



Entente Florale, Hungary

climate resistant plants - design, planting, maintenance

Niek Roozen Landscape

A photograph of a lush garden. In the foreground, there are large, rounded green hydrangea flower heads on the left and some reddish-pink ones on the right. A gravel path leads from the bottom center towards the background. The background is filled with dense green foliage and trees. A house with a red-tiled roof and white window frames is partially visible through the trees on the left side.

Judith van der Poel
landscape architect / director

Niek Roozen Landscape



Arcen castlegardens



Arcen castlegardens



Arcen castlegardens

World Horticultural Exhibition Amsterdam Holland



Floriade

feel the art of nature



Floriade 2002, Haarlemmermeer



Floriade 2002, Haarlemmermeer



Floriade 2002, Haarlemmermeer



Floriade 2002, Haarlemmermeer



Green City

based on scientific research

Floriade 2002, Haarlemmermeer

Green+

The Green City Guidelines

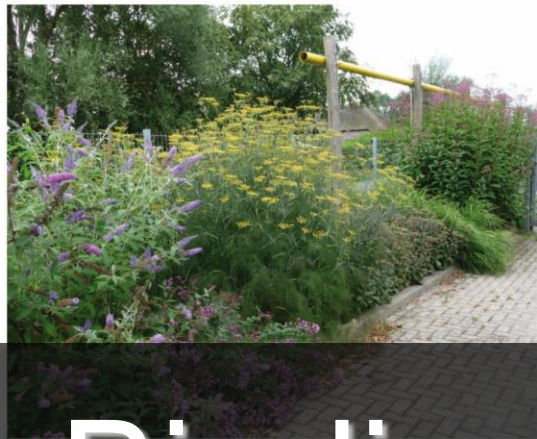
Techniques for a healthy liveable city

Michelle de Roo | landscape and urban designer

The Green City Guidelines



17 Biodiversity



Plant mix for biodiversity. Plants selected for their ecological value (e.g. nectar source for butterflies and bees) can be attractive for people too. A Soontjens Stadsnatuur project | Photo: Soontjens Stadsnatuur

Biodiversity

Plant a wide variety of plants

Pollen and nectar-rich trees, shrubs and perennials attract bees, butterflies and other insects which are essential for the pollination of plants. The pollinators themselves are food for many birds and small animals. Plant a variety of berry and nut producing trees and shrubs to allow birds and other small animals to sustain themselves in urban areas. Create sheltered areas with dense shrubs as nesting, hiding and foraging places for birds and other small animals.

Develop new / existing biotopes

Create stepping stones of wildlife habitats in between the paved urban environment to attract various sorts of plants and animals. In areas with water such as shallow ponds, natural processes provide habitat for water plants, amphibians, dragonflies and other aquatic insects, etc. The use of the right set of plant choices will support the provision of sufficient food for native animals.

Plant choices are not limited to native species

Many non-native plant species are well adapted to urban conditions as well as being colorful and attractive for use in parks, gardens etc. Combinations of native and non-native

Example of plants used in The Netherlands that benefit the biodiversity in the city

trees, shrubs, vines & perennials	bees & bumblebees	butterflies	birds	shelter
<i>Crataegus laevigata x media</i>	x	x	x	x
<i>Salix sp.</i>	x	x	x	x
<i>Buddleija davidii</i>	x	x		(x)
<i>Rubus fruticosus</i>	x	x	x	x
<i>Hedera</i>	x	x	x	x
<i>Agastache</i>	x	x		
<i>Monarda</i>	x	x		
<i>Sedum spectabile / telephium</i>	x	x		
<i>Aronia sp</i>	x		x	x
<i>Taxus</i>			x	x

PLANTING CONCEPTS

perennial mixes



perennial & bulb mixes



**perennials, bulbs, ornamental
grasses & small shrubs mixes**

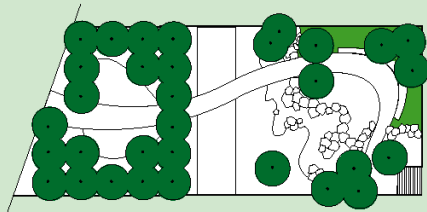


annual mixes

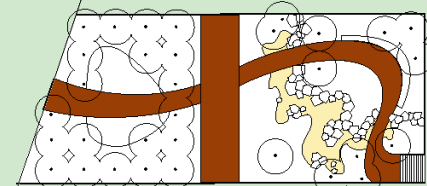


flower meadow seed mixes

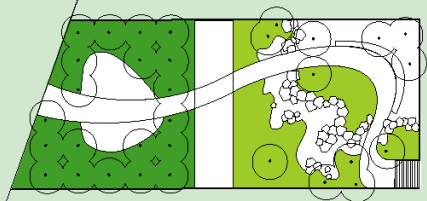




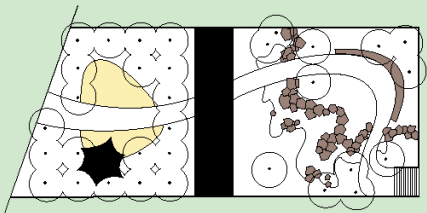
ruimtelijke opbouw



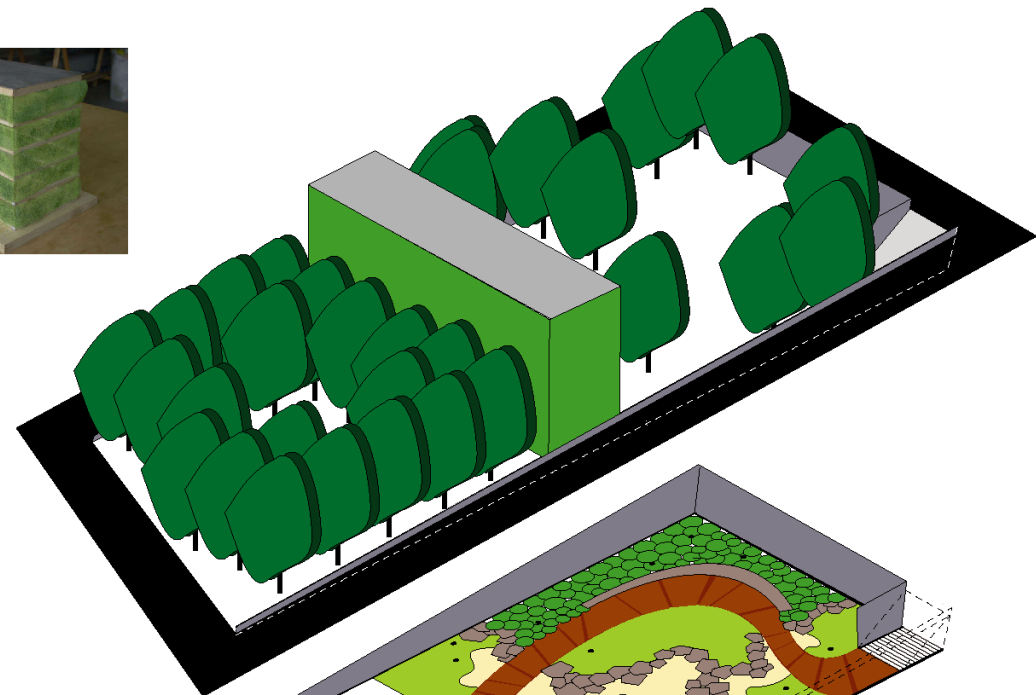
routing



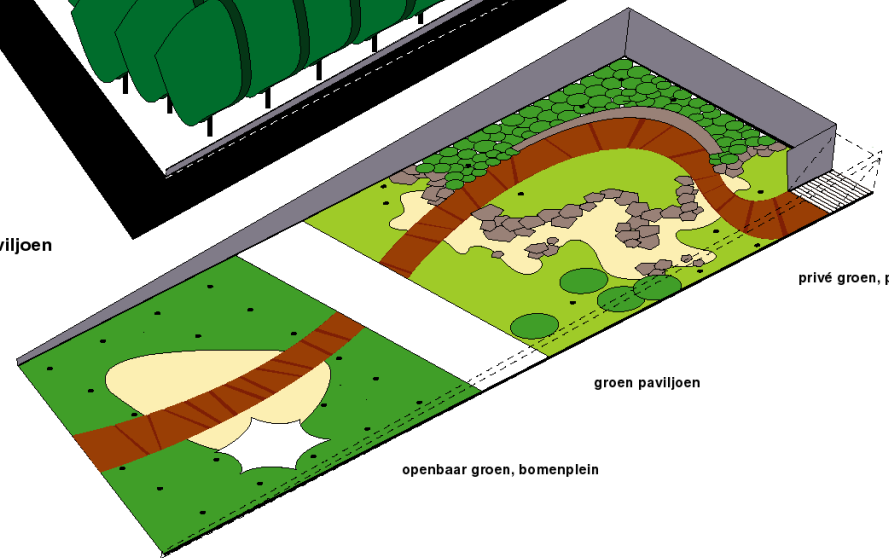
kleur



bijzondere elementen



bomen en paviljoen



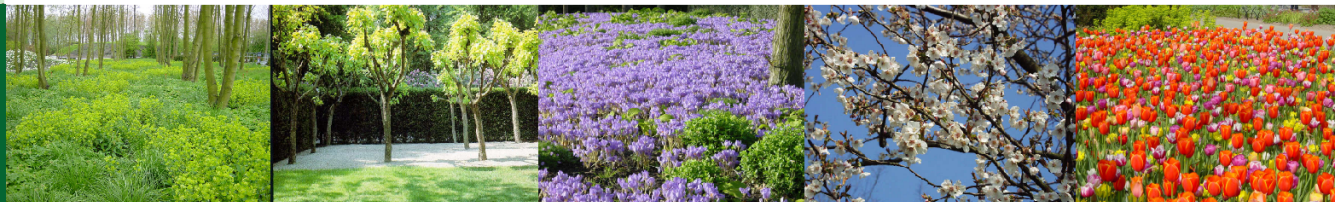
privé groen, patiottuin

groen paviljoen

openbaar groen, bomenplein

plattegrond

'Plants for People'
een groene omgeving,
binnen en buiten



de kleur van emotie; een jaarrond seizoenseffecten

Die Grüne Woche, Rostock



Die Grüne Woche, Rostock



Die Grüne Woche, Rostock

16 Water runoff

Integrate water into planning and design

Surface storm water management solutions should be integrated into the overall design and planning of an area and involve a multidisciplinary team of professionals. This way technical as well as aesthetic issues are addressed at all phases of design. Be sure to consider maintenance requirements in the design in order to guarantee performance and quality.

Use water as a green solution

Combine water with the need for recreation and nature in the city or other green city solutions such as green roofs and green streets. Be sure that the solution appropriately ties in with the land use. Make stormwater visible in the design of public and private open spaces. Features add to the amenities in urban public green spaces. Create ways to not only buffer water but also to use it in times of drought.

Don't open a pipe with water

All newly paved surfaces should be compensated by extra open water which equals at least 10% of the paved surface area.

Use trees to catch water runoff

Trees are very effective at slowing runoff. They intercept peak rainfall, improve the infiltration capacity of the soil and can improve the quality of the water that is buffered. They also bring groundwater from the roots up to the surface where some evaporates and the soil is kept moister. Conifers are 3x more effective than deciduous trees.

Use plants to help purify water

Biofiltering wetlands can be designed as functional and aesthetic solutions to surface water pollution. As water gradually filters through the plants into a series of basins, the pollution sediments are able to sink to the bottom.



