



DE CENTRALE

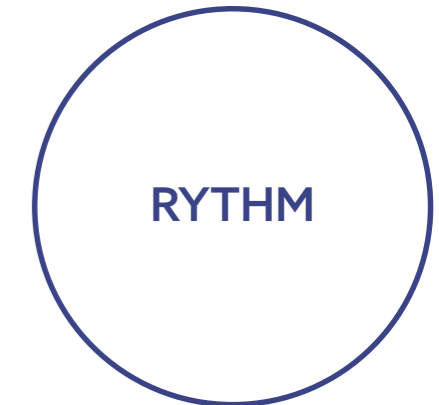
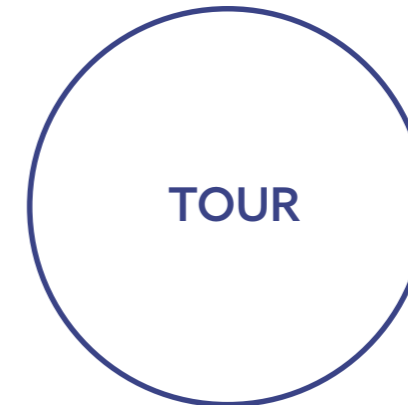
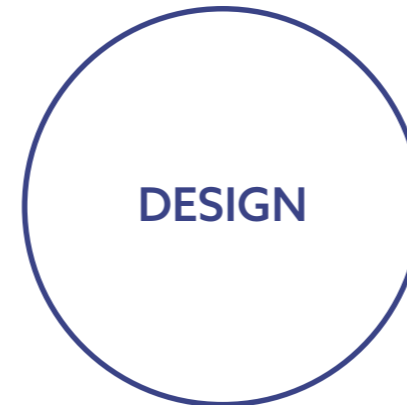
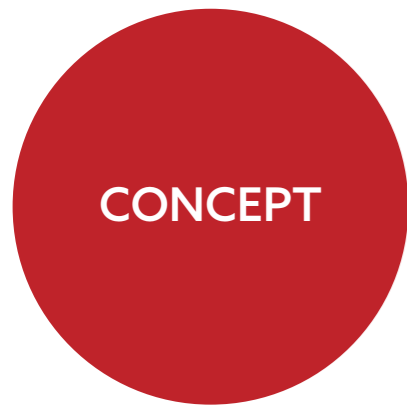
Public indoor pool and
datacentre located in the
West Port of Amsterdam.

Femke Groot | 4550862
Technische Universiteit Delft, MSc Architecture

Tutors: Annebregje Snijders, Jos de Krieger & Ger Warries



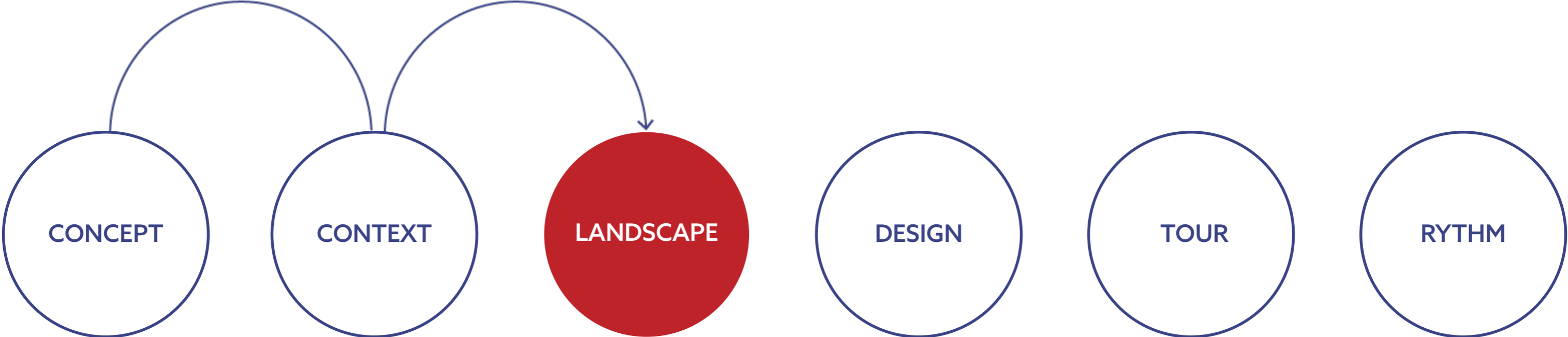
0.1 INTRODUCTION | ONDERTITEL



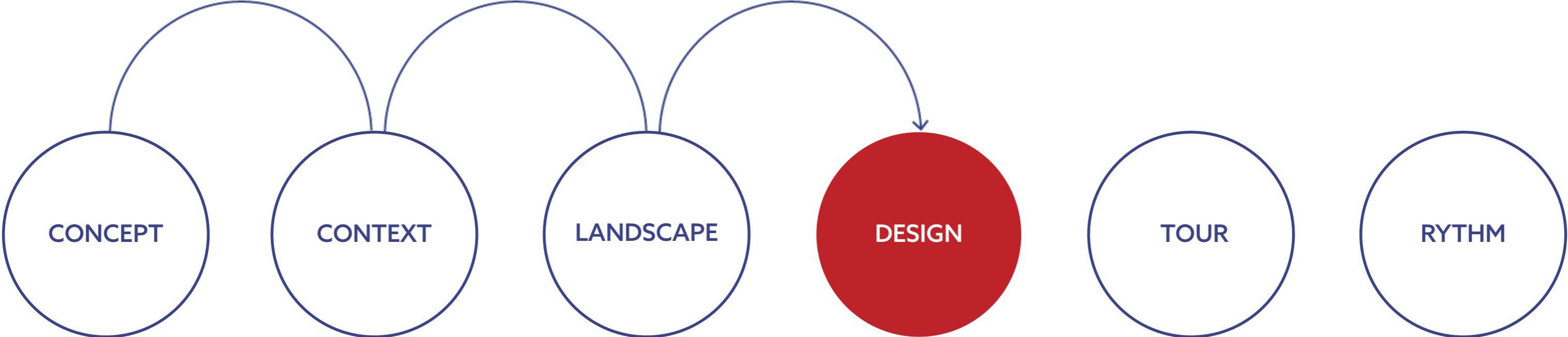
0.1 INTRODUCTION | ONDERTITEL



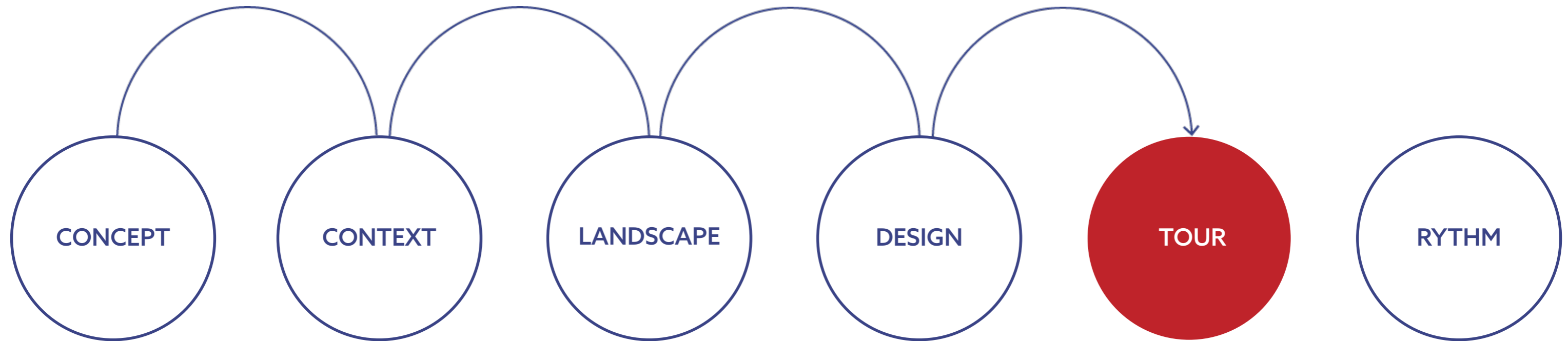
0.1 INTRODUCTION | ONDERTITEL



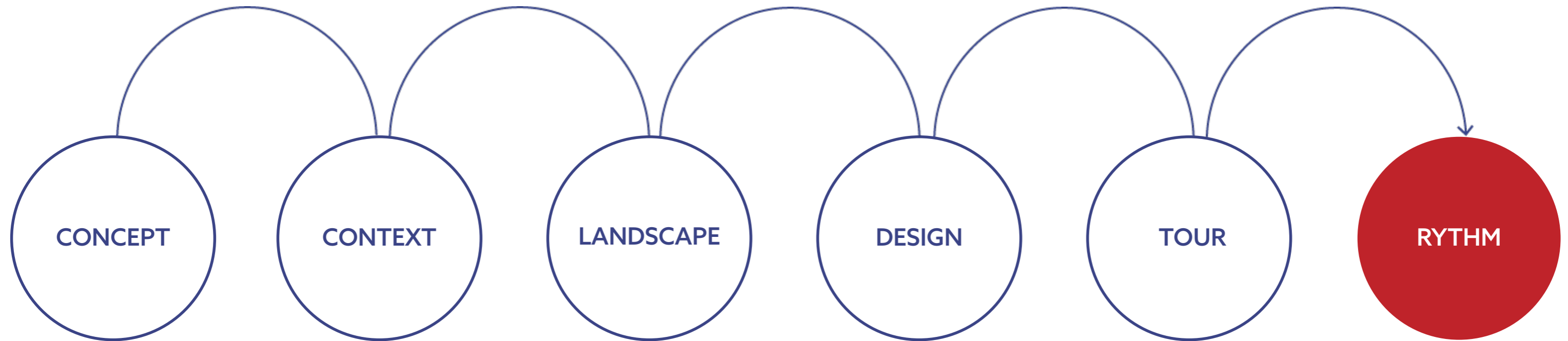
0.1 INTRODUCTION | ONDERTITEL



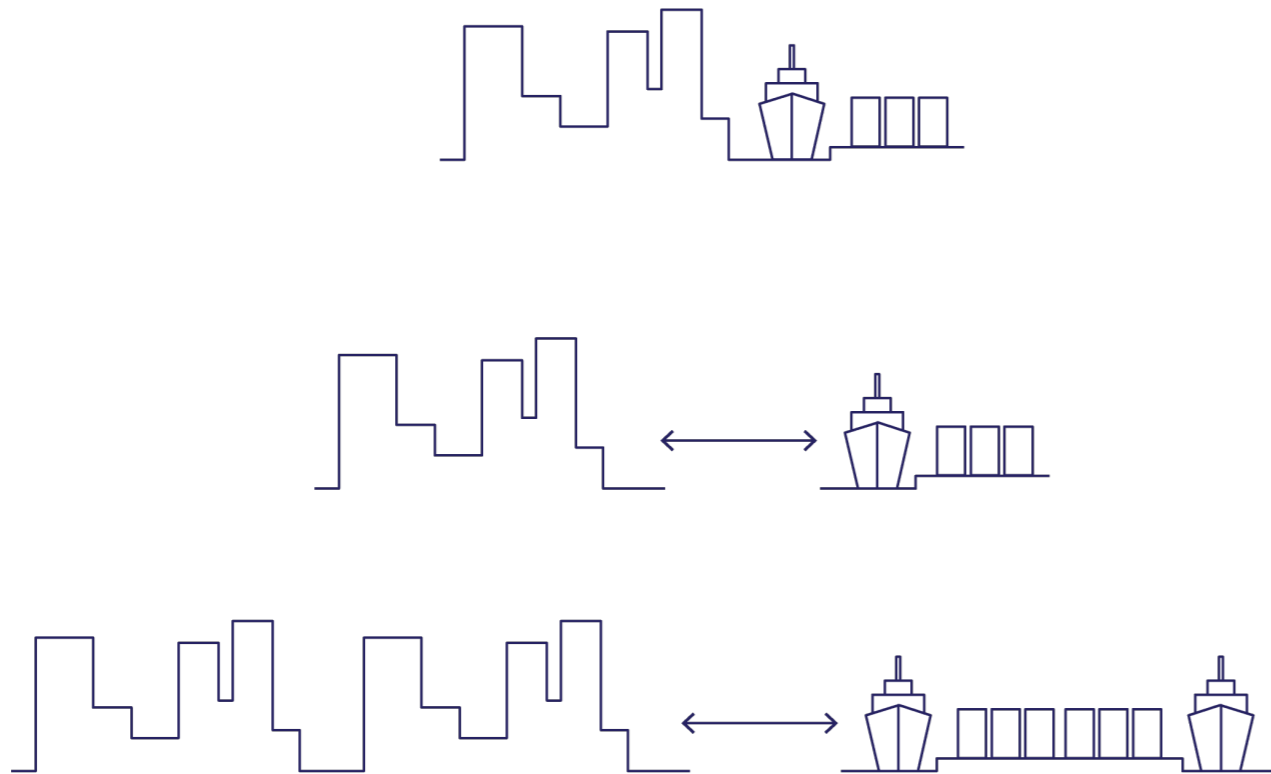
0.1 INTRODUCTION | ONDERTITEL



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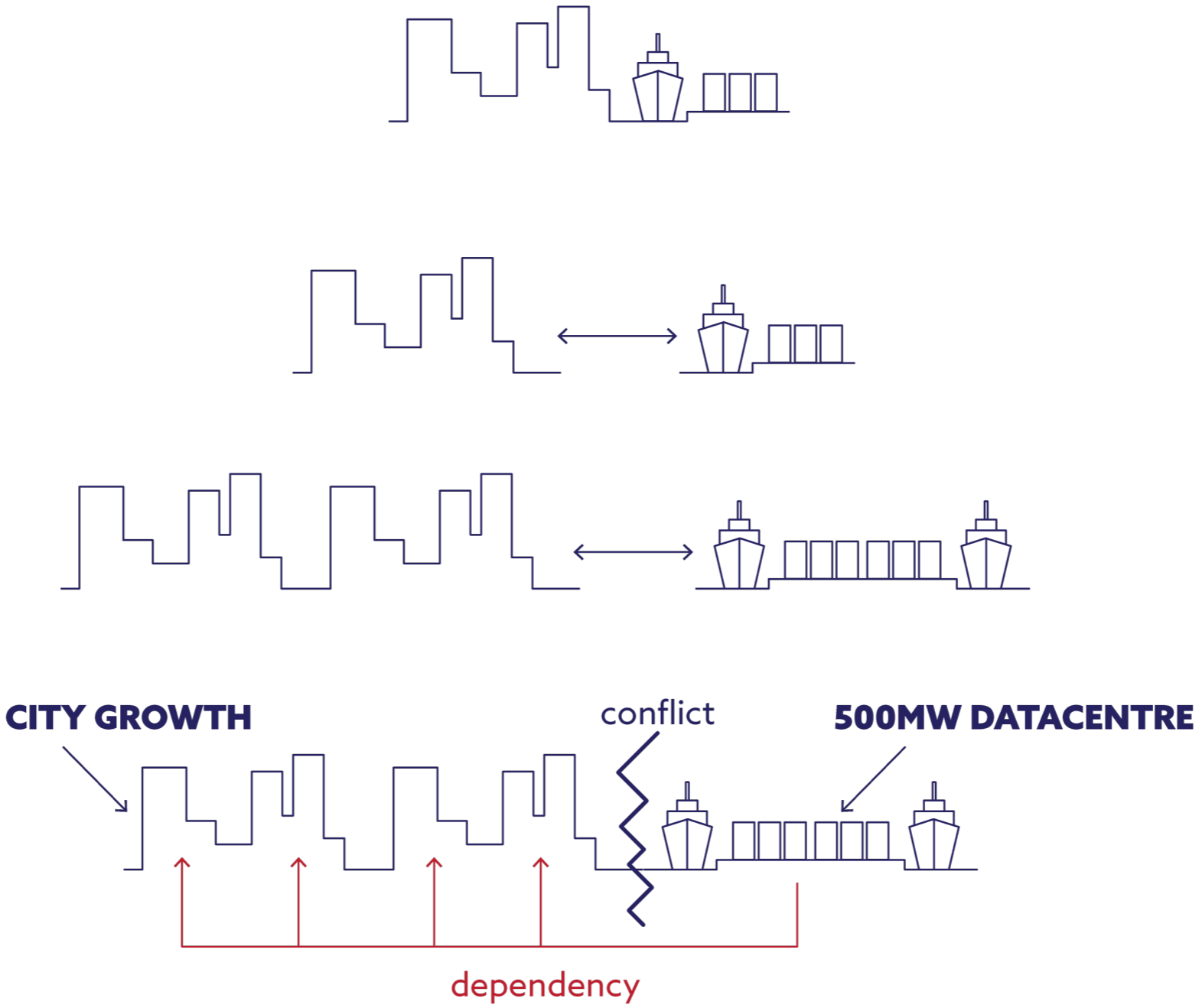


1.1 CONCEPT | PROBLEM STATEMENT



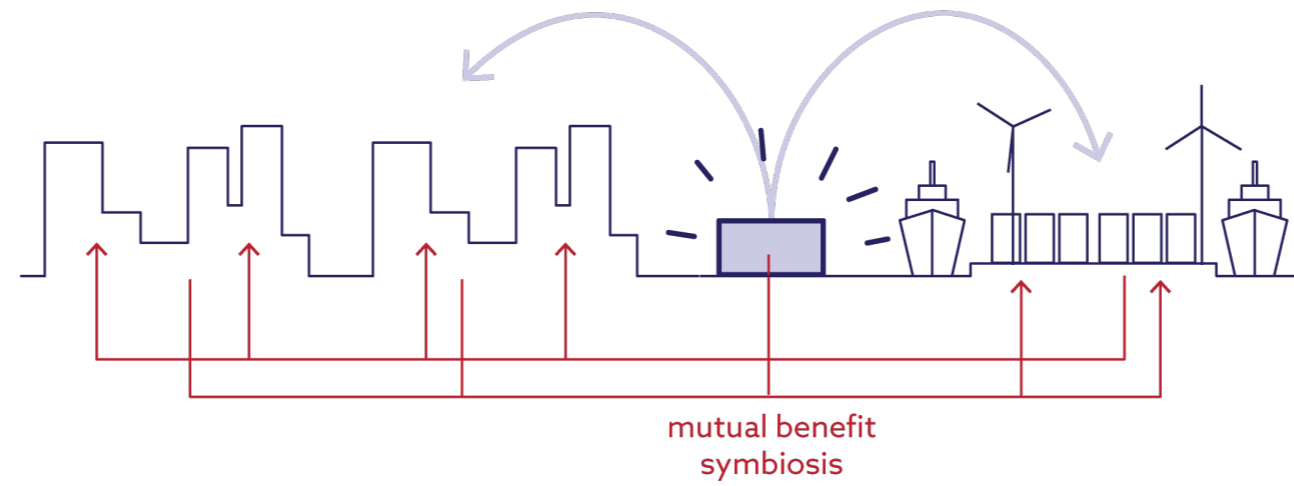
city and port grew apart, programatically
and spatially

1.1 CONCEPT | PROBLEM STATEMENT



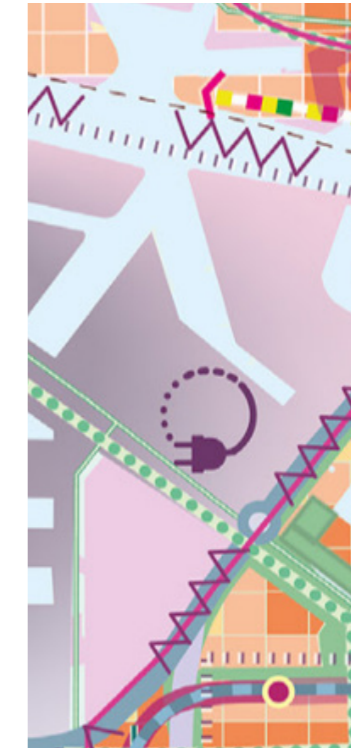
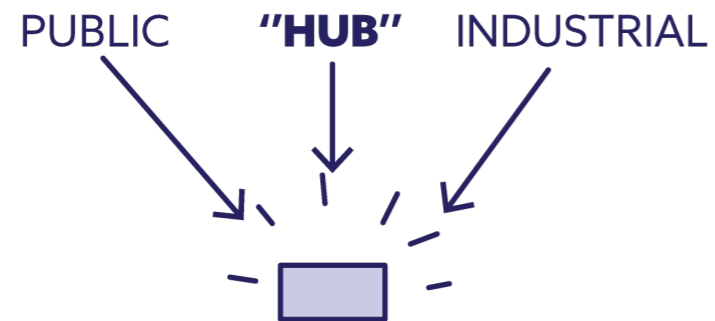
lack of space leads to conflicts at the border,
but they do depend on each other

1.1 CONCEPT | PROBLEM STATEMENT



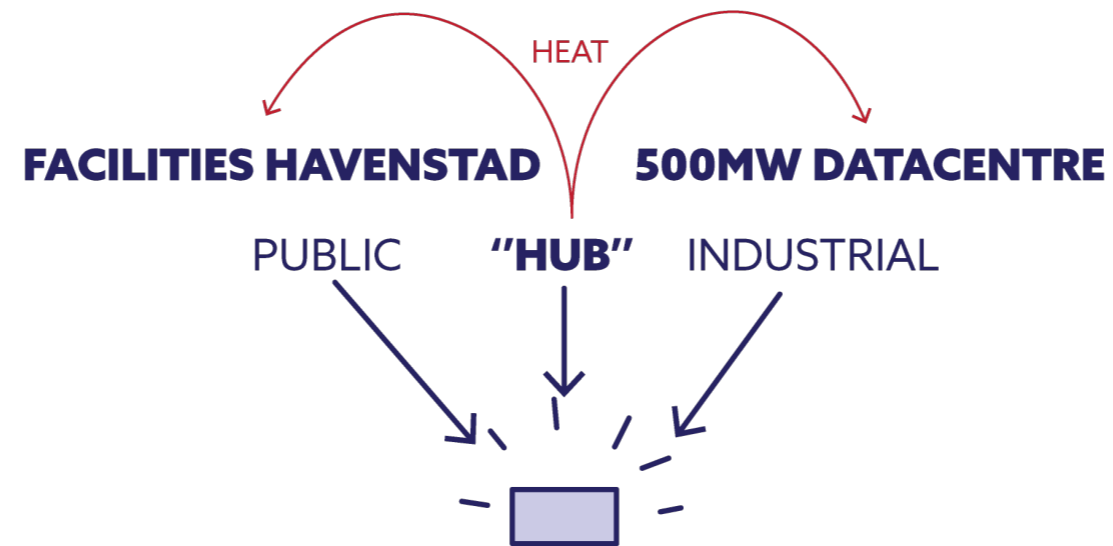
however, there is potential for the port and city to work in symbiosis

