

# The Maassilo

**Heritage + Architecture**  
Rotterdam Harbour



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### **Heritage + Architecture** ***‘Rotterdam Harbour’***

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**Cover image:** Maassilo-maashaven-rotterdam-spiegeling, by Frans Blok, source: (<http://www.3develop.nl/blog/wp-content/uploads/2018/09/maassilo-maashaven-rotterdam-spiegeling.jpg>)



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# Introduction

Introduction

# Introduction

## Introduction & Methodology

The port of Rotterdam has played an important role in the development of the city itself. More specifically, the existing industrial buildings made this harbor activity possible and encouraged the development of adjacent areas. All these industrial buildings maintained different processing methods concerning often different products. Ultimately, they gained certain pre-set routines. This awakened a certain flow, not only in the buildings themselves, but also in their surroundings: there was this constant flow of people, vehicles and goods that helped the process going on and established themselves in it.

Because this process kept going, certain demands kept growing, which over time led to the growth of the surroundings. One can say that the industrial buildings were designed and worked as pre-set machines in order to keep the industry going. The original purpose of the Maashaven in this, like many other docks in Rotterdam, was to provide suitable loading docks where the maritime industry could flourish. Although these areas have already been subject to a shift in function, some of them are still poised between industry and residential areas. The contemporary bipolar nature of these areas will eventually shift to an exclusion of (maritime) industry.

This was also the case for the former grain silo, now referred to as the Maassilo, which owes its name to the river Meuse (Dutch translation of Maas) that runs through the city in search for the sea. The building is positioned in the armpit of the Maashaven and rests on an infrastructural node in the city. The Maassilo was originally designed for

the process and storage of grain. Now it is being used as an event location, where you can rent different parts of the building for parties, concerts, business gatherings, exhibitions, fashion shows, and so on. In other words, it went from a building designed for a specific industrial function to a building that could house several cultural functions.

In the midst of this changing environment rest more buildings like the Maassilo. Buildings that are originally purposed for industrial activities but now offer a possibility to be transformed into something cultural valuable.

## CONTENT

This booklet, which is a combination of three reports, will analyze the building and will take a position in assessing the cultural values that can be of significance to its transformation. Each report will answer a sub-question which is inherent to the main research question; ***How did the Maassilo transform from an industrial machine to a contemporary cultural platform?***

By answering this question, we hope to get an insight in the original spirit of the building and its valuable elements that contributed to this, but also in how to approach heritage buildings that need to be redeveloped to cultural spots. Furthermore, we can get an overview in what redevelopment adjustments, in our opinion, damaged the original spirit of the Maassilo.





Image by Rodesk, source: (<https://onthegrid.city/rotterdam/zuid/maassilo>)

In order to answer the research question, the analysis has been divided in three parts. Each part contains a conclusion chapter at the end that answers a sub question regarding its overall topic. By doing this, we hope to answer the main research question as accurate as possible.

The topics of the three parts and their sub questions are as following:

1. **Architecture**

How do different architectural and historical layers of the building affect each other, and how do they work together?

2. **Building Technology**

Which building techniques of the Maassilo contribute to its historical and contemporary processes?

3. **Cultural Value Assessment**

How could the DNA of the building be defined and how does it affect the tolerance for change?

## 1. Architectural Analysis

This is the first of the three reports. Through an architectural lens the building will be presented in a complete perspective that is bounded by the subject of stratification. This layering of time and perception will provide the structural underground in understanding the building. When referring to the main research question the building will be analyzed through the comparison of the human body. This unique perspective will offer a cohesive interpretation of the readers view on the building. Comparing it to subjects such as organs, one could easily understand its significance to the building. Furthermore, it forms an addition to the long list of former analyses in a distinctive perspective.

The subjects will be listed in a hierarchical manner, starting with the human body in its totality and proceeding to its skeleton, its organs, its vessels, its skin and finally to a separate but even though inherent subject, its ornaments.

**Body:** The subject of body incorporates the *surroundings* and *site*. The human body relates to its immediate surroundings and forms relations with it. Also, the site where the building is positioned is unique to the building and relates heavily to the appearance and functionality of the building.

**Skeleton:** Like the human skeleton, the *structure* of a building is one of its core elements. Together with the *space plan* of a building it positions every space in a building and forms the layout.

**Organs:** In order to function properly, a human body is in need of its organs. They help provide the body with vital processes that keep one alive. The subject of *services and stuff* addresses these processes. Furthermore, they help function the building, where a building without organs couldn't.

**Vessels:** Inside the human body vessels offer connections between organs to help them operate. The mapping of these (circular) *flows* are necessary to understand the essence of the building. They are the processes that form the identity of the building.

**Skin:** The human *skin* is a permeable barrier and forms an interaction between outside and inside. The *material* and *composition* of the skin are important in this interrelation.

**Ornaments:** Although *ornaments* are not an inherent part of the human body, they are strongly related to the body in presenting its appearance. Ornamentation is important in understanding superficial and subcutaneous layers that provide meaning to its bearer.

## 2. Building Technical Analysis

Although various subjects in the previous analysis have touched the technical area of the building, they have lacked a deeper understanding. This report offers a technical insight in these processes that are of key importance to the building. They will evolve around the important theme of construction. It will be divided into three subjects, respectively the construction, the materiality and the services.

**Construction:** This subject will deal with stability, flows of power, bearing loads and building methods. It will help understand the motives of the former architects and why the building is constructed in such a manner. Furthermore, it provides the reader with a time frame of construction methods available in these time periods and helps them create a perspective on the constructional significance of the building.

**Materiality:** The building is constructed in several materials, all with their own unique and suitable aspects. They form an insight in helping to understand the motives of the architects. This subject will explain why, how and which materials are applied in the building.

**Services:** The last subject of this report will attribute to the previous subject of services and stuff. It forms a technical perspective of several processes that are inherent and unique to this building.

## 3. Cultural Value Assessment

The last report will contribute to a subjective positioning, supported by research and analyses, where the building is dissected into a catalogue of values that will be of help in the coming design process. The assessment will evolve around the theme of transformation. Beginning with a historical interpretation, the building will be positioned in different time periods. Its significance will be stated through argumentation. Furthermore, the matrix will catalogue the different cultural values that are



subject to the building. This forms an underlayer in future design decisions. Because this is a subjective report, it will generate key discussion that are up for debate.

## **RESEARCH METHOD**

This research booklet consists of three individual reports. Their content is explained in the introduction on the previous page. Each report will provide the reader with data, in the form of text, photographs, diagrams and/or drawings. Subsequently this data is analyzed and eventually concluded at the end of each report. We try to analyze every topic in different time layers, which will lead to us being able to set up an overview of the overall development and points of value. The findings in the conclusions and cultural value assessment will help in setting up conditions for the coming design phase.

The information is gathered from primary and secondary sources. Although we created this report in unconventional circumstances, we were not always able to provide it with the best information we could find.

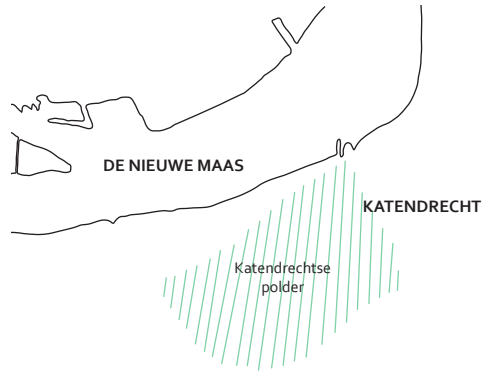
# Historical development

This chapter gives a clear overview over the most important events concerning the historical development of the Maassilo and its area. Furthermore, it will give an elaborated insight in the industrial and architectural influences that played important roles in this development.



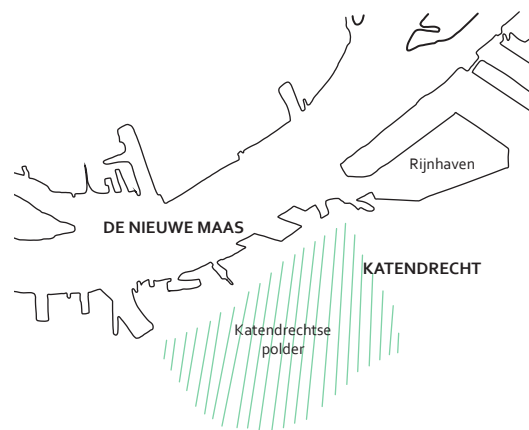
# Historical development

## OVERVIEW: Timeline



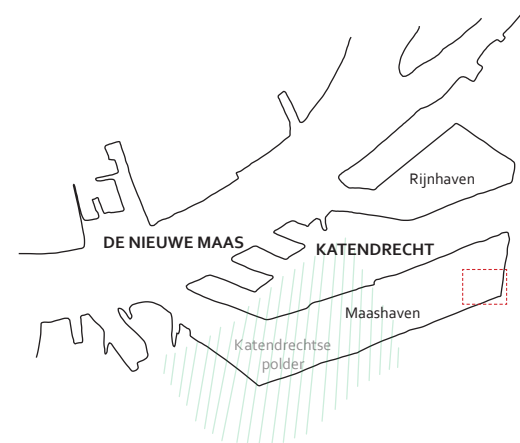
1865

The population along the Nieuwe Maas increased significantly as a result of immigration stimulated by the agricultural crisis. Thinking that there was always work available in ports, many poor families moved here, causing the area to be overcrowded ('Wijkhistorie: Katendrecht', n.d.). As a result, no space was left for the industry and ports to expand further (van Kuilenburg, 2009).



1895

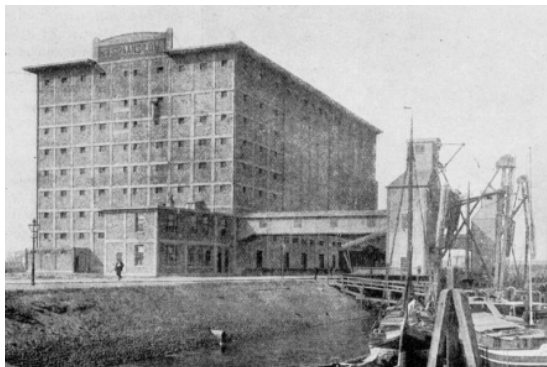
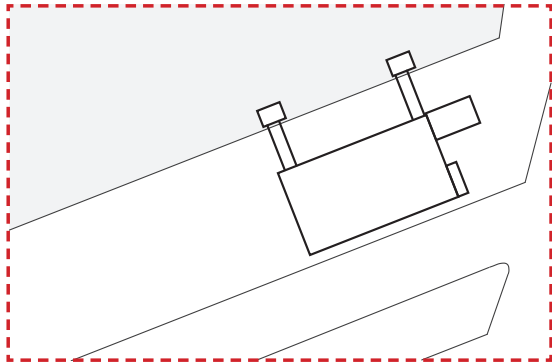
Rotterdam needed new ports, warehouses and dwellings, due to this enormous growth in population (van Meijel, Hinterthur & Bet, 2008). City architect G.J. De Jongh became the director of Municipal Works in Rotterdam in 1880 and developed plans for the construction of new base ports, after which the Rijnhaven started being dug in 1894. Shipping and freight companies set up here after completion of the port (Stichting Historisch Katendrecht, n.d.).



1905

After the Rijnhaven was finished, the Maashaven started being dug in 1898 and was finished in 1905 (van Kuilenburg, 2009). Almost the entire village of Katendrecht and also part of the village of Charlois had to disappear. This includes areas where the Maashaven itself was not dug, because there were areas necessary around the Maashaven to harbor functions for trade and industry, so for industrial buildings, machines, etc. (Stichting Historisch Katendrecht, n.d.). The Afrikaanderwijk was built around 1900 to house dock workers ('Wijkhistorie: Katendrecht', n.d.).

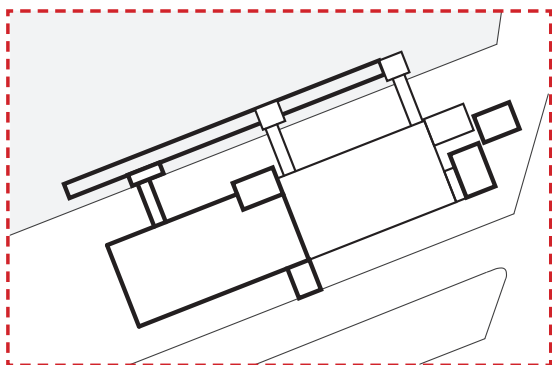
The marked area shows where the future Maassilo will be built.



## 1910

The building permit to build the grain silo was granted in 1906 and, designed by J.P. Stok, was finished in 1910 (Top010, 2013). The building is 60 meters long, 33 meters wide and 30 meters high and has 8 floors. It contains 128 silos, which together have a storage capacity of approximately 20,000 tons (De Kleine Courant N.V., 1911). At the time, the building was one of the largest buildings in Europe realized in reinforced concrete (latinworld.nl). There are also 2 grain elevators on the quay, one of which processes 100 tons of grain per hour and the other 70 tons per hour (De Kleine Courant N.V., 1911).

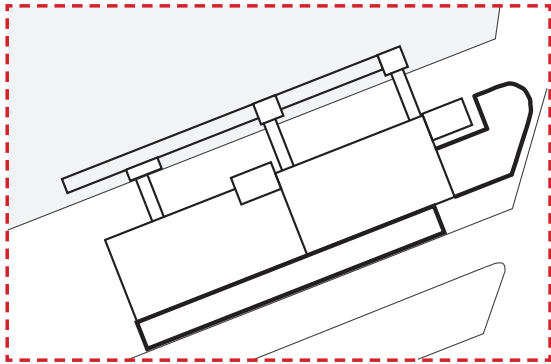
As far as the residential environment is concerned, around this time, behind the large grain silos of the Maashaven a municipal housing complex has been realized for the benefit of the dock workers, the Tarwewijk (Gemeente Rotterdam, 2010).



## 1931

Due to the growing demand in grain storage space, the capacity of the grain silo is increased by expanding the building. This extension was designed by J.A. Brinkman and L.C. van der Vlugt and resulted in a contiguous building of 48 meters high and 146 silos with a combined storage capacity of 44,000 tons (Top010, 2013). This tripled the total storage capacity to approximately 65,000 tons. In addition, a third elevator tower was added, a centrally located transformer house in the southeast of the building and a tower in the northwest of the building, including the stairwell (Bouwkundig Weekblad, 1931).

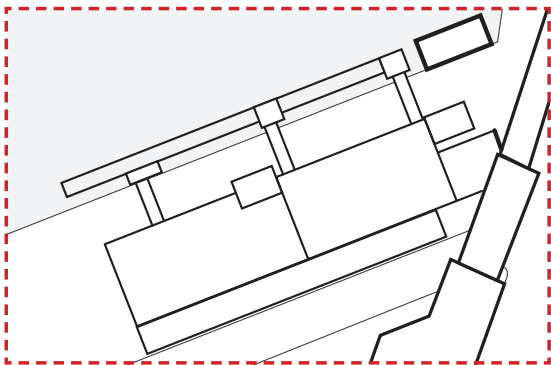
Furthermore, the first canals had now been constructed in Charlois and the first complex buildings on the Katendrechtse Lagedijk (Gemeente Rotterdam, 2010).



## 1951

A third expansion of the grain silo has been designed by A.G. Postma and J.D. Postma, father and son. The design can be described as an elongated building volume placed between the existing parts of the building and the Brielselaan (Blok, 2019). The storage capacity of this part is 22,000 tons, which makes the total storage capacity of the grain silo about 90,000 tons (Top010, 2013).

The district has slowly grown thick and the area was given an important traffic function due to the earlier realization of the Maastunnel in 1940. Furthermore, Dordtselaan and Mijnsheerenlaan were constructed as part of the two green wedges that penetrate deep into the city center. The green edge of the city where the two wedges originate was transformed into the Zuiderpark in the 1960s (Gemeente Rotterdam, 2010).



## 1963

The last on site addition was built in 1963, designed by H. Haan, and was situated on the northeast from the existing complex. This intervention consisted of a officebuilding including two service homes. These service homes would be transformed into offices a few years later (Architectuurgids, n.d.-b).



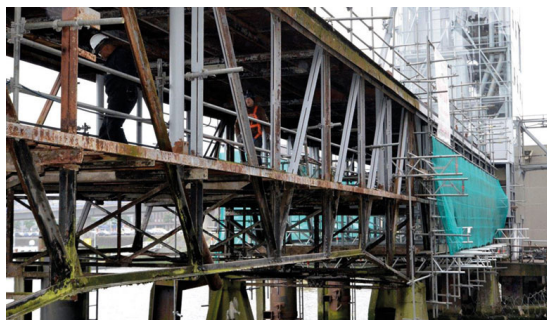


## 2004

The silo proved to be difficult to automate, so the function was moved to an other silo in the Botlek area. The silo was being used for storage until 2003 (Top010, 2013).

After that, the building has been used as an event location since 2004, initially by disco Now&Wow ('Maassilo', n.d.).

During this process of taking in a new function, the silo had to be adapted to this. Since the function of a dancehall required a lot of open space and adequate ventilation for a lot of people, the building's structure was modified and the building was adapted to the requirements of the new function for ventilation, (fire) safety and furnishing (Debets, 2004).



## 2015

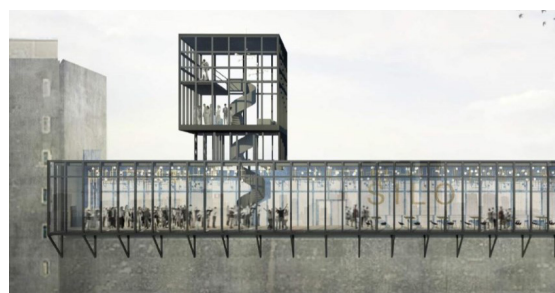
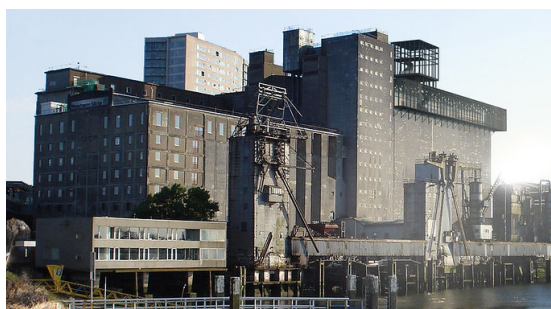
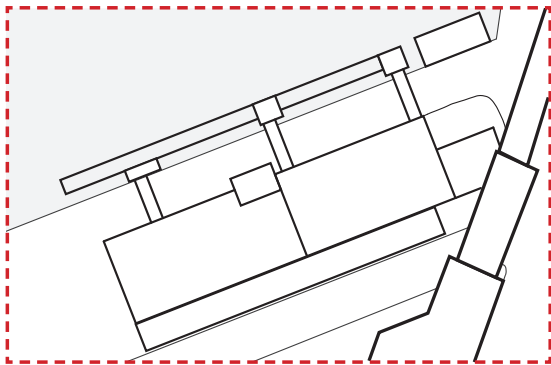
Now&Wow decided to look for another location in 2007, after which the Maassilo continued as an independent event location ('Geschiedenis: Een 100 jaar oude graansilo', n.d.).

In 2015, two of the three grain elevator with their towers, bridges and walking decks were renovated. These elevators are part of the complex and are one of the few remnants of the historical port activities from the last century. This makes them give a valuable contribution to the cultural and industrial heritage of the port of Rotterdam. Refurbishment of the elevators is seen as an eye-catcher in the South, a way to make the Maassilo and surroundings inviting and inspiring again (Stichting RCIEEM, 2015).



The process consisted of the following:  
The inspection of the current construction, cleaning it and removing the rust, recover damages and painting it. Afterwards, a wooden substructure was added for the floor parts in the bridges, decks and





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floors in the towers (Stichting RCIEEM, 2015). The tower was being surrounded by curtain walls and bitumen roofing, bars of balustrades and EWL-installations were added. The glass curtain walls were chosen to enhance the appearance of the elevators. any other material would have caused the unique and distinctive construction to become hidden and forgotten (Meppelink, 2015).

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## Present day

The Maassilo still continued as an independent event location. In addition to the entrance with a wardrobe and first aid room, the Maassilo, with the 'Factory 010' and 'Creative Meetings & Events', has fifteen halls/rooms that can be rented individually or in combination ('Geschiedenis: Een 100 jaar oude graansilo', n.d.).

The Spatial Plan Rotterdam Region 2020 (RR 2020) covers the territory of all municipalities affiliated with the Rotterdam City Region. It concerns a strategic spatial development program for the Rotterdam region for the period from 2005 to 2020. The RR 2020 has been drawn up by the Province and the urban region and it contains an implementation-oriented Regional Structure Plan for the urban region of Rotterdam (Gemeente Rotterdam, 2010).

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## Future plans

A project is currently under development that concerns an addition to the roof of the second extension of the grain silo of Brinkman and Van der Vlugt. This is a design for a sky bar that has won first prize in October 2018 for the design competition of the roof of the Maassilo, called 'Je kan het dak op!', that the Municipality of Rotterdam launched. On March 6, 2019, the design was being discussed in the committee for wealth in Rotterdam (Top010, 2019).

An addition of high-quality public space to the Maashaven is currently under development. This addition includes a tidal park that consists of the construction of a park

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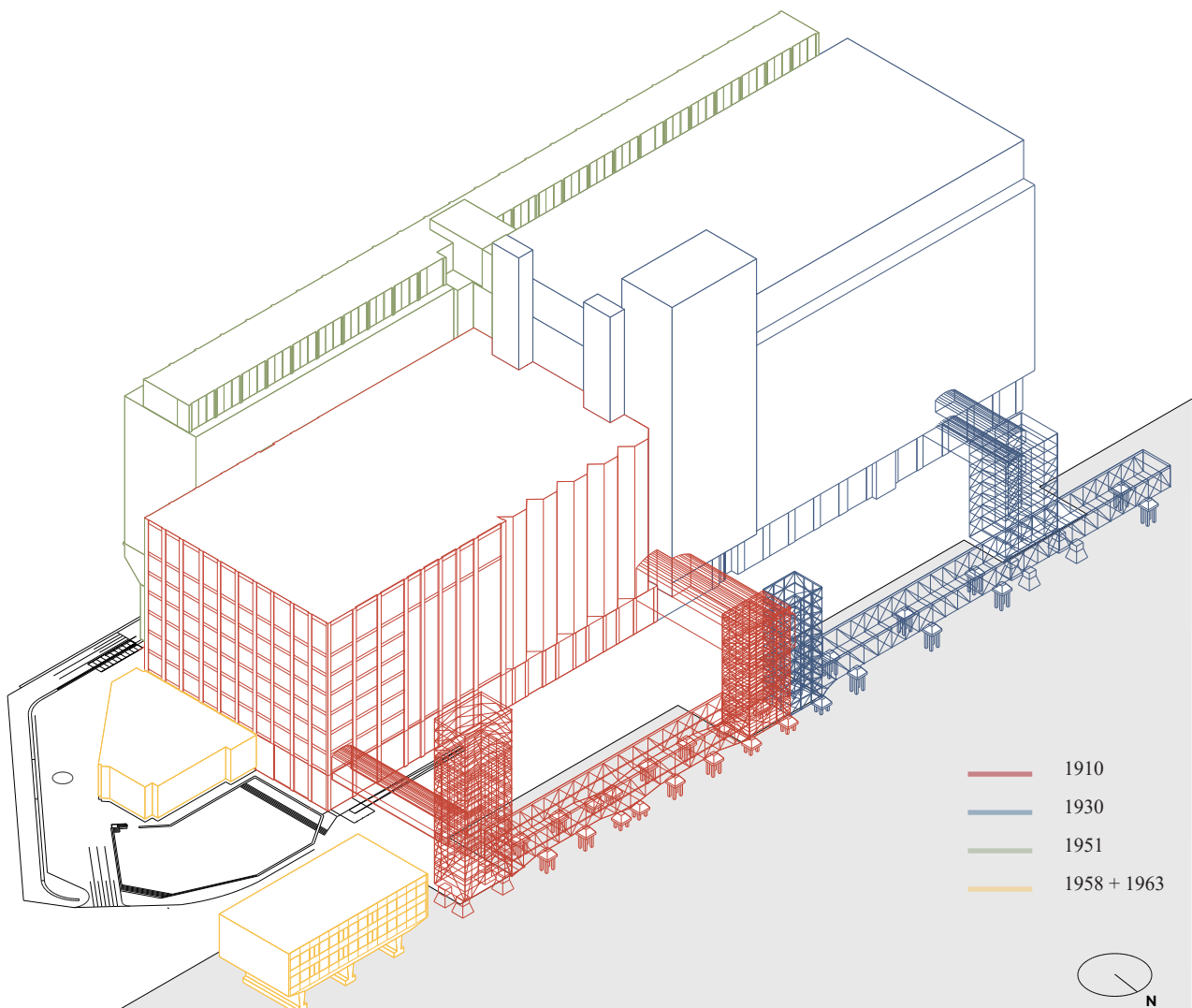
in the water with nature-friendly banks. This will add public space, natural values and the perception of the tide, and the city will again be nicely connected to the port.

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The intended implementation for this idea is between 2018 and 2022 (Gemeente Rotterdam, 2018).

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Chronological building phases of the Maassilo 1910-1963

# Historical development

BUILDING PHASES: Phase 1 (1910) and its architect



The building permit to build the grain silo was granted in 1906 and was finished in 1910. The silo was designed by J.P. Stok (1862 - 1943), a Dutch architect practicing from 1886 to 1917 (Top010, 2016).

Stok grew up in a family of architects. His father as well as his brother were architects. He studied at the Academy for Visual Arts and Technical Sciences from 1876 to 1882. After this he continued his studies at the Academy des Beaux-Arts in Brussels (1882 - 1884) and the Polytechnic School in Delft (1885 - 1886) ('Jacobus Pieter Stok', n.d.).

In his active period Stok realized about 40 officebuildings and warehouses, from which many of them were destroyed because of the bombardment in 1940 during WWII (Top010, 2016). Still, he could be seen as an important architect who has made an essential contribution to the cityscape of Rotterdam from before 1940.

A development could be traced in his works that was exemplary for the Dutch architecture of that time. Around the end of the 19th century, Dutch architects were looking for a national architectural style ('Neo-Renaissance', n.d.). This resulted in a style that reverted to the motifs of Renaissance architecture, neo-Renaissance. A few characteristics of this style are: stepped gables, horizontal lines that divide the facade into planes, cross frames, natural stone facades, impressive roofs, etc. ('Neorenaissance', n.d.).

During the period of this architecture style, Stok designed a building for the firm Laming & Sons, which was his first major independent work in 1888. It was a complex assignment for an office and home, integrated



Hulstkampbuilding, (Architectuurgids, n.d.-c).



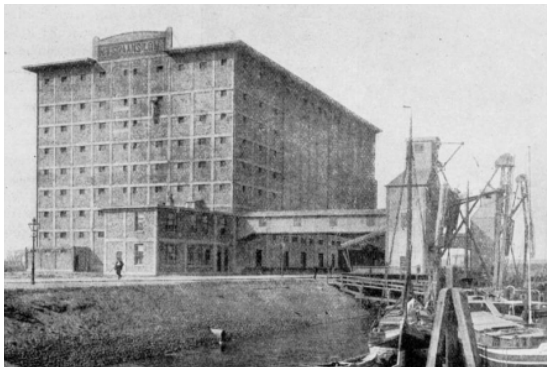
Warehouse Santos in Rotterdam, (Rijksmonumenten, n.d.)

with large-scale production and storage areas. The building ultimately turned out to be one of the most famous and iconic buildings in Rotterdam from the pre-war period (Crimson, 2016).

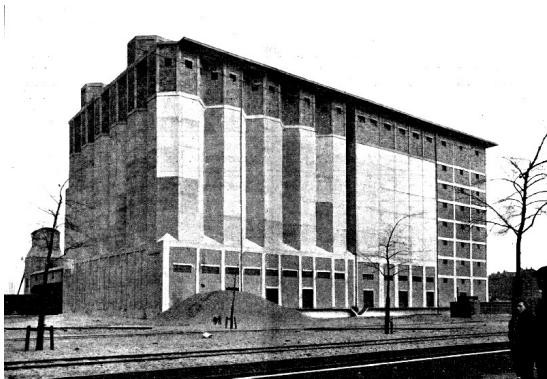
The building was finished in 1889 and, obviously, designed in the neo-Renaissance style. The front facade shows a clear division, with the middle part being symmetrical and is made out of a combination of brick and natural stone. This combination of red brick and natural stone is a typical characteristic of the Dutch neo-Renaissance style architecture. An other typical characteristic are horizontal, white lines in the facades, which is clearly visible in the Hulstkamp building (Crimson, 2016).

In particular, the designs from the early beginnings of J.P. Stok are characterized by a combination of architectural styles, using elements from classicism, gothic and renaissance. As previously described, in his design for Laming & Sons, Stok mainly reverts to the elements of Renaissance architecture. From 1895 onwards, a style change was noticeable in which the architect abandoned his often applied Neo-Renaissance architecture and experimented more and more with the application of floral and other natural motifs, clearly inspired by the international Jugendstil style movement. At the same time, he was also challenged by the modern developments in American architecture, which were mostly characterized by a robust and simple reinterpretation of the Romanesque language of form, the use of materials such as concrete and iron and the construction of buildings in high-rise buildings (Crimson, 2016). The interest American architecture grew during this period, because of their advanced building techniques. This advancement was highly needed, since Since the harbor as well as the city of Rotterdam underwent an enormous growth due to the industrial revolution and thus asked for an architectural solution to speed up building processes while simultaneously using materials in a cost-efficient manner.





De graansilo van Stok, (Bouwkundig Weekblad, 1911)



De graansilo van Stok, (Bouwkundig Weekblad, 1911).

Elements of the previously explained foreign influences can be found in the design he made of the Santos warehouse, commissioned by N.V. Blauwhoedenveem (1901, in collaboration with J.J. Kanters). This warehouse was a clear example of the eclectic style, which is characterized by the combination of different (foreign) styles. Compared to the Hulstkamp building, the Santos warehouse has a more sober facades with ornaments that were less refined.

Architects started to slowly adapt the idea of the form of a building being expressive to its structural and functional logic, rather than a decorative style. This principle is clearly visible in the first part of the grain silo of 1910 that was designed by Stok.

The form of the grain silo explicitly expressed its functionality. Its visible in the facade that no distinction is made between the structure of the building and its skin. You can say that the building is the structure.

The building is 60 meters long, 33 meters wide and 30 meters high and has 8 floors. It contains 128 silos, which together have a storage capacity of approximately 20,000 tons . The building is composed of reinforced concrete for which 900.000 KG of steel has been used (De Kleine Courant N.V., 1911). At the time, the building was one of the largest buildings in Europe realized in reinforced concrete (Top010, 2013).

Of the total of 128 silo's, 30 of them have a storage capacity of 300 tons, 60 of them have a capacity of 100 tons, 20 of them 60 tons, 12 of 50 tons and 6 of them have a slightly smaller capacity. There are also 2 grain elevators on the quay, one of which processes 100 tons of grain per hour and the other 70 tons per hour. Furthermore, there are machines that clean the grain from stones, sorting machines, a cooling room and grinding machines (De Kleine Courant, 1911). Everything that was needed for fast process was present.



# Historical development

BUILDING PHASES: Phase 2 (1931) and its architects



In 1919 the Rotterdam Grain Silo Company was taken over by the International Control Company (ICM) and the Grain Elevator Company. Due to the growing demand in grain storage space, the silo building of Stok needed to be expanded. This expansion was decided shortly after takeover of the Rotterdam Grain Silo Company.

The extension was designed by J.A. Brinkman (1902 - 1949) and L.C. van der Vlugt (1894 - 1936). The firm of this duo was called Brinkman & Van der Vlugt from 1925 to 1936 and they were considered very important because of their works in the style of 'Het Nieuwe Bouwen' (Het Nieuwe Instituut, 2000).

Light, air and space were important qualities for the architects of 'Het Nieuwe Bouwen'. They strived for a healthy living environment, with fresh air and sunlight for the residents and users of their buildings. The function of a building and the needs of the residents were considered more important by these architects than the monumentality of a building.

Efficient, hygienic buildings were designed with modern techniques and materials such as concrete and steel structures. Functional floor plans with freely divisible spaces gave the buildings an open, airy impression ('Het Nieuwe Bouwen', n.d.).

The firm actually started with the father of J.A. Brinkman, who unexpectedly passed away in 1925. Van der Vlugt was then asked to be his successor, since his son was still studying civil engineering in Delft. Brinkman then temporarily quit his studies to work for the firm along with Van der Vlugt (Het Nieuwe Instituut, 2000).

Van der Vlugt studied, from age 16 to 21, at the Academy of Visual Arts and Technical Sciences in Rotterdam. Here he



MTS in Groningen, (Brockhuizen, 2014).



First expansion grain silo, (Bruinsma et al., 2017)



First expansion grain silo, (Pinterest, n.d.)

was taught by the Rotterdam architect Willem Kromhout, with whom he also worked for a short time after his studies. After the age of 21 he attended lectures at the Technical College in Delft. In 1919, at the age of 25, Van der Vlugt started his own architectural firm. Five years later, in 1920, he became a member of the architects association called 'de Opbouw' where he met J.A. Brinman's father, M. Brinkman. A few years later in 1923 Van Der Vlugt realized, together with constructor J. Wiebenga, the first built example of the architecture style 'Het Nieuwe Bouwen' in the Netherlands, namely the MTS in Groningen and joined the firm of Brinkman two years later.

J.A. Brinkman temporarily quit his studies at age 22 to take his place in the architecture firm of his father. He did not do much of the designing work, this was more in the hands of Van der Vlugt. Brinkman was mostly occupied with maintaining contacts with all the clients and was more involved in the organizational and technical matters. He went back to his studies and graduated six years later, in 1931, after realizing the second building of the grain silo (Top010, 2014).

The design of the extension of the grain silo took up the challenge to be the largest possible silo building on the available site, without extraordinary expensive constructions (Top010, 2013). This resulted in a contiguous building of 48 meters high and it consisted of 146 silos with a combined storage capacity of 44,000 tons. The processing speed of this new grain silo is 1600 tons per hour (Top010, 2013). This tripled the total storage capacity to approximately 65,000 tons.

On the northeast side inside the building an almost 60 meter high elevator tower, is realized, which contains the stairwell, the lifts and two vertical pipe shafts. The construction of this fourteen-level tower only took 29 working days, because of the sliding framework method (Top010, 2013). In addition, a third elevator tower was added on the quay as well as a centrally located transformer house in the southeast of the building (Bouwkundig Weekblad, 1931).

# Historical development

BUILDING PHASES: Phase 3 (1951) and its architects



A third expansion of the grain silo has been designed by A.G. Postma (1917 - 2001) and J.D. Postma (1890 - 1962), father and son.

J.D. Postma attended the HBS in Leeuwarden and left school after the third grade, after which he was apprenticed to a carpenter in Apeldoorn. In 1908 Postma joined 'Landsgebouwen' in Apeldoorn and was also an auditor at the Delft University of Technology for four years. He then worked with the architects J.J., M.A. and J. van Nieukerken in The Hague.

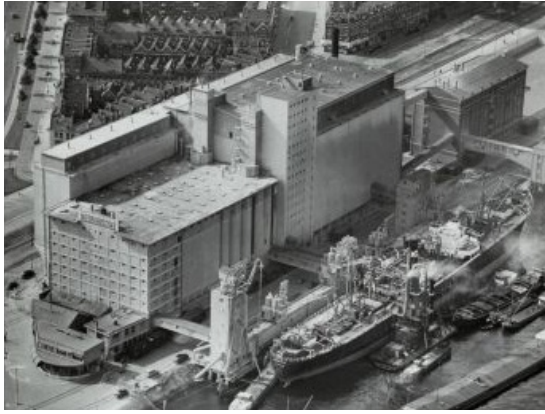
Until the 1950s, the Van Nieukerken bureau worked in a distinctly conservative style. Postma was trained in the spirit of J.J. van Nieukerken, who believed that handicraft was the best school in practice (Het Nieuwe Instituut, 2000c).



Villa E. Kluwer in Epse, (SVWMAKELAARS, 2019).

J.D. Postma started his own architectural office in 1919 in Deventer. He specialized in the design of factory and office buildings and developed extensive knowledge of new construction methods and materials. He had good business insight, which enabled him to acquire a large customer base nationwide. He built offices for various companies and worked abroad, for instance, in Germany, Belgium, France and Ireland. Partly thanks to his contacts with industrialists, Postma developed a second specialism, namely the design of country houses. A fine example is the thatched manor that he designed for his brother-in-law in Epse (Het Nieuwe Instituut, 2000c).

Postma had a large production of often technically innovative buildings. Architecturally he showed himself to be a craftsman with a sense of proportions and balanced spatial structures, but he did not



Second expansion grain silo, ('Geschiedenis: Een 100 jaar oude graansilo', n.d.)



Second expansion grain silo, (Bruinsma et al., 2017).

develop his own distinct style. He followed the mainstream movements, such as the Amsterdam School, the Art Deco, the English country house style and the Gooise country house style. He designed factory buildings in the Interbellum in the style of The Hague School, which is a business variant of the Amsterdam School.

In the 1930s and 1950s, the Delft School also influenced his work. Postma adapted the style and form language to the building type. For example, he chose the sober style of Haagsche School for the production buildings of factories and was inspired by the more representative style of Delft School in the office buildings of electricity companies. In the 1950s, Postma worked in the typical reconstruction form language: sober brick construction with concrete roof frames and concrete frames around the windows and doors, combined with references to classical architecture. (Het Nieuwe Instituut, 2000c)

W. Knuttel emphasized Postma's technical and organizational qualities in his obituary: 'His floor plans, which show an empathy for the company in question, are always beautiful, the daring, often new construction methods and the carefully finished interior and facades. He was blessed with a strong body and a sharp, fast mind, an indomitable work ethic, thoroughness and indestructible optimism.' This work ethic he wrote about is evident from the number of buildings he designed, which is over 1500 in total.

A.G. Postma joined his father's office on August 15, 1939 and two years later, in 1941 the new Postma & Van Kempen office was founded in Amsterdam. This new location was necessary in order to improve contact with clients in the west of the country. On August 1 in 1950, J.D. Postma's other son, J.D. Postma jr., joined the office as well, after which they designed the second expansion of the grain silo (Het Nieuwe Instituut, 2000c).

The design of this expansion can be described as an elongated building volume of almost 40 meters high placed between





Decorative grid on the southeast facade, (van Apeldoorn, 2017).

the existing parts of the building and the Brielselaan (3develop.nl). The expansion was adjusted to the footprint of the former transformer from the first expansion on the southeast of the building.

The storage capacity of this third part is 22,000 tons, which makes the total capacity of the grain silo about 90,000 tons (Top010, 2013).

The facade on the side of the Brielselaan contains a decorative concrete grid that gives the complex a transparent appearance. Due to this transparent element, the third extension is quickly referred to as “The Garden” (Stichting RCIEEM, 2015).



# Historical development

BUILDING PHASES: Phase 4 (1963) and its architect



The last on site addition of the complex of the grain silo was built in 1963 and designed by H. Haan (1914 - 1996).

After not finishing several studies, including the craft school and the HBS, Haan follows two years of education at the MTS in Groningen. In this previously named building by Van der Vlugt and Wiebenga, he is confronted early on with the idiom of 'Het Nieuwe Bouwen'. Around 1932, Haan joined the Groningen architect Egbert Reitsma (Het Nieuwe Instituut, 2000b).

After spending six months as a graphic drawer at the cartography department of British Petroleum, Haan gets his first serious assignments as a private architect. He moves to Rotterdam in 1940 and joins the architect/contractor Ph. Kanter, where he collaborates on a number of projects. A year later, in 1941, Haan enrolled himself at the Amsterdam Academy of Architecture. Here he was taught by Willem van Tijen, among others, who characterizes Haan as 'an honest candid student and a hard worker'. According to other teachers, Haan has a good understanding of architecture, rises above the mediocre and produces extremely good drawings.

His studies were suspended due to the WWII and Haan started his last academic year in 1945. However, he fails in graduating and starts his career as an architect without a diploma (Het Nieuwe Instituut, 2000b).

From the moment Haan hung up a sign to his wall that said 'H.P.C. Haan, architect', he pretty much worked as an independent architect. During the early days of him working as an independent architect, he gained experience by working with Kanter on several projects. After the



Haan's own home, (Nationaal Archief, n.d.).

daytimes of working with Kanthers he worked on smaller projects at night, for instance, on student houses.

Thanks to the contacts he gained from the resistance and the reconstruction of Rotterdam, his own office started off to a good start after the war. By the end of the 1940s his office was strengthened with P. de Hoog in 1918, with whom he worked until 1963. After that, around 1967, the partnership between Haan and his employees was transformed into Atelier aA.

As time passes, Haan's interest in Africa increases. Sometimes his impulsive character emerges when he no longer sees any point in a project and immediately leaves for, for instance, the Sahara for months, abandoning his employees.

An assignment for housing in the Sterrenburg III district of Dordrecht in 1975 is the last major project for the architectural office and Haan. Atelier aA ends, as vague as it started, around the middle of the 1970s. Haan's last completed work was a holiday home in Burgsluis in 1984.

Haan's work could be roughly divided into three periods. An early period, in which he is more or less 'searching' for his own answer to the pre-war modernist idiom. In the second period, after the realization of his own house in 1951, he managed to develop his own architectural form language in a series of detached houses. The nature of the assignments changed during the 1960s. In this last period, the one-off assignments with a small-scale character make way for the more large-scale projects (Het Nieuwe Instituut, 2000b).

Haan's work is difficult to place in one movement or style because of his stubborn, bold way of designing. His designs are clear, consisting of rectangular shapes, which, however, are rendered delicate by a humane attention to the resident and the detail.

The characteristics of rectangular shapes and attention to the resident can be



Haan's addition to the grain silo complex, (Architectuurgids, n.d.-b).

seen in the last on site addition of the grain silo that was built in 1963. The building was situated on the northeast from the existing complex. This intervention consisted of a officebuilding including two service homes. These service homes would be transformed into offices a few years later (Architectuurgids, n.d.-b).

# Historical development

BUILDING PHASES: Phase 5 (2004) and its architect



The grain silo proved to be difficult to automate, so the function was moved to another silo in the Botlek area. The silo was being used for storage until 2003 (Top010, 2013). After that, the building would be used as an event location, initially by the disco organization Now&Wow ('Maassilo', n.d.).

During this process of taking in a new function, the silo had to be adapted to this and architect H. de Jong, architect of Art Constructions B.V., was put in charge of this project. According to him, as a 'horeca-architect', you have to pay necessary attention to routing (de Jong, n.d.). He also considers it important to preserve cultural characters (Delft op Zondag, 2016).

Under his supervision, with the importance of routing in mind, various demolition and construction work was carried out on the inside as well as a bit on the outside of the grain silo to make the building usable for its new function (IOB, n.d.).

At first, little seems to have changed in the old grain silo. This was also the intention of de Jong. His intention was to leave as much of the interior and exterior as possible in order to preserve the historic industrial character. According to him: 'With a redevelopment, you have to cooperate with the building and especially not go against it'. However, he did have to make some adjustments to make the huge concrete building suitable for the new function as a dance club. The club is estimated to receive approximately 6,000 visitors over the weekend, which requires design for sound insulation, the load and space of the floor, (fire) safety and escape routes, good routing and solving the ventilation problem (Debets, 2004).





The concrete columns were demolished by blowing them up after the reinforcement was cut at the edges with a saw, (Debets, 2004).



A number of demolished columns have been replaced by slimmer columns in order to create longer sightlines, (Debets, 2004).

In the space on the ground floor, the entrance with a cash register, a cloakroom and three halls have been realized. The open ground floor space is about 4.5 meters high, but the openness of this is only relative. The concrete columns sometimes have dimensions of up to 1.3 by 1.4 meters. For this reason, a number of columns have been removed to create greater openness and longer sightlines (Graansilo Maashaven Brielselaan (Rotterdam), n.d.). This could be done because a recalculation of forces showed that this was possible. The 'schijfwerking' of the silo walls played an important role in this. Furthermore, a number of columns have been replaced by slimmer columns with a diameter of 220 mm.

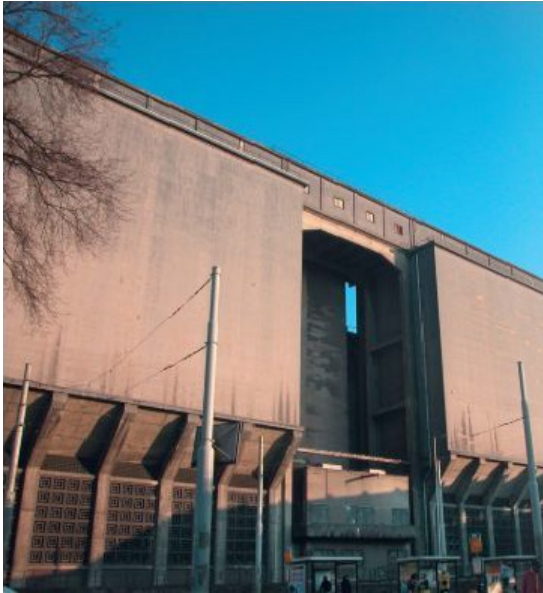
But how was this all done?

The columns that had to be demolished were blown up after sawing out the outer edge with reinforcement. Of the columns that were replaced by slimmer columns, the new steel columns were already provided with end plates before delivery and filled with reinforced concrete to increase the fire resistancy. After these steel columns were placed, jackscrews brought the columns back to tension (Debets, 2004).

At the last minute, the municipality also decided to investigate whether the existing concrete floor could bear the load of 500 kN / m<sup>2</sup>. This investigation eventually showed that there was hardly any reinforcement and that it was no longer allowed to assign a calculation value to this old floor, which in some places turned out to be only 10 cm thick. For that reason, the old floor subsequently served as lost formwork for a new reinforced concrete floor of 15 cm thick. This meant that the old floors in the existing basements had to be strongly supported (Debets, 2004).

As for the ventilation problem: since the silo was going to accommodate thousands of people, the building required a large ventilation capacity. Statutory regulations indicated that a publicly accessible space must be refreshed six times an hour. However, the construction team found this insufficient for the new function of the silo and doubled





Behind the decorative concrete grid, steel plates were placed to increase sound-insulation, (Debets, 2004).

the ventilation rate. This meant that approximately 220,000 m<sup>3</sup> of air had to be extracted and supplied.

But how was this realized?

The existing silos were used to achieve this goal. Round holes were simply cut into the bottom of the concrete walls of the silos. The problem with supplying air, however, is that you also have to preheat it. For that reason, 34 heating boilers have been installed in the attic. Second-hand boilers from greenhouse construction were used for this. In the end 176 silos were thoroughly cleaned under high pressure steam to realize the goal (Debets, 2004).

For the sound insulation you would think that the concrete mass would take care of this. This is, however, just partially the case and not enough for the new function of the silo. With the help of 'Cauberg-Huygen Adviseurs', the acoustics are improved to the club function. The decorative concrete grid on the southeast facade that gave the complex a transparent appearance was provided with 20 mm thick steel plates behind it. Furthermore, other facades were, where necessary, also provided with 'buigslappe' retention walls to increase the sound insulation. Lastly, all escape doors between the silo rooms and the corridor are equipped with 'sluisconstructies' and double sound-insulating doors (Debets, 2004).

