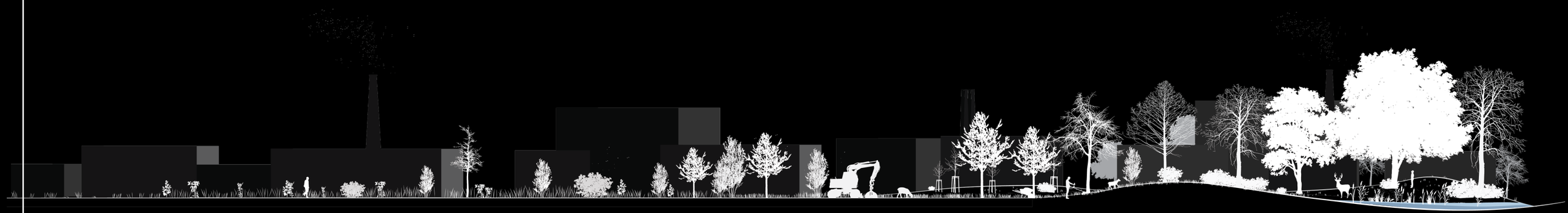
FOURTH TO SIXTH NATURE

FERALISING THE POST INDUSTRIAL LANDSCAPE



Flowscapes Studio - P5 Presentation

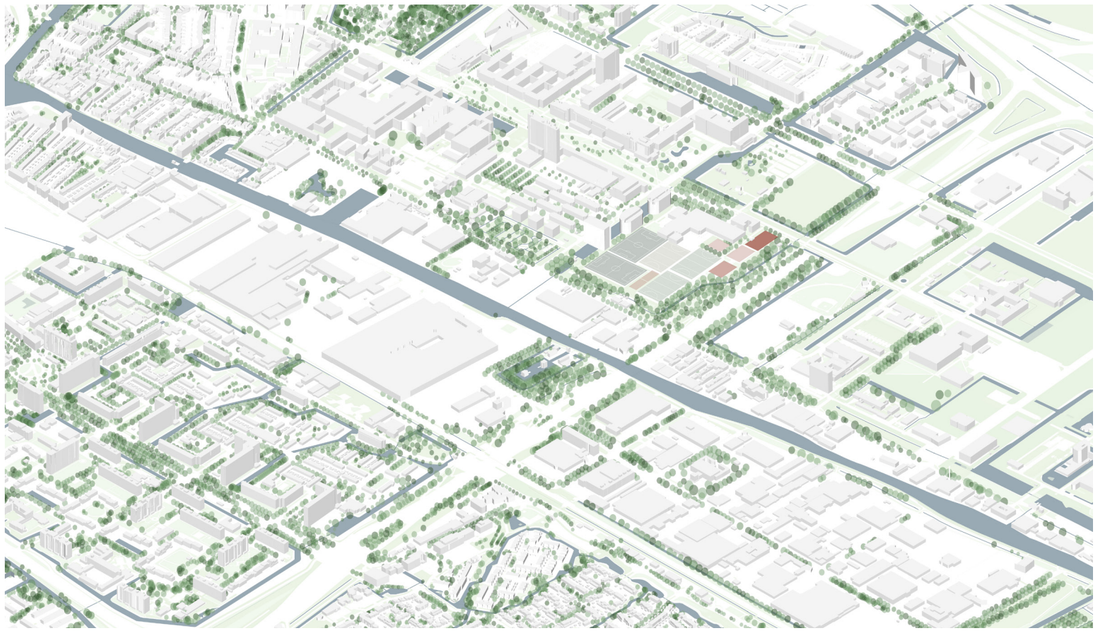
Urban Forestry Lab
Student: Jan Houweling
Mentors: Saskia de Wit & Suzana Milinovic

> Decrease of industrial function

> Reprogramming for housing









Reclaimed by nature



Eco-Kathedraal Louis Le Roy



Chernobyl: completely reclaimed by nature in 25 years



Landschaftspark Duisburg: Post-Industrial Landscape Park

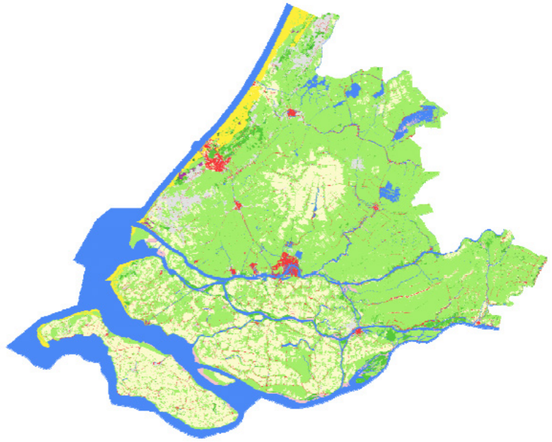


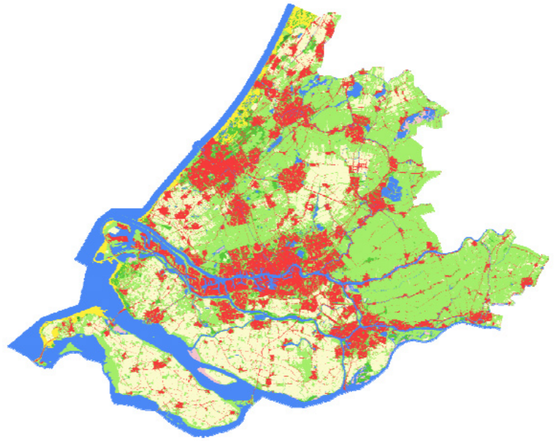
Zollverein: Post-Industrial UNESCO Heritage

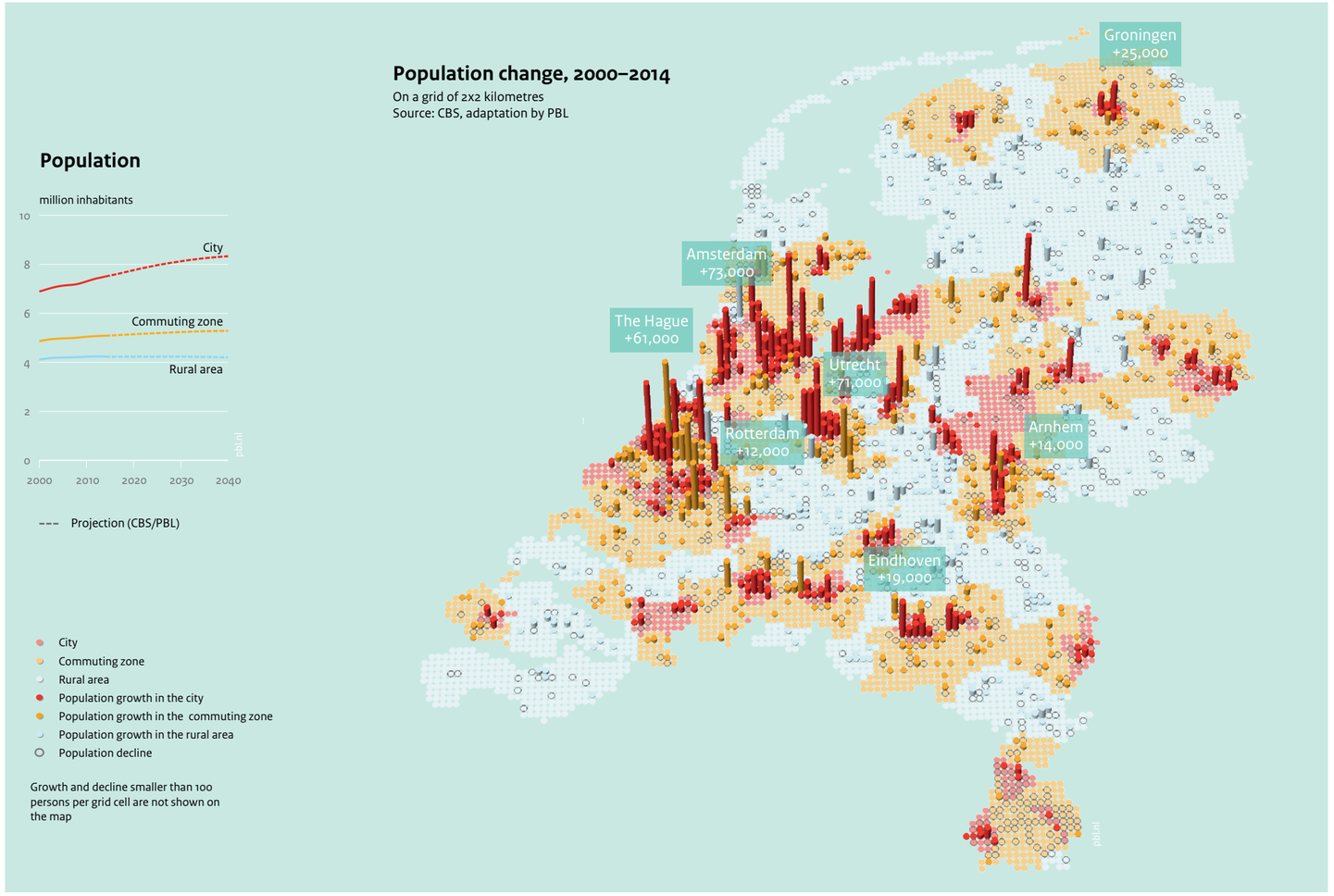
Representing the voiceless



> by 2040, ± 1 million more people will be living in the city

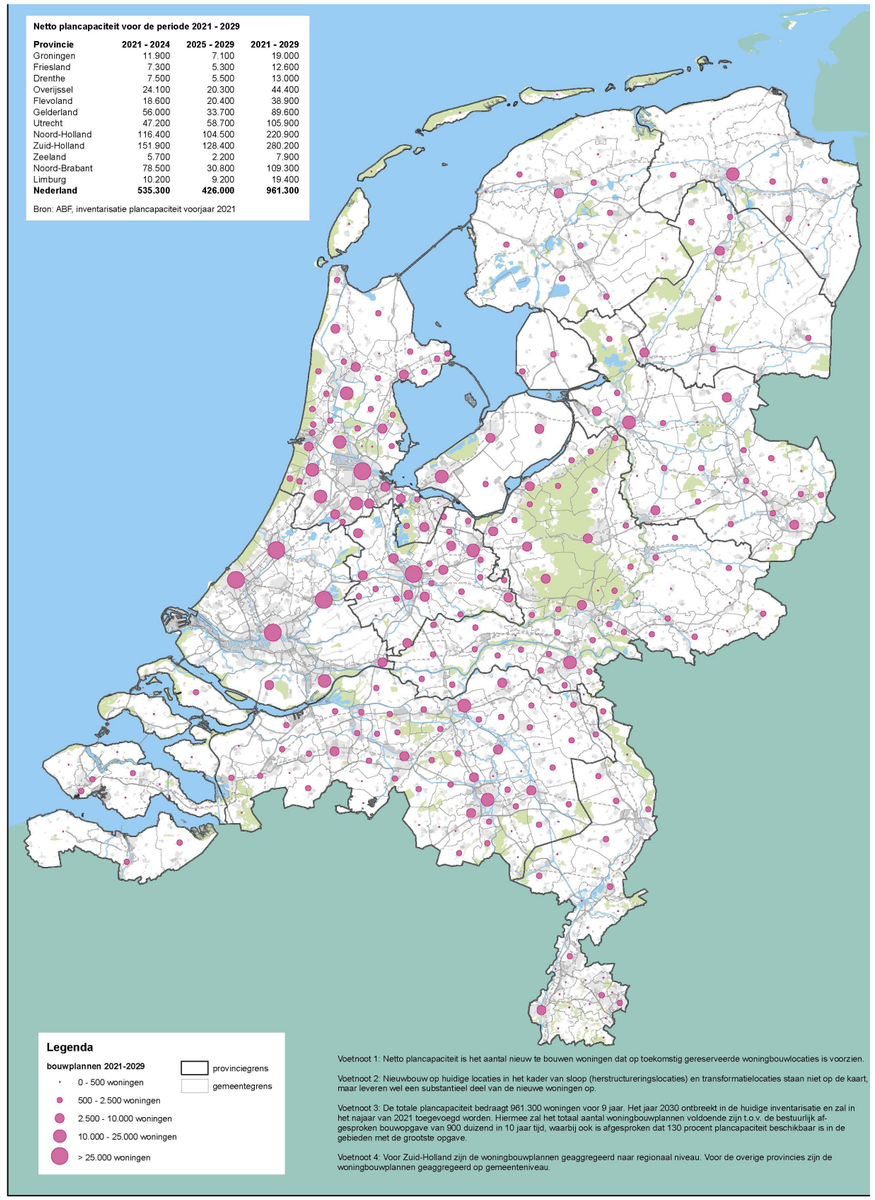






Source: PBL/CBS

Housing goals



Netto plancapaciteit voor de periode 2021 - 2029

Provincie	2021 - 2024	2025 - 2029	2021 - 2029
Groningen	11.900	7.100	19.000
Friesland	7.300	5.300	12.600
Drenthe	7.500	5.500	13.000
Overijssel	24.100	20.300	44.400
Flevoland	18.600	20.400	38.900
Gelderland	56.000	33.700	89.600
Utrecht	47.200	58.700	105.900
Noord-Holland	116.400	104.500	220.900
Zuid-Holland	151.900	128.400	280.200
Zeeland	5.700	2.200	7.900
Noord-Brabant	78.500	30.800	109.300
Limburg	10.200	9.200	19.400
Nederland	**535.300**	**426.000**	**961.300**

Bron: ABF, inventarisatie plancapaciteit voorjaar 2021

Legenda

bouwplannen 2021-2029

- 0 - 500 woningen
- 500 - 2.500 woningen
- 2.500 - 10.000 woningen
- 10.000 - 25.000 woningen
- > 25.000 woningen

provinciegrens

gemeentegrens

Voetnoot 1: Netto plancapaciteit is het aantal nieuw te bouwen woningen dat op toekomstig gereserveerde woningbouwlocaties is voorzien.

Voetnoot 2: Nieuwbouw op huidige locaties in het kader van sloop (herstructureringslocaties) en transformatielocaties staan niet op de kaart, maar leveren wel een substantieel deel van de nieuwe woningen op.

Voetnoot 3: De totale plancapaciteit bedraagt 961.300 woningen voor 9 jaar. Het jaar 2030 ontbreekt in de huidige inventarisatie en zal in het najaar van 2021 toegevoegd worden. Hiermee zal het totaal aantal woningbouwplannen voldoende zijn t.o.v. de bestuurlijk afgesproken bouwopgave van 900 duizend in 10 jaar tijd, waarbij ook is afgesproken dat 130 procent plancapaciteit beschikbaar is in de gebieden met de grootste opgave.

Voetnoot 4: Voor Zuid-Holland zijn de woningbouwplannen geaggregeerd naar regionaal niveau. Voor de overige provincies zijn de woningbouwplannen geaggregeerd op gemeenteniveau.

> developing 280.000 housing units in South Holland before 2030

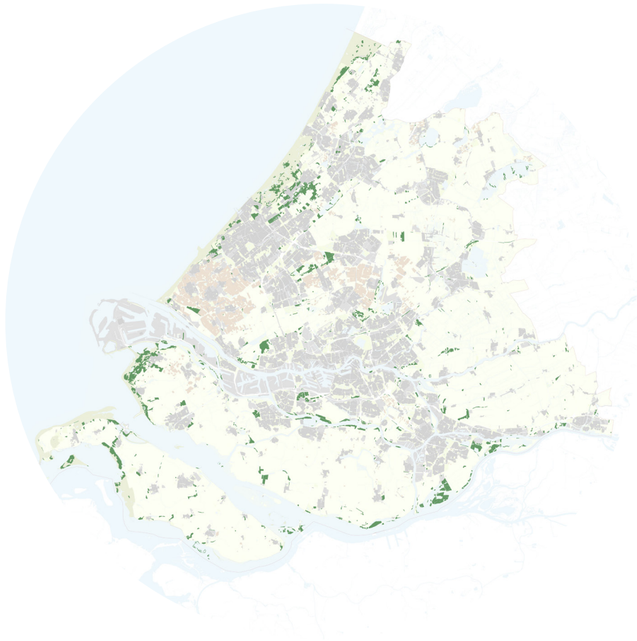
Biodiversity crisis



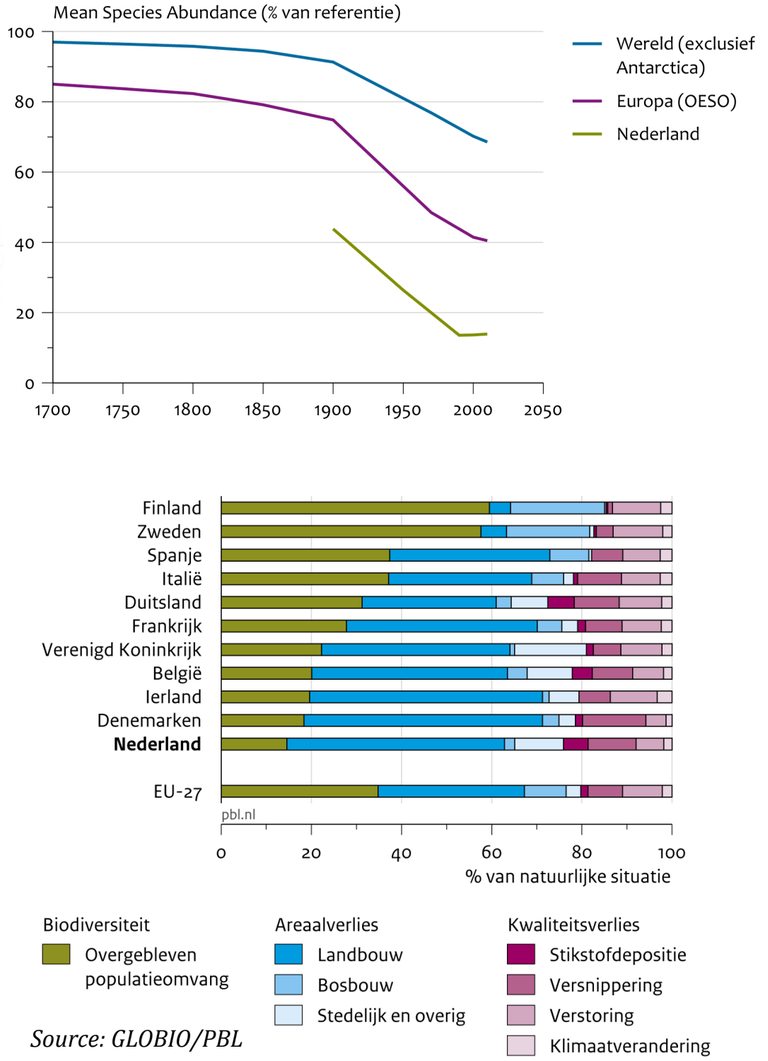
> 85 % biodiversity loss

> habitat areal loss due to agriculture and urban-isation

> habitat quality loss due to
- > nitrogen deposition
- > fragmentation
- > disturbance
- > climate change



> Remaining forests in South Holland



Source: GLOBIO/PBL

Carbon & reforestation goals



> 2030: reduced carbon emission 49% irt 1990

Rijk en provincies: 10% meer bos in Nederland

Nieuwsbericht | 04-02-2020 | 15:09

10% meer en gezonder bos in 2030 (ofwel 37.000 hectare, 2x de omvang van Apeldoorn), vervanging van gekapte bomen en meer bomen in woonwijken. Dat zijn de belangrijkste onderdelen van de vandaag gepresenteerde visie op de toekomst van het Nederlandse bos die minister Schouten van Landbouw, Natuur en Voedselkwaliteit (LNV) – mede namens de provincies – naar de Tweede Kamer heeft gestuurd. Medio 2020 volgt er een invulling van de benodigde stappen om deze visie in praktijk te brengen.

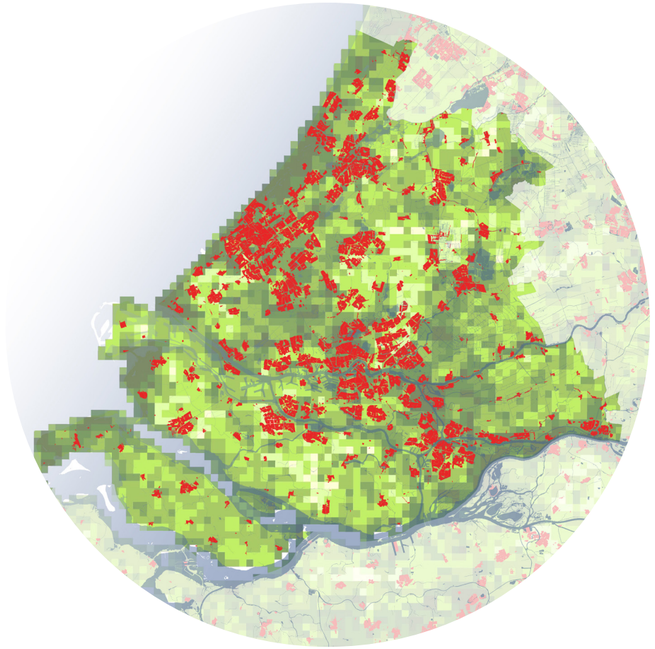
> 2030: 10% more forest (37.000 ha)



