Research book

Maassilo complex

Maashaven | Rotterdam

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Tutors:

Lidy Meijers (Arch.)
Frank Koopman (Bt.)
Suzanne Fischer (His.)

Giel Leunissen 4386256

History

Introduction

The aim of this study is to research the development, typology and value of the grain-silos in the Netherlands, especially grain and farm feed silos. With this knowledge we will be aware of the transformation of this typical type of building.

Silos are a typical typology in the industrial building history. this building type is common in the Netherlands. Silos are build everywhere, in the city, on the country side, near the water, train-tracks and highways. The character of a silo are blind facades, vertical orientated, consist of shafts and at the top and bottom activities are experienced.

The definition of a silo is as followed.

Noun, plural silos.

1 .a structure, typically cylindrical, in which fodder or forage is kept.
2. a pit or underground space for storing grain, green feeds, etc.
3. Military. an underground installation constructed of concrete and steel, designed to house a ballistic missile and the equipment for firing it.

(oxforddictionaries.com)

A silo is installation to store and to adapt a resource. These resources can be everything from grain to oil. A silo is not intended to be beautiful, it accommodates technology and results from technical developments. These technical developments define the form. Still in these buildings are hiding a beauty and architecture, they are also part of the landscape or urban plan. Also the social aspect scan be very important. Silos was a place were people worked, it was a kind of a symbol for the community. Silos are telling also a story of technical development during the centuries (Loeff, 2004).

As described above silos have some kind of values. silos still under further pressure by scaling and loss of function.

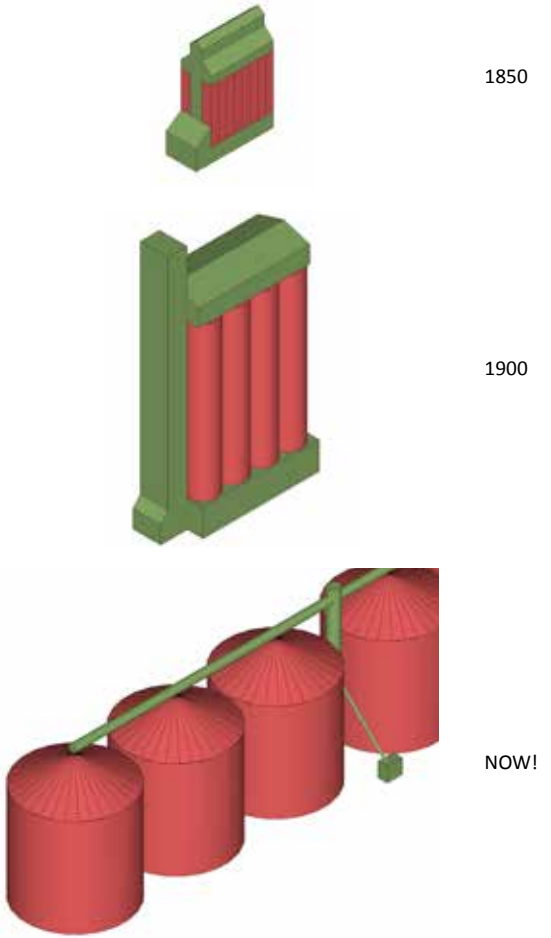
Happily in recent times silos are again in the spotlights for re-use. In order to prevent silos from bad intervention and revaluation of these buildings, we must examine the value proposition of silos.

This study is build up as followed

-Historical development of the grainindustrie
-Introduction of the ‘‘modern’’ grain silo
-The location and distribution of the silos
-The appearance of the silo building
-Architecture: Grain silos, from industrial palaces to functional structures
-Technology and equipment
-Overview of the development grain silo
-Conclusion

In the entire study I use the same colors for the functions of the silo, these are:

Red: Storage
Green: Installation



Schematic change of the appearance of the ‘‘modern’’ silo

Historical development of the grainindustrie

Preindustrial time

In the pre-industrial time the whole proces of harvesting corn was much more labor intensive, small scale and on a traditional way. Everything was then done by hand. The goods were stored in bags and almost direct processed into flour.

+/- 2000 B.C. Egyptians, Romans, Chinese empire

The very first grain shelters were stored in dry soil. These ''holes'' were called ''Seiros'' by the Greeks, ''Sri'' by the Romans and ''Sylos'' by the Spanish.

The goods were stored in small scale what is still happening today in Africa. The Romans build this kind of silos nearby the water to supply their troops for food.

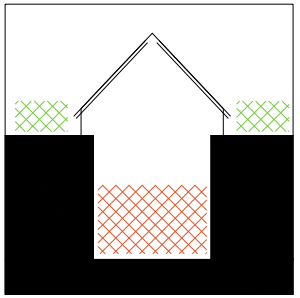
+/- 1000 A.D.

The form and function remained the same for the former times. Only in the Middle Ages they build ''tiendsilo's'' these silos were owned by the church and monasteries. The grain that was stored at this silos were intended for the poor people.

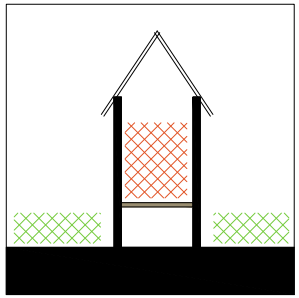
Egyptian grain silo in the ground +/- 2000 B.C.

African grain silo Nowadays

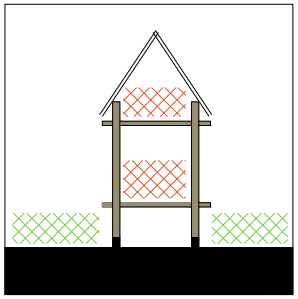
A reconstruction of a medieval grain silo



Schematic representation of the first silo



Schematic representation of the African grain silo, to protect the grain from wetness it is stored at a higher level



Schematic representation of the medieval grain silo, often made in wood.

+/- 1600 A.D.

In this time there were three types of storage buildings namely: corn warehouse (spieker) at the countryside, early industrial-mill in the city and brick warehouse in the city.

Industrial time

+/-1800 A.D.

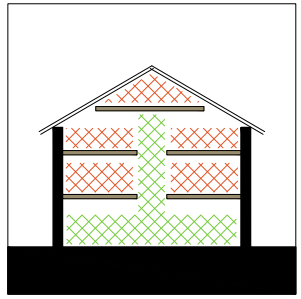
Before the industrial time people live of the small scale food production, they mostly worked at a farm small industry and trade. All there needs they found in the neighborhood. In the industrial time the world population is growing significantly and people leave the country side to live in the cities. This resulted in a big change in the food supply. A lot of food (mostly grain) has to be imported from other countries.

This importation of goods happened already in the 17th century during the golden age in the Netherlands.

In 1828 the first steam mill is founded in Amsterdam.

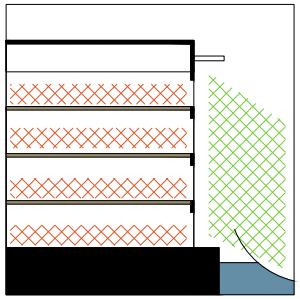
From 1870 the European grain market could not compete with the very cheap grain from the US (United States). European markets were flooded with cheap grain from the US. This was a disaster for grain farmers but a luck for city dwellers that had now cheap grain for hands. The grain industry was from this time

Barn at the countryside, this example can also used for other storage.



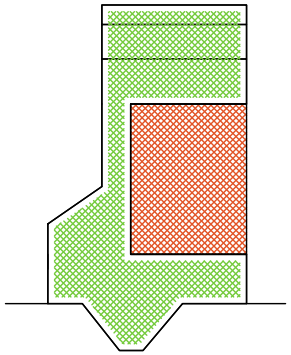
The setup of a ‘‘spieker’’

A warehouse in the city, this example can also used for other storage



Schematic representation of a warehouse with the combination of the water

A typical American silo



Schematic representation of a grain silo in America

independent on local agriculture (Richards, 1958).

In foreign agriculture changed very much. The magnification of scale and industrialization and brought the farmland much more per hectare. This leads to several new port buildings include: entrepots, vemen, refrigeration warehouses and (grain)silos.

In 1880 a new type of grinding technique is invented a so-called ''walsenmolen'' with iron grinder, therefore they used stone grinders.

+/- 1950 A.D.

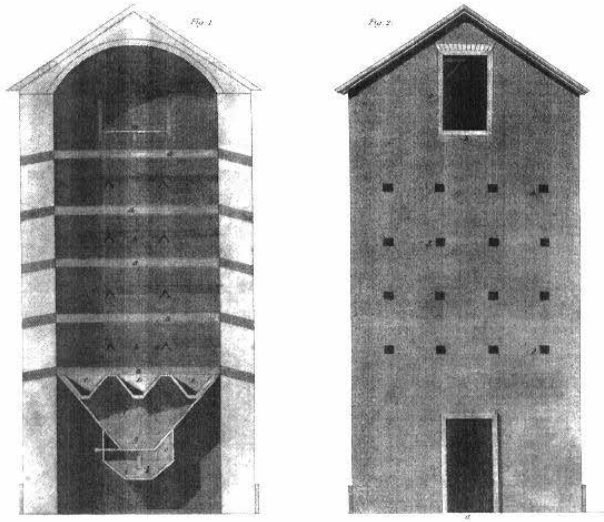
After the world war II the small grain companies were displaced by large corporations. The increasingly scientific agronomy resulted in rapid succession of technical improvements. In a span of two decades the machines took a large part of the work of man and horse over. One of the biggest improvements in the manufacturing process was the switch from bag to bulk transport. This meant that people did not have to drag with bags of grain, this spared a lot of hard labor.

Introduction of the ''modern'' grain Silo

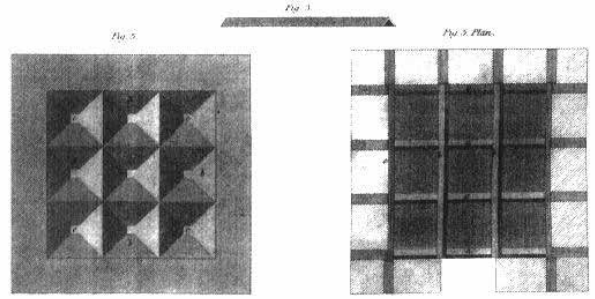
The modern industrial silo typology is originally invented in the US (United States). Under the influence of new techniques and materials that created an entirely new silo building, this

A example of a big scale silo from 1920

Early example of a functional approach to store goods (the early functional tradition)



Section and facade of one of the first drawings of a grain silo ca. 1810 (http://www.horizonview.net/~ihs/GrainElevators/GrainElevator_Types1.html)



Plan of one of the first drawings of a grain silo ca. 1810 (http://www.horizonview.net/~ihs/GrainElevators/GrainElevator_Types1.html)

building will also end up in Europe as well. This development takes place in the beginning of the 1850's.

Farm lands in America were at first very difficult to reach but by the arrival of train tracks that were connected to the open grain market, these farmlands become very attractive for economical advantages. The farmlands were connected with the harbor at the east-coast of the US and from there the goods were transported to Europe (Loeff, 2004).

Next to the train tracks arrived a lot of farmer activity. There was a demand of a new type of building to efficiently store grain namely the grain-silo.

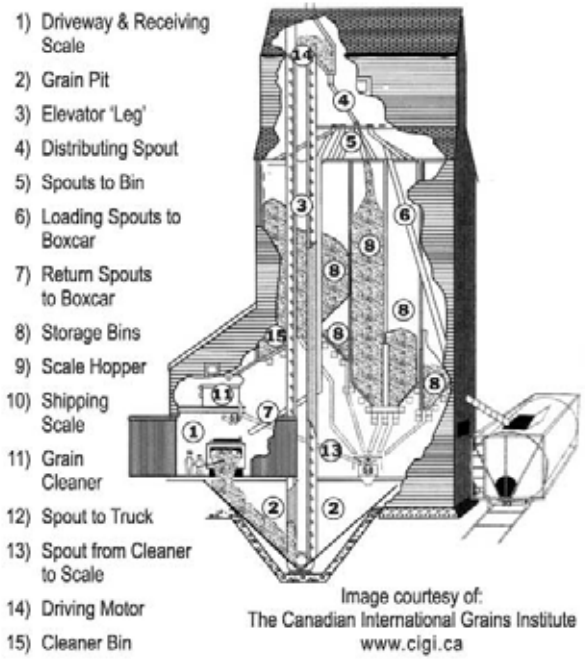
The first grain-silos were barns with cells, these cells one could fill with grain.

There was a big difference between the silos at the countryside that was build by a local contractor (small and made of wood) or at the city by an engineer (big and made by concrete). (Mahar-Keplinger, 1993)

The wooden silo is now a typical icon of the countryside of the US. (Richards, 1958)

In the United States the silos are the leader in the technology and design of the grain silo. Many European modernist architects (Mendelsohn, Grophius and Le Corbusier) were inspired by the large concrete silo buildings in the US.

A example of a typical American silo (earlyindsutrialmachines/grainsilosinamerica.com)



The organization of the first ''industrial'' grain silo (earlyindsutrialmachines/grainsilosinamerica.com)


Inside of a wooden silo where the elevator leg is visible (http://www.sandpointfilmmakers.net/filmmaking/co-op-grain-elevator-sandpoint-idaho/)


Inside an old grain silo made out of wood (http://www.sandpointfilmmakers.net/filmmaking/co-op-grain-elevator-sandpoint-idaho/)

The European countries that were front-runner's to bring grain silos to Europe were France and Germany in the 1820's.

The knowledge of grain silos took off much later in the Netherlands, in 1890 the first journals were distributed with information of grain silos. From 1880 the Netherlands imported a lot of grain via the port of Rotterdam. Rotterdam become therefore the main port for transhipment and grain storage in the Netherlands.

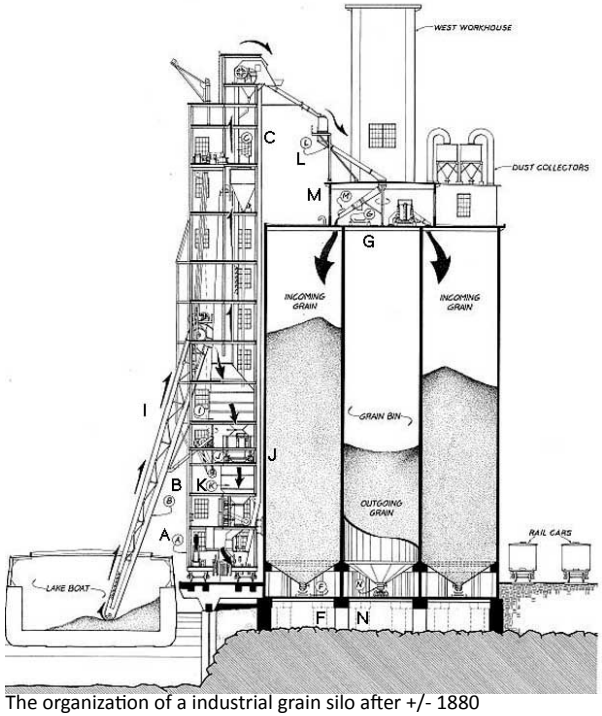
The location and distribution of the silos

Water

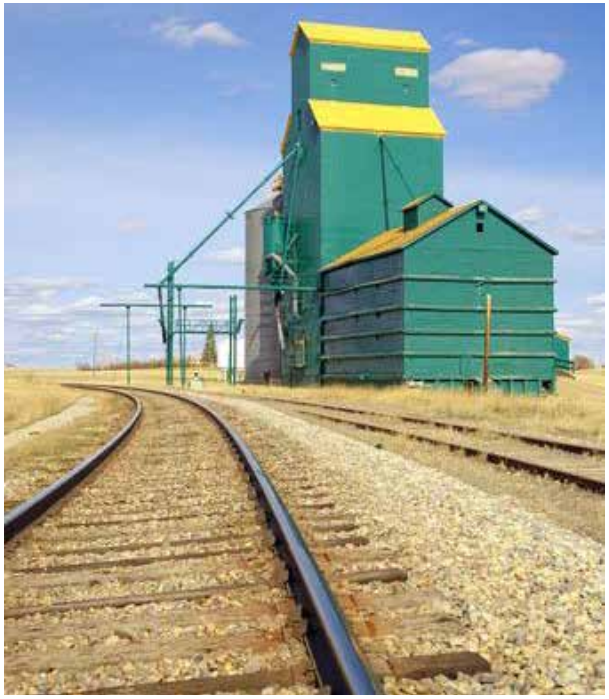
The oldest silos in the Netherlands are all located next to the water. This is the direct result of the way of grain transport. The grain came from overseas territory with ocean steamers to the major ports of Amsterdam and Rotterdam. From these silos the grain was transferred to smaller boats to the hinterland to other silos near the water.

Train tracks

Besides waterways the railway played an important role for the transport of grain. In the second half of the 19th century the train tracks quickly developed over time. Corporations who had not direct access to a canal or



The organization of a industrial grain silo after +/- 1880


Grain silo at the train tracks

Maashaven 1925 The waterside in front of the maassilo, in the Netherlands the silos are almost all located near the water. (rapport CV graansilo maashaven)


Grain silo in the middle of nowhere, connected only at a street, you only see these silos at the country side

waterway used the railway-track.
Road

In areas where a high intensity of farms silos are usually on the side of a road. These silos are usually fairly recently built (Mahar-Keplinger, 1993).

The appearance of the silo building

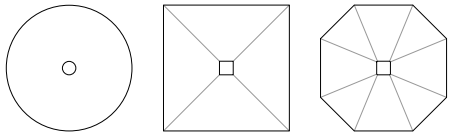
Plan

The plan of a grain-silo consist of two components namely: the cells and the installation/ transportation of the goods. Mostly the cells are a repetition of several cells. The installation/transportation can be positioned next to or above the cells. (Mahar-Keplinger, 1993)

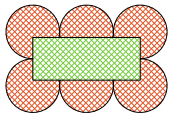
Form follows function,

The appearance of a silo depends a lot on the kind of installation because a silo is just an installation it exist out of machines. The discussion about the appearance change much over time from an industrial castle to a functional machine. Globally you can separate two types of silo in history.

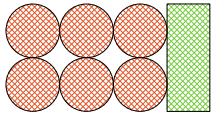
1. The silos are hidden behind a facade so the function of the building is not immediately visible.
2. The Silos are visible, the building revealed the function as industrial installation.



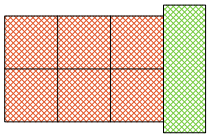
The different kind shapes of silos



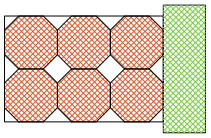
Silo with the elevator in the middle



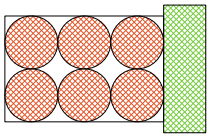
Silo with the elevator at the outside, the building revealed the function as a grain silo



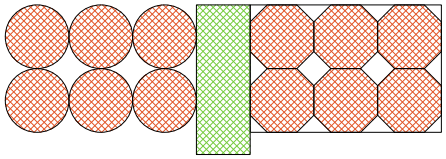
Silo with the elevator at the outside



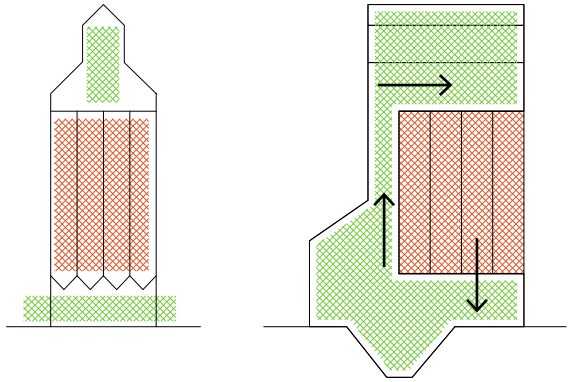
Silo with the elevator at the outside



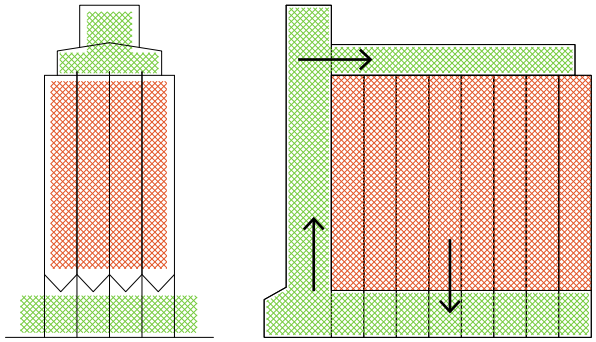
The silos are hidden behind the wall



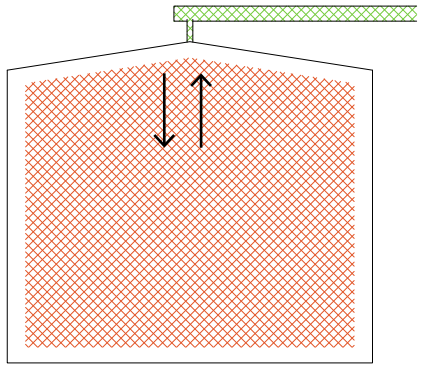
A typical plan of a grain silo that is expanded over time, the silo consist out of two forms of silos



Organization of the silo around 1850



Organization of the silo around 1900



Organization of the silo today (one sided)

Building materials

The form has also a lot to do with the materials they used. Till the end of the 19th century the silo exist out of one closed form. With the further development of the reinforced concrete the silos change came detached from the building form.

Wood

The first silos in America were made in wood, the compartments of the silos were very small.

Brickwork

Silos in brickwork are very rare. To build a silo in brick it was very time consuming because of the load of the grain the thickness of the walls can be up 1 meter. Besides brickwork steel also had to be used to incorporate the pulling force.

Concrete

Reinforced concrete is the most used material for silo buildings. The advantage of concrete is that the dimensions are almost limitless. The pressure can are incorporated by the concrete and the tensile strength by the reinforcement. Yet another advantage is the speed of construction, through the use of '' sliding formwork '' glijbekisting.

Steel

After the second world war the use of steel silos grew enormously, and still today it is the favorite material to use. The advantage is that it can be built up quickly because they consist of prefabricated panels, they are therefore easy to adapt and light weight. The only downside is that they may rust.

Wooden silo (wikipedia wooden silo)

Silo made out of bricks at the harbor of Bremen build between 1914 and 1929 (http://corabuhlert.com/2013/05/18/photos-bremen-harbour/)

American Elevator made out of concrete Buffalo, New York built in 1906 (http://wikimapia.org/12904236/American-Elevator)

Stainless steel silo (Americansilo.com)

Architecture: Grain silos, from industrial palaces to functional structures in the Netherlands

<1900

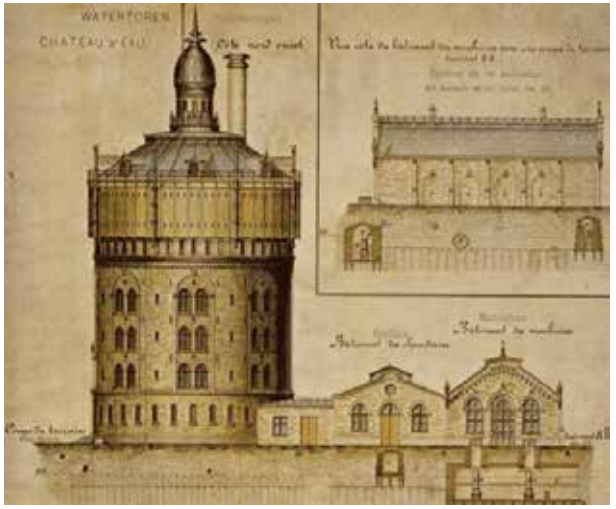
The oldest silos of the Netherlands are located in the harbor of Amsterdam and Rotterdam and other important industrial cities. The first Dutch silo was build in 1885 in Delft. This silo was used by the ‘‘Gist en Spiritus fabriek’’ (yeast and methylated spirits factory Delft) (Loeff, 2004).