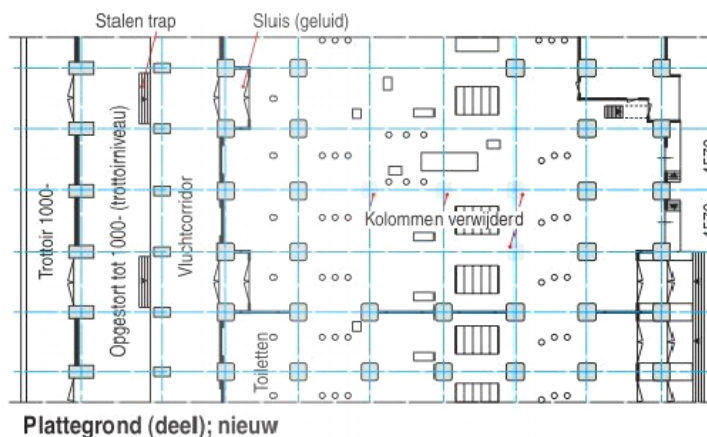
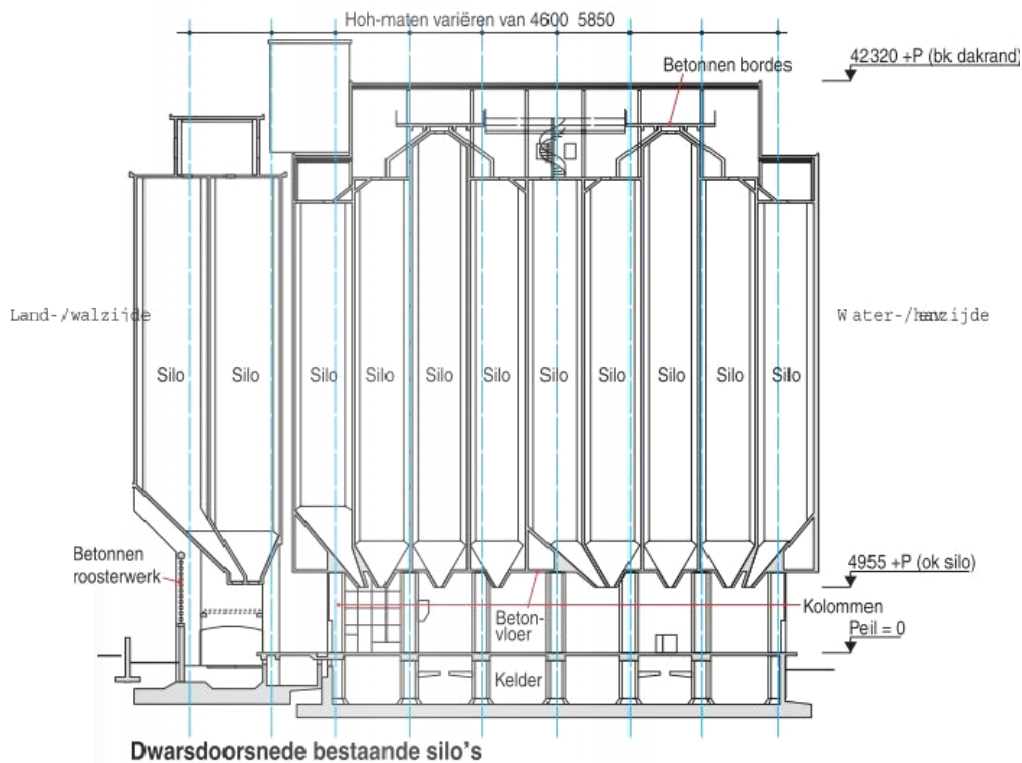
As for the fire safety and usage, with a floor area of 6000 m<sup>2</sup>, the maximum requirement of 1000 m<sup>2</sup> per fire safety compartment did not apply to the grain silo. It was found that with the large amount of concrete and steel, a very low smoke load is present. A total of 90 people are able to escape per linear meter of door. With this knowledge and the known number of visitors, it has been calculated how many running meters of escape route had to be created. This led to a large number of double doors that were also constructed as 'sluisconstructies' because of the requirements for sound insulation.

Furthermore, the building also required good routing and 120 toilets as an

entertainment venue for about 6,000 people. A simple built-in system has been used for the toilets. The necessary pressure, supply and discharge pipes were installed in the basement. As for the sinks, the old ones were used from the time when the silo was still in use.

Lastly, the space above the concrete silos, the 'attic', created too many problems with escape routes. This is because there are only a few stairs and elevators present that make the implementation of facilities meant for a large number of people economically unfeasible (Debets, 2004).

The drawings below show part of the removal of the colossal columns in order to create space for a dance floor, (Debets, 2004).





# Body

Architectural Analysis



# Surroundings

This chapter gives a clear overview over the historical development of the Maashaven area concerning its dwellings and infrastructure. Information regarding the port's development has already been provided in the Historical Development chapter. Furthermore, the information in this chapter will give an insight in the Maassilo's connection with its adjacent neighborhood and the infrastructural development.

# Surroundings

## URBAN CONTEXT: Neighborhoods



Urban context, 1900.



Urban context, 1910.

The following five drawings show the development of the Maashaven and the neighborhoods in its area.

The drawing of the situation in 1900 shows the Rijnhaven and the following four show both the Rijn- and Maashaven, of which their development has already been explained in the timeline chapter.



Urban context, 1931.



Urban context, 1951.



Urban context, present day.

This subject is more about the neighborhoods around the Maashaven. In the timeline it has been explained that the industry around the Maashaven kept growing, which kept the economy growing, and thereby also the requirements for the area.

The area began to need more dwellings, since more and more families moved here in order to find work in the port industry. This growth in dwellings is clearly visible in the five drawings. You can clearly see that the industrial development more or less shaped the urban context of the Maassilo. To highlight the importance of the link between the industrial development and the adjacent neighborhood, the street names in the neighborhood and the name of the neighborhood itself refer to the old function of the Maassilo, namely processing and storing grain. See examples below:

Product old Maassilo:

**Grain**

Names adjacent neighborhoods:

**Tarwewijk** (yellow marked area)

Few street names in the neighborhoods:

**Speltstraat**

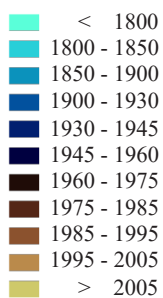
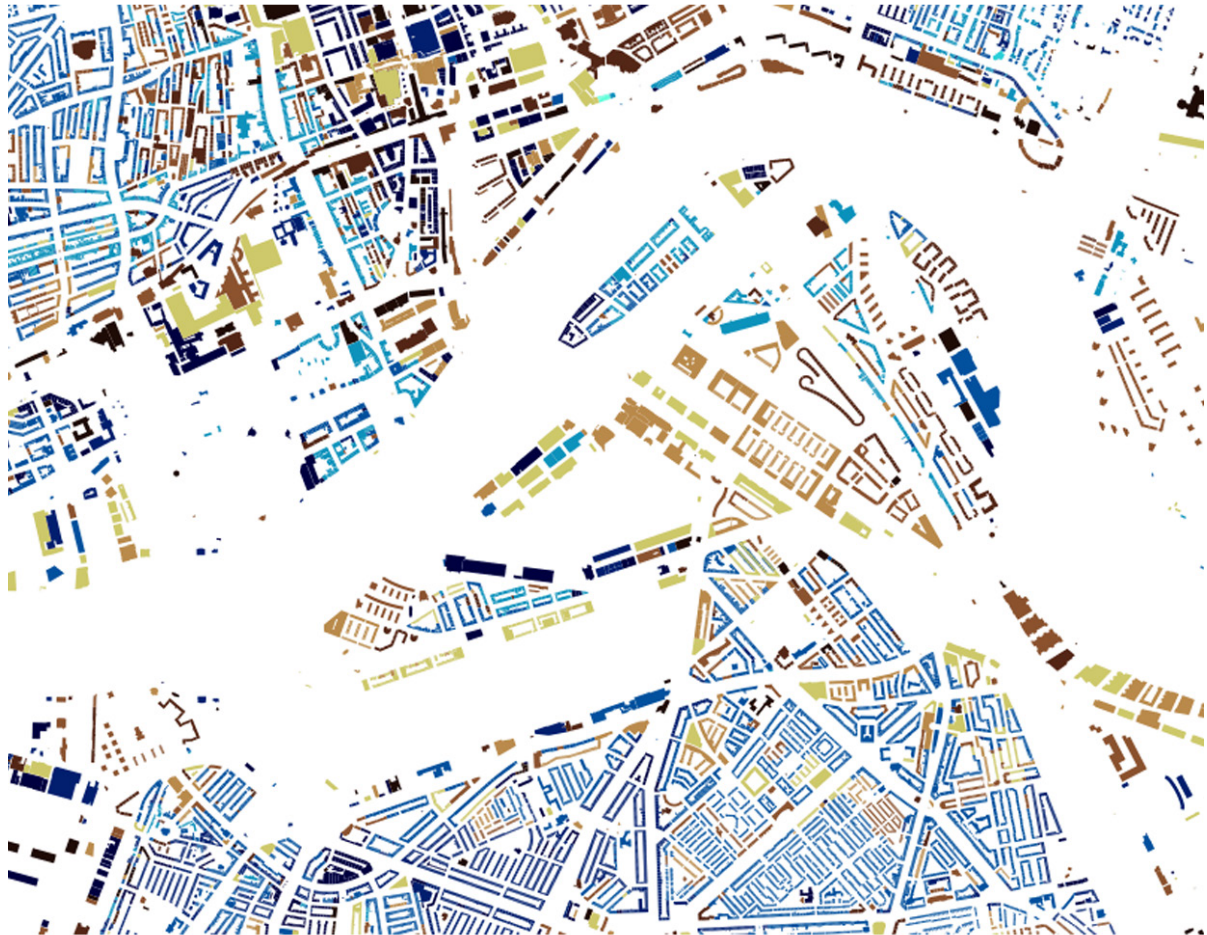
**Roggestraat**

**Gerststraat**

Should the Maassilo be demolished, this whole connection would fall apart, since the neighborhood would have nothing to connect with anymore but just a historical story.

# Surroundings

URBAN CONTEXT: Buildings by age, present day situation



This map shows the construction year of each building in the Maashaven area. You can clearly see that a lot of buildings of the period of the development of the Maassilo as industrial building are still present in its adjacent neighborhoods. This presence contributes to the value of the connection between the complex and its neighborhoods. This is because the majority of the streets in the neighborhoods, that were named so to refer to the function of the silo, still contain the same dwellings of that period.

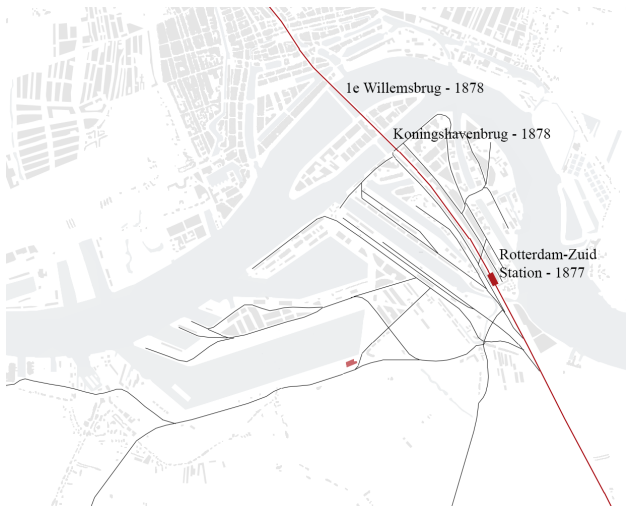


# Surroundings

## INFRASTRUCTURE: Railways



Railways, 1900.



Railways, 1910.

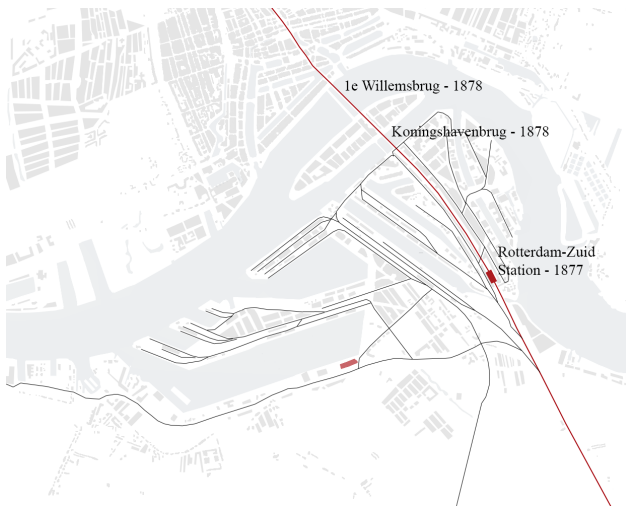
The drawings on this and the next page show the development of the infrastructure from 1900 until today. This network had developed itself under the influence of the development of port activity, the economy and growing neighborhoods. Because the industry kept growing, the economy, neighborhoods and infrastructure kept growing as well. The development of the infrastructure consisted of several train- and metrolines, bridges and tunnels.

It is visible in the drawings from 1900 until 1951, that the railways kept growing. This was a result of the growing industry and its demands. Industrial areas kept expanding their buildings or building new industrial buildings for new and bigger demands, which is also why the Maassilo kept expanding. In order to keep this flow of industry going the railways had to be expanded. The industrial areas and its buildings had to be easy and quickly accessible.

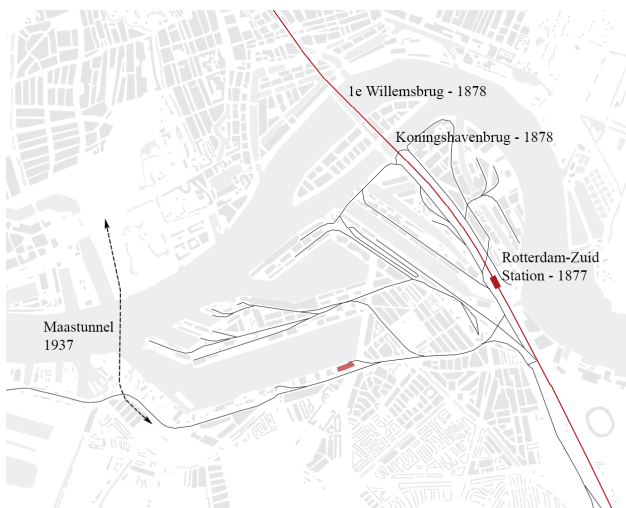
During this time the famous Maastunnel was built. This tunnel made the whole Maashaven area a lot more accessible, since it is a passageway for not only cars, but also motorcycles, bikers, pedestrians and mopeds ('Maastunnel', n.d.).

From that period on to now, the first metroline, the North-Southline, was built in 1968, that connected the center of Rotterdam with Rotterdam-South ('Rotterdamse metro', n.d.). This connection resulted in a metro stop right in front of the Maassilo.

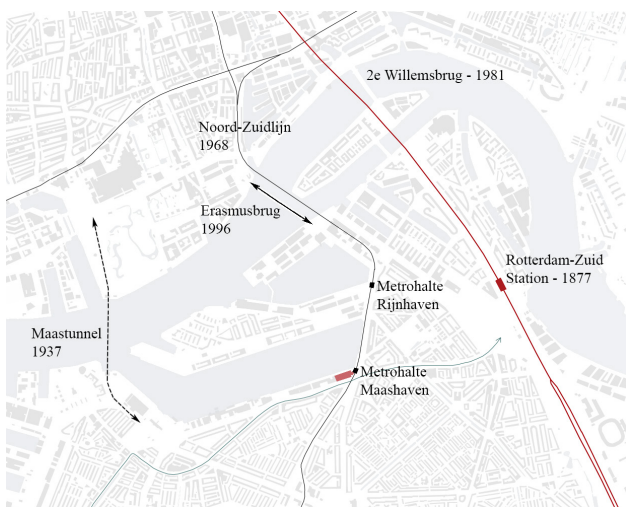
In the 80's the industry began to shift away from the Maashaven area (Tweede Maasvlakte, n.d.). Industrial functions began to relocate themselves elsewhere, because the Maashaven and its industrial area became too small to house the developed industrial



Railways, 1931.



Railways, 1951.



Railways, present day.

activities. This made place for the city to develop itself apart from its former industrial habit. This shift from industrial activity caused the railways to slowly disappear, since they were less and less needed.

Nowadays, all the railways to the industrial areas are gone. What has been added, beside the mentioned metroline, years later was a tramline (see green line in last drawing). This tramline ultimately caused the entire Maashaven area to be reachable from all sides, since it began to house more cultural functions.

Not only to the area, but also from the area to other parts of the city. Because this also benefited the people that lived in the neighborhoods near the Maassilo that no longer worked in the industry of the Maashaven, but elsewhere.

The Maastunnel also still plays an important role in this.

Ultimately, you could say that, presently, the area is perfectly reachable to all modes of transport.

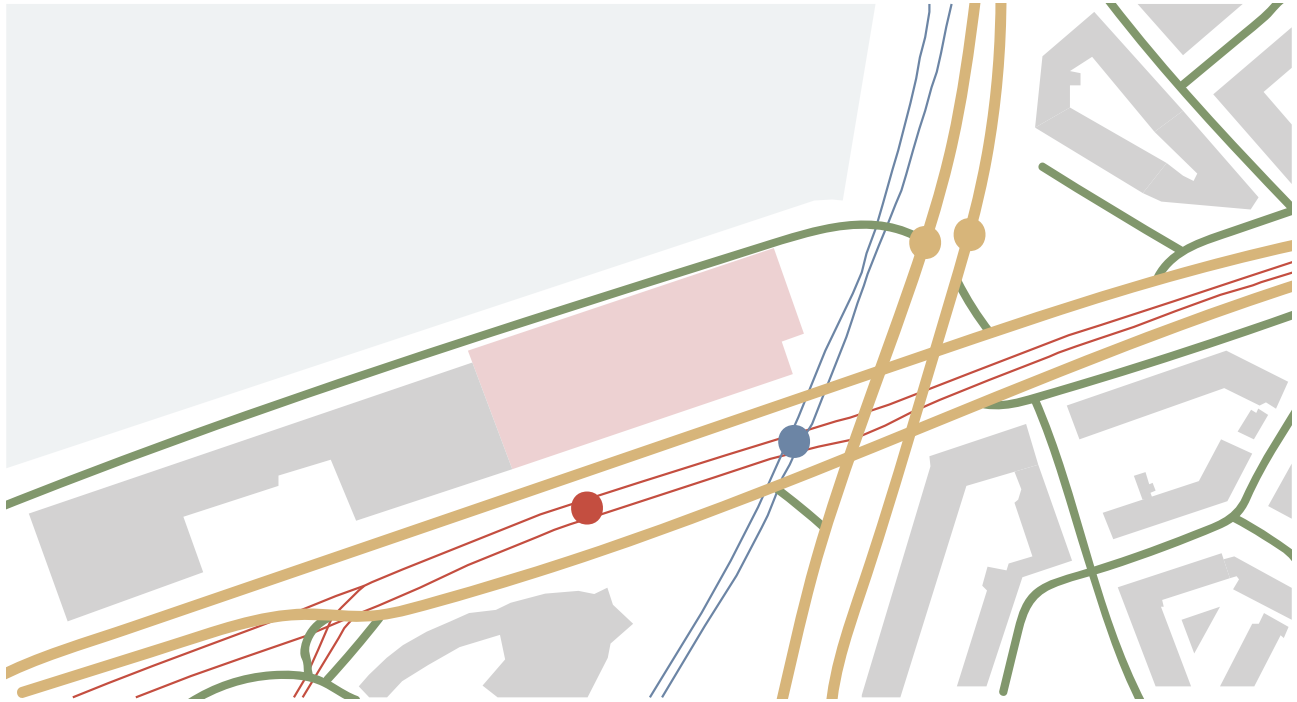
# Site

This chapter zooms more in on the Maassilo and its direct adjacent surroundings.

It will provide information about the accessibility of the building and its site, the different types of borders that are present around it and play a role in this, its visual recognizability from all present urban axes and its vulnerability concerning water.

# Site

## CONFIGURATION: Infrastructure - reachability



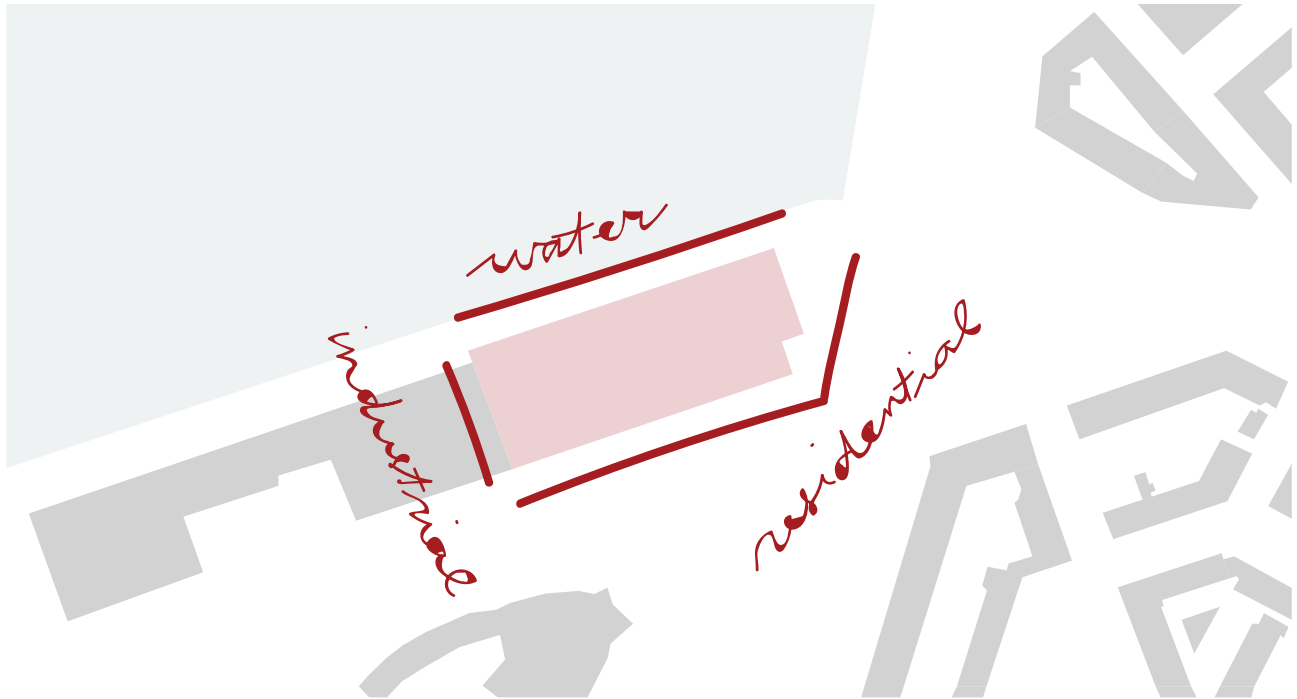
- Car - bus - bike
- Car - bike
- Tramline
- Metroline
- Tramstop
- Busstop
- Metrostop

In the previous chapter it is stated that the Maashaven area is presently perfectly reachable to all modes of transport. But our main concern is if the Maassilo itself is also perfectly reachable. For that we had to zoom in on the location and analyse the adjacent infrastructure. In the drawing is shown that the Maassilo can be reached by car, bike, bus, tram and metro, which confirms that the complex is reachable by all modes of transport. It can be said that the Maassilo functions as a infrastructural node, since the lines of all modes of transport seem to intersect around the complex.



# Site

CONFIGURATION: Types of borders

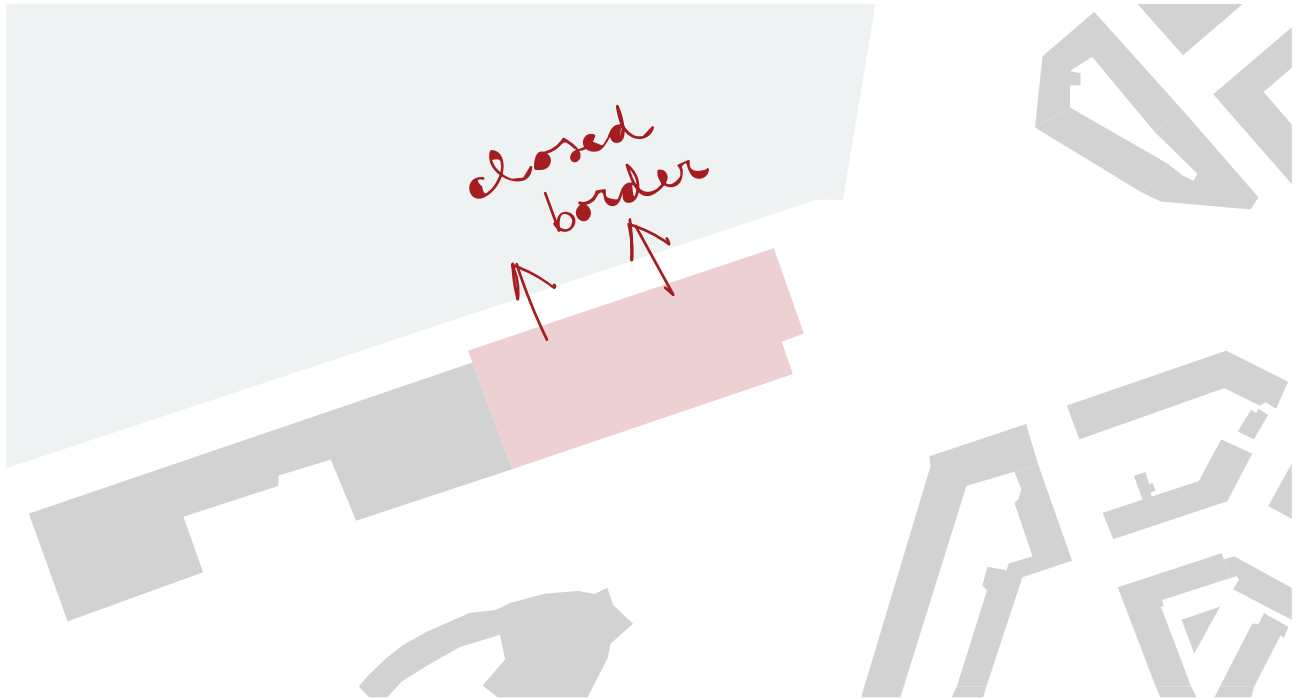


The Maassilo is directly surrounded by different kinds of borders:

1. On the north-west there is the Maashaven that borders the whole north-west side of the building.
2. The north-east as well as the south-east of the building is bordered by the residential neighborhoods.
3. On the south-west of the building there is another industrial building that closes off the entire south-west facade.

# Site

CONFIGURATION: Border of water - accessibility

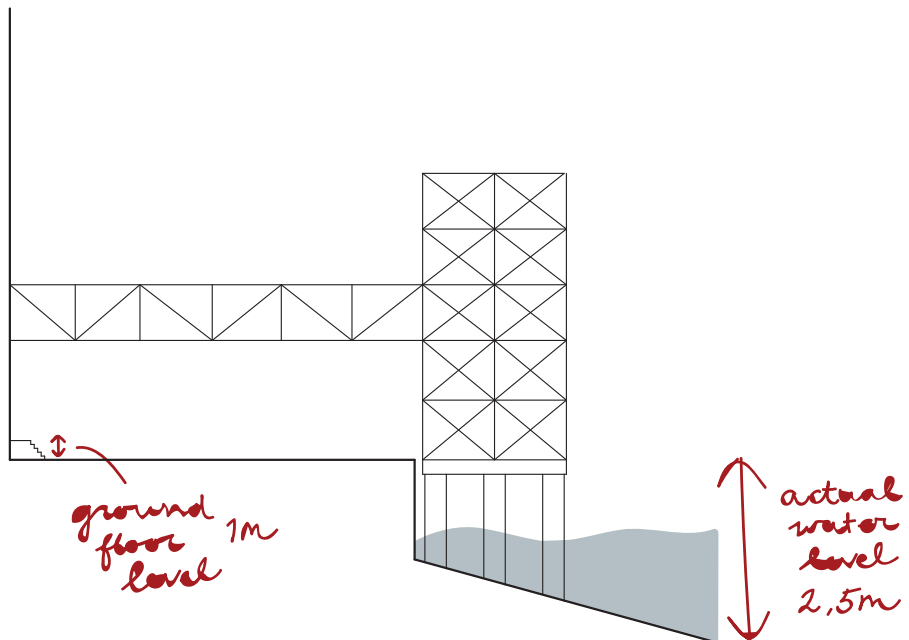


The Maashaven borders the whole north-west side of the building. But what does this border look like and what kind of connection does it have to the Maassilo?

The pictures and diagram on the next page show the visual connection the building has with the water of the Maashaven. The diagram enhances several important heights. First is the actual height of the water level, which is 2,5 m below the quay. The second is the height of the ground floor of the building, which is 1 m above the level of the quay. This height of 1 m was beneficial to the former function of the Maassilo. It was at perfect height for easy loading and unloading goods from the former trains. The stairs that lead to the ground floor are built over the former loading docks.

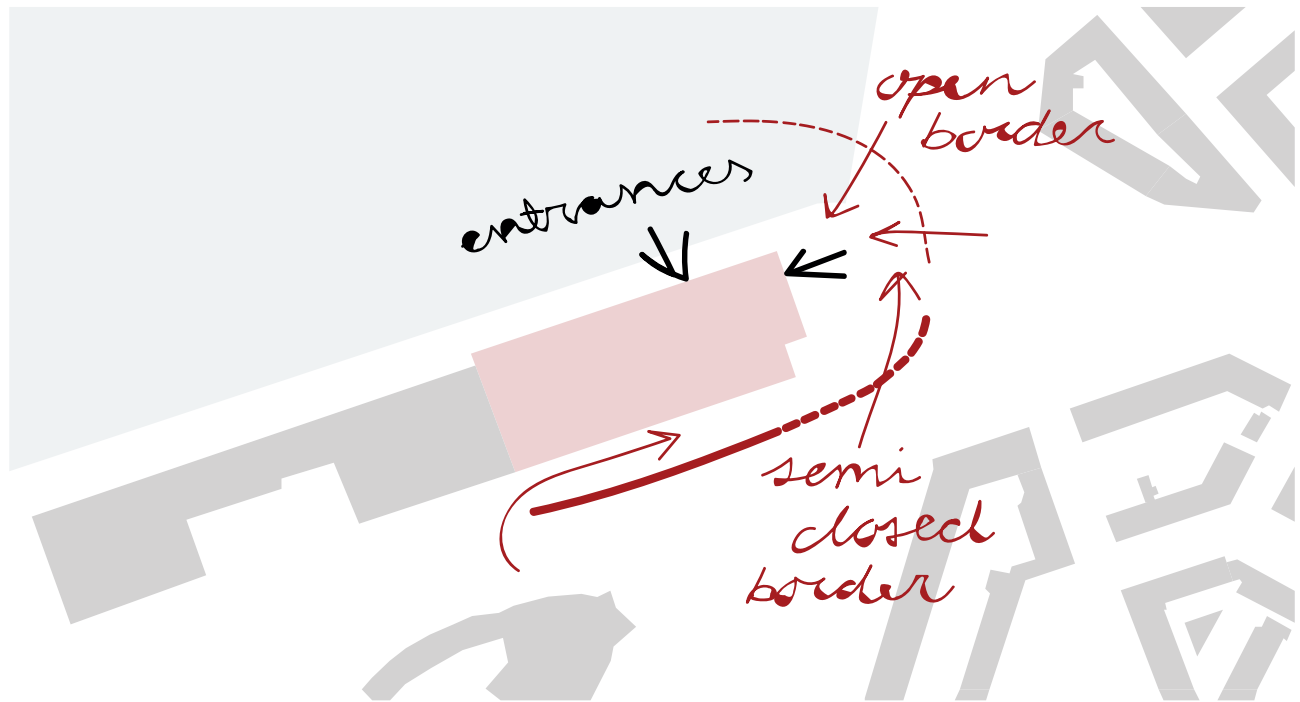
The height difference of the actual water level and the presence of the elevator towers make it impossible to reach the Maassilo from the water. For this reason the water can be considered as a closed border.

## Closed border



# Site

CONFIGURATION: Residential borders - accessibility



This drawing shows the location of the entrances of the building and the accessibility in concern of urban borders around the building. It is clearly visible that this kind of border is present, but becomes thinner, the closer you get to an entrance.

## Open border



The north-east and north-west side of the building each contain an entrance to the building. Also, these sides are openly accessible from the context and it has no border that serves as an obstacle for visitors to avoid in order to come close or enter the building.



## Semi-closed border

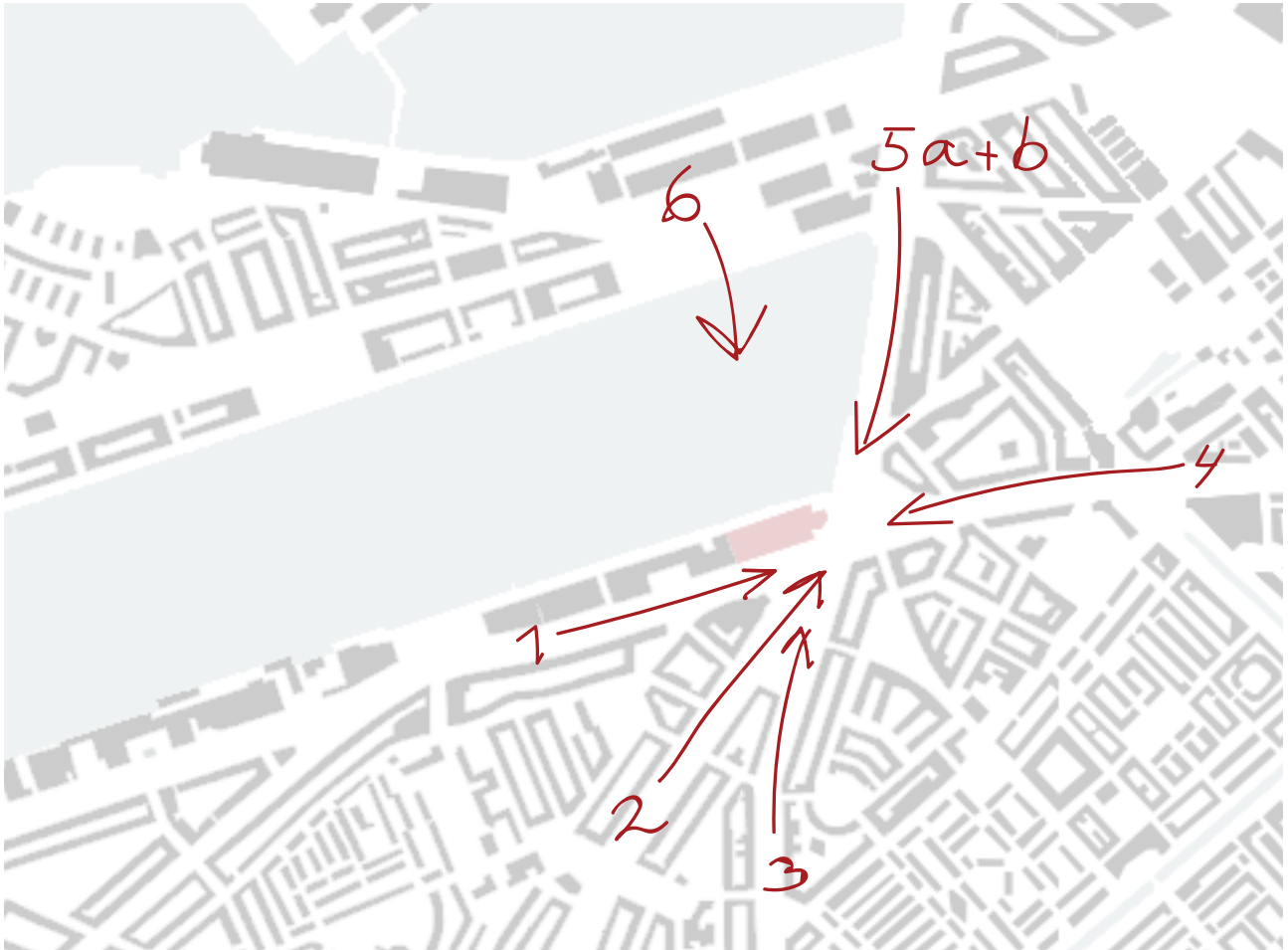


The south-east side of the building does not contain an entrance anymore as when it did before the expansion of Postma. What it does have is a semi-closed border to the building. This border is enhanced by the level difference of the dyke. The closer you get to the entrances of the building, the thinner the border becomes. It serves as an obstacle that has to be dealt with in order to enter the

building. However, even if this side of the building still had an entrance, people still would need to walk around the border in order to enter.

# Site

CONFIGURATION: Visual recognizability



The views to the Maassilo from the main roads and lines are crucial to its monumentality and title of a landmark. In the following pages these views will be shown and examined in order to be able to confirm why the building is considered a landmark.





View 1

The first thing you see of the Maassilo from view 1 is the closed of facade, known as the back of the building. The more you approach the building, the more the south-east side and its artwork and decorative facade becomes visible. These two things are important characteristics that contribute to the recognizability of the Maassilo.



View 2

Approaching from the side of view 2, the Maassilo seems to be a bit hidden behind the trees and metrostation. However, the south-east side of the building is still quite visible. The artwork on it can be partly seen, but as for the decorative concrete grid, this is still recognizable. This path towards the building is mostly used by pedestrians and bikers since cars have to make a U-turn on this road.



View 3

This view is taken from more to the right of view 2. This because this road enables cars, buses and bikers to pass by the Maassilo. As seen in the picture, the building stays mostly hidden behind the elevated metrostation, blocking the view to the Maassilo. The top of the building can be seen, but contains no specific characteristic that stands out in order to recognize it.



View 4

View 4 is from the opposite side of view 1. As has been seen, view one approached the back of the building. View 4 approaches the opposite, namely the front of the Maassilo. Even though the view is a bit obstructed by the elevated Metroline, the building is still recognizable. This because the front facade of the Maassilo has specific characteristics that contribute to the recognizability of the building: the big historical name tag on top of the facade with the grid of squares. Also, the elevator tower on the right side of the facade also heavily contributes to the recognizability.



View 5a - car, bus, bike



View 5a2 - pedestrian



View 5b



View 6

View 5 is one that stands out a bit. This because this view is approached from the city centre of Rotterdam, which is highly connected to the Maashaven area. Almost all possible modes of transport are being accommodated in this line. This means that approaching the Maashaven area has different viewpoints demanding on what mode of transport is taken. View 5a shows the Maassilo building from the approach by car, bus or bike. The view to the building is highly blocked by the elevated metroline. What can partly be recognized are the elevator towers on the quay

View 5a2 shows what is seen when you approach the building as a pedestrian. Pedestrians walk under the elevated metroline, causing this not being a blockade to the Maassilo. The elevator towers, the front facade with recognizable characteristics, the building by Haan and the silo shapes in the north-west facade are all visible for the pedestrian.

View 5b approaches the Maashaven area from the metroline. This means the building is seen from an elevated viewpoint and there is nothing more up that blocks the view to the Maassilo. From this point of view the Maassilo is highly recognizable to almost all of its important characteristics: its concrete massivity, the elevator towers, the north-west facade and its silo shapes and a bit of the front facade and its characteristics.

View 6 shows the Maassilo from the other side of the Maashaven. From this viewpoint it is clear that the Maassilo really marks its spot, because of its massivity, the clear silo shapes in the facade and the elevator towers that are connected to it. The Maassilo is highly recognizable from all main roads/lines, except from view 3 and 5a. However, the further the building is approached from the roads of these viewpoints, the more the Maassilo becomes visible and recognizable of its characteristics.



# Site

CONFIGURATION: Main urban axe

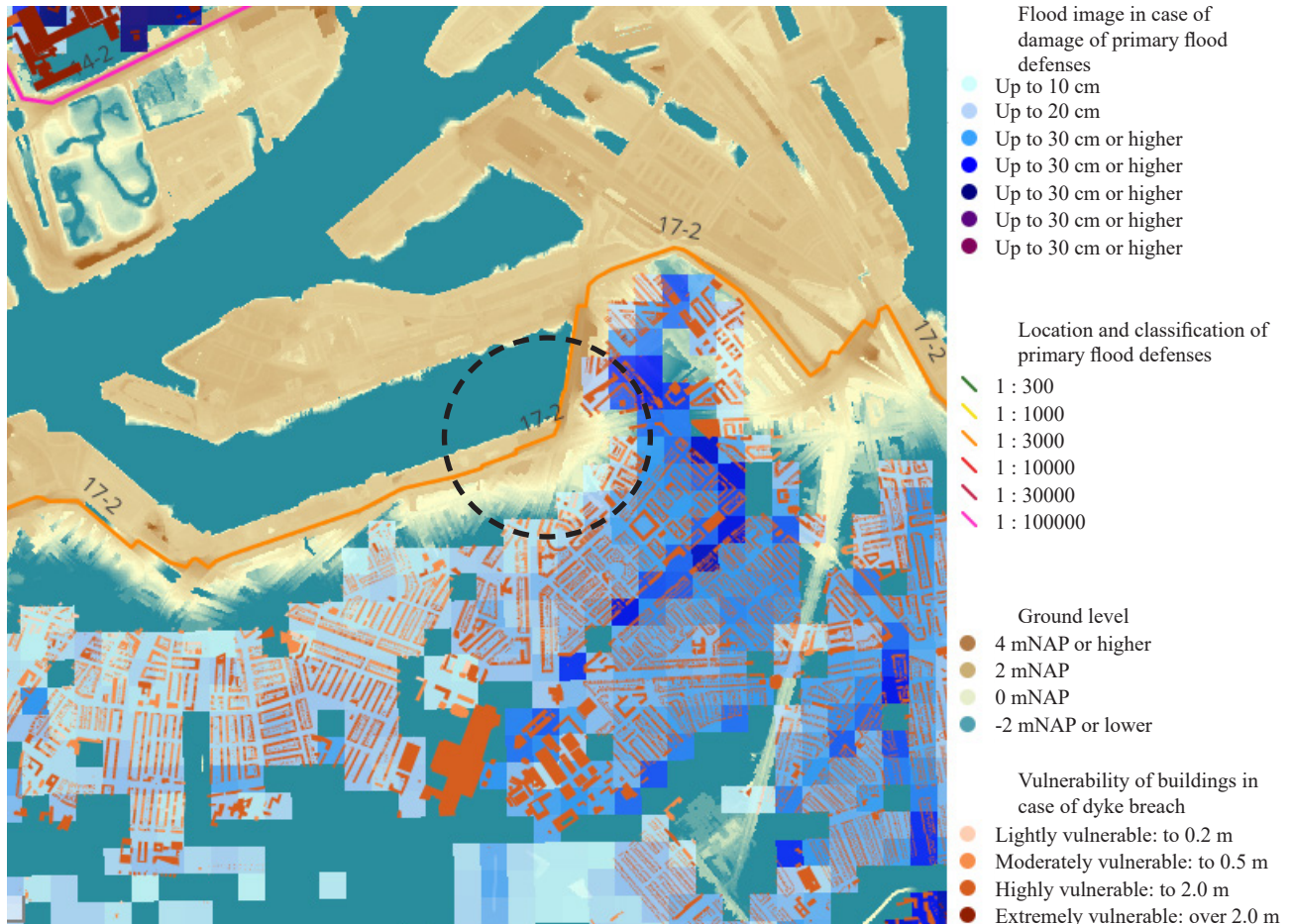


The highlighted urban axe can be considered most important for the Maassilo. This axe connects the Maashaven area to the most popular part of Rotterdam, namely the city centre. It contains roads and lines that house almost all possible modes of transport. This means that daily, a lot of people see and/or pass by the Maassilo, whether or not from different heights, depending on what mode of transport is used. This way a lot of people are constantly in touch with the Maassilo, contributing to the title of a landmark.



# Site

## WATER: Vulnerability



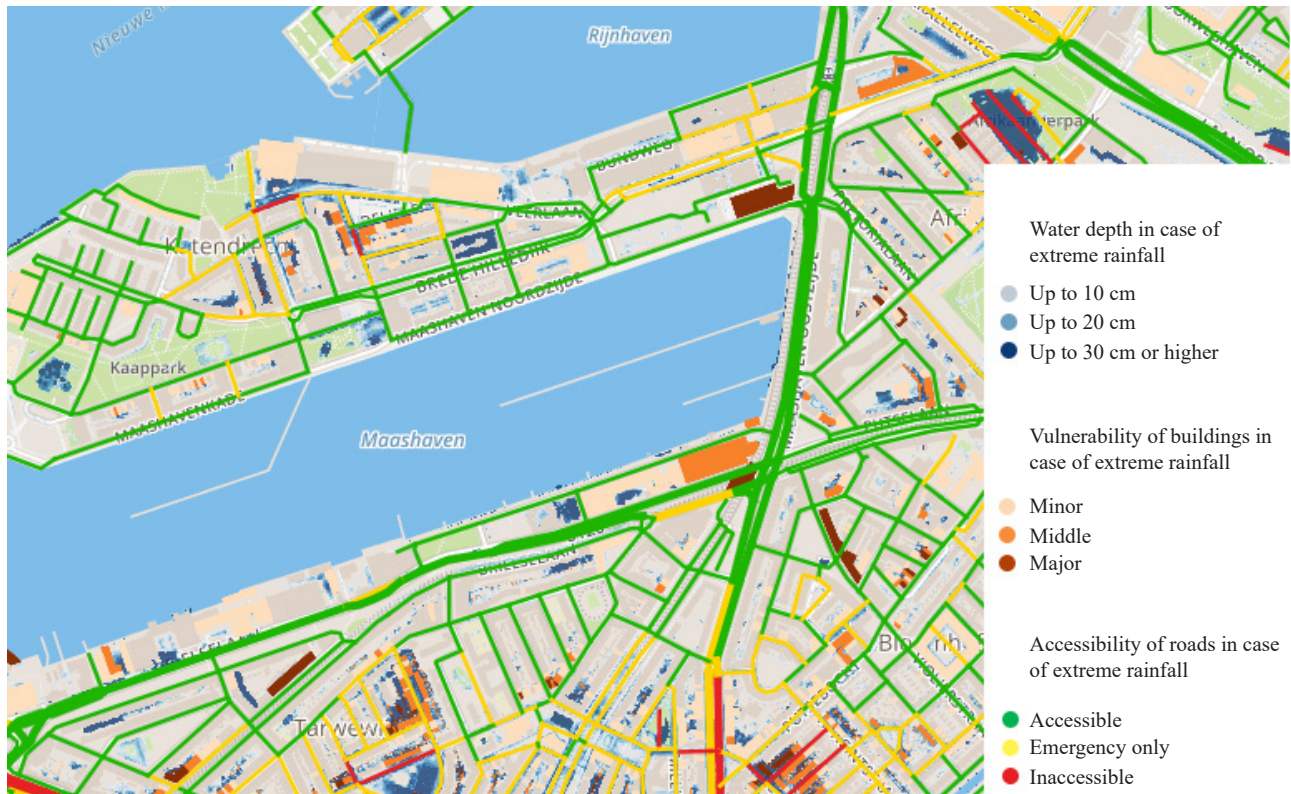
Map and information from ('Klimaatatlas | Zuid-Holland', n.d.).

Our country is vulnerable to flooding due to the fact that it is located below sea level. To protect us from these floods, primary and regional flood defenses, dykes, are present in the Netherlands. The map above gives an overview of what can happen when a dyke breaks, in worst case scenario, and what the vulnerabilities are.

It is clear that the Maassilo is located outside the orange marked dyke. This dyke seems to have a chance of 1 in 3000 to break. Since the Maassilo is located outside of it, the building will get completely flooded. The information this map provides can help making decisions for future developments of the Maassilo and its area.

# Site

## WATER: Vulnerability



Map and information from ('Klimaatatlas | Zuid-Holland', n.d.).

As a result of climate change, short and heavy rainfalls will happen more frequently. Since this cannot be avoided, the question is where the water nuisance will occur, to what extent and what the consequences thereof will be. This map provides an insight into the water nuisance of the area around the Maassilo. According to the map there are a few areas around the Maassilo that are threatened by a water depth of at least 20 cm, while the building itself seems to be moderately vulnerable during heavy rainfalls.

The findings are based on the situation after a heavy rainfall of 100 mm in 2 hours, which falls under the category of a rare downfall. However, the likelihood that this rare rainfall can occur is only increasing due to climate change.

On a more positive note: it seems that in case of a heavy rainfall, there are enough roads accessible in order to move away from the area.



# Skeleton

Architectural Analysis

# Structural Grid

## Structure (Skeleton)

The structural grid of the Maassilo complex is similar to the expansions subject to an accumulation of different constructions. Therefore the grid is composed of five different grids (red lines), some contiguous some deviating.

The first building designed by J.P. Stok is composed of three different parts. These parts are expressed through the interior and exterior of the building. The most eastern part, recognizable as the main entrance of the building, has a orthogonal grid structure that is based on the columns, that span from the ground floor up until the sixth floor. The middle part slightly deviates from this grid and is based on the rectangular silo cells above it. Similar to the middle grid the western grid is also based on the silo cells above it, only here the grid intersections are centered in the 90 degrees rotated square silo cells that are in between the octagonal silo cells.

The second building designed by Brinkman & van der Vlugt is based on the columns on the

ground floor. The expansion joint in the middle of the building divides the building into two parts, although the grid doesn't deviate from each other. However it does deviate slightly from the adjacent part of the first silo building. Still they have maintained the same orthogonal directions.