Bellamyple Rotterdam, NL | The plaza is a multifunctional water plaza designed by us + v, including Stadsbouw, has the capacity to hold 750 m³ water during extreme rain in order to ease the storm sewer system in the neighbourhood of Spangen. The plaza is 90% of the time dry | Photo: Gemeente Rotterdam, afdeling Stadsontwikkeling



European Patent Office, Rijswijk, NL | The 25,000m² roof garden includes a series of gardens including a wetland and lake with ecological value | Photo: Copijn Tuin- en Landschapsarchitecten

Water runoff



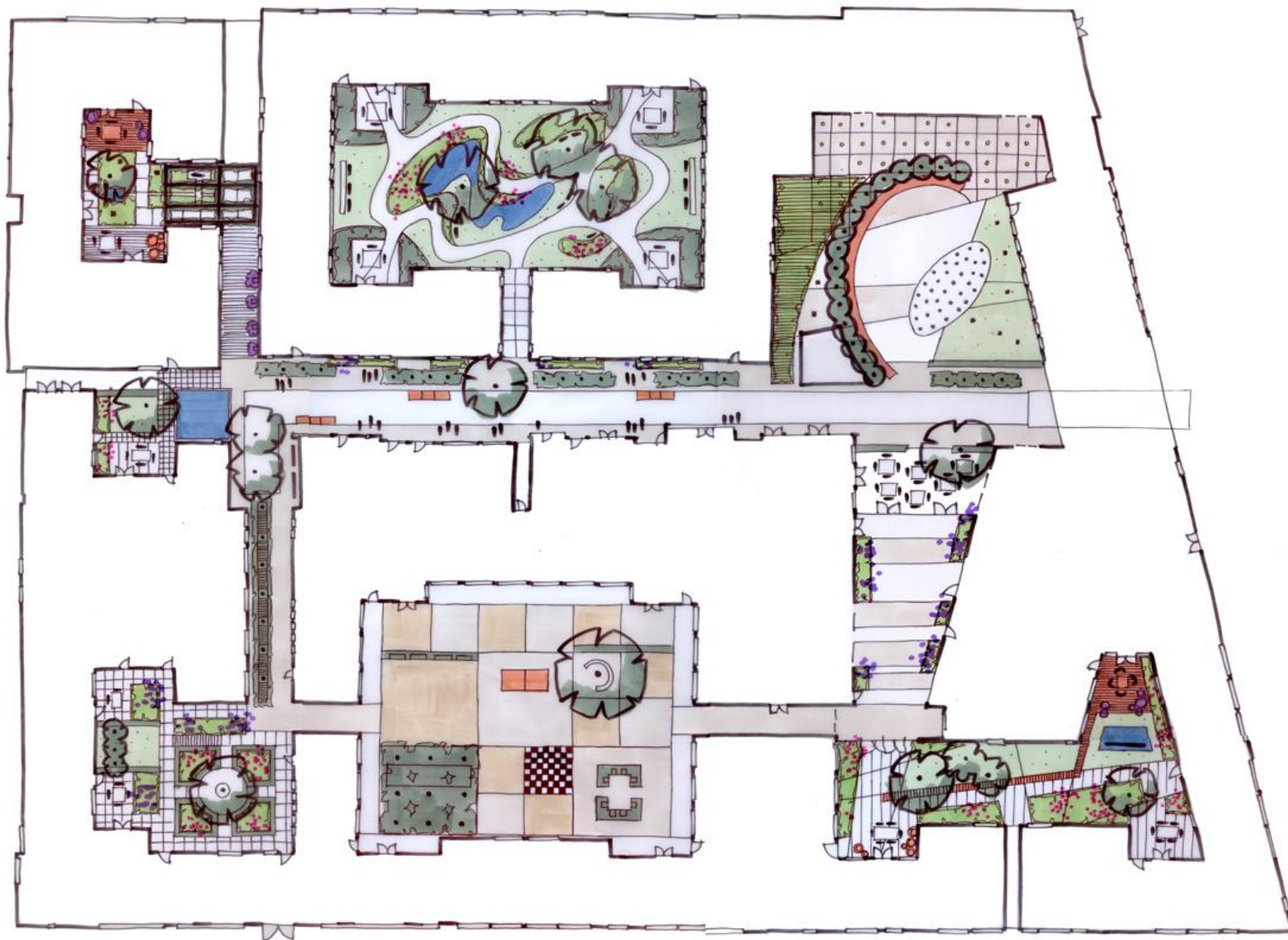
Andros-Sciencepark, Amsterdam



Andros-Sciencepark, Amsterdam



Andros-Sciencepark, Amsterdam



Nursing home, Weesp

Awards for The Hogeweyk®

The Hogeweyk was awarded several national and international prizes for the way care is organised at The Hogeweyk.

The most prestigious awards for The Hogeweyk.

Hospitality Care Award 2010

Nominated for the Hedy
d'Ancona Award 2010,
Excellence in Health care
architecture

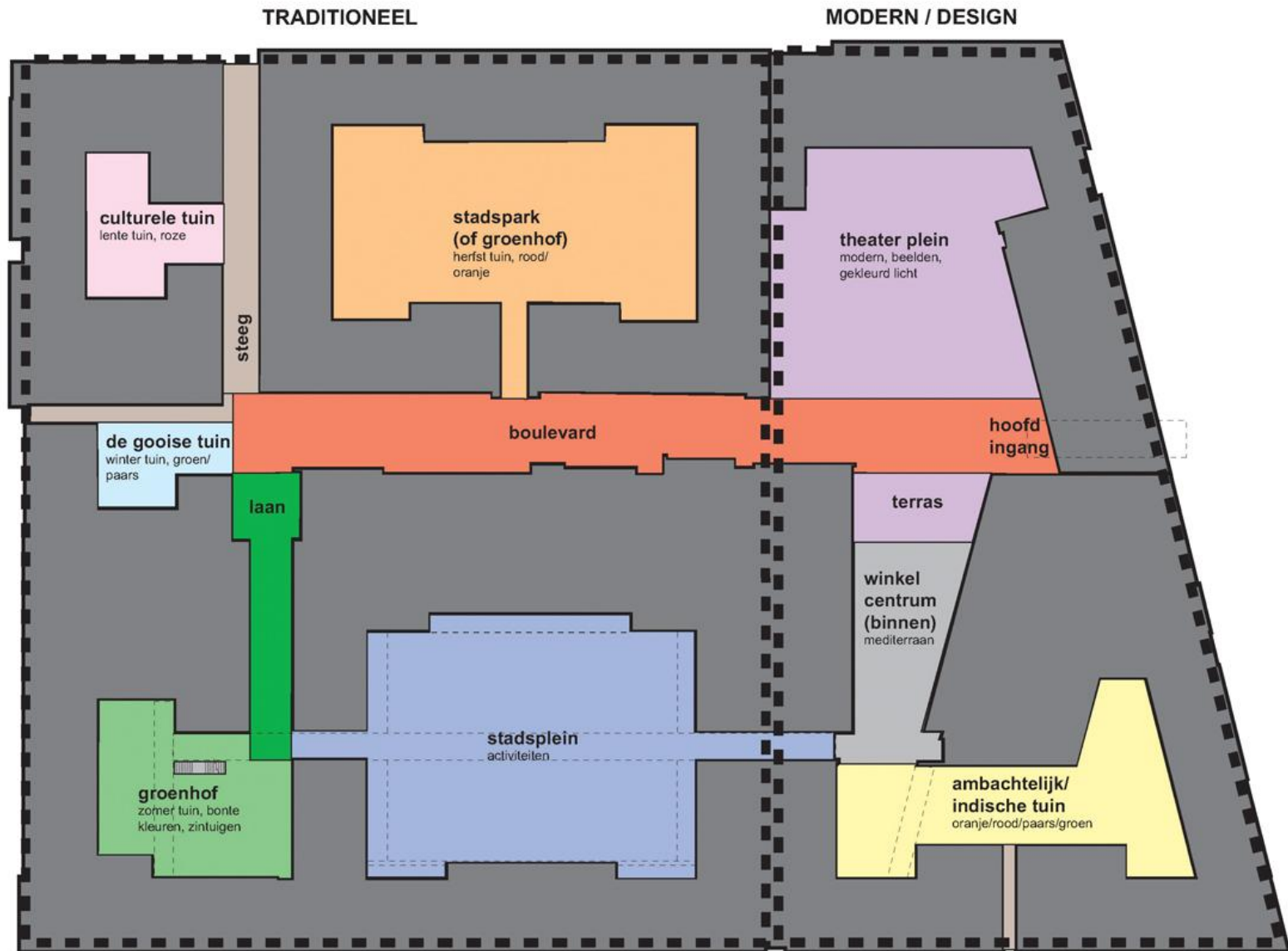
Golden label for Quality by
Perspect 2006