One of the most important 19th century grain-silo in the Netherlands is the ‘‘Korthals Altes’’ in Amsterdam that dates from 1898. The typical appearance of the symmetrical building is the brick and use of the pitched roof with a tower in the middle. From the outside it doesn’t even looks like a grain silo but a warehouse. The design refeers to the 19the century neo-gothic style. The architect J.F. Klinkhamer expressed that the most appropriate architecture for utility was the neo-gothic style. This concept refers to the idea that an industrial complex is a castle or a cathedral for the employees. Such examples of silos we can also find in Germany. A other good example of a neo-gothic style silo is the silo Sint Job in Rotterdam. Unfortunately, this silo was demolished in 1986, the only remaining part is the warehouse.
These examples show clear that the build-

Meelfabriek ‘‘De sleutels’’ (flourfactory) at Leiden ca. 1900 (willemsmithistorie.nl)

Silodam Amsterdam 1995 (now reused) (vanstigt.nl)

Maassilo 1st part of Stok ca. 1910 (rapport CV graansilo maashaven)



Water tower of rotterdam build in 1874, this example show the expression how an industrial building have to look (http://www.engelfriet.net/Alie/Hans/watertoren.htm)

ings in that time the industrial buildings got very expression with the use of decorated elements, also the function as a silo is hidden behind a facade.

1900-1930

In the ‘‘10 and ‘‘20 of the 20th century their is a big change in architecture style that the appearance of silos shift drastically. This style called functionalism. Functionalism assumes that the function determines the shape of the building, so that the building should be set clear and legible. The oldest silo build in concrete in 1910 is the Maassilo (1st part) in the harbor of Rotterdam by architect J.P. Stok. The design The design of the grain silo is drastically different from what we saw before. This building breaks with traditional design and can be compared with the early American silo buildings. Also a good example of this kind of silo is the Lassie silo in Wormerveer, build in 1912 by the famous architect M. Stam.

The typical characteristics of the functionalist are the installation shafts and silo cells that are organized separately. The naked construction are also good visible (Loeff, 2004).

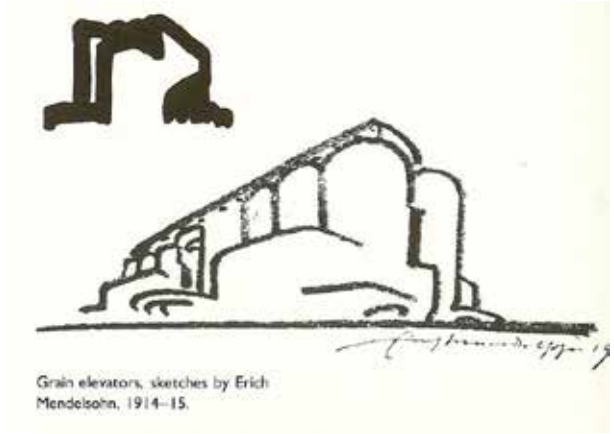
The second part of the maassilo (1927-1931) was build by the famous architect J.A. van der Vlugt. This part of the maassilo is also designed in a functional way. The shaft and the ‘‘concrete box’’ are visible and revealed their function.

Maassilo 1st part of Stok ca. 1910 (rapport CV graansilo maashaven)

Lassie silo Rice factory complex in wormerveer 2015 (Flickr Morpheus)

Maassilo 2nd part of Brinkman en van der Vlucht ca. 1935 (rapport CV graansilo maashaven)

This silo build in 1906 American Elevator - Buffalo, New York built in 1906 (http://wikimapia.org/12904236/American-Elevator)



Silos were an inspiration source for the functional architects, like Mendelsohn sketch from 1914

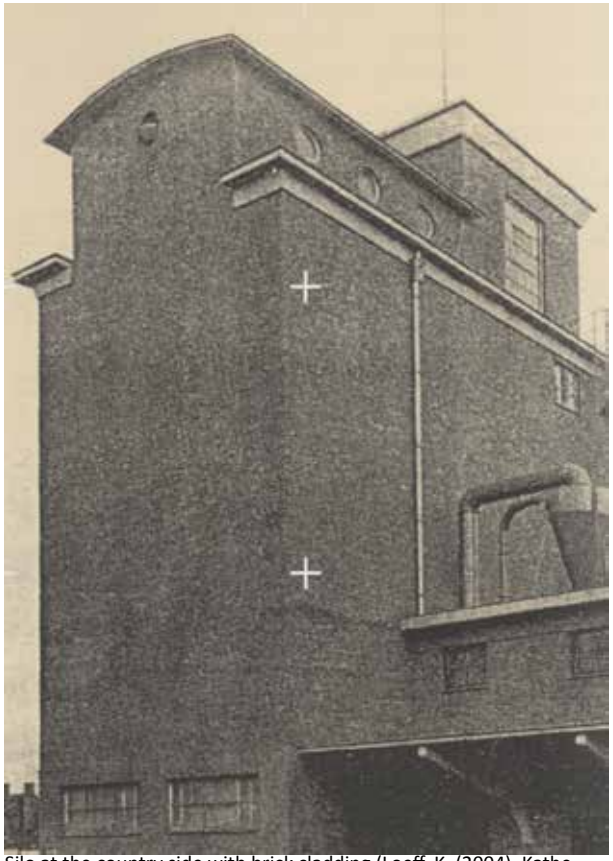
1930-1945

From the ‘30 besides functionalism their was another style called expressionism. Functional architects assume that their is a direct link between: design, technical lifetime and users need. A good example of this style as an silo building form is the silo complex agricultural cooperative ABCTV in Winterswijk. This complex was build in 1940 and designed by architect J.G.A. Heineman. The construction is build of reinforced concrete and then clad in yellow brickwork. The steel box on top has been set up later.

1945-1965

This period after the world war II was marked by rebuilding the Netherlands. This time was the opportunity for new companies. Although it seems that there was little attention during this period to design, the opposite is just the case. They put a lot of afford to make a nice design and also with traditional elements. This was probably the result of the countryside beauty committees, these conservative committees were not charmed about modern industrial silos. Good example is the silo building in Nieuw Buinen build in 1952 by architect ... The building refers to a kind of a castle tower included turrets. Unfortunately, this silo is demolished (Loeff, 2004).

Silo at the country side with brick cladding (Loeff, K. (2004). Kathedralen van het platteland, Silogebouwen van graan- en veevoederbedrijven in Nederland. Zwolle, The Netherlands: Tijl offset.)



Silo at the country side with brick cladding (Loeff, K. (2004). Kathedralen van het platteland, Silogebouwen van graan- en veevoederbedrijven in Nederland. Zwolle, The Netherlands: Tijl offset.)

Silo (Loeff, K. (2004). Kathedralen van het platteland, Silogebouwen van graan- en veevoederbedrijven in Nederland. Zwolle, The Netherlands: Tijl offset.)

1965-now

From the ‘60 ans ‘70 they go back to the idea of the functionalism, thus the function of the building to be visible from the outside. This resulted in a silo building with detached silo cells. Cost aspects also played a big role because labor costs have risen considerably in that time. Scaling makes many silos become too small. In port areas such as Amsterdam and Rotterdam a lot of silos lost their function.

The silos of today are above all very functional and represent not an architectural style anymore. The most surprising thing to note is that no known architects are involved in designing silos.

Now in 2016 we are looking for a new functions for the old silos ,or they will unfortunately demolished.

The Belgian newspaper ‘‘Historical silos Noordkasteel go down’’ (Historische silo’s Noordkasteel gaan neer, Gezet van Antwerpen 05-09-2016) warned for the demolition historical silos that is part of the industrial heritage in the harbor of Antwerp.

Silos have values, they are silent witnesses that show technology advances and architecture through decades.

Big scale stainless steel silos (SCAFCO Commercial Grain Bins & Silos 2015)

Small stainless steel silos at a farm (Stalenvoedersilo.nl 2016)

The newspapers emerge! The demolation of industrial heritage in the harbor of Antwerpen (Gezet van Antwerpen 05-09-2016)

RE-use of the big space of the work floor at the ‘‘Meelfabriek’’ De sleutels’’ (flourfactory) at Leiden ca. 1900 (willemsmithistorie.nl)

RE-use of the big space of the work floor at the ‘‘Meelfabriek’’ De sleutels’’ (flourfactory) at Leiden ca. 1900 (willemsmithistorie.nl)

For more RE-use projects see reference projects

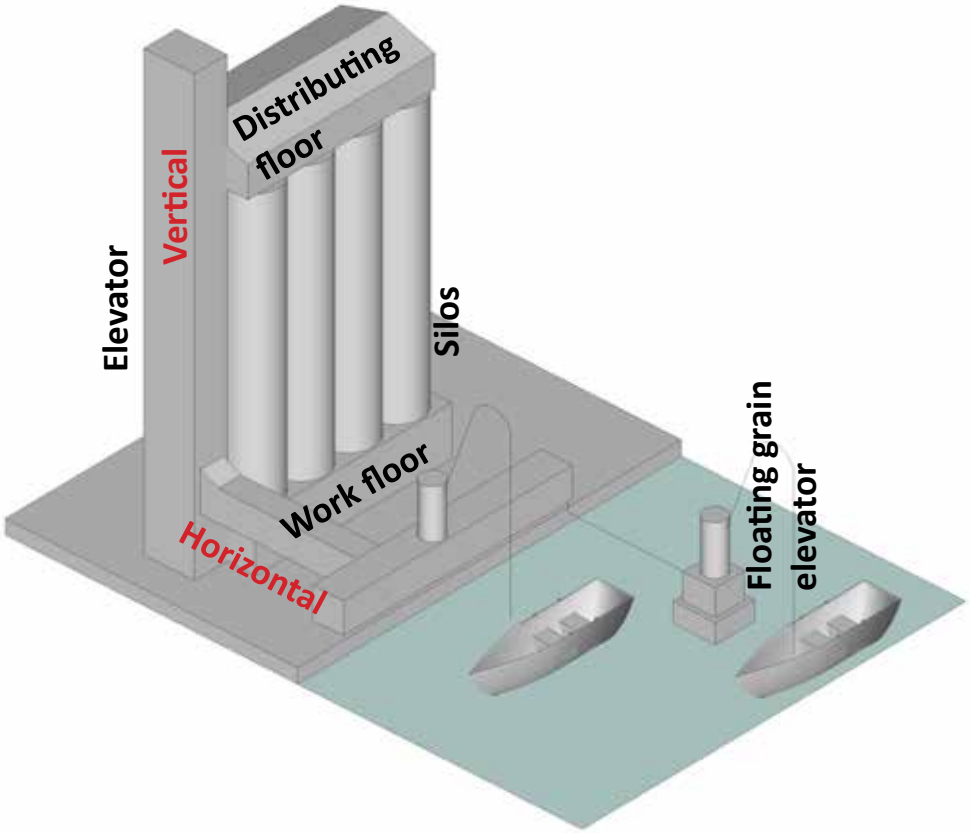
Technology and equipment

What we first mentioned about the appearance of the silo has a lot to do with technology. To understand the technology you immediately understand the form (Mahar-Keplinger, 1993).

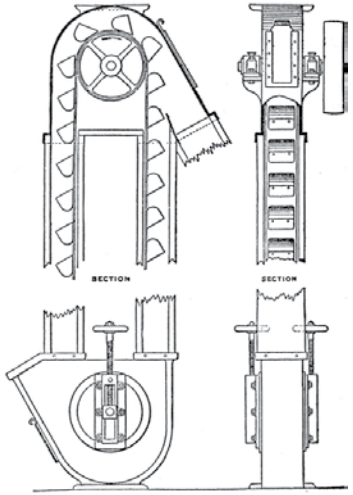
Easy said a silo building exist out of two parts. Part one, the elevator shaft and installation. Part two, the silo as storage space itself. In the design process the architect start with a scheme of the installation and the storage space. After that he designed the envelope of the building, the appearance of the silo buildings depends a lot of the time it is build (look at chapter: *Architecture: Grain silos, from industrial palaces to functional structures).* The evolution of the grain installation has also a great impact of the appearance of a silo building. The silo that which I will describe is a bulk silos for grain. With bulk is meant as goods that is loaded in the hold of the ship, so not per piece, container or on pallets.

When the ship arrived the goods will transported through a pipe, steel screw or elevator leg (see image). This pipe system can also be a floating grain elevator (see image).

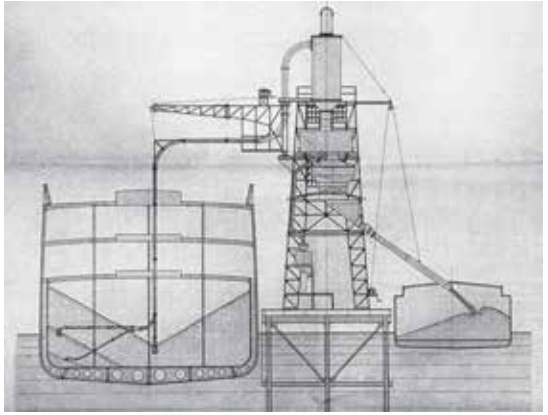
The grain can transported horizontal en vertical on several ways, with a ‘‘elevator leg,’’ rolling tire (only horizontal) and with a pneumatic pipe that causes a suction force. The first elevators in America had a wooden screw.



The components of a silo at the waterside



Elevator leg (Clipart.com/grainsilo elevator leg)



A floating grain elevator that transported the goods into smaller boats (rapport CV graansilo maashaven)

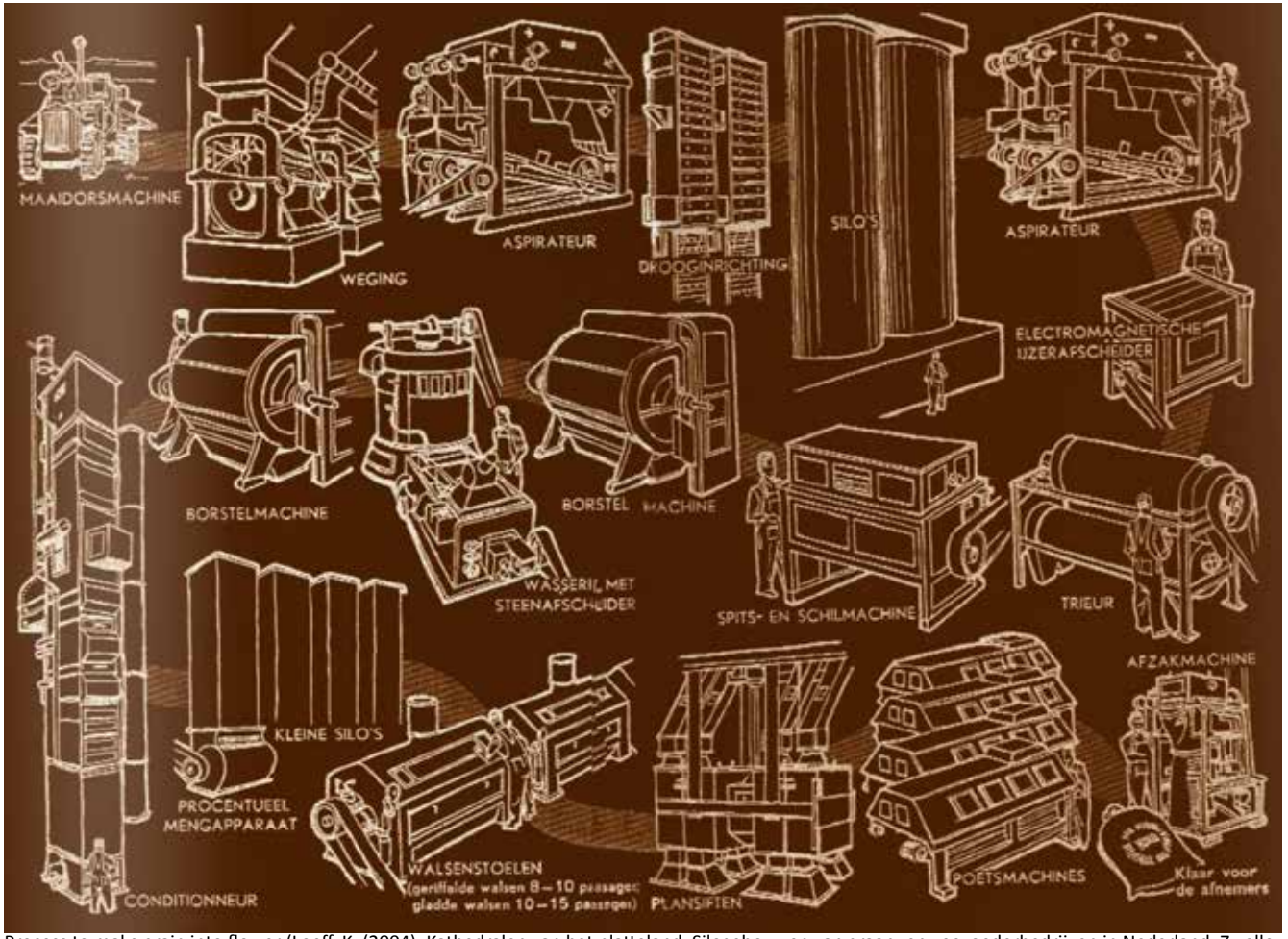
The elevator leg is still used today, so you could not date a silo with this equipment. Especially in smaller businesses it still be used today because it is easy to maintain.

When the grain is inside the silo building the grain will be weight and cleaned. These actions creates a lot of microscopic dust. This substance can be discharged again through a ventilation hole or by a purely installation. This substance is hazardous to health and the risk of fire or explosion is present.

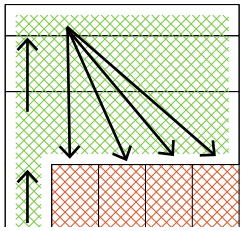
At the distributing floor the grain can transported into the silos directly or when we talk about a bigger silo, it can be put on an other horizontal transportation.

This transportation can be a rolling tire, elevator leg or a pneumatic system. This system is placed at a higher level and can through a pipe enter the silo to store finally the grain.

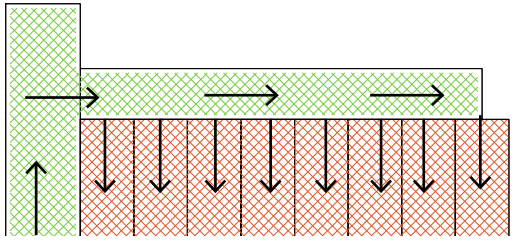
When they need the grain they open up the silo at the work floor of the silo. Than it can be exported on a train for further process (Mahar-Keplinger, 1993).



Process to make grain into flower (Loeff, K. (2004). Kathedralen van het platteland, Silogebouwen van graan- en veevoederbedrijven in Nederland. Zwolle, The Netherlands: Tijl offset.)



Process of the transportation of the grain in the silo from one point. This is mostly the case in the early ''moder'' silos in America



Process of the transportation of the grain in the silo horizontal

Process of the transportation of the grain in the silo (YouTube Oprichting van 'n Boeren CHV (Foundation of the farmer's cooperative CHV) Veghel)

1. The grain sucked out the boat

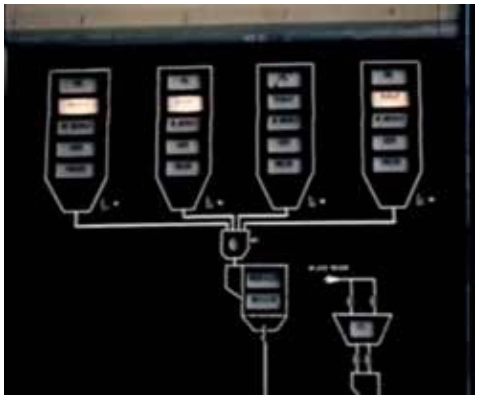
2. The elevator leg transport the grain to the distributing floor

3. The grain is weighed and cleaned before it goes into the silos

4. At the distribution floor the grain is transported to the tube that goes into the silos

5. The distribution floor with the pipes that let the grain into the silos

6. Inspector goes (rarely) into the silo



7. In the inspection room they can see which silos are full or empty

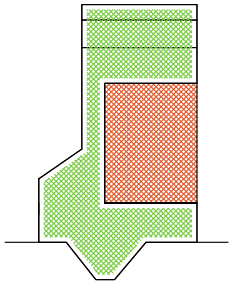
8. At the top of the work floor you see the funnels of the silo

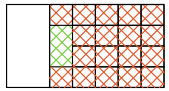
9. At the work floor the grain can be transported to an other place where it can be further processed

10. An option is that the company can put the grain in sacks

11. The grain put in a sack

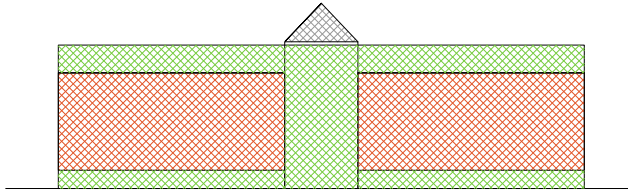
12. The grain loaded on a truck

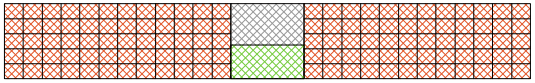




Pre-industrial silo

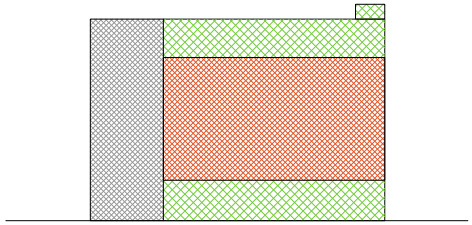
Architect: -
Year: 1850-1920
Place: United States/ Canada
weight goods: -

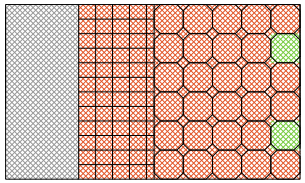




Silodam

Architect: Klinkhamer
Year: 1898
Place: Amsterdam
weight goods: 17.000 ton

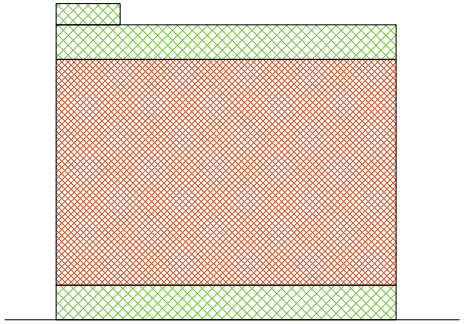


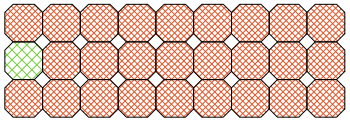


Maassilo 1st part

Architect: Stok
Year: 1910
Place: Rotterdam
weight goods: 20.000 ton

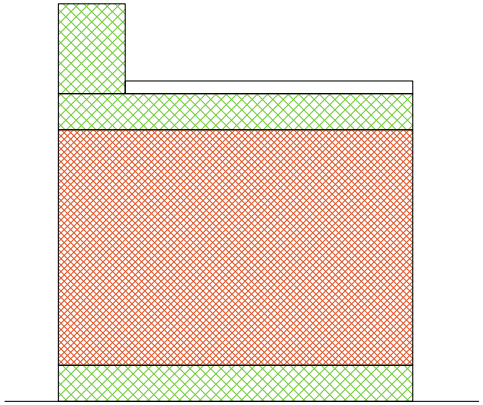
The scale of the silos are not equal to each other

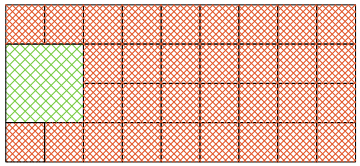




Lassie silo

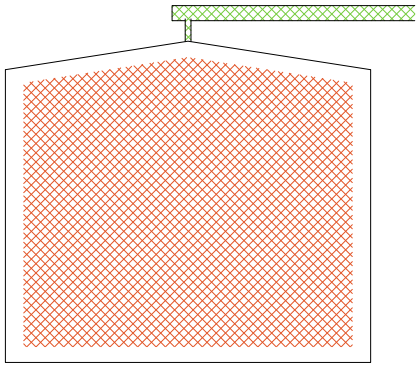
Architect: Klinkhamer
Year: 1912
Place: Rotterdam
weight goods: 23.000 ton

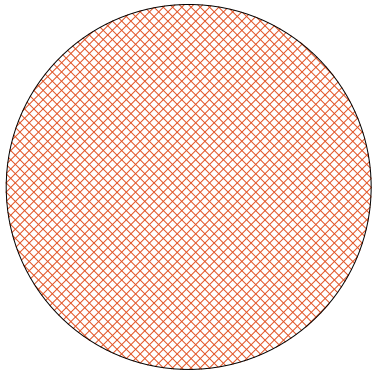




Silodam

Architect: J.D. Postma
Year: 1951
Place: Rotterdam
weight goods: 25.0003

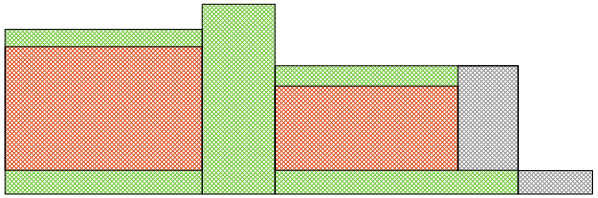


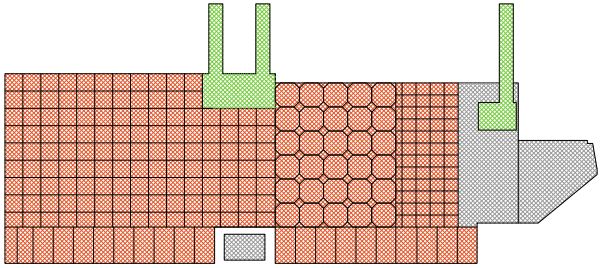


Everywhere

Architect: -
Year: 1960 - now
Place: everywhere
weight goods:-

The scale of the silos are not equal to each other





Maassilo 1980

Architect: Stok, Brinkman en van der Vlucht, Postma
Year: 1910-1951
Place: Rotterdam
weight goods: 86.000 ton

Conclusions

The first silos in the Netherlands were very similar to warehouses are entrepot blocks. The grain was that time also stored in sacks.

