

# INTEGRATED MOVEMENT

*The reintegration of the marine establishment into the public space of Amsterdam*



# PRESENTATION CONTENT

1

## Introduction & Function

---

*Introduction to the marine area*

2

## Research

---

*Thematic research  
Research program  
Site analysis*

3

## Design

---

*Site intervention  
Building design*



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# MARINE AREA

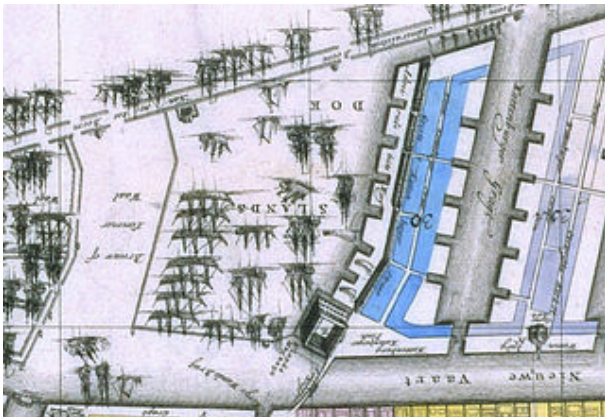


The Netherlands

Amsterdam

Marine area

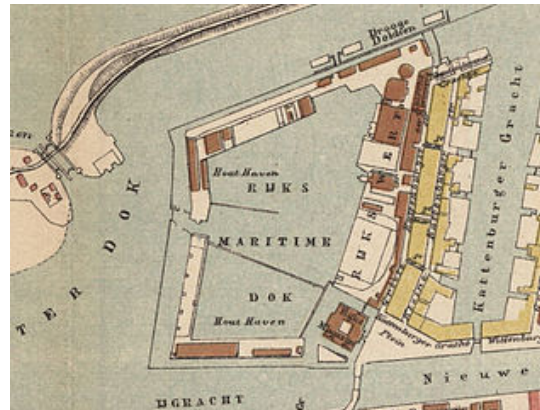
# MARINE AREA - HISTORY



1796

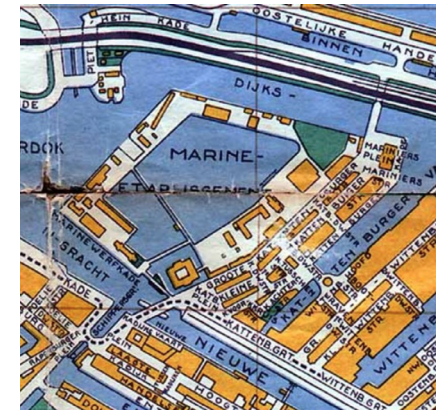
**1655:** Used for **building** Navy ships

**1790:** **Outer ring** of the Marine Establishment Amsterdam is built



1875

**1915** No longer suitable as shipyard. **Storage of military equipment and training of personnel**



1950

**1968** Central water body in the area is **reclaimed**

**2015** Parts of the area **disclosed to Rijksvastgoedbedrijf** to start the **gradual development** of entire area

# MARINE AREA

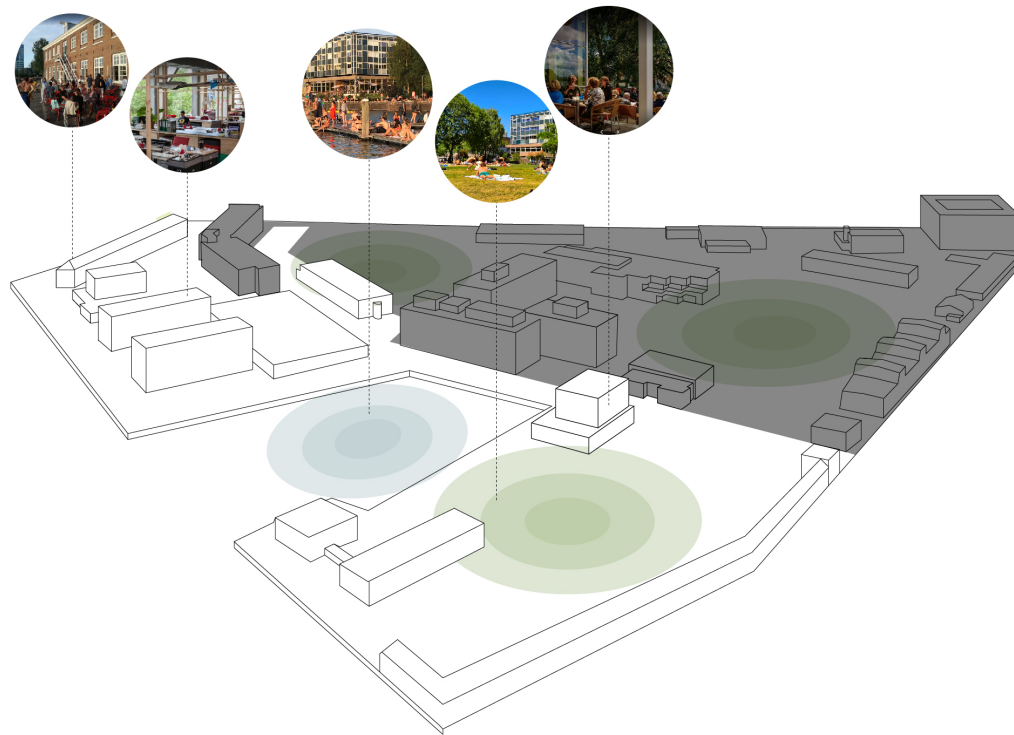


Transition period 2018 - ?



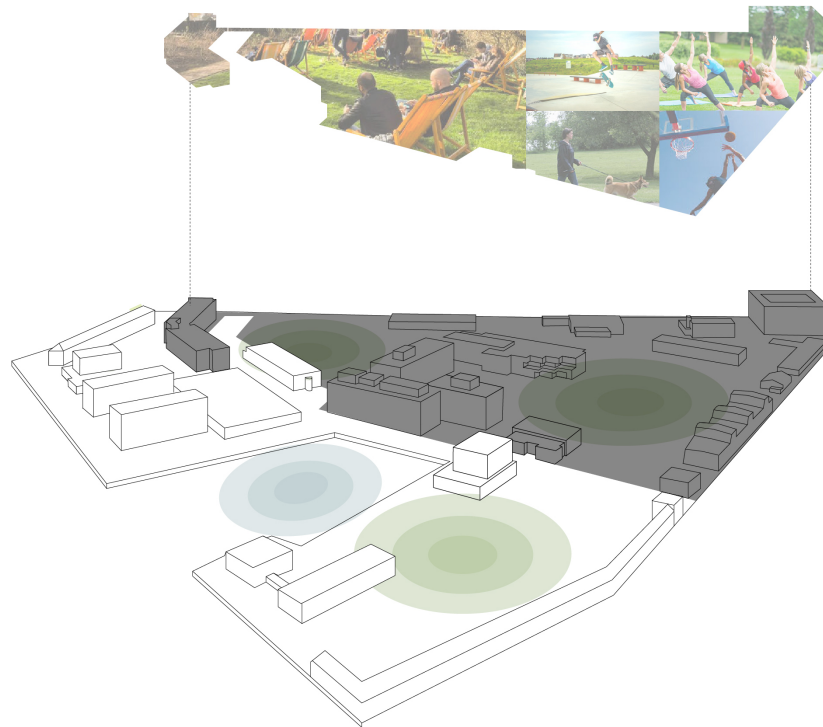
Future -?

# INVENTORISATION



# VISION

The reintegration of the marine area into the public space of Amsterdam.



## VISION

The reintegration of the marine area into the public space of Amsterdam.





# TRANSITION AREA

Transition area unites current and future users taking into account the identity and vision of the area



# INTEGRATED FUNCTION



Marine area since  
1655

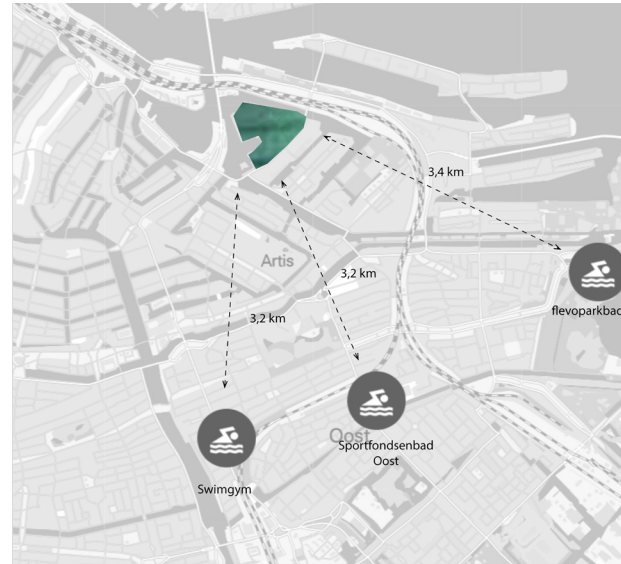
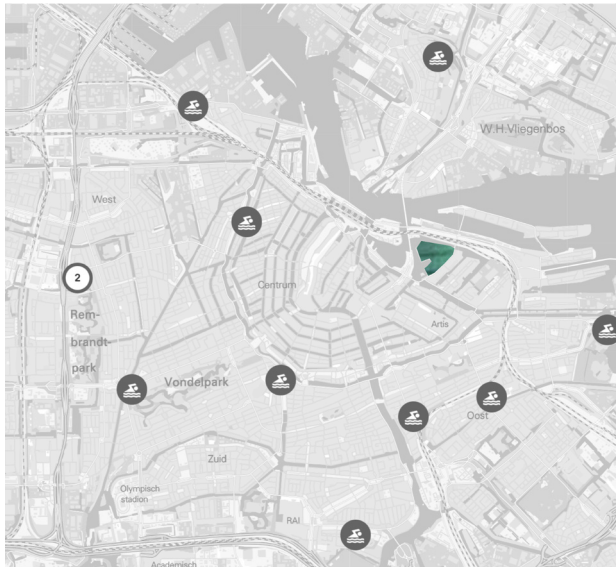


Transition period



Future

# EXISTING POOLS



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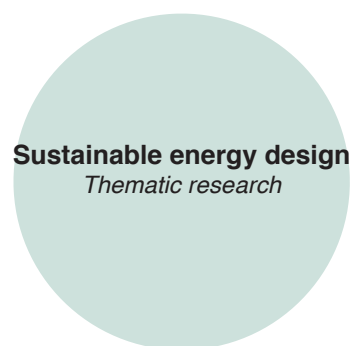
*Site intervention  
Building design*

***Main research question***

*How can a swimming pool with a sustainable energy design bring the vitality of the city into the marine area?*

***Main research question***

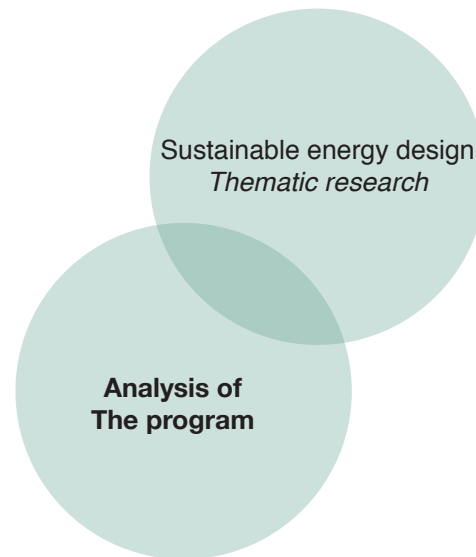
*How can a **swimming pool with a sustainable energy design** bring the vitality of the city into the marine area?*



**Sustainable energy design**  
*Thematic research*

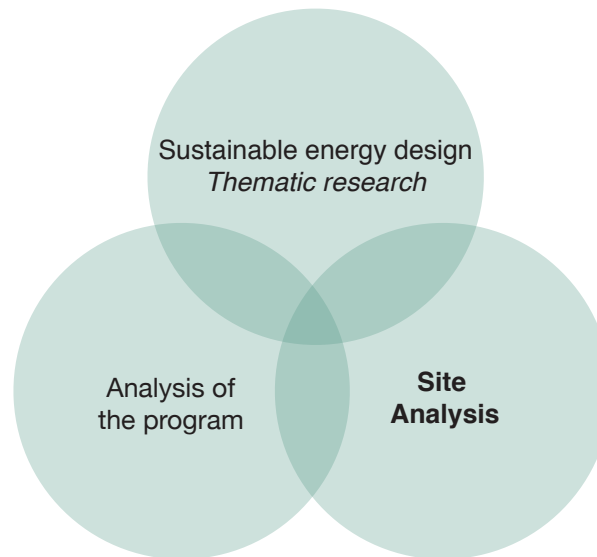
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***Main research question***

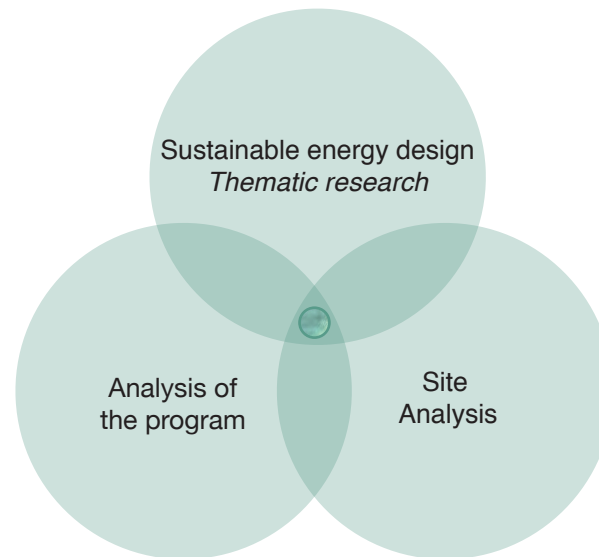
*How can a swimming pool with a sustainable energy design bring the **vitality of the city** into the marine area?*





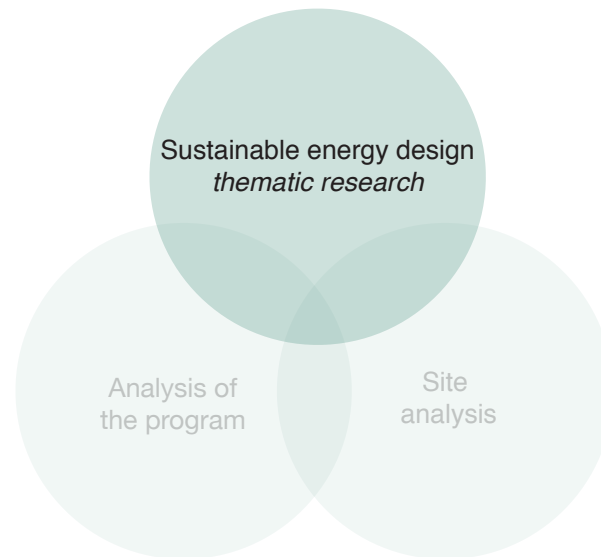
***Main research question***

*How can a swimming pool with a sustainable energy design bring the vitality of the city into the marine area?*



***Main research question***

*How can a swimming pool with a sustainable energy design bring the vitality of the city into the marine area?*



# ENERGY CONSUMPTION

High gas consumption

Netherlands 700 pools = Total of 1.6 million MWh energy ~ 90.500 households

**Mainly natural gas**



$\geq 27^{\circ}\text{C}$



# THEMATIC RESEARCH

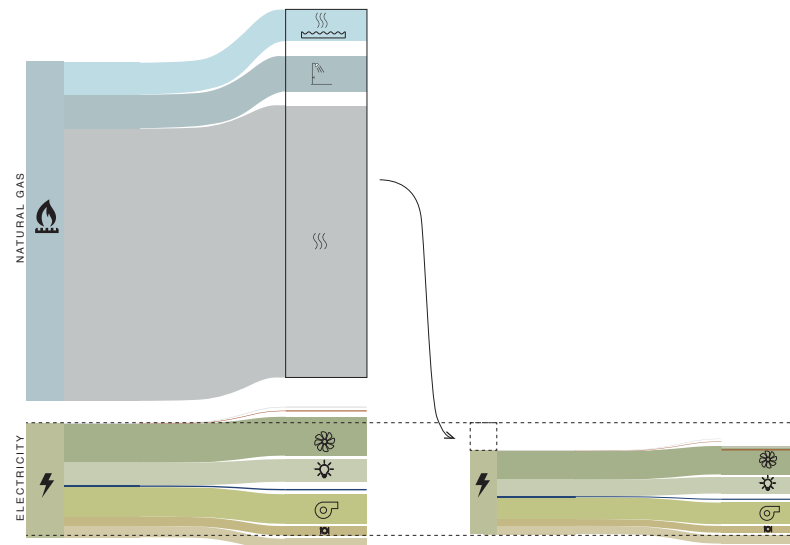
*What interventions can be applied to a(n) (existing) swimming pool to eliminate natural gas consumption and reduce the overall energy consumption?*

