The Changing zone of Hembrug
The Changing zone of Hembrug
<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>6</td>
</tr>
<tr>
<td>History</td>
<td>16</td>
</tr>
<tr>
<td>Urban context</td>
<td>34</td>
</tr>
<tr>
<td>Local context</td>
<td>48</td>
</tr>
<tr>
<td>Architecture</td>
<td>68</td>
</tr>
<tr>
<td>Building technology</td>
<td>86</td>
</tr>
<tr>
<td>Cultural value</td>
<td>156</td>
</tr>
<tr>
<td>Masterplan</td>
<td>174</td>
</tr>
</tbody>
</table>
Introduction

Hembrug is a military industrial area in the port zone of Zaandam. The Hembrug area is situated in between the North Sea Canal and the Zijkanaal G. In 1875 this canal was dug and changed the landscape of the area from a headland outside the dike, into a typical Dutch 'polder'. This headland was called 'Hem' in Dutch and the new bridge build over the North Sea Canal was named after this type landscape. This was the start of the 'Hembrug' and the Hembrug area.

In front of you is presented a research into the 'Changing zone' area of the Hembrug complex. "Palmbout" was the first to divide the Hembrug area into different ensembles, in their research about the Hembrug area in 2010. The name "uitwisselzone" was used to define our ensemble. In our research we have translated it and reshaped it into the "Changing zone" of Hembrug. In this zone a special exchange emerged in the density of the buildings. When production started growing, buildings that were seen as unfunctional were demolished and often the new created open spaces were filled with buildings again. This interaction of dilution and compaction resulted in the ensemble we see nowadays what is named after this development of buildings.

This research is done as part of the Masters 3 graduation studio Heritage and Architecture: Revitalising Heritage. The main research question is: "What is the coherence in the changing zone?". At first sight, the Changing Zone looks really complex and diverse, but still interrelated with each other. The question of how the complex fits together will be answered in this research on different levels. This will be discussed on the Urban level, looking at the interrelation between Hembrug and Amsterdam, but also Hemburg and Zaandam. The local level will discuss the coherence between Hembrug and the changing zone, but also in relation to its history. The building level will zoom into the relationship between the different buildings of the Changing Zone ensemble. Then the cultural value will be discussed. This all in order to end with a valid answer to the main research question.

In the last chapter some preconditions are layed down to ensure a well-founded master plan.
“Samenhang”

The main research question stated in Dutch: “Wat is de samenhang in de ‘Uitwisselingzone’?” Difficulties occurred when translating ‘samenhang’ into English because there are multiple translations. Some of them fit the context, while others do not. The definitions of these different translations were looked for in the Oxford Dictionary in order to pick the most suitable translation.

Cohesion:
Forming a united whole: a cohesive group.

Coherence:
The situation in which all parts of something fit together well: The points you make are fine, but the whole essay lacks coherence.

Consistency:
The quality of always behaving in the same way or of having the same opinions, standards, etc; the quality of being consistent: She has played with great consistency all season.

Connection
Something that connects two facts, ideas etc. syn: link. a direct/close/strong connection with something.

Interrelation
The way in which two or more things or people are connected and affect each other.

Relation(ship)
The way in which two people, groups or countries have towards each other or deal with each other. The way in which two or more things are connected.

Combining the different translations into one solid definition of the word "samengang", creates the following definition: The way or the situation in which two or more things are connected, or affect each other and fit together. Grammatically, coherence fits the best in sentences and will, therefore, be used in the document, with the definition above in mind. The translation of the main research question will then be: “What is the coherence in the changing zone?”
The Hembrug terrain was the heart of the military industry in the Netherlands around the twentieth century. This terrain is a fascinating ensemble consisting of buildings and its surroundings with their own history.

In 1874 the government of the Netherlands decided on creating a new waterline as their defense of the west against their enemies from the east and south. This new waterline was situated around Amsterdam and was therefore named the Stelling van Amsterdam (Defense Line of Amsterdam). This defense line was built up with a number of forts to create a last base where the army could withdraw, in case of an attack. In the centrum of this defense line was the area of Hembrug situated. This area in Zaandam is positioned at the meeting point of the North Sea Canal and the Zijkanaal G of the river the Zaan. Because of this central position, the easy possibility to secure the terrain of the surrounded water and the purchase of a new gun, the Dutch government decided in 1889 to establish a weapon- and ammunition factory on the Hembrug terrain. After a period of 200 years of the artillery factory in Delft, the factory did not fulfill the needs or space for the production of this newly purchased gun. So the factory moved to the Hembrug terrain.

Between 1895 and 1890 this weapon- and ammunition factory was built. Before this time the terrain consisted of a big coal shed of the Dutch navy. The factory was created next to this shed and around 1899 the complex was ready. It contained a workshop for portable weapons, artillery warehouses and an ammunition factory. The workers called the rehousing to Zaandam "the exile to Hembrug", because they were able to reach the factory in three different ways: with the unreliable steam train, with an expensive boat trip and by walking. This was a lot more difficult then the former factory in Delft.
The Changing zone

In this analysis the buildings will be addressed by their number. To remember the numbers of each building they are explained by the former function.

322a & 322b = former ‘gloeierij’ & ‘draaierij’
269 = ‘de Dood’, former cartridges storage
91 = former ‘patronenmagazijn & waterzuivering’
112 = ‘de Kathedraal’, former press building
294 = former ‘draaierij’
330 = former ‘draaierij’
29 = oldest building, former ‘controlegebouw’
407 = former ‘gloeierij’
437 = newest building, former ‘werkplaats’

* * *

= boundaries The Changing zone
Multiple times we have visited the Hembrug area, and especially the Changing zone ensemble. Everytime we discovered something we hadn’t seen before, something new. With this photo-impression we mapped the photos into different categories, different atmospheres.

The first atmosphere is the greenery, nature. rought into the complex by the ‘plofbos’. This military forest has a strong connection with the ensemble, both from the inside and outside. The other atmospheres have to do with the materialization of the ensemble. The white colour that resembles the unique orientated bricks of building 294 as well as in the window frames of different buildings. Brown-red occurs in the frequently used brick and the timber floors of the storage buildings (269 and 29). The stuff, referring to the original use of the buildings, is categorized into one atmosphere. The orange-brown colour of the rusted steel is also a characteristic colour of the ensemble, both inside as outside. Finally, the grey colour is often returning and can be found in on the floors, walls, and roof (constructions).
History
What is the coherence between the history and the ensemble of the Changing zone?
Steenhuis & Meurs, (2010). Cultuurhistorische Analyse Hernbrugterrein
De stelling van Amsterdam via https://www.stellingvanamsterdam.nl/

Source: https://www.stellingvanamsterdam.nl/
As described in the previous chapter, when the government had to find a new location for the weapon- and ammunition factories, the Hembrug terrain was chosen. This area in Zaandam is positioned at the meeting point of the North Sea Canal and the Zijkanaal G of the river the Zaan, but also very close to (the Stelling of) Amsterdam and is closely connected with the Stelling. The stelling was an inventive system, a defense line, to control the water level around Amsterdam and was built between 1880 and 1920. This defense line, of 135 kilometers, was built up with a number of forts to create the last base where the army could withdraw, in case of an attack. The line consists of inundation areas, forts, batteries, dams, divers, and plantations. The idea was to flood the land, not deep enough for ships to go through and too deep for a man on a horse. In this way, the capital of the Netherlands would be protected against an enemy invasion.

The central position of Hembrug and the easy possibility to secure the terrain was the most suitable to establish a weapon- and ammunition factory. Another motive to choose Hemburg was because in case of an explosion both Amsterdam and Zaandam would not suffer too much because of the distance. Safety was a key element in that time. The Hembrug terrain was as said above a suitable location for the Artillery, but also for other military facilities like, equipment and ammunition facilities.
In the history of Hembrug a lot has happened over time. First, with the landscape Hembrug nowadays is situated on. In 1815 it existed of water and was it called the ‘Hem’. In the next years the land got diked and the shape it is currently in occured. Buildings got built and the trainbridge crossing the North Sea canal emerged. In 1894 the current function, the ‘Artillerie Inrichtingen’ moved in. This ammunition factory started in 1830 in Delft. Because of lack of space and the development in the weapon industry, it was decided to move the ammunition factory to another area, this was the start of Hembrug. This timeline explains this growth and development of Hembrug. It also shows the number of employees, to address the golden days and the decline of the ‘Artillerie Inrichtingen’. 
1815

1850

1882

1860 Start of the ironworks factory in Delft

1840 Start construction of North Sea canal

1835

1865 De Hem got diked, the shape of this is still visible

1875 First Hembrug was built

1869 Zaandam joined the nationwide traintracks

1879 200 years anniversary of Delft

1890

1888 Start with the ‘Stelling of Amsterdam’

1889 Decision of moving to Zaandam

1888 Start with the ‘Stelling of Amsterdam’
The weapon factory at the start of the Hembrug 1907

The Cathedral and cartridges factory around 1936

1894

1901 First factory was finished

1914-1918 WWI

1920 Finished 'Stelling van Amsterdam'

1944 Strike leads to shut down and evacuation

1895 Start with the building of Hembrug

1905

1912 The complex became a state-owned company

1924 Finished relocating from Delft to Zaandam

1933 Hitler became the ruler of Germany

1940 Separation of the civil production

1923

1920 Treaty of closing Hembrug

1925 Start building houses (Delfste Rij)

1940-1945 WWII

1875 Bridge built between Hembrug and the mainland

1906 Start second building phase

1923 1923

1944 1944

1895 1895

1901 1901

1924 1924

1944 1944

1875 1875

1906 1906

1920 1920

1933 1933

1940 1940

Source: Beelbank Zaandam
Source: Beelbank Zaandam
Source: Beelbank Zaandam

Source: www.topotijdreis.nl
Source: www.topotijdreis.nl
Source: www.topotijdreis.nl
1945

- 1950 Decrease demand for ammunition
- 1952 Restart production

1950

- 1959 Hembrug becomes a limited company instead of state-owned

1956

- The whole Hembrug terrain

1960

- 1983 Commissioning and the opening of Hemtunnel

1973

- Limited company becomes ‘Eurometaal N.V.’

1975

- 1996 Stelling of Amsterdam becomes UNESCO World Heritage
- 2001 Workshops were given by the government

1979

- 1950

1980

- 1960

1983

- 1975

1986

- 1996

2000

- 2003

2001

- 2006

2006

- 2017

2011

- 2017

2016

- 2018

2018

- 2017

- 2006

- 2003

- 2001

- 1996

- 1983

- 1973

- 1959

- 1950

Images of development over time; own illustrations, based on Steenhuis & Meurs (2010). Cultuurhistorische Analyse Hembrugterrein.
During the 19th century, there were a lot of conflicts around Europe, with this conflict the need for weapons increased. In the Netherlands, the weapon industry was growing and in need of a new place to make these fulfill this demand. The artillery factory was moved from Delft to Zaandam and in 1895 a start was made with the buildings of the weapon- and ammunition factories at Hembrug. The first buildings were all according to a symmetry axis, running across the terrain. At the middle, a shooting range was situated. Every building that was build in the period around 1904 had to keep this shooting range in mind and was therefore positioned parallel to the symmetry axis.