The first ‘‘modern’’ silo was build in America around 1850. This kind of organization you still see in the silos today, only the stainless steel silos with an one sided installation has an other organization.

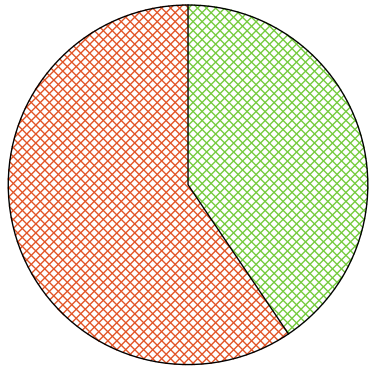
The expression depends a lot on the time/philosophy, material and installations they have used.

The installation space become less and less over time. The opposite happened of the storage capacity of the silo , it become bigger and bigger (see image at the right).

Due to these developments a lot of silos have lost their function. This is reflected in the demolition or re-use of the silos.

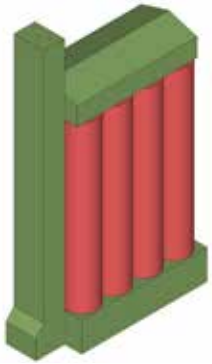
Silos have values, they are silent witnesses that show technology advances and architecture through decades. Loeff, K. (2004) stated silos as cathedrals that are part of the landscape. It is part of the city, countryside and for the people.

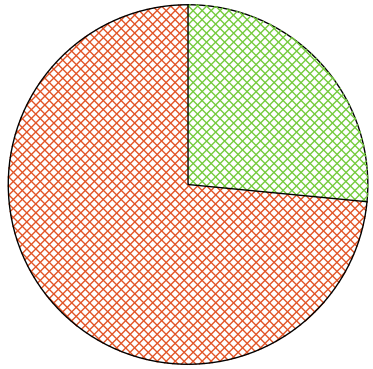
1850



40% installation and 60% storage

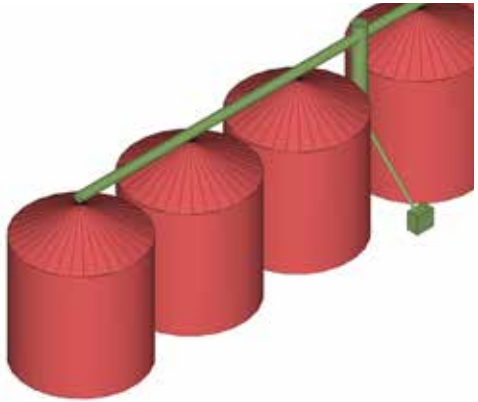
1900

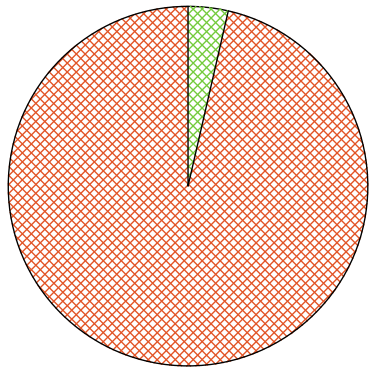




27% installation and 73% storage

NOW!



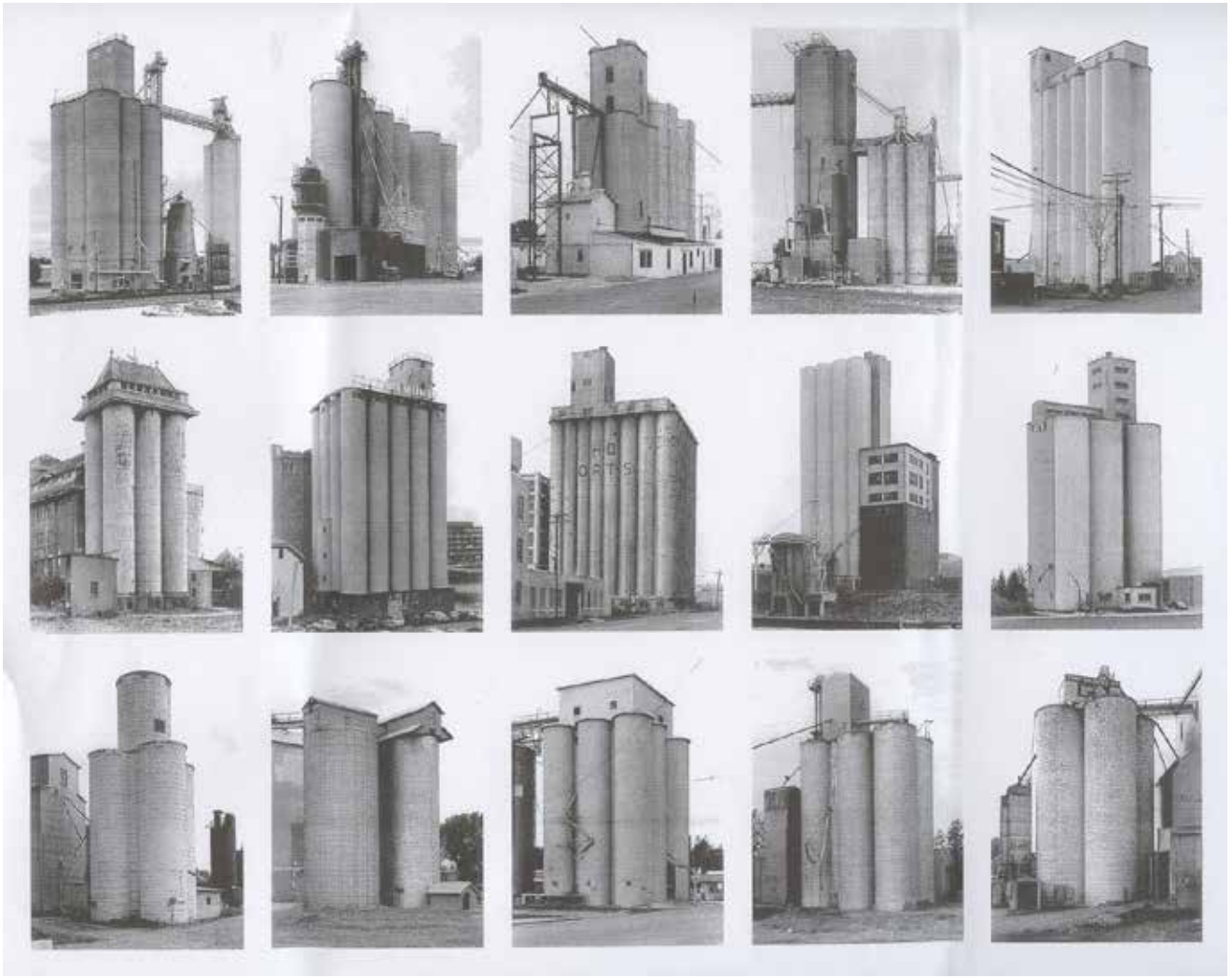


3-4% installation and 96-97% storage

Loeff, K. (2004). Kathedralen van het platteland, Silogebouwen van graan- en veevoederbedrijven in Nederland. Zwolle, The Netherlands: Tijl offset.

Mahar-Keplinger, L. (1993). Grain Elevators. New York, United States: Princeton Architectural Press.

Richards, J. M. (1958). The Functional Tradition, in early industrial buildings (Herz. ed.). London, United Kingdom: The architectural Press.



The book Typology of Grain Silo - Bernd & Hilla Becher

Maassilo as a Machine

Cover graphic: collage of the Maassilo as a Machine (Leunissen G.)

Maassilo as a Machine, title page

Title:	Maassilo as a Machine
Student:	Giel Leunissen
Studentnumber:	4386256
Email:	gleunissen@tudelft.nl / gielleunissen@gmail.com

Abstract:

.....

Tutors:	Lidy Meijers	Architecture
	Suzanne Fischer	Building History
	Frank Koopman	Building Technology

Institution:	Delft University of Technology
Faculty:	Architecture and the Build Environment

Date:	4 November 2016
Words:	4200
Images:	60

Preface

This graduation project ‘‘Maassilo’’ is initiated by Delft University of Technology Master track Heritage & Architecture at the faculty of Architecture and the Build Environment. This graduation project takes place from September 2016 till July 2017.

For the upcoming weeks, months and year..

I would like to thank the tutors for the support of this project, Lidy Meijers for the Architectural part, Suzanne Fischer for the building history part and Frank Koopman for the building technology part.

I also want to thank my fellow students for the great atmosphere at the studio. And of course the Maassilo (Factory 010) for the enthusiasm and the tour through the building.

Preface

Content

Introduction

By different trends in recent years a lot of facilities lost their function, like factory areas, offices, shops, churches, etc .. (site 1). These vacant places in our environment are a big issue in the Netherlands. As a result is there a great demand for transformation of existing buildings. To deal with this problem the department Heritage and Architecture at the TU Delft investigating this problems and tries to tackle these issues and research for possibilities. The definition of ‘‘Heritage’’ is interpreted broadly, and is not only intended for national monuments. The domain of the section has greatly gained in importance in recent years (Site 2, H&A Redactie).

Also the harbor of Rotterdam changes over time, some of the positive and negative trends are:

- Increasing of the big scale transshipment
- Increasing competition of other world harbors
- Shortage of place in the city harbor
- Data & IT for logistics, need of high educated people (Port of Rotterdam, 2015)
- The harbor leave the city towards the sea to the so called the ‘‘Maasvlakte’’ 1 and 2 area (Vermeulen, 2014)

The Rotterdam port authority assumes that these trends will continue in the future. To prevent this space (1600 hectare) of abandonment and rotten places between harbor and the city, the municipality has to give these areas new functions. (Westerlengte, 2011)
The Maassilo is also a former harbor building that is out of function for industrial activities. The building is now in use as a dance club and offices for small creative firms.

For me the program and the set up of the Maassilo is made from one specific product namely grain. The building act as an intermediary in the process from the grain to grain products. The building was conceived as a transitional from bulk to sack transport or from bulk to bulk, ship to smaller inland boats. The Maassilo can be seen as machine that shapes the process and the process forms the Maassilo building. To learn more about this topic my research question is: How does the Maassilo envelope bend around the machine, and what is the influence of the environment?

My subquestion: ‘what is a machine? And what is a grain elevator or silo?’

To find out my research question I position myself and try to explain what heritage means to me, then I analyze the Maassilo as a machine by several aspects like: worldwide/direct context, grain treating, light, flow of the grain through the Maassilo, expression and construction. In the end of this analysis a conclusion and a valuation will draw of the whole Maassilo complex.

My Position about Heritage

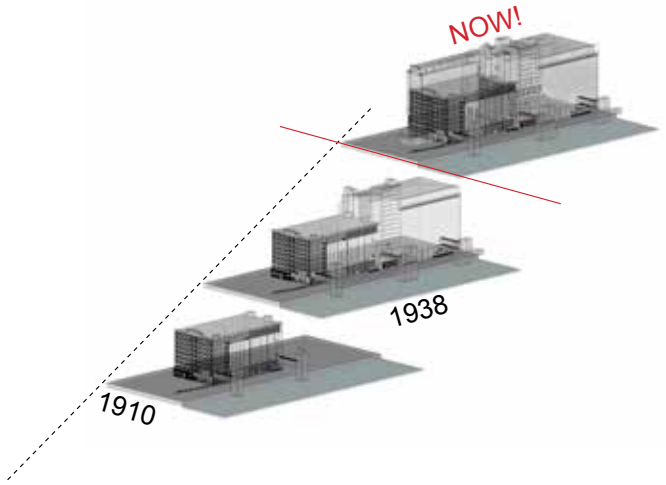
For me Heritage is something that is be handed to us from the past. In different shapes heritage defines the identity and expression of a period of time and place.

Heritage is always been there. In fact heritage is born, when people start building. Of course, not every human building belongs to heritage. Al lot of buildings are lost by weather conditions or loss of function. Buildings who are still there, are there with a reason. Examples of these reasons are, age, historical, artistic, commemorative, use and newness (Riegl, 1903).

There are also preserved buildings covered by creations of change. In the past it was very common to reuse old buildings. Often when a building lost their function, they use the building for other purposes. An striking example that I visited myself is the temple of Purtuno (Roman god of doors and harbours) in Rome. The temple was build in the first century before Christ near the harbour of Rome. In 872 it was turned into a church dedicated to St. Mary of Egypt. In the XVIth century Pope Pius V assigned it to the Armenians who incorporated it into a hostel for pilgrims from their country (site 3). So, this building has had several functions of cultures and religion. But the construction and some elements are remained.

So, there are two reasons to maintain buildings, the value (conservation) and change of function (change). These two components are the input for heritage (Lecture 16-10-2016 by Nicholas Clarke).

For me Layers of time, Intangible values and community value are important aspects in my own vision. These values are fascinating me and are important for the continuity of the building.



Layers of time (Leunissen G.)

Layers of time

History is a sequence of events in time. Every building is part of the expression of human being. This expression changed during history and can be related to technical-, political-, social- or a sudden event. Even in one building's lifetime it changed like the temple of Purtuno. Building are silent witnesses of an particular time. As an architect you have to be aware of these changes and look at a building not as an object, but as a building in a changing world. Also continuity is important for a heritage building it have to be part of our society, and not taken apart from the others and treated as a "fixed monument". If you are aware of those days a heritage building can be contemporary change and be part again of everyday life, that enriches our environment.

Intangible Values

The most difficult task is to try to make intangible qualities into tangible qualities. For me it is the task to grasp these qualities to look at old pictures or at the situation now to get inspired of the place and the building. The essence of the building is therefore important why

it is build. For the Maassilo the essence is the grain, storage and the flow of the grain through the building.

Users

Building belongs to the people and it is for me the job to make an abandon place vital again. A place were people feel the history and the value of the building.

As a conclusion all these aspects are related to each other. A sentence by Jo Coenen that strikes me was. The insight of the relationship between connection and continuity demands a scientific attitude involving constant alternation between design and research at all scale levels from the building to the city and the landscape. (Jo Coenen)

To learn more about the user and heritage I wrote an essay about different approaches on heritage buildings and sites for the course Lecture Series Research Methods December 2016. The questions I asked myself was: how can you make and keep an existing building interested for the user? Is it possible to make long-term approaches? And what is the role of the transformation architect in this rapidly changing world?

Cover graphic, Lecture Series Research Methods | AR3A160 | December, 2016 (Leunissen G.)

Lecture Series Research Methods | AR3A160 | December, 2016
Giel Leunissen | 4386256
gleunissen@tudelft.nl
gielleunissen@gmail.com
Studio: Heritage & Architecture

#Copy paste
Different Approaches on Heritages Buildings and Sites

Introduction

Since the recent development of different trends, a lot of facilities lost their function, like factory areas, offices, shops, churches, etc .. (site 1). These desolate places in the Dutch environment are a matter of concern. Therefore, transformation of existing buildings is the main investigation of the researchers of the department Heritage and Architecture at the TU Delft. One major focus point is the continuity in the Dutch build environment. The definition of ‘‘Heritage’’ is interpreted broadly, and is not only intended for national monuments. Therefore, the domain of the department increased in importance in recent years (H&A Redaction).

One of the most important aspects in the architecture are the users of a building or site; these users are the key for the continuity of a building (Meurs, 2016). How can you make and keep an existing building interested for the user. Is it possible to make long-term approaches? And what is the role of the transformation architect in this rapidly changing world?

An article in the NRC newspaper with the title ‘‘World wide every hipstercafés looks the same’’ really appealed to me. I noticed this trend also in transformations of a heritage building. I noticed that

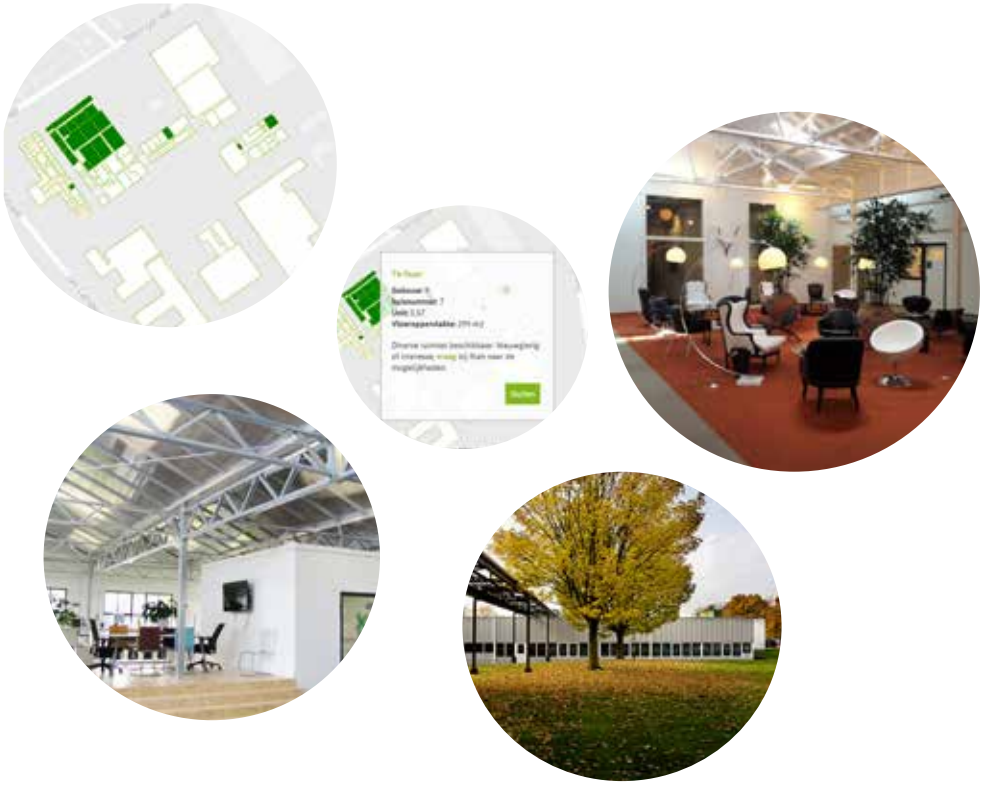
World wide every hipstercafés looks the same | Kooyman, J. NRC (2016, 24 november)

many approaches were quite general like: make a cozy vintage building on his own with coffee, Wifi rather than create an interesting building that is connected to the context. I think this ‘‘copy paste’’ approach doesn’t work for the long term of the building lifetime.
I investigated that there are three different approaches to attract users to re-using existing buildings after the crisis. These approaches are discussed with three transformation projects These projects show the various possibilities to attract the user for an existing building. These approaches are Competitive offer, Branding and Co-creating. The three projects are all realized after the 2008 crisis.

I assessed these projects not whether they are successful or not, but use them as an example for the three different approaches.

Competitive offer | C-MILL Heerlen

This strategy is based on cheap offer to attract users from somewhere else. This attraction can through low pricing, flexible lease or providing an extra service. This strategy prevents mostly unattractive vacant buildings to compensate which leads to re-use of an existing building. This strategy is especially applicable for remote places out of the city or outside the Randstad. An example of this strategy is the C-mill nearby Heerlen. The project consists of a former Philips industrial site which has been transformed into small workshops, live / work combinations, education, culture and offices. The former production halls are thus made suitable for creative companies. The area around Heerlen is also called Parkstad. This region is known as the largest crimp area in the Netherlands. In this kind of areas there have to be more requirements than just refresh the interior. The most attractive aspects for companies located in the industrial C-mill site are the high-quality service, flexible rental contracts and events. This concept ensures that the companies feel free and able to make their own choices. This high-quality service means that the user does not have to worry about the maintenance of the buildings or near the premises. They also provide a cafeteria with conference and meeting rooms that are included in the cost. C-mill gives therefore the opportunity to interact with several companies that are located at the site. The flexible rental contracts ensure that growth and shrinkage of an office or workshop are possible. The size of companies varies greatly, so the smallest tenant uses 15 m² and the largest 8.000 m². This variety in sizes also reflected in the wide variety of companies. C-mill has made it as easy as possible to rent a space. On their website you will be sent directly to a map of the buildings where you can see the place that is still available, how much square meter and how much it costs to rent that space. Events and meetings organized by companies inside and outside C-mill give the business reputation of the outside. An example is the adjacent neighborhoods of the C-mill that interact reinforce each other.