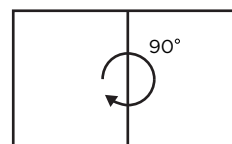
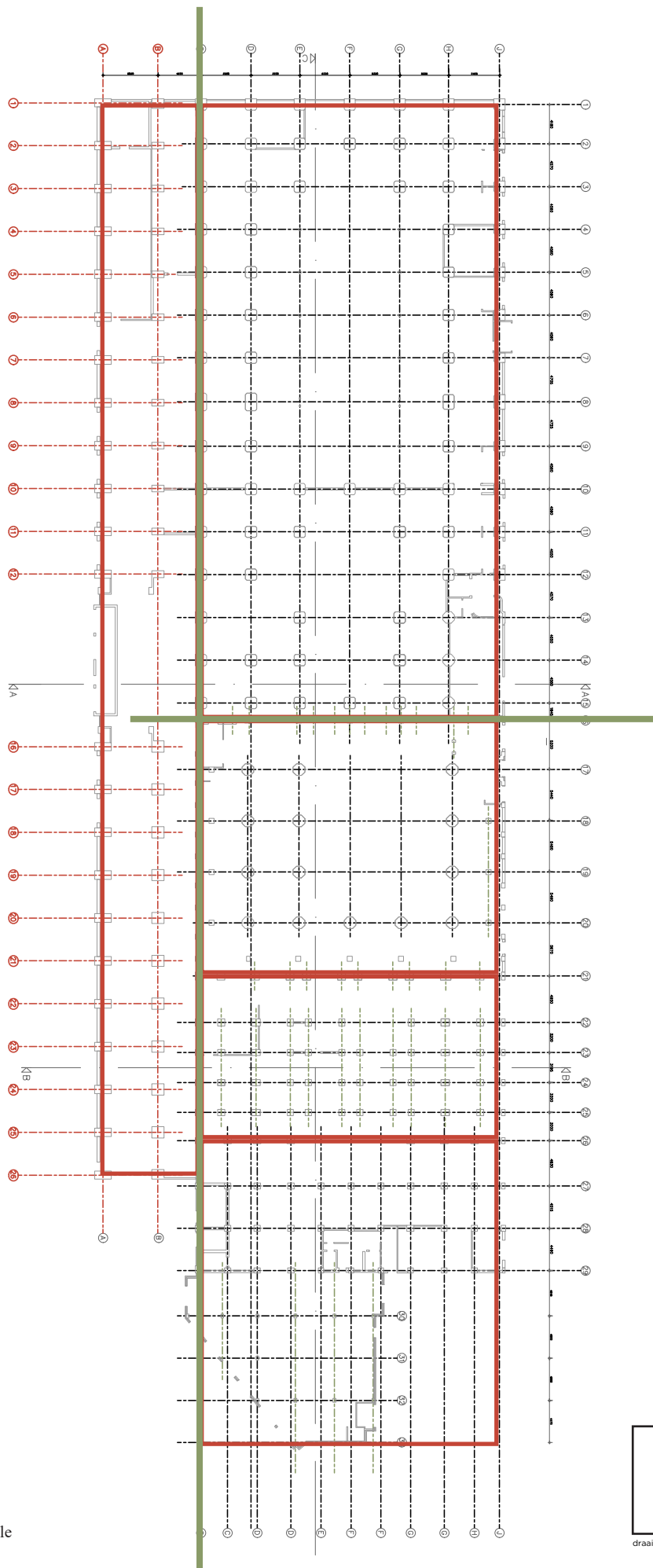
The third and last building designed by A.G. and J.D. Postma has the same orthogonal directions as the two previous buildings. The building stretches over the full length of the other two building parts and deviates in its north-south direction from the other two. However its east-west direction is contiguous to the other two parts.

In conclusion is the building divided into two main directions, respectively the north-south direction and the east-west connection. The east-west for the second and third building are the same, but deviate from the first. However the north-south directions is different for every part of the building. Furthermore the three buildings have grid lines on the borders of their respective buildings (green lines).





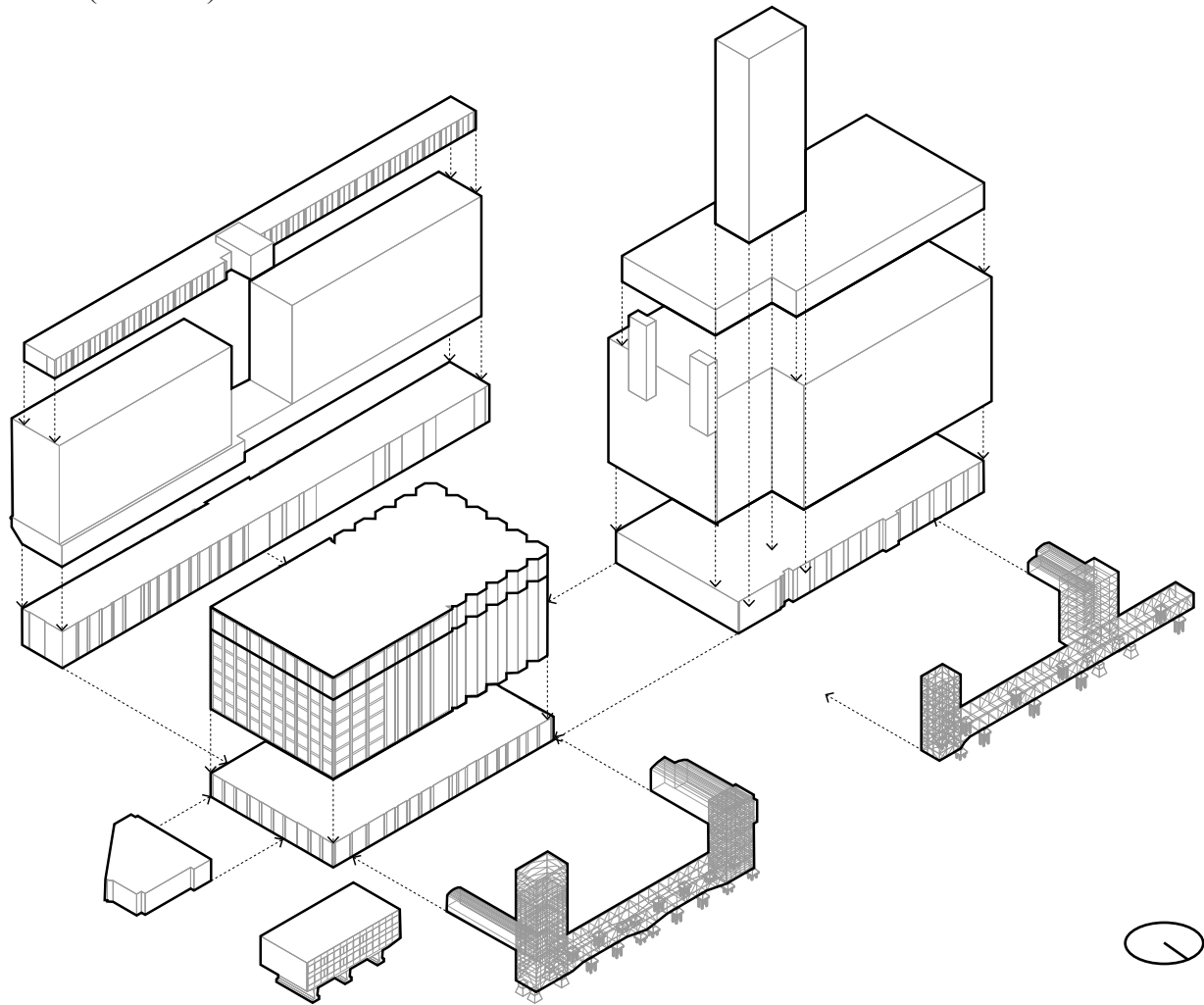
Grid of the Maassilo - no scale



draai boek exact 90° voor meer kijkplezier

# Anatomy of Volumes

## Structure (Skeleton)



3D diagram of composition of volumes

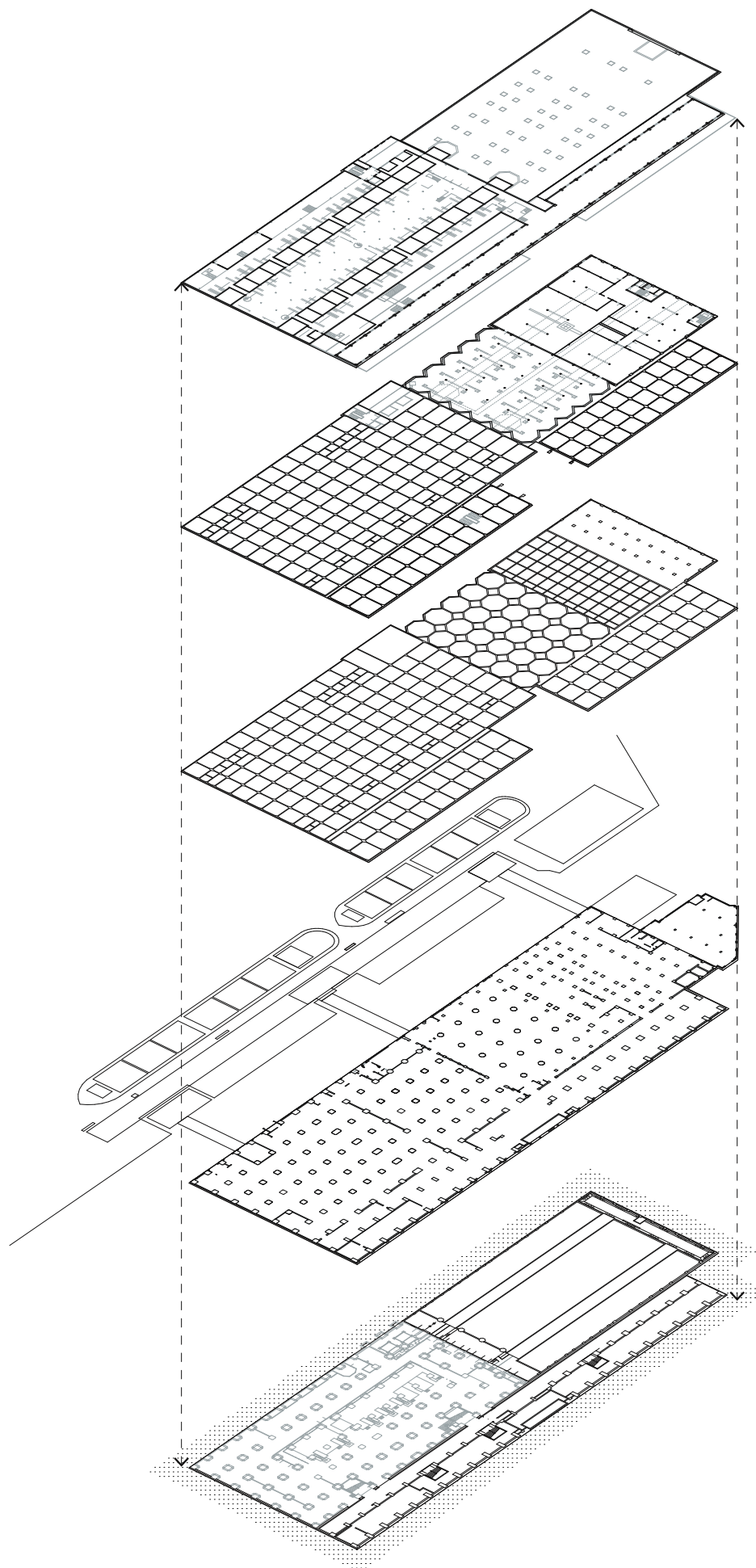
Although the three phases of the 1910, 1930, 1951 & 1963 building each represent their own volumes, the sub-volumes of each of those buildings is part of a hierarchal system. The Maassilo forms a complex blocks set where rectangular, orthogonal shaped boxes are composed in relation to each other. The most dominant volume inside this constitution is the elevator tower on the north-east corner of the second expansion. This towering form extends in height and forms an accentuation. Furthermore it's also centered in the building bridging the second expansion to the first building. This tower was purposed, and still does, as the main staircase and elevator for the NOW&WOW. The two smaller extensions on the edge of the first and second building are the elevator machines, where grain is transported from the ships to the top of the building.

The three buildings, apart from the 1963 office extension, each have a tripartition inside their own volume. This partition is the same in each building,

respectively a ground floor, purposed for the collection of the stored grain, the silo cells, expanding multiple floor, purposed for the storage of the grain, and the top level of each building, purposed for accessing the grain silo's from above and filling them.

The third expansion has the most odd shape of the three building. This was due to the fact that there was a shortage in available space for an expansion of the facility. The small strip available is extended over the Brielselaan, but remains set back at the ground level. Furthermore the building is split in two parts where the central vide is located above the electrical transformer unit that now provides electricity for the neighborhood.

The first building and the second expansion each have access to the cranes and elevator machines that are located on the edge of the quay. The machine are mobile and slide over the horizontal truss that extend over the full length of the complex.



10th Floor

7th Floor

2nd - 6th Floor (Silo)

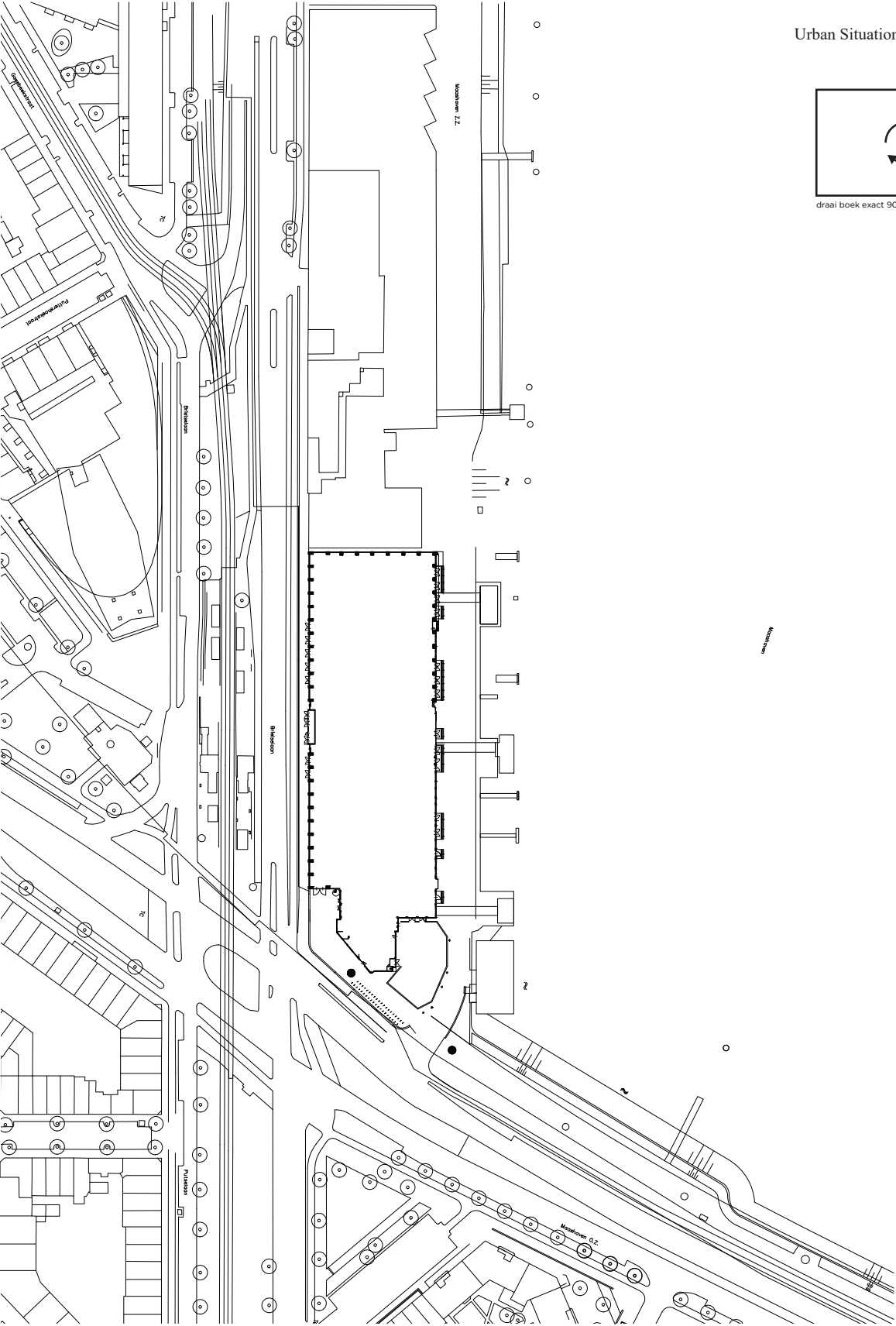
Ground Floor

-1 Basement

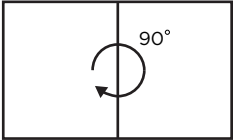


# Construction Floorplan & Sections

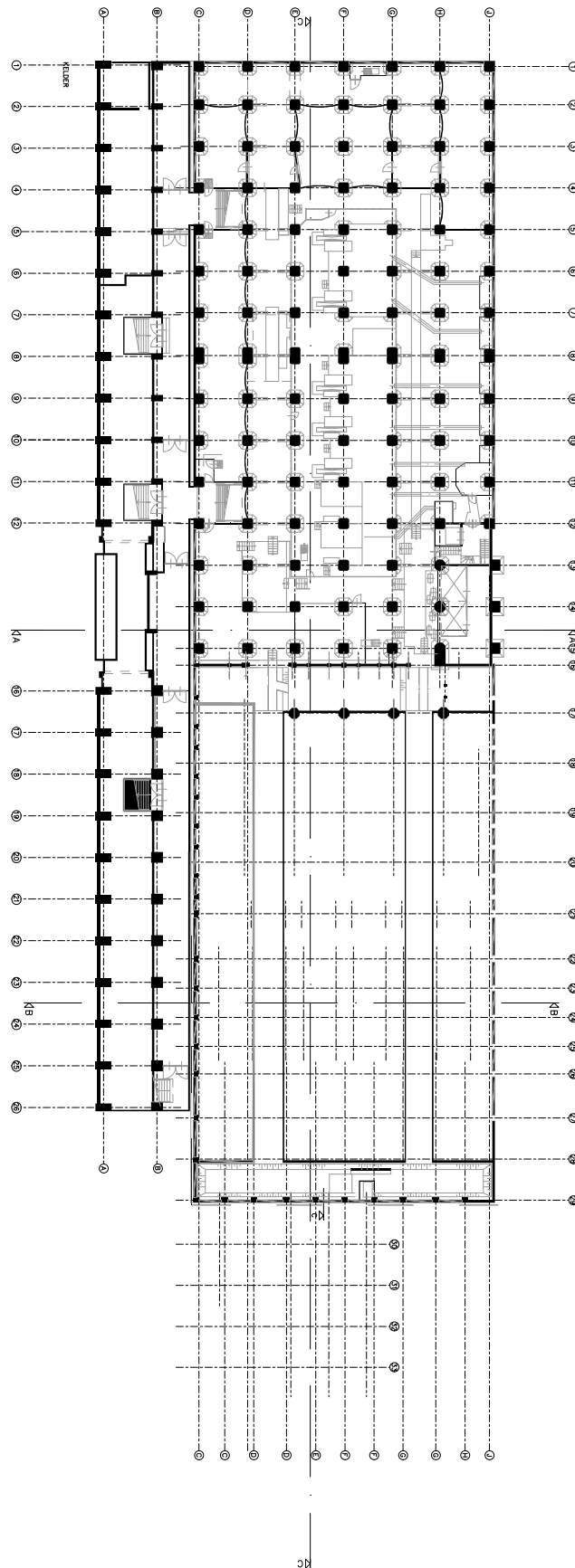
Structure (Skeleton)



Urban Situation - scale 1:2000



draai boek exact 90° voor meer kijkplezier

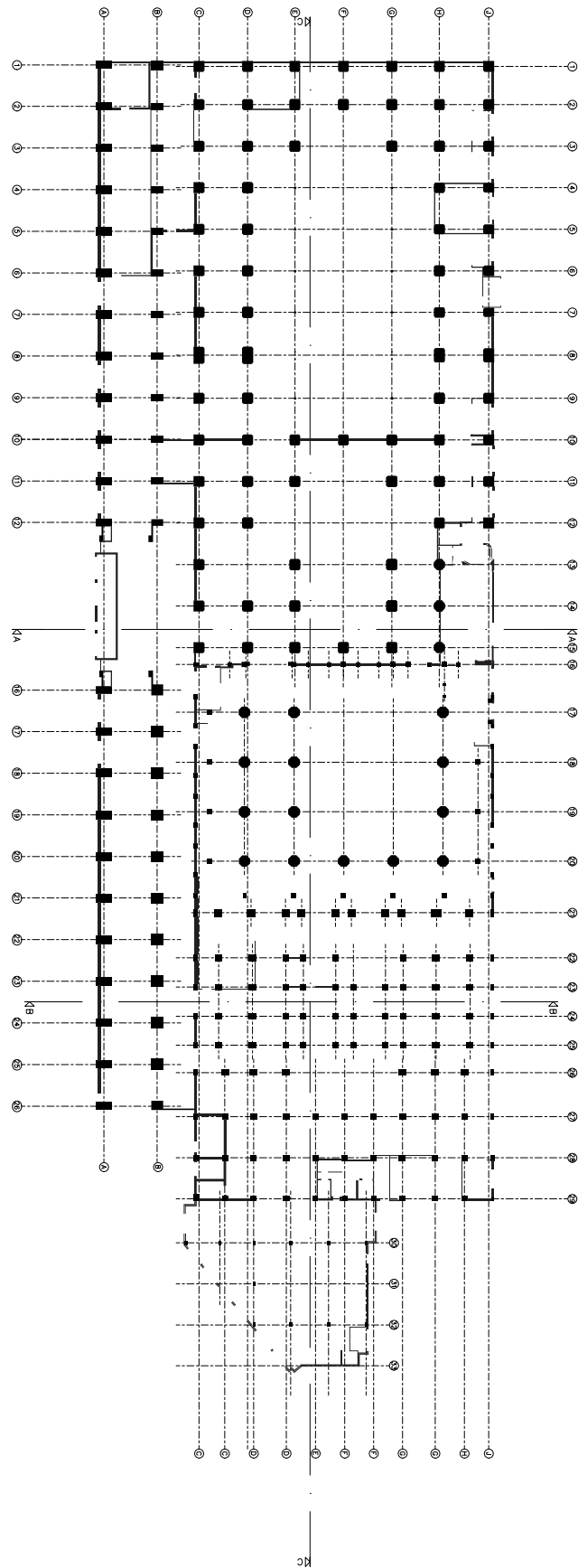


Basement - Construction - scale 1:750

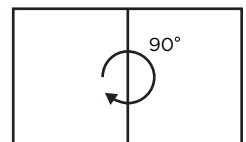


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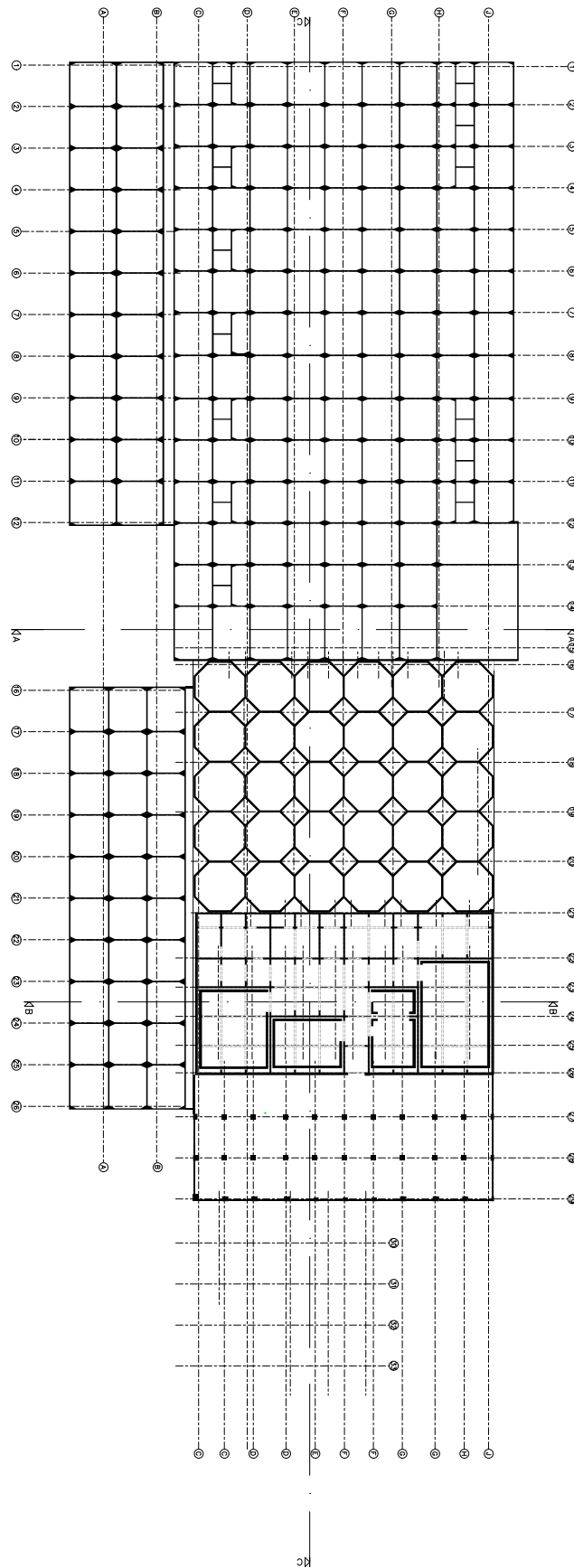




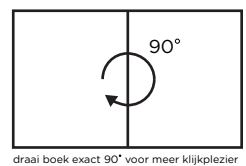
Ground Floor - scale 1:750



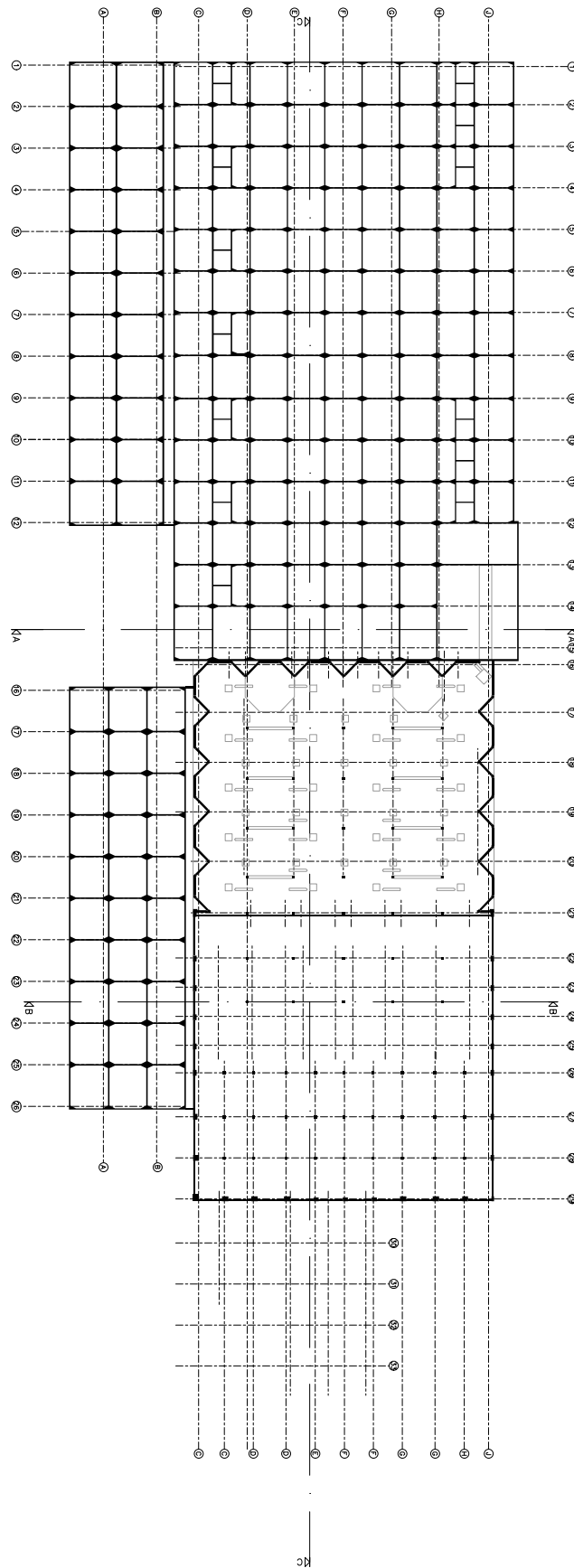
draai boek exact 90° voor meer kijkplezier



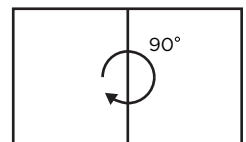
2nd - 6th Floor - Construction - scale 1:750



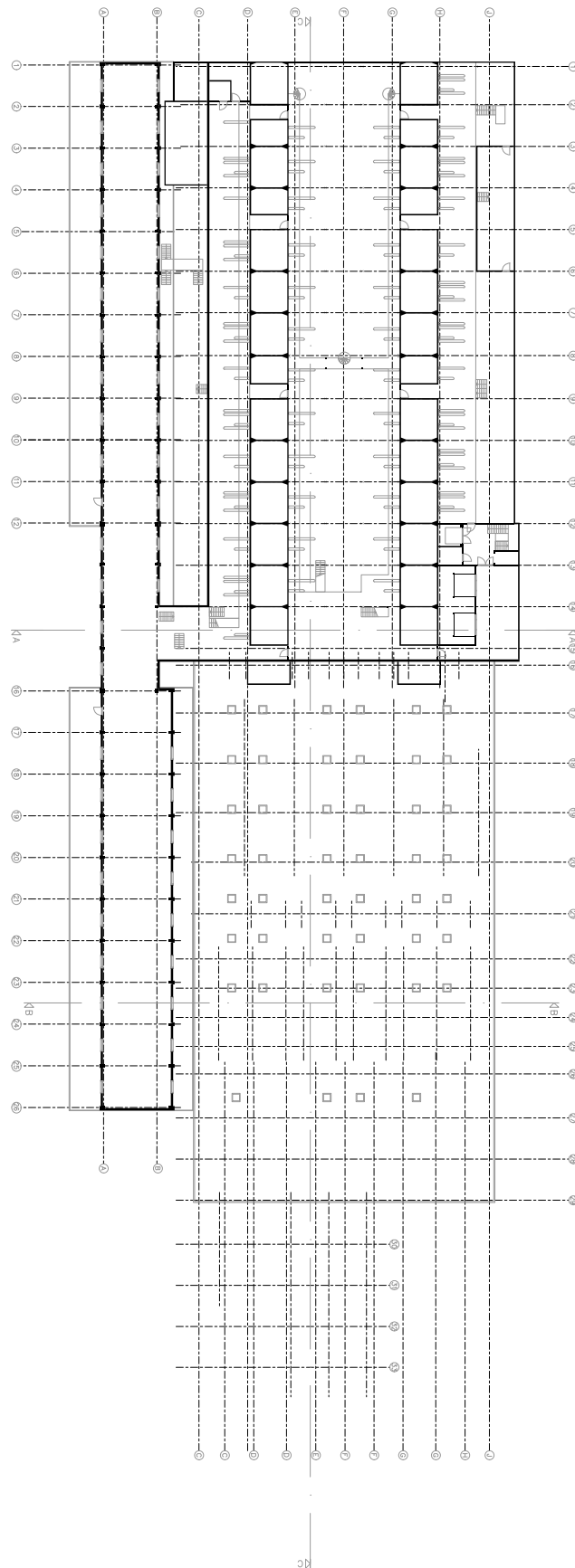
draai boek exact 90° voor meer kijkplezier



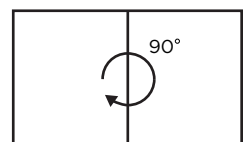
7th Floor - Construction - scale 1:750



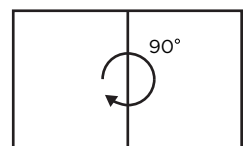
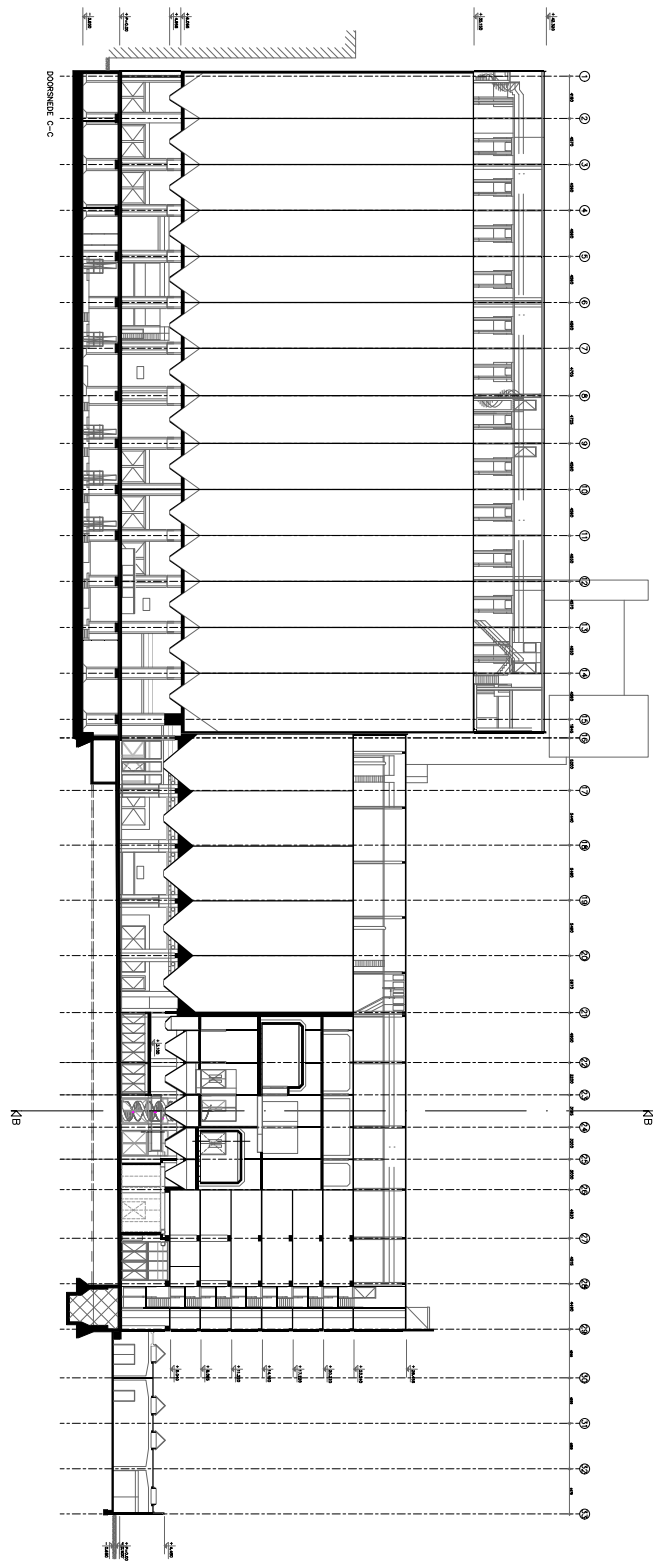
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10th Floor - Construction - scale 1:750



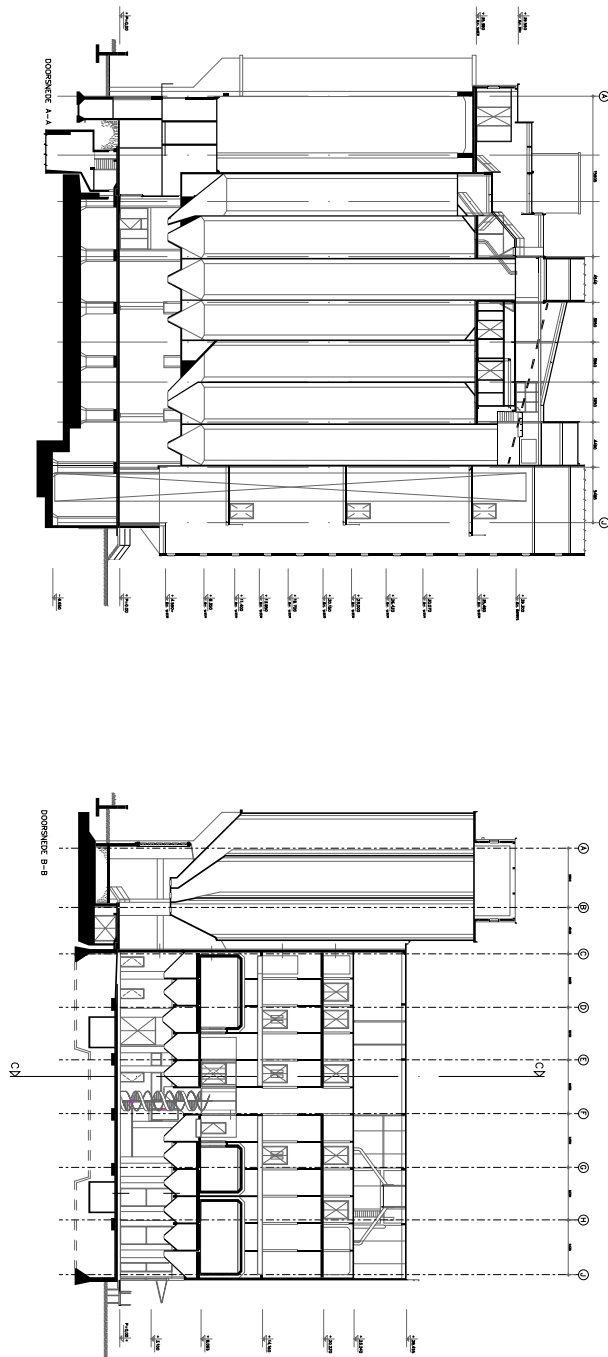
draai boek exact 90° voor meer kijkplezier



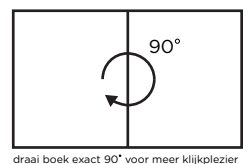
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Section CC - Construction - scale 1:750



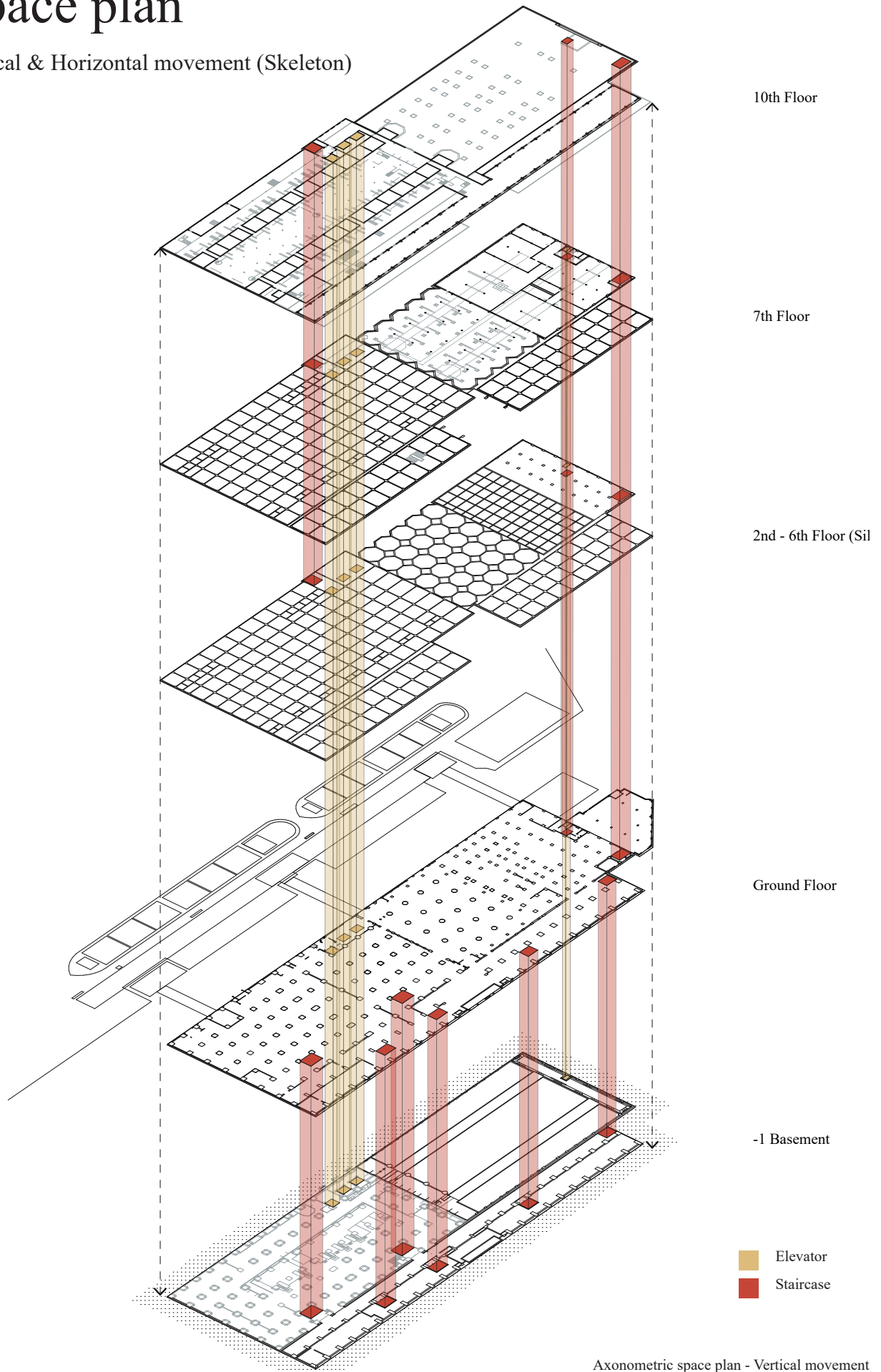


Section AA (up) & BB (down) - Construction - scale 1:750

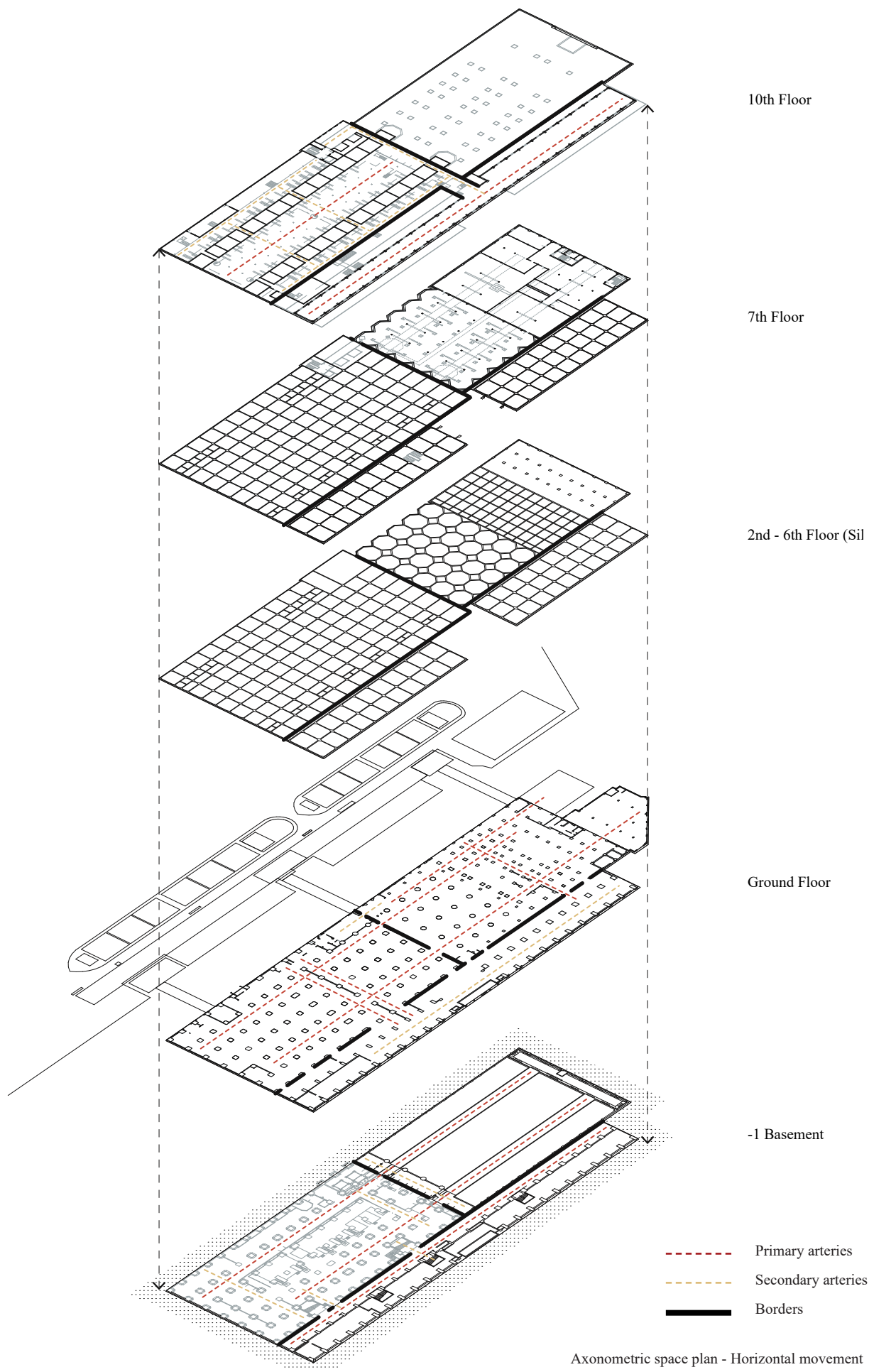


# Space plan

Vertical & Horizontal movement (Skeleton)



Axonometric space plan - Vertical movement



Axonometric space plan - Horizontal movement



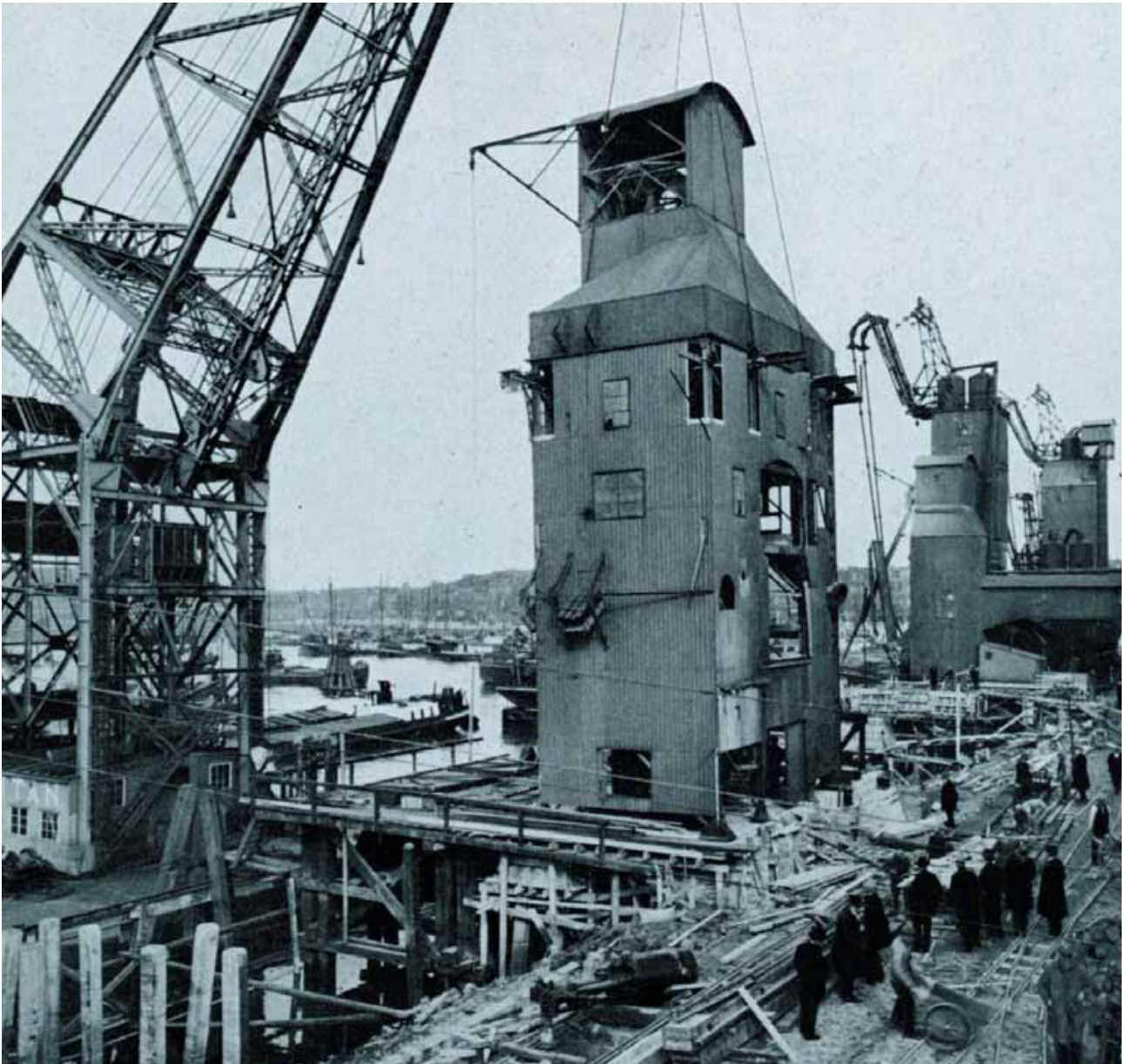
# Organs

Architectural Analysis



# Organs

## Introduction



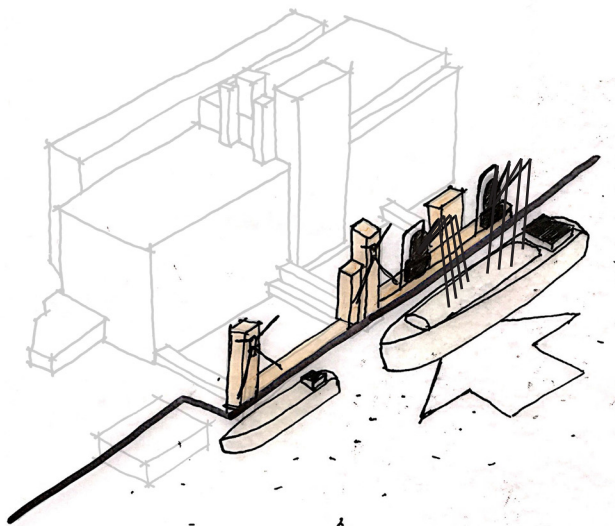
(Transformers & Mellegers, 2008)

The parts of the machine that make the Maassilo are compared to organs, in order to define their individual meaning. The first question that rises when defining the organs is: What spatial elements does the building exist of? On the following pages different organs and their role are presented.

