

Grow
Houthaven

Carl Matthew Senarta | 5867363

AR3AO10 Architectural Wood Design Studio



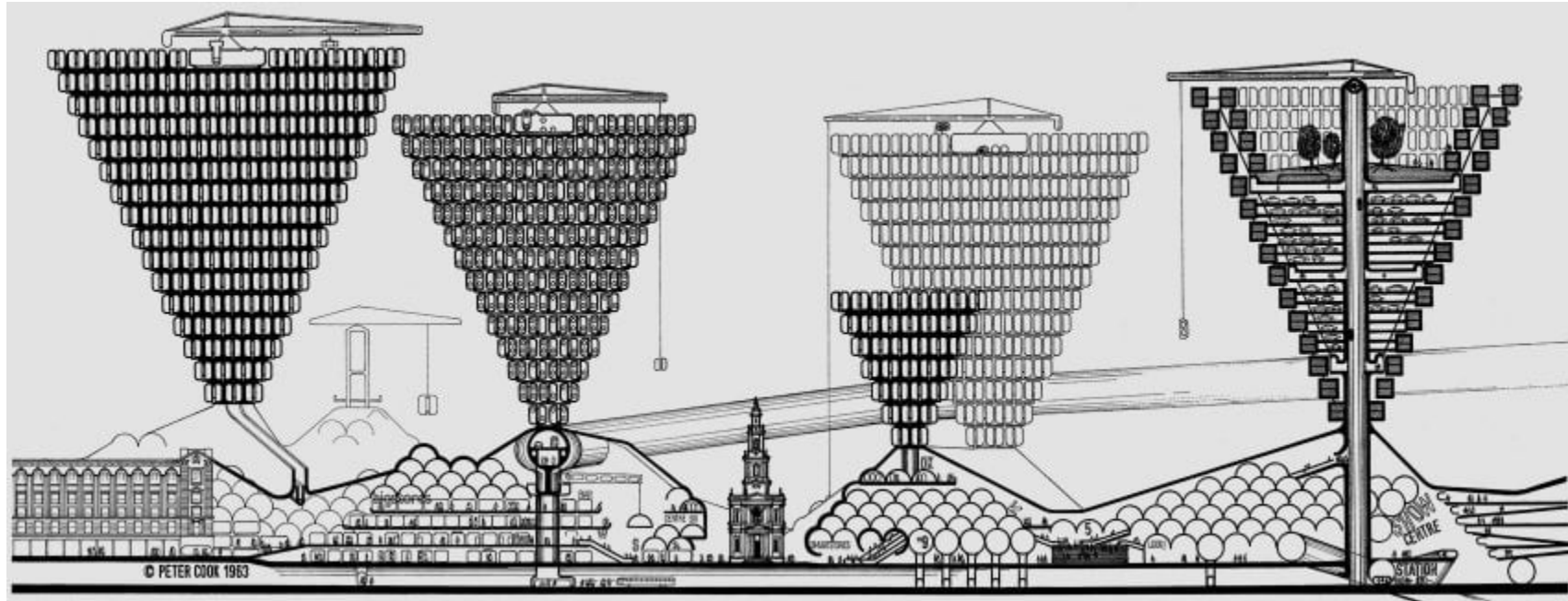
Studio if+, Würzburg Hubland

Adaptive timber construction systems

How a dwelling can **grow** alongside its inhabitants

A “Living” System

How does this translate into the scale of our cities?



Peter Cook's Plug-in City

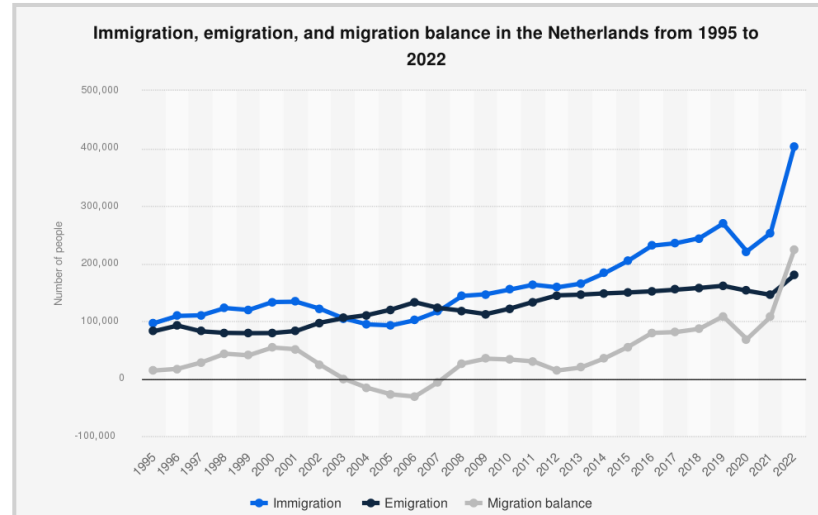
The usage of cranes to relocate its residents to neighbourhoods fitted with non-residential infrastructure best suited to their various demographic needs

What do people need and when do they need it?

Challenges and Changes surrounding Amsterdam



Housing Shortage
Growing population
results in a high demand
for urban dwellings



**Unpredictability in
Demographic Demands**
Exponential increase in
immigration



Ageing Population
Low birthrates and
higher life expectancy



With this increase in uncertainty in **demographic changes**, there is a need for architecture that can keep up and meet its demands

How does this translate into adaptability in both the urban and building scale?

How can the limited space within cities be maximised?

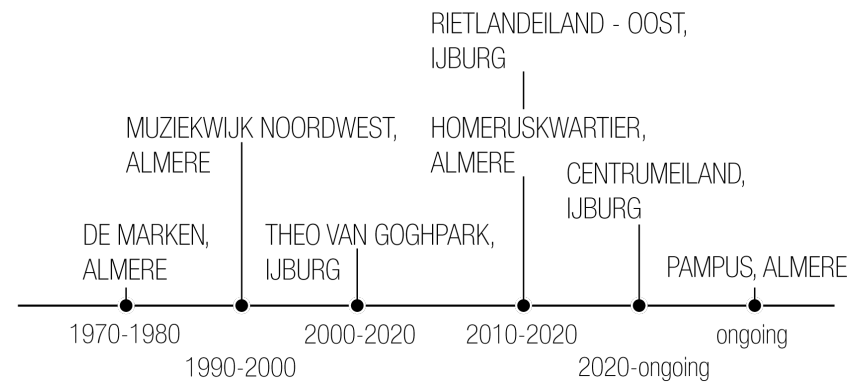


Case Studies Analysis

When should non-residential infrastructure be introduced?

How are different functions prioritised?

What are the strategies for adaptability undertaken?



Non-residential Infrastructure Age Overview

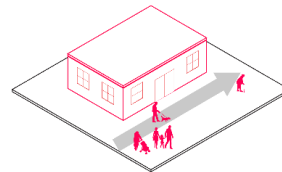


Key Findings

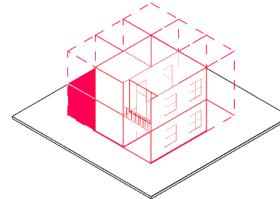
Triggers/Catalysts

Building Scale Strategies

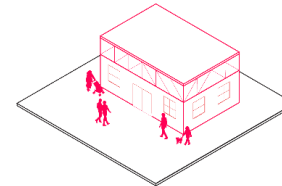
Urban Scale Strategies



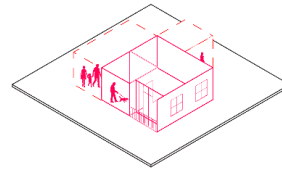
Ageing Demographic



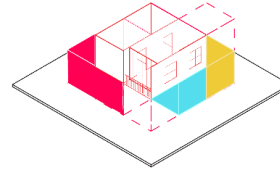
Adaptive Housing Types



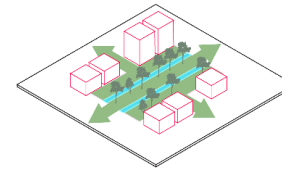
High traffic infrastructure



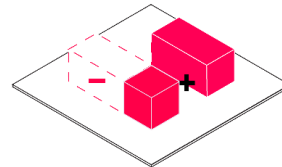
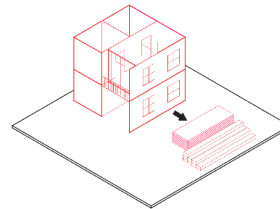
Changing family composition



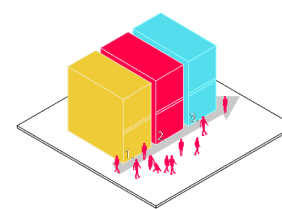
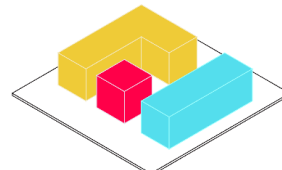
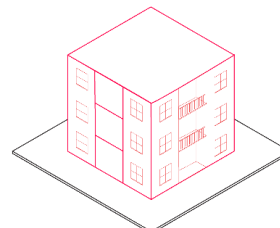
Mixed Functions



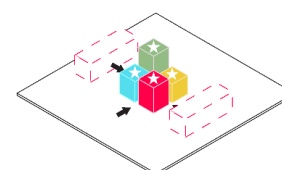
Green Corridor Network

Changing Neighbourhood Population Size:
Growing/Shrinking

Demountable Construction

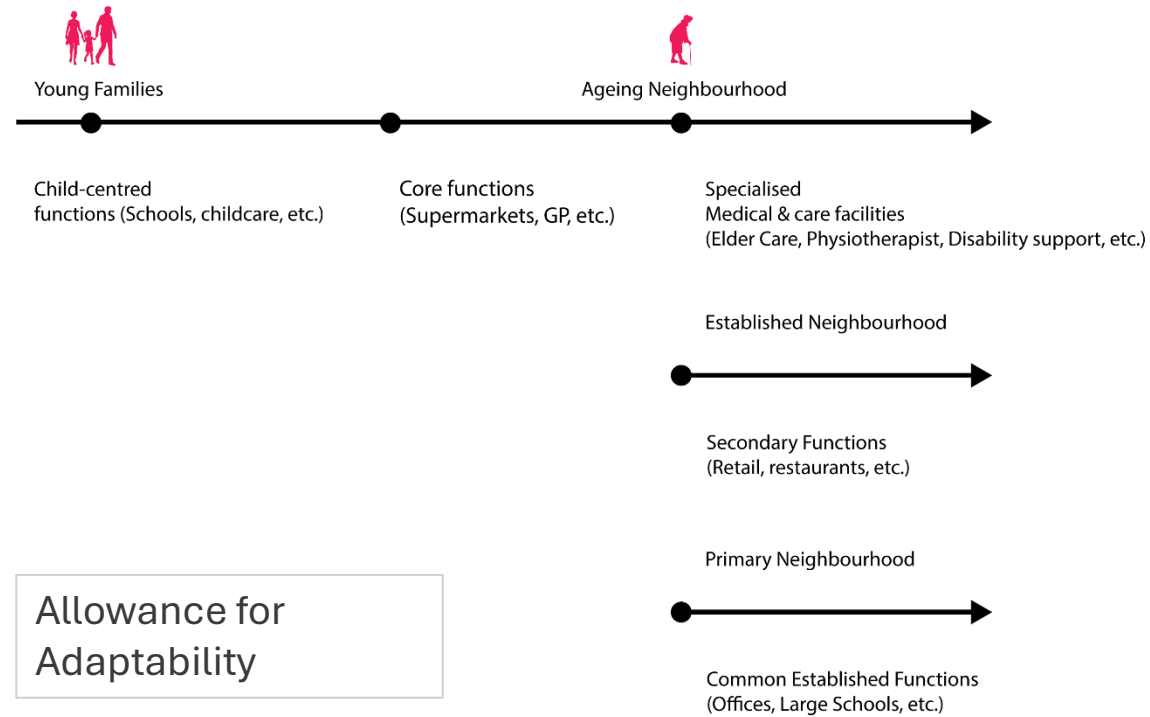
Introducing Infrastructure Based on Frequency of
Use:Change in Surrounding Neighbourhood
Development/Expansion/Change in Function

Low Cost Construction

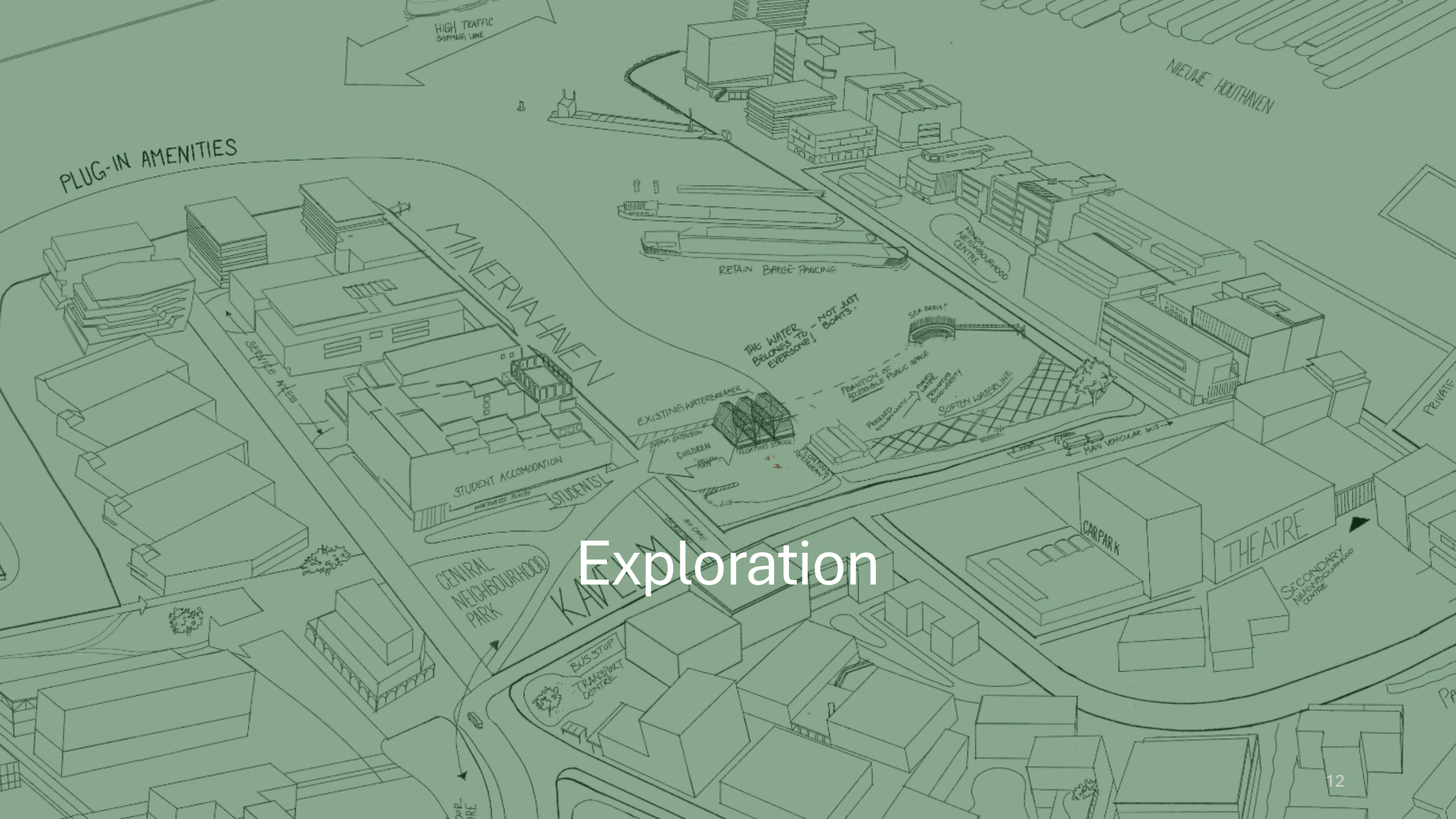


Strong Core Attractive Functions

Design Considerations



Progression of priority in non-residential infrastructure



Exploration



Houthaven,
Amsterdam



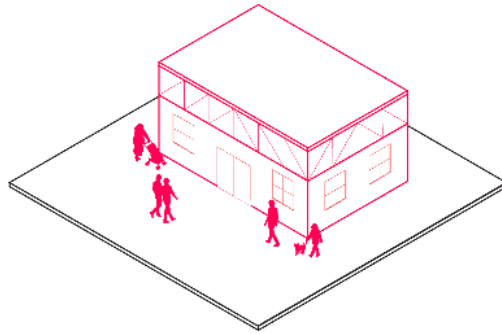
Non-Residential Infrastructure

8 x Primary Schools
2 x Secondary Schools
2 x Elderly Centre

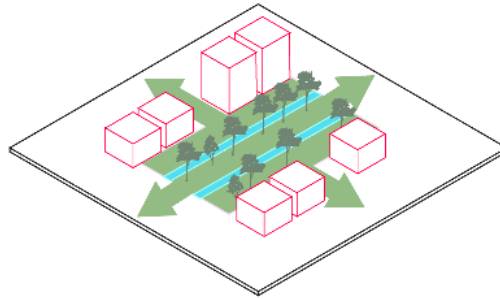
Houthaven,
Amsterdam

11,620 Dwellings by
2040

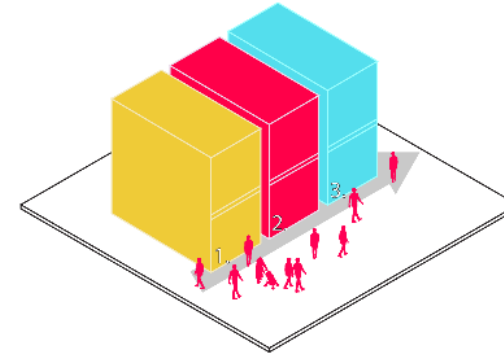
Urban Considerations



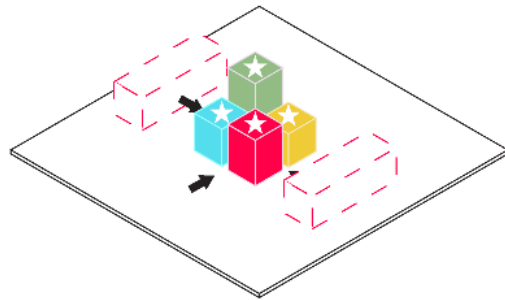
High traffic infrastructure



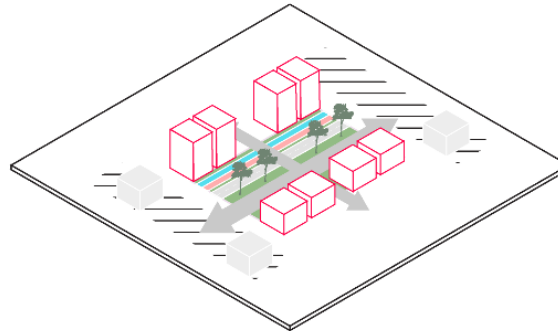
Green Corridor Network



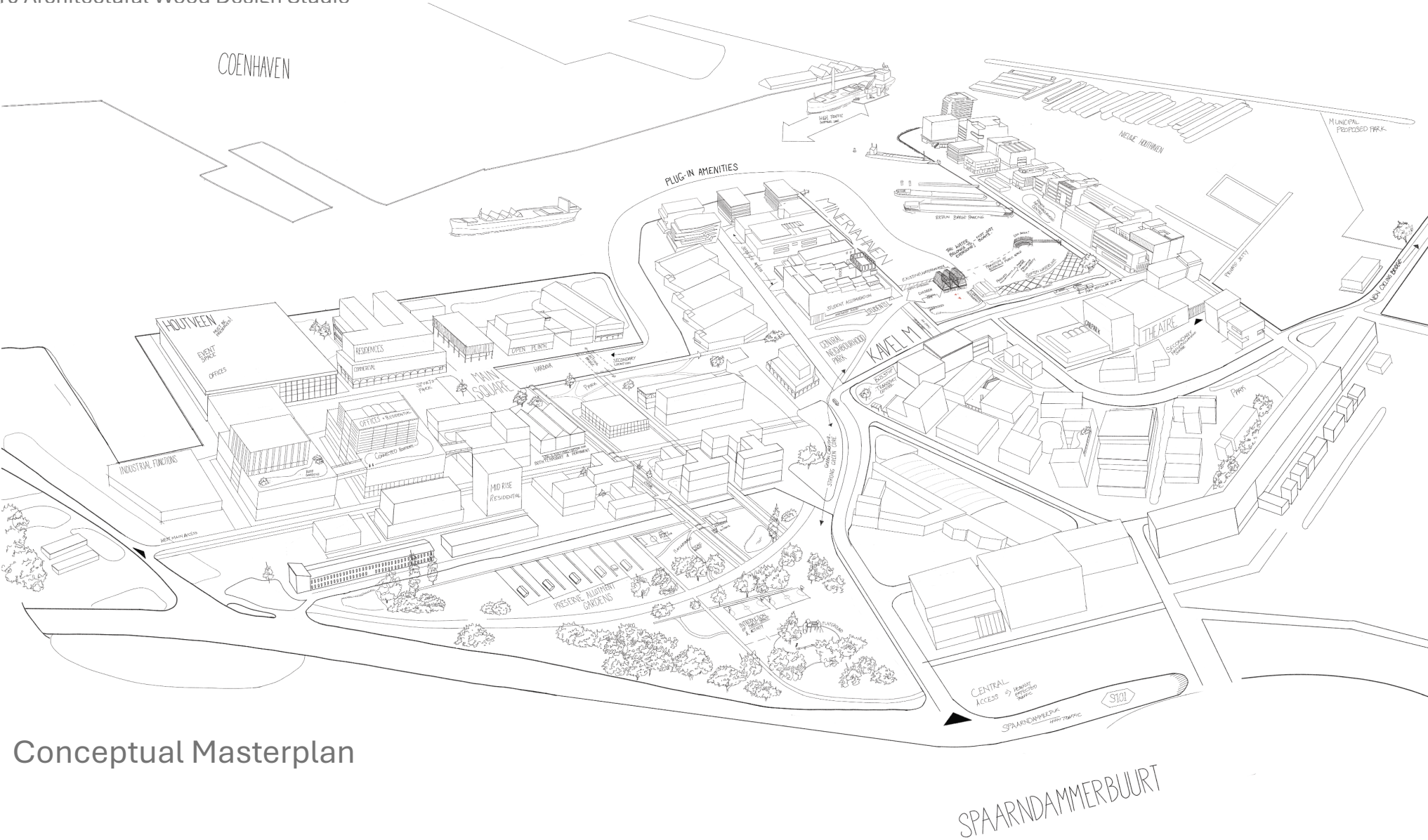
Introducing Infrastructure Based on Frequency of Use:



