URBAN GARDENS OF THE FUTURE: WADI HAWA

Imagining the urban gardening community of the future in Az Zubayr from an equitable perspective

P5 - Iman Mustafa
5259193
3-7-2025

حدائق حضرية في المستقبل : وادي الهواء

Ancient: The Fertile Crescent

- First region with settled agriculture, leading to early civilizations like Sumer, Babylon
- Key innovations: agriculture, irrigation, writing, wheel, glass
- Diverse climate and elevation supported high-yield crops and domestication
- Home to key neolithic crops (wheat, barley, lentils) and major livestock
- Many self-pollinating plants, allowing stable and independent agriculture

A 15th century copy of Ptolemy's fourth Asian map, depicting the area known as the Fertile Crescent

In this day and age...

Population Iraq:
41.2 million (2021)

Internally Displaced Persons:
1,186,556 (2021)

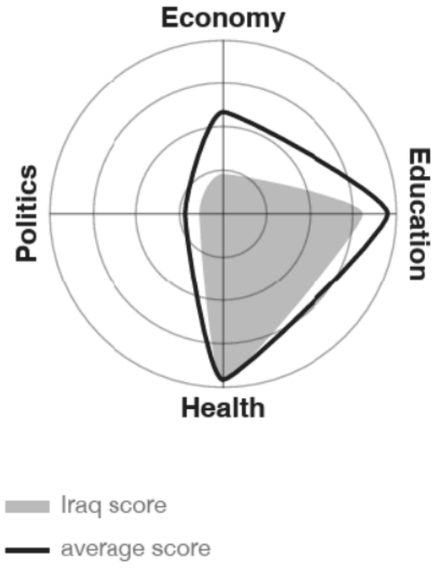
Mid-term projected temperature increase: 2.0°C (2050)

Increasing evapotransipiration, severe droughts & dust storms

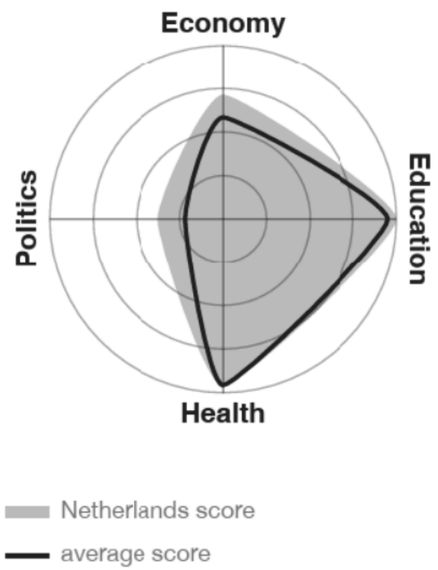
Decreasing annual rainfall, fewer rainy days and increasing water insecurity

25 per cent of households supported by agriculture (2017)

Iraq
gender gap score 0,54



The Netherlands
gender gap score 0,76

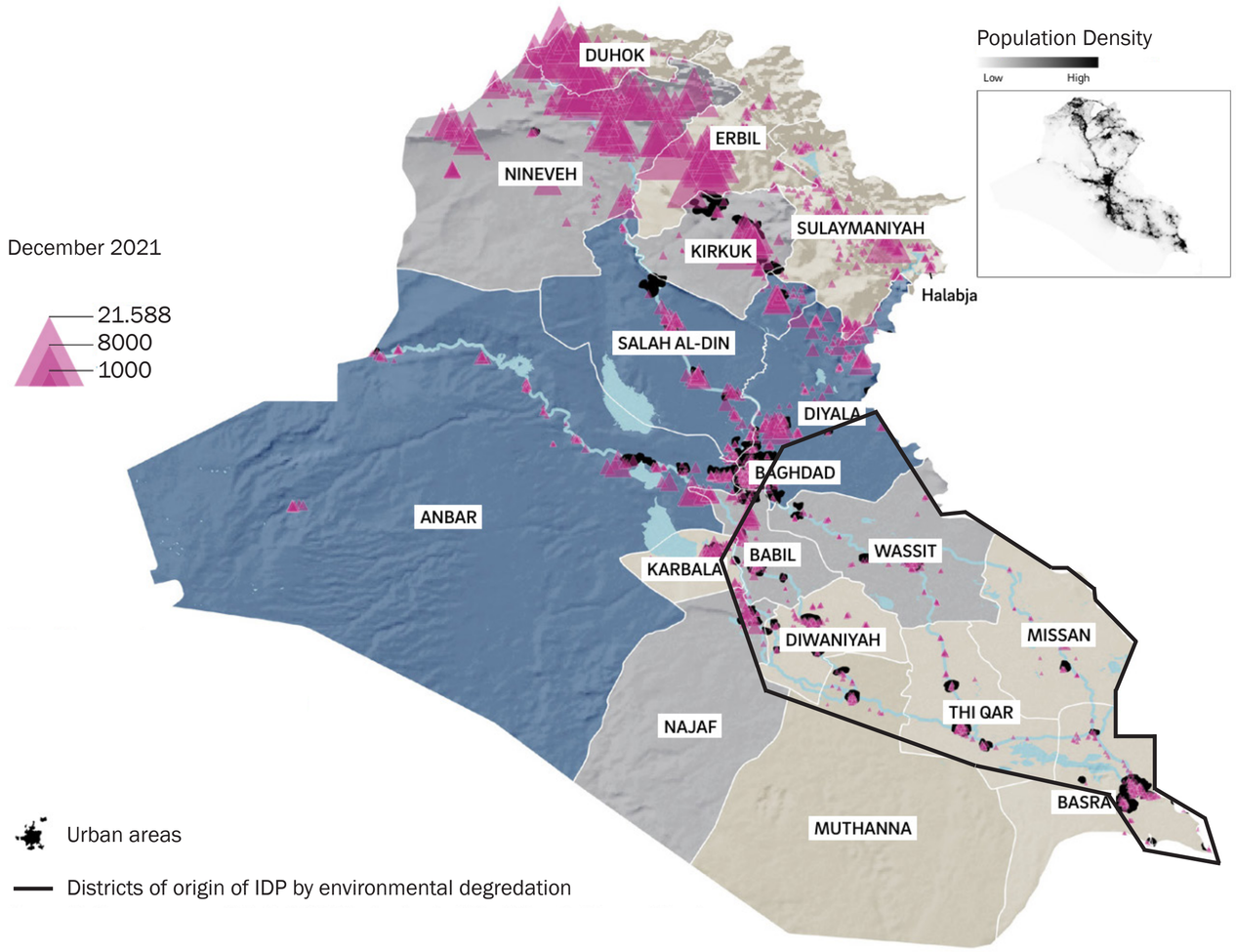


WEF. (2021). Global Gender Gap Report 2021. In World Economic Forum. https://www.weforum.org/reports/global-gendergap-report-2021

Internally displaced people (IDPs)

- IDPs northern Iraq –> ISIS war (2014-2017)
- Host community often within IDPs gouvernante

- In central and southern Iraq, the reasons are different:
- IDPs due to environmental degredation (marked area)
- This project: Internally displaced people with origin in Basra region



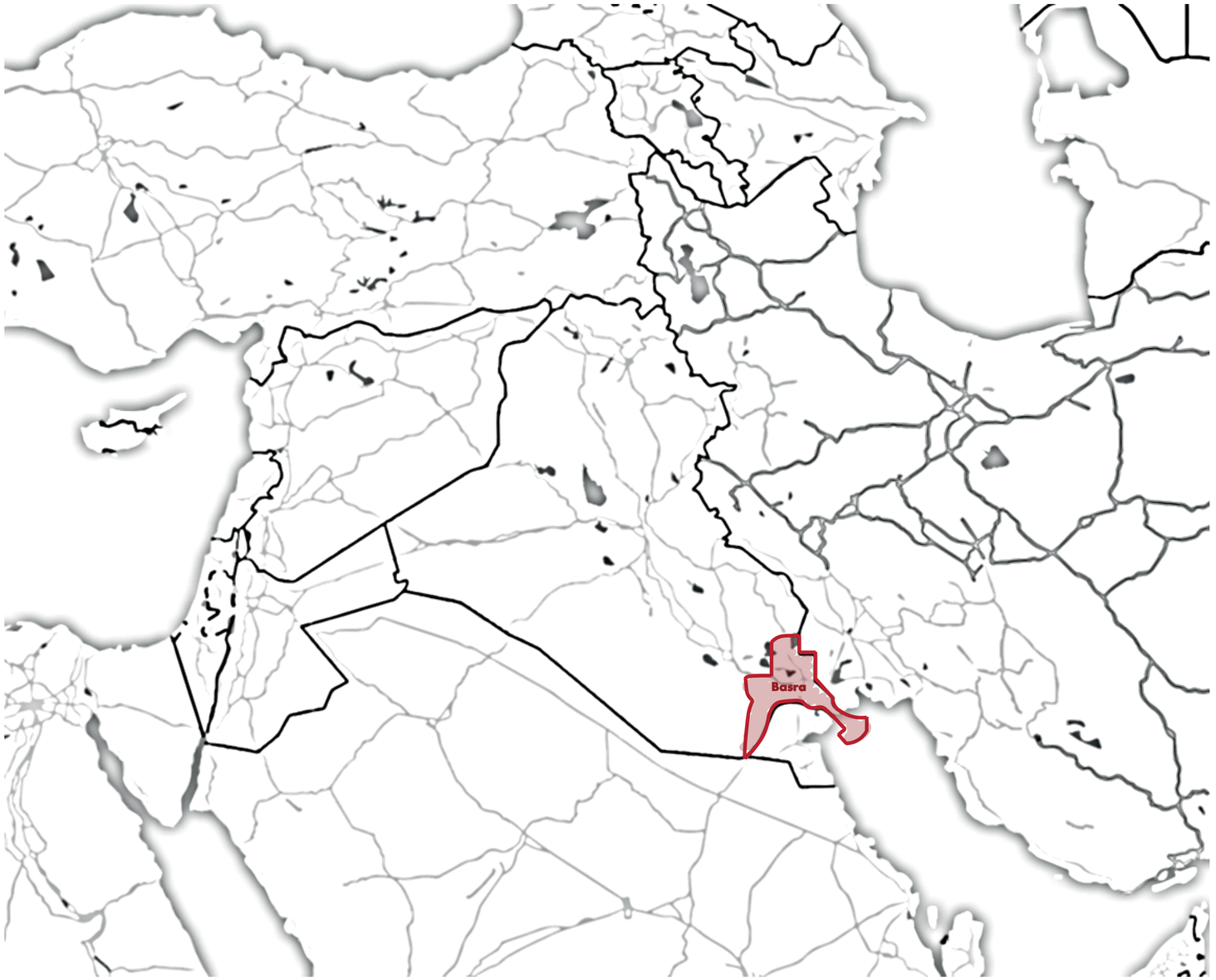
Edited from Iraq - National Displacement Profile 2023 (UNIOM, 2023).

Buffalo herder Haddam fills his boat with drinking water purchased miles away to keep his animals alive (Malfatto, 2021)

Sara (8) looking over at her family's empty boats (Garthwaite, 2023)

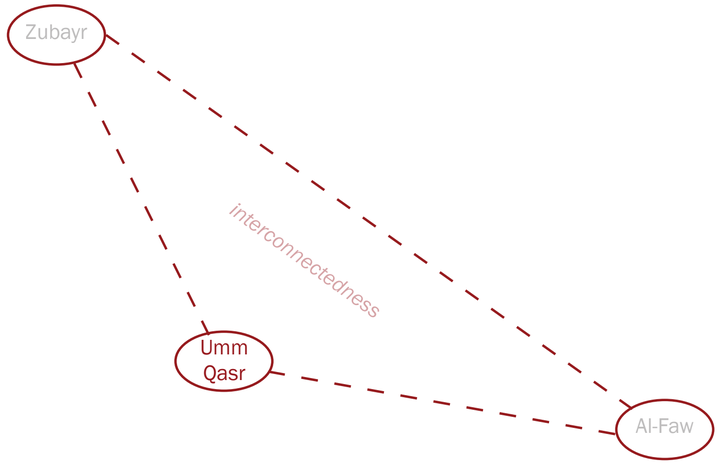
Severe oil pollution near the Shatt Al-Arab (Al Jazeera, 2023)

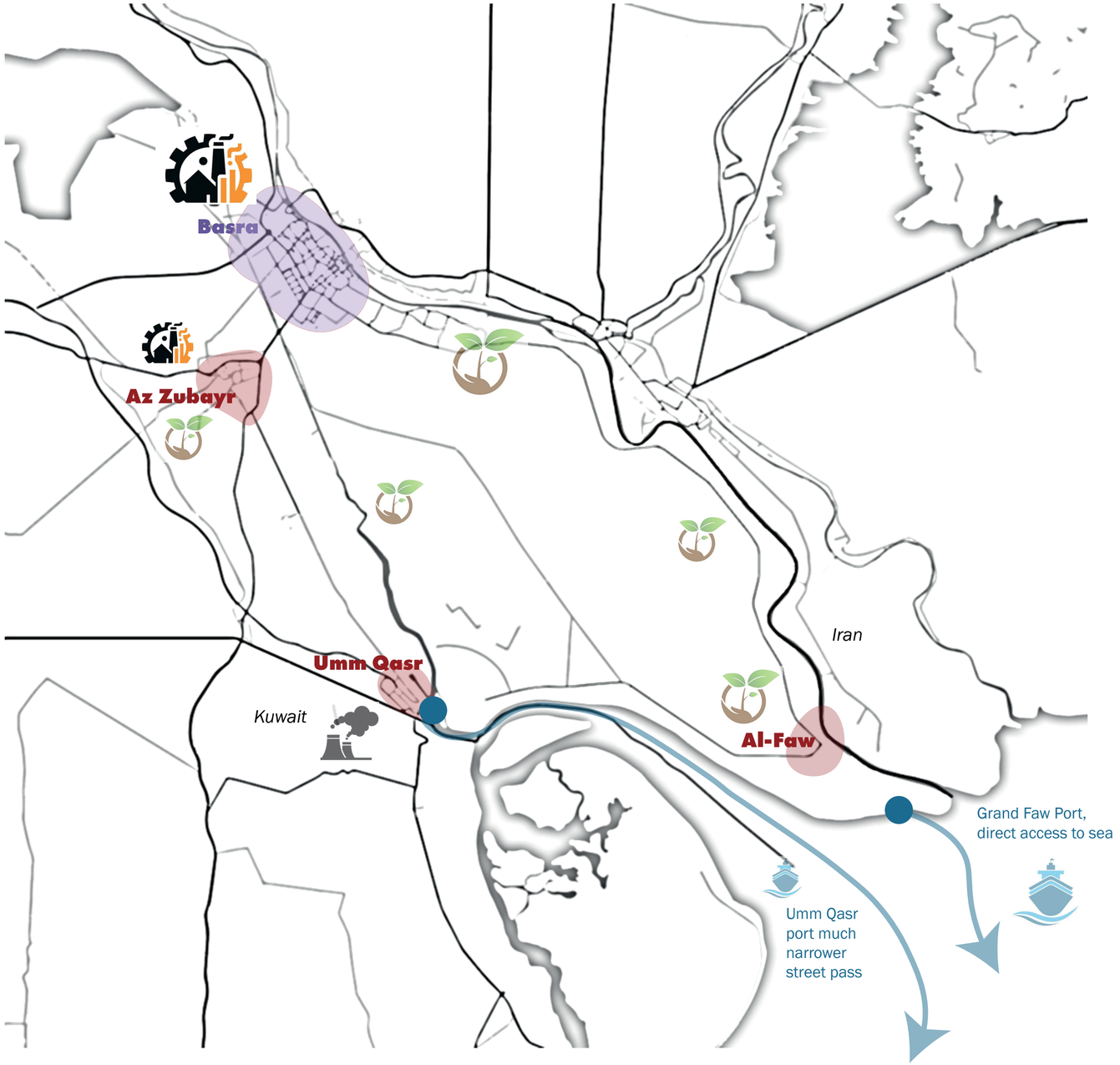
Three interconnected sites within the Basra region



- Kuwait south of Umm Qasr, Iran east of Shatt Al-Arab
- There are 5 larger cities in this region,
- Iraq has dealt with decades of war since the 1980s

- **Umm Qasr** was Iraq's main deepwater port city, but has limited
  water depth, space constraints and lack of direct Gulf access
- displacement of families to other cities in the Basra gouvernant

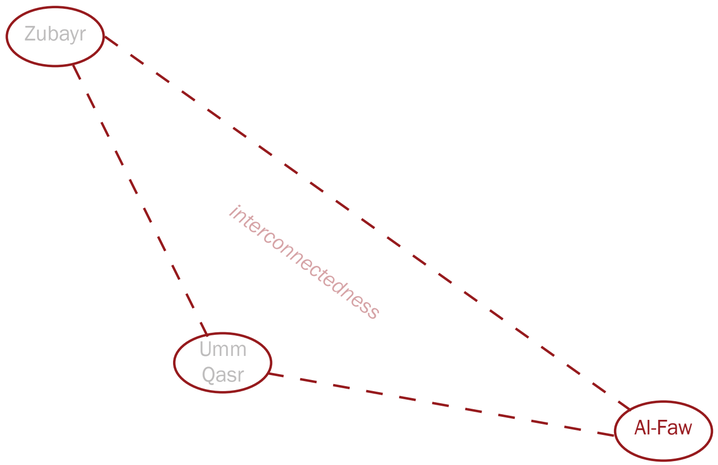


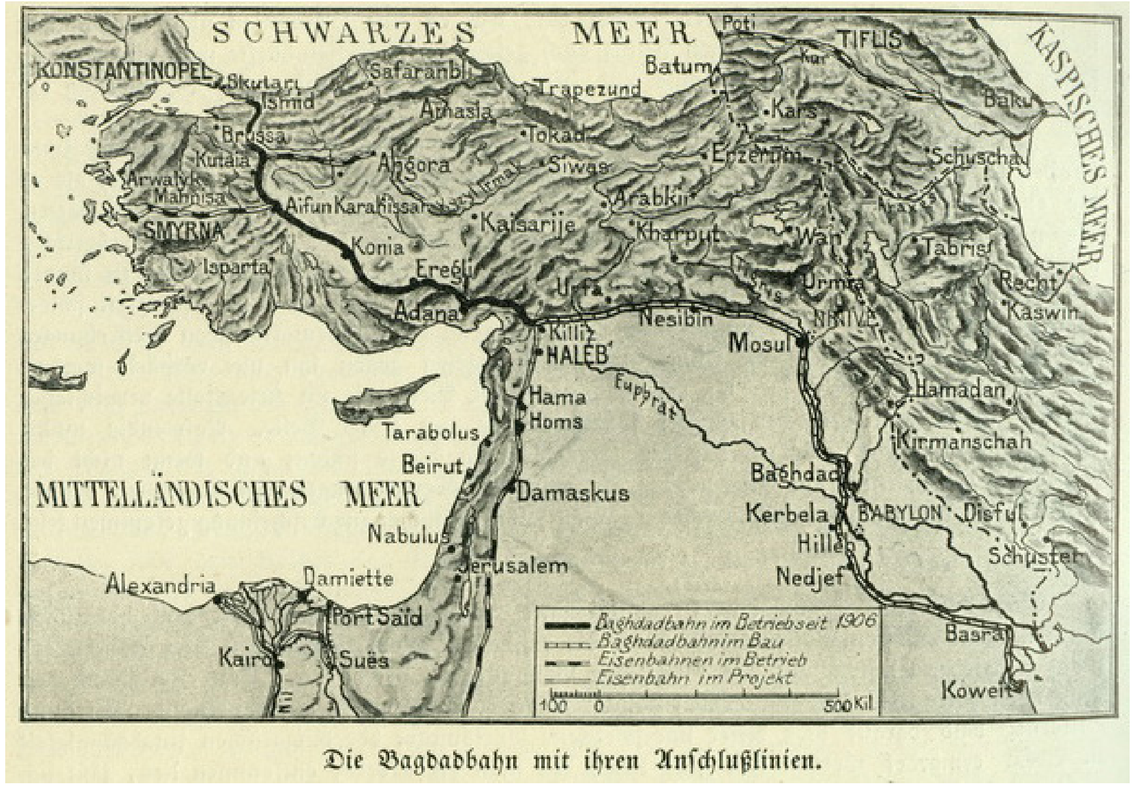


Highlighting the 5 larger cities in the Basra Gouvernante

N

- Revitalisation projects
- Expanding the already existing port of Al-Faw, alongside a high-speed railway network: The Grand Faw Port
- **Al-Faw** port was small, focused on local rather than international maritime activities
- Supposed to change the global transport map by becoming the biggest and most modern port of the region, strengthening Iraq's geopolitical position
- Linking the east to the west through a 'dry canal', the Iraq Development Road
- Through a network of railways and roads (Berlin-Baghdad railway)



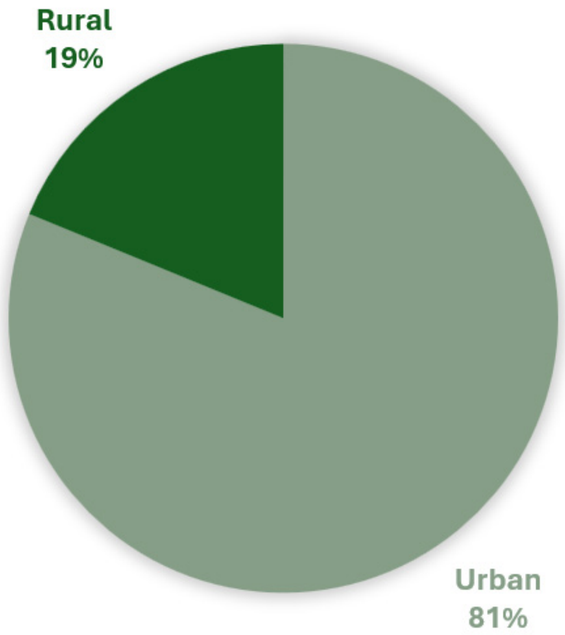


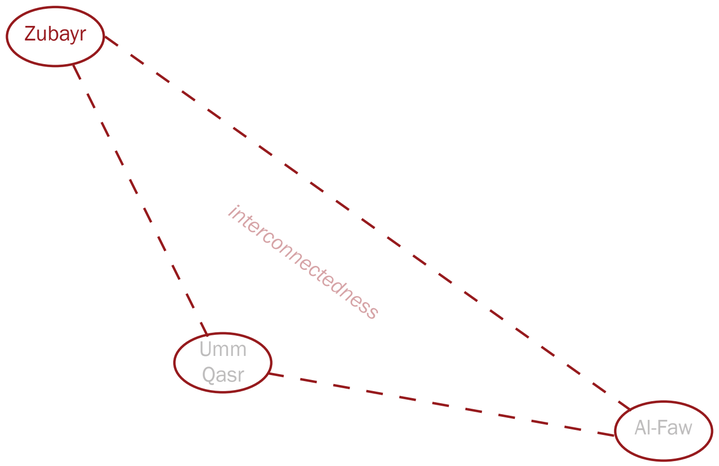
Die Bagdadbahn mit ihren Anschlußlinien.

The map showing the Berin-Baghdad railway and the deal (12.240.000 Reichsmark) between the Germans and Ottomans

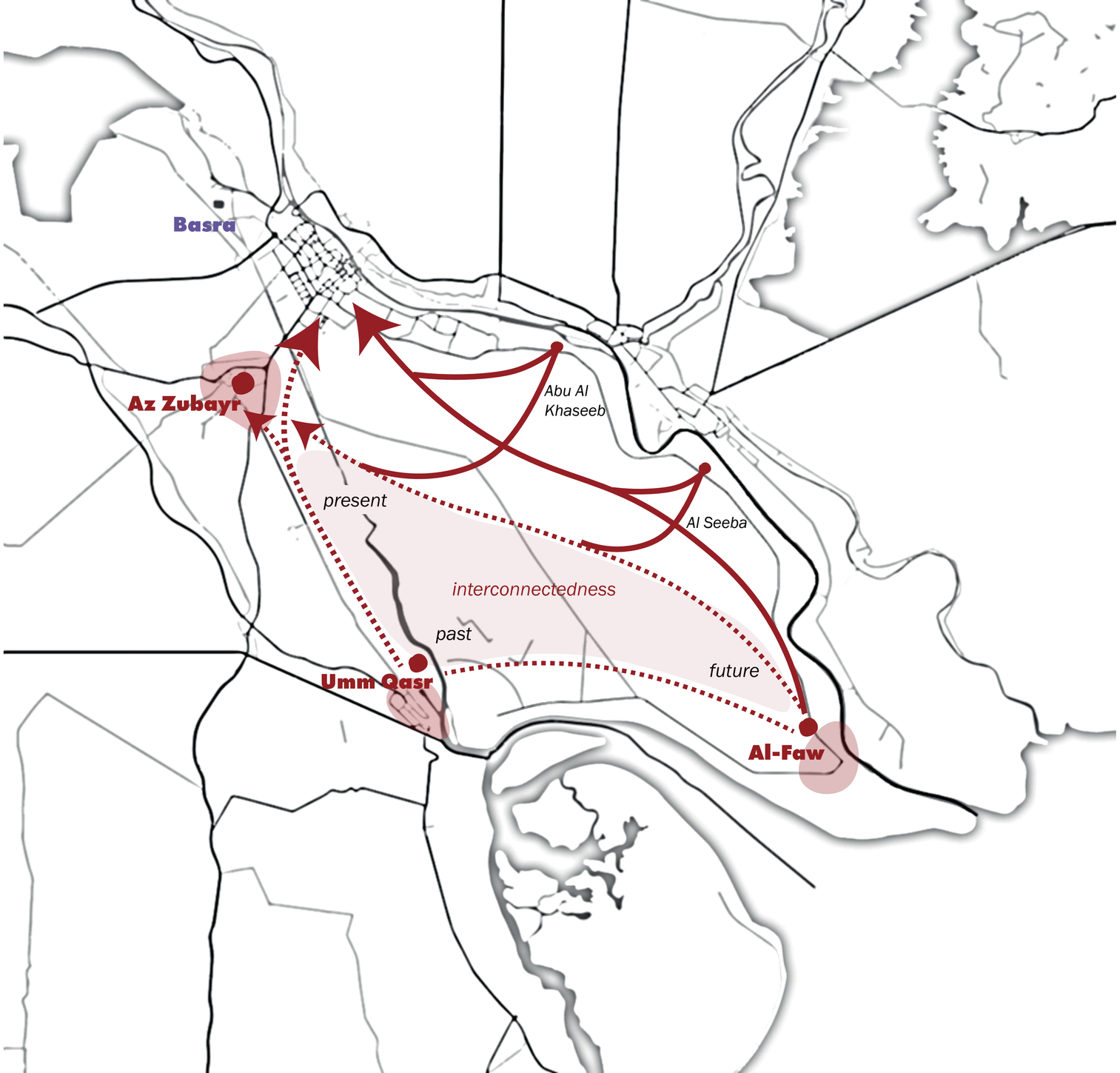
Al-Faw city from birds eye view (Eiraqiin, 2021)

Al-Faw masterplan by Technital Italian engineering firm (Technital, 2024)


Rural
19%
Urban
81%


Zubayr
interconnectedness
Umm
Qasr
Al-Faw

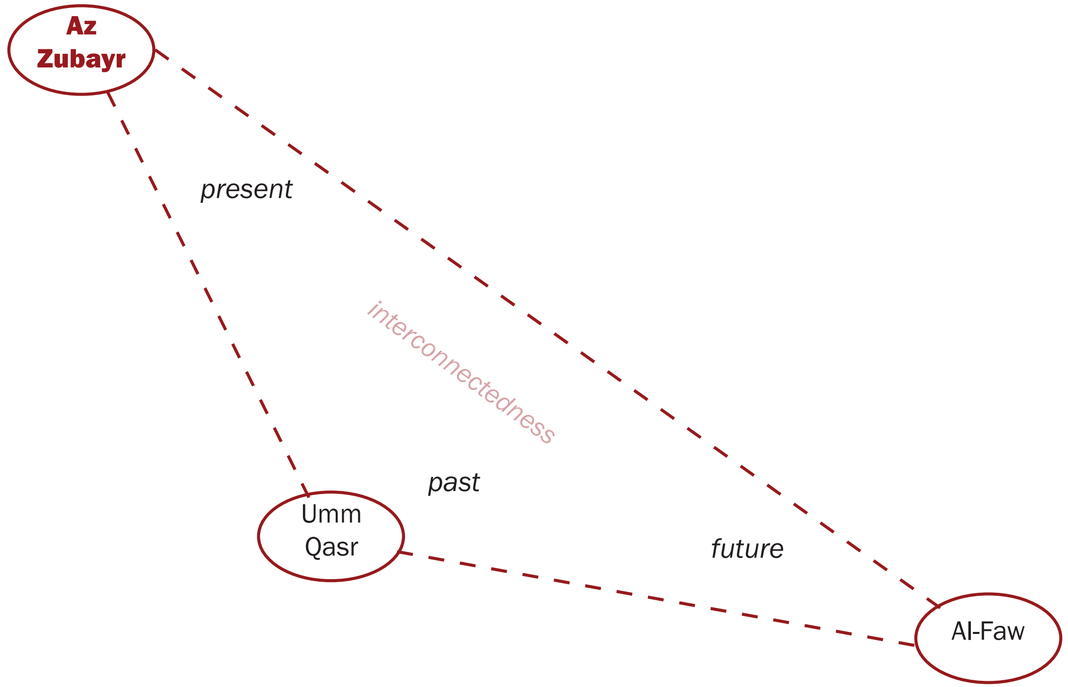
Internal migration flows



Problem Statement

–> Iraq is undergoing through ambitious infrastructure projects, including the Grand Faw Port in the Basra region, which is reshaping local dynamics. The cities of Umm Qasr, Al-Faw, and Az Zubayr are **interconnected** through environmental, economic, and migration challenges.