1.1 CONCEPT | PROBLEM STATEMENT



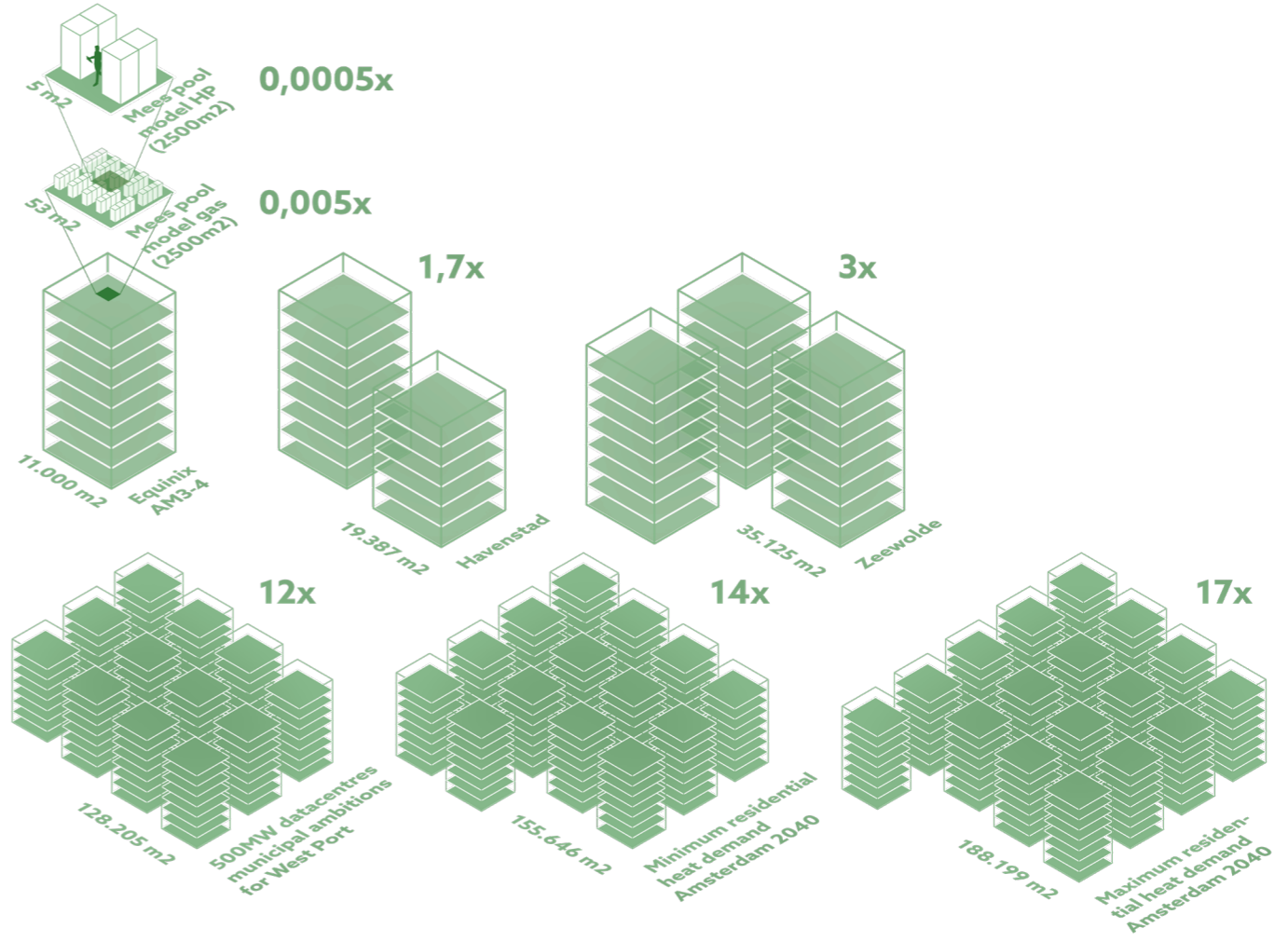
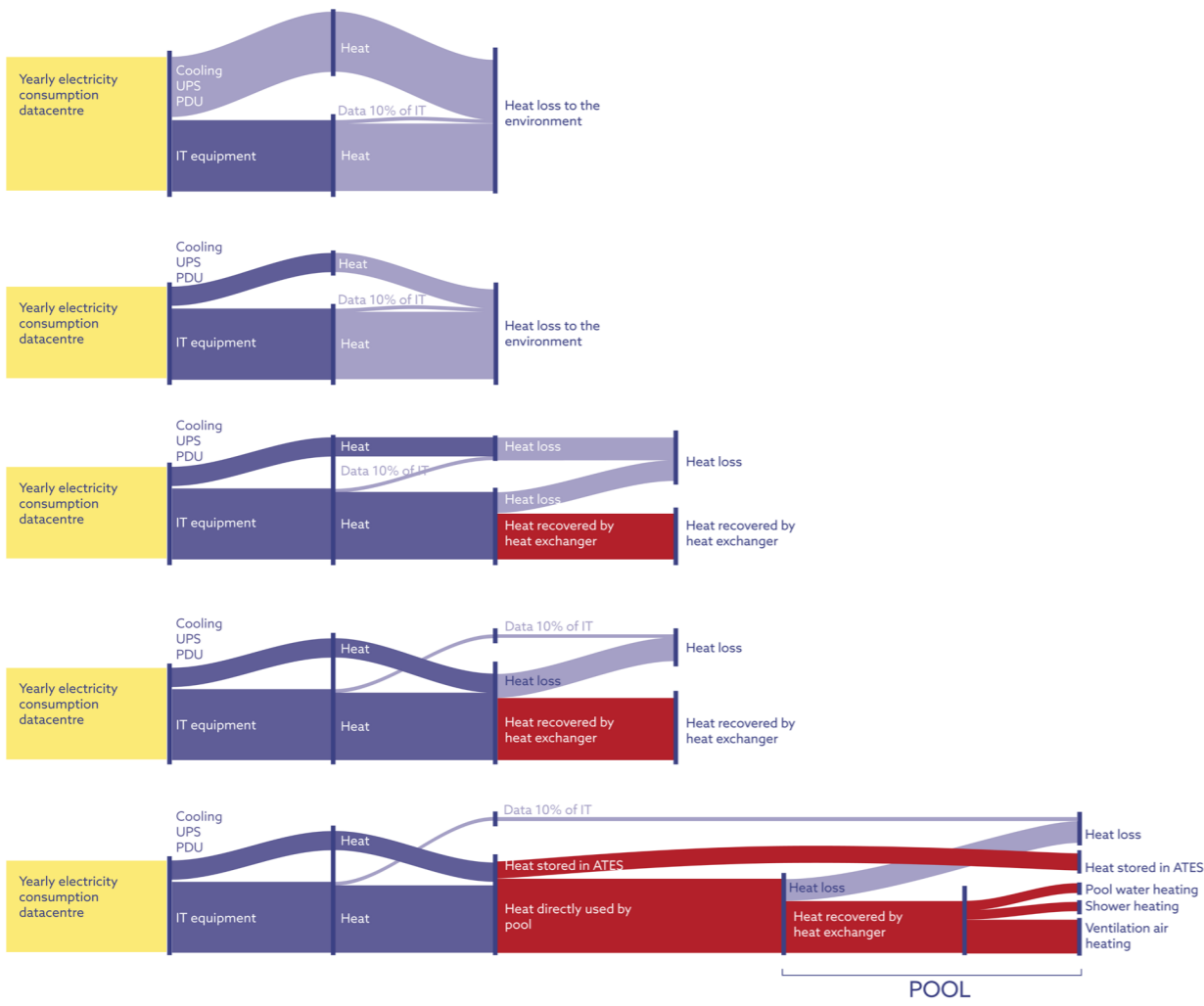
the municipality of Amsterdam and port company want to create an energyhub and realize 500MW datacentre capacity in the port, next to it 40.000-70.000 new homes will be realized as part of Havenstad

1.2 CONCEPT | GOALS



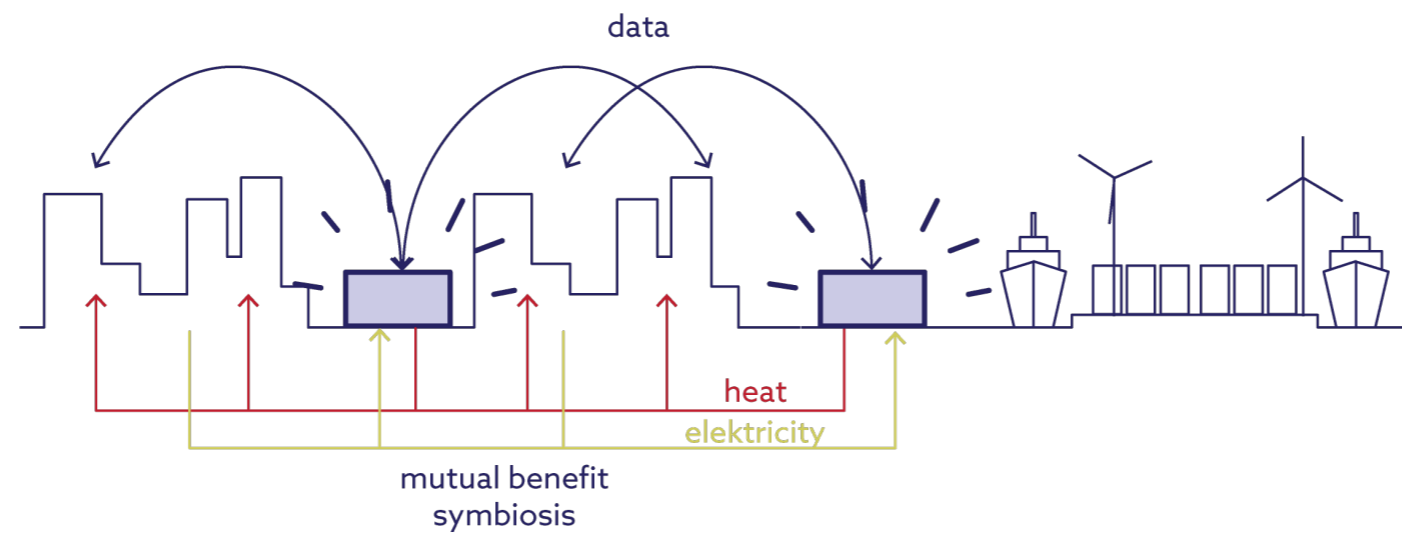
a datacenter combined with a public function could become the mutual benefit which connects city and port (havenstad and westhaven)

1.2 CONCEPT | GOALS



by connecting the cooling system of servers to the heating system of a heat-demanding function up to 60% of the produced heat can be recovered

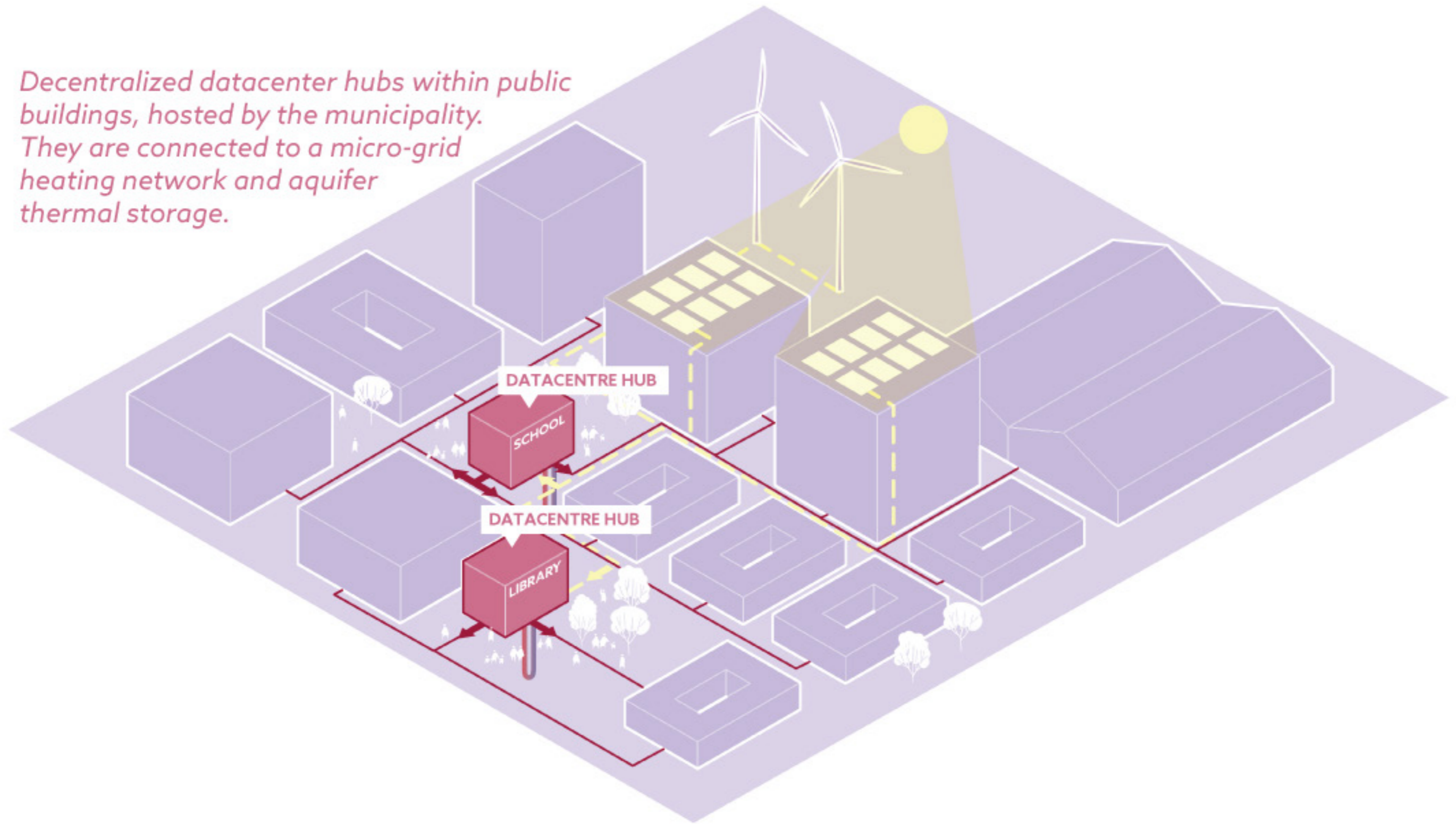
1.2 CONCEPT | GOALS



decentralized datacentres in public buildings could be connected to micogrid heating networks in the city

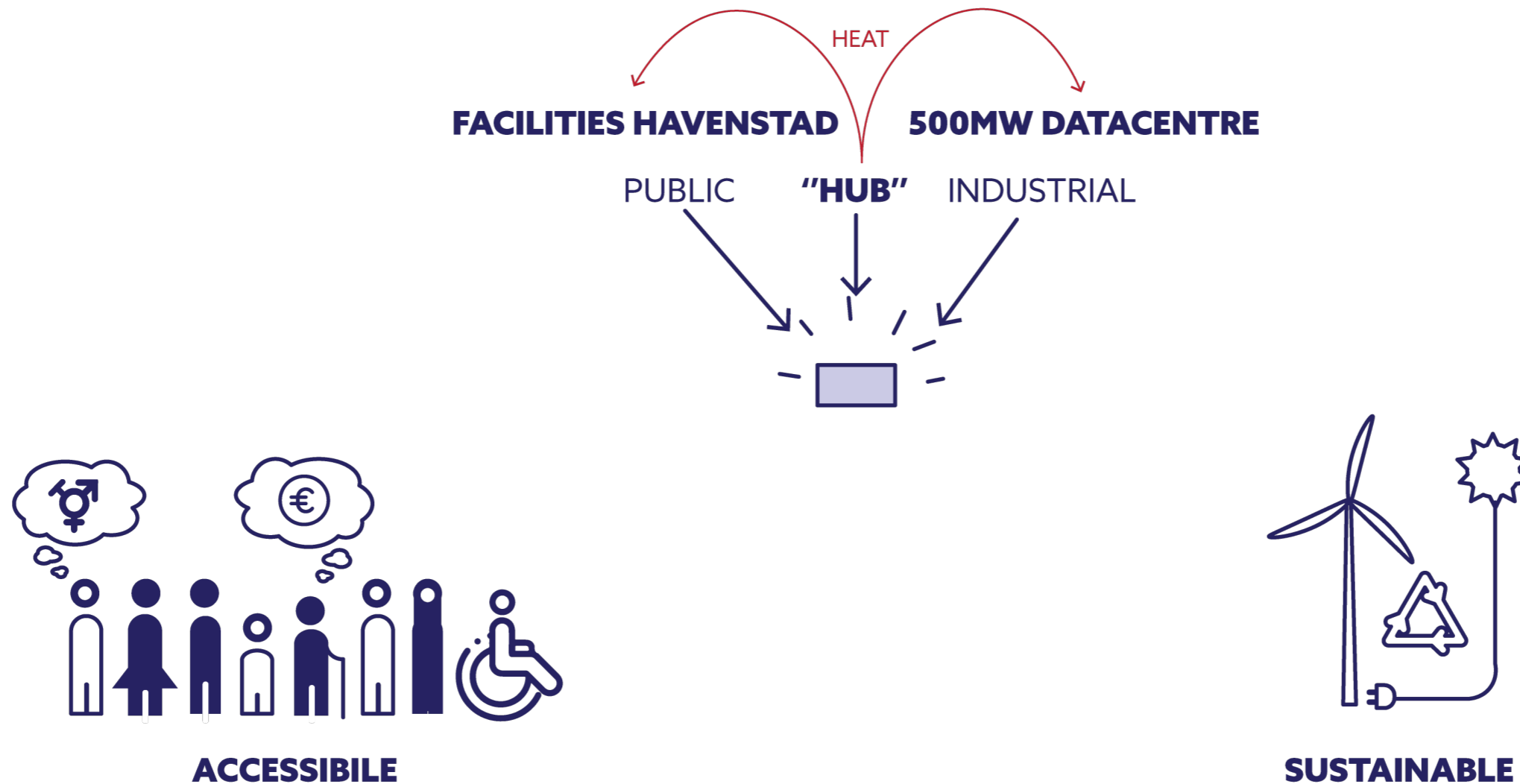
1.2 CONCEPT | GOALS

Decentralized datacenter hubs within public buildings, hosted by the municipality. They are connected to a micro-grid heating network and aquifer thermal storage.



eliminating large-scale datacentres

1.2 CONCEPT | GOALS

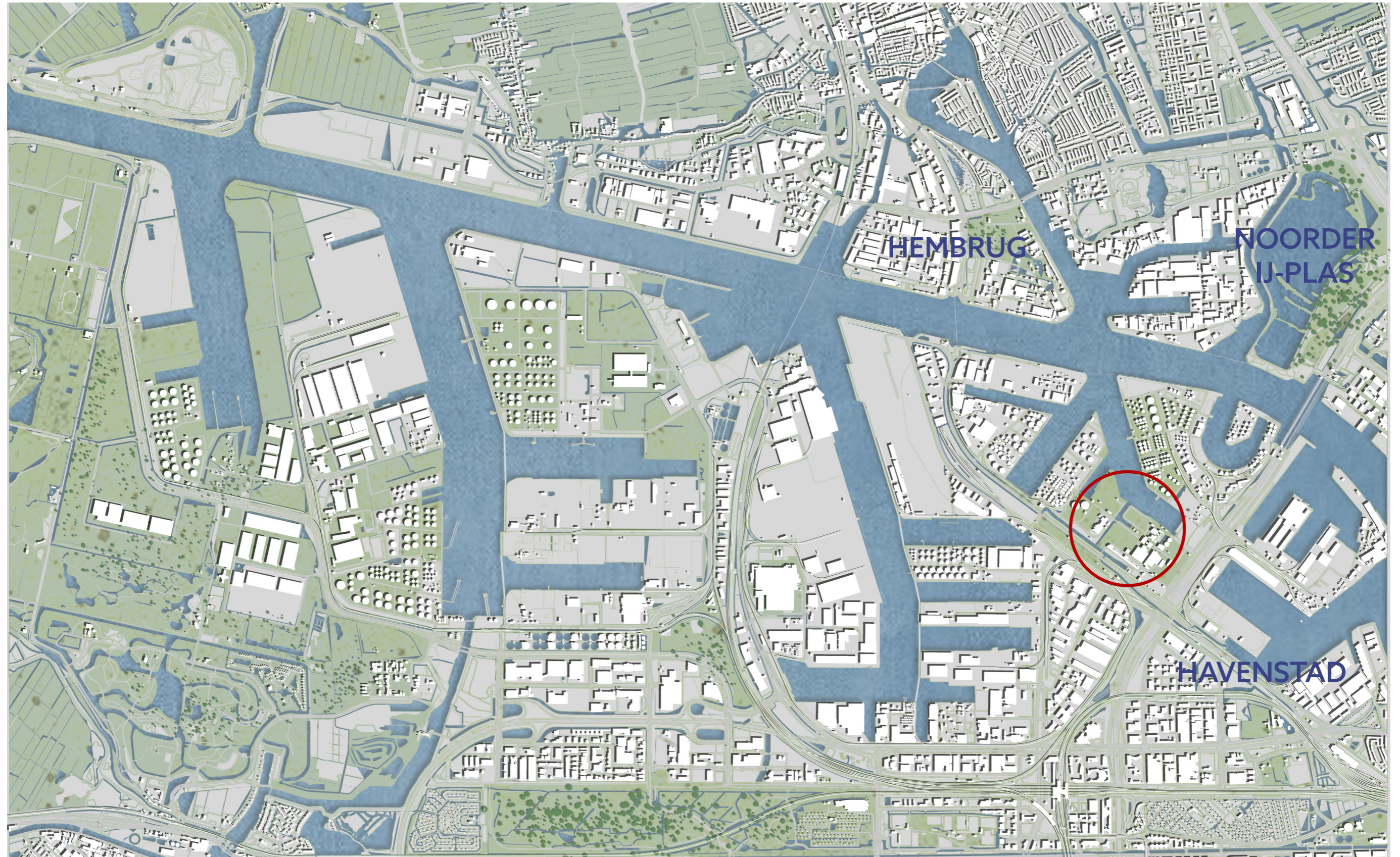


economic, cultural and physical accessibility and representation make the design educative for all of society (Sloterdijk and Havenstad)

only a sustainable and clean industry can be combined with a public function and will change the identity of the industrial port