Strong Core Attractive Functions

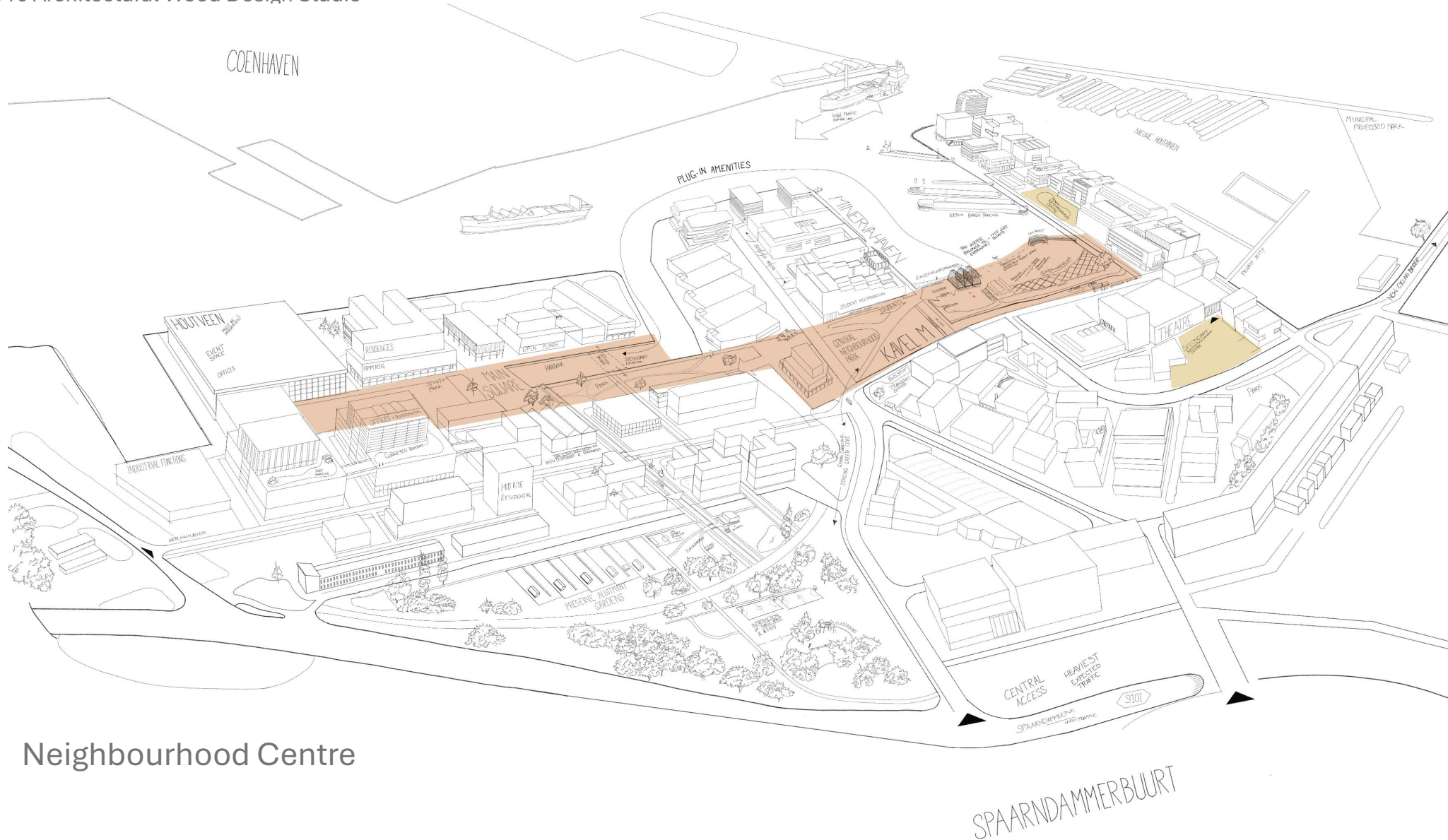


Transport Infrastructure:



Conceptual Masterplan

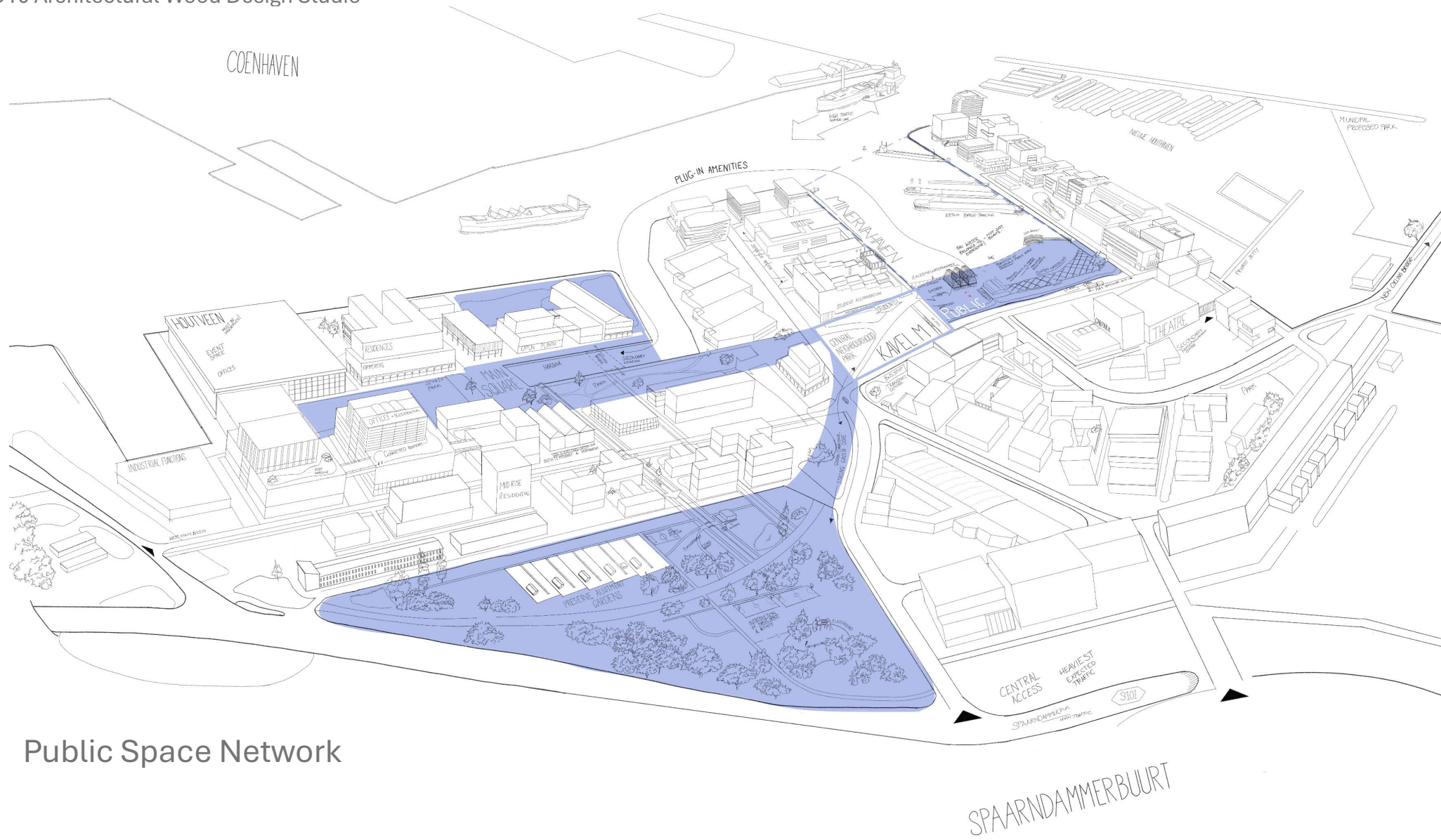




Neighbourhood Centre







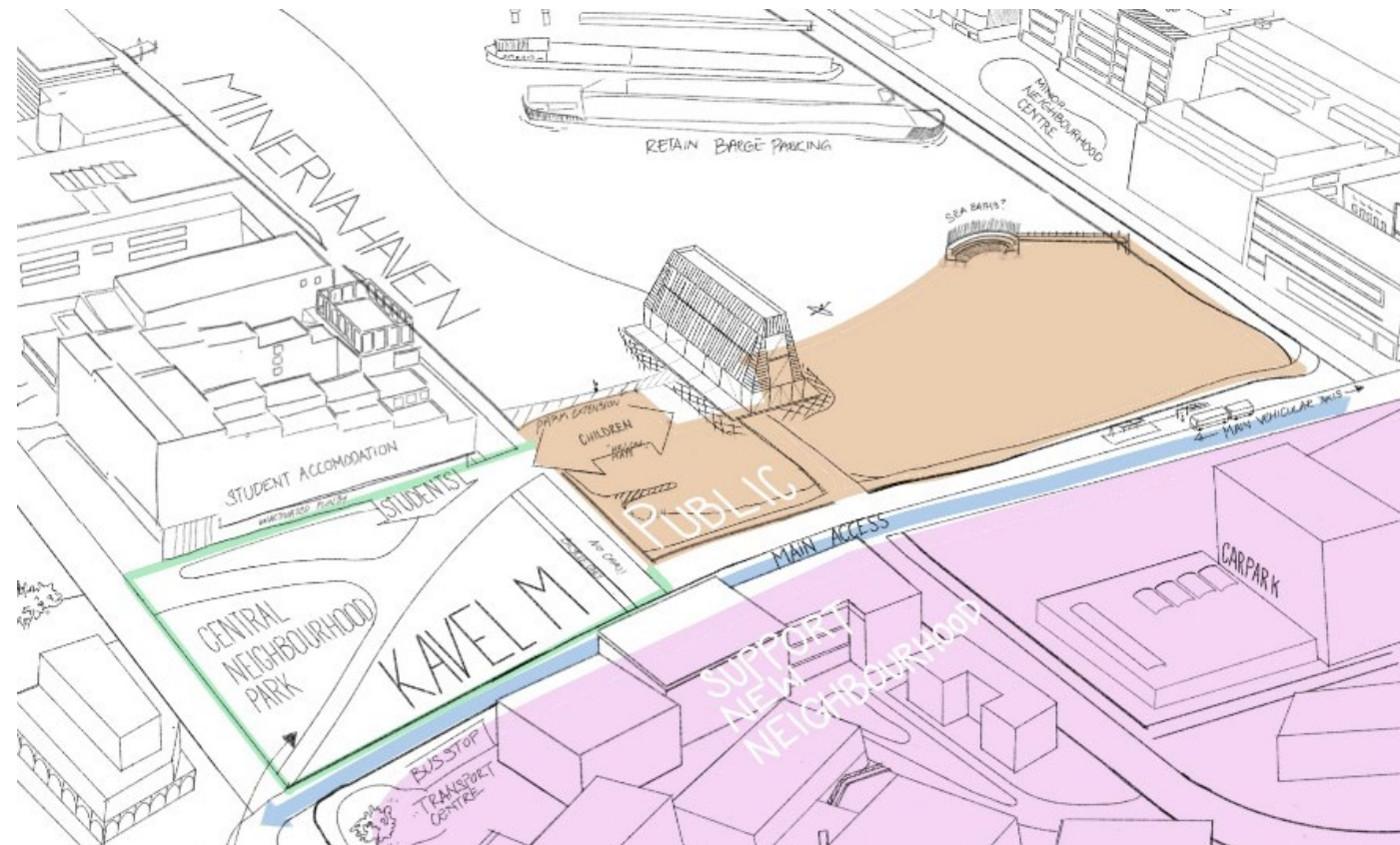
Public Space Network

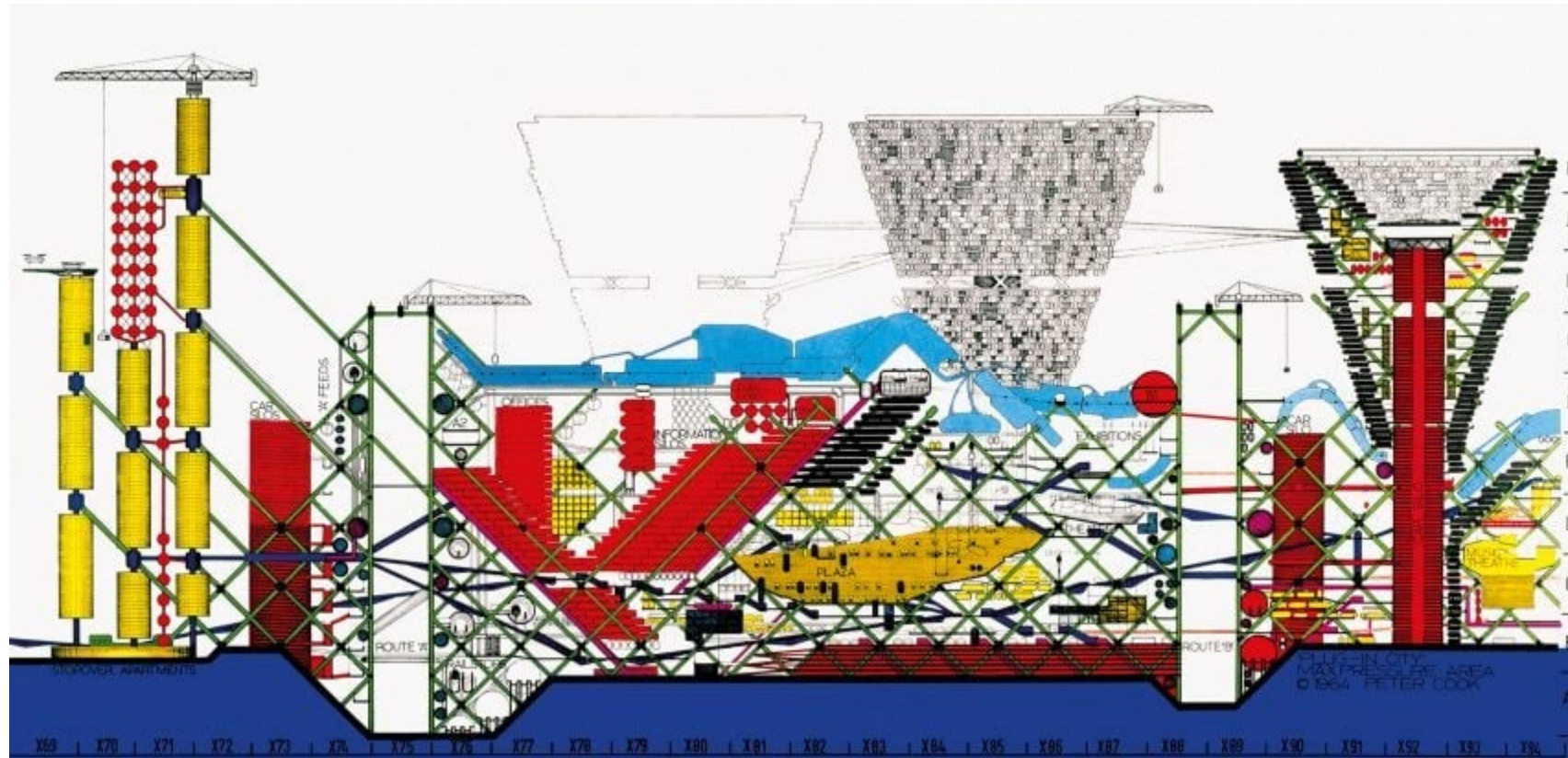


“The Water is Public and Should belong to Everyone”

Primary Location

1. Creation of **Public space** within the water
2. Encourage **activity** in Kavel M
3. Connects and strengthens the **new green network**
4. Supports the development of the **new neighbourhood** (phase 1)





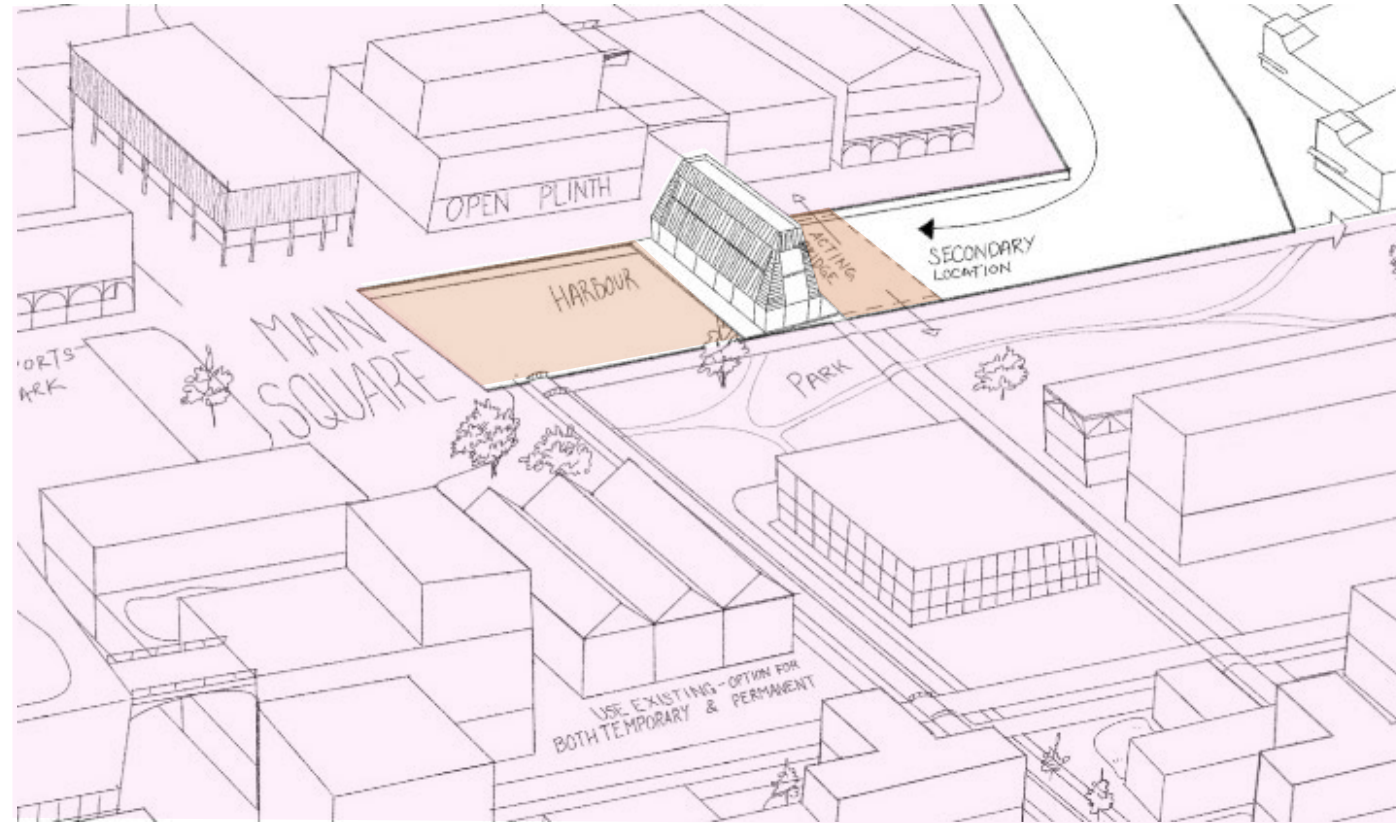
Peter Cook's Plug-in City

Can we make use of Houthaven's water in place of the plug-in city's cranes?