# DEFINING

## Division energy consumption swimming pool

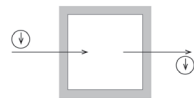
Status quo

Goal



# INTERVENTIONS

Trias Energetica

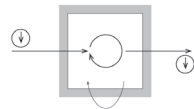


## 1. Reduce energy consumption

- Orientation and organisation of the building
- Improved Insulation
- Pool covers

**Passive**

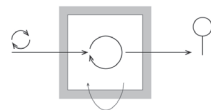
- LED Light
- Frequency pool water pumping system



## 2. Reuse waste energy streams

- Heat exchangers and heat pumps for ventilation
- Heat recovery and heat pump for shower water
- Heat recovery and heat pump for pool water

**Active**

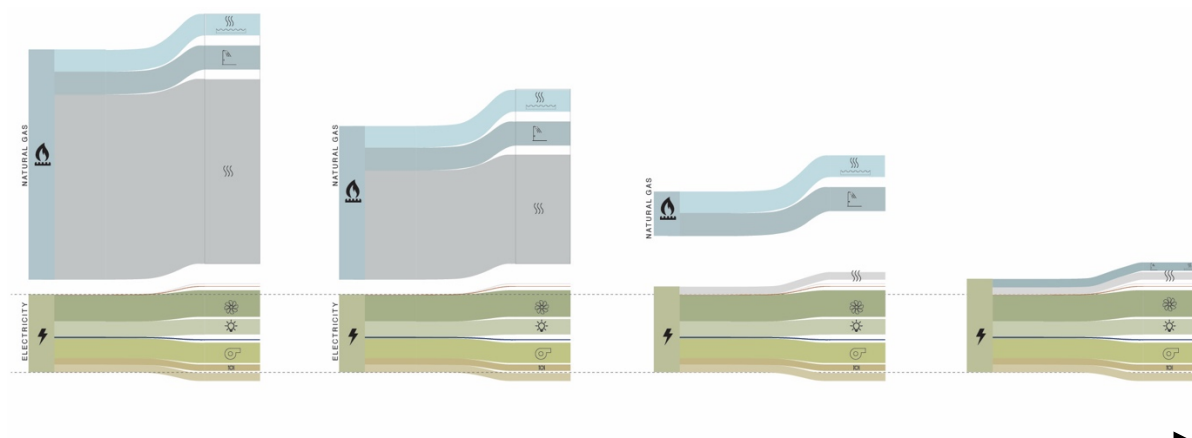


## 3. Use renewable energy sources

- Geothermal heat
- Sewer heat recovery
- PV Panels
- Solar collectors
- PVT Panels

# COMBINING INTERVENTIONS

Most effective interventions to eliminate natural gas



Status Quo

Insulated

Air heat pump  
+ Heat recovery

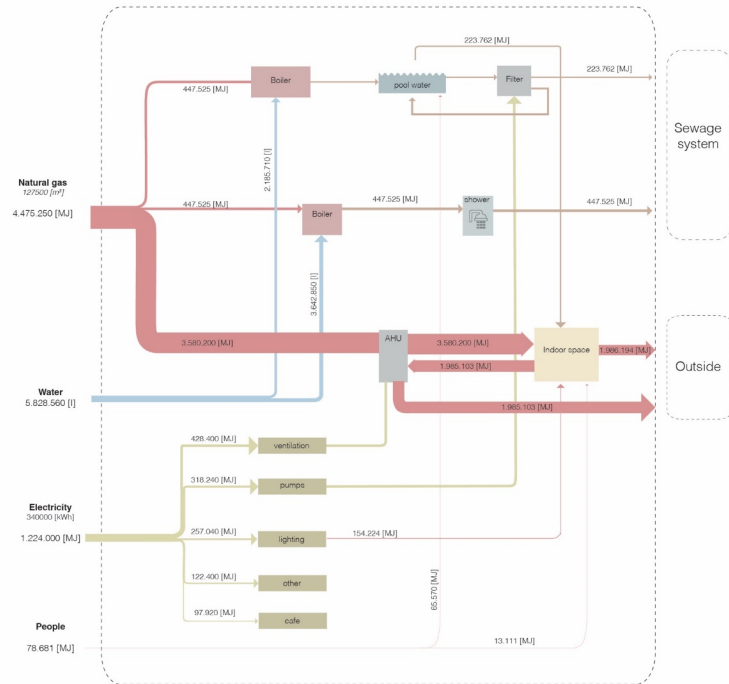
Shower and pool water heat  
pump + heat recovery

Saving natural gas: 32%  
Saving total: 24%

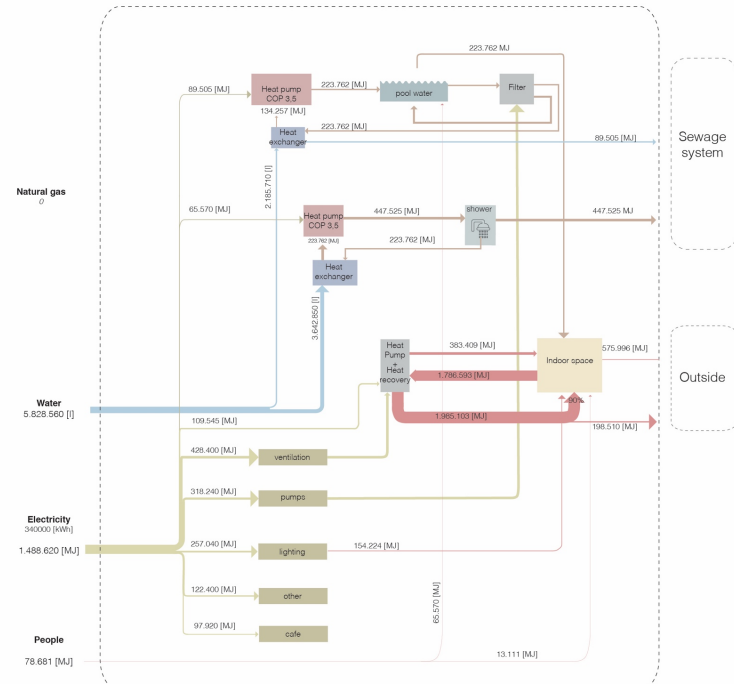
Saving natural gas: 80%  
Saving total: 60%

Saving natural gas: 100%  
Saving total: 73%

# FLOWS WITHIN POOL



Status Quo



With sustainable energy interventions



# CONCLUSION RESEARCH

*What interventions can be applied to a(n) (existing) swimming pool to eliminate natural gas consumption and reduce the overall energy consumption?*

Orientations and organisation should be considered initially as this can, through energy collection and absorption greatly reduce energy consumption

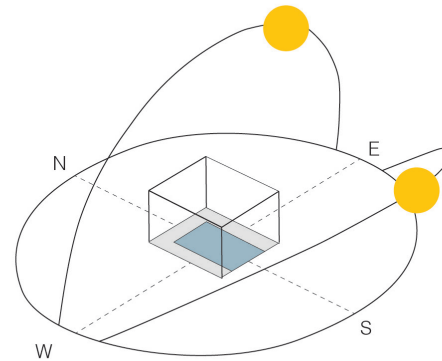
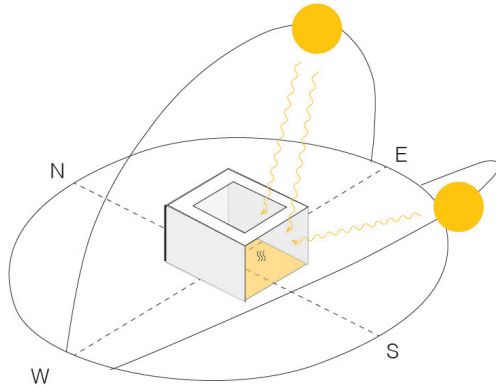
Technical interventions can completely eliminate gas consumption

Insulation is a key aspect in energy reduction

Quick wins like a pool cover, led light and frequency pump systems should always be applied

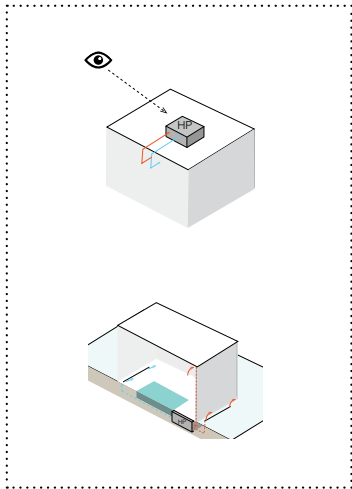
# DESIGN CONSIDERATIONS

Initial design considerations



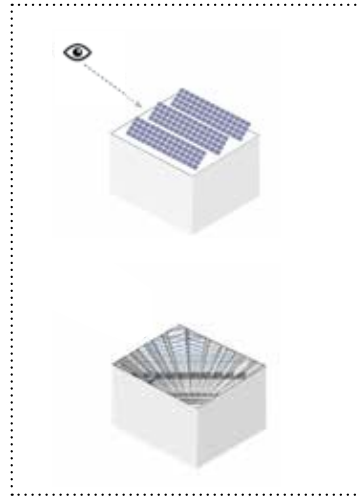
# DESIGN CONSIDERATIONS

## Further considerations

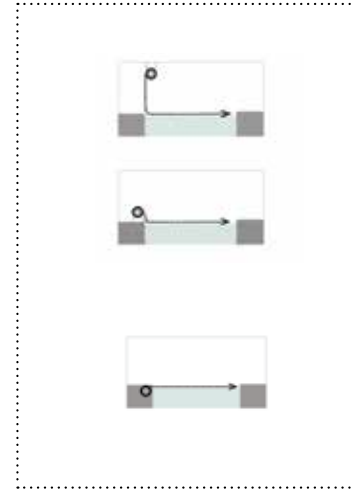


Heat exchangers and heat pumps:

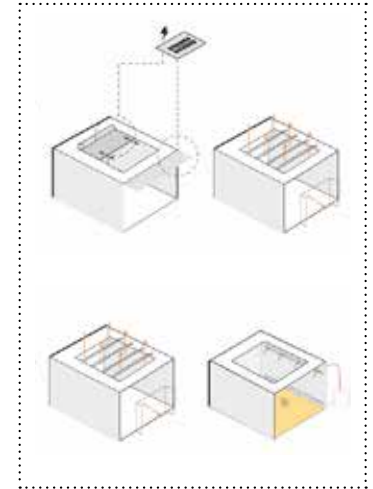
- ventilation
- shower water
- pool water
- Geothermal heat
- Sewer heat recovery



PV(T) Panels, Solar Collectors



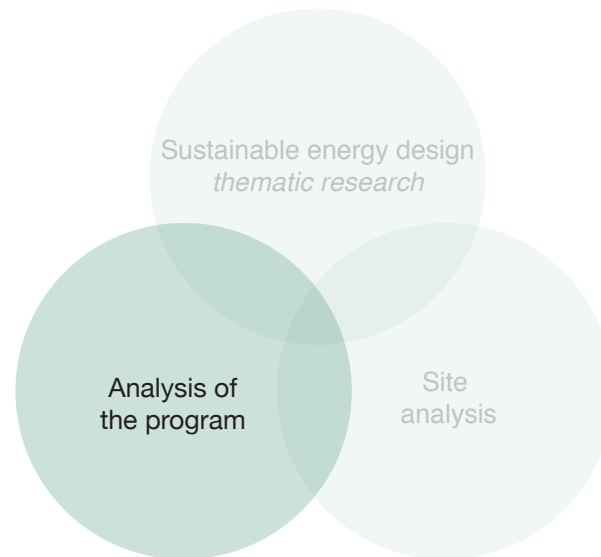
Pool covers



Prevent overheating

***Main research question***

*How can **a swimming pool** with a sustainable energy design bring the vitality of the city into the marine area?*



# CONCLUSIONS

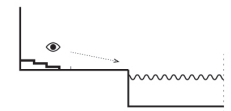


Double height pool area

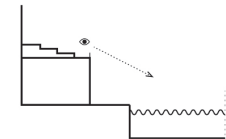


Standard order of spaces  
Not always on same level

Basement usually used for  
technical spaces



Small pools < 3100m<sup>2</sup>



Small pools > 5500m<sup>2</sup>

Large pools have a  
raised audience stand

# SWIMMING POOL

## **Minimal program** - indoor pool

- Entrance
- changing rooms + locker area
- Toilets
- Showers
- **Pool(s)**
- Staff room
- Audience stand

[*technical space*]

## **Usual**

- Cafe

## **Sport**

25 meter pool  
15 meter pool

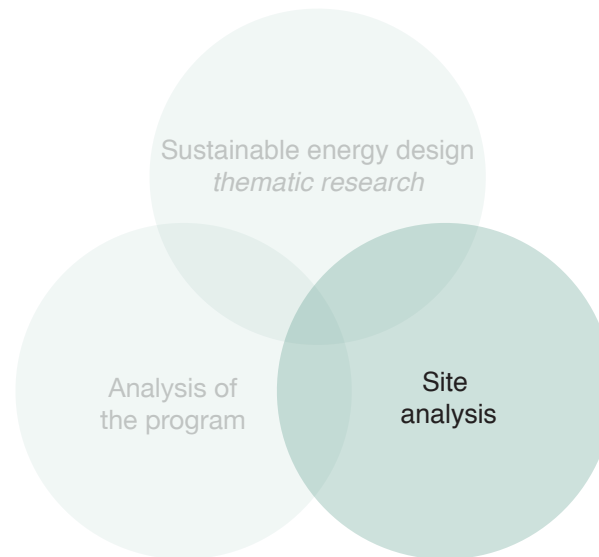
2000 - 3000 m<sup>2</sup>

## **Additional**

- Sauna
- Tanning facilities
- Training facilities
- Recreation facilities (slides, waves etc)

***Main research question***

***How can a swimming pool with a sustainable energy design  
bring the vitality of the city into the marine area?***



# ACCESS

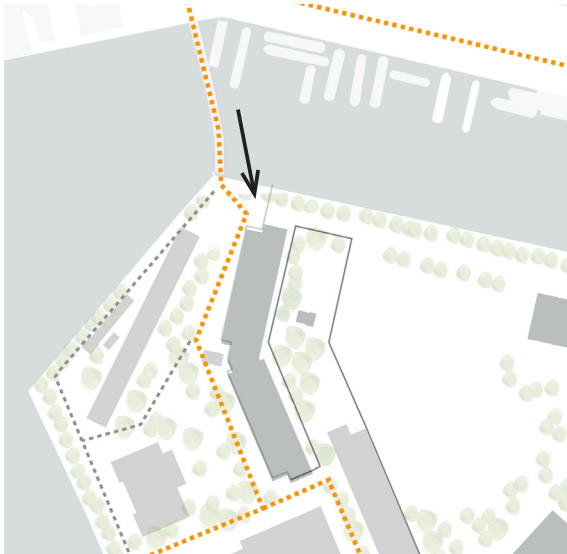
Current access to the marine area





# ACCESS

Current access to the marine area, no clear entry



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# SITE INTERVENTION

Creating a central route through the marine area



# SITE INTERVENTION

The buildings open to the route to create vitality



# CLOSED VS OPEN

## *Transparency*

*Walking in the city is enhanced for pedestrians if they can see goods on display and what is going on inside buildings. And that works both ways.*



