# MAASSILO

## Maashaven | Rotterdam

P1 Research Report
Heritage and Architecture Graduation Studio

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# Introduction

## Problem Statement

In the past, areas located in between ports and their cities have generally been abandoned , which made them subject for urban redevelopment. Derelict port areas are compelling for urban re-use due to their connection with the waterfront and their close relation to the inner city. In addition, the change of the public attitude towards waterfront zones that occurred after the 1960's has created a high social, communal, economic and political interest of waterfront areas inside the urban sphere. Nowadays, the urgency for development of these obsolete areas, with new alternative function, is growing. This is particularly evident in areas of the port which are inside the city's boundaries. In fact, this amount of attention for redevelopment projects on the waterfront has lead the port activities to decline while simultaneously has given rise to new redevelopment opportunities.

The city of Rotterdam has the largest port in Europe and the fourth largest one in the world. Today, the activities of the port are mostly located near the west side, by the sea, resulting in a disconnection of the port and the city. Hence, a large number of the open areas, infrastructure and built environment has been disengaged from their context, as they are not being used for their original function. In order to keep these evidences and traces of history in the present and promote them in the future, the new pressure for development has to be balanced with an attitude of conservation. These elements are testimonies of the relation between the water, the harbor and the city, which should be transfered in the future. Moreover, they are the most appropriate elements that through reinterpretation and intervention can bring together the old and the new identity of the city of Rotterdam and make it legible.

## Research question

What are the elements that contribute to the legibility of the building, from the surrounding to the building and its interior?

## Legibility

This term is mainly used in text, and more specifically in combination with the term readability as the main aspects to communicate the type. It is important to distinguish those elements as separate ones. More specifically legibility applies to parts of the text like letters and words and paragraphs. It's micro-typography. It's about type's ability to be easily read, particularly under normal reading conditions. While, readability Applies to the overall reading experience. It's macro-typography and it's about making type aesthetically pleasing in order to make it more inviting to read. In this case we could say that illegibility is where the mind is waiting on the eyes and acts as a barrier to communication while legibility leads to effortless reading and fosters communication.

When transitioning to the field of architecture we can find similarities with these terms. Kevin Lynch in his book the Image

of the City while trying to elaborate on the visual qualities of the American cities he focuses on their legibility. His interpretation of this term is:

*"By this we mean the ease with which its parts can be recognized and can be organized into a coherent pattern." (Lynch, 1960, p. 2-3)*

This term is quite similar to the one used to describe types in texts. However, instead of the use of readability he distinguishes another term the one of 'imageability', which refers to:

*"…quality in a physical object which gives it a high probability of evoking a strong image in any given observer". (Lynch, 1960, p.9-10)*

For the purpose of this research both of the definitions of legibility and imageability that Lynch provides are going to be used. However, the concept of legibility as an element or group of elements that enable and enhance the orientation and way-finding of the visitor-user will also be included.

Methodology

The methodology is divided in three parts. The first part consists the research and analysis of all the different scales, from urban to architectural and technological aspect. This analysis is a combination of research in literature, archives and on site observations. The second part refers to the investigation of the research question and combines research on additional literature, which would provide an strong theoretical foundation for questions on legibility, and evaluation through the aspect of legibility of the information gathered by the aforementioned first part of the analysis. The last part, will be the evaluation of the fundamental values of the building, in order to define its character and identity, so that the first starting points for the later design process can be formulated. However, this process is not linear, which means that even after the first development of analysis, value assessment and starting points, the designing process will be used as a research tool to re-investigate and re-evaluate the building. It is not a linear but rather a rhythmic transition from analysis to research and visa versa.

# Site _ History

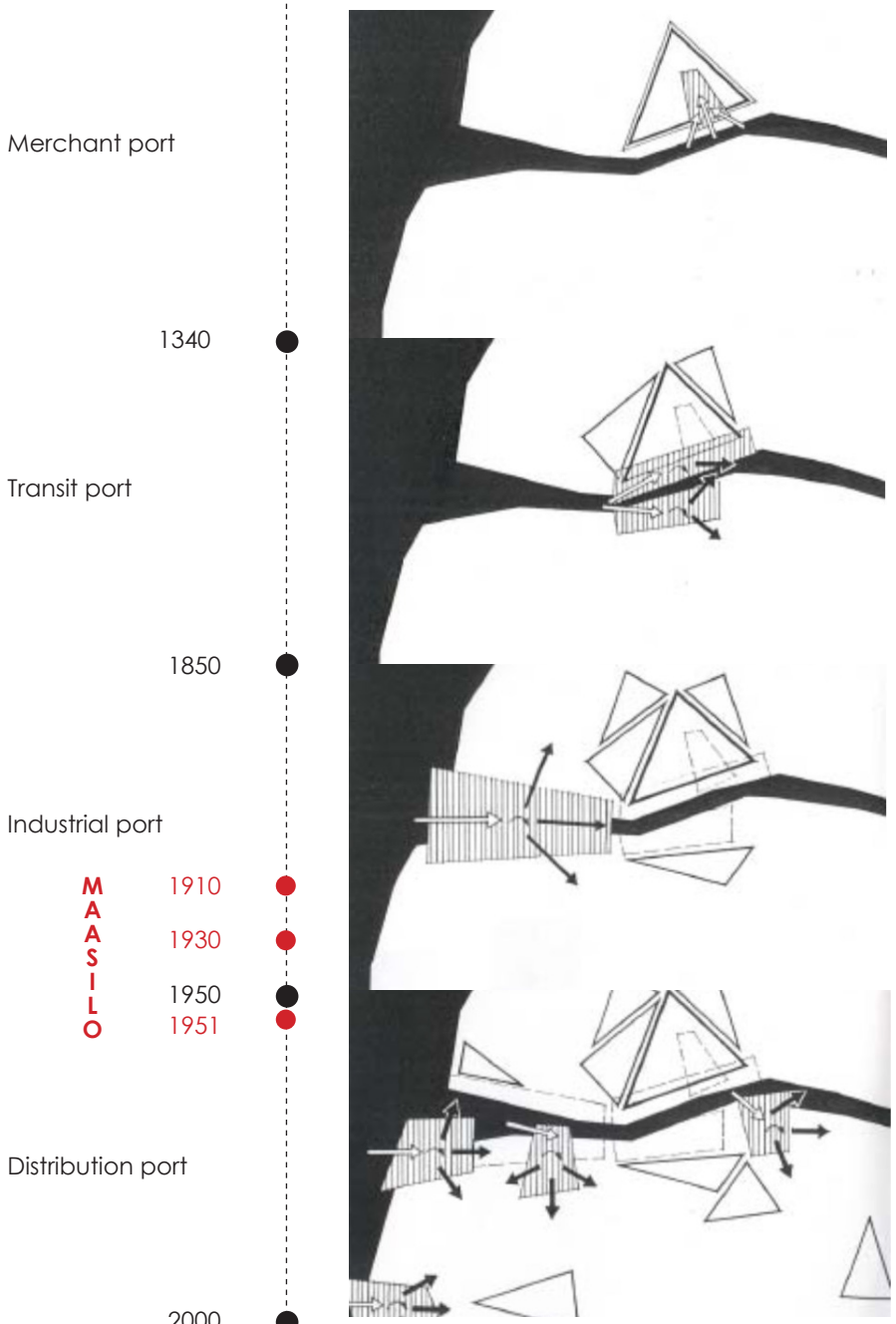
## Rotterdam

Rotterdam is located in South Holland, within the Rhine–Meuse–Scheldt river delta at the North Sea. Its history goes back to 1270 when a group of people constructed a dam in the Rotte river and settled around it for safety. In 1340 Rotterdam was granted city rights by the Count of Holland and slowly grew into a major logistic and economic center. Nowadays it is home to Europe's largest port and is the second city with the highest population in Netherlands.

## The 4 stages of the port

The development of Rotterdam is integrally connected to the development of its port. The historical development of the harbor can be divided in four different periods according to its change of basic character (Image 1). This division is based on the needs of the harbor, its expansion process and the supporting industries. The first part of the Maassilo is built in 1910 while the port was in the industrial era. Similarly, the second phase built in 1930 belongs in the same period. While the third extension, in 1951, concurs with the beginning of the distribution port (image 1).

The international trade of the transit port makes enormous profits and gets Rotterdam to industrialize on a large scale. This makes the Rotterdam harbor a major provider of work and the motor of the Dutch economy. During this period the harbor grows rapidly. Large scale international networks of trade are established and the harbor grows faster than Rotterdam and it




Images 1. Four different type of harbors.
Source: H. Meyer, 1996.

expands outside the city. Transshipment and storage of goods and raw materials is still the main trade. Now almost the whole of Europe is the hinterland of the harbor and goods come in from all continents. Competition is intercontinental. Because of the bombing of the city in W.W.II the city completely changes and adapts to the 20th century and its demands of functionality. During this period many new developments were constructed in order for the port to expand. The Maashaven was one of those and was developed from 1898-1908.

First developments

The first proof of human presence in the Maas / Rhine Delta date to the middle stone age era. In the first development of Rotta is formed around a church, at the point where river Rotte meets Merwede river. Later, the area starts to become populated and cultivated. However, in the 12th century Rotta is destroyed due to a major flood. This resulted in the construction of river dike along the north bank o Merwede and Maas. It is in 1270 that the dam is completed at the mouth of Rotte. At the place where the Rotta was located the village of Rotterdam is formed (P.T.Laar, 2006). With the separation from the Merwede river transshipment activities begin to emerge at the dam. In order to be competitive in trading activities Rotterdam constructs a new canal system towards the north. This is the reason that the harbor starts expanding on the north bank of the New Maas (P.T.Laar, 2006).

Image 2. Reconstruction of Rotterdam in 1340. Source: P.T.Laar, 2006

During the 15th to 18th century

During this time period the city developed at a slow pace. The main income of the population comes from the trade in haring. All labor supporting harbor work and shipping flourishes in this time. To accommodate the growing number of citizens and laborers, and to accommodate the expansion of the harbor the city and harbor expands to the south of Rotterdam.

In the 16th and 17th century the harbor starts claiming new land from the Maas to accommodate even more expansions, which fit in the urban fabric. Like mentioned earlier the port at this time is a merchant port and trade is conducted in the city and with surrounding ports. Expansions of the city and port go hand in hand. Typical for the merchant port, which Rotterdam still was during this time, was that merchants lived in the harbor in the same house where goods were stored. Usually directly in front of the place where the goods were transshipped. With the latest expansions of the city the same urban principle towards harbor architecture was upheld. (P.T. Laar, 2006)

The 19th century

In the 19th century expansion and transformation of the harbor accelerated very fast compared to the growth in earlier centuries. The Ruhr region in west Germany was a landlocked area along the Rhine river of cities that were industrializing fast. To accommodate this industrialization of the region vast amounts of raw materials and steel were needed.

In 1868 the 'act of Mannheim' was signed which provided free trade for countries along the Rhine river. This made Rotterdam, situated at the mouth of the Rhine, the perfect port to transship materials coming over sea and deliver them to the Ruhr region

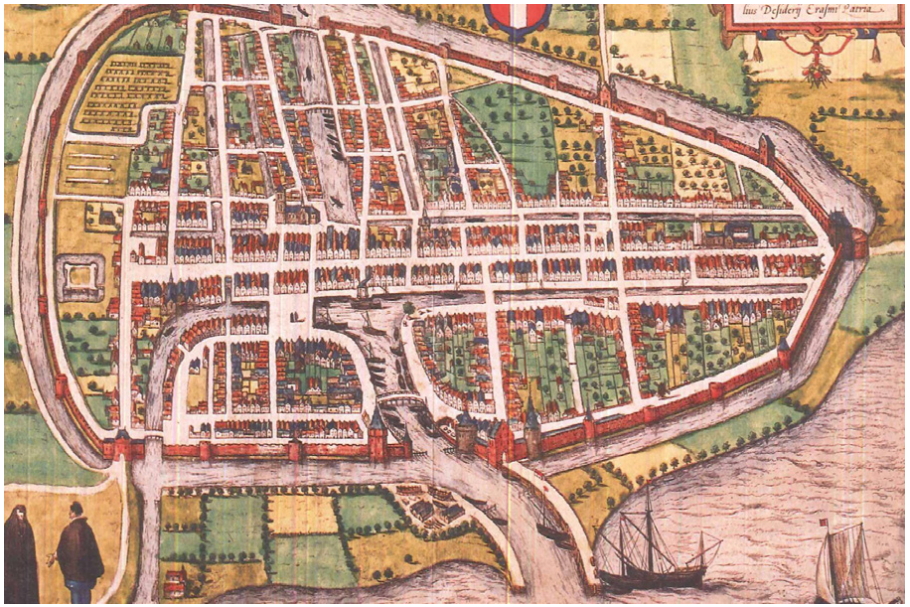


Image 3. Map from the 'City book' of Braun en Hogenberg 1560 source: P.T. Laar, 2006.

(Steenhuis 2015). The former merchant port trading with close-by ports became industrialized which meant expanding on a large scale and for the first time the council was looking to cross the Maas and claim land on it's south banks. The first part that was claimed was Feyenoord. In order to make this part of the harbor accessible simultaneously a railway and transport bridge were build. In 1885 the small workers village of Katendrecht was demolished for the next expansions of the Rotterdam harbor. From 1887 to 1895 the Rijnhaven (Rhine harbor) was constructed and quickly after that the Maashaven was constructed (1898 tov1908). This is the harbor where the Maassilo is situated.

With the expansion of the harbor the city broke with the traditional merchant setup. Transshipment and storage of goods scaled up and outgrew the merchants house. Ships had bigger loads, inland ships grew in size and amount. In designing these new harbor area's harbor activities and housing was separated.

With this first separation the detachment of the Rotterdam harbor of the city of Rotterdam began.

## The new city

Due to industrialization the population of the city you can see the population quadruple between 1870 and 1910. To accommodate these people new housing projects aimed at the working-class popped up all over the city. In the beginning of the 20th century the Infrastructure of Rotterdam was not able to accommodate the fast changes society was going through. The only bridge connecting the north to the south could not handle the amount of traffic and was more often open so boats could pass than closed for traffic to flow. Many city planners made a plan to reorganize the city center and it's infrastructure like De Jongh and for example Burgdorffer who's infrastructure plan would become the blueprint for the post war reconstruction of the city center. But non of these plans ever got constructed. With the bombing of Rotterdam by the Nazi's on May 14th 1940 the whole of the city center is bombed and destroyed. The bombing also destroyed the harbor and therefore the economical heart of Holland. The reconstruction plan included only 10.000 dwellings back in the city center compared to the 25.000 before the war i. This also made it possible to have a more modern infrastructure in the city center and help the flow of traffic. To boost the national economy huge unprecedented expansions of the harbor where planed towards the west.

Image 4. Rotterdam city center in 1946 showing the empty heart of the city. (VersBeton, 2015)

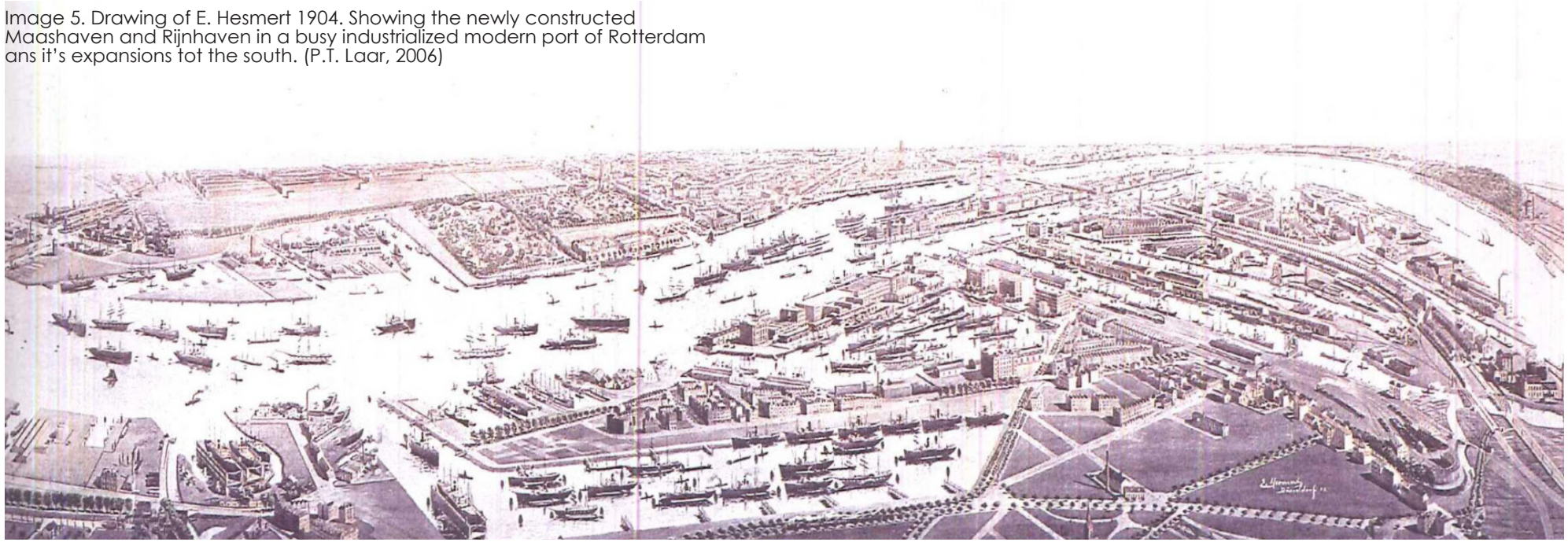
## Present day Port

Nowadays the port is the largest distribution port of the world, the largest port outside of Asia and the backbone of the Dutch economy and spans over 12.603 acres of land. The port of Rotterdam is owned by a company called Havenbedrijf Rotterdam N.V. (Port of Rotterdam). The port functions as a distribution port, focusing on transshipment and temporary storage of goods in a network system. Because the harbors growth potential is smaller compared to it's main competitors in Asia the Rotterdam harbor now works with close-by harbors and supporting infrastructures to accommodate this growth. The city of Rotterdam has become a network city creating a business hub with Amsterdam, The Hague, Utrecht and Antwerp. Supporting this system of the port and in return stimulating trade and business inside the network itself.

As mentioned in the first chapter the expansion of the city of Rotterdam to the south banks of the Nieuwe Maas only started in the19th century. Earlier in the south of the Nieuwe Maas was cultivated farmland behind a sea dike. The Island of Feyenoord was closest to the center of Rotterdam. . Next to Feyenoord was the small workers village of Katendrecht surrounded by the municipality of Charlois. In 1863 the city council decided to make the leap over the water. After the decision was made to make a railway connection to Feyenoord. This part of the South-bank became the first part to be developed. The first industry that initiated harbor activity, the RHV (Rotterdam trade company), started working on the development of Feyenoord with the construction of a number of bridges an infrastructural plan and a sewerage system for the whole neighborhood. In the late 19th century the harbor was expanded by the building of the Rijn-harbor and Maas-harbor. In the development of these harbors the village of Katendrecht was completely demolished. Its place took the Maas-harbor 1898-1908. After Feyenoord, the Rijn-harbor and the Maas-harbor the Waal-harbor was also constructed. Next to the harbor works there was a big demand on housing projects to accommodate the workers that had flocked to the city to find work in the docks.

A planned expansion of a city aimed to have lots of greenery and gardens to battle the declining working-class neighborhoods of those days. The rapid growth of the population at that time how ever made this impossible. To accommodate

Image 5. Drawing of E. Hesmert 1904. Showing the newly constructed Maashaven and Rijnhaven in a busy industrialized modern port of Rotterdam ans it's expansions tot the south. (P.T. Laar, 2006)



the increase a integral expansion plan was created that would make the South of Rotterdam an independent city rather than being dependent on the old city. For the infrastructure of the south new connections to the north bank were needed. In 1937 the Maastunnel was built and the Brienenoord bridge opened in 1965 as part of the modern ring-road system. In the vision of Witteveen also an extra bridge was needed in the city center exactly at the location where much later, in 1996, the Erasmus bridge was built. (P.T. Laar, 2006).

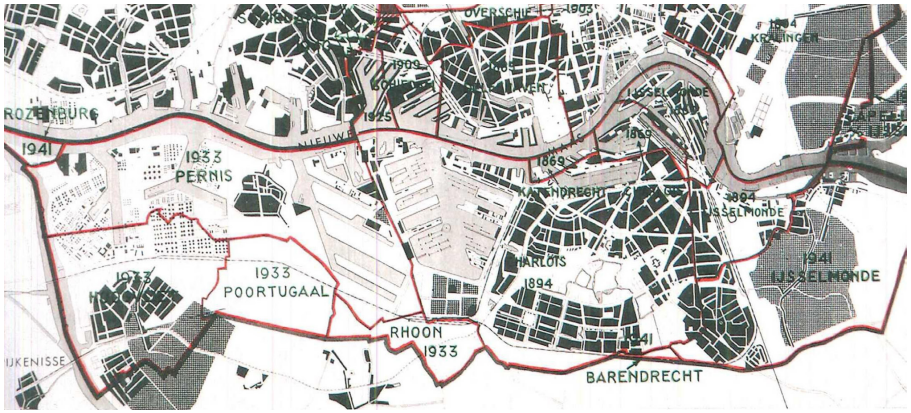



Image 6. Neighboring municipalities and there annexation over time (P.T. Laar, 2006)

## Maashaven

To create the Maas-harbor 35.000 people needed to move. 700 houses, two schools and a church had to be demolished. 35 of the 60 acres needed for the Maas-harbor was land that was already in use (Katendrecht 2016). From the very first design the function of the Maas-harbor was for transshipment of goods from sea-ships to inland vessels. For this transshipment elevators and cranes were needed. This was done with elevators on boats as well as with fixed elevators on the quay like the elevator that is still on display at the Maassilo. This industry of transshipment on the water industrialized the quay as well. Warehouses and storage facilities like the Maassilo immediately arose on the north and south quay after the completion of the harbor. The east quay never industrialized. The infrastructure, first a road later also the subway, connecting the harbor to the city was to important. Next to the transshipment in the Maas-harbor there was also a dry-dock. This dry-dock was built in 1904 and was situated not on the quay but was floating in the Maas-harbor. It was the third dry-dock in the port of Rotterdam when it was made and was owned by the municipality. (Katendrecht 2016)

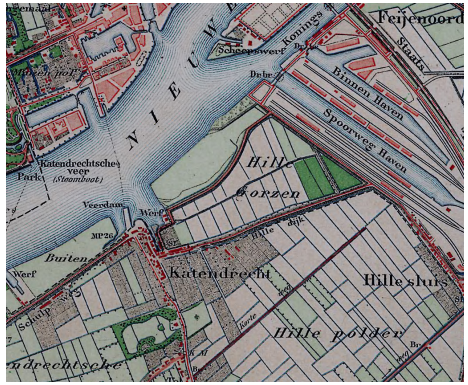



Image 7. Bonnebladen, 1880. The original south bank which was an empty agriculture landscape changed halfway the 19th century.

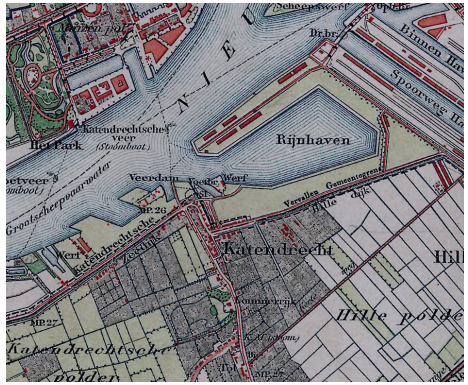



Image 8. Bonnebladen, 1896. The Rijnhaven got completed in 1894.

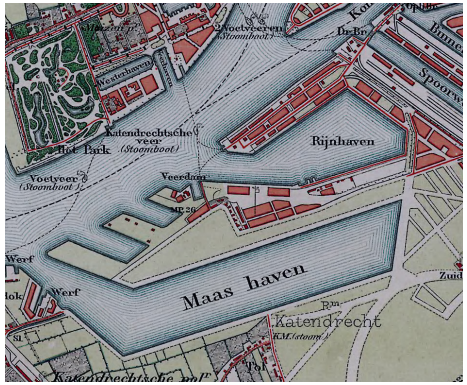



Image 9. Bonnebladen, 1901. The Maashaven got completed in 1905.

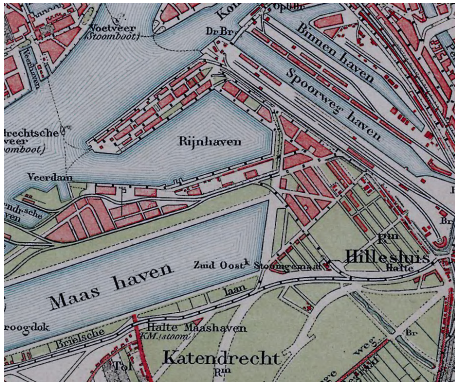



Image 10. Bonnebladen, 1910. South and South East of the Maassilo roads and neighbourhoods developed slowly.

# Existing situation

## Infrastructure

According the urban plan at the time the Maassilo is now situated along the circulation axes of the whole city. This can be seen clearly if the infrastructure is broken down in to different traffic flows. Tram, subway and main roads cross at the intersection of the Maassilo. And is within a 1000 meter range of two train stations. The Maas is a major barrier in the flow of traffic. only at three points can the water be crossed. The Maas tunnel, the Erasmus bridge and the Willems bridge.

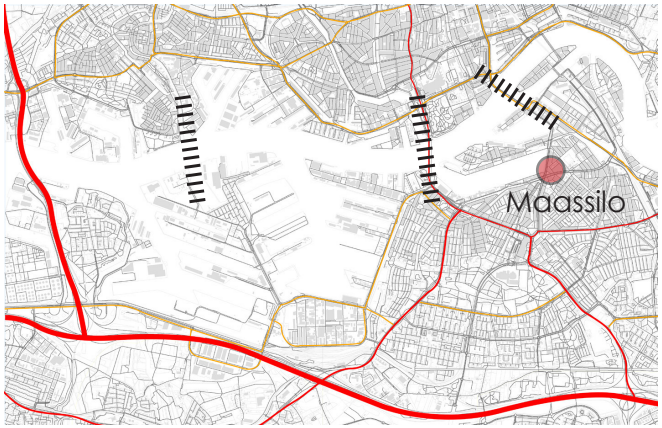



Image 9. Infrastructure including the bridge and tunnel locations.


Image 10. Public railway transport.

## Built environment

Analyzing the area it is evident that Rotterdam South is prominently a living area. The only industry in the area is located along the Maas- and Rijn-harbor. Large apartment buildings have taken the place of the warehouses. Hight limitations on building apply throughout the city. Only in the center of Rotterdam this does not apply. The Maassilo's height and location on the waterfront, combined with it's distance to the center of Rotterdam gives it a unique view of the city skyline.


Image 11. Functions of the city, close to the Maassilo.

