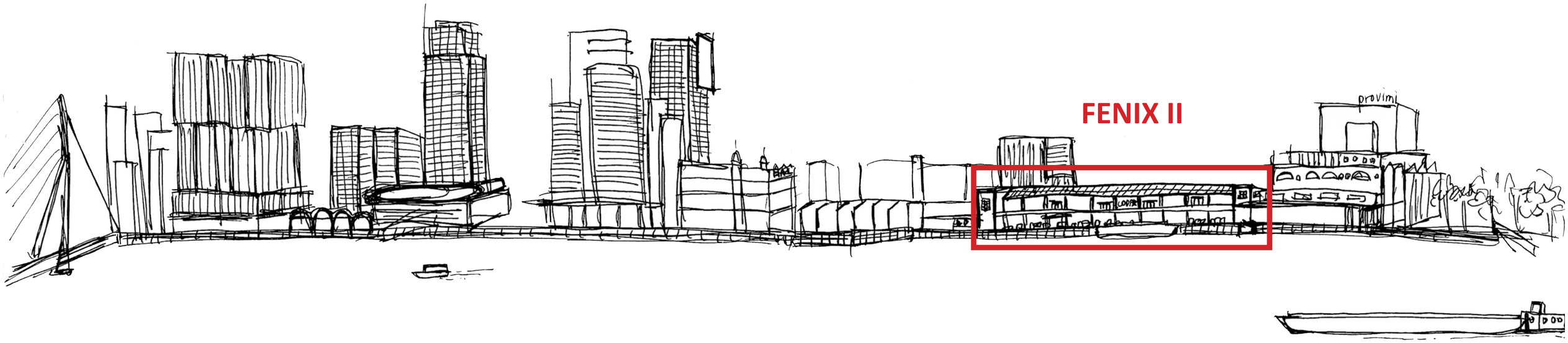
HA

HERITAGE & ARCHITECTURE

Rotterdam Industrial Harbour



P5 Presentation

4508297 Chieh-Hsin Cheng

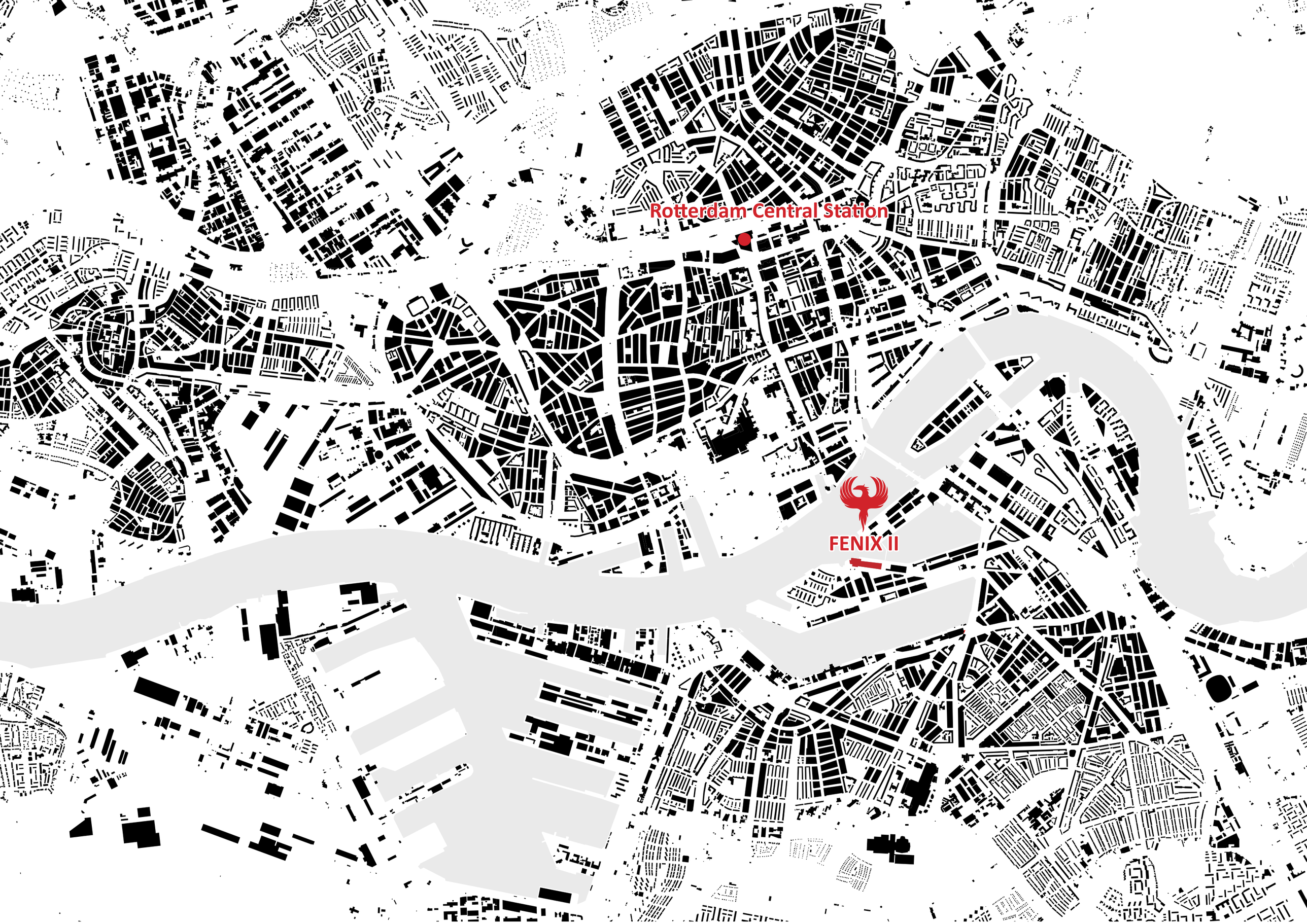
TUTORS
Lidy Meijers
Bas Gremmen
Nicholas Clarke

Index

Fenix II

The witness of Rotterdam active industrial harbour transformation

1951


Rotterdam Central Station
FENIX II

Research Question

Who is Fenix II?

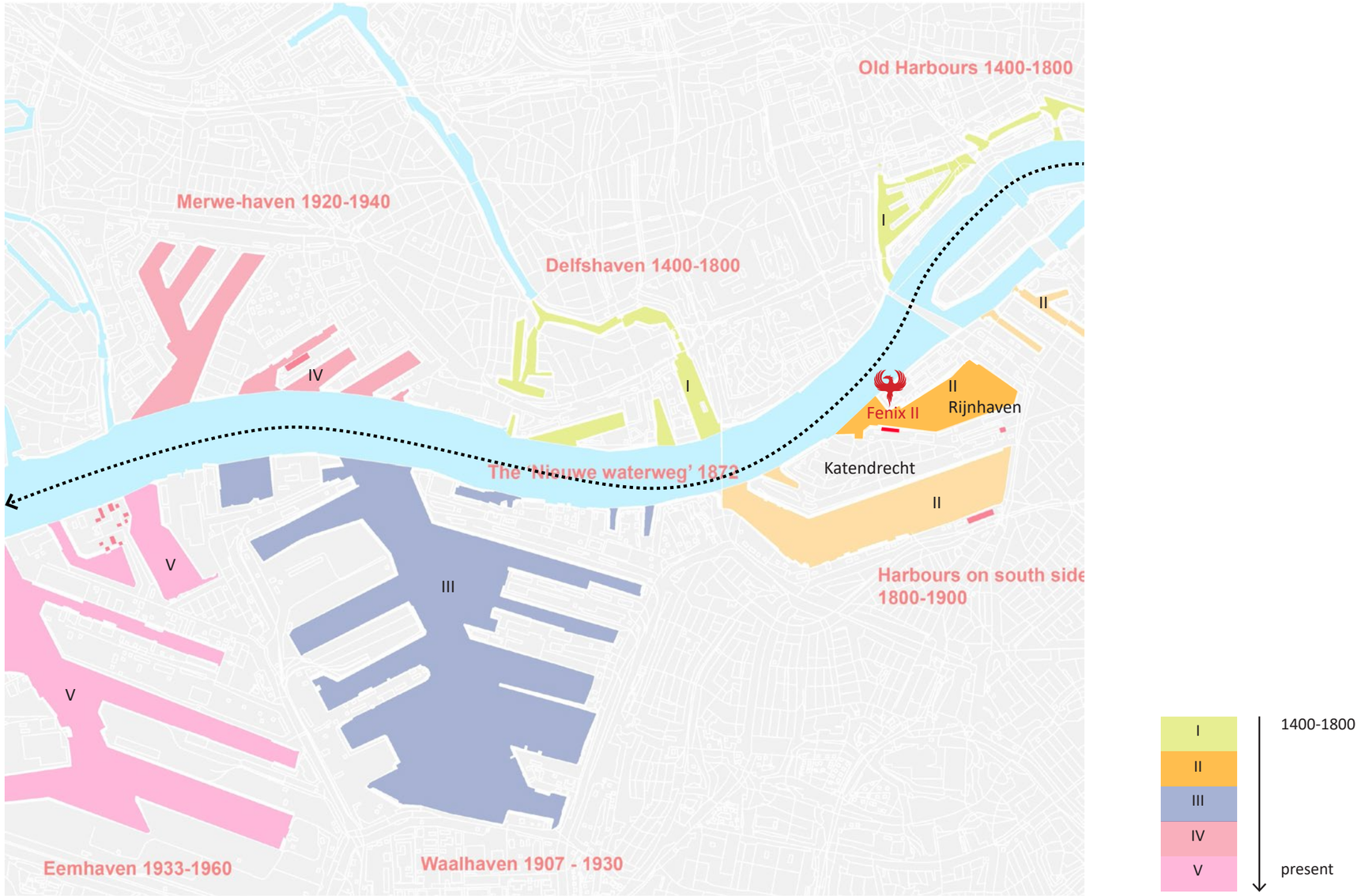
What is the hierarchy of existing values? During the intervention, which elements should be preserved, transformed or demolished?

What is the relation with the context?

History background

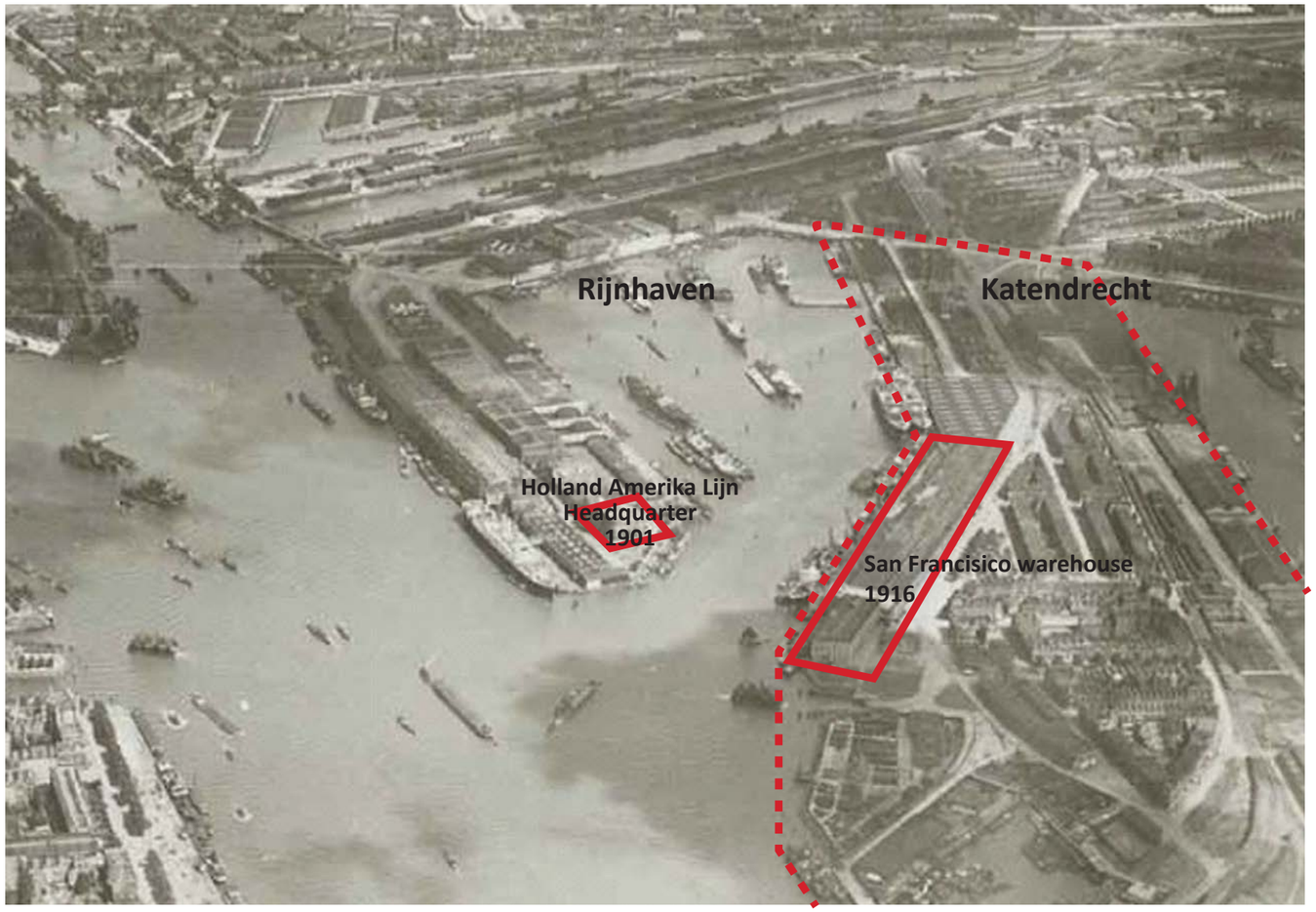
Rotterdam Harbor Development over Time

Rijnhaven as the second early developed industrial harbor



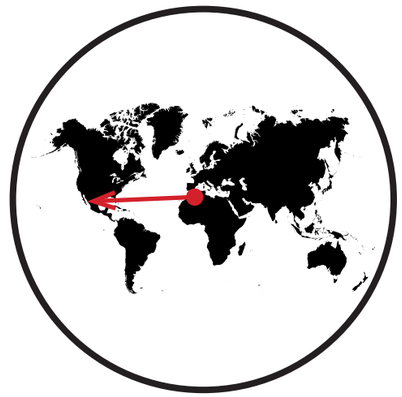
History background

Katendrecht-warehouses
Holland Amerika Lijn



Active industrial harbor

Reached out to America



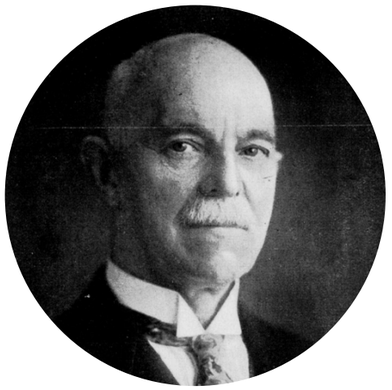
History background

San Francisco warehouse

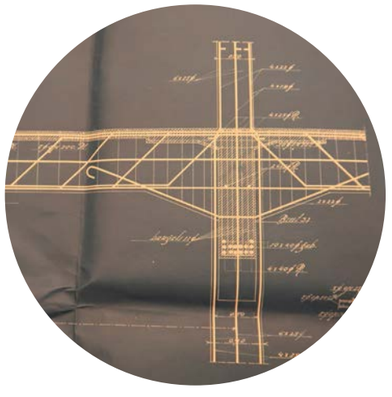
The longest warehouse in Europe at the time

Early stage of using reinforced concrete

C. N. van Goor



Reinforced concrete



History Background

Transformation of the building

Once an entirety

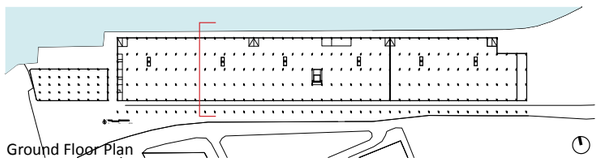
Phase I

1916-1922

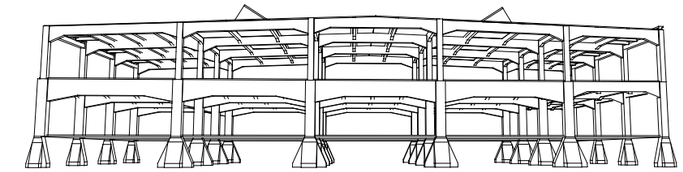
San Francisco Warehouse

1922

Completion



Ground Floor Plan



North side(waterfront) South side (Deliplein)

Phase II

1944-1951

Fenix I and Fenix 2

1944

WWII

Quay side damaged

1947

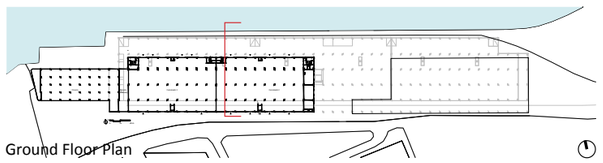
Fire Damage

1951

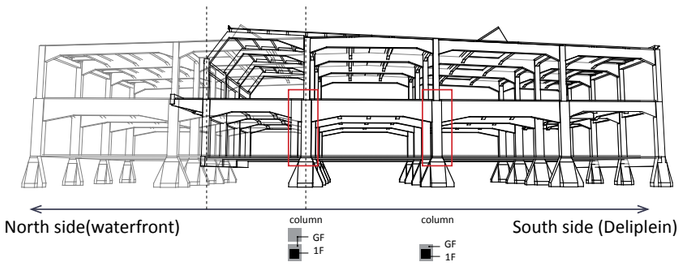
Fenix I and Fenix II

1969

Provimi Factory



Ground Floor Plan



North side(waterfront) South side (Deliplein)

Phase III

2012-2014

Fenix I- New programs

Fenix 2- Dwellings

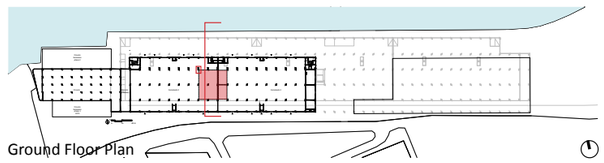
2014

Food Factory

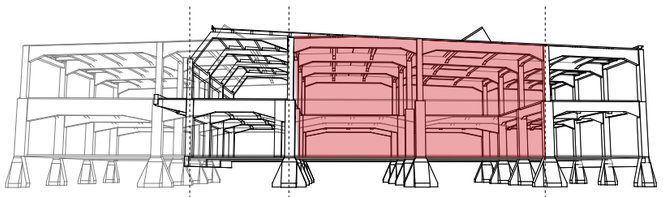
circus

Codarts

...

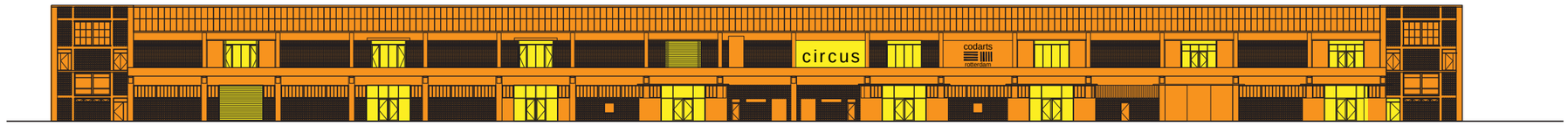


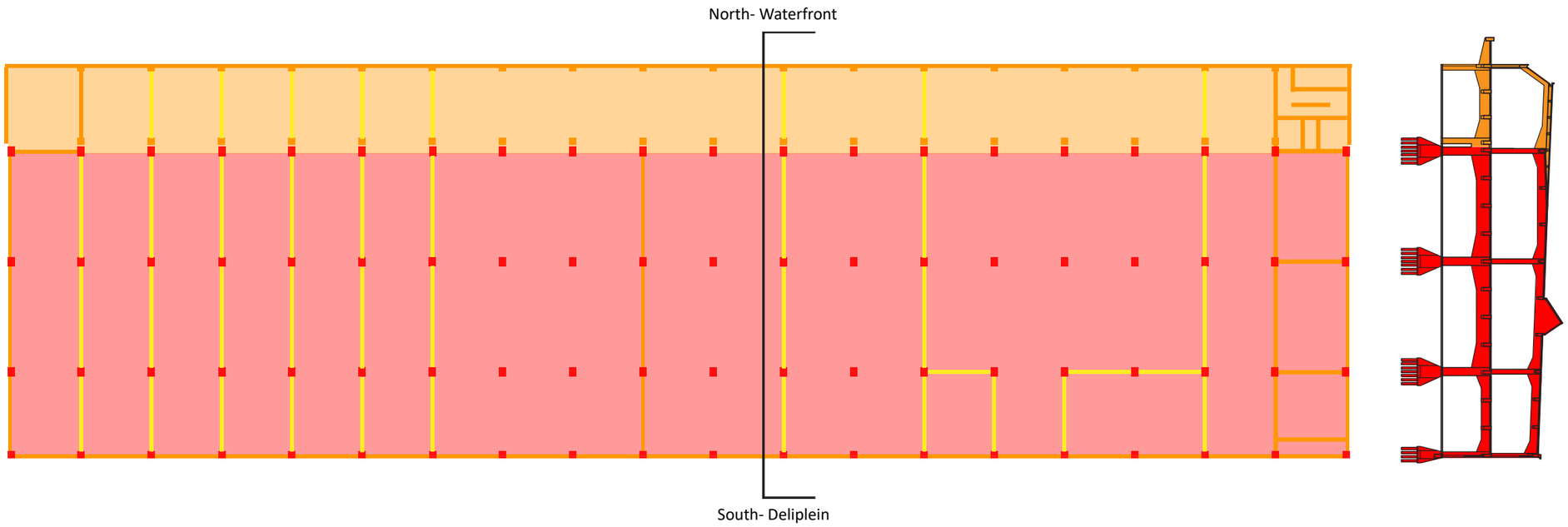
Ground Floor Plan

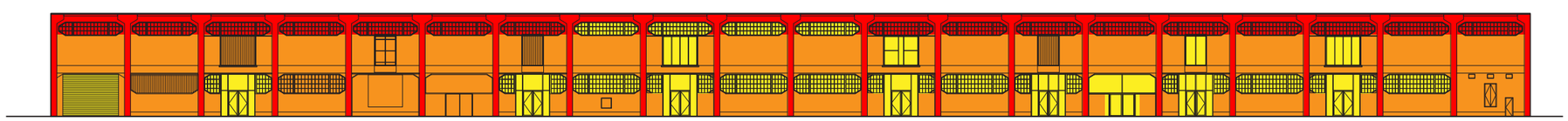


North side(waterfront) South side (Deliplein)

