The Head of the Cape

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TU Delft Heritage and Architecture,
Heritage and Architecture Graduation Studio, 2018-19
Revitalizing Heritage
Hembrug Studio

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Head of the Cape

An Analysis of the Head of the Cape in Hembrug

Content

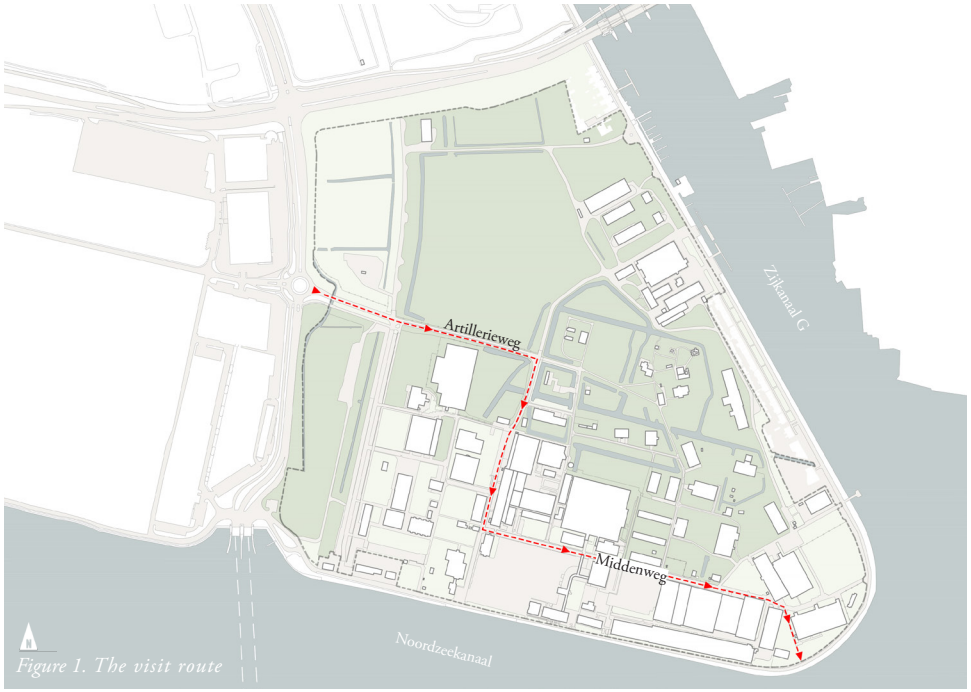

Figure 1. The visit route

Preface

Defining the Character of the Head of the Cape

During the first visit to Hembrug, all students and tutors wandered around the terrain to explore the defunct military industrial area. We entered the site from the entrance at the Artillerieweg. We walked along one of the major roads, Middenweg. A street sign was standing at the end of the road, revealing the name of the very tip of Hembrug - Kop van de Kaap, translated as the Head of the Cape in English. When we turned at the corner, we were enchanted with the open space framed by the building facades and fence, which directed one's eyes towards the wide open Noordzeekanaal. We immediately indulged in the unique atmosphere. The tranquil canal view, the framed green lawn, the composition of buildings, the vacant factory buildings, we questioned ourselves which elements we fell for this spot. We could not pin down to a single element, indeed, we fell for all of the characters of the Cape. However, what are these elements? What makes the Head of the Cape different from other space in Hembrug? These questions triggered a research which revolves around one main question:

What composes the character of the Head of the Cape?

According to the Cambridge dictionary,[1] character is defined as:

Character *noun* [C or U]

1. The particular combination of qualities in a person or place that makes them different from others
2. Qualities that are interesting and unusual

This analysis focuses on these interesting and usual qualities which shaped the character of the Head of the Cape. Besides the apparent street name sign, the history, location and spatial quality also constitute the unique identity of the Cape. (fig.2) The booklet examines these three aspects on four levels of scale, starting from the regional scale to the district level - Hembrug, then zooms in to the Head of the Cape, follows by a close inspection on the individual buildings.

Photos from top left to bottom right:

1. View from the entrance at Artillerieweg
2. View from main road Middenweg
3. View at the end of the Middenweg
4. The street name sign - Kop van de Kaap
5. The open space facing the Noordzeekanaal
6. A map indicating the visit route

Notes:

1. "English Dictionary | Oxford Dictionaries." Oxford Dictionaries | English.

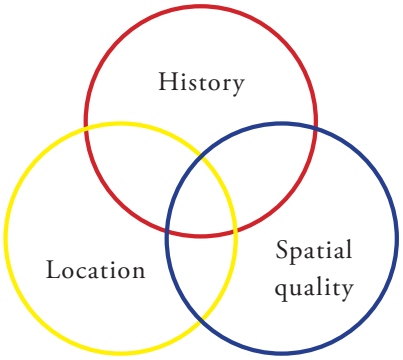

Figure 2. The three aspects that compose the character of the Head of the Cape


AMSTERDAM

01 | *Regional Level*

The set up of Stelling van Amsterdam

Before diving into the Head of the Cape is, it is necessary to learn about the history of the place - Hembrug, which is closely related to the set up of the Stelling van Amsterdam (translated as the Defense Line of Amsterdam in English). This chapter investigates the historical development of the Stelling van Amsterdam and the role of Hembrug within the Defense Line. It also covers the topographical changes of hembrug terrain over time.

Photo source: https://maps.noord-holland.nl/extern/gis-viewers/sva/desk.htm#

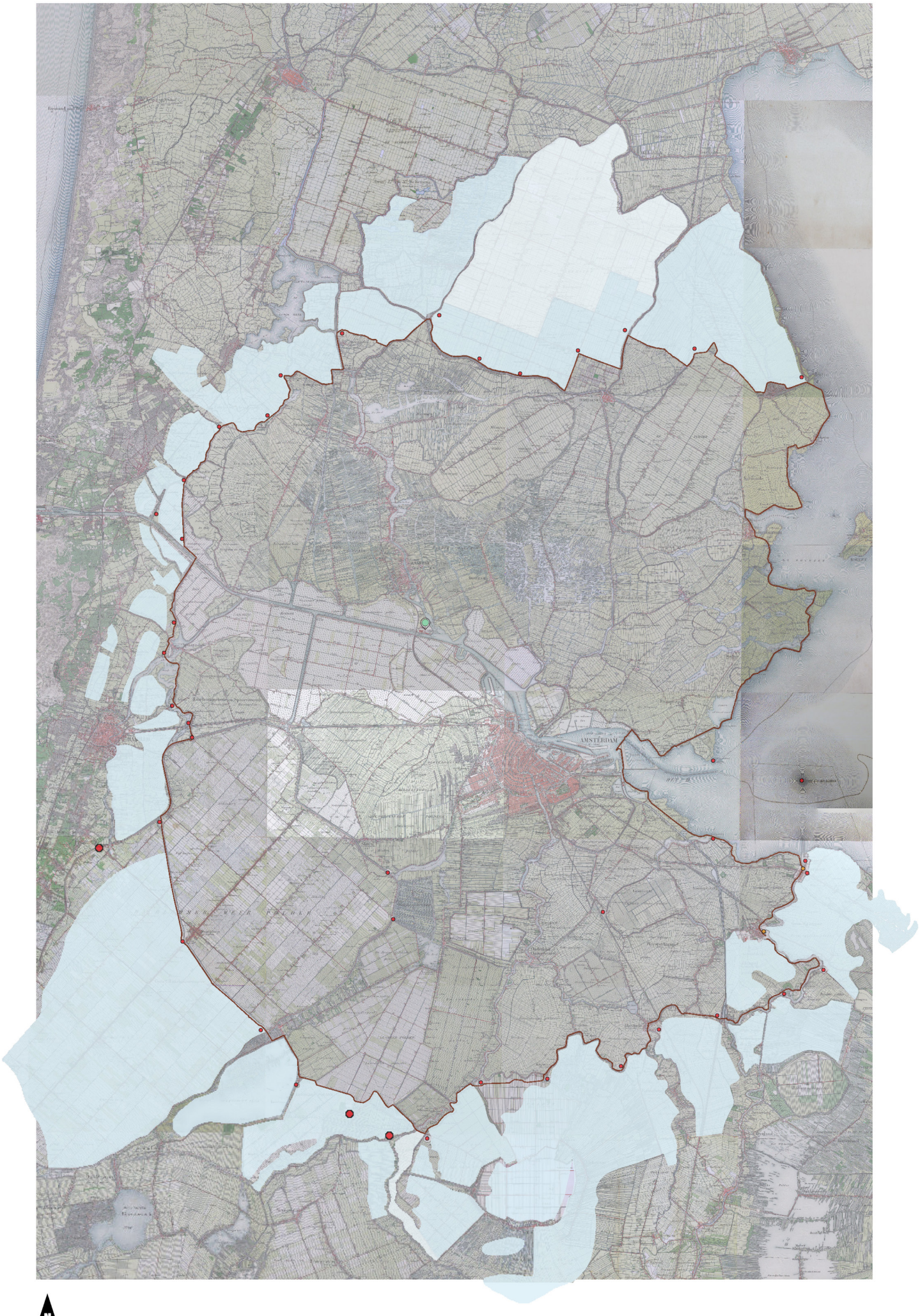

Figure 3. The Stelling van Amsterdam in 1914

1.1 History of Stelling van Amsterdam

The history of Hembrug is closely linked to the establishment of the Stelling van Amsterdam. Since the 16th century, the Netherlands has developed a defense system based on inundation, a military tactic to impede the movement of the enemies by flooding the lowlands of the country. The Stelling van Amsterdam (translated as the Defense Line of Amsterdam) was built in 1880-1920 with dikes, sluices, inlets, 42 forts and several batteries located at 10-20 kilometers away from Amsterdam. It formed a 135km ring of fortification around the capital. Forts were built at strategic locations where roads or railroads cut through the defense line. The Stelling van Amsterdam was the last refuge for the government and the army in wartime. At the time the Stelling van Amsterdam was finished, it was the largest and most modern defense line of the world. The Stelling van Amsterdam is an exceptional example of an extensive integrated European defense system of the modern period which has survived intact and well conserved since it was created in the late 19th century.

The army command assumed that the army could sustain the defense of the Stelling van Amsterdam for six months. Within the Stelling van Amsterdam, Amsterdam and the Zaanstreek had circa 700,000 inhabitants around 1900. In the case of a siege, this number of persons would be increased by refugees and withdrawn soldier, the number of persons could rise to one million. This population required the necessary military and civilian provisions, which would come about at the same time as the construction of the Stelling van Amsterdam. The drinking water supply was adequately regulated around 1900 and for the storage of grain, the still existing grain silo was built in 1896. The preparation for defense was nearly done. There were also several barracks in the city of Amsterdam, realized before the construction of the Stelling van Amsterdam was done, such as the Oranje Nassaukazerne (1814) and the Cavalry Barracks (circa 1865).

Within the strategic concept of the Stelling van Amsterdam, the establishment of various weapon and ammunition factories was needed. Between 1895 and 1900 these factories were created on the Hembrug site near Zaandam. The construction of the Dutch weapons and ammunition factories began in Delft, in 1679, after the disastrous events in 1672, when the country was threatened by enemies from all sides. The different companies endured the eighteenth century and the French occupation period. After that, the companies were transformed into a single organization in 1815. Because of reorganization, in 1887, the Artillerie-Inrichtingen was created. The factories provided for the development, production, maintenance and testing of weapons, equipment and ammunition for the Dutch army. At the end of the nineteenth century, the most important parts of the Dutch arms and ammunition industry were located in Delft, The Hague, Muiden and Ouderkerk aan de Amstel.

The transfer of parts of the Artillerie Inrichtingen to a location within the Stelling van Amsterdam was speed up by the decision of 1900 to purchase a new rifle for the Dutch army, the M95. A different type of cartridges was needed so new factories had to be built. In Delft there was no room, which is why it was decided to build a factory in the area of Amsterdam and relocate the Artillerie Inrichtingen to Hembrug.

Sources:

1. 2010_SteenhuisMeurs_Cultuurhistorische-Analyse_Hembrugterrein

2. UNESCO http://whc.unesco.org/en/list/759/

Photo source:

https://maps.noord-holland.nl/extern/gis-viewers/sva/desk.htm#

Legend:

Hembrug

Inundation field

Fort

Fortress

Main defense line

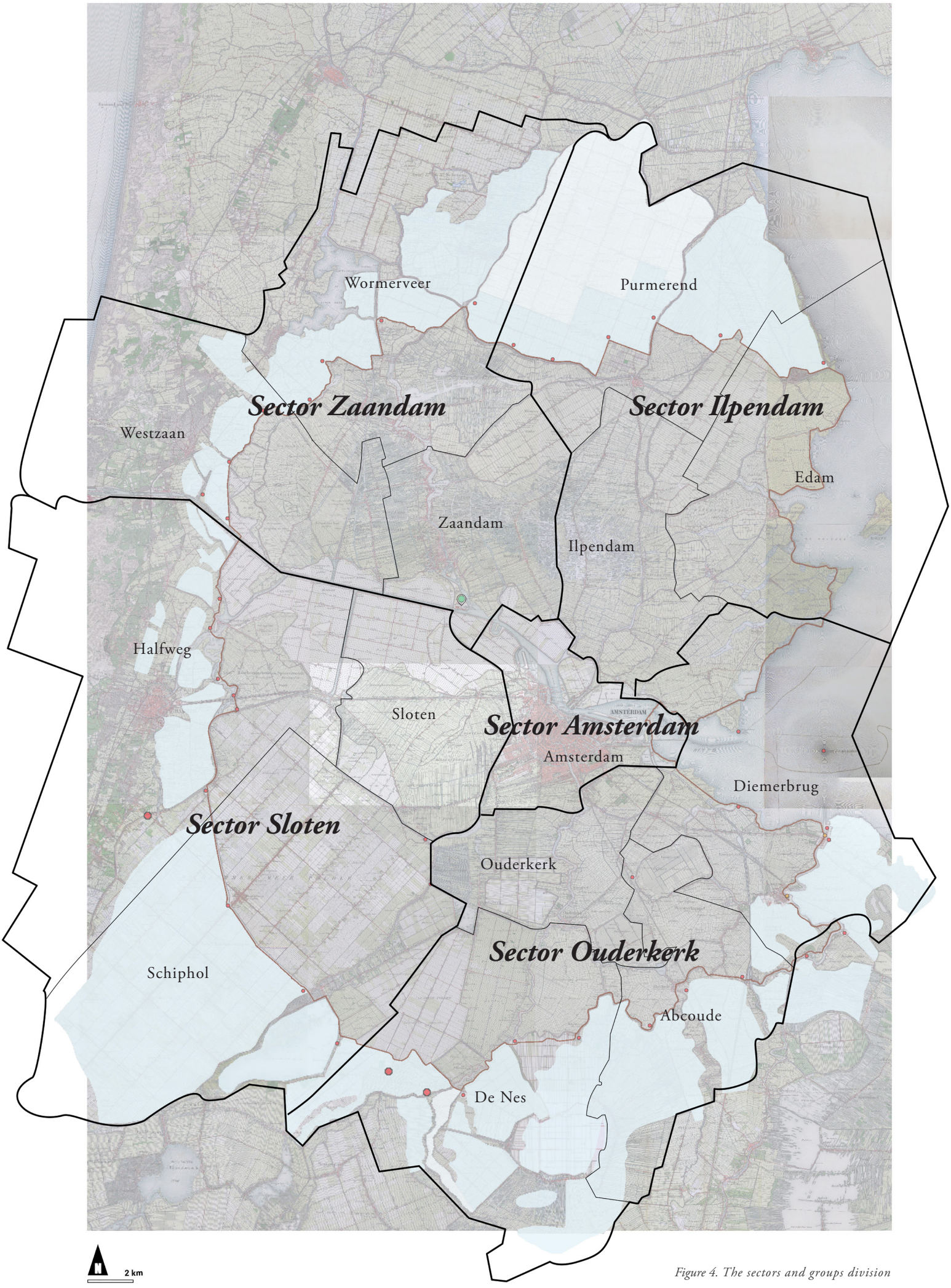

Figure 4. The sectors and groups division

1.2 Sectors and Groups

The Stelling van Amsterdam was divided into sectors, groups and sections. There were five sectors: Sector Zaandam, Sector Ilpendam, Sector Ouderkerk, Sector Sloten and Sector Amsterdam. Hembrug belongs to group Zaandam within Sector Zaandam. Each of these sections had its own commander and staff in wartime.

Shortly after the mobilization of 1914, a separate Positie van IJmuiden was established to simplify the role of the Commander. During this mobilization the Sector Commanders got less and less of a tactical role but more of a territorial commander with no direct role in defensive actions. The disabling of a command level made it easier for the Group Commanders to cooperate if different groups were attacked. Moreover, the Municipality of Amsterdam would annex several peripheral municipalities and therefore change the areas considerably.

In 1919, the Sectors were discontinued, so that the command structure was in line with that of the Nieuwe Hollandse Waterlinie. It also simplified the command, improved command management between groups and reduced the required staff. The Positie van IJmuiden was then enlarged to the entire coastal area of the Stelling van Amsterdam and formed a separate group. In 1921 it became part of the coastal defense.

After the First World War it was decided in 1921 to drop the idea of a 'national refuge'. The Stelling van Amsterdam then became part of the Fortress Holland and formed the northern side of it. The east side was formed by the Nieuwe Hollandse Waterlinie.

The Stelling van Amsterdam has never been used for the purpose for which it was built. During World War I, the Netherlands had not only remained neutral, but because airplanes were used during the warfare, the principle of the Stelling van Amsterdam was now obsolete. Nevertheless, the forts were deployed during World War I. In the forts were numerous soldiers. After the flood of 1916 many soldier who stayed on the various forts were deployed. Also during World War II the Stelling van Amsterdam was in use. Just before the outbreak of the war in May 1940, a part of Beemster and Zeevang were put under water by the Dutch government to stop the Germans. In February 1944 the area was flooded by the Germans to stop allied parachutists. The forts were deployed during and after World War II, by the Germans and then by the Dutch government.

Sources:

1. 2010_SteenhuisMeurs_Cultuurhistorische-Analyse_Hembrugterrein

2. http://www.stelling-amsterdam.nl/stelling/gebruik/index.php

Photo source:

https://maps.noord-holland.nl/extern/gis-viewers/sva/desk.htm#

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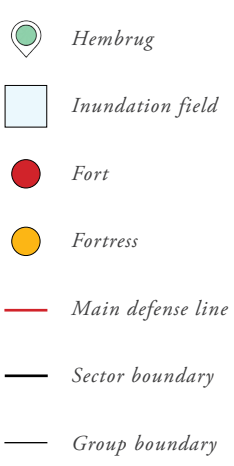


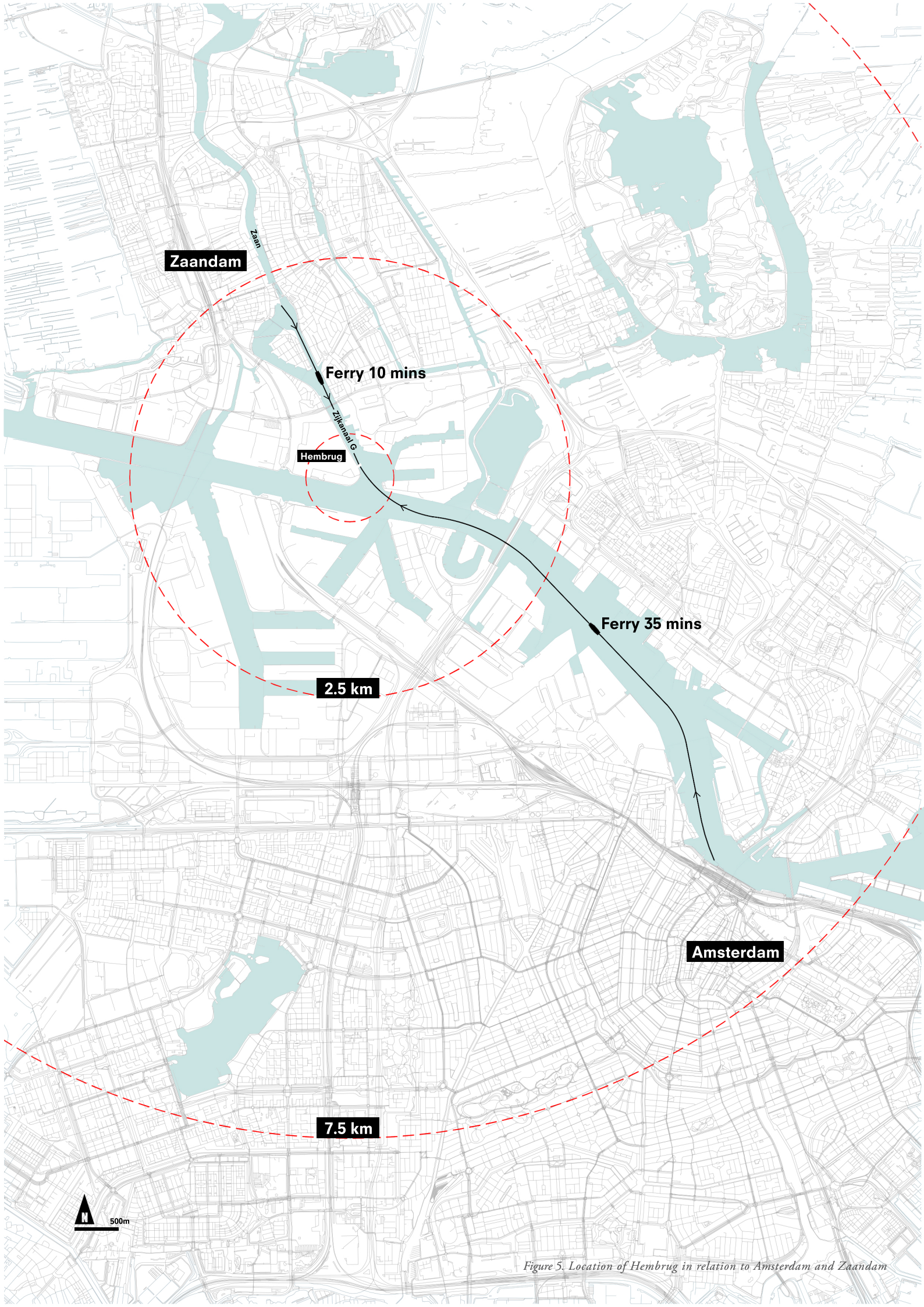
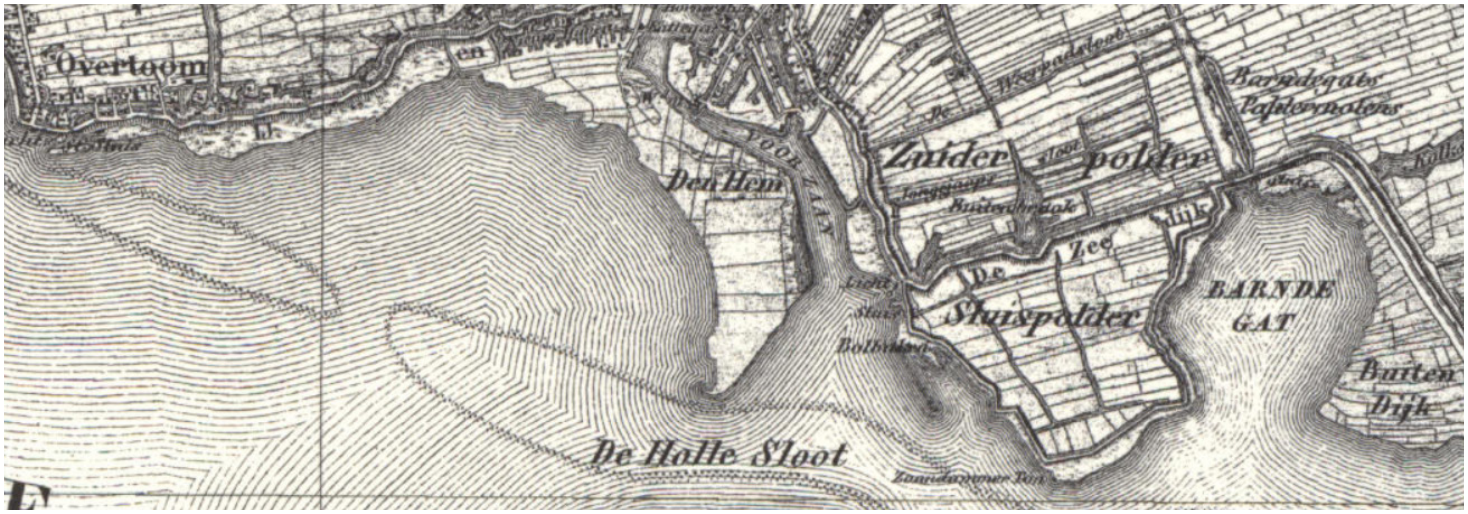
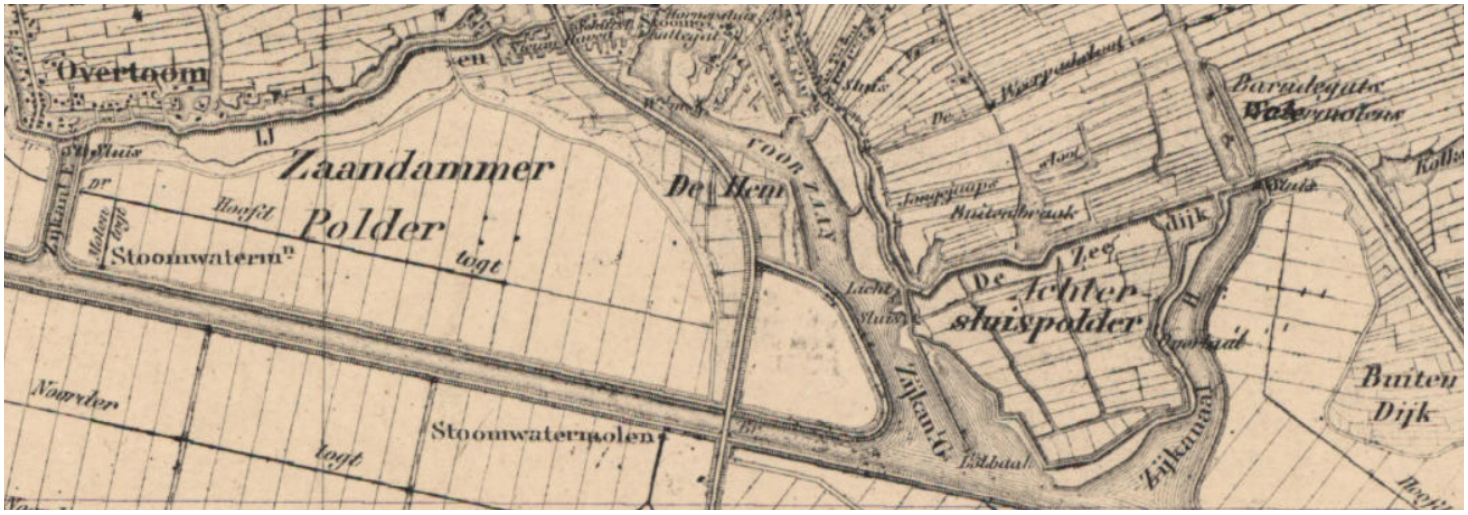