C-mill Parkstad (C-mill.com)

Offering cheap space has a value but is not a guarantee for the future. Especially if there is competitive and will interfere with other providers of empty spaces in the real estate market. In the case of c-mill they go beyond renting of cheap square meters. They must also offer a high level of service and organizing meetings to users to keep them in place.

Branding | DE HALLEN Amsterdam

This strategy is based on the looks of a heritage building to create authentic, historic, crafts and a honest atmosphere. Mostly the philosophy of a company fits with the building, and the building give value to the company (Meurs, 2016). Usually, these projects have a sharp change of function for example from factory to restaurant. Through this transformation, the building will have a unique experience and so get attention of the public. A good example of this strategy is De Hallen in Amsterdam. This building had a former function as a storage space for trams. The program of the Hallen is a hotel, movie theater, gallery, library, studios, restaurant and rooms for small entrepreneurs.

The place is a real place maker for the whole area around therefore, the value is also increased in the direct area. De Hallen are characterized by various functions are housed under one roof. However, these multiple functions, the building expresses one clear original design. The design is recognizable and radiates unity (Bovens, 2014).

One of the first examples in the year 2000 of this approach is the Van Nelle Factory in Rotterdam. In this example is highly sought for experiencing the modernistic building. People were in the beginning very keen to get a space in the building. Now Rotterdam has a wide range of interesting heritage buildings and sites and there is competition between those locations. Even though the location is unique as status as a UNESCO world heritage gives it no guarantee of a lasting success (Gelinck, 2014).

De Hallen in Amsterdam (dehallen-amsterdam.nl)

Branding is mainly organizing experience. It is the feeling that users appreciate the atmosphere. Unfortunately, perception can become jaded, it may become too general. Users are increasingly looking for experiences that go beyond the appearance of the building (Meurs, 2016). It is relevant to their experiences that the user does not entertain but shift their attitude. For me heritage is not reliving the past but more experience the past in a broader social and context way.

Co-creating | SCHIEBLOCK Rotterdam

This strategy is based on collaboration with different companies for a new intervention of a building or area. Thinking together of the implementation of a spatial plan can lead to new ideas and a close relationship with the different companies (Gelinck, 2014). An example of this approach is the Schieblok in Rotterdam. The Schieblock is a modernistic office building build direct after the Second World War. This project started as an experiment and was intended for temporary use, but now it is still in use as a collective ‘‘city workshop’’. The main theme in this building is the connection to the building and its surroundings in a more social field. The ‘‘luchtbrug’’ is the main link between the functions and the environment. The bridge is a wooden pedestrian bridge with a length of 390 meters, which connects Rotterdam Centre with Rotterdam Noord. It acts as a public route through the building and therefore the building is part of the urban area. The companies that can buy realized the bridge a piece of bridge included the name of the company as a kind of advertising. The building program consists of a mix of public functions, catering and workstations for small businesses. The public spaces are the bars and restaurants (beer garden) and roof garden. These functions provide more activity in and around the building, which in turn has a positive impact on small businesses. These companies are also arranged that all companies can reinforce each other. These functions make use of a simple model that one settler can rent per square meter building.

Co-creating goes beyond the looks of the building. It is about joining social qualities, embedding in place. That is what me really strikes about the Schieblock, is the way to make even an unattractive building can become a meaning in today society.

The municipality had initially plans to demolish the Schieblock building for new construction plans. The architecture firm ZUS which was housed at that time did not like the plan and started this Schieblock project. The architecture office and other companies

Schieblock Rotterdam (schieblock.com)

have taken charge of the project as initiators. The next topic is the initiatives of the clients and what is the role of the transformation architect.

Bottom up movement and the role of the architect

In the book ‘‘counting on re-using’’ (Rekenen op herbestemming), it is notable that after the crisis more individuals take the initiative in reusing existing buildings. Before the crisis the government or big institutions had control on decision making on the real estate.

A big obstacle in transformation of a building or site is the slow political top down imposition. In the current time there are a lot of restrictions to change sites, for example transformation in function like offices into combination of living and working areas. To prevent abandon places the municipality has to make contribution. These places can no longer act as money-spinners for other city projects (klok, 2013). To give individual and small entrepreneurs ease and time to search for possibilities will lead to new life to places where it is needed.

This movement demands a new mindset and design attitude from architects. The transformation architect of the future must be aware of defining a topical programmatic concept that directly reflects the needs of society, and of penetrating all the spatial and social facets of this concept. Be aware that an existing building has the potential to be transformed into an attractive, alternative and programmatic concept. Be capable of providing insight into the possible spatial, functional and psychological value and significance that a transformation can offer for both a buildings occupants and its urban context. The transformation architect has to deal with what exists without a clearly formulated commission. He must continually generate ideas and opportunities, not only with his own office but also with the user of the future building (Klok, 2013).

Conclusion

Today nothing is obvious anymore. The product, target group, the process and the finance (Bovens, 2014). The three approaches discussed in these examples are all positive for the continuity of the heritage building or site but which approaches are for the long term?

In conclusion the Competitive offer, can be applied everywhere. Branding is about the atmosphere of the building itself and mostly not about the context. Co-creating is looking for formula that is based on co-operation in the context; it is creating something unique that only fits in its own environment.

The first two approaches are kind of general and can therefore be used almost Copy Paste anywhere.

The transformation architect is involved beyond space and form, they concern a way of thinking and working. Architects give value to a certain place. Find strategies together with the clients and give freedom how they will intervene the building.

Words: 2065

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The Maassilo as a Machine

My first reaction when I saw the massive concrete building, what happened behind that facade? What is the system behind this building? and what is the influence of the machine on the facade and the construction.

For me it is an Machine with a 15cm coat made out of concrete, so the machine defines the expression of the building.

So my research question is: How does the Maassilo envelope bend around the machine, and what is the influence of the environment?

My second question was, what is a machine?

~ A piece of equipment with moving parts that does work when it is given power from electricity, gasoline, etc.

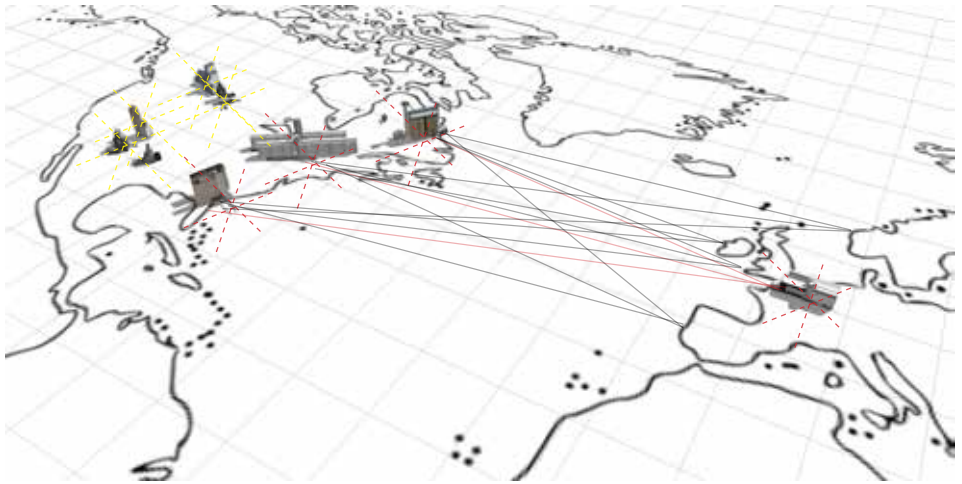
My third question was, what is a grain elevator/silo?

~ A granary equipped with conveyors to transport grain from ground level to the top of a storage silo or bin.

~ A specific building for the storage of grain.

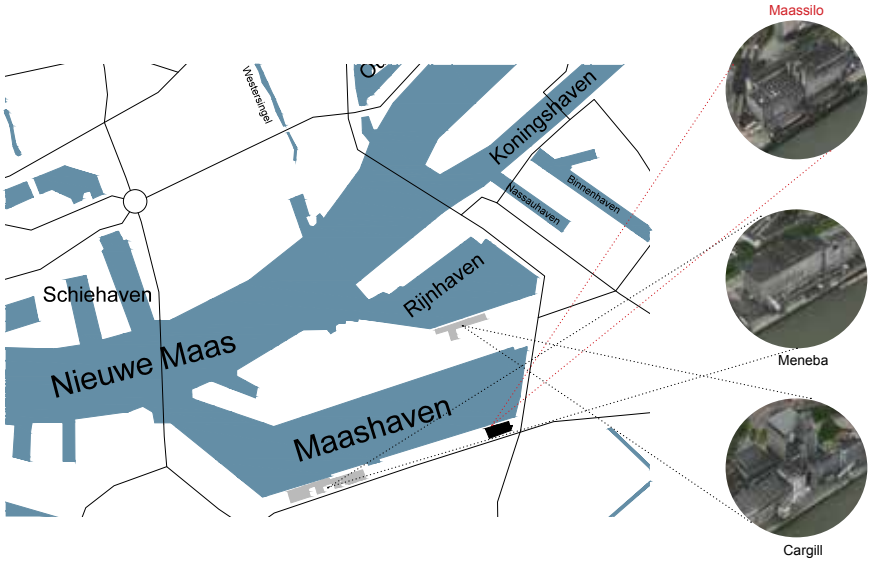
There were a lot of definitions of a grain elevator or silo. To make it clear how the process works is to make a scheme and position the Maassilo in this process. The grain originates from the United Stated or from Canada where the grain from the country side transported to the major ports in North-America. Then the grain will be transported to Europe and also to the Netherlands. Important grain harbors in the Netherlands are Amsterdam and Rotterdam. In these harbors the grain will go to grain elevators at the harbor like the Maassilo. The grain elevator puts the grain in sacks and transported into land or put the grain as bulk on smaller boats or train. So the grain silo is also a

Process from grain to grain products (Leunissen G.)



Process from grain on the world map (Leunissen G.)

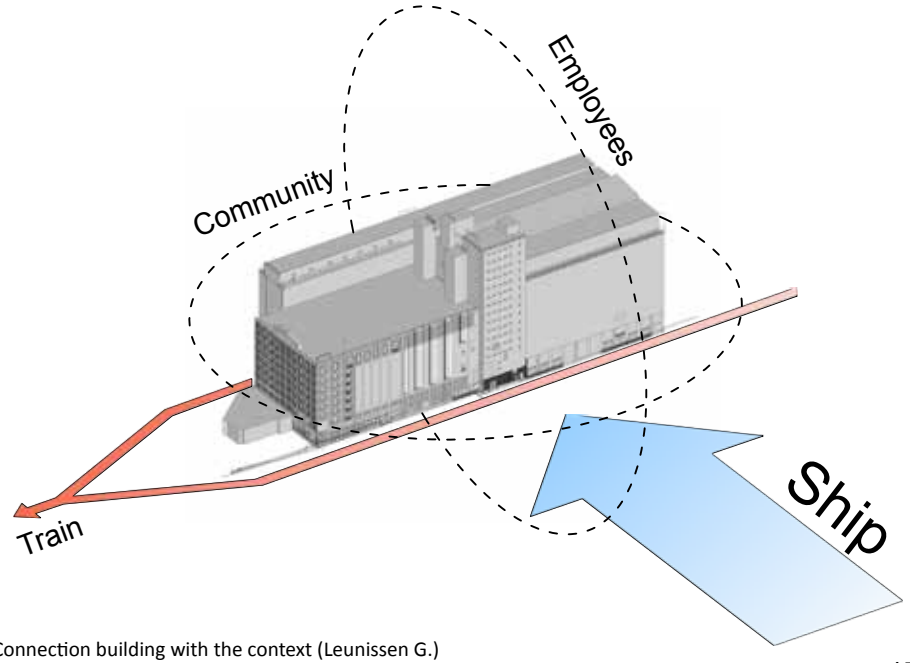
kind of intermediary in the whole process. When we zoom in on the harbor of Rotterdam where the grain silos are situated. Besides the Maassilo their are two other grain silos situated in the neighborhood. These other silos calles the Meneba and the Cargill. When we observe these grain silos the waterways in front of the silos are wide. This has to do with the transshipment of the bulk goods from big ships to smaller boats. Also there has to be enough space to turn the boats. So this part of the harbor is set up as a bulk (grain) transshipment place and suitable for grain elevators. You can almost say that the waterway is part of the machine.



Location of the silos in the harbor of Rotterdam (Leunissen G.)

A scheme of the Maassilo building with all the connection with the environment. So the Maassilo is connected at the waterside with the ships and at the land with the railway.

Also very important is the connection with the direct context. For example the community that lives around the ‘‘tarwebuurt’’ and of course the employees. For many people the Maassilo was the main income for the people around. It was also a vital place in the harbor with transshipment of grain all over the world.

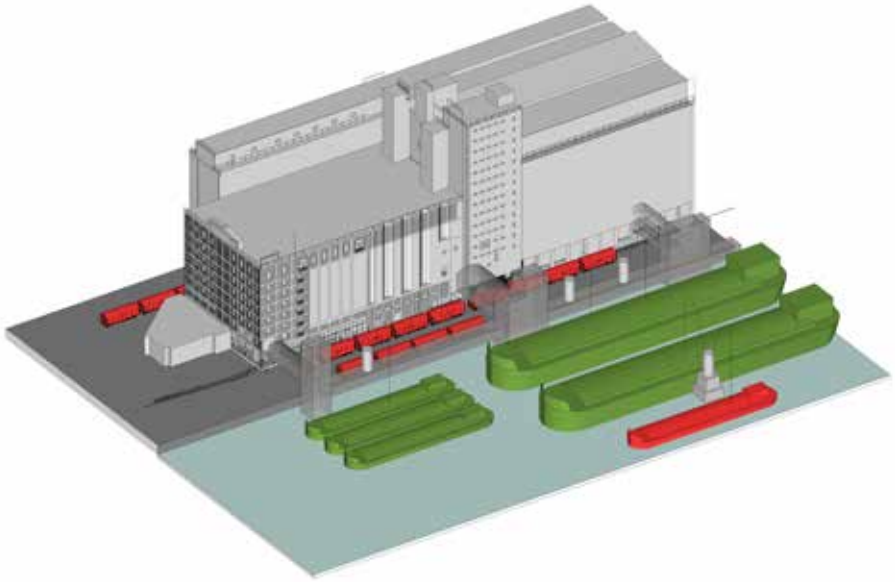


Connection building with the context (Leunissen G.)

Green: input of the big ships from North-America

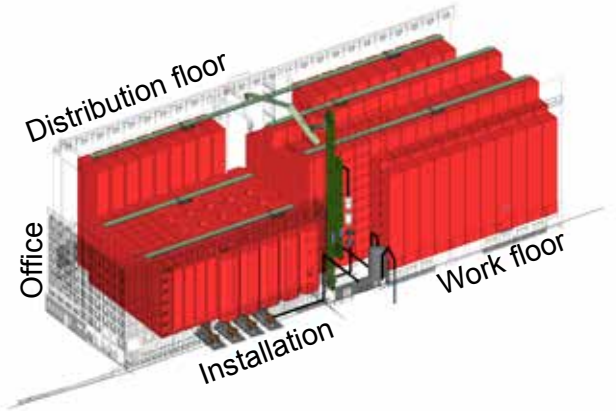
Red: output, train or barges to the inland

The installation on the steel structures that are positioned on the water sucked the grain from the ship into the building.



What is striking about grain silos are the blank walls at the outside, it looks like one giant concrete block. Due to the storage in the middle of the building there is no need for light. In figure is clearly see (next page) the relation of the facade openings (light intensity) and the workspaces. The facade openings provide light for the employees that were working with the machine. Light was an important aspect of the activities that took place. In 1910 the Maassilo was not connected to the electricity grid yet. From 1912 when the municipality took over private electricity companies the Maashaven became also connected to the electricity grid (2016, City Archive Rotterdam, Elektriciteit in Rotterdam (site 4)).

You can divide the spaces in Distribution floor at the top where the grain is put in the silos, the work floor where the grain can be put in sacks, the installation in the basement with the shaft in the middle and the offices at the side of the building.

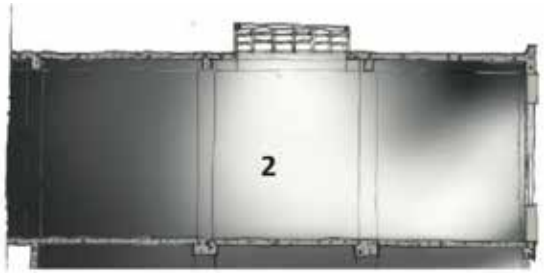



Distribution floor

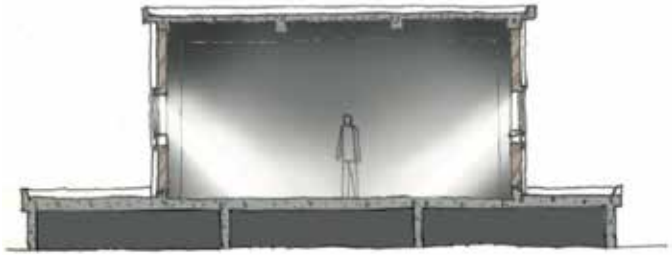

Work Floor


Installation

The different spaces of the Machine (Leunissen G.)

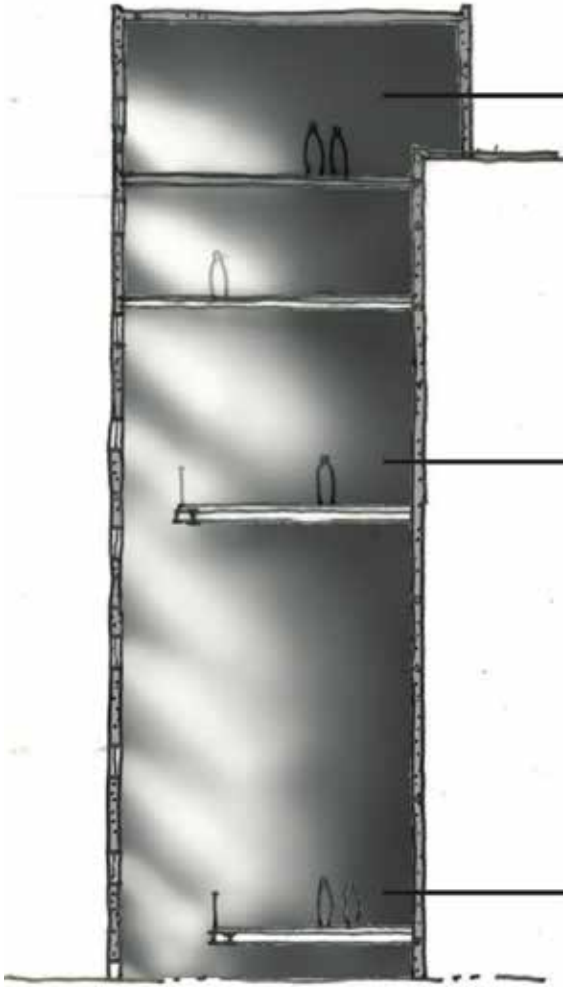


Distribution floor at the Stok building (2016. S, Chittavanich)



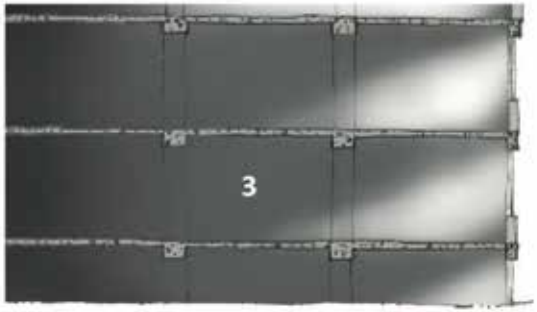
Distribution floor at the Postma building (2016. S, Chittavanich)

Distribution floor at the Stok building (2016. S, Chittavanich)

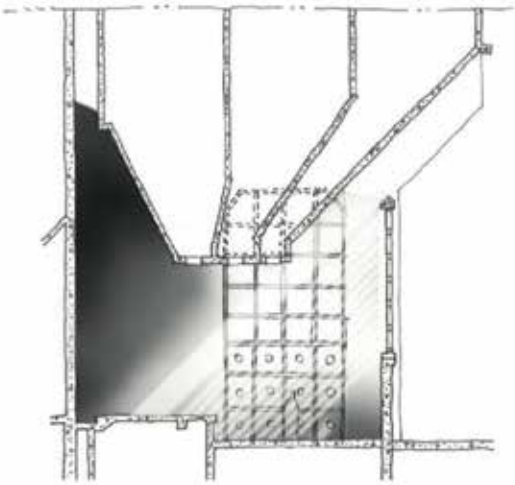


Shaft of the Brinkman en van der Vlucht part (2016. S, Chittavanich)

Light study of the Maassilo complex (2016. S, Chittavanich)



Office/factory of the Stok building (2016. S, Chittavanich)

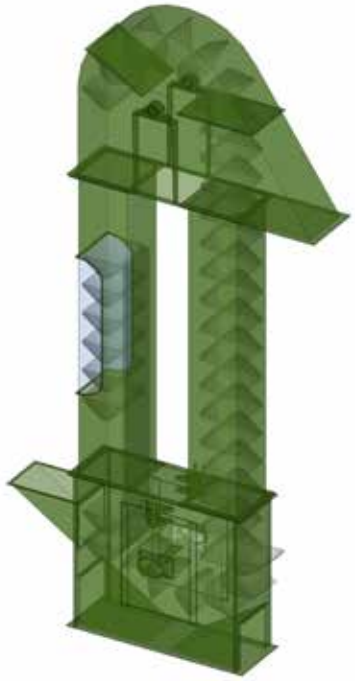


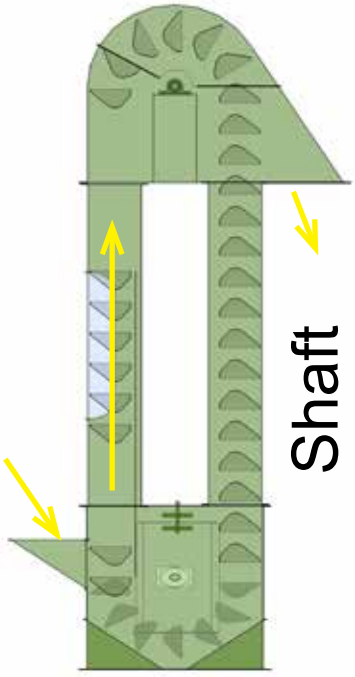
Work floor of the Postma building (2016. S, Chittavanich)

The transport-systems horizontal conveyor and vertical elevator (bekerelevatoren). Some relics of the transport-systems are still visible in and around the complex.

