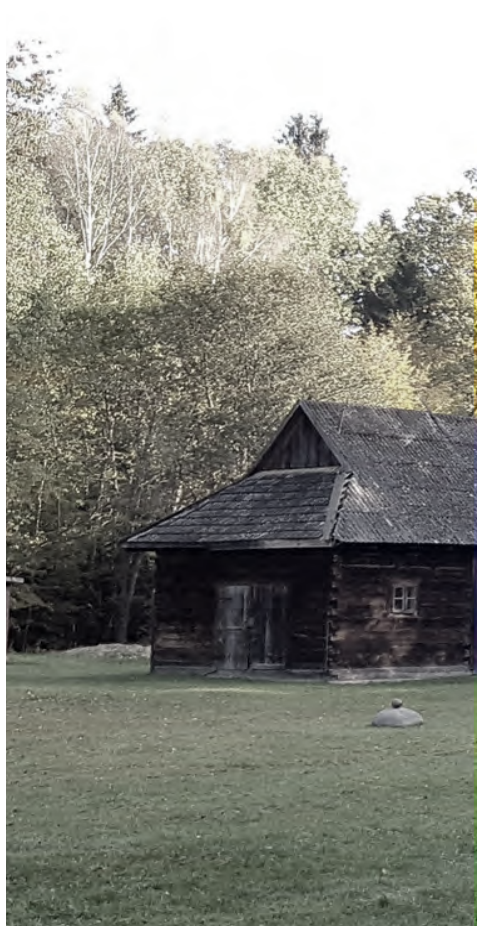


solid timber log
construction

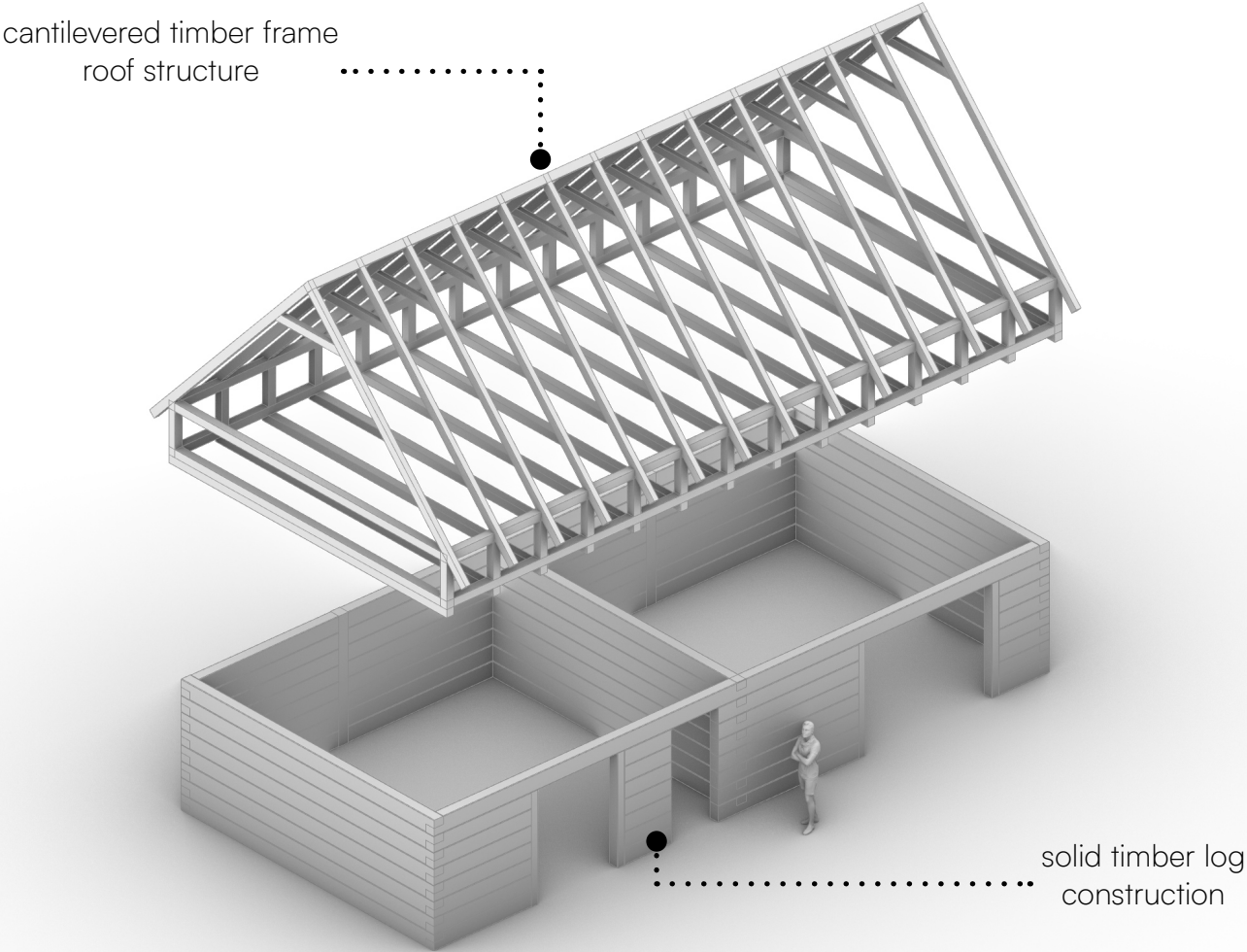
traditional timber hut from the region



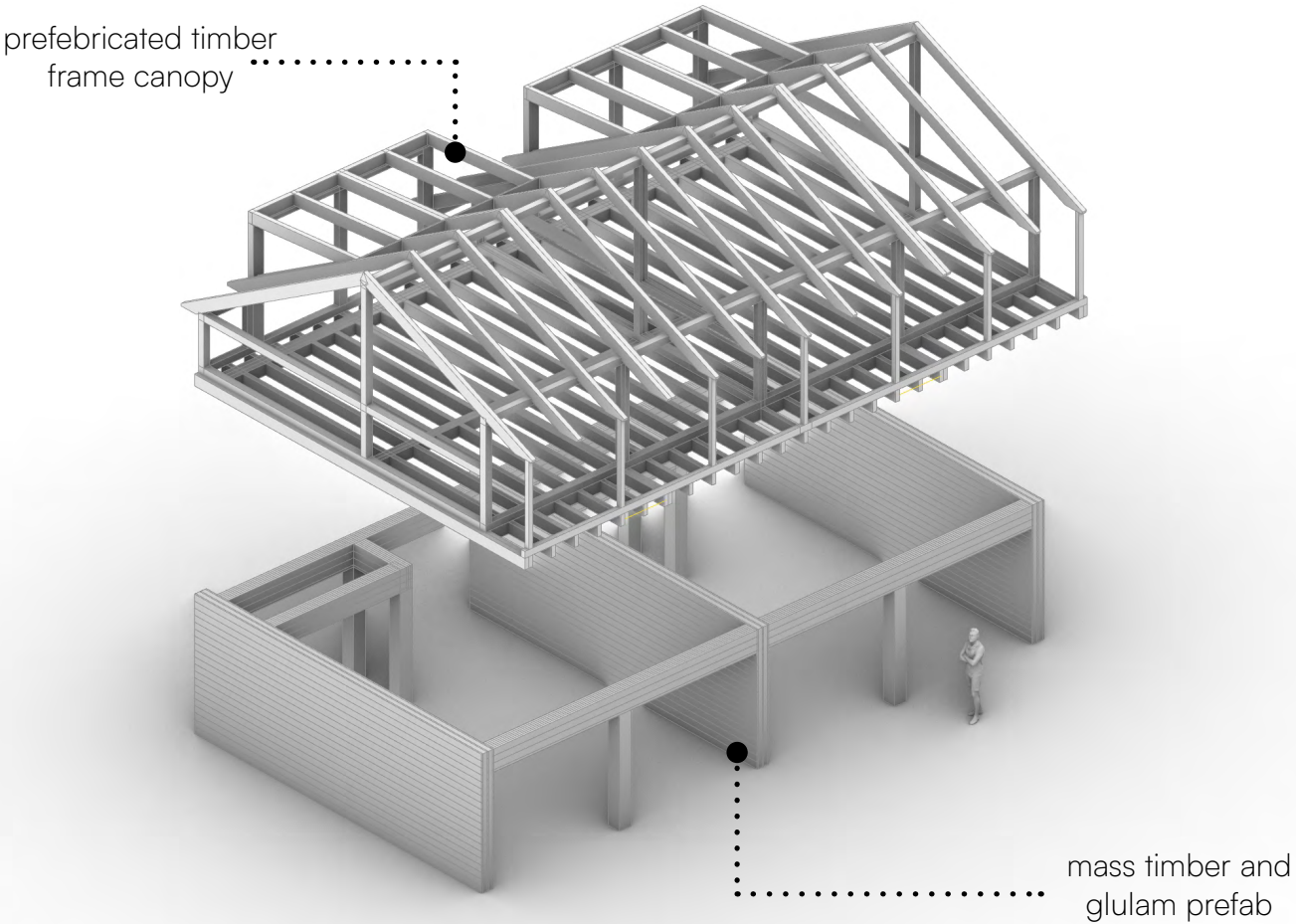
Housing unit



Housing unit

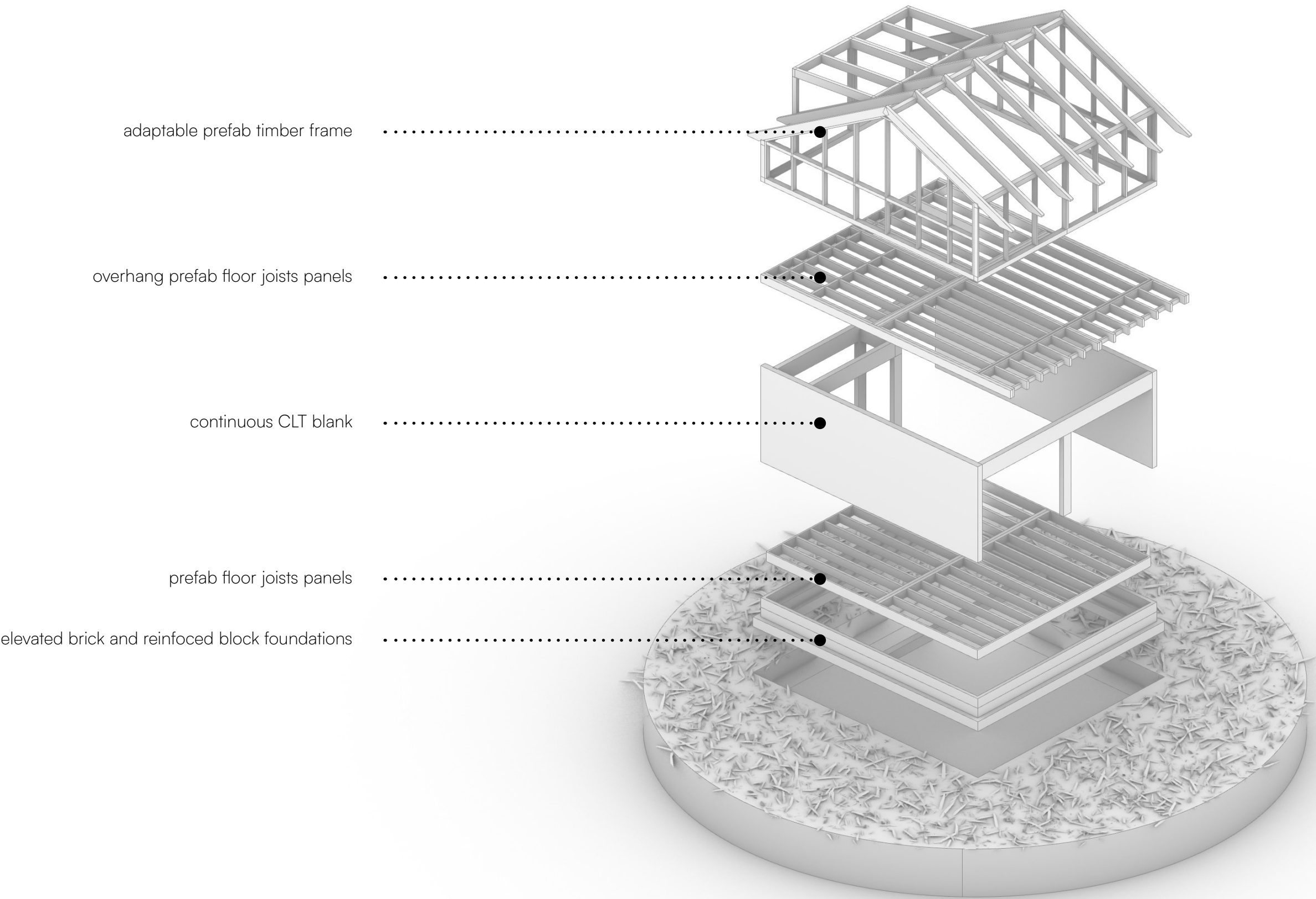


traditional timber hut from the region

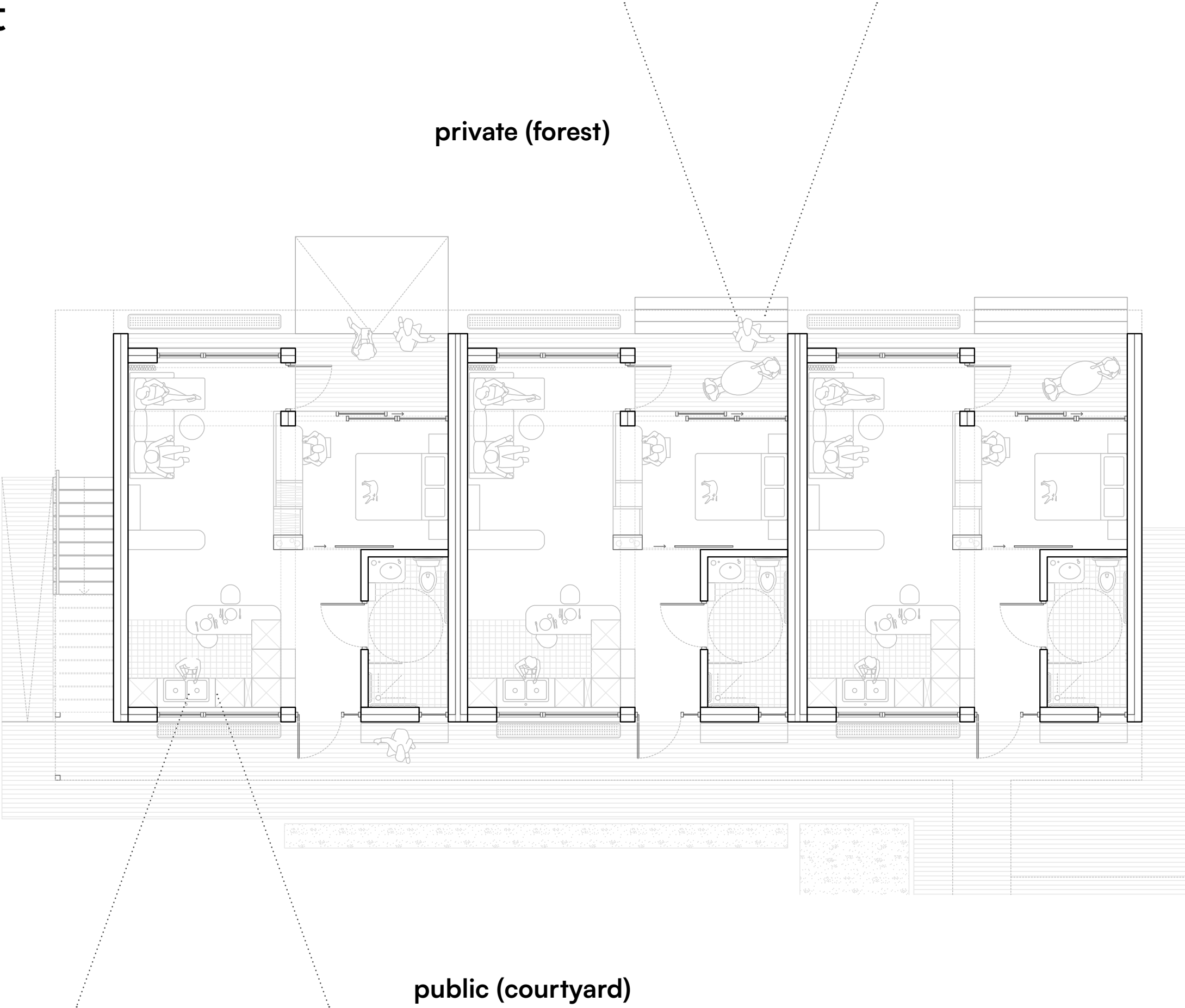


contemporary reinterpretation

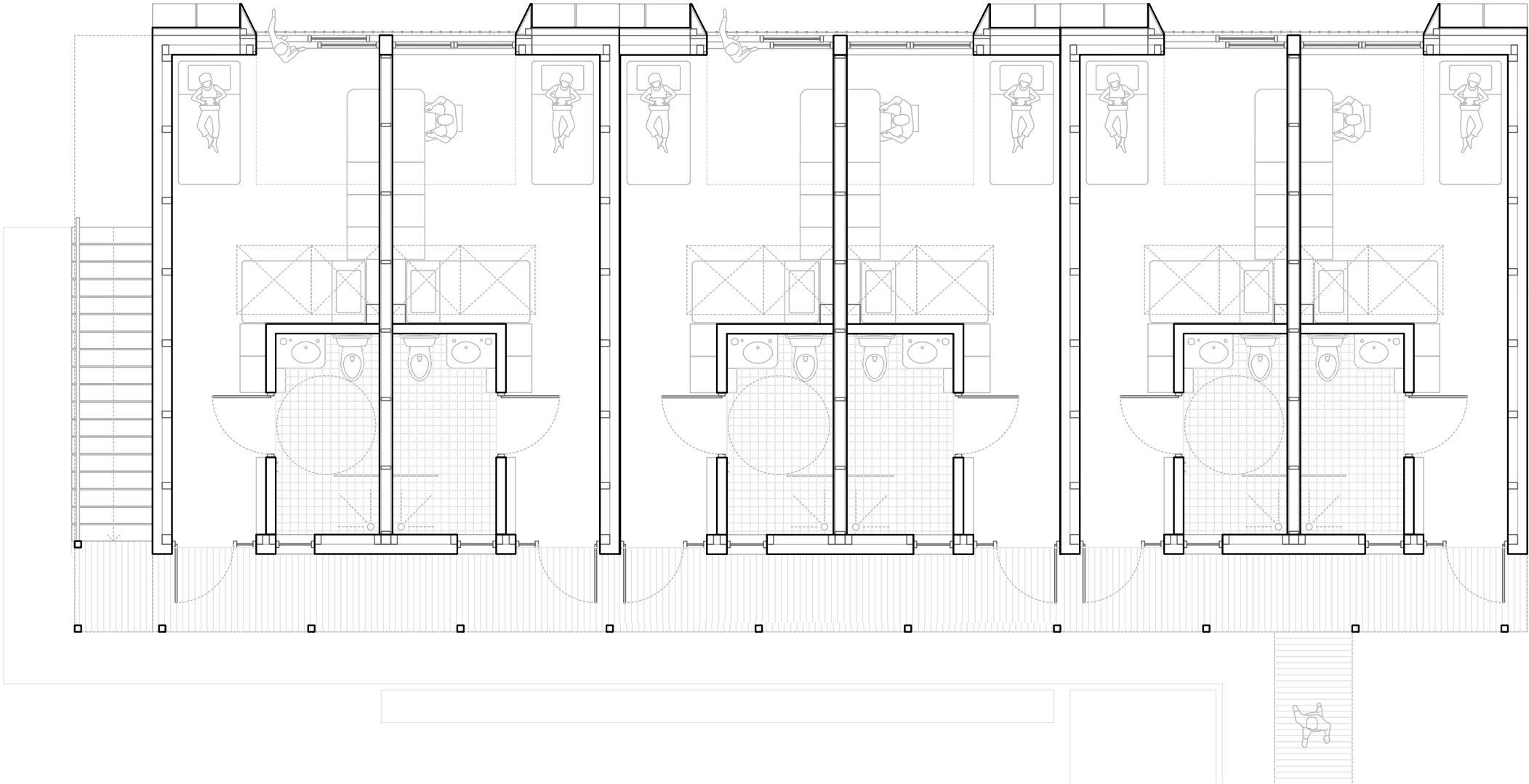
Housing unit structure



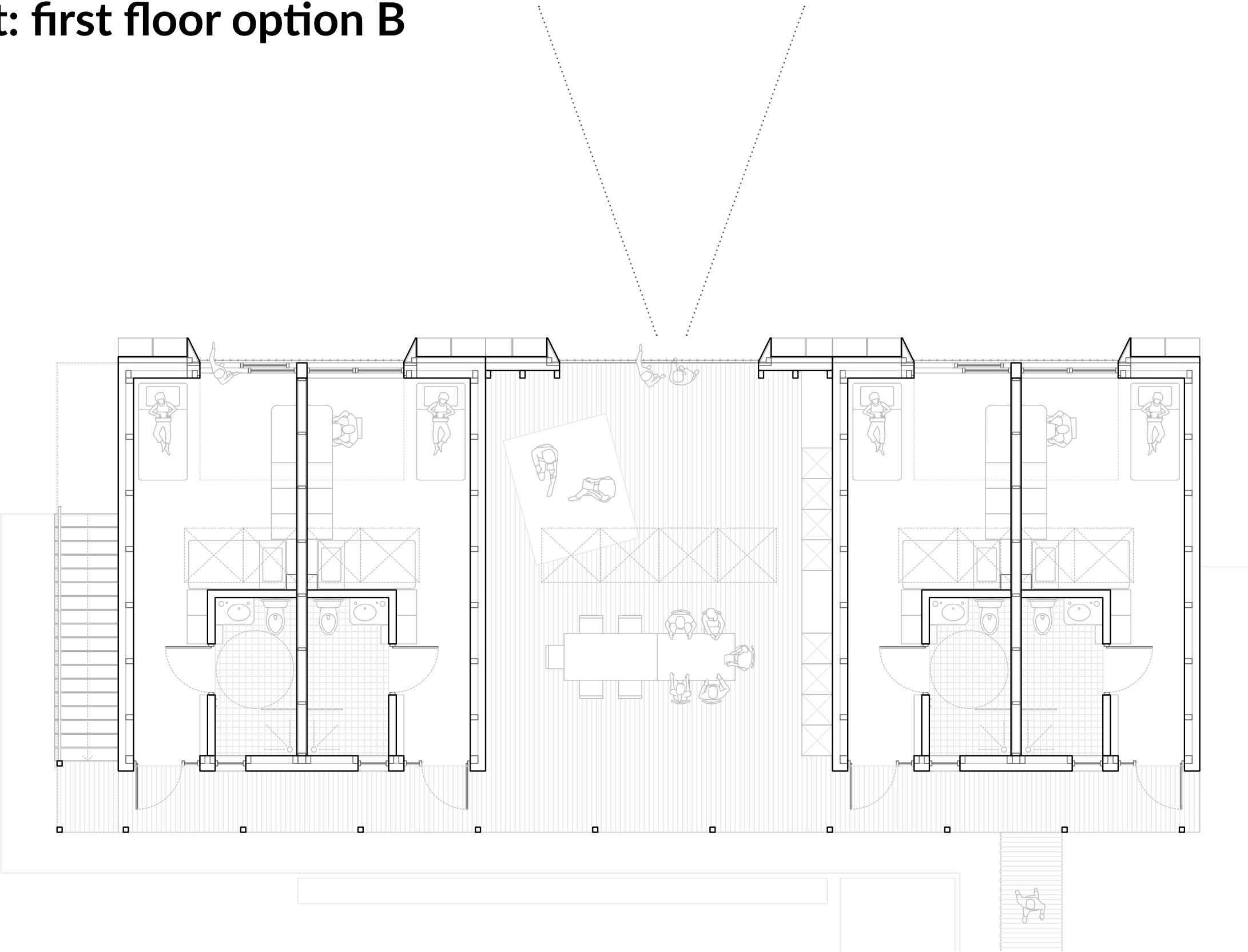
Housing unit