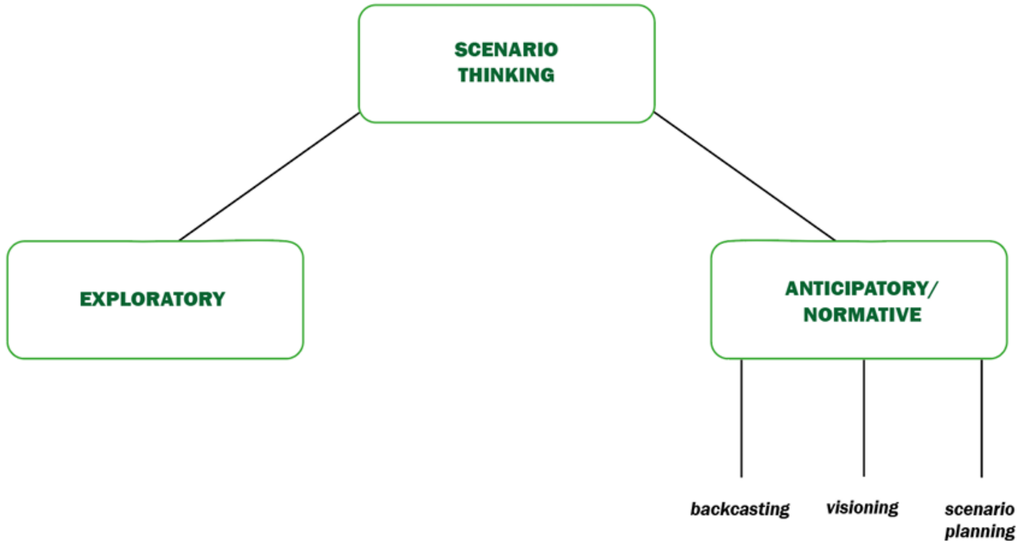
–> **Umm Qasr**, facing severe pollution and political tension, is experiencing displacement, while **Al-Faw**'s new port is expected to change and perhaps the the role of the port of Umm Qasr, changing regional trade patterns. The citizens of Al-Faw are also facing displacement due to drought and high salinity levels. **Az Zubayr,** already growing rapidly due to migration, is an emerging hub for both displaced populations and innovative agricultural practices.



Scenario thinking as a methodological and conceptual tool

This research and design recognises that the major infrastructure projects cannot be stopped by this project, but adopts a critical design approach to these challenges.

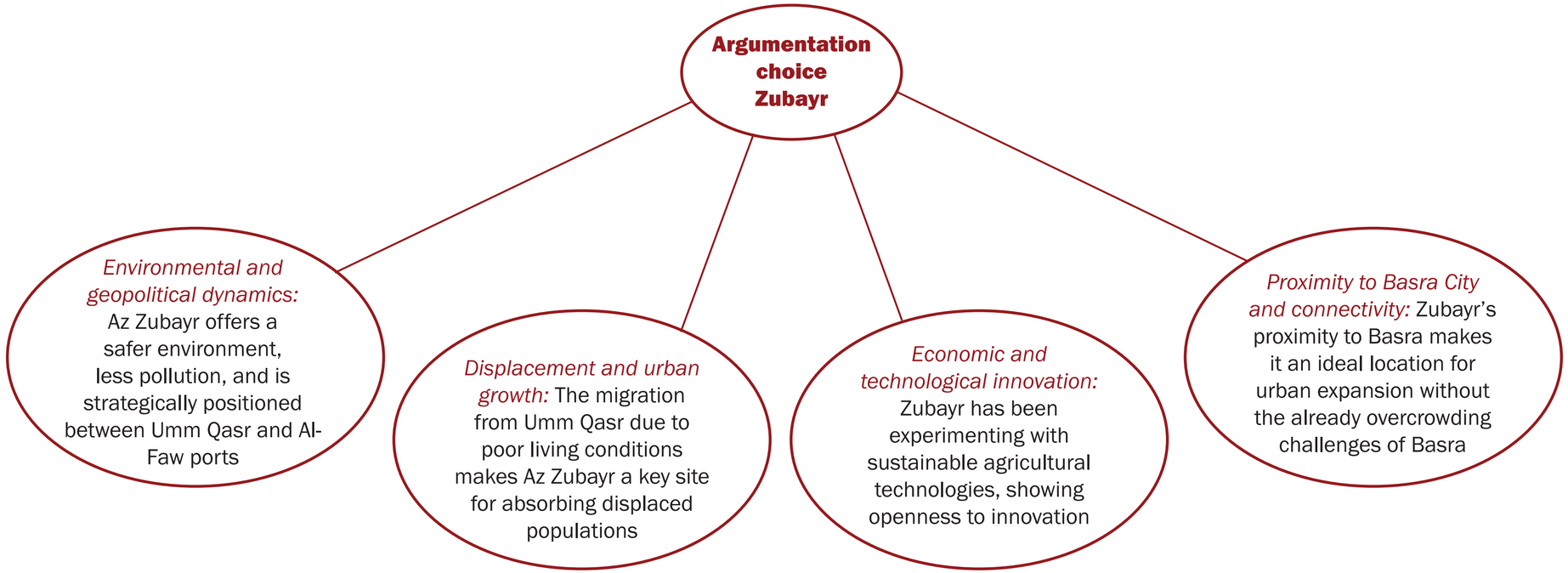
--> *Aim:* The focus is to find ways to mitigate their negative impacts and to push for equitable development. This means taking into account the displaced communities, the host community, and marginalised groups. In addition, protecting and preserving the environment in the design is part of this too.



Scenario

--> This project:

- **Internally displaced people with origin in Basra region**
- **Chosen host community is the city of Az Zubayr**
- **Close attention to marginalized groups and environments**



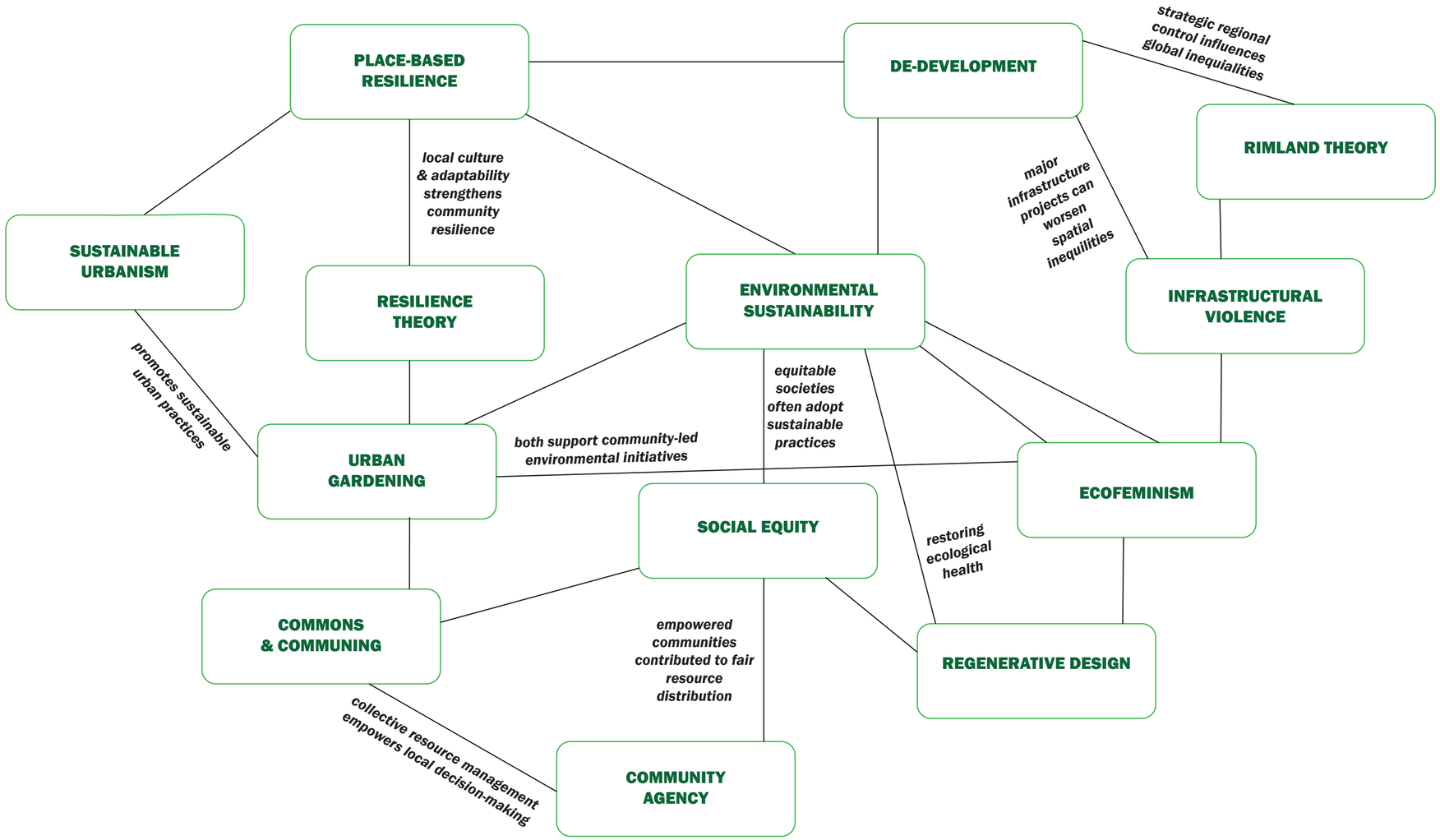
Research Questions

In which way could we imagine the urban gardening community of the future in Az Zubayr, from an equitable perspective?

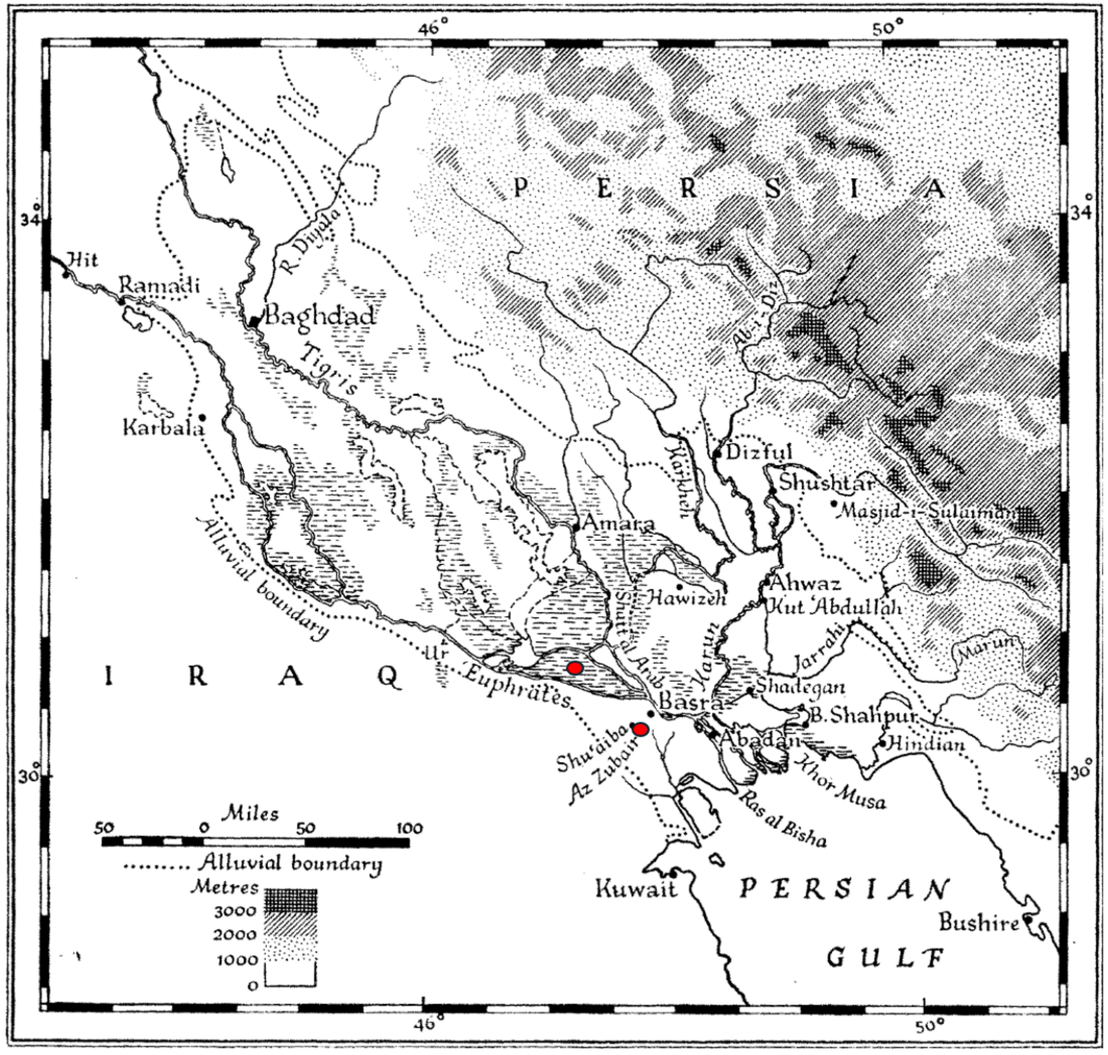
The sub questions:
1. What are the historical and urban backgrounds of the three interconnected sites, through the lens of infrastructure?

2. Through which spatial interventions can urban gardening and commoning translate in a way that enhances social bonds within the envisioned new community, through an equitable perspective?

Theoretical Framework



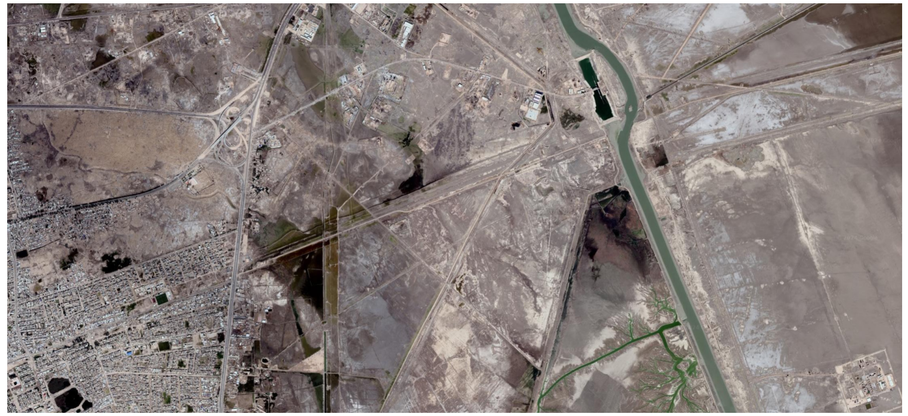
Alluvial boundary

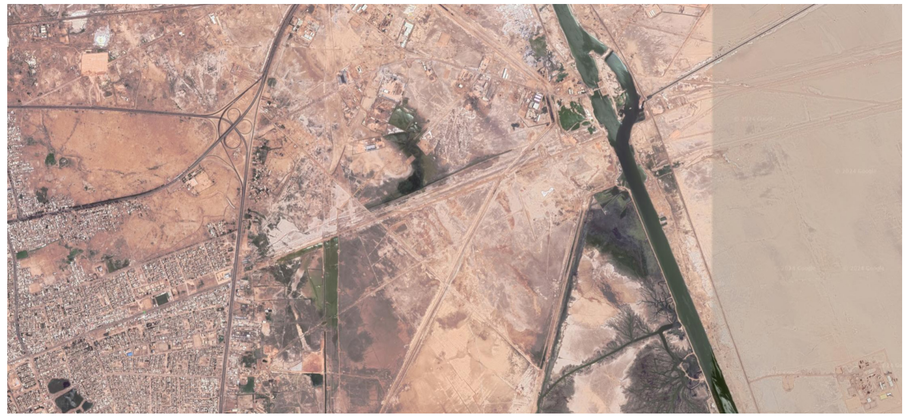


: The Mesopotamian plains (Lees & Falcon, 1952)

Satellite photos sequence

Zubayr in time






Site
in time









Site area analysis: *existing buidings*

N

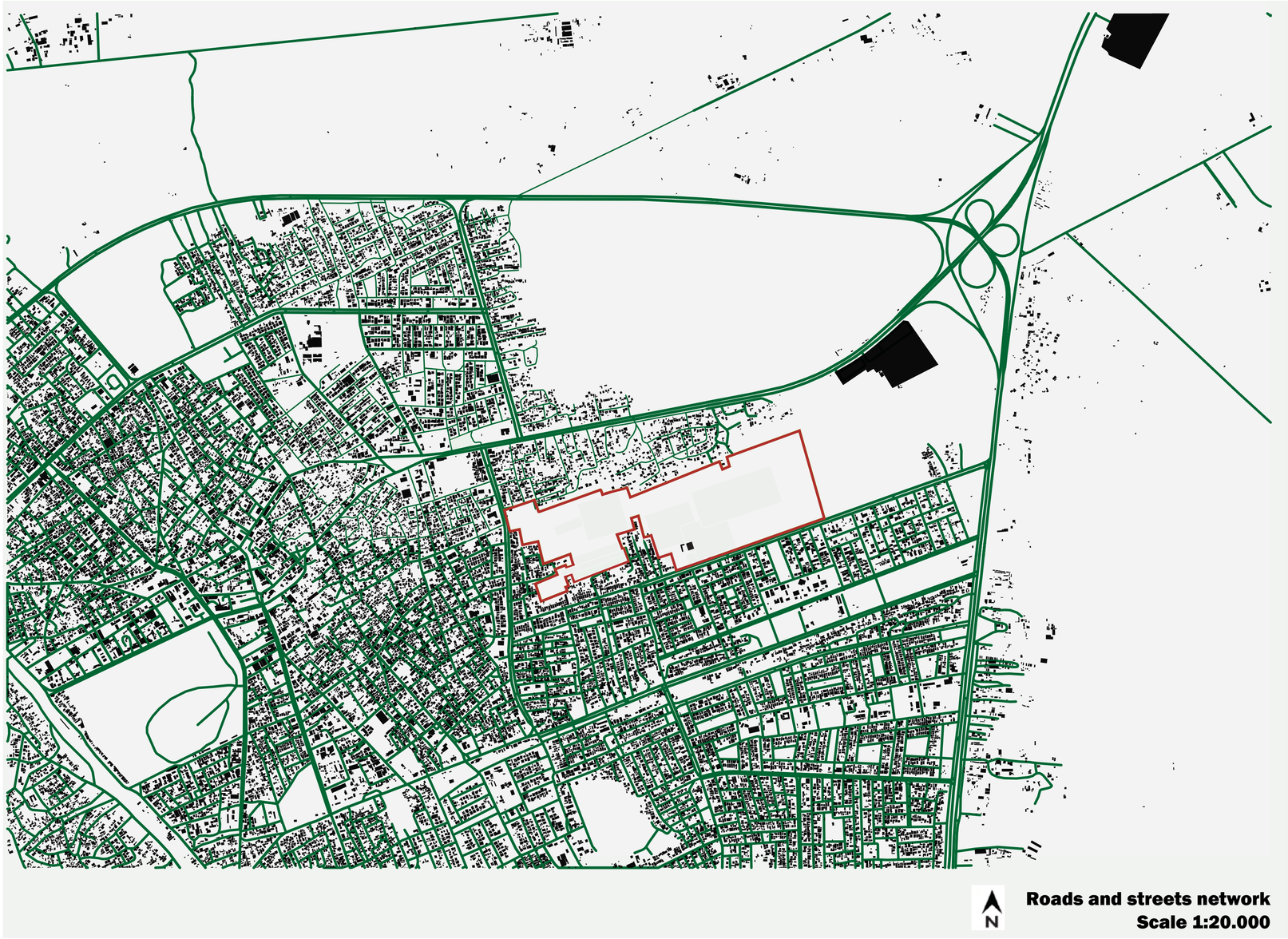
Buildings and plot
Scale 1:20.000

Site area analysis: *infrastructure*

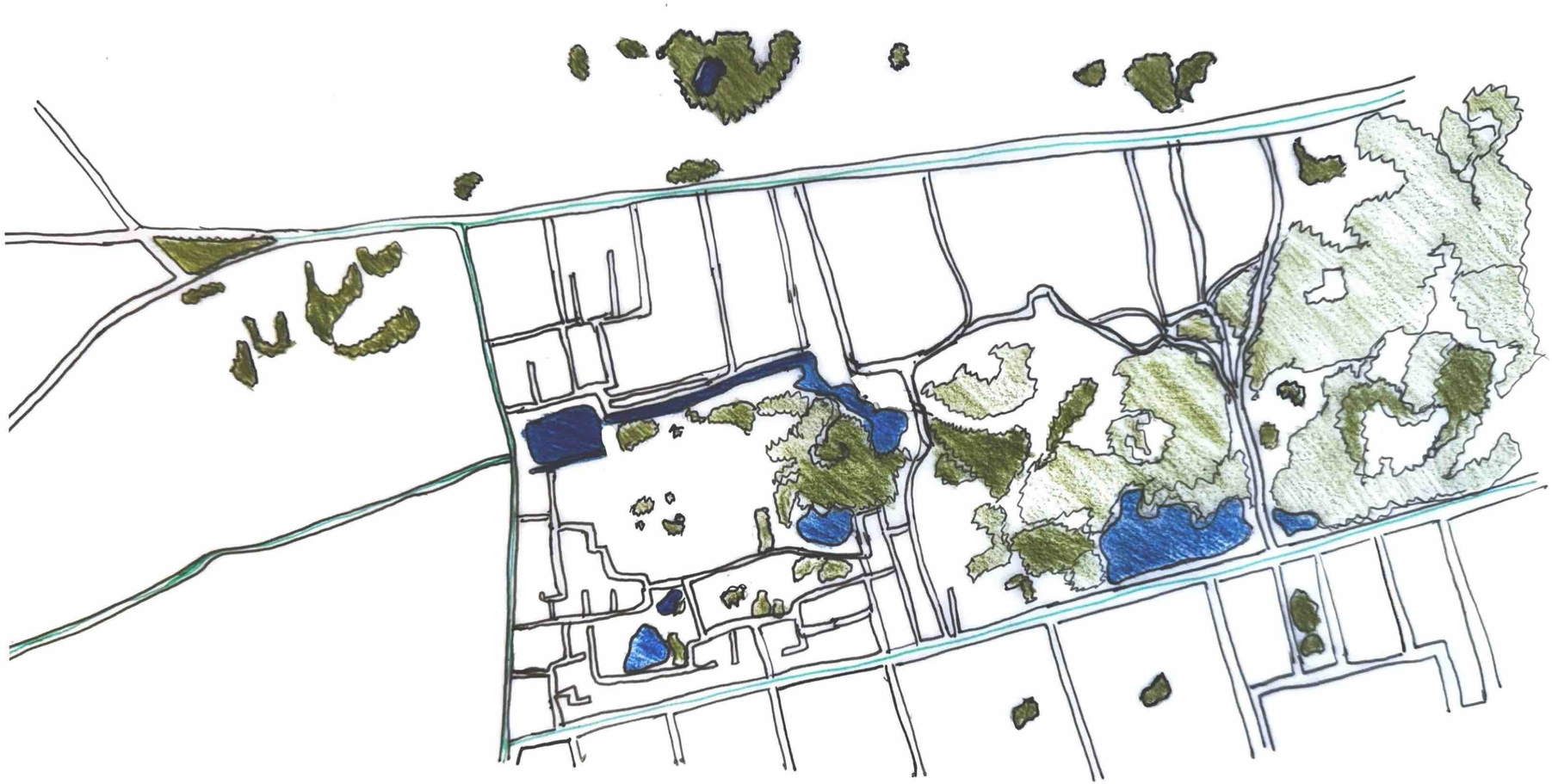
N

Roads and streets network
Scale 1:20.000

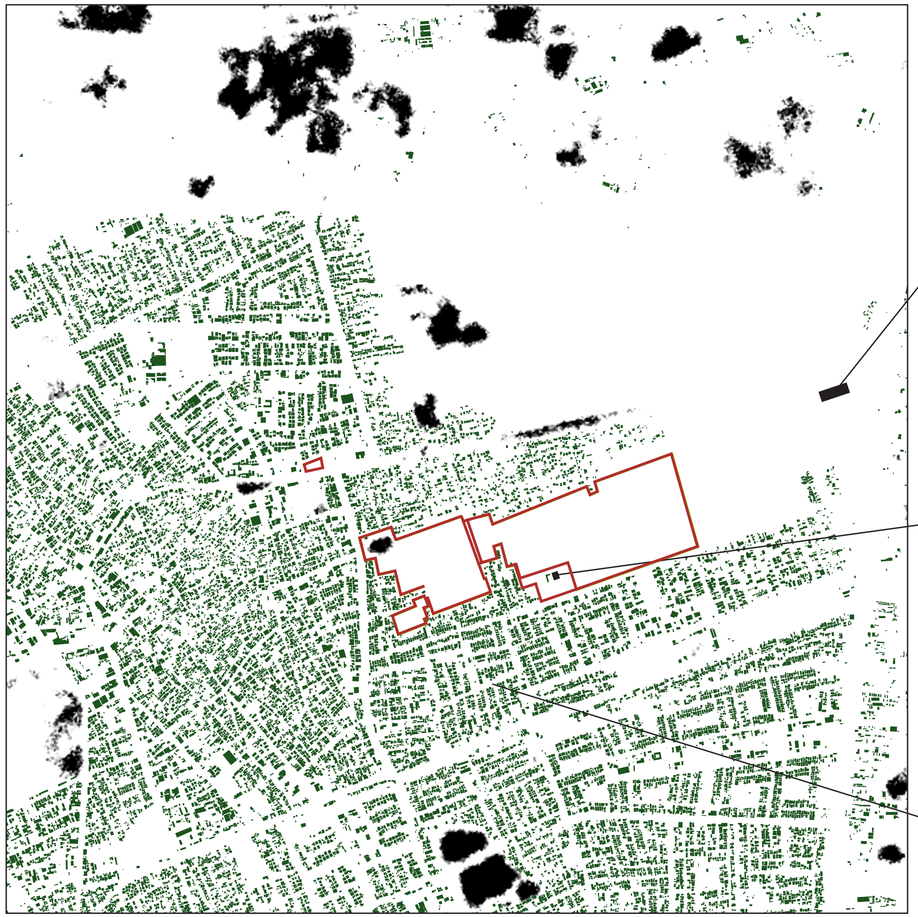
Site area analysis: *infrastructure and buildings*



