



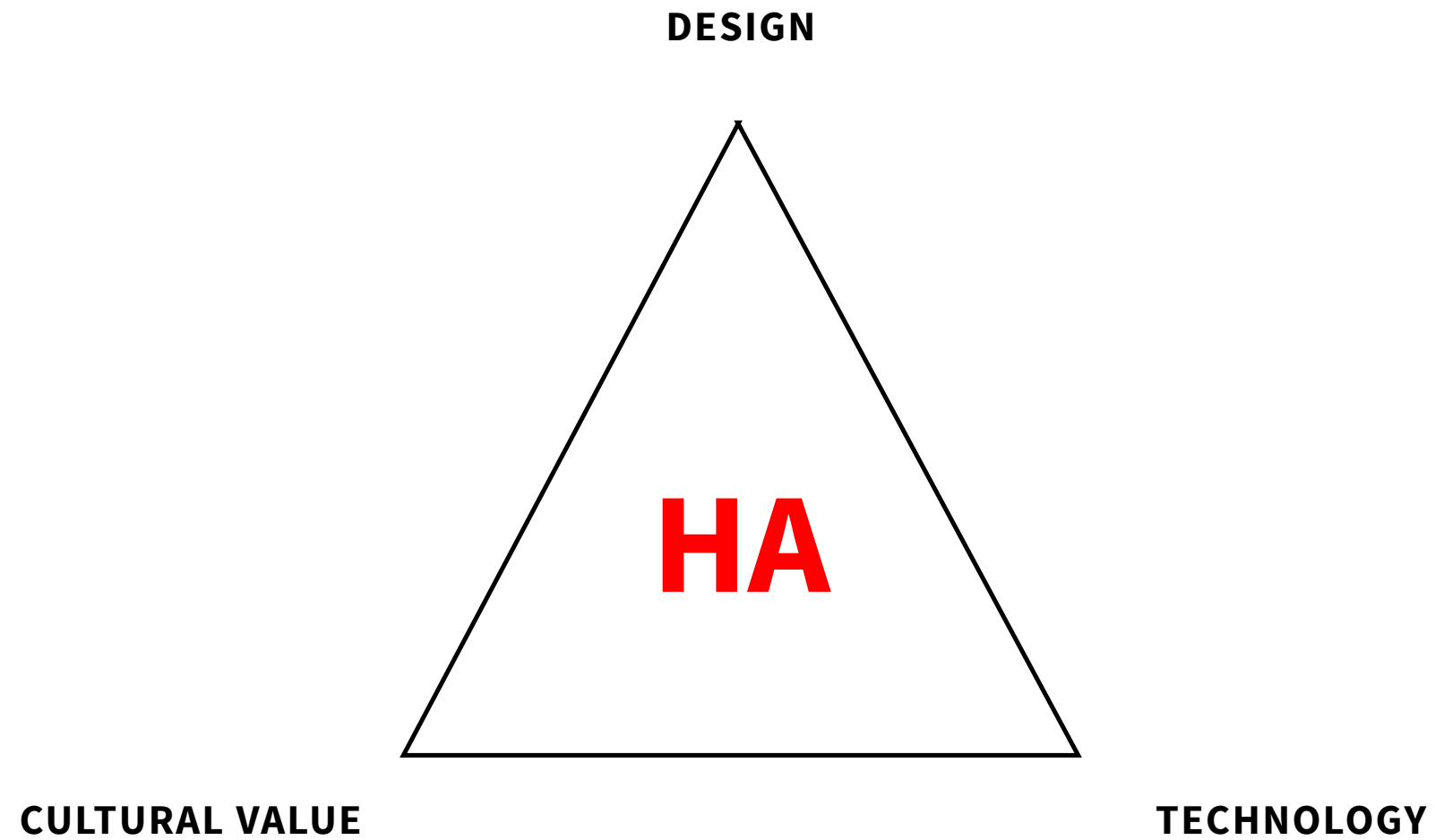
**P5 PRESENTATION**  
**RESTARTING THE MACHINE**  
ADAPTIVE RE-USE OF THE MANUTENÇÃO MILITAR COMPLEX IN LISBON

*tuesday 4th july 2017*

*AR3AR111 Heritage and Architecture Graduation Studio (2016-2017 Q1)  
Lisbon studio: Manutenção Militar complex*

# CONTEXT OF THE STUDIO

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*“Heritage & Architecture brings together the fields of cultural history, technology, and architectural design in a single holistic approach.”<sup>1</sup>*

<sup>1</sup>

Quist, W., Roos, J., Zijlstra, H., & Kuipers, M. (2016, October 05). Graduation Studio Manual - Heritage & Architecture: 'Disclosing the Military City Lisbon'. Retrieved from <https://blackboard.tudelft.nl>

# START OF THE STUDIO

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# TABLE OF CONTENT

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PLAN AREA**

**VISION**

**SITE**

**STRATEGY**

**SILO**

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**REFLECTION**

# INTRODUCTION

# INTRODUCTION OF THE PLAN AREA

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*The graduation project is part of the Lisbon studio: 'Disclosing the military city Lisbon'  
The site is located in Lisbon, Portugal*

# LISBON

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*The city of Lisbon is historically orientated and situated next to the river Tagus. The city has grown from a small settlement to the city it is today by its many expansion over the years mainly across the riverside. In this other riverside settlements were integrated into the Lisbon city.*

# BEATO

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*Neighbourhood Beato in between the Lisbon city centre and the Expo'98 area.*



# BEATO

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*Overview current situation*

# STRUCTURE OF BEATO

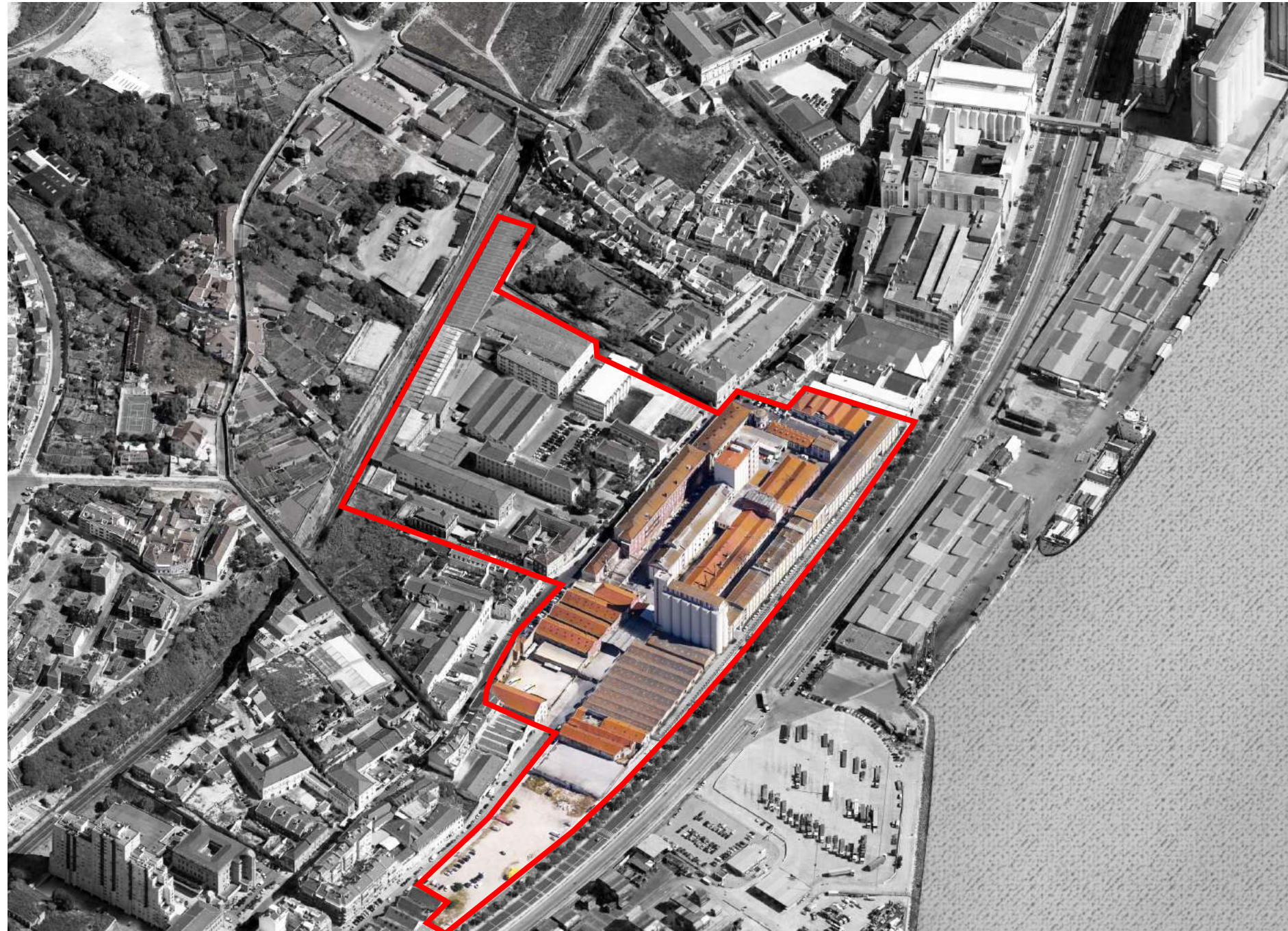
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*The MMC complex is divided, by a street called 'Rua do Grillo', into two parts: 'North' part and a 'South' part. North part contains mostly the offices and is used for administration. The South part was used for production. The complex is located in between residents, social housing 'Madre de Deus' and the harbour.*

# MANUTENÇÃO MILITAR COMPLEX

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*Graduation project location*

## USE OF MMC

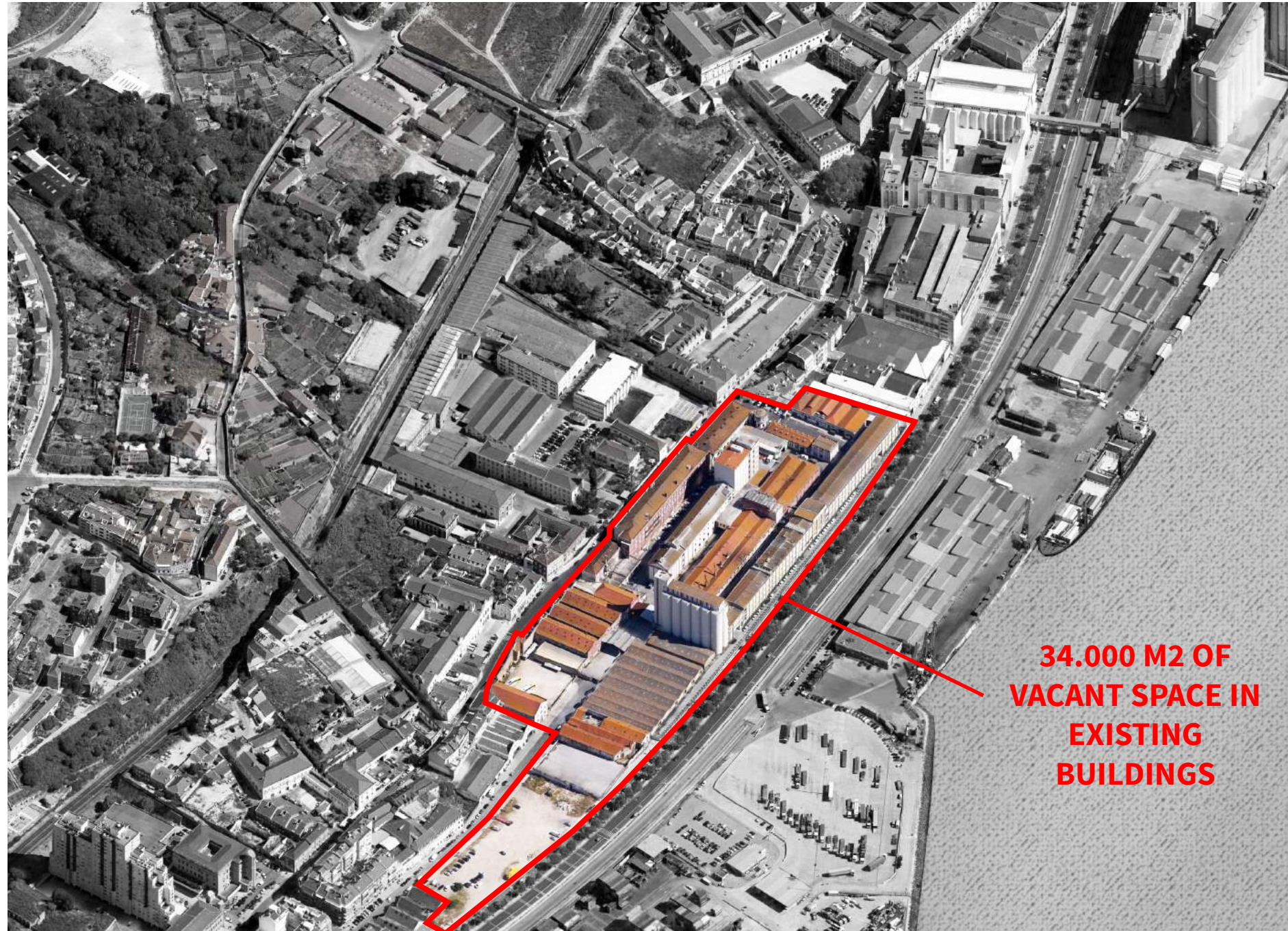
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*The Manutenção Military Complex produced food and goods for the Portuguese Military Army until 1992*

# FOCUS

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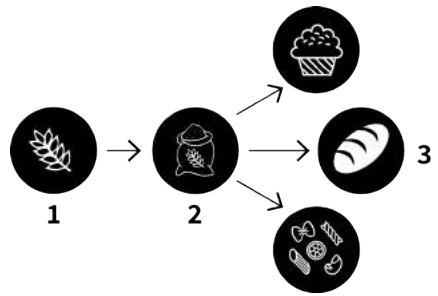
**34.000 M2 OF  
VACANT SPACE IN  
EXISTING  
BUILDINGS**

*What to do with it??*

# PROBLEM STATEMENT

**CLOSED  
KEEP OUT!**

**ENCLOSURE**



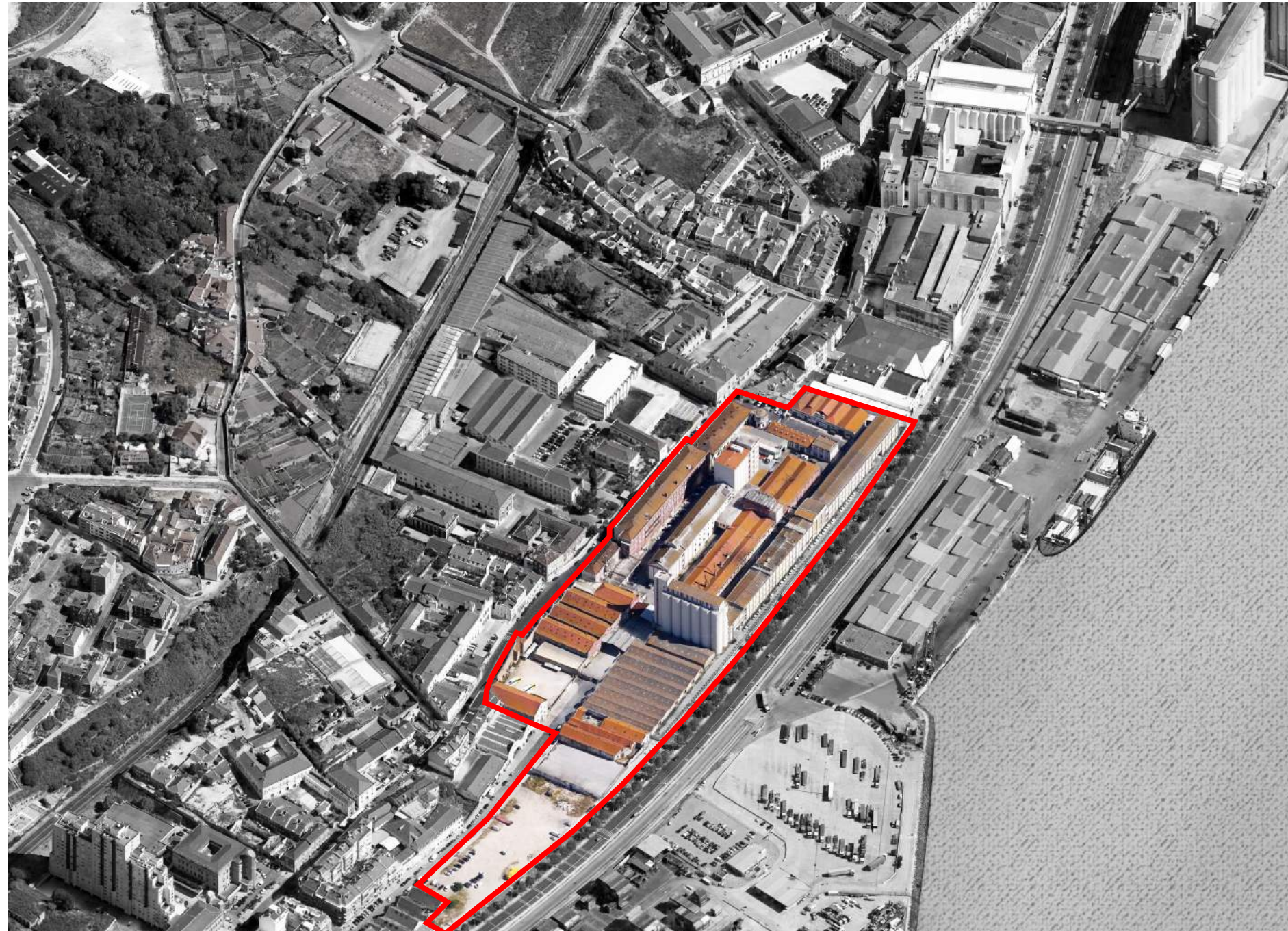
**PRODUCTION PROCESS**



**TWO FACE**

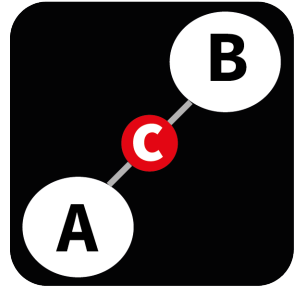


**PRAGMATISM/ LINEAR  
STRUCTURE**



**MMC**

# PROBLEM STATEMENT



IN BETWEEN ZONE



INACTIVITY



UNBALANCED DEMOGRAPHICS



*Disconnection water*



BEATO



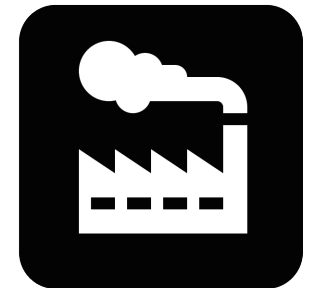
*Inaccessible green space*



*Lack public spaces*



LACK PUBLIC FACILITIES



*Presence harbour/ industry/ military history*

## RESEARCH QUESTION

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**CLOSENESS**

**INACTIVITY**

**IN BETWEEN ZONE**

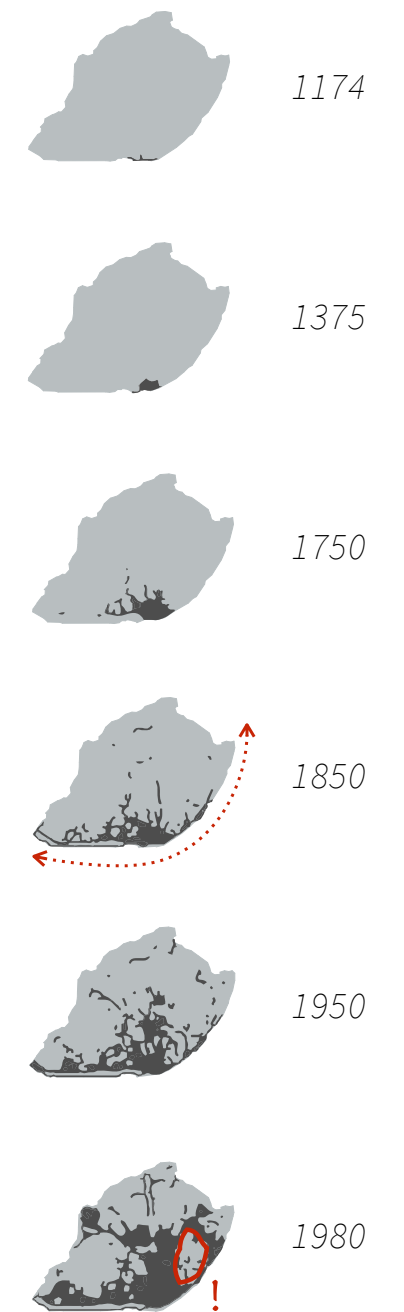
**ABANDONED FACTORY**



WHAT **STRATEGY** CAN ONE USE TO **INTERVENE** IN A **MONO-FUNCTIONAL STRUCTURE**  
IN ORDER TO **REGENERATE** THE BUILDING (SITE) AND **CONNECT** IT TO THE CITY?

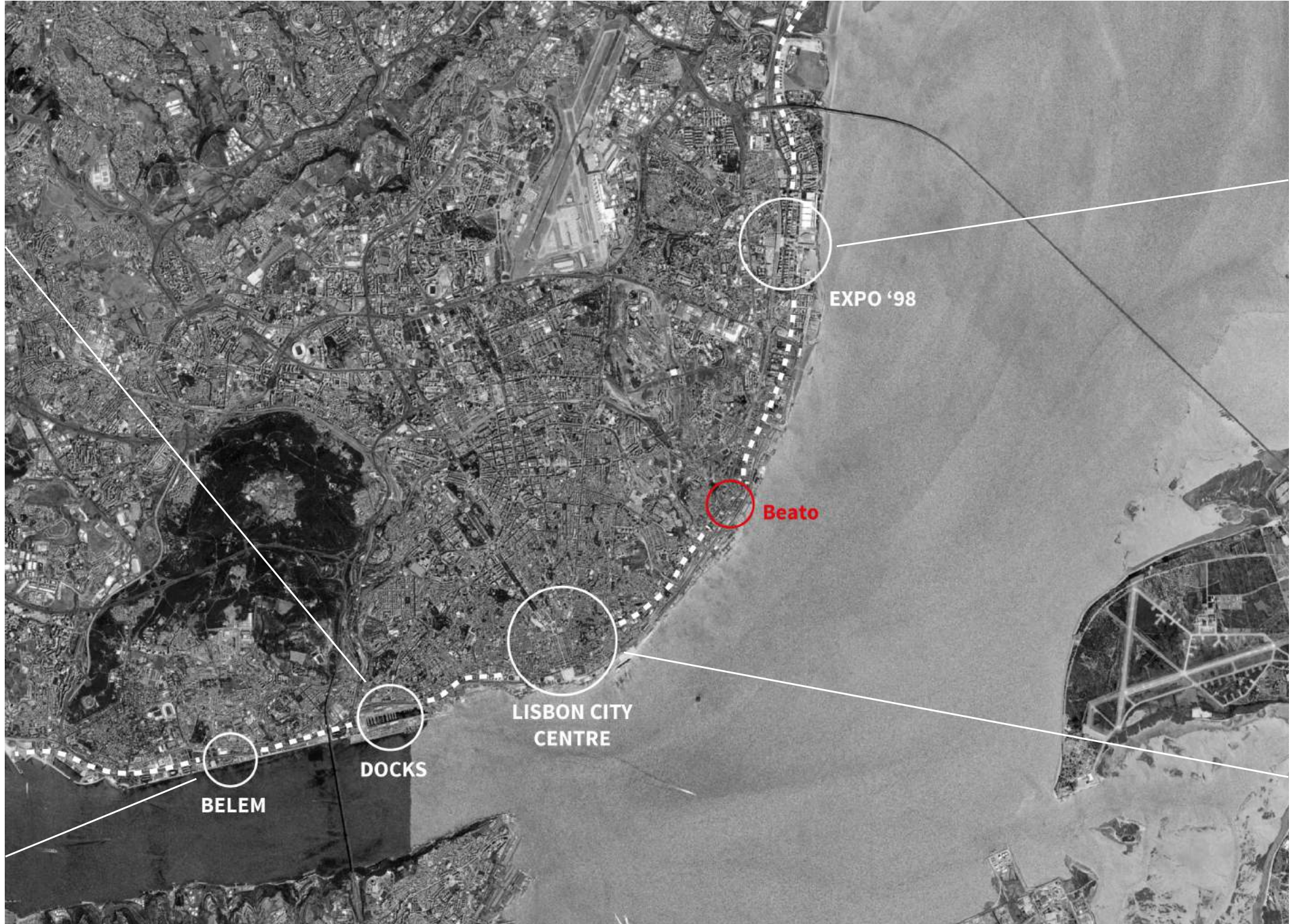


# DEVELOPMENT OF LISBON



The city of Lisbon is historically orientated and situated next to the river Tagus. The city has grown from a small settlement to the city it is today by its many expansion over the years mainly across the riverside. In this other riverside settlements were integrated into the Lisbon city.

# CURRENT SITUATION

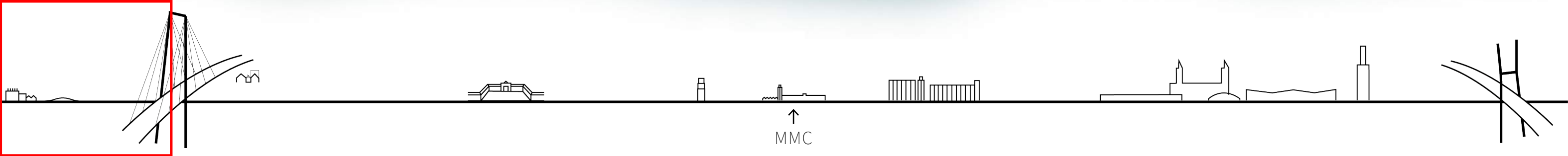


*Iconic areas of Lisbon, located at the waterfront*

# COASTLINE

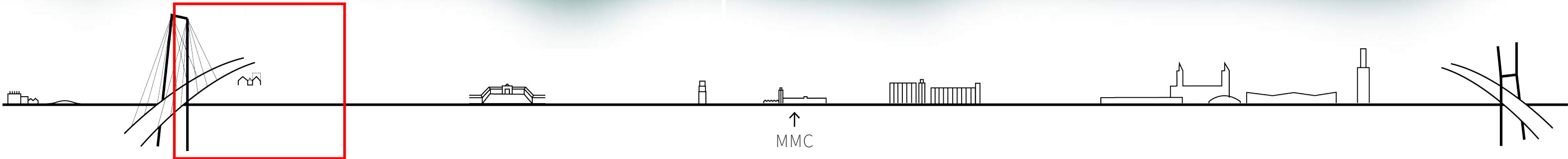


MAAT MUSEUM



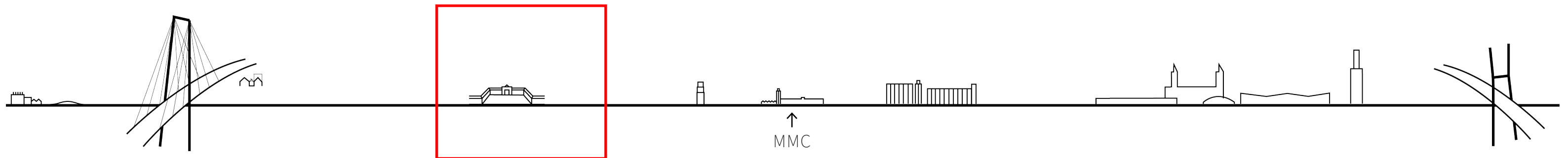
# COASTLINE

LX FACTORY

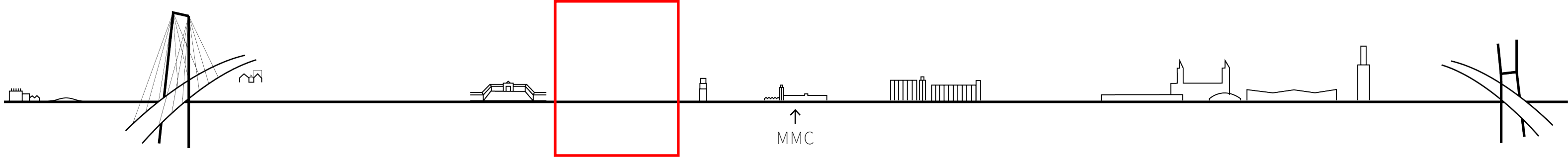


# COASTLINE

## LISBON CITY CENTRE

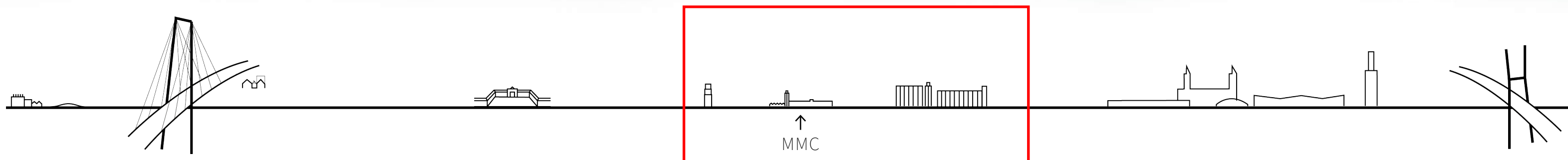


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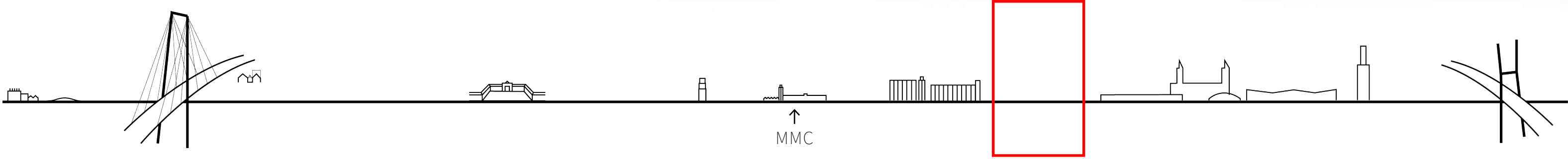