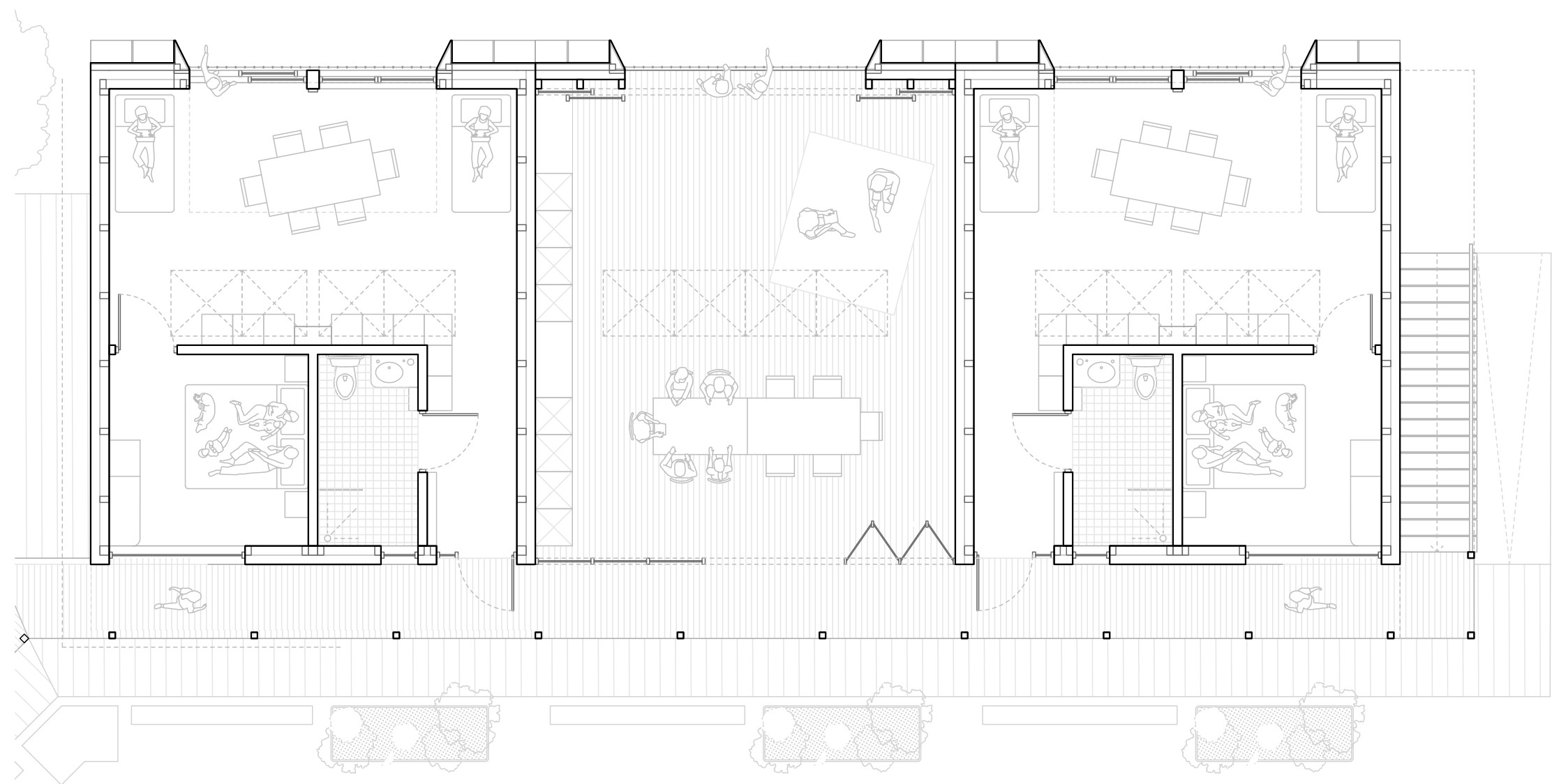
Housing unit: first floor option A



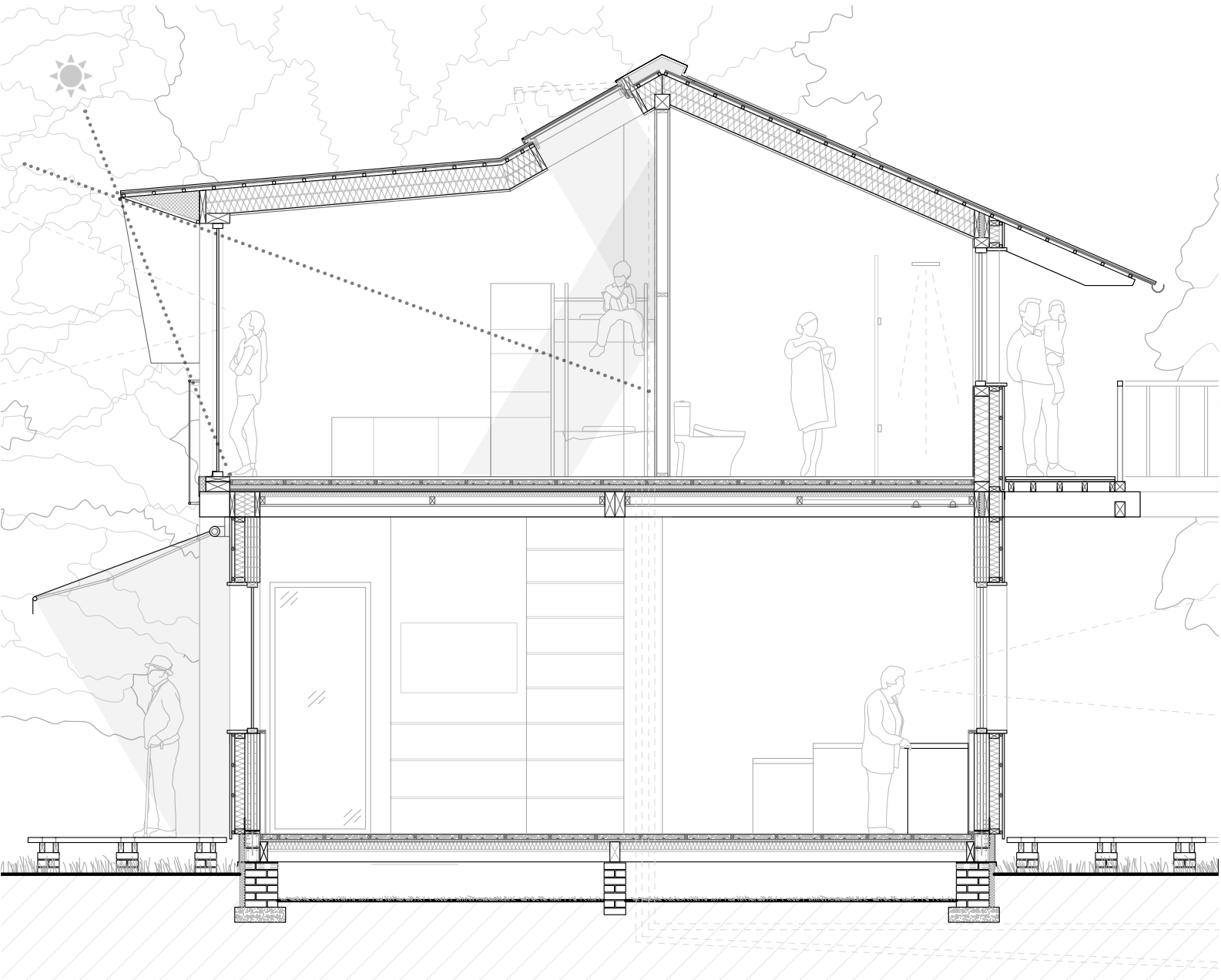
Housing unit: first floor option B



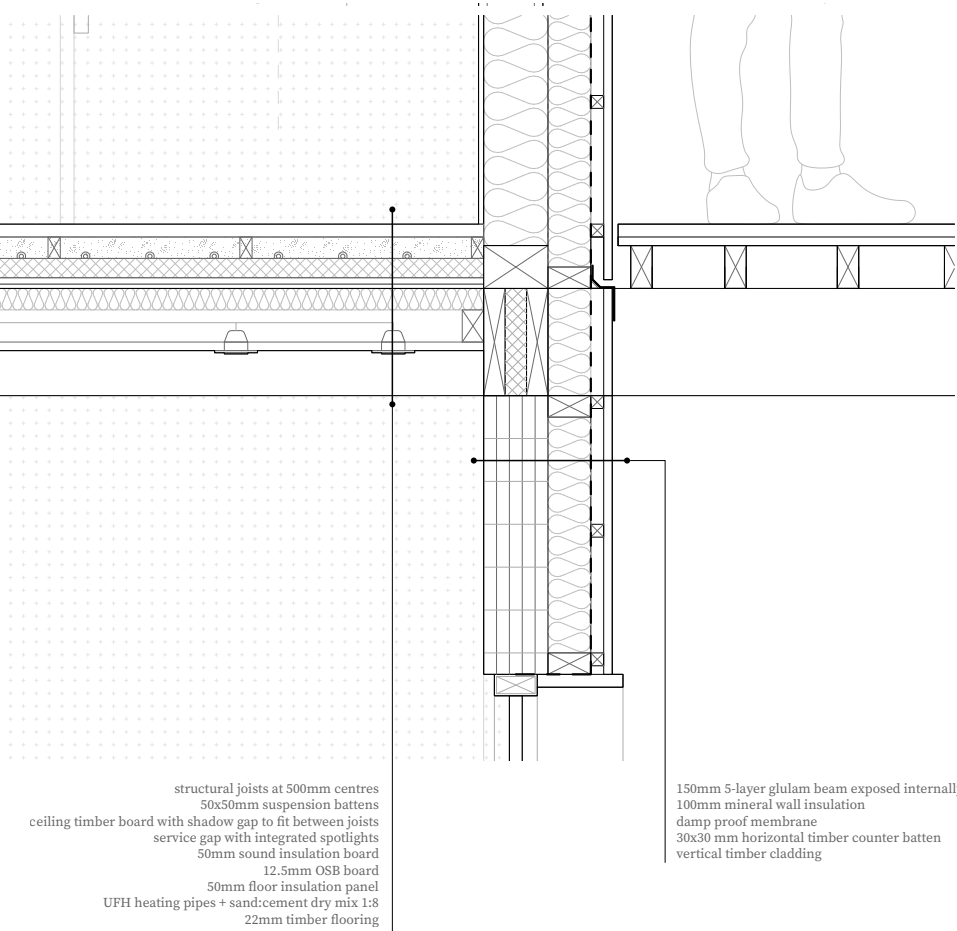
Housing unit: first floor option C



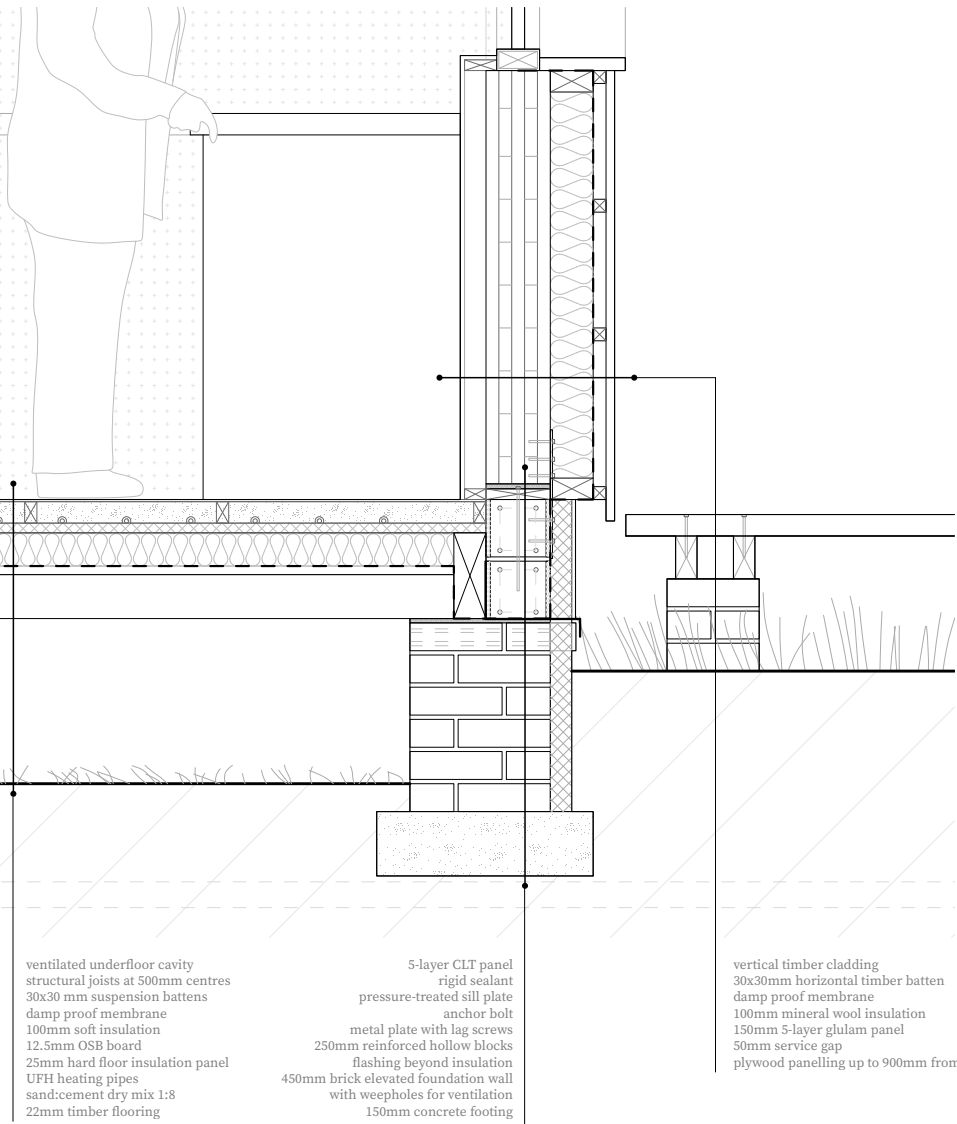
Housing unit



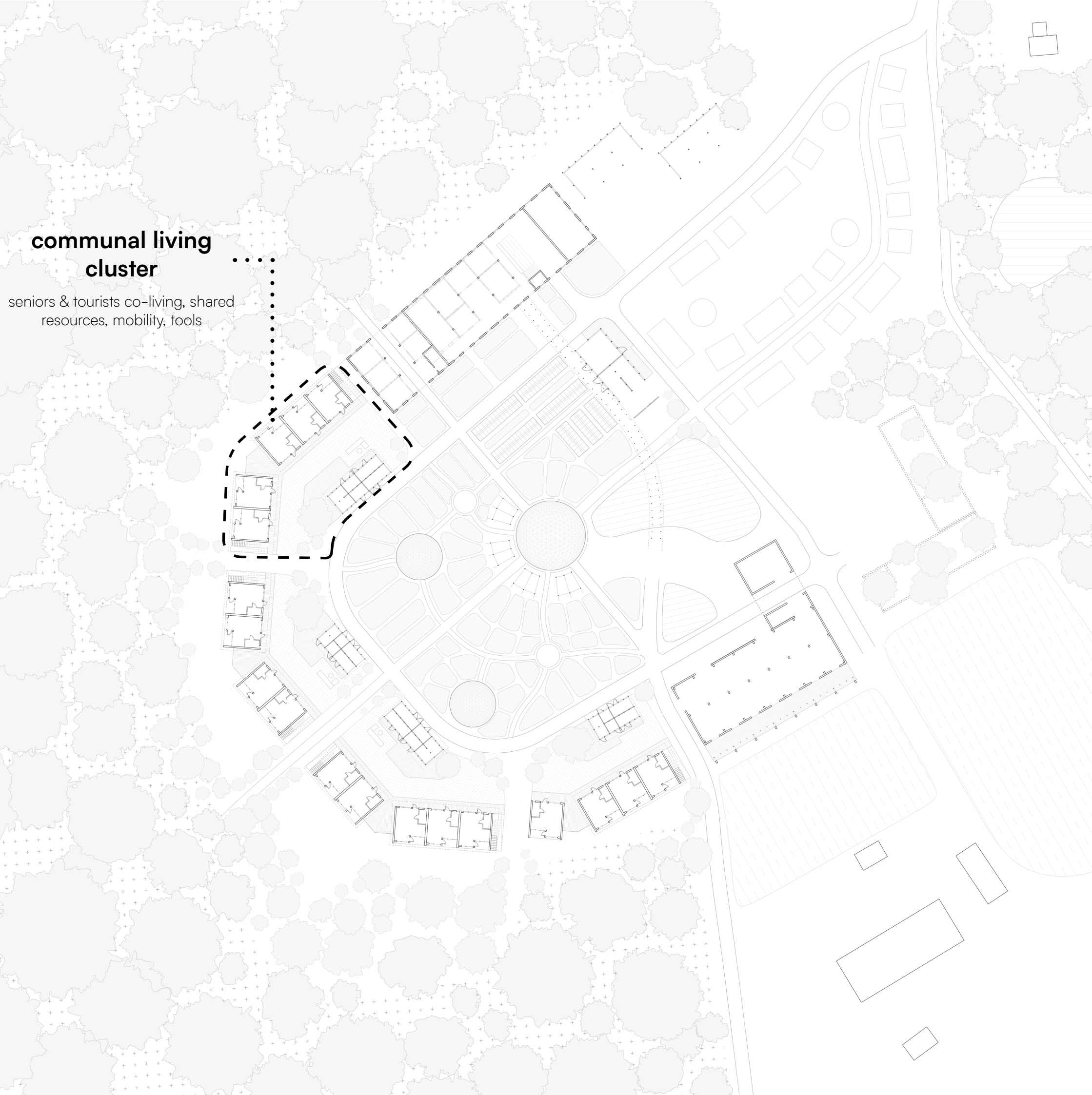
WALL TO FLOOR DETAIL. SCALE 1:10



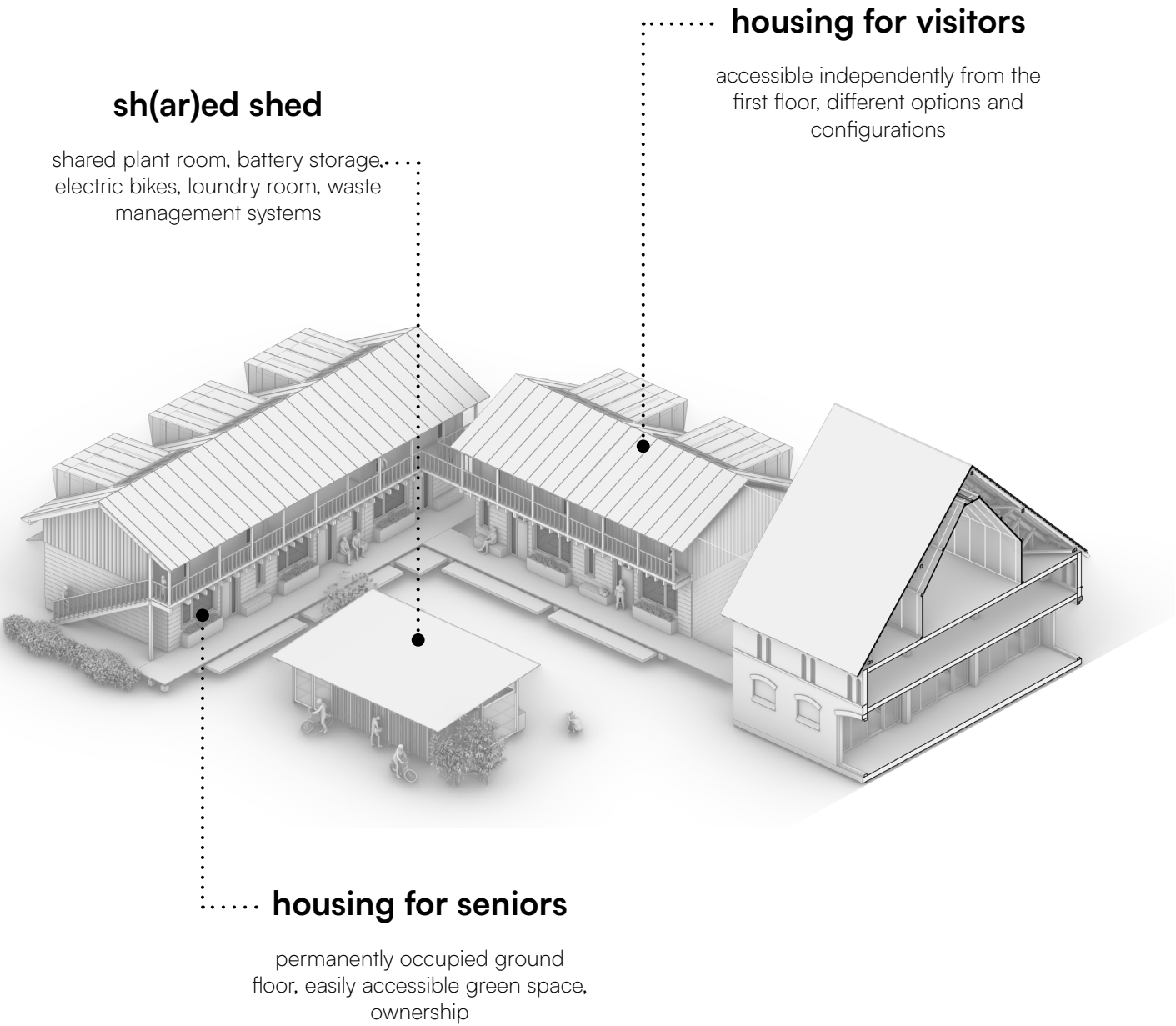
FOUNDATION TO FLOOR DETAIL. SCALE 1:10





Masterplan proposal




Communal living cluster