*closed*



*Open*

*-Jan Gehl, Cities for people-*

# CLOSED VS OPEN

The buildings will be opened towards the new main route



# BUILDING POSITION

Building added as vital part of the main route







heepskameel

Dijksgracht



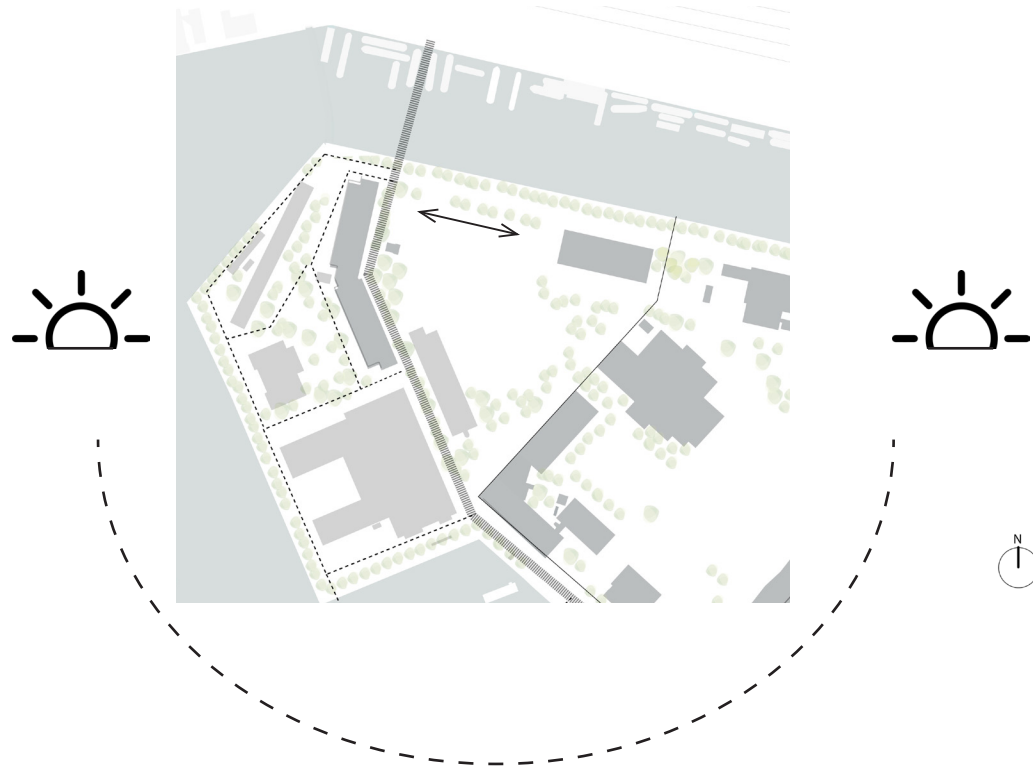
# BUILDING POSITION

Building added as vital part of the main route



# BUILDING POSITION

Orientation of the building - maximize solar gain south facade -



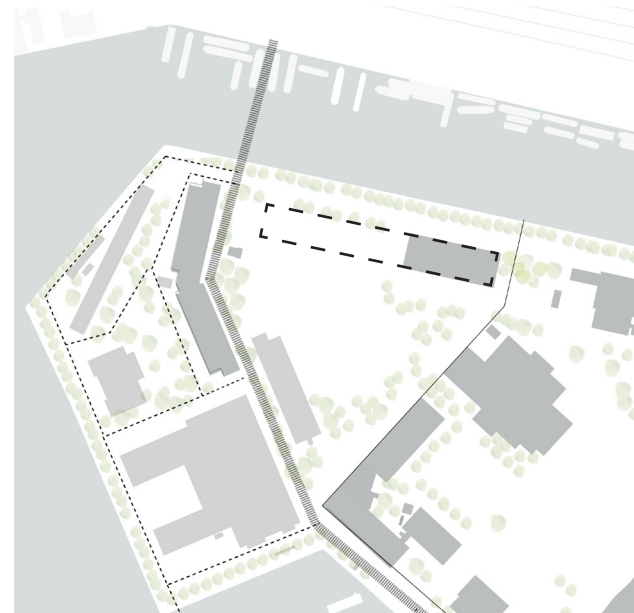
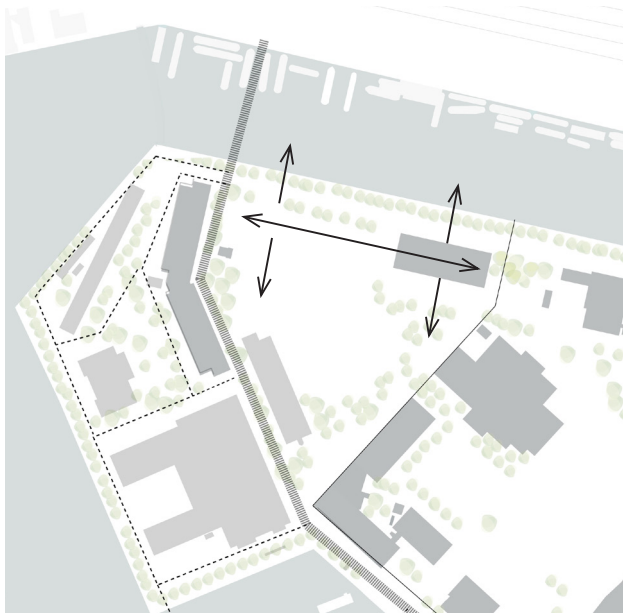
## EXISTING STORAGE BUILDING



Loods, foto's MenA juli 2017

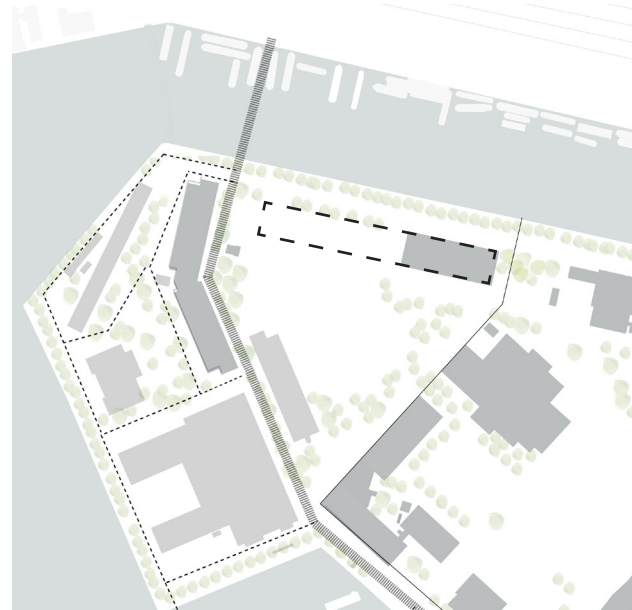
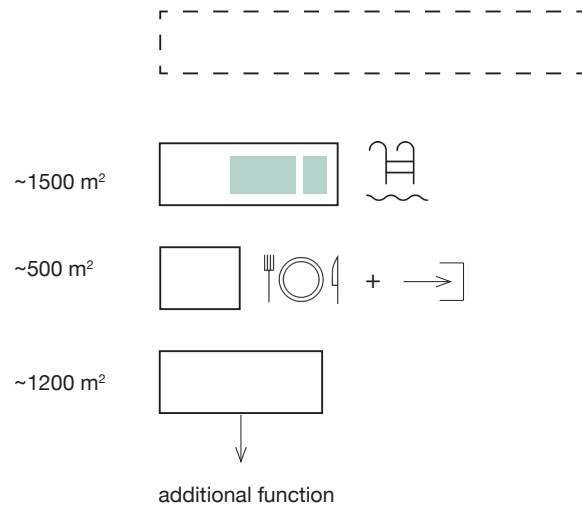
# BUILDING POSITION

Development of the complete strip to create vitality towards both sides and to define the green area



# BUILDING FUNCTIONS

Opportunity to include an additional function to the program



# ADDITIONAL FUNCTION

A place to escape the busy city, and experience peace and quiet



## Minimal program - indoor pool

- Entrance
- Changing rooms + locker area
- Toilets
- Showers
- **Pool(s)**
- Staff room
- Audience stand

[*Technical space*]

## Usual

- Cafe

## Additional

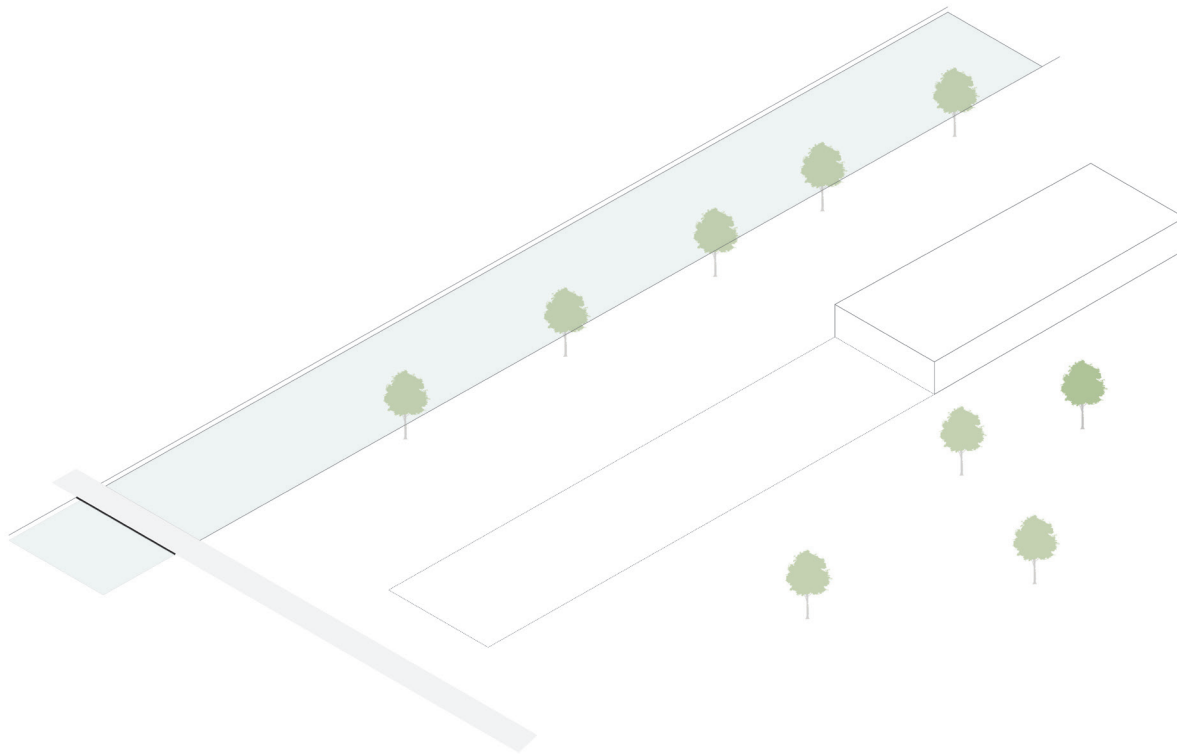
- Sauna/ Spa
- Tanning facilities
- Training facilities
- Recreation facilities (slides, waves etc)