# COASTLINE

## MANUTENCAO MILITAR COMPLEX



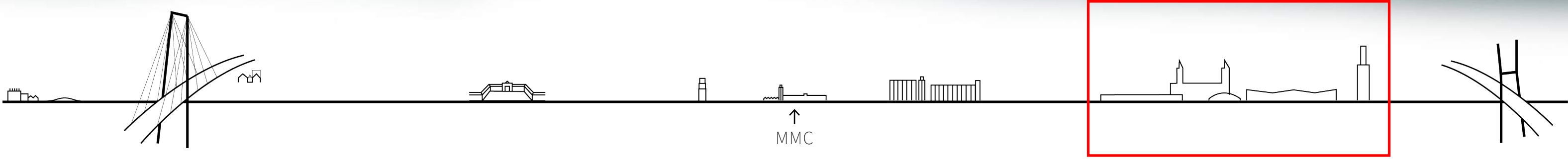
# COASTLINE



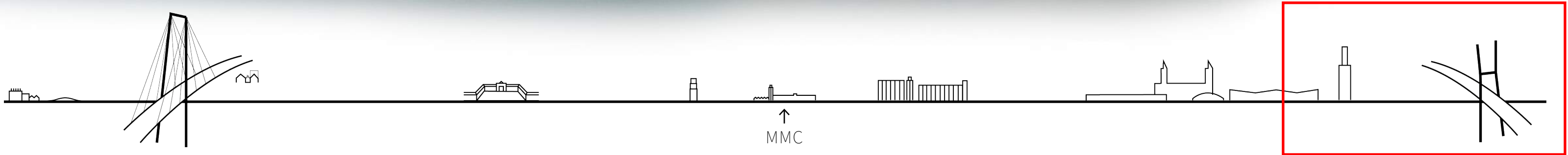


# COASTLINE

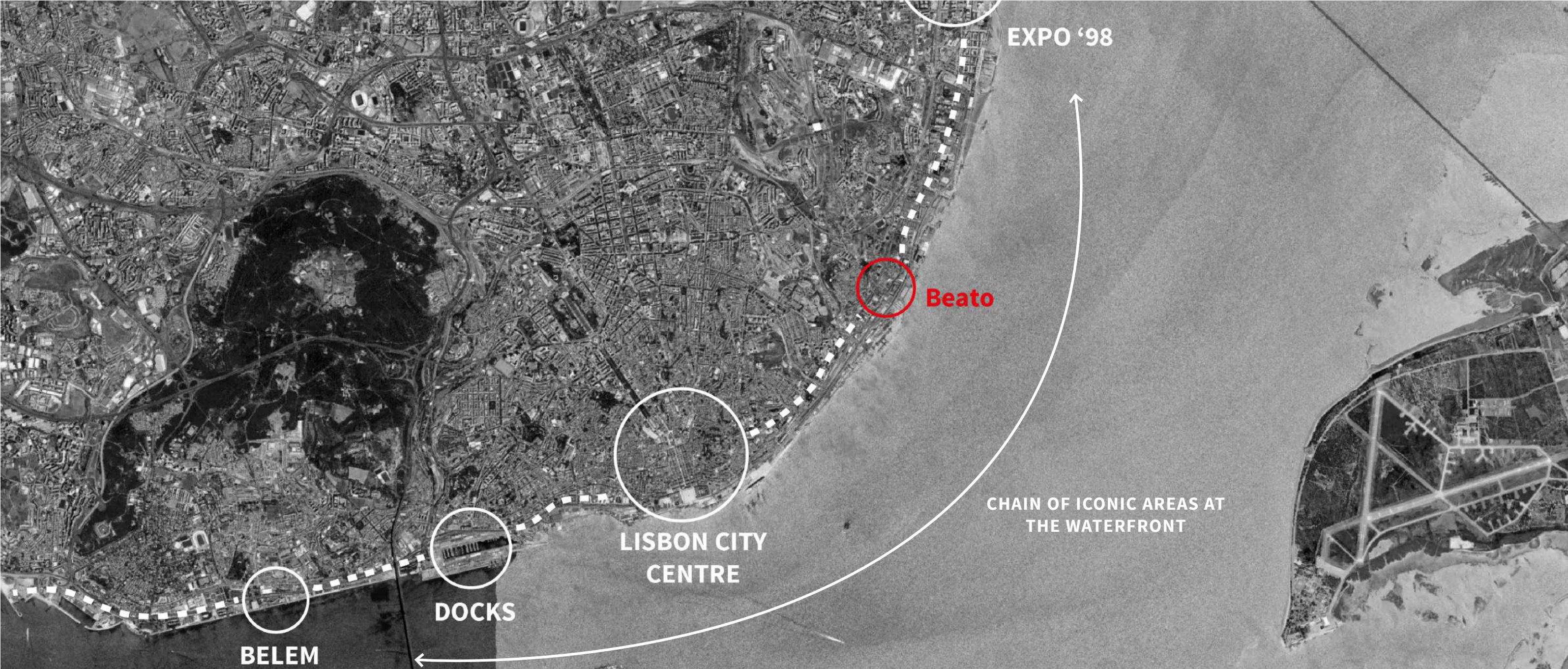
## EXPO '98 - PARQUE DAS NAÇOES



# COASTLINE



# POTENTIAL



## POTENTIAL BEATO

- Place where the industrial and military history of Lisbon is connected to daily life.
- New place for all Lisbon citizens at a good location (near the city centre and near the waterfront)

# VISION

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**EXISTING WATERFRONT**

# VISION

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**FUTURE WATERFRONT**

# VISION

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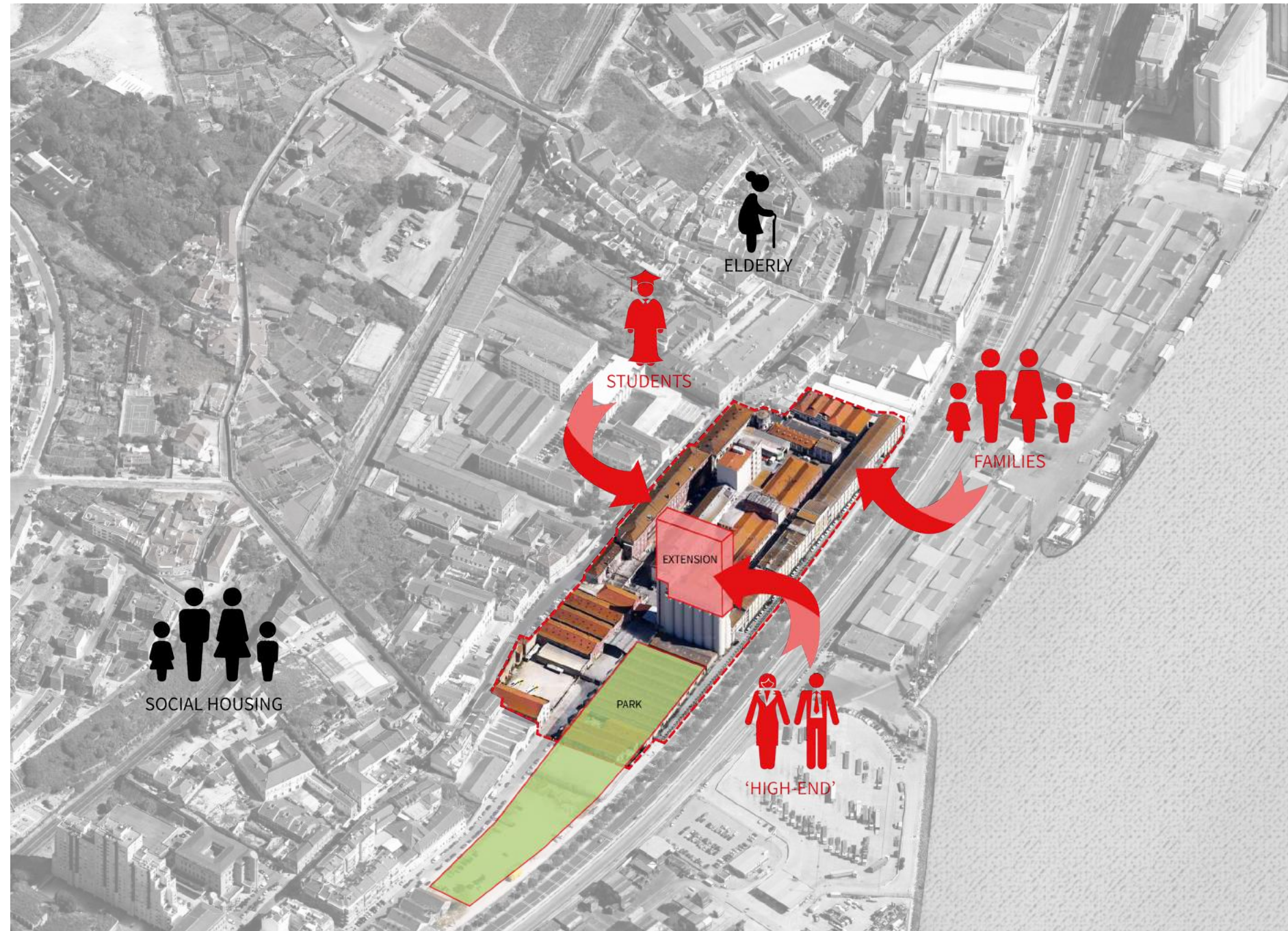
# VISION

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**EXTENDING THE ICON**

# VISION



*Politically: placing the MMC and Beato on the map - Economically: generating funds for transformation of the MMC and Beato - Socially: attracting different groups of people to make the social machine work*



# INSPIRATION

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*Expo '98 pavilion - during construction*

# INSPIRATION

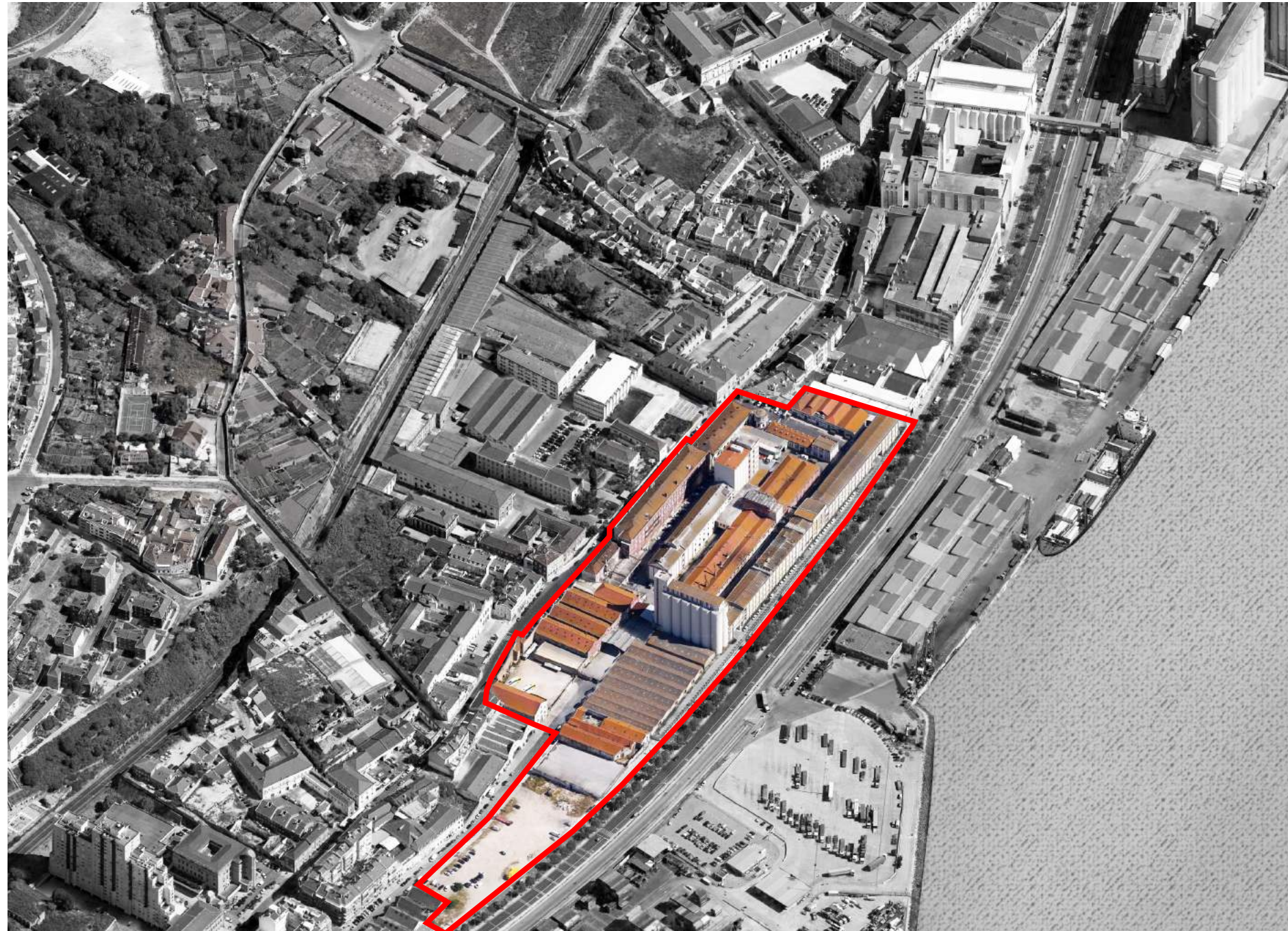
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*Expo '98 pavilion - present*

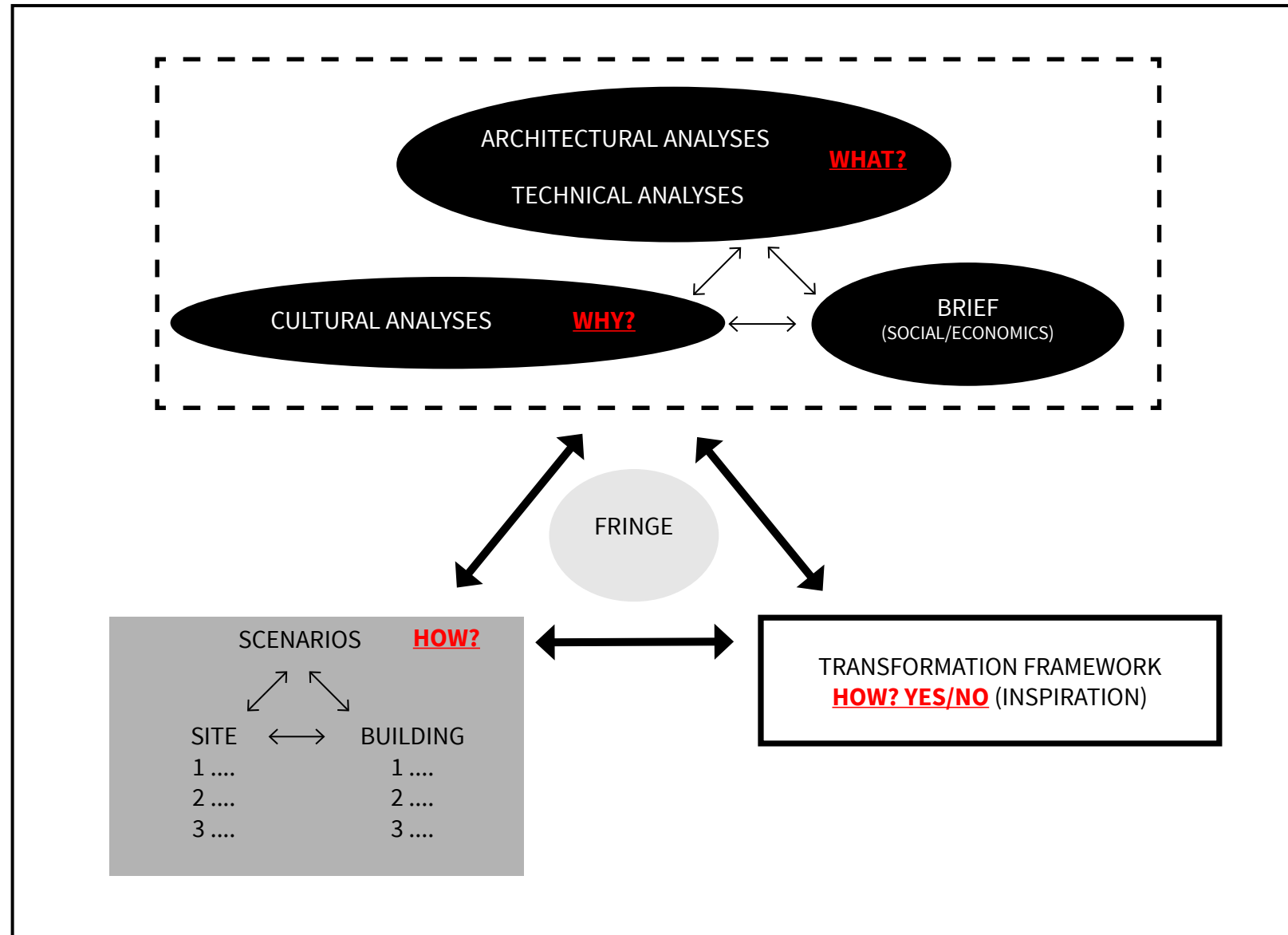
# EXISTING VALUES

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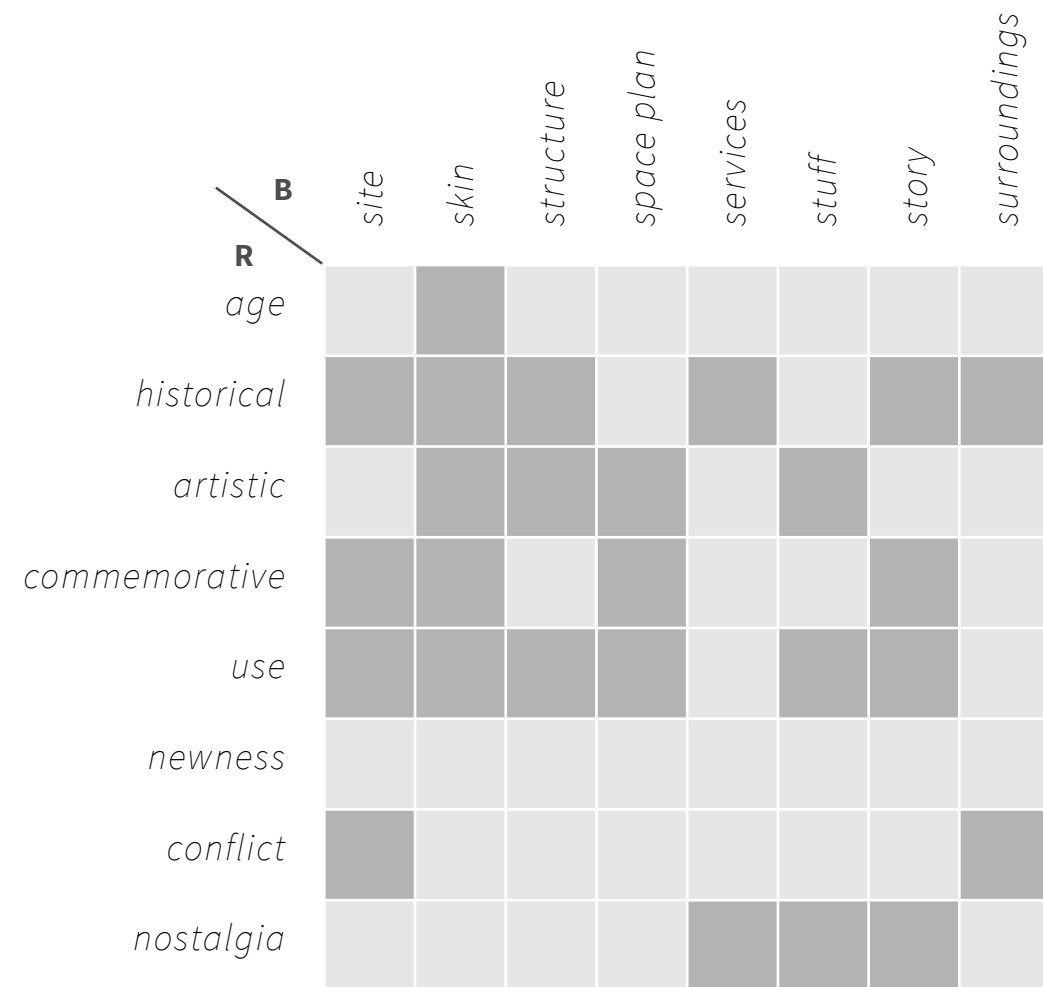
*Existing benefits from the new and vice versa*

# WORK METHOD

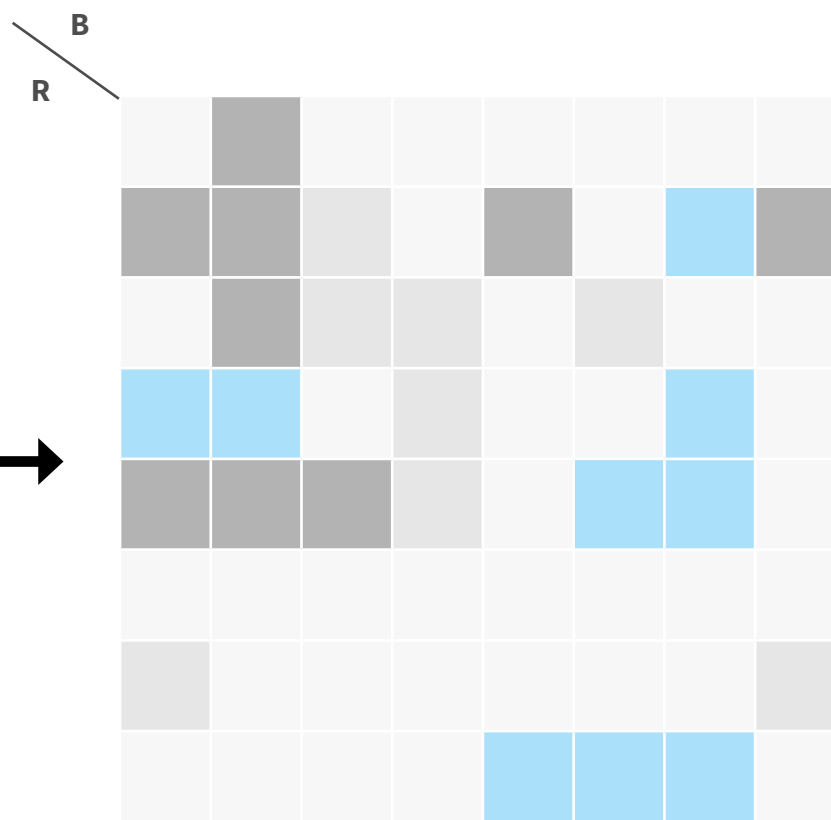


DESIGN

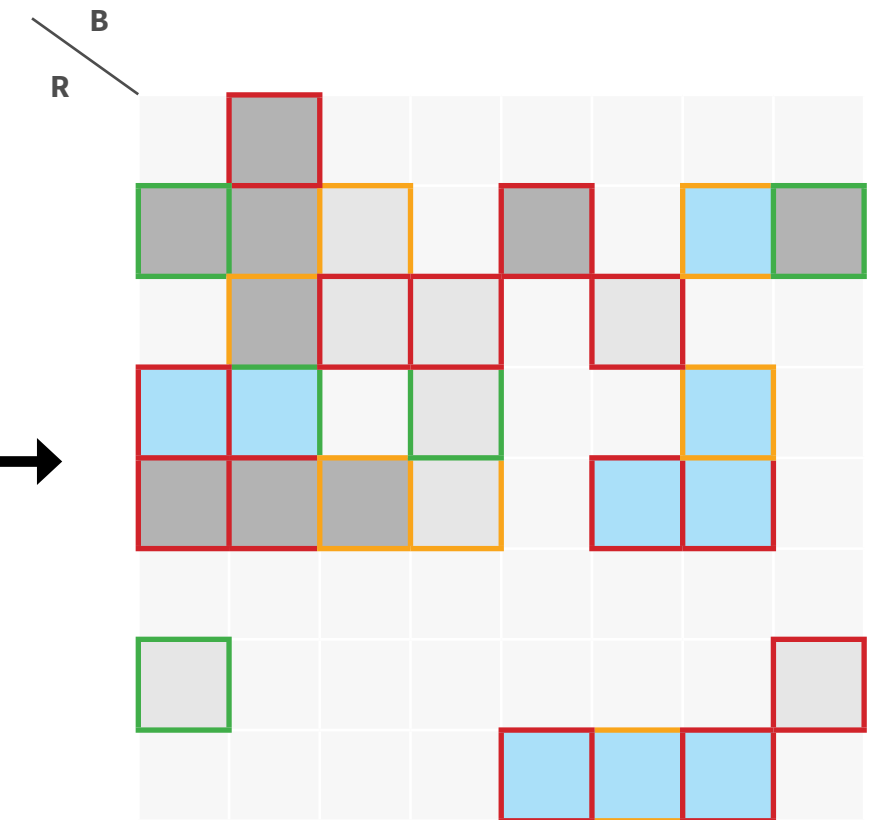
# CULT MATRIX



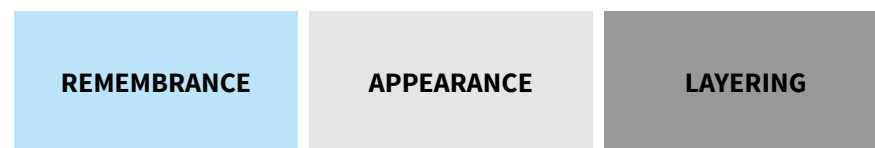
Cult matrix - Riegl & Brand



Use of themes



Differentiation through value-ing



# REMEMBRANCE

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## ENCLOSURE

*The complex has always been enclosed. From its time as a religious complex to being a military complex*

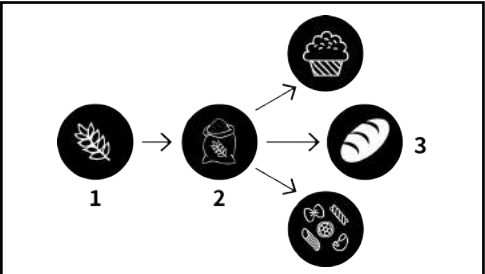
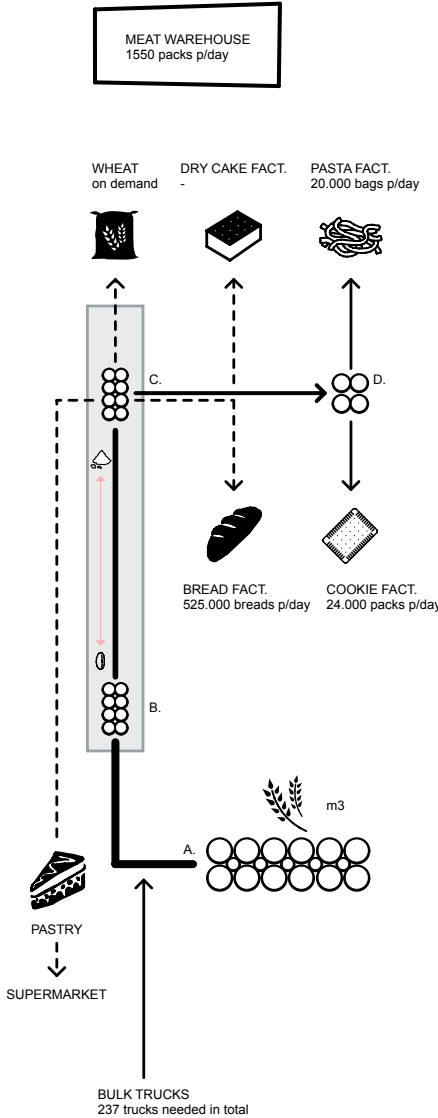


# APPEARANCE



## PRODUCTION PROCESS

MMC is a military complex but had a production process of mainly goods and food like bread, pasta, cookies and pastries. The production process is expressed by the machines (stuff) but most important how the spaces were made to fit the process and how the routing is still expressed



# LAYERING

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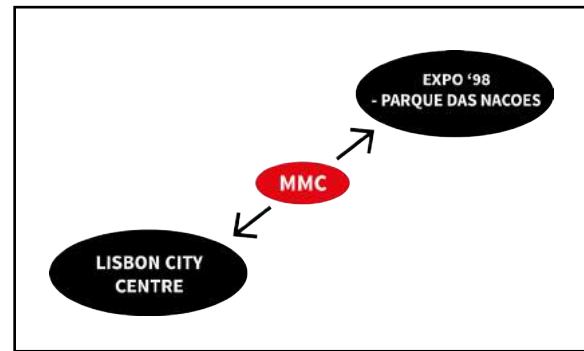
## TWO FACE

*The site was not build over night, but is part of an evolution over time. Expressed by its two face character: classical vs modern/industrial. Classical towards the neighbourhood and modern/industrial towards the city*

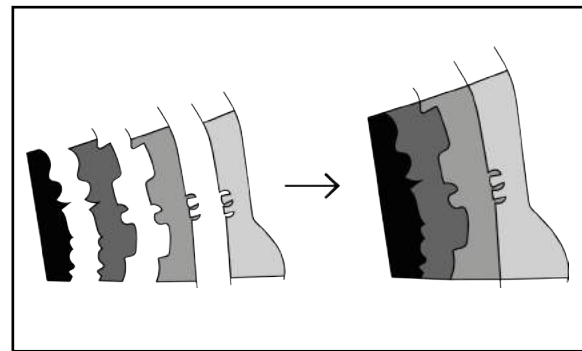




# TRANSFORMATION FRAMEWORK



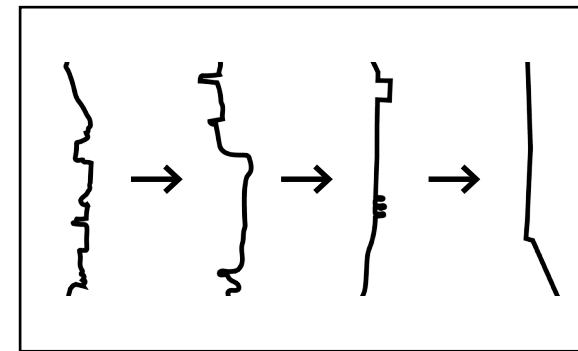
MMC: In between space



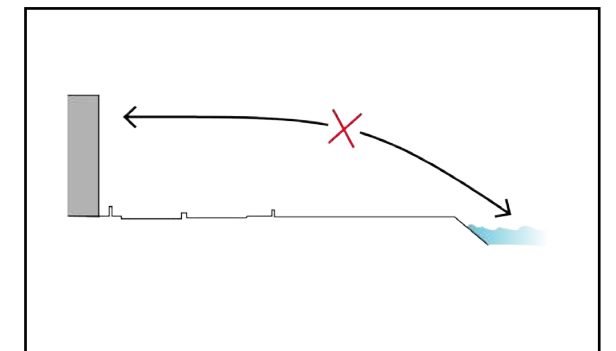
Historical layering riverside



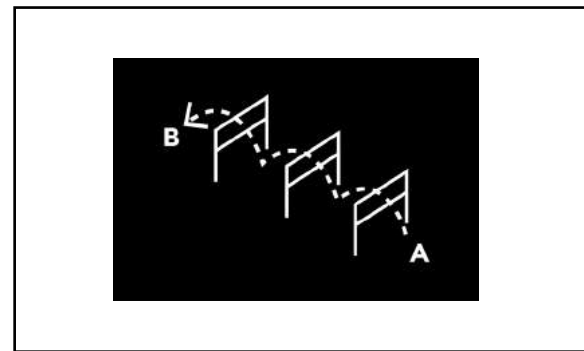
Enclosure



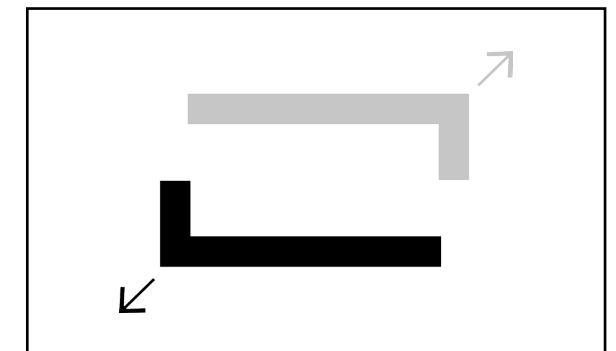
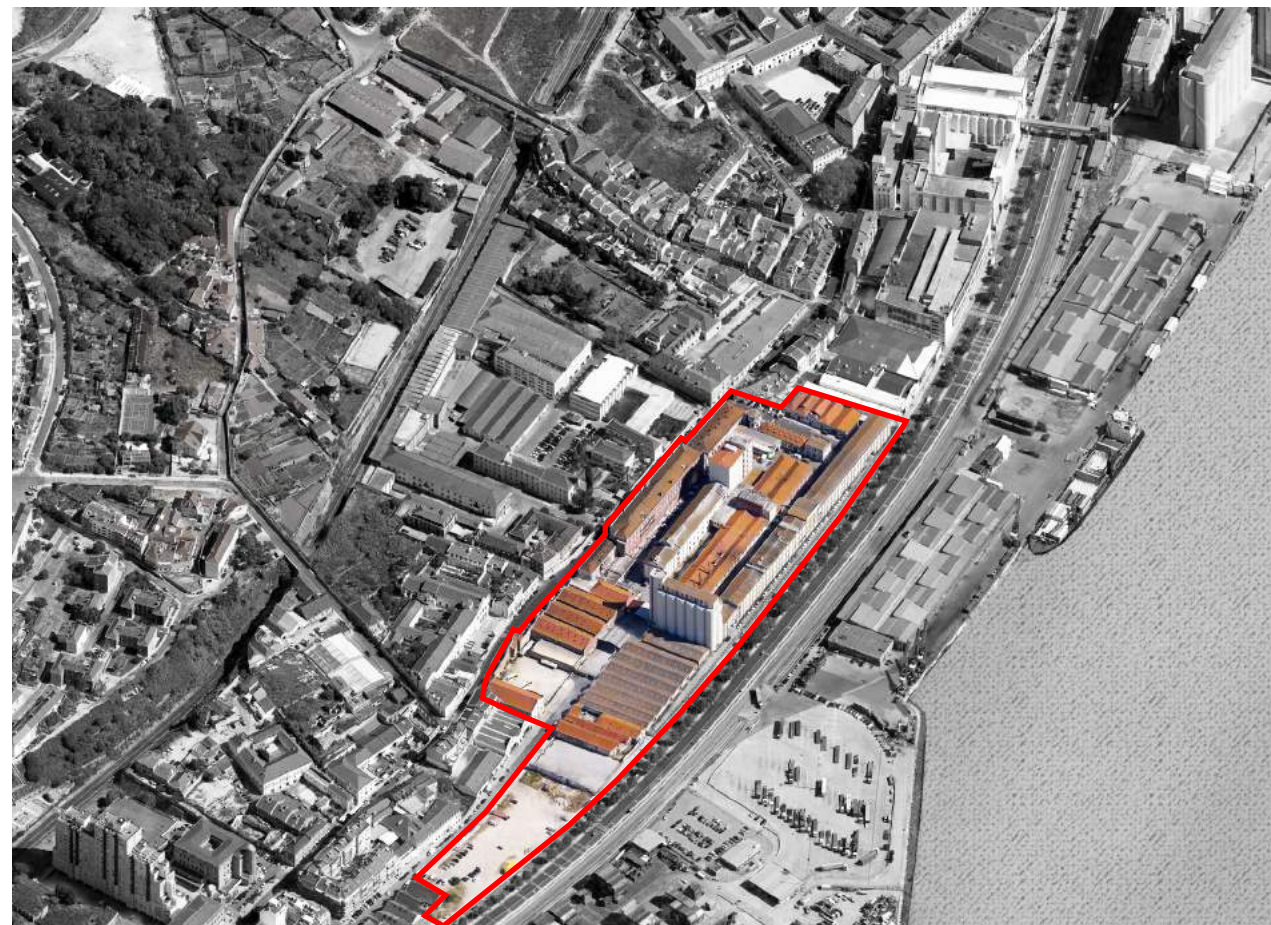
Coastline development