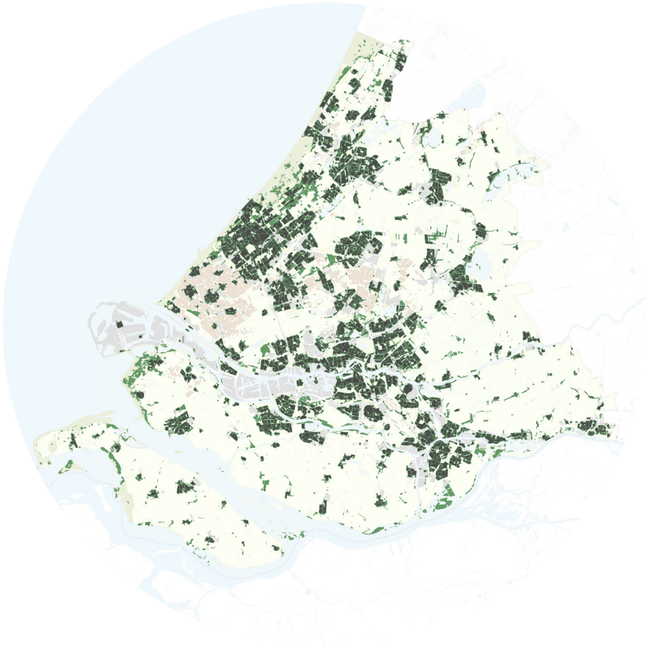
> Search area reforestation



Species richness



Species richness pattern follows urban fabric



Urban Forestry as the solution for reforestation



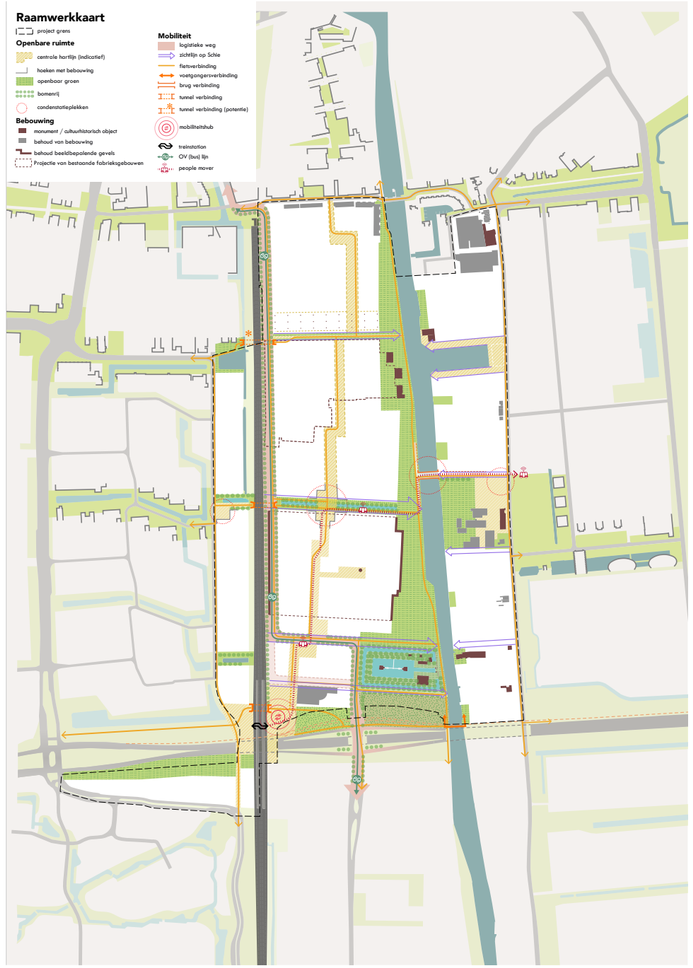


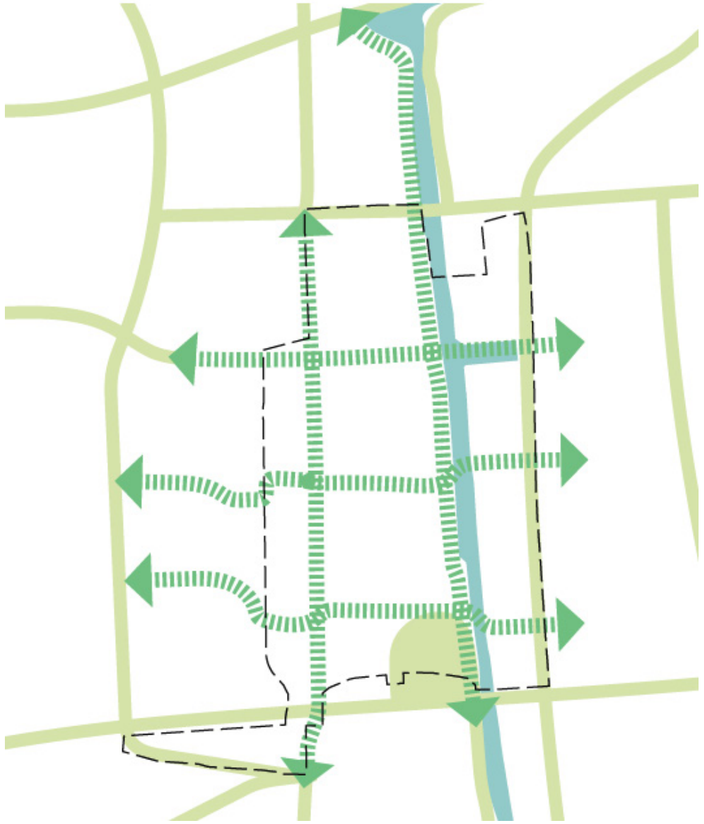






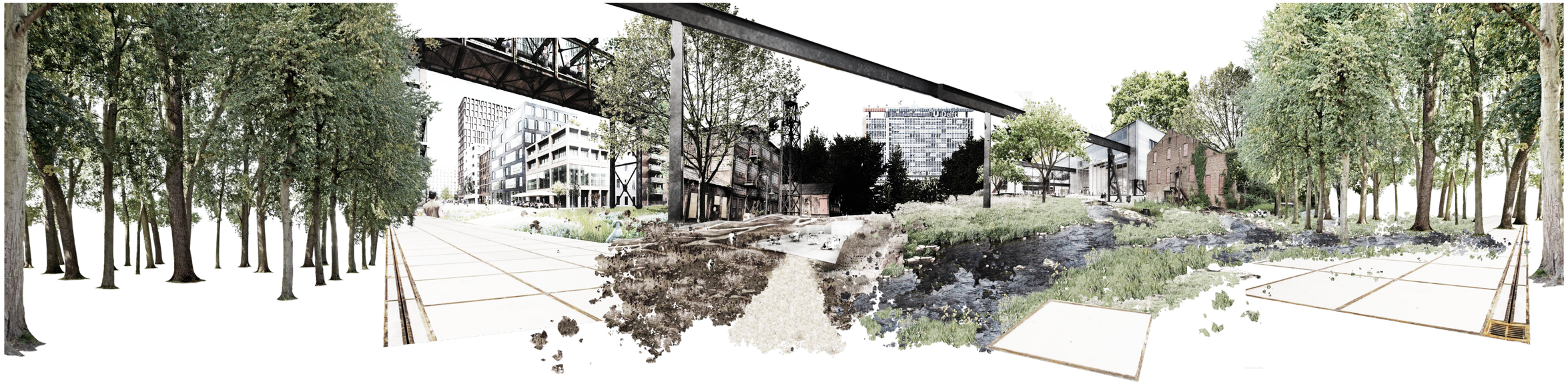
Source: Ontwikkelplan Schieoevers Noord





Source: Ontwikkelplan Schieoevers Noord

Main research question



How can we utilise the potential of feralisation in transforming the post-industrial landscape to a healthy, climate-adapted and inclusive living environment for all species?



What is our relation to nature?

Categorizing nature (i.r.t. mankind)



	DESIMINI	HUNT	KOWARIK	HOFMEISTER	GEUZE	GIROT	CLÉMENT
Pristine	First Nature	First Nature	First Nature	First Wilderness	First Nature		
Cultivated/Infrastructural/ Silvicultural/Agricultural	Second Nature	Second Nature	Second Nature	Second Wilderness			
Horticultural/Designed/ Planted in Green Spaces	Third Nature	Third Nature	Third Nature				
Successional Ecosystems on Urban-Industrial Sites	Fourth Nature		Fourth Nature	Third Wilderness	Second Nature	Nouvelle Nature	Third Landscape
Managed Succession on Urban-Industrial Sites/ Cultivated/Infrastructural/ Silvicultural/Agricultural on Urban-Industrial Sites	Fifth Nature						
Ecological-Cultural Hybrids on Urban-Industrial Sites	Sixth Nature						

Desimini, J. . (2013). **Notions of Nature and a Model for Managed Urban Wilds.** In Terrain Vague (pp. 173–186). Taylor & Francis.

Geuze, A. (2010) **Second Nature.** Topos: The International Review of Landscape Architecture & Urban Design, 71, 40-42

First Nature



First Nature *Source: Far Out*

> Uninfluenced by man

> Self-sustaining successional cycles

> Cyclical, complex, dynamic and diverse

Second Nature



First Nature *Source: Far Out*

> Uninfluenced by man

> Self-sustaining successional cycles

> Cyclical, complex, dynamic and diverse



Second Nature *Source: Hugova*

> Start of domestication

> Out of necessity

> Focus on growth

> Linear, simple, static

Third Nature



First Nature *Source: Far Out*

> Uninfluenced by man

> Self-sustaining successional cycles

> Cyclical, complex, dynamic and diverse



Second Nature *Source: Hugova*

> Start of domestication

> Out of necessity

> Focus on growth

> Linear, simple, static



Third Nature *Source: UK National Trust*

> Start of landscape culture

> Manipulating no longer out of *necessity*, but out for our *pleasure*

> Maintaining a fixed image

> Aesthetics, status

Fourth Nature



First Nature *Source: Far Out*

> Uninfluenced by man

> Self-sustaining successional cycles

> Cyclical, complex, dynamic and diverse



Second Nature *Source: Hugova*

> Start of domestication

> Out of necessity

> Focus on growth

> Linear, simple, static



Third Nature *Source: UK National Trust*

> Start of landscape culture

> Manipulating no longer out of *necessity*, but out for our *pleasure*

> Maintaining a fixed image

> Aesthetics, status



Fourth Nature

> *Conditions* are altered by man

> No human intervention in the process of forest development

> Different vegetation/processes compared to the natural landscape

Spontaneous vegetation













Fifth Nature



First Nature *Source: Far Out*

> Uninfluenced by man

> Self-sustaining successional cycles

> Cyclical, complex, dynamic and diverse



Second Nature *Source: Hugova*

> Start of domestication

> Out of necessity

> Focus on growth

> Linear, simple, static



Third Nature *Source: UK National Trust*

> Start of landscape culture

> Manipulating no longer out of *necessity*, but out for our *pleasure*

> Maintaining a fixed image

> Aesthetics, status



Fourth Nature

> *Conditions* are altered by man

> No human intervention in the process of forest development

> Different vegetation/processes compared to the natural landscape



Fifth Nature *Source: Valkenburgh Associates*

> Managed Urban Woodland

> Intervention in the successional development of fourth nature on industrial sites

> In order to increase cultural and economic benefits, without compromising the ecological value

Sixth Nature



First Nature *Source: Far Out*

> Uninfluenced by man

> Self-sustaining successional cycles

> Cyclical, complex, dynamic and diverse



Second Nature *Source: Hugova*

> Start of domestication

> Out of necessity

> Focus on growth

> Linear, simple, static



Third Nature *Source: UK National Trust*

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Fifth Nature *Source: Valkenburgh Associates*

> Managed Urban Woodland

> Intervention in the successional development of fourth nature on industrial sites

> In order to increase cultural and economic benefits, without compromising the ecological value



Sixth Nature *Source: Kengo Kuma & Associates*

> Managed successional progression of feral nature in industrial sites, combined with new programme

> Ecological-cultural hybrid

fe·ral·i·sa·tion

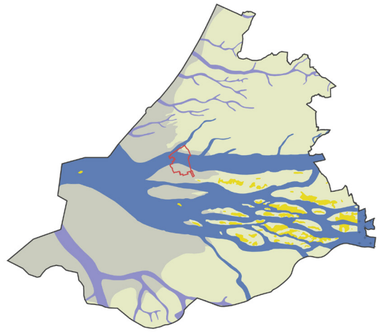
The process of subsequently returning to wildness after being domesticated



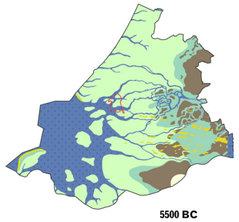


What place specific aspects give motive for design intervention?

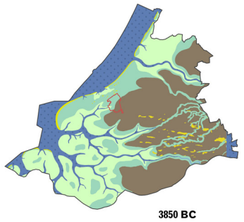
The Natural Landscape



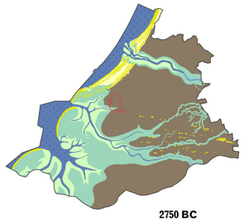
9000 BC



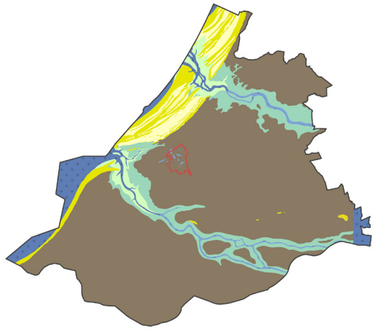
5500 BC



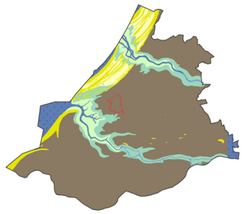
3850 BC



2750 BC



500 BC



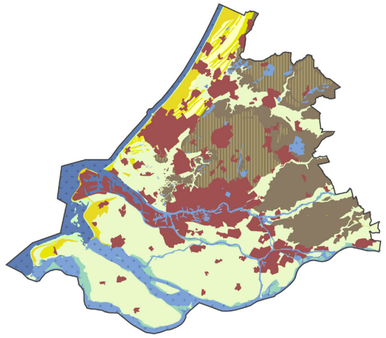
1500 BC



100 AC



800 AC



2000 AC



1250 AC



1500 AC



1850 AC



peat bog landscape



the river cuts through the bog



sand is deposited in the ridge, clay is deposited on the plains



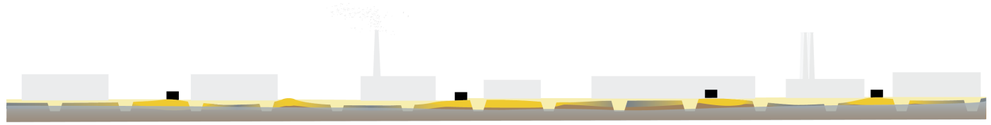
sea level rises and peat oxidizes



inversion: the sand stays stable while the clay sinks

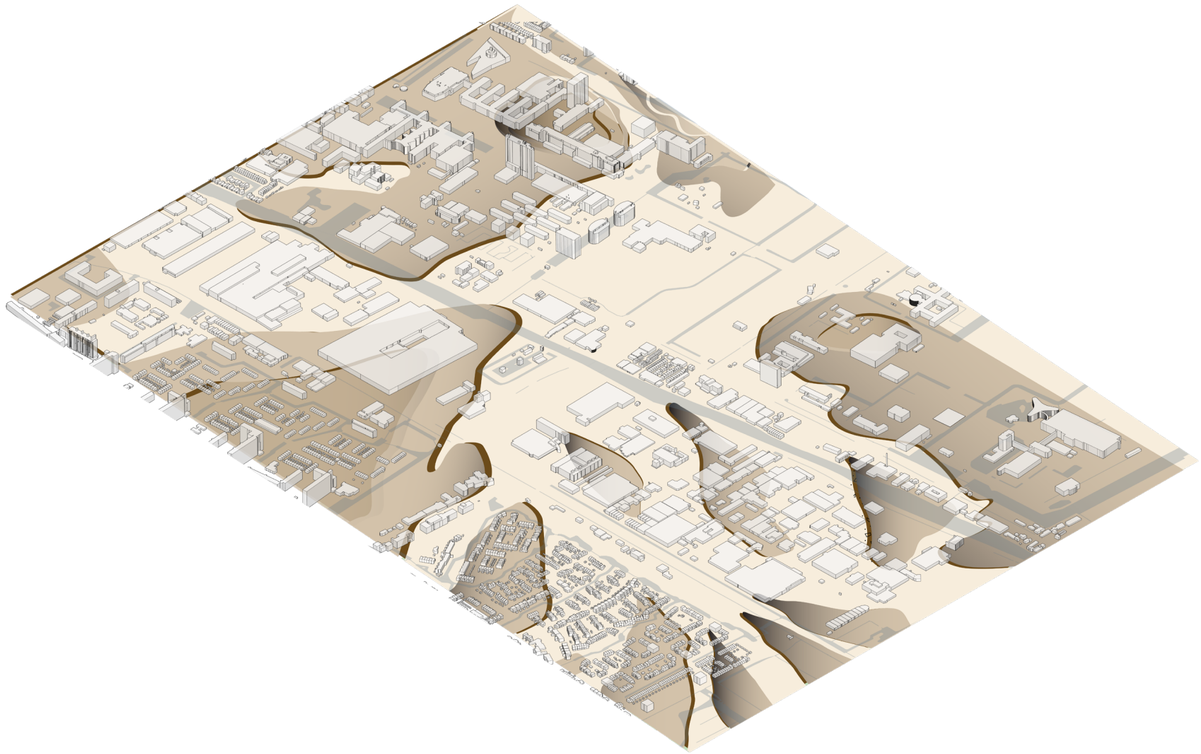


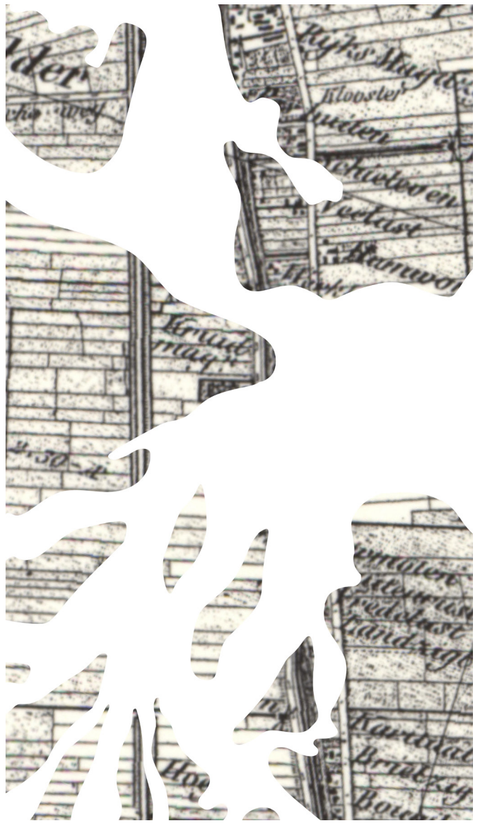
agraric reclamation



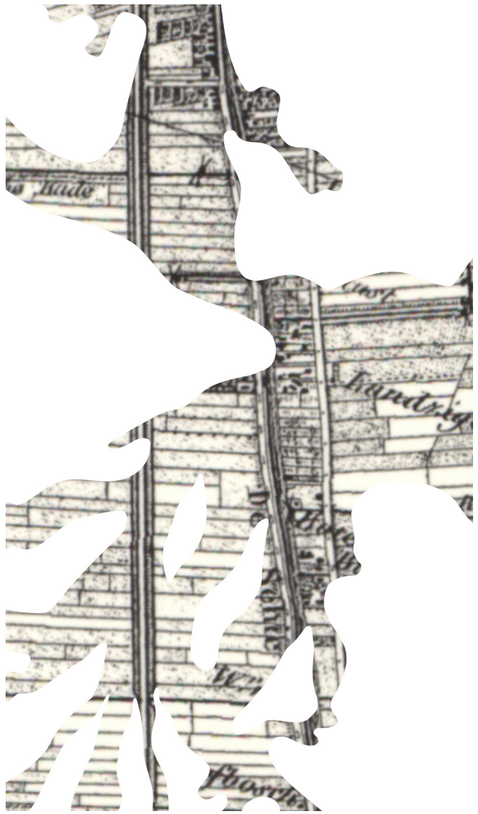
industrial development

The Natural Landscape



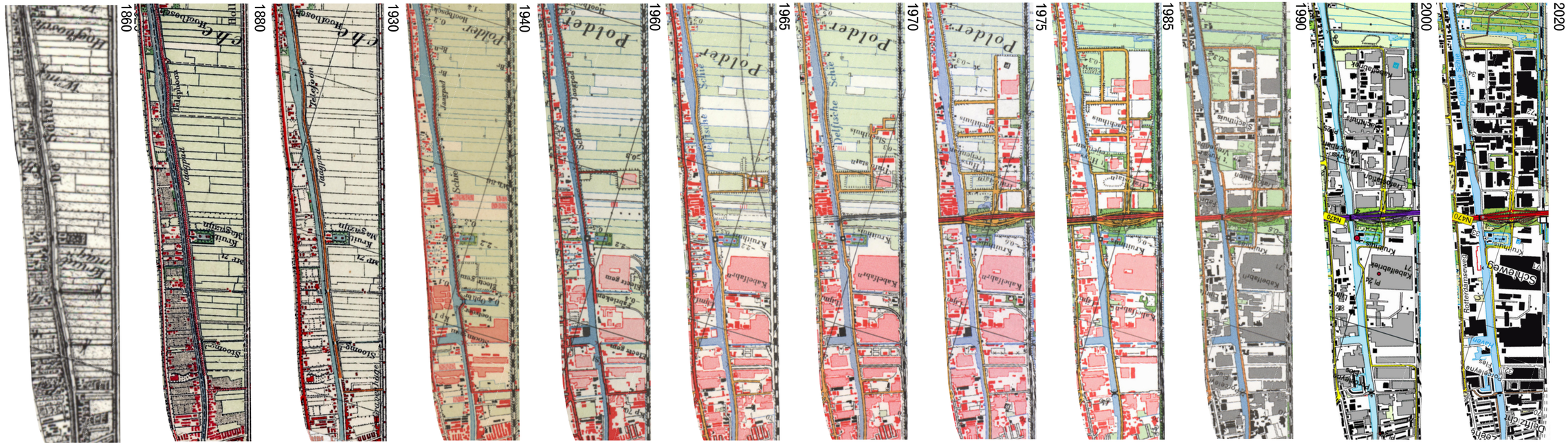


Claybed polders
Smaller plots, more ditches



Sandridge polders
Larger plots, less ditches

Plot-by-plot development



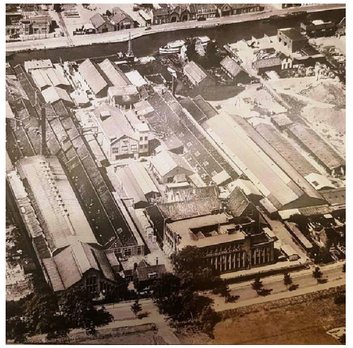
Agraric period **Early industrial period** **Late industrial period** **Modernisation**