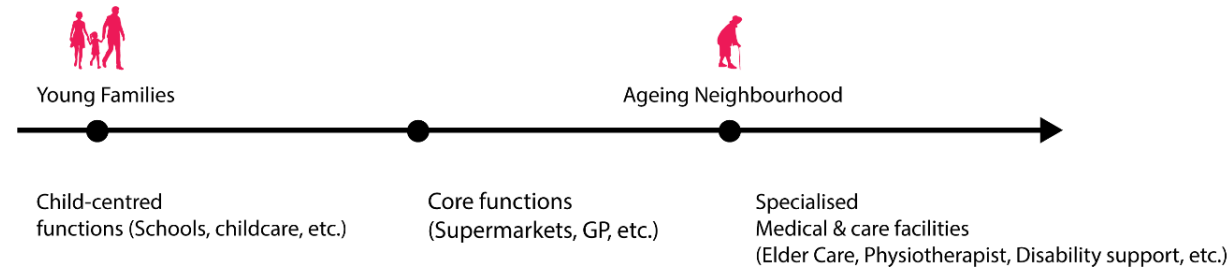


Secondary Location

1. Creation of **Public space** within the water through **bridging** both ends of the new canal
2. Support the development of the **new neighbourhood** (phase 2)



Function & Target Groups

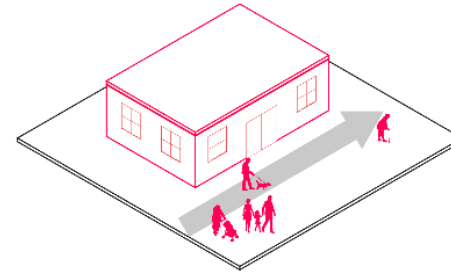


Progression of priority in non-residential infrastructure in Starter Neighbourhoods

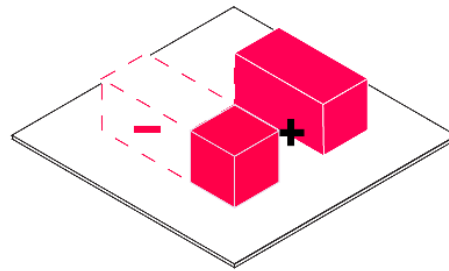
Within Houthaven the initial target group will be **young families** followed by **the elderly**

Therefore, the non-residential infrastructure will cater to the respective groups, through the transition from **child-centred** infrastructure to **medical and care facilities**

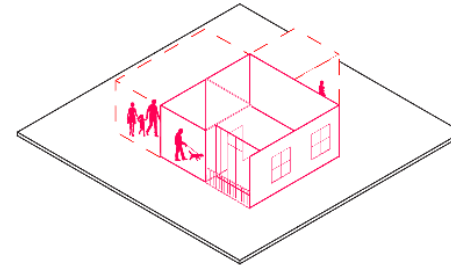
But how can our architecture support and adapt to these changing functions and target groups?



Ageing Demographic



Changing Neighbourhood Population Size:
Growing/Shrinking



Changing family composition

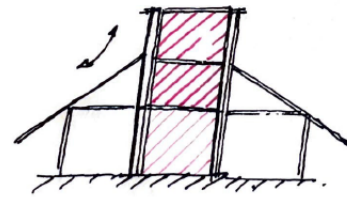
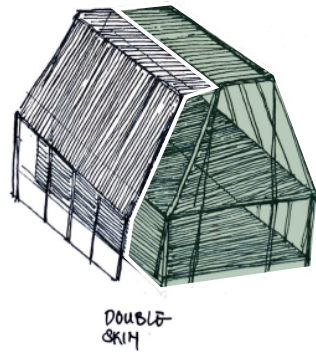
Size & Composition



Expanding structure



Modular components



SEPARATE
THE FACADE FROM
THE STRUCTURE.

ADDITIONAL SPACE ALONG THE PERIMETRY.

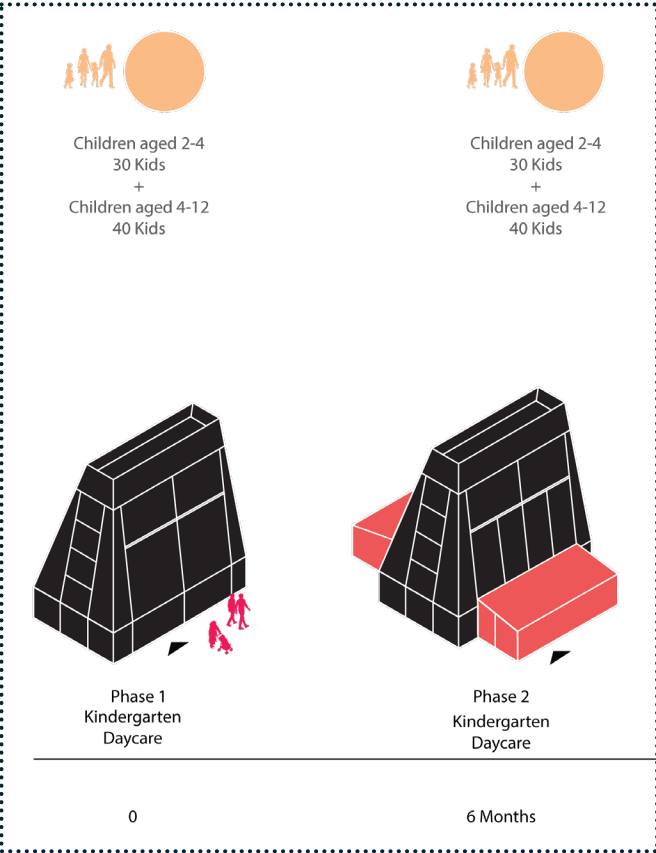
Correlation between the degree of adaptability and the frequency of adaptability

Fixed Interior cell

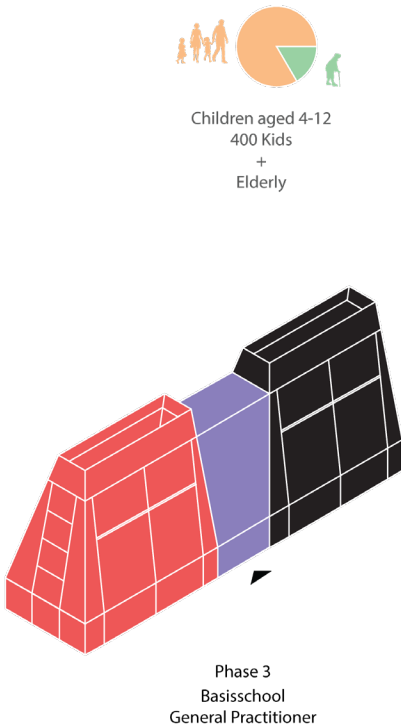
Separation between Façade and structure

Phasing

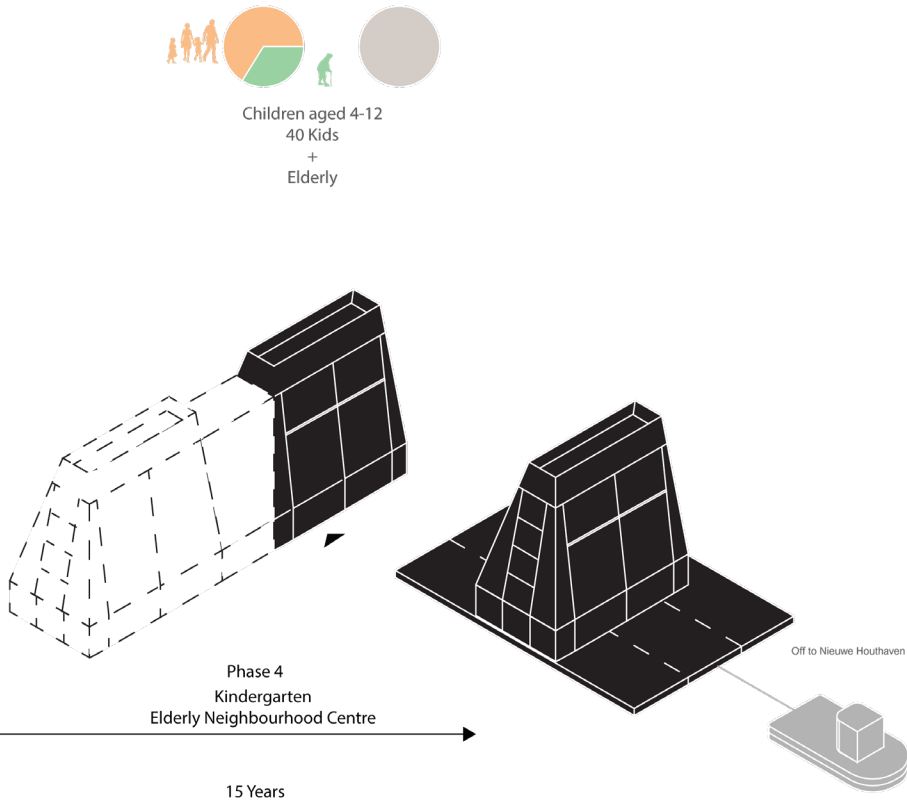
Annually reoccurring



- First dwellings in Phase 1



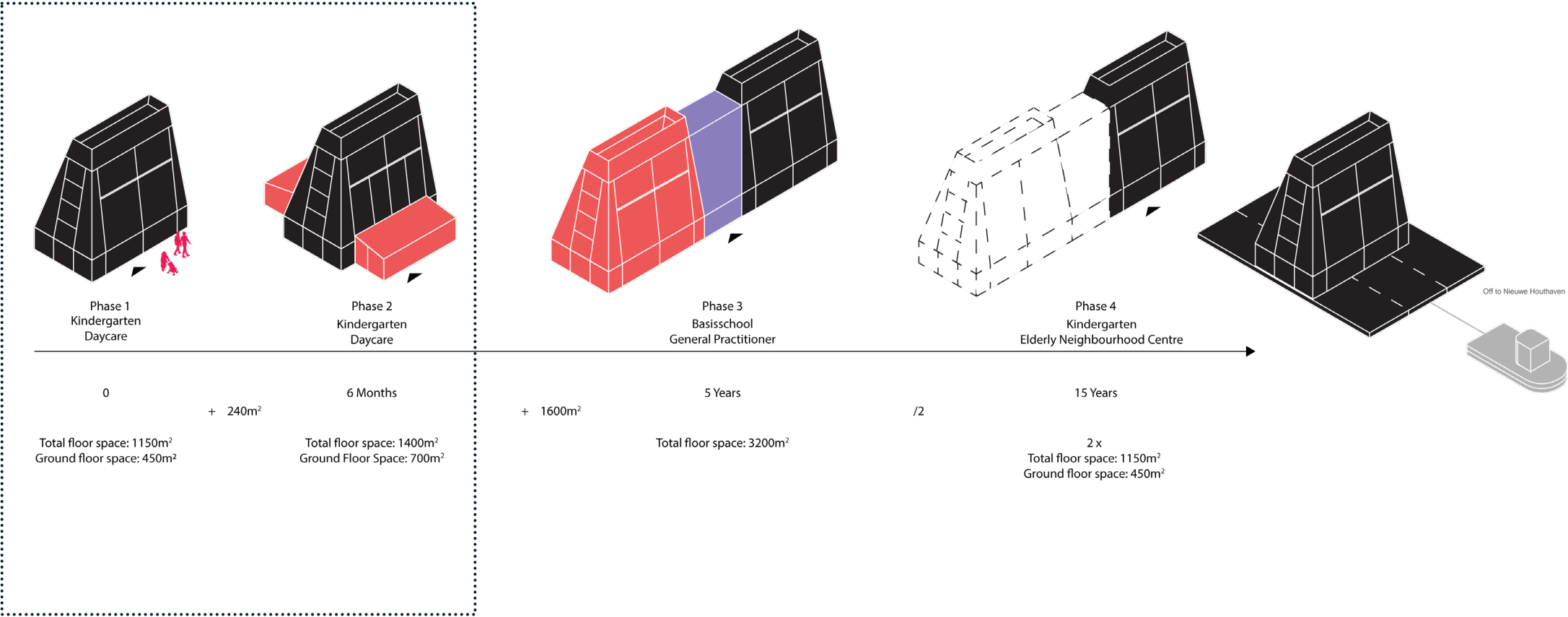
- When Population reaches 5000



- Population shrinks below 2500
- When phase 2 has its first dwellings

Expansion

Annually reoccurring

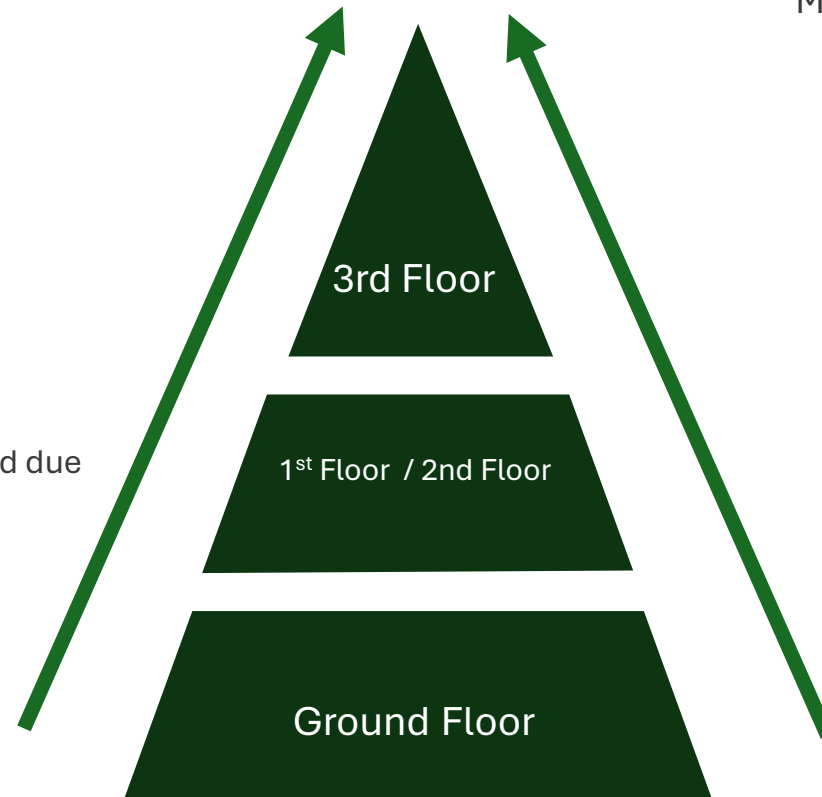


Child Centred

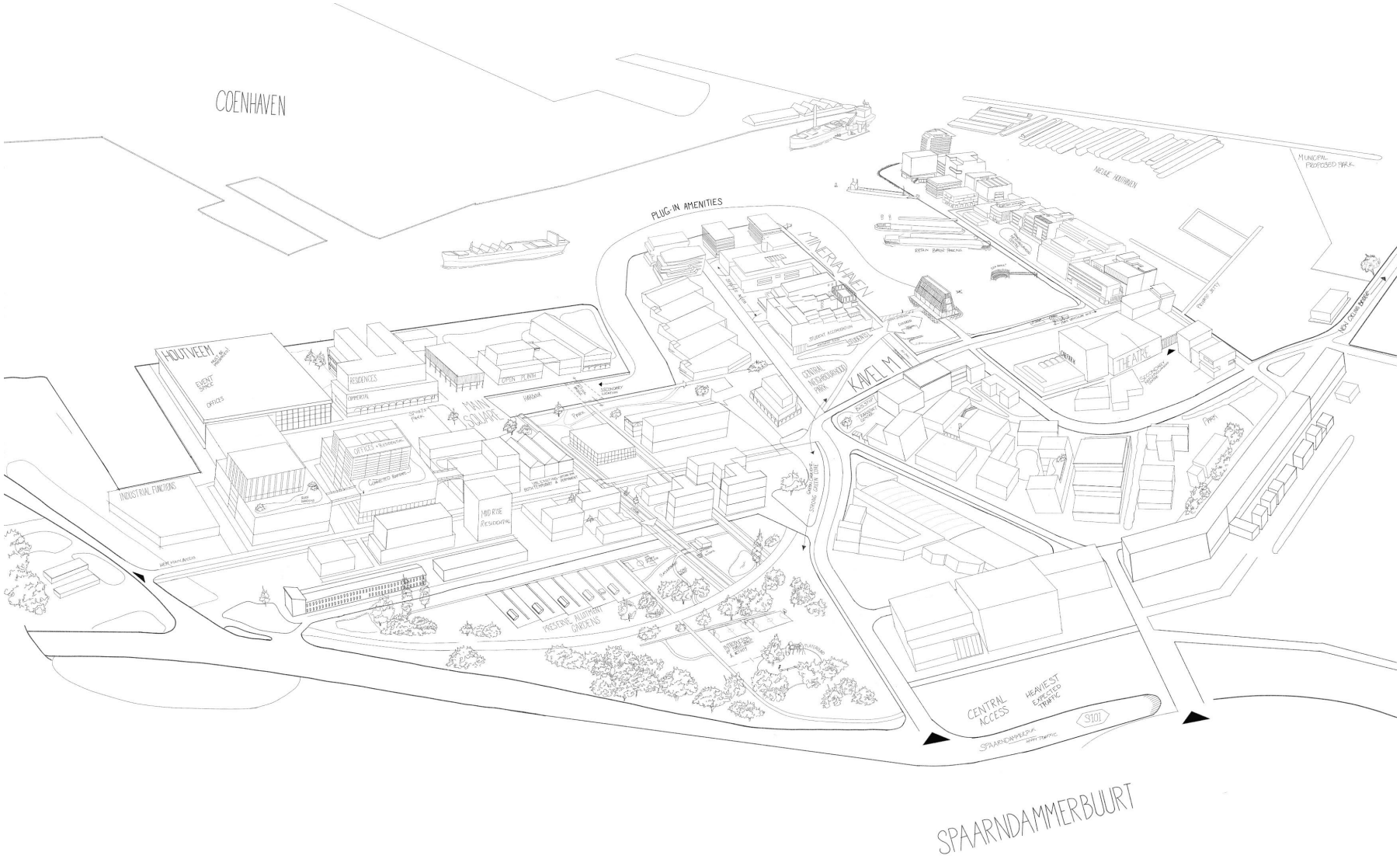
Medical & Care

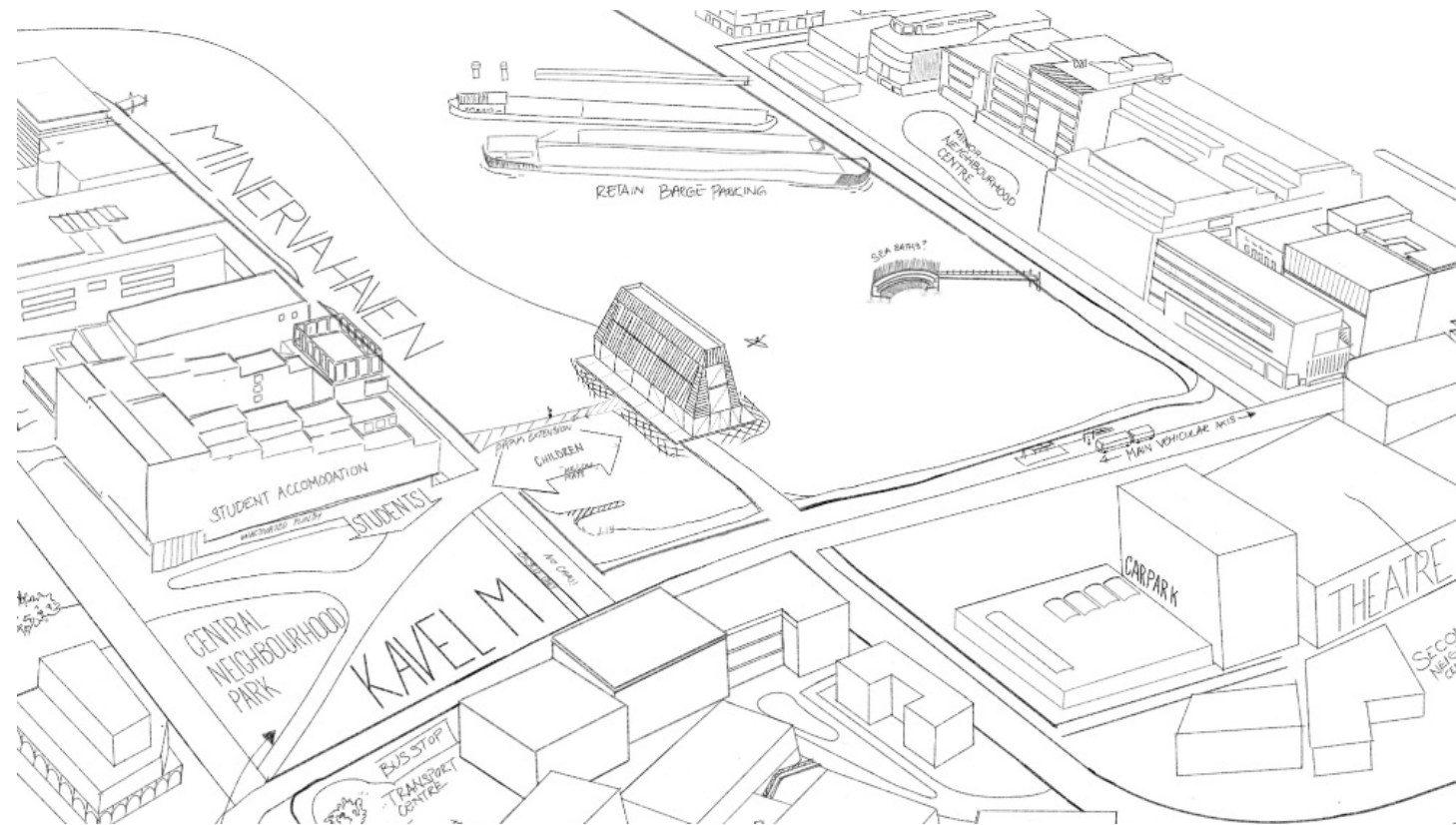
Minimise usage by
children <5 years old due
to safety risks