Chronomapping







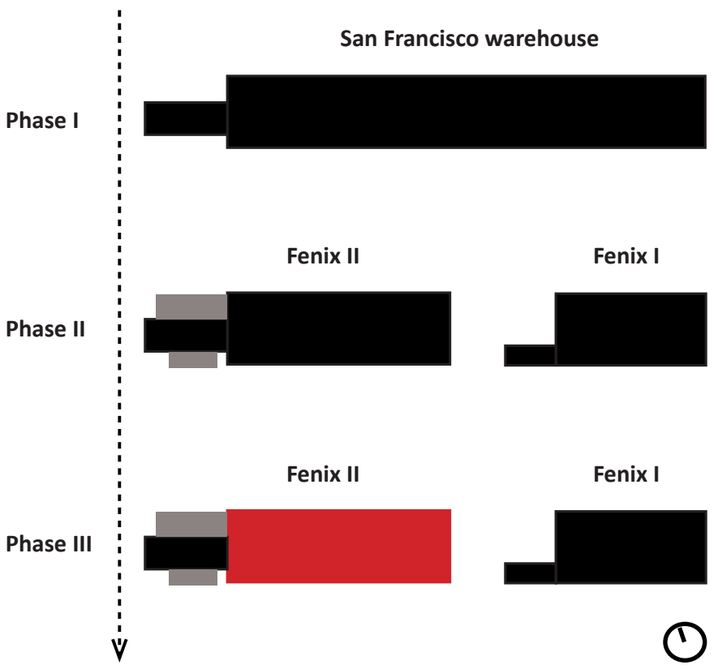
1916

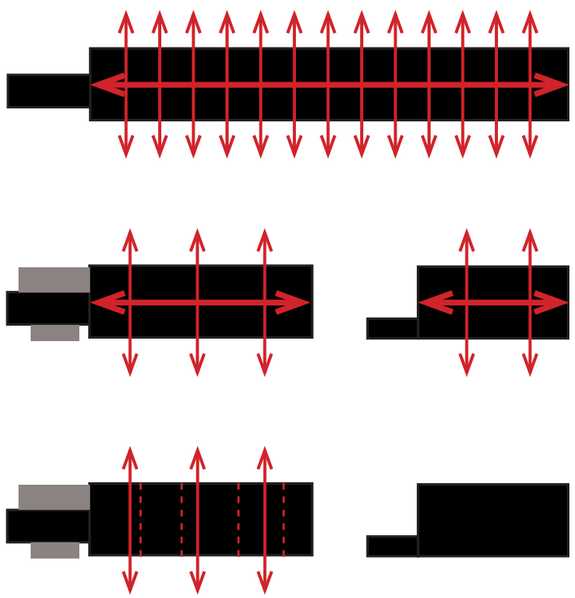
1951

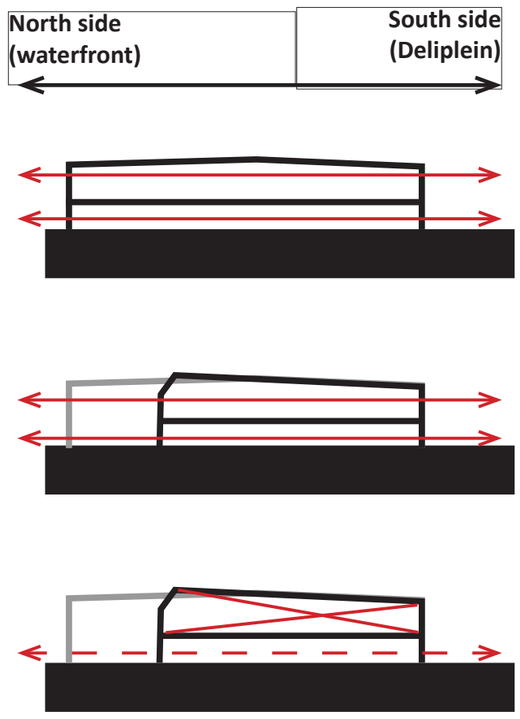
2014

History Background

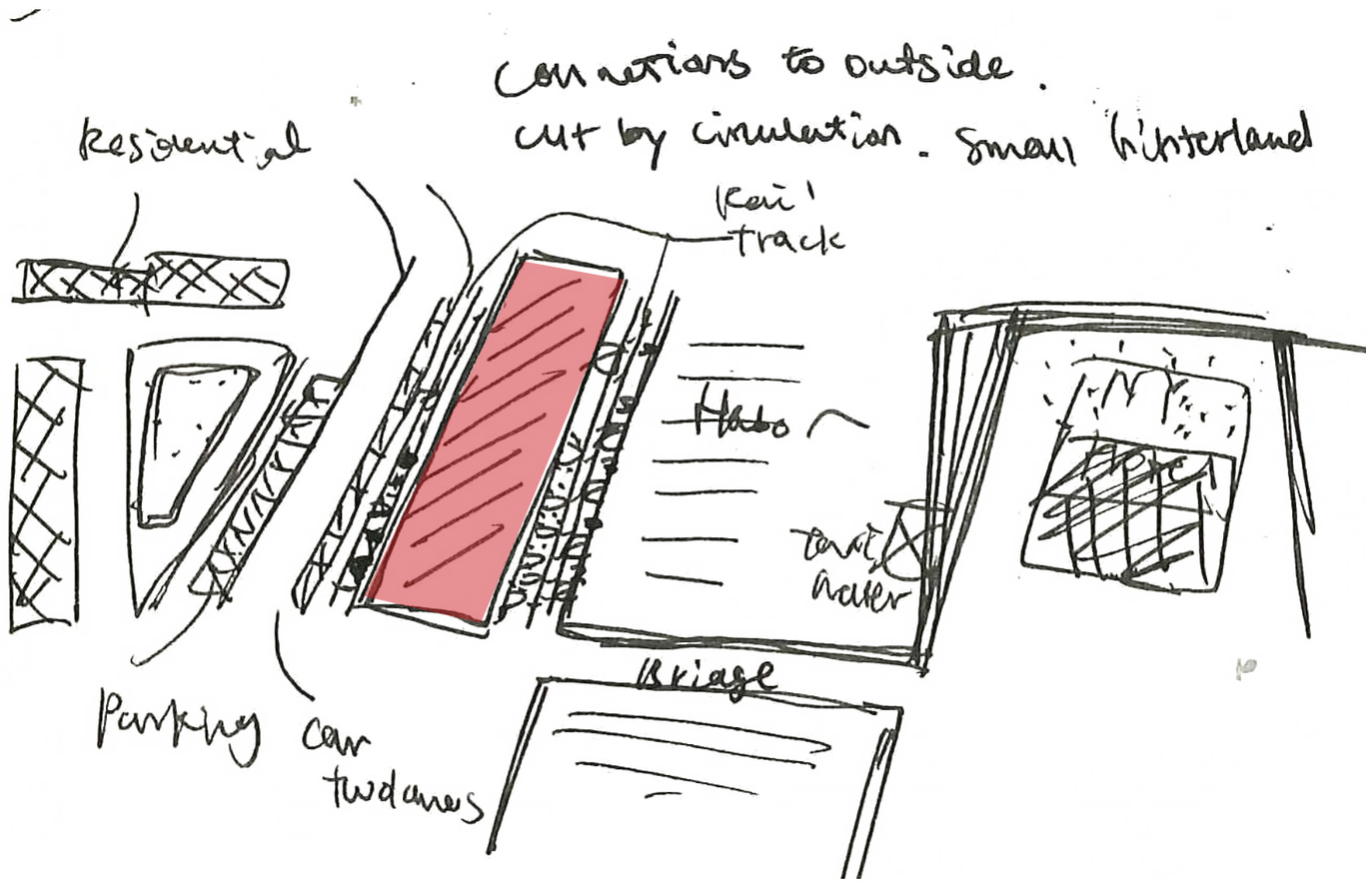
Transformation of the accessibility and axis

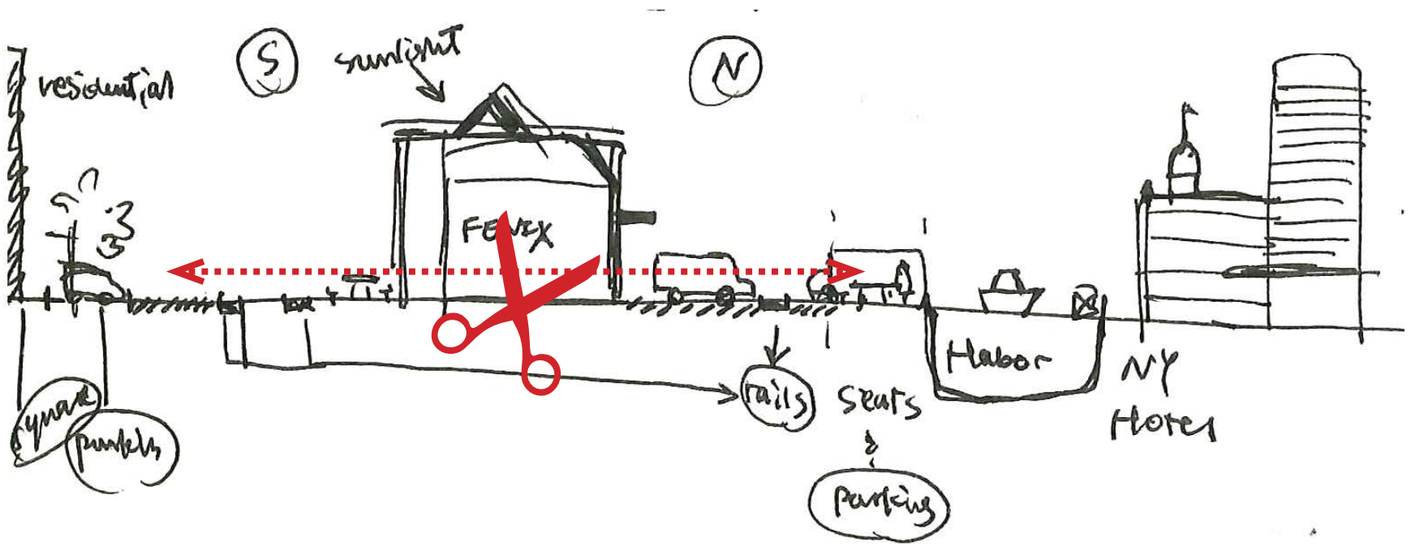






Surroundings





Character of Fenix II

First thing to notice on facade

On the south façade
The repetitive rhythm
The shape of the columns
The shape of the window

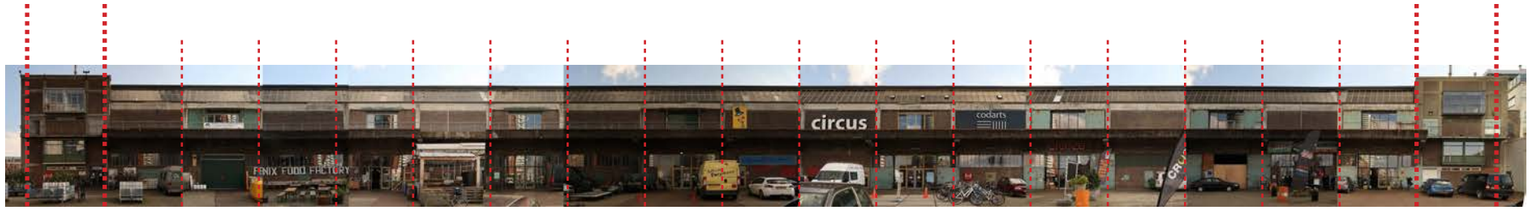
On the north façade

The consistent side window on the first floor

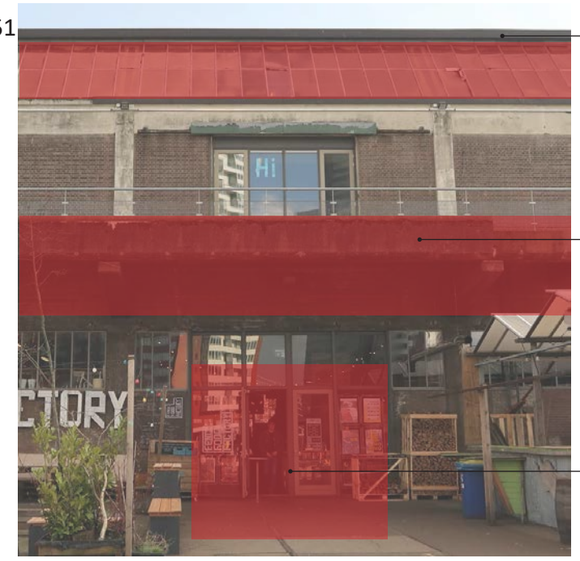
South facade (Deliplein) 1916

Shape of the column
Color of the column

Shape of the window



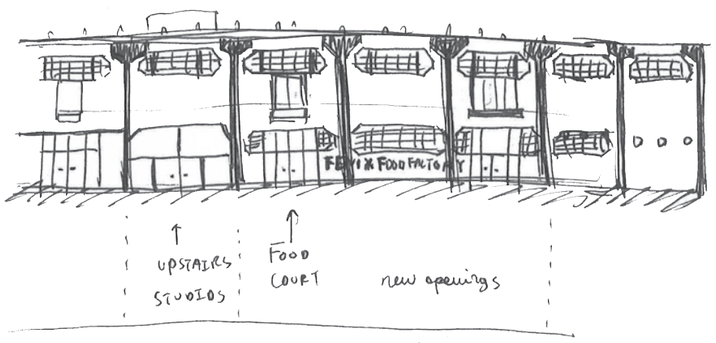
North facade (waterfront) 1951



Side window all along the building

Extended balcony and its structure

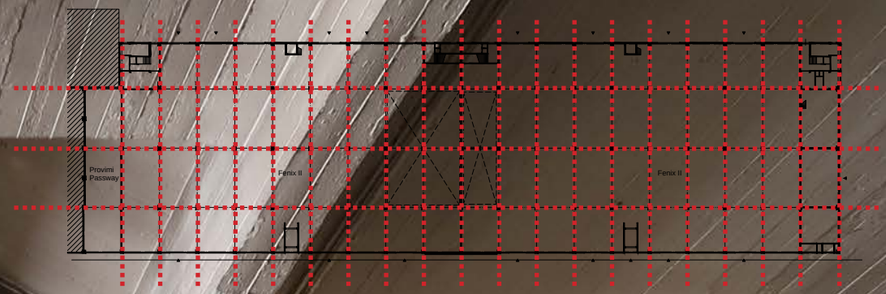
Huge opening as entrance



Character of Fenix II

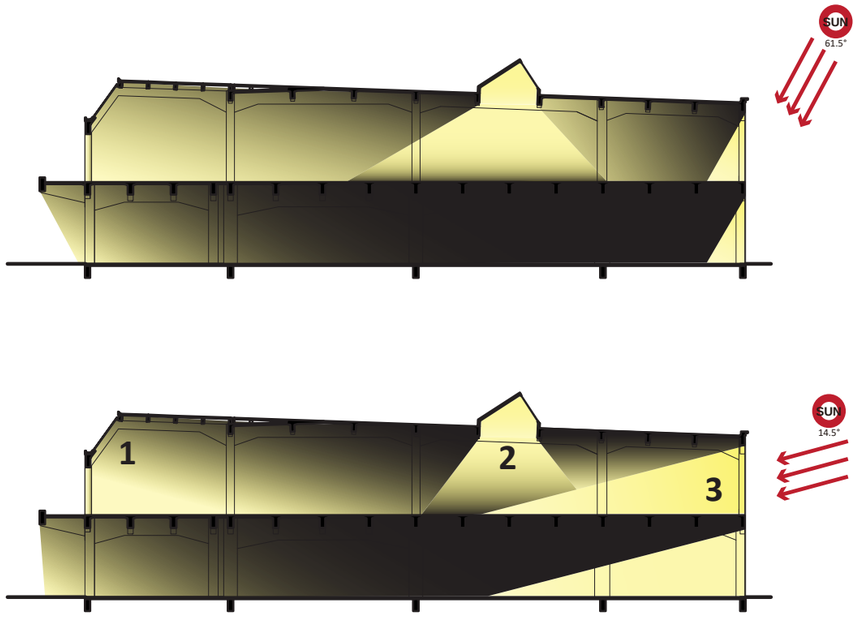
Repetitive Open space

Similar space experience



Character of Fenix II

Natural day light introduce



1

2

3

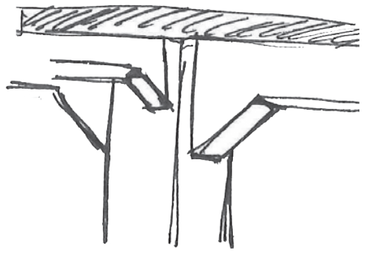
Character of Fenix II

Reinforced concrete

Trance of concrete casting

Aesthetic aspects

Monolithic reinforced concrete-casted on site 1916

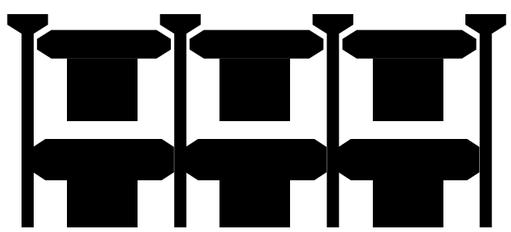


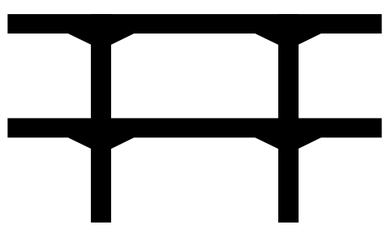
Pre-fabricated concrete 1951

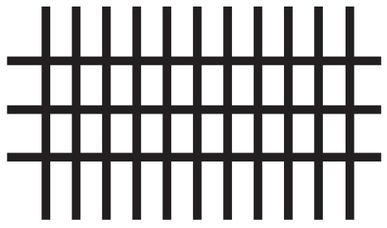
New and Old Joint

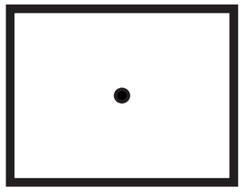
Cultural Valuation

History layers
Façades
Structure
Rhythm
Repetition
Openness

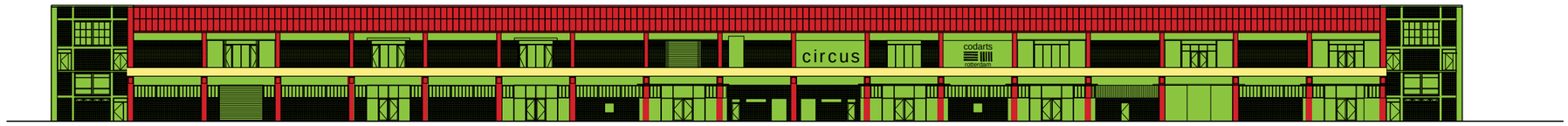


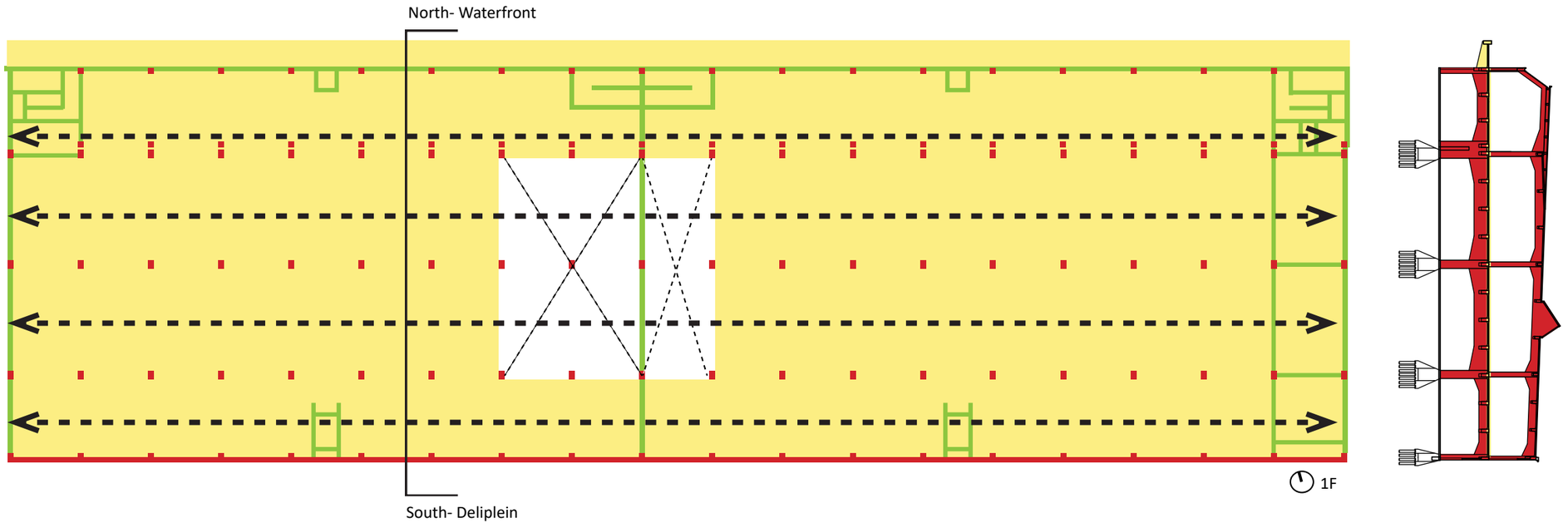


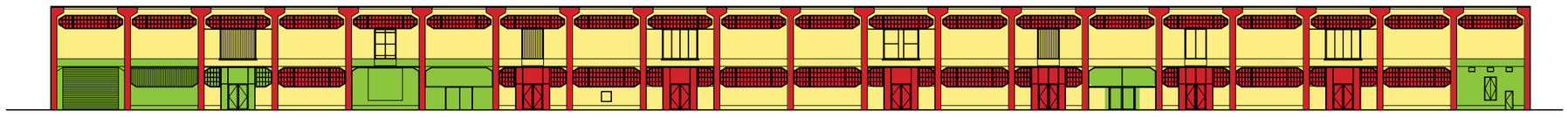




Cultural Valuation





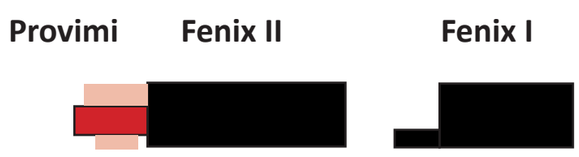


High values Original element- façade, structure

Medium values Flooring and partial south facade

Low values

Current Neighbors



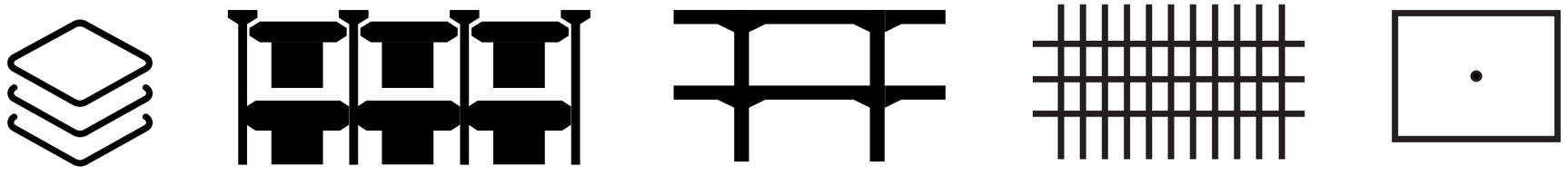
Provimi Factory

One last trace of industrial activities in Katendrecht
Possible to relocate

Fenix I

New dwelling complex
Expected to be completed in 2018.
130 units, from 81 to 186 m²

Cultural Value Statement



Fenix II, *she* is the witness of Rotterdam industrial harbor transformation over time.

She represents the growth of Rotterdam industrial harbor.
She was once the longest warehouse in Europe.
She shows the modernity of applying cutting edge building technology by using reinforced concrete.
She is a strong survivor from both WWII and on-site fire damage.

Fenix II states important valuable layers: historical, cultural, technical, non-intentional commemorative, and rarity aspects. Even though Fenix II is not yet listed on Rotterdam municipality monuments, the characters and facts found in the building prove the importance of Fenix II.

Fenix II, *she* continues *her* journey to the new phase of Rotterdam industrial harbor.

Design Question

How can Fenix II act as a driver to revitalize the glory history layers of liveliness from previous industrial harbor?

Sub Questions

What will be the new identity of Fenix II?

How to reconnect the entirety of San Francisco warehouse? How to show the continuity within the aspects of forms and functions?

With urban transformation, in which forms of natural elements can provide better relation and integration to the city context.
How can these natural integrations influence public health and surrounding quality?