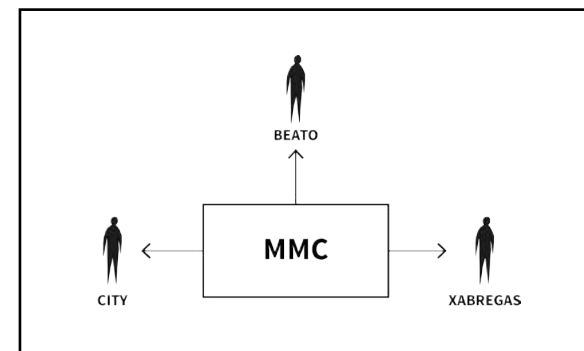
MMC: Loss of direct connection



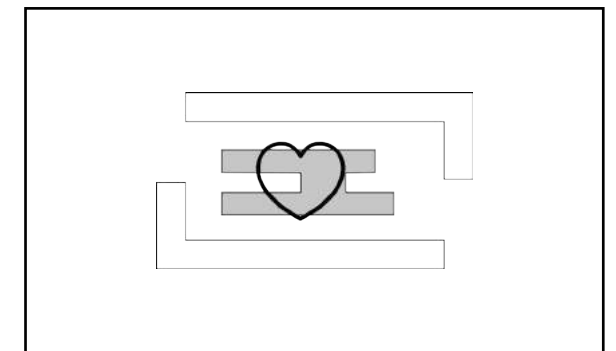
Barriers: between innerland and water



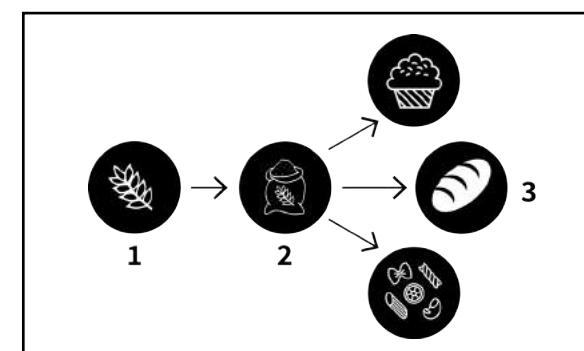
Two - face



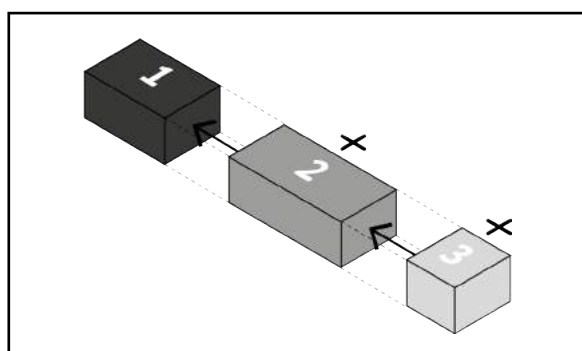
Social connection



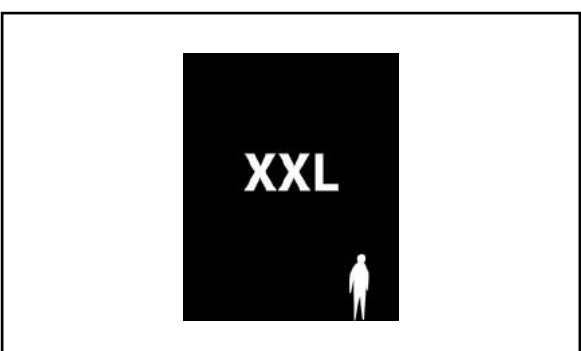
Embracing the heart



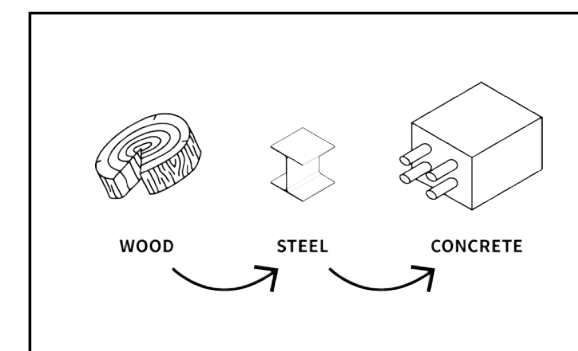
Production process



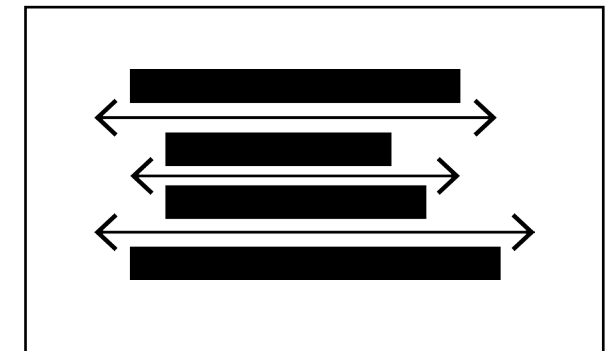
Pragmatism



Oversized character

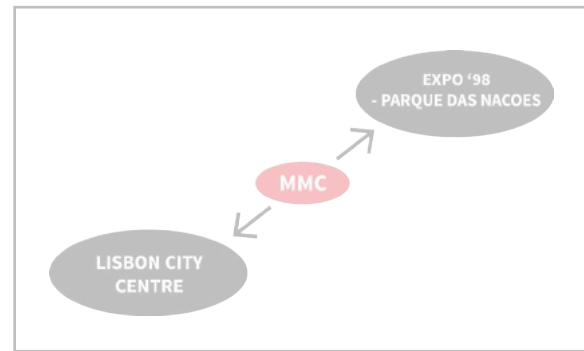


Technical development

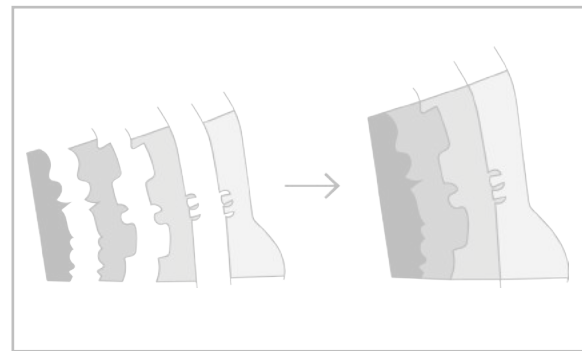


Linear structure

# TRANSFORMATION FRAMEWORK



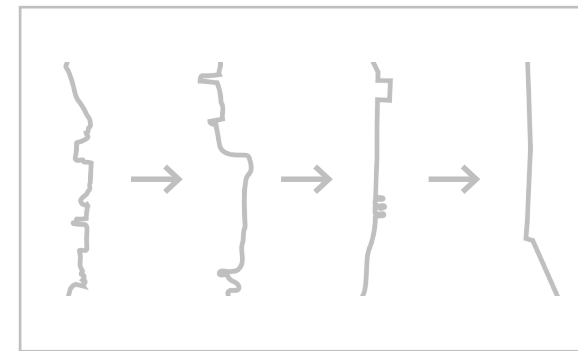
MMC: In between space



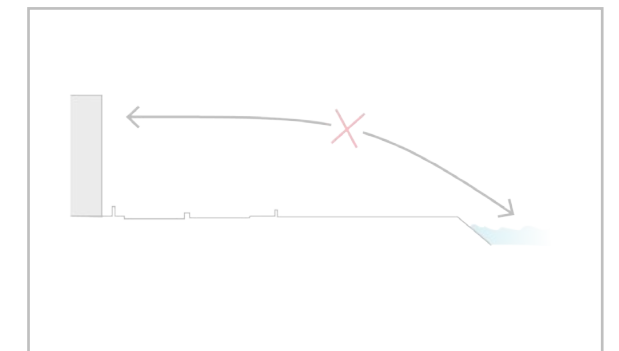
Historical layering riverside



Enclosure



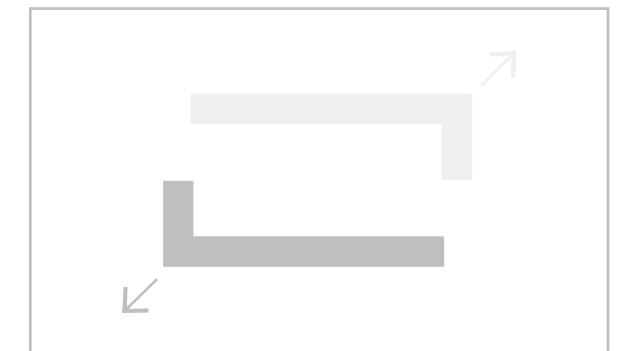
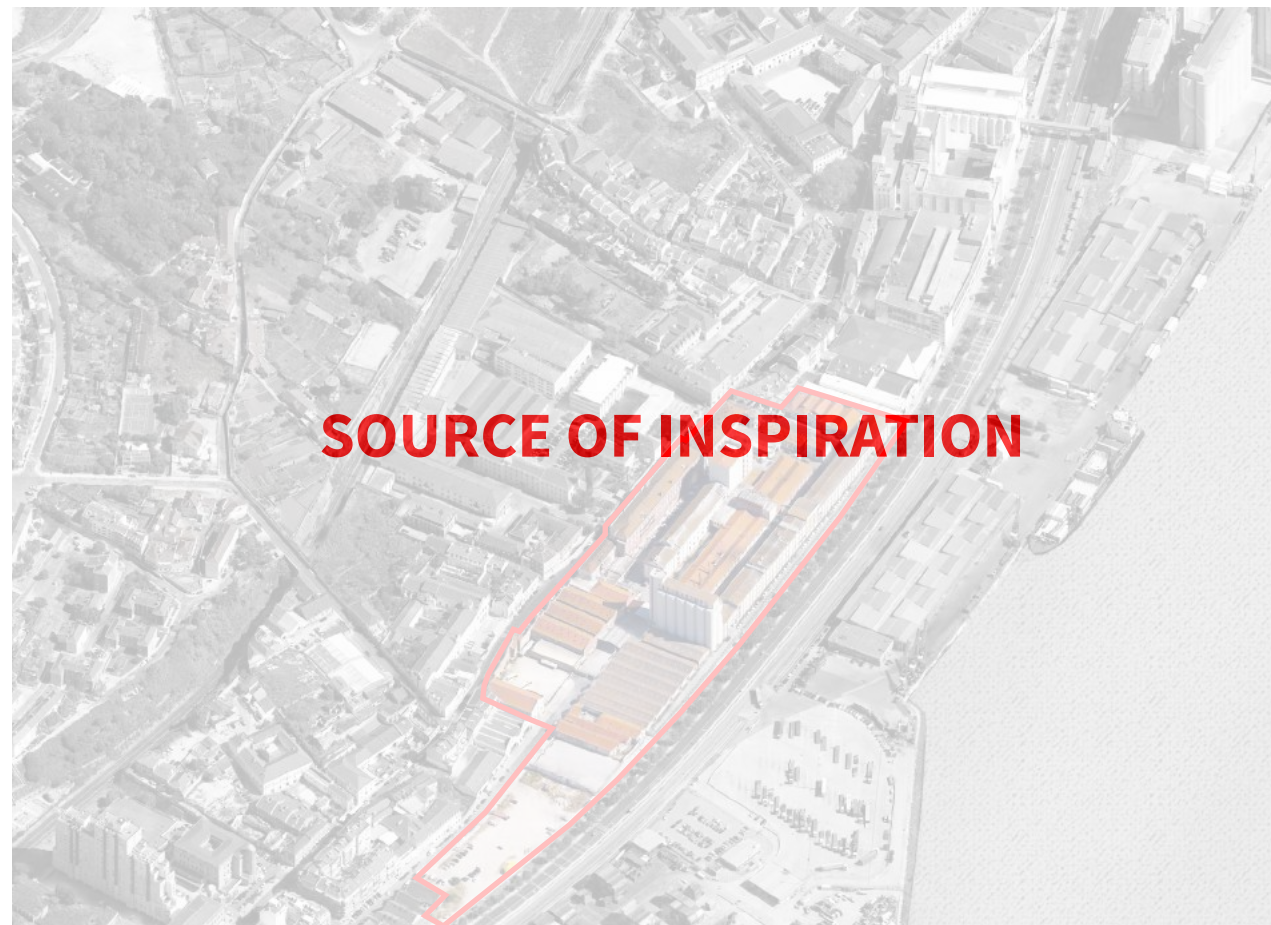
Coastline development



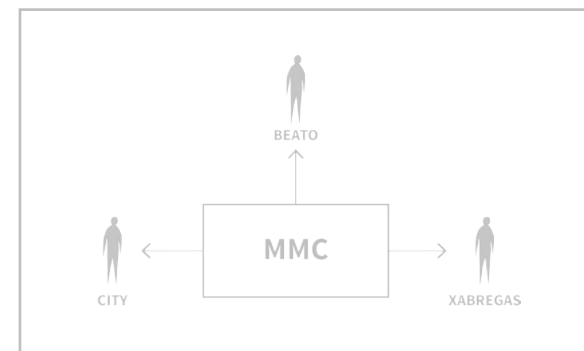
MMC: Loss of direct connection



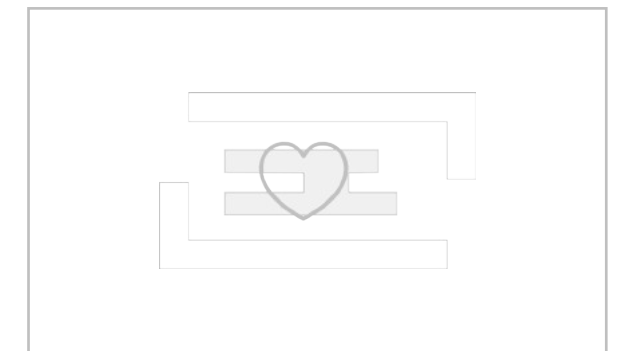
Barriers: between innerland and water



Two-face



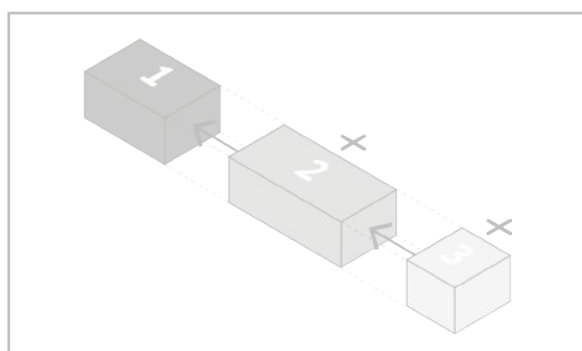
Social connection



Embracing the heart



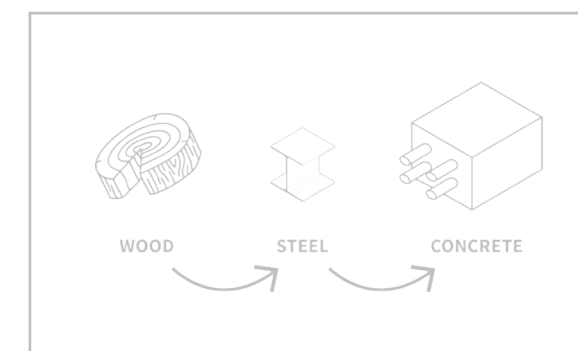
Production process



Pragmatism



Oversized character

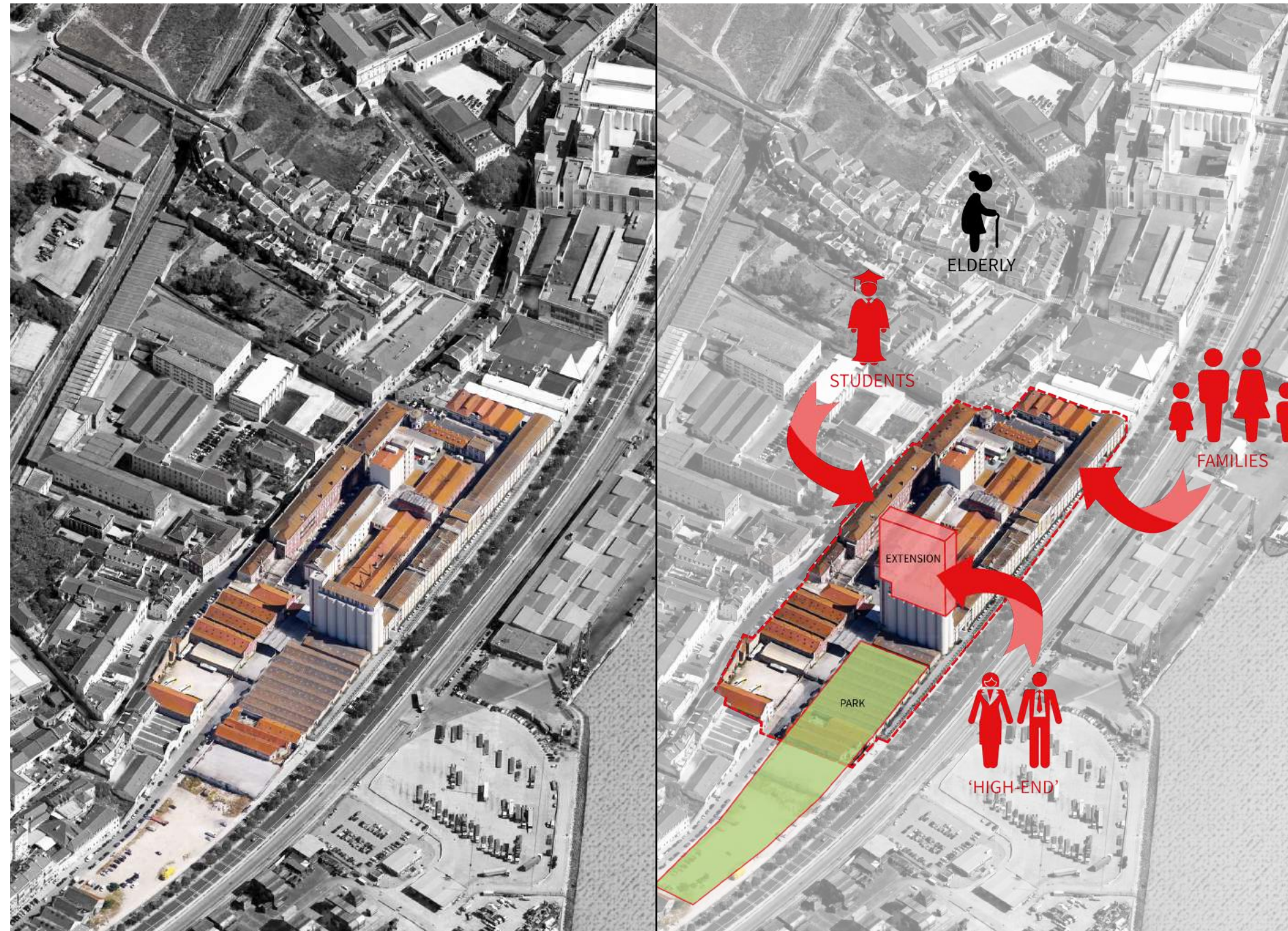
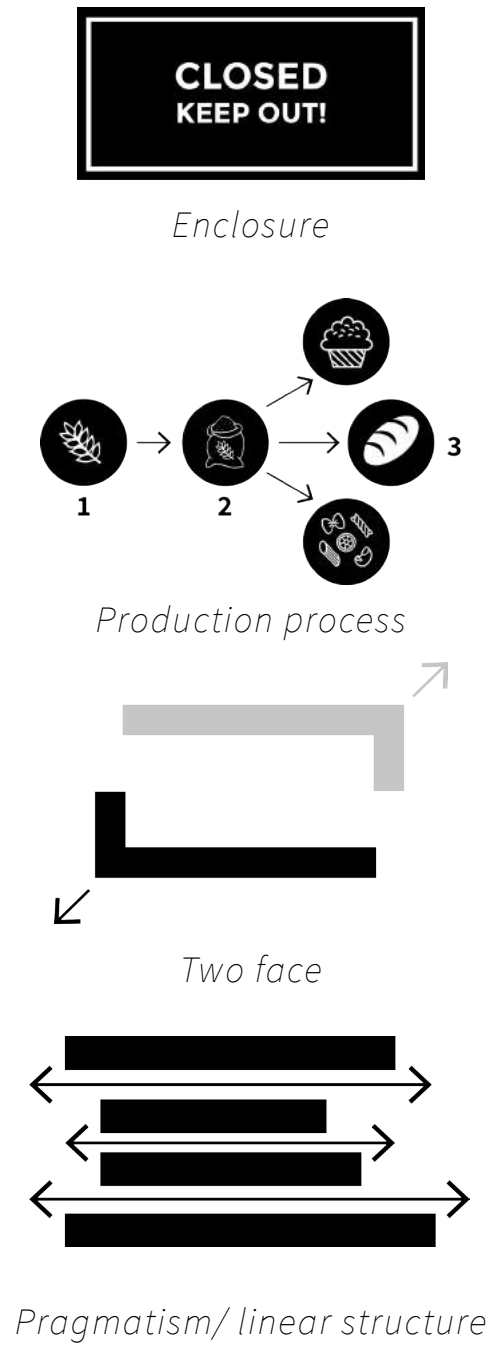


Technical development



Linear structure

# DILEMMA



Existing values and characteristics

**VS**

Vision

**ACCESSIBILITY**

**NEW FUNCTIONALITY**

**LOCAL SCALE  
VS  
CITY SCALE**

**CONNECTING**

**STRATEGY**

# EXISTING

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*34.000 m2 vacant space inside existing buildings*

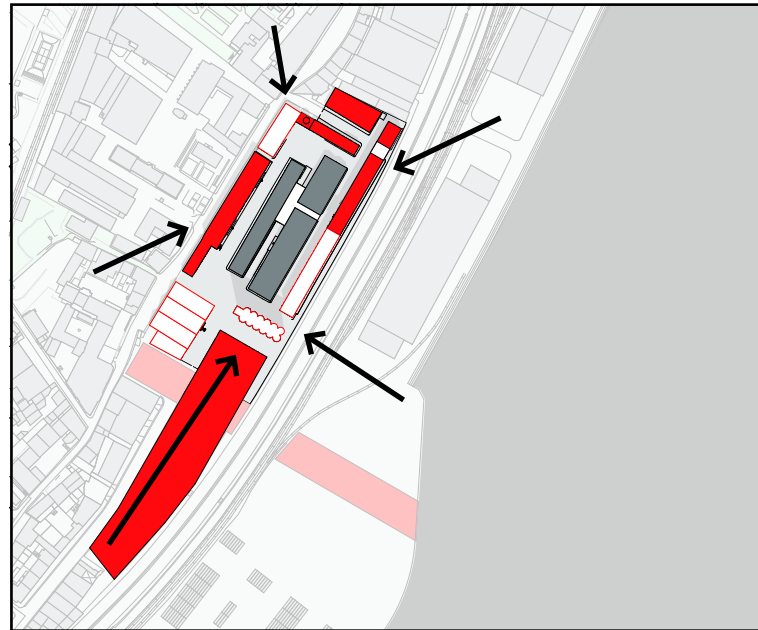
# STRATEGY

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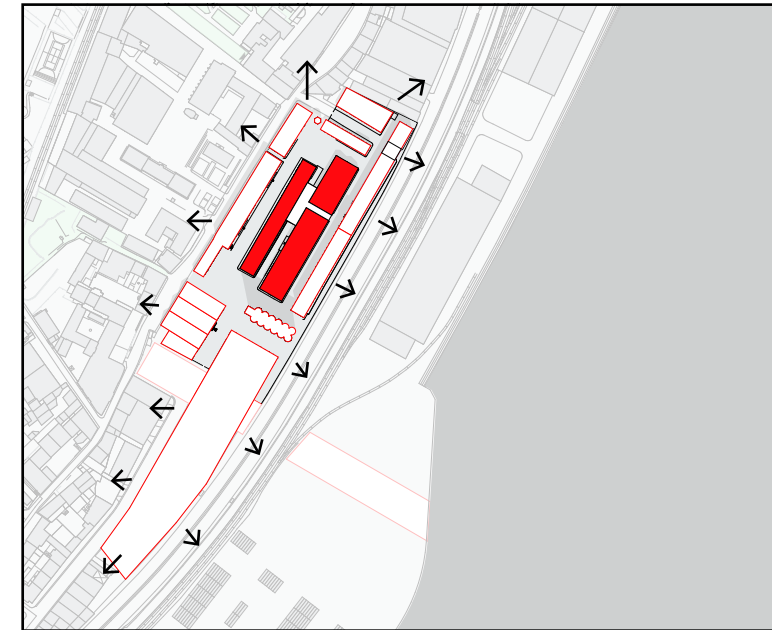
## PHASING



