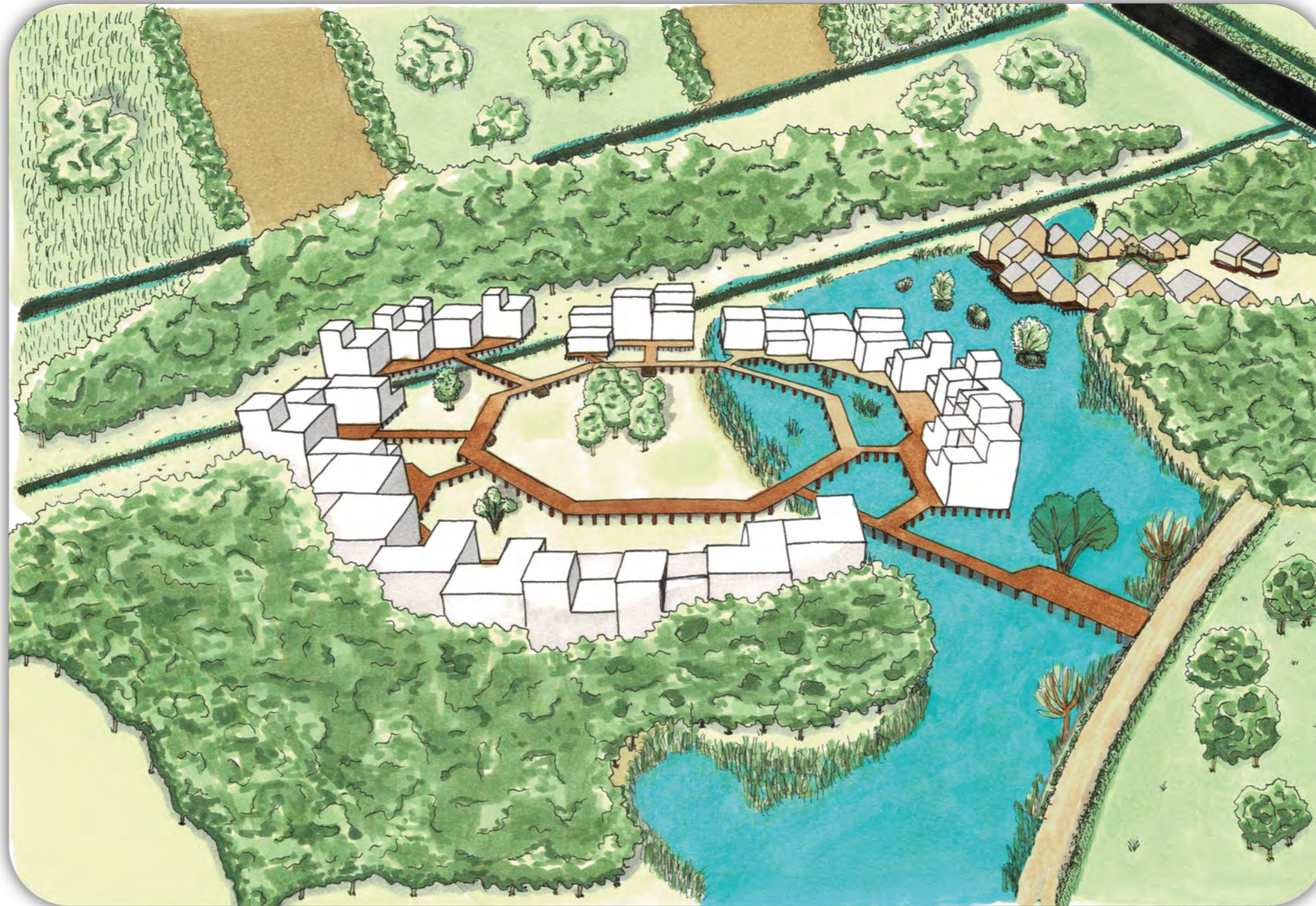


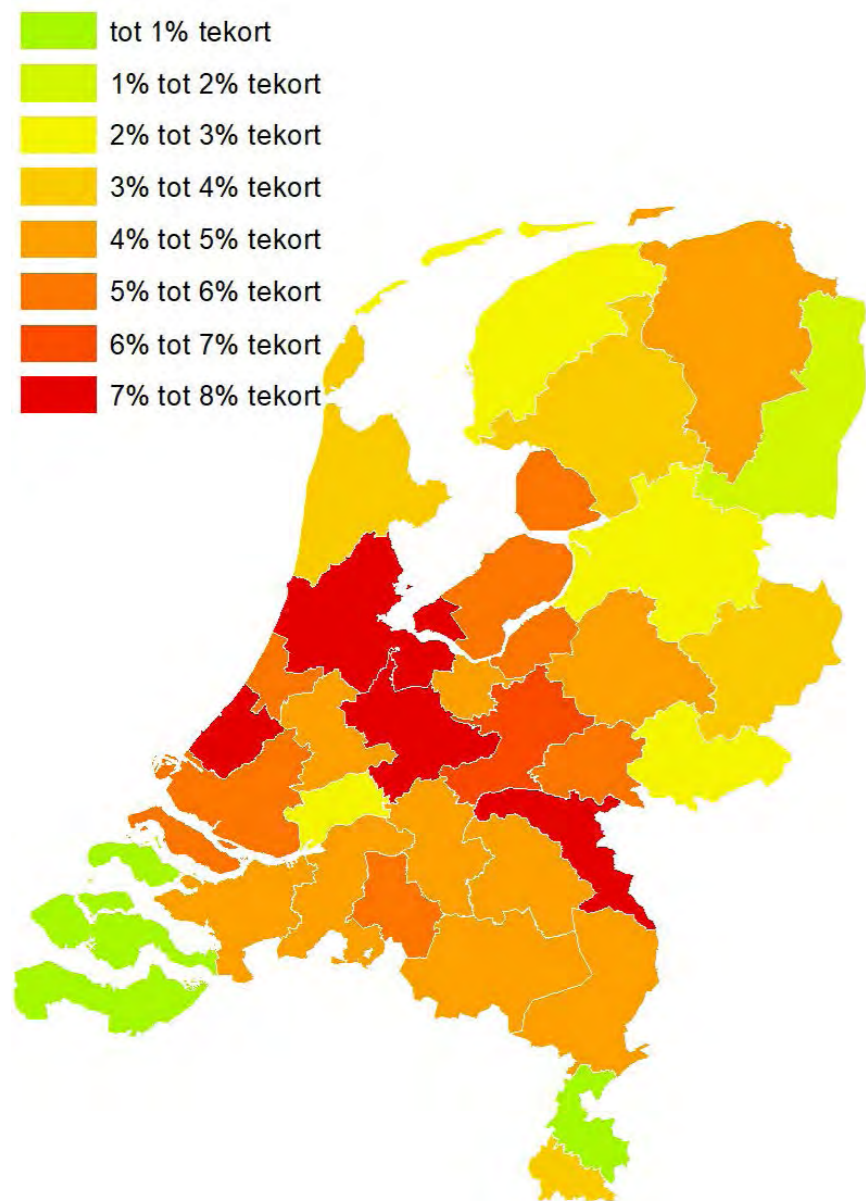
Designing a new village character



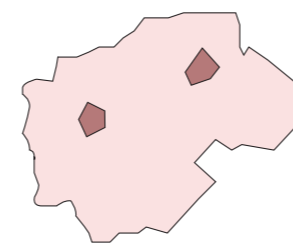
P5 Presentation - Anne-Mieke Boerendonk - 26 October 2021

First mentor: ir. Leo van den Burg
Second mentor: ir. Denise Piccinini

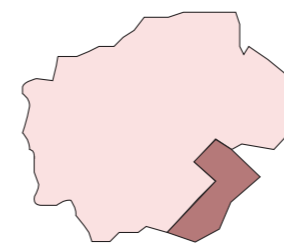
We need to build 1 million homes.... but where?



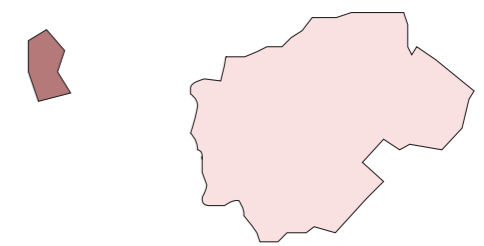
Primos 2020



Within the city

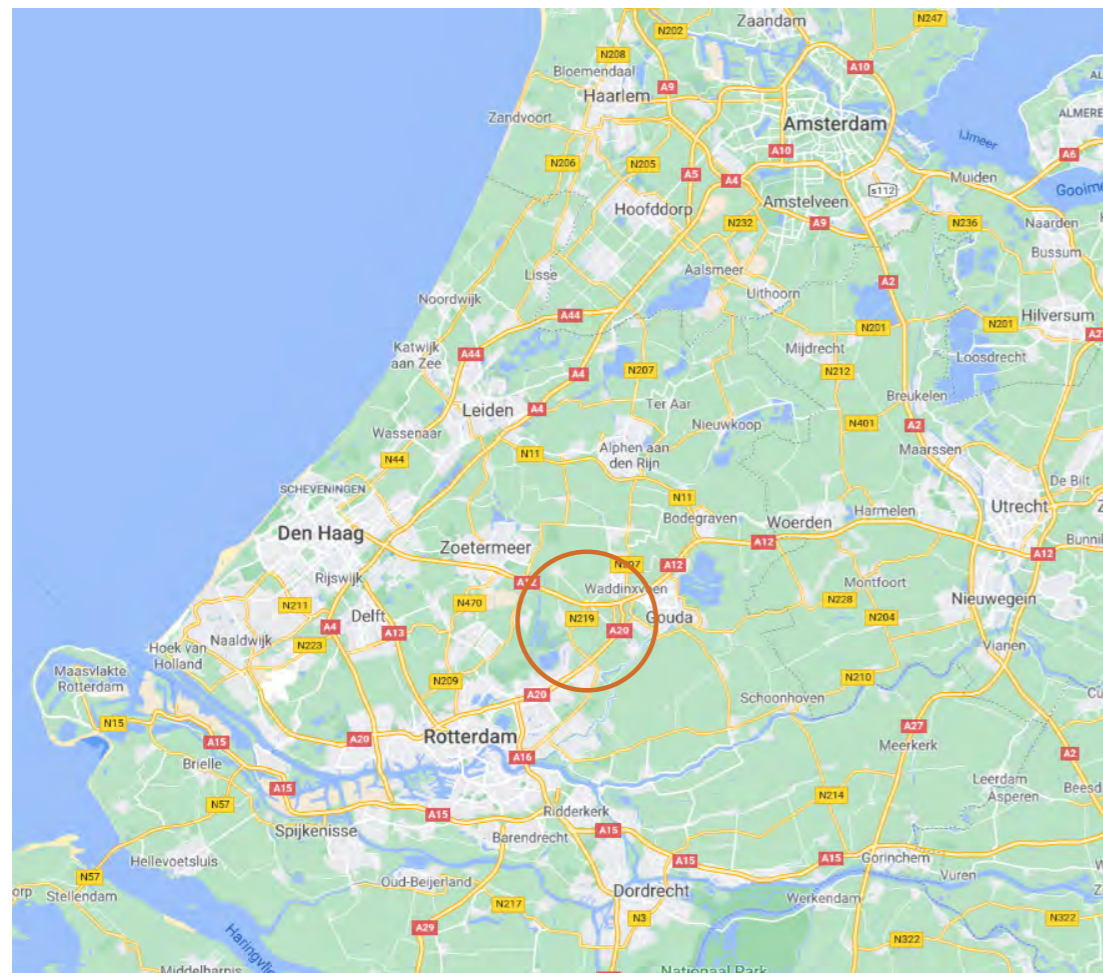


Expansion



In open space

The Zuidplaspolder



Google Maps

Fifth Village

- *Protect village character.*
- *Create a large green zone and green buffers around the villages.*

“Should you want to build there at all?”



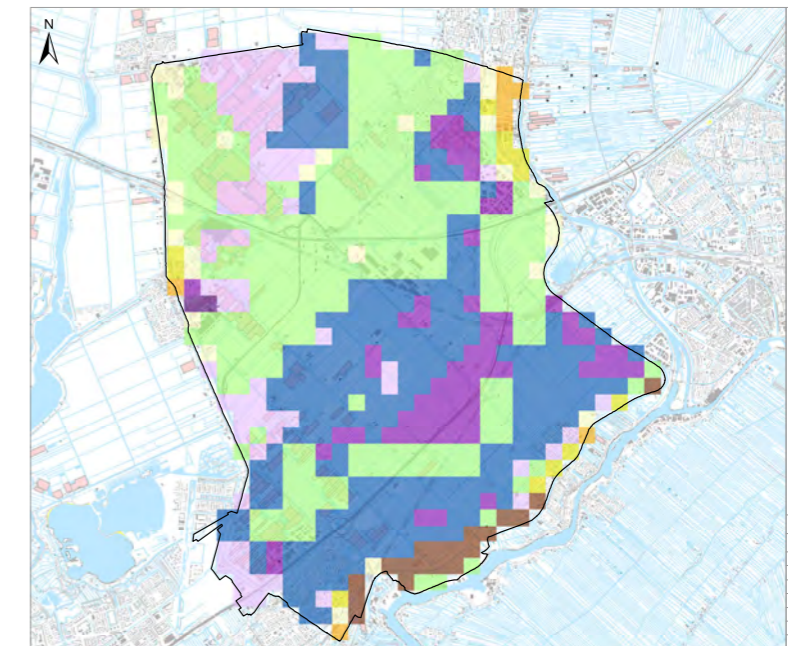
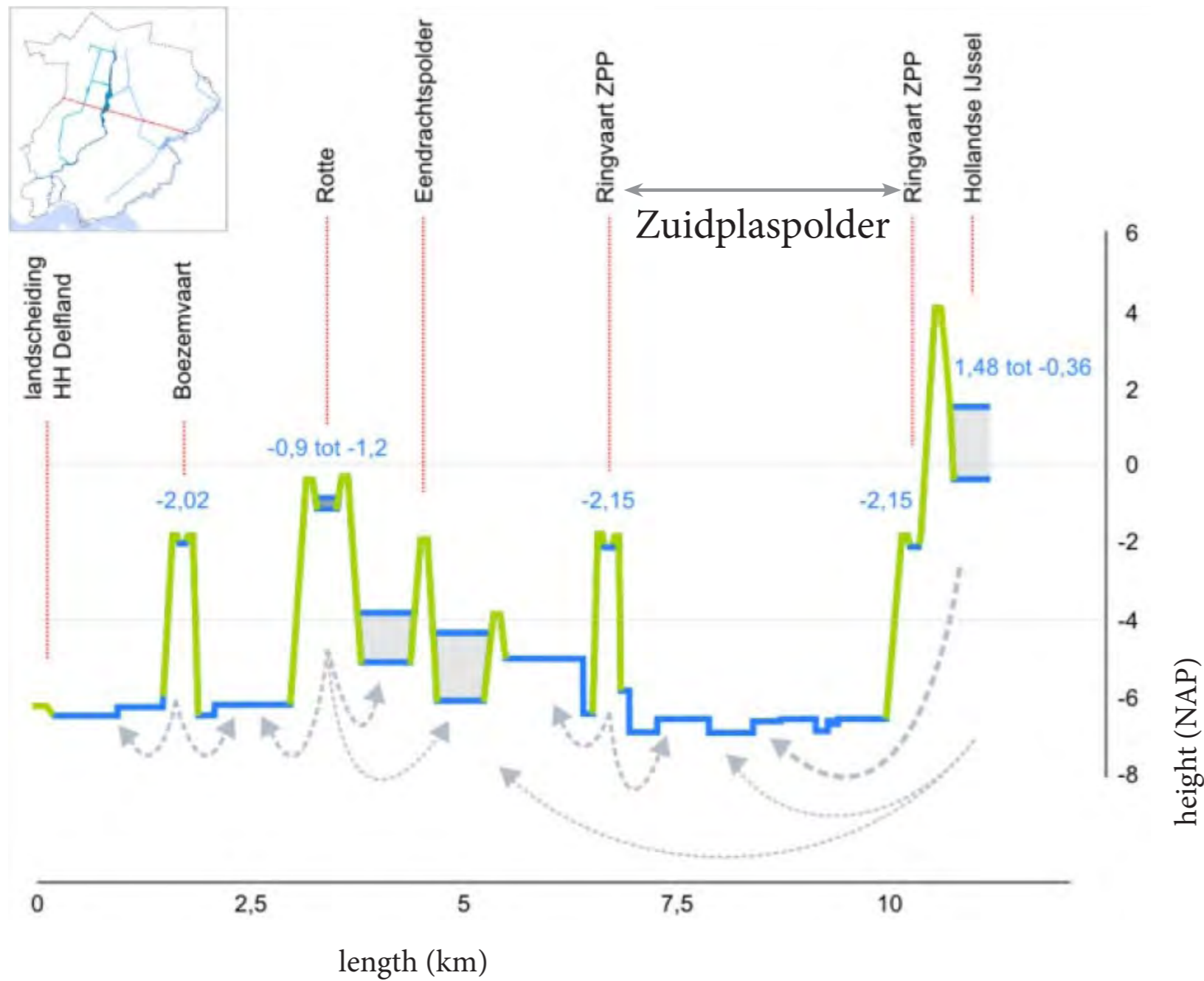
View on the Zuidplaspolder. Gouwe IJssel Nieuws (2017)

Can we build there if we do things differently than usual?



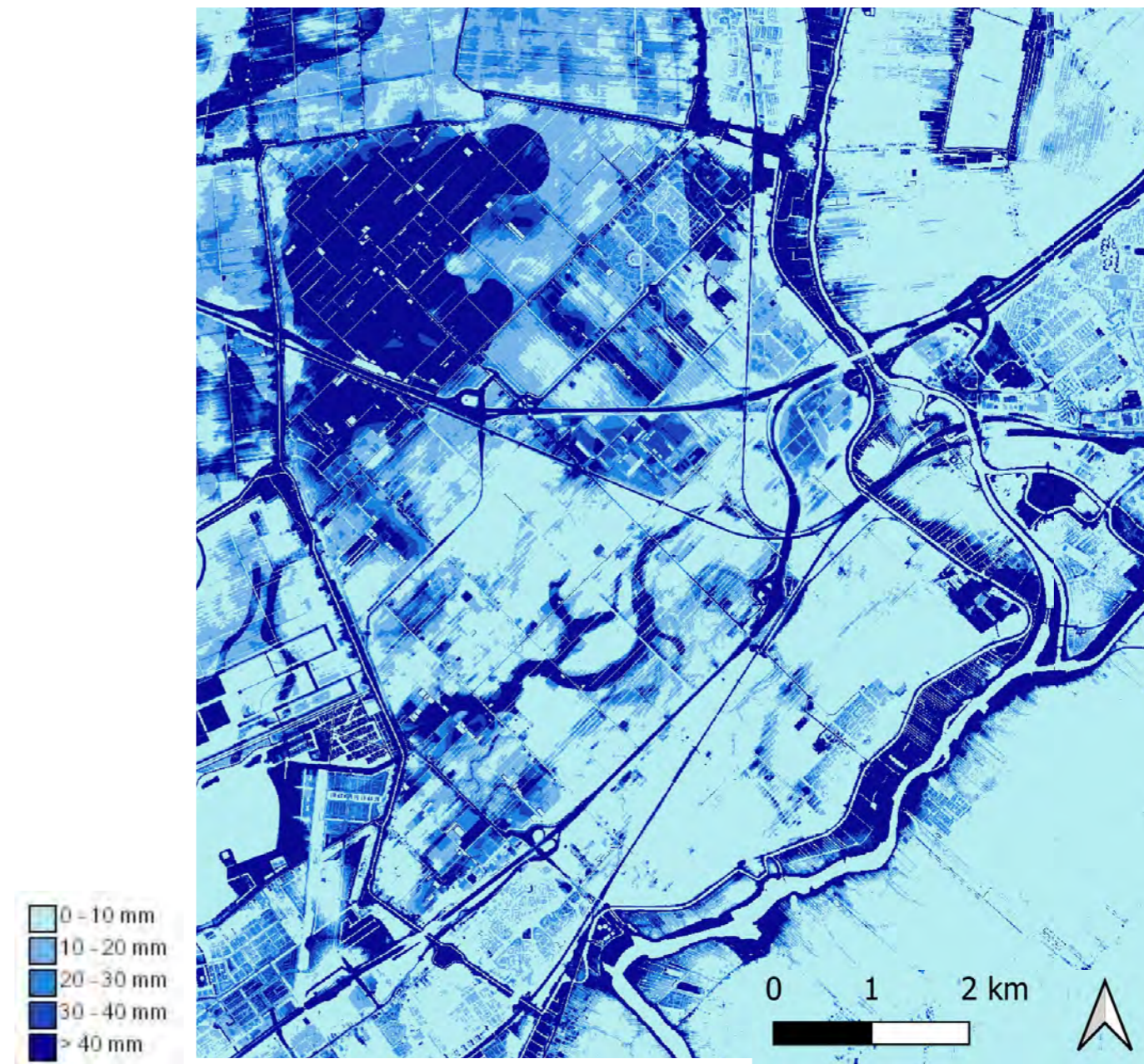
View on the Zuidplaspolder. Gouwe IJssel Nieuws (2017)

1. Put biodiversity and the water system first
2. Find a form that suits the polder and the people.



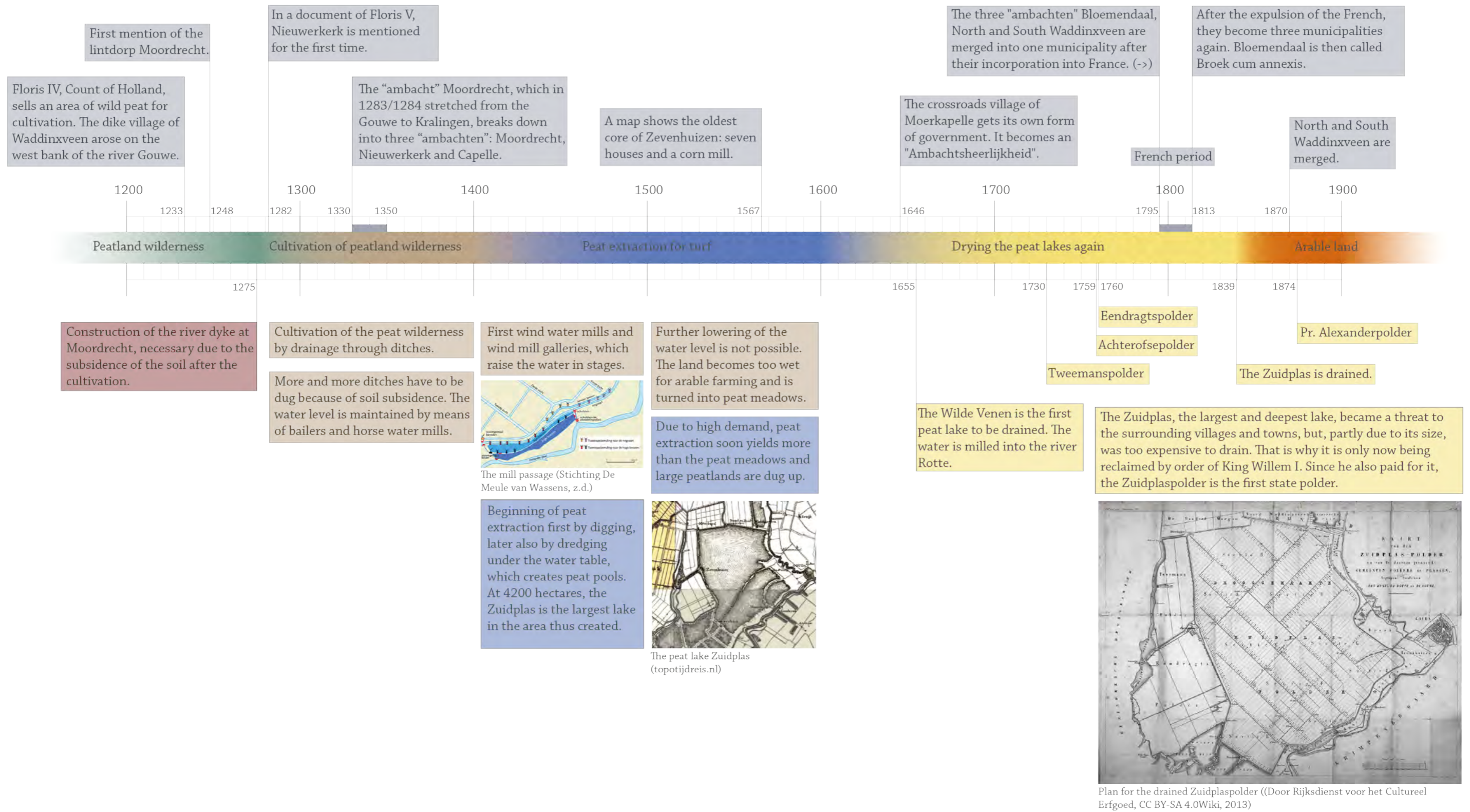
Adapted from Nota Watersystemen HHSK, Hoogheemraadschap van Schieland en de Krimpenerwaard.