CONTEXT

2.1 CONTEXT | SITE



westport Amsterdam

2.1 CONTEXT | URBAN STRATEGY



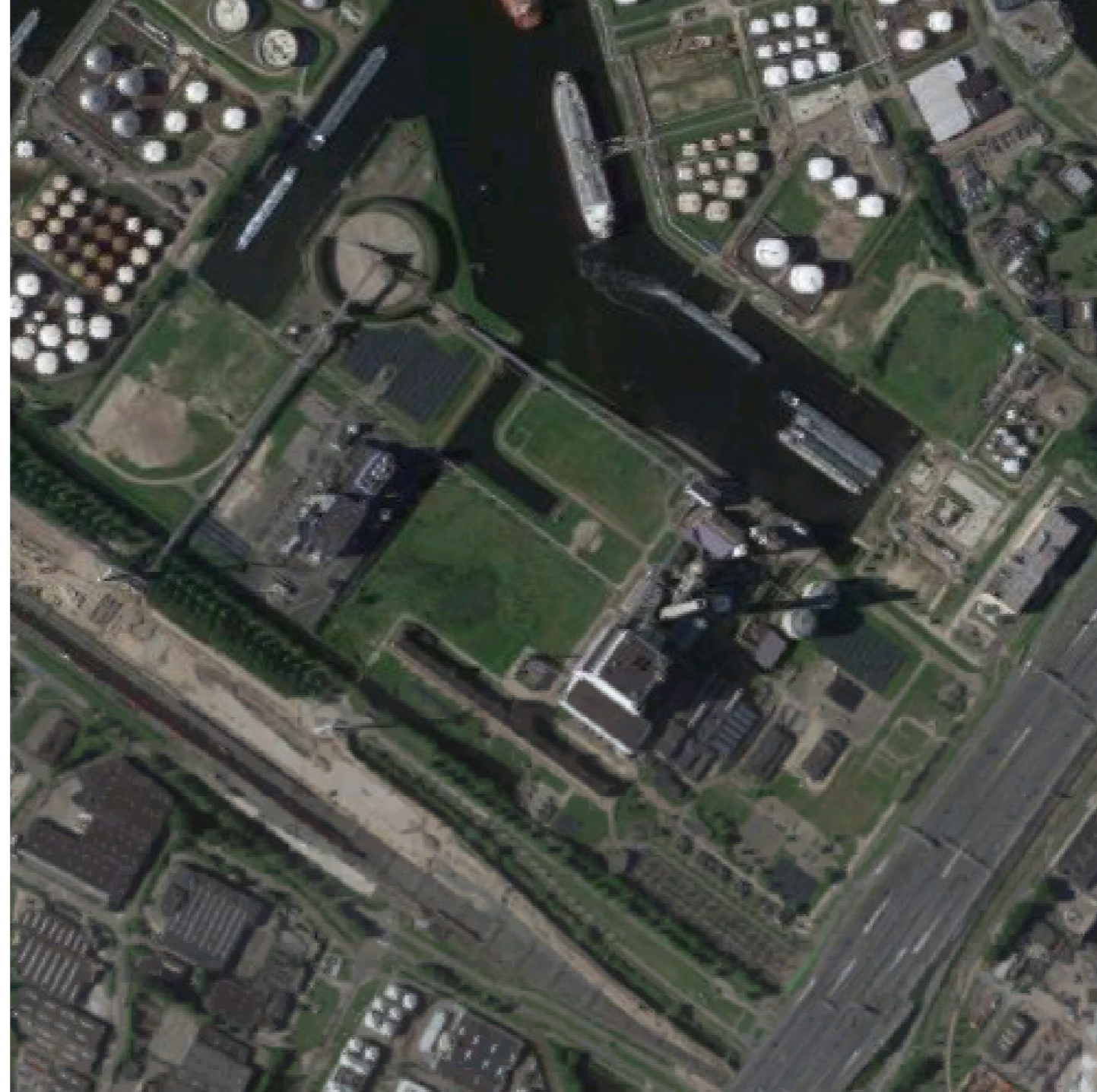
HEMBRUG



WESTERGAS

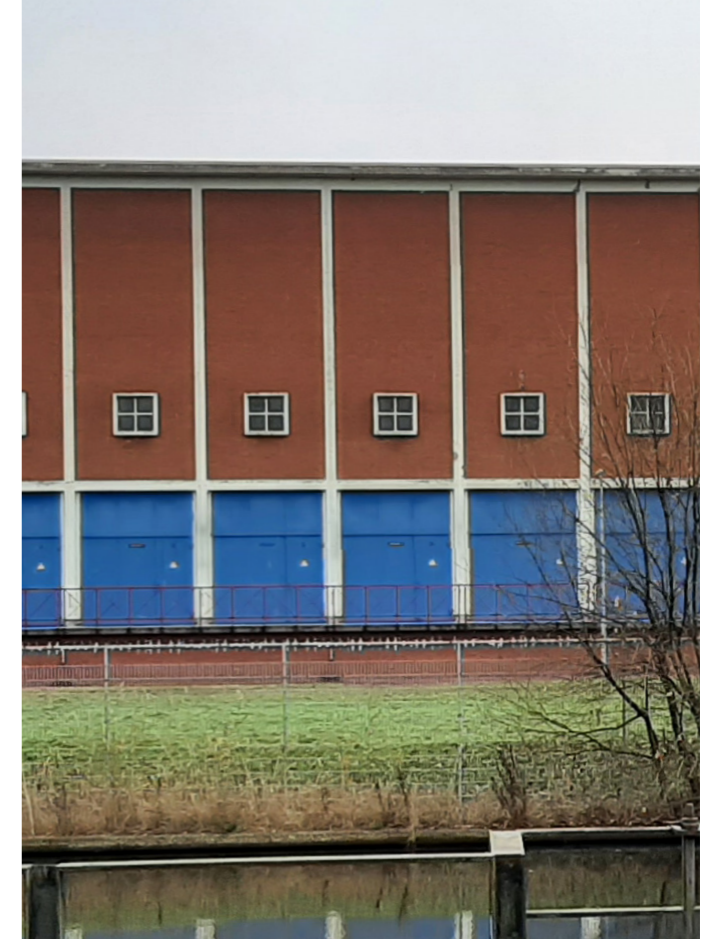
strategy: connecting the hubs

2.2 CONTEXT | HEMWEG TERRAIN



reusing the closed terrain of the old coal plant
the hemweg centrale

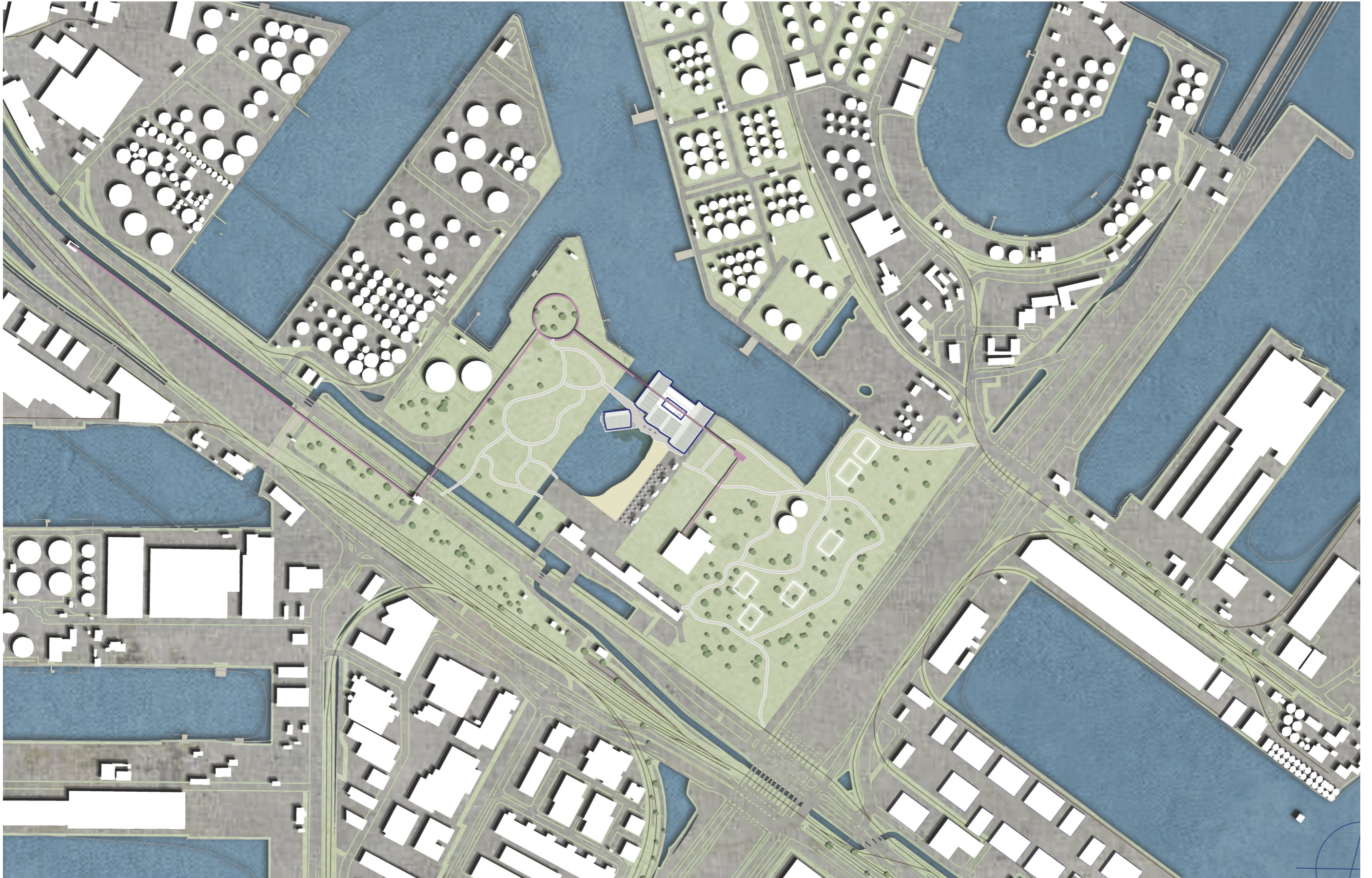
2.2 CONTEXT | HEMWEG TERRAIN



industrial heritage which remains

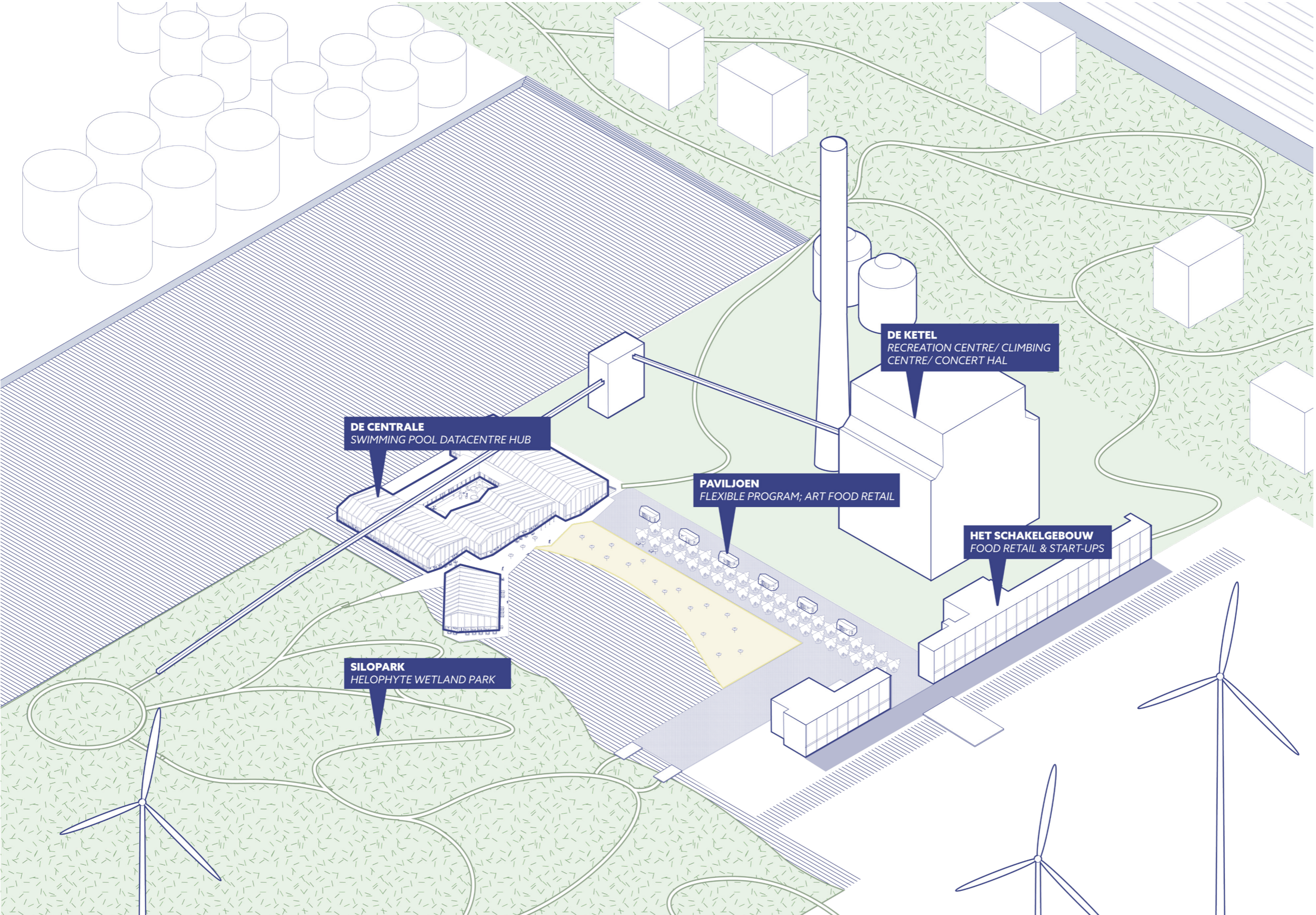
LANDSCAPE

3.1 LANDSCAPE | SITE PLAN



a new public place for the city

3.2 LANDSCAPE | PROGRAM



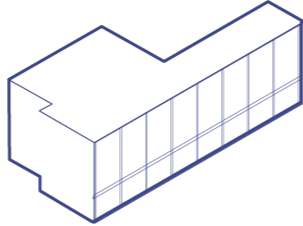
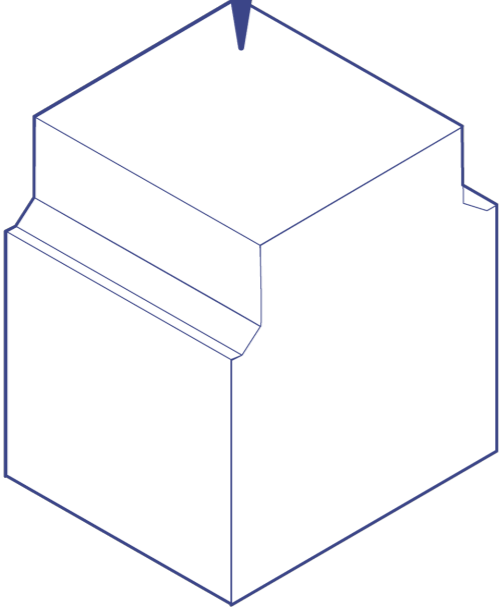
program in the hub

3.2 LANDSCAPE | PROGRAM

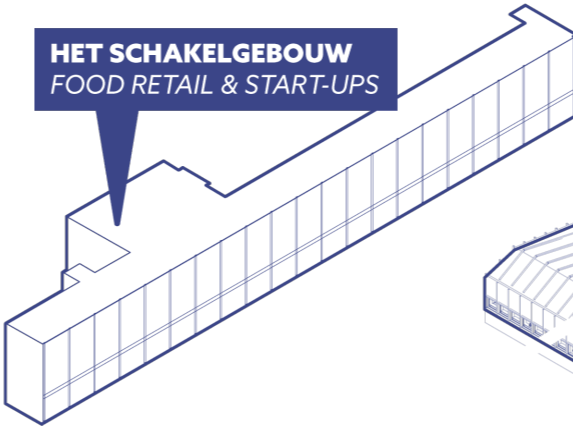
CHIMNEY
HIGHEST CLIMBING TOWER EU



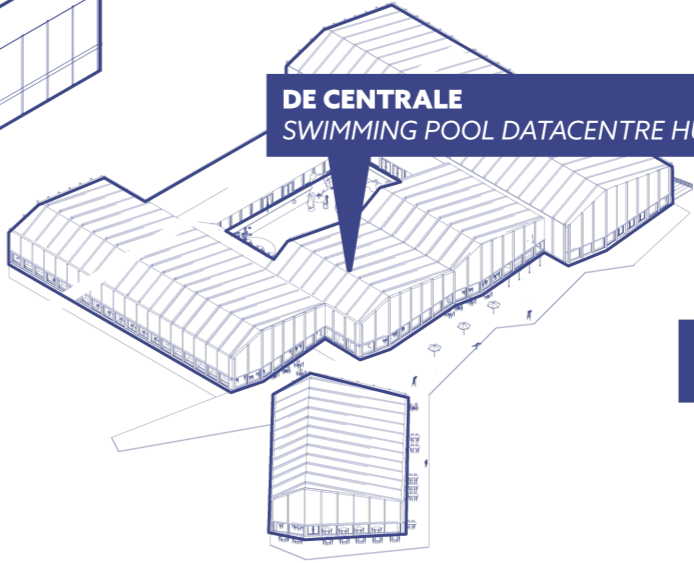
DE KETEL
RECREATION CENTRE/ CLIMBING CENTRE/ CONCERT HAL



HET SCHAKELGEBOUW
FOOD RETAIL & START-UPS



DE CENTRALE
SWIMMING POOL DATACENTRE HUB



PAVILION
FLEXIBLE PROGRAM; ART FOOD RETAIL



scales of assembly

3.3 LANDSCAPE | WATER

INLET ZONE

Removes coarse sediment with gravel.
Regulates flow into macrophyte zone.

MACROPHYTE ZONE

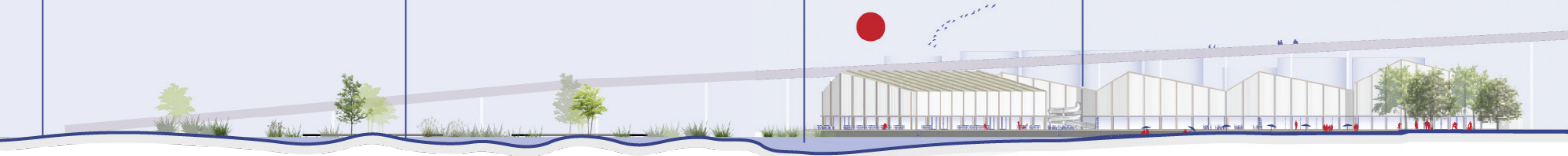
Significant coverage of aquatic planting 80% from various species.
Water treatment through sedimentation, filtration, absorption, biological and chemical translocation.
Habitat for small animals and insects.

HIGH FLOW BYPASS AND SWIMMING AREA

Water buffer swimming area with filtered harbour water.

RAINWATER COLLECTION

7.500 m² roof used for water collection
(almost 5.000.000 L per year.)



