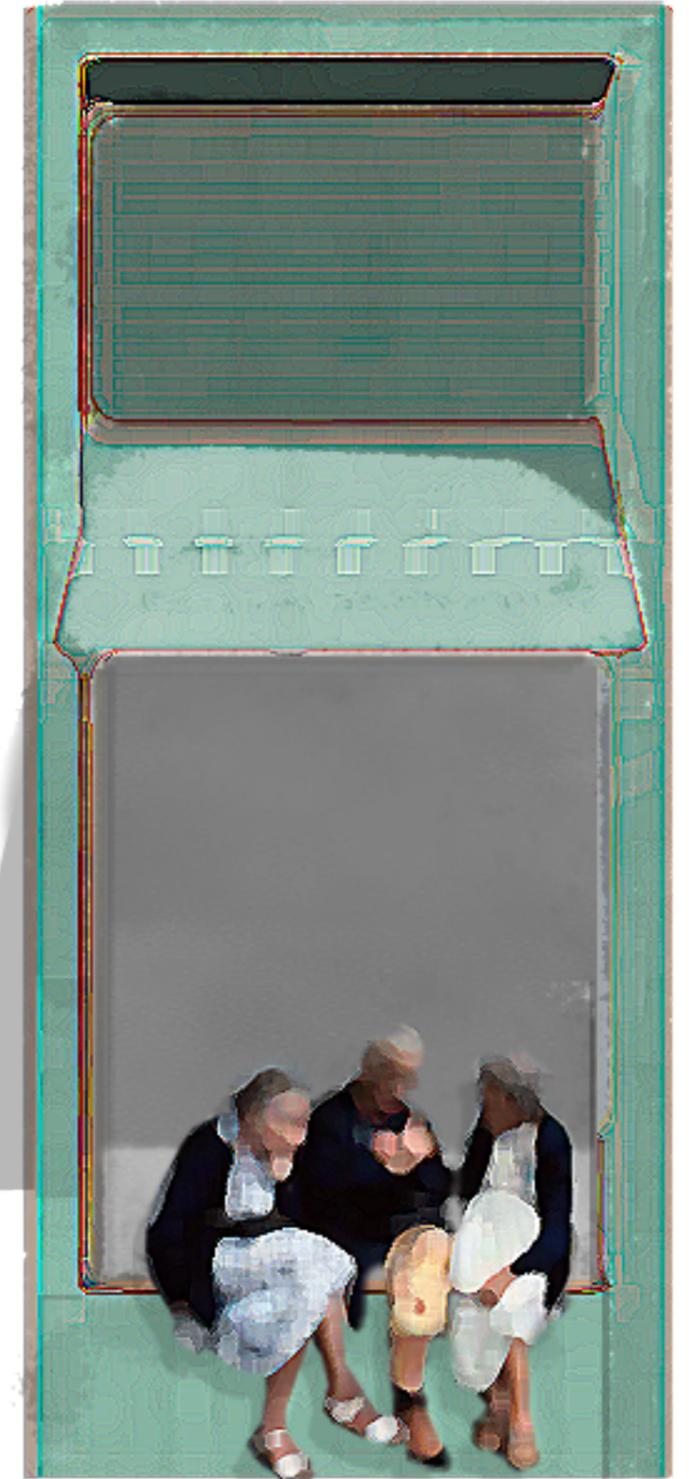


COMMUNITY CENTERS IN CLIMATE CHANGE

Building elderly heat resilience
with social cooling centers
in Rotterdam South



Master thesis by Leonie Straub

Leonie Straub
6063624

Architecture mentor:
Jacques Vink

Building technology mentor:
Frank Schnater

Research mentor:
Istiaque Amed

Die Stadt Stuttgart hat eine Viertelmillion Euro investiert, um acht Plätze besser gegen Hitze zu wappnen. Doch mancherorts werfen die neuen Sonnenschirme Schatten dorthin, wo ihn niemand braucht.



STUTTGARTER-NACHRICHTEN.DE

Stadt Stuttgart investiert 250 000 Euro gegen Hitze: Neuer Sonnenschirm beschattet Straße...



www.knmi.nl

2024 warmste jaar ooit gemeten

Het zat eraan te komen, maar nu is het zeker: het aardoppervlak was nooit eerder sinds metingen zijn begonnen zo warm als in 2024. Volgens de Europese klimaatdienst Copernicus was het zelfs 1,6 °C warmer dan eind 19de eeuw. In alle datasets, die allemaal...



www.sciencenews.org

Extreme heat will put millions more older adults at risk in the future

By 2050, as many as an additional 246 million adults 69 and older could experience temperature extremes that exceed 37.5° Celsius.



XINHUA NEWS

Heatwave caused nearly 400 more deaths in Netherlands
Almost 400 people more died in the Netherlands during Europe's recent record-breaking heatwave than in a regular summer week, according to a report. In total, 2,964 people died in the Netherlands during the week that started on July 22, which was around...



www.globaltimes.cn

Extreme heat waves

The World Meteorological Organization (WMO) warned on Tuesday that Europe's heat wave could persist into the middle of next week, whereas the negative impacts of climate change are bound to continue at least until 2060s.

Summer is coming...

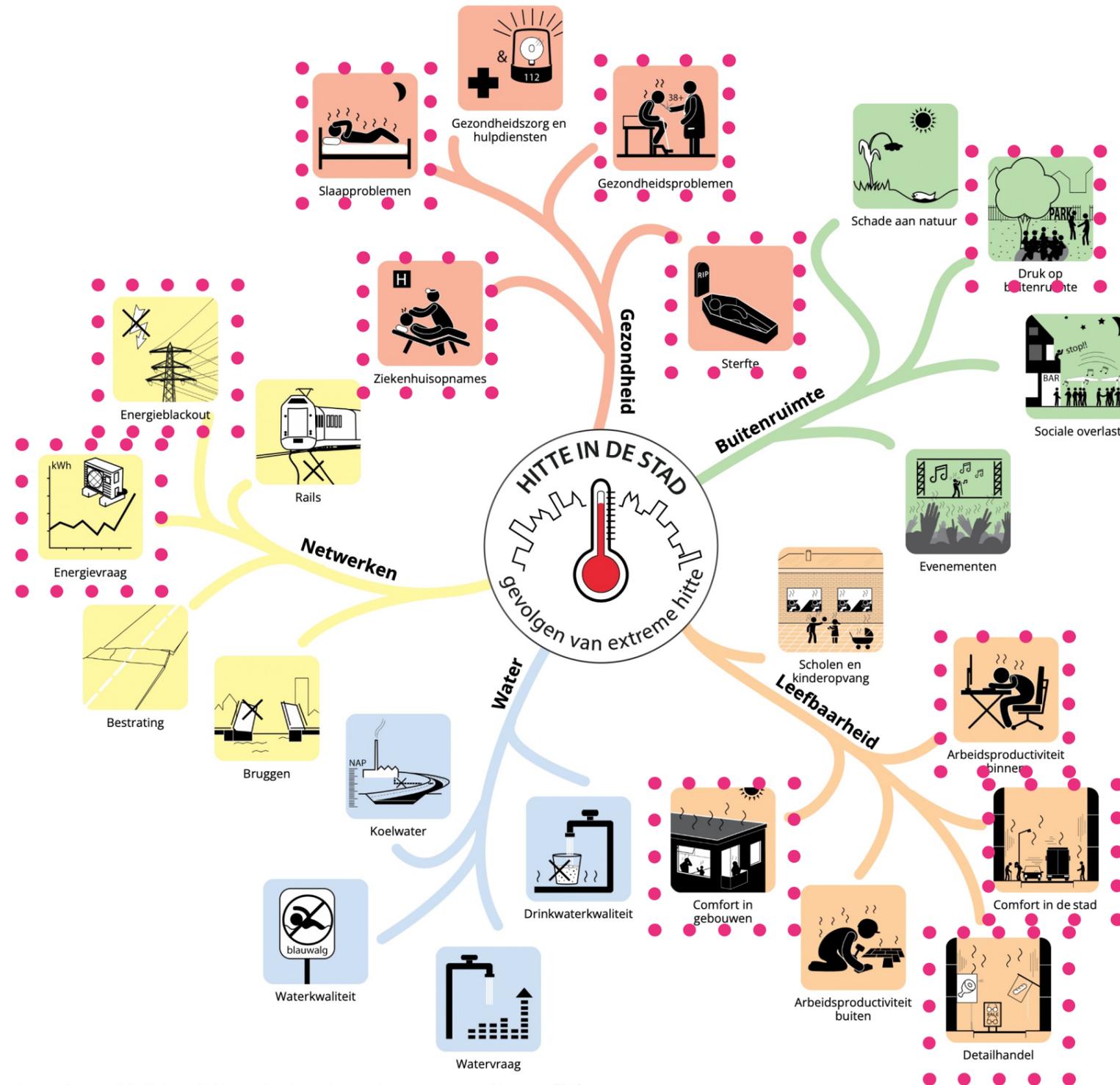
ERIC KLINENBERG SCIENCE OCT 25, 2016 11:00 AM
Want to Survive Climate Change? You'll Need a Good Community
People are realizing that when the floods come or the heat wave settles, neighbors are the true first responders. We must nurture those social ties.