Virtually no storage capacity, while climate change is causing much more rain to fall in a short period of time.



Water storage capacity in the soil (QGIS, data from province of South Holland).

Landscape - Water system



Risc of drought and salinisation.



QGIS, data from province of South Holland.

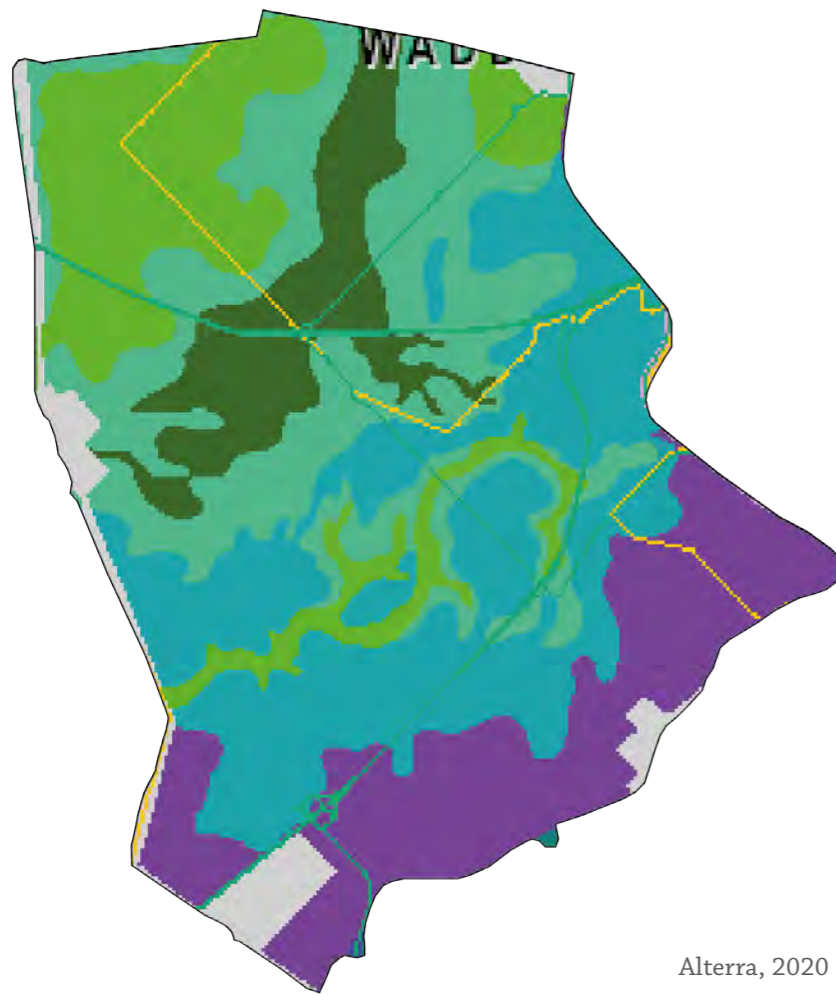
Therefore, in the future, most of the land will no longer be suitable for (regular) agriculture.

What could be an alternative?

Make space to safely store the extra rainwater (water storage).

Save it for dry periods (water buffering).

soil

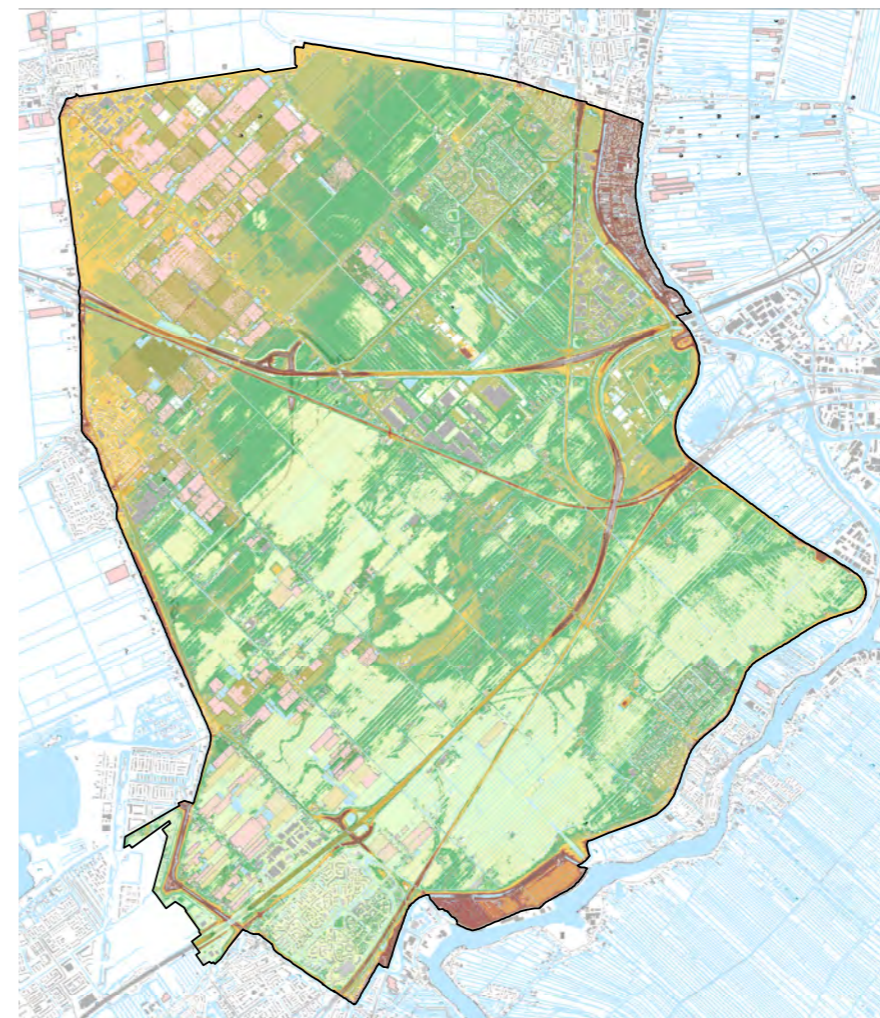


Alterra, 2020

Potential for diversity in biotopes.

- Municipality
- Earthy topsoil on deep peat
- Peat on unripened clay
- Sandy clay with homogeneous profile
- Light clay with homogeneous profile
- Clay with heavy intermediate layer or subsurface
- Buildings

ground level

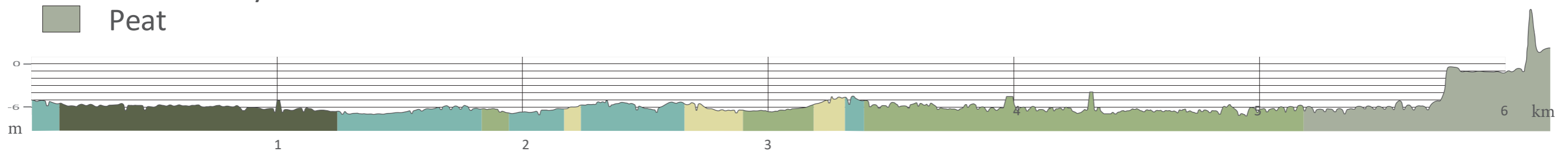


Hoogheemraadschap van Schieland en de Krimpenerwaard.

Legenda

- gebiedsgrens
- AHN2**
- < -8
- 8,61 - -7,25
- 7,24 - -6,15
- 6,14 - -5,8
- 5,79 - -5,7
- 5,69 - -5,41
- 5,4 - -5,25
- 5,24 - -4,66
- 4,65 - -3,75
- 3,74 - -3,25
- 3,24 - -3,15
- 3,14 - -2,75
- 2,74 - -1,64
- 1,63 - -0,7
- 0,69 - 0,63
- 0,64 - 2,13
- 2,14 - 3,46
- 3,47 - 4,59
- 4,6 - 6,1
- 6,00 - >

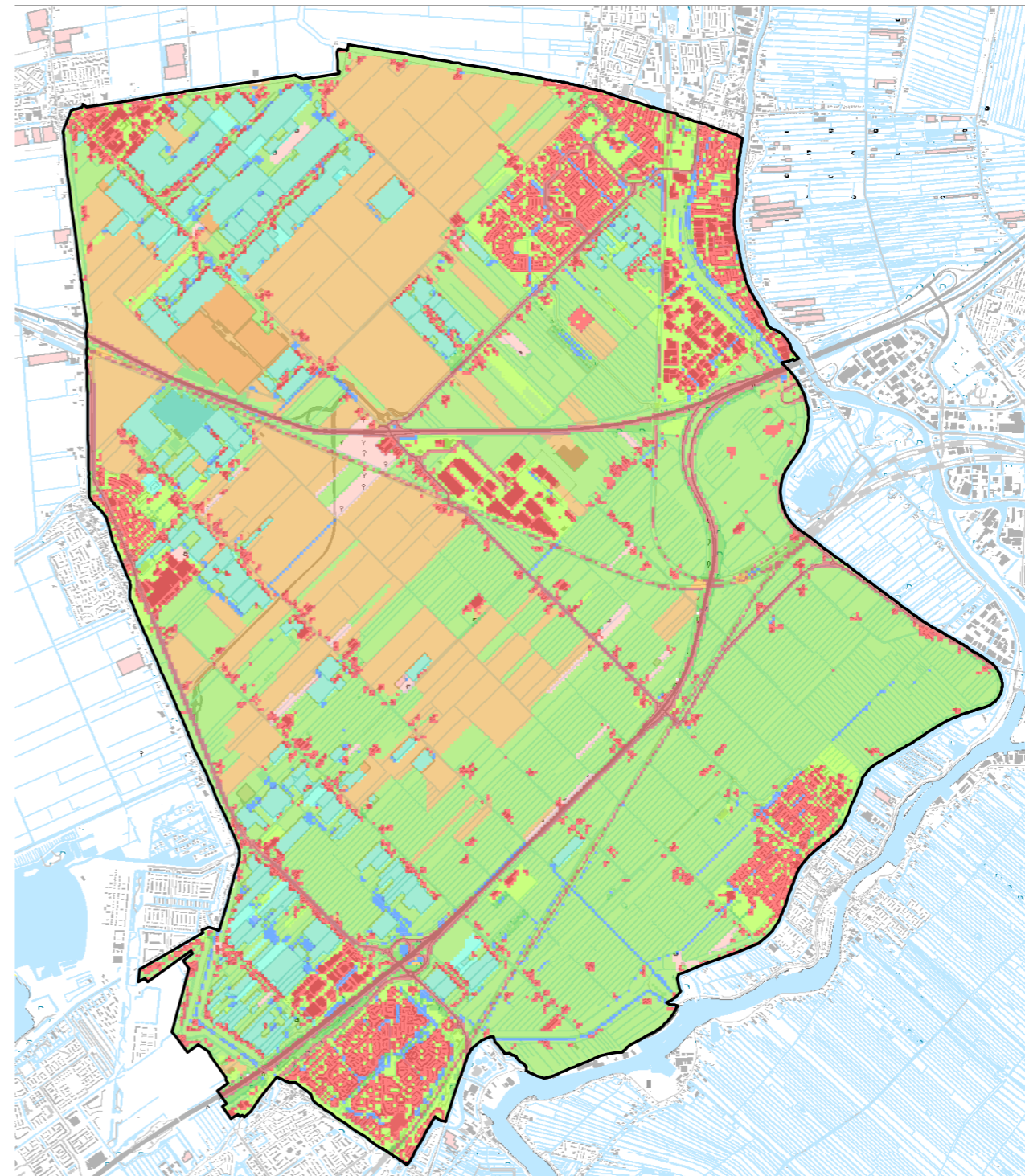
- Clay
- Cat clay
- Sandy clay
- Peat on clay
- Peat



Landuse

Not much biodiversity now.

Scale increase in agriculture:
Not many trees, shrubs and
hedges anymore.



Hoogheemraadschap van Schieland en de Krimpenerwaard.

Biodiversity requires:

- diverse biotopes, big enough
- native vegetation
- gradients
- good water quality

Sense of place

Place attachment
Spirit of place
(identity)

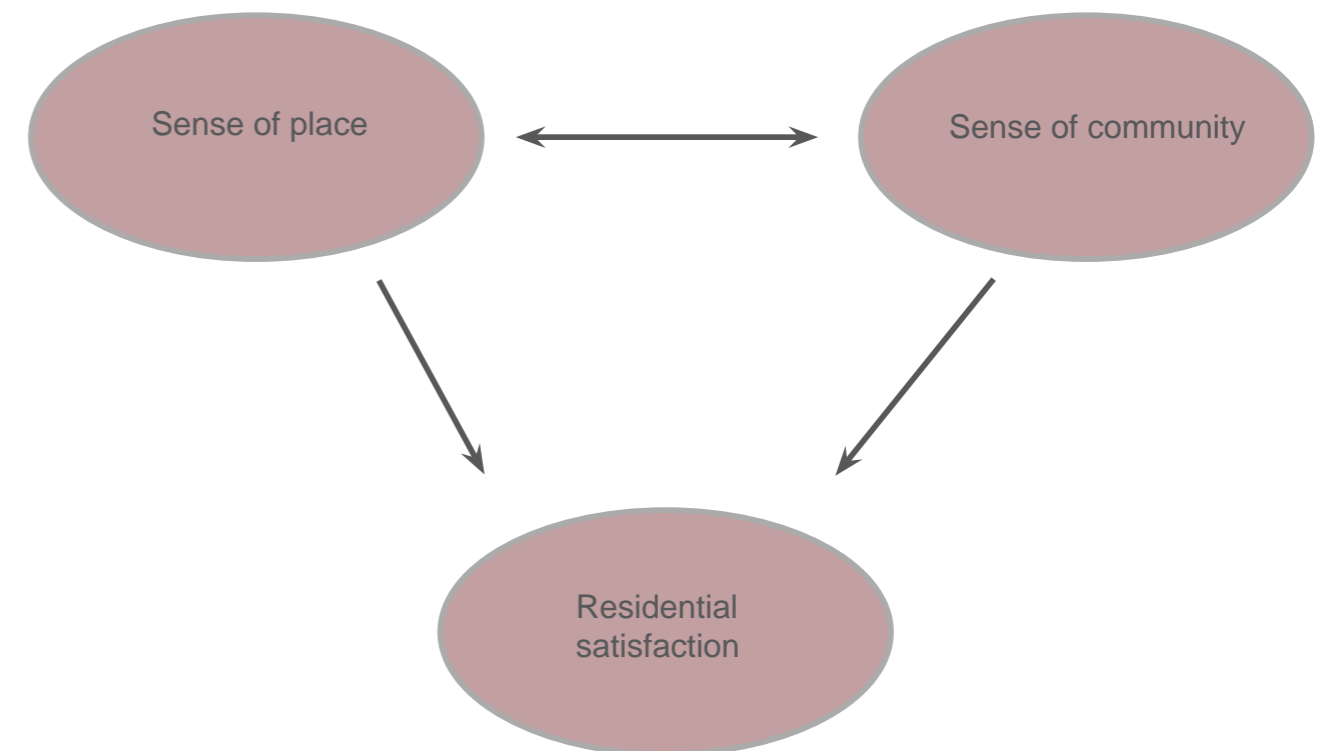
Sense of community

Community attachment
Community Identity
Social Interaction
Pedestrianism

Residential satisfaction

Satisfaction with:

dwelling,
neighbourhood and
neighbours



Influence of the physical environment

- Green and water
- Open space
- Human scale
- Interaction
- Houses (design quality, architectural style and diversity)

Family traits of the Zuidplas villages

2 families:

Evolved from a ribbon along a river:



Waddinxveen



Moordrecht



Nieuwerkerk a/d IJssel



Zevenhuizen

Founded as a crossroads village:



Moerkapelle

All were heavily involved in peat extraction and became agricultural after the drainage of the peat lakes.

A (small) village in general



Individual house



Private land



Backbone



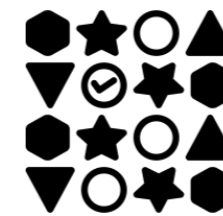
Public space



Existing soil



Traffic profile



Mixed functions

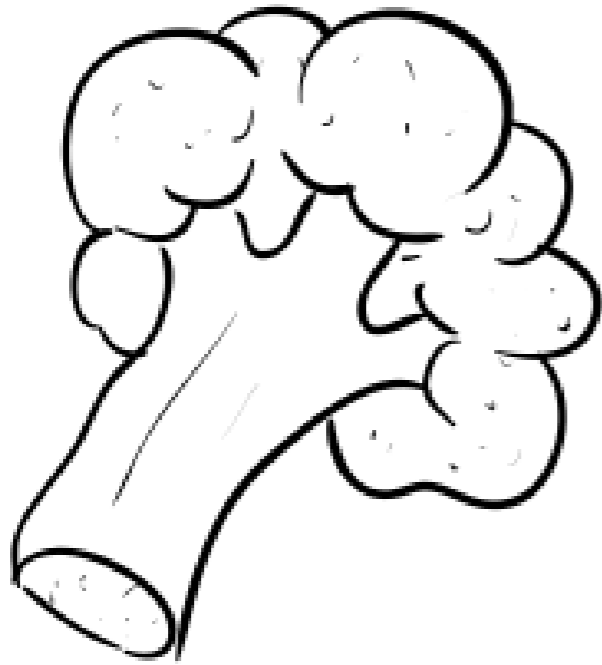


Core strength

People - Village character

Apart from the historical centres, the villages of Zuidplas are not really villages anymore according to the characteristics of la4sale.





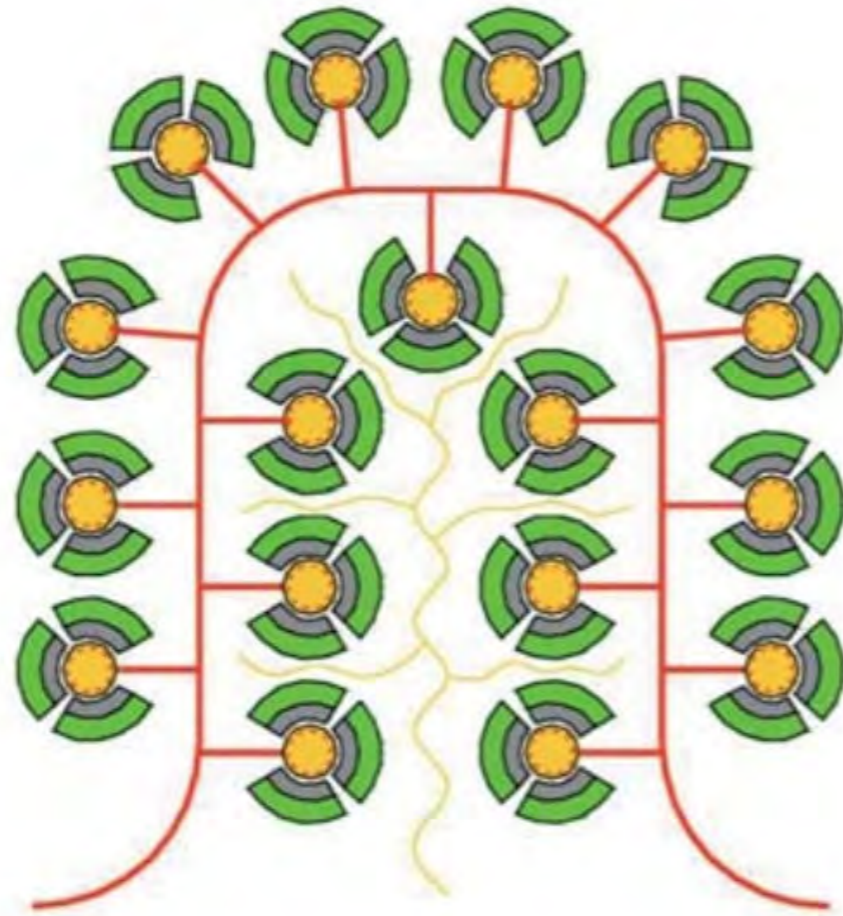
The highest scoring neighbourhood by residents: the cauliflower district.

Appreciated for its small scale, cosiness, green and variation.