Starting Points

Urban continuity

Urban life cluster

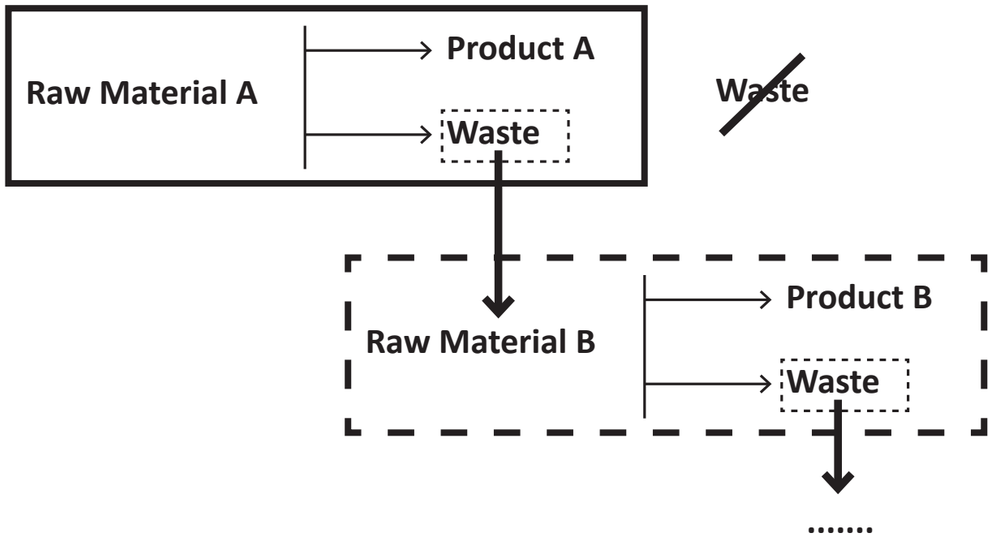
Rotterdam Central Station

FENIX II

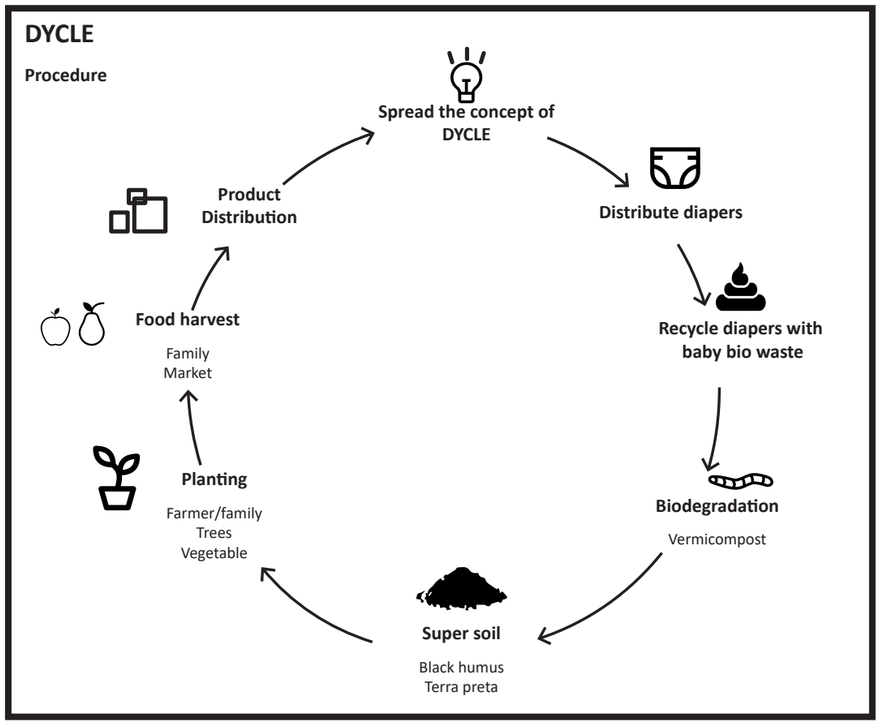
Circular Economy

Existing current programs- Tropicana and RTM Campus
Turning phase of industrial nature

Concept



Research Lab Example



Knowledge Exchange
Small working space

Starting Points

Urban continuity

Innovation cluster

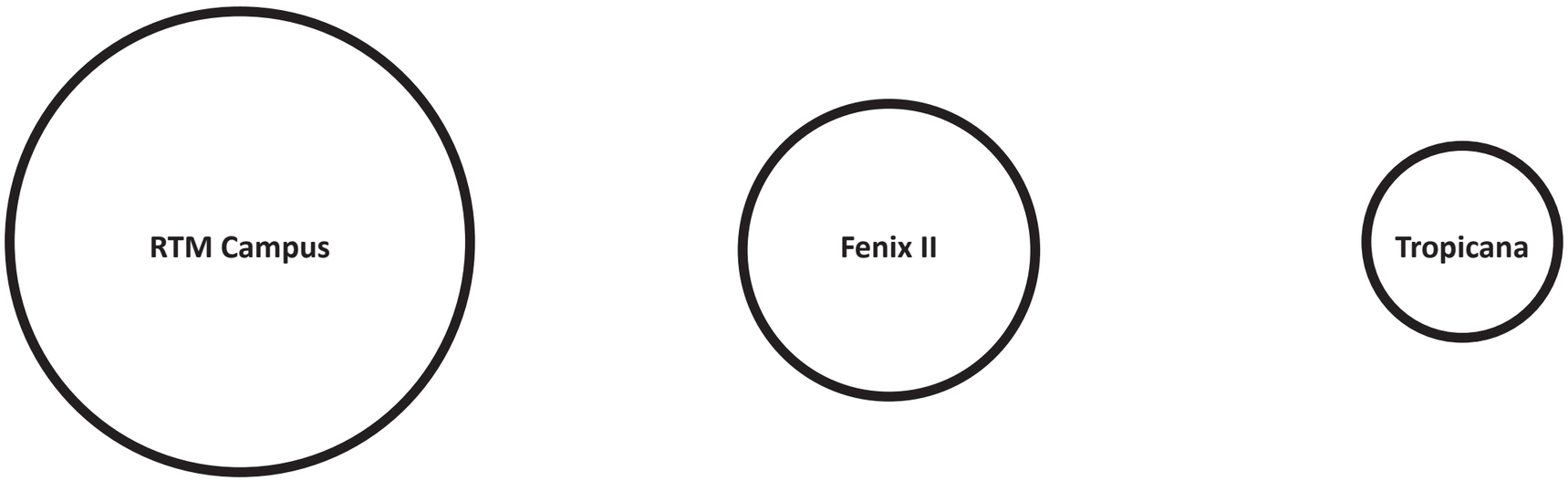
Tropicana

FENIX II

RTM Campus

Innovation Cluster

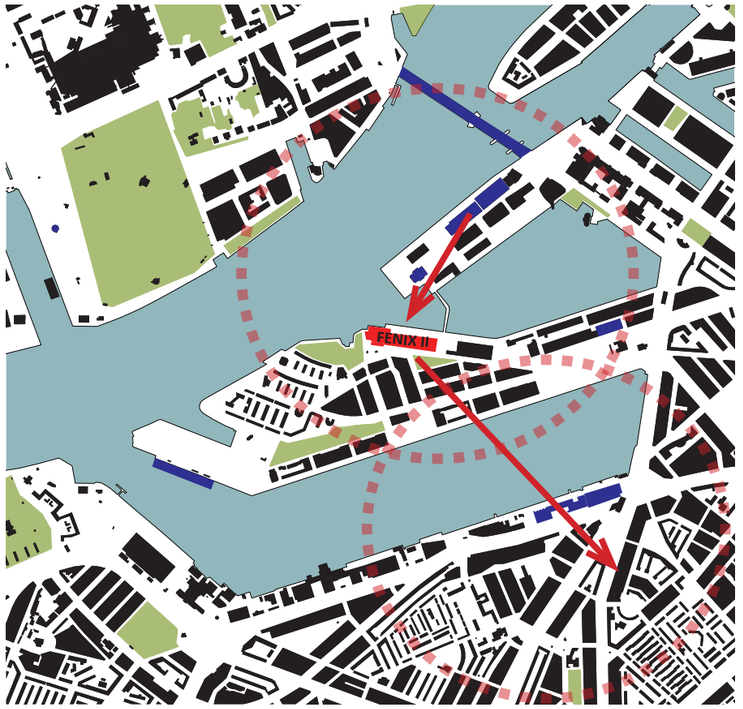
Cultural and educational gathering point
from the south of Maas River



Education	Leisure	Commercial
Large machinery space (Innovation Dock)	**Exhibition**	Small research office
Medium research office	**Large research office**	Small research labs
	Research Labs	
Workshops	Workshops	Events
Events	Events	Lectures
Lectures	Lectures	Café
Canteen	Café	

Starting Points

Continuity
Entirety
Pubic programs required



Residential
Commercial
Factory
Office
Hospital
Leisure
(museum, theater)