Monumental buildings

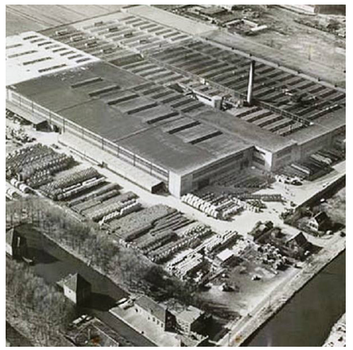




Kruythuis, Schieweg

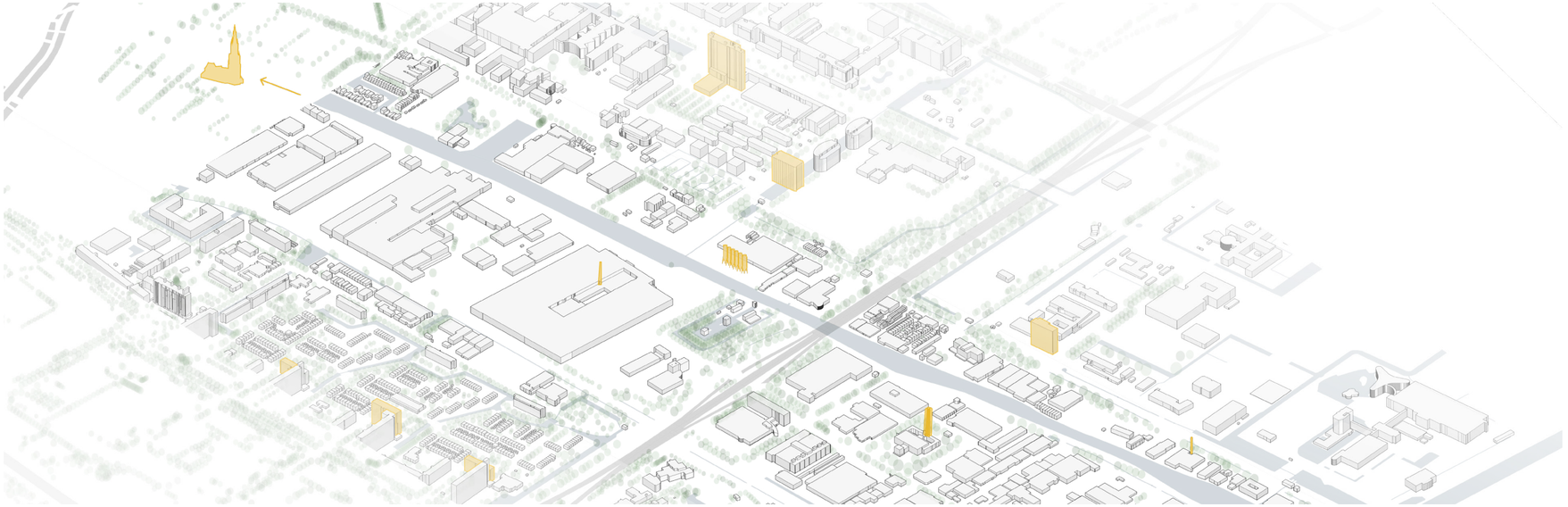


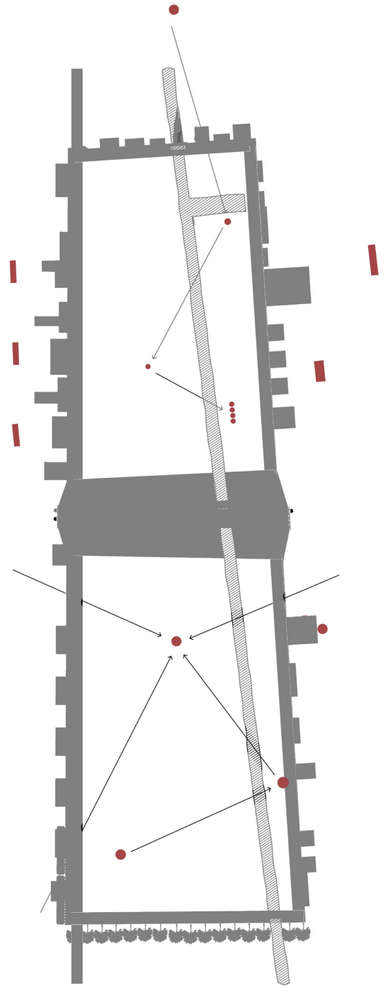
De Porceleyne Fles, Rotterdamseweg



Cable factory, Schieweg in xxxx

Industrial landmarks



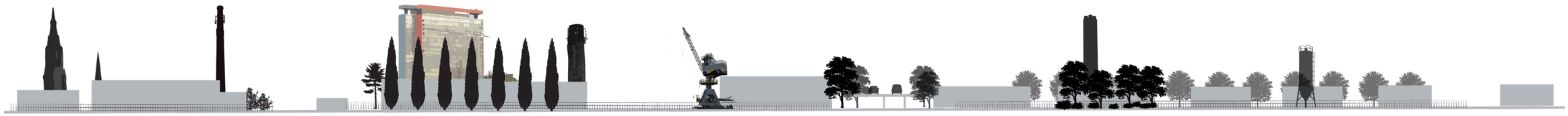








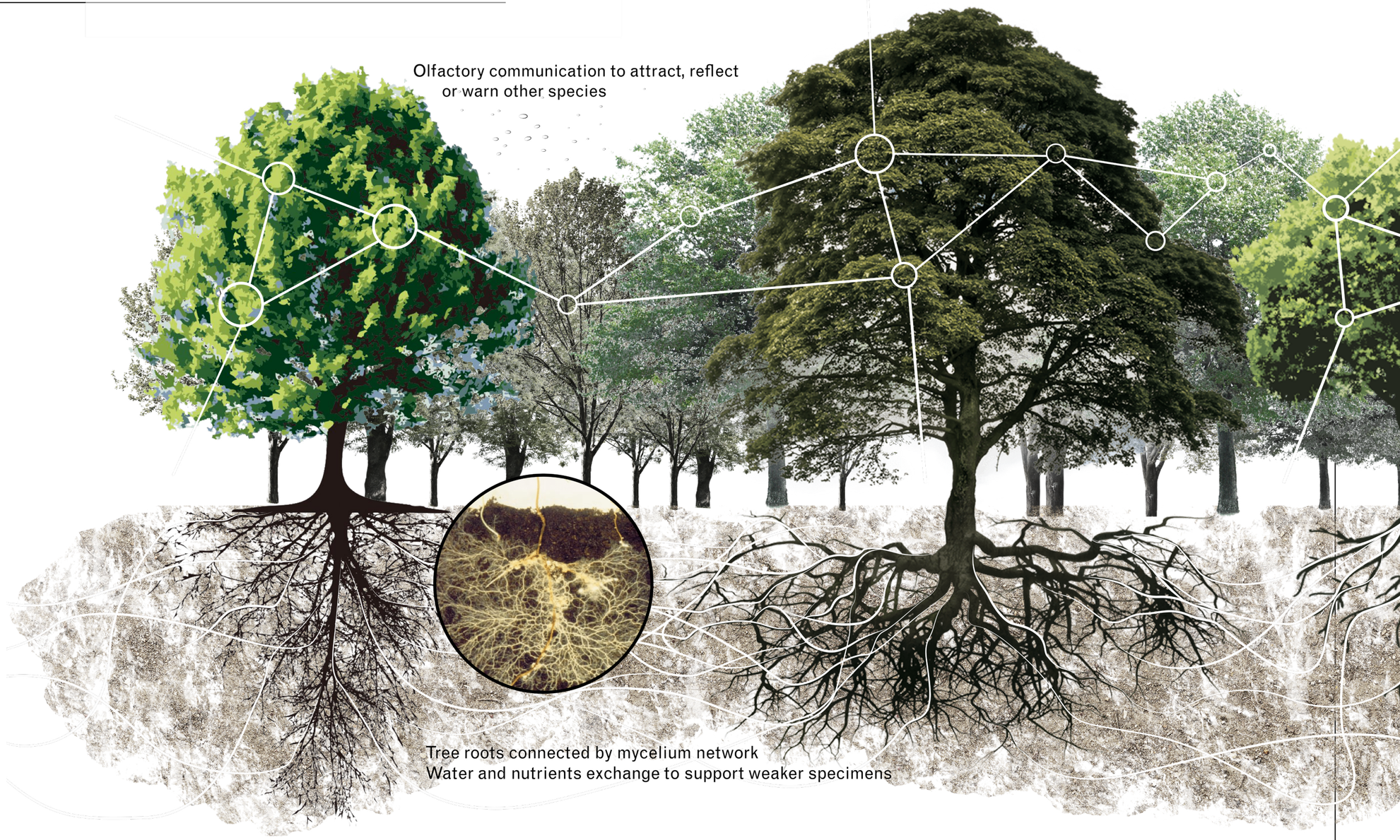




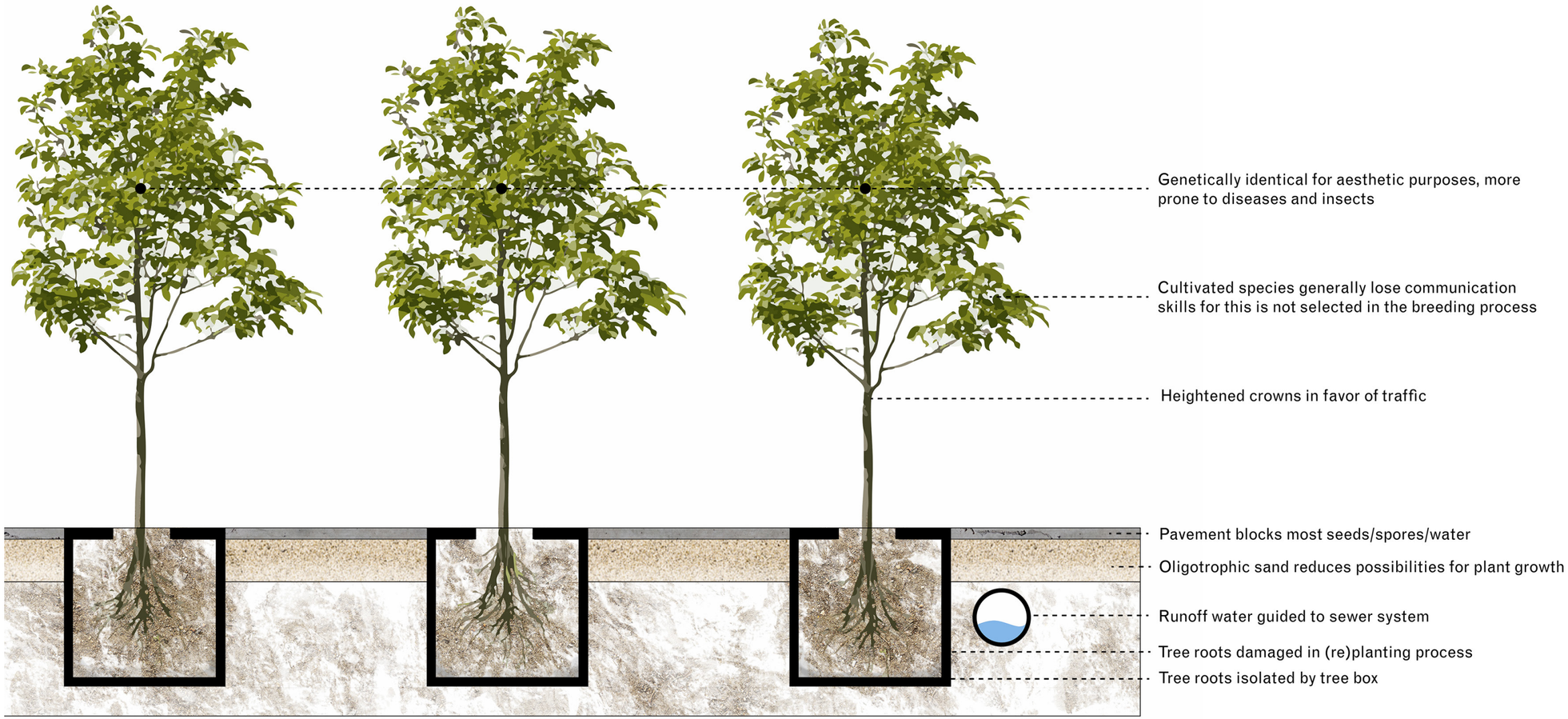


How can we create the best conditions for forest development in the urban context?

The forest as a superorganism



Condition of city trees



Condition of city trees



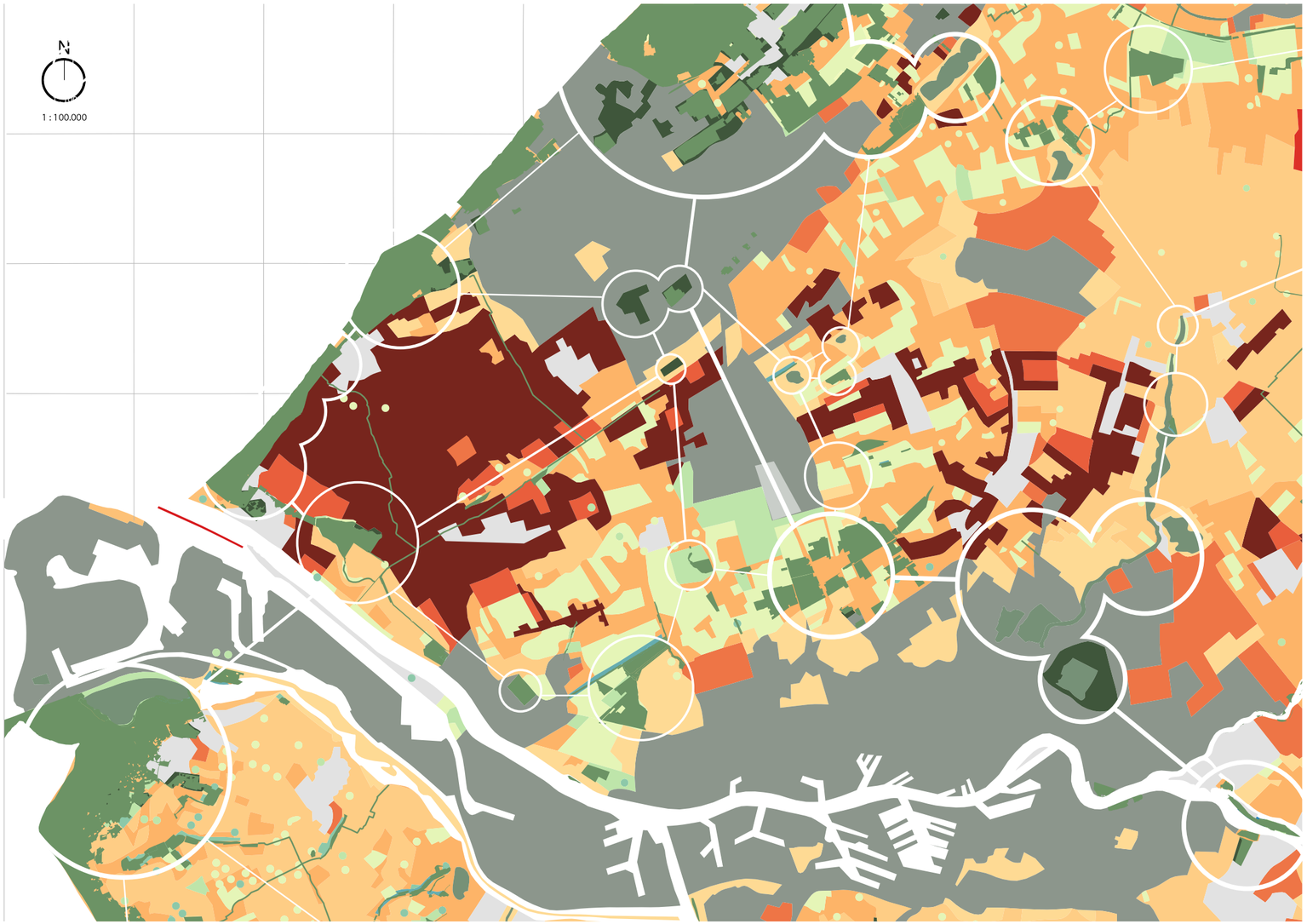
Condition of the trees in Delft



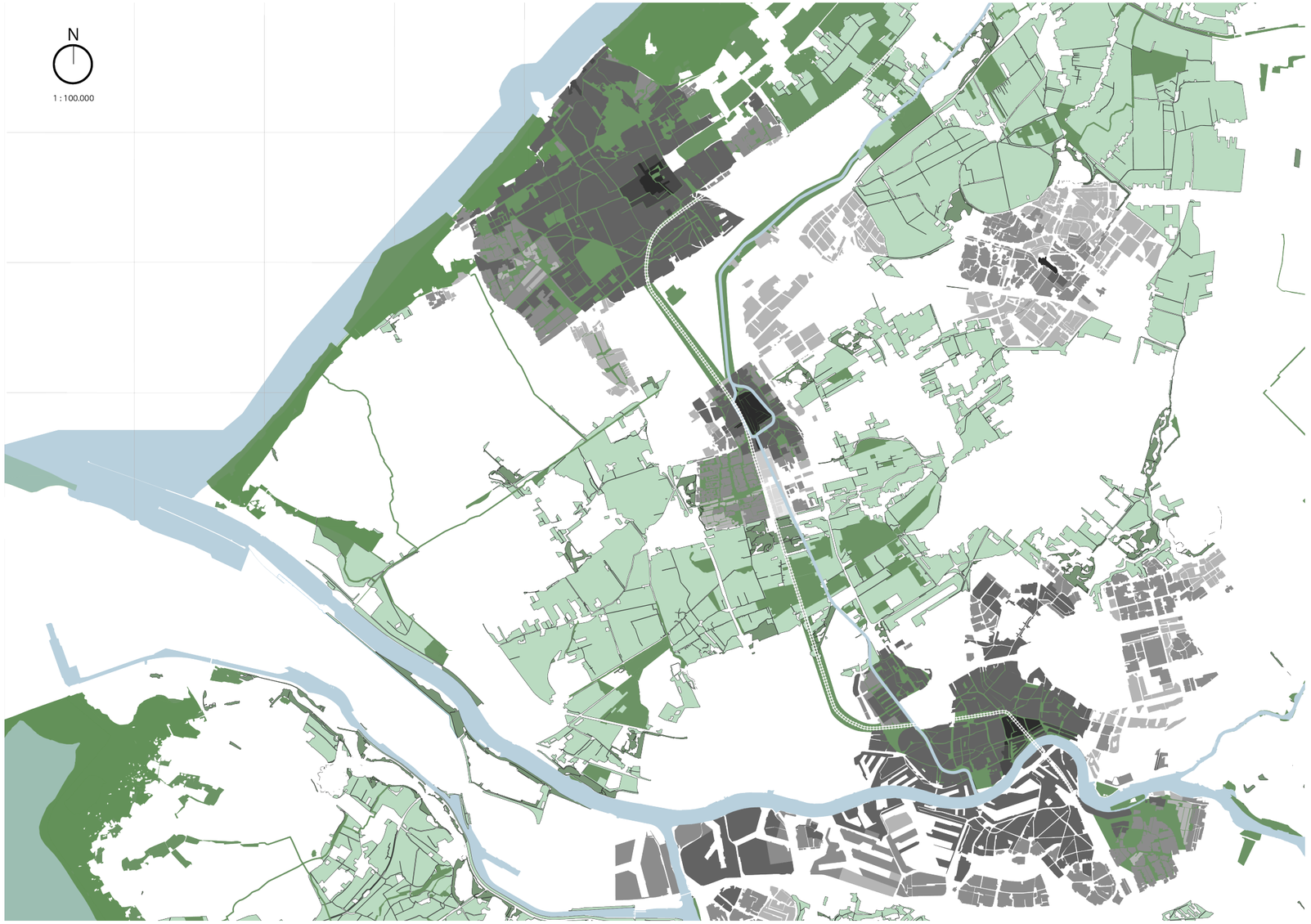
Sewer- and cable infrastructure in Delft

> apparent relation between amount of underground infrastructure and tree condition