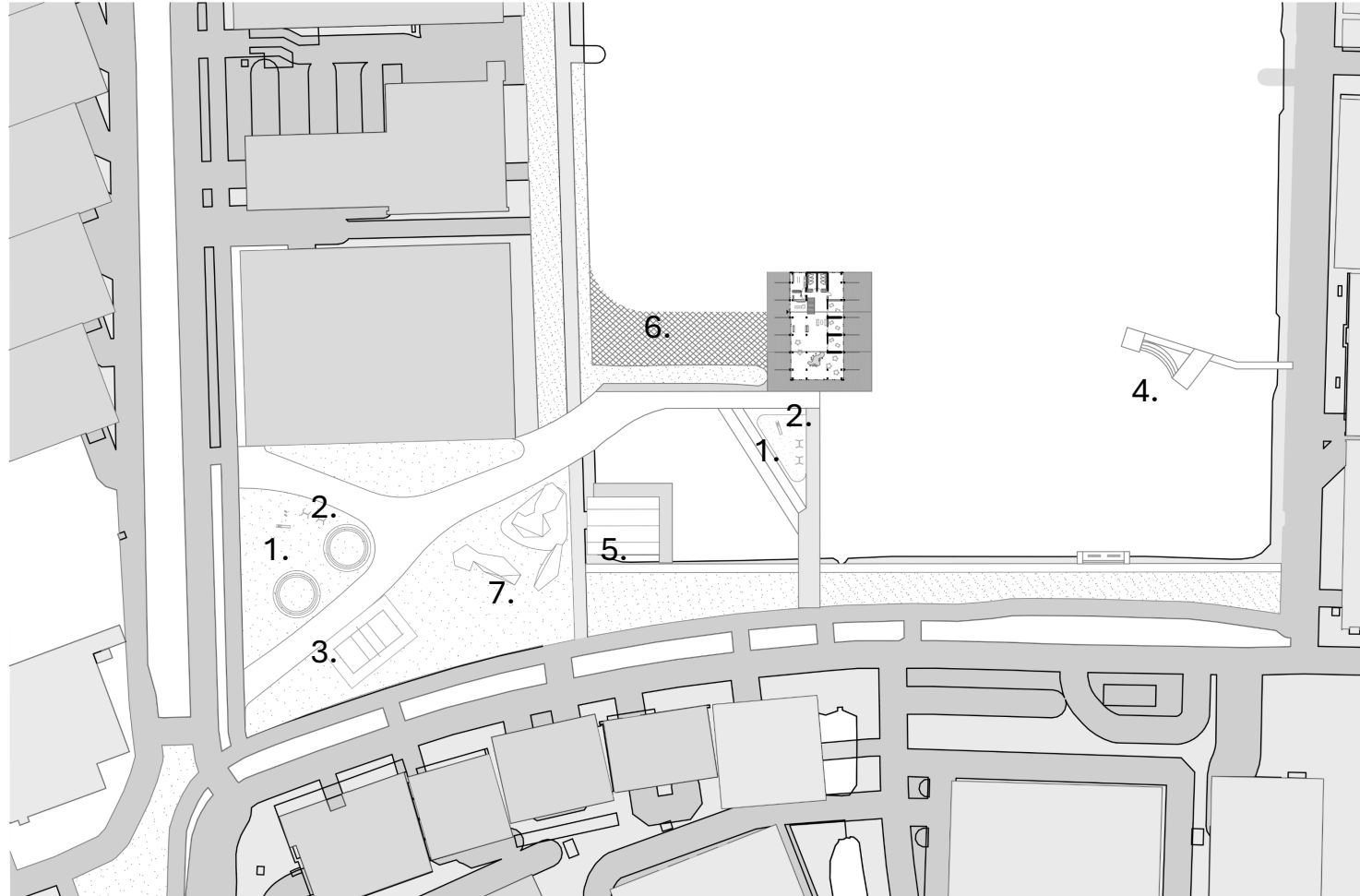
Reduced accessibility for
mobility impaired users



The bulk of functions would be located on the lower floors, thus expansion should be prioritised on these floors





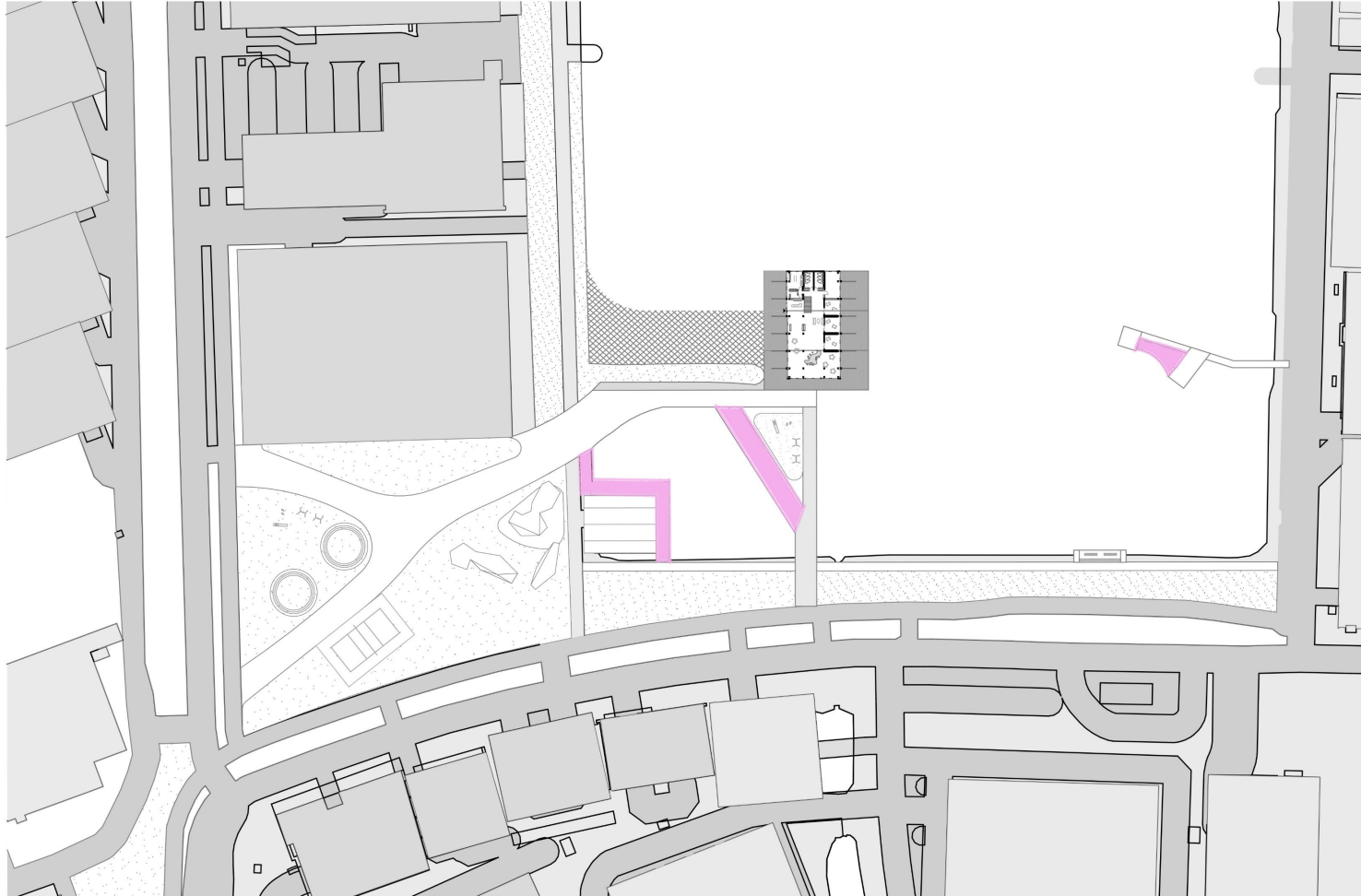


Phase 1 & 2

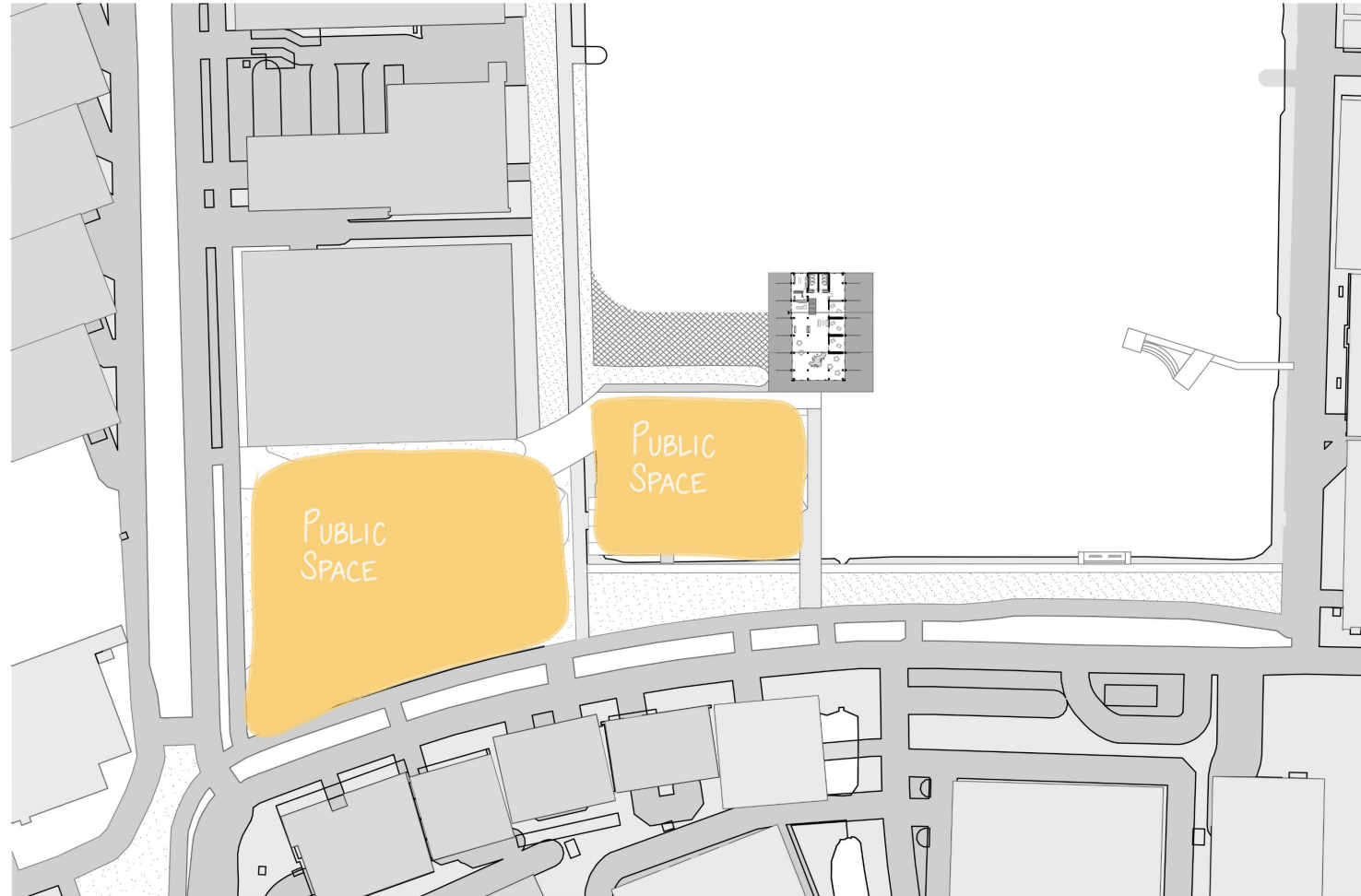
- 1. Gathering Space
- 2. Playgrounds
- 3. Basketball court

- 4. Sea Bath
- 5. Floating Restaurant
- 6. Fascine Mattress

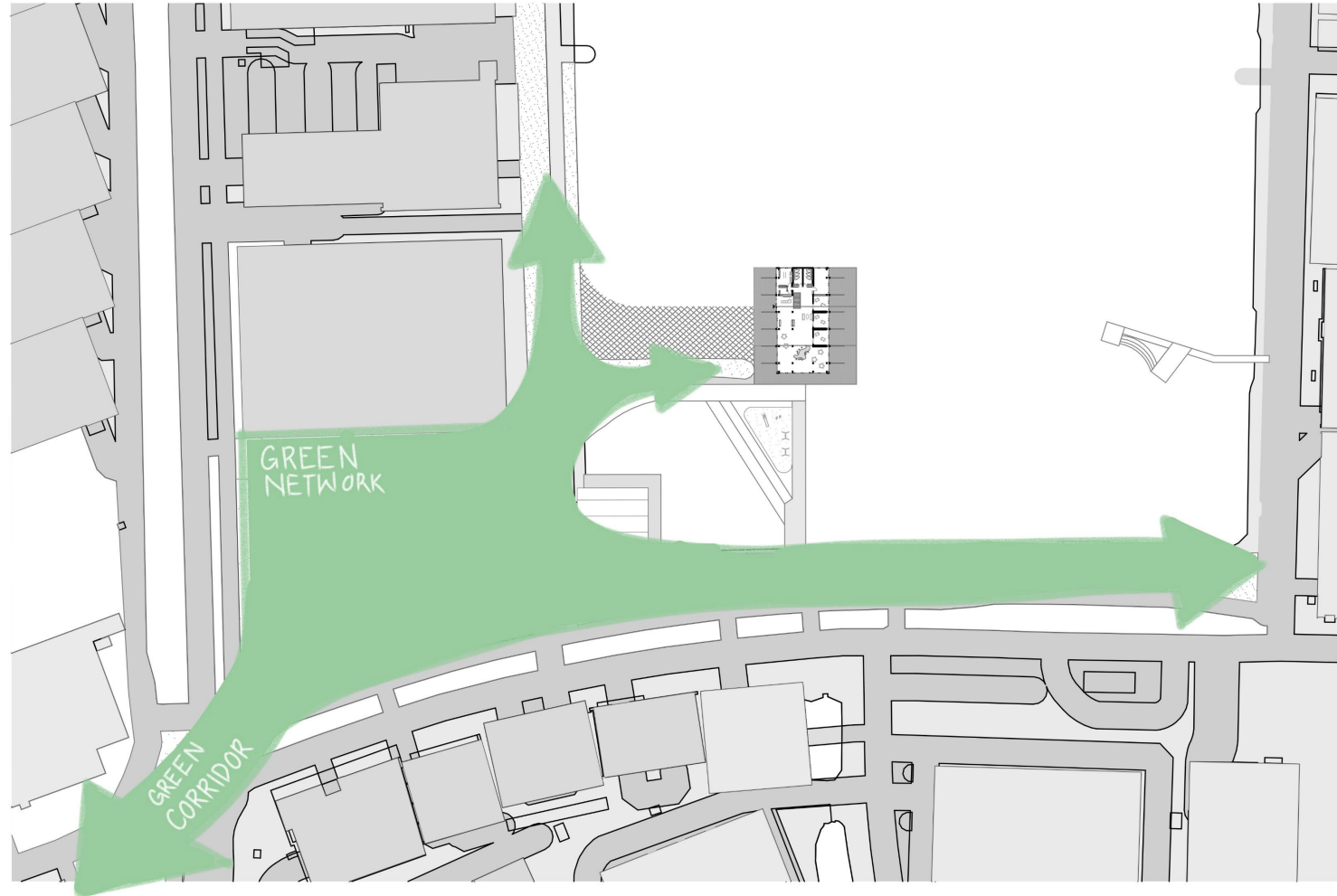
- 7. Outdoor boulder playground



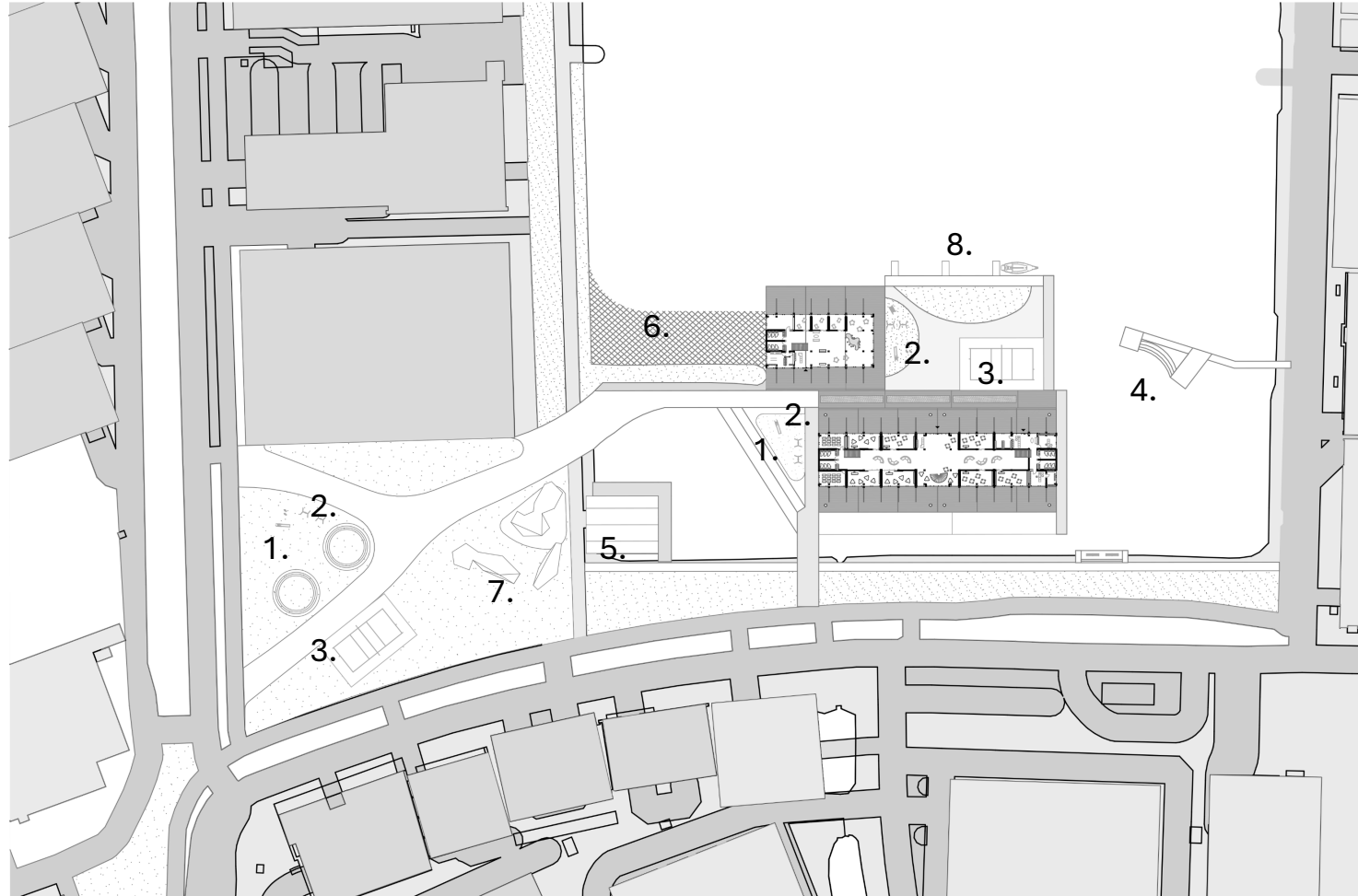
Access to Water



Establishing Public Space



Green Extension



Phase 3

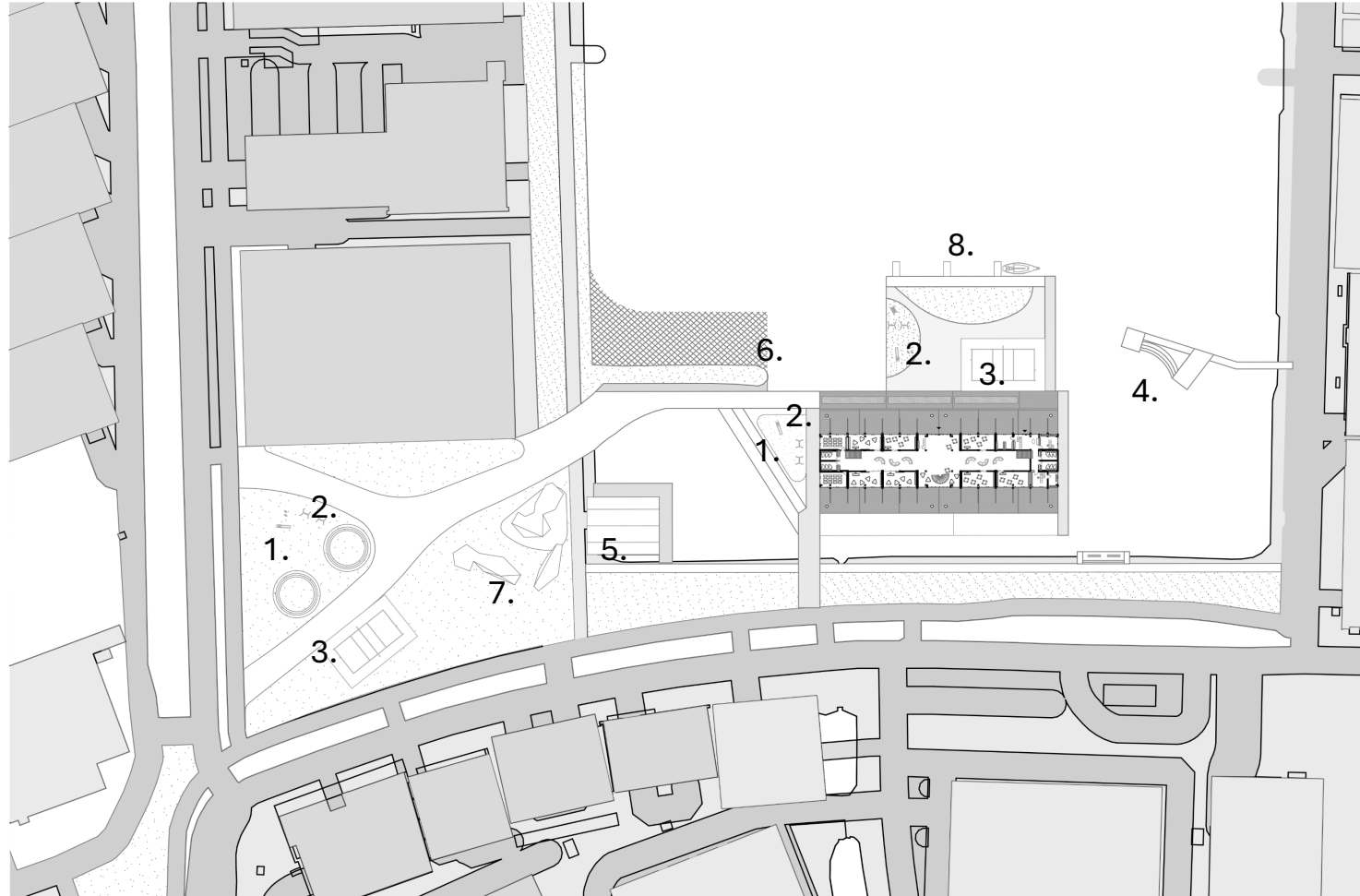
- 1. Gathering Space
- 2. Playgrounds
- 3. Basketball court