# PROGRAM ORDER

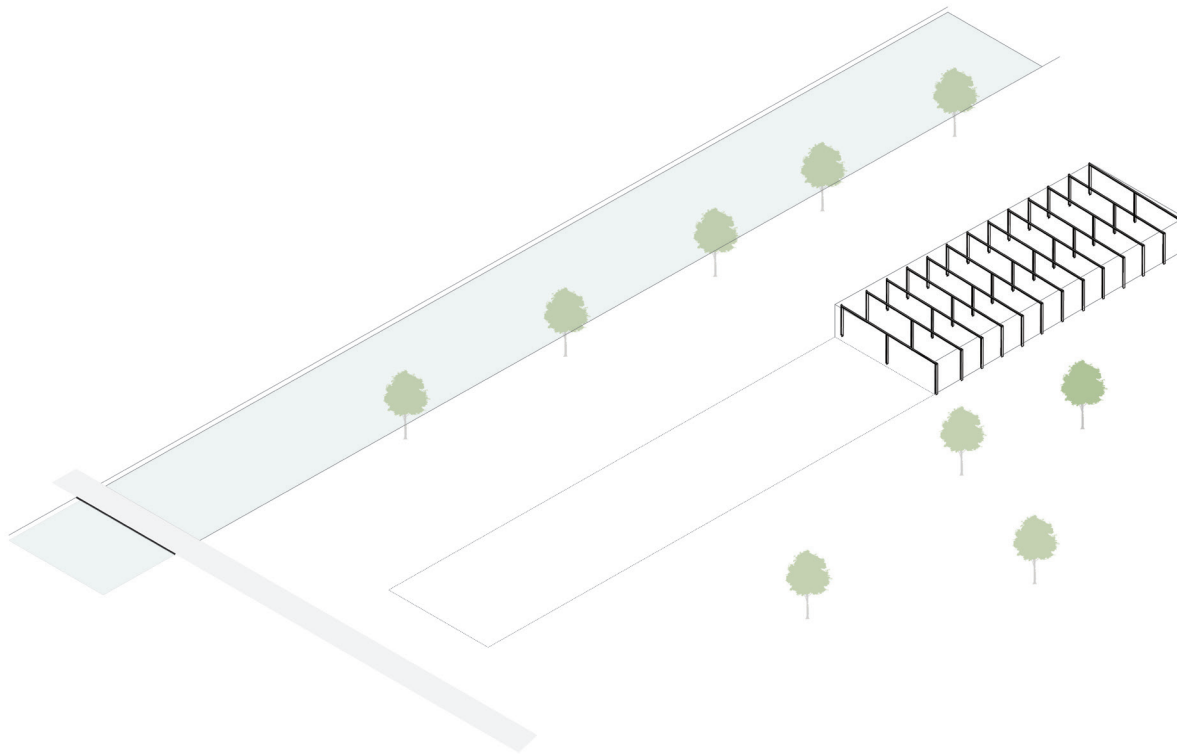
Existing building





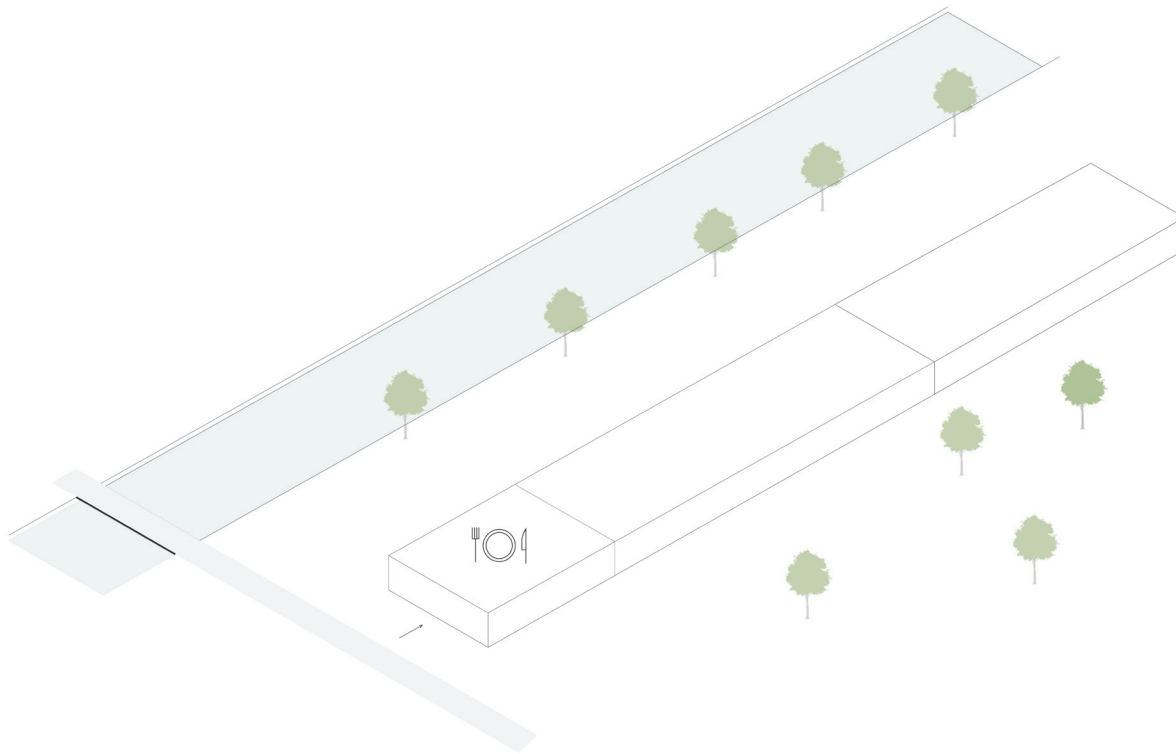
# PROGRAM ORDER

Structure existing building

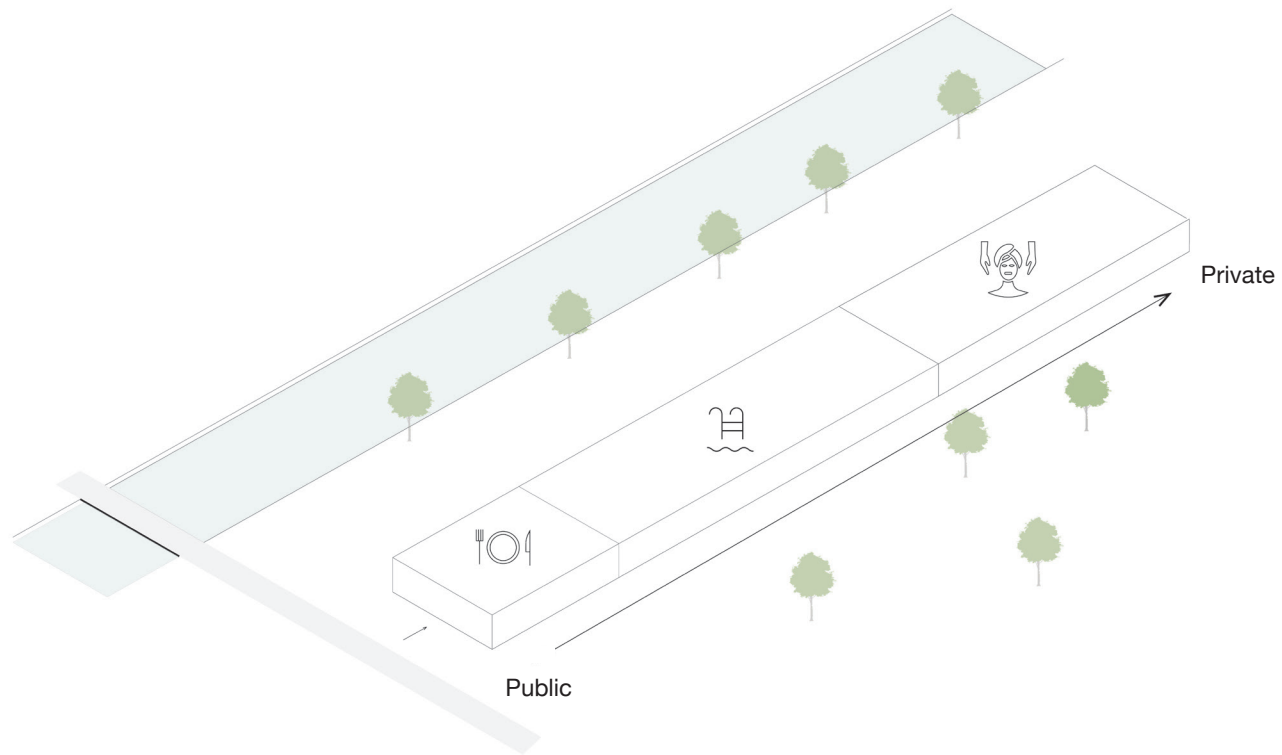


# PROGRAM ORDER

Most public function connected to main route

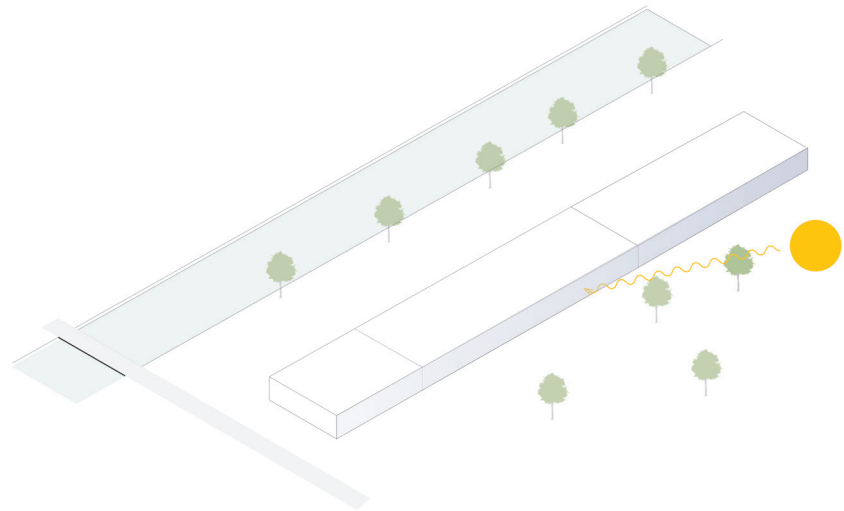
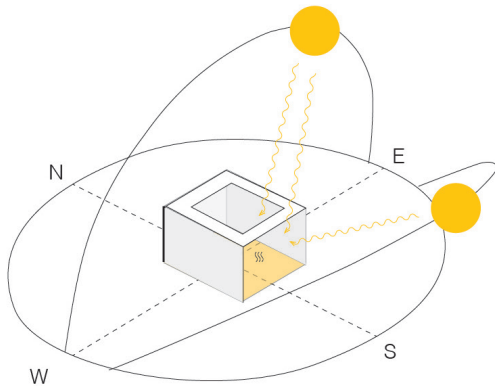


# PROGRAM ORDER



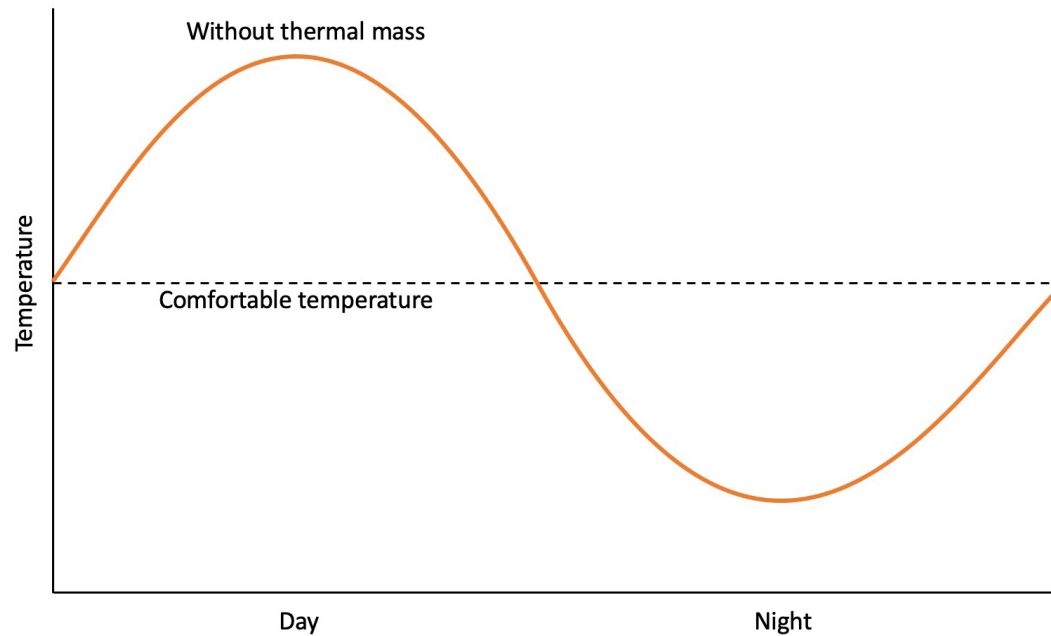
# ENERGY CONCEPT

Using the large south facade to gain solar energy



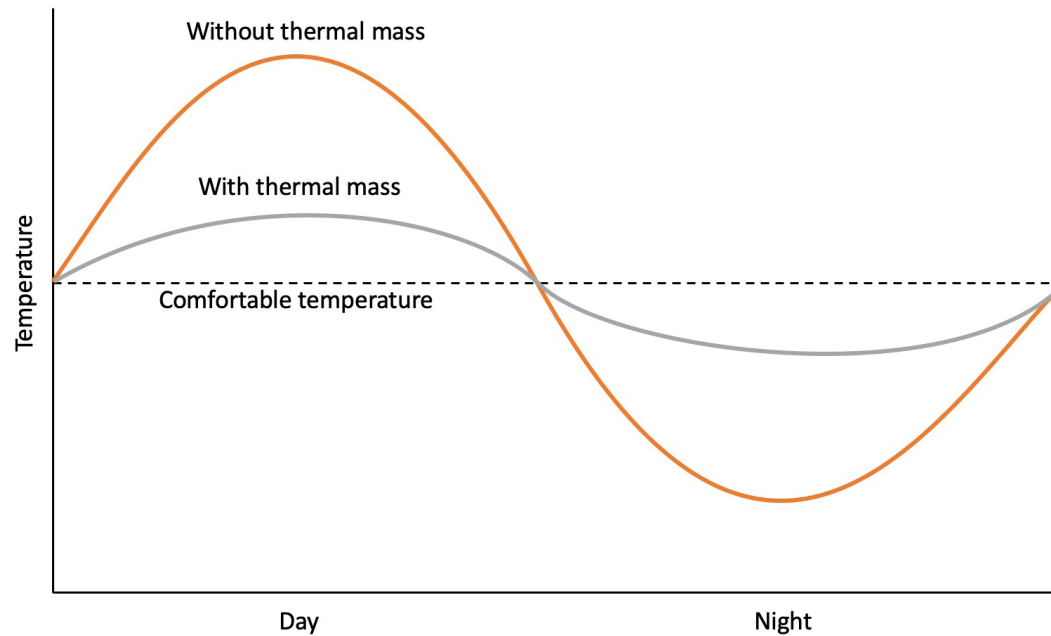
# THERMAL MASS

Using thermal mass to capture and store the solar energy



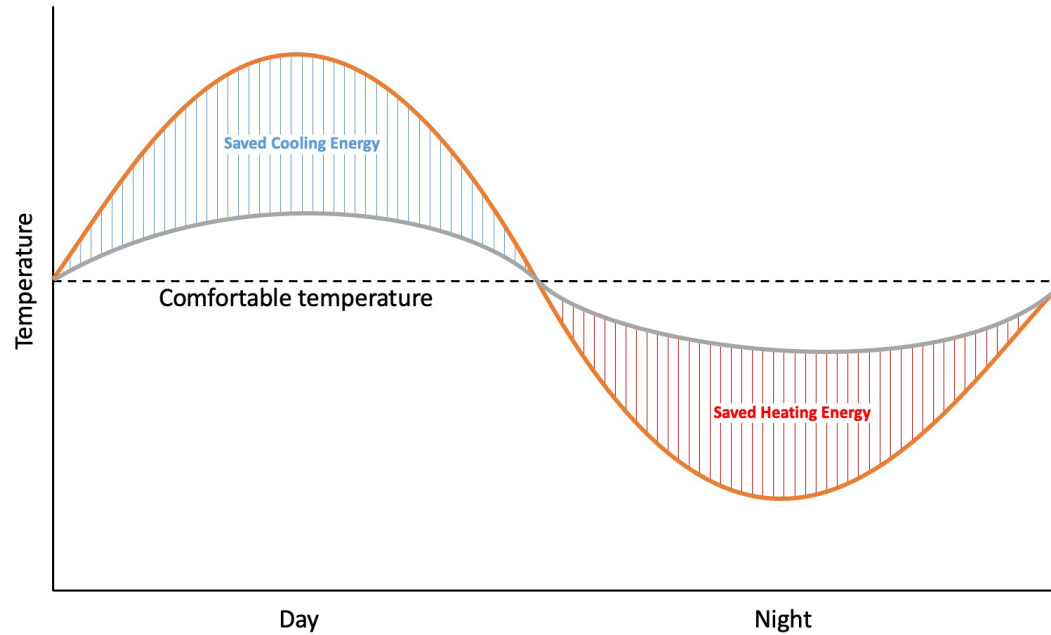
# THERMAL MASS

Using thermal mass to capture and store the solar energy



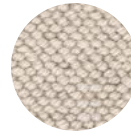
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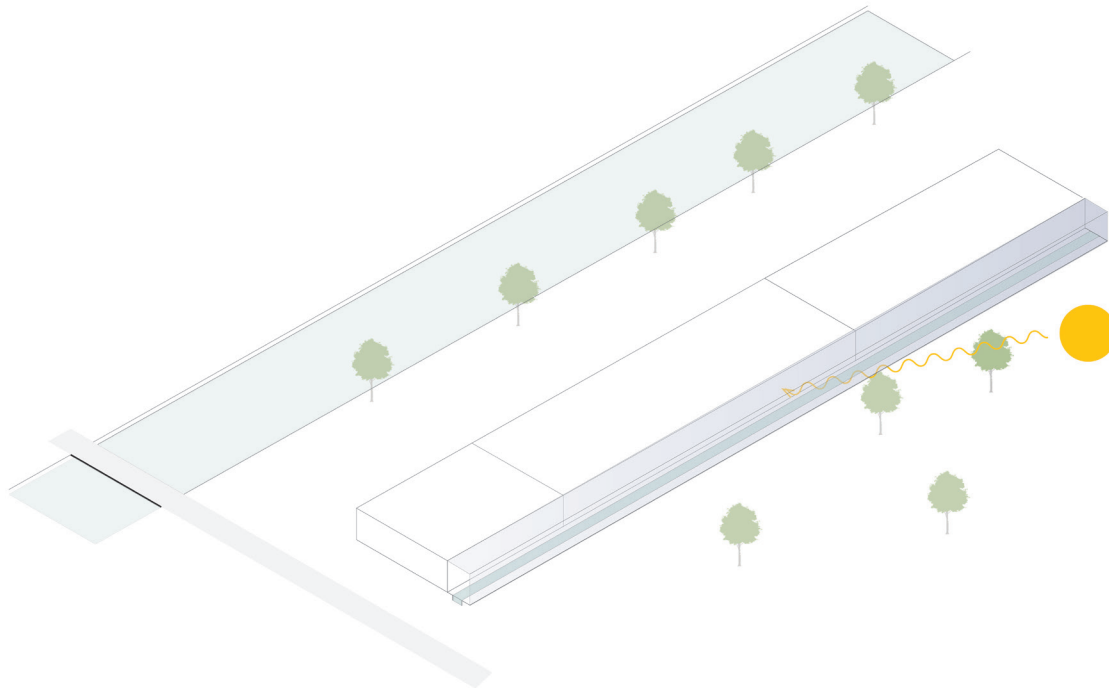
Hoog