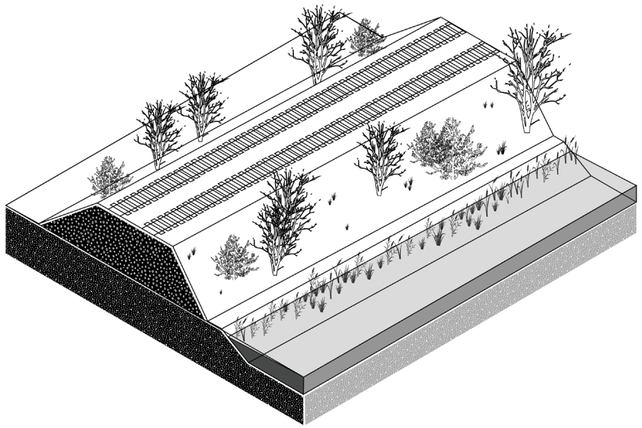
(Urban) Green Structure

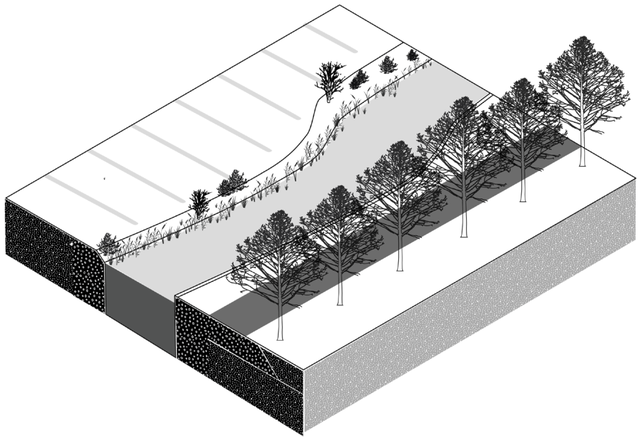


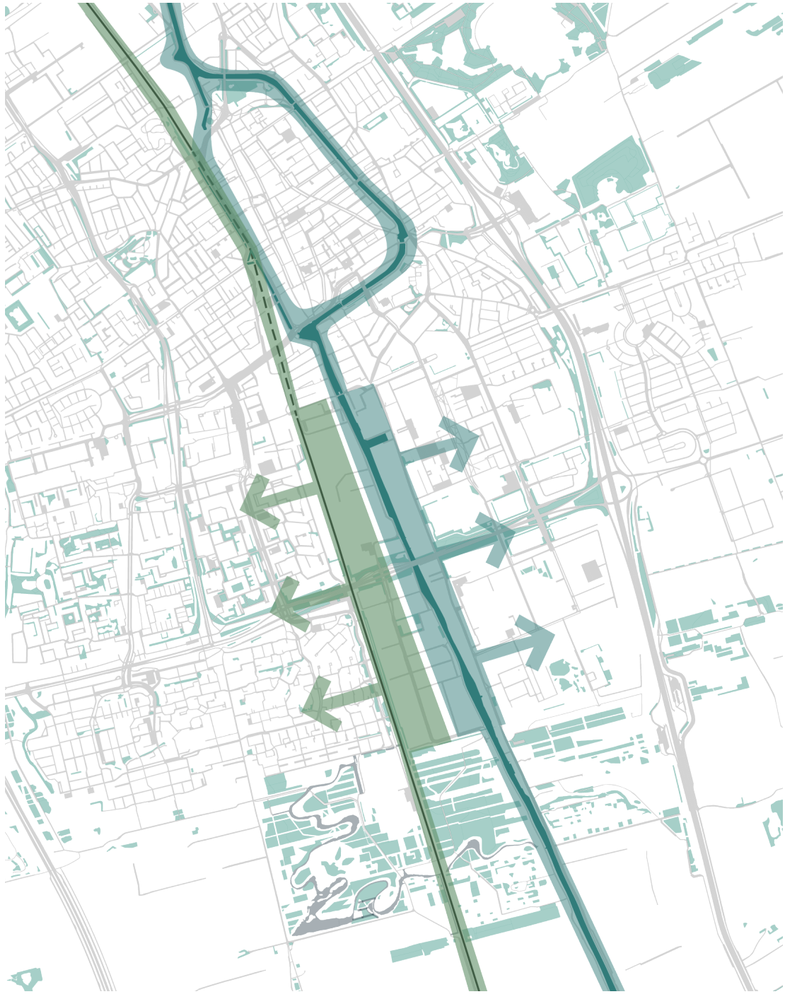
(Urban) Green Structure



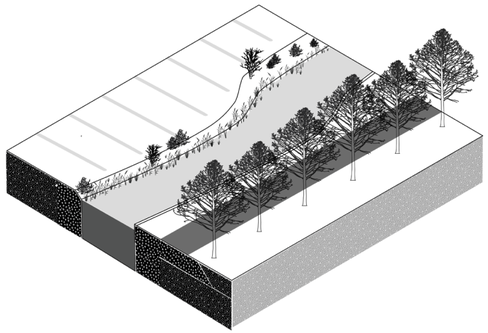
(Urban) Green Structure

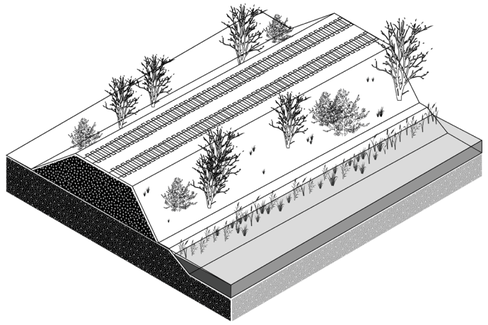


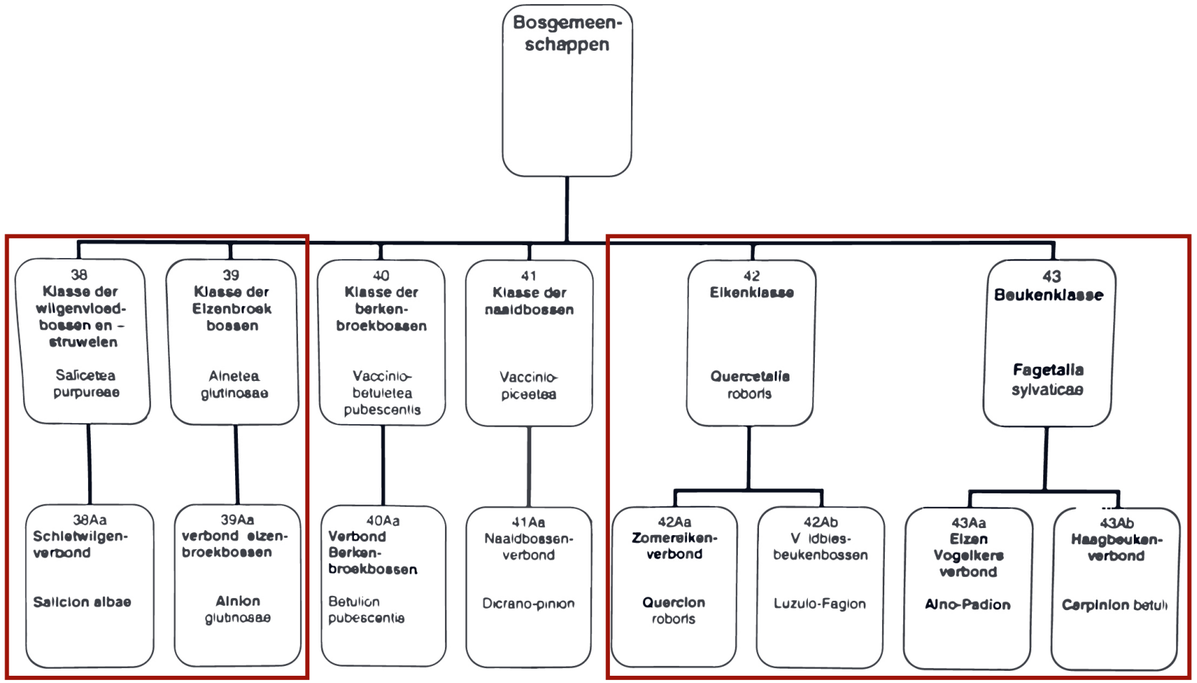




Corridors i.r.t. forest plant communities





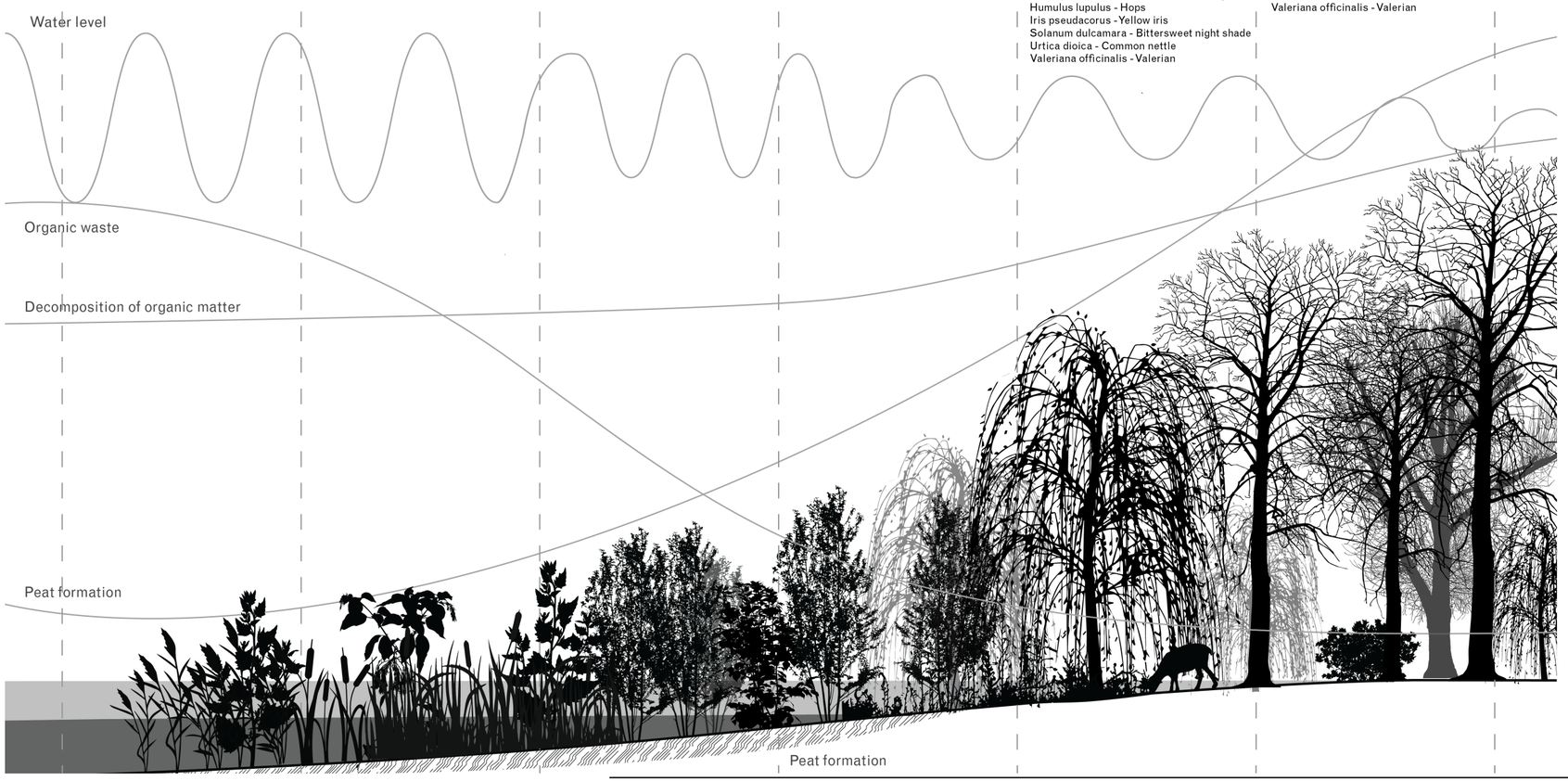


Willow - alder successional course

> mysterious | whimsical | purifying | dancing | transparent | symbolic | eager | vulnerable

Willow - Elder Forest Hydrosere Succesional Cycle

Reedland stage	Wetland stage	Shrub/heathland stage	Pioneer forest	Transition forest	Climax stage
± 0 - 2 years	± 3 - 5 years	± 5 - 10 years	± 10 - 25 years	± 25 - 60	± >60 years
		Shrubs Salix alba Salix viminalis - Basket willow Salix fragilis Salix triandra	Trees Salix alba 95% Populus nigra 5% Shrubs Salix viminalis - Basket willow	Trees Alnus glutinosa 10>90% Salix alba 90>10% Shrubs Salix viminalis - Basket willow Sambucus nigra - European elderberry Herbacious vegetation Aegopodium podagraria - Ground elder Angelica archangelica - Garden angelica Caltha palustris - Marsh marigold Carex paniculata - Greater tussock-sedge Humulus lupulus - Hops Iris pseudacorus - Yellow iris Solanum dulcamara - Bittersweet night shade Urtica dioica - Common nettle Valeriana officinalis - Valerian	Trees Alnus glutinosa >90% Salix alba <10% Shrubs Salix cinerea - Grey willow Sambucus nigra - European elderberry Herbacious vegetation Aegopodium podagraria - Ground elder Angelica archangelica - Garden angelica Iris pseudacorus - Yellow iris Urtica dioica - Common nettle Valeriana officinalis - Valerian





Reedland stage *Source: Fryske Gea*

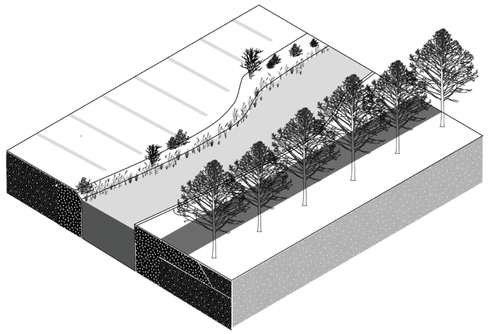


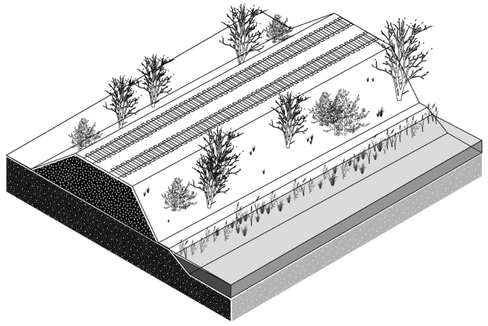
Wetland stage *Source: Waamps*

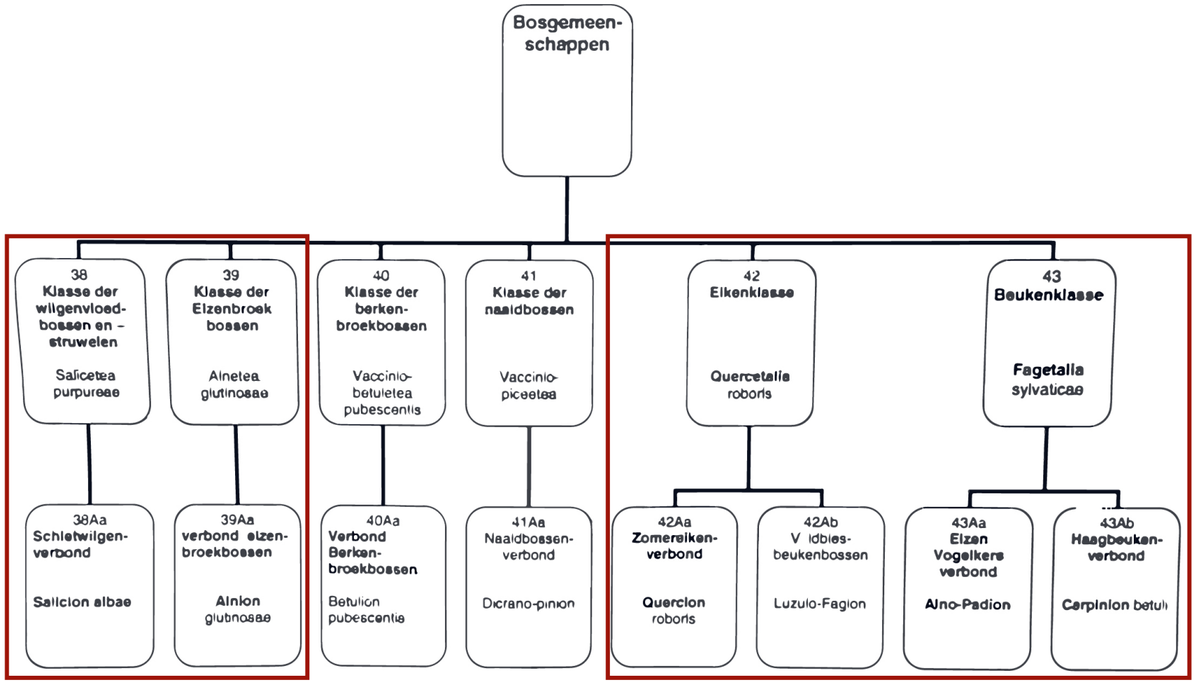


Forest stage *Source: Van Goesen-Groot*

Corridors i.r.t. forest plant communities





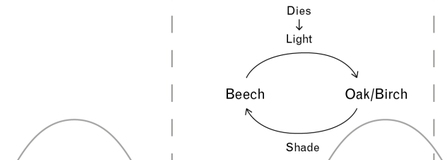


Oak - beech successional course

> strong | monumental | stable | heritage | power | opaque | endurance | frugal | resilient

Birch - Oak - Beech Succesional Cycle

Herbacious stage ± 0 - 2 years	Grassland stage ± 3 - 5 years	Shrub/heathland stage ± 5 - 10 years	Pioneer forest ± 10 - 25 years	Transition forest ± 25 - 100	Climax stage ± >100 years
Population sizes	Deschampsia flexuosa - Wavy hair grass Galium saxatile - Heath bedstraw	Corylus avellana - Hazel (chalk-rich) Frangula alnus - Alder buckthorn Sorbus aucuparia - Rowan Vaccinium myrtillus - European Blueberry *Ailanthus altissima - Heaven tree* *Buddleja davidii - Butterfly bush*	Betula pendula - European birch 90% Quercus robur - European oak 10% (Pine?) Pteridium aquilinum - Eagle fern	Betula pendula - European birch 90>10% Quercus robur - European oak 10>40% (Pine?) Betula pendula - European birch ± 30 % Quercus robur - European oak > 40% Fagus sylvatica - European beech > 20 %	Betula pendula - European birch <10% Quercus robur - European oak >45% Fagus sylvatica - European beech >45% Betula pendula - European birch 10 % Quercus robur - European oak 45 % Fagus sylvatica - European beech 45 %



Nutrient circulation

Species richness

Nitrogen deposition

Ph-value

Carbon captured

Mushrooms in fall

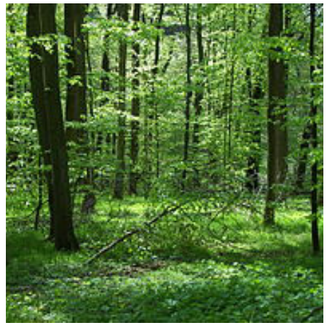
Rich moss layer in winter



Grassland stage



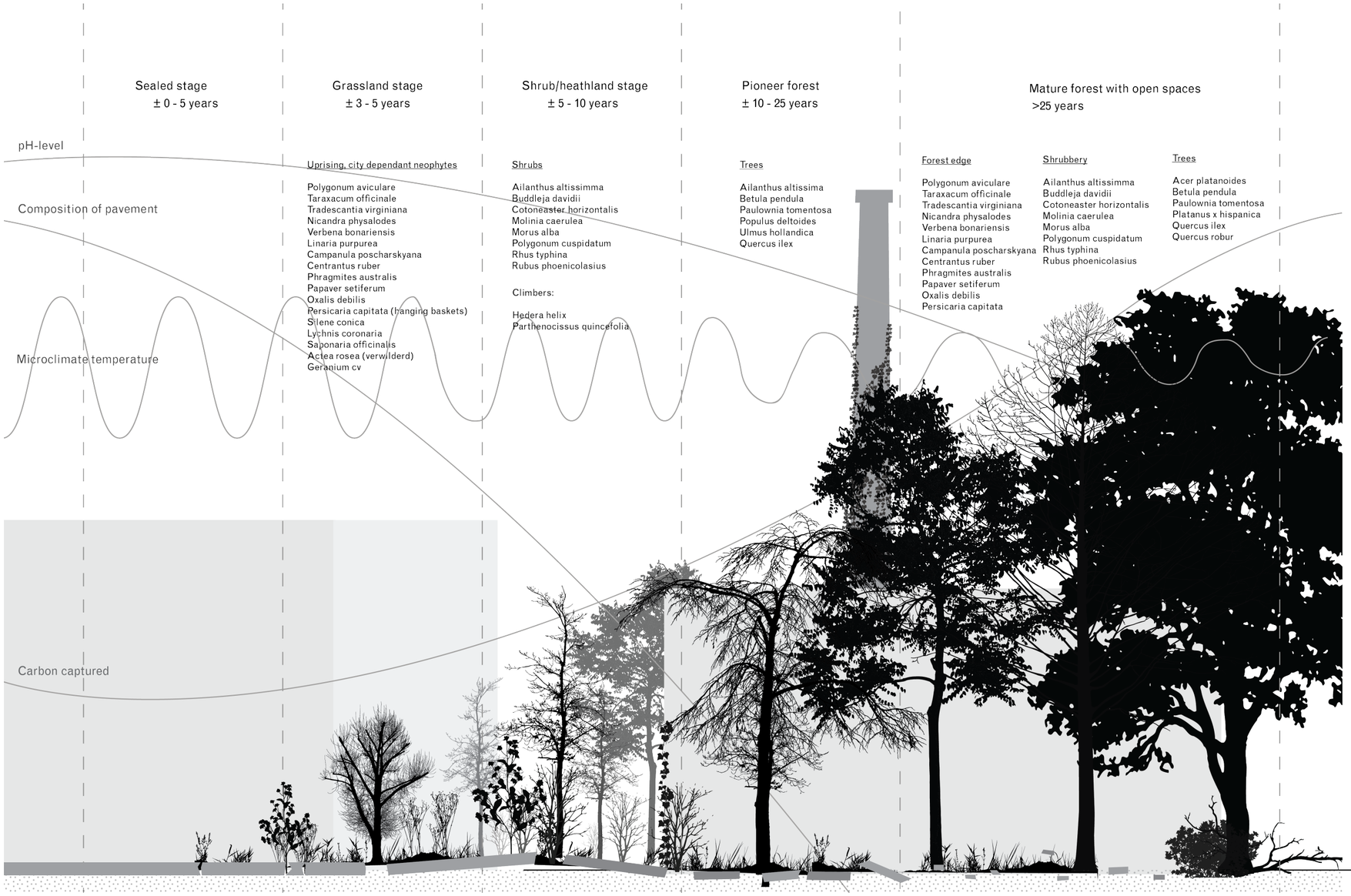
Young forest stage *Source: Own picture*

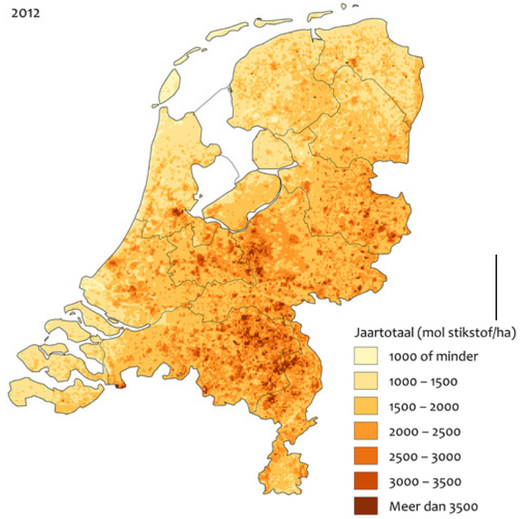


Adult forest stage *Source: Wikipedia*

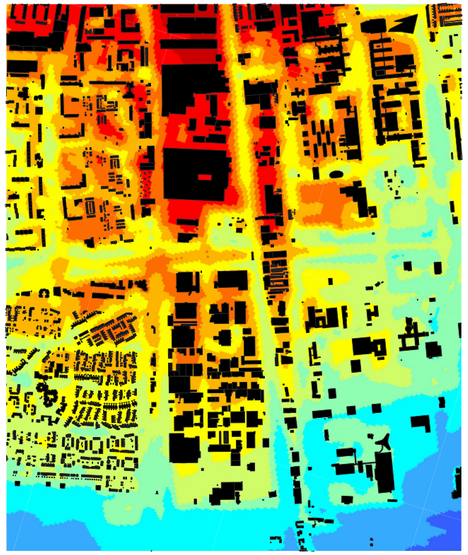
Urban Forest successional course

> rugged | wayward | adaptive | diverse | surprising | regenerative | exposing





Nitrogen deposition *Source: RIVM*



Urban heat stress

Influencing space and time

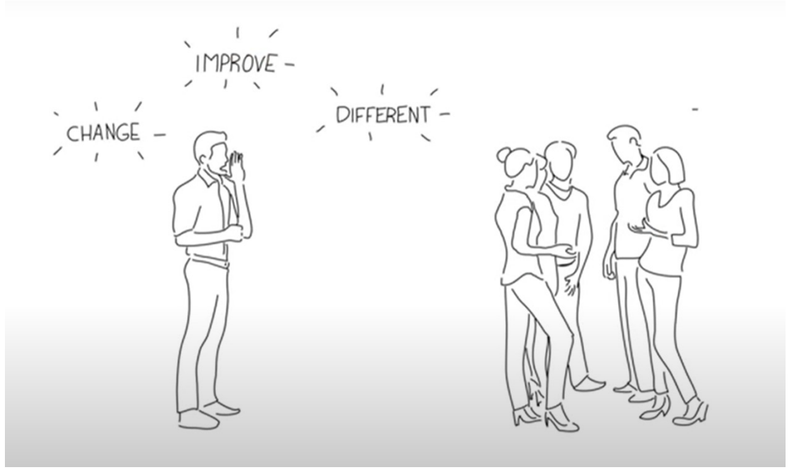


> time



How can we gain public acceptance for integrating feralisation in this transformation?

Not in my backyard!





Care

Neatness		Stewardship		Naturalness	
Attractive	Unattractive	Attractive	Unattractive	Attractive	Unattractive
Apparent yard care	*Dead or rotten*	*Good conservation*	*Poor conservation*	*Apparent naturalness*	*Too formal*
Fences	Dead or rotten	Conservation	All planted to corn	Development blends in	Too formal
Flowers or shrubs	*Lack of yard care*	Contour plowing	Effluent from feedlots—poor water quality	Habitat	Too much concrete
Home	No flowers	No erosion	Erodible land plowed	Native vegetation	Too open
Landscaped	No shade	Pasture	No conservation practices being used	Natural	Bare
Lawn ornaments or architectural details	Not landscaped	Stripcropping	Pastures are overgrazed	Trees	Flat
Trees in rows	Not mown	Terraces	Plowing up the hills	Wildlife	Monotonous
Big yard	*Messy*	Windbreak	Runoff		No trees
Big yard	Cluttered		Slimy looking water		
Clean and neat	Construction going on				
Clean	Junk				
Neat	Messy				
No junk	*Poor care*				
Put away	Abandoned				
Good care	Neglected				
Cared for	No house on a farmstead site				
Maintained	*Weedy*				
Well kept	Weedy				
Mown					
Mown					
New					
New					
No weeds					
No weeds					
White					

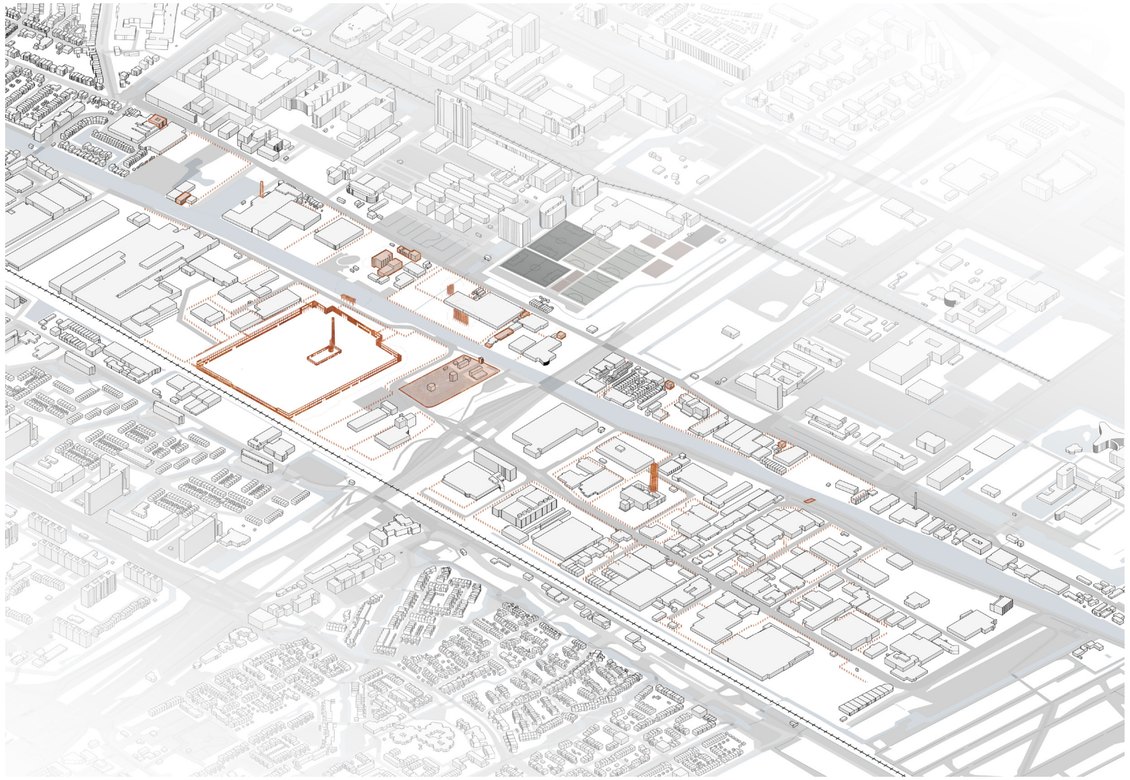
Cues for care as defined by Nassauer

> The act of placing unfamiliar forms into familiar packages

> "*What is good, may not look good and what looks good, may not be good.*"

Nassauer, J. I. (1995). **Messy Ecosystems, Orderly Frames.** Landscape Journal, 14(2), 161–170. https://doi.org/10.3368/lj.14.2.161