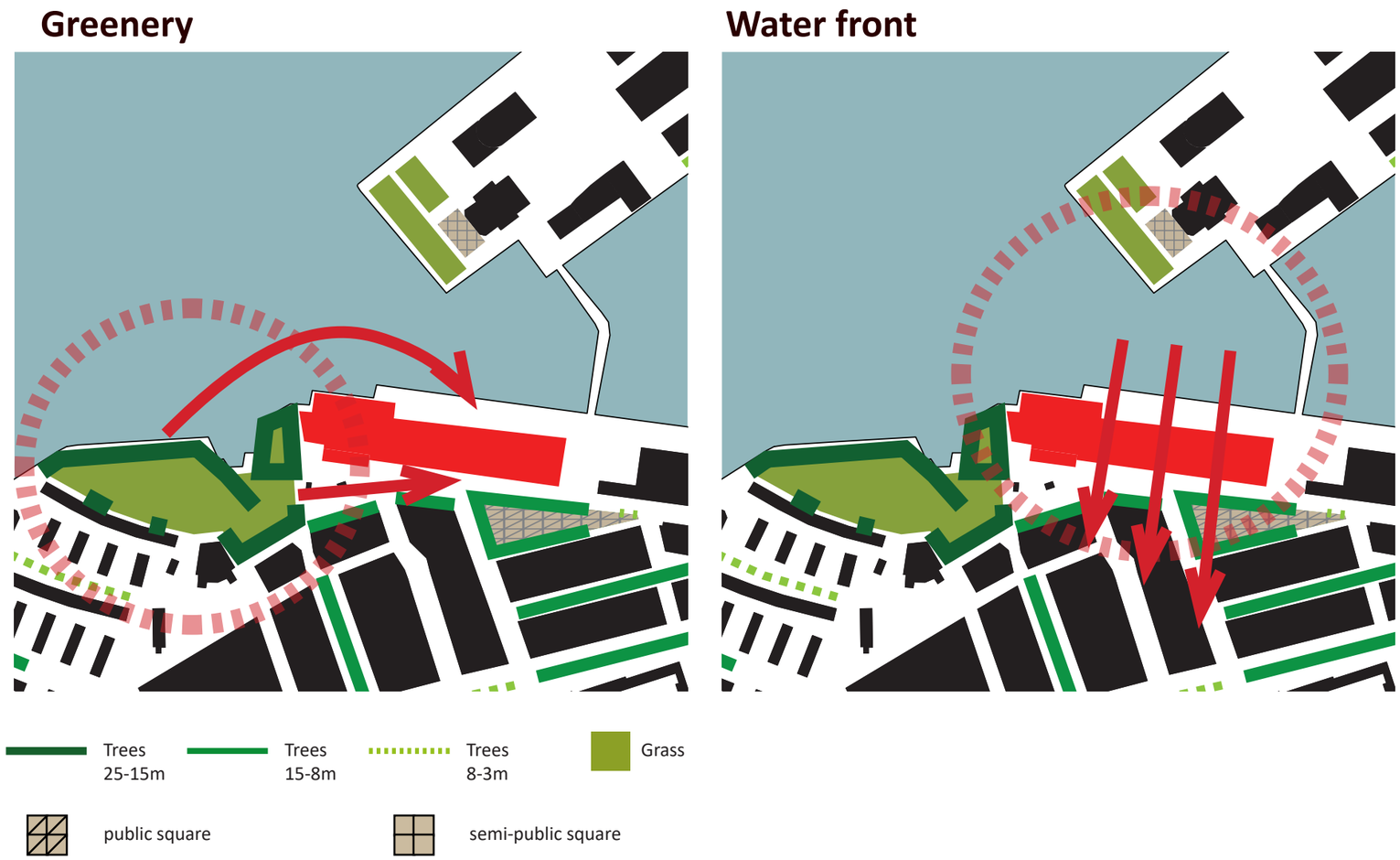
Landmark

Public
Semi-Public
Private

Starting Points

Continuity

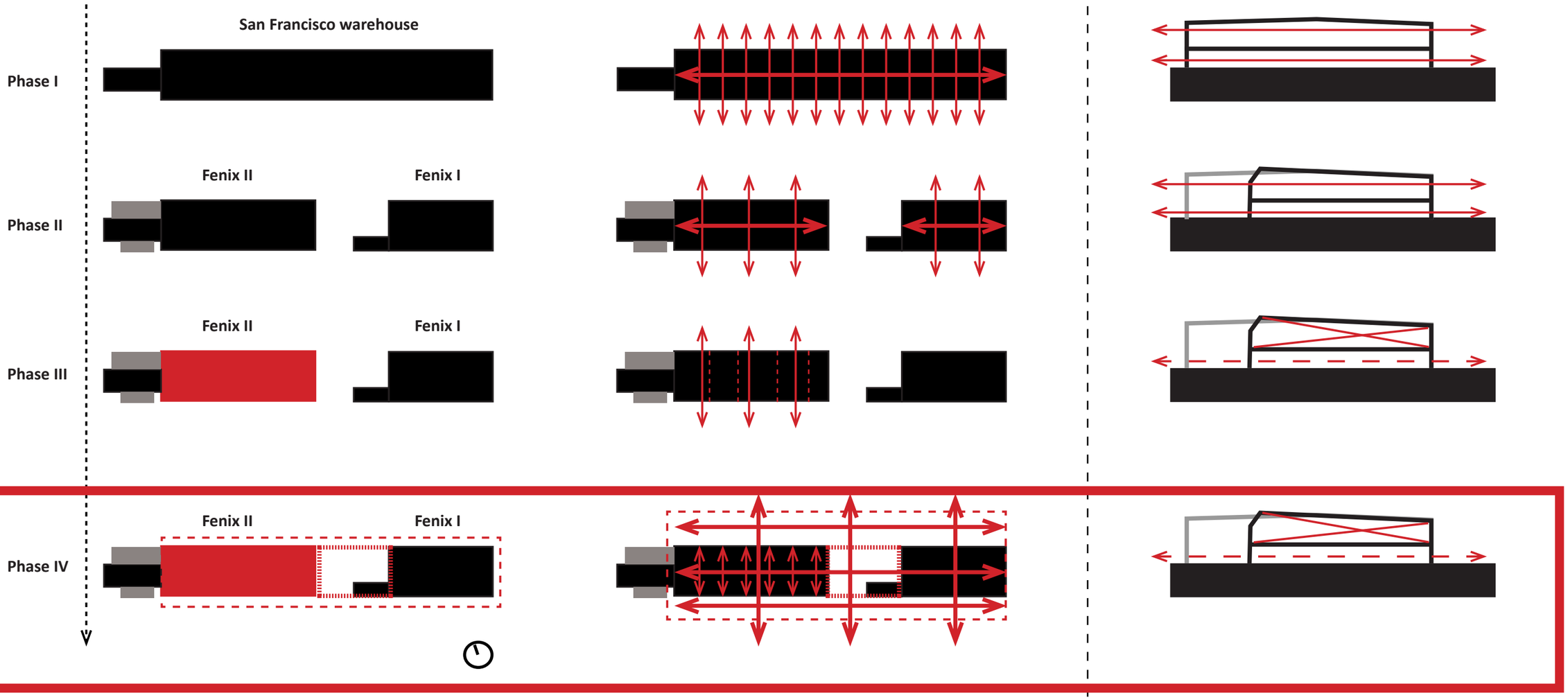
Entirety



Starting Points

Continuity

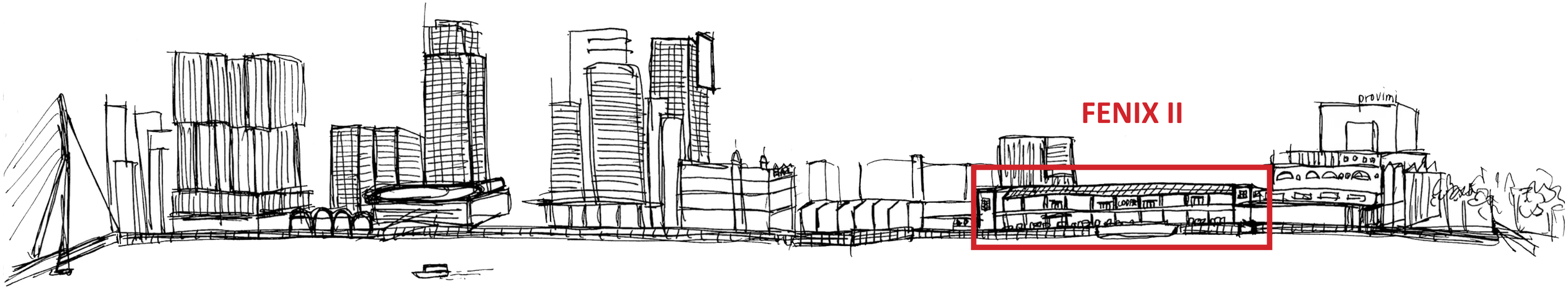
Entirety

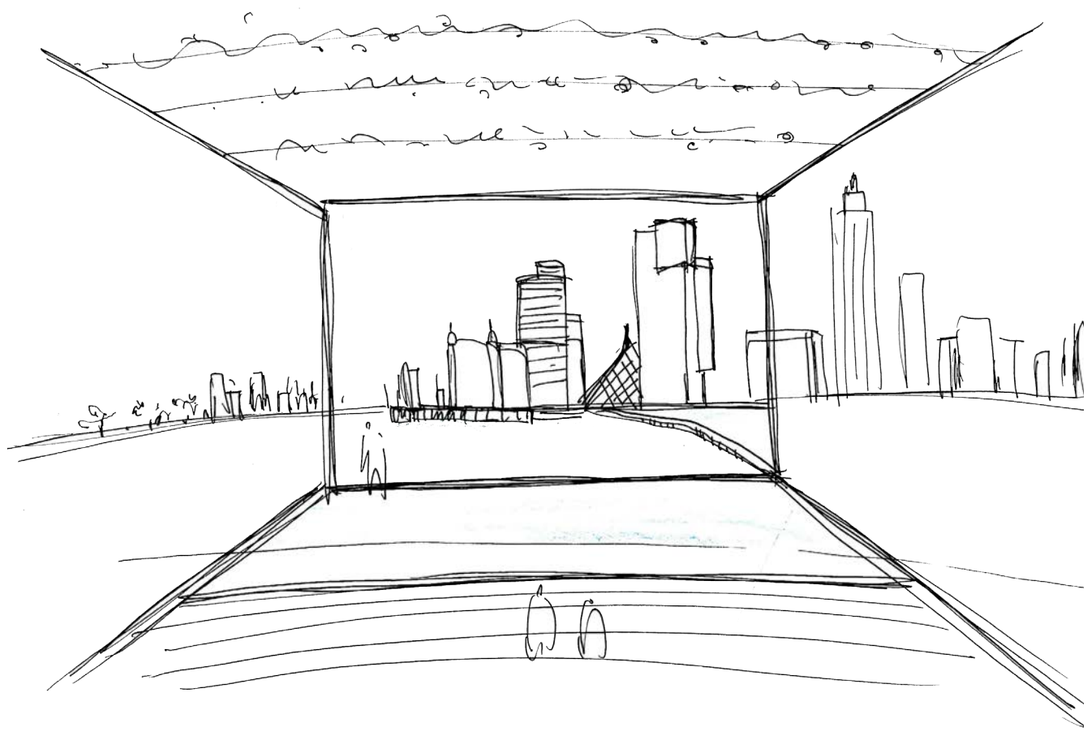


Starting Points

Continuity

Entirety

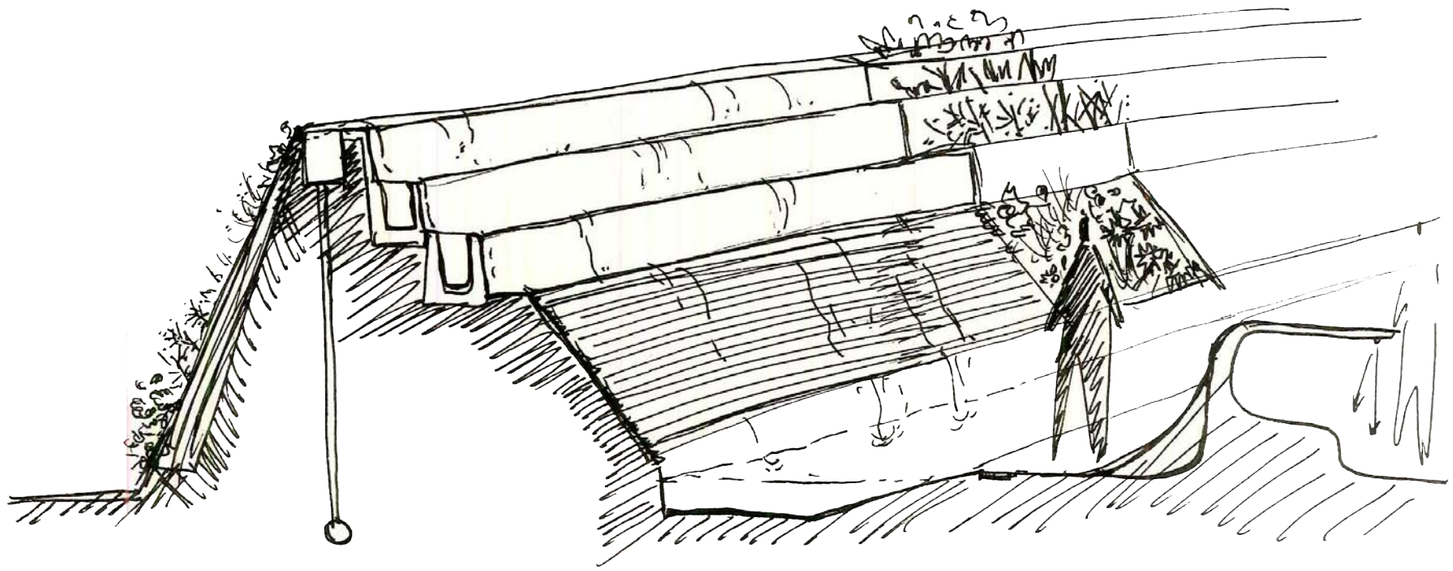




Visual continuity

Inspiration

Integration with different natural elements
Increase public health

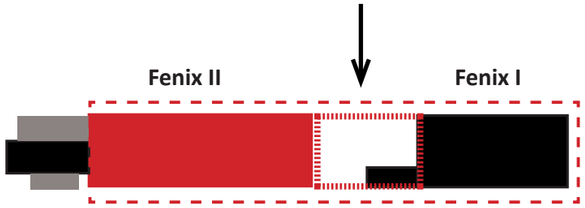


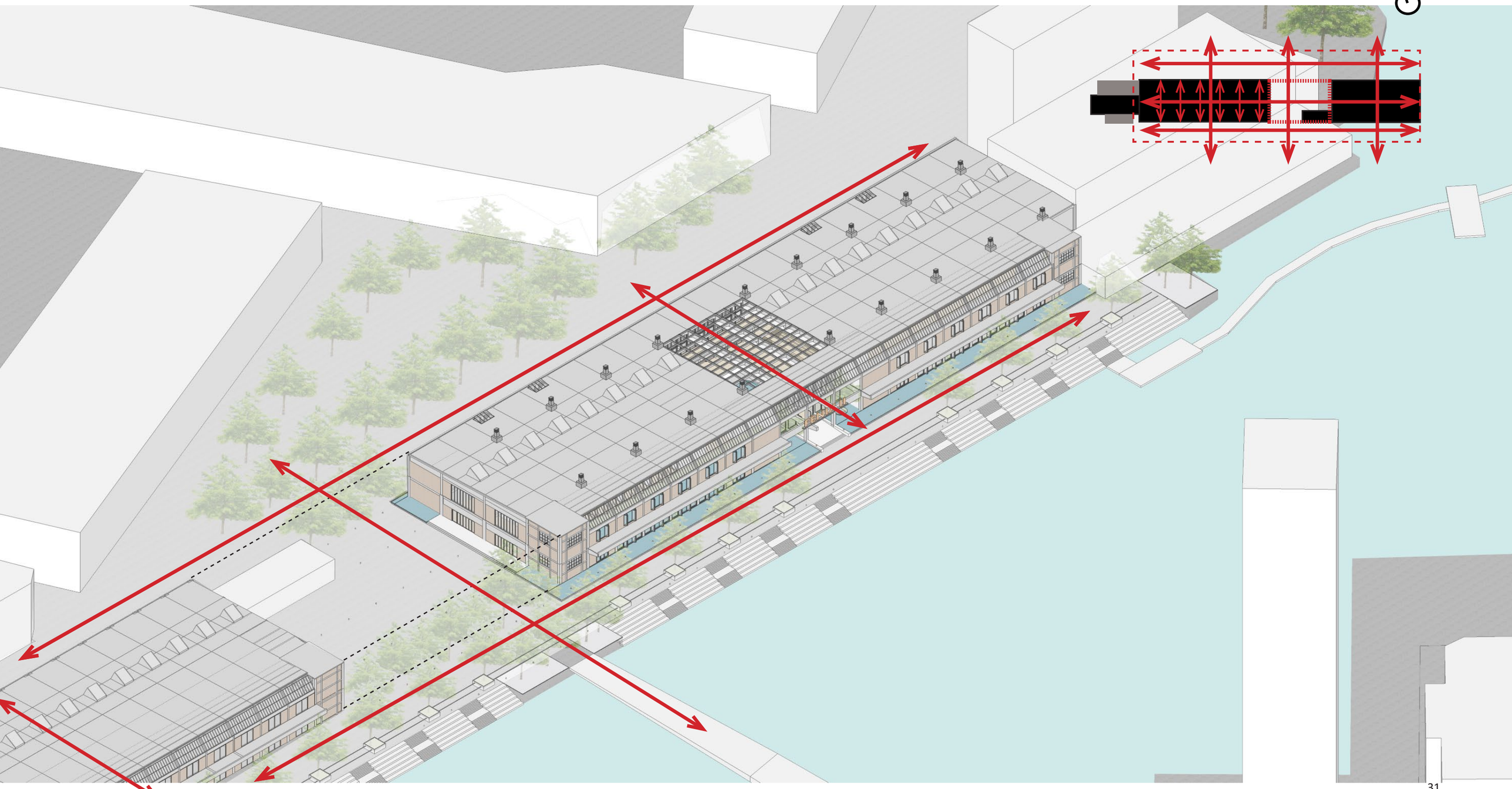
Intervention

Master Plan

Continuity

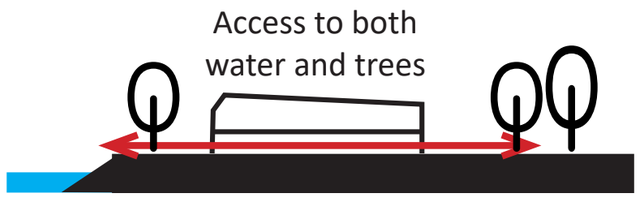
Entirety





Circulation

Continuity
Entirety
Pedestrian
Traffic
Leading visitors with water and trees



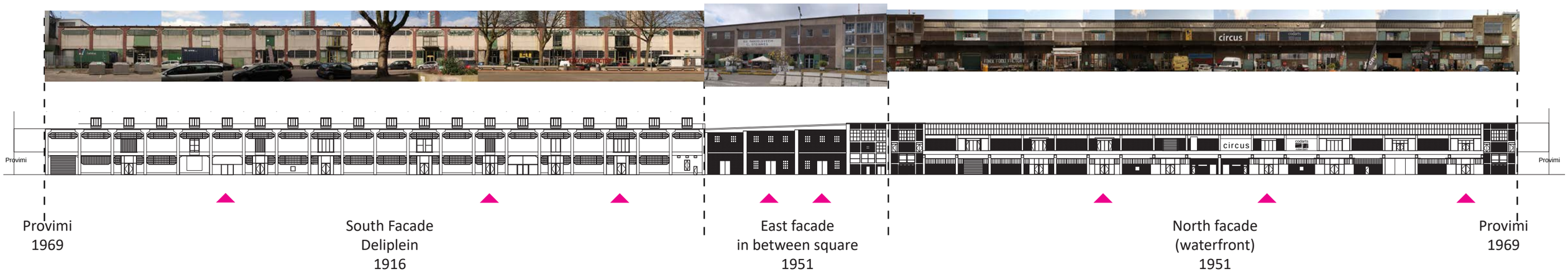
Car way
Residential area
Car-Free Zone
water bus
Temporary Car Access
Car-Free Zone
Car-Free Zone
Kop van Zuid

Intervention

Façades

Entrance

Existing Facade



Provimi
1969

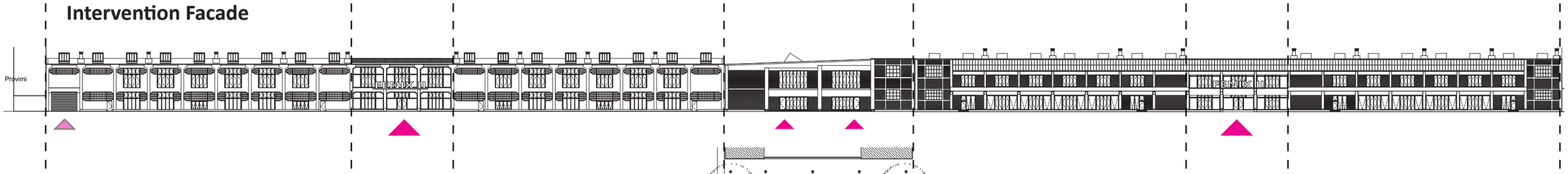
South Facade
Deliplein
1916

East facade
in between square
1951

North facade
(waterfront)
1951

Provimi
1969

Intervention Facade

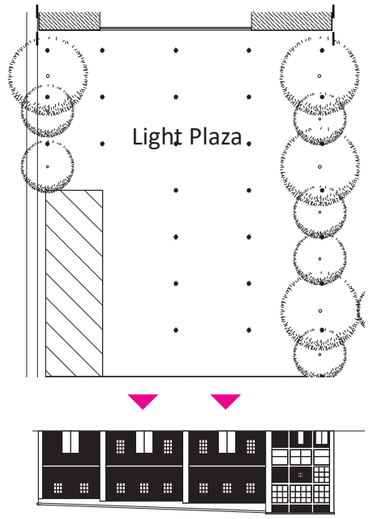


Provimi

Central Green

Central Green

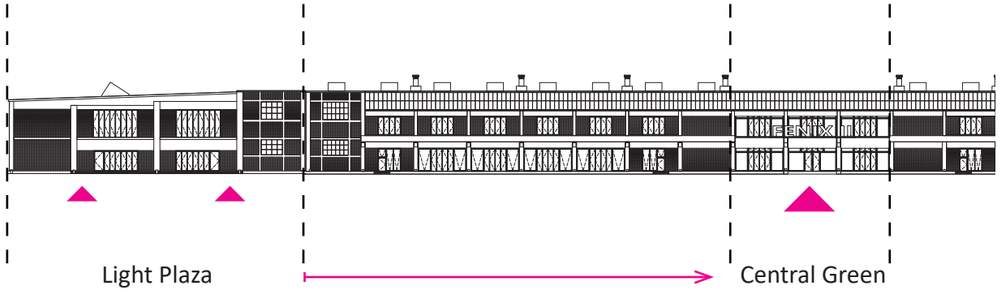
Provimi

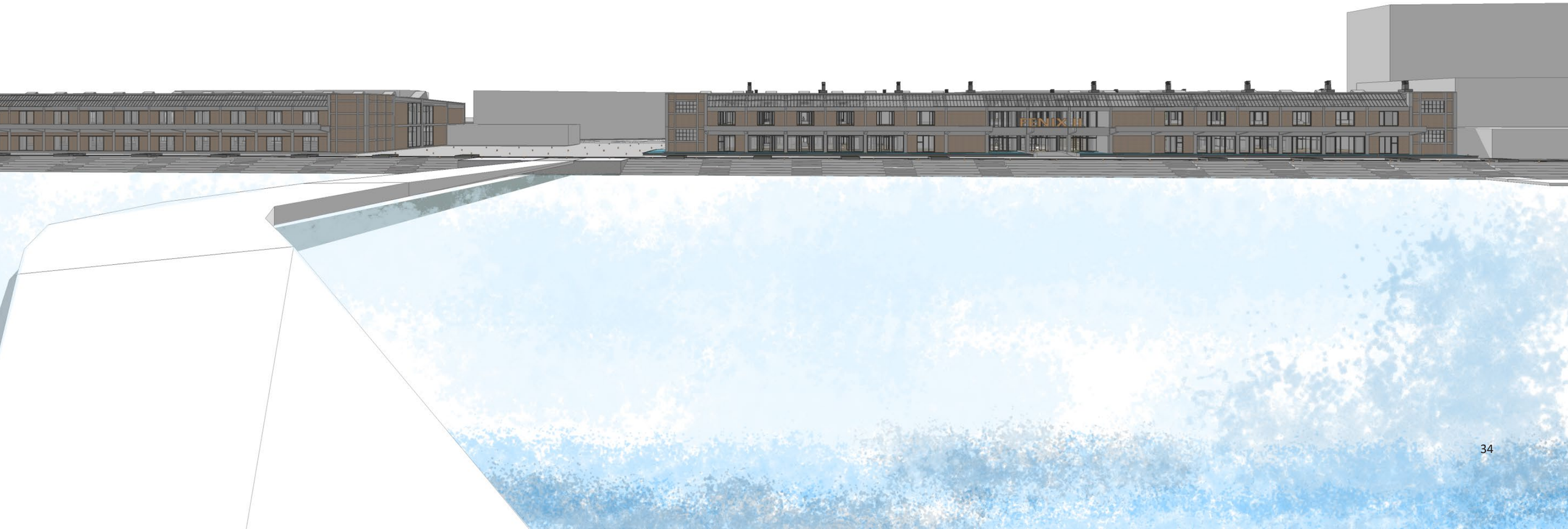


Fenix I

Circulation

North façade
Waterfront entrance
Main pedestrian flow
Visible entire façade



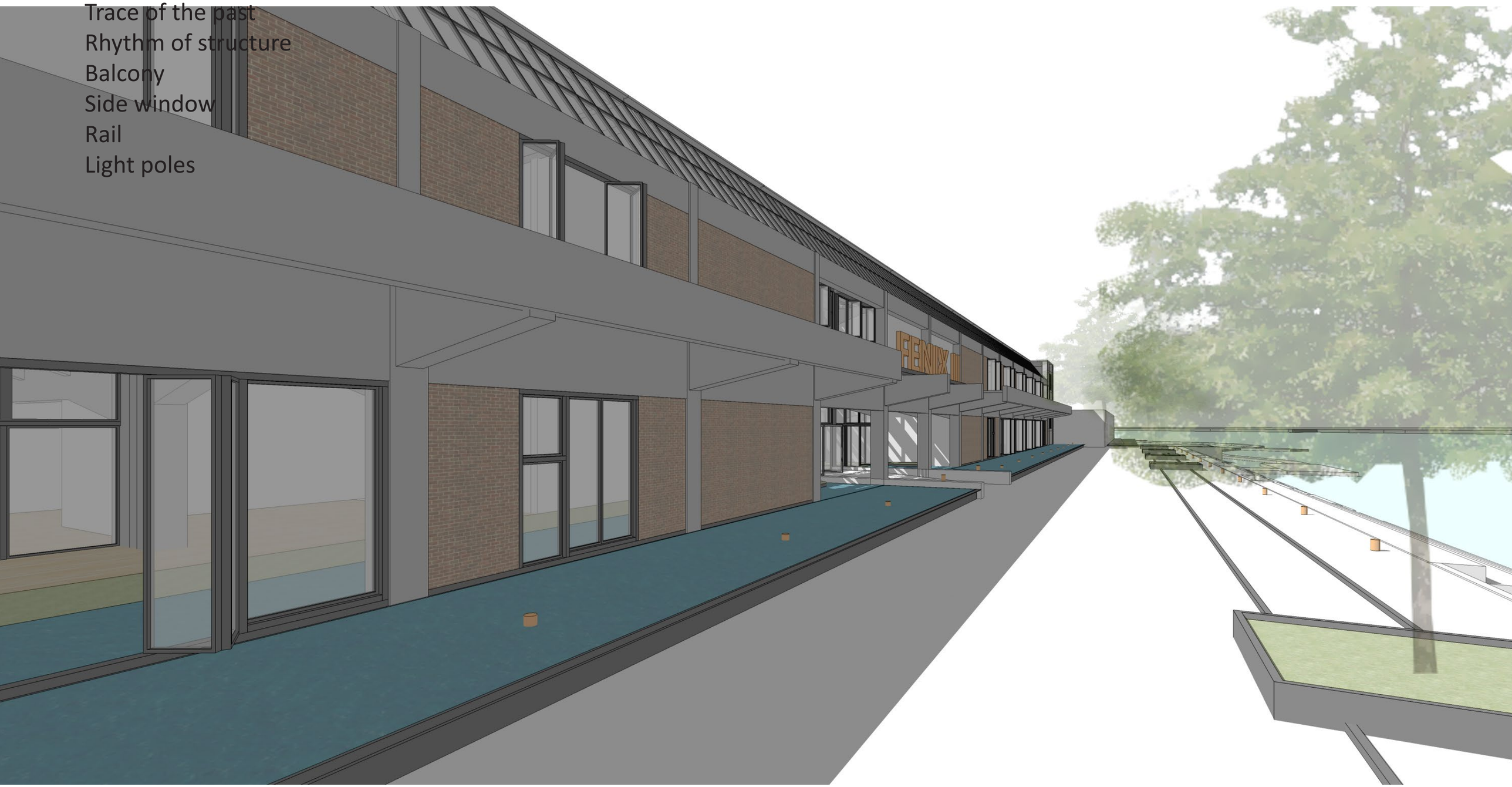


Intervention

Light Plaza/ Temporary exhibitions events
Waterfront
Trace of the past

Intervention

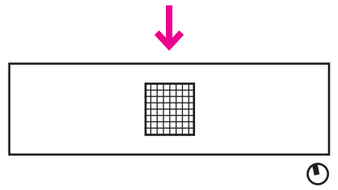
Waterfront
Trace of the past
Rhythm of structure
Balcony
Side window
Rail
Light poles



Circulation

North façade

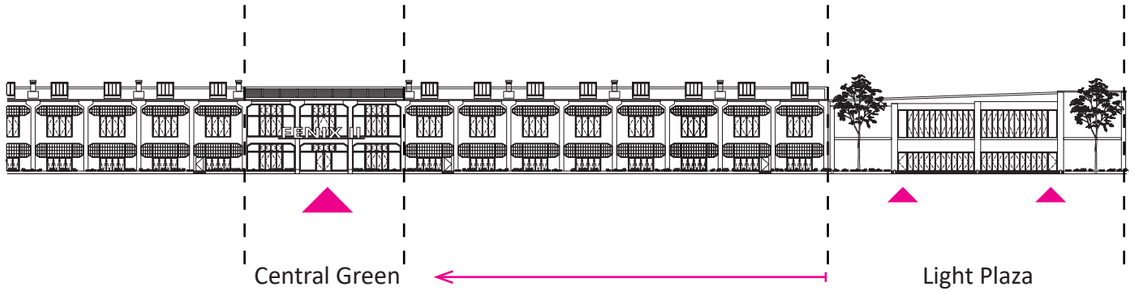
Waterfront entrance



Circulation

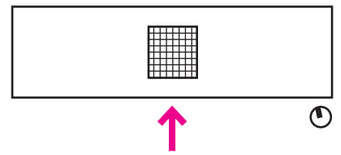
South Façade

Deliplein Entrance
Original Façade Elements
Rhythm of structure
Rhythm of openings



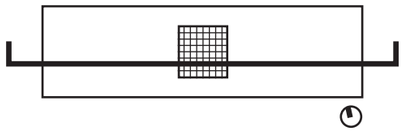
Intervention

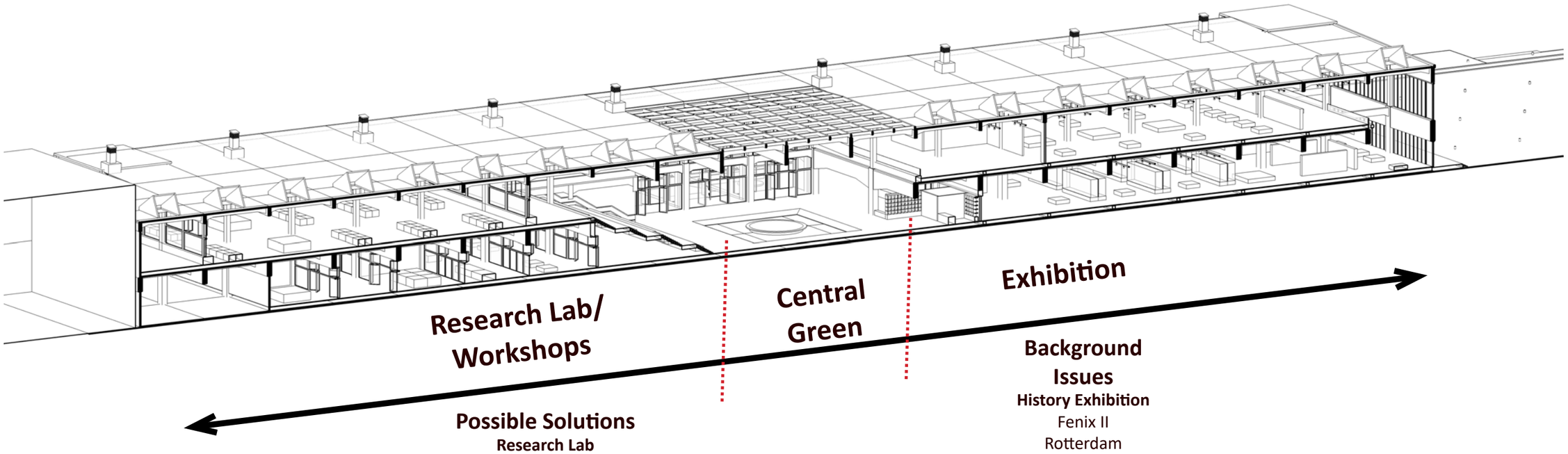
South Entrance
Original Elements
Guided by light



Programs

Fexix II- Innovation Cluster of circular economy





Possible Solutions

Research Lab
Workshops
Explore Labs
Harvest Hub
Food pick-up shop

Background Issues

History Exhibition
Fenix II
Rotterdam
Industrial Harbor
Exhibition shop
Harvest Hub
Cafe