Site analysis: *intermittend greenery and water bodies*



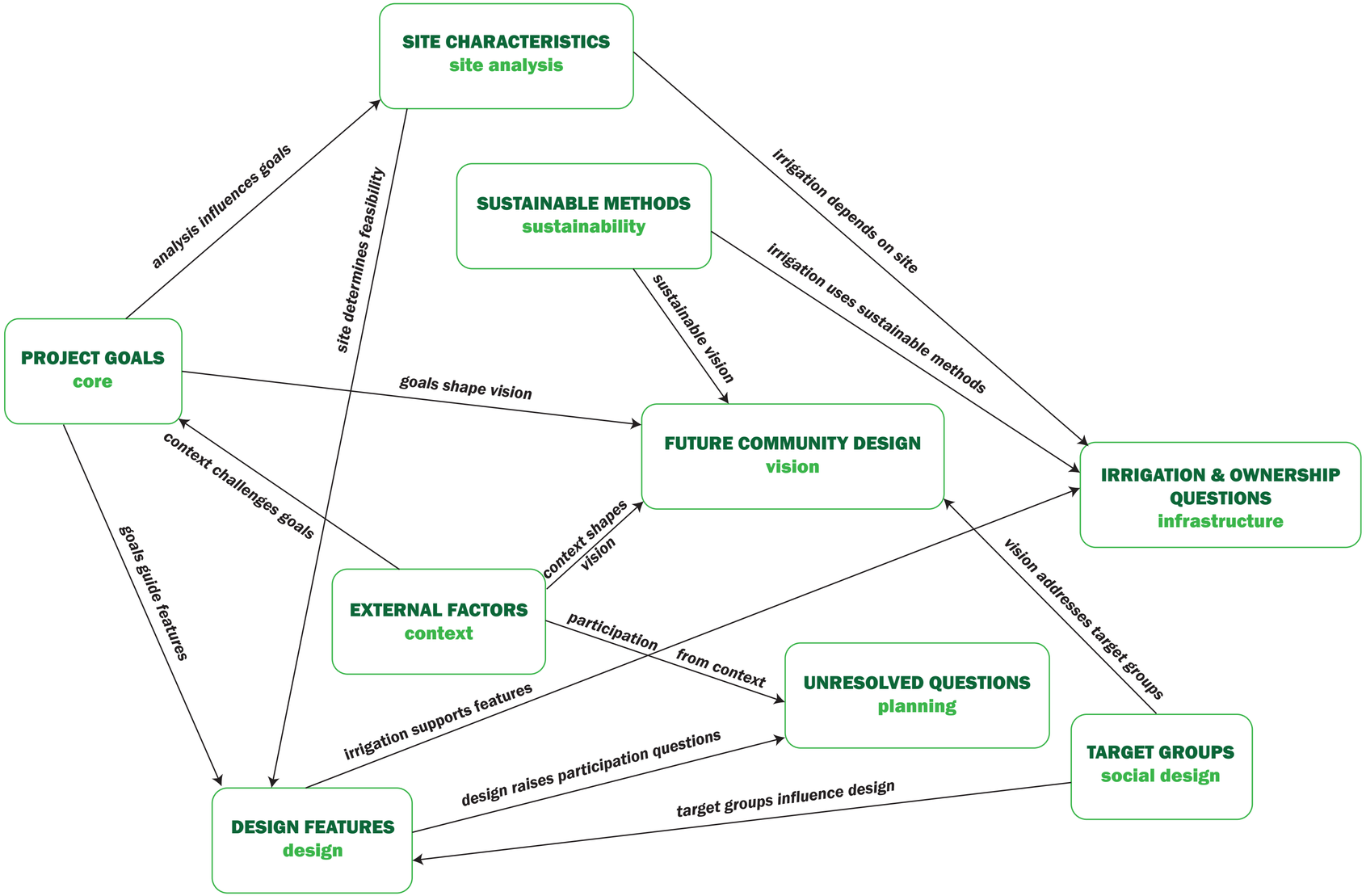
Surrounding of the site



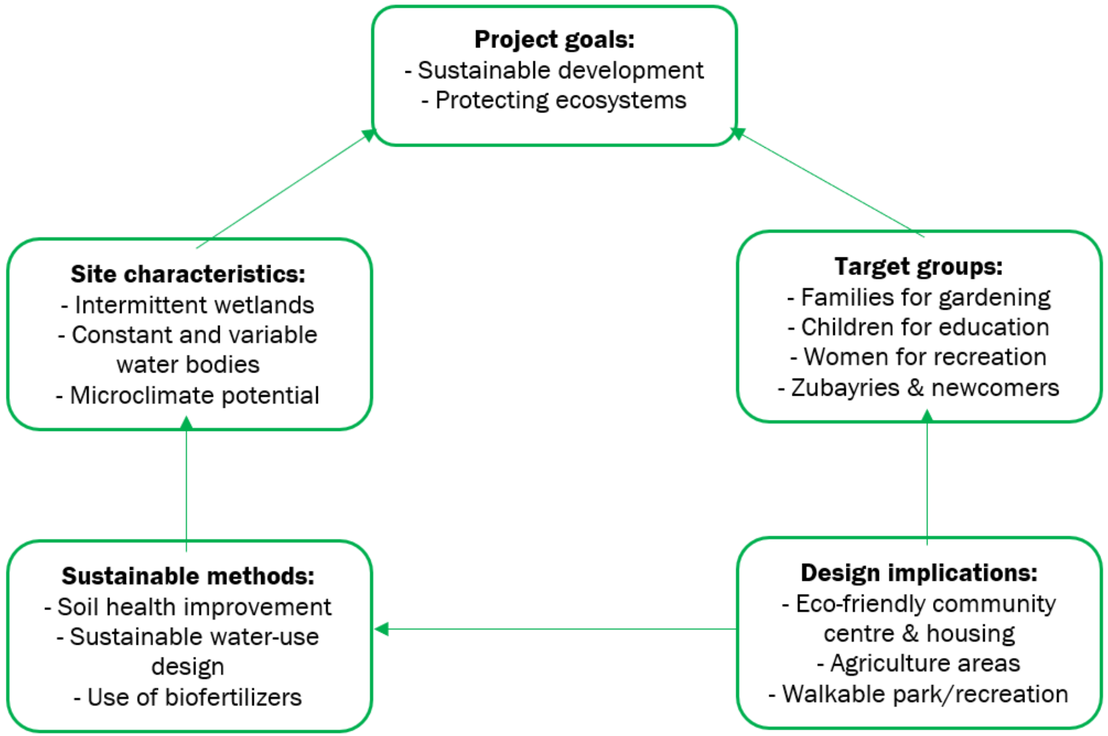

ZAGROS


ZAGROS

The aim and idea of the project



Rational behind the project site



What?

Interventions for spatially translating urban gardening and commoning

Focus: Empowering vulnerable groups and creating interaction and exchange between displaced communities and current residents

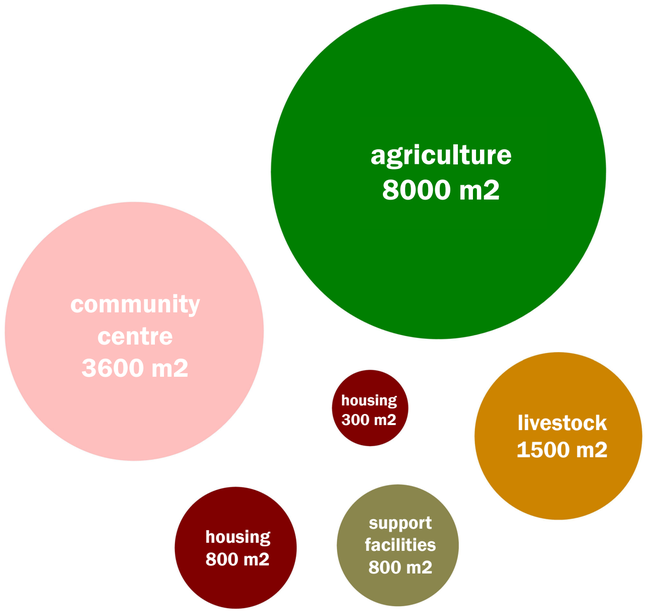
Approach:
- Multispecies urbanism – integrating humans, animals, and ecosystems
- Ecofeminism
- Regenerative agriculture
- Permaculture
- Continuous productive urban landscape

Nature-led design: Spatial planning guided by water flow and site fertility, and the power of the sun and wind

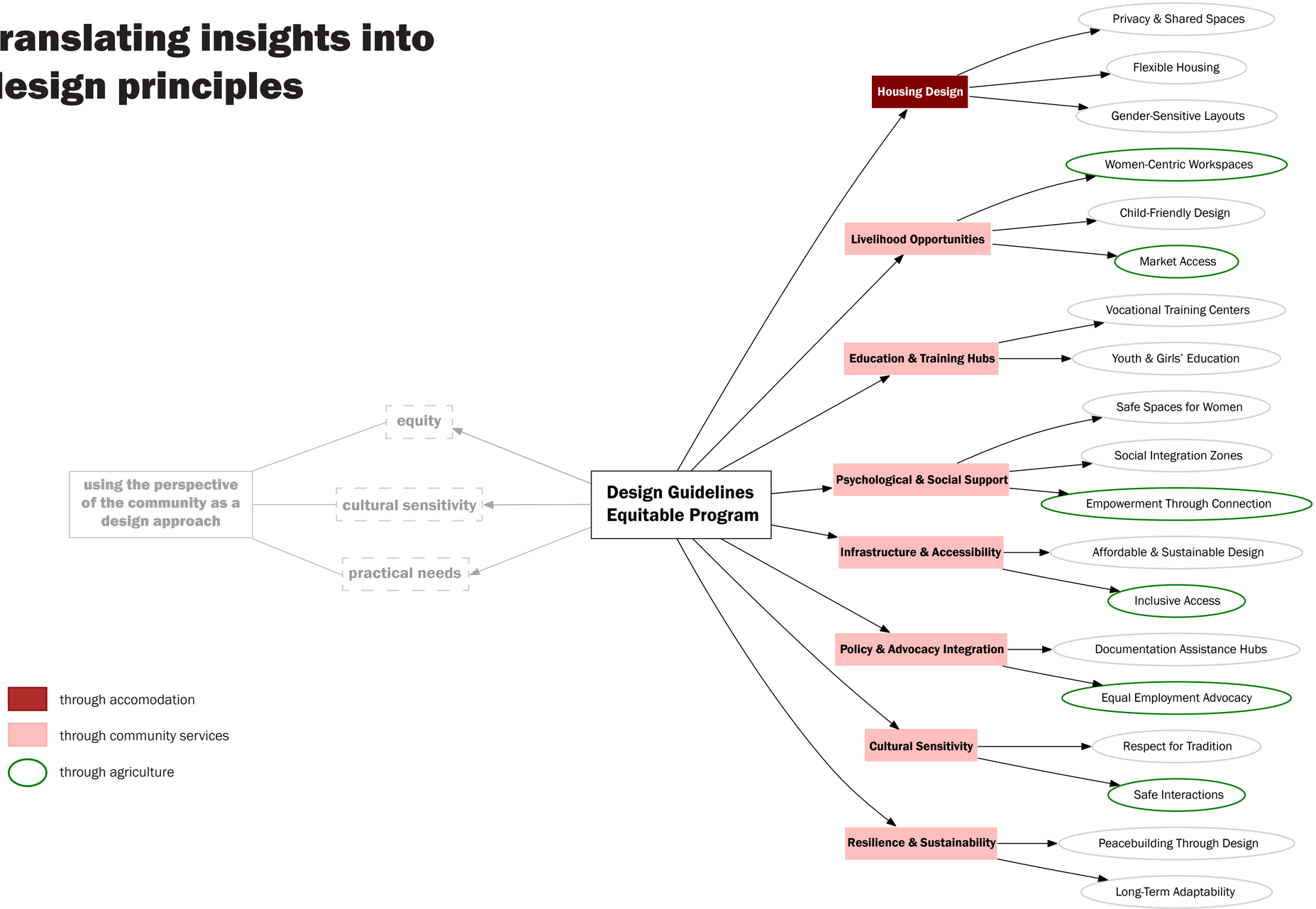
Method: Backcasting combined with site-specific observation and interaction

Soil and water: Emphasis on fertile alluvial soil and seasonal freshwater sources

The Program


agriculture
8000 m2
community
centre
3600 m2
housing
300 m2
livestock
1500 m2
housing
800 m2
support
facilities
800 m2

Translating insights into design principles



How?

Scale 1:7000

Legend

- constant waters
- intermitted waters
- intermitted greenery
- agriculture
- community centre
- housing
- livestock
- support facilities
- paths

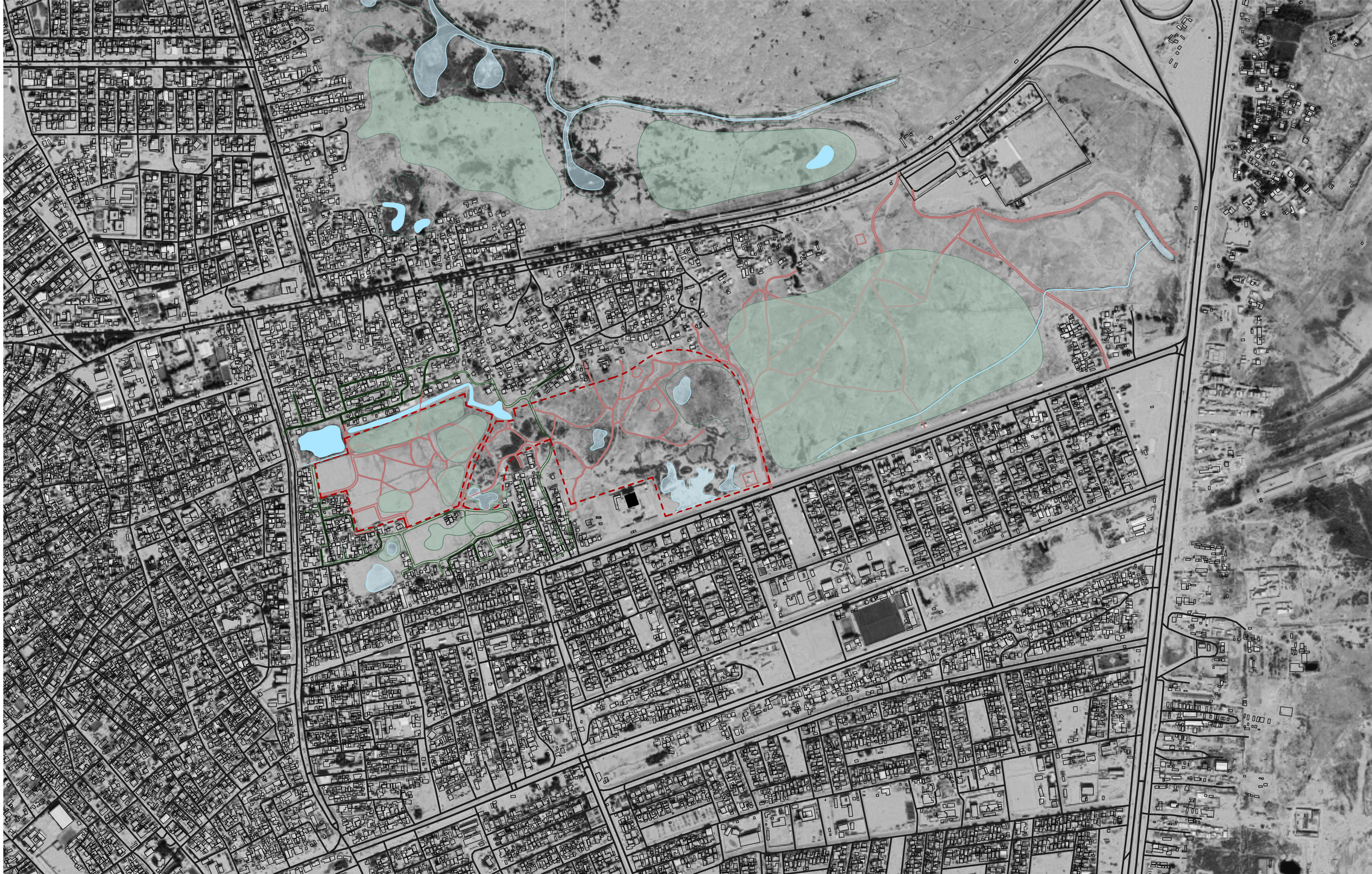
N

Scale 1:7000

Legend

- constant waters
- intermitted waters
- intermitted greenery
- agriculture
- community centre
- housing
- livestock
- support facilities
- paths

N



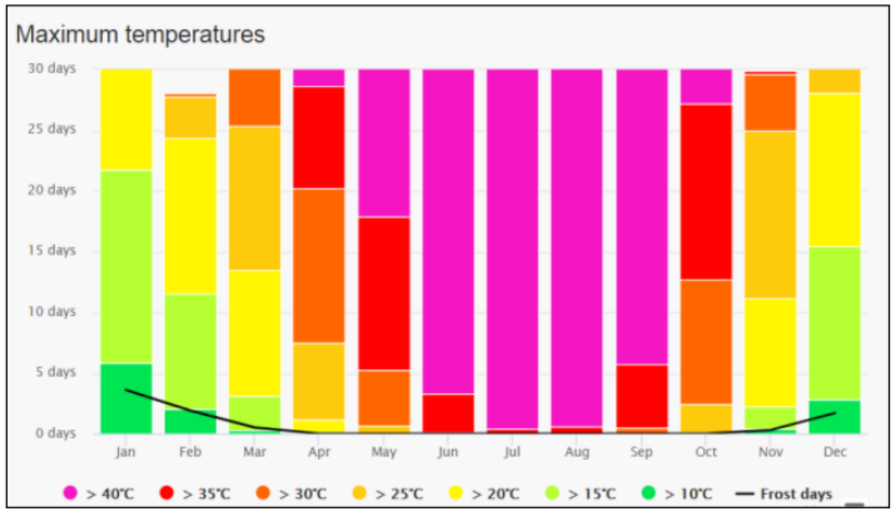
Scale 1:7000

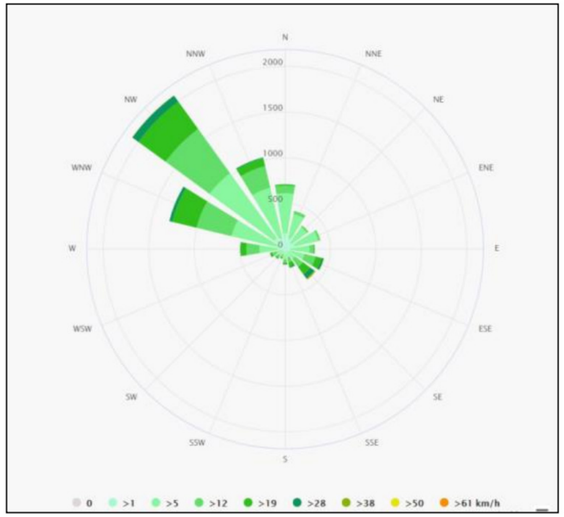
Legend

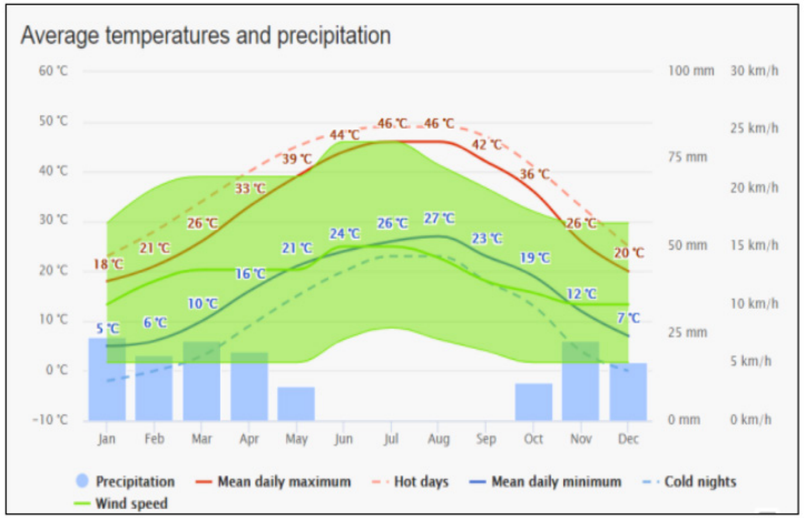
- constant waters
- intermitted waters
- intermitted greenery
- agriculture
- community centre
- housing
- livestock
- support facilities
- paths

N

Further relevant conditions of the site







DISPLACEMENT

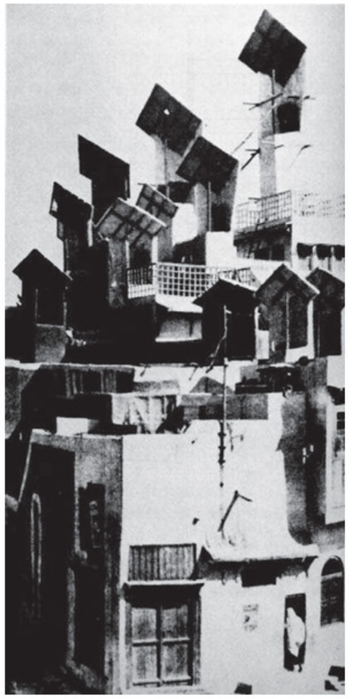
MARGINALISED GROUPS

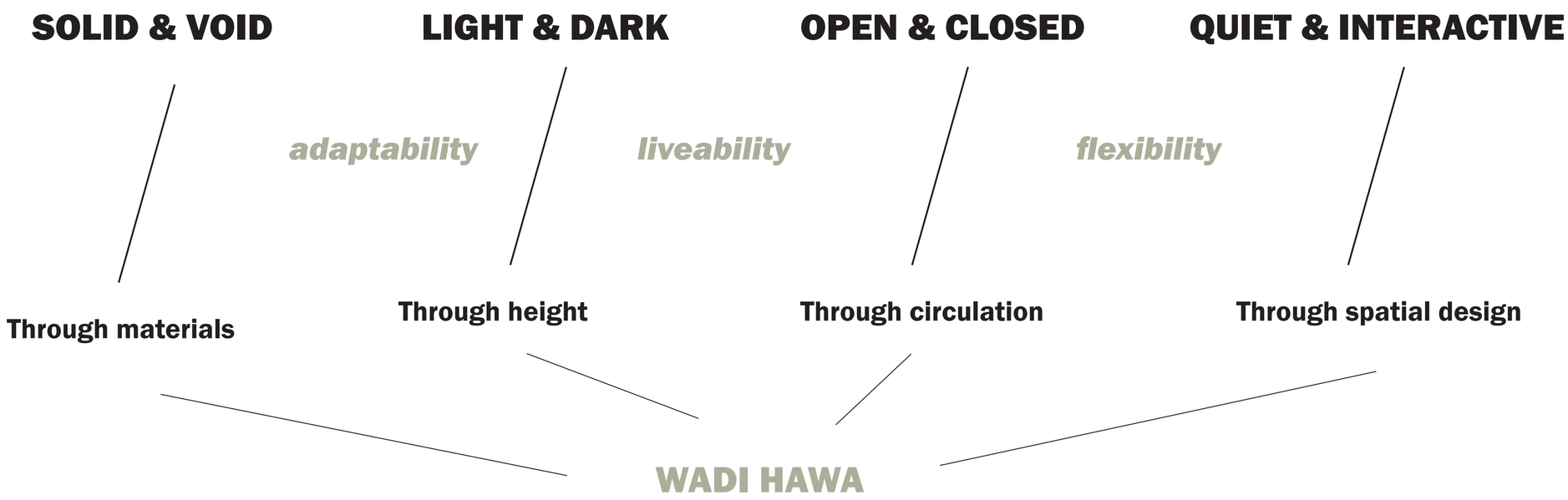
ENVIRONMENTAL SUSTAINABLITY

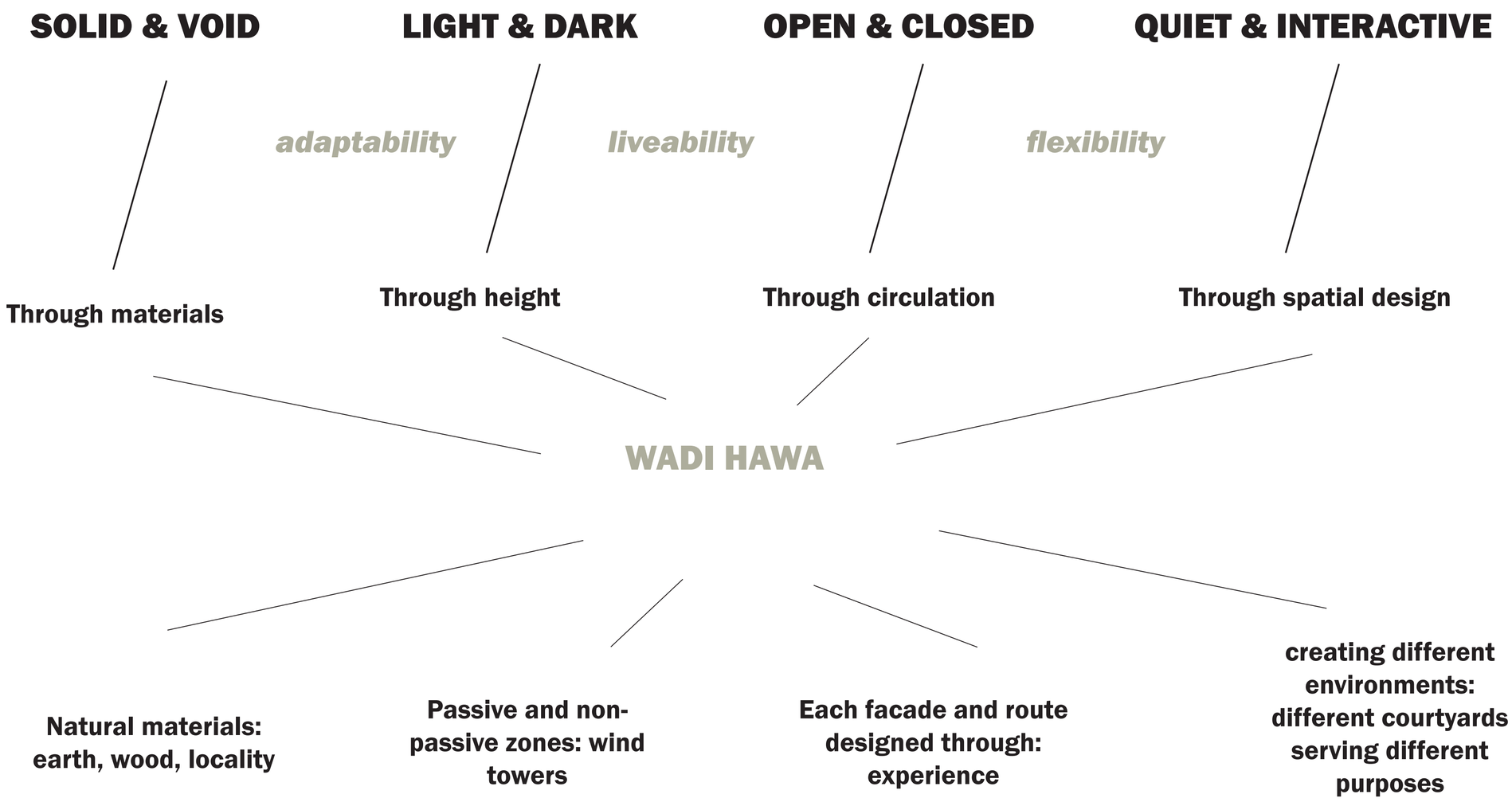
ECOFEMINST APPROACH TOWARDS THESE ENVIRONMENTAL, SOCIAL & URBAN CHALLENGES

Concept development based on community needs

AND local and contemporary technologies




SOLID & VOID
LIGHT & DARK
OPEN & CLOSED
QUIET & INTERACTIVE
adaptability
liveability
flexibility
Through materials
Through height
Through circulation
Through spatial design
WADI HAWA