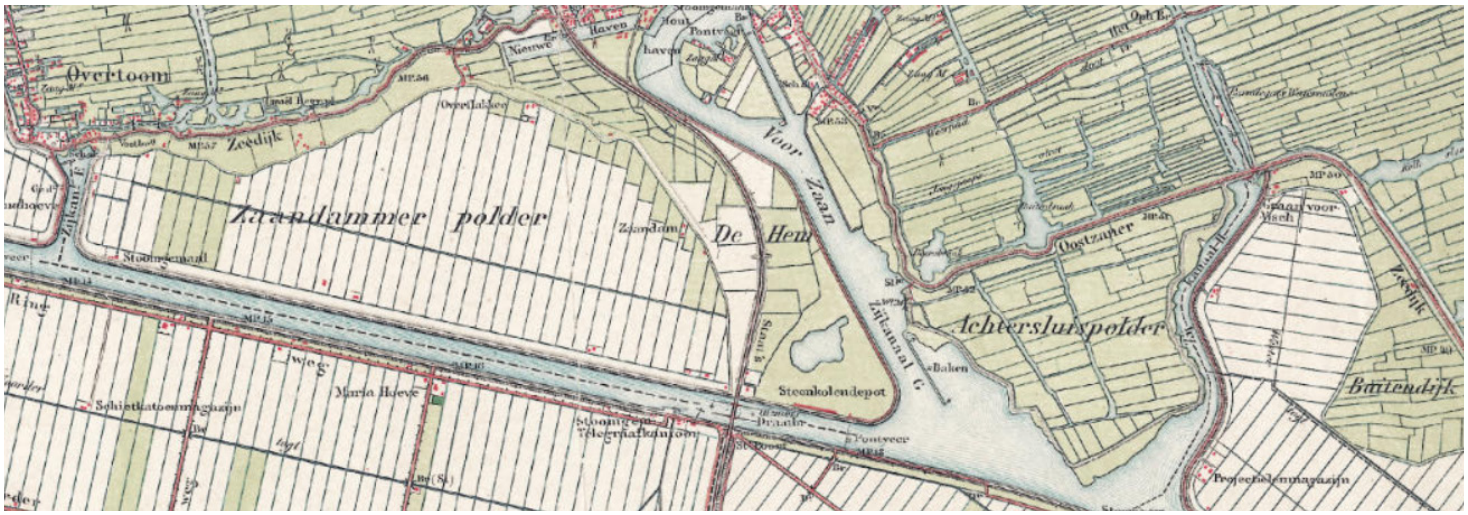
Figure 5. Location of Hembrug in relation to Amsterdam and Zaandam

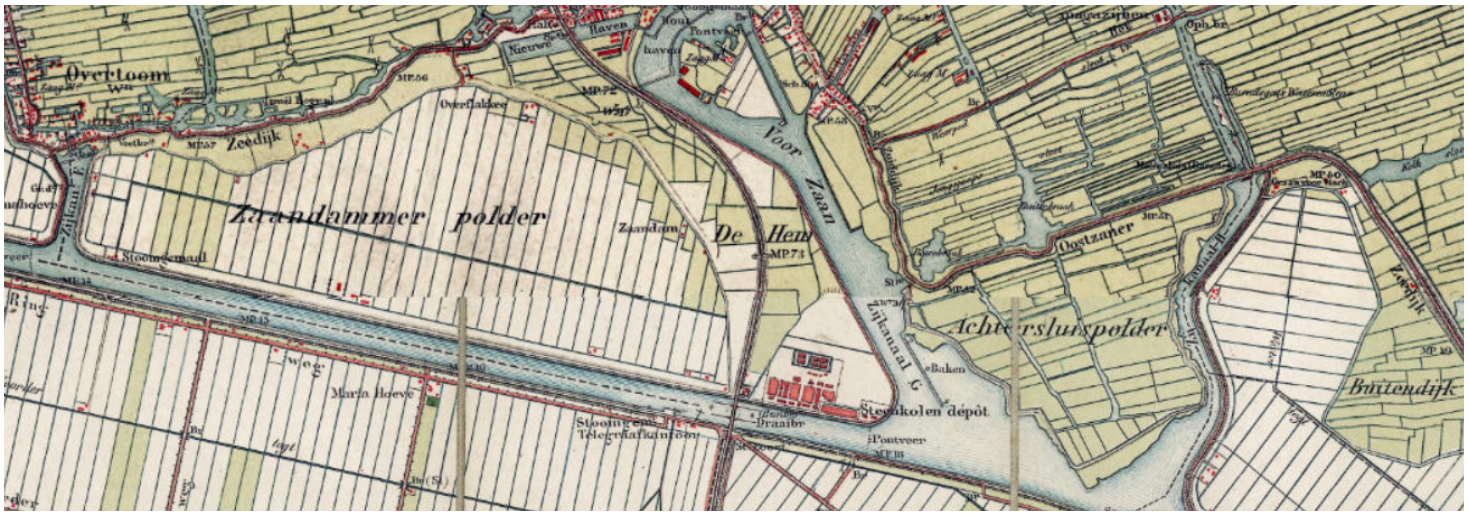
1.3 Location

Hembrug is located in the midway of Amsterdam and Zaandam, approximately 2.5km to Zaandam and 7.5km to Amsterdam. Situated between the two canals, Hembrug can be reached along water. From Zaandam, visitors can travel to Hembrug along river Zaan and Zijkanaal G by ferry. Visitors can also start their journey from Amsterdam Central Station.


Overtoom
Zuider polder
Den Hem
Sluispolder
BARNDE GAT
Buiten Dijk
De Halle Sloot


Overtoom
Zaandammer Polder
Stoomwatermn
De Hem
Achtersluispolder
Stoomwatermolen
Buiten Dijk


Overtoom
Zaandammer polder
De Hem
Achterslurspolder
Stoomgemaal
Stoomkolendepot
Buitendijk


Overtoom
Zaandammer polder
De Hem
Achterslurspolder
Stoomgemaal
Stoomkolen dépôt
Buitendijk

1.4 Historical Development

Historical maps source:
https://www.topotijdreis.nl/

Since 1815

Hembrug originated from the former peninsula of the Hem, at the location of the debouchment of the Voorzaan on the IJ. This area was extended with the construction of the North Sea Canal and straightened out to the polder de Hem.

Since 1882

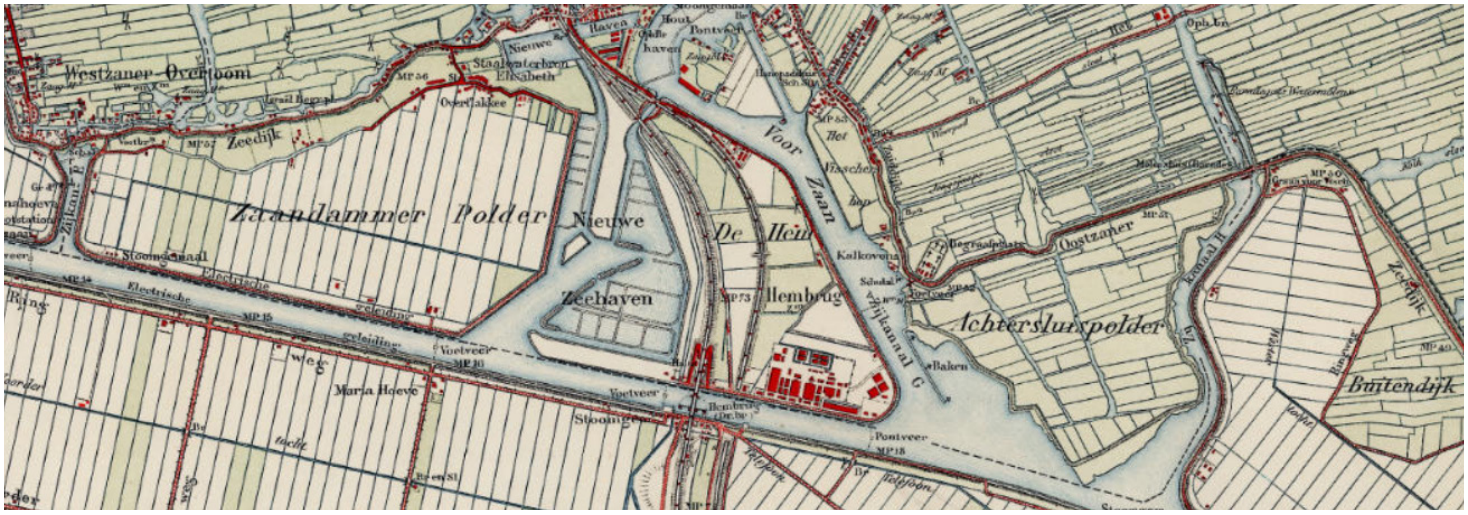
The creation of the Noordzeekanaal has been completed between 1862 and 1874. By dredging the area, a surface of 42 hectare became available to use as land. On the polder the dredging depot of Rijkswaterstaat was realized to store peat, clay and sand from the Noordzeekanaal, after which the Navy built a coal shed along the water.

Since 1894

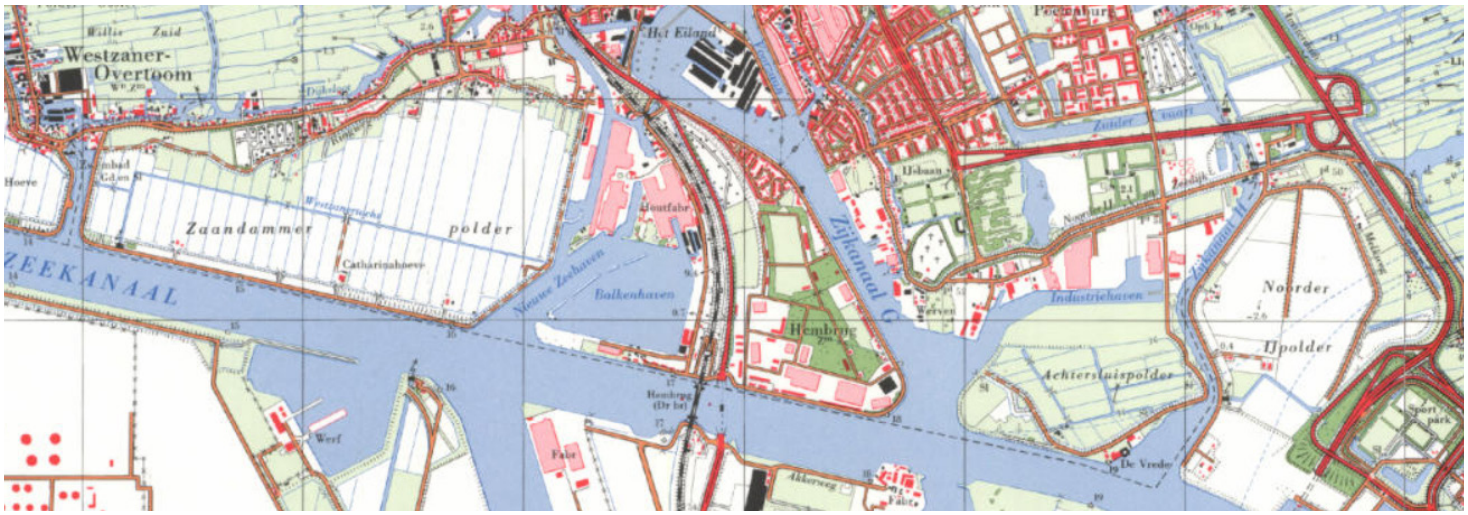
The land of Hembrug was created. However, the reorganization and relocation of the company from Delft to Hembrug wasn't done yet. Therefore, no density of buildings can be found on the map.

Since 1898

The location on the Noordzeekanaal and Zijkanaal G was safe from the risk of explosion, at a distance from existing buildings. In addition, the area was fairly central within the Stelling van Amsterdam, far from the defense limits.


Westzaner Overtoom
Zeedijk
Zaandammer Polder
Nieuwe
Zeehaven
De Heit
Hembrug
Voor Zaan
Achtersluispolder
Oostzaner
Buitendijk
Stoomgemaal
Maria Hoeve


Westzaner Overtoom
Zaandammer
polder
KANAAL
Hembrug
Nieuwe
Zeehaven
Zeembad
Achtersluispolder
Oostzaner
Noorder


Westzaner-
Overtoom
Zaandammer
polder
ZEEKANAAL
Balkenhaven
Hembrug
Het Eiland
Industriehaven
Achtersluispolder
IJpolder
Noorder


Zaandammer
polder
Hembrug
Het Eiland
Ankerweg

Since 1914

The production for military equipment, weapons and ammunition expanded due to World War I. This led to an intensive densification of the industrial zone. The buildings forming this industrial zone were mainly concentrated along the Noordzeekanaal due to sea transport being the main transport system for logistics. Beside the waterfront being an industrial zone, buildings were realized at the West side of the area as well due to train transport.

Historical maps source: https://www.topotijdreis.nl/

Since 1950

During, and after, World War I, the production activities were increased. This means that the area became denser. More production lines were needed and built. However, during World War II, the expansion was limited. A new development which can be noticed on the map is the green area; the Plofbos. This plantation acted as a test area for explosives. The trees were acting as camouflage and should limit the damage of the explosions.

Since 1969

Many developments have been realized on the east side of Zijkanaal G. For the larger part, the polders have been transformed into dwellings and greenery. This means an expansion of Zaandam and Amsterdam.

Since 1993

The Artillery Inrichtingen closes in 1983 officially. Many buildings are vacant and nature takes over some parts of the area. In the meantime the area's around Hembrug are developing dwellings and public space. Hembrug starts to possess an interesting geographical location.


Westzaner Overtoom
Zaanenland
Oud-Zuid
Westerspoor
Zuiderhout
Hembrug
Achtersluispolder
Noorder IJ-Plas
Zijkanaal G
Veerdienst IJmuiden - Amsterdam
Ankerweg
Vrede


Zaanenland
Oud-Zuid
Westerspoor
Veerdienst Amsterdam - Beverwijk - Velsen
Zuiderhout
Hembrug
Achtersluispolder
Noorder IJ-Plas
Zijkanaal G
Ankerweg


Zaanenland
Westerspoor
Zuiderhout
Havenbuurt
Achtersluispolder
Noorder IJ Plas
Zijkanaal G
Amerikahaven

Since 1999

The military defense left Hembrug officially in 2000. Since that moment the area has been vacant until squatters and artists arrived. They saw opportunities and a unique built environment with a lot of potency. Hembrug starts to transform very slowly.

Historical maps source:
https://www.topotijdreis.nl/

Since 2010

Hembrug was surrounded by other industrial areas. However, most of these areas have been transformed to residential use. Hembrug occupies a few starters whom are creating a new atmosphere for the area. Plans have been made to transform the whole area of Hembrug.

Since 2016

The density of the geographical area has been increased in the past decades. Besides the expansion of Zaandam at the East side of Zijkanaal G, also the western land of the Balkenhaven was reclaimed to make space for built environment.

2018 - Current aerial photo

While several parts of Hembrug are slowly transforming from a former military function to a residential function with retail and/or cultural activities, still many buildings are vacant.

02 | *Hembrug*

Where the story begins...

Place identity has become a significant issue in recent years in the fields of urban planning and architectural design. It concerns the meaning and significance of the place for their inhabitants and users which highly relate to the historical context of a society. Before asking what the identity of the Head of the Cape is, it is necessary to learn about the history of the place - Hembrug.

This chapter investigates the historical development of Hembrug by which we can understand how the Head of the Cape evolved over time. The Head of the Cape today still bears some traces of her military past, for instance the existence of a national monument - a bunker.

Photo:
Aerial photograph of Hembrug taken between 1920-1940.

Photo source:
https://commons.wikimedia.org/wiki/File:NIMH_-_2011_-_0237_-_Aerial_photograph_of_Hembrug,_The_Netherlands_-_1920_-_1940.jpg

Figure 6. Site Map of Hembrug

Canals *Roads* *Greenery* *Trees*

2.1 Location

Hembrug is a green enclave amidst the industrialized areas. The border of Hembrug is defined by the road Doctor J.M. Den Uylweg (s150) in the north, the Zijkanaal G in the East, the North Sea Canal in the South and the road Provincialeweg (s152) in the west. The area of Hembrug is mainly man-made land. Due to new visions of Zaandam and Amsterdam, Hembrug's geographical location will become more important in the coming decades.

Source:
2010_SteenhuisMeurs_Cultuurhistorische-Analyse_Hembrugterrein, p.4

	COMPANY	WORLD EVENTS / ACCIDENTS	CONSTRUCTIONS
1654		Explosion Delft.	
1872			Start digging the Noordzeekanaal.
1875			Constructing the first Hembrug (bridge).
1880			Start of constructing the Stelling of Amsterdam.
1887	Reorganization: 'Constructiewerk-plaatsen' is now 'Artillerie Inrichtingen'.		
1895			Start of construction 'Artillerie Inrichtingen' on Hembrug.
1899	Relocation production center to the Hembrug site.		
1906	The company uses an nine-hour working day.		Construction second bridge.
1907	Every employee gets eight days off per year.		
1912	The 'Artillerie Inrichtingen' becomes a state-owned company.		
1913	Relocation of the factory management from Delft.		
1914		Start of World War I.	
1916			Separate production area on the other side of the Canal.
1917			New trotyl factory on the other side of the Canal.
1918		End of World War I.	
1920		Anti-militarism "No man, no cent" influences the decline of the company.	Completion Stelling of Amsterdam.
1921	Political plans for closure of the company.		
1924	Completion of relocation from Delft.		
1928	Artillerie Inrichtingen gets more freedom.		
1938			Placement of test equipment mustard gas.
1939		Accident with poured mustard gas.	
1940		Start of Second World War.	
1941	Civil production became Nederlandsche Machinefabriek Artillerie Inrichtingen.		
1944	The company is shut down and evacuated after a strike.		
1945		End of World War II.	
1950		Accident with buried piping of the mustard gas plant.	
1957			Construction .50" factory.
1959	State company becomes Public Company.		
1967		Explosion upon pressing of trotyl in building 418.	
1973	Company is Eurometaal N.V. and N.V. Machine tools Industry Hembrug.		
1983			Commissioning Hemtunnel.
1996	Stelling of Amsterdam on the World Heritage List.		
1999	Owned by State, Dynamit Nobel AG and Rheinmetall Euro B.V.		
2000	Defence leaves the Hembrug site.		
2001	The municipality organizes first workshops for the redevelopment of the site.		
2003	Closing Eurometal.		Plans are made for the redevelopment of the site with a prison.
2006	Establishment of the Nieuw Hembrugterrein foundation. Vision created by the municipality, province and state.		

Figure 7. Historical events related to Hembrug

2.2 Timeline of Hembrug

As mentioned, Hembrug area was once the heart of the Stelling van Amsterdam. However, the story was not originated from there but in Delft instead. The Dutch army started to use a new weapon M95 rifle in 1889. New cartridge factories and ammunition factories were required for weapon and ammunition production. Due to insufficient area in Delft, the Artillerie Inrichtingen had to relocate to Hembrug.

Source:
2010_SteenhuisMeurs_Cultuurhistorische-Analyse_Hembrugterrein, p.11-13

Hembrug was previously a dredging depot located at De Hem. It was used to store peat, clay and sand excavated from the North Sea Canal. After a few terrain adjustments, the depot was transformed into Hembrug terrain. The relocation of machines and equipments took place between 1895-1924. New buildings were also constructed for cartridge factories, artillery warehouses, projectile factories and chemical laboratories.

The outbreak of the First World War led to a rapid growth of the workforce in the area. The number of workers increased from 1,200 in 1912 to 1,500 in 1914, the number then doubled to 3,000 in 1915. The site was operated at maximum capacity in 1917 with 8,500 workers working on shifts. The workers were not allowed to disclose their work to others, not even with families and friends. The long working hours and secret nature of the job formed a closed community with a strong bonding.

The timeline on the left showed all critical events from the birth of Hembrug terrain to its development history and the future redevelopment planning.

Figure 8. Map of Hembrug in 1901

Figure 9. Map of Hembrug in 1924

2.3 Historical Development

In 1899 the Artillerie Inrichtingen relocated to Hembrug. Several buildings had to be built. In 1901 the construction of the new ammunition factory was finished. The weapon factory existed out of fourteen buildings, a variation of workplaces, weapon depots, shooting ranges and a test building to test gun barrels. Remarkable is the compact design: the factories were dense on a rectangular terrain, surrounded on three sides by dug ditches with high walls. The rest of Hembrug was a bare, undeveloped area, with just a few other buildings: a coal shed of the Navy and two pontguard houses.