the surrounding landscape functions as biological helophyte filter

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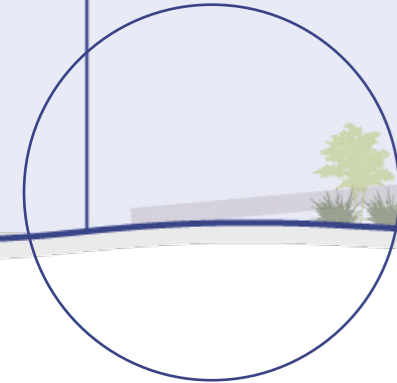
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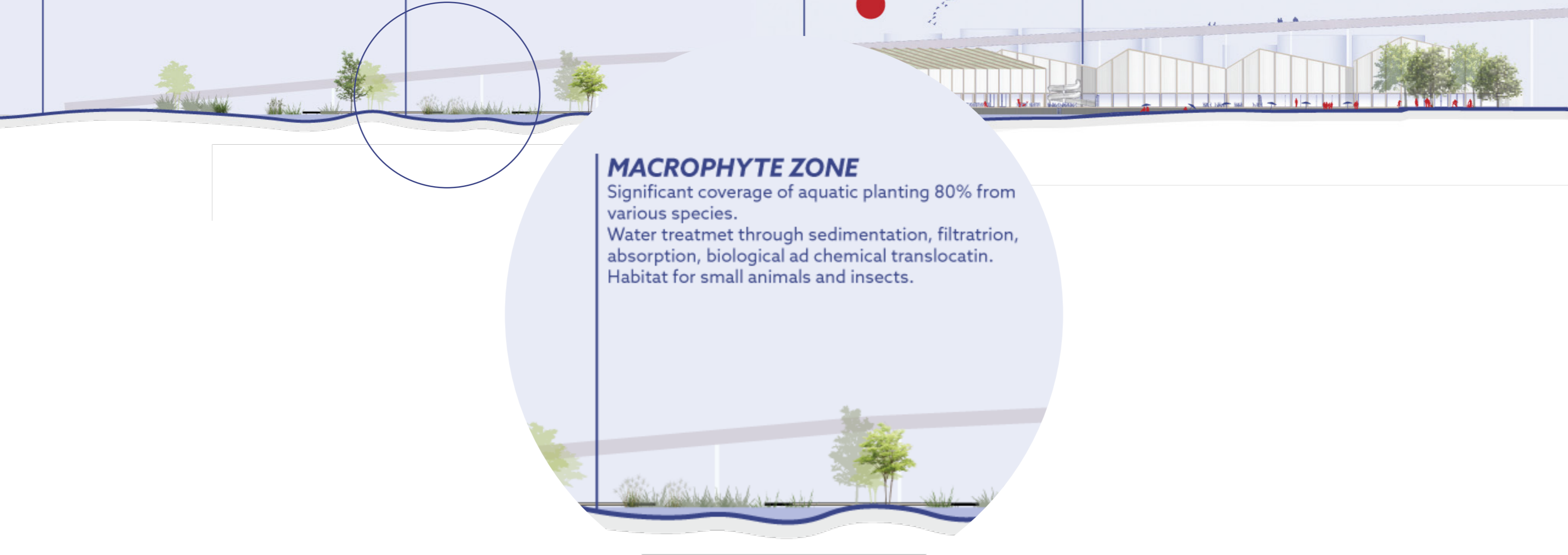
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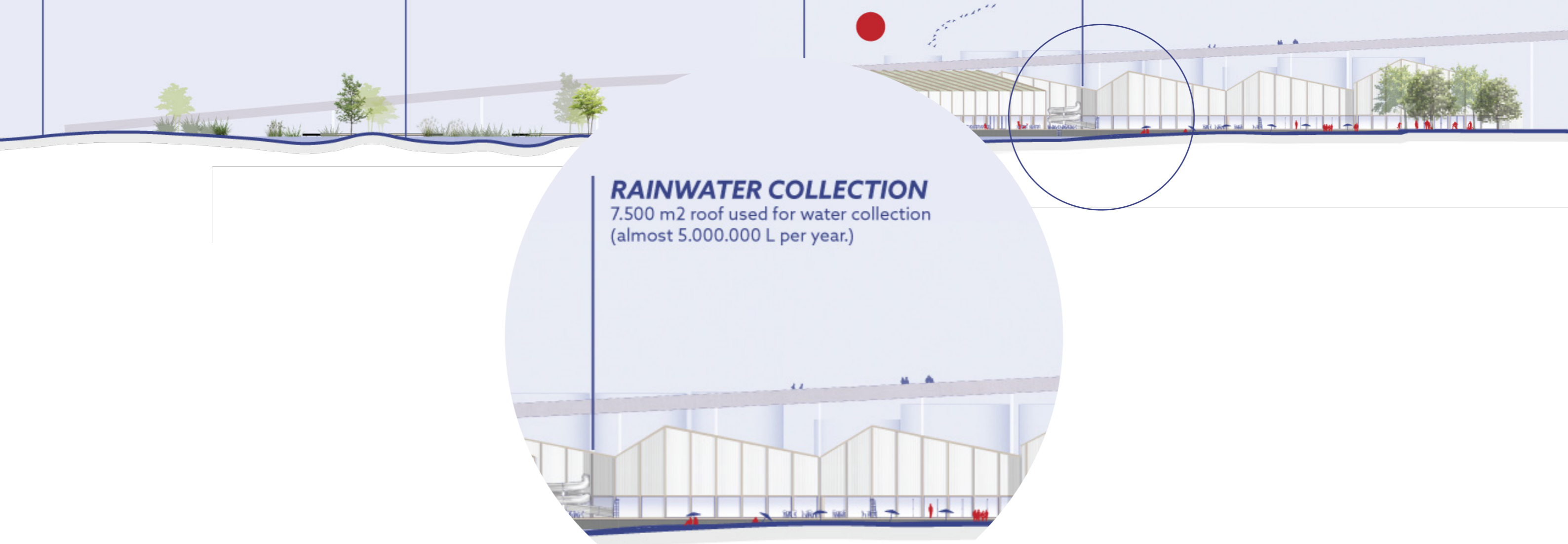
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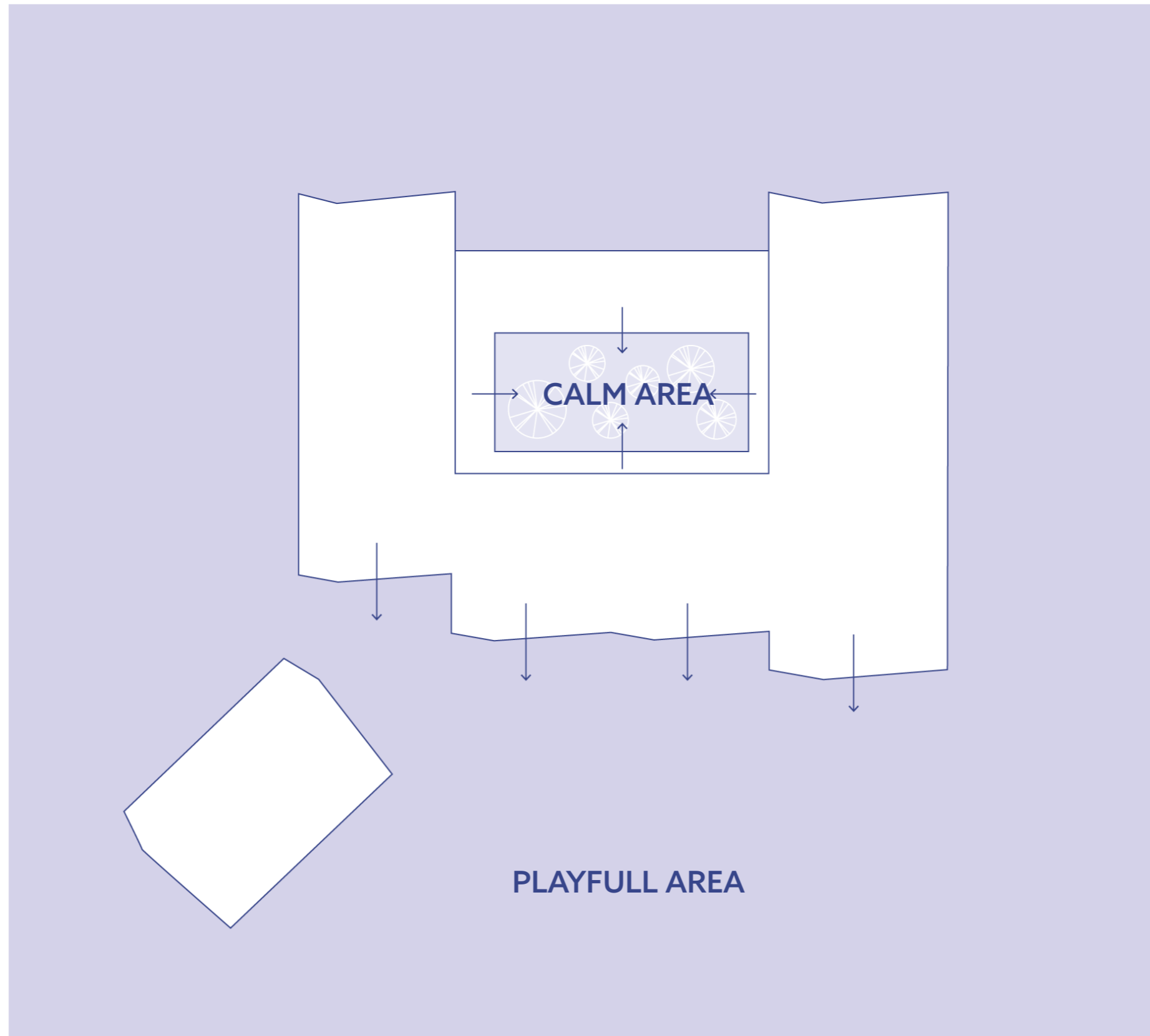
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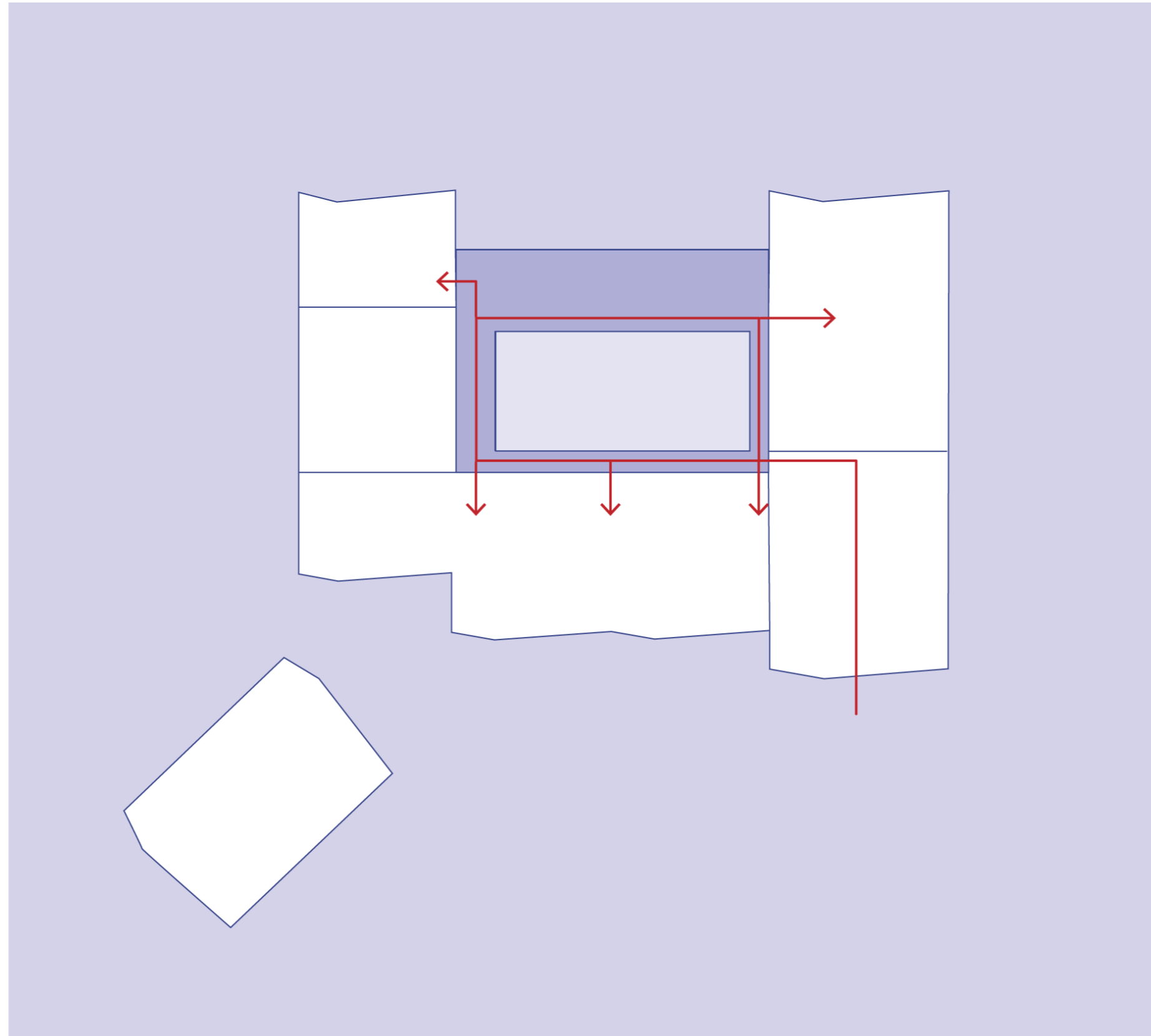
DESIGN