SOLID & VOID
LIGHT & DARK
OPEN & CLOSED
QUIET & INTERACTIVE
adaptability
liveability
flexibility
Through materials
Through height
Through circulation
Through spatial design
WADI HAWA
Natural materials: earth, wood, locality
Passive and non-passive zones: wind towers
Each facade and route designed through: experience
creating different environments: different courtyards serving different purposes

Design

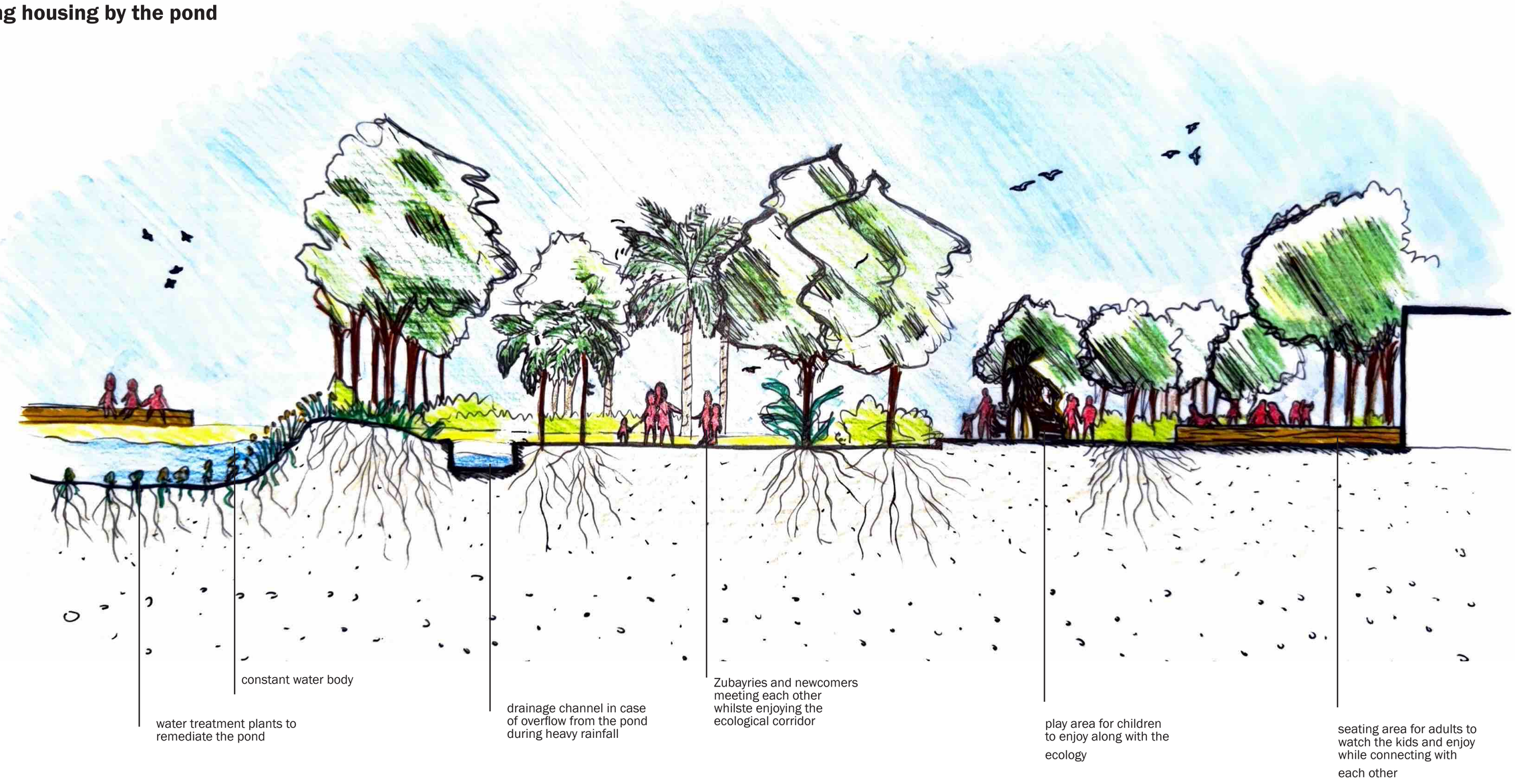
Site plan

site plan
1:2500

N

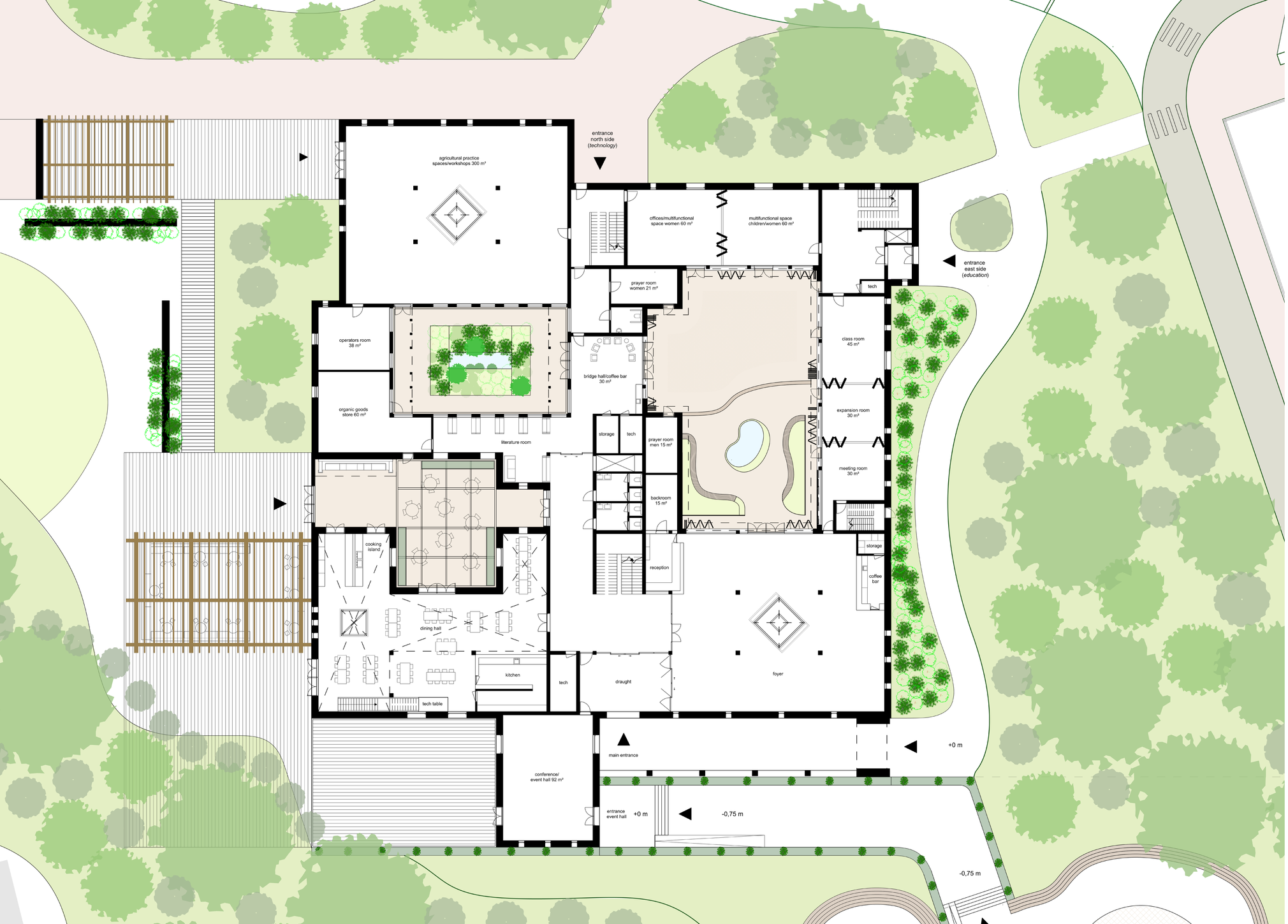
site plan west of plot
1:1000

nature inclusive design
along housing by the pond



community centre
building plot

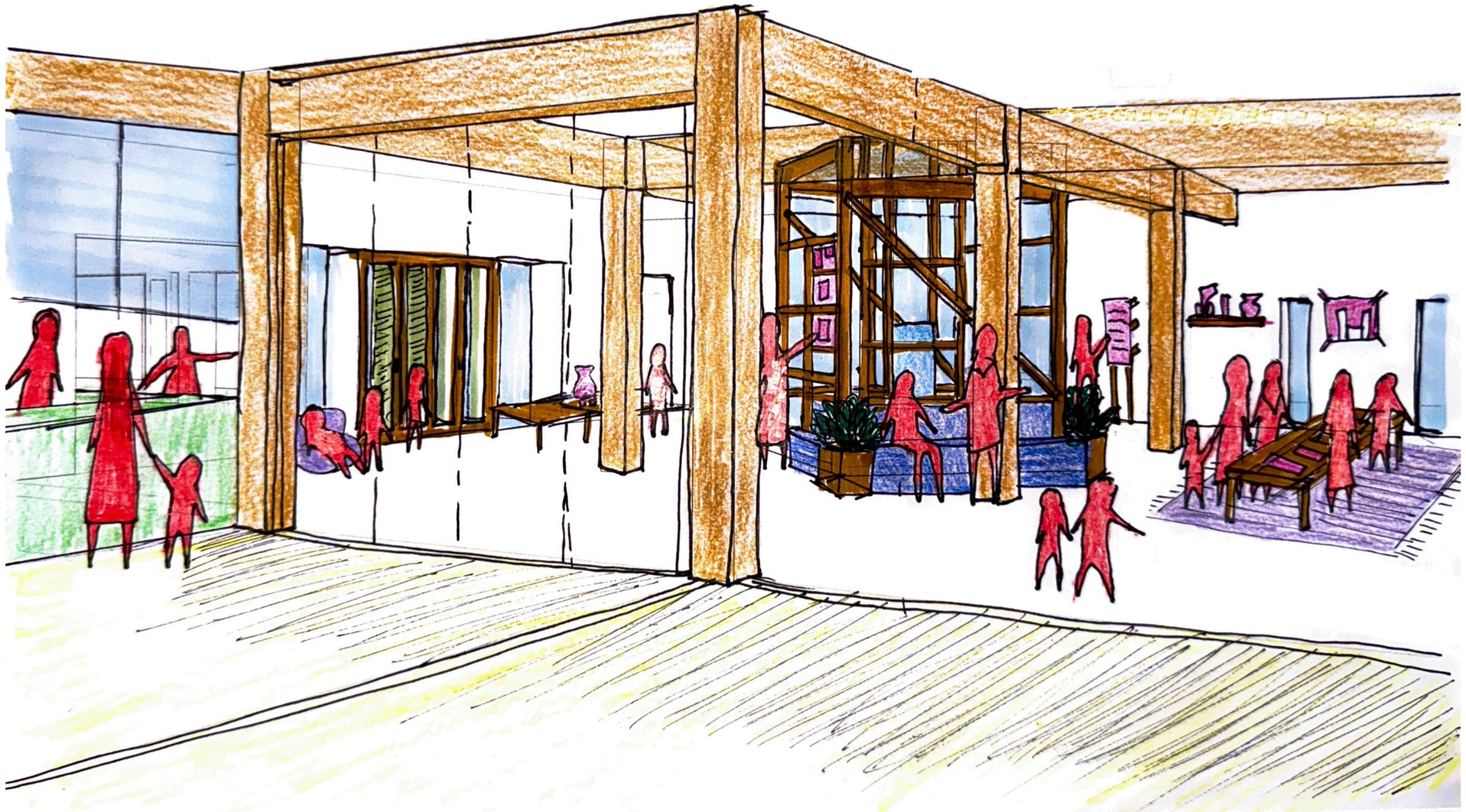
N

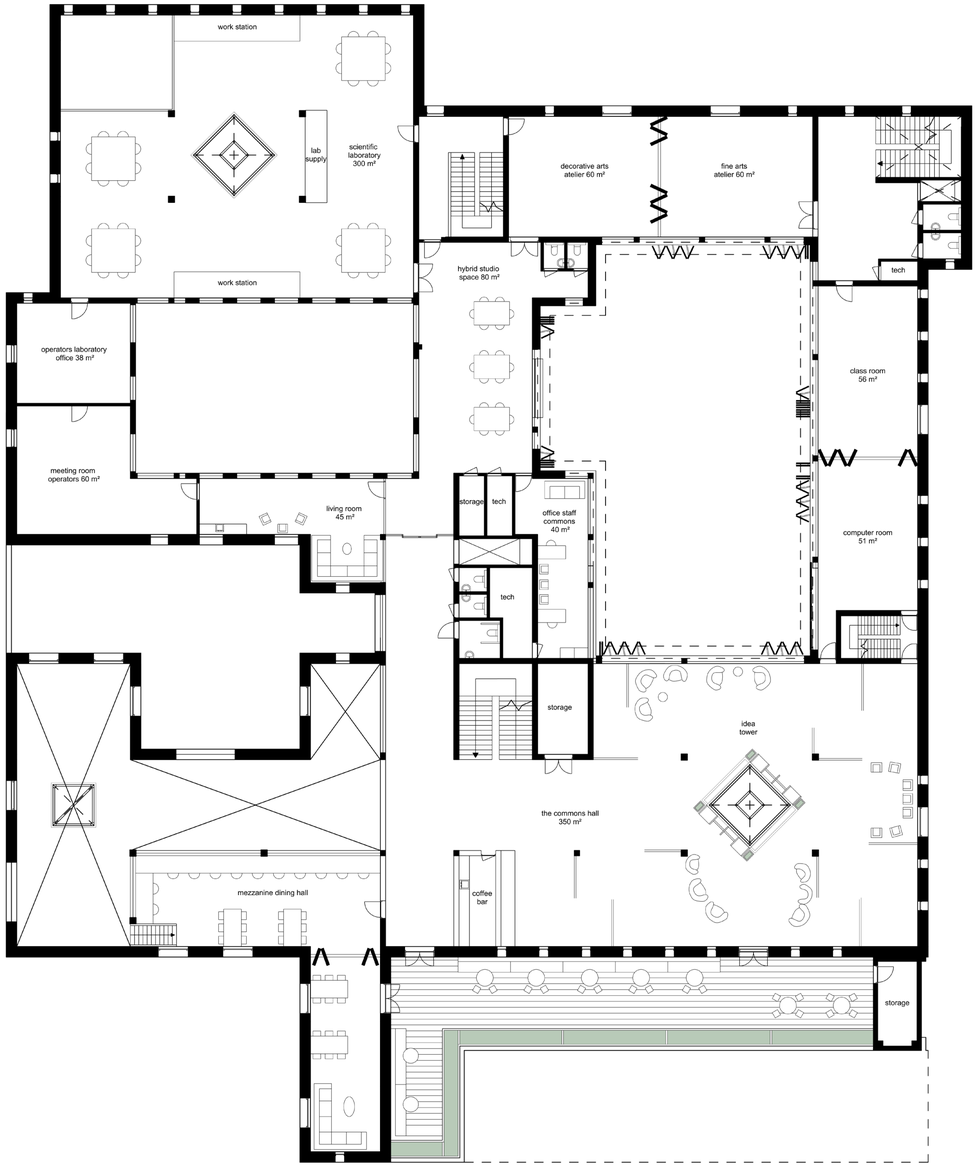


ground floor plan
1:200

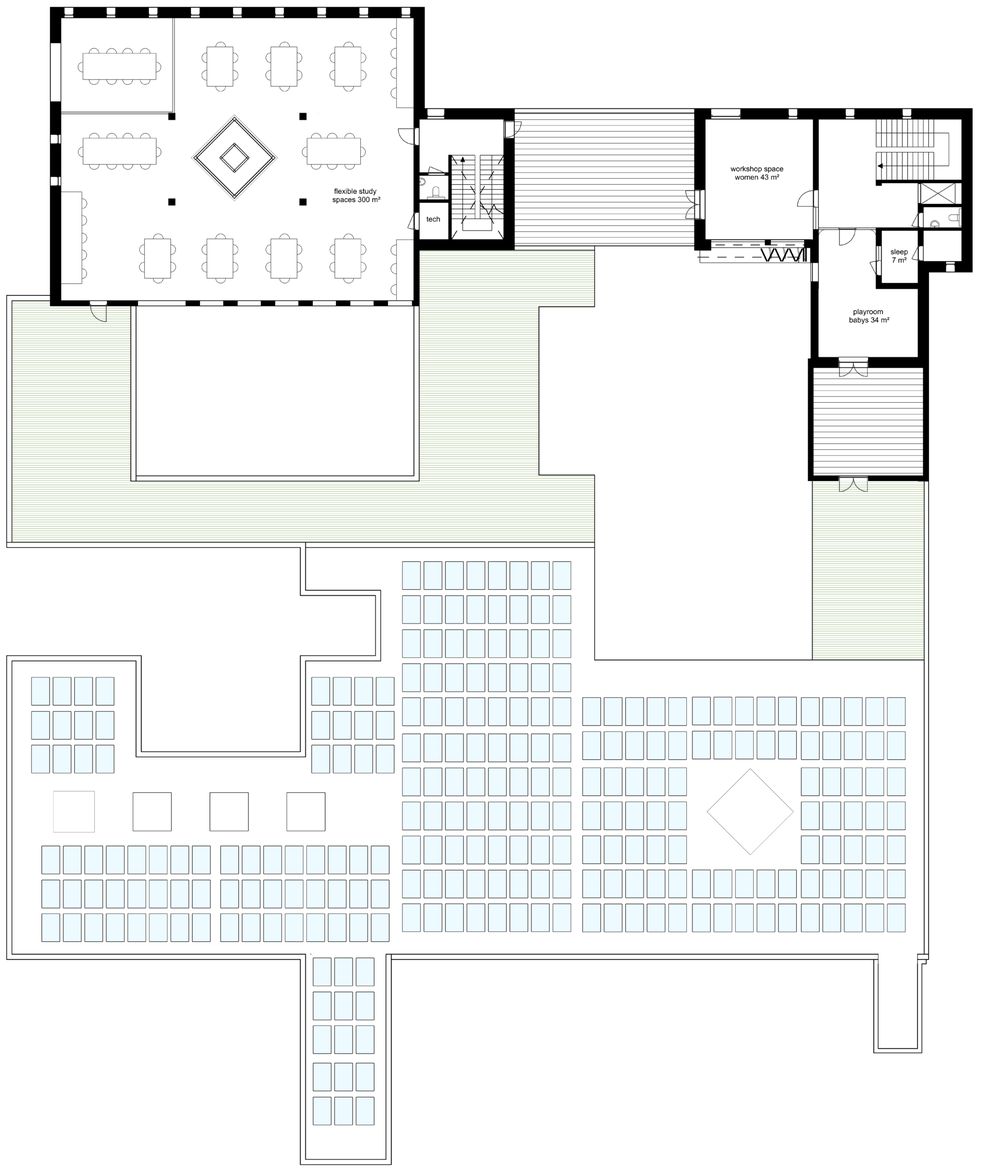