Bibliotheken dicht: te warm voor medewerkers
Verschillende bibliotheken in de regio passen hun openingstijden aan in verband met de hitte. Niet omdat de boeken smelten maar omdat het te warm is voor de medewerkers én bezoekers.
Jitske-Sophie Venema 24-07-18, 11:20 Laatste update: 04-02-19, 11:57

a potential 2050:



city and heat



De mindmap en de factsheets zijn ontwikkeld door de Hogeschool van Amsterdam in samenwerking met TNO.

elderly and heat

Vulnerability:

- thermal sensitivity
- thermo-regulation
- co-morbidity with cardiovascular and respiratory diseases
- dehydration due to lack of thirst



VULNERABILITY (IPCC)

=

exposure +

e.g. living in a hot place or a city

sensitivity -

e.g. having a pre-existing illness

adaptive capacity

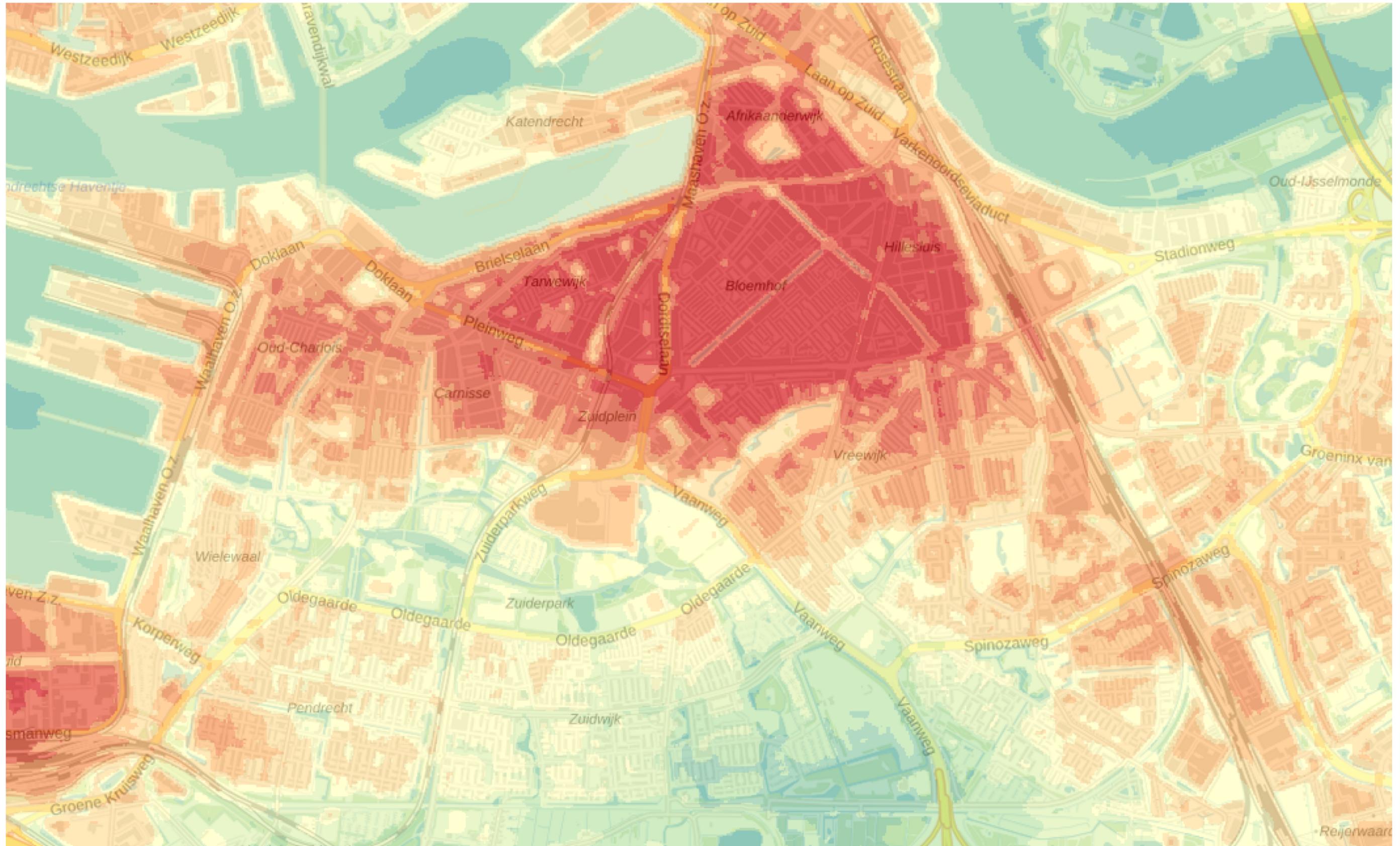
e.g. owning cooling devices

RQ:

How can age-friendly climates be achieved in challenging contexts where conventional methods are difficult to apply?

| | | Literature/ guidelines | Observation | Mapping/ Analysis | Interview |
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| Policy | temperature threshold of 25°C indoors V | X | | | |
| | Classifying regional heatwaves V | X | | | |
| | Start of heat protection remodelling now V | X | | | |
| | Cool public indoor space in walking distance V H | X | | X | X |
| Neighborhood | Complementary sensitivity and adaptive capacity strategies V | X | | | |
| | „Cool streets“ network VH | X | | X | |
| | Parking garages HM | X | X | | X |
| | Site next to open space for outdoor area and maximum PET impact H | | | X | |
| | Materiality/width sidewalks M | X | X | X | |
| | Reorganising street canyon HM | X | | X | |
| Program/activities | Wijktaunmannen for desealing H | | X | X | |
| | Space for overnight guests H | X | | | |
| | Space for community-organised activities C | | X | | X |
| | Volunteering opportunities C | X | | | X |
| | Weekend opening times C | | X | | |
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| | Gardens integrated into building M | | | | X |
| | Low threshold activities C | | | | X |
| | Community-specific activities C | | | | X |
| | Intergenerational activities C | X | | | |
| | Social and community engagement functions V | X | | | |
| Building design | Low tech building V | X | | | |
| | Cool public indoor space H | X | | X | X |
| | Cool public outdoor space VH | X | | X | X |
| | Visually „cool“ H | | X | | |
| | Welcoming but intimate design C | | | | X |
| | Resting places, benches M | X | | X | X |
| | Accesssible building M | X | X | | |
| | Accessible toilets M | X | X | X | |
| | | | | | |
| | V = Vulnerability | H = Heat | M = Mobility | C = Community | |

UHI in Rotterdam South



Summer in Bloemhof: Christine's experience:

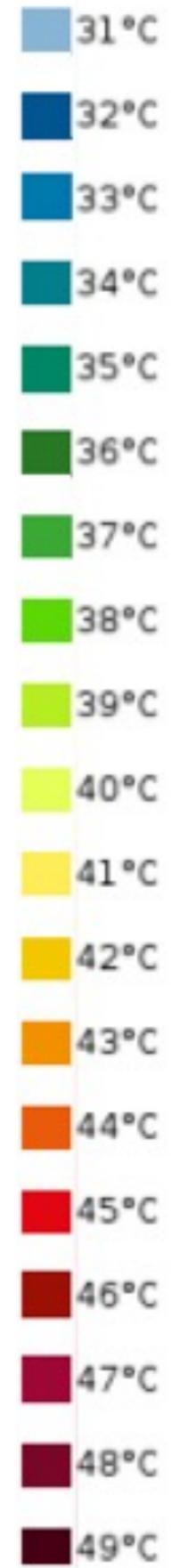
The heat usually stays for some weeks and the old houses make it worse, nobody in our street has air-conditioning, the electricity would be too expensive.

I use an electric fan and keeps my windows open to cool the house.