With the threat of the first World War in 1914, the Hembrug terrain started growing. New buildings were needed for the production of weapons. New warehouses and factories arose adjacent to, in between and next to existing buildings at the terrain. The amount of workers started off in 1912 at 2000, increased to 3000 in two years and was in 1917 at its highest with 8500 workers. After WOI ended in 1918 the number of workers started to reduce from 8500 to 2000 in 1921. The demand for weapons shrank and an anti-militarism feeling emerged after the first World War. This resulted in an all-time low for the artillery factory of Hembrug.

Around 1935 a change was happening. Hitler got the power over Germany and conflicts were started to emerge again in Europe. The demand for new products started to arise in the Netherlands and therefore old buildings were demolished and new buildings were built at Hembrug. In 1940 the number of employees was at its highest with 7000 people working in the factories. When Germany occupied the Netherlands, the Hembrug terrain was obliged to surrender to the German occupier. The chief of Hembrug at that moment started to secretly dismantle machines of the factory and ‘fired’ around 5000 people, so the Germans would not have anything to occupy. Unfortunately, in 1944, the Germans did succeed to man the Hembrug factory and they emptied out the factories and moved everything to Germany. After the Second World War Hembrug had to start all over again.
After the Second World War, the Hembrug terrain needed to face the new realities of the post-war economy. Weapons were not asked for anymore and the factories in Hembrug were therefore used to create other objects like; army vehicles, bikes and even iron bolts. This did not provide the same success as in the earlier days and after the transition into a state-owned company, the setbacks began. The production of a new gun was not what they expected and the Netherlands was obliged to sell the license to America, which did not lead to new work for the Hembrug factories.

In the seventies, the Hembrug terrain was split up in two separate companies. One was a state-owned company still used by the ministry of defense and the other was called 'Eurometaal', which was combined with the German company 'Dynamit Nobel'. This split provided for a final doubling of employees of Hembrug, which counted 1400 people around 1978. This was the highlight before the fall. In the year 2000 the ministry of defense unfortunately decided to leave the Hembrug terrain. Three years later, in 2003, the company 'Eurometaal' closed their doors as well.

A new period of time arrived when Eurometaal decided to leave the Hembrug terrain. Buildings were abandoned and the nature took over the site. In 2010 parties started to become more interested in this designated site. Steenhuis & Meurs started with a cultural historical research and the urban designer Palmbout created a development strategy for Hembrug. Buildings were renovated by the city council and new users started to come. Also a couple of buildings were demolished. Nowadays a lot of buildings store a new function and plans are made for the development of the Hembrug terrain.
Historical pictures

Along the North Sea side, a monumental waterfront was situated in the early days (1907). The big chimneys are representing the three factories of the Hembrug. On the right the cartridges factory was positioned, where the Changing zone was a part of.

At the middle of the original symmetry axis a shooting range was positioned. This shooting range had an impact on the future development of Hembrug. Buildings were built parallel to this range for security reasons. Also the tracks for transportation of goods was defined by this shooting range. This is the plan of the shooting range in 1897.

The Hembrug terrain around 1990, the first factories were built in this time.

In the overviews of the Hembrug area you see the dilution and the compaction that occurred over time. Where the picture on the left (around 1933) is filled with buildings around the Cathedral, the openness of the picture of the right (around 1956) shows the big change of density.
In the building 407 the annealing ovens were standing to melt the metal before pressing. The rails where the cars are moving on, are still there.

The demolished cartridges factory is shown in this picture. A lot of machines are all connected to one system of rotating wheels, driven by steam engine. This elongated system is copied in the buildings that can still be found in the ensemble of the Changing zone.

In this picture the editing of the cartridges is happening (building unknown). What can be taken out of this picture is the elongated structure of the building needed for the installations of the machines (1950).

This is the building 112, filled with big presses. A good image of the cartridges production can be picked up from this picture.

This is the ammunition factory that is demolished around 1898, the striking aspect of this picture is the shed roof, which can also be found in our buildings.

Here the press standing in building 112 is in use and the cartridges are inlaid. This wells are covered with a new floor nowadays, but this picture still shows us the way that the production used to be (1955).
Production process

Over time the production of the cartridges grew and new buildings were necessary for this expansion. The buildings that are left nowadays are all a result of this production process, therefore it was necessary to look into this process. All the buildings nowadays resemble this original function in character. Traces of this original function can also be found in the structure or building technology. The current production process is shown upwards and the images below resemble the process at the ensemble over time.

1. *Gloeierij* - Annealing oven
2. *Knippen* - Cutting
3. *Persen* - Press
4. *Walsen* - Roll
5. *Draaien* - Editing
6. *Transporteren* - Transport
7. *Controleren* - Check
8. *Opslaan* - Store
To know more about the production process of the whole ensemble, it is best to zoom in on the part where building 29, 294, 330, 407 and 112 are coming together. Inside this part of the ensemble, the cartridges were pressed, edited, stored and checked. A lot of machinery was necessary for this production. The image on the right shows a plan of how the machines were placed inside the buildings. It is built up as a large open space, with only separate booths for the few offices that were needed. This offices can be recognized because of the heating that can be found next to the window. This shows that the room is used as a space to stay. Nowadays you can still find clues of what used to stand inside the buildings. For example next to the doors of building 294. In this part of the ensemble the cartridges were edited. One part was filled with machines with so-called ‘brass curls’ and the other part existed of ‘aluminum curls’ (see image right). This division can also be seen in the original setup of the machines. The presses were situated in the highest part of the ensemble, the Cathedral. They were put next to the window, to leave a big space in the middle for transportation. The crane that was used to transport this big machinery is still there in the current state. The building where the metal was heated before pressing is situated next to the building 112. This building 407 was filled with ovens and rails to transport the cartridges. Next to the ovens and presses, the ensemble was also filled with welding machines, and storage units to fulfill for the production of the cartridges.
The curved wall of 330
In the facade of building 330 is a unique element applied. A curved wall is leading towards the door which used to be the entrance of the expedition. This curve is probably introduced to enlarge the overview of the doorman. Looking out of his office, the doorman could see the entire entrance and everything entering the building could be checked before moving inwards.
Urban context
What is the coherence between the Changing zone and its urban context?
Amsterdam - Hembrug

In a radius of 7 kilometers around the city center of Zaandam en Amsterdam the Hembrug terrain is situated. It is on the edge of Zaandam, but also close to the growing city of Amsterdam. Amsterdam is expanding towards every direction, as well to Zaandam, therefore the Hembrug area is a great location to contribute to this growth.
accessibility

This centrality can be found in the accessibility of the Hembrug terrain. From the city center of Zaandam it is maximum 15 minutes of travelling by public transport. As well as the trainstation of Amsterdam, this is plus minus within 40 minutes by public transport.
Zaandam - Hembrug

Source: Own illustration based on Steenhuis & Meurs, (2010): Cultuurhistorische Analyse Hembrugterrein
In Zaandam and the Zaanstreek, a lot of activity took place along the shores of the river the Zaan. Different industries had their place here: from food products and the timber industry until the cocoa processing industry and the soapmaking industry. All these different factories were located in warehouses along the river, in the 19th and 20th century.

In 1907 a trainbridge was built to connect (the Hembrug terrain with) Zaandam and Amsterdam. At the high days of the Hembrug terrain, it facilitated 8500 with a job. However to most residents and to most people the Hembrug terrain was a secret place. It was hard to enter and with strict access control. To most people, Hembrug has always been a mystery.

People did not only work at the Hemburg complex, they also lived there. This part is now called ‘Havenbuurt’ and was originally a housing plan for employees of the Hembrug complex. Directly to the Hembrug area, some houses were built as well, these houses can still be found. The row with the houses is called the ‘Delfse Rij’ (see picture on the left) because of the former employees that had moved from Delft.
Original setup Hembrug

Source: Own illustration based on Steenhuis & Meurs, (2010) with underlayer of peetbank Zaandam: (Hembrug between 1930-1940).
The Hembrug complex was originally divided into three different zones:

The first one is the ‘Artillerie Inrichting’ (AI) consisting of factories for weapons, cartridges for ammunition and ammunition. The second is the General Defense Park. Here workshops places and stocks lie for the ‘Stelling van Amsterdam’ (Defense Line of Amsterdam) and later for other military lines. The third part is the Sector Park Zaandam. Here are the stocks located (ammunition, weapons, fuels) for the forts in the northwestern part of the ‘Stelling of Amsterdam’.
Division of Hembrug

Source: Own illustration based on Steenhuis & Meurs, (2010), the underlayer (1916) is a photo taken at the archives of the NIMH.
The Changing zone is part of the ‘Artillerie Inrichting’ (AI). As described the AI consists of three separate zones; a weapon factory, a factory for cartridges and a factory for the ammunition. Everything was designed for an efficient and safe mass production. The Changing zone is where the production of cartridges for ammunition took place. Originally in this ammunition area, two large factories with the same size and dimensions were located. In total there were 12 depots for the production of the cartridges. The storage of this cartridges could be found at a save behind high walls. Some supporting storage depots were located at the now called Changing zone. Between the two World Wars, these two sheds were demolished and replaced by an ensemble of consecutive buildings. The two factories are now demolished but the ensemble remained and expanded further.
Eurometaal

Source: Own illustration based on Steenhuis & Meurs, (2010), the underlayer www.hembrugterrein.com
Eurometaal was established with the privatization of the ‘Atillerie Inrichting’. In 1973, the transition into a state-owned company divided the AI into two independent companies: ‘Eurometaal’ and ‘NV Gereedschapswerktuigenindustie Hembrug’. This division had consequences for the layout of the terrain, where Eurometaal settled in the east part.

In this period when Eurometaal was situated at the Hembrug terrain, buildings got demolished and also new buildings arose. Also, some big changes took place in the Changing zone and the big factory halls, buildings 20 and 40, got demolished. This resulted in the fact that the original north-south structure of the original factories is not visible anymore. However, also some new buildings arose in and around the Changing zone ensemble with the arrival of Eurometaal. The buildings 501, 505 and 513 were built and densified the ensemble. However, these new buildings constructions did not always fit with the existing setup. This is probably why, after the recommendations of Palmbout, these got demolished around 2010.

In 2003 Eurometaal closed its doors forever and for a couple of years, the buildings became vacant. In 2010 a renewed interest in the Hembrug area arose, which led to new owners and several interventions.
Local context
What is the coherence between the Changing zone and the rest of Hembrug?
The Hembrug area is situated on a central location in between Zaandam and Amsterdam. The Changing zone is even literally and figuratively the central point of the Hembrug area. It is not only located in the middle of the area but it also contains a high cathedral, which is very visible around the complex.
The parcel direction of the buildings is orientated parallel and perpendicular to the North Sea canal. The oldest and largest buildings are oriented perpendicular to the canal, while the smaller buildings more often are orientated parallel to the canal.