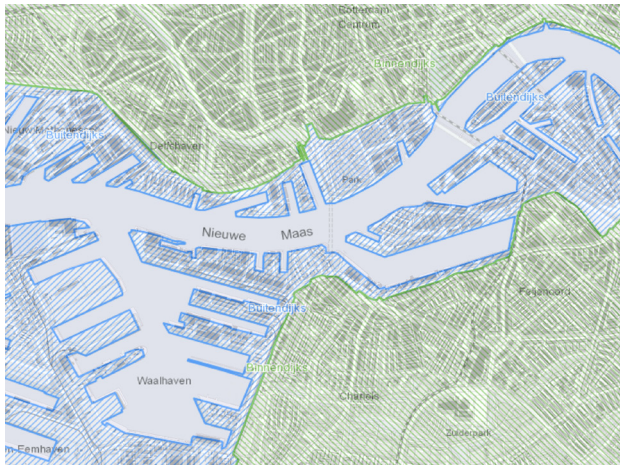
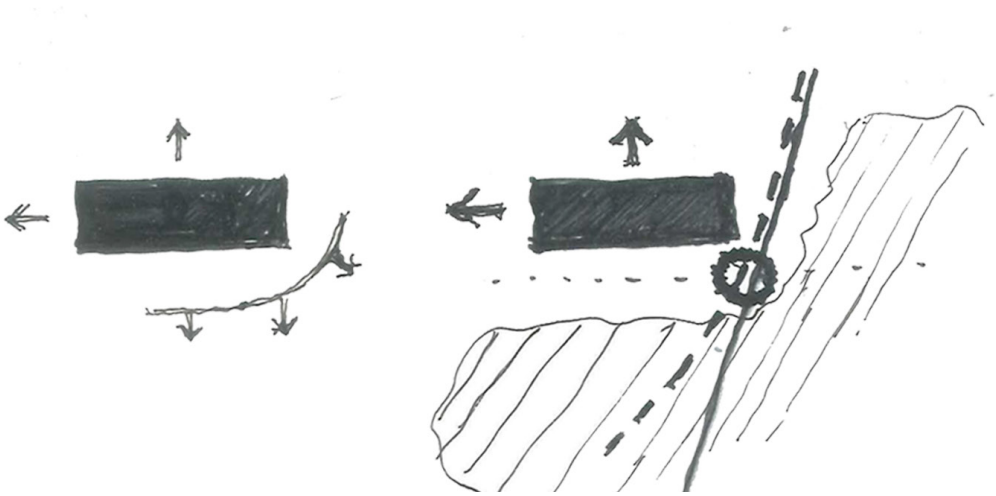



Image 12. Areas outside (blue) and inside (green) of the dike.

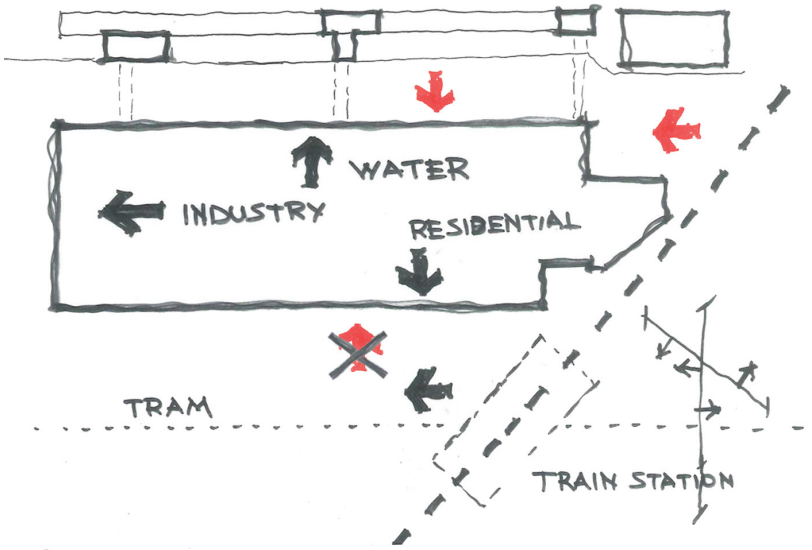
## Connections-disconnections

As was mentioned before nowadays the Maassilo is occupied by the Creative Factory in the first building and the nightclub on ground floor and upper floors. The new functions, specifically the nightclub, are quite introvert and enhance the disconnection between the building and the city. This sense of integration is also compromised by the removal of the old railway tracks, which were the tangible connections of the building to its surrounding, the Rotterdam center and its expression of functionality. The elements that are present now and contribute to the concept of connection are the elevator buildings on the water. These structures enhance the recognizability, of the silo's previous connection to its context and functionality. This is possible as these structures are recognizable elements of the typology of silos.



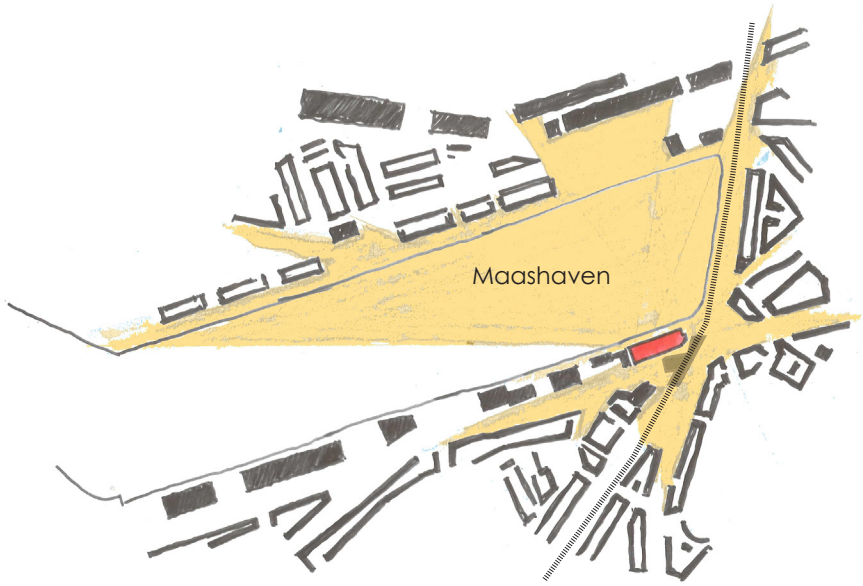
## Accessibility

The building's significance is highlighted by its position in the intersection of all these "paths"(metro line, tram, roads) and its positioning at the end of the industrial zone, next to the water, making it a strategic point as an intersection node. However, the aforementioned paths act as strong barriers for the physical connection between the city and the site. Especially on the south side were the border include a two direction road and the tram lines. This is enhanced by the difference of the floor levels between the pedestrian street and the building, but also of the lack of accessibility on this side. More accessible are the east and north side due to the open spaces.



Visual recognizability

As we can see from the sketches the scale and position of the building make the building visible and recognizable from the surrounding area. This provides a monumentality and characteristics of a landmark to the building. However, the new apartment building on the south part, which is the only other large scale structure, reduces this effect of the Maassilo (sketch 4). Similar, obstruction on the visibility is the train station, which creates a horizontal disconnection, when seen from the east side (sketch 2). However, as mentioned before the elevator buildings are elements that contribute to its recognizability and legibility. The aspect of legibility is also acomplished due to the buildings skin as will be explained in more detail later.




1. Personal sketch of the area in which the Maassilo is visible.

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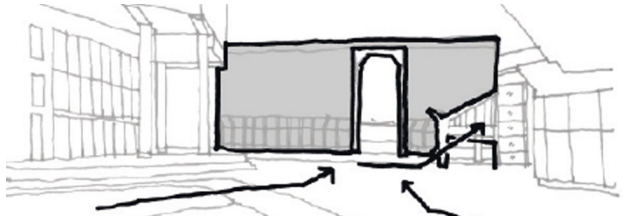


3

Sketches of the views of Maassilo by Sicha Chittavanich

4

5

6


Section of the Maassilo, Maashaven and Rijnhaven.

Future developments

Looking at the future the rising sea level has to be mentioned. Simply because the it is the major thread of the future to the city of Rotterdam and the whole of Holland. The plans for the future include protecting the city from the water, making people aware, aiming to be climate proof in 2025. Looking at Rotterdam South plans are in place for 'Hart van Zuid'. A plan supported by the city council and major contractors to revitalize the South by creating a new city center with all the functions needed to support this like, recreational facilities like hotels, restaurants, shops and sports facilities. This plan is centered around the Ahoy building and the nearby Zuidplein. Moreover, the Port authority and the municipality are planning a new setup for the inland ships in the Maas-harbor to accommodate more ships. Regarding the Port of Rotterdam the Port authority is planning to increase their inland trade. As the Rijn-Harbor has lost it's original industrial buildings and infrastructure for the most part the Maas-harbor becomes the ideal spot for inland ships to dock ad work from. In the same plans the aim is to construct a bridge over the Maas-harbor connecting the center of Katendrecht to the south bank of the Maas-harbor. This plan is combined with a tidal park on the eastern quay of the harbor. The park will have a grass beach stretching all the way to the subway line with a dune like park visible only at low tide. At high tide people can walk on a walking bridge to see the park. The aim of this development is to make people aware of the effect of rising water levels. At this point we should include the immediate plans of the city to demolish some of the low quality residential areas and to create more expensive and high quality ones.

Image 13. Future rendering of the beach development.

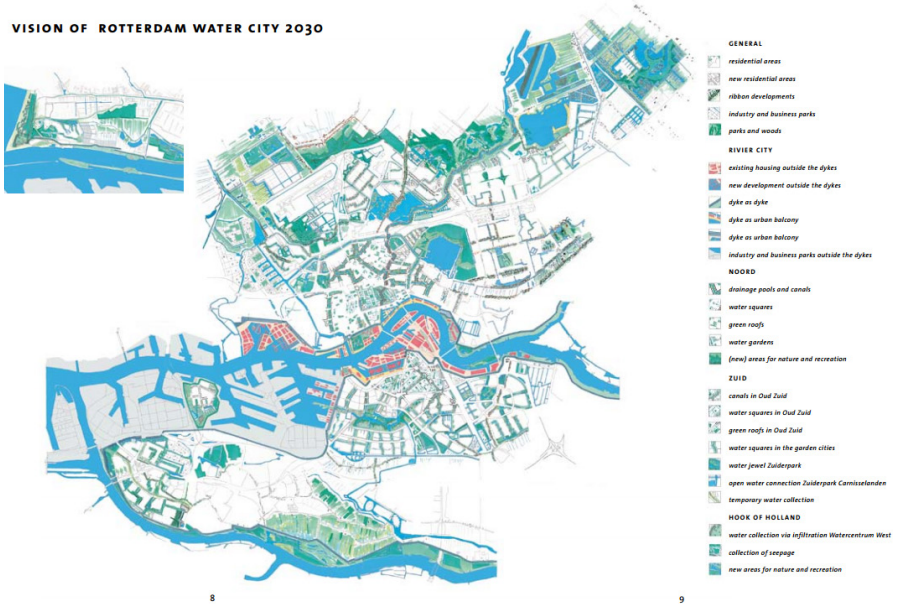
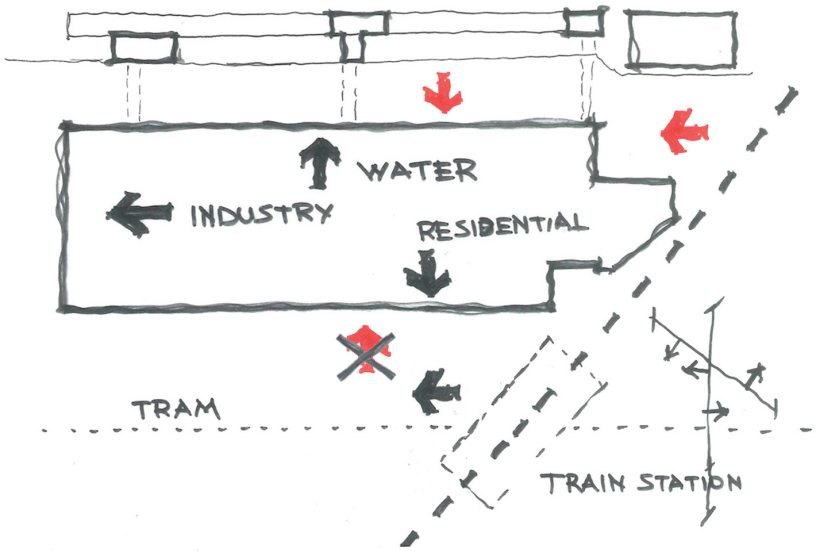
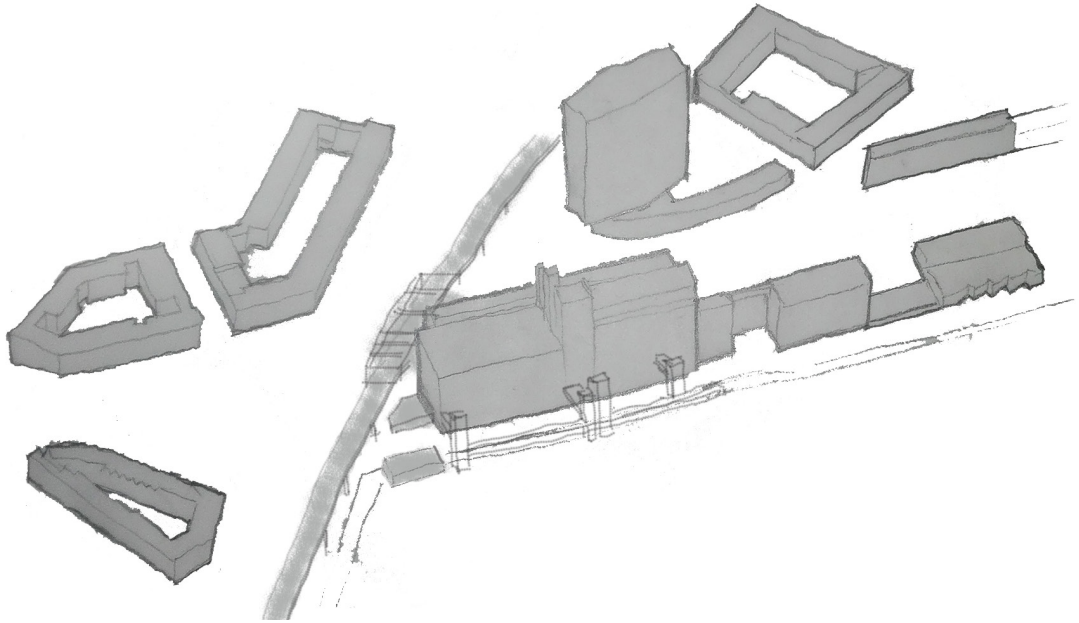



Image 14. Future developments in Rotterdam for 2030 in compatibility with flood protection. source: Rotterdam Municipality (http://www.rotterdam.nl)

# Conclusions

Researching the history of the surrounding we realize that the Maassilo is an important element of the historical development of its context and enhances its legibility. It reflects the rapid industrialization which led to the creation of the Maashaven (in the old Kanderdrech area) and the expansion of the city towards the south of Rotterdam. Thus it also represents the later residential development, which was the result of the demand for the accommodation of the workers. Moreover, many of the people working in the Maassilo where living in the area around it. Hence, the building is part of the intangible value of memory and identity of its surrounding. Its positioning and development has historical and memory value. It reflects the industrial activities that tool place at the port and the connection between water and land. However, this relation is undermined by the removal of the railway tracks that connected the industrial riverside to the land distribution processes. Nowadays, although the building is connected to the industrial zone enhancing its legibility, there are some disconnections due to the wide and busy roads crossing the intersection and the metro and tram lines. In General the building stands out in its surrounding through its scale and mass. In this aspect the building seems cut off from its residential surrounding .



# Complex

## Development

As was mentioned before the construction of the Maashaven attracted many industries in the area. In 1910 the first phase of the Maassilo was built by J.P.Stok in the Maashaven in a surrounding of open fields. However, the supporting infrastructure of the railway and roads was already there, which also defined the position of the building. With the rapid expansion of the industrial field new demand for supporting infrastructure and worker housing appeared. The South of Rotterdam was the ideal location to create housing because of the infrastructural situation which was much more favorable than that of the old city. (P.T. Laar, 2006). Maassilo was one of the biggest silos and the largest reinforced concrete structure of Europe at the time. Originally there was a small two story office annex dwelling in front of the east facade. There was also a smaller one store structure in front of the building. This space probably contained the transformers which converted the energy of the grid. The building consisted of three parts, one process building on the east side two silo parts.

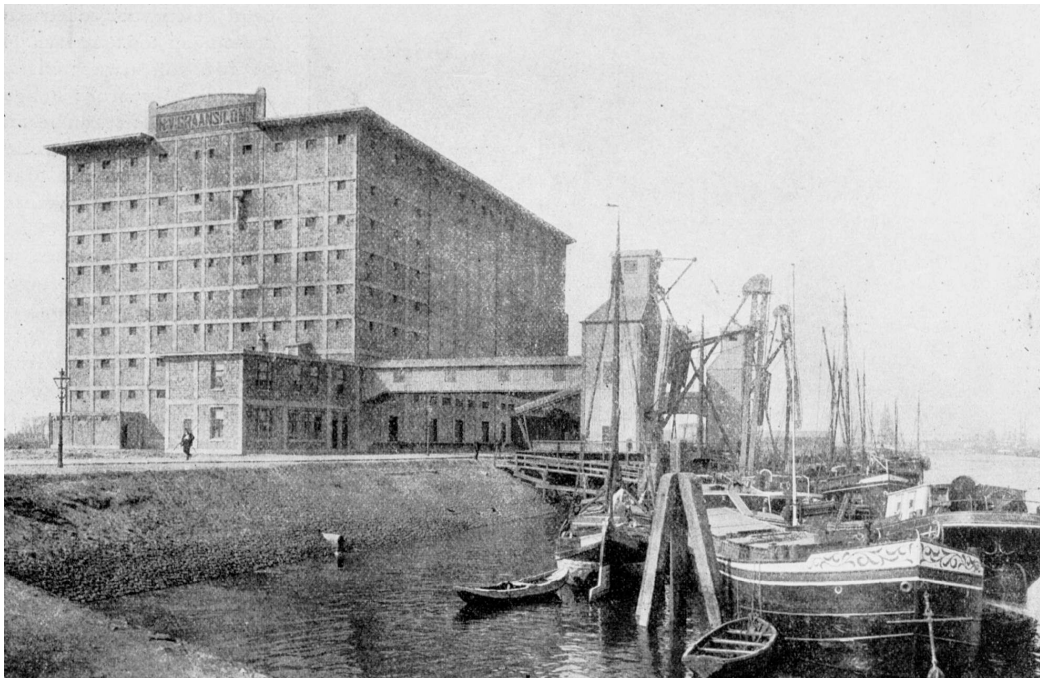
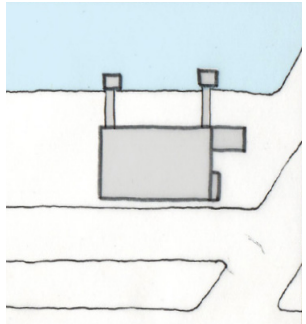
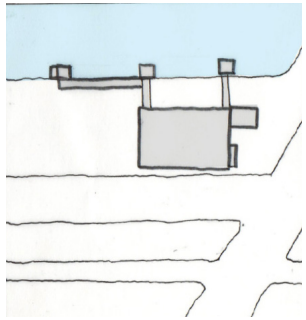


Image 1. Photo of the first part of the Maassilo. Source: Drs. Ernie J. Mellegers, Rotterdam 2008.

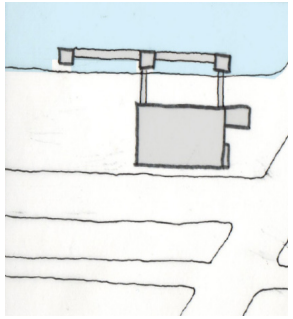
1910-1917
First development of the silo.



Between 1917-1925.
Extension and connecting the new structure on the quay.

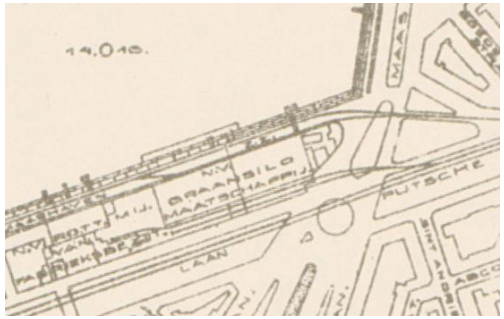


Between 1925-1930.
Connection of the elevators with a bridge.

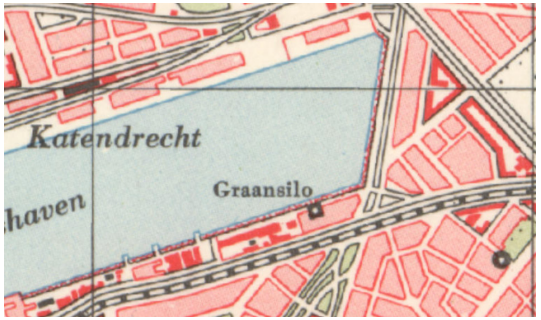


Sketches by Bram Bronswijk.

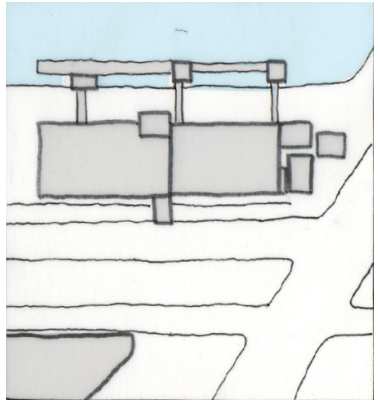
Gemeentewerken, 1942. The railway tracks were on site since 1910.




Topografische Dienst, 1958. On the map of 1958 it looks like that the train tracks on the quay have been removed. It is possible that the tracks have been removed because of the construction of the metro line in 1963. We do know for sure is the tracks were not there anymore in 1974 (Het Vrije Volk, 1974).



After the 1st part of the Maassilo was built the development of the south city began with all the housing and supporting functions. Similar industrial functions started appearing along the coastline of Maashaven, with Meneba in 1919 being one of them. In 1930 the second phase of the Maassilo was completed by the architects Brinkman and Van der Vlugt, with a double capacity compared to the first building. The N.V. Graansilo Maatschappij was taken over by the Graan Elevator Maatschappij (GEM). Shortly after the acquisition the company decided to provide extra storage capacity for the harbor and expanded the Maassilo towards the West. The assignment was to build a silo as big as possible on a rather small site. In order to make the transportation as fast as possible the new building had to be connected to the existing part. The only way to do this was to put both systems in line with each other. When the new building would cover the entire width of the site, an extra conveyor would have been necessary. Besides that there wouldn't have been any room left for a connection to the railway. This connection was necessary to quickly load and unload the goods. The rail way tracks could have gone thought the building. This however would have made the silos above the tracks too small, which would have made the construction too expensive.



The addition of the second part of the Maassilo. It is visible that changes have occurred on the east part of the first building, where the small office buildings are located and the position of the west elevator.

Sketches by Bram Bronswijk.

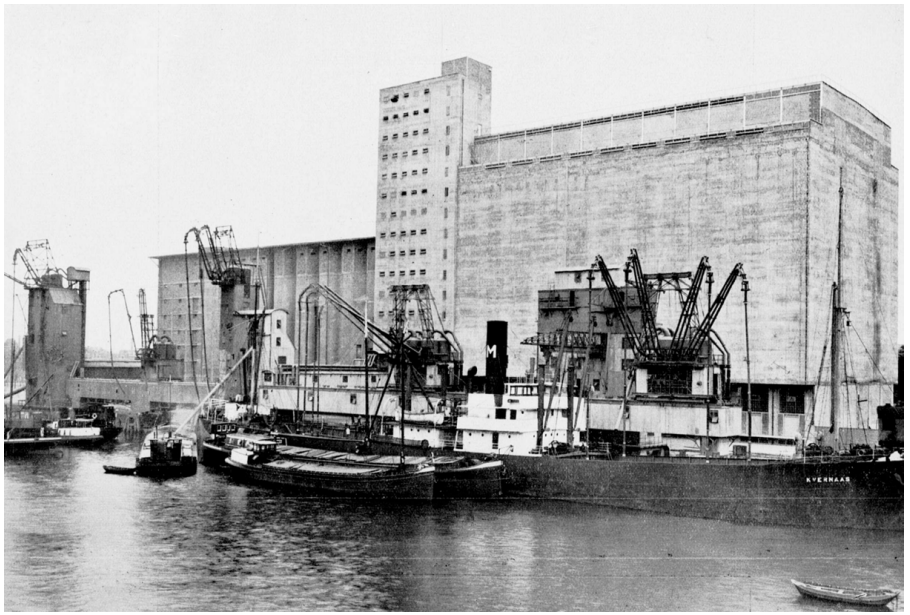
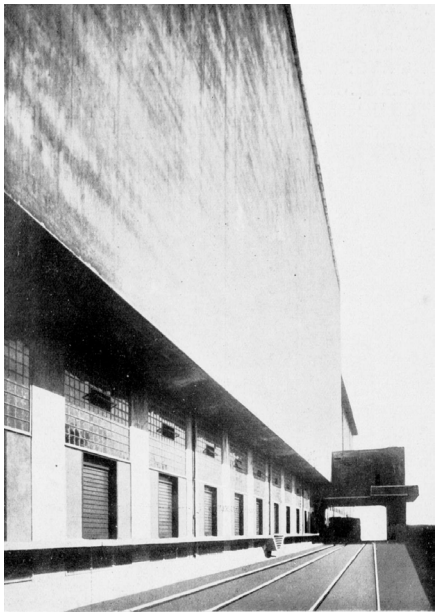


Image 2. Photo of the 2nd part of the Maassilo. Source: Drs. Ernie J. Mellegers, Rotterdam 2008.

Image 3. The cantilever outer part of the silos and the connection to the railway with the transformation building above the railway tracks. Source: Drs. Ernie J. Mellegers, Rotterdam 2008.



The next phase of the silo was built by A.G. and J.D Postma and was completed in 1951. The positioning of this part is interesting as it is located along the street on the south part of the site and create the urban "face"of the building. Two silos nearly are placed on both sides of the existing transformer building. The extensions is 100 meters long and had a capacity of 22 ton. It was separated from the rest of the building to increase the flexibility during storms. The outer silos cantilever over the railway next to the building. The new part is adjusted to the existing site capacity. Hence, the east part contained 2 rows of eleven silo cells, the west past contained 3 rows of 10 smaller cells. On top of the building there is a transport attic which are connected by a bridge forming a niche underneath. One of the active sites of the building was on the north-east side where small extensions were changing through time. The most significant is the office building built in 1963 by H. Haan on the north east part of the plot on the water as there was not enough space on land and the older part was demolished in order to give space for the metro line. The construction of the metro station Maashaven next to the building was finished in 1965.