Laag



# THERMAL MASS

Using thermal mass to capture and store the solar energy - adding a water body -



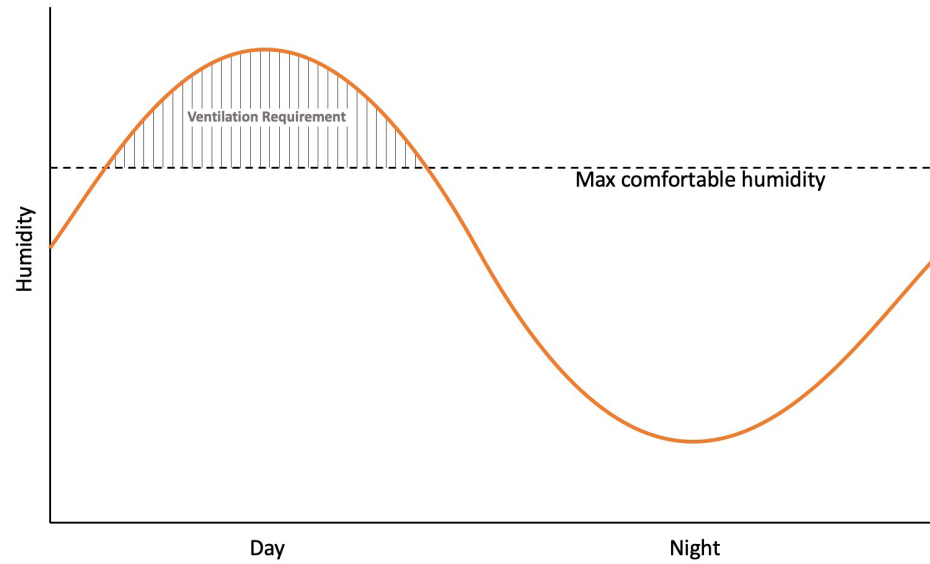
# THERMAL MASS

Using thermal mass to capture and store the solar energy



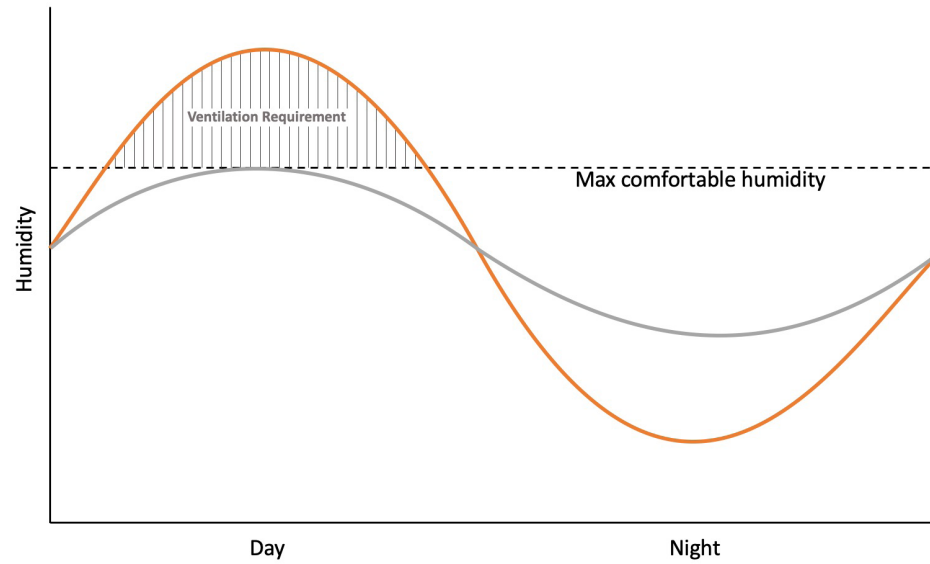
# HUMIDITY

General ventilation requirement



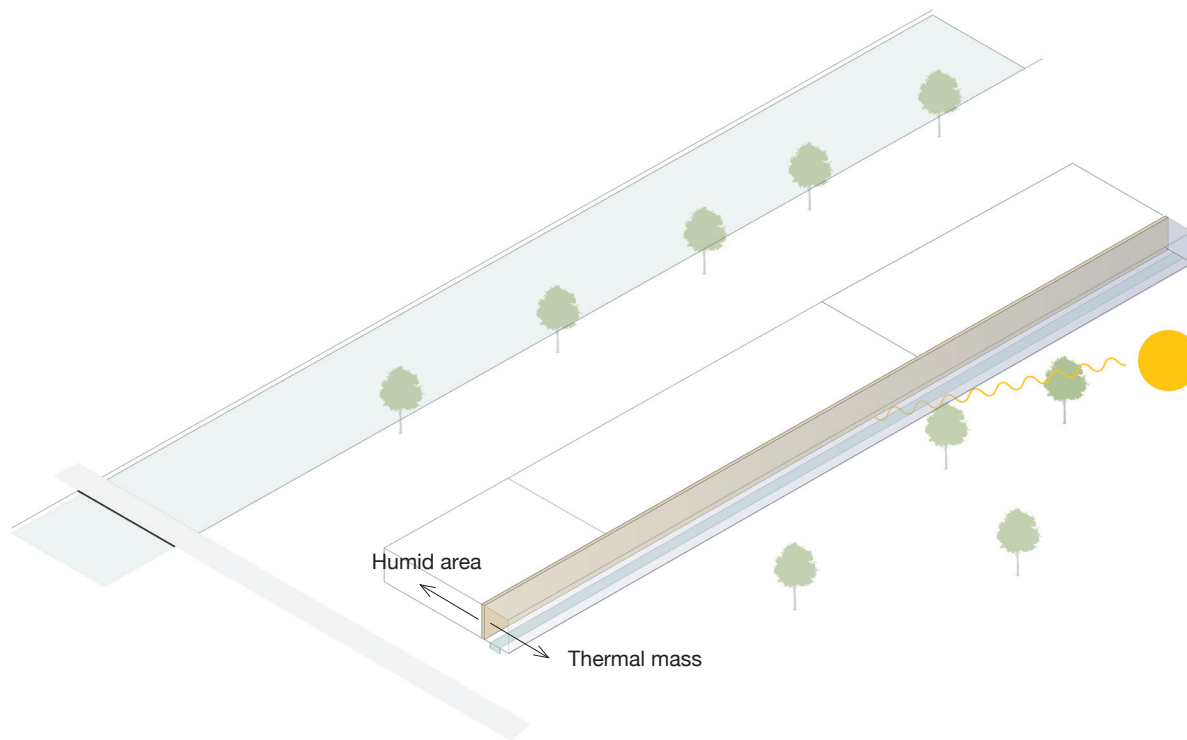
# RAMMED EARTH

Rammed earth stores a large amount of moisture



# NATURAL HUMIDITY & HEAT CONTROL

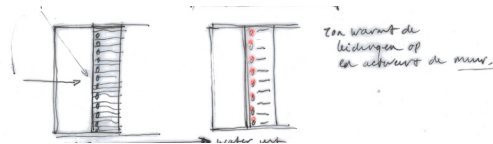
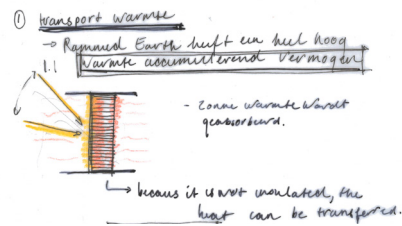
Thermal mass and moist absorbsion reduce the energy consumption



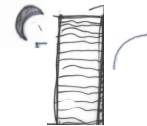
# INFRASTRUCTURE CONCEPT

Overview of the infrastructure that can be solved within the rammed earth wall

## Heat



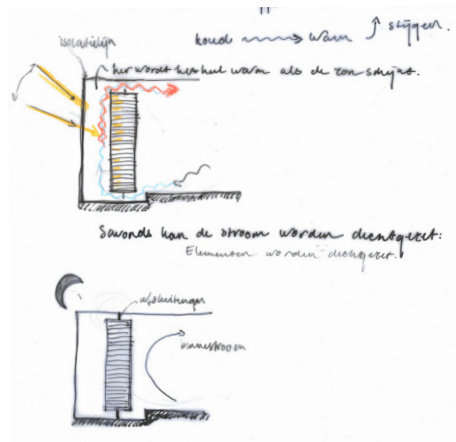
## Humidity



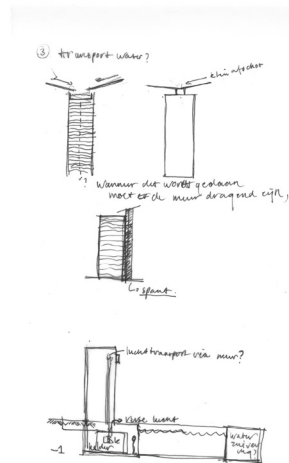
# INFRASTRUCTURE CONCEPT

## Overview of the infrastructure that can be solved within the rammed earth wall

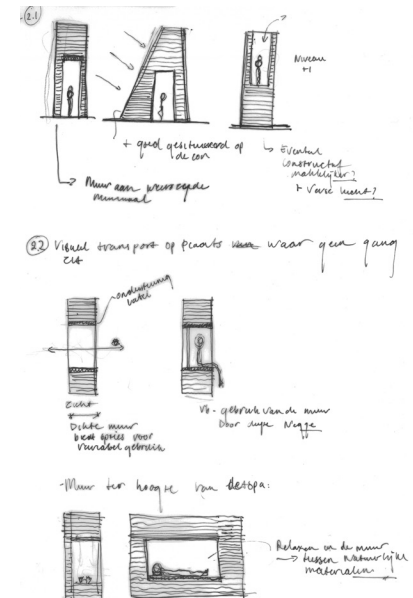
Air (ventilation)



## Stormwater

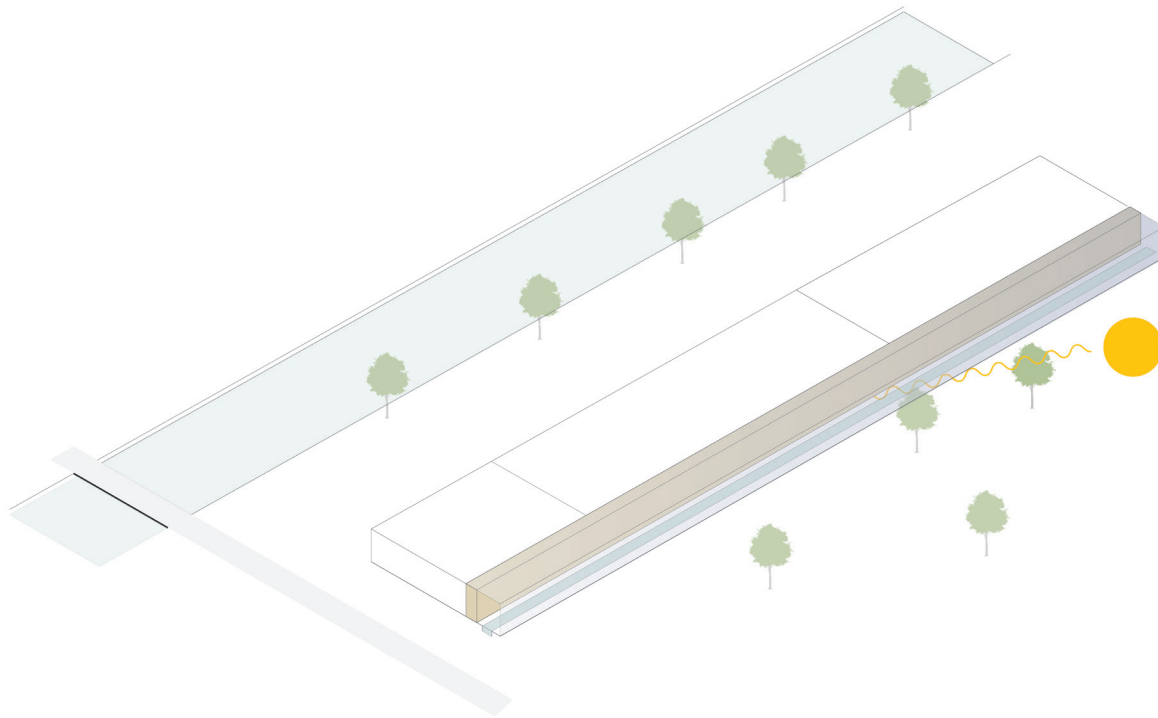


## People



# WALL

Building with wall

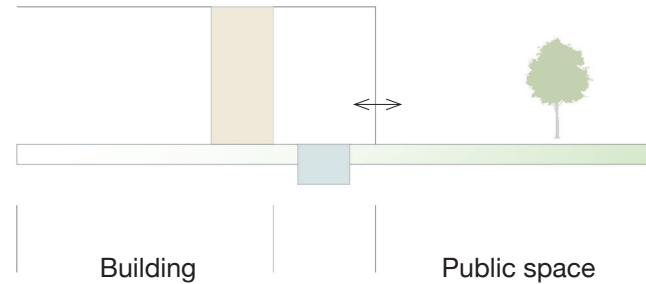
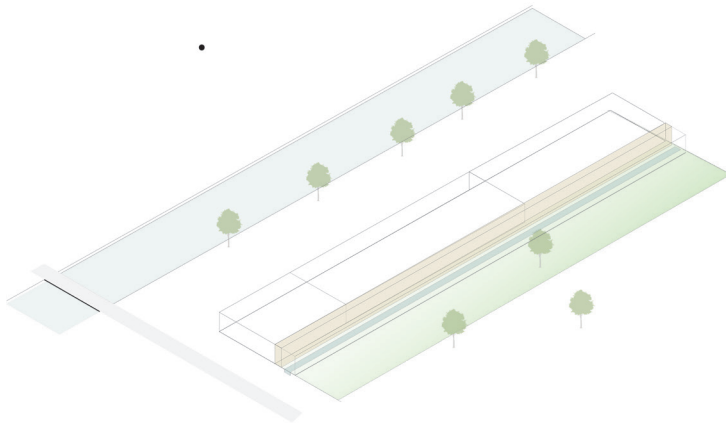