The terrain organically grew, a building was built when needed, there was no prearranged plan. Still this composition can be found in the ensemble. Everything was designed in the most effective way, the buildings, the routes, the power lines, and the plants. This no prearranged and efficient way of building is a key element in the Changing zone. Only the main parallel and perpendicular structure were leading in the growth of the complex. Esthetic qualities were not so important at the Hemburg complex, it was all about functionality.
The ensemble is constructed by different buildings with their own heights and dimensions. What can be noticed is the highest point of the ensemble, the Cathedral. This building is with its 16 meters immediately noticeable as the center of the ensemble. The storage building has with its accumulation of stories also a noticeable height, all the other buildings are only one story high.
At the ensemble, the buildings do not only have different heights, but also their own volumes. Because of the coherence and the concatenation of the ensemble the volumes form one mass. The totality of the mass is shown in the outlines above. The Cathedral is the highest point of the ensemble, the only things getting near the cathedral are the tower of building 269 and the trees of the woods.
A clear division can be drawn between the military forest and the Changing zone. The military forest with the forest trails, little buildings and ramparts, is an opponent of the densely built area around the Changing zone.

Zooming in to the Changing zone one can find an even more densely built ensemble combined with paved public space and assigned plant boxes. The strong division between the forest and the factory building ensembles, by a ditch, is very present at the complex. This ditch can be found at the rear of the buildings 269 and 322.
On the edge of the ensemble a special connection can be found under the ground. Next to the building 294 a shelter is situated, running from the woods in the north to the south perpendicular on the water of the north sea canal.

It is part of a shelter-system where hundreds of employees could go into hiding in the case of an emergency. With this unique function this shelter is therefore named as a municipal monument in 2007. Three entrances are positioned next to the ensemble of the Changing zone.
new open spaces

The Changing zone is a dense part of the Hembrug area. During time the demand for cartridges increased and the factory started growing. Every open space connected with the existing factory was used to create buildings to fulfill this demand. The whole site of the ensemble was filled with buildings. In the restoration phase of 2003 the designers of Palmbout decided to demolish, what they thought to be, detonating buildings. With this removal new open spaces occur. This happened in three cases in particular.

1. On the western part of the ensemble a production hall was blocking the view line from the woods to the water (see page 58). By demolishing this building the connection was restored and a new open space was created.

2. Next to the Cathedral another production hall was placed in the ’70s. This squared white building is now changed into an open space with only the steel structure left of it, to remind us of what used to be here.

3. The building 91 is the only building that is standing on its own in our ensemble. This was not the case before the restoration. A building was connecting the storage space with its surrounding neighbours.
view lines

Source: Own illustration
Viewpoint 1: Showing the firm boundary between the Changing zone and the 'plofbos', the military forest. The backstreet is really small and is more and more taken over by the greenery.

Viewpoint 2: Also illustrates the boundary with the military forest. It also focuses on the museum and the characteristic steel structure in the background.
Viewpoint 3: Looks, along with the storage building (‘de Dood’), all the way down to the waterfront. Hereby the focus is on a windmill in the distance.

Viewpoint 4: Has high buildings on the left and an open space on the right. The end of the view is bounded by the green oasis of the military forest.
Viewpoint 5: Follows the overhead steampipes all the way to one of the entrances of the Hernburg complex, with the shifting buildings on the right.

Viewpoint 6: Follows also the overhead powerlines all the way to the waterfront. All the way at the end the focus is drawn to a windmill in the distance.
Viewpoint 7: In history, there was a point that this viewing was blocked by buildings 501 and 335. These buildings are now demolished and the view is opened to the military forest.

Viewpoint 8: Looks into the original entrance of the area where the cartridge factories were located.
Viewpoint 9: Looks out over the newly created open space. This results in a new view of the Changing zone complex, whereby the Cathedral is very visible.
The ensemble has one feature that stands out if you look at it from above. Almost every building has a skylight on the roof. These skylights were needed to create enough daylight inside the large production halls because of their limited facades.

In the current situation, part of the Cathedral and building 29 do not fulfill to this feature, but old pictures show that they did had skylights until a transformation around 1940. This skylights are in all in different shapes, the shed, the triangle or the rounded sky light.
What is the coherence between the buildings of the Changing zone?
Almost all buildings have multiple entrances. As described earlier all buildings are orientated perpendicular or parallel to the North Sea canal. This composition also results in the orientation and location of the entrances of the buildings.
In the Changing zone, five different typologies can be distinguished: the shack, the shed, the barn, the cathedral, and the warehouse. The shack is an elongated box with only roof lights. The shed has more ornamentations and northern roof lights. The barn is the most common typology on the complex. It has most of the time roof lights and comes in all sizes and variations of detailing. The typology is not so much related to the function because one typology can be found in multiple functions. The Cathedral is the highest building of the complex and has windows in the shape of arches. The warehouse is a massive brick building in ‘Amsterdamse school’ style.

In and around the ensemble, the same typologies can be found. In the Ladder, another Cathedral is dominating the place. This Cathedral had the same function of pressing, only the size of the elements are different. In the Ladder, they produced grenades, while the production at the Changing zone of cartridges was much smaller. Also, buildings 29 and 91 both at the Changing zone ensemble do look alike. They are built in the same building period and had a similar function, they only differ in height. The shed typology of building 322, was widely used in the past of the Hembrug terrain. The big former factories near the North Sea Canal (building 20 and 40) for the production of cartridges and ammunition both had this typology with the iconic shed roofs. These shed roofs are located towards the north to provide enough daylight, but without heating the place up too much.
connections

The ensemble of the Changing zone is a mixture of buildings. All of this buildings are connected with each other in different ways.

Buildings 294 and 330 (1) for example, there you can find an open connection, with their mutual load-bearing structure. Whereas the connection in between the Cathedral and building 322 (2) is bricked up nowadays. The warehouse 269 (called ‘the Death’) is also connected with building 322 (3). The facade of building 269 is also used as a closing of 322, causing a visible transition of the building structure. There is one point were four buildings interrelate with each other, seen on picture 4. The space in between those buildings is filled with smaller spaces, which resulted in a mayhem of different roofs at this connection of the ensemble.
294 & 330
294 & 330
330 & 112
330 & 112
112 & 322
29 & 330
29 & 330
407 & 112
407 & 112
322 & 112
322 & 112
505 & 322
505 & 322
269 & 322
269 & 322
437 & 407
437 & 407
269 & 322
269 & 322
Source: Own illustrations
traces from the past - 29

Building 29 is the oldest building of the ensemble. A lot of history to find traces of. The function of this building was a mix of storage and the final check of the cartridges. The first floor has two different patterns, one defining the place for storage and one for transportation. Next to that are the holes in the floor made for the vertical transportation and the text on the wooden roof structure, reminding us of the old storage function.
Not only the name of the Cathedral is a trace of the past, also the structure of steel in the upper part of the high part is a reminder of the original function. Back in the day this space functioned as a press building. This big presses needed to move around. The crane connected to this structure made this possible. Unfortunately the floor is replaced and the old wells used for the production are not visible anymore.
The storage with its nickname the Death is characterized by the open ordered structure. The load-bearing structure needed to carry a lot of weight, which still can be found on the signs on the wall. The white lines also are a trace of the past, they indicate the place of storage. If you look closer to the pattern of the floor, two different kind of wooden patterns are used. One for the transportation lanes and one for the storage space.
Building 294 is an elongated building used to cover the machines which were used to work on the metal cartridges. The high doors are still a reminder of the height that was necessary to transport this machines. Also the signs next to this doors declare the function that was there. All the machines were connected to multiple extraction systems where the air was led out at a point in the wall, visible by the big exhaust pipe in this picture.
Also the building of 330 was an elongated building to cover the machines. The pointed roof-light is a trace that makes one think about the light that was needed for the workers in this production hall. The curved wall is leading towards the door which used to be the entrance of the expedition. This curve is probably introduced to enlarge the overview of the doorman.
This building consists of two parts which both served different functions over time. In the beginning it was used to melt up the metal, which needed a system of exhausted pipes to get rid of the heat. Also the shape of the roof and the windows are a reminder of this function. The installations of the old machines that are still visible on the old picture are nowadays removed. The green paint on the wall that is also used in other buildings was chosen for by its easiness to be cleaned.

Source: Beeldbank Zaandam & own illustrations
traces from the past - 407

The building of 407 is one of the only buildings in this ensemble that does not really have a new function yet. It is in use by a catering company, which only added some internal stuff like tables. They did not do anything with the interior or exterior. Therefore there are a lot of traces from the past still visible. Signs that are defining the function of the space for example, or rails that were used for the transportation of the cartridges.
This separate steel structure was probably used for supporting the ovens. Holes in the wall reminding us of the exhaust pipes that used to be there. Also the baths on the side of the building are a trace from its original function, where cooling of the elements took place.
architectural aspects

To analyze the architecture of the ensemble of the Changing zone, the whole ensemble is seen as a whole. The buildings cannot be seen on its own. However, with the recent interventions, some of the buildings are not interrelated anymore. For example building 322 is split up in two and one part is only accessible from 1 entrance and is closed off from the other buildings.

This interrelation is also linked to routing. The movement is often limited into one building, wherein history the buildings were connected with each other and the movement was across the whole ensemble.

Another aspect where the ensemble is seen as a whole is contrast. In this aspect, the dense buildings are opposite from the open space, which is scarce in the Changing zone.

An overview of all different architectural aspects is made to get a grip on the ensemble.
<table>
<thead>
<tr>
<th>Rhythm</th>
<th>Orientation</th>
<th>Green/Plants</th>
<th>Developments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Movement</td>
<td>Symbol</td>
<td>Organisation</td>
<td>Water</td>
</tr>
<tr>
<td>History</td>
<td>Fabric</td>
<td>Sequence</td>
<td>Monument</td>
</tr>
<tr>
<td>Proportion</td>
<td>Measure</td>
<td>Culture</td>
<td>Environment</td>
</tr>
<tr>
<td>Texture</td>
<td>Ensemble</td>
<td>Icon/ordinary</td>
<td>Art</td>
</tr>
<tr>
<td>Interior</td>
<td>Architectural style</td>
<td>Air/ventilation</td>
<td>Articulation</td>
</tr>
<tr>
<td>Structure</td>
<td>Layers</td>
<td>Transparency</td>
<td></td>
</tr>
<tr>
<td>Contrast</td>
<td>Typology</td>
<td>References</td>
<td></td>
</tr>
<tr>
<td>Continuity</td>
<td>Mass</td>
<td>Installations</td>
<td></td>
</tr>
</tbody>
</table>
Building technology
What is the coherence in the building technology of the Changing zone?
Building 29 a/b: Controlegebouw patronenfabriek

This building is build in 1910, which left traces on the load-bearing structure. The roofstructure for example is the only structure made of wood of this ensemble. This structure is explained on page 108. The foundation method of ’Amsterdam’ is also a trace from the building period. This method is often used at other brick buildings of this time as well as the method of building 29. Drawings of this buildings were found in the archive of Amsterdam, which helped to understand how the building is constructed.