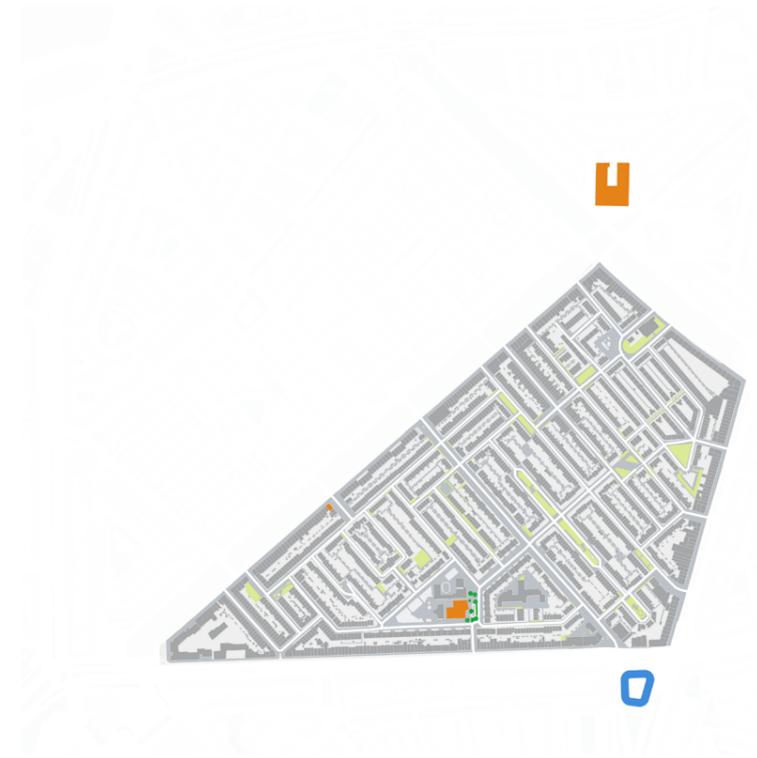
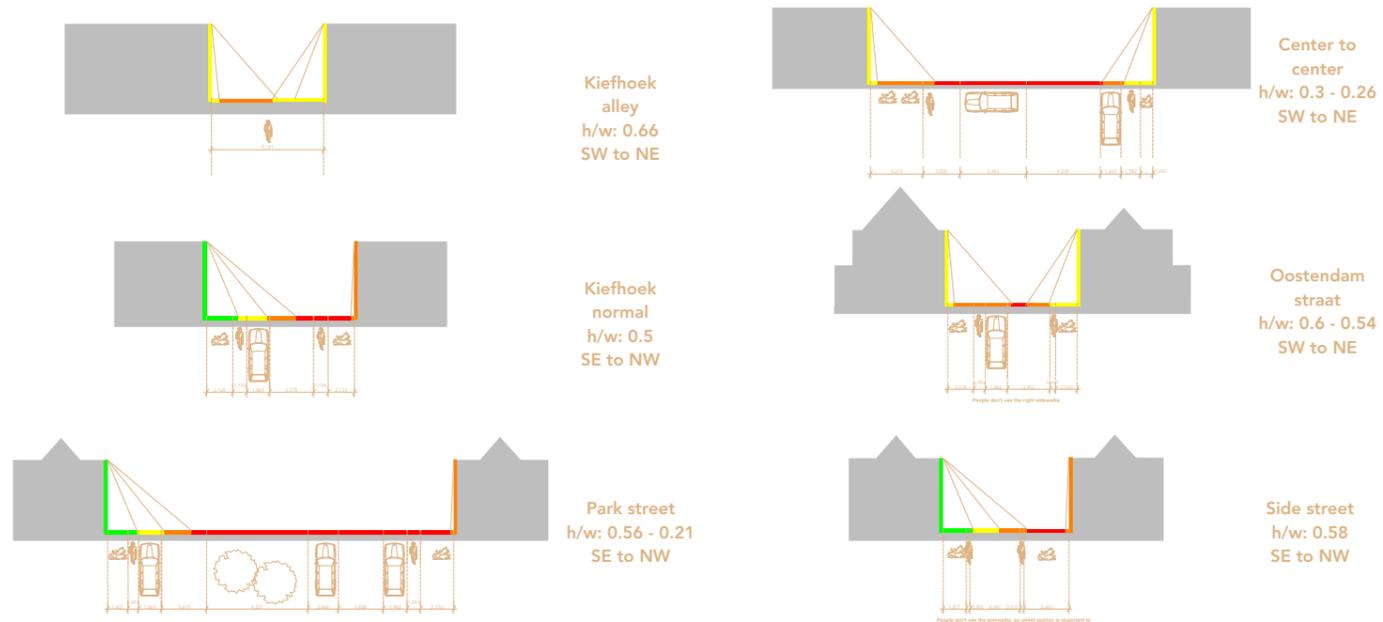
My asthma gets worse.

When it gets too hot, I might linger a little in the cool supermarket in Hillesluis after shopping.

Sometimes during the hot weeks, I will take my friend and take the tram to the beach and spend the day there.



PET



Canyon analysis

cooled public buildings



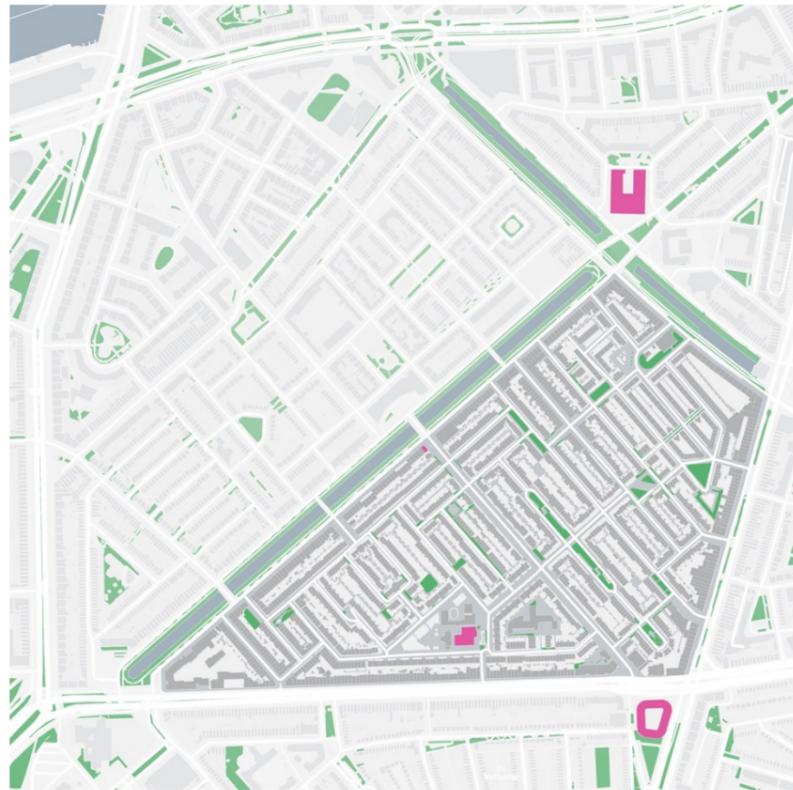
Cool street/cool outdoor space one turn away two turns away three turns away

Space syntax analysis for "cool" streets



PET in sealed gardens

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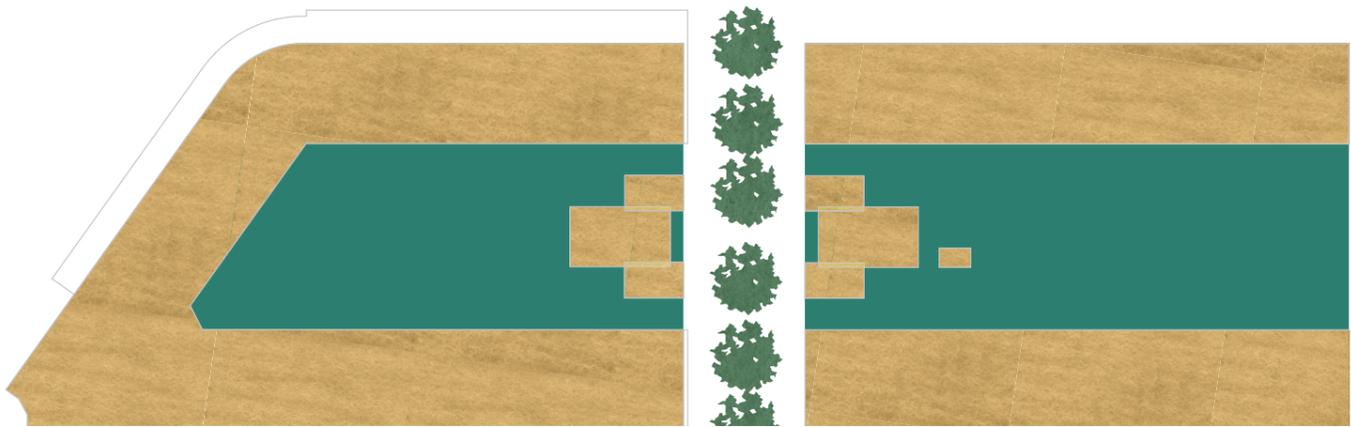
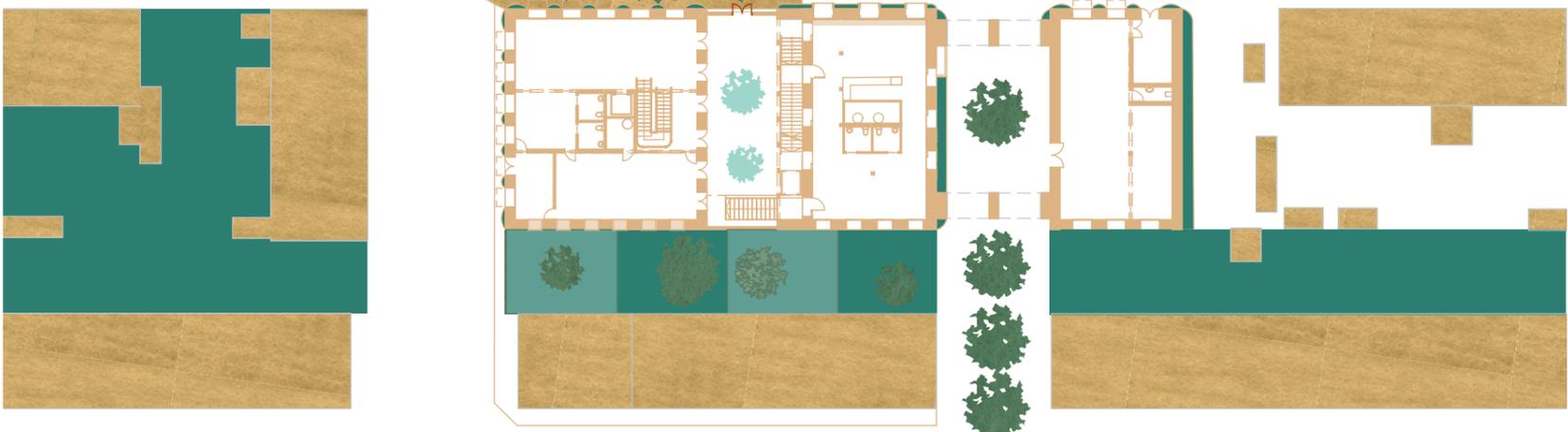
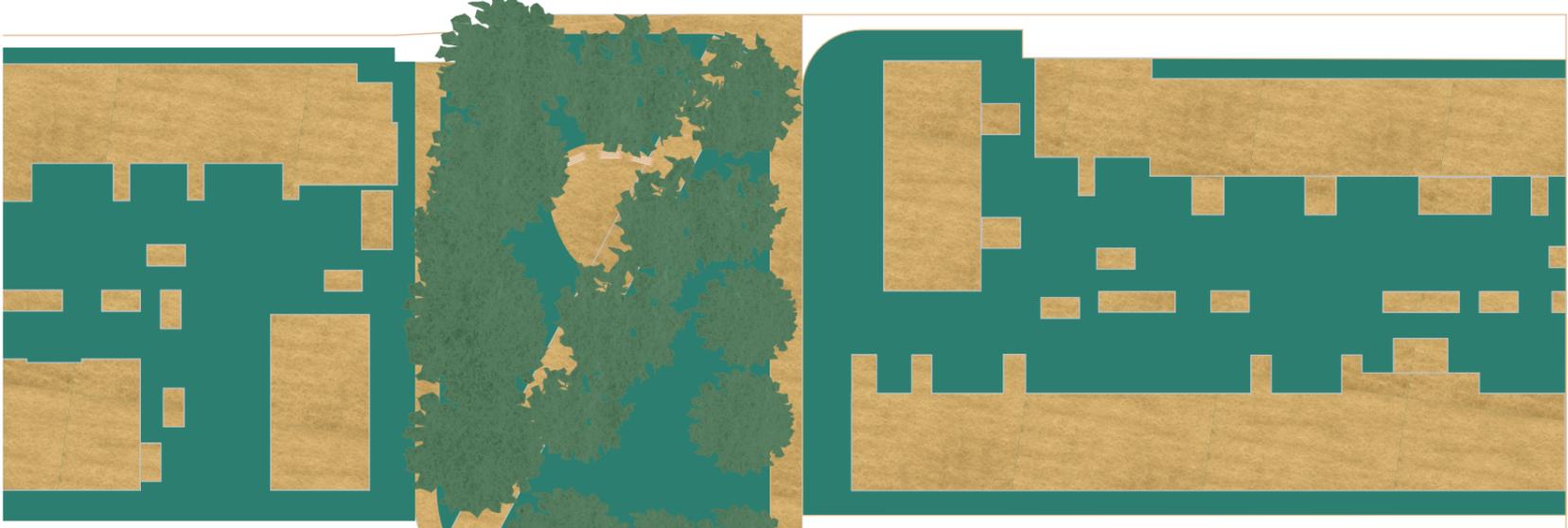
lack of initiatives in Bloemhof in comparison