Source:
2010_SteenhuisMeurs_Cultuurhistorische-Analyse_Hembrugterrein, p.32, 33, 36, 40.

The people who worked on the Hembrug terrain had three ways to access to area: by steam locomotive, by boat or by bicycle. Due to the cold winters, the steam locomotive was unreliable during this period. The travel time of the boat was long, which was a disadvantage as well. Due to these disadvantages, the people who were forced to go from Delft to Hembrug were talking about 'being exiled to Hembrug'. One specific weapon was important for the development of the Hembrug terrain; the M95 with 6,5 mm cartridges. This weapon would be the standard weapon of the Dutch army and would be used until World War II.

The production process developed and therefor new production lines were needed. Thus, new buildings were built in order to make the production process as efficient and optimal as possible. Not only buildings were built, also the infrastructure, steam pipes, greenery and narrow-gauge tracks were developed. On the eastern tip of the site were three large square sheds for peat storage that served the entire Stelling van Amsterdam. All materials for the factories arrived by boat in this area.

The compact design developed into a complete area filled with factories due to the enormously increase in weapon demand. The terrain was divided into three zones (weapons, patterns and ammunition). Low iron fences separated the three factory sites. Per factory there was a private entrance, own facilities and a private engine room for generating power and luminous flux.

The spatial layout was the same per factory. Along the Noordzeekanaal lay the main entrance and representative buildings. Directly behind this was a strip with large wooden production halls, and to the north there were brick warehouse buildings. The tripartite division resulted in a strong north-south orientation of a large number of roads and buildings. The connecting structure of the site was a central east-west axis, with narrow-gauge tracks for the transport of materials between the factories and from the warehouses to the ships and vice versa. Along this central axis there were above-ground pipes that provided each building along this route with steam. Also, the forest, Plofbos was expanded. In this densely wooded area tests were done with explosives and there were secured depots.

Figure 10. Map of Hembrug in 1941

Figure 11. Map of Hembrug in 1996

Expansions of the factory did not take place during the World War II. However, the Germans built shelters on the northern part of the site and on the head of the Cape (where in 1939 a hiding place had already been built). In 1944, machines were still transported to Germany. After the liberation from Germany, production could start again.

Source:
2010_SteenhuisMeurs_Cultuurhistorische-Analyse_Hembrugterrein, p. 44.

After 1945 there was an increase in scale and modernization of the weapons and ammunition factories. New warehouses were built and many older buildings were demolished. On the eastern part of the terrain, buildings in concrete skeleton construction with curved roofs were built. Eurometaal settled in the eastern part, NV Machine tools industry settled in the western part.

In the post-war period, some small military units settled on the site to the north of the Artillerie Inrichtingen, such as the Munitie Onderzoeks Dienst in the experimental buildings. Around 1950 a mobilization complex was set up on the western part of the military site. New warehouses were built for this purpose and all older buildings of the former Algemene Verdedigingspark disappeared. For heavy goods, a 5-ton crane came along the railway. As usual with the Dutch mobilization complexes, the site received planting as camouflage.

The civil production of the Artillerie Inrichtingen continued after the war. The Hembrug bench became a household name in the metal industry. In 1969 the machine factory specialized in precision benches. Four years later, in 1973, the Artillerie Inrichtingen were split into two independent companies: Eurometaal and NV Gereedschapswerktuigenindustrie Hembrug. The state retained 70% of the Eurometaal shares and sold the rest to the German Dynamit Nobel. NV Hembrug remained fully owned by the state.

The division into two companies had consequences for the layout of the area of the Artillerie Inrichtingen. Eurometaal settled in the eastern part. NV Gereedschapswerktuigenindustrie Hembrug established on the western part.

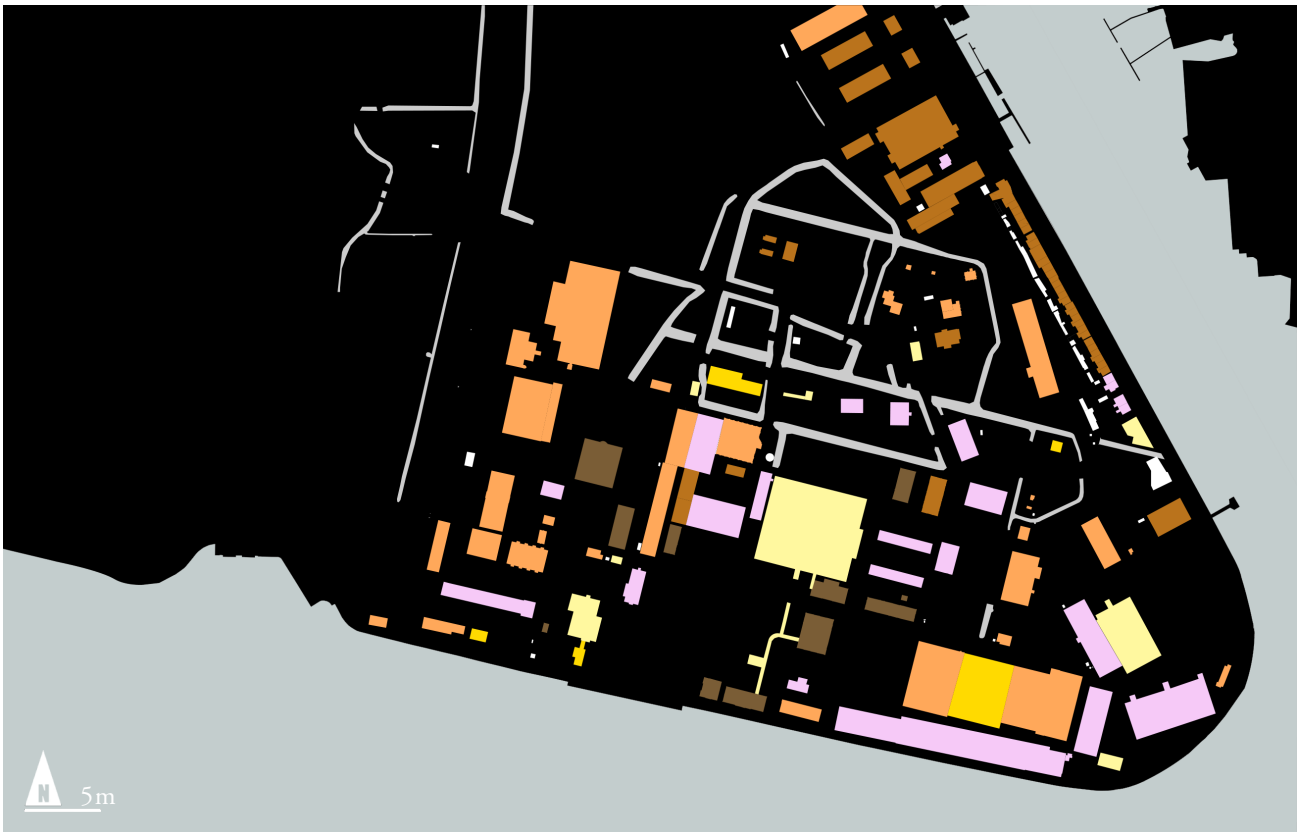


Figure 12. Map of Hembrug indicating different building phases

1895-1901

1901-1924

1924-1945

1945-1960

1960-1973

1973-2018

2.4 Building Phase

The history of more than a century of development on the Hembrug site can be noticed from the existing building stock.

Source:
2010_SteenhuisMeurs_Cultuurhistorische-Analyse_Hembrugterrein, p. 48

Construction phase 1: 1895 - 1901
From the period of the construction of Stelling van Amsterdam, eleven buildings have been preserved. This includes six national monuments and three municipal monuments. Part of the above-ground pipeline network from this phase has also been preserved and is on the municipal monument list. It concerns the steam pipes in the east-west direction.

Construction phase 2: 1901 - 1924
The second phase of construction includes the expansions of the Artillerie Inrichtingen until after the First World War and the oldest buildings of the military site. Many buildings were needed due to the extra demand of weapons and ammunition which were needed for World War I.

Construction phase 3: 1924 - 1944
During the interwar period, both the factories and the military area expanded considerably, as a result of an increase in the product range and the threat of war in the thirties. This led in particular to new construction to the west of the arms factory, the construction of factory halls at the ammunition factory and the densification of the cartridge factory.

Construction phase 4: 1944 - 1960
After the Second World War, expansion took place mainly on the grounds of the Artillerie Inrichtingen.

Construction phase 5: 1960 - 1973
The fifth phase of construction covers the last period that the Artillerie Inrichtingen were located on the Hembrug site. At that time a restructuring took place, which resulted in a modest construction flow.

Construction phase 6: 1973 - 2010
The sixth construction phase is the phase in which Eurometaal got a part of the Hembrug. Many buildings were demolished during this period. The new building did not always fit naturally into the existing structure, certainly not in comparison with the many building activities in the preceding decades.

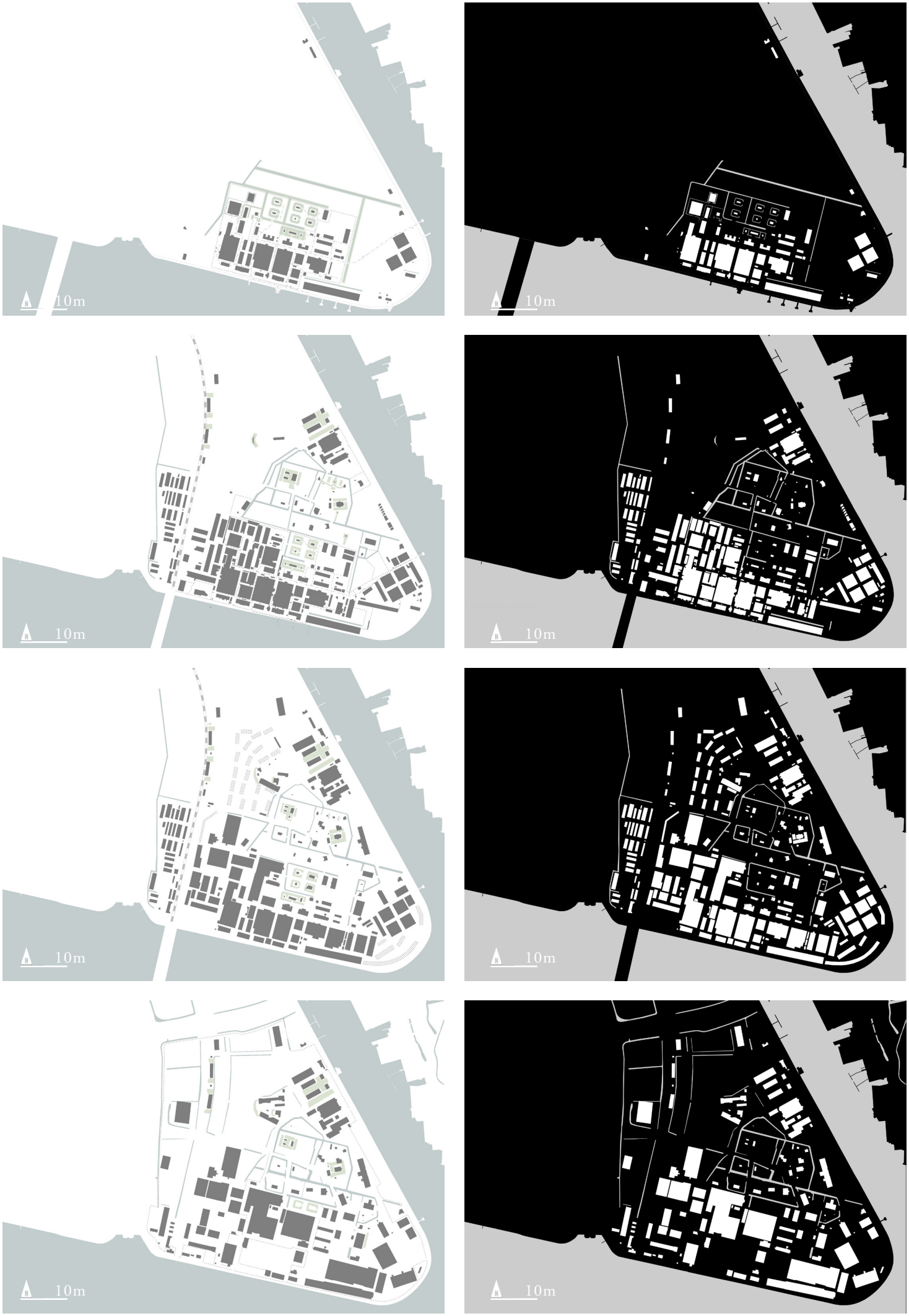


Figure 13. Figure and ground diagrams

2.5 Figure and Ground

Through the years of the existence of Hembrug, not only the density of the buildings has changed. Besides the densification of the former military terrain, the accessibility has changed as well. Hembrug had two bridges which were important for the logistics and accessibility of the area. Nowadays there are no traces left of these two bridges due to the realization of the Hemtunnel. This resulted in more space for the boat industry which uses the Noordzeekanaal as transport route.
The open spaces between the buildings are the result of the orientation and placing of the buildings itself. Remarkable for this aspect is the open space at the northern part of the area. Within this part, the forest was created to limit the damages any potential explosive could cause. However, as can be seen on the maps, the density of the Head of the Cape was, and still is, quite low.

Source:
2010_SteenhuisMeurs_Cultuurhistorische-Analyse_Hembrugterrein, p. 35,39, 43, 47.

Figure 14. Three main zones and nine ensembles of Hembrug proposed in 2010 SteenhuisMeurs document

Ensemble borders

Waterfront zone

Production zone

Forest zone

2.6 Ensembles of Hembrug

According to document of SteenhuisMeurs from 2010, nine ensembles can be noticed within the area of Hembrug. The first ensemble is the waterfront. It's the face of the Hembrug terrain. The separation from the waterfront to the Noordzeekanaal is emphasized by a graceful and robust marking that underlines the stately appearance of the waterfront. The former main entrance on the Hemkade is of historical importance for the site as a whole.

Source:
2010_SteenhuisMeurs_Cultuurhistorische-Analyse_Hembrugterrein, p. 71.

2016_SteenhuisMeurs_Gebiedspaspoorten-Omgevingsplan-Hembrugterrein, p. 48, 50, 52, 54, 56, 58, 60, 62, 64, 66

The second ensemble is the Head of the Cape. It is the green informal waterfront of the Hembrug site and is part of the edge of the site. The area is characterized by the open structure and spaciousness at the tip of the Havenstraat. In this area the forest, the open greenery and the water come together. The Head of the Cape has two atmospheres: the west is part of the 'urban' production area and the east is green, open and has a strong relationship with the water. The buildings along the water stand loose in the green, and have a variety of functions and architectural features.
The third ensemble is the Ladder. It's part of the production area of Hembrug, behind the waterfront. From origin it was an ammunition factory. The area is crossed by the historical main structure with a characteristic profile consisting of above-ground pipeline network and a flanking green structure (in east-west direction).
Fourth, the changing zone, which is an ensemble of connected buildings with a number of special monuments. The highlight of the ensemble is The Cathedral, a building that towers above the other buildings. This area is the middle production area of the Artillerie Inrichtingen in which the production of cartridges was concentrated.

The next ensemble is the Campus. The Campus is the largest production area behind the waterfront. Arms were produced here. The area is characterized by detached buildings in an open area of grassy areas with some valuable trees.

The ensemble Plofbos with testing area is the oldest part of the Hembrugbos (the forest that surrounds the production areas). The area was a natural and wooded resting point with respect to all zones and areas around it. The forest consists of a system of ditches, forest and earthen walls and many small monuments in the form of bunkers and wooden houses.

The next area, Enclaves, is the former Algemeen Verdedigingspark, a large central warehouse that had to supply the entire Stelling van Amsterdam. The buildings were used as workshops, warehouses and troop sheds and can be seen as a group of enclaves in green. These are wedged between the dense Hembrugbos and the water of the Zaan.

The area Hembrugbos forms together with the Plofbos a natural resting point with respect to all zones and areas around it. The Hembrugbos surrounds the production areas of the Hembrug site and was still relatively open at the end of the seventies, with a few wide greenery strips around the shooting ranges. In the past thirty years the forest has been heavily compacted and nowadays it is a richly wooded area.
The final ensemble is the Boskavels. This area is part of the green edge of the military industrial production complex that was previously set up as a mobilization complex, a military complex with a number of sheds scattered throughout the area.

Figure 15. The circulation map

Hembrug border *Main roads* *Secondary roads* *Border walkway*

2.7 The Roads

Hembrug has a clear infrastructure which followed the former production lines when the terrain was still active as an industrial area. Within the borders of Hembrug, a few main roads can be noticed. These roads are the main roads due to optimization of the production process and make it as efficient as possible.

Source:
2010_SteenhuisMeurs_Cultuurhistorische-Analyse_Hembrugterrein, p. 58, 60.

The main structure on the site consists of two parts. Firstly, the old route that connected Zaandam on the railway to Amsterdam. It is a single long line in the area. The tracks have disappeared, but the structure is still dominant.

Secondly, there are the main routes of the internal road structure. These are recognizable by a hardening of two or three Stelcon plates next to each other, with strips and an green structure. Originally these roads were completely paved with a cobblestone paving and equipped with a narrow-gauge railway. The main routes roughly form a cross shape. The east-west axis runs from the old loading point at Zijkanaal G, through all production areas and ends with a kink on the railway line. This is the most important route on the site of the Artillerie Instellings, which ran right between the (disappeared) large production halls and the warehouses. The main steam pipes also follows the central east-west axis. In addition to the main structure on the site of the Artillerie inrichtingen, there is a main road over the Military site. This starts at the Hemkade and runs in a large bend around the test area to the Havenstraat.

The other secondary roads on the site are paths and streets through the forest or between the factory buildings. They usually consist of single vowels, or of a concrete slab with a vowel edge on both sides. They offer different views, especially to the Noordzeekanaal and in the direction of the forest area. In the forest, the paths follow the structure of ditches and islands, around the clusters of depots and test buildings.

Remarkable about the infrastructure is the fact that the ensemble of Head of the Cape isn't directly connected to a main road, while most of the other ensembles are directly connected to a main road.

Figure 16. The two prevailing grid systems in Hembrug

----- *Hembrug border*

——— *Prevailing grids*

2.8 The Grid

Hembrug knows a clear grid system. The production area has a clear grid going parallel and perpendicular on the Noordzeekanaal. Along Zijkanaal G, a second grid system can be noticed. This grid system is also parallel and perpendicular on the water; Zijkanaal G.
Remarkable about the grid system is the fact that these two grid system are coming together at the Head of the Cape. However, the grids are not merging or connected with each other. Moreover, not one grid system can be noticed within this ensemble, resulting in the buildings being off grid orientated. This characteristic can be related to the open spaces. The buildings are placed off grid, which results in unique open spaces.

Figure 17. The pipelines in Hembrug

----- *Hembrug border*

– – *Pipelines*

2.9 The Pipes

The above-ground pipeline network is one of the most recognizable structures on the site: each of the three factories was connected to it and branches also run to the test fields. Steam was fed through the pipes to heat the buildings in which explosives were used. Steam was used to heat instead of gas or petroleum because it was safer. In the first years of production steam was also used for the drive of machines. A functional component of the steam pipe system is the boiler building in which the steam was generated. The oldest pipelines above ground lie along the main structure of the production area.

Source:
2010_SteenhuisMeurs_Cultuurhistorische-Analyse_Hembrugterrein, p. 60.

Figure 18. The fence erected to avoid transgressing

----- *Hembrug border*

— — *Fence*

2.10 The Fences

The map on the left shows where the current fences are located. As can be seen from the images underneath, several types of fences have been applied. In the earlier years of Hembrug, bigger plots were surrounded by fences which led to private zones which were only accessible by authorized employees. In the current situation, the bunker at the Head of the Cape is inaccessible due to fencing. Also, a big part of the waterfront and Head of the Cape is seperated from the Hemkade, which leads to even more inaccessibility. Furthermore, in the northern part the woods are inaccessible due to the fences.

Figure 19. The pavement pattern in Hembrug

----- *Hembrug border*

Red brick pavement

Grey brick pavement

Concrete pavement

2.11 The Pavement

The main roads in Hembrug are mainly paved with square concrete plates with steel border (figure 23). On the sides of the concrete pavement are paved with bricks. Two colors of brick pavement can be found in Hembrug, red and grey.

