

MUSEUM MAAS MODERN ART AND SCULPTURES

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P5 01-02-2018

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-RESEARCH QUESTION

-PROGRAM

-URBAN CONTEXT

-DESIGN

-BUILDING TECHNOLOGY

RESEARCH

HISTORY

MAASSILO ENSEMBLE



HISTORICAL DEVELOPMENT

BUILDINGS AND WATER

The following maps show the development of water and buildings in Rotterdam, focussed on the southside of the Maas and the areas around the Maassilo. The four analy-

sed times show the area before the Maashaven was dug (1900), after the first phase of the Maassilo by Stok was built (1910), after the second phase by Brinkman & Van

der Vlugt was built (1930) and after the third phase by Postma & Postma was built (1951). On the maps we see that the Maassilo was one of the first buildings in the sou-

th of Rotterdam and that with its expansion in building volumes and in harbour activity, the surrounding neighbourhoods attracted working people and grew as well.



HISTORICAL DEVELOPMENT

BUILDINGS AND WATER



CHRONOMAP



1Phase J.P.Stok 1910

Grootste Gebouw in Gewapend Beton.

Door den architect J. P. Stok Wzn. te Rotterdam is namens de „Graansilo-Maatschappij“ te Rotterdam, onderhands, zonder concurrentie, opgedragen aan de N. V. Industriële Maatschappij van F. J. Stulemeyer & Co., Constructeurs van werken in gewapend beton te Rotterdam, het bouwen van graansilo's en graanpakhuizen, geheel in gewapend beton, voor een bedrag van 460.000 gulden. Zoo zal de Maatschappij van Rotterdam het grootste gebouw in Rotterdam bouwen.



Additional Elevator Tower 1910 - 1917



2nd Phase Brinkman & Van der Vlugt 1931

Zaterdag 17 en Zondag 18 Mei 1930.
No. 15.900.
DERDE BLAD.
Stadsnieuws.
DE NIEUWE GRAANSILO AAN DE
MAASHAVEN.
Een moeilijk speedwerk.



Corner buildings 1931



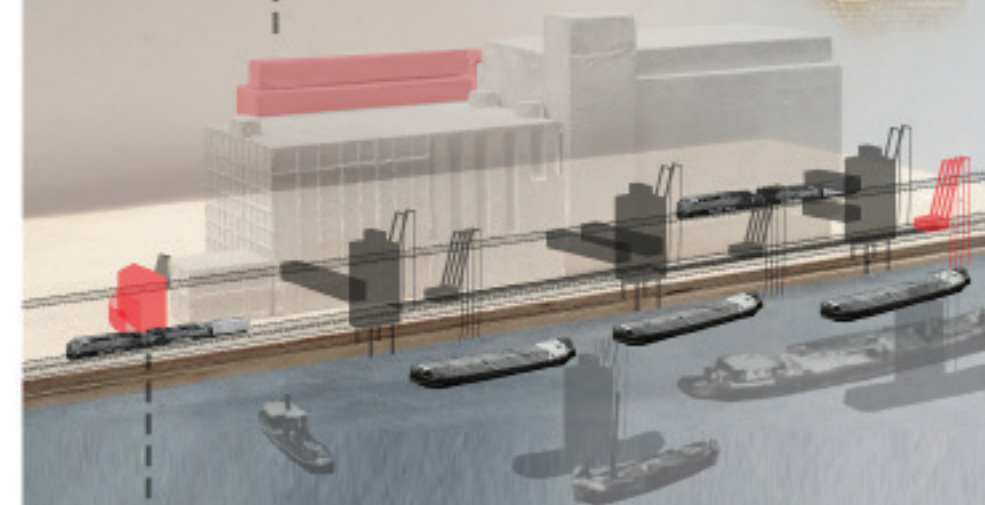
DE GROOTSTE GRAANSILO VAN WEST-EUROPA



3rd Phase A.G. & J.D. Postma

Rotterdam heeft thans grootste graansilo van Europa

Positie van Maastad van voor de oorlog in graanoverslag te hervinnen



Corner buildings 1951



Corner buildings 1956

1910

Great Depression
1929

1931

WW2
1940 - 1945

1951

CHRONOMAP



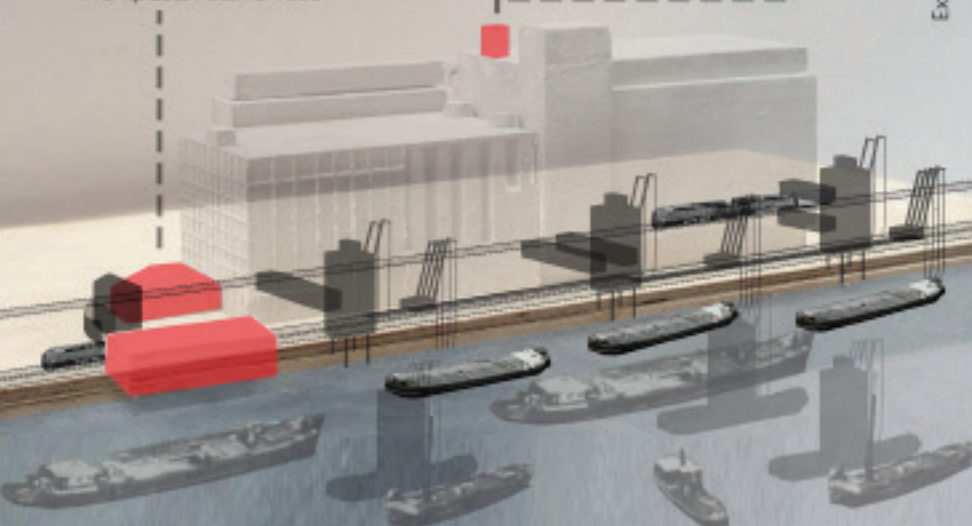
5th Phase Office Herman Haan 1963



Werkplaats Postma 1956



Extra elevator Postma 1958



Nieuw kantoor Graanelevator Maatschappij

ROTTERDAM, 23 dec. — Op 3 januari zal de bouw beginnen van het nieuwe kantoor van de Graan Elevator Maatschappij (GEM) aan de Brielsesteen in Rotterdam.

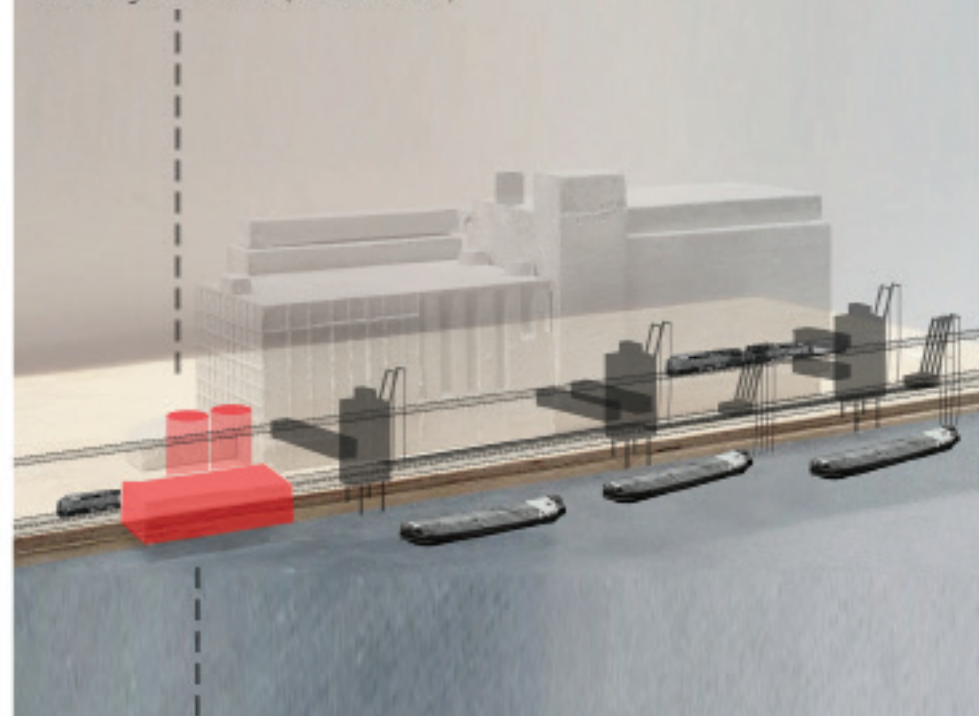
De bouw, naar het ontwerp van Herman Haan, is aan de Breda 123 gegund na een openbare inschrijving. De nieuwbouw bedraagt 1,2 miljoen.

joen. Na een jarenlang proces het kantoor gereed zijn. Oorspronkelijk had de GEM een hoog kantoor willen bouwen bovenop het bestaande gebouw in de hoek van de Maatschappij bij de Graanste. Zij kon echter daar niet voldoen aan de eisen van de gemeente om een aantal koerplaatsten te leveren.

— H. J. van Eijck, voorzitter van de bedrijfspgroep, zegt dat de vervoersbedrijf NVV, in Zuidwest, zal 1 gebouw met functie meerleiden en het zal met de interne en externe verlichting van de gebouwen worden.



Oil storage 1963 - 1971 (foto taken 1971)



Office groundfloor after renovations (dwellings to office)



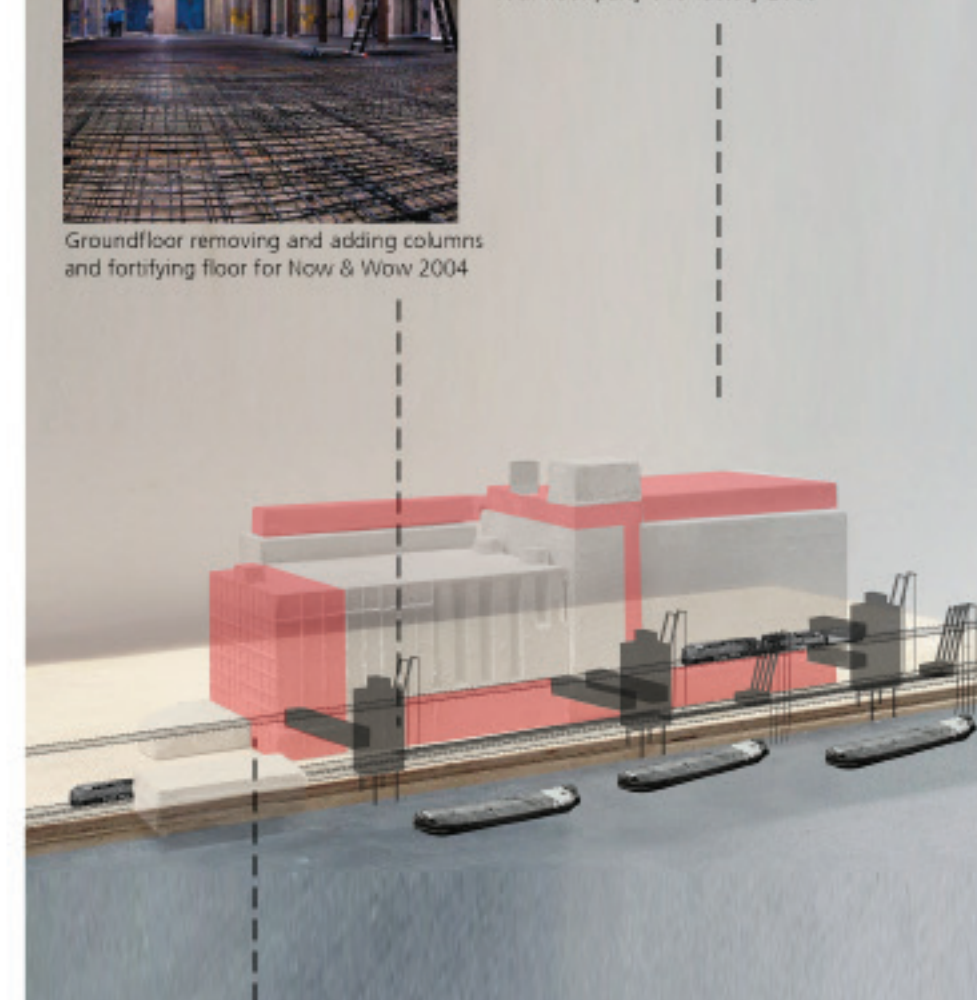
Office 1st floor original



Groundfloor removing and adding columns and fortifying floor for Now & Wow 2004



10th floor party 010 factory 2008



Creative-Factory new main entrance 2008

1963

1971

Global Financial Depression
2007 - 2008

2008

FLOW

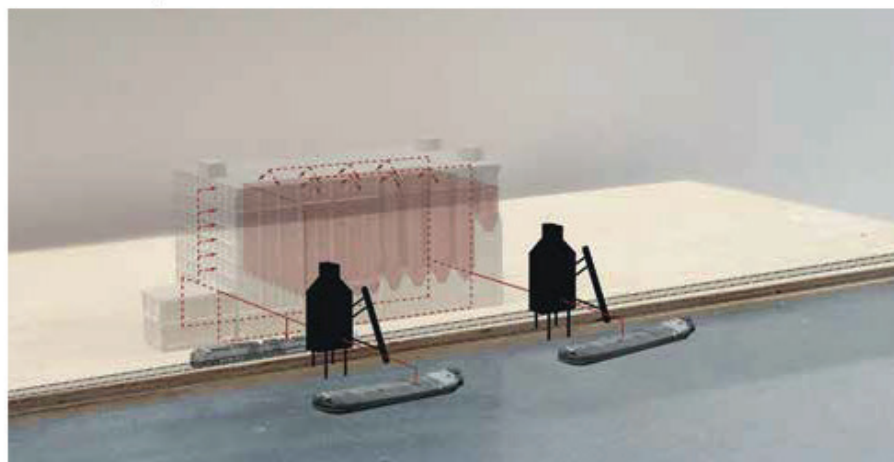
On the pictures on this page, the movement of grain and workers through the building is made visible per building phase. In the first phase, the grain was transported into the building using mostly the west grain elevator. Two

elevators transported the grain to the attic, where the grain was distributed among the silos. In the east part of the building the grain was weighed and cleaned. The former entrance was located at the north facade.

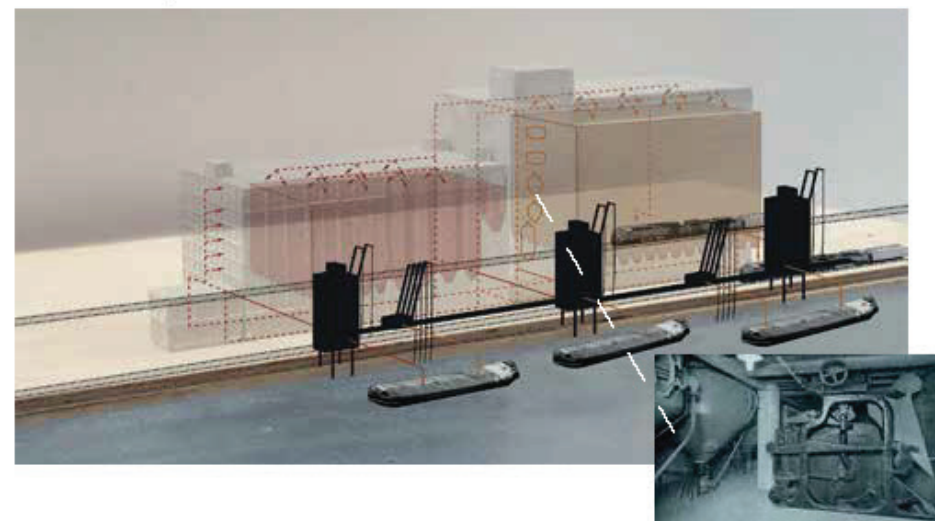
This entrance is not present anymore. In the second building phase, the horizontal transport was connected to the first phase, so the building worked as a whole. In the machine tower, machines were placed to weigh,

filter and dehumidify the grain. An extra entrance with a rounded wall was added, an interesting detail that is not present anymore. In the third phase, two extra silo clusters were added.

Grain flow phase 1 (1910)

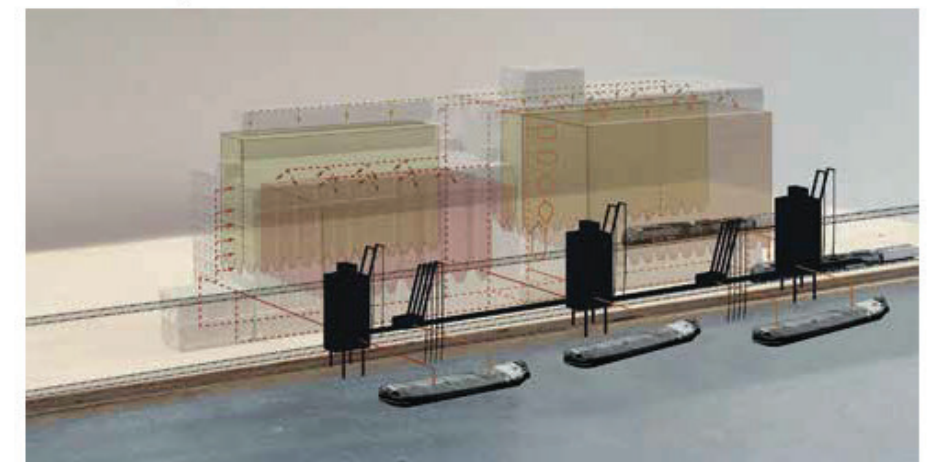


Grain flow phase 2 (1931)

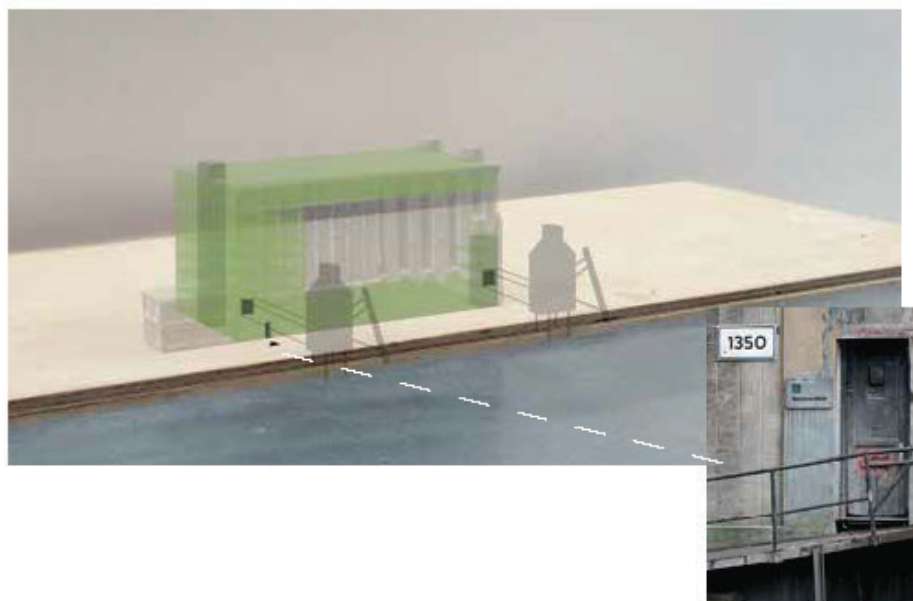


dehumidifiers and automatic weighing scale in the machine tower

Grain flow phase 3 (1951)

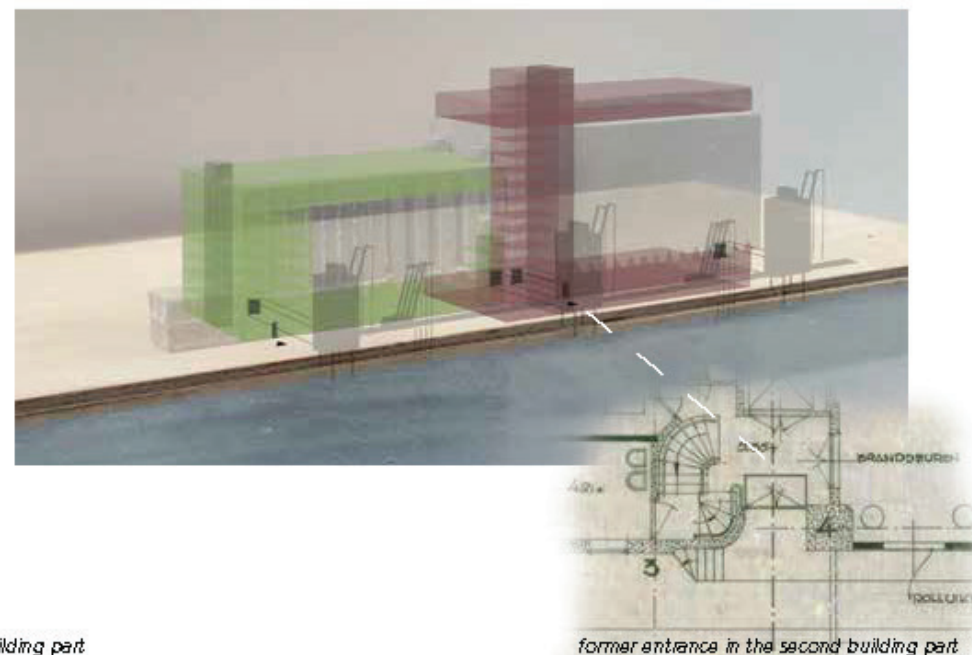


Workers flow phase 1 (1910)



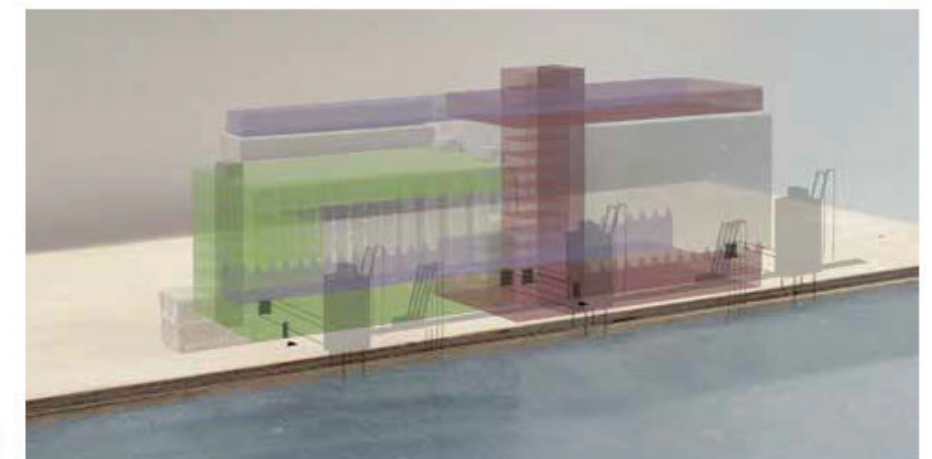
former entrance in the first building part

Workers flow phase 2 (1931)

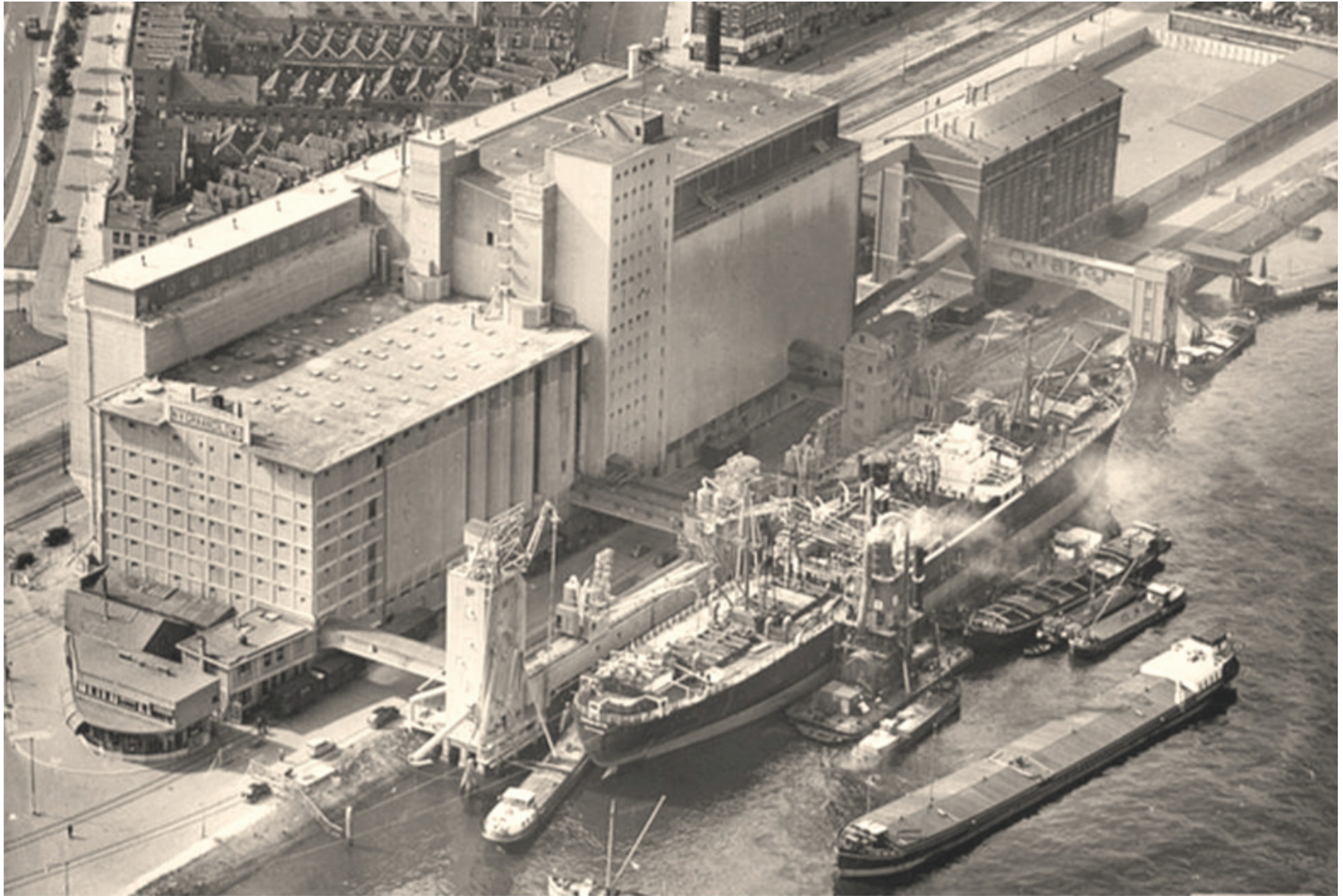


former entrance in the second building part

Workers flow phase 3 (1951)

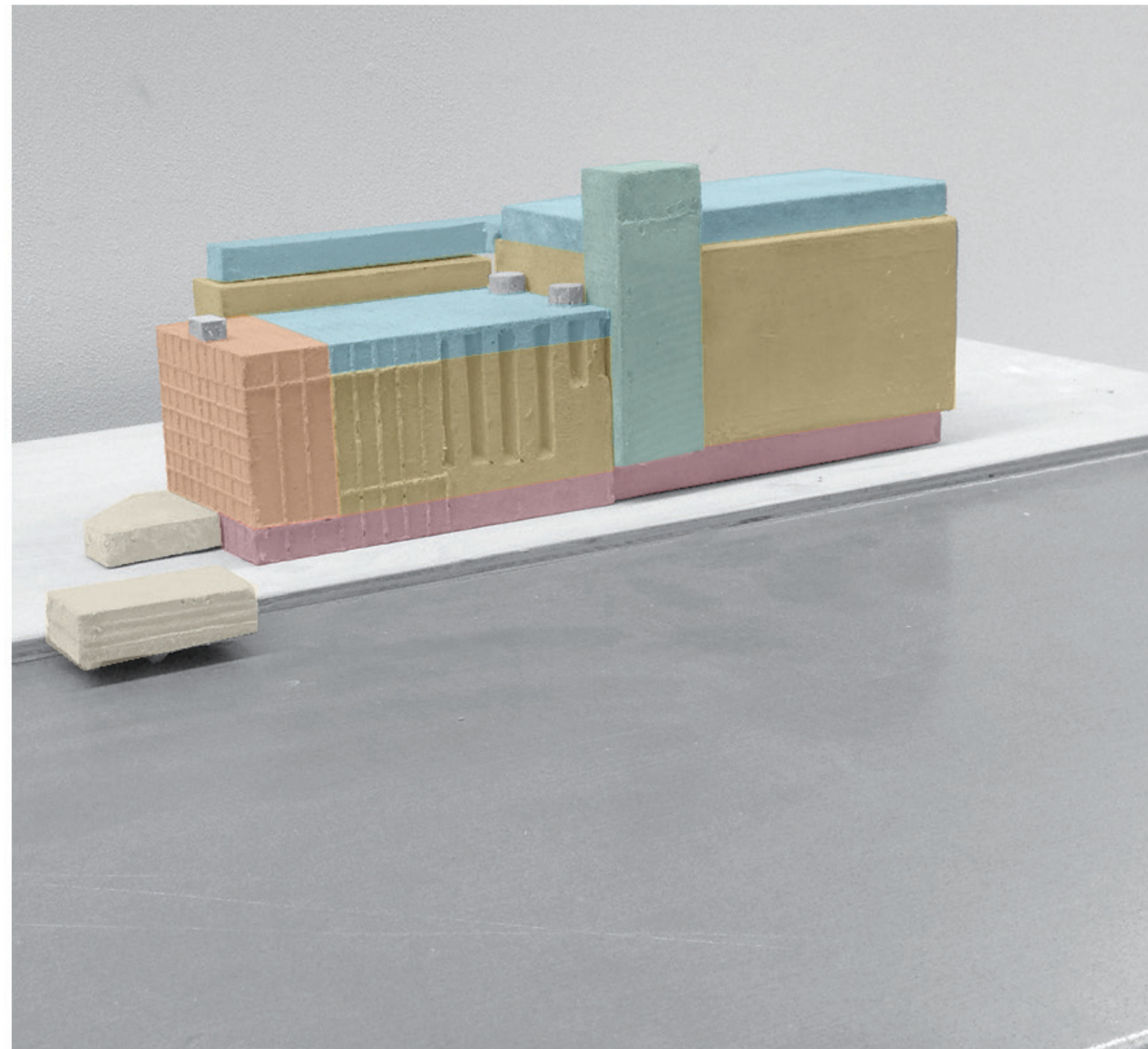


ACTIVE ENSEMBLE



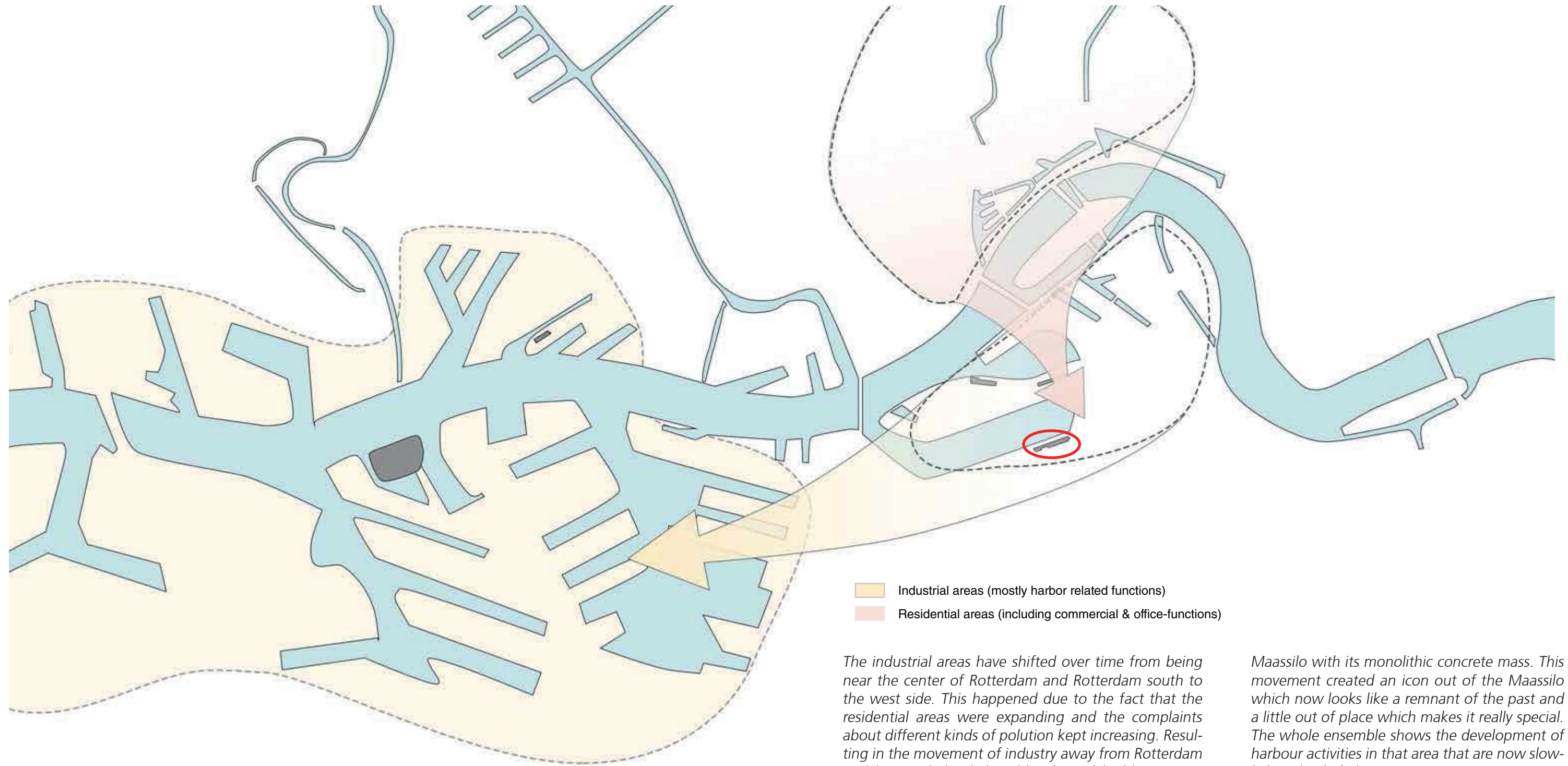
BUILDING FUNCTIONS

The functions within the Maassilo are pretty much all build up the same way in each phase. The basement and groundfloor of the buildings are used to transport grain horizontally as well as allow workers to move about and have access to the funnels, machines and train tracks. The middle 'floors' of the building or in the case of the Maassilo the silo's take up the most space in the building. The top floor of each building phase gives room to distribute grain to the silo's and also for workers to adjust the grain pipes and have access to the machines. As for the two vertical exceptions, they are used as rising cores for the workers as well as storage and other activities such as washing grain. The office and former dwelling were situated over the water due to the lack of space on the site.



-  *Silo's / grain storage*
-  *washing/drying area for grain*
-  *workfloor / transportfloor*
-  *machine storage/tower*
-  *grain distribution rooms for silo's*
-  *office / dwelling*

MOVEMENT OF INDUSTRY

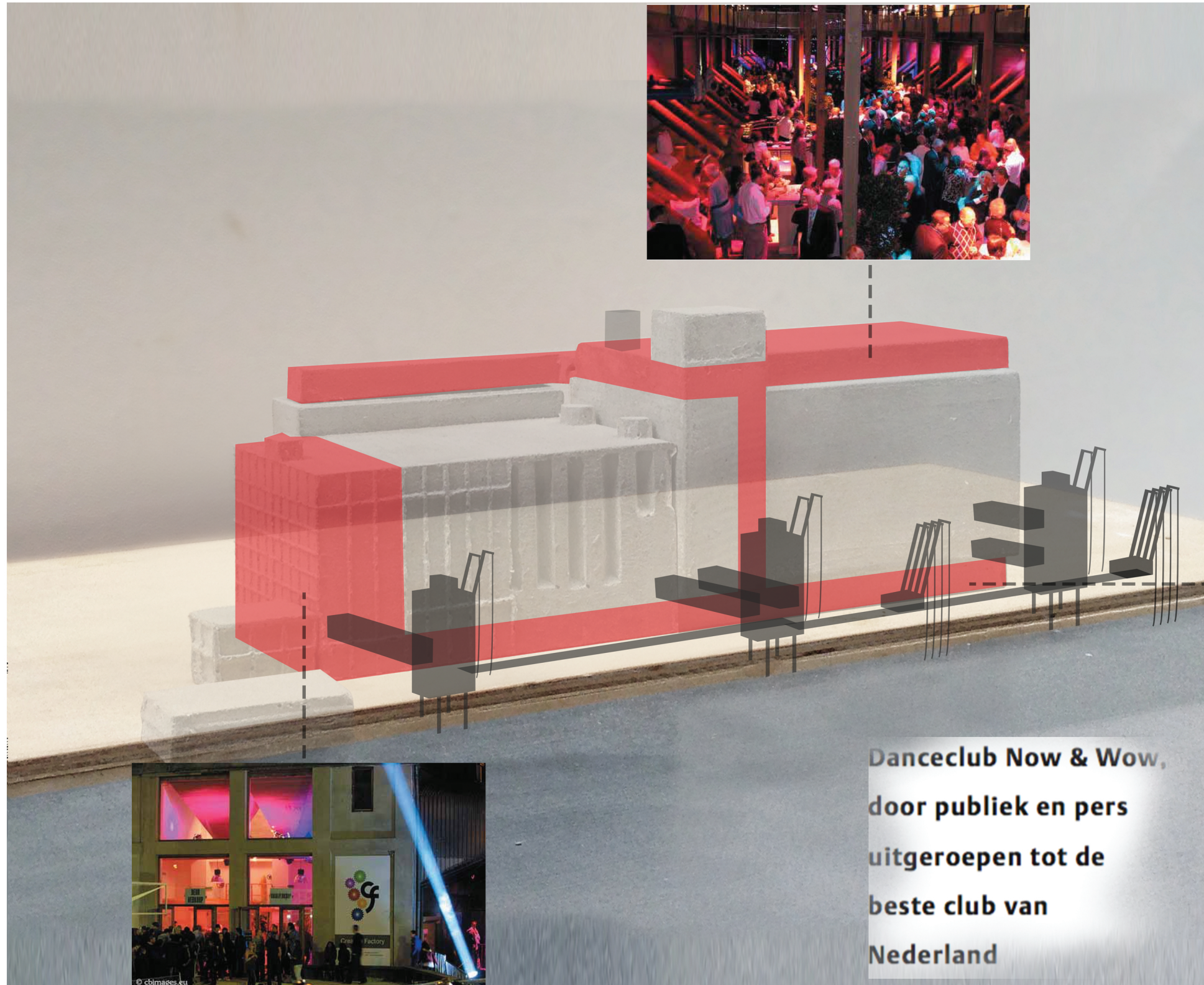


The industrial areas have shifted over time from being near the center of Rotterdam and Rotterdam south to the west side. This happened due to the fact that the residential areas were expanding and the complaints about different kinds of pollution kept increasing. Resulting in the movement of industry away from Rotterdam and leaving behind the old industrial buildings/areas. Which over time created a big contrast between the newly build low rise residential areas and for example the

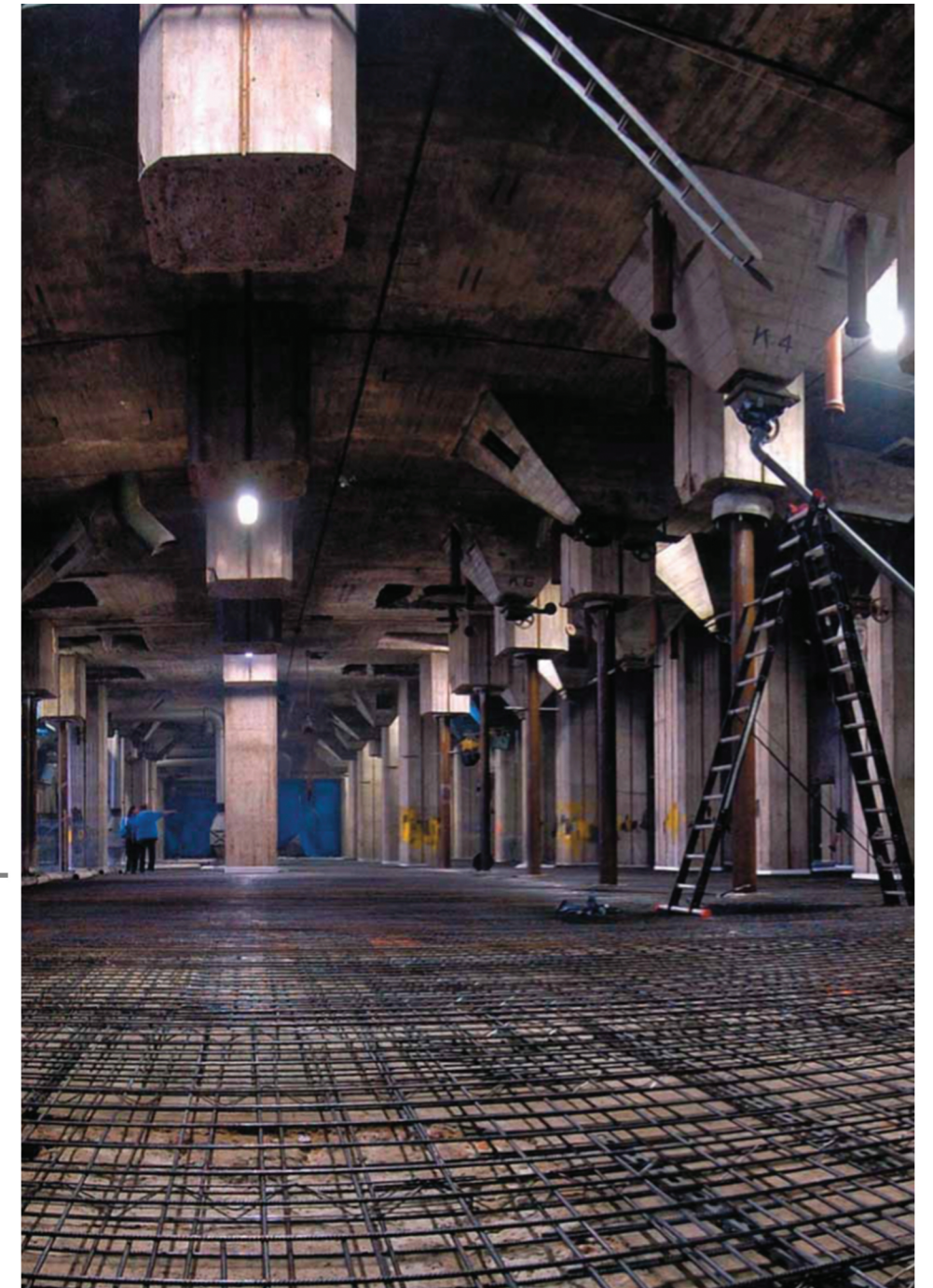
Maassilo with its monolithic concrete mass. This movement created an icon out of the Maassilo which now looks like a remnant of the past and a little out of place which makes it really special. The whole ensemble shows the development of harbour activities in that area that are now slowly but clearly fading away.