# PUBLIC BUILDING ZONE

Front facade area as serre for the park

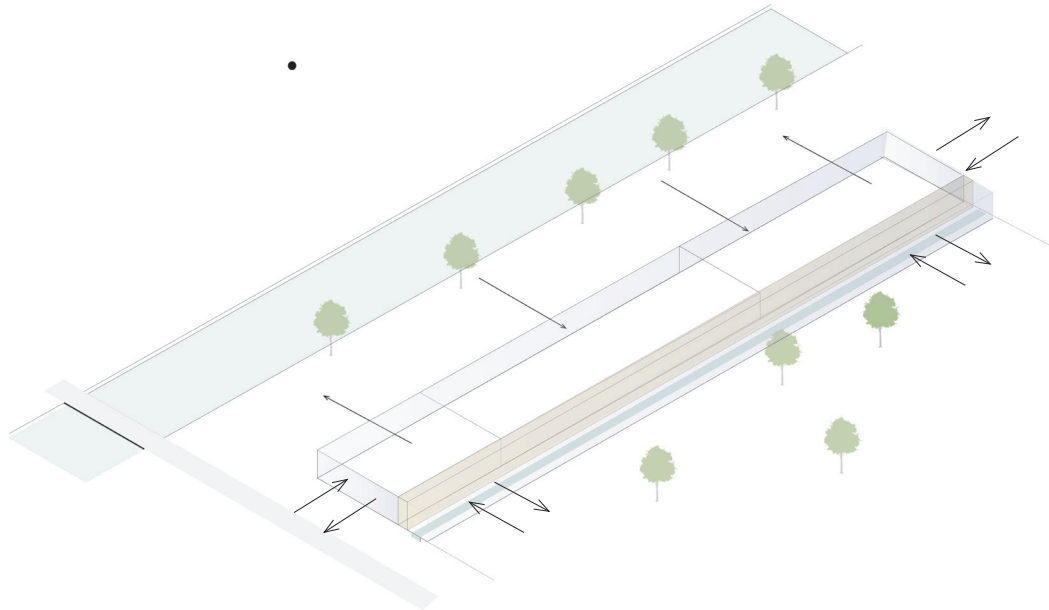


Public zone

*between building and park, a public part of the building as part of the park*

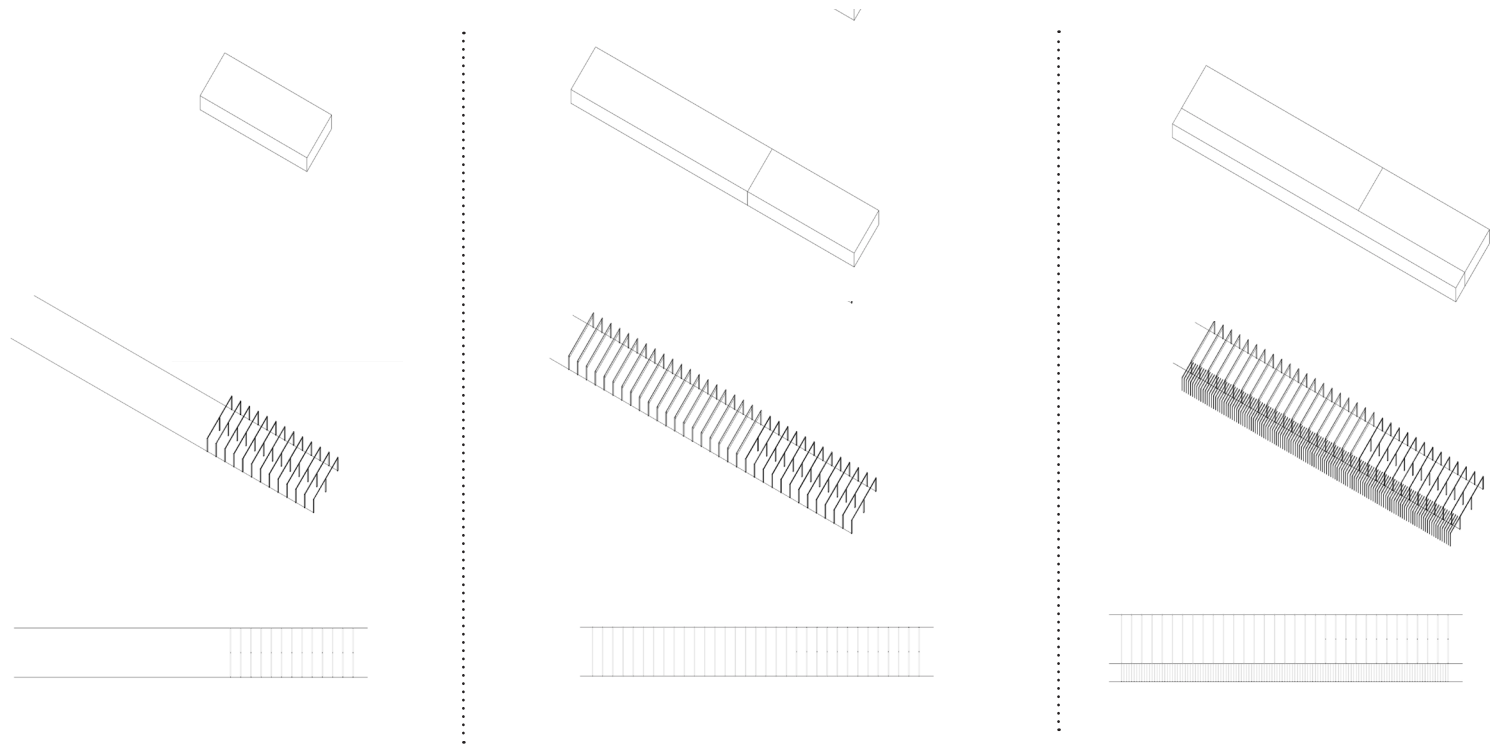
# TRANSPARENCY

Interaction between in and outside



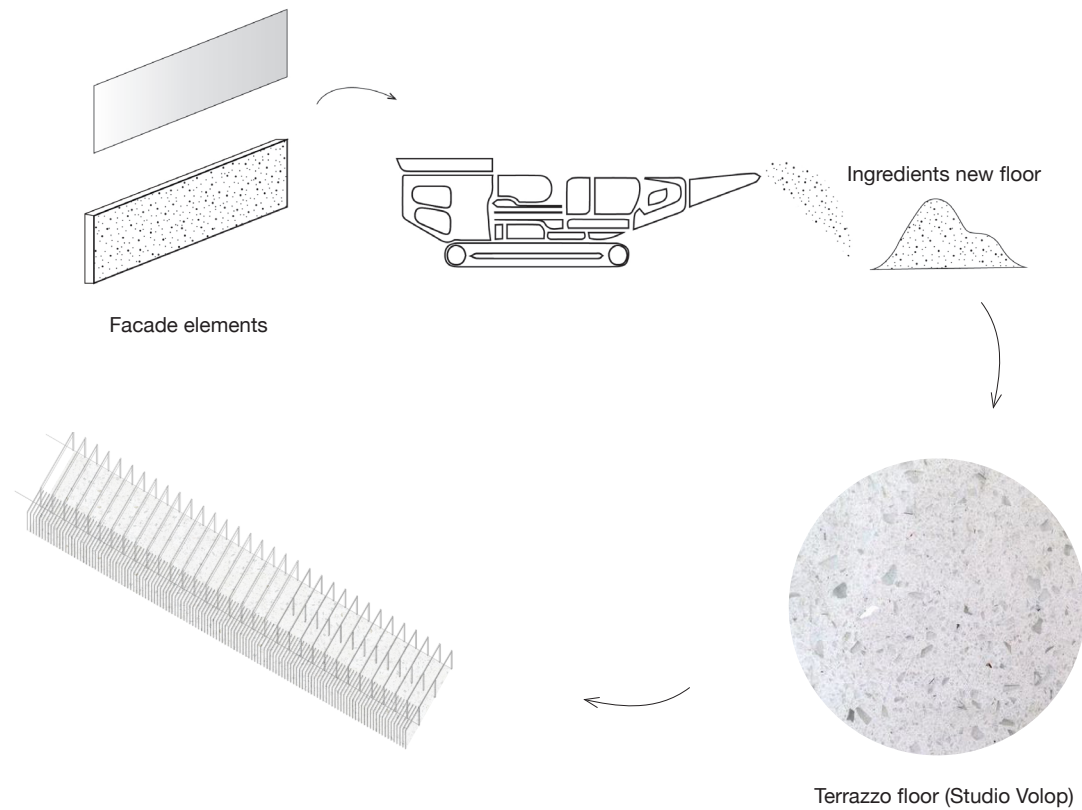
# BUILDING CONSTRUCTION

Making use of and extending the existing structure



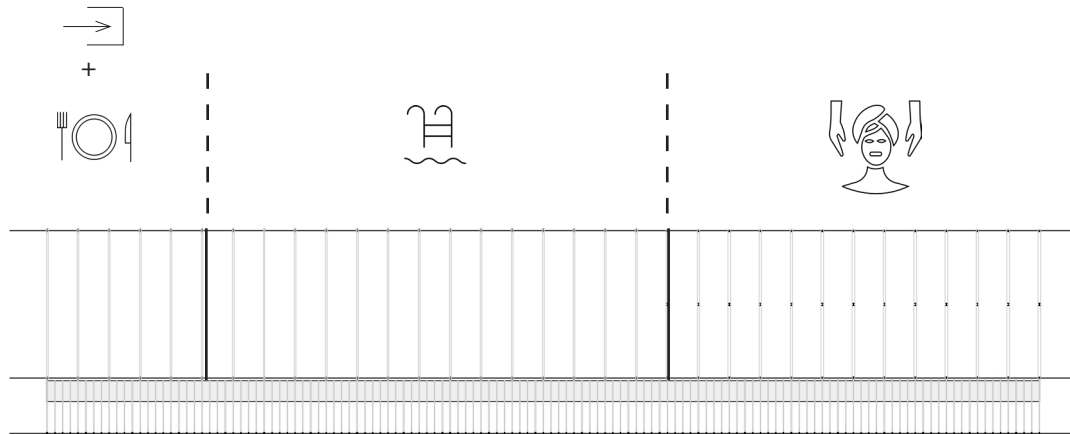
# EXISTING BUILDING

Using facade elements to create a new floor throughout the entire building

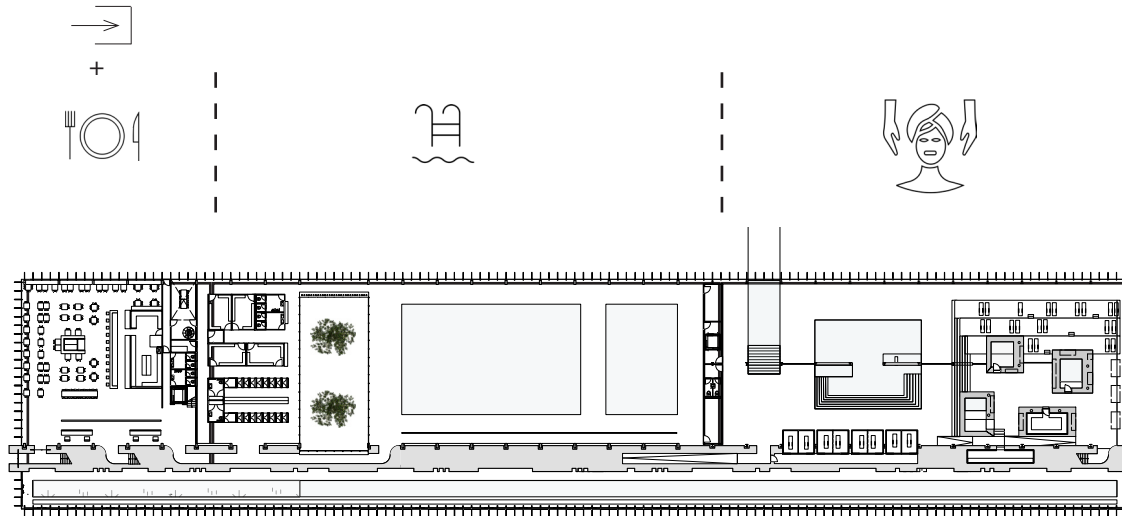


# DIVISION OF SPACE

CLT panels divide the building in three parts



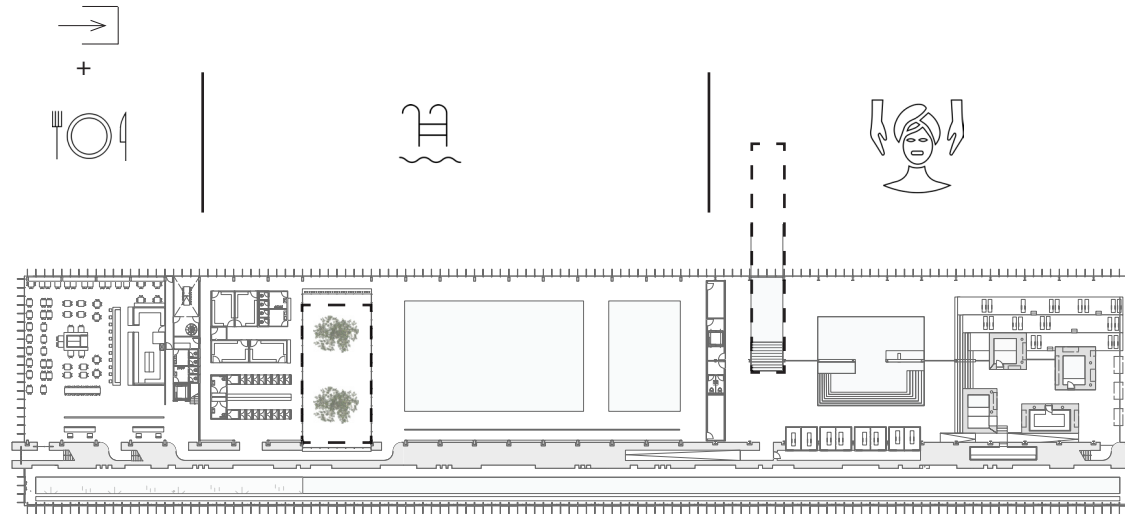
# BUILDING LAYOUT





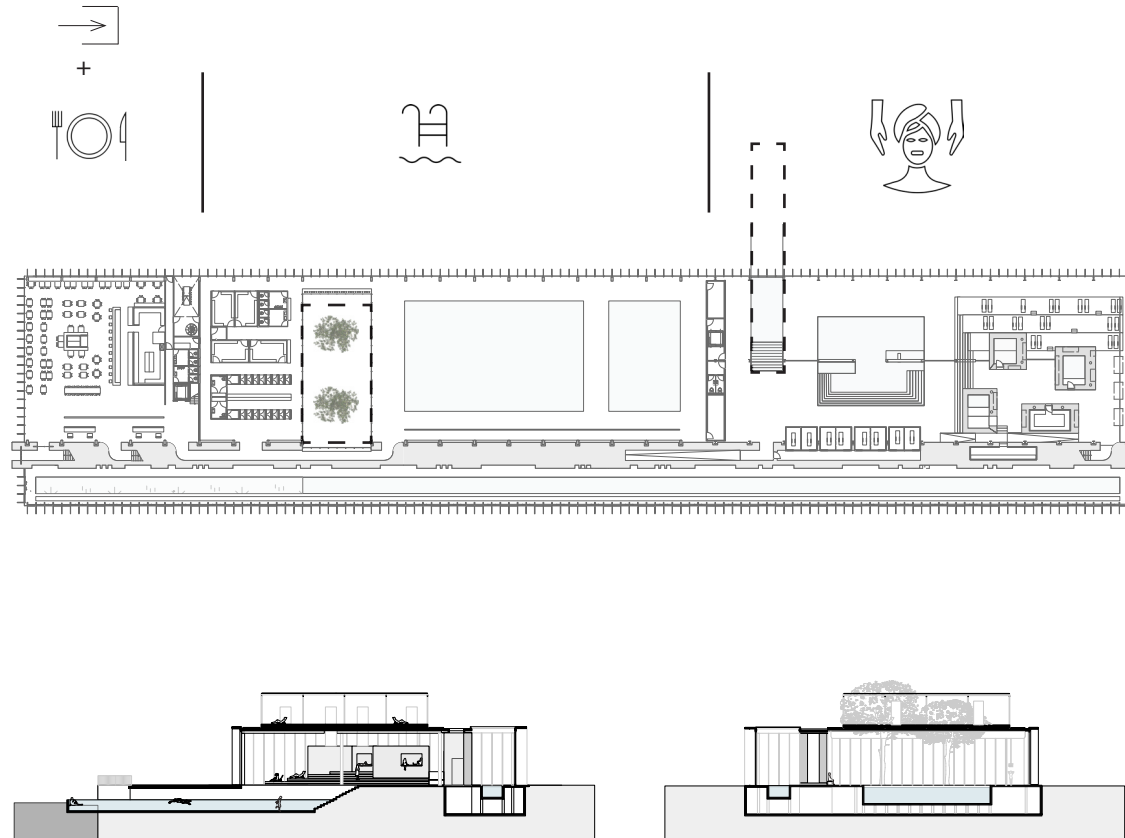
# BUILDING LAYOUT

Within each main function a special intervention takes place



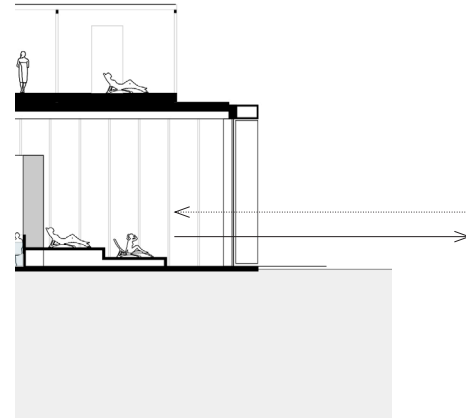
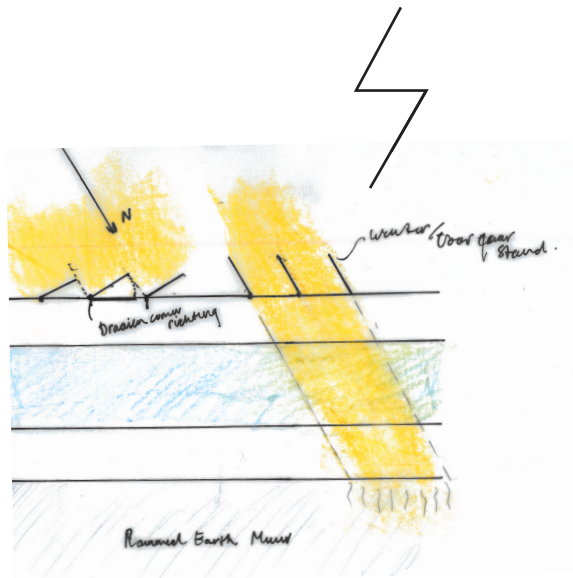
# BUILDING LAYOUT

Within each main function a special intervention takes place



# FACADE

Facade elements that are able to block the Sun on the south facade and collect energy