4 DESIGN | STRATEGY



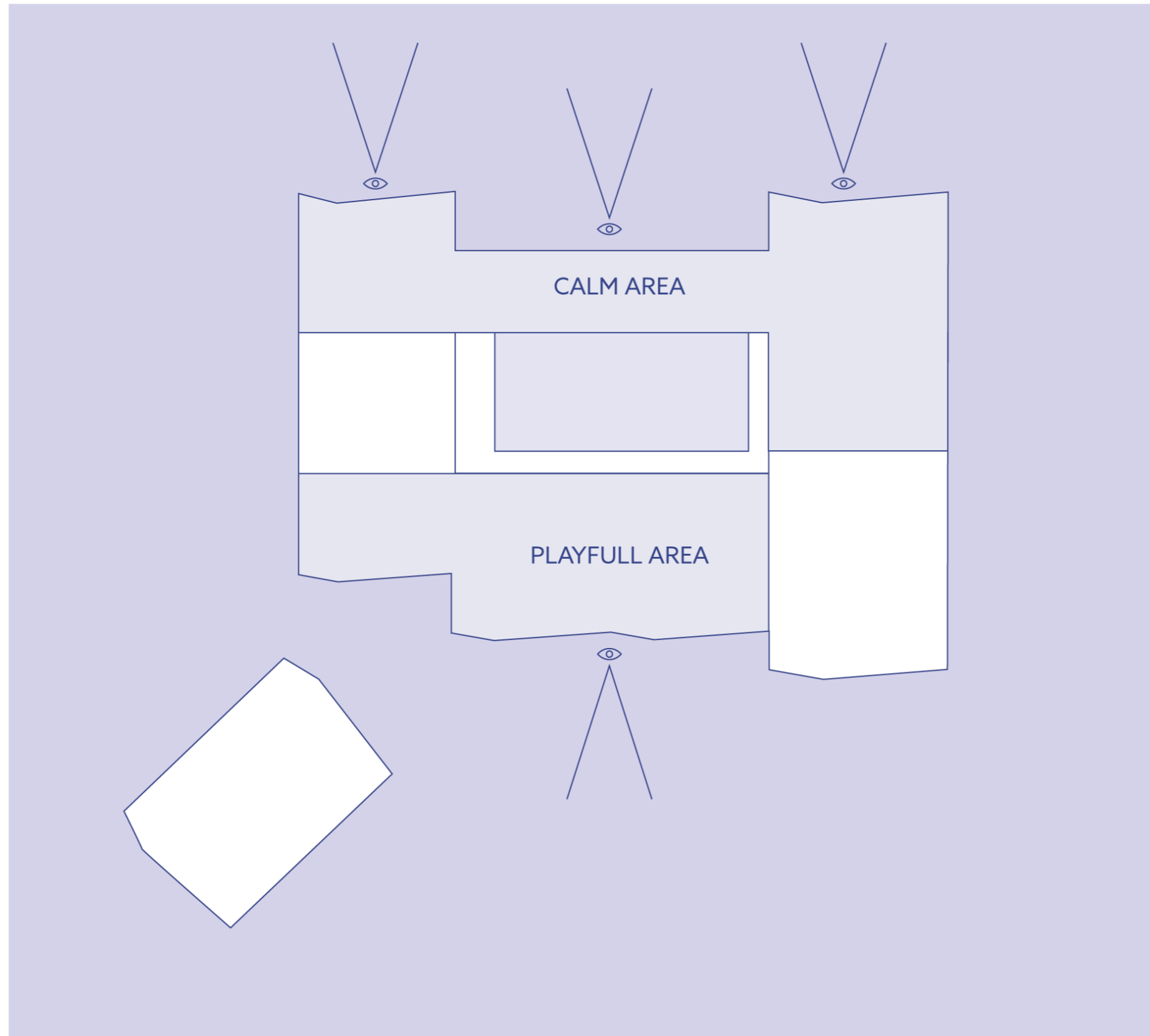
outdoor space organisation

4 DESIGN | STRATEGY



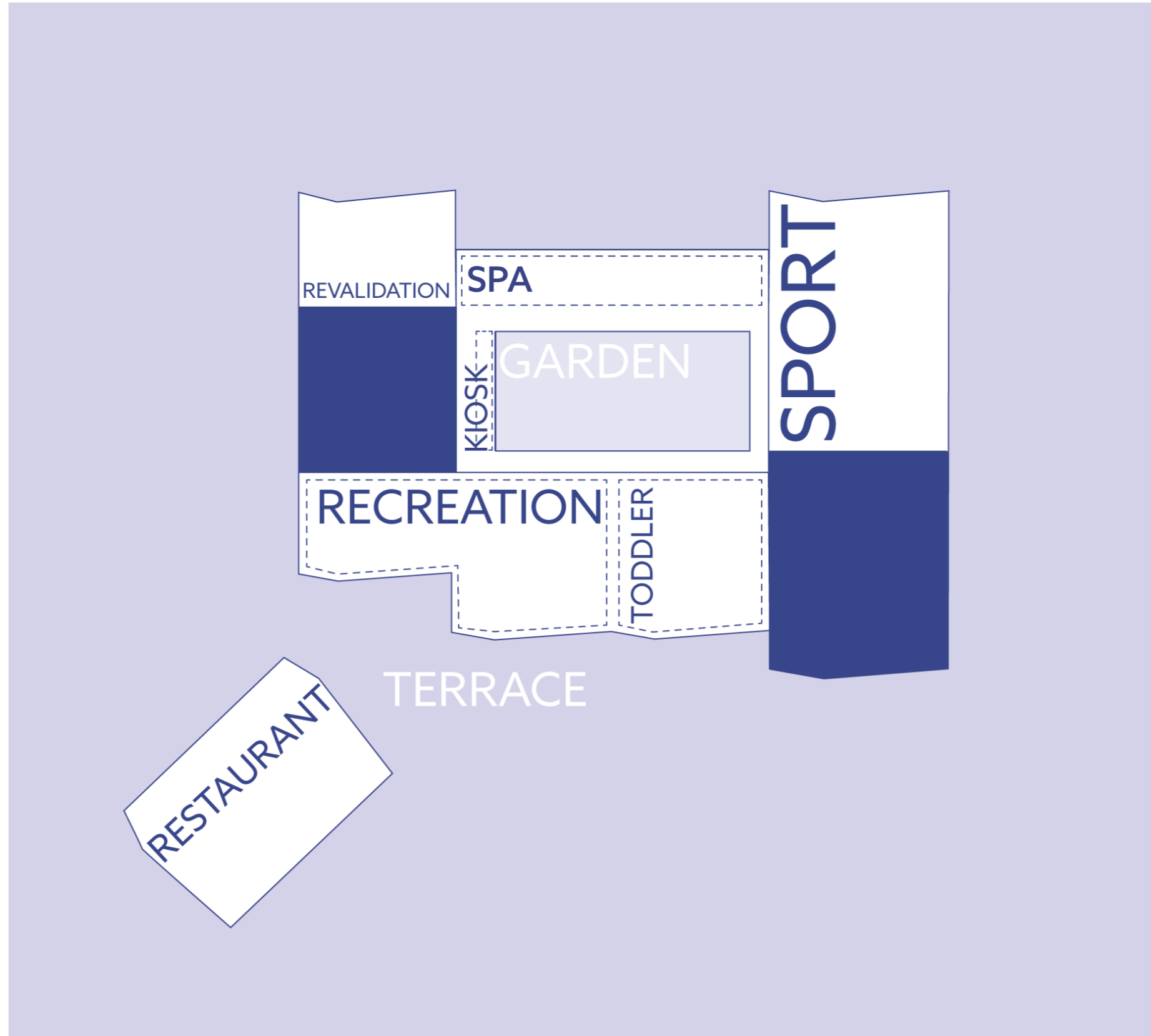
routing

4 DESIGN | STRATEGY



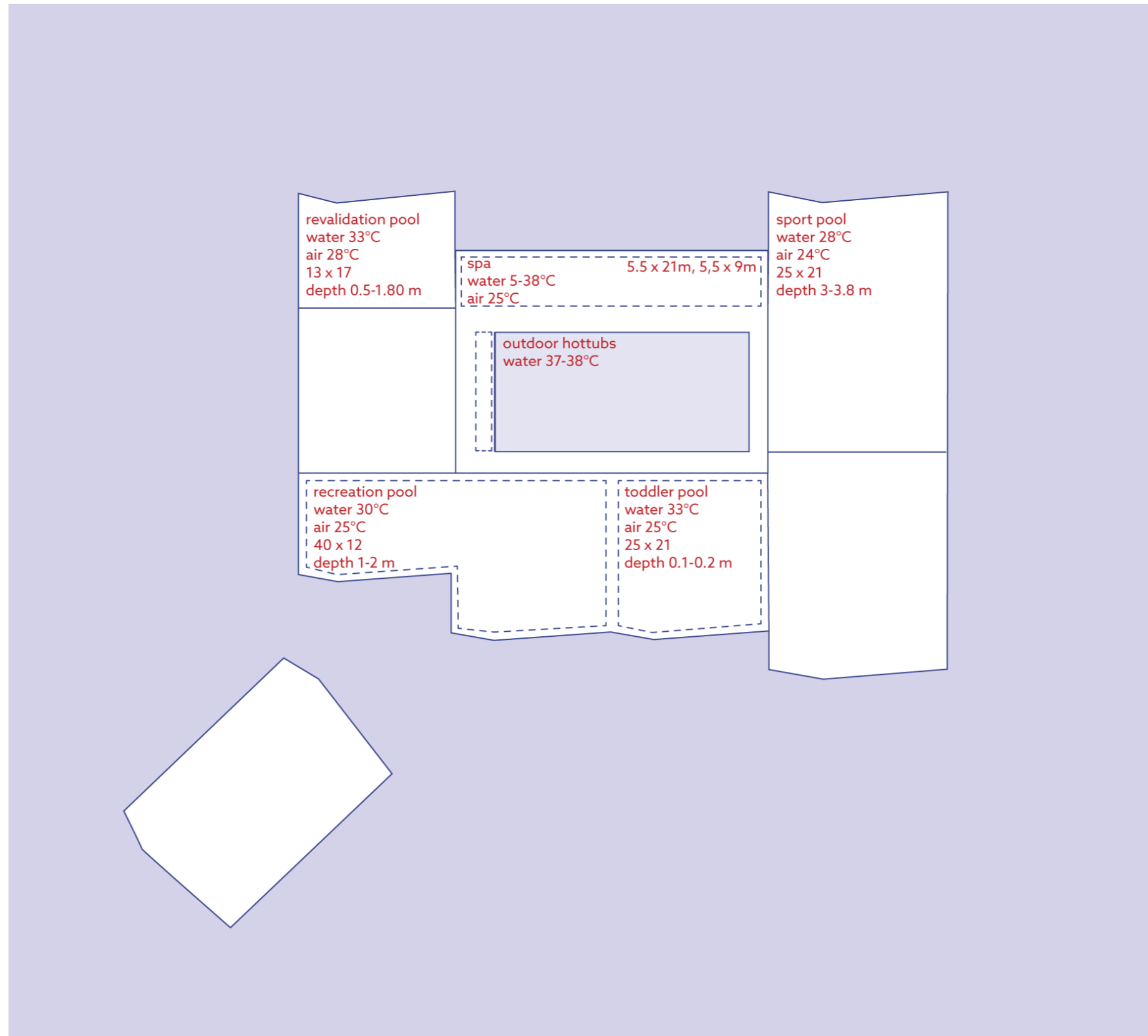
building organisation

4 DESIGN | STRATEGY



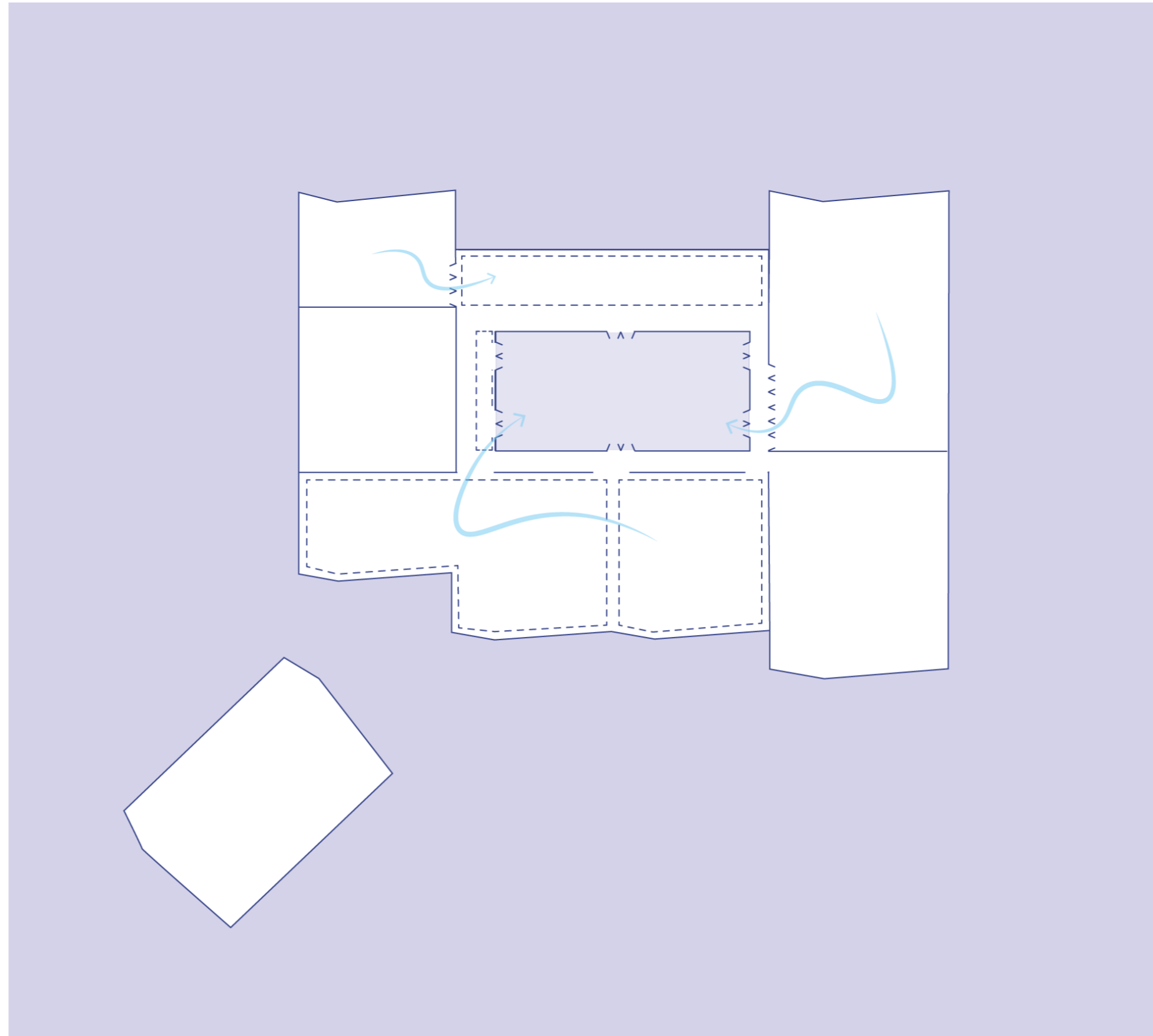
program

4 DESIGN | STRATEGY



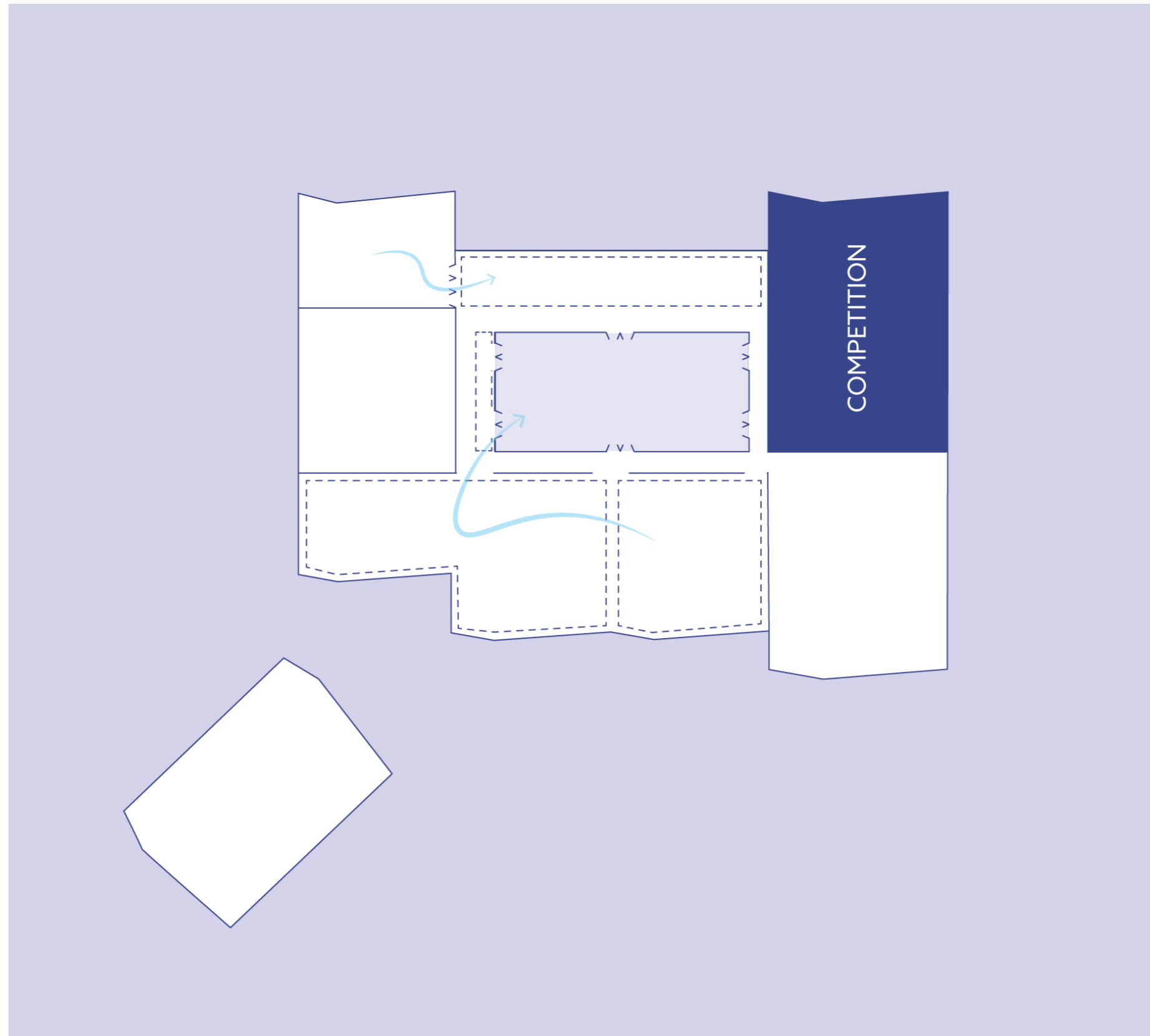
preferences per pool

4 DESIGN | STRATEGY



open/closed

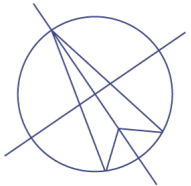
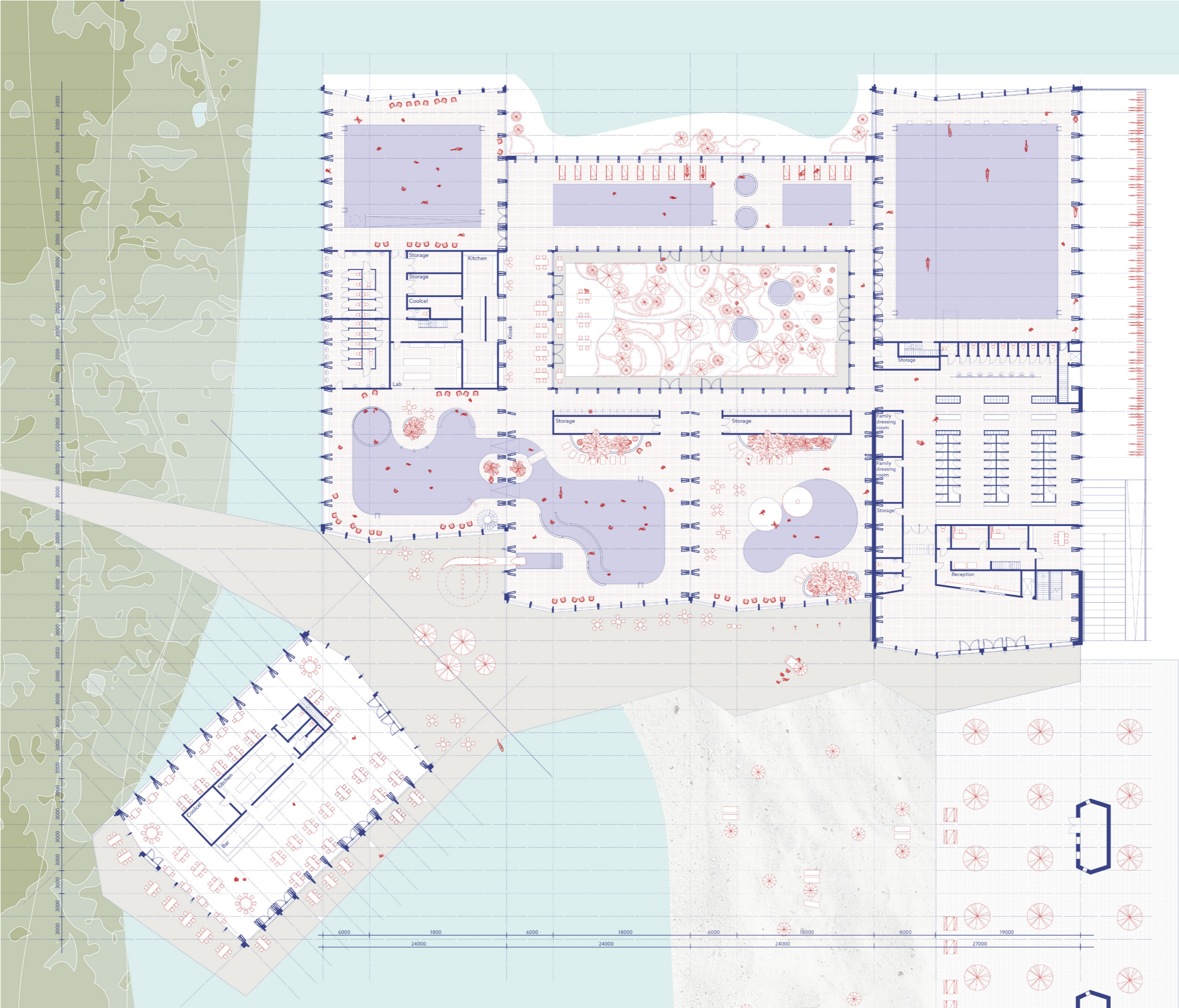
4 DESIGN | STRATEGY