- 4. Sea Bath
- 5. Floating Restaurant
- 6. Fascine Mattress

- 7. Outdoor boulder space
- 8. Boat Docks



Establishing Public Space

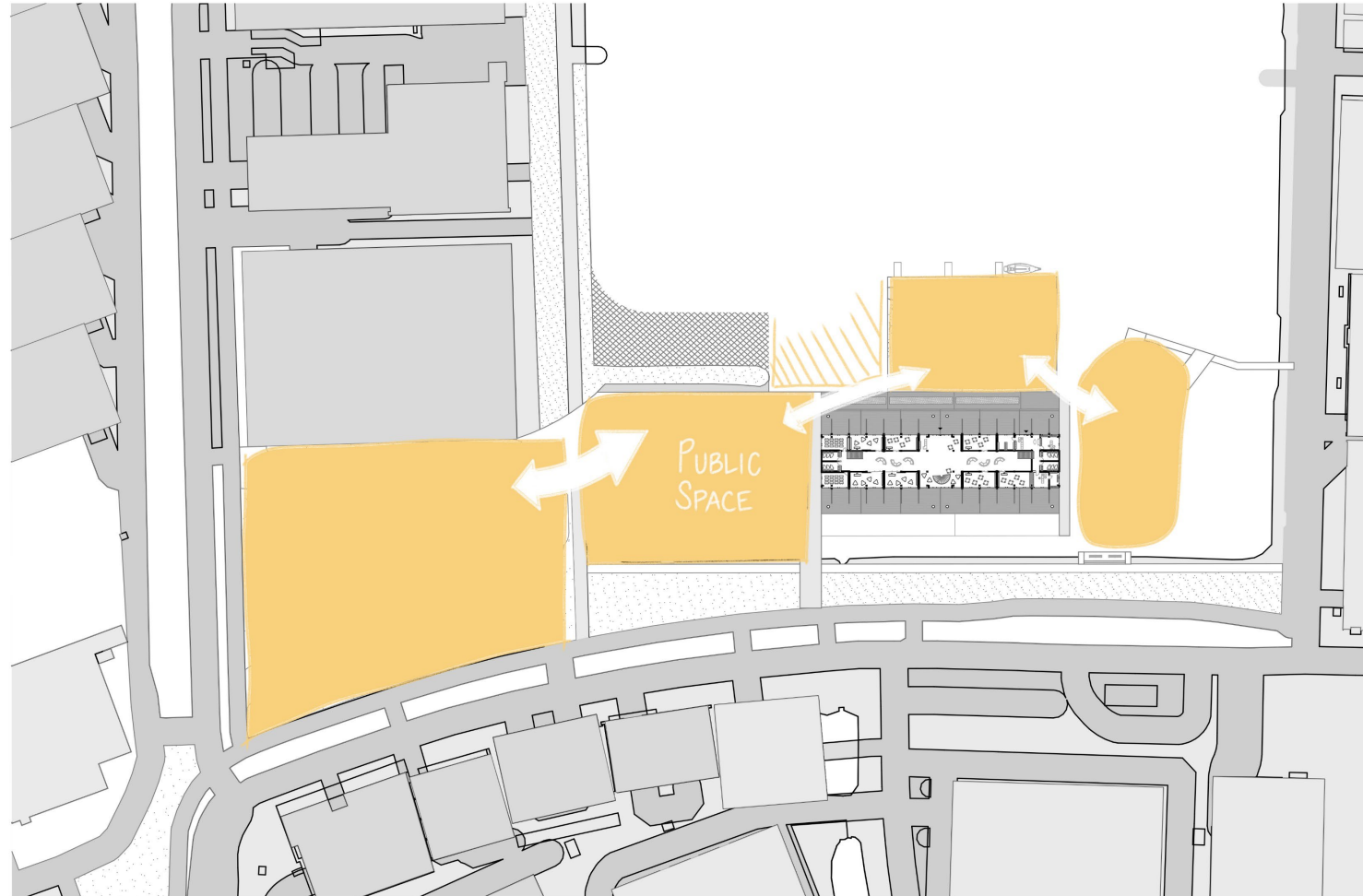


Phase 4

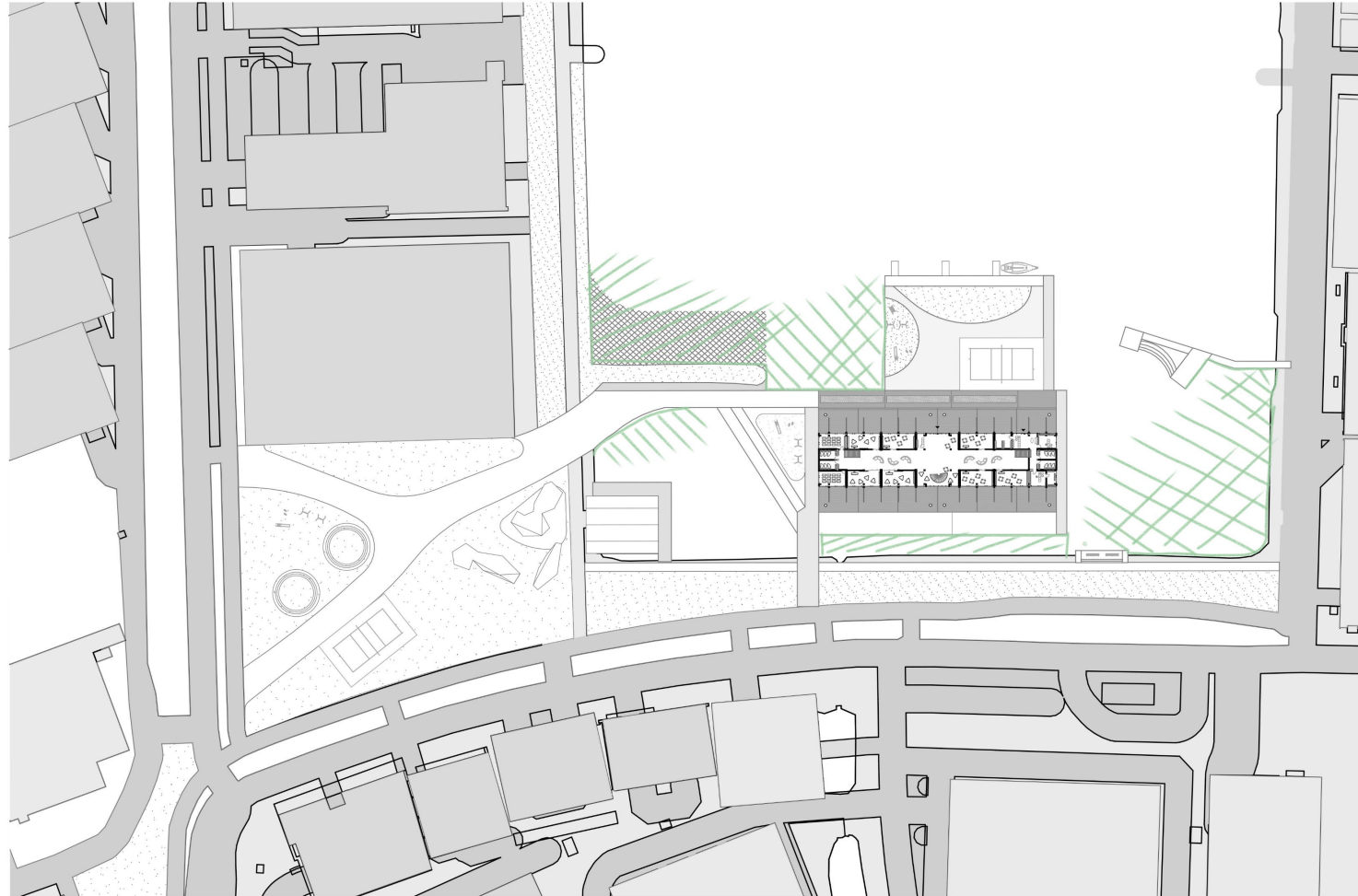
- 1. Gathering Space
- 2. Playgrounds
- 3. Basketball court

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- 5. Floating Restaurant
- 6. Fascine Mattress

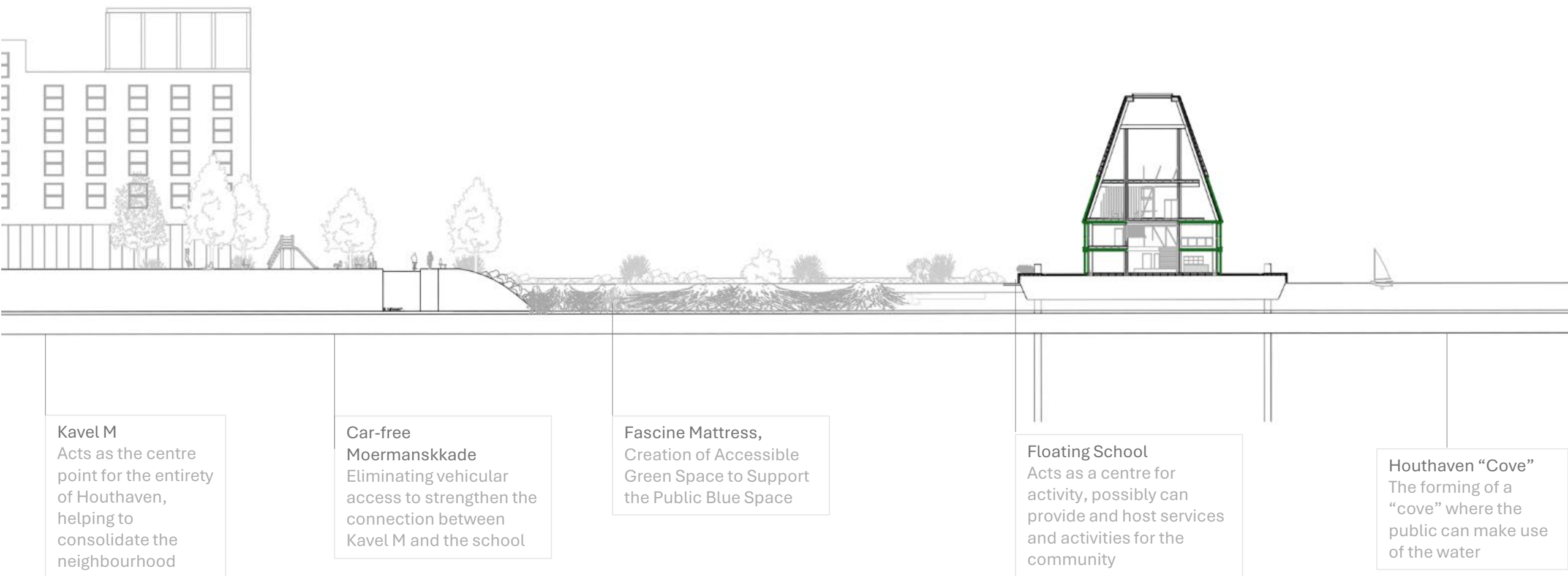
- 7. Outdoor boulder playground
- 8. Boat Docks

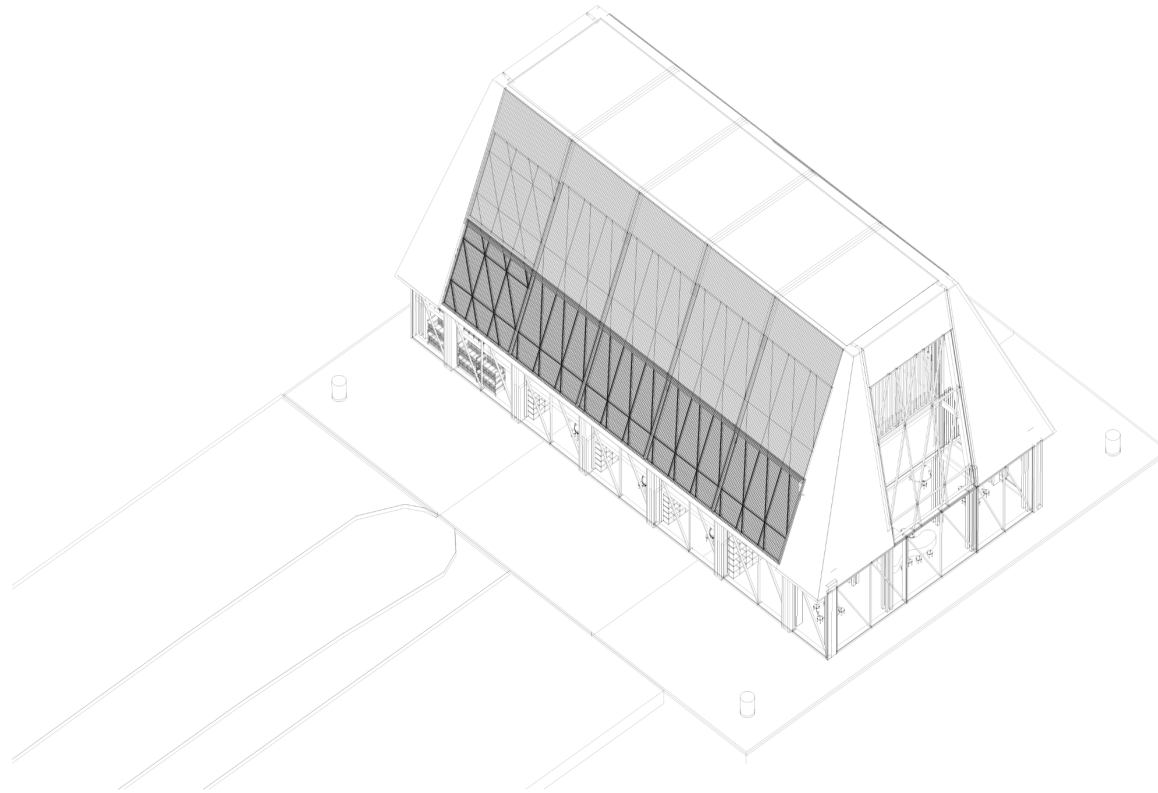


Public Space Network

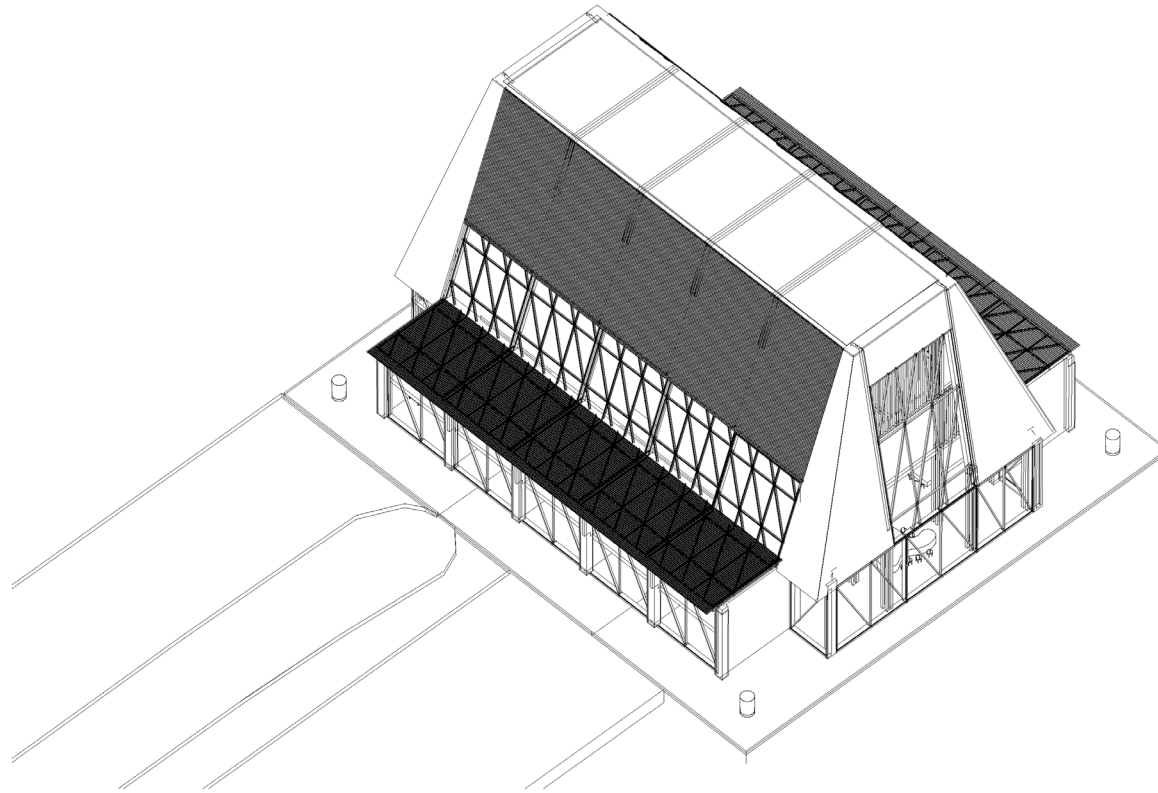


Creation of “Eco-spaces”