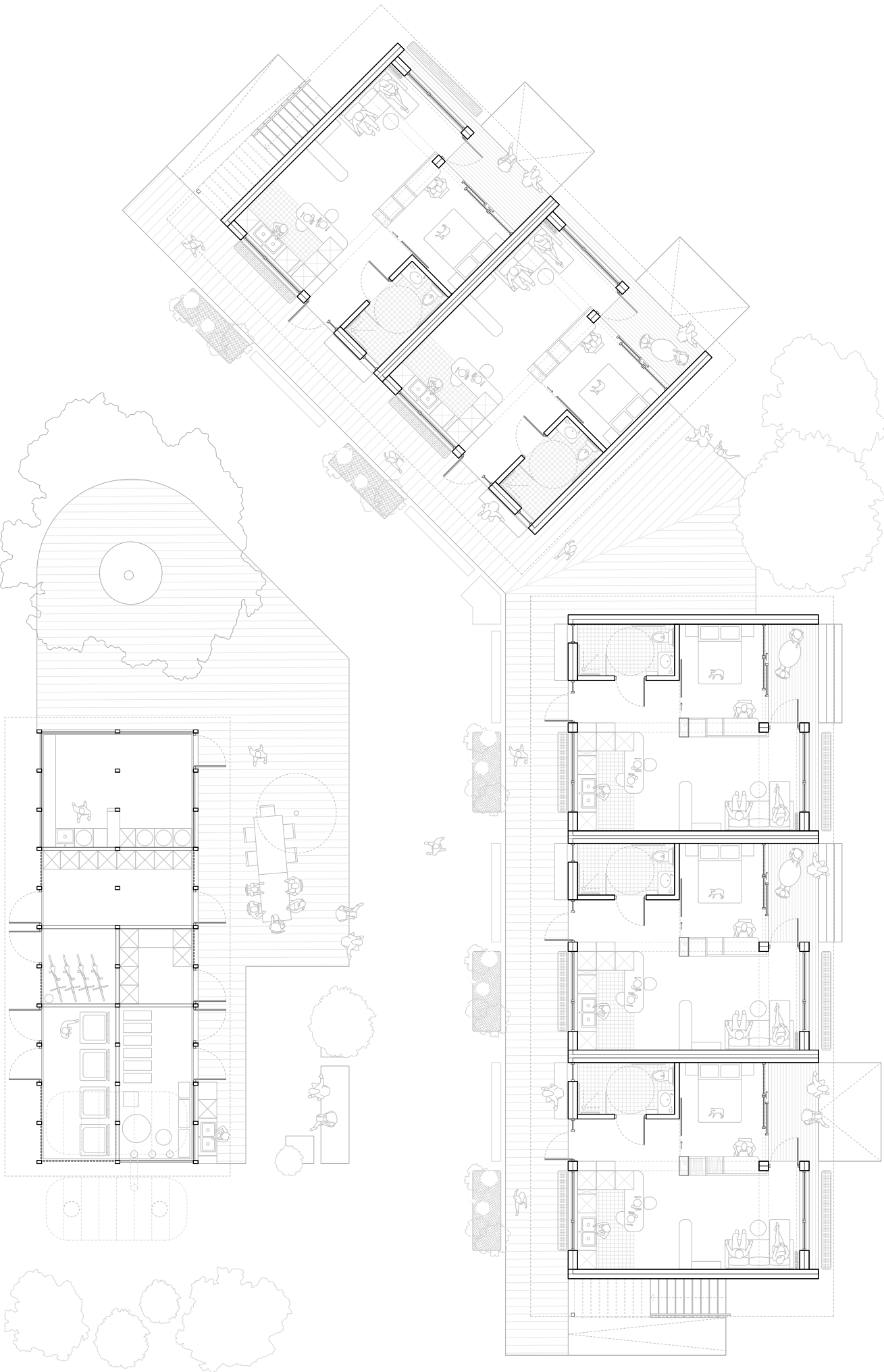


 6-10 seniors
 10-15 guests

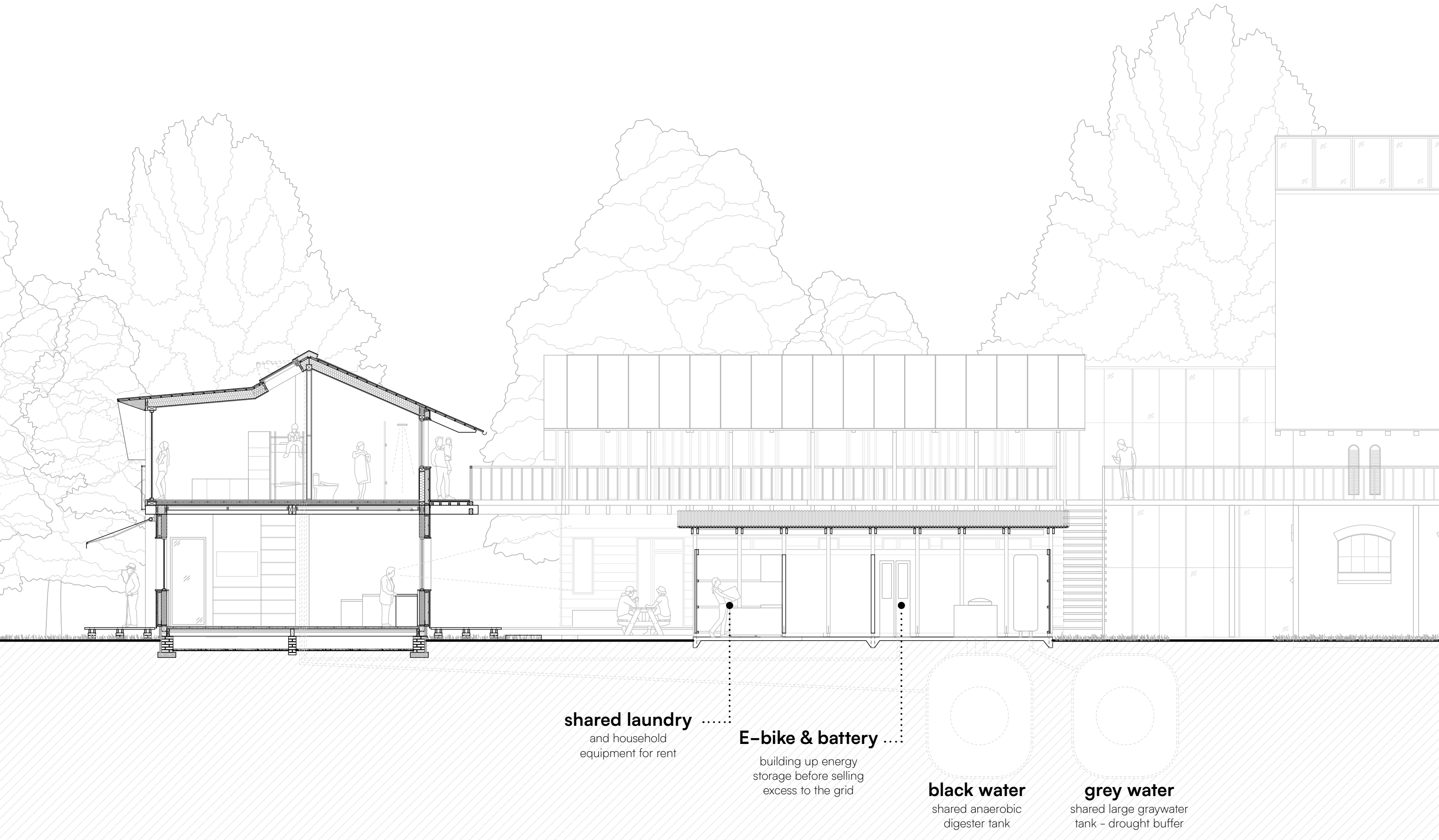

900 m²
of water
capture area


580 m²
of potential solar
energy surface


shared
black water
anaerobic digester



Communal living cluster



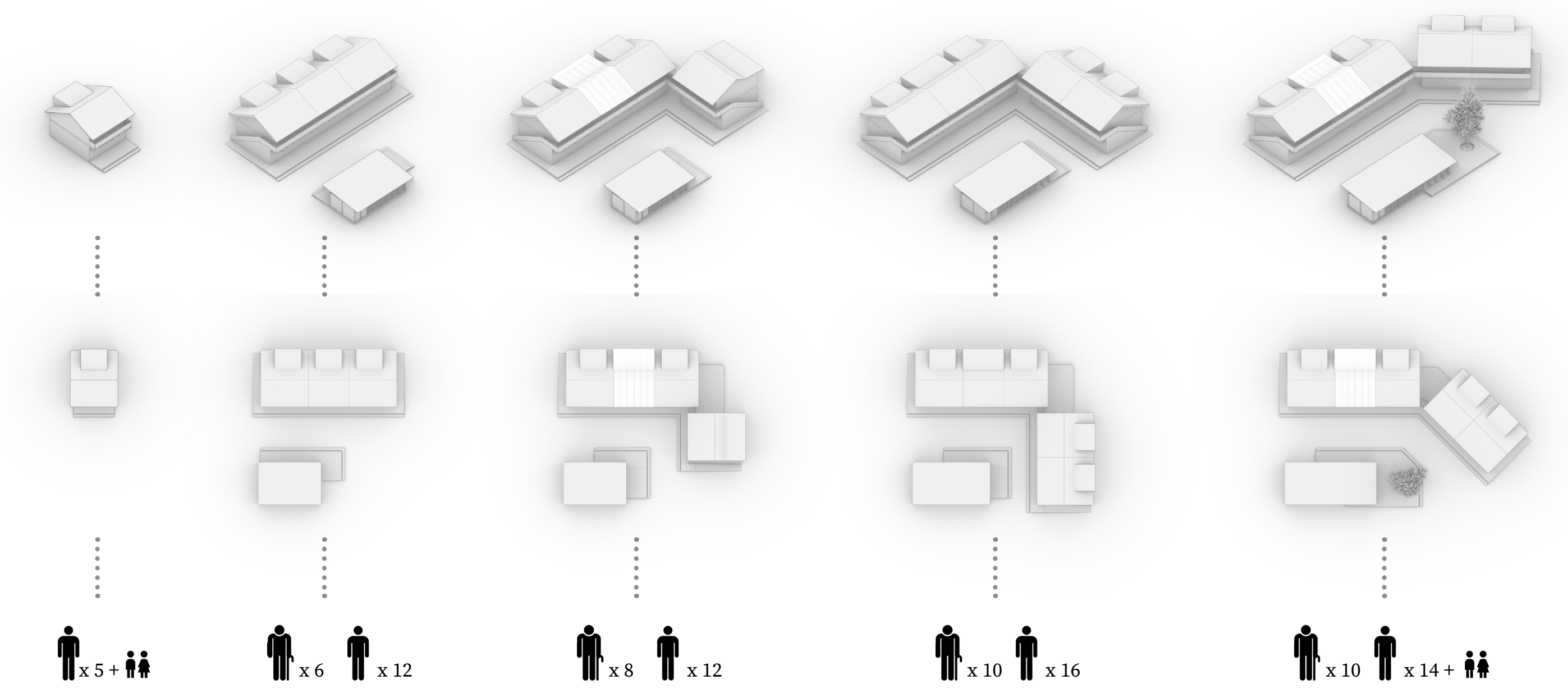
shared laundry
and household
equipment for rent

E-bike & battery
building up energy
storage before selling
excess to the grid

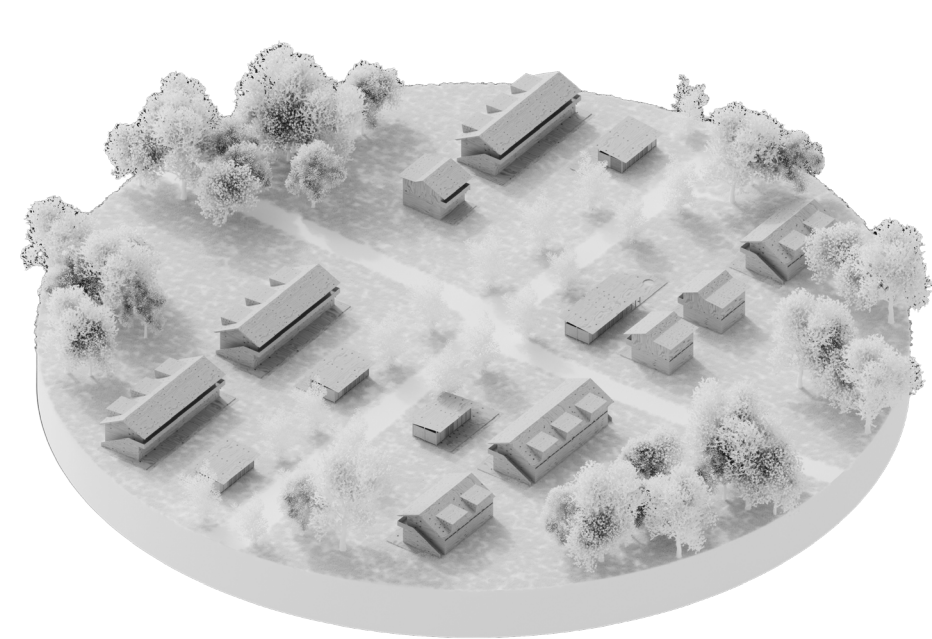
black water
shared anaerobic
digester tank

grey water