Source: Own illustration based on measurements and drawings ABT
Building 112: de ‘Kathedraal’

The so called ‘Cathedral’ is a building with different load-bearing structures. Some of them resemble a function of the past and some of them still fulfill their function. The steel roof structure for example nowadays supports a new roof. The piers on the wall supported the crane track that used to be there. They are still very important for the strength of the brick facade. In the lower part of this building there are two striking beams in the middle of the space. This beams can refer to an old floor that used to be here. Also in this case the foundation is a question left to answer. With a renovation that already took place a new ground floor was created and therefore traces are difficult to find. The same assumption is made as in building 29 and the Amsterdamse foundation method is chosen.
Building 269 a/c: magazijn ‘de Dood’

The foundation of this building was found in original drawings and is sometimes still visible in the current building. Therefore we know that the columns are supported by concrete blocks, supported by concrete poles which stand on 9 wooden poles. The floors are all supported by a steel structure which is systematically ordered to fulfill the function of a warehouse.

The stiffness of the building is created by the diagonal timber flooring, which will be explained on page 113.
Building 294: Draaierij kardoeshulzen

The load-bearing structure of this building was first the only thing that made this building. It was only designed as a shelter for the machines. It transformed into a building where the walls were filled in between the columns with bricks. Looking at the columns you see the ‘poer’ sticking out of the floor, which gives a little hint of the foundation that is underneath the building. The assumption is made that this poer is supported with timber beams.
Building 322a/b: Gloeierij en draaierij kardoeshulzen

The roof of this building is chosen for the function of this building. In this ‘gloeierij’ a lot of heath was created but light was still necessary. Therefore the sheds with the northern windows were created. This shed is made of a steel structure supporting the windows and a ‘bims’ roof. The columns of this structure are supported by a so called ‘poer’. This poer is not visible in the new flooring, old pictures led to the assumption of this foundation method.

The connection of building 269 and 322 is shown on the picture right below. The striking element is the partly lowered ceiling in building 322. The assumption is made that this is done to hide several pipes. Another point worth to mention is the column of building 322, which is remote from the facade of 269. This building is constructed in two phases over time. Building 269 was already there beside the first part of 322. In between the two structures the second part of 322 was added, with its own structure.
Building 407: Gloeierij

In this building a lot of support systems come together. Despite the fact that the different roof structures and heights could refer to different building phases, the original drawings from the archive of Soest shows that these systems were all designed and build at once in 1952. (See picture on the right)

One column in the middle supports three roof structures (summary below) and therefore needs a good foundation. The concrete element, supported by wooden poles, carrying this column is still visible in the existing floor. Next to the support systems of the roof, also separate structures can be found in this building. These systems were probably there to move around the machinery of the ovens.

- The structure for the triangle shaped roof
- The structure for the flat roof with skylights
- The structure for the flat roof connected with building 112.
Building 437: Afwerkplaats patronen

This shack is connected to the building of 407, but has a detached load-bearing structure. Next to the wall of 407 is therefore a steel column supporting the roof of the building. The foundation of the brick facade is assumed to be the 'Amsterdamse paal funderings methode'.

Source: Own illustration based on measurements and drawings Rijksvastgoedbedrijf
In general, the stability of buildings works in three directions, the roof, and the two wall directions. The stability of the Changing zone is established in different ways. First are the masonry walls that function as disks to take care of the stability. Also, the roofs have rigid panels to transfer forces through the building. This is, for example, the case in building 407.

These rigid disks do not work on their own, they work often together with a steel structure. Connections are made with a fixed-moment construction, like in between building 294 and 330. In other cases, the columns are placed inside or against the masonry (322). Other solutions that are used are wind bracings, which can be found in the roof structure (building 112) or the oblique direction of the flooring in building 269. In the end, all the buildings are constructed with a combination of masonry walls, rigid roof panels, and a fixed steel structure.
The Changing zone complex has grown over time and consist of many different buildings. These buildings are interrelated and connected in multiple ways. The rainwater drainage is an essential part of the connection and the coherence of the different buildings. Some of the rainwater pipes are joined together while others are not.

An overall conclusion that can be assumed is that all pipes can be found at the outside, along with the facade, of the buildings.
The only toilets nowadays remaining in the Changing zone are located in ‘de Dood’, building 269. With the latest renovation of YadaYada in the buildings 294, 330 and 112 (the Cathedral) toilets were also added in the middle building, number 330.

The toilets of ‘de Dood’ are of high value because of its uniqueness. Future plans have to take this into account.
Building 29 a/b: Controlegebouw patronenfabriek

General information
Original function: Controle, opslag and drukkerij
Monument: Municipal monument
Architect: -
Building period: 1900
Load-bearing structure: Steel columns, timber beams and flooring
Building style: Neoclassical
Building height: 9,2 meter
Facade: Brick building with very orderly and repetitive openings. Building expression is in line with other buildings of the Hembrug complex of that time.
brick  window  structure  roof  floor
Brick

Kruisverband

Size: Waalformaat
Dimensions:
  Strek: 210 mm
  Kop: 100 mm
  Height: 50 mm
Mortor:
  Lagenmaat: 60 mm
  Koppenmaat: 105 mm
Bond: Kruisverband
Colour: Brown red
Note: Knipvoeg

Source: Own illustrations based on measurements
This building makes use of window type A. The frame is made out of green painted timber and is in between the masonry.
Structure

Brick and cast iron load-bearing structure

On the ground floor, a rich ornamented cast iron column carries the upper floor. The story floors are made out of timber beams with timber flooring. The timber beams on the first floor are richly ornamented. The second floor is carried by the timber structural element that is also supporting the roof. This timber structural element and the peers in the facade are also functioning for the stability of the building.

Dimensions
Column diameter: 200mm
Beam height: 287.5mm
Floor
In building 29 the wooden floor shows the original function of the building, which functioned as a storage building. The pattern in the timber floor shows, where things got stored (horizontal pattern) and the cross pattern shows where transportation of goods took place.

Story floor
In building 29 the wooden floor shows the original function of the building, which functioned as a storage building. The pattern in the timber floor shows, where things got stored (horizontal pattern) and the cross pattern shows where transportation of goods took place.

Ground floor
On the ground floor the original ceramic tiles are still visible too.

Vertical transportation
Just behind building 29 a small building is made for the vertical transportation, both for goods and persons.
The roof structure of building 29 is a timber roof construction. The building 29 has two story floors and makes use of pull rods ('trekstangen'), to support the structure of the second floor, which is built up by timber beams and flooring.

Construction elements with pull rods

Source: Own illustration
Facade construction

The facade of building 29 is load-bearing and is immediately seen in the thickness of the wall, 42 cm. It is assumed that the facade consists of 2 layers of brick, an air cavity layer and again a layer of brick. This inner layer of brick is finished with a layer of plaster.

**Horizontal facade detail (1:10)**

The picture above shows that there is a cavity between the layers of brick at the thickening of the wall. This is something that is not very common in buildings of the beginning of the 20th century.

**Thermal conditions**

The building probably has an air cavity layer at the thickenings in the wall. This offers potentially to insulate this in future renovations. The windows and the window frames have recently been replaced. By doing this with probably higher performance glass the thermal conditions of this building already increased.
### Building 112: de ‘Kathedraal’

<table>
<thead>
<tr>
<th>General information</th>
<th>Pers gebouw</th>
<th>Municipal monument</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Original function:</th>
<th>Building period:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pers gebouw</td>
<td>1917</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Monument:</th>
<th>Load-bearing structure:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Municipal monument</td>
<td>Steel beams and roof structure on brick columns. The building consists of two parts, one higher part with a pointed roof and a lower part with a flat roof.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Architect:</th>
<th>Building style:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Neoclassical</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Building period:</th>
<th>Building style:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1917</td>
<td>Neoclassical</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Building height:</th>
<th>Facade:</th>
</tr>
</thead>
<tbody>
<tr>
<td>12 meter</td>
<td>Big open windows combined with smaller circular windows</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Note:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Both of the roofs are not original.</td>
</tr>
</tbody>
</table>
**Staandverband**

<table>
<thead>
<tr>
<th>Size:</th>
<th>Waalformaat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensions:</td>
<td></td>
</tr>
<tr>
<td>Strek:</td>
<td>210 mm</td>
</tr>
<tr>
<td>Kop:</td>
<td>100 mm</td>
</tr>
<tr>
<td>Height:</td>
<td>50 mm</td>
</tr>
<tr>
<td>Mortor:</td>
<td></td>
</tr>
<tr>
<td>Lagenmaat:</td>
<td>62,5 mm</td>
</tr>
<tr>
<td>Koppenmaat:</td>
<td>112 mm</td>
</tr>
<tr>
<td>Bond:</td>
<td>Staandverband</td>
</tr>
<tr>
<td>Colour:</td>
<td>Brown red</td>
</tr>
<tr>
<td>Note:</td>
<td>Knipvoeg</td>
</tr>
</tbody>
</table>

*Source: Own illustrations based on measurements*
This building makes use of window type C. The frame is made out of a white plastic frame. Originally this frame was probably made out of white painted steel and was in between the masonry. This type occurs in buildings with and without an air cavity layer.

Some of the original windows are now closed off.
Structure

Steel and concrete load-bearing structure

1. High part of the cathedral:
   In this part of the cathedral, the heavy machines were located. To move the machines around, thick columns are introduced, with a steal rails structure and an adjustable hook.

2. Lower part of the cathedral:
   This lower part of the cathedral shows a big steel beam and some traces of a former story floor. The dimensions of the steel beam indicates that this floor could have carried a lot of weight. However, there is also a lot of uncertainty about the construction of this beam. This is shown in the adjacent picture.

Assumptions:
1. Could be added later with the addition of the new roof.
2. Carrying the roof structure, by means of a pressure force on the steel beam. At this point is it not possible to name the function of the steel column.

In all probability an indication of a heavy story floor
Ground floor

The original floor of the ‘persgebouw’ is not visible anymore. Old photos and original drawings show that there were some pits in the ground. These were located near and under the machines.

Comparing the cathedral of the Changing zone with the Cathedral of the ladder (both ‘persgebouw’) at the location of the heavy machinery the foundation is thickened. The pits are probably introduced to cool down the warm metal.
Roof

The old photo of the ‘beeldbank NIMH’ shows that the two roof parts of the Cathedral are not original (picture taken inbetween 1930 and 1940).

1. High part of the Cathedral:
The high part had originally a small extension on the roof to ventilate the building, which gets hot, due to the pressing process of the cartridges. In the roof were also some roof lights.

2. Lower part of the Cathedral:
In this part the roof is also changed. The original roof had a pointed rooflight, while the new rooflight has the shape of a half circle. The flat roof was very modern for its time.