CHRONOMAP - 2008

10th floor party 010 factory 2008



Creative-Factory new main entrance 2008



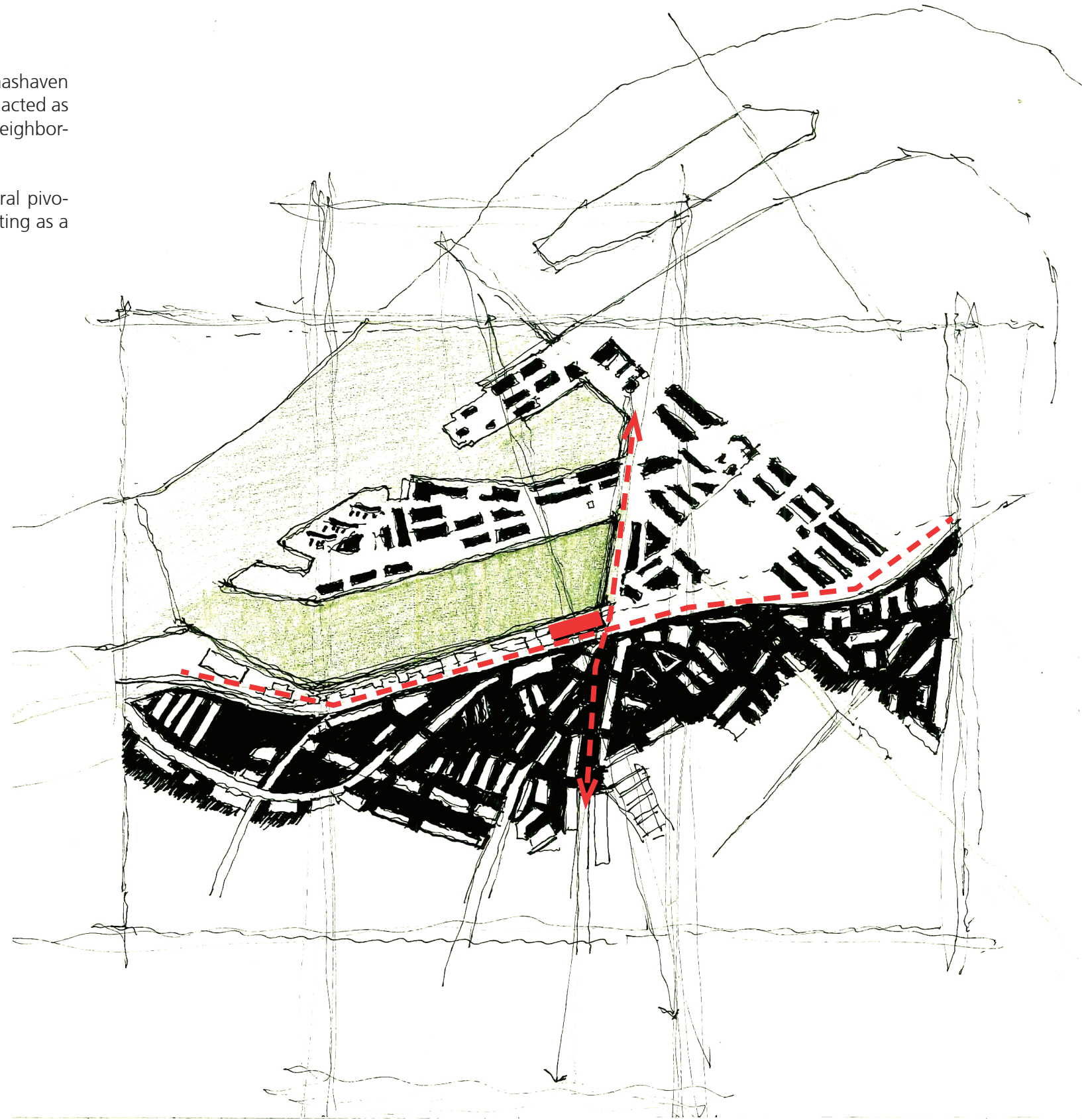
Groundfloor removing and adding columns and fortifying floor for Now & Wow 2004

ANALYSIS

URBAN CONFIGURATION

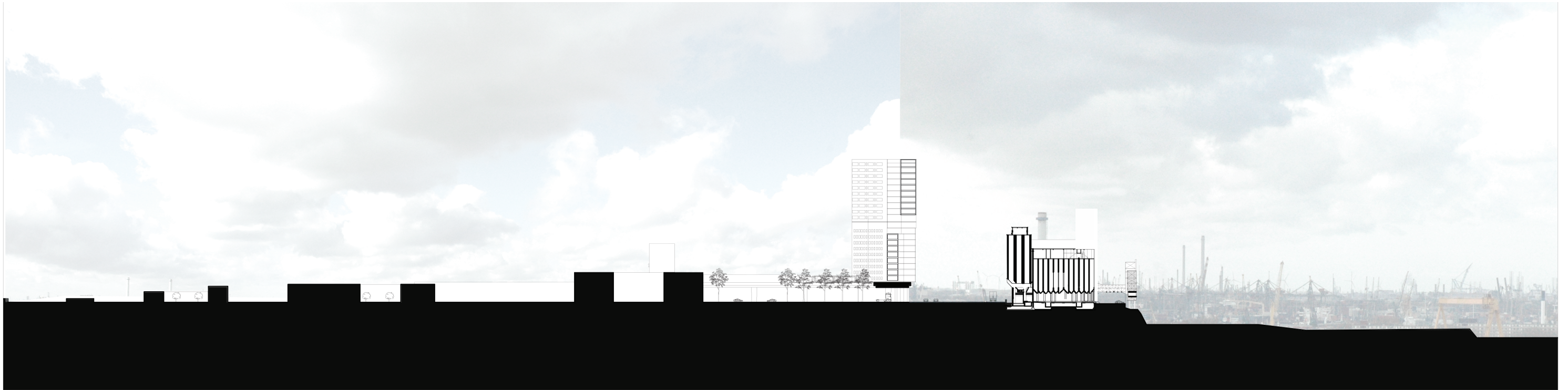
Directly connected to the creation of the Maashaven and defining its southern edge, the Graansilo acted as the generator of the southern working class neighborhoods of Tarwewijk and Bloemhof.

In this context, the building assumed a central pivotal role towards the city and harbour, also acting as a 'gate' between north and south.

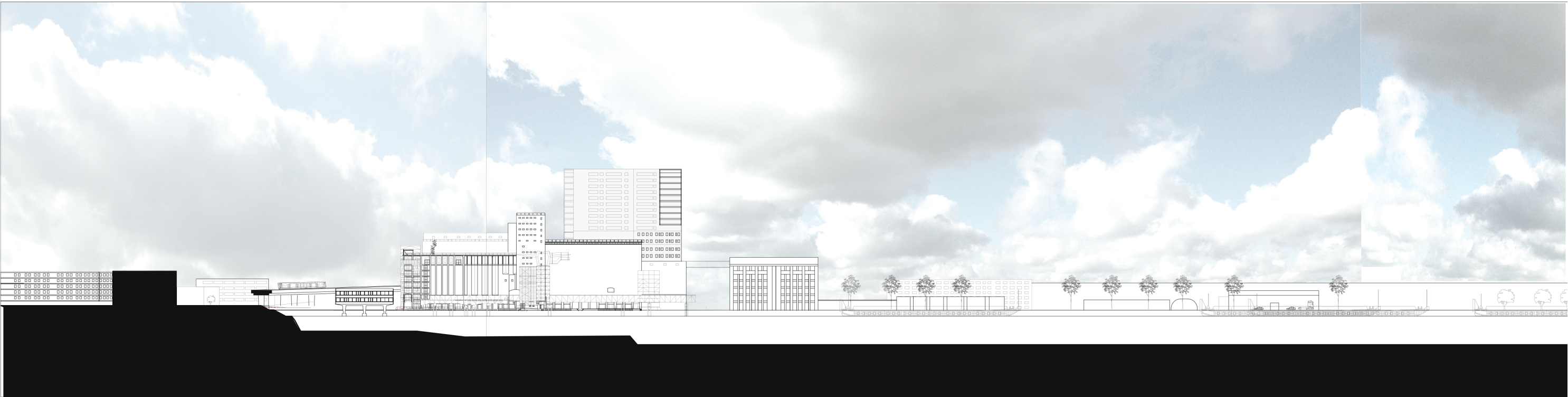


RELATIONSHIP TO SURROUNDINGS

Being stricly defined by the arteries of Maashaven Oostzidre and Brielselaan and bordered by the rail-way, the building becomes clearly separated from the eastern neighborhoods of Bloemhof and acts as a northern terminal (yet abstracted) for the southern district of Tarwewijk.



Sectional relationship with Tarwewijk



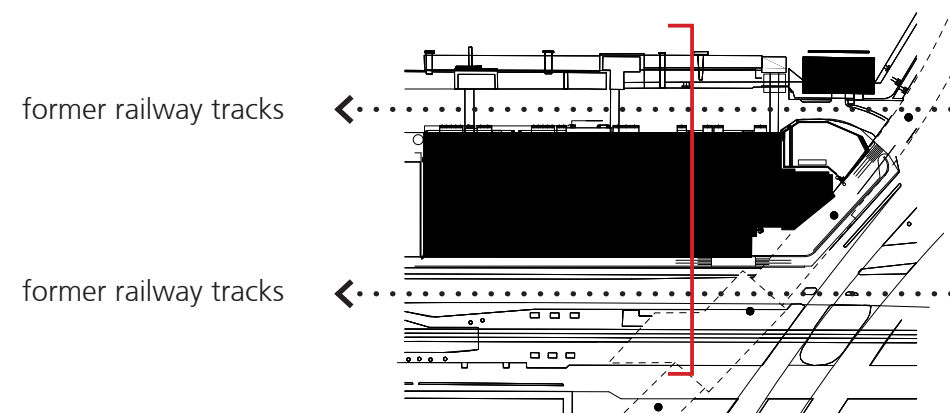
Maashaven Oostzidre and waterfront profile

TWO-FACED

The main linear layout of the building is closely related to its position towards the Maashaven and the former railways. The result is that the building has two long facades, each with a particular relation to the public space. The public space on the south side (left in the section above) has a strong linear character and is enclosed from both sides. The repetition of concrete columns in the facade enhances this linearity. In terms of scale, the building has an ambivalent relation to this public space. On the one hand, the human scale is introduced through the so-called “plofroosters”, the concrete ornament tiles in the lower part of the facade. On the other hand, the division in two parts, mirrored in the high bridge in the middle, imposes a colossal scale.

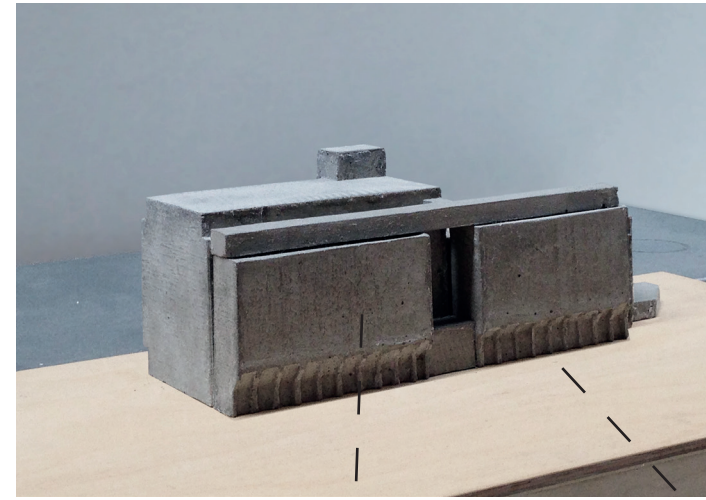
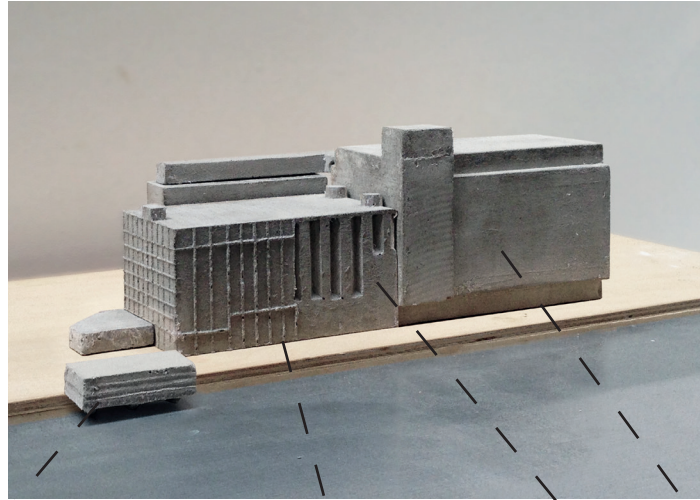
The north side of the building is perhaps a more challenging public space, mainly because of the distance to the water. The space is narrow, certainly in relation to the height of the building, and is completely cast in shadow. The original elevator constructions block the view towards the Maashaven, and so the space is now used for parking. The facade does not have an articulated expression of the human scale as the south facade has. The result is that the building becomes inconceivable. Its totality disappears because of its swallowing scale in relation to the narrow public space.

Both facades have one thing in common, they completely conceal their interior. The relation between inside and outside is almost non-existent in the Maassilo, certainly in this section.



CONCRETE APPEARANCES

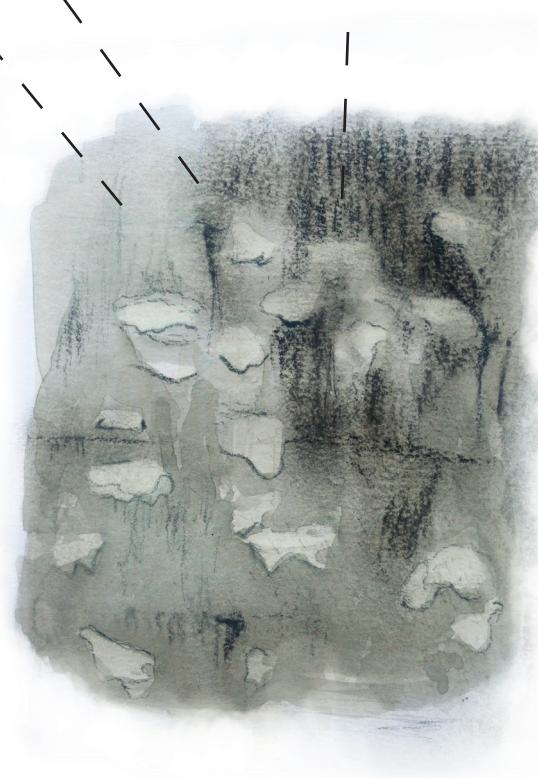
From the urban and site scale, the building is conceived as a monolithic mass of concrete. At a closer look however, the concrete has multiple appearances in the Maassilo. These appearances point to the developments in the economy of the building, the different stylistic choices of the architects and the development of the material itself. All these appearances have their own texture, scale, and relation to the observer.



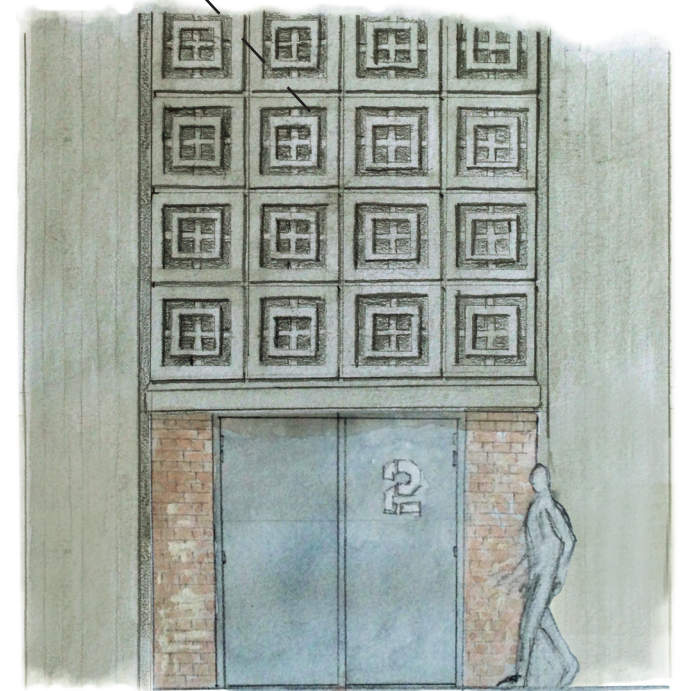
concrete tiles - part 4 (Haan) - rational - indifferent - sober



hollow concrete stones - part 1 (Stok) - tactile - human scale - contingent

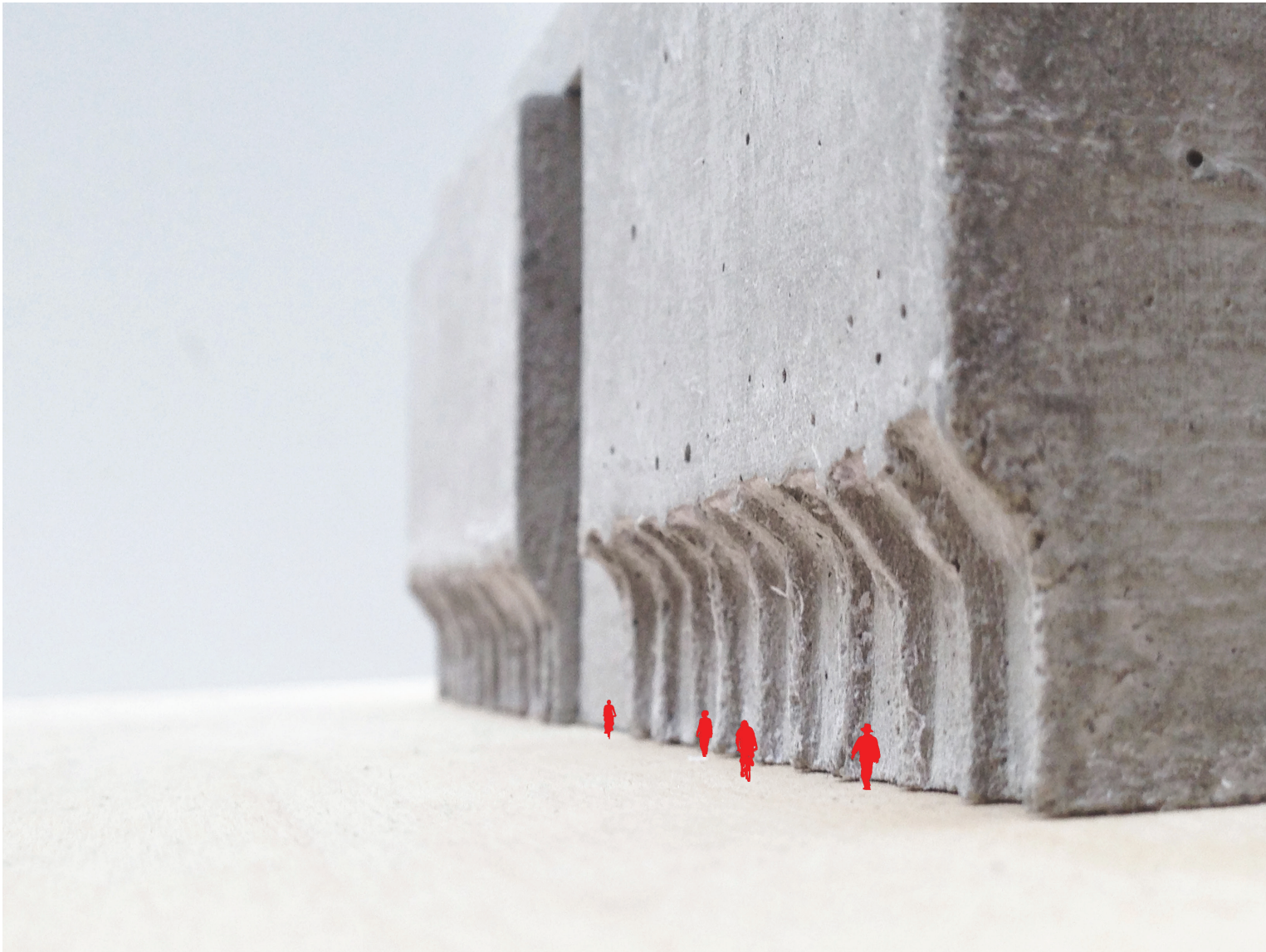


plastered concrete surface - part 1,2,3 - damaged - inconceivable scale - worn

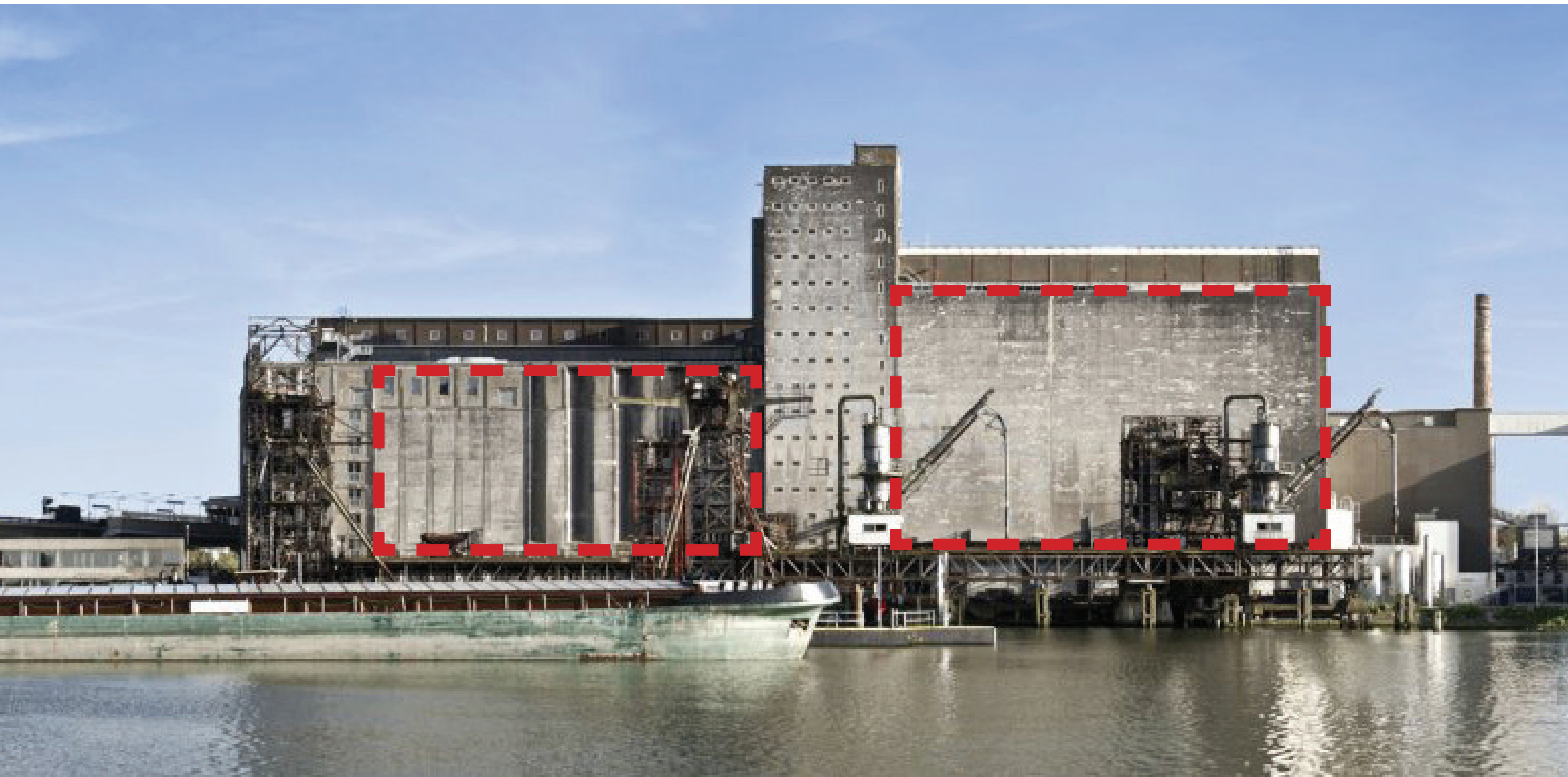


plofroosters - part 3 (Postma) - lively - human scale - active - transparent

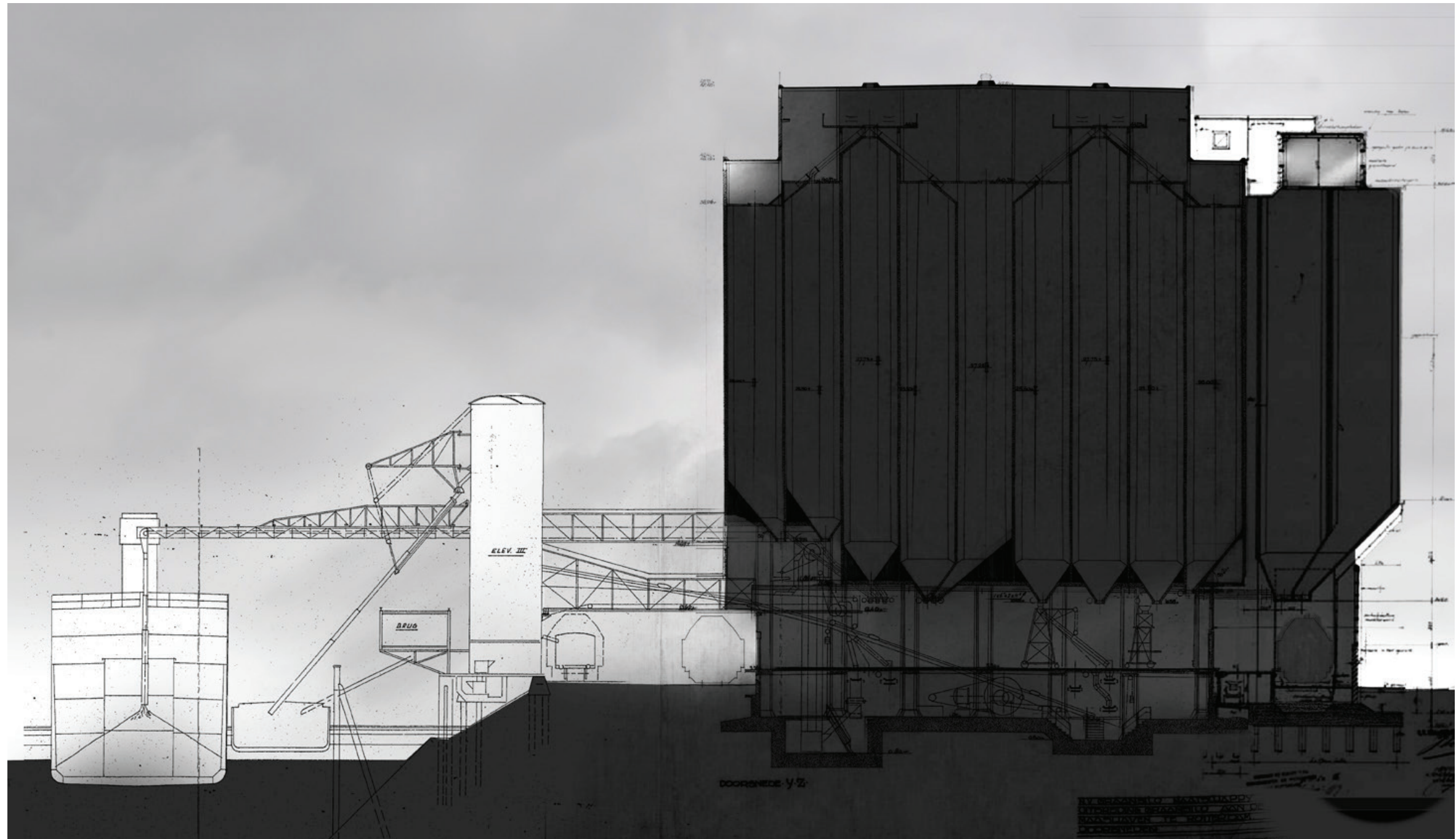
LACK OF HUMAN SCALE



CONCRETE MOLOTHIC FACADES

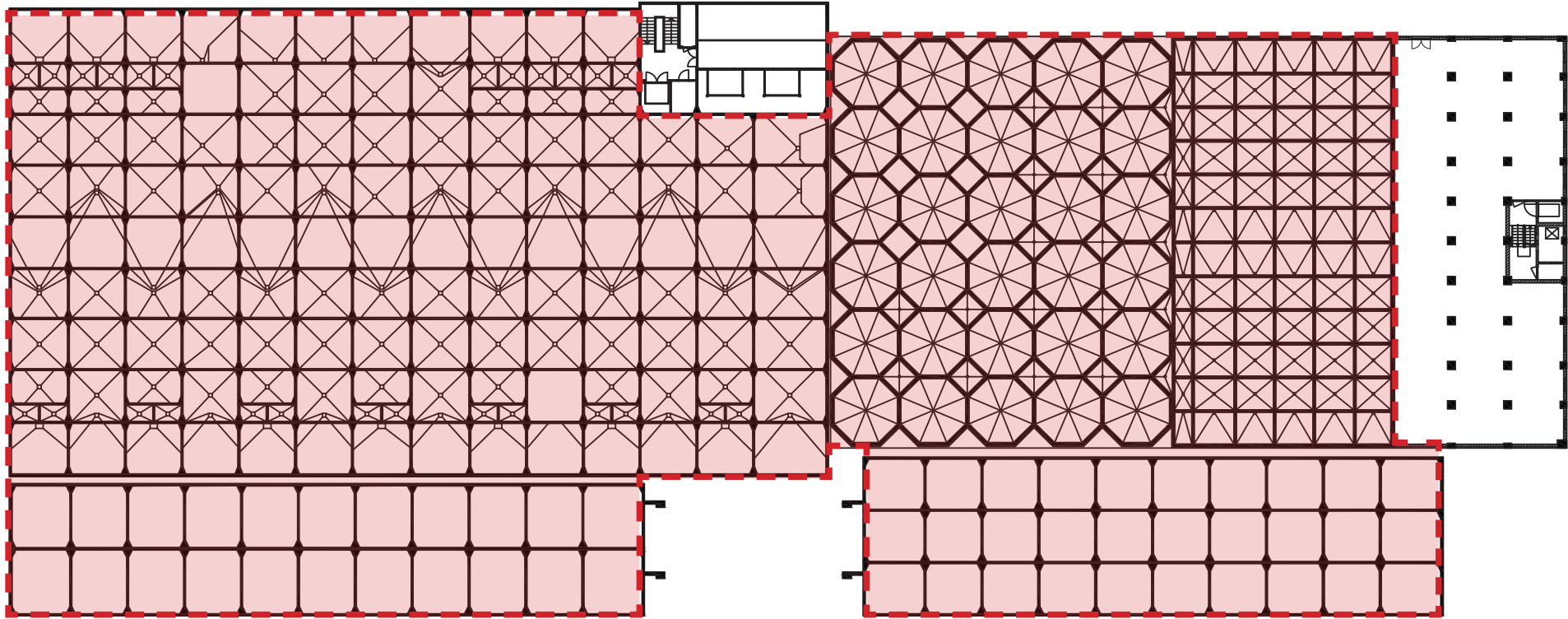


CURRENT DAYLIGHT ENTRY



daylight current situation

SILO VOLUMES 71 %



URBAN CONTEXT

STATEMENT OPPORTUNITY

NORTH / SOUTH

conflict

The two-faced character of the Maassilo and its historical relation with the public space and infrastructure have historical significance. On the other hand, they form a barrier that makes it difficult to connect the southern districts to the harbour area north of the building.

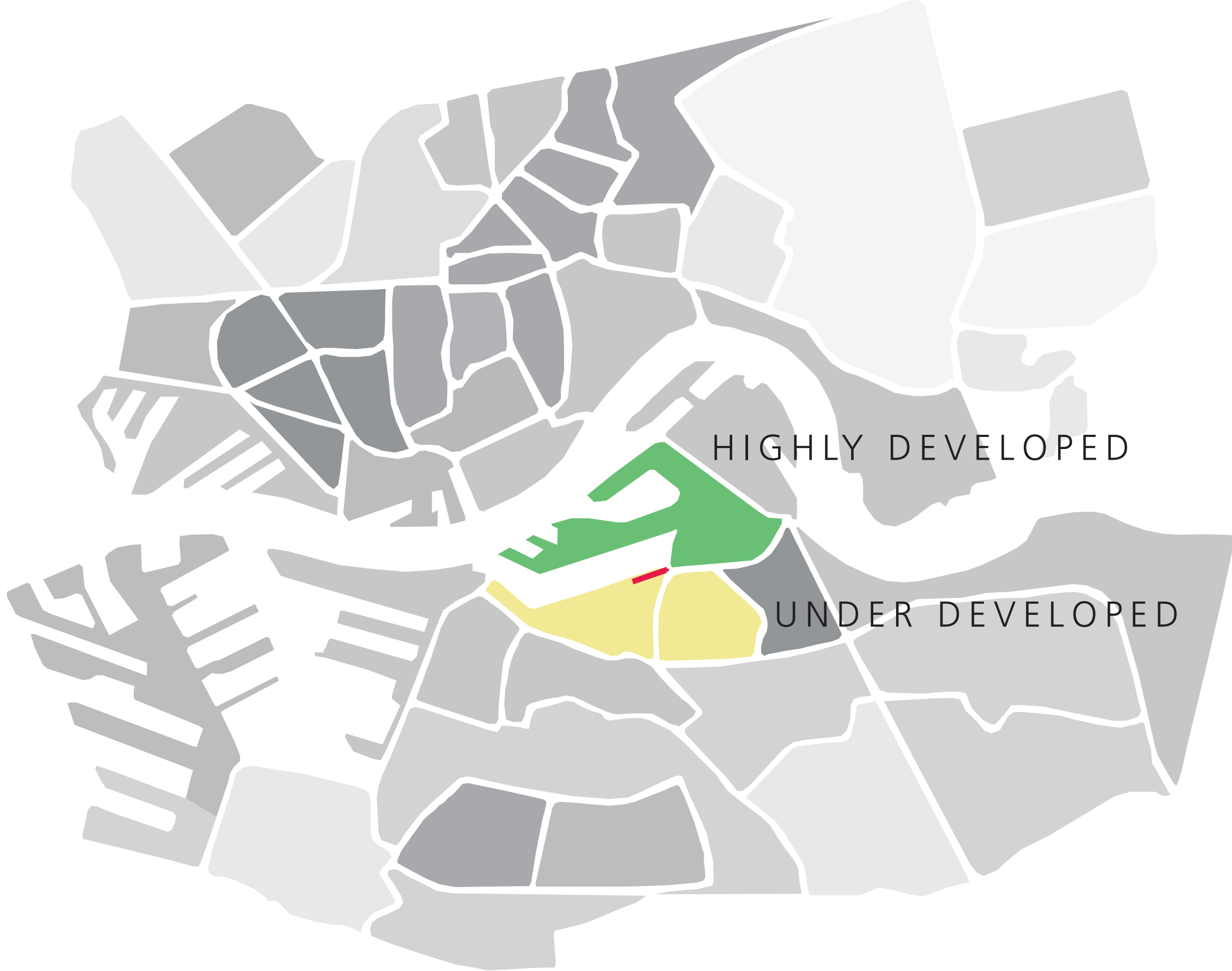
opportunity

The Maassilo could be treated as a gate, mediating between two different stages of development and help gentrify the districts with a low social standing.

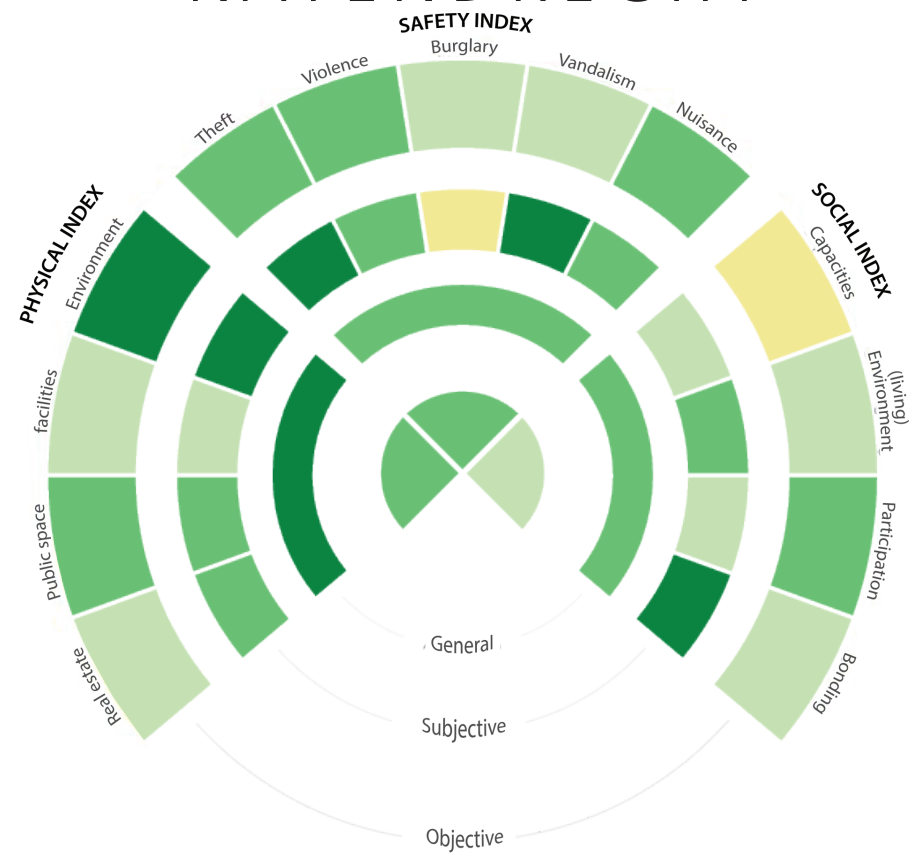
OBLIGATION

The areas north and south of the Maassilo have completely different characteristics and show opposite states of socio-economic development. If the aim is to develop the workers' districts to the harbour area, the right balance must be sought between connecting the two neighborhoods and respecting their historical separation. The Maassilo, historically connected to both the districts and the border itself, plays a key role in this respect.