shared large graywater
tank - drought buffer

Communal living cluster: flexible unit configurations

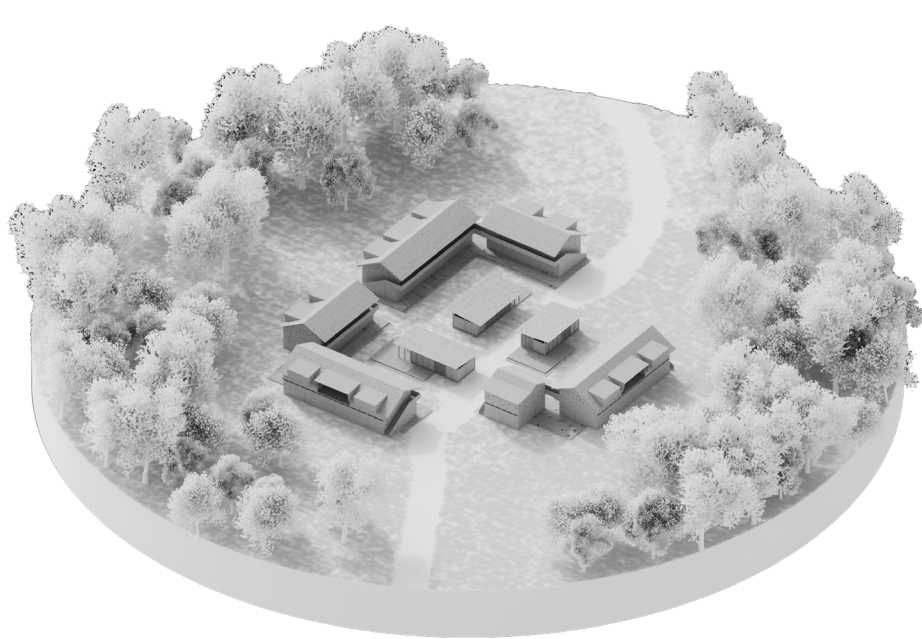


Communal living cluster: masterplan configurations



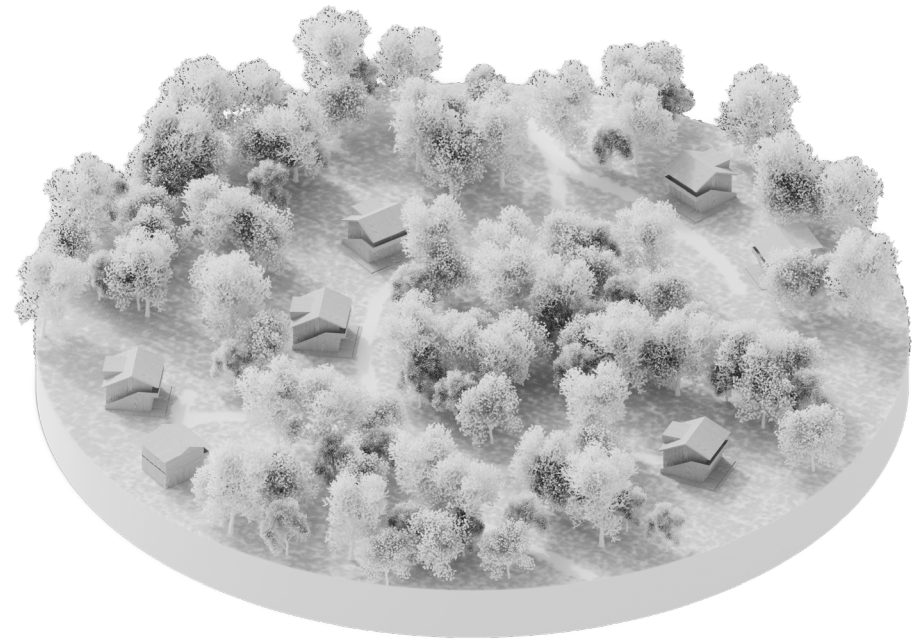
option A

linear village lane



option B

lincourtyard cluster



option C

scattered cabins

Communal living cluster: masterplan configurations



Communal living cluster: private backyard



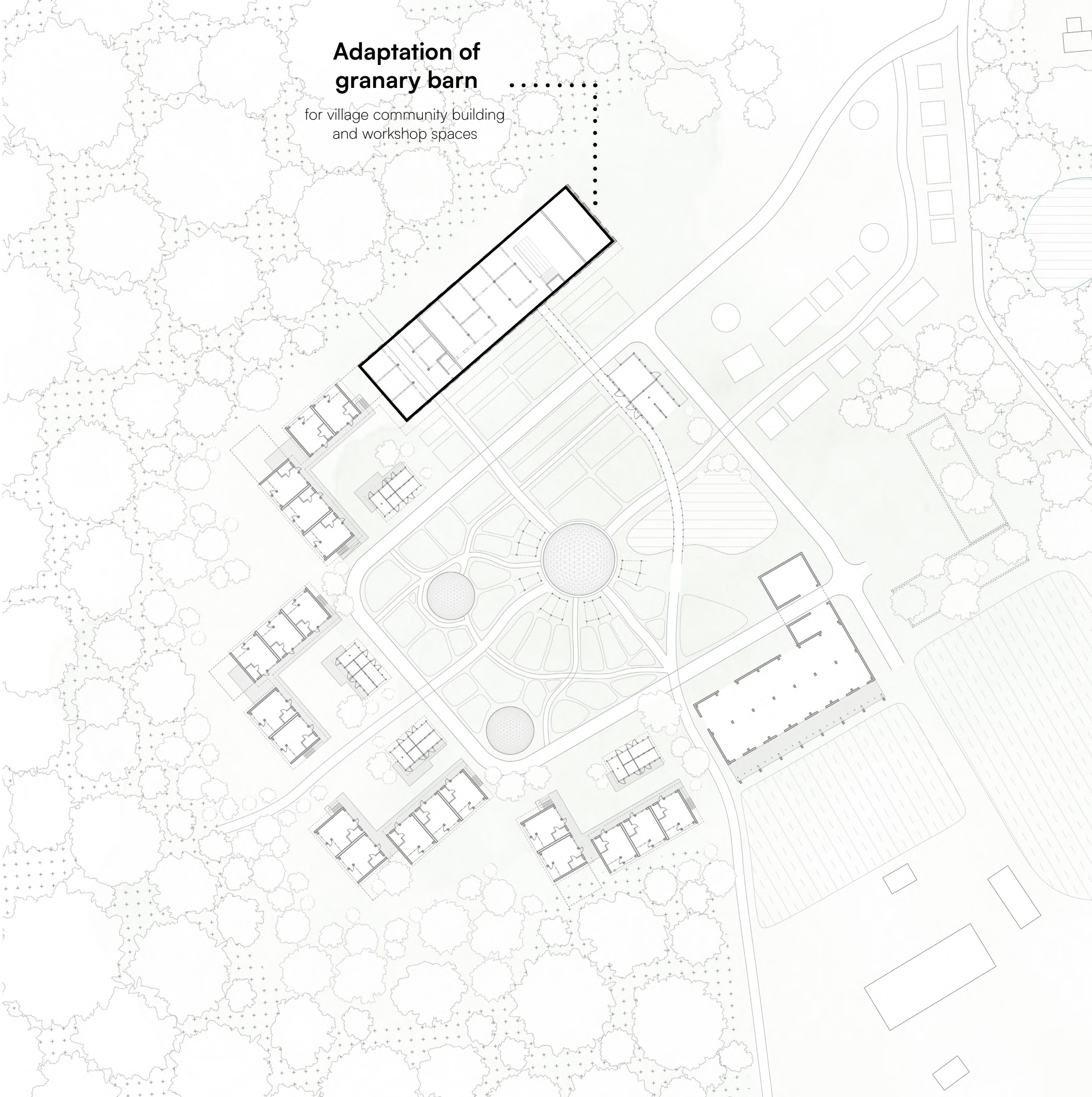
Communal living cluster: communal courtyard