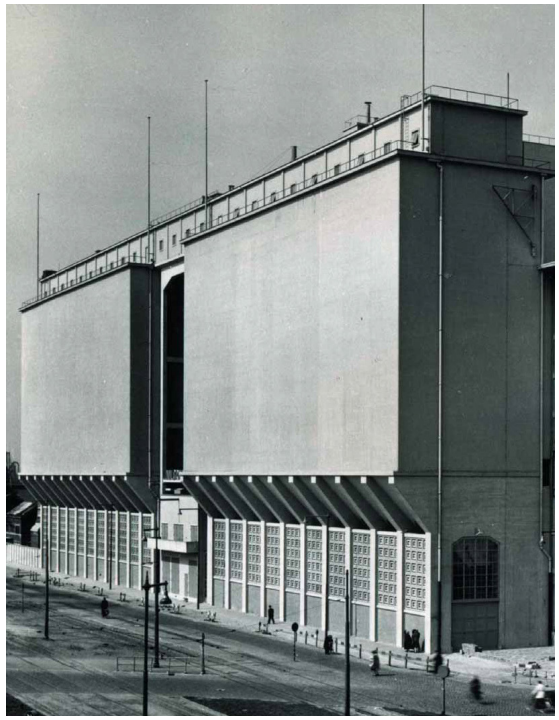
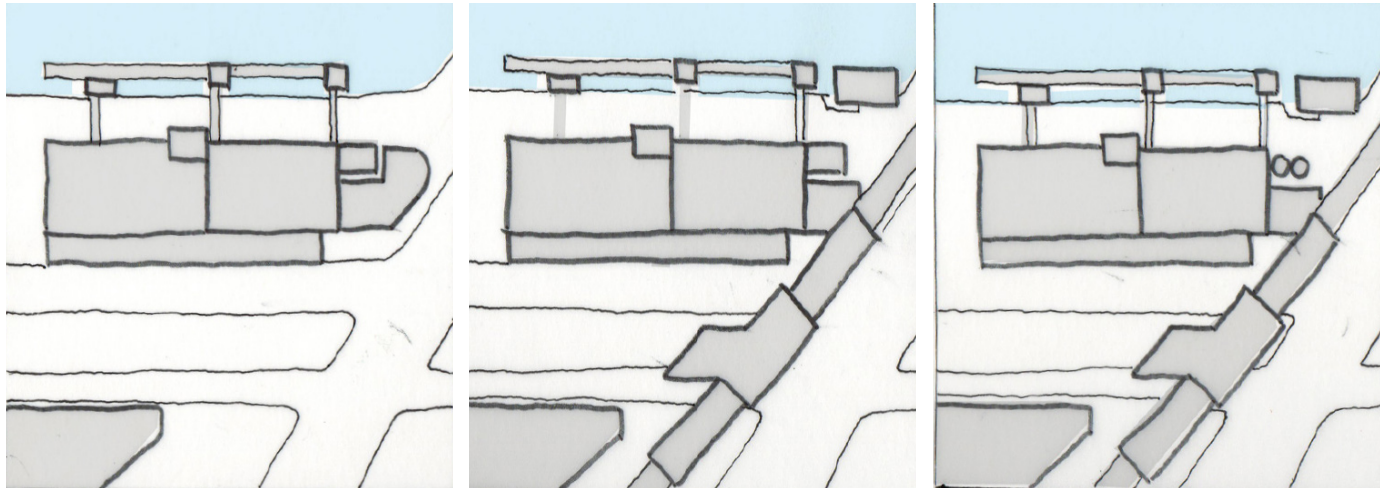


Image 4. Photo of the south-east facade of the third part. Source: Drs. Ernie J. Mellegers, Rotterdam 2008.

Development of the third part. Again we see changes in the office buildings on the first part.

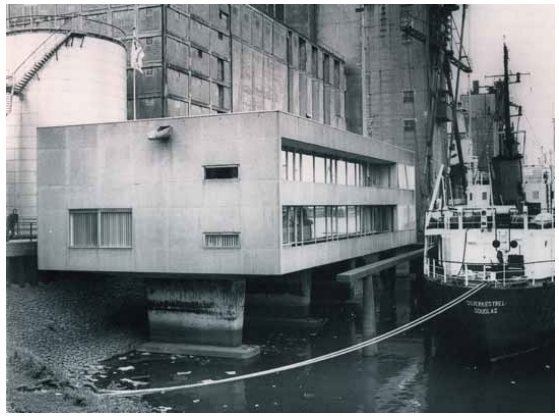
In 1963 the new office - dwelling building was designed by H. Haan and built. This was due to the demolition of part of the office building to make room for the metro station, which was finished in 1965.

Replacement of the supporting small buildings area, with the placement of two oil tanks. In 1980 the function of the office building by Haan changes its function into offices.



Sketches by Bram Bronswijk.

Image 5. Photo of the north-east facade of the office building of H. Haan. Source: Drs. Ernie J. Mellegers, Rotterdam 2008.



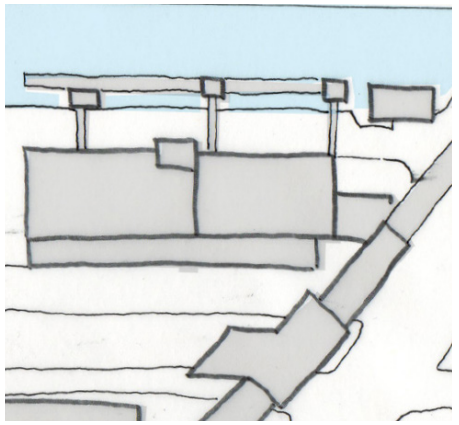
Loss of function

Due to the Maashaven getting too shallow for the big ships and the new environmental laws the harbor activity moved away slowly from the Rijn- and Maashaven in the 80's. Moreover, improving the automation process of the Maassilo was hard with its three different structures. This lead to a transition of the Maassilo company to the Botlek before the 80's. After this the Maassilo remained functioning as storage only. The number of employees went from 68 in the 80's to a team of eight man.

Redevelopment

On 31st of July in 2003 Ontwikkelingsbedrijf Rotterdam (OBR) becomes owner of the building. The company planned on demolishing the building and redevelop the location. However, due to expensive demolishing costs, the cultural historic value and the potential monumental status OBR changed its plans. The spaces of the Maassilo were leased out. The first tenant of the new owner was the dance club NOW&WOW. They redeveloped the ground floor and the attic of the second and third part, but tried to preserve the industrial characteristic elements.

In May 2008 the Creative Factory moved into the building. The second to seventh floor were transformed into offices spaces for start ups. However only the west half of the attic has been redeveloped. The east part is still original with many parts of the distribution systems present.



Existing situation. Sketch by Bram Bronswijk.

Images 6 & 7. Spaces of the night club of the NOW NOW. The attic (left) and the ground floor (right) of the 2nd part of the building.

Image 8. The offices of the Creative Factory on the 7th floor of the 1st part of the building.

Source of photos: Drs. Ernie J. Mellegers, Rotterdam 2008.

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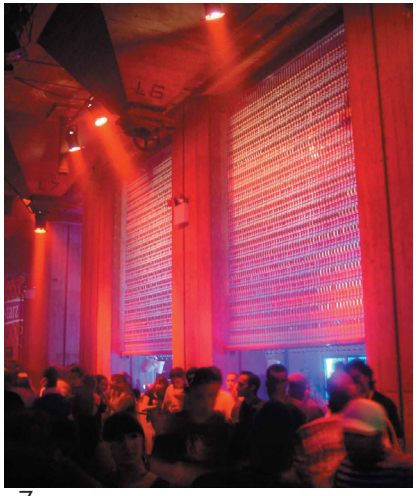

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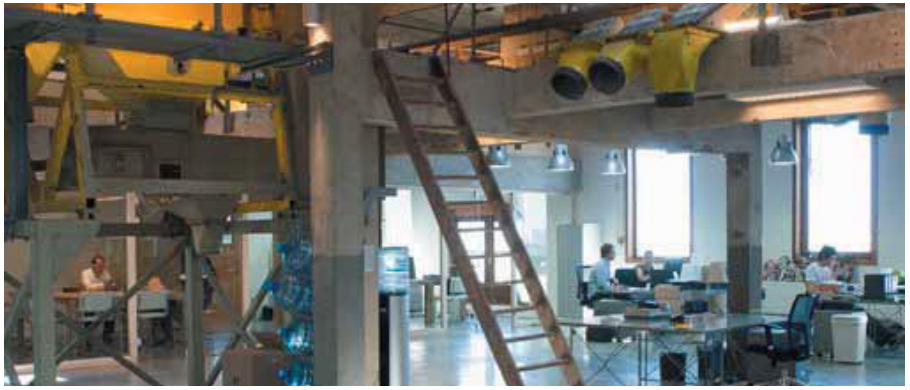
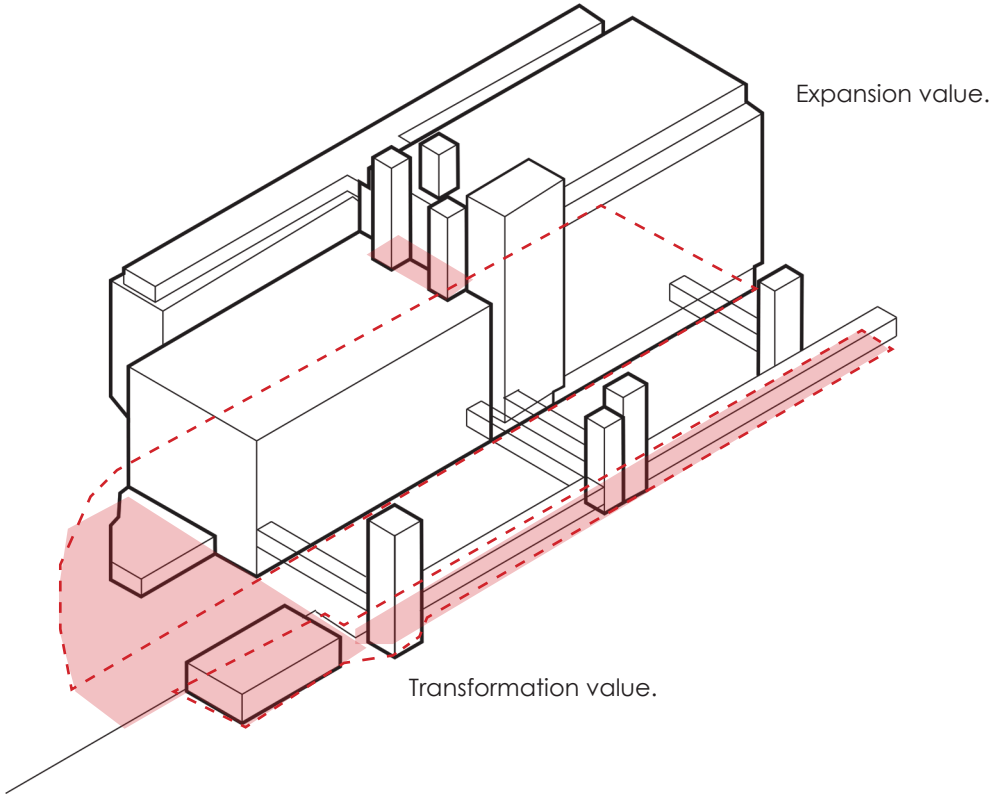
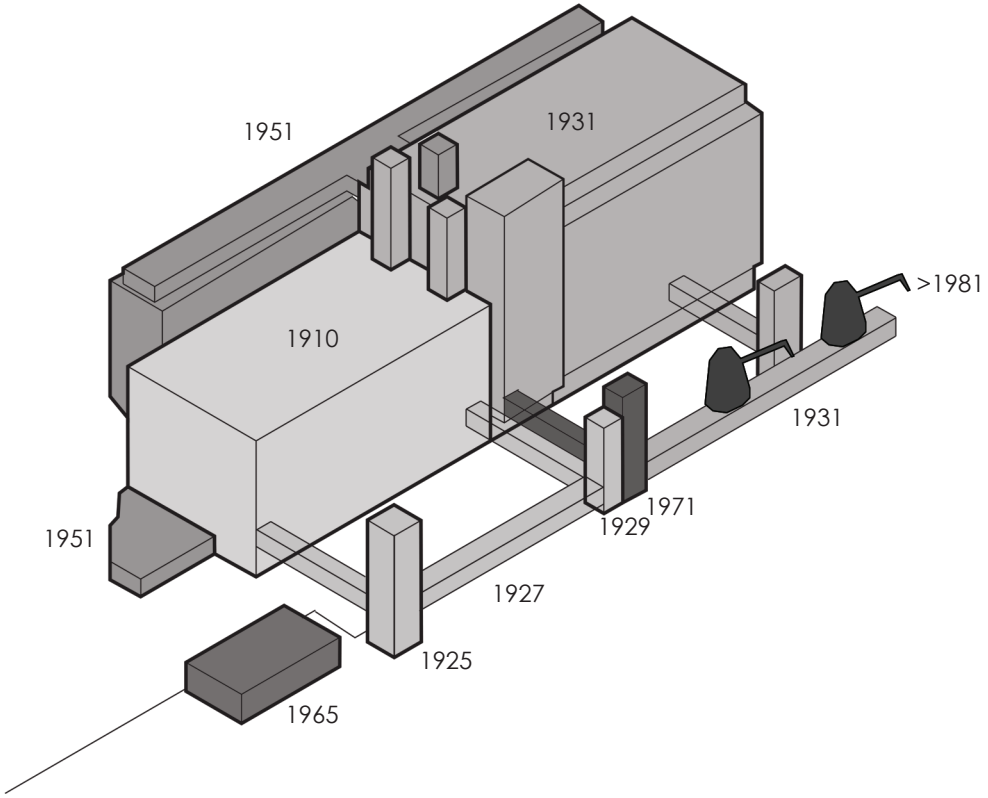


8

As was mentioned before in order to adapt to the new demands the Maassilo was extended through the years. Hence, the main building expanded and the secondary supporting structures where renewed, adapted, demolished and rebuilt. It is this adaptable development and the relations that it creates both between the structures and their immediate surrounding that expresses the character and the spirit of the building. The new developments always followed the technological developments, the functionally appropriate positioning and the site constrains. The building development expresses its immediate surrounding and the financial and technological developments of its era (industrialization). In this aspect it is the whole complex as an ensemble that portrays the historical value and the story.

This aspect of the historical development is clearly distinguished in the silhouette of the whole complex and the way the different parts developed. In addition these differentiations that make this development legible are deeper investigated and analyzed later in this report. Moreover, we should mention that the size and scale of the building in combination with the elevator structures on the riverside, not only showcase the gradual development of the complex but also make legible the functionality and the organization of the silo. We could say that the complex is part of the public memory and enhances the identity of the area.



# Silo function

In order to understand the building someone needs to understand the processes that take place in and out of the building. It is important to understand that this silo typology was realized due to the technological achievements of the time and especially the elevator building.

In general, when referring to functionality silo buildings can be divided in two parts. The first part are the elevators and the transportation installations. While the second part consists of the silo as storage space. When the ship arrives the grain is transported through a pipe, steel screw or elevator leg. This pipe system can also be a floating grain elevator. The grain can be transported both horizontally and vertically on several ways, with a ''elevator leg,'' rolling tire (only horizontal) and with a pneumatic pipe that causes a suction force.

When the grain is inside the silo building the grain is weighted and cleaned. These processes create a lot of microscopic dust, which needs to be ventilated as it is hazardous to health and creates risk of fire or explosion. At the distributing floor the grain is transported into the silos directly or it is placed on one of the aforementioned horizontal transportation systems. From the silos the grain can be extracted through the funnels on the ceiling of the ground floor (work floor). From there the grain is transfered on a train for further processing (Mahar-Keplinger, 1993).

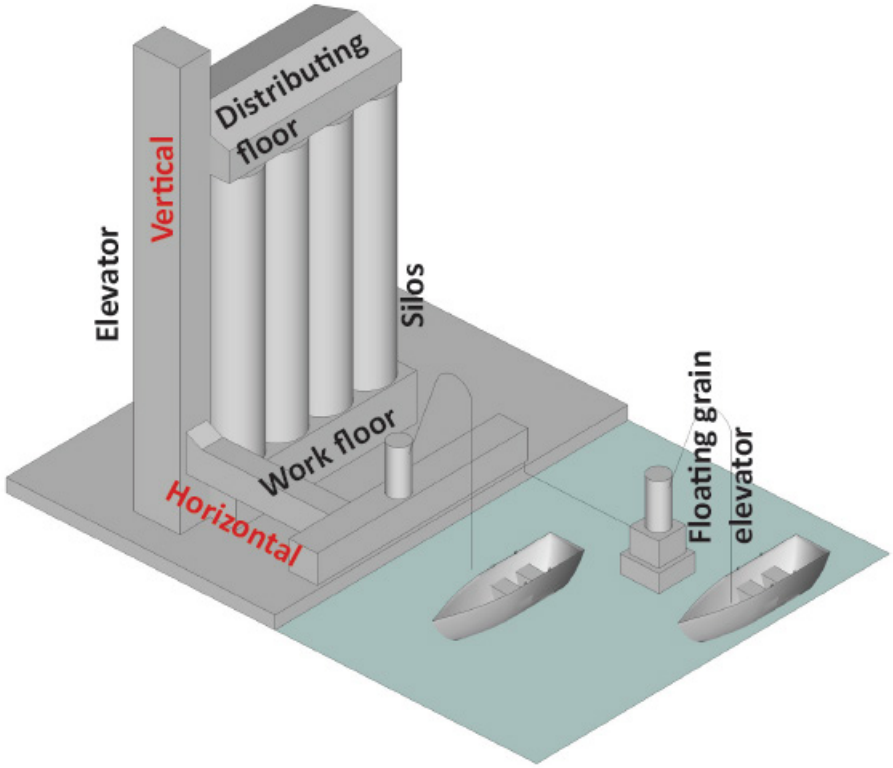



Image 1. The components of a silo at the waterside (Leunissen, G.)

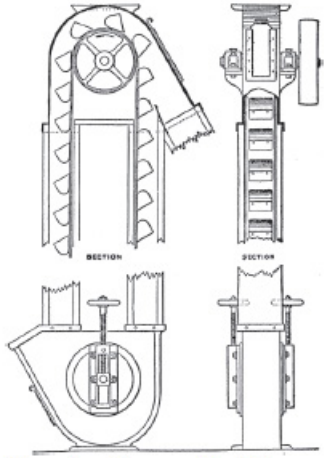


Image 2. Elevator leg (Clipart.com/grainsilo elevator leg)

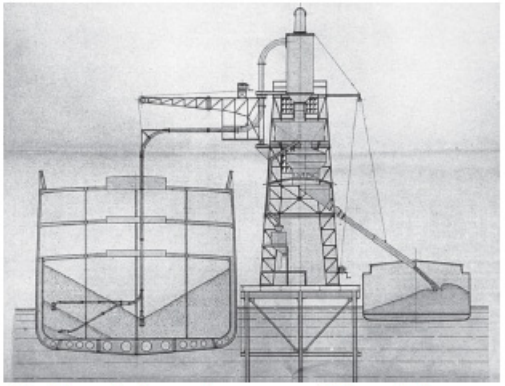


Image 3. A floating grain elevator that transported the goods into smaller boats (De Vrieze, R., et al. Transformers. (2008))

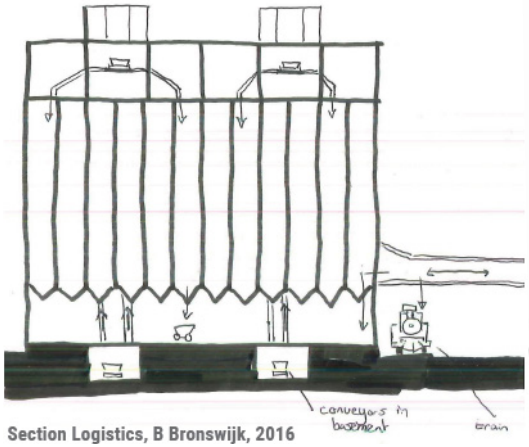
Maassilo

At the first building there were two grain elevators positioned at the quay, which could load and unload the grain from the ships. The towers were also able to weigh the in and outgoing grain. Using a telescope tube the ships get unloaded and the grain is being dropped onto conveyors which are connected to the silo building through bridges above the railway. From here the grain is transported to one of the main grain elevators inside the building. In the attic two conveyors distributed the grain into the silos. To process the grain there were two corridors underneath the ground floor. In this basement the grain could be transported from the east to the west side of the building.

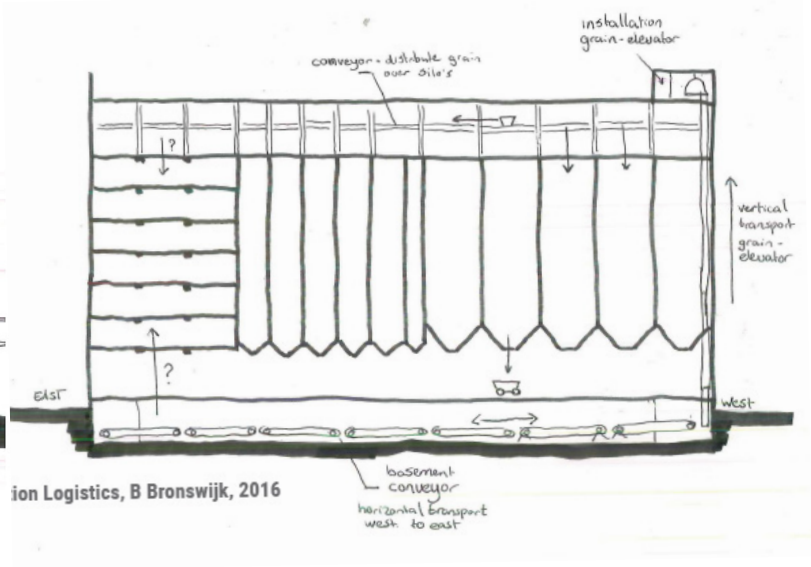
Originally two grain elevator towers were built. On photographs from 1917 a third elevator is visible. In 1925 these traditional elevators where replaced with more advanced pneumatic systems with a capacity of 100 tons/hour. In 1927 the three towers where connected by bridges. On top of these bridges, moving elevators where placed to better connect to the ships (Vrieze et al., 2008).

With the extension of the building the existing transport system had to be improved as well. A new 65.5 meter long bridge was built, to increase the range of the portable pneumatic elevators. To make room for the new and longer bridge, the third tower had to be moved backwards onto the quay. The existing portable pneumatic elevators with a capacity of 125 tons/hour were replaced by new ones. Two conveyor covers the total length of the bridge. One conveyor transported the grain to the second static elevator tower. The other conveyor transported the grain to the third tower. From here is was transported into the building.

The second and third tower where renewed. In the second tower two new elevators were placed. The first elevator was used to transport the grain from the conveyor in the bridge to the building. The other was used to load the grain from the



Section Logistics, B Bronswijk, 2016



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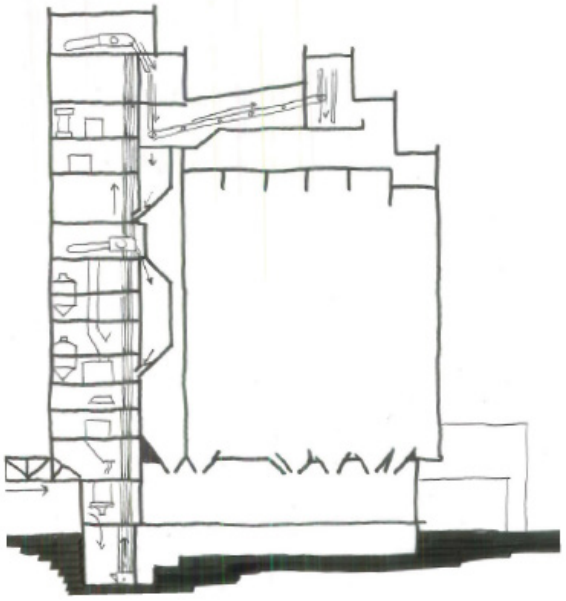

Functionality diagram by Bram Bronswijk

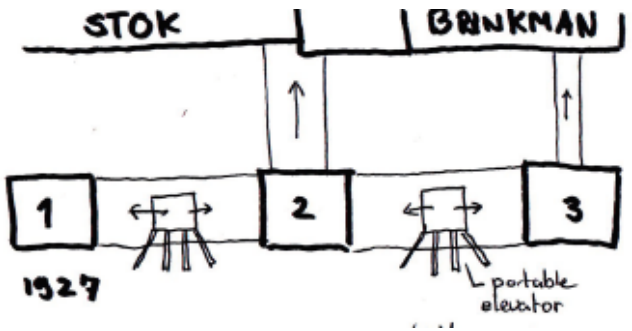
building into the ships using a telescope tube.

In the third tower two extra elevators with a capacity of 200 ton/hour were added to the third tower. Just as an automatic scale. The third tower was connected to the building through two bridges. The top bridge was used to load the ships. The bottom one was used to transport the grain to the silo's using conveyors. A second conveyor was used to transport grain that was put in bag by the elevator.

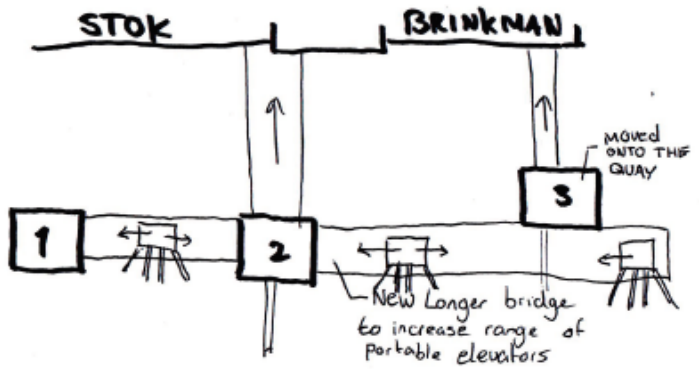
The under pressure needed for the pneumatic transport system was provided by four big air pumps in the basement. These air pumps were powered by four electric engines with big flywheels. The electric engines where cooled using water pumps with water of the Maas. The air was delivered using pipes. The pipes which covered the whole length of the bridge, could be connected to the portable pneumatic elevators.

The incoming grain was transported by conveyors in the basement to the central tower of the new silo. In the tower four big elevators bring the grain to the top floor. A conveyor perpendicular to the tower drops the grain onto one of the two conveyors which will distributed the grain over 146 silos. Besides the four grain elevators the tower contains stairs, elevators,automatic scales, machines to process the grain and water filters to filter the air before is was pumped through the building. Studying the section of the building we see two characterizing silos adjacent to the elevator tower. These silos were supposedly used to temporarily store the grain before it was being processed.

The transport system of the new and the old part were connected in basement and the top floor. The connection of the conveyors in the basement made it possible to ship bags of grain through the whole building. Stok's existing grain elevators are extended with two new towers to connect both attics.