The timber roof elements look like they are recently placed at the last renovation (2010).
Facade construction

The facade of building 112 could partly be measured and partly reasoned. The assumption is made that it is a brick wall with a thickness of 34cm. In this 34cm three layers of bricks can be found.

Thermal conditions

This building consists of three layers of brick and no insulation. It is therefore facing some obstacles. Therefore insulating is only possible at the inside of the building, if one wants to keep the atmosphere of the outside of the building. The windows recently have been replaced, probably with glass with higher thermal conditions as the old glass windows.
Building 269 a/c: ‘de dood’

General information
Original function: Magazijn ‘de Dood’
Monument: Municipal monument
Architect: 1928
Building period: Structure of steel columns and beams, with timber flooring and the roof that is made out of a ‘bimsbeton’ cassette ceiling.
Load-bearing structure: Amsterdamse school; an example of modern civilian architecture
Building style: 9 meter (tower is 14,3 meter)
Building height: This building consists of both horizontal and vertical stratification. On one hand the vertical load-bearing structure that is visible in facade. This is also emphasized by the vertical entrance tower which houses the vertical transportation of the elevator and stairs. On the other hand horizontally orientated windows. The front facade is most impressive due to its entrance tower. Like at the rest of the Changing zone these elements can not be seen seperately from each other.
Facade: typology municipal monument building phases
Brick

(Noors)kettingverband

Size: Waalformaat
Dimensions: 210 mm
   Strek: 210 mm
   Kop: 100 mm
   Height: 50 mm
Mortor: 62,5 mm
   Lagenmaat: 62,5 mm
   Koppenmaat: 115 mm
Bond: (Noors)kettingverband
Colour: Bonte miskleurige gevelsteenlinkers
Exception:
Windows

window type 1

window type 2: is the same, only with an extra layer of glass

window type 3: stair windows

window type 4: toilet windows

This building makes use of window type C. The original steel frames are still present in this building. The frames are painted green and are in between the masonry. This type occurs in buildings with and without an air cavity layer.
Structure

Steel column load-bearing structure

*Dimensions ground floor*
Column: HEA 260
Beam: IPE 500

*Dimensions first floor*
Column: HEA 250
Beam: IPE 450

*Dimensions second floor*
Column: HEA 150
Beam: IPE 220

As the dimensions reveal, the steel columns are getting smaller each story of the building.
Floor

Story floors
The floor finish of the stories 1 and 2 are made out of 3.6 cm thick pine wood and have a width 13 cm. This finish is supported by steal beams. The pathways have a different pattern, which indicate the route of transportation in between the storage places. These places of the cabinets are marked with white lines. The main floor direction is diagonal, this is probably done to make the building more stable against the wind load.
'Bimsbeton'
'Bimsbeton' is a lightweight kind of concrete. It consists of a porous material, Bims, and has a volcanic origin. Bims is mainly used in roof panels and is always used in combination with a steel load-bearing structure. The company N.V. Betondak was in charge of making these panels.

The Bims panels were 50 cm wide and 8 cm high. There were three types of Bims panels: massive cassette panels, hollow cassette panels, and flat hollow panels. The massive cassette panels were mostly applied.

The Bims panels are strong, lightweight and have (sound) insulating properties.

A drawback of these porous panels is that they always have to be provided with a waterproof roofing. In this building, bitumen is used for the waterproof roofing.

Rooflight
On the top floor there is a rooflight, enlighting the room. A steel structure is supporting this glass rooflight in a triangle/pointed shape.
Facade construction

The facade of building 269 differs in thickness. In the archive of Den Haag ‘bestek’ drawings of building 269 were found. They state that the pillars thickness of the wall is 55cm and has an air cavity layer between two layers of ‘halfsteense’ brick. The smaller part of the facade, underneath the windows, is not mentioned clearly, except that it also has an air cavity layer. The inner layer of brick is finished with a layer of plaster.

Thermal conditions

This building consists of multiple layers of brick, most likely without an air cavity layer. The windows are still the original ones (‘getrokken glass’) and are of high value. Looking at the thermal insulation of this building a lot of steps will still have to be taken to make this building more sustainable.
Art. 6. Metselwerken.

Op te trekken ten deele in Vlaamsch, ten deele in \textit{Klinkers}.

Zweedsch verband van bonte miskleurige gevelsteen/alle buiten-
gevels, in specie 1 cement, 1/4 kalk op 3 zand. Verdeeling van
kopen en strekken zal op detailtekening nader worden aange-
geven.

De peilers zijn 55 cm dik, de tusschen-welden 2 halve
steen met spouw, voor de overige muurdikten wordt naar de
teckeningen verwezen.

De binnenzijde van de peilers in kruisverband, die van
de spouwmuuren in halfsteensverband uit te voeren.

De spouwmuuren 2 lagen onder de betonlateien dicht te
steken en in de spouw de binnenmuur zwaar te vertinnen.

De uitvoering moet geschieden met gebruikmaking van
spouwlatten. Er moet gemetseld worden met een vallende tand,

Gedeelten van steenen mits niet kleiner dan een halve
steen mogen uitsluitend in de peilers verwerkt worden.

Alle voegwerk diep uit te krabben.

Voor de boven- en onderdorpels der vensters te rekenen
op betonlateien, waarover nader in een volgend artikel.

Alle metselwerk uit te voeren met de noodige rollagen.
Building 294: Draaierij kardoeshulzen

General information
Original function: Editing and pressing
Monument: -
Architect: -
Building period: 1932
Load-bearing structure: Steel column and beam structure
Building style: Industrial building
Building height: 6.5 meters
Facade: The facade is made out of brick and glass panels. These glass panels do not occur in a total rhythmic order.

Building 330: Persgebouw kardoezen

General information
Original function: Shell factory
Monument: -
Architect: -
Building period: 1937
Load-bearing structure: Steel column and beam structure
Building style: Industrial building
Building height: 7 meters
Facade: The building consists only out of one facade, which is made out of brick and glass panels. It is made in a rounded shape. The bottom part is made out of brick and the glass is on top of it.
**Engelsverband**

Size: Waalformaat
Dimensions:
- Strek: 185 mm
- Kop: 95 mm
- Height: 50 mm
Mortar:
- Lagenmaat: 62 mm
- Koppenmaat: 115 mm
Bond: Engelsverband
Colour: Brown

**Klamplaag**

Size: Waalformaat
Dimensions:
- Strek: 200 mm
- Kop: 100 mm
- Height: 50 mm
Mortar:
- Lagenmaat: 115 mm
- Koppenmaat: to be determined
Bond: Klamplaag/Keperverband
Colour: Brown
Note: Different orientation of the stones, most likely for ornamental reasons.

**Halfstiens staandverband**

Size: Waalformaat
Dimensions:
- Strek: 200 mm
- Kop: 100 mm
- Height: 50 mm
Mortar:
- Lagenmaat: 208 mm
- Koppenmaat: 62 mm
Bond: Halstiens staandverband
Colour: Brown red
Note:
Windows

East facade (building 294)

South facade (left building 294 and right 330)

This building makes use of window type B. A steel frame in a steel construction on top of the masonry. Originally this frame was made out of white painted steel.

This building makes also use of window type C. Originally this frame was probably made out of white painted steel and was in between the masonry. This type occurs in buildings with and without an air cavity layer.
Structure

Steel structure
Both buildings (294 and 330) have a steel structure, and connect at the same column. The trusses are used to support the roof and the roof lights.

Dimensions
Column: HEA 220
Beam: HEA 240
Beam 330: IPE 180
Ground floor
The original ground floor is not visible any more. An old drawing of the archive in Zaandam shows the original setup of the different machines in the buildings (294, 330 and 112).
Roof

‘Bimsbeton’
For more information about ‘Bimsbeton’, see page 124.

Rooflight
Both of the buildings have roof lights, the roof lights of building 294 have a rounded shape in comparison to building 330 with a pointed shape. It is uncertain to state the originality of the rooflights, they could have been renovated over time.
Facade construction

The facade of building 294 (left) consists of two layers of brick between a IPE 200 profile. The bricks on the inside have a different orientation and are painted white. It is logical to have these two layers with an air cavity space in between. This is partly done for ornamental reasons and also for thermal reasons.

The facade of building 330 (right) is only a small part between buildings 29 and 294. This facade is not load-bearing and therefore only consists of 1 layer of brick with a plaster layer as finish.

Thermal conditions (building 294)

This building consists of multiple cold bridges. This is due to the steel structure both visible on the in and outside of the building. There is potential to improve the thermal insulation of this building because it has an air cavity layer between the two layers of brick. The inner layer of the brick probably has ornamental reasons, this brings also a challenge to keep it.

Thermal conditions (building 330)

The only, and rounded, facade of building 330 consists of one layer of brick and is finished with plaster. This offers opportunities to isolate this wall in the future. The windows are still an opportunity because they still consists of one layer of glass in a steel framework.
### Building 322a: Draaierij kardoeshulzen

**General information**
- Original function: Gloeierij en Draaierij
- Monument: -
- Architect: -
- Building period: 1928
- Load-bearing structure: Steelcolumn and beam structure
- Building style: Industrial building
- Building height: 7.9 meter
- Facade: Brick facade with glass openings. These openings have two different sizes. On the west facade they are more square, on the south facade the windows are more rectangular.

### Building 322b: Uitbreiding draaierij
- Uitbreiding draaierij: -
- Building period: 1949
- Load-bearing structure: Steelcolumn and beam structure
- Building style: Industrial building
- Building height: 7.9 meter
- Facade: The same materials and the same rhythm is used to make it look like that 322a and 322b are one building.
Brick

**Staand klezoorverband**

<table>
<thead>
<tr>
<th>Type:</th>
<th>Waalformaat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensions:</td>
<td></td>
</tr>
<tr>
<td>Strek:</td>
<td>210 mm</td>
</tr>
<tr>
<td>Kop:</td>
<td>100 mm</td>
</tr>
<tr>
<td>Height:</td>
<td>50 mm</td>
</tr>
<tr>
<td>Mortor:</td>
<td></td>
</tr>
<tr>
<td>Lagenmaat:</td>
<td>62,5 mm</td>
</tr>
<tr>
<td>Koppenmaat:</td>
<td>112 mm</td>
</tr>
<tr>
<td>Bond:</td>
<td>Staand klezoorverband</td>
</tr>
<tr>
<td>Colour:</td>
<td>Brown red</td>
</tr>
<tr>
<td>Exception:</td>
<td>In 322a at the location of an column there is a differentiation, a ‘kop’ is used (shown in red below).</td>
</tr>
</tbody>
</table>

Source: Own illustrations
This building makes also use of window type C. Originally this frame was made out of white painted steel, but is recently renovated with and changed into white plastic. The frames are in between the masonry. This type occurs in buildings with and without an air cavity layer.
Structure

Steel column load-bearing structure

*Dimensions*
Column: HEA 240
Beams: HEA 200

* This dimensions are measured in the ifc-model of the building and need to be checked.