Intervention

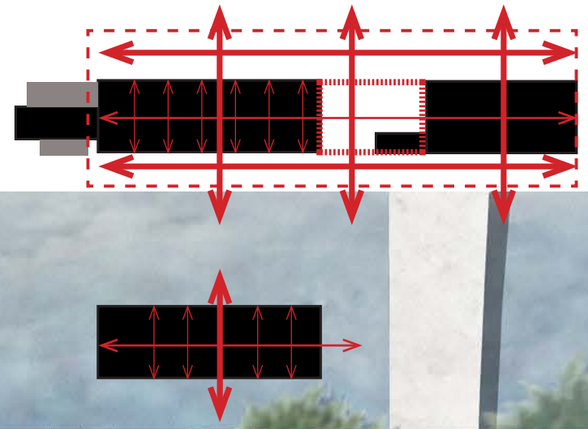
Ground Floor

Leading visitors with water and the trace of the past

Natural elements embrace Fenix II

Central Green as the main gathering point

Axial space arrangement

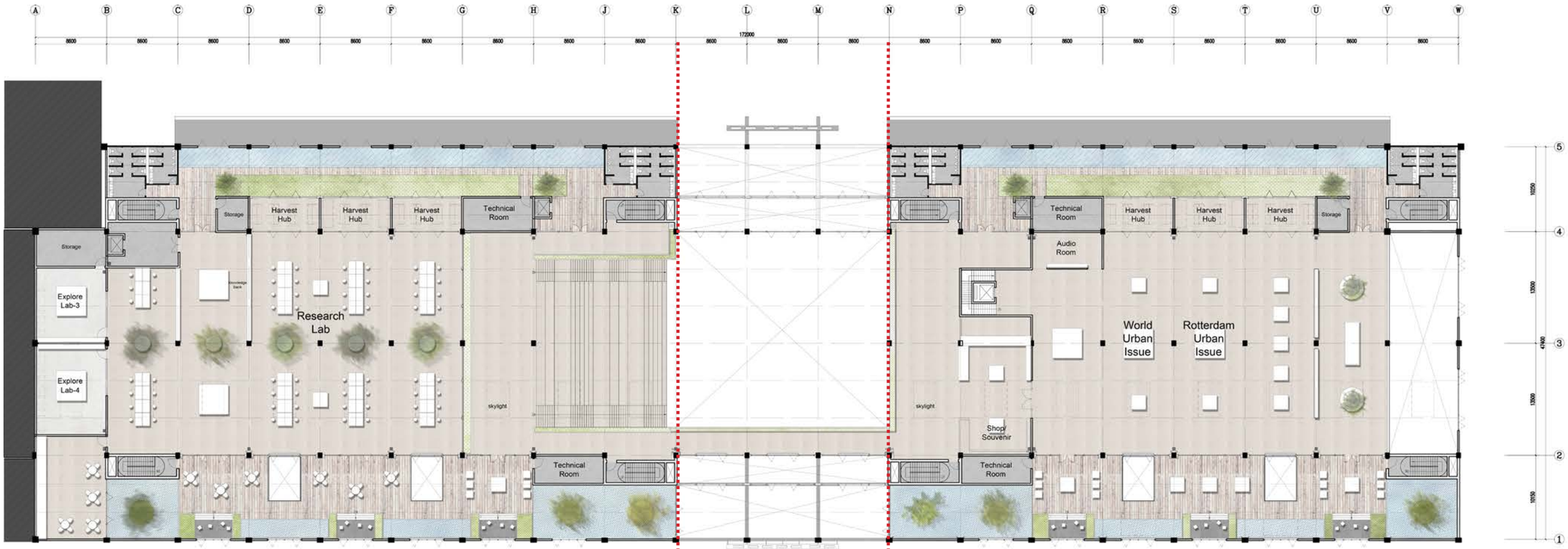


Intervention

1F

Natural elements embrace Fenix II

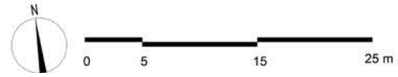
Open space arrangement



Research Lab
Zero waste study
Explore labs
Harvest Hub

Central Green

Urban Exhibition
Worldwide
Rotterdam
Harvest Hub

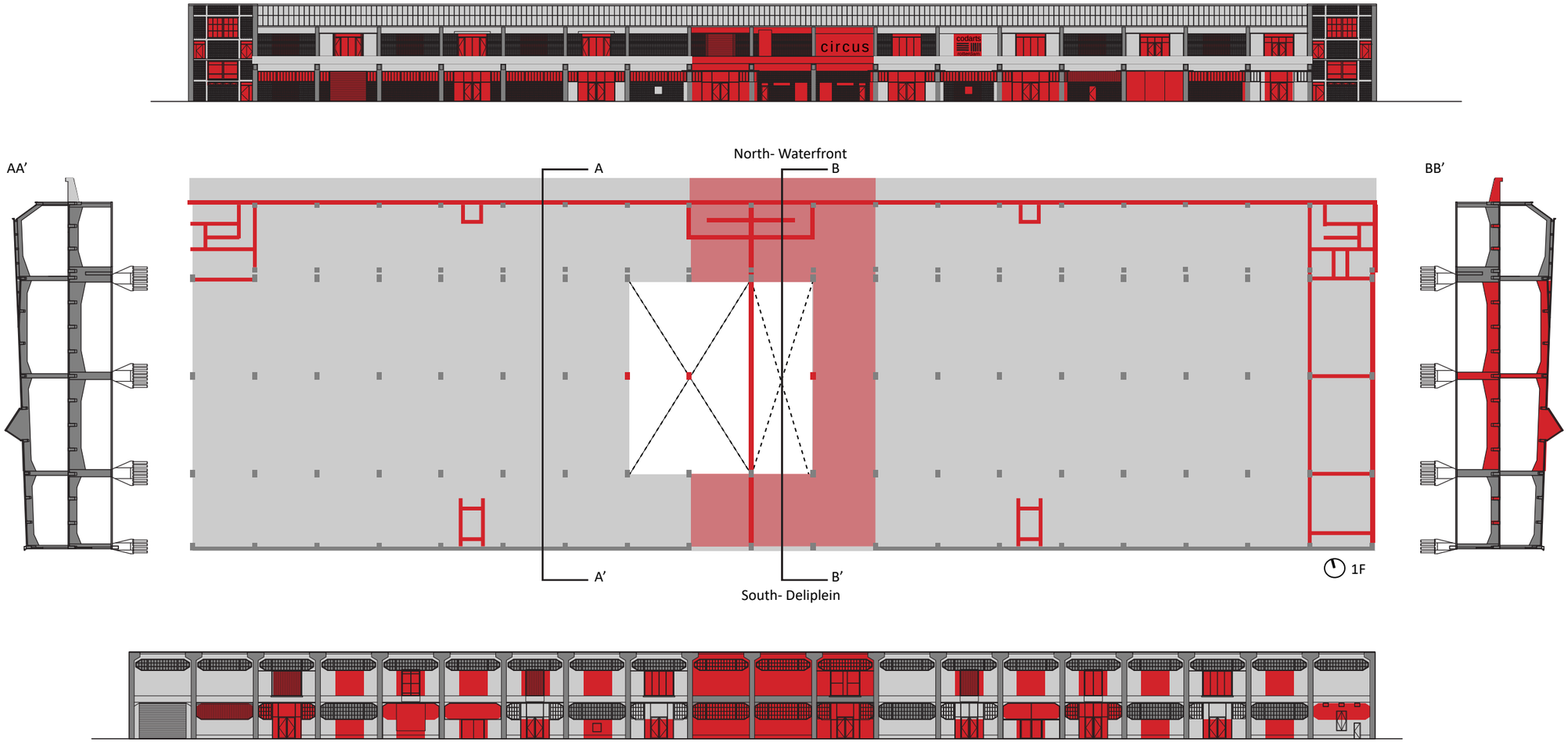


Intervention

Demolishment

Retreat with caution

Preservation

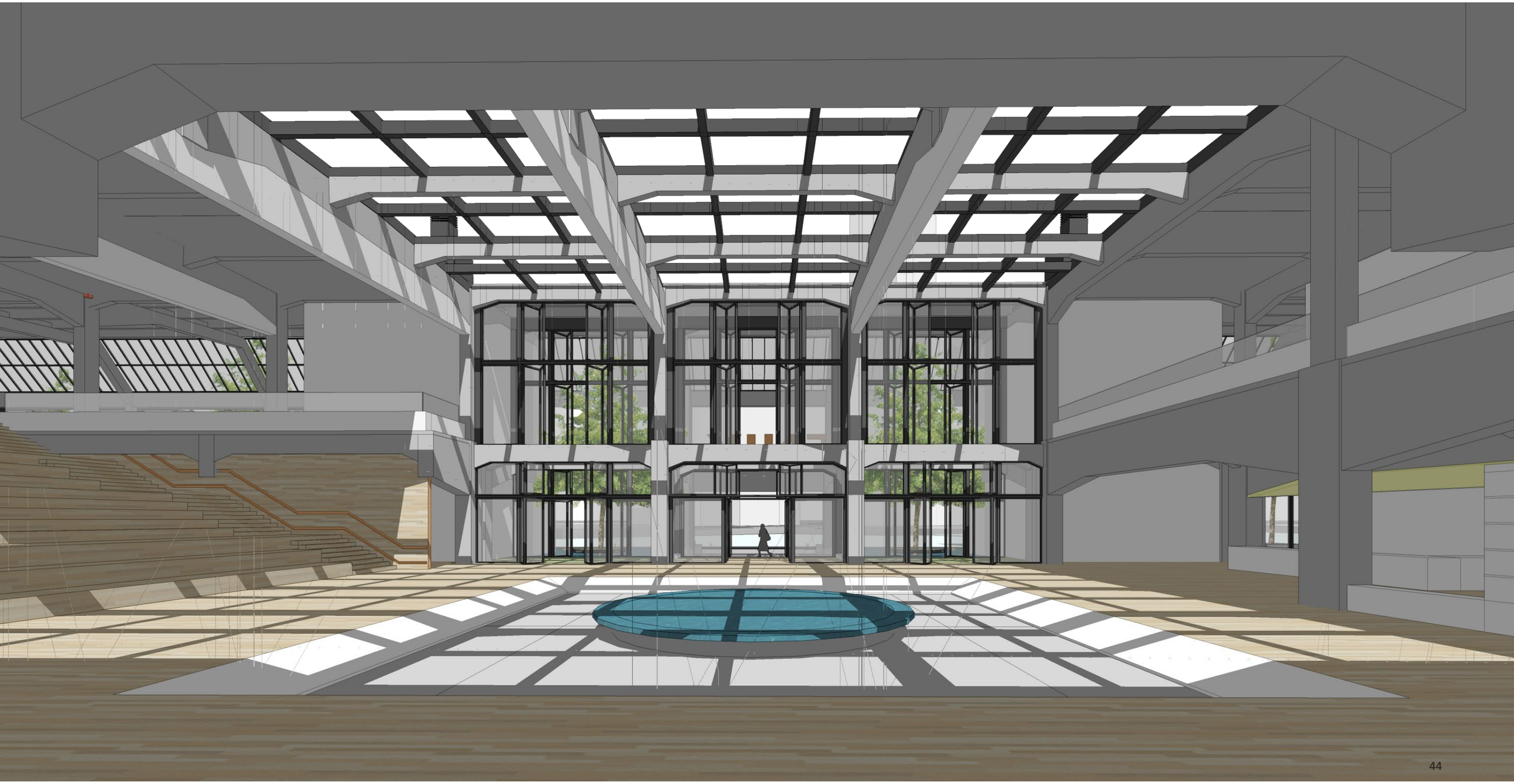


Intervention

Central Green

New spatial experience

Where the existing and the new meet

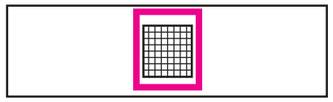


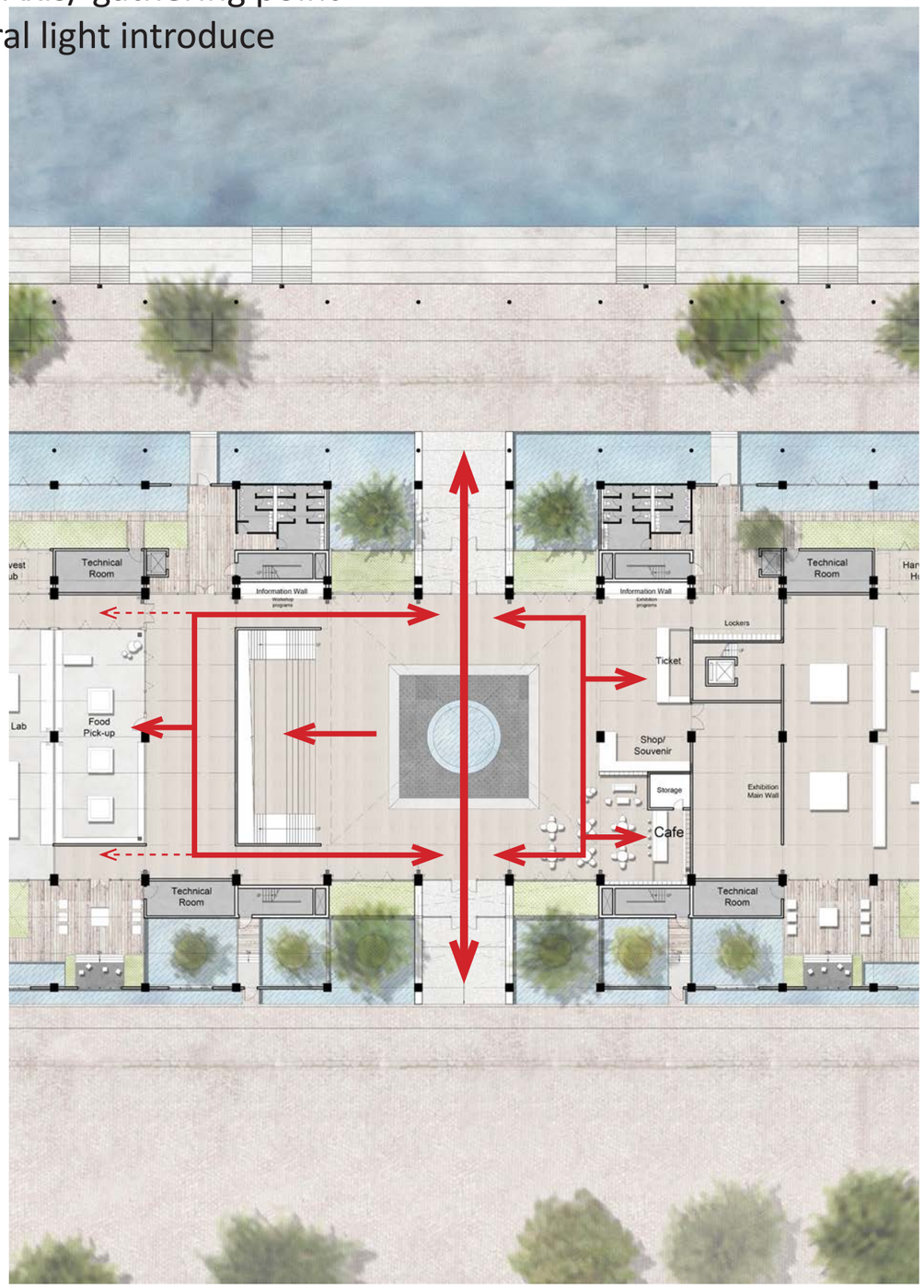
Intervention

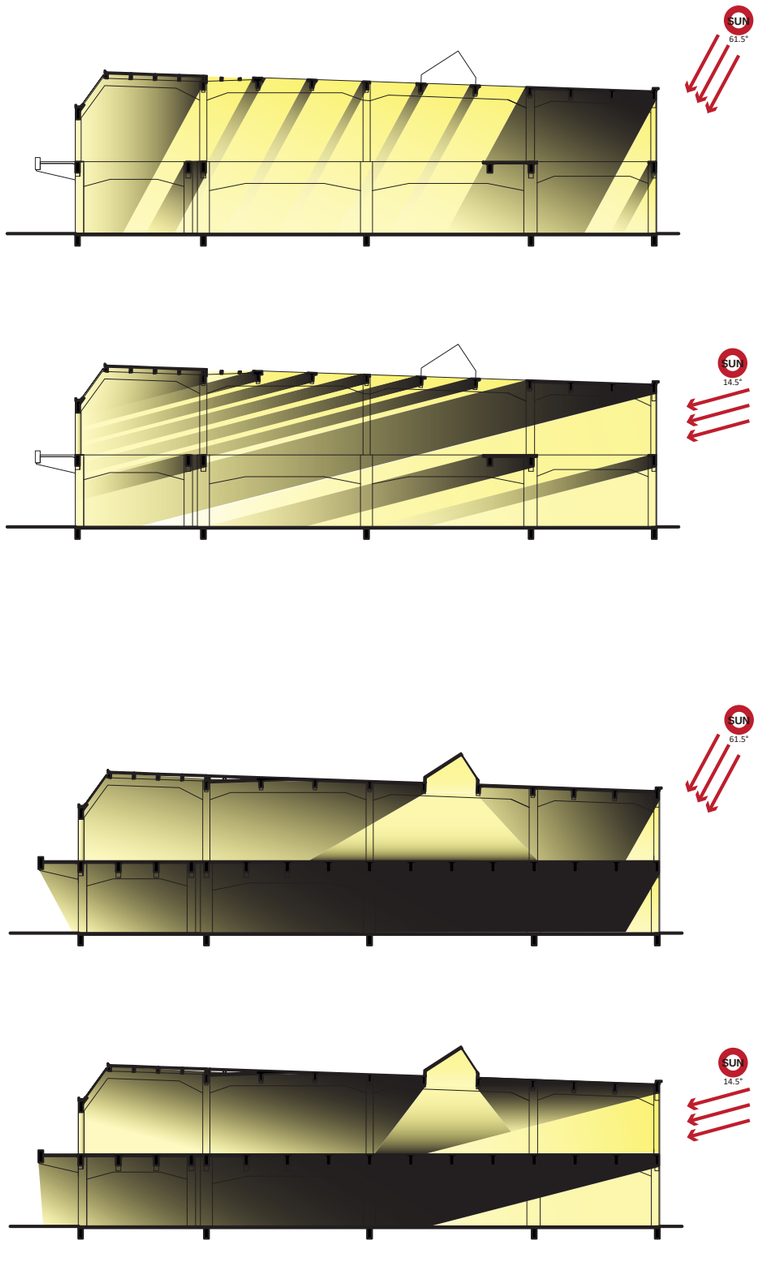
Central Green

Main Axis/ gathering point

Natural light introduce

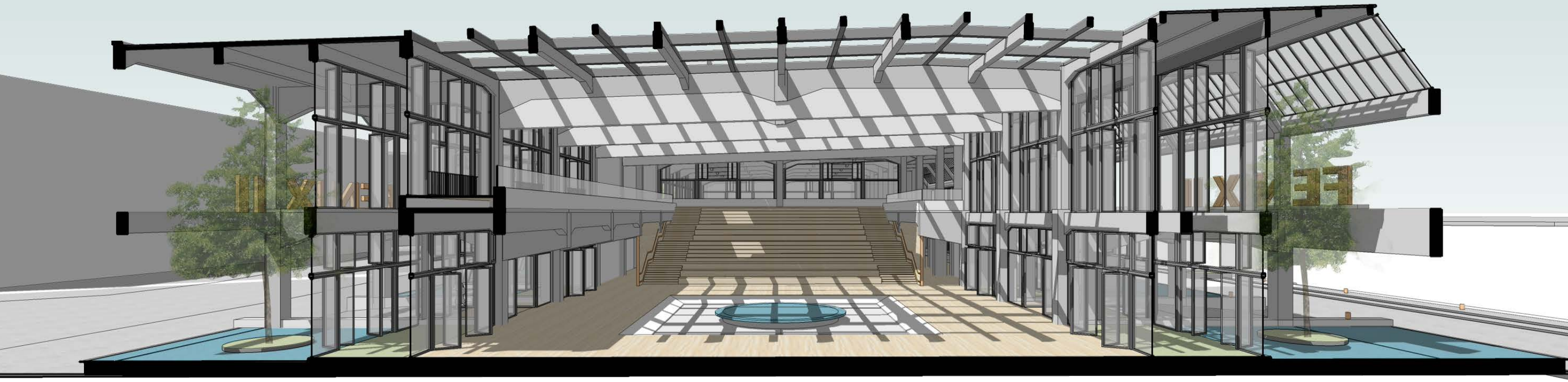






Intervention

Central Green
New spatial experience
Natural light introduce
Large Events
Resting point