Functionality diagram by Bram Bronswijk



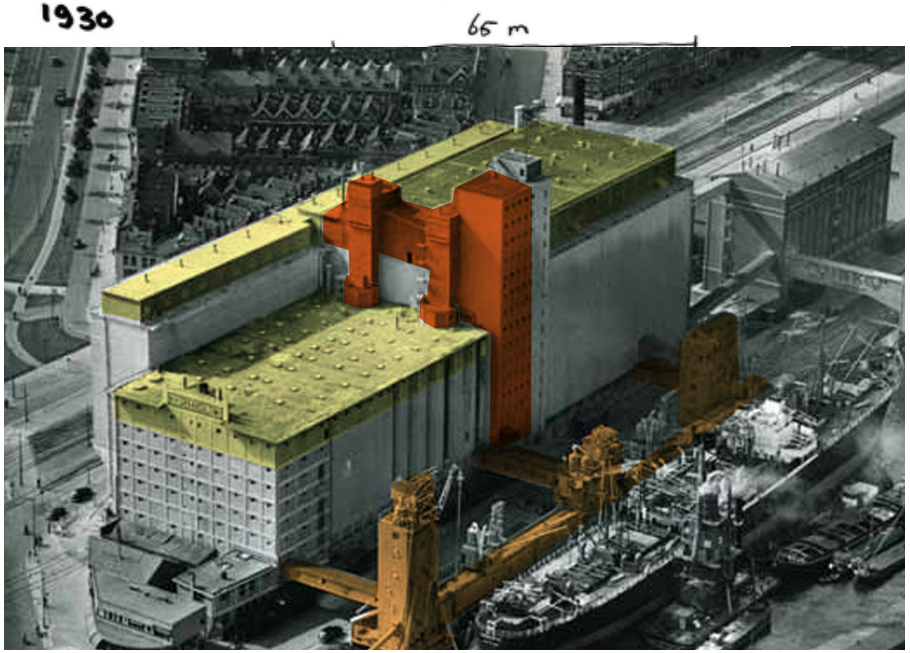
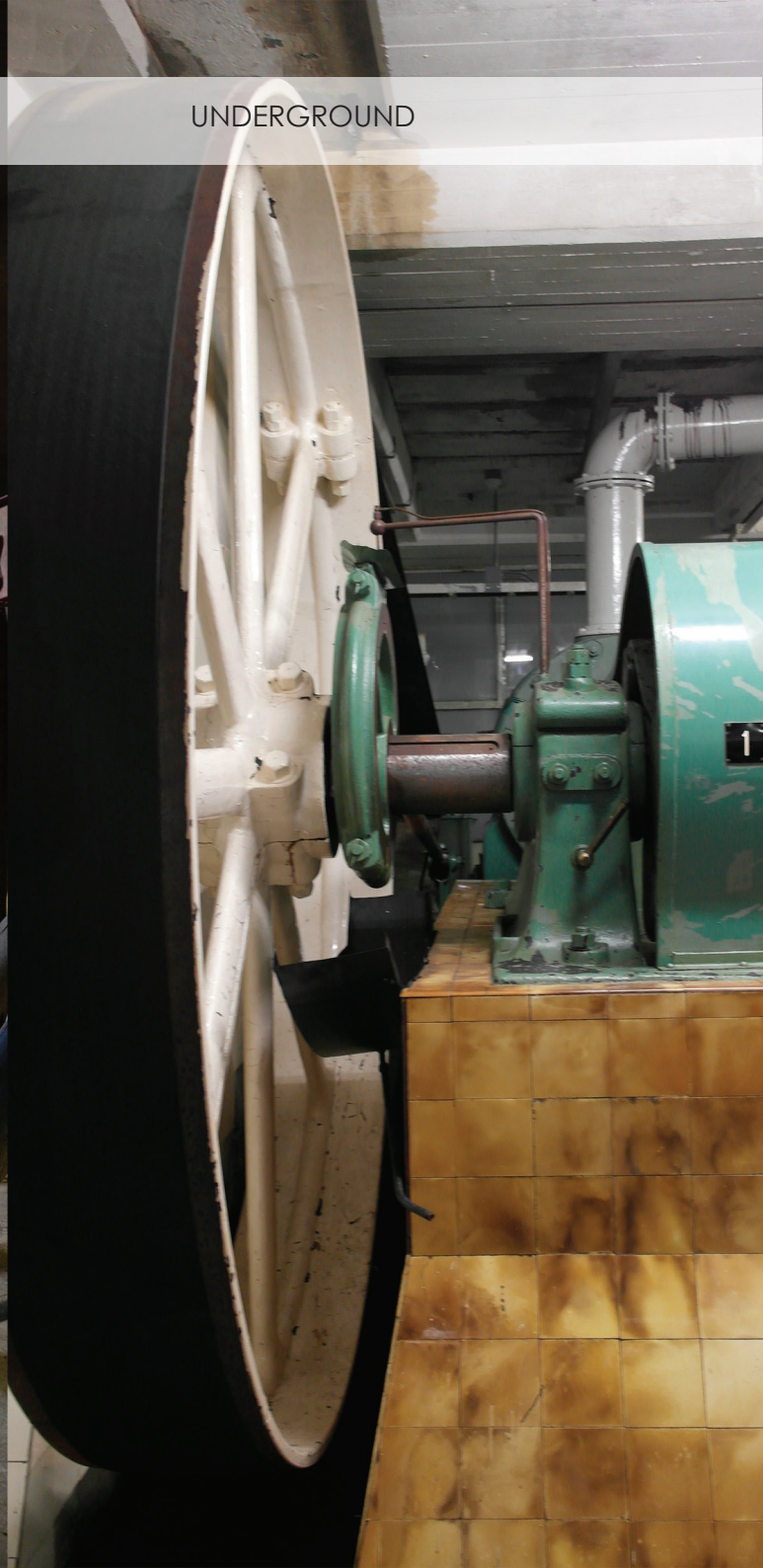




Image 4. The transportation systems of the Maassil0.

OUTSIDE

UPPER FLOOR

UNDERGROUND



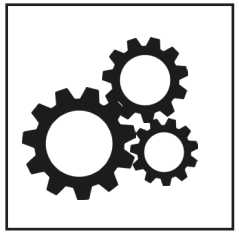
# Conclusions

As it is evident the installations of the building are necessary for the understanding of the procedures taking place inside and outside the building. They create a motion system which runs through all the different historical parts and connects them. In this sense all these elements enhance the legibility of the logistics but also the relation and development of the different parts together. Moreover, those services embody the adaptation character of the building and the up-to-date relation to that era's technological innovations. In addition, considering the machinery and installations taken out after the last renovation, the existing services become even more essential for the expression of the industrial character of the building.

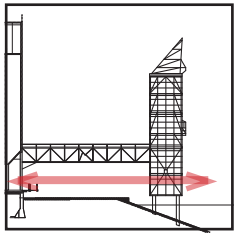
More specifically, the elevator towers on the north side have high historical and cultural value, as they are connected with the memory of the building and they cannot be separated from it. They make the building legible and they portray its relation to the docks and the cargo. Also, we can see how many changes there have been on these towers through time in order for the installations to adjust to the new demands for faster and more advanced transportation.

- Historical value, representing the development of the silos and port.
- Expression of the functionality and the transportation system.
- Integral for the enhancement of the industrial character (spirit and story).
- Expression of the technological developments of that time.
- Age value.
- The elevator buildings with highlight the connection of the building to the context and express the functionality of the building. Moreover, they are connected to the public memory and the identity of the area.

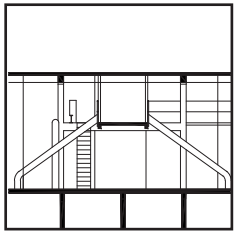
Functionality



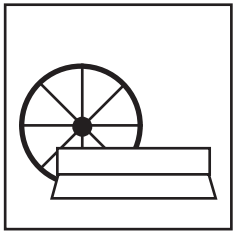
Connection to the context



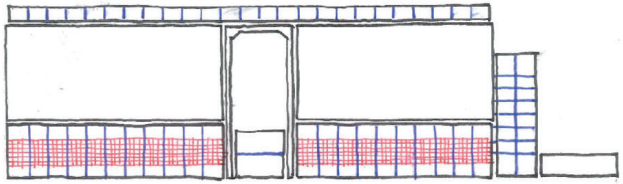
Industrial character

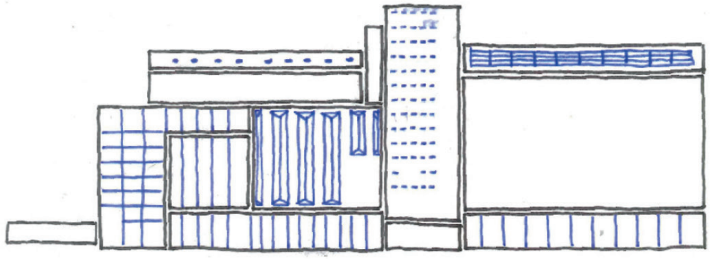


Technological achievements

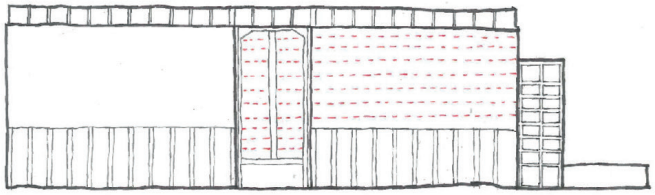


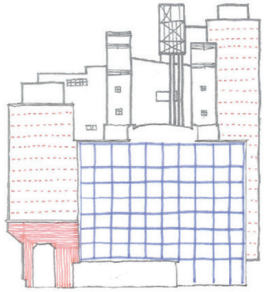
# SKIN

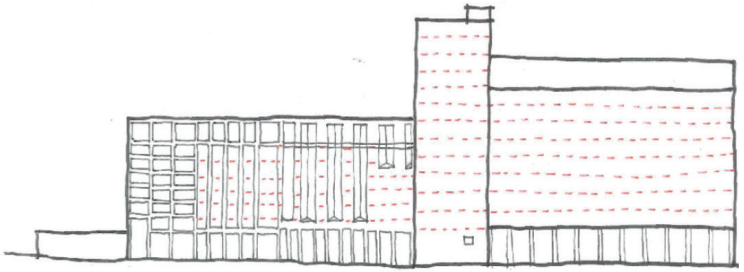




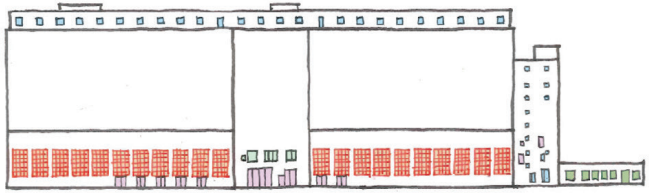
Elements affecting the rythm

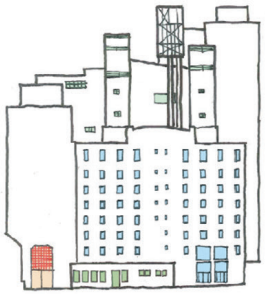




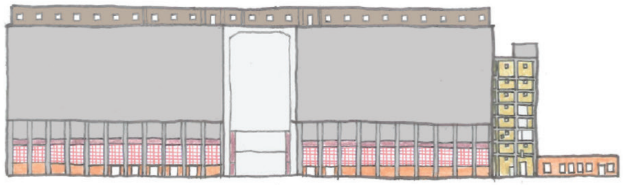


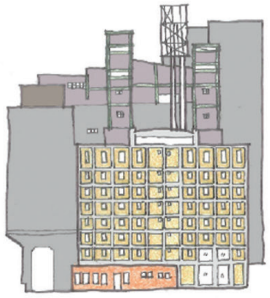
Visible structure





Openings



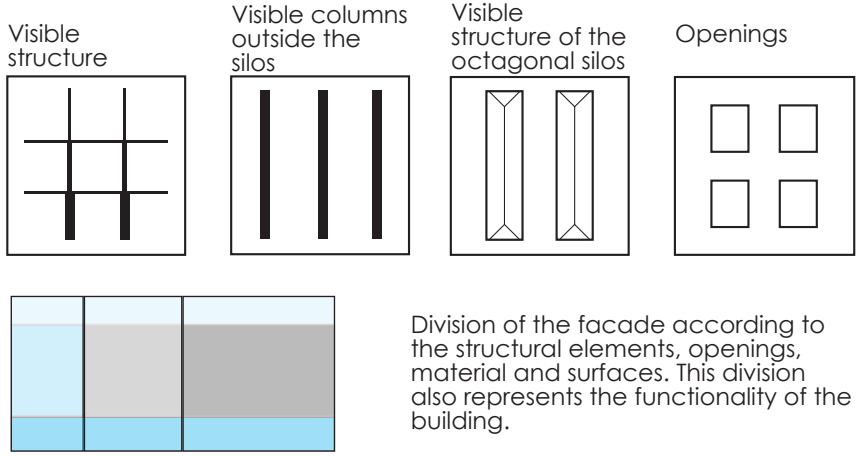


Materials

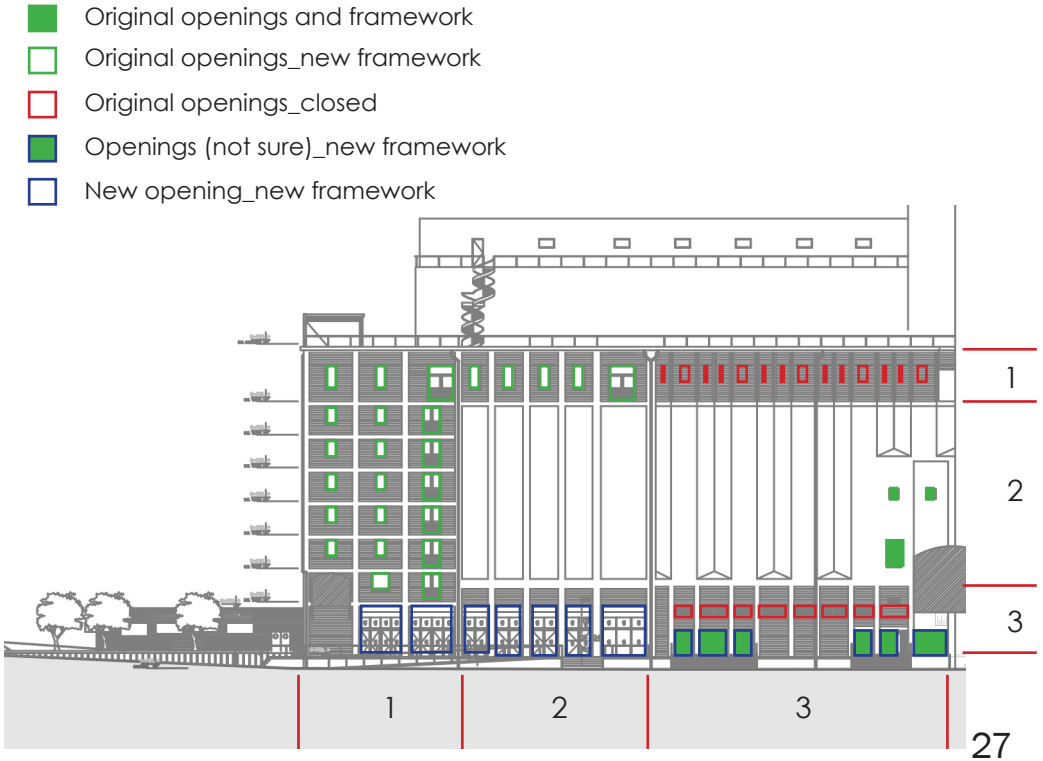
Sketches of the facades of Maassilo by Sicha Chittavanich

# Skin-1st part

The first part belongs to the silo typology which has the silos visible from the outside. This follows the ideology of the prevailing architectural style of the time, Functionalism. Specifically, this approach supported that the function determines the shape of the building, so that the building should be set clear and legible. This is evident in the first part of the Maassilo. The facades of the building are organized by distinguishable parts and elements that make the building legible. One of the main factors that define the configuration of the buildings is the structural elements. The structure is clearly visible and reflects the three level division both vertically and horizontally. In addition, this division is supported by the positioning of the openings. In this aspect the windows represent the spaces which are accessible to people. Similarly, the differentiation in materiality of the skin, mainly concrete and the concrete blocks, also contributes to the vertical division. This is the only part of the silos where we meet this type of facade typology, in which the silos are visible from the outside. It is important to mention that the windows on the top floor above the octagonal cells are closed nowadays. Generally, this building is the most structurally expressive and seemingly the most subdivided part of the three parts of the silo development. Finally, we should mention the concrete blocks used for the filling walls in the facade as they create their own grid on the facade making the scale of the building even more close to the human scale.

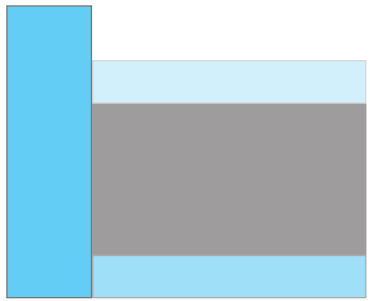


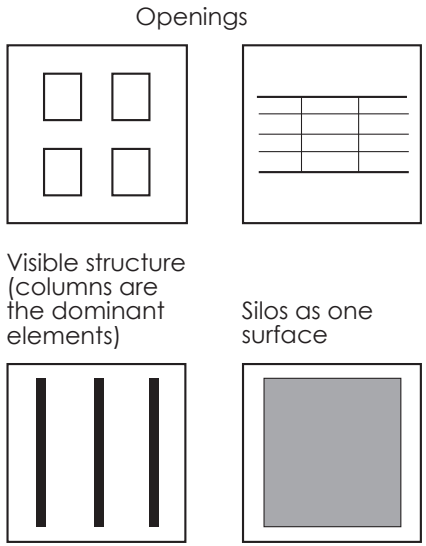

Division of the facade according to the structural elements, openings, material and surfaces. This division also represents the functionality of the building.

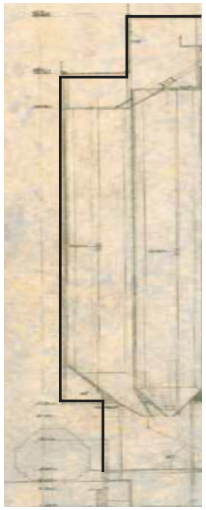


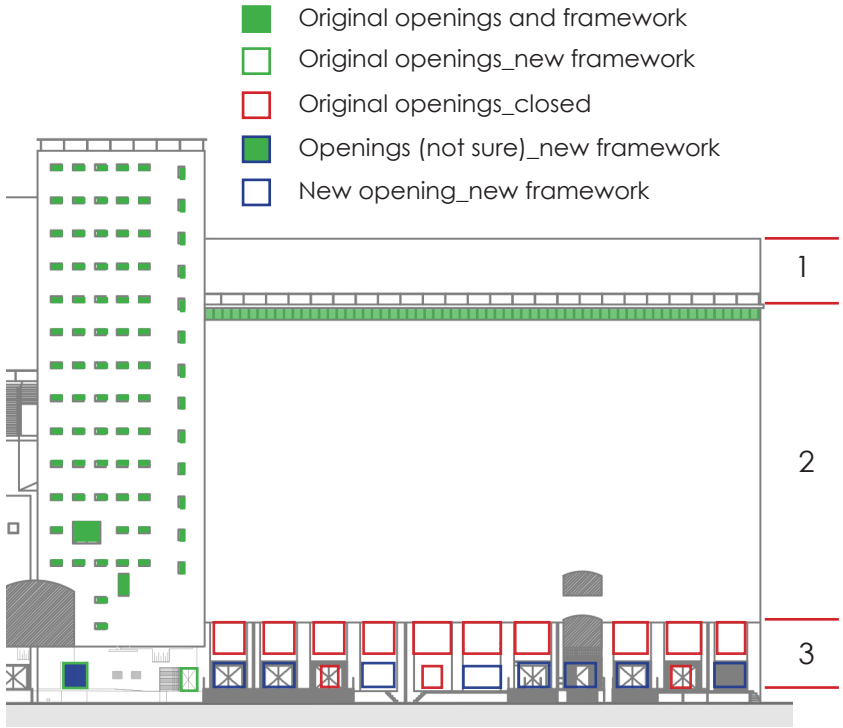
# Skin-2nd part

The facade of the second part of the Maassilo belong to the second type of silos, where the silos are hidden. This part also expresses the functionality of the silo but through the element of large surface. It has similar types of organization of the facade with elements that create patterns and order. Although, the structure is visible on the ground floor and highlights the horizontal connection of this zone, in this case the it is not the main element that makes the function legible. One of the elements that contributes in the 'reading 'of the facade is the depth. The silos are cantilevered and are outer of the ground floor and the attic The tower building and the silo cells are the main surfaces that are on the front of the upper floor and the ground floor, creating a vertical and a horizontal axis and the three level horizontal separation. In this case, highly important are also the different type of openings on the facade. The tower building is dominated by small openings which create a clear coherent surface, in which we can even distinguish the zone with the one vertical row of windows (where the staircase is). On the ground floor, although there were windows in the past they were closed. But there is a different type of openings on the upper floor with a continuous row of windows which strongly highlights the differentiation of this zone. As for the materiality, the whole building is concrete except for the structural elements on the upper floor, which are not clearly visible from the outside. Only the expansion zone which divides the building is visible on the outside as a line which runs on the concrete surface. Generally, this part of the building is distinguished by simplicity in the facade and expresses the big scale of an industrial building.





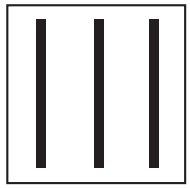



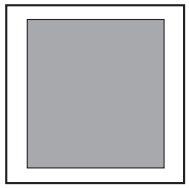
# Skin-3rd part

The facade of the third part of the Maassilo is a really interesting case. It has a symmetry in its composition with a central focal point the void in the center which is also the place where the three parts meet. This decision was made in order to preserve the transformation building on the ground floor. Similarly to the other parts, the building expresses its function on the facade through repetition and rhythm. Here the structure is visible both on the ground floor and the upper floor, while the silos are expressed through the large concrete surfaces. There is also the aspect of recession, with the silos being cantilevered. The typological three level division is also legible through the types of openings on the top floor and the ground floor. Especially the openings of the ground floor are really interesting due to the ornamentation. As the building was built along the road, towards the city the architect creates the new face of the building, which will relate to the city. In my opinion, this element of ornamentation on the street level shows his concern on how to relate to the city and the human scale. Also, considering the orientation of the facade (south), he probably used the ornaments as a barrier for direct sunlight. As for the materiality, the architect uses concrete for the tectonic elements and the ornaments, while the filling walls on ground floor and top floor are made out of bricks. However, on the top floor there is a layer, which seems as a concrete plaster on top of the brickwork.

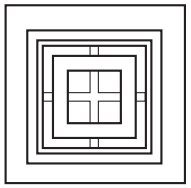
Visible structure (columns are the dominant elements)



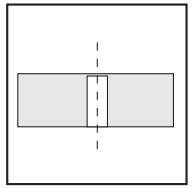
Silos as one surface

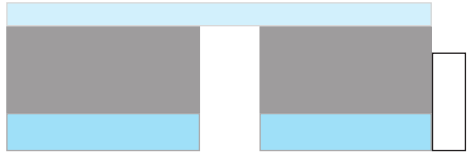


Ornament



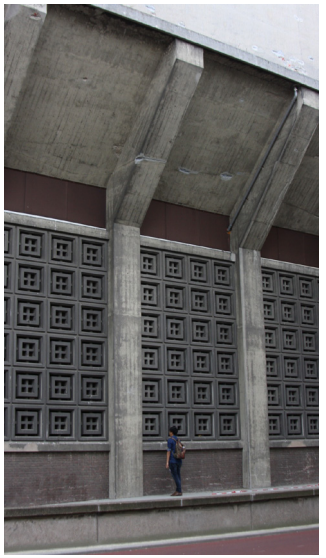
Symmetry



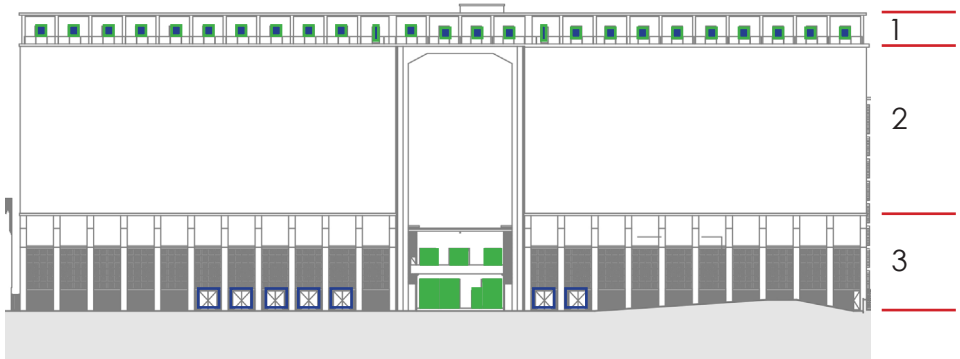


Division of the facade in three horizontal parts. In order to retain the former transformation building, the silo is divided in two parts resulting in an empty space in the middle.

Relation of the facade to the human scale.



Original openings and framework
Original openings_new framework
Original openings_closed
Openings (not sure)_new framework
New opening_new framework

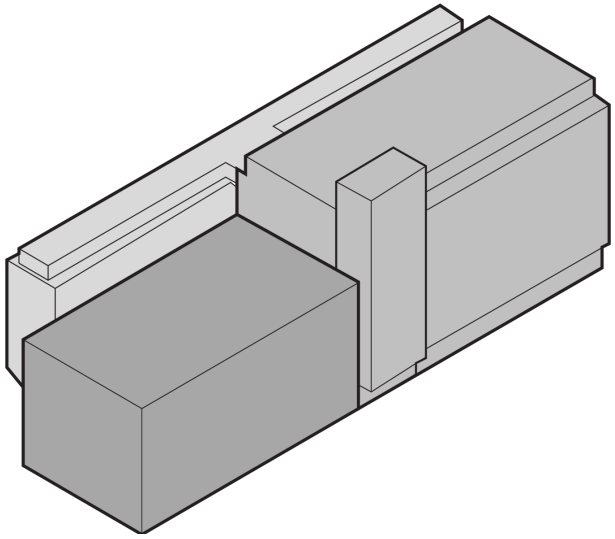


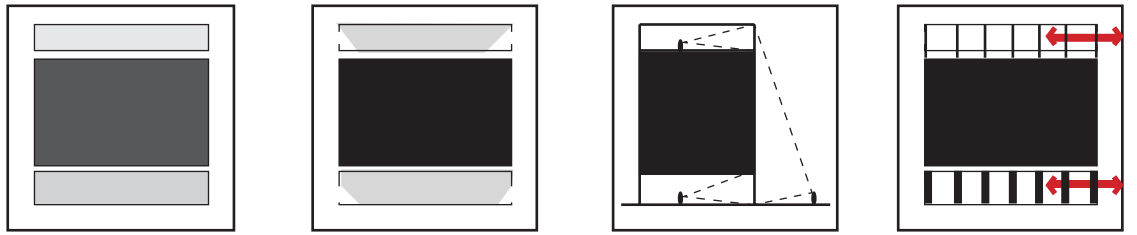
# Conclusions

From the analysis becomes evident that the building's "skin"has a variety of elements that contribute to the legibility of the building. As mentioned above such elements are the visible structure, the openings, surfaces, depth and materiality, which create order and coherent patterns. In this way different type of information is organized in order to communicate to the people. As a whole the facade enhances the legibility of the historical development of the complex. Generally, the main element that is evident from the facade is the utilitarian aspect of the complex. The three level horizontal division is dominant, while the three part vertical division is visible in the first building. Also, the big scale of structural elements and surfaces establish a monumental image of the building especially in the second and third part, while the first part due to its subdivision, from structure to material, is closer to the human scale. Similarly, works the ornamentation on the ground floor of the third part, which seems to be the only part considering its relation to the city.