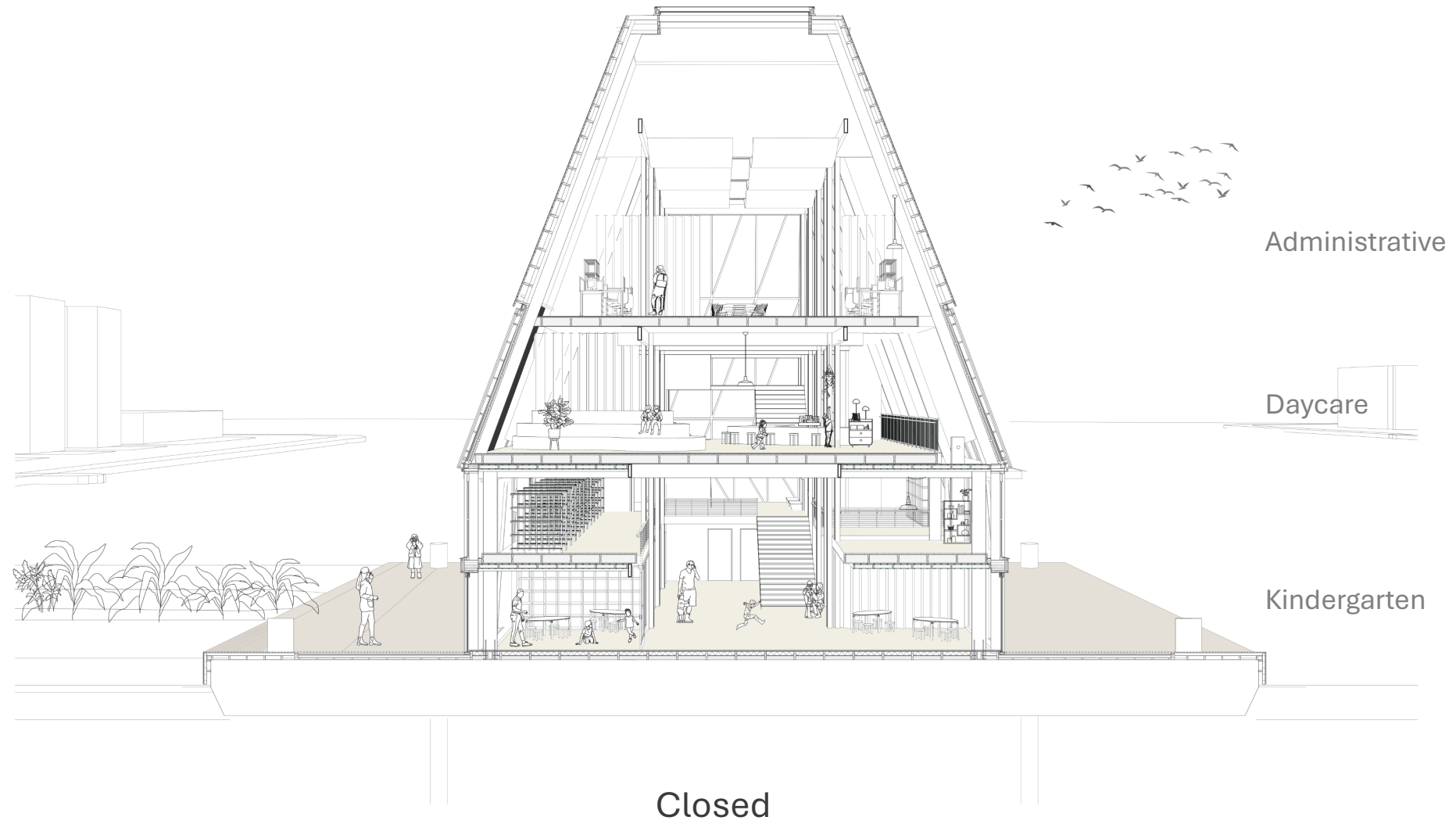




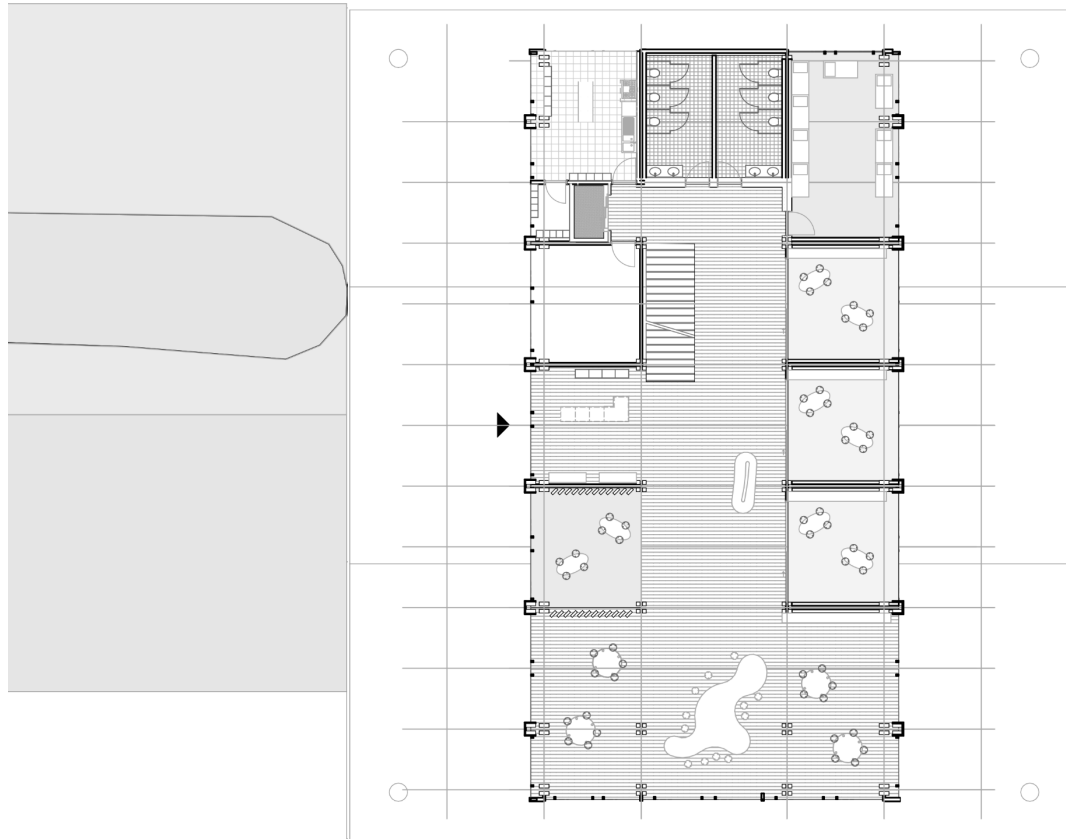
Phase 1: Introduction



Phase 2: Reaction



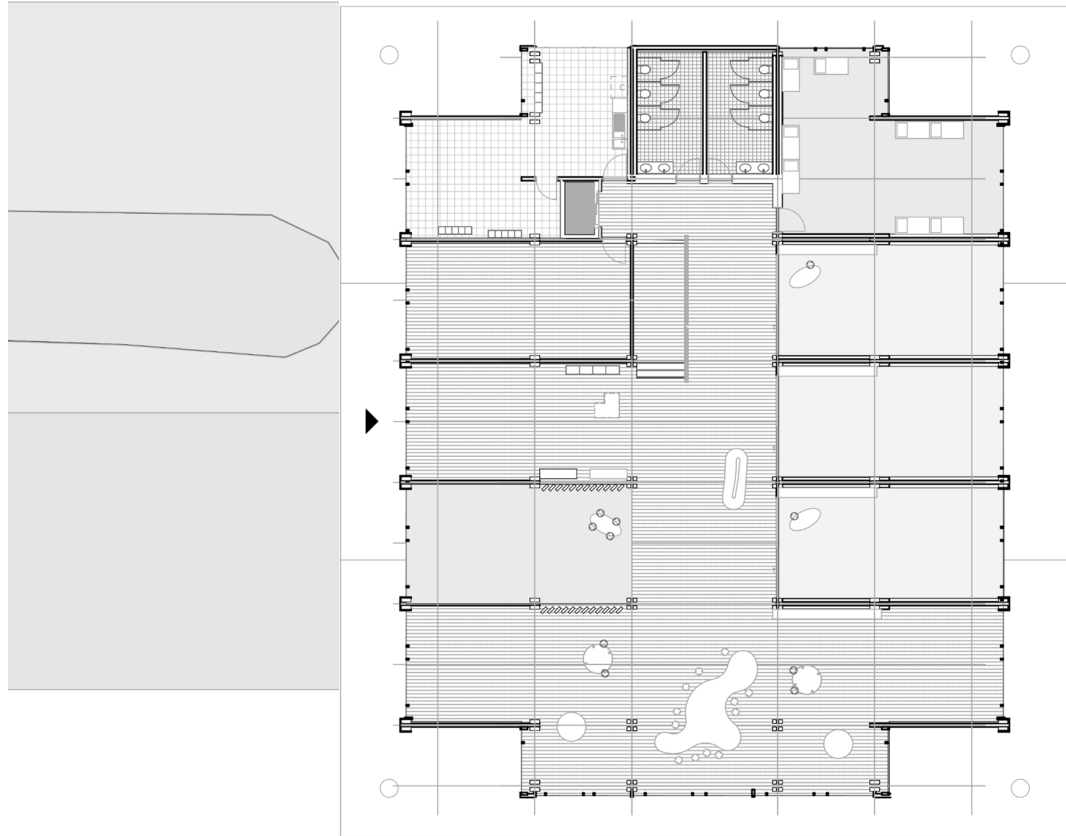




Kindergarten

Group rooms
Common Space
Waiting Space
Reception
Kitchen
Nap Room

Phase 1 Ground Floor



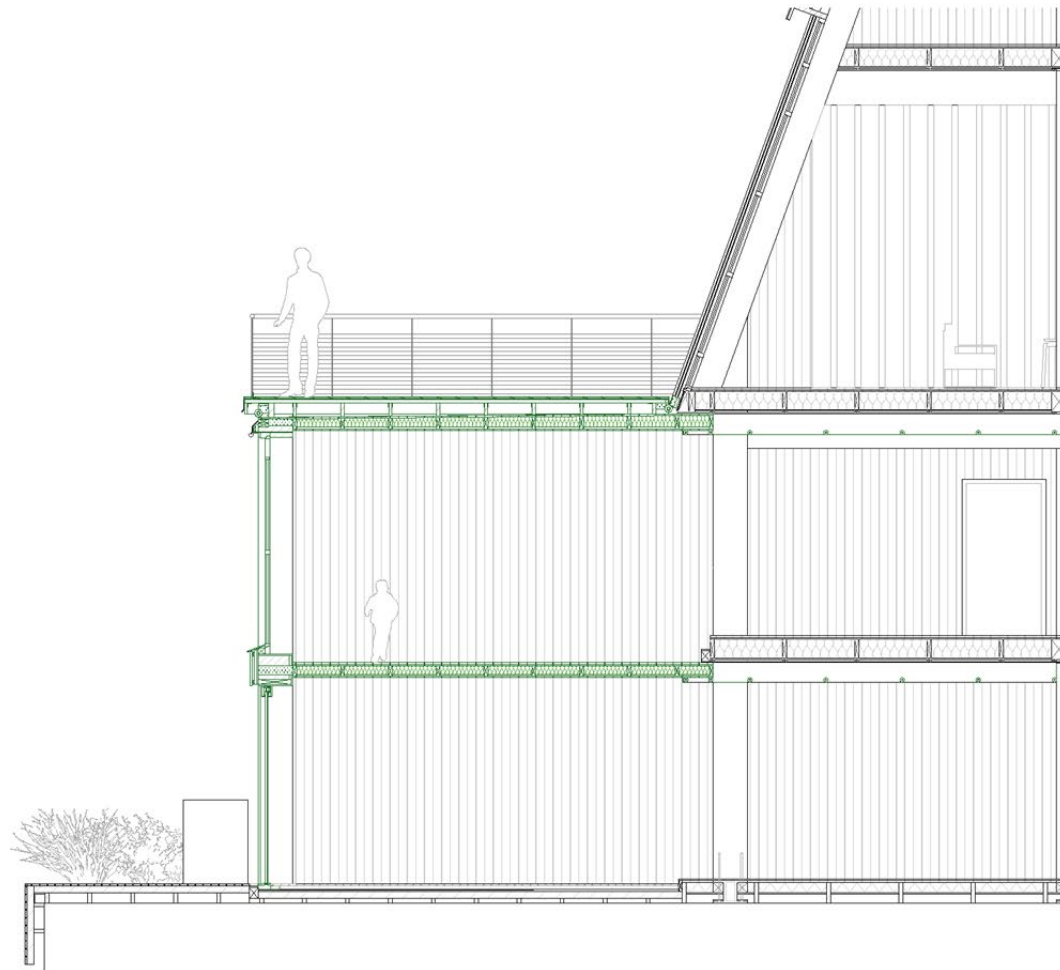
Kindergarten

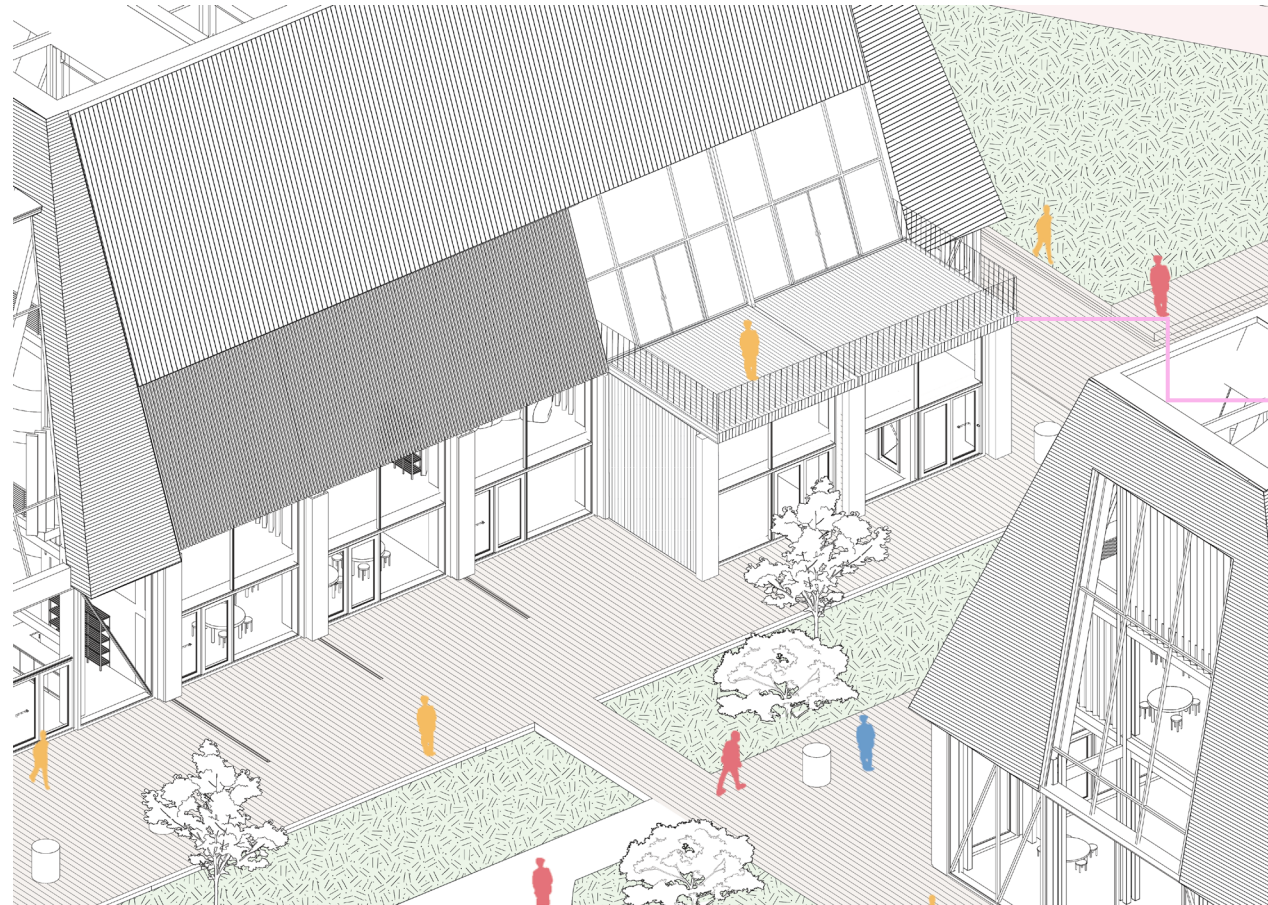
240m2 Floor space

Phase 2 Ground Floor

Creation of outdoor
space

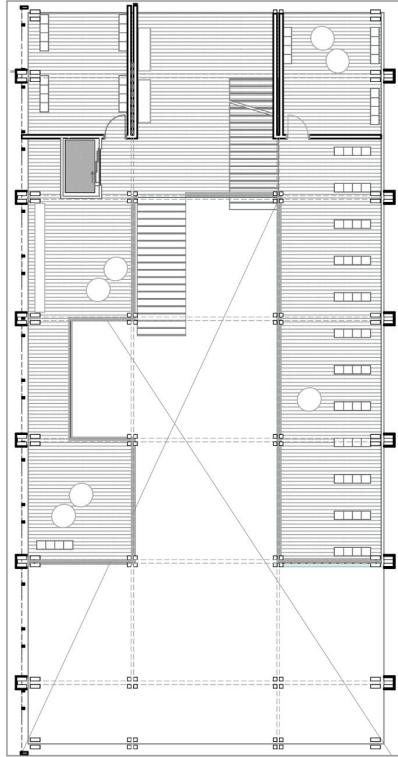
Expansion of lower
floor space





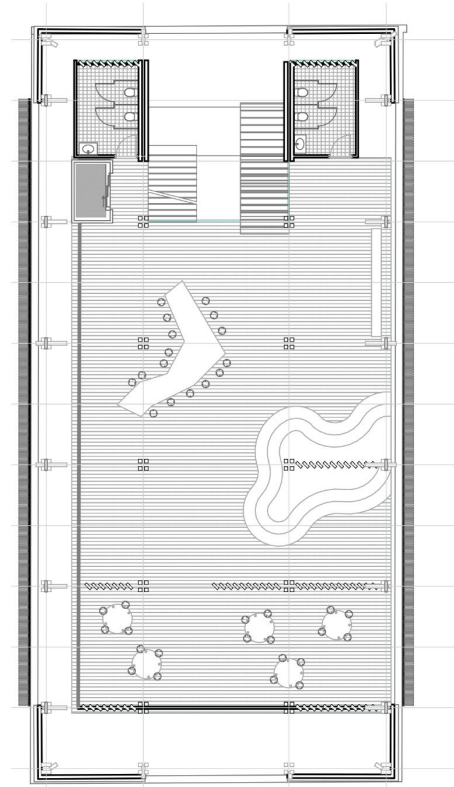
Strengthens
connection to
outdoor public
spaces