functioning of program

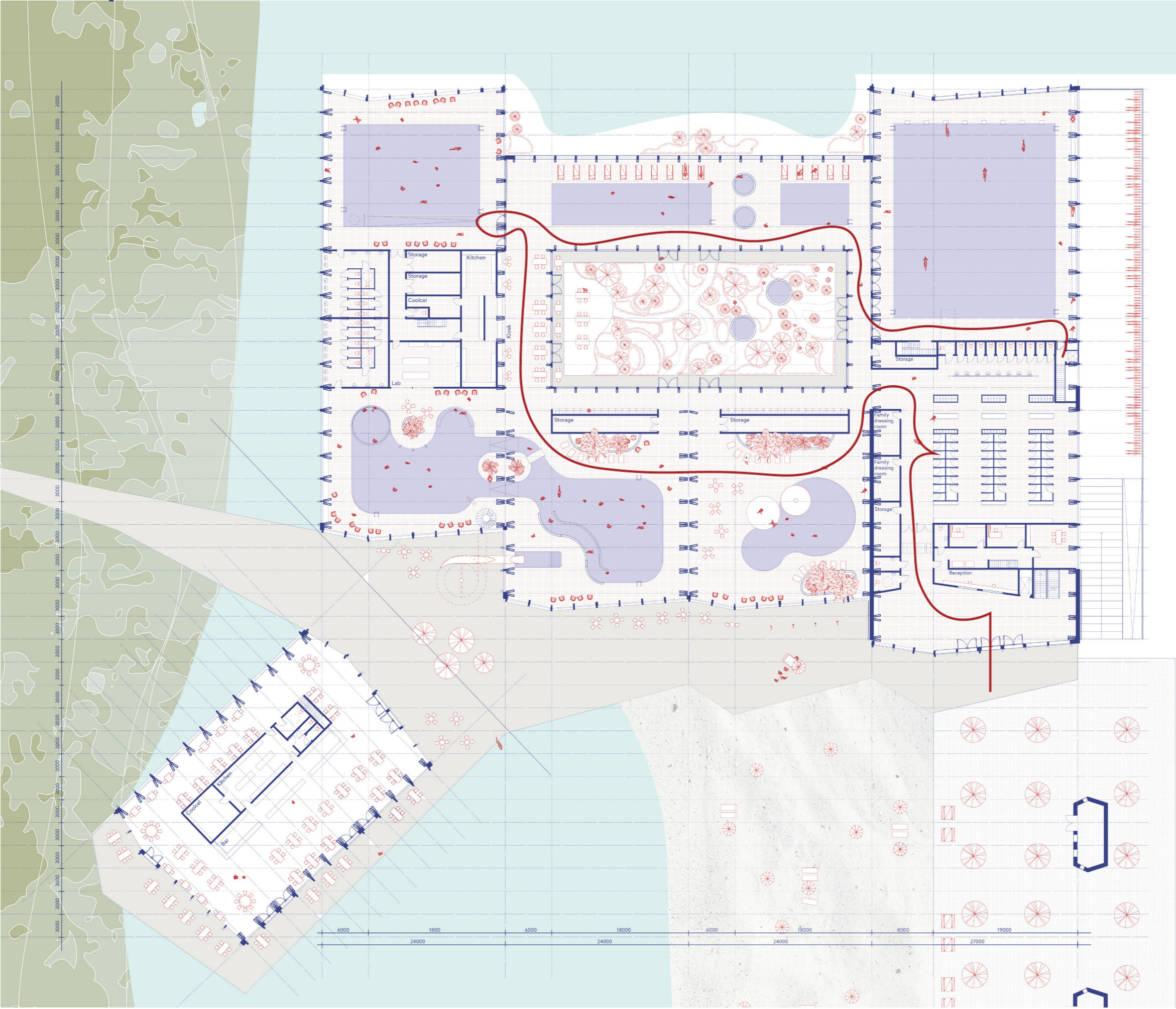
TOUR

5 DESIGN | TOUR THROUGH THE BUILDING

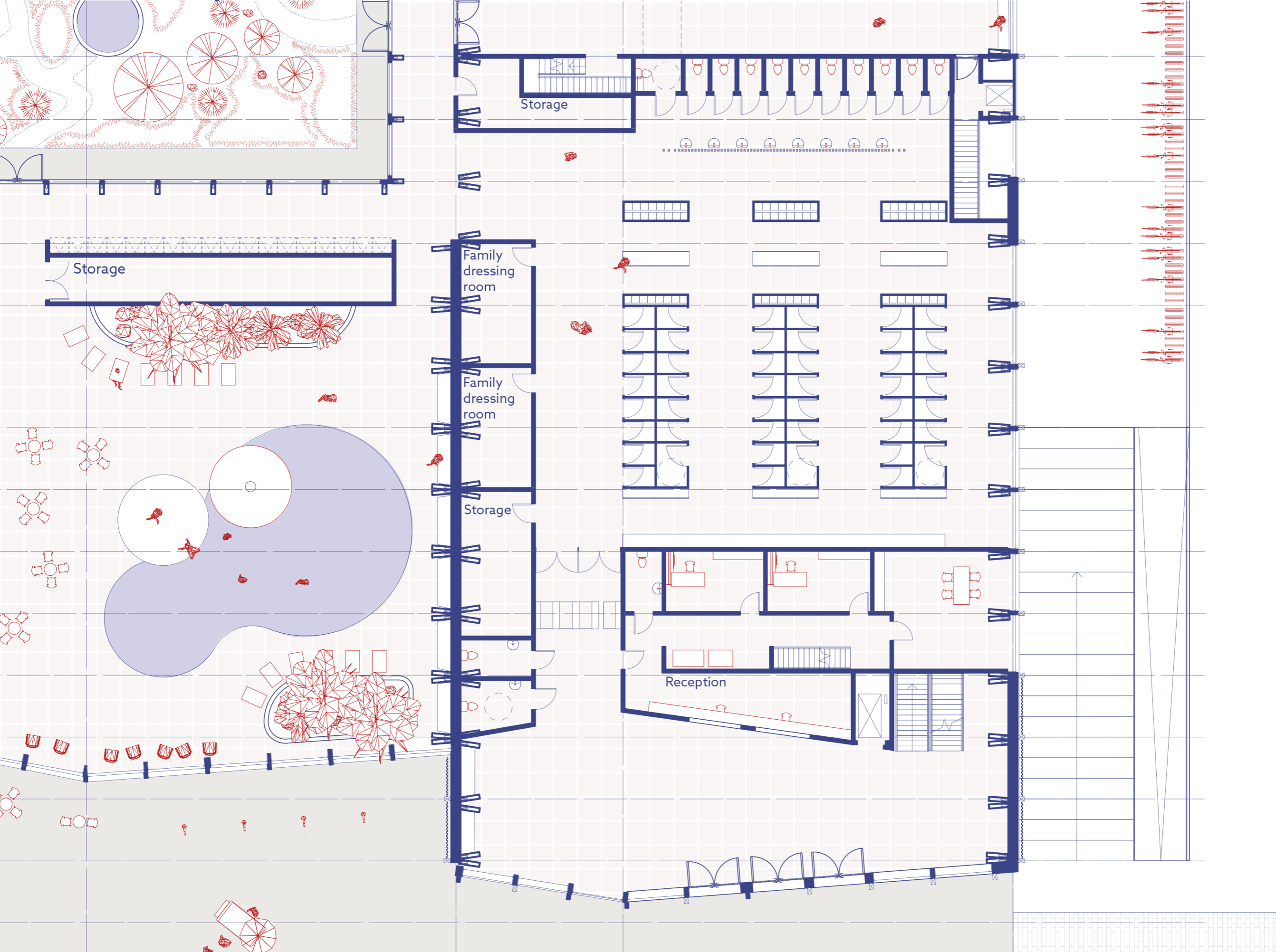


1:200
0 2 4 6 8m

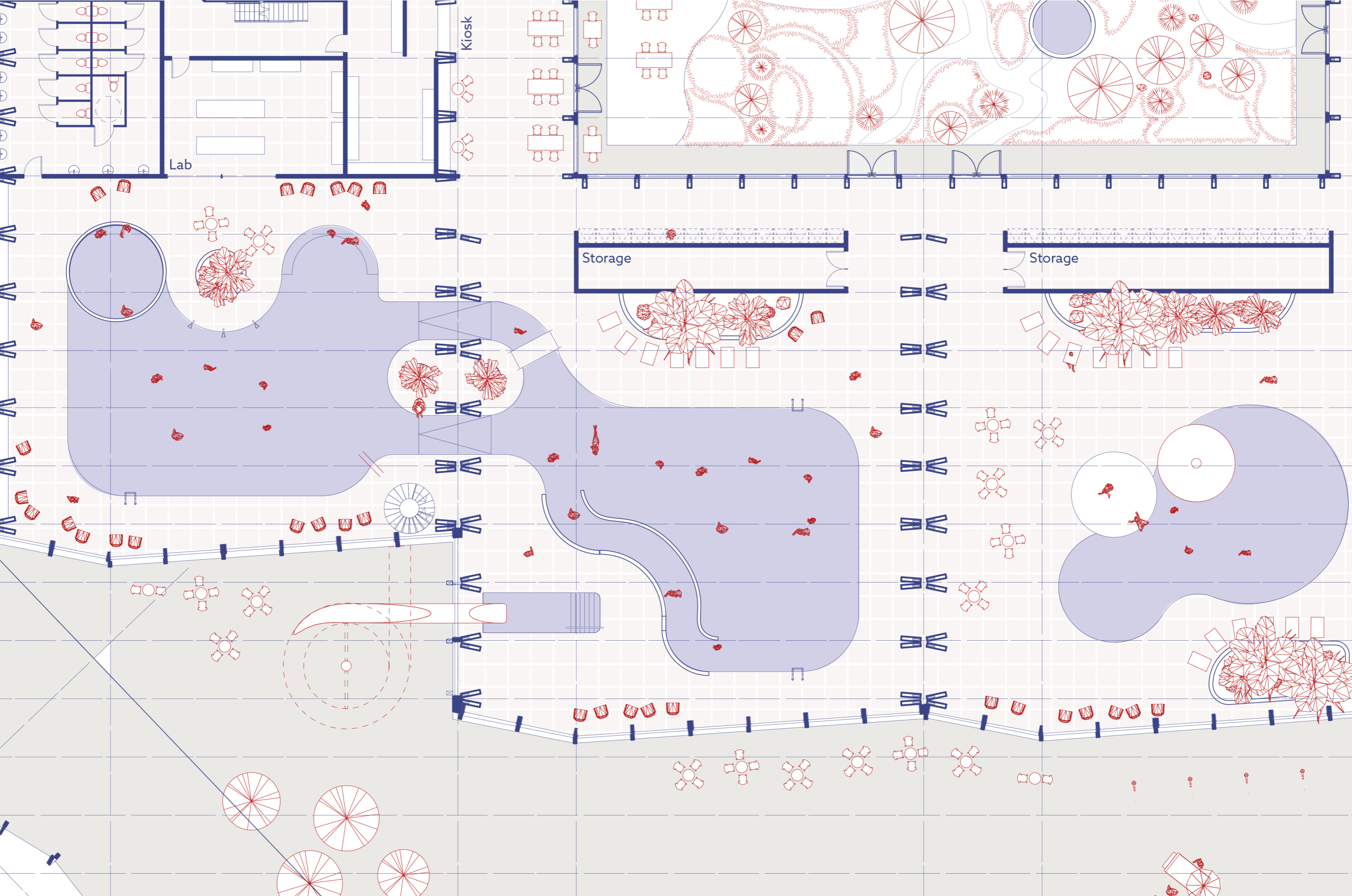
5 DESIGN | TOUR THROUGH THE BUILDING



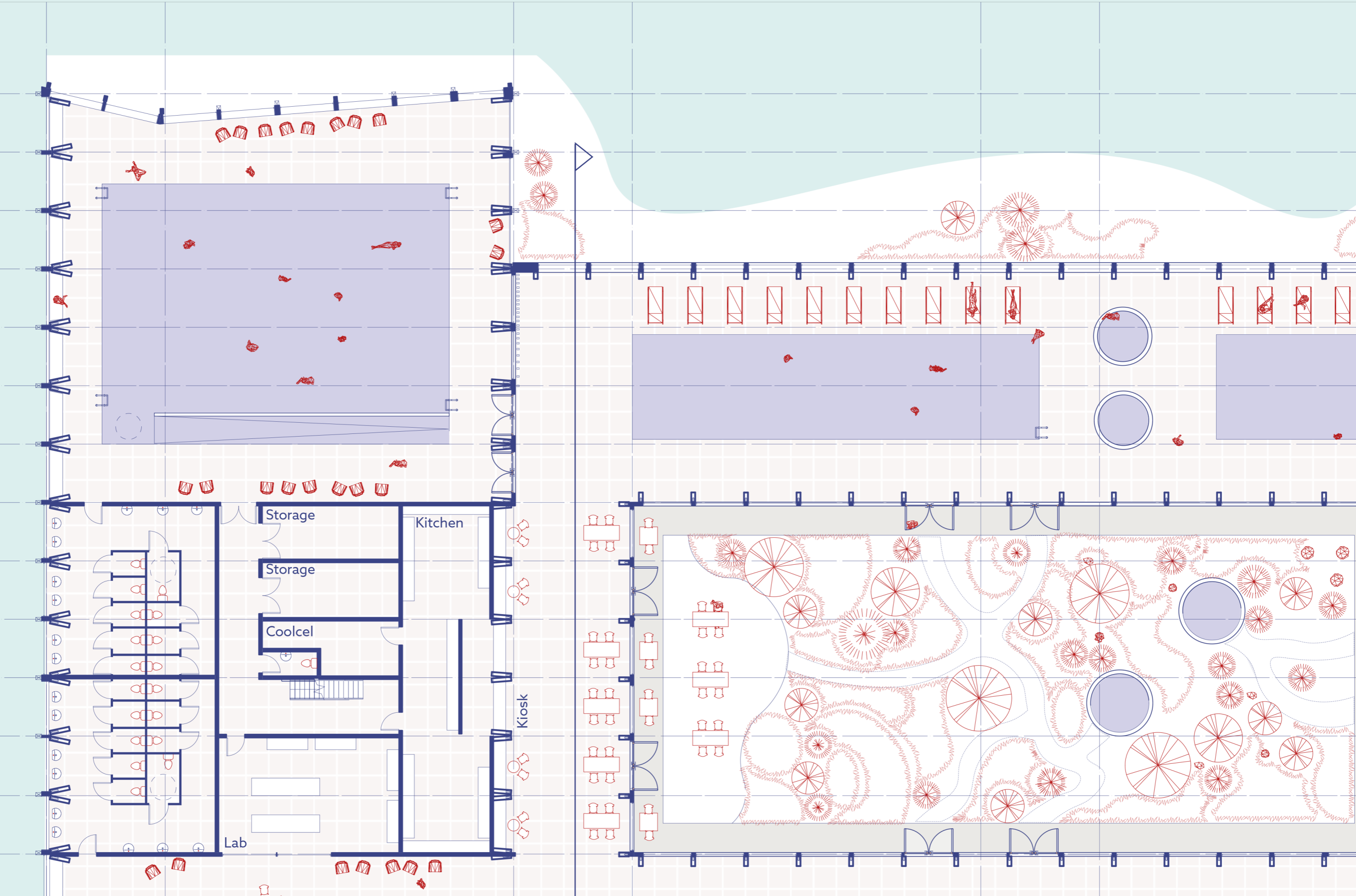
5 DESIGN | TOUR THROUGH THE BUILDING



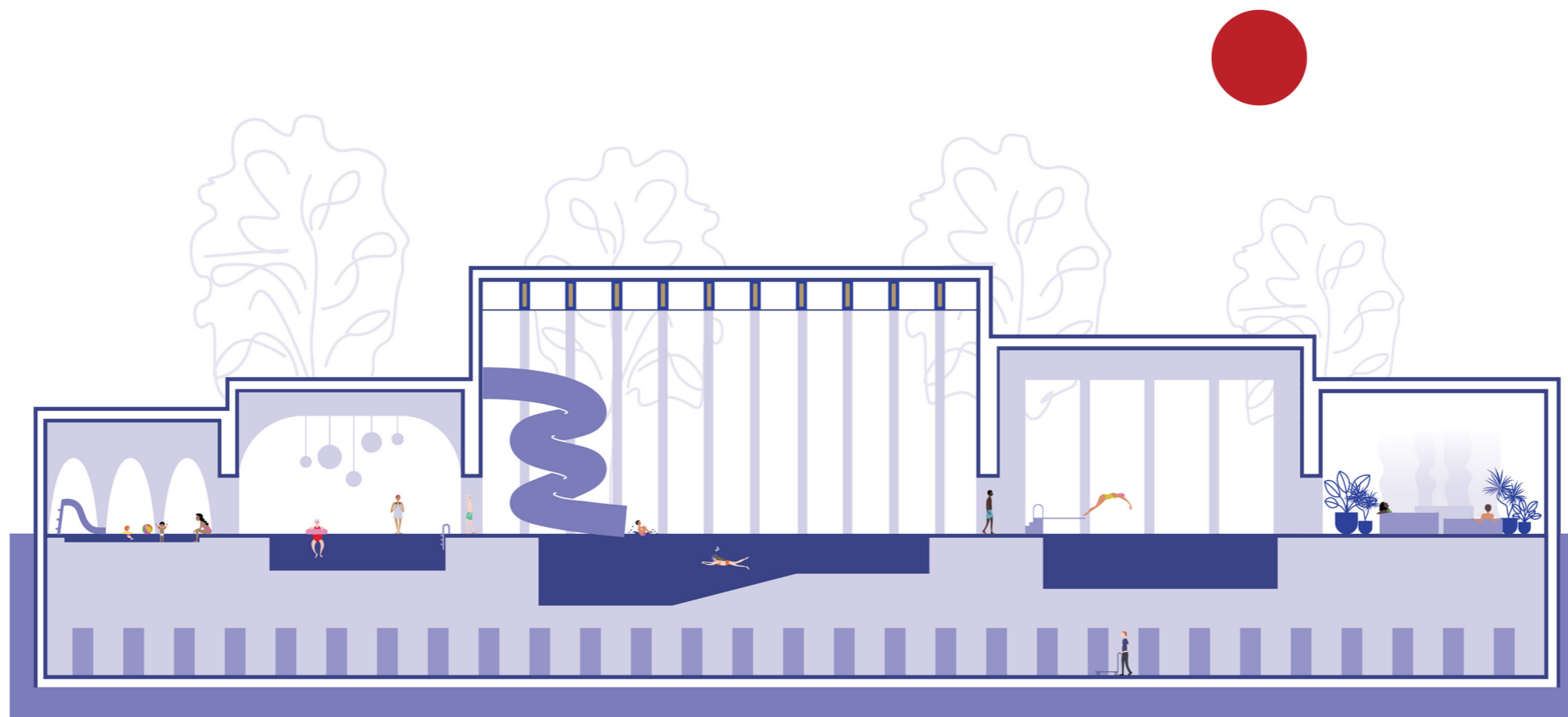
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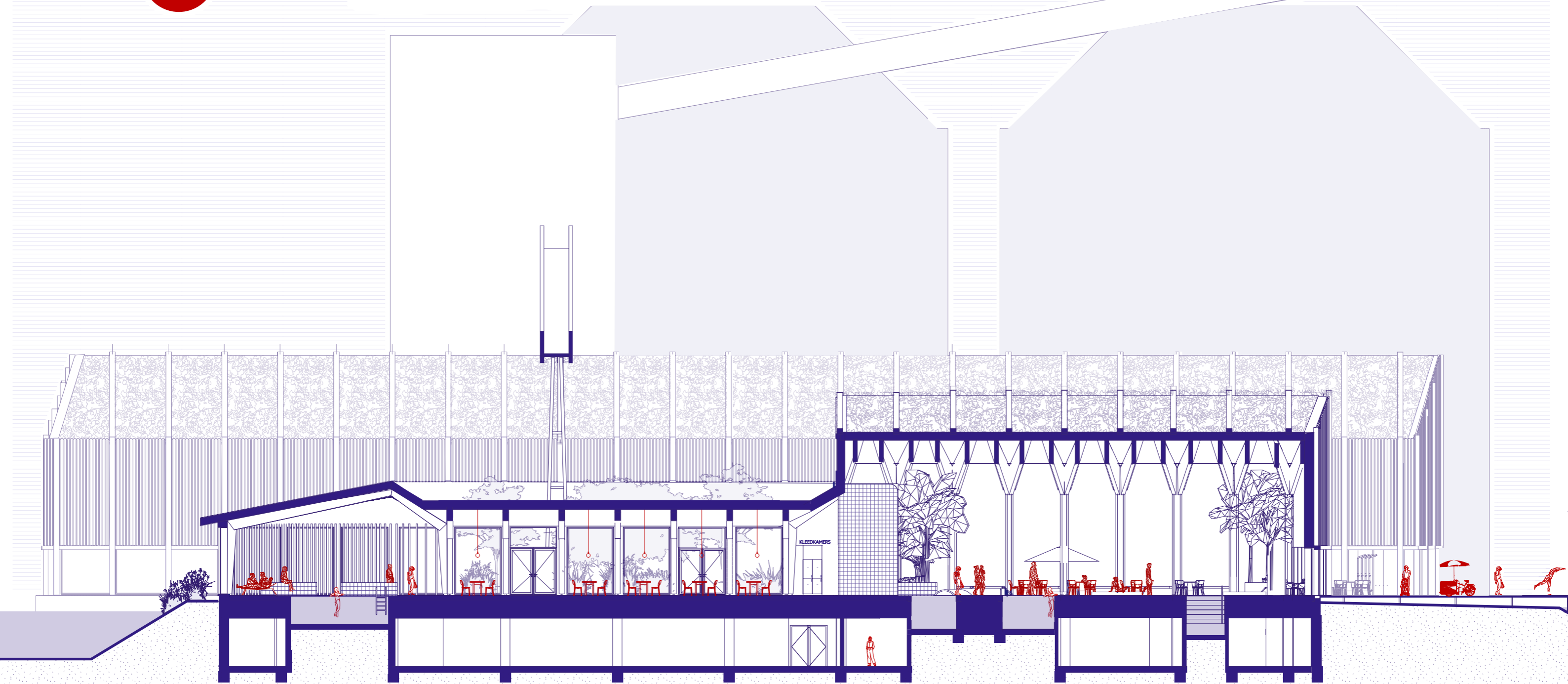
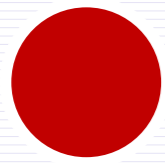


5 DESIGN | TOUR THROUGH THE BUILDING



height difference concept

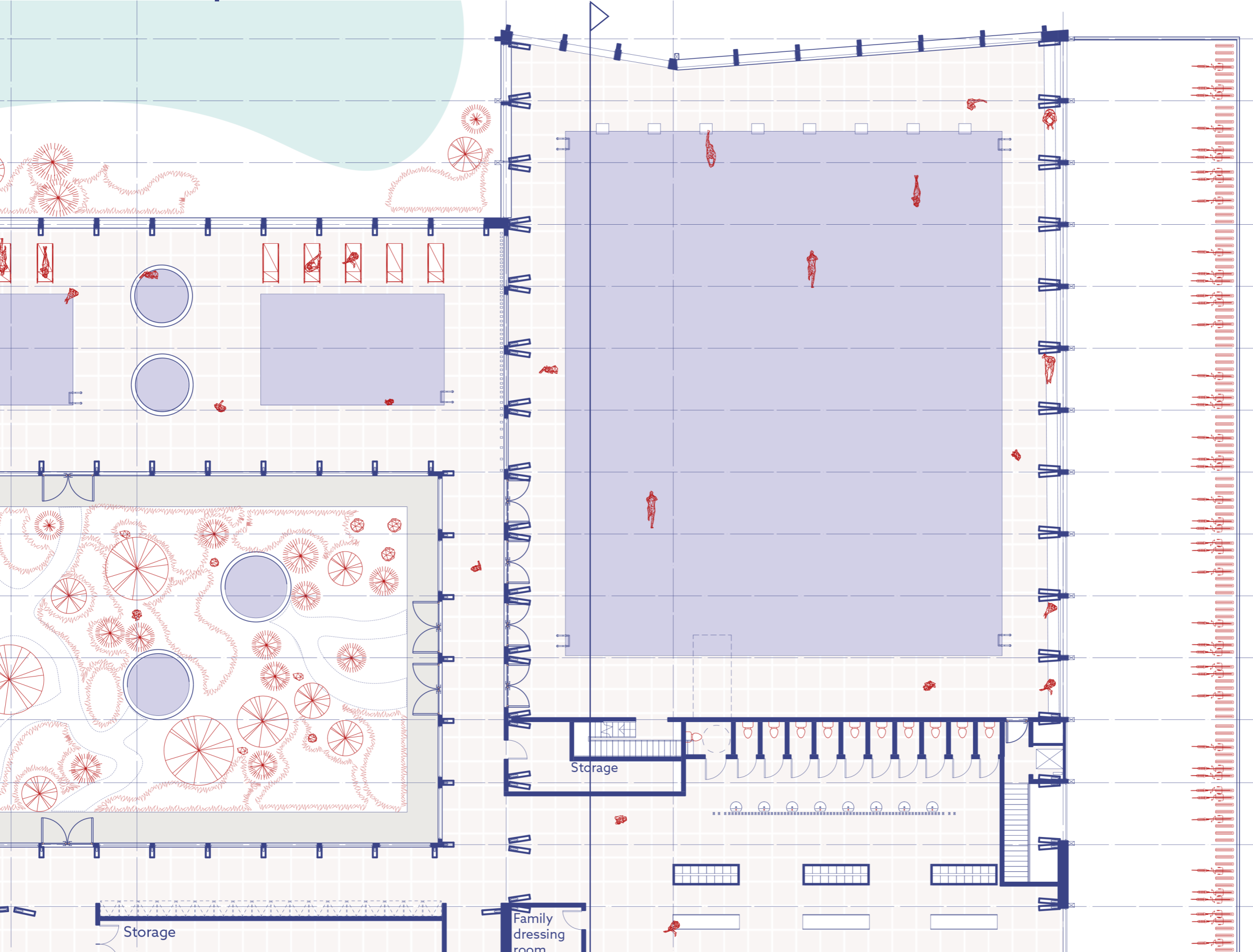
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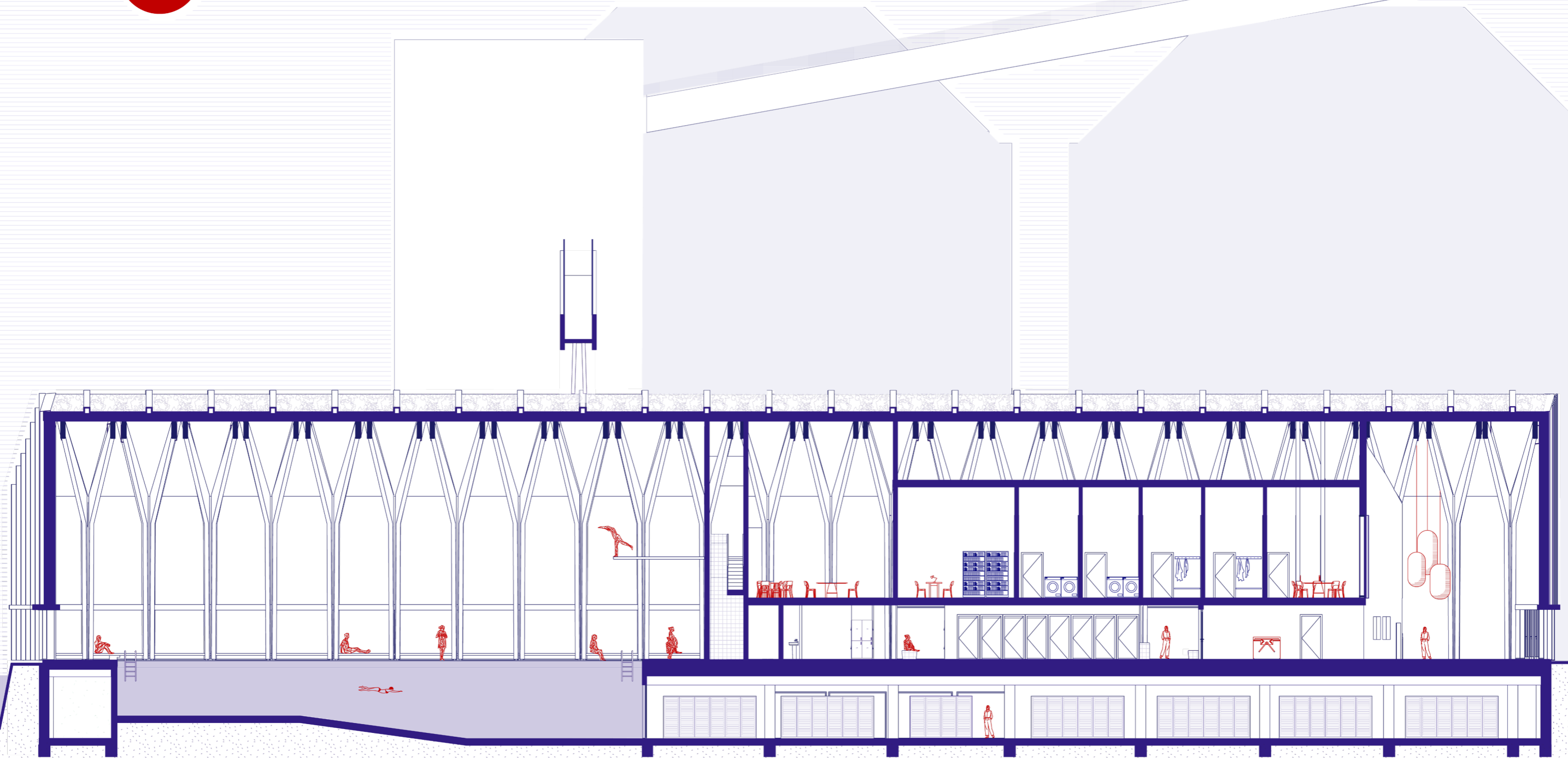
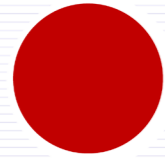
KLEEDKAMERS



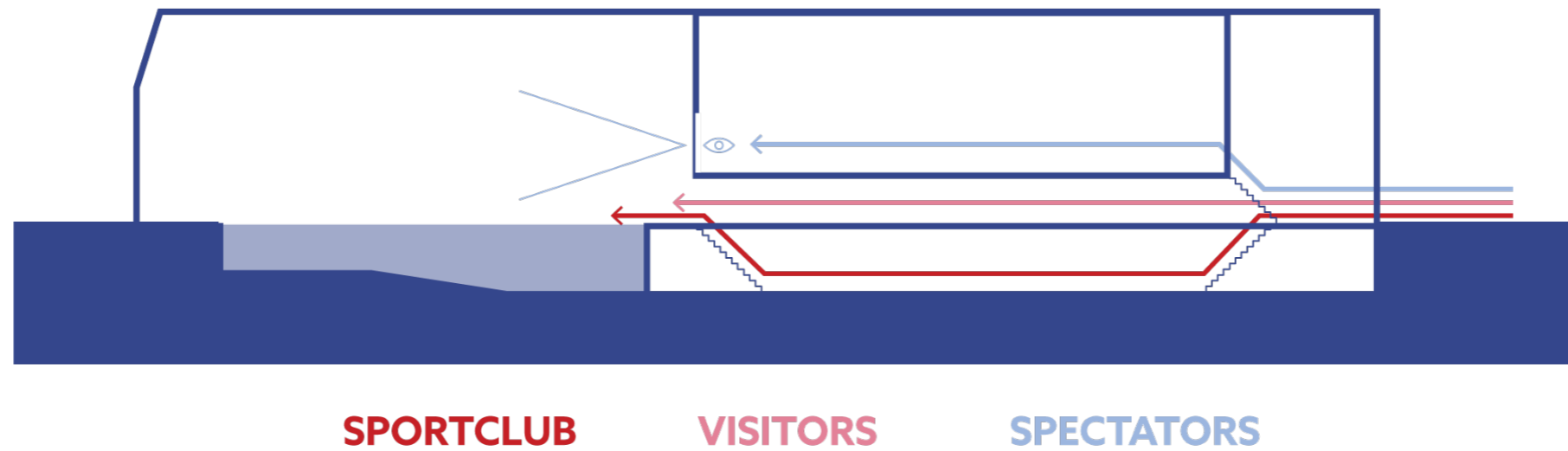
5 DESIGN | TOUR THROUGH THE BUILDING



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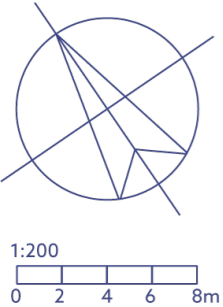
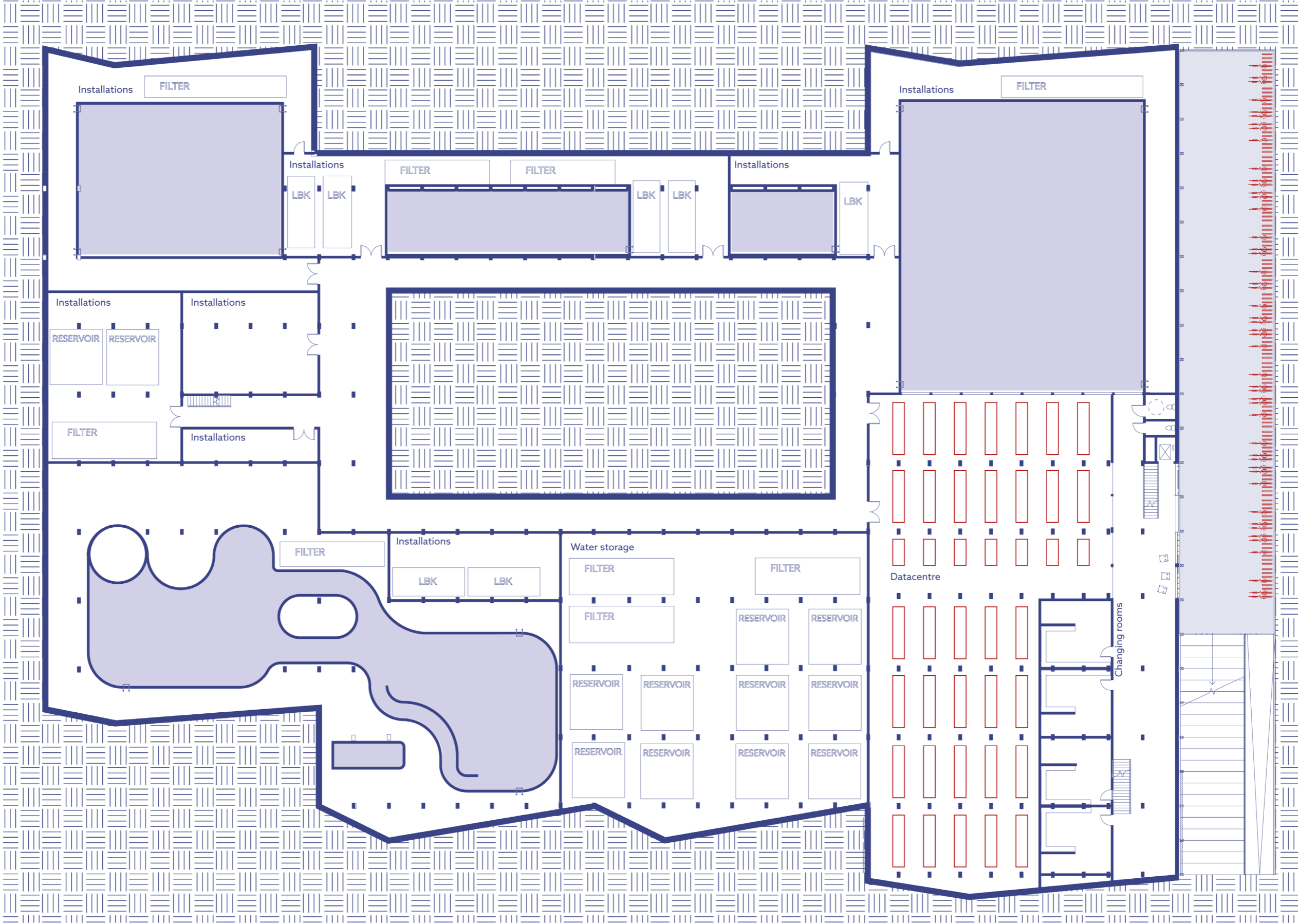


5 DESIGN | TOUR THROUGH THE BUILDING



routing per user

5 DESIGN | TOUR THROUGH THE BUILDING



800m² of datacentre, required for pool is 15m²



3

SPORTBAD

5 DESIGN | TOUR THROUGH THE BUILDING

AIR

- 1 Fresh warm air from below (prevent condensation)
- 2 Fresh dry warm air from above
- 3 Exhaust air below
- 4 Dry air pushes humid air down to pool
- 5 Air handling unit preheated by servers

WATER

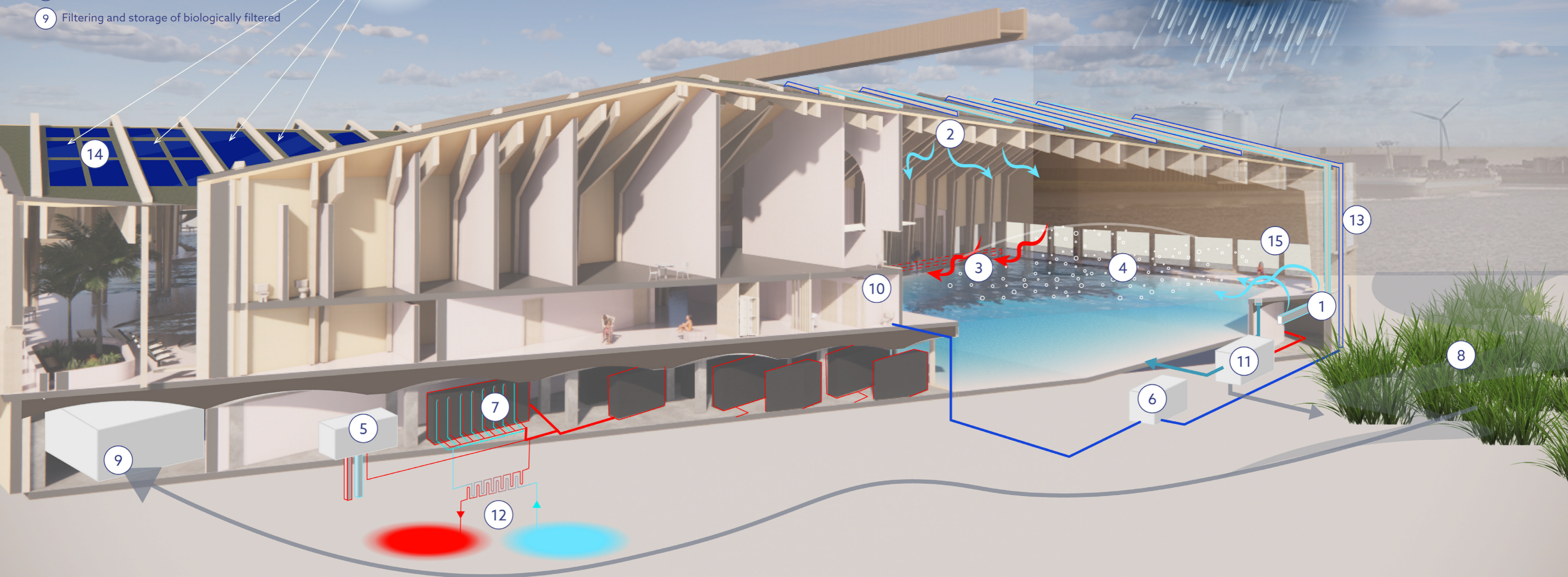
- 6 Rainwater reservoir
- 7 Rainwater used for toilet flushing
- 8 Helophyte filter filters port water
- 9 Filtering and storage of biologically filtered