N

view from main entrance south



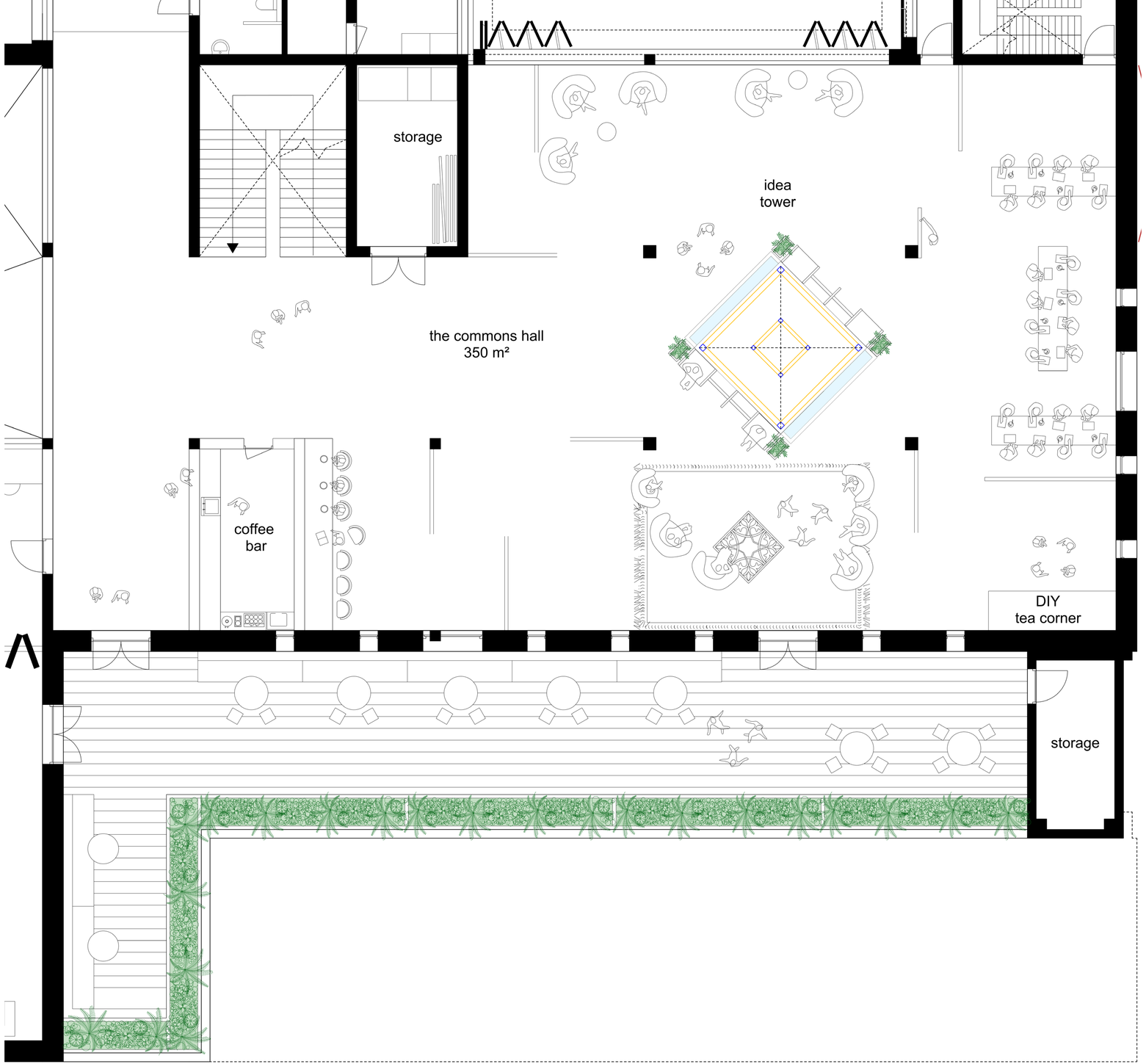


first floor plan
1:200

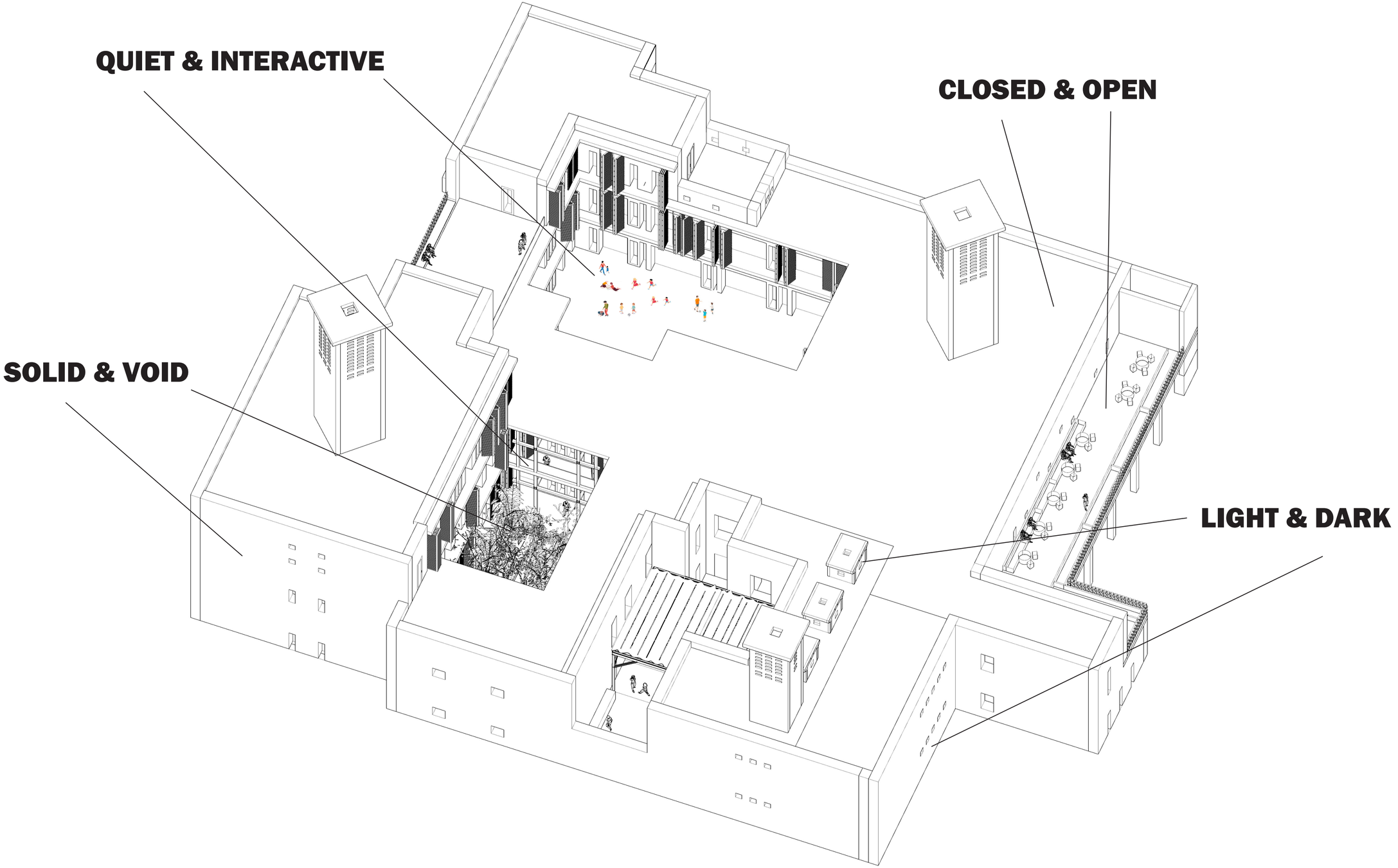


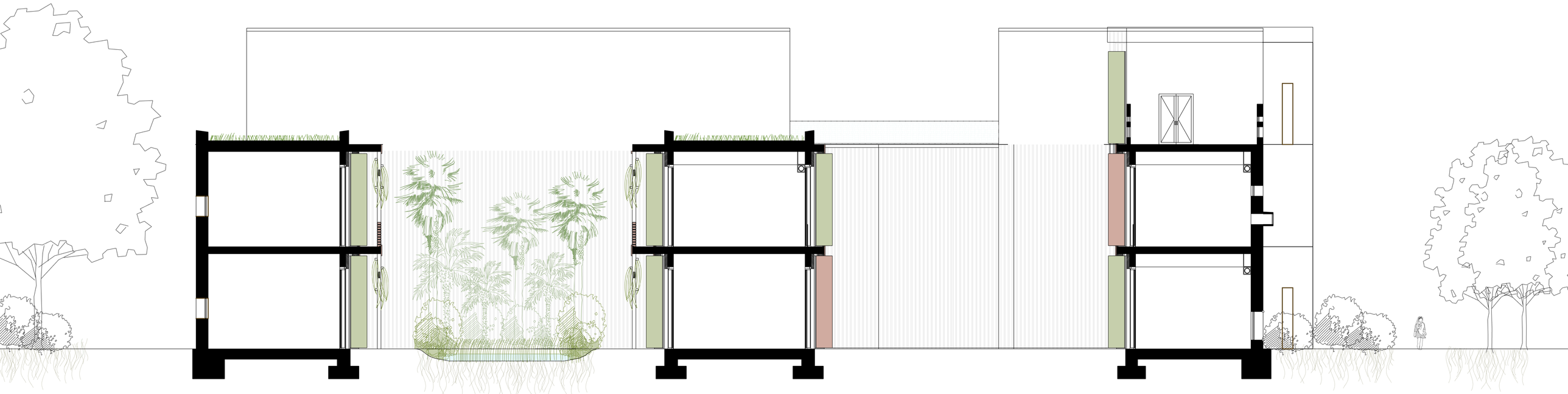
second floor plan
1:200

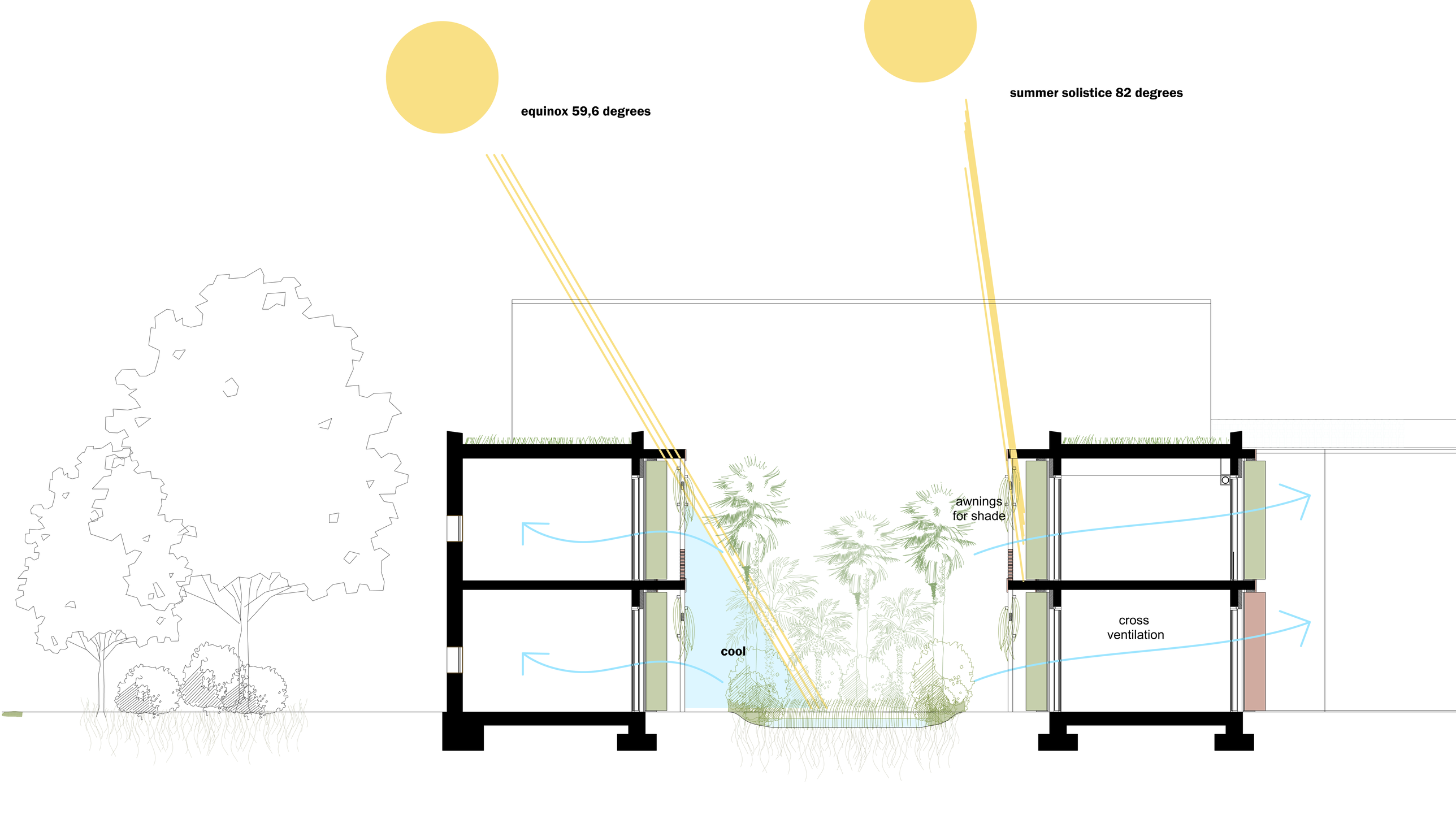
N



1:50 scaled down to 1:80

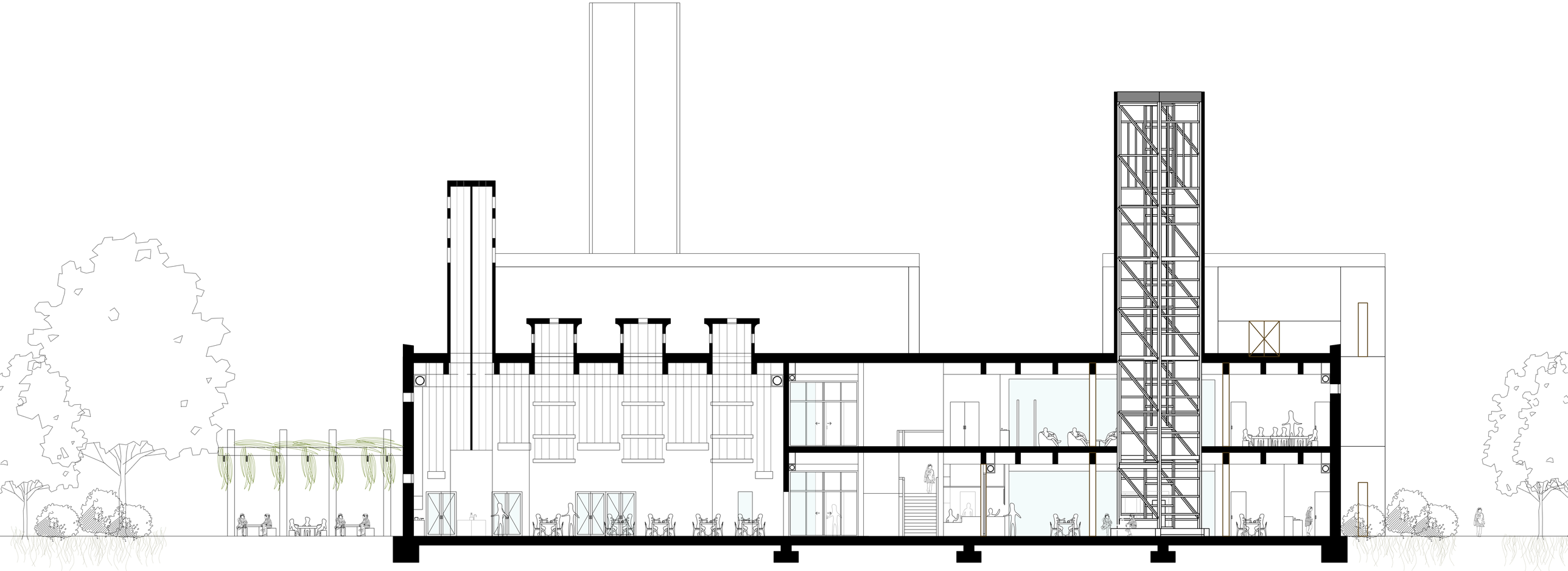

QUIET & INTERACTIVE
CLOSED & OPEN
SOLID & VOID
LIGHT & DARK

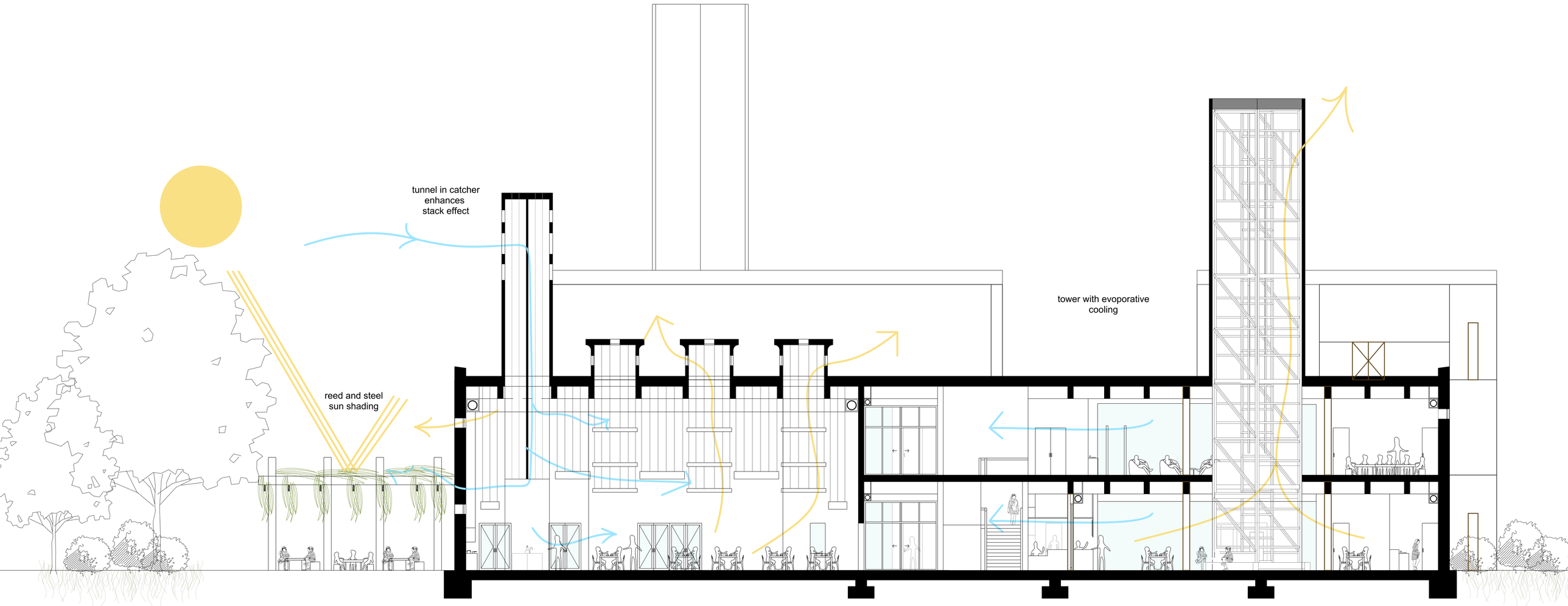



equinox 59,6 degrees
summer solistice 82 degrees
awnings
for shade
cross
ventilation
cool

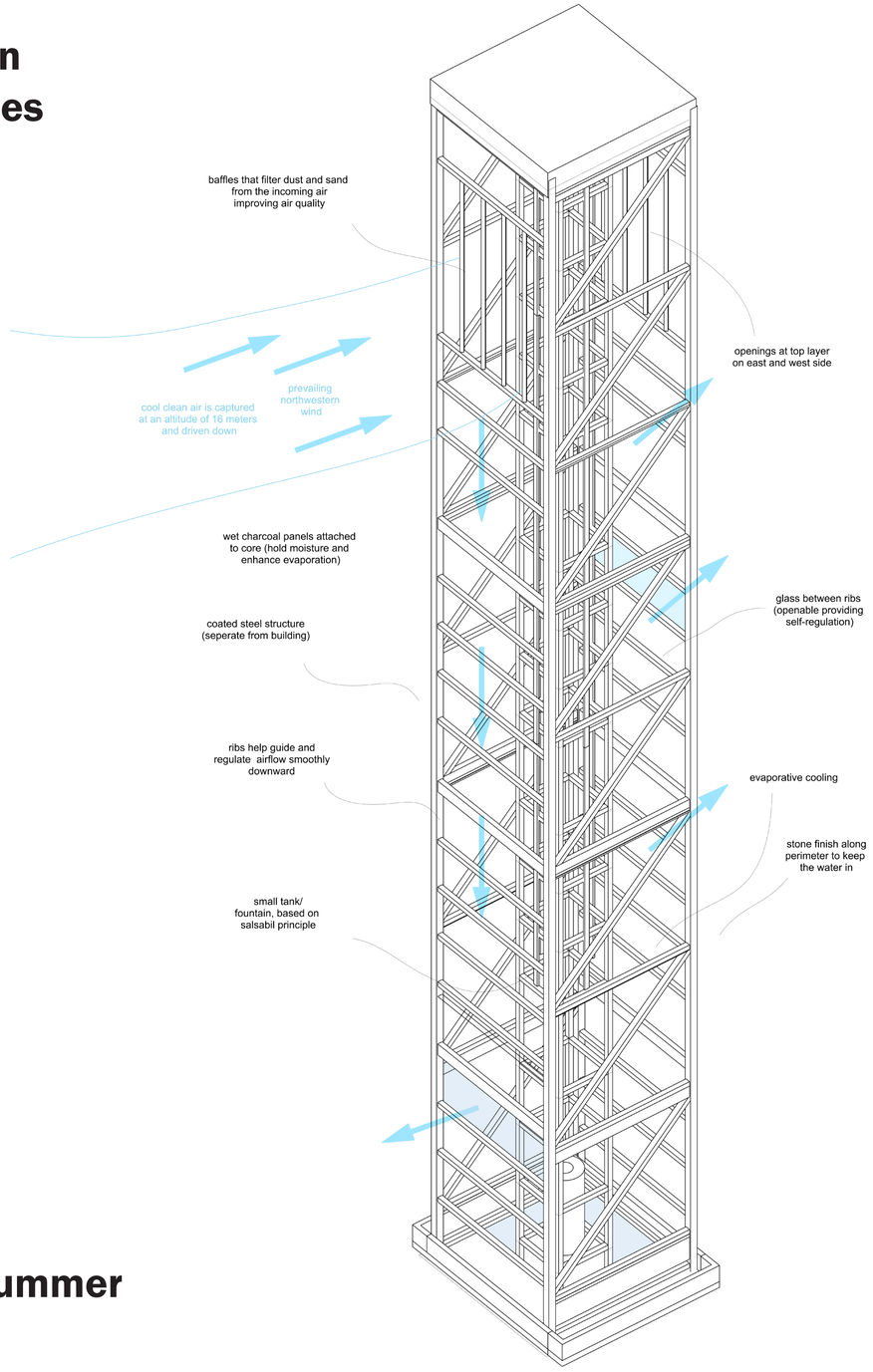
Botanic courtyard dry period

Botanic courtyard wet period

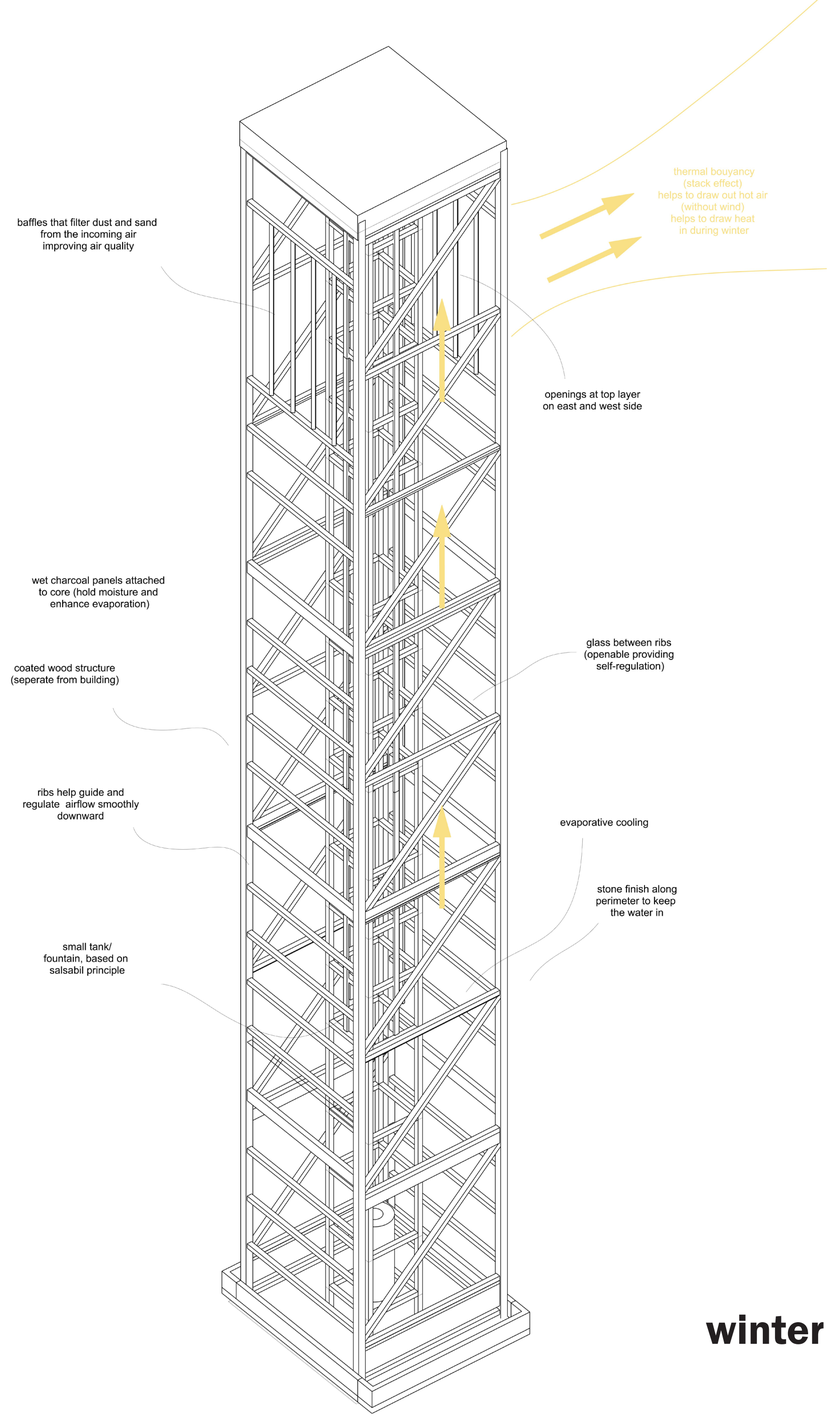



tunnel in catcher
enhances
stack effect
reed and steel
sun shading
tower with evoporative
cooling

