BADHUIS MARINETERREIN

Re-imagining combined energy production & bathhouse as contributing to valuable urban social space

Fallon Walton

aE Intecture - Graduation
July 6, 2017

Tutors:
Roel van der Pas (Design)
Jan Jongert (Research)
Mauro Parravincini (Building Tech.)

Context

Bathhouse

Objective

Technical Research

Design

Context

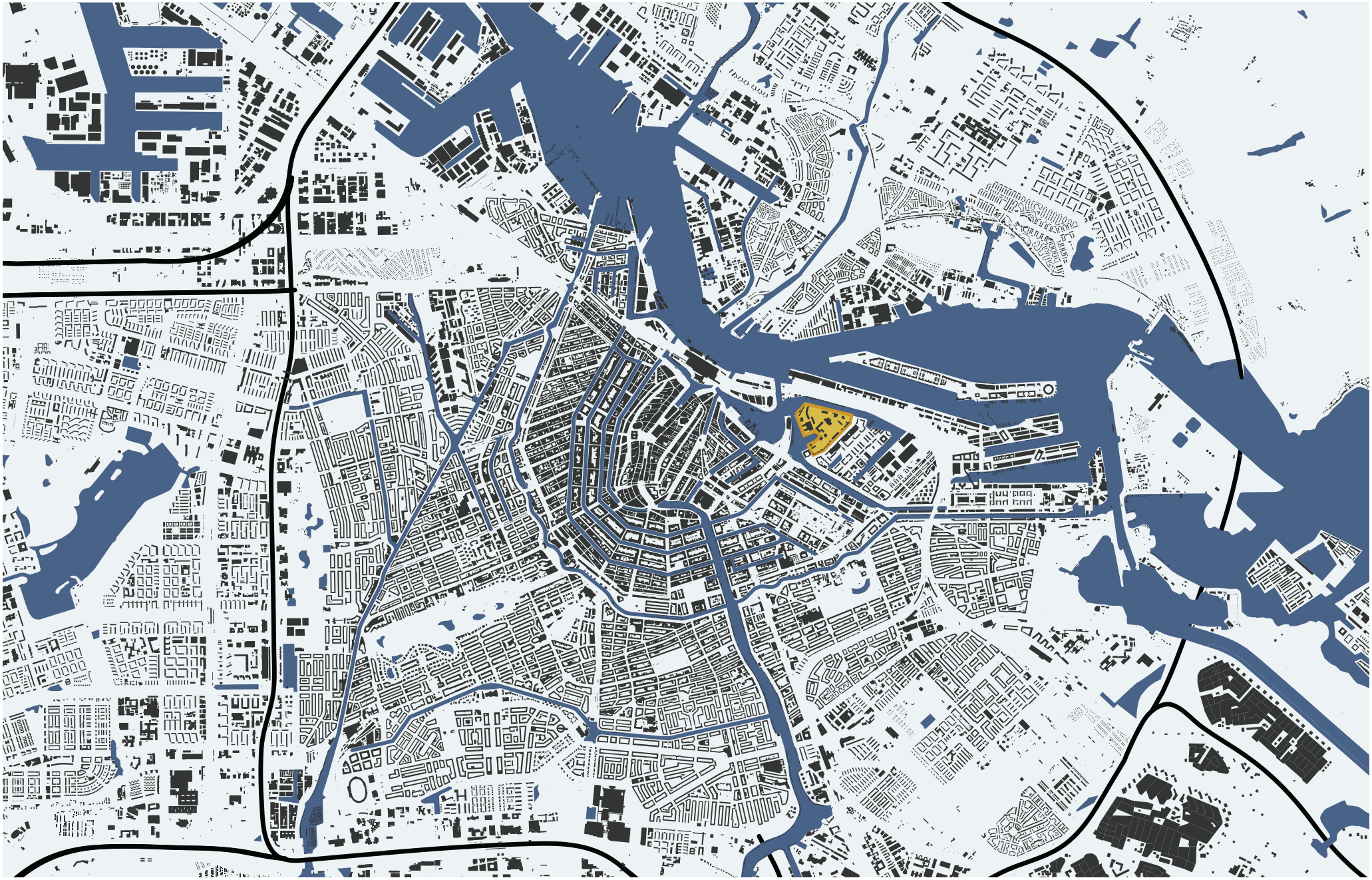
Bathhouse

Objective

Technical Research

Design

Amsterdam



Marineterrein, Amsterdam

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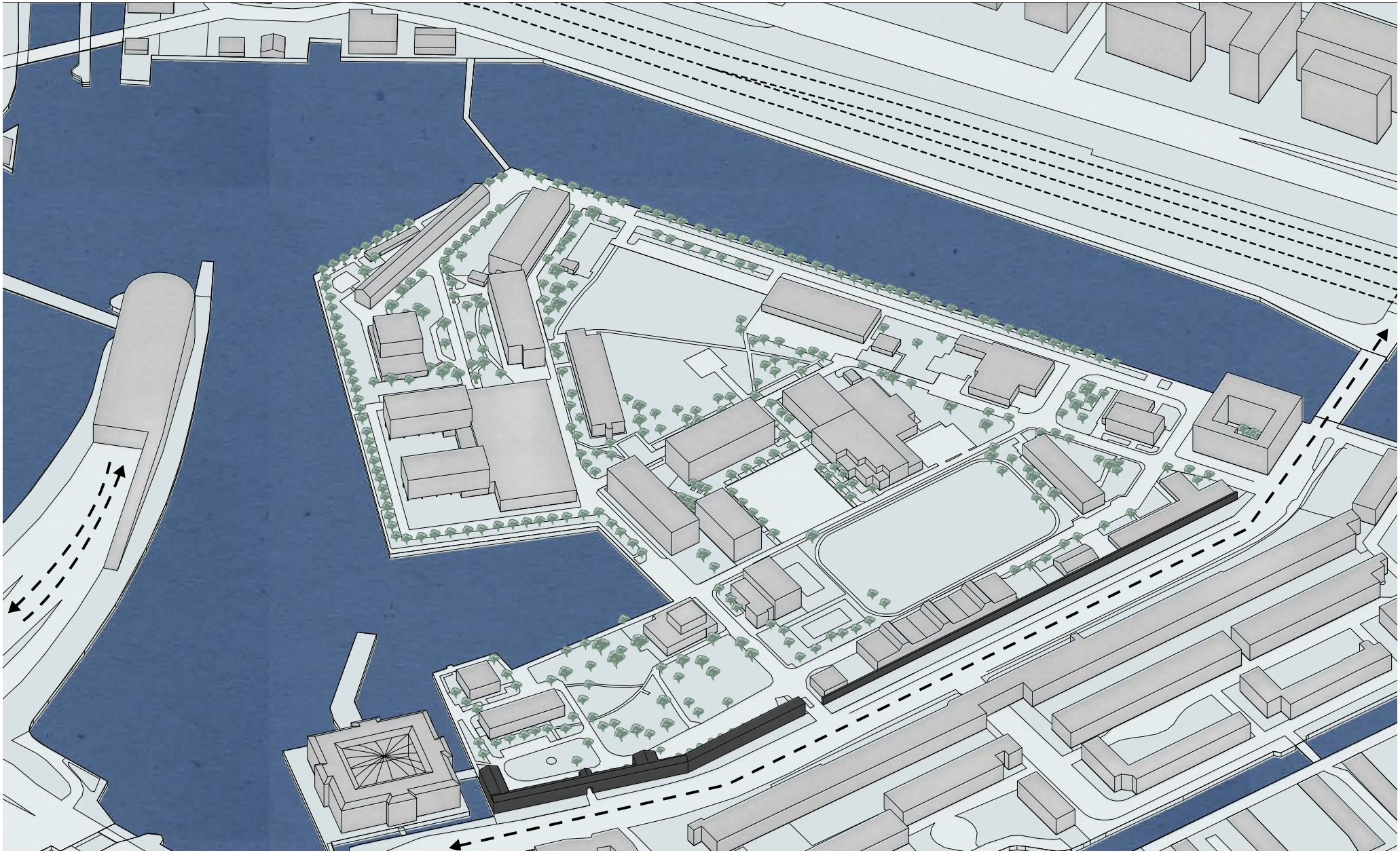
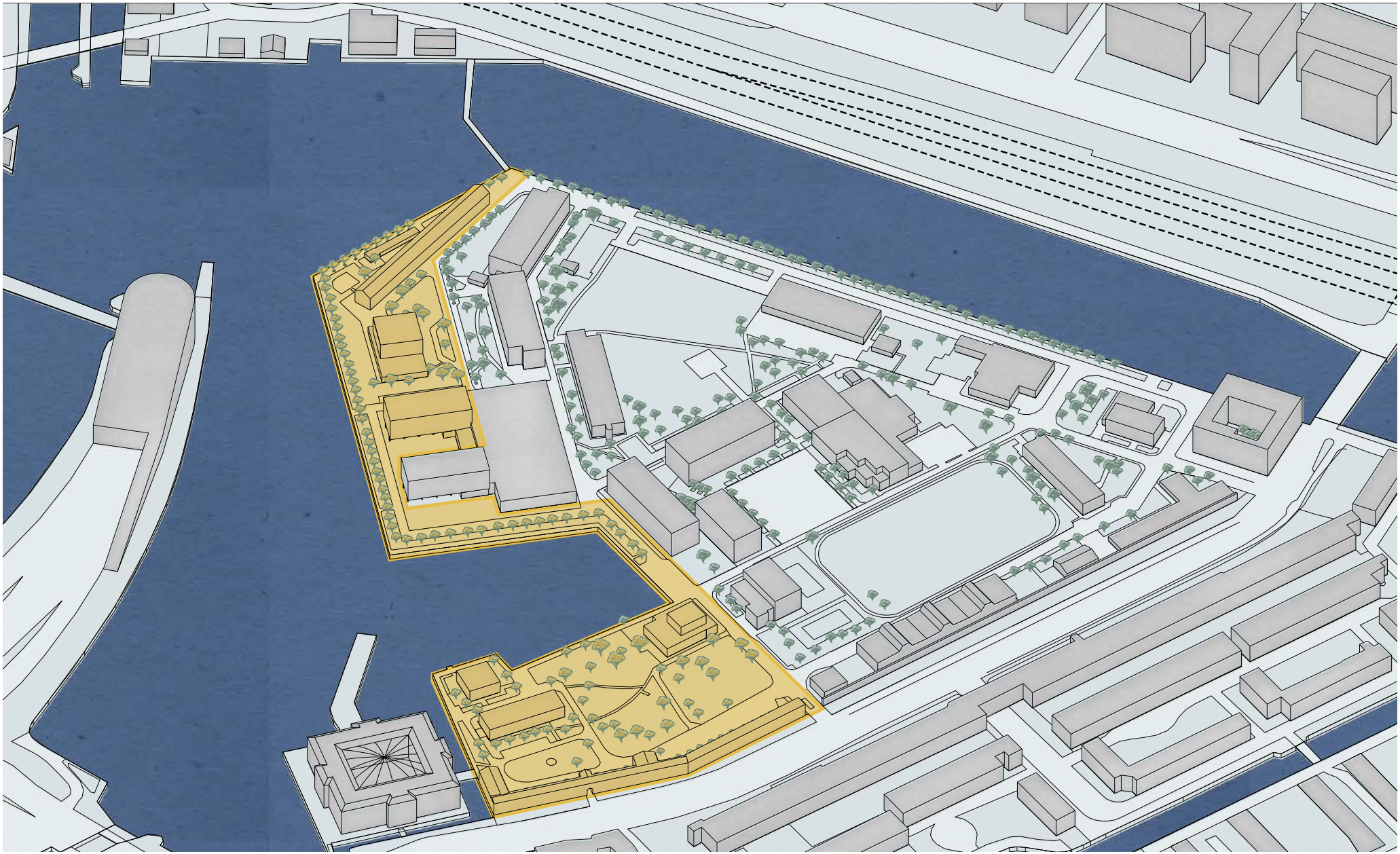
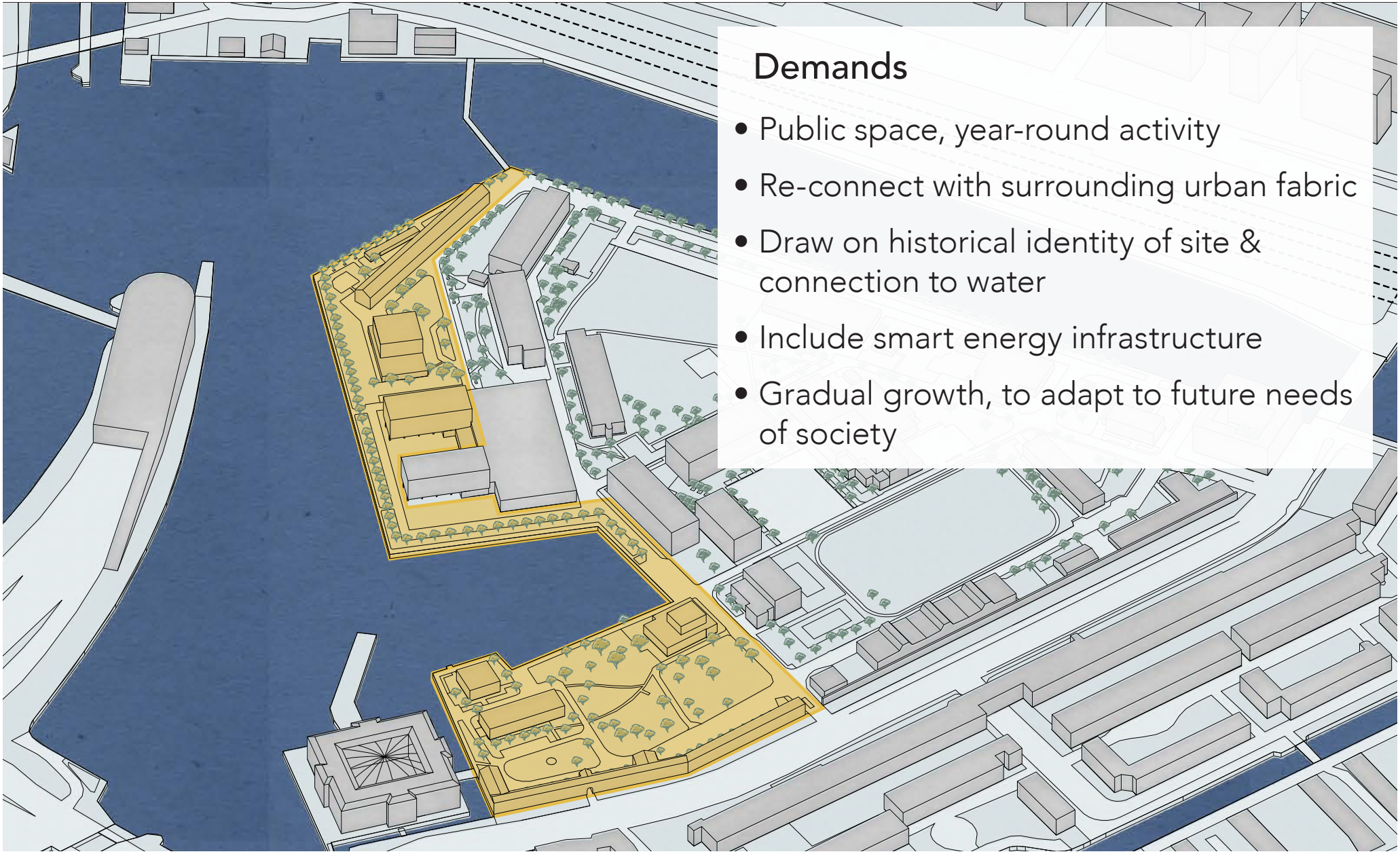


Marineterrein, Amsterdam



Marineterrein, Amsterdam



Demands

- Public space, year-round activity
- Re-connect with surrounding urban fabric
- Draw on historical identity of site & connection to water
- Include smart energy infrastructure
- Gradual growth, to adapt to future needs of society

Opportunities

- Refuge and quietness within city
- Reclaim green public space
- Intersection point between disconnected neighbourhoods
- Inventory of existing buildings
- Play a role in improving current urban **social** & **sustainability** issues

Amsterdam City Swim, 2016

Sustainable Issues

- Untapped potential of food waste as energy
- Recovery & processing of organic residues using innovative applications
- High density of residents & restaurants

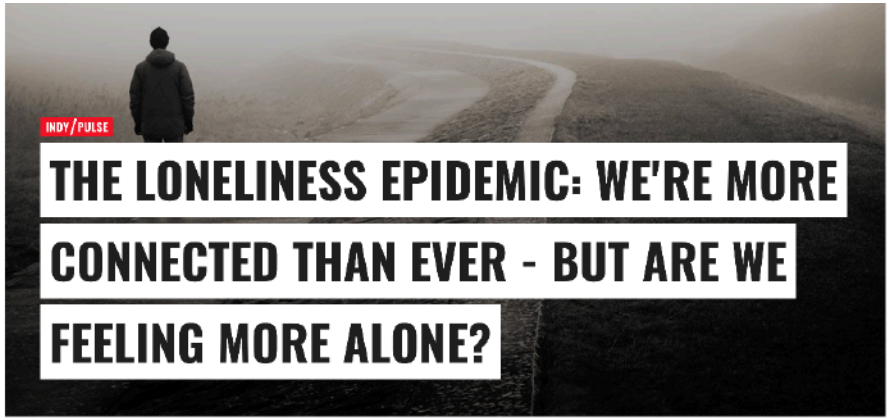
Social Issues

nrc.nl›

‘De stad zag de gevaren niet op tijd’

Interview Hoogleraar Jan van der Borg Toerisme levert óók veel op, zegt hoogleraar Jan van der Borg. Maar bewoners profiteren er te weinig van.

Mirjam Remie 12 april 2016



Social pain is as real a sensation for us as physical pain, and research has shown loneliness impacts on health in a greater way than smoking or obesity

Het Parool HOME AMSTERDAM STADSGIDS OPINIE

Drukte in de binnenstad kan paniek veroorzaken

Op plekken als de Kalverstraat dreigt 'overcrowding'. © ANP

De sociale cohesie in Amsterdam staat onder druk, blijkt uit een rapport van de politie. Ook dreigt 'overcrowding:' zoveel mensen bijeen dat paniek kan ontstaan.

DOOR: MAARTEN VAN DUN 1 OKTOBER 2016, 07:00

Context

Bathhouse

Objective

Technical Research

Design

Evolution of the Bathhouse

Antiquity

1 Century BC

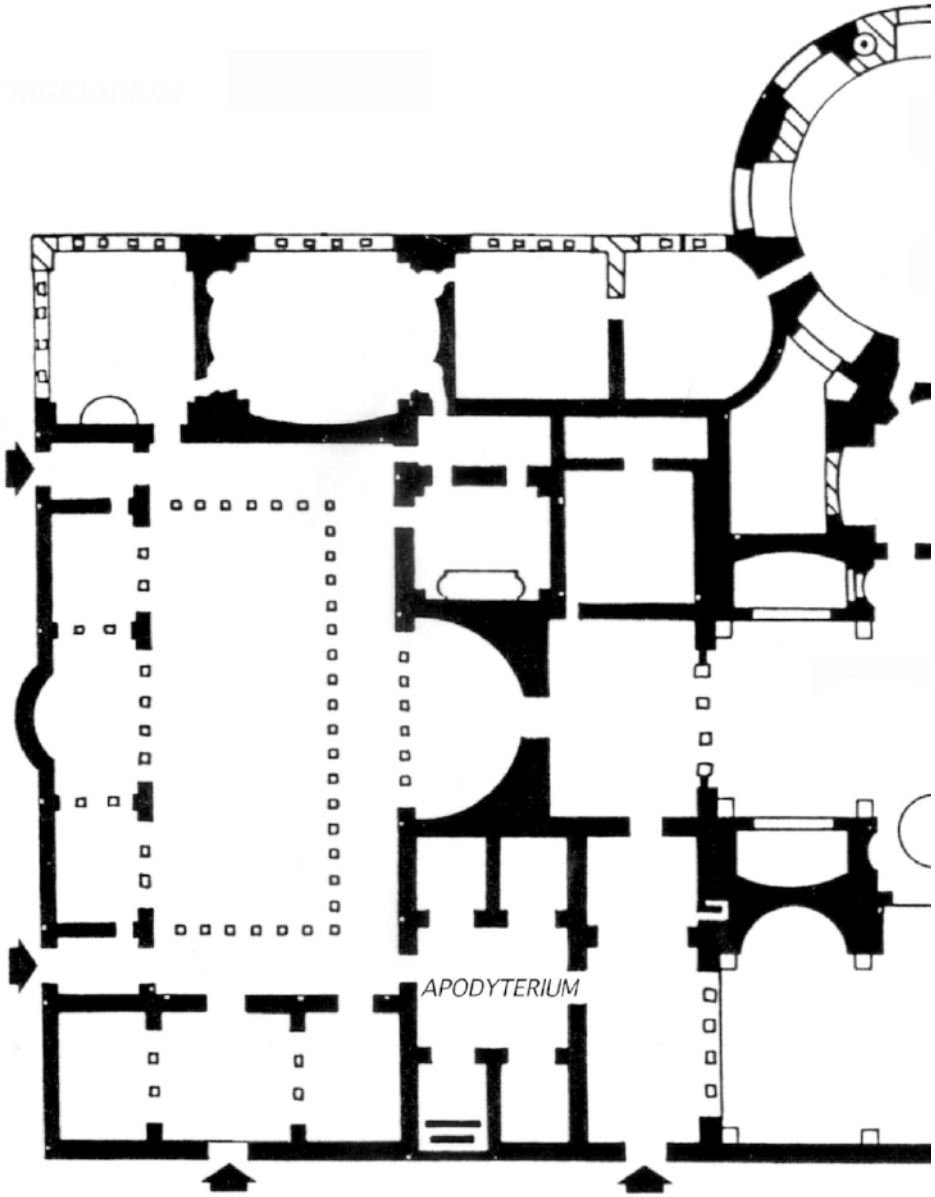
Hygiene Movement

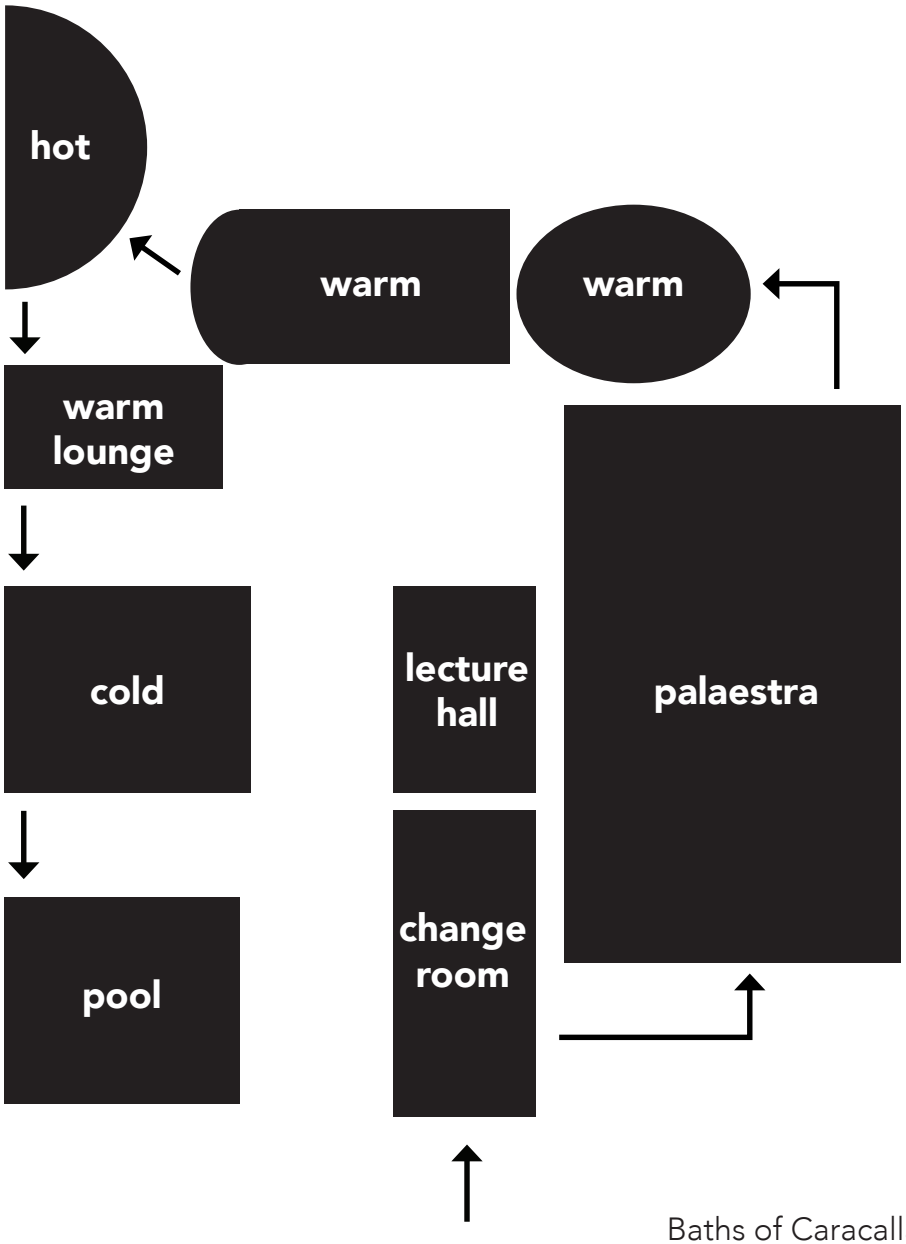
+/-1911

Contemporary Spa Culture

+/-1980

Typical Procession





Baths of Caracalla, Rome
212 AD

Architectural Features

Columns

Introvert

Tiles

Light

Social Relevance

Context

Bathhouse

Objective

Technical Research

Design

Design Question

How can the integration of energy production from food waste and a public bathhouse become a cohesive design?