Industrial Frames

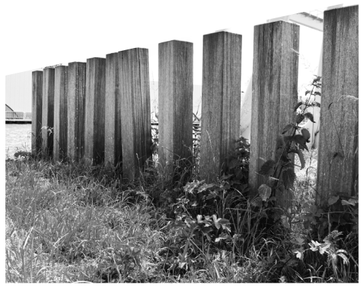




> Historical remnants



> Construction/facade



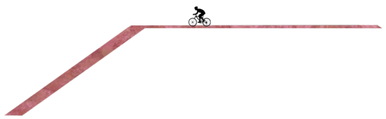
> Property boundaries



> Industrial relics



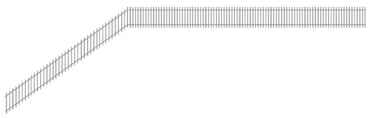
Sheet piling



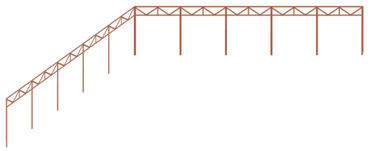
Existing infrastructure



Building facades

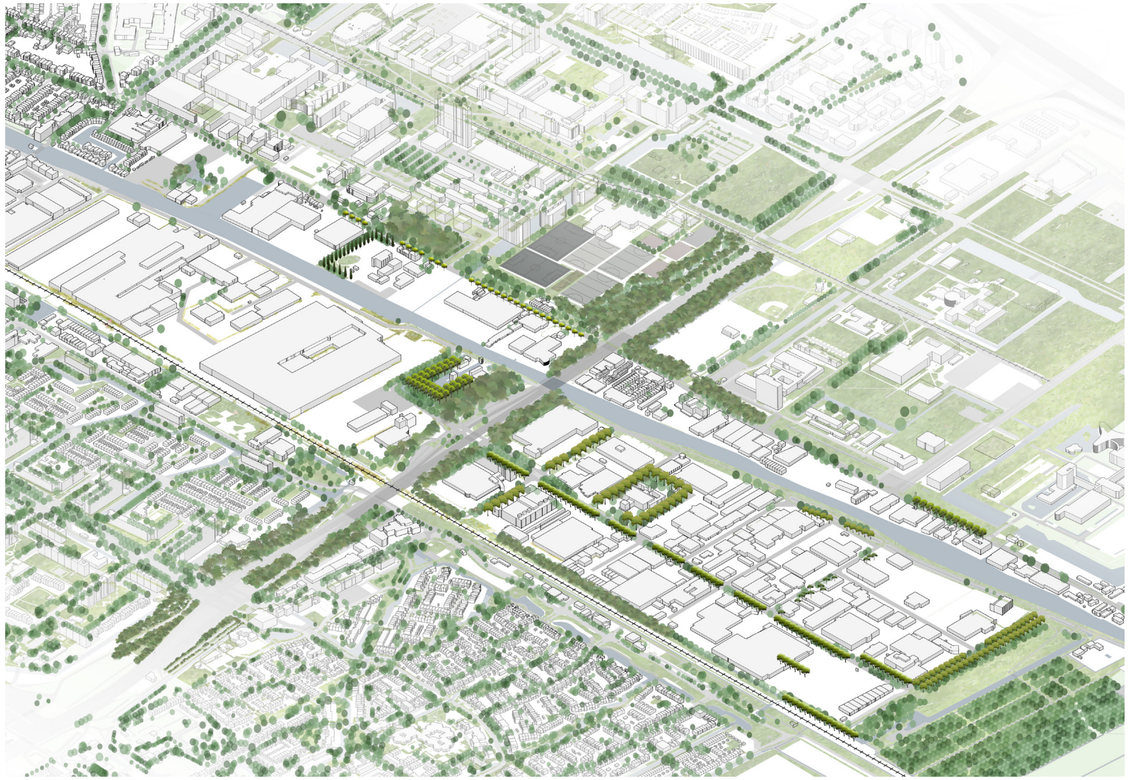


Property boundaries



Building constructions

Living Frames





> Herbacious



> Shrubbery



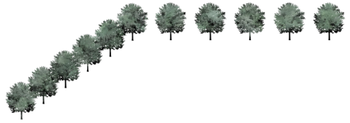
> Conical trees



> Forest patches



Tree lanes - Conical



Tree lanes - Round



Trimmed hedge

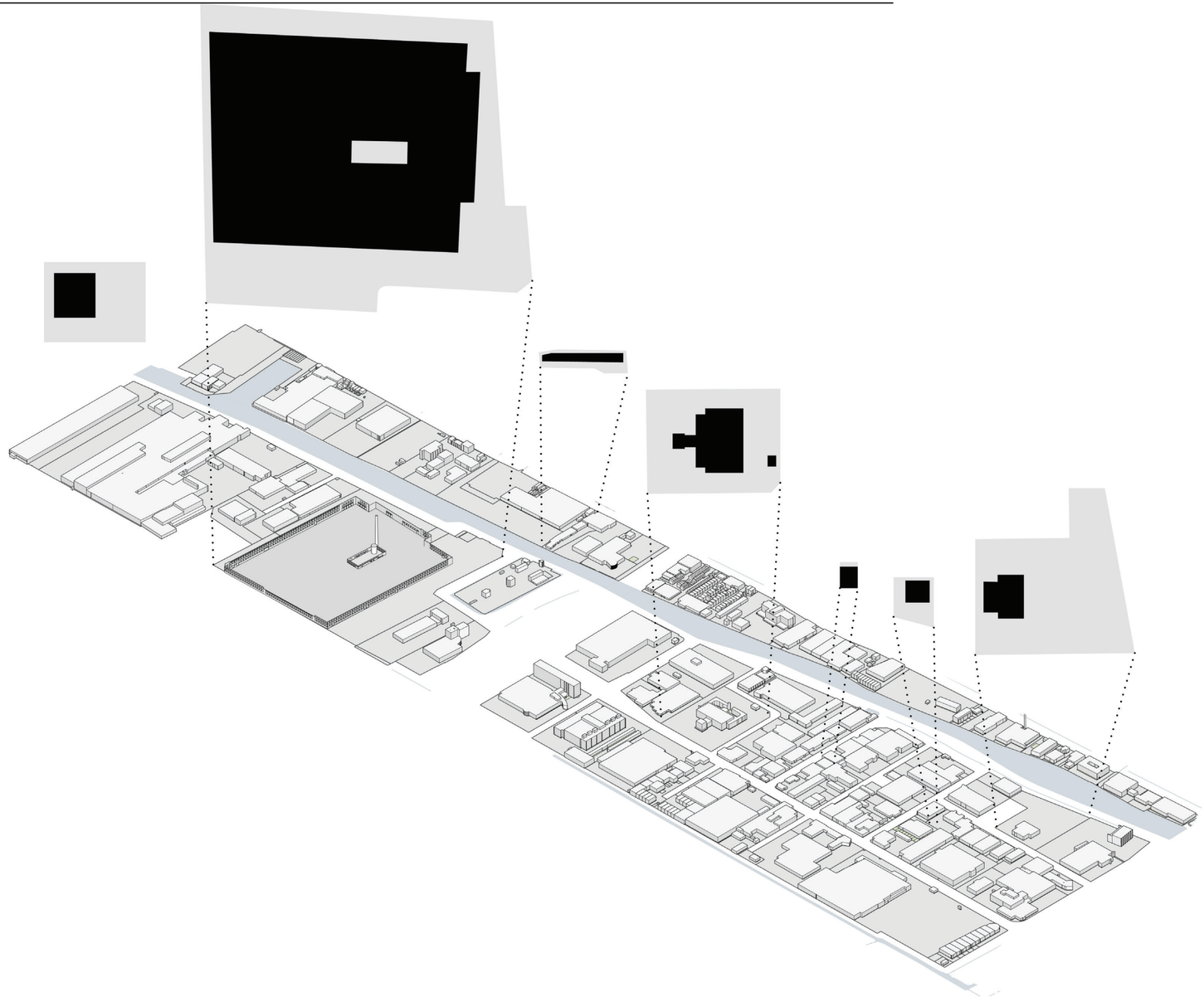


Strip of lawn

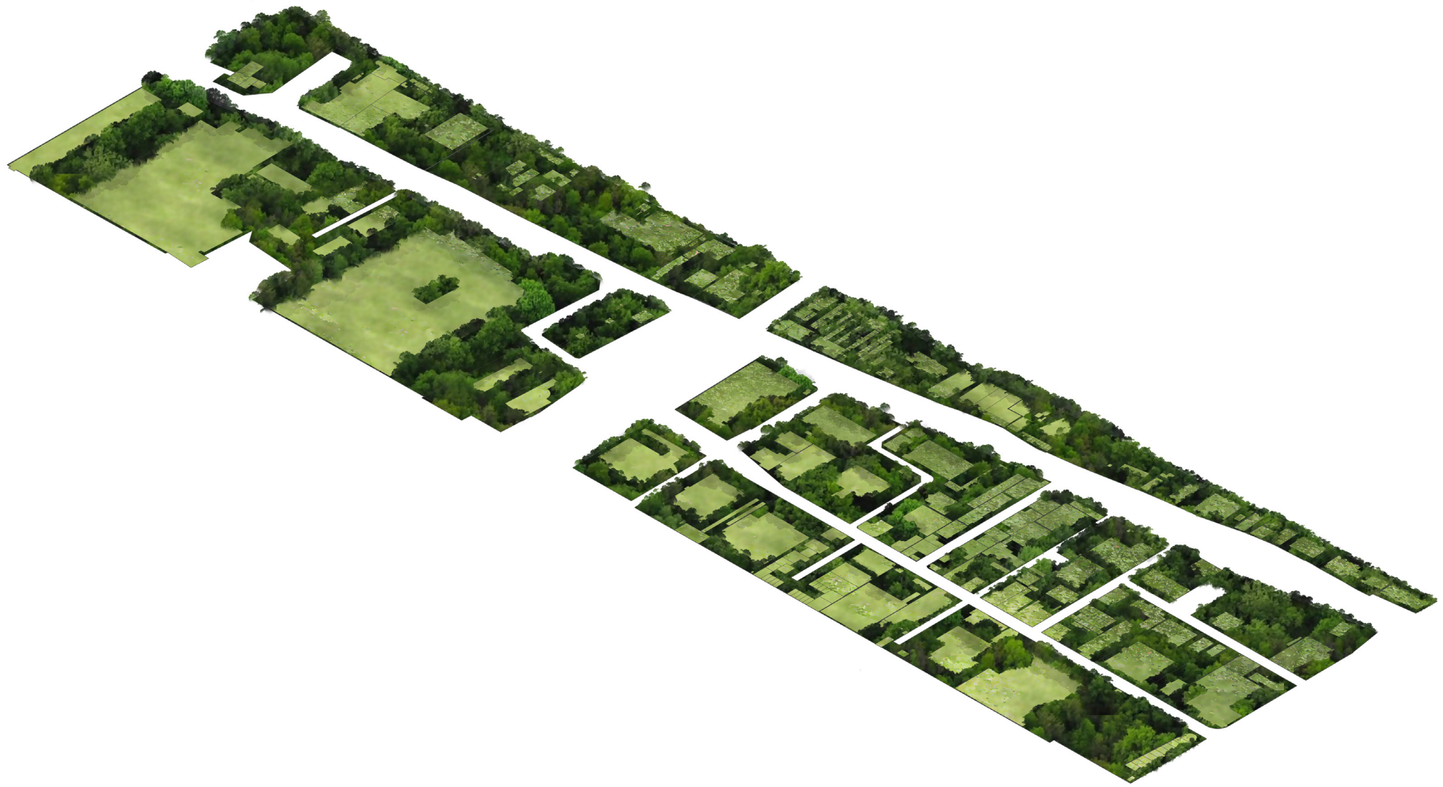


Strip of wildflowers

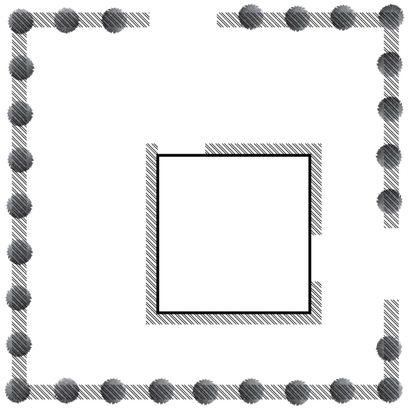
Building - property contour



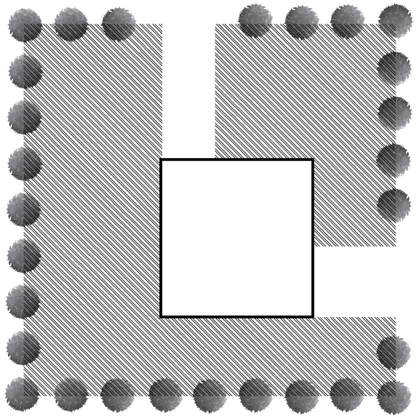
Building - property contour - forest



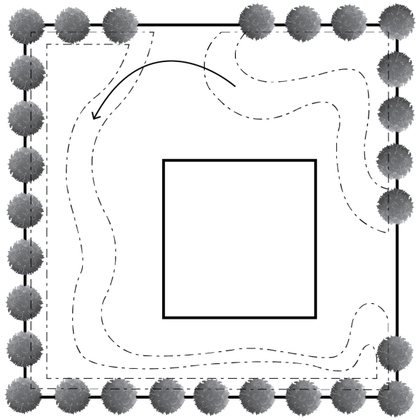
Development strategy



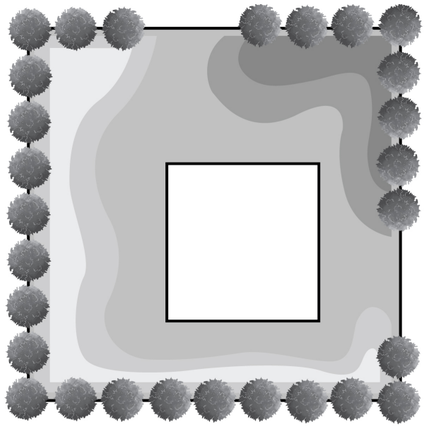
t=-1 plot is still in industrial use
unused/nonfunctional areas (often along plot edges) can be depaved and planted with lanes/hedges



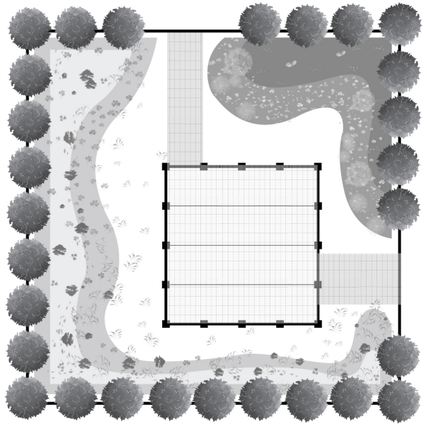
t=0 plot is vacant
future infrastructural connections are anticipated, the rest of the plot is depaved



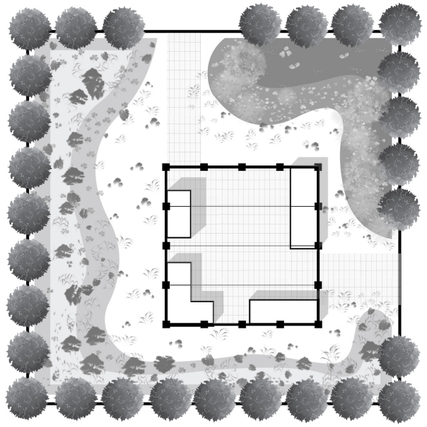
t=0 plot is vacant
groundwork is done through cut/fill method or by use of the depot. goals:
> shaping diverse conditions for ecological development
> this includes soil sanitazition or phytoremediation
> utilising depression for water buffering and connecting to the water system



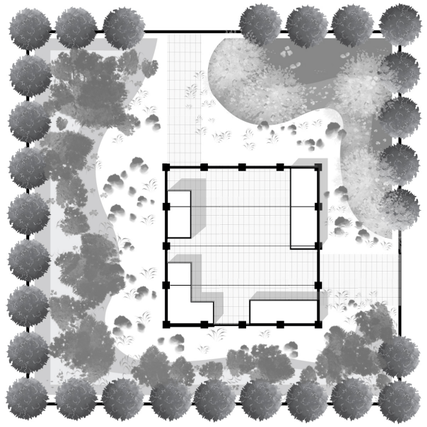
t=1 plot is vacant, nature development, this phase lasts as long as there are no plans for future developments



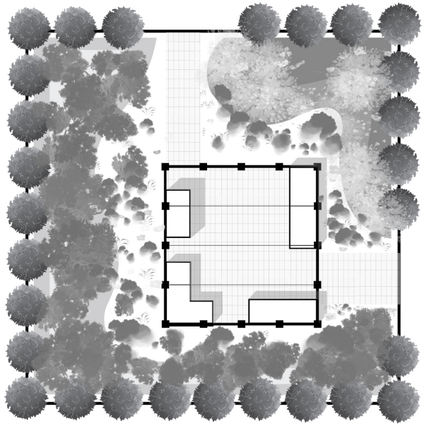
t=2 the building is reduced to a casco state and the remains of the construction form the boundary of the new building plot



t=3 vegetation is starting to grow as the new houses are being developed

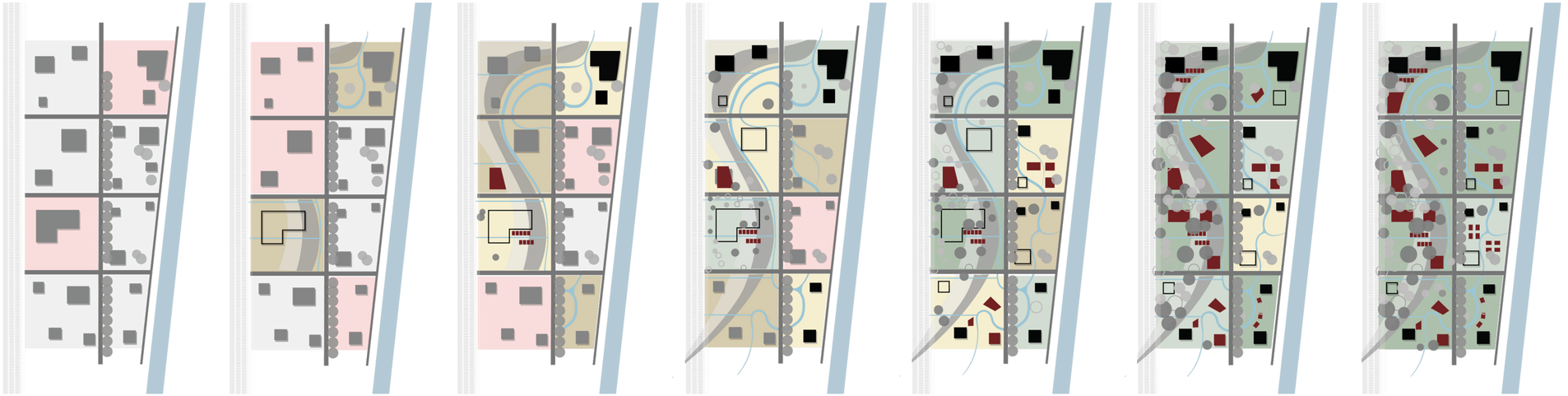


t=4 right before inhabitation of the new housing units, a selection of the spontaneous vegetation is being made and placed within orderly frames



t=5 from this moment, the plot is maintained as a managed urban woodland

Diversity through strategy



Vacant plot
Shaping conditions & remediation
Brushwood land
Shrubwood land
Woodland

Existing industry
Repurposed industry for housing
Feral industry
Developed housing

Goals

> Mediating between ecological and social needs
> Maximizing diversity
> Minimizing disturbances

Knowledge

> Flora & fauna, ecosystem services
> Succession
> Social needs, safety, aesthetics

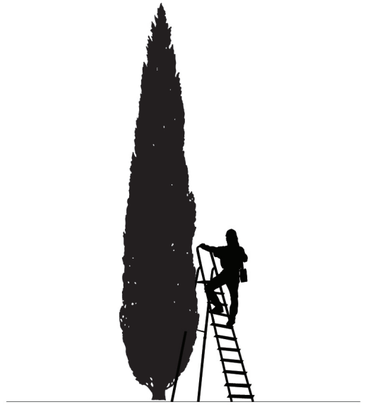


Activities

> Maintaining Living and Industrial Frames
> Forest rejuvenation/preserving layeredness
> Tree selection & support
> Organising and guiding community maintenance