Project of the World, Expo 2000
Hannover

International Hospital
Federation Award 1995, for
innovative management

Dien Cornelissenprijs 1993 for
privacy in nursinghomes

Nursing home, Weesp



Nursing home, Weesp



Nursing home, Weesp





Nursing home, Weesp



Nursing home, Weesp



Nursing home, Weesp



Nursing home, Weesp



Nursing home, Weesp



Nursing home, Weesp

Bataafse kamp, Hengelo



toegang naar de stad



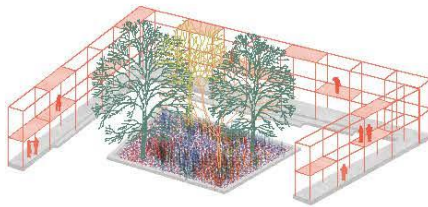
toegang naar de stad









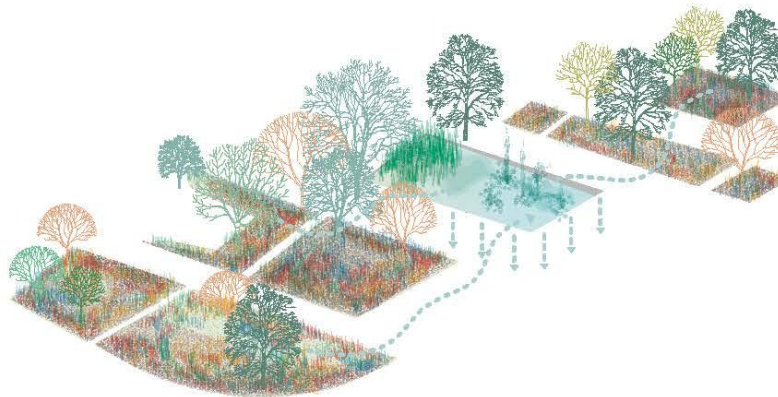


BATAAFSE HOF

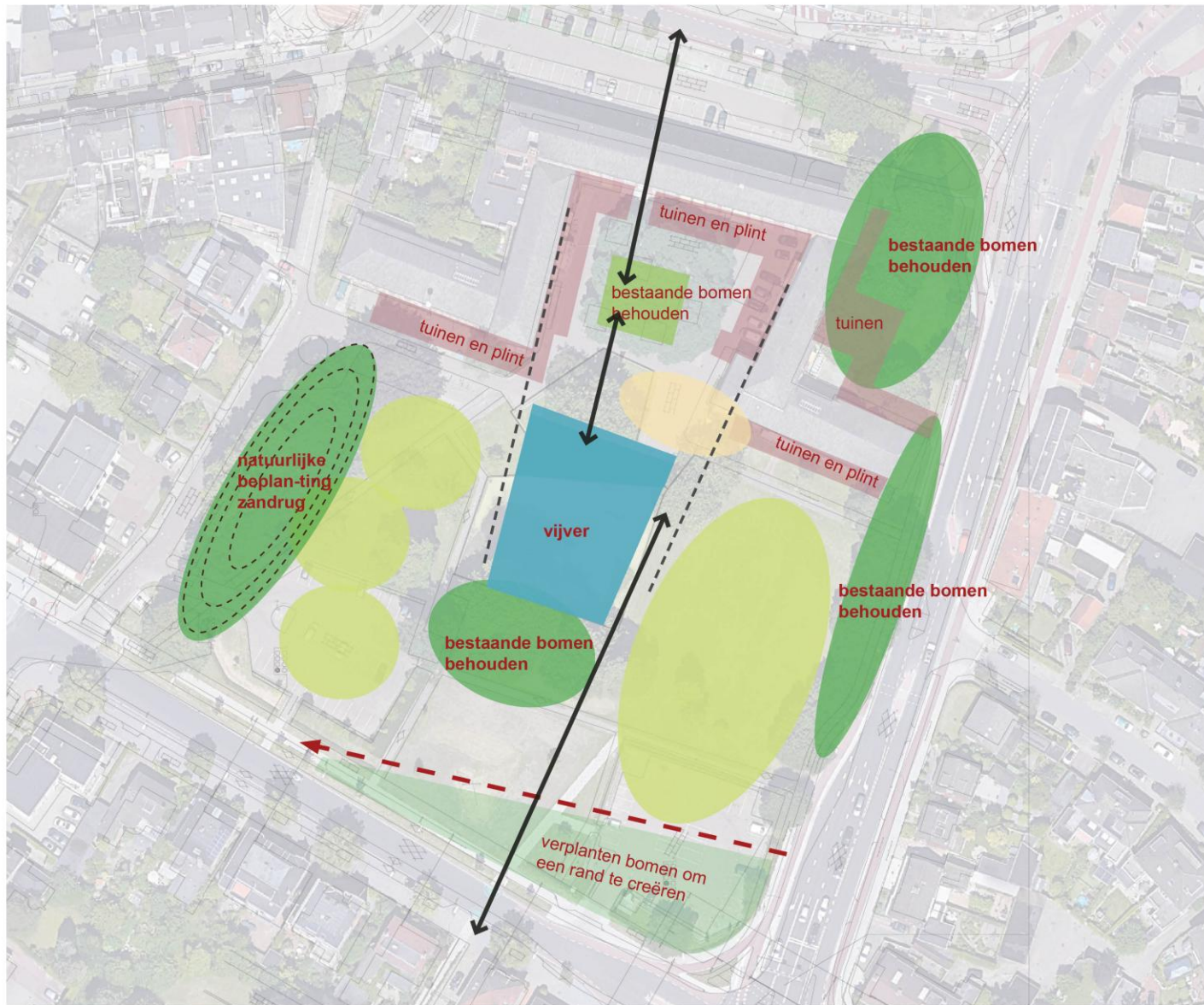
Het u-vormige binnenhof wordt ingericht als semi private binnentuin met het karakter van de oude hofjes zoals men deze vindt in de oude binnensteden. De pergola-constructie staand op een verhoogde plint geeft uitzicht op de lommerrijke binnentuin met ruimte voor bewoners en de toevallige passant. De plint, de privé buitenruimten van de op de begane grond gelegen woningen, wordt ingericht met siergrassen, vlinderstruiken en andere vaste planten voor de nodige privacy en groenbeleving. Tussen de bomen staan een aantal bankjes waar men in de schaduw een boek kan lezen.

BIODIVERSITEIT

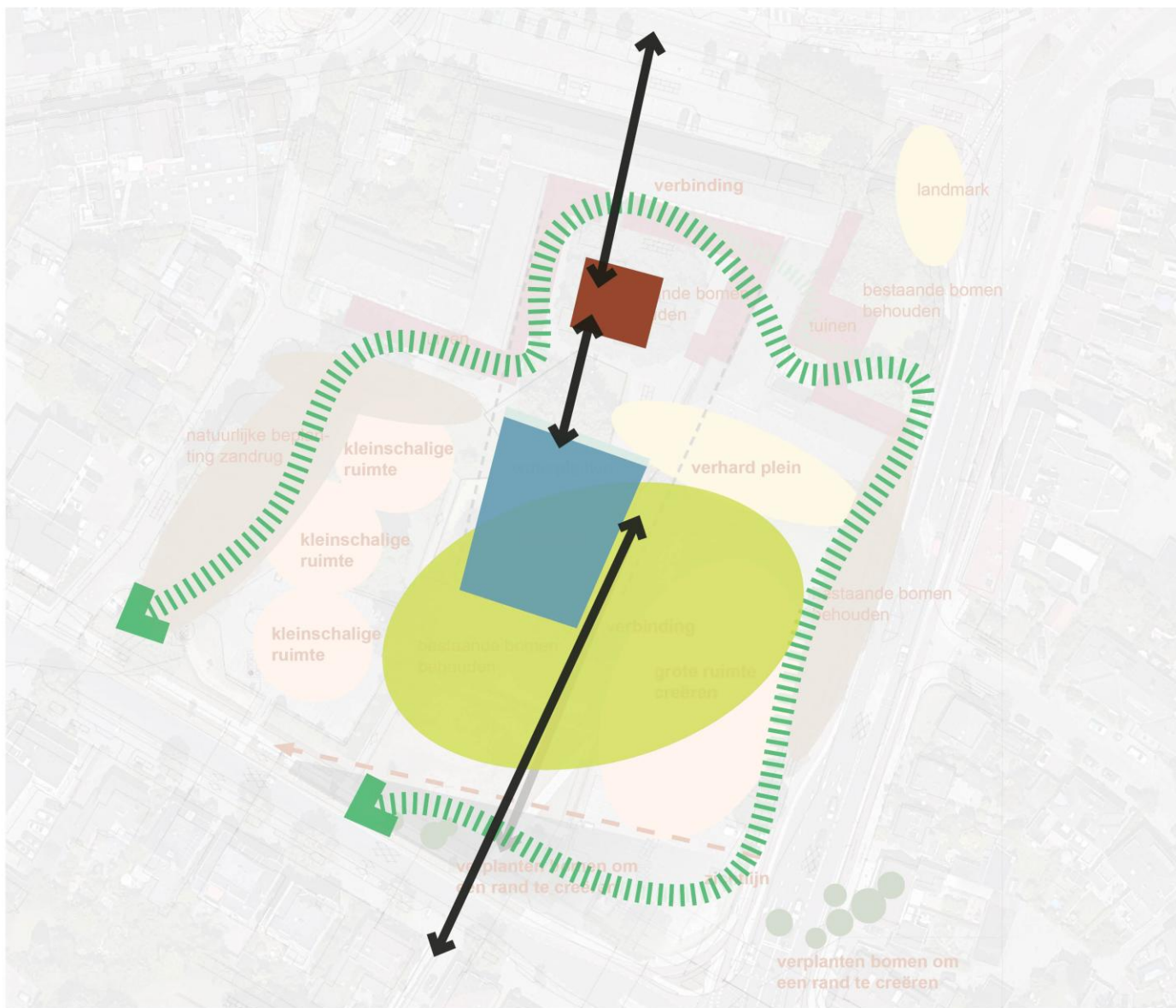
Het huidige aanbod aan flora en fauna in het park kan op het moment beter. Er is vooral veel gras en bomen. De Zwemvijver, die ook als waterretentie gebied dient, draagt hier al een heel stuk aan bij. De rietkragen van de helofytenfilter zijn een welkome schuilplaats voor kikkers, libellen en andere waterinsecten. De Kleurentuinen worden ingericht met bijen- en insectenhotels en er worden nestkasten voor vogels geplaatst in het Klimbos. Alles om bij te dragen aan een biodivers, educatief en natuurinclusief stadspark voor bewoners, bezoekers maar ook voor de natuur zelf.