How can it facilitate social connections on the Marineterrein & accommodate future visions for the site?

Technical Question

How can the flows of food waste, energy, and water be locally managed and integrated into the design of a public bathhouse?

Context

Bathhouse

Objective

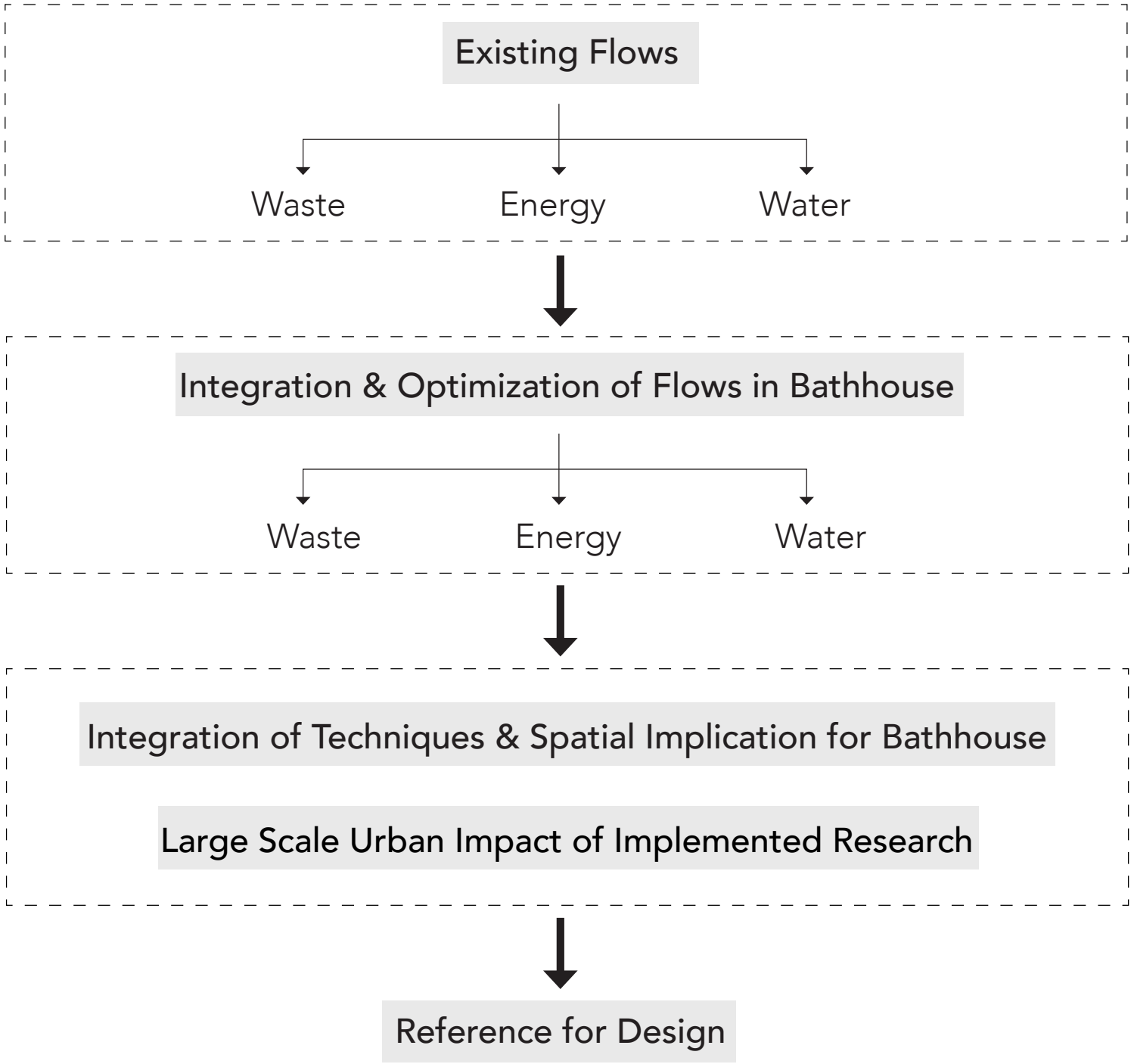
Technical Research

Design

Part 1

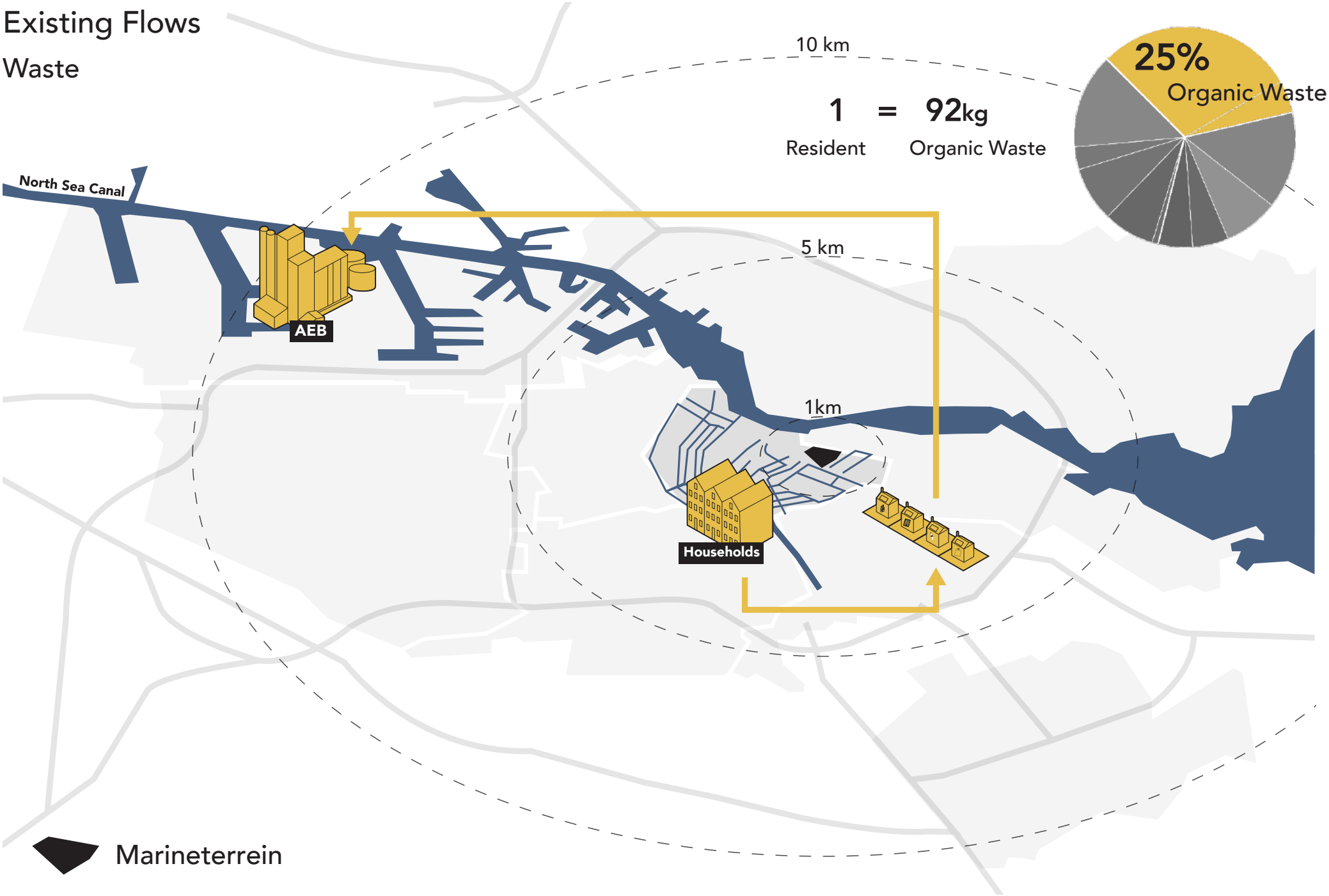
Part 2

Part 3



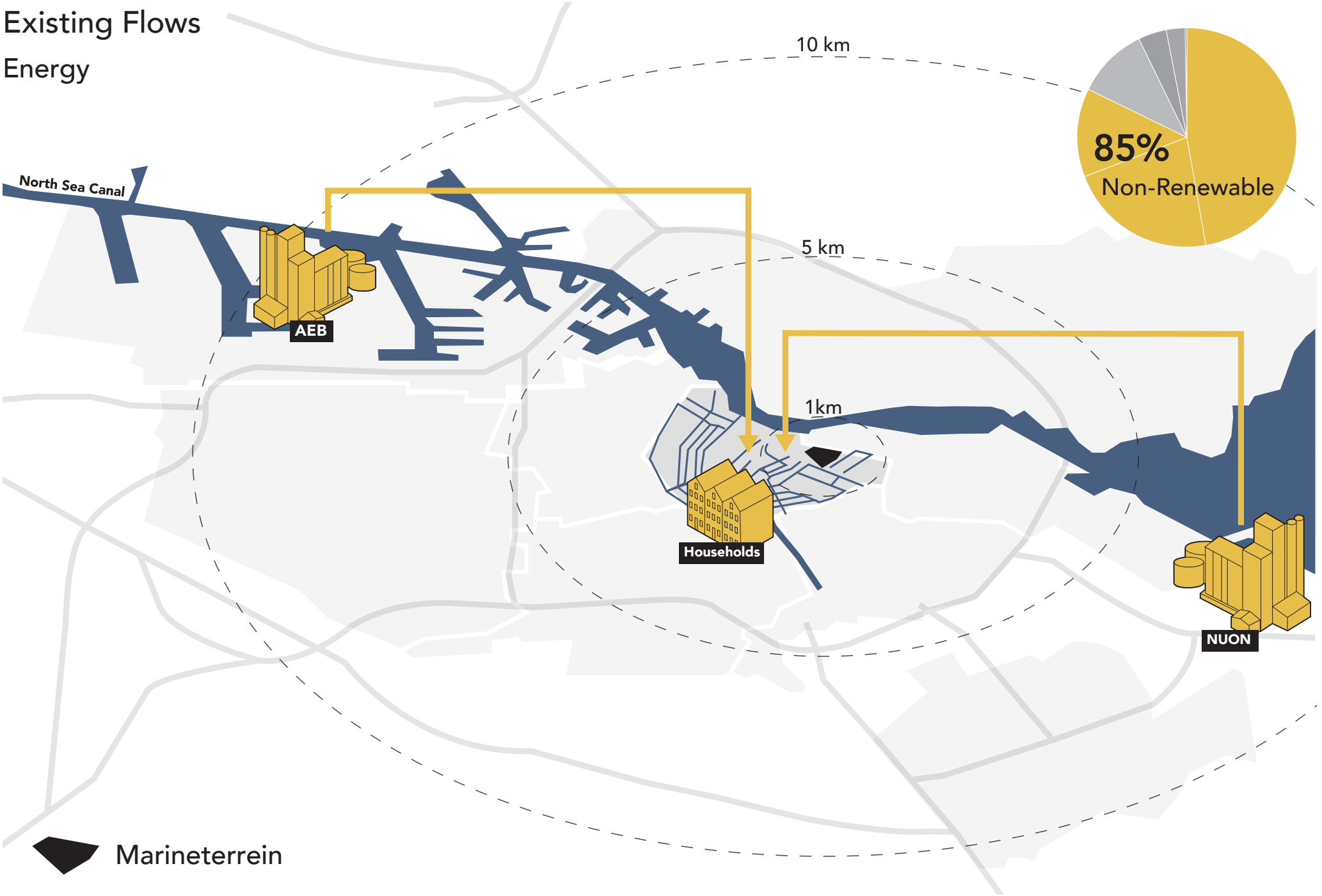
Existing Flows

Waste



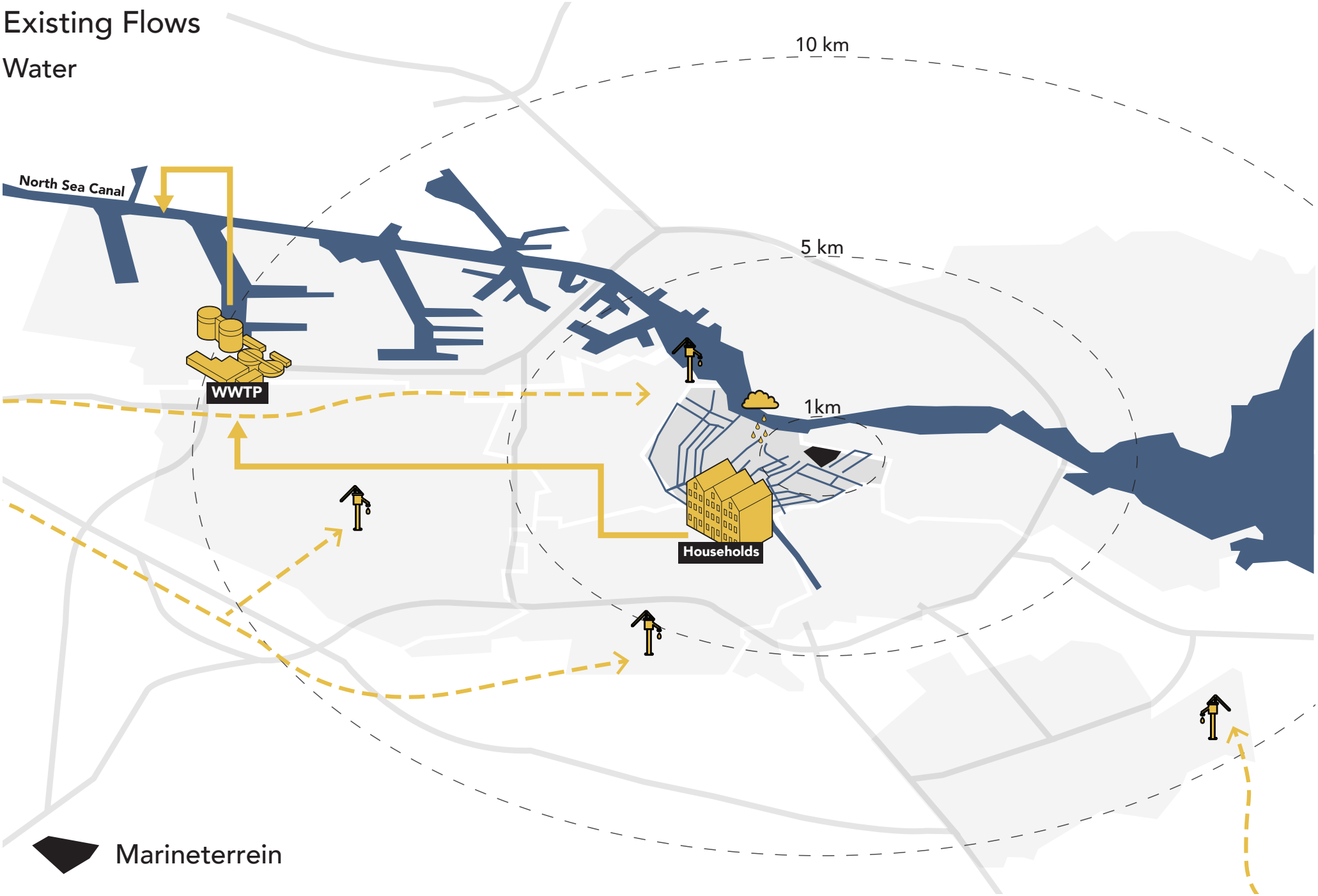
Existing Flows

Energy



Existing Flows

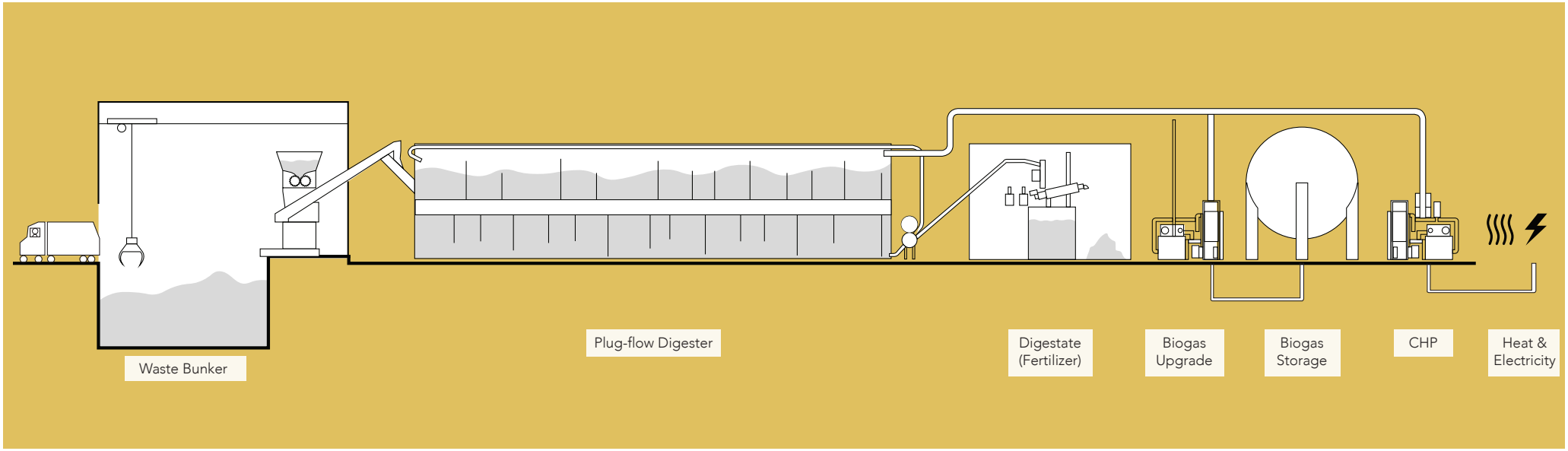
Water



Proposed Techniques

Food Waste

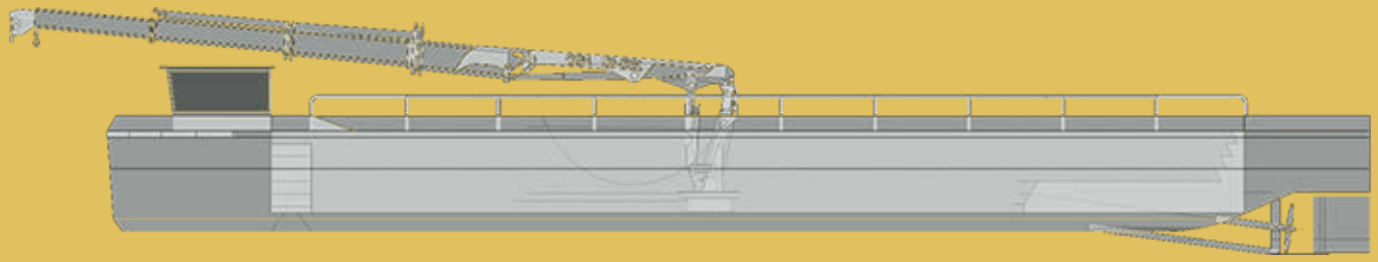
1000kg Food Waste = **720kWh** Energy + **370kg** Natural Fertilizer



Anaerobic Digestion

Proposed Technique

Energy

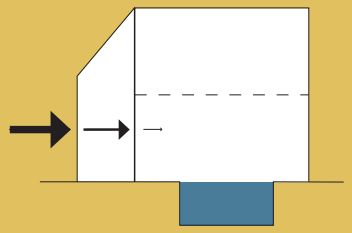


Electrically-powered
Canal Barge

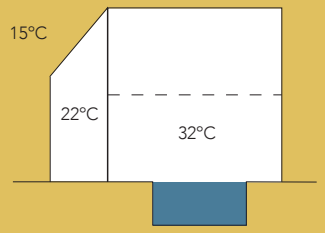
Transportation

$$1m^2 = \underset{\text{Energy}}{500kWh} \left(\underset{\text{Heat}}{300kWh} + \underset{\text{Electricity}}{200kWh} \right)$$