Trimming edges



Pruning lane trees



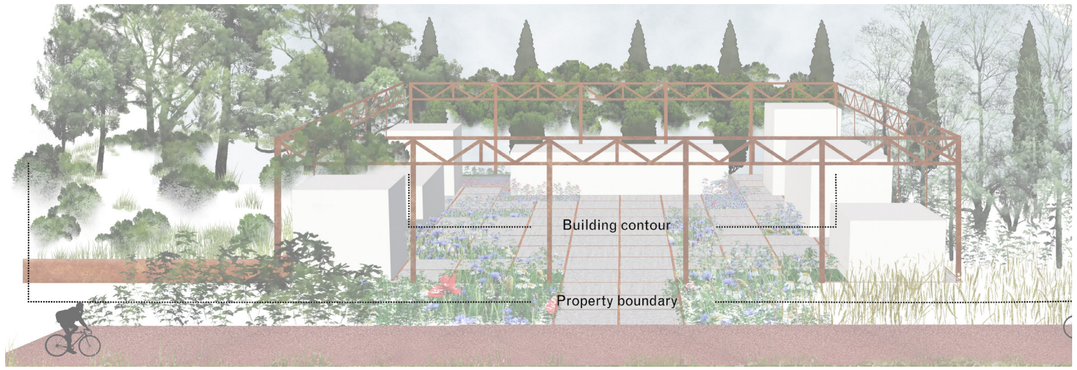
Select & Support



Forest rejuvenation

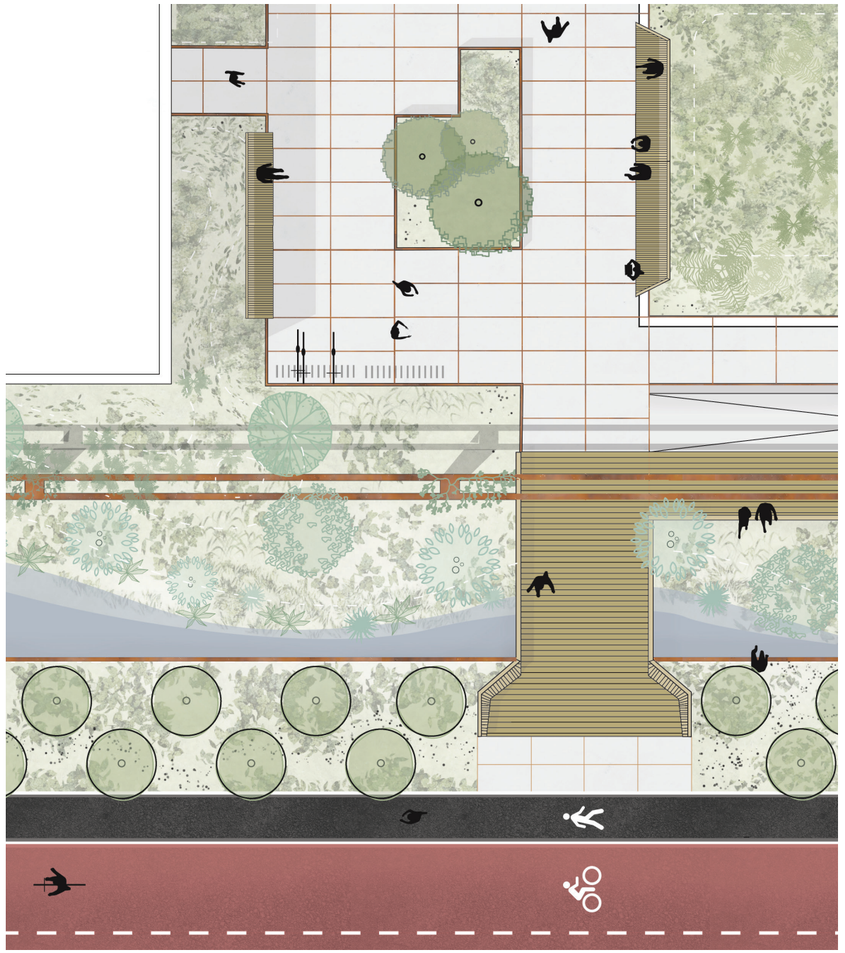
Herding

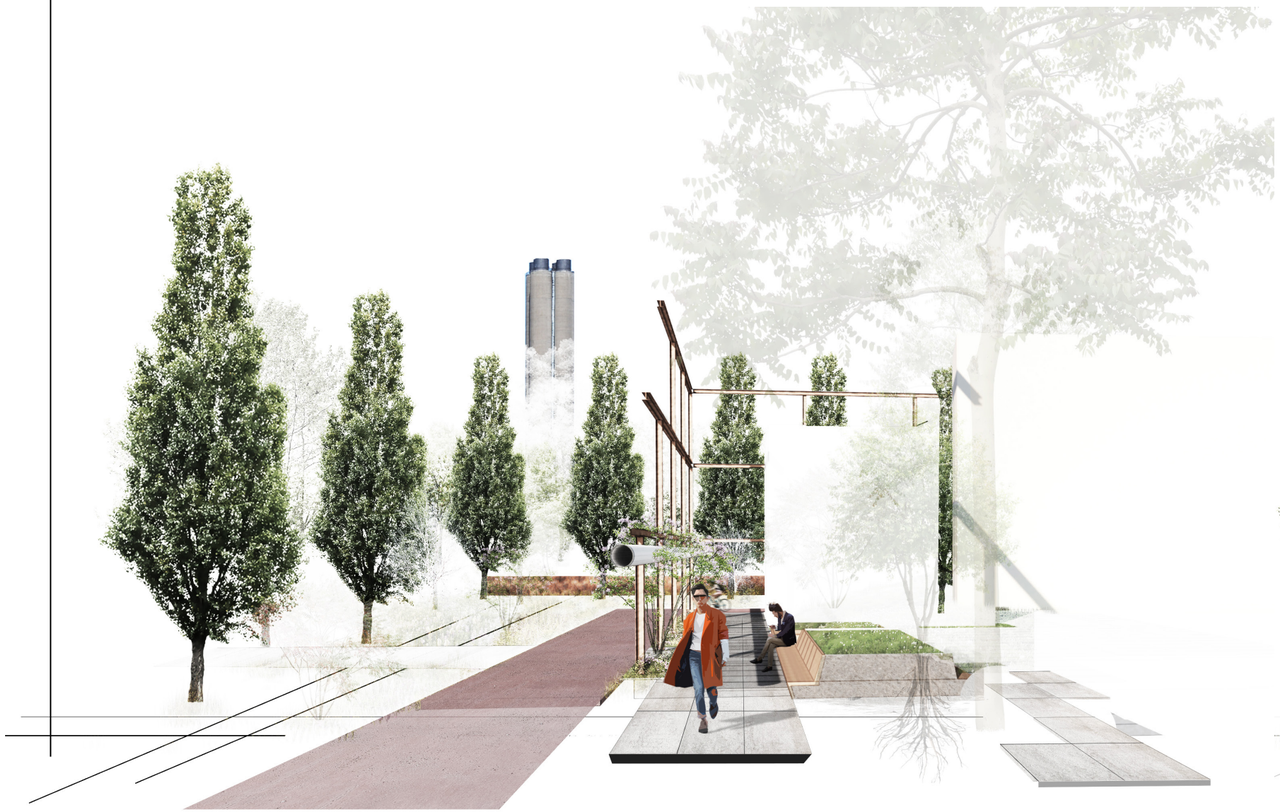
Impresssion of a transformed plot







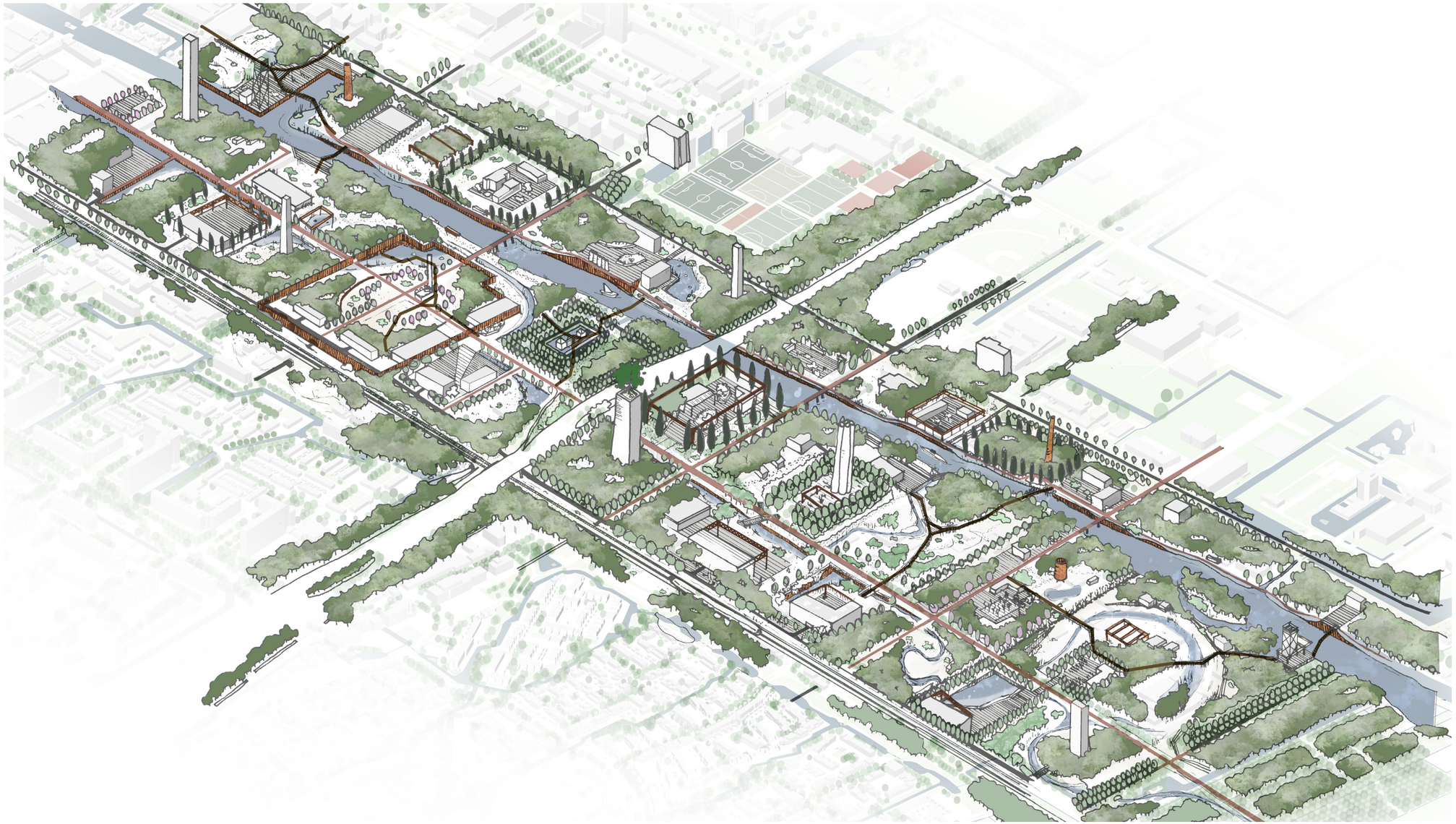




Orderly Frames...

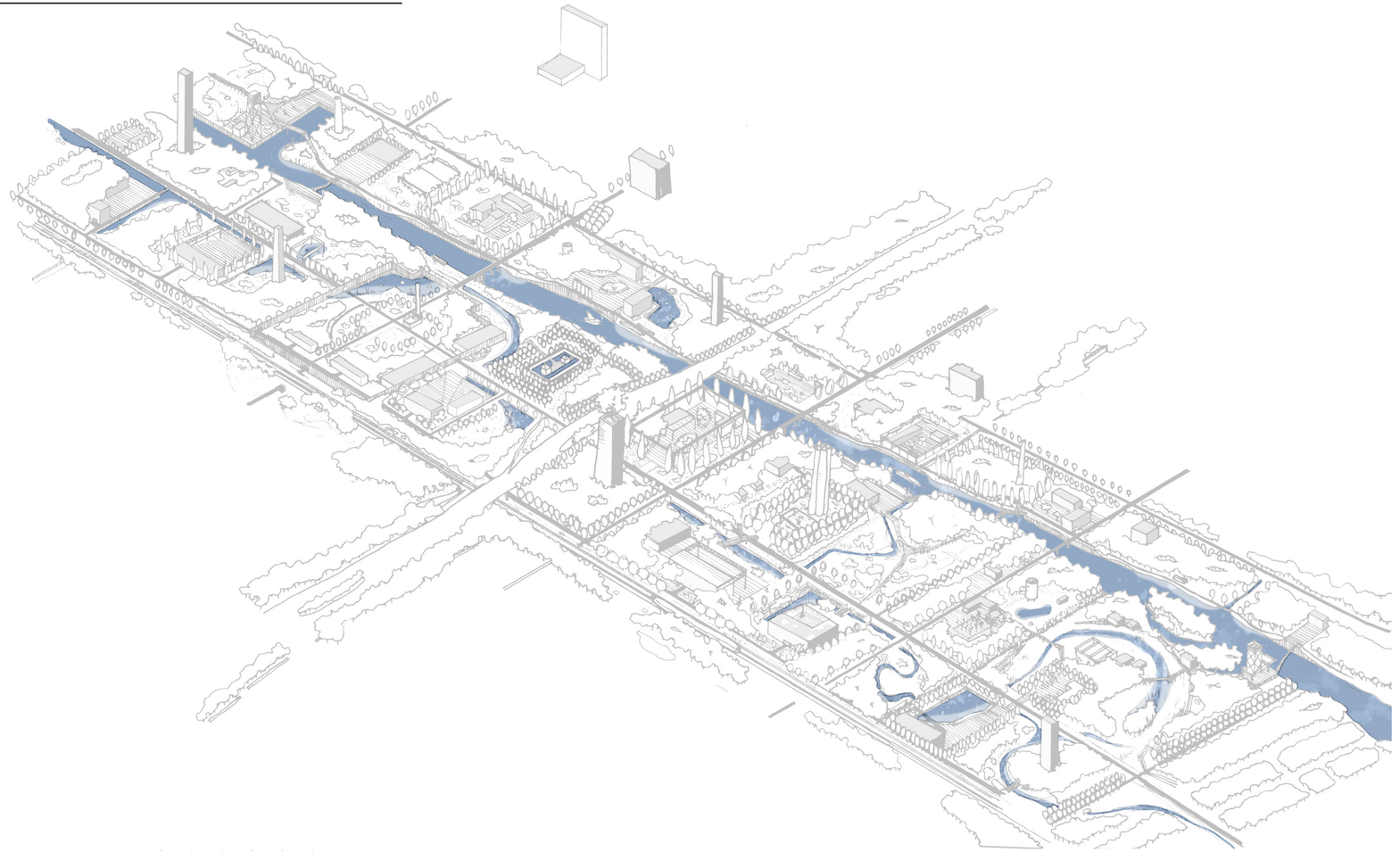


...For Messy Ecosystems



Watersystem

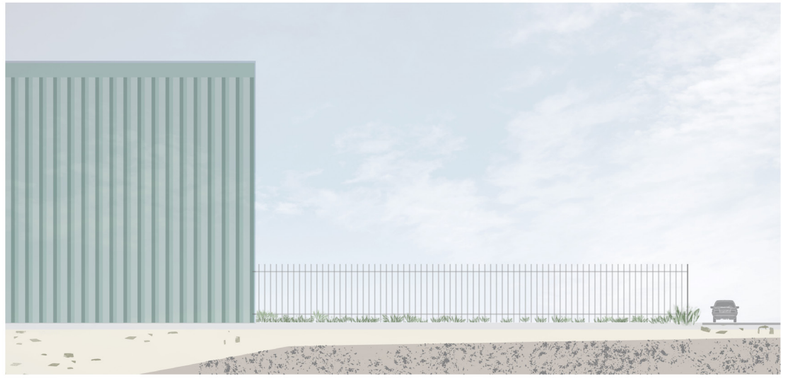




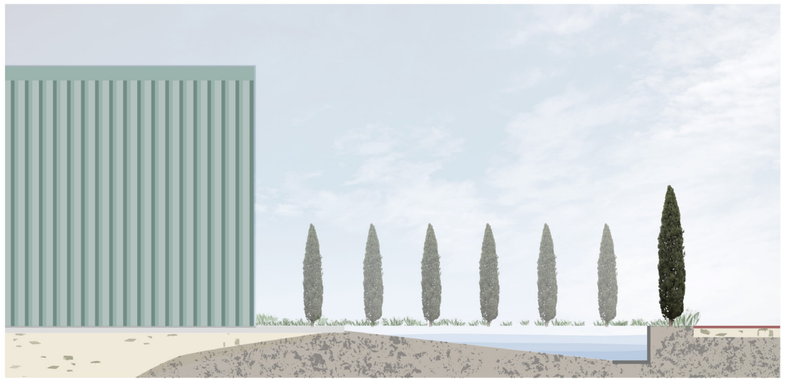


Willow forest succession

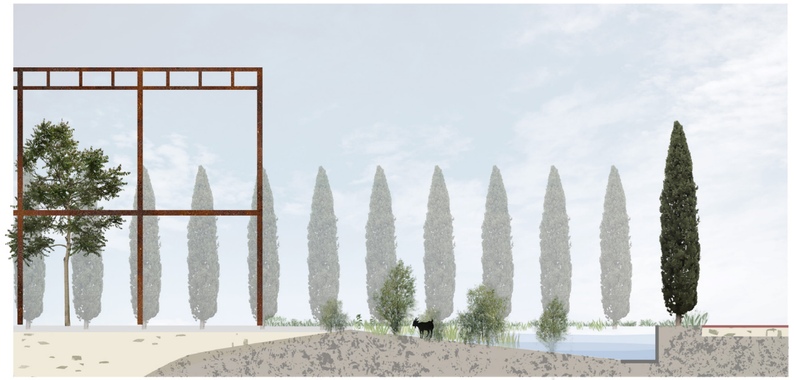
This sequence of drawings shows an example of how the strategy is integrated with the successional forest development .



> Plot is in industrial use, clay in the subsoil is covered by 1m of sand



> Plot is vacant, groundwork is done through cut and fill and Living Frames are planted



> During development, the basins function as retention pond. Therefore the waterlevel is dynamic, which will result in a willow successional course. It needs to be kept open in favor of water flow. This can be done by grazers or by maintainance.



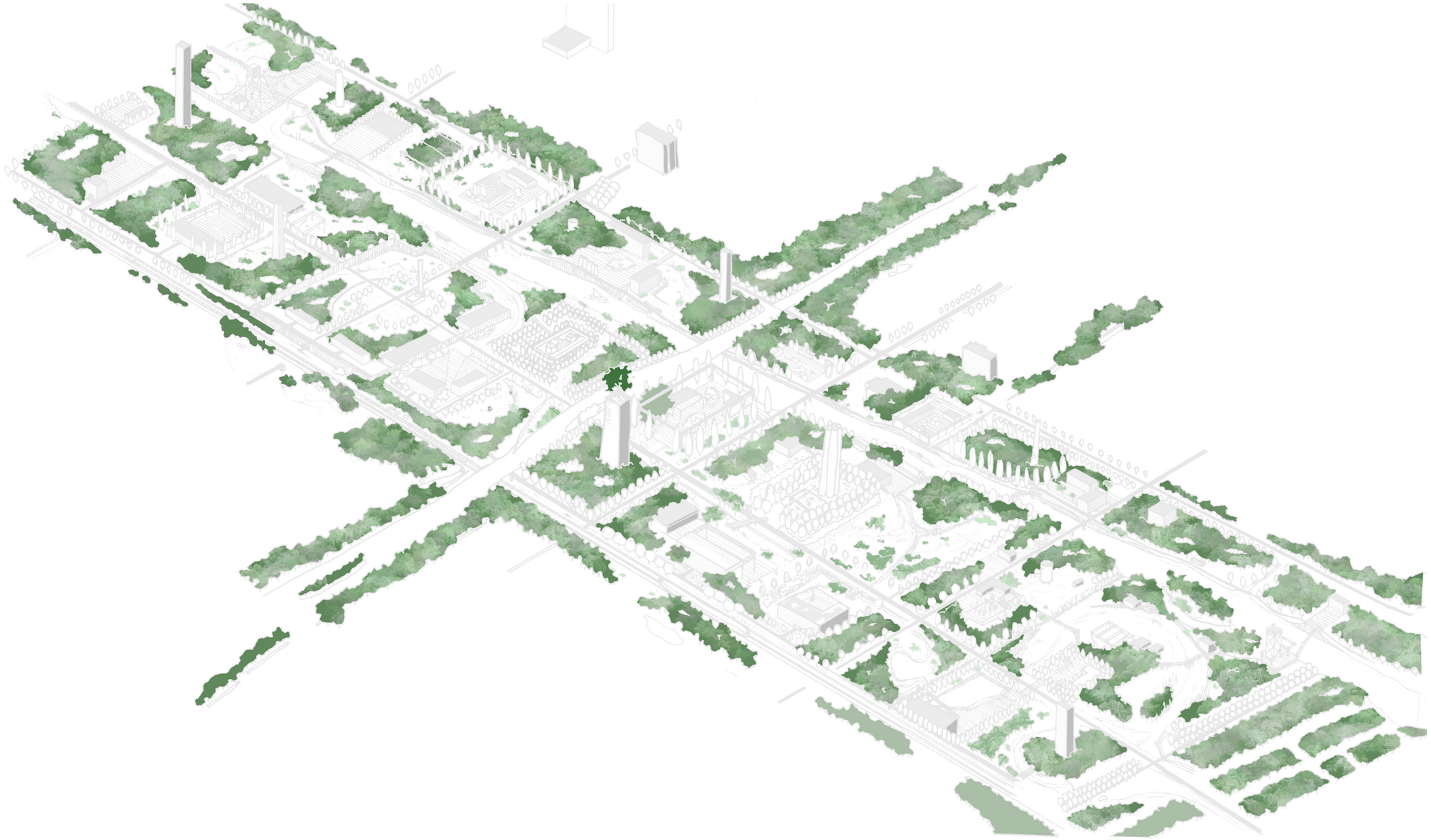
> The plant community of the willow successional course is specialized in capturing nitrogen, and some can even capture industrial pollutants

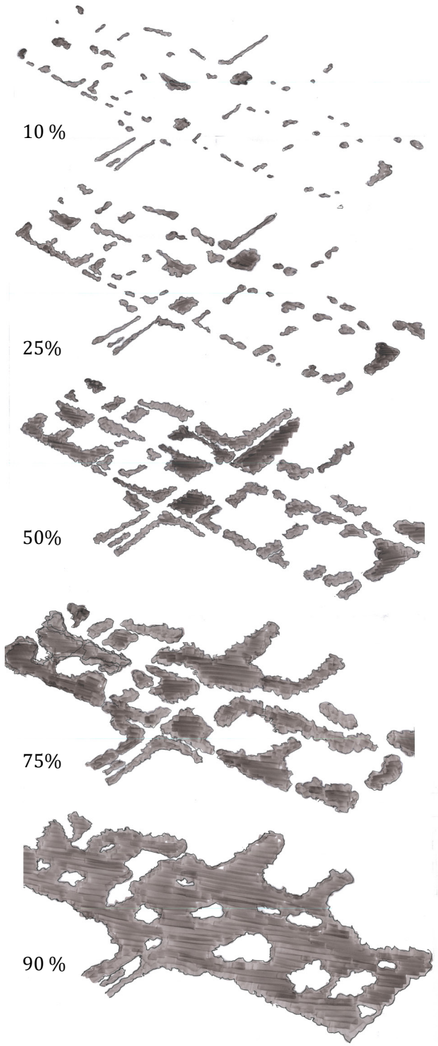
Willow forest > Alder forest transformation



> Once the transformation is complete and the water system is fully connected to the surrounding neighbourhoods, the water level will be stable, resulting in alder forest

Forest structure





Forest rejuvenation // temporal small scale housing

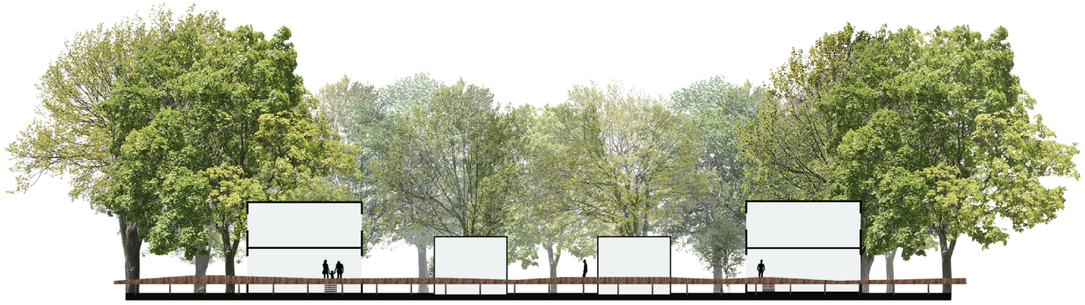


> ‘doing nothing’ leads to a less diverse closed phase in the forest

> the patch to rejuvenate is selected by the forester based on ecological quality and speed of growth



> open spaces in the forest make for a more interesting spatial differentiation

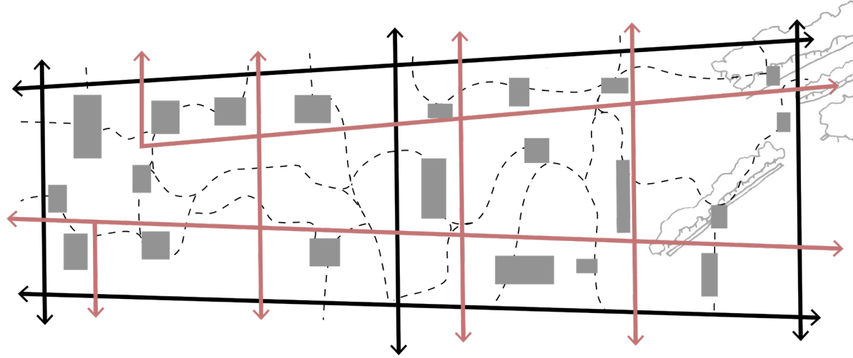


> the open space can be temporarily occupied by mobile/tiny houses



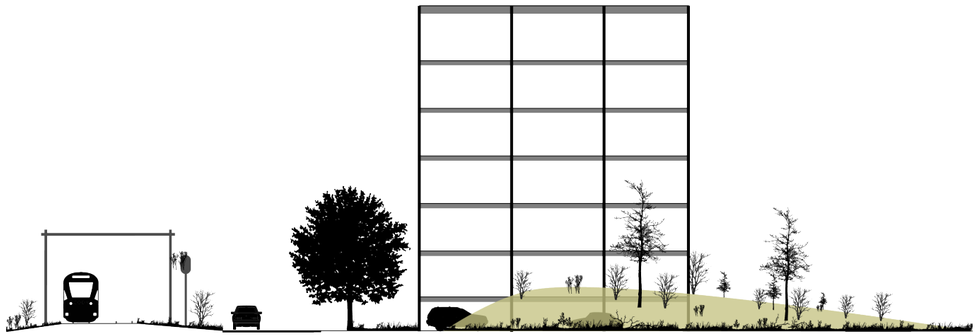
> the open space allows for more ground covering vegetation and shrubbery to grow