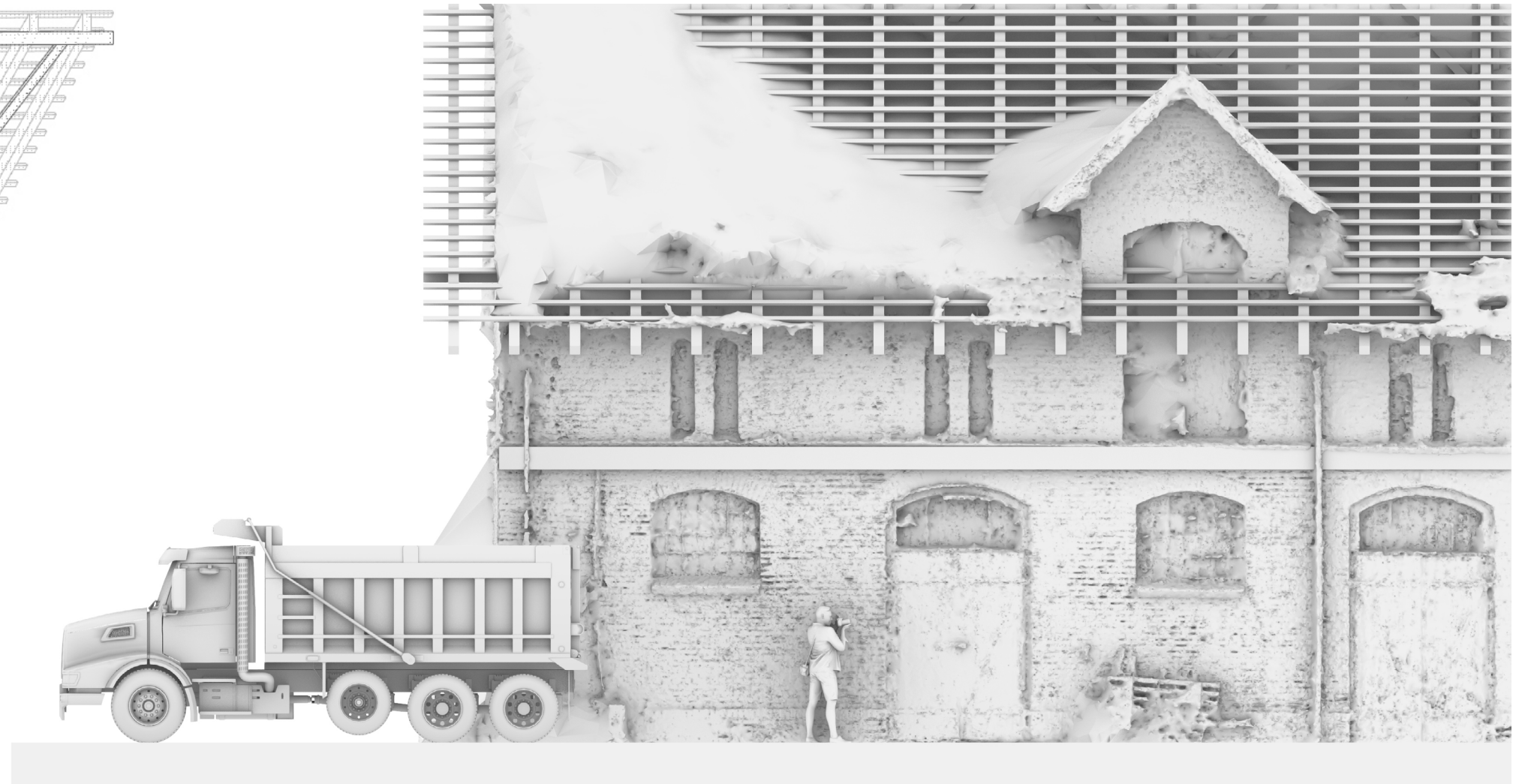
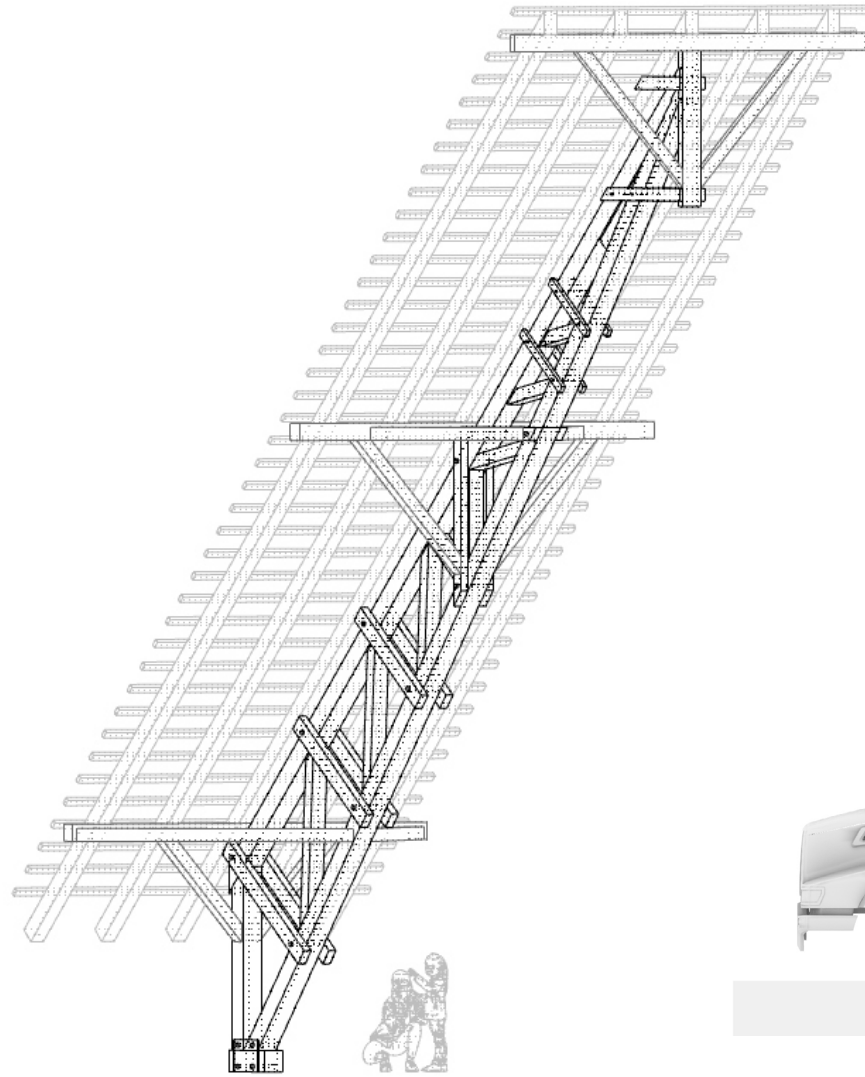
Communal living cluster: gallery access for visitors



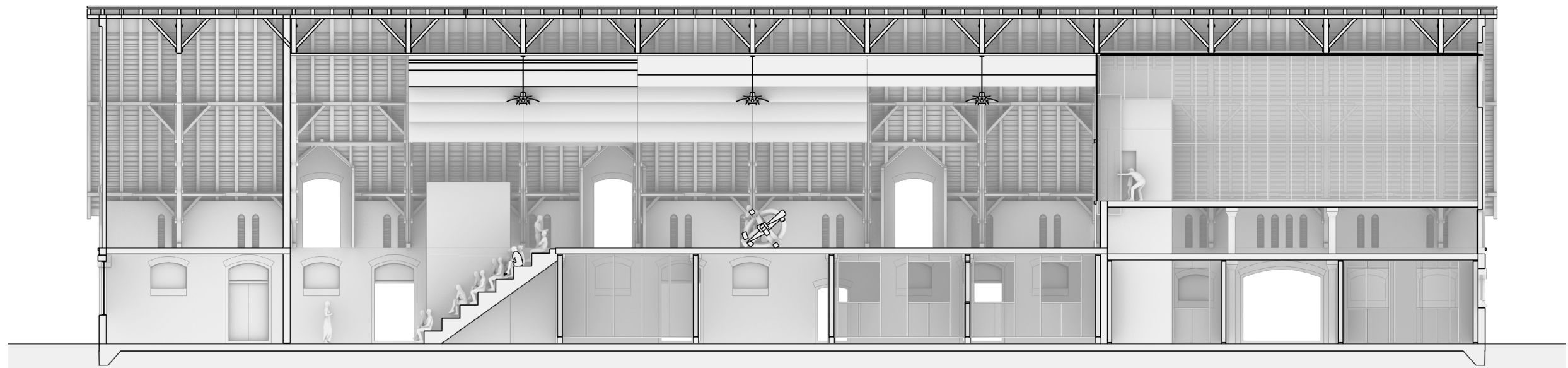
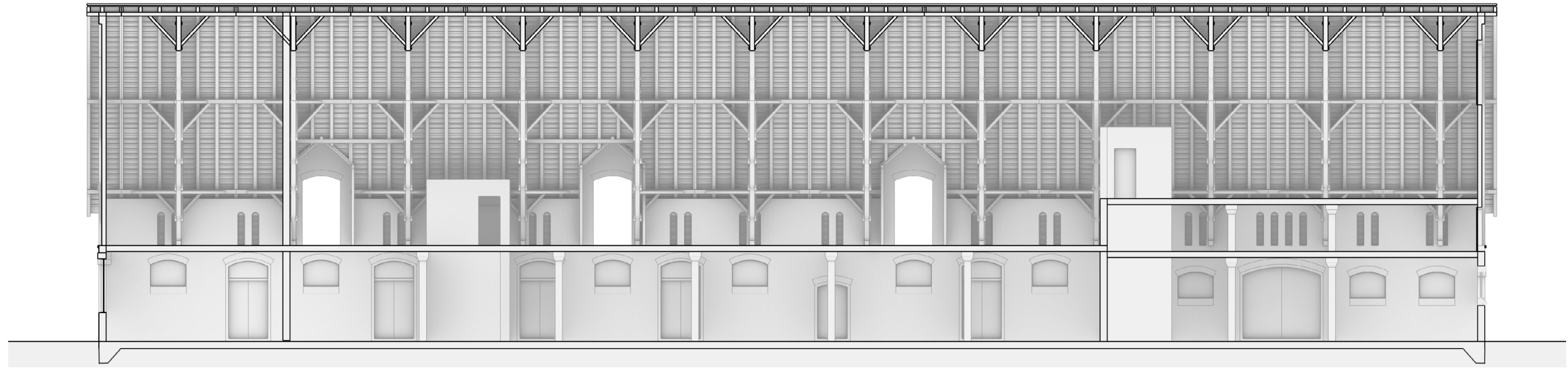
Masterplan proposal