1. ACTIVATE

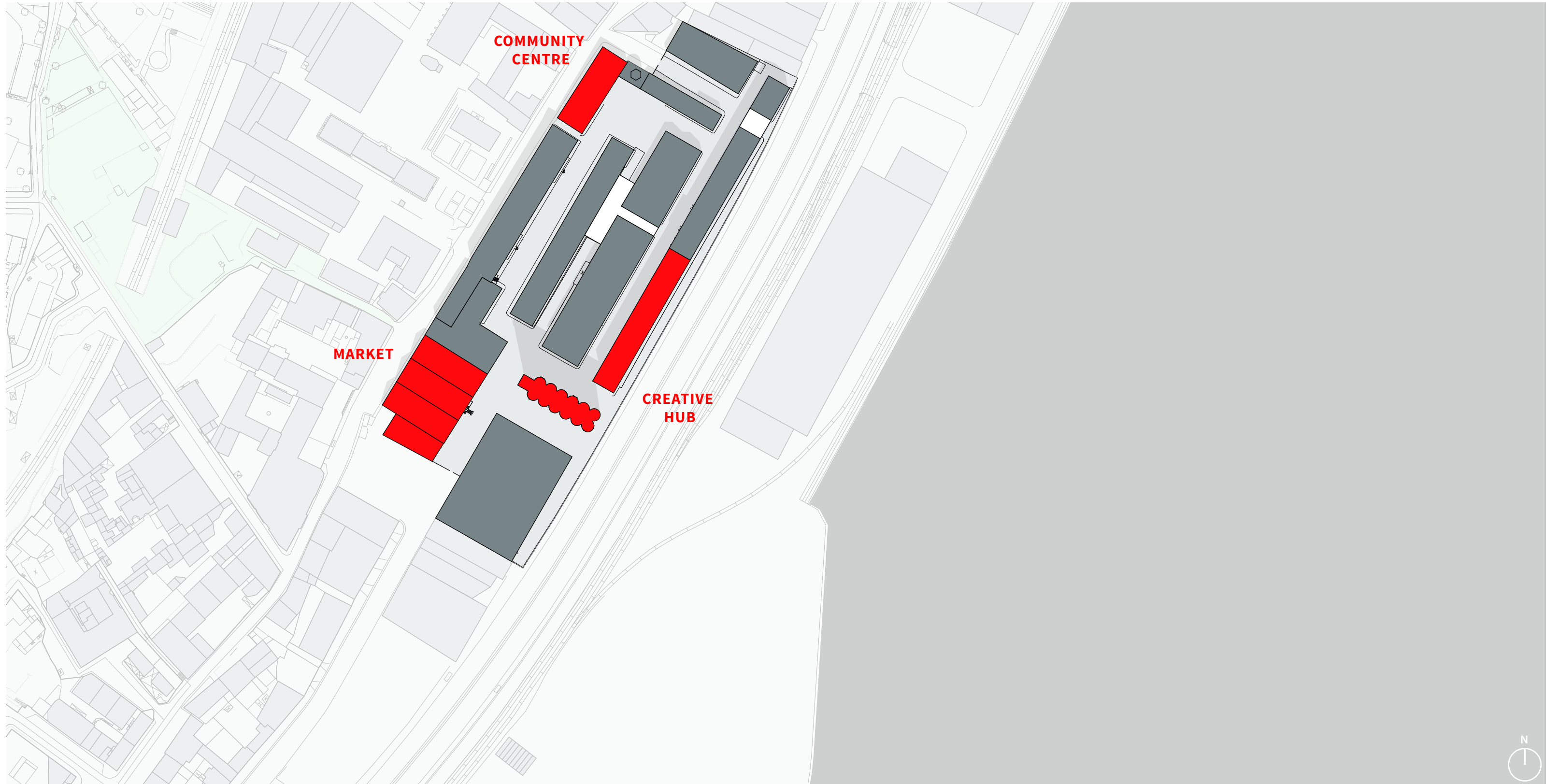


2. GENERATE



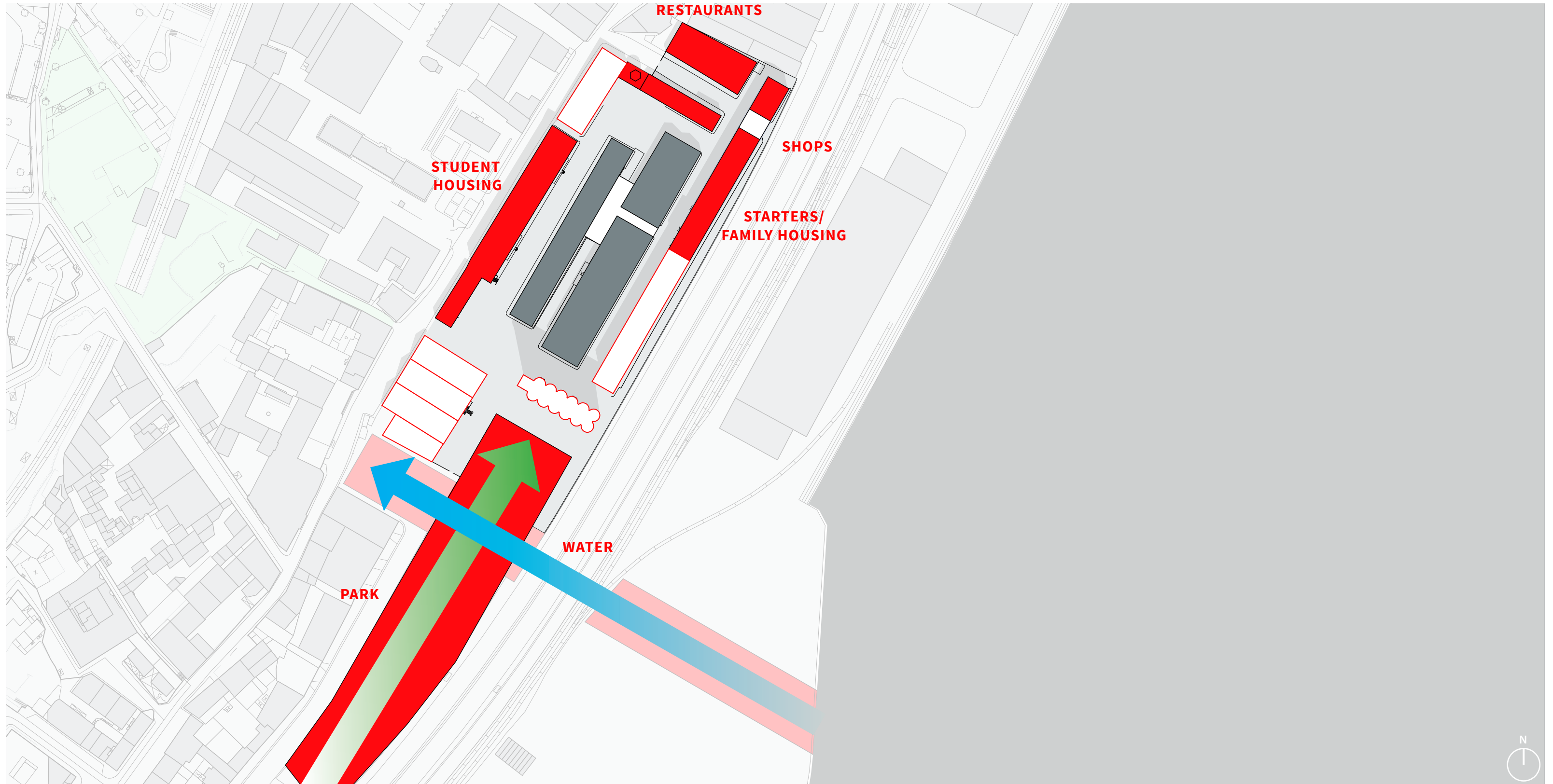
3. INTEGRATE

# ACTIVATE



**PLACEMAKERS - STARTING POINTS**

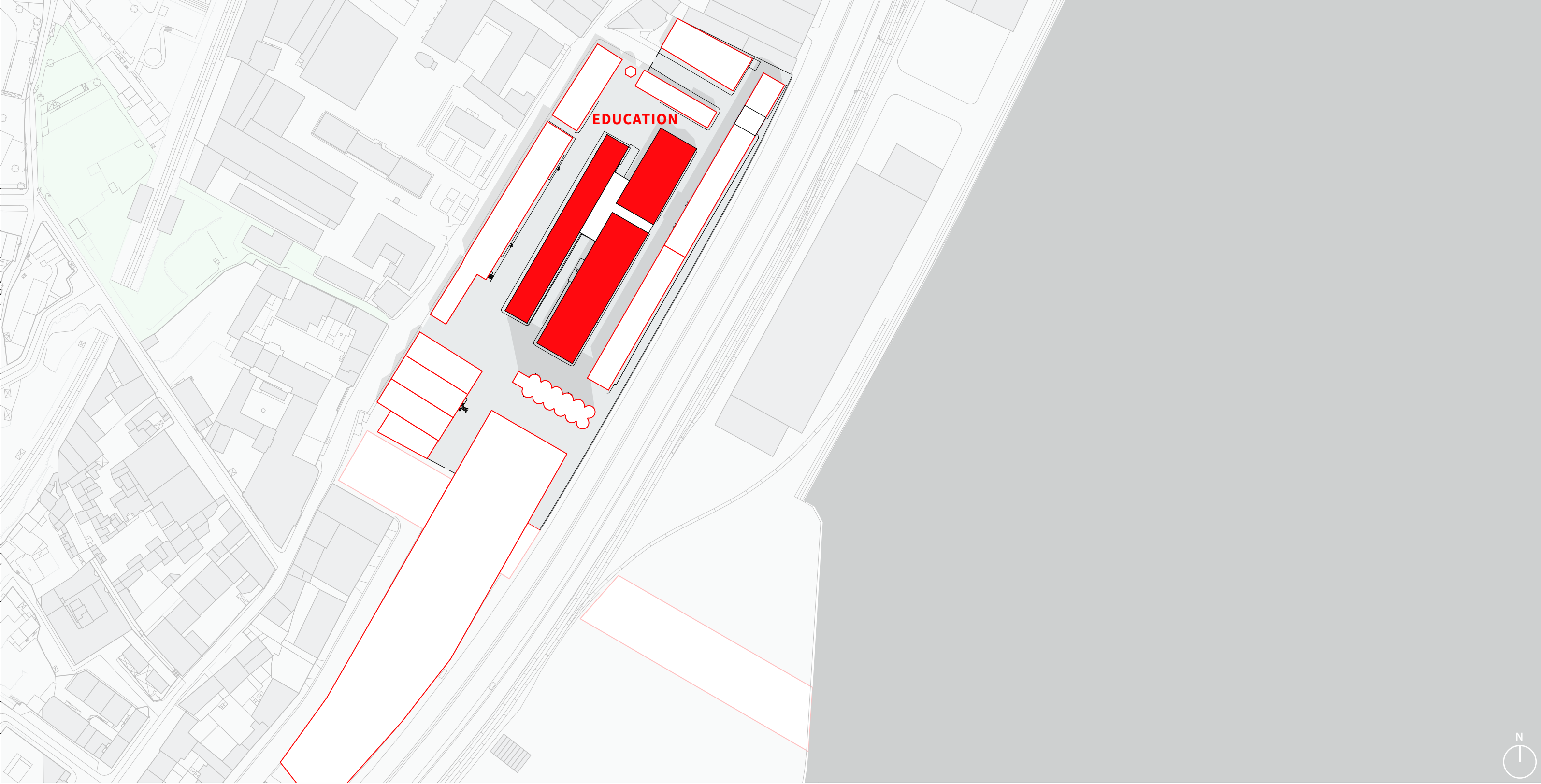
# GENERATE



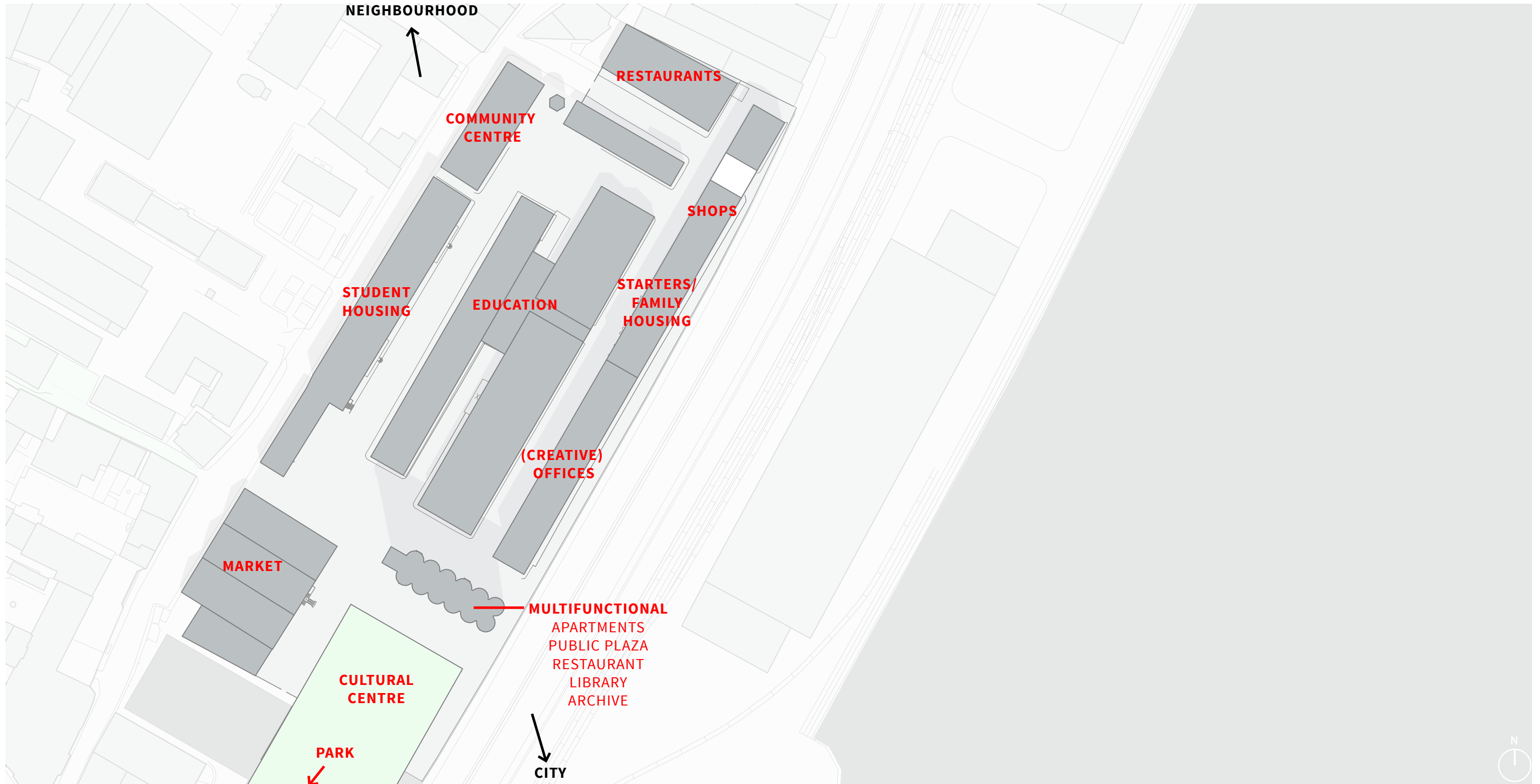
**PLACE TO STAY - FACILITIES NEEDED**



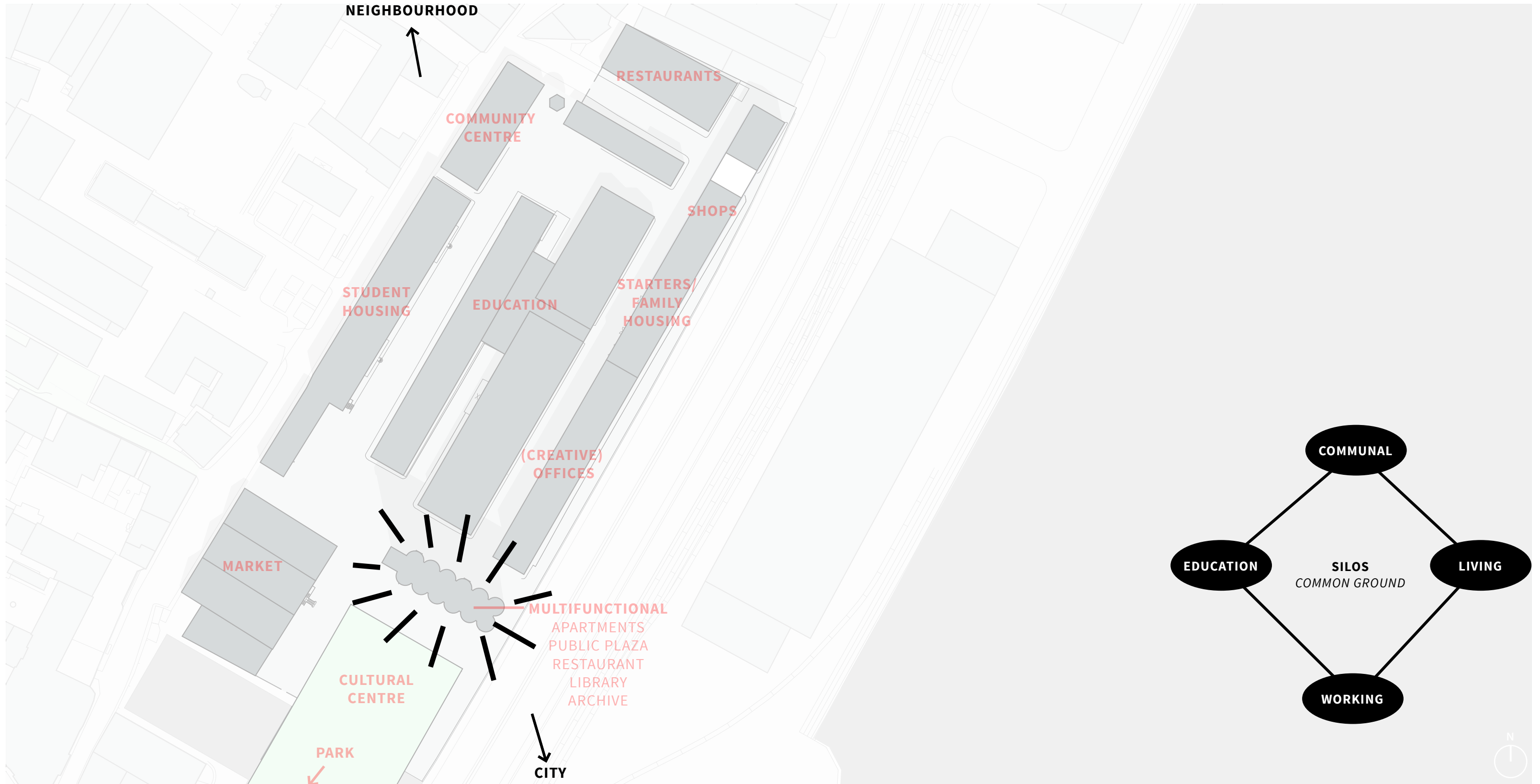
# INTEGRATE



# PROGRAM AND TARGET GROUPS

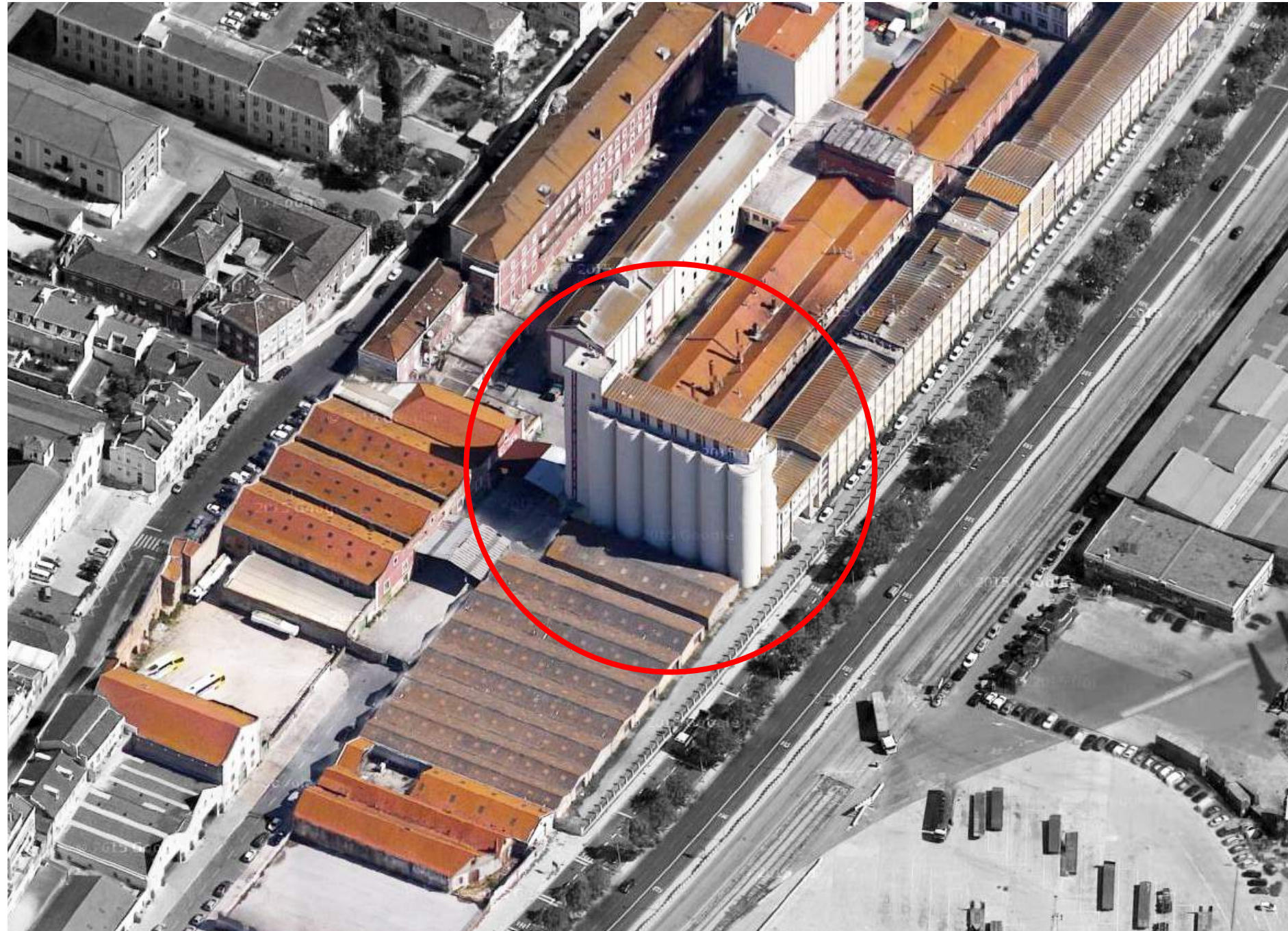


# ROLE OF THE SILO



# THE SILOS

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*How to extend the icon and to integrate the existing in the new, embracing the existing character and qualities?*

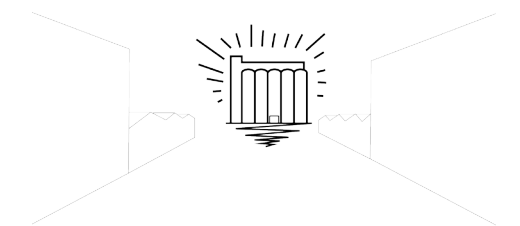
# APPEARANCE

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## ICON OF THE SITE

*Silos are the face of the site towards the city*



## APPEARANCE

---



### **FORM FOLLOWS FUNCTION**

*The skin is a direct expression and representation of its use, 'Form follows function'*

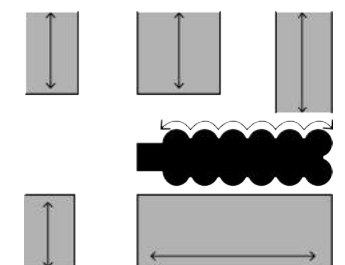
# APPEARANCE

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## CONTRASTING ROUND SHAPES

*Contrasting with the linear shaped site and buildings*

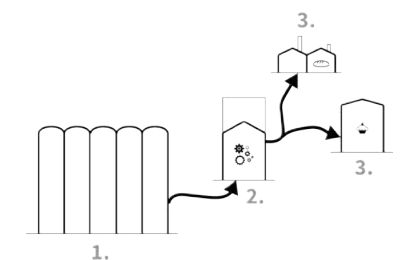
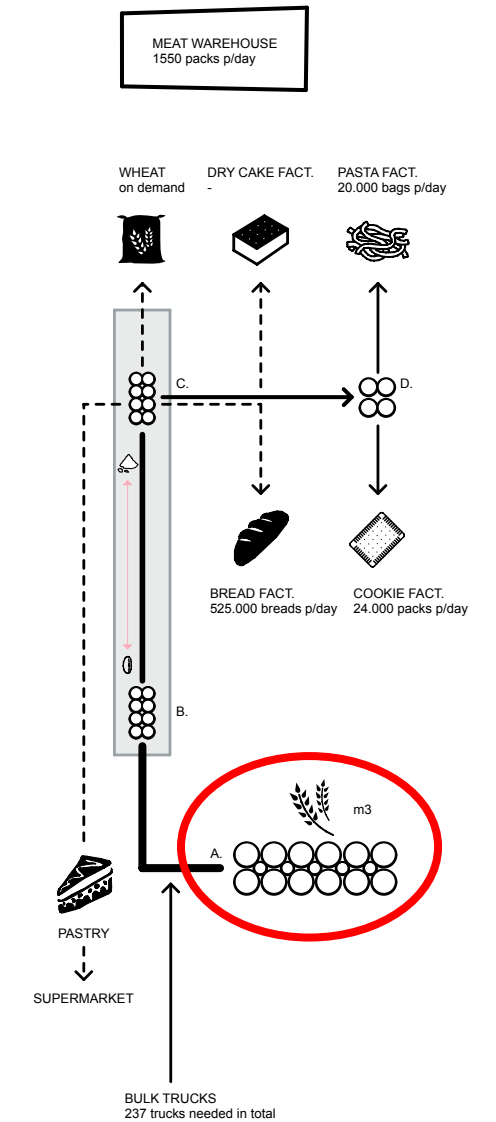


# REMEMBRANCE



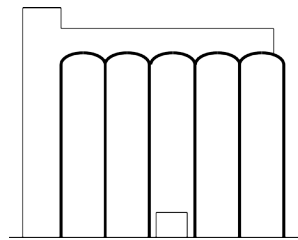
## START OF THE PROCESS - FEEDER OF THE MMC

*Silos were used for storage and was so the start of the process  
- feeder of the machine (MMC)*

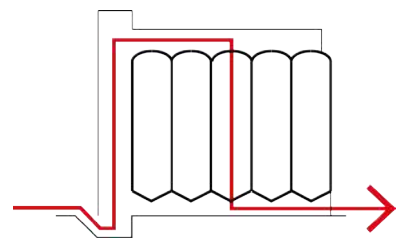




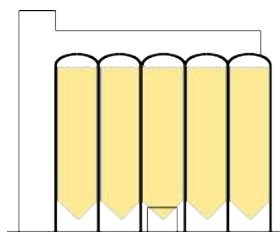
# TRANSFORMATION FRAMEWORK



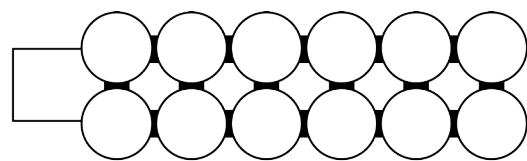
Closeness



Remembrance past process



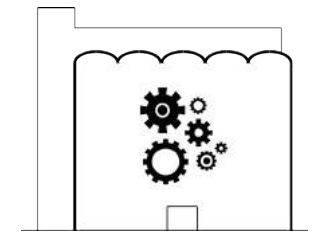
Mono-functional / Silo is machine itself



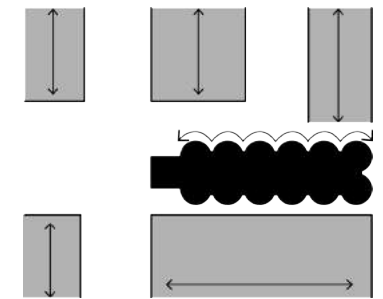
Compartments



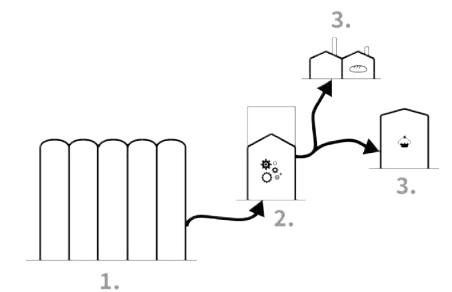
SILOS



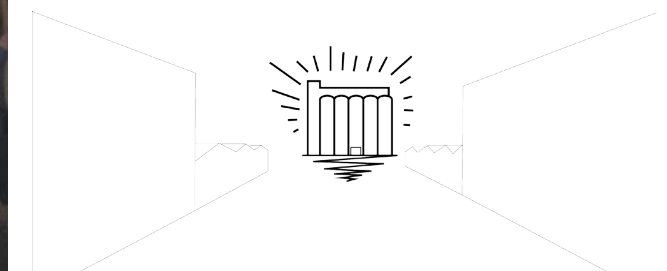
Build for machines not for humans



Round shape - sculpture?

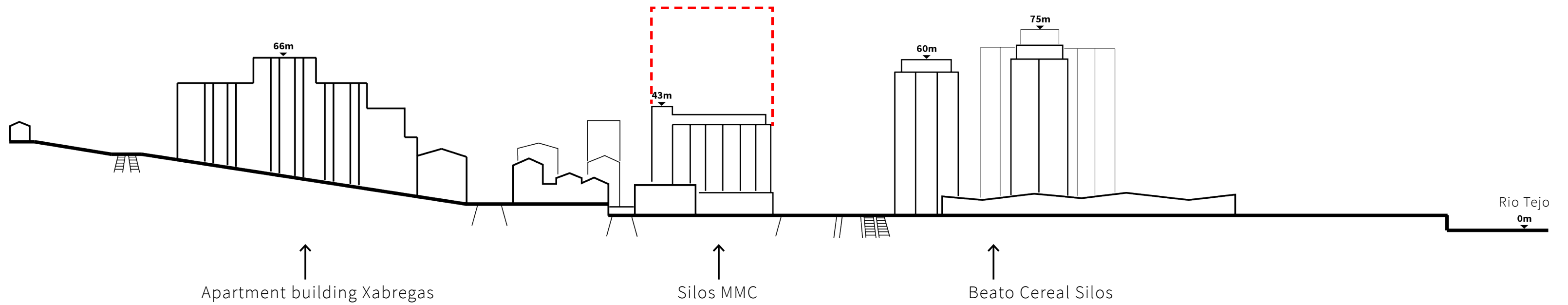


Start of the process

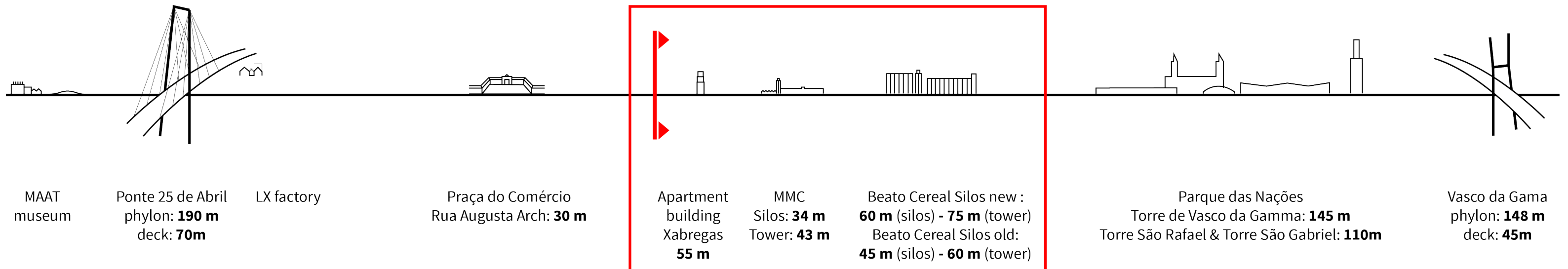


Landmark

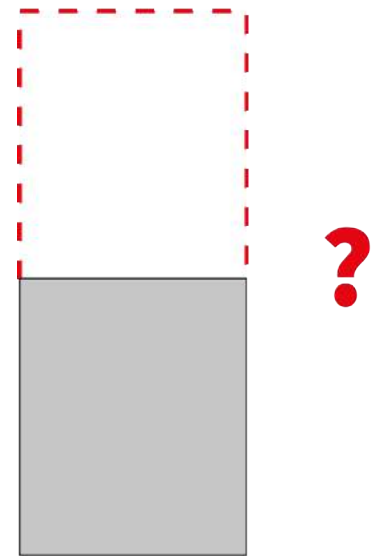
# ROLE OF THE SILO



## SECTION

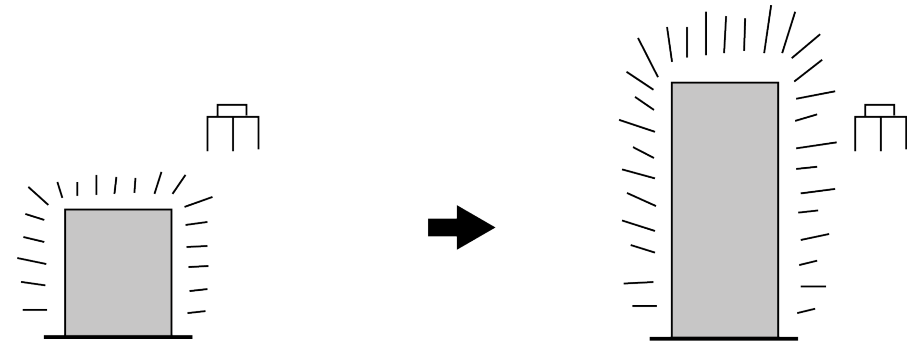


# STARTING POINTS

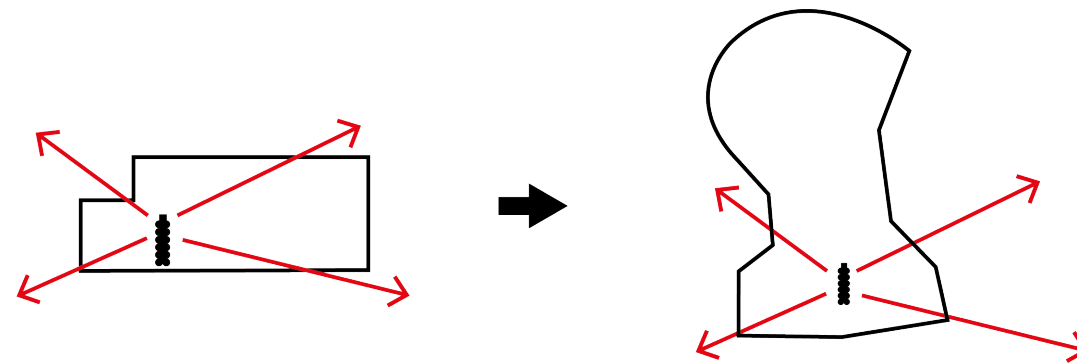


## EXTENDING SILOS

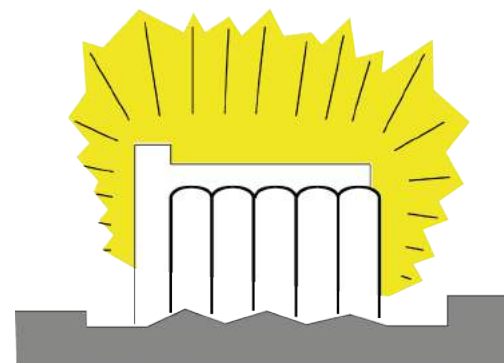
Integration existing in new and vice-versa



Emphasizing silos as icon (billboard)

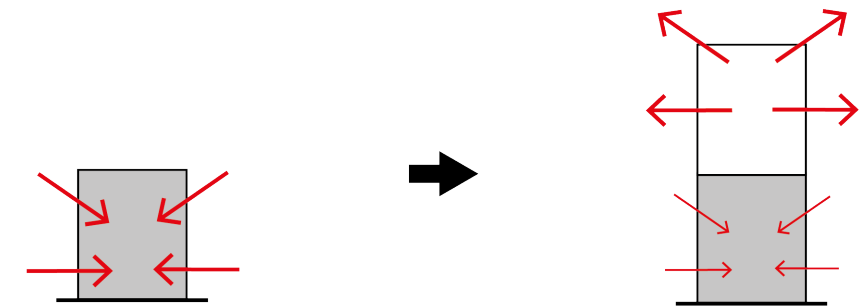


Increasing the range: small scale to larger scale

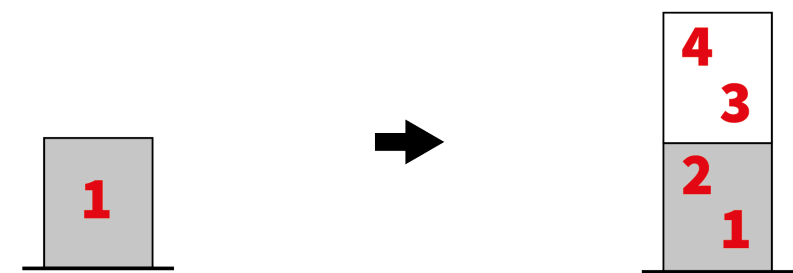


Showcase of activity

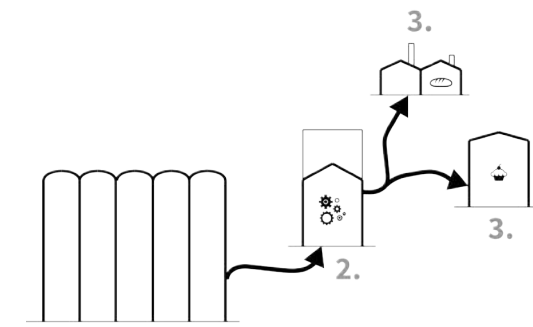
## STRATEGY POINT OF VIEW



Keep characteristics and economically viable  
Massive vs Light  
Introvert vs Extrovert