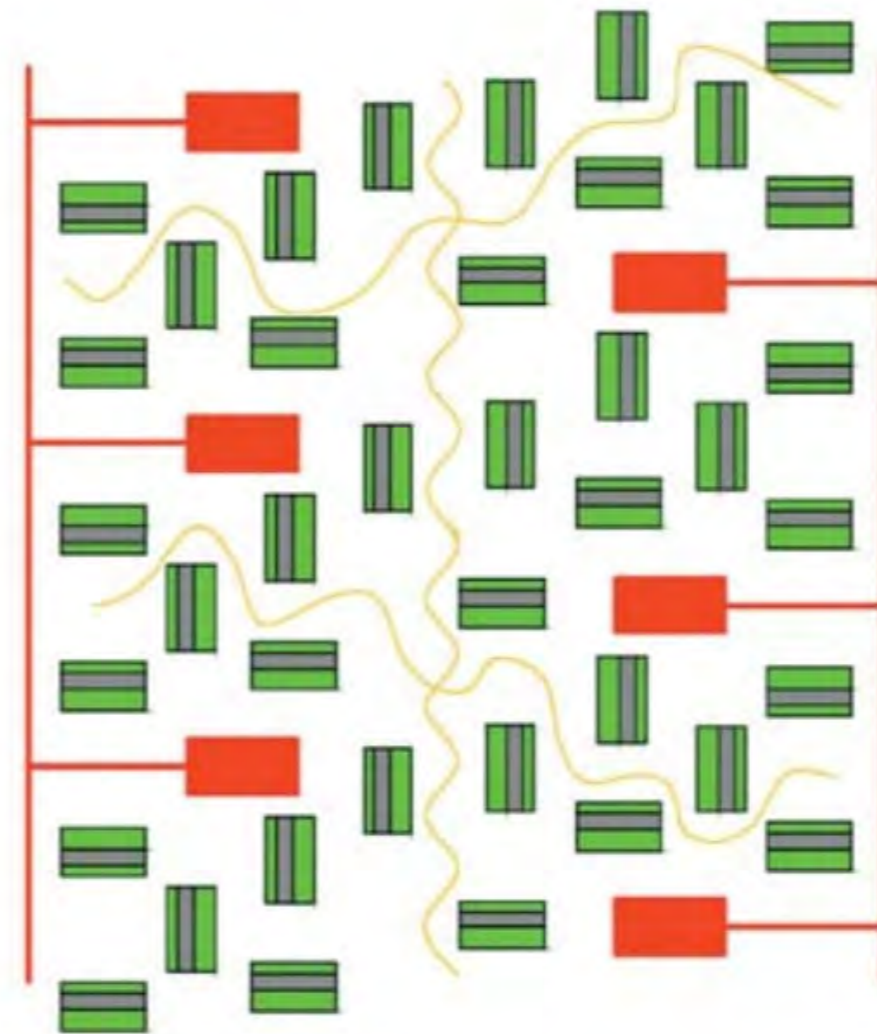
P. Eenink, 2007



Nieuwerkerk aan den IJssel, Google maps



- *cul-de-sac access*
- *collective green zone between clusters*
- *dwellings around enclosed collective outdoor space*
- *small-scale green layout of the neighbourhoods*



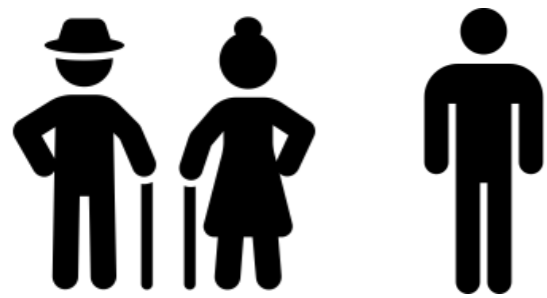
- or:*
- *scattered in groups in a shared green area*

Disadvantage of some "woonerven": unattractive, uninviting backsides

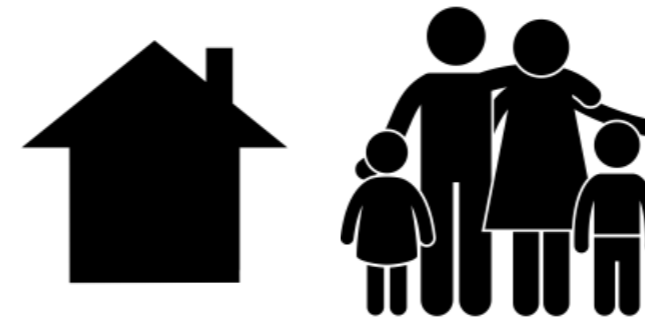


own picture, 2021

Main trends in housing preferences from the Woon 2018 survey:



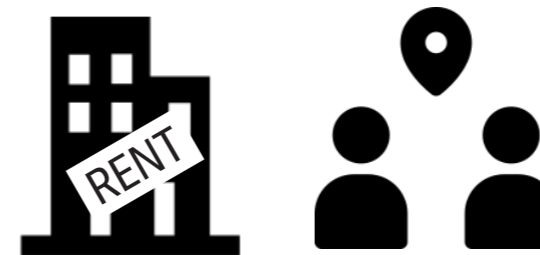
More elderly and single person households.



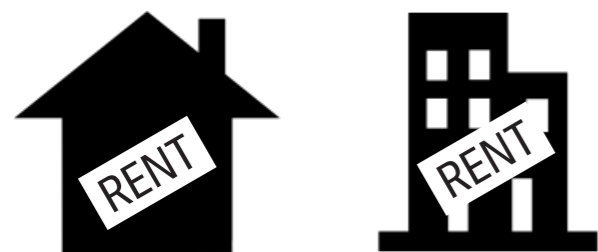
Large demand for single-family houses (owner-occupied). (Demand exceeds stock.)



More and more older households in owner-occupied homes.



Demand for rental flats from starters. (Fill stock left vacant by demand for single-family houses.)



Demand from middle and high income groups for regulated rental housing.



Elderly people are more inclined to consider a flat, but they rarely move house.

People would like:

- a lot of green
- variation
- village and community with character
- dwellings around enclosed outdoor space
- human scale
- mostly single-family houses, owner-occupied
- rental houses (single-family and apartments)

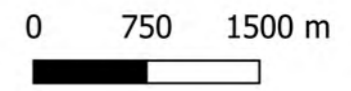
Infrastructure and buildings



OpenStreetMaps



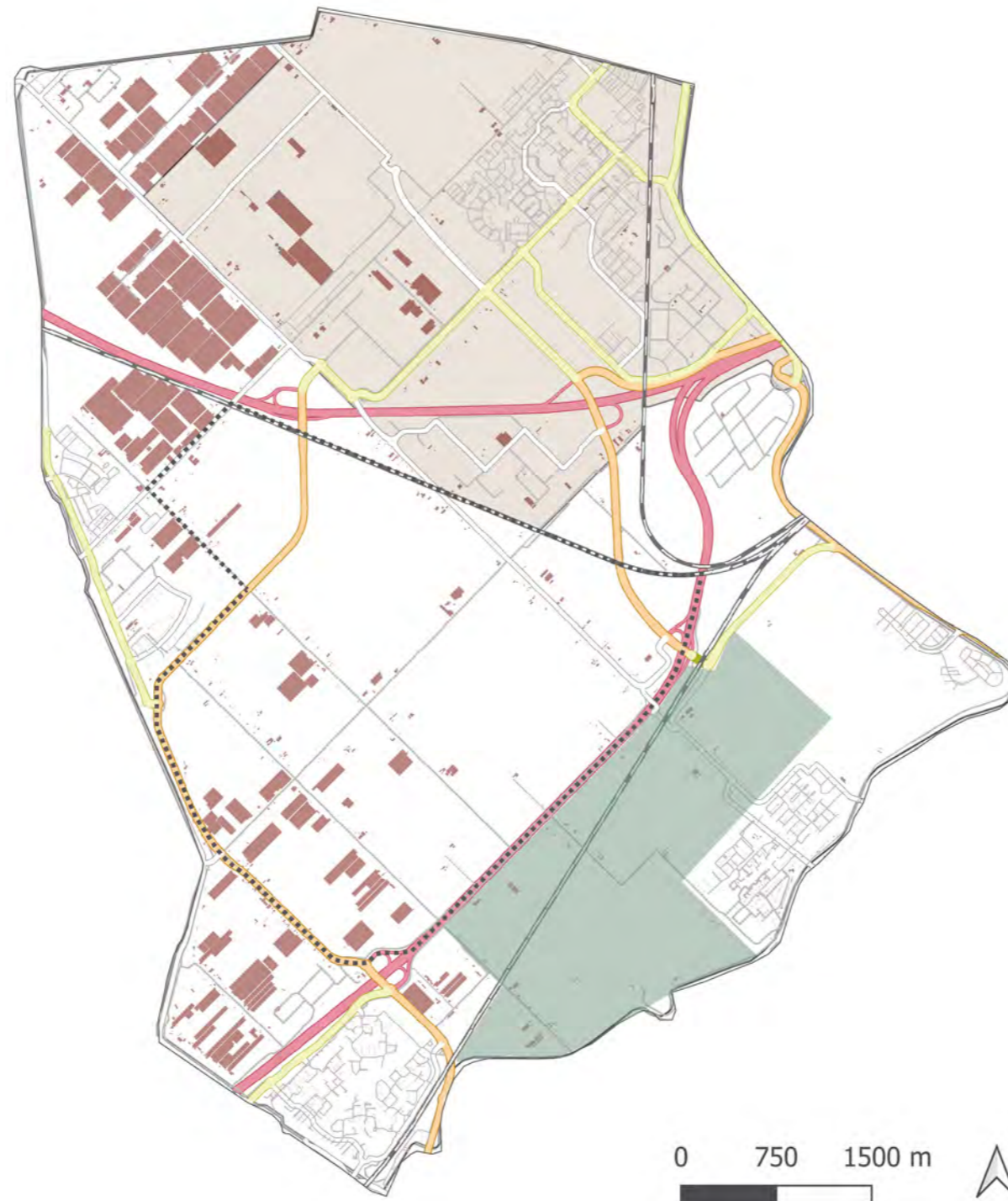
QGIS, data from BAG



Existing habitats



The site



- Greenhouses and barns
- Part of municipality of Waddinxveen
- Area valuable for meadow birds

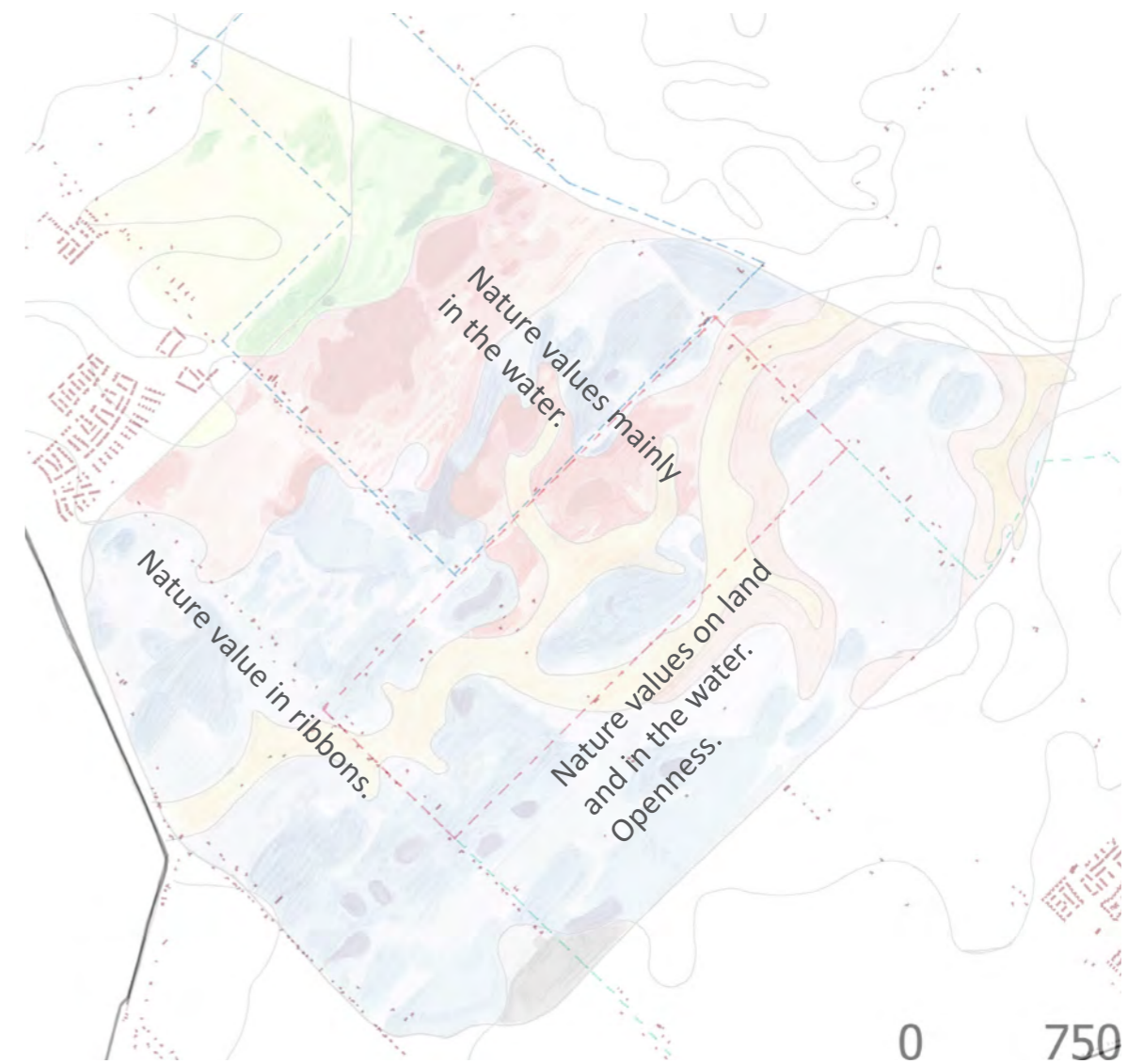
Guidelines of the Water Board for all plans in the polder:



As little fragmentation of water table areas as possible.

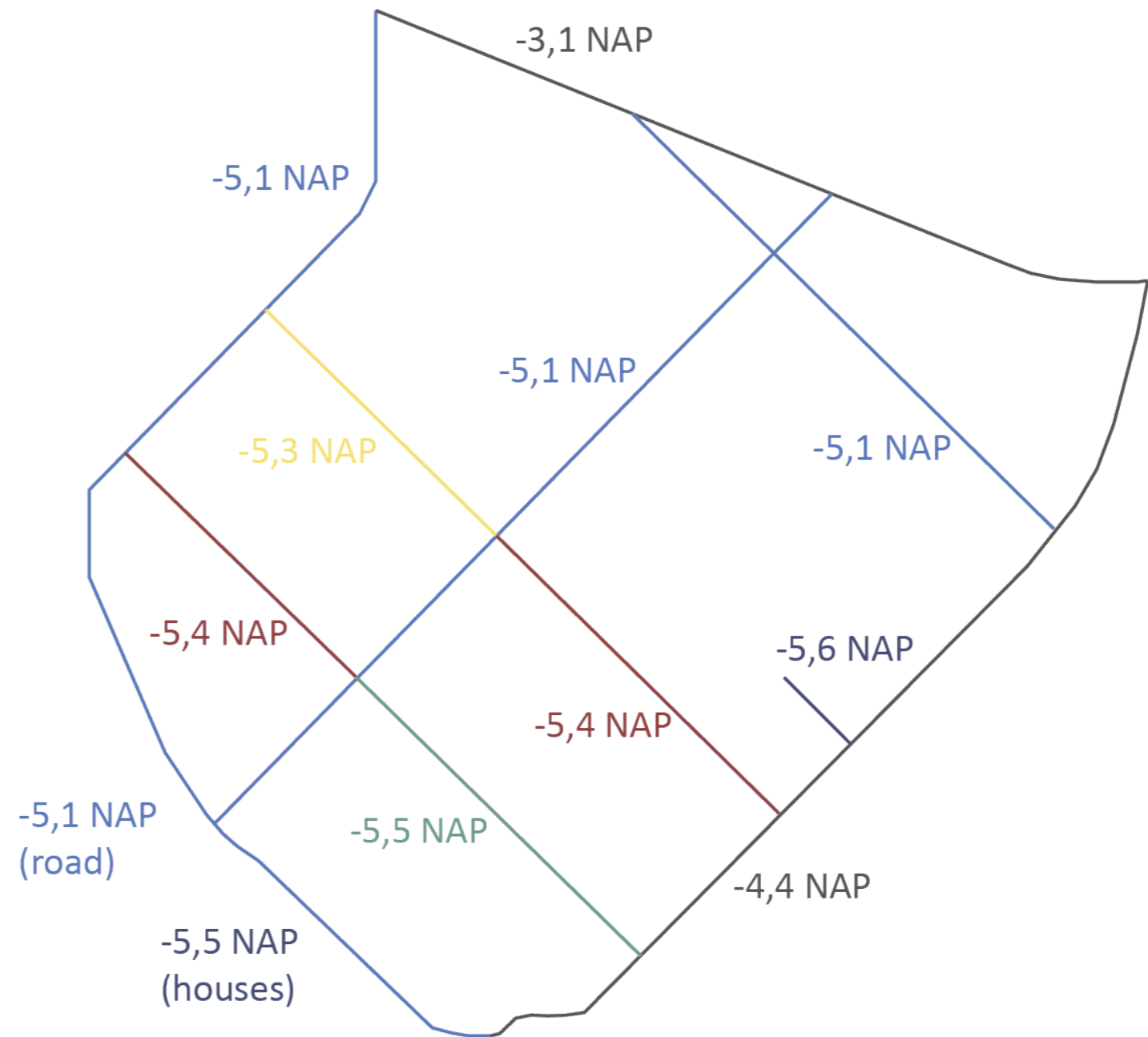


No excavation at the site because of seepage and the risk of soil bursting.



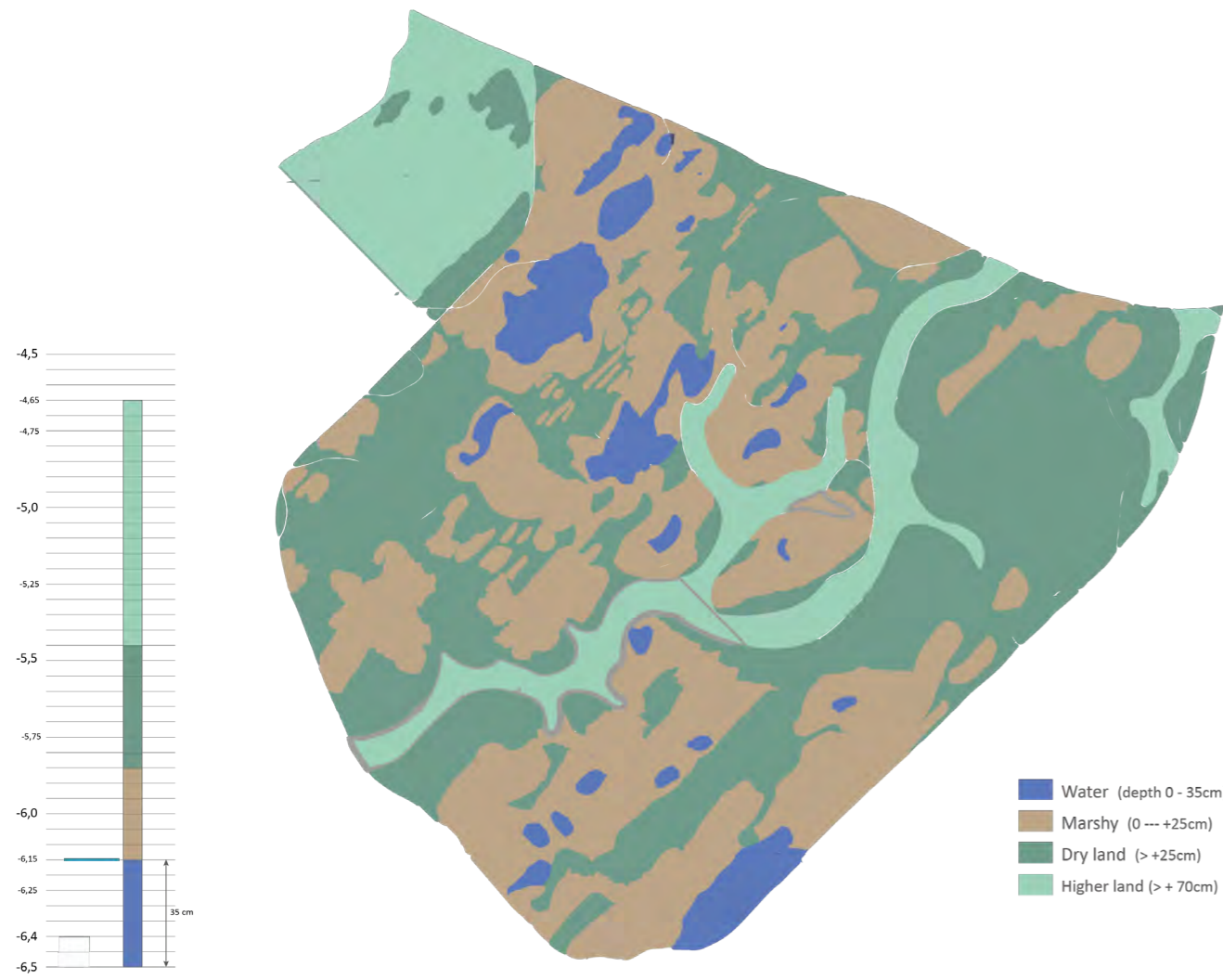
- Preserve the existing natural values.
- Preserve part of the characteristic openness of the polder.
- preserve the existing ribbons.

Raise water level



Most promising levels:

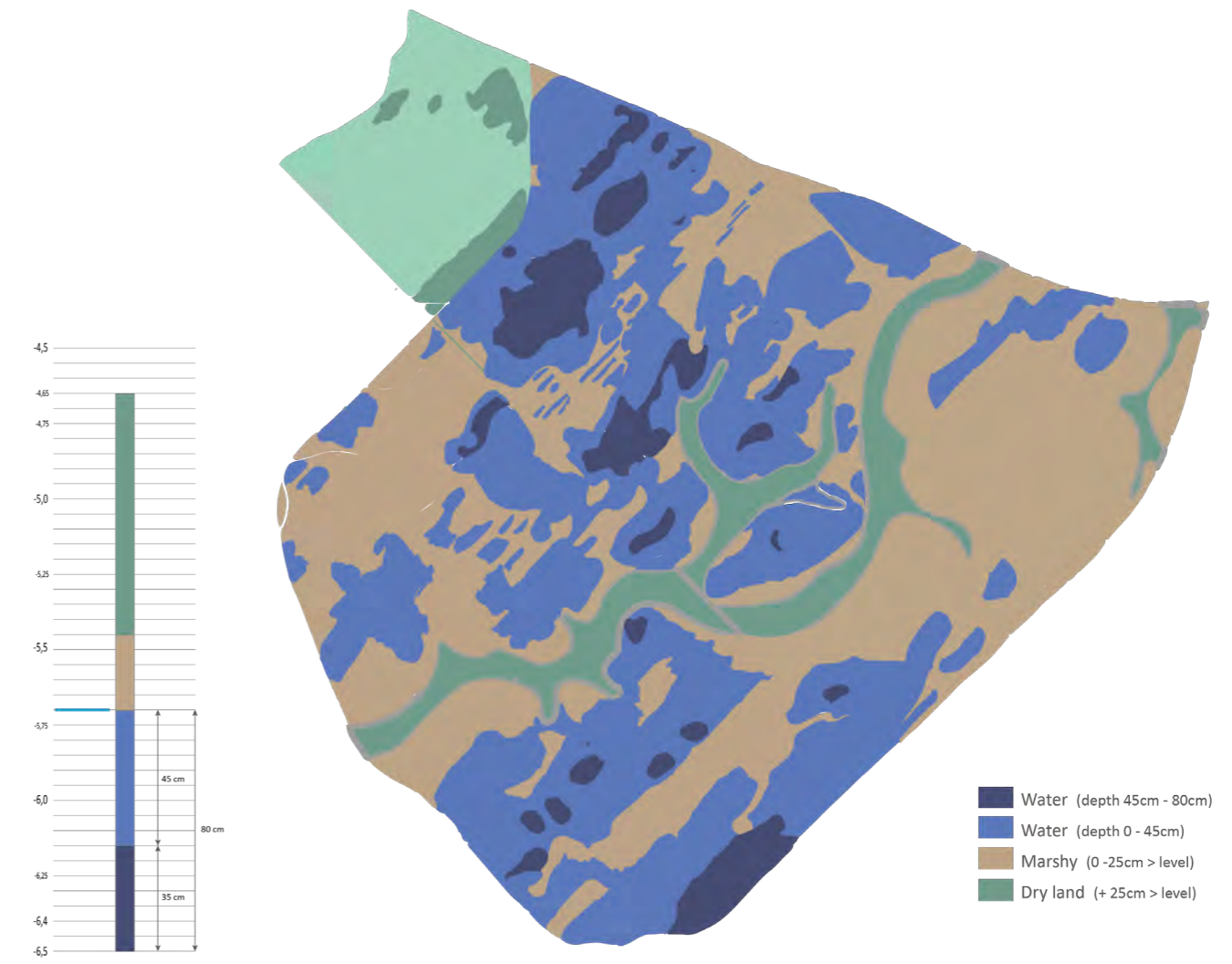
Diversity and water, but more water is needed.