Granary barn adaptation



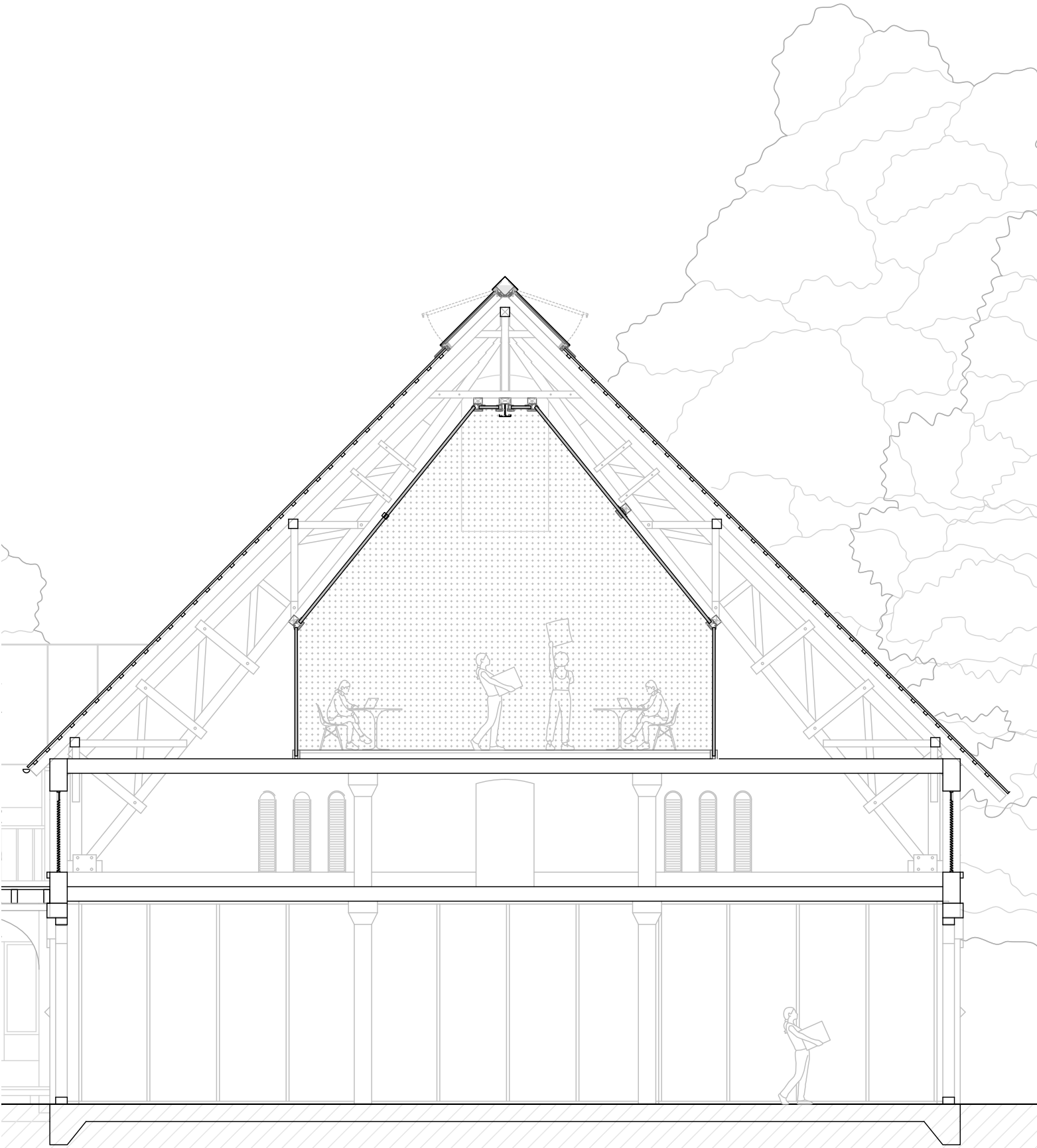
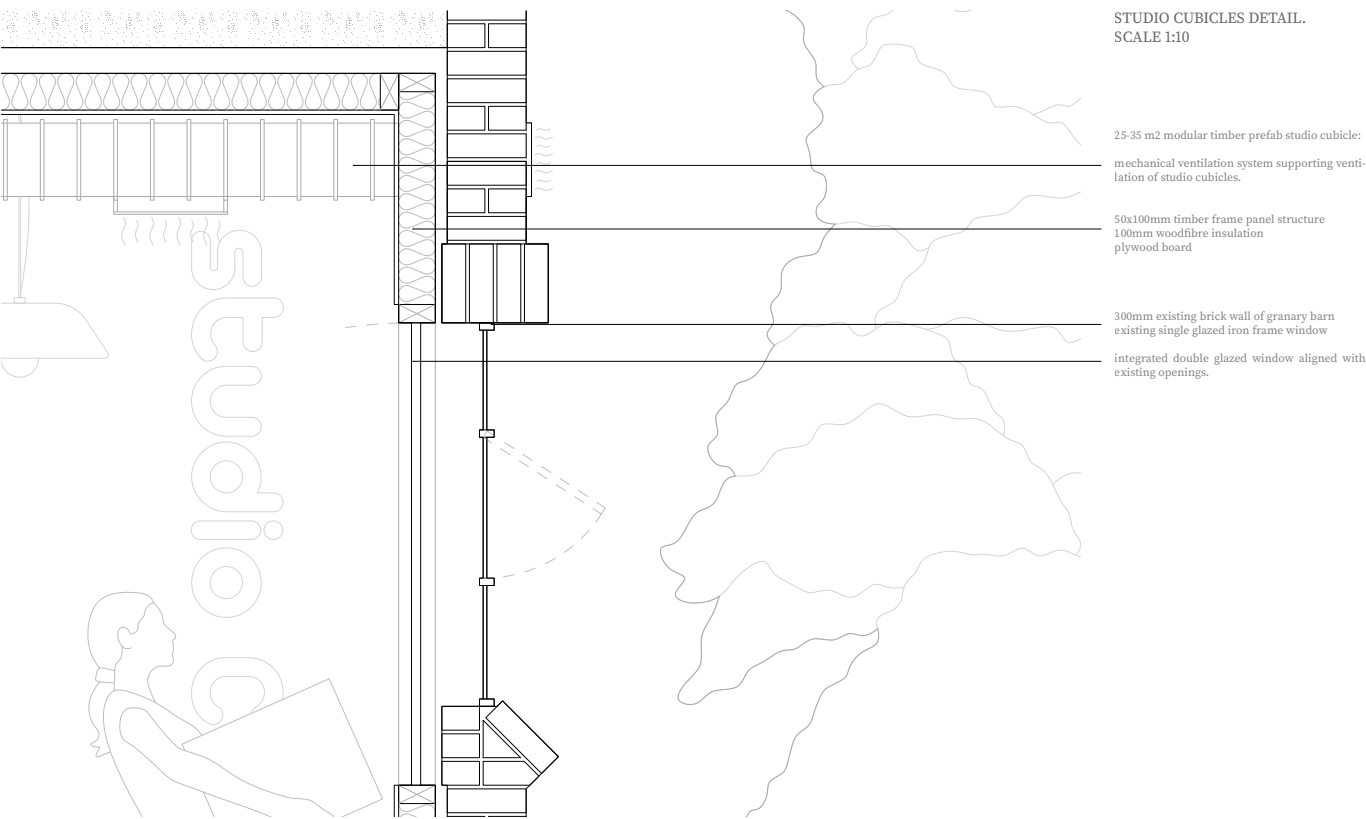
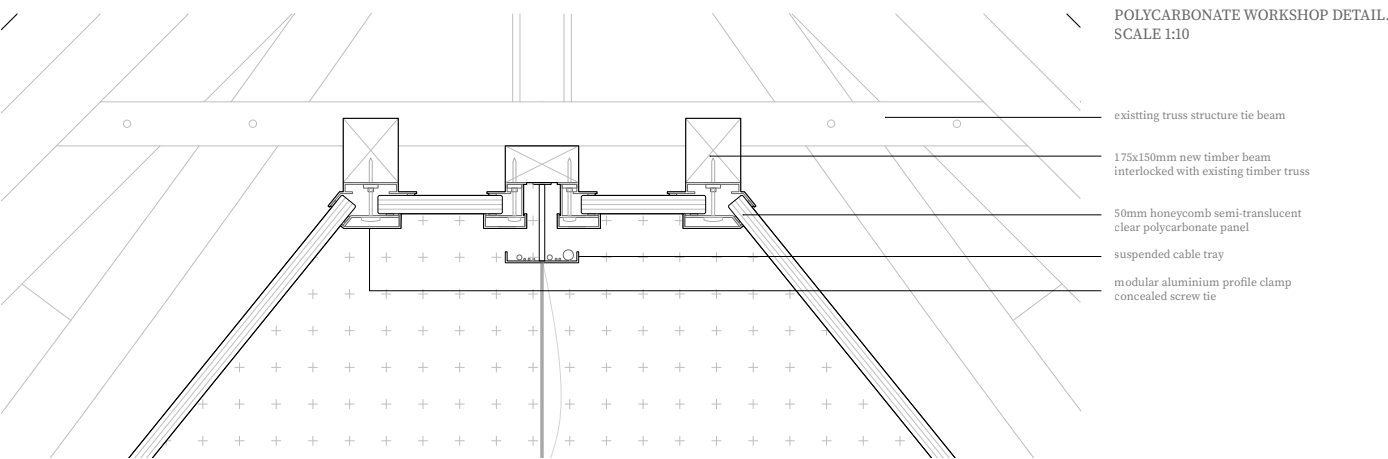
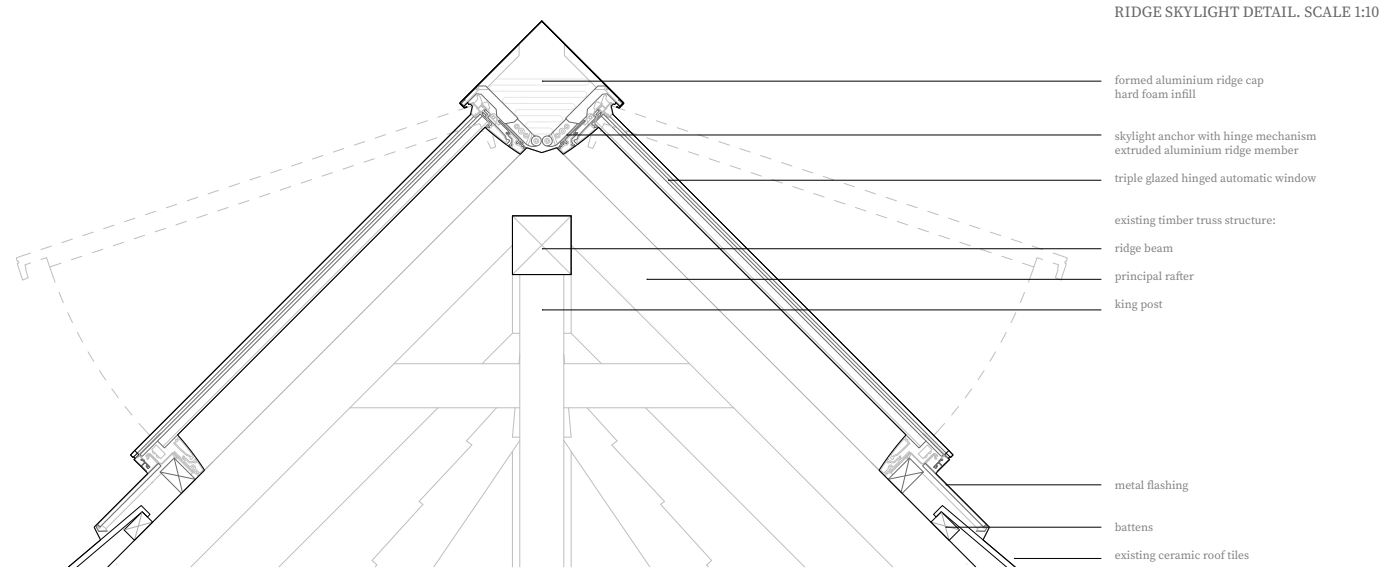
Granary barn adaptation



Granary barn adaptation



Granary barn adaptation



Granary barn adaptation: existing



Granary barn adaptation: daytime exhibition



Granary barn adaptation: evening workshop



Granary barn adaptation: workshop late evening



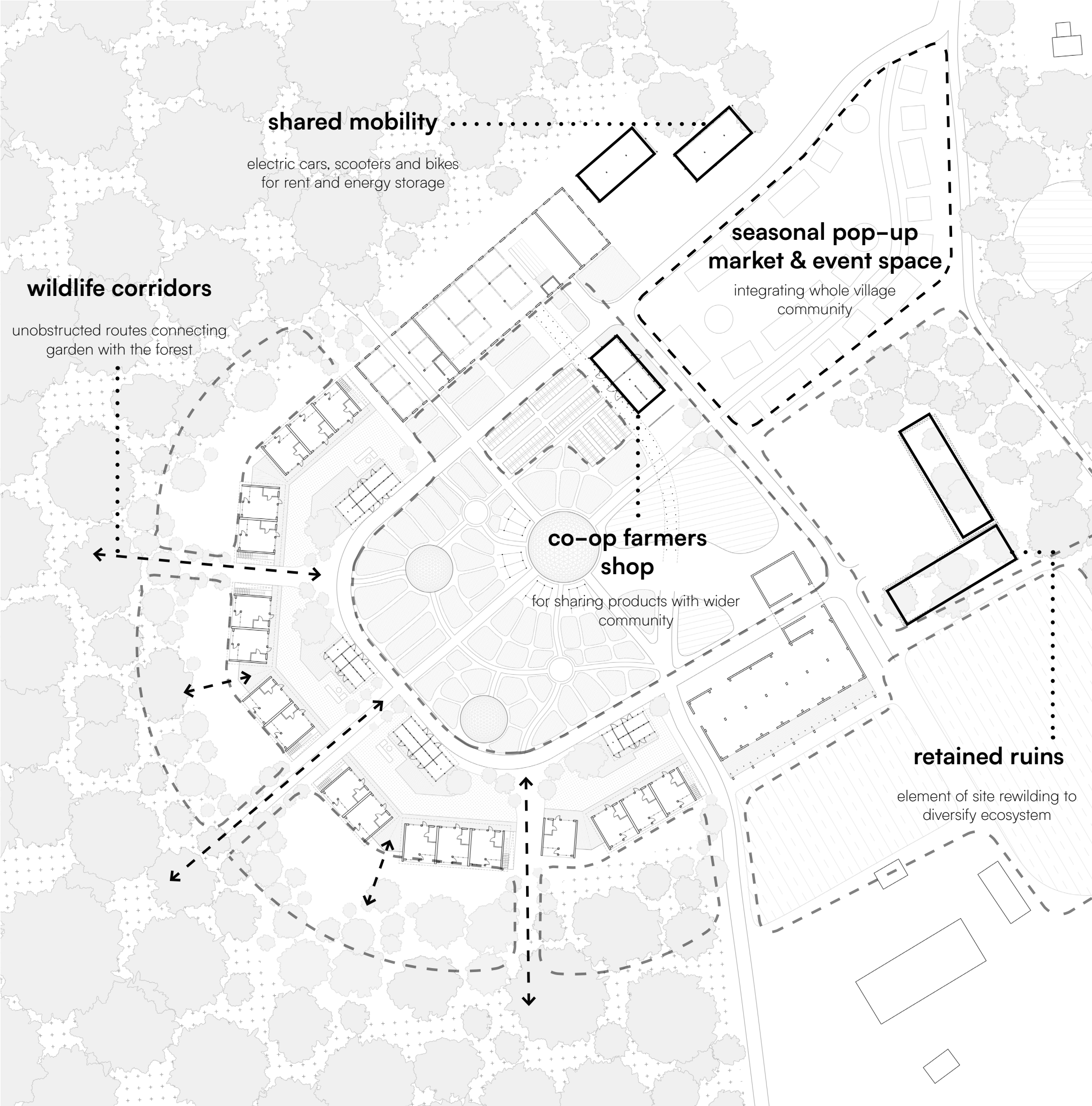
Granary barn adaptation: workshop detail