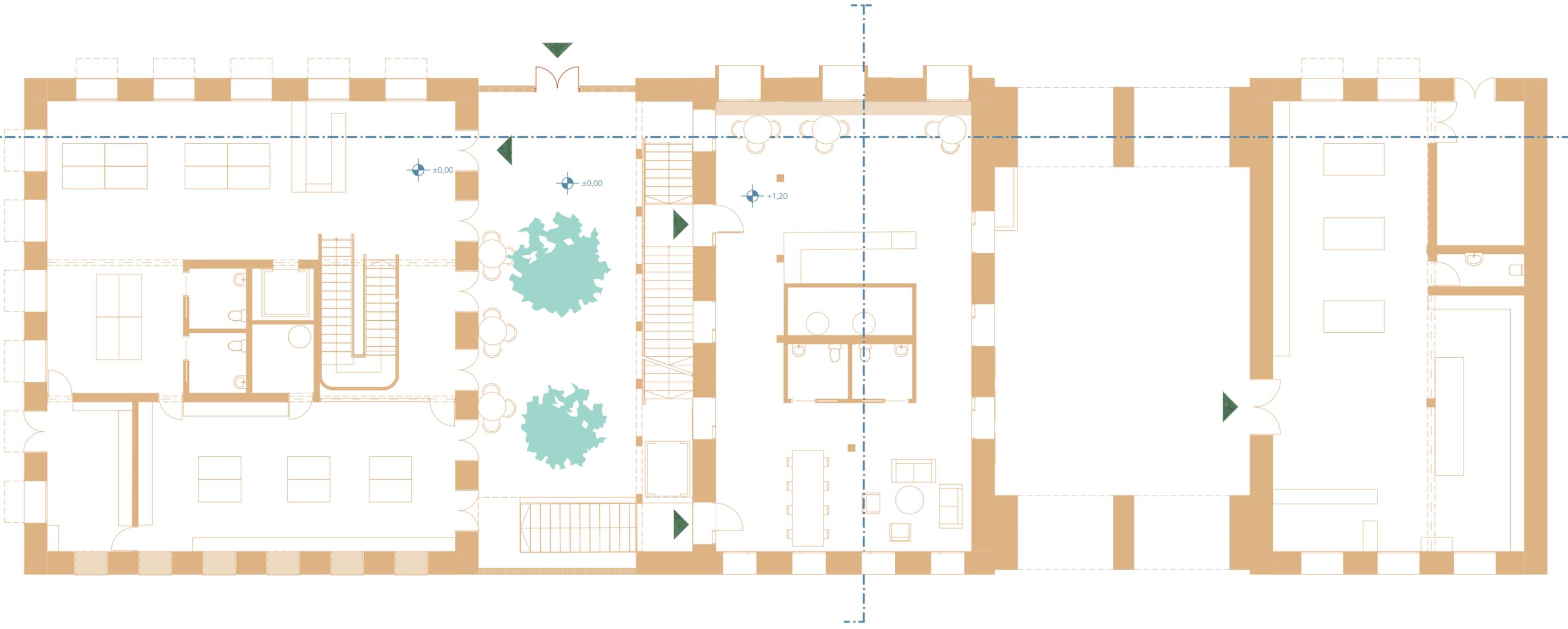


| Community centers | Huis van de Wijk Irene (municipality) | Café Blend (commercial, church) | Bibliotheek Feijenoord (municipality) | De Hillevliet (Private, social entrepreneur) |
|-------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------|
| 1. Education & Personal Development | <ul style="list-style-type: none"> Integration through language | | <ul style="list-style-type: none"> Digital competence Children's reading Language café | <ul style="list-style-type: none"> Coaching |
| 2. Arts, Culture & Creativity | | <ul style="list-style-type: none"> Music | | <ul style="list-style-type: none"> Dance Art |
| 3. Social & Community Activities | <ul style="list-style-type: none"> Coffee Children's activities Activities for adults + seniors "Praatgroep marocaanse dames" | <ul style="list-style-type: none"> Café Board games Worship | <ul style="list-style-type: none"> Coffee | |
| 4. Food & Hospitality | <ul style="list-style-type: none"> Soup | <ul style="list-style-type: none"> Café Community dinner | | <ul style="list-style-type: none"> Food/cooking |
| 5. Well-being & Support | <ul style="list-style-type: none"> Mental health Financial support program | | | |
| 6. Libraries & Reading | | | <ul style="list-style-type: none"> Library Children's reading | <ul style="list-style-type: none"> Library |