Figure 20. The red brick pavement

Figure 21. The grey brick pavement

Figure 22. The concrete pavement

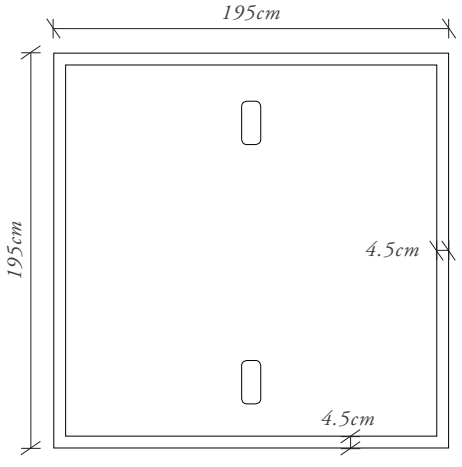
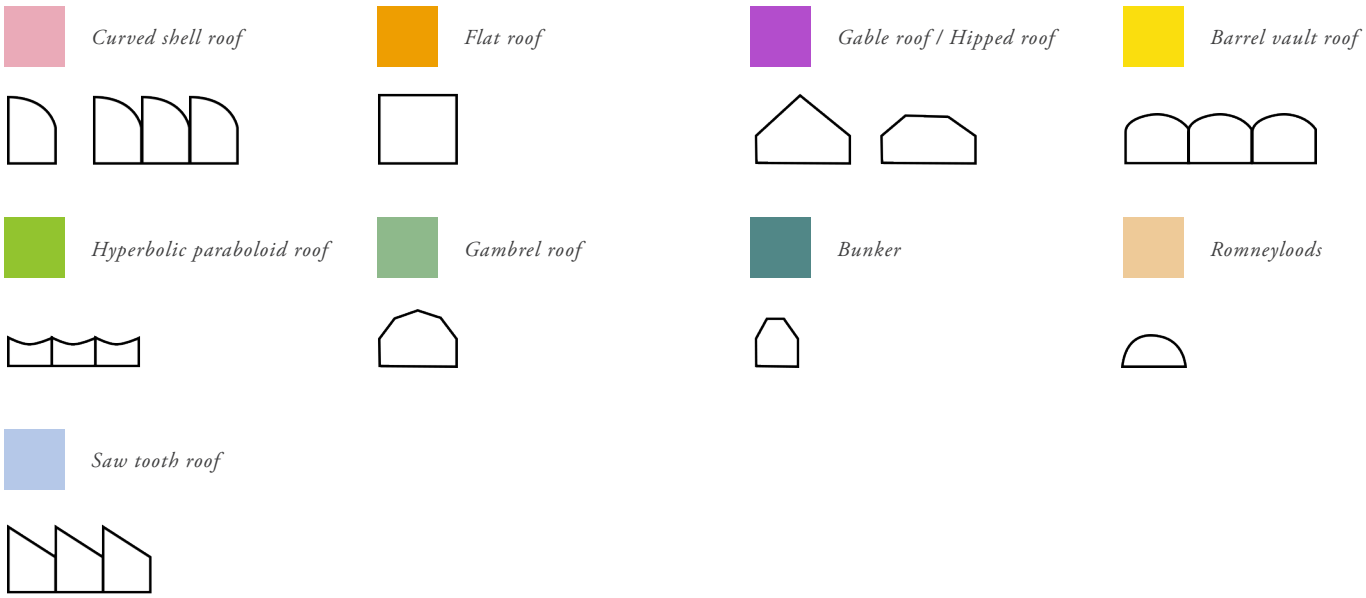


Figure 23. The concrete pavement dimension

2.12 The Typology

Figure 24. Building shape typology



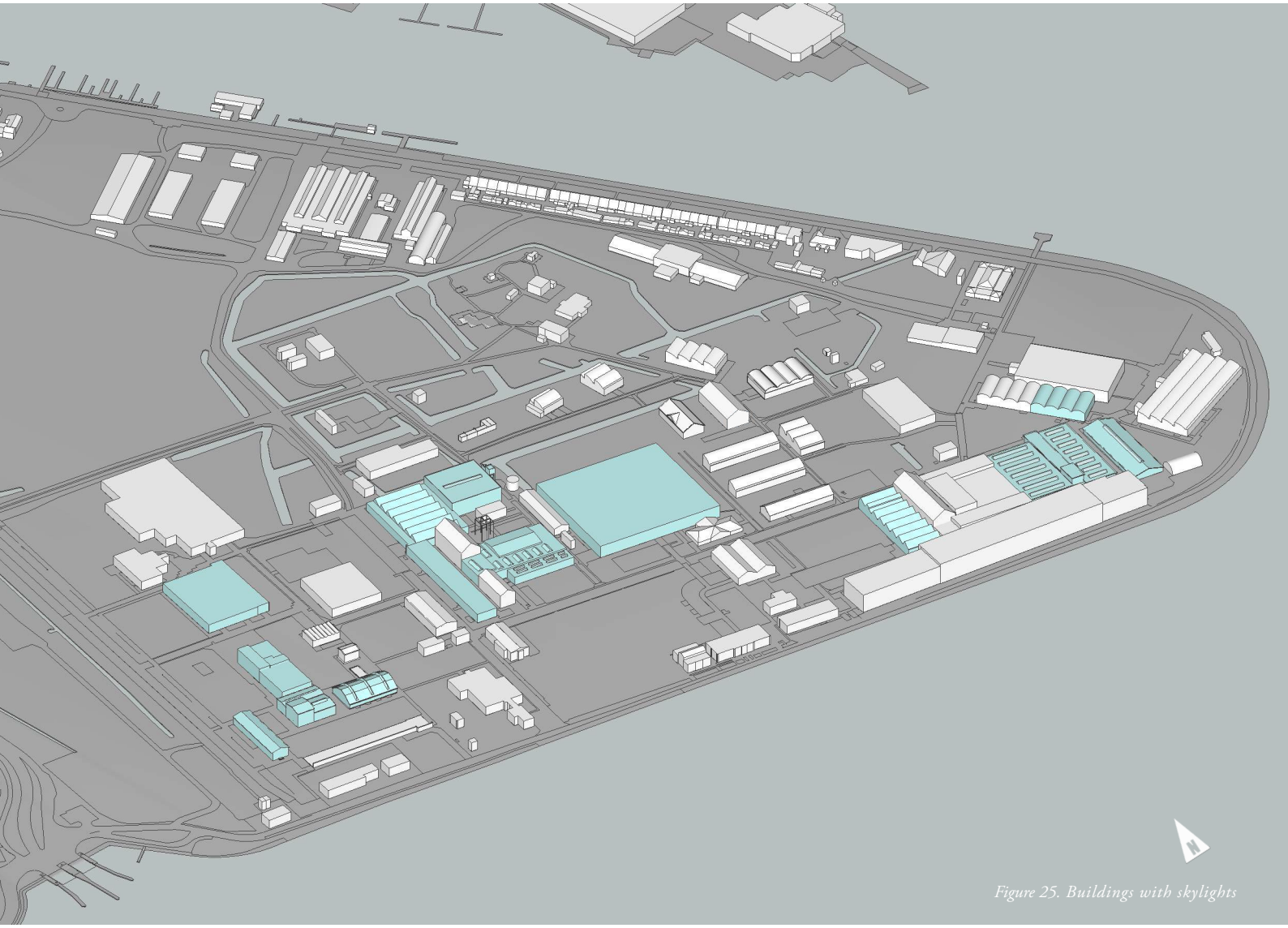


Figure 25. Buildings with skylights

Building with skylights

Figure 26. Current functions in Hembrug

Greenery

Residential area

Restaurants

Warehouses

Cultural activities

Parking space

Retail

Office

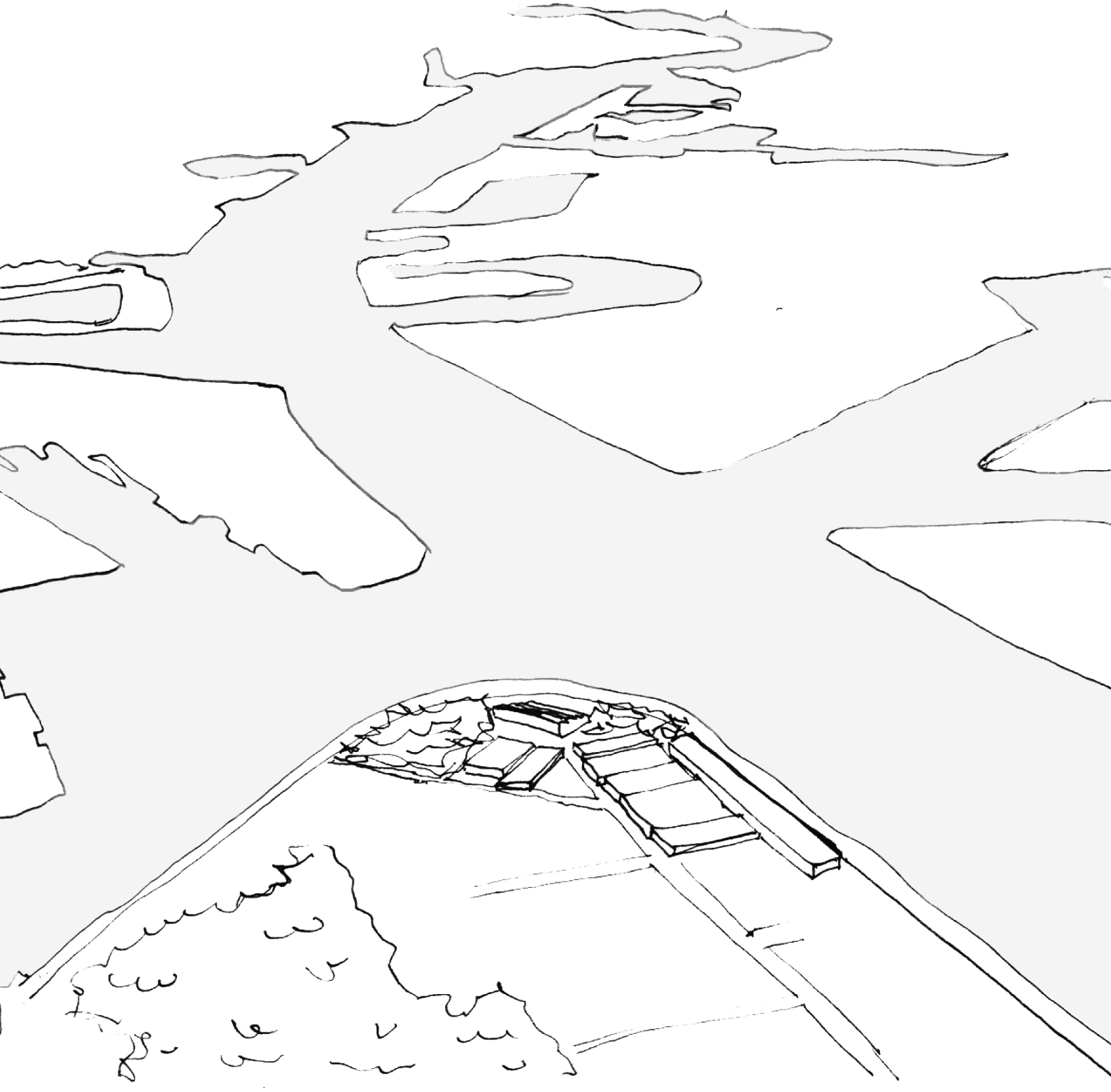
Currently no function

2.13 The Function

When Hembrug was still active as an military industry, the terrain was separated in several zones with several function. From 1899, the area knows two sites: the Artillerie Inrichtingen en the Military Terrain. The part from the Artillerie Inrichtingen is de factory area with several factories, it is the area just behind the waterfront. This part from the Artillerie Inrichtingen included three factories: the cartridges factory, buildings to serve the Algemene Dienst and the ammunition factory.

Source:
2010_SteenhuisMeurs_Cultuurhistorische-Analyse_Hembrugterrein, p. 57.

After the area became vacant, several squatters and artists came to Hembrug to start a creative subculture and give new life to the old buildings. On the map, shown on the left, several functions are shown which are mainly the result of the revival of the area. The functions include restaurants, offices, cultural activities and residential functions.



03 | *The Head of the Cape*

The secluded beauty of Hembrug

It is time to zoom in to the Head of the Cape. Several aspects will be analyzed, such as the historical development of the ensemble. By doing this, it becomes clear why one specific building is off grid orientated. Furthermore, the accessibility and sight lines will be analyzed. After a walk-through experience of the area, the chapter will conclude with one specific critical spot.

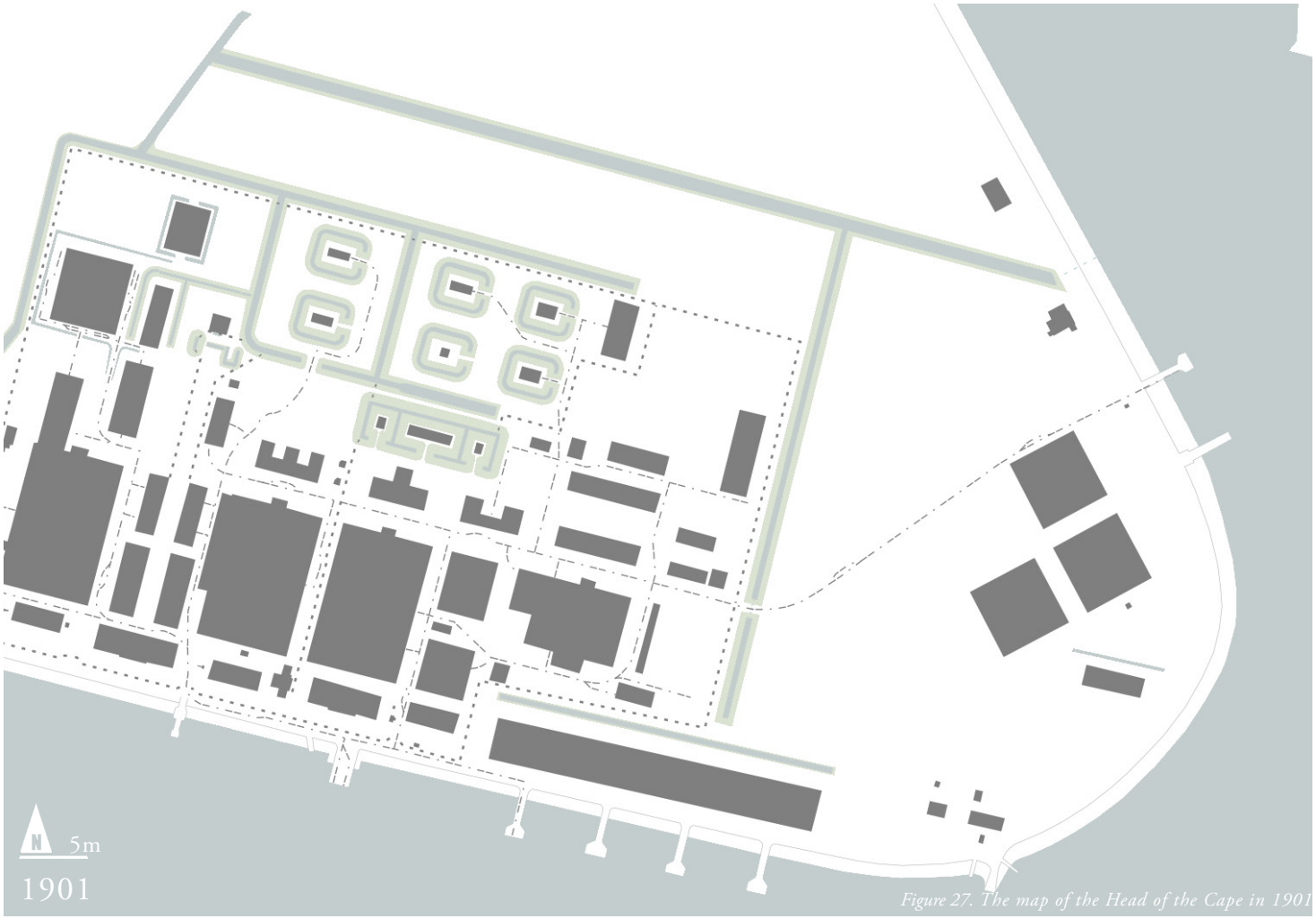


Figure 27. The map of the Head of the Cape in 1901

Figure 28. The map of the Head of the Cape in 1924

3.1 Historical Development

In 1899 the Artillerie Inrichtingen relocated to Hembrug. Several buildings had to be build. Remarkable is the compact design: the factories were dense on a rectangular terrain, surrounded on three sides by dug ditches with high walls. The rest of Hembrug was a bare, undeveloped area, with just a few other buildings: a coal shed of the Navy and two pontguard houses.

Source:
2010_SteenhuisMeurs_Cultuurhistorische-Analyse_Hembrugterrein, p.35, 39.

The compact design developed into a complete area filled with factories due to the enormously increase in weapon demand. The reason of this increase was due to World War I. The terrain was divided into three zones (weapons, patterns and ammunition). Also, the forest, Plofbos was expanded. In this densely wooded area tests were done with explosives and there were secured depots.

Figure 29. The map of the Head of the Cape in 1941

Figure 30. The map of the Head of the Cape in 1996

Expansions of the factory did not take place during the World War II. However, the Germans built shelters on the northern part of the site and on the head of Cape South (where in 1939 a hiding place had already been built). In 1944, machines were still transported to Germany. After the liberation from Germany, production could start again.

Source:
2010_SteenhuisMeurs_Cultuurhistorische-Analyse_Hembrugterrein, p. 43, 47.

After 1945 there was an increase in scale and modernization of the weapons and ammunition factories. New warehouses were built and many older buildings were demolished. On the eastern part of the terrain, buildings in concrete skeleton construction with curved roofs were built. Eurometaal settled in the eastern part, NV Machine tools industry settled in the western part.

Figure 31. The grid layout in the Head of the Cape

Grid lines

3.2 Off Grid Layout

There are two major grid directions prevailing at the tip of Hembrug following the former grid system which was used when the area was still active as a military industry. One grid direction is following the northeast-southwest direction (1) and the other is orientated towards the northwest-southeast direction (2). Building 421 and 512 still follow the grid system 1.

Nevertheless, building 430 and the historical bunker 382 are off grid. The bunker 382 was built with a series of a long strip of defensive bunkers in 1939 following the shape of the terrain while Building 430 was built in 1958 following the path at its back. This path dates back from the period during World War I, when several new buildings were built at the Head of the Cape and the infrastructure was extended to optimize the accessibility of these buildings.

The regular grids fade away when the two prevailing grid systems come together at the Cape. The off-grid layout evokes an informal atmosphere of the area. Yet, such layout surprisingly frames result in unique open spaces which have a peaceful atmosphere which can't be experienced anywhere else on the site of Hembrug.

Figure 32. The means of access to the Cape

Hembrug border

Main roads

Ferry Route

Bicycle path and pedestrian walkway

3.3 Accessibility

The decades when Hembrug was active as a military industry, the area could be approached by several ways of transport: train, boat, foot or bicycle. Nowadays, visitors mainly approach the Cape South from Middenweg by cars or on foot. The road becomes narrower when it turns into Vulhuis (red circle) which makes the site hidden from public. The ensemble of the Head of the Cape isn't located at a main road, it's located at a secondary road which results in the ensemble being secluded. This atmosphere can be experienced when turning around the corner at the Vulhuis. Suddenly the space opens up towards the water.
Another option is to go by ferry from Zaandam or Amsterdam. When arriving from the ferry from Amsterdam, one notices the Head of the Cape immediately. It is the face of Hembrug when arriving over the water by ferry. The old pier was once the main entrance of Hembrug. The current main entrance has moved to Artillerieweg on the West of Hembrug.

Figure 33. The sight lines in the Cape

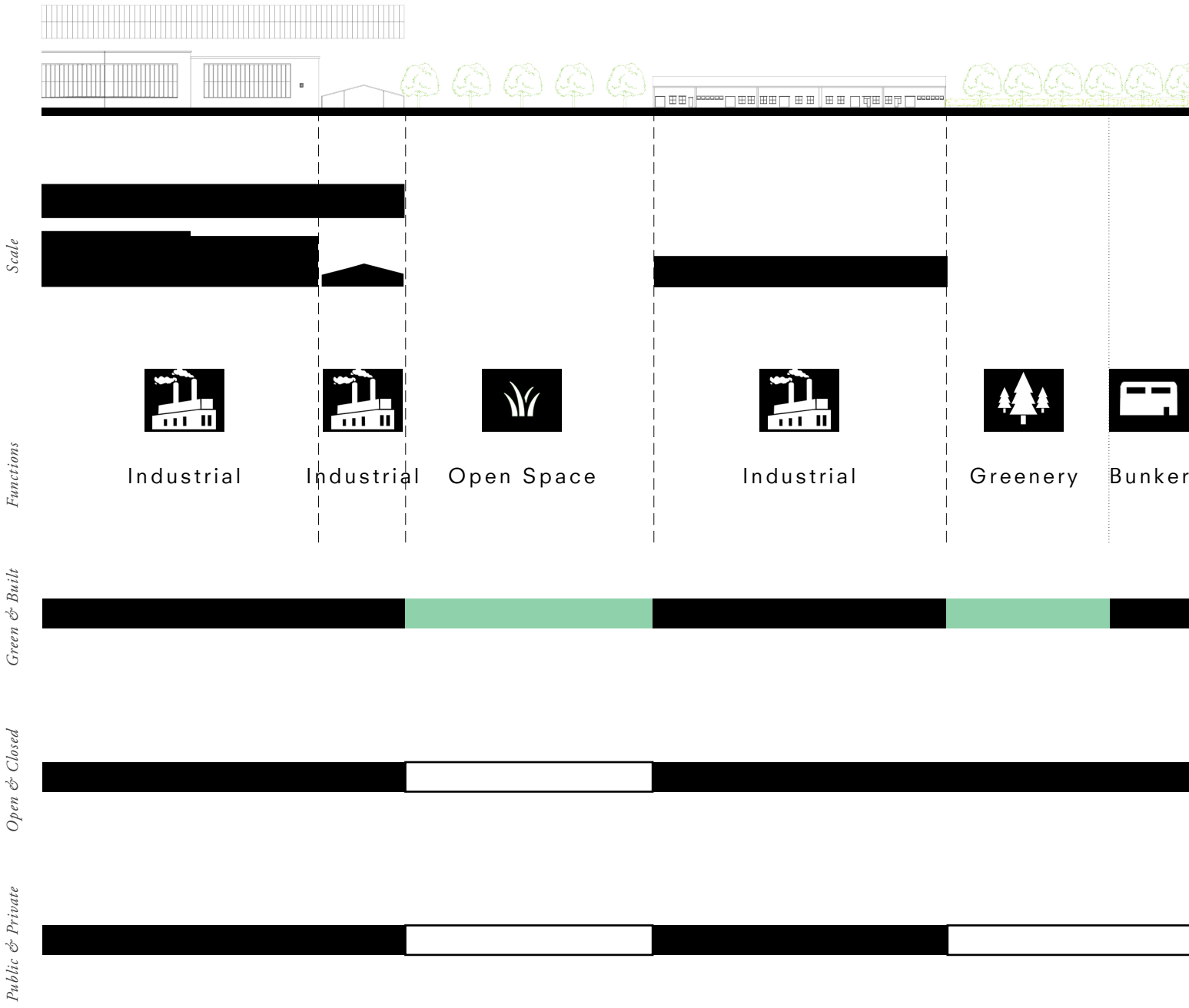
3.4 Sight Lines

The factory complex as a whole can be overseen on the east-west axis, but the lines of sight do not extend beyond the Hembrug site. The line of sight leads to the boiler house on the west side. This has to do with the main steam pipes, which also follow the central east-west axis. On the east side the line of sight does not extend to the water. It bends at the junction of Middenweg and Vulhuis.

Due to the off grid layout, the building facades are not in a tight position. The gaps do not form a formal urban grid. This creates a varied and rich spatial experience.

The experience starts when a visitor walks until the end of Middenweg and turns at the corner to Vulhuis, the green lawn with tall trees will be discovered.

3.5 Function


Scale
Functions
Industrial
Industrial
Open Space
Industrial
Greenery
Bunker
Green & Built
Open & Closed
Public & Private

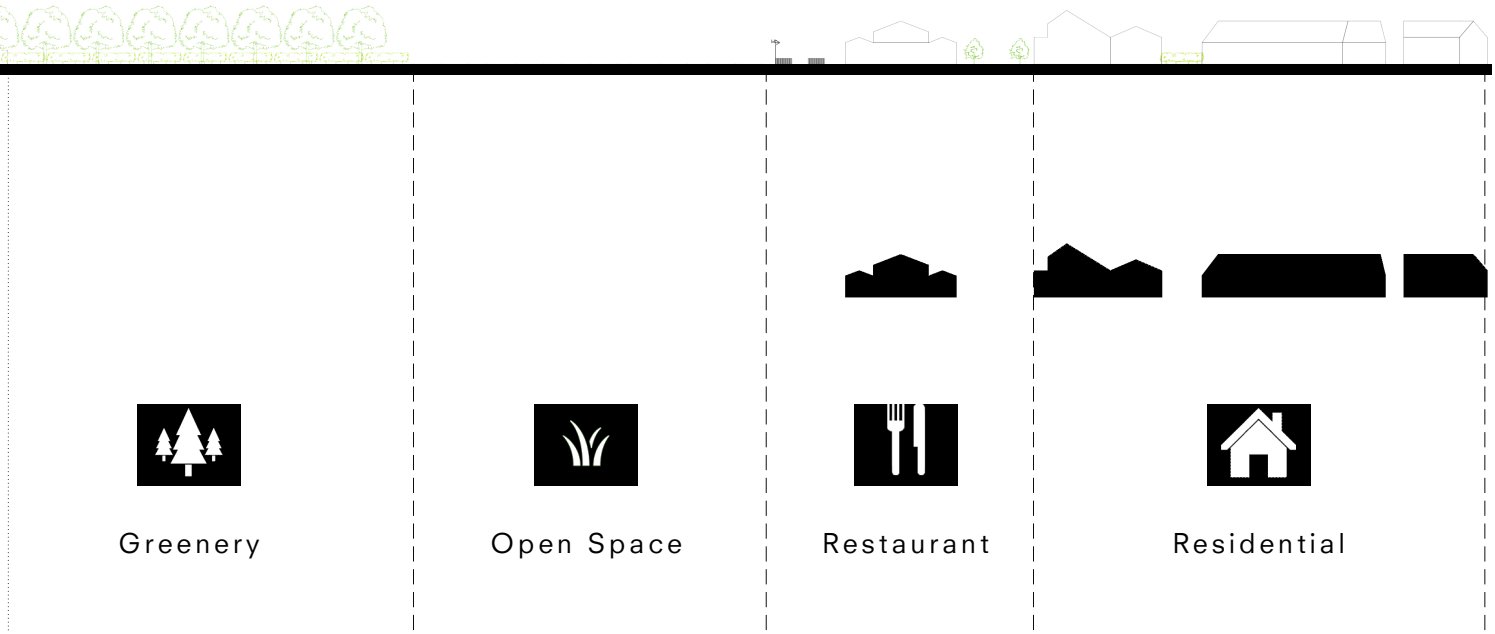


Figure 34. Stretched elevation of the Head of the Cape

The diagram shows a stretched elevation of the Cape with the current function and their relative scale. From the analysis of green & built zone, open & closed zone and public & private zone, we can conclude:

1. The scale of the building increases from residential area along Zijkanaal G to the industrial area along the Noordzeekanaal.
2. All green areas belong to public but not all of them are accessible. The forest area surrounding the bunker is fenced off.
3. The green area is divided into pieces.
4. All the industrial monuments are privately owned and not open to public.
5. The bunker, even being a national monument, is not open nor accessible to public.