- 6,2 NAP

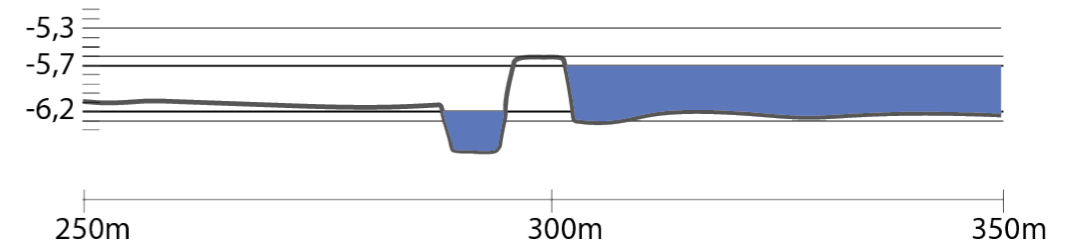
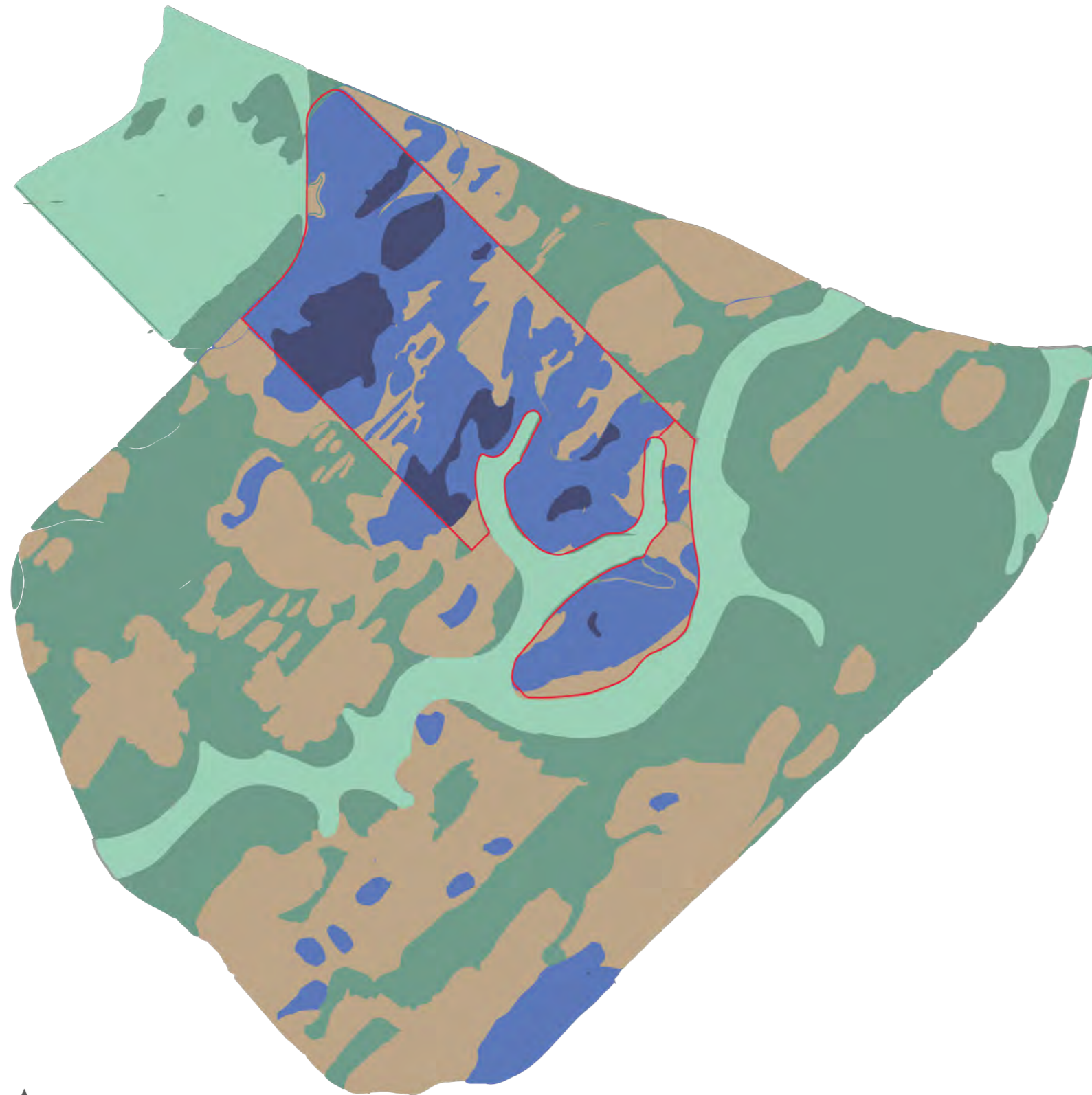
The meadows south-east of the creek ridge need to keep this level.

More water, but landscape is hard to live in.



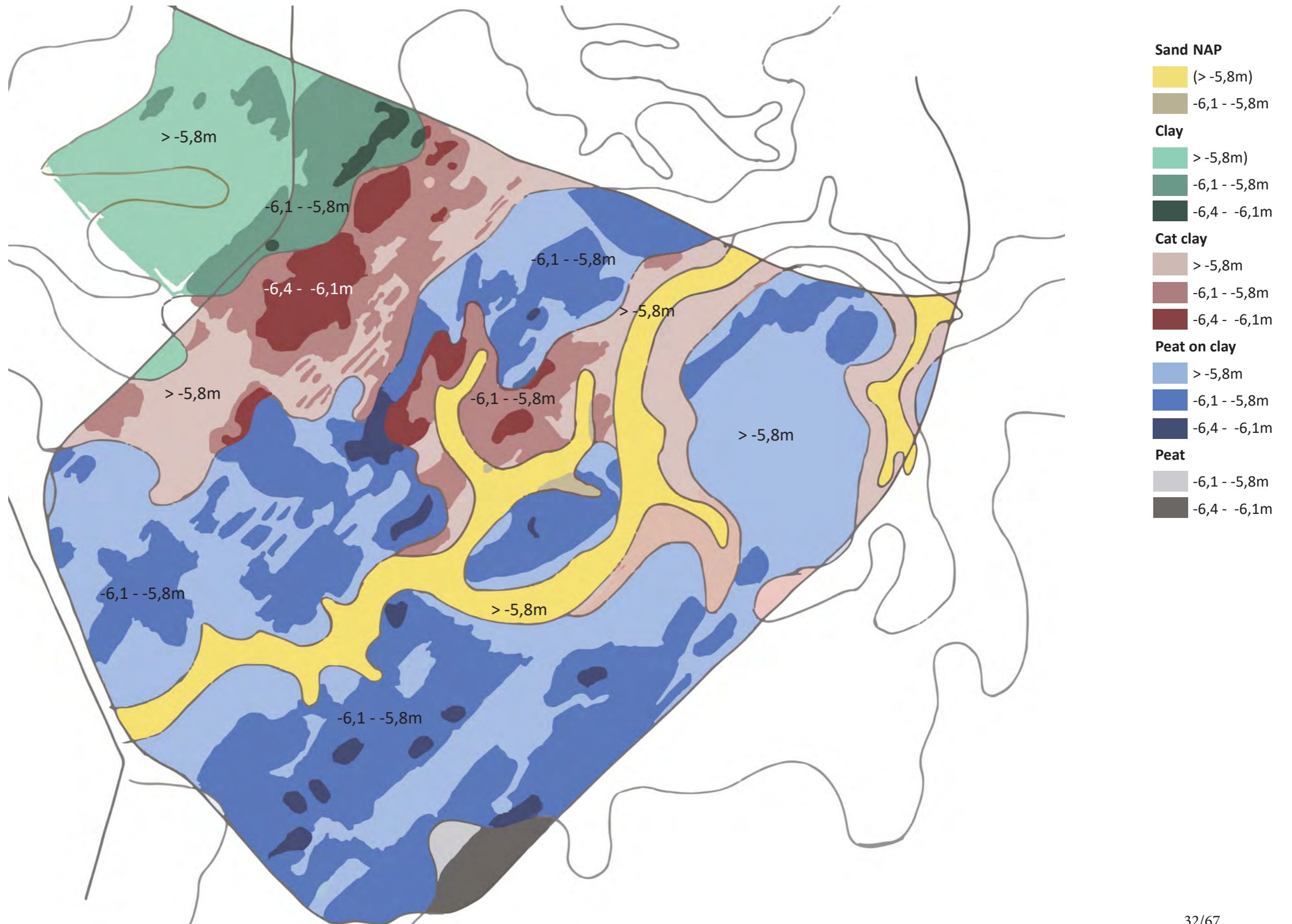
- 5,7 NAP

Combination of levels -6.2 and -5.7 NAP.



A dike of about 70 cm is needed.

Landscape - Native vegetation



Ecological building blocks
Klaas Jan Wardenaar
VISTA 2014

Weergave van de mogelijke natuurtypen die met behulp van grondverzet, verschillende bodemsoorten en een oplopende waterkwaliteit kunnen voorkomen.



Landscape - Native vegetation



Food forest (<https://www.voedselbos.eu/images/tpi/back.jpg>)



Common Cattail (www.floravannederland.nl)



Yellow floating-heart (www.floravannederland.nl)



Orchid-rich hayfield (<https://fotografie54.wordpress.com/2011/05/30/brede-orchis/>)



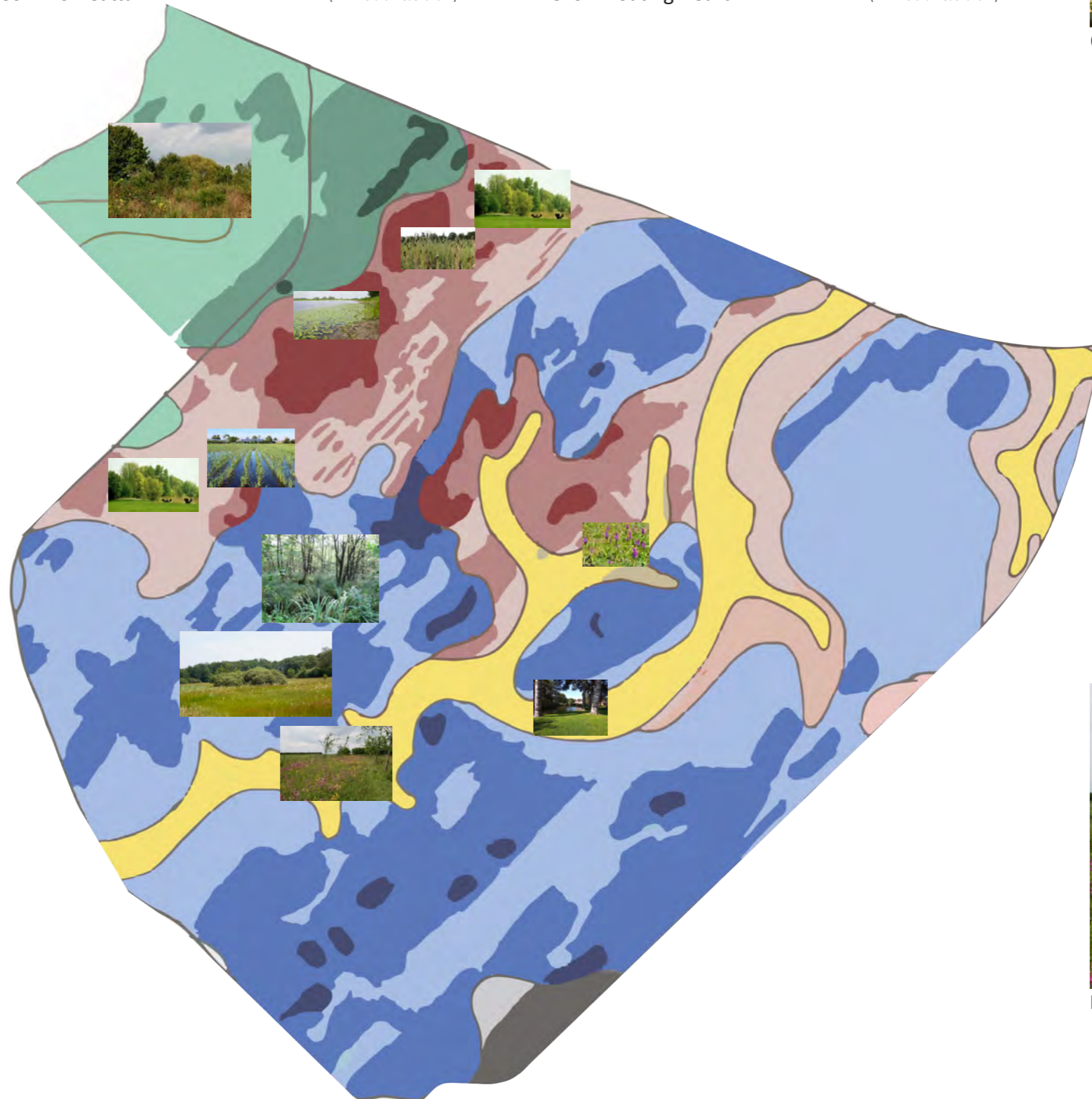
White willow forest (<https://www.denederlandsebijen.nl>)



Alder brook wood (<https://www.zumpe.nl/vegetatie/vegetatie-in-2008/elzenbroekbos/>)



Grey willow and grassland (https://www.floravannederland.nl/planten/grauwe_en_rossige_wilig)



Birches in park-like setting (own picture)



Common cattail as a wet crop (<https://www.veenweiden.nl/natte-teelten/>)



Dry flowery grassland (ikl-limburg.nl)

How to give character to the new village?

The village needs a backbone,



variation

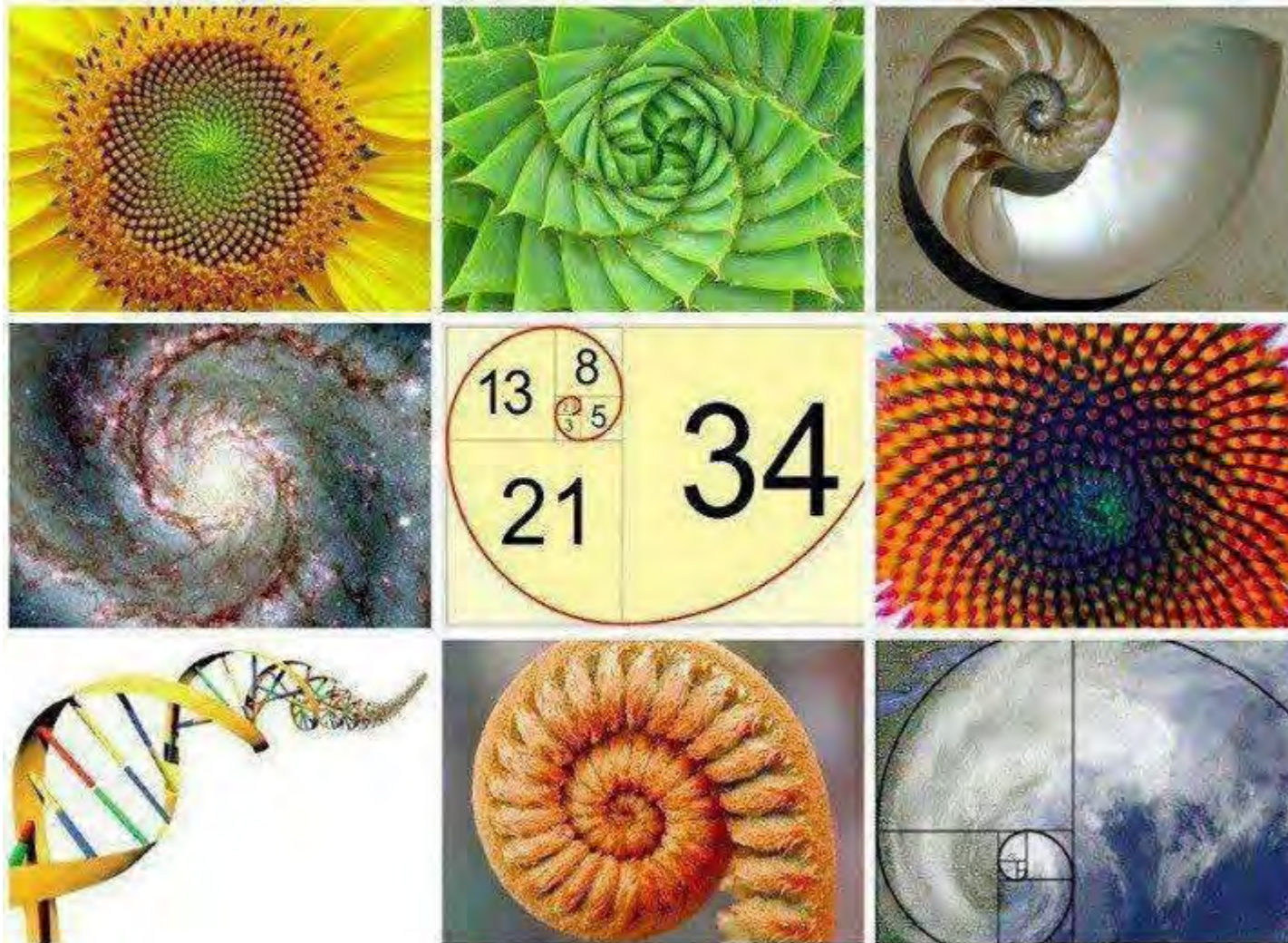


and unity

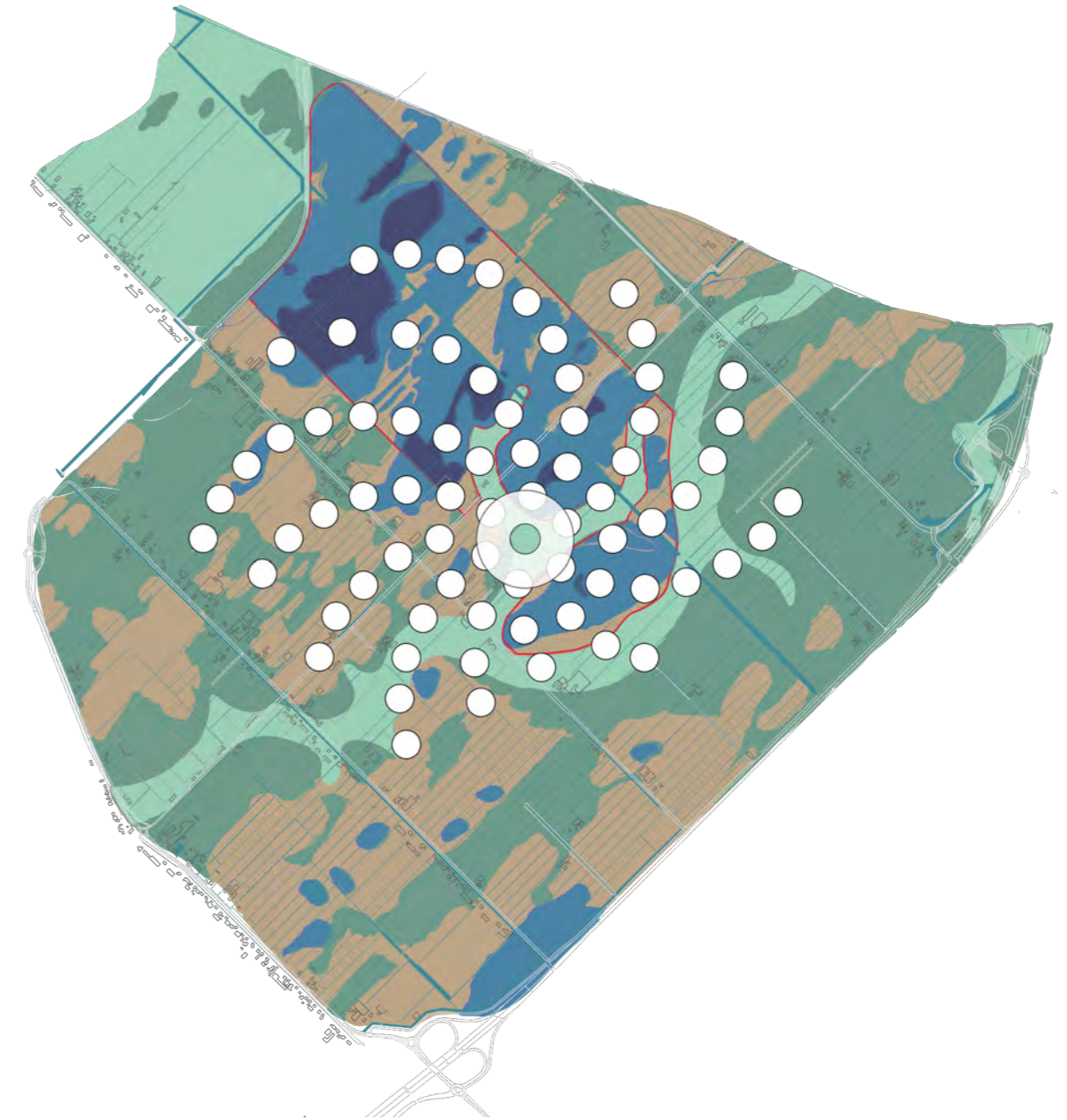


Most appreciated: natural features → diversity of the landscape

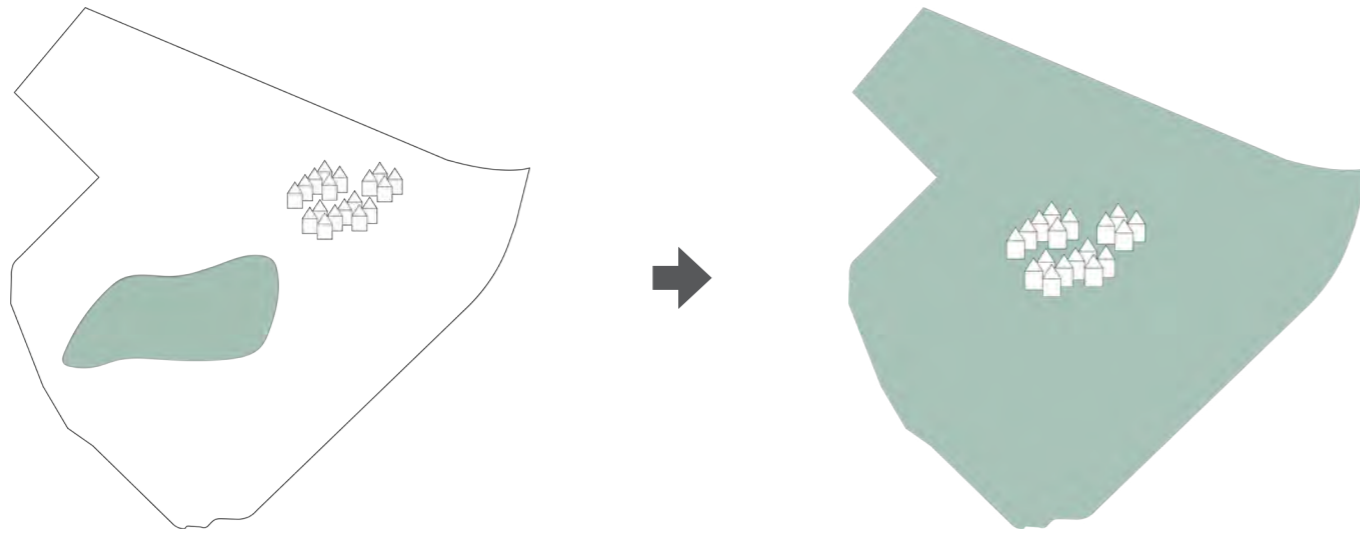
Fibonacci sequence



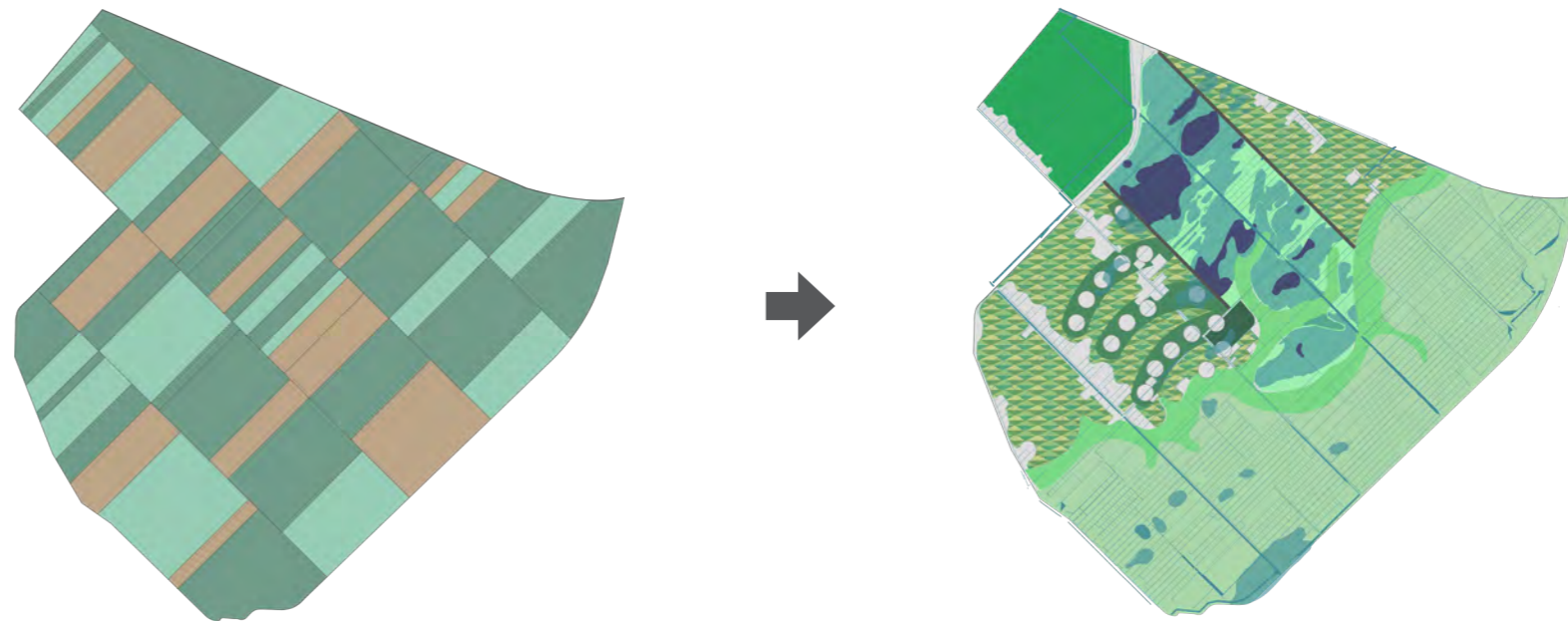
- Tool for diversity.
- Provides unity, every arm leads to the centre.
- Long lines, but everywhere surrounded by the village.
- Green reaches to the core, view on agriculture brings awareness.
- No street network to burden the weak soil.