Construction and principles towers

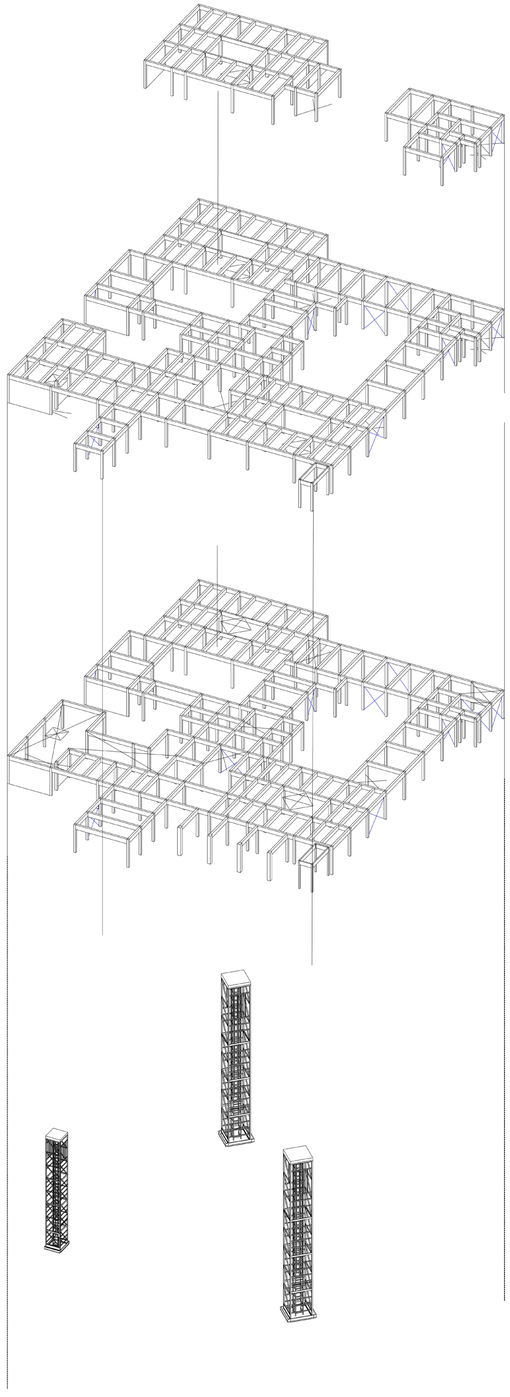


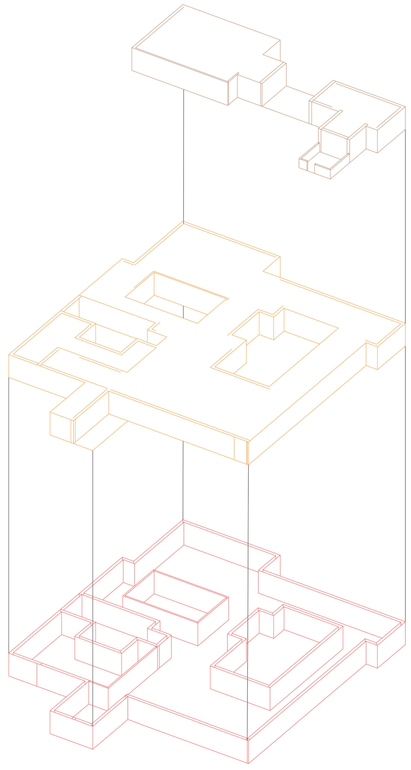
summer

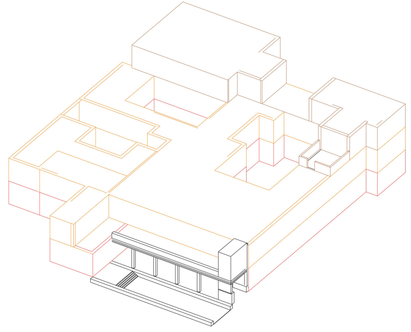


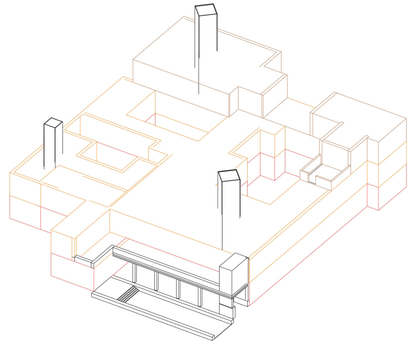
winter

Mass development

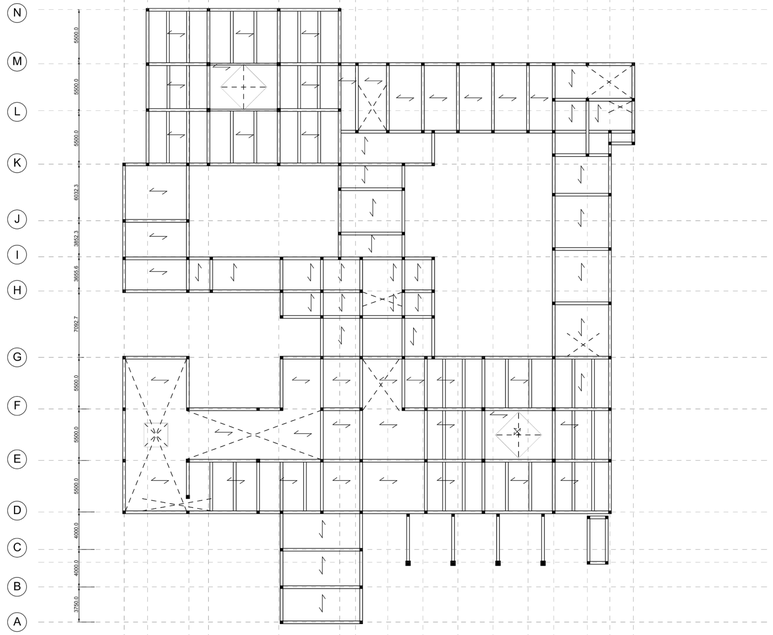


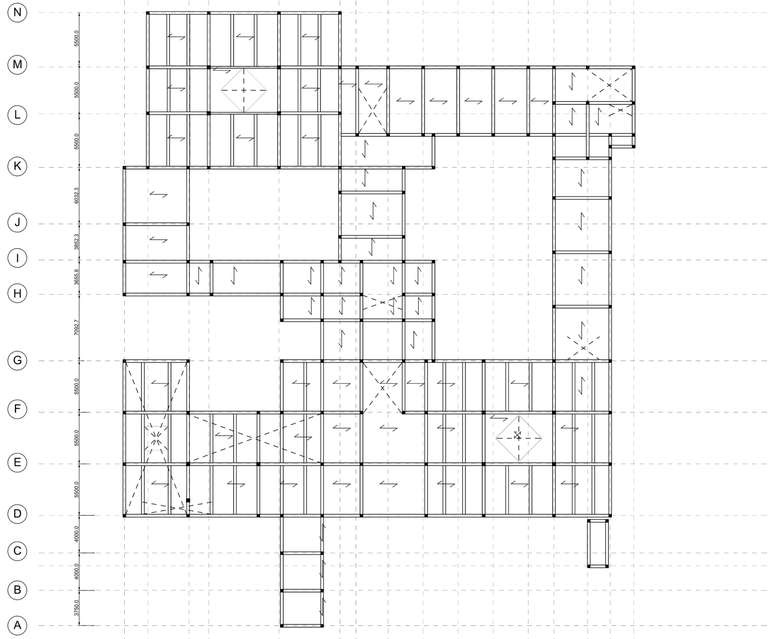




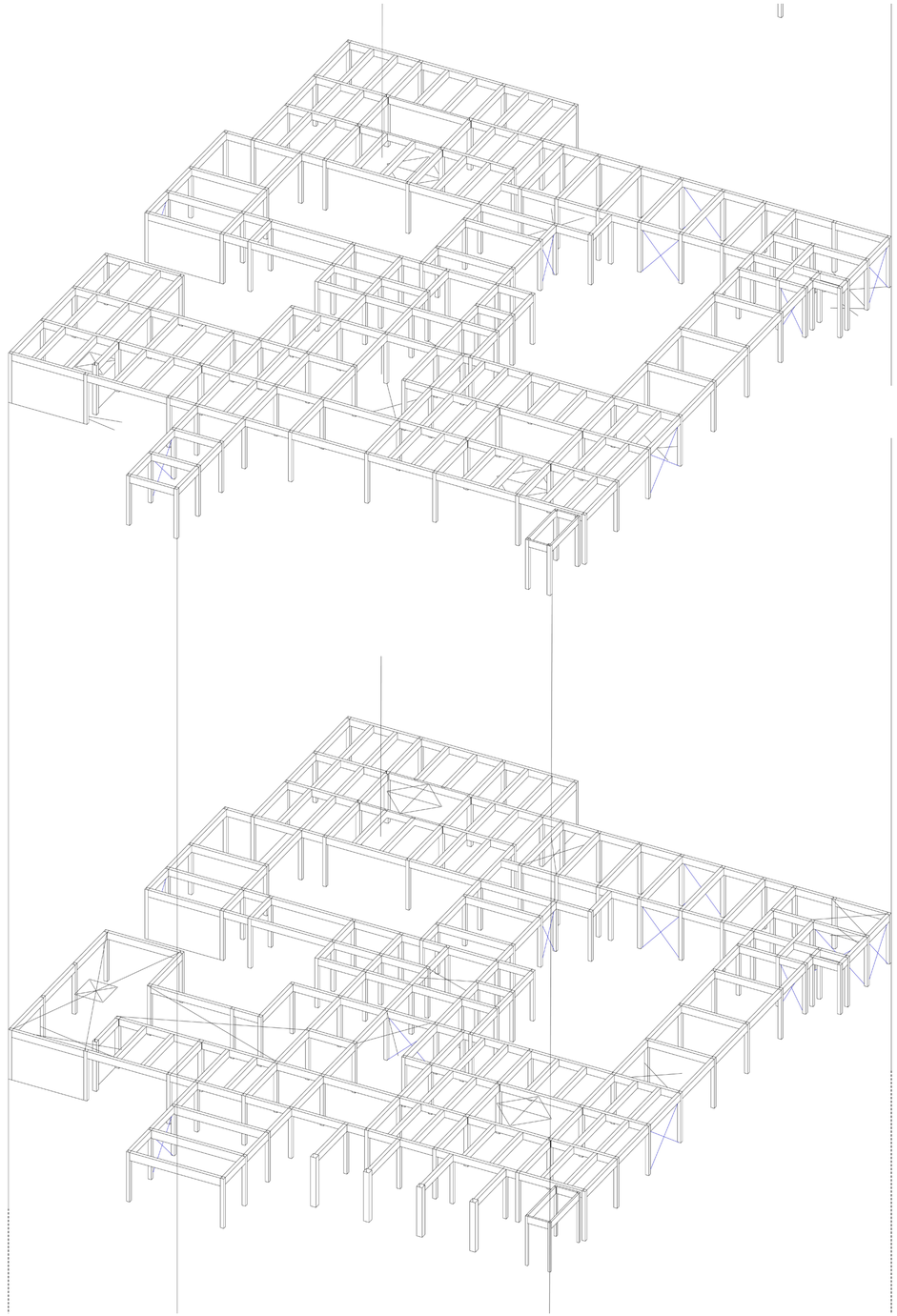


Construction plans





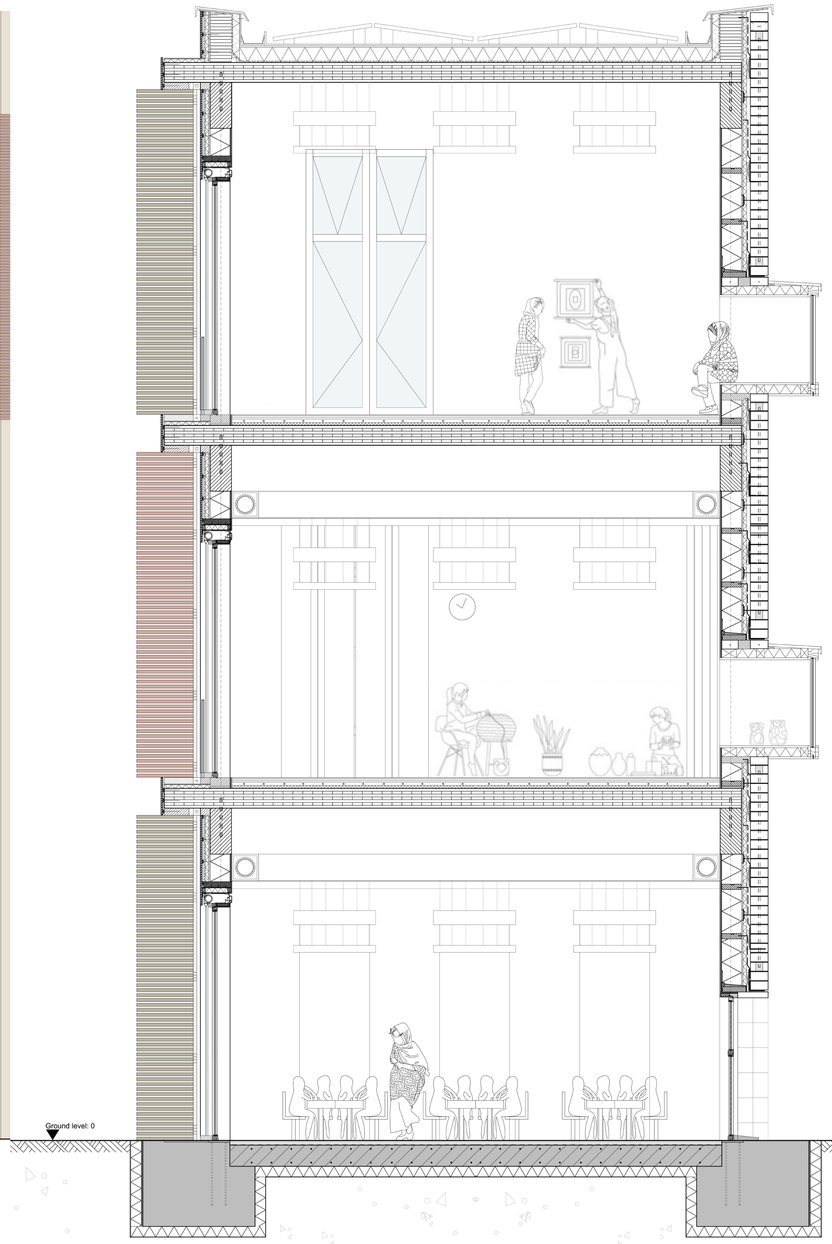
Load bearing
wooden construction

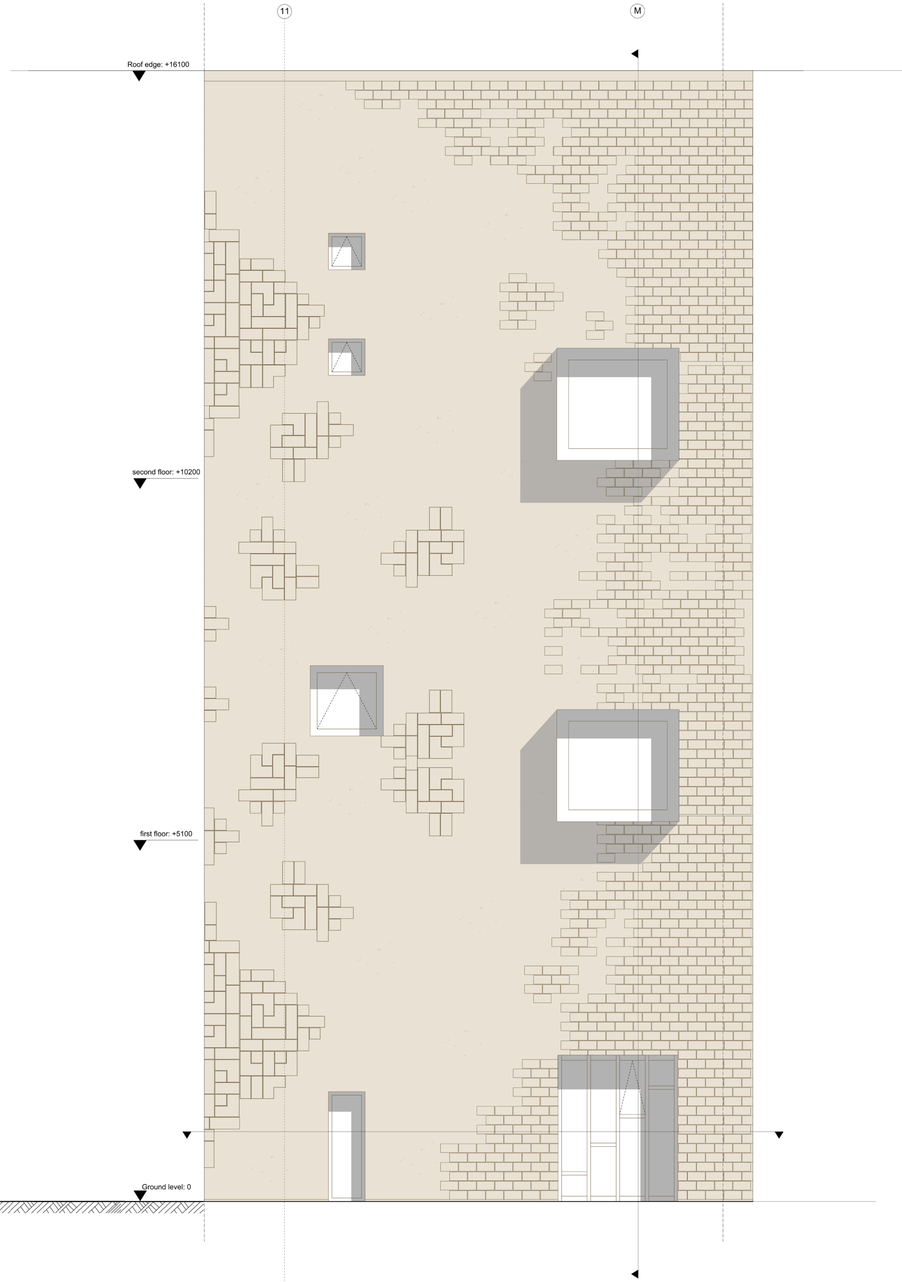


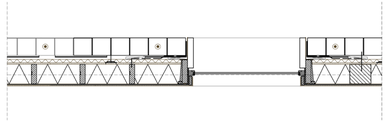
view approaching the building from the slope of the south side

view approaching the building from the north side

1:20 fragments
northeast



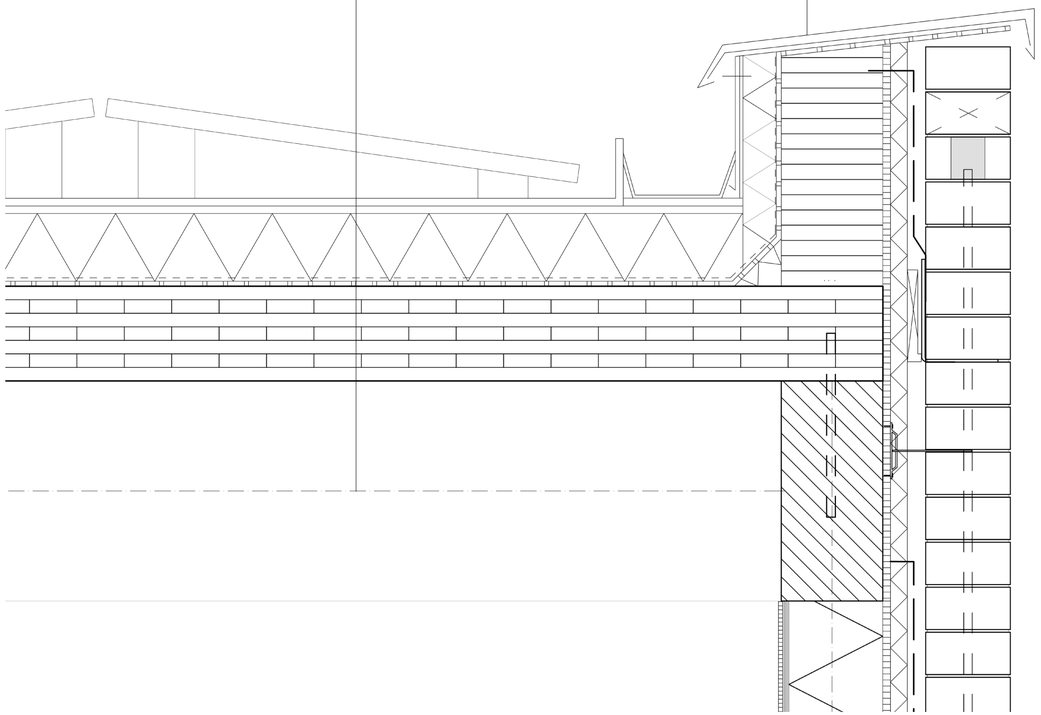




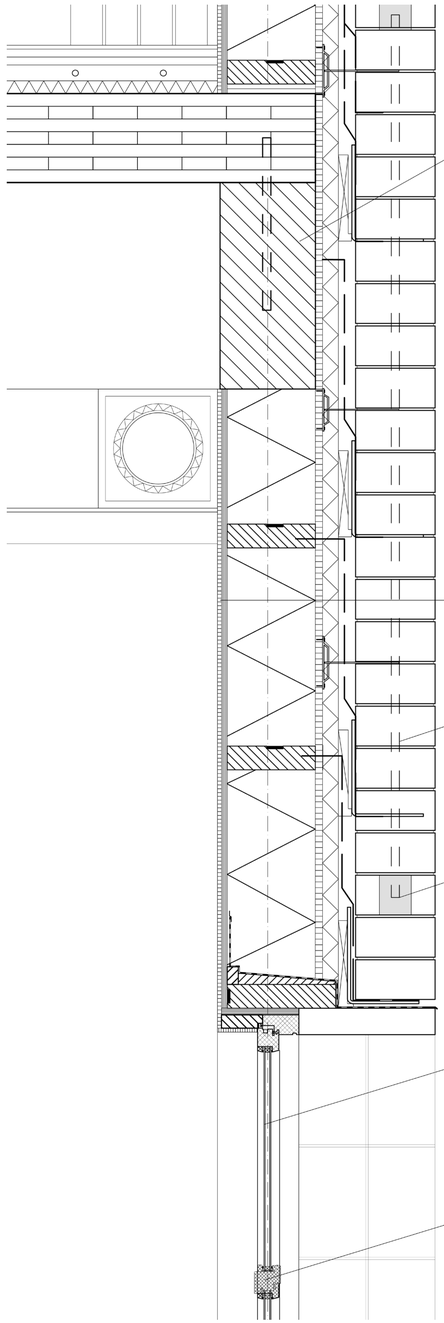
Roof detail solid 1:5

Roof build up:
solar panels
projecting roof 22 mm
insulation EPS 180 mm (with slope)
waterproof layer 2 mm
CLT floor (280 mm)
wooden beam 650 mm in
wall behind (construction: pine)

parapet capping,
sheet aluminium clip



Wall detail 1:5



construction wooden beam 300 mm

Facade build up:
non-load bearing
compressed earth blocks, anchored
to load bearing timber construction
via metal plates carrying the load
insulation 50 mm
plywood sheet 22 mm
insulation mineral wool 300 mm
timber frame construction regels 300x75 mm
vapour barrier
bitumen plate 12 mm
wall finish

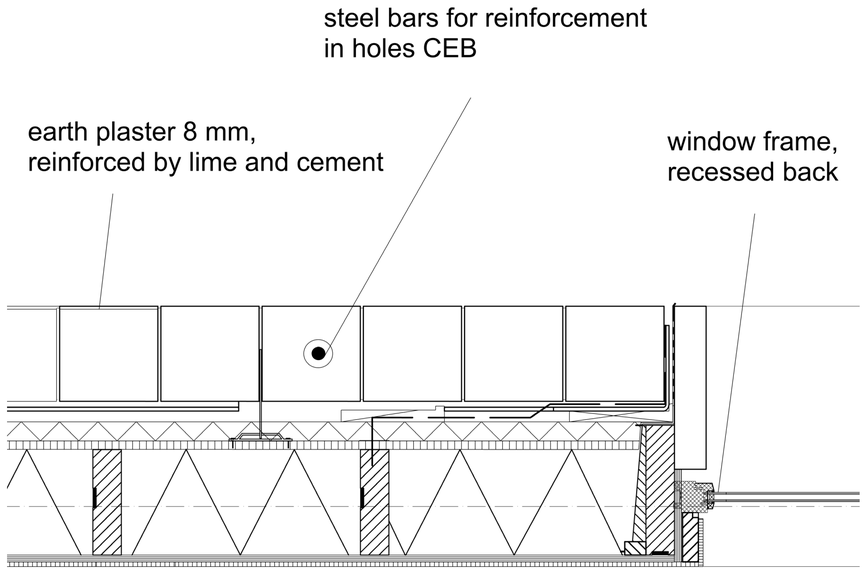
steel bars
supporting the CEB wall

concrete hidden lintel
support the CEB wall

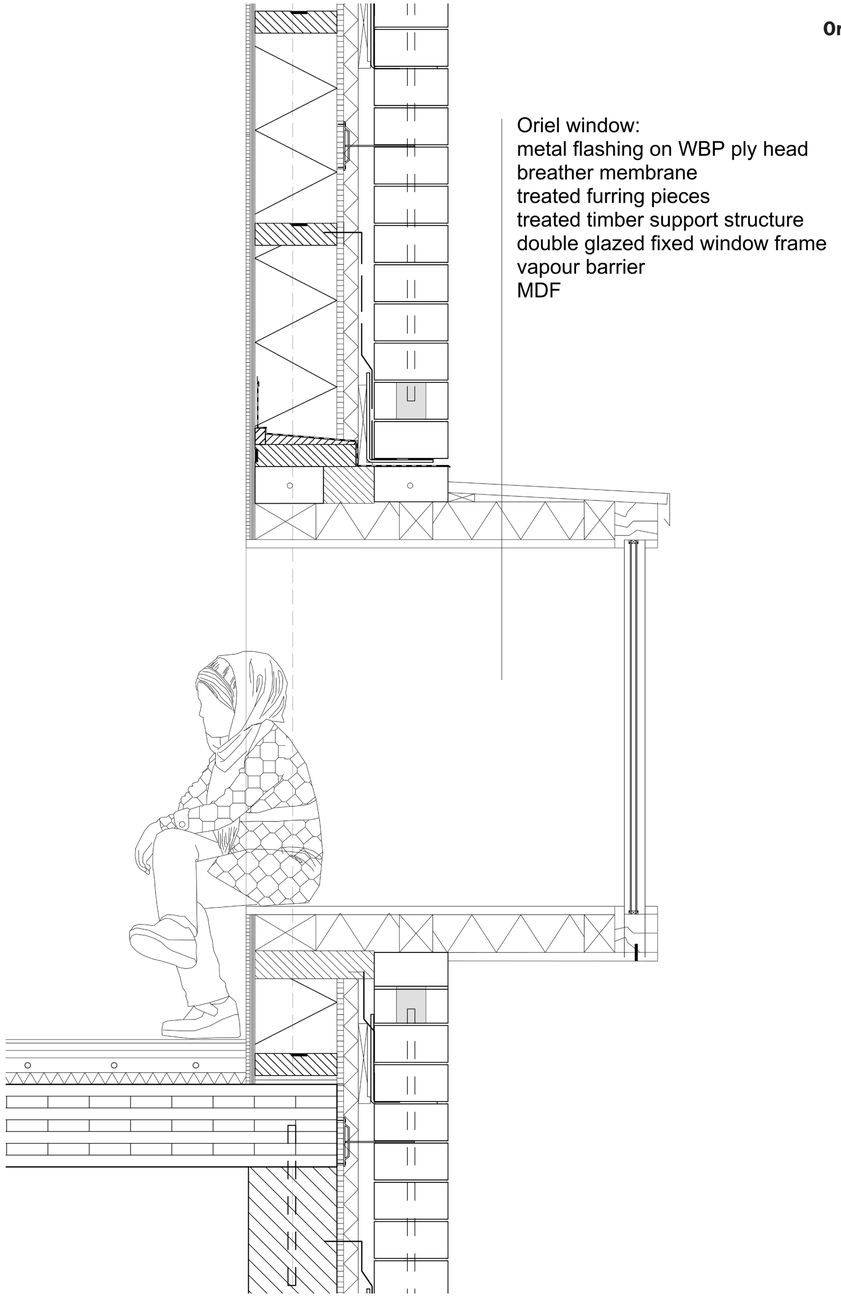
openable window

wooden window frame,
recessed back 530 mm
preventing direct sunlight

Horizontal detail wall 1:5

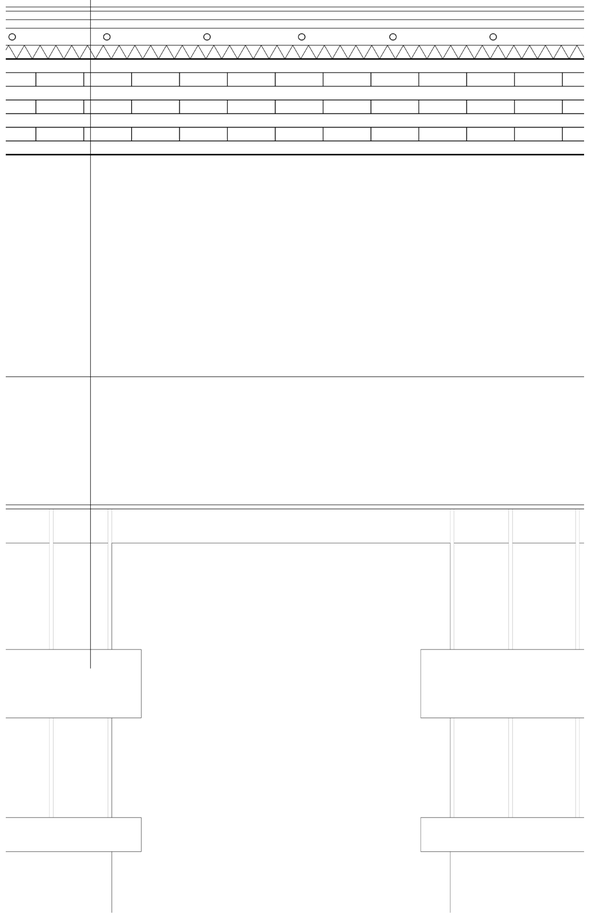


Oriel window detail 1:10

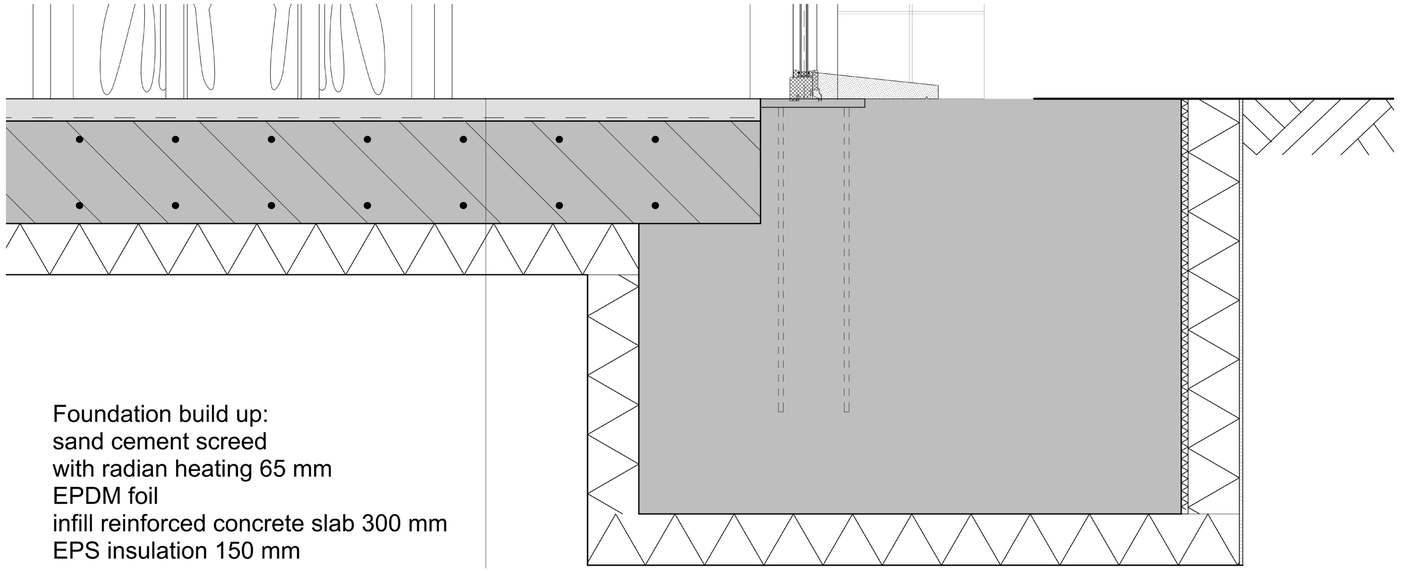


Floor detail 1:5

Floor build up:
floor finish 12 mm
underlayment 25 mm
dry underfloor heating system 25 mm
installation zone 60 mm
insulation wood fibre 40 mm
CLT 280 mm
wooden beam 650 mm (construction: pine)
rail system foldable seperation wall
acoustic panels with artifical
lighting panel hanging underneath