Vertical elevator on the roof (Bronswijk, B. 2016)

Vertical elevator in the postma part (CV Maassilo. 1951)

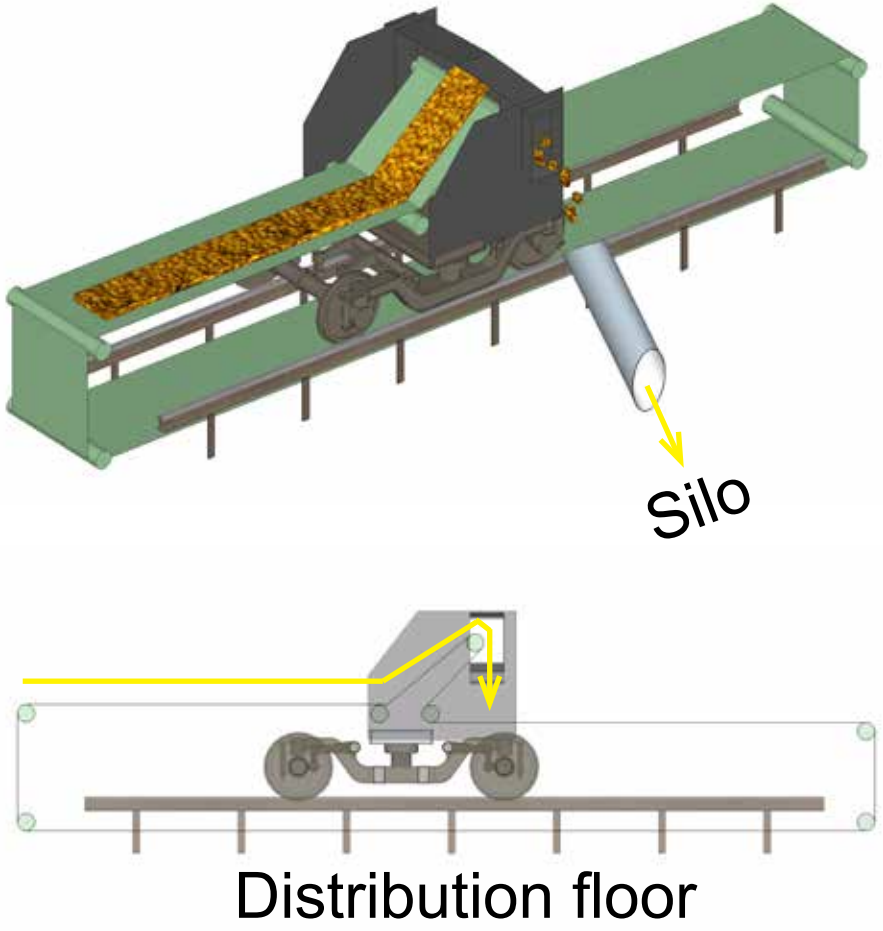




Vertical elevator (bekerelevator) (Leunissen, G.)

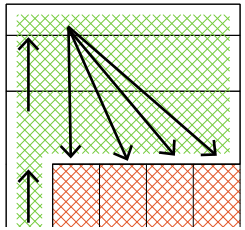
Remnant propelled trolleys on rails for the horizontal transport of the grain (Bronswijk, B. 2016)

Horizontal conveyor in the postma part (CV Maassilo. 1951)

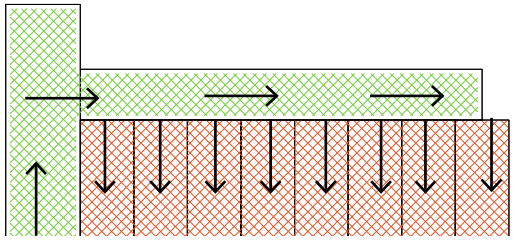


Horizontal conveyor (Leunissen, G.)

The distribution floor indicate the length of the building. When the distribution takes place from one point like the first grain elevators in America the silo plot is not elongate. Around 1900 they invented distribution line at the top floor, since then the plot of a silo building changed into an oblong plan.

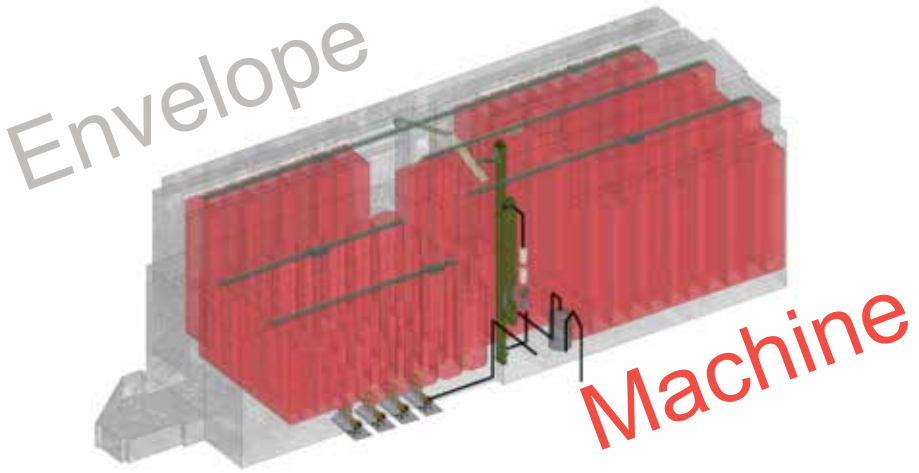


Process of the transportation of the grain in the silo from one point. This is mostly the case in the early ‘‘modern’’ silos in America (Leunissen G.)

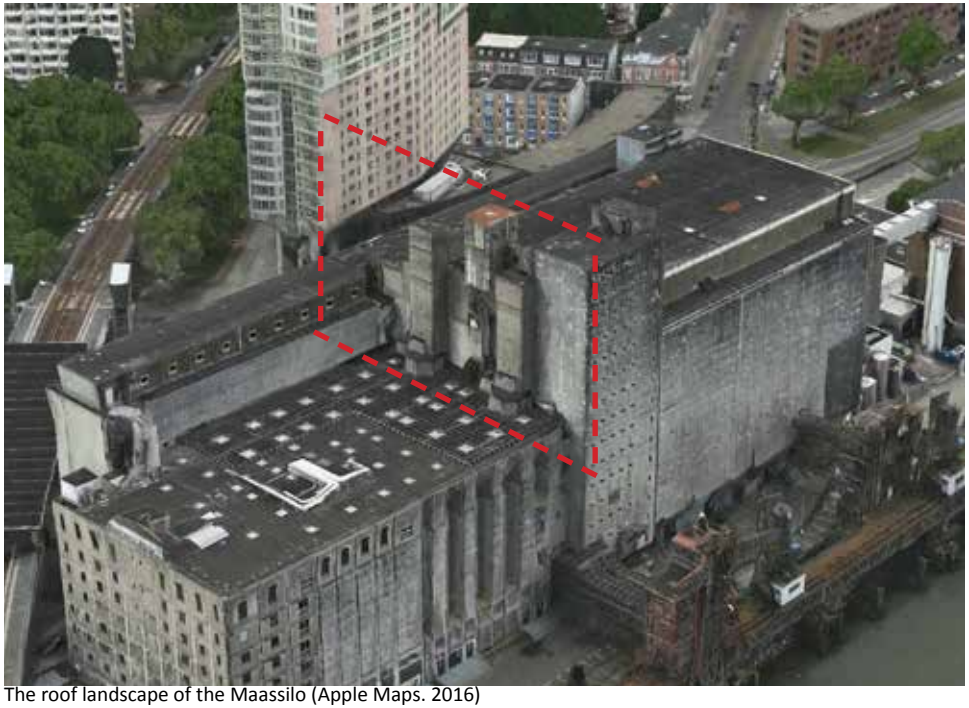


Process of the transportation of the grain in the silo horizontal (Leunissen G.)

Image shows the machine and the envelope of the Maassilo together. The transportation installation in green and the storage in red. The transportation plays an important role of the shape of the building. Especially the roof landscape is dotted with shafts and boxes filled with engine drives for the grain elevators.



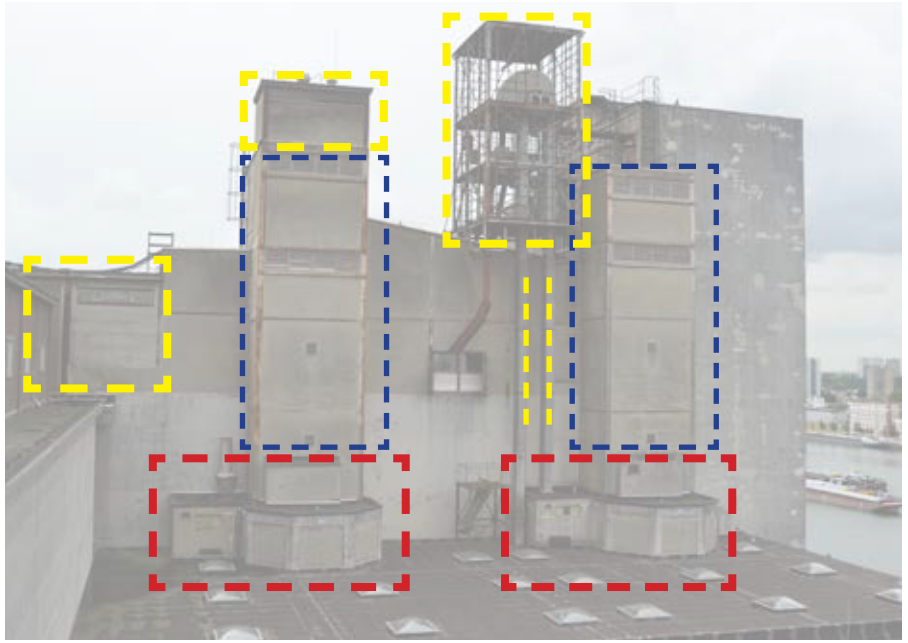
Envelope and the Machine (Leunissen G.)



The roof landscape of the Maassilo (Apple Maps. 2016)

The roof landscape of the Maassilo (Bronswijk, B. 2016)

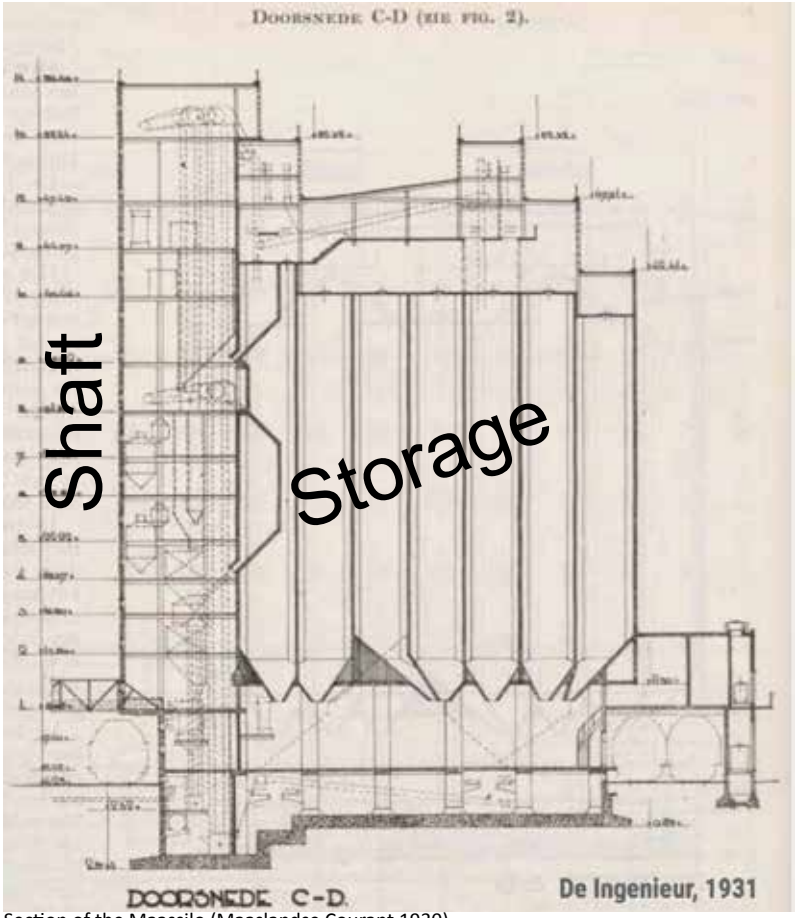
At the roof landscape of the Maassilo it is noticed the different kind of building blocks they build on each other to improve the vertical transport. Here is the place where the different part meets and exchanged the grain.



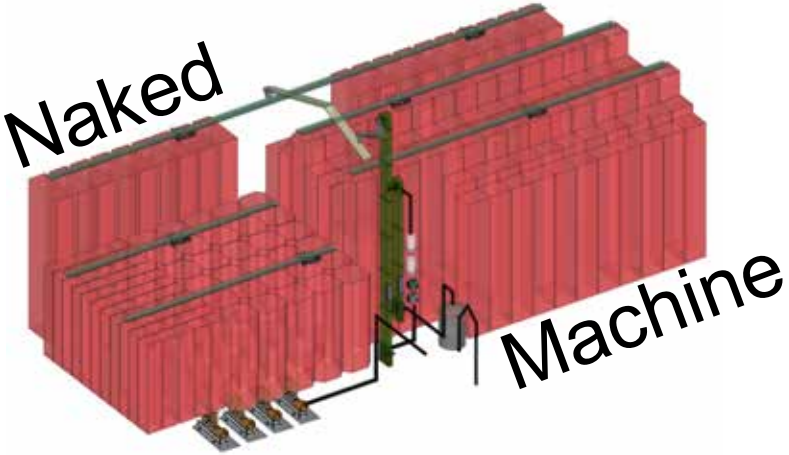
The roof landscape of the Maassilo with the different building parts (Leunissen, G.)

Stok Part
Brinkman en van der Vlucht Part
Postma Part

This image shows the naked machine. A big part like 75% of the building contains out of storage place (red). The section at the bottom is taken at the heart of the building at the shaft. The shaft provides the vertical transportation, the cleaning and weighting of the grain. The Pneumatic pump which cause a heavy load are positioned at the basement.



Section of the Maassilo (Maaslandse Courant 1930)



The Naked Machine (Leunissen G.)


Distribution floor (Maaslandse Courant 1930)


Pneumatic pump (Maaslandse Courant 1930)


Weighting machine (Maaslandse Courant 1930)

Work floor (ground floor) (Maaslandse Courant 1930)

1. The grain sucked out the boat

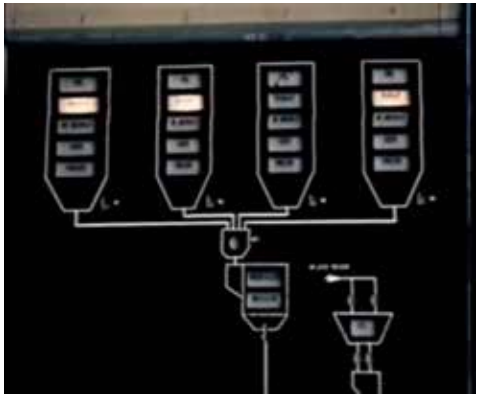
2. The elevator leg transport the grain to the distributing floor

3. The grain is weighed and cleaned before it goes into the silos

4. At the distribution floor the grain is transported to the tube that goes into the silos

5. The distribution floor with the pipes that let the grain into the silos

6. Inspector goes (rarely) into the silo



7. In the inspection room they can see which silos are full or empty

8. At the top of the work floor you see the funnels of the silo

9. At the work floor the grain can be transported to an other place where it can be further processed

10. An option is that the company can put the grain in sacks

11. The grain put in a sack

12. The grain loaded on a truck

Process of the transportation of the grain in the silo (YouTube Oprichting van ‘n Boeren CHV (Foundation of the farmer’s cooperative CHV) Veghel)


1.

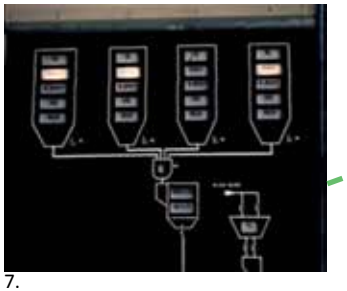

2.


3.


4.


5.


6.


7.


8.


9.


10.


11.

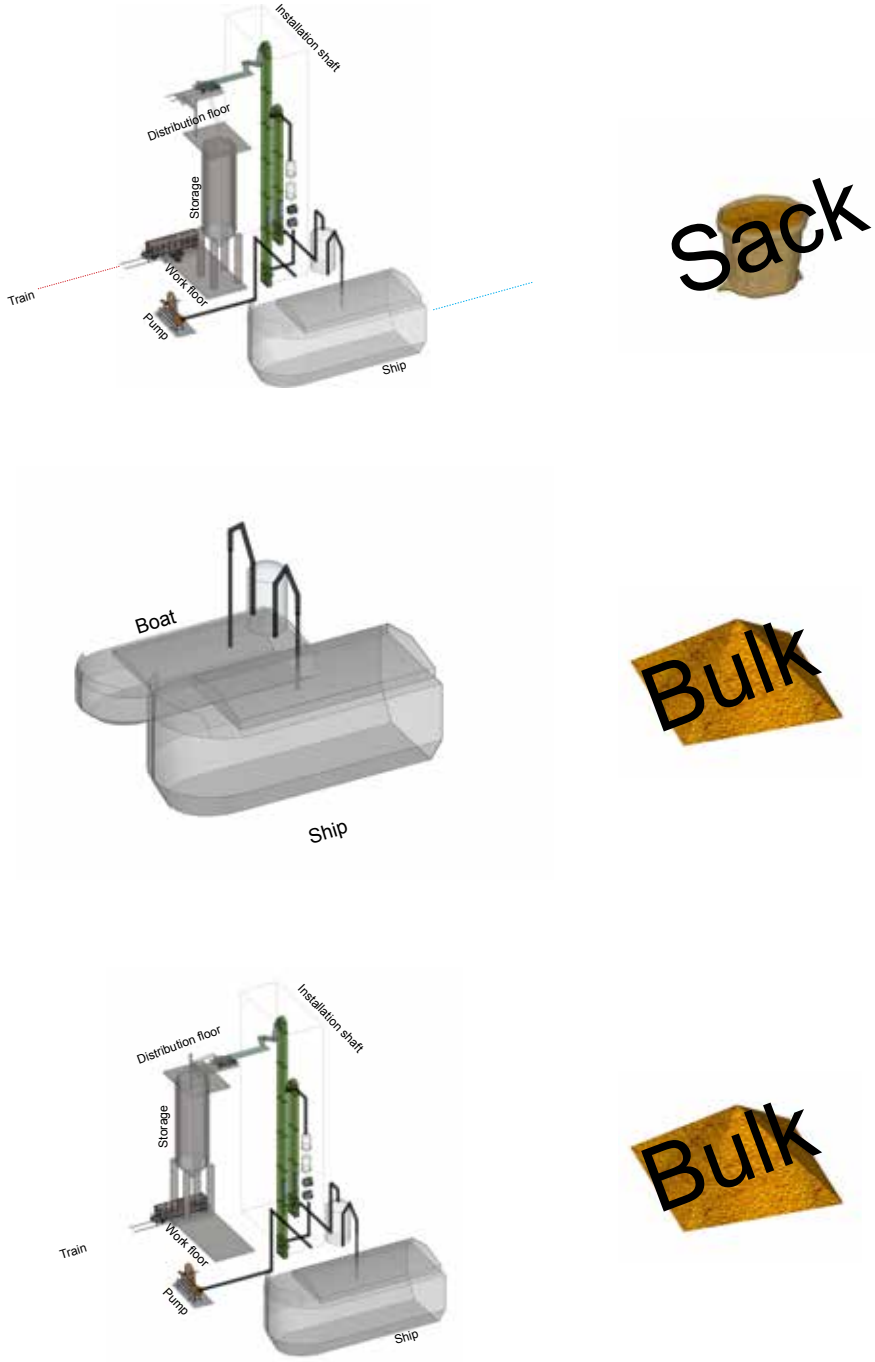

12.

In these figures the Machine inside the Maassilo is reduced to get an overview what happened behind the facade.

The first image is pictured the process of the transshipment of the grain from bulk to sacks. First the grain is sucked out the boat into the silo building using the pneumatic pump in the basement. After that the grain is put in a elevator leg that will lift up the grain to a between process. This between process is placed at the shaft of the building. This process contains a cleaning and a weight machine. After the grain is cleaned and weight the grain will again put in the elevator leg and will be lift up to the top of the building. At this point the grain will transported to the distribution floor. This distribution floor contains rolling tires wherein the propelled trolleys on rails take care that the grain through the tubes end up in the silo. When they need the grain at the bottom of the silo they simply open the tap and they can pack the grain in the sacks with a rolling plant.

The second image is pictured the process of the transshipment of the grain from bulk to bulk. So the grain is sucked out the ship by a floating grain elevator to a smaller boat that will go to the inland.

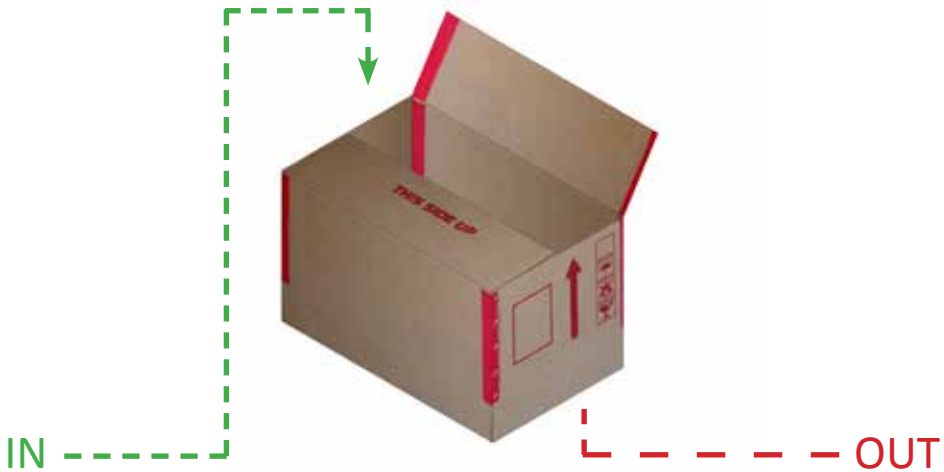
The tird image is pictured the process of the transshipment of the grain from bulk to bulk via the grain silo. This was possible from 1951 with the last extension of the Maassilo.



The different processes at the Maassilo (Leunissen G.)

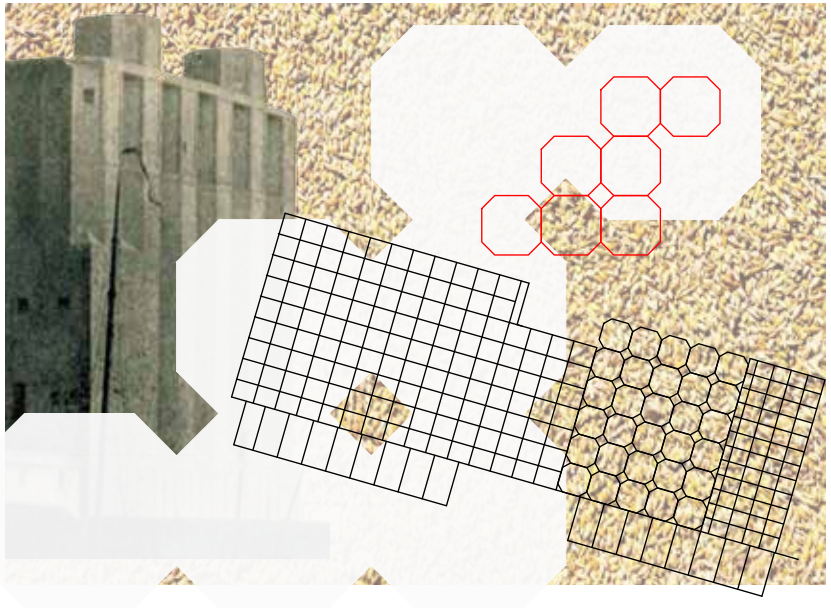
in conclusion you could say that the grain silo consist out of two different worlds. On the one hand there is the active part with: a lot of Light, Noise and movement, and on the other hand there is the inactive part that is dark, silent and motionless (Collages).