Mono-functional to multi-functional  
Attract multiple target groups

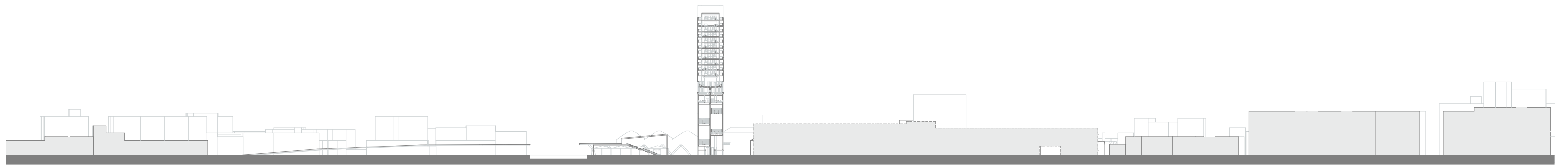


Feeding the machine to feeding the complex

## BUILDING POINT OF VIEW

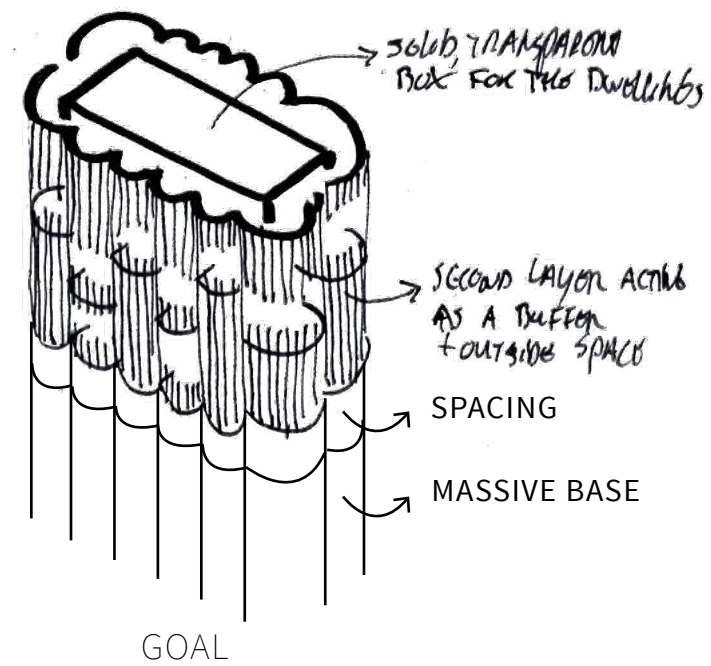
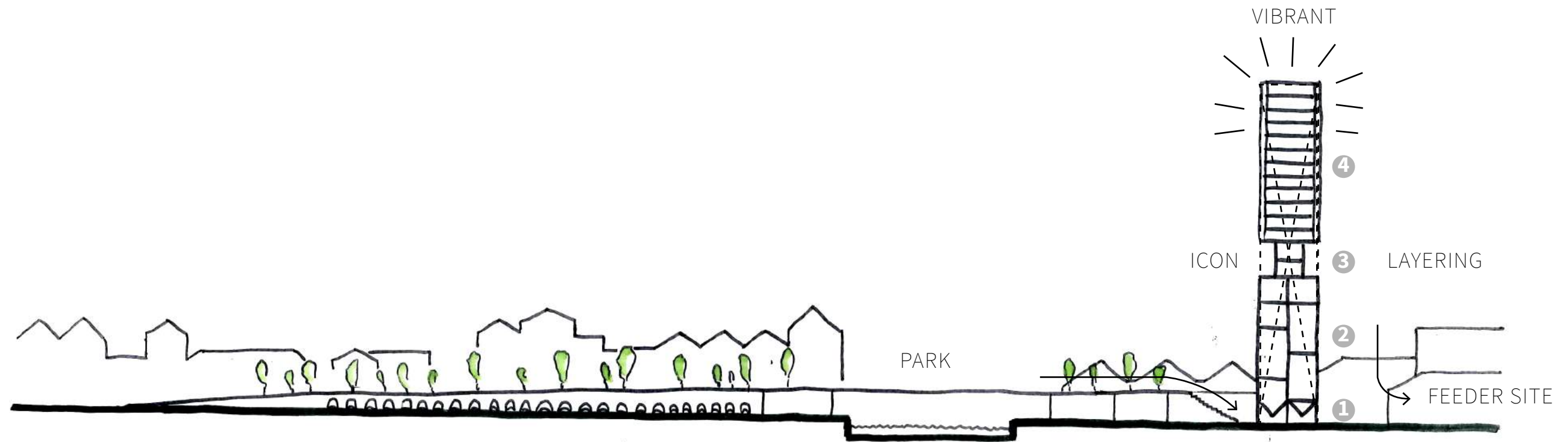
# SECTION STRATEGY

---



*New situation*

# CONCEPT



**DESIGN**

# END RESULT

---



# END RESULT

---





# OVERVIEW STUDIES

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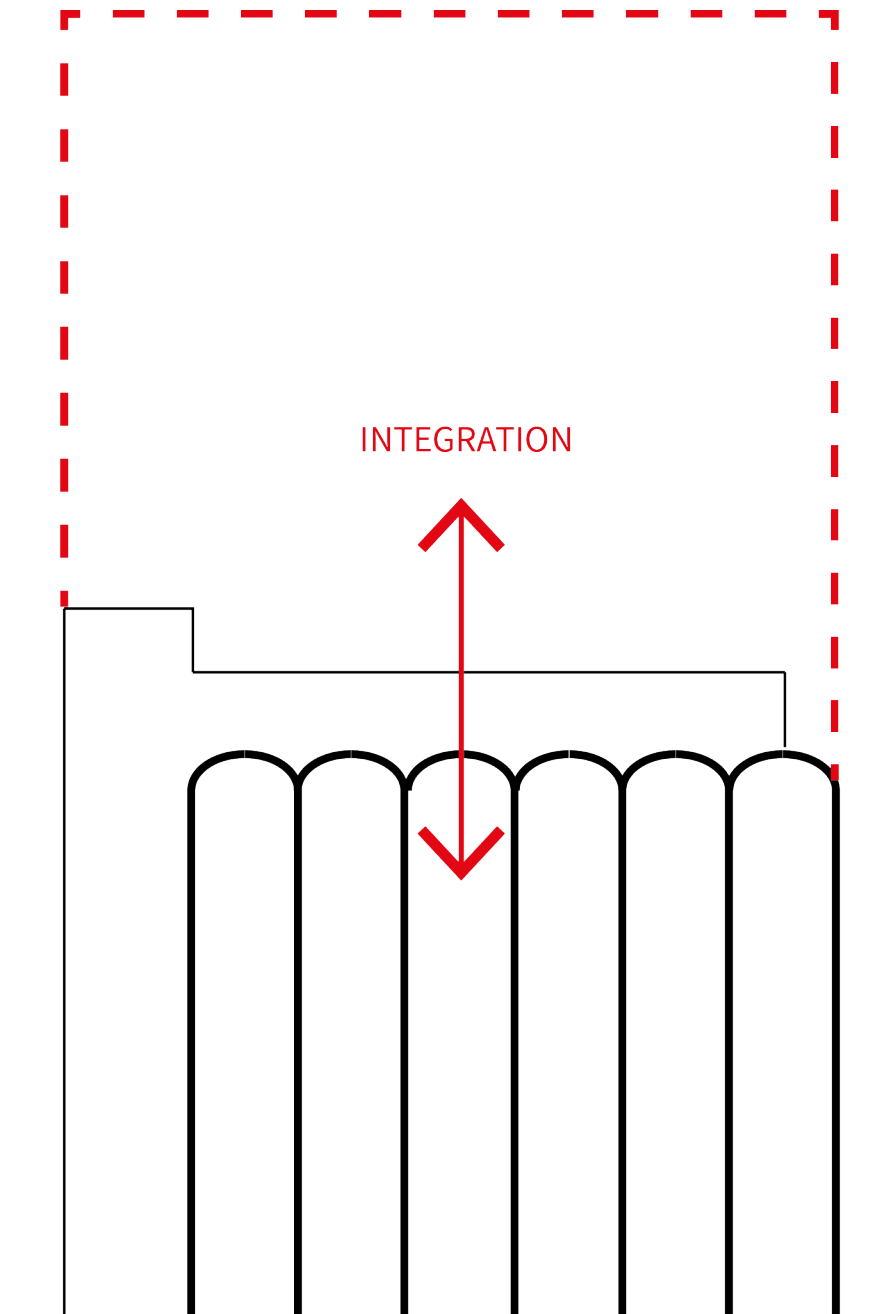
**COMPOSITION**

**HEIGHT**

**CONSTRUCTION**

**CIRCULATION/ ROUTING**

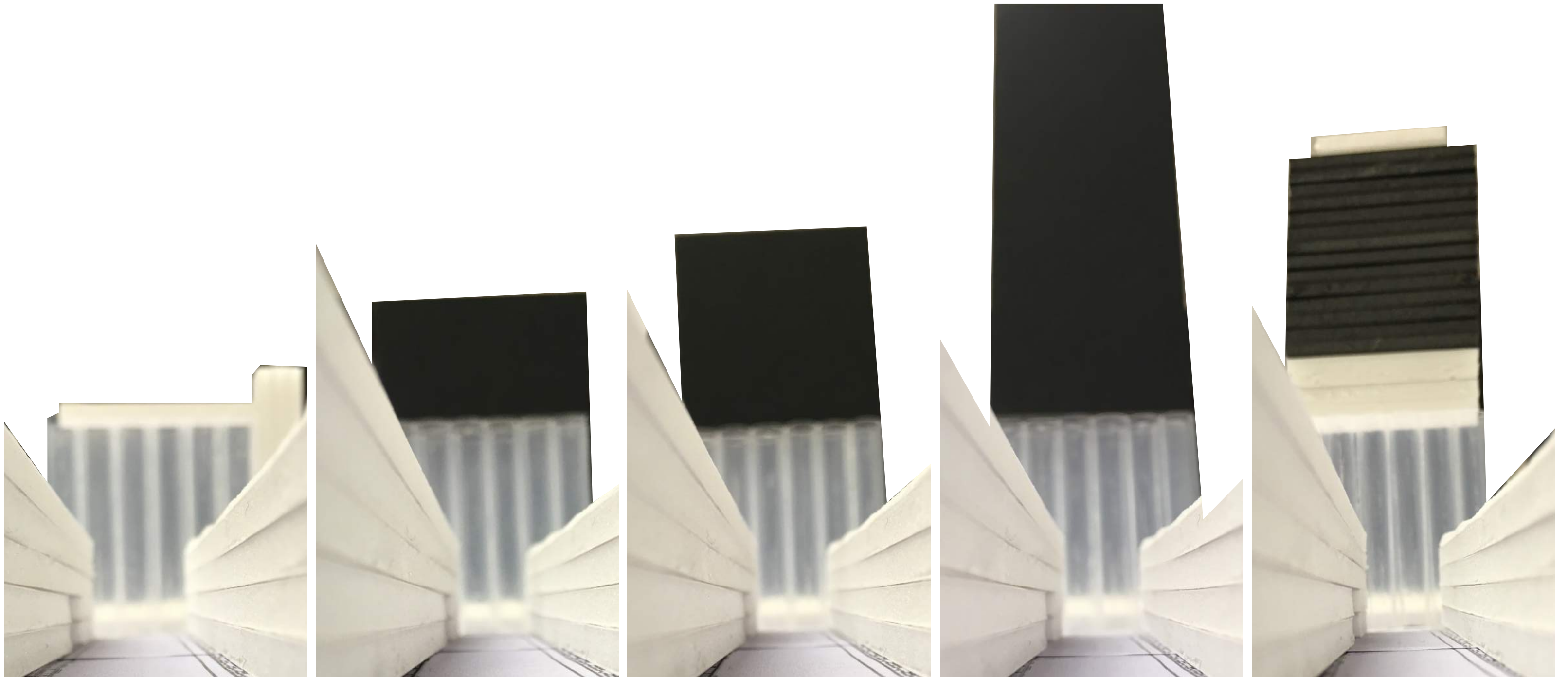
**FUNCTIONALLY**



*Integration of existing into the new extension and vice versa*

# HEIGHT

---



EXISTING

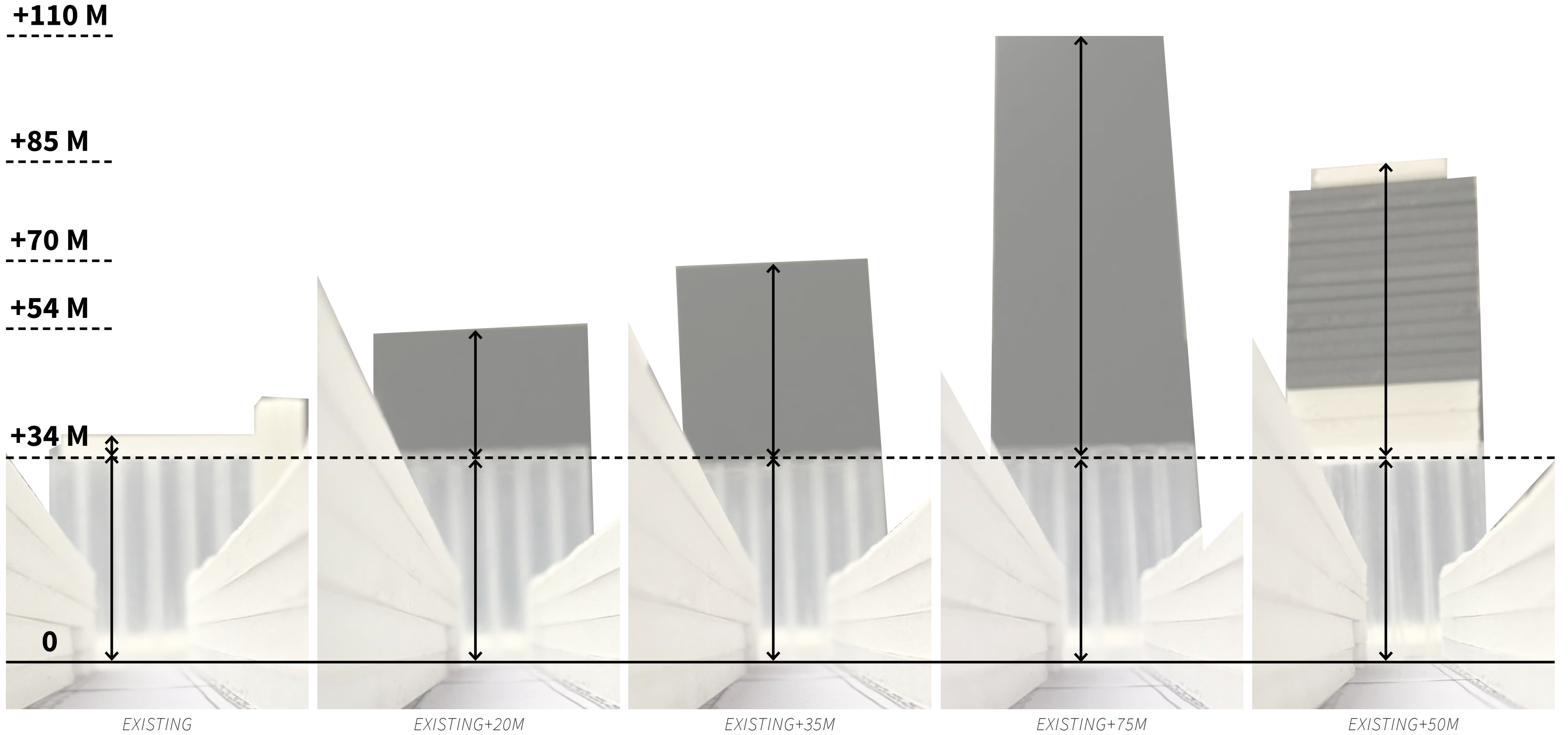
EXISTING+20M

EXISTING+35M

EXISTING+75M

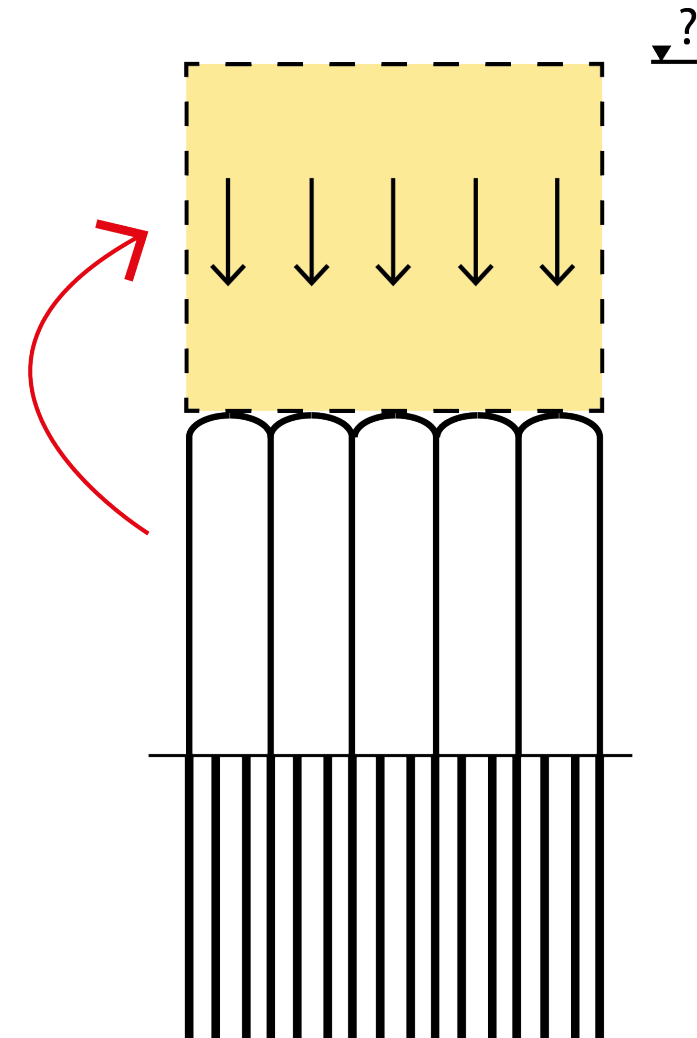
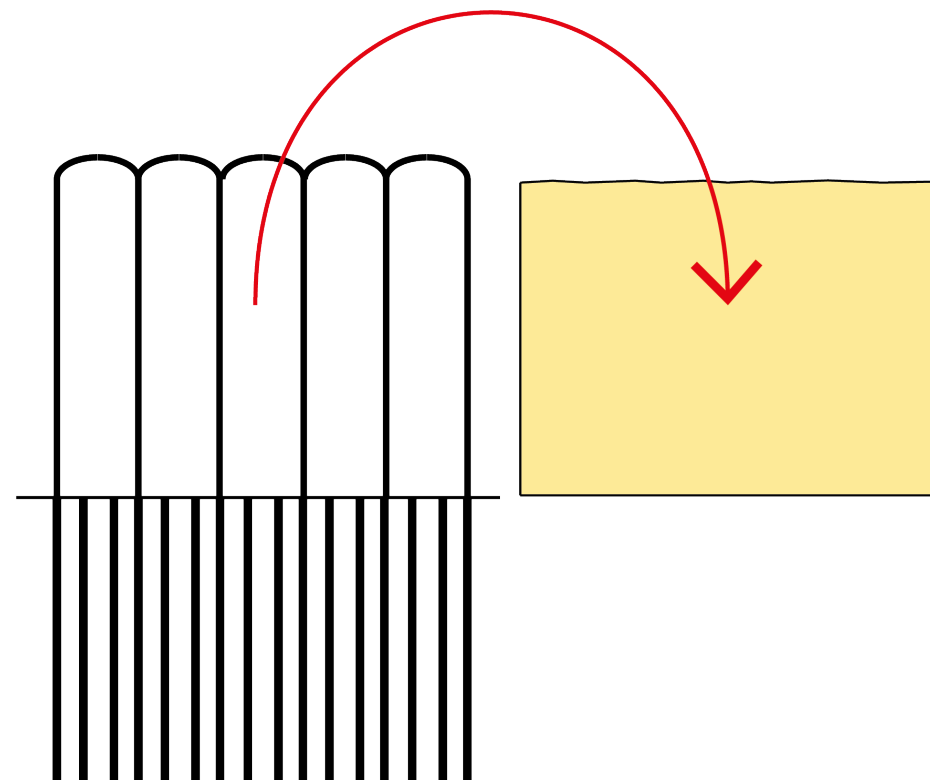
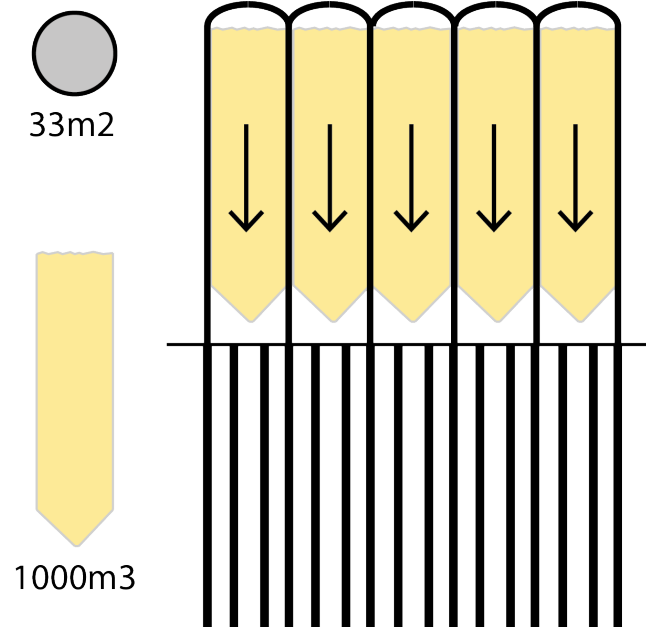
EXISTING+50M

# HEIGHT



**BALANCE BETWEEN EXISTING AND NEW**

# HEIGHT



## STARTING POINTS

Grain = 750 kilogram/m<sup>3</sup>  
 Silos = 13000 m<sup>3</sup>  
 Total = 750 x 13000  
 = 9.750.000 kilograms  
 m<sup>2</sup> silos = 430 m<sup>2</sup>  
 Load/m<sup>2</sup> = 9.750.000/430  
 = 22.675 kg/m<sup>2</sup>  
 Load grain = 23 tons/m<sup>2</sup>

## CHARACTERISTIC LOADS

**HIGH-RISE**  
 = 3-4 kN/m<sup>3</sup>  
 22.675 kg/m<sup>2</sup> = 22.675/101,97  
 = 222 kN/m<sup>2</sup> (kg/m<sup>2</sup> to kN/m<sup>2</sup>)  
 4 kN/m<sup>3</sup> x H(height) = 222 kN/m<sup>2</sup>  
 H<sub>1</sub> = 222/4 = 56m  
 H<sub>2</sub> = 222/3 = 74m