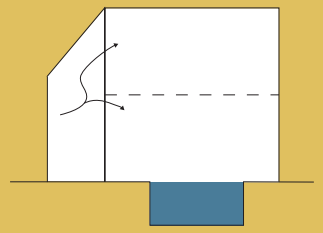
Consumption



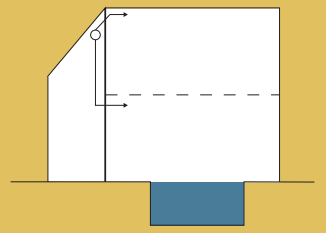
Draught



Buffer Space



Naturally Pre-heated
Ventilation

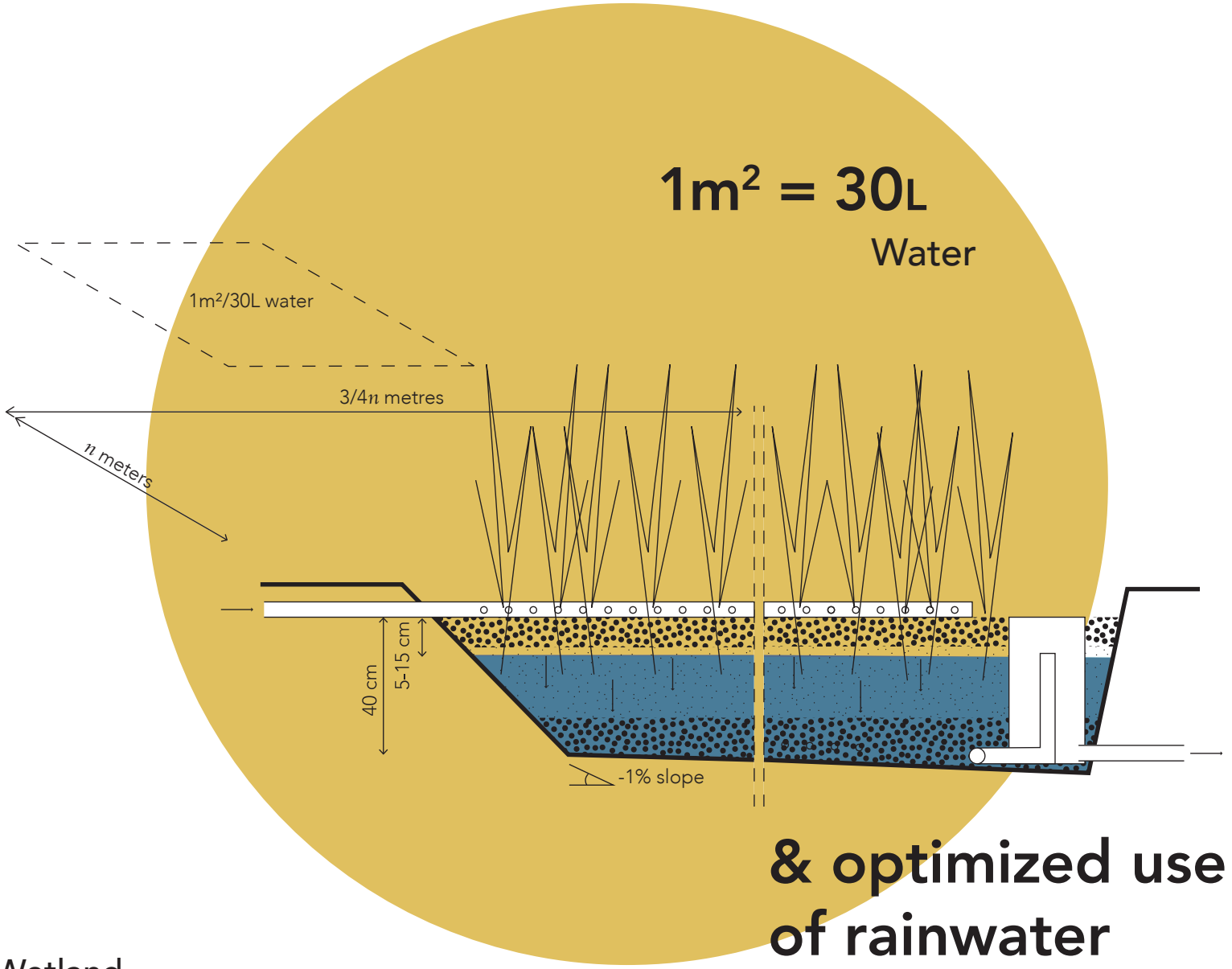


Mechanically Pre-heated
Ventilation

Reduction & Recovery

Proposed Technique

Water



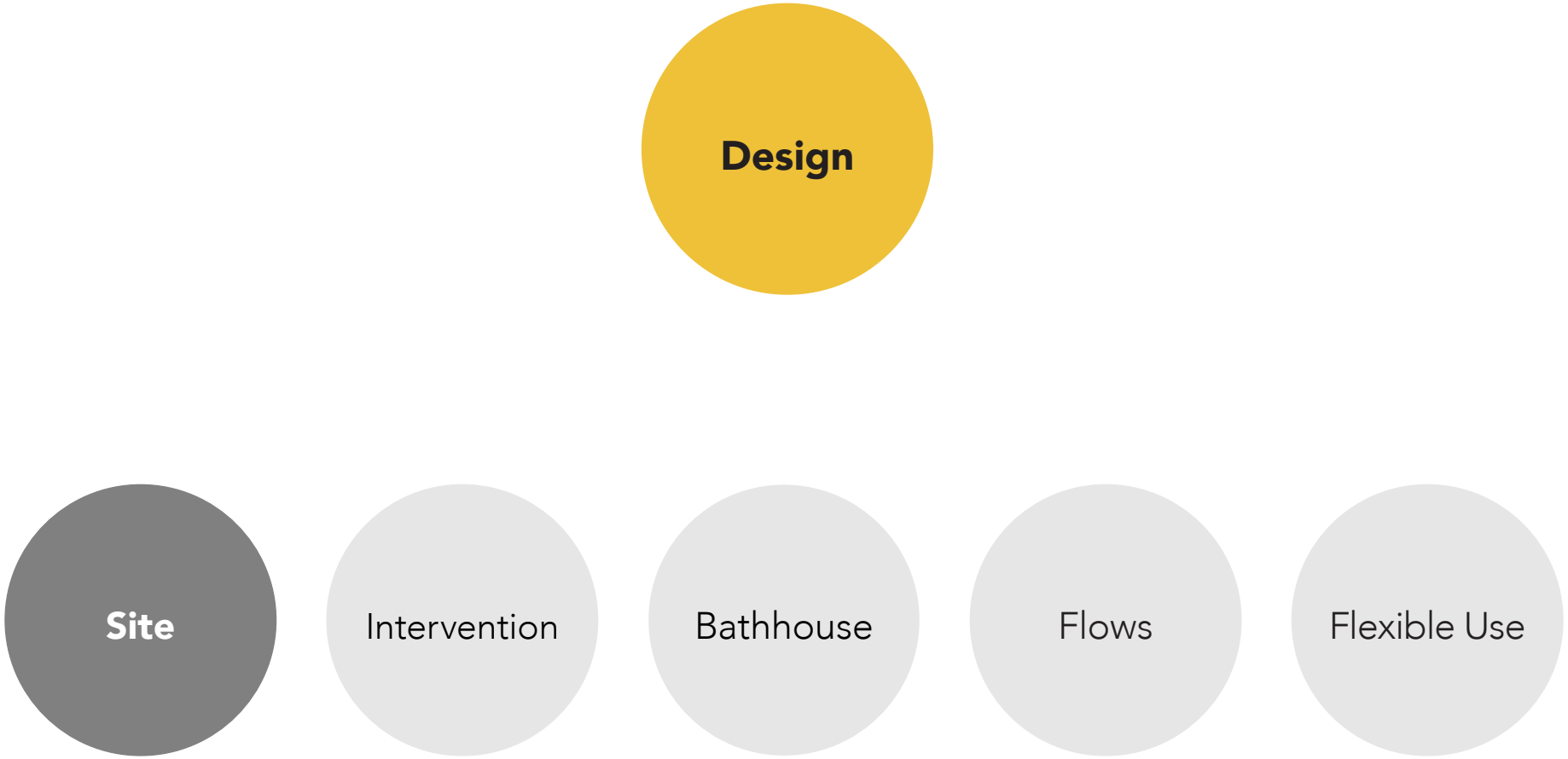
1m² = 30L

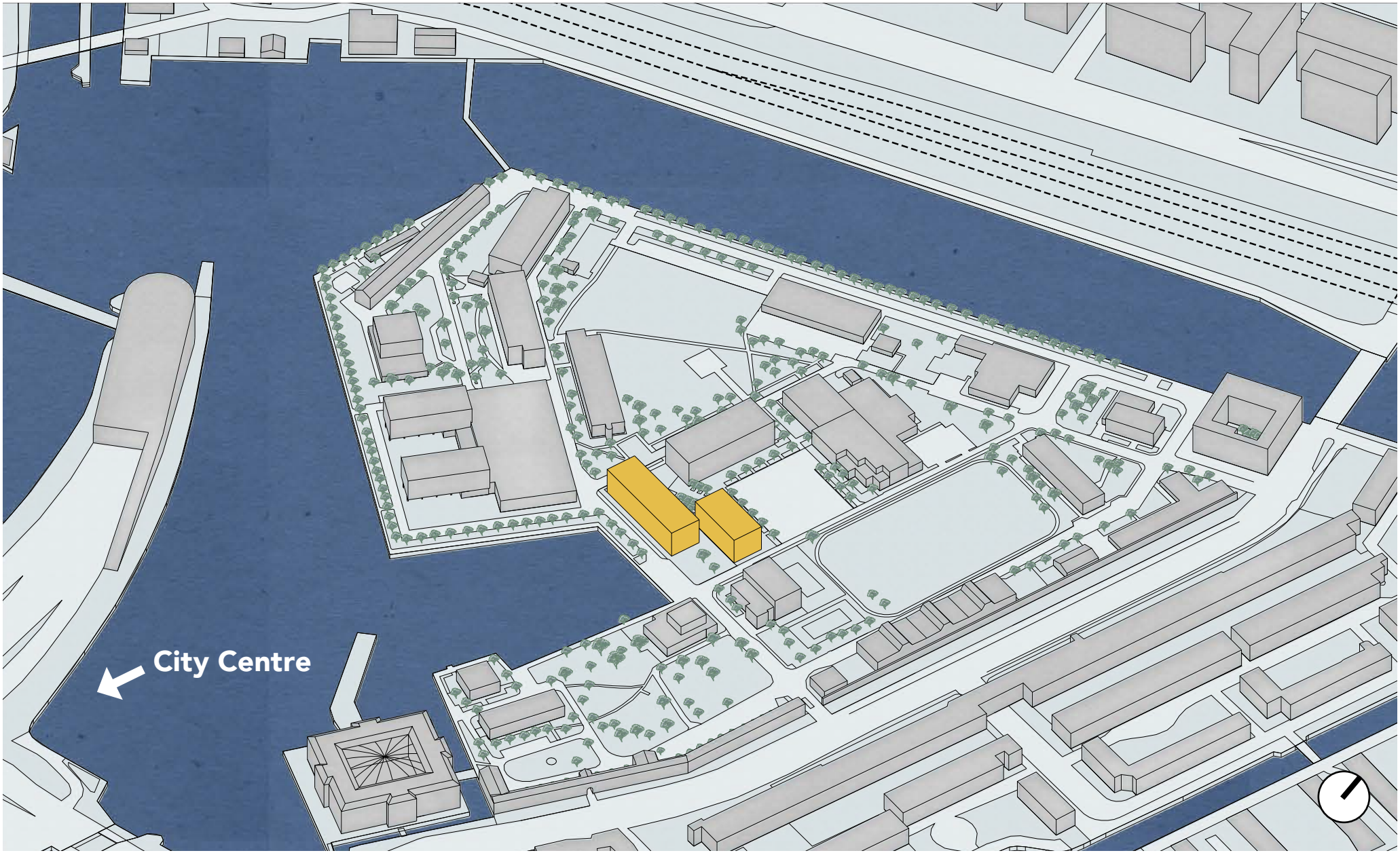
Water

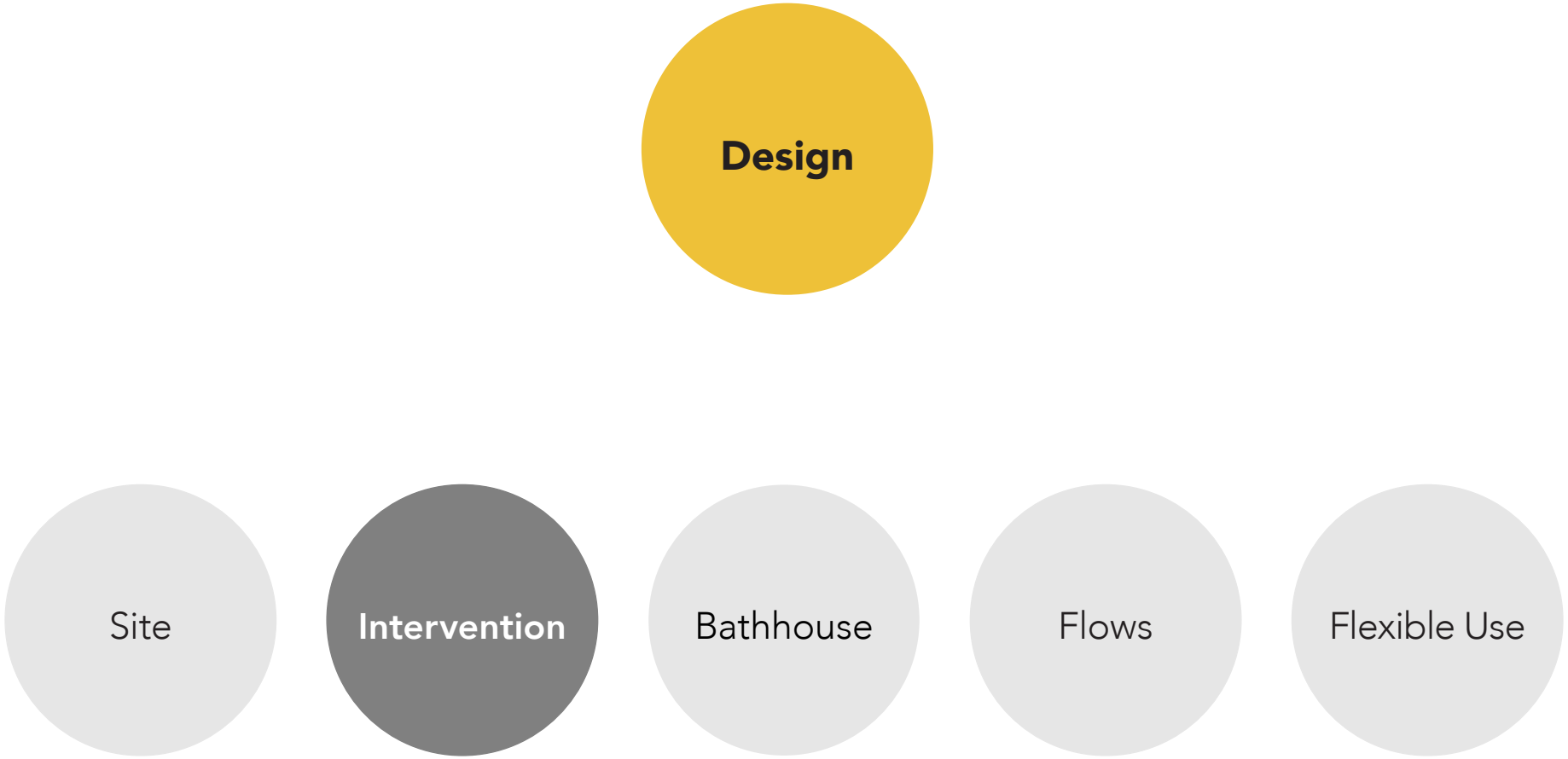
& optimized use of rainwater

Constructed Wetland

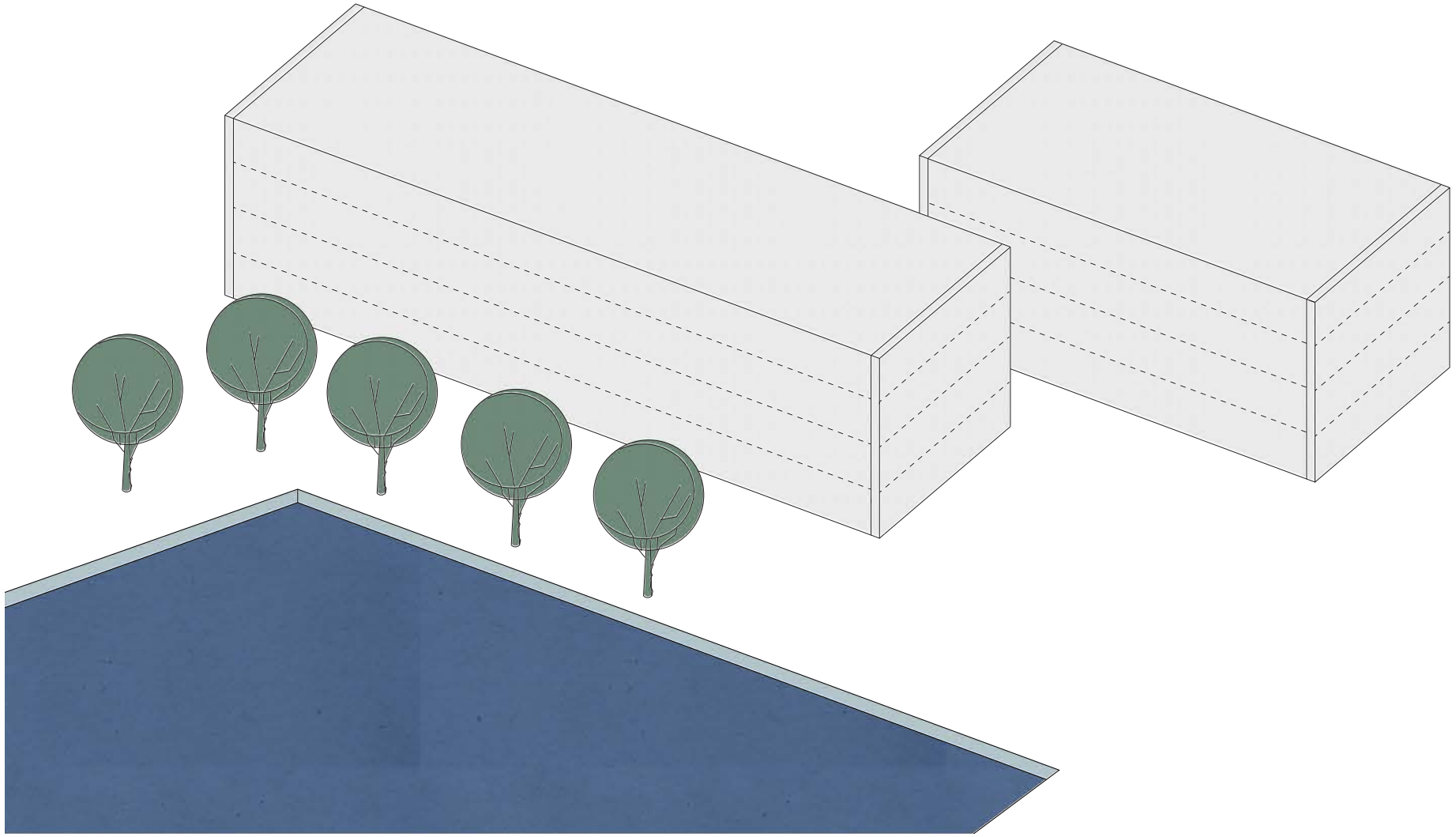

Context
Bathhouse
Objective
Technical Research
Design


Design
Site
Intervention
Bathhouse
Flows
Flexible Use

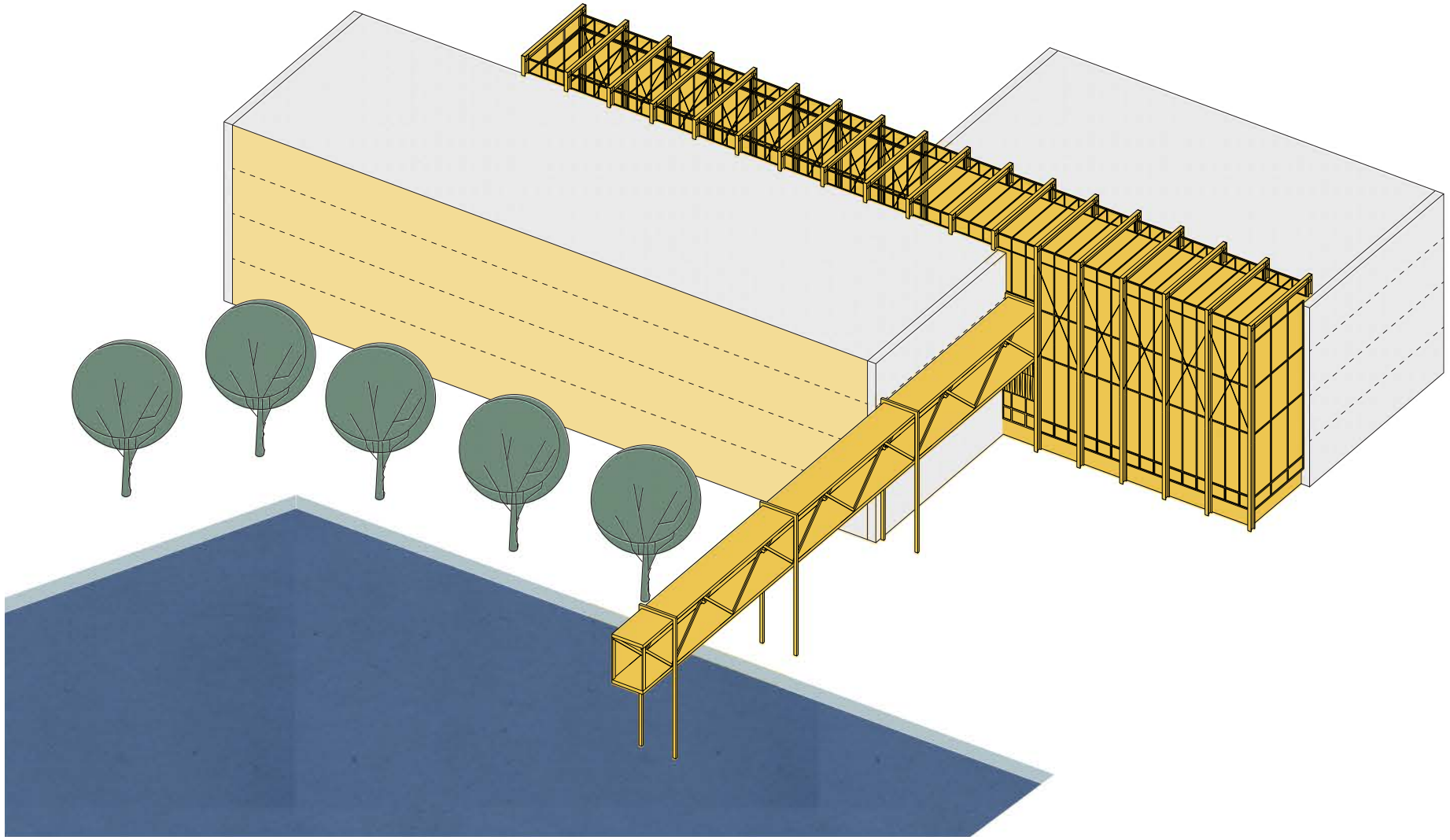

City Centre


Design
Site
Intervention
Bathhouse
Flows
Flexible Use

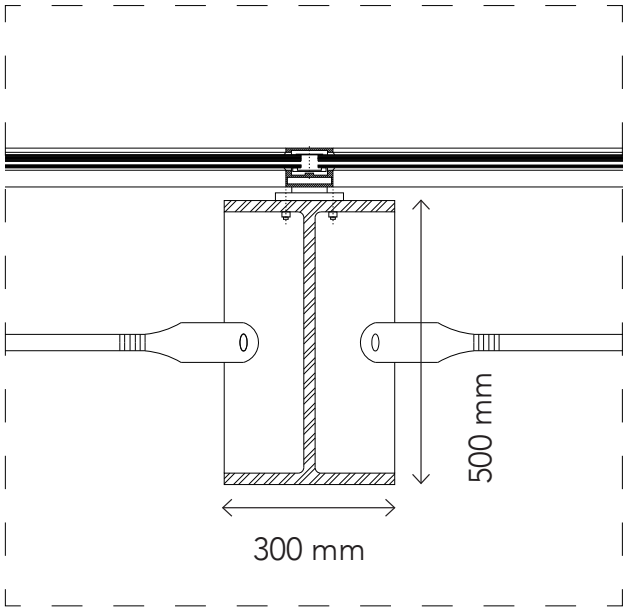