The Maassilo can also be interpreted as a box where you store something temporarily to create bulk. If there is a need of grain, it can be taken out and used for further fabrication.



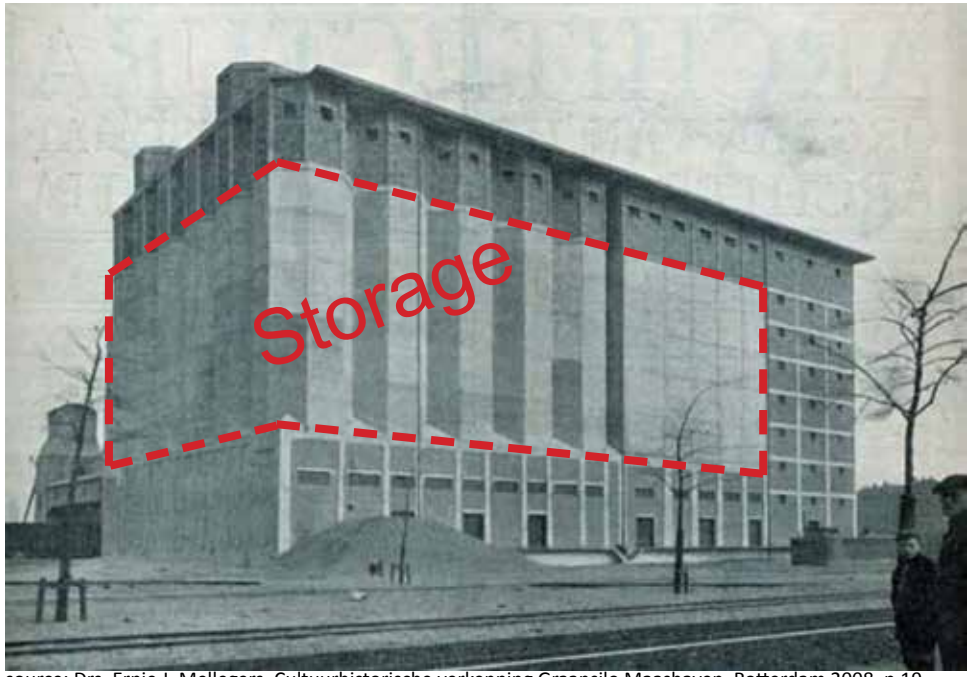
The box (Leunissen G.)

Collage the Machine (Leunissen G.)



Collage silence of the Machine (Leunissen G.)

The expression of these two worlds are also a theme in the first part of the Maassilo. The offices and the distribution-, workfloor are applied with a different covering than the silos itself. The first one with a tile cladding and the silos with a smooth plaster cover. This use or other material you will get an insight of the program inside the building.



source: Drs. Ernie J. Mellegers, Cultuurhistorische verkenning Graansilo Maashaven, Rotterdam 2008, p.19.

Kuipri B. (2016) Storage part flat finishing and active part tiles

From the 1970's the silo building improved very fast, the installation and use of other materials make it possible to make much bigger storage place in the silos. For this kind of scaling there was no space anymore in the harbor nearby the city.

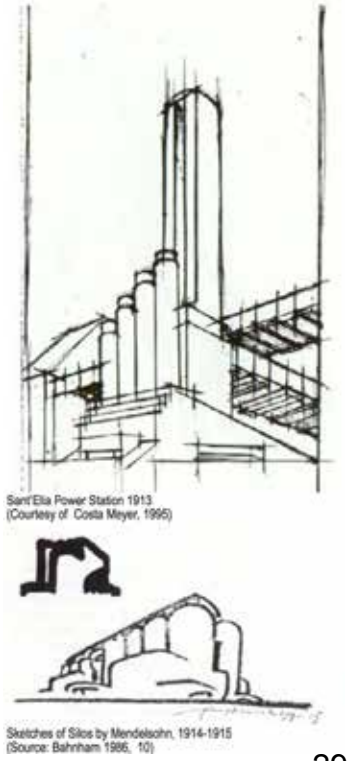
By scaling the silos of today have been disappeared from the urban landscape. In Rotterdam the silos are now placed at the Botlek and are no more connected with the people or neighborhood.

The Belgian newspaper ''Historical silos Noordkasteel go down'' (Historische silo's Noordkasteel gaan neer, Gezet van Antwerpen 05-09-2016) warned for the demolition historical silos that is part of the industrial heritage in the harbor of Antwerp.

The silos of today are above all very functional and represent not an architectural style anymore. The most surprising thing to note is that no known architects are involved in designing silos.

Schematic change of the appearance of the ''modern'' silo

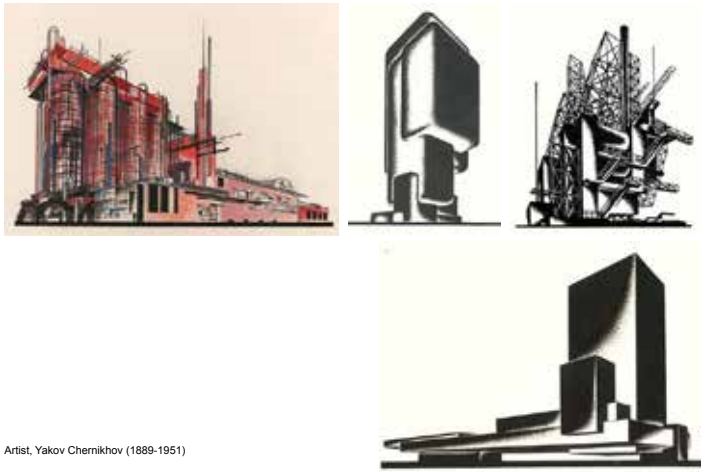
1981-04; G.J. Dukker (photographer)


Sant'Elia Power Station 1913
(Courtesy of Costa Meyer, 1995)

Sketches of Silos by Mendelsohn, 1914-1915
(Source: Bahnham 1986, 10)

Around 1900 a lot of artists and architects used grain elevators or other industrial buildings as inspiration source for their drawings or sculptures. These artists were searching for the beauty of geometric proportions.

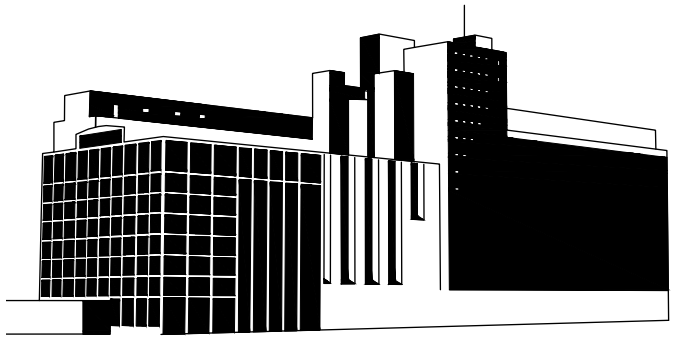
Sketches (Leunissen G.)



Artist, Yakov Chernikhov (1889-1951)

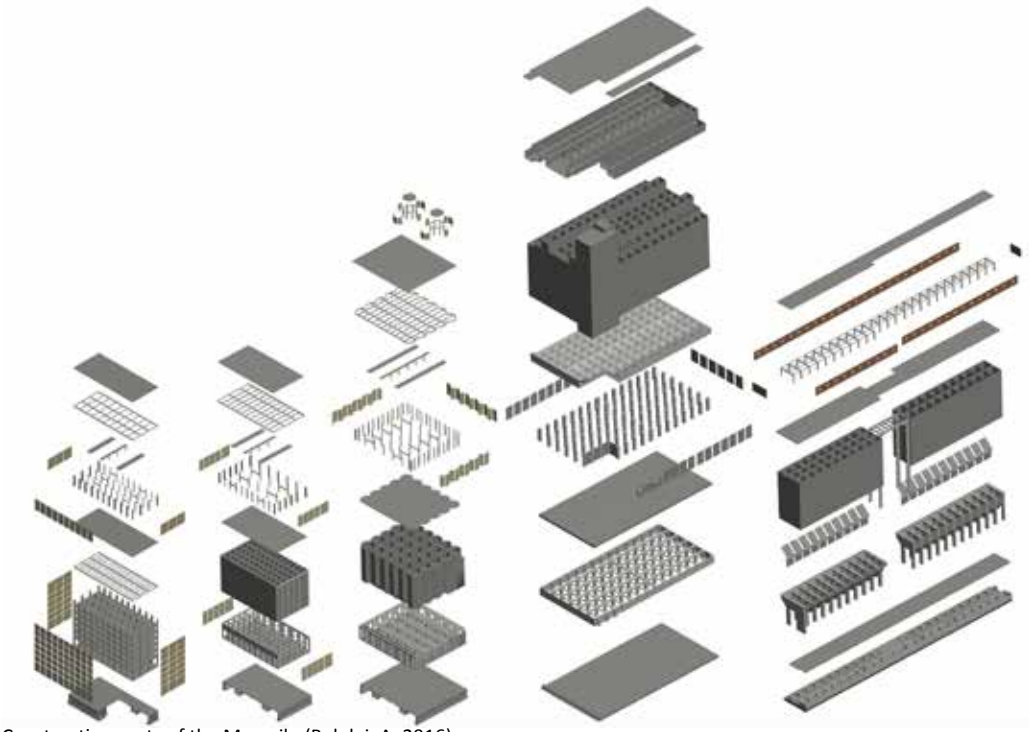
I also made an abstract drawing of the Maassilo and discovered the important characteristics of the building like the construction lines, light openings, horizontal and vertical transport lines.

Loeff K. (2004) compared the big urban grain elevators as concrete Cathedrals of the beginning of the 20th century.



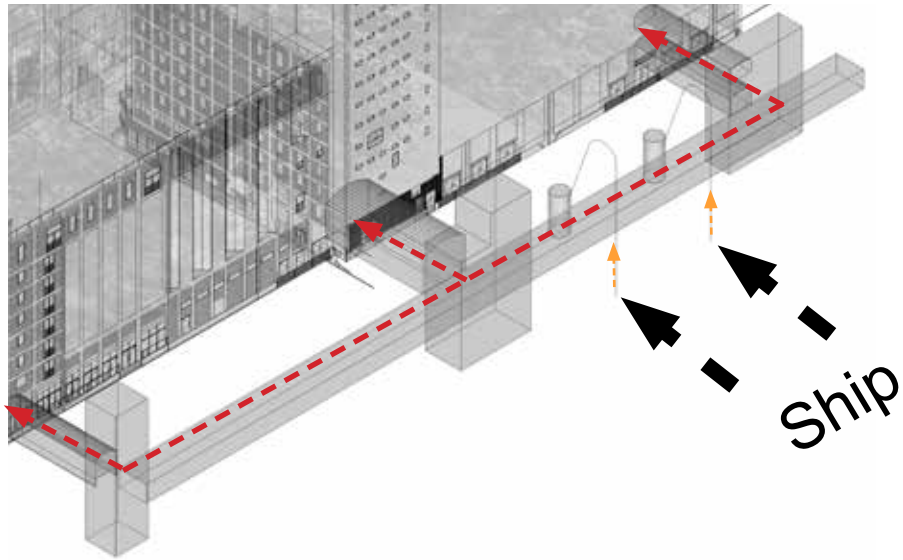
Expression of the Maassilo (Leunissen G.)

For me the Maassilo is a Machine with a 15cm coat made out of concrete, so the machine defines the expression of the building. The construction is therefore also a important topic of the Maassilo complex. The construction is almost fully made out of concrete. In this chapter the influence of the machine on the construction will be analyzed, here the silo complex is subdivided into the following components: steel structure, shaft, distribution floor, silo bins, work floor and basement. This sequence of the construction parts is the same as the process transport of the grain through the building.



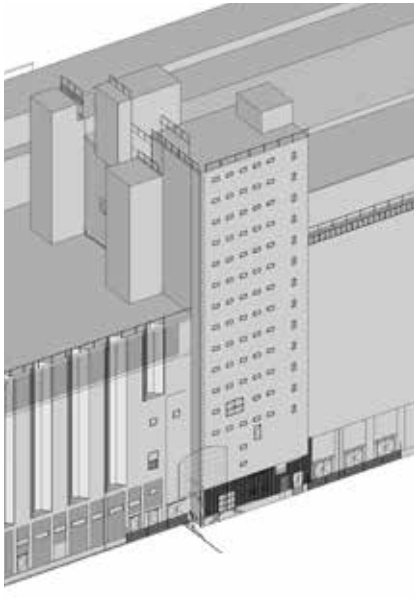
Construction parts of the Maassilo (Belulaj, A. 2016)

The steel structure bridge the distance between the water and the silo building. The steel structure contains three towers and is connected with trusses. The structure was originally covered with steel plates but is now stripped off. This bridge is made of steel because of the spatial freedom, adaptability, take forces of the rigid and strong material. Inside the structure are different installations arranged to transport the grain from the ship to the shaft of the building. The most striking element are the sliding elevators along the waterside.

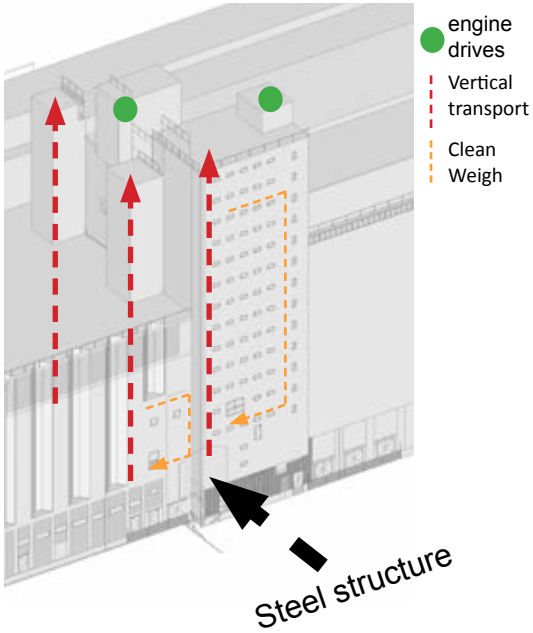


The steel structure on the water (Leunissen G.)

The shaft takes care of the vertical transport of the grain to the attic. Therefore the shape of the shaft is vertical and is also used to weight and clean the grain. The small windows in the shaft provide light for the process to weight and clean the grain. An elevator for the employees is also positioned in the middle of the shaft. The main shaft of the Brinkman en van der Vlucht is made out of concrete. This is due to the strong vertical forces of the production line of the grain. The shaft which is put on the existing Stok building is a combination of steel skeleton with concrete infill. This is done in order to make the structure as light as possible.

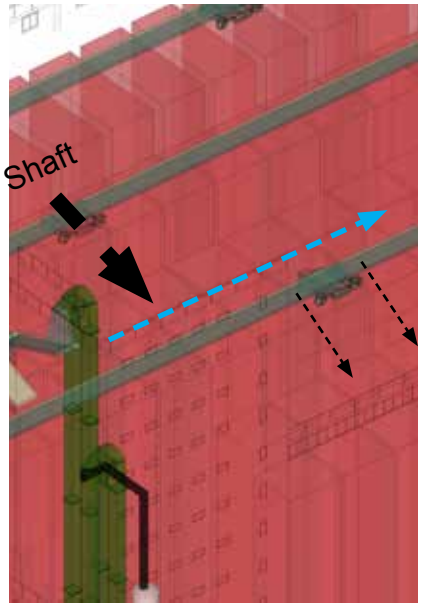


Shaft of the Maassilo (Leunissen G.)

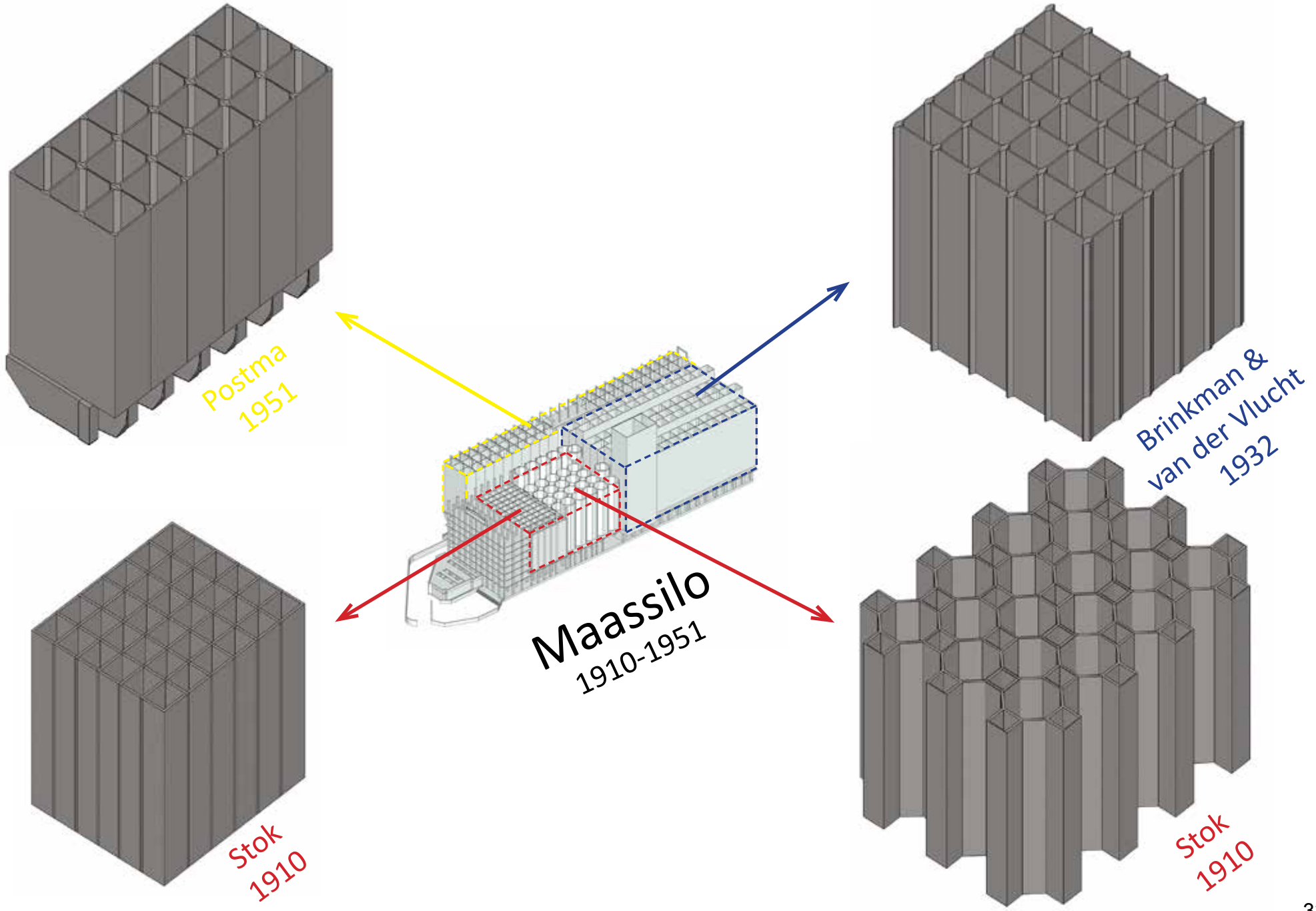


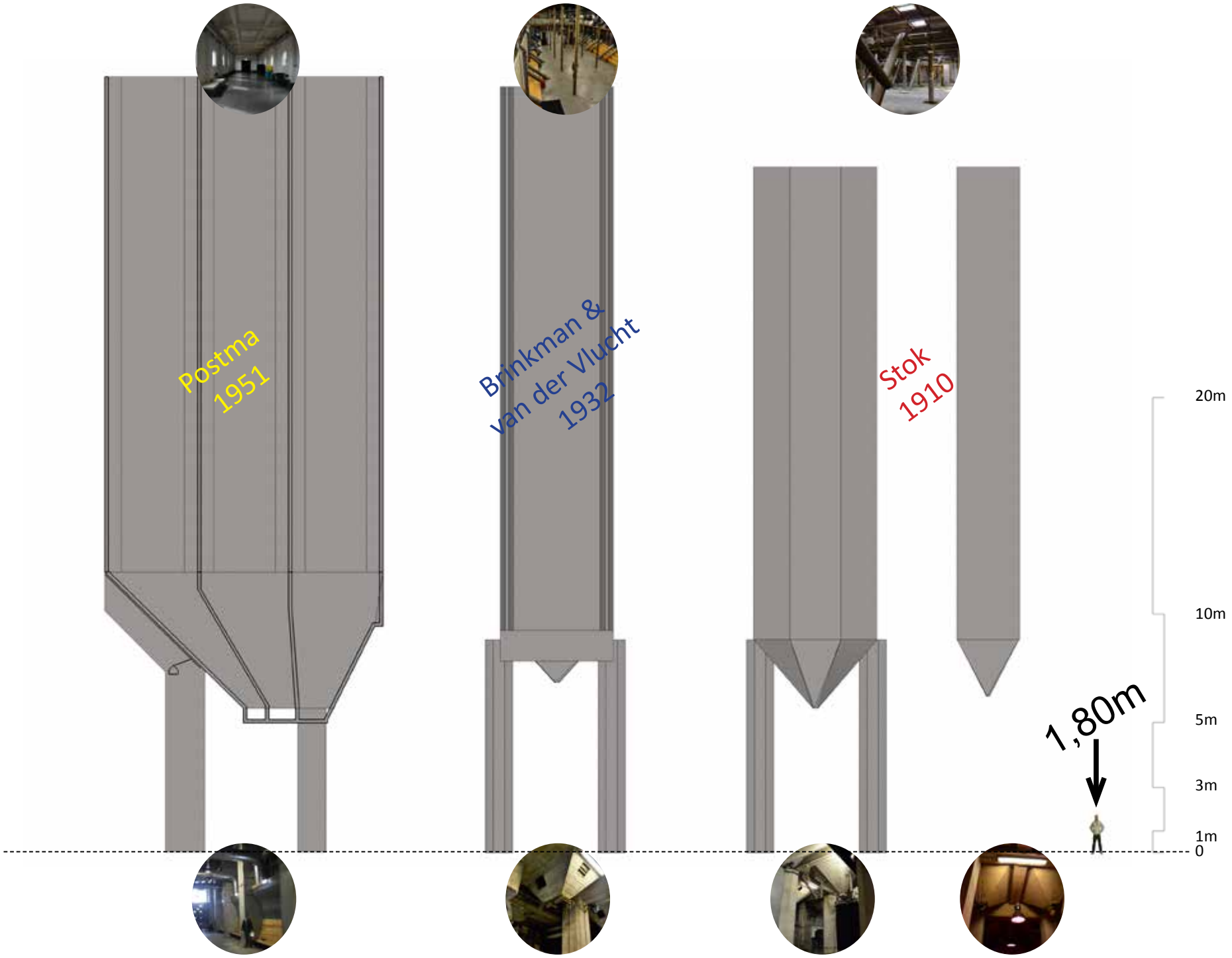
The distribution floor is placed at the attic of the grain elevator. In this space the horizontal transport takes place to the silo bins. The horizontal transport is done by conveyors which ends at a rolling trolley which ultimately leads the grain to a tube, which thereafter enters the silo bin. Only in the Stok building are these conveyor belts placed on a concrete columns and floor construction. In the other following building parts they are directly placed on the silo bins. The roof construction on the distribution floor is kept as thin as possible by danger of explosion, a so-called ‘‘plofdak’’. Which means that the roof construction during an explosion can be damaged rather than the entire construction.