Connection between the extended and the surroundings



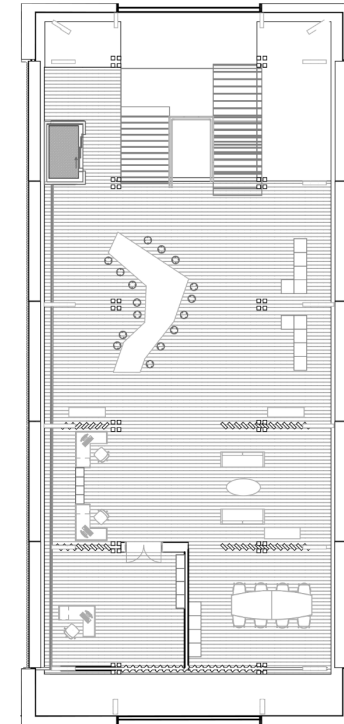
0,5 Floor

Kindergarten & Daycare
Library
Reading Space



1st Floor

Daycare
Activity Space
Workspace

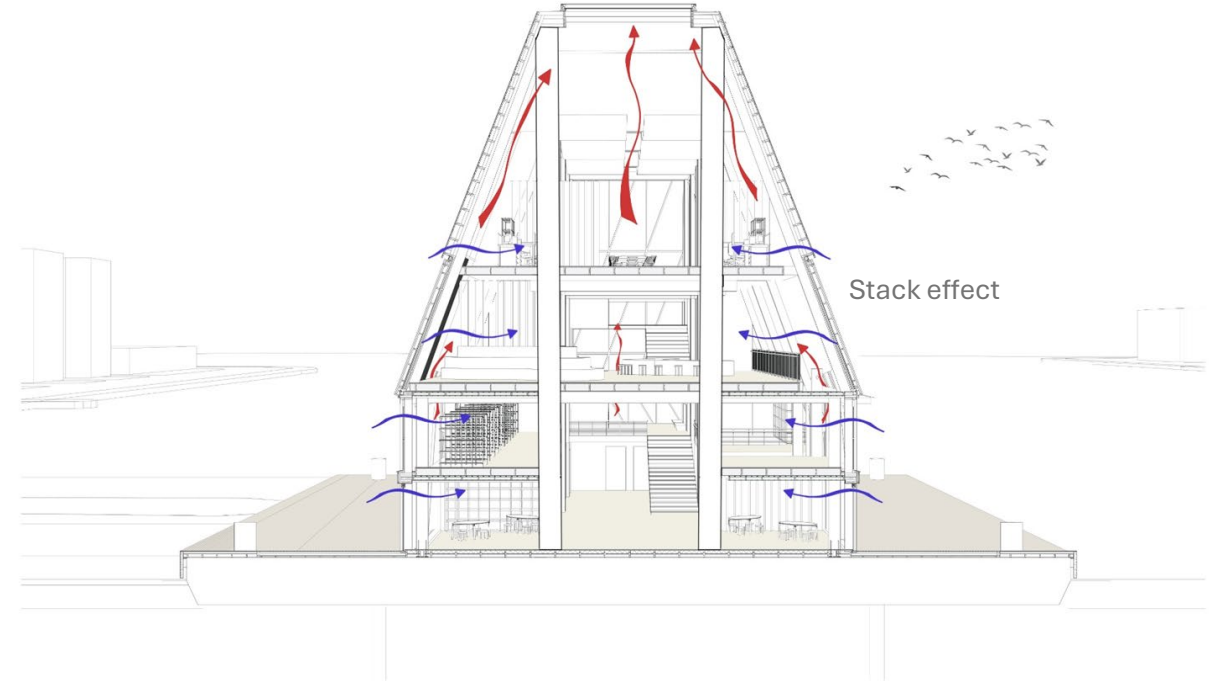


2nd Floor

Atelier
Headmaster's Office
Pantry
Meeting room

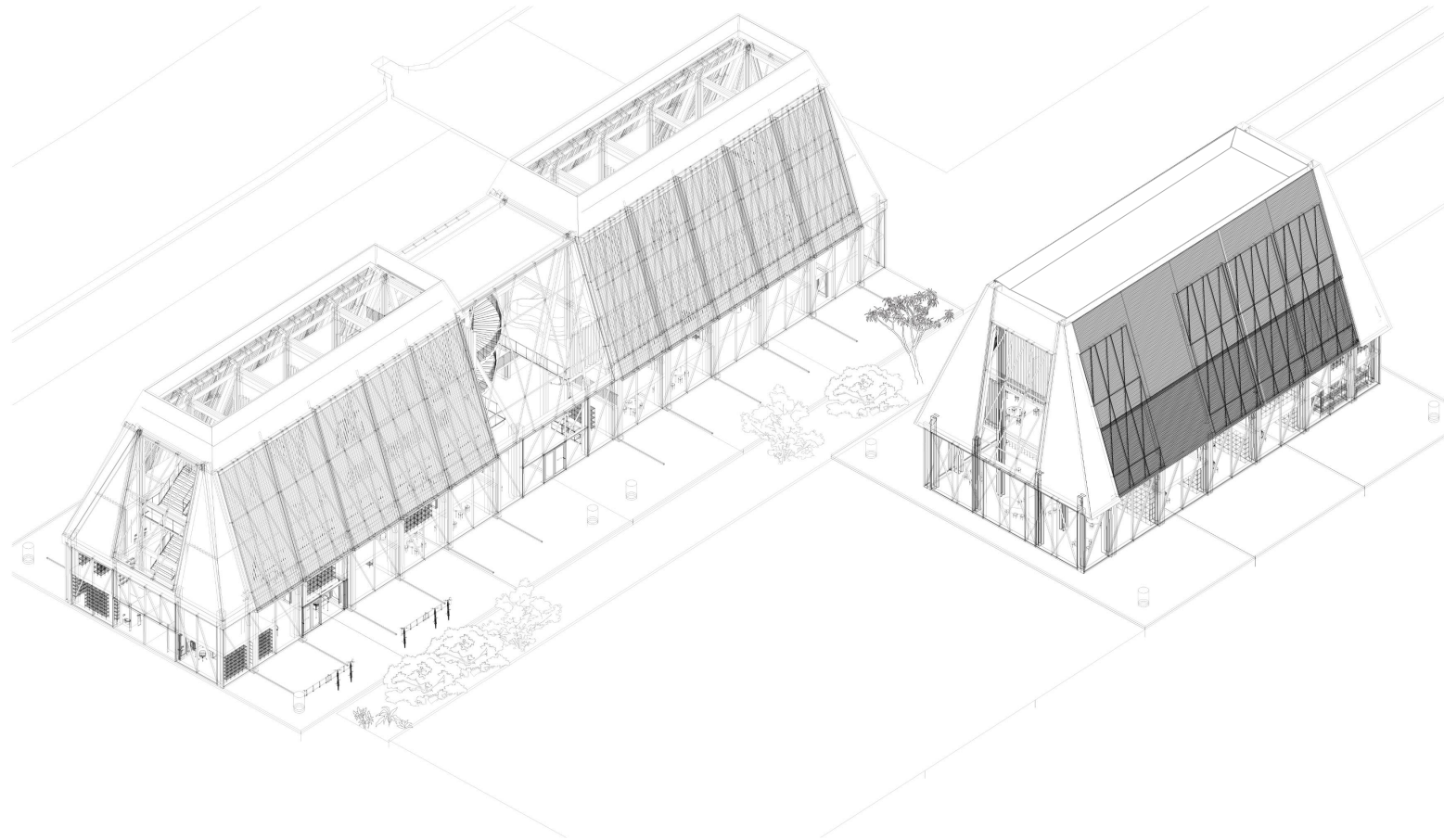


Heating

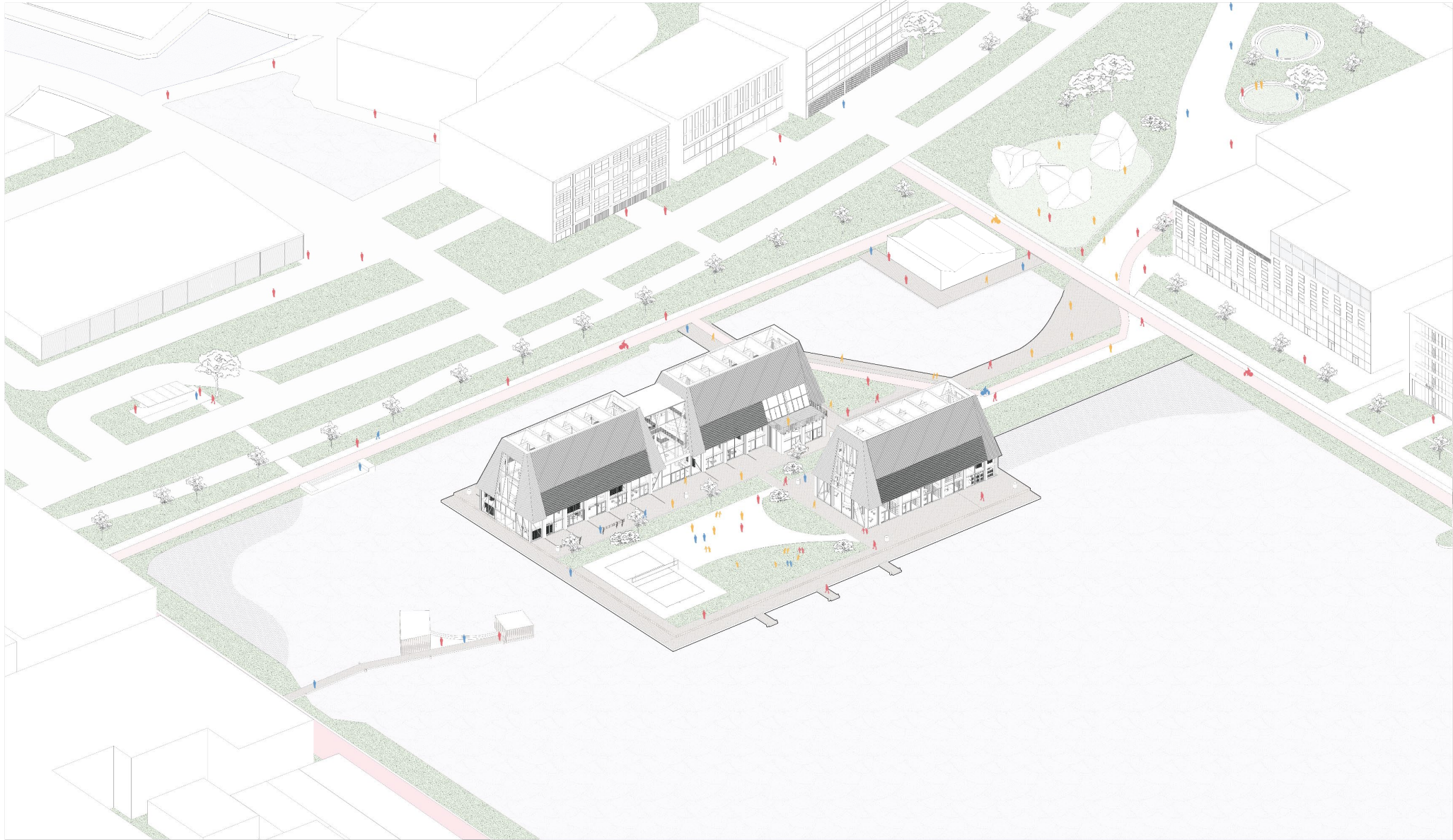


Ventilation

Climate Design



Phase 3: Maturing





Balance between permanence and temporality

Kindergarten & Daycare

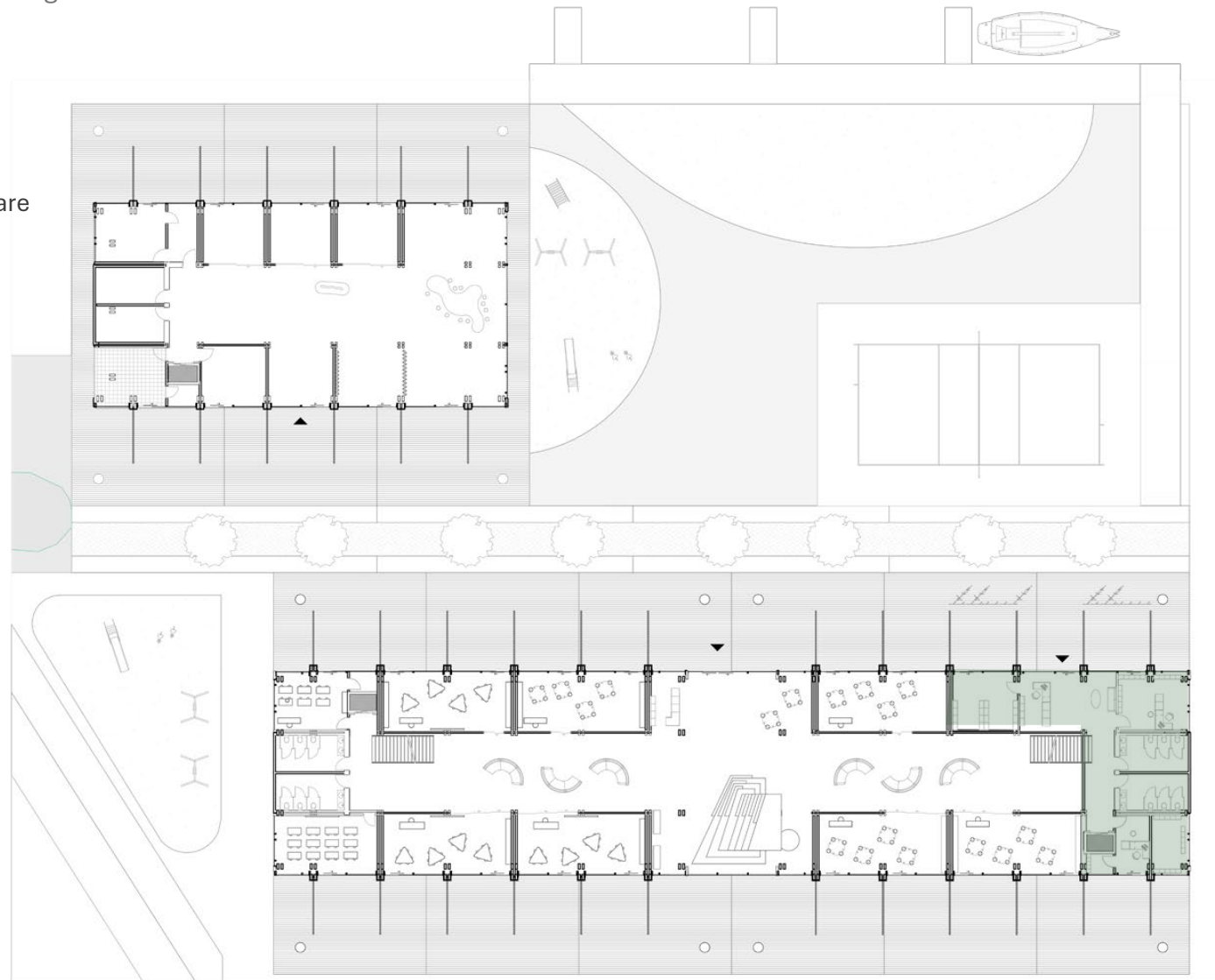
Ground Floor

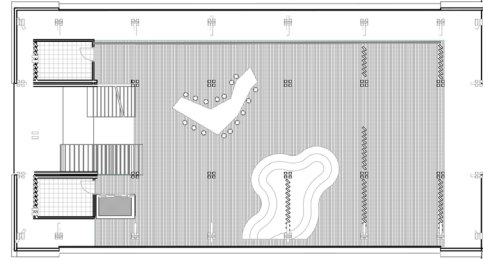
Basisschool

Classrooms
Working Space

General Practitioner

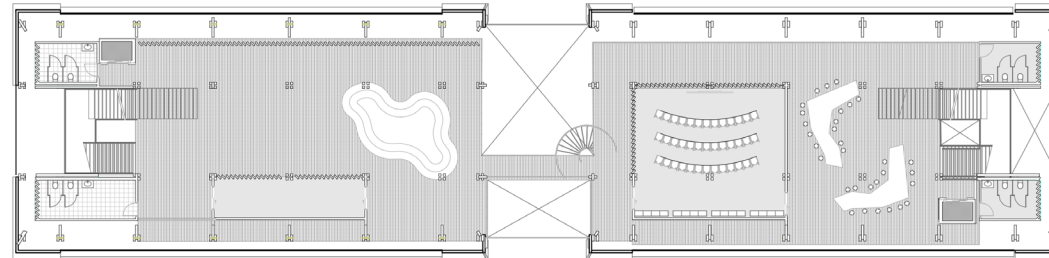
Reception
Check-up Rooms

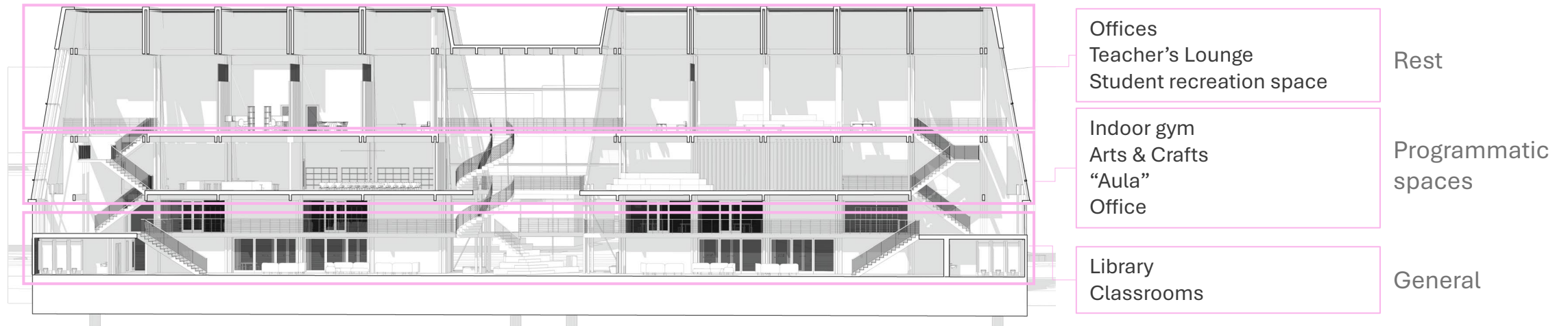




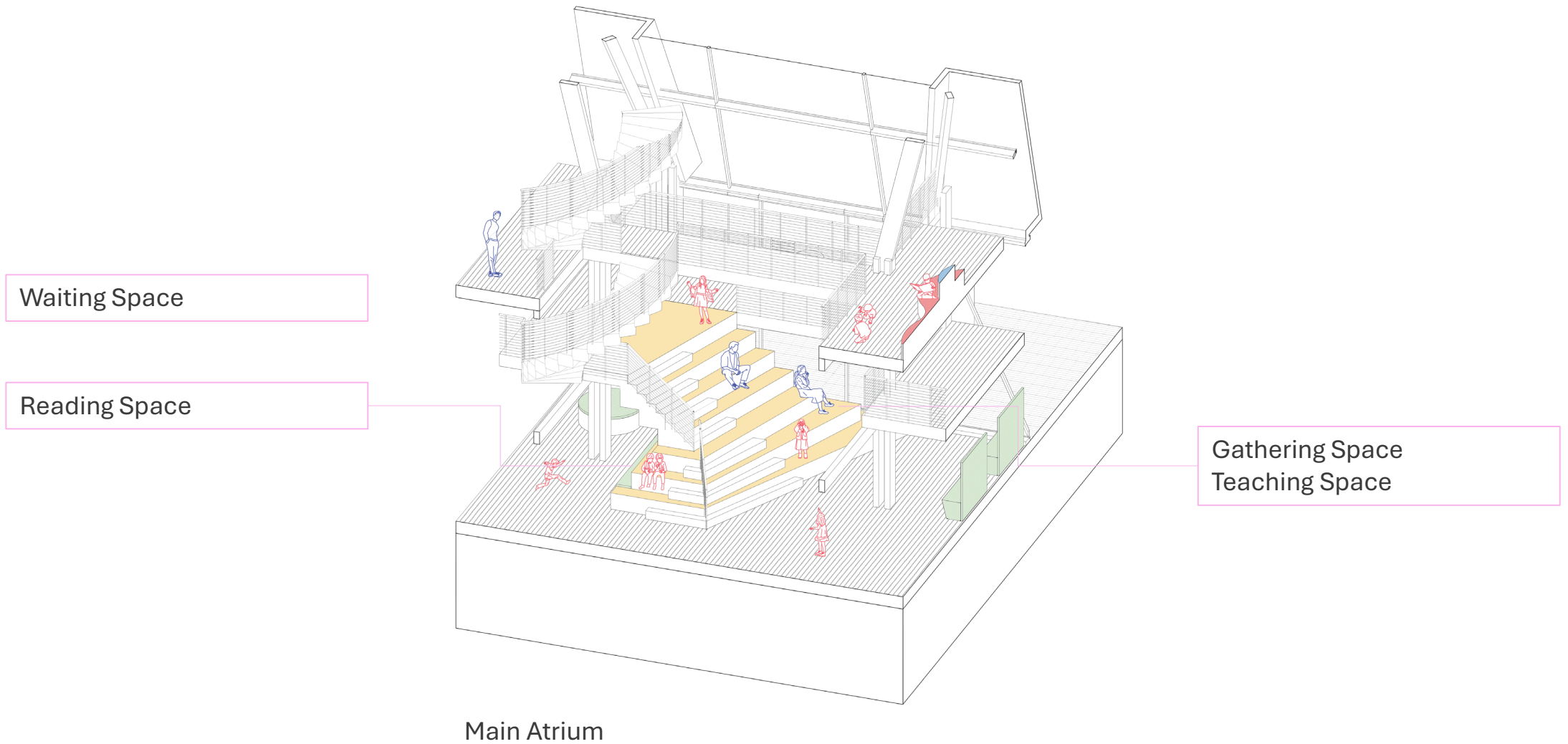
1st Floor

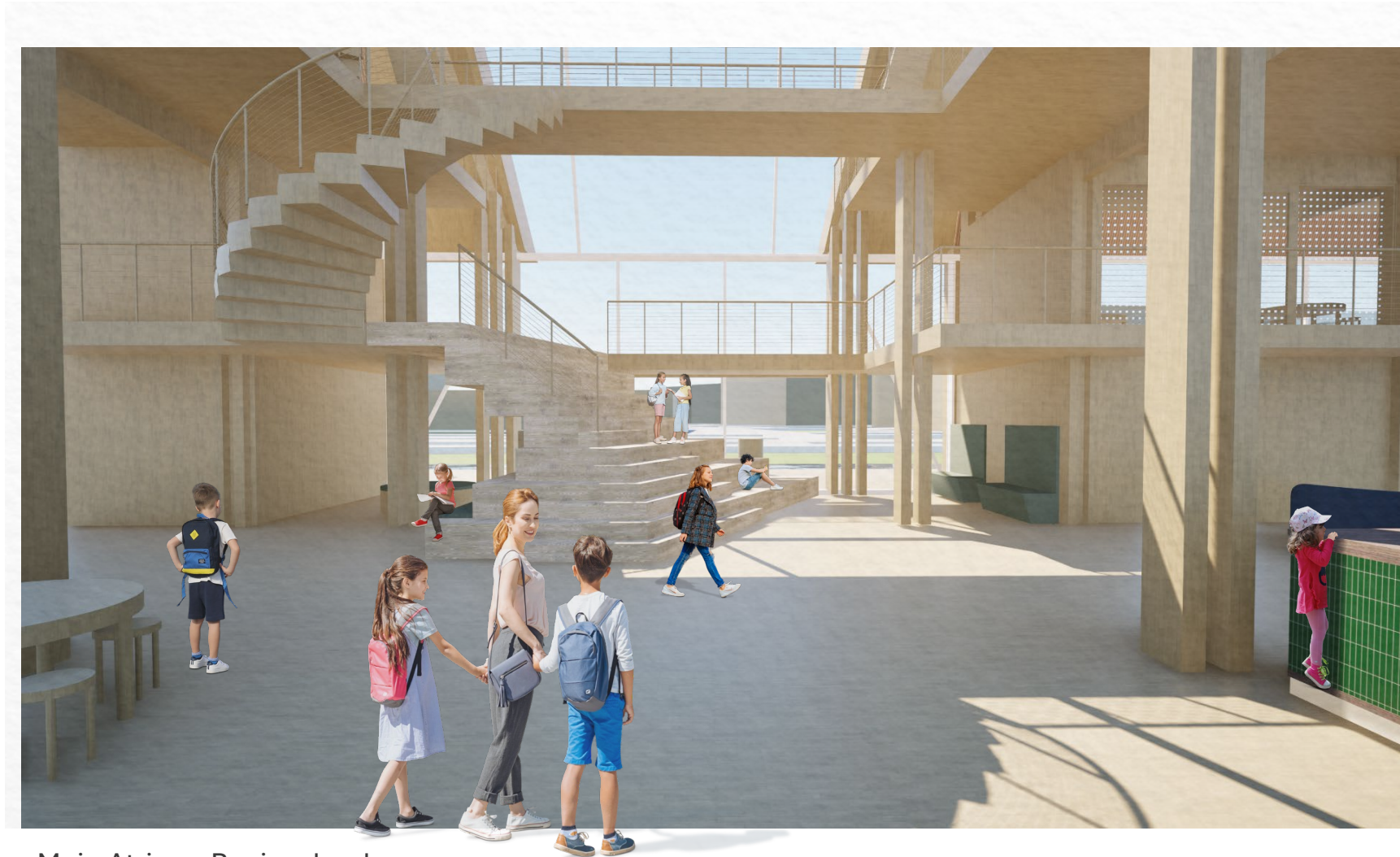
Indoor gym
Arts & Crafts
“Aula”