The second question is: How do these organs affect each other and how are they connected? This is analysed after the different organs are distinguished. Then it is analysed how these organs affect the skyline around the Maassilo.

To further research the organs of the Maassilo, public, semi-public and private spaces are distinguished. After that, it is analysed how daylight enters the Maassilo now and during its former use. Then it is analysed how spaces their function, their accessibility and presence of daylight affect each other.

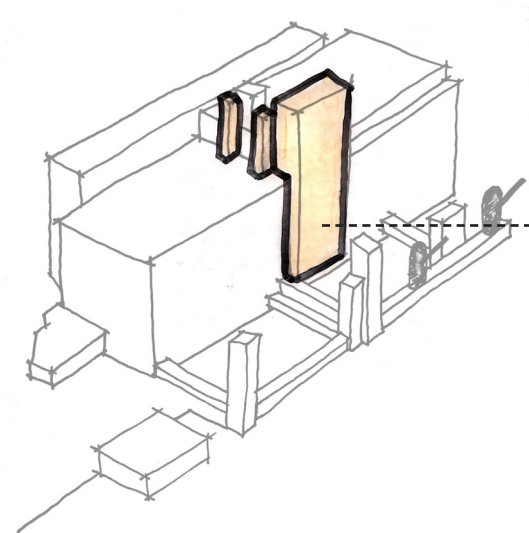
To conclude this chapter, it is analysed what organs 'make' the Maassilo and where the 'heart' of the Maassilo can be found, now and in the former situation.



Pneumatic elevators on the quays transported grain from ships onto the vertical (mechanical) cup elevators. From there the grain could be moved to other ships or into the silos of the Maassilo for storage.



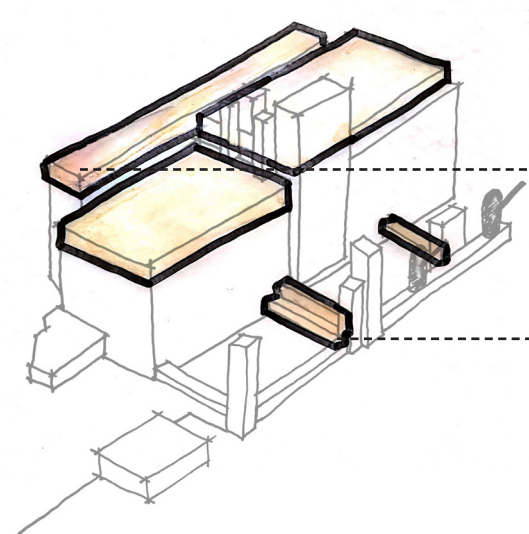
Image: Transformers & Mellegers, 2008



The elements of the building used for vertical transport.



Image: Transformers & Mellegers, 2008



The attics where grain was divided over the silos.

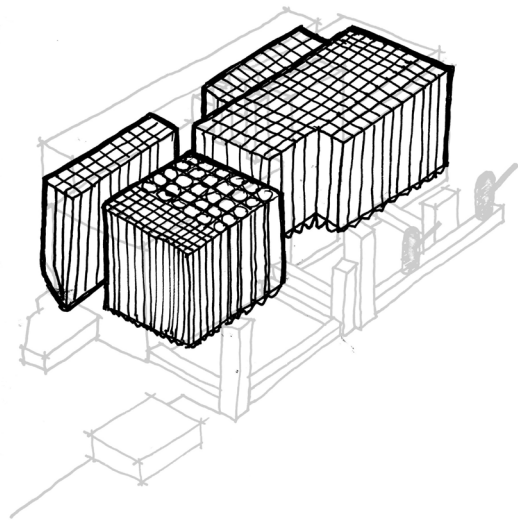




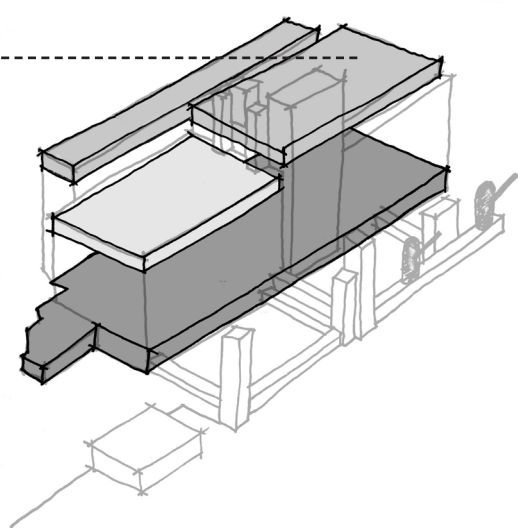


The silos accommodate for the main purpose of the building, the storage of grain.

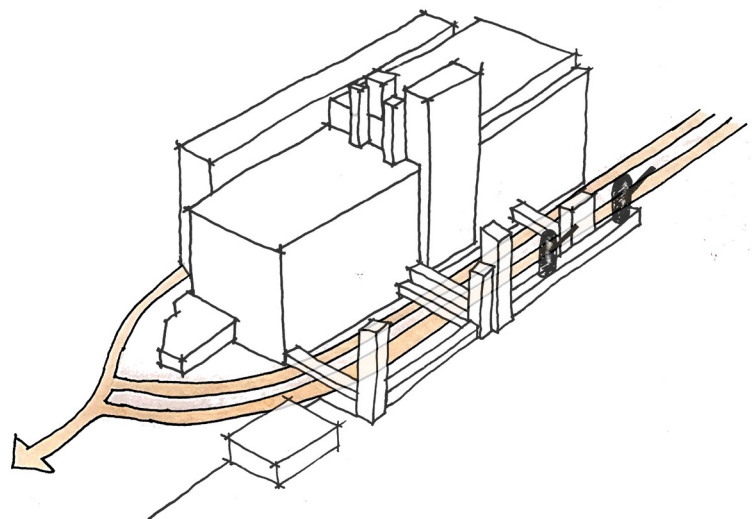
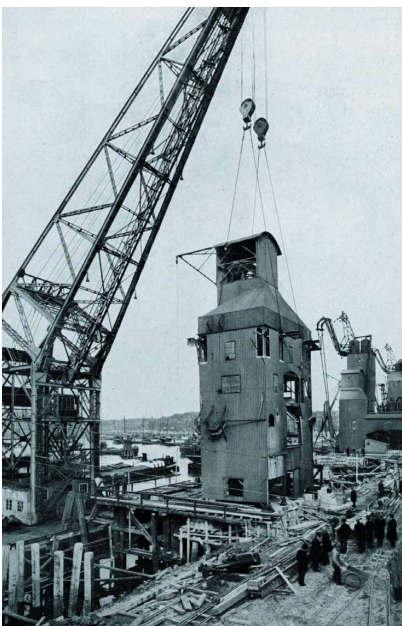
**Top, Upper Middle & Bottom:** (Transformers & Mellegers, 2008)



Silo compartments of the Maassilo where grain was being stored.



The ground floor and the attics, the areas where people came to work.



Train tracks around the building.

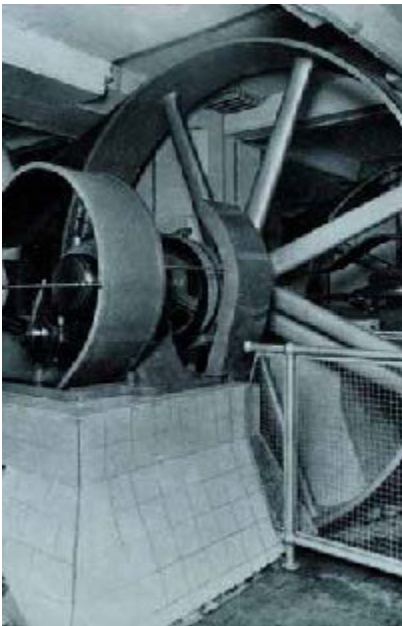
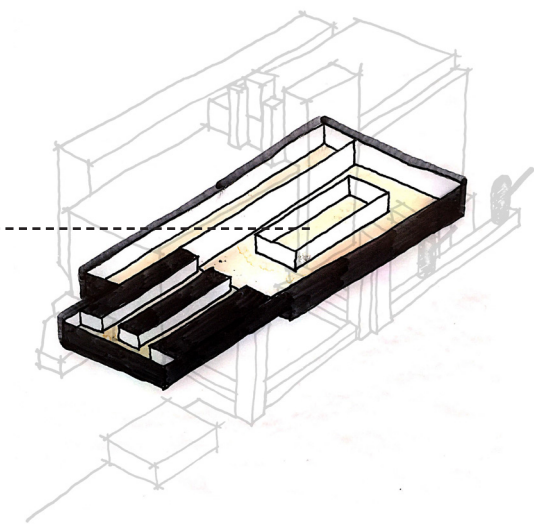


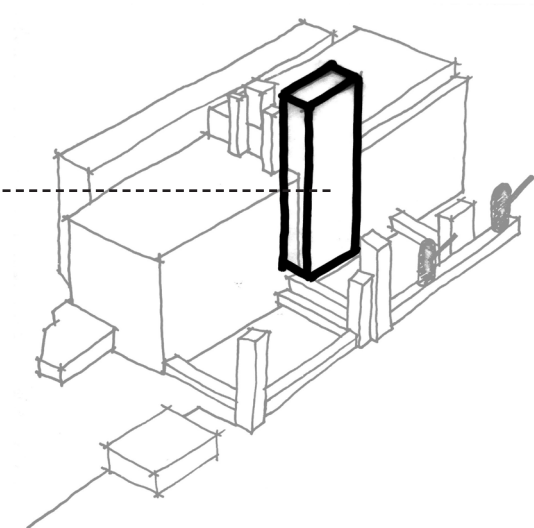
Image: Transformers & Mellegers, 2008



The basement area with the engine room. The negative pressure required for the pneumatic elevators was generated by four large air pumps powered by four electric motors with large flywheels.



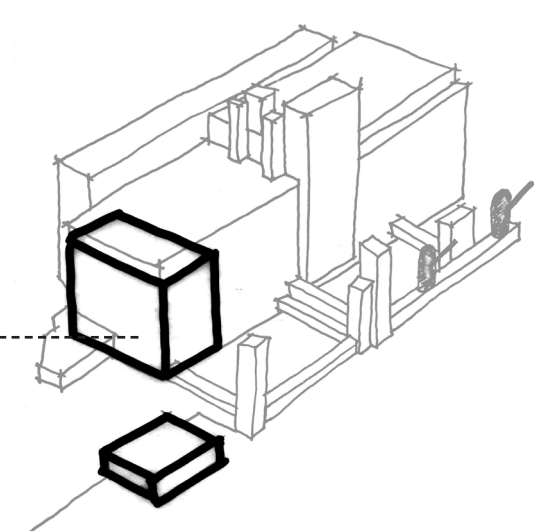
The machine tower became the centre of the building, used for most of the vertical transport of grain towards the attics.



The machine tower.



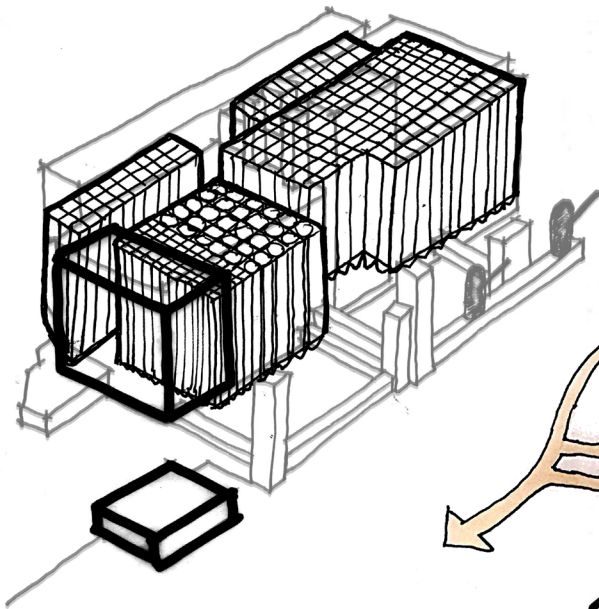
The face of the Maassilo since it was first built.



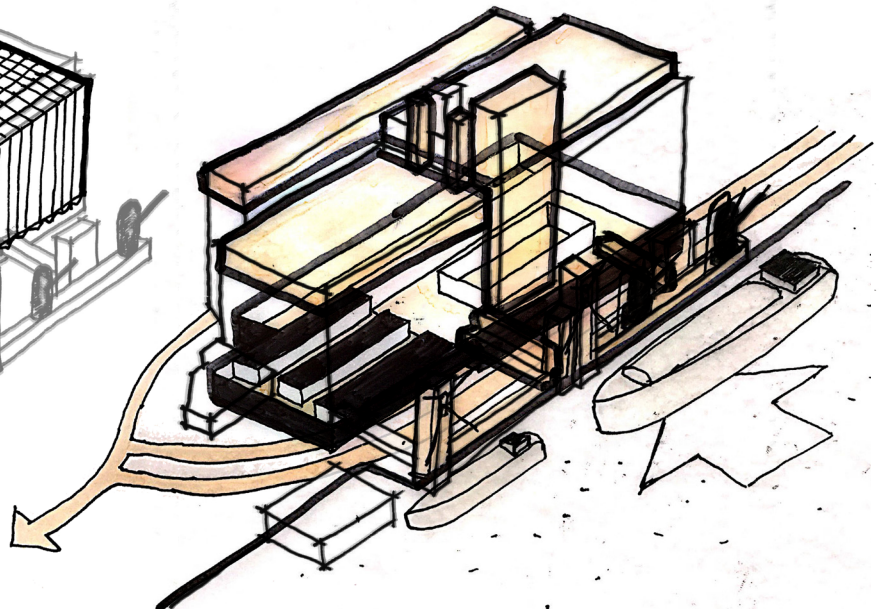
The two office areas in the buliding.

# Organs

How do the organs of the Maassilo affect each other and how are they connected?



More passive organs of the Maassilo.

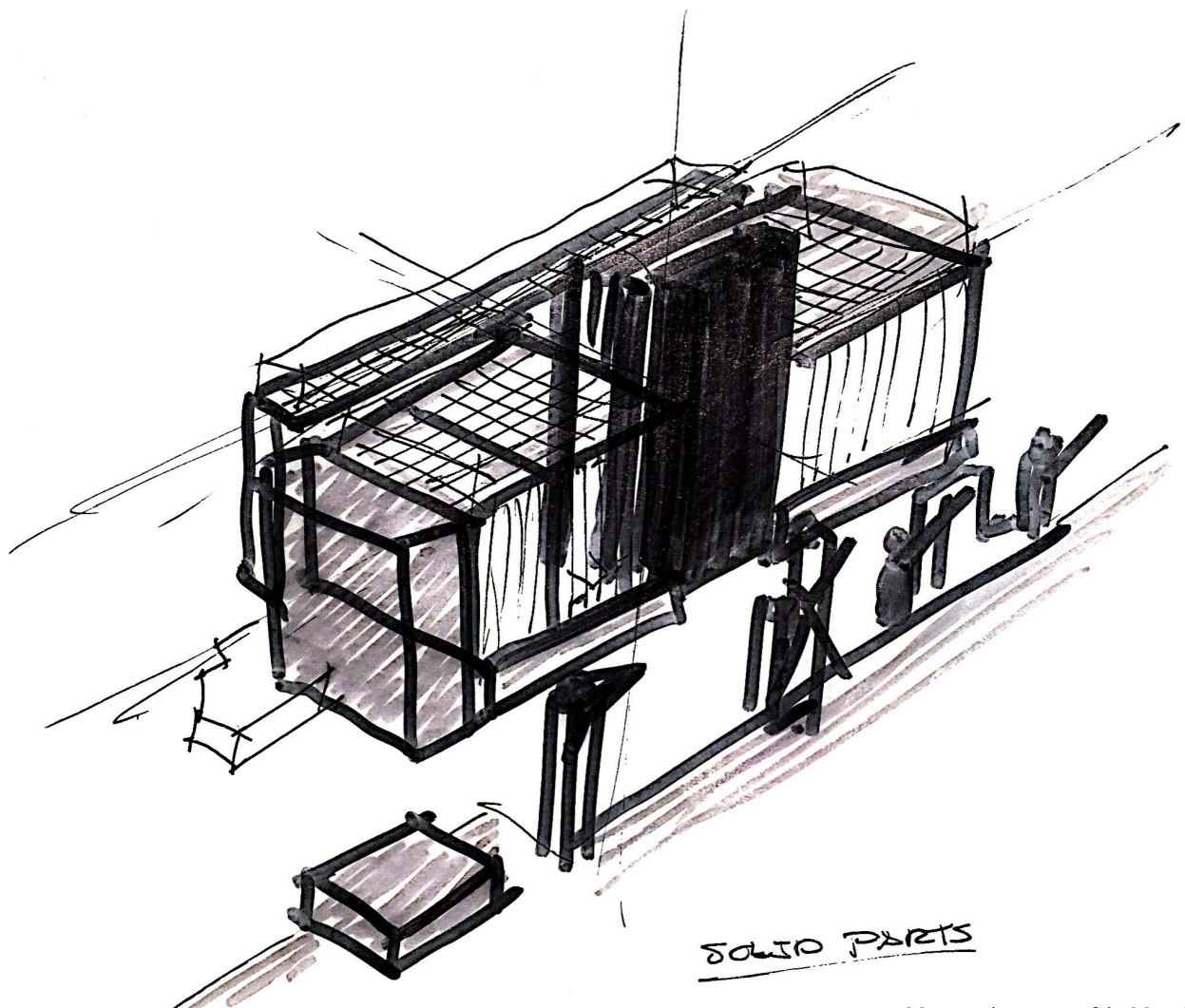


Active organs for motion in the Maassilo.

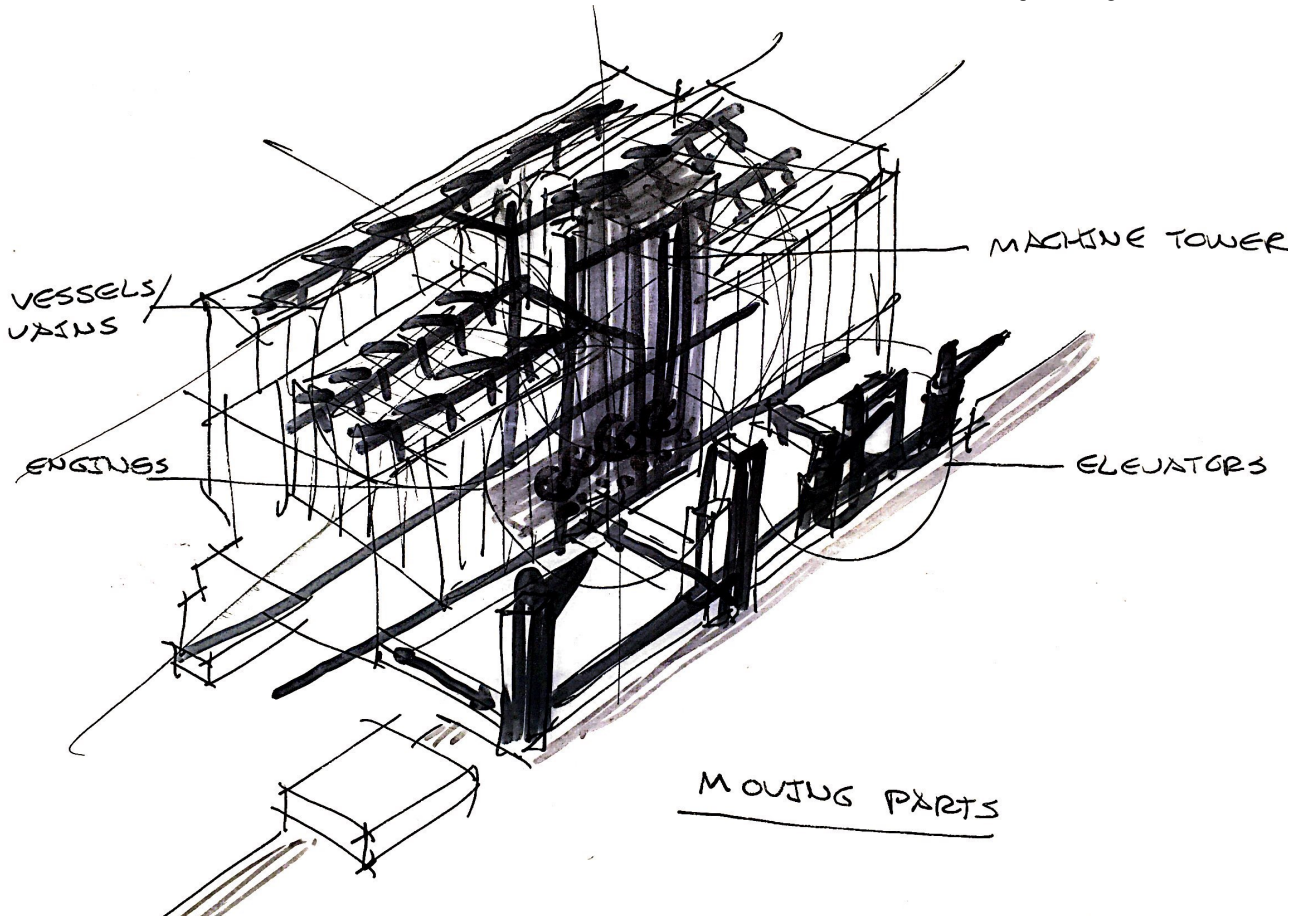
It seems that organs can be divided into two categories: the active organs, that relate to movement, and the passive organs that relate to passive functions, like storage and offices. The different passive organs are connected by different active organs. Interesting is that the passive organs and active organs are complementary.

The passive organs are important for the main purpose of the building, storage, and also for a large part of the structure. The active organs make the building 'work'.





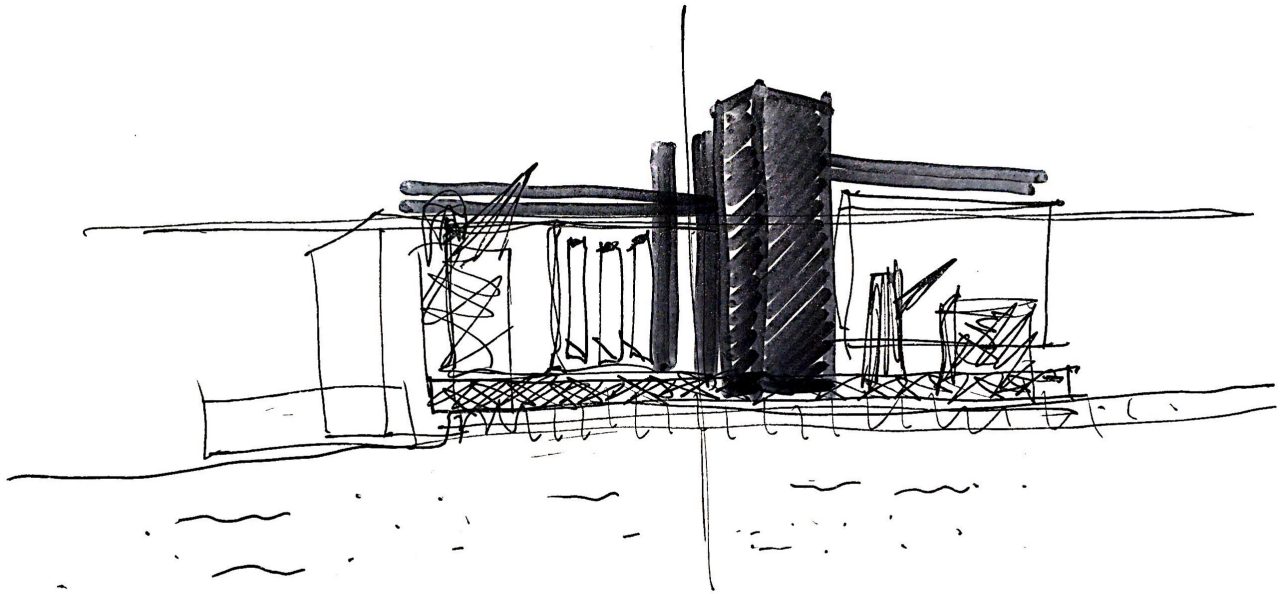
More passive organs of the Maassilo.



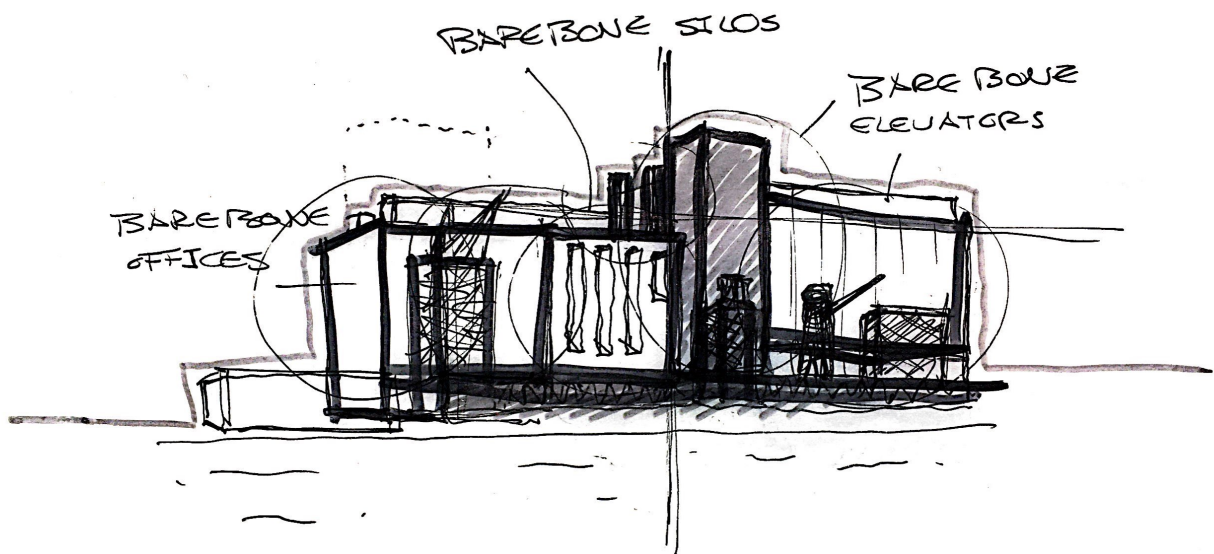
Active organs for motion in the Maassilo.

# Organs

How do different organs affect the skyline around the Maassilo?



ORGANS ARE CONNECTED BY BARE TRANSPORTATION SYSTEMS.



THERE IS NO SKIN, ORGANS ARE CONNECTED BY TRANSPORTATION SYSTEMS.  
IT'S NOT ONE BUILDING, BUT SEVERAL. A COLLECTION OF PARTS.

The silos are three things at once: structure, skin and silo. The biggest part of the building is made of silo's and has no skin. The building is a barebone collection of different organs that make it seem like the building has an exoskeleton. Therefore the skyline is rugged.

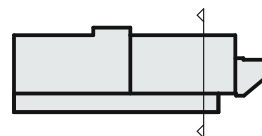
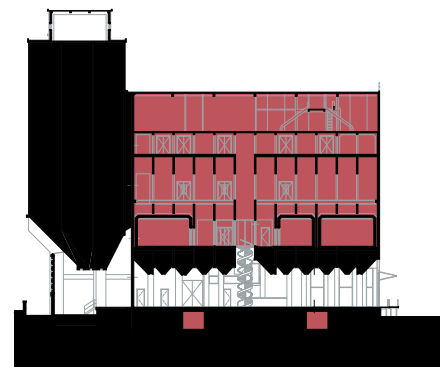
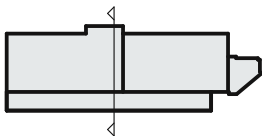
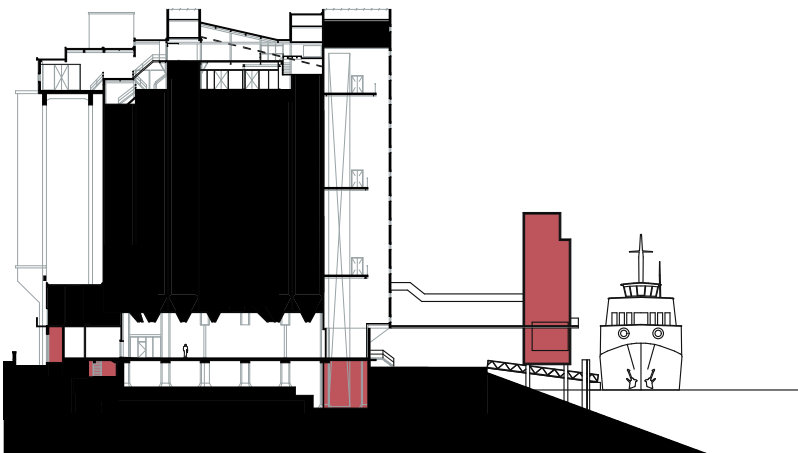
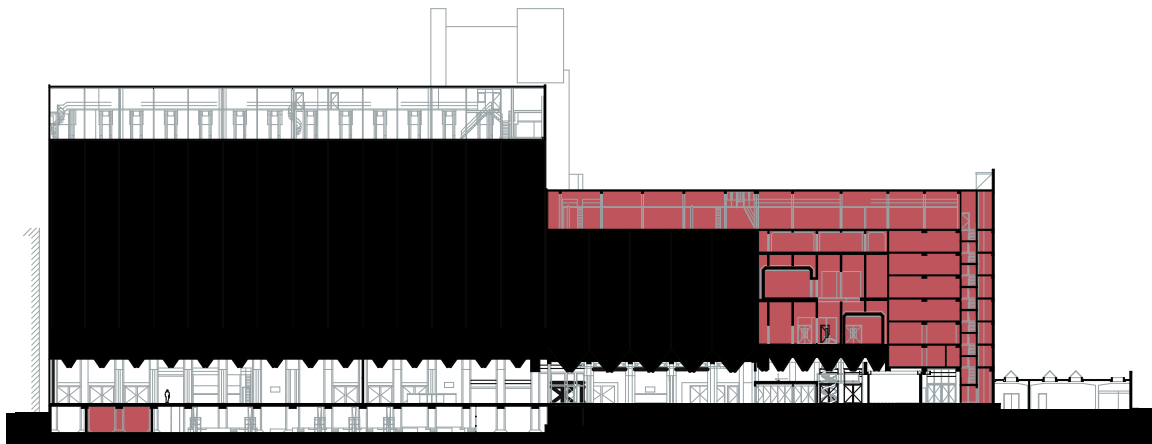
Right page:  
**Top:** Skyline of the Codrico factory at the Rijnhaven  
**Bottom:** The Maassilo at the Maashaven. Concrete mountains, existing of a variety of concrete, steel and glass blocks.





# Spatial composition

Private, semi-public & public spaces nowadays



In the former use of the Maassilo, the building was not open to visitors on a daily basis because of the nature of the former use and company in the building. Nowadays the Maassilo is open to visitors during planned cultural events, but not on a daily basis. Therefore the Maassilo is considered to be a semi-public building. The site of the building is publicly accessible nowadays. During the night, the offices (marked red, private) are closed.

The semi-public areas are only open to visitors when there is an event planned, so day-night cycles don't necessarily affect the accessibility of spaces in the Maassilo nowadays. Private spaces can be bars, kitchens, offices, backstage areas, elevator towers, storage, technical rooms and unused spaces of the Maassilo.

- inaccessible
- private spaces
- semi-private spaces
- public space, only outside the building

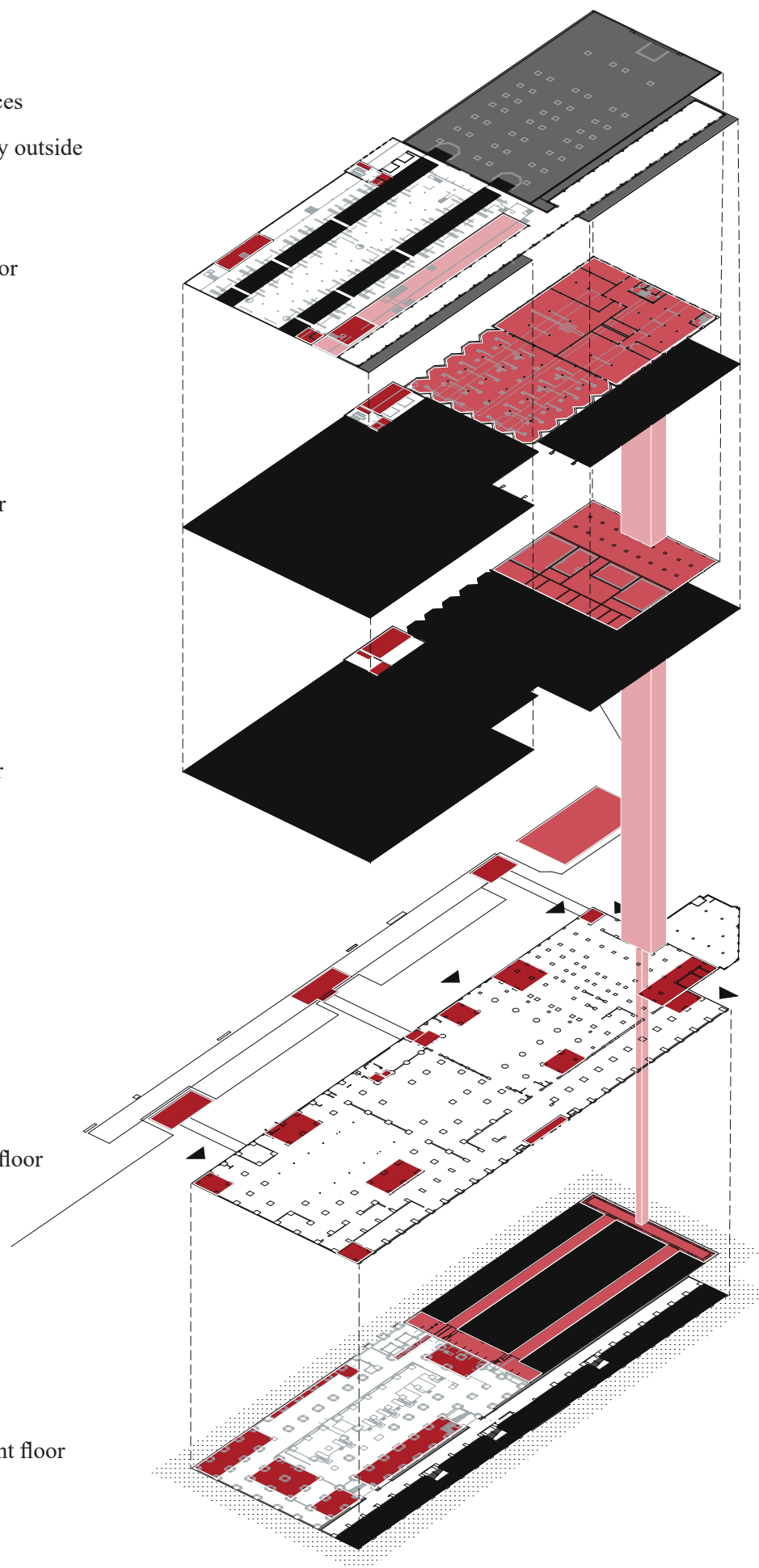
10th floor

7th floor

1st floor

ground floor

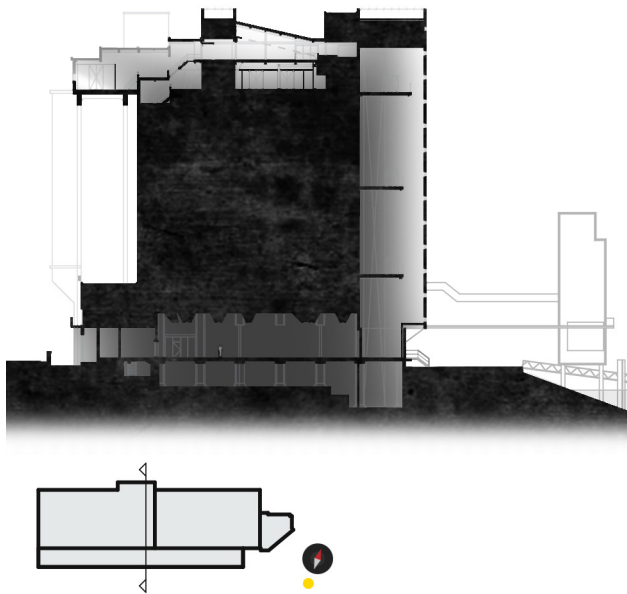
basement floor



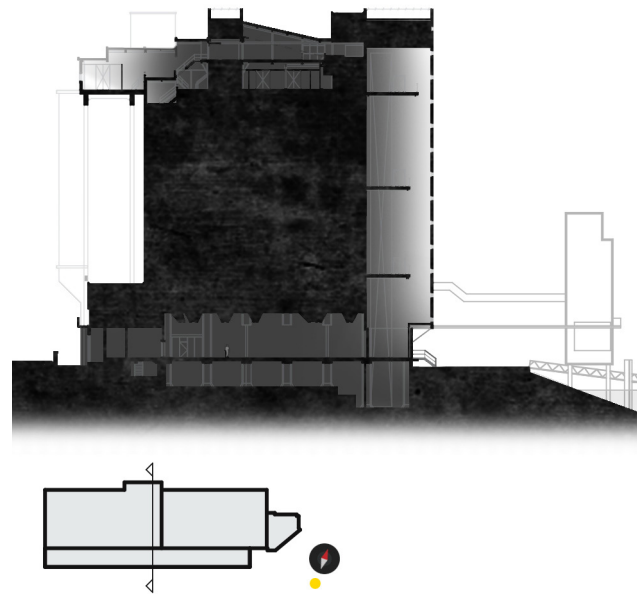


# Daylight

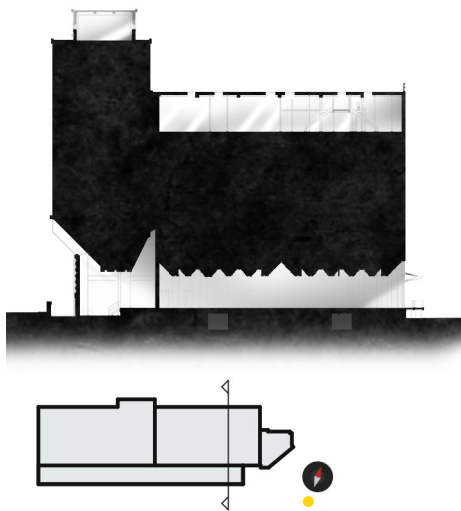
## Daylight in former and current situation



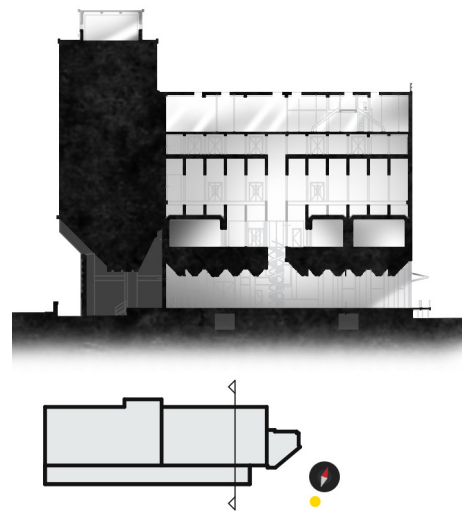
Daylight in the former situation



Daylight in the current situation



Daylight in the former situation



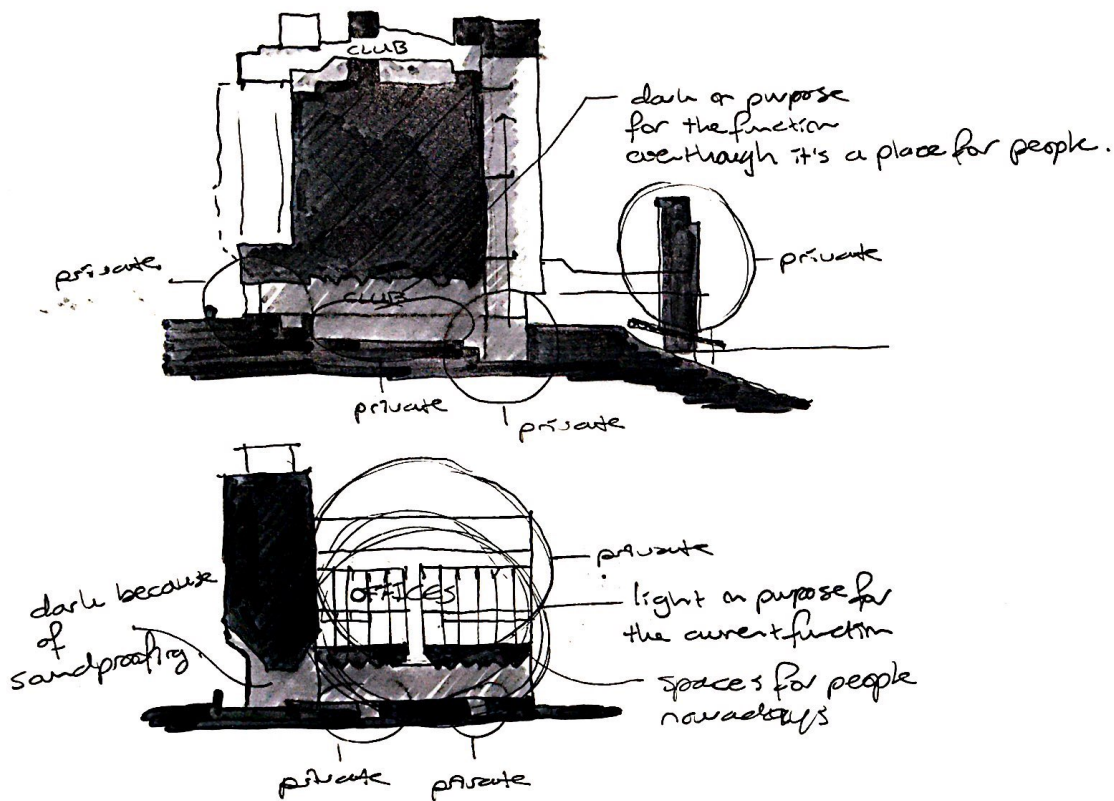
Daylight in the current situation

The main question about daylight is: How do spaces their function, their accessibility and daylight affect each other?

The images on this page illustrate the presence of daylight in the current and former situation. Interesting is that certain spaces that used to let daylight in, are now dark. In the former use the distinction was clear: spaces for people had daylight, spaces for machines did not. Nowadays, the amount of people in the

building increased, while the amount of daylight has decreased. This is because the current functions need soundproofing and controllable lighting.

Form followed function in the former use of the Maassilo. In the current situation, function follows the existing form. The presence of daylight follows function in both current and former situation. Whether a space is semi-public or private also follows the function in both the former and current situation.



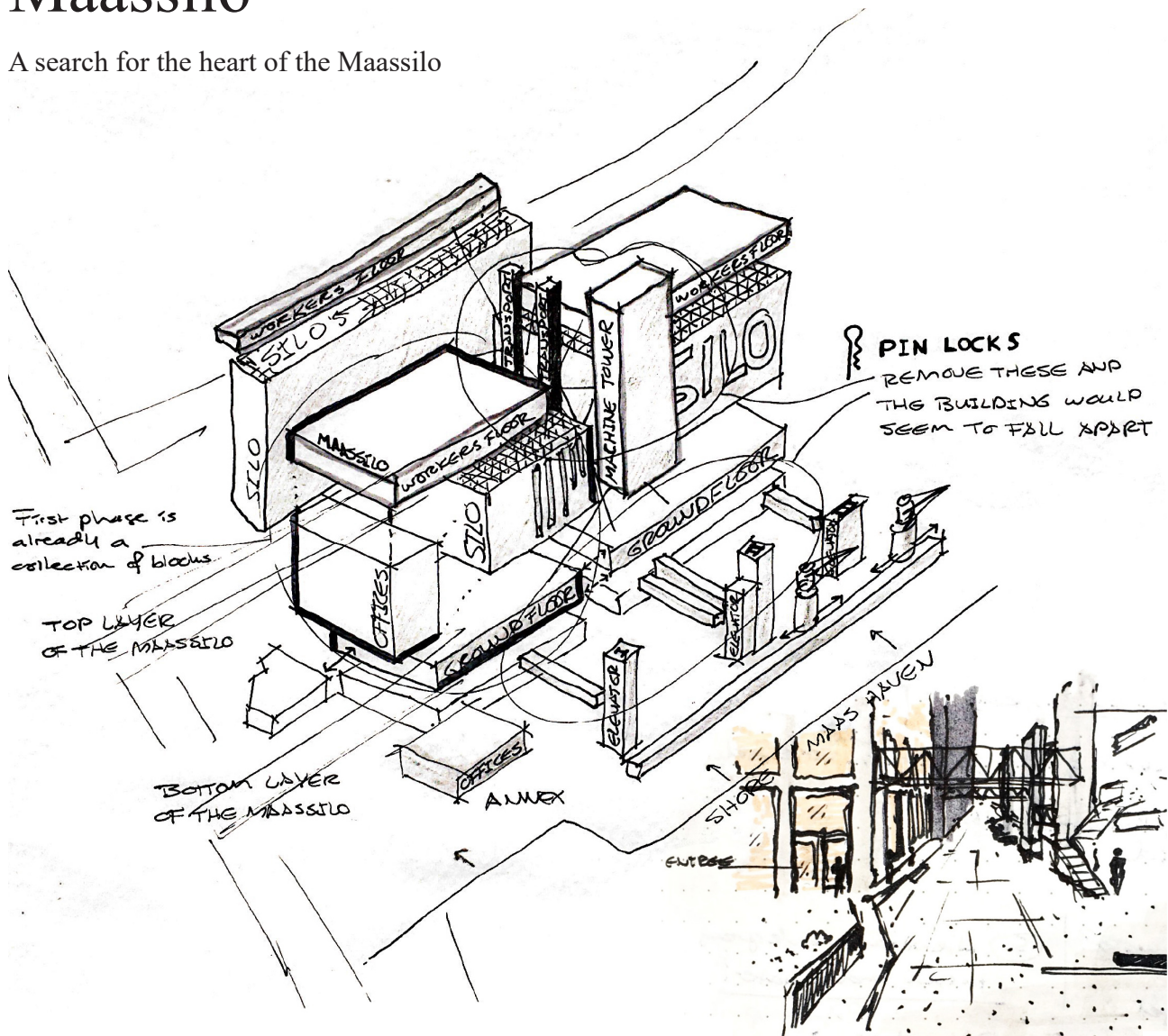
- Places for workers had windows. Places for machines didn't.
- In the current situation some spaces are made dark on purpose for the new function.
- As the spaces for people changed over time (different use), the light/daylight is adjusted to the function of this space. Some spaces for people now don't have daylight, while in the former situation all spaces for people had daylight.

- ▷ Function follows form (available space)
- ▷ Daylight follows function (concerts, soundproofing)
- ▷ Private/public follows function (storage & offices are private, empty/unused spaces are private)

How does space, daylight or functions affect which areas are public or private?

# Characteristic organs of the Maassilo

A search for the heart of the Maassilo



What organs 'make' the building?

To find out what the characteristic organs of the Maassilo are, it is analyzed which organs 'make' the building.