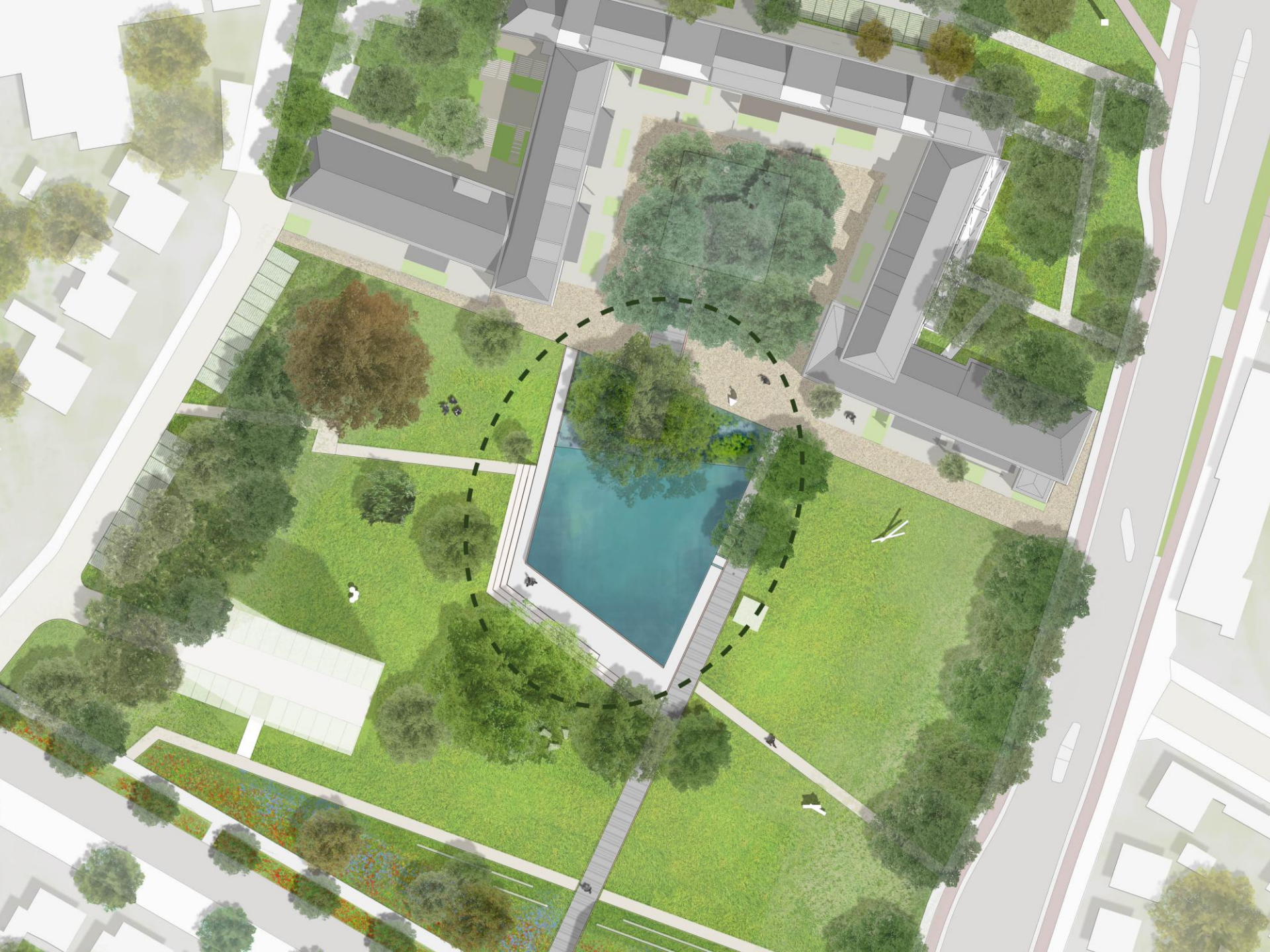
uitgangspunten

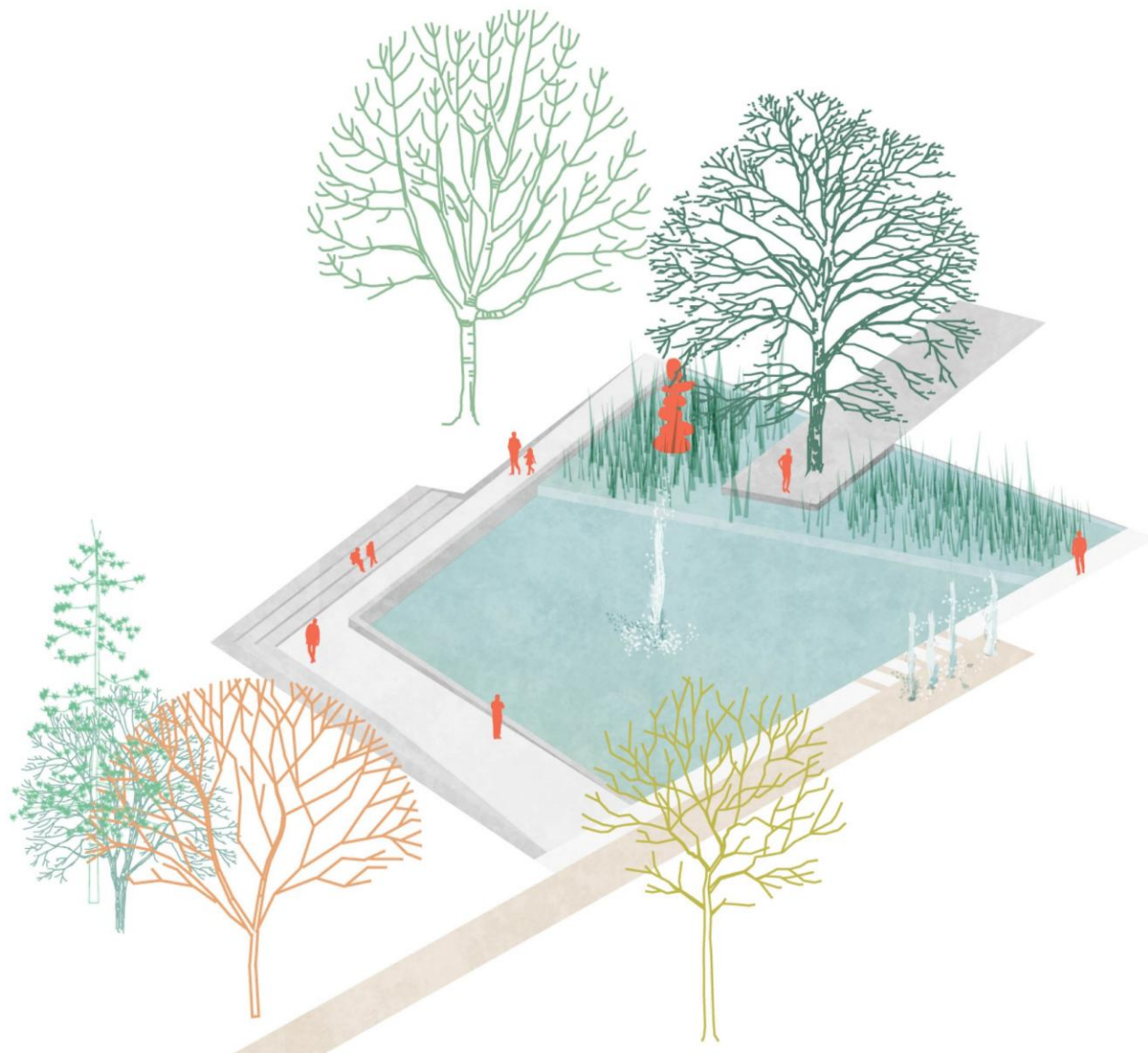


concept





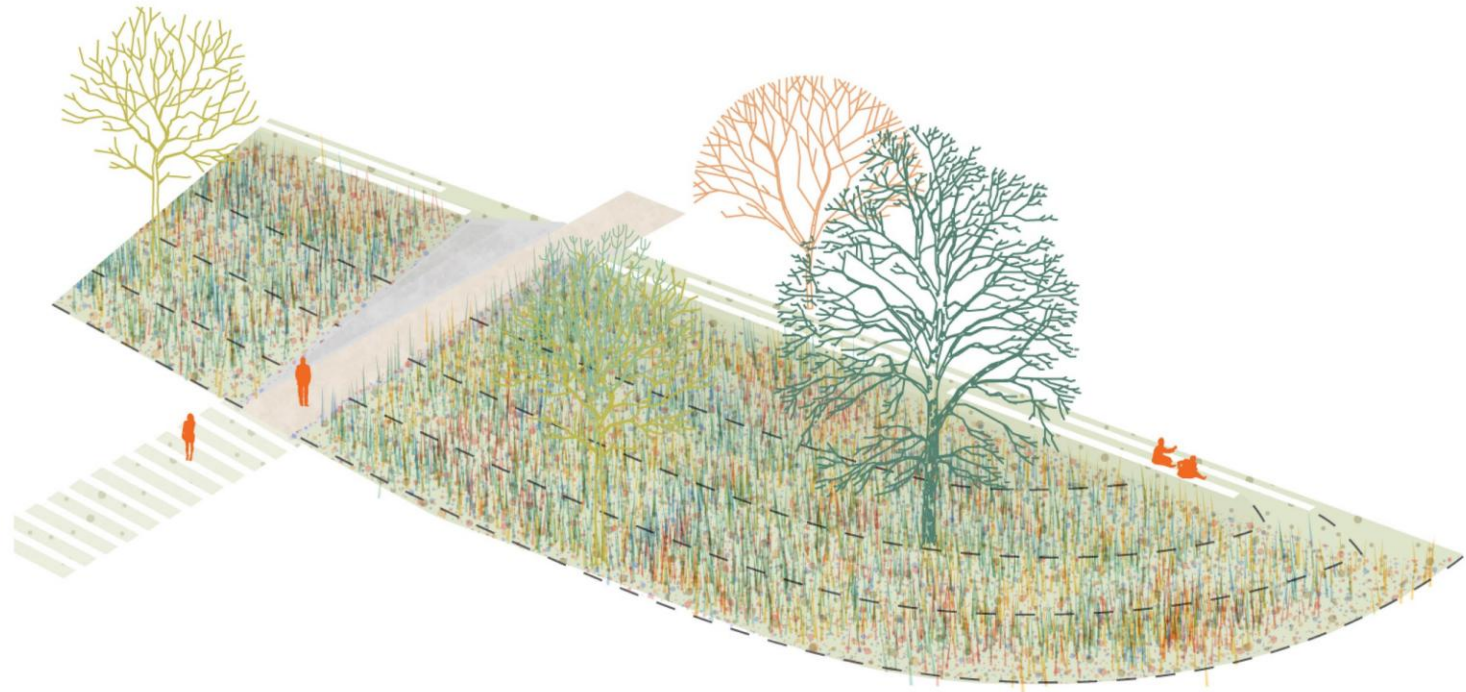














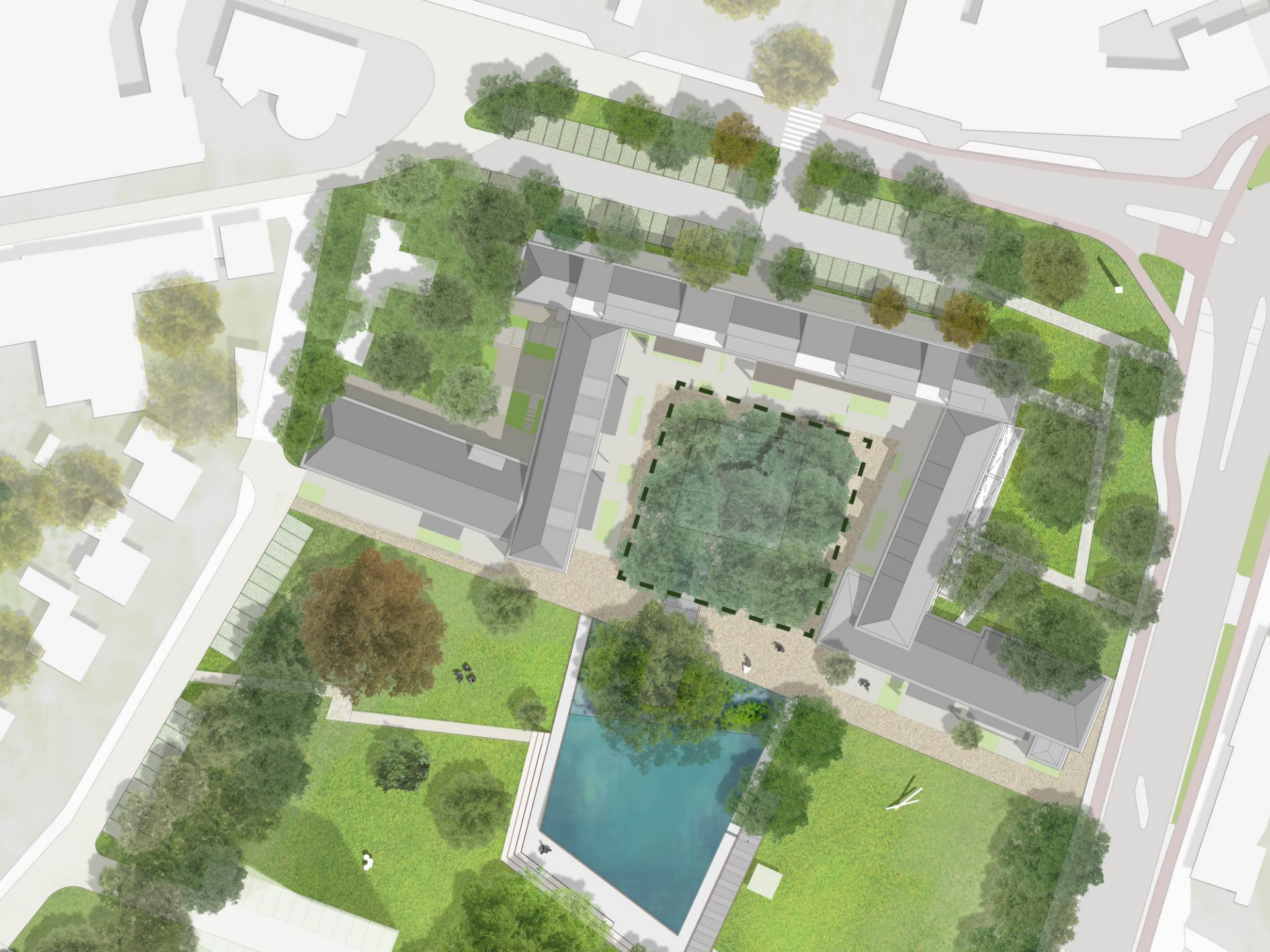






BATAAFSE KAMP



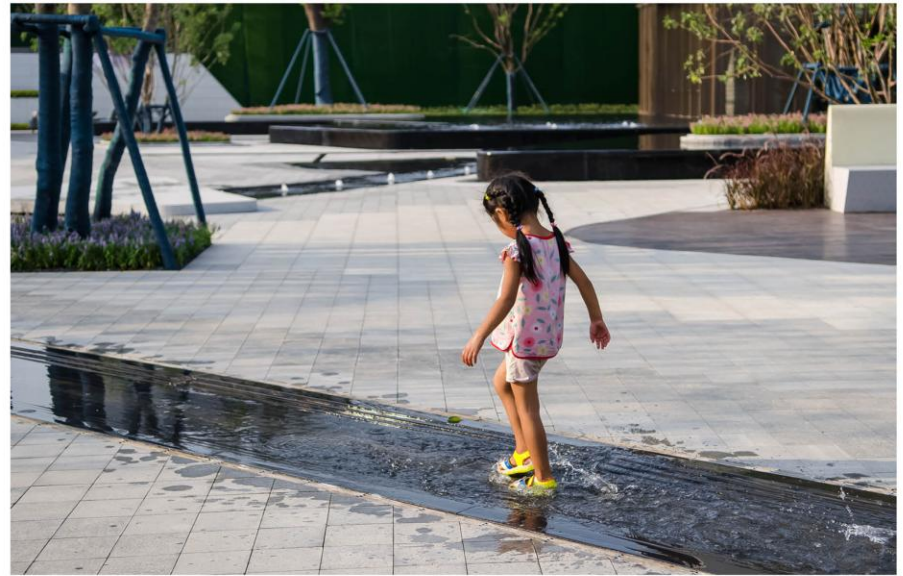
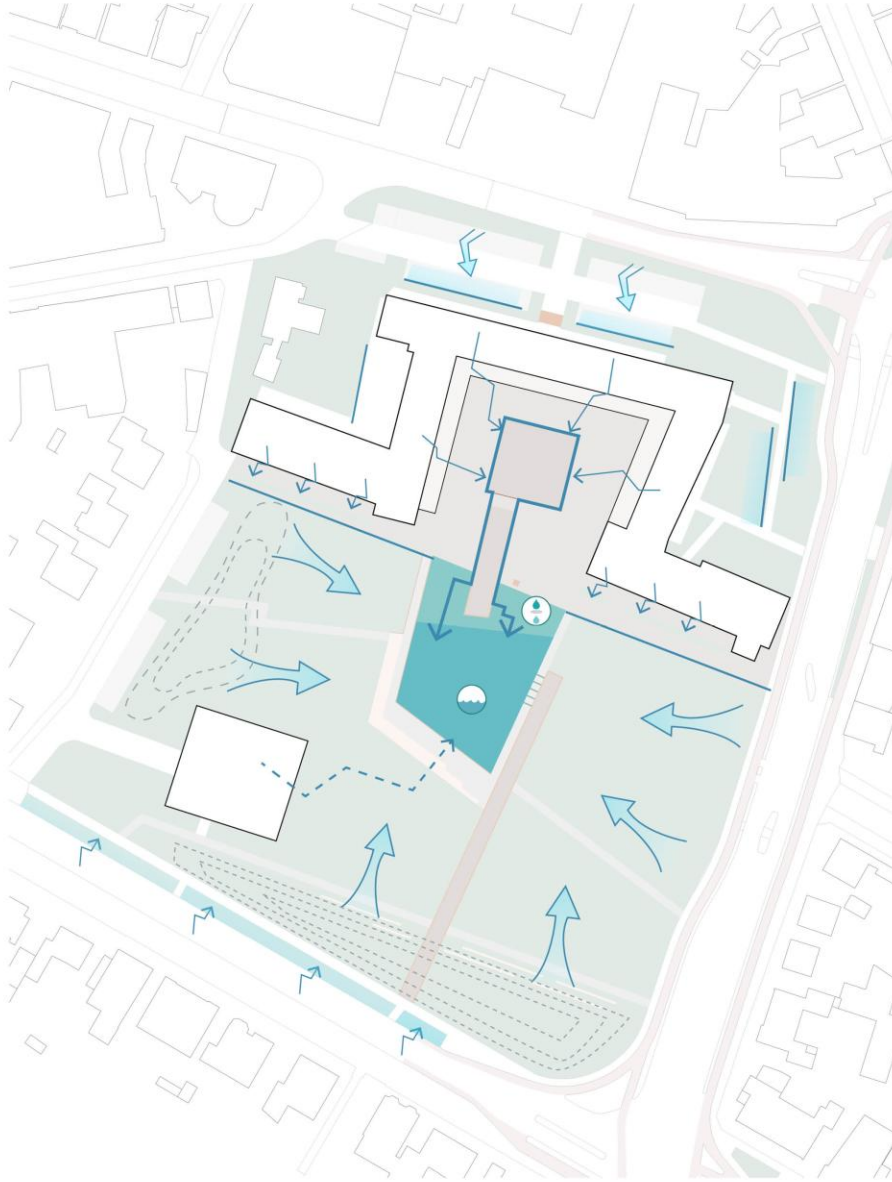








Rainproof







nieuw
wonen
twente
Nieuwbouwmarkt

HK²
PROJESTONTWIKKELING

HK²
PROJESTONTWIKKELING

HK²
PROJESTONTWIKKELING







Biodiversiteit



Euroflora, Genua, Italy

Dutch Garden - Euroflora

green in the city



water in the city



purifying air & water



stimulating social interaction



creating microclimates



biodiversity in the city



Farming
the
Future



EUROFLORA 2021

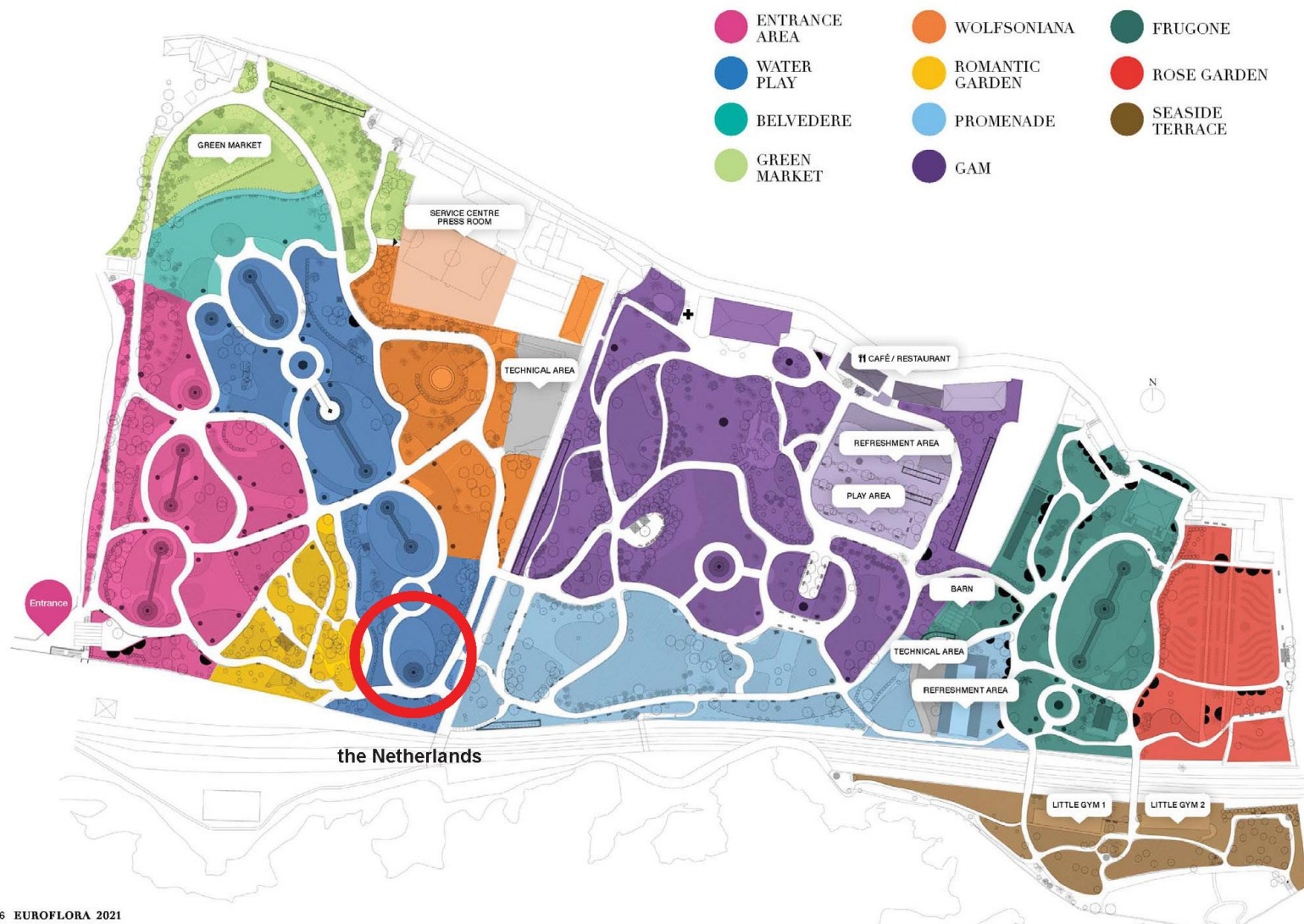
A WORLD
OF RARE BEAUTY