Schematic Volume
Existing



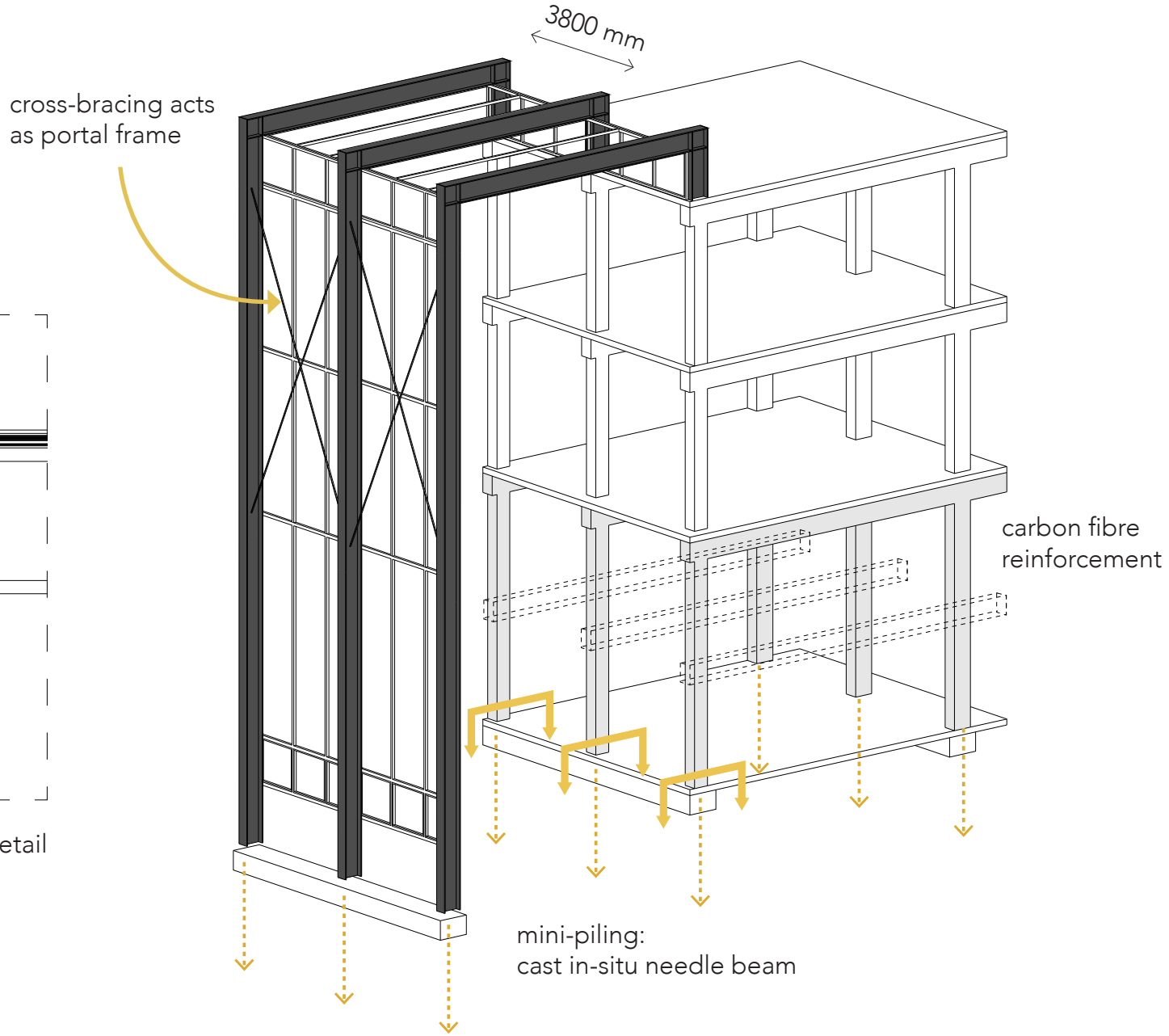
Schematic Volume
Proposed

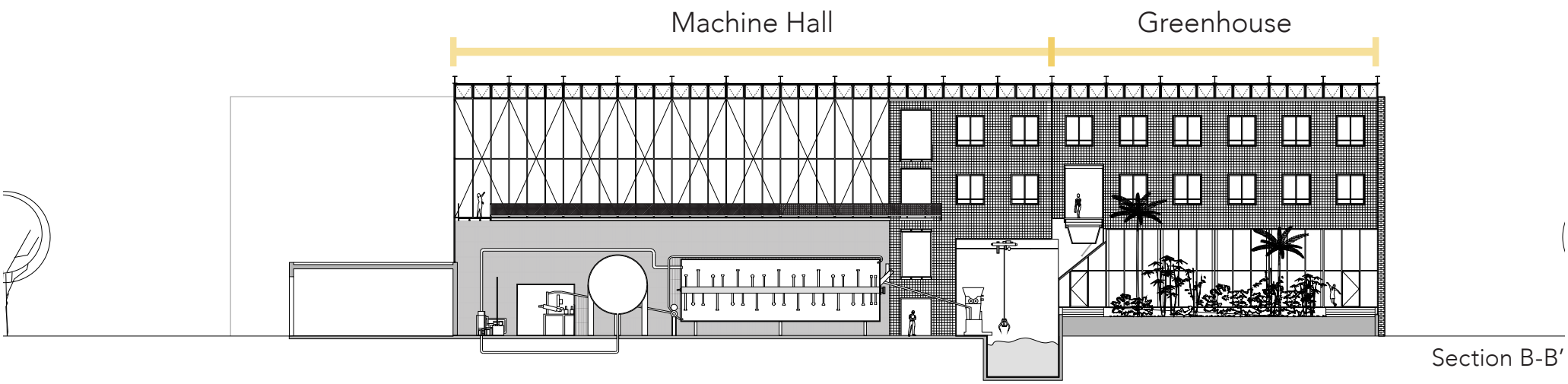


Structure

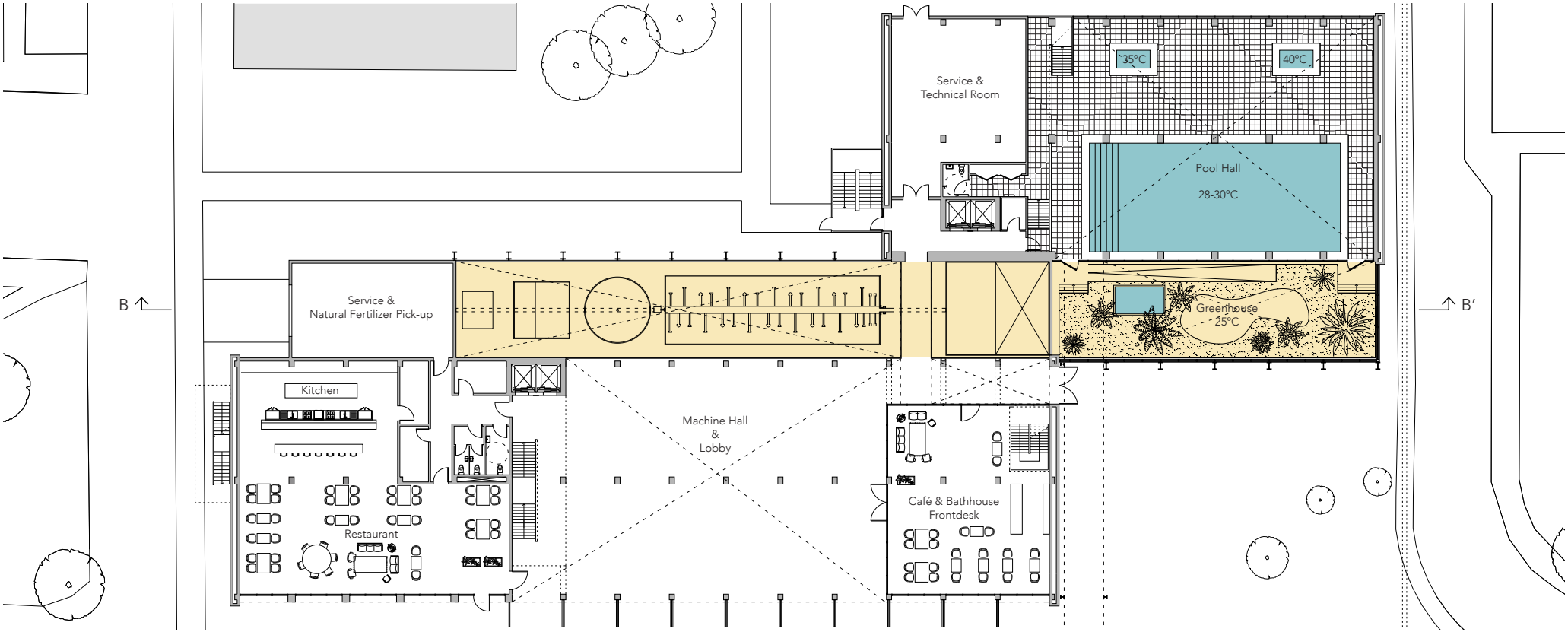


1:5 Detail

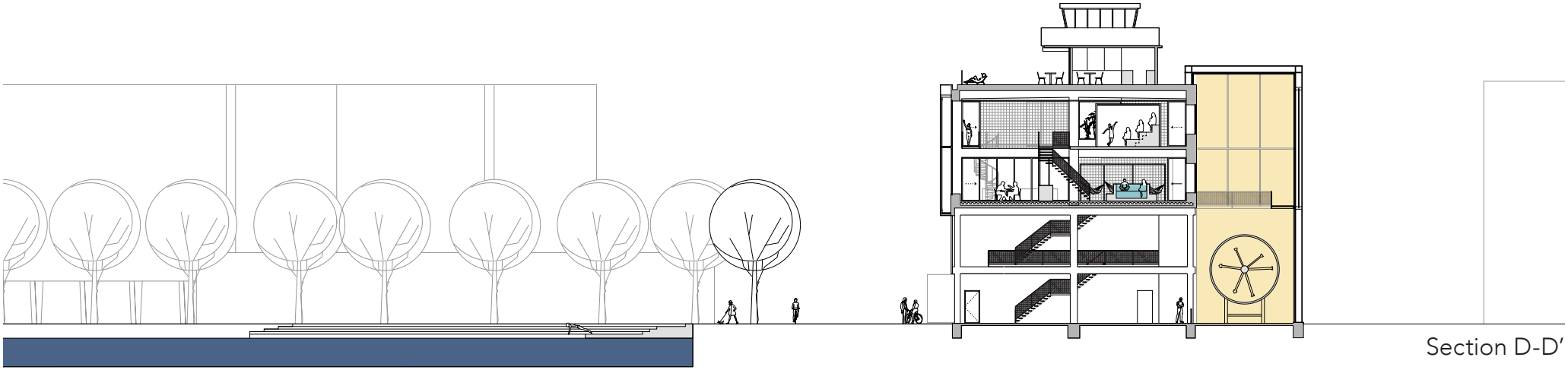




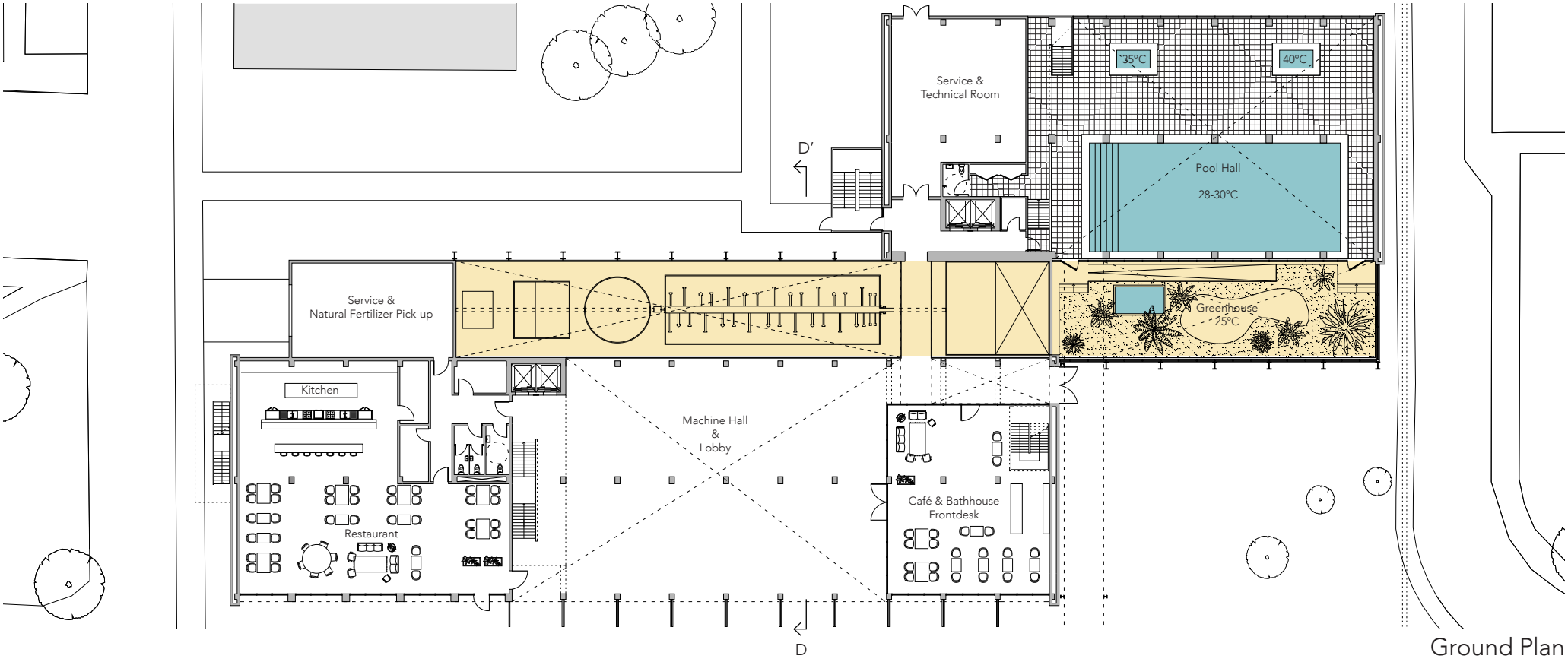
Section B-B'



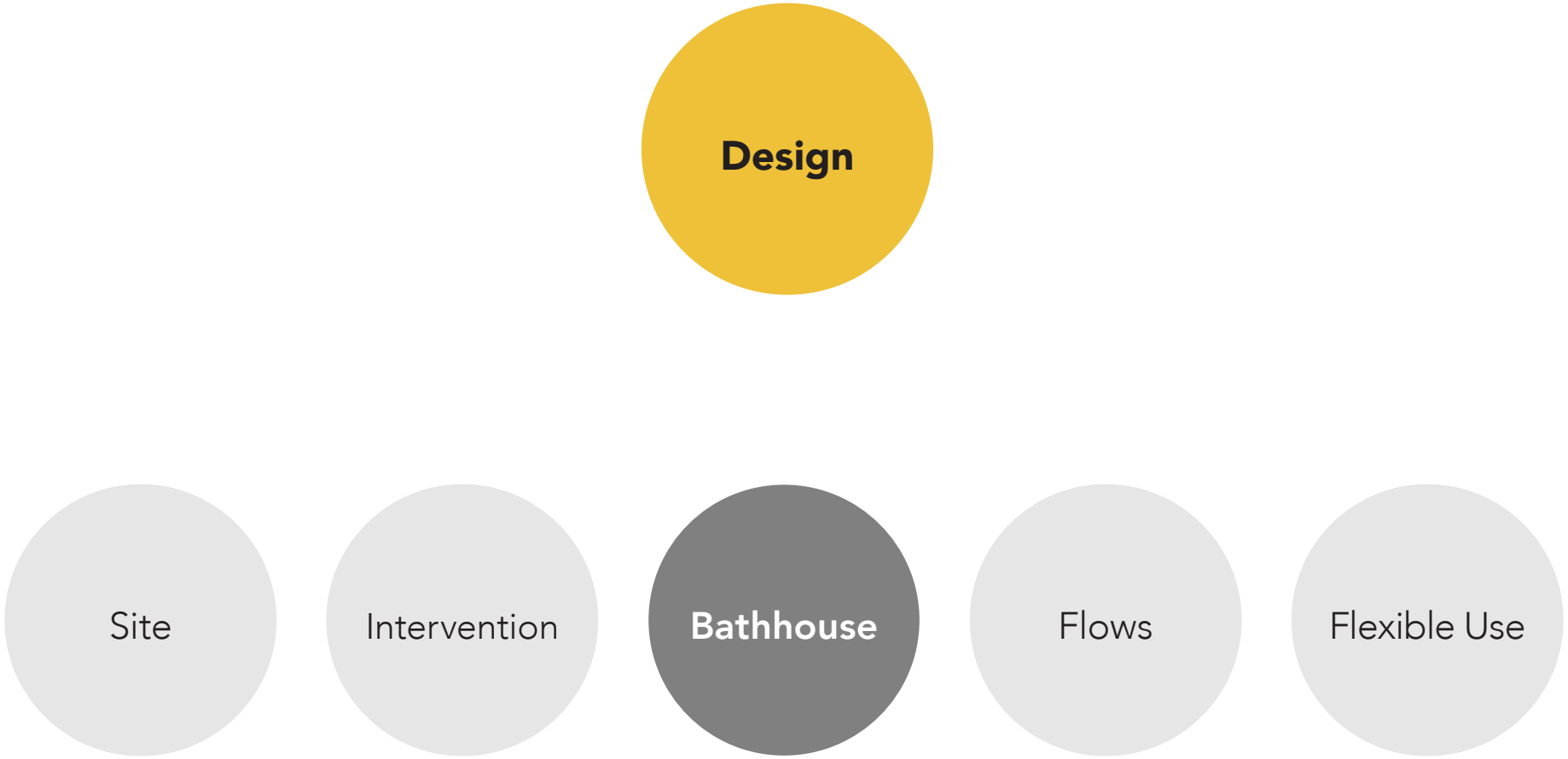
Ground Plan



Section D-D'



Ground Plan


Design
Site
Intervention
Bathhouse
Flows
Flexible Use

Bathhouse

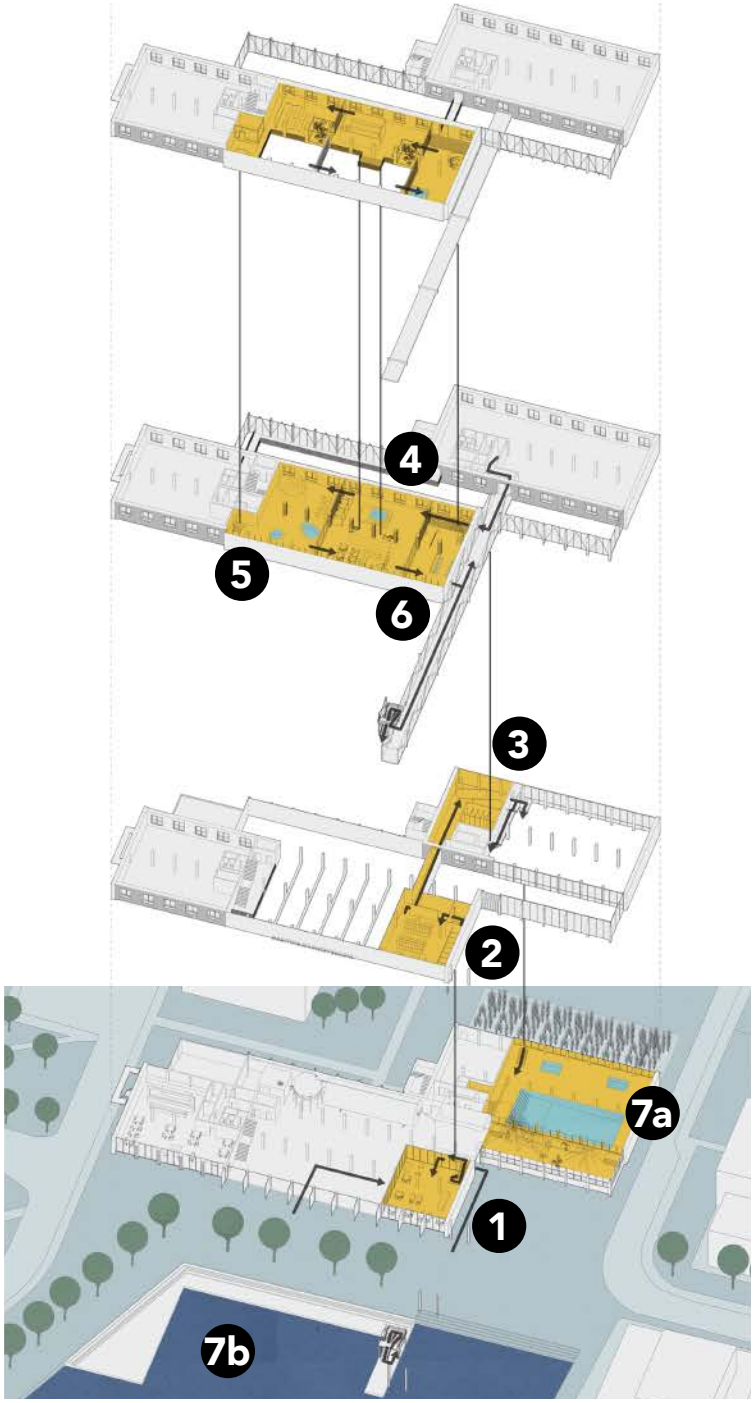
Circulation

Level 3

Level 2

Level 1

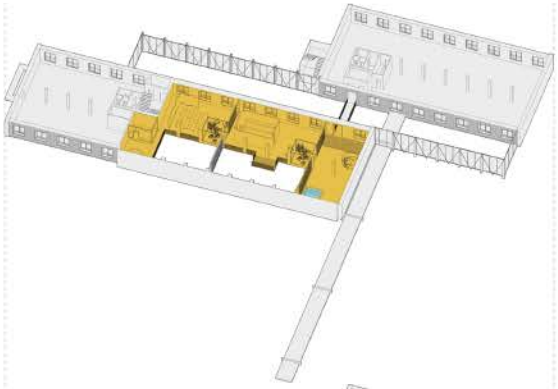
Level 0



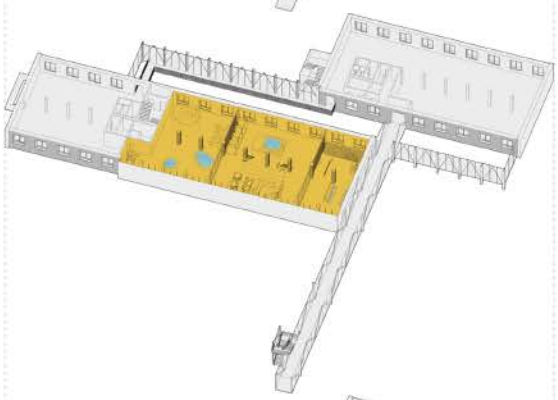
1 Front Desk/Cafe
2 Change rooms
3 Showers
4 Tepidarium (Warm)
5 Calidarium (Hot)
6 Frigidarium (Cold)
7a Pool
7b Harbour Bath