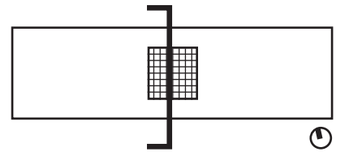


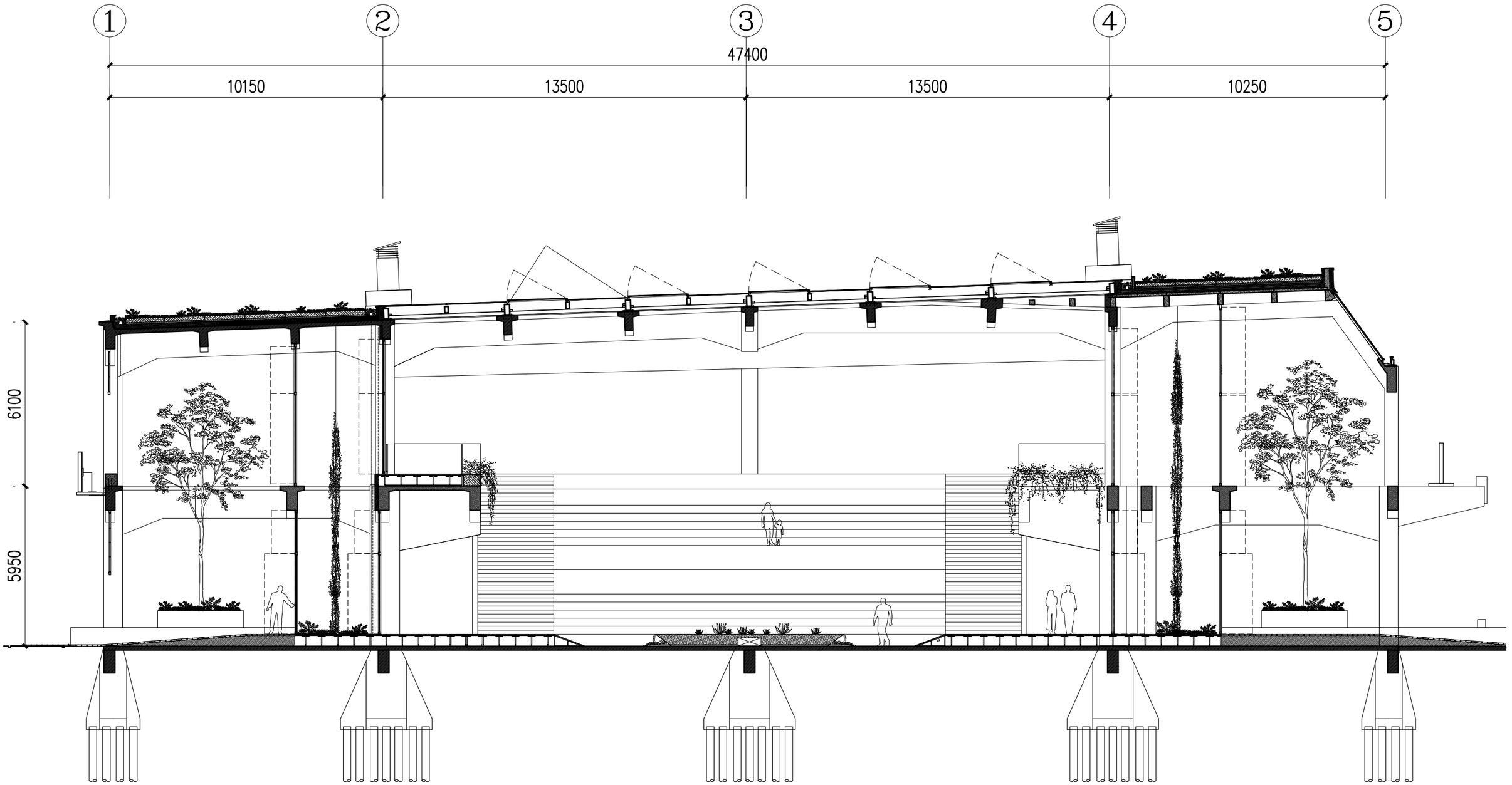
Intervention

Central Green

New layer-raised floor

Trace of the past-existing floor





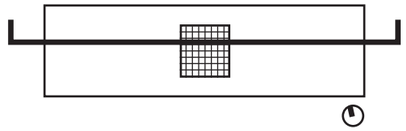
0 1 3 5m

Intervention

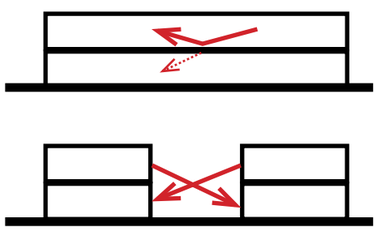
Central Green

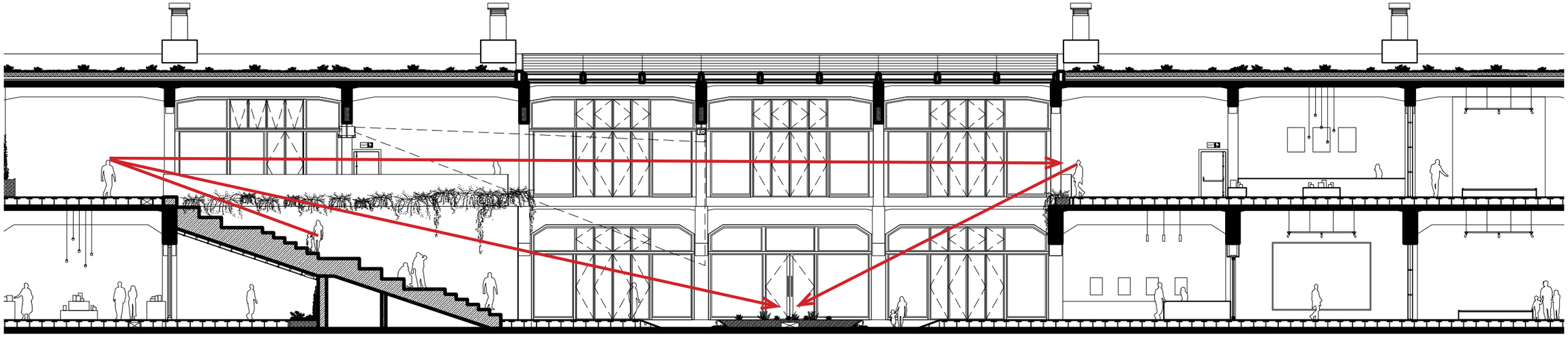
New spatial experience

Visual connection



Visual continuity

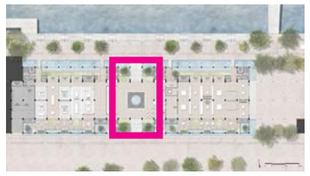




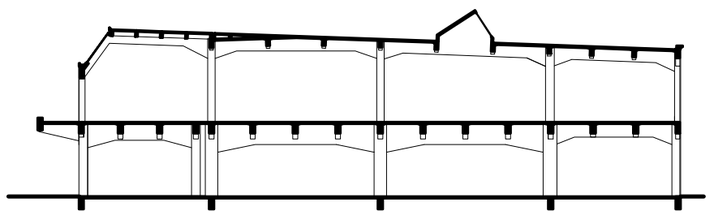
Intervention

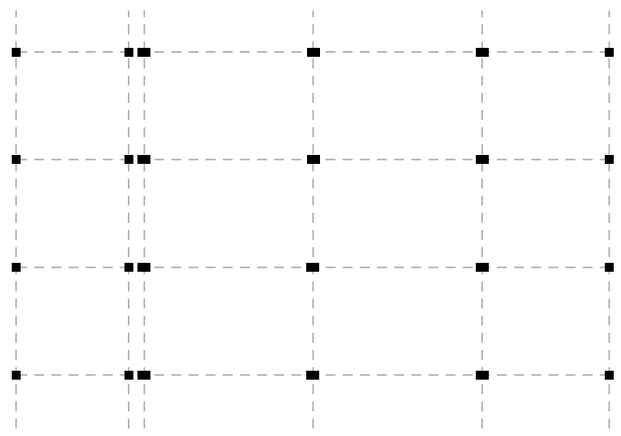
Central Green

Structure demolishment



Original situation



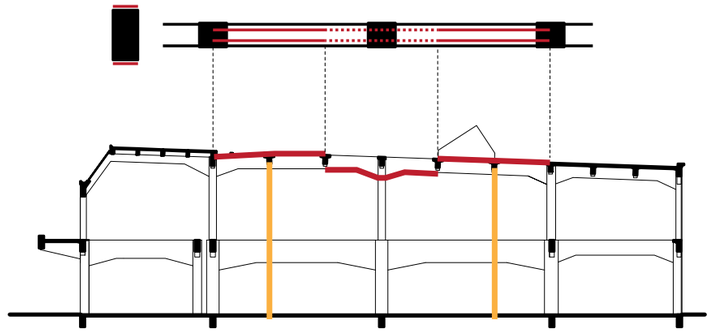


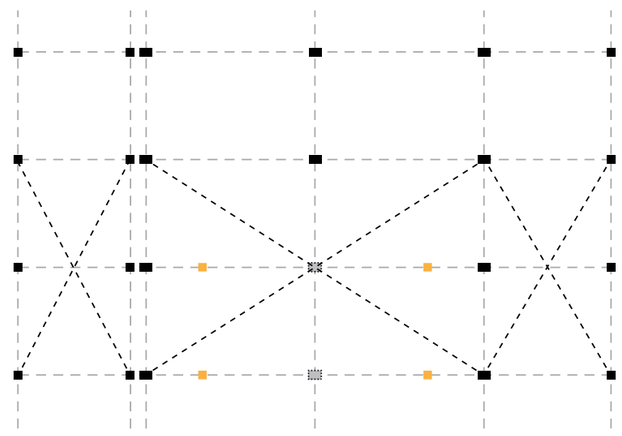
Bending moment

Double height space - option 1

Extra columns

Carbon fiber reinforcement



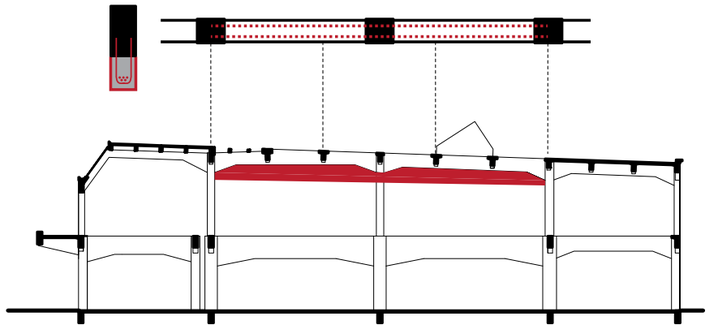


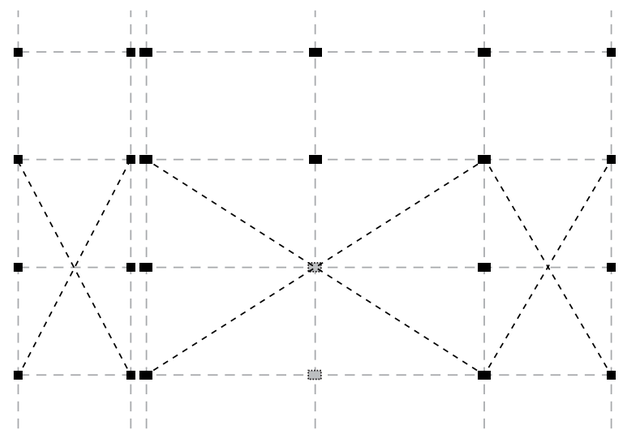
Bending moment

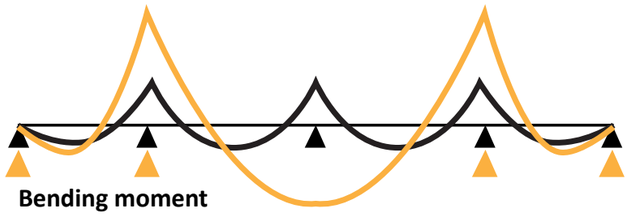
The new bending moment acts on contrary with the original situation. A new reinforcement is required.

Double height space -option 2

Extra reinforced concrete







Bending moment

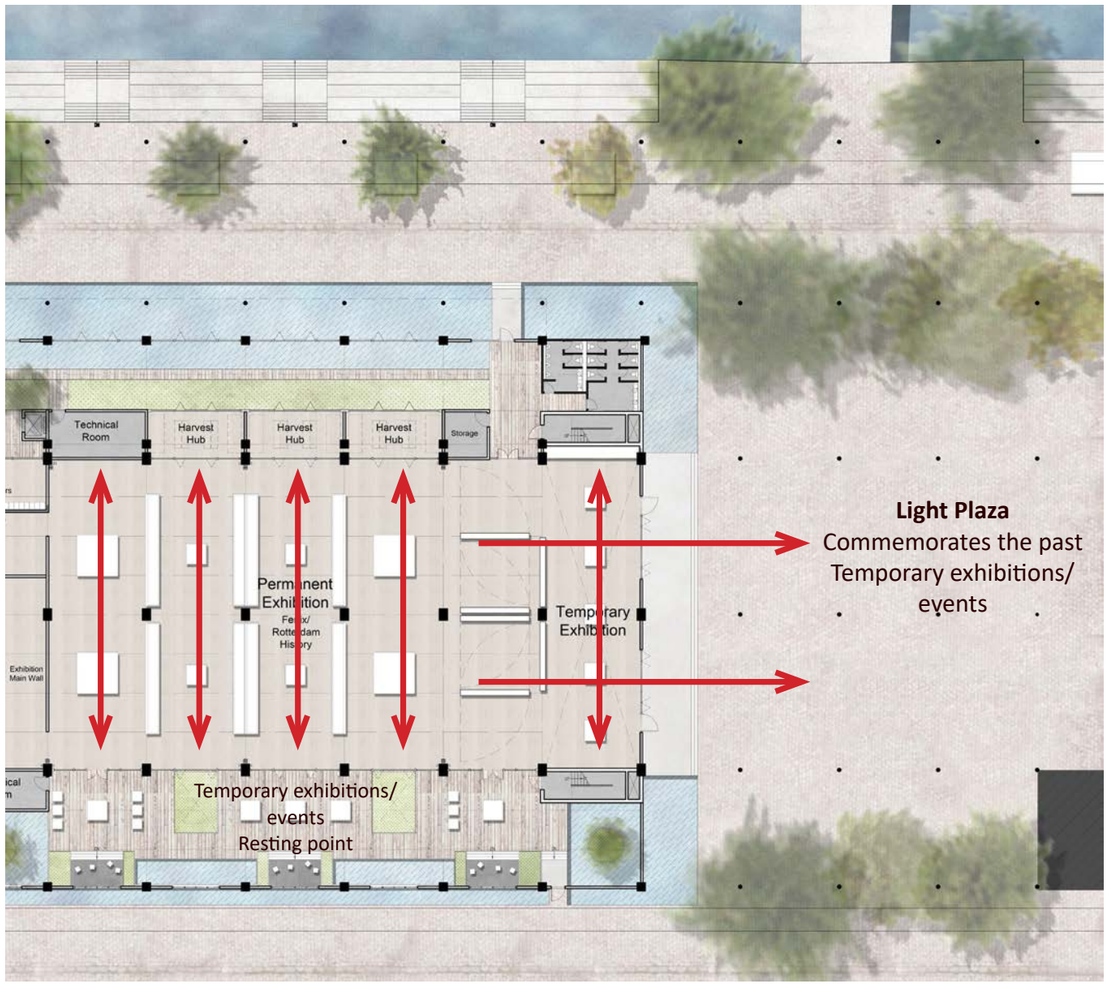
The new bending moment acts on contrary with the original situation. A new reinforcement is required.

Intervention

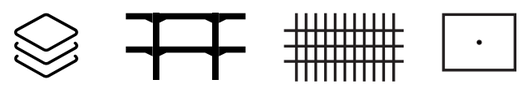
Exhibition Experience

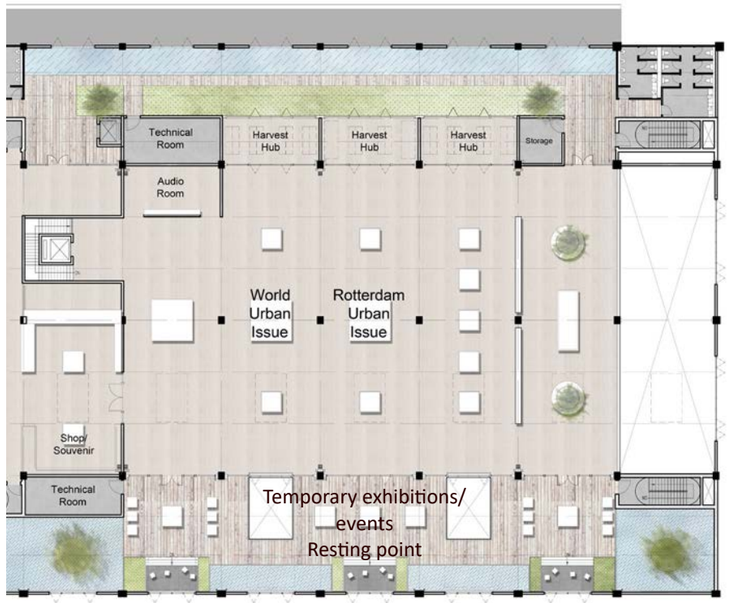
GF-Fenix II,Rotterdam Industrial Harbor History

GF- WOrld Urban Issue and Rotterdam Urban Issue



GF
Axial experience





1F
Open space experience

Intervention

Exhibition

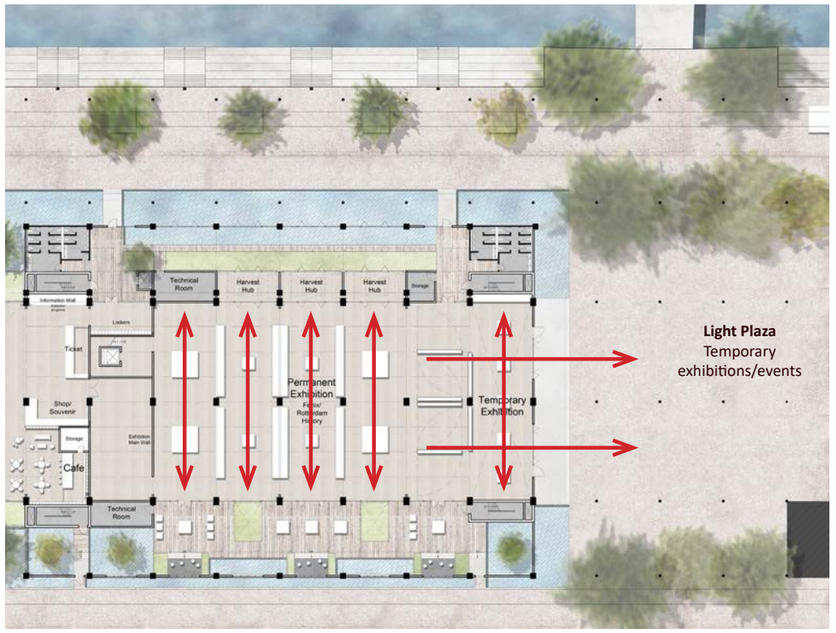
GF

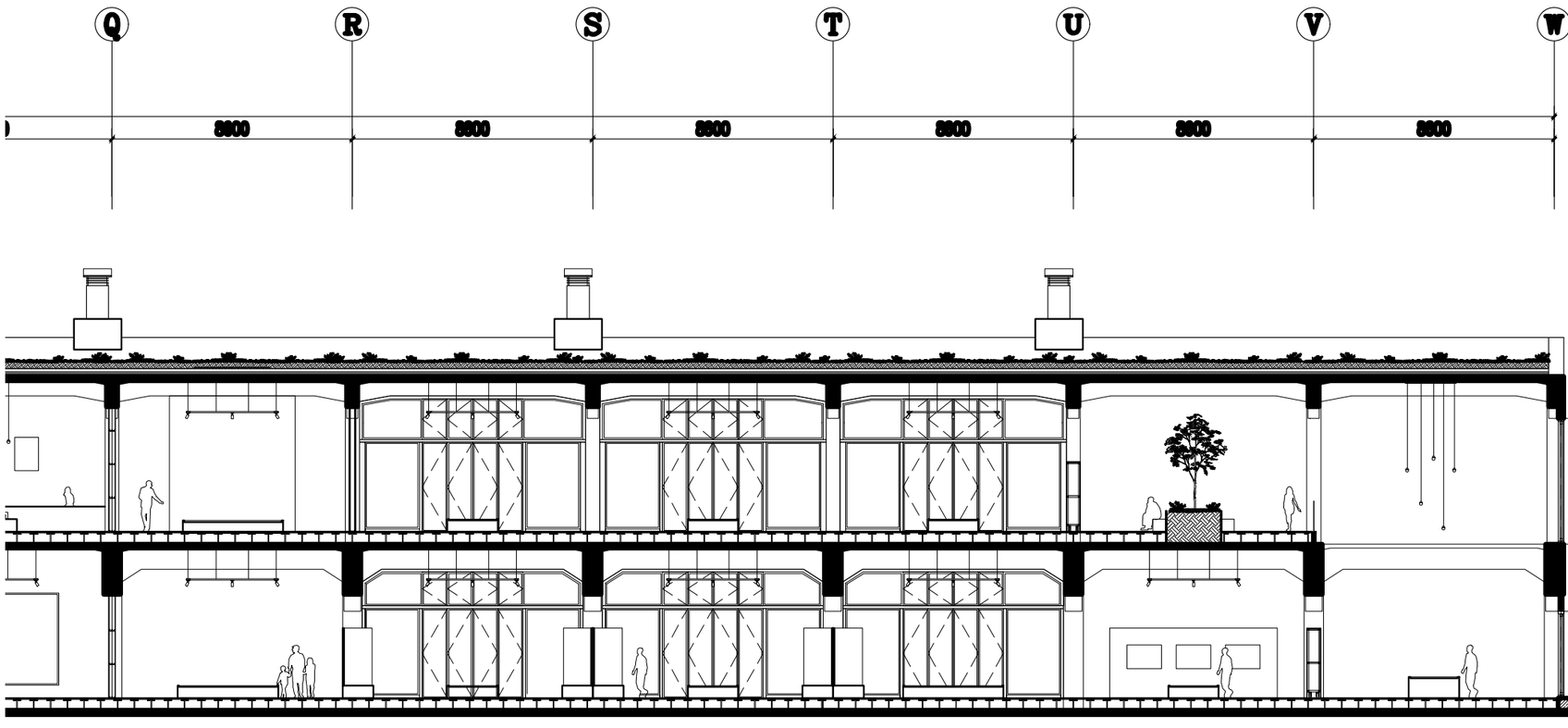
Axial experience

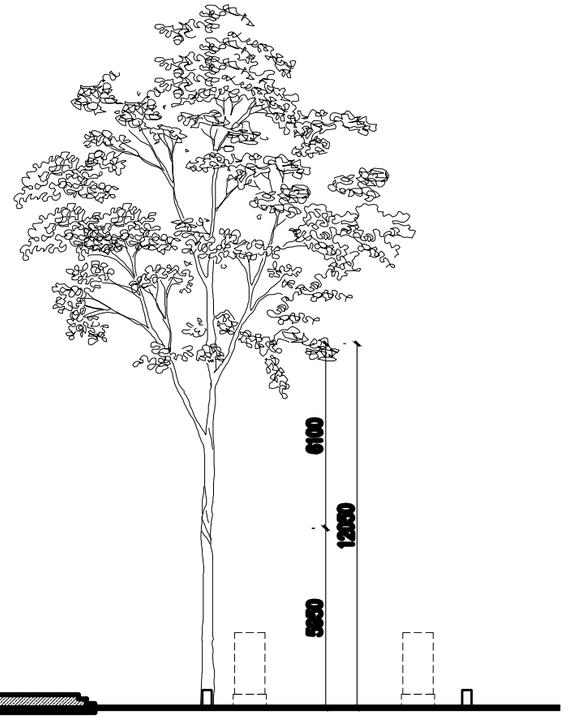
Surrounded by natural elements

Light Plaza

Temporary Exhibition/ Events







Intervention

Exhibition experience

GF

Axial routing

Intervention

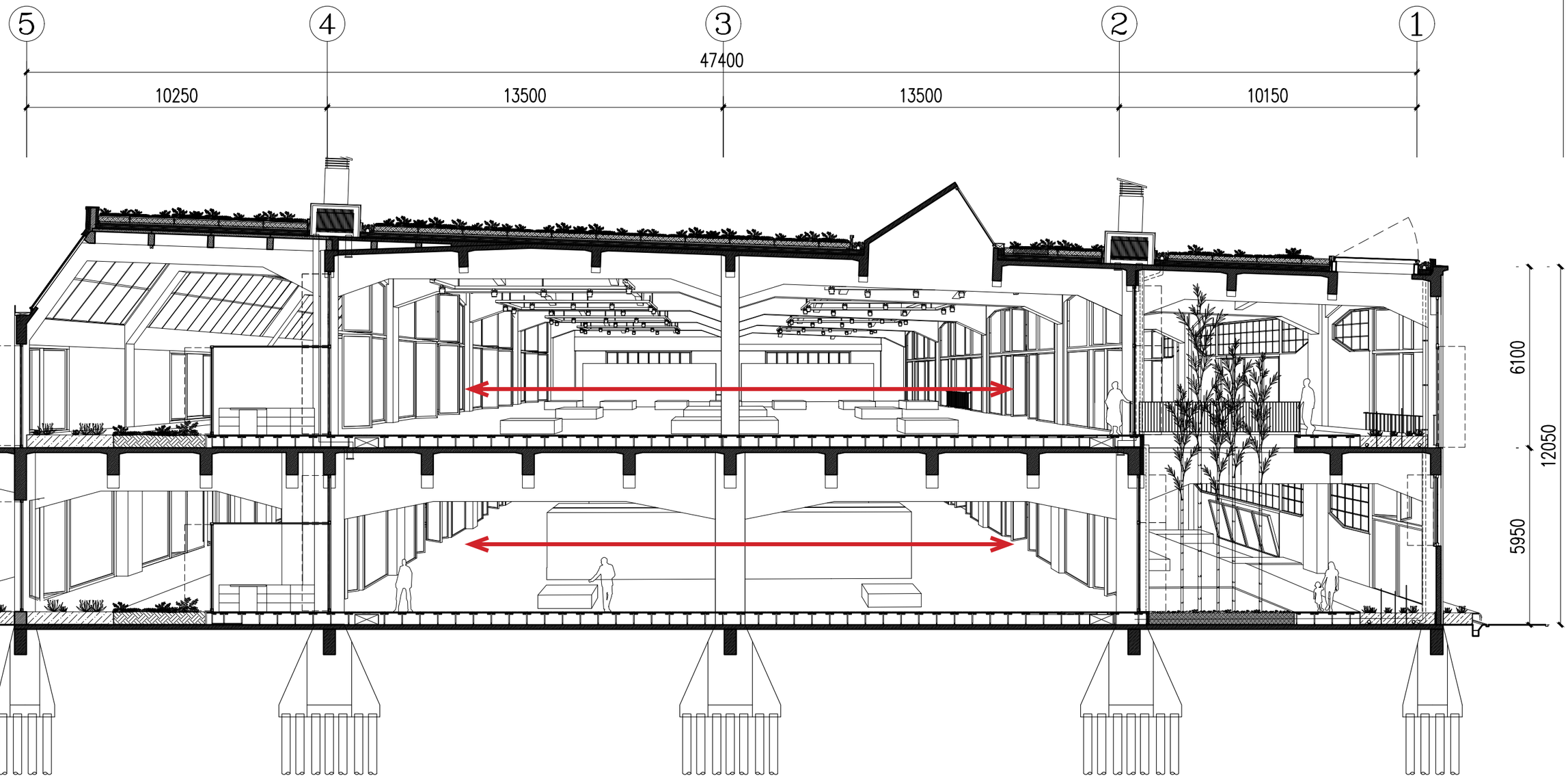
Exhibition experience

1F

Open Space

Intervention

Existing structure entirely visible
Raised Floor
Visual connection



Intervention

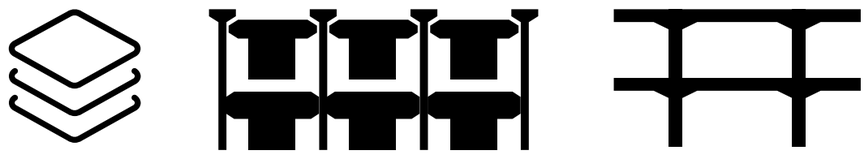
Pass by Research Lab

Central Green as ending point

Intervention

Climate Principles

Position of existing elements



South facade (Deliplein) 1916

Intervention

Climate Principles

Buffer Zone/Green way

Buffer Zone

Using water and plants to control intake air temperature and humidity

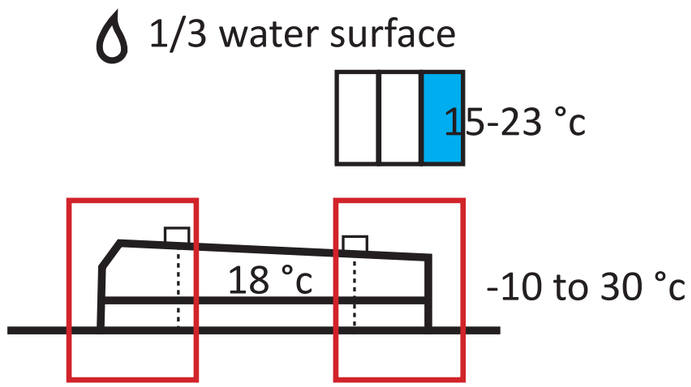
~~**Traditional insulation layer**~~

Suitable existing structure

Heavy load

Higher ceiling

Better ventilation



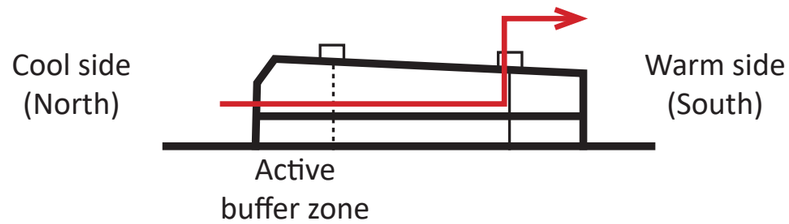
Plants to increase evaporation

Climate condition

Outdoor temperature = Needed temperature

Natural cross ventilation

Outdoor temperature > Needed temperature



Solution

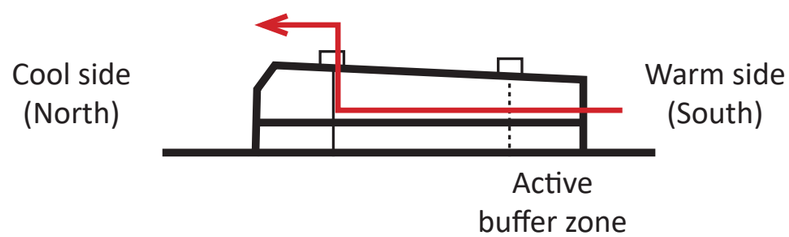
Intake air becomes cool and wet

Dehumidification

Ventilation ↑

Evaporation ↑

Outdoor temperature < Needed temperature



Solution

Intake air becomes warm and dry

Humidification

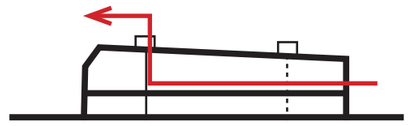
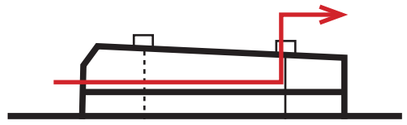
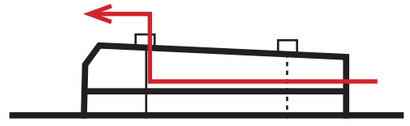
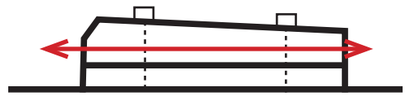
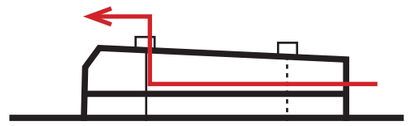
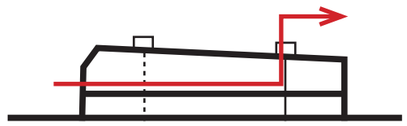
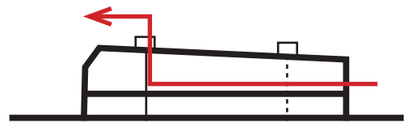
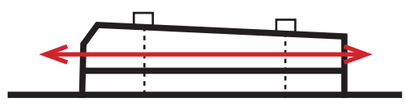
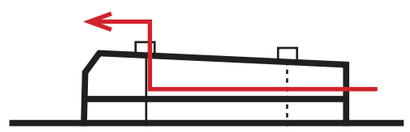
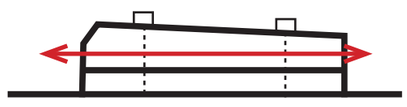
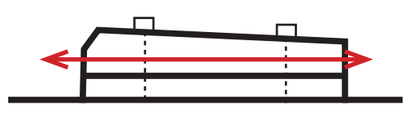
Ventilation ↓