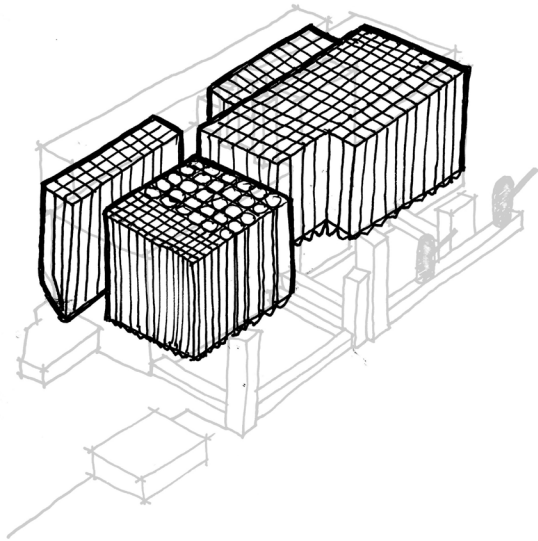
The main characteristics are the magnitude of the Maassilo, the uniformity of the function, structure and skin, and contrasts between dynamic and static elements of the building, as well as daylight and darkness. These characteristics all remind of the identity of the site, and Rotterdam as a harbour city.

The most characteristic static organs are likely to be the silos, a uniformity of function, structure and skin. The most characteristic active organs can be

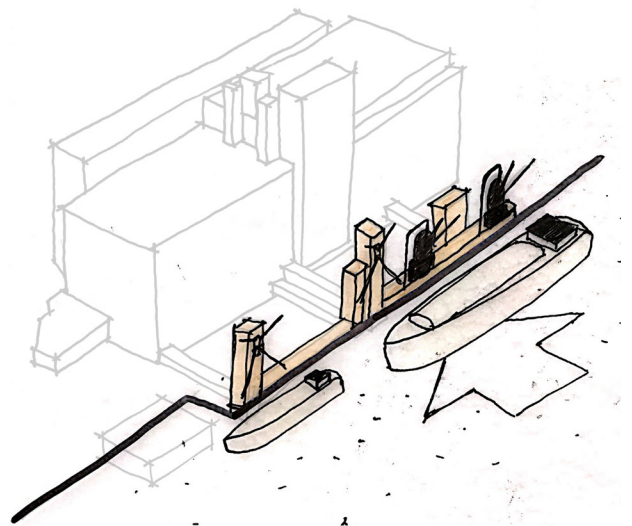
the elevator towers on the quay, that remind of the activity and identity of the site.

All organs are connected by the machine tower that, in case it was removed, would make the building seem to fall apart. Even if the machine tower is not the most characteristic organ of the building, it is still one of the most important ones, connecting all parts of the machine like a pin lock.

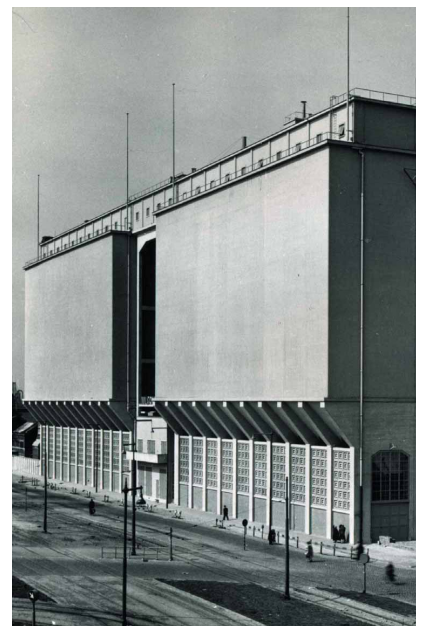
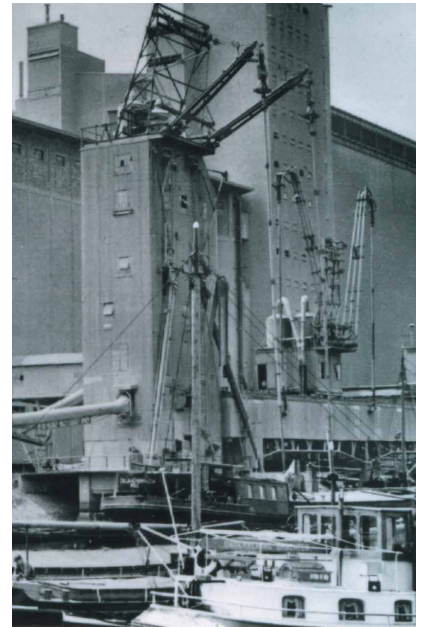
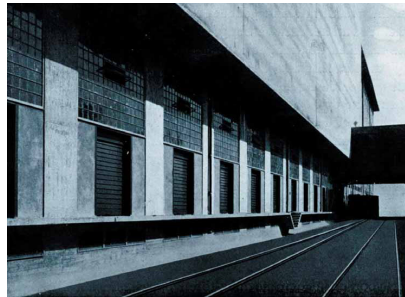




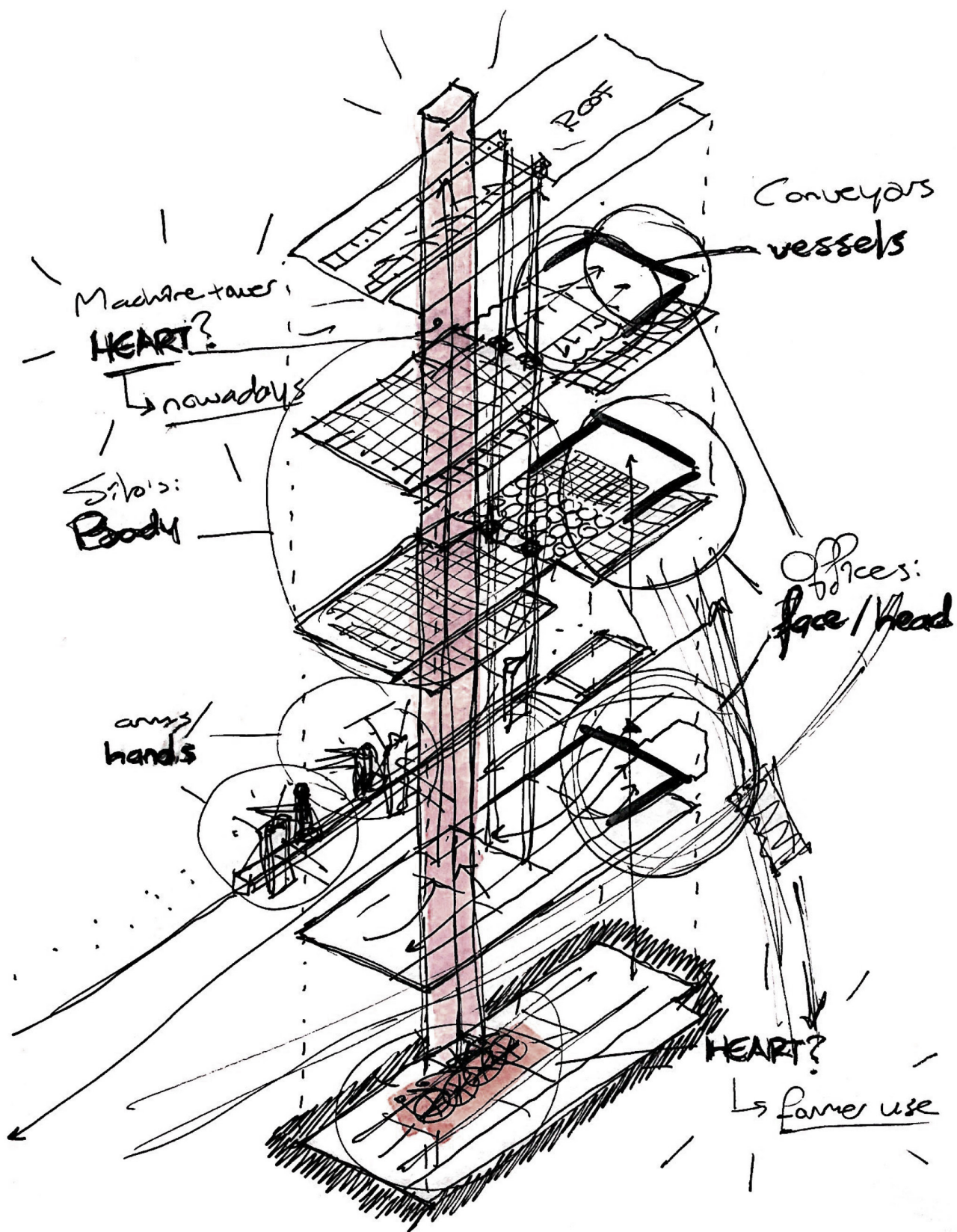
The silos; one of the passive organs. A uniformity of function, structure and skin.



The elevator towers on the quay; one of the active organs that relate the building to the water and remind of the identity of the site.







Where is the 'heart' of the Maassilo?

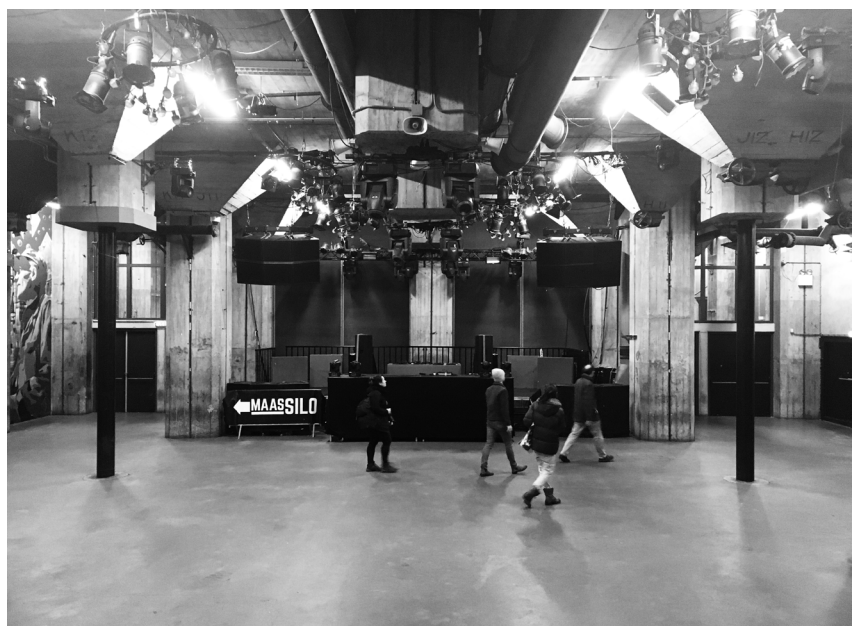
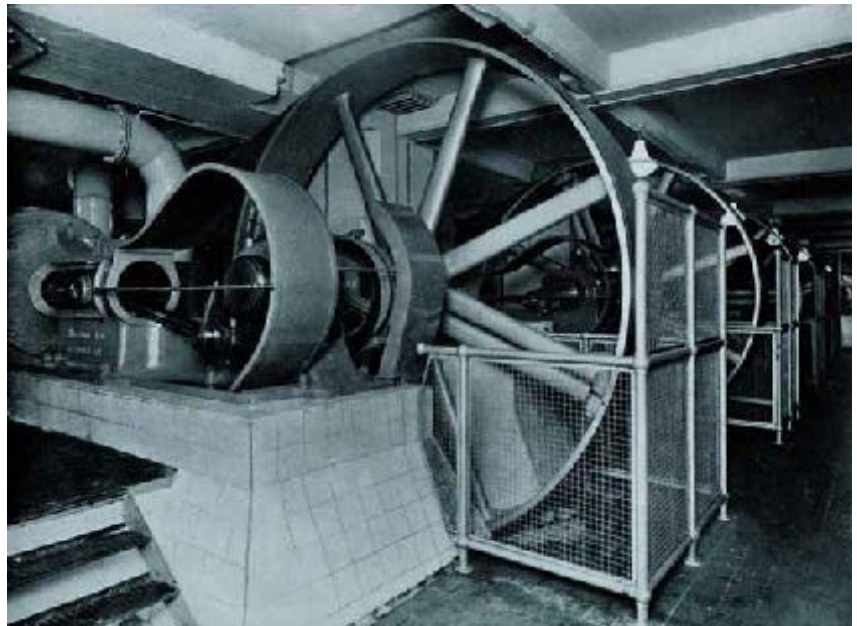


The heart of the Maassilo can be different from the organs that ‘make’ the building. It can be a rather intangible aspect opposed to the more tangible organs. The heart of the building could also be defined as the most important organ of the building, which makes the building come to life.

In the former use, the workers, together with the engines and air pumps in the basement, made the building come to life and were essential for the building to function. Nowadays, it is harder to grasp what makes the building come to life. It is likely to be the people that use and visit the building, or the cultural events that take place. Or even the memory of the former use, visible in the configuration and characteristics of all the organs.

Continuing to compare the building to an organism, the offices appear to be the face of the Maassilo in its former use, while the face of the Maassilo nowadays seems to be more intangible as well: the cultural events that take place in the building.

If the heart of the building were to be represented by a tangible organ of the building, it would be the large open spaces on the ground floor underneath the silos, and the central machine tower, distributing the people through the building to make the Maassilo come to life.



**Top:** Four large air pumps powered by four electric motors with large flywheels (Image: Transformers & Mellegers, 2008).

**Middle:** Machine Tower and elevators from the street on the north side.

**Bottom:** One of the stage areas on the ground floor, underneath the silos.

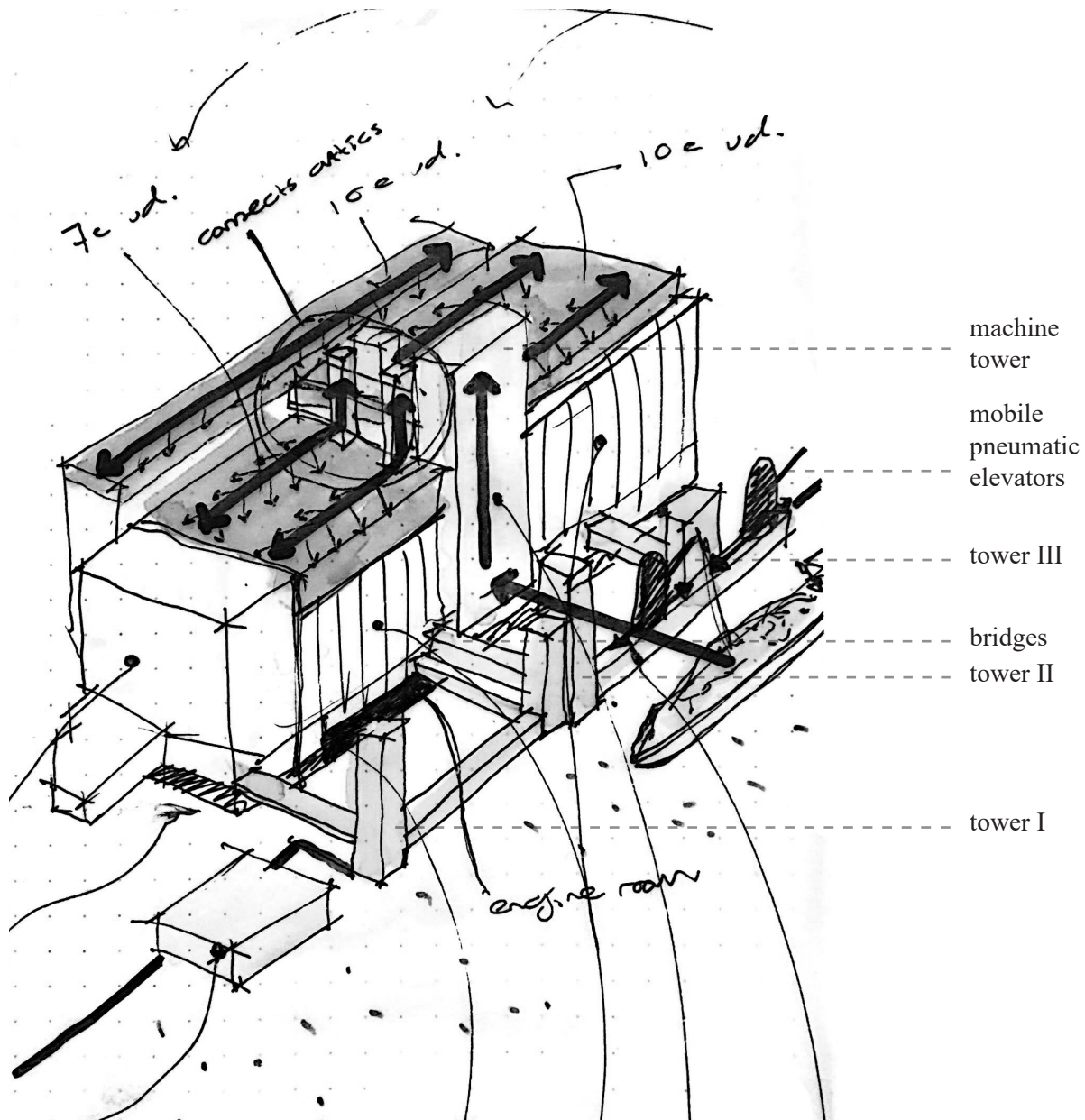


# Vessels

Architectural Analysis

# Flows of grain and workers in the Maassilo

Flows of people and grain in the Maassilo as a machine for storage (former use)



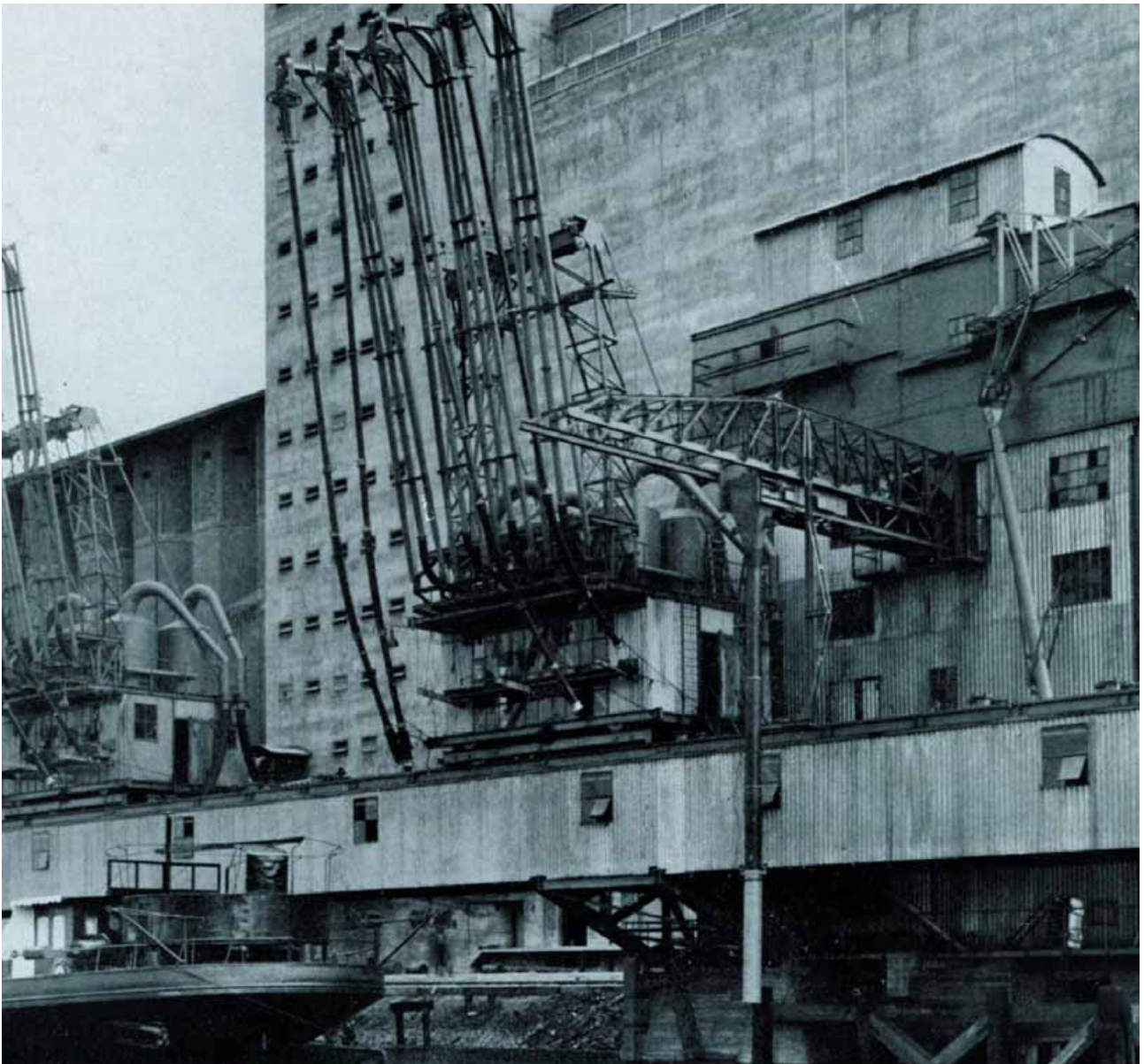
How did grain and people move through the Maassilo before the building was transformed to a cultural platform?

The Maassilo is first designed to transport and store grain. In this chapter, it is presented how grain and workers moved through the building. During the different building phases, the main principle of how grain was moving through the building remained similar, but the building has expanded and the process has been optimized.

In the first phase (1910-1930), there were two elevators on the quay. In the eastern elevator (tower I), the

grain was transported from the ships into the elevator towers. From there the grain could be either moved to other ships, or packaged and slid into railway wagons. The western elevator (tower II) could move the grain to one of the two main elevators in the building, where it could be transported to the attic. In the attic, the grain moved onto a conveyor belt that distributed the grain into the silos through tubes.

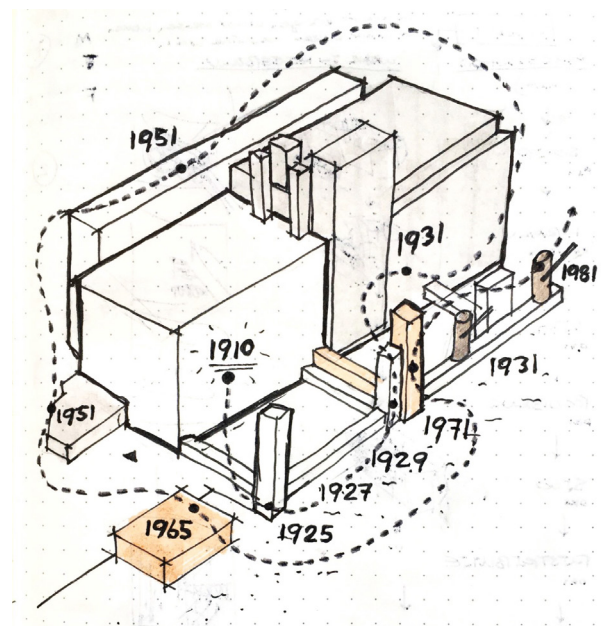




Mobile pneumatic grain elevator next to tower III (phase 2, 1930-1951)  
Image: Transformers & Mellegers, 2008

In the second phase (1931-1951) the grain was transported from the ships into the elevator towers with mobile pneumatic elevators, visible in the above image. The elevator towers are connected to the building by bridges with conveyor belts. The grain was moved from tower II to the machine tower, where it was transported to the top floors using cup elevators. On the top floors the grain was distributed over the silos. Tower I was used for transporting grain into the silo. Tower II and III were used for transporting grain into the silo, and to transfer grain to other ships. From the bridge between tower III and the silos, grain could be moved onto trains (Transformers & Mellegers, 2008). In the third phase (1951-2004) more silos were added on the south side. Overtime there were several improvements to the overall system.

On the following pages the flows in the Maassilo of the third phase and the current situation are compared.





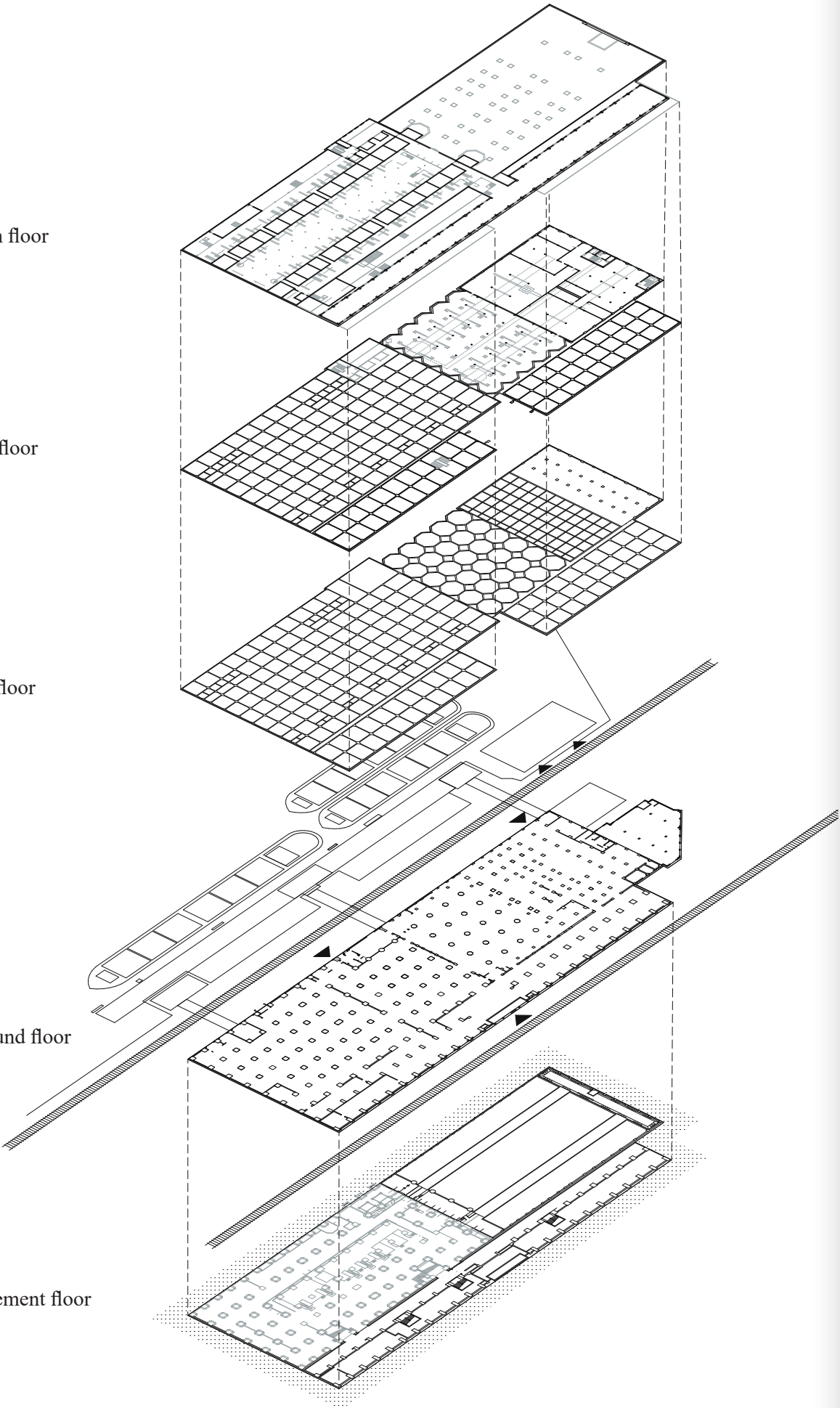
10th floor

7th floor

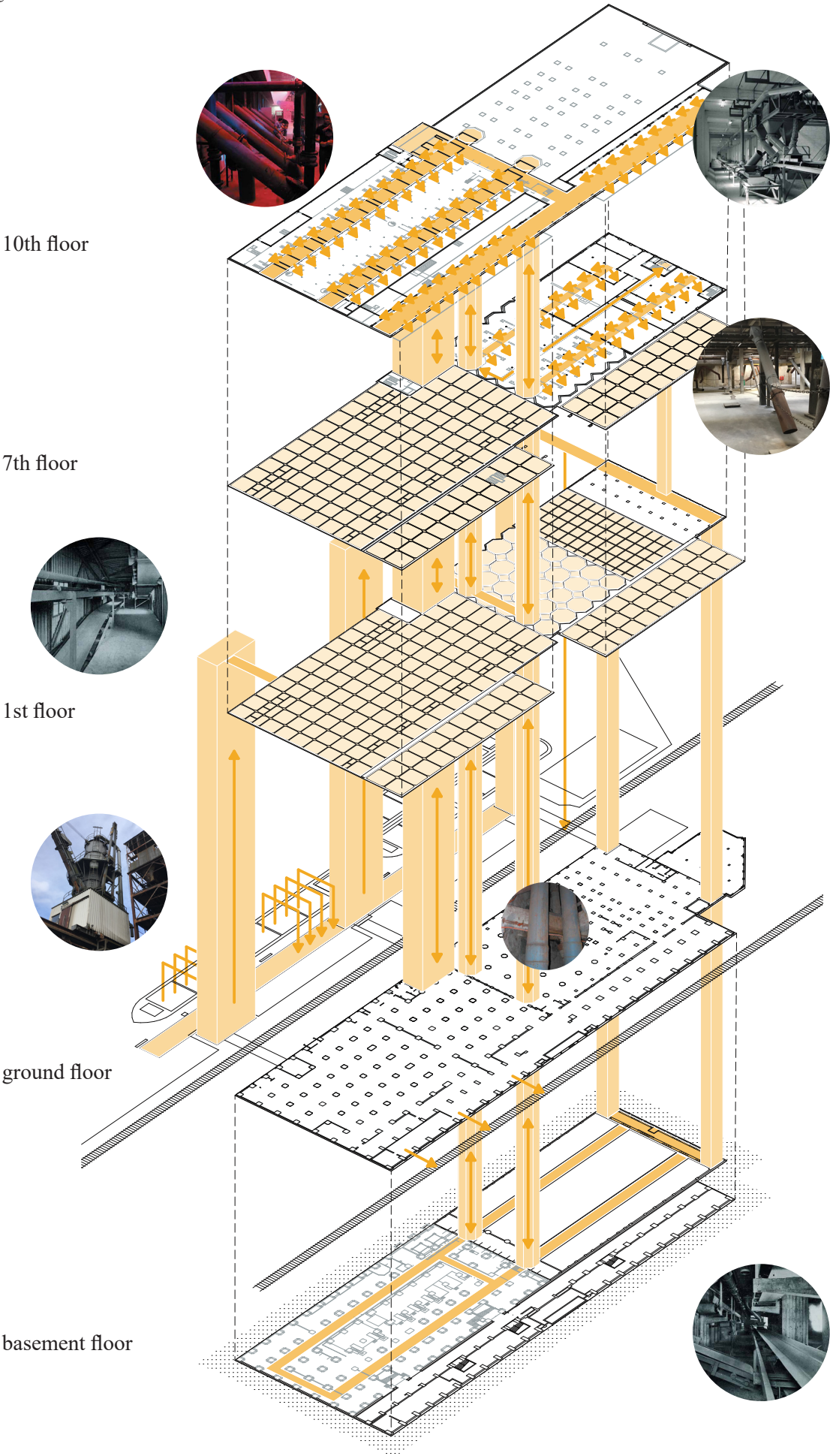
1st floor

ground floor

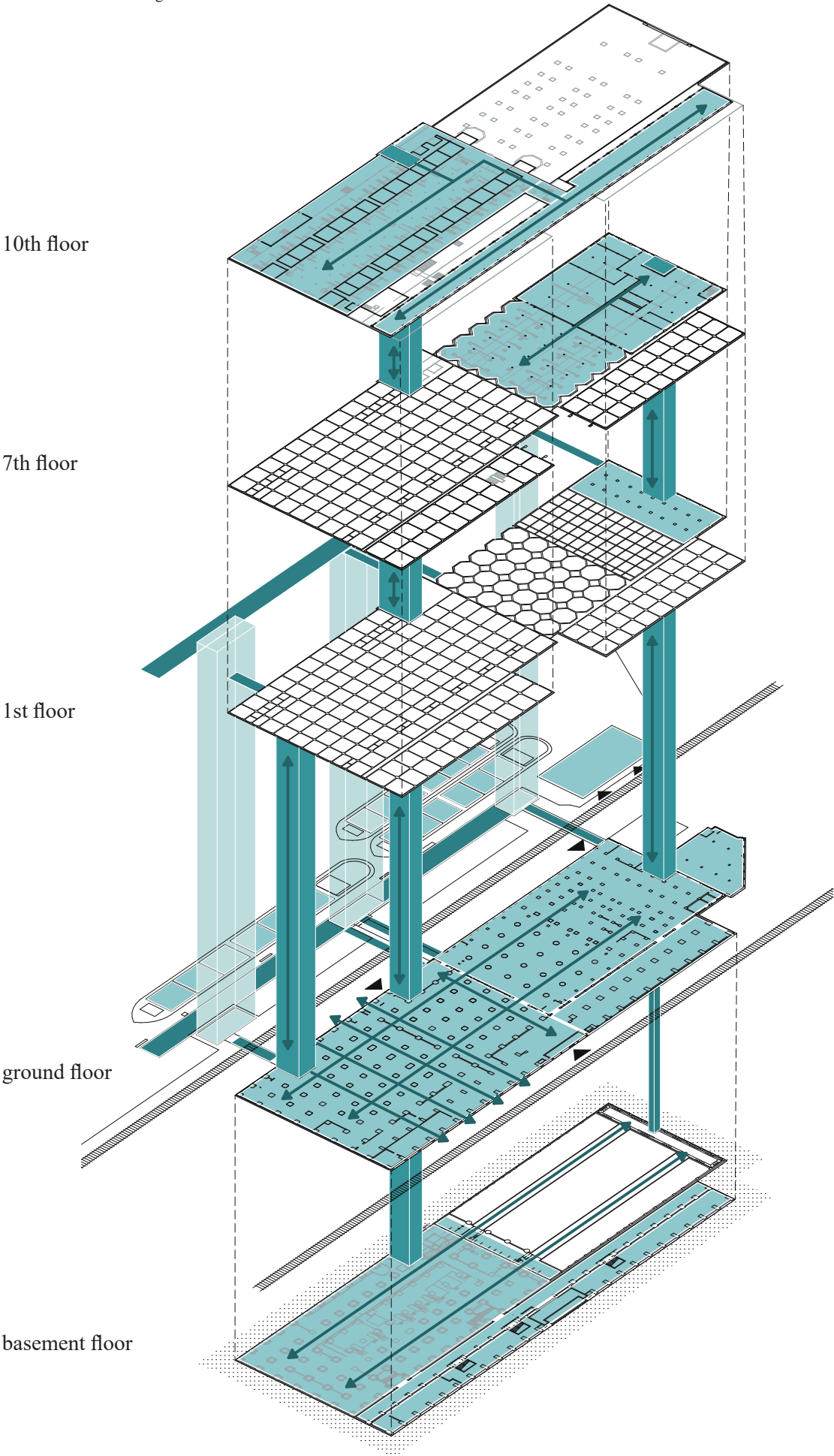
basement floor



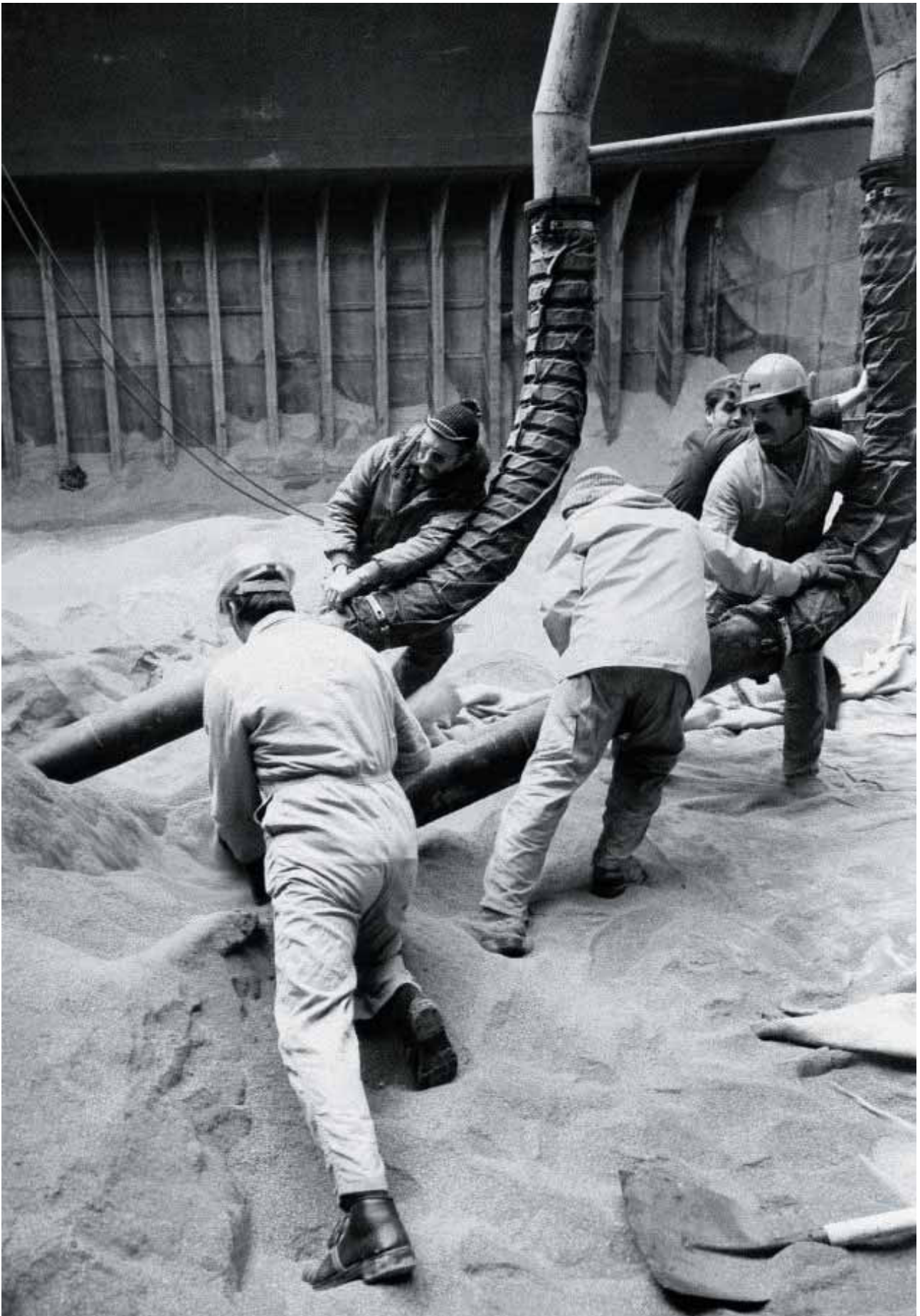
Flows of grain through the maassilo.



The areas that about 70 workers moved through in the Maassilo.







Workers in the ship's hold. If there was still a bottom of grain left in the ship's hold, the suction nozzle had to be led there (Image: Transformers & Mellegers, 2008).



# Flows of people and supplies nowadays

Flows of people and supplies in the Maassilo as a cultural platform (current use)

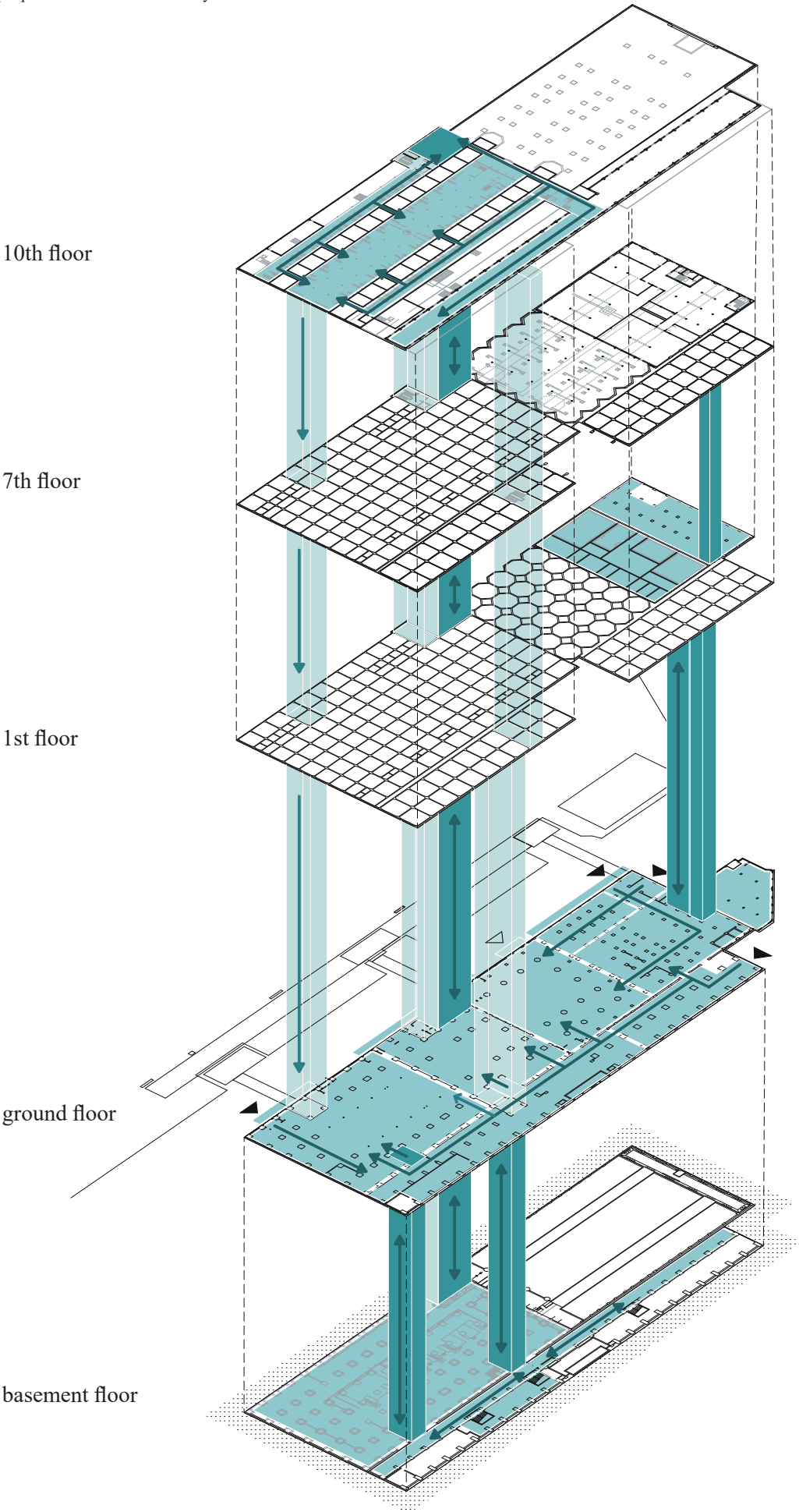


Image: Transformers & Mellegers, 2008

In the current situation, it is mostly people that move through the building as opposed to grain in the former situation. A maximum of 5000 people can be in the Maassilo at once. In the former situation, around 70 people worked in the Maassilo (Wikipedia, 2019). Some silos are now used as escape routes and the machine tower is used for vertical transport of people. Although most people stay on the ground floor. In the

offices there is less movement, but on a daily basis. In the other areas is movement of more people, but only during events.

Flows of max. 5000 people in the Maassilo nowadays.



Flows of supplies through the Maassilo nowadays. For example food & drinks for the kitchens and bars. Or stage equipment, exhibitions, etc.

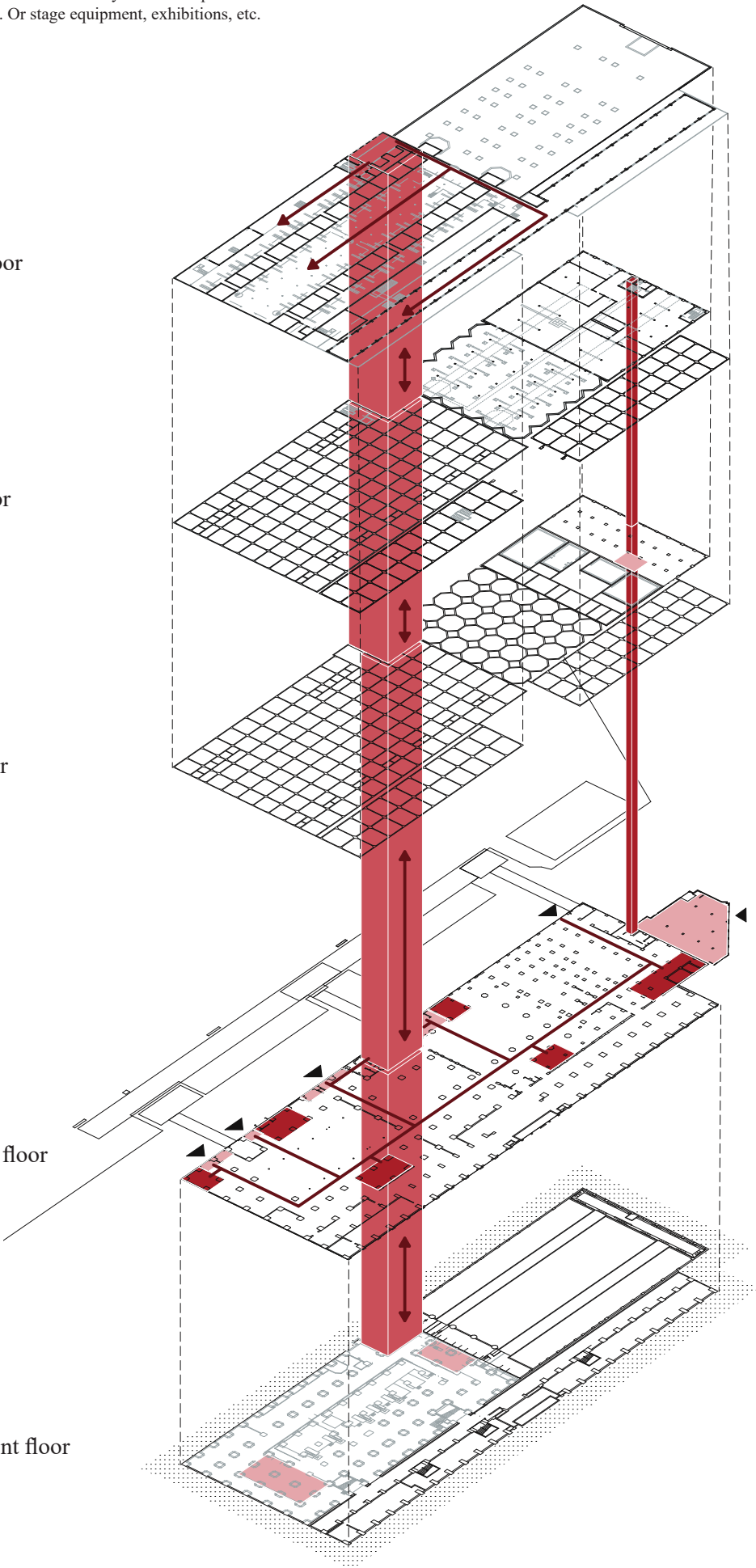
10th floor

7th floor

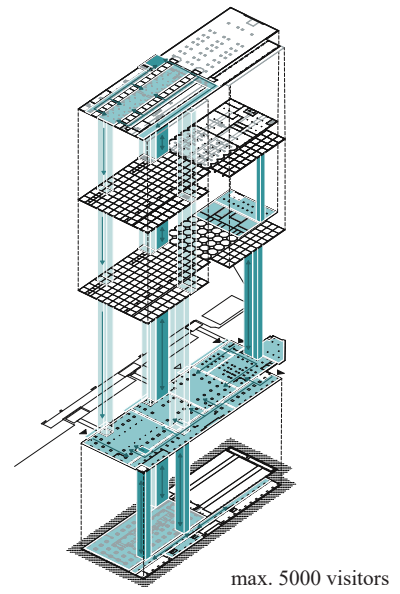
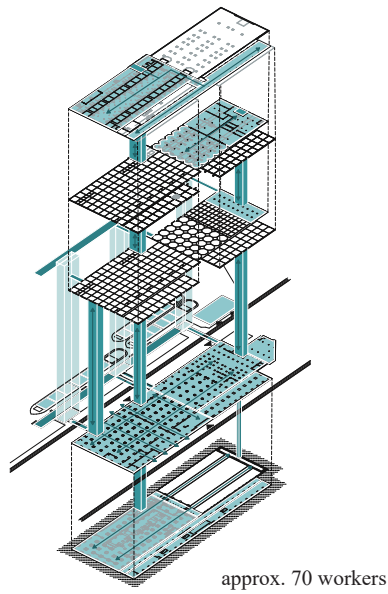
1st floor

ground floor

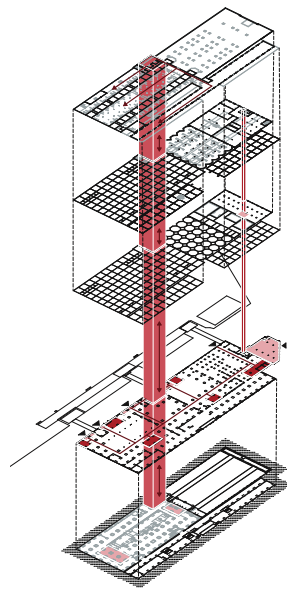
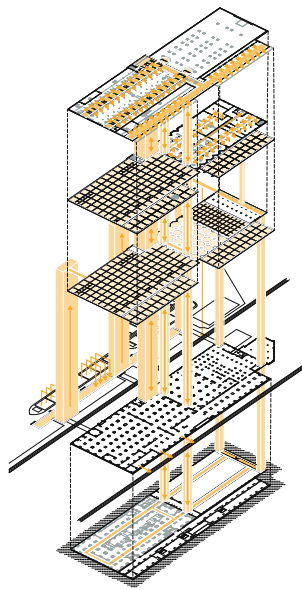
basement floor



People



Grain/Supplies



Comparing the former situation with the current, there is a contradiction of a few people and a lot of grain in the former situation, to a lot of people and a relatively small amount of supplies nowadays. It is interesting that the amount of space that people move through did not really change much.