Infrastructure



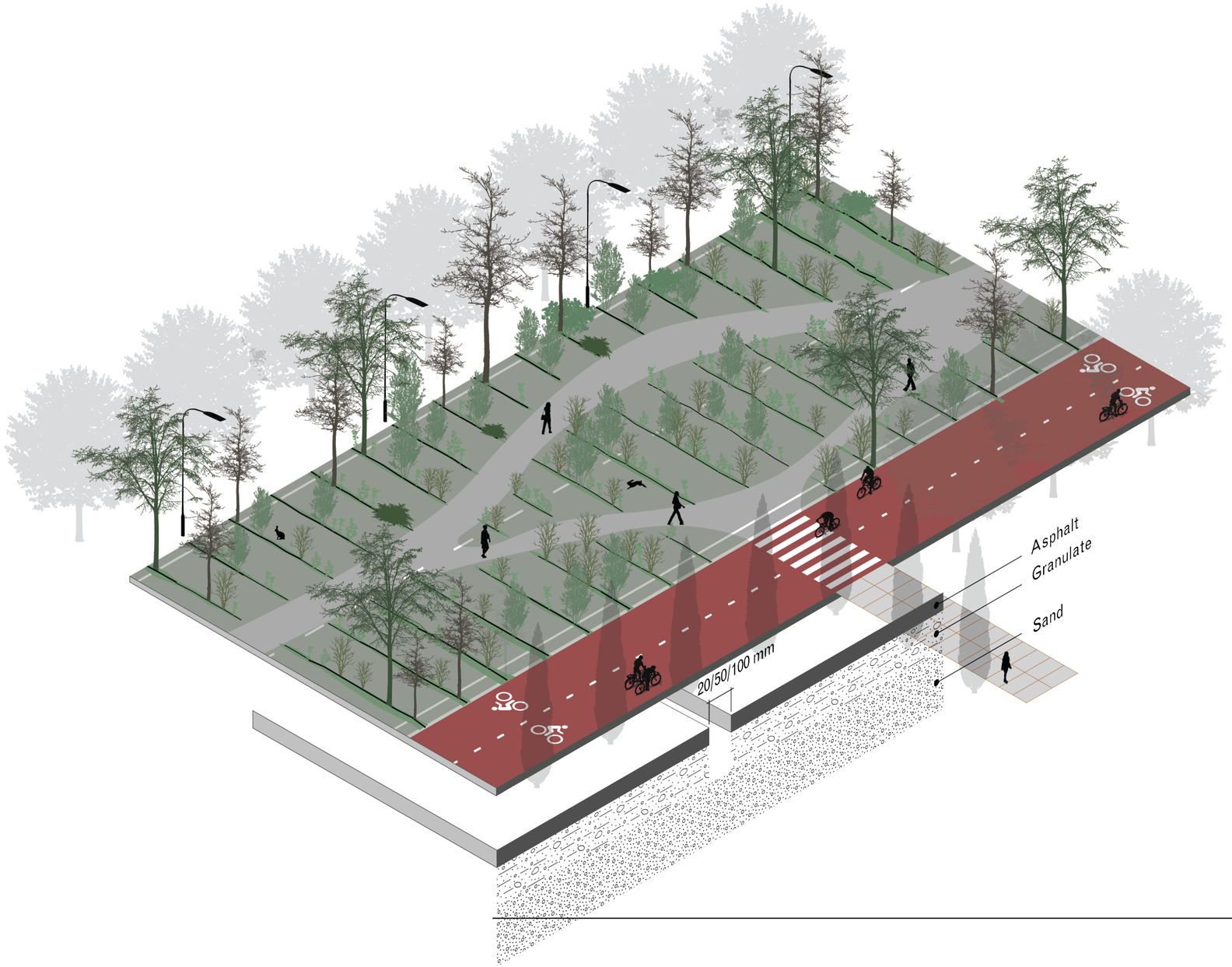




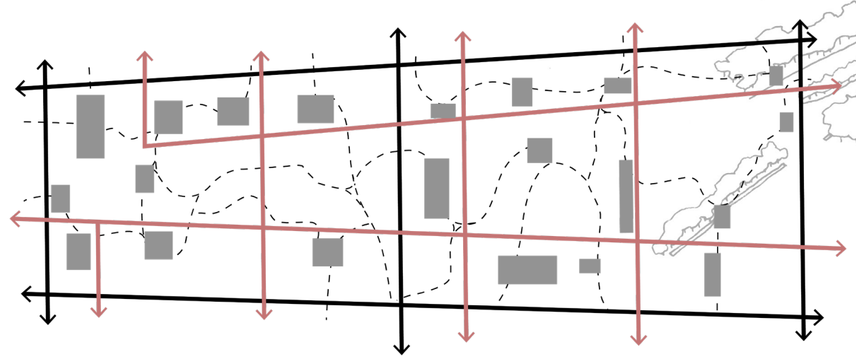


> Car lane is pushed to the outer edge, with parking on ground level of the building

Obsolete roads



Infrastructure



Raised walkway



Raised walkway



Living Frames



Lane trees on sand

Platanus x hispanica

Quercus robur ‘Fastigiata’

Betula pendula ‘Fastigiata’

Ulmus ‘New Horizon’

Lane trees on clay

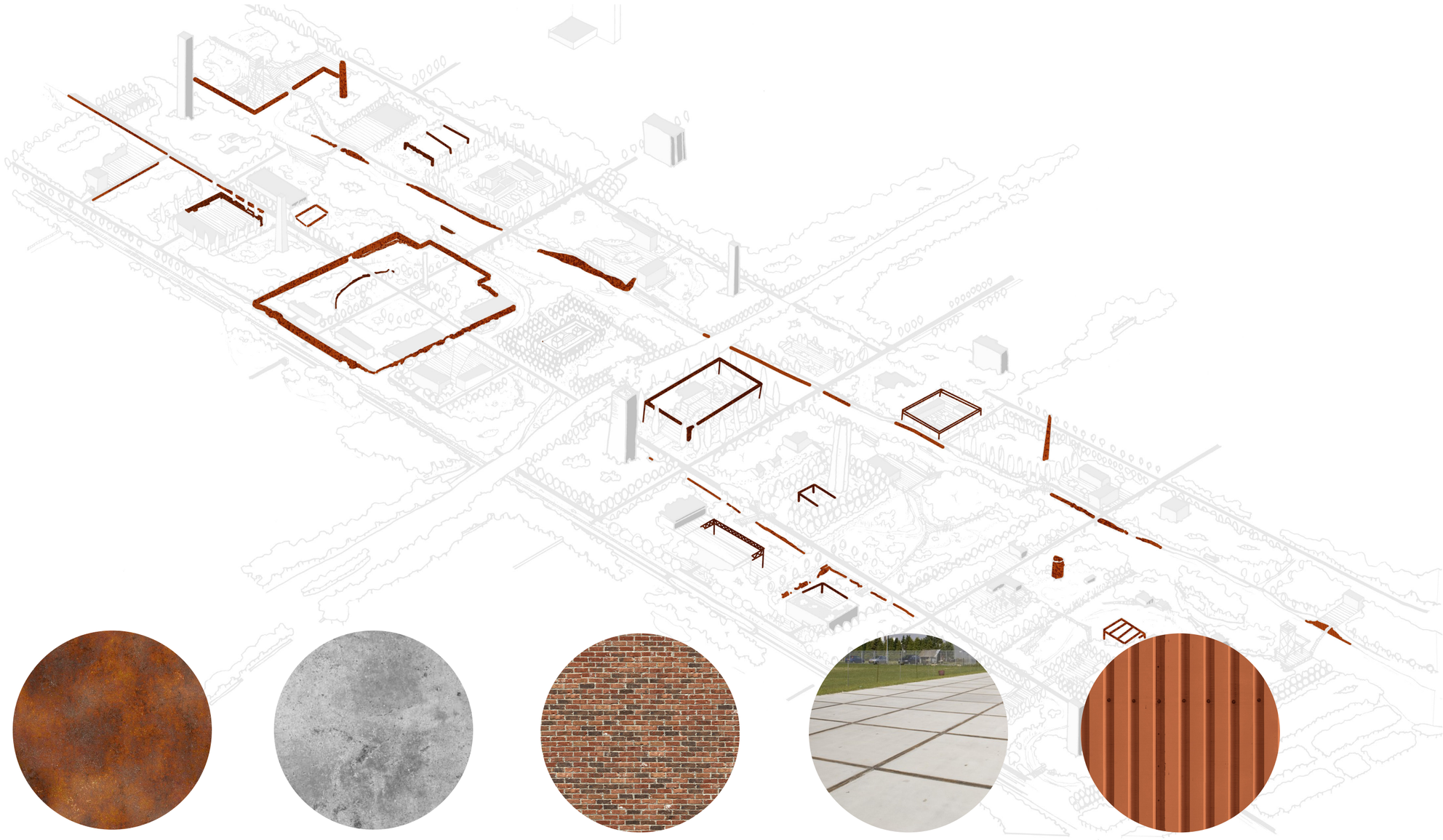
Salix babylonica ‘Umbraculifera’

Alnus glutinosa ‘Pyramidalis’

Prunus avium ‘Plena’

Populus nigra ‘Italica’

Industrial Frames



Rusted metal/corten steel

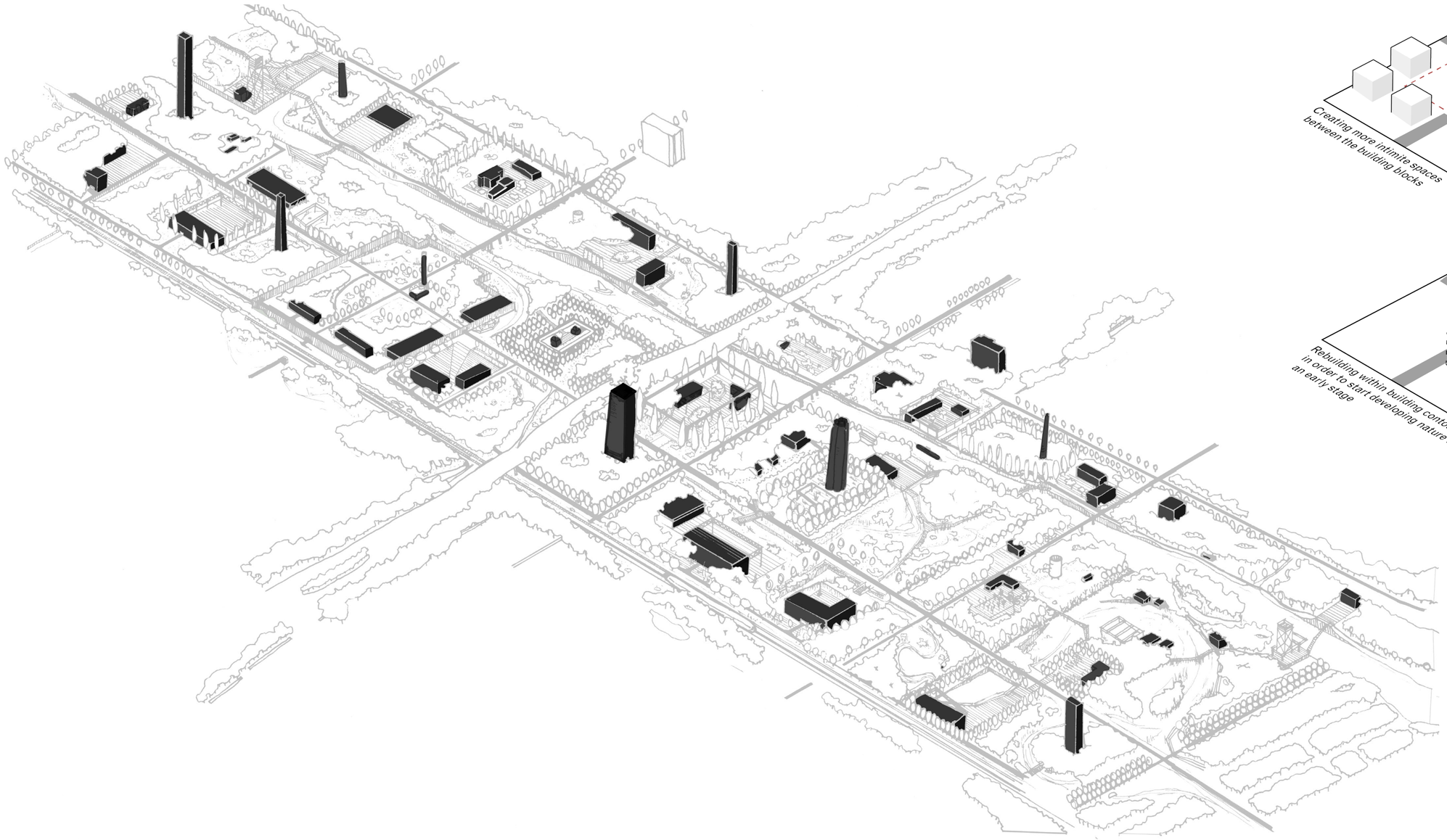
Concrete

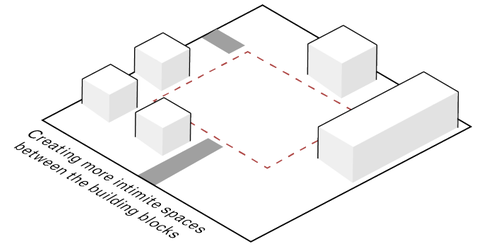
Brickwork

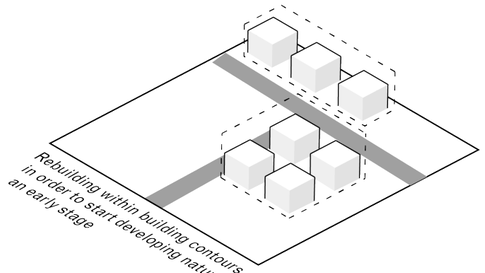
Stelcon tiles

Corrugated metal

Urban plan



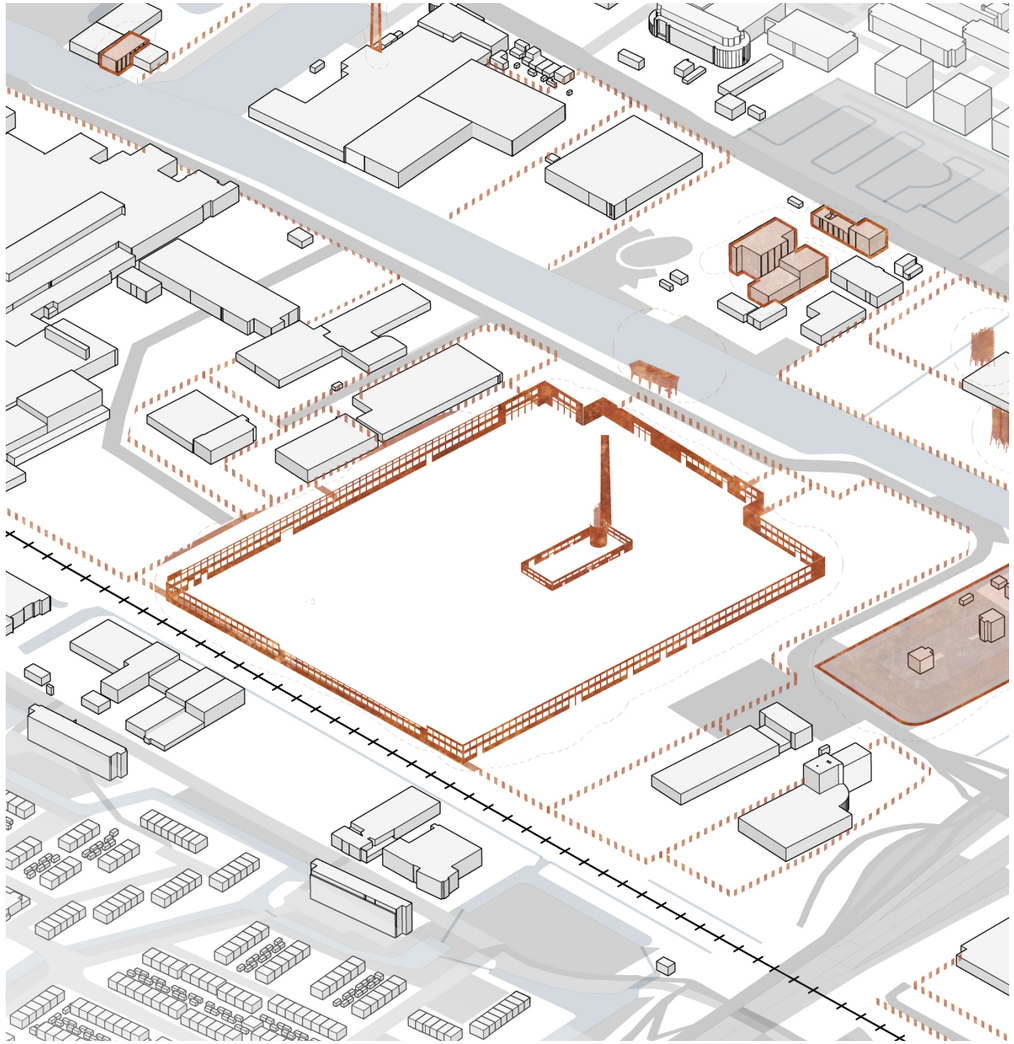

Creating more intimite spaces
between the building blocks


Rebuilding within building contours
in order to start developing nature in
an early stage