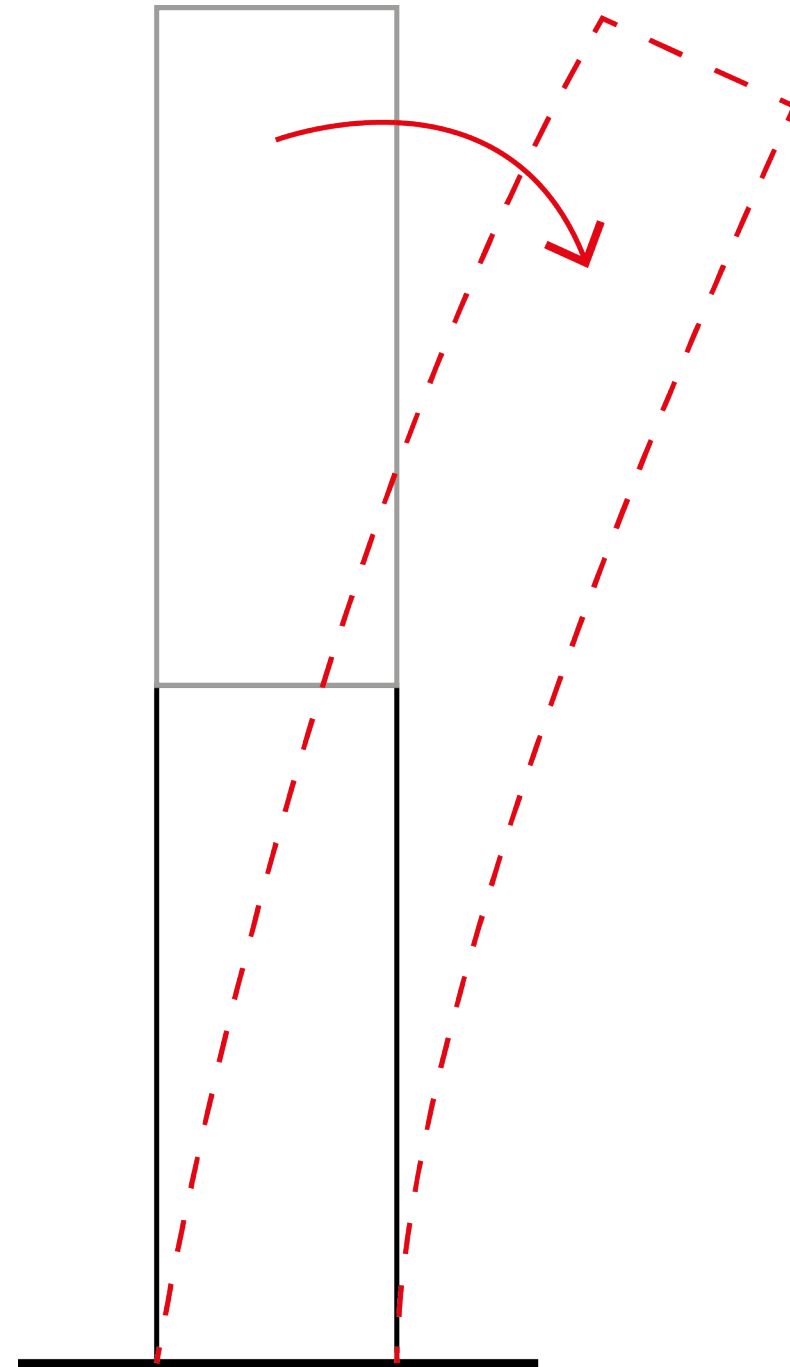
## LIVE LOAD

H<sub>1</sub> = 56/1,75 = 32m  
 H<sub>2</sub> = 74/1,75 = 43m

**TECHNICALLY**  
*possibilities existing construction*

# HORIZONTAL LOAD

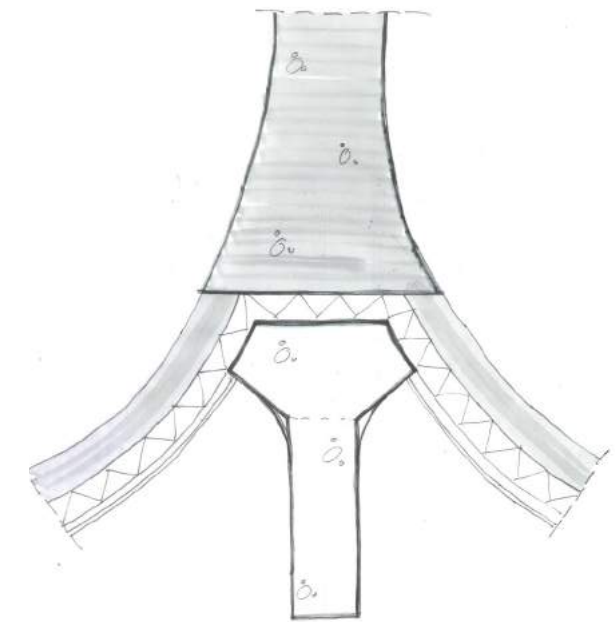
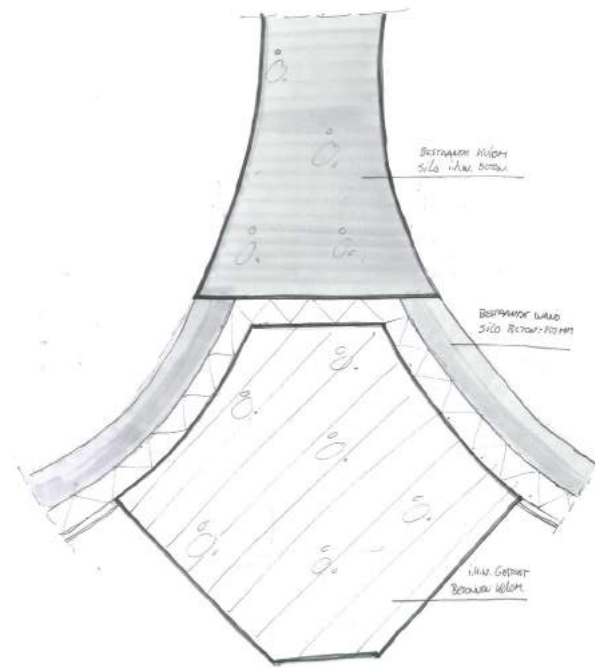
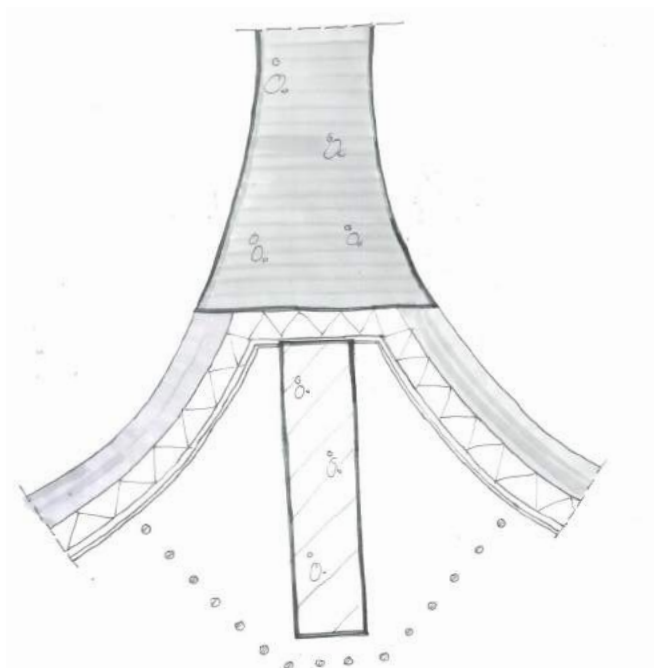
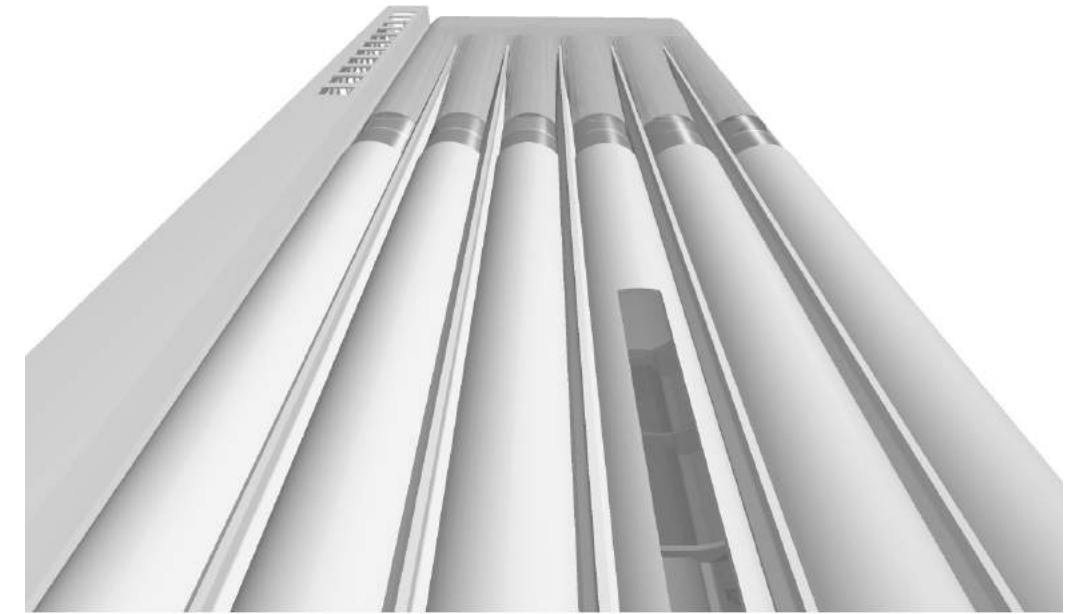
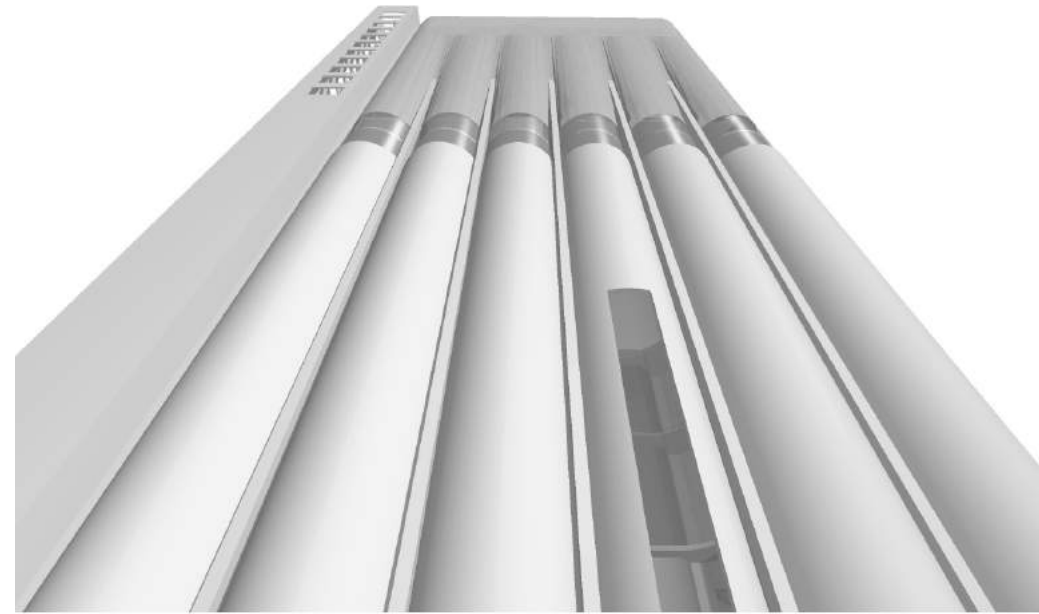
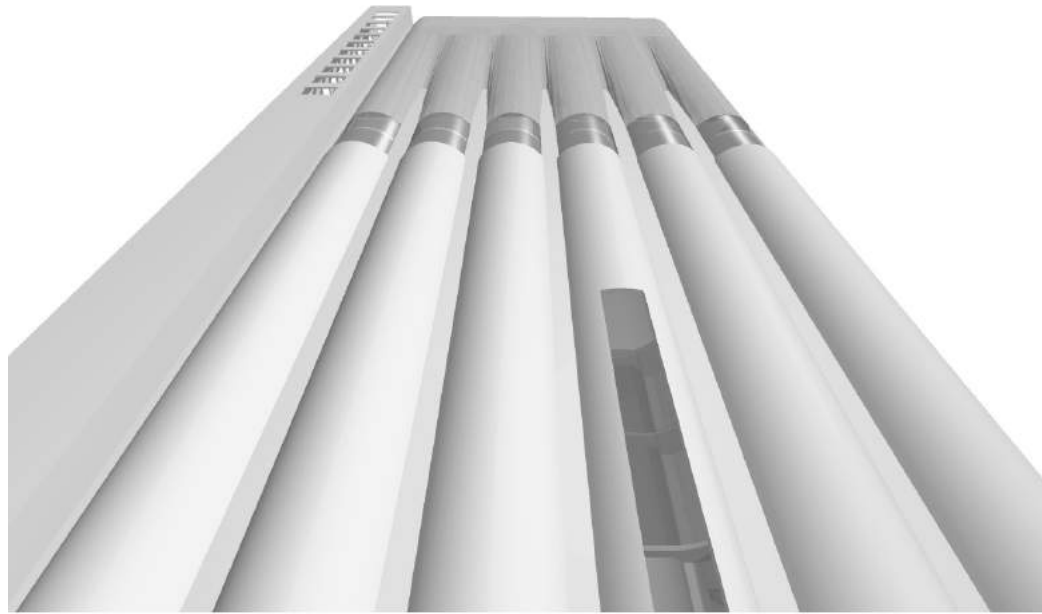
---



**AFTER STUDIES HEIGHT-FUNCTIONALITY-CIRCULATION-COMPOSITION**

# HORIZONTAL LOAD

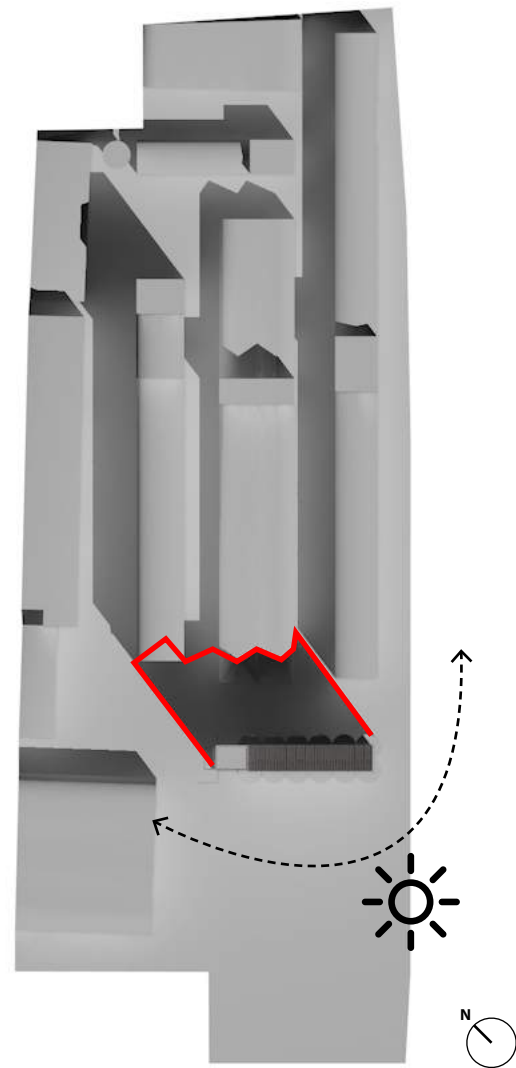
---



**ALTERNATIVES**

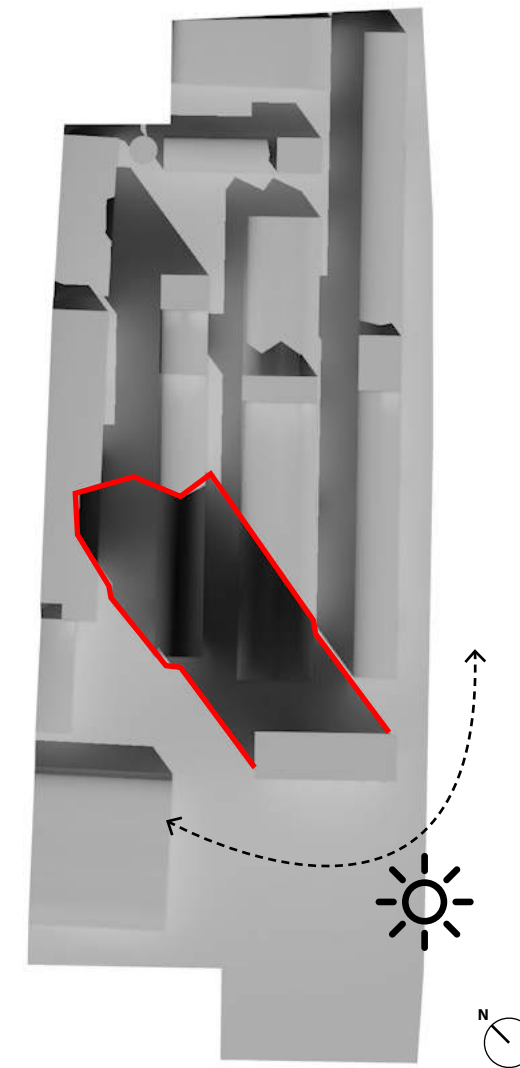
# HEIGHT

## EXISTING



21 October  
13 o'clock

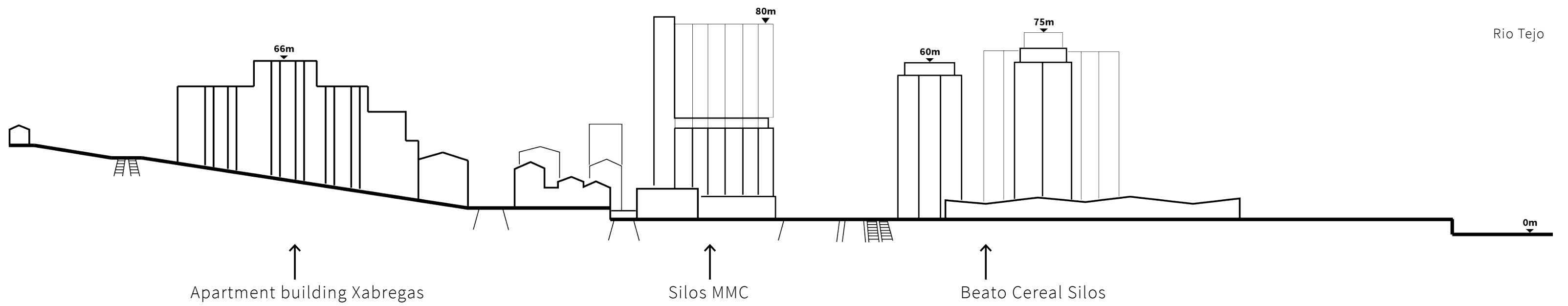
## NEW (+50M)



21 October  
13 o'clock

## IMPACT ON SURROUNDINGS

# HEIGHT




## CONCLUSION



FUNCTIONALLY

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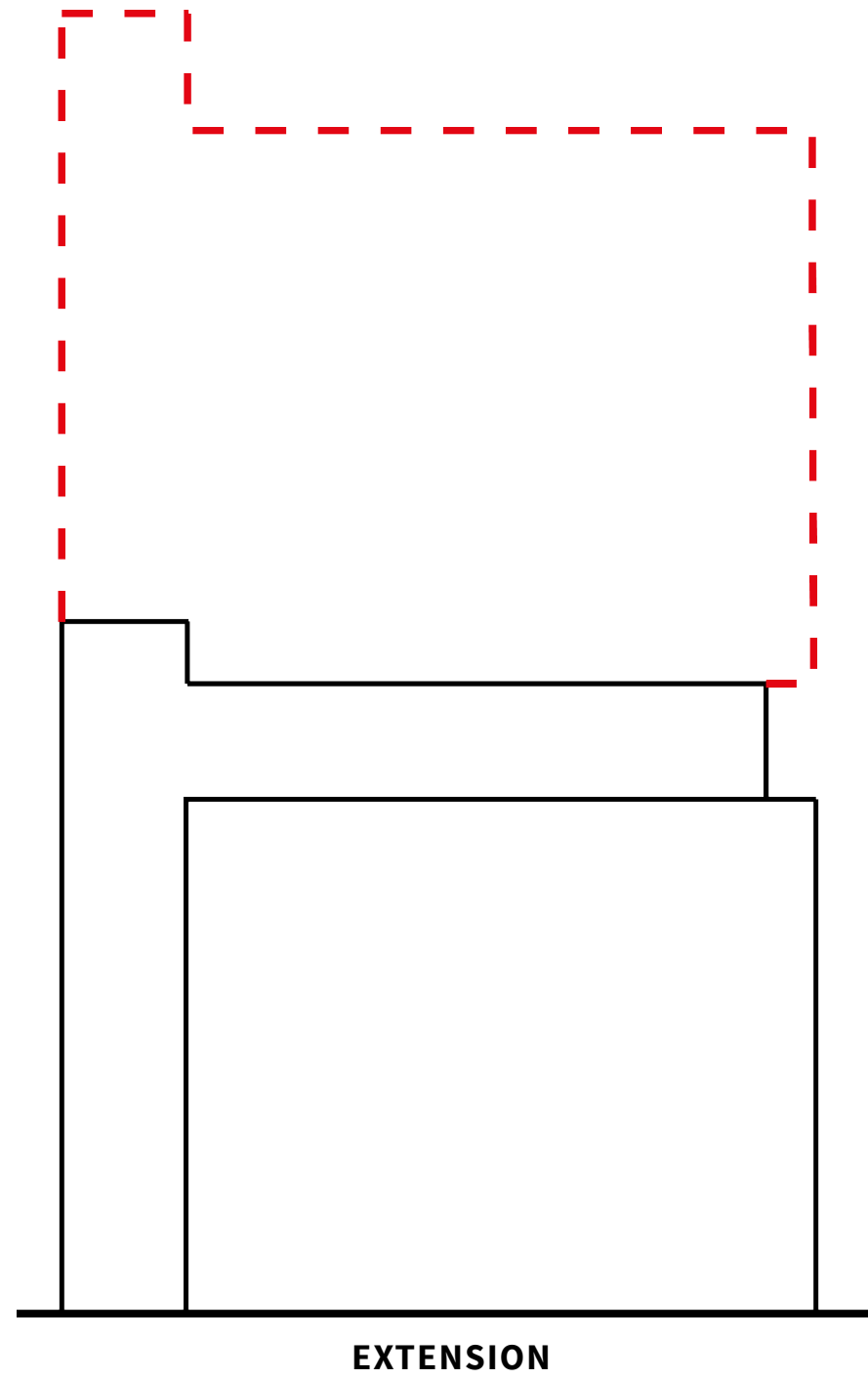
**GRAIN**

PRESENT

The graphic features the word "GRAIN" in a bold, black, sans-serif font. The letters are contained within a white rectangular area that is part of a larger, stepped structure. This structure consists of three horizontal levels of decreasing width from left to right, creating a staircase effect. The entire graphic is supported by a solid black horizontal line at the bottom. Below this line, the word "PRESENT" is written in a smaller, black, sans-serif font.

# FUNCTIONALLY

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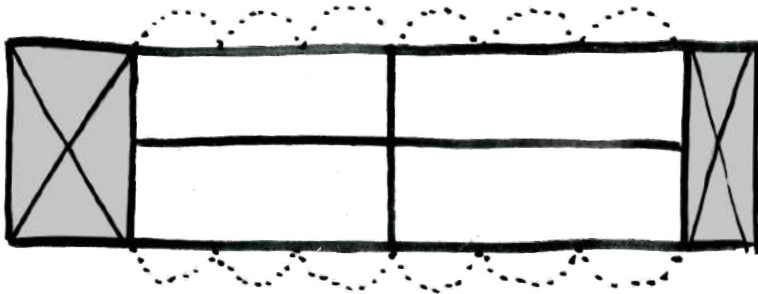
FUNCTIONALLY

---

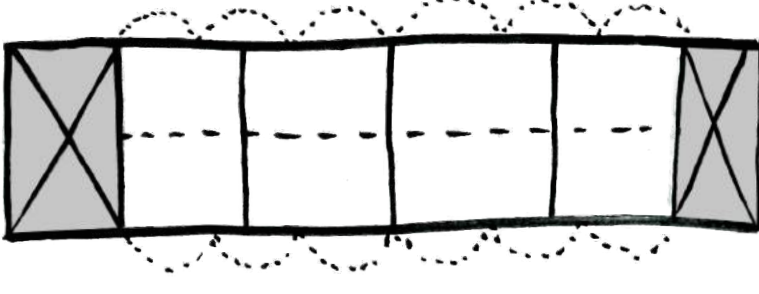


NEW

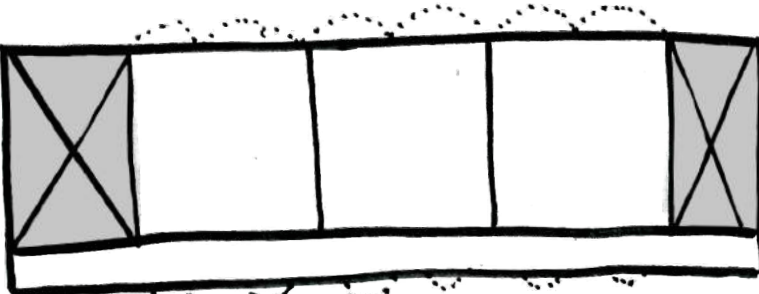
# CIRCULATION



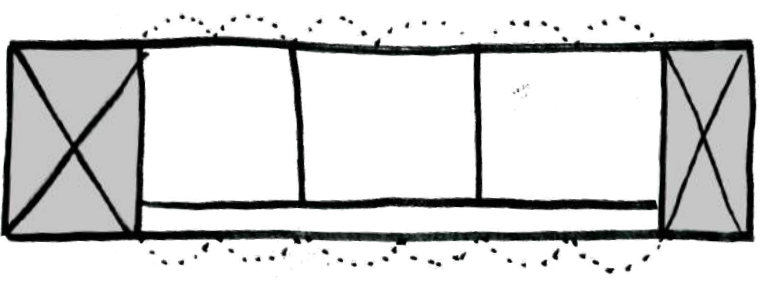
TWO ENDS



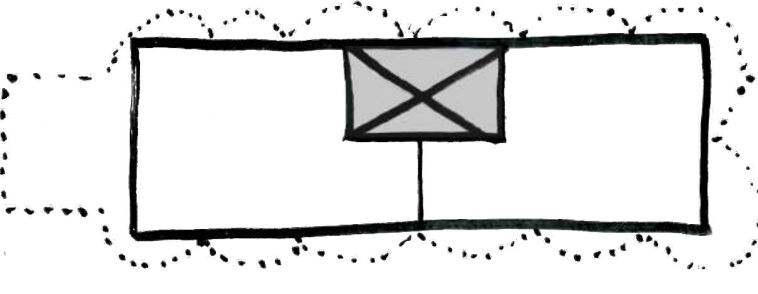
MAISONETTE



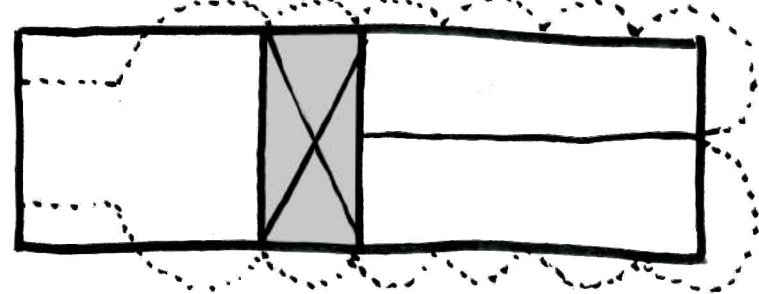
BALCONY ACCESS I



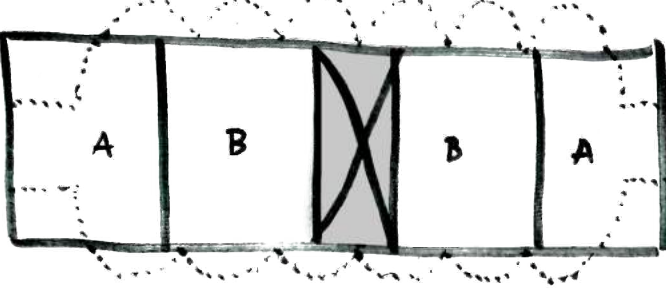
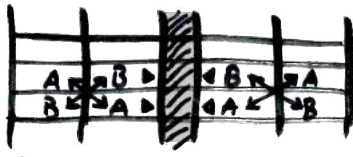
BALCONY ACCESS II



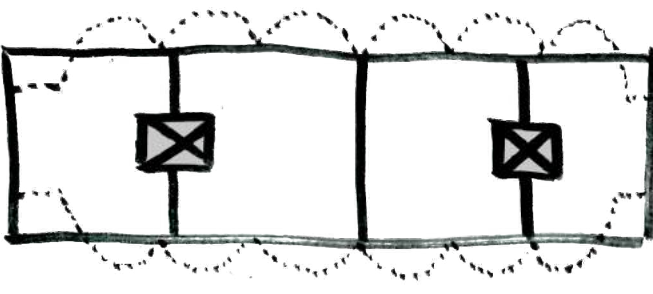
CENTRAL



CENTRAL II



TETRIS

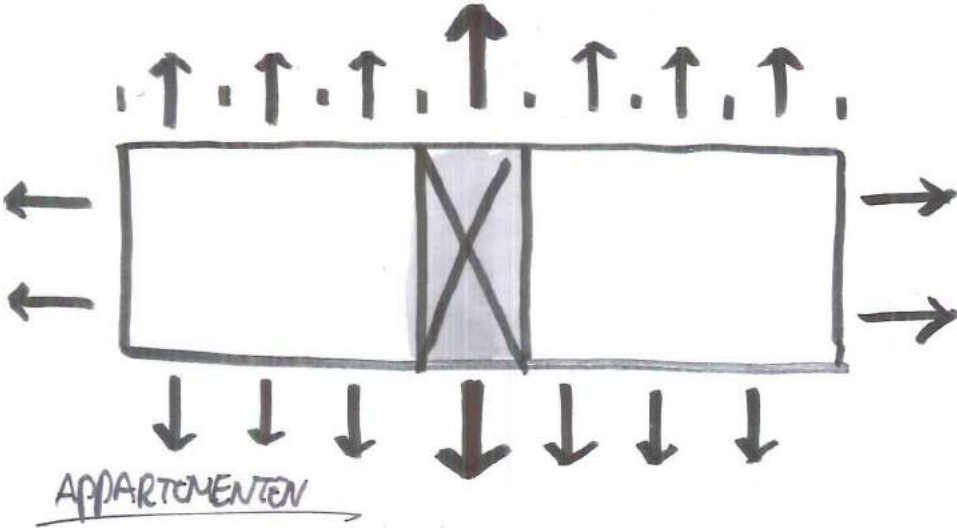


TWO CENTRAL

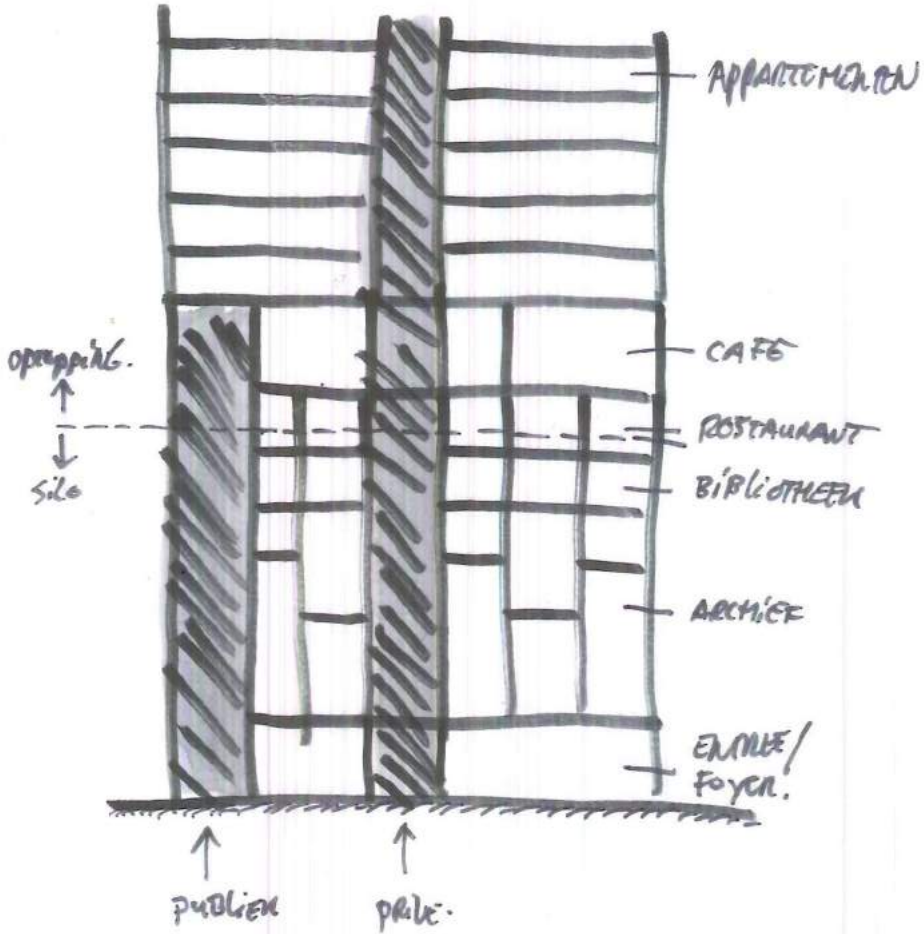
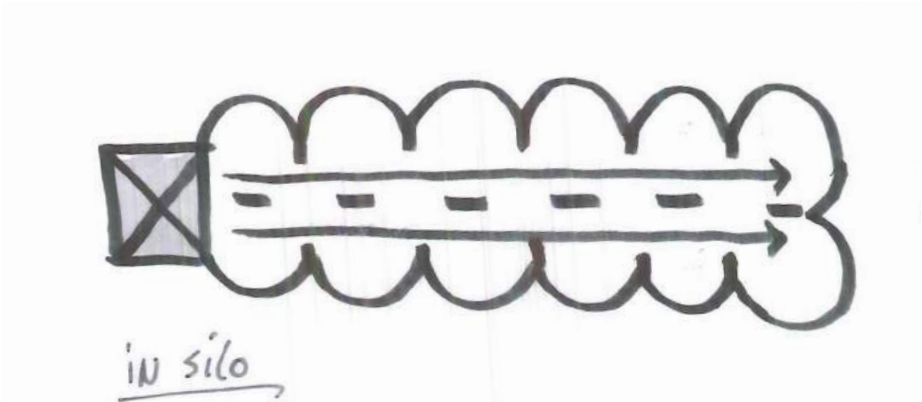
**ALTERNATIVES**

# CIRCULATION

FULL USE FACADE



RE-USING PRODUCTION PROCESS



CONCLUSION

# COMPOSITION

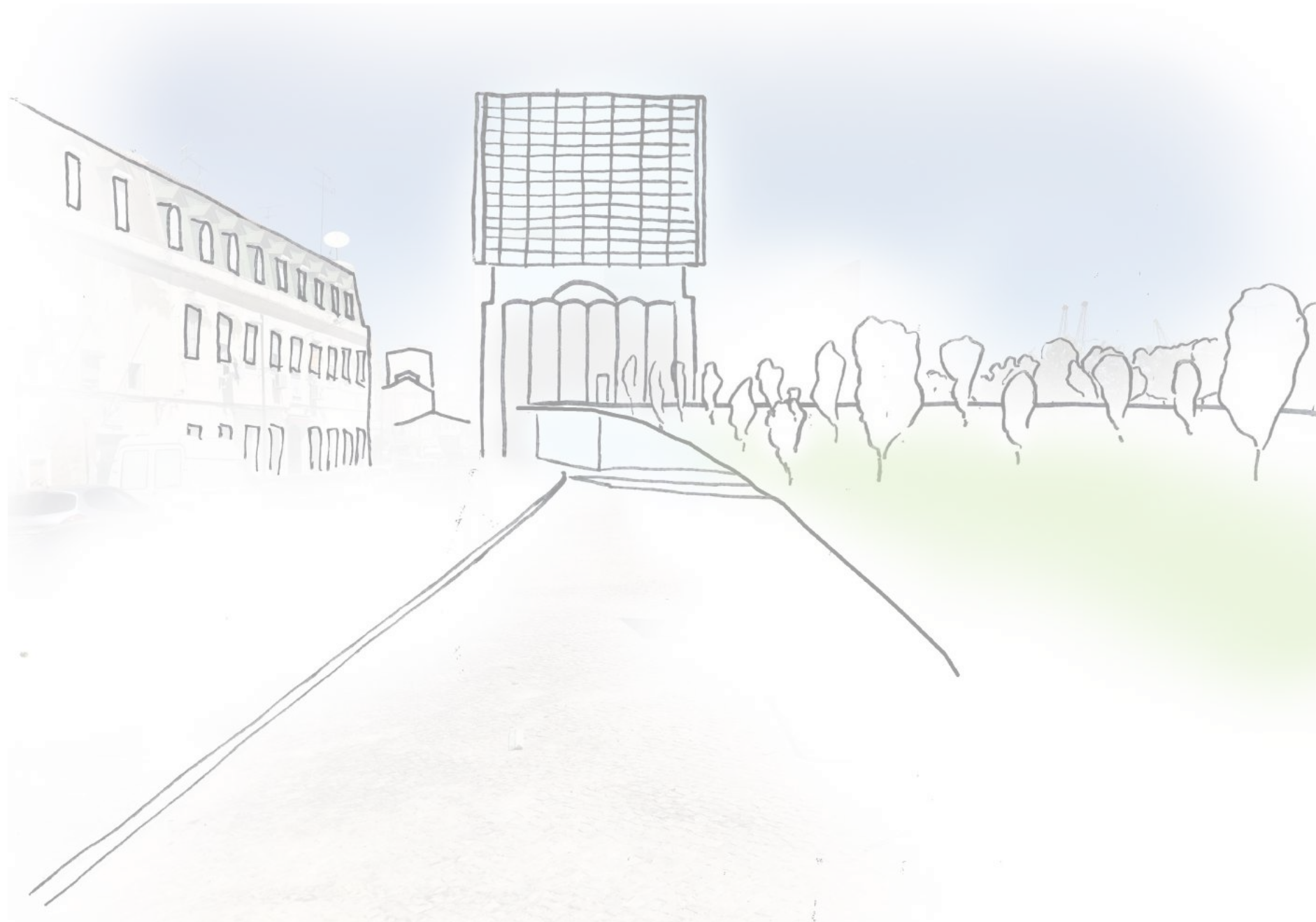
---

**RECTANGULAR ON TOP OF ROUND  
IS CONTRASTING**

**PUBLIC PLAZA CUTS BUILDING IN  
TWO**

**NOT ONE ENTITY**

**STILL ONE THING ON TOP OF EACH  
OTHER**



**STARTING POINT**

# COMPOSITION



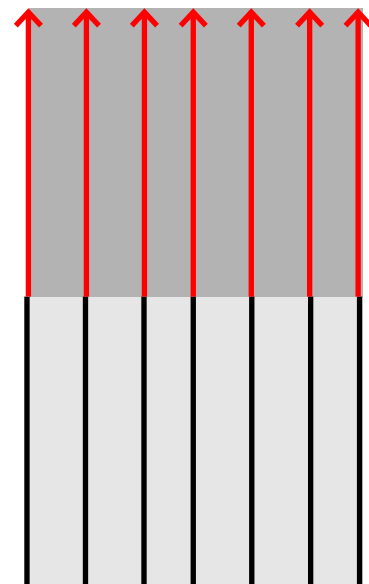
MOCAA Museum - Heatherwick, Cape Town



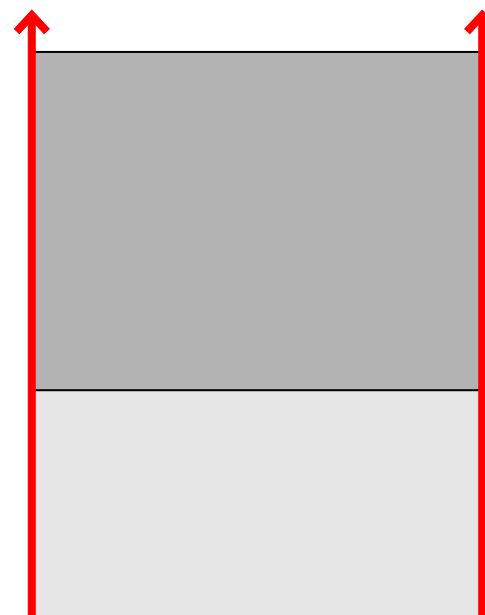
Elbphilharmonie - Herzog & de Meuron, Hamburg