3.6 Walk Through Experience

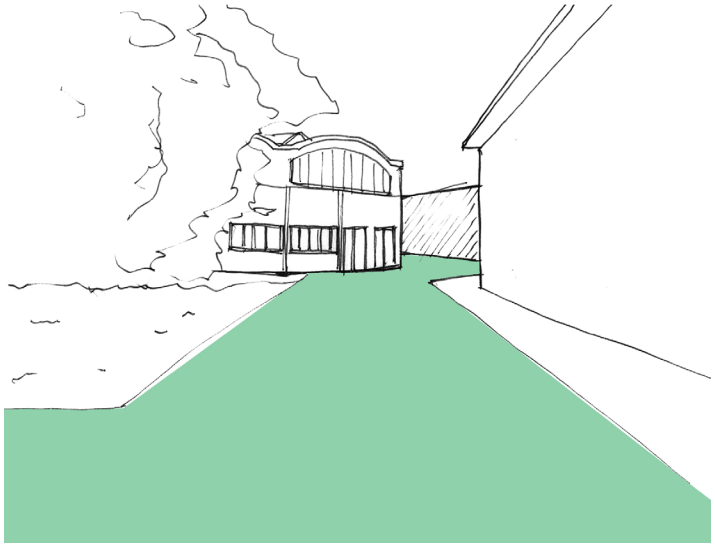


Figure 35. Viewpoint 1: approaching the Head of the Cape from Middenweg

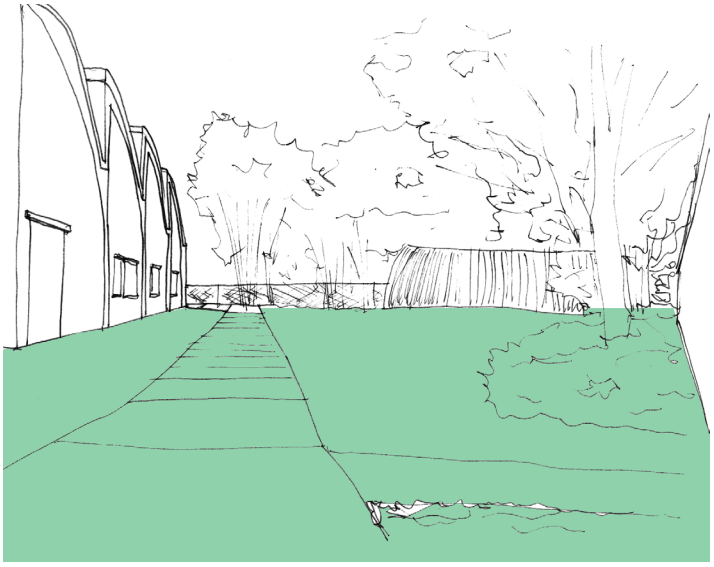


Figure 36. Viewpoint 2: Framed open space defined by building facades

Figure 37. Viewpoint 4: Alley with 2.1m wide entrance, average width ranges from 4.6m-4.7m

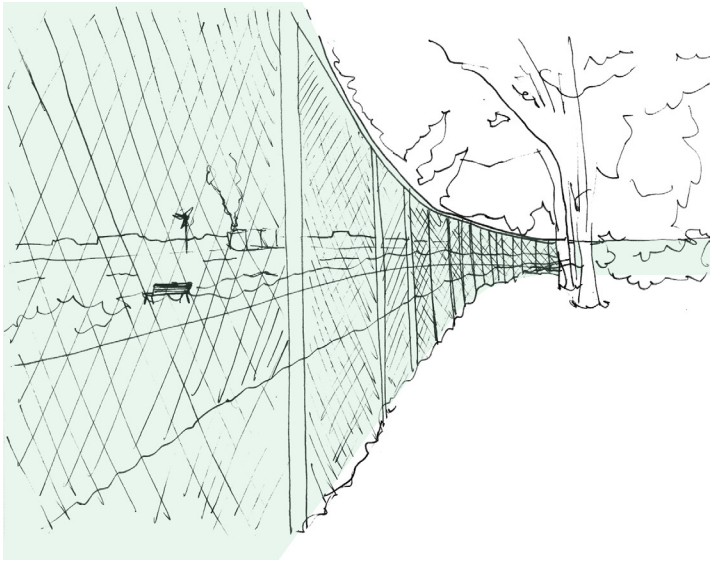


Figure 38. Viewpoint 5: Fence acts as border demarcation

Figure 39. Viewpoint 3: Open space framed by building facade and fence

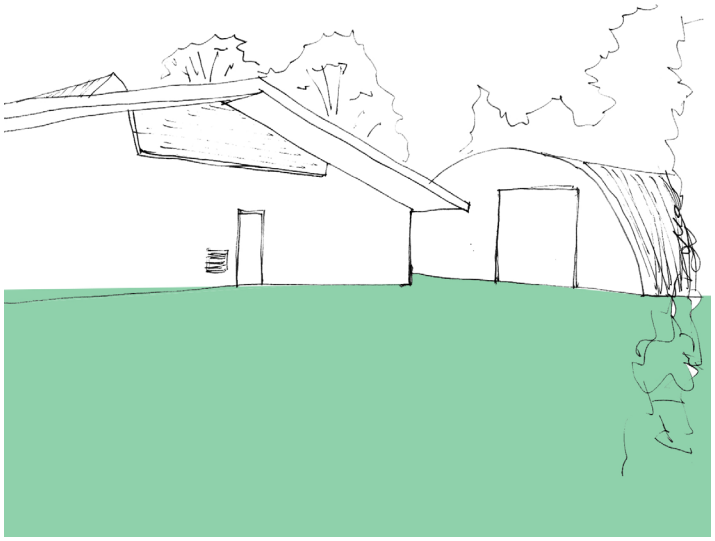
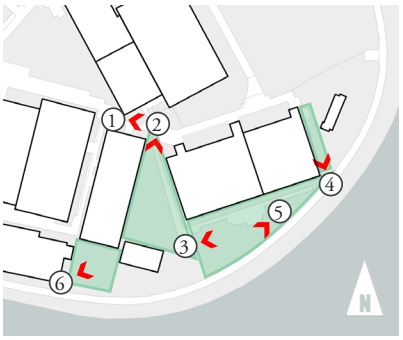


Figure 40. Viewpoint 6: Looking at the south facade of the projectile workshop and the west facade of the Romneyloods

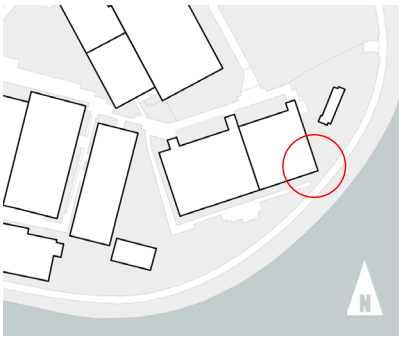
Key plan:



3.7 Critical Spot

The south facade composes a large part of the new image of the Cape. Due to the orientation of the ammunition factory, its southeast corner becomes very important for the perception of the waterfront. The corner is currently fenced off and not accessible from the waterfront.

Key plan:



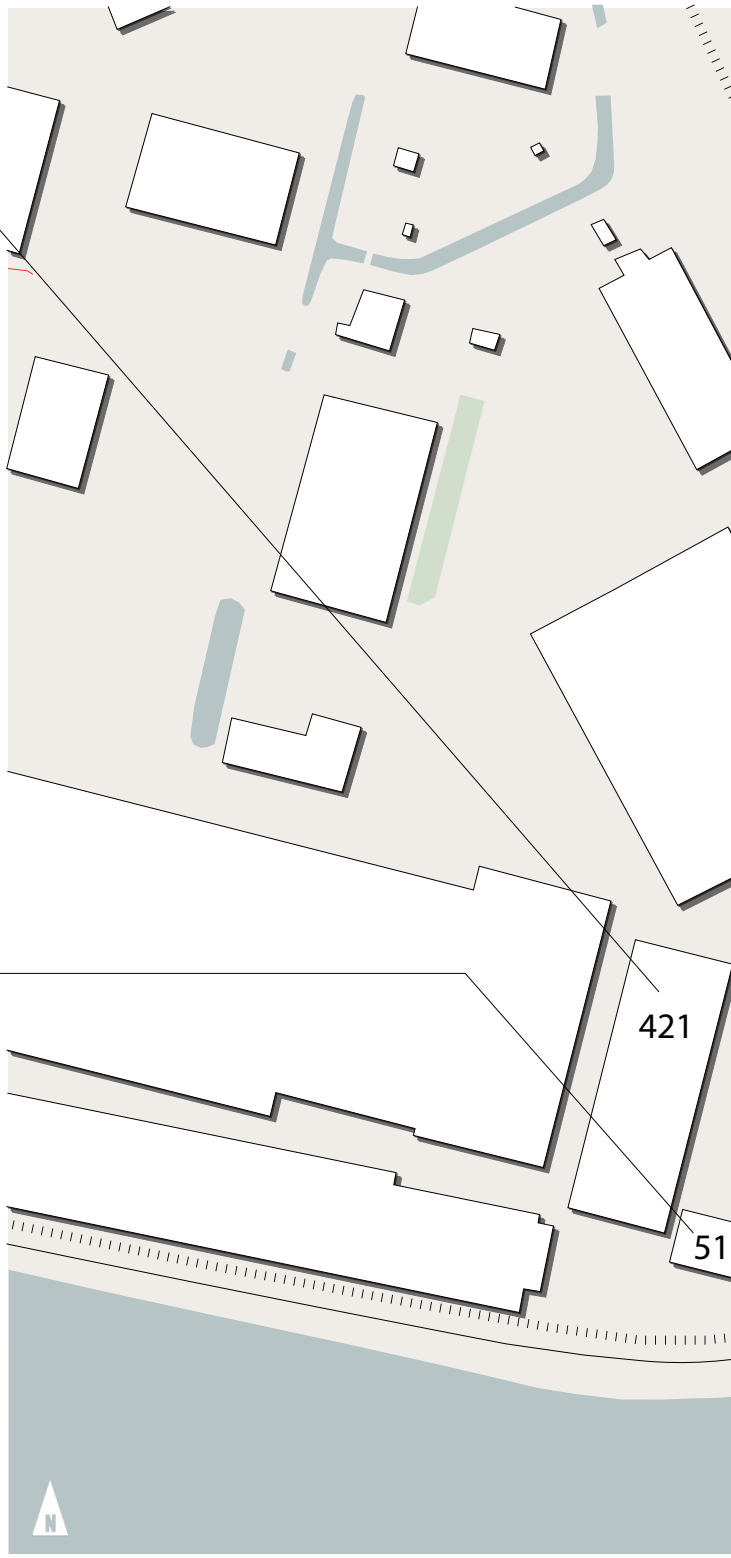
Photos:
Left: Looking at the southeast corner of the ammunition factory
Bottom: Looking at the Noordzeekanaal from the corner

04 | *Buildings*

The witnesses of time

Building name:	Projectile Workshop
Building number:	421
Building year:	1952
Address:	Lorriegarage 3, 1505 RP
Monument:	No
Surface:	1.129 m²
Ridge height:	8 m
Former function:	Warehouse, projectiles workshop, washroom, garage, fire brigade

Building name:	Romneyloods
Building number:	512
Building year:	1980
Address:	Lorriegarage 1, 1505 RP
Monument:	No
Surface:	220 m²
Ridge height:	5,5 m
Former function:	Storage



4.1 Building Overview

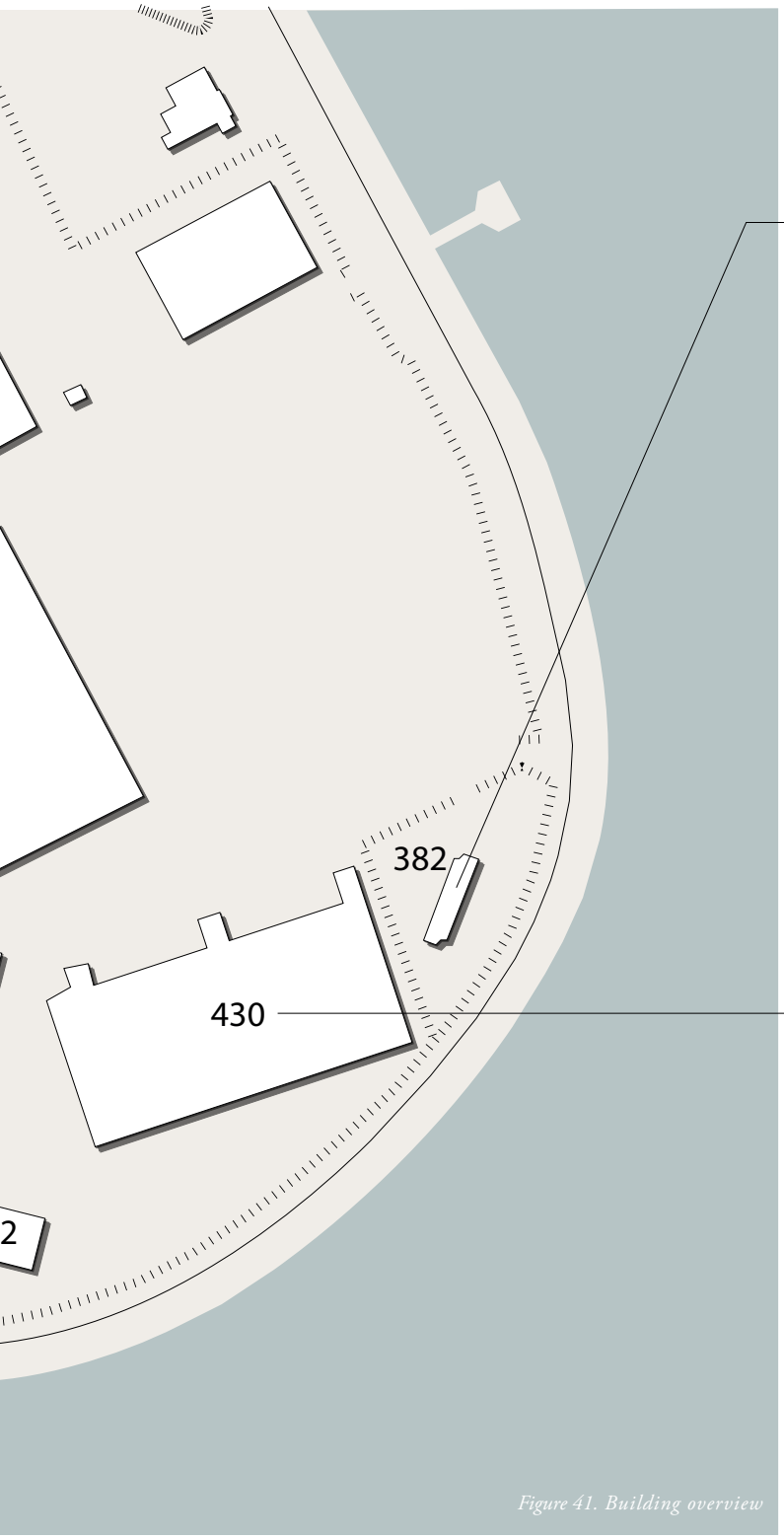


Figure 41. Building overview

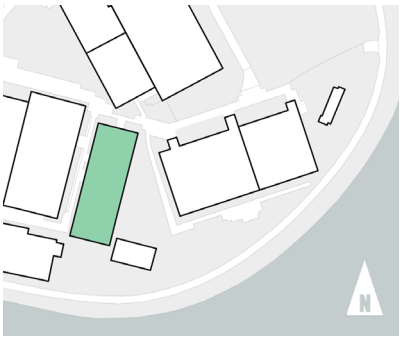
Building name:	Commander Bunker
Building number:	382
Building year:	1939
Address:	Vulhuis 0, 1505 RS
Monument:	National monument
Surface:	107 m²
Ridge height:	3,2 m
Former function:	Bunker

Building name:	Ammunition Factory
Building number:	430a/b
Building year:	1958
Address:	Vulhuis 2, 1505 RS
Monument:	No
Surface:	2.369 m²
Ridge height:	8 m
Former function:	Assembling ammunition

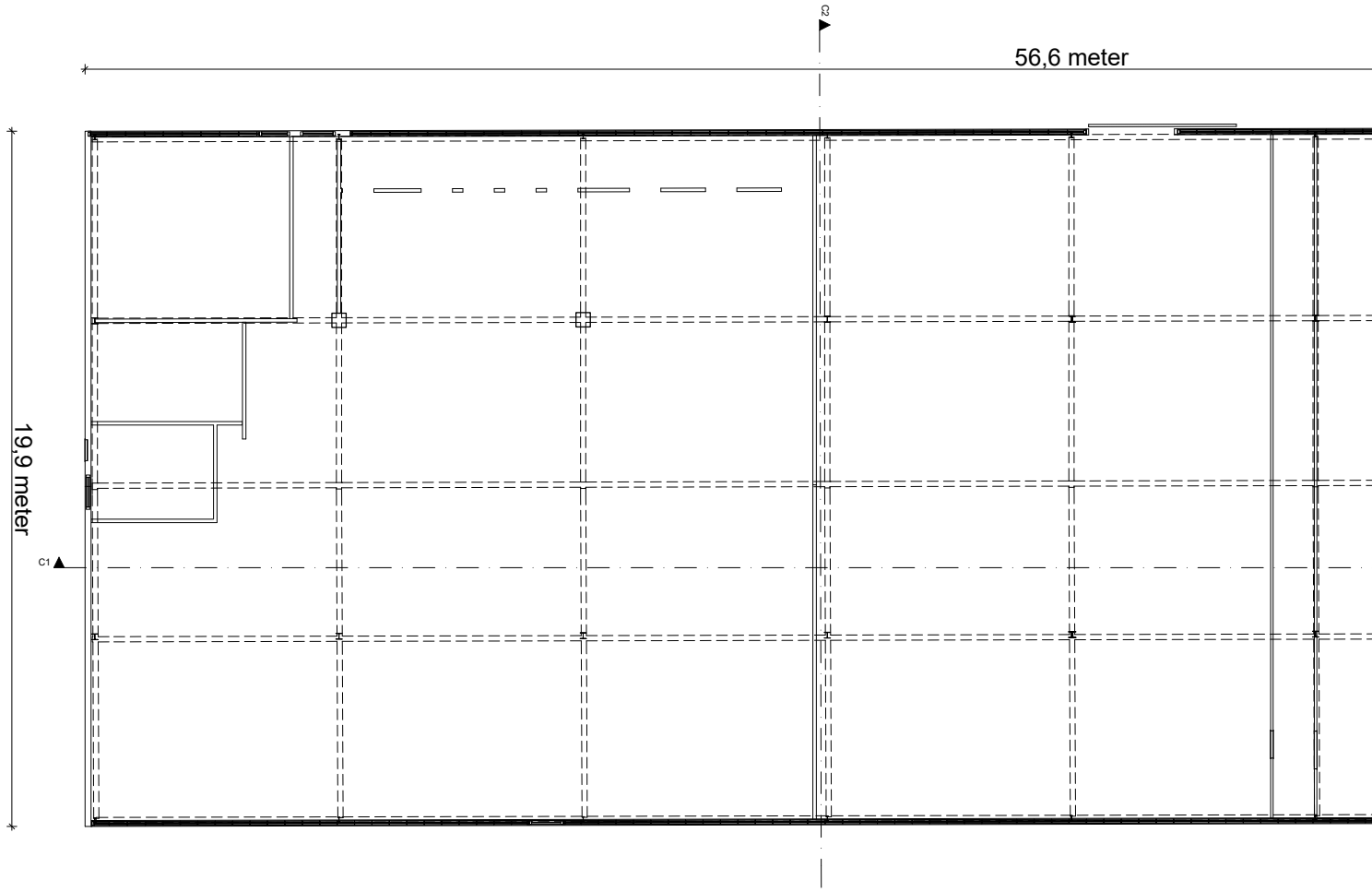
4.2 Projectile Workshop (Building 421)

Building 421, better known as the Projectile Workshop, is one of the few buildings located at the ensemble Head of the Cape. It was a former projectile workshop where projectiles were made and checked. One who goes inside the building will discover washing services. Beside being a former projectile workshop, the building also acted as washing room and even services for the fire department were available within building 421. Nowadays the building is empty and vacant.