Bathhouse
Thermal Zones

Level 3

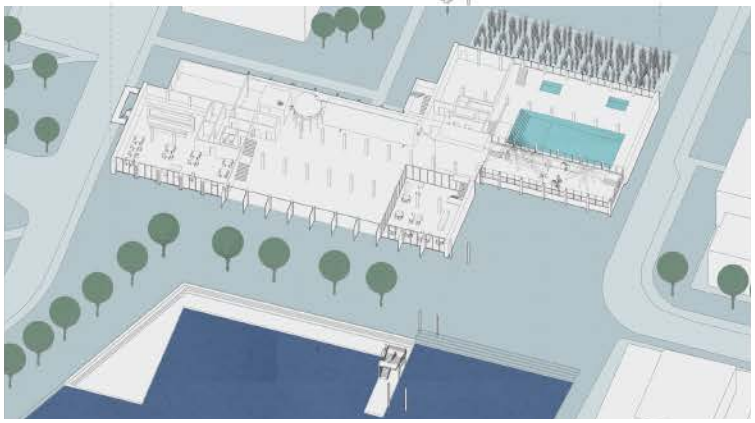


Level 2



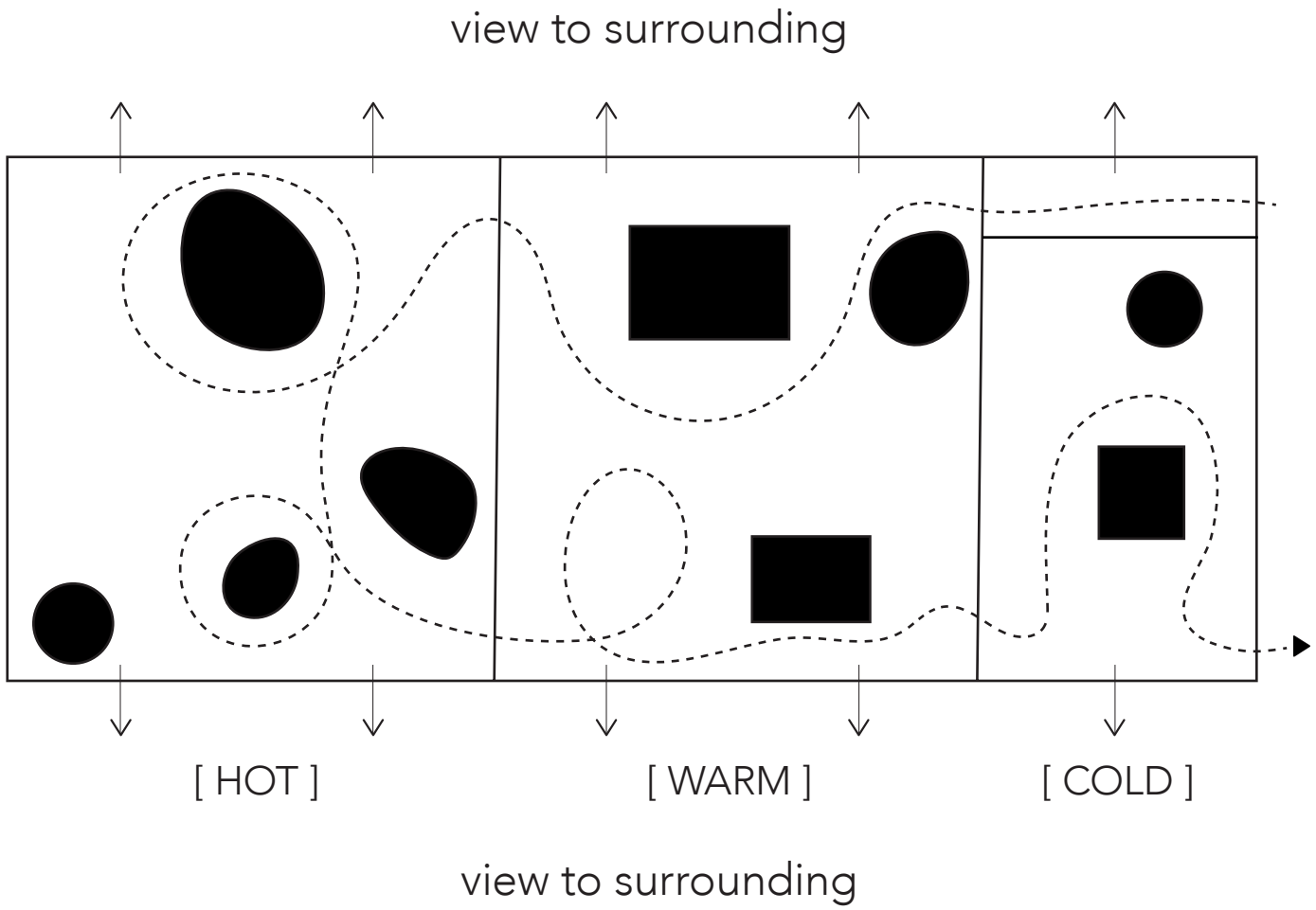
Level 1

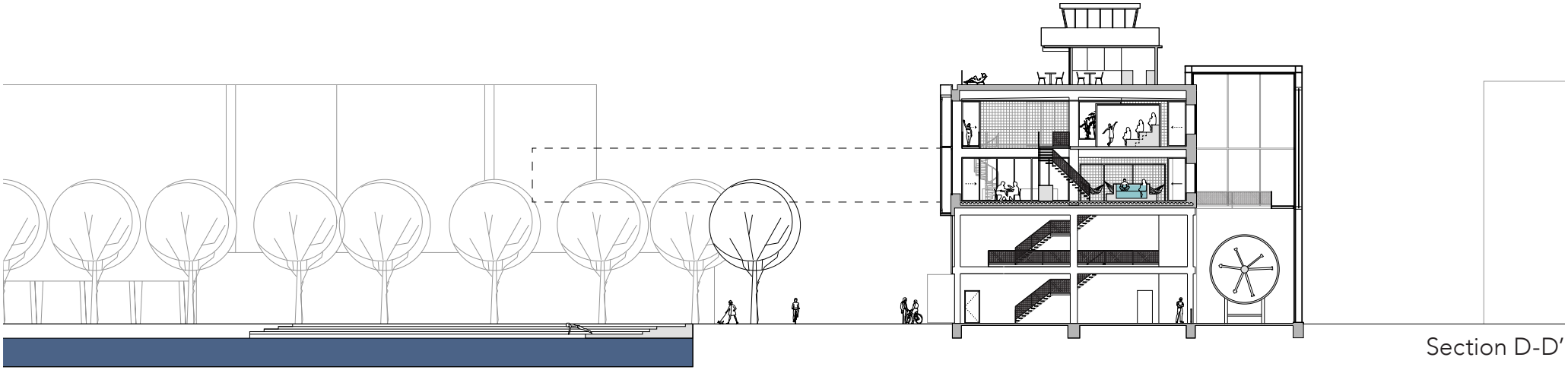
Level 0



Bathhouse

Conceptual Plan





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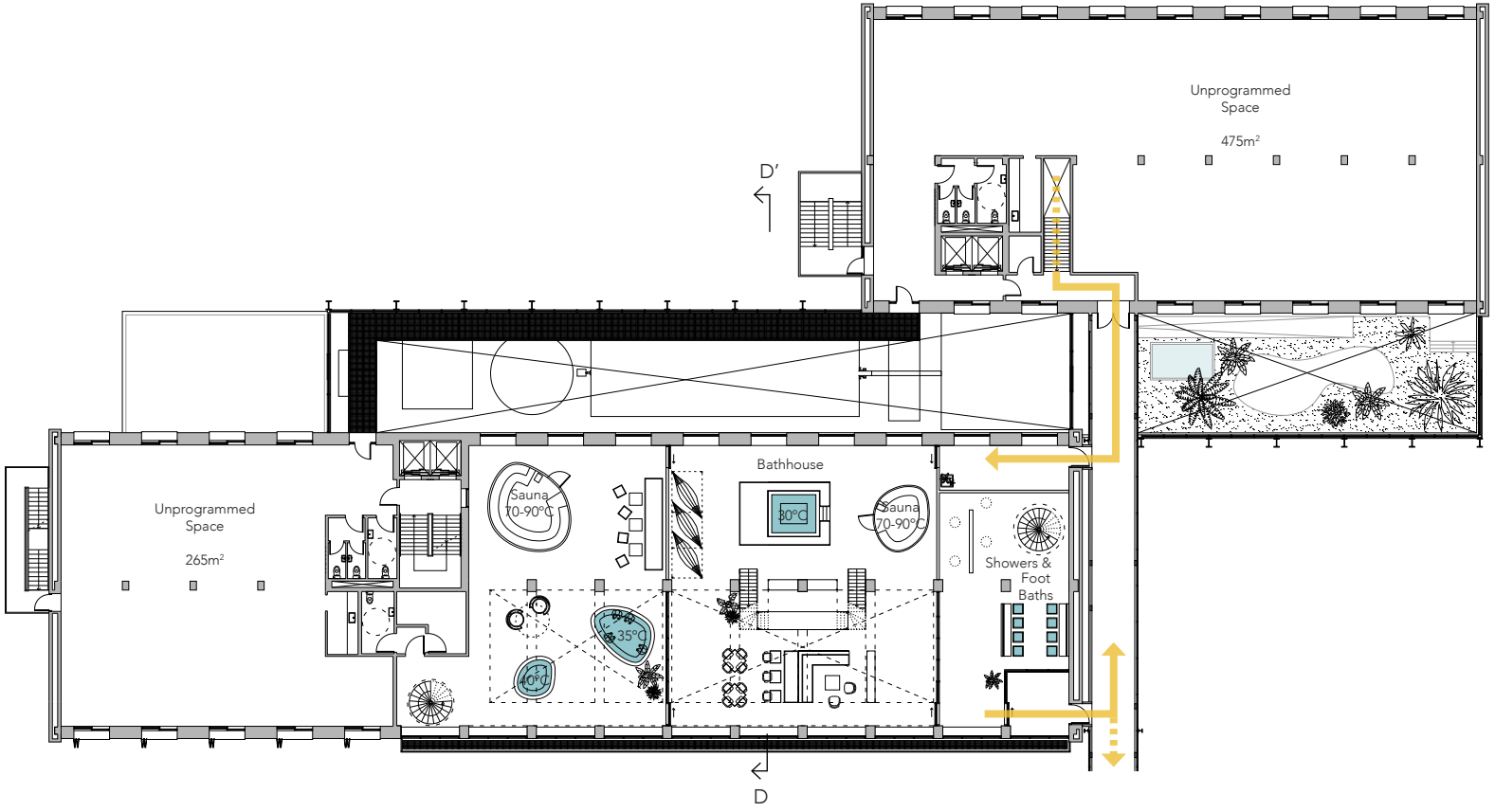
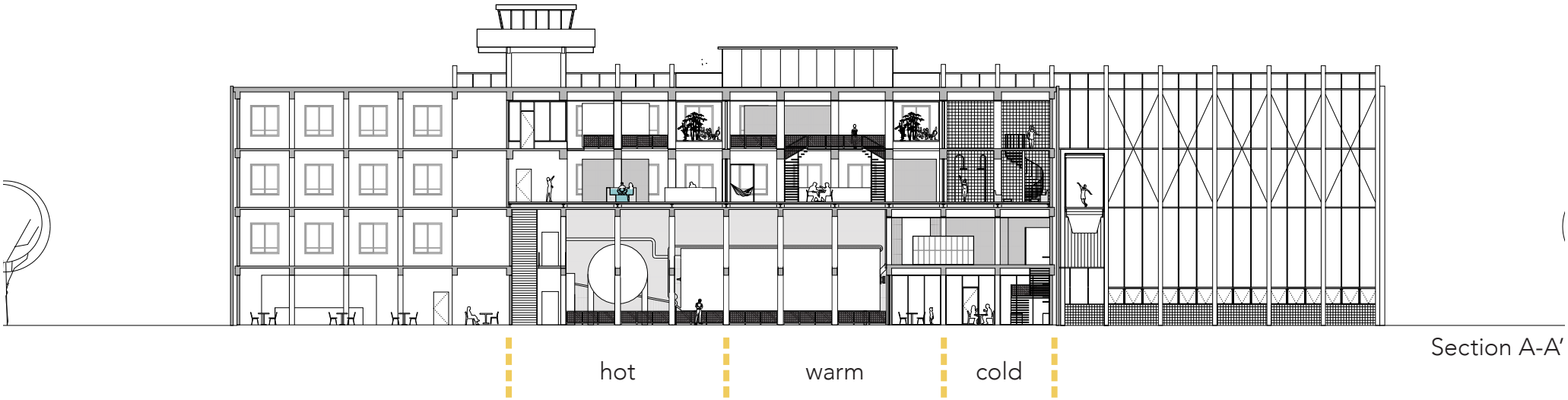
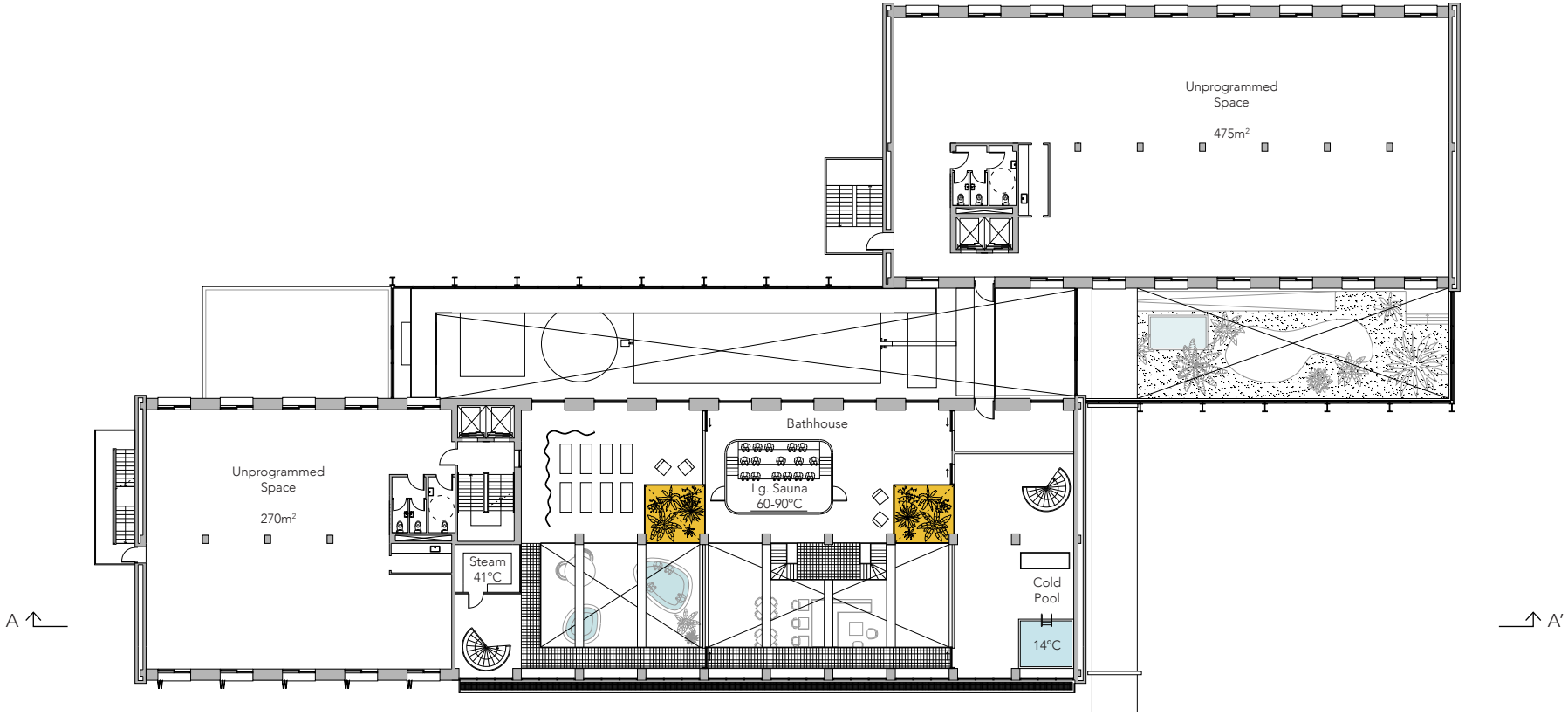


Level 2



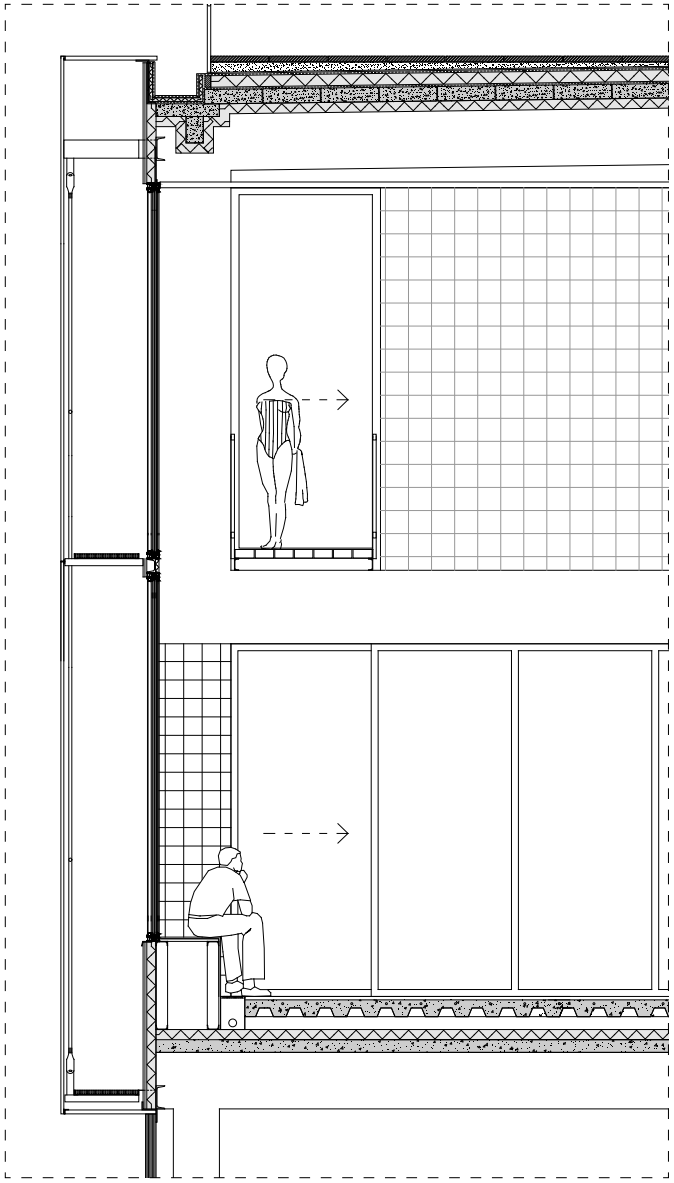
Section A-A'

hot warm cold

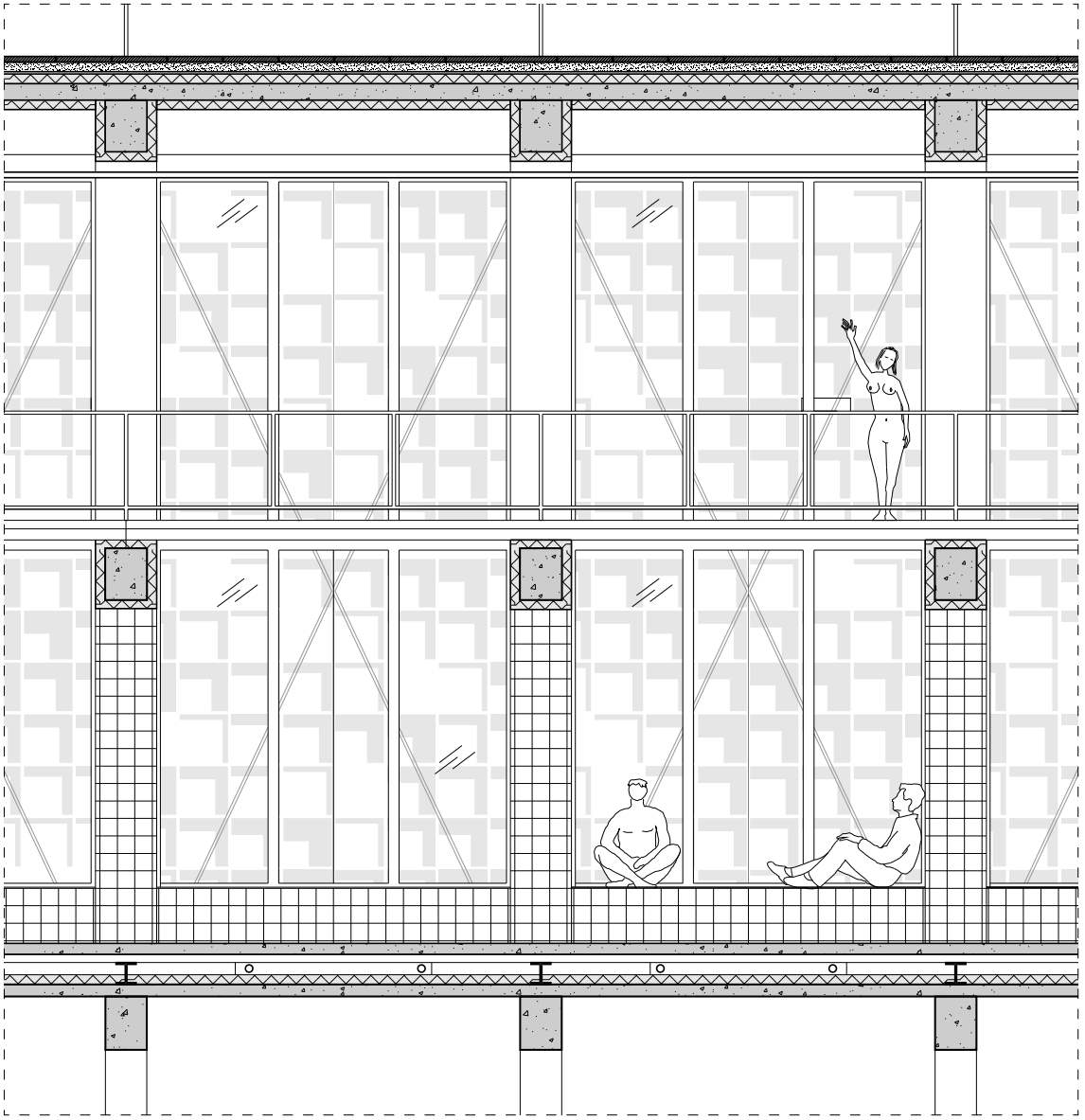


Level 3

Bathhouse
Facade & Structure

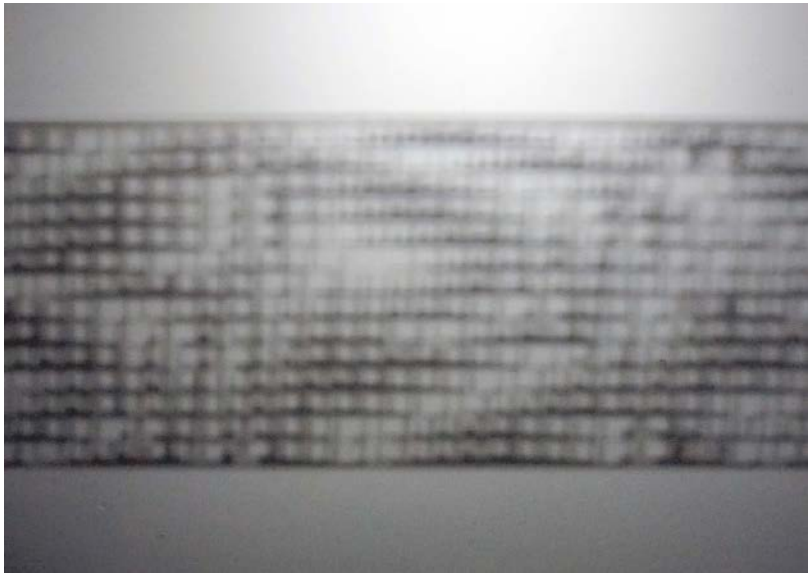


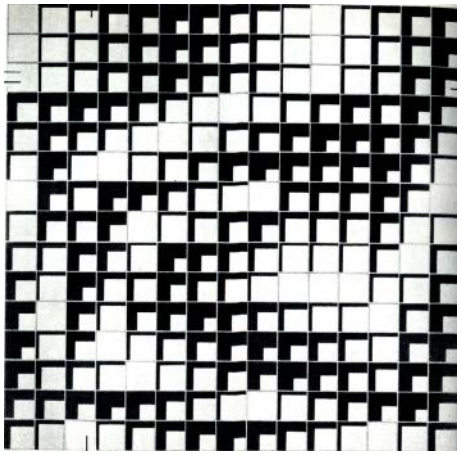
Facade Section



Interior Elevation

Bathhouse
Facade Design

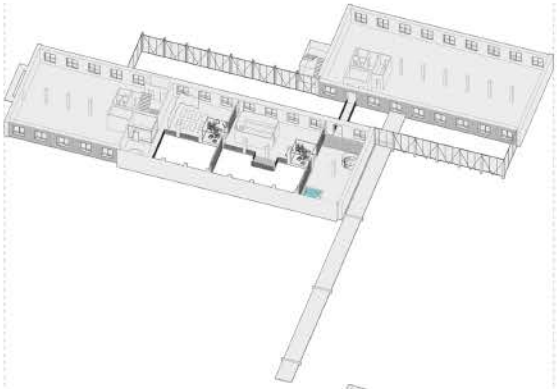




Bruno Morassutti & Enzo Mari
Domus, 1965.

Bathhouse
Pool Hall

Level 3



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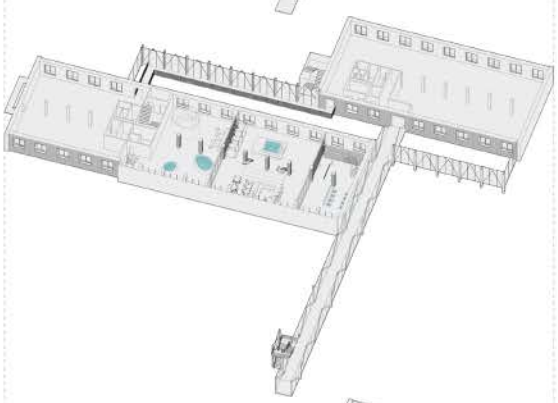
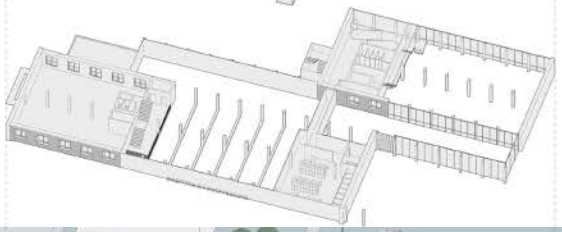
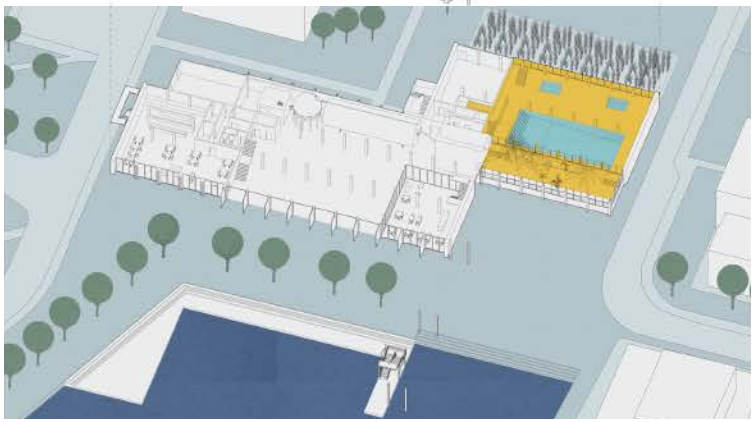