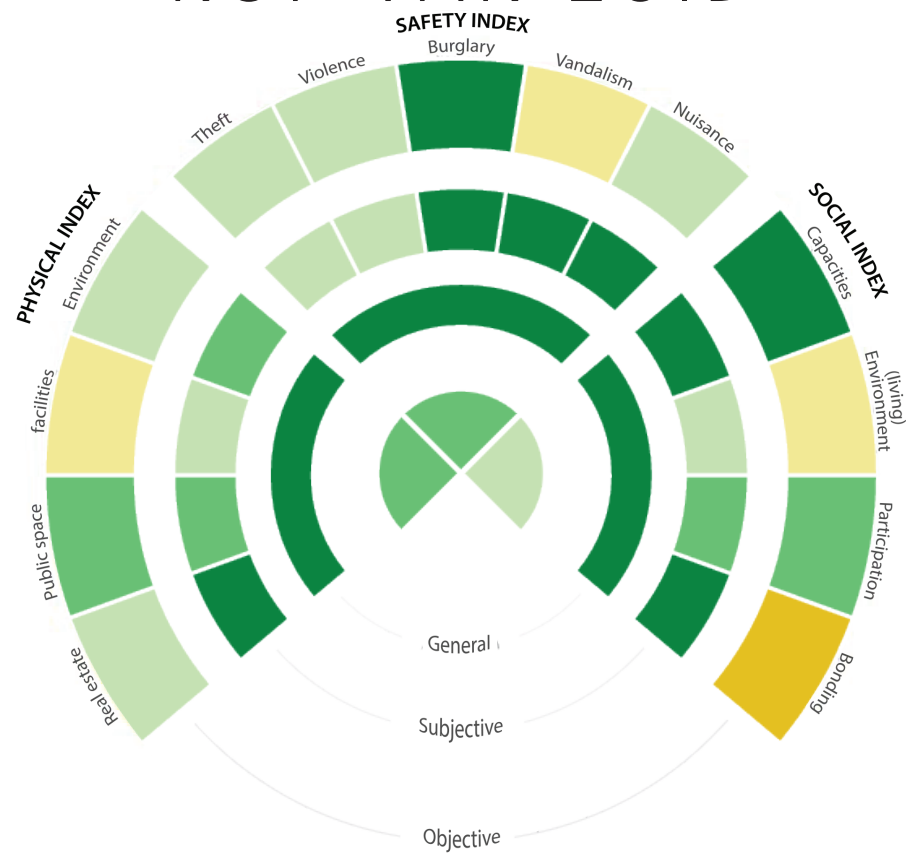
NORTH/SOUTH DISTRICTS



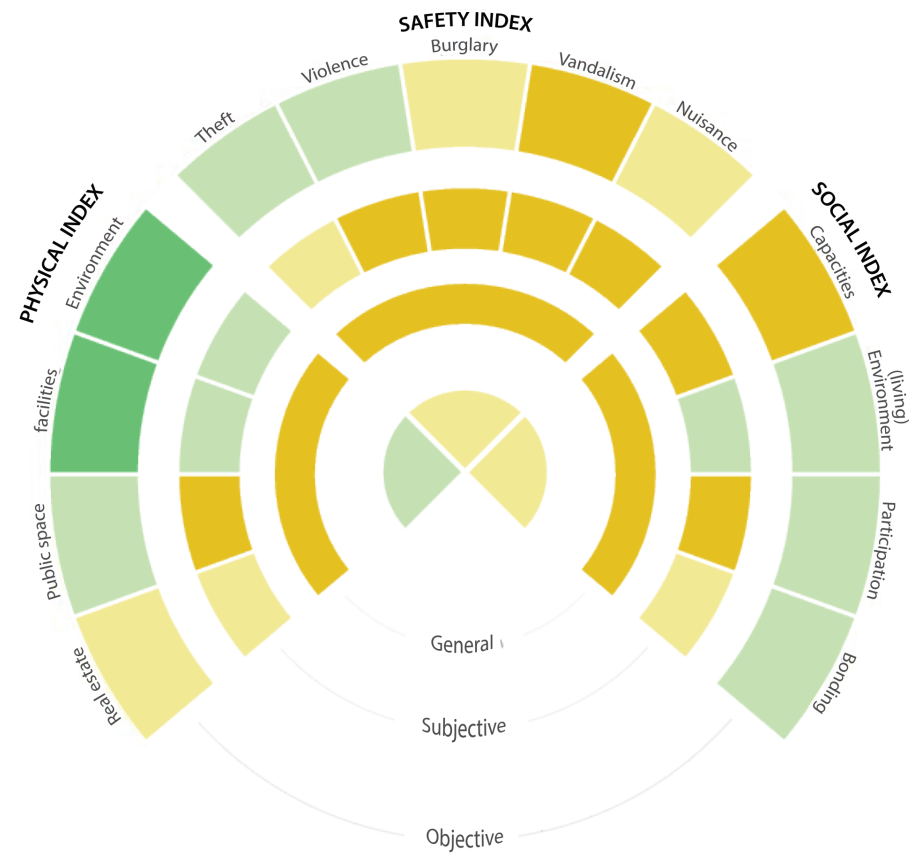
INDEX COMPARISON KATENDRECHT



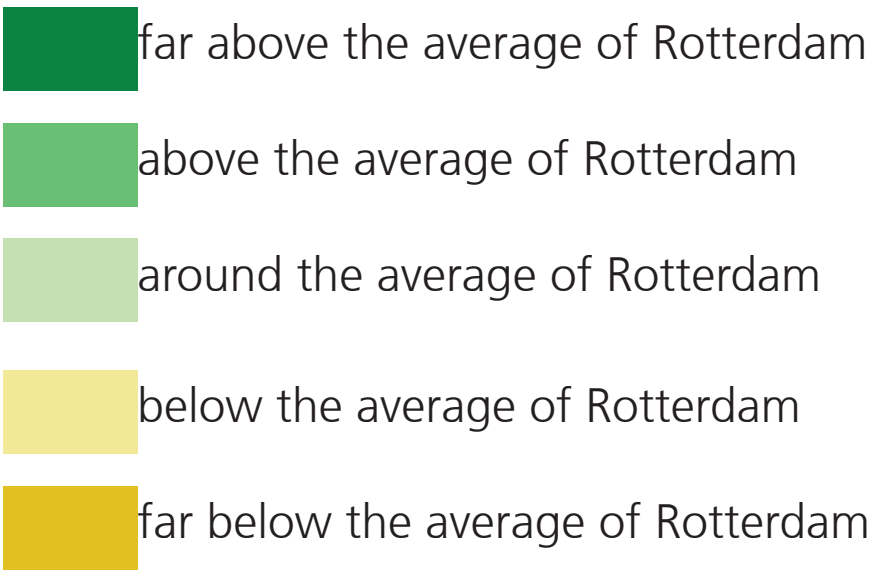
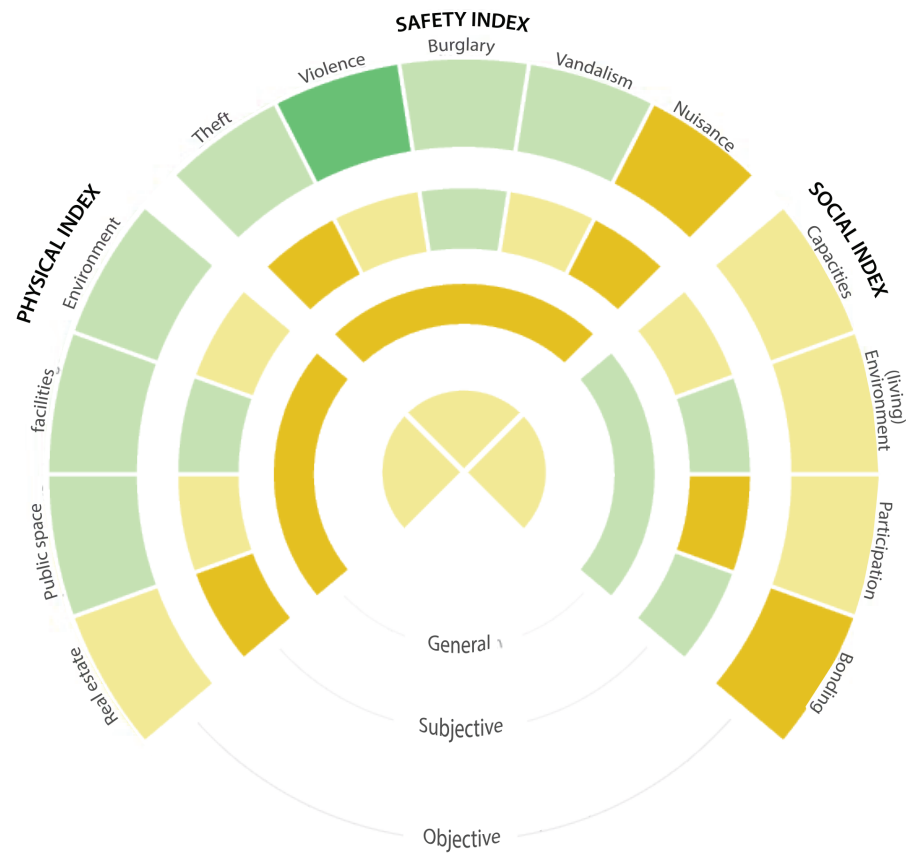
KOP VAN ZUID



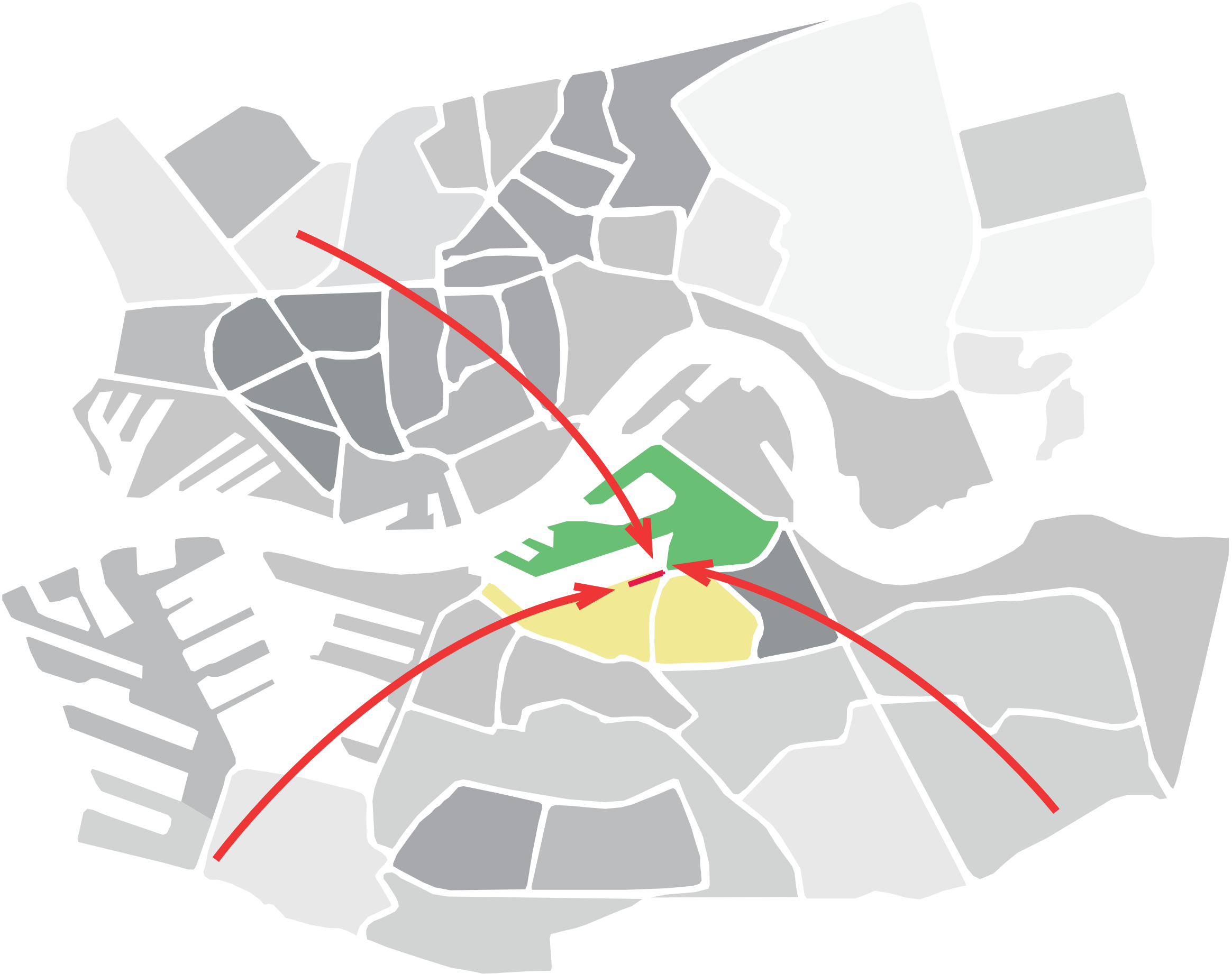
BLOEMHOF

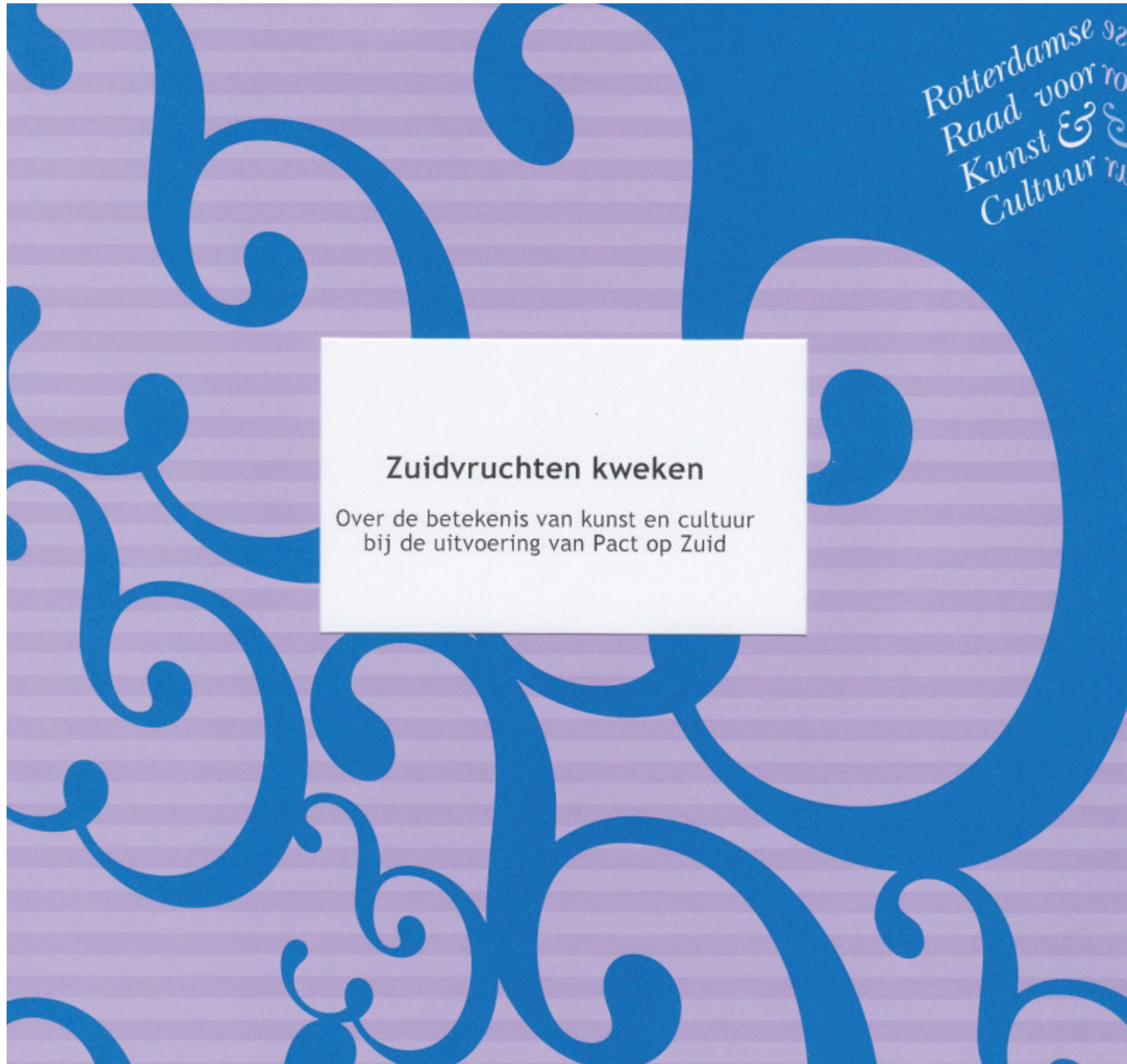


TARWEWIJK



ICON





Research Questions

How to redesign the Maassilo into a museum?

How to cope with the lack of daylight without decreasing the cultural value of the facades?

How to deal with the silo structure and potentially enhance its architectural value?

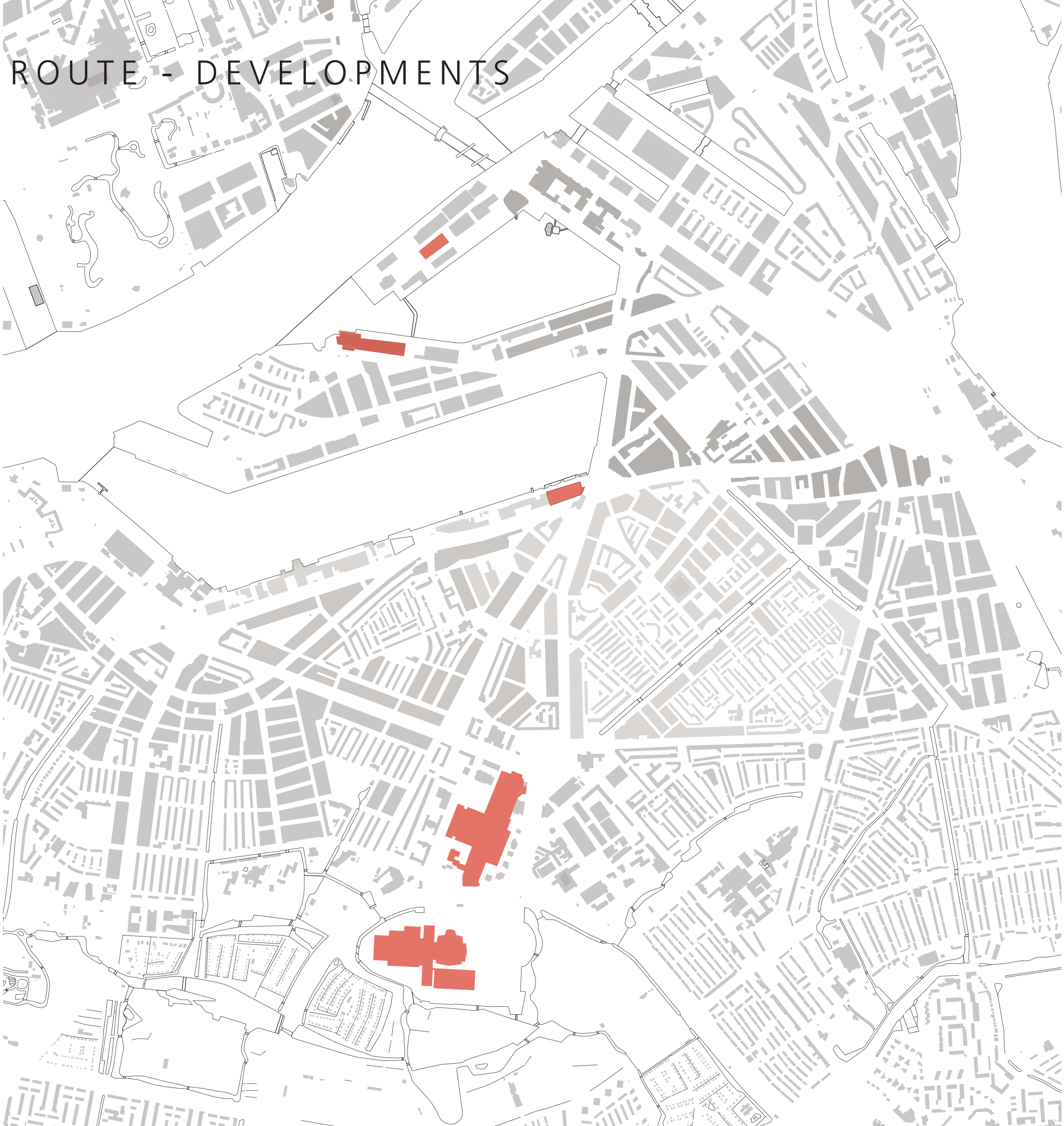
How to use Art&Culture as an instigator for urban social growth?

CONNECTING NORTH AND SOUTH

CULTURAL ROUTE - MAASSILO



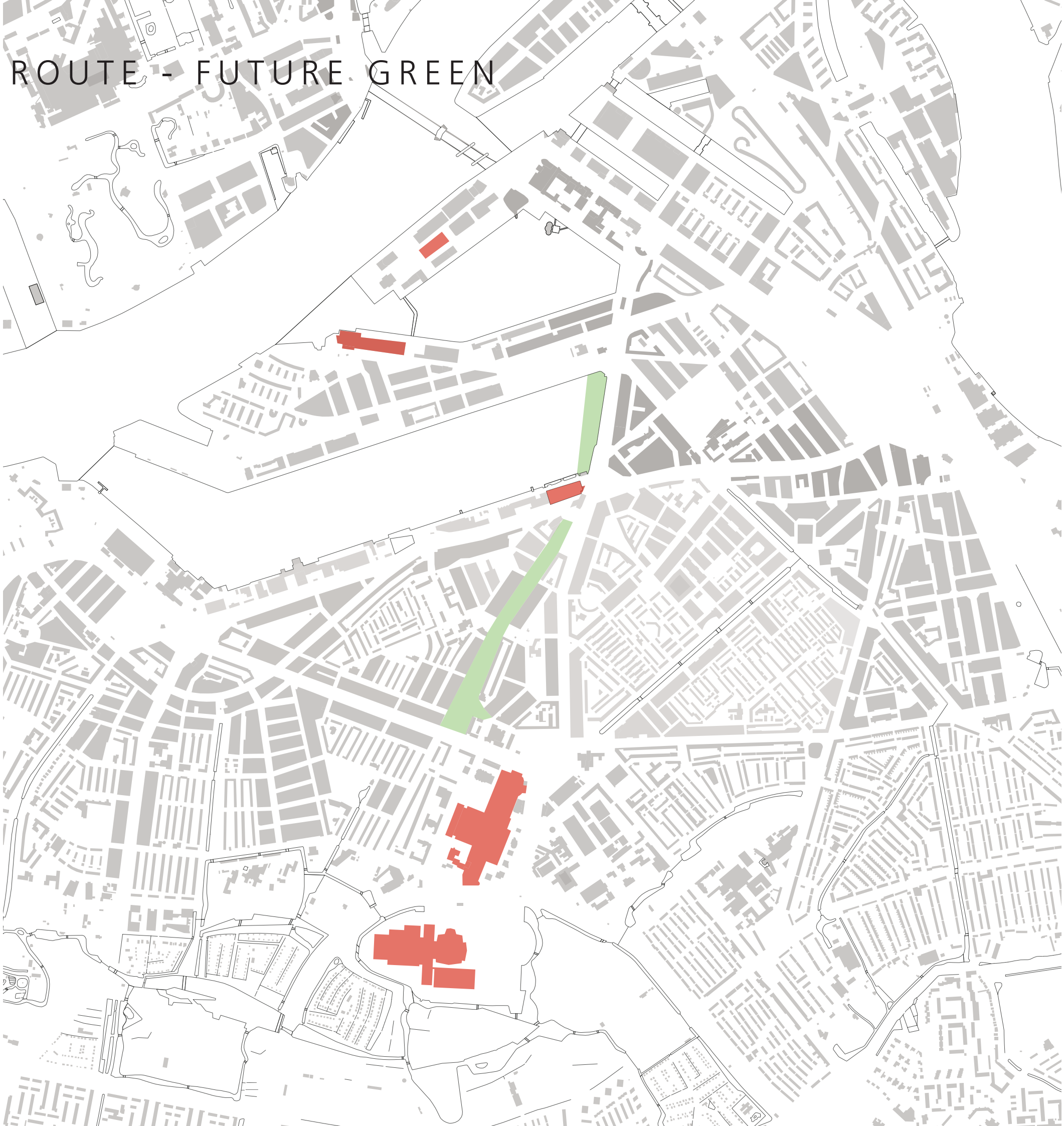
CULTURAL ROUTE - DEVELOPMENTS



CULTURAL ROUTE - ZUIDPLEIN



CULTURAL ROUTE - FUTURE GREEN



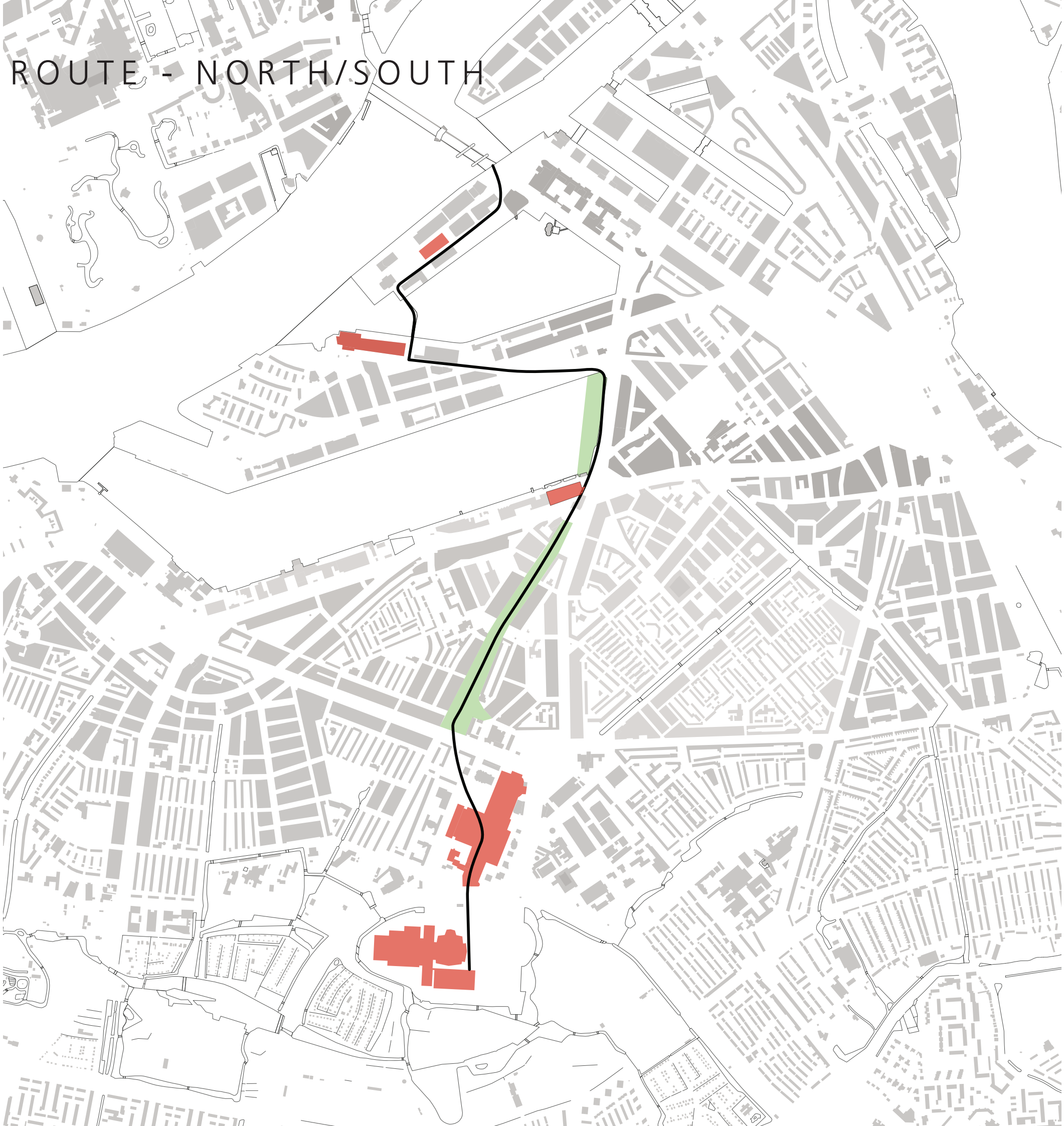
CULTURAL ROUTE - TIDALPARK



CULTURAL ROUTE - METROLINE



CULTURAL ROUTE - NORTH/SOUTH



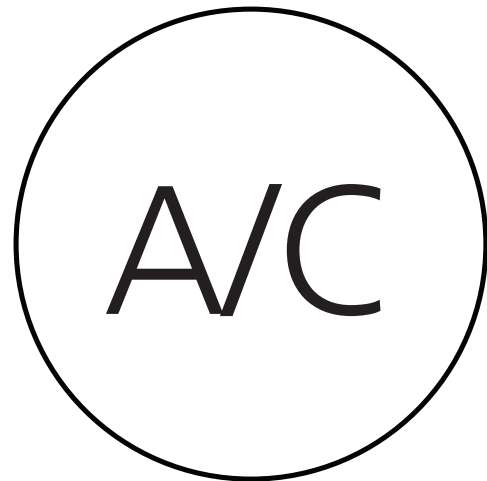
PROGRAM

museum

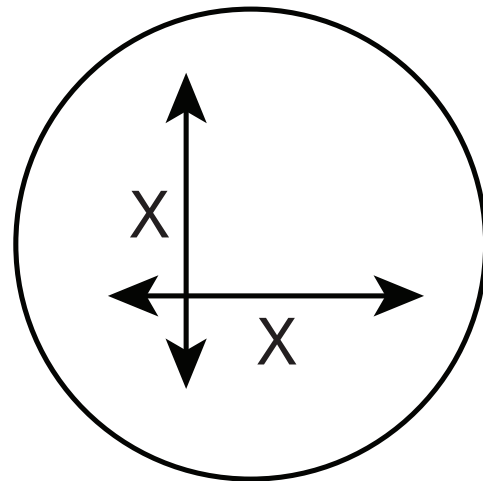
needs



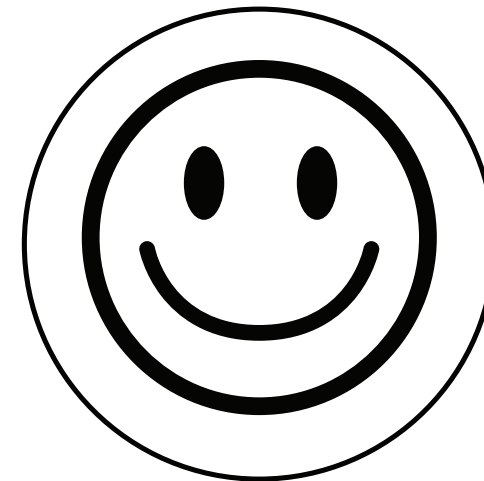
lighting



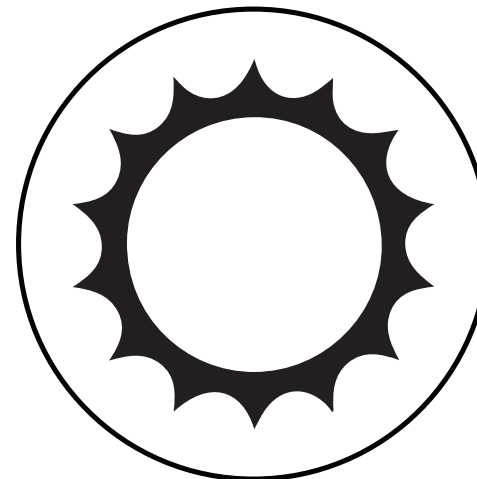
climate
control



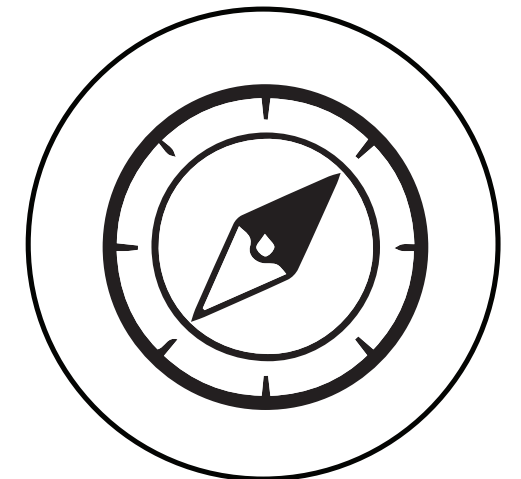
sizes
exhibition
space



user experience



daylight



routing

REFERENCES

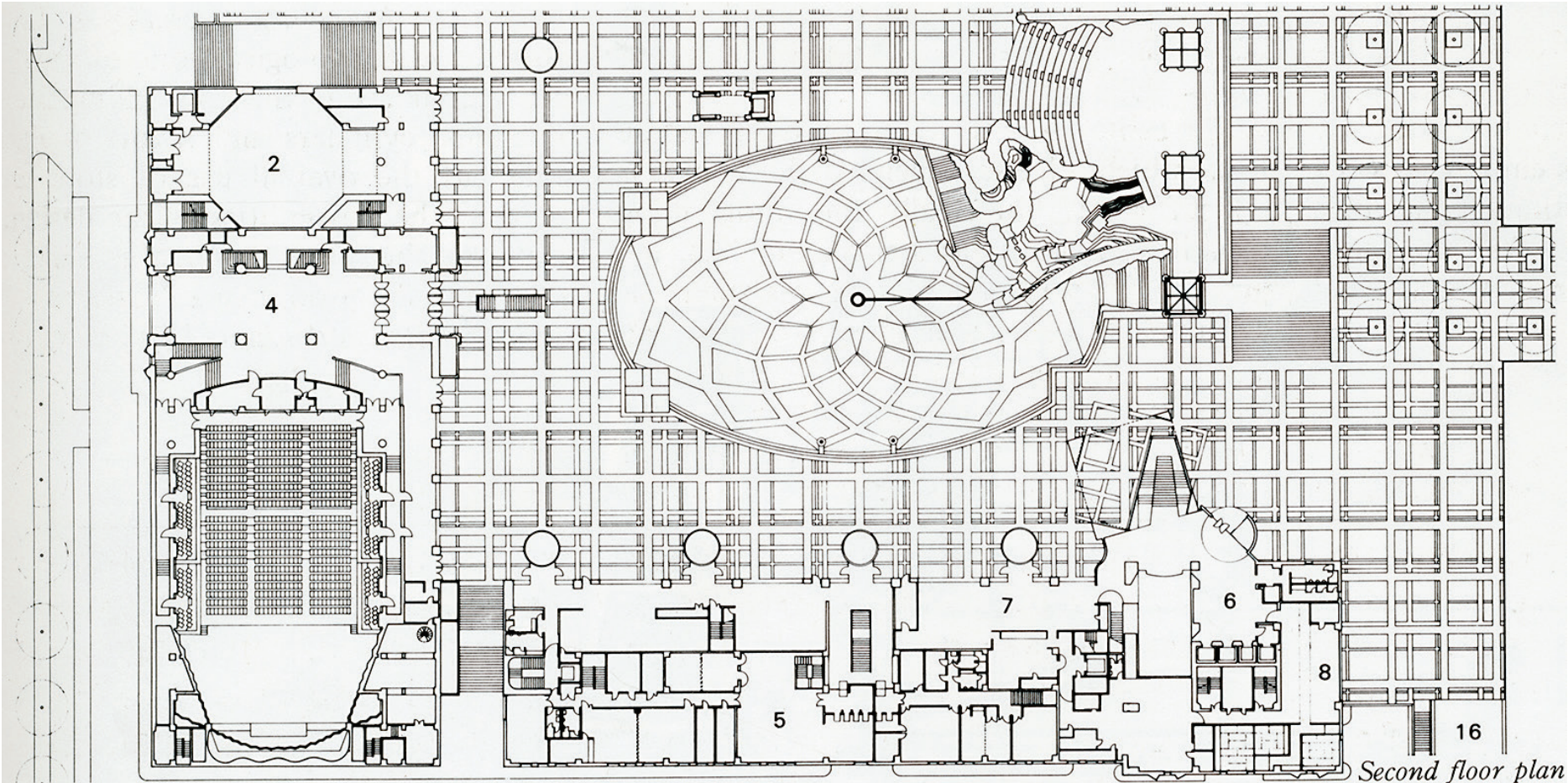
SOLOMON R. GUGGENHEIM MUSEUM



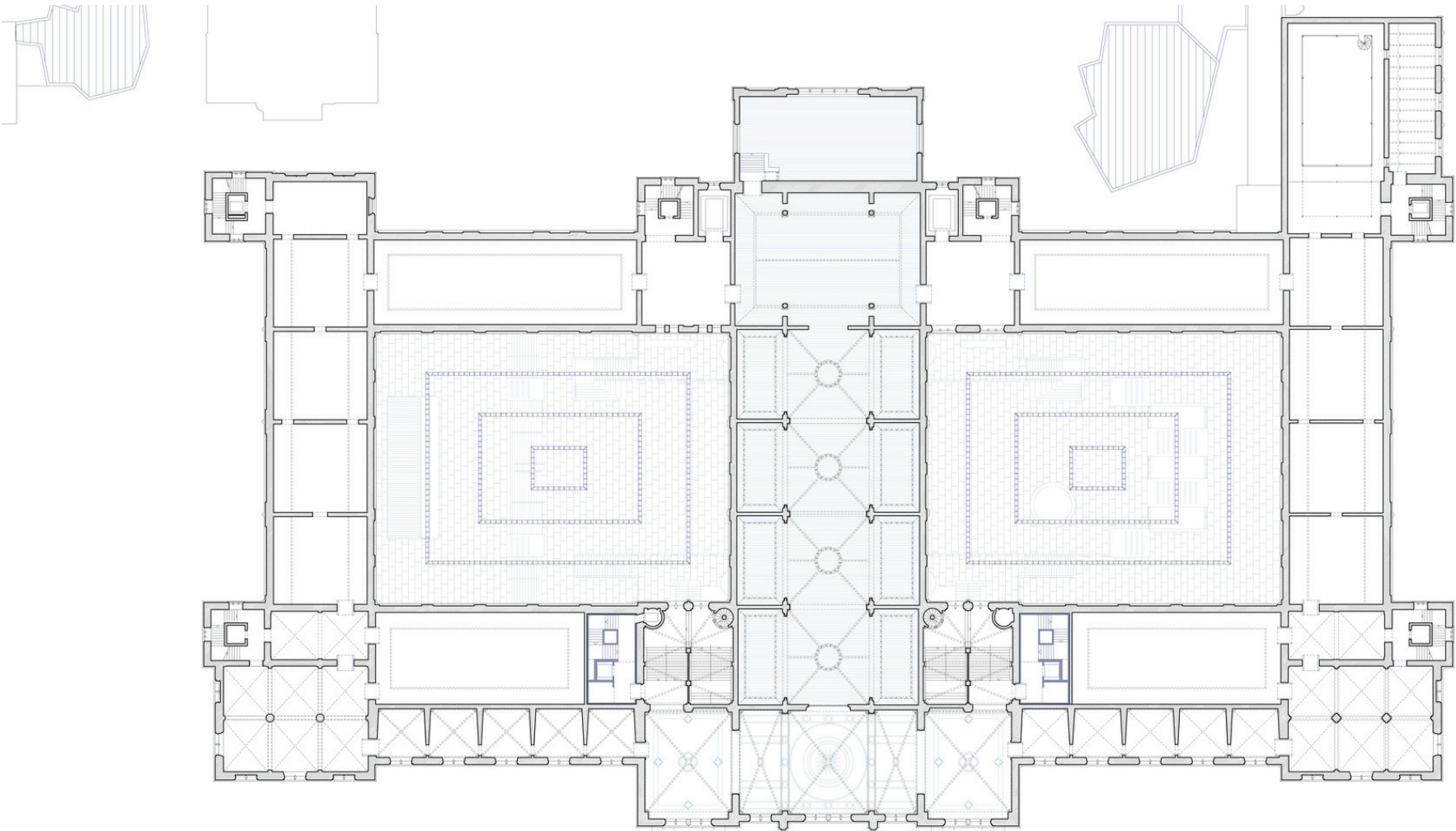
TATE MODERN MUSEUM



REFERENCES



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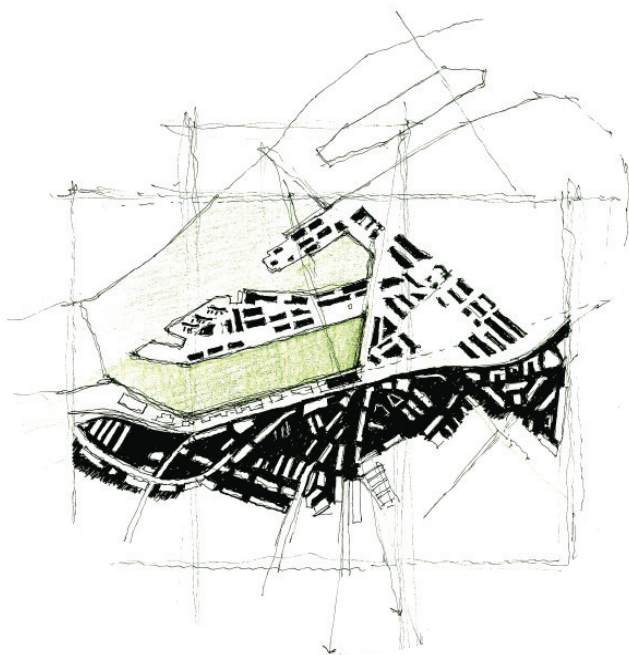