Legend:



Construction



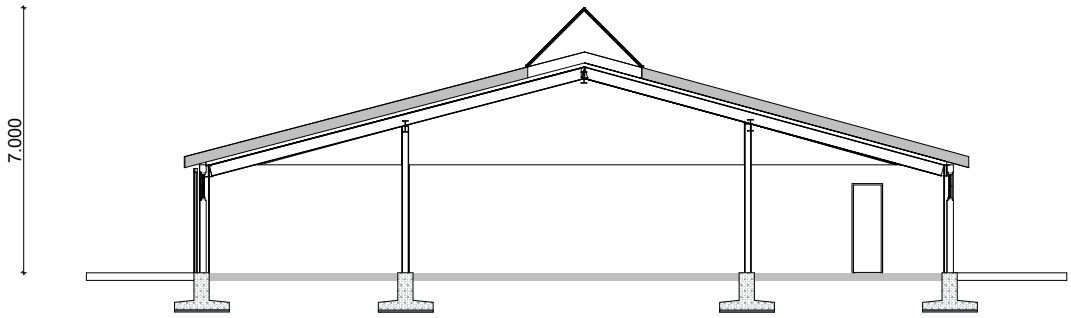
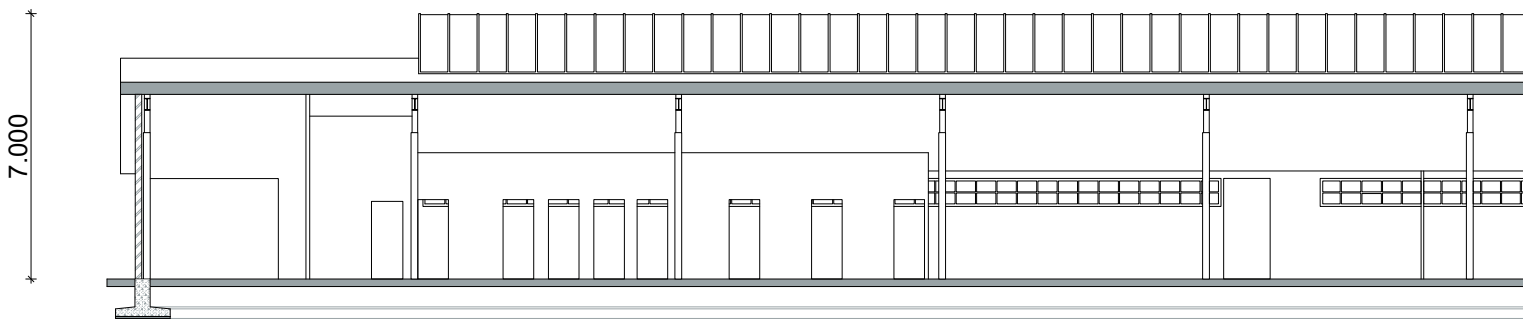


Figure 42. Section C2 of projectile workshop (building 421), 1:200



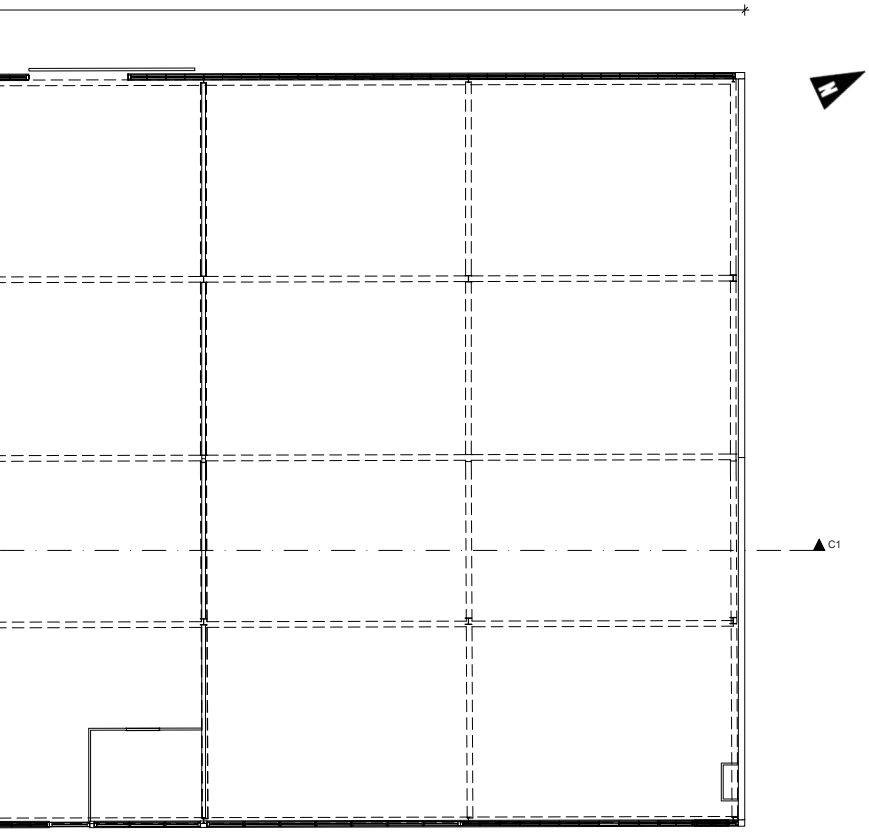
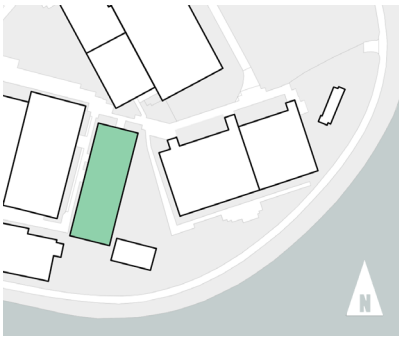


Figure 43. Plan of projectile workshop (building 421) 1:200

Legend:



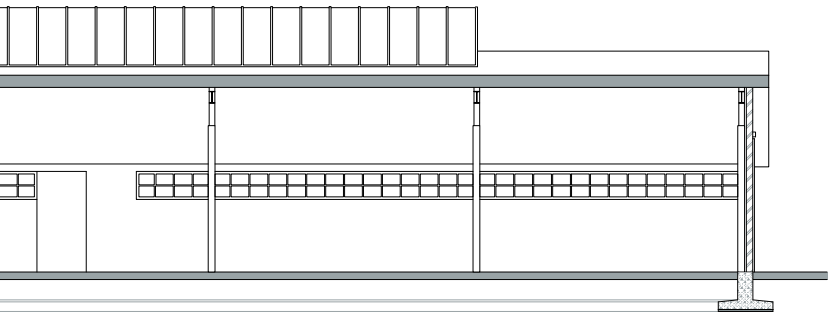


Figure 44. Section C1 of projectile workshop (building 421), 1:200

Foundation and Stability

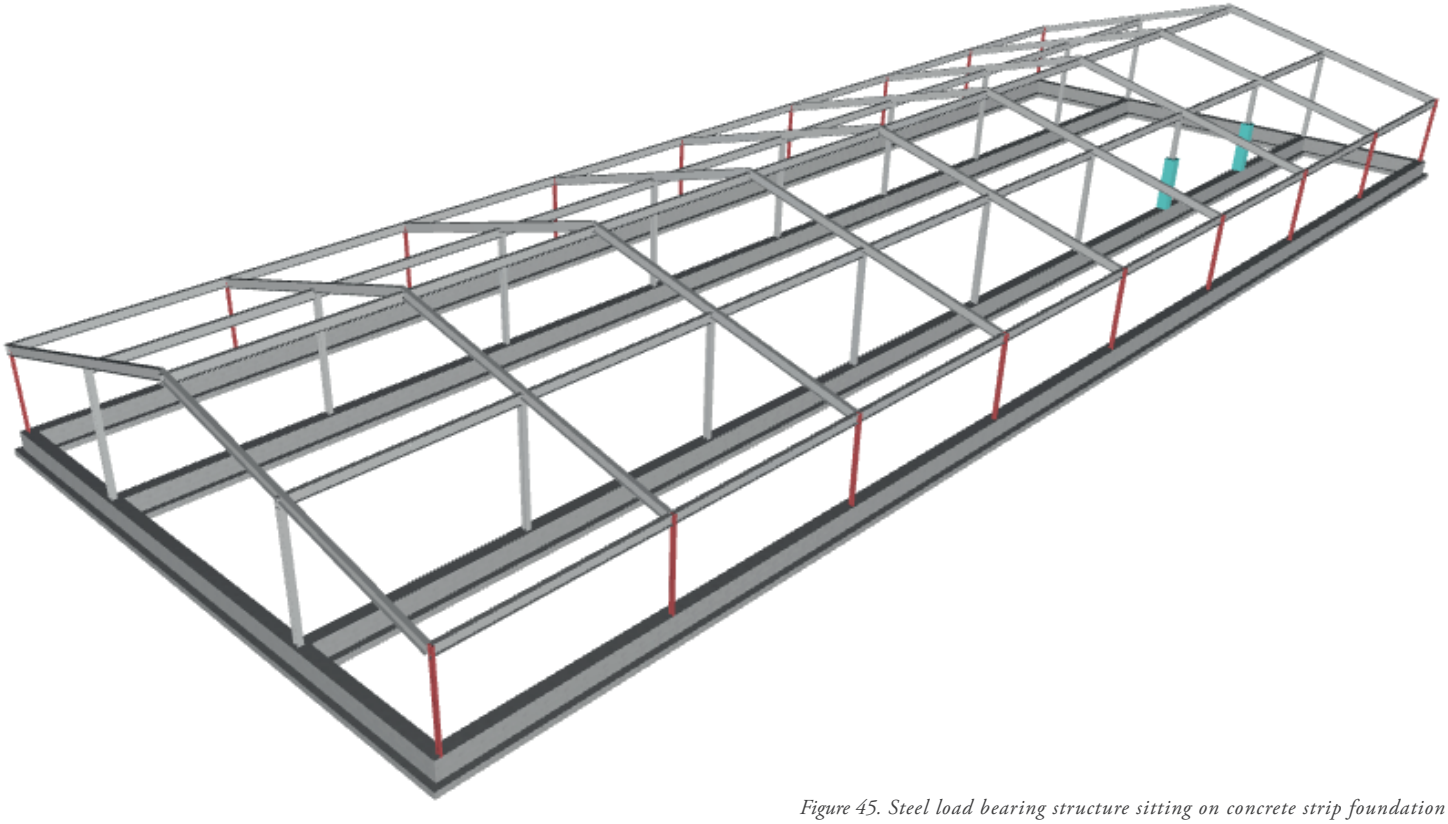


Figure 45. Steel load bearing structure sitting on concrete strip foundation

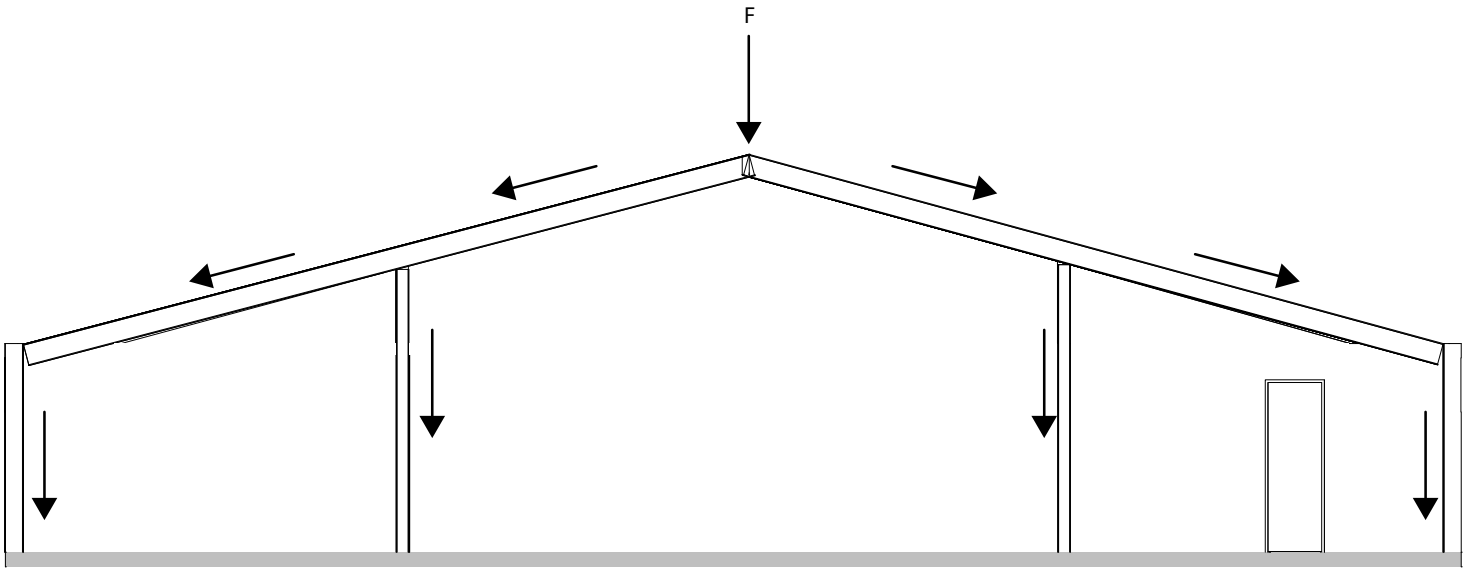
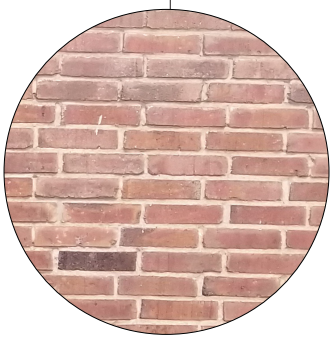


Figure 46. Force diagram of projectile workshop (building 421)

Light Study

Material - Exterior

Figure 47. Northeast corner of projectile workshop (building 421)



Material - Interior

Figure 48. Interior photo

Material photos:

Image 1. Original bricks. Bonding: staand klezorenverband.

Image 2. Original wooden door with original paint.

Image 3. Metal window with puffy profiles.

Image 4. Metal sliding door.

Image 5. Tiles around the steel column.

Image 6. Bricks on the inside.

Image 7. Tiles from the washing room.

Image 8. Original skylight.

Detail

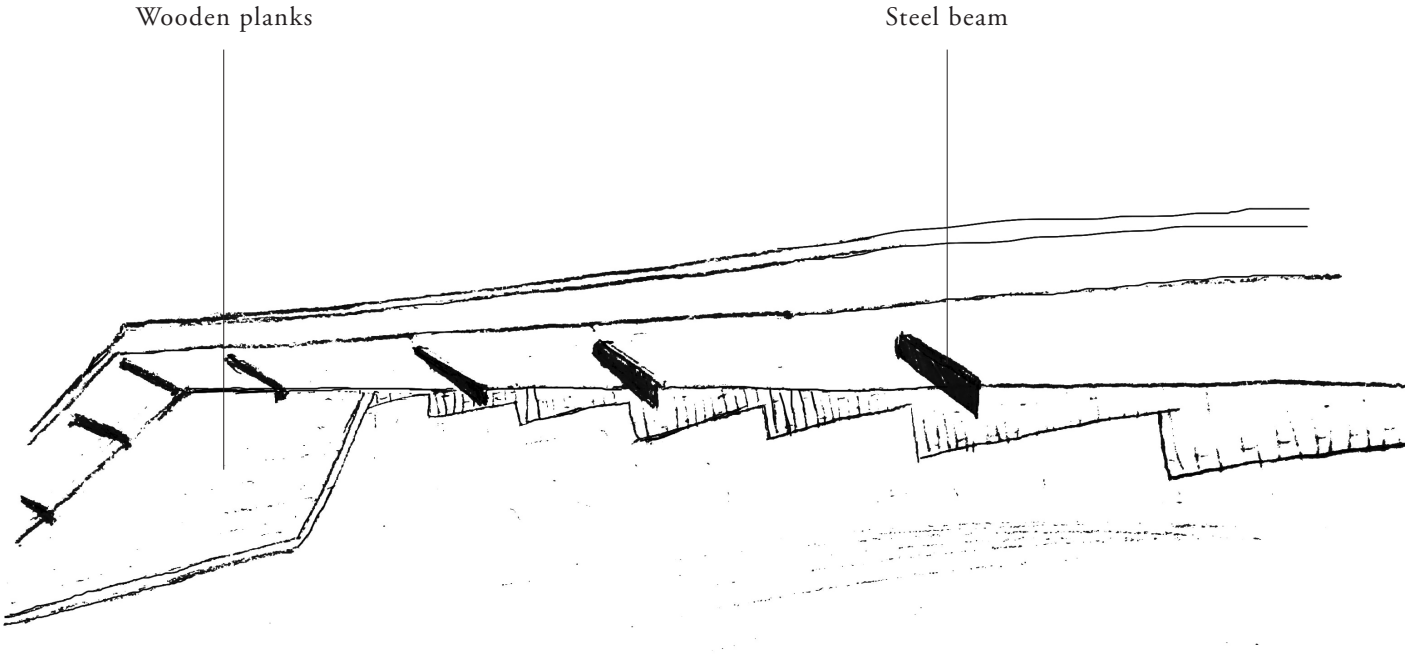


Figure 49. Sketch of the fascia with steel beams sticking out of the wall

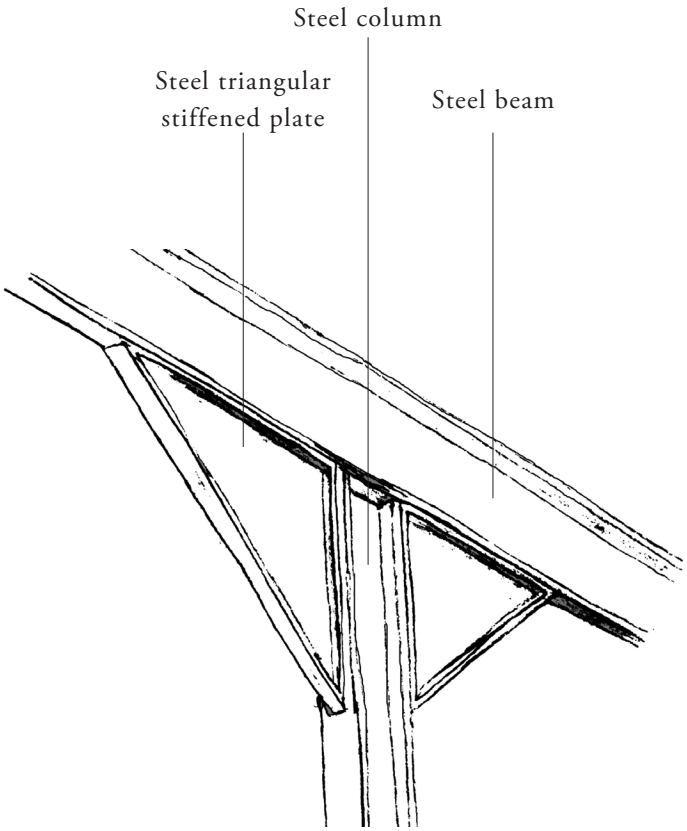


Figure 50. Sketch of connection between steel column and steel beam

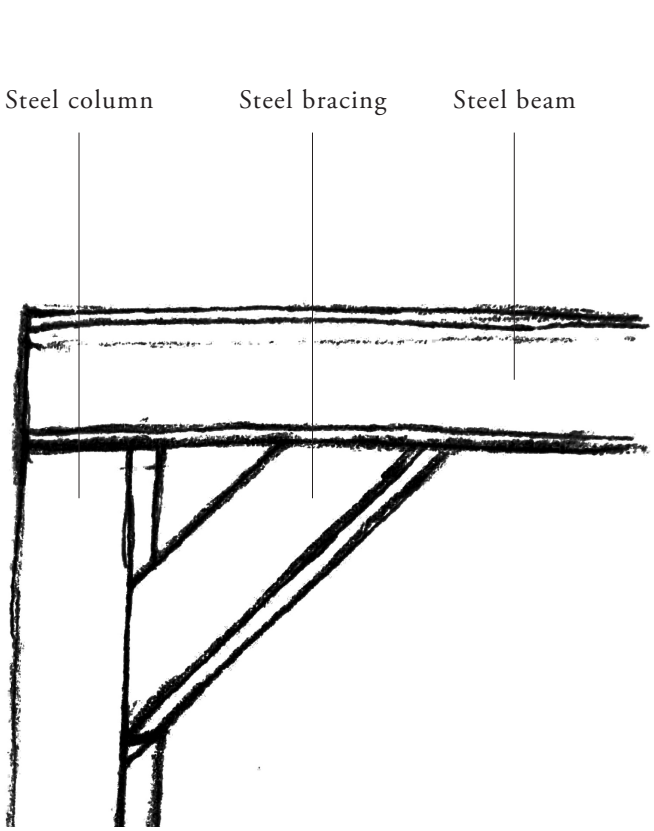


Figure 51. Sketch of steel end connection

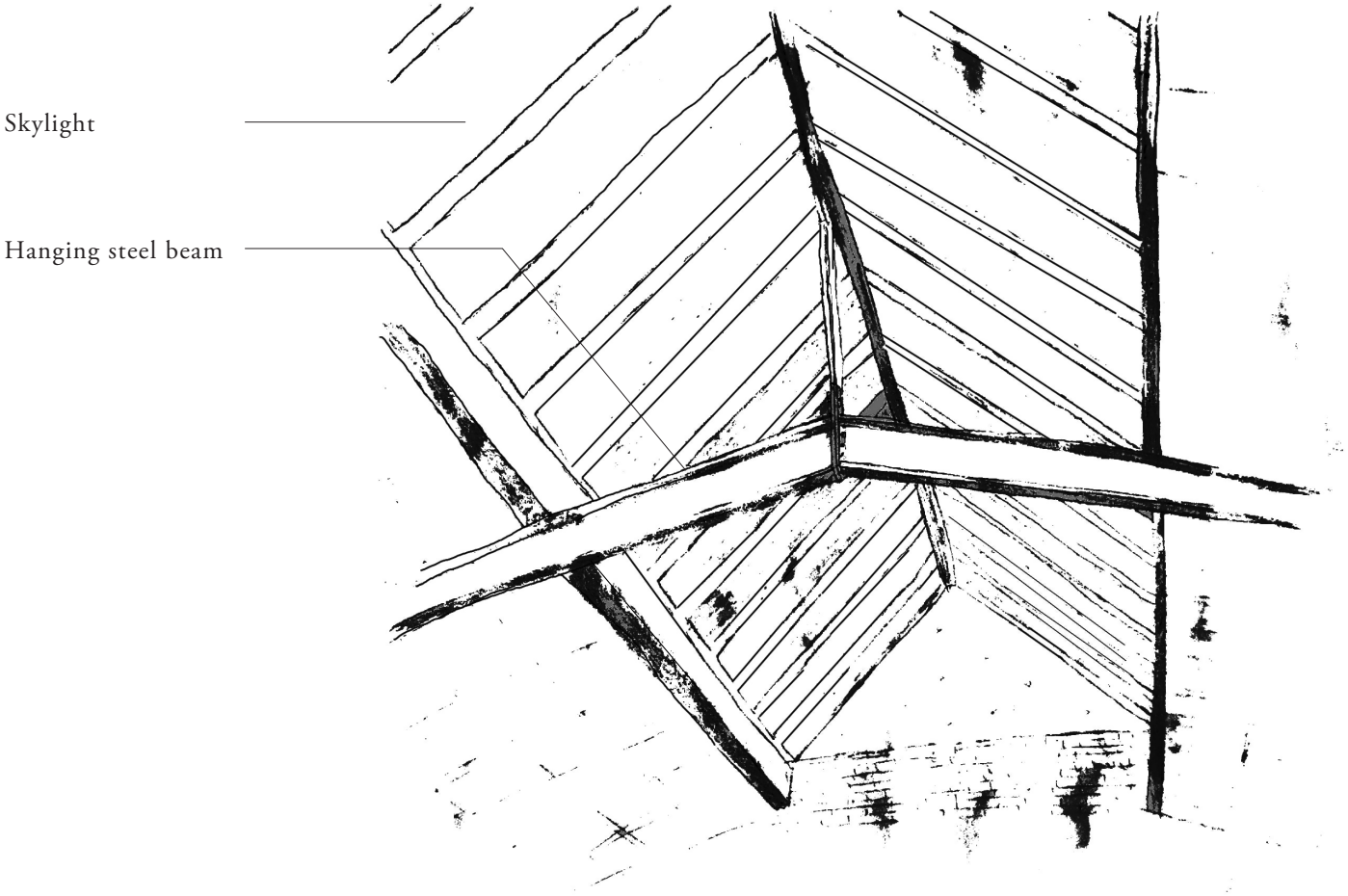


Figure 52. Sketch of skylight and steel beam

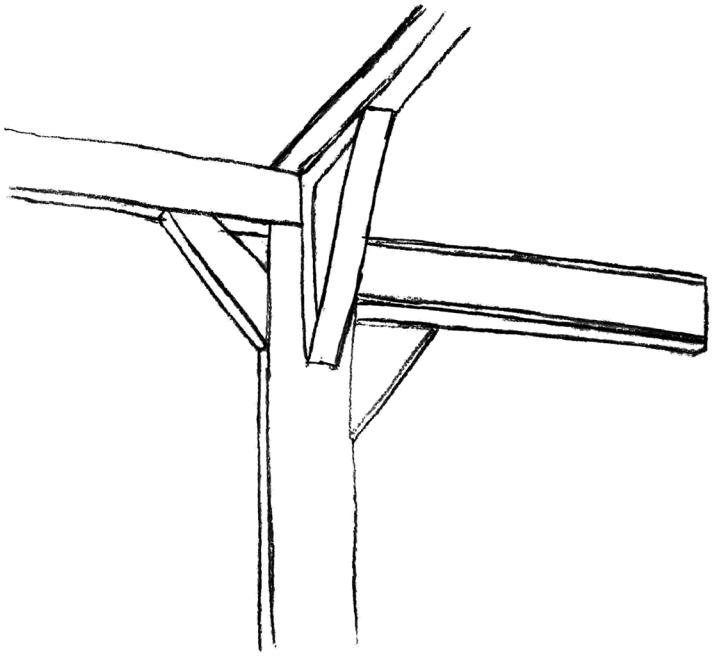


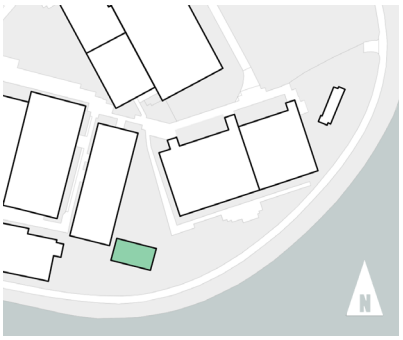
Figure 53. Sketch of steel beam and column connection

4.3 Romneyloods (Building 512)

A romneyloods is a type of shed that is produced in the United Kingdom. It is a developed variant of the 'nissenhut' which was invented during World War I. It was mainly built on a large scale as an emergency shelter in the World War II. However, the romneyloods on the Head of the Cape is built in 1980. The romneyloods is prefabricated and has the shape of a reclining half cylinder. This makes it easy to set up and break down on the site by a few people. It consists of a number of curved frames, over which corrugated steel sheet is fixated.