Floor

The original floor is not visible anymore, as well as some traces of the past.

Source: Own Illustrations
Roof

'Bimsbeton'
For more information about 'Bimsbeton', see page 124.

Facade construction
The facade of building 322 is in all probability built up out of two layers of brick with an air cavity layer in between. The inner layer of brick is finished with a layer of plaster. The total thickness is 250mm.

Northern rooflights
Building 322, was a former 'gloeierij'; a place where metal got heated. This resulted in a warm atmosphere. Extra overheating by southern windows was not desirable. However, daylight to do this precise job was very useful. Therefore the Northern windows were introduced in this large building.

Another point worth to mentioning is that there is no glass used in this roof lights. The windows are made of a translusced type of plastic.

Facade construction

Thermal conditions
This building consists of two layers of brick with an air cavity layer in between. There is a possibility to insulate in between these layers of brick. With the new owner and the new function of this building (Art Zaanstad), the building got already partly renovated. The windows and the window frames have been replaced by new ones, with probably higher thermal conditions. At the outside of this building, some cooling machines can be found. This indicates that there is still too much heat production in this building.
Building 407: Gloeierij

General information
Original function: Gloeierij
Monument: -
Architect: -
Building period: 1952
Load-bearing structure: Steel column and beam structure

Building style: Industrial building
Building height: 6.7 meter
Facade: The facades are made out of brick and glass windows. The south facade has a clear rhythm in the openings. A combination of brick with some glass openings, different on each side of the building. The load-bearing structure is made out of steel. Also at the inside of the building there are some leftover steel structures.
The wall consists of two layers of brick with an air cavity in between. This can only mean that the ‘koppen’ of the bond are all stones cut in half.

**Kettingverband**

- **Size:** Waalformaat
- **Dimensions:**
  - Strek: 200 mm
  - Kop: 90 mm
  - Height: 50 mm
- **Mortor:**
  - Lagenmaat: 62,5 mm
  - Koppenmaat: 102 mm
- **Bond:** Kettingverband
- **Colour:** Brown red
- **Note:**
  - The wall consists of two layers of brick with an air cavity in between. This can only mean that the ‘koppen’ of the bond are all stones cut in half.
Windows

Window detail

Front facade

Right facade

Sources:
- Underlayer ABT
- Militair archief Soesterberg
- Own illustration

Window types:
- Window type 1: white painted steel, glass, ceramic glazed sill
- Window type 2: white painted steel, glass
- Window type 3: white painted steel
Steel load-bearing structure

Building 407 has a mix of steel structures. Some of them support the main load-bearing structure, while others are standing on their own and have functioned for transportation of heavy goods in the building.

**Dimensions**
Column 1: IPE 300
Column 2: HEA 300
Beam 1: IPE 200
Beam 2: IPE 400

The stability is also assumed to be created by this mix of steel structures. The trusses supporting the roof lights in the lower part are in combination with the trusses of the pointed roof creating the stability of this building.
Ground floor
In building 407 the original concrete floor is visible. Old traces of the location of former machines are still there. Also some old tracks are still visible, they probably have functioned to transport goods in the 'gloeierij'.

Source: Own illustrations
Roof

'Bimsbeton'
For more information about ‘Bimsbeton’, see page 124.

Rooflight
In this building two types of rooflighting. The first one is on the east side of the building as an extention of the facade. The other rooflights are on top of the building and have a triangle shape.
Facade construction

The built up of the facade of building 407 is shown on the picture above. It consists of two layers of brick with an cavity layer in between. At the inside the brick is finished with a thick layer of plaster. With a total thickness of 26.5 cm.

Important to mention is that the wall thus consists of two layers of brick with an air cavity in between. This can only mean that the “koppen”, used in the “ketting” bond, are all stones cut in half. It is not very logical, so it is most likely for the ornamental reasons.

Thermal conditions

This building consists of two layers of brick with an air cavity layer in between. It also has some holes in the facade, some of them are bigger ones others are smaller. There is a possibility to insulate in between these layers of brick. There is also an opportunity to look at the windows of this building. Some of them are broken and some of the window frames show some damages too.
Building 437: Afwerkplaats patronen

General information
Original function: Workshop for finishing cartridges
Monument: -
Architect: -
Building period: 1970
Load-bearing structure: Steel columns and beams
Building style: Industrial building
Building height: 6.1 meter
Facade: The facades are made out of brick and corrugated steel. There are no facade windows only rooflights.
**Halfsteensverband**

Size: Waalformaat

Dimensions:
- Strek: 210 mm
- Kop: 100 mm
- Height: 50 mm

Mortor:
- Lagenmaat: 65 mm
- Koppenmaat: 110 mm

Bond: Halfsteensverband

Colour: Brown

Exception:
Windows

window type 1

Source: Own illustrations

Source: Own illustrations

Source: Underlayer ABT

Source: Underlayer ABT

Front facade

Left facade
Structure

Steel and concrete load-bearing structure
Building 437, former workshop place, is a small building with a steel structure of columns and beams. This structure is painted white.

Dimensions
Column: HEA 200
Beam: HEA 240

Floor

Ground floor
The floor of this building is made out of concrete. Due to the age of this building (1970), one can conclude that this is the original one.
Roof
The roof of the former workshop place is at the inside finished with white paint. On the outside it probably is bitumen with two rows of roofwindows.

The roof lights are supported by a steel-structure. With the combination of beams and the elongated brick facade it is probably also working for the stability of the building.

Facade construction
The facade of building 437 is a simple structure of two rows of brick with an air cavity layer in between. This results in a wall of 25cm thick. The inner brick is painted white.

Facade construction 1:5

Thermal conditions
This building consists of two layers of brick with an air cavity layer in between. There is a possibility to insulate in between these layers of brick.
Cultural value
What is the coherence between the values of the Changing zone?
In the ensemble of the Changing zone four buildings are appointed as a municipal monument. The oldest one of the ensemble (29), the highest building (112), the 'Amsterdamse school' warehouse (269) and the only building that is standing on its own (91). Strikingly for this ensemble are the monuments that are not the buildings. The shelter walking on the westside of the buildings for example. This almost invisible underground shelter is also called a municipal monument. The steam pipes on the southern part, connecting the Changing zone with the other ensembles is also listed as a monument.
When you look to the ensemble over time, a lot of buildings are built in the same period. Noticable is the oldest building from the 1900 and the addition of the highest building of the Changing zone. The Cathedral was expanded in between 1933-1940.
Valuing the ensemble of the changing zone is done on different scales. First of all the buildings are separately valued. On this scale also the view lines are rated.

In the valuation of the ensemble as a whole the connections, openings, load-bearing structures, facades, traces from the past and floors are valued. The floors can also be on another floor then the ground floor. The building 269 for example, where the second floor is from more spatial quality then the others.

In the end it results in a mapping of the ensemble in general and the specific qualities on the image on the next page.
Source: http://www.zaans-industrieel-erfgoed.nl/
Source: Archief Zaandam

Trace from the past, exhausting outlet in combination with ‘bimbeton’ ceiling.

Shed roof, best way to get daylight in without the heat.

The 2nd floor has a better spatial quality then the other two floors, this is because of the rooflight.

The unique shape of staircase.

A combination of load-bearing structures positioned on top of the original flooring, with a lot of traces from the past.

Trace from the past: installations of the warehouse.

Structure used to cover the production hall.

The oldest building with an unique vertical transportation system.

One of the little skylights left in the roofstructure.

A combination of load-bearing structures positioned on top of the original flooring, with a lot of traces from the past.

Bathtubs reminding of the cooling that was needed in the old function: annealing ovens.

Thickening of the walls used for the movement of the press machines.

Opening in the floor for vertical transportation.

Entrance to the underground shelters.

Rounded wall, brick pattern is different than all the other buildings.

Unique facade structure, with the combination of columns and brick.

Functional height and structure.

Old versus new, open versus closed.

Functional height and structure.

Unique facade structure, with the combination of columns and brick.

Entrance to the underground shelters.

Rounded wall, brick pattern is different than all the other buildings.

Unique facade structure, with the combination of columns and brick.

Entrance to the underground shelters.

Old versus new, open versus closed.

Functional height and structure.

Unique facade structure, with the combination of columns and brick.

Entrance to the underground shelters.

Rounded wall, brick pattern is different than all the other buildings.

Unique facade structure, with the combination of columns and brick.

Entrance to the underground shelters.

Old versus new, open versus closed.
Building 29
The windows in building 29 have recently been renovated. This is done with care of the old building. The original rooflights of the building are gone now. Therefore the acces of daylight in this building is valued lower. By adding roof lights the building can connect again with the other buildings of the ensemble. These roof lights can increase the value of the daylight acces and by lightning up the second floor becomes more functional.

Building 112
The daylight access of the Cathedral is valued high, this is however in the current state of the higher part of the building. Over time the Cathedral got surrounded by buildings which blocked the daylight acces, like building 505. Nowadays the windows in the higher part are again providing an artistic entrance of light into the building. The windows in the lower part are still closed because of the building 407 which is next to it, here lies the potential to recreate the same approach as what happened in the higher part to increase the value.

Building 269
In this storage building the daylight is provided by a rhythm of windows on the north and south facade. On the ground and first floor this is the only way of daylight acces. Striking for this building are the exceptions, for example in the staircase. Here elongated windows provide daylight on every intermediate floor. To top off the building there is a roof light on the second floor. This roof light creates a special atmosphere on this floor. These exceptions of building 269 are valued high.

Building 322
In both buildings of 322 a lot of work was done on the cartridges. The people working here needed daylight and this is provided by the shed roof, which partly exist of windows. What is striking for the windows are their orientation and materialization. A lot of heat occured in this building and windows on the south would be creating only more heat. Therefore the sheds were oriented towards the north and the windows were made of a translucent plastic. This is the only building in with this system in the ensemble and is valued high.
Building 294
This one story building has an open atmosphere created by the connection with building 330, but especially by its roof light. Almost the entire roof consists of this window and a light space is created underneath it.

Building 330
This building originally was not there. It was an open space between the buildings 29, 112 and 294, a very long alley. This alley is now covered by a roof which has a big roof light, and one (rounded) wall is added. Therefore the space beneath it still feels as an open space in between buildings.

Building 407
Building 407 is a combination of a lot of different systems, structural systems, materials and also in the case of daylight access. One facade has a rhythmic layout of windows, another one only has windows on the top and there are also some rooflights in the lower part of the building. This accumulation of systems is valued low.

Building 437
This building has no windows in its elongated walls and only gets the entrance of light through the windows on the roof. This lack of windows is valued low. There is potential to increase the value of the building by creating windows in the facades. By doing this the building will more flexible in housing different functions.
connections

The coherence of the ensemble can also be found in the connections between the buildings. Almost every building is interrelated with each other in different ways. All these connections are valued separately and can also be of low value. However, the coherence created in the ensemble with this connections is from a high value.