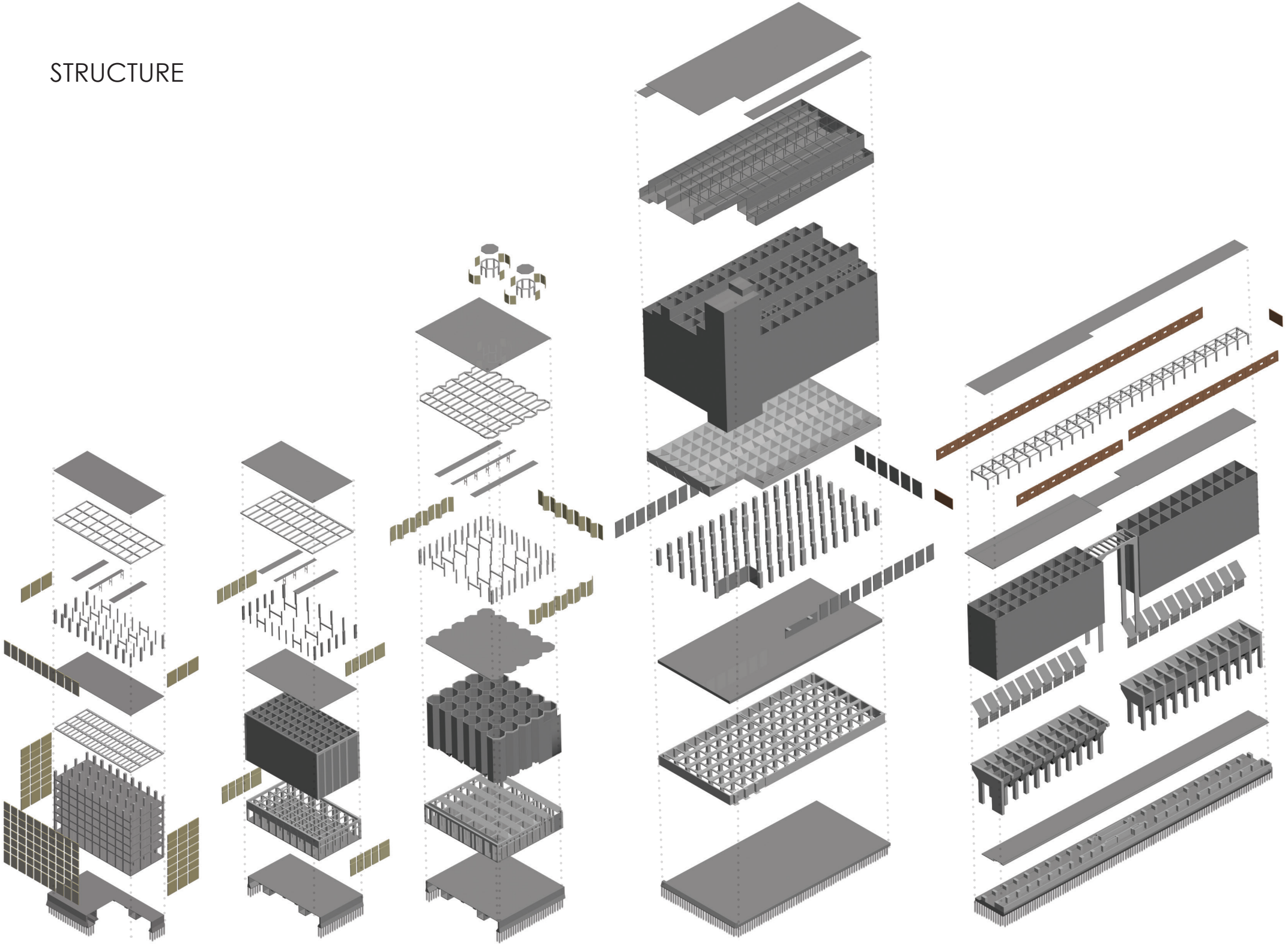
Moreover, it is clear that this scale especially in height is not experienced in the interior where the length and width of the space is proportionally dominant to the height. In addition, it is visible that the skin acts mostly as a separation layer between interior and exterior. Finally, it is important to mention that the materials of the facade develop an age value.

- Expression of the historical development.
- Reflection of the functionality, in the three level division.
- Visibility of the structural elements.
- Repetition and rhythm (structural elements, recessions of surfaces, openings).
- Mostly acts as a barrier between inside outside in regard to visual connection.
- Not much light penetrates the skin.
- Expresses the age of the building (age value).
- Not much connection to the surrounding.
- Representation of both the silo typologies.



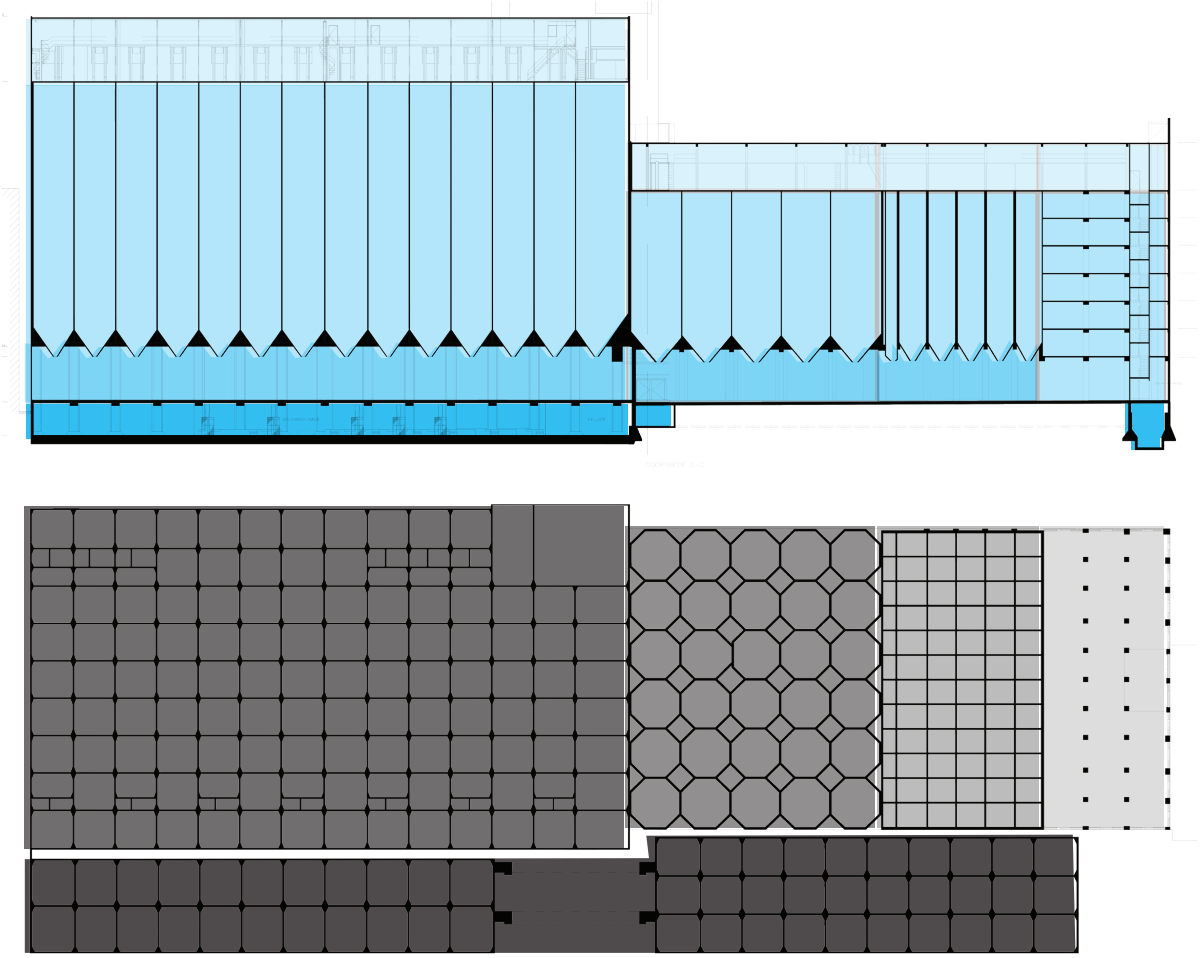


# STRUCTURE



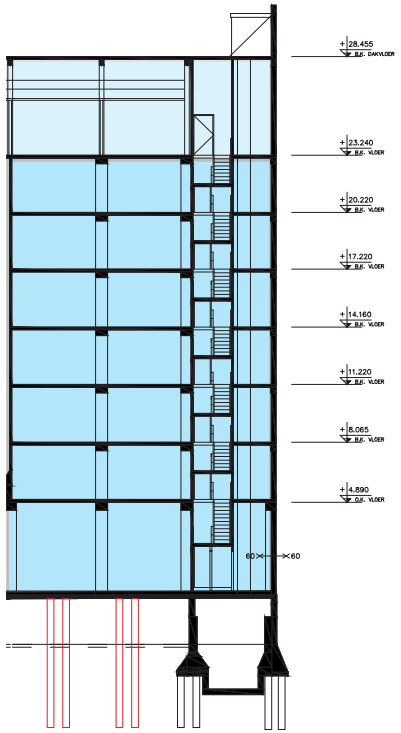
# Complex

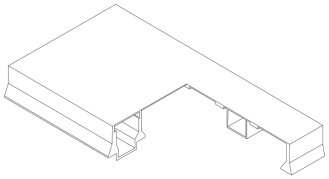
The structure of the silos is probably the most important element of this industrial building as it is designed to support extreme loads. When analyzing the complex we see that there are many differentiations between the structural elements columns, beams and silo cells. In general through all of the construction phases the main aim was to build in the most efficient, economic and fast way possible. They all reflect the three level vertical division with strong ground floor structure, silo cells as a structural system and a lighter top floor.

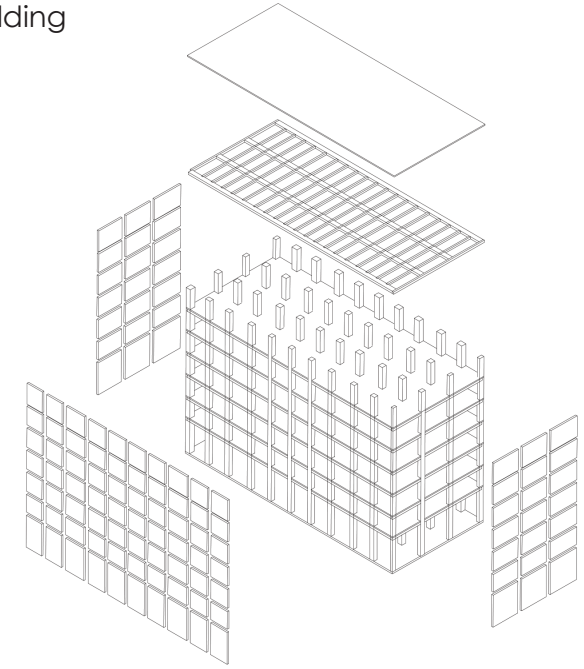


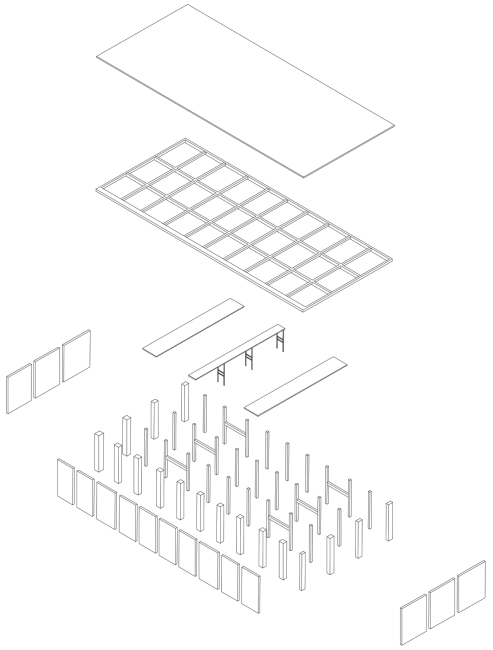
# First phase-1st part

The construction of the first part of the silos is divided into three parts. The first part is mainly a typical construction of columns, beams and floors made out of concrete, which are visible in the facade. The walls are made of a type of high porosity blocks (puimsteen). The foundations have some accessible corridors which were used for transportation. The upper floor is distinguished by a lighter concrete construction with smaller concrete columns and two concrete transportation aerial corridors, which are supported by secondary beams between the columns. The beams on the upper part follow the grid of the columns, while on the lower levels there are additional beams spanning in the east west direction as shown in the diagram. The structure follows the same axis in the first part of the building from the ground floor to the top floor.



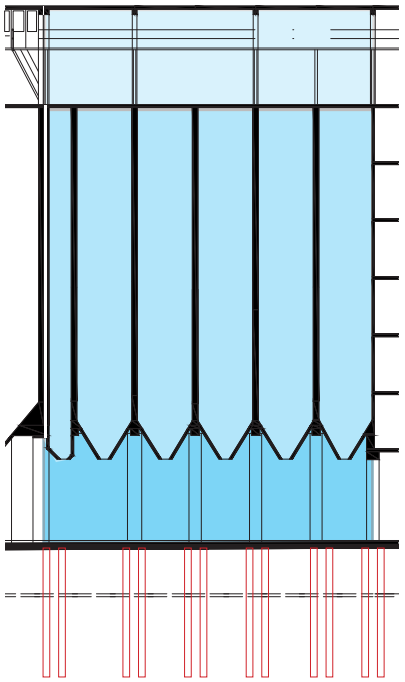



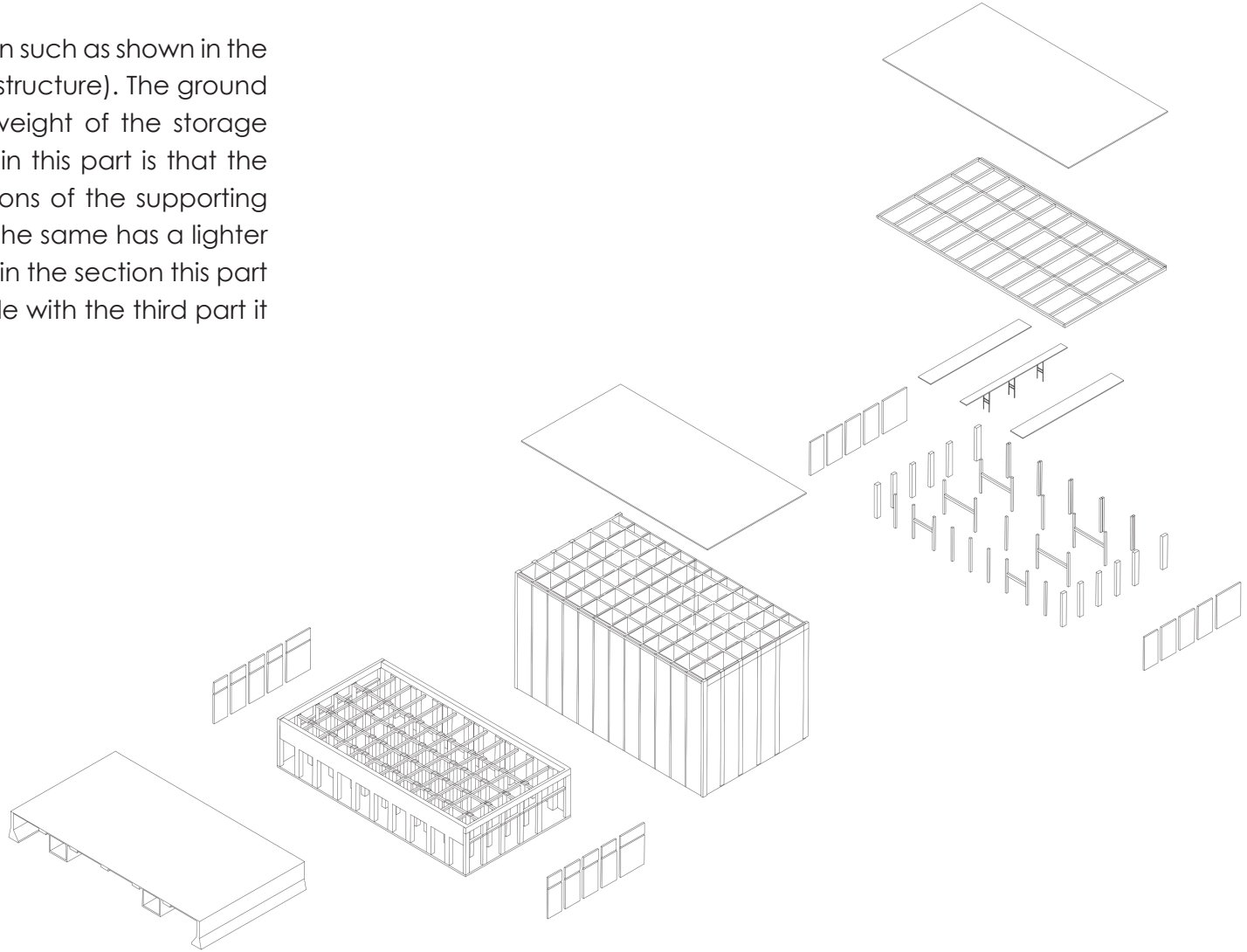




# First phase-2nd part

This part has the basic three type division such as shown in the section (ground floor-silo cells-lighter top structure). The ground floor has thick columns to support the weight of the storage cells on top of them. What is interesting in this part is that the cell walls are thick and that the dimensions of the supporting beams are small. The upper floor follows the same has a lighter structure than the ground floor. As shown in the section this part is strongly connected to the first part, while with the third part it has as separation expansion zones.



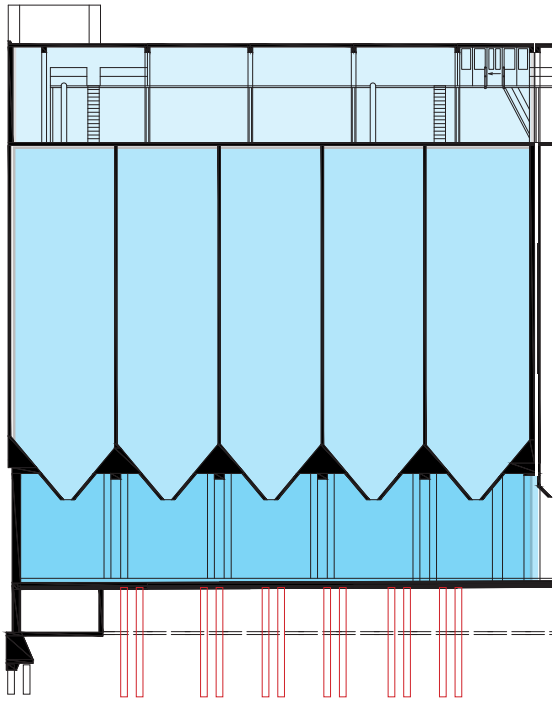


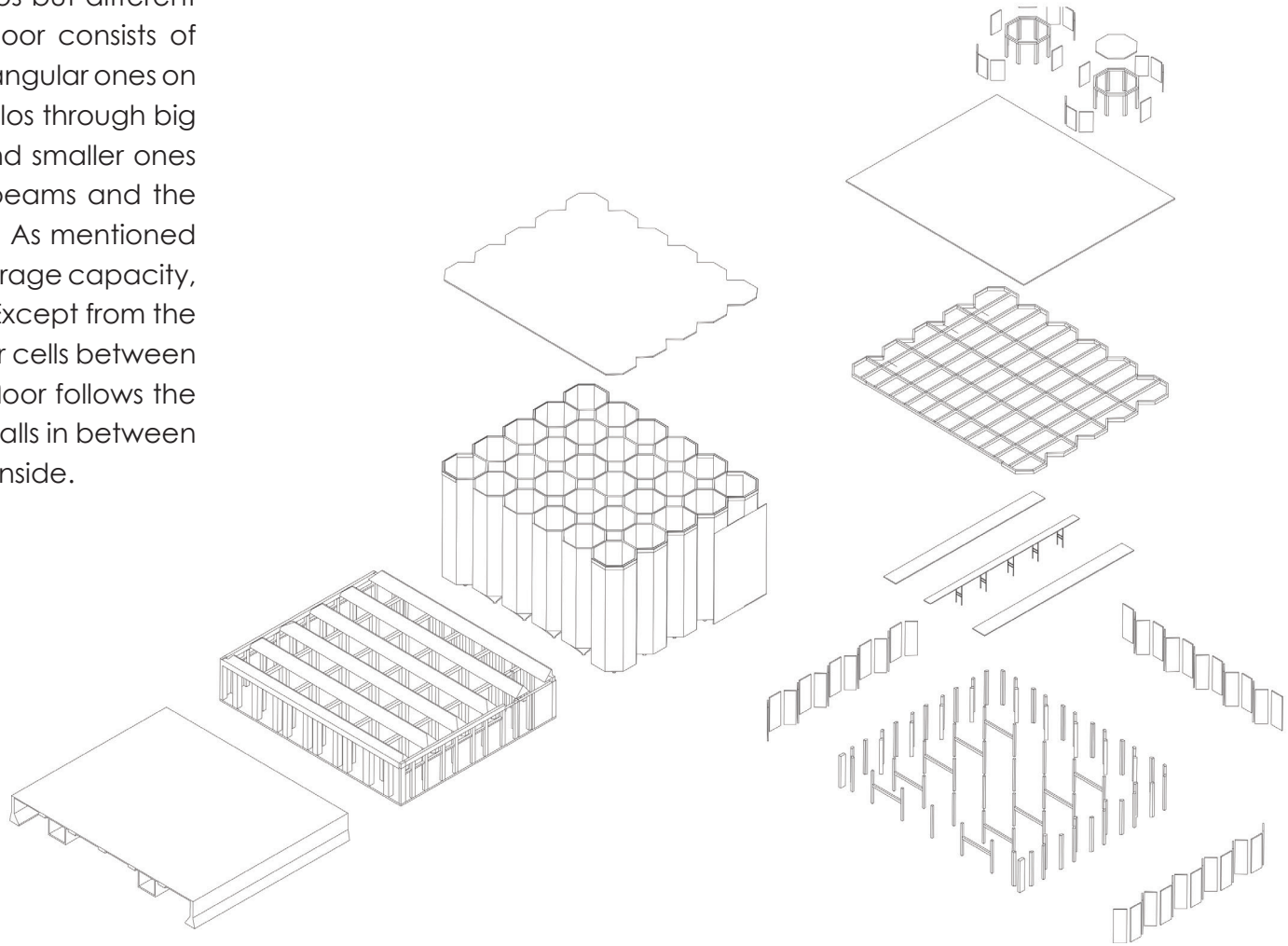
North

# First phase-3rd part

The third part of this building also contains silos but different from the rectangular silos. Firstly, the ground floor consists of large octagonal columns with some smaller rectangular ones on the perimeter. The columns are supporting the silos through big concrete beams in the north south direction and smaller ones in east west. Actually the construction of the beams and the silos bottom is interconnected and acts as one. As mentioned before the goal was maximum efficiency and storage capacity, which lead to the octagonal shape of the silos. Except from the large octagonal cells there are small rectangular cells between them which are used also for storage. The top floor follows the same structural principle of columns and filling walls in between on the outer skin and lighter concrete structure inside.

Image 1. Part of the section showing the bottom structure of the silos and its connection to the second part and the expand zone.

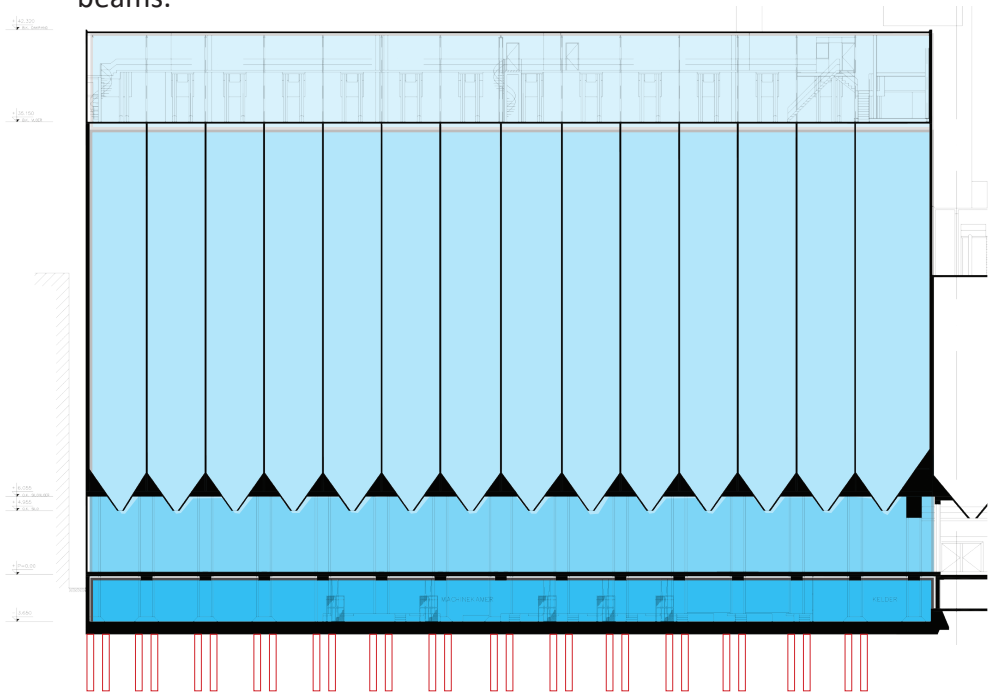


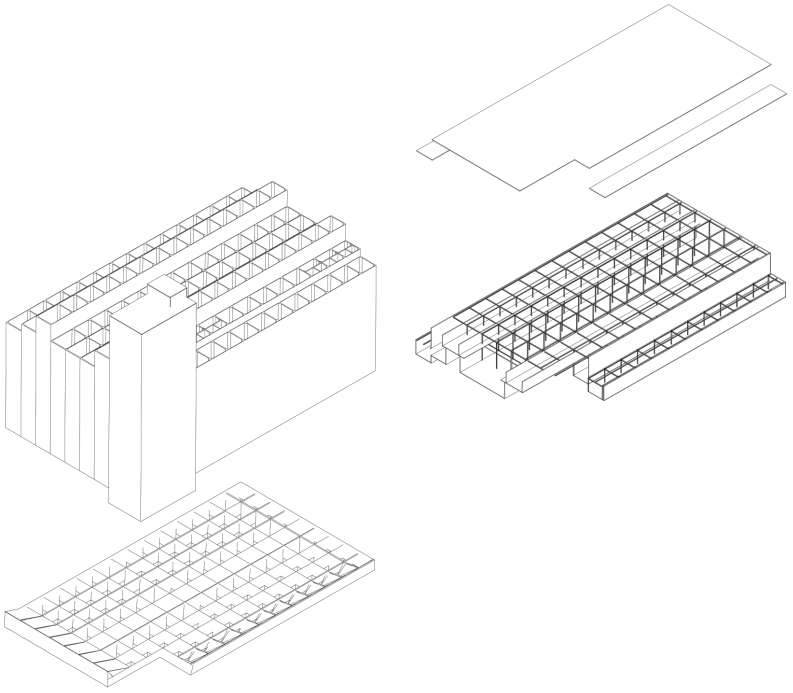


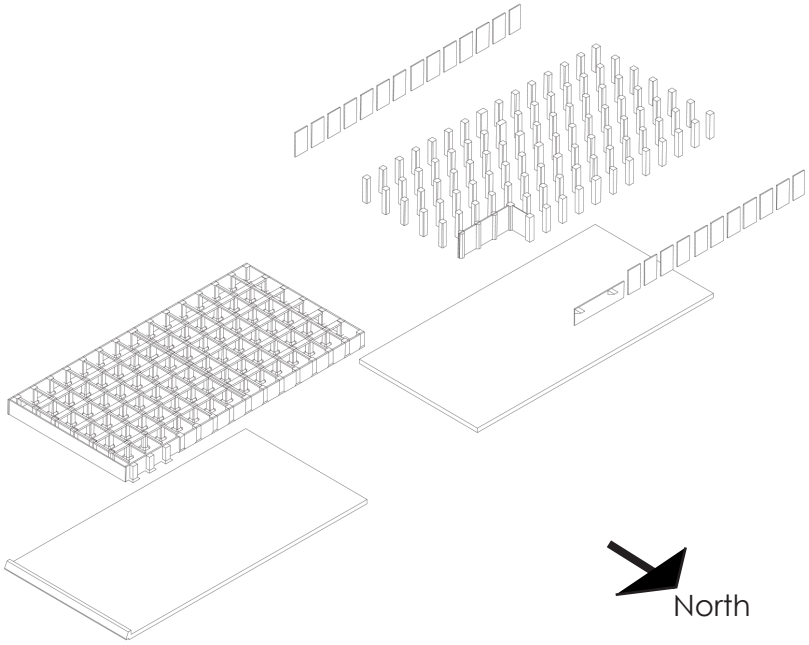
North

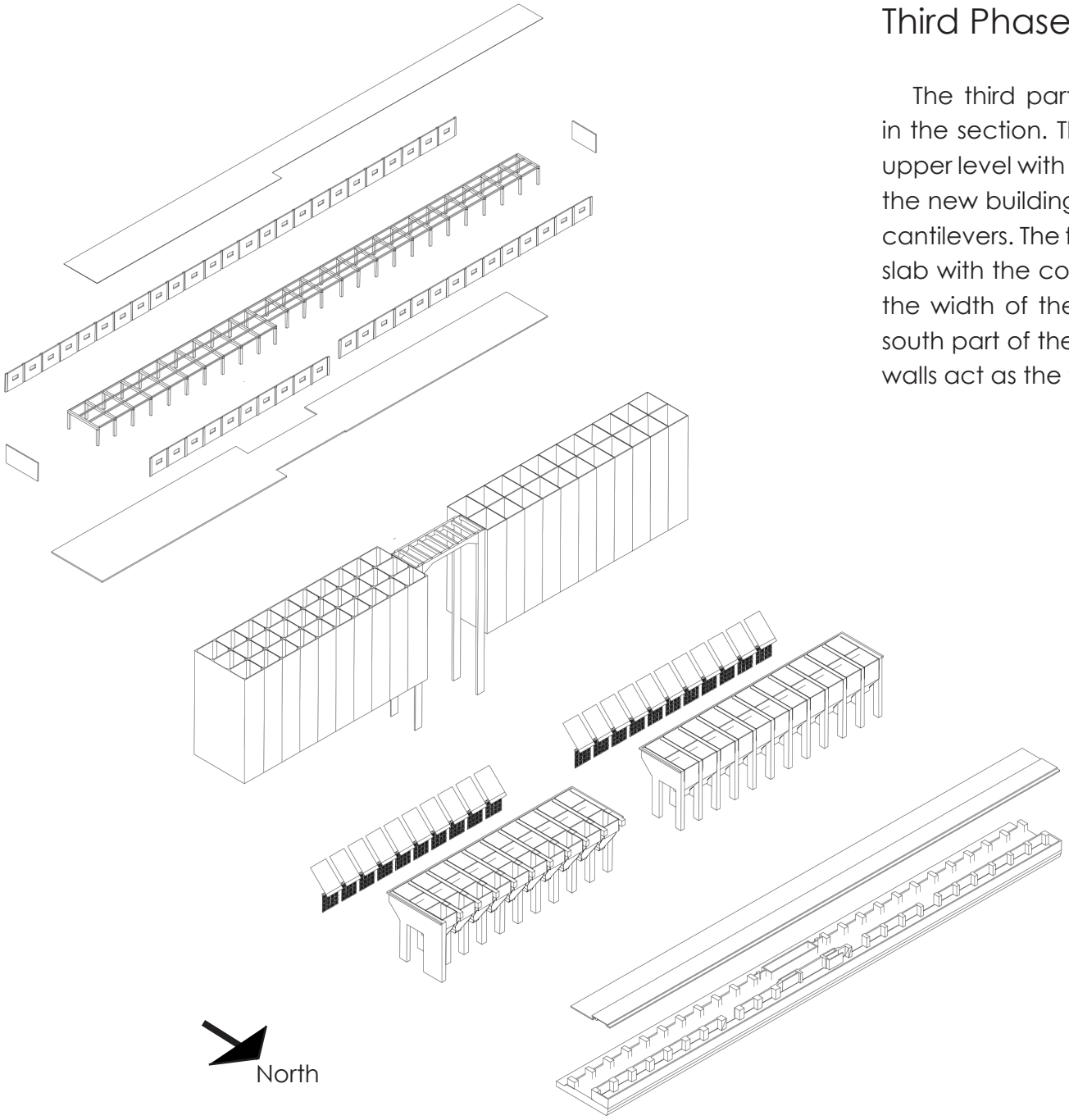
# Second phase

In the second phase there is also the three part division of the section plus the underground part with the foundation. As mentioned above the foundation consists of a one meter concrete slab which rest on the pillars. As seen from the photos the vertical tower was built first and the silos later. The original tower building had ten floors and was built with a steel structure and concrete outer layer. Under the silos part, the ground floor consists of rectangular columns with “filleted” corners except from the three columns in the tower part (image 1). Although, there is no clear indication why these columns differ from the other ones, one hypothesis could really on the fact that it was built first and adapted the columns of the first part. As mentioned before, due to the use of the Mcdonald system the beams and bottom of silos are interconnected and act as one. There is a variety in cell sizes and also there is a structural reinforcement in the corners (image 2). In the top floor some of the silos are developed higher than others resulting in a deviation of the heights of the floors. In order to create a light structure the structural elements are mainly iron columns and beams.