The romneyloods has many different applications. Initially it was developed for military use, but after the World War II it was deployed in civilian ways in many ways. The most important application is the cheap and quick provision of a temporary shelter, this is also the reason for building it on the Head of the Cape. It functions as a storage room where nowadays a lot of stuff is stored. It is already certain that this building will be demolished within a foreseeable time.

Legend:



Plan and Sections

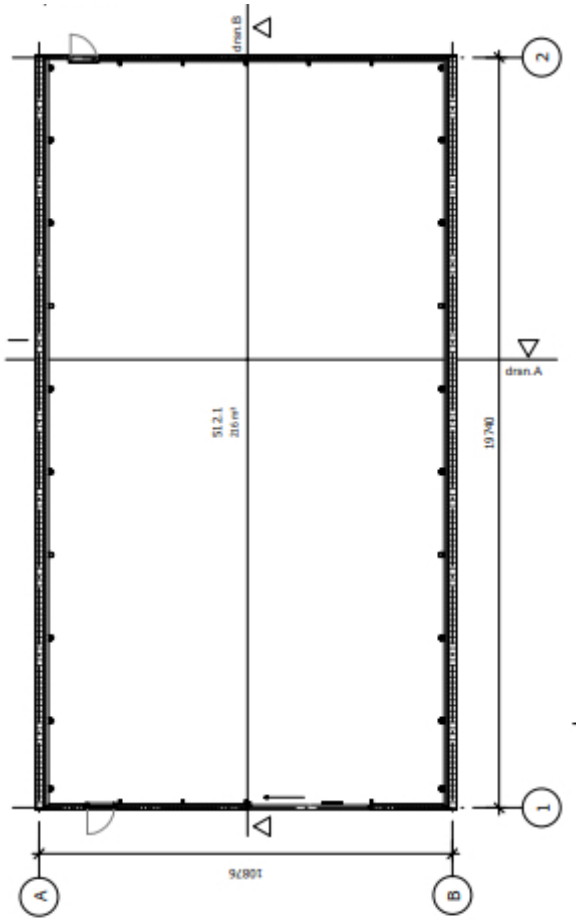


Figure 54. Plan of Romneyloods, 1:200

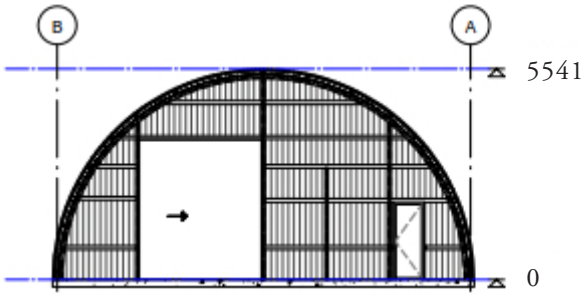


Figure 55. Section of Romneyloods, 1:100

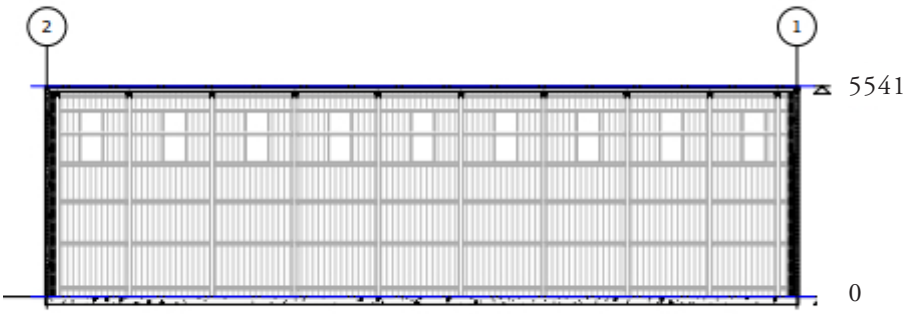


Figure 56. Section of Romneyloods, 1:100

Stability

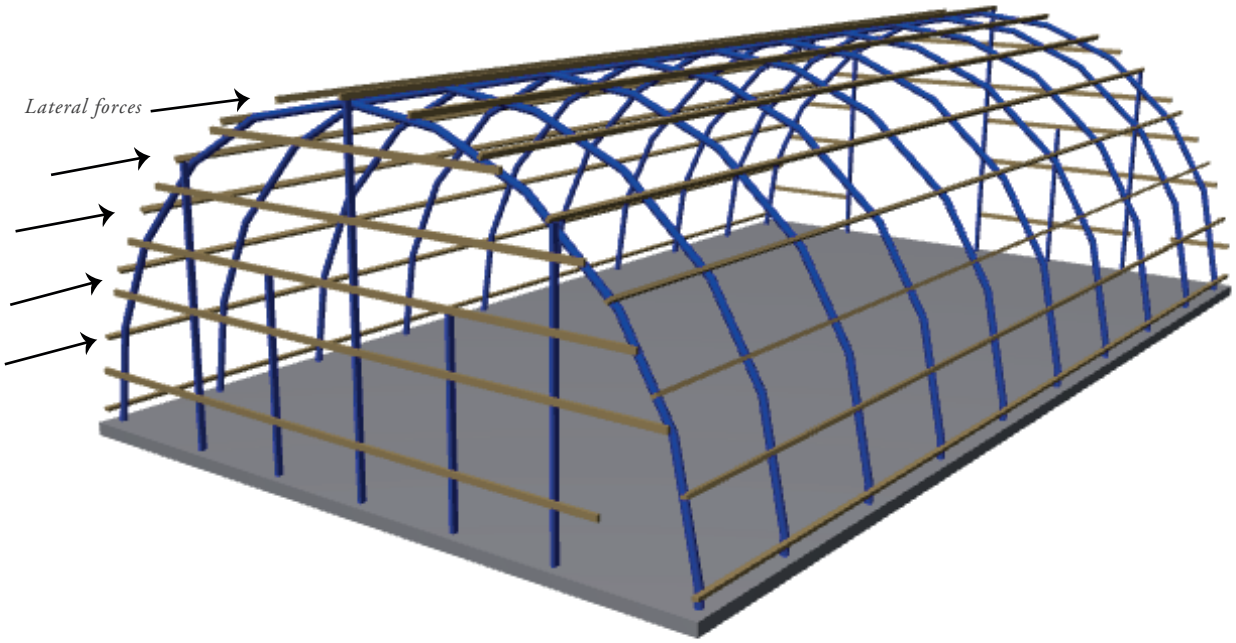


Figure 57. 3D structure of the Romneyloods (building 512)

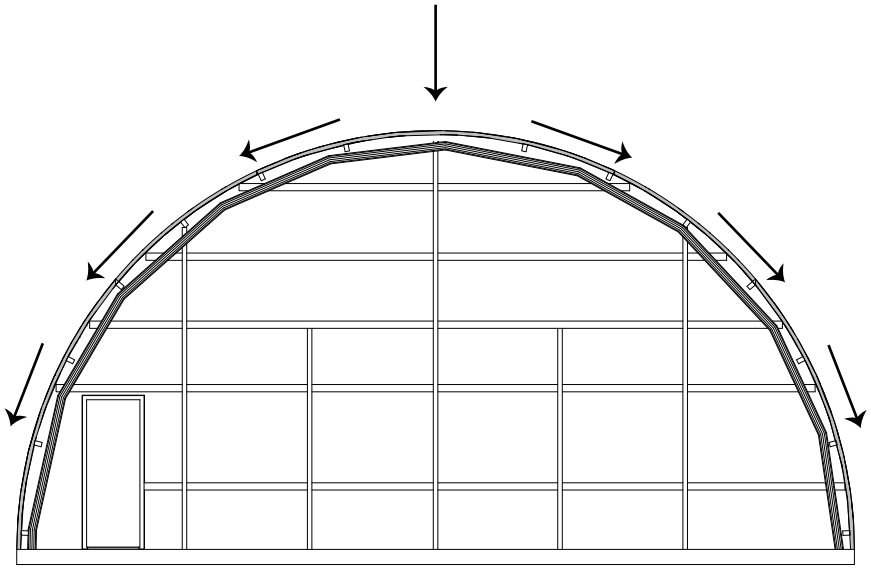


Figure 58. Force diagram of the Romneyloods (building 512) 1:100

Source:
Factsheet_Gebouwen_Hembrug_v2.2_26-6-2018, p. 23.

Material - Exterior

Figure 59.East facade of the Romneyloods (building 512)

Figure 60.West facade of the Romneyloods (building 512)

Material - Interior

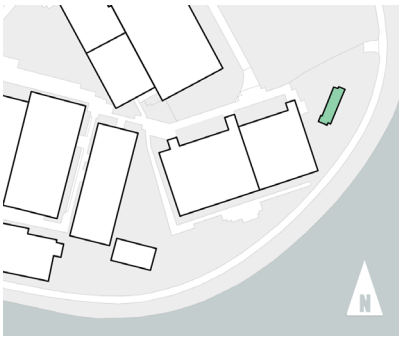
Figure 61.Peek into the Romneyloods (building 512)


382

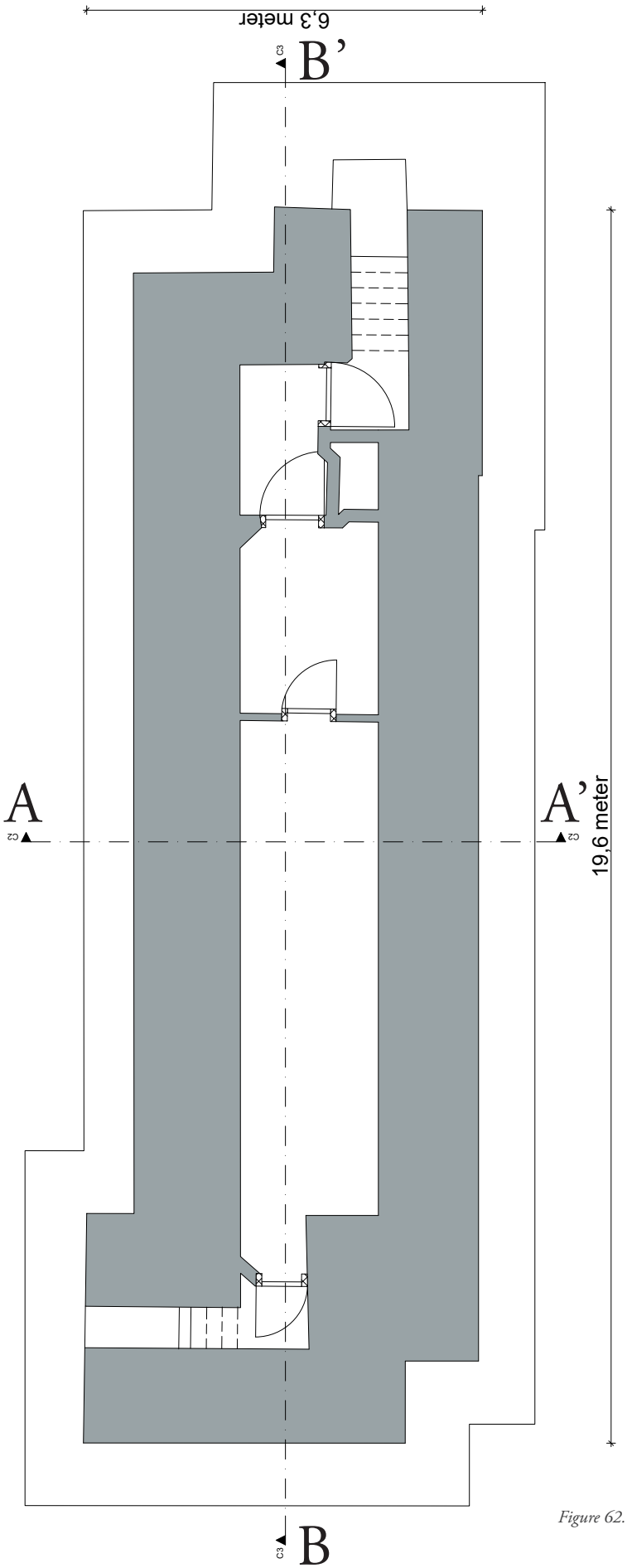
4.4 Commander Bunker (Building 382)

The commander bunker, building 382, is the only monument located on the ensemble of the Head of the Cape. The bunker is inaccessible due to the fences surrounding the bunker. However, when visiting the area, we had a chance to get closer to the bunker. The bunker is filled with water, which makes the bunker itself inaccessible as well. The bunker dates back from 1939, when the Germans took over the Hembrug area. It served as a one-person bunker for the commander of the army. Several bunkers were built on the Head of the Cape during World War II, this is the only bunker left at the Head of the Cape. However, traces of the other former bunkers can be noticed when exploring the area; several concrete spots are hidden within the grass.

Legend:



Construction



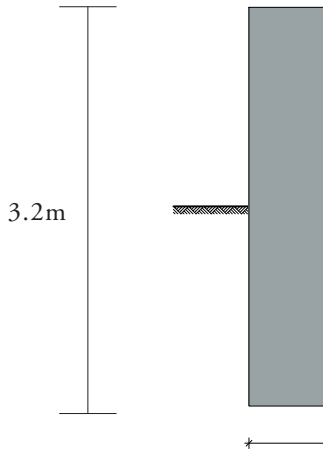


Figure 62. Plan of the Commander bunker (building 382)

Foundation

Source: Factsheet_Gebouwen_Hembrug_v2.2_26-6-2018, p. 24.

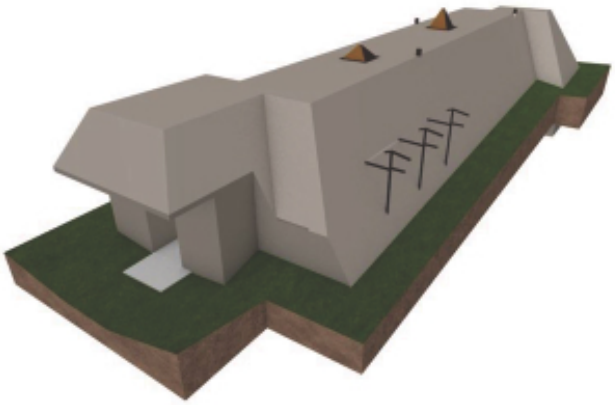


Figure 63. 3D model of the Commander bunker

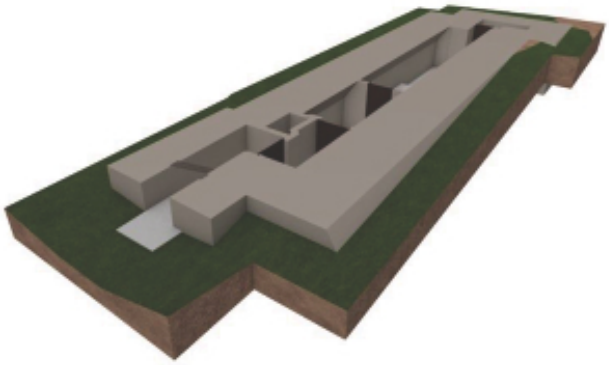


Figure 64. 3D plan of the Commander bunker

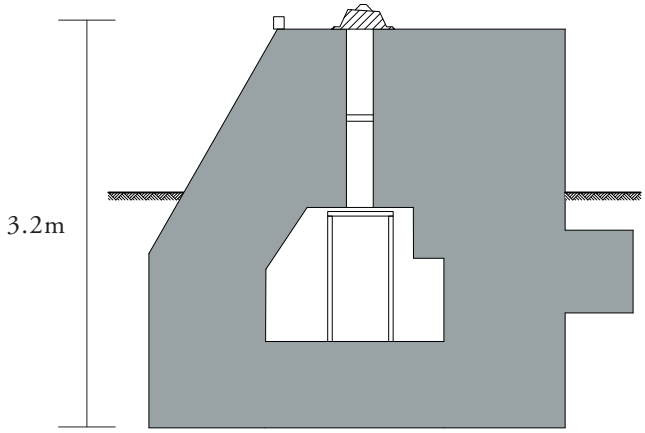


Figure 65. Section A-A'

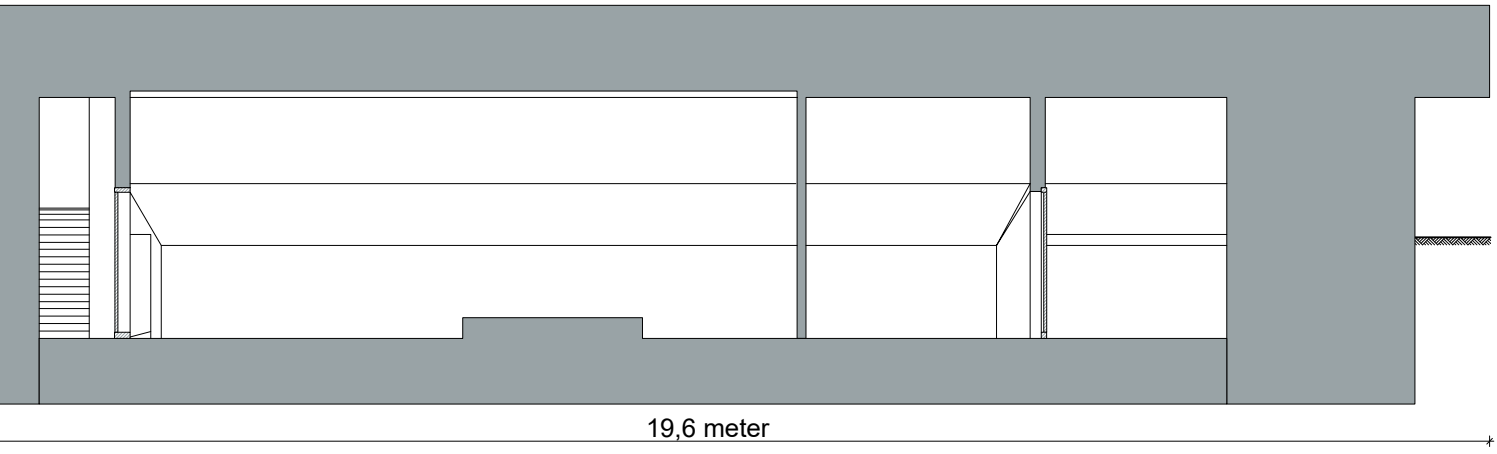


Figure 66. Section B-B'

Material - Exterior

Photos:
Left page top and bottom:
Exterior view of the Commander bunker

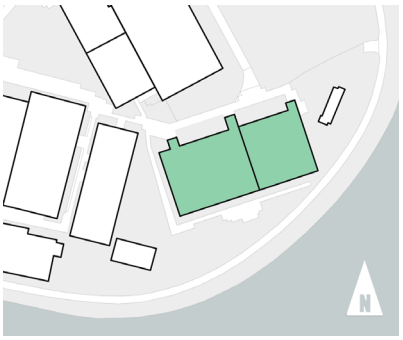
This page:
Top left:
Entrance of the Commander bunker
Top right:
Concrete surface of the bunker
Bottom left:
Flooded entrance
Bottom right:
Lighting fixated on the concrete surface where form-work trace is visible

4.5 Ammunition Factory (Building 430)

The ammunition factory, building 430, is the largest building on the Head of the Cape. It was a former assembling factory when it was built in the 1950s. Within the building, cartridges were assembled, painted, measured, gauged, visual inspected and connected to the belts.

The typology of the building can be noticed in several other areas within Hembrug. The saw tooth roof has windows which are orientated towards the north. This was done due to the indirect sunlight and to make sure the employees weren't distracted by the light or view. Furthermore, the building is off grid. The building is located at the waterfront, however, there was no intention to connect the water with the building or its open space. Due to being off grid orientated, a peaceful open space exists around the building. Nowadays the building is empty and vacant.

Legend:



Building Typology

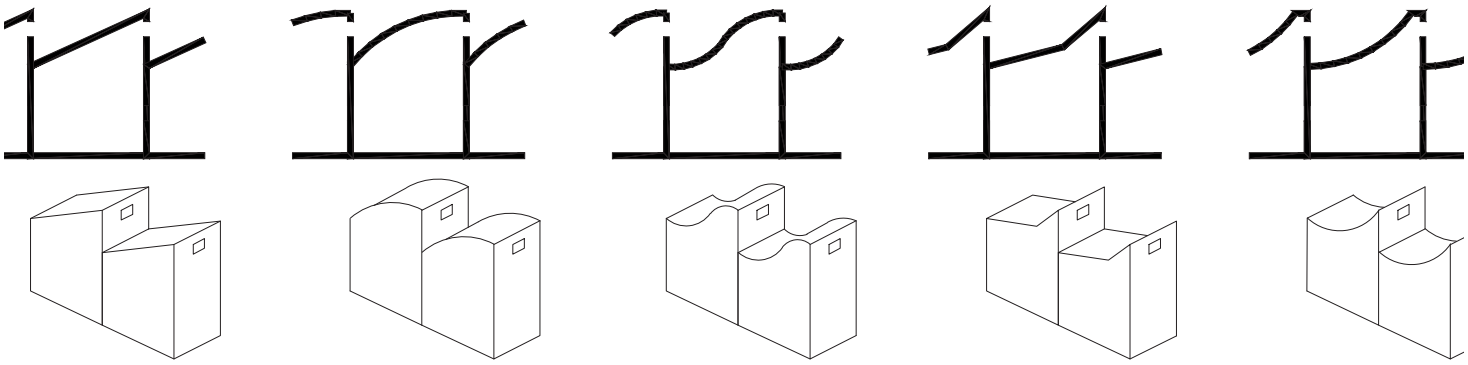


Figure 67.Typology of saw tooth roofs

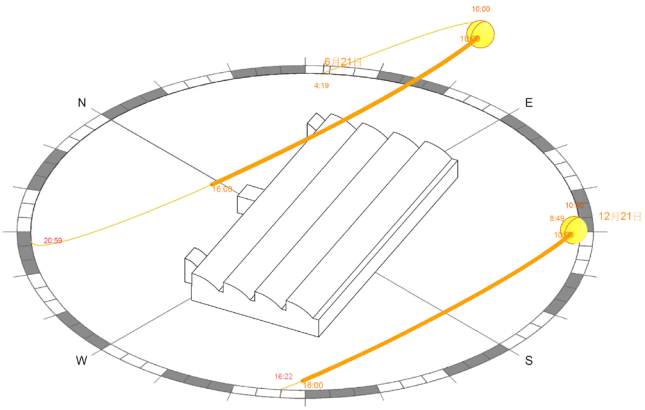


Figure 68.Solar study of building 430

From the mid-1850s the saw-tooth roofs, a typical feature of the industrial image, could be seen in the Netherlands. It was used in combination with wood and cast iron structures and later with reinforced concrete. Saw-tooth roofs were mainly used in low factory buildings.

There are a large variations of saw tooth roof shapes. The shapes range from a slightly curved one to those made up of a succession of sharp angles.

Building 430 has a curved sawtooth roof which comprises a series of ridges with a curved surface and a vertical surface on either side. The vertical surfaces are glazed and face away from the sun in order to shield workers and machinery from direct sunlight. It reduces heat gain and provides uniform natural light over a larger area.