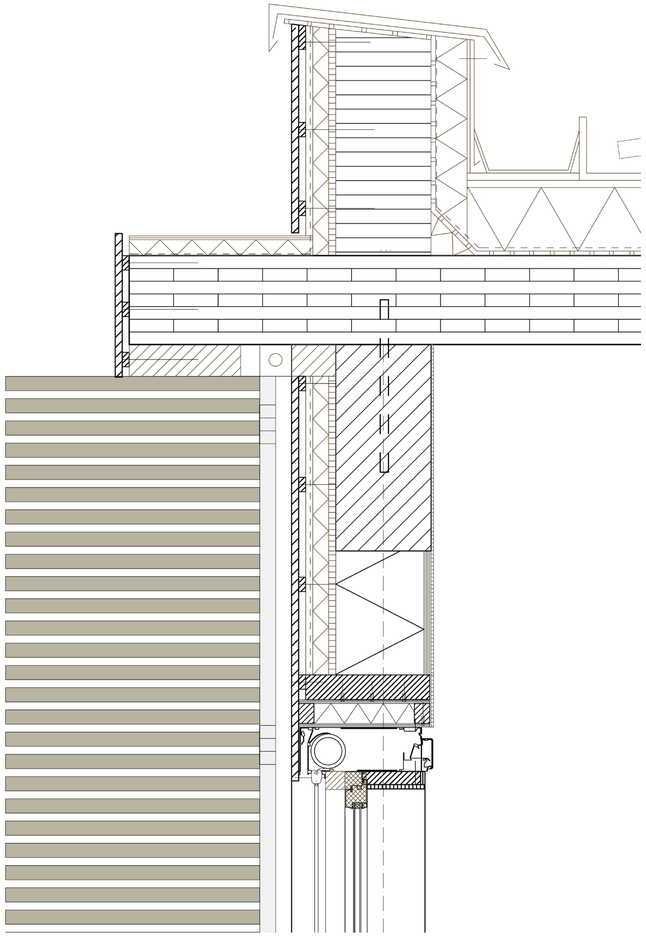


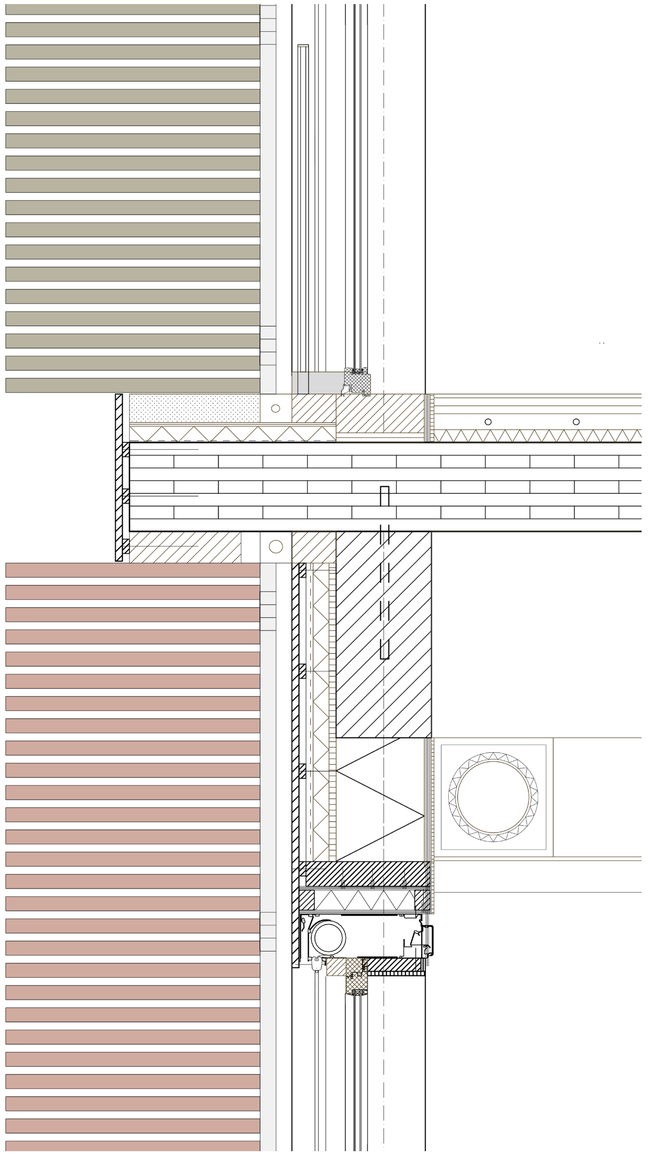
Foundation detail 1:5



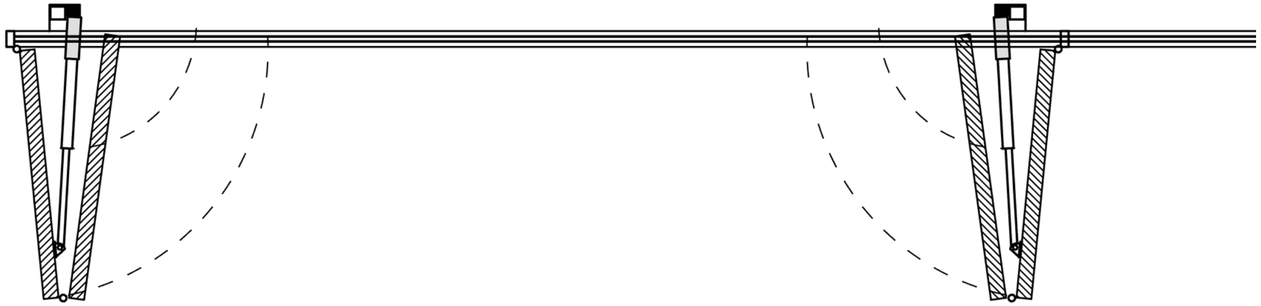
Foundation build up:
sand cement screed
with radian heating 65 mm
EPDM foil
infill reinforced concrete slab 300 mm
EPS insulation 150 mm

Void wall details
with moveable panels 1:5

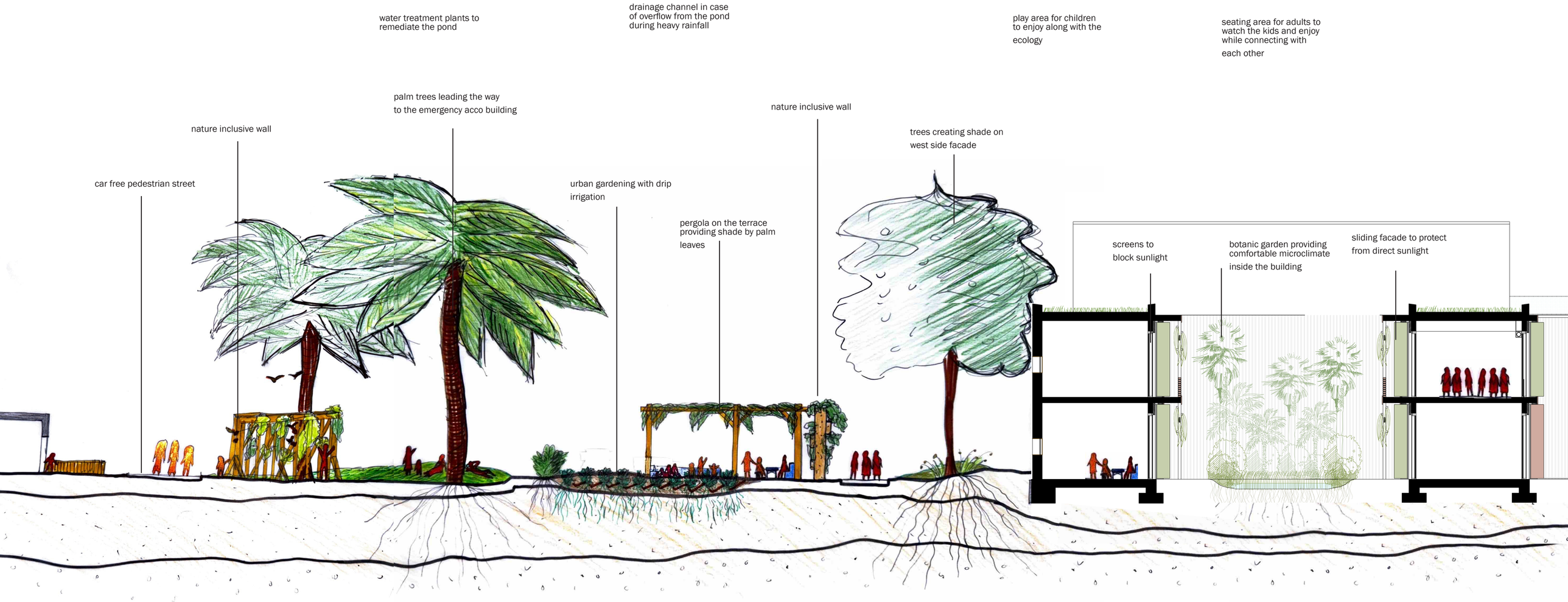




Horizontal detail panels 1:5

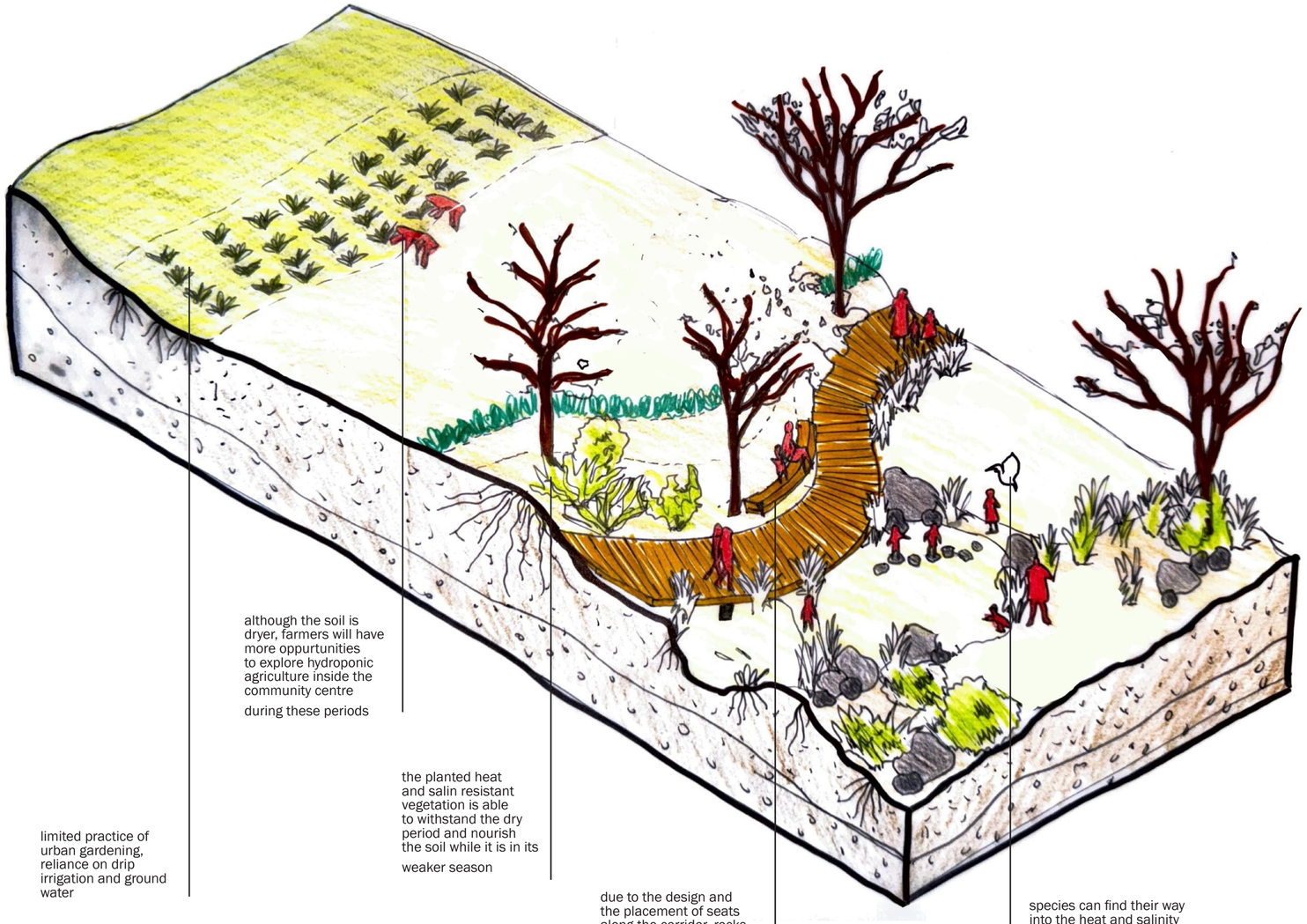


soft edge creation between existing buildings and the community centre



view from housing
west side of the plot

ecological corridor dry period



limited practice of urban gardening, reliance on drip irrigation and ground water

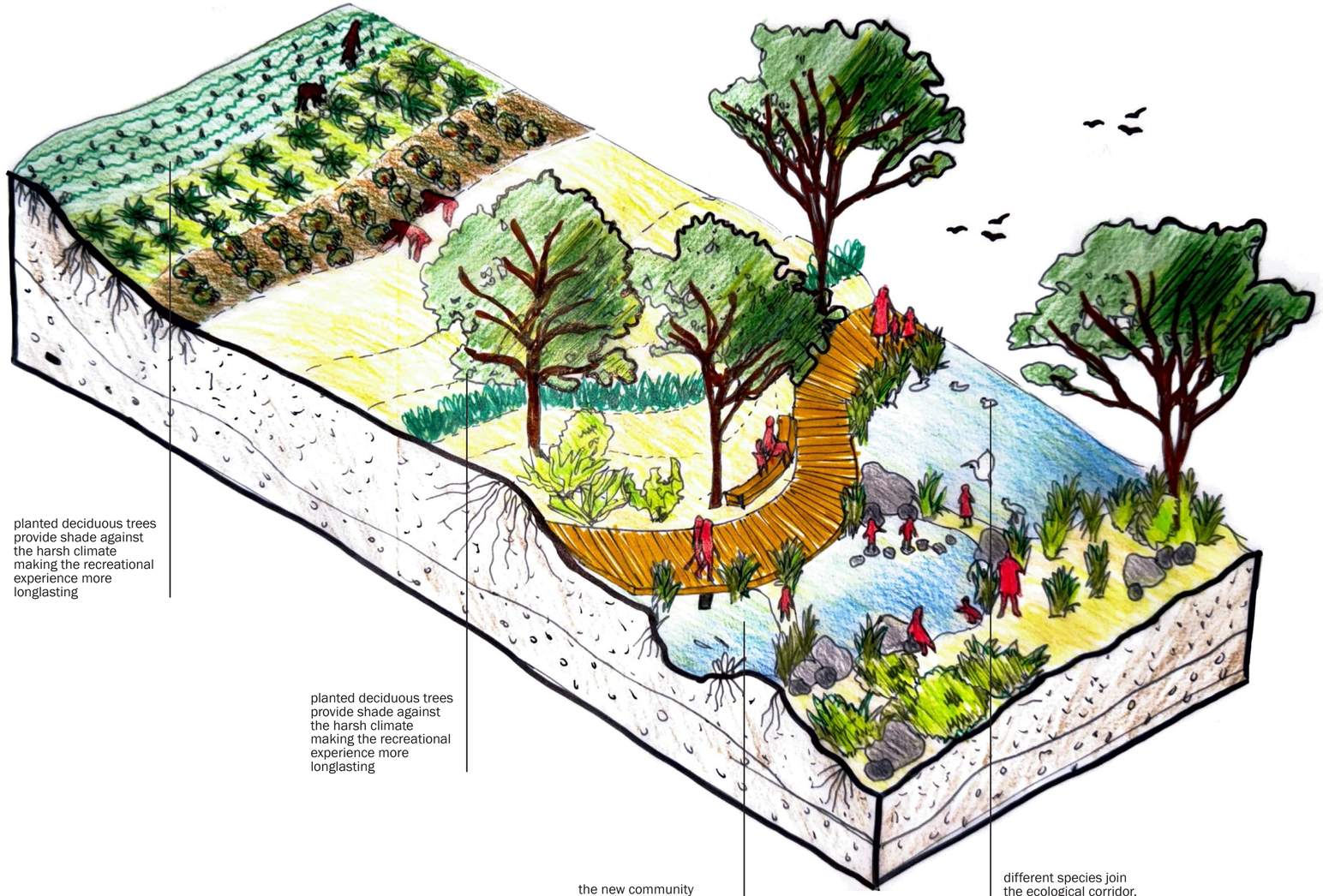
although the soil is dryer, farmers will have more oppurtunities to explore hydroponic agriculture inside the community centre during these periods

the planted heat and salin resistant vegetation is able to withstand the dry period and nourish the soil while it is in its weaker season

due to the design and the placement of seats along the corridor, rocks to climb and play on, the ecological corridor is still enjoyable for the new community

species can find their way into the heat and salinity resistant plants to settle

ecological corridor wet period



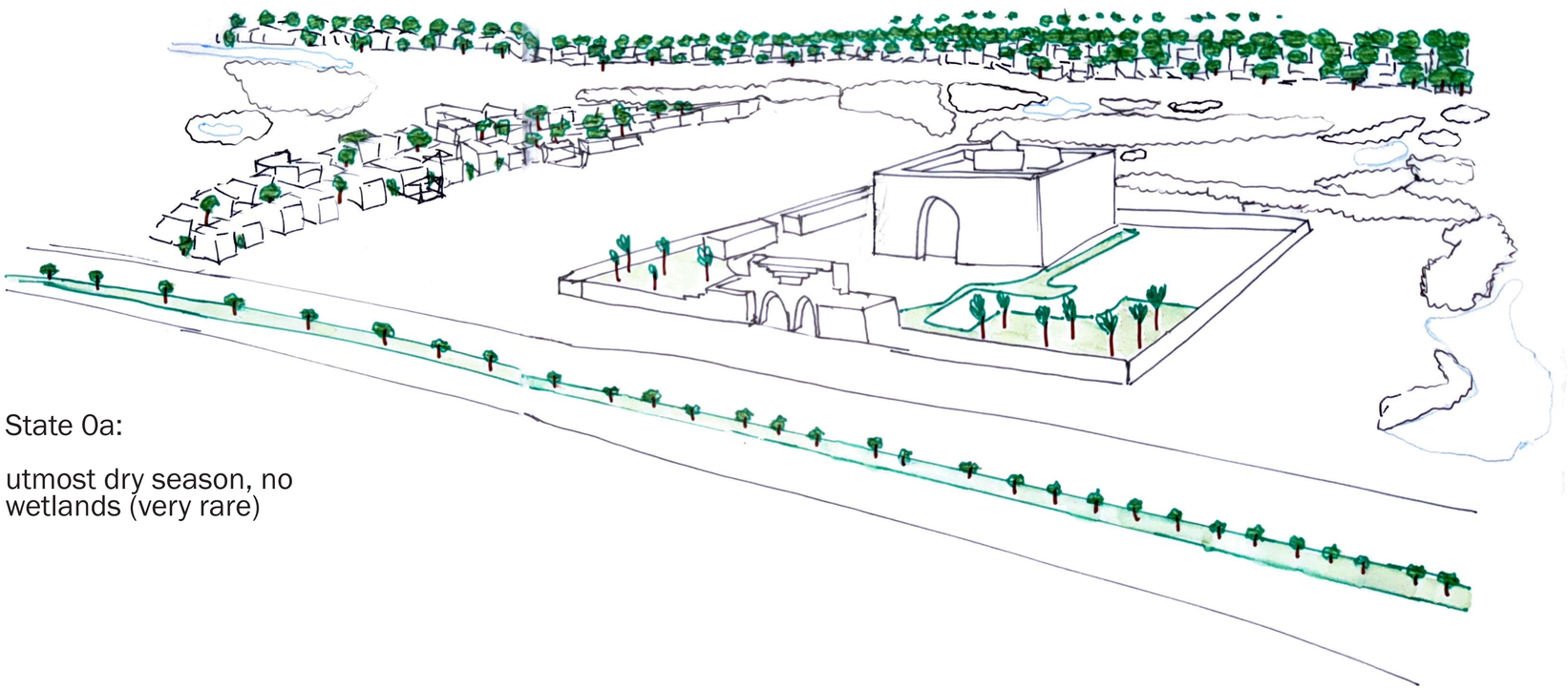
planted deciduous trees provide shade against the harsh climate making the recreational experience more longlasting

planted deciduous trees provide shade against the harsh climate making the recreational experience more longlasting

the new community can enjoy the seasonal wetlands and explore the rich ecology and microclimate along the pathway

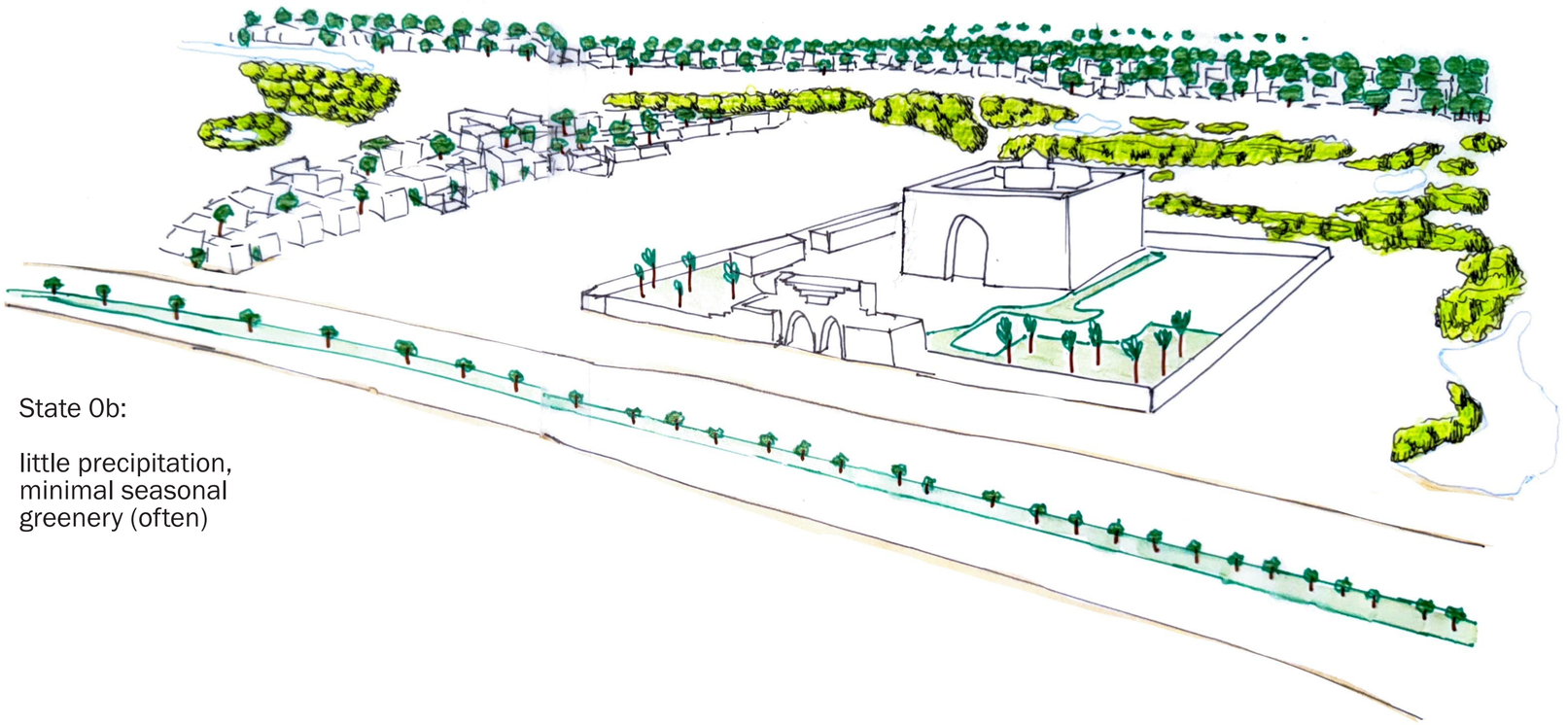
different species join the ecological corridor, for example after bird migration