The only two connections valued high are in the current state the column in between building 294+330 and the transition from 330 into the Cathedral. However, there are connections valued low which have the potential to be valued more if they are restored. The closed openings in between the Cathedral and 407 for example, of the one in between building 112 and 322. At the transformation that happened in 2003, these connections got closed with bricks. To strengthen the coherence of the ensemble the original connections (the state they were in before 2003) can reoccur in between the buildings again.
<table>
<thead>
<tr>
<th>BRAND</th>
<th>Age Value</th>
<th>Historic value</th>
<th>Intended commemorative value</th>
<th>Non intended commemorative value</th>
<th>Use value</th>
<th>New-ness value</th>
<th>(Irritated) art value</th>
<th>Rarity value (+)</th>
<th>Other relevant values (+)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surroundings / Settings (+)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Site</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Skin (exterior)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Structure</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Space plan</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Surfaces (interior) (+)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Services</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stuff</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spirit of place (+)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

High value | Medium value | Low value

Values with a star will be highlighted & discussed on the following pages.

The valuation of the ensemble continues by looking at the facades and roofs of the different buildings in the ensemble. Some buildings are in front of others and literally ‘stand in the way’, detonate and can possibly be demolished. Some of the changes made are regarding the windows. These windows can be reopened again to increase the value of the building where they are in.

The different aspects of the facades of the building are discussed here. In the end, this results in a mapping of the ensemble. In general as well as the specific qualities visible on the image below.

Values with a star will be highlighted & discussed on the next pages.
The interrelation between different buildings

The ensemble of the Changing Zone is interrelating on a lot of different levels. The ensemble, for example, has turned out to be a coherence of a lot of typologies and architectural layering. This architectural layering led to the fact that the buildings can not be seen as separate buildings but as an unique ensemble as a whole. Every building is interrelated with its architecture, its building technology, and its values. This is what makes the spirit of place of this ensemble so unique.

Building 407

Building 407 was built in one of the last stages of the development of Hembrug. The east facade of the Cathedral was not covered by this building for a long time and stood out better than in the current state. This is why the structure of building 407 is valued low and should be demolished in future plans. By restoring the east facade of the Cathedral afterward, the landmark will be a better landmark in the centre of the ensemble.

Building 437

This building was the latest addition to the ensemble and lacks of detailing and windows. It is nothing more than a shack. Therefore it is valued low and is recommended to be demolished in the future. It is also recommended to restore the layout of the facade of the Cathedral. By this the original daylight access will be restored and the place will be lightened up again.

Machines (and original floor) of building 407

The machines standing in building 407 are traces of the past. These machines are leftovers which refer back to the original function of the building (‘gloeierij’). They are of value because they are the only ones that are left at the Hembrug complex, which makes them unique. This is why the machines are valued high. It is recommended to keep them. This can be on the same spot but the machines can also be moved to another place.
The Cathedral as an industrial landmark

In the center of the ensemble, the Cathedral can be found. This building is with its height of 16 meters the highest point of not only the Changing zone but also of its surroundings. Therefore it can be seen as an industrial landmark of Hembrug. New buildings that will be developed in the future should not overshadow this landmark and are restricted to a height of 12 meters.

Source: www.rijksvastgoedbedrijf.nl

Materialization and detailing

The level of detailing at the Changing zone ensemble varies widely. Especially the older buildings (29, 122 and 269), which are now listed as municipality monuments are richly ornamented. Examples of this rich materialization and detailing are the timber floors, cast iron columns, rounded wall, and original ‘getrokken’ glass. This materialization can be an inspiration for the future buildings, that will be developed.

Open space created by the demolition of the cartridges factory

In between the waterfront and the ensemble, a big parking lot is now to be found. In the past, the bigger factories stood on the southern part of the Hembrug, and other functions were put to in the north. The ensemble with its density was filled with ‘other functions’ and this parking lot was filled with the big original cartridges factory. Because of the original building, the open space is valued low. In future plans, the open place could be filled with buildings again. These buildings should follow the composition and view lines of Hembrug and should not be higher than the Cathedral. The only exception will be the buildings on the waterfront, these can be higher to create a front for the smell and noise.
The coherence that is found in the valuation of the ensemble can be related to the time the interventions took place. The additions or demolitions of buildings that were done in the last part of the development of the ensemble are generally valued lower than interventions that took place earlier in history. This can be linked to the interrelation of the elements that are left. No element can be valued on its own, without thinking about the others. Whether it is about coupled load-bearing structures, closed openings or the materialization. Every element, as well as the ensemble, works as a whole.

When translating the values into reality, the result will occur as shown in the adjacent drawing. In this drawing the rooflandscape of our ensemble is taken into account. The previous value mapping, chrono-mapping, and the Rieg! & Brand-scheme are taken into account by the decision to demolish the parts that have the lowest value and to keep the parts with medium and high value.

The striking element of this intervention that comes forward is that the open space in the ensemble will grow by demolishing buildings 407 and 437. This demolition also has a positive effect on the remaining buildings, which then also can be restored in a state where the buildings are appreciated to the fullest. This will lead to the return of roof lights and the restoration of mutual connections and facade openings. The ensemble as a whole will then be appreciated to the full extent.
General note on the value assessment: shed roofs, best way to get daylight in without the heat.

A combination of load-bearing structures positioned on top of the original flooring, with a lot of traces from the past.

One of the little skylights left in the roof structure.

Thickening of the walls used for the movement of the press machines.

The 2nd floor has a better spatial quality then the other two floors, this is because of the rooflight.

Oldest building with an unique vertical transportation system.

Source: Own illustration
Master plan
What is the coherence in the Changing zone?
The question that was the start of our research was the following: *What is the coherence in the Changing zone?*

In the case of heritage, the coherence will always be a balance between architecture, building technology, and cultural value. This is also the case for the complicated Changing zone ensemble of Hembrug. Buildings were expanded, demolished and replaced, all in order of the production process. This functional way of thinking resulted in an organic growth of the ensemble, which came before the esthetics and an accumulation of different typologies and styles are now to be found in the ensemble. Even the name of the ensemble remembers of the exchange of dilution and compaction that used to take place over time.

With the Cathedral as the central and highest point of the ensemble, it is visible on the entire area. It is in the middle of the Changing zone and of the Hembrug area. This Cathedral is connected with almost every building of the ensemble. The buildings in the ensemble are often connected when they share a facade, load-bearing structure or rainwater management. The coherence in the materialization of the buildings is often determined by brick facades, steel structures, ‘bimsbeton’ ceiling and wooden flooring.

The valuation of the ensemble is a good resemblance to the complexity of the Changing zone. No element can be valued on its own, without thinking about the others. A general note that can be found is in the valuation of the ensemble, which can be related to the time the interventions took place. Overall the latest additions and interventions are valued lower and they could be reversed in future development.

The functions, the (load-bearing) structures, the architectural layering as well as the materialization are all elements that contribute to the coherence of the ensemble and therefore cannot be seen on its own. Next to that, the composition, the functional way of thinking, the density, the connections, the history, and other relevant values all take part in the coherence of the Changing zone ensemble.

The ensemble of the Changing zone is therefore literally and figuratively interrelated. Through this, the buildings and elements of the ensemble cannot be seen on its own. This is why the ensemble can only work as a whole.

**conclusion**
How to deal with the coherence at the Changing zone
repeating historical steps

There is a question to create 300% of the original volume on the ensemble plot. To achieve this different mass studies are done to see the impact of this.

Changing zone: 9,000 m²
New total: 27,000 m²

Current situation
Empty plot

Source: Own illustrations
Option 1: Generating a big tower to achieve the square meters. In this case the Cathedral is not the highest point and the eye catcher of the ensemble.

Option 2: Hereby the open spaces and the building volumes are reversed. A lot of open spaces is created, but also two high rise buildings emerge. Original buildings are lost and the atmosphere of the ensemble is totally changed.

Option 3: Demolishing of the two low rise buildings and creating one new volume to achieve the number of square meters. A large volume of 5 stories, this transcends the height of the Cathedral.

Option 4: Demolition of the entire plot and rebuilding a volume of one story high. Not only is the ambiance of the ensemble gone, but also the open spaces, which have high value too, are lost.
function as leading element

The Changing zone is an ensemble that changed a lot over time. A special exchange emerged in the density of the ensemble. When production started growing, buildings that were seen as unfunctional were demolished and often the newly created open space was filled with new buildings.

There is a question to create a residential function in the buildings. The buildings are categorized into buildings that fit, do not fit this function and buildings that can be altered to serve the residential function. These alterations are sometimes big and sometimes smaller ones.

Source: Own illustrations
The idea is to bring the original first floor, in the lower part of the cathedral, back. In the higher part, the building can also partly have a story floor to suit the residential function. Some windows need to be restored and also roof lights will be reintroduced.

An option is to demolish building 330 to generate an alley between the buildings 29 and 294. Building 29 will be provided with (original) skylights and building 294 will be subdivided into smaller houses.

To achieve a residential function in this building an atrium seems a logical solution. To generate more daylight into the building and make more use of the existing roof lights.

To make this building suitable for living, an option is to divide the building into two. In this way, more daylight is provided and more houses can be created.

Building 330, 29, and 294

407, 437 and part of 29

Are not suitable for housing and will be demolished from the residential point of view.
Spirit of Place
The Changing zone has a specific spirit of the place, which is made visible in the photo impression in the appendix. Each atmosphere has a different colour and a different meaning to the place. What is still visible now should be leading in the redevelopment of the Changing zone.

Source: Own illustration

Function as a leading element
At the Changing zone ensemble, the function was always leading, resulting in adjustment, demolition and new constructions. For the future development of the ensemble, this approach can function as a guideline.

Source: Beelbank NIMH

Accessibility
The Hembrug area is very well accessible by public transport (bus and train), car and bike. However, originally the Hembrug area was a closed-off zone, which was not open for anyone not working in one of the three departments. This provides a potential for bringing back a car-free zone at the Hembrug. To achieve this a parking place should be appointed.

Source: https://www.youtube.com/ ErfgoedInZicht

Central location
The Hembrug area is situated on a central location in between Zaandam and Amsterdam. The Changing Zone is even literally and figuratively the central point of the Hembrug area. It is not only located in the middle of the area but it also contains a high cathedral. This cathedral is very visible around the complex.

Source: Beelbank NIMH

Underground shelters
The underground shelters have a strong connection with the history of Hembrug. This provides potentials to house new functions. This function can depends on the new function of the entire ensemble. They are also one of the connecting elements of the Hembrug area, literally connecting the ensemble with the different buildings of Hembrug underground.

Source: Archief Zaandam & own illustration
**View lines**

It is important not to block the original view lines. These connect the ensemble with the former entrance of the cartridge factories and with the waterfront. Reasoning from the view lines point of view will result in low-rise and maintaining these sightlines.

**Source:** Own illustration

**Roof lights**

All buildings of the Changing Zone had roof lights. This provides potentials to bring back these roof lights and therefore the buildings will have a better daylight access. When choosing for new constructions opportunities lies to add roof lights as well.