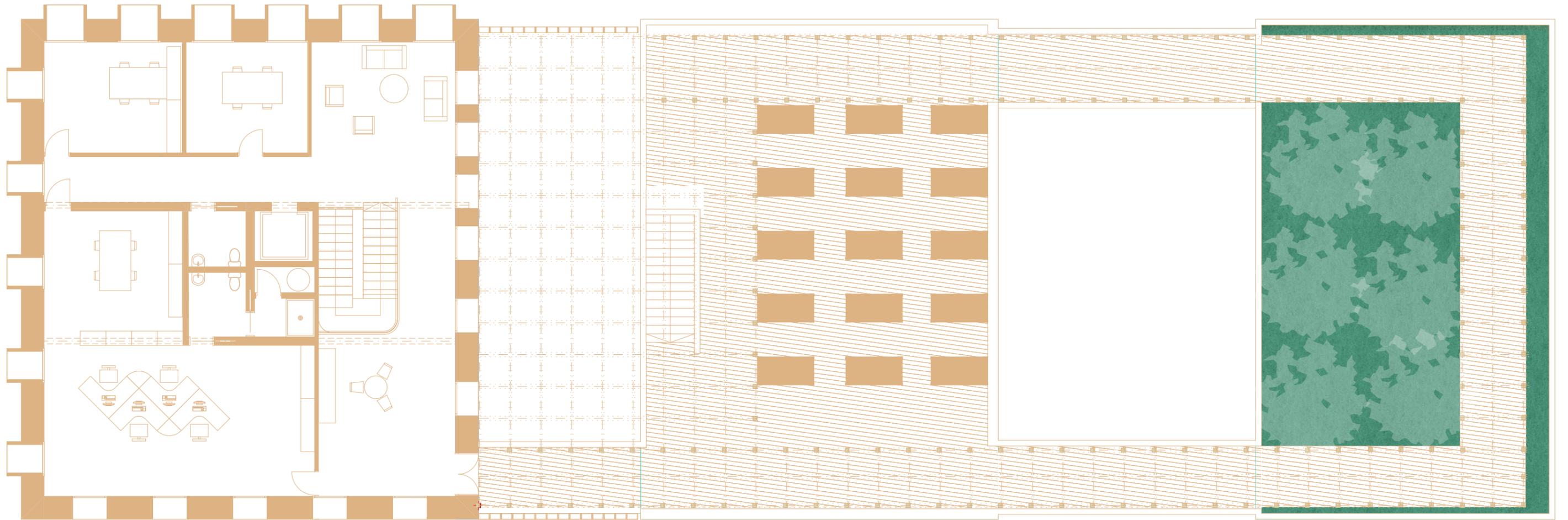
lack of intergenerational activities

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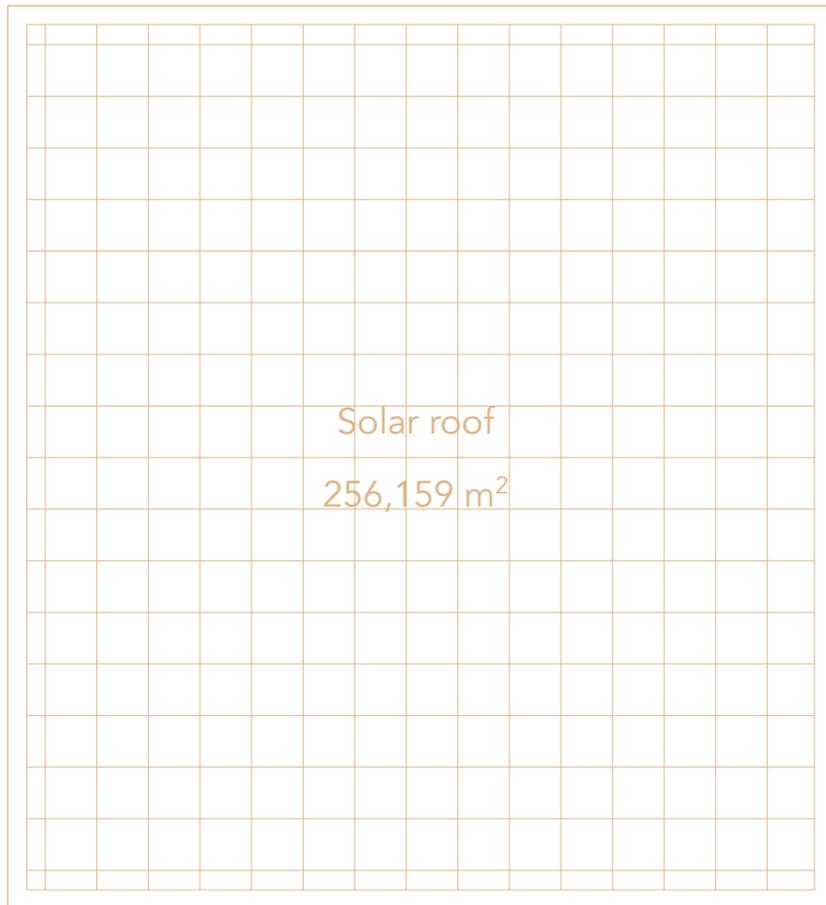








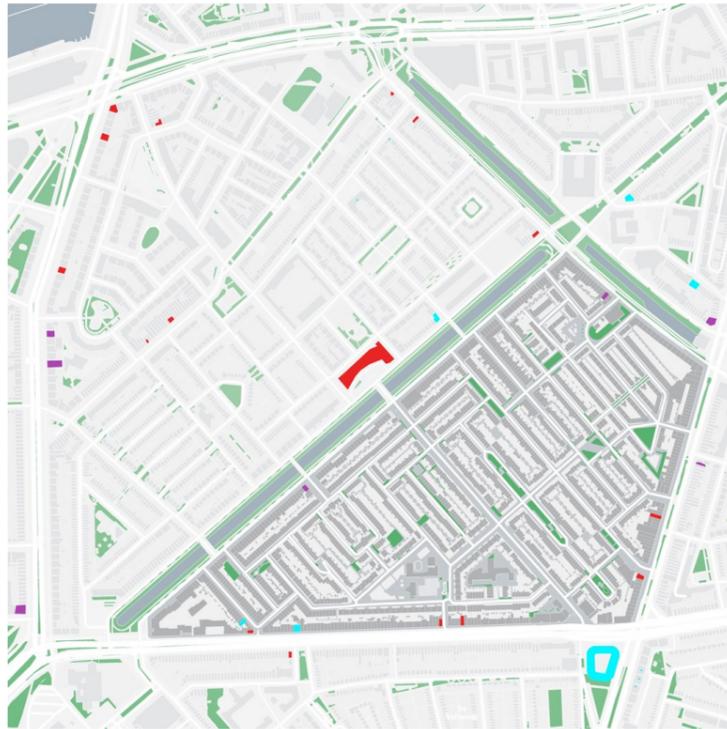
| month | PV-system 1 |
|-------|-------------|
| j | 1.086 |
| f | 1.898 |
| m | 3.250 |
| a | 3.621 |
| m | 4.866 |
| j | 4.627 |
| j | 4.904 |
| a | 4.322 |
| s | 3.120 |
| o | 2.057 |
| n | 1.251 |
| d | 767 |
| year | 35.768 |



age-friendly build environment: mobility



informal support systems, lack of inclusive design



decentralised everyday functions



inadequate pedestrian infrastructure



informal support systems, lack of inclusive design

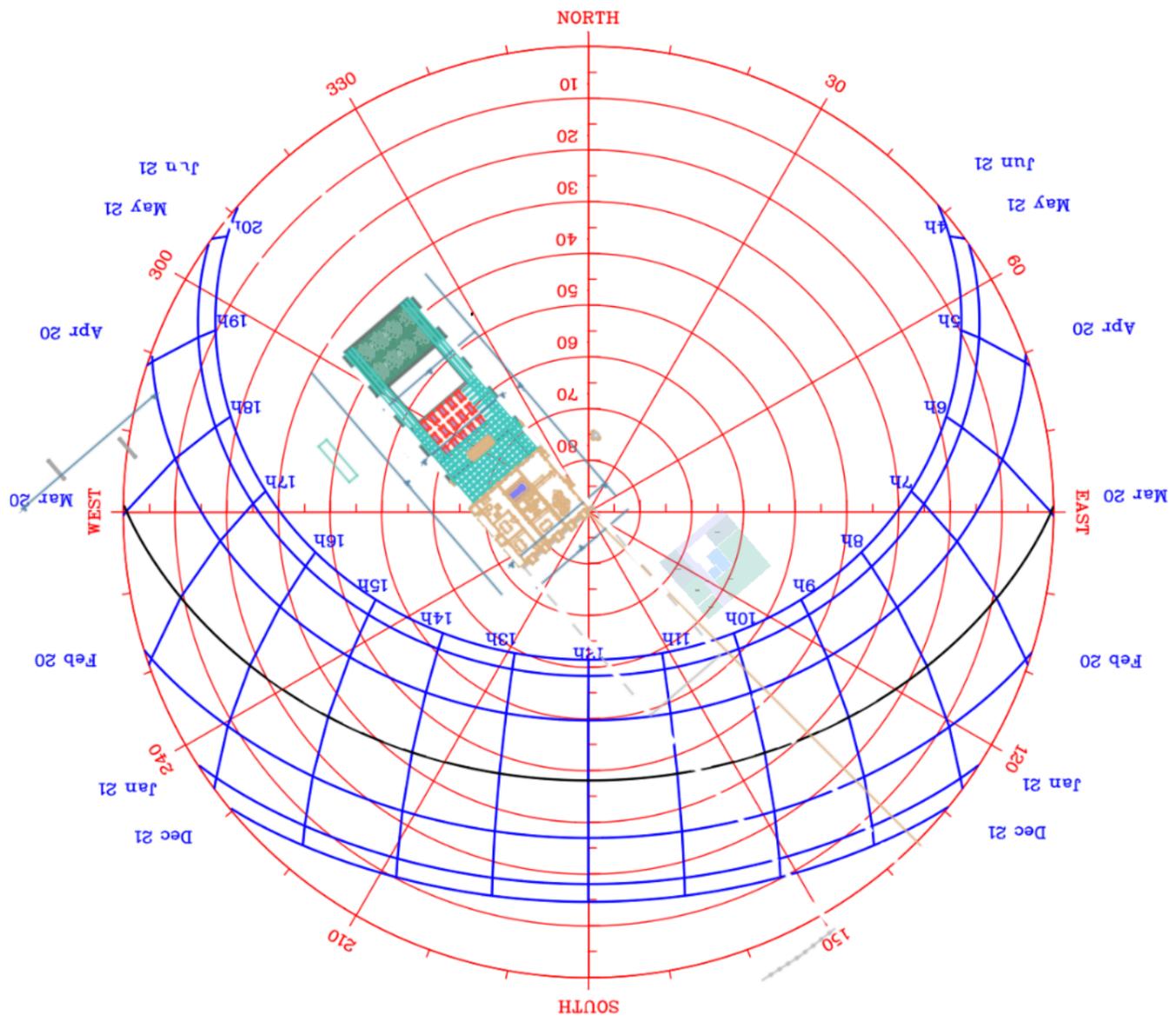
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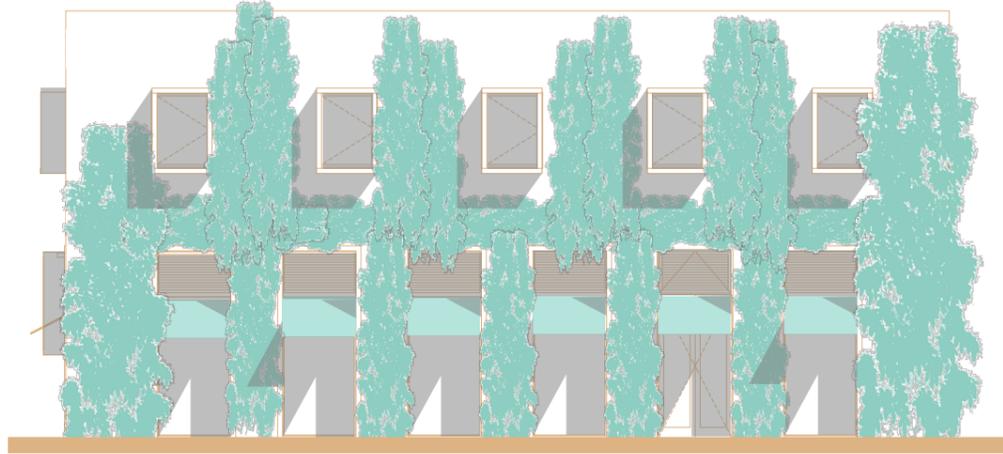