location Dutch garden in masterplan

EUROFLORA 2021 GENUA - ITALIE



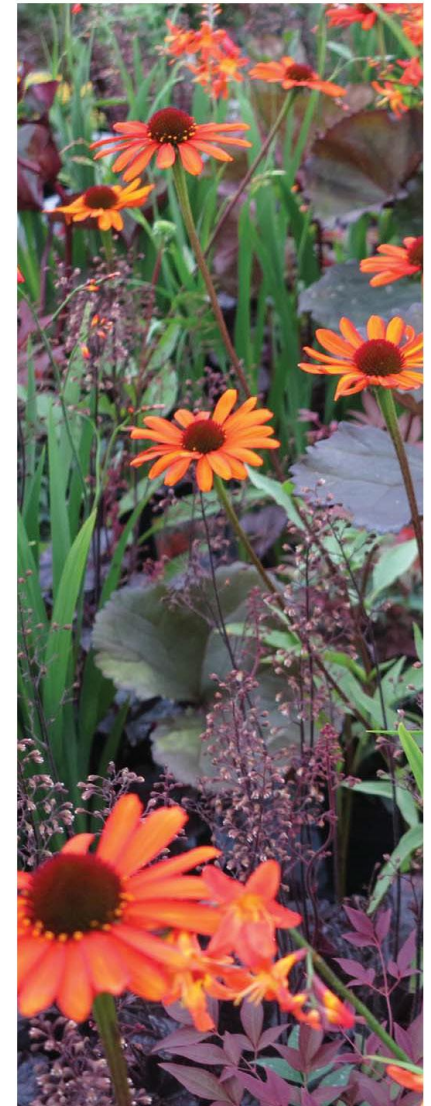
11 areas of RARE BEAUTY













La Città Verde per un futuro sostenibile

La città ha bisogno di verde, alberi e piante per l'aria pulita, per unire i centri storici, per la biodiversità e come riserva d'acqua. Il verde contribuisce al miglioramento dell'ambiente urbano. Le piante mitigano le isole di calore, riducono l'inquinamento atmosferico e l'erosione del suolo, riducono l'uso di acqua, riducono l'isola di calore e forniscono nutrimento a molti e api. Il verde è un valore indispensabile per condotti di vita più sani e più felici per tutti gli esseri viventi. Questo è l'obiettivo della Città Verde del futuro, che l'Amministrazione di Parigi ha presentato nel Giardino Châteauneuf.