Evaporation ↓

Intervention

Climate Principles

Buffer Zone/Green way

	Summer Outdoor temperature > Needed temperature	Winter Outdoor temperature < Needed temperature	Suitable temperature
Sunny			
Rainy			
Windy			
Cloudy			
Night with people			
Night without people Cool down building			

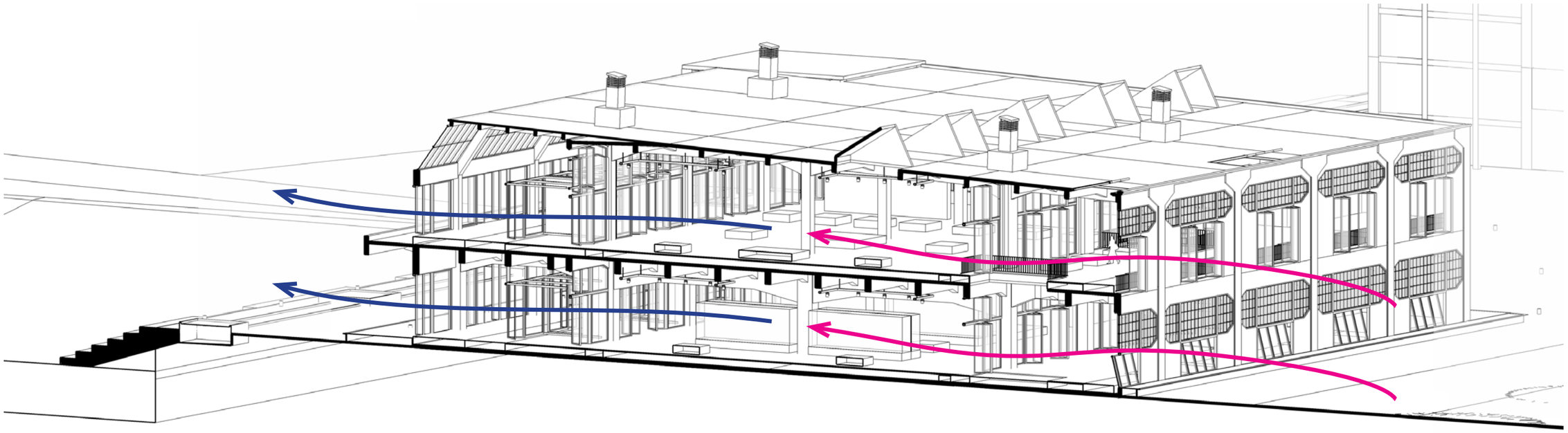
Intervention

Climate Principles

Buffer Zone

Ventilation

Outdoor temperature = Needed temperature



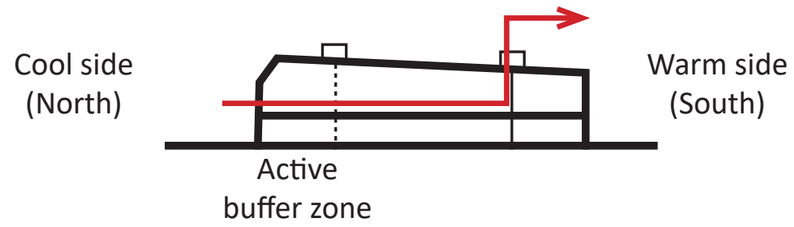
Intervention

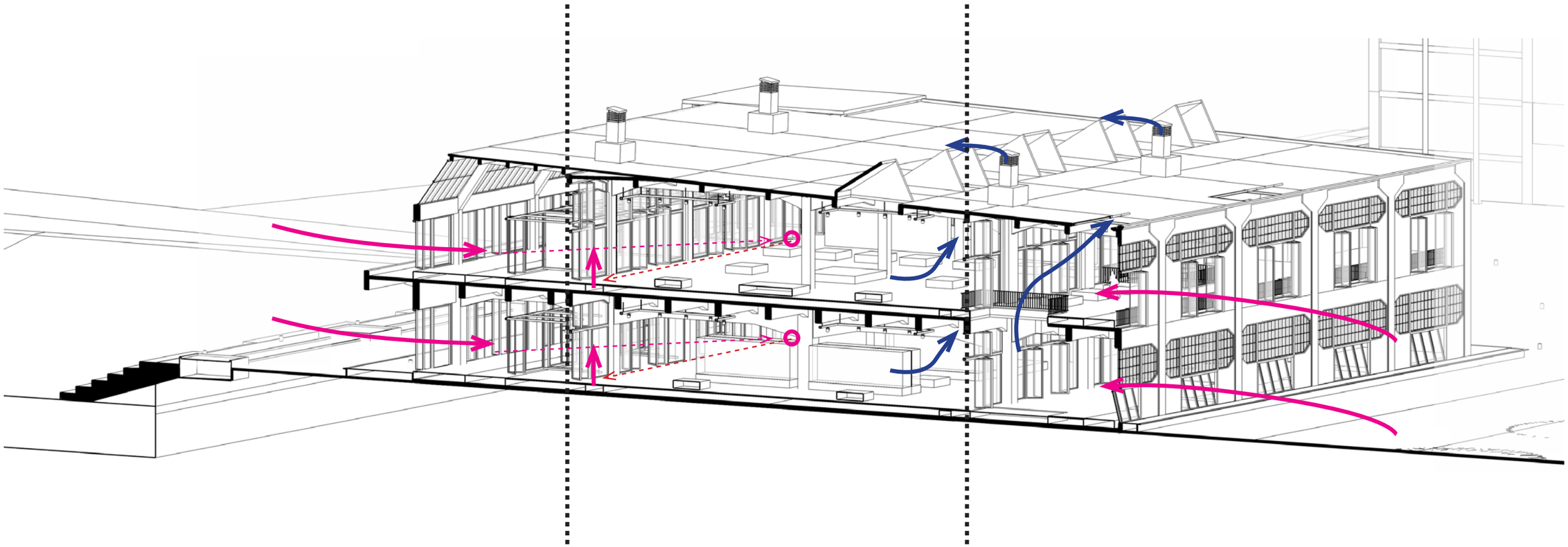
Climate Principles

Buffer Zone

Ventilation

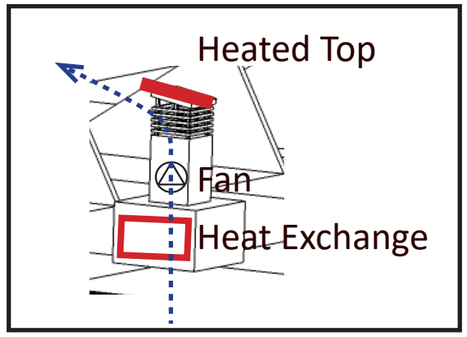
Outdoor temperature > Needed temperature



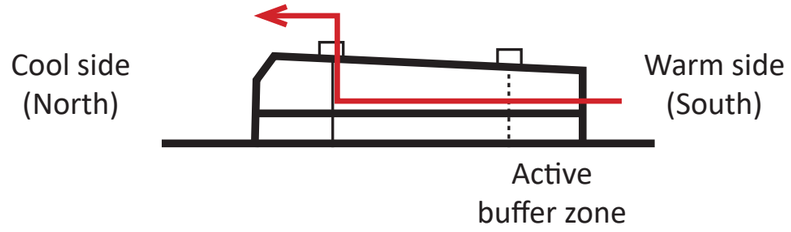


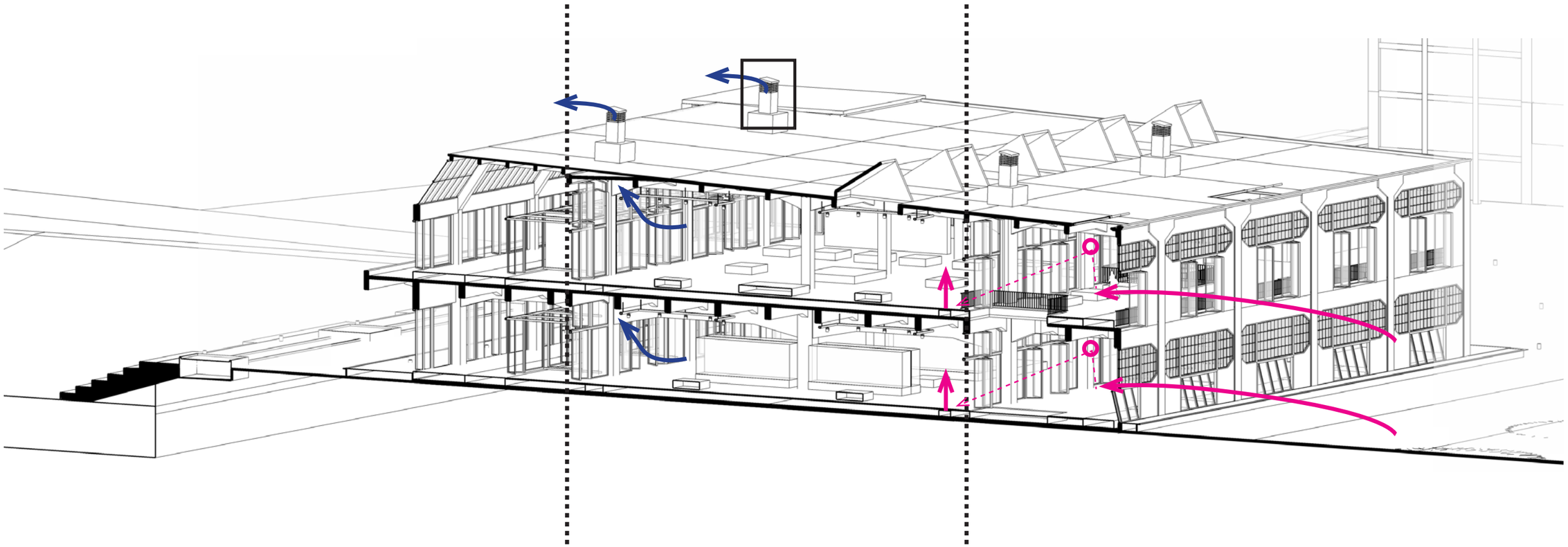
Intervention

Climate Principles
Buffer Zone
Ventilation



Outdoor temperature < Needed temperature



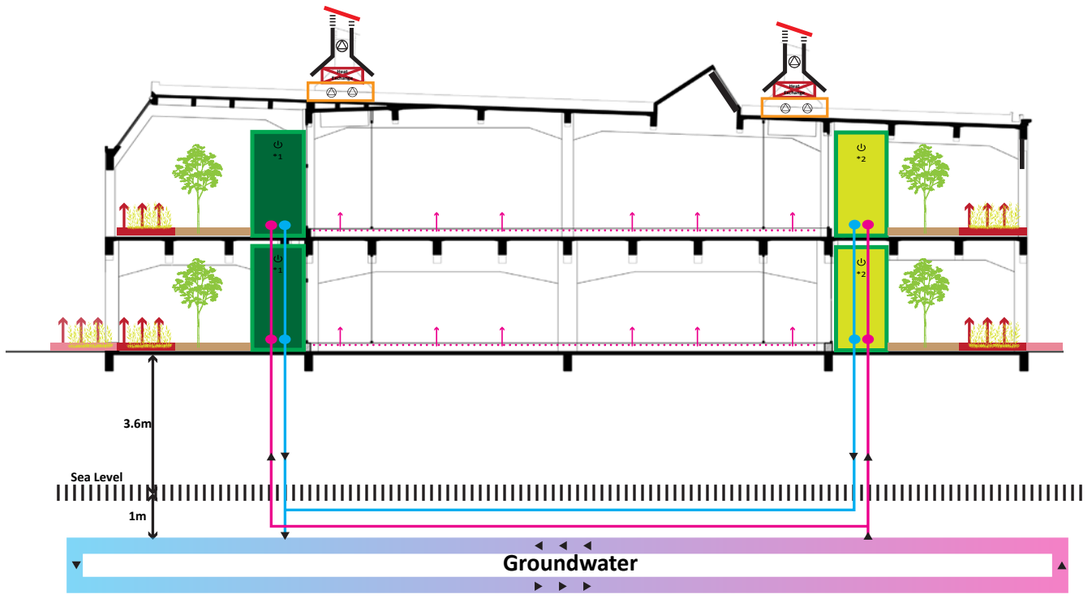


Intervention

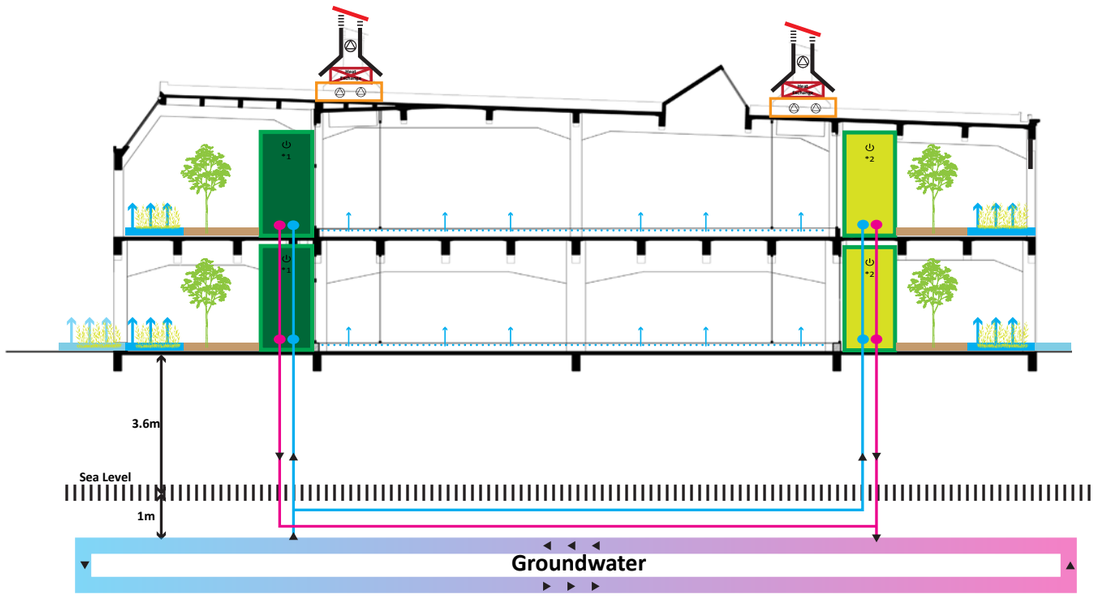
Climate Principles

Floor heating/Cooling

Winter



Summer

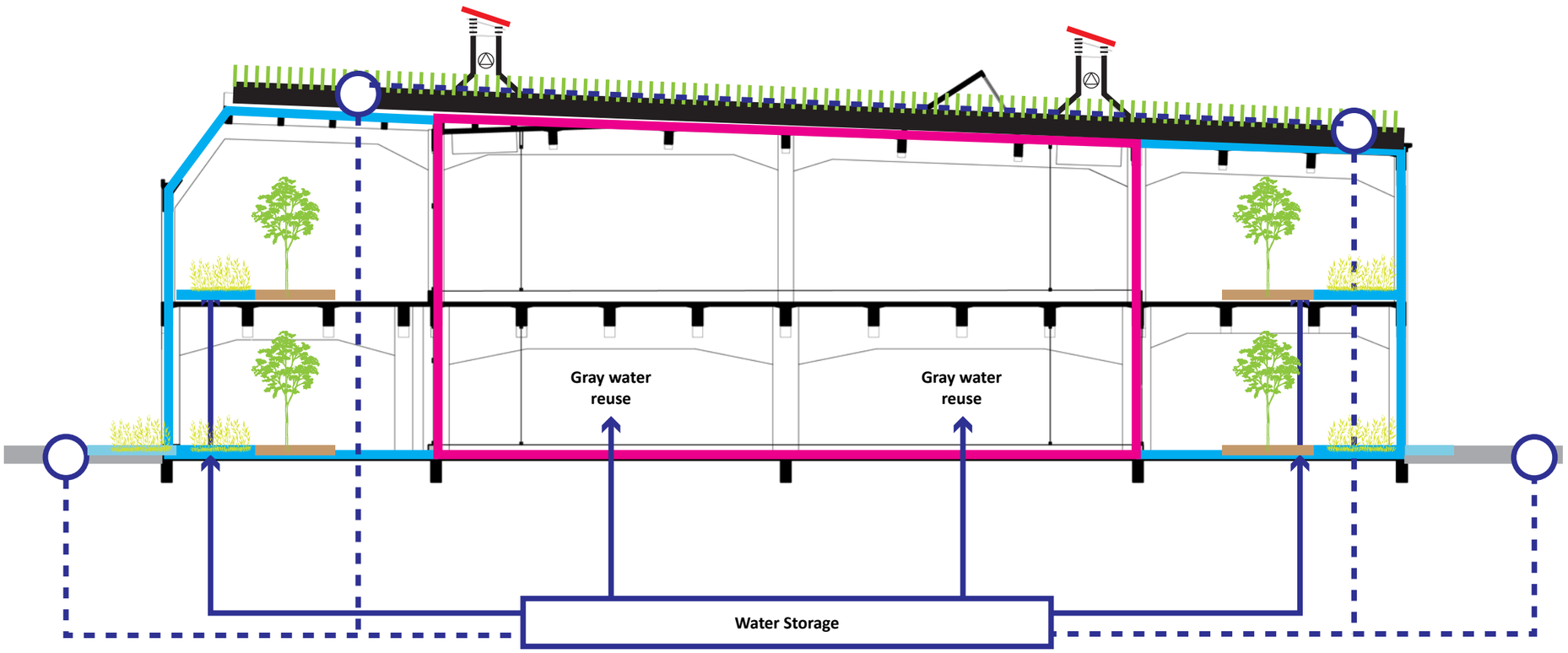


Intervention

Climate Principles

Green roof/ Water collection

buffer Zone



Good roof insulation

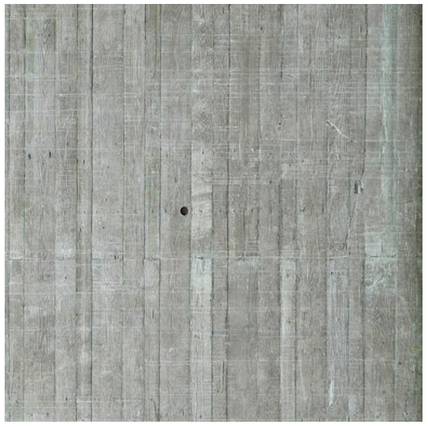
- Increases the efficiency of buffer zones
- Creates the critical point to increases ventilation

Intervention

Buffer zone green way- Semi outdoor experience
Temporary Exhibition or events/ Resting point