Temporality of the site



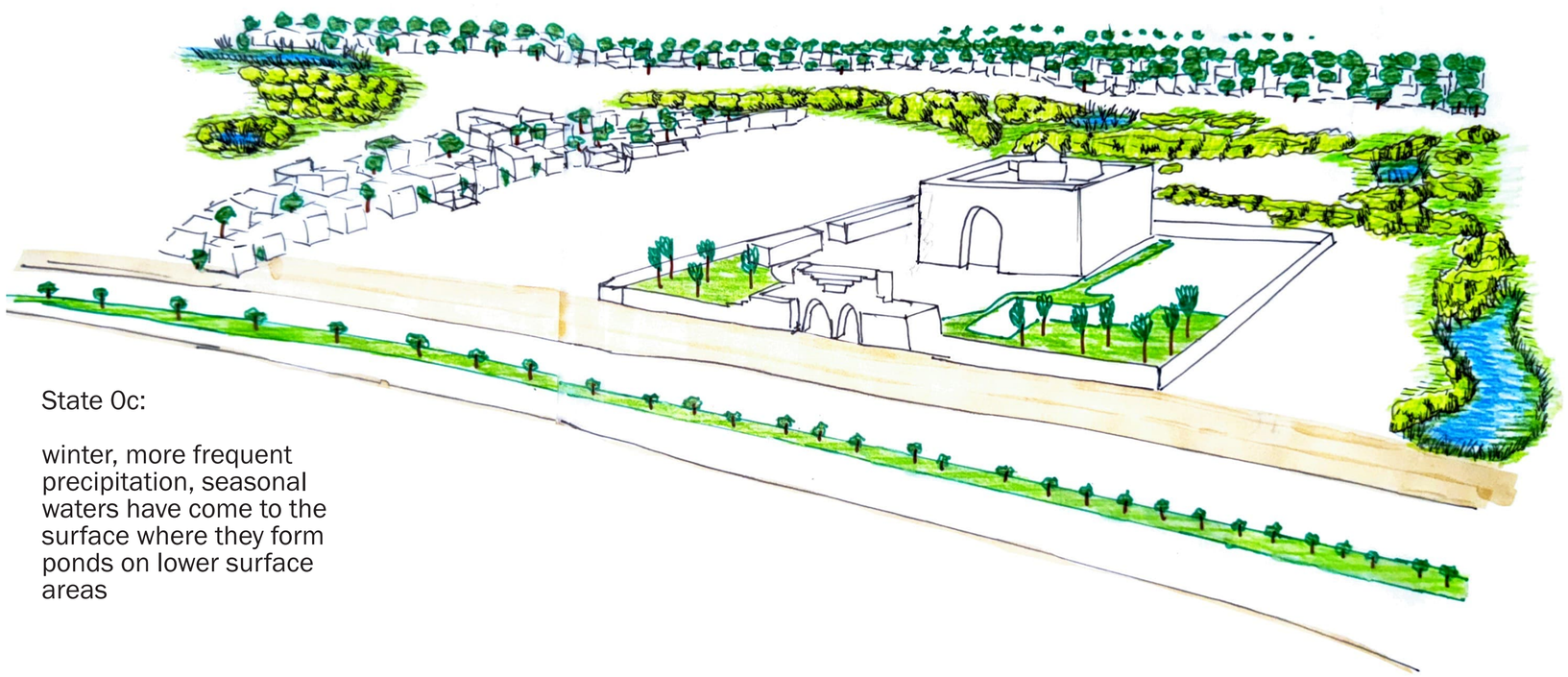
State 0a:

utmost dry season, no wetlands (very rare)



State 0b:

little precipitation,
minimal seasonal
greenery (often)



State 0c:

winter, more frequent precipitation, seasonal waters have come to the surface where they form ponds on lower surface areas

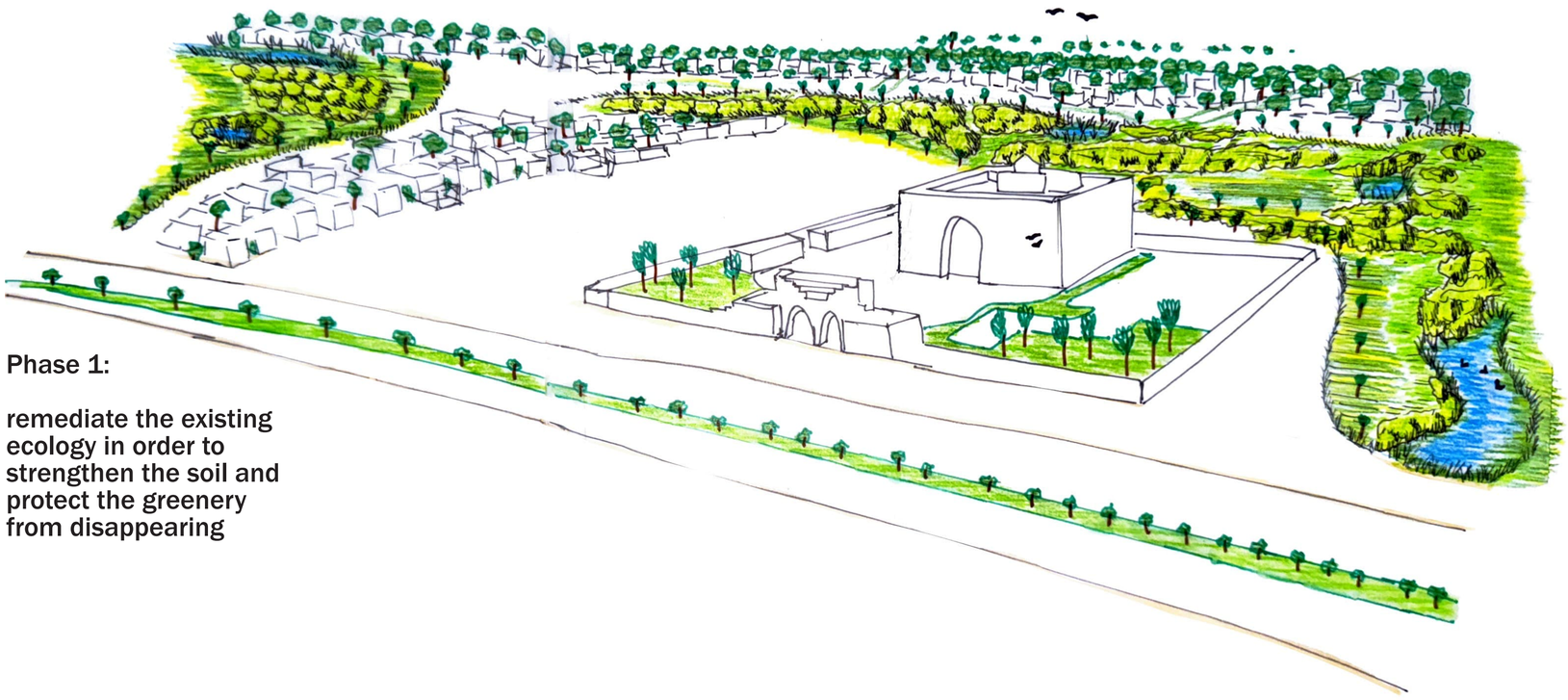
Phasing of the project

Phase 1 – Soil Stabilisation & Initial Remediation (2025–2027)
Duration: ~2 years

Plant hardy, fast-growing halophytes and nitrogen-fixing shrubs (e.g. Atriplex, Hippophae, Sesbania)

Begin raised beds and drip irrigation to support soil structure

Start community awareness & experimentation with small-scale composting and mulching



Phase 1:

remediate the existing ecology in order to strengthen the soil and protect the greenery from disappearing

Soil remediation: halophytes and nitrogen-fixing shrubs

atriplex

hippophae

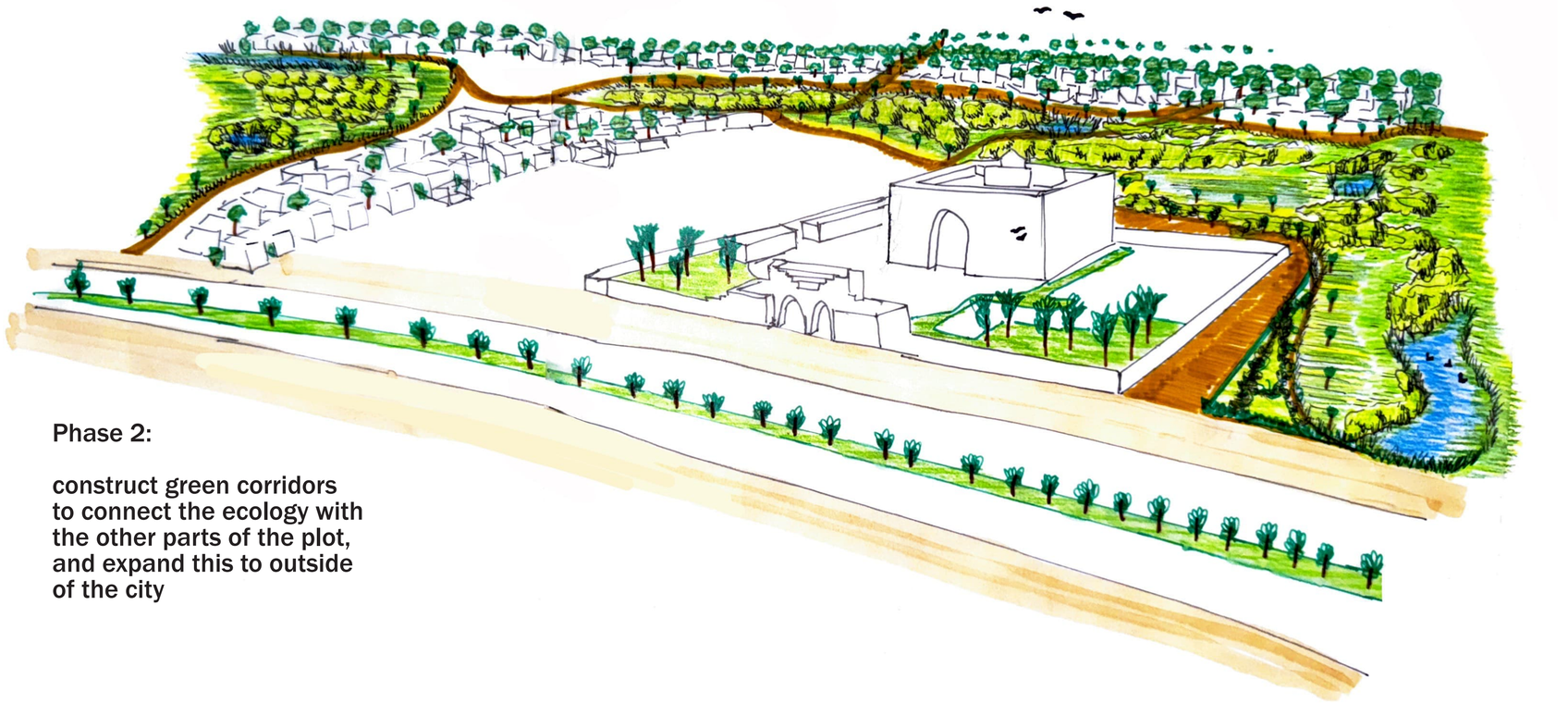
sesbania

Phase 2 – Tree Layer Establishment & Microclimate Shaping (2027–2030)
Duration: ~3 years

Introduce larger, heat/drought/salt-resistant trees (Phoenix dactylifera, Populus euphratica, Ziziphus)

Continue intercropping and add more productive soil-improving plants (Salicornia, Tamarix)

Expand irrigation infrastructure and initiate pond filtration with aquatic plants



Phase 2:

construct green corridors to connect the ecology with the other parts of the plot, and expand this to outside of the city

tree layer establishment & microclimate shaping

phoenix dactylifera

populus euphratica

tamarix

sallicornia

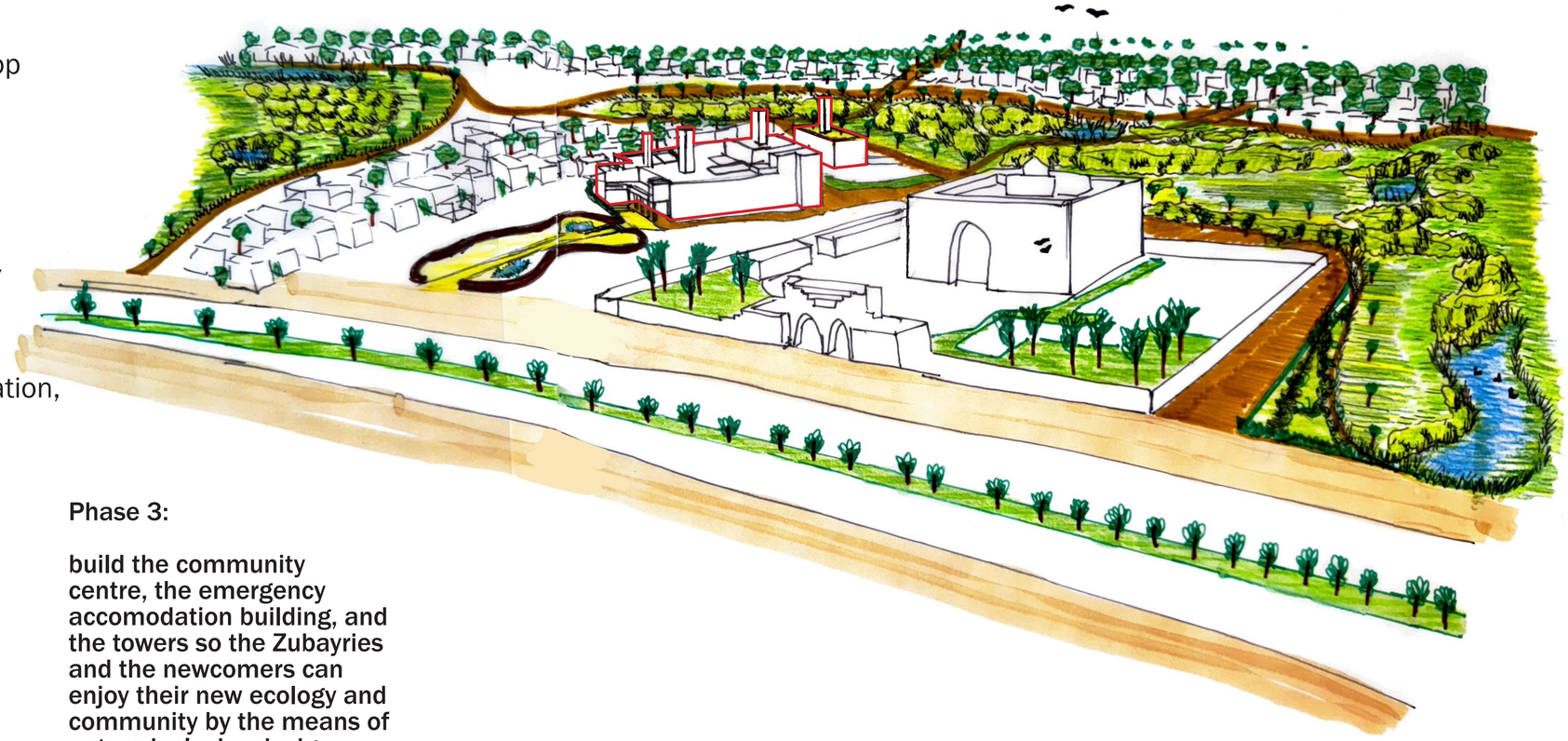
Phase 3 – Functional Ecosystem & Food Production (2030–2034)
Duration: ~4 years

Soil shows visible remediation; first modest crop yields from salt-tolerant and raised-bed crops

Ecosystem services begin: shade, windbreak, biodiversity restoration

Start of experimental agriculture: hydroponics/ aeroponics in designated community zones

Community services expand (education, recreation, food markets)



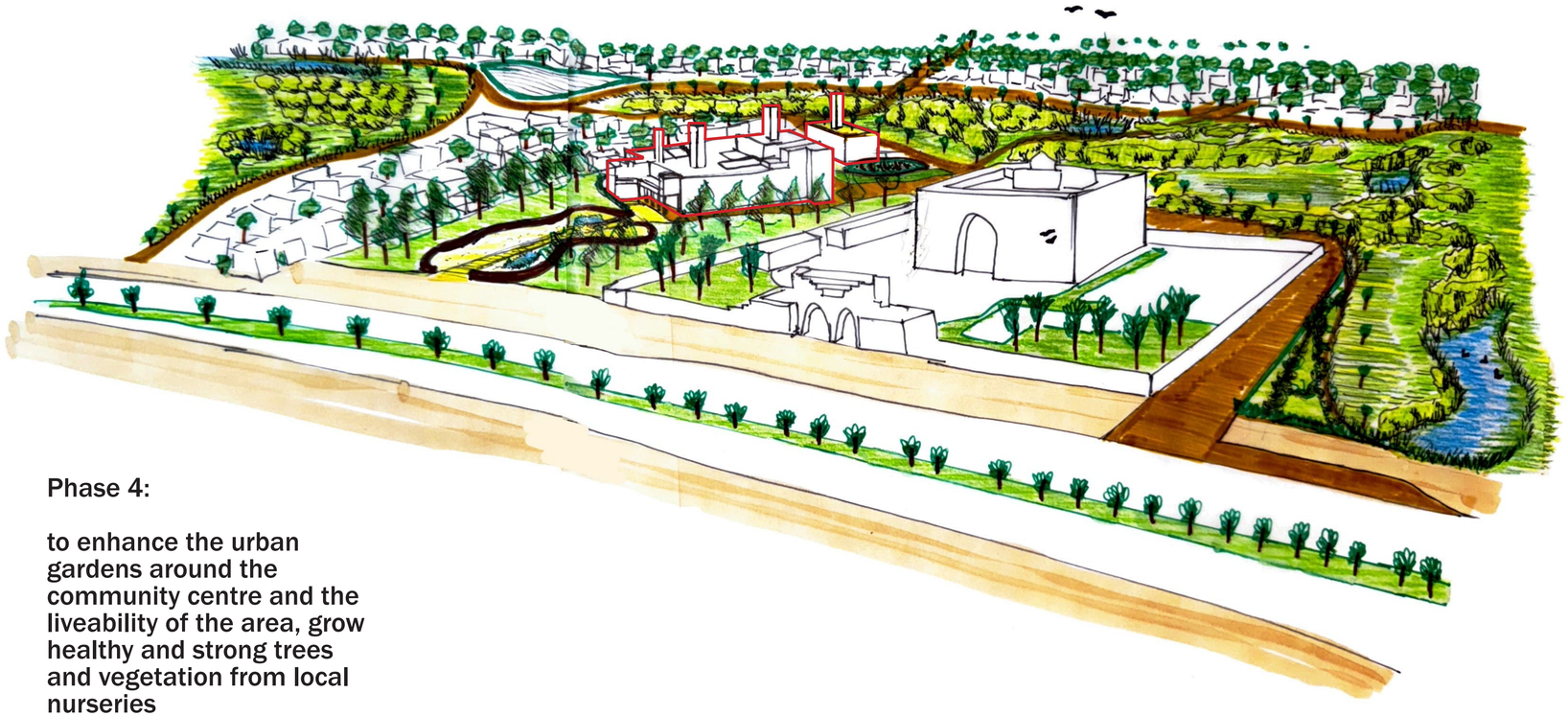
Phase 3:

build the community centre, the emergency accomodation building, and the towers so the Zubayries and the newcomers can enjoy their new ecology and community by the means of nature inclusive design

Phase 4: Regional Green Corridor Integration (2035–2040)
Duration: ~5 years (depends on site performance & external policy)

Connect restored site to nearby green belts and wetland patches

Strengthen ecological corridors using native trees and wildlife support



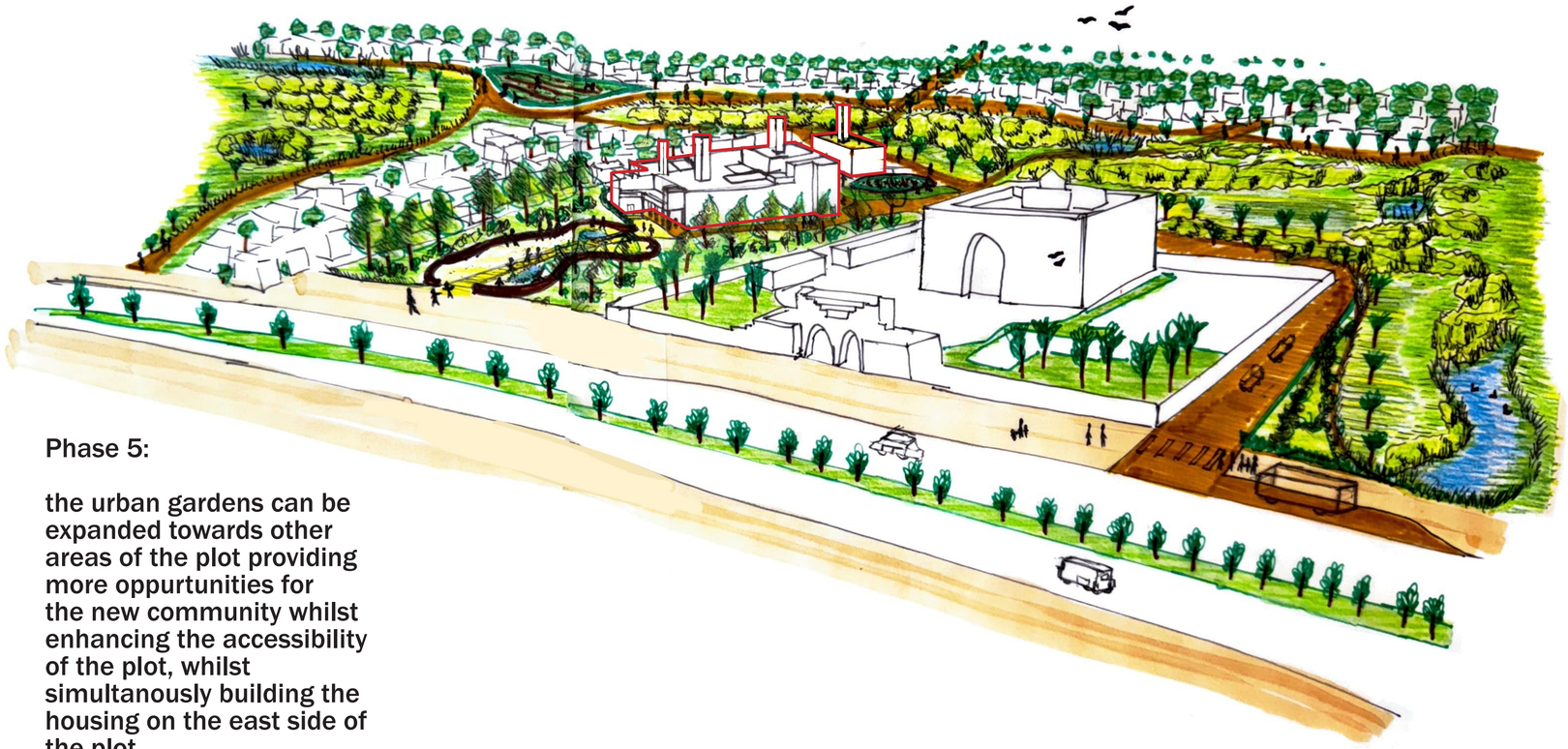
Phase 4:

to enhance the urban gardens around the community centre and the liveability of the area, grow healthy and strong trees and vegetation from local nurseries

Phase 5: After 2040

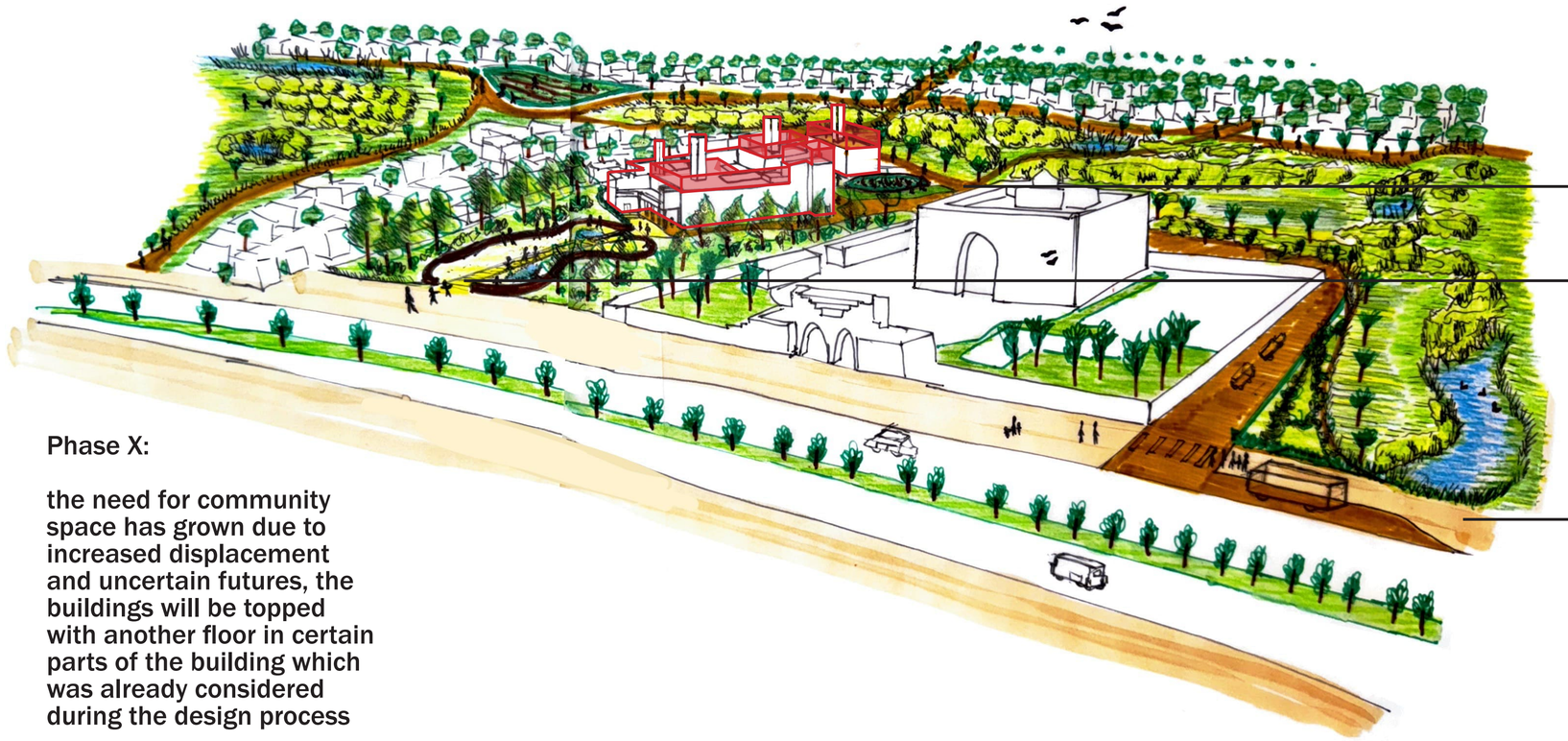
Further connect restored site to nearby green belts and wetland patches

Promote the model as a blueprint for similar climate-challenged areas in southern Iraq



Phase 5:

the urban gardens can be expanded towards other areas of the plot providing more oppurtunities for the new community whilst enhancing the accessibility of the plot, whilst simultanously building the housing on the east side of the plot



Phase X:

the need for community space has grown due to increased displacement and uncertain futures, the buildings will be topped with another floor in certain parts of the building which was already considered during the design process

stabilized gravel: cooler tone gralux

warmer tone gralux

sandy pavement on existing flat surface

Scale of intervention housing east side of plot

Size of household:
rural Basra average = 8 members
urban Basra average = 6,7 members
--> often extended families
internally displaced families Zubayr = 378
378 x 8 = 3022 people

1 block:
4 houses (expandable) = 1300 m2 (ground level)
4 gardens = 2400 m2 (ground level)
4x livestock = 180 m2 (ground level)
For a standard medium density house, 12 people could live in each of these houses (1 level)
Design provides these sizes roughly times 5 so:
20 houses x 12 people = 240 people (only ground level)
= 480 people (2 levels)
= 1440 people (3 levels)
I implement a variety of levels so roughly = 1000 people --> 3022 displaced people in Zubayr / 1000 so ~ 30% of IDPs in Zubayr can be accomodated within these considerations

Thank you.
Questions?