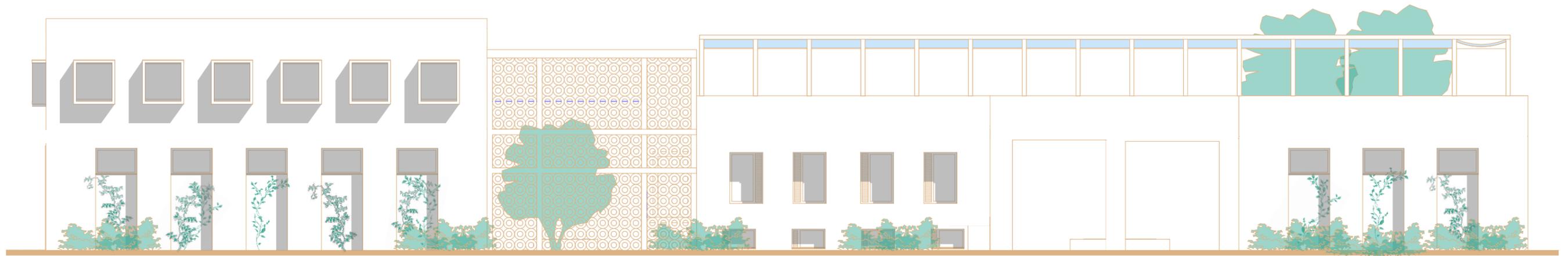


*Site:
Kiefhoek
(Bloemhof
South)*











cooling effect green facade

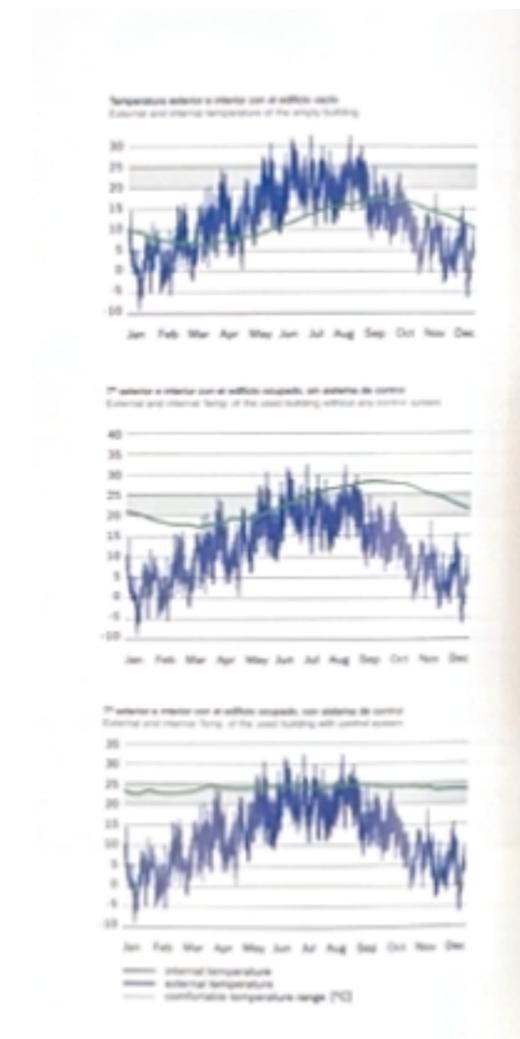
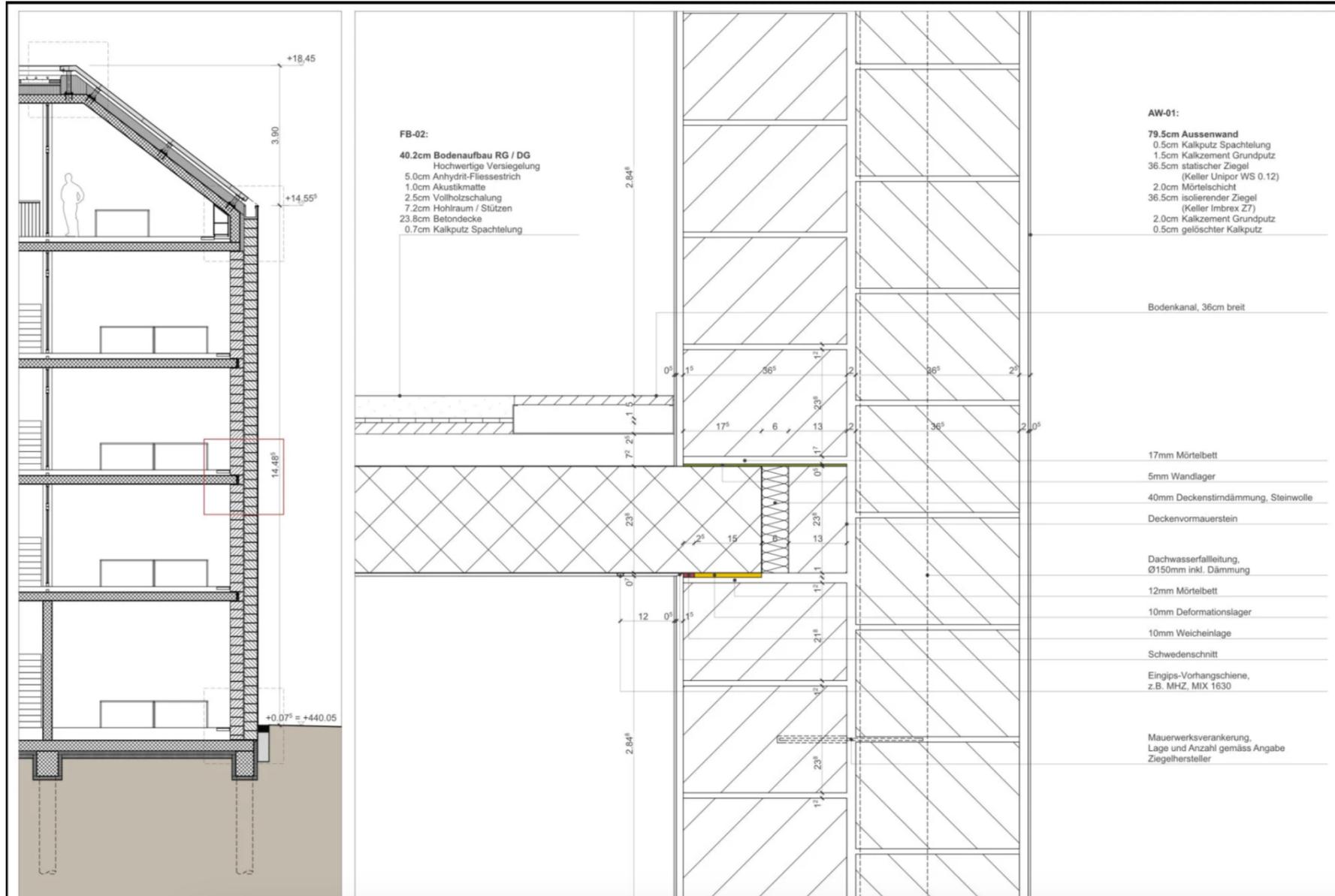