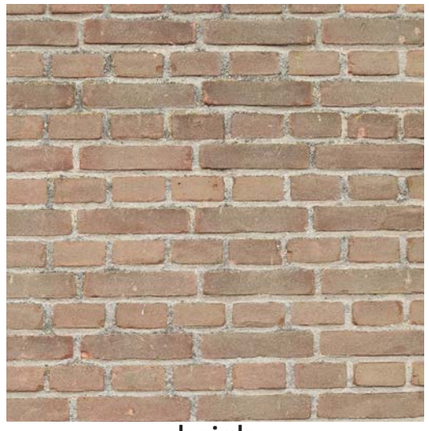
Intervention
Materialization

Phase I-1916



concrete

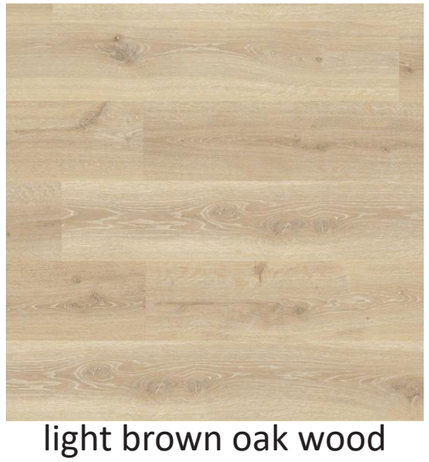
Phase II-1954



brick

Intervention-2018

white concrete



light brown oak wood

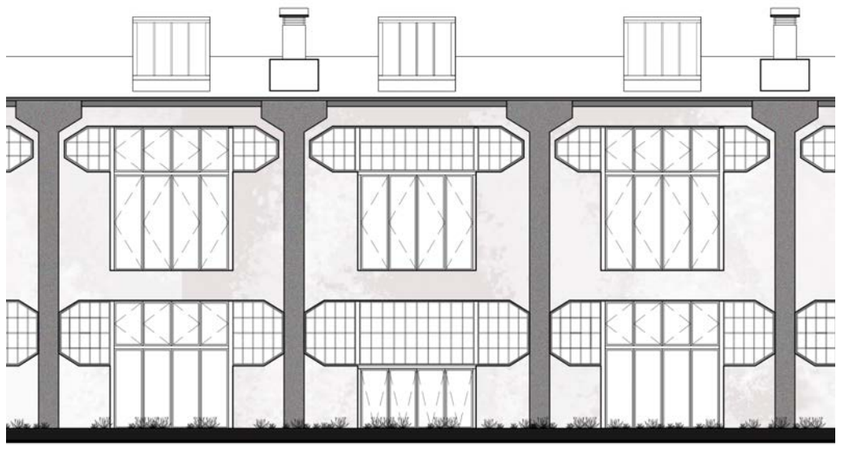
Intervention

South Facade Expression

Bring back original character

South facade (Deliplein) 1916

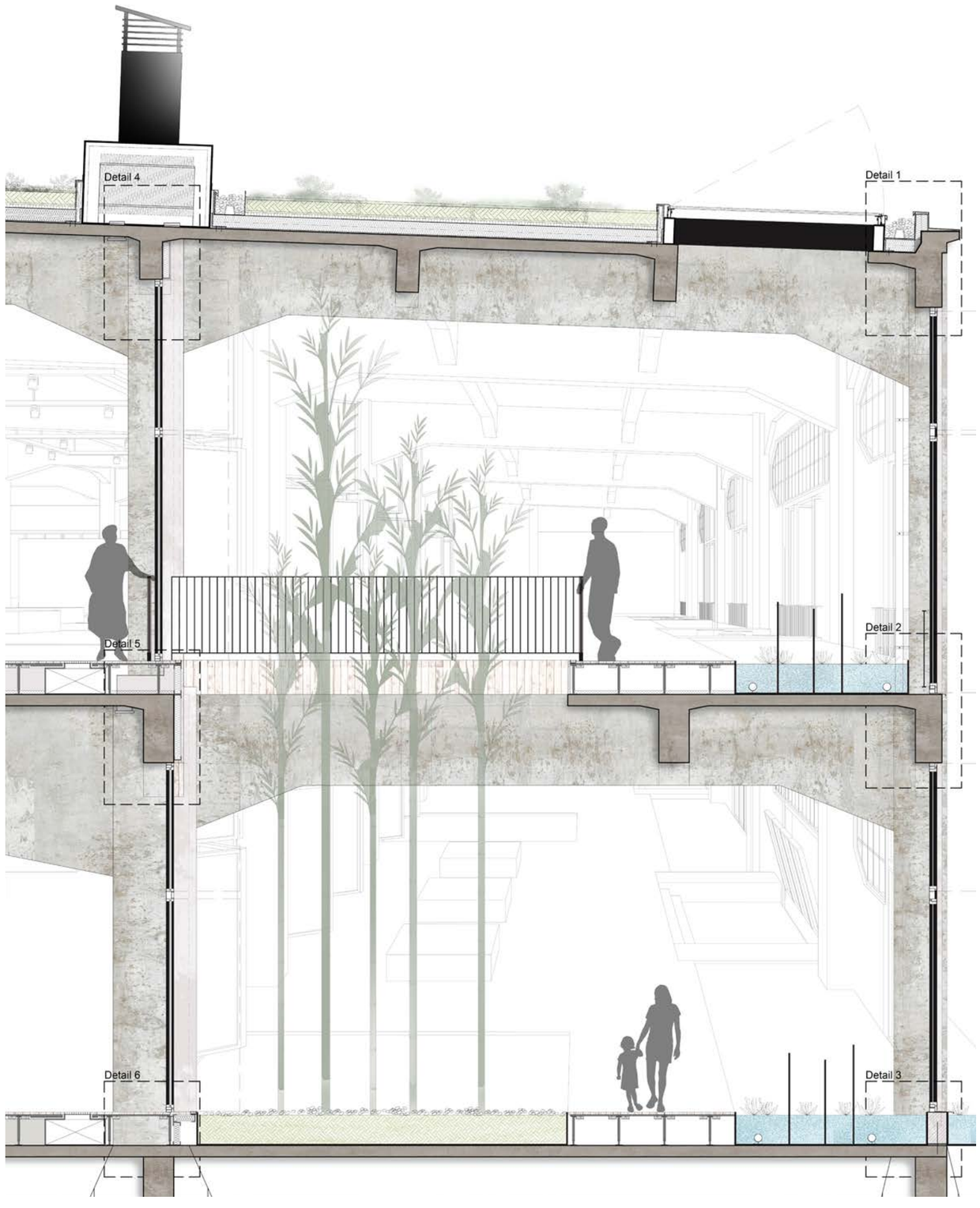
South facade (Deliplein) 2018

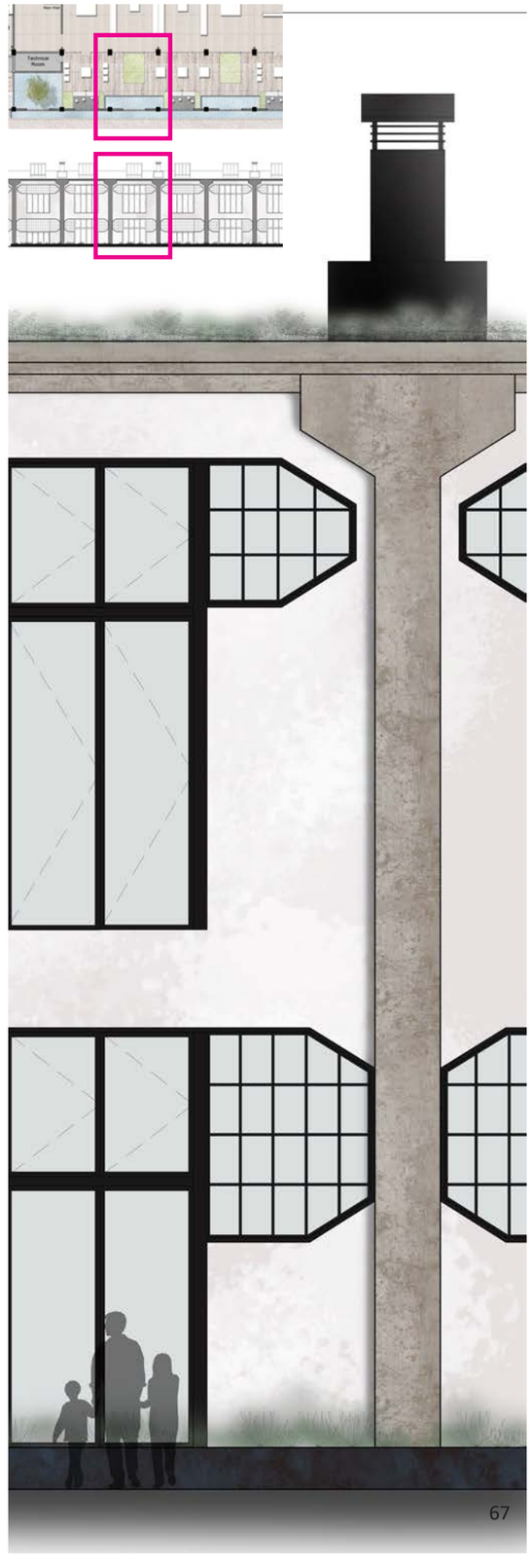


South facade (Deliplein) Intervention

Intervention

Green way



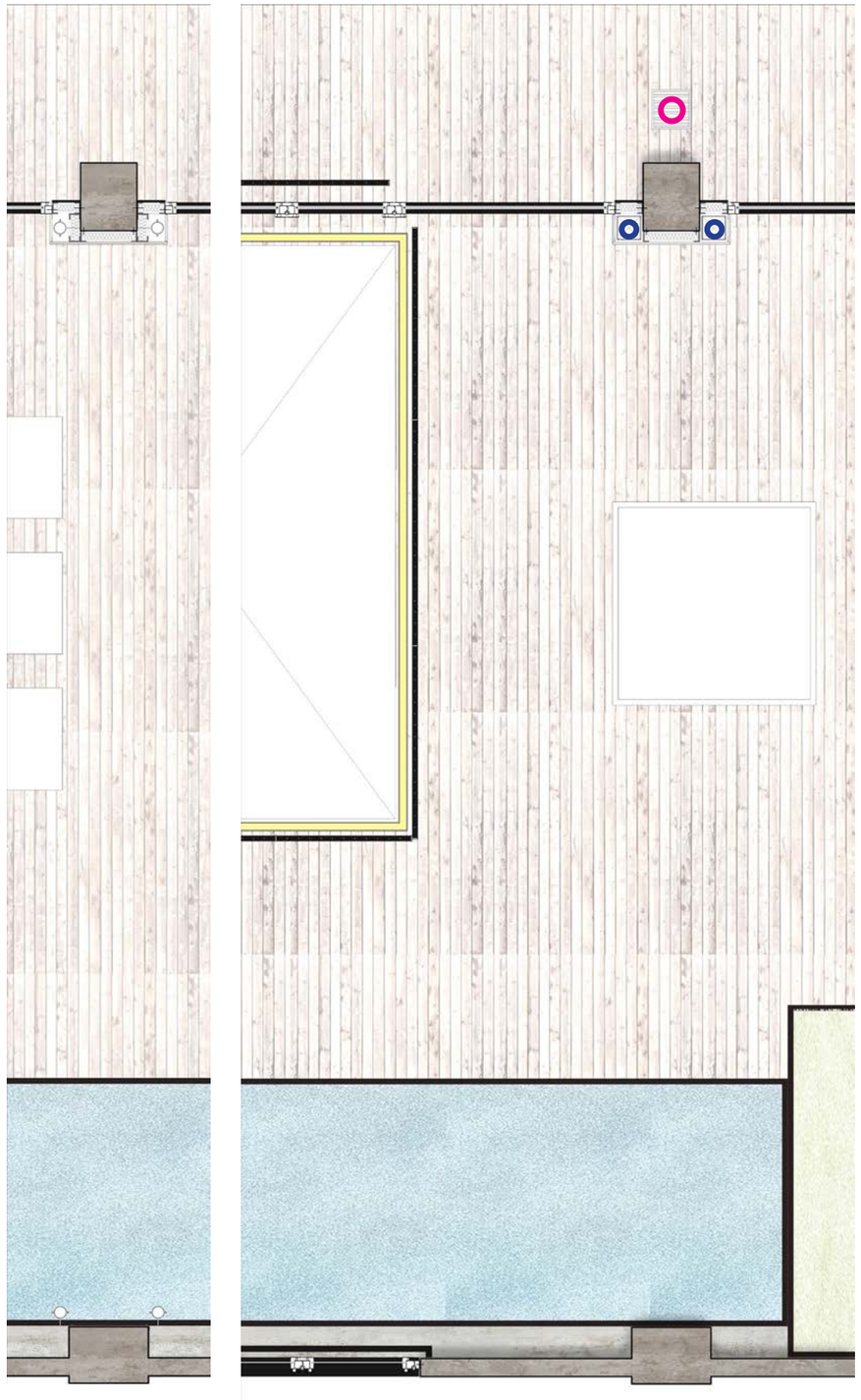


Intervention

Green way/ extension of central main space

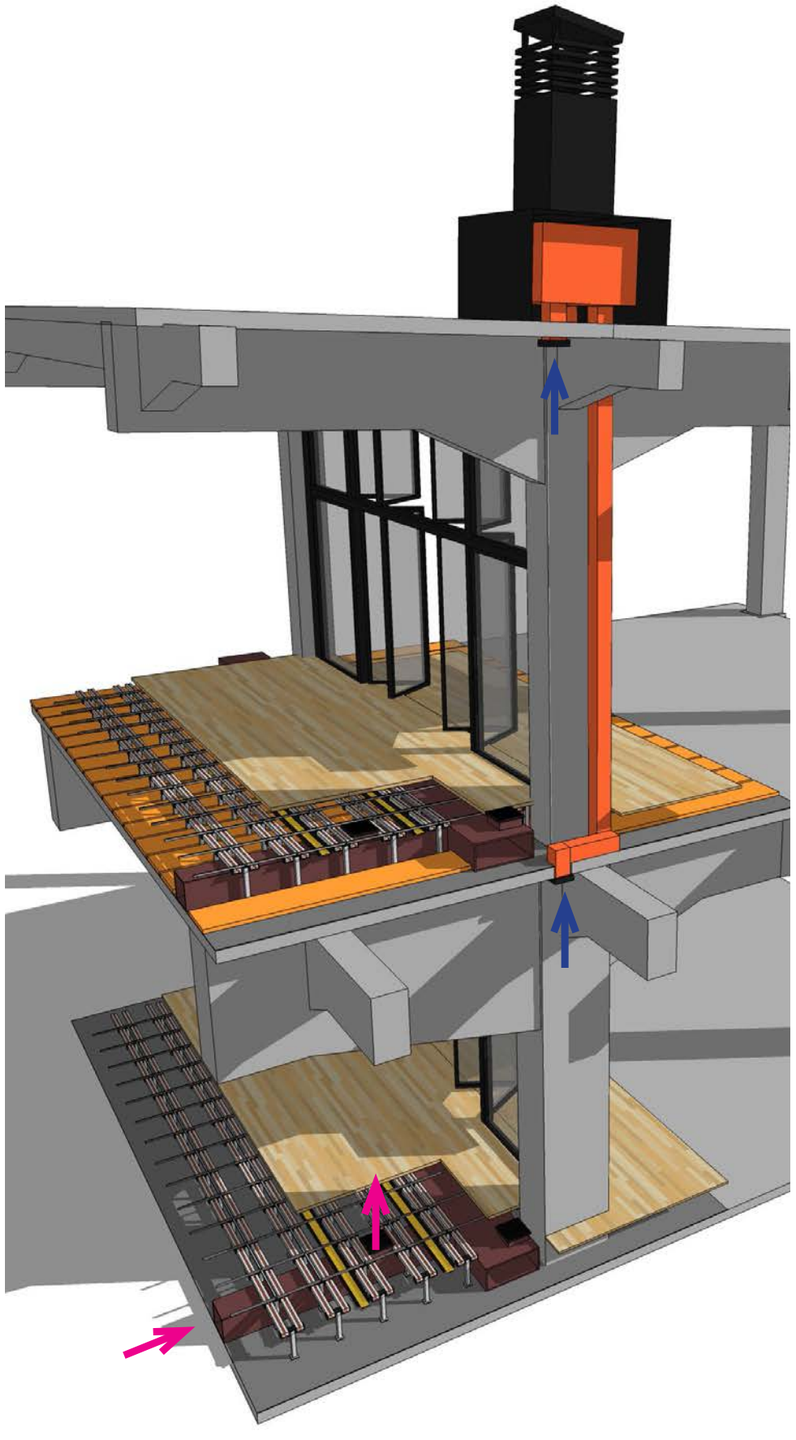
Ventilation system

Raised floor/ existing structure



Air intake

Air outtake

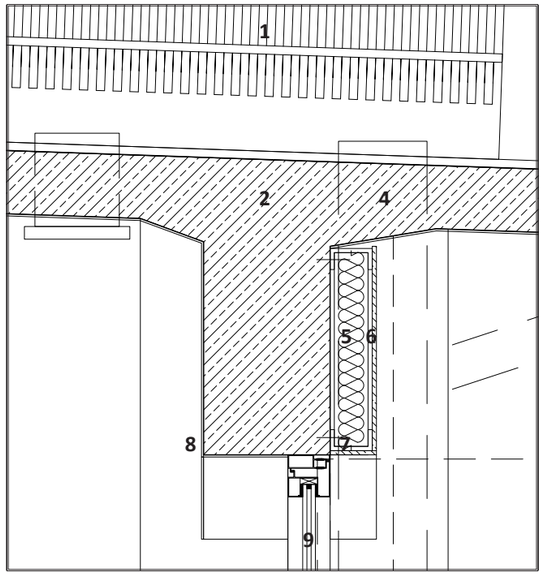


Air intake

Air outtake

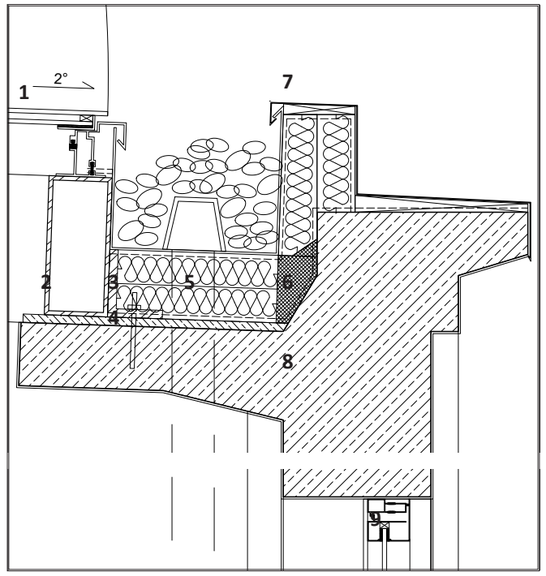
Intervention

Detailing



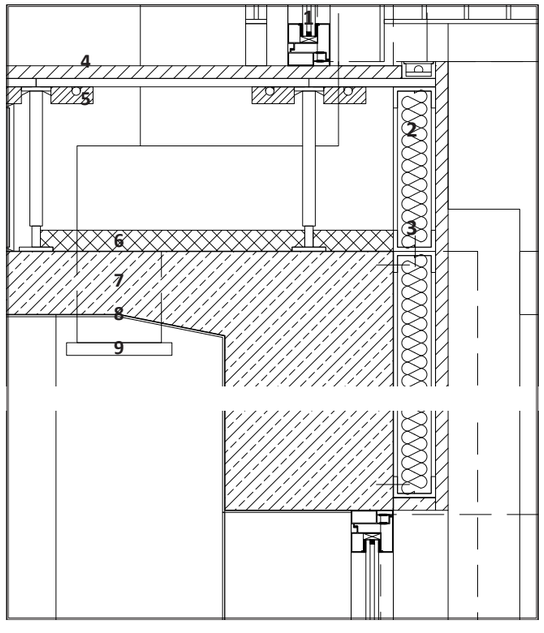
Detail 1

1 Heat exchange (air to water)
2 Existing structure- reinforced concrete
3 Air outtake 1F
4 Air outtake GF
5 Insulation XPS 100mm
6 Cement board 12 mm
7 C shaped aluminum
8 Clean and apply cement if stain unremovable
9 Double glazing



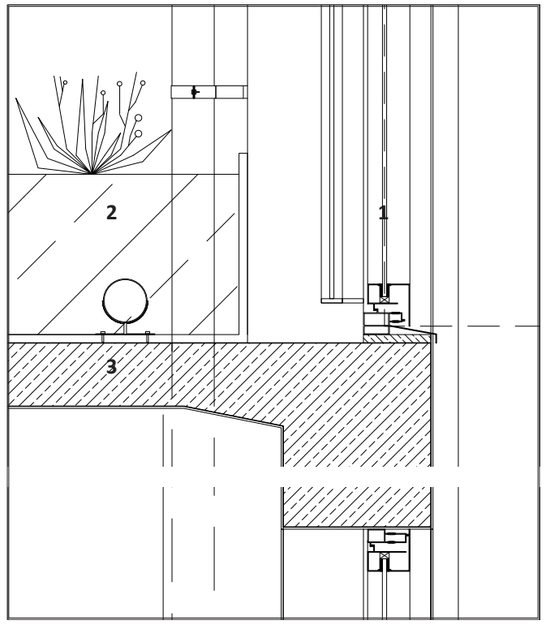
Detail 4

1 Aluminum double glazing window frame with existing 2° roof slope
2 HSS. 150mm 50 mm 7mm
3 L-shaped steel. Equal angle 150mm
4 Leveling cement if needed
5 Insulation XPS 100mm
6 Foam sealant
7 Aluminum flushing
8 Existing structure- reinforced concrete
9 Original steel window frame. Needed to be retreated and reinstalled



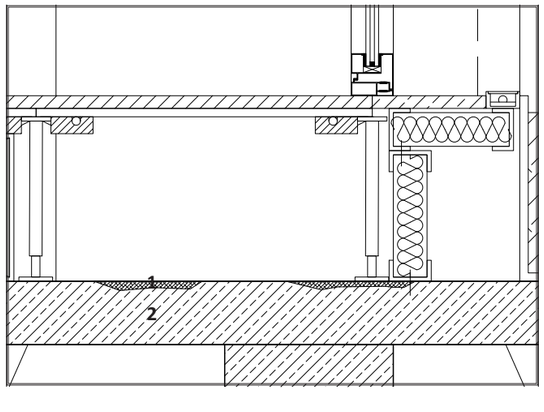
Detail 2

1 Double glazing
2 Insulation XPS 100mm
3 C-shaped aluminum
4 Wooden flooring
5 Floor heating
6 Sound insulation
7 Existing structure- reinforced concrete
8 Clean and apply cement if stain unremovable
9 Air outtake GF



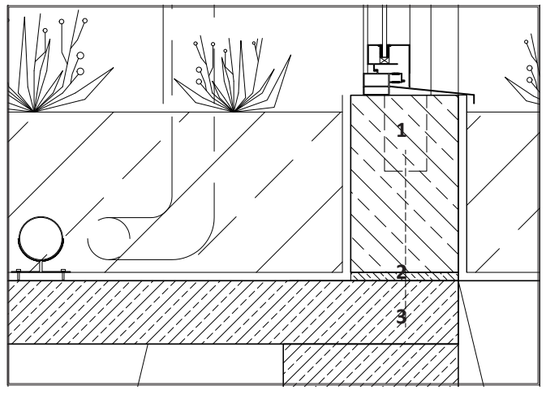
Detail 5

1 Single glazing
2 Water tank (The water is used for controlling incoming air temperature and humidity. Water temperature range is from 15°C -23°C, year round.)
3 Existing structure- reinforced concrete



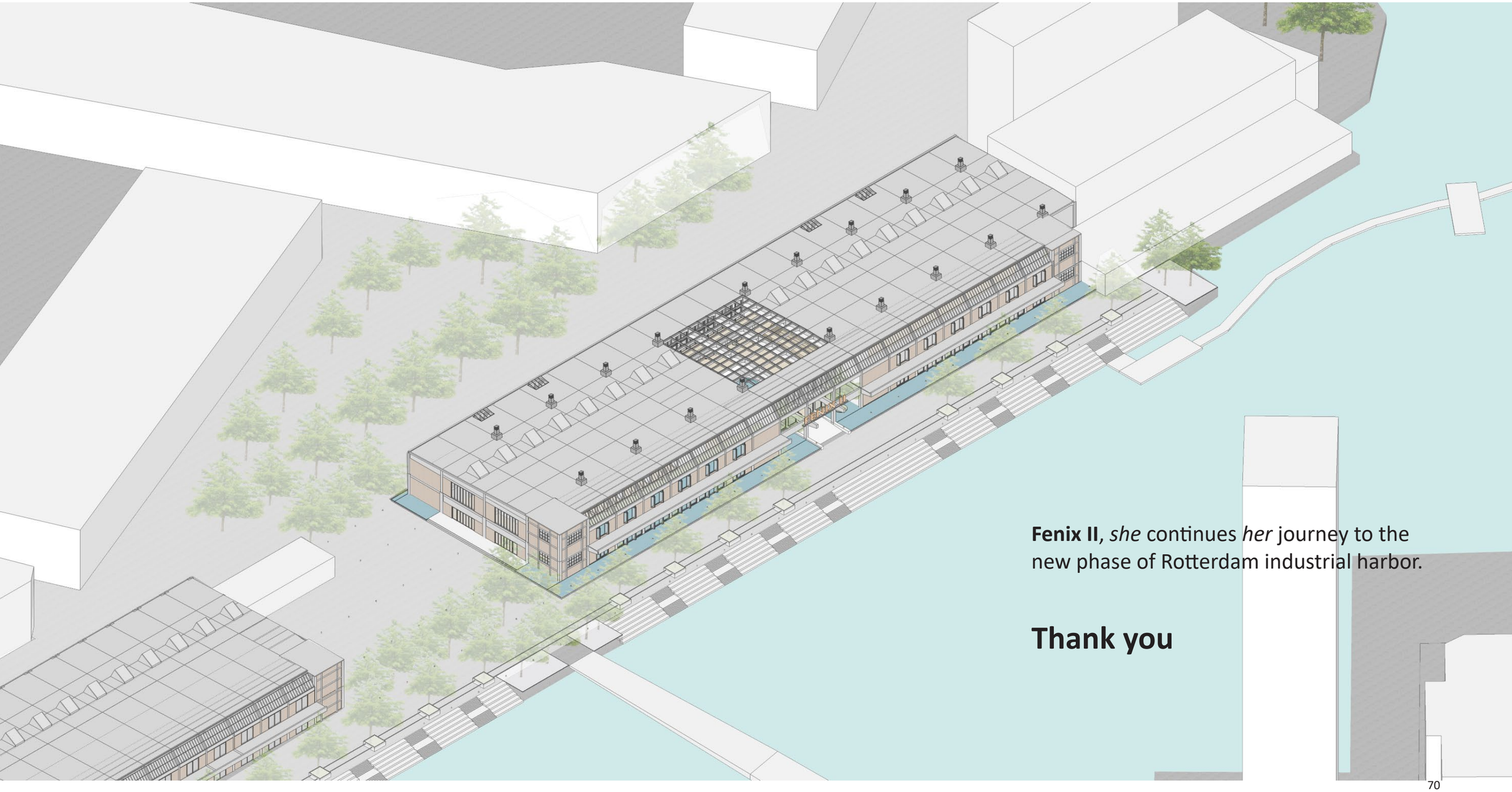
Detail 3

1 Polymer mortars for larger damage
2 Existing foundation- reinforced concrete



Detail 6

1 Prefabricated concrete base
2 Leveling cement if needed
3 Existing structure- reinforced concrete



Fenix II, *she* continues *her* journey to the new phase of Rotterdam industrial harbor.

Thank you