HEAT

- 10 Liquid cooled datacentre used to heat air and water
- 11 Pool filter with heat exchange from servers
- 12 Aquifer thermal storage
- 13 High Rc value

ENERGY

- 14 Solar energy collection
- 15 Flexible sun shading



heat exchange datacentre

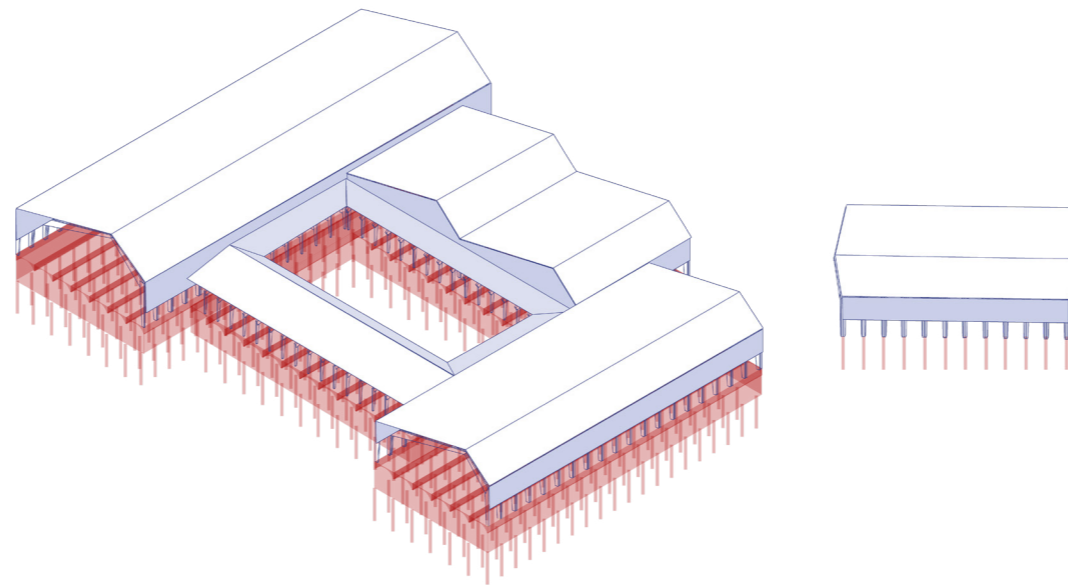
RYTHM

6 RYTHM



industrial heritage on the site has a very repetitive character

6.1 RYTHM | STRUCTURE



the design adopts this rythm through a repeating construction
made of glulam and clt

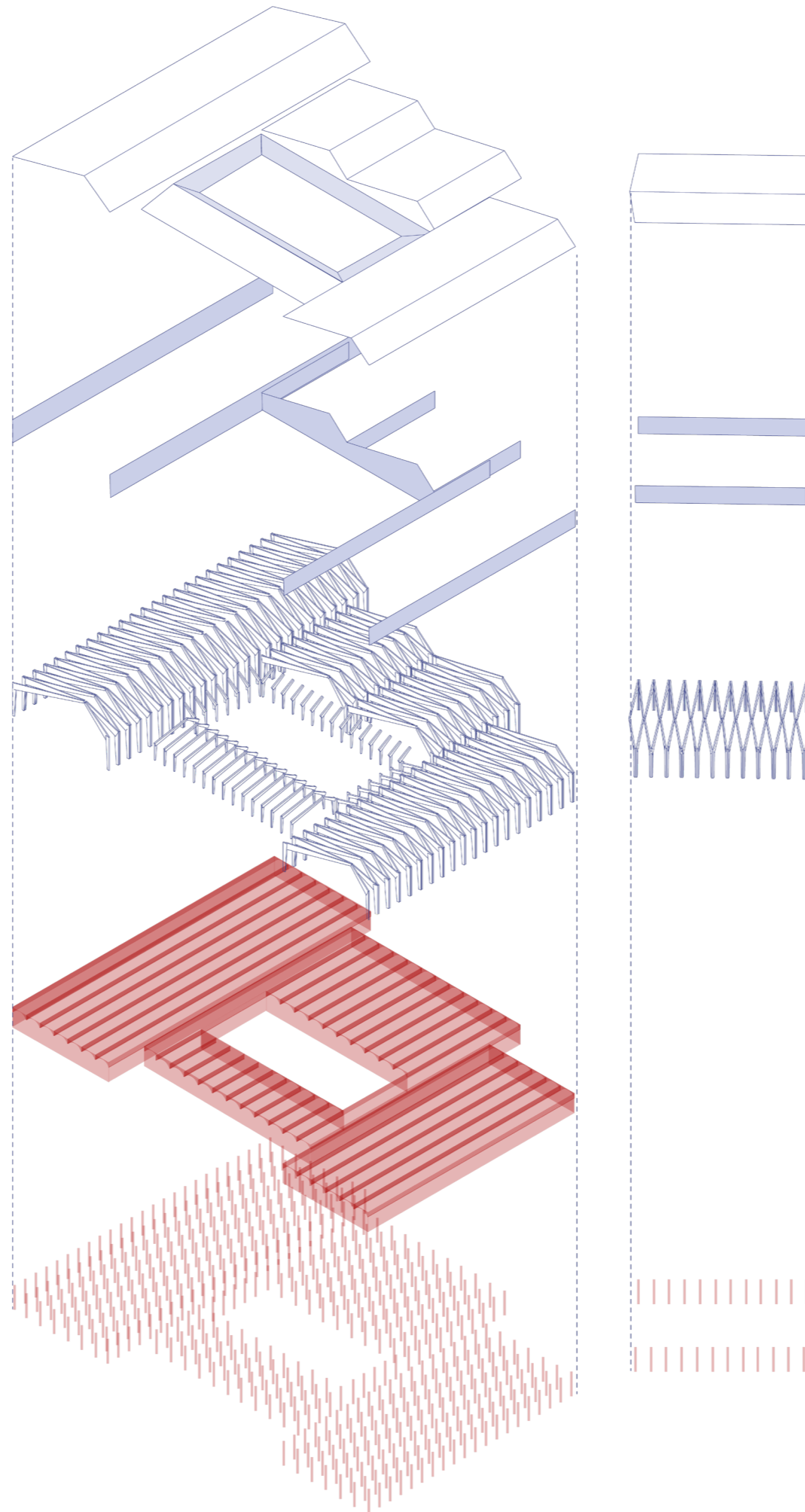
6.1 RYTHM | STRUCTURE



freemen ashted swimming pool by
Hawkins\Brown



archivo municipal by Aulets Arquitectes

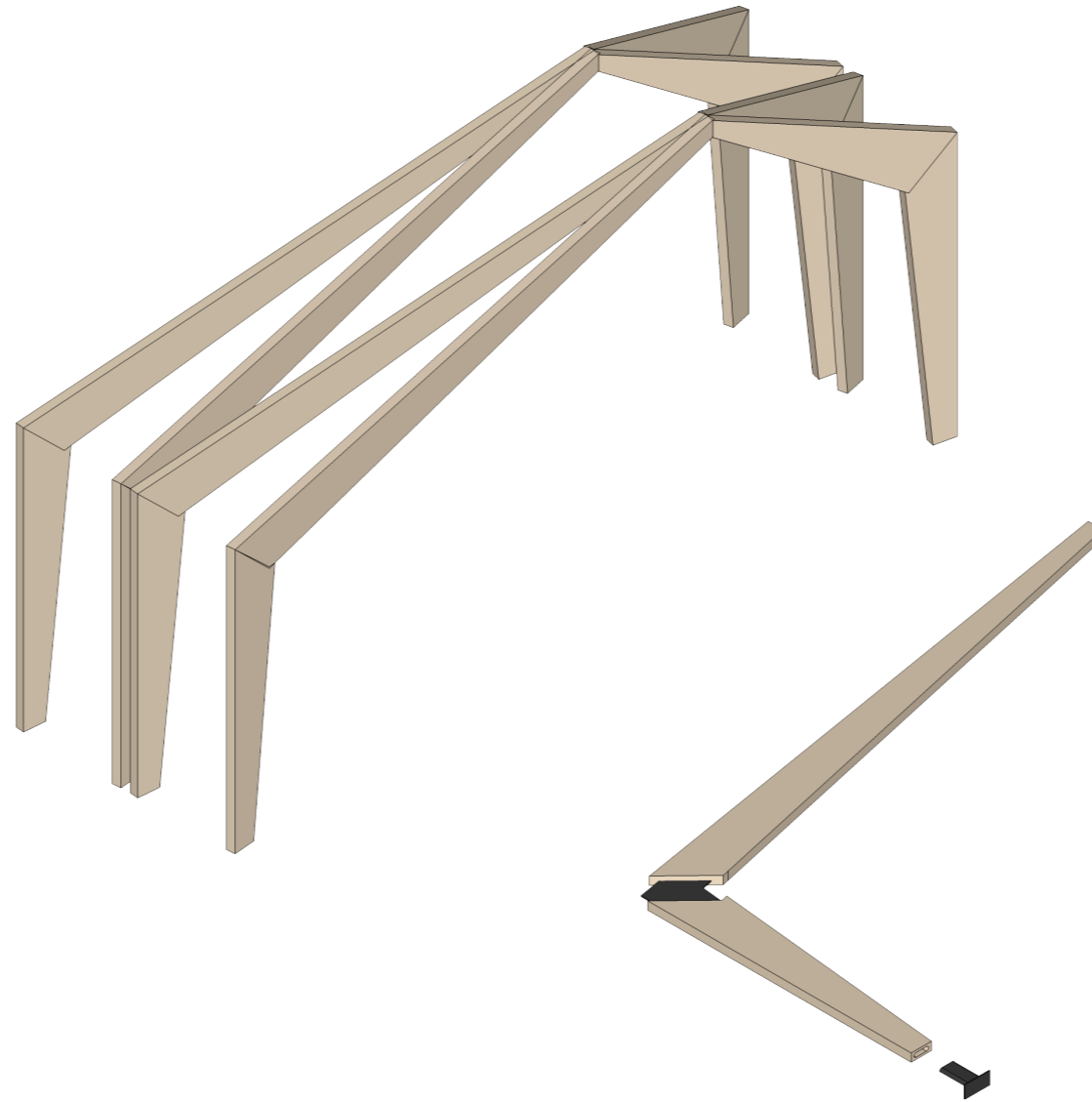


cross laminated timber
is used for stability in
the facade

the angled beams bear
horizontal forces

the basement is made of
a concrete barrel vault
construction

6.1 RYTHM | STRUCTURE

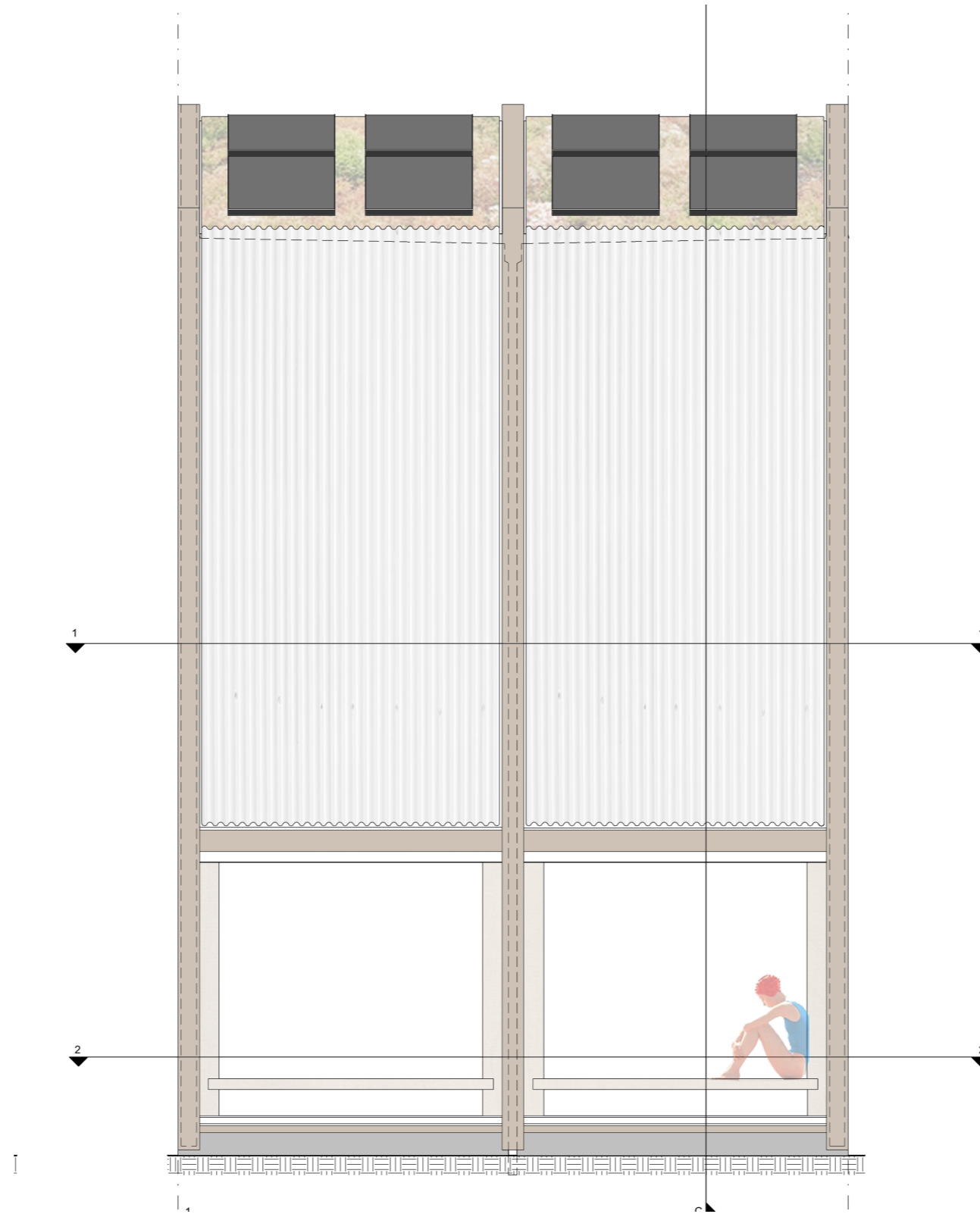


6.2 RYTHM | FACADE



the facade structure and lines relate to the existing context

6.2 RYTHM | FACADE

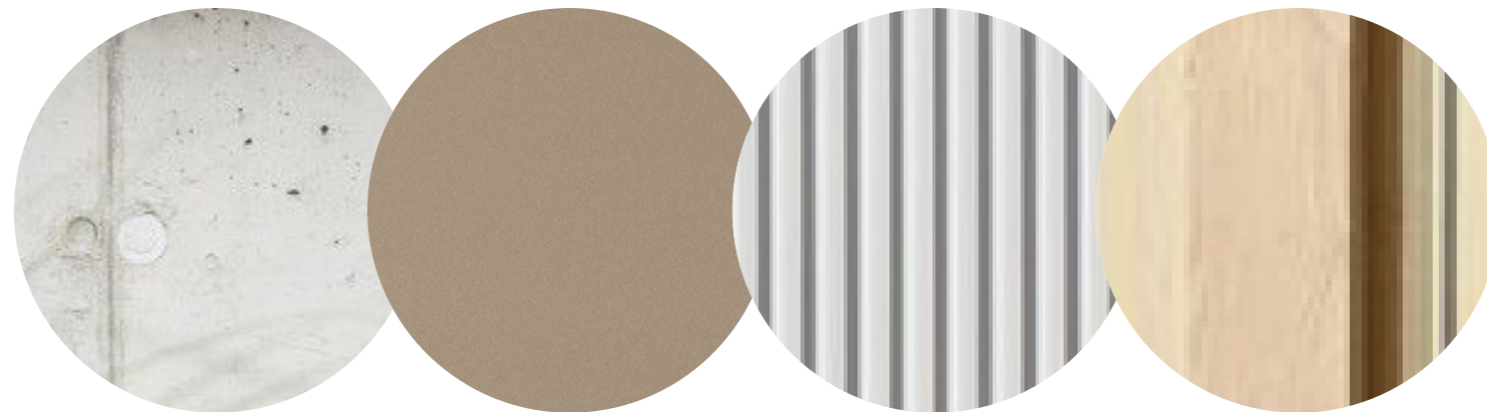


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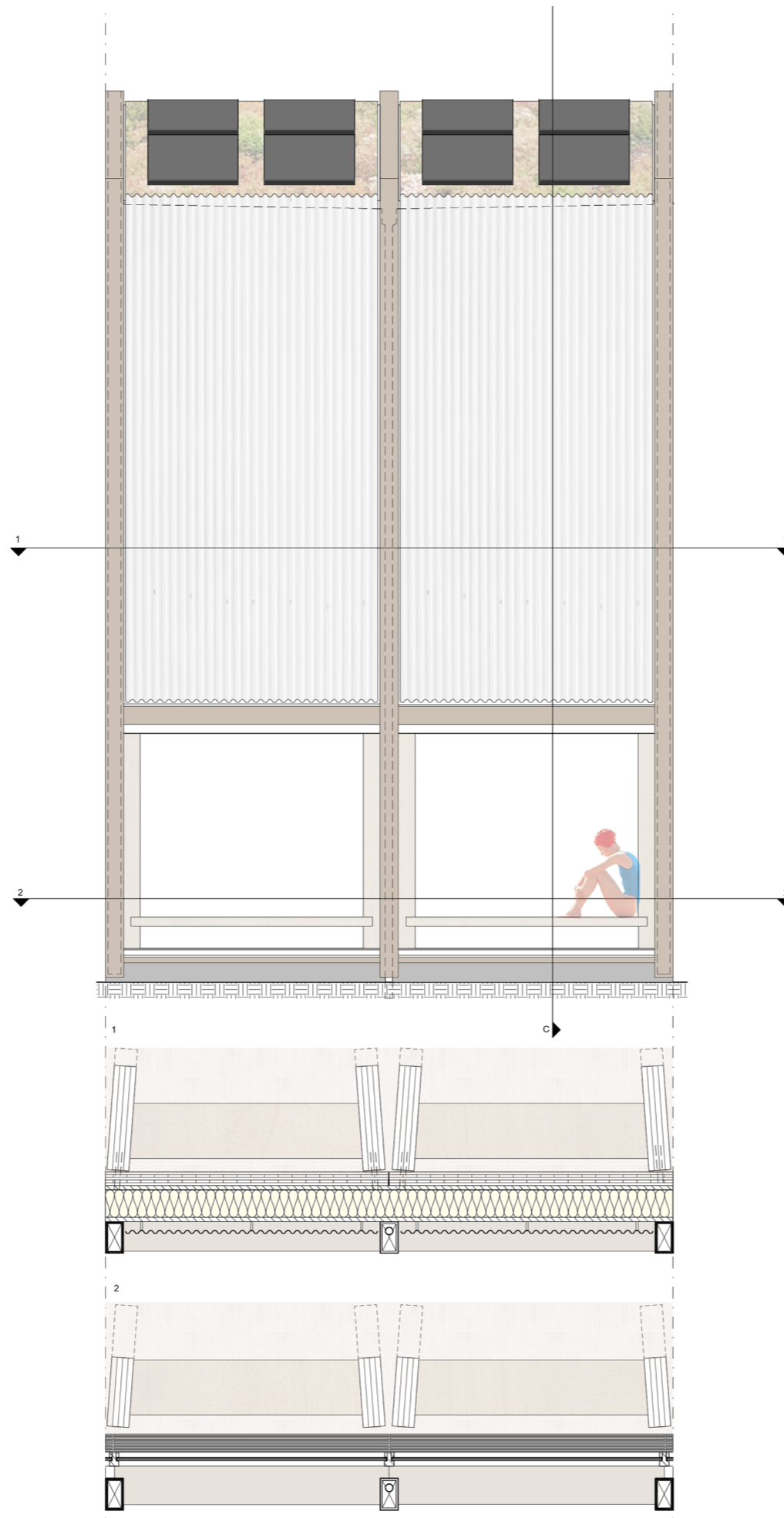
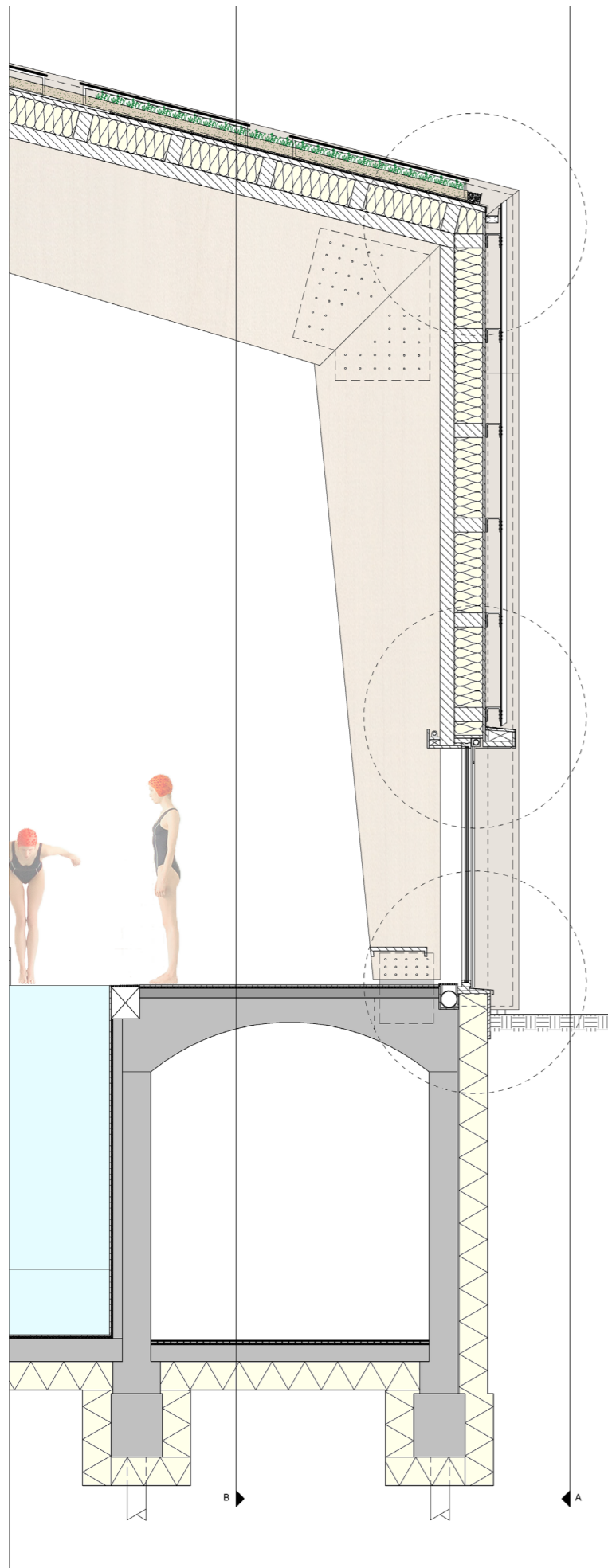
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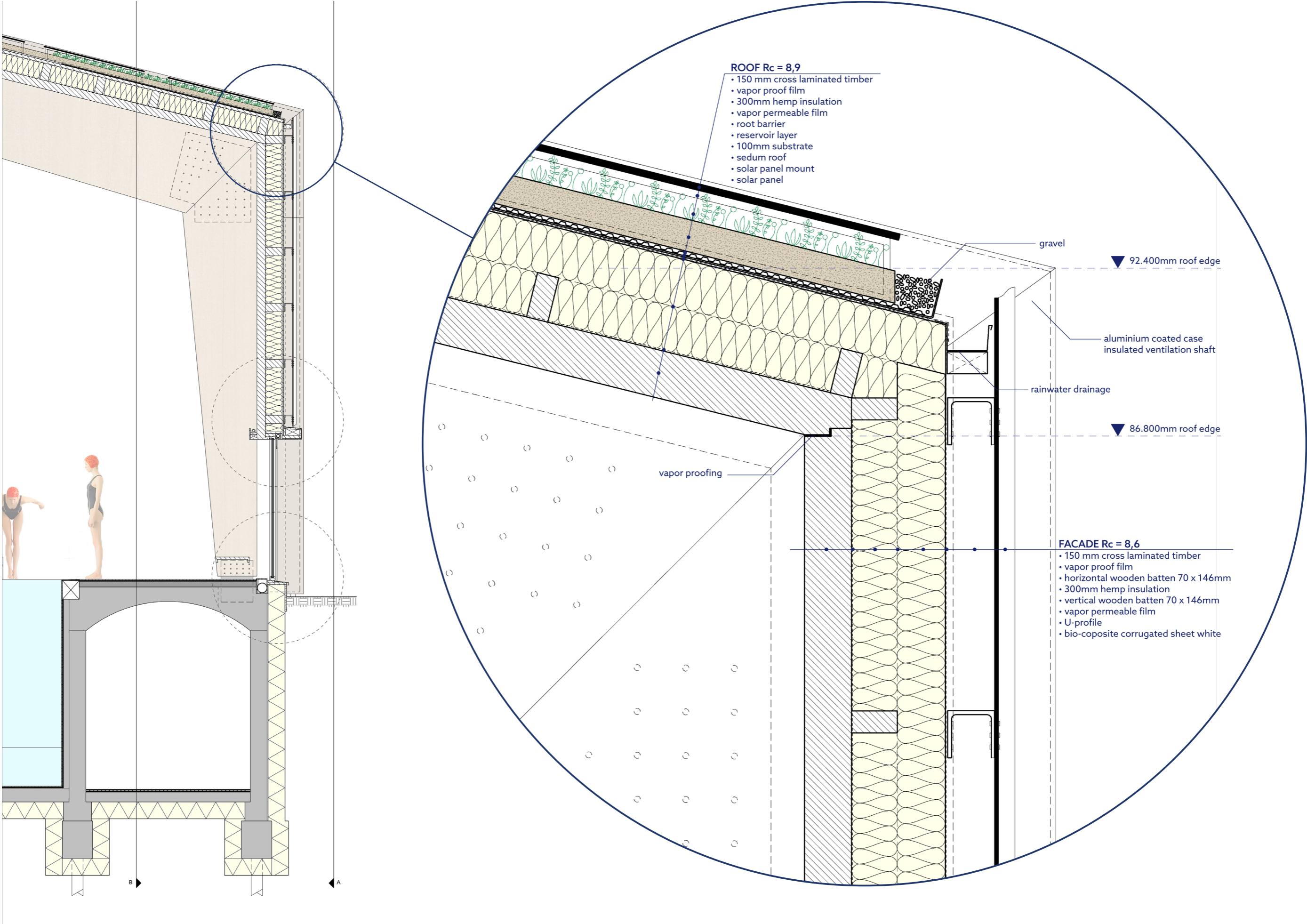
East facade