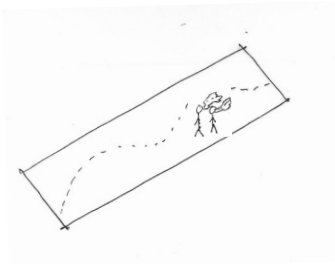




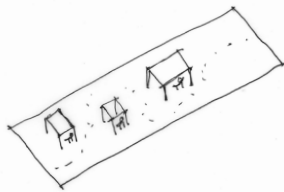
# ROOF CONCEPT

Concept for the roof to include all

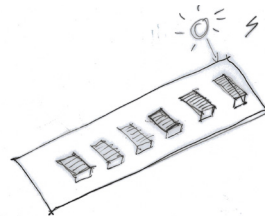
Walking



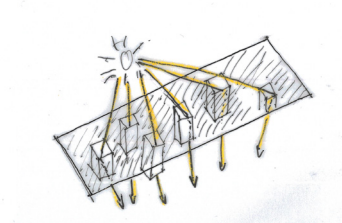
Relaxing  
privacy



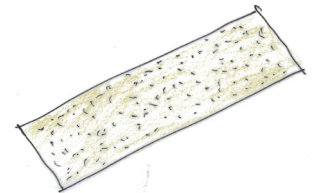
Solar energy



Natural Daylight

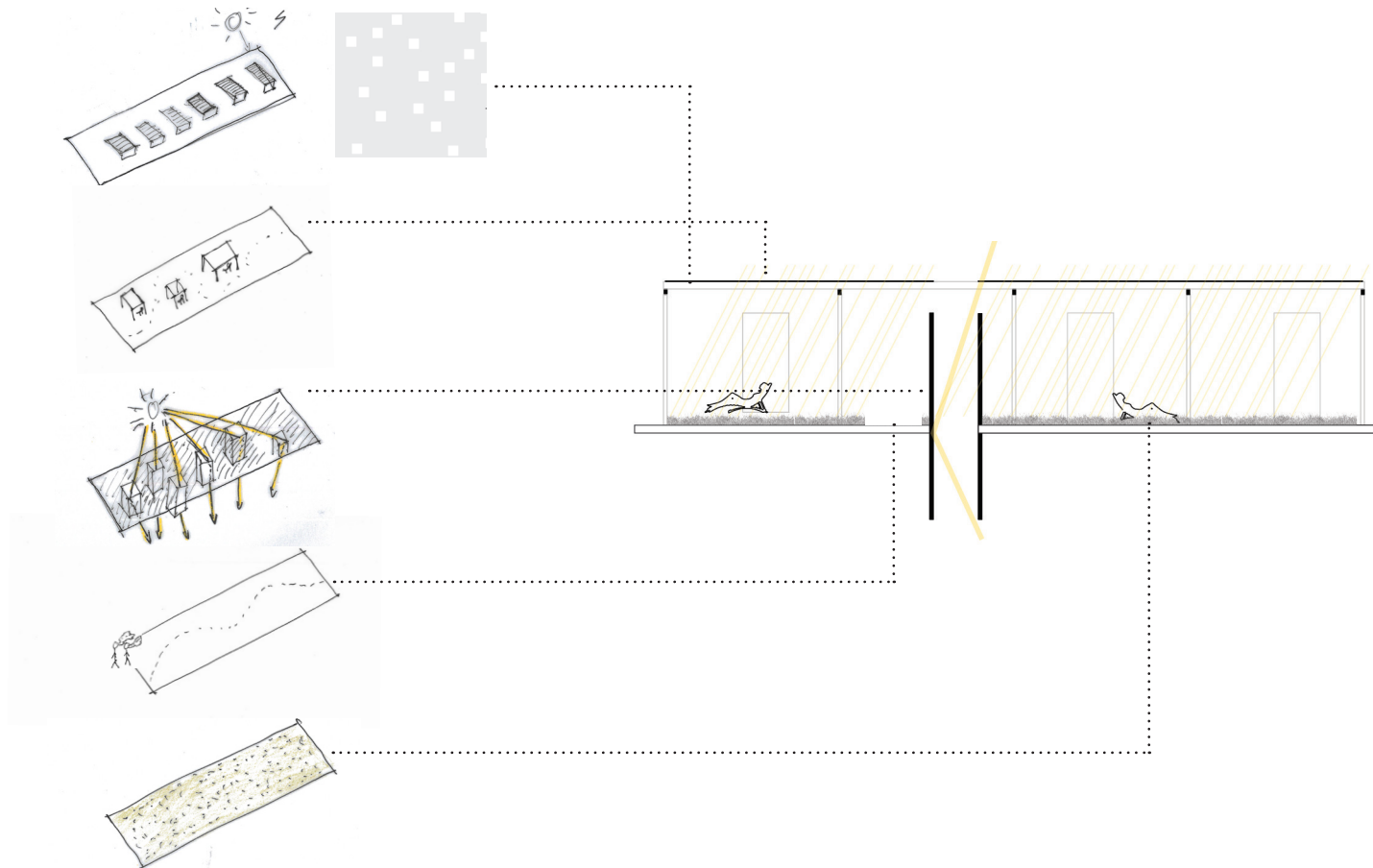


Green roof  
Insulation



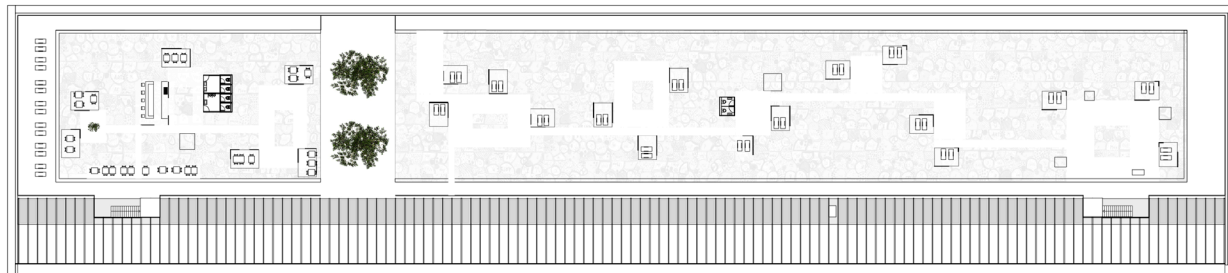
# ROOF CONCEPT

Integrated layers in a new roofscape



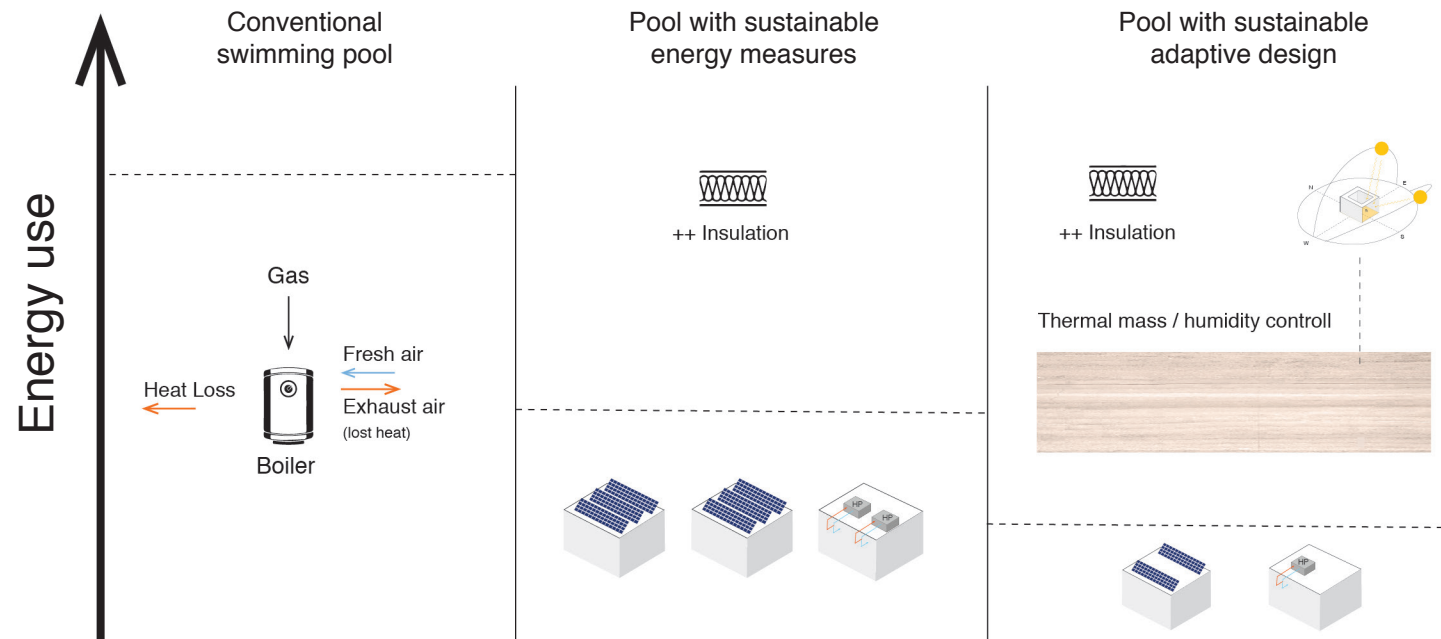
# PLAN ROOFSCAPE

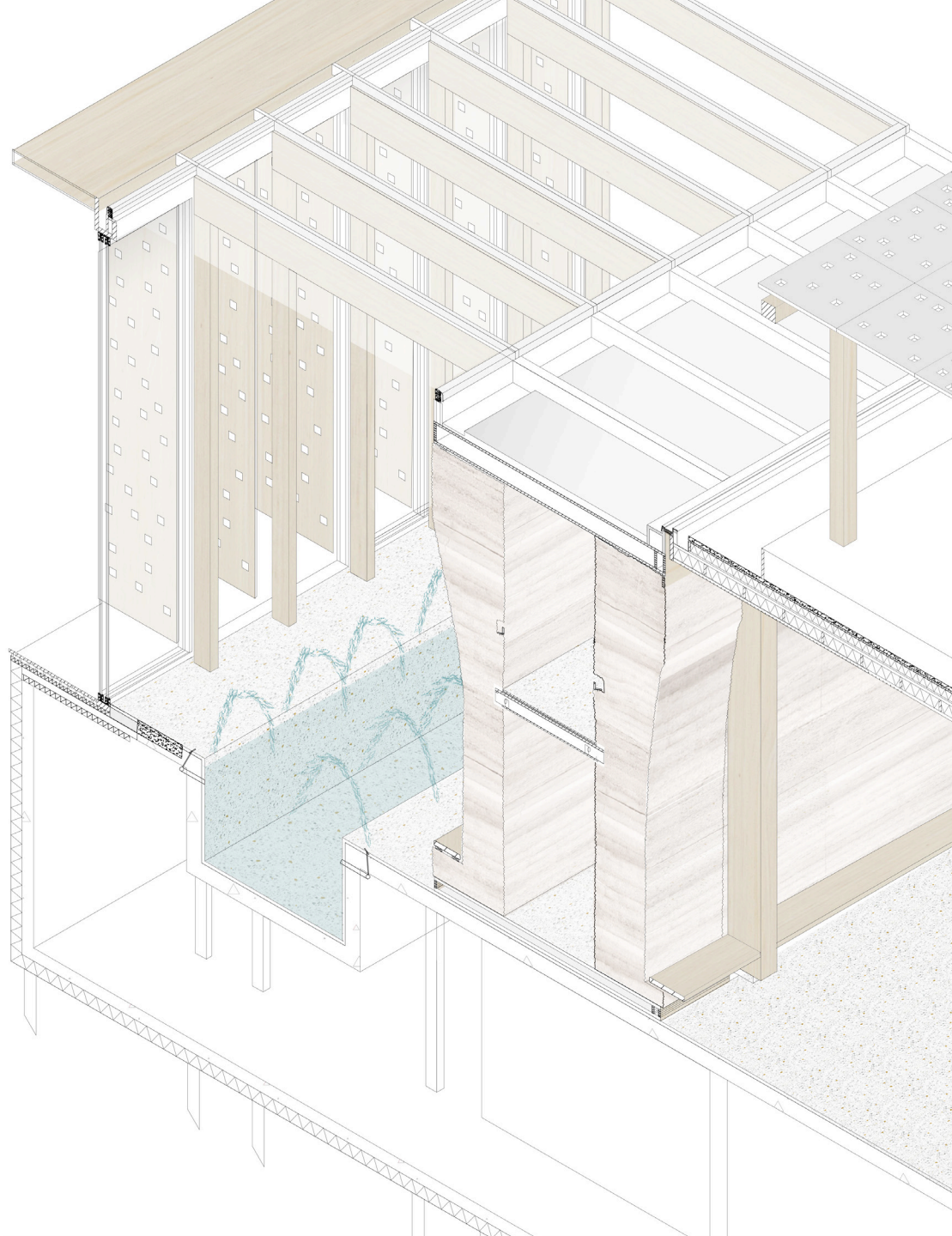
The roofscape consists of a garden with a path, and private areas





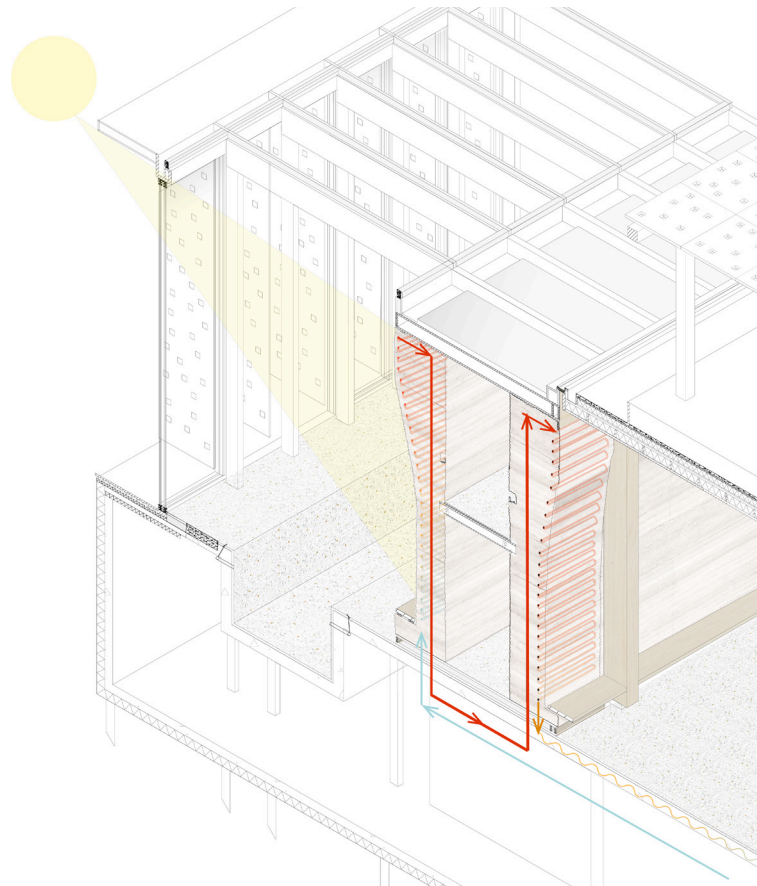
# ADAPTIVE SUSTAINABLE DESIGN





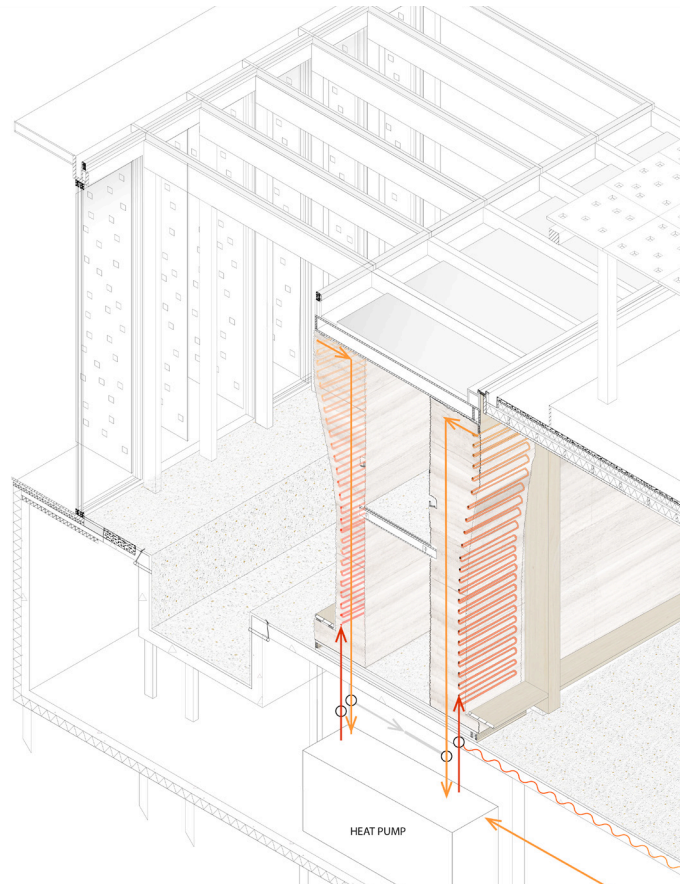
# HEAT TRANSFER

Heat can be transported through the building



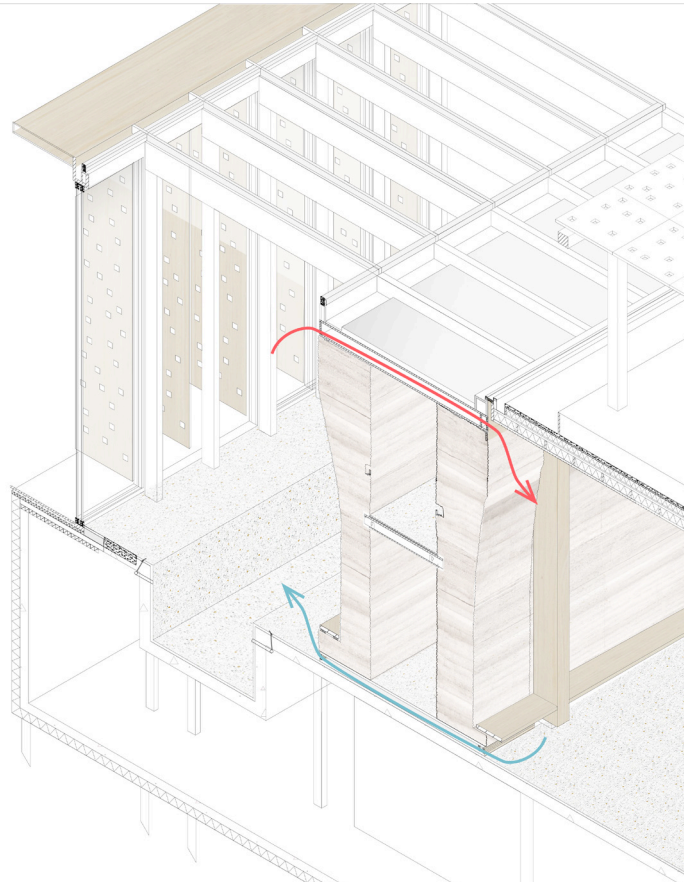
# HEAT TRANSFER

Additional help from heat pump



# VENTILATION

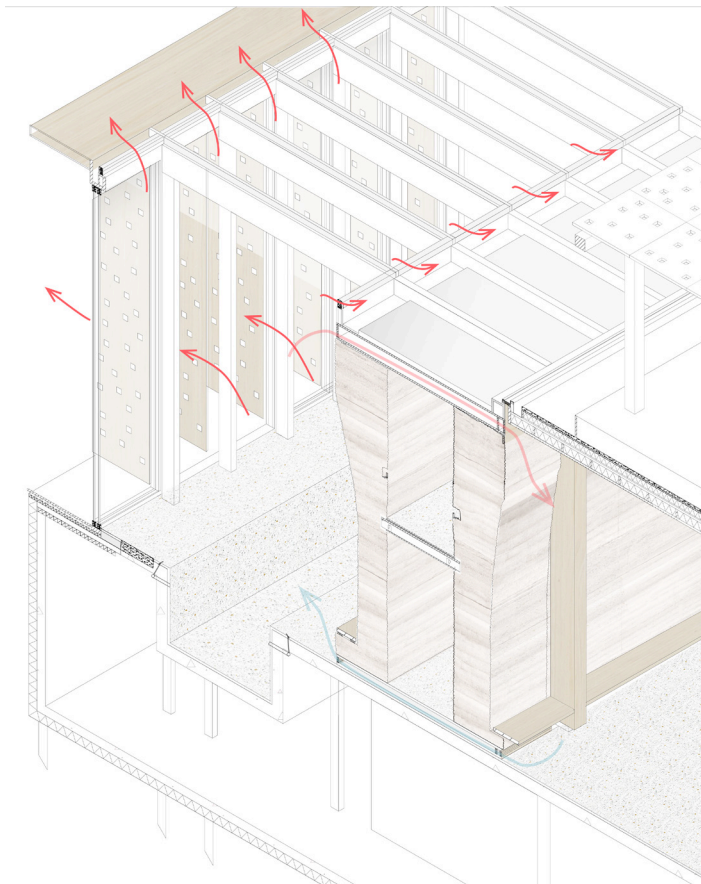
Natural ventilation through wall from serre