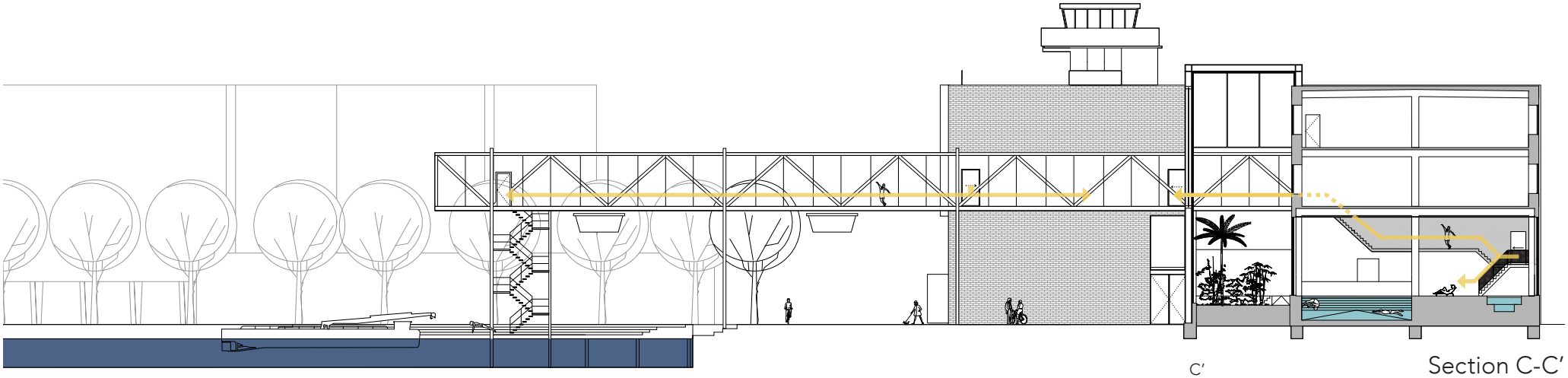
Level 1



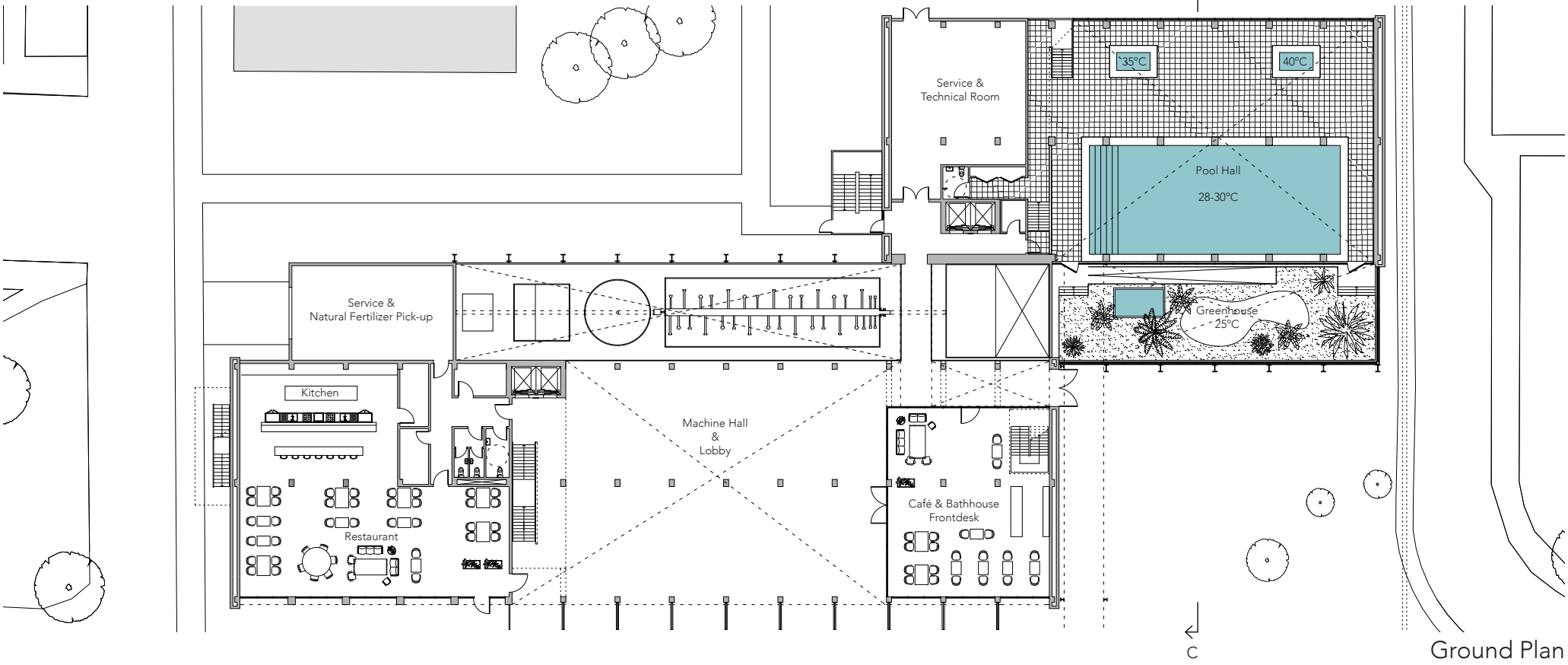
Level 0



Bath, England

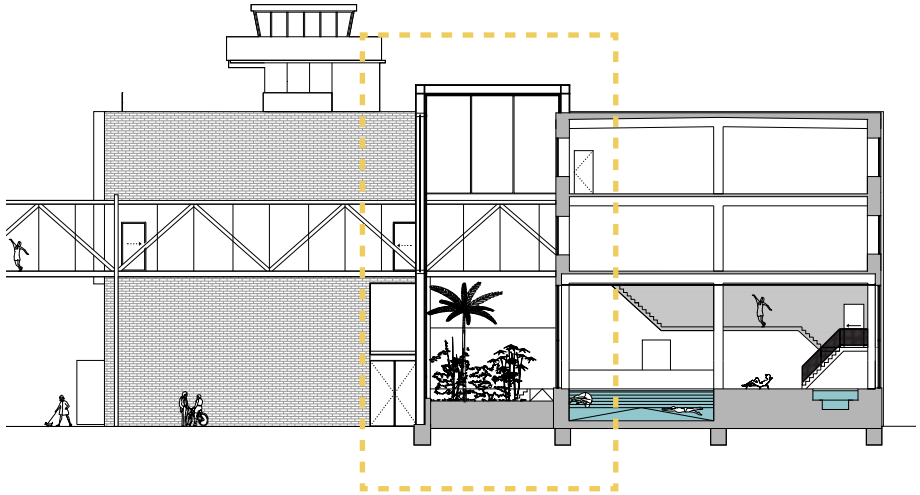


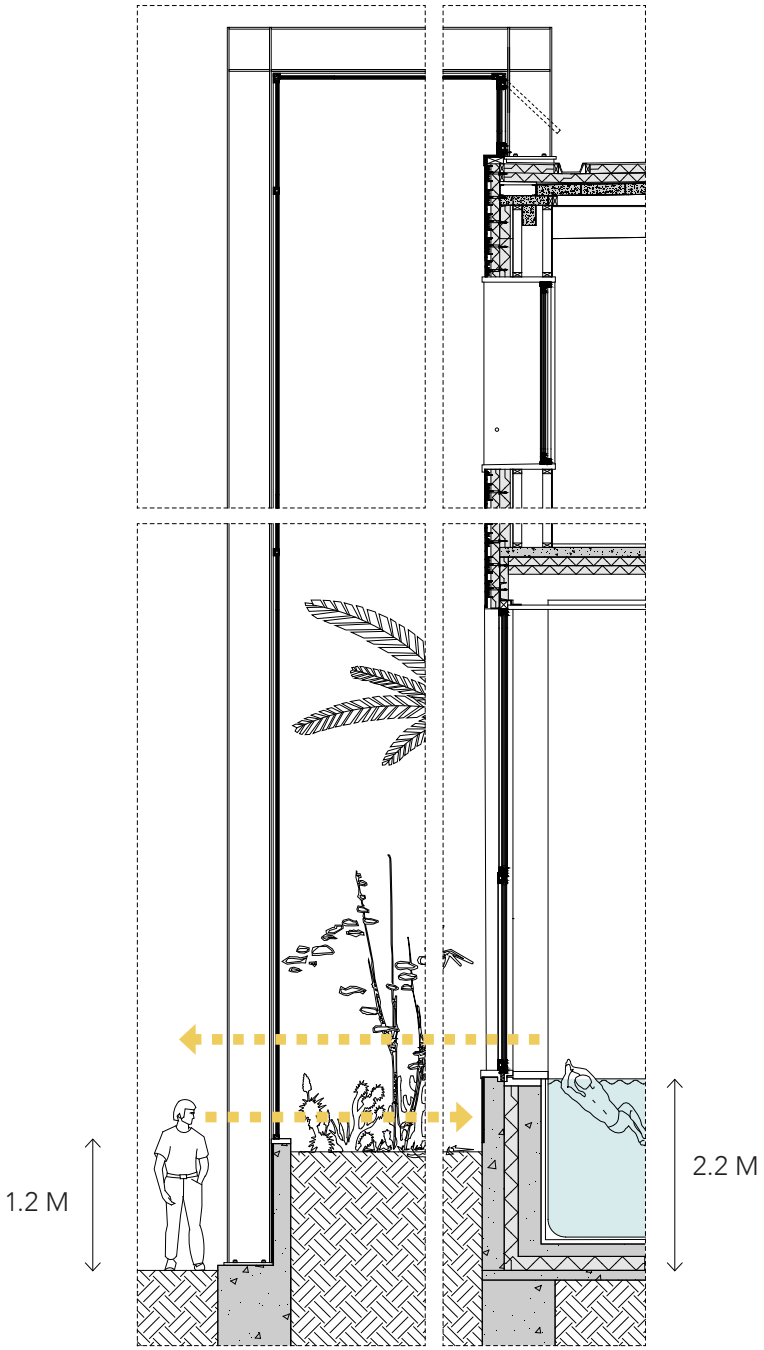
Section C-C'



Ground Plan

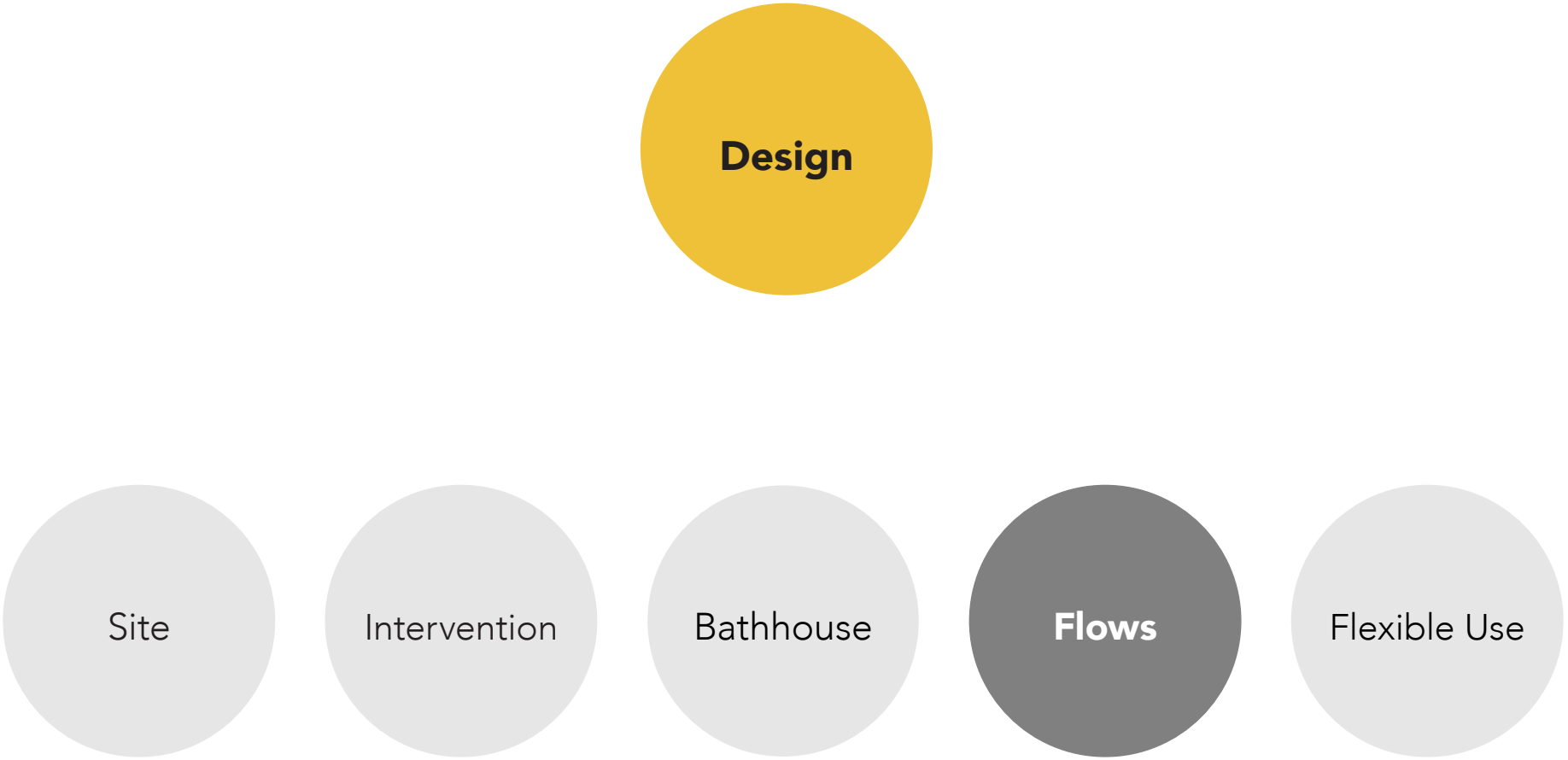
Pool Hall | Greenhouse
Facade & Structure

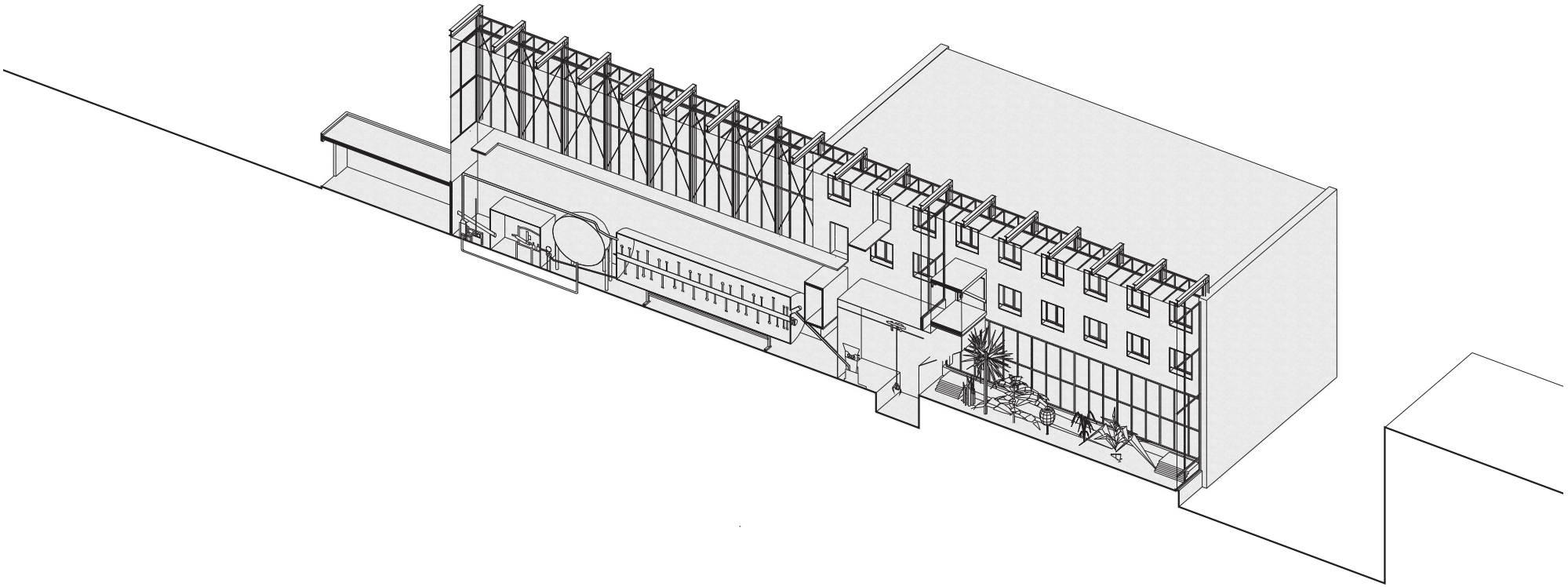




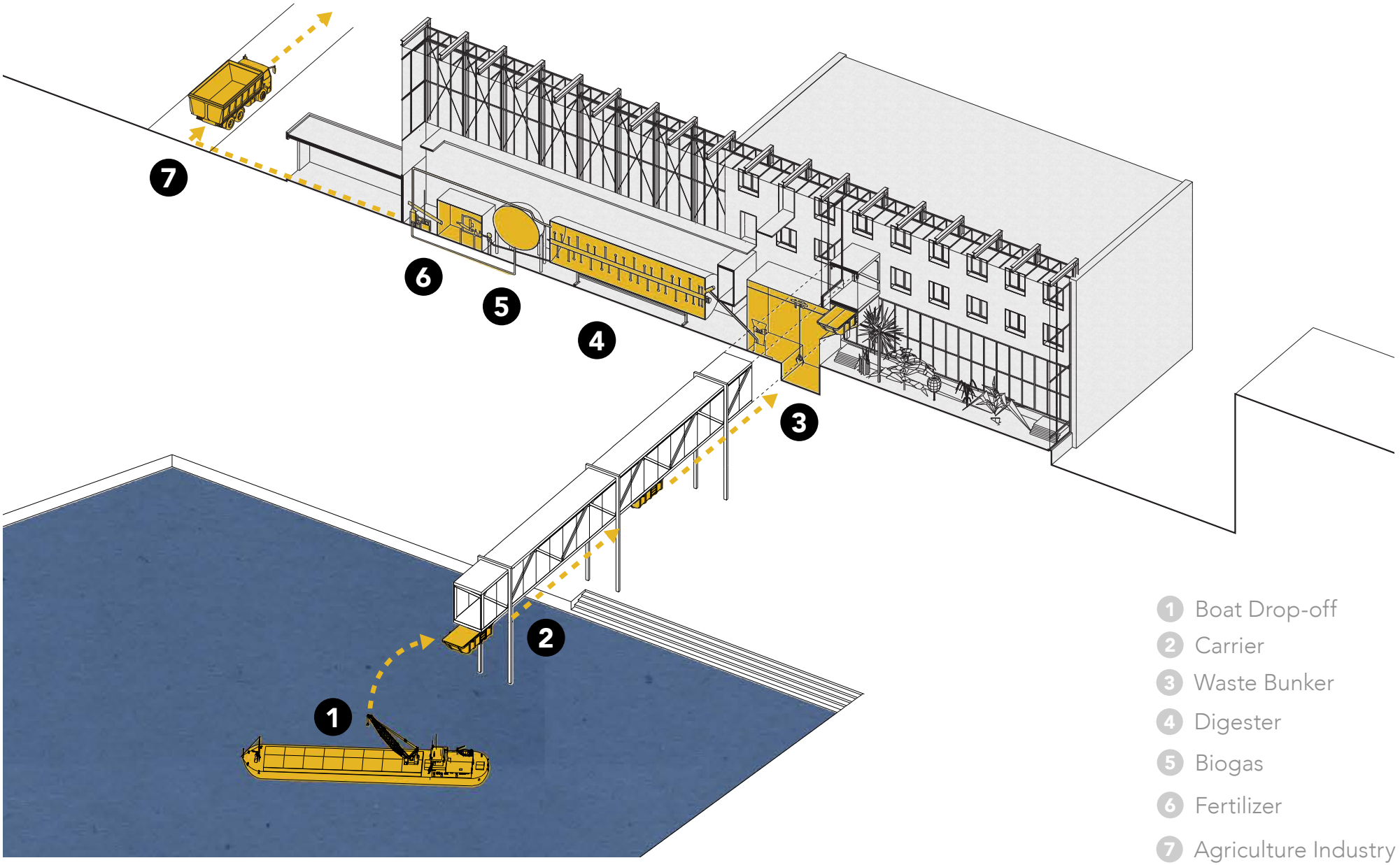
Section C-C'