Design principles

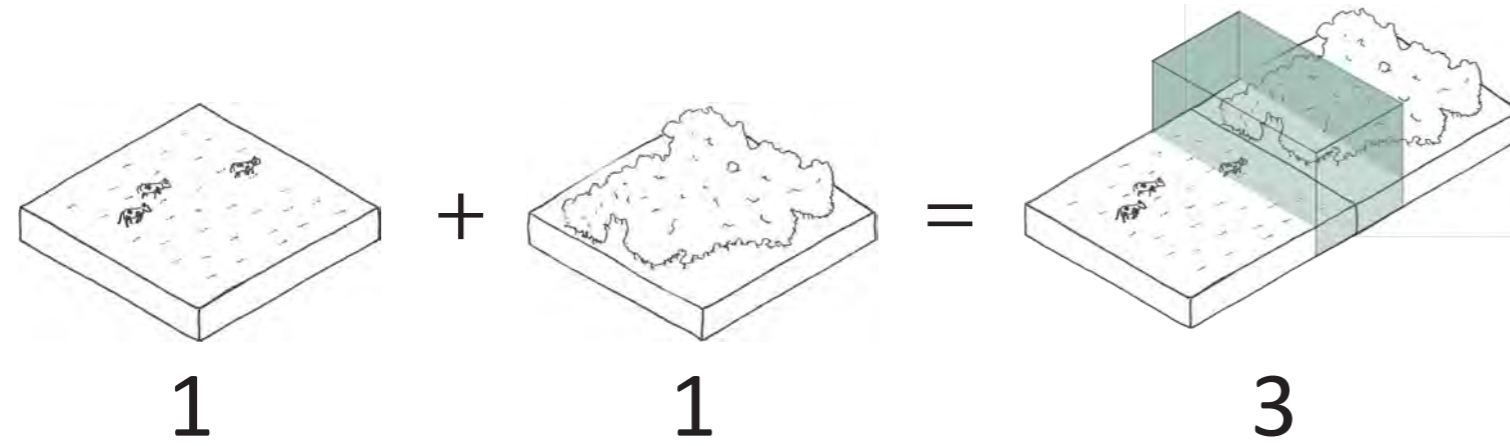


From a village and a green zone to living in the natural landscape.

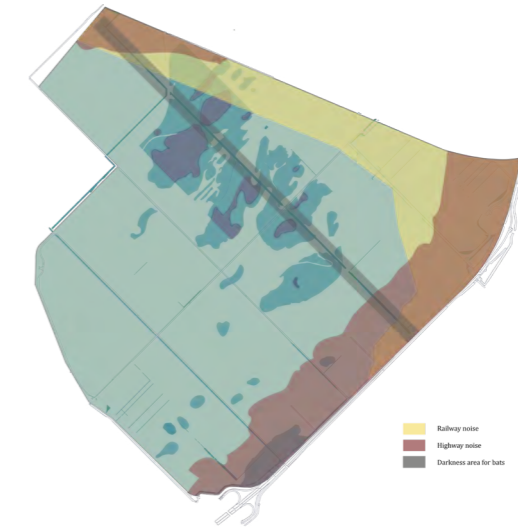


From traditional monoculture agriculture to a biodiversity-friendly landscape and agriculture.

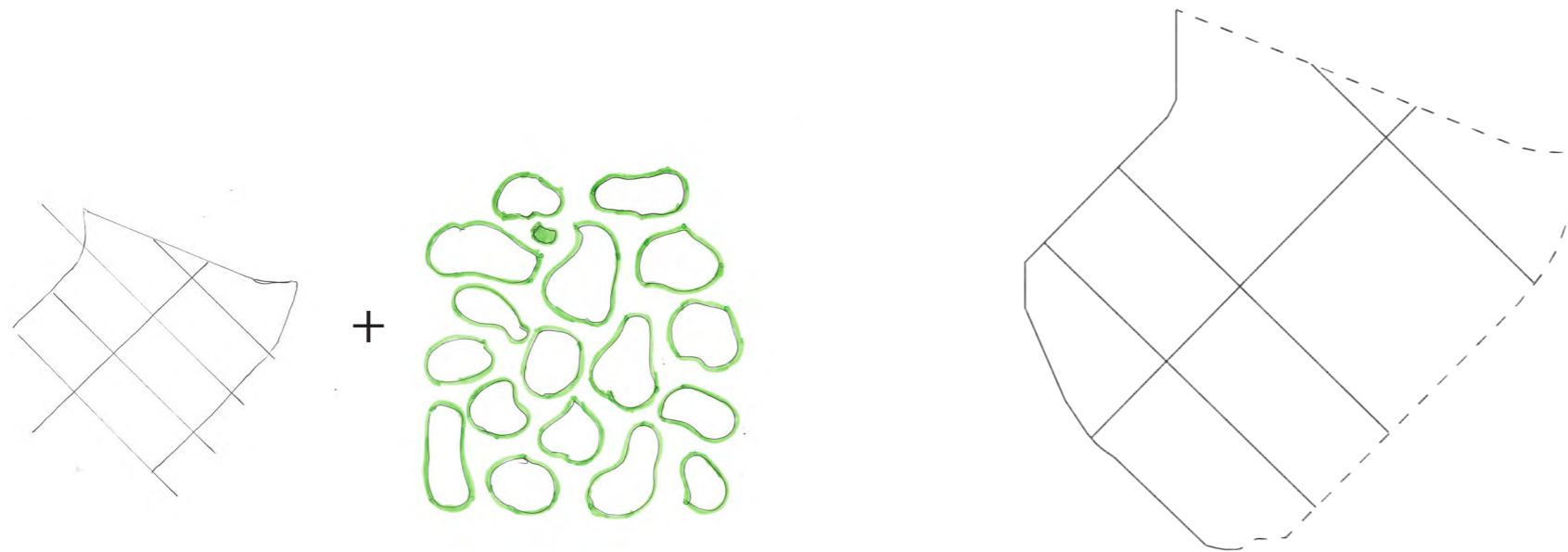
Design principles



“Ecological land-use complementation” (Colding, 2007).

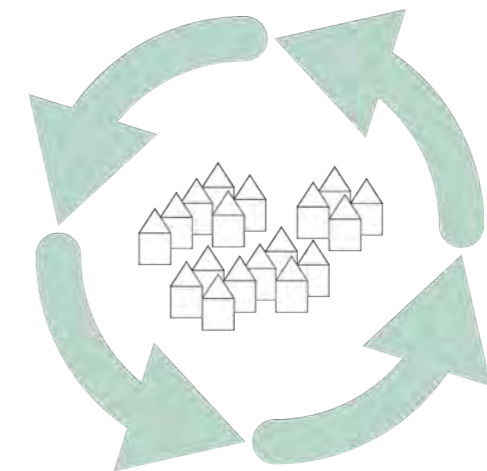


- Noise pollution from highways and railways.
- Limit light pollution as much as possible.



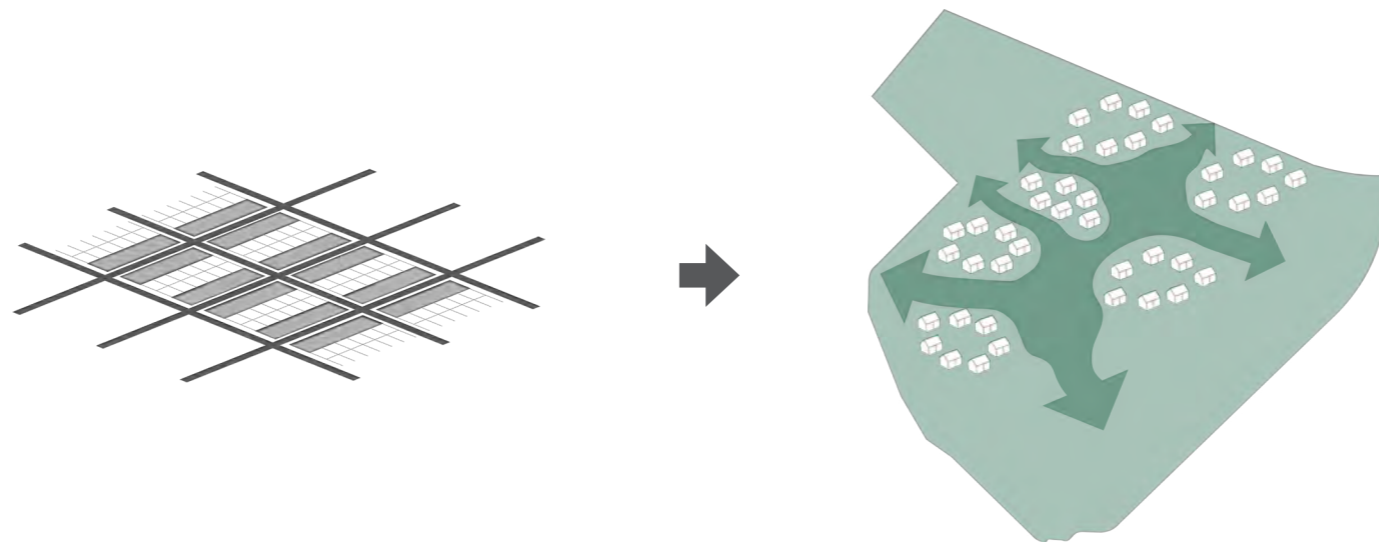
The straight lines of the original polder landscape are combined with the flowing forms of nature.

Preserve and use the existing infrastructure.

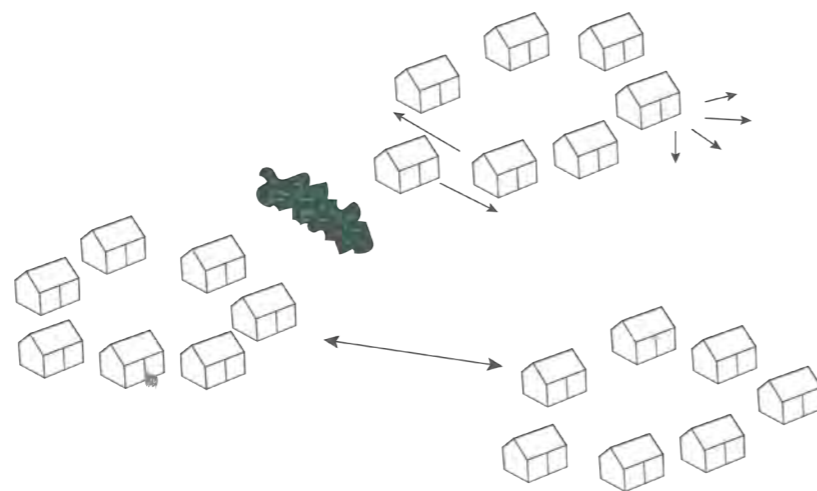


Although it cannot be fully worked out in this project, the aim is to make the village self-sufficient in food and energy.

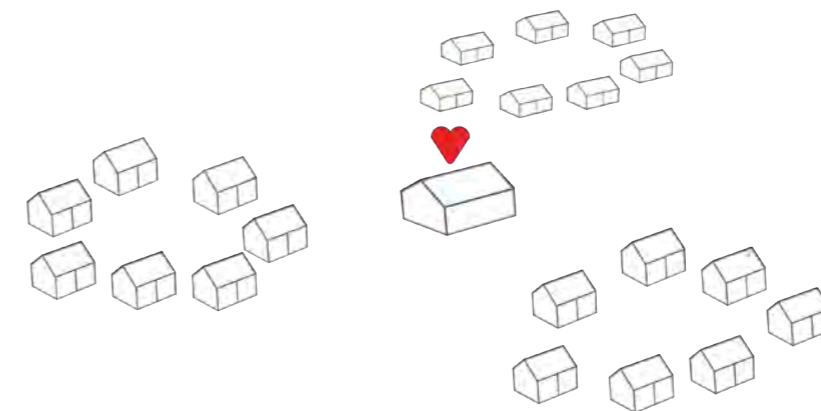
Design principles



From streets in a grid with enclosed, often paved gardens, to residential clusters where nature can flow through.

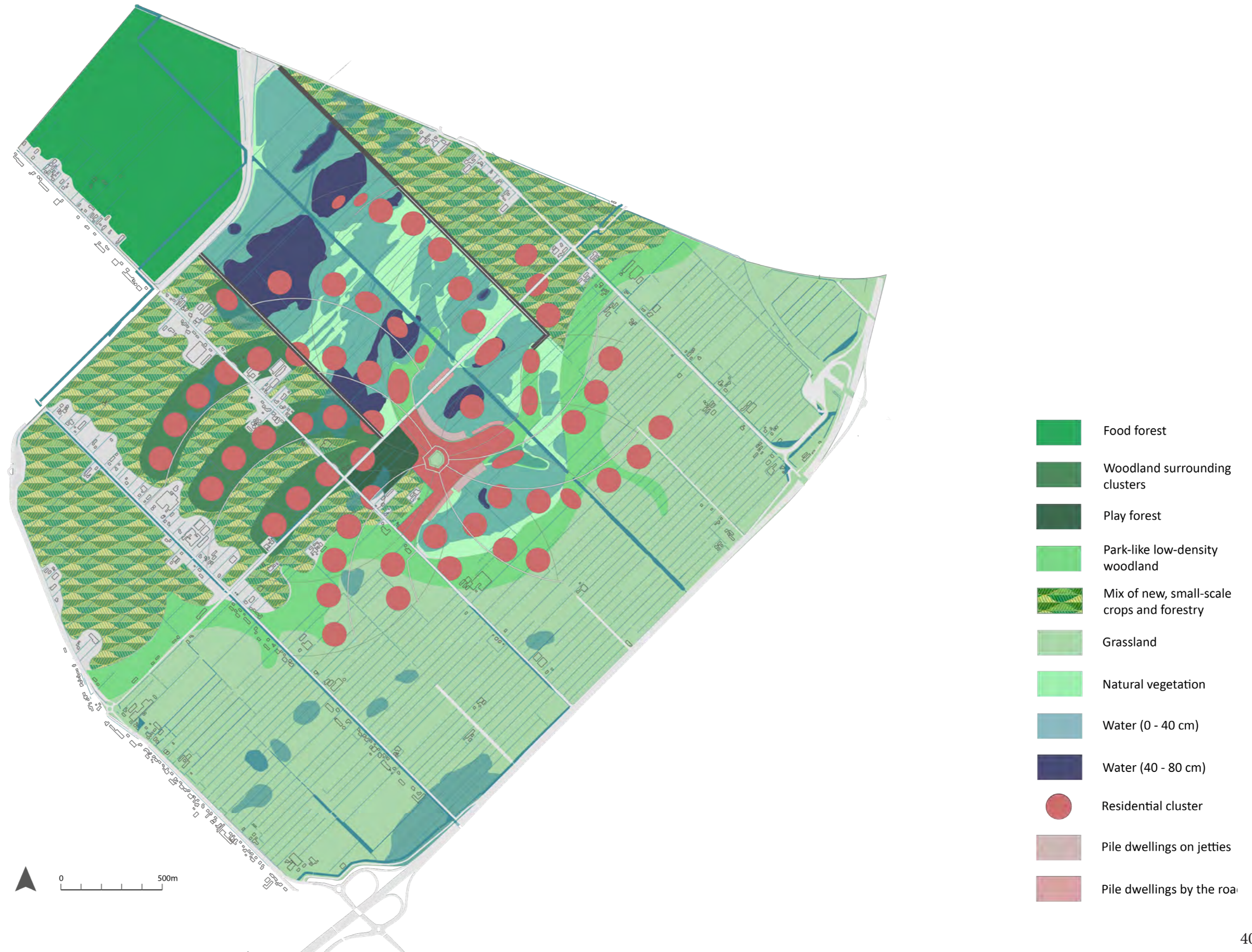


Privacy through positioning, distance and vegetation.

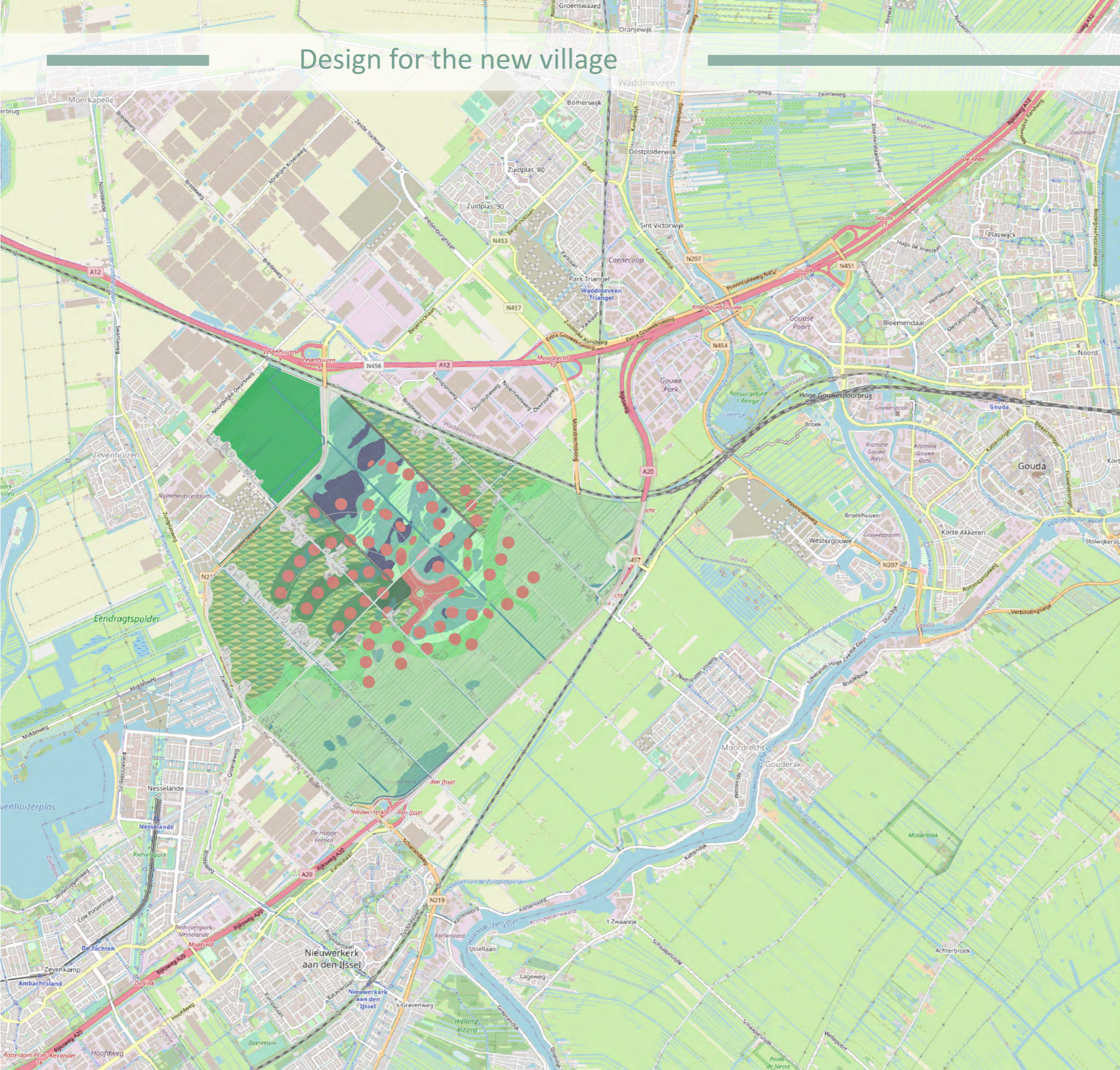


Community centres are at the heart of communities.

Design for the new village



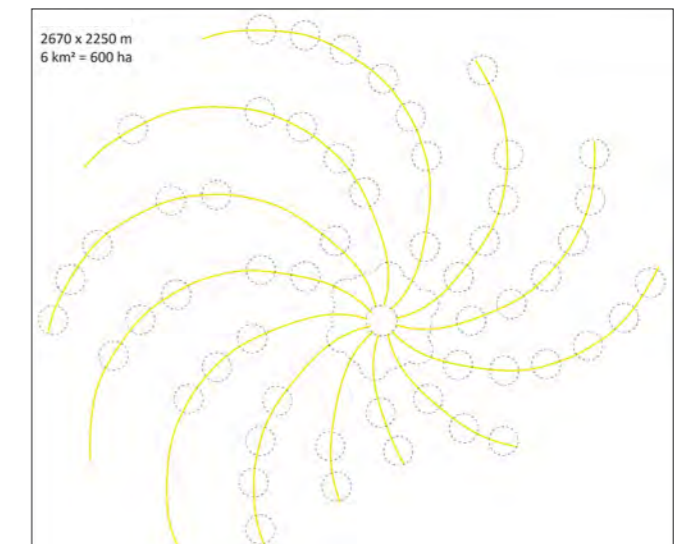
Design for the new village



Density

About 60 clusters x 35 houses = 2100 houses.