Distribution floor of the Maassilo (Bronswijk, B. 2016)



Distribution floor of the Maassilo (Leunissen G.)

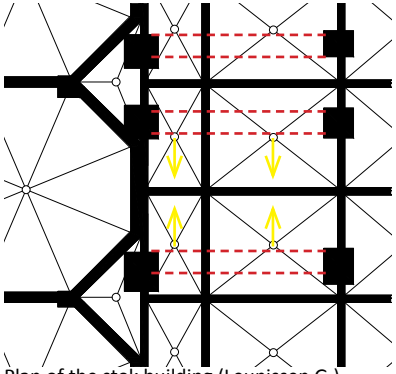

Postma
1951
Brinkman &
van der Vlucht
1932
Maassilo
1910-1951
Stok
1910
Stok
1910


Postma
1951
Brinkman &
van der Vlucht
1932
Stok
1910
20m
10m
5m
3m
1m
0
1,80m

The Maassilo consist out of +/- 75% out of silo bins. The bins provide the storage of the grain and is therefore the main feature of the Maassilo. The silo bins of the different building parts vary greatly from one another. In the Stok part are three types of silo bins: large octogonal, small square between the octogonal silo bins and square bins. The Brinkman en van der Vlucht and the Postma part has one kind of silo size. The silo bins are made out of concrete, this is due to the strong vertical forces of the storage of grain.

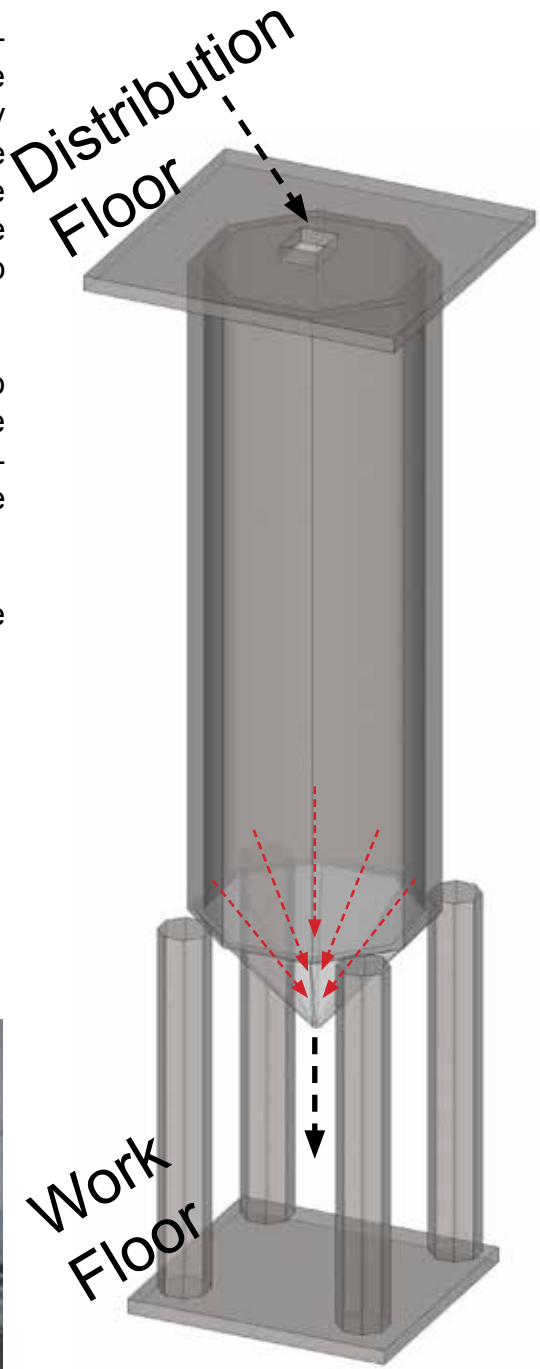
The work floor is positioned on the ground floor at the end of the silo bins. These end of the bins have a funnel shape with a steel crane on the end. It is noticeable that the openings of the silos are so positioned that the columns do not get in the way when processing the grain with the aid of rolling devices.

In the basement are the pneumatic pumps positioned due to the heavy weight.

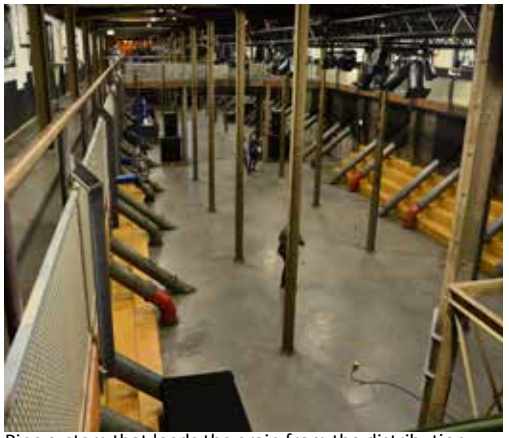


Plan of the stok building (Leunissen G.)

Left behind devices to take the grain from the silos to the workfloor (CV Maassilo. 1951)

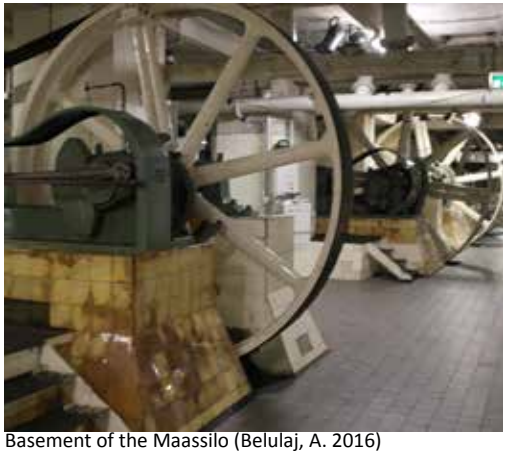


Octagonal silo bin (Leunissen G.)



Pipe system that leeds the grain from the distribution floor to the silo bins

Ceiling of the work floor of the Maassilo



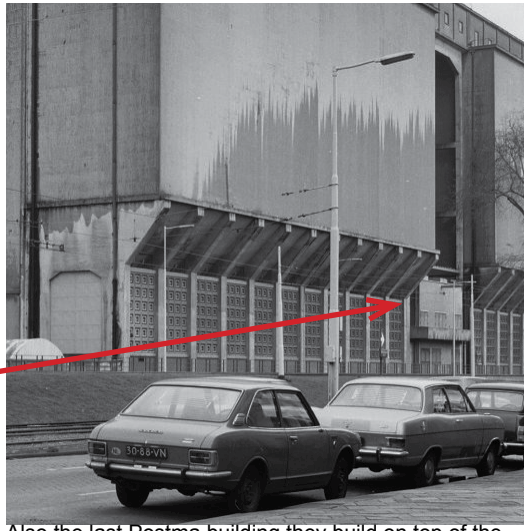
Basement of the Maassilo (Belulaj, A. 2016)

The construction or building envelope has also a relation with the direct context. Every building part owes its shape to different aspects in the immediate area. The owner of the Maassilo would of course keep the capacity as large as possible by cantilevering the building on the railway track and the road. This is the case with the Brinkman en van der Vlucht part en de Postma silo building. At the platforms it also had an advantage that it is dry during rainfall.

The transformation building had also influence on the later building part of the Postma silo at the Brieselaan. They built a construction like a bridge over the plant because the plot was too narrow.

Also the metro station had an influence on the building itself. The arrival of the new metro station had an result that the office had to cut off partially. The former building became a workplace and the office had to move to the quay. Here was also the case that there was too little place to build on the plot itself.

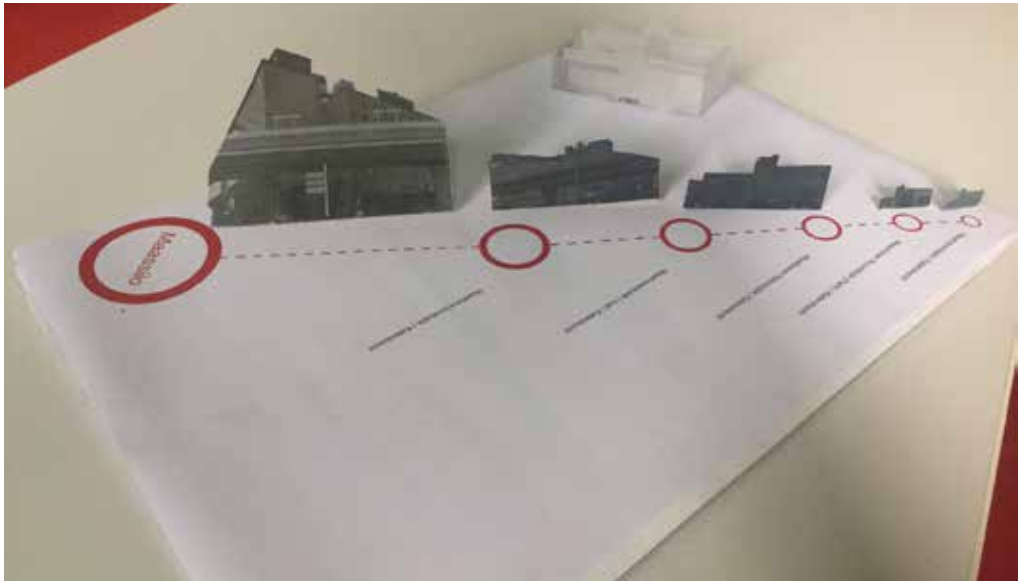
Brinkman en van der Vlucht building part at the Brieselaan. The building cantilevers on the platform and on top of the railway they placed the transformation building (Bouwkundig weekblad, 1931)

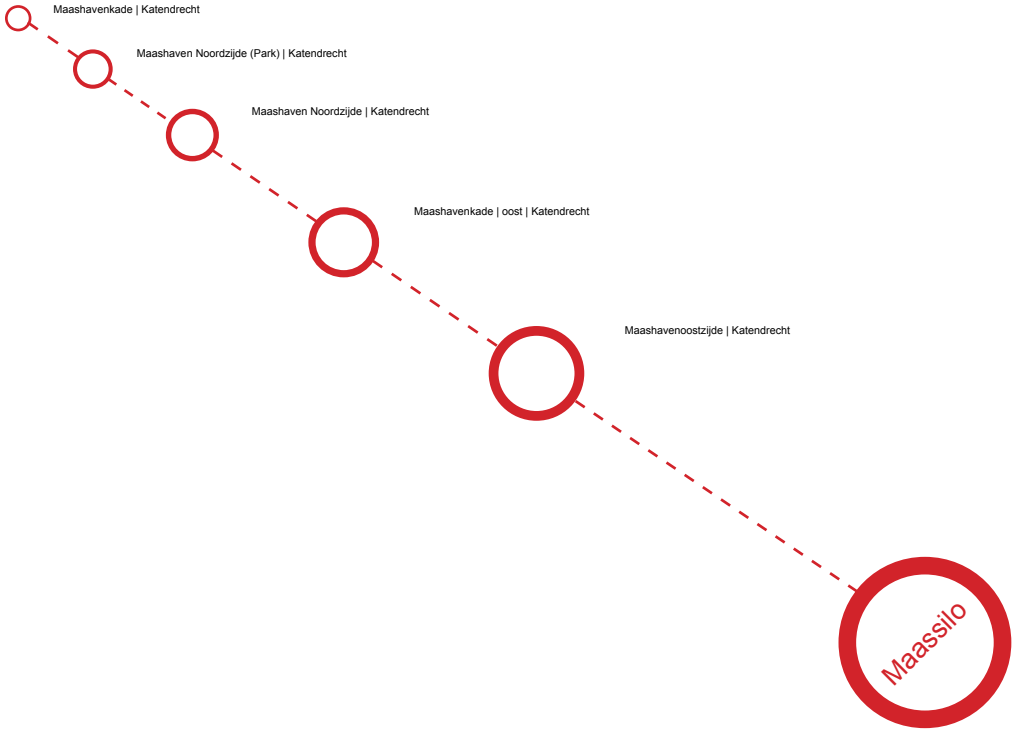


Also the last Postma building they build on top of the railway and cantilevers to the road (G.J. Dukker, 1984)

Situation in 2016 (Apple Maps, 2016)

The metro station under construction (Cees Schultz, 1965)





The model shows that the Maassilo as a silhouette is visible from a far distance at katendrecht, till the detail at the subway station. The Maassilo is from the side of the water good visible from a far distance. This side has become a kind of icon of the Maashaven and the neighborhood.

Model of the Maassilo, The approach to the building from katendrecht to the Maassilo (Leunissen G.)

The maassilo plays an important role in the urban landscape.

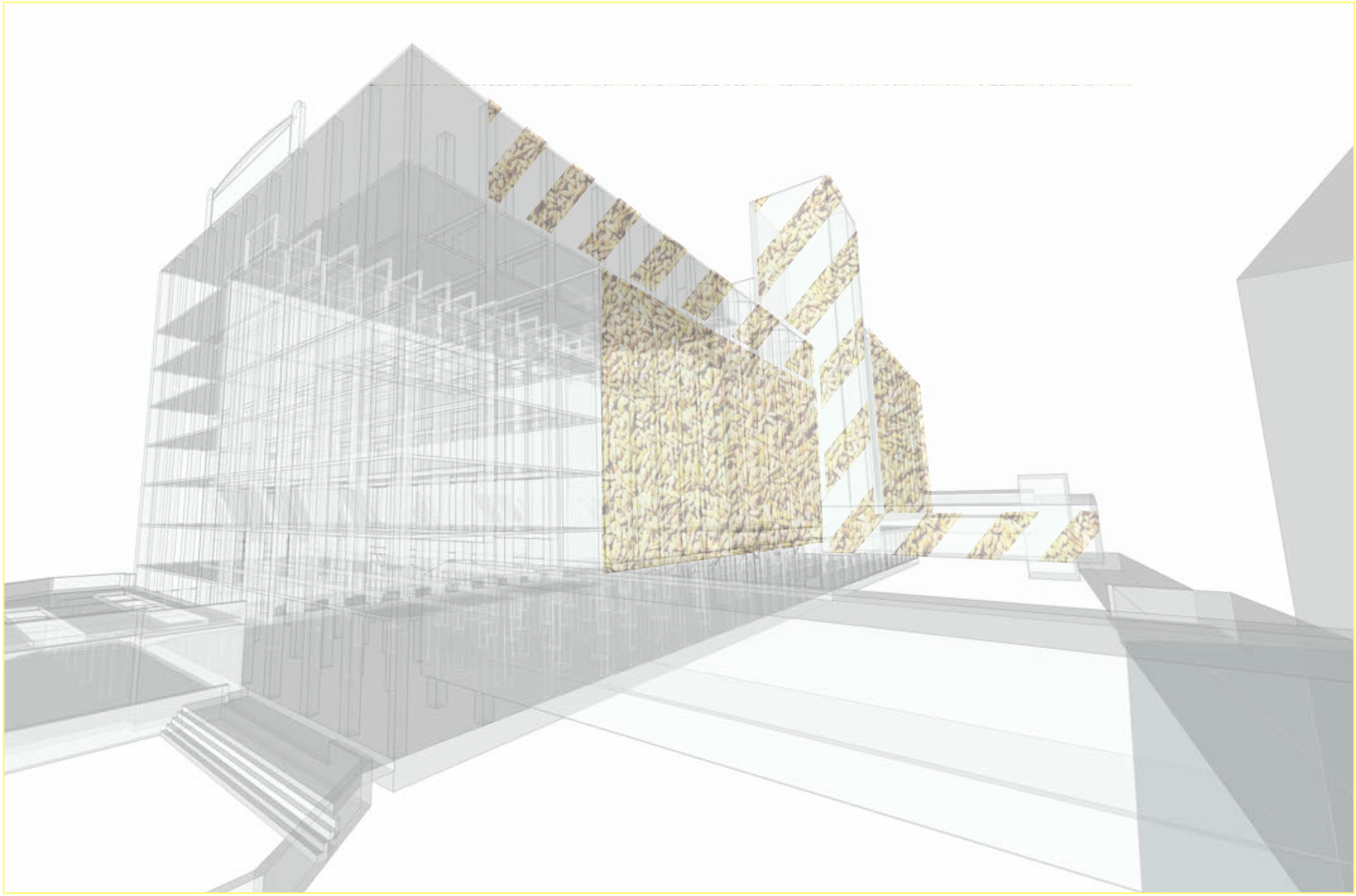
Visibility of the Maassilo from streetlevel projected on the map (Apple Maps 2016, Leunissen G.)

Conclusion

The most characteristic feature about the Maassilo is for me the machine. The machine has played the determining role in the area, shape, dimensions, openings in the facade, construction and materials of the Maassilo. The plot where the Maassilo is built pretty small and therefore every improvement over time is compact and is searched for the optimum storage capacity. Also the infrastructure like the broad waterway end train indicates that the area is set up for transport of grain.

By scaling the silos nowadays are located outside urban areas. Thus, they are no longer involved in the urban context. Also by this phenomenon a lot of urban grain silos like the Maassilo have lost partly their function. Sadly some grain silos in Antwerp were demolished. Fortunately, there is now more awareness about these concrete cathedrals that are part of the urban and harbor landscape.

The Maassilo is now partly in function as an event hall and offices for small creative offices. But, for me personally the machine is not functioning anymore. The biggest part of the building like the silo bins are not used anymore also the steel structure on the water is out of function. For me it is the task to make the Maassilo lively again and make 100% use of the building.



Transportation and the storage of the grain (Leunissen G.)

Value assessment

The prior research was primarily based that the Maassilo is like a machine, I discovered that the characteristics of the building are derived from that typical ‘‘grain’’ machine. And how this machine fits from the landscape till the bins of the silo.

The main aspect of this value assessment is the preservation of the urban landscape value. The bins of the silo themselves are not ‘‘valuable’’ how they look today. The bins are important because they are a measure of the whole building. These dimensions vary greatly by every single building part and time frame, so for the design phase they are key element for the interior of the building. It is also structurally wise to follow the grid.

Next questions:

-How can the Maassilo be adapt the existing structures for contemporary use without losing their specific identity as a silo?

-How can we re-use the bins of the silo?

-What is the next function?

Conservation and preservation in their original state. These elements are essential to the experience of the industrial silo complex and of great cultural and historical value.

Redevelopment possible while respecting the existing structure and materialization. The original design idea must remain recognizable.

Original designs can be changed in the sense of the spirit of the building. Elements undermining the coherence of the complex.

The photographs used in this value assessment were made in 2016 by:
Leunissen, G.
Belulaj, A.
Bronswijk, B.
Apple Maps.

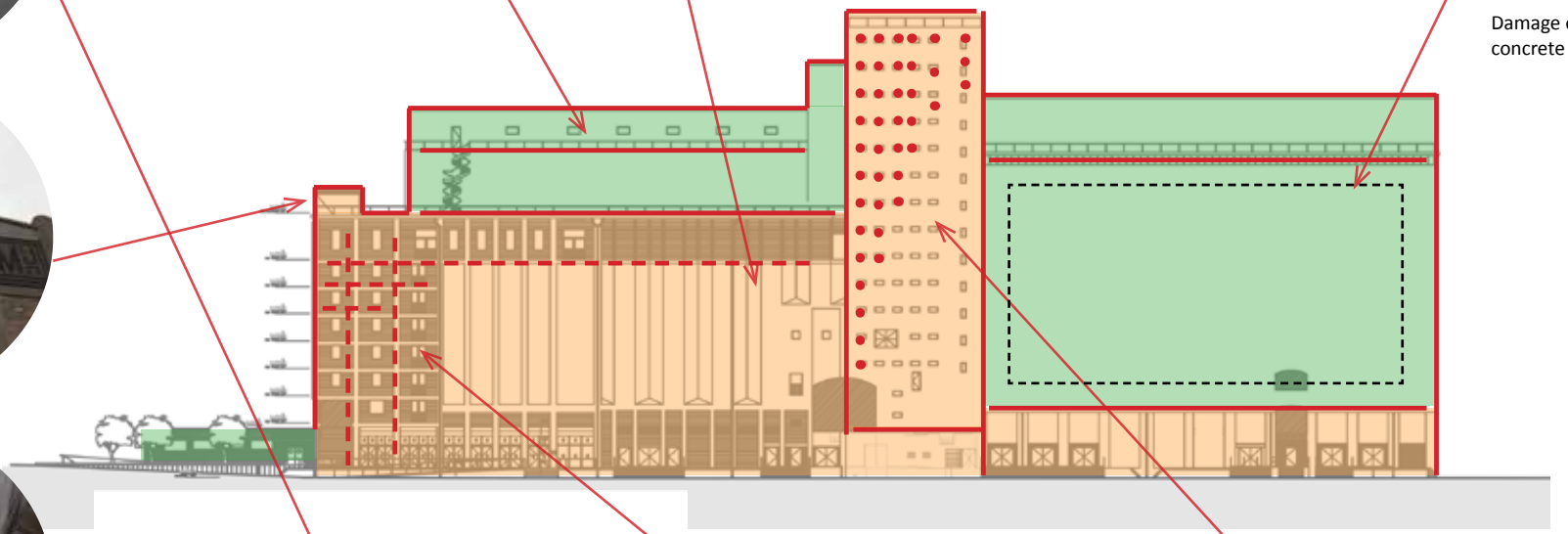
The shafts

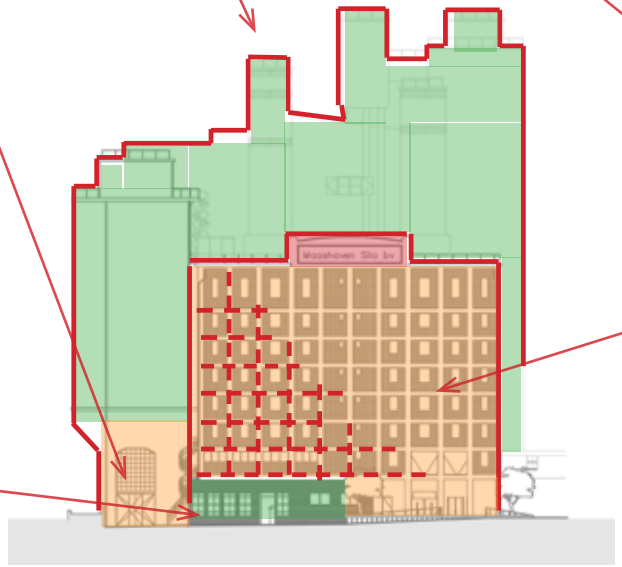
Old logo of the Maassilo

Big openings for the train

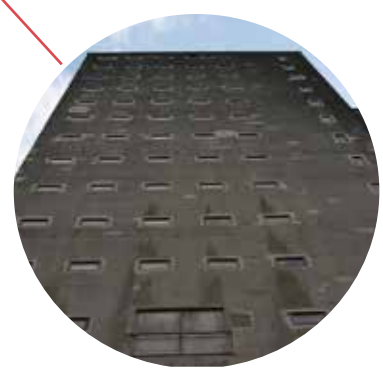
The form of the facade reveals the silo bins