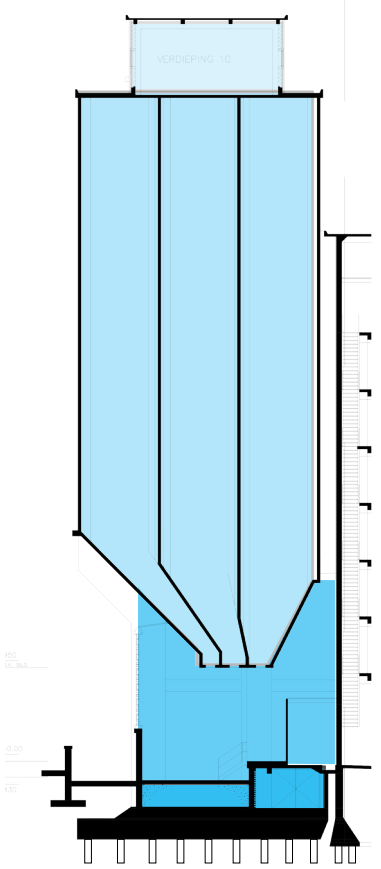




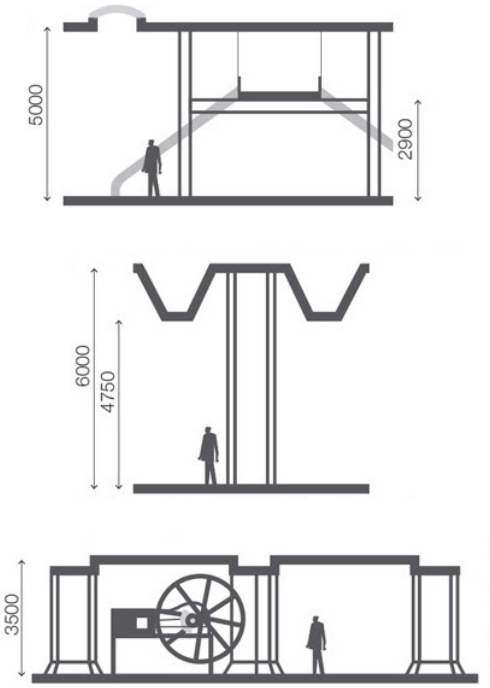



# Third Phase

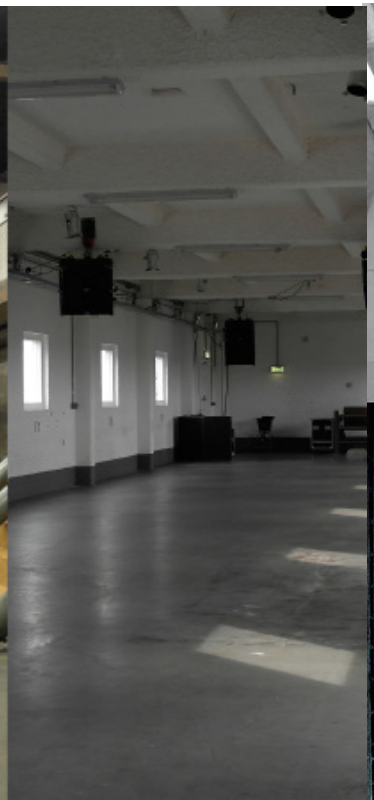
The third part of the silos follows the same three part division in the section. The two parts of this phase are connected on the upper level with concrete beams. There is expansion gap between the new building and the old parts which are connected through cantilevers. The foundation consists of pillars and a heavy concrete slab with the columns resting on top. There are beams only along the width of the structure, with extension supporting the exterior south part of the silos. Along the length of the base of the silos the walls act as the force distribution elements.



In the interior the structure is the most dominant element of the old building. As seen in the photos the character of every attic is different and this is due to the combination of the structural elements as well as the services. In the first part the structure is integrated with the conveyors, as the corridors are part of the structure. In the second part, the original conveyors where located on the balcony. Also, this is the only attic made out of steel. In the third part due to the small size of the width of the building there is no need for in-between columns. Similar differentiations are visible on the ground floor with the variety of funnels and columns.







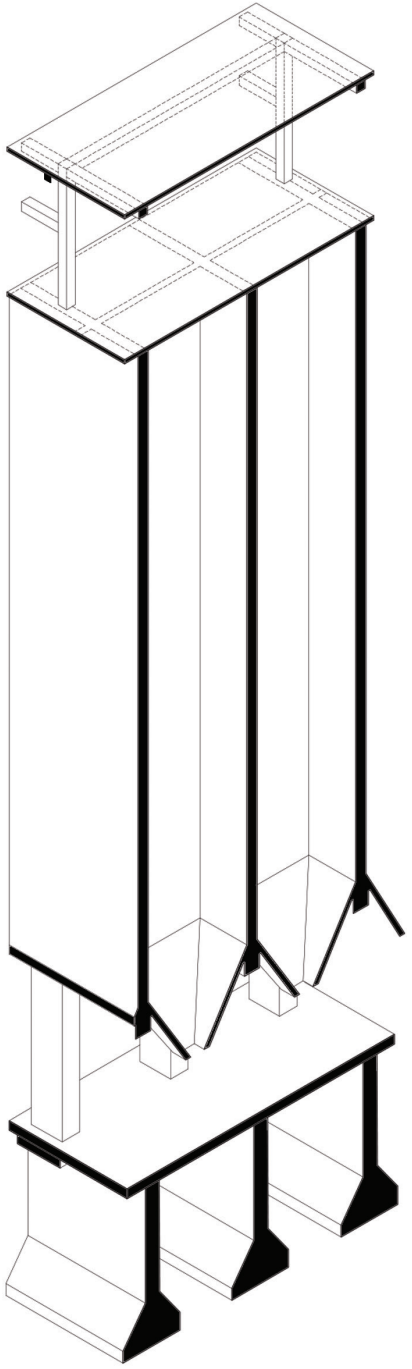
# Conclusions

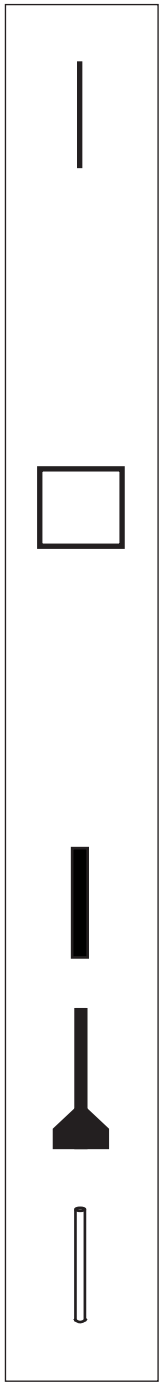
After analyzing the structure of the whole complex we can identify some important elements. Firstly, the structure is of high value both historically and technologically as it is an example of the concrete construction processes for silos that occurred at the time. Especially, in this case where different structural developments occurred through time in the same complex. Also, the structure itself is the main expression of the functionality of the building for supporting the heavy load of the grain and how to make that with efficiency, economy and fast construction time. In the structure we also see the three level division, which reflects the function, always with the aim to be efficiently adopted in the construction principles. Accordingly, there are strong foundations and floor structural elements, in large sizes to support the heavy load of the cilo cells above, and a lighter structure on the top floor so it will not overload the system with unnecessary loads. It is also important to mention that the building has also use value as the structure is stable and can be used for new functions.

The legibility of the building is interconnected to the structure. Not, only it makes the different developments legible but also connects the building to the construction developments and the structural typologies of its era. In addition, especially in an industrial building as this the structural elements such as columns and silo walls are the ones that define the interior spaces, as the floor plans are usually bare of walls. In this case, not only the structural elements provide legibility of the structural and overall development, but they also enhance the legibility of space or orientation / "way-finding. This is feasible due to the differentiation of the different elements in the different parts of the building. From the shape and dimensions of columns, to beam connections, silo structure and funnels.

- Expression of the historical development.
- Expression of the functionality, in the three level division.
- Repetition and rhythm.
- Expression of the technological developments of that time.
- Adequate for reuse.

## Structural principle of silos





Light structure

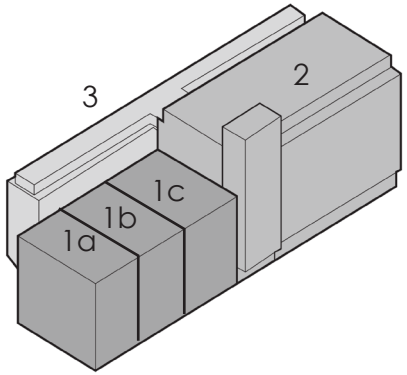
Silo cells

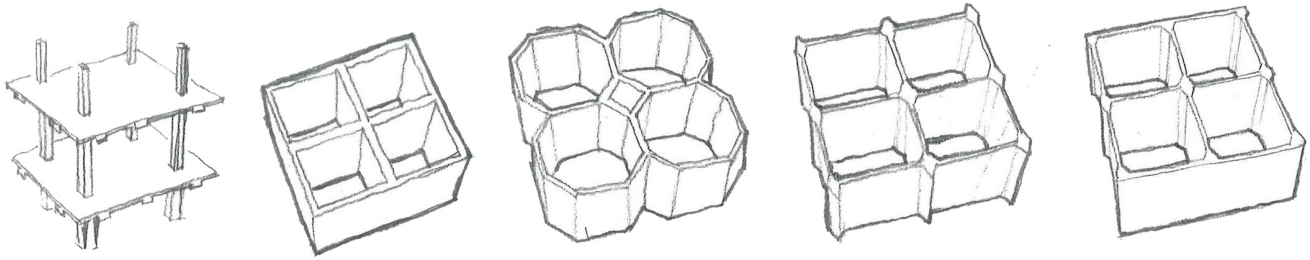
Ground floor

Foundation

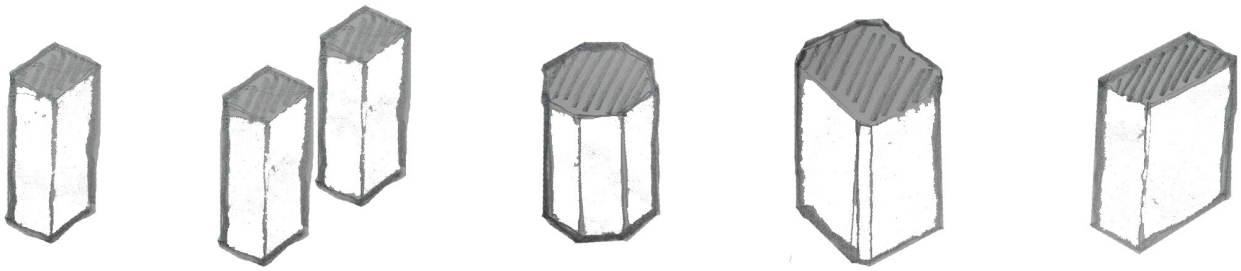
Pillars

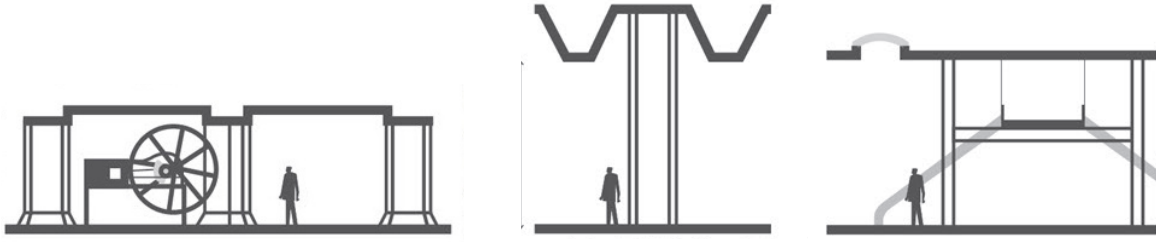
## Differentiations



1a 1b 1c 2 3

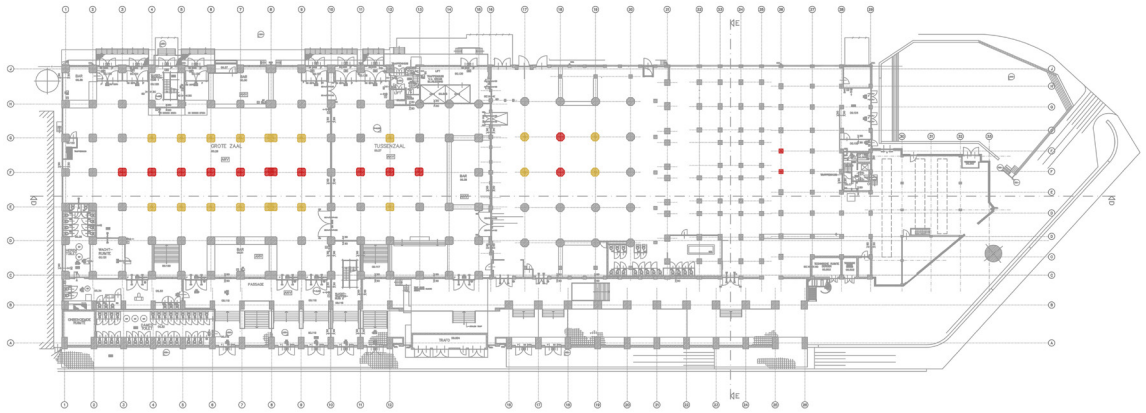




# Remark

There are some significant alterations on the original structure from the previous intervention. In order to open the visibility for the club they cut of some of the columns on the ground floor (color). The yellow is for the columns that they took out and replaced with thin cylindrical steel columns, while the red ones they cut but did not replace. In this alterations we should also mention:

- New floor top layer
- New window frames in most of the parts
- Opening of one of the cells for the creation of a fire escape staircase.
- Interior walls
- Load-bearing columns on the ground floor
- ...



# Conclusions

Research question.

As shown in the analysis, the question of legibility is strongly present in the building. This is happening mainly due to the functional character of the silo and the typological developments of this industrial building that occurred in history. The Maassilo is a representation of both the more functionalist style (1st part), where the silo cells are visible from the exterior, and the hidden silo cells type. 'Functionalism' is based on the conviction that forms should express the use-functions for which a building is produced (Leach, 1997, p. 219)

As we have mentioned, in the urban level the Maassilo is a 'live proof' of the rapid industrialization of the port of Rotterdam, which led to the creation of the Maashaven and the expansion of the city towards the south of Rotterdam. Moreover, it is linked with the past and the people of the area as many of the workers were living in the surrounding are. Hence the building is part of the intangible value of memory and identity of its surrounding and as such it contributes to the legibility of the context. Moreover, due to the combination of scale and position the building stands out in its surrounding making it a local landmark. According to Lynch (1960), if any landmark has a clear form, clearly contrasts with its background, and has a crucial location, then it can be considered important.

The developments that took place on the site are mainly legible through the silhouette of the ensemble itself and the supporting structures (office buildings and elevators). The expanding character of the building is legible in the visual division of the different parts and makes legible the historical development that took place. Similarly, this enhances the realization of the rich industrial era. The building development expresses its immediate surrounding and the financial and technological developments of its era (industrialization). In this aspect it is the whole complex as an ensemble that portrays the historical value and the story.

Moreover, we should mention that the size and scale of the building in combination with the elevator structures on the riverside, not only showcase the gradual development of the complex but also make legible the functionality and the organization of the silo. We could say that the complex is part of the public memory and enhances the identity of the area. In the functional recognizability the skin/facade plays an important role as well. In the analysis many elements that constitute patterns and organize the exterior, such elements are the visible structural components, the openings, surfaces, depth and materiality, which create order and coherent patterns. In this way different type of information is organized in order to communicate to the people. These functional aesthetically aspects are integrally connected to the recognizable types of silos, making them easier to be understood as such. Also, the facade enhances the legibility of the historical development of the complex. Generally, the main element that is evident from the facade is the utilitarian aspect of the complex, with the three level horizontal subdivision. In the interior the legibility of the function is mainly provided by the structure and the services. The

funnels on the ceiling in the ground floor, the pump generators underground and the conveyors with the pipes in the attics connect the interior to its original function.

The principle that unites all the architectural elements into a group and the buildings into a whole site is the functioning of the production process at the level of the individual building as well as of the whole site. It is then proposed here to term this archaeological explanation of the relationship between individual building elements, as well as between all the structures on the site, as 'technological functionalism'. Since this principle describes the architectural totality of a building and the site, 'technological functionalism' can be understood as the principle of the 'aesthetic integrity' of industrial buildings and the whole site (Rogic, 2009, p.51).

The aspect where legibility seems to fail in the building is the orientation and way-finding. From the exterior there is no clear indication of the entrance or entrances to the building, making it really difficult to orientate and be disconnected from its surrounding. Similarly, inside the complex the subdivision of the originally ope floor plans has created a very complicated route connection between the different parts.

For future research on this topic aspects such as the subjectivity and objectivity of legibility should be investigated. Moreover, some research on the capacity of the buildings legibility to be altered should be incorporated, so the building will not loose its readability.

# Value assessment

## Site

East side and supporting structures.

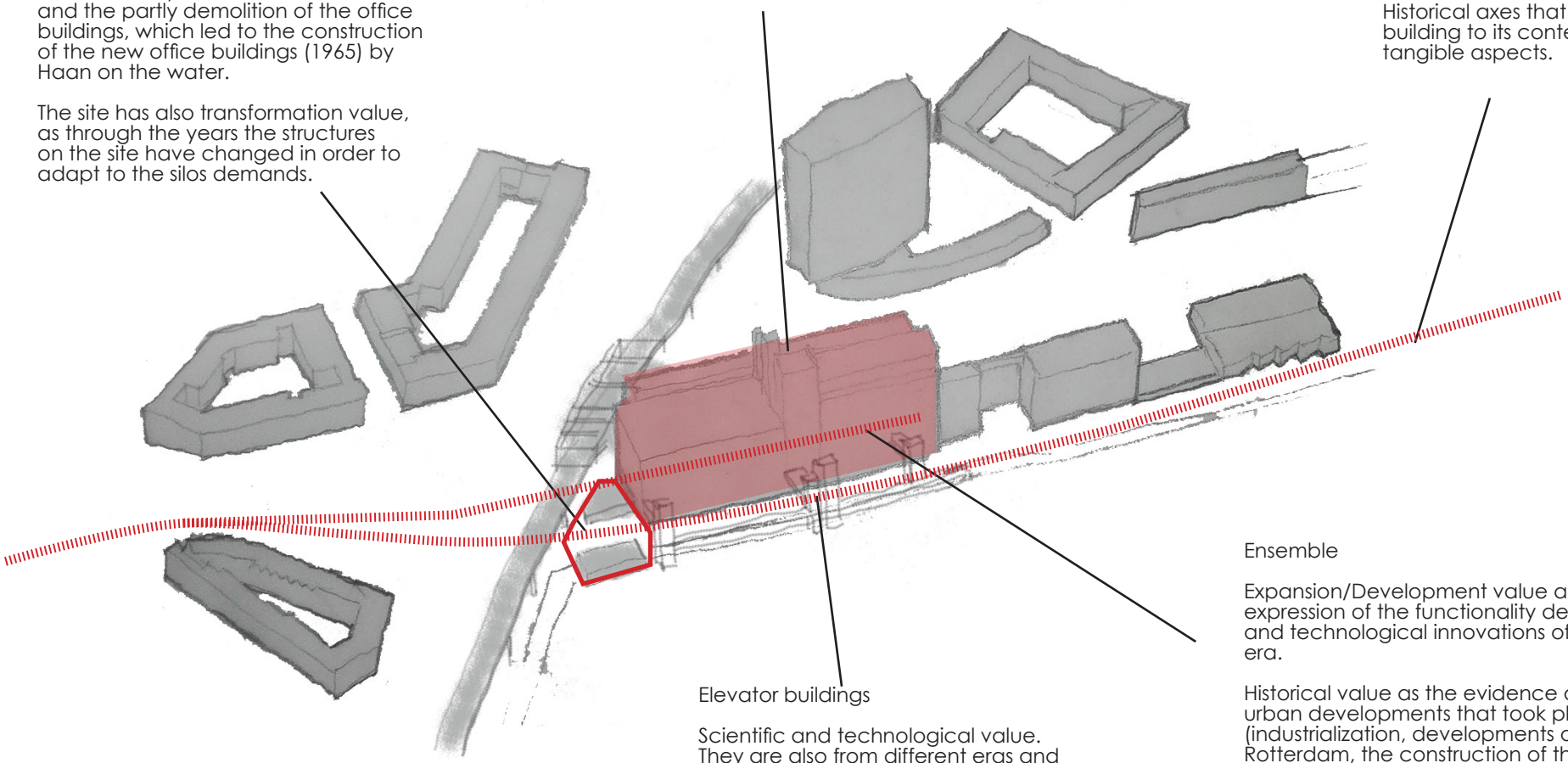
Historical value as they express the historical developments that took place with the completion of the metro station and the partly demolition of the office buildings, which led to the construction of the new office buildings (1965) by Haan on the water.

The site has also transformation value, as through the years the structures on the site have changed in order to adapt to the silos demands.

Transformation and adaptability value.

Functionality values: show the relation between the different parts.

Historical axes that connected the building to its context but with no tangible aspects.



Ensemble

Expansion/Development value as the expression of the functionality demands and technological innovations of that era.

Historical value as the evidence of the urban developments that took place. (industrialization, developments of south Rotterdam, the construction of the Maashaven).

Elevator buildings

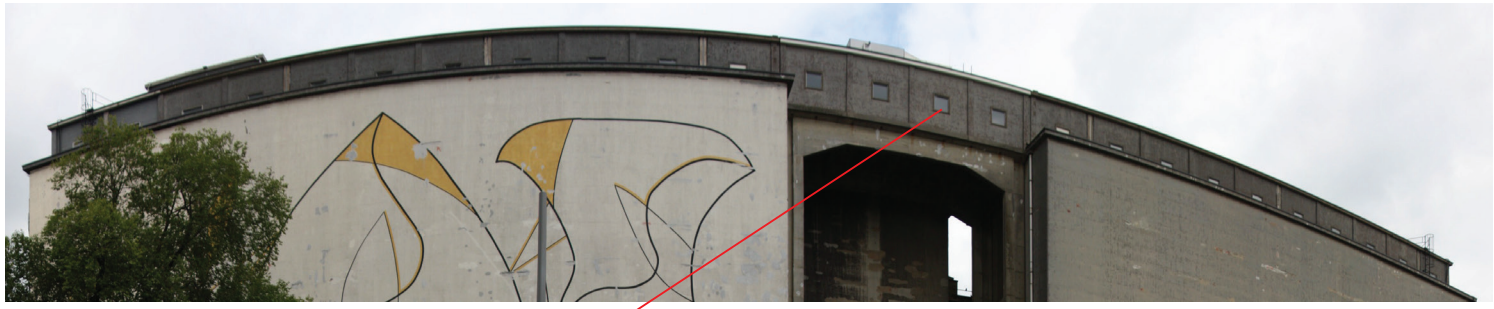
Scientific and technological value. They are also from different eras and show the variety and also the adptation nature of these structures.

Connection of Maassilo to the context and its functionality.

## South Facade

The south facade consists mostly out of the Postma period of 1951. But elements of the Brinkman period are seen in the middle part with the transformator house.