Surface 600 ha -> density = $2100/600 = 3,5$ houses/ha.



Or:

Surface is about 1/3 of 600 ha = 200 ha

Density is about 10 houses/ha.

This can still vary considerably if larger or smaller clusters or more or fewer apartments are built.

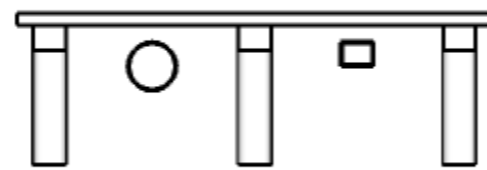
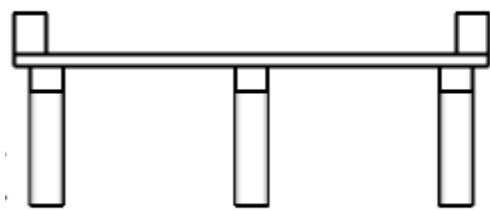
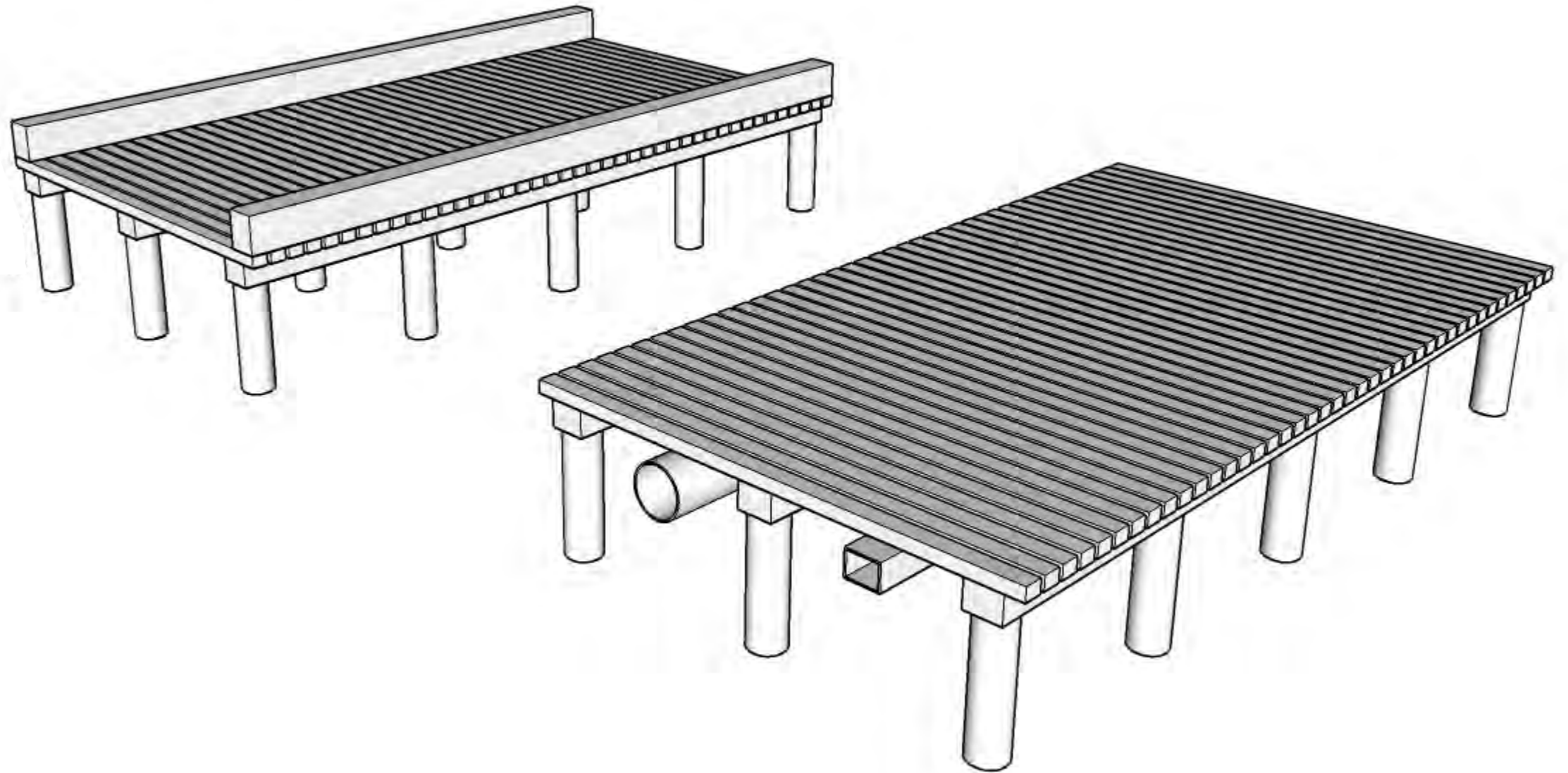
Surface area Zuidplaspolder: 45 km²
Surface area of central area: 9,7 km²
Surface area food forest: 0,6 km²

Roads and paths

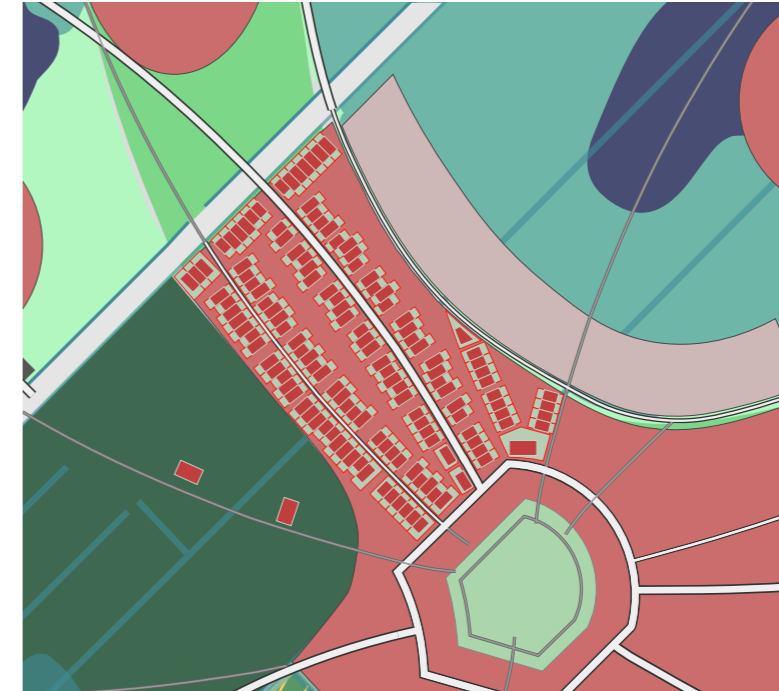


- Dike road, semi-paved
- Jetty road, wood
- Semi-paved road
- Paved road
- Road for pedestrians, cyclists and local car traffic only, paved
- Pedestrian and cycle path, semi-paved
- Pre-existing roads

Jetty road



Centre

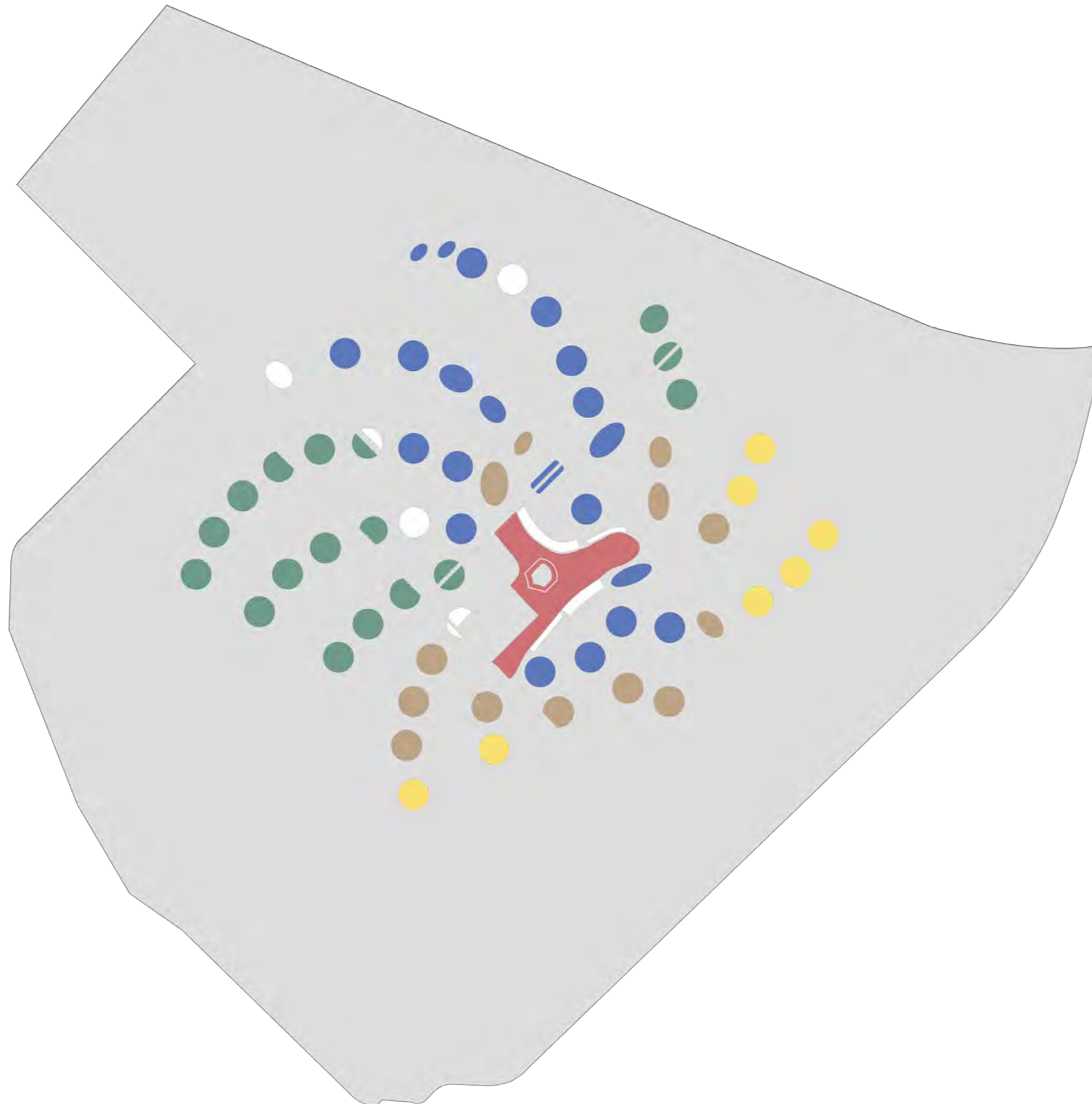


Facilities in the centre

- convenience stores
- cafés and restaurants
- primary school
- child care
- health care
- library
- sustainable mobility facilities
- scouting
- other small businesses



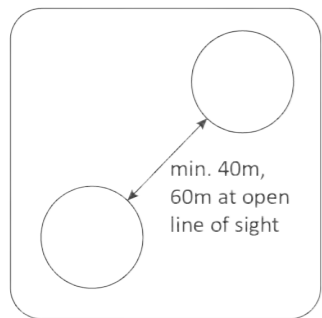
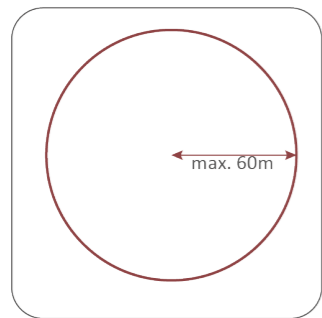
Clusters



- Forest cluster
- Farm cluster
- Water cluster
- Park cluster
- Centre
- Mixtures

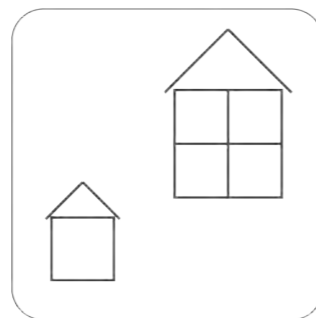
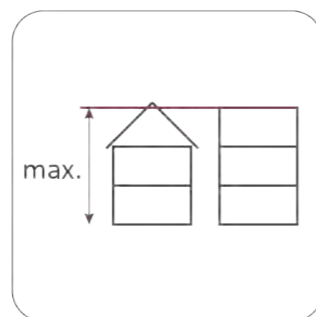
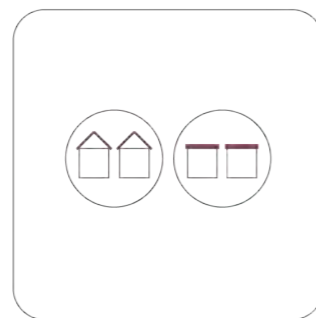
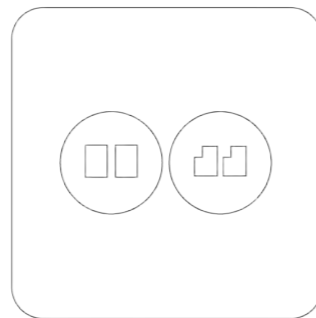
General guidelines

dimensions

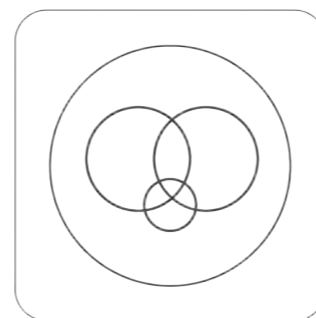
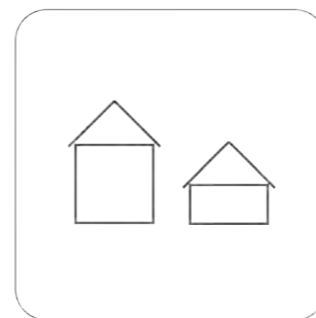


Form

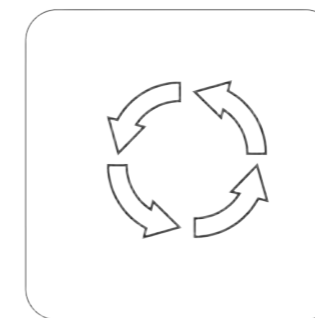
unity



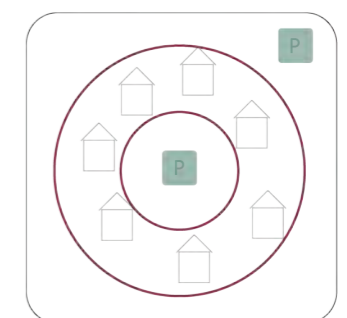
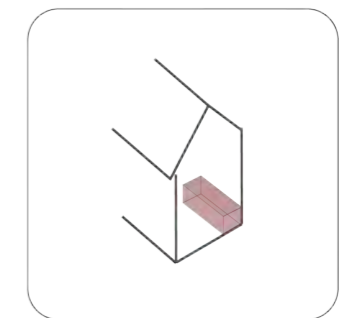
diversity



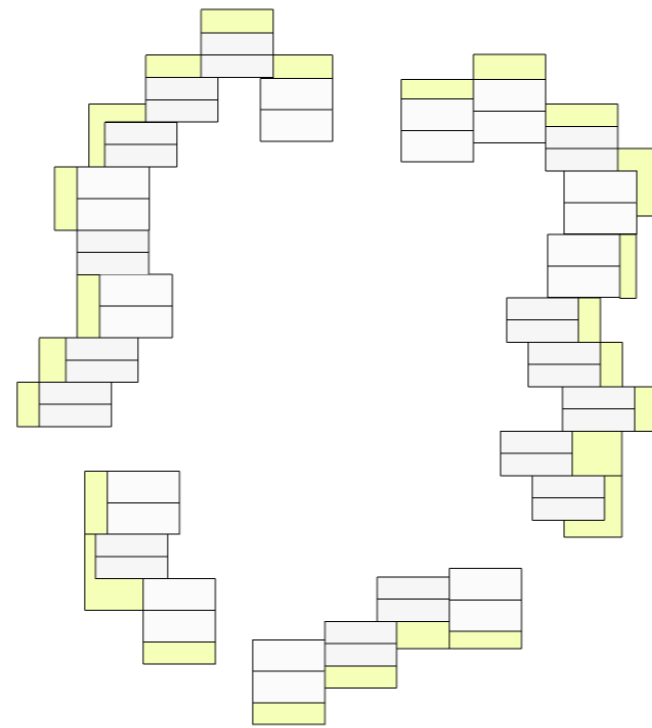
materials



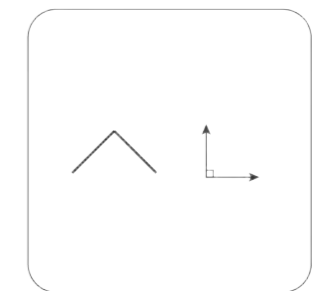
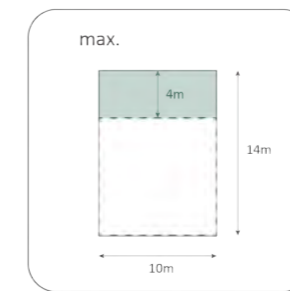
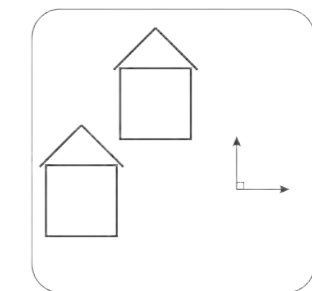
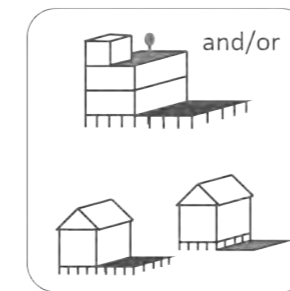
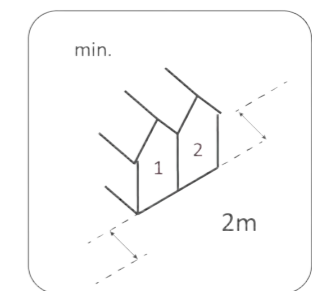
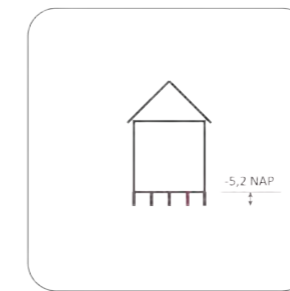
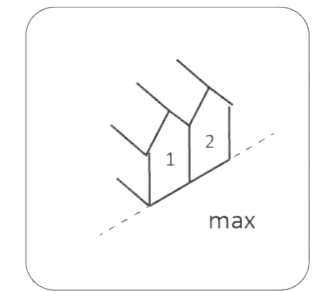
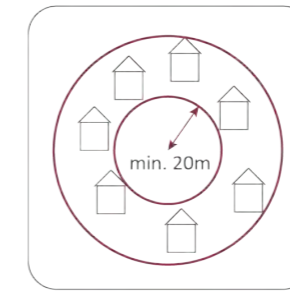
parking



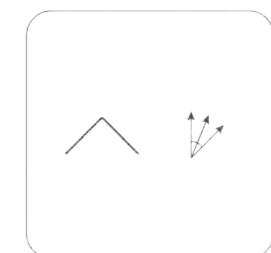
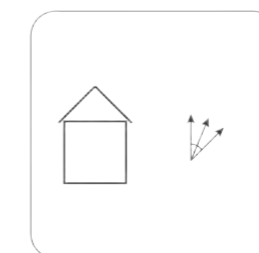
forest cluster