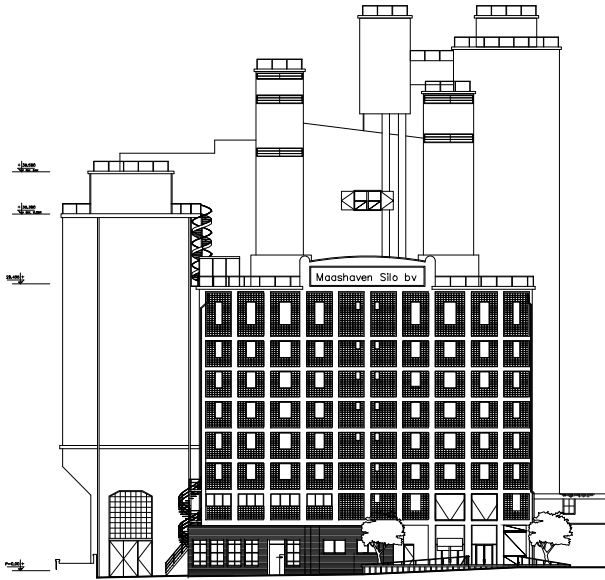


**Skin**

Architectural Analysis

# Facade Composition

## Skin (Skin)



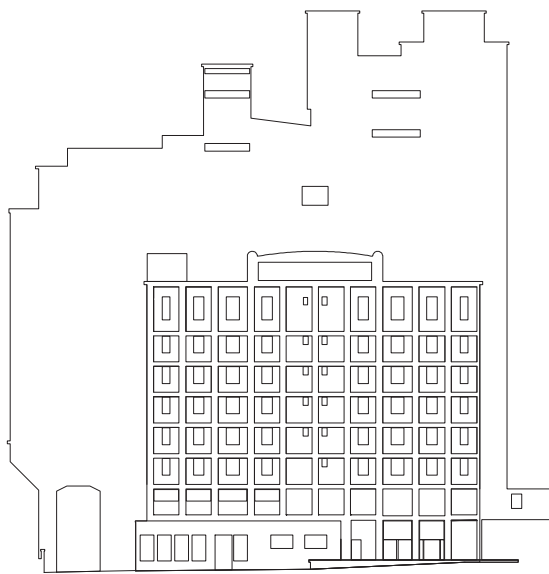
Elevation West - scale 1:750

The Maassilo complex has four facades, three facades visible and one blind façade on the western part of the complex. This analysis shows four different stages of each façade. The first stage shows the silhouettes of the different elements of the façade, the second stage shows the composition of volumes, the third stage shows the façade composition and fourth stage shows the window frames or cavities. All diagrams are accompanied by the respective elevation, shown on the page next to it.

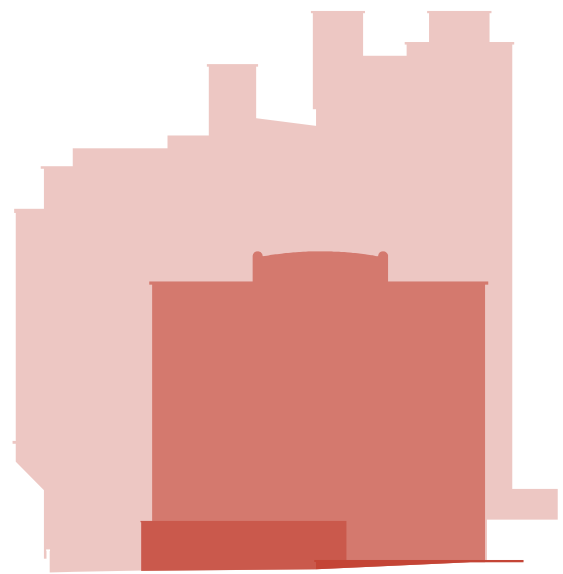
The western elevation shows the main entrance of the building, which gives access to the office spaces and access to the complex. The façade is characterized by the orthogonal grid which forms the most dominant feature of this façade (stage 3). It also displays a form of symmetry. Additionally the name of the building is placed on top of this façade and forms an accentuation and decorative ornamentation (stage 1). The amount of window frames expresses the program that resides behind the façade (stage 4). Currently there are office spaces situated in these parts of the building, but formerly it was purposed for cleaning and sampling the grain. These activities required natural daylight to enter the building, hence the large amount of windows. The orthogonal grid structure was purposed as a building technique where the fill in of the grid

was constructed in pumice stone, lightweight hollow elements that could absorb the blast from a possible explosion (stage 3). When looking at the last stage, you notice the different shapes of the cavities in the façade. In the lower right corner you notice the entrance, with large window frames. In the center of the building you notice the smaller cavities, where behind the façade there is a staircase and elevator. Also in the lower left corner you notice a large gate, this cavity was purposed for the entrance of the train (stage 4).

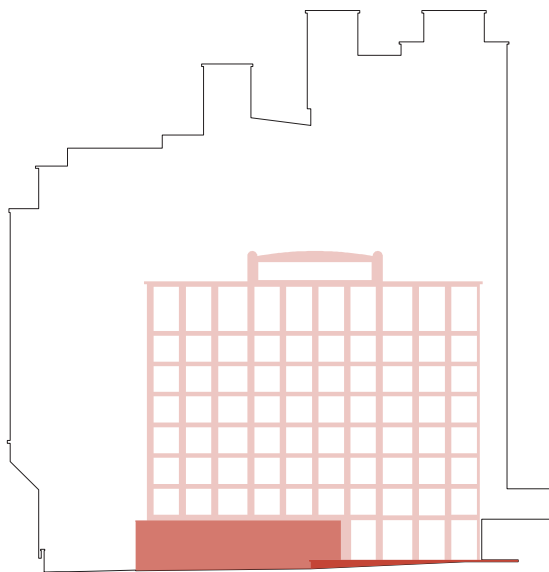
The northern façade is the façade that is located on the side of the quay. Noticeable are the deep red planes that resemble the connections to the elevator cranes. The façade is a composition of the first two buildings and is shaped asymmetrical. On the backdrop the third building forms a barrier with the neighborhood. The most dominant feature in this façade is the juxtaposition of the two building parts. The first building is highly accentuated, while the second building is a blind façade with minor detail (stage 3). The second most dominant feature is the centered tower that divides the buildings from each other (stage 2). The first building shows the triptych-like partition in the façade (stage 3). Similar to the western façade the interior program can be translated through the language of the composition. In the left part are the contemporary office spaces and former sampling and cleaning spaces for the grain. Both program that requires daylight (stage 4). In the middle part and right part are the silo cells. These spaces needed to be excluded from daylight and therefore the facades are blind. Still the right part shows the last remaining façade of the first silo building with its iconic octagonal shaped cells. This tripartition is not only visible in an horizontal order, but also in a vertical order, where the ground floor and top floor both were needed to process the grain. Here workers would either deposit the grain on the top floor or withdraw the grain on the ground floor from the silo cells. Both floors were in need of daylight and therefore the façade shows cavities in these parts. The second building on the right side of the diagram shows the blind façade, where behind it are the silo cells. On the ground floor there are former loading docks where grain was deposited in trains and other transportation vehicles.



Stage 1



Stage 2



Stage 3



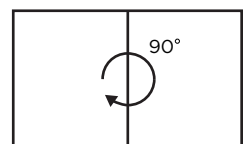
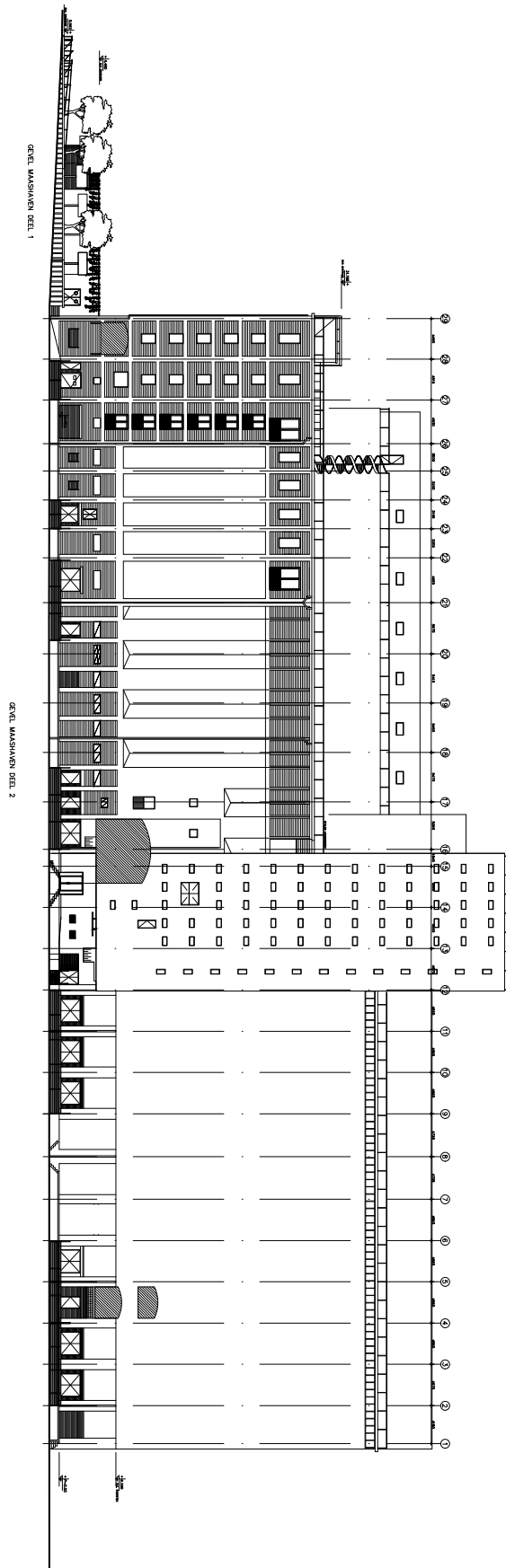
Stage 4

Elevation West Diagram 4 Stages

The southern façade shows symmetry and a similar vertical tripartition (stage 2). On the ground floor it shows the grid with decorative fill in elements, purposed to exhaust the smoke from the train that would ride behind it and also purposed to absorb the blast in case of an explosion (stage 3). In this situation the elements would pop out, minimalizing the damage to the construction. The top floor of the third building is purposed for the depositing of grain (stage

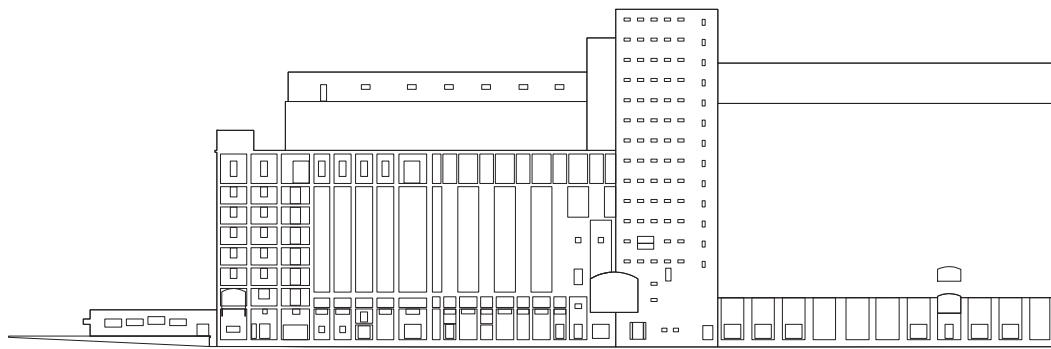
4) in the silo cells that lay beneath it. Therefor the façade is blind, excluding daylight that could damage the storage (stage 4). In a horizontal order there is a division created by a large excavation (stage 2). This vide was created because beneath it there was an electrical transformer unit from the second expansion. They bypassed the repositioning of this unit by keeping it in the same place and building around it.





draai boek exact 90° voor meer kijkplezier

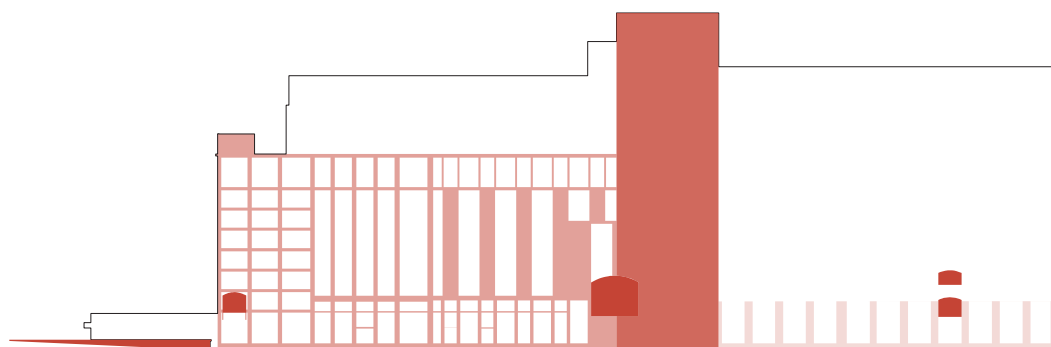
Elevation North - scale 1:750



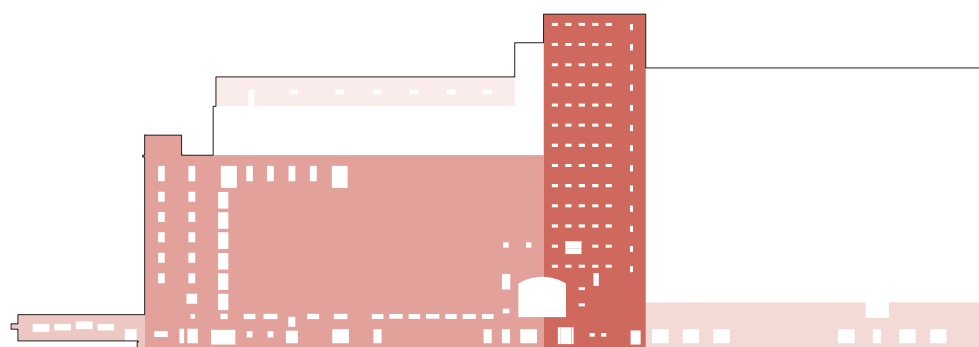
Stage 1



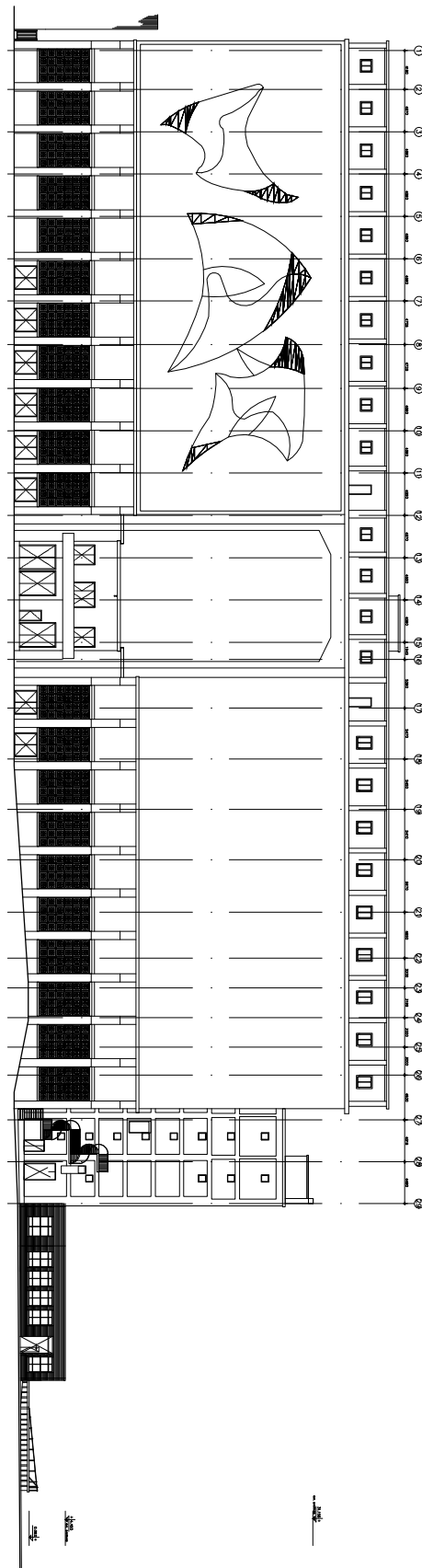
Stage 2



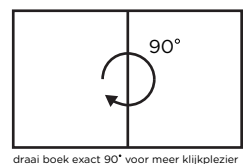
Stage 3



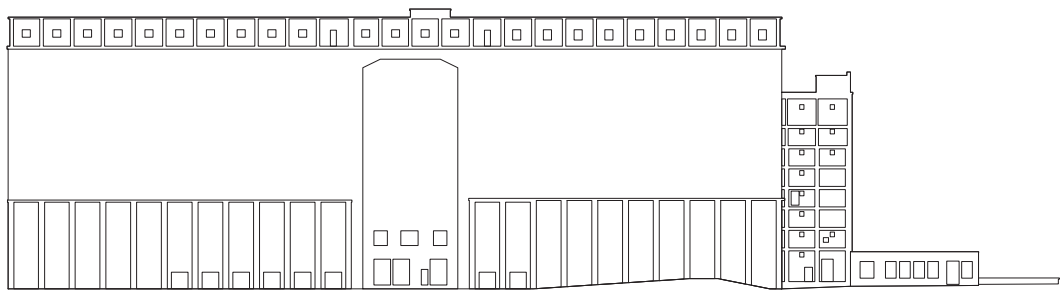
Stage 4



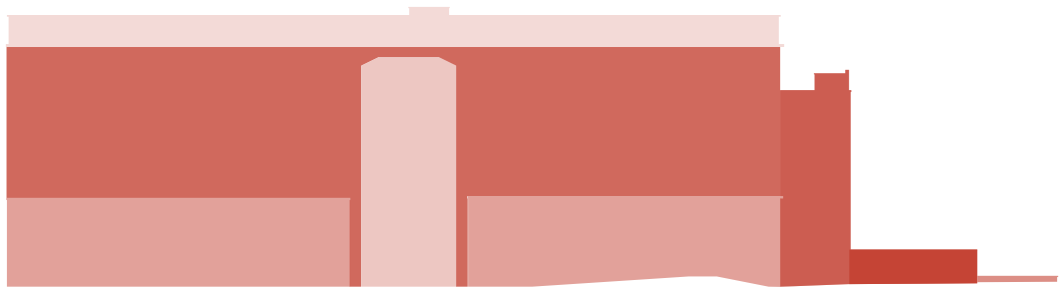
Elevation South - scale 1:750



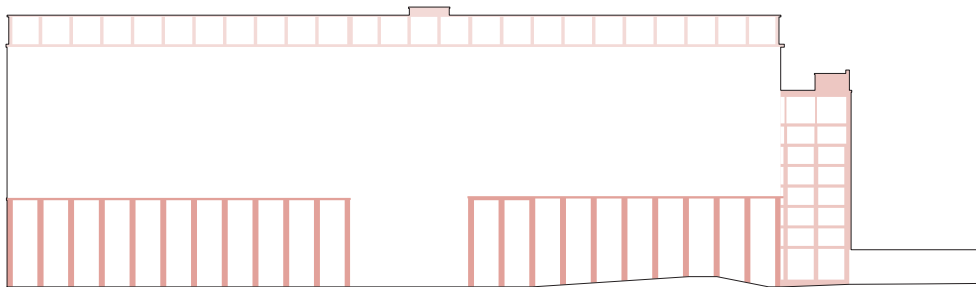
draai boek exact 90° voor meer kijkplezier



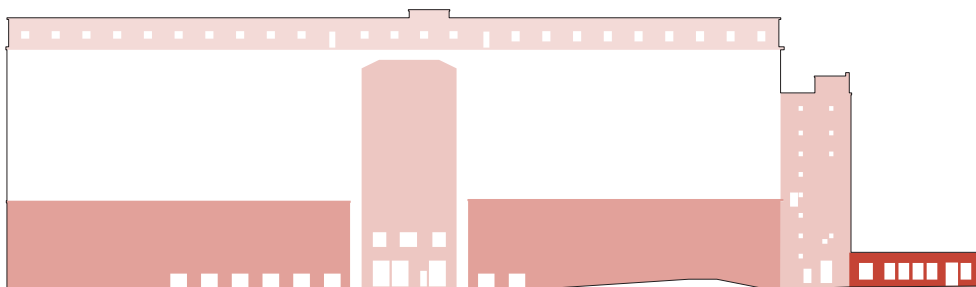
Stage 1



Stage 2



Stage 3



Stage 4





# Ornaments

Architectural Analysis

# Use of Ornamentation

## Ornaments (Ornaments)

The use of ornamentation within the anatomic perspective of this architectural analysis may seem off. However ornamentation can be seen as dressing the naked body of a person, or in this case a building. The definition of an ornament stated by the Cambridge Dictionary is; ‘an object that is beautiful rather than useful’ and ‘decoration that is added to increase the beauty of something’. In both cases it addresses the aspect of aesthetics, where some is beautified by the designer.

Ornamentation in architecture is often found in buildings that claim a strong relation with the cultural arts, such as opera houses, libraries or theaters. The Maassilo however is deemed an industrial building, purposed for the storage of grain. One could argue that these two functions are juxtaposed, resulting in a biased position that there is a logical absence of ornamentation in this building. Yet the Maassilo argues differently.

The Maassilo is a composition of three different buildings, all with the same function, but built in various periods during the twentieth century. Each period symbolizes a perspective in the view towards the building ideals of the respective period. The three periods are; the silo designed in 1910, a pre-World War I building, the second building designed in 1930, built during the Interbellum and the third building, built during the reconstruction period at the end of World War II. This report will analyze an offer perspective on the design motifs of the architects regarding the use of ornamentation or beautifying of the exterior façade.

### 1910

The first building was built in 1910. The turn of the century marked an important period regarding several forms of legislation that were purposed to create better conditions in homes, work environments and public places. These conditions are visible in the exterior where the amount of windows contribute to a better work environment. The same period is part of the Second Industrial Revolution, where new techniques

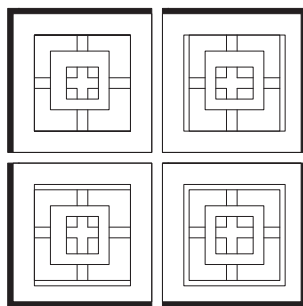
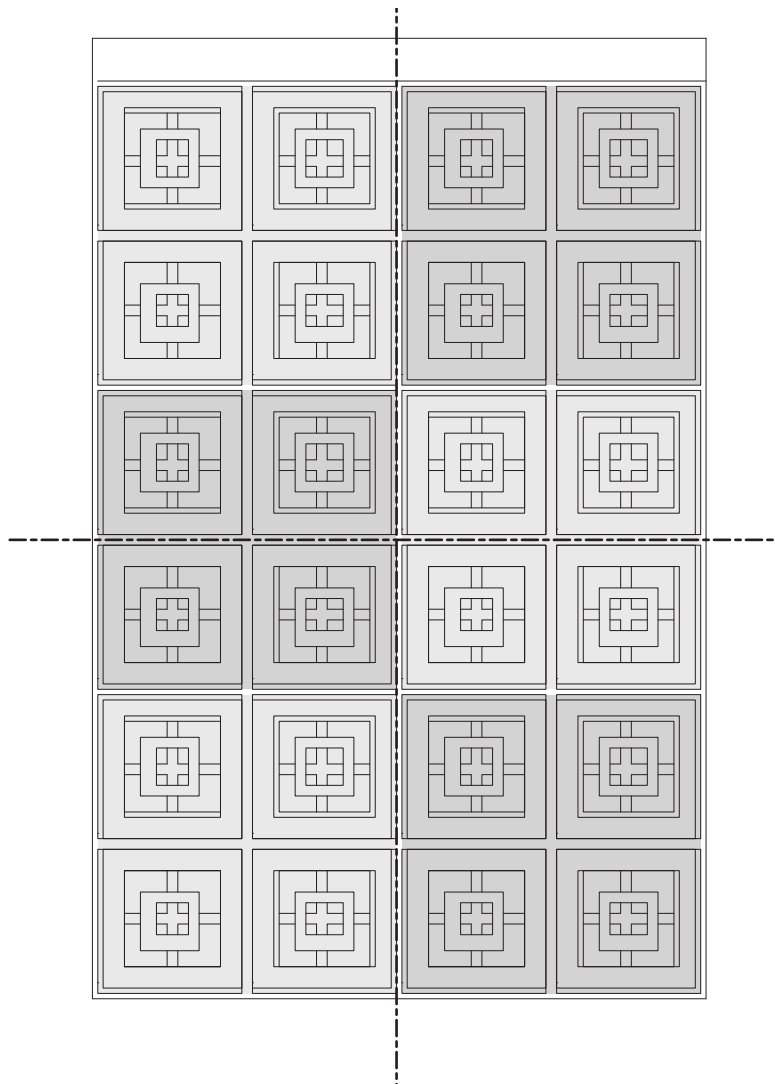
were developed and were showcased in the new commercial industrial facilities. Building techniques like monolith concrete building are visible in the Maassilo. The design by Stok is different from its successors, there is a fine line between functionality and aesthetics. The vertical and horizontal tripartitions contribute to this experience and the different facades each translate through their form language the relation between interior and exterior. The eastern and western facades of the building are now iconic shapes and can be reviewed as decorative ornamentation. There is a subtle cohesion where ornamentation becomes skin and skin becomes structure.

### 1930

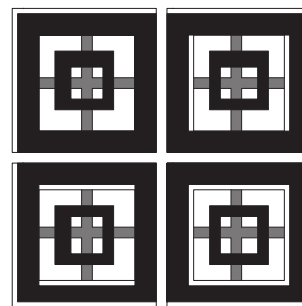
It seems only a logical assumption that the expansion designed by Brinkman & van der Vlugt is abstained from any decorative ornamentation. The building built during the Interbellum was subject to a financial crisis where there was no need for extra decorative elements. Instead they focused on efficiency of building costs versus maximalization of available space. This draws the conclusion that any form of decorative ornamentation is not present in the first expansion of the Maassilo complex.

### 1951

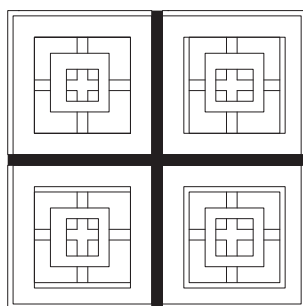
The second expansion built in 1951 was built shortly after the end of World War II. This period is marked as the reconstruction period. Rotterdam, among other damaged cities, was heavily bombarded during the war and lost a vast amount of its architecture. The Maassilo however was not hit by the bombardment of the Nazi's in 1940. Although Rotterdam abandoned the pre-war ideals regarding the urban layout of the city, the reconstruction period reconsidered the perception of architecture where there was a revival of classical features and aesthetic ideals. This revival is best experienced through the decorative ornamentation of the lower south façade, where the concrete decorative ornamentation can be seen as the only pure form of ornamentation in the whole complex.



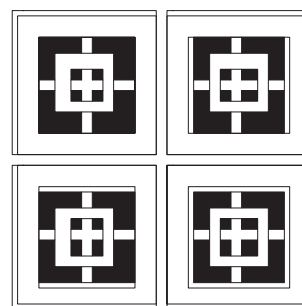
Clustering



Hierarchy



Division



Voids



## Conclusion

In conclusion this chapter shows the different time periods and design choices made by the architects. Especially the first building designed by J.P. Stok shows the inseparable relation between ornamentation, skin and structure. Although the function of the building is not related to the use of ornamentation, there are small elements that soften

the experience of the harsh concrete massiveness of the building. However this chapter challenges the reader to review the conventional perception of ornamentation in architecture. Can ornamentation also be seen as the iconic octagonal shaped silo walls that are inseparable from the image of the Maassilo?



### Left Page:

**Top:** The wall painting made by Lisa Lux, image by Dietmut Teijgeman-Hansen source: (<https://www.flickr.com/photos/reisgekki/5287843908>)

**Bottom Left:** Eastern facade of the first building, designed by J.P. Stok.

**Bottom Right:** The elevator machine, parallel to the quay.

### Right Page:

Concrete decorative elements underneath the overhang of the second expansion.









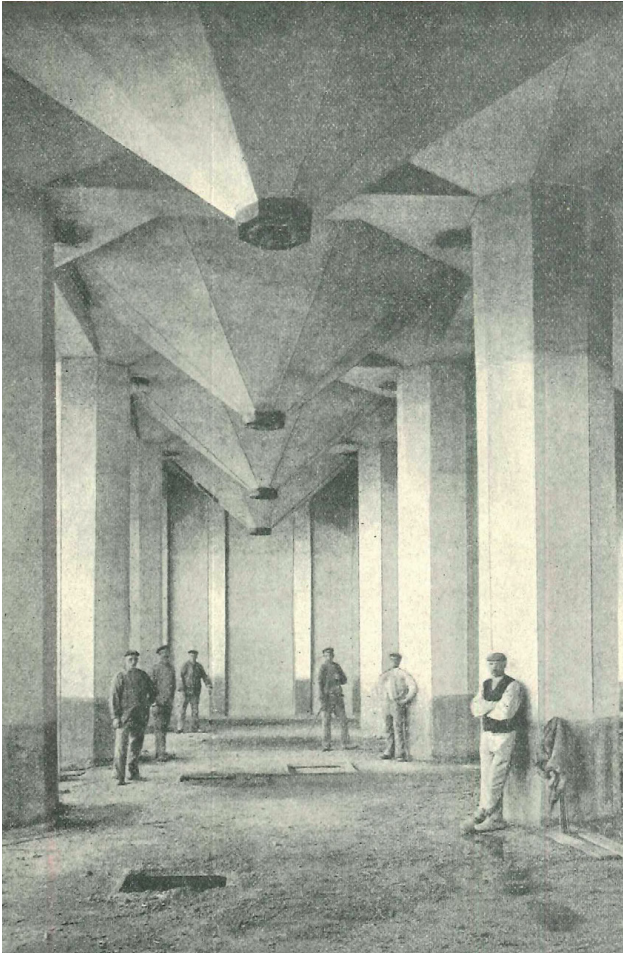
# Construction

Building Technical Analysis



# Construction

## Building Method & Static Schemes (Building Technical Analysis)



*Phase 1 - 1910*

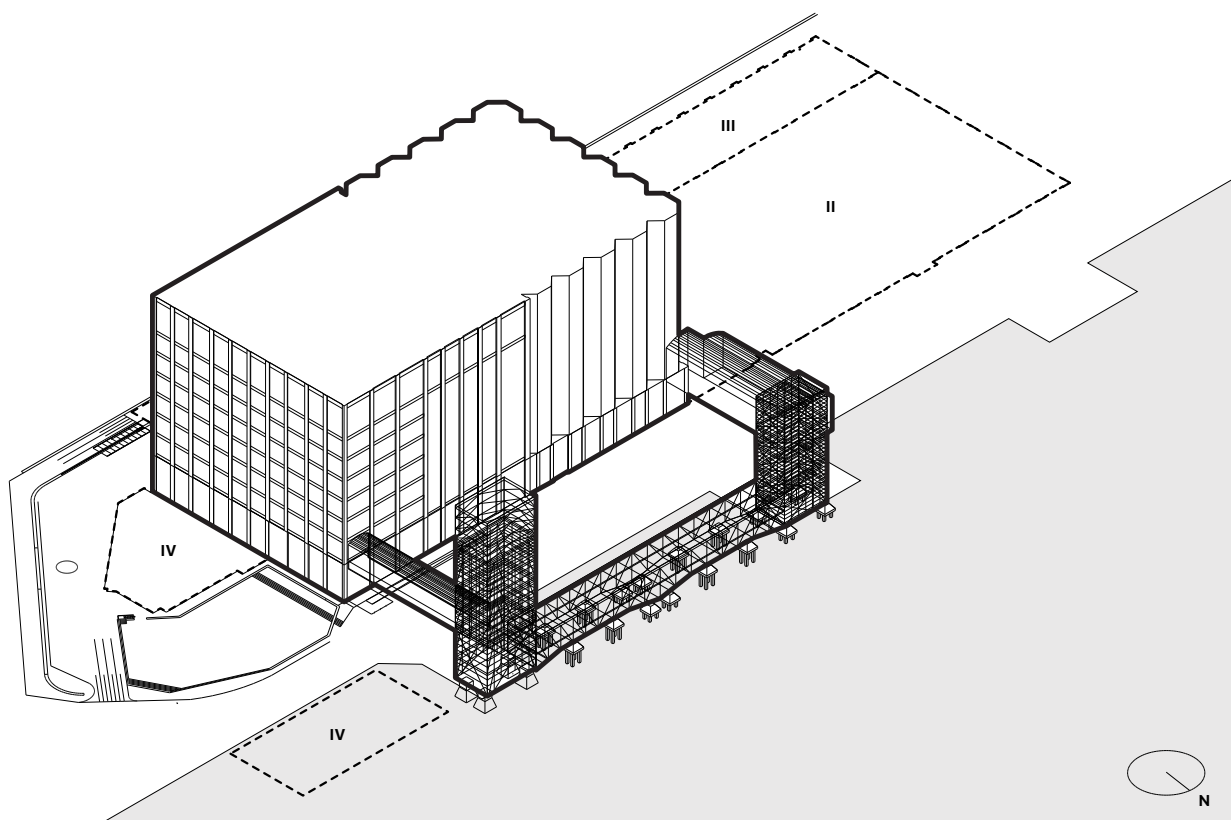
The first Silo was designed by the Dutch architect J.P. Stok and was completed in 1910. Although many buildings of his oeuvre didn't survive the Second World War, his buildings form an inherent bond with Rotterdam as a modern world harbor. The building types that rise together with the harbor demand for different building techniques. His first buildings are designed in an eclectic style, while his successions from 1895 possess an individual style, less historic and more contemporary. Architectural styles like the Art Nouveau and the American architecture began to make more appearances throughout designs in the city. These new building techniques were also applied to the Maassilo in 1910, which was during the period of its completion an extraordinary sight in the Rotterdam harbor. The silo's dimensions upon its completion were 59 by 32 by 20 meters (l.w.h). The façade presented itself as a triptych-like wall, where you could distinguish the threefold of different building parts. The most eastern part consists of ten aisles wide and three aisles deep and gave room to appropriate activities, like sorting and cleaning grain. The



**Upper Left:** Inside the first building designed by J.P. Stok in 1910, workers standing on the ground floor underneath the octagonal silos, source: (Transformers & Mellegers, 2008)

**Lower Left:** The first building designed by J.P. Stok in 1910 without surrounding expansions, source: (Transformers & Mellegers, 2008)

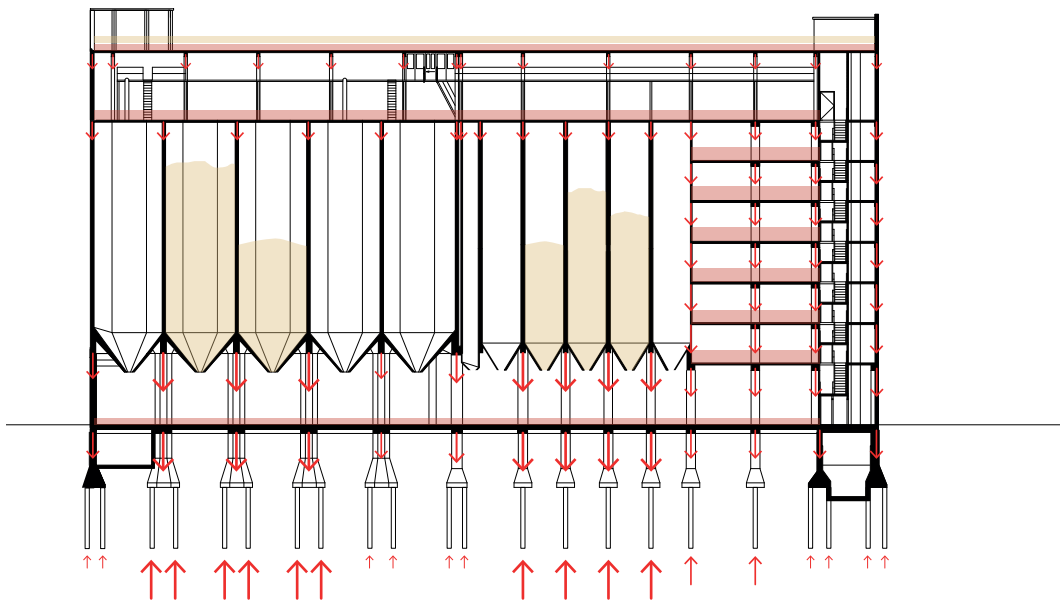




façade of this building part was constructed of a grid of concrete columns and floors, filled in with pumice stone. Every grid plane had a small window.

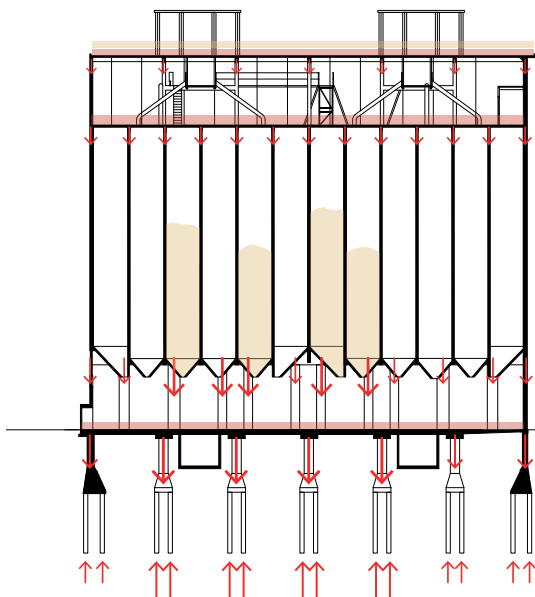
To facilitate the various amounts of grain, the silo's have various dimensions. All the silo's accumulate to a total of 20.000 tons of grain. The middle part of the building has five rows of twelve square silo cells, each capable of containing 100 tons, and one row of 12 smaller rectangular silo cells, each capable of containing 50 tons. The western part of the building offers room to 30 large cells, capable of containing 300 tons. These cells are octagonally shaped and its iconic shape can be translated through the outer façade of the building. The octagonal shape is the replacement of the circular shape where the pressure distribution is equal. In between the octagonal cells are 20 square cells, each capable of containing 50

tons. Underneath these square cells on the ground floor stand large concrete columns, each capable of withstanding 600.000 kilograms. The western part of the building is separated from the other two parts to prevent planar force effects. The cells of the silo are made of reinforced concrete with a thickness of 21cm.



Vertical Loads

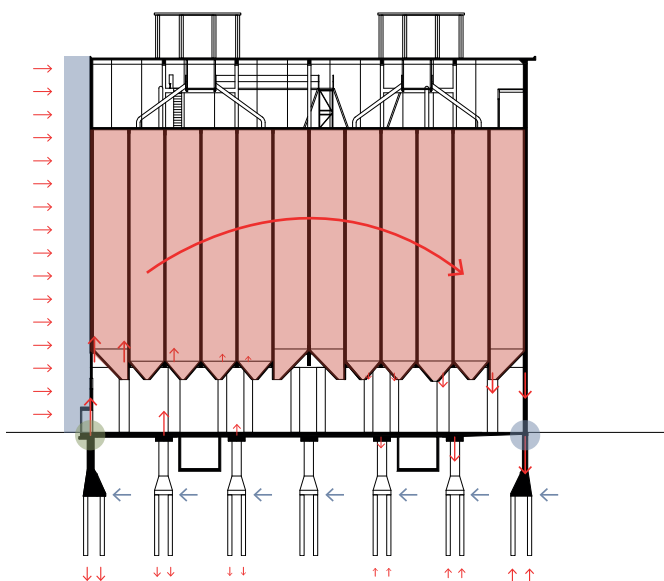
Longitudinal section



Vertical Loads

Cross section

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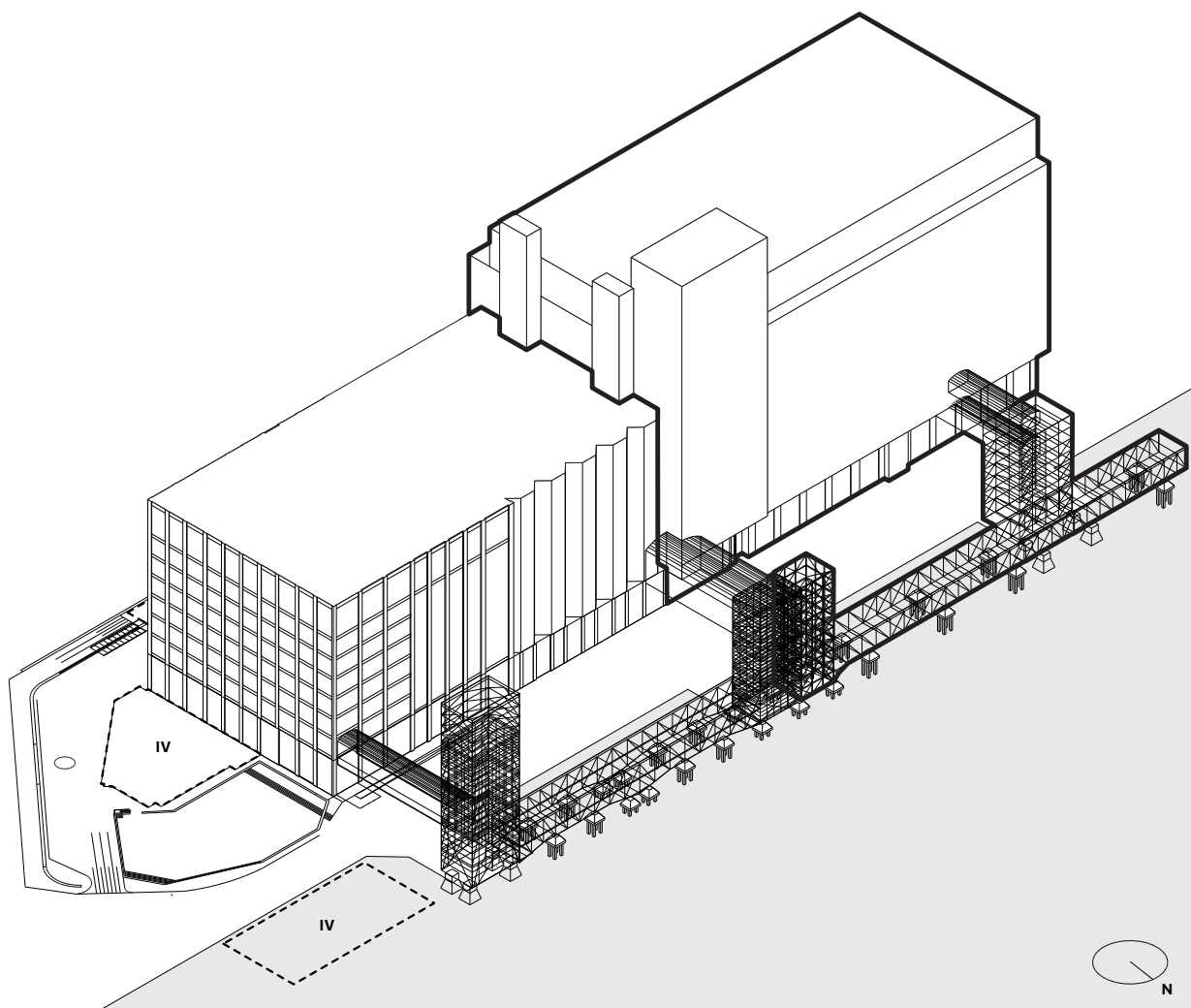


Horizontal Loads - Torsion

Cross section

#### Legend

- = Live loads (q-load, spread over a surface)
- = Dead loads (q-load, spread over a surface)
- = Wind loads (q-load, spread over a surface)
- = Direction and magnitude of the force
- = Direction and magnitude of the soil & hydraulic force
- = Torsion force
- = Largest pull force
- = Hinge point



### *Phase 2 - 1930*

The second phase in the silo construction is designed by Brinkman & van der Vlugt, a renowned architectural firm, and completed in 1930. Due to an increase demand in grain, the Société Générale Surveillance and the Grain Elevator Company (Graan Elevator Maatschappij, GEM) decided to increase its capacity. They demanded a building that was as large as possible on the available lot. To create as much capacity as possible they had to design a foundation with maximal carrying capacity and an building on top that was as light as possible. Furthermore the building had to be capable to process the grain faster and more efficient. Therefor they purchased two mobile elevators, capable of processing 200 tons of grain per hour. The

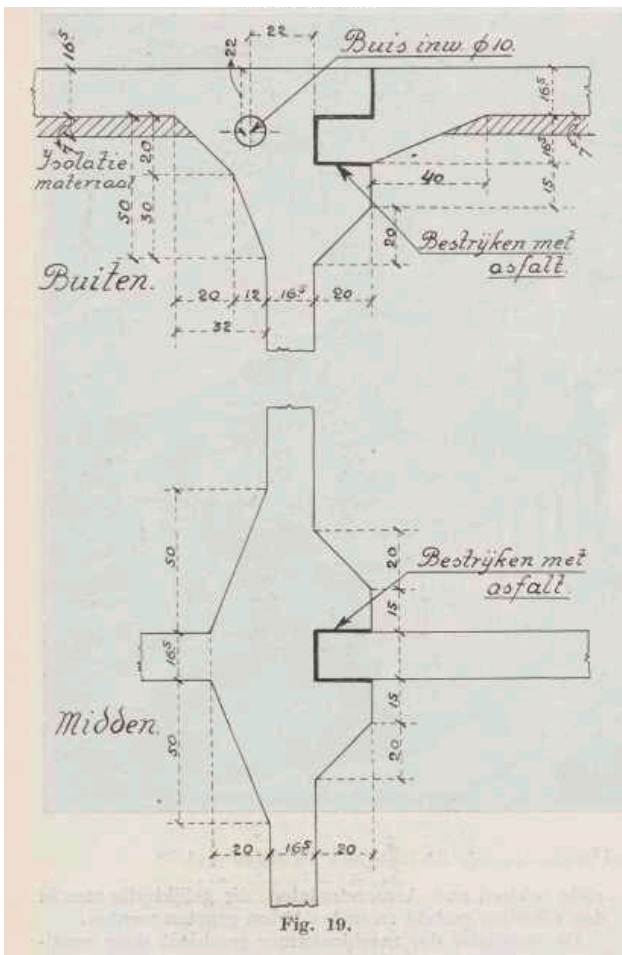
expansion increased the total capacity to 42.000 tons.

The foundation of the building stands on top of 1370 pre-casted Sprenger piles, each with an thickened end that resulted in an increase of carrying capacity from 40 to 60 tons. The building was made of reinforced concrete and was executed after the American Macdonald system. This system consisted of a sliding formwork that glided subsequently on top of the new structure.