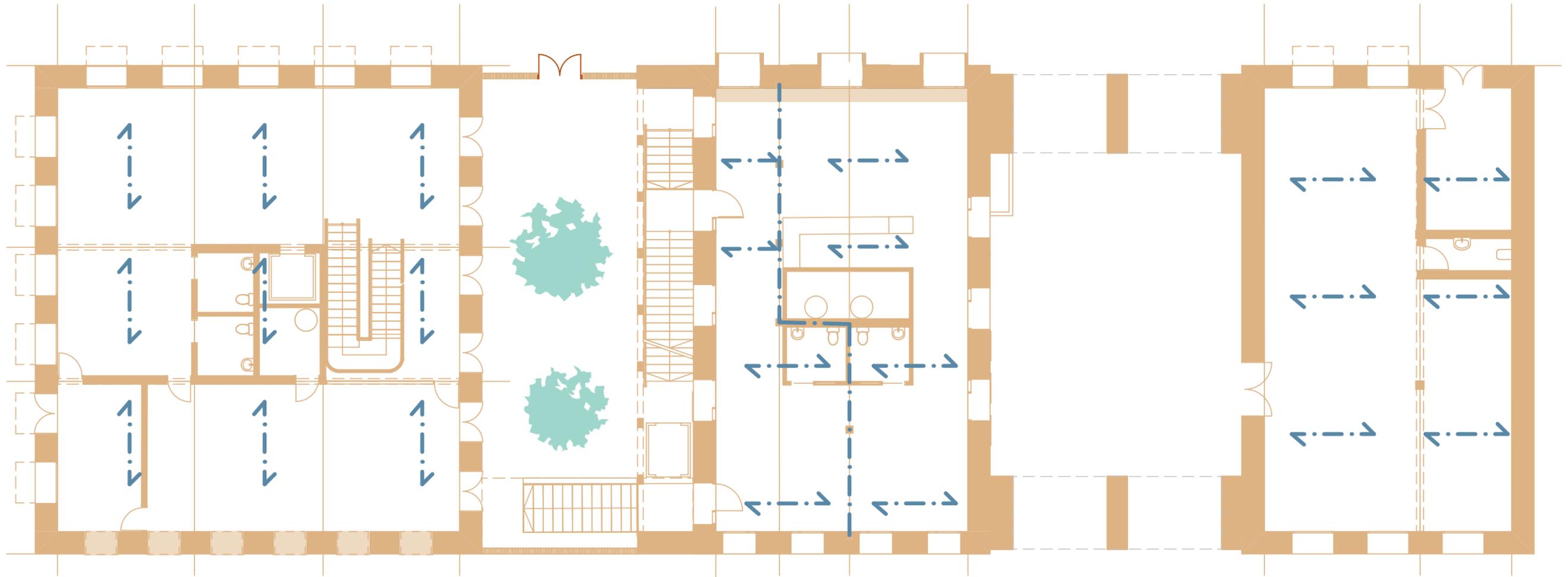
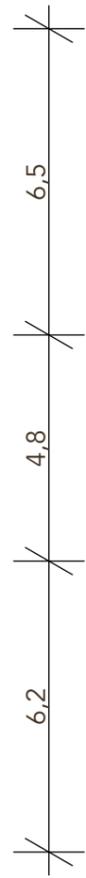
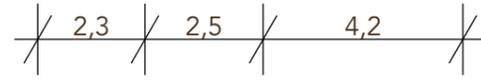
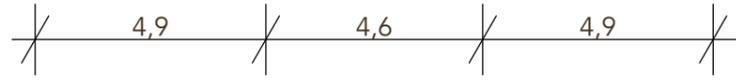
cooling effect green
facade:
aprox. 1,8°C

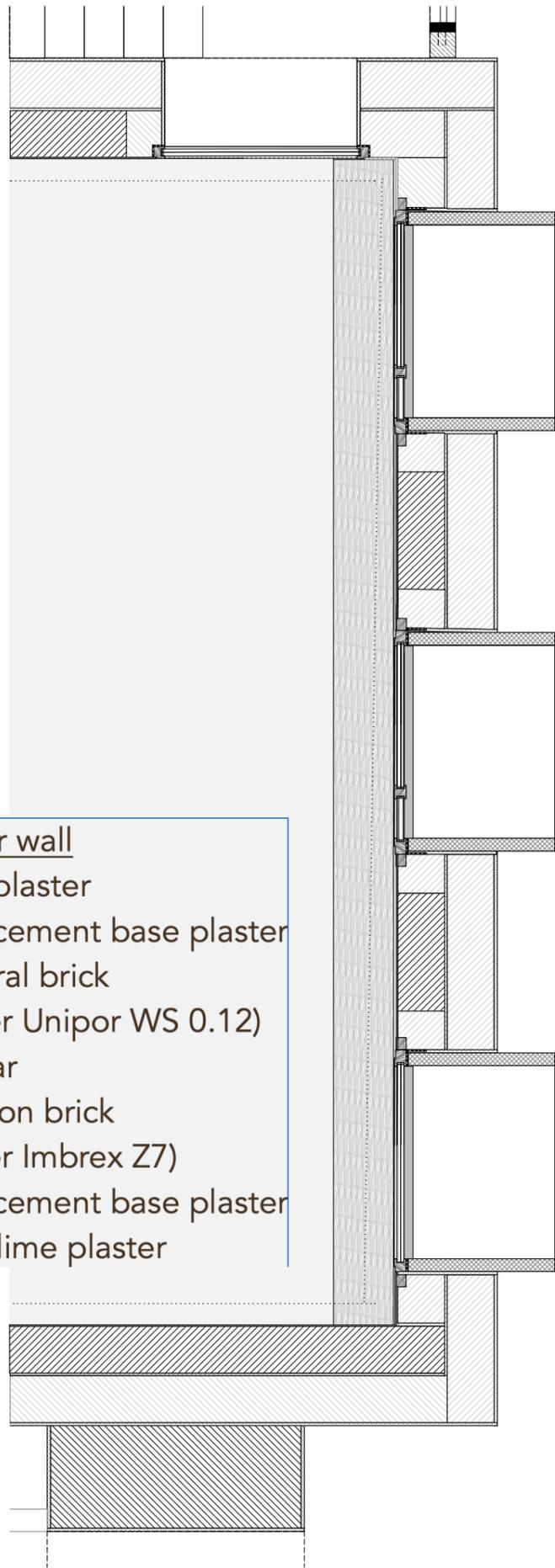


REFERENCE: 2226

no heating, no cooling. temperatures between 22 and 26°C throughout the year in the current climate





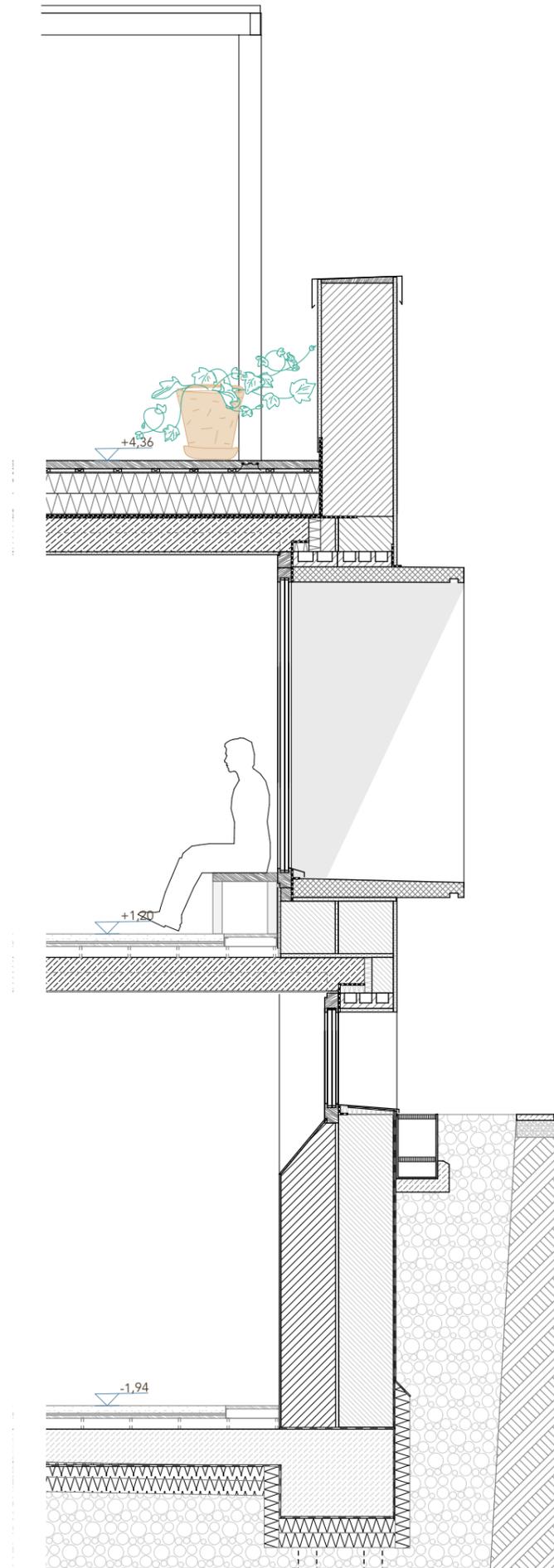


79.5 exterior wall
 0.5cm lime plaster
 1.5cm lime cement base plaster
 36.5 structural brick
 (Keller Unipor WS 0.12)
 2.0cm mortar
 36.5 insulation brick
 (Keller Imbrex Z7)
 2.0cm lime cement base plaster
 0.5 (slaked) lime plaster

63cm inverted roof / terrace structure
 5.5cm wood flooring
 5/3 counterbattens
 separation layer
 28cm insulation (incl. gradient)
 waterproofing bitumen
 22.5cm wide slab concrete
 0.7cm lime plaster

38.9 cm floor structure / finishing
 sealing
 5.0cm anhydrit self-leveling screed
 1.0cm acoustic insulation mat
 2.5cm solid wood formwork
 7.2cm cavity / supports
 22.5cm wide slab concrete
 0.7cm lime plaster