Guidelines for forest clusters

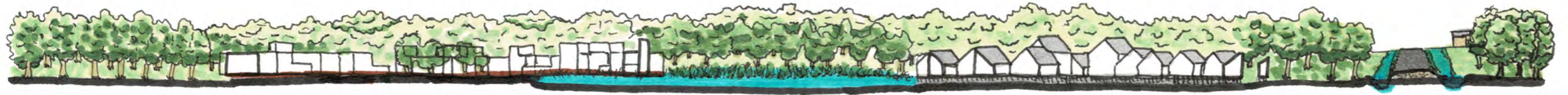


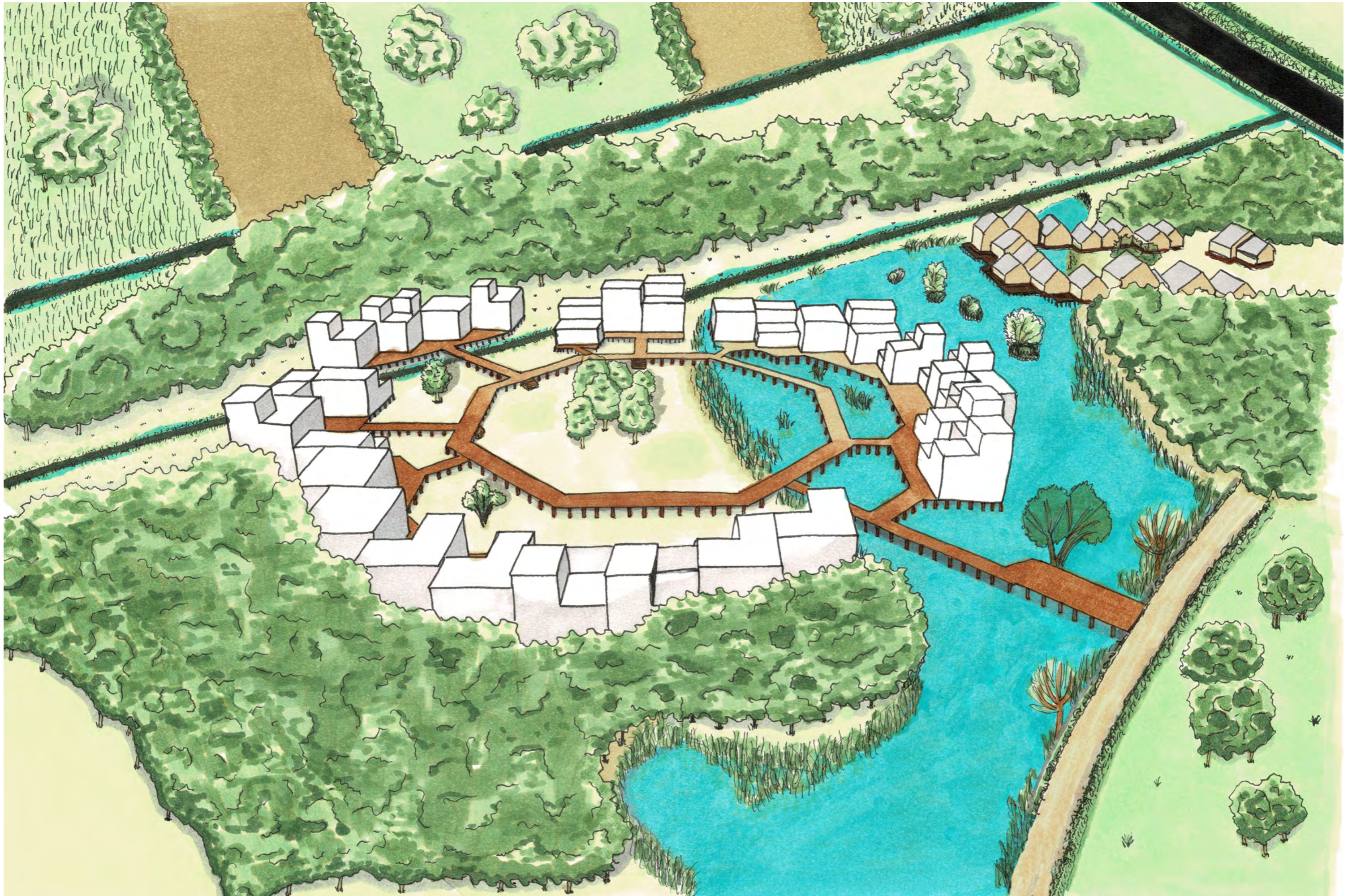
Also possible in forest clusters





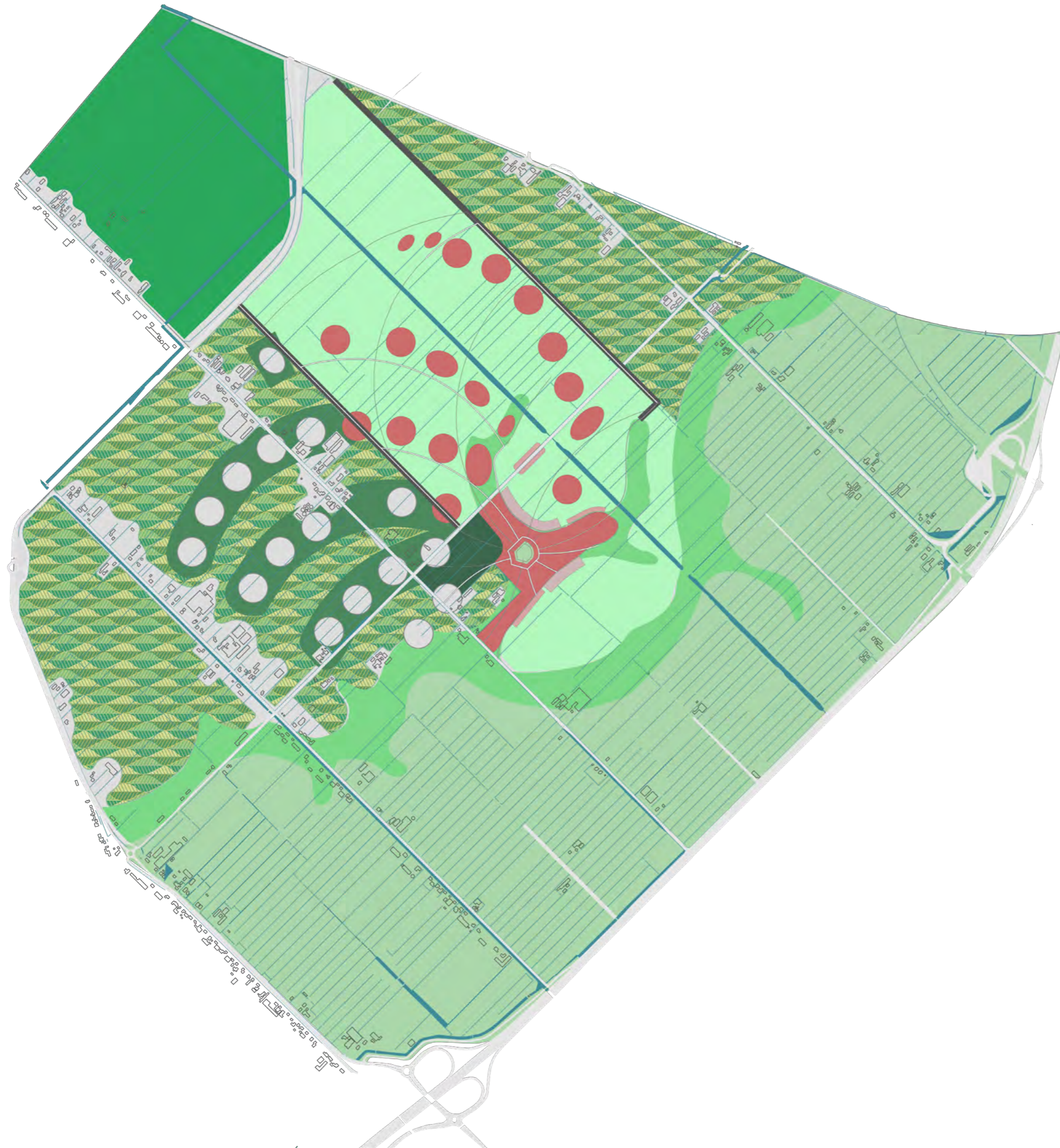
Design for the new village
















Phasing

Phase 1 0 - 5 years

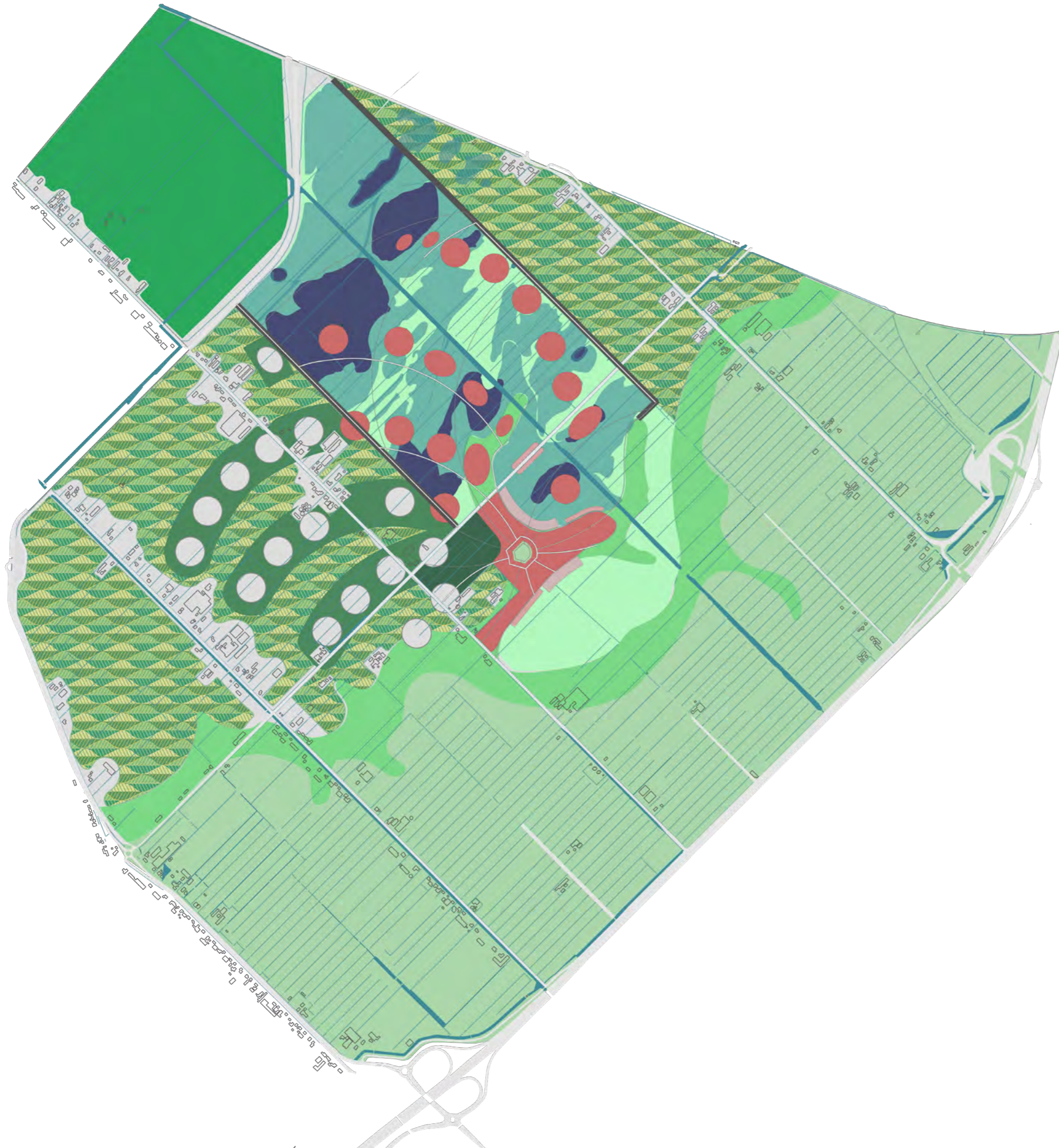


Legend












- | | | | |
|---|--|---|--------------------|
|  | Food forest |  | Natural vegetation |
|  | Woodland surrounding clusters |  | Water (0 - 40 cm) |
|  | Play forest |  | Water (40 - 80 cm) |
|  | Park-like low-density woodland |  | Under construction |
|  | Mix of new, small-scale crops and forestry |  | Completed |
|  | Grassland | | |

Phasing

Phase 1 0 - 5 years



Legend












- | | | | |
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|  | Food forest |  | Natural vegetation |
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|  | Grassland | | |

Phasing

Phase 2 6 - 10 years



Legend












- | | |
|--|--|
|  Food forest |  Natural vegetation |
|  Woodland surrounding clusters |  Water (0 - 40 cm) |
|  Play forest |  Water (40 - 80 cm) |
|  Park-like low-density woodland |  Under construction |
|  Mix of new, small-scale crops and forestry |  Completed |
|  Grassland | |

Phasing

Phase 2 6 - 10 years



Legend












- | | |
|--|--|
|  Food forest |  Natural vegetation |
|  Woodland surrounding clusters |  Water (0 - 40 cm) |
|  Play forest |  Water (40 - 80 cm) |
|  Park-like low-density woodland |  Under construction |
|  Mix of new, small-scale crops and forestry |  Completed |
|  Grassland | |

Phasing

Phase 3 11 - 15 years



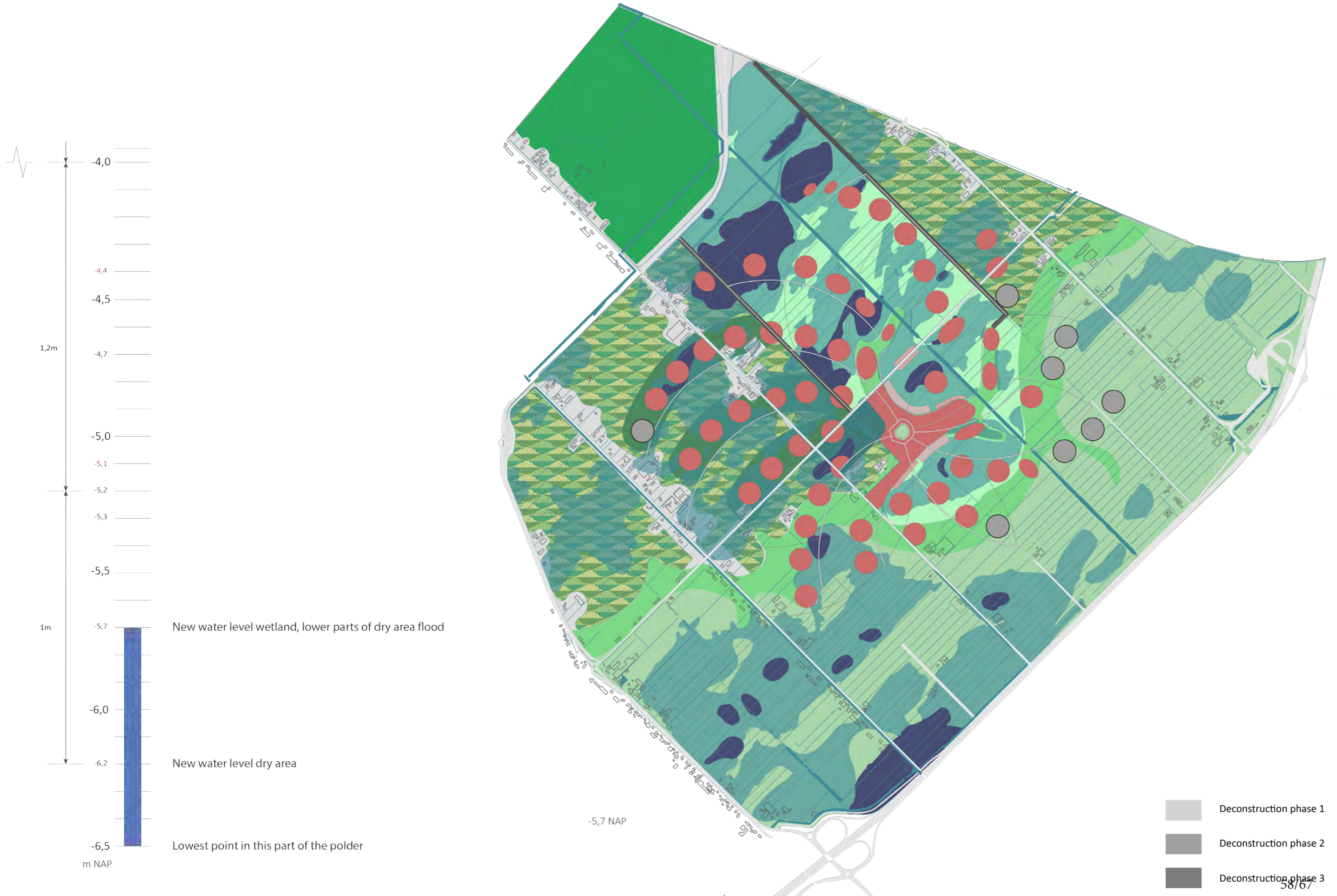
Legend

- | | |
|--|--|
|  Food forest |  Natural vegetation |
|  Woodland surrounding clusters |  Water (0 - 40 cm) |
|  Play forest |  Water (40 - 80 cm) |
|  Park-like low-density woodland |  Under construction |
|  Mix of new, small-scale crops and forestry |  Completed |
|  Grassland | |