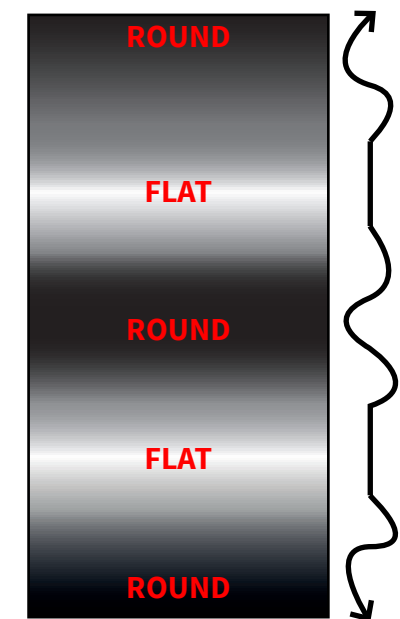
Aqua building - Studio Gang Architects, Chicago



CONTINUING THE GRID

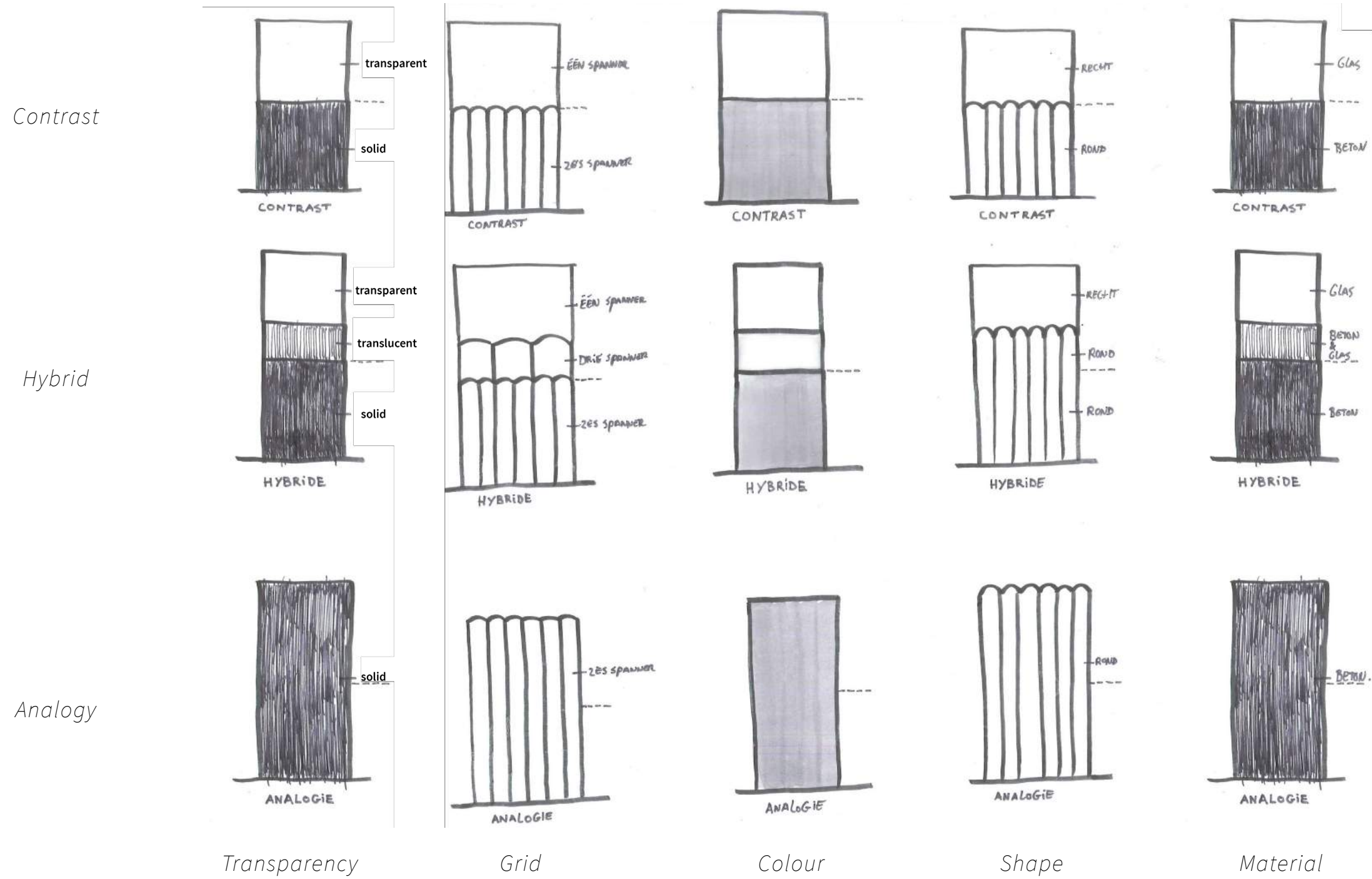


CONTINUING THE BUILDING ENVELOP - CONTOURS



USE OF SLABS ROUND VS FLAT

# COMPOSITION

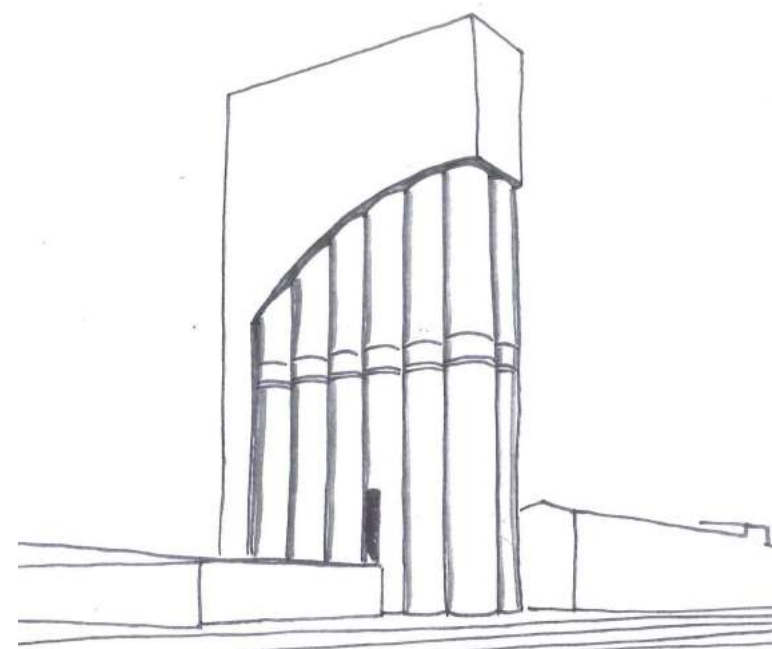
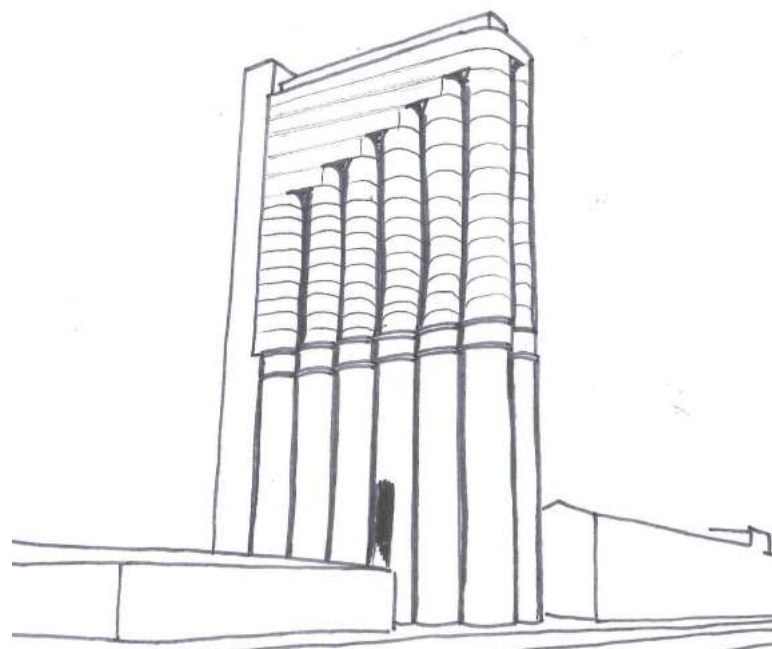
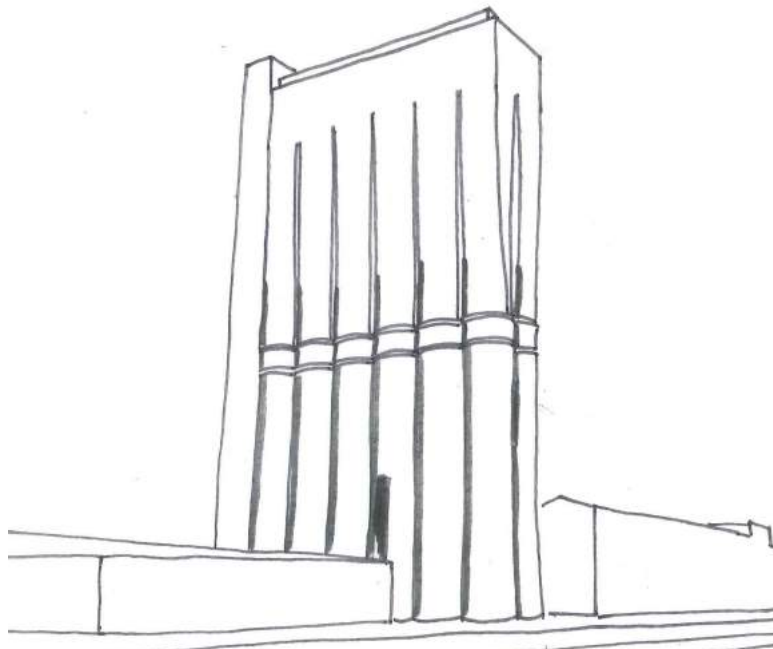


## INTEGRATION EXISTING IN EXTENSION



# COMPOSITION

---



ALTERNATIVES

# RESULT

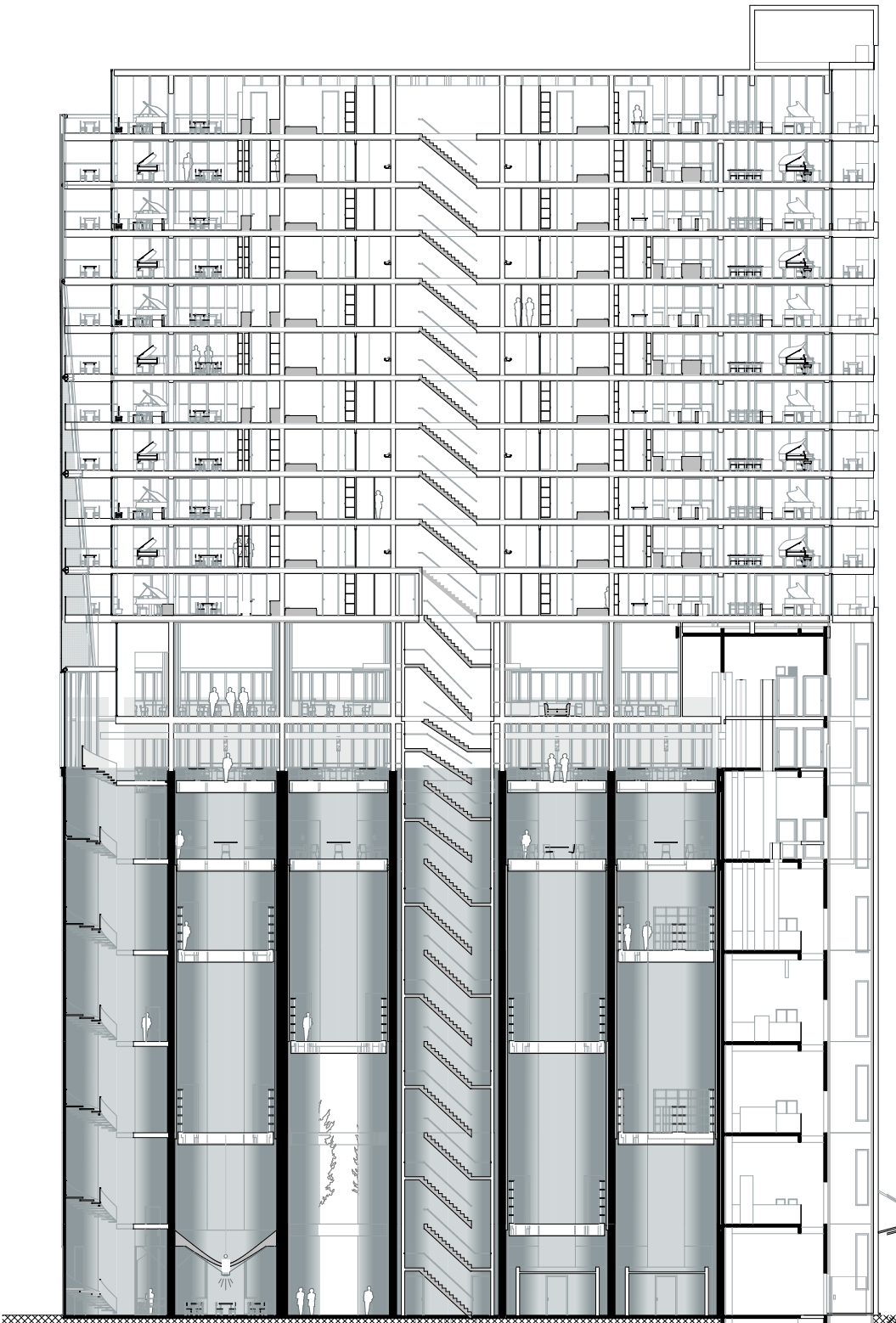
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**AFTER STUDIES HEIGHT-FUNCTIONALITY-CIRCULATION-COMPOSITION**