Damage of the concrete

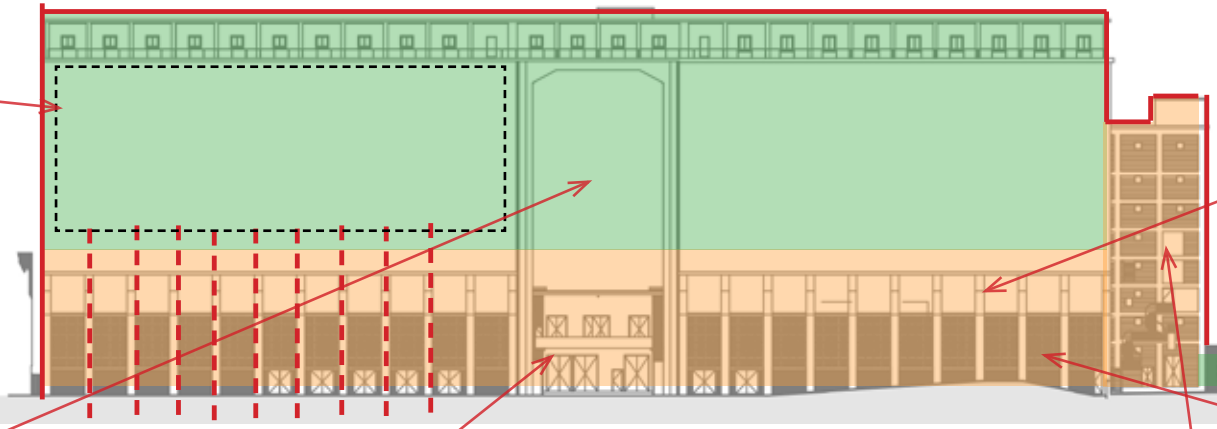


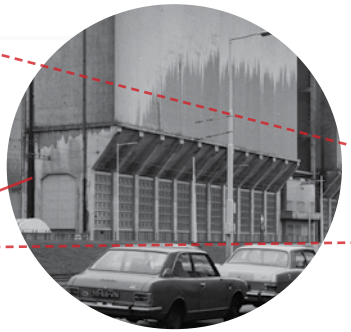


The expression of the structure with the infill of tiles motif



The shaft with the little openings revealed that there was activity





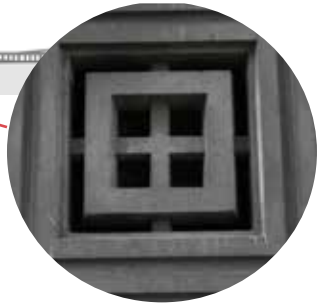
The cantilevering building part

The bridge construction build on top of the transformation plant

Distribution floor

Transformation building

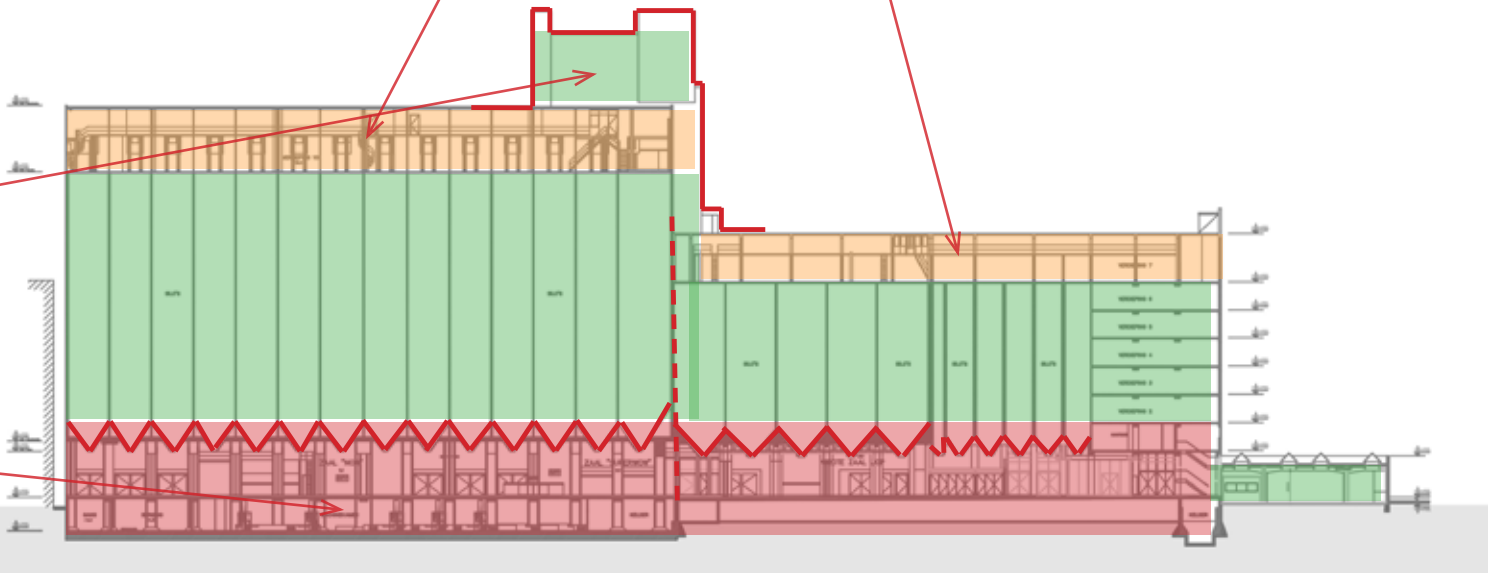
Distribution floor



The decoration block pattern have an industrial character

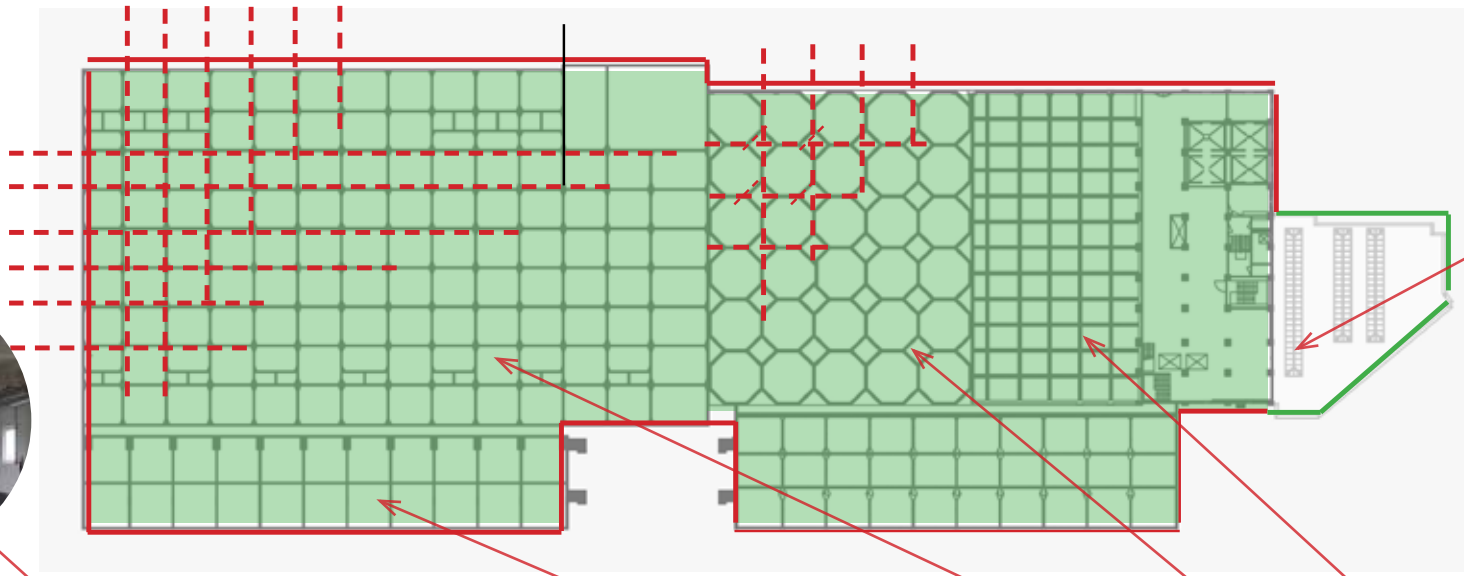
Inside the shaft

Pneumatic pumps in the basement

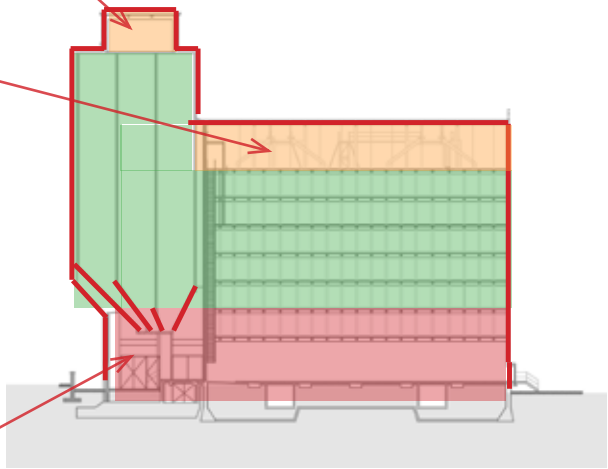


The roof of the former workshop is in bad condition

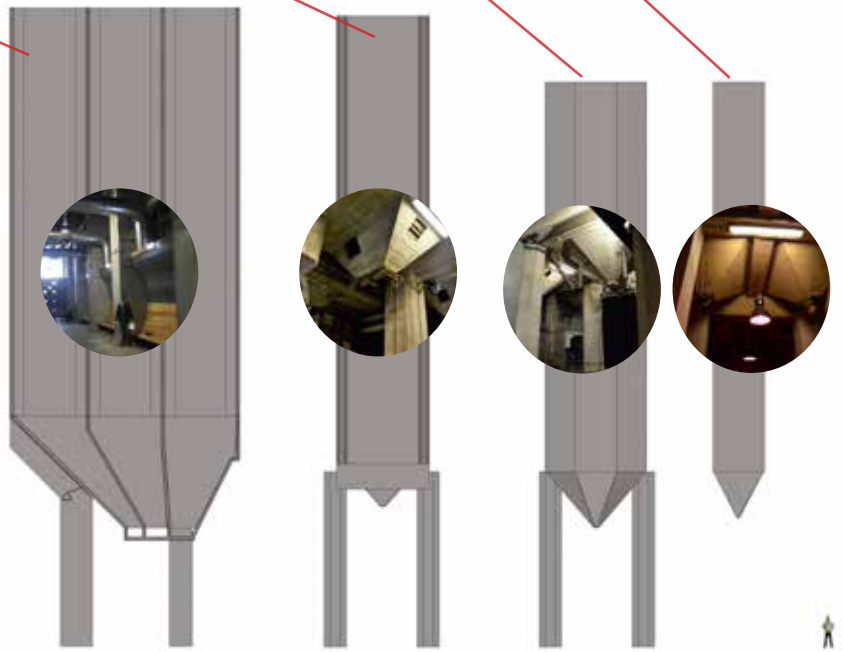
Distribution floor



Distribution floor with the original structure for the rolling plants



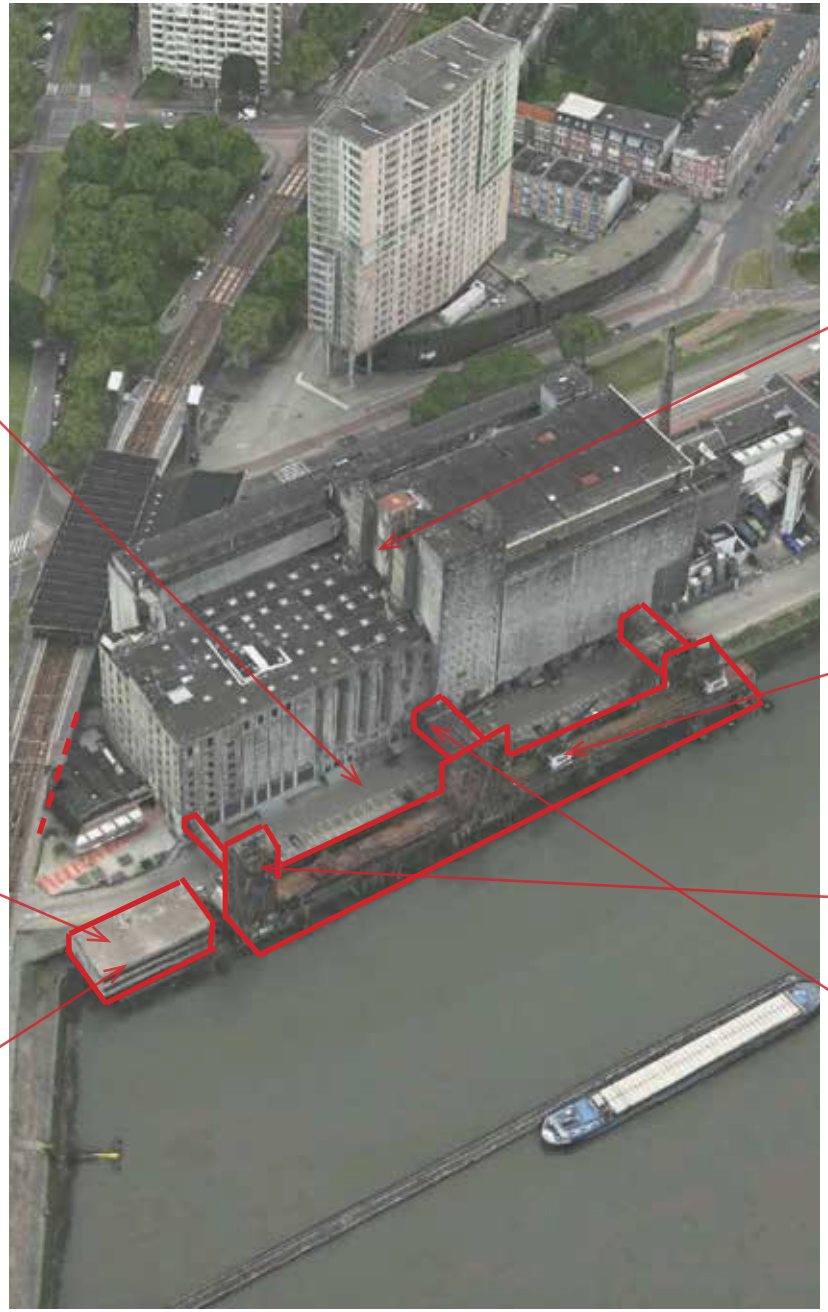
Work floor with the train platform



The funnels of the silo bins in the interior are characteristic for every building part. They reveal the former function as a grain silo, and they are also part of the machine

On the waterfront is the steel structure placed, that bridge the connection from the boat to the Maassilo. This structure is part of the machine and is not in use anymore

Due to lack of space on the land they placed the office on the waterside in 1964



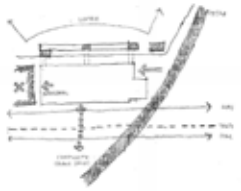
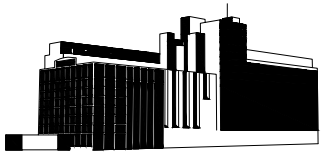
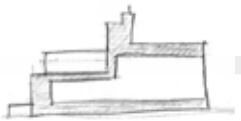
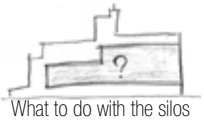
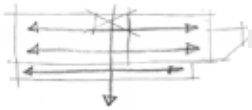
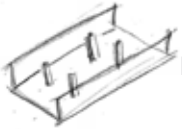
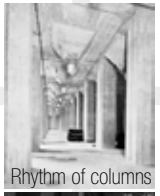
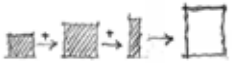
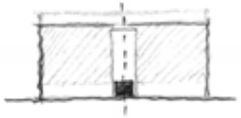
The elevator towers on the roof are characteristic of the Maassilo

The portable elevators

The first tower from 1925

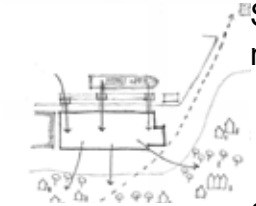
The bridge made of steel from the tower to the Maassilo complex

1981-04; G.J. Dukker (photographer)

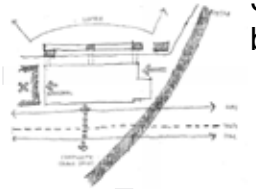
	Age	Historical	Artistic	Commemorative	Use	Newness	Conflict
Site		 Development of complex on site		 Value for the surrounding			
Structure		 Development sizes silo	 Rhythm and organization of facade		 Used parts of structure		 What to do with the silos
Skin	 Degradations of concrete	 Approaches for facades			 Daylight	 New facade elevator tower	 closed facade
Space plan	Relics of former machinery	 Axis according to transport system			 Big open space		 Compartmentalized
Services			 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		

Valuation scheme (Nicholas Clarke)

Site vs. Historical: The railway of the Maassilo structured the streets in the neighborhood.



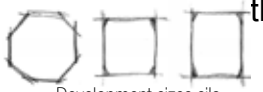
Site vs. Commemorative: The Maassilo was en still is an attractive building for the community. In the past it provided work for the neighborhood and now it is a place for events en small creative firms.



Site vs. Conflict: The infrastructure around the Maassilo cause noise and pollution on the other hand is the place easily accessible by public transport and car.

Structure vs. Age: The structures in and around the Maassilo has been transformed and improved many times therefore there is a big variety in age.

Development of complex

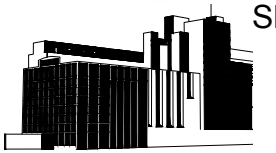


Development sizes silo

Structure vs. Historical: The structures in and around the Maassilo has been transformed and improved many times therefore there is a big variety in age.

Approaches for facades

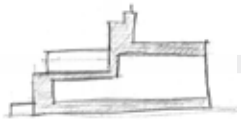
Skin vs. Historical: At the outside there is a big variety in finishing of building parts.



Rhythm and organization of f

Skin/Structure vs. Artistic: The Building marks and is characteristic of the harbor area.

Structure vs. Use: The Maassilo is now (2016) partly used namely the basement, ground floor and the attic.



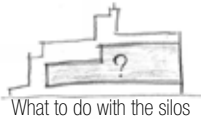
Used parts of structure

Skin vs. Use: The blank facade from the outside shows the storage space in between the attic and the ground floor.

Daylight

Structure vs. Newness: For the new function as event (place maker) they removed some columns to have a better view to the stage.

Structure vs. Conflict: The silo bins as closed structure are an obstacle for a new function. What to do with high narrow spaces?



What to do with the silos

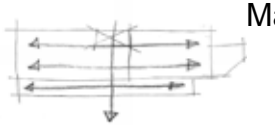
Skin vs. Newness: The steel structure is now (2016) partly renewed.

New facade elevator tower

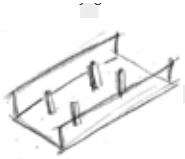
Skin vs. Conflict: The newly added emergency doors deteriorate the original image.

closed facade

Space plan vs. Historical: The elongated plot is due to the infrastructure like the water, railway and the organization inside the Maassilo at the work- and the distribution floor.



Axis according to transport system



Big open space

Space plan vs. Use: In former days the ground floor was one clear and open space.

Compartmentalized

Space plan vs. Conflict: For the new function as event hall, they put every function as cheaply as possible in enclosed spaces like: toilets, ticket shops, lockers, kitchen, bar and several stages.

Services vs. Age: At various places you can still find old equipment of the previous function as a silo building.

Rhythm of columns

Services vs. Artistic: The rhythm of the organization is a beauty in itself.

Funnel cut by wall

Services vs. Conflict: The enclosed spaces for the new function are not within the same original structure.

Relics of former machinery

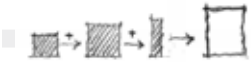
Stuff vs. Age: At various places you can still find old equipment of the previous function as a silo building.

Rhythm of tubes

Stuff vs. Commemorative: The old stuff tell a story how they have used the stuff.

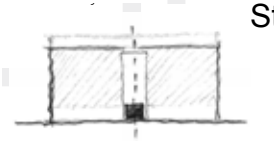
Stuff on the ceiling

Stuff vs. Conflict: The two functions former and now forming a clash between each other.



Scale of grain storage to empty bu

Story vs. Historical: In former glory the silo bins were full of grain, now they are full of air.



Adjustment to site

Story vs. Artistic: The layers of time had a big influence on every building part.

Once upon a time

Story vs. Commemorative: Old pictures of the Maassilo tell a story about the situation those days.

From industry to night club and offices

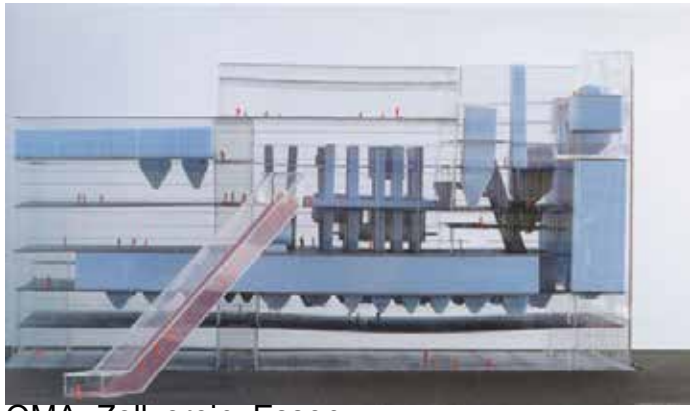
Story vs. Use: Old situation vs new situation

Reference projects

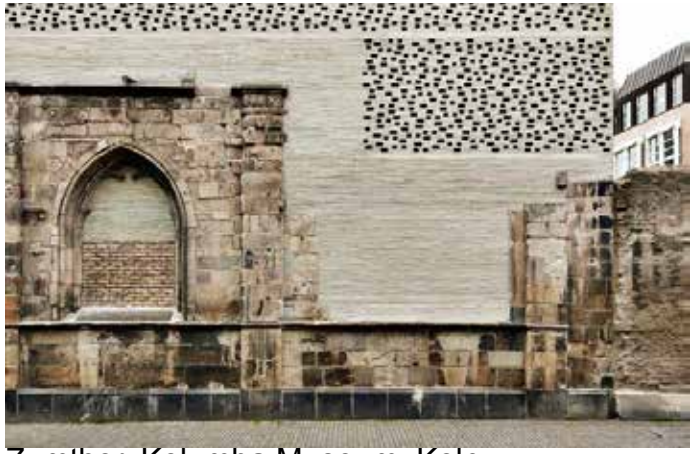
What I personally find very interesting in these reference projects are the expression of the former situation, without trying to look like original. It gives an idea of the old situation.

divisare.com | Designer Edoardo Tresoldi

What I really like about the Zolverein in Essen is that it seems as if the machine is still in alive. It just has a different fuel namely ‘’ people ‘’.



OMA, Zollverein, Essen



Zumthor, Kolumba Museum, Koln

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http://www.clo.nl/indicatoren/nl2151-leegstand-winkels

Site 2: http://www.bk.tudelft.nl/over-faculteit/afdelingen/architectural-engineering-and-technology/organisatie/heritage-architecture/

Site 3: www.khanacademy.org/humanities/ancient-art-civilizations/roman/roman-republic/a/temple-of-portunus

Site 4: City Archive Rotterdam, Elektriciteit in Rotterdam http://www.stadsarchief.rotterdam.nl/elektriciteit-rotterdam

Maassilo as a Machine