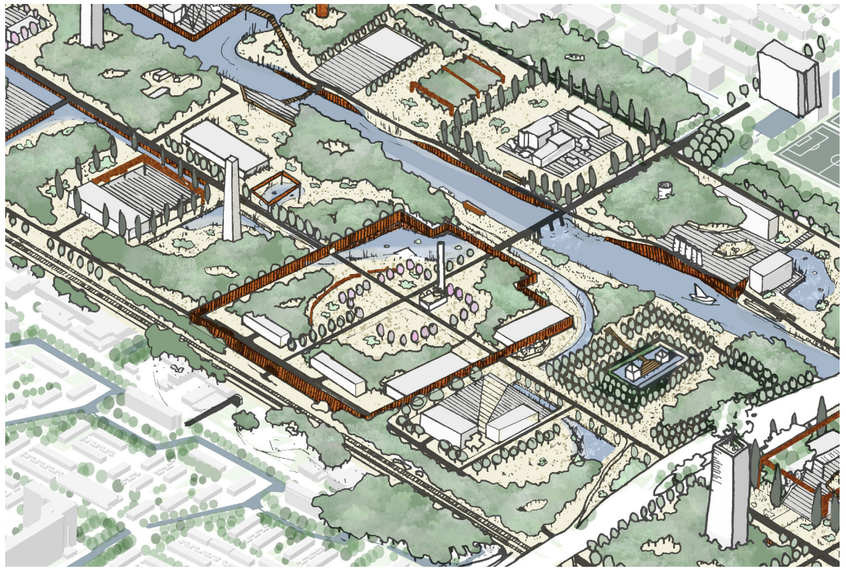
Kabelfabriek as the starting point





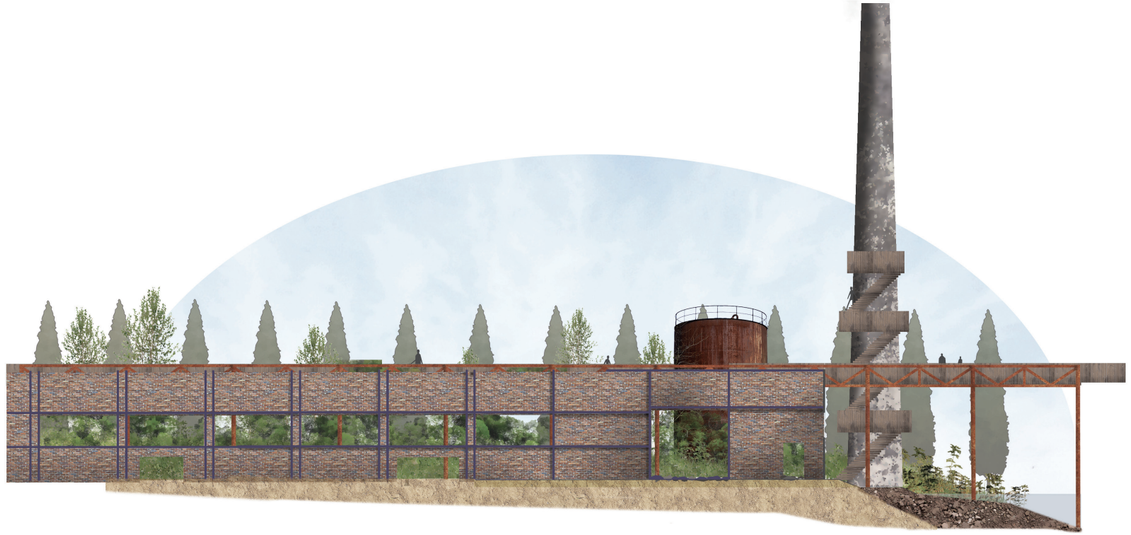


Facade as a frame for forest development





The patio







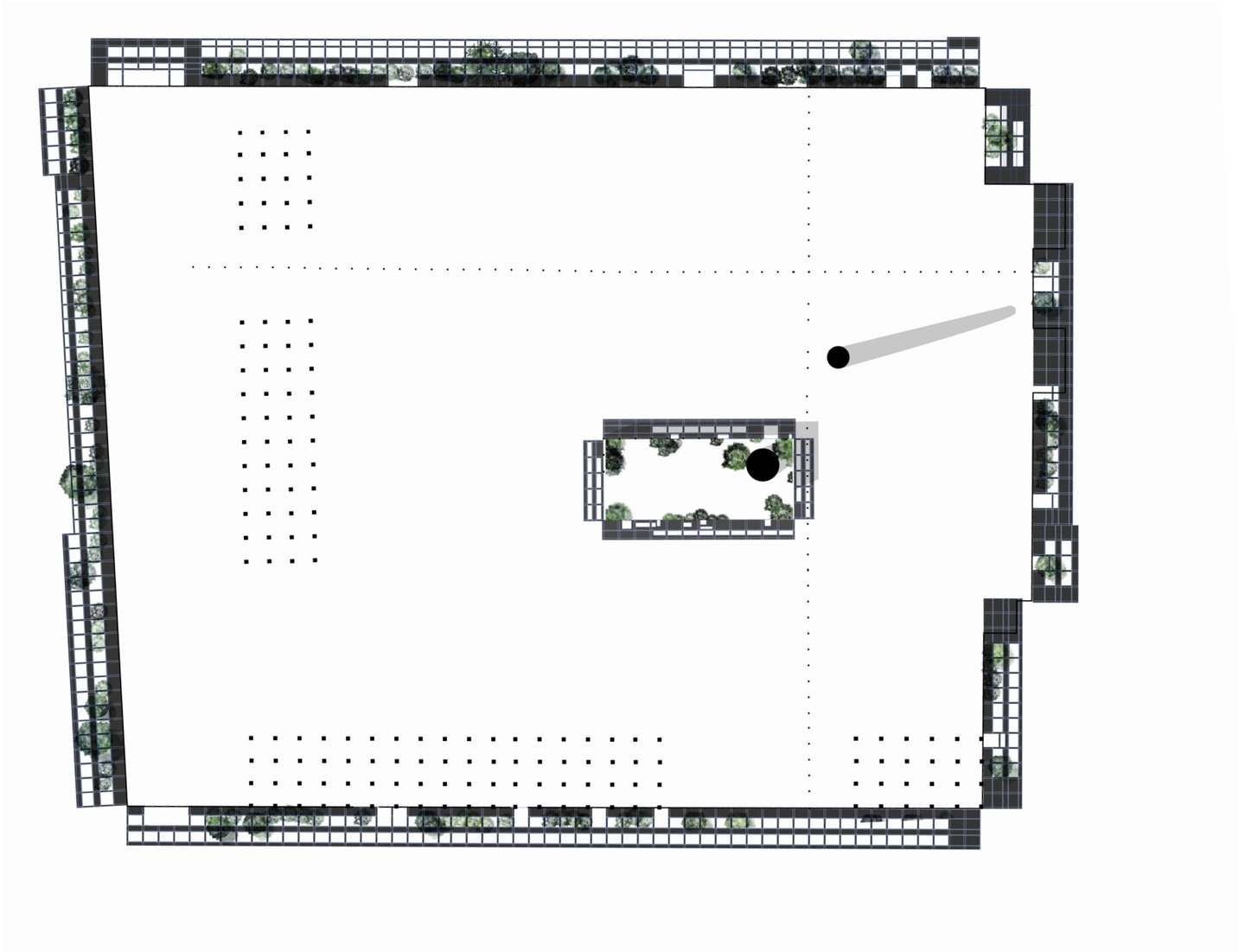




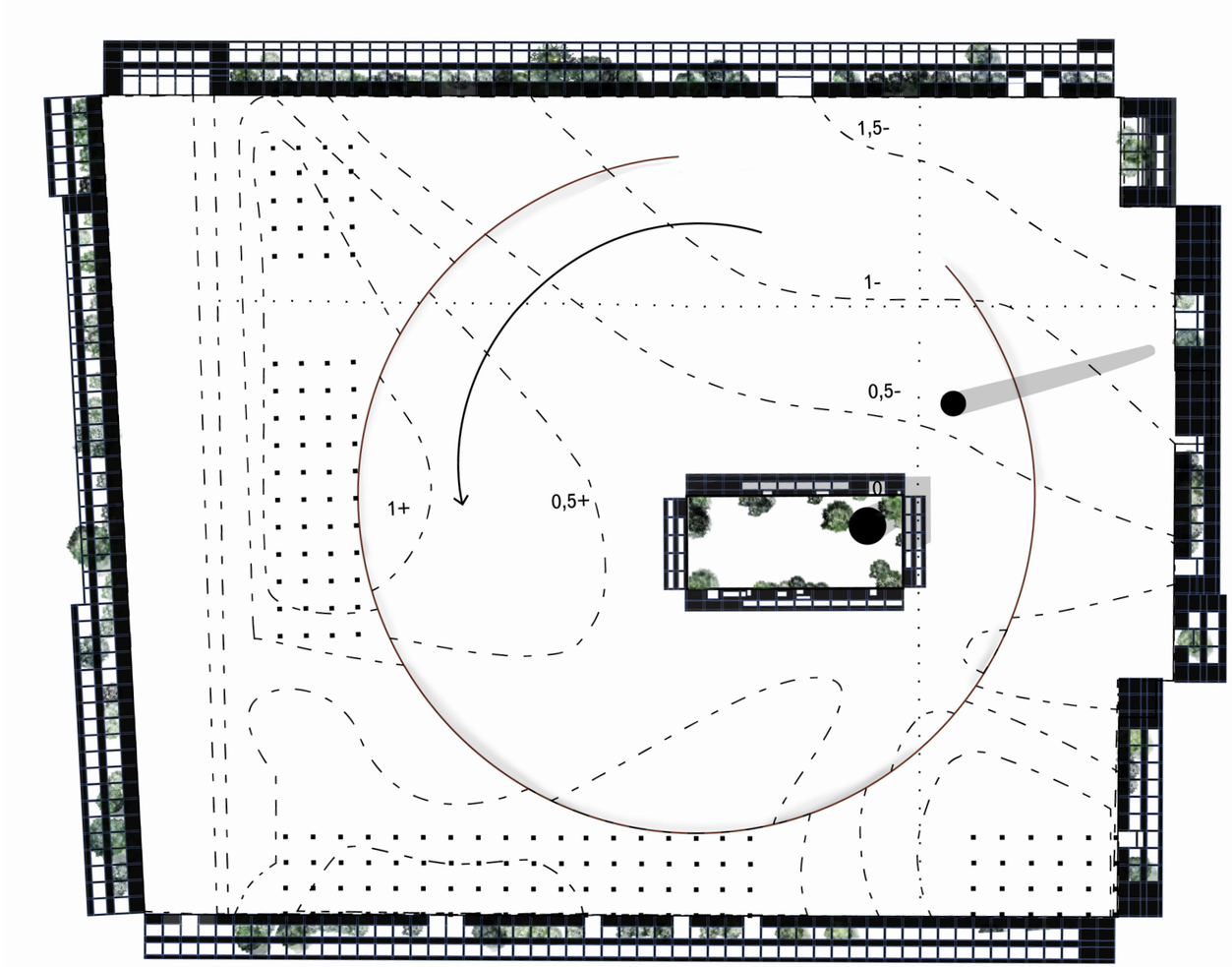


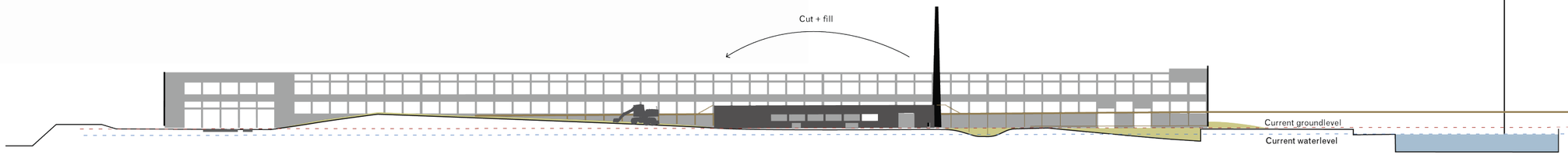

verder

Phase 1 - Preserving Frames and Landmarks

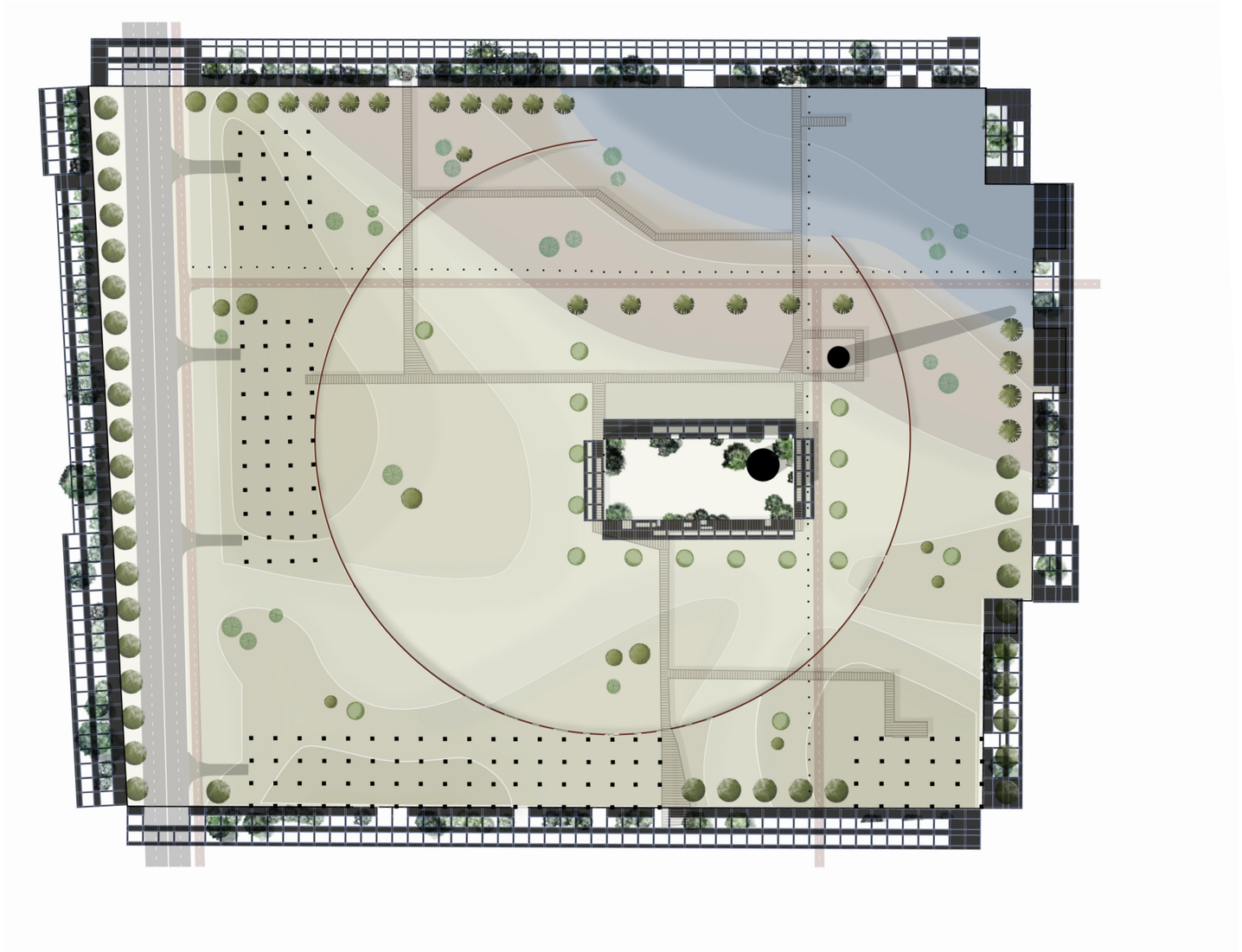


Phase 2 - Shaping conditions

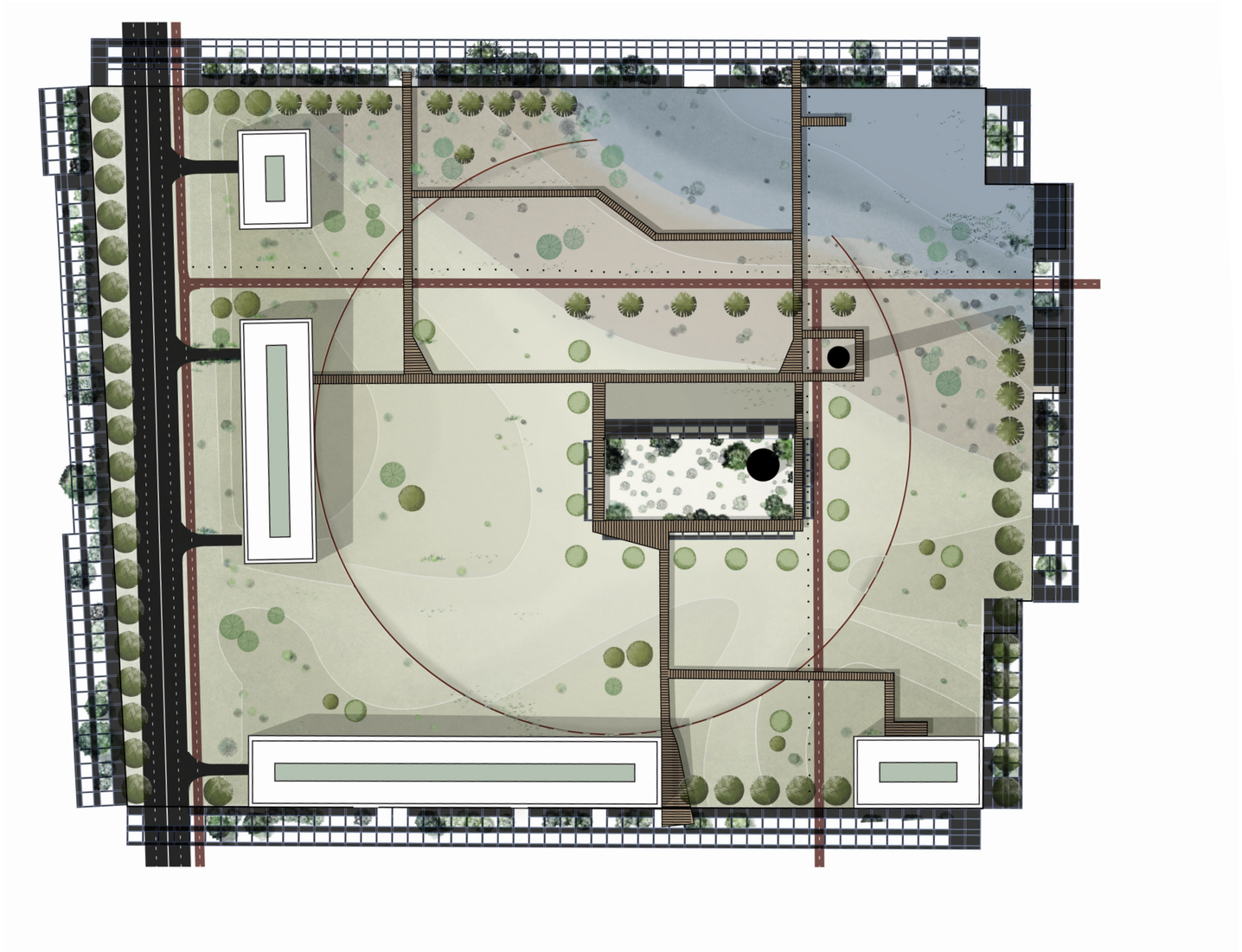




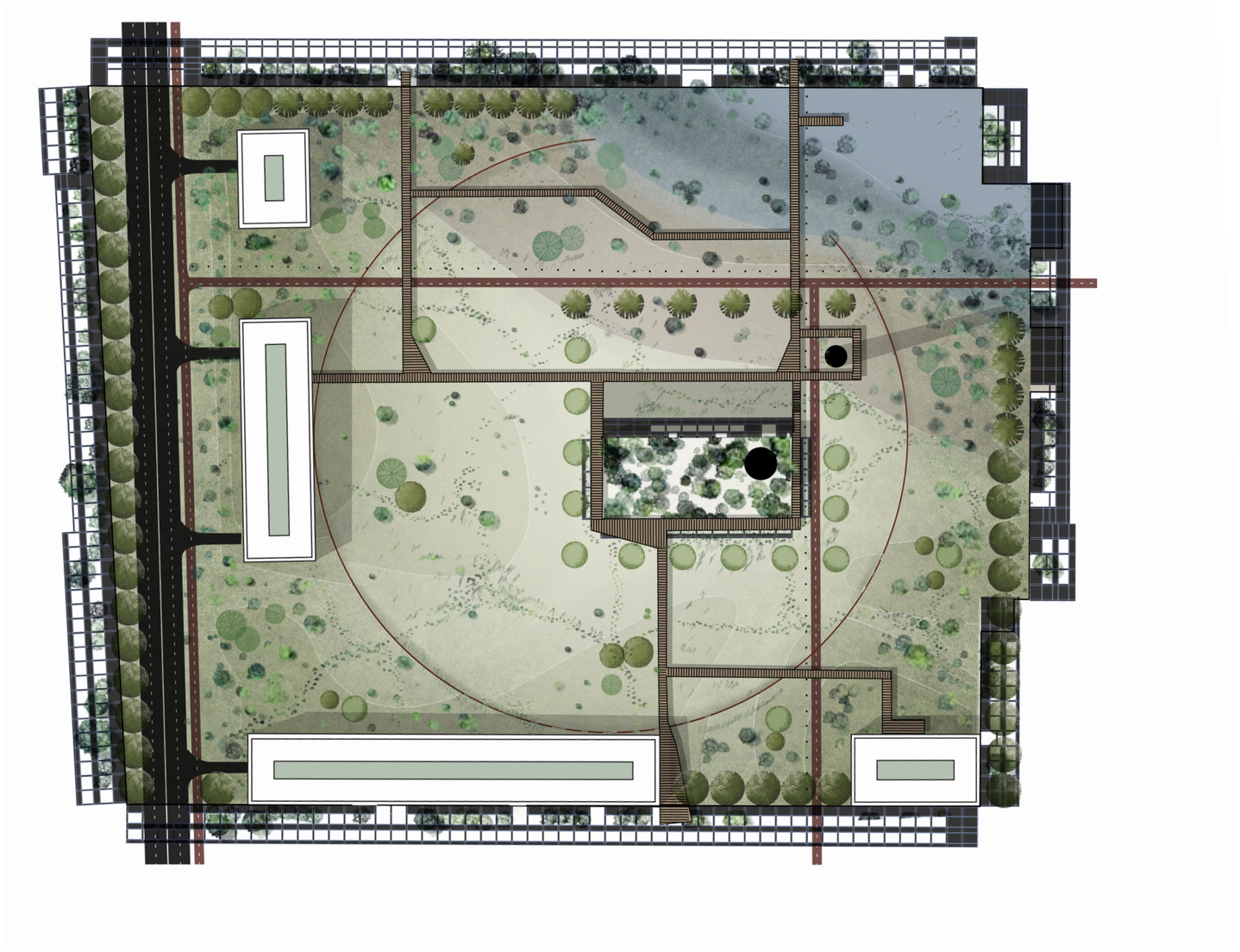
Phase 3 - Planting Living Frames



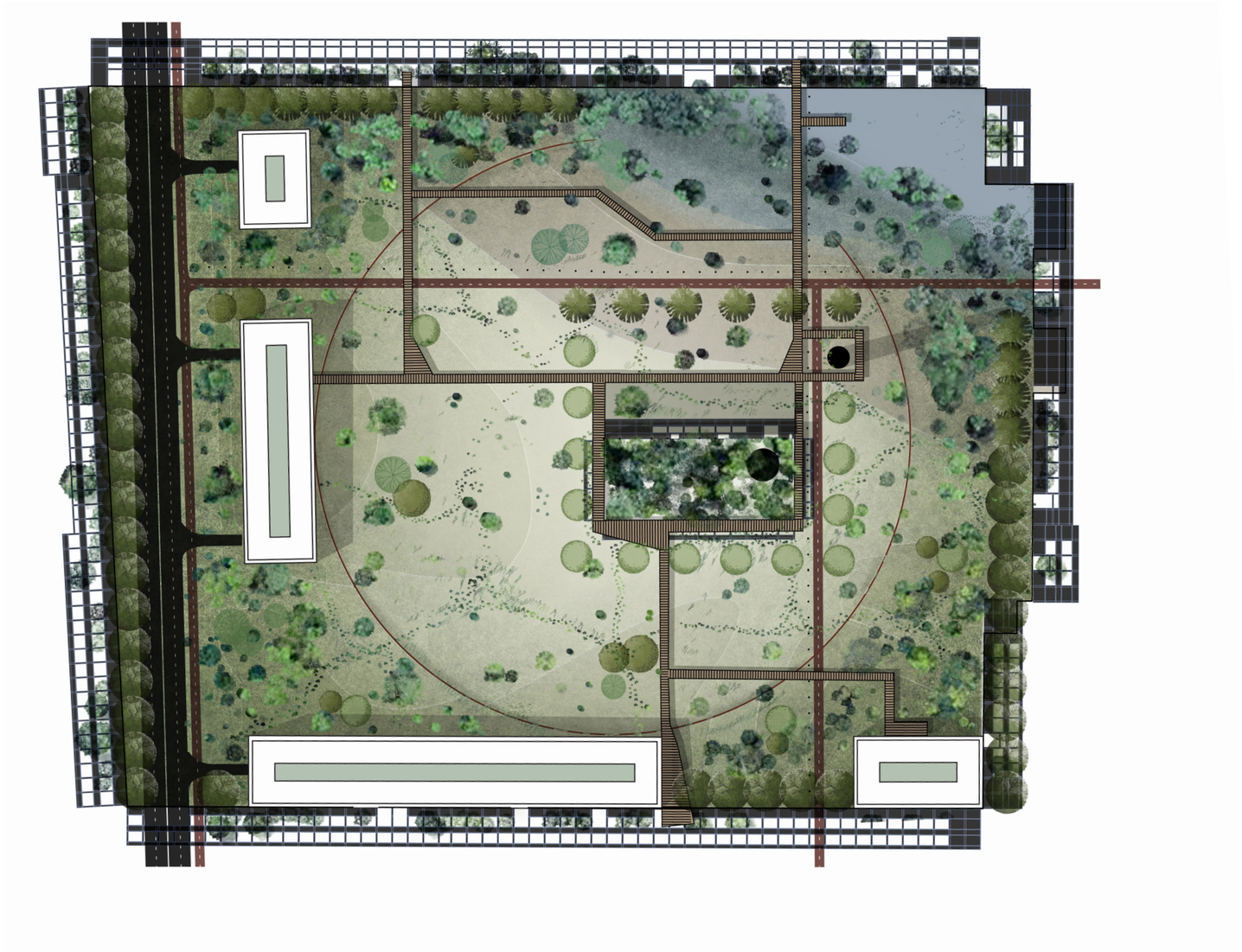
Phase 4 - Ready for occupancy - Grassland stage



Phase 5 - Fifth Nature - Managed Urban Woodland - Shrubland Stage



Phase 6 - Sixth Nature - Ecological/cultural hyrbid - Young Forest Stage



Conclusion

How can we utilise the potential of feralisation in transforming the post-industrial landscape to a healthy, climate-adapted and inclusive living environment for all species?

> Considering how the forest can benefit life in the city

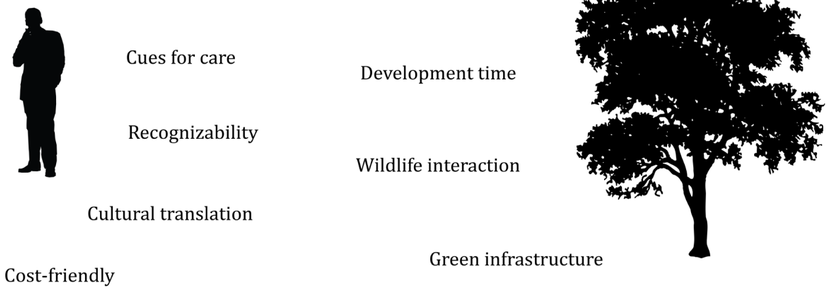
> Considering long-term thinking and development

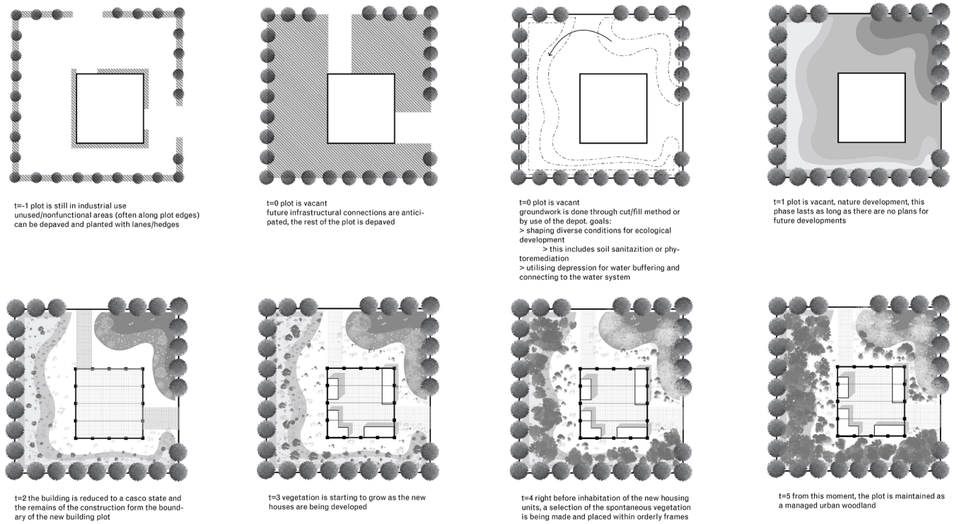
> Allowing space and time for this development

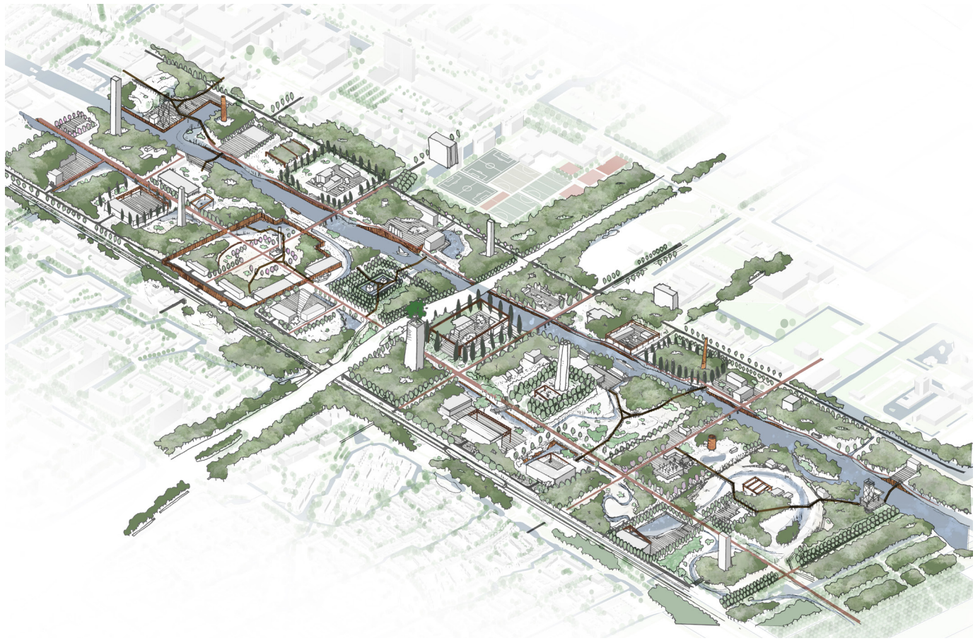
> Having a flexible strategy with rules for the small scale and design principles for the whole

> Translating ecological notions to cultural language by the use of orderly frames derived from the existing built environment

> Having a starting point that encourages further development









Thank you for listening!



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Suzana Milinovich

And Board of Examinators delegate:

Marietta Haffner



Questions?