Granary barn adaptation: afternoon lecture



Masterplan proposal



Main entrance North-East



Main pedestrian entrance South



Restaurant and ruins



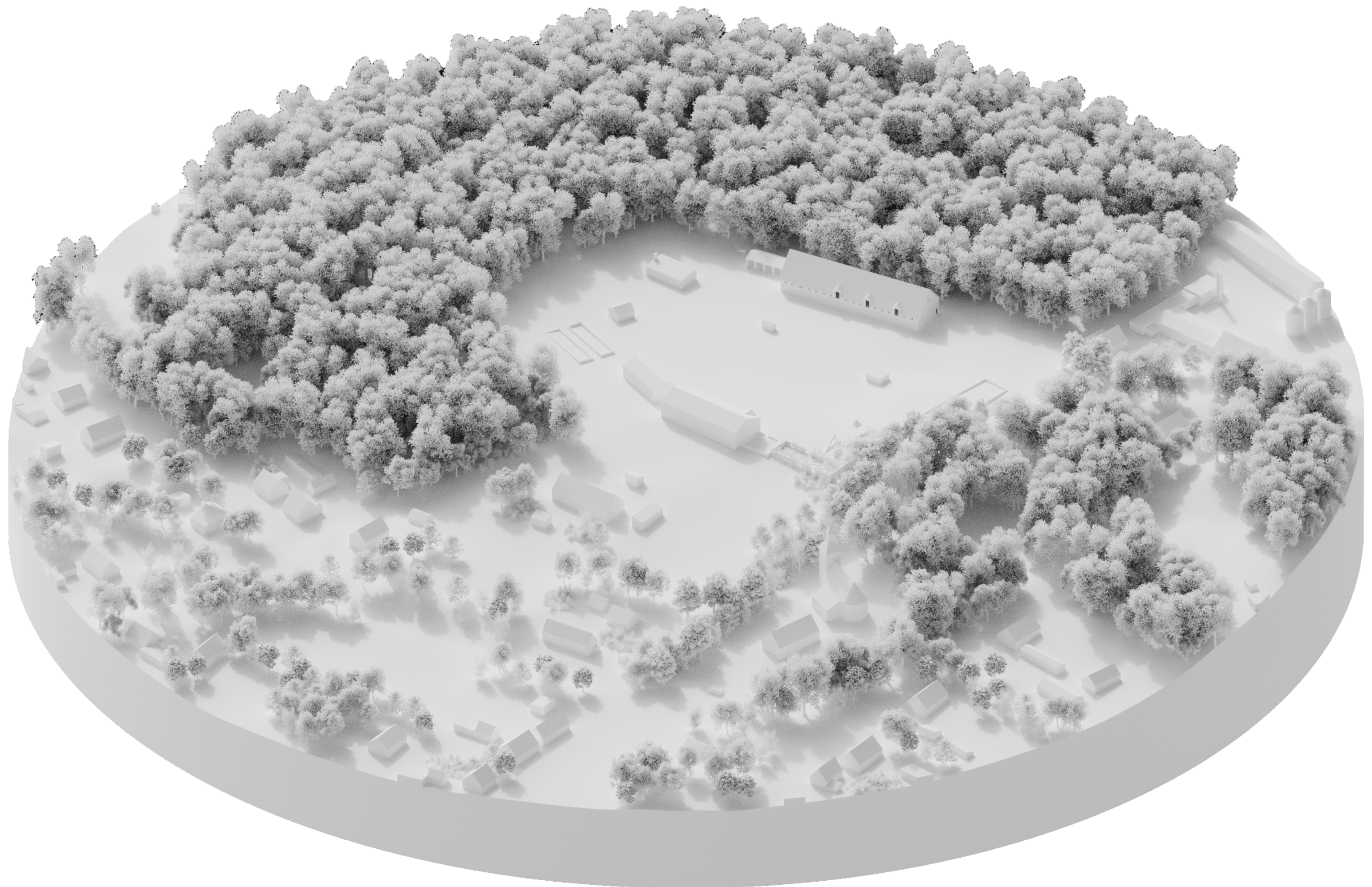
Restaurant and orchad



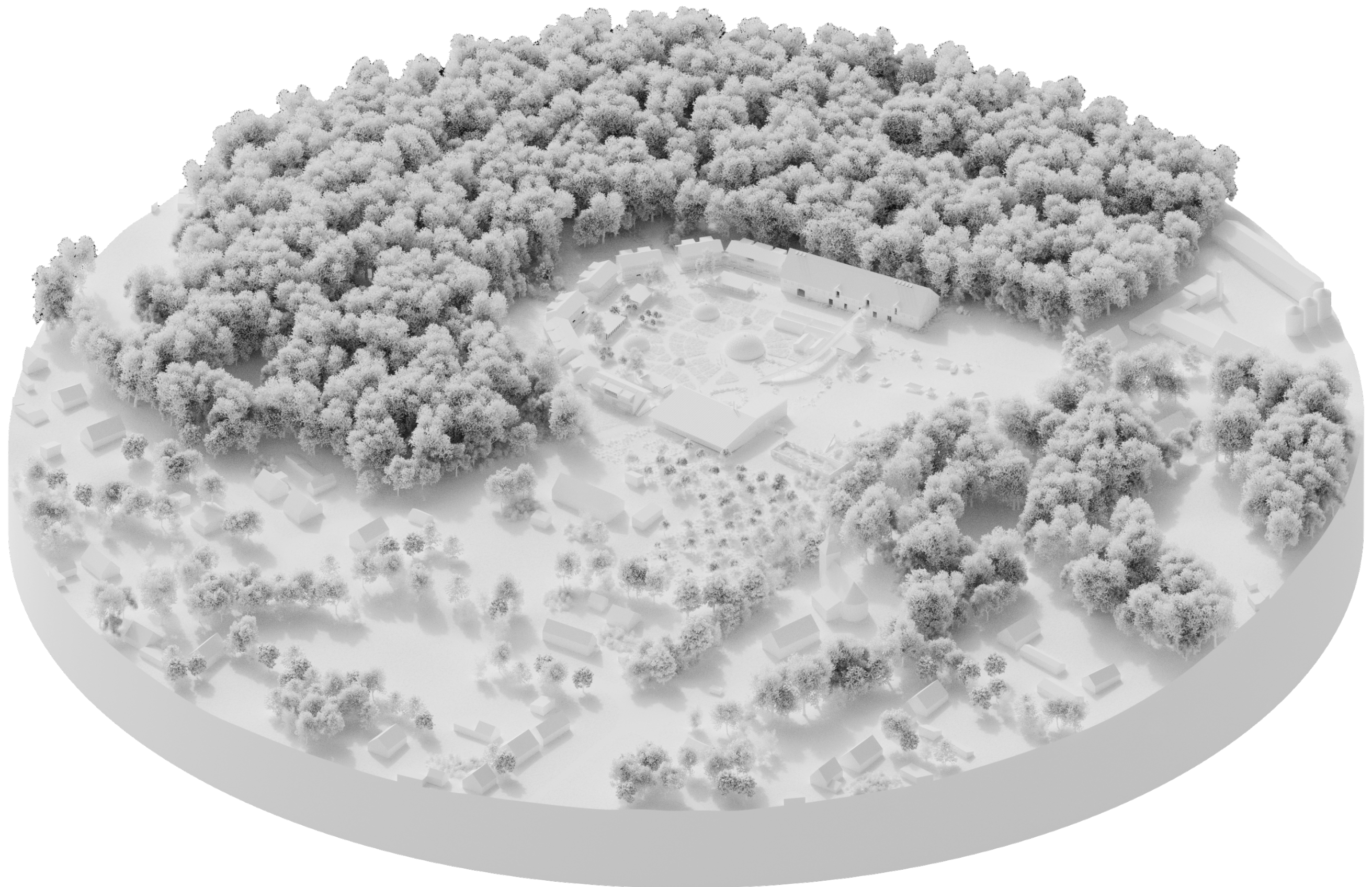
Walk after the summer storm



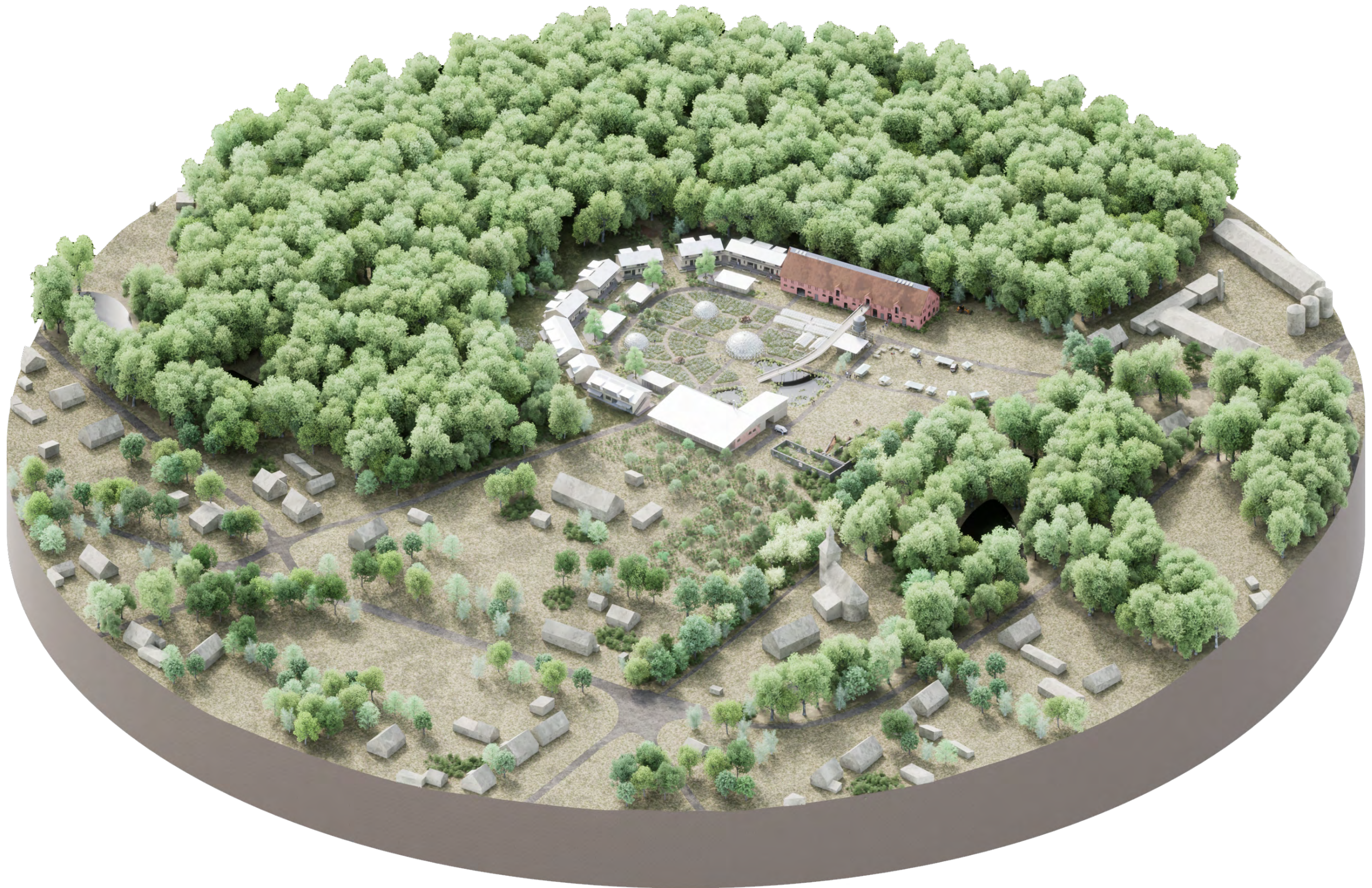
Reviving the Rural



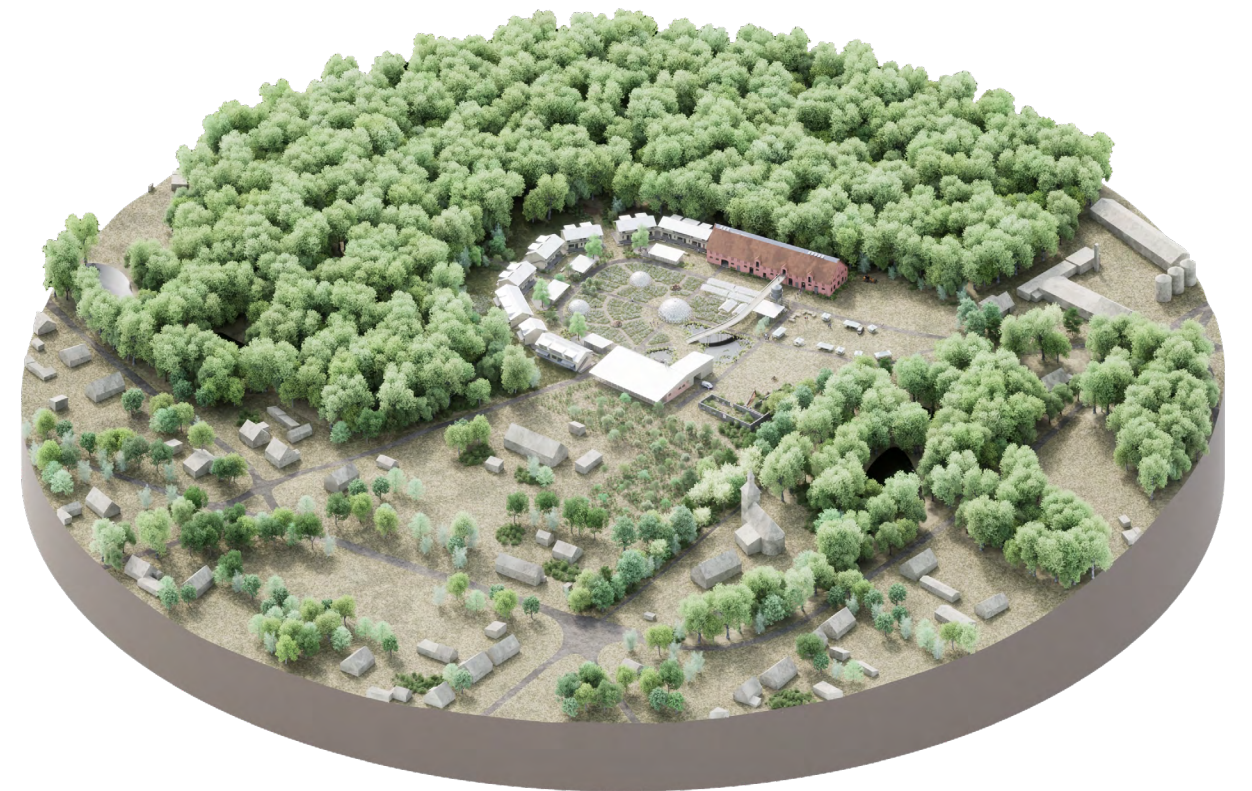
Reviving the Rural



Reviving the Rural

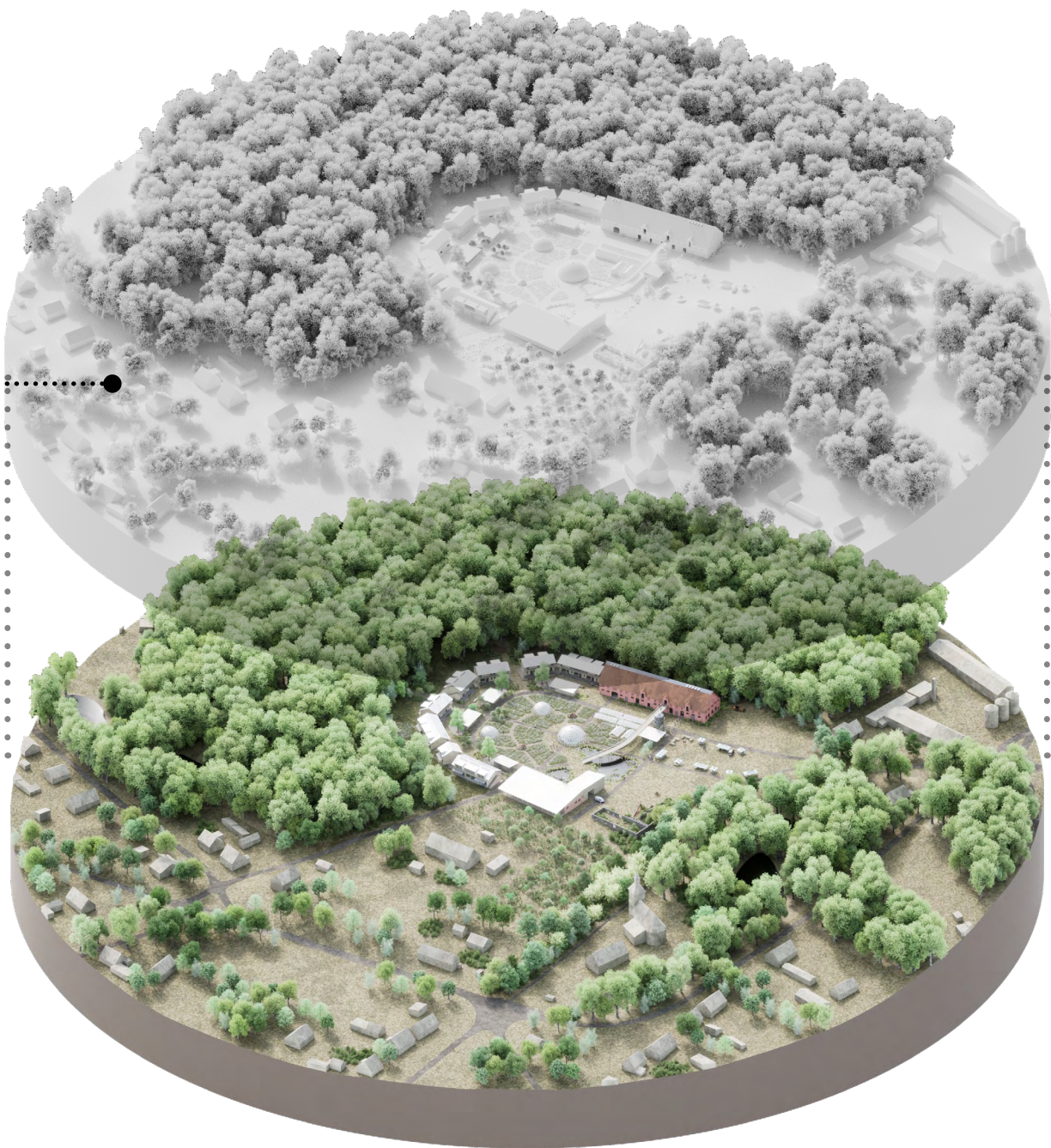
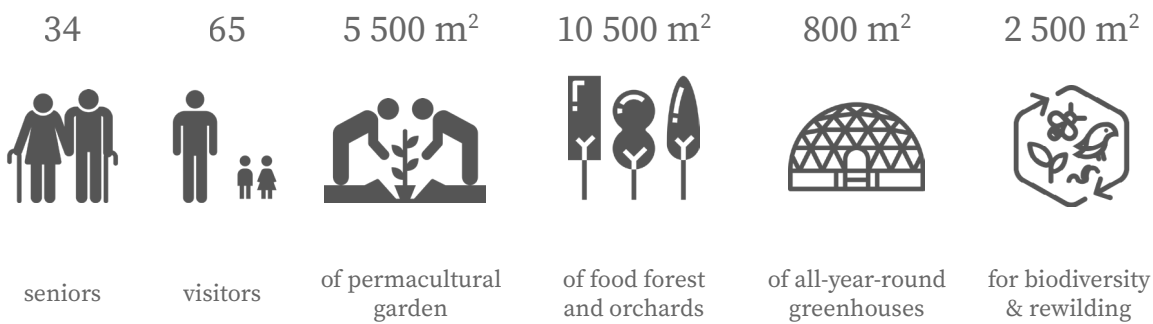