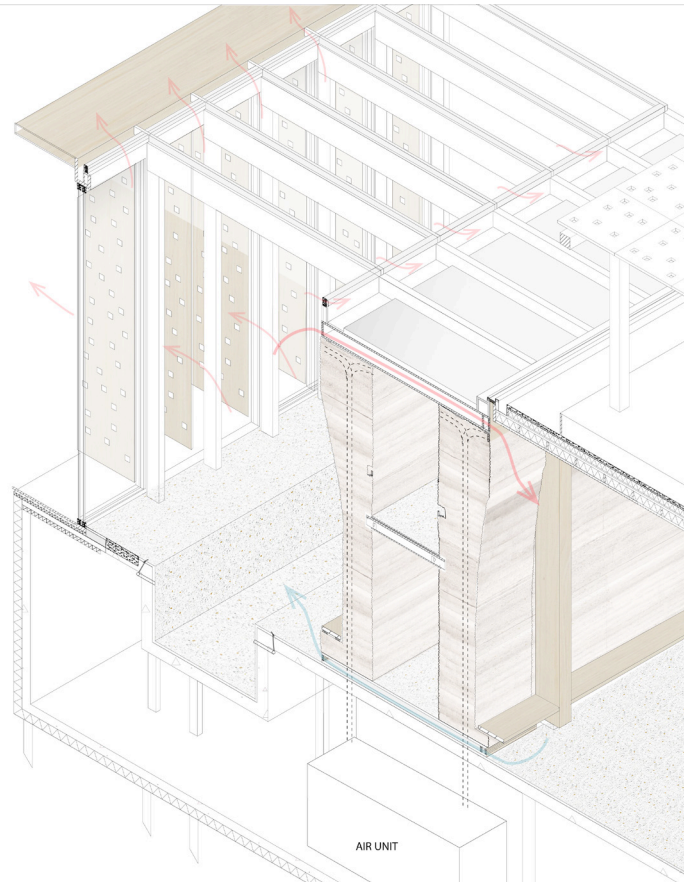
# VENTILATION

Natural ventilation through adjustable openings



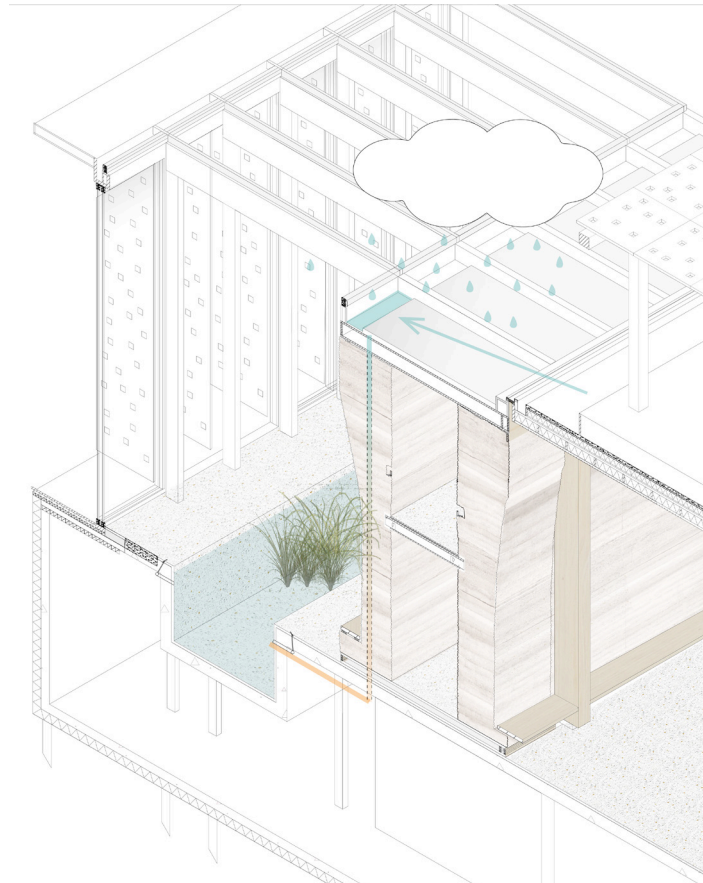
# VENTILATION

Air unit for extra ventilation, situated in wall



# STORM WATER COLLECTION

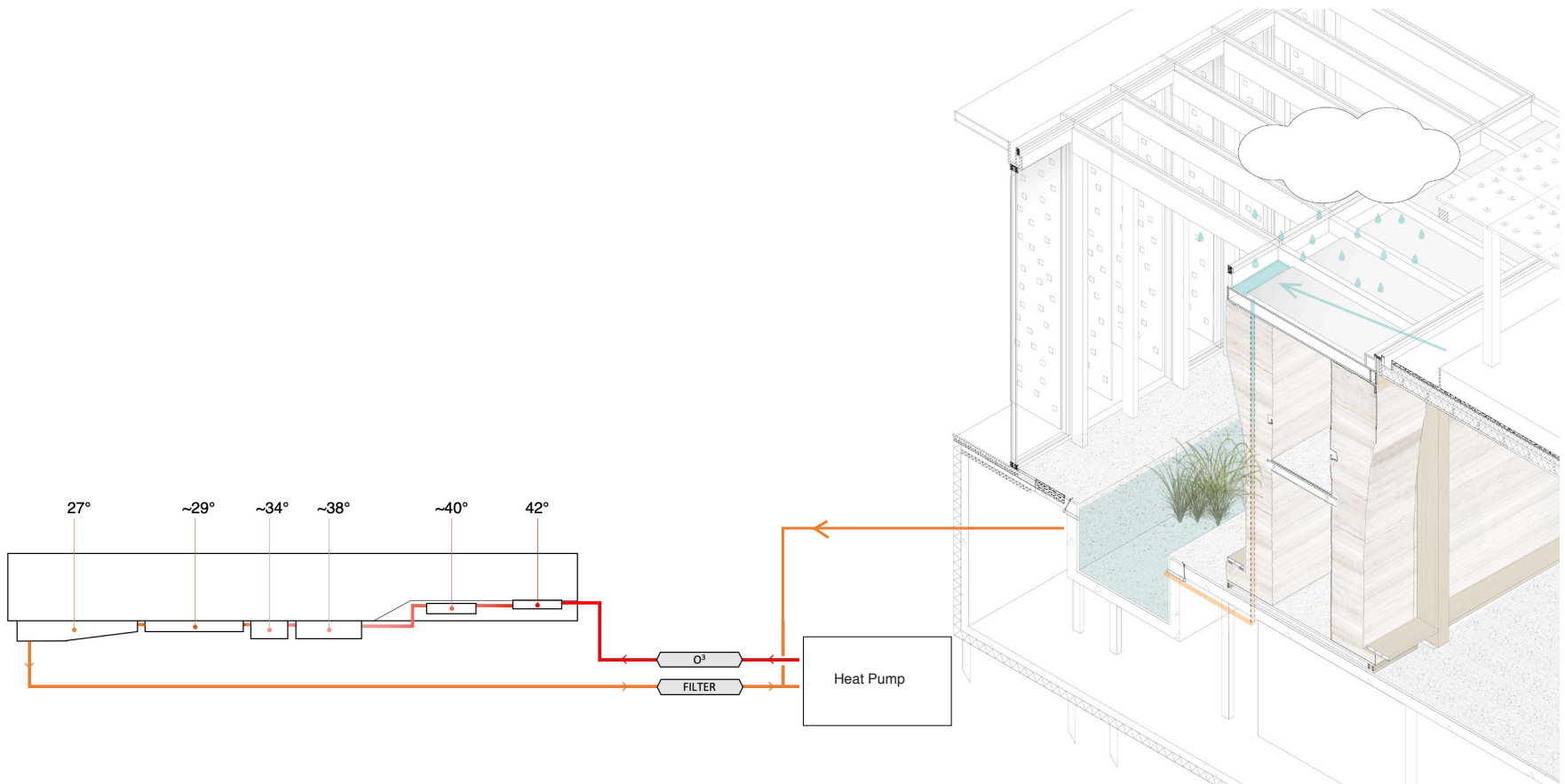
Storm water collection through the wall into the swimming pond / helophyte filter





# POOL WATER SYSTEM

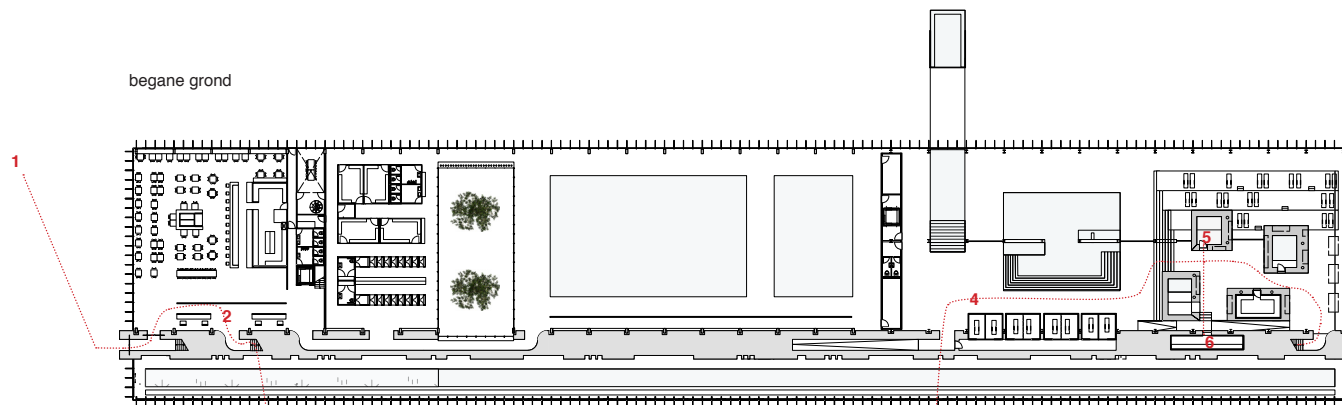
Water flows from hot to lower temperature pools. Additional water from swimming pond



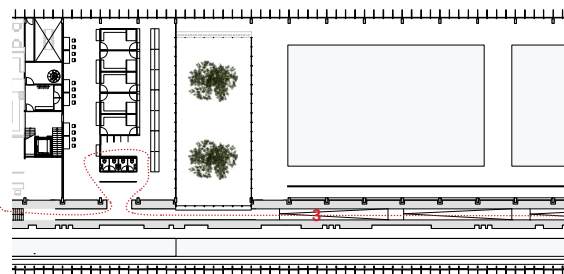


# A VISIT TO THE SPA

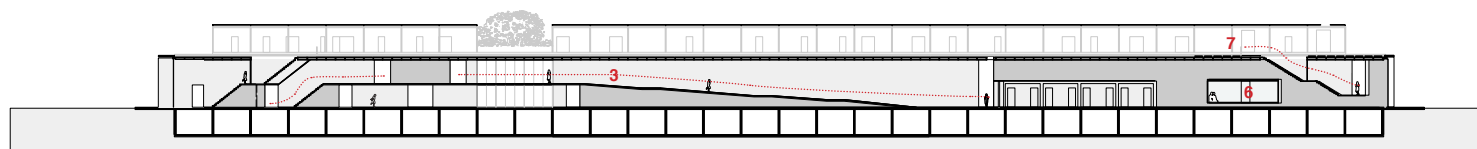
begane grond



1e verdieping



Doorsede muur































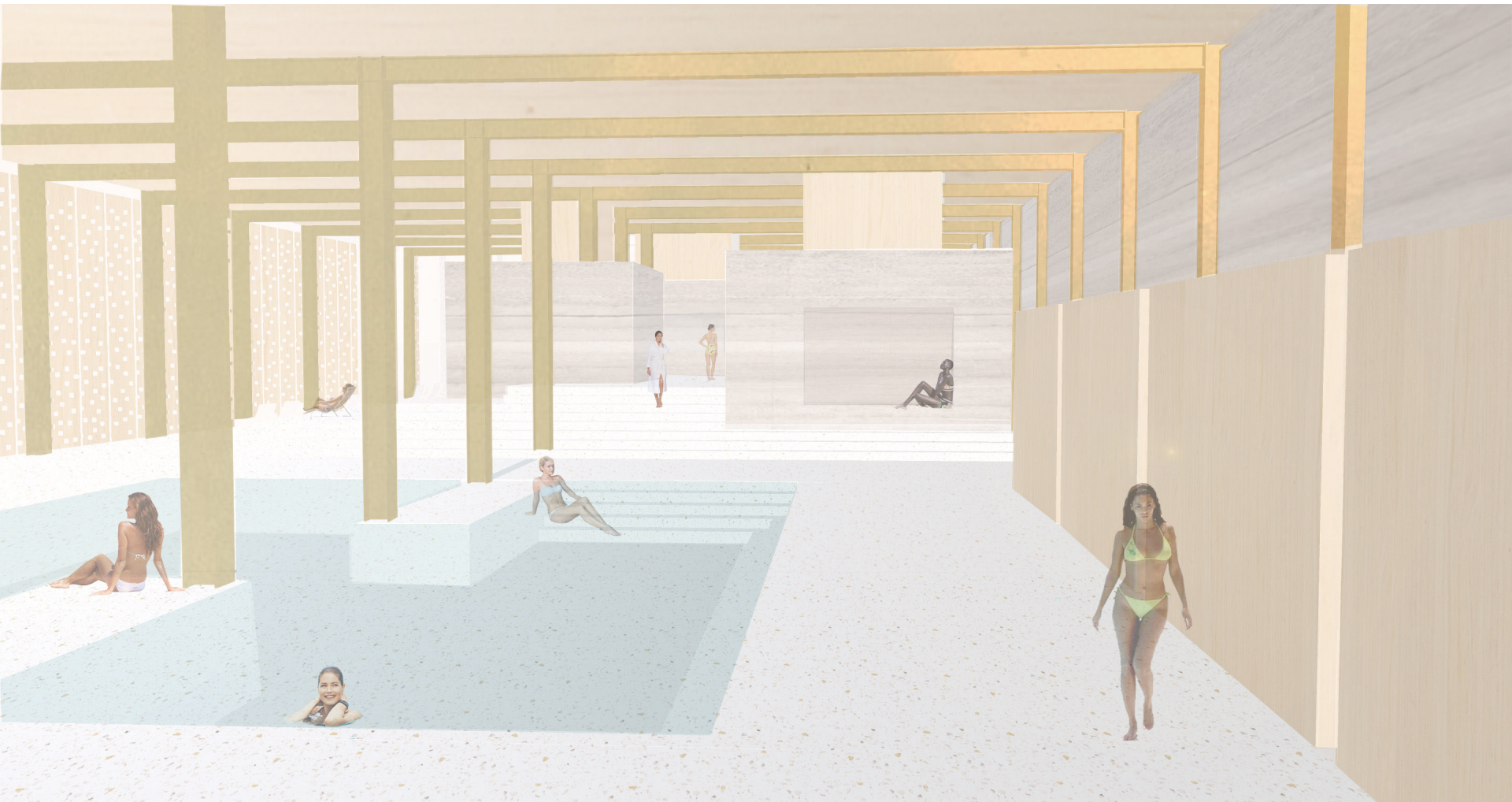


















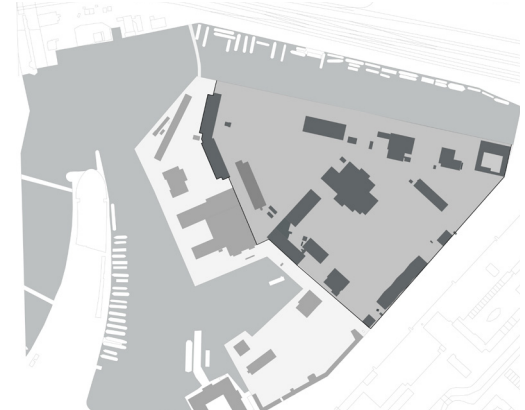
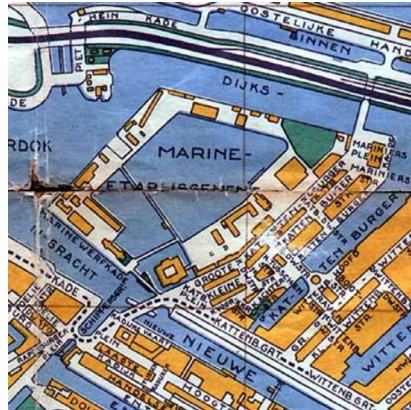
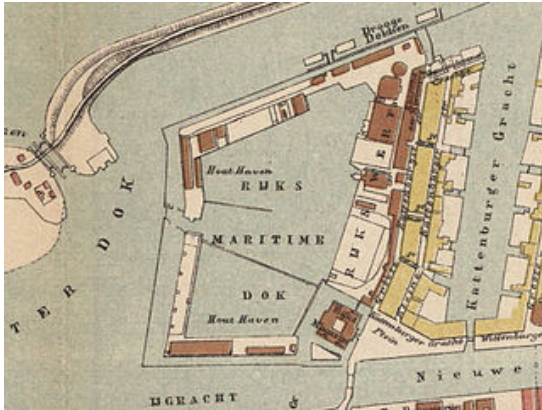








# IDENTITY



Navy since 1655, still present  
Closed off and peaceful area



Foto: Eddo Hartmann

# VISION OF THE AREA

A search for buildings that can both be used by the military and the public

- Statement from the ministry-

Ambition - municipality

Detailed analysis by urban dynamics

*Verkenning marineterrein*

INNOVATION



FLEXIBLE WORKSPACE



HOUSING



SPORT



RECREATION



GREENERY



Sport



Movement



Playing

# USERS