**Source:** Own illustration

**Composition**

An essential quality of the complex is the ensemble direction. The parcel direction of the buildings is orientated parallel and perpendicular to the North Sea canal. New constructions must take this into account and connect to it.

**Source:** Own illustration

**Typology**

At the Changing zone ensemble already a large variety of different typologies exists. For the new constructions, this offers opportunities regarding new typologies, that do not exist yet.

**Source:** Own illustration

**Monuments**

The complex contains some municipal monuments. Dealing with these monuments should always be with extra care (for example the original ‘getrokken glas’ of building 269).
preconditions

Facades & roofs
It is highly recommended to bring back the original facade (openings) and original roofs of some of the buildings of the Changing zone ensemble (for example the closed-off windows of building 322).

Open floor plan
In order to bring back the historic connection between the different buildings, it is highly recommended to bring back (part of) the open floor plan of the ensemble.

Military forest
Originally the ensemble has a strong relationship with the forest. This natural boundary should also be retained in the future.

The rarity of the ensemble
The different buildings of the Changing zone ensemble and the ensemble as a whole has a unique spirit and unique qualities. It is recommended that with future renovations/adjustments this atmosphere should be kept.

Materialization and detailing
The materialization and detailing of new constructions must be in line with the existing buildings, with its factory architecture. For example elements such as; skylights, openings, use of brick, timber floors, etc. However, the new building may reflect its own time.
Building height
The mass study shows the maximum height of the potential new buildings should be 12 meter. The Cathedral will then still be the highest building of the ensemble, and the mass of the ensemble will stay intact.

Source: Own illustration

Structure
The original north-south structure of the original factories is not visible anymore. This is due to the demolishment of the big original factories in the south. This provides opportunities to locate new buildings on this area. The maximum height of these potential new buildings must be taken into account.

Source: Beeldbank Zaandam

Low-rise buildings
If necessary, small buildings with supporting functions can be erected on and around the Changing zone ensemble.

Source: Own illustration

Demolition
In cultural value point of view, detonating buildings could possibly be demolished. This can only be done when it is for the greater cause; improving the appearance of other buildings to appreciate these buildings to the fullest.

Source: Own illustration

Where not to built
The Changing zone is already a very dense area, which leads hardly any room for new buildings. It is recommended not to build, without demolishing some parts first. This also applies to the closely connected environment.

Source: Own illustration
masterplan

Current situation

Future situation

Source: Own illustrations
Future situation bigger scale
**Demolition**

After the value assessment of the ensemble, the buildings of 437 and 407 were labeled as detonating buildings. The reasoning behind it is determined by the original function, the age, the facades, the materialization and detailing, the state it is currently in, the role in the coherence of the ensemble and therefore the buildings it is connected to.

The function of 437 for example, this latest addition of the ensemble (built in 1970) used to be a workshop for the cartridges production. This function was not as valuable as compared to the other steps of the process, which also is seen in the appearance of this building. This appearance is almost the same as of the already demolished building 505. It is a simple structure, with the same corrugated steel and brick facade. In the case of materialization and detailing the building is spared of specialties. In this building, there are even no openings to be found in the facade. The building is standing on its own structure, it has no internal connections to the other buildings and can be seen as a separate building. It does not interrelate to the rest of the Changing zone. Demolishing it will, therefore, strengthen the coherence of the ensemble.

Building 407 did have internal connections with the Cathedral. Unfortunately this connections were filled with bricks in the transformation of 2003. No other changes have happened to the building which was a former ‘gloeierij’. A lot of traces from the past can still be found inside this building. These traces, like installations and machines are one of a kind on the Hembrug terrain and will therefore be kept in the masterplan. It is also a possibility to keep the steel-structures of this building, like what happened to building 505. However, when we look to the building as a whole, it is not playing an important part for the coherence of the ensemble anymore. Here also the former function plays a role. The melting of the metal that was done here also happened in building 322a. This step of the production process is therefore already to be found in the ensemble. In case of materialisation and detailing this building is interesting then building 407 and will be a better reminder to this function. The machines found in building 407 can for example be placed in this building, to strengthen this connection with the past. The building 407 is also forming a blockade for the Cathedral. In this masterplan we emphasize on this Cathedral. By demolishing 407, the east facade of the Cathedral can be restored again and the Cathedral will be a greater centre of the ensemble and of the rest of the Hembrug terrain.

So, it decided to demolish these buildings to create a bigger open space and make the ensemble less dense. This in order to strengthen the coherence of the Changing zone and to improve the buildings that will be kept of the ensemble. The buildings that are kept create an L-shape, which functions as the enclosing of the newly created open space. When more buildings are demolished, this open space will lose its enclosed atmosphere and the ensemble will lose its story. In the surroundings of the ensemble, two other buildings can possibly also make room to fulfill the demand for new buildings.
Open space
Nowadays the changing zone ensemble is a dense area, which will be enriched by a bigger open space. The added value of this new open space is that it still has its enclosed atmosphere and is a welcomed opponent of the dense ensemble.

Composition
The Hembrug terrain is constructed along a noticeable composition. The parcel direction of the buildings is often parallel and perpendicular to the North Sea Canal. This is also the case in the Changing zone ensemble. New buildings must take this composition into account and follow this direction.
The transition from water to the ensemble

The buildings along the waterfront will be higher than the ensemble and the Cathedral. This is because of the industry that can be found on the other side of the canal. To create a barrier against the smell and noise coming from the opposite side, the buildings parallel to the canal will be higher than 16 meters.

Spatial conditions

Around the Changing zone, there is the possibility to develop new buildings. These buildings are restricted to a certain height, to not overshadow the Cathedral. The only exceptions are the buildings situated along the North Sea Canal.

Source: Own illustrations
View lines
It is important not to block the original view lines. These lines connect the ensemble with the former entrance of the cartridges factories and with the waterfront. Reasoning from the view lines point of view will result in low-rise buildings to maintain these sightlines.

Traces from the past
The ensemble has a rich history where it was functioning as a cartridges factory. Inside the ensemble, a lot of traces from this past are still visible. These traces can also be found in the detonating buildings. It is important to keep this unique traces, while these detonating buildings will be demolished.
Restoring buildings

After the demolition of building 407, the east-facade of the Cathedral becomes visible again. This gives the opportunity to change this facade. The facade is going to be restored to its state that it was in before the building of 407 was built against it. It is decided to restore the facade to this state for a couple of reasons. First, it is from great importance to preserve the rhythm of the openings as is already happening. The openings now filled with brick will be replaced by windows and new windows will be added to connect with the rhythm of the Cathedral. This rhythm is a representation of its neoclassical building style and therefore a symbol of the time that it was built. One layer of time will be peeled off by this decision. This already happened at this facade by the demolition of building 505 and could happen again. A remembrance of this layer of time is however still to be found in the Changing zone. It is not in the east-facade of the Cathedral, but it is in the form of the steel-structure that is kept. The building of 407 will also be remembered in a different way than in the facade. This will happen by keeping some of the unique traces from the past.

The east facade of the Cathedral is not the only place where an intervention is suggested. Also, at some of the roofs the rooflights can be brought back in order to increase the value and connect with the past. This because these roof lights were also there over time. So by introducing this lights, the roofs will be in some way restored to a state of the past. The Cathedral and its relations with the whole ensemble will be appreciated to its full extent. The coherence of the Changing zone will, therefore, be preserved and strengthened by this intervention.
The Cathedral as the center of the Changing zone

In the center of the Changing zone, the highest building of the ensemble can be found. This former press building is nowadays called the Cathedral, because of its appearance and the atmosphere inside. This building will be the spill of the coherence of the Changing zone. It is interrelated with almost every building of the ensemble, it is positioned on a central location inside the ensemble and the Hembrug area, and with its height standing an outstanding building to emphasize on in the masterplan.

This Cathedral was not the only press building in the Hembrug area. In the ensemble of the Ladder, there is a building where the pressing of grenades was done. This building has also the same atmosphere as the Cathedral. To link the Changing zone ensemble to the ensemble of the Ladder and therefore the rest of Hembrug, this building should be kept. This building can become helpful for the development of the Cathedral. So the Cathedral becomes the center of the coherence of the Changing zone.

The exhibition center in Dunkirque, Belgium is a good reference of how to deal with the emphasis on the Cathedral. For the need of more space another building is added which is shaped almost the same. The appearance, height, and centrality of the Cathedral will stay the same when this is done, and therefore the coherence of the ensemble will not be affected by this creation of new space.

FRAC Dunkerque
Architect: Lacaton & Vassal
Location: Dunkirk, Belgium
Former function: Boat warehouse
New function: Exhibition centre for contemporary art

https://www.archdaily.com/office/lacaton-vassal
Lofts Rodebroek
Architect: Volt Architecten
Location: Ronse, Belgium
Former function: Textile factory
New function: six houses, an atelier and two office spaces.

https://www.vai.be/nl/project/lofts-rodebroek

Crown
Architect: Scott Henson Architect
Location: Minneapolis, America
Former function: Steelwork factory
New function: Creative industries like: architectural offices, design firms, and a microbrewery among them


Auditorium Paganini
Architect: Renzo Piano
Location: Parma, Italy
Former function: Sugar factory
New function: Theater

https://www.retecittadellacultura.it/parma/06_auditorium-niccolo-paganini-di-renzo-piano/
Docklands housing complex
Architect: Agence Nicolas Michelin & Associés
Location: Bordeaux, France
Former function: Submarine base
New function: Housing and gardens


Nantes Warehouse
Architect: Franklin Azzi Architecture
Location: Nantes, France
Former function: Warehouses
New function: School of fine Arts


Zollverein Park
Architect: Franklin Azzi Architecture
Location: Essen, Germany
Former function: Industrial complex
New function: A place for art, culture and creativity

https://www.planergruppe-oberhausen.de/zollverein-park/
Appendix
Building 505 was a former production hall, built in the very last building period. The height of this building reveals the former function. This building houses the biggest press of the ensemble. The picture above shows how this press could have looked like. Plambout advised to demolish this building, which is done recently. Only the steel structure, where nature (greenery) can take over.

General information

Original function: Production hall
Monument: -
Architect: -
Building period: 1978
Load-bearing structure: Steel column and beam structure
Building style: Industrial building
Facade: The facades are made out of brick and corrugated steel. There are some facade windows and no rooflights.
Building 91, is in line with building 29 and is only built 10 years later. The construction of this building is almost identical. The difference is that building 91 only consists of one story floor and doesn’t have rot iron columns. It functioned as a storage building and for water purification. The building now is recently renovated and a workshop space. The building is listed as a municipal monument.

**General information**

- **Original function:** Storage and water purification
- **Monument:** -
- **Architect:** -
- **Building period:** 1910
- **Load-bearing structure:** Brick load-bearing structure
- **Building style:** Neoclassical
- **Facade:** Brick building with very orderly and repetitive openings. Building expression is in line with building 29, the difference is that it is only one story height.