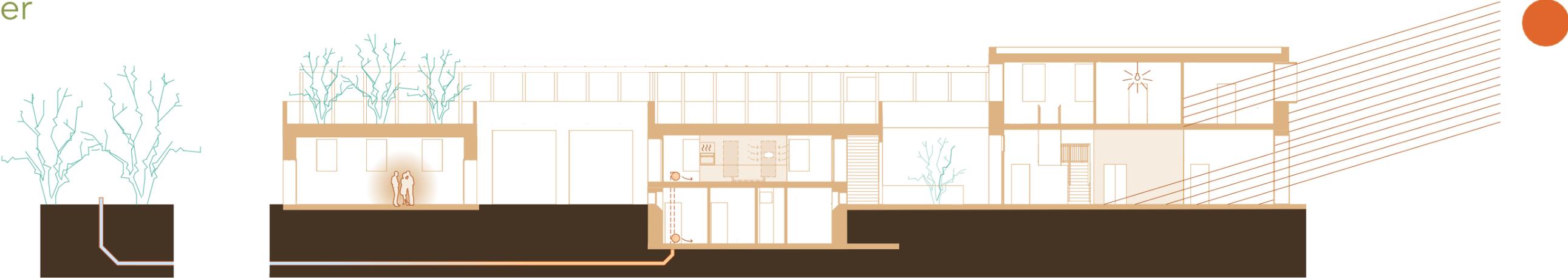
foundation / souterrain floor
 sealing
 5.0cm anhydrit self-leveling screed
 1.0cm acoustic insulation mat
 2.5cm solid wood formwork
 7.2cm cavity / supports
 25cm concrete base slab
 waterproofing
 20cm perimeter insulation



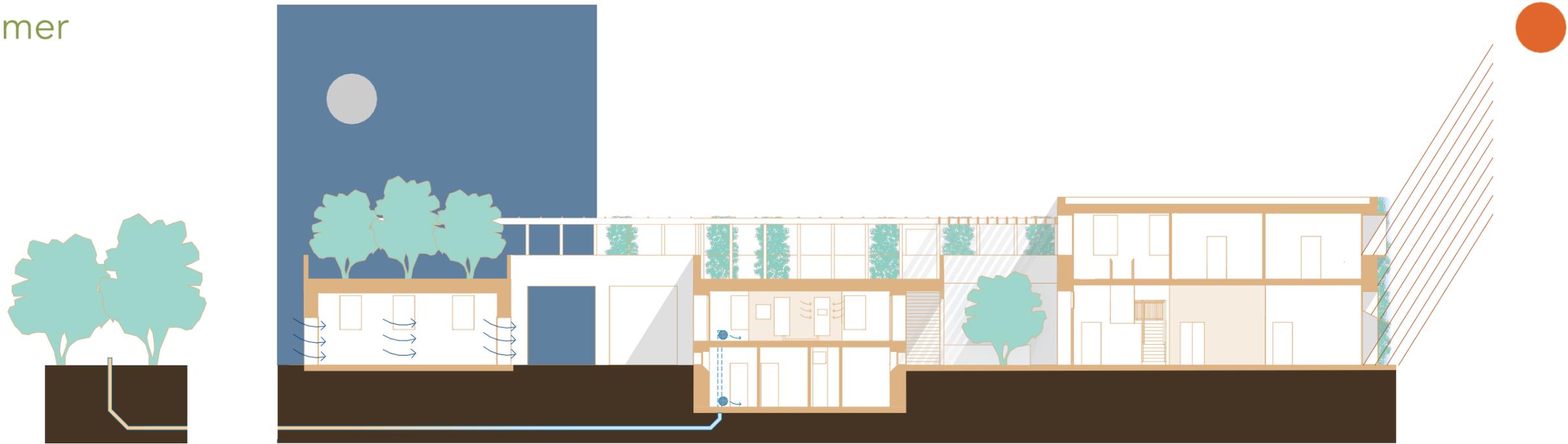
autumn / spring



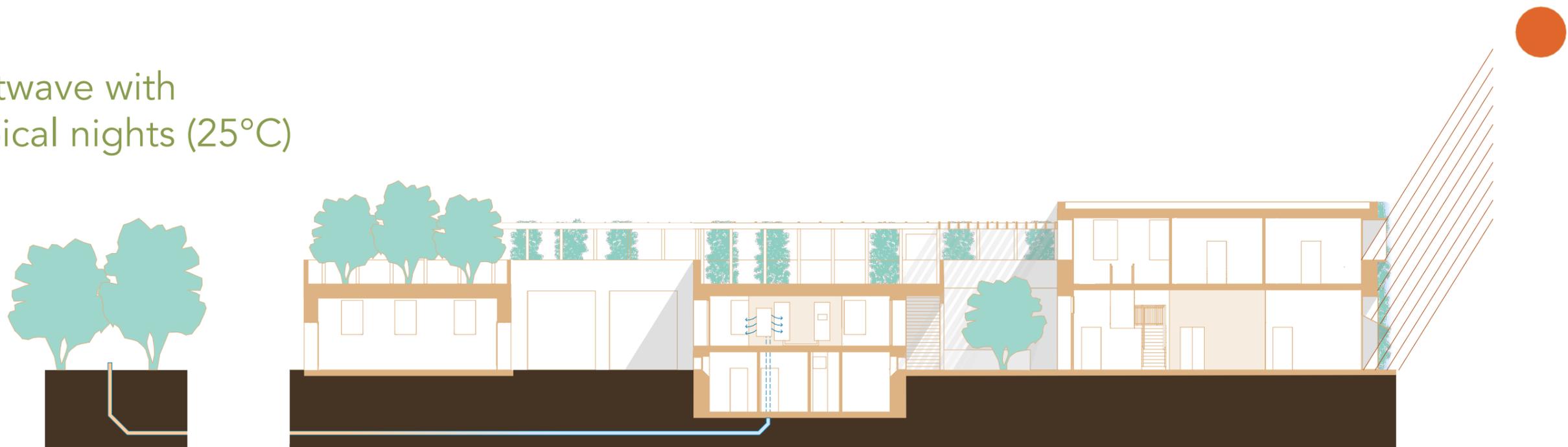
winter



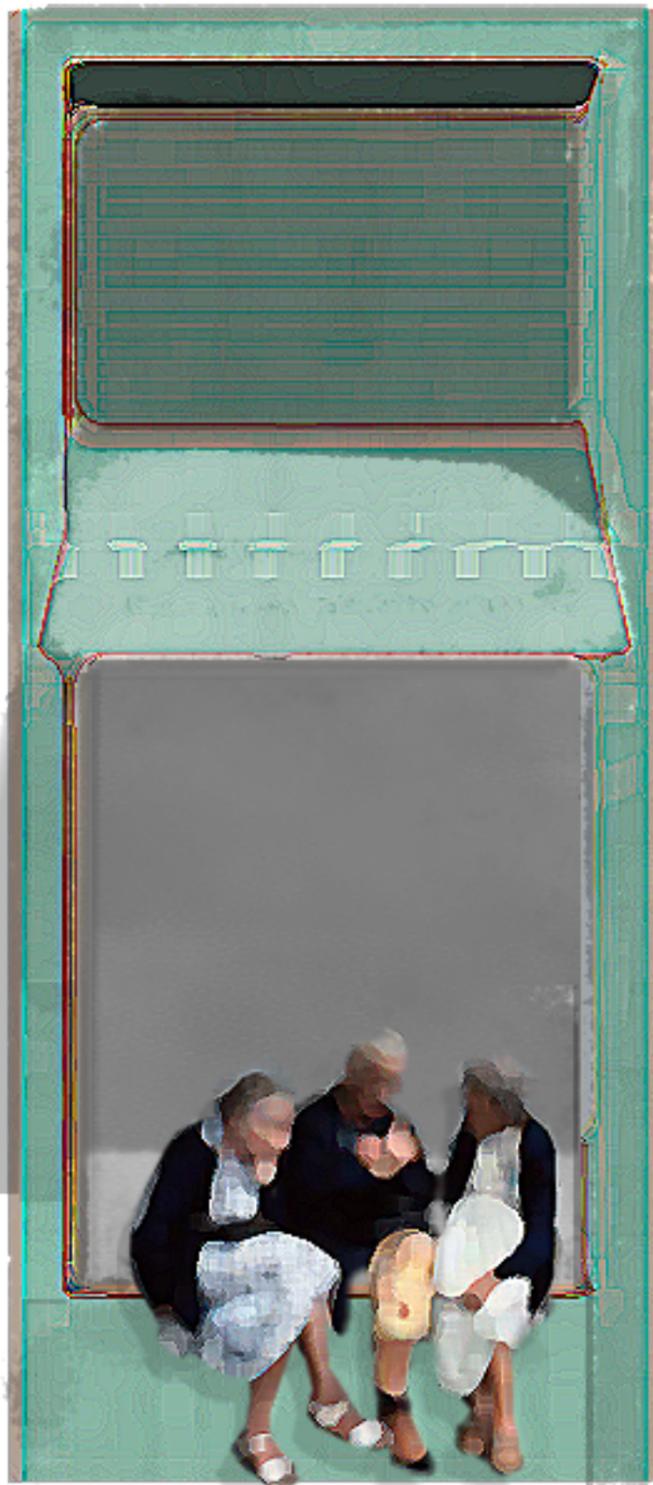
summer



heatwave with
tropical nights (25°C
+)







Thank you!