The south facade is the only part where the program is partly visable above the concrete windowframes.Although not much has changed since 1951 all doors on the groundfloor are from the reconstruction in 2003



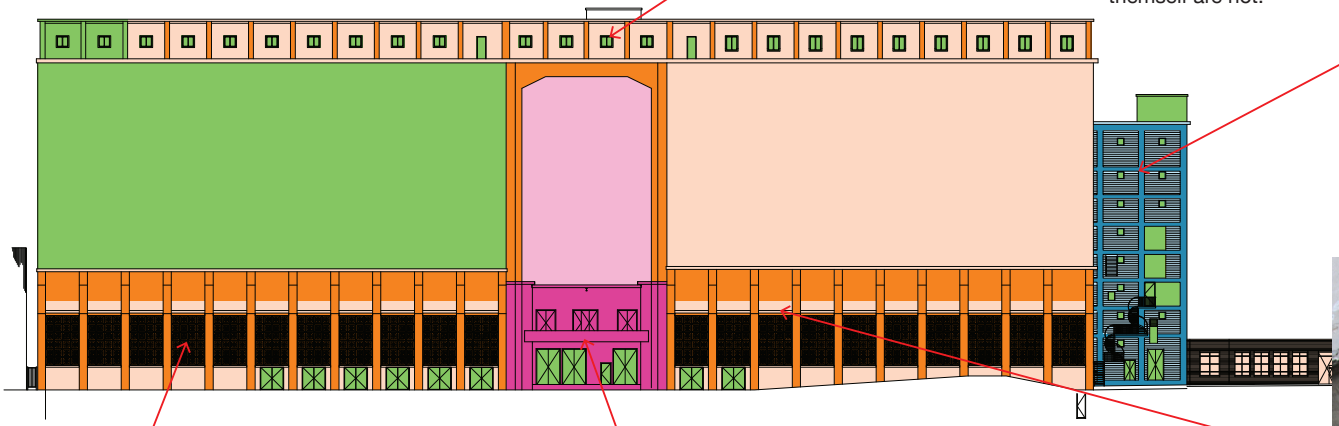
B. Kuiperi, 2016

## Stok Building

A part of the Stok period is visable. The windowframes are from 1910 but the windows themself are not.

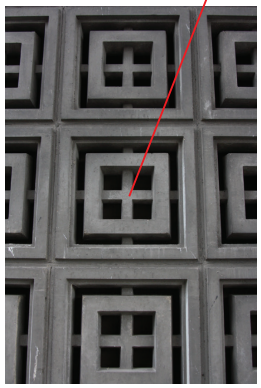
B. Kuiperi, 2016

B. Kuiperi, 2016



## Concrete decoration

The windowframes of the south facade are the most decorative addition to the whole building. They are original parts of thw 1951 period. Light is blocked by panels on the inside but when the panels are removed these frames filter the light in a unique way beacuse of it's orientation.



B. Kuiperi, 2016

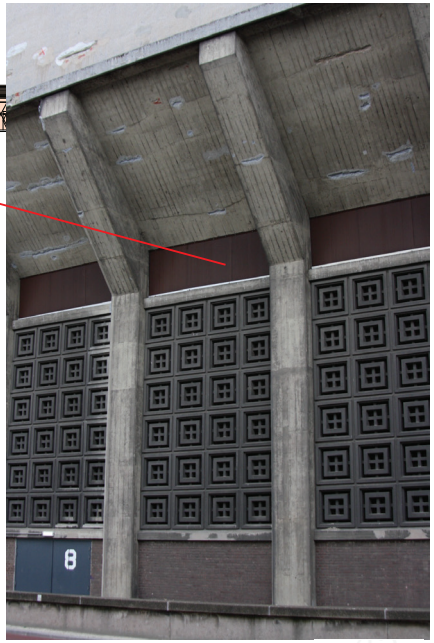
B. Kuiperi, 2016

## Transformator house

Build in 1930 it is part of the Brinkman period. It is deamd valuable because this building is the reason why the south facade of the 1951 period is divided in two parts.

## Decoration and Expression

The concrete windowframes in combination with the brick work and the slanted facade make is the most expressive the building gets. The slanted facade shows the fact that the building houses silo's




B. Kuiperi, 2016

Traffic light
( redevelopement + office )
high value medium value low value

Historical mapping
( high value - low value )
1951-high 1951-low 1930-high 1930-low 1910-high 1910-low

## East Facade

The original building of Poestma was is now most prominently visable on the east facade but the ensamble of all the periods come together from this perspective as well.

The biggest changes to the facade have been made in 2008 with the removal of a large part of the facde to make an entrance for the offices.

Original sign of the factory from 1910 (B. Kuiperi)

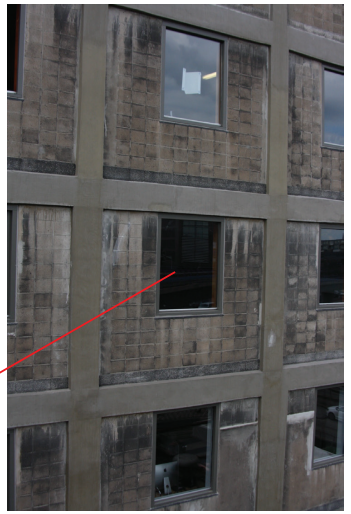
## Grainsilo Sign

The original factory sign of 1910 is still part of the east facade and is in good condition. The sign spells Grainsilo.


B. Kuiperi, 2016

## Office Windows

With the renovation of 2008 the windows and the window frames heve been replaced. Thereby they are not original and have low value.

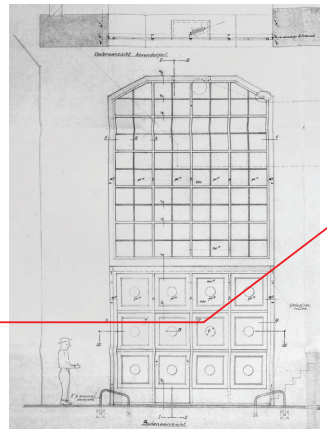


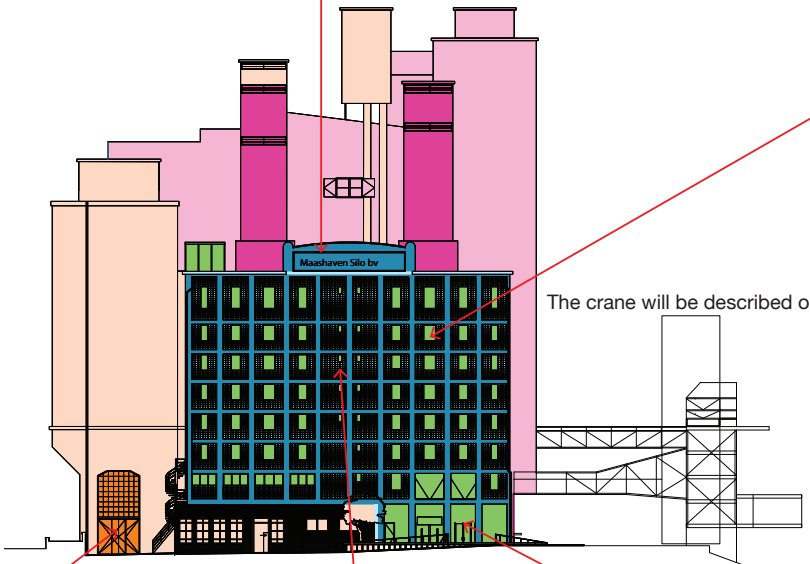
B. Kuiperi, 2016

## Train Door

The train door is part of the Postma period of 1951. The current door is a reconstruction of the original door. comparing it to the original drawings it is a copy of the original.
The door has long been hidden from sight by a large steel plate infront of the door.

B. Kuiperi, 2016

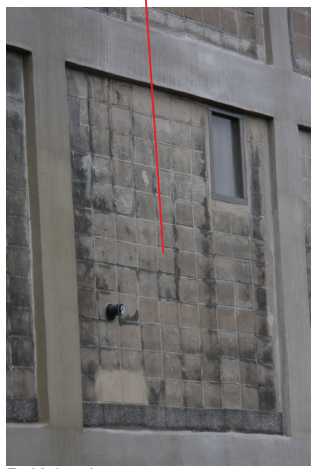





The crane will be described on another page

## Saircase

Behind the smaller windows is the staircase. The window frames of the staircase are original, The windows themself are not.



B. Kuiperi, 2016

## Entrance

In 2008 this entrance was changed. A glass facade was made. Only the concrete columns are still original.

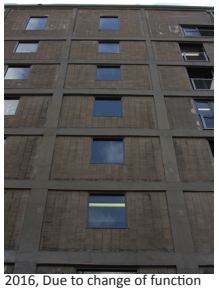
B. Kuiperi, 2016

Glass facade and entrance was made in the 2008 renovation

Traffic light
( redevelopement + office )
high value medium value low value

Historical mapping
( high value - low value )
1951-high 1951-low 1930-high 1930-low 1910-high 1910-low

1982, Small openings in the facade (Dukker, G.J.)



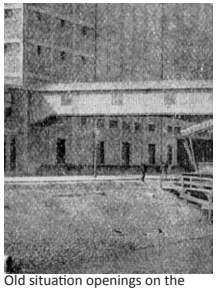
2016, Due to change of function into offices they made big window openings (Kuiperi, B.)

2016, Emergency staircase at the Postma silo building to the Stok part (Kuiperi, B.)

2016 Traces of the small window openings are still visible, red squares (Kuipri, B.)

Damages of the concrete surface (Kuipri, B.)


2016, Entrance of the 020 factory. The building in the front is provisionally closed down with steel plates (Google, streetview)



Old situation openings on the ground floor (1912, Bouwkundig_Weekblad architectura)

2016, Openings of the cafe (Google, streetview)

2016, opening for the employees of the Maassilo (Google, streetview)

2016, Emergency doors with new added steel staircases on top of the concrete platform (Google, streetview)

2016, Original concrete staircases to enter the train platforms (Google, streetview)

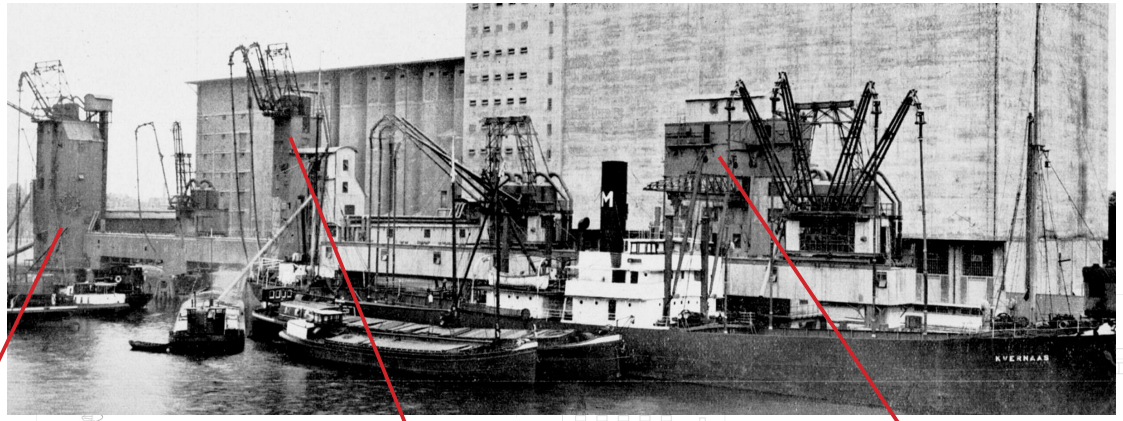
Traffic light

Historical mapping

# Grain Elevator Towers

The grain elevator structures has kept changing over the year. We are able to pinpoint the year of construction of the main structure for each separate part. However the machinery in the towers have been replaced many times over the years. The structure of towers themselves would probably have changed a bit to fit these new services.

Because of the great cultural historical value we have valued these structure of the grain elevator as a high value. We all thought removing the corrugated steel sheets (2010) of the grain elevators was a good intervention.

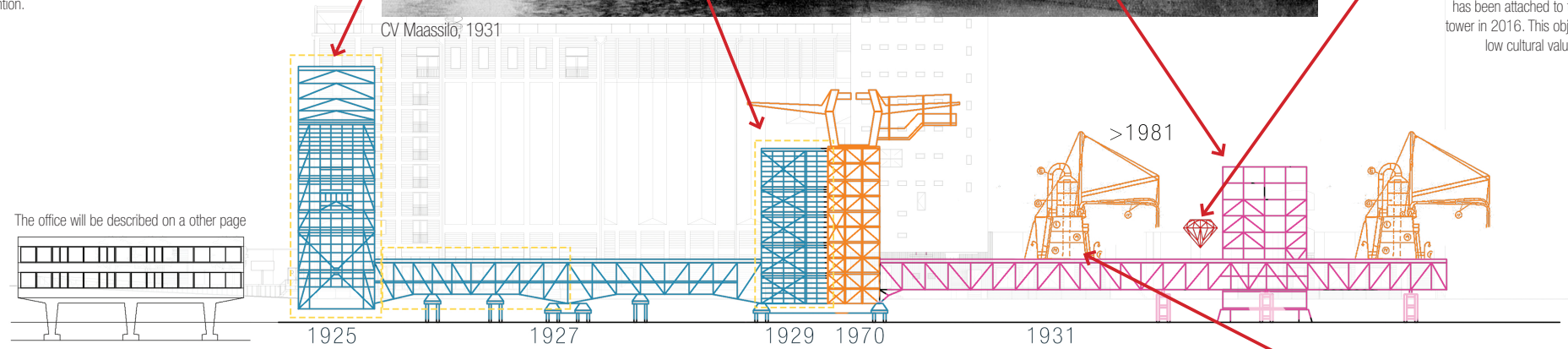


CV Maassilo, 1931

TVR Rijnmond, 2016

## Diamond

A diamond, designed by artists, has been attached to the third tower in 2016. This object has a low cultural value.




The office will be described on a other page

## Tower 1

The original tower has been constructed in 1925. From 2015 the structures are being redeveloped and the tower has gotten a new curtain wall. This intervention is colored yellow because we felt that this was possibly a good idea

B. Bronswijk, 2016

## Bridge 1

The bridge was constructed in 1927 connecting the first and the second tower. Have of the bridge has been renovated and painted to conserve the steel of the structure.

B. Bronswijk, 2016

## Tower 2

The second tower has been constructed in 1929 when a pneumatic system was integrated. In 1960 a new tower was constructed next to the original tower. This part was extended in 1970. In 2016 the original tower from 1929 has been redeveloped.

G.J. Dukker, 1981

## Bridge 2 + Tower 3

The original bridge from 1927 was replaced in 1931 with a new and longer bridge. With the construction of this new bridge the third tower was rebuild as well.

## Portable elevators

The portable elevators have been changed multiple times. There are no historical photos of the current portable elevators. The latest historical photos we have are of the year 1981. We only know that these elevators have been replaced in the 20 years after that.

B. Bronswijk, 2016

Traffic light
( redevelopment + office )

high value  medium value  low value

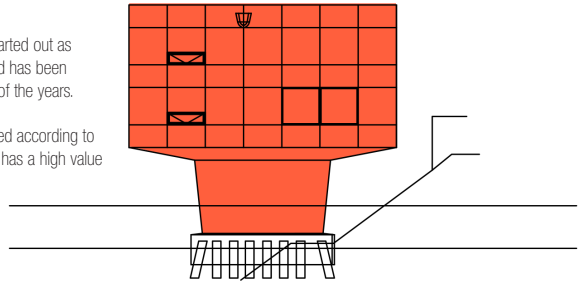
Historical mapping
( high value- low value )

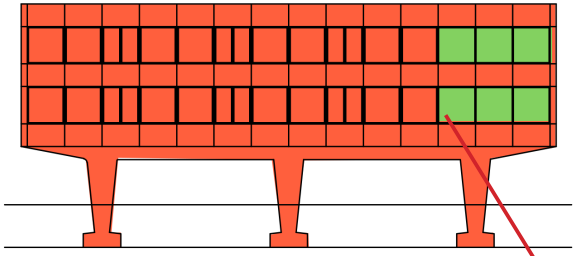
1951-high  1951-low  1930-high  1930-low  1910-high  1910-low

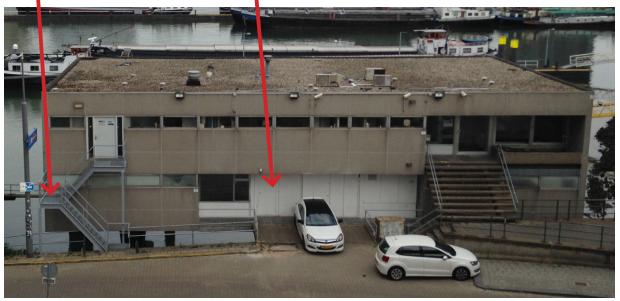
## Office building

The building on the quay started out as an office annex dwelling and has been transformed multiple times of the years.

This building has been valued according to the traffic light system. Red has a high value and green a low value.







B. Bronswijk, 2016

## Facade

The prefab concrete panels which cover the total building have the same colour as the façade of the Maassilo and are still original. The material of the facade has a high historical value. Some camera's and street lighting have been attached on the façade, which give the façade a messy appearance.

The original garage doors on the groundf loor have been replaced after 1971 and the windows on the left side has been covered. The setback in the facade has been preserved therefore we valued this part of the building as a medium value.

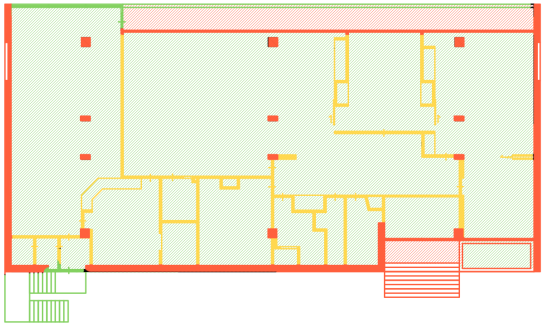
## North facade

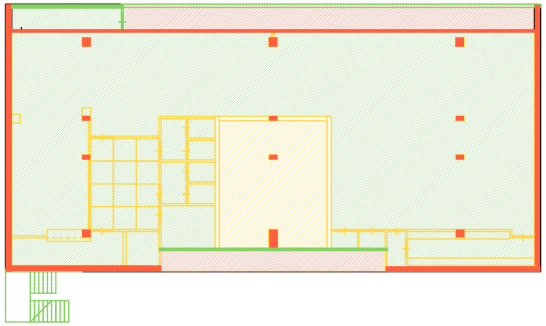
Part of the terrace of the north side has been replaces with an internal staircase. The addition of this staircase compromised the symmetrical character of the north façade. This interventions has a low value.

CV Maassilo, 1980

## Interior walls

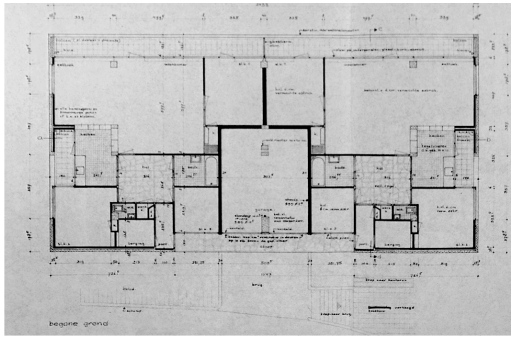
The two original dwellings were transformed into a office in 1971. At the same time top floor office got transformed as well. The interior walls are not original and therefor we valued them as medium valuable.



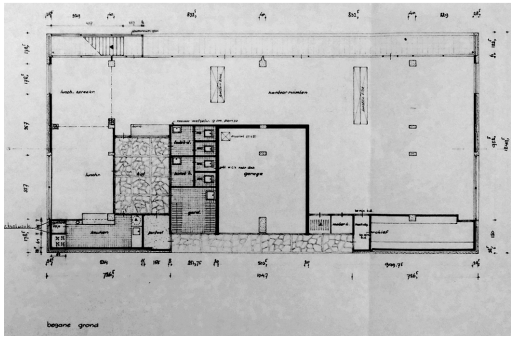


## Fire escape

After 1971 a fire escape from the first floor onto the quay has been added on the south side of the building. A door has been added to provide access to the fire escape. This door compromises the original design where all the doors have a setback in the facade.



Achive NAI, 1963 - Plan dwellings ground floor



Achive NAI, 1970 - Plan office ground floor

CV Maassilo, 1971 - Office ground floor

Traffic light
( redevelopment + office )

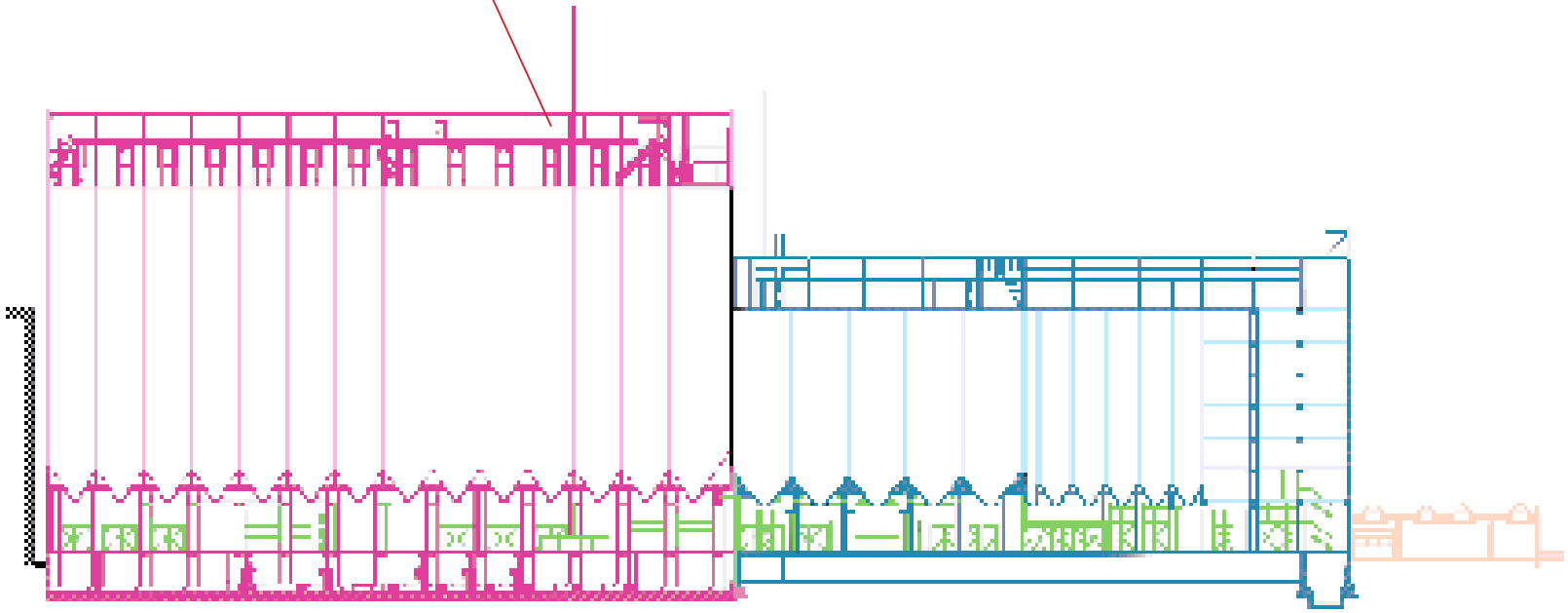
high value · medium value · low value

Historical mapping
( high value- low value )

1951-high · 1951-low · 1930-high · 1930-low · 1910-high · 1910-low

Source: Photo by Andi Belulaj (left) and Drs. Ernie J. Mellegers, Cultuurhistorische verkenning Graansilo Maashaven, Rotterdam 2008

The walls on the upper floor of the attic are later insertions which hinder the open space quality of the space. Furthermore, the walls prevent the light to enter the central space form the outer openings and the ability to have an overview of the attic from those corridors.

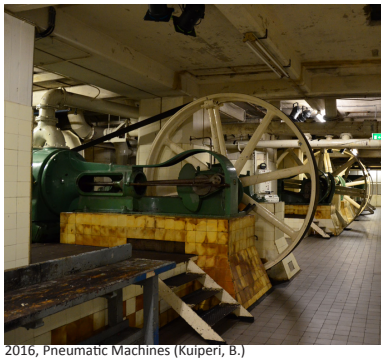


Traffic light
( redevelopment + office )

high value | medium value | low value

Historical mapping
( high value- low value )

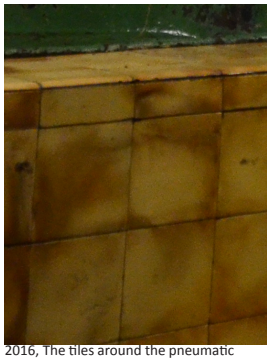
1951-high | 1951-low | 1930-high | 1930-low | 1910-high | 1910-low



2016, Pneumatic Machines (Kuiperi, B.)

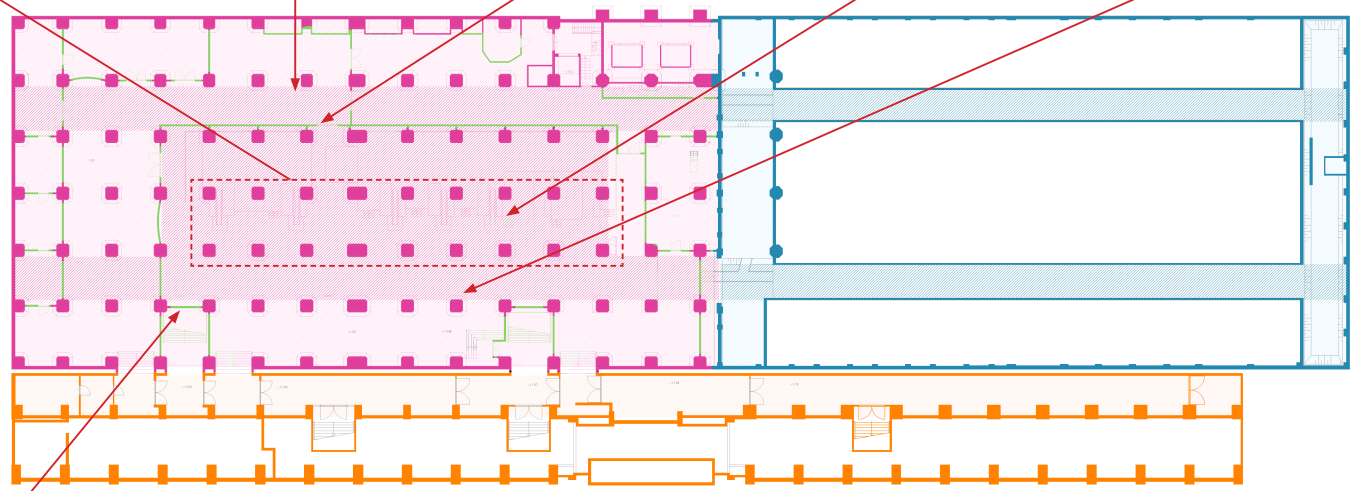
2016, The ridges conceal where the conveyor belts were placed on (green area) (Kuiperi, B.)

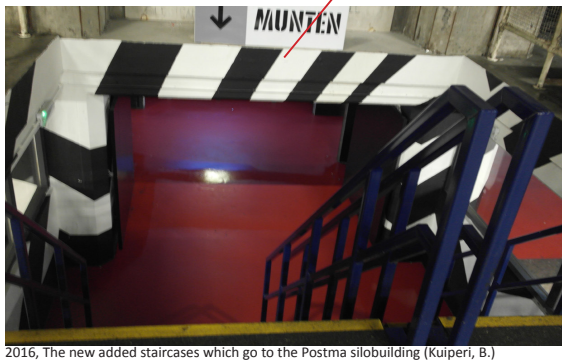
2016, Behind the soundproof walls are the original steel frame with glass walls (Kuiperi, B.)



2016, The tiles around the pneumatic machines have a brown colour (Kuiperi, B.)

2016, End of the columns with white tiles (Kuiperi, B.)