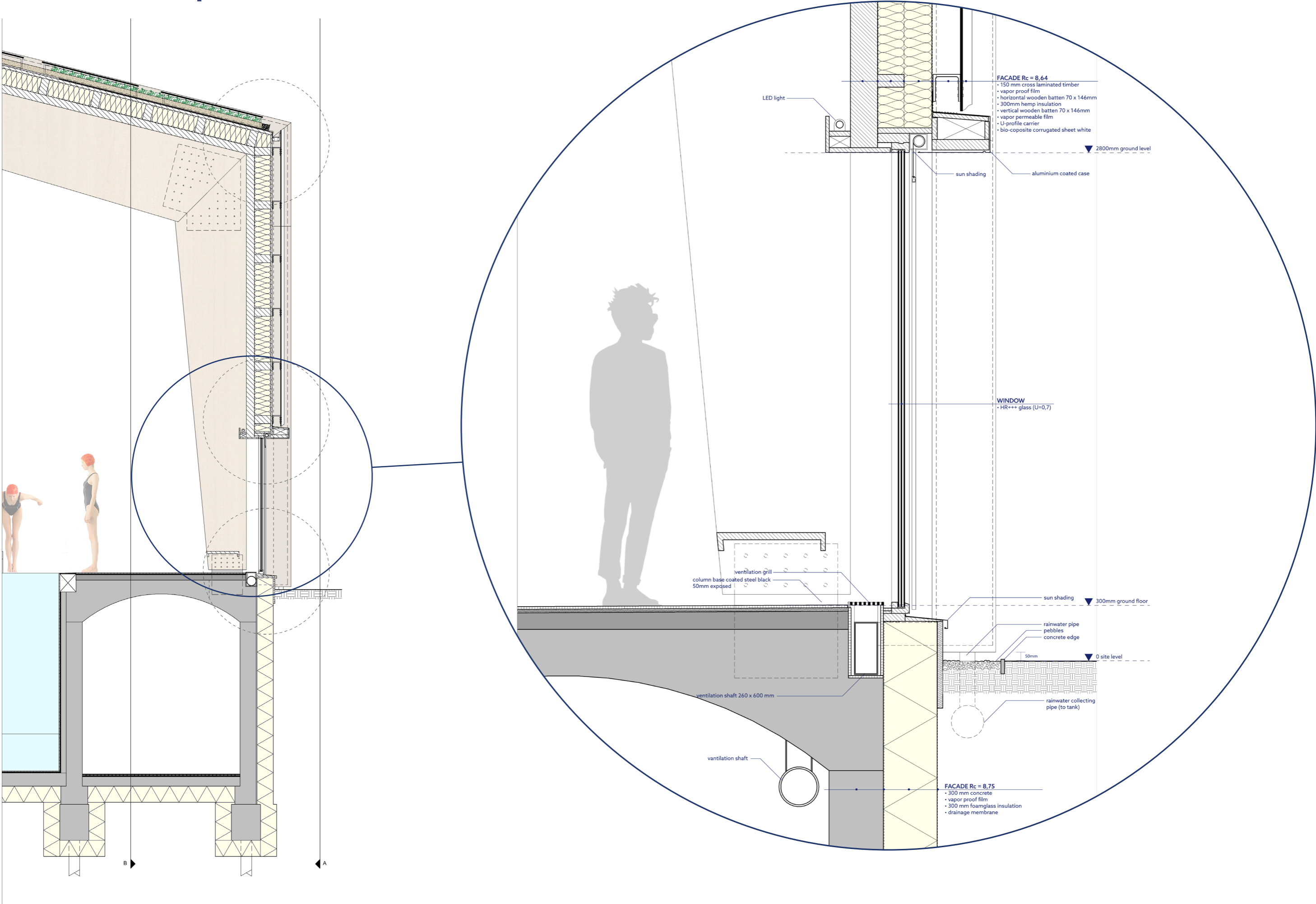
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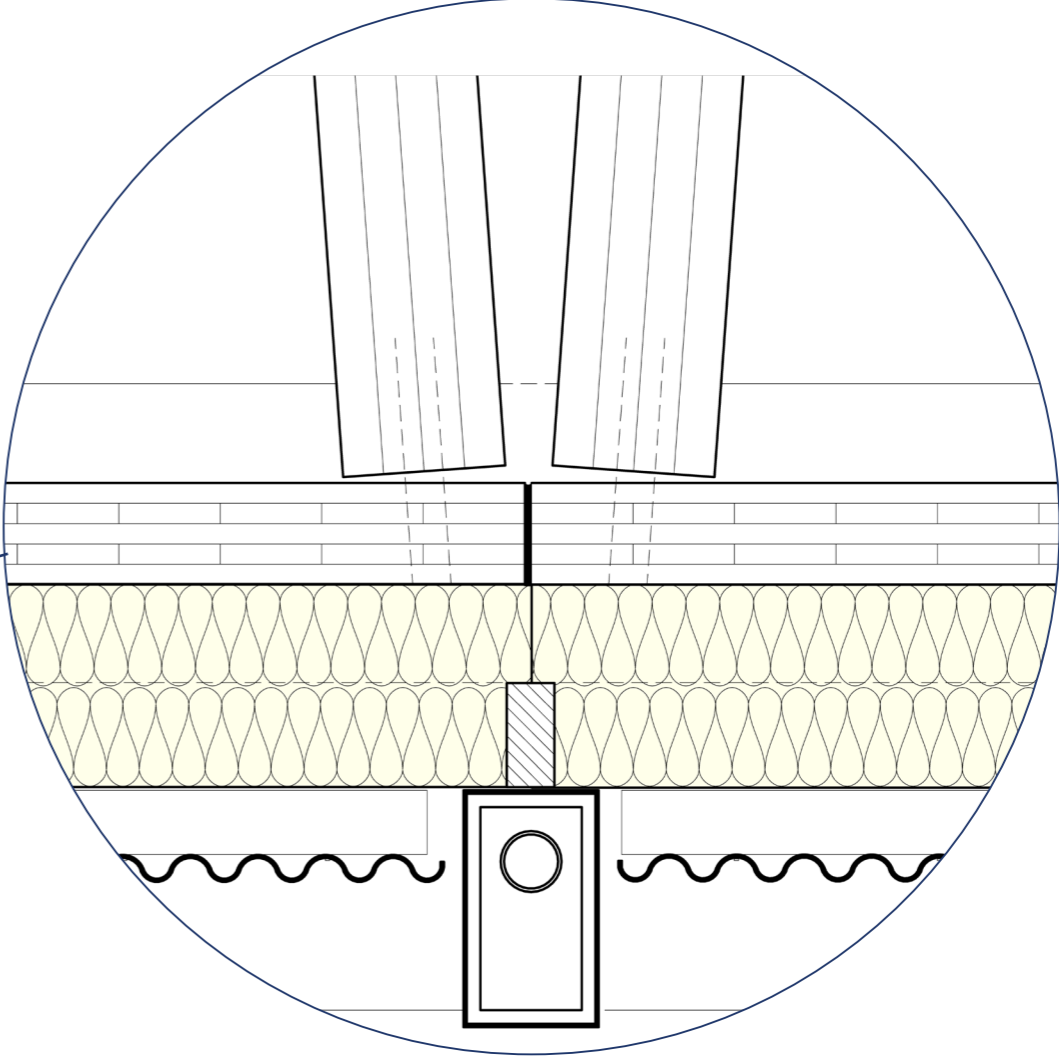
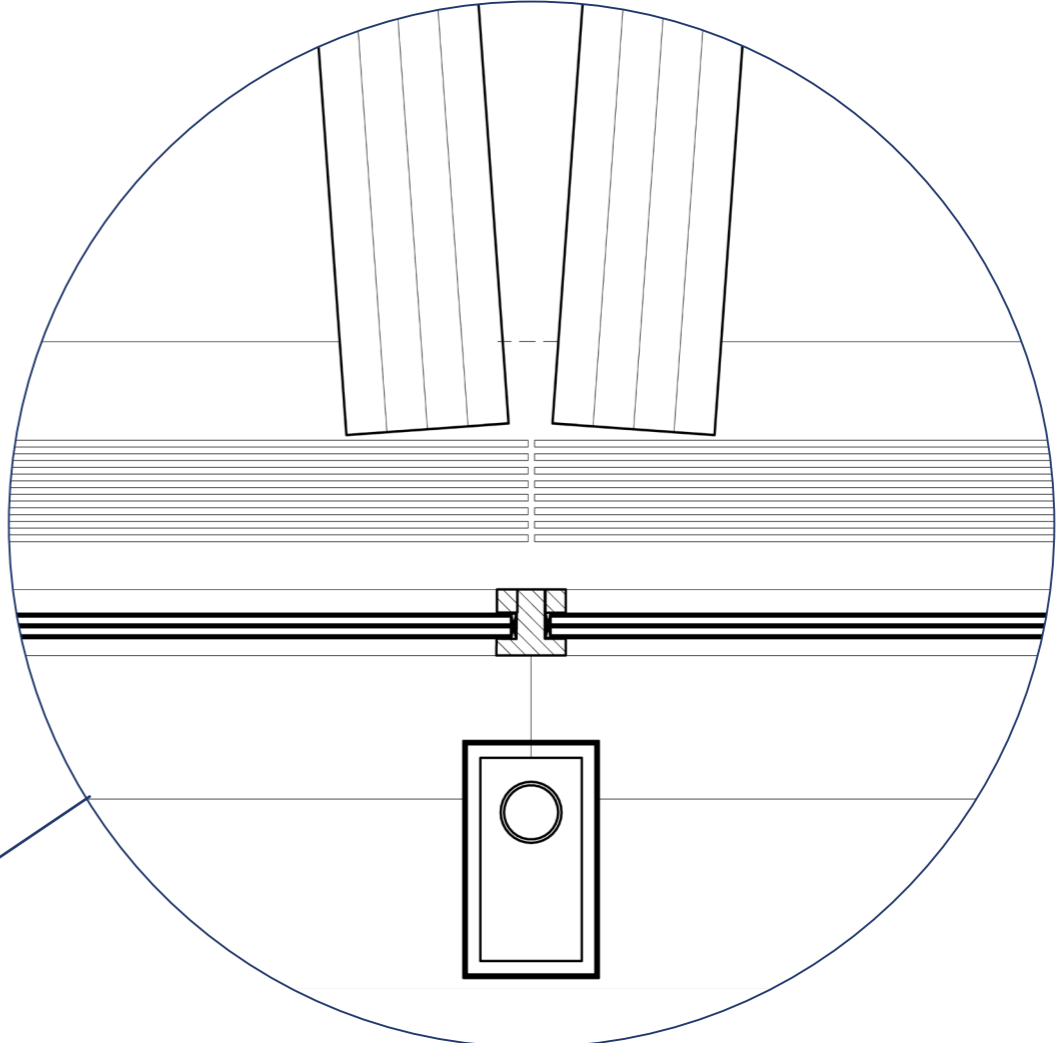
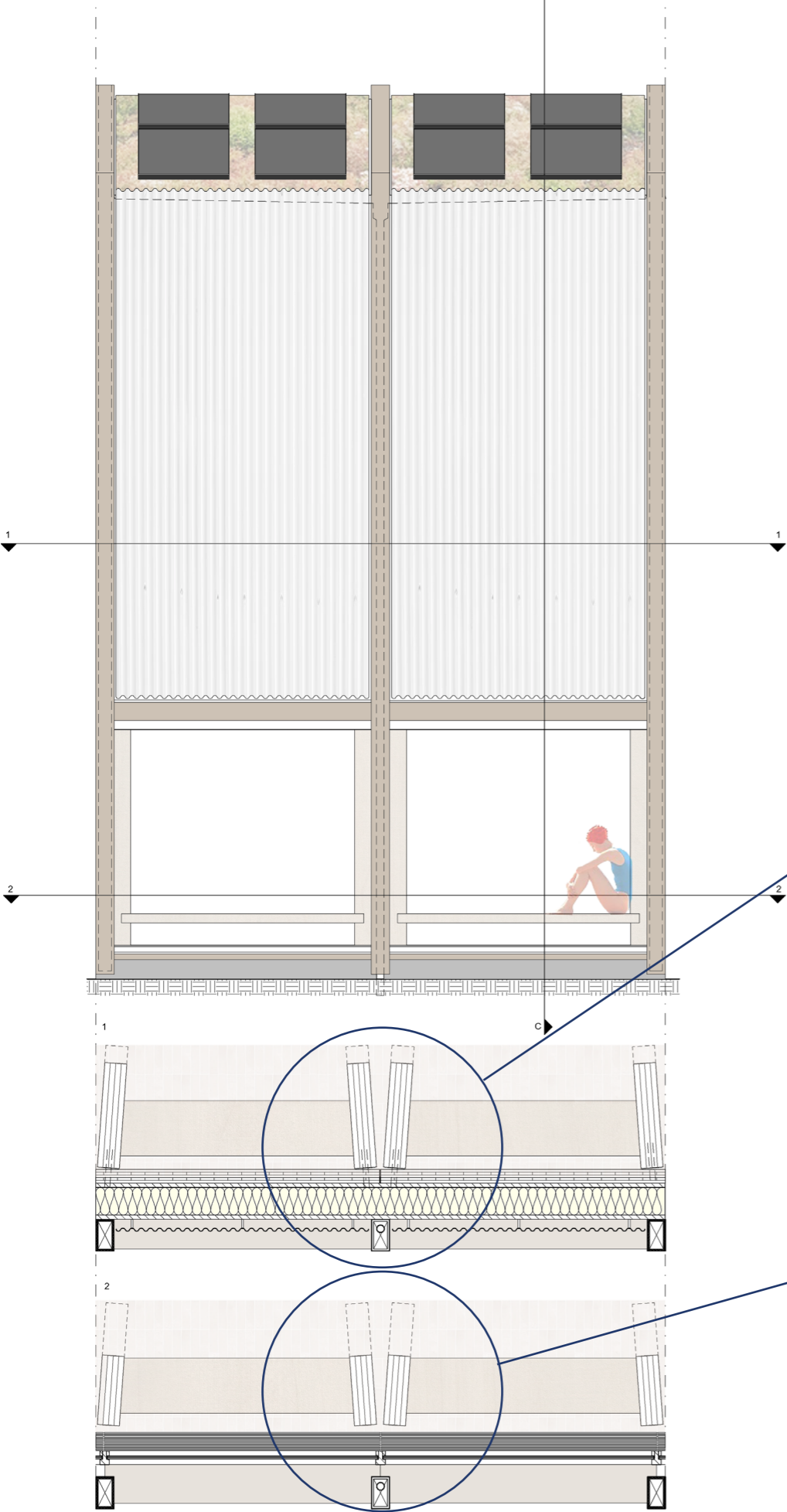
6.2 DETAILS | FACADE



6.2 RYTHM | FACADE



6.2 RYTHM | FACADE



6.2 RYTHM | CLIMATE

AIR

- 1 Fresh warm air from below (prevent condensation)
- 2 Fresh dry warm air from above
- 3 Exhaust air below
- 4 Dry air pushes humid air down to pool
- 5 Air handling unit preheated by servers

WATER

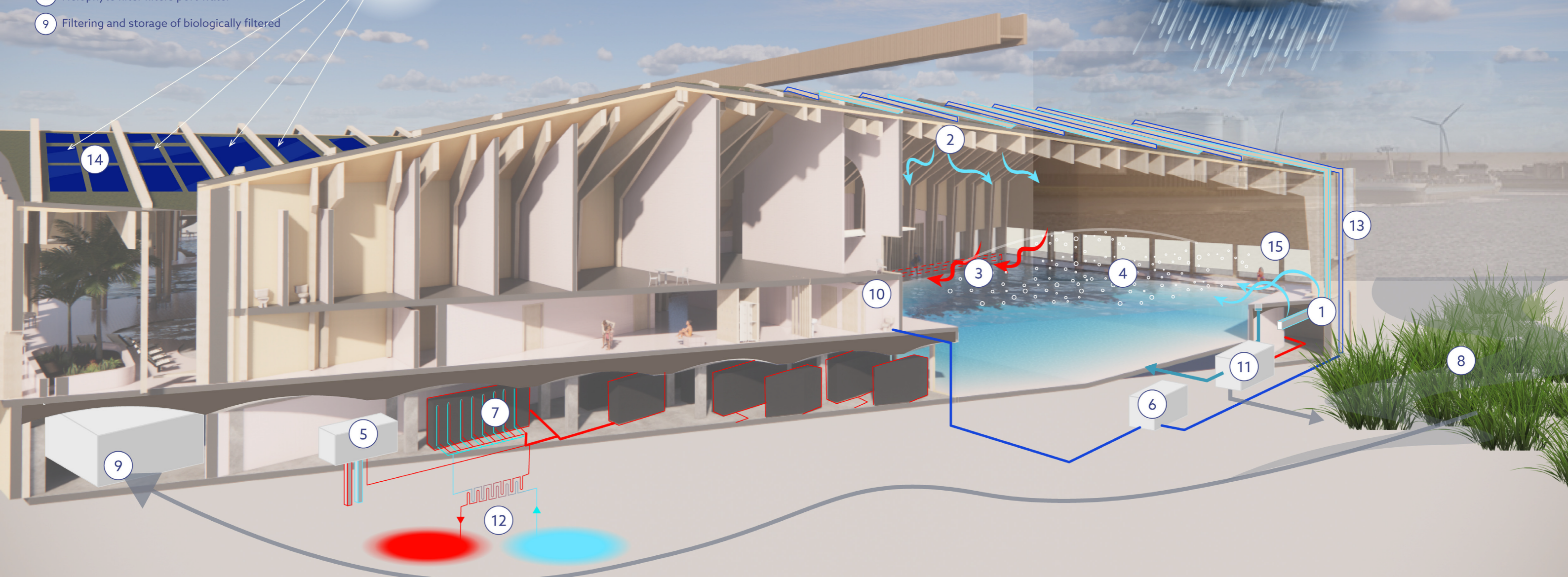
- 6 Rainwater reservoir
- 7 Rainwater used for toilet flushing
- 8 Helophyte filter filters port water
- 9 Filtering and storage of biologically filtered

HEAT

- 10 Liquid cooled datacentre used to heat air and water
- 11 Pool filter with heat exchange from servers
- 12 Aquifer thermal storage
- 13 High Rc value

ENERGY

- 14 Solar energy collection
- 15 Flexible sun shading



ventilation and rain