Construction

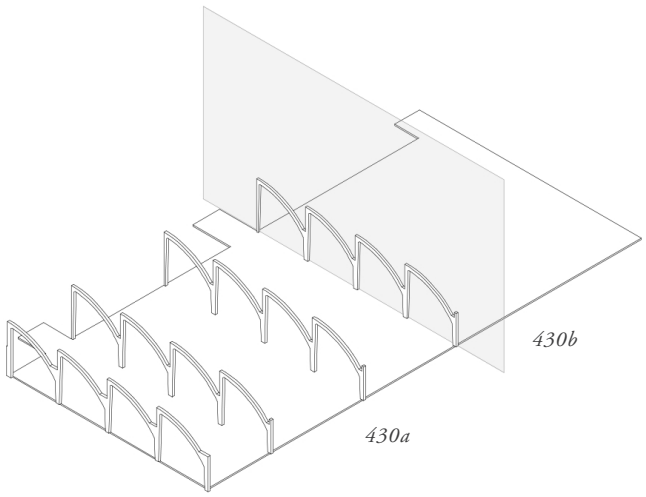


Figure 69. 430a's concrete frames are erected

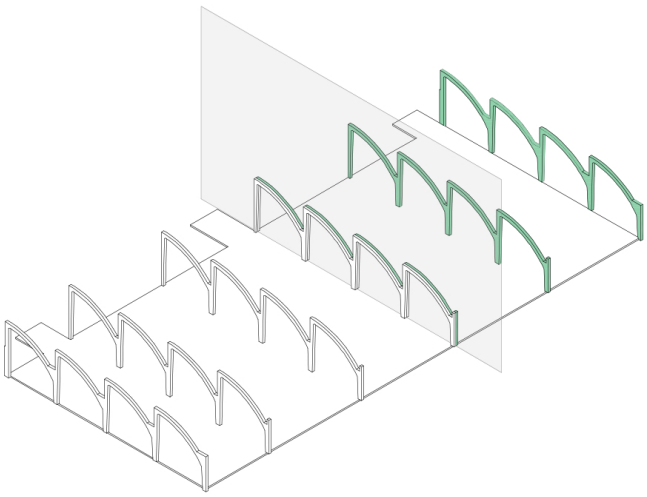


Figure 70. 430b's concrete frames are erected

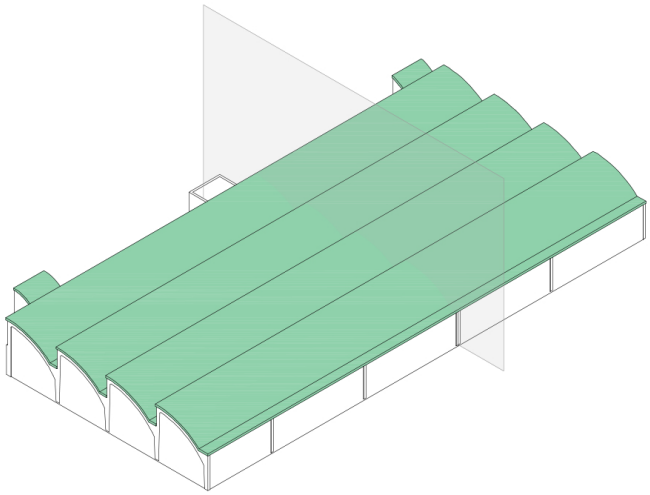


Figure 71. Concrete roof is poured

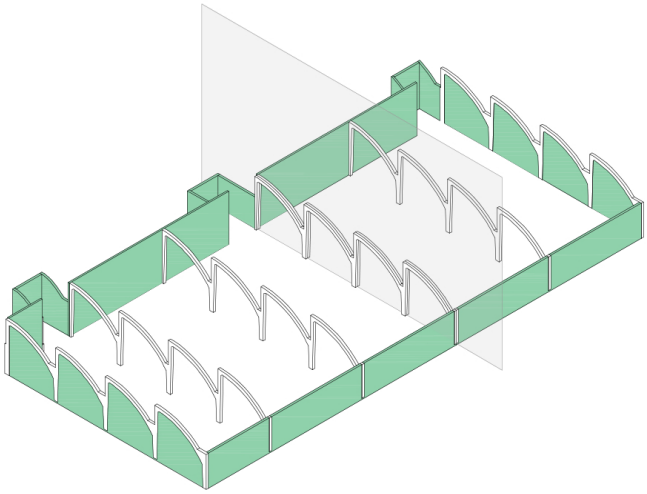


Figure 72. Adding brick infill walls afterwards

Building Components

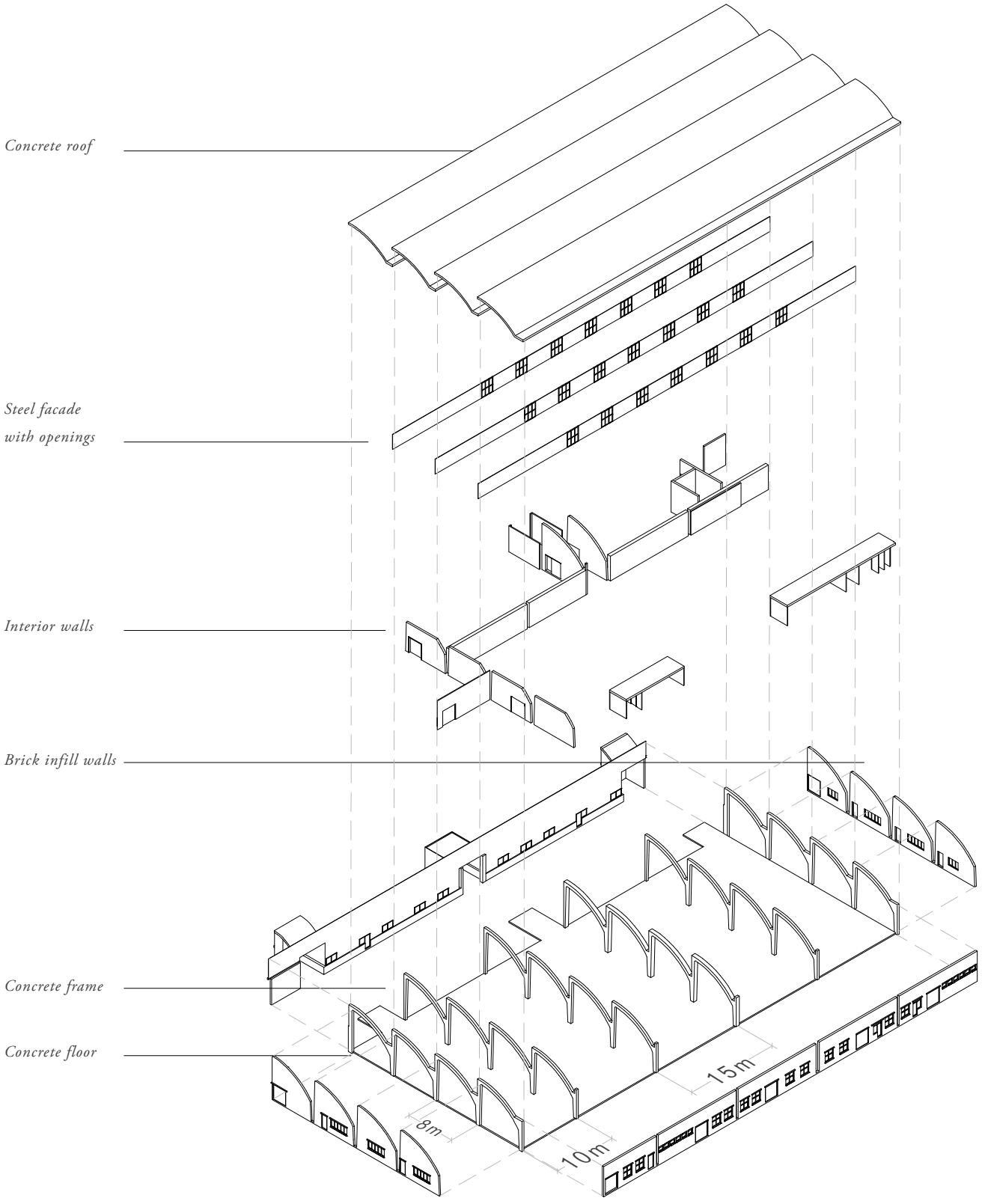


Figure 73.Exploded axonometric, author's illustration

Value of Building Components

The red color indicates things that have high value to us. Yellow means the evaluated item is indifferent to our consideration. Green color stands for least value or even negative value.

We valued the north facade as green because we have reason to believe that it was not the original facade. The brick look newer than the other facades. Also, the facade is insulated which is not common practice in 1950s.

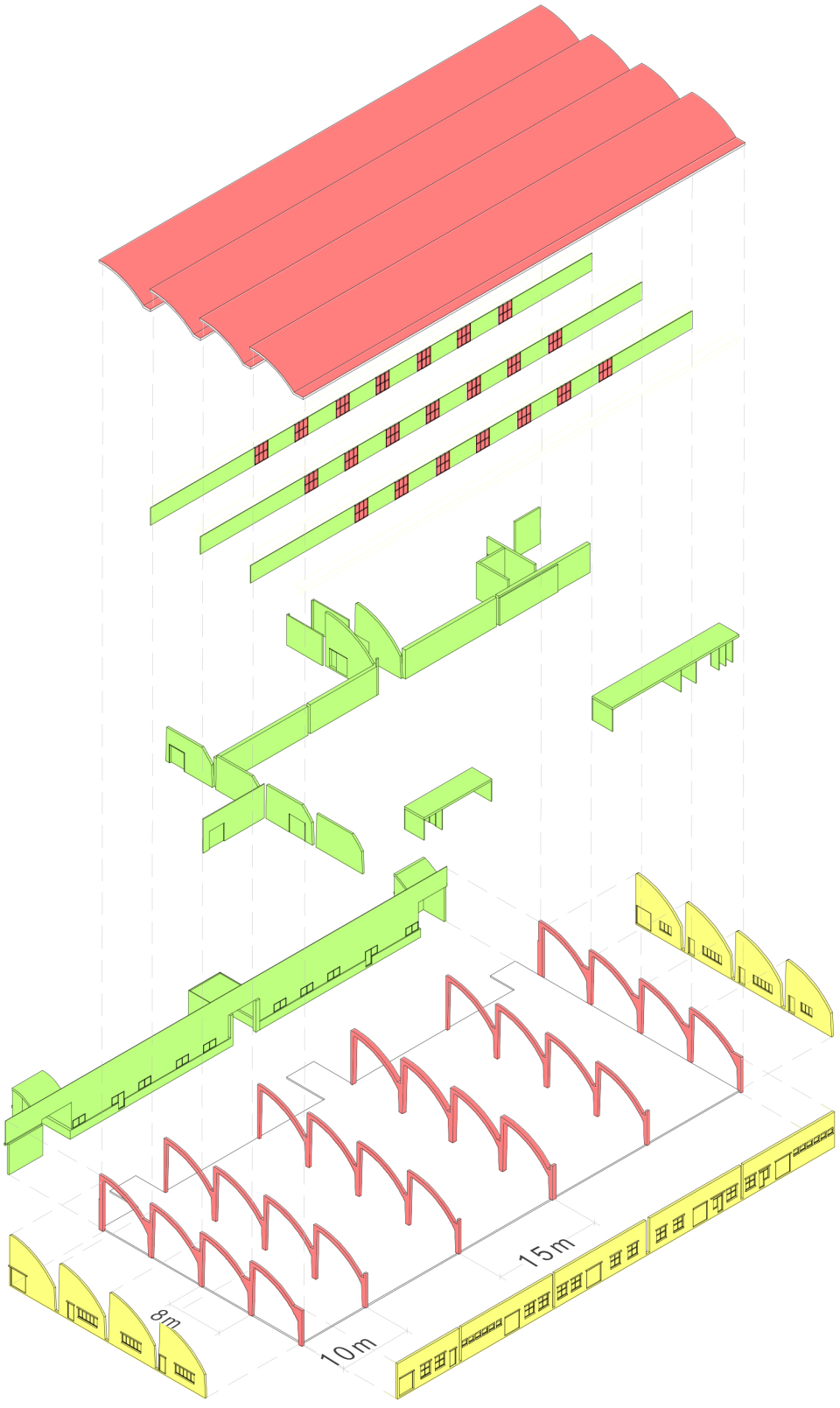


Figure 74.Value of each component, author's illustration

Repeated structural element

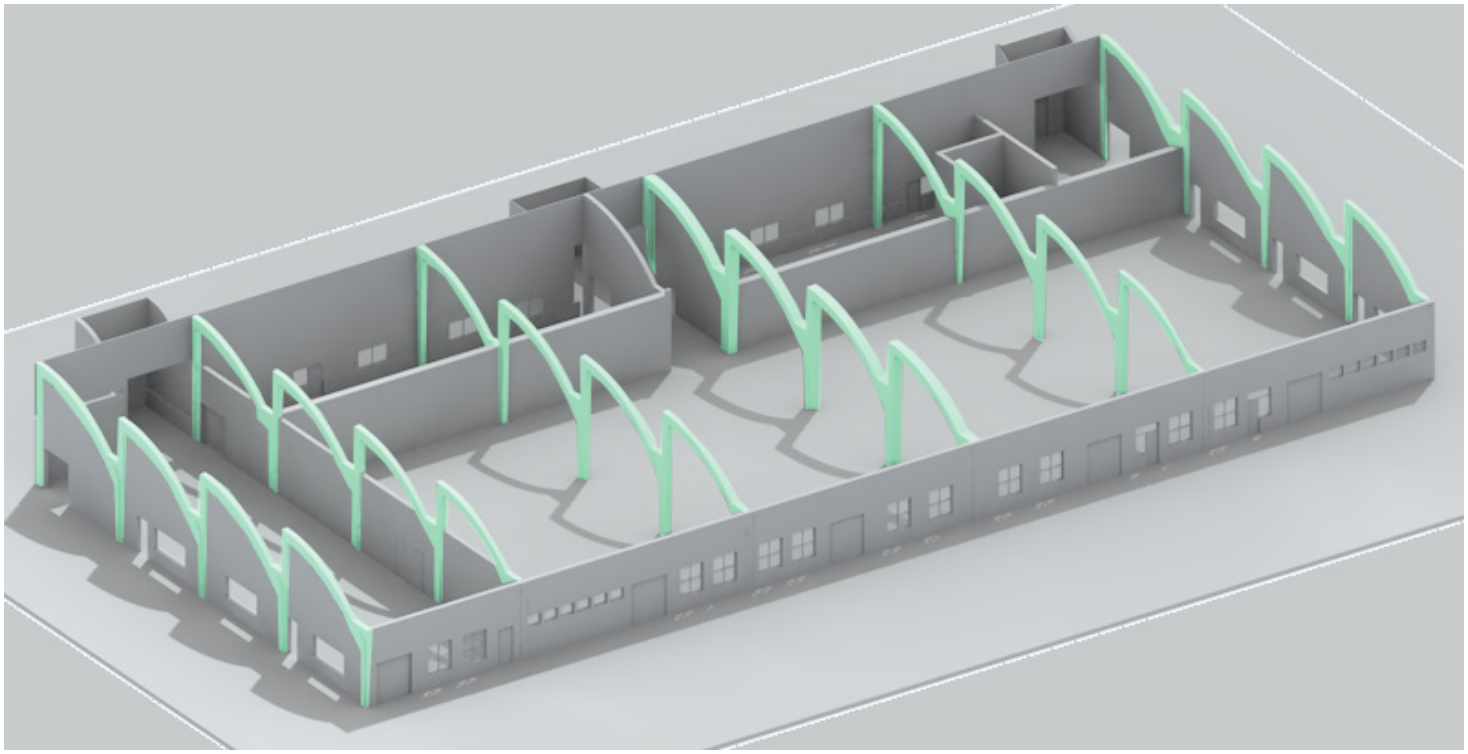


Figure 75.Repeated concrete frames, author's illustration

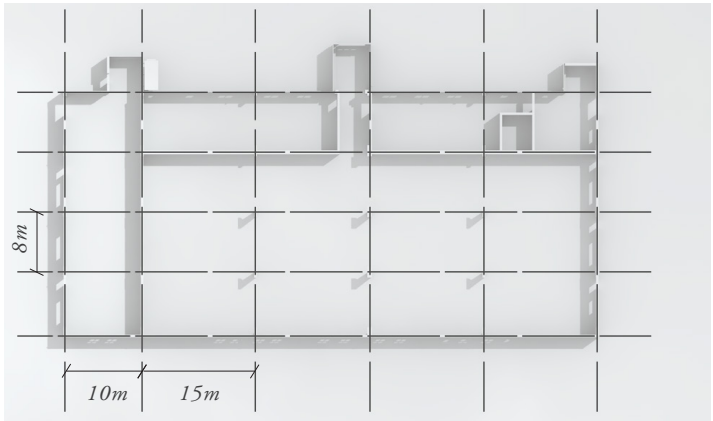


Figure 77.Grid system of building 430, author's illustration

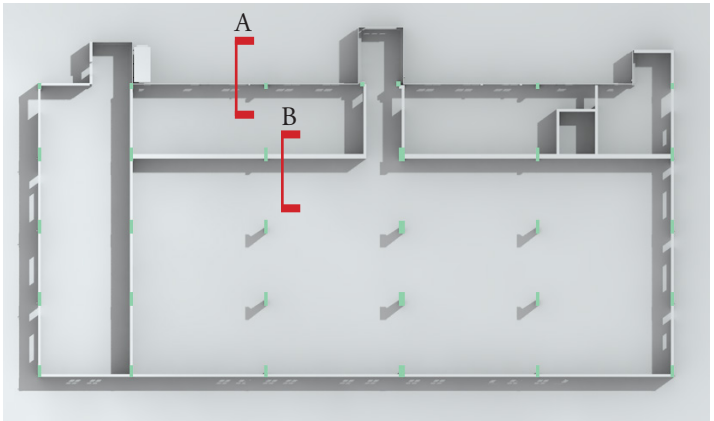
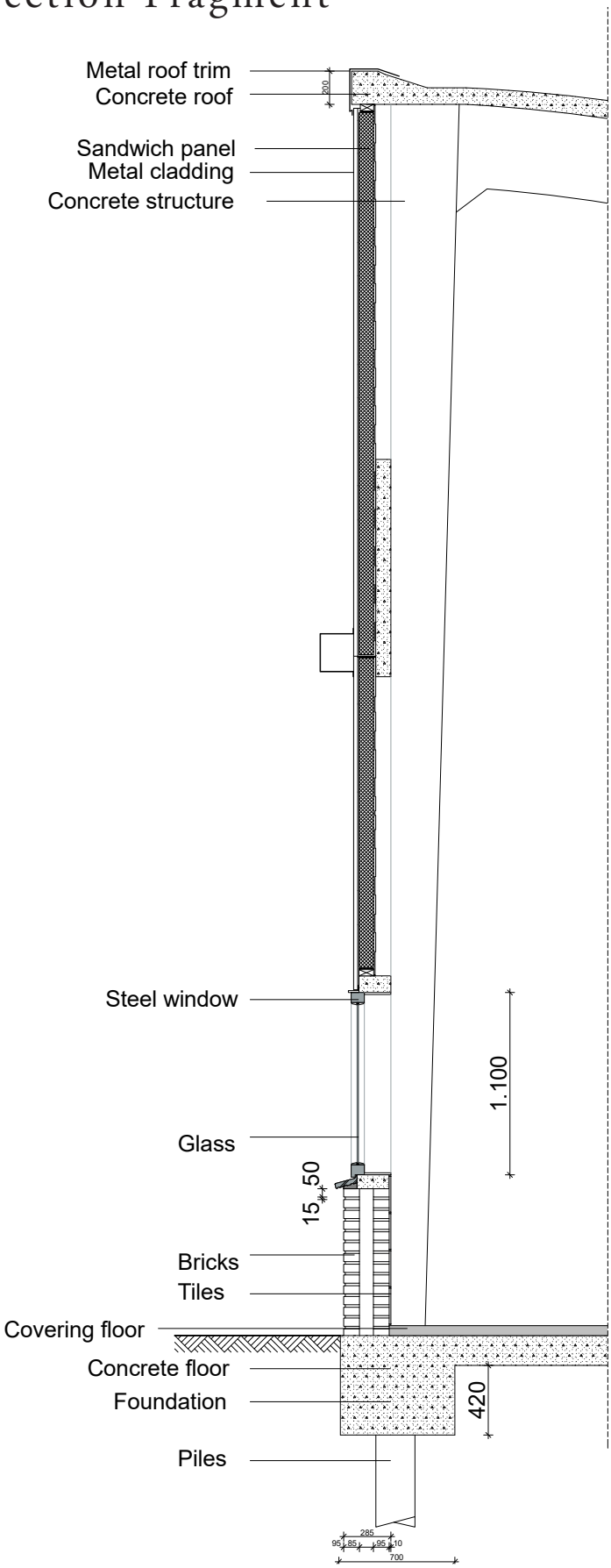


Figure 76.Column plan building 430, author's illustration

The building is constructed with repeated elements, like concrete frames, beams and brick infill walls. The floor plan on the right and facade below show a clear rhythm of the repetition.

The distance between these columns are circa 15 meter in the horizontal direction and 8 meter in vertical direction. This results in an open floor plan where the production process can be optimized without any barriers.

Section Fragment



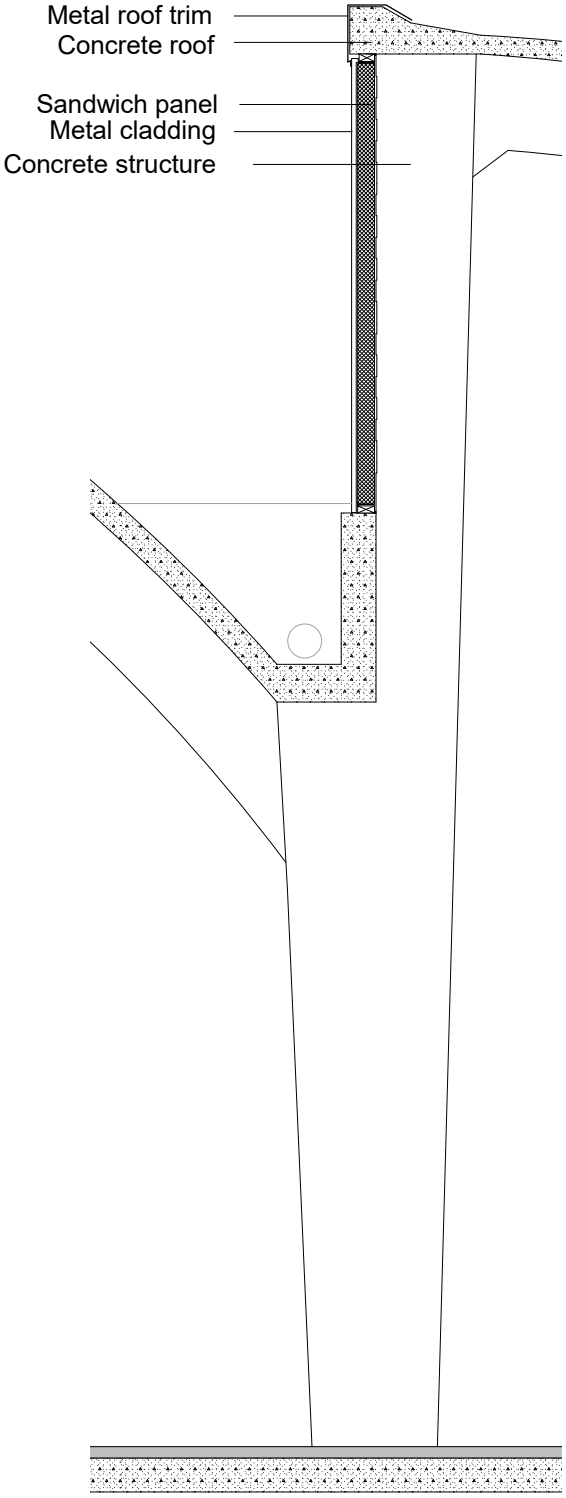


Figure 78. Wall Section A 1:40

Figure 79. Section B showing the continuous connection 1:40

Plan and Sections