2016, The new added staircases which go to the Postma silobuilding (Kuiperi, B.)

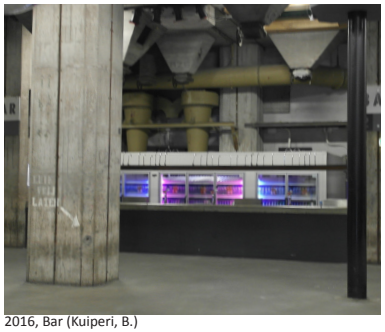
Traffic light
( redevelopment + office )

high value · medium value · low value

Historical mapping
( high value- low value )

1951-high · 1951-low · 1930-high · 1930-low · 1910-high · 1910-low

2016, The biggest partyspace of the Maassilo (Kuiperi, B.)

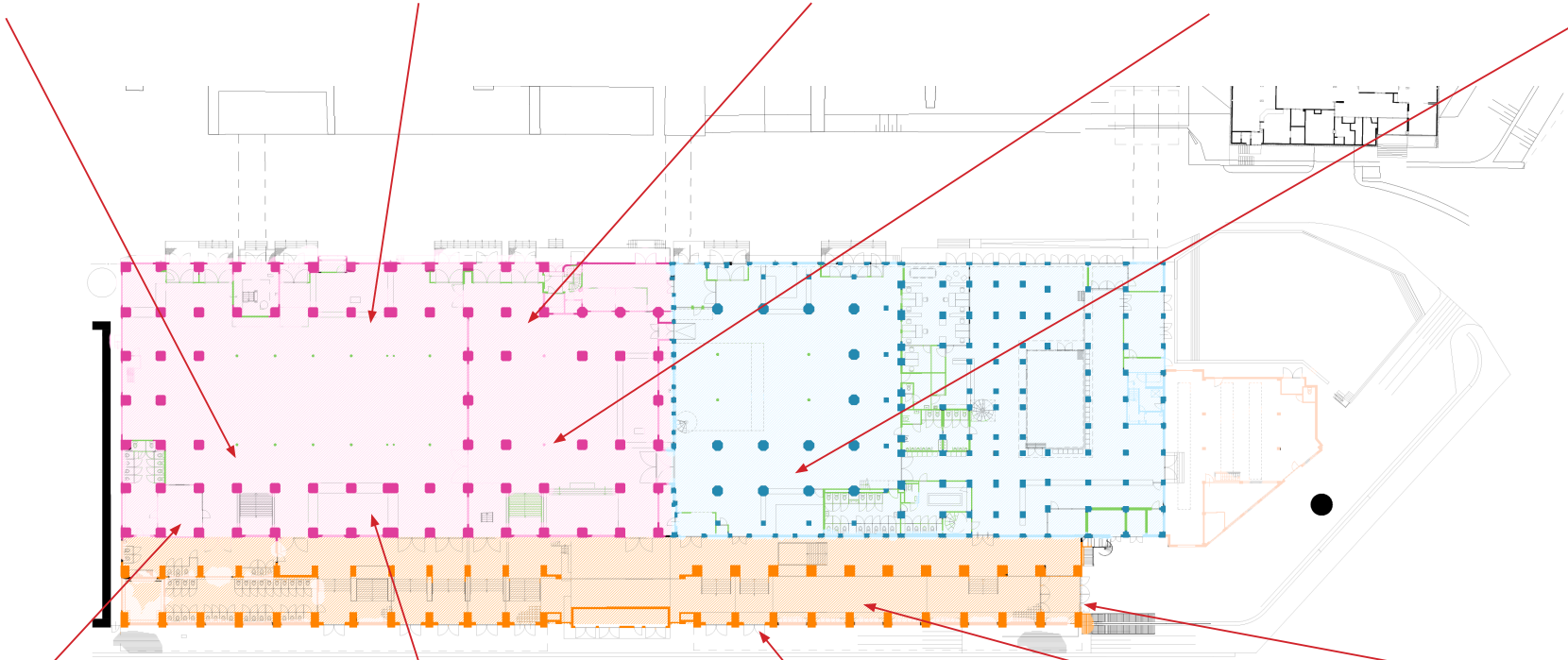


2016, Bar (Kuiperi, B.)

2016, Some of the funnels are interrupted by the last intervention (Kuiperi, B.)

2016, Some of the collumns in the middle have been removed and reinforced with round steel columns (Kuiperi, B.)

2016, Funnels of the Stok part (Kuiperi, B.)

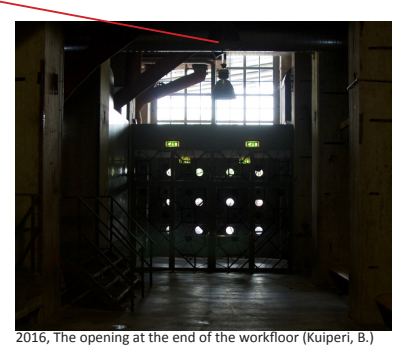



2016, Control room (Kuiperi, B.)

2016, Bar (Kuiperi, B.)

2016, The light and ventilation openings covered by steel plates due to noise disturbance (Kuiperi, B)

2016, Height difference by platform of the train (Kuiperi, B.)



2016, The opening at the end of the workfloor (Kuiperi, B.)

Historical mapping

Traffic light
( redevelopment + office )

high value medium value low value

Historical mapping
( high value- low value )

1951-high 1951-low 1930-high 1930-low 1910-high 1910-low

A. Belulaj, 2016 - entrance emegency stairs in silos

## Emergency stairs in silo

The top of two silos has been cut open and a emergency stair case has been placed inside. These stairs placed during the redevelopment have a temporary structure and have a low value.

## Silos

We recognize that the silos have a historical value as they display the original function as a building. However, to the structure of the silos can't be perceived right now.

Greatavenue.com 2016

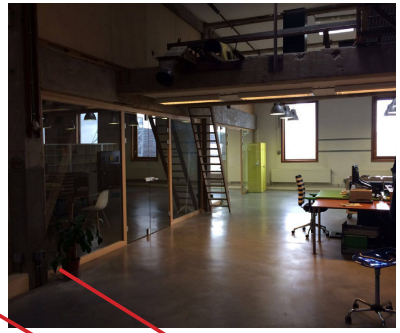
## Elevators

During the redevelopment of 2007 two new elevators have been placed into the original elevator tower of Brinkman. These elevators are very new and have no cultural historical value.

## Interior walls

Originally the attic of Stok was one open space. The East past of the attic has been transfromed into office spaces. During the redevelopment walls have been added. These walls have low value.

B. Bronswijk, 2016

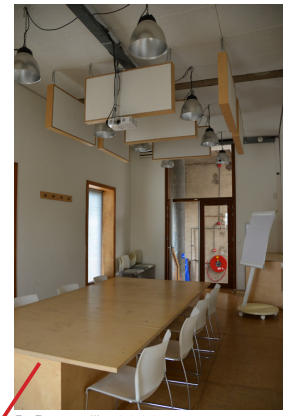


Creativefactory.nl, 2016

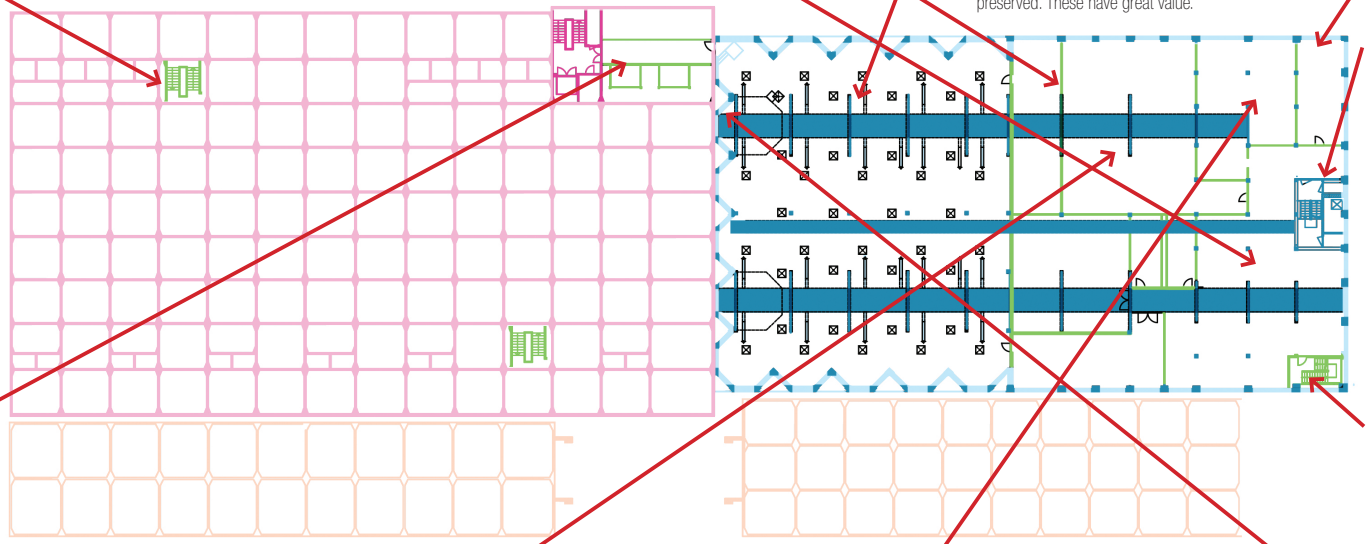
B. Bronswijk, 2016

## Structure Attic

The structure of the original conveyor belts cover the total length of the building. The combination of the structure and the tubes attached to these structure clearly display the original distributions system. This is the only part in the Maassilo where the original transport system is well preserved. These have great value.



B. Bronswijk, 2016



## Original staircase

The staircase is still original and displays the original logistics of the building. Over the years when the Maassilo still functioned as a grain storage, a elevator has been placed into this stair case. Although this elevator is not from the original design of Stok, it shows that the building has adapted itself to new developed techniques. The elevators fits the original logistics. This is not the case with the two elevators in the Elevator tower of Brinkman which replaced all the original machines in the tower.

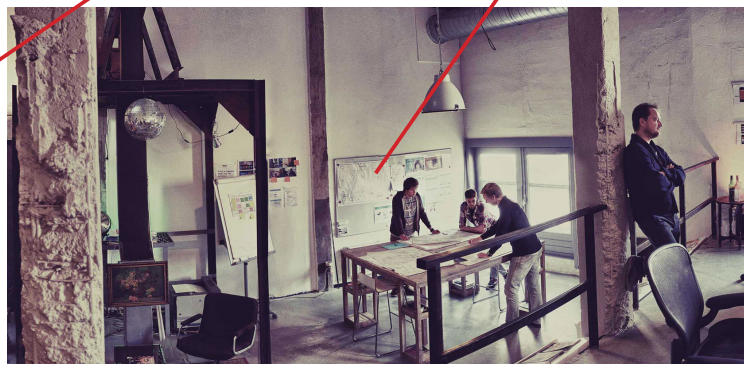
## Emergency stairs

In the corner of the building some emergency stairs have been added during the redevelopment. These have a low value.

## Elevators tubes

The elevator tubes which distributed the grain through the Silo show that the Maassilo functioned as a machine and have a high value. This should be handled carefully.

Creativefactory.nl, 2016



http://archive.onlinedepartment.nl/about-us/, 2016

B. Bronswijk, 2016

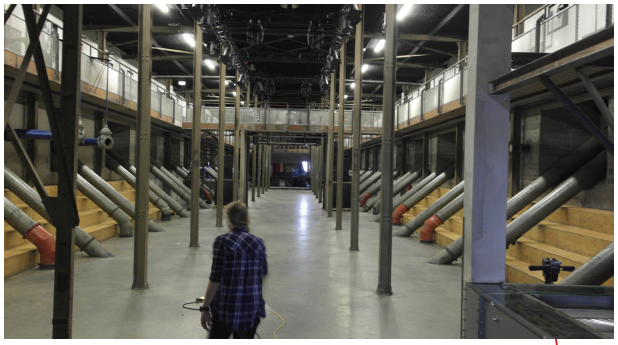
Traffic light
( redevelopment + office )

high value · medium value · low value

Historical mapping
( high value- low value )

1951-high · 1951-low · 1930-high · 1930-low · 1910-high · 1910-low

Source: Photo by Andi Belulaj



## Attic of the Brinkman and Van der Vlugt.

The spatial quality of this area has high value as it clearly represents the original function. In addition, the authenticity and originality of the space expresses the character of the building. There are many elements such as pipes, floating corridors etc. that contribute to this experience. Thus, they should be carefully retained.

Source: Photo by Bart Kuiperi

## Original circulation.

The staircase and the elevators in this area are the original ones. They are the only original vertical connection to all the three part of developments.

Source: Photo by Andi Belulaj

## Interior of the tower.

As shown in the image the floors and elevators are new structures and not original ones.

Source: Photo by Andi Belulaj

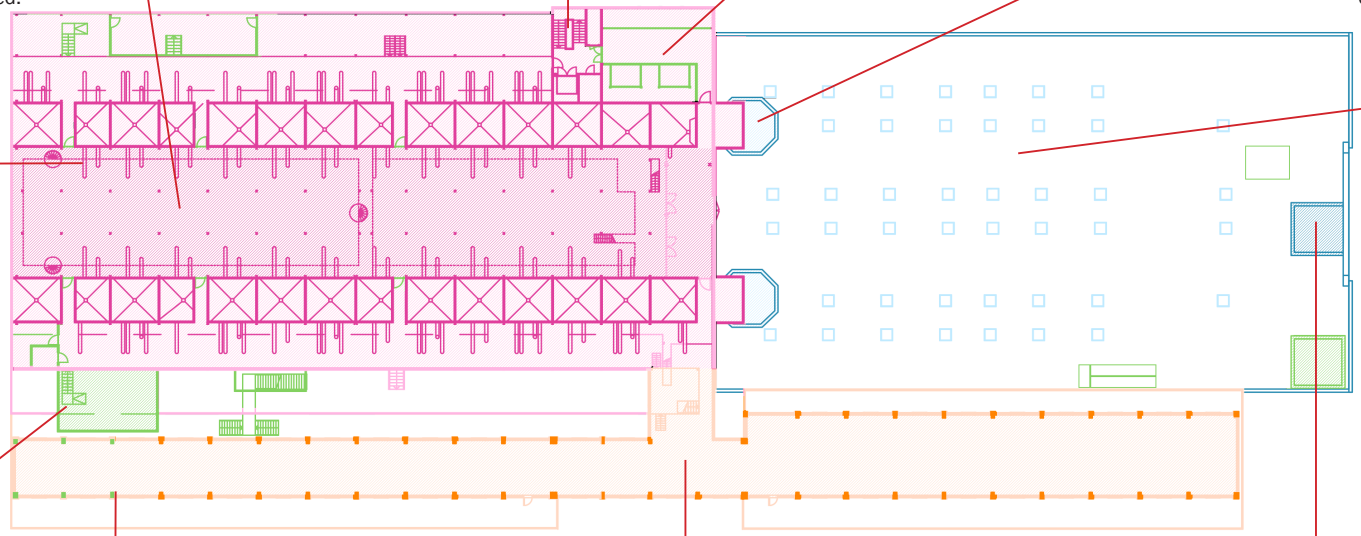
## Transportation connections

These additional structures connect the different silo developments (functionally) and expresses the process of enlargement and adaptability of the of the complex.

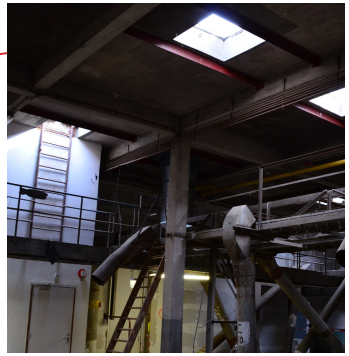
Source: Photo by Andi Belulaj

## Attic of the Brinkman and Van der Vlugt.

The pipes and the original transportation systems should be retained while part of the later interventions (wooden steps) should be removed.



Source: Photo by Andi Belulaj



## Opening on the roof.

The openings of the roof create a unique experience of the space and provide light to the interior.

Source: Bird view google maps.

## Additions.

The new circulation additions on the southwest part are undermining the clarity of the complex silhouette.

Source: Photo by Andi Belulaj

## Intervention?

Although, there are no information on why, when and how this part cahnged, it is clear that it is not the original structure.

## Machinery parts.

Although many parts of the conveyors are missing the ones that are still in the building are highly valued. Not only they express the function but they also provide information on the technology that was used.

Source: Photo by Andi Belulaj (left) and Drs. Ernie J. Mellegers, Cultuurhistorische verkenning Graansilo Maashaven, Rotterdam 2008

## Sign

Original exit of the staircase carefully positioned behind the sign of the building. The sign has high cultural, historical and commemorative value as it is the symbol and the authentic identification sign of the building.

Source: Photo by Andi Belulaj

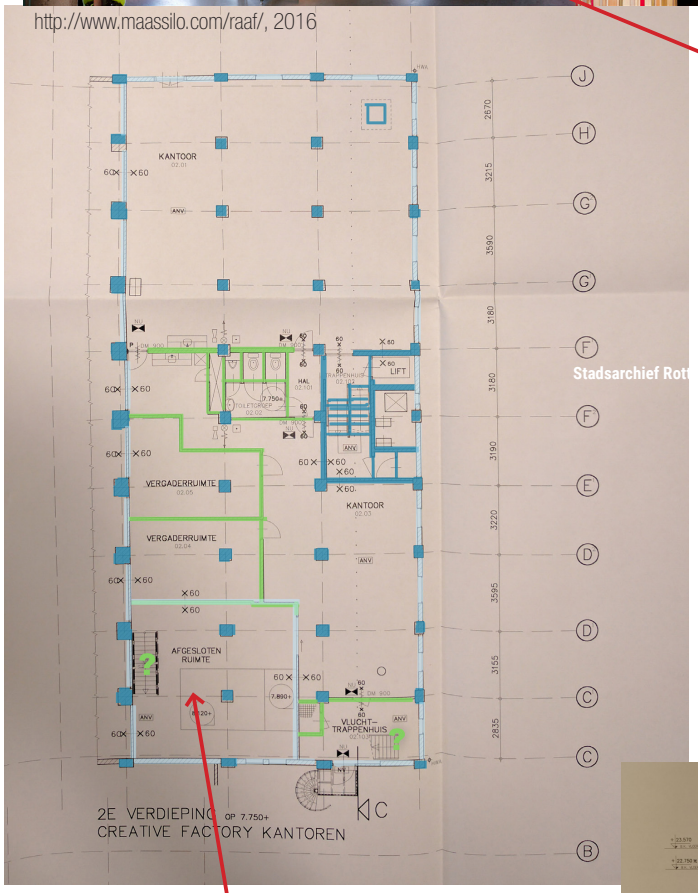
Traffic light
( redevelopment + office )

high value · medium value · low value

Historical mapping
( high value- low value )

1951-high · 1951-low · 1930-high · 1930-low · 1910-high · 1910-low · -low

http://www.maassilo.com/raaf/, 2016




## Original machinery

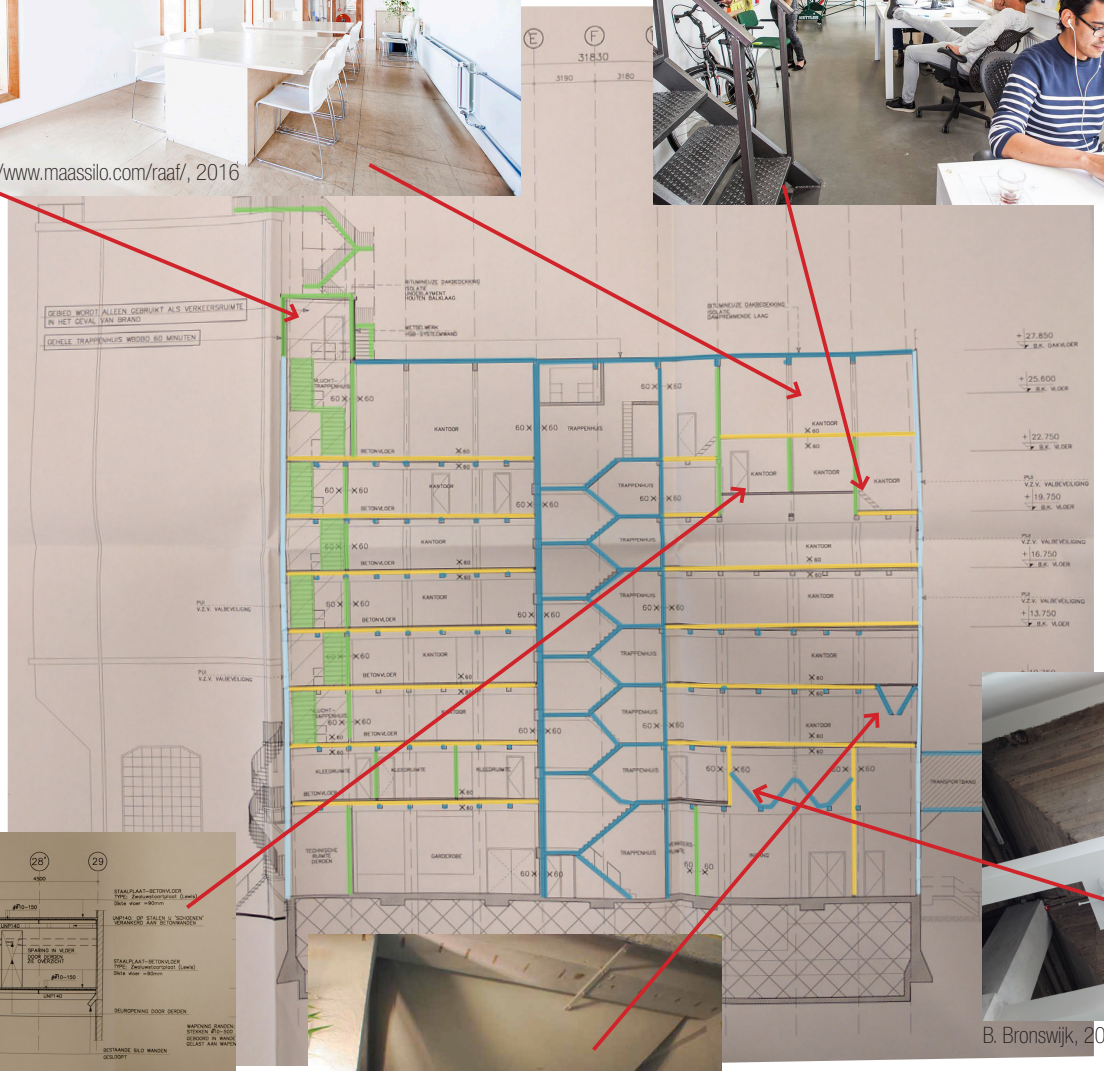
One corner of the factory part hasn't been touched during the redevelopment. We didn't have access to this part, but supposedly there is a lot of original machinery preserved in this space. This machinery has a high cultural value.

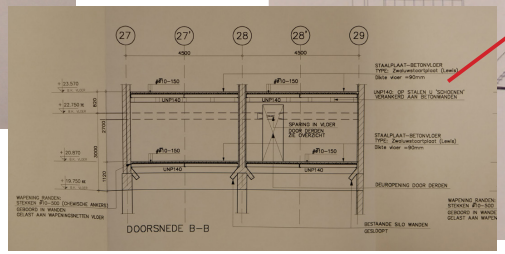
http://www.maassilo.com/raaf/, 2016

## Floors

An additional layer of concreted has been added to all the floors. This interventions destroyed all the visible tracks of the original machinery.

Facebook - Creative factory, 27 mei 2016




The factory part of Stok contained some smaller silos as well. After the redevelopment of the Creative Factory new floors were made and all the silo walls were removed. Only a few funnels of these silos are still there.

B. Bronswijk, 2016

CV Maassilo, 2008

## Funnels and elevator tubes

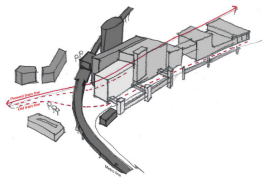
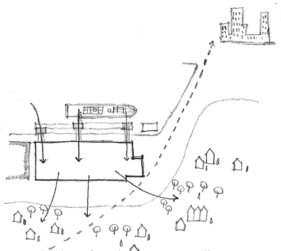
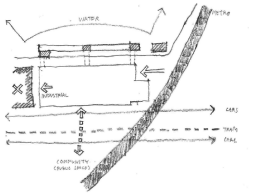
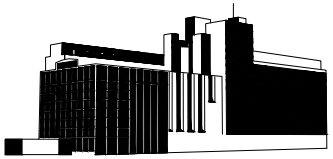
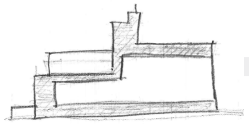
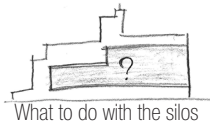
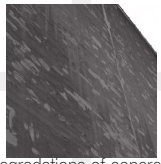
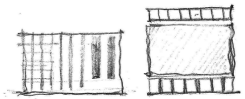
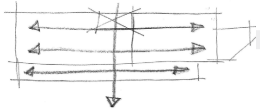
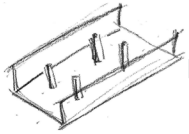
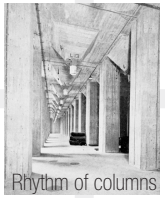
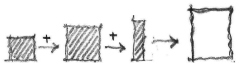
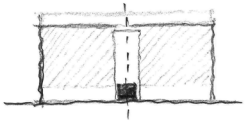
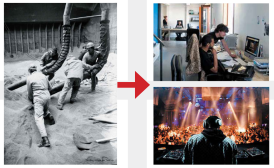
A few funnels and elevator tubes have been preserved. These display how the building original worked and have great value. -

Traffic light
( redevelopment + office )

high value · medium value · low value

Historical mapping
( high value- low value )

1951-high · 1951-low · 1930-high · 1930-low · 1910-high · 1910-low

| | Age | Historical | Artistic | Commemorative | Use | Newness | Conflict |
|---|---|---|---|---|---|---|---|
| Site | |  Development of complex on site | |  Value for the surrounding | | |  |
| Structure |  |  Development sizes silo |  Rhythm and organization of facade | |  Used parts of structure |  |  What to do with the silos |
| Skin |  Degradations of concrete |  Approaches for facades | | |  Daylight |  New facade elevator tower |  closed facade |
| Space plan | |  Axis according to transport system | | |  Big open space | |  Compartmentalized |
| Services |  Relics of former machinery | |  Rhythm of columns | | | |  Funnel cut by wall |
| Stuff |  Relics of former machinery | |  Rhythm of tubes | | | |  Stuff on the ceiling |
| Story | |  Scale of grain storage to empty building |  Adjustment to site |  Once upon a time |  From industry to night club and offices | | |

# Bibliography

Eric Michael Weisenmiller, *A study of the readability of on-screen text,* Virginia Polytechnic Institute and State University, July, 1999 Blacksburg, Virginia.

Lynch, Kevin. *The Image of the City,* MA: MIT, *Cambridge,* 1960.

Leach, Neil. Rethinking Architecture: A Reader in Cultural Theory. New York: Routledge, 1997.

Patrik Schumacher, *Tectonic Articulation – Making Engineering Logics Speak, A*D 04/2014, Future Details of Architecture, 2014, London.

Rogic, Tamara. Converted Industrial Buildings: Where past and Present Live in Formal Unity. S.l.: S.n., 2009.

Vrieze, R. d., Vliet, P. v., & Mellegers, E. J. *Cultuurhistorische verkenning Graansilo Maashaven*. 2008, Rotterdam.

Costanzo, Denise. What Architecture Means: Connecting Ideas and Design. New York (N.Y.): Routledge, 2016.