1:20


Design
Site
Intervention
Bathhouse
Flows
Flexible Use

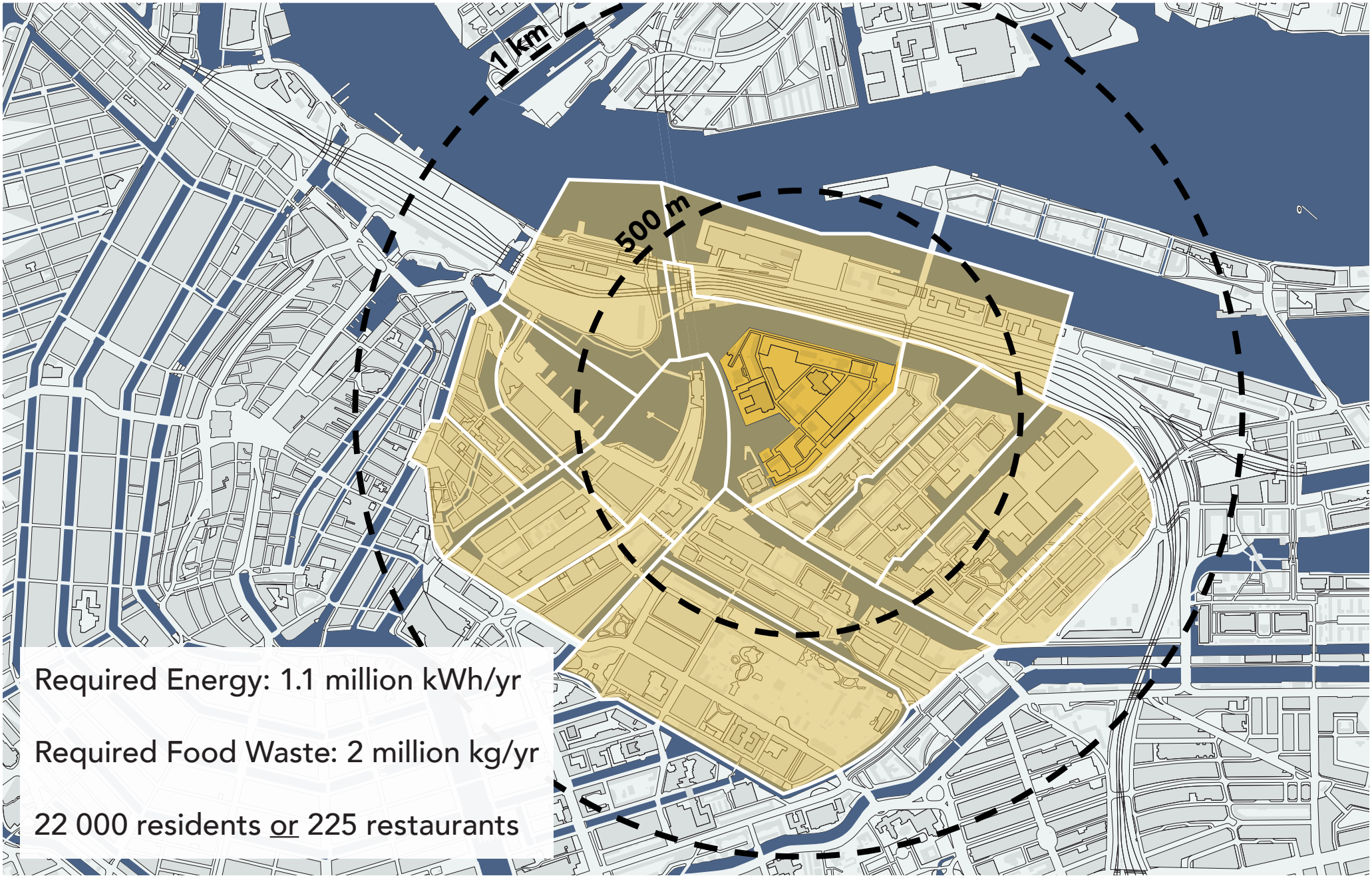


Food Waste

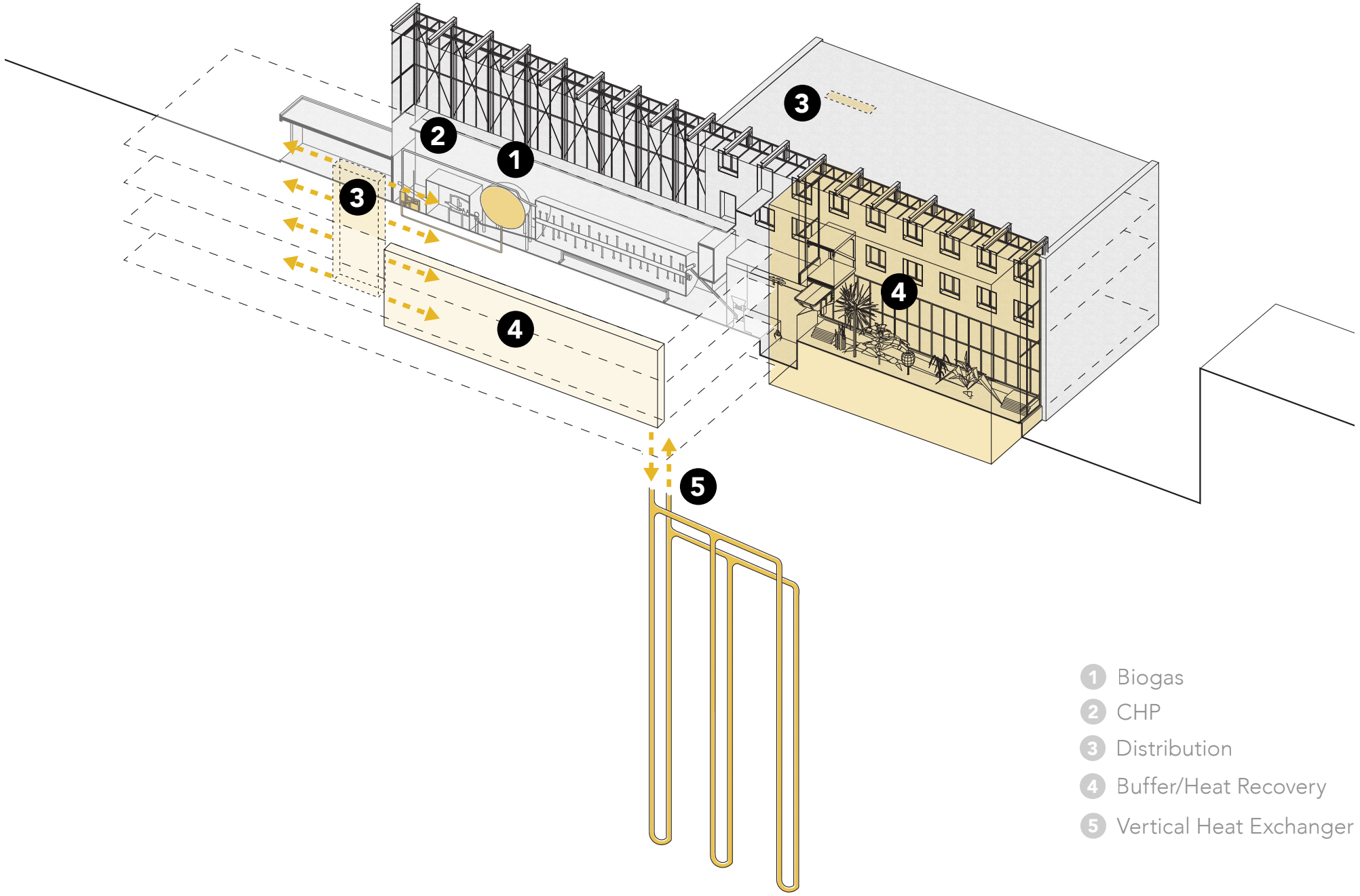


1. Boat Drop-off
2. Carrier
3. Waste Bunker
4. Digester
5. Biogas
6. Fertilizer
7. Agriculture Industry

Food Waste Collection Map

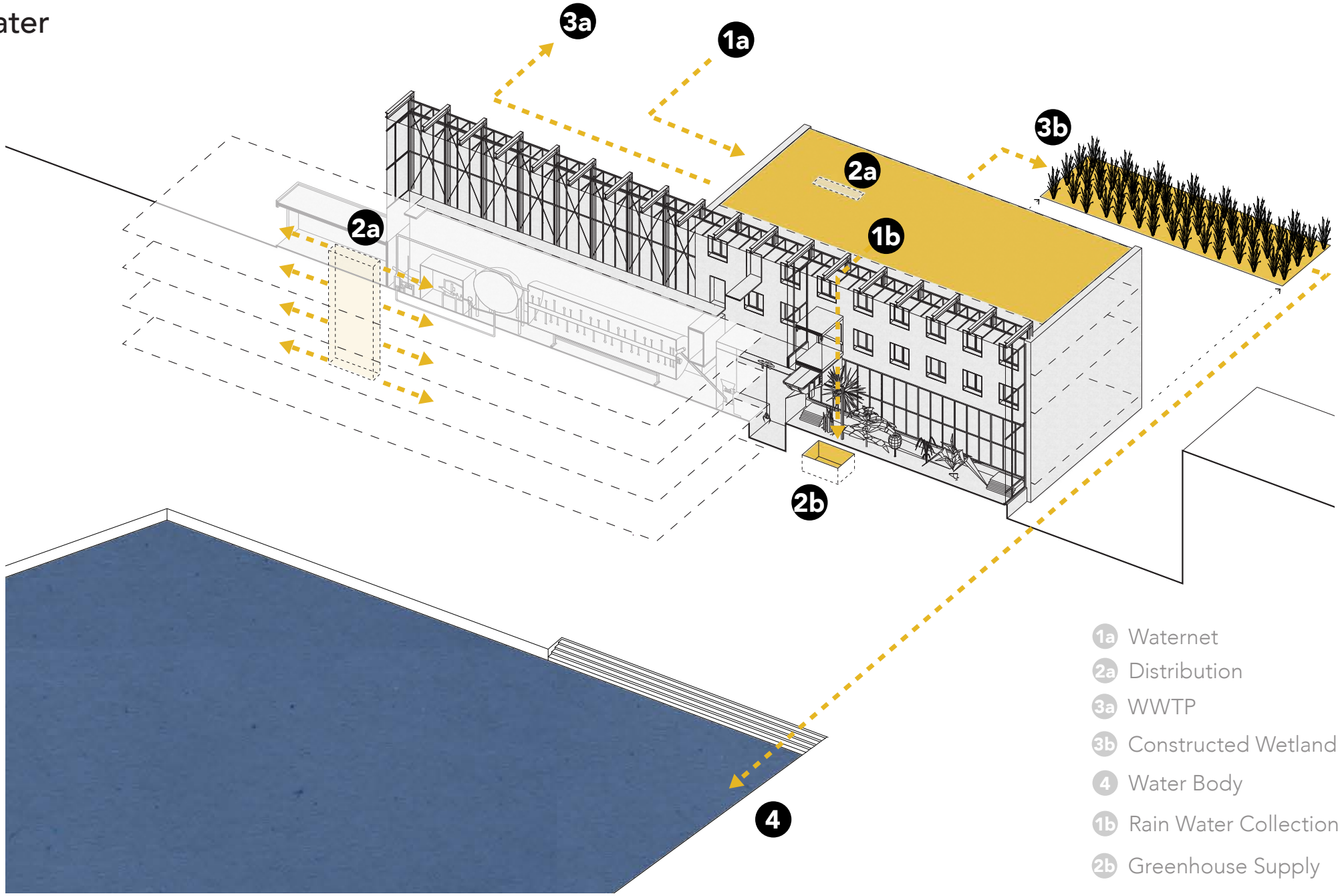


Energy

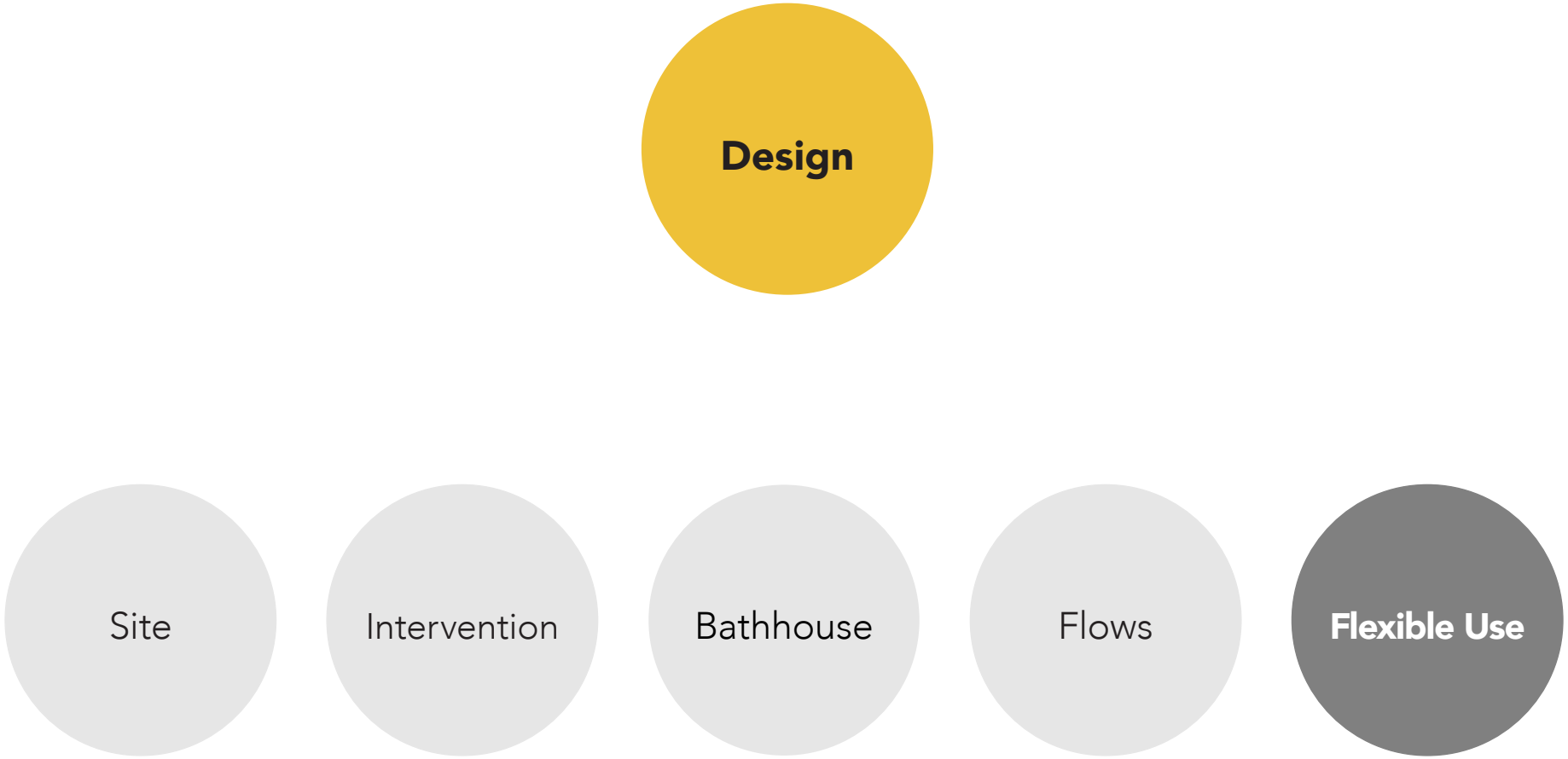


1 Biogas
2 CHP
3 Distribution
4 Buffer/Heat Recovery
5 Vertical Heat Exchanger

Water



1a Waternet
2a Distribution
3a WWTP
3b Constructed Wetland
4 Water Body
1b Rain Water Collection
2b Greenhouse Supply


Design
Site
Intervention
Bathhouse
Flows
Flexible Use

Public & Unprogrammed Space

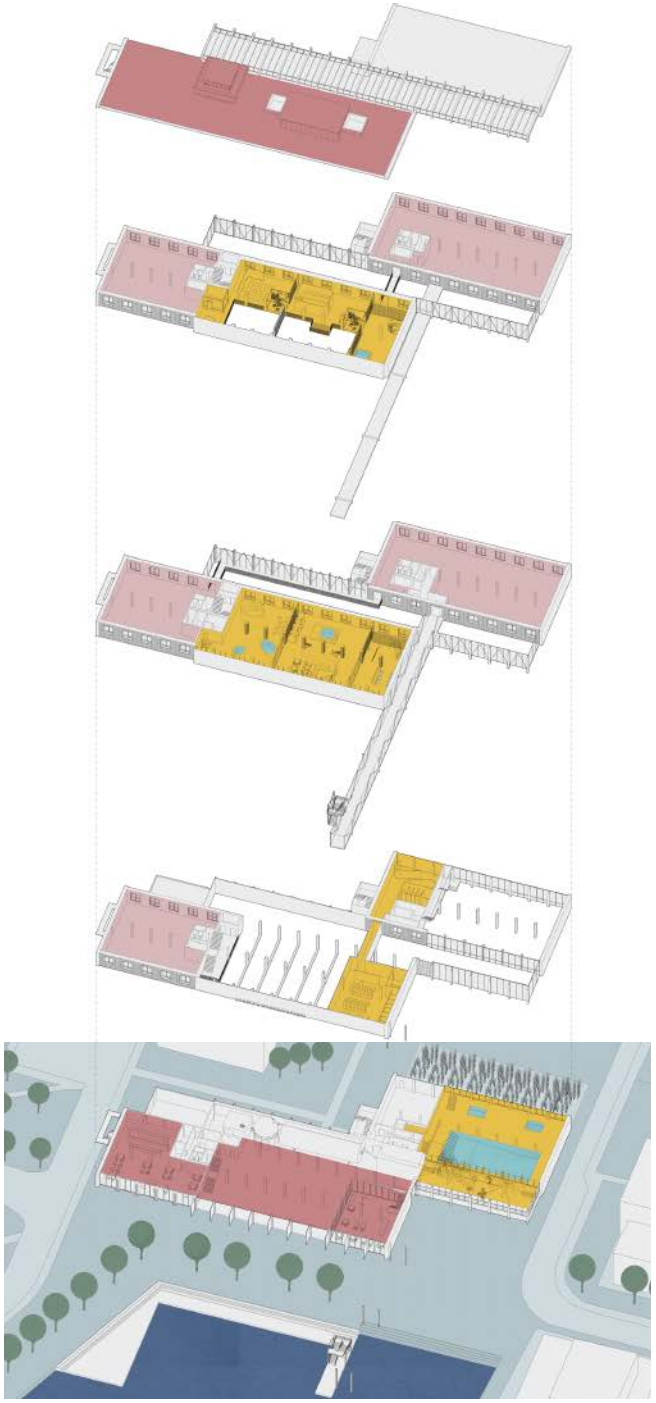
Level 4 (roof)

Level 3

Level 2

Level 1

Level 0



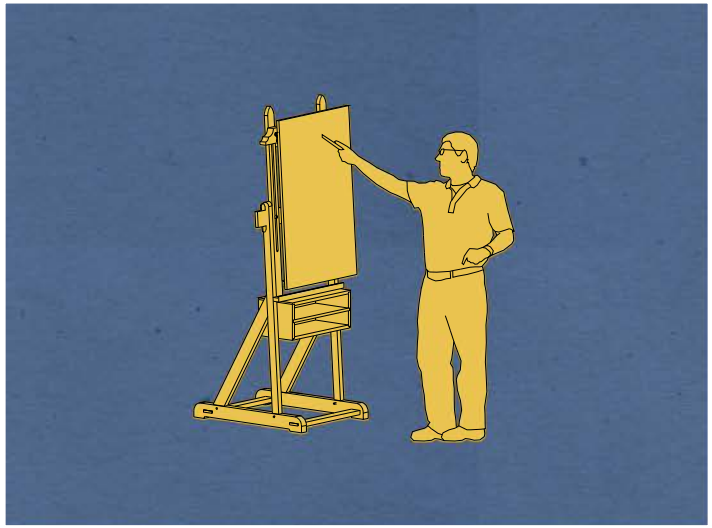
Bathhouse

Public

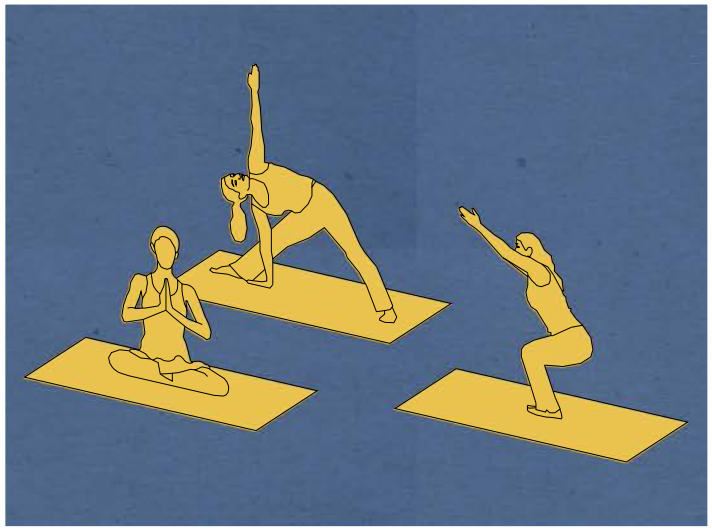
Unprogrammed

Flexible Use

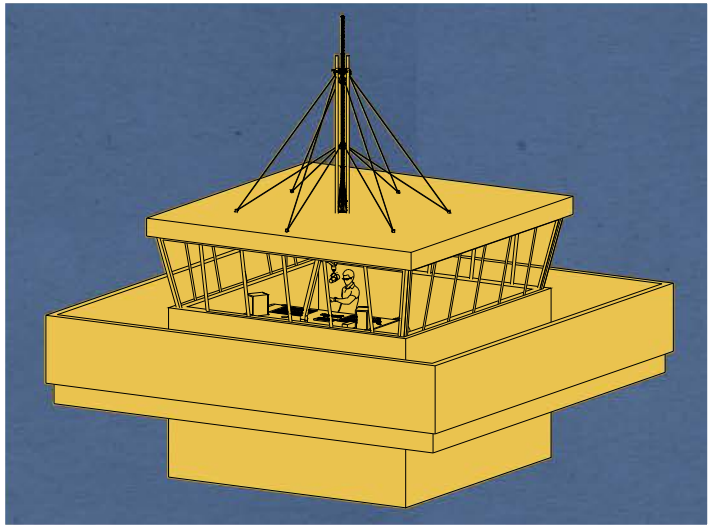
Office Space



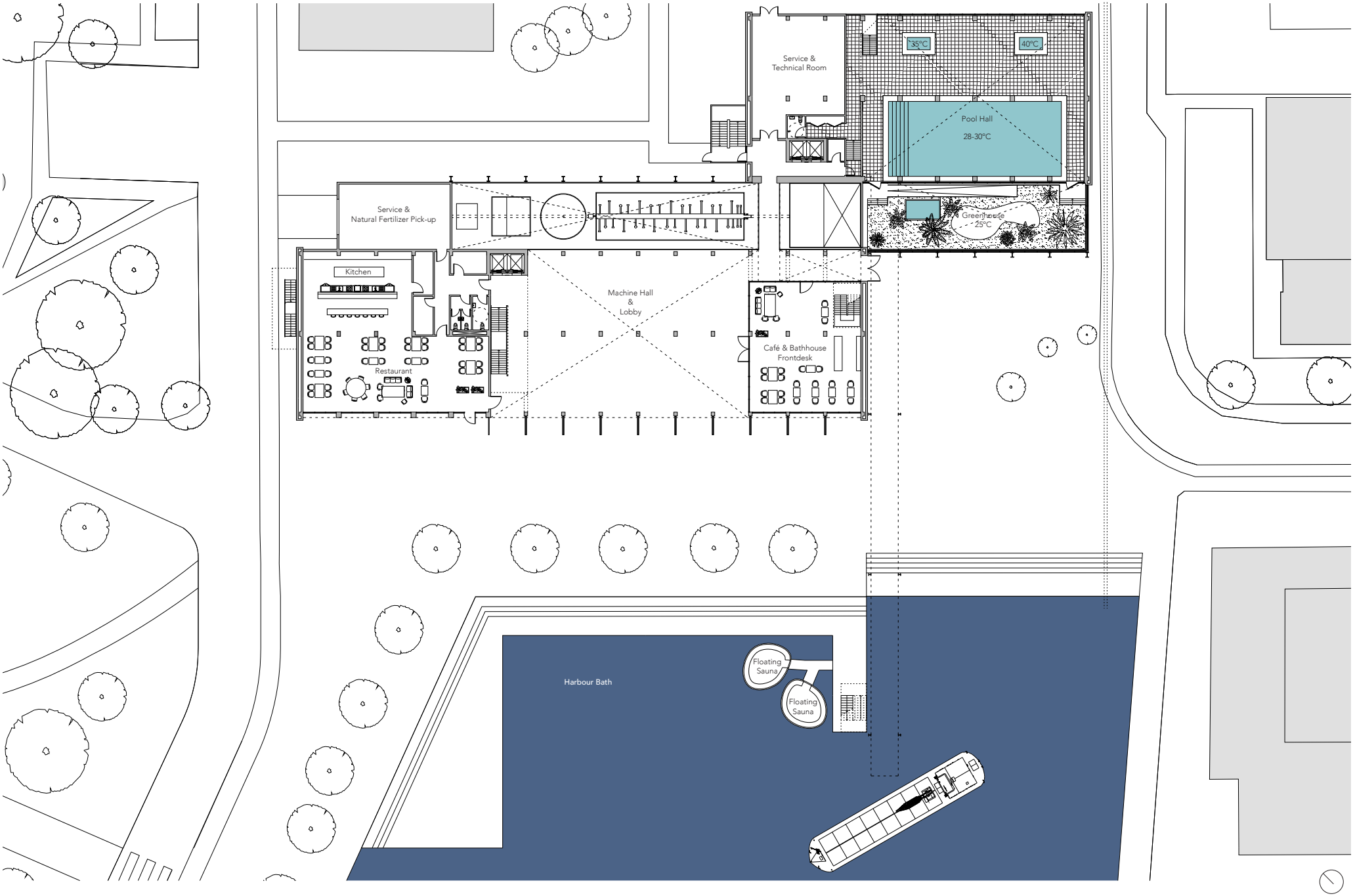
Artist Atelier



Wellness Studio



DJ/Podcast Booth

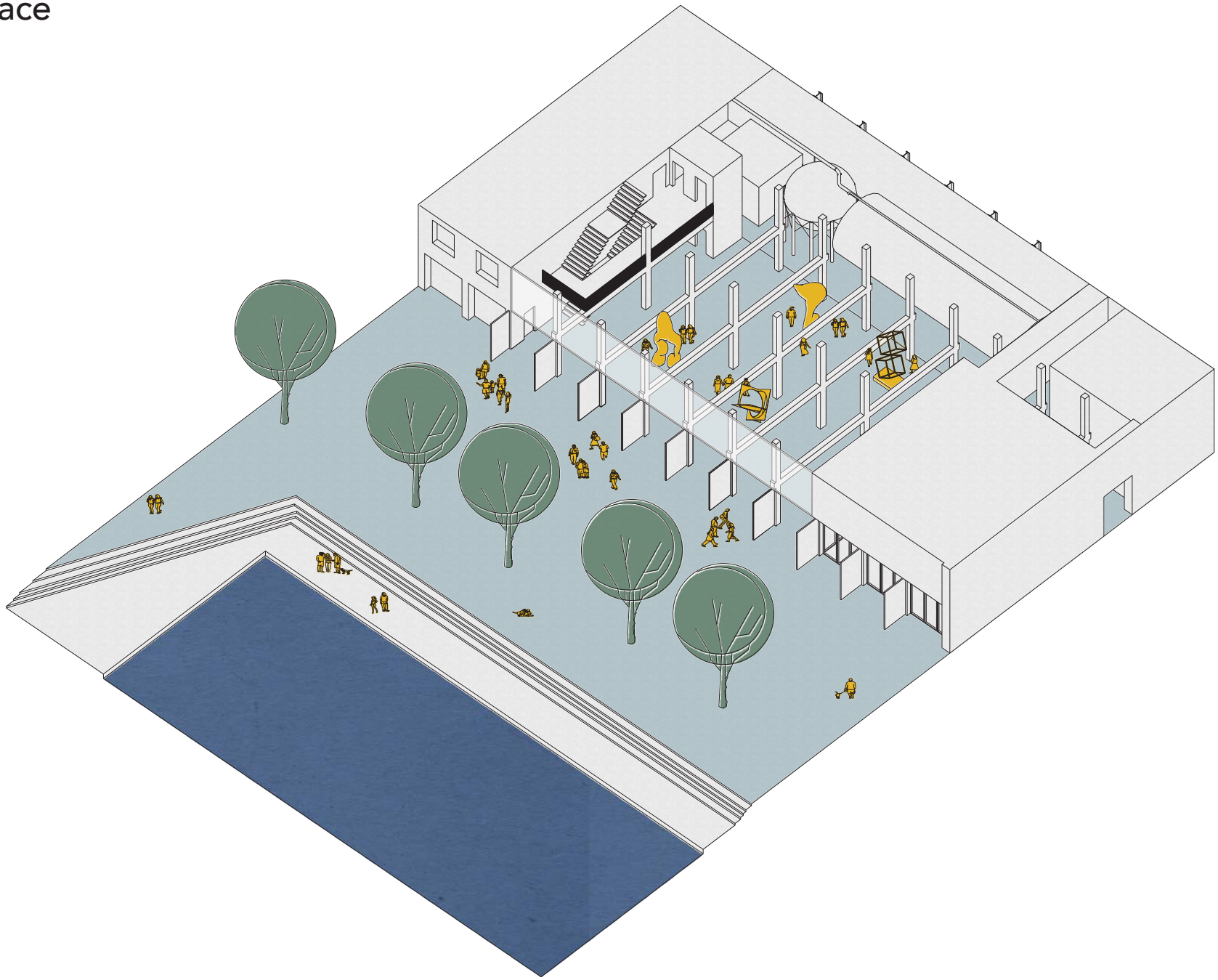

Service &
Technical Room
35°C
40°C
Pool Hall
28-30°C
Service &
Natural Fertilizer Pick-up
Greenhouse
25°C
Kitchen
Machine Hall
&
Lobby
Café & Bathhouse
Frontdesk
Restaurant
Harbour Bath
Floating
Sauna
Floating
Sauna