The second expansion of the silo is 66 meters long and consists of two cell groups, respectively 33 and 37 meters wide and 42,5 and 48 meters high. The cell groups are separated by a expansion joint. The cell wall is 16cm thick. On top of the cells is the attic where conveyor belts and downpipes process the grain into the silo cells. The attic is constructed in a lightweight construction in order to remove as much loads as

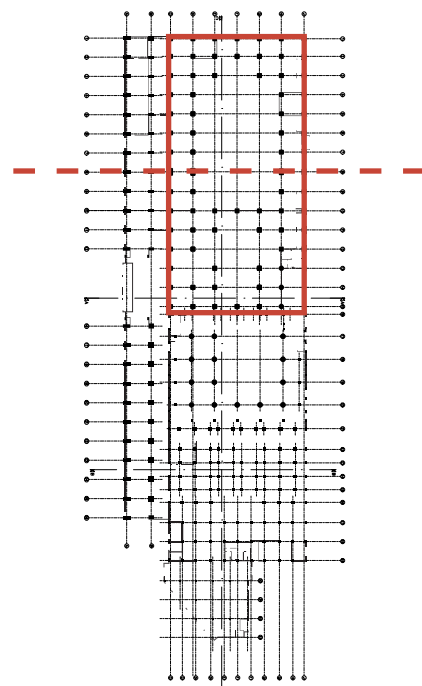


**Top:** Aerial photograph of the Maassilo, view towards the Meuse: (de Ingenieur, 1931)

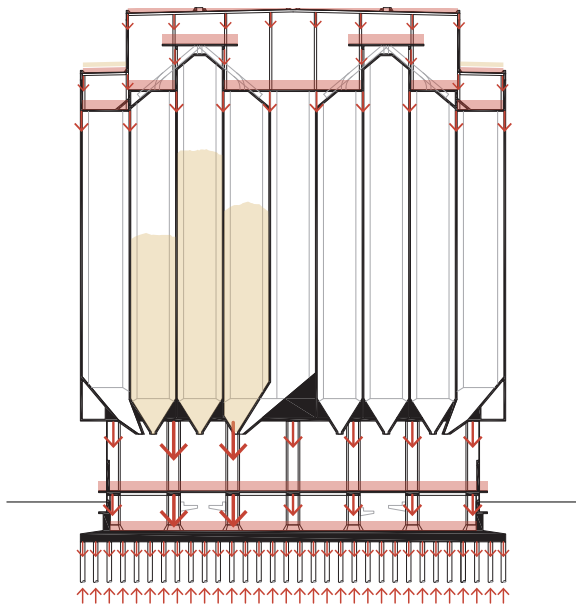


**Lower Left:** Details of the expansion joint, bridging the two parts of the first expansion: (de Ingenieur, 1931)

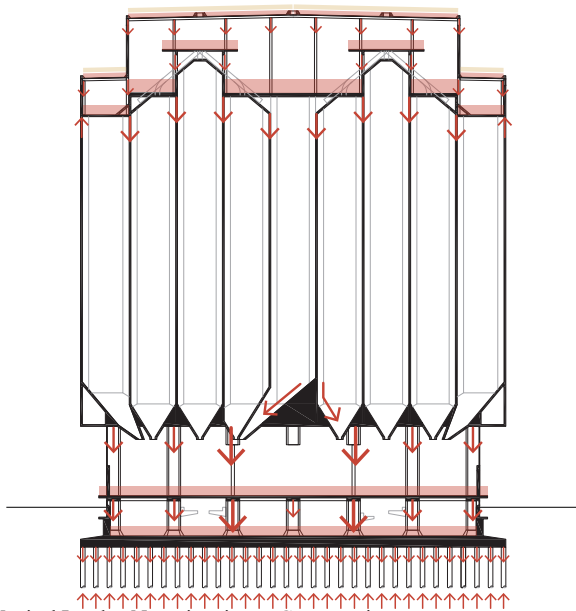
**Lower Right:** Location of the expansion joint in the first expansion.



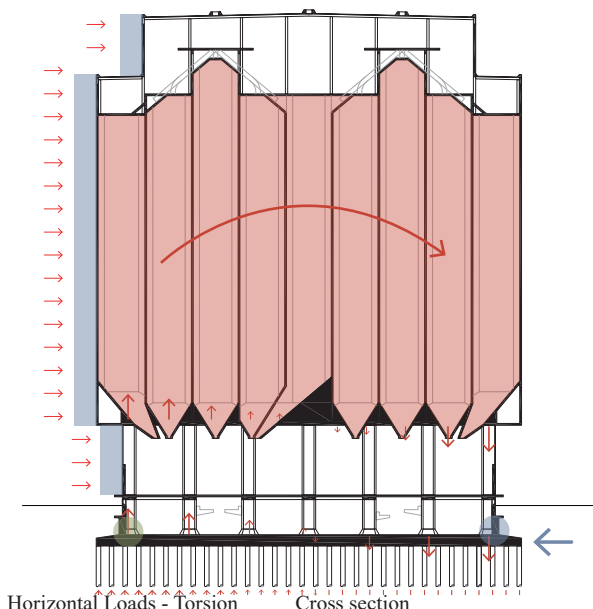




Vertical Loads - Old situation Cross section



Vertical Loads - New situation Cross section



Horizontal Loads - Torsion Cross section

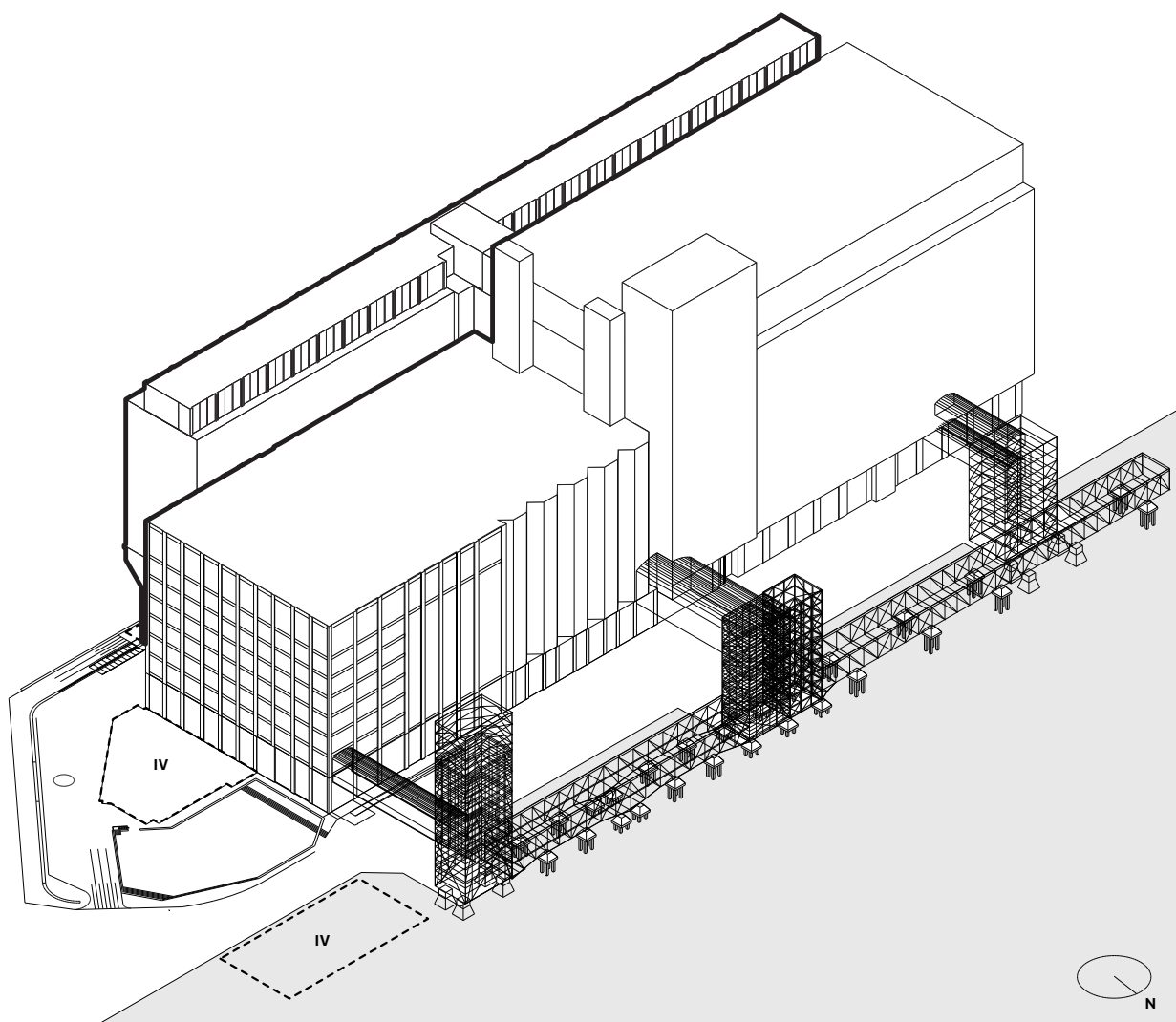
possible for the foundation. The iron truss is filled in with pumice stone. The floor of the attic, made from large concrete floor panels, is placed on two concrete beams. Because the grid of the ground floor doesn't match with the grid of the silo's they placed a grid of large concrete beams in between the columns to extradite the accumulated force. The cantilevered façade of the expansion creates centric loads for the outer row of columns. The created overhang of two meters wide offers room to a covered railroad track.

In the northwestern tower of the expansion stands the 59,4 meter high elevator machine, a staircase, elevators and two vertical installation shafts. On the southern side of the building was placed an electrical transformer with blind concrete facades, capable of generating 380 Volt (p. 26-33).

#### Legend

- = Live loads (q-load, spread over a surface)
- = Dead loads (q-load, spread over a surface)
- = Wind loads (q-load, spread over a surface)
- = Direction and magnitude of the force
- = Direction and magnitude of the soil & hydraulic force
- = Torsion force
- = Largest pull force
- = Hinge point





### *Phase 3 - 1951*

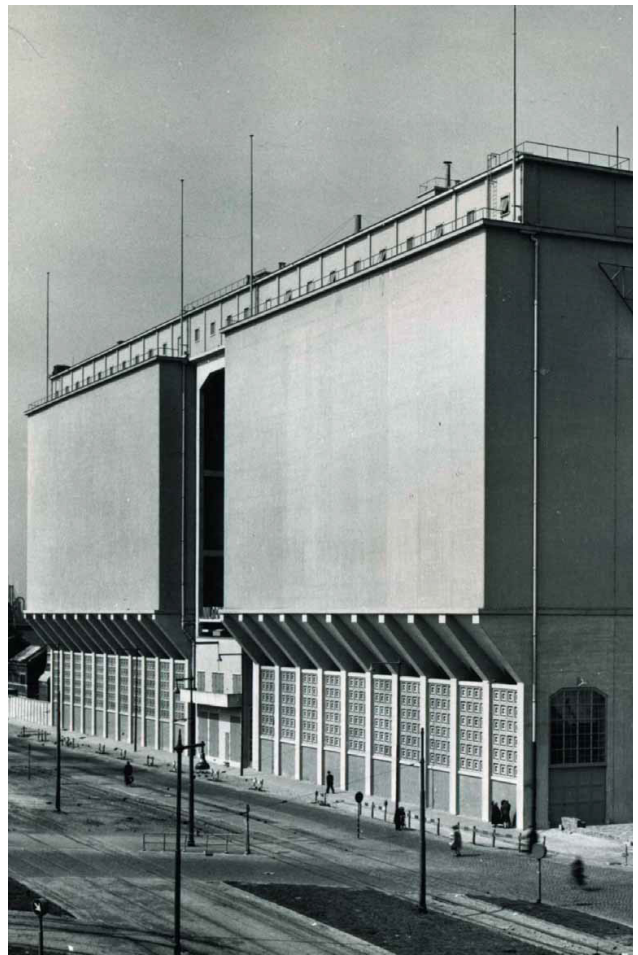
The last expansion of the silo building is the 1951 expansion designed by A.G. and J.D. Postma. The building is constructed over the full length of the two former buildings. The building is designed with symmetry and constructed during the reconstruction period in the late 1950s in Rotterdam. The symmetrical division creates two equal building parts that are bounded by a large void where the electrical transformer unit remains positioned. The building offered space to another 22.000 tons of grain, totaling the building's capacity to 64.000 tons. The expansion is 100 by 10,75 by 39,35 meters and is placed on top of 474 Franki piles and a concrete baseplate. The piles are in situ casted, right after excavating a hole

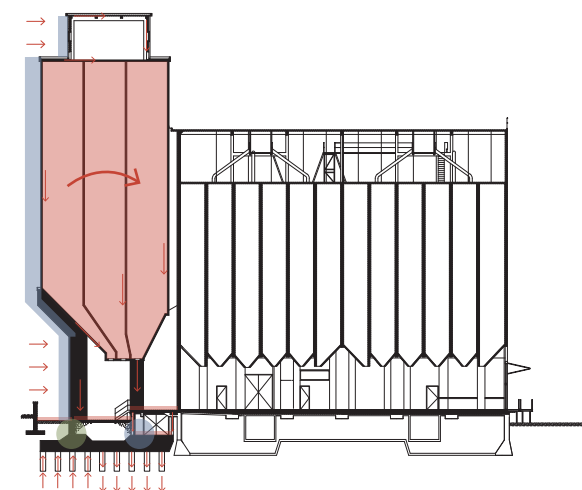
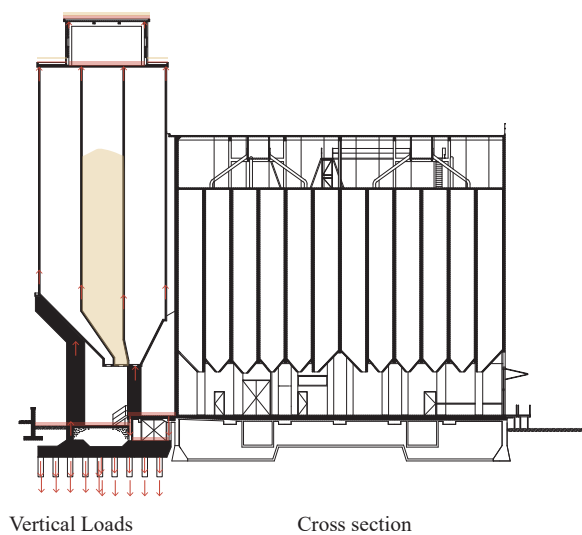
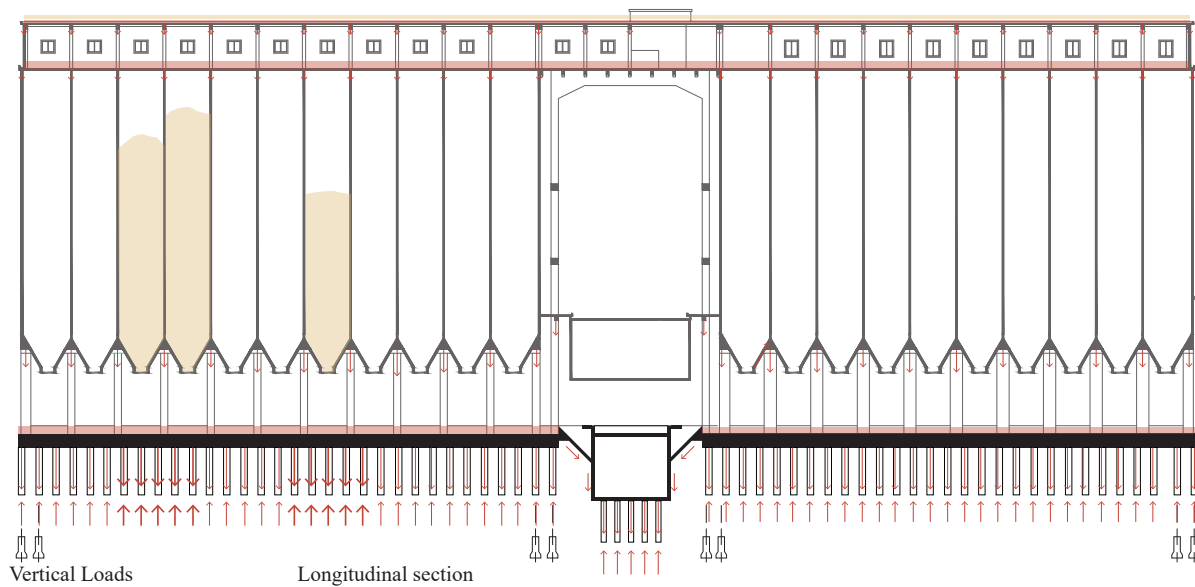
with a drill. The expansion overhangs the railroad track that is centered underneath the new silo cells. The upper façade of the building extends over the Brielselaan. The lower façade is constructed of brick and a decorative concrete grid, a so called pop schedule. This allowed the force of an explosion to minimize the damage to the construction. The western cells are made up of two rows of 11 cells, while the eastern part is made up of three rows of ten smaller cells. On top of the cells, over the total length of the expansion is space for conveyor belts and windows. Like the second expansion, the façade of the third expansion is blind and made of plaster (p. 51-55).









**Top:** The second expansion, view from Brielselaan, source: (Transformers & Mellegers, 2008)

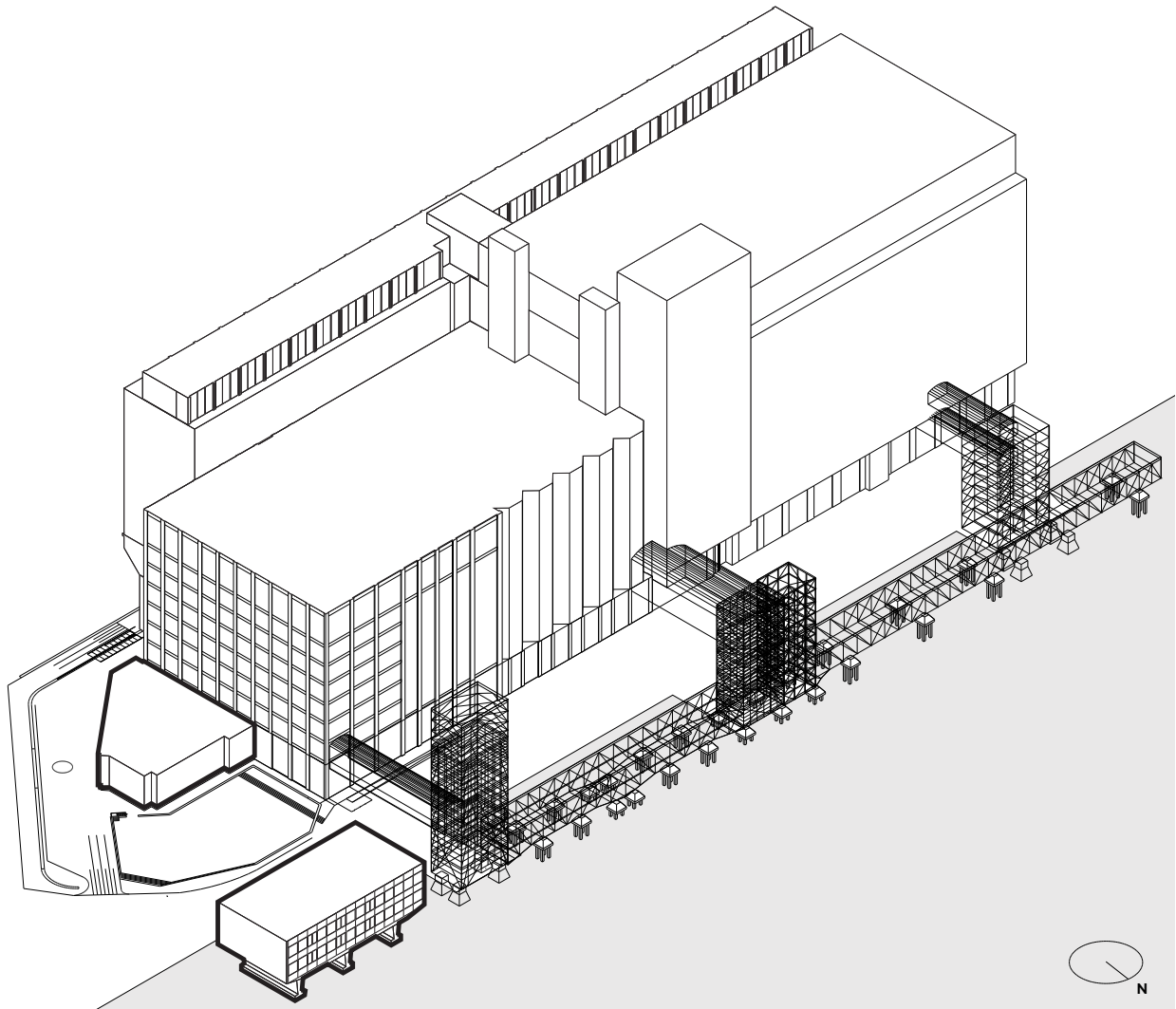
**Bottom Left:** Conveyor belt on the top floor of the second expansion, source: (Transformers & Mellegers, 2008)

**Bottom Right:** The second expansion, view from Brielselaan, source: (Transformers & Mellegers, 2008)





Legend	
	= Live loads (q-load, spread over a surface)
	= Dead loads (q-load, spread over a surface)
	= Wind loads (q-load, spread over a surface)
	= Direction and magnitude of the force
	= Direction and magnitude of the soil & hydraulic force
	= Torsion force
	= Largest pull force
	= Hinge point

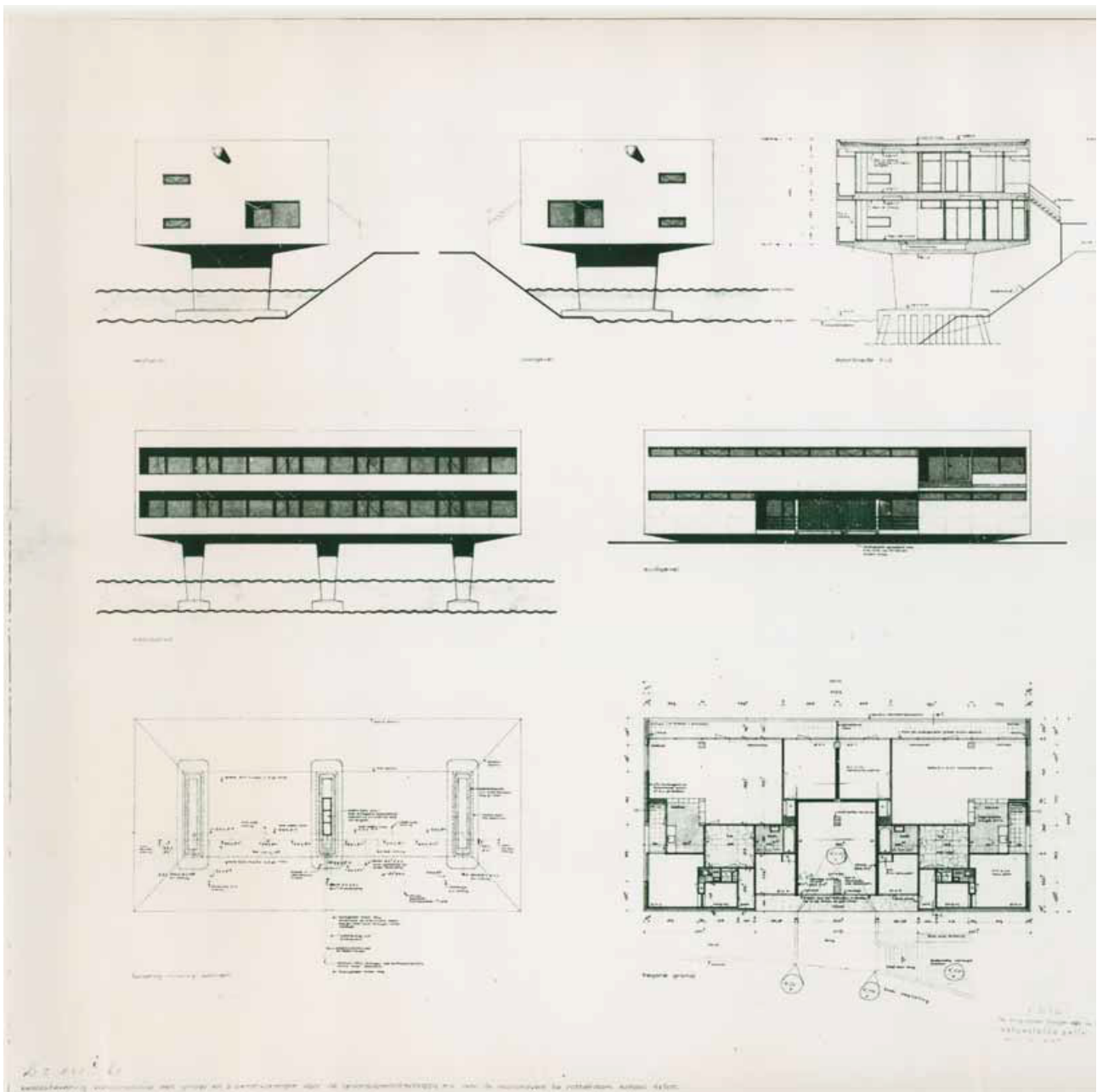


#### *Phase 4 - 1963*

The final phase of the silo complex is the addition of the Haan office building located on the edge of the site. Designed by H. Haan in 1963 the building lays on top of three wide pillars that stands in the water. In the early 1960s the old office building that was situated at the front of the first silo building had to be demolished due to the construction of the subway. Therefore the company was in dire need for a office building situated adjacent to the complex. The design is a rectangular building block of two stories that rests on three concrete pillars. It offers space to 250m<sup>2</sup> office space and two service residences. The façade is composed of prefab

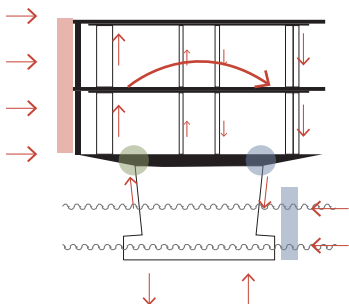
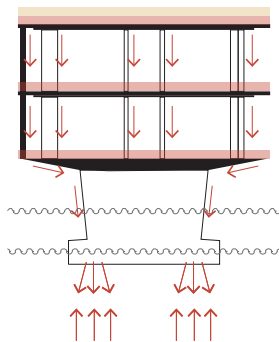
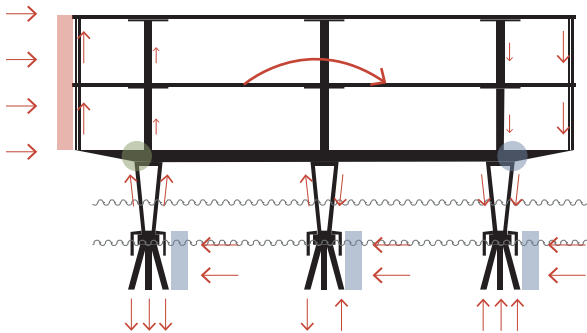
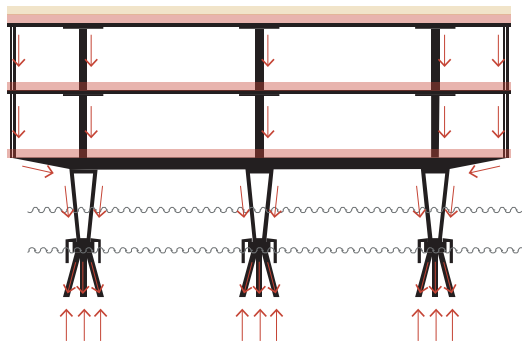
elements and anodized aluminum window frames. The building is connected to the quay via a steel bridge. The design has a Corbusian-like appearance due to the 'pilotis' construction and the strip windows. Eventually the office space was deemed to small in the late 1980s and the company moved their offices space to a near by location that was more suitable (p.73).





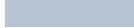







**Top:** The office building designed by H. Haan, source: (Transformers & Mellegers, 2008)

**Bottom Left:** Office space inside the H. Haan building, source: (Transformers & Mellegers, 2008)



#### Legend

-  = Live loads (q-load, spread over a surface)
-  = Dead loads (q-load, spread over a surface)
-  = Wind loads (q-load, spread over a surface)
-  = Direction and magnitude of the force
-  = Direction and magnitude of the soil & hydraulic force
-  = Torsion force
-  = Largest pull force
-  = Hinge point



# Materials

Building Technical Analysis



# Materials

## Materialisation, History of Silo's & Characteristics (Building Technical Analysis)

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### Materials & Building Techniques

For the largest part of the building, the material is concrete. Often reinforced, where the section modulus needs to be strong enough to withhold the tensile force in the construction. This enormous accumulation of concrete creates a part of the identity of the silo complex. The choice for concrete was logical given the nature of this building. Industrial complexes are often materialized in concrete, due to its fire resistance and its ability to withhold large pressure. However the architects discussed also the possibility of constructing the building, in this case the second expansion, in steel. However due to condensation problems that concerned the quality of the grain, they chose concrete. Although the building may seem like it's constructed of 100% concrete, there are some anomalies to this perception. For instance, the eastern façade of the building, recognizable due to the large name sign on

top of the façade, is constructed of a concrete grid composed of columns and floors and filled in with hollow concrete elements, also referred to as pumice stone. Pumice stone is a lightweight material that was used to absorb the force of a possible explosion. In this situation the pumice stone would pop out of the concrete grid and the explosion could exhaust from these created cavities. This technical ingenuity was deemed necessary due to the large accumulation of grain dust that circulated in the building. The dust was highly flammable and prone to an explosion risk. The same building technique is applied on the roof of the second expansion, where the top of the roof has the same quality of popping of when needed in case of an explosion and the southern façade on the Brielselaan where decorative concrete elements could pop out of their frame. The latter was in case of a train explosion since it was situated adjacent to the railroad.



**Top left:** Cribbed wood silos near Soda Springs, Idaho, Photographer: Zetrules, source (Berg, 2011)

**Bottom Left:** Concrete stave silos of varying height and diameter. These silos are built with automatic unloaders, seen by the use of small diameter chutes on the side of the structure. This type of silo is still built today. Location unknown. Photographer: D. Mahalko, source (Berg, 2011)

**Right:** Fired clay tile silo located near Boulder, Colorado, source (Berg, 2011)

### History of Silo building

The three parts of the Maassilo each represent an historic period of time, respectively the first building was built pre-World War One, the second expansion was built during the Interbellum and the last building was constructed during the reconstruction period shortly after the end of the Second World War. Each period symbolizes the contemporary building techniques and materials that were logical or even possible at that period of time. Where the silo was originally an building typology that was found on every farmer's land, now the silo was purposed for a larger scale. The first silo's where constructed from wood, but given the difficulty to create airtight and watertight silo's the construction method needed to evolve. After the wooden silo came the silo constructed from masonry. This improved the stability and strength of the silo and offered the possibility to

construct a taller silo than ever before. While the wooden silo was prone to fire damage and rot the brick silo was superior to these circumstances and could even withstand large forces of wind. However brick silo's demanded skilled laborers and were expensive to build. The development in the early 1900s of natural gas offered the use of gas-fired ceramic hollow blocks. The ceramic material was durable, attractive and prevented freezing of the harvest. However the material was prone to damages such as brittleness, leading to cracks in the material causing difficult replacement problems. Quickly after the turn of the century in 1900 the farmers were using cement, that eventually gave way to the use of concrete. Beside the farmer's use of concrete, commercial silo's were also constructed in concrete, offering attractive, durable and long lasting silo's at low costs. The final development in concrete silo building was the leap



towards monolithic silo building, where a seamless and smooth concrete structure is poured, creating a solid construction. These silos could withstand the test of time like no other silo before. They offered minimal maintenance and low building costs (p.42-45).

### The characteristics

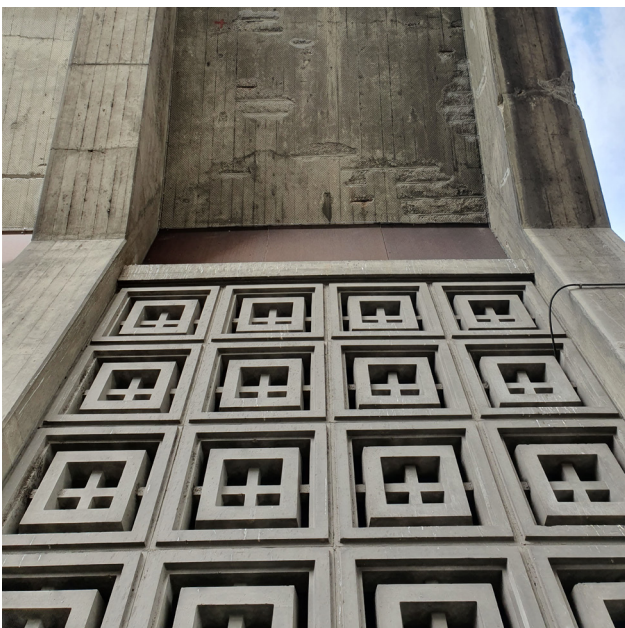
It was only natural that given the size and the time period of the first building it was made from casted concrete and is typical for that period of time. The triptych-like façade showcases the different program behind the exterior. The eastern part is designed according to the human scale, the western part reveals the vast shape of the silo's and the middle part forms a bridge between these two opposite characters. The second building's construction technology is characteristic for its time period due to the Macdonald building technique, where the building is constructed by a gliding construction frame, creating a vast concrete monolithic appearance. The last expansion is distinctive for the reconstruction period of the damaged city of Rotterdam. The austere structure with a formal language of reference (p.53). Subject to classical ideals like symmetry and decorative ornamentation is translated into a multi-materialized façade composed of plaster, brick, concrete and decorative concrete elements.



Monolithic concrete silo located in Oconto County, Wisconsin built in 1919. Note the dormer window and the attached ladder. This silo also features reinforcing hoops and due to the weathering of the paint, the slip form seams are now visible, source (Berg, 2011)









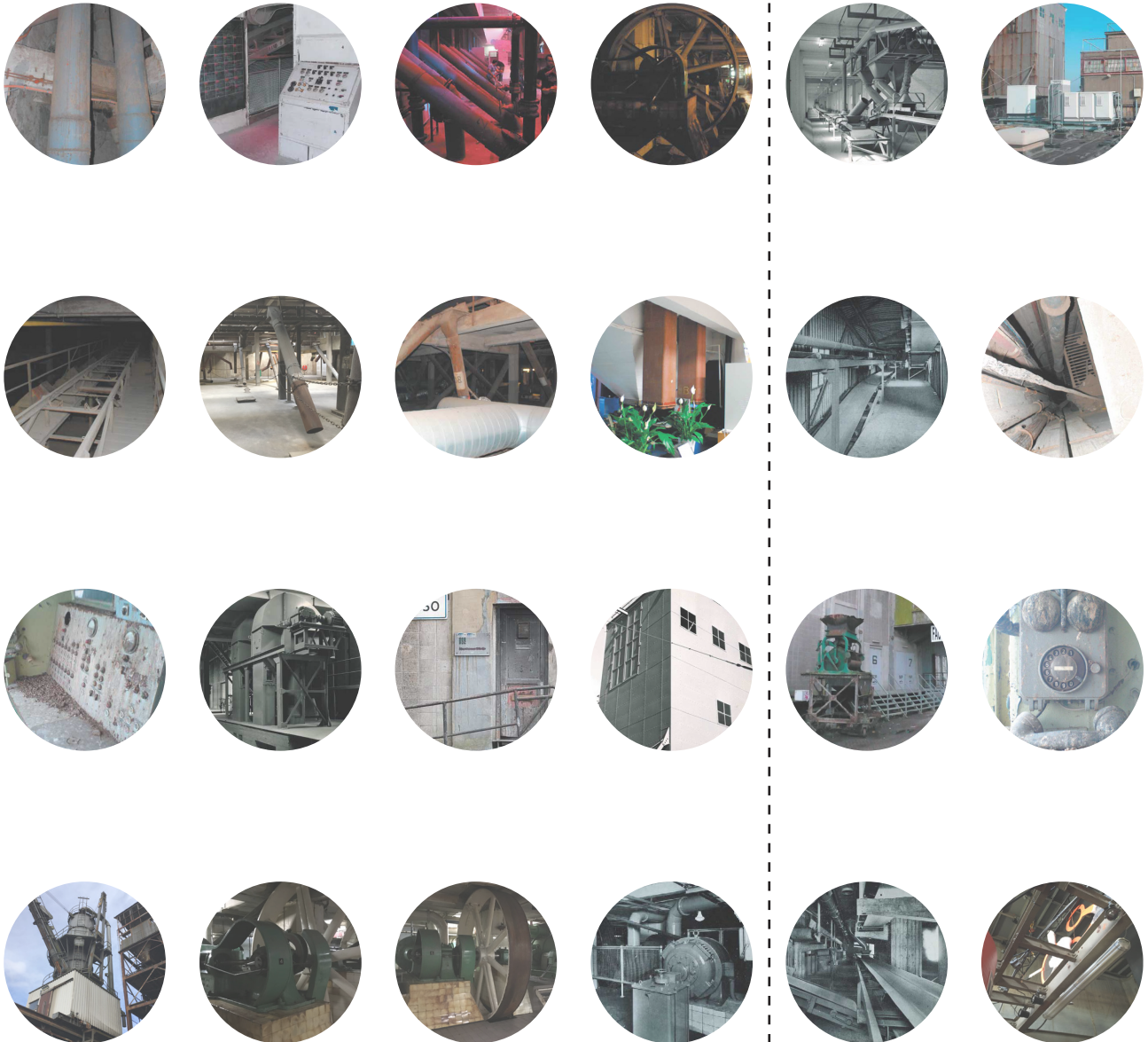


# Services

Building Technical Analysis

# Services & Stuff

A collection of services & stuff and their location in the Maassilo



Fixed (left) and non-fixed (right) services & stuff in the Maassilo.

Services and stuff are usually two different things. Services often support the functions of the building in a technical way and stuff can range from furniture to mobile machines in this case. In the Maassilo, services and stuff somewhat overlap because some of the old machines can be seen as stuff,

as well as services. Therefore they are divided in two groups: fixed and non-fixed services and stuff. The above image shows this distinction. The image on the right page shows the approximate location of different services & stuff in the building.

Collage of Services & Stuff on different floors of the Maassilo.

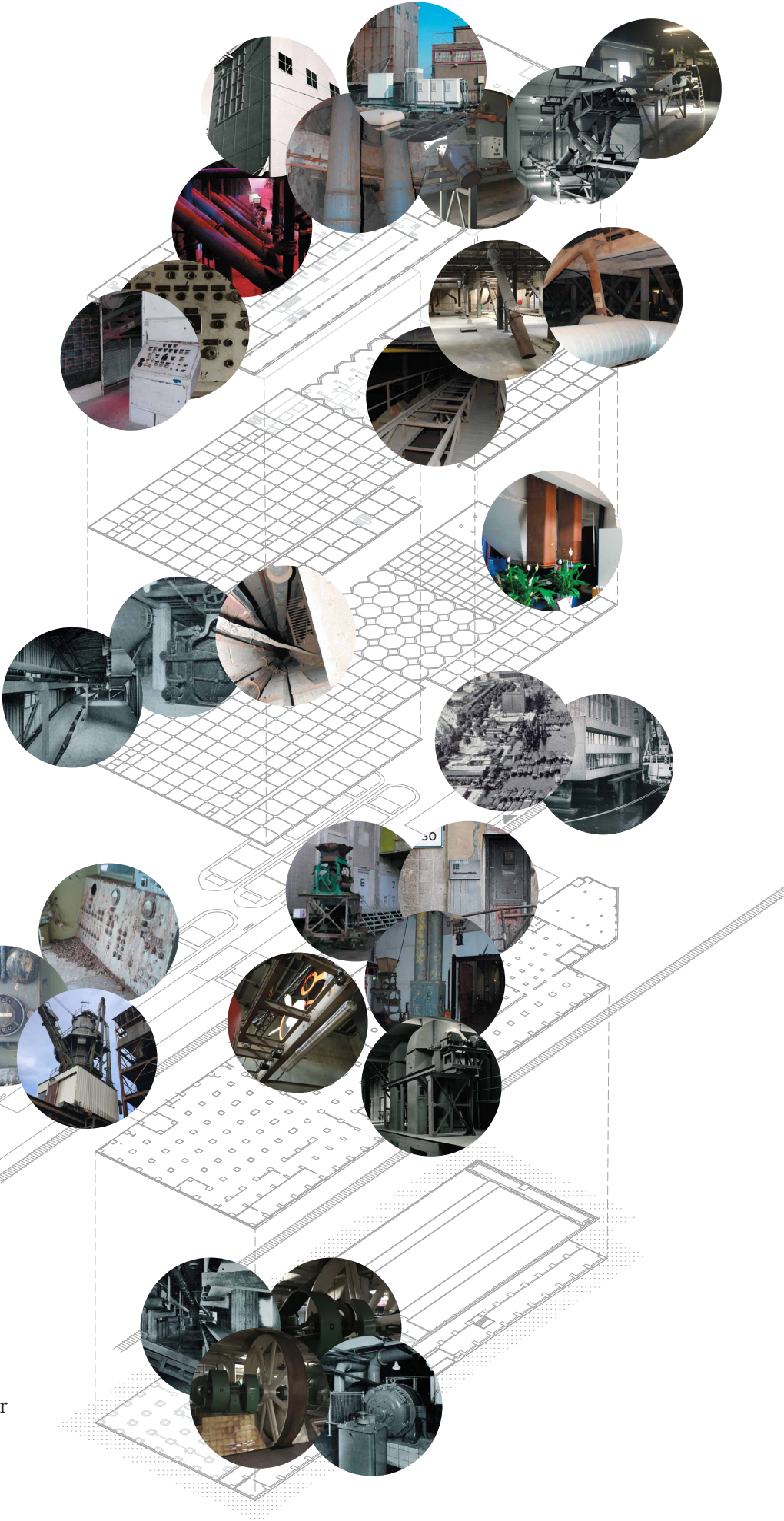
10th floor

7th floor

1st floor

ground floor

basement floor



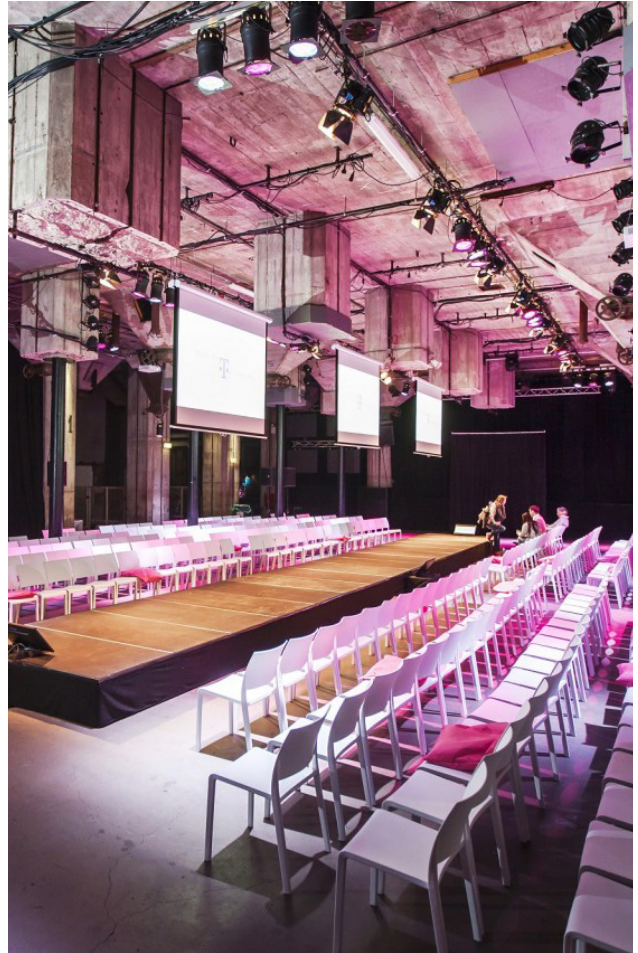


# Services & Stuff

How does the metabolism of the Maassilo work?



Air handling unit on the roof (Transformers & Mellegers, 2008).

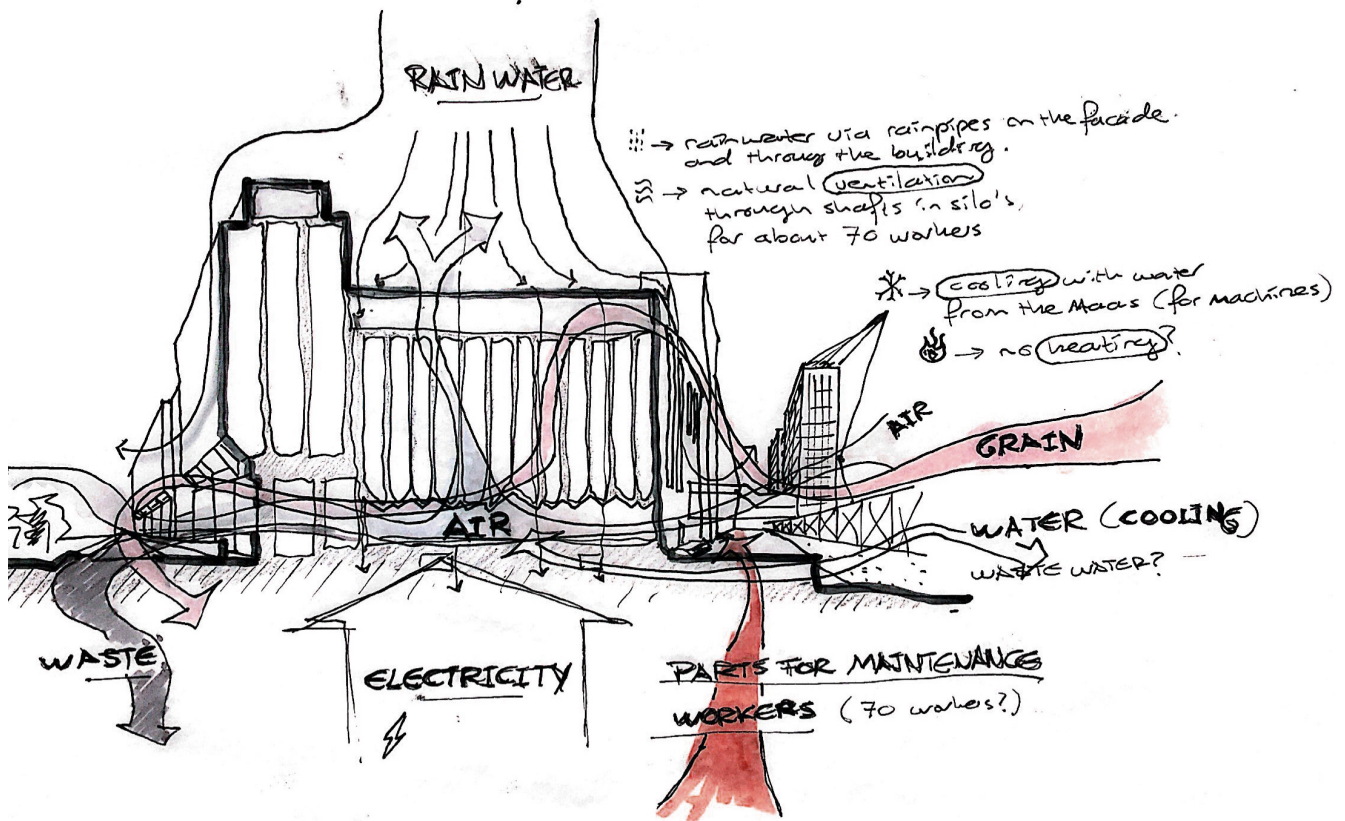


Grote Zaal (Verheij, 2017).

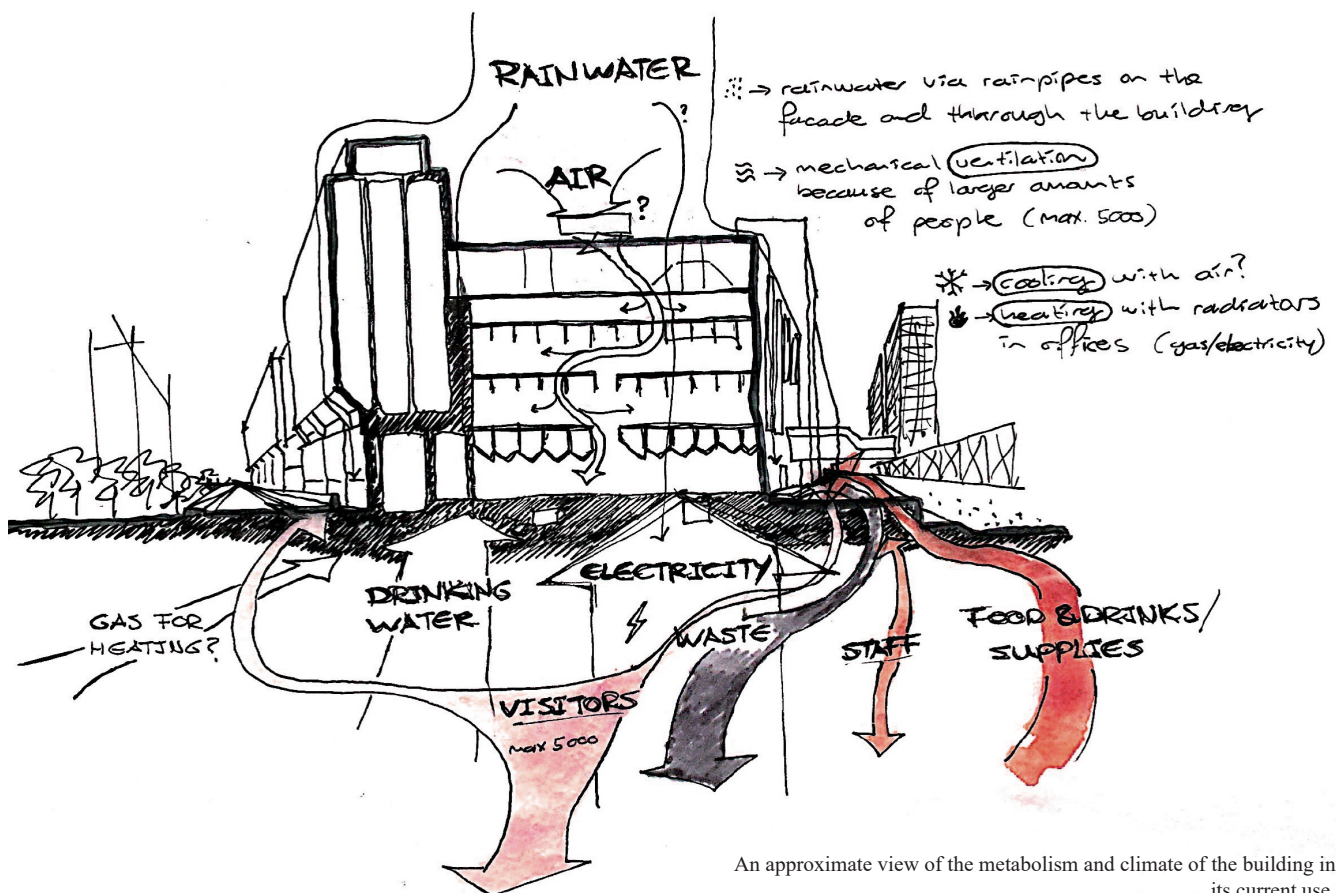
Comparing the machine to an organism; how does the metabolism of the Maassilo work and how did it change?