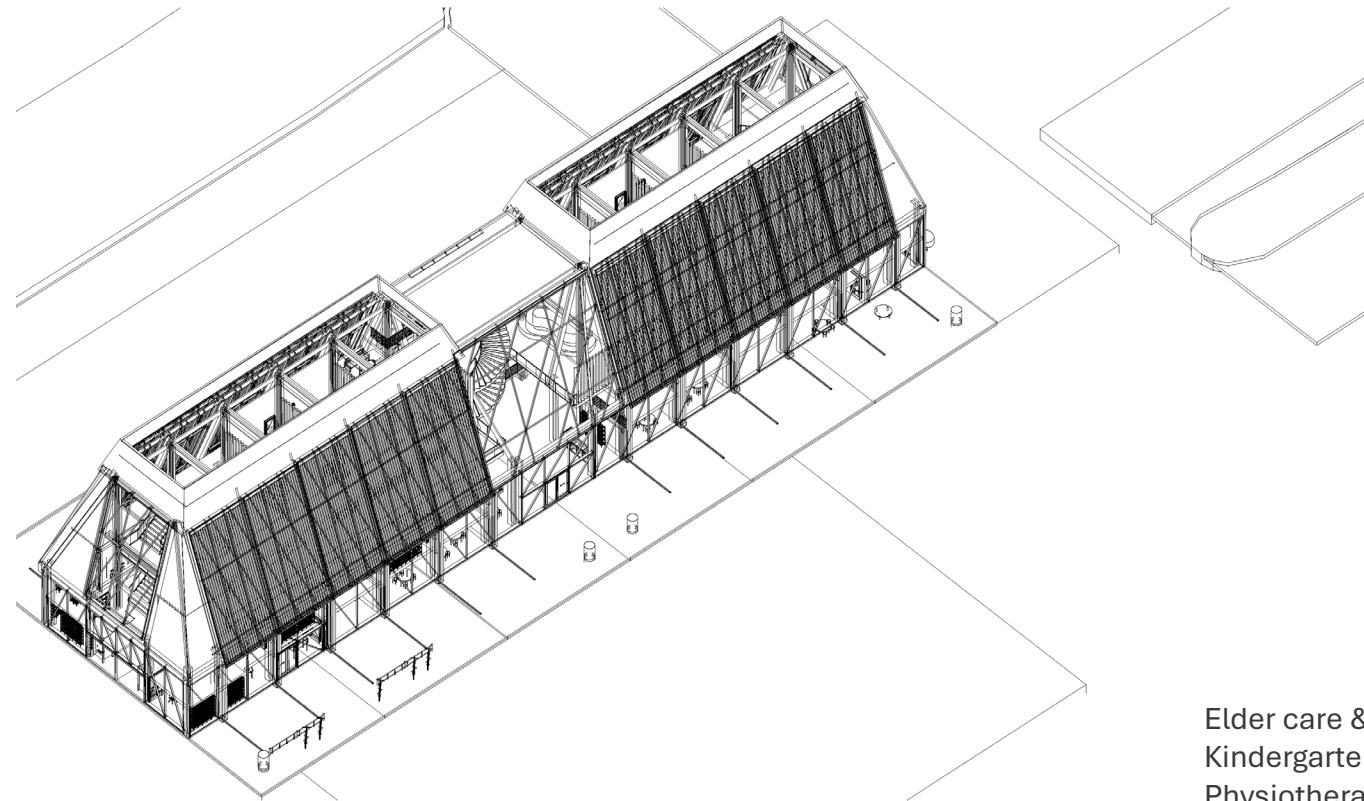


Phase 3: Program



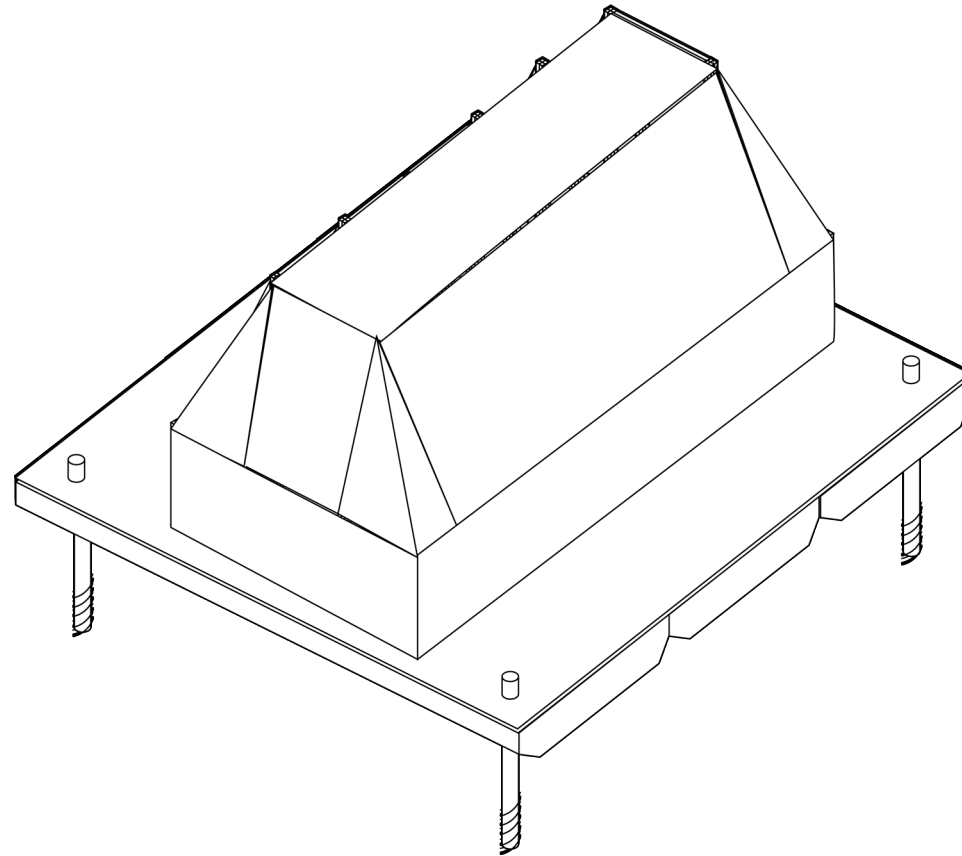


Main Atrium, Basisschool



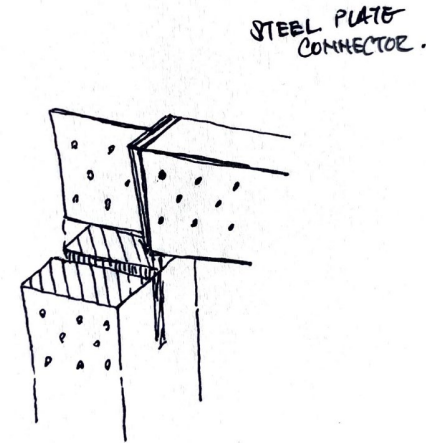
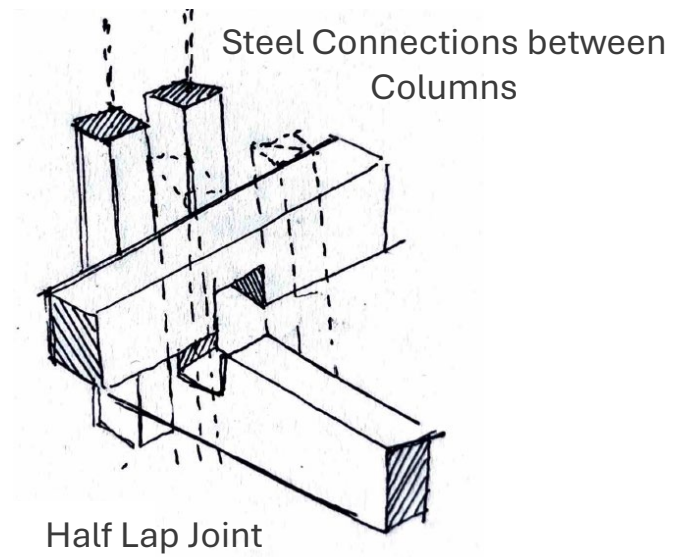
Phase 4

Elder care & Recreation
Kindergarten & Day Care
Physiotherapist
General Practitioner



Assembly Order

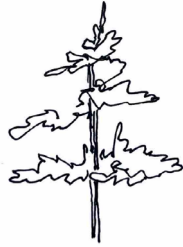
Hybrid Connections





Willow

Interior finishing,
façade elements



Accoya (radiata pine)

Exterior Decking and
Heavily Exposed
Elements



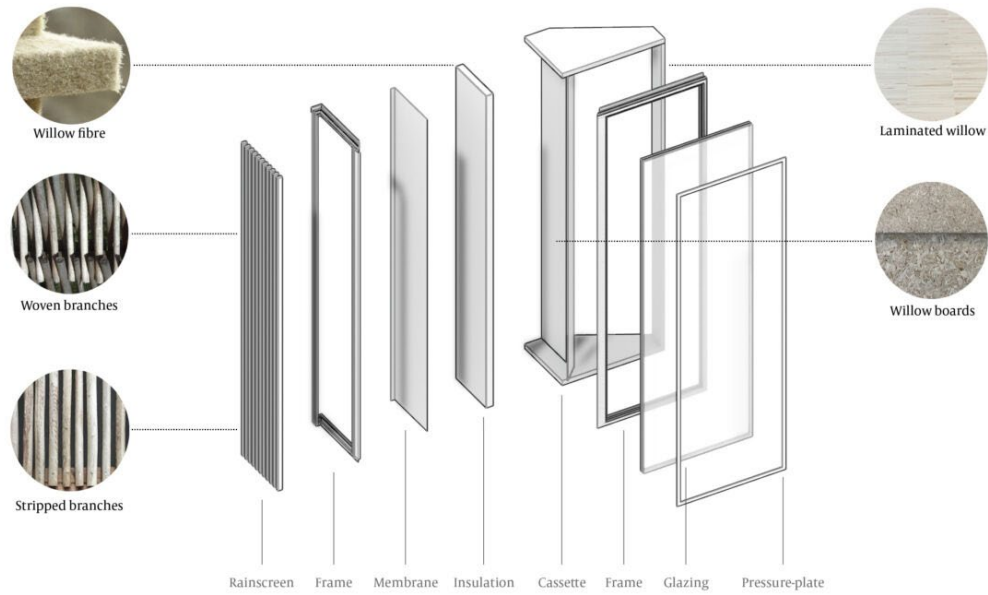
Douglas Fir

Structural
Elements

Locally
available

Fast growth
rate

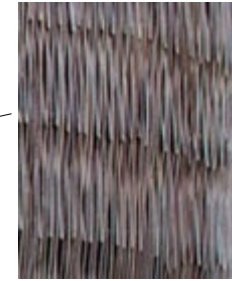
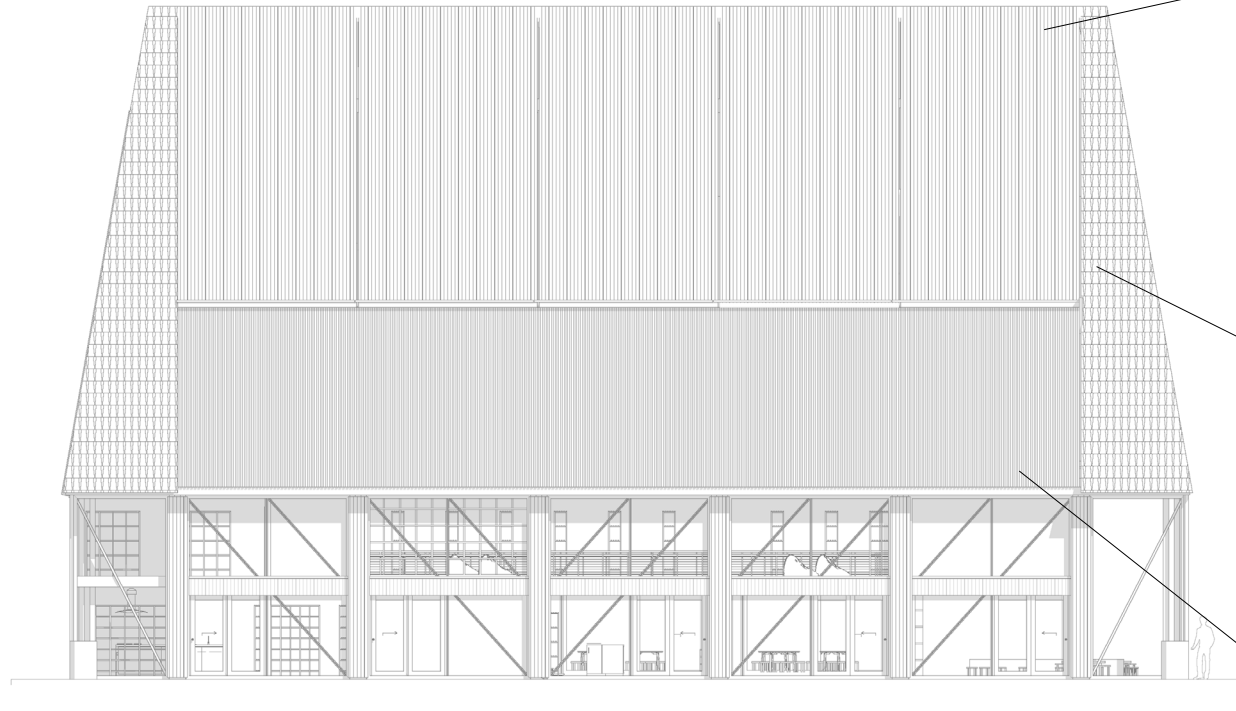
Choice of material



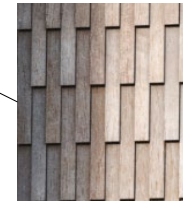
RoSana Guest House, Anna Heringe

Willow Unitised Facade

Façade Materials



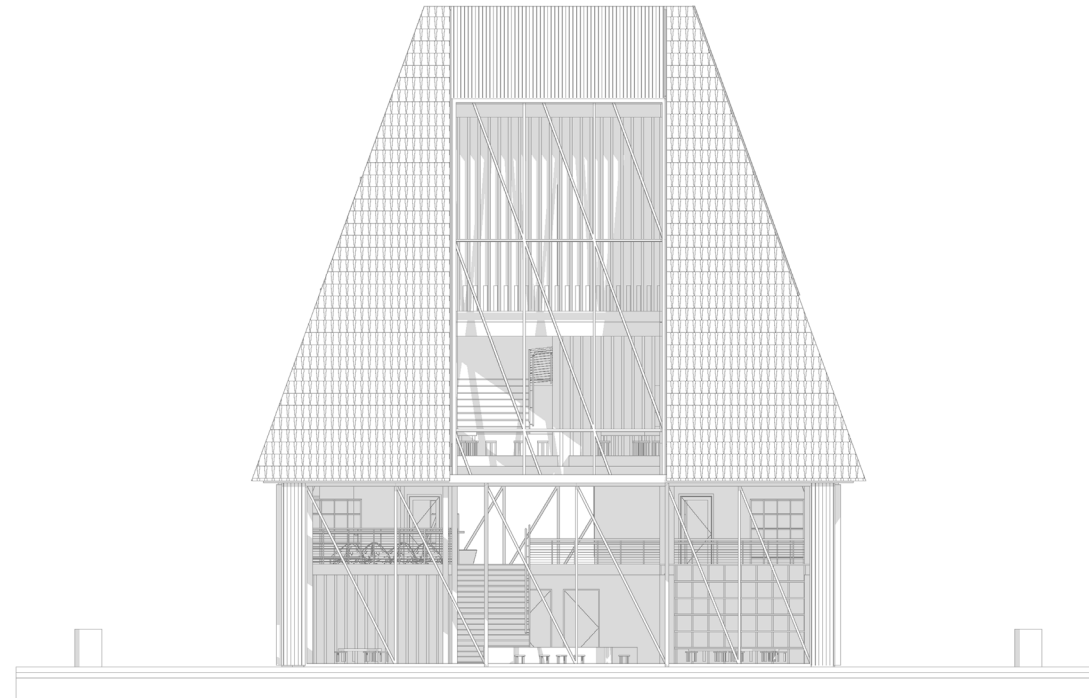
Woven Willow Cladding



Willow Section Facade



Accoya Decking



South Elevation

Interior ceiling & wall Materials



Pressed Willow Acoustic Panels



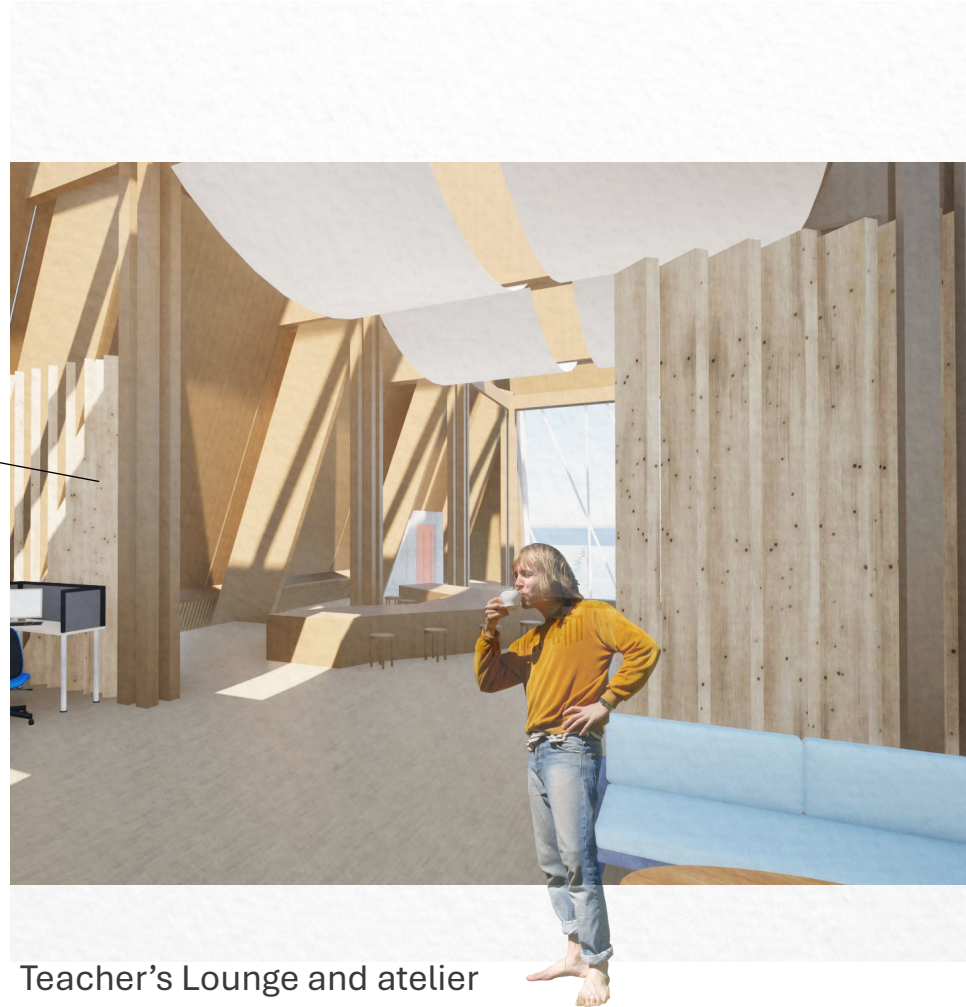
Willow Siding Panels



Daycare



Rotating Wall Partitions



Teacher's Lounge and atelier



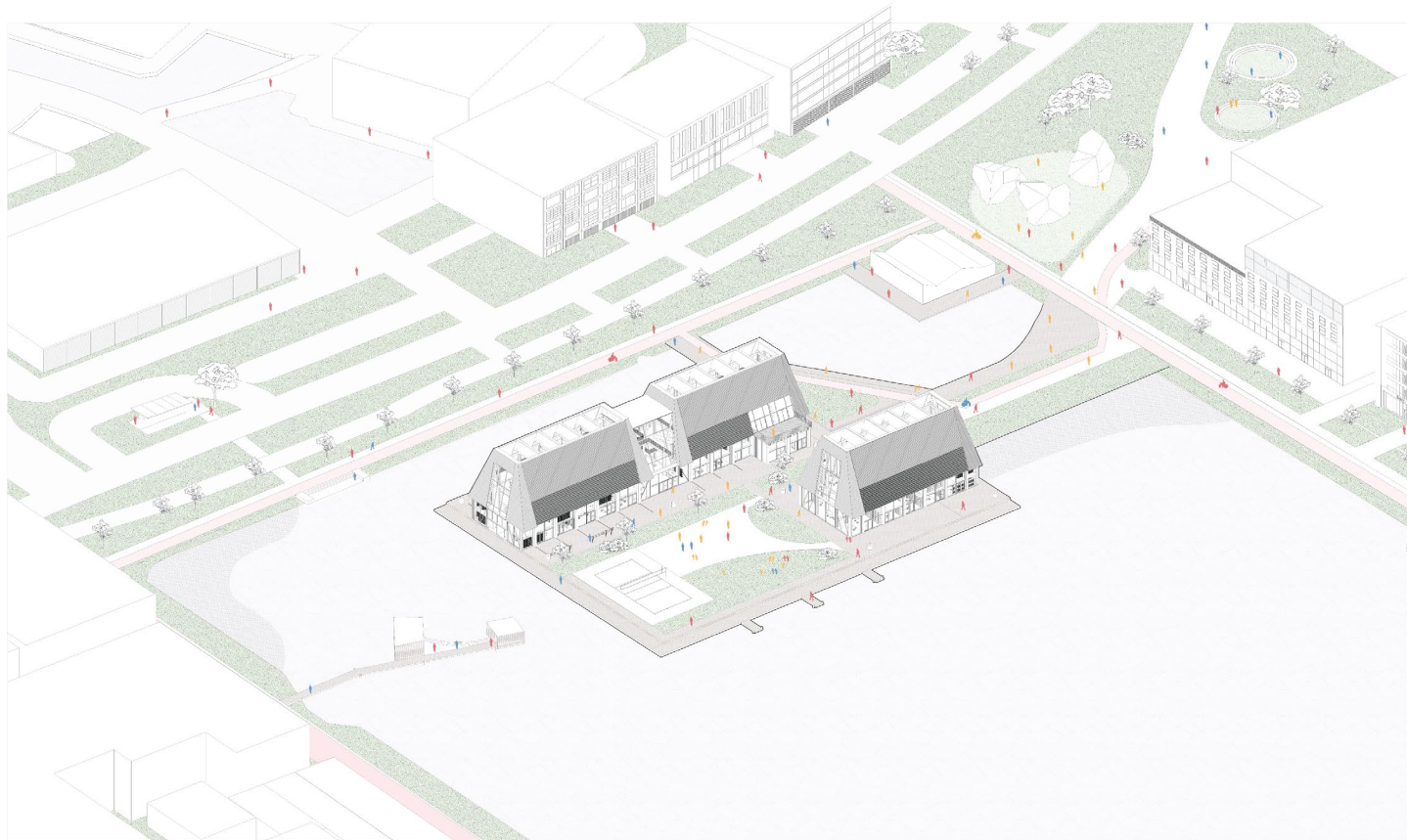
Kindergarten



Park Deck



Between the Modules and passage to the floating park



“How can non-residential infrastructure be effectively introduced into Dutch neighbourhoods in response to their evolving demographic needs through the use of timber construction?”