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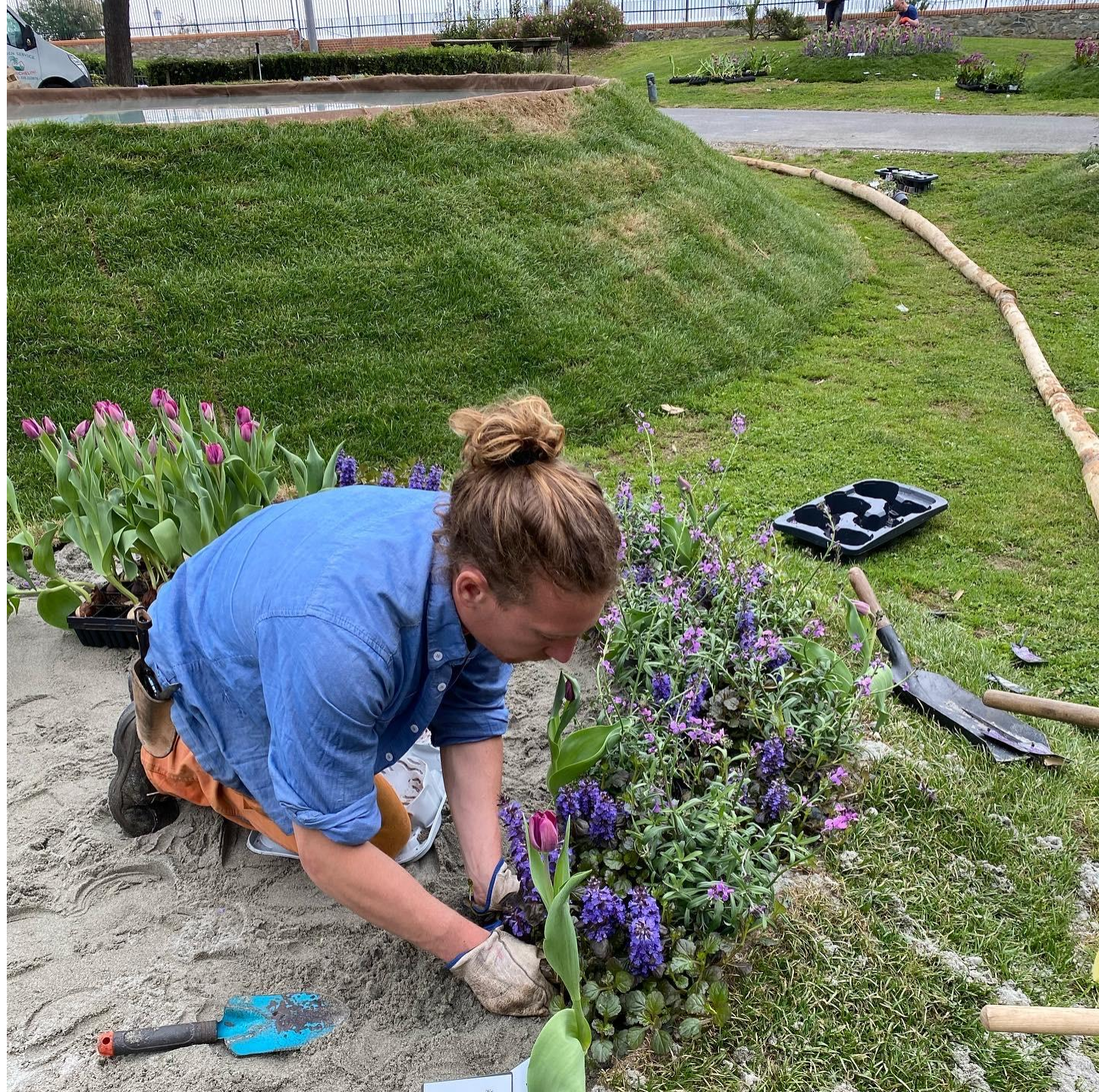
Cities need green trees and plants for clean air, for a fair climate, for biodiversity and as a water buffer. Green contributes to the betterment of the urban environment, where plants purify polluted air and water, help combat water evaporation, reduce the heat island effect and provide nutrition for insects and bees. It is an indispensable ally for healthier and happier living conditions for all beings. This is the essence of the Green City of the future, that the Embassy of the Netherlands presents in the Dutch Garden.

1992

Griffioen Wassenaar IX, Van der Hoe, B. Moermp IX, Jansen Houten, Jacques van der Korf, Unwatt Epseide IX

EUROFLORA
2022

Ambasciata del Regno dei Paesi Bassi
Progettista: Niek Roozen Landscape
www.netherlandsandyou.nl





















Carex acutiformis
"Newspaper"

Euphorbia
polioides
"Parade"

5.2 30 165
Euphorbia
polioides
"Parade"

5.2 30 165
Euphorbia
polioides
"Parade"






V2
 VILLA GROPALLO - AREA 29
 GIURIA **28**
 CONCORSO **163**
005 - 00 - 00 - 000
 TULIPA
 TULIPA

1°
 PREMIO
EUROFLORA
 2022

Salvia nemorosa
 'Blue Marvel'


 VILLA
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Effective Climate Green, research

Effective climate green



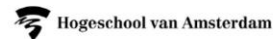
Effective climate green

Cooperating partners

Green sector



Education & Research



Urban management



More and more attention for green

- More and more people live in cities
 - ❑ now >50%; 2050: 70% (FAO)
 - ❑ worse living conditions: luvo & UHI
- Health
 - ❑ changing eating habits
 - ❑ less exercise
 - increase in welfare diseases
- Climate change
 - ❑ raising temperatures and UHI → heat stress
 - ❑ increase of peak rainfall
- Decrease biodiversity



Effect green on health

Scientific prove

- Amount of green closeby (within 500 m) positively correlated with health (vanDillen et al, 2012);
- Density of street trees (within 250 m) positively correlated with general health (Ulmer et al. 2016)
- In neighborhoods with more street trees less use of anti-depressiva (Taylor et al. 2015; Marselle et al. 2020)
- More street trees positively correlated with health of newly borns (Jones & Goodkind 2019)

Conclusion: Best results with combination of green on different scale levels

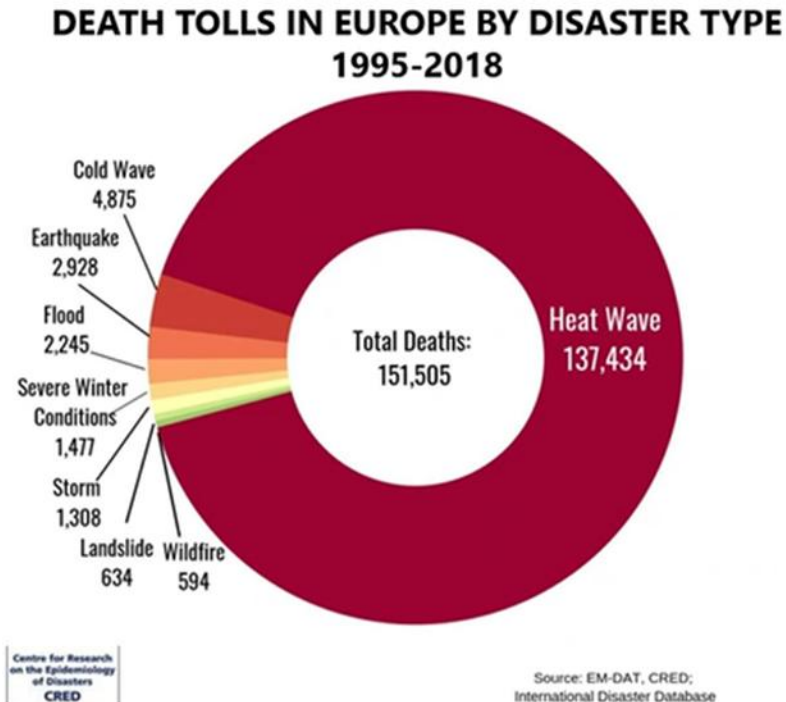
- in direct surroundings (building/plot and view)
- along daily routing (street trees and green surfaces)
- large green areas within walking distance

Health & well-being

- Mechanisms
 - Recovery of stress and mental fatigue
 - Exercise and sport
 - Social contacts/social cohesion



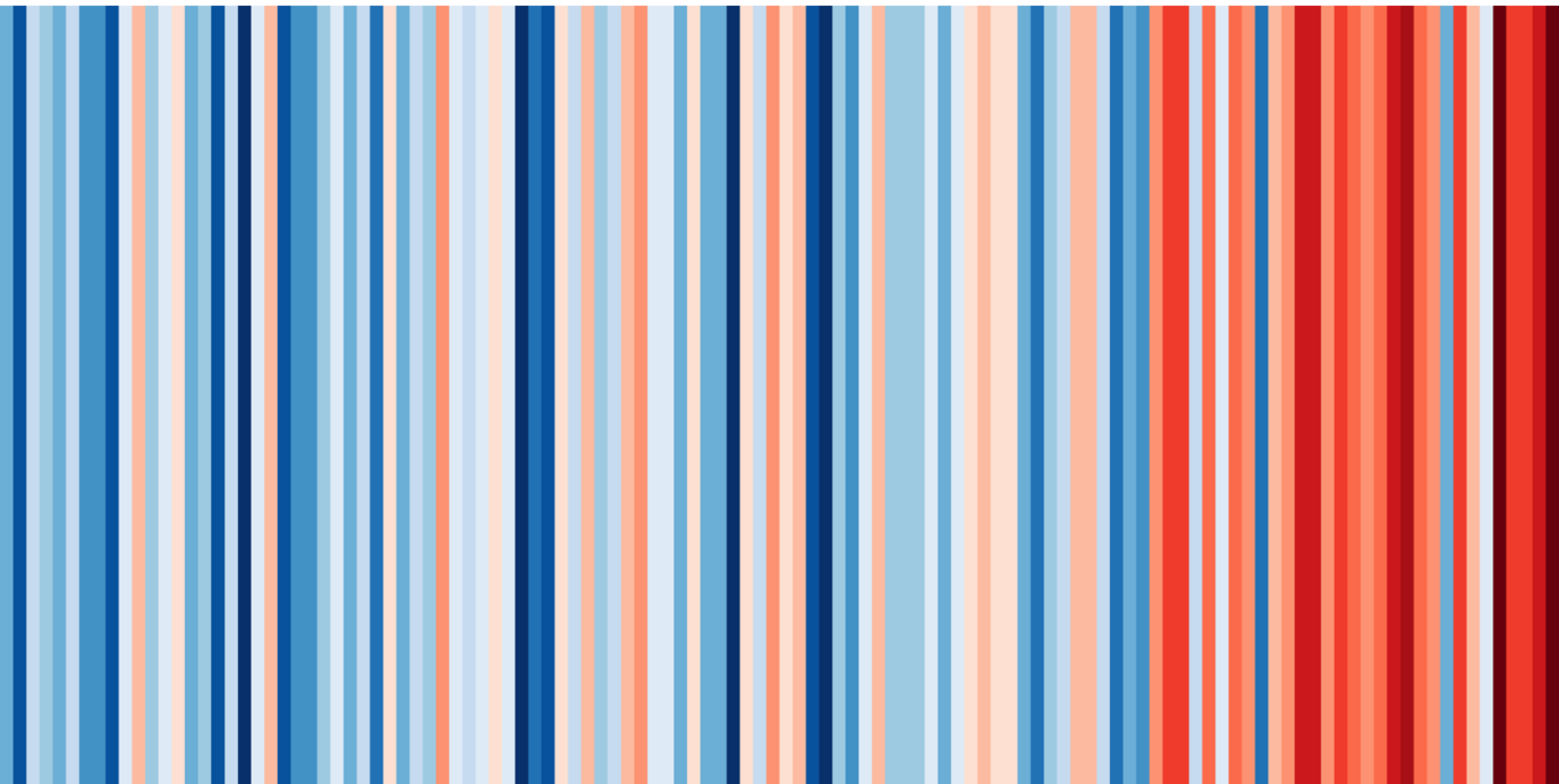
Effects of heat stress



over 4% of death in European cities during summer are due to the 'heat-island-effect'