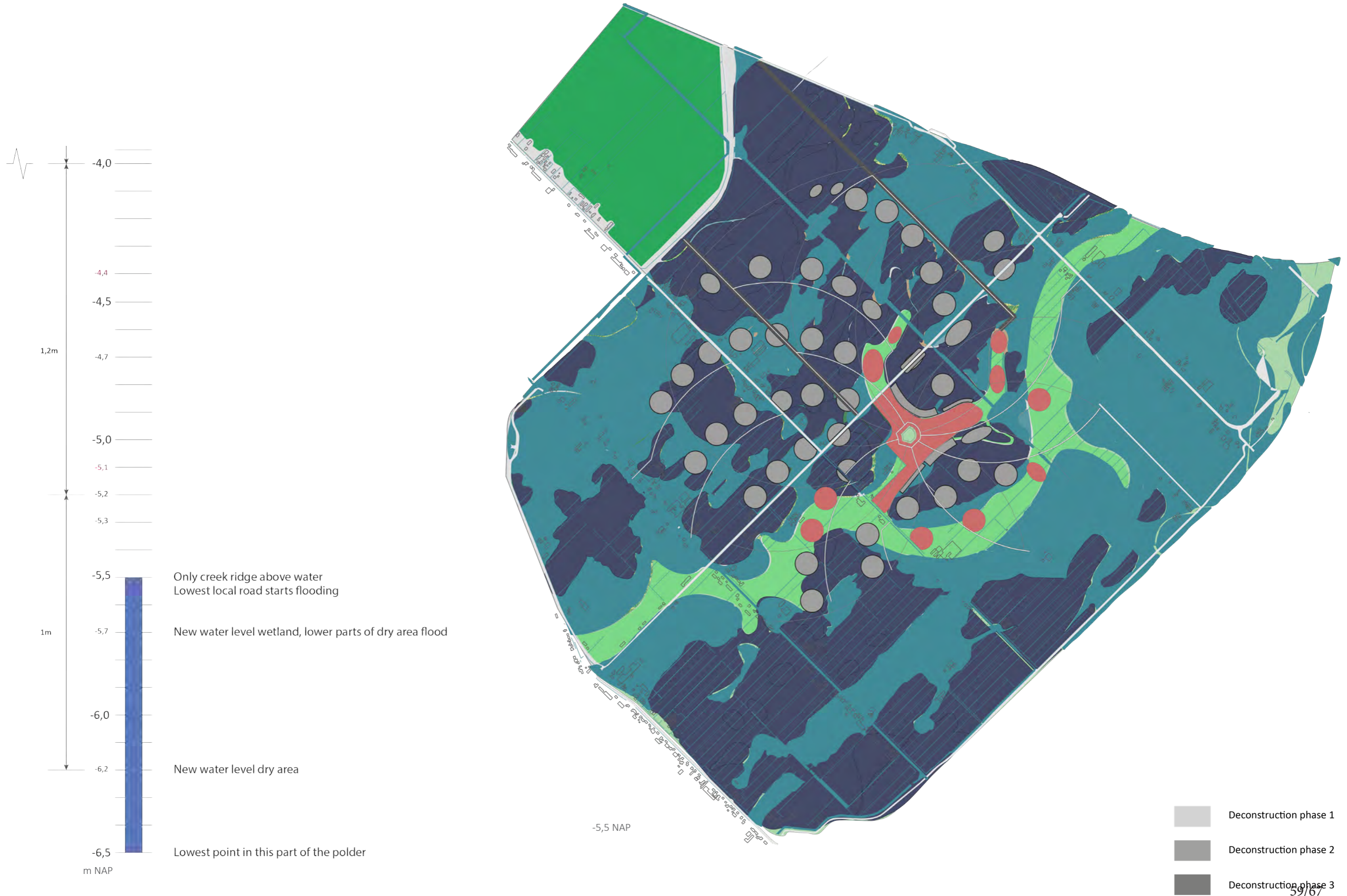
Phasing deconstruction



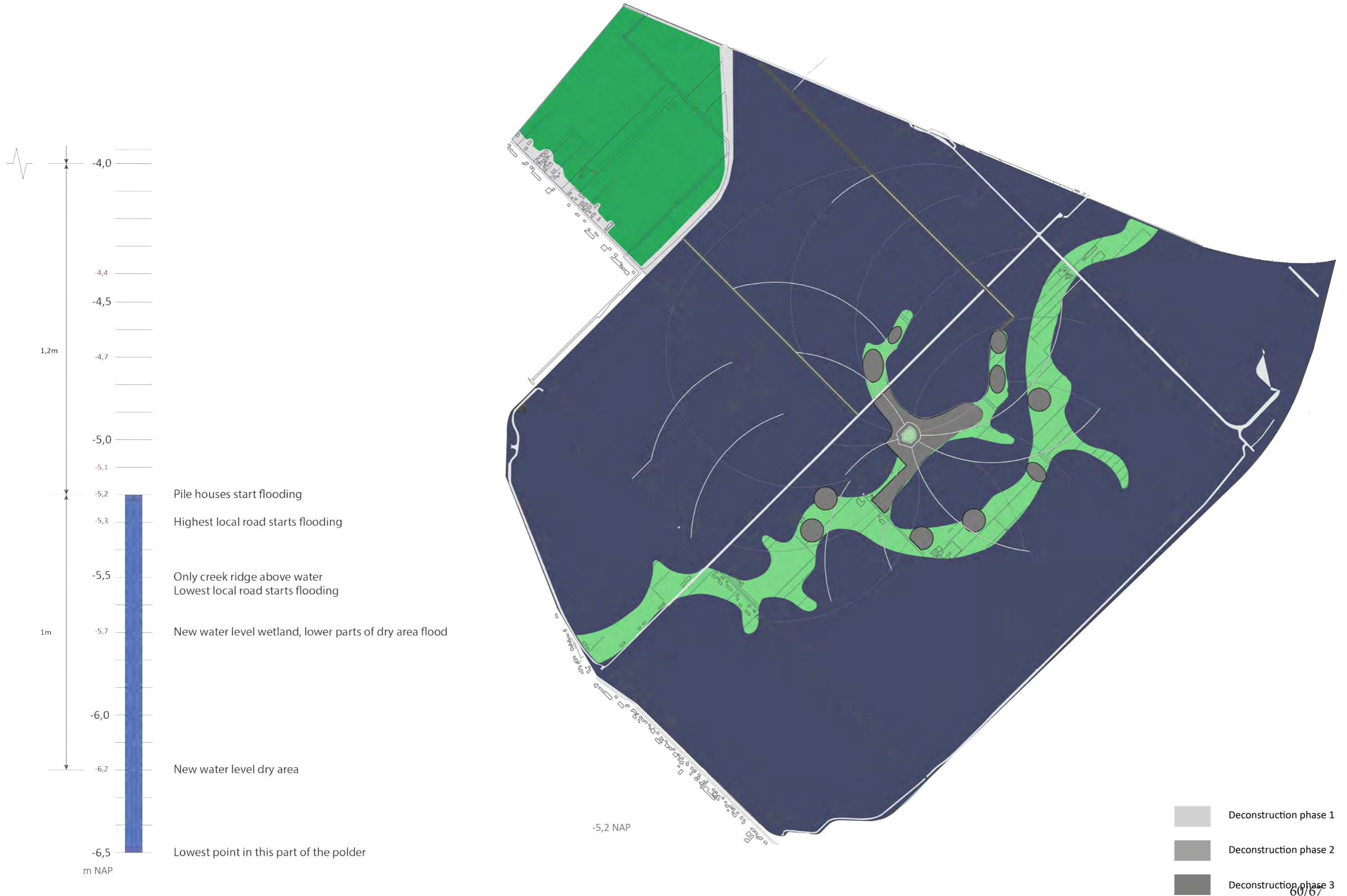
Phasing deconstruction



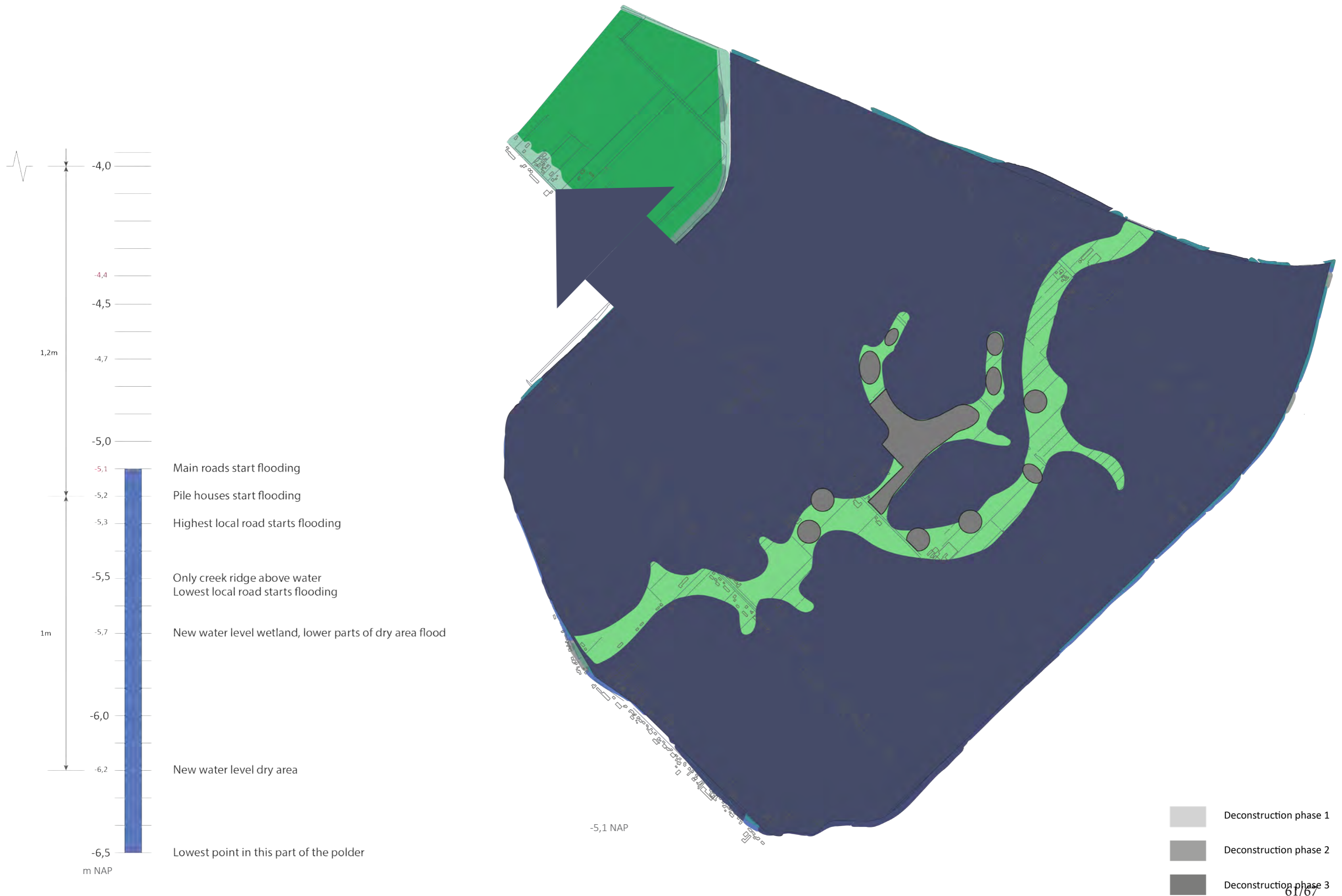
Phasing deconstruction



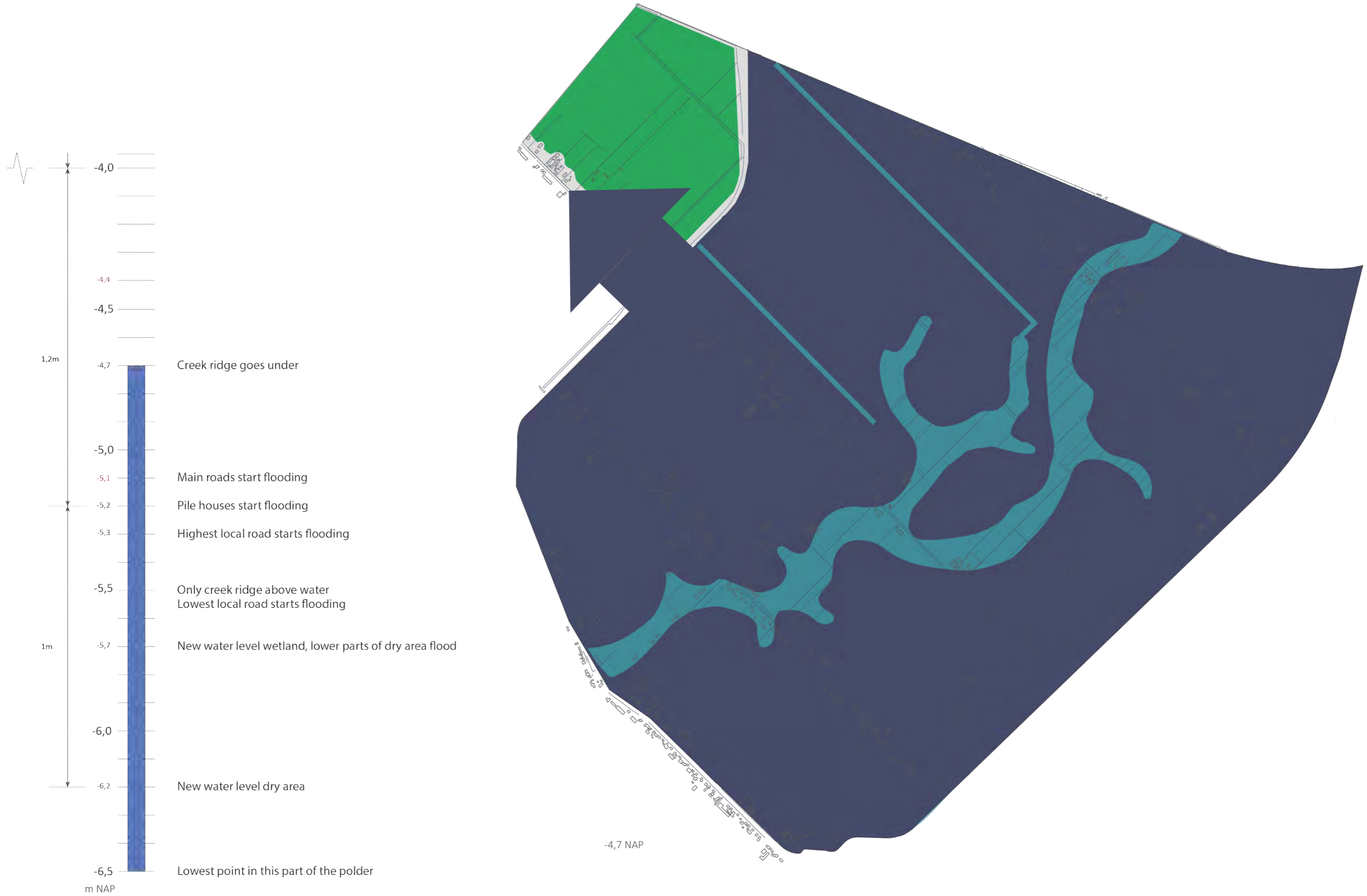
Phasing deconstruction



Phasing deconstruction

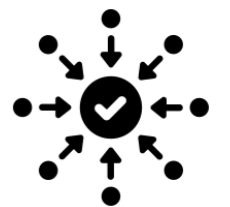
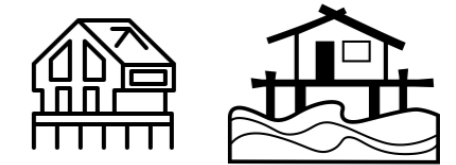


Phasing deconstruction



Will villagers like it?

- natural features are the backbone
- identity
- community
- shared open spaces
- different atmospheres
- human scale

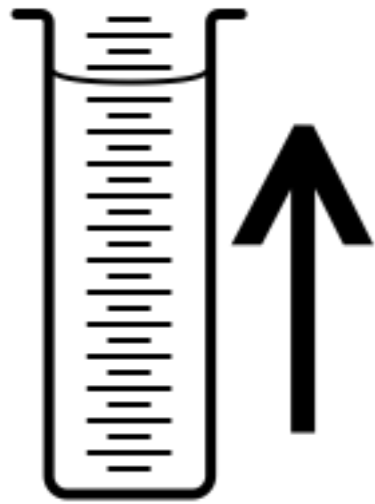


Conclusion

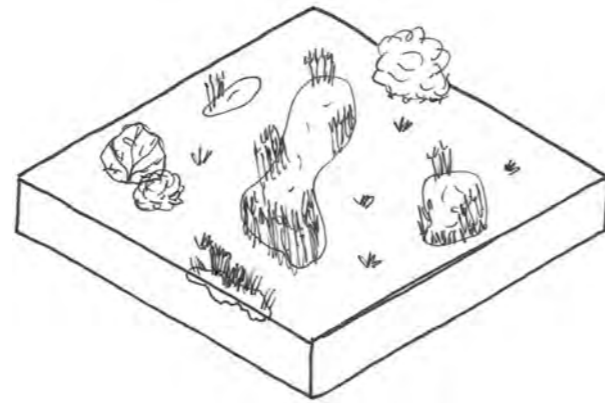
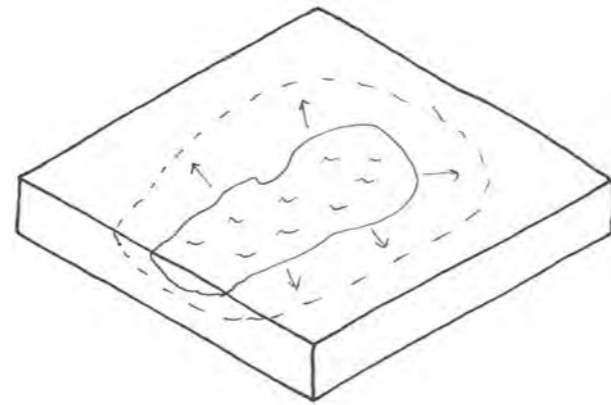
Aspects of sustainability

Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

UN Brundtland Commission, 1987.



Water level up



(Rain)water storage, buffering, purification and reuse



Wood construction



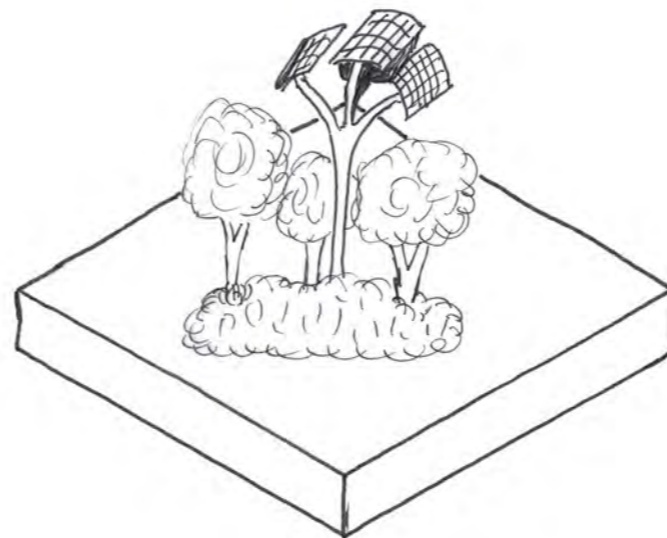
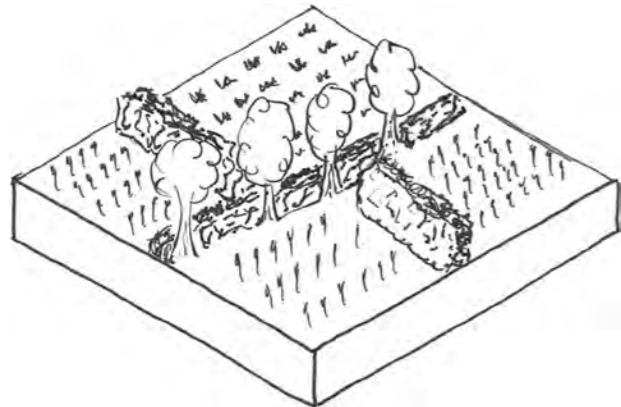
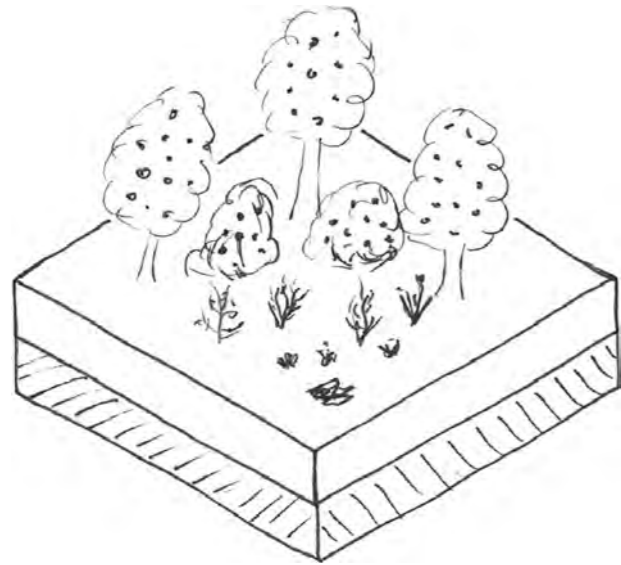
Self-sufficient houses



Diversity in biotopes
Forest



Aspects of sustainability



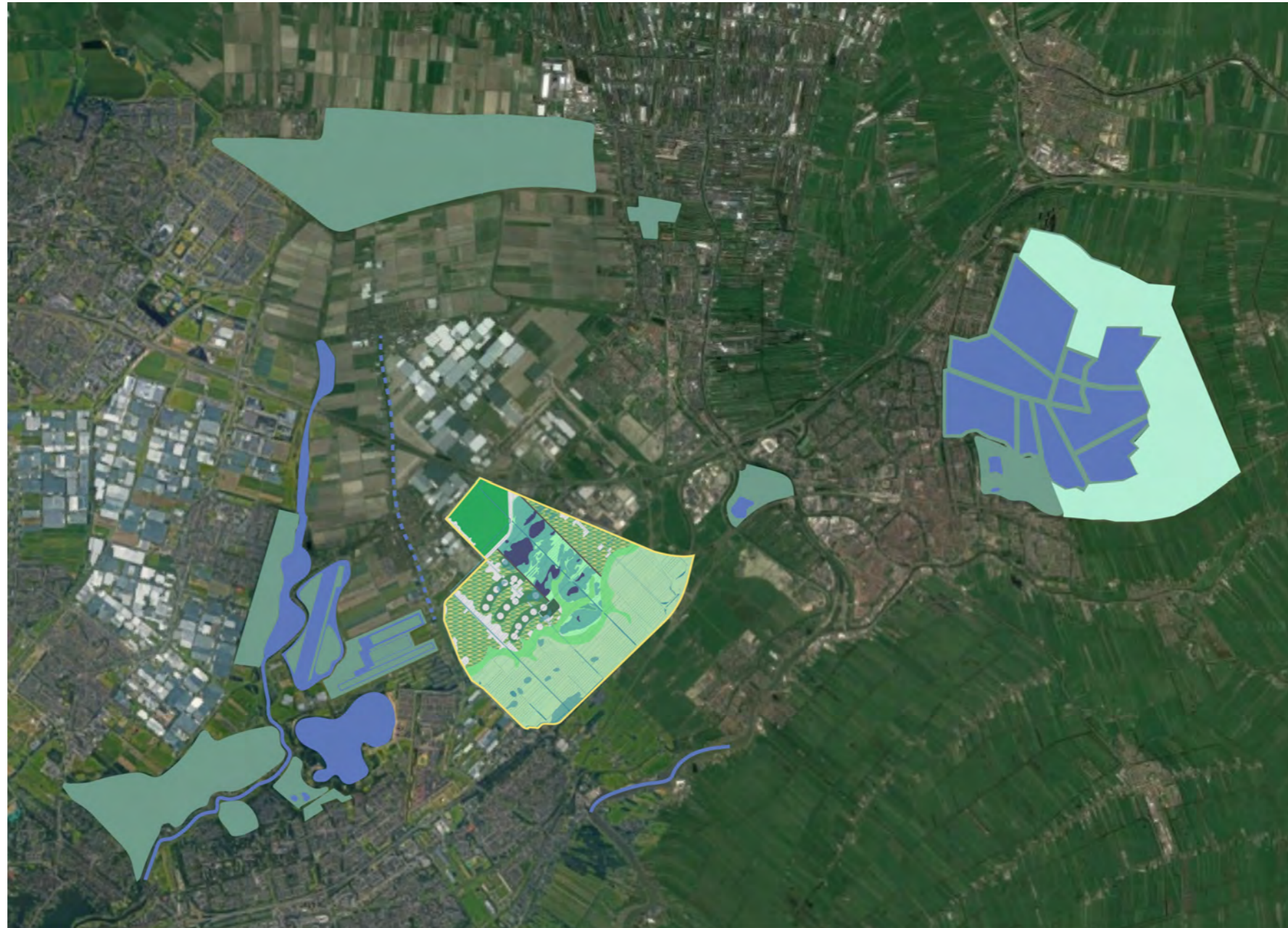
40%
Social housing

Food production
agroforestry

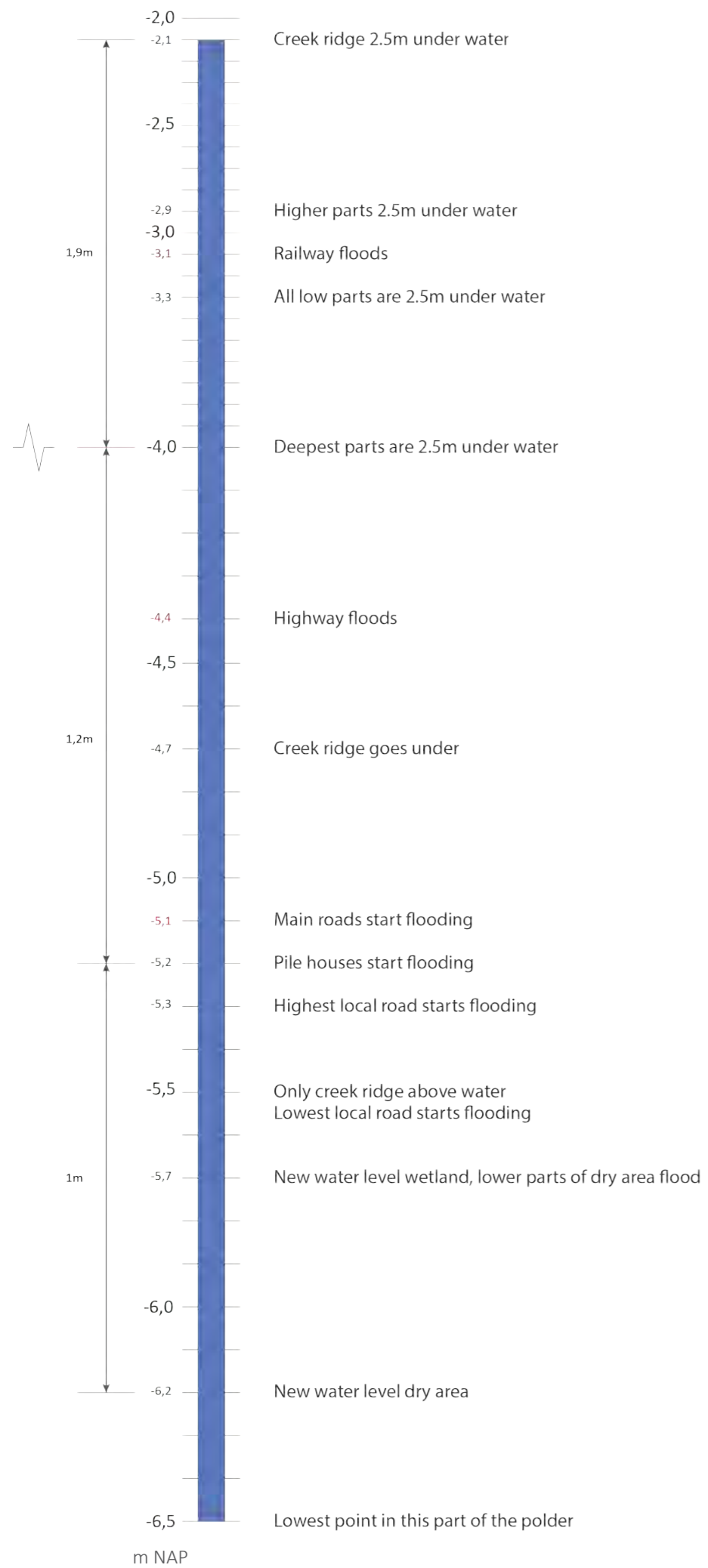
Solar energy

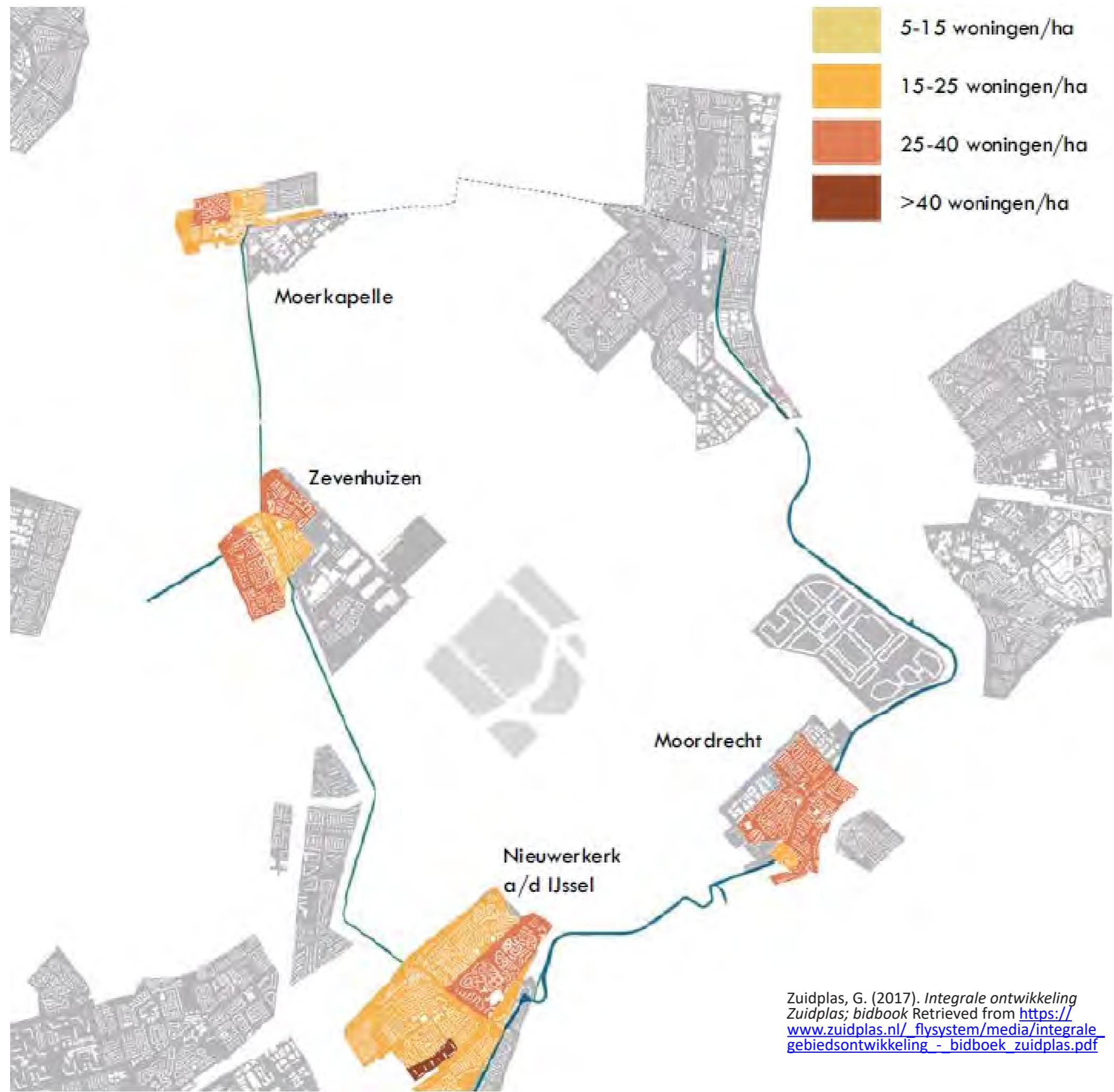
Social sustainability

Green link in the regional green and blue infrastructure



Thank you for your attention!





Zuidplas, G. (2017). *Integrale ontwikkeling Zuidplas; bidboek* Retrieved from <https://www.zuidplas.nl/flysystem/media/integrale-gebiedsontwikkeling-bidboek-zuidplas.pdf>

Influence of the physical environment

Sense of place

- geographic location
- boundaries/enclosure
- geographic distinctiveness
- scale and proportion
- rich images

*Things that make an impression,
often great natural features*

- also:
- the people that are there (or not) both number and kind.
 - doers and watchers

Steele (1981)

Sense of community

- natural features
- houses (design quality, architectural style and diversity)
- walkability
- overall layout

- density*

* both higher and lower density appreciated by different people

Kim and Kaplan (2004)

Residential satisfaction

- provision of open space
- higher degrees of tree coverage
- good sidewalk provision
- higher number of community spaces
(=> friendly, walkable neighbourhoods)

- greater proportions of detached dwellings

(in dense suburbs, because of the lack of privacy. Benefits of higher density can also be attained with clusters of dwellings with well-designed private and shared open spaces)

or

- greater proportions of semi-detached dwellings

(when detached houses are too far apart)

Abass & Tucker (2018)