RIJKSMUSEUM AMSTERDAM, CRUZ Y ORTIZ ARCHITECTS

VALUES

MAIN REDESIGN ASPECTS TO CONSIDER

BOLD STATEMENTS



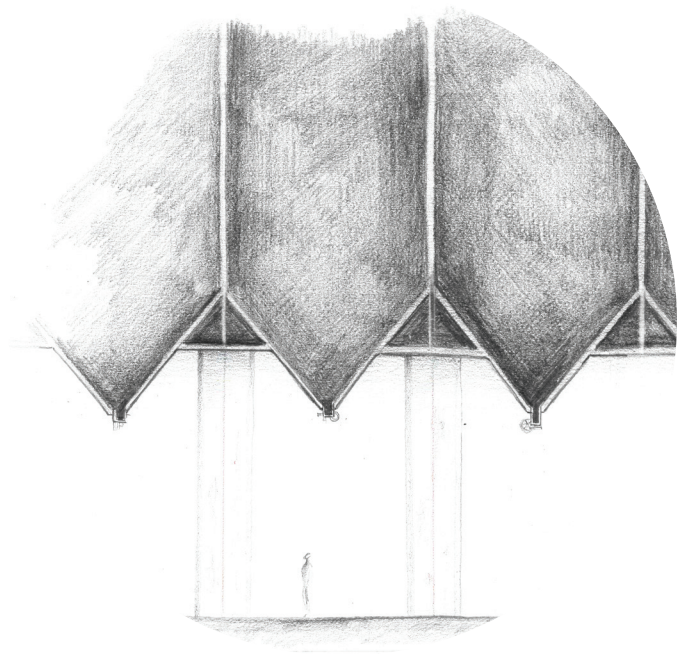
URBAN CONFIGURATION



ENSEMBLE VISIBLE

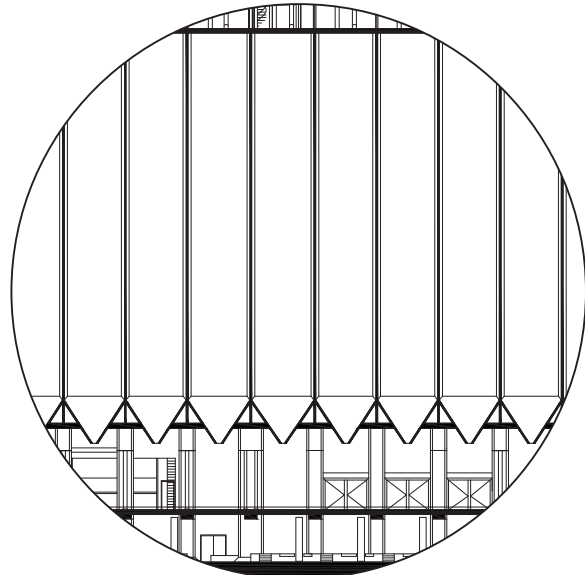


PUBLIC/PRIVATE

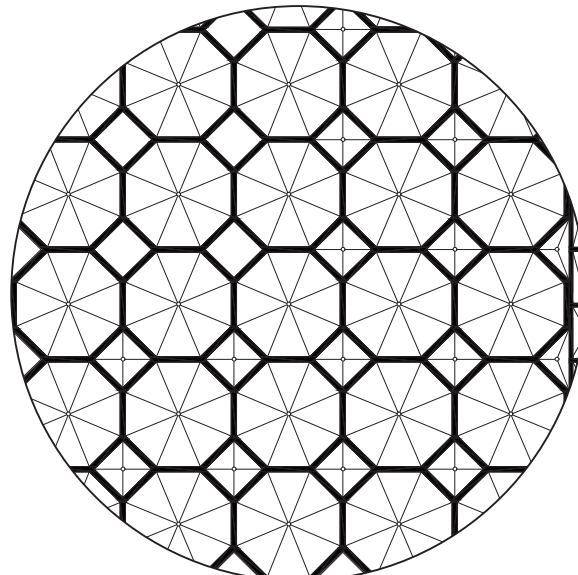


READABILITY/
CONCEALMENT

ESSENTIAL ARCHITECTURAL ASPECTS



VERTICAL SILO
STRUCTURE



SILO GRID



WEATHERED CONCRETE
FACADES



INTROVERT
CHARACTER



NO HUMAN
SCALE



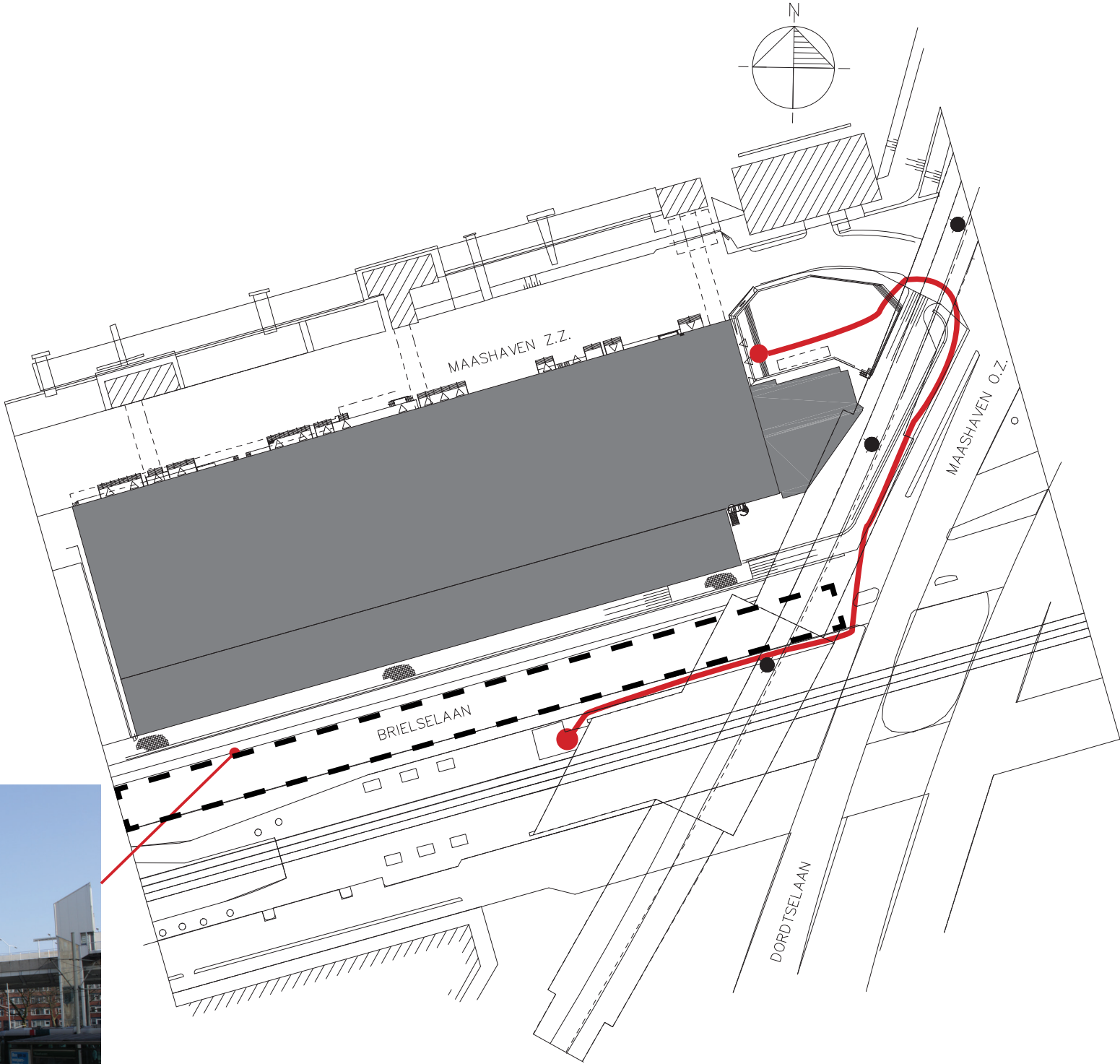
ORIGINAL FUNCTION

MASTERPLAN

CURRENT MAIN ENTRANCE

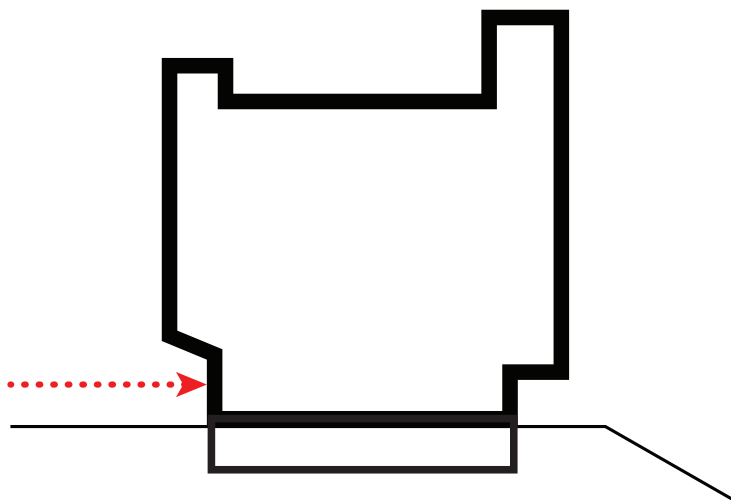


CURRENT SITUATION



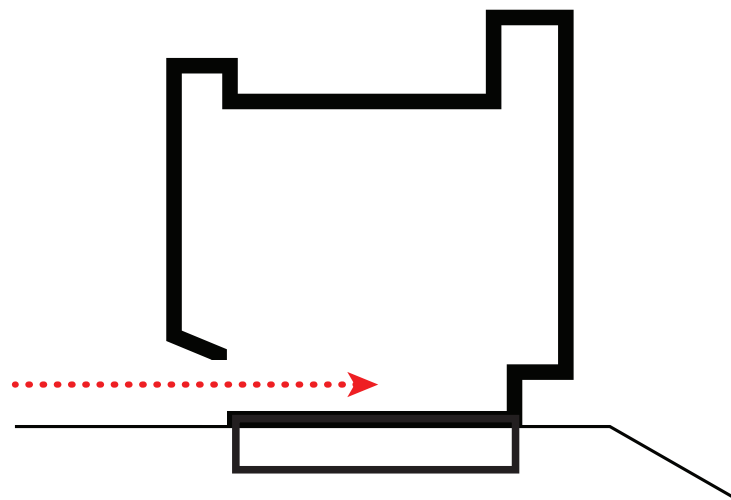
ENTRANCE CONCEPT

CURRENT



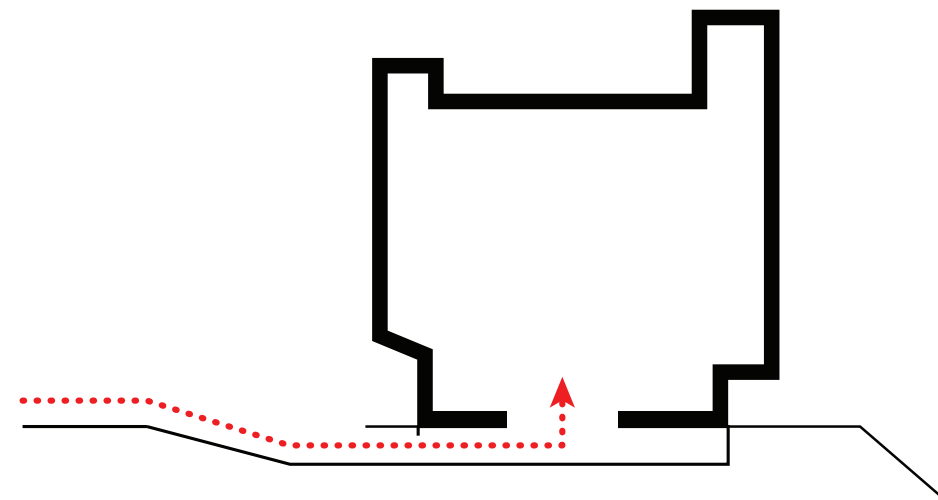
PRIVATE
CHARACTER

INTERVENTION
STREET LEVEL



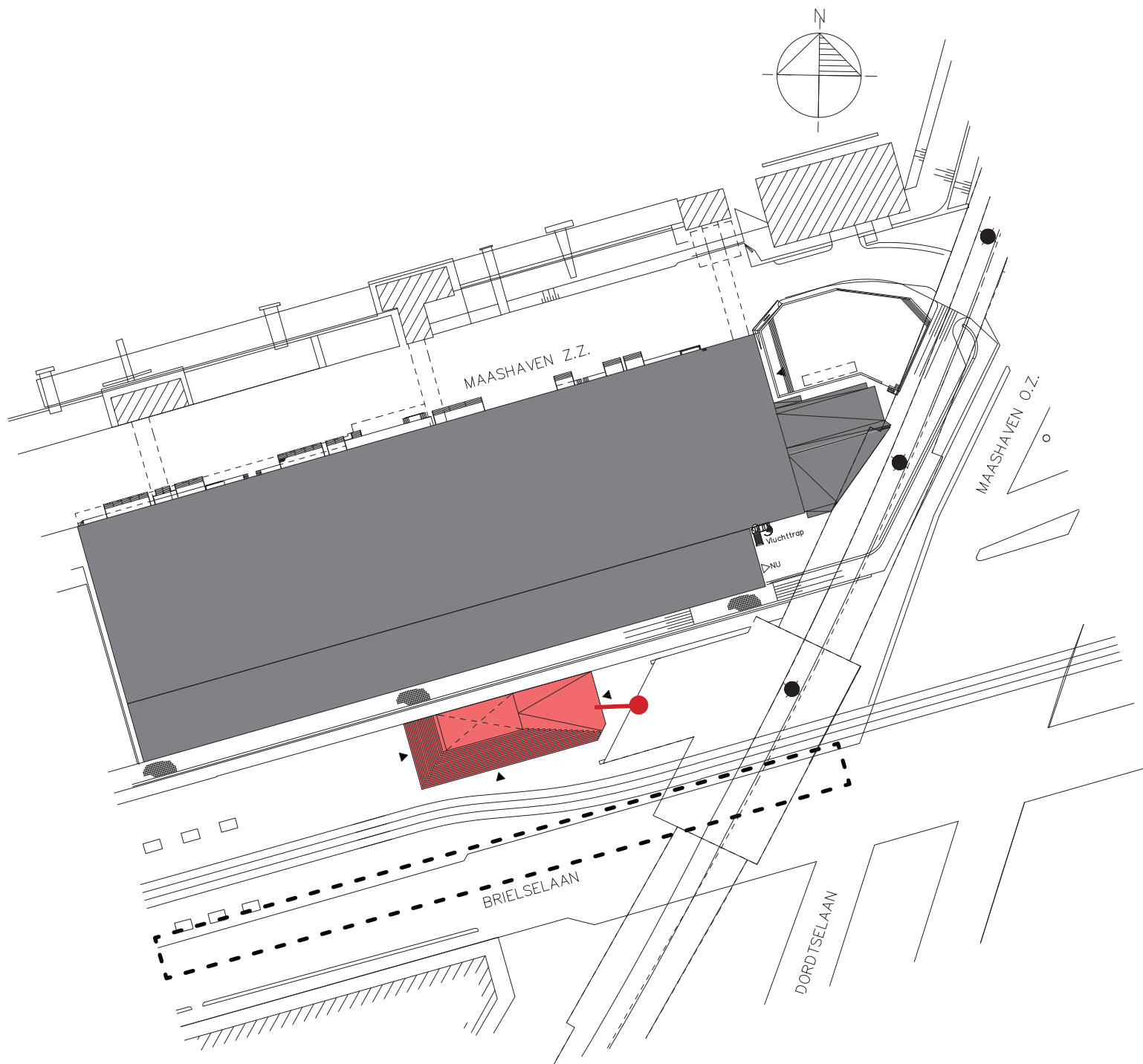
PUBLIC
CHARACTER

INTERVENTION
BASEMENT LEVEL



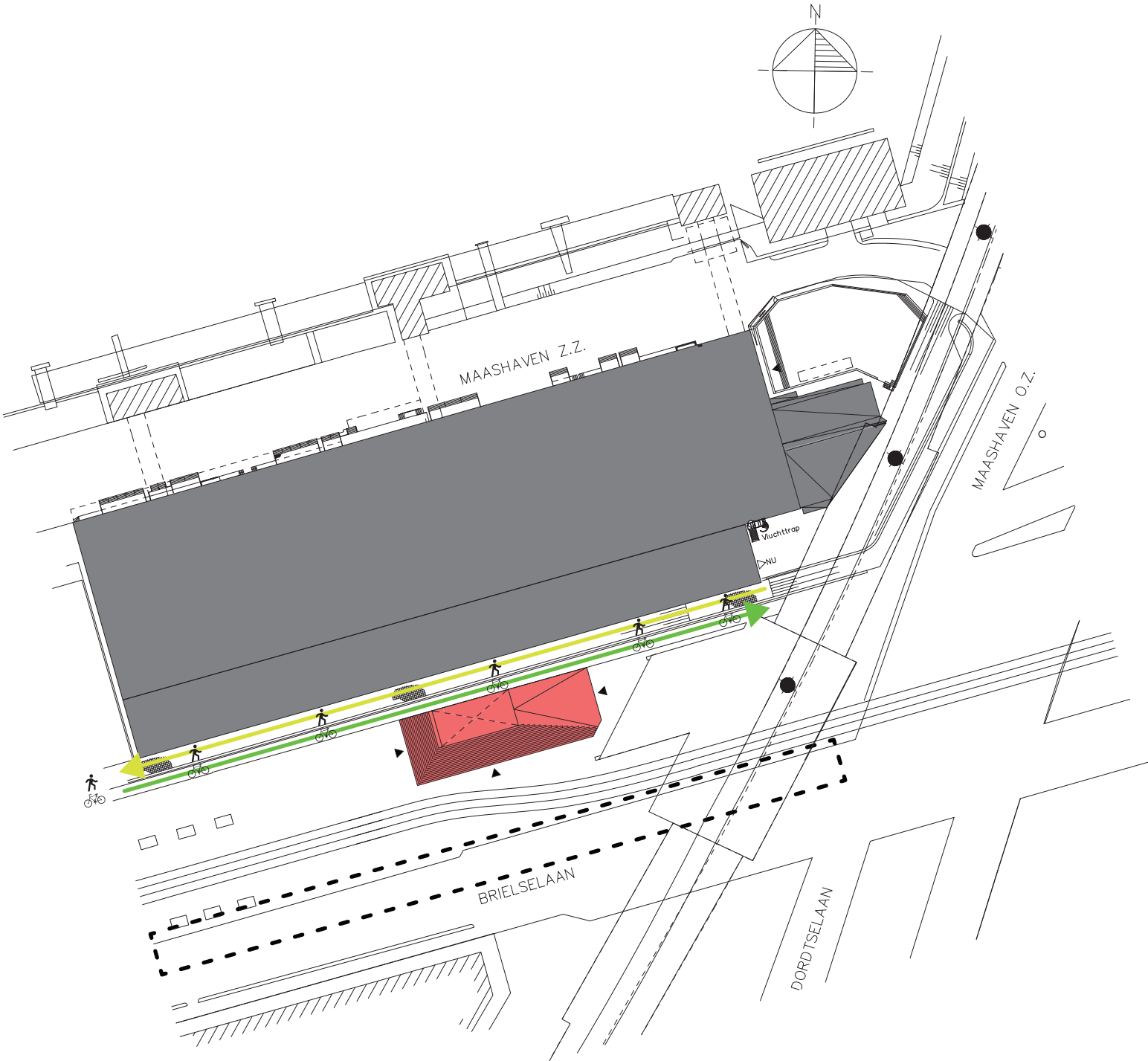
PRIVATE
CHARACTER

ENTRANCE SOUTH SIDE CONNECTING THE PUBLIC

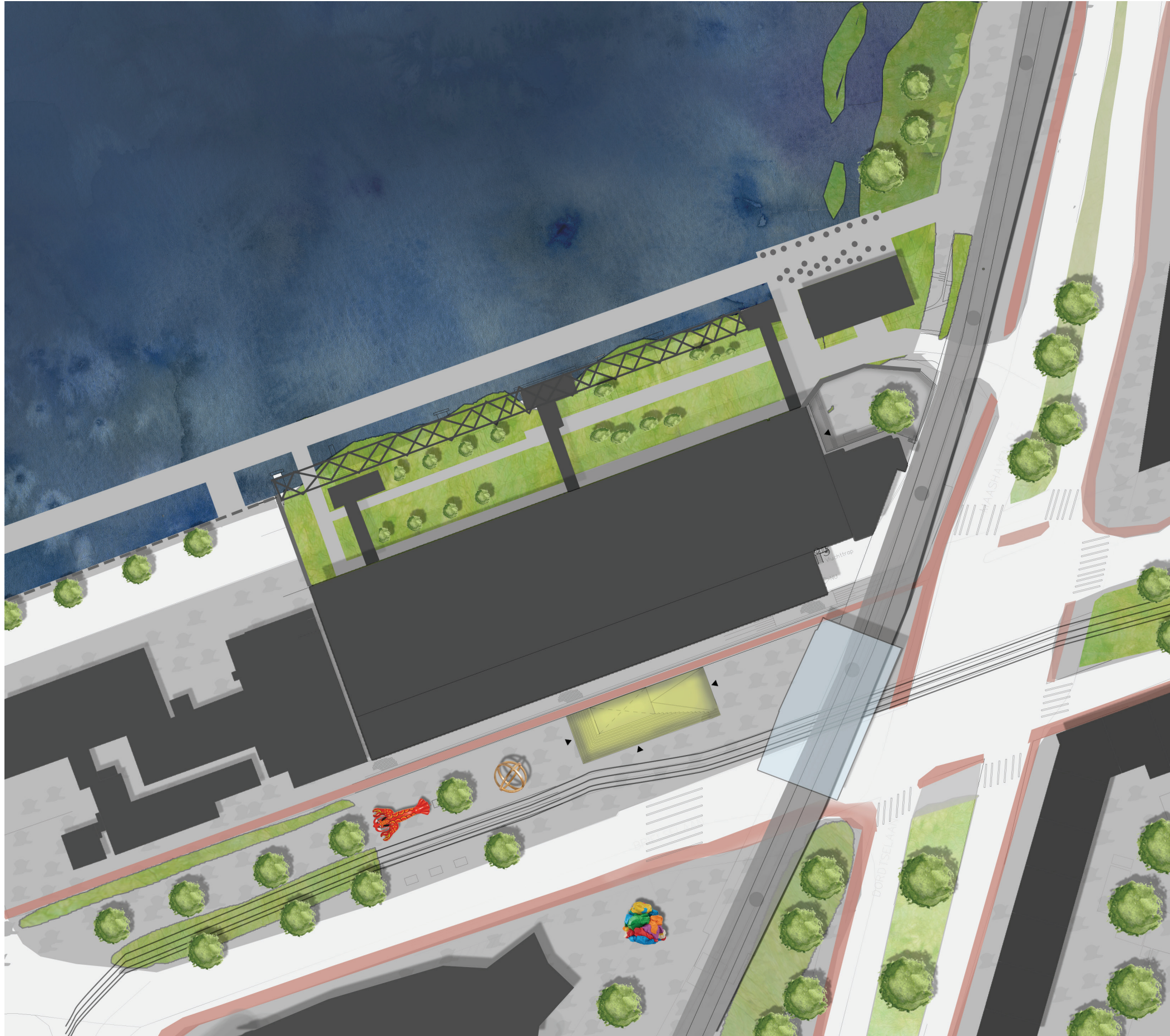


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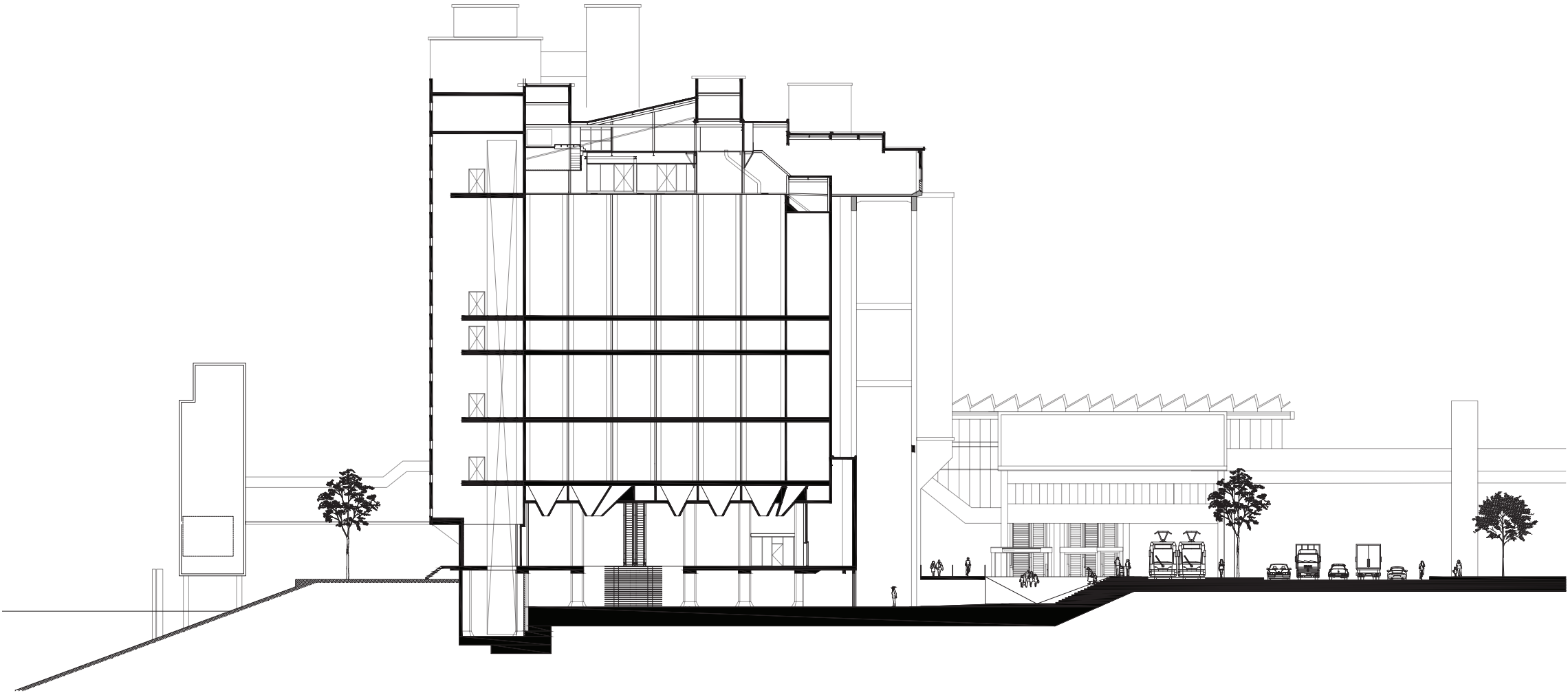
CYCLING/PEDASTRIAN ROUTES REMAIN



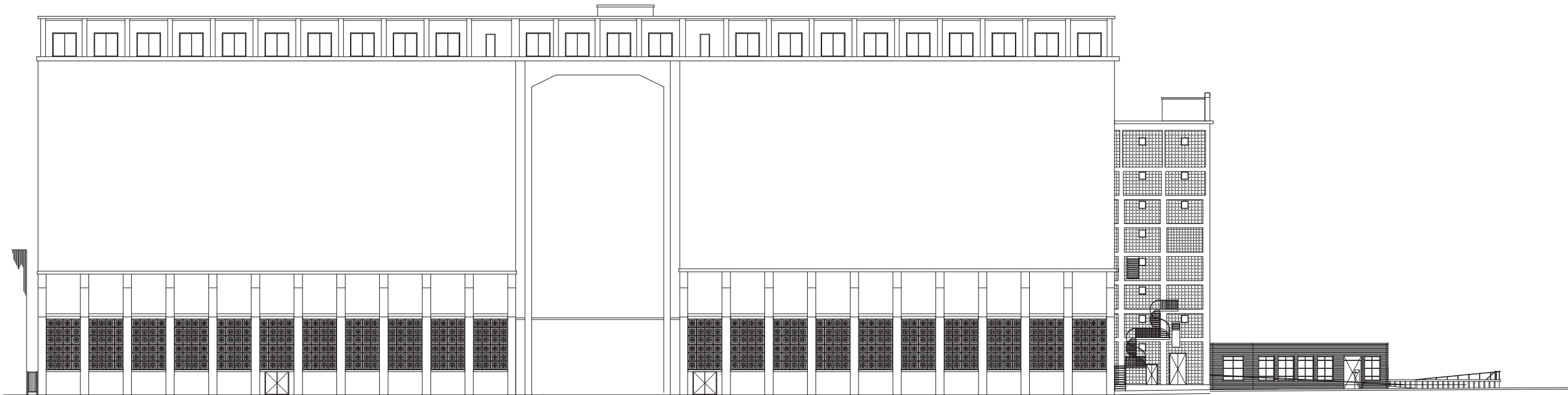
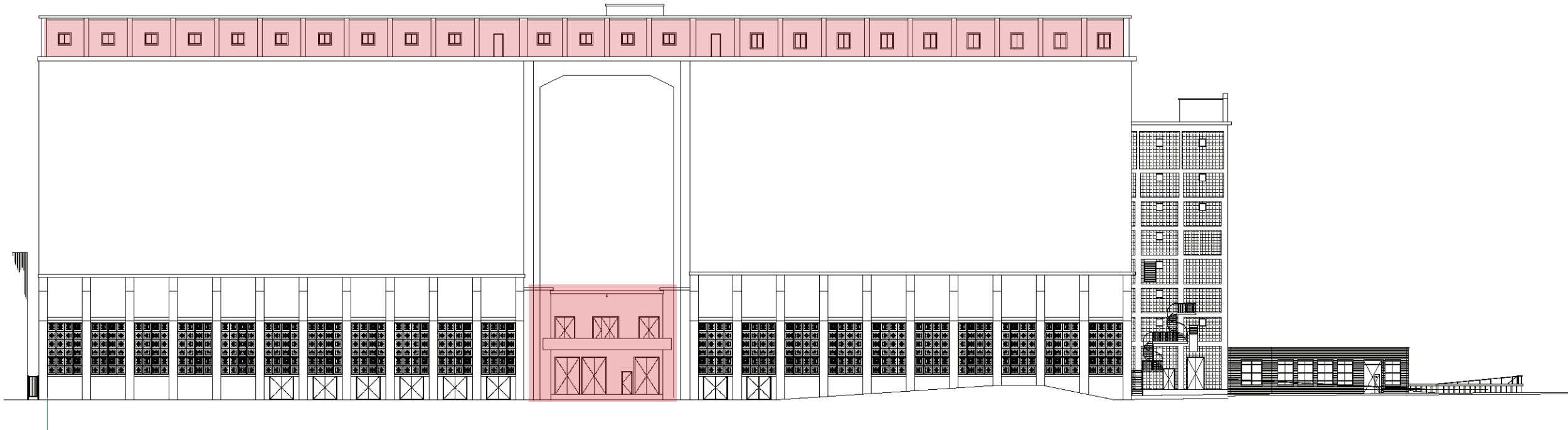
MASTERPLAN 1:1000



SECTION NEW ENTRANCE 1:500



SOUTH FACADE CHANGES



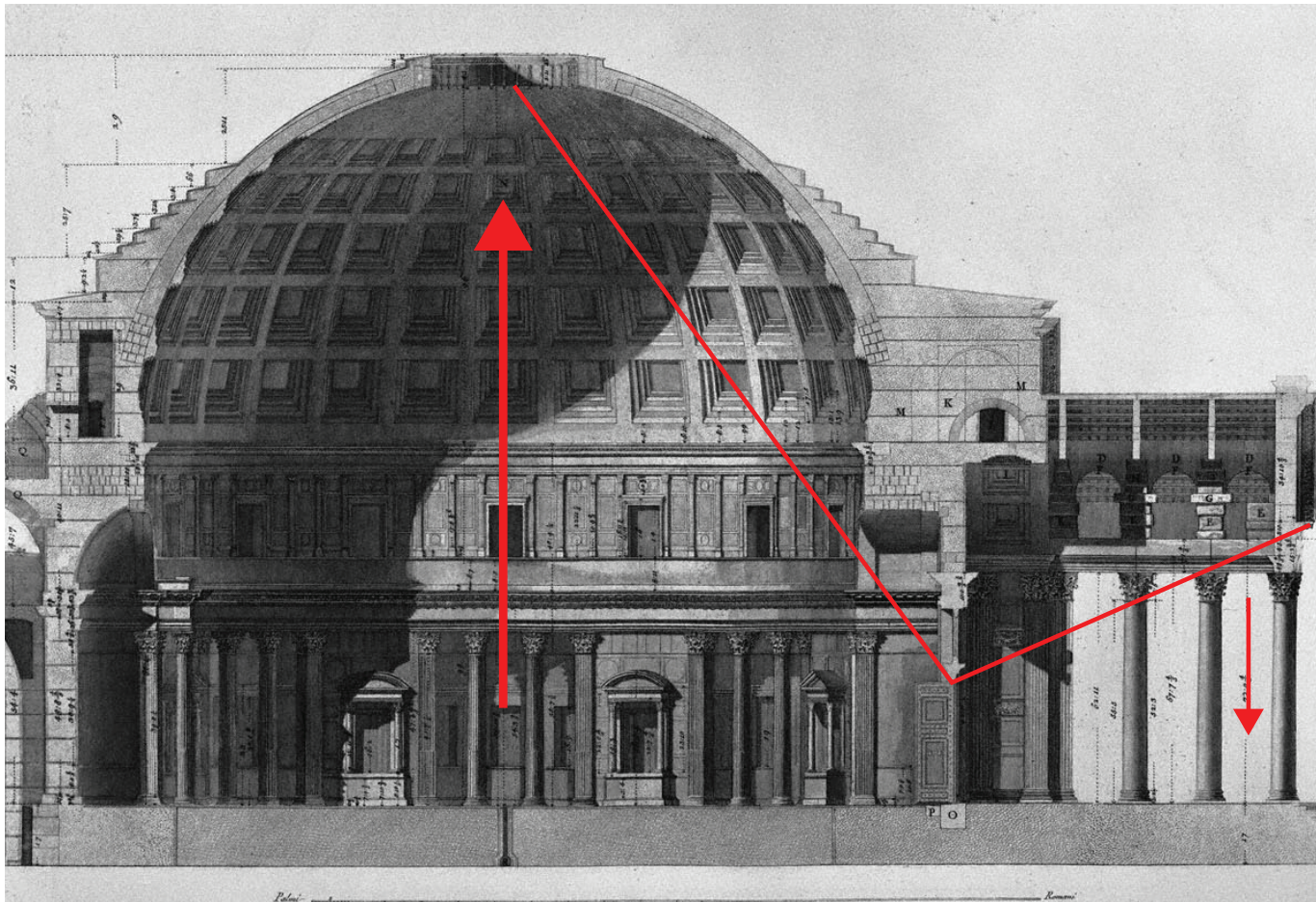
3D IMPRESSION - ENTRANCE/SQUARE



3D IMPRESSION - ENTRANCE BASEMENT



TRANSITIONS TO ENHANCE THE DIFFERENCE

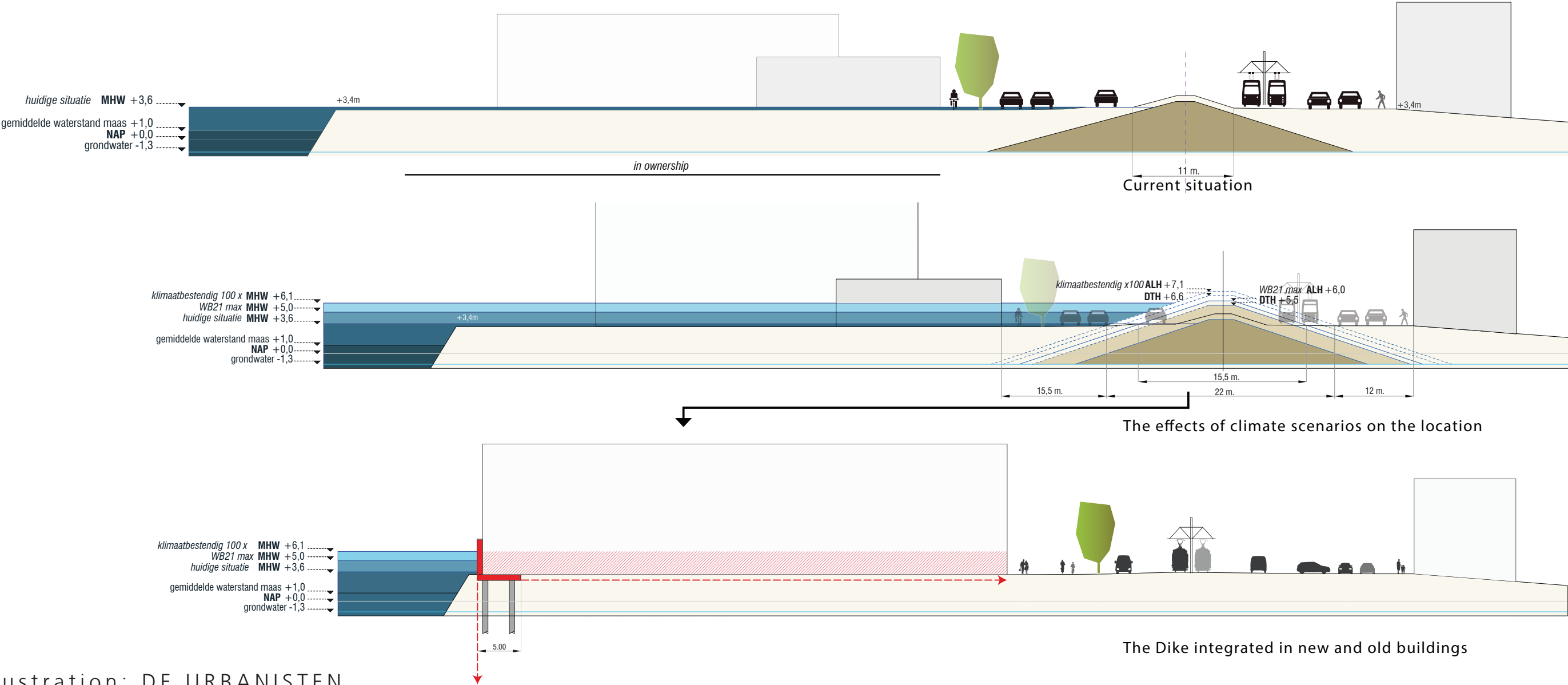


DIKE

CURRENT AND SOLUTION



Locaties profielen



CASE STUDY SECTIONS

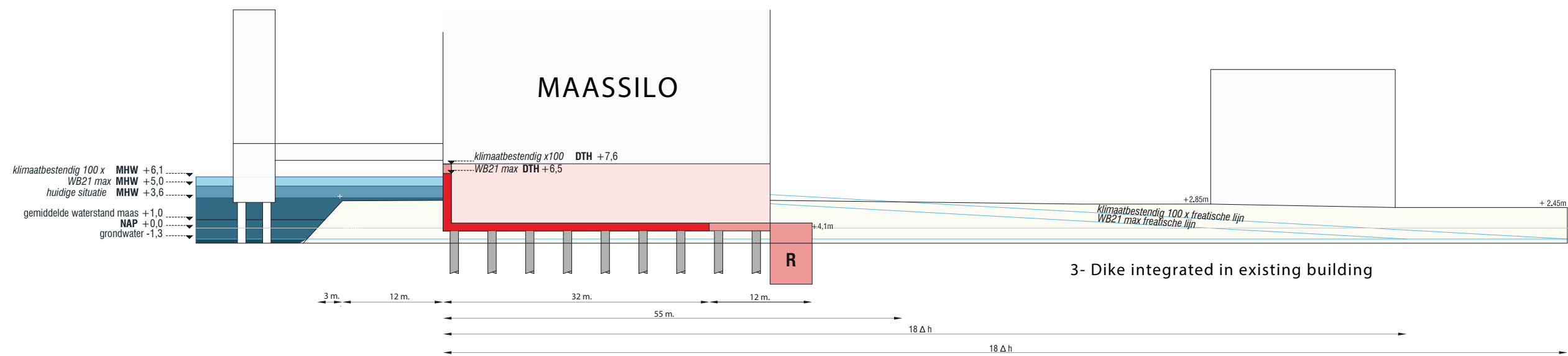
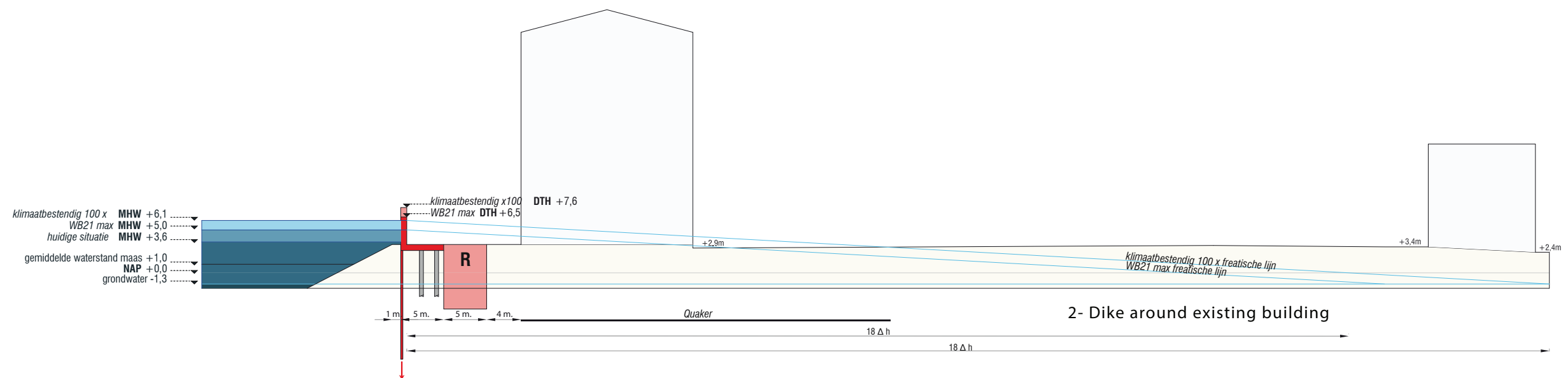
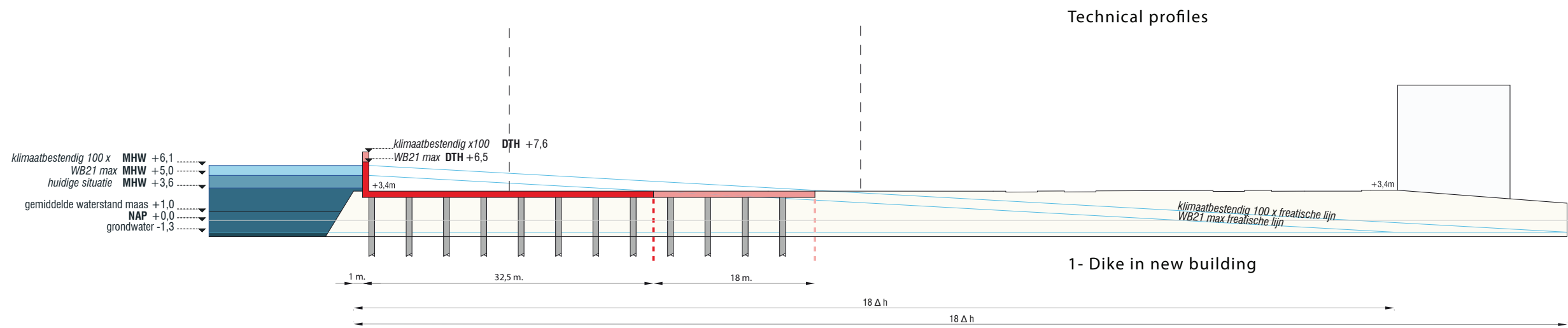
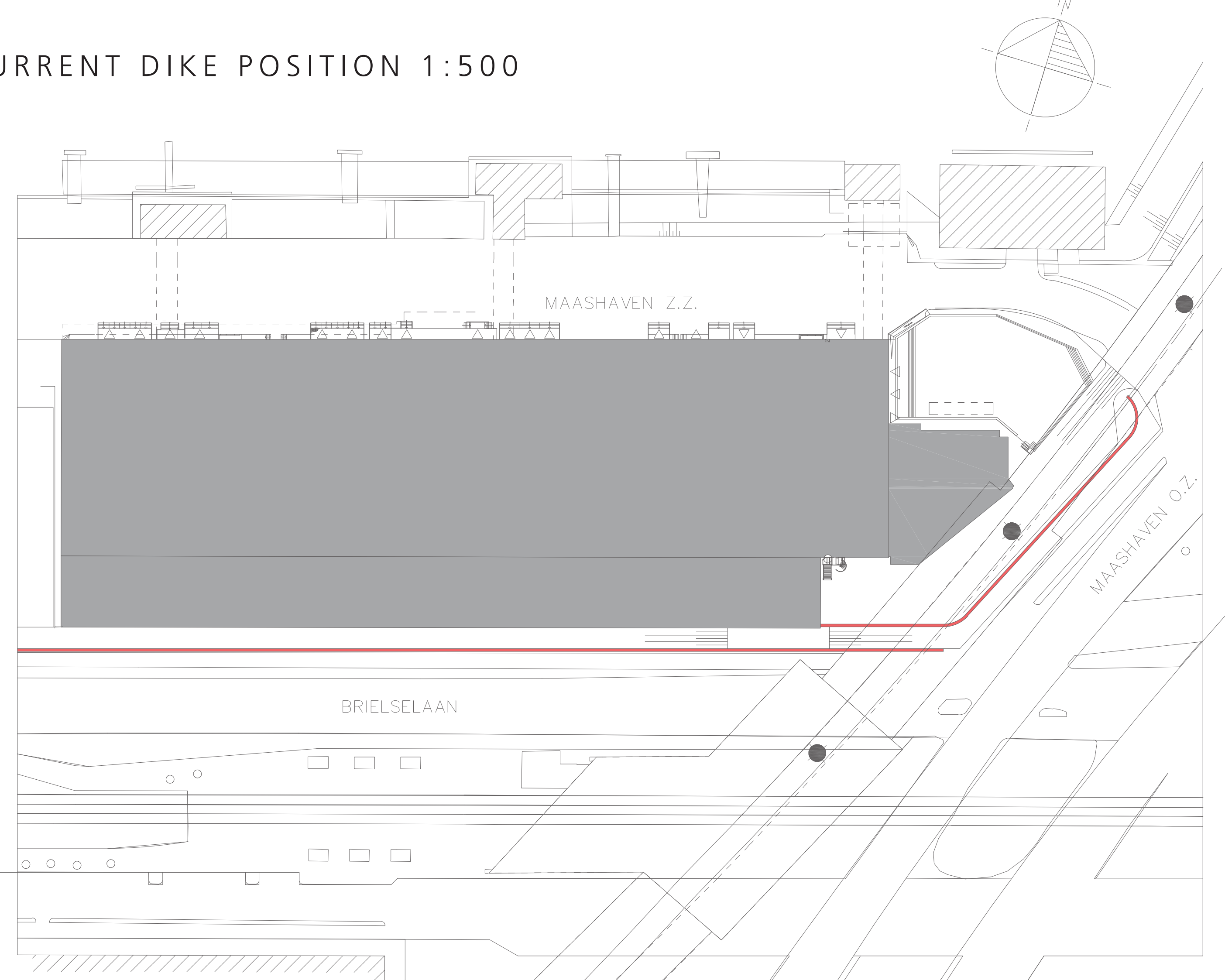
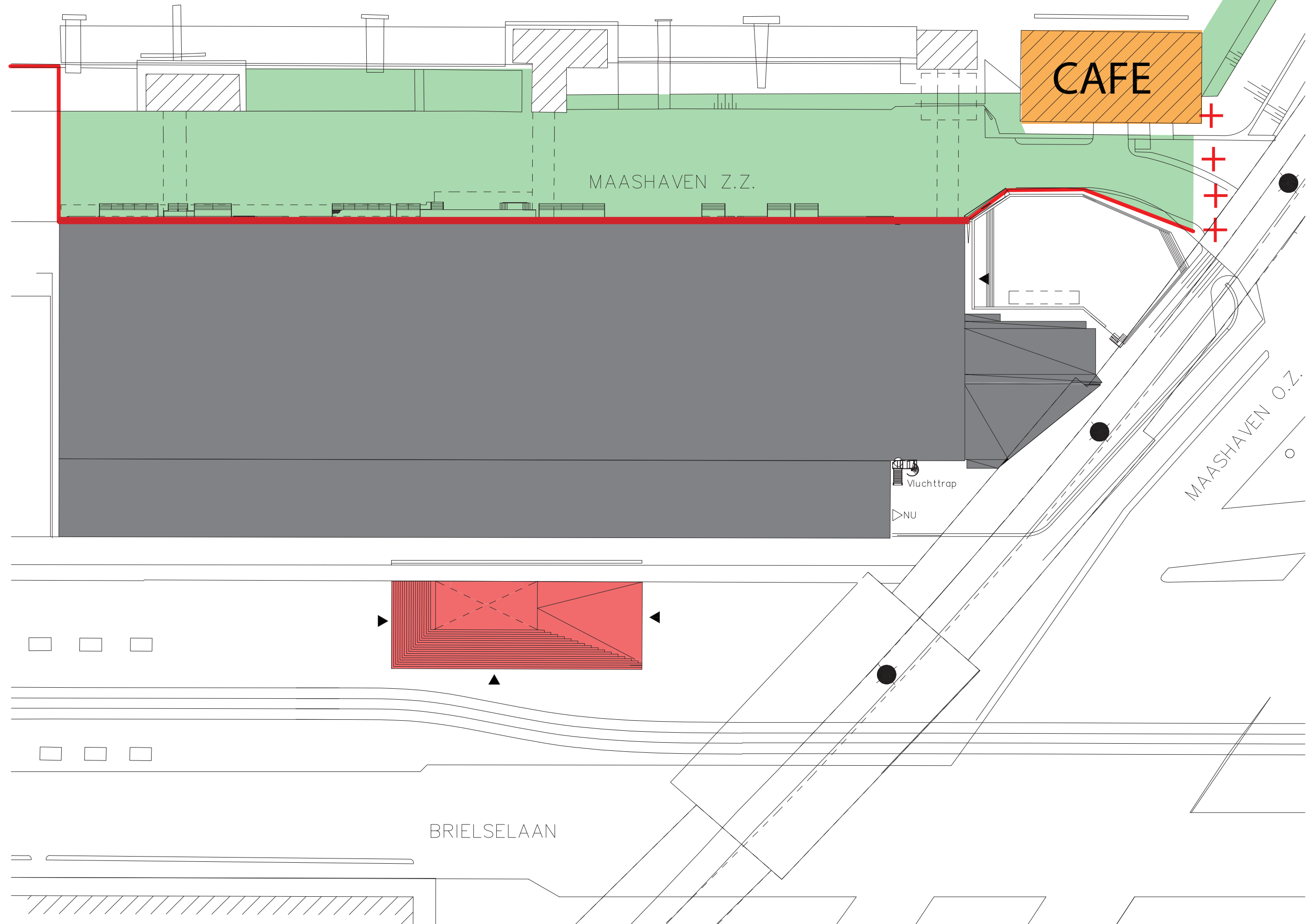


Illustration: DE URBANISTEN & OWN ADJUSTMENTS

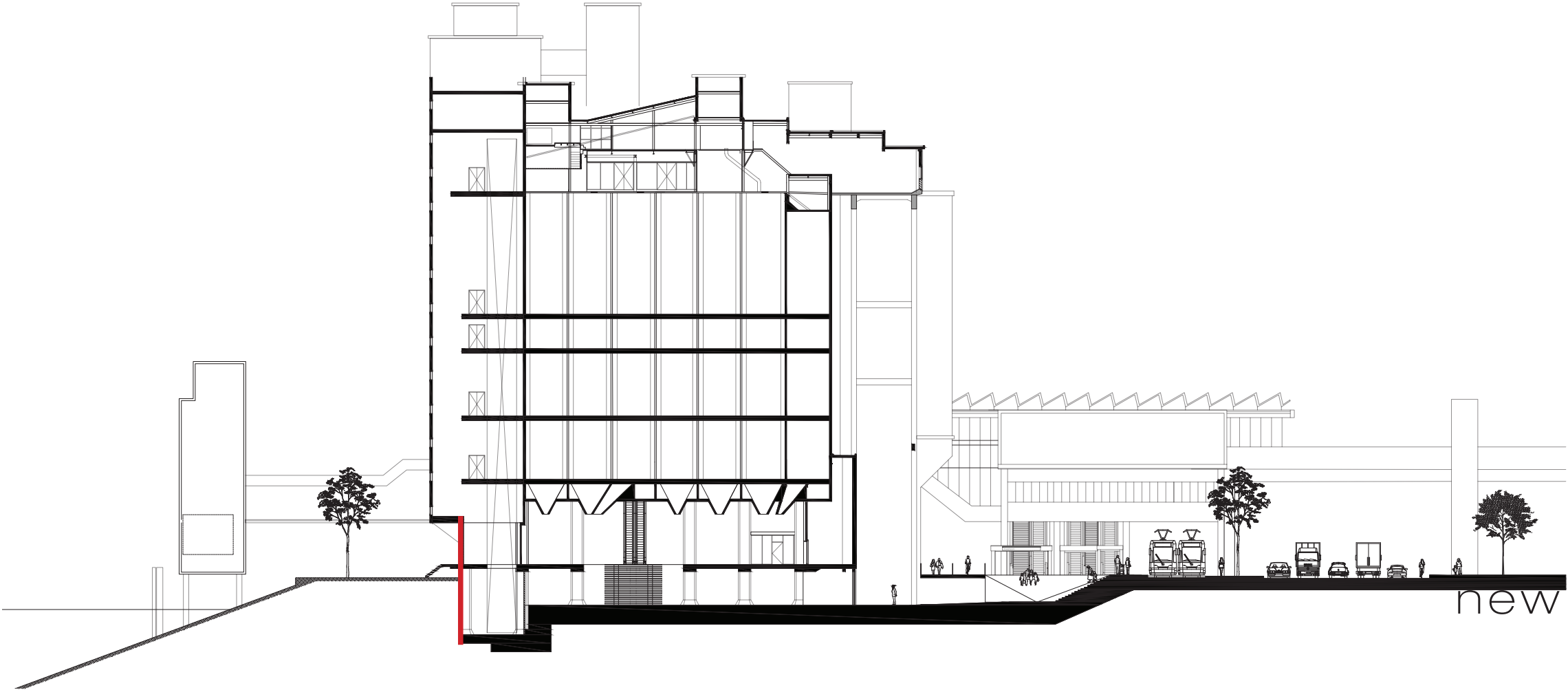
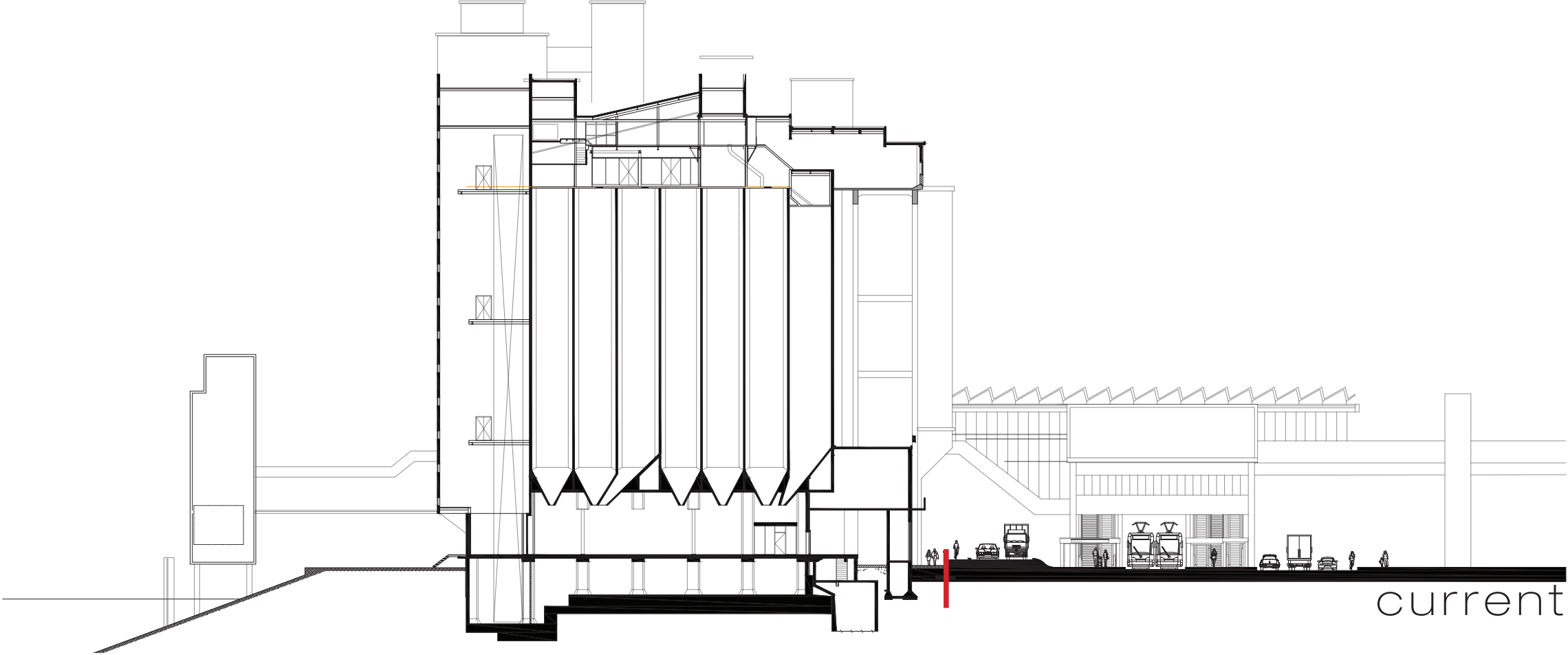
CURRENT DIKE POSITION 1:500



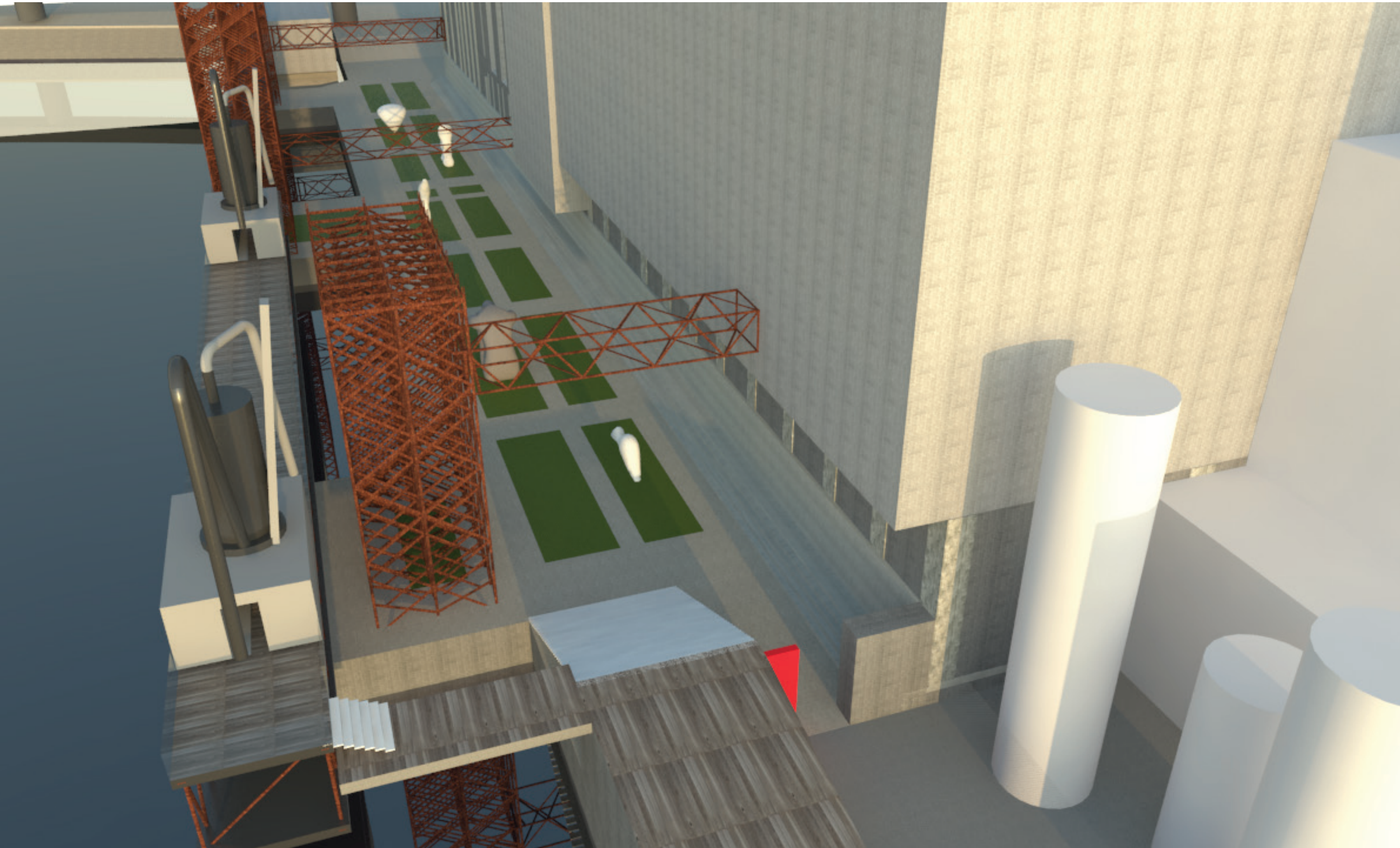
A circle with a shaded sector and a triangle. The shaded sector is formed by two radii and an arc, with a central angle of 60 degrees. A triangle is inscribed in the circle, with one vertex at the center of the circle and the other two vertices on the circumference. The triangle is shaded with diagonal lines.



SECTION/STREET PROFILE 1:500

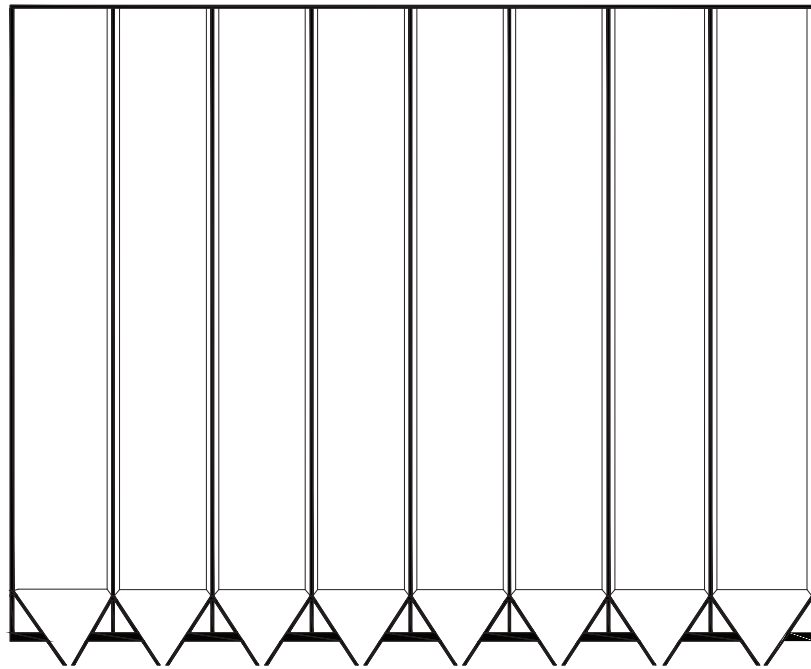


IMPRESSION INTEGRATED DIKE



INTERVENTION

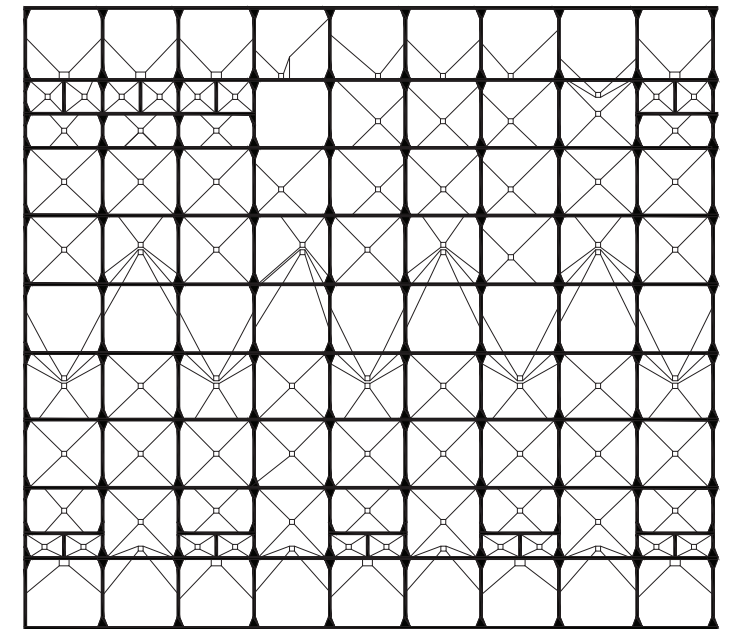
SILO CHALLENGES



vertical silo structure

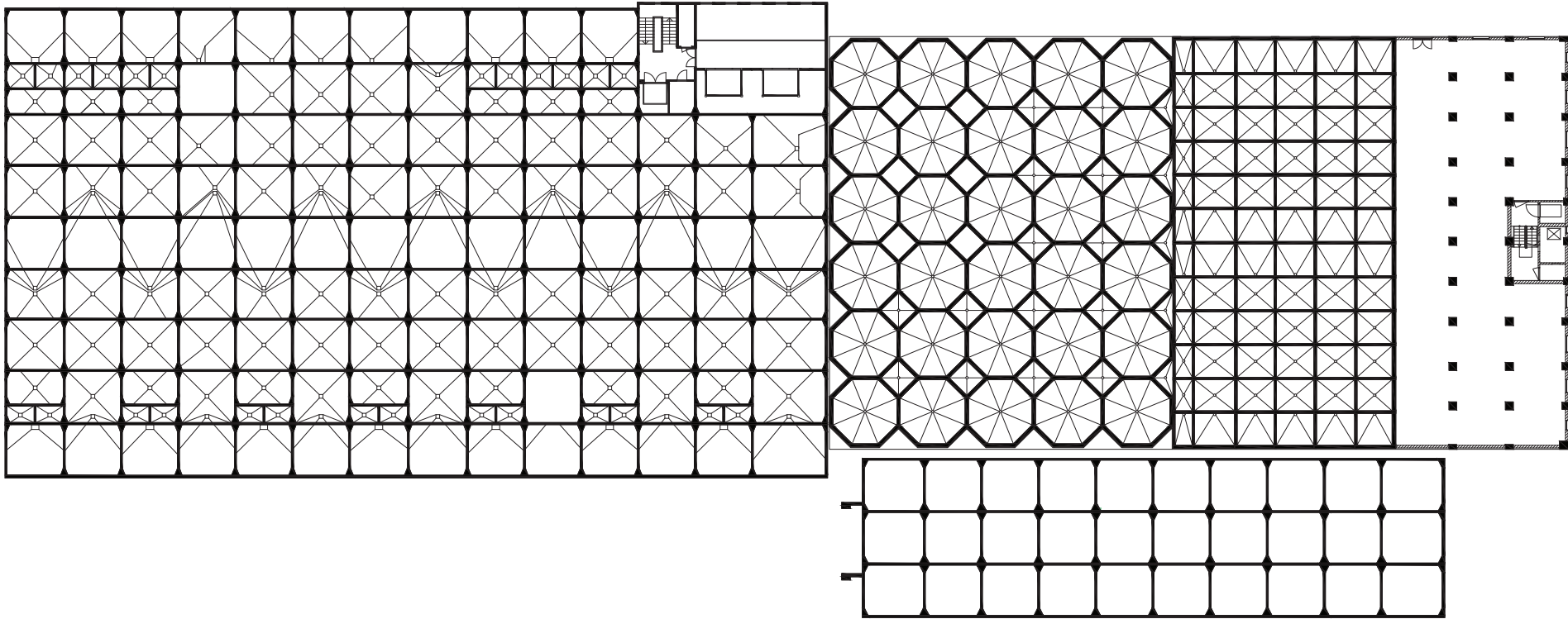
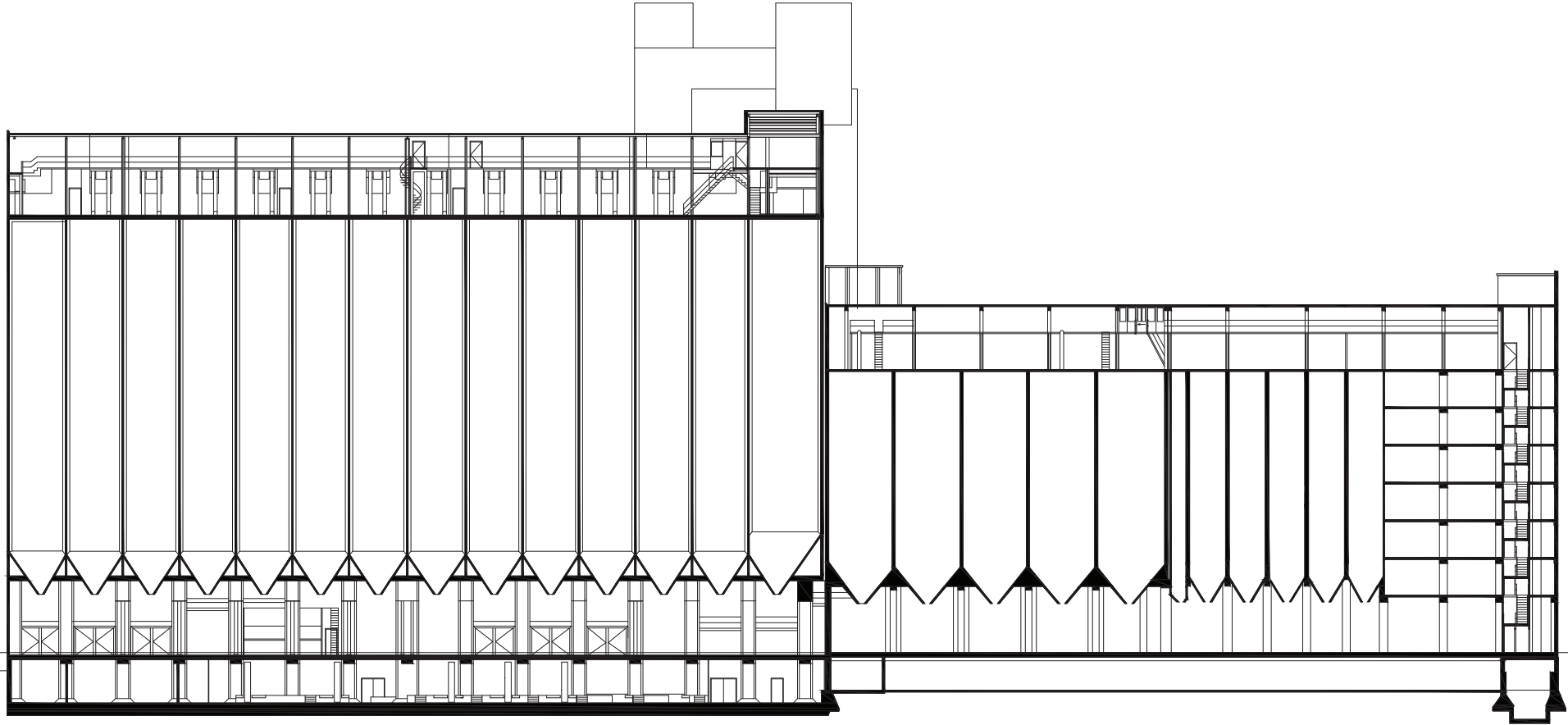


no daylight entry

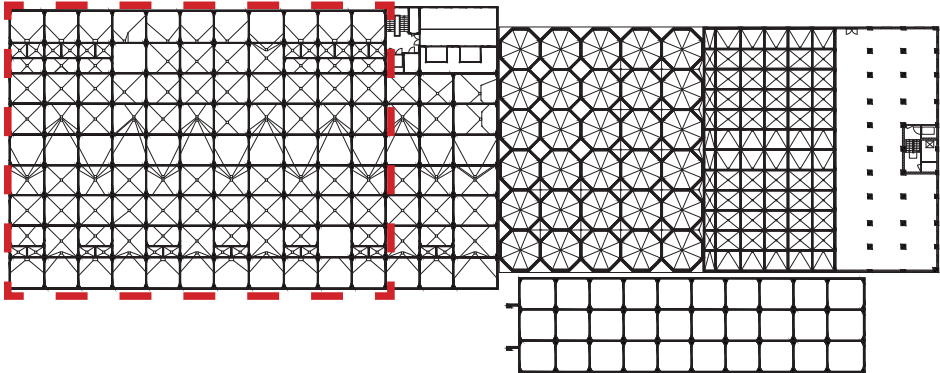
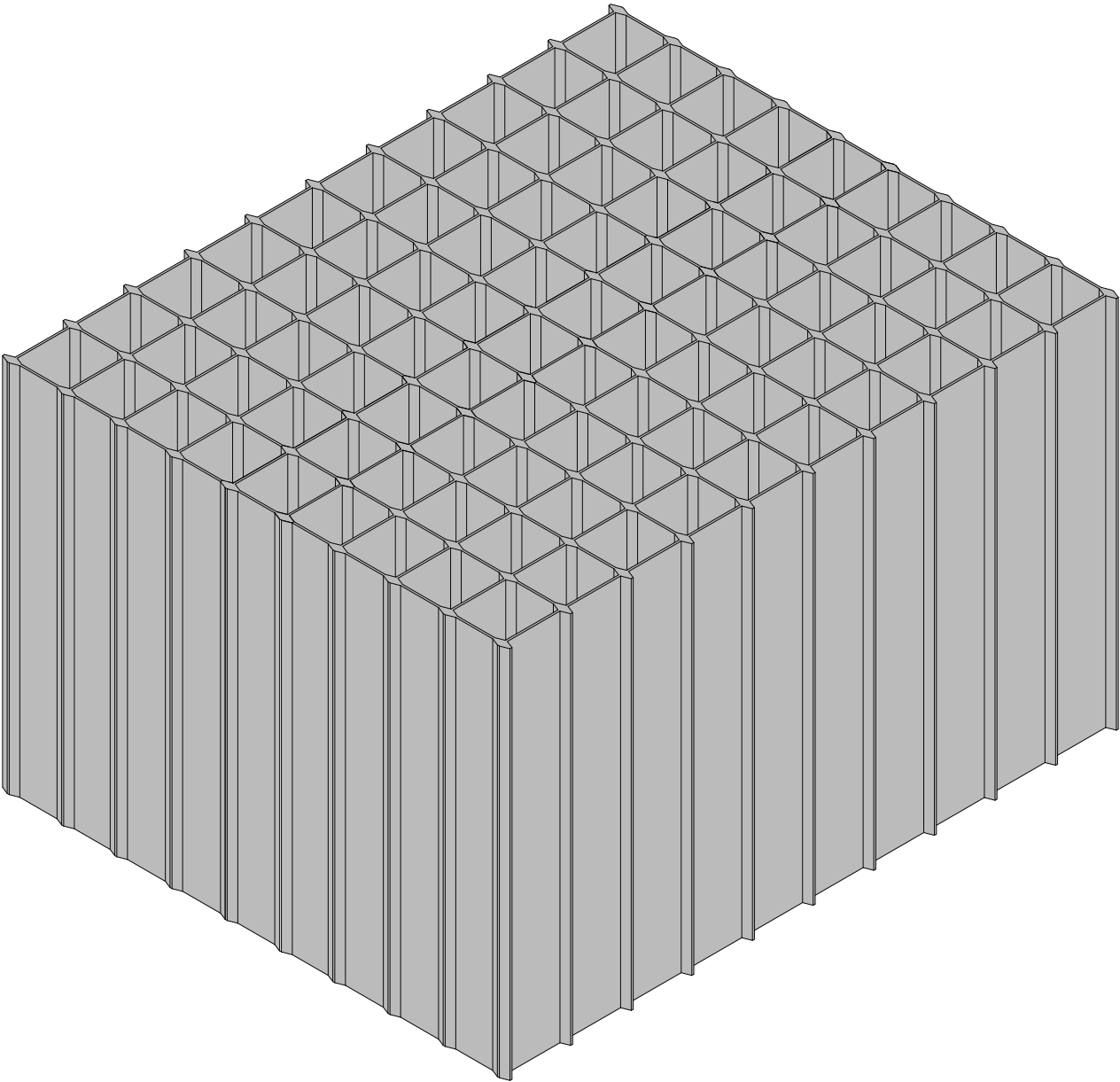


repetition/grid

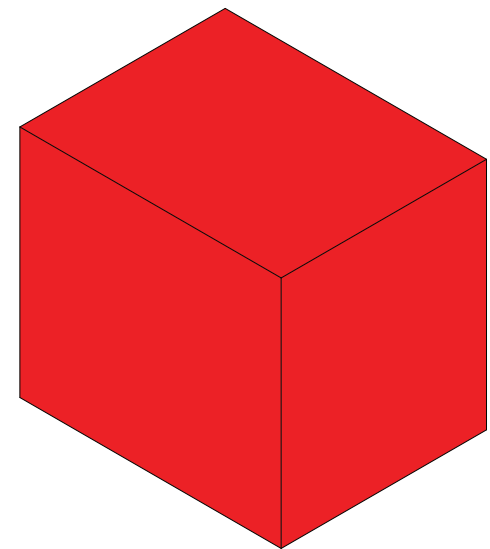
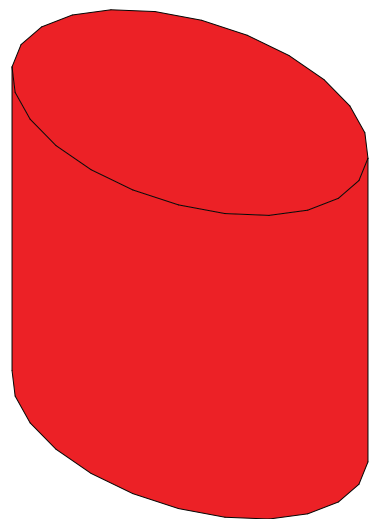
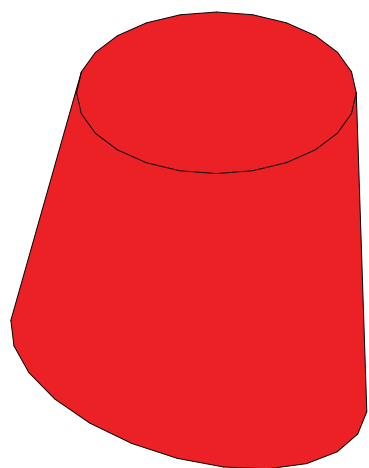
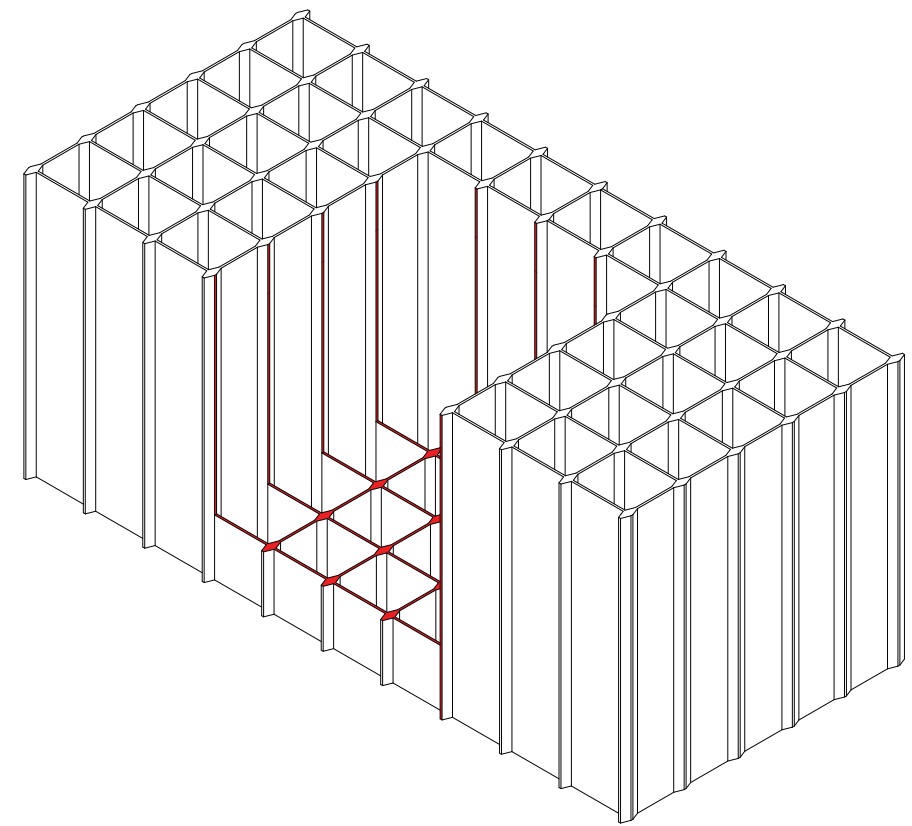
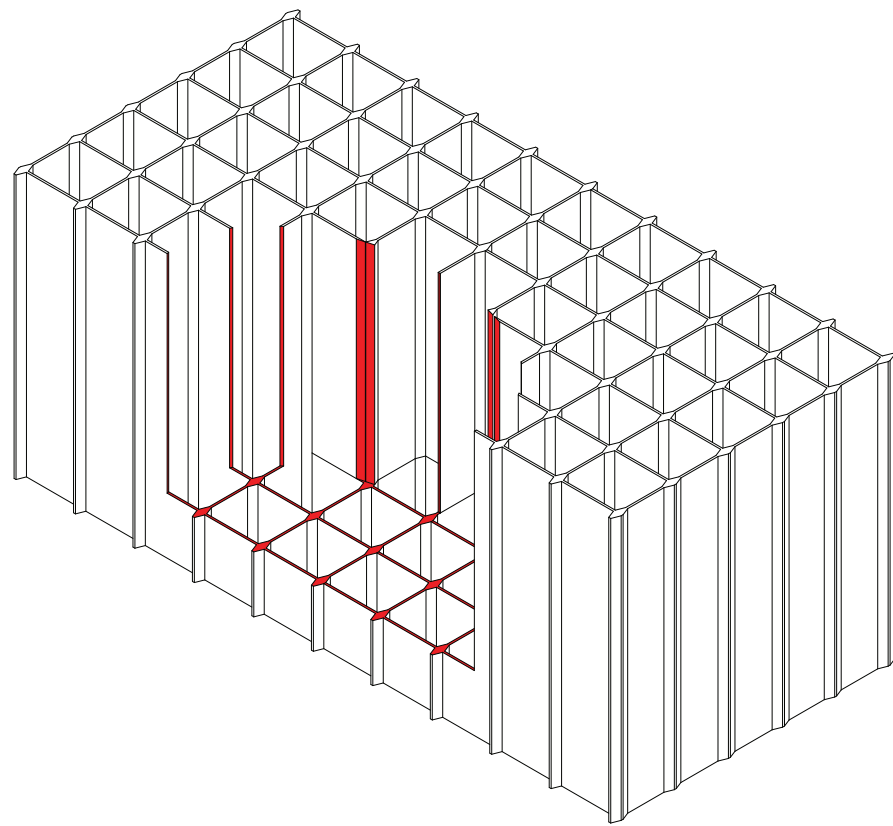
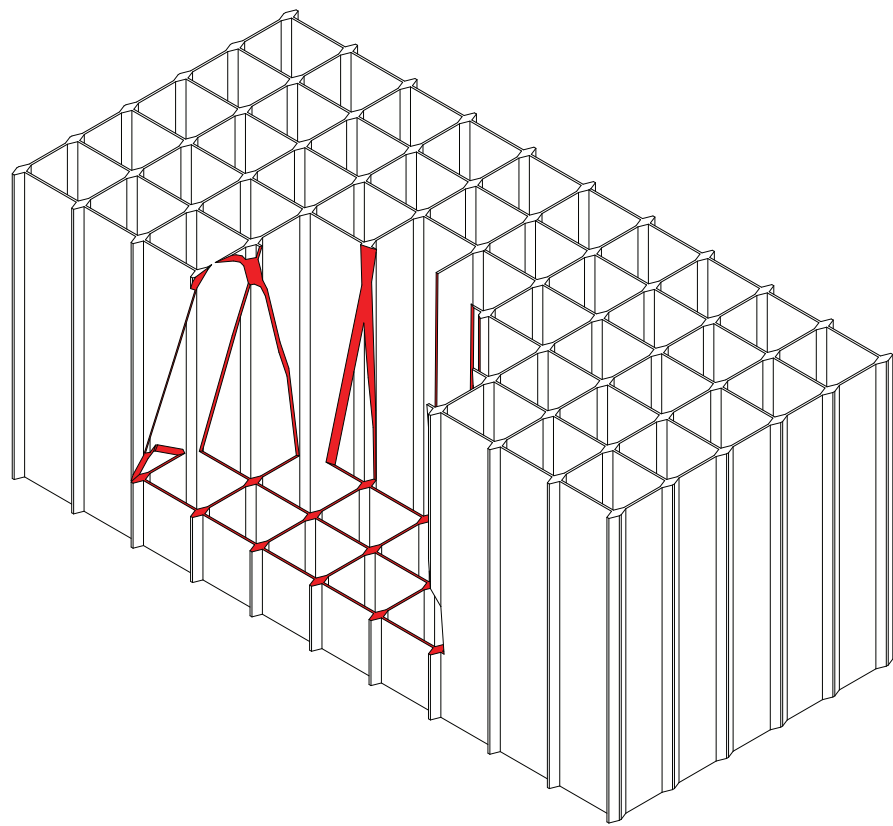
CURRENT BUILDING PLAN & SECTION 1:500



BRINKMAN SILO'S



HOLLOWING OUT THE BRINKMAN SILOS - APPROACH



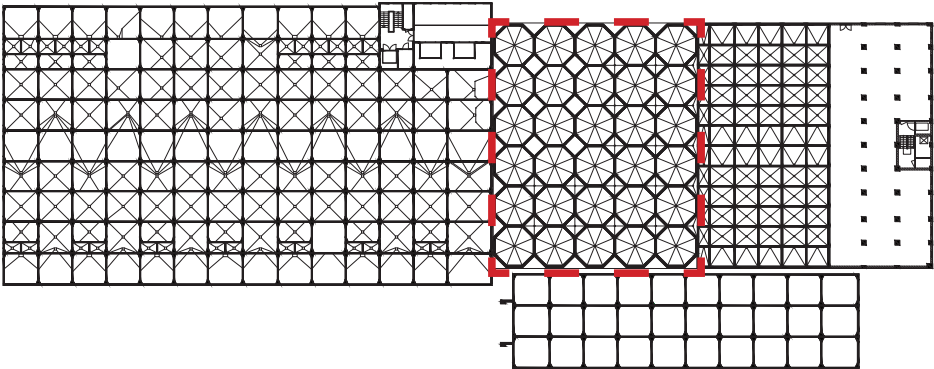
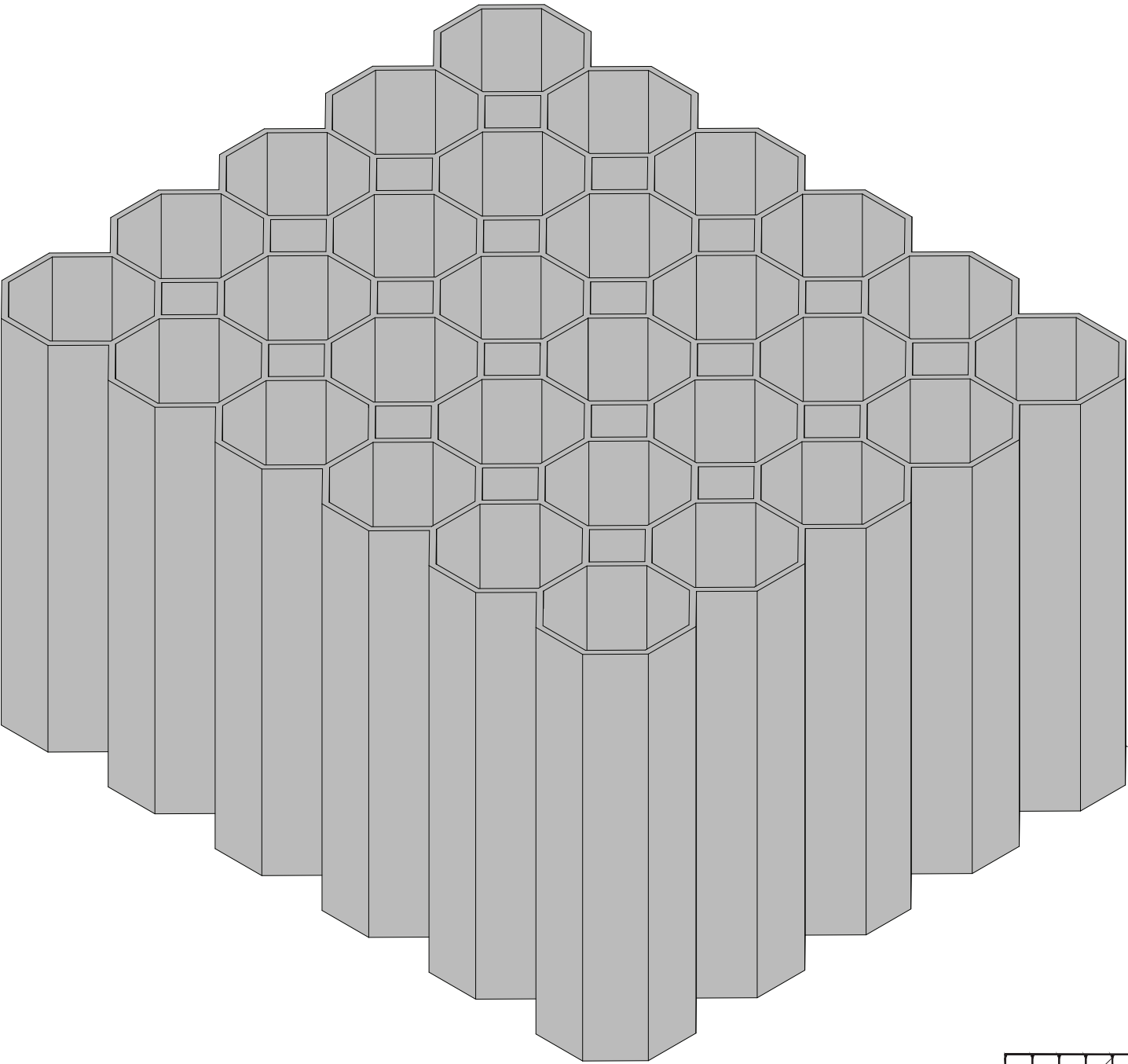
3D IMPRESSION - VOID/DAYLIGHT BRINKMAN PART



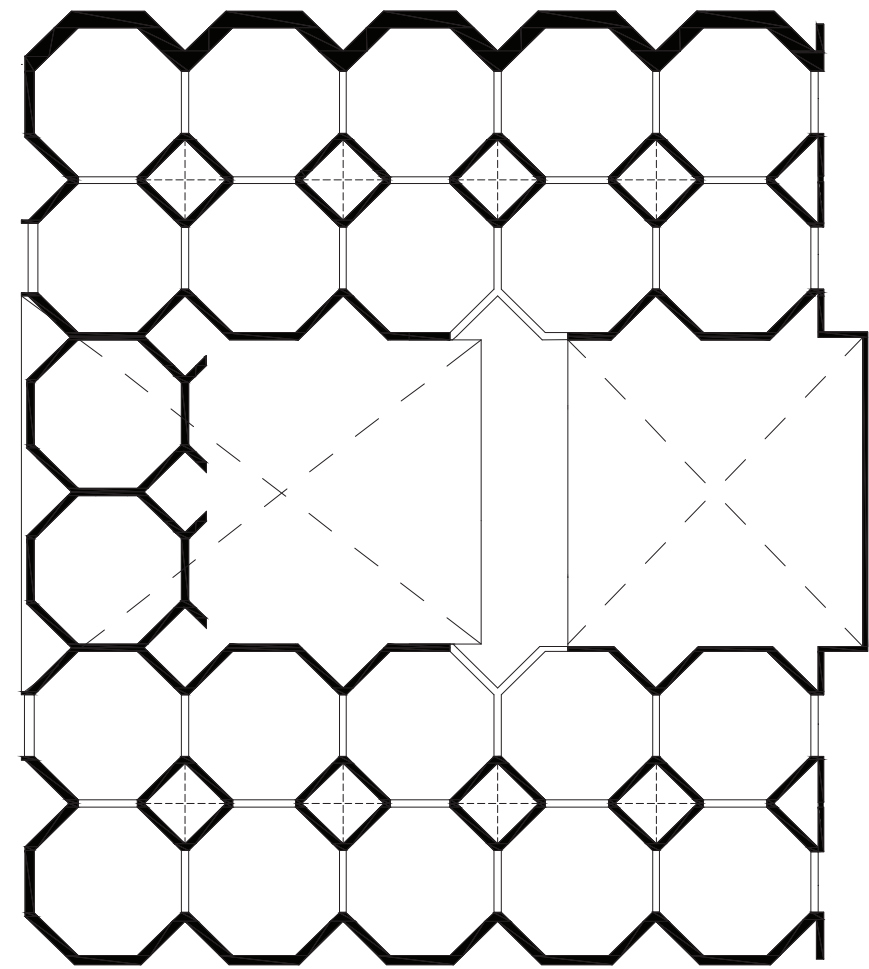
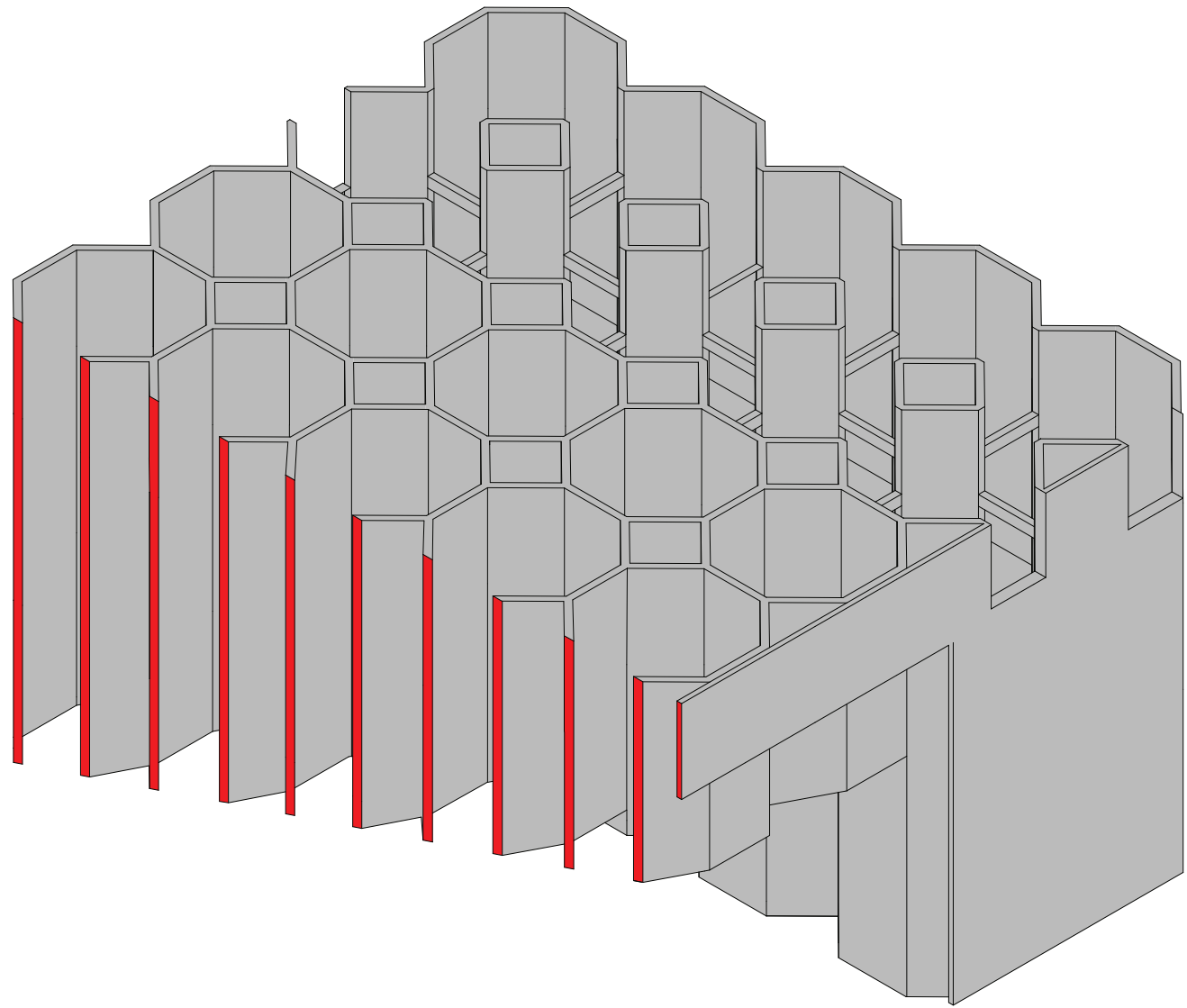
3D IMPRESSION - VOID/DAYLIGHT BRINKMAN PART



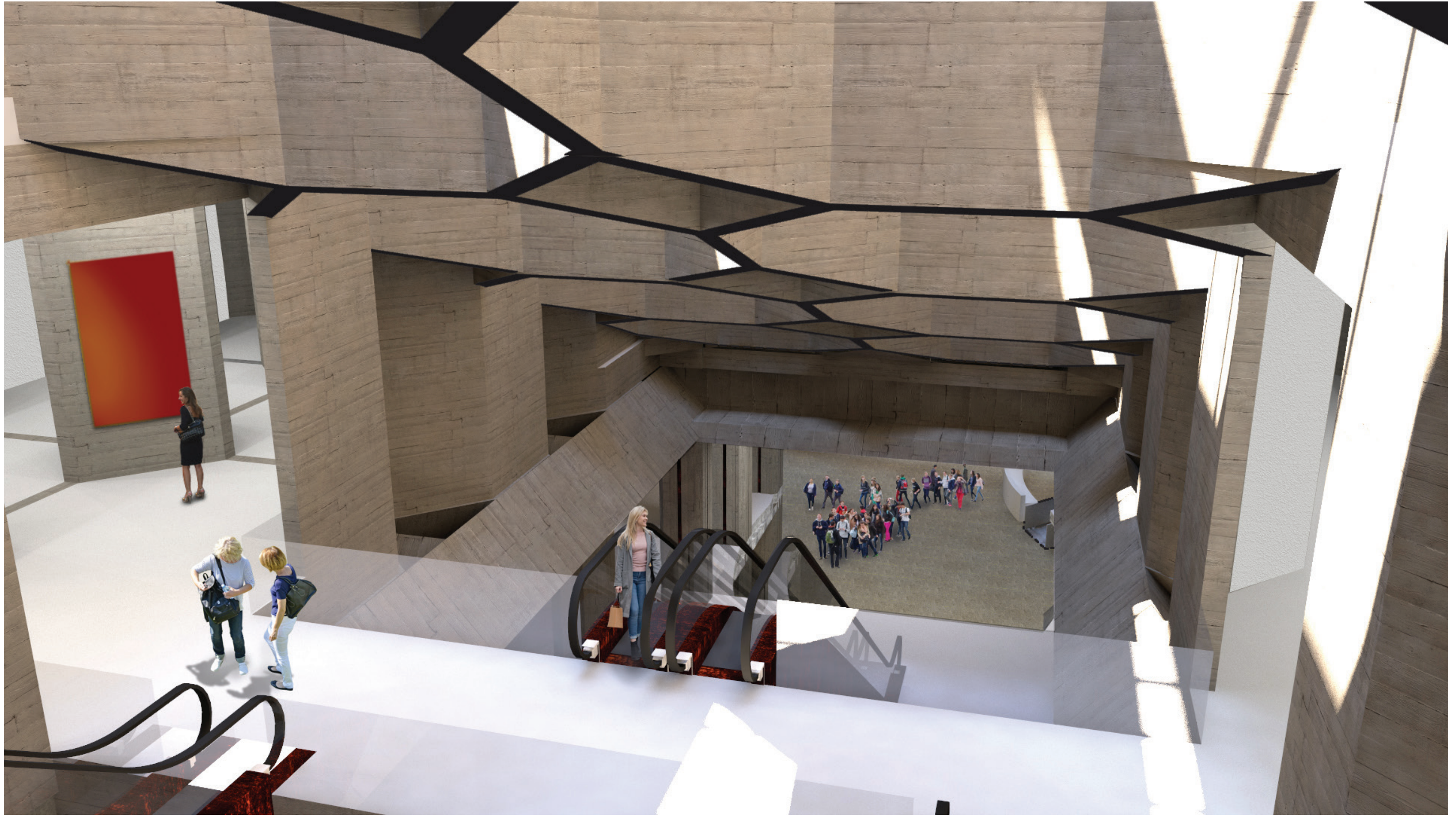
STOK SILO'S



HOLLOWING OUT THE STOK SILOS - APPROACH



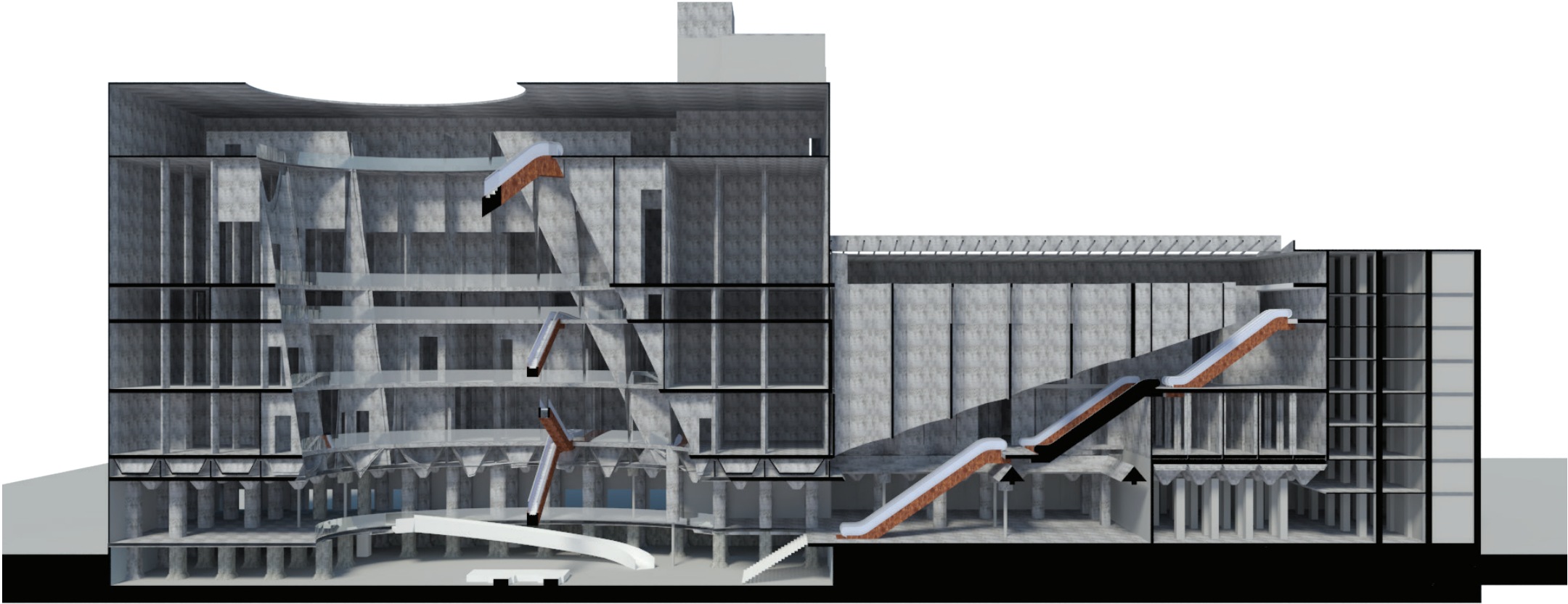
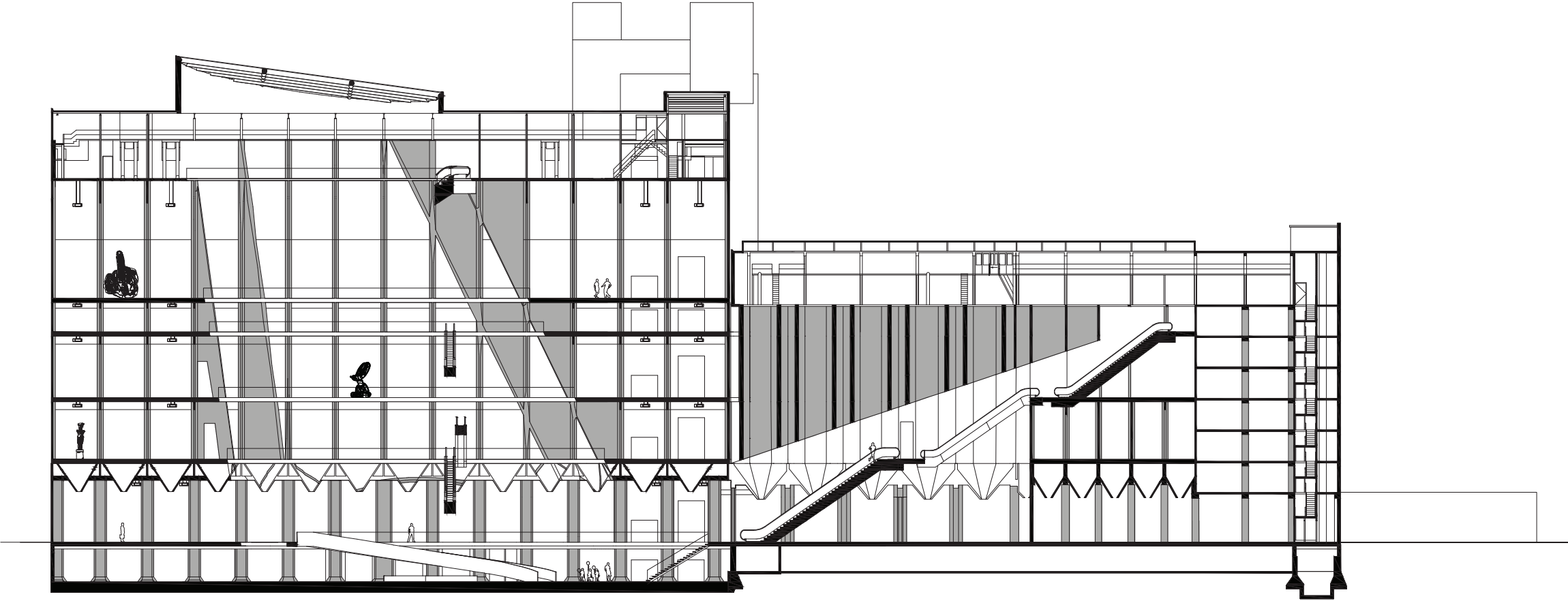
3D IMPRESSION - VOID/DAYLIGHT STOK PART



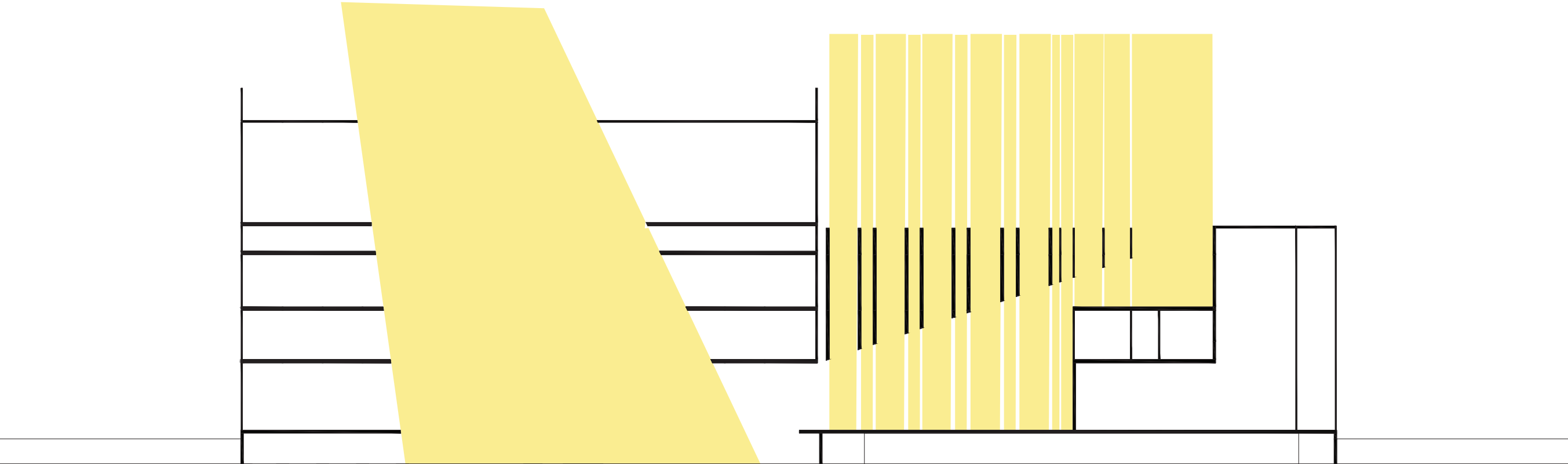
3D IMPRESSION - VOID/DAYLIGHT



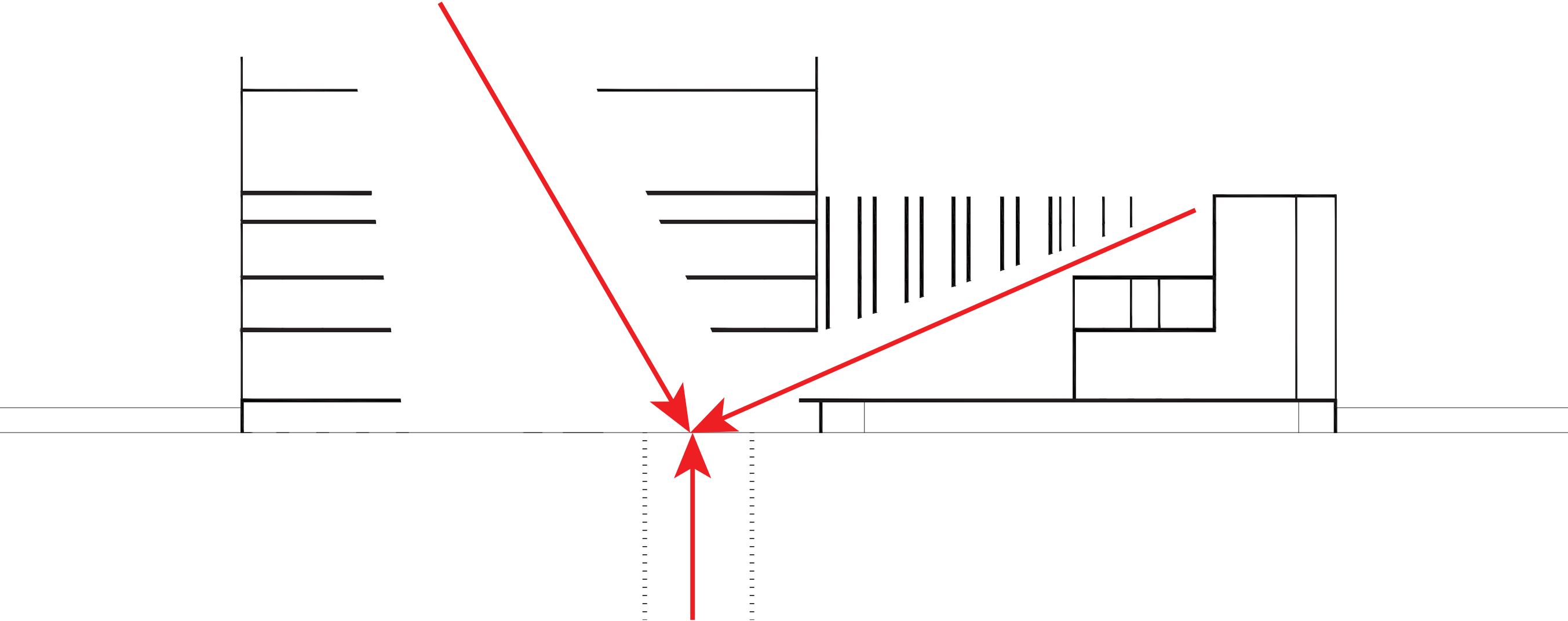
SECTION 1:500



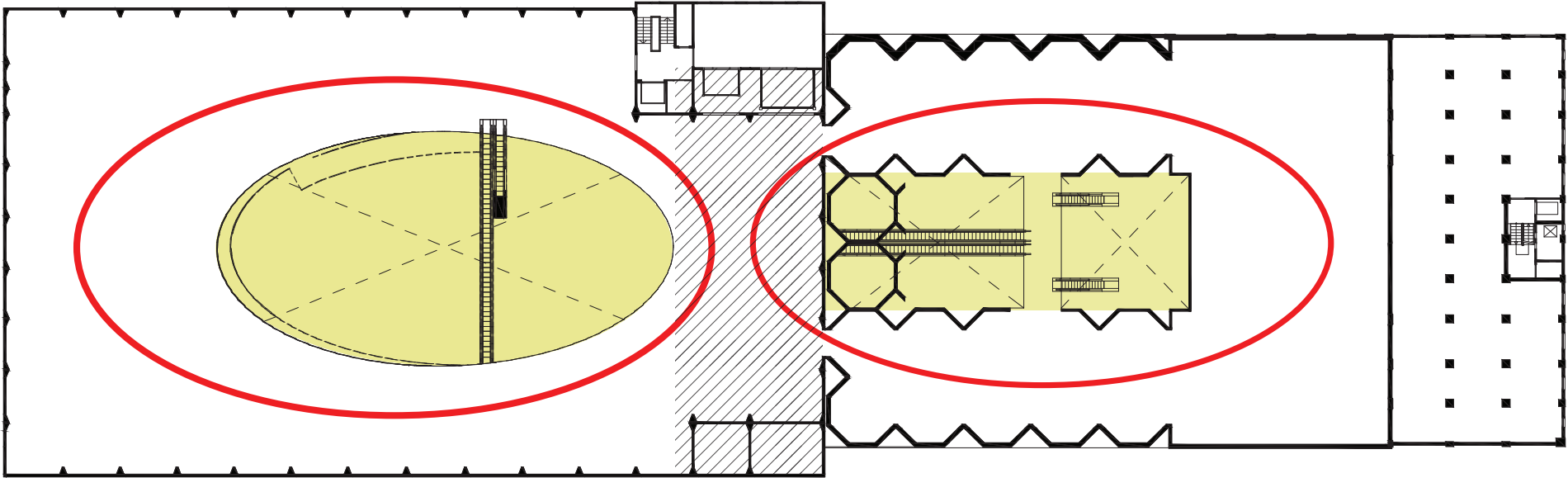
DAYLIGHT ENTREE THROUGH VOIDS



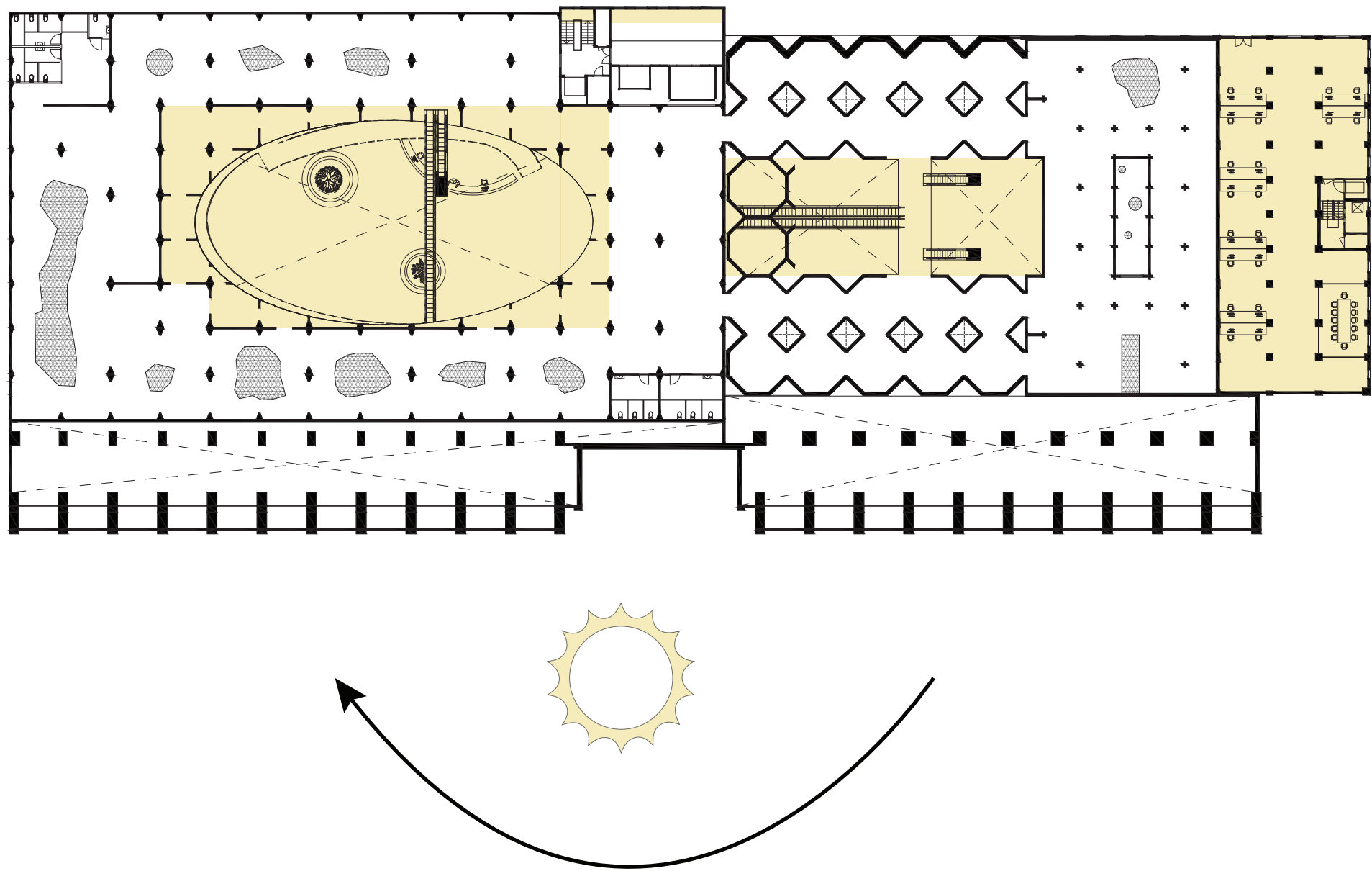
VERTICAL ROUTING CONNECTION/CENTERPOINT



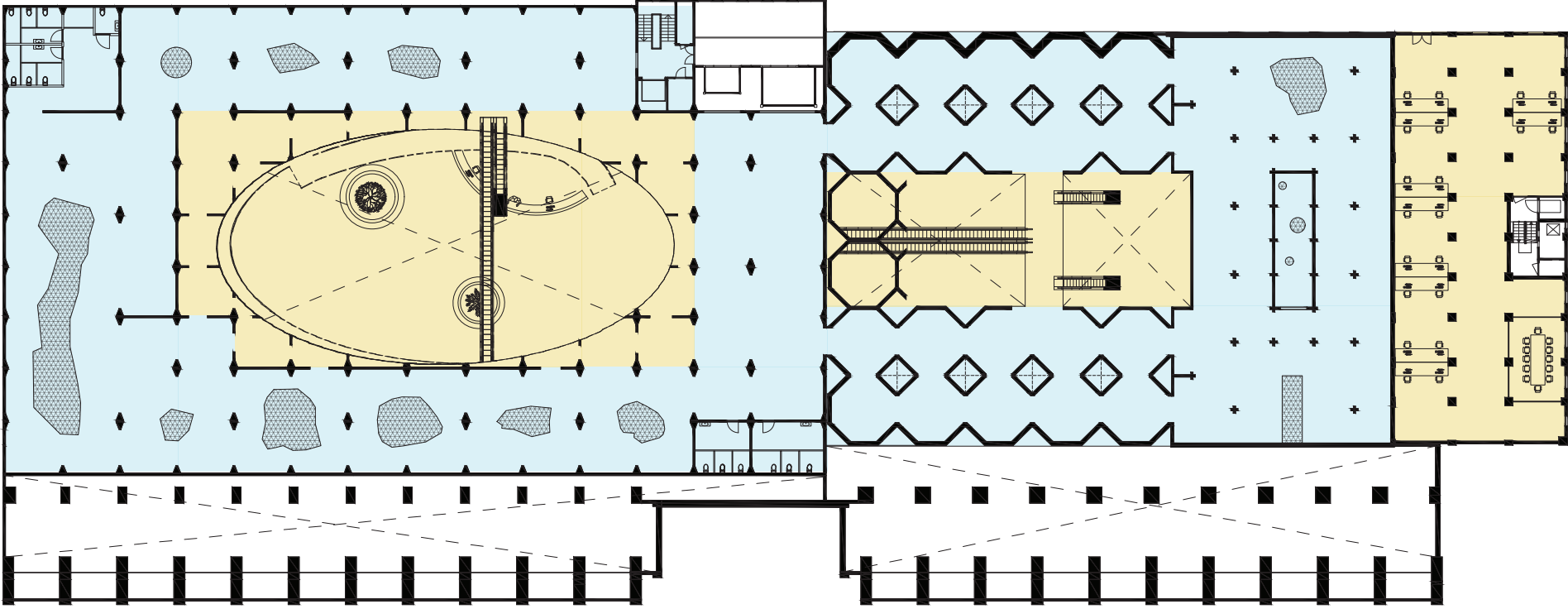
SIMPLIFIED ROUTING DIAGRAM



DAYLIGHT ENTRY



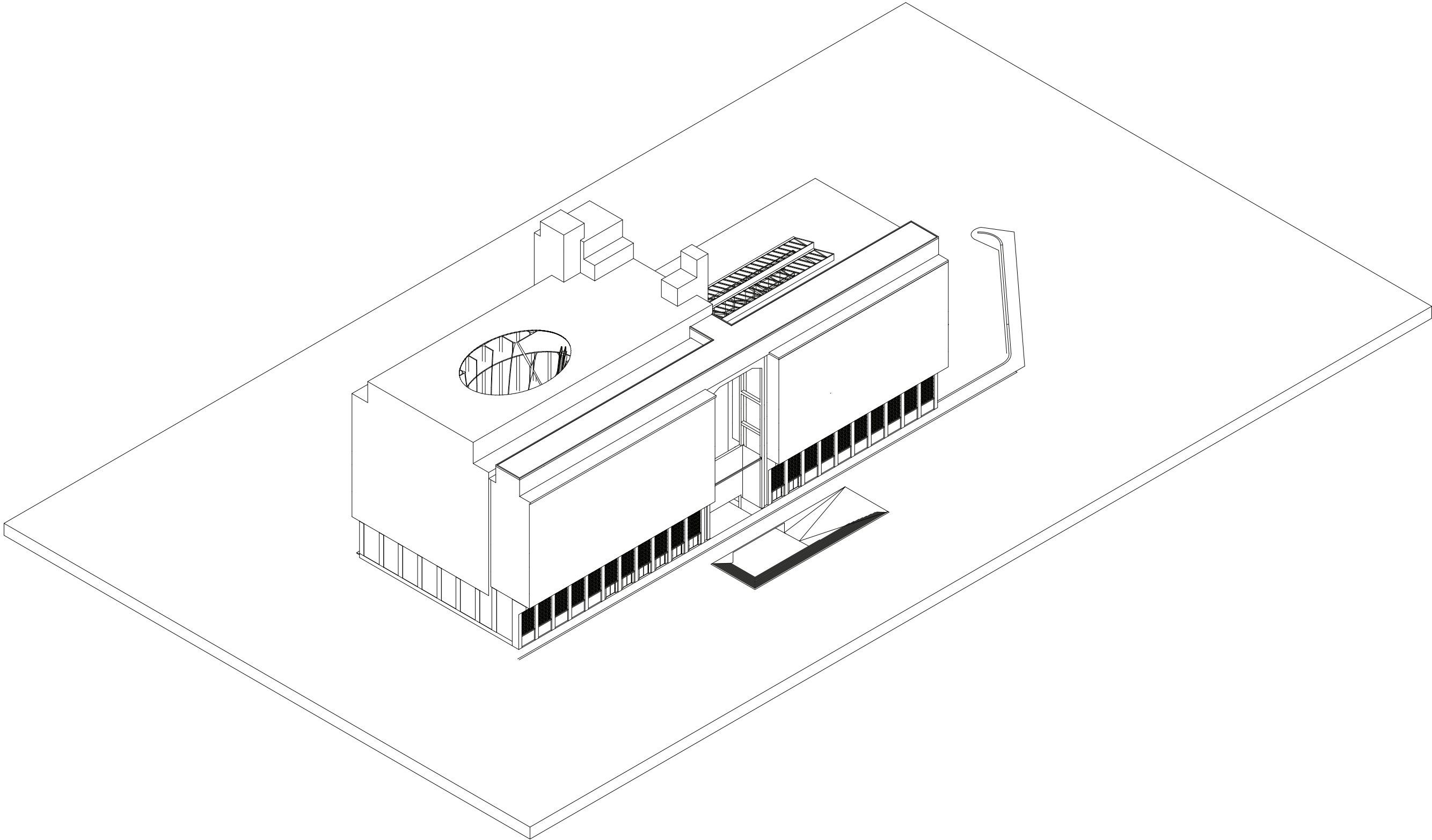
DAYLIGHT AND CONTROLLED LIGHTING



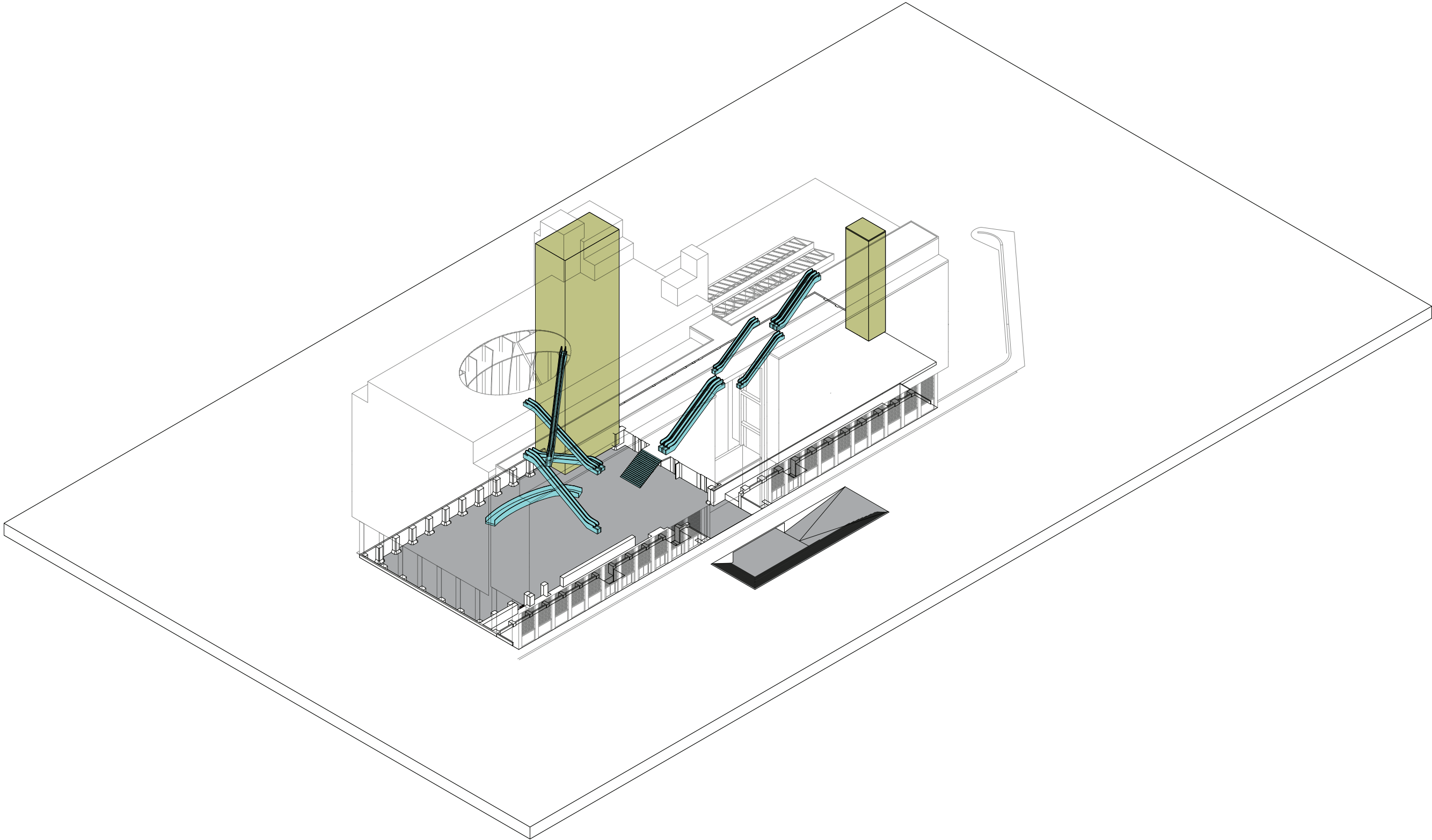
Daylight

Controlled light

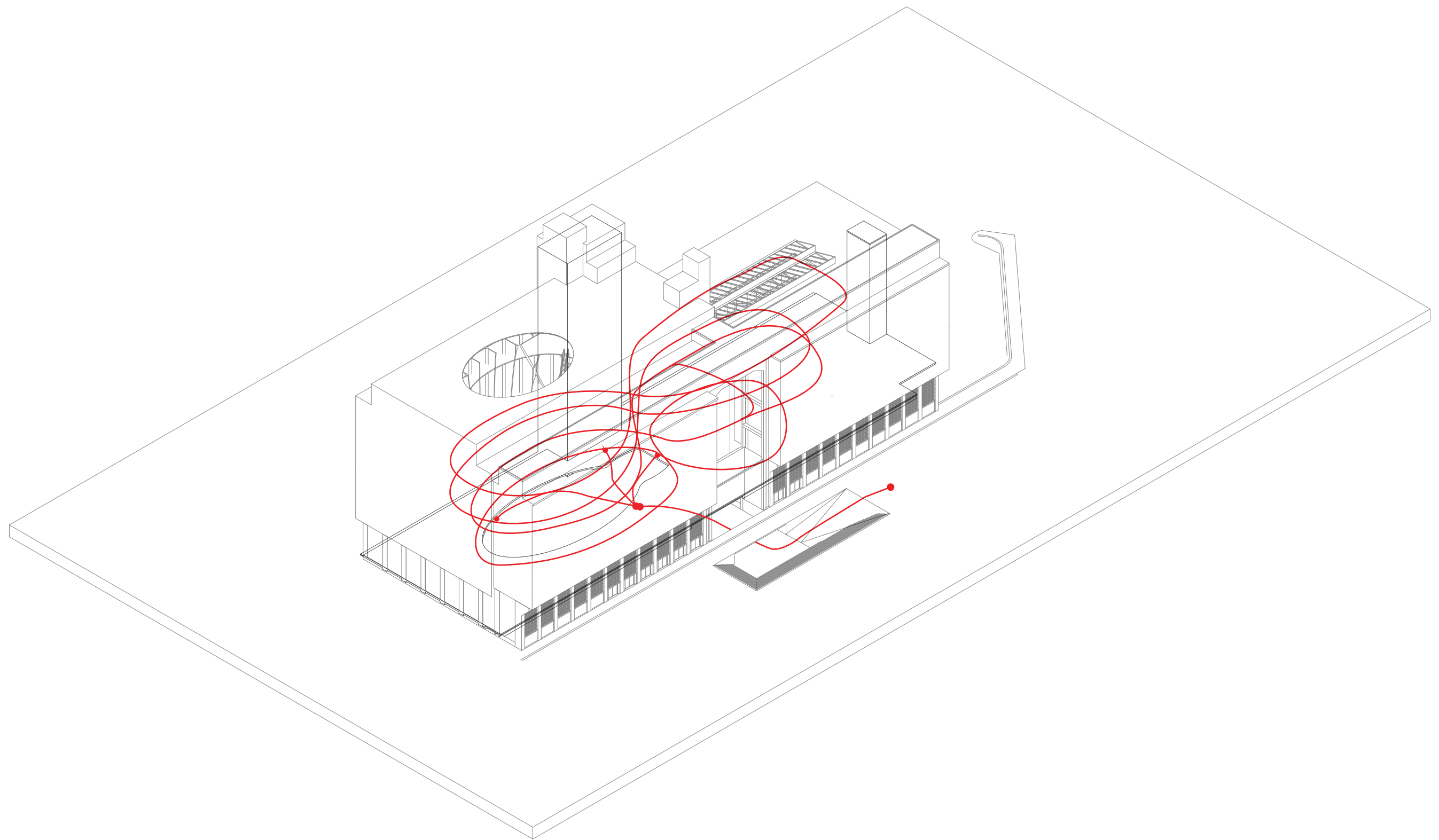
THE MAASSILO



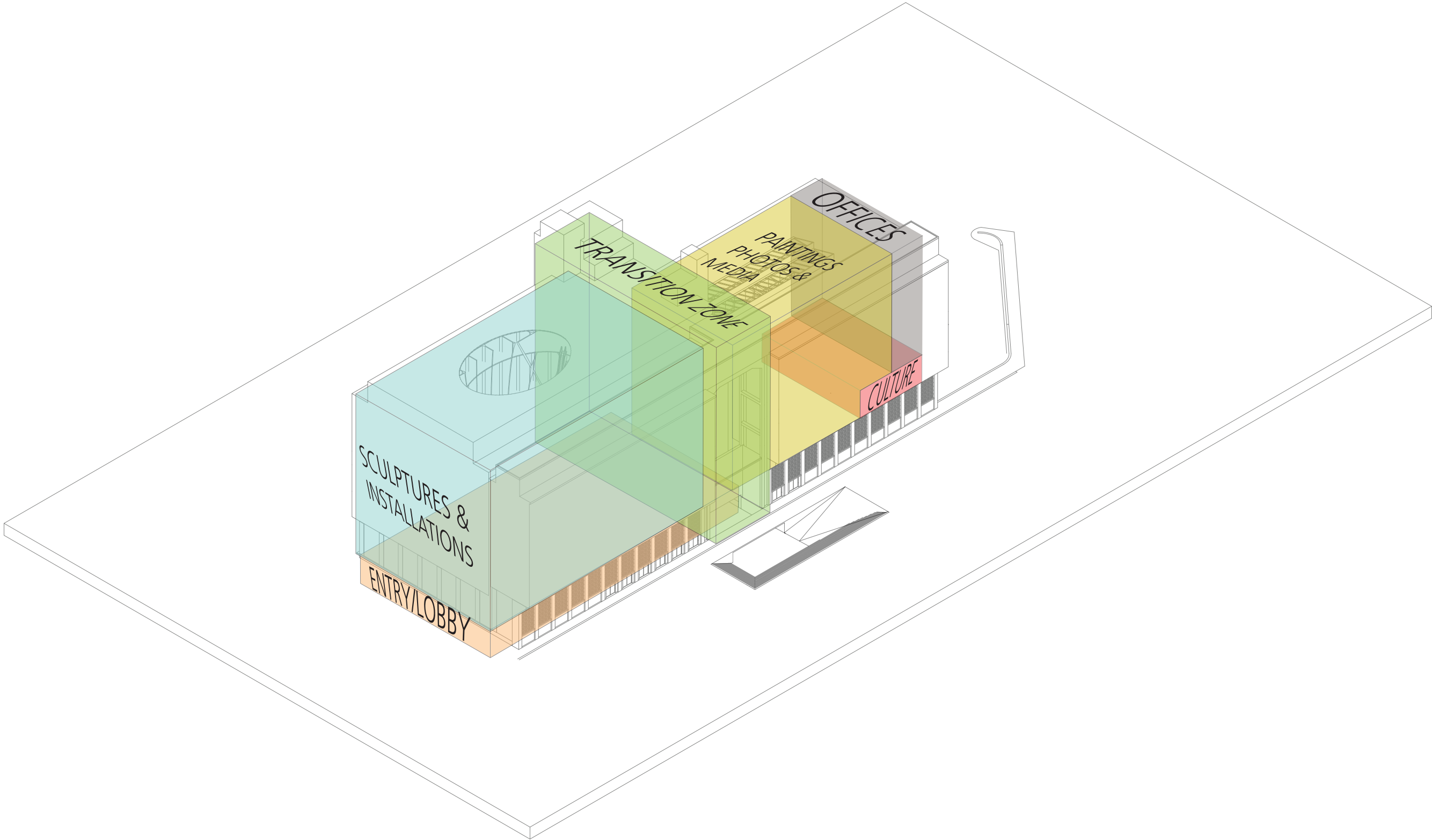
VERTICAL ROUTING



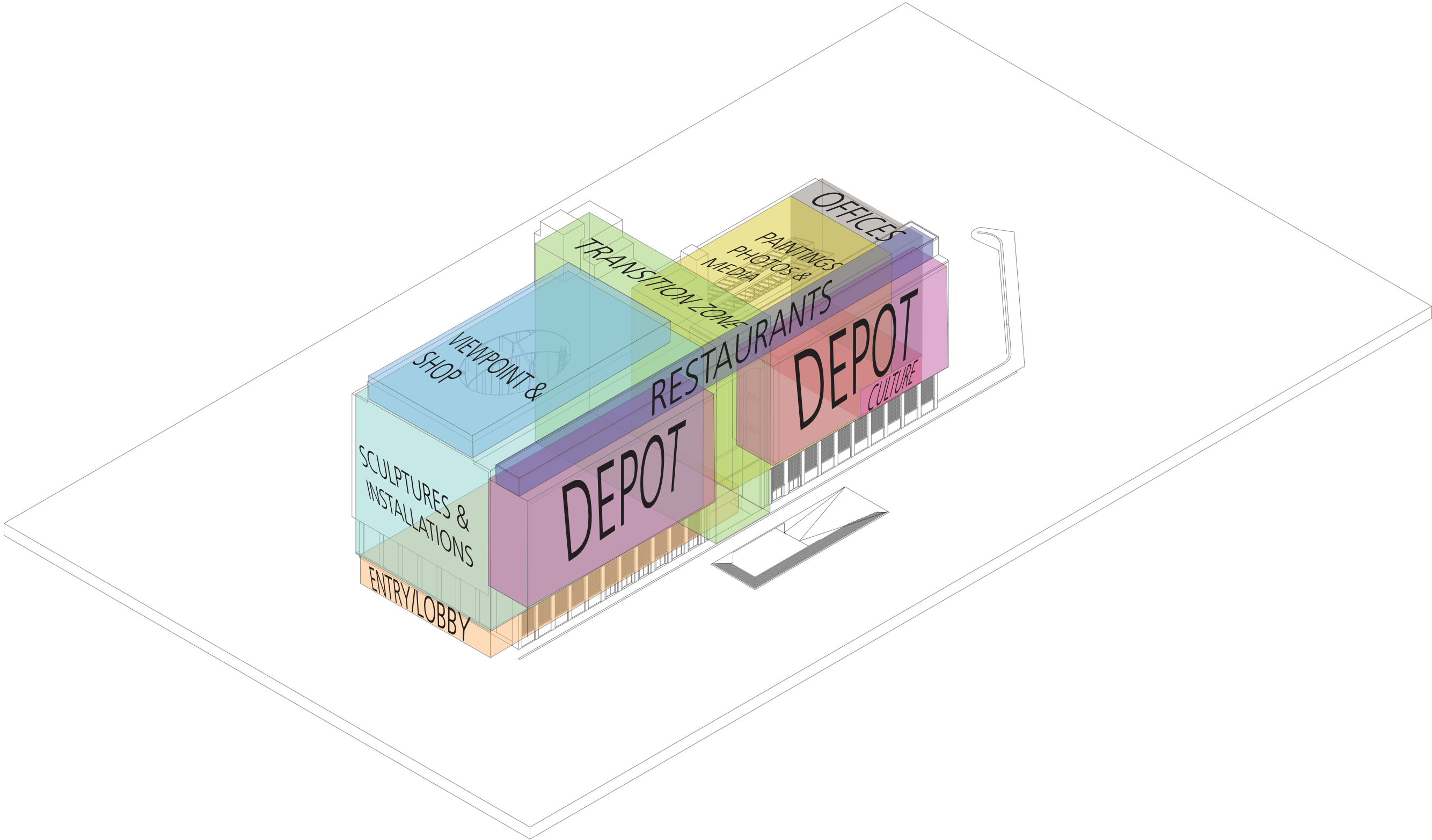
3D ROUTING THROUGH THE BUILDING

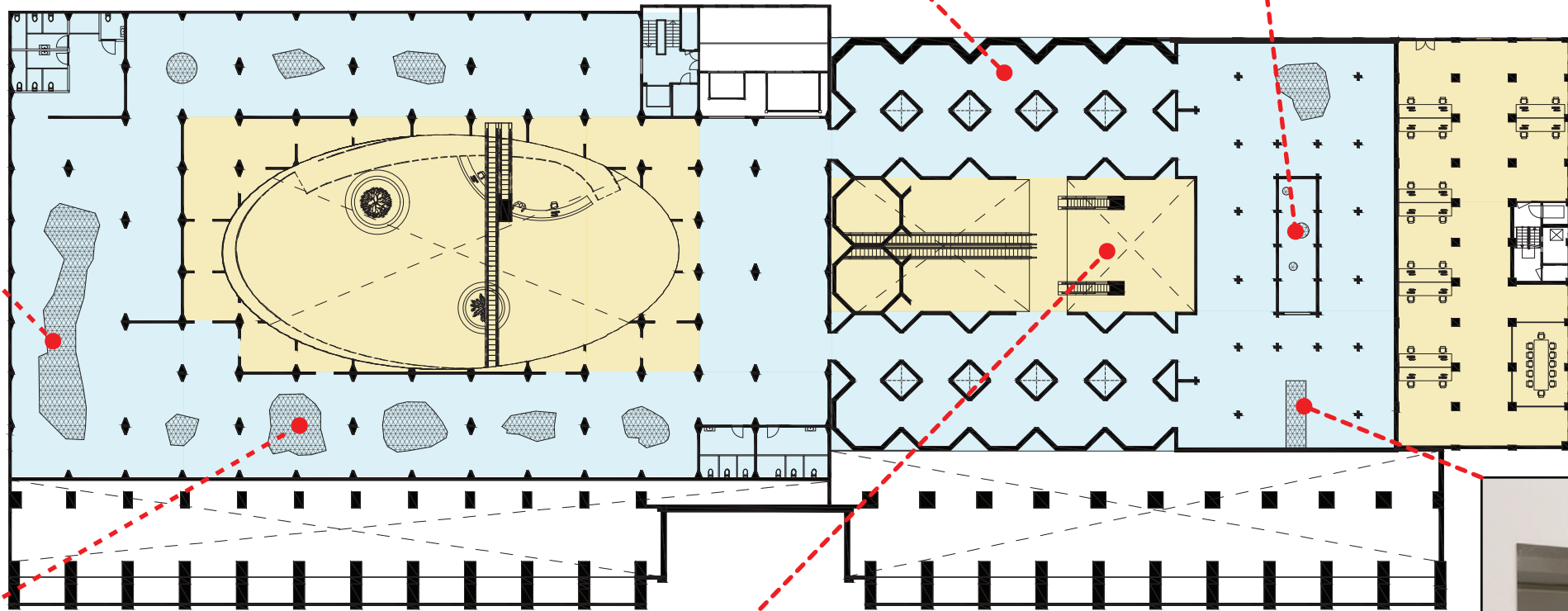
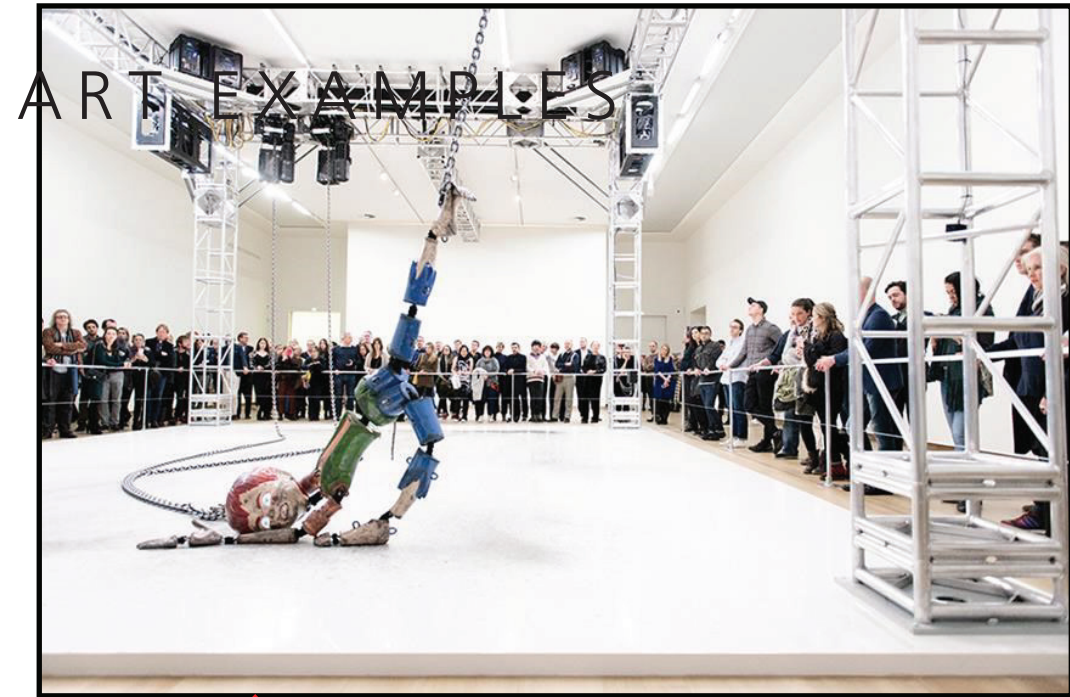


FUNCTIONS



FUNCTIONS





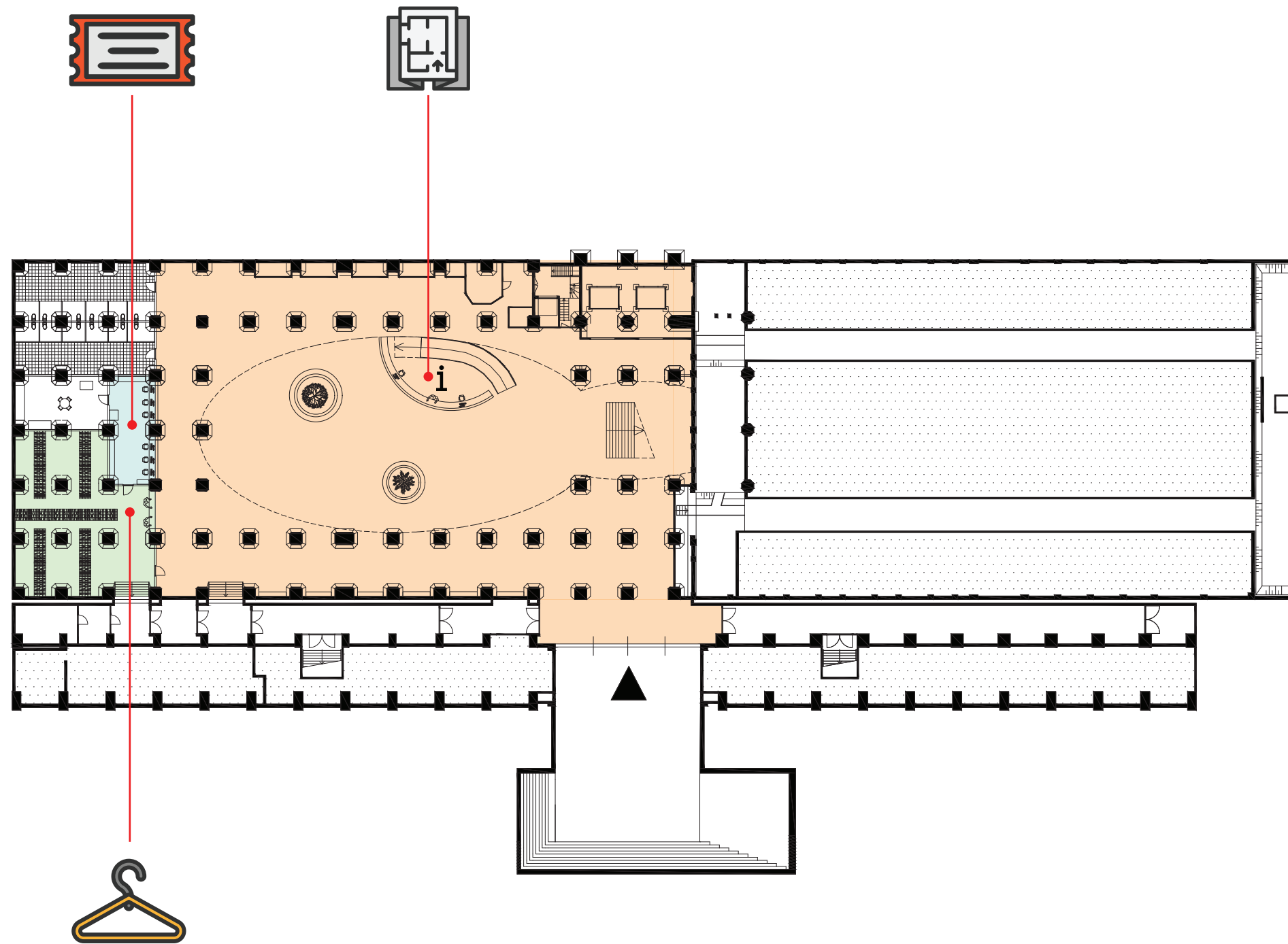
IMPRESSION BRINKMAN 1E FLOOR ART



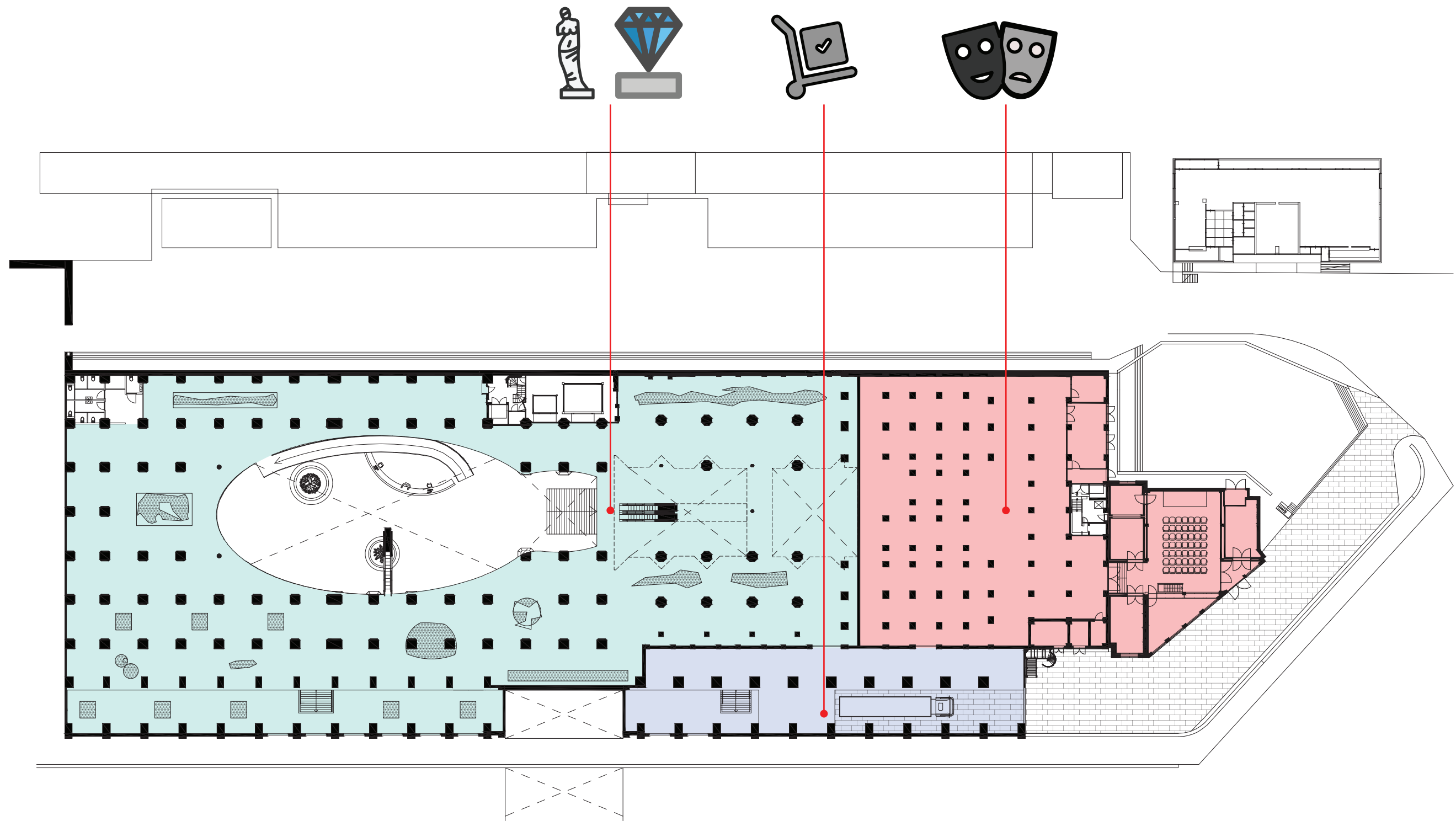
IMPRESSION STOK 1E FLOOR ART



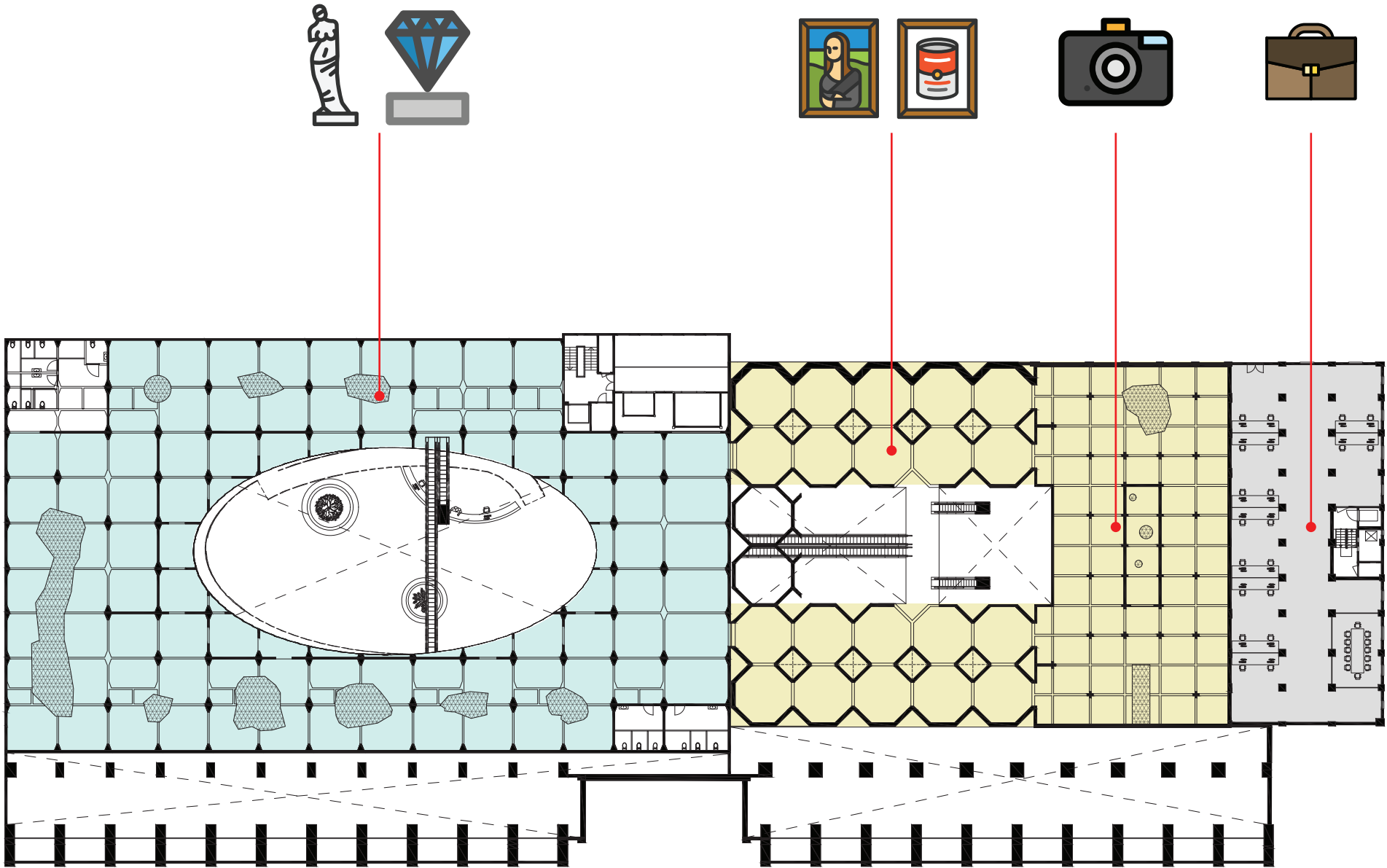
BASEMENT FLOORPLAN 1:500



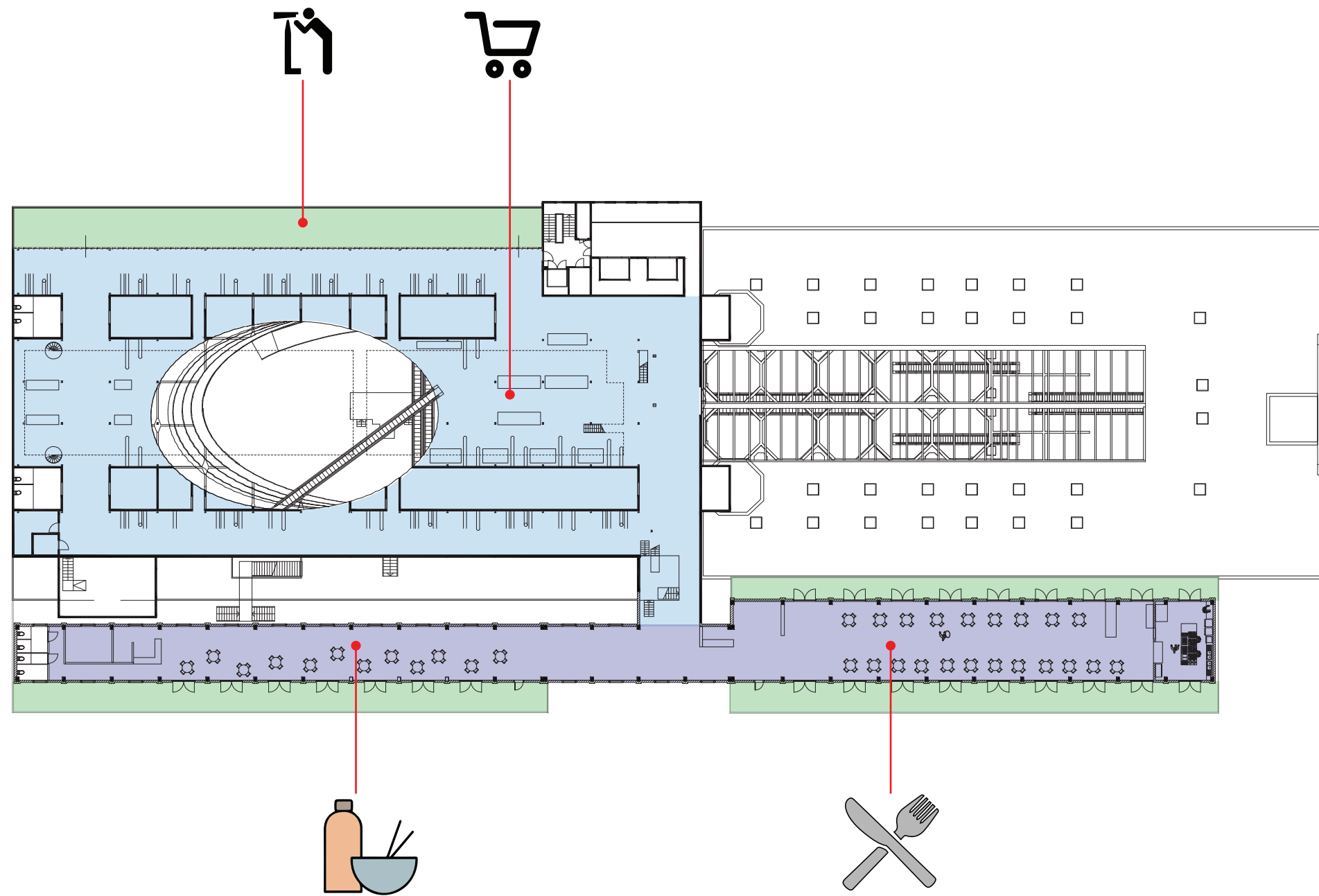
GROUND FLOOR FLOORPLAN 1:500



1E(2-4) FLOOR FLOORPLAN 1:500



5E FLOOR FLOORPLAN 1:500



VIEW FROM TOP NORTH FACADE TO KOP VAN ZUID & KATENDRECHT



BUILDING TECHNOLOGY

BEAUTIFUL IMPERFECTION



kintsukuroi

(n.) (v. phr.) "to repair with gold"; the art of repairing pottery with gold or silver lacquer and understanding that the piece is more beautiful for having been broken

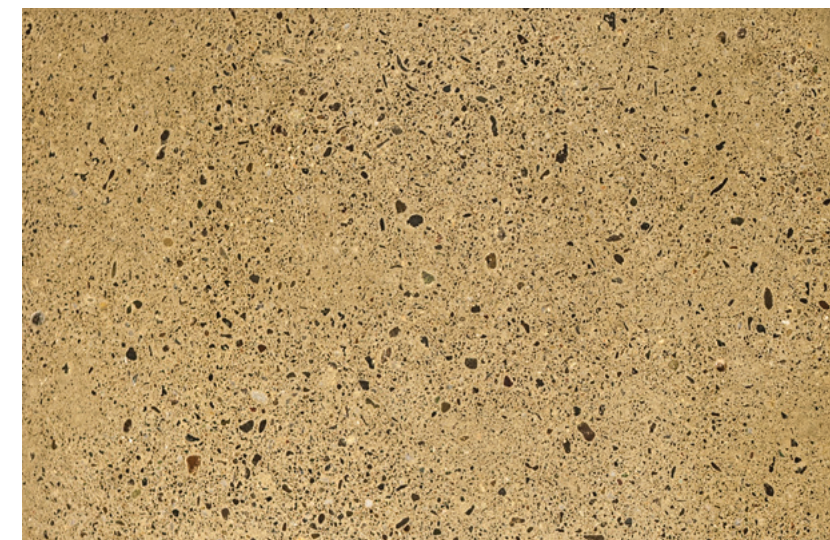
KINTSUKUROI NORTH FACADE



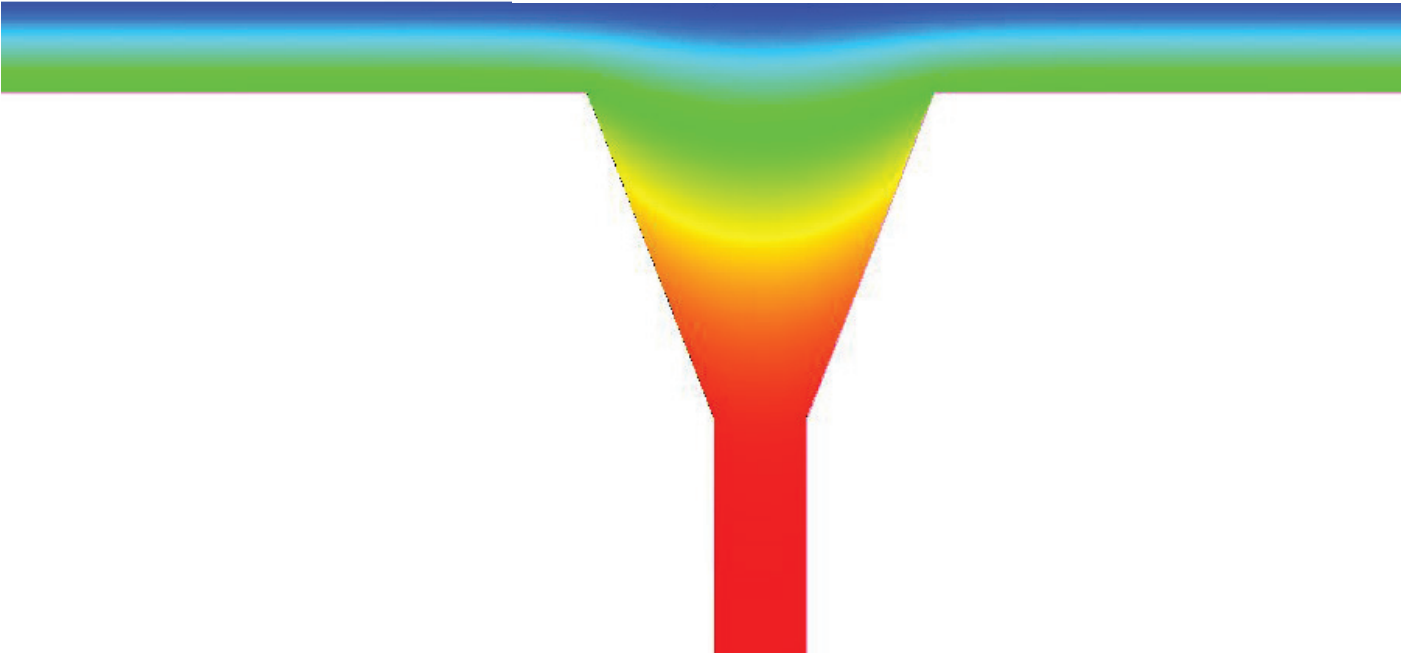
KINTSUKUROI NORTH FACADE



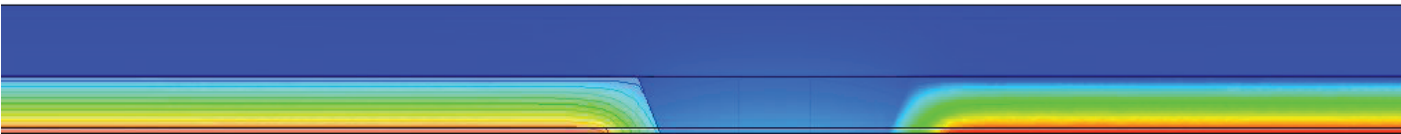
EXAMPLE KINTSUKUROI NORTH FACADE



THERMAL BRIDGE - INSIDE INSULATION

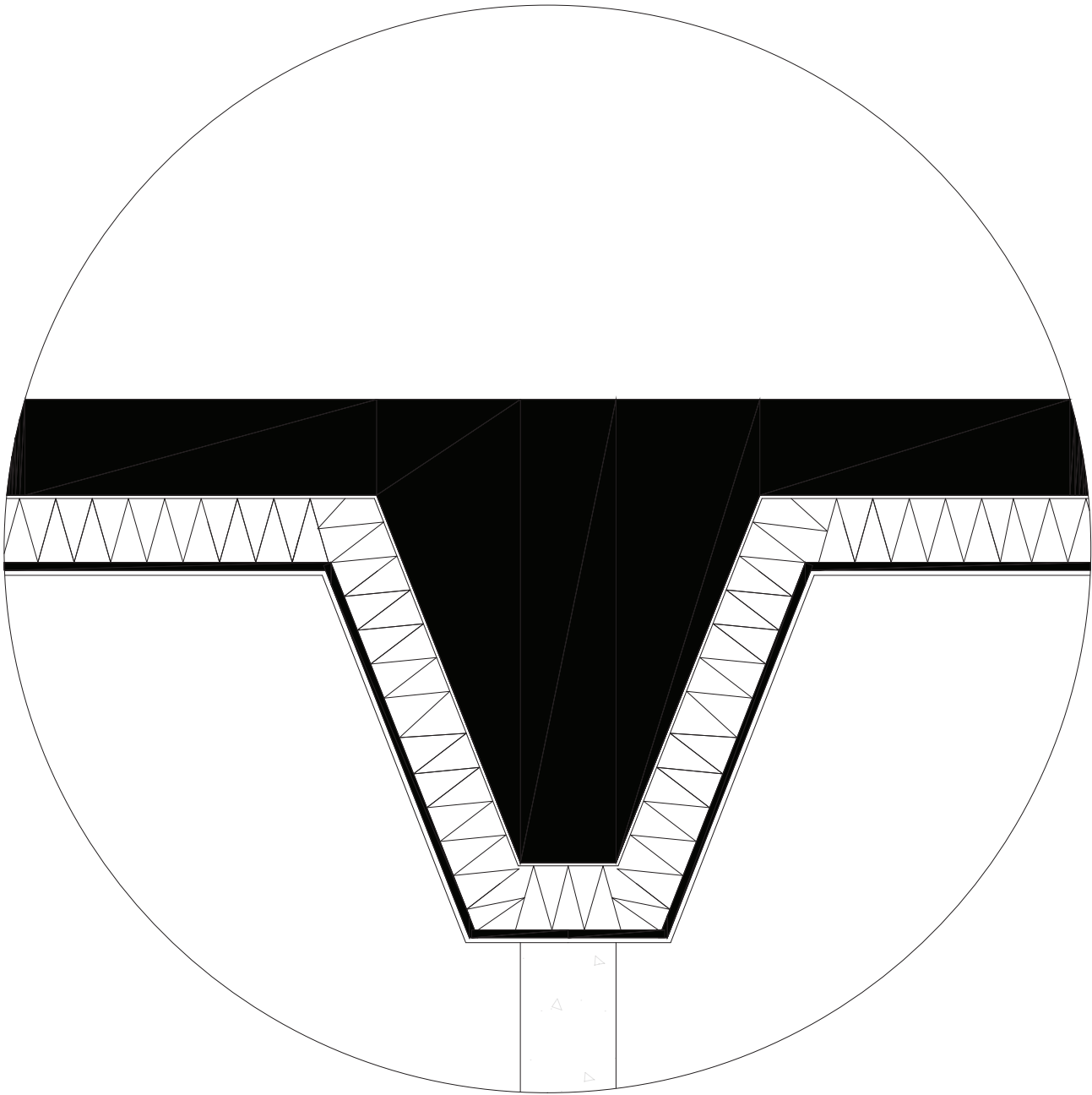


-5C



20C

20C



ROOF-SKYLIGHT STRUCTURE

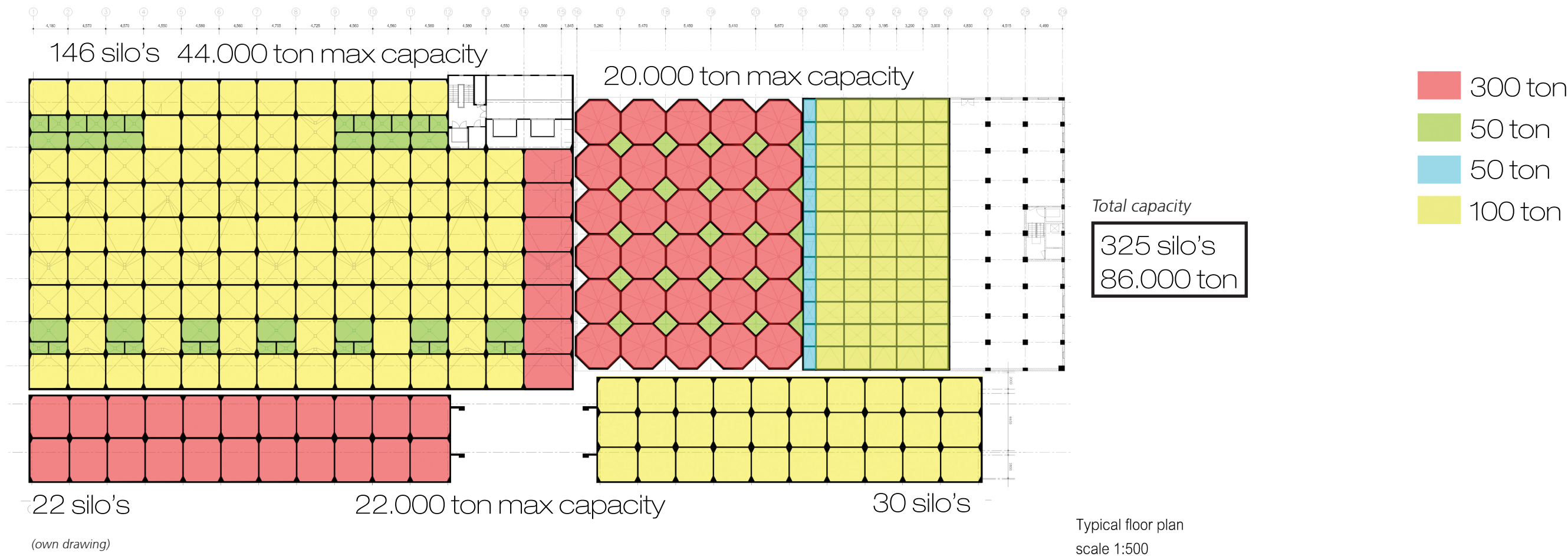


IMPRESSION ROOF/SKYLIGHT

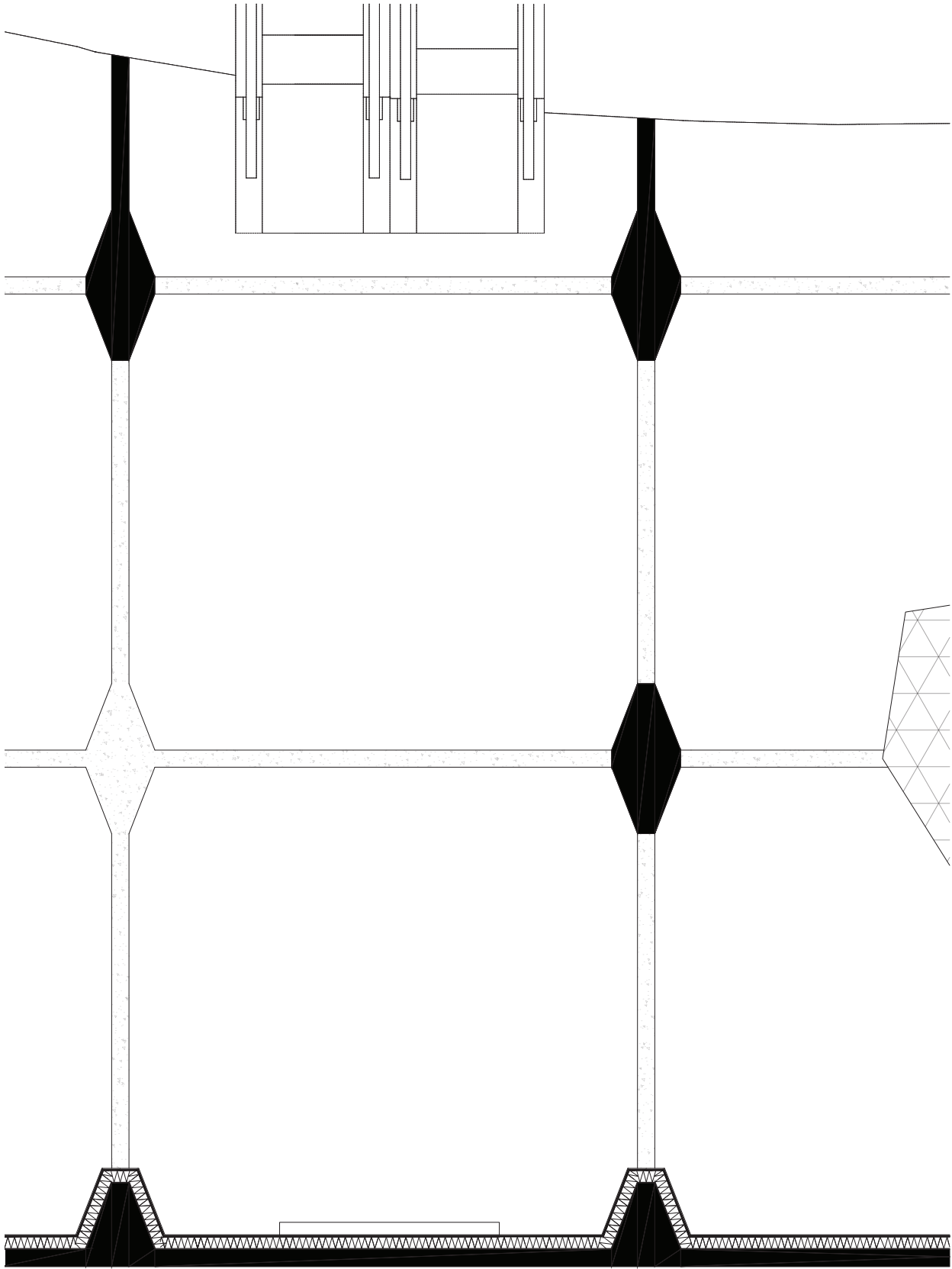
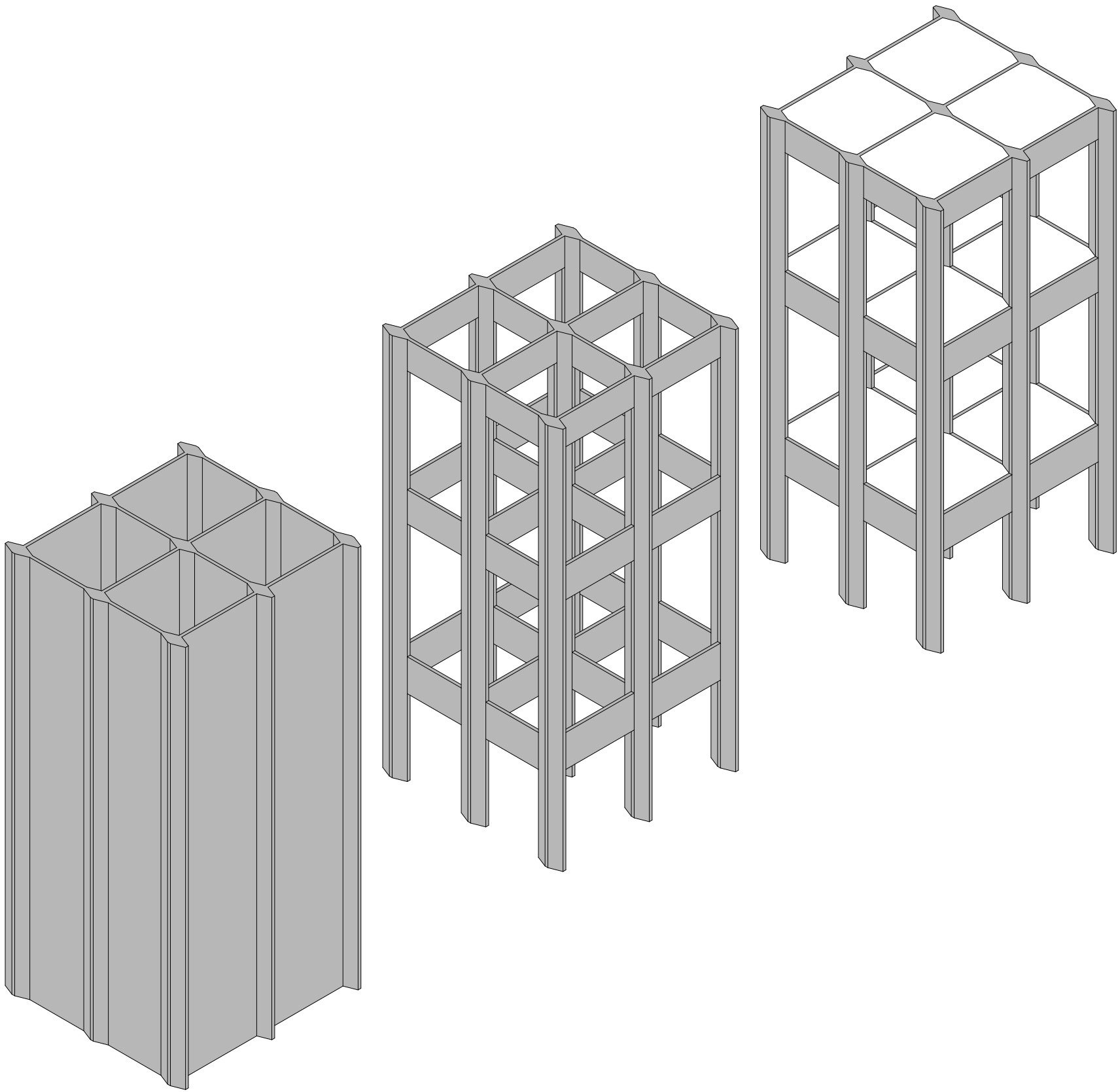


SILO CAPACITIES

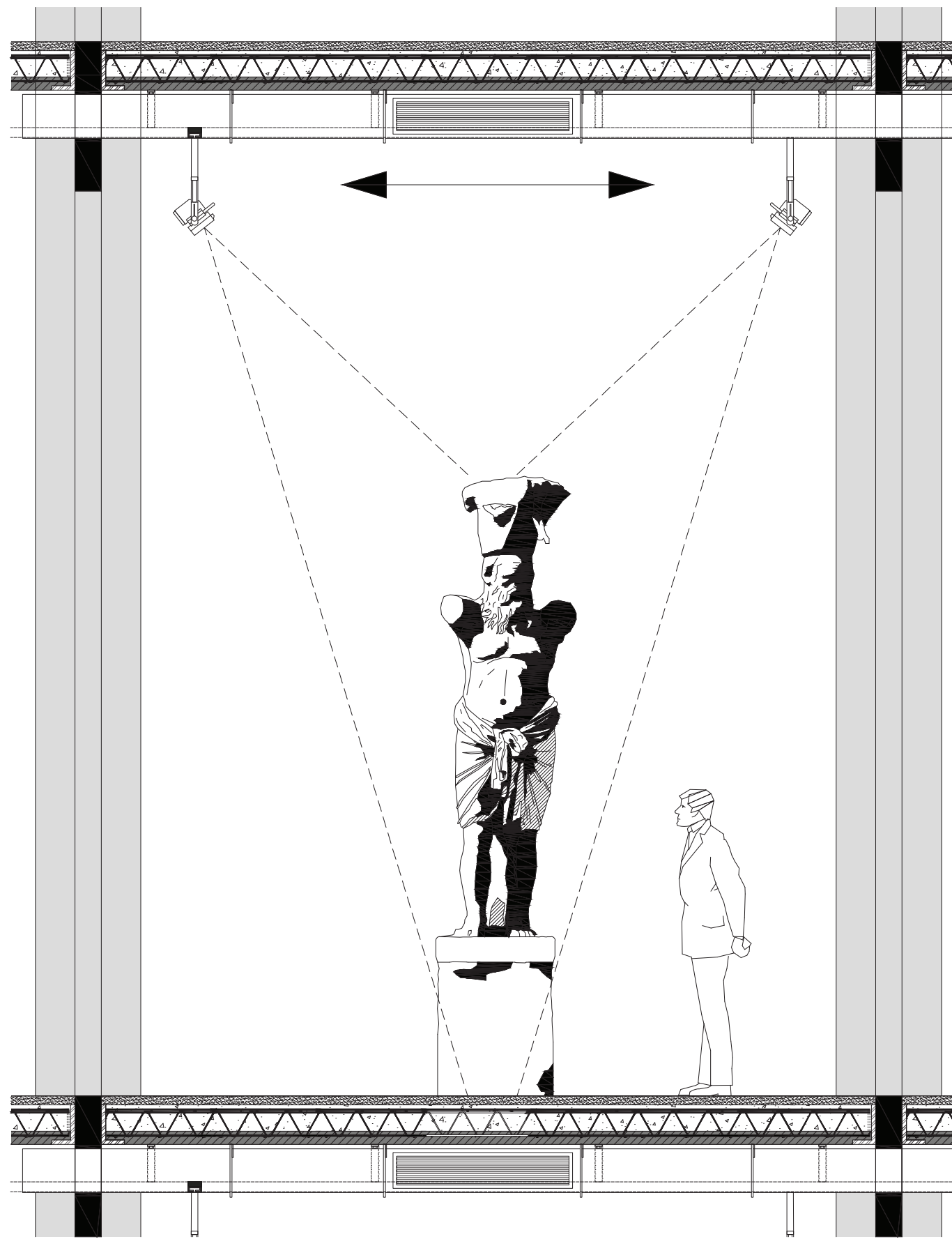
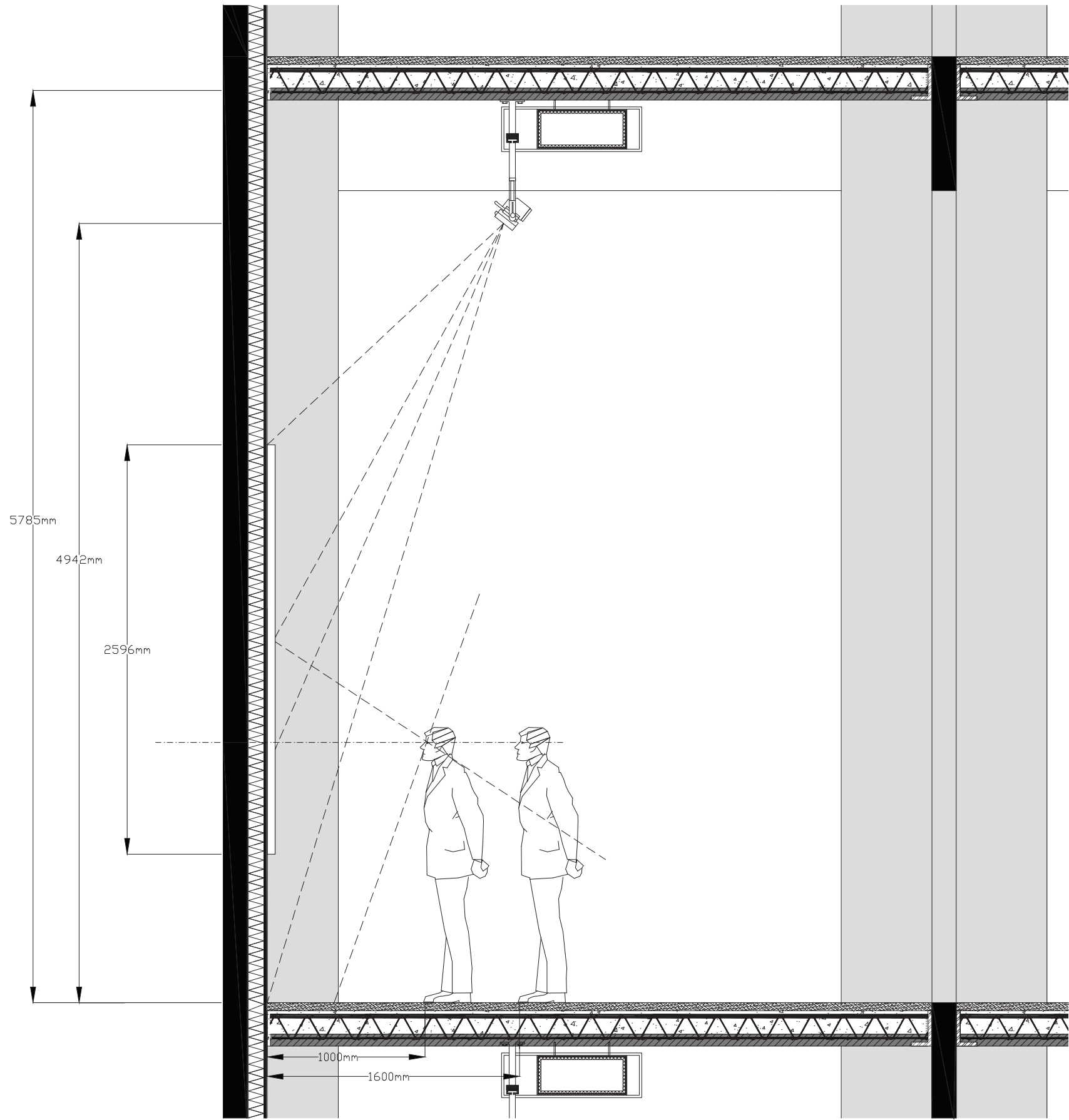
The silo capacities show really well what this structure can handle in terms of loads and also shows with it sheer number of tons how massive this complex really is in terms of cubic meters of space. 86.000.000 KG of grain could be stored in the Maassilo making it Europe's largest grain storage facility when the three phases were completed. To give some kind of scale to that gigantic number, an full grown elephant weighs 6000 KG. So that would mean that the building could possible house 14.333,3 elephants in the building. which could also be translated to housing floors on top of the Maassilo because it is no longer used as a storage.



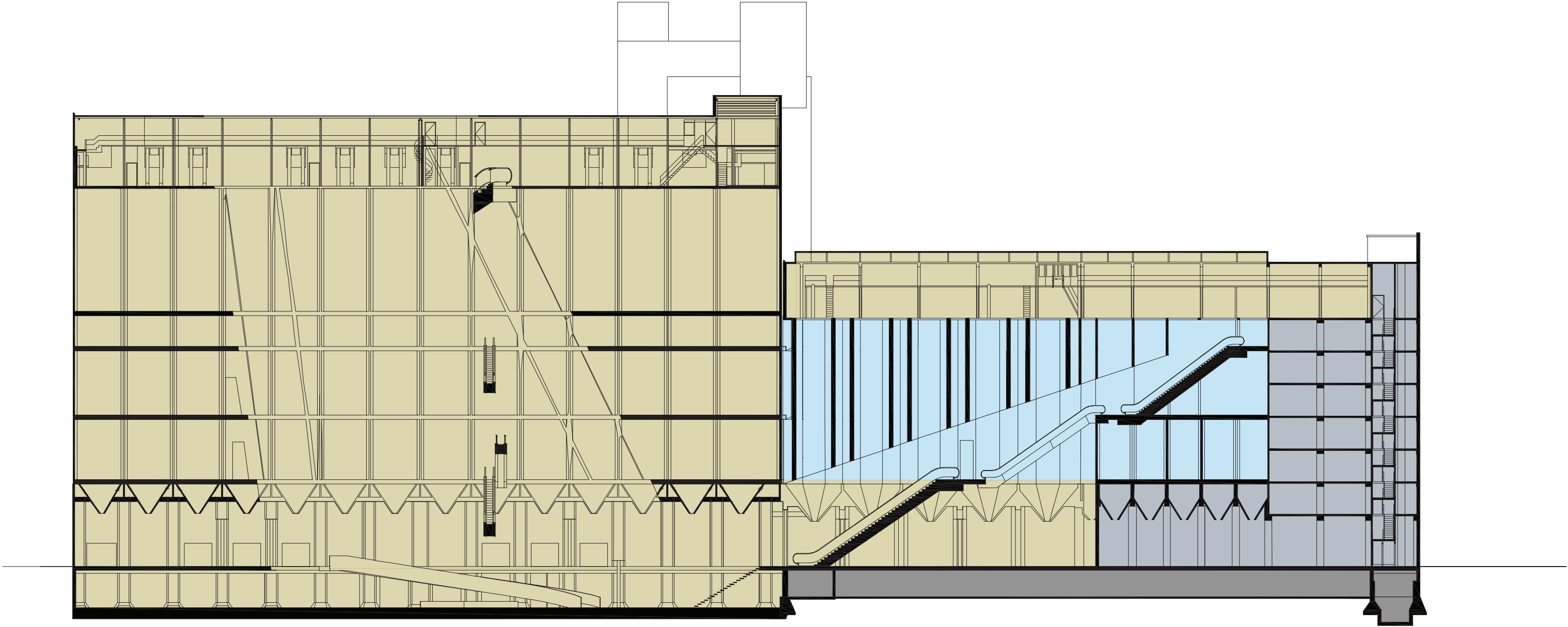
REUSING THE SILO STRUCTURE



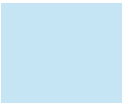
LIGHTING SET UP 1:30



CLIMATE ZONES



zone 1

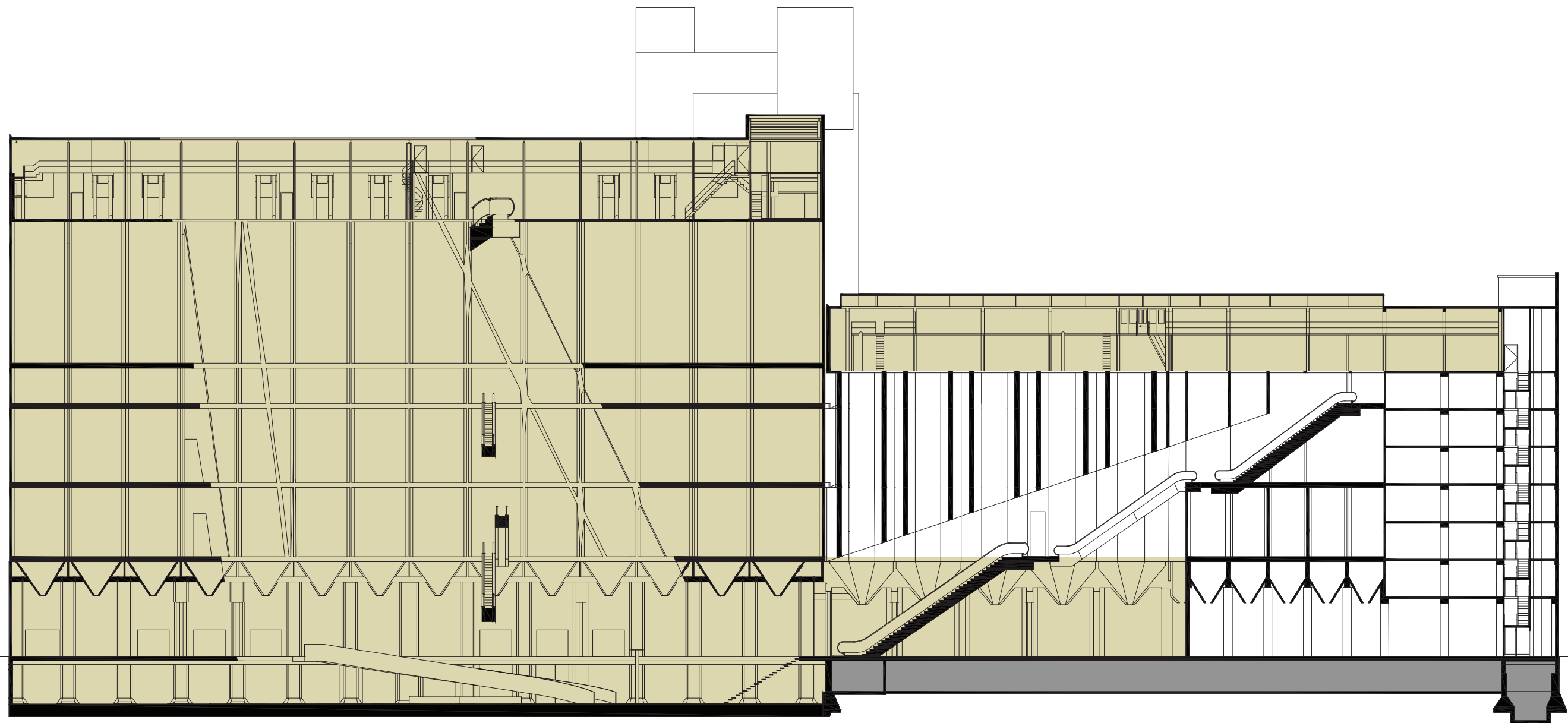


zone 2



zone 3

CLIMATE ZONE 1



zone 1

zone 1

metal (iron, copper, lead, zinc and silver)

temp: min. : 2 C max. : 25 C

RH: <45%

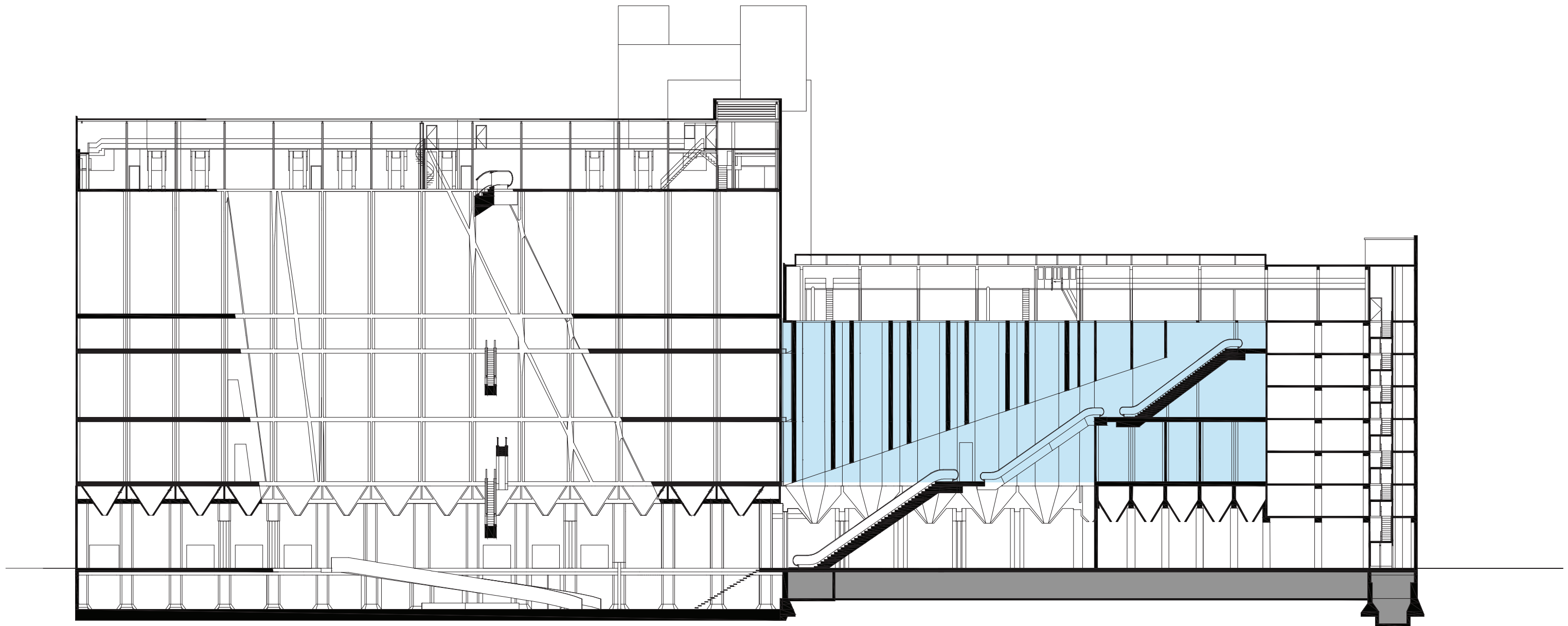
no lumen

sculptures (stone)

temp: min. : 2 C max. : 25 C

RH: <45%

CLIMATE ZONE 2



zone 2



zone 2

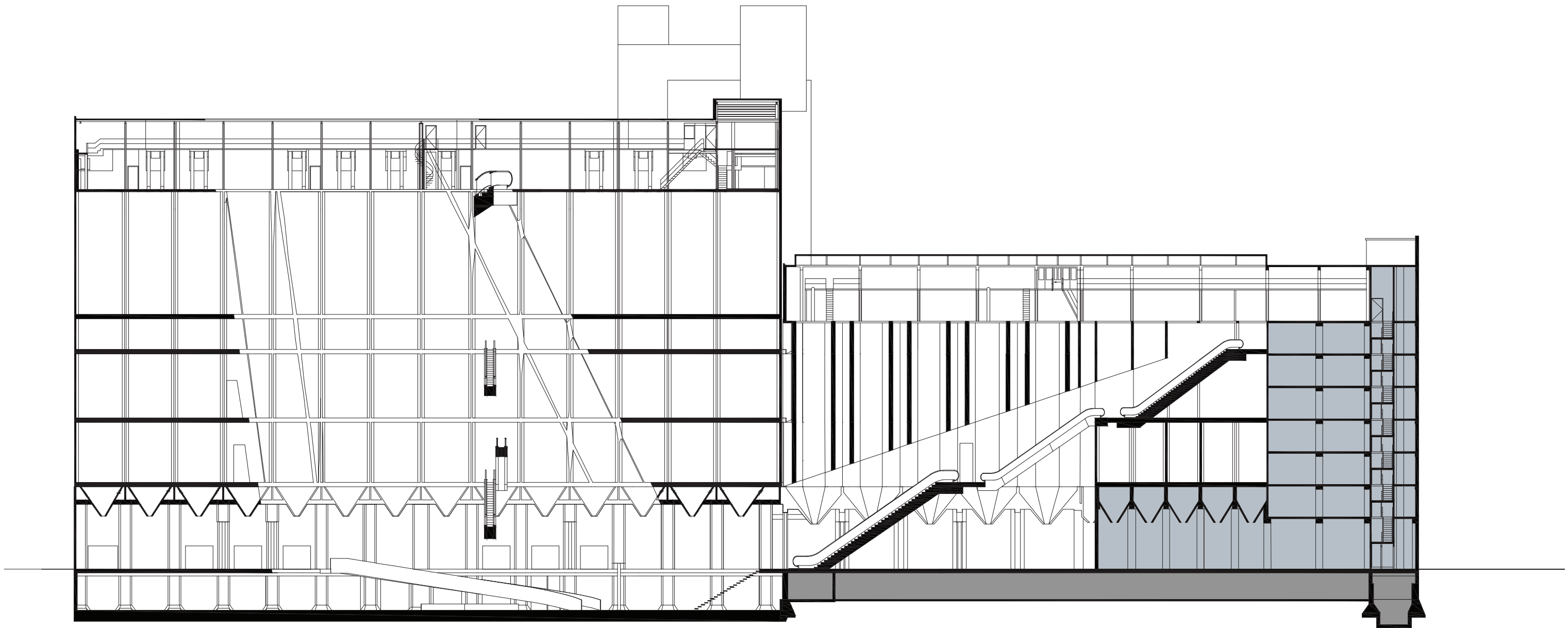
unprocessed leather, wood, painting on canvas, panel painting, chinese lacquer, bone, hornes, pearl, toys, rubber, fossils, skeletons and chalk.

temp: min. : 2 C max. : 25 C

RH: 52+/-3%

max. 150 lux

CLIMATE ZONE 3



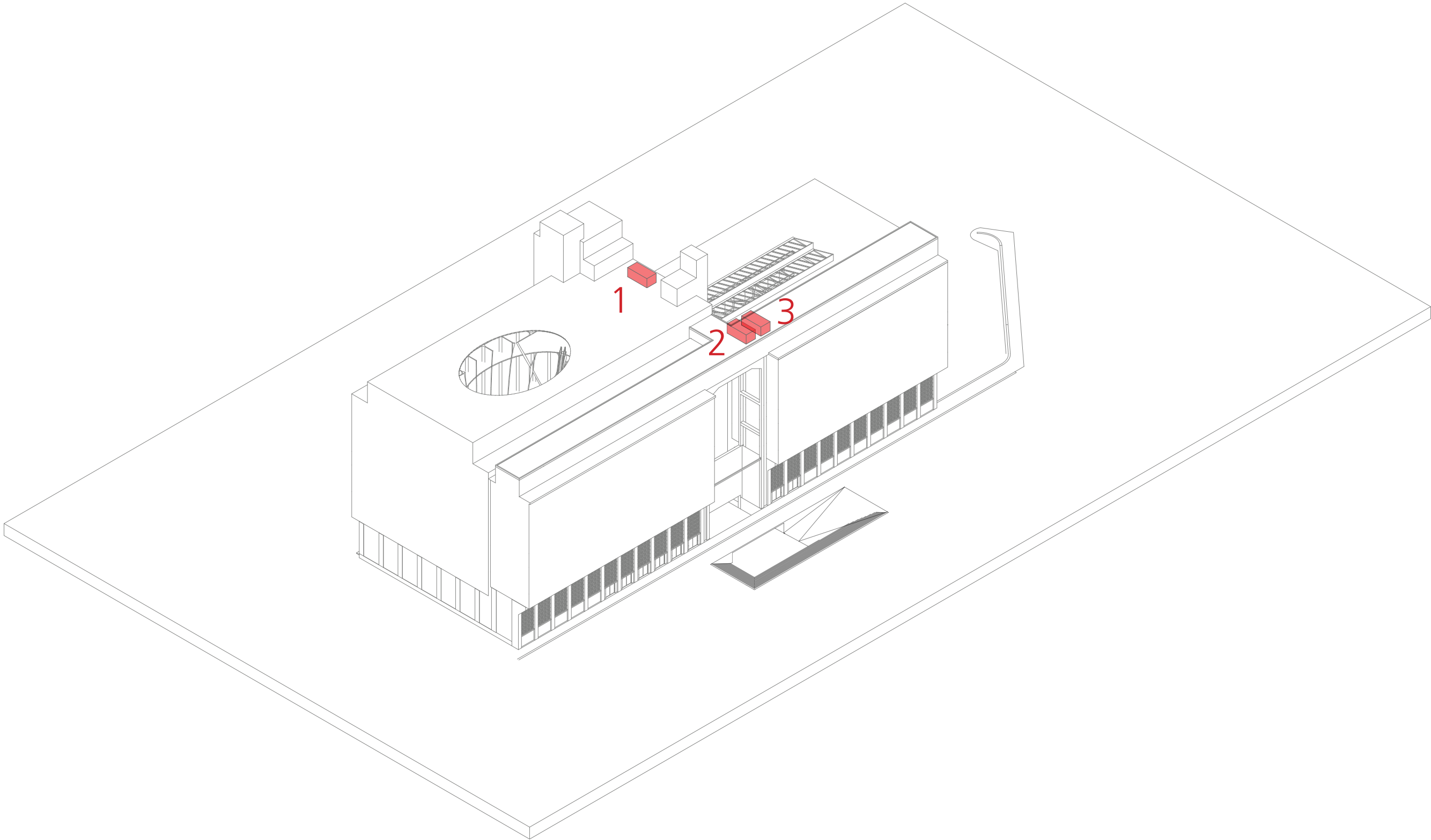
zone 3

office/culture centre
temp: min. : 2 C max. : 25 C
RH: <45%
no lumen

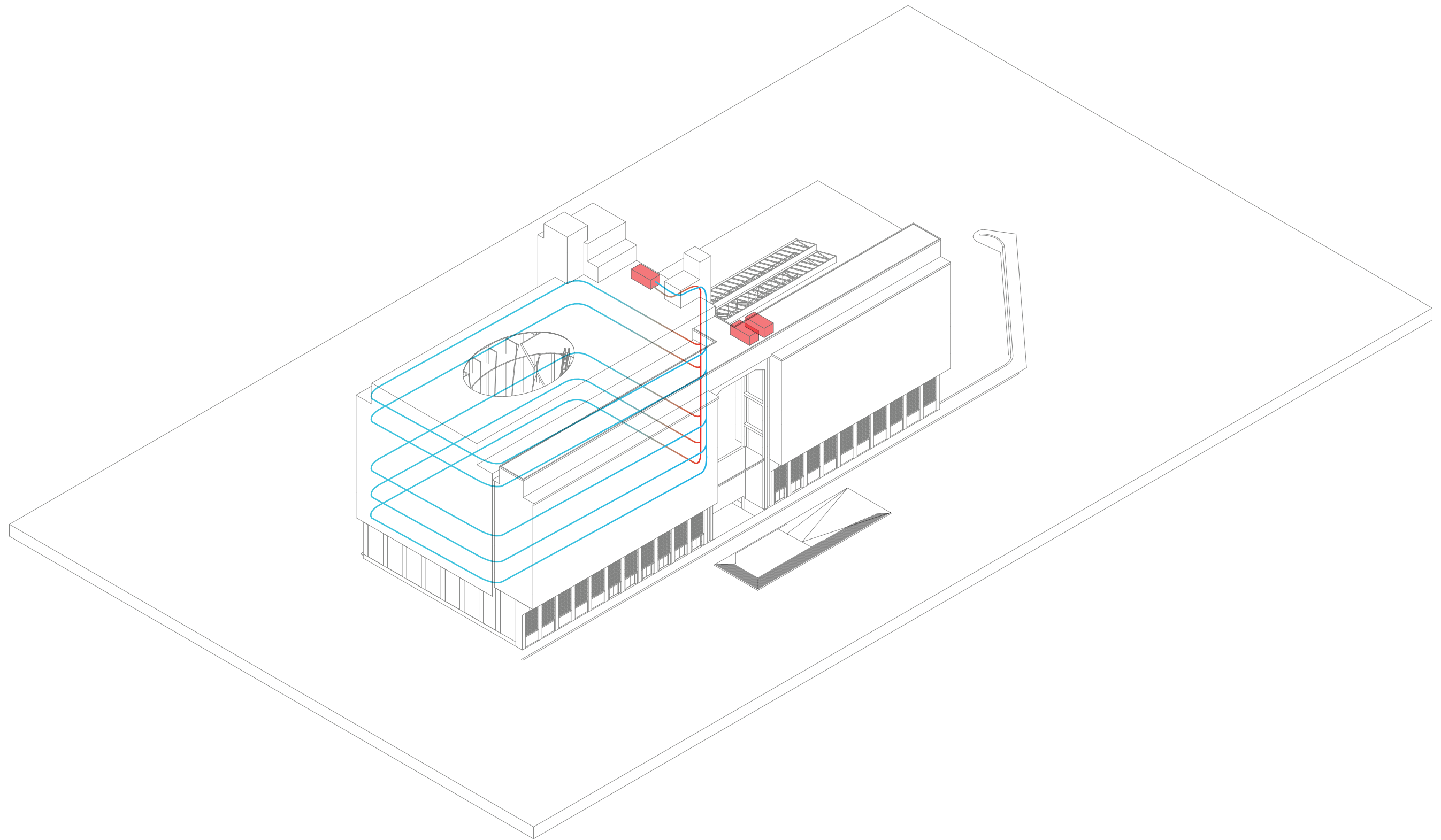


zone 3

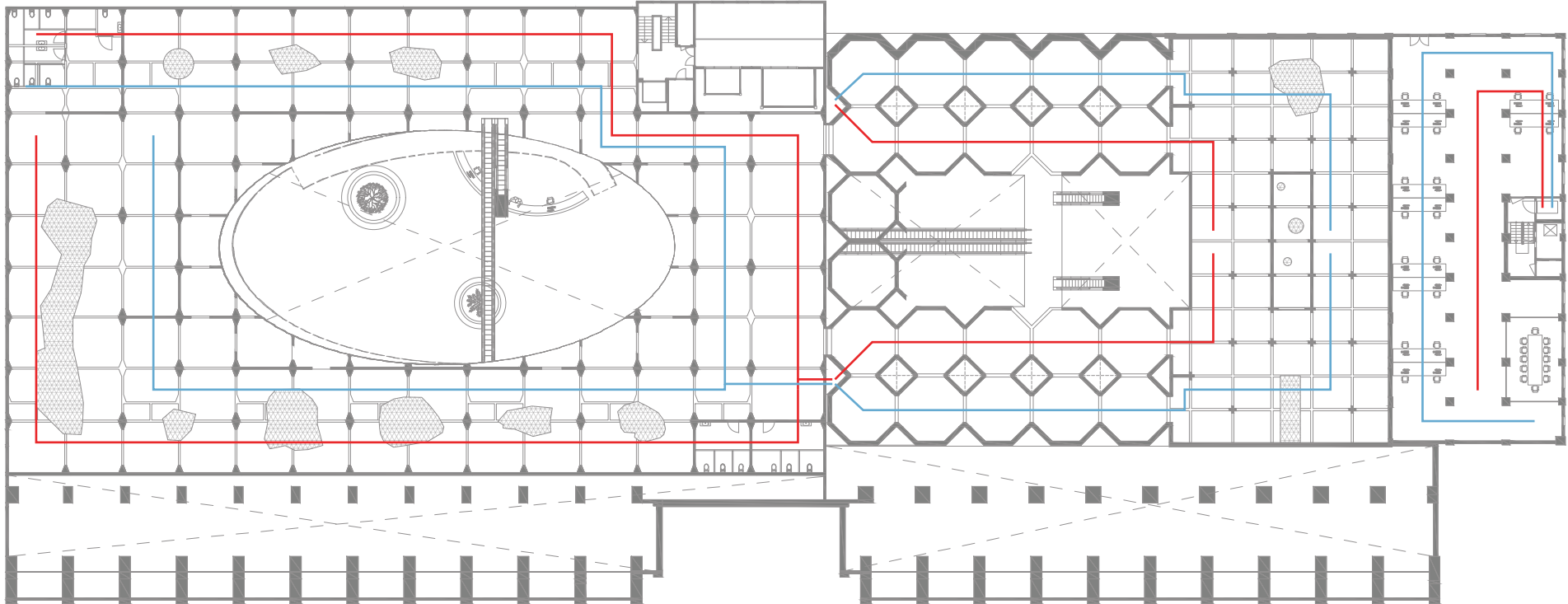
AHV'S VENTILATION UNITS



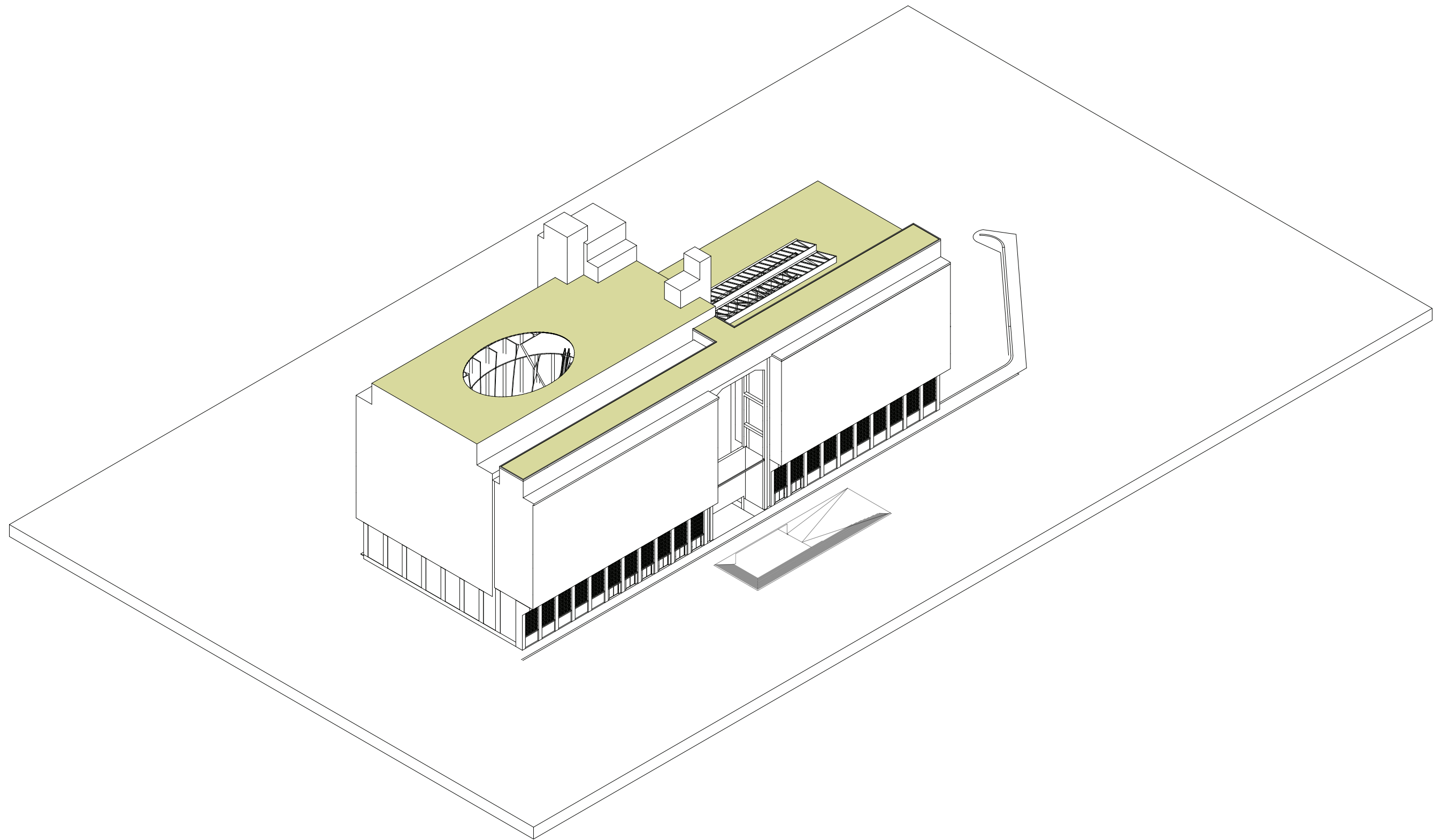
EXAMPLE ZONE 1



VENTILATION EXAMPLE 1E FLOOR



ROOF SURFACE - HEATING SURFACE



SOLAR PANELS