Ground Plan


BADHUIS MARINETERREIN

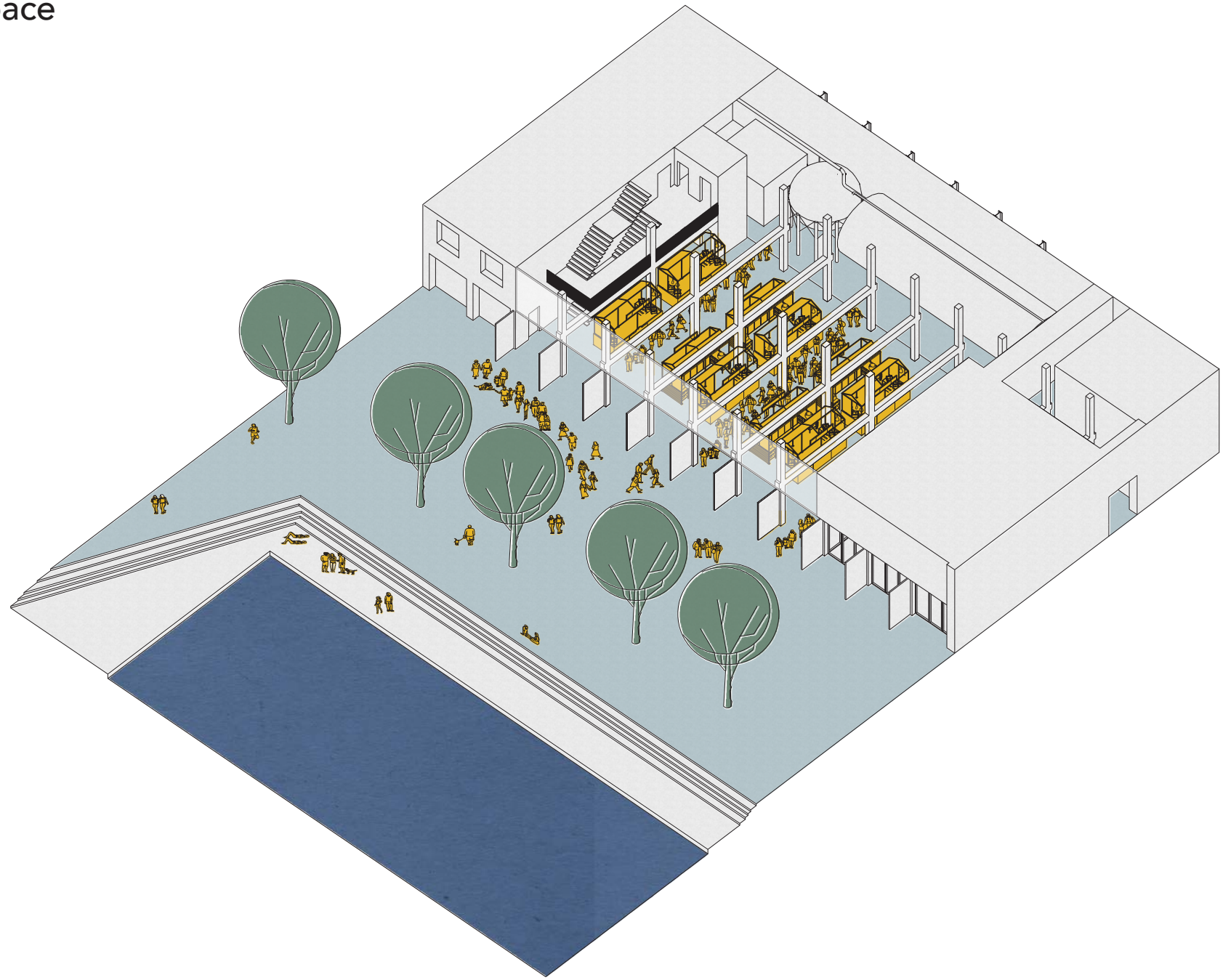
Public Space

Exposition



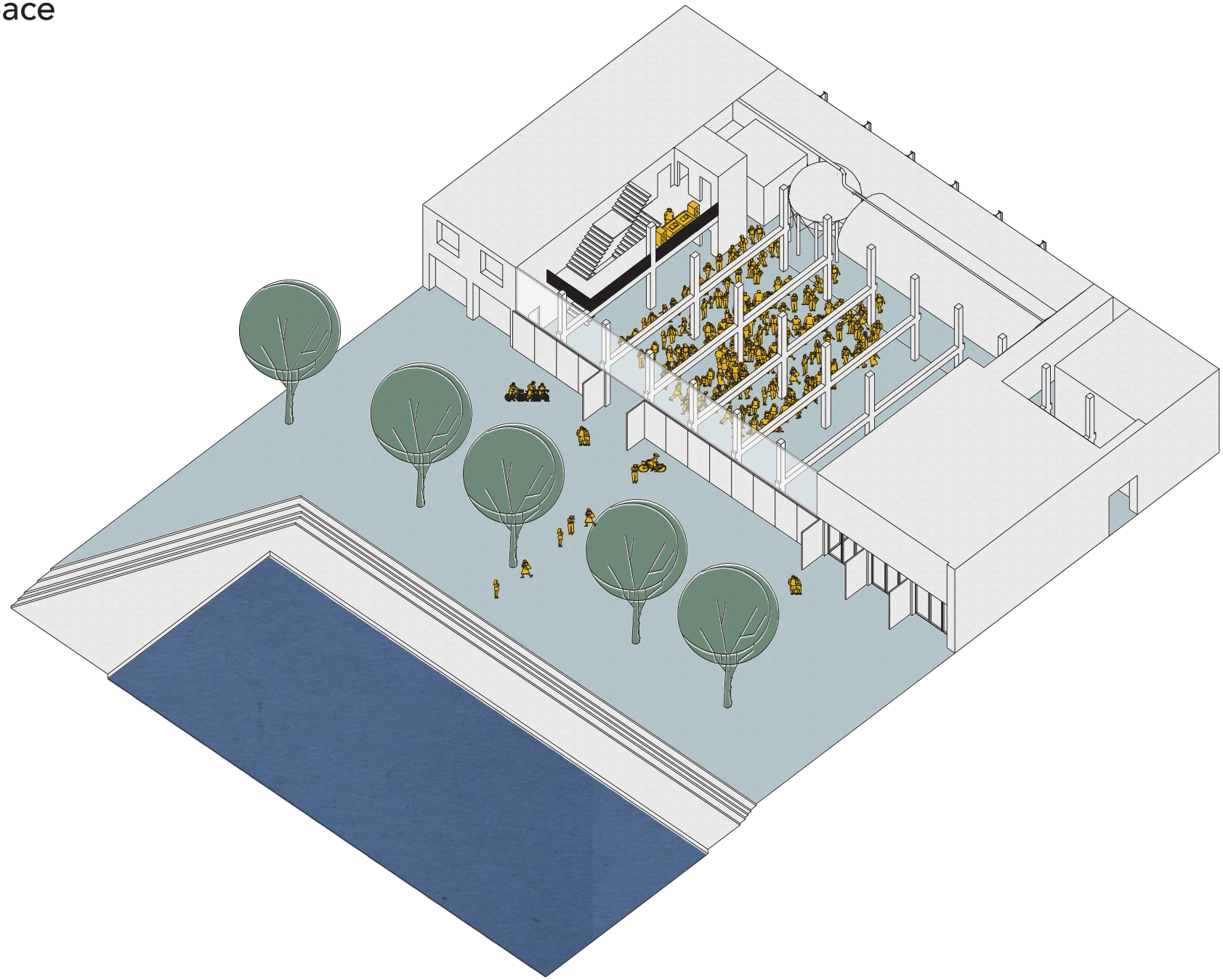
Public Space

Market



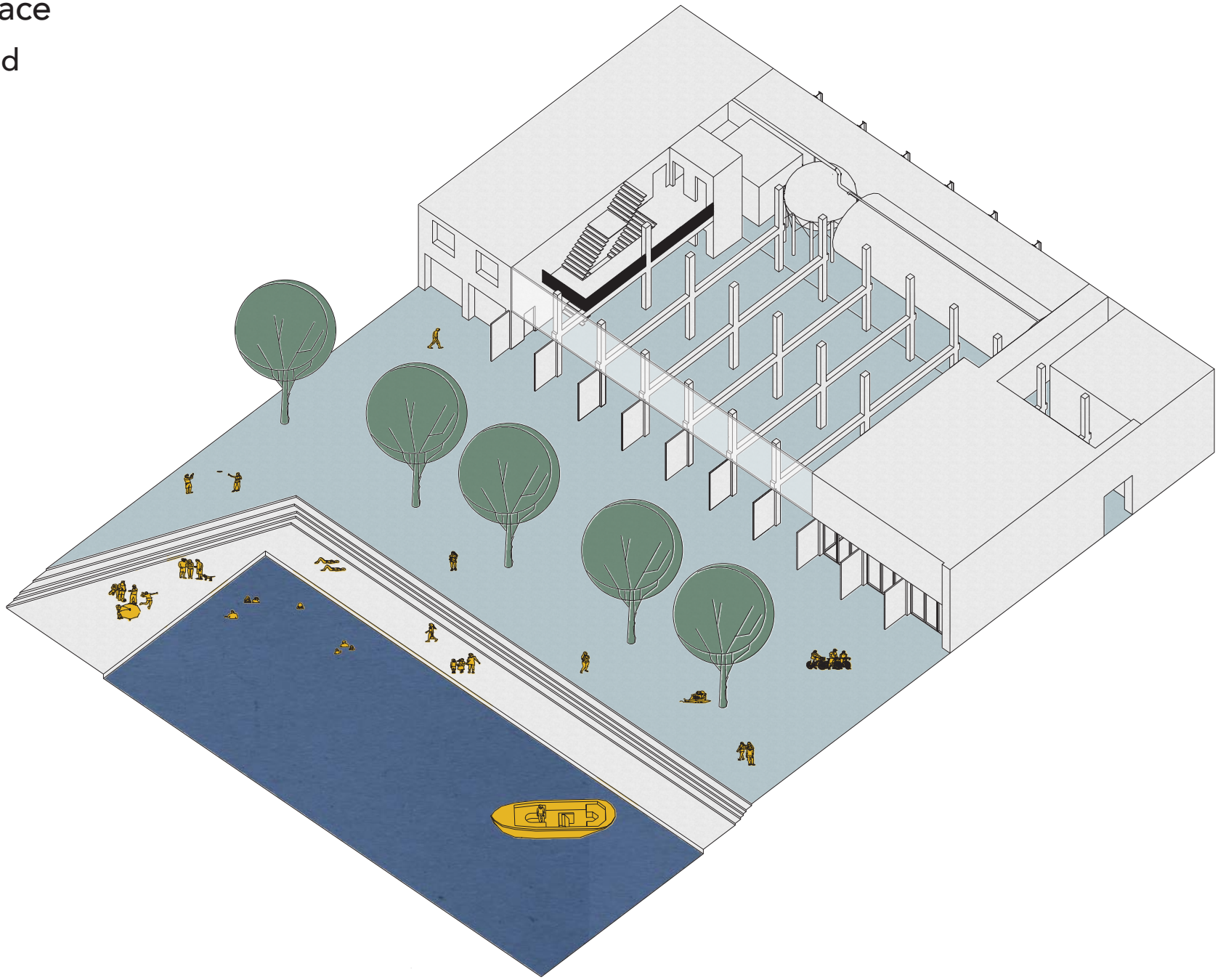
Public Space

Party



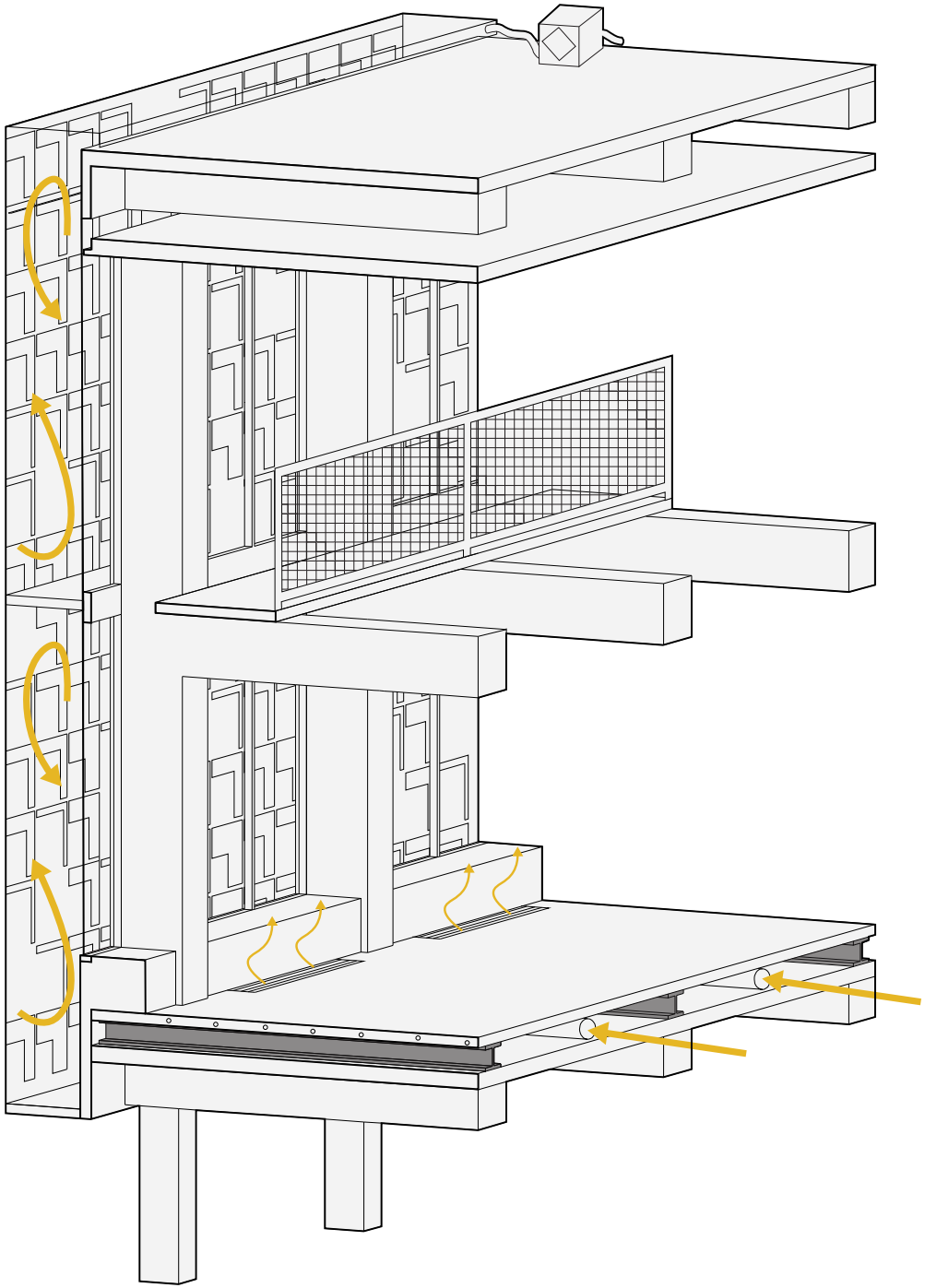
Public Space

Unoccupied

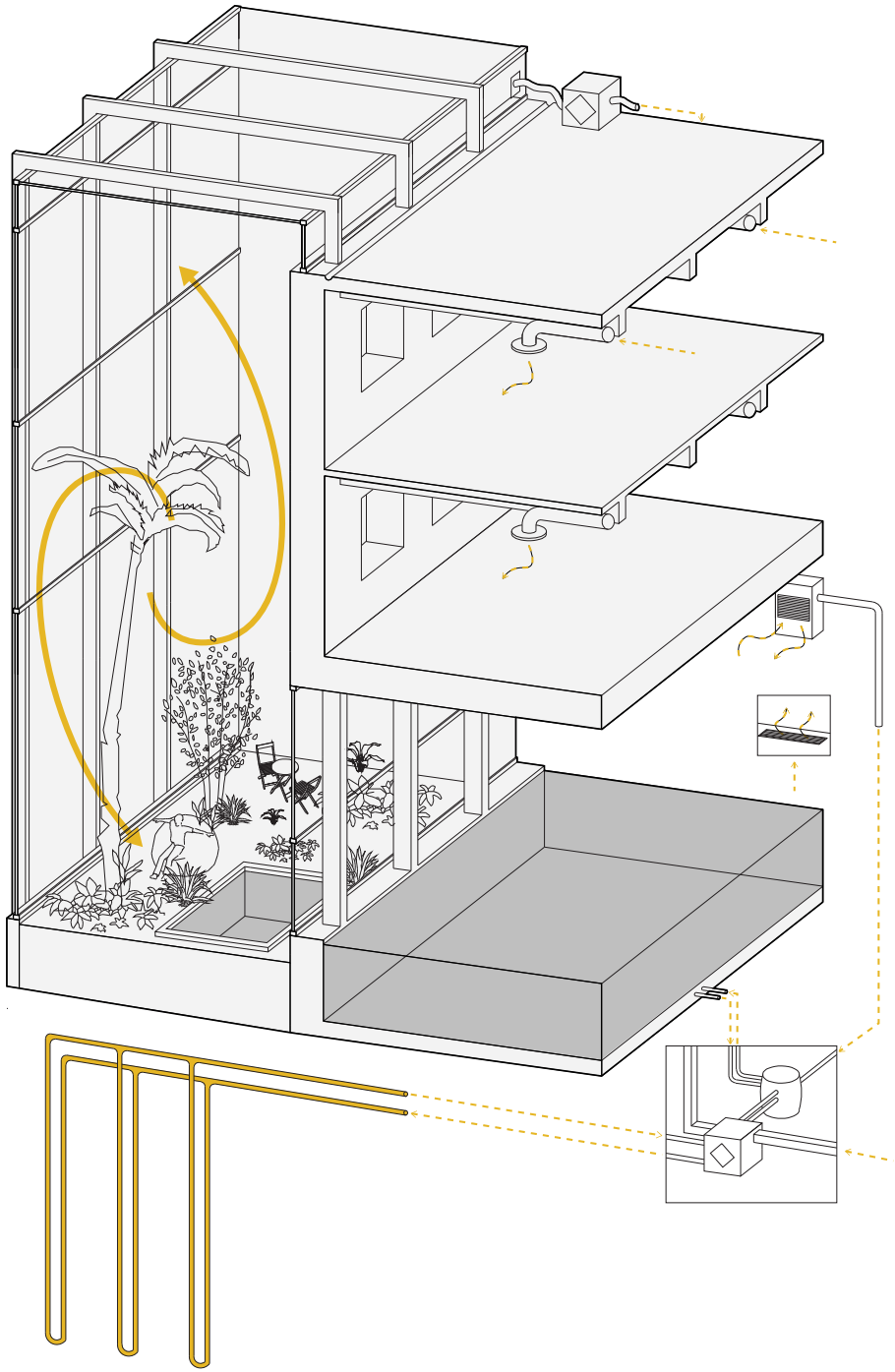


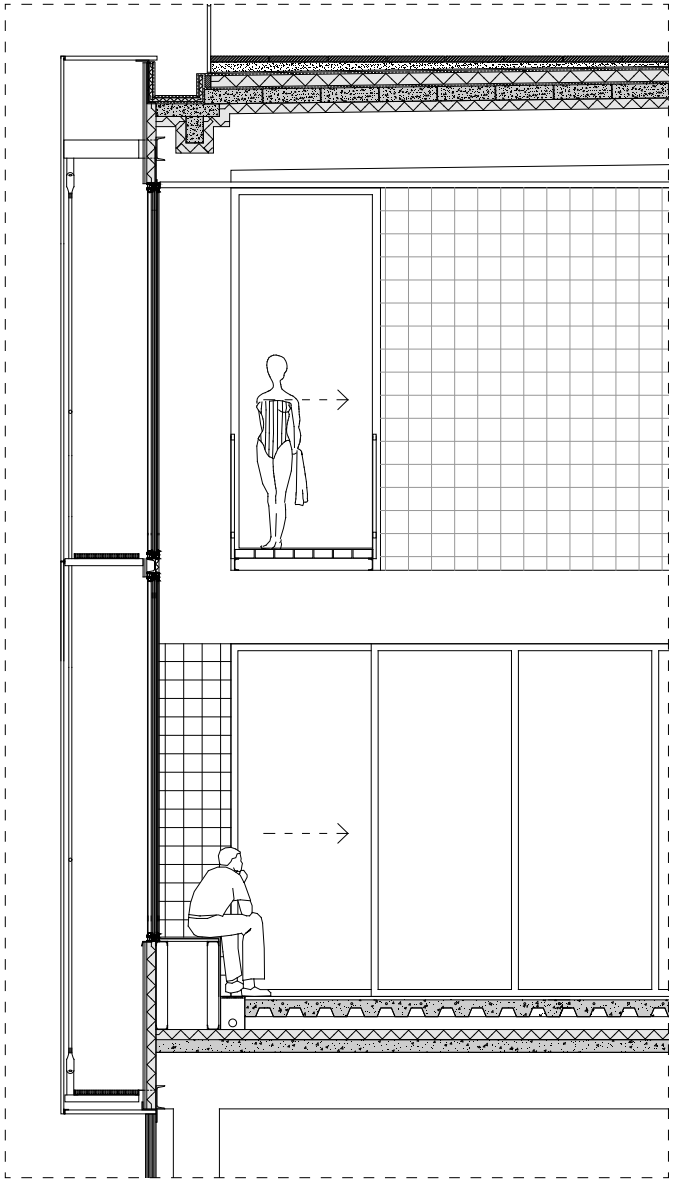

BADHUIS MARINETERREIN
The END.

Energy
Bathhouse Climate System

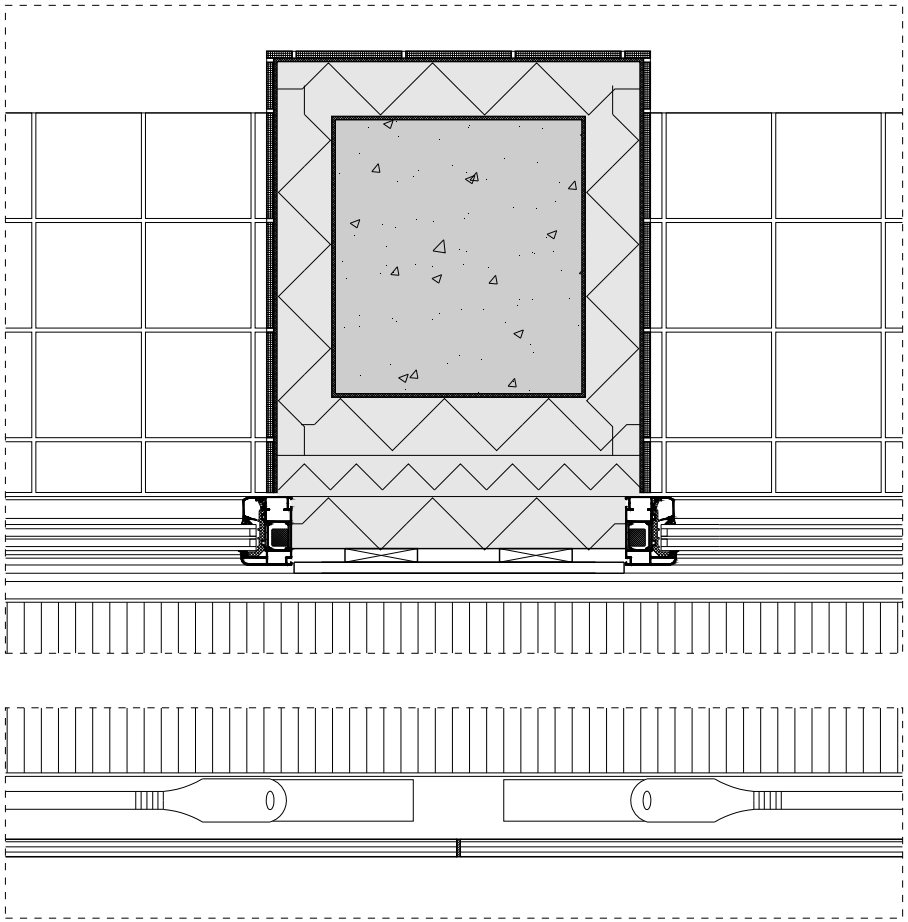


Energy
Pool Hall | Greenhouse
Climate System





Facade Section



1:5 Detail