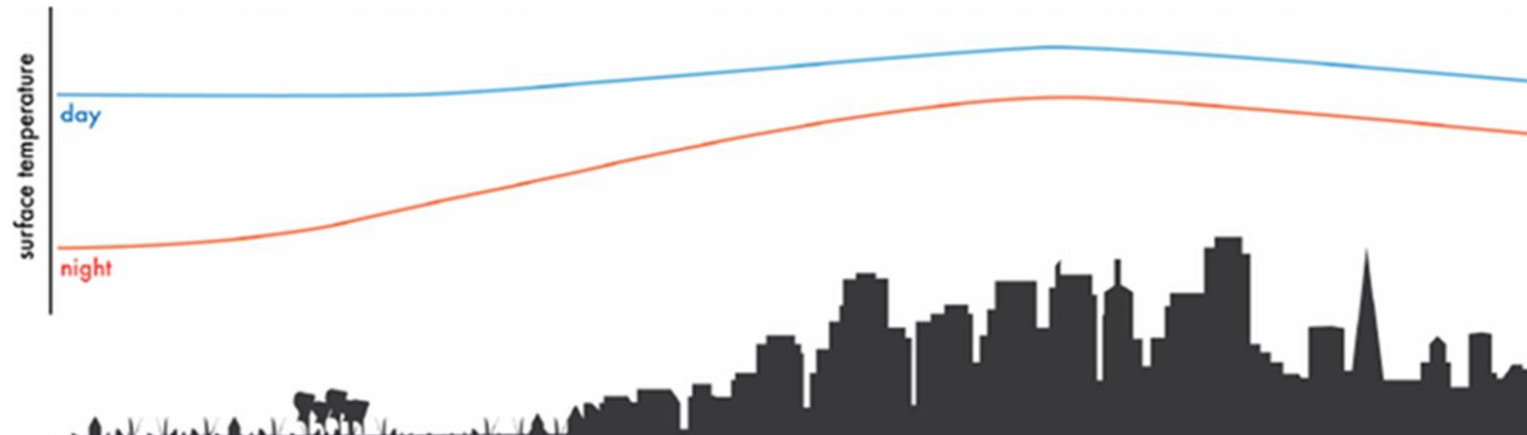
The Lancet 2 feb 2023

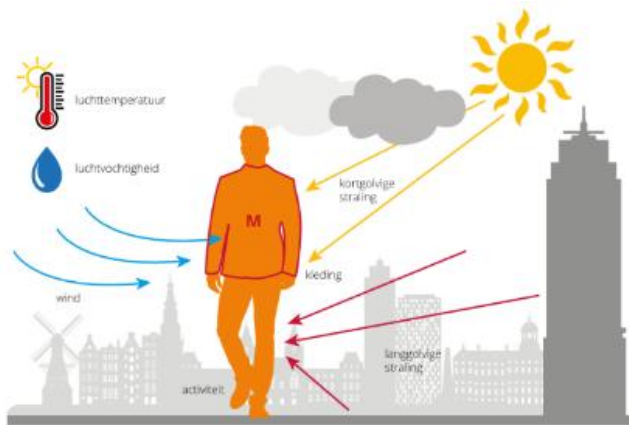
Extra trees in the city would avoid almost one third of those deaths.



Institute for Environmental Analytics, Reading UK, 2019

Average annual temperature; NL 1901-2018



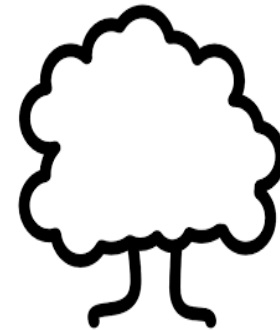


Principles

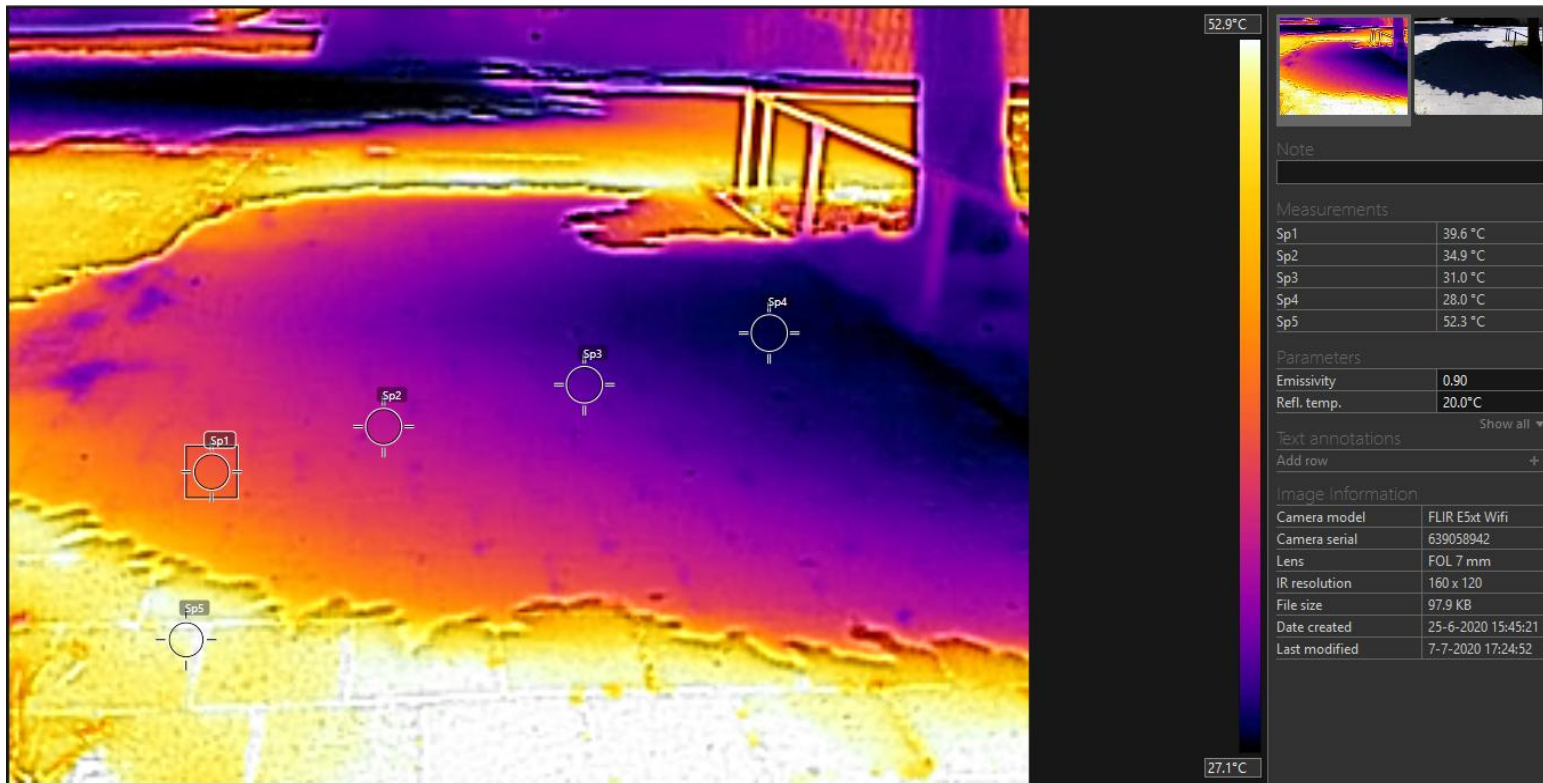
1. Evaporation of water
2. Ventilation

3. Shadow

**Urban
green**

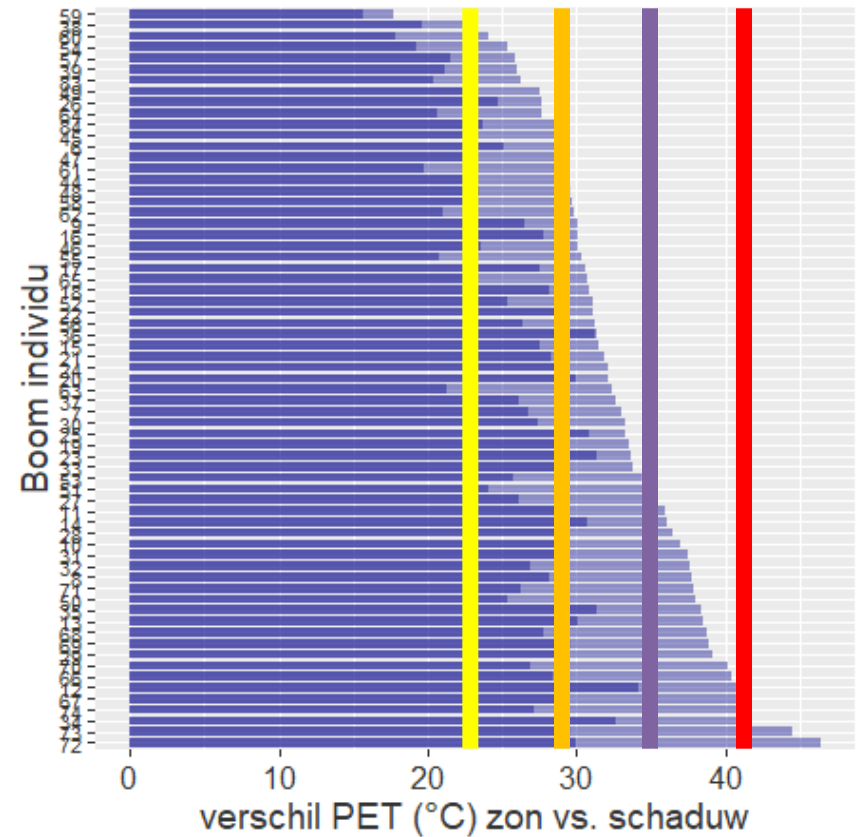


Measurements



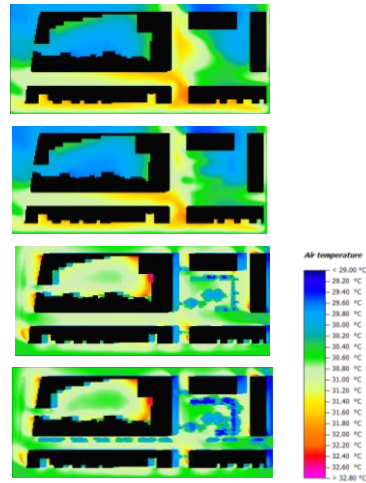
Effect trees on heat stress (PET)

PET [°C]	Thermal sensation	Level of thermal stress
< 4°C	very cold	extreme cold stress
4.1 - 8°C	cold	strong cold stress
8.1 - 13°C	cool	moderate cold stress
13.1 - 18°C	slightly cool	slight cold stress
18.1 - 23°C	neutral (comfortable)	no thermal stress
23.1 - 29°C	slightly warm	slight heat stress
29.1 - 35°C	warm	moderate heat stress
35.1 - 41°C	hot	strong heat stress
41°C >	very hot	extreme heat stress