Reviving the Rural



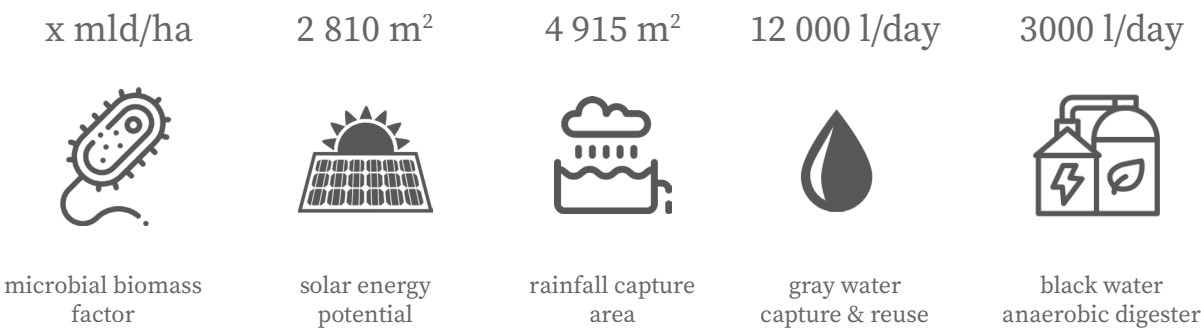
Reviving the Rural

holistically designed neighbourhood ecosystem

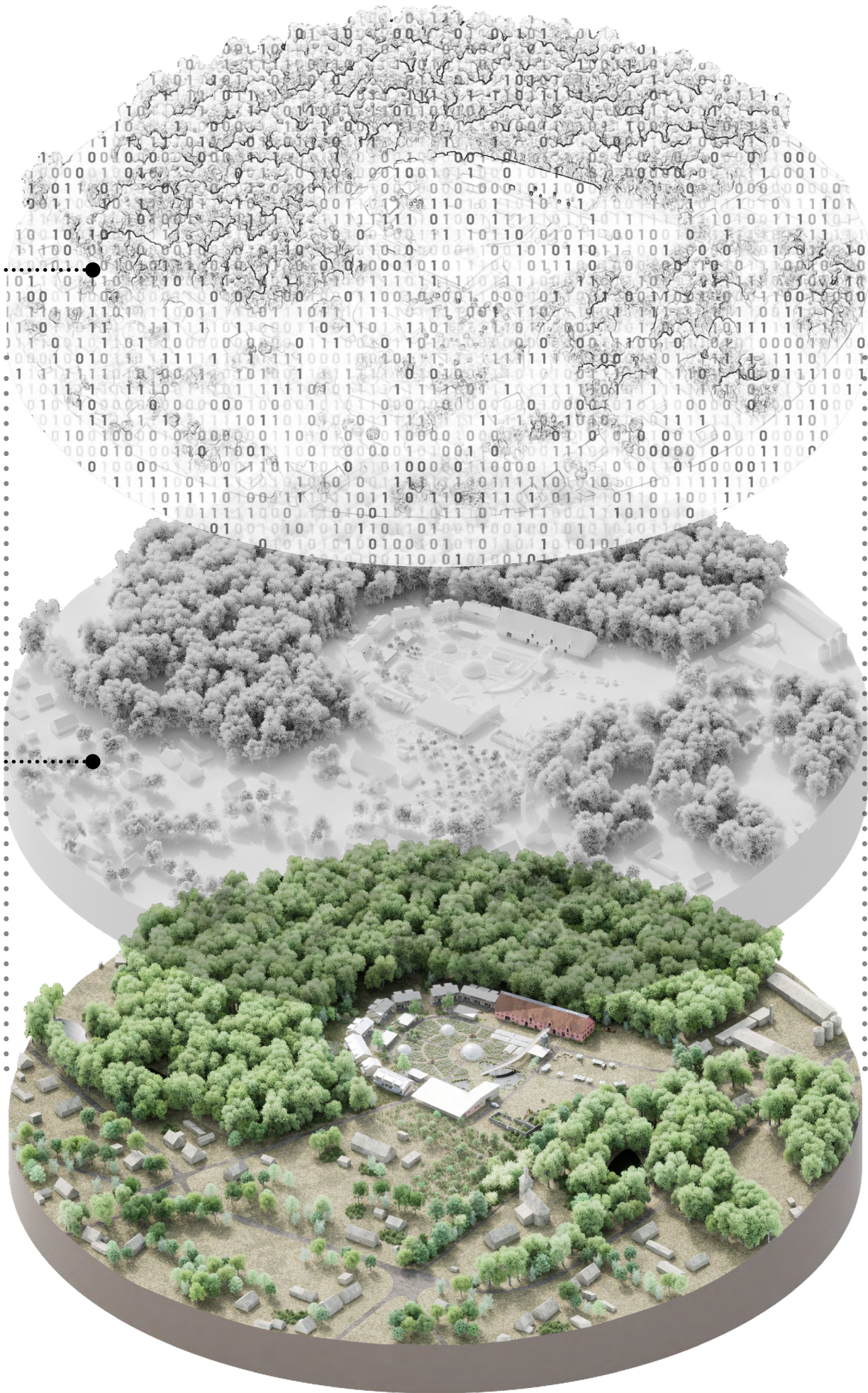
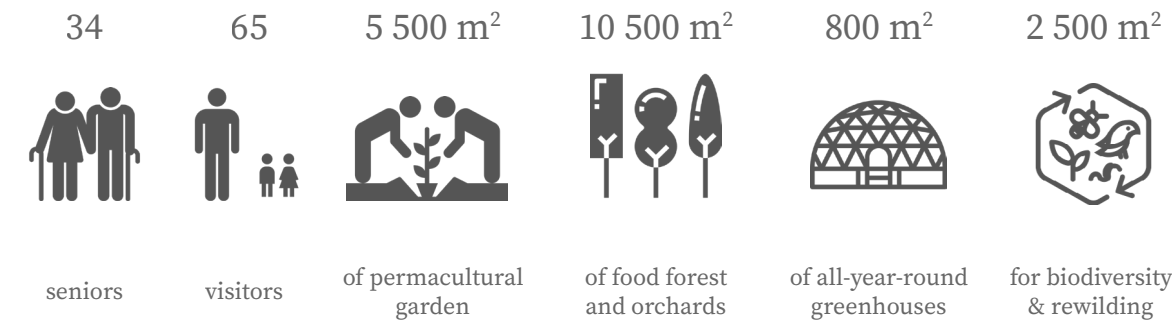


Reviving the Rural

digital twin – modelling resource consumption and production



holistically designed neighbourhood ecosystem



Reviving the Rural: wider context

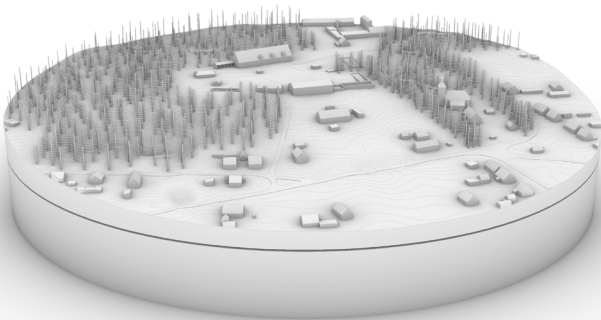




Reviving the rural

Identifying existing underused plots

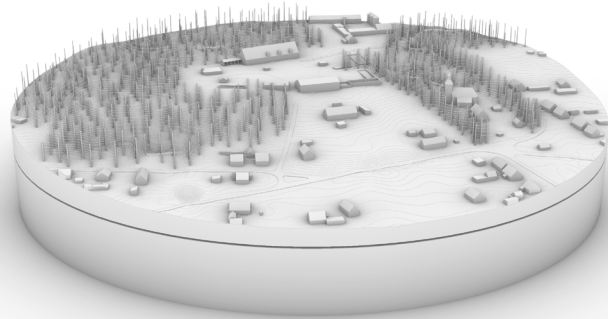
exploring the potential of former state owned farms



Reviving the rural

Identifying existing underused plots

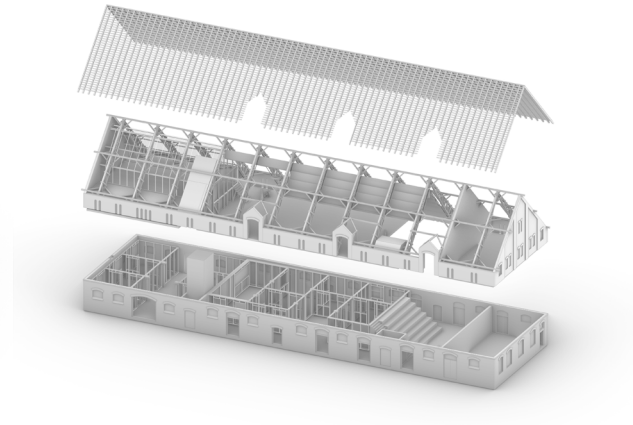
exploring the potential of former state owned farms



+

adapting existing infrastructure

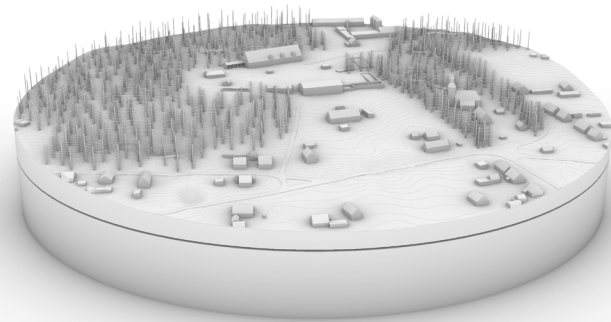
utilising adaptable barn architecture for public programme



Reviving the rural

Identifying existing underused plots

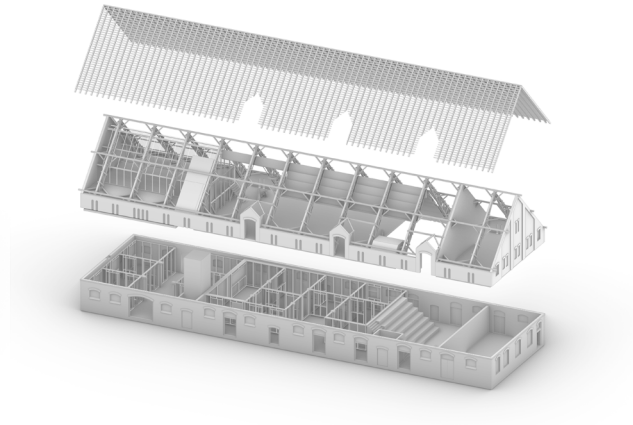
exploring the potential of former state owned farms



+

adapting existing infrastructure

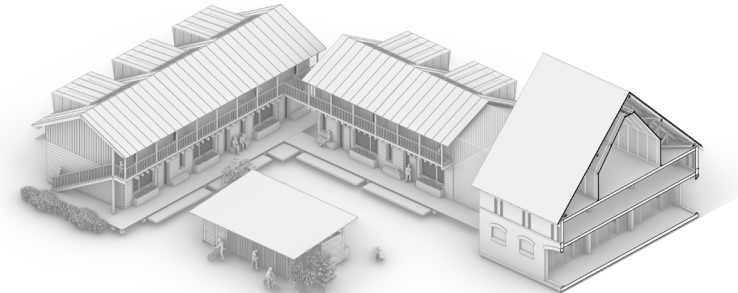
utilising adaptable barn architecture for public programme



+

popularizing shared communal living

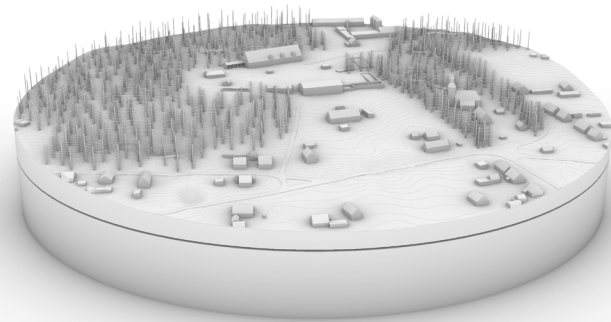
paired with on-site food & resource production



Reviving the rural

Identifying existing underused plots

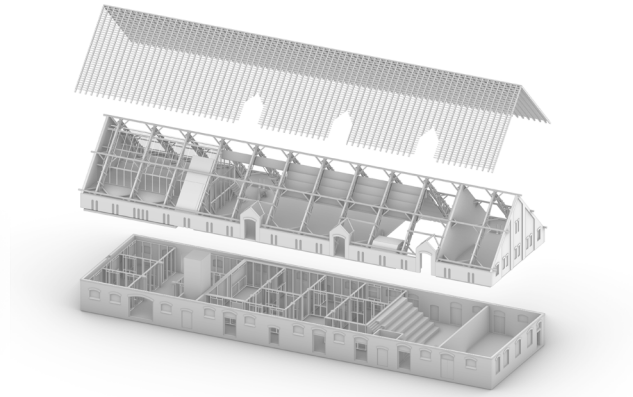
exploring the potential of former state owned farms



+

adapting existing infrastructure

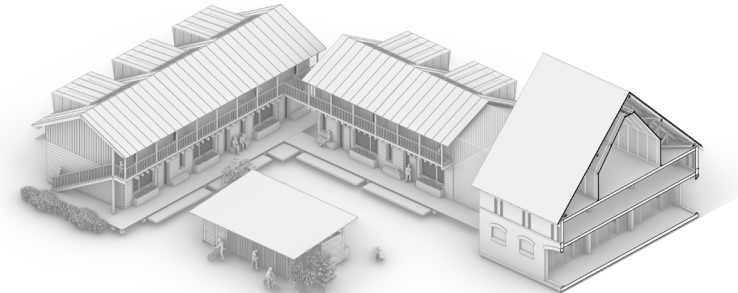
utilising adaptable barn architecture for public programme



+

popularizing shared communal living

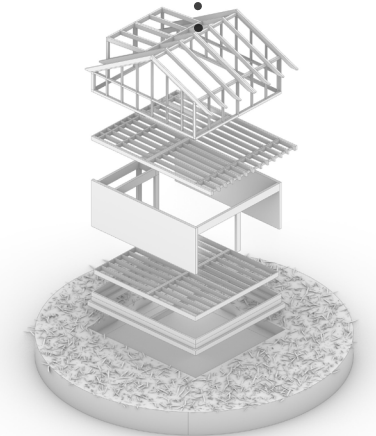
paired with on-site food & resource production



+

delivering quality prefabricated housing

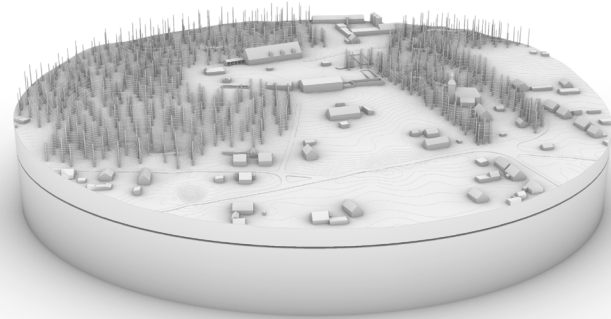
ensuring circular material sourcing and high thermal efficiency



Reviving the rural

Identifying existing underused plots

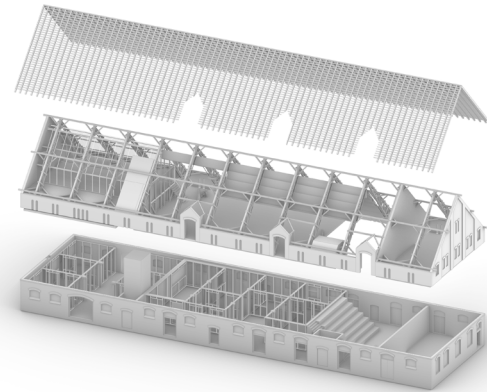
exploring the potential of former state owned farms



+

adapting existing infrastructure

utilising adaptable barn architecture for public programme



+

popularizing shared communal living

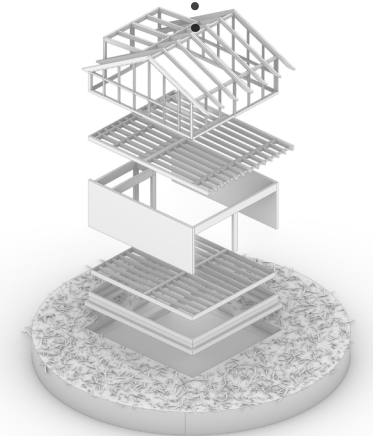
paired with on-site food & resource production



+

delivering quality prefabricated housing

ensuring circular material sourcing and high thermal efficiency



building upon unique local values

recognising and strengthening local economy



Vision for a...

- Locally productive -
- Globally connected -
- Economically competitive -
- Self-sufficient -

countryside



Vision for a...

- Locally productive -
- Globally connected -
- Economically competitive -
- Self-sufficient -

countryside

thank you.