# LAYERING

## LAYERING



SECTION A

APARTMENTS

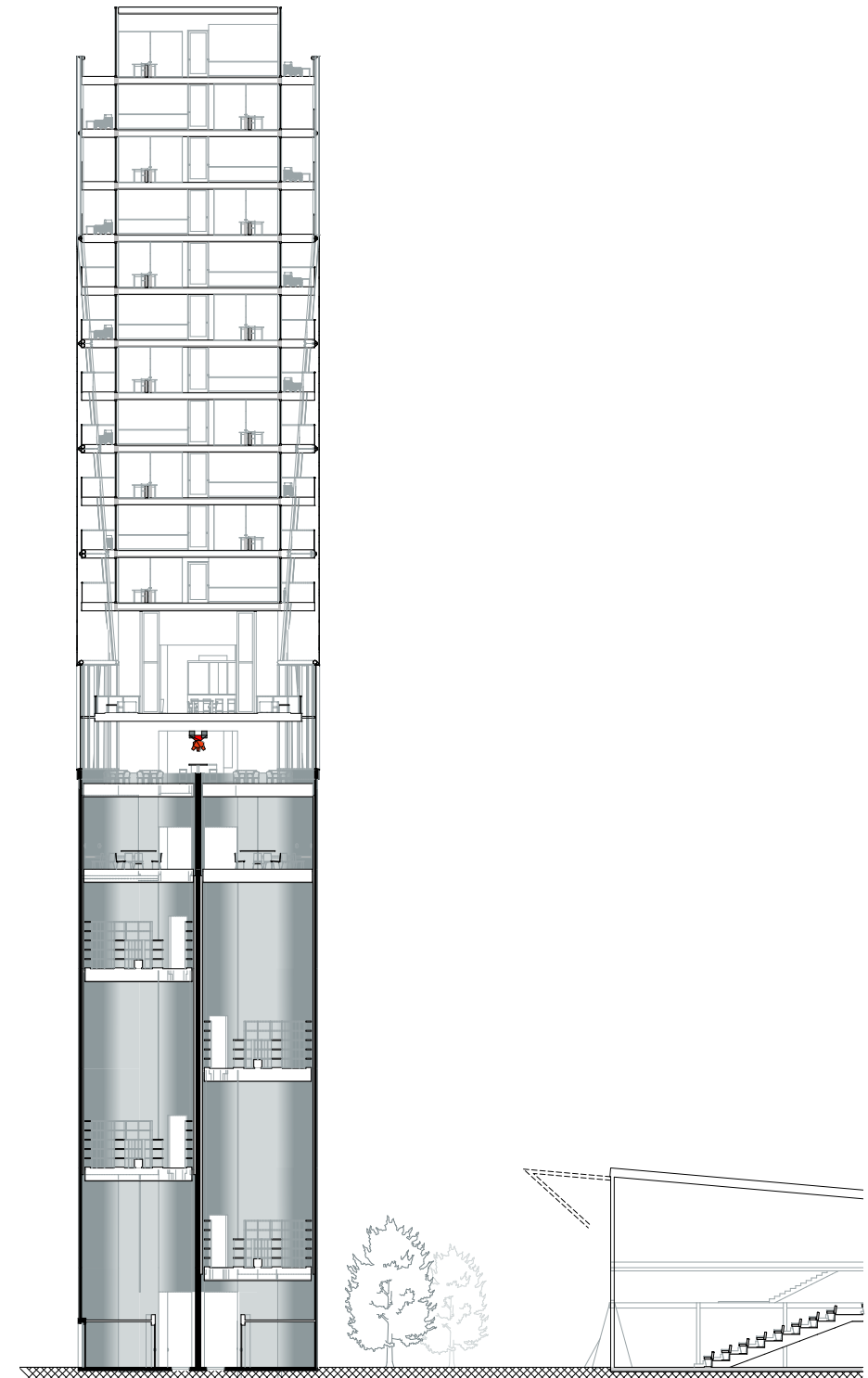
PUBLIC PLAZA/CAFE

RESTAURANT

LIBRARY

ARCHIVE

PUBLIC STREET



SECTION B

# SECTION

LAYERING

APARTMENTS

PUBLIC PLAZA/CAFE

RESTAURANT

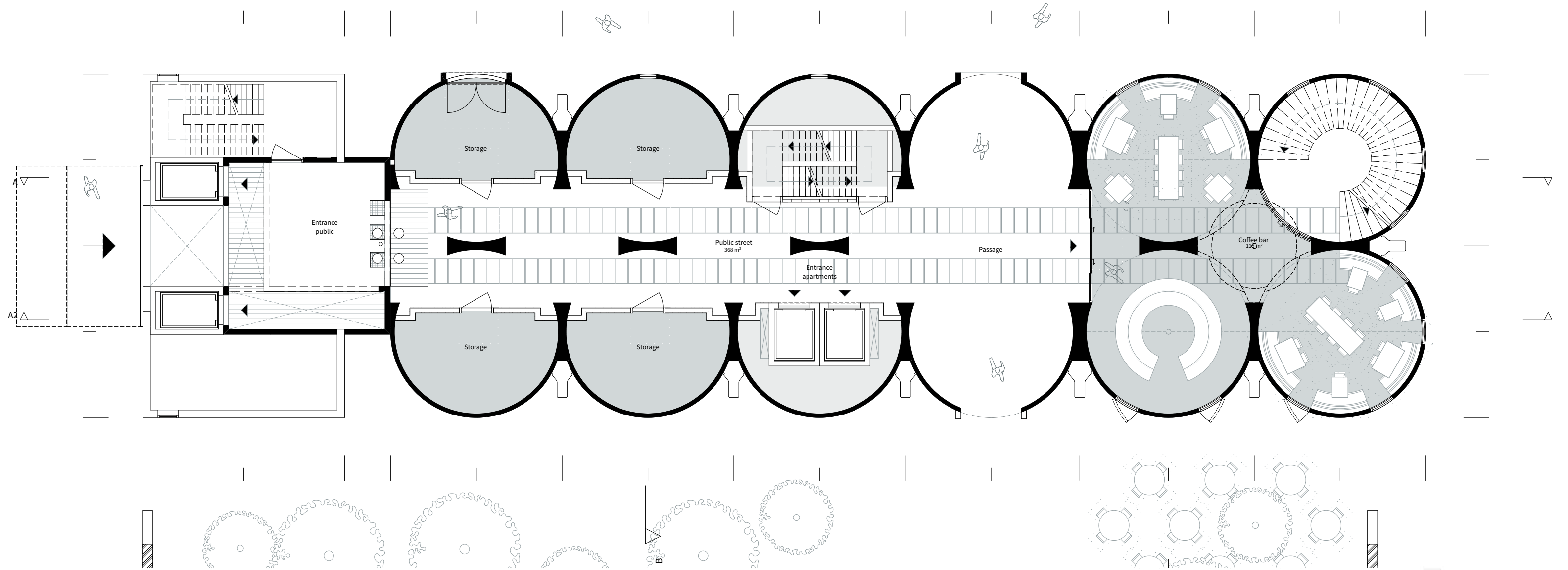
LIBRARY

ARCHIVE

PUBLIC STREET



# LAYERING



0 - ENTRANCE

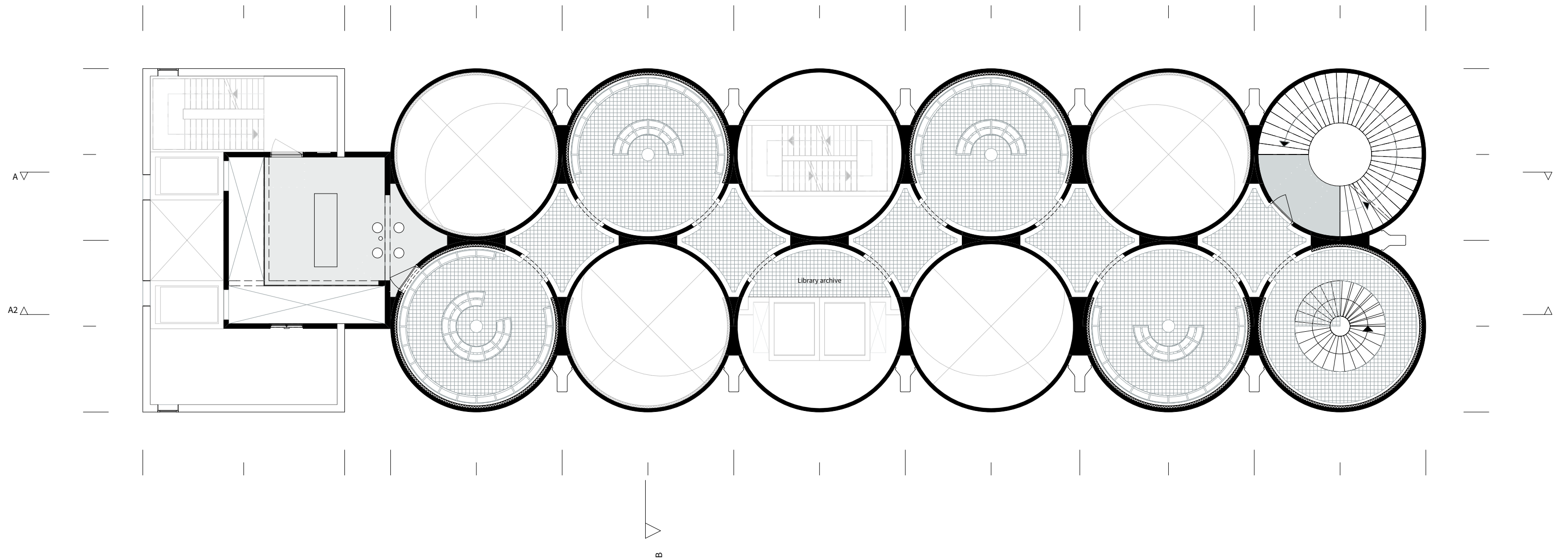
BG - ENTRANCE



SILO  
01 - 24

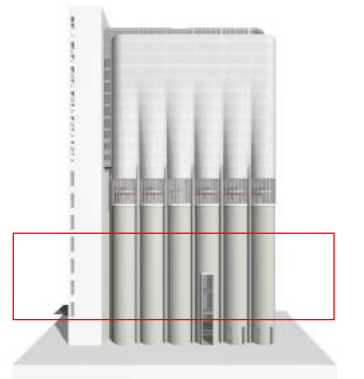


# LAYERING

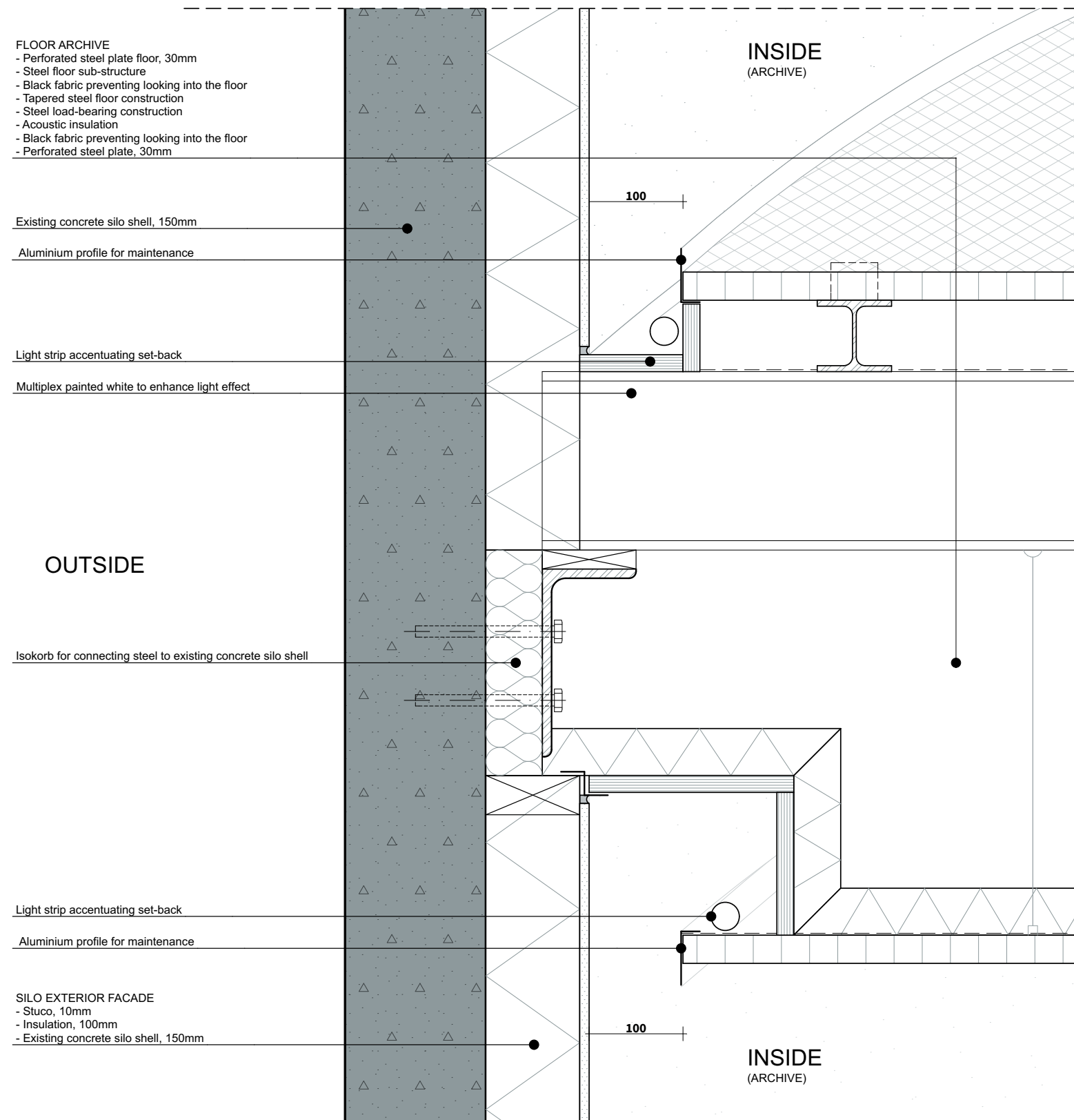


**INSIDE THE SILO - INTERNAL HEIGHT**

**1-4 - ARCHIVE**



# LAYERING



1-4 - ARCHIVE



ARCHIVE

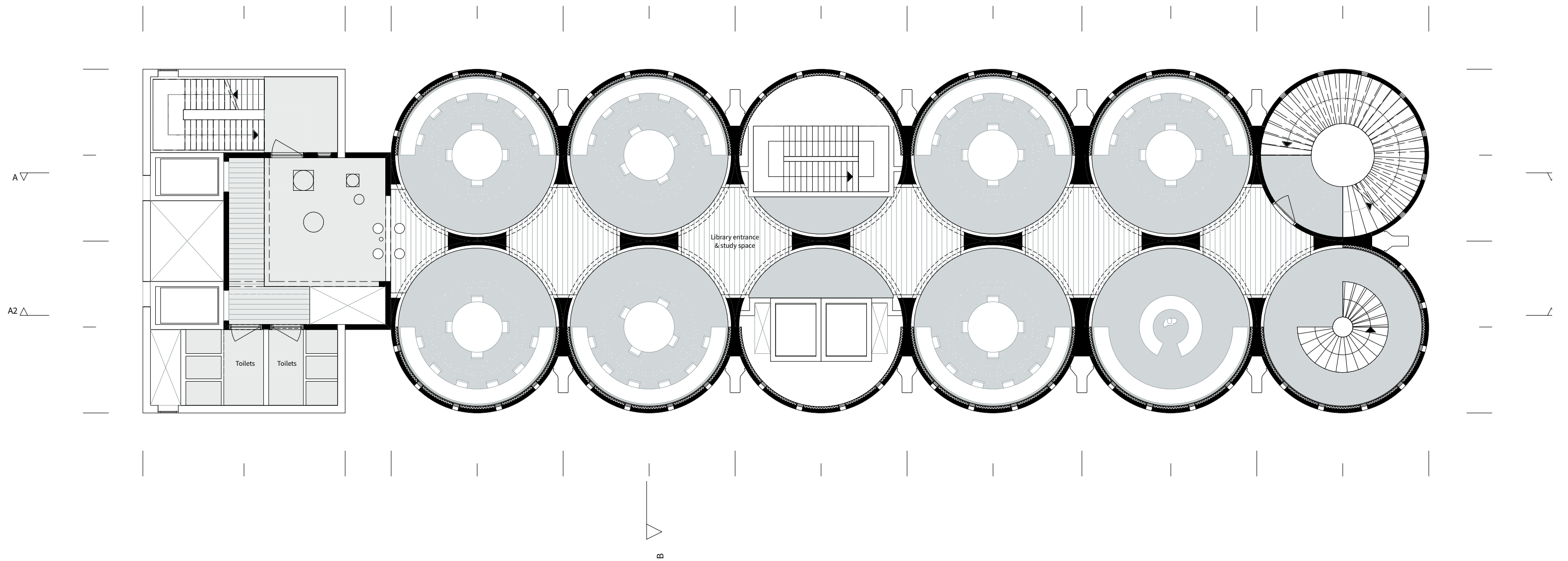


# ARCHIVE

---

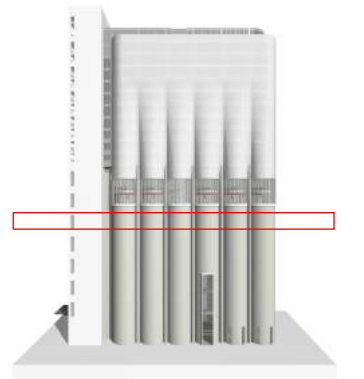


# LAYERING

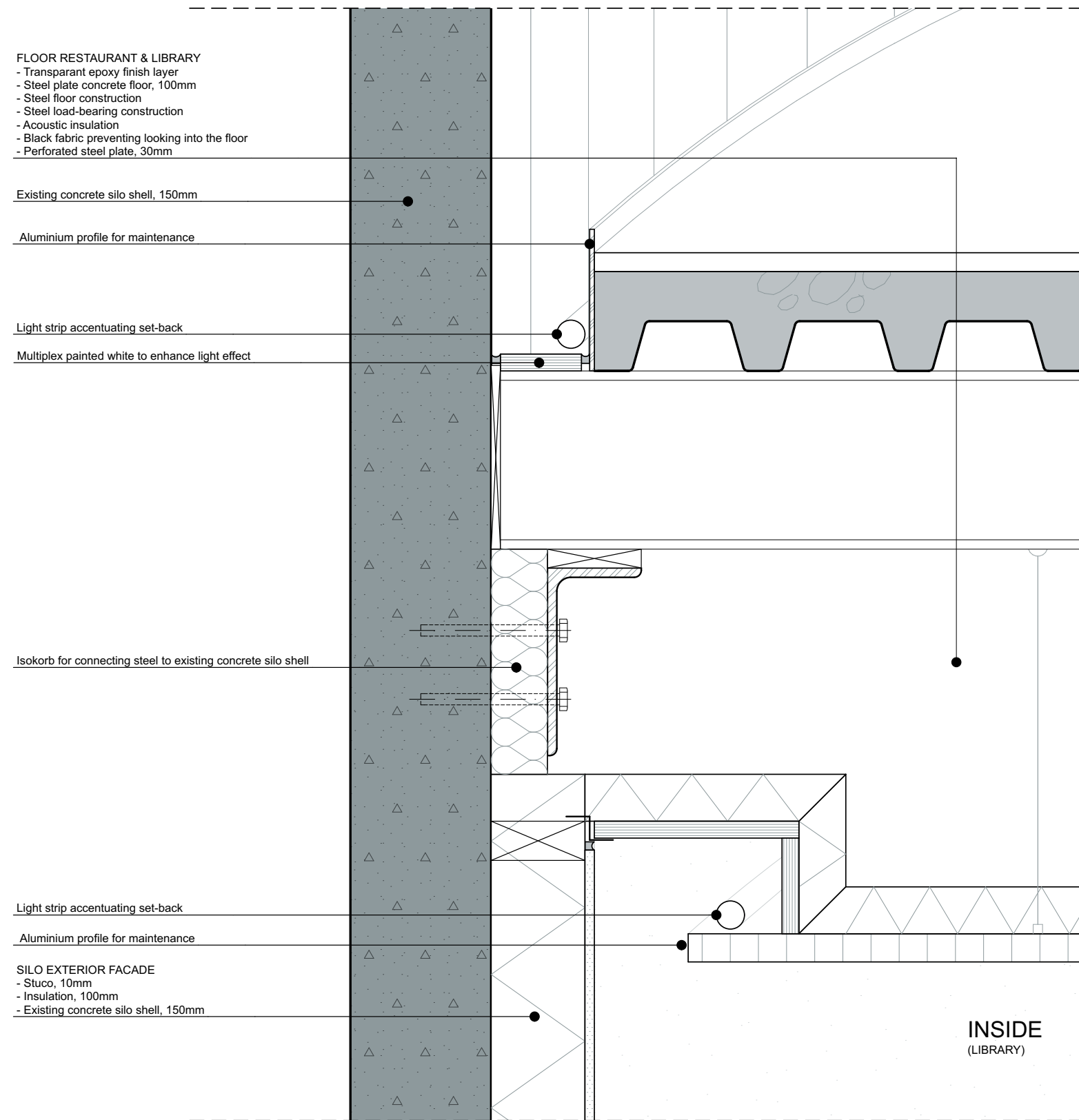


## INSIDE THE SILO - COMPARTMENTS

### 5 - LIBRARY



# LAYERING



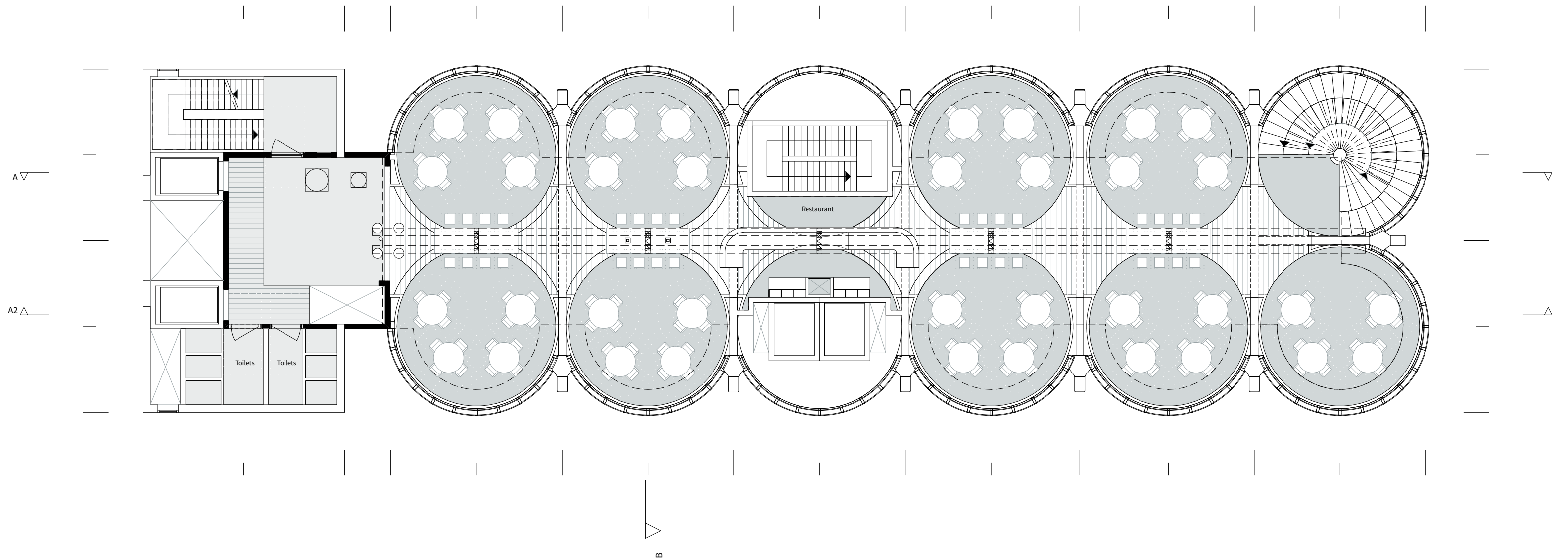
1-4 - ARCHIVE

# LIBRARY

---

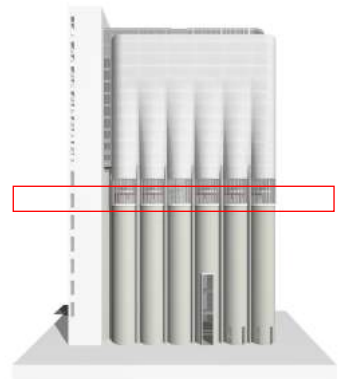


# LAYERING

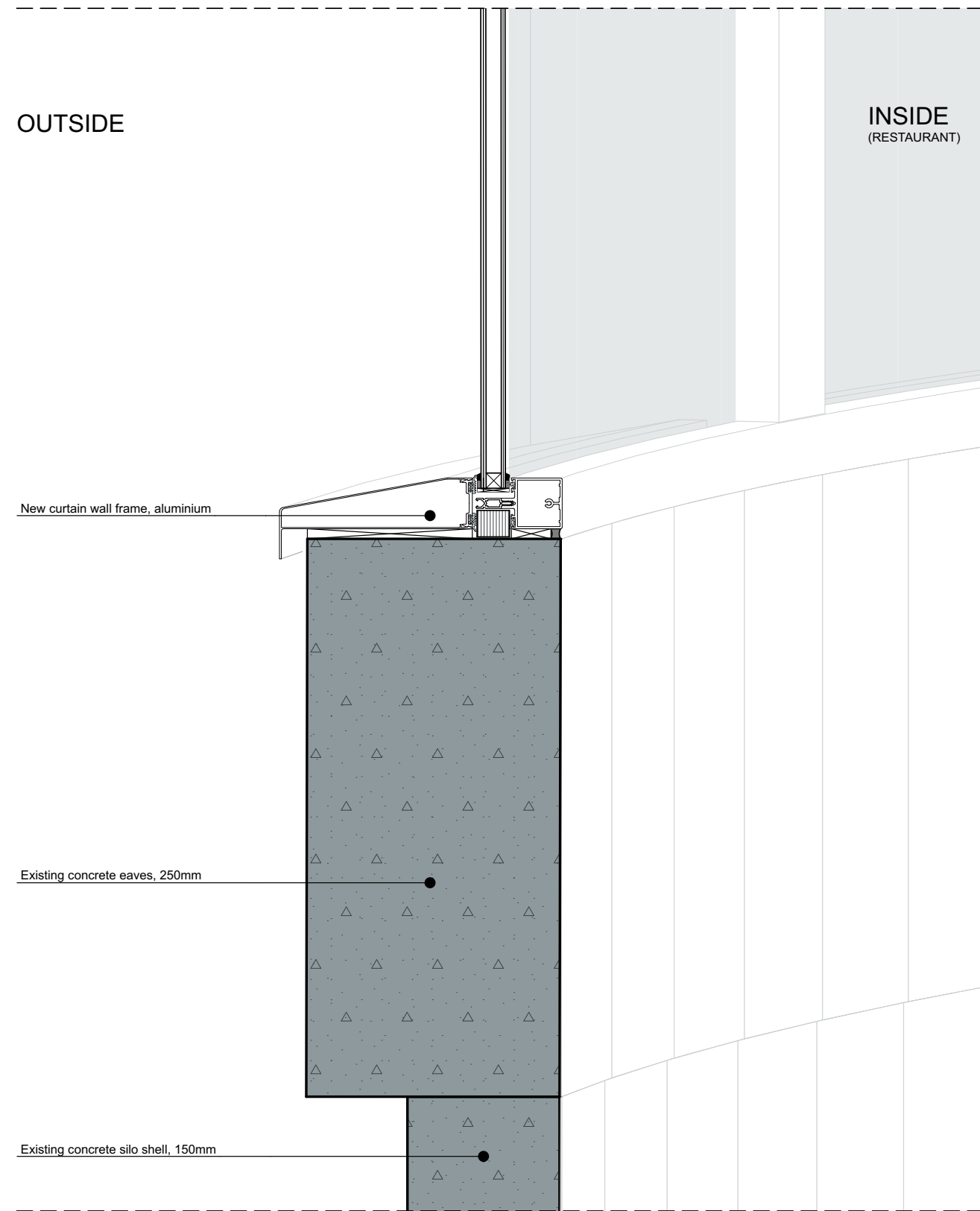


**INSIDE THE SILO - ON TOP SILO**

**6 - RESTAURANT**



# LAYERING



1-4 - ARCHIVE

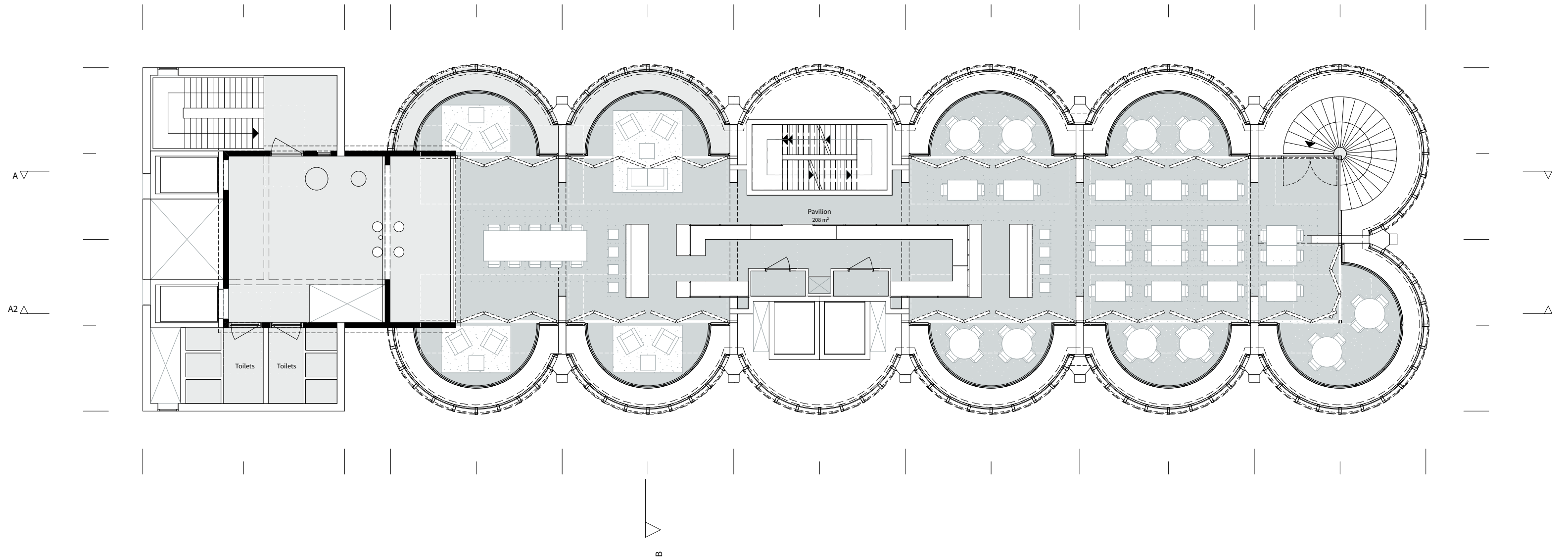
# RESTAURANT

---





# LAYERING



**ON TOP SILO**

**7 - PUBLIC PLAZA**

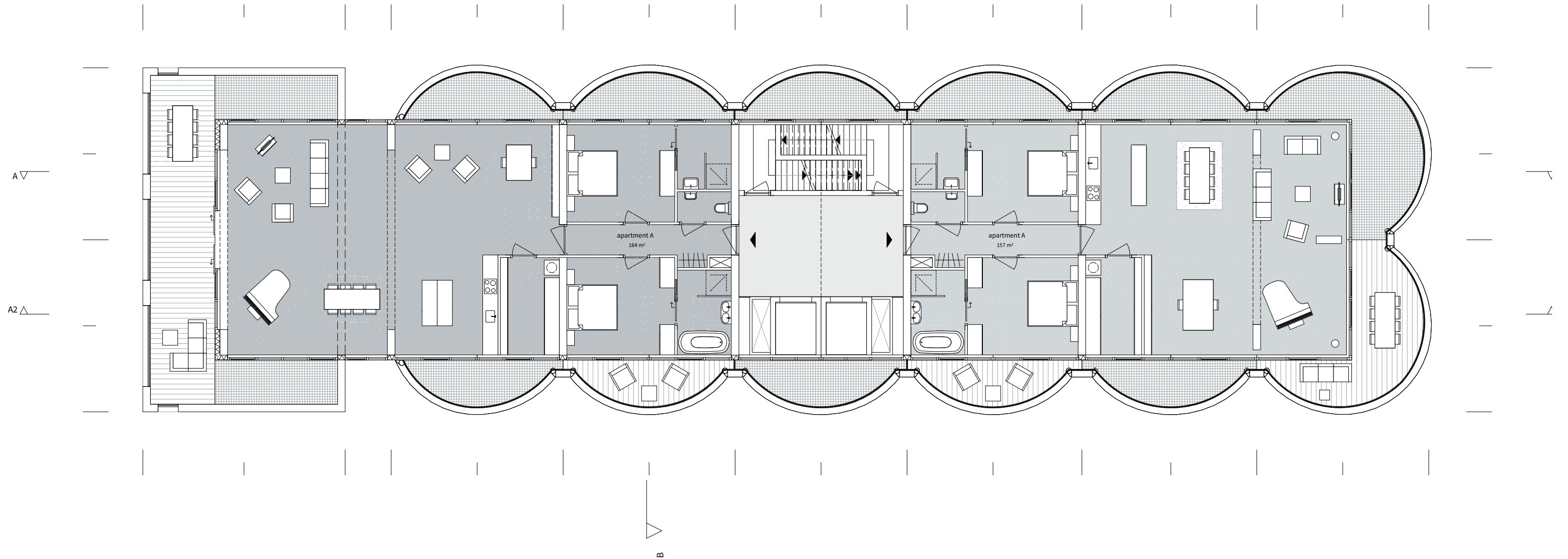


PUBLIC PLAZA

---

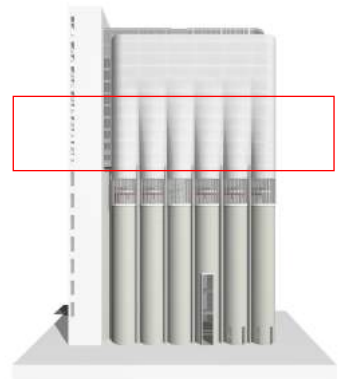


# LAYERING



**VIEW ON TOP SILO + STRUCTURE SILO**

**8 - APARTMENTS**

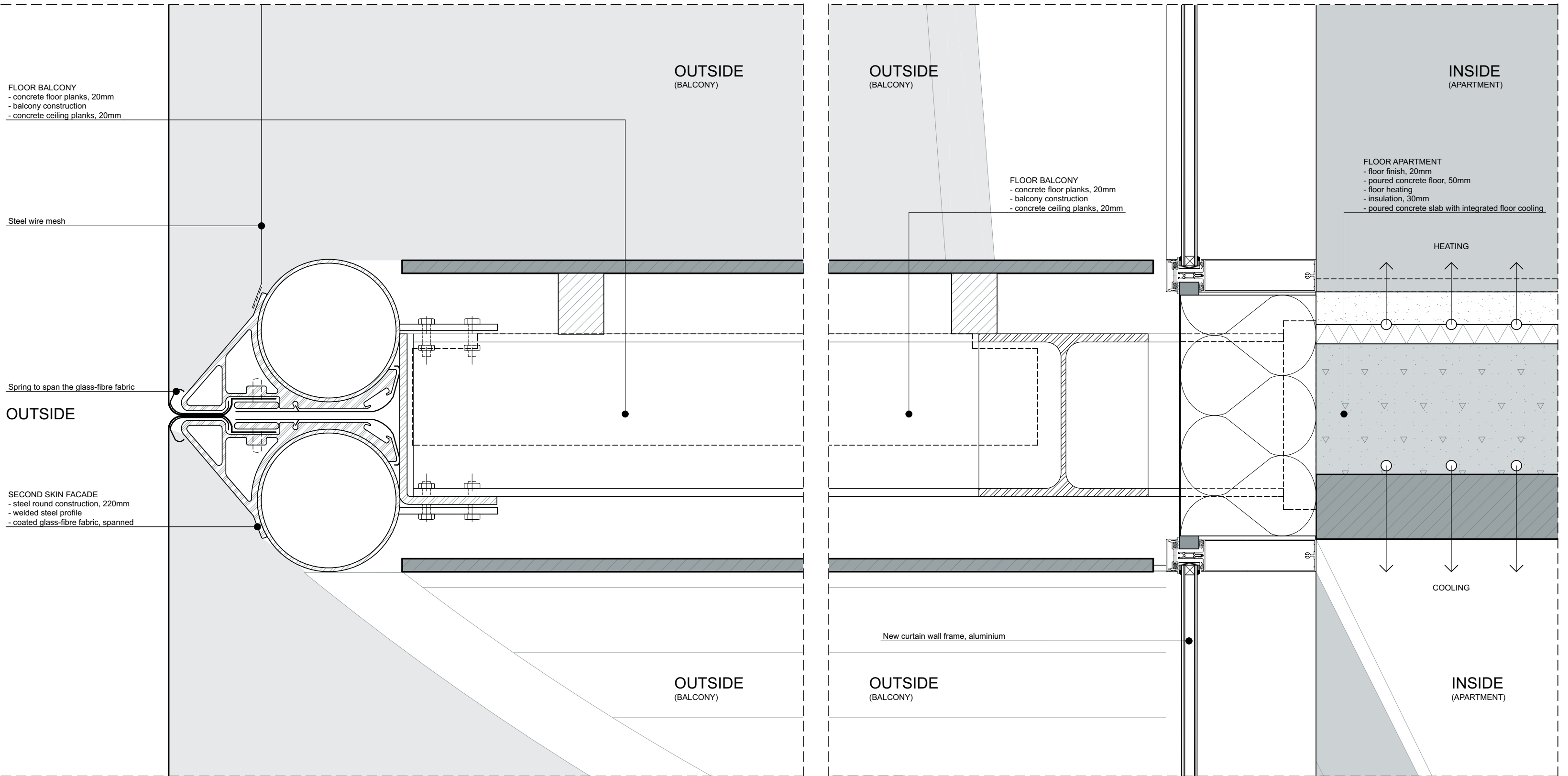


# APARTMENT INTERIOR

---



# LAYERING

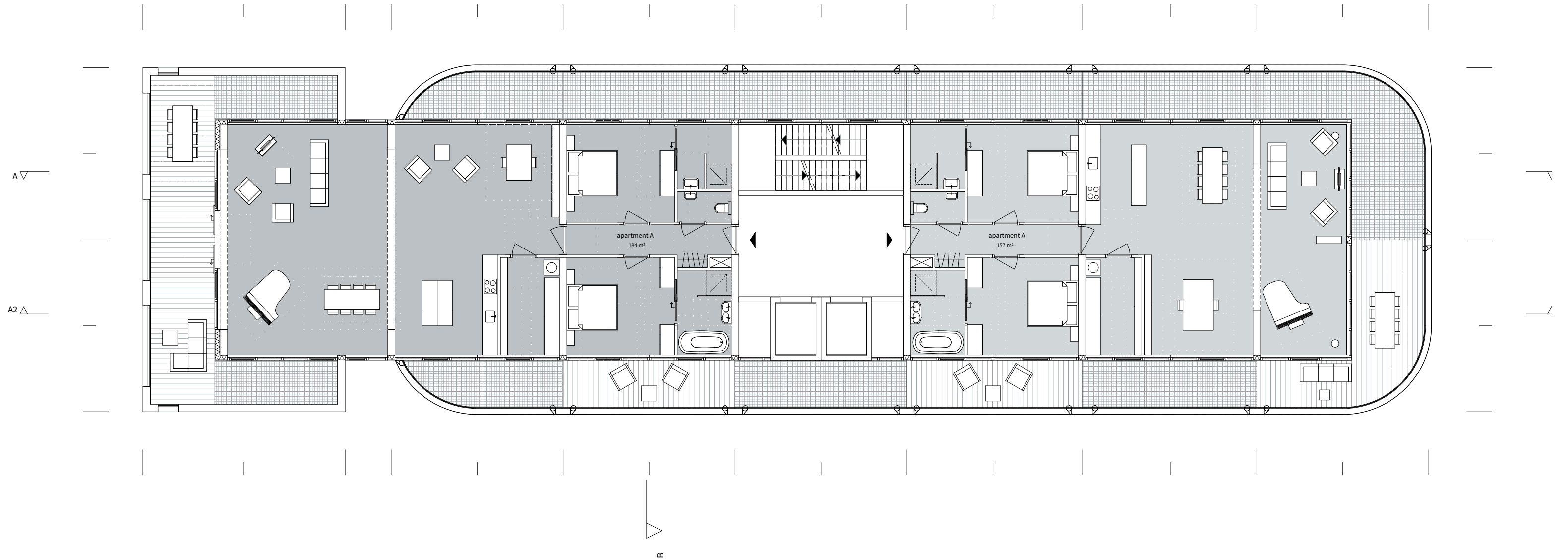


## SECOND SKIN

---

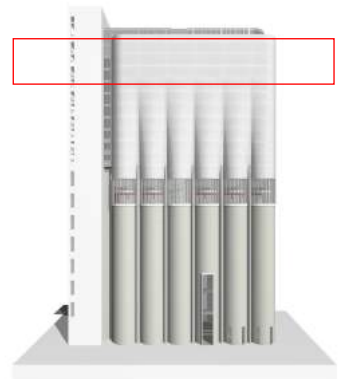
- **ARCHITECTURAL - EXTENDING EXISTING SILO IN NEW**
  - **CLIMATE - SUN SHADING**
    - **CLIMATE - NATURALLY VENTILATION**
- **LAYERING - MASSIVE BASE VS LIGHT TOP**

# LAYERING



**VIEW ON TOP SILO + STRUCTURE SILO**

**16 - APARTMENTS**



# APARTMENTS OUTSIDE SPACE

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# INTERVENTION

**LAYERING**

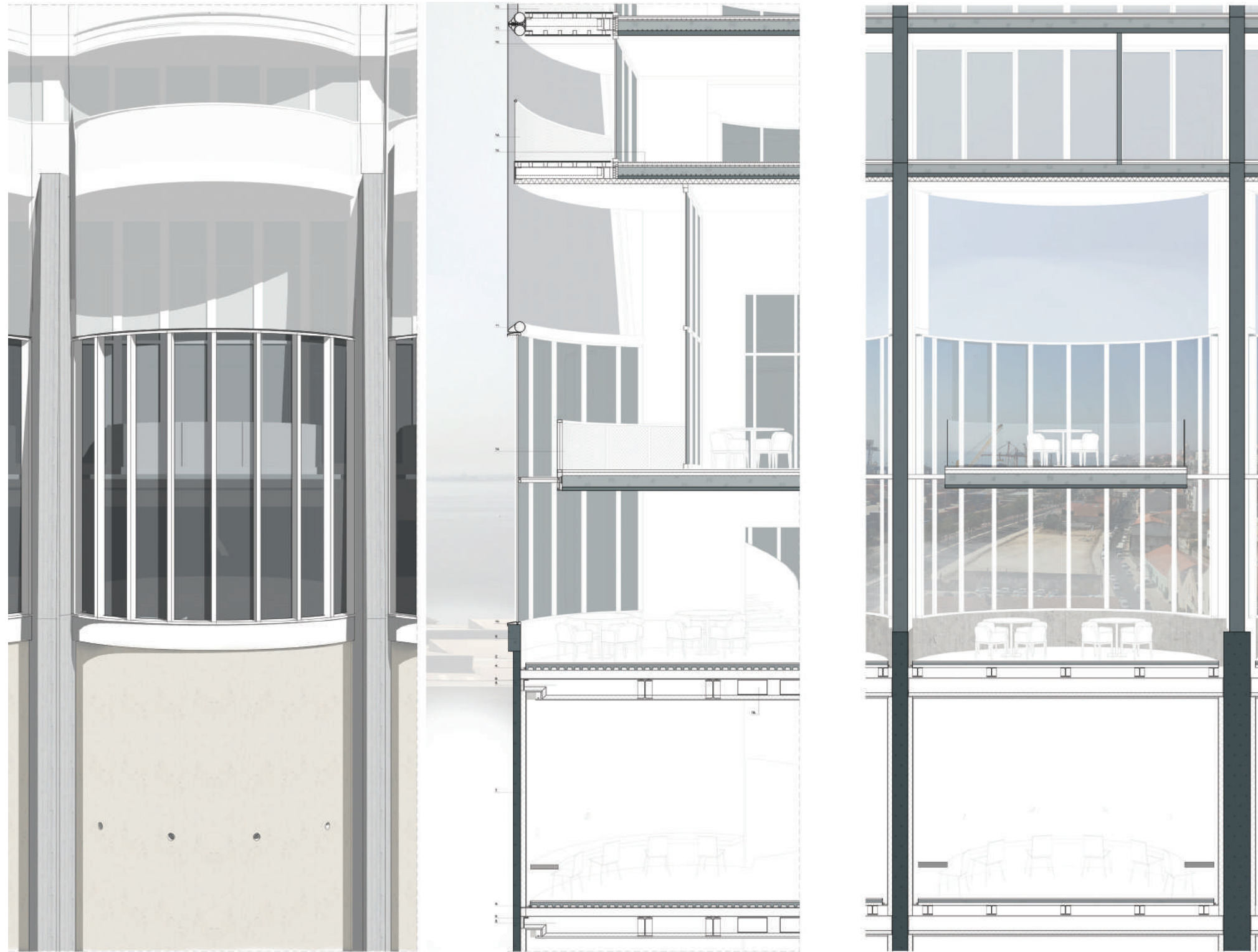
**LIGHT TOP - MASSIVE BASE**

**LIFE BEHIND SECOND SKIN**

**INTEGRATING EXISTING IN NEW**

**SPACING EXISTING - NEW  
ELEVATED PUBLIC PLAZA**

**SECOND SKIN IMPROVING HIGH-  
RISE CLIMATE**

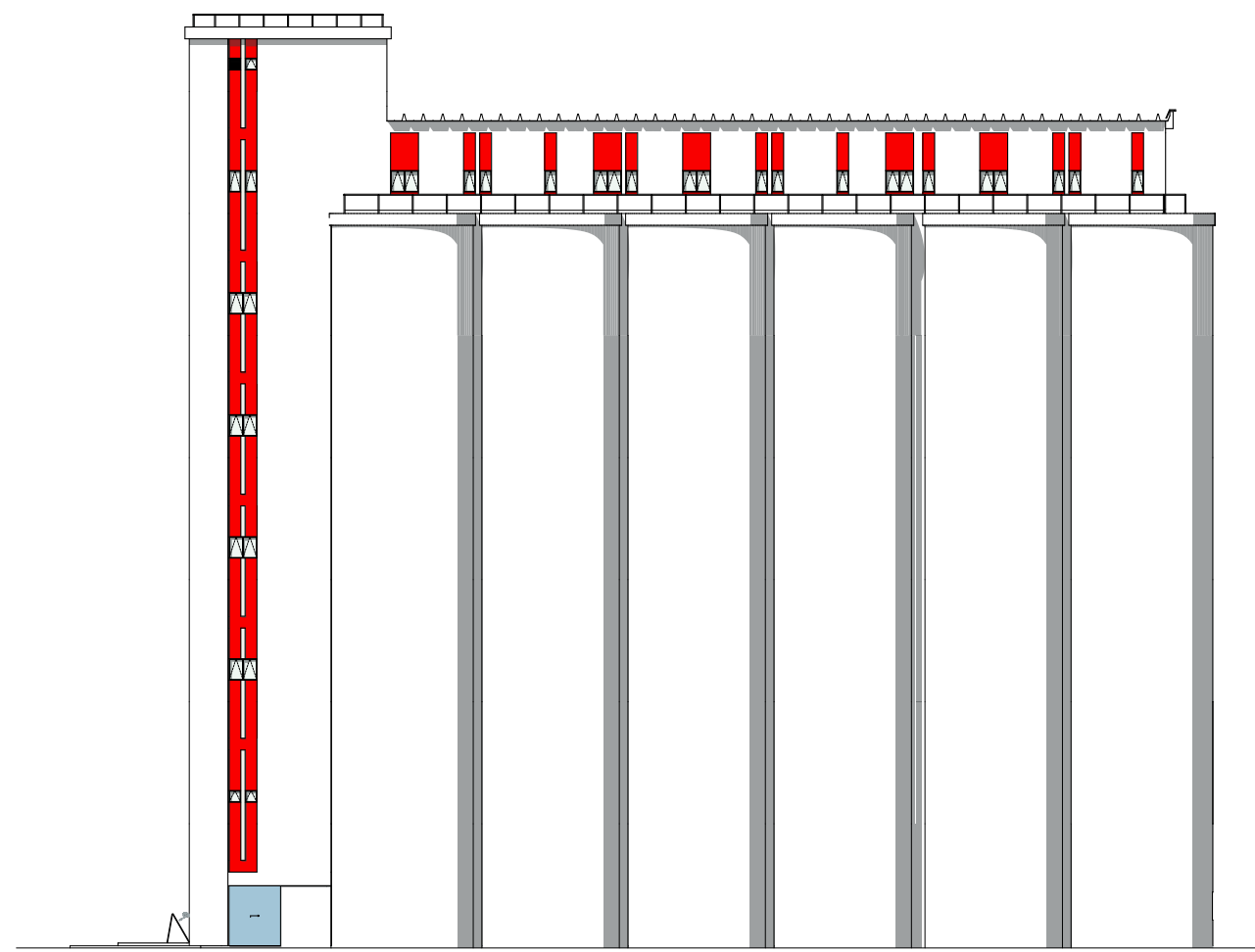


**BUILDING FRAGMENT**



# ARCHITECTURAL EXPRESSION

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**EXISTING**

# ARCHITECTURAL EXPRESSION

---



# ARCHITECTURAL EXPRESSION

---



**THANK YOU!**