Design &
Workshop



Simulation

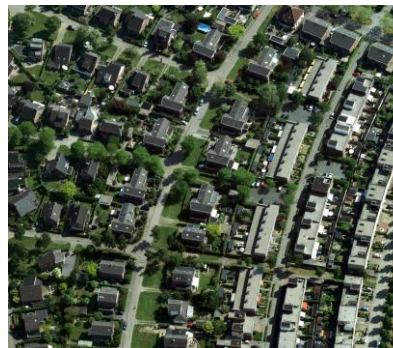


Templates per
neighborhood type

different neighborhood types

Wijktypen Buurten 2023

- Historische binnenstad
- Stedelijk bouwblok
- Volkswijk
- Tuindorp
- Vooroorlogse woonwijk
- Naoorlogse woonwijk
- Tuinstad laagbouw
- Tuinstad hoogbouw
- Hoogbouw
- Bloemkoolwijk
- Vinex-wijk
- Villawijk
- Vernieuwd
- Bedrijven
- Overig
- Groen



different neighborhood types

Effective climate green

Heat stress, cooling & green

- klimaateffectatlas.nl/nl/wijktypologie

	Historische binnenstad	Vooroorlogse woonwijk	Stedelijk bouwblok	Tuindorp	Volkswijk	Naoorlogse woonwijk	Tuinstad laagbouw	Tuinstad hoogbouw	Hoogbouw	Bloemkoolwijk	Vinexwijk	Villawijk	Vernieuwd	Bedrijventerrein
 Bouwjaar	Voor 1910	Voor 1945	1890-1940	1910-1940	1910-1940	Na 1945	1945-1960	1950-1965	Na 1960	1970-1990	1990-2010	Van alle tijden	Van alle tijden	Van alle tijden
 Hoogte	3 tot 5 lagen	2 tot 4 lagen	4 tot 6 lagen	2 tot 3 lagen	2 tot 3 lagen	2 tot 3 lagen	2 tot 3 lagen	4 tot 10 lagen	6 tot 20 lagen	3 tot 5 lagen	3 tot 10 lagen	1 tot 4 lagen	2 tot 6 lagen	2 tot 3 lagen
 Groen	10-22%	21-46%	18-26%	20-35%	14-26%	25-40%	27-40%	29-45%	13-45%	28-42%	17-35%	33-53%	13-27%	9-32%
 Hitte	Hoog	Laag	Hoog	Hoog	Hoog	Midden	Midden	Midden	Laag	Midden	Midden	Laag	Hoog	Laag
 Wateroverlast	Hoog	Midden	Hoog	Midden	Hoog	Midden	Midden	Midden	Midden	Laag	Laag	Laag	Midden	Laag

different neighborhood types researched

Effective climate green

Neighborhood type



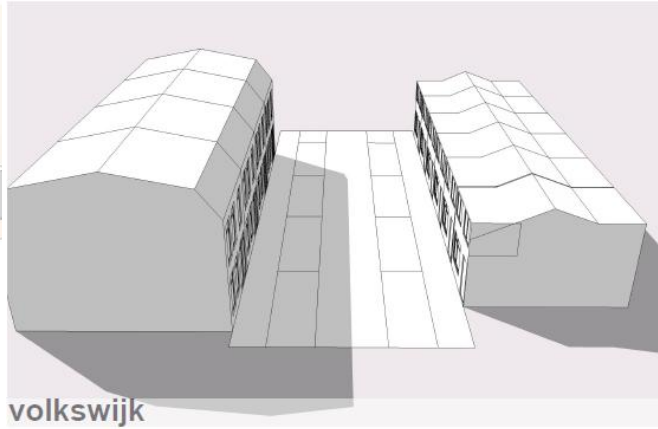
stedelijk bouwblok



verbindingsweg



bloemkoolwijk



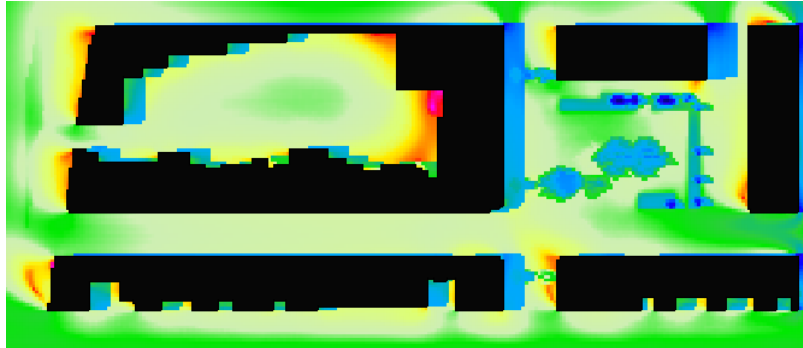
volkswijk

case: cypresstraat volkswijk tree lane simulation

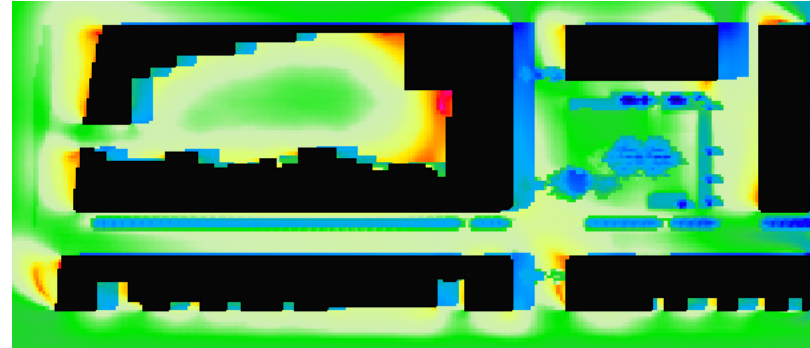
► feeling temperature PET, 15:00uur

PET [°C]	Thermal sensation	Level of thermal stress
< 4°C	very cold	extreme cold stress
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41°C >	very hot	extreme heat stress

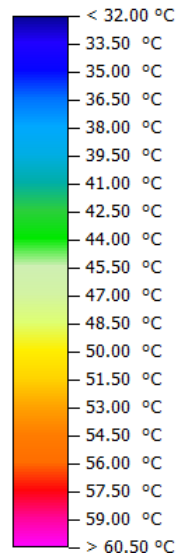
existing situation



variant 1: tree lane



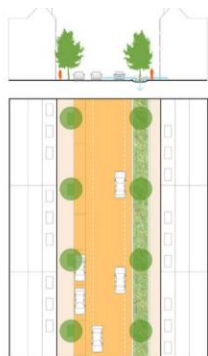
PET



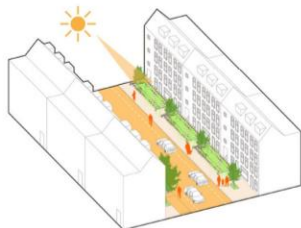
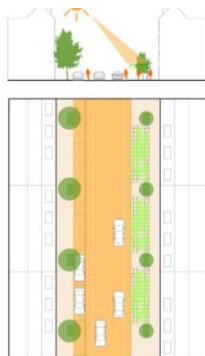
Effective climate green
Result-STEDELIJK BOUWBLOK



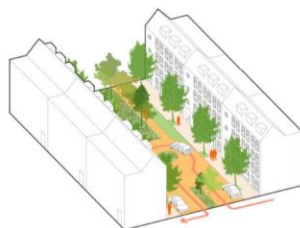
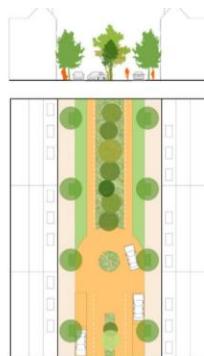
green infiltration zone with trees



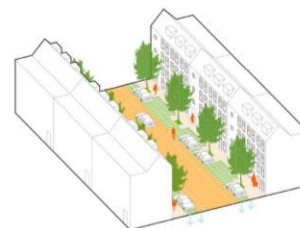
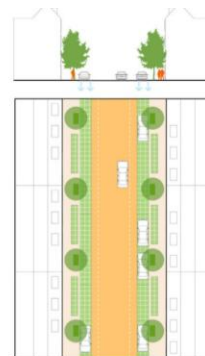
pergola with climbing plants



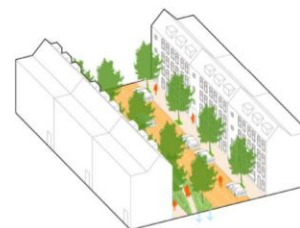
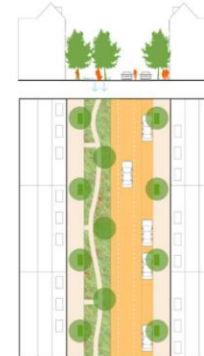
central coolspot



permeable paving



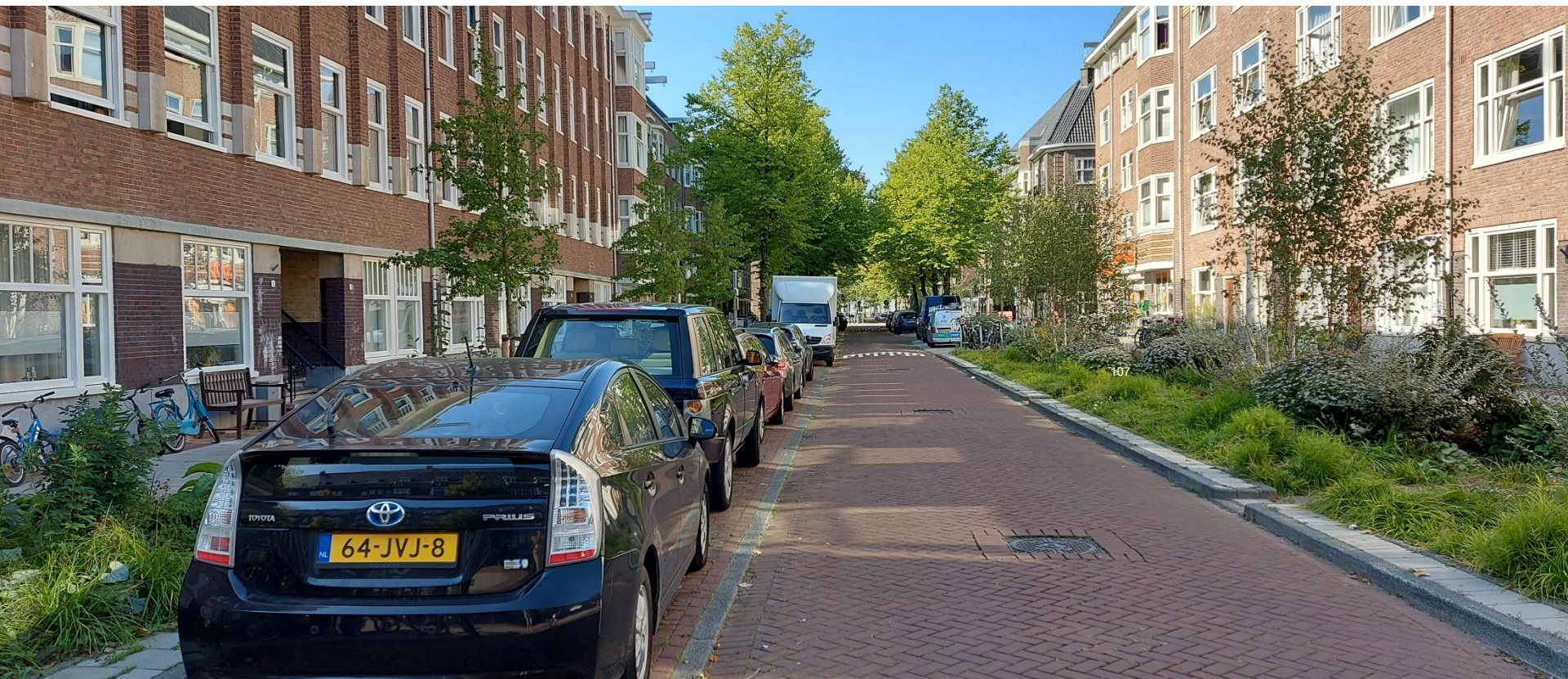
one way street green recreation



local feeling temperature drops by

|-3,5 tot -19 °C | -1 tot -5 °C | -12 tot -19 °C | -1 tot -2 °C | -12 tot -19 °C |

built area of stedelijk bouwblok





Effective climate green

Result-VERBINDINGSWEG



wide central greenzone



symmetrical green



large trees north side



pergola xl



local feeling temperature drops by

-12 tot -19 °C

-10 tot -19 °C

-10 tot -19 °C

-2 tot -8 °C