In the drawings on the right page, an approximate distinction of different resources, waste and people are shown in the former and current situation. In the former situation, the machines were cooled with water from the Maas. Air could move through air shafts, situated in the corners of some silos. How the heating was regulated in the building in the former situation has not been found in the available sources yet. In the current situation, the offices are heated with

radiators. Because of the large increase of people in the Maassilo, the existing natural ventilation is not sufficient anymore. There are several air handling units on the roof that supply different spaces in the building with air through new air ducts. While the machines for transporting grain are not used any more, there is an increase in systems that regulate the climate in the Maassilo.



An approximate view of the metabolism and climate of the building in its former use.



An approximate view of the metabolism and climate of the building in its current use.



# Historical Interpretation

Cultural Value Assessment



# Historical Interpretation

## Cultural Value Assessment



Image taken on top of the Maassilo, May 14th, 1940. (<https://www.pinterest.es/pin/389068855306419778/>)

This chapter will explain what we think is the overall essence or DNA of the Maassilo and its site, which will serve as a run-up to the cultural value assessment. The assessment will sum up (matrix) and further elaborate on what we think are the valuable elements that contribute to our essence of Maassilo. This elaboration consists of a thorough explanation of the values concerning the surroundings and site, and key-discussion points that explain the (non-)importance of the rest of the values. The values regarding the surroundings and site are more elaborated, because we think that the historical development of the area and the (valuable)

characteristics it left play a major role in the forming of the Maassilo's DNA.

The DNA of the Maassilo is formed by three key elements: the process of the area's and building's historical development, its massiveness, and the tangible hints to the process of grain inside and around it. These elements were all influenced by three types of development: industrial, architectural and economic.

The first element is of utmost importance, because, as indicated in the previous paragraph, we think that

this has played a major role in the forming of the building's DNA. It is where the story of Maassilo began. The area's development was steered by the industrial and economic development. The industry kept simultaneously growing with the economy, which asked for bigger capacities in industrial buildings as well as more of them. This event caused the first grain silo by Stok to be built, which would be expanded over time, influenced by architectural developments that took place. Simultaneous to these expansions, the surrounding area developed as well in terms of dwelling and infrastructure as a reaction to the growing industry. In other words: the grain silo exists and looks the way it does because of these developments and, with them, the growing demands of industrial buildings, while also functioning as a catalyst to the surrounding neighborhoods.

The first building of Stok was made in reinforced concrete and over time the construction method with this material kept evolving. This evolution is visible in the total complex and eventually resulted in a grain silo that was characterized by its impressive massiveness. This massiveness highlights the building's sturdiness and immovability facilitated in its context juxtaposed to the once vibrant harbor.

The fixed and non-fixed industrial and architectural elements that are still present in the Maassilo give us a hint to the story of the past processes and developments that took place in and around the building. Being able to see this story of past processes allows us to experience the spaces in and around the building as if in their historical time.

Overall, we find that the Maassilo contributes to the historical identity and memory of Rotterdam as an international harbor city. The magnitude of the Maassilo, its development, the uniformity of the function, structure and skin, and contrasts between dynamic and static elements of the building, as well as daylight and darkness, are all a reminder of the former identity of the place.

Conclusive: *the DNA of the Maassilo incorporates the in(tangible) memories and experiences of past processes within and around the Maassilo.*



# Cultural Value Matrix

Cultural Value Assessment



	AGE VALUE	HISTORICAL VALUE	INTENTIONAL COMMEMORATIVE VALUE	NON INTENDED COMMEMORATIVE VALUE	USE VALUE
SURROUNDINGS SETTING BUILDING		Connection with the Maashaven and overall relation with water.	The relation of the historical function of the Maassilo and the names of and in the adjacent neighborhood.		The overall perfect reachability of the Maashaven area and Maassilo.
SITE	The over time damaged and rusted grain elevators on the quay	The grain elevators on the quay.	The renovation and preservation of the elevator tower on the quay.		
SKIN (exterior)	Weathered facades, damages that were created by time.	Visibility of historic time periods represented through the architectural language of the facade.	The denomination of the building on top of the eastern facade.	The skin and structural techniques (grid) applied in order to absorb the blast of an explosion.	Presence of daylight on the ground floor and top floors of each respective building.
STRUCTURE	The worn out structure, concrete decay of the columns and load bearing walls.	Visibility of historic time periods represented through the architectural language of the structure.			The over dimensioning of the building, suitable for carrying heavy loads.
SPACE PLAN		The spaceplan of the building relates to the historical function of the silo complex.			Large open spaces, suitable for large services and crowds. Large axis make the building easily readable. Use of 'pilotis' scheme, suitable for every infill.
SURFACES (interior)		The iconic cone-like surfaces of the octagonal silo cells. The rectangular ends of the silo cells have a positive value.			
SERVICES	The fixed machines that were used for the process of the grain.			The fixed machines that were used for the process of the grain.	Some installation systems and shafts can be re-used.
STUFF	The non-fixed machines that were used for the process of the grain.			The non-fixed machines that were used for the process of the grain.	
SPIRIT OF PLACE		The traces of historical activities.		The activities in relation to the presence of daylight.	

NEW-NESS VALUE	(relative) ART VALUE	RARITY VALUE	SPATIAL VALUE	TECHNICAL VALUE	OTHER VALUE
		The view over the water and the city.	Present dykes on site / in the area		
The redevelopment of the old loading docks and train tracks.	The preservation of the elevator towers on the quay.	The Maassilo stands as a rare ensemble of different building phases that highlight the uniqueness of the complex.	The favorable location of the building in relation to transport.		
The restauration of the skin could contribute to the industrial character of the building. The removal of safety nets can restore the building in its original state.	The preservation of the decorative elements, the octagonally shaped skin and the art piece.	The octagonally shaped skin.		The abstraction of the circular shape to an octagonal shape. The efficiency became an iconic shape of the facade.	
The restauration of the structure could contribute to the industrial character of the building.	The structural layout and spaceplan of the building.	The builing is overdimensioned and can carry immense loads.		skin=structure	
			The space plan of the building is hard to read.		
The restauration of the surfaces could contribute to the industrial character of the building.	The iconic cone-like surfaces of the octagonal silo cells. The rectangular ends of the silo cells have a positive value.	The iconic cone-like surfaces of the octagonal and rectangular silo cells.			
The restauration of the services could contribute to the industrial character of the building.	The fixed machines that were used for the process of the grain.	The two mobile elevator machines on the quay.			
The restauration of the stuff could contribute to the industrial character of the building.	The non-fixed machines that were used for the process of the grain.				
		The experience of the weight/ mass and the robust character of the enormous silo complex.			



# Value Statements

Cultural Value Assessment



# Value Statements

SURROUNDINGS - Historical value



Urban context, 1910.

The Maassilo has an important historic relation with the Maashaven. As is explained in the timeline, the Maashaven was dug because of the industrial development that kept going. This development caused growing demands in industrial buildings/functions. One of these buildings was the Maassilo.

The Maassilo was one of the first industrial buildings at the Maashaven, which is why it is located in the 'armpit' at the very end of the port. The building contributed in the growing demands of the port industry and the industrial area along the Maashaven kept growing/expanding in south-west direction of the Maassilo.

The connection of the Maashaven with the Maassilo is therefore important to maintain. Without this connection, the historical value of the Maassilo

itself would be a lot less, since part of its historical identity would be lost.

Furthermore, the water could positively contribute in a different way. Rotterdam-South is an area that is rich in water and its possible water connections, which can be used in order to improve the quality of the whole area. But this would mean having fundamental interventions in the urban area. Future interventions could be, for instance, creating new water networks from existing and new canals and connecting them, which would connect the area, improving its overall quality (Gemeente Rotterdam, 2007).

This possibility regarding water is, however, not on the scale of the Maassilo itself, but concerns the whole Maashaven area.

## SURROUNDINGS - Intentional commemorative value



Urban context, present day.

Product old Maassilo:

**Grain**

Names adjacent neighborhoods:

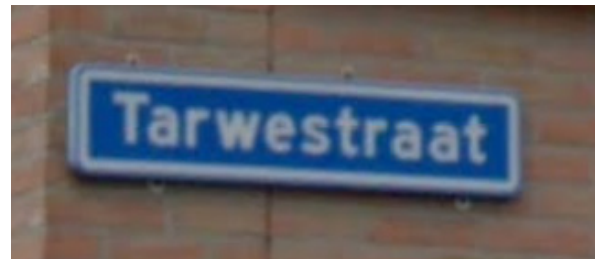
**Tarwewijk** (yellow marked area)

Few street names in the neighborhoods:

**Speltstraat**

**Roggestraat**

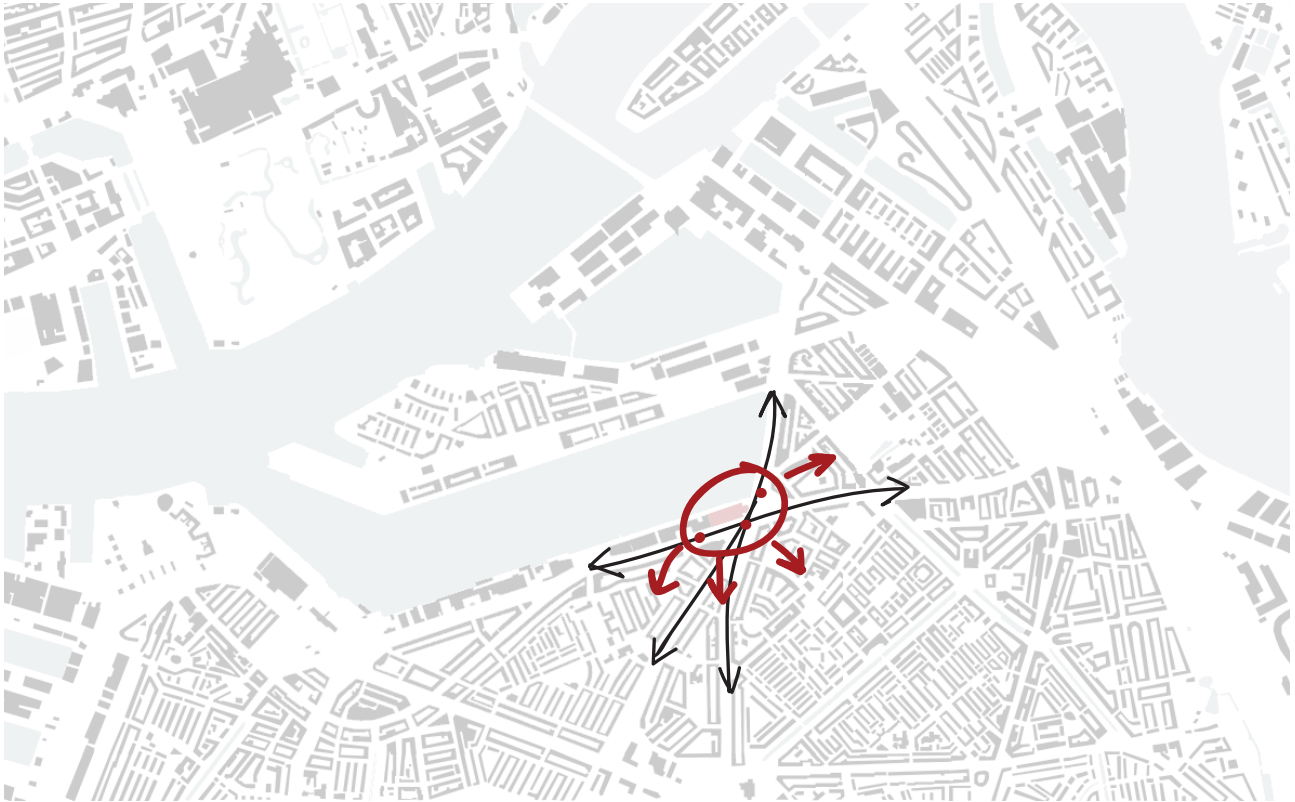
**Gerststraat**



In the chapter about the development of the Maashaven area is clearly visible that the industrial development more or less shaped the urban context of the Maassilo. To highlight the importance of the link between the industrial development and the neighborhoods, the street names in the neighborhoods and the names of the neighborhoods themselves are named in a way that they refer to the old function of the Maassilo, namely processing and storing grain.

Should this connection be lost either in the demolition of the Maassilo or changes in the names of the neighborhood and its streets, the historical connection would be weakened and no longer visible for the eye. This connection should be maintained in order to avoid this. Or it could be strengthened by, for instance, changing more

streetnames into ones that refer to the old function of the Maassilo. Because not all streets refer to it, just a part of them.



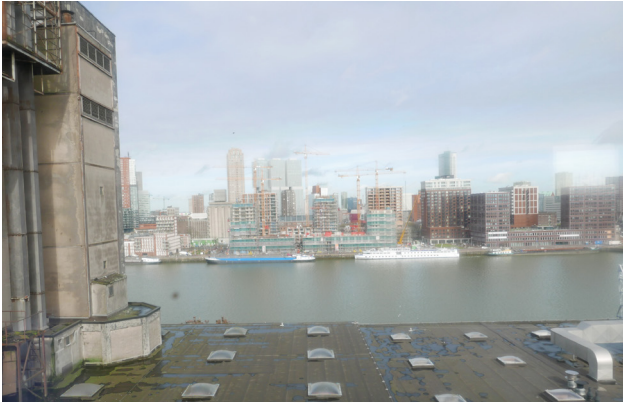
Urban context, present day.

As a result of infrastructural research, it was concluded that the Maassilo could be seen as a infrastructural node, since all modes of transport seemed to intersect around the Maassilo. Also, stops from several sorts of public transportations seemed to be placed around the Maassilo. This not only makes the Maassilo perfectly reachable, but also the whole Maashaven area. This is because all modes of transport go in both opposite ways and are not just one way lines or roads. The network covers the whole area perfectly.

This element of the Maassilo's surrounding is not of utmost importance for cultural redevelopment. Not all modes of transport have to be present in order to initiate a cultural development in the area. A lot more factors play a role in this. However, being perfectly reachable can be beneficial for this,

depending on what cultural function is implemented where. This reachability should therefore always be thought about before initiating a cultural development.

## SURROUNDINGS - Rarity value



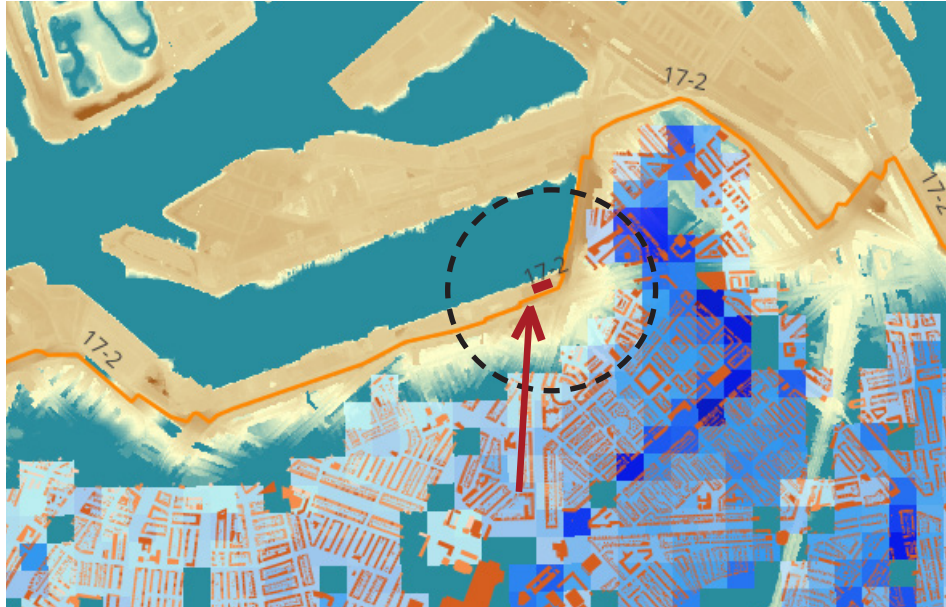
From inside the Maassilo, the view to the port and the city can positively contribute to the building's capability to house new cultural functions, depending on the needs of the new function. These views are one of a kind, since no other industrial building along the Maashaven is housing a cultural function. The Maassilo has a direct view over the Maashaven, but some elements, like the roof of Stok or other parts of the complex, can block the view a bit.

Despite these nice and rare views towards the port and city, there are just a few openings in the huge and massive façades that have such a view. Making more openings would mean the loss of the monumental façades that show a lot about its historical function and processes.





## SURROUNDINGS - Spatial value



The drawing shows that the Maassilo is situated outside the dyke, which brings with it certain important risks in case of redevelopment. Our country is vulnerable to flooding due to the fact that it is located below sea level. And this vulnerability only increases over time due to climate change.

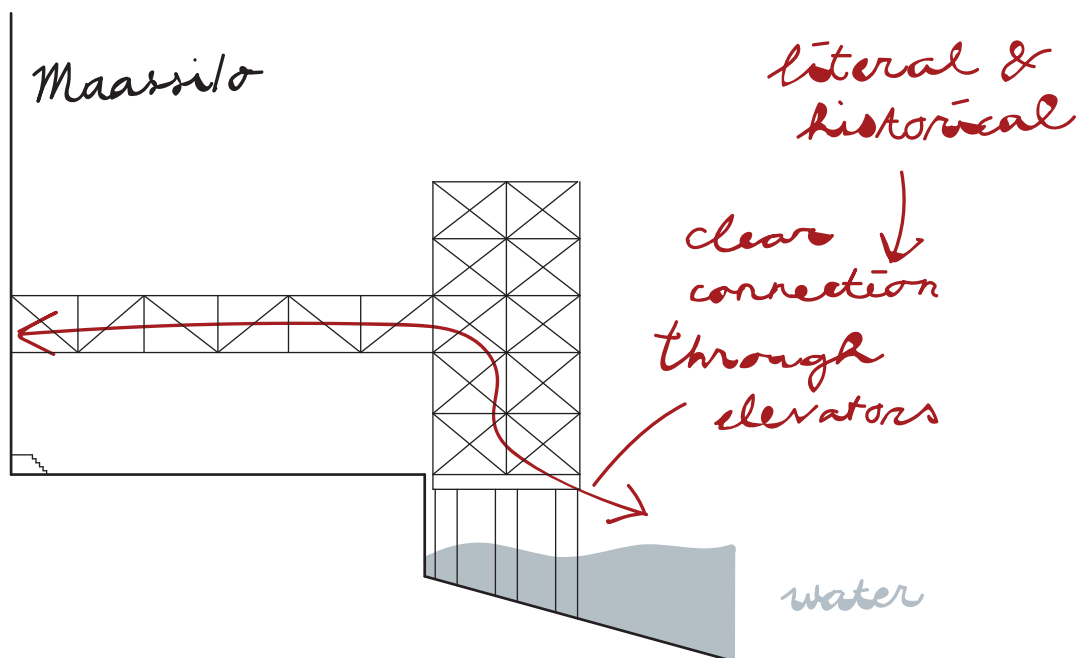
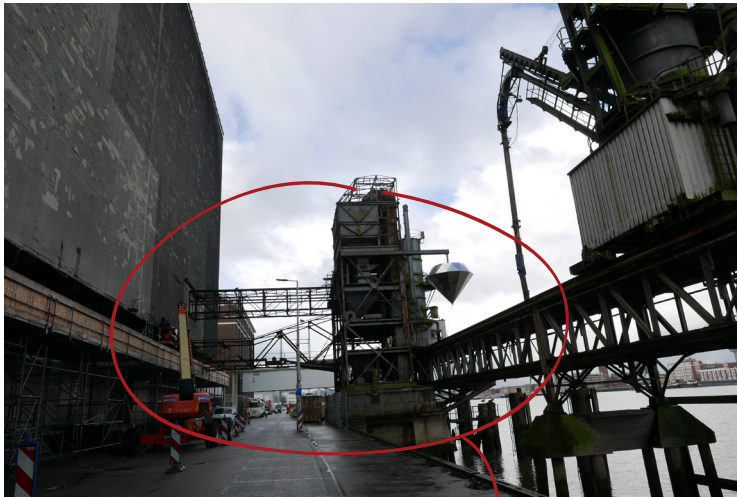
This information should be kept in mind while planning future cultural development for the building.

## SITE - Age value



The damages and rust on the grain elevators on the quay show that they are very old. This ‘visible age’ of the elevators allow us to be in contact with the past function of the Maassilo. It allows us to situate ourselves in the past times of the place and really experience the ‘age’.

This characteristic contributes to the historical essence of the Maassilo and has to be handled with utmost care in order to maintain it.



The Maassilo has a clear historic relation with the Maashaven. This relation is made clear by the visible connection of building and water through the grain elevators. This connection tells us part of the story of the old function of the Maassilo. It tells us how the grain went from the water (ships) into the building, which was a crucial part of the historic process through the building. This connection with

the water is therefore of important value and has to be maintained in order to prevent the loss of the Maassilo's visual identity.





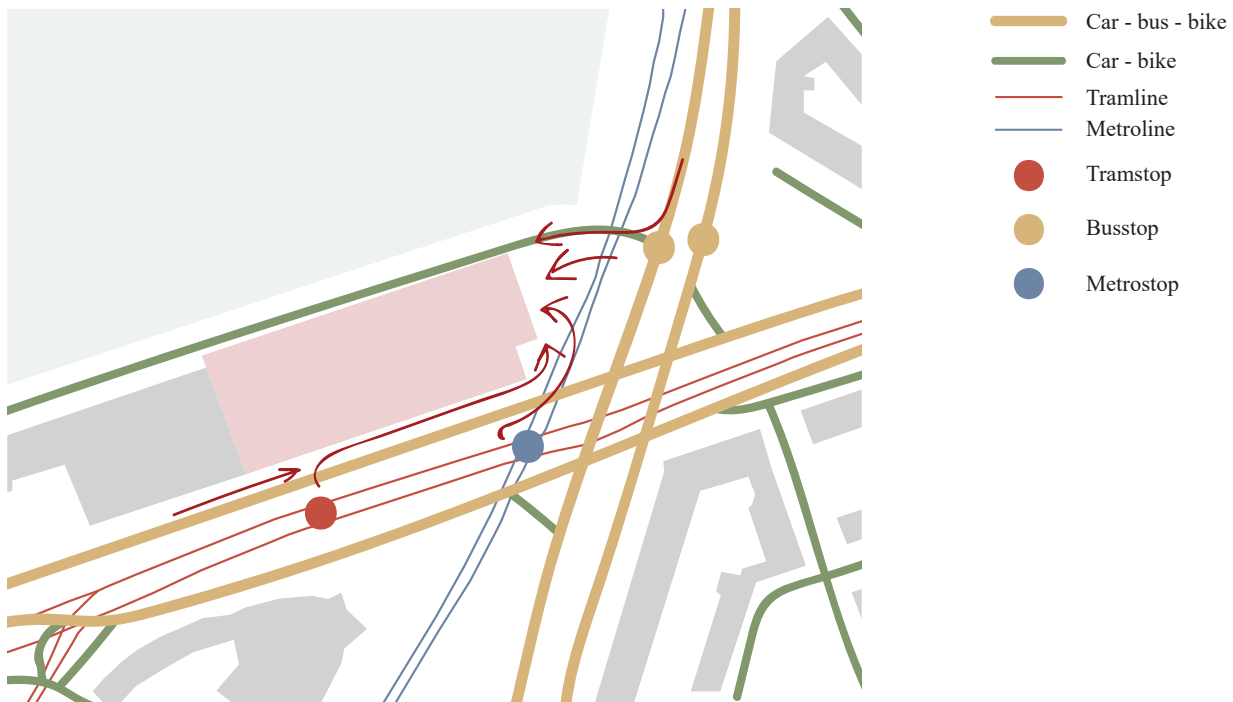
The grain elevators connected to the Maassilo are a very important part of the complex. These elevators are one of the few remnants of the historical port activity from the last century. For this reason they give a highly valuable contribution to the industrial heritage of the building. To be able to preserve this contribution to the industrial heritage, the elevators must not be handled in such a way that the essence would weaken.

Eventually the elevators had to be restored, because of all the damages and rust. This was carefully done and for the skin, glass curtain walls were intentionally chosen to enhance the historical appearance of the elevators. Any other material would result in the historical appearance being hidden and eventually forgotten.

In short, the renovation of the towers were intentionally handled in such a way that the towers keep serving as elements of the building that contribute to its historical essence.



## SITE - Use & spatial value

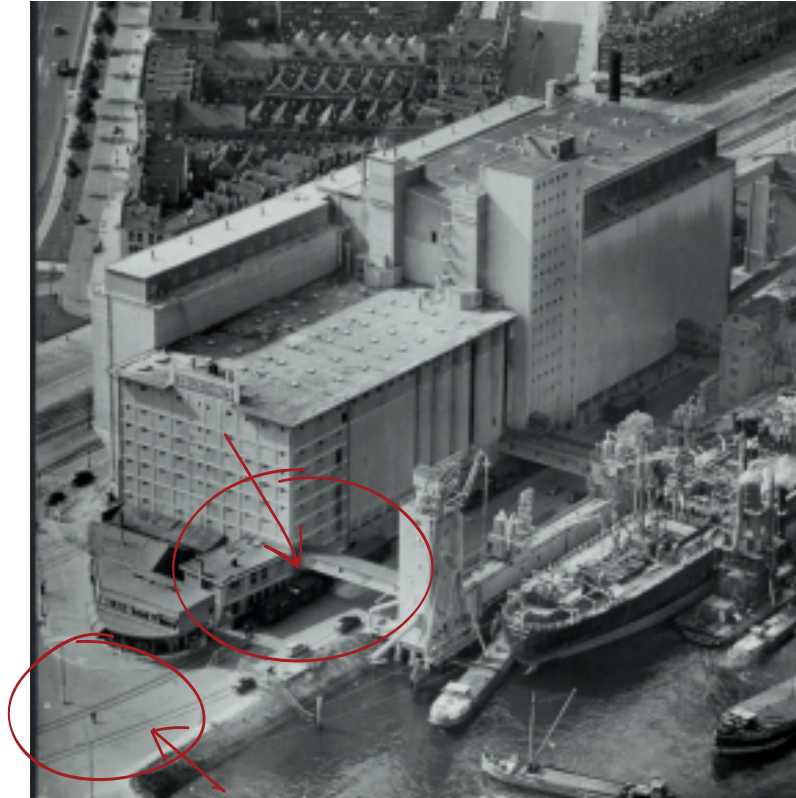


Previous infrastructure analysis stated that the Maassilo is located in such a way that it can be reached by car, bike, bus, tram and metro, in other words, by all modes of transport. It can be said that the Maassilo functions as a infrastructural node, since the lines of all modes of transport seem to intersect around the complex.

This infrastructural and spatial characteristic of the Maassilo, the same as stated for the surrounding, is not of utmost importance for cultural redevelopment. Not all modes of transport have to be present in

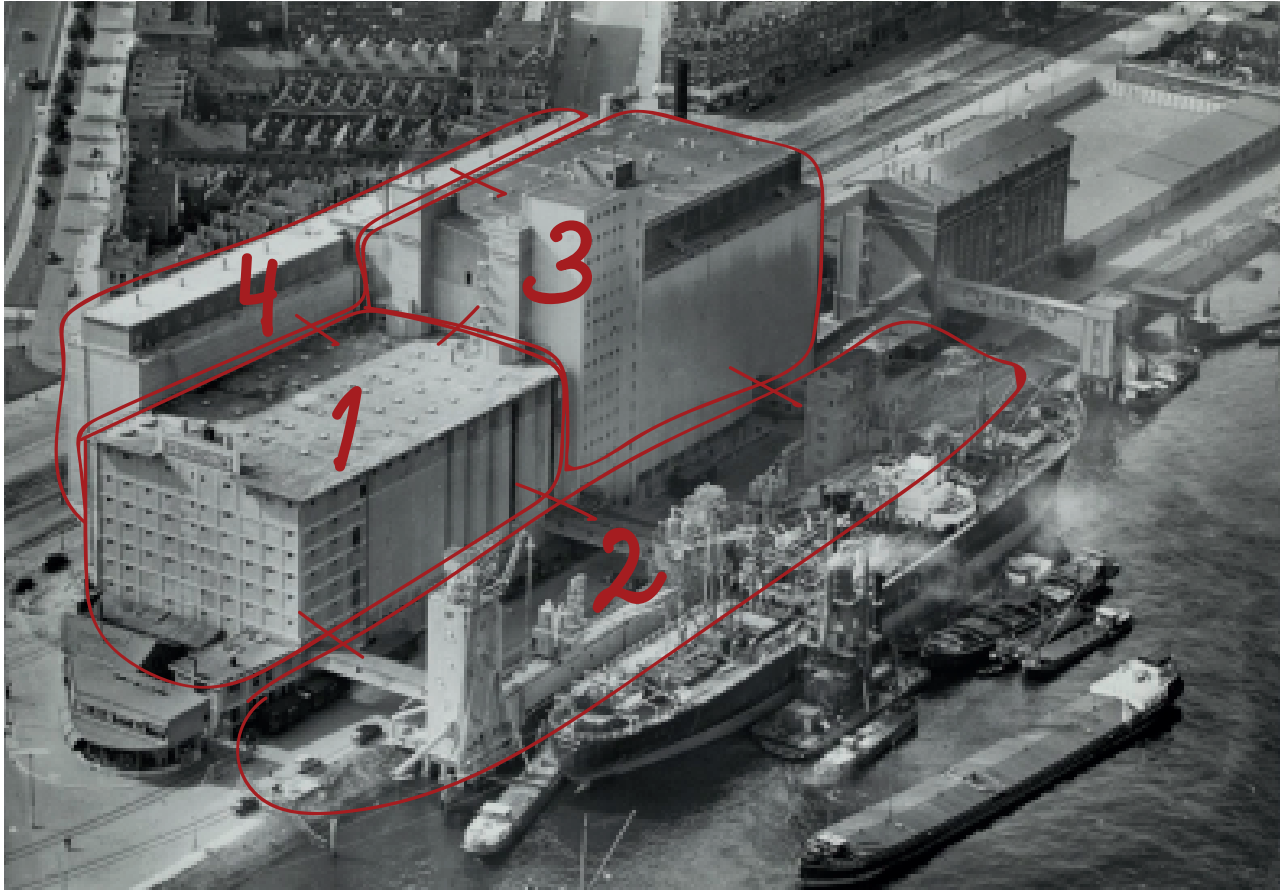
order to initiate a cultural development for the Maassilo. A lot more factors play a role in this. However, being located in a way that is perfectly reachable can be beneficial for this, depending on what cultural function is implemented.

This reachability should therefore always be thought about before initiating a cultural development.



The height of the ground floor of the building is 1 m above the level of the quay. This height of 1 m was beneficial to the former function of the Maassilo. It was at perfect height for easy loading and unloading goods from the former trains through sloped loading docks. Nowadays, stairs have replaced the loading docks and the train tracks were removed as well. There is nothing present anymore that relates to the elevated level of the ground floor. It almost seems like part of the story of the historical process in the building is missing now.

We think the removed loading docks and train tracks would have contributed to the historical essence of the building if they were still present. Therefore, it could be considered redeveloping (one of) these elements on the site. However, even if it seems like part of the story of process is missing, the overall essence of the Massilo is still graspable.



The Maassilo stands as a rare ensemble of different building phases that reflect the growth of the complex over time. This sequence of the different ensemble pieces/parts in connection with the monumental grain elevators, is a unique combination that won't be found elsewhere easily. It extremely highlights the uniqueness of the Maassilo.

This unique characteristic should be preserved during al future cultural redevelopments of the building. Just missing one of the ensemble pieces would shatter the historical value and overall essence of the Maassilo.





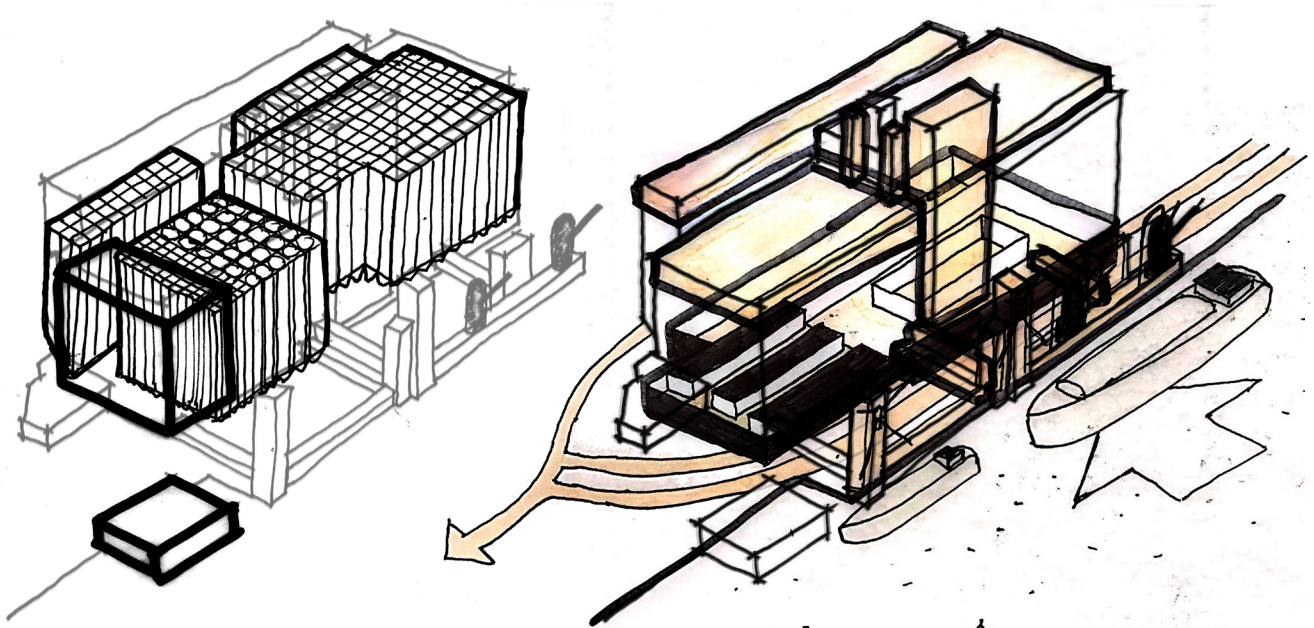


# Key Discussions

Cultural Value Assessment

# Services & stuff

## Key discussions



Static organs of the Maassilo.

Dynamic organs of the Maassilo.

### Conflict

The Maassilo is designed as a machine and contains many fixed and non-fixed machinery, of which their nature can be divided into dynamic and static parts of the machine. The problem is that, unlike for example Le Corbusiers' 'machines for living in', the machine is not designed for people.

### Opportunity

When the buildings' identity of a 'machine' needs to be maintained, it can make the transition from machine for stuff, to a cultural 'machine' for people. The memory of the former use lies for a reasonable amount in the physical traces of the buildings' identity: the machines. If valued, conserved, restored, relocated or removed correctly, the services and stuff can play an important role in creating a symbiosis between the original identity of the Maassilo and the building as a cultural 'machine' for people.

### Obligation

The most important role that services and stuff need to play, is making the Maassilo a healthy, durable 'machine' for people. To do this, a holistic approach is needed towards systems and processes in the building, even though the building consists of several parts.

It is therefore important that climate is not only regulated by systems, services and stuff, but also by design. That way climate is not only about good air quality, the right temperature and energy efficiency, but mostly about quality of life.

An example of the value of different services and stuff on different floors of the Maassilo. Blue is high value; green is positive value; yellow is indifferent; red is negative value.

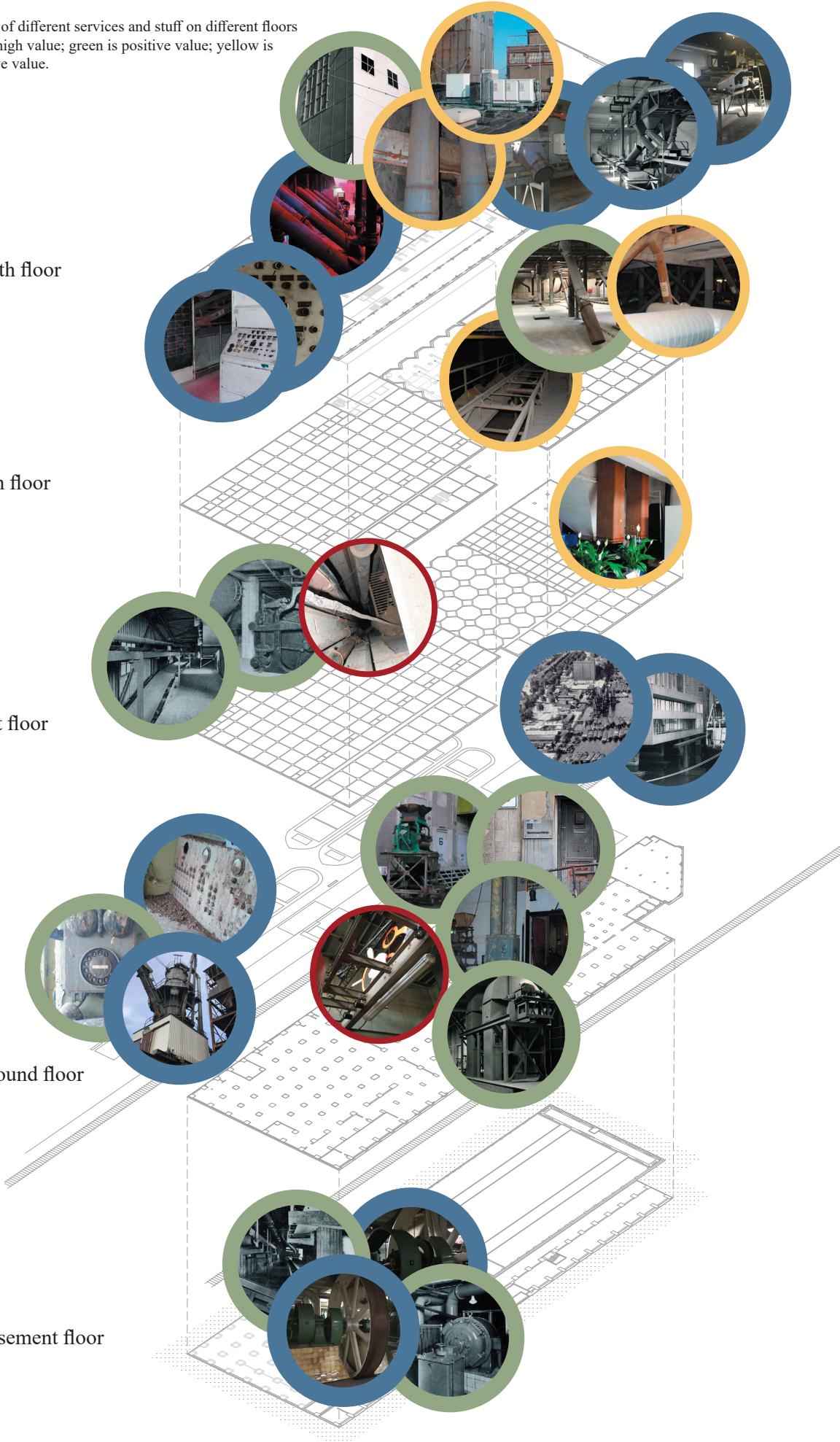
10th floor

7th floor

1st floor

ground floor

basement floor





# Spirit of the place

Key discussions

## **Conflict**

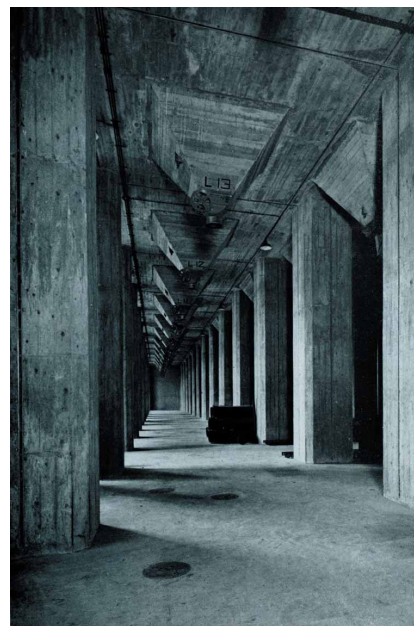
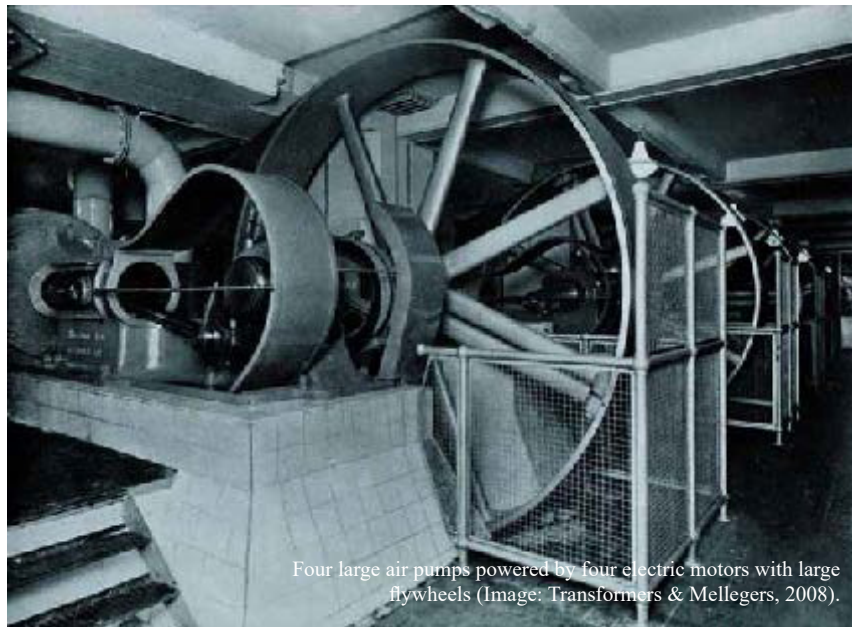
The spirit of the place lies partly in the mystery of the large empty spaces, the experience of weight and mass, the smaller hidden places, the rarity of daylight, the disorienting space plan of the building and the traces of the past. The problem is that most of these things are difficult to maintain as soon as a space gets a new function or certain elements are altered.

## **Opportunity**

If the mystery can be enhanced, by using elements like daylight, views, contrast between spaces and functions, combined with readable routing and configuration, curiosity could be triggered to improve on the cultural quality of the Maassilo.

## **Obligation**

**The readability of the building needs to be improved, without compromising the mystery of the building. It is important to take into account what organs ‘make’ the building, as well as intangible characteristics. Different architectural tools, suitable for each individual situation, need to be taken into account while enhancing the mysterious atmosphere and identity of the building.**



# Perception versus Expectation

## Key discussions

The Maassilo is one of the oldest inhabitants of Rotterdam. With an age of 110 years it survived two World Wars, several financial crisis's and still rests unmoved in the armpit of the Maashaven. This renders the building as an historic artifact of the harbor area. Like any other artifact is bears the appreciation to be preserved, restoring a link with the past that is inherent to the urban tissue of the Rotterdam harbor area.

### Conflict

The exterior skin of the Maassilo has significant value, in different categories such as historical, technological or even the ability for future use. This accumulation of values makes the skin one of the most important aspects of the building as is shown in the matrix. However the current state of the façade poses an issue. Safety nets and other placeholders now sever the users experience of the building. Another important notation is shown in the conclusion of the analysis, being that in most cases the skin = structure. When addressing the skin, one must keep in mind that these are inseparable, creating stability and structural problems when there is a modification.

### Opportunity

The skin of the building creates an iconic link with the user's experience of the building. When passengers

pass the building the skin forms a relation, being the only thing that is visible without experiencing the interior of the building. The skin offers the possibility of creating this historical link with the past that can be a vital element in the historical perception of- and relation with the Rotterdam harbor.

### Obligation

**It is essential that this relation between the skin and the perception of the user is preserved and reinstated to its original condition. The removal of safety nets can only be accomplished when the façade is restored. There can be a discussion if the skin should be restored to its full origin, or only to the state where its safety is ensured. Consequently the skin is one of the few aspects that should be minimalized in its modification and maximized in its potential.**





The safety net is spanned accross the northern facade of the first expansion in order to prevent concrete to fall down.



# Dynamic versus Static

## Key discussions

The Maassilo can be seen as a building that can carry tangible as intangible loads. It was dimensioned to withhold 64.000 tons of grain. This is visible throughout the whole complex, from exterior to interior. The vastness and massiveness of the building are juxtaposed to the rapid change of its environment. Born as a concrete mammoth, it now blends in with the upscaled developments that sprawl around it.

### Conflict

The massiveness of the structural layout of the building is a dominant factor in the whole building. The enormous amounts of concrete and over dimensioned structural element create a heavy character, where one could argue that it isn't suitable for public use. These large structural (reinforced) concrete elements are difficult to modify or even demolish.

### Opportunity

Since the building is in no need to carry 64.000 tons of grain, there is an opportunity to carve away some structural elements. This is already been done on the ground floor where several columns are removed or replaced by smaller ones, giving room to large open spaces. The two 'pilotis' layout offers a lot of flexibility in future use. The structure and layout offer a wide range of possibilities, but require heavy modifications in order to accomplish this.

### Obligation

**Being over dimensioned doesn't create the possibility to trim the flesh of the building, it poses the opportunity to create smart and well argued modifications that can enhance the experience of the user and help soften the harsh atmosphere that is created by the overkill of raw concrete elements. The new design must become an equilibrium of tangible and intangible weights. This suggests there should be an historical appreciation of the vastness and massiveness of the building in relation to the possibility to create a comfortable environment that is capable of opening the building up to the public.**



Natural daylight entering the top floor of the first building, softening the raw concrete environment.



# Reflection

Cultural Value Assessment



# Reflection

## Cultural Value Assessment



Aerial photograph of the Maassilo, source: (<https://www.events.nl/nieuws/idee-ncompetitie-maassilo-je-kan-het-dak-op>)

The tripartition of the report forms an cohesive and chronological understanding of the building. By comparing the architectural report to the human body we could easily discuss and relate what the essence of the subject was that we were discussing. Since the human body is also composed in a hierarchical fashion, it immediately became clear were the most imported structures were inside the buildings and its surrounding context. Through a series of Skype meetings, that were being held on three days during the week, we discussed the progress of the group and formed discussions that narrowed down our perspective of the building. By finishing the architectural and building technical report first, we could form well-argued opinions about the cultural value assessment that form a bridge between the two analyses and the coming design phase. By introducing the building and its most important components in the architectural report, we could define them more thoroughly and technically in the building technical report. The cultural value assessment can be seen as a

underlayer for future design interventions. Although the assessment is a report based on subjective opinions is forms a cohesive group perspective that focusses on the bigger picture and leaves room for individual interpretations and visions.

Given the circumstances of the process from our analysis, regarding the Covid-19 pandemic we were forced in our limitations of sources. Furthermore it withheld us from site visitations, which were needed in our analysis. This resulted in the fact that we couldn't make a damage analysis by cataloging all the damages apparent in the building. Hopefully we are able to do this in a later stage. The three reports form a cohesive story were the building is explained and analyzed from a wider scope to a more detailed one. In this way we can approached the building from multiple angles. Given the time and scale of this project we were forced to be as specific as possible and are certain that in the coming weeks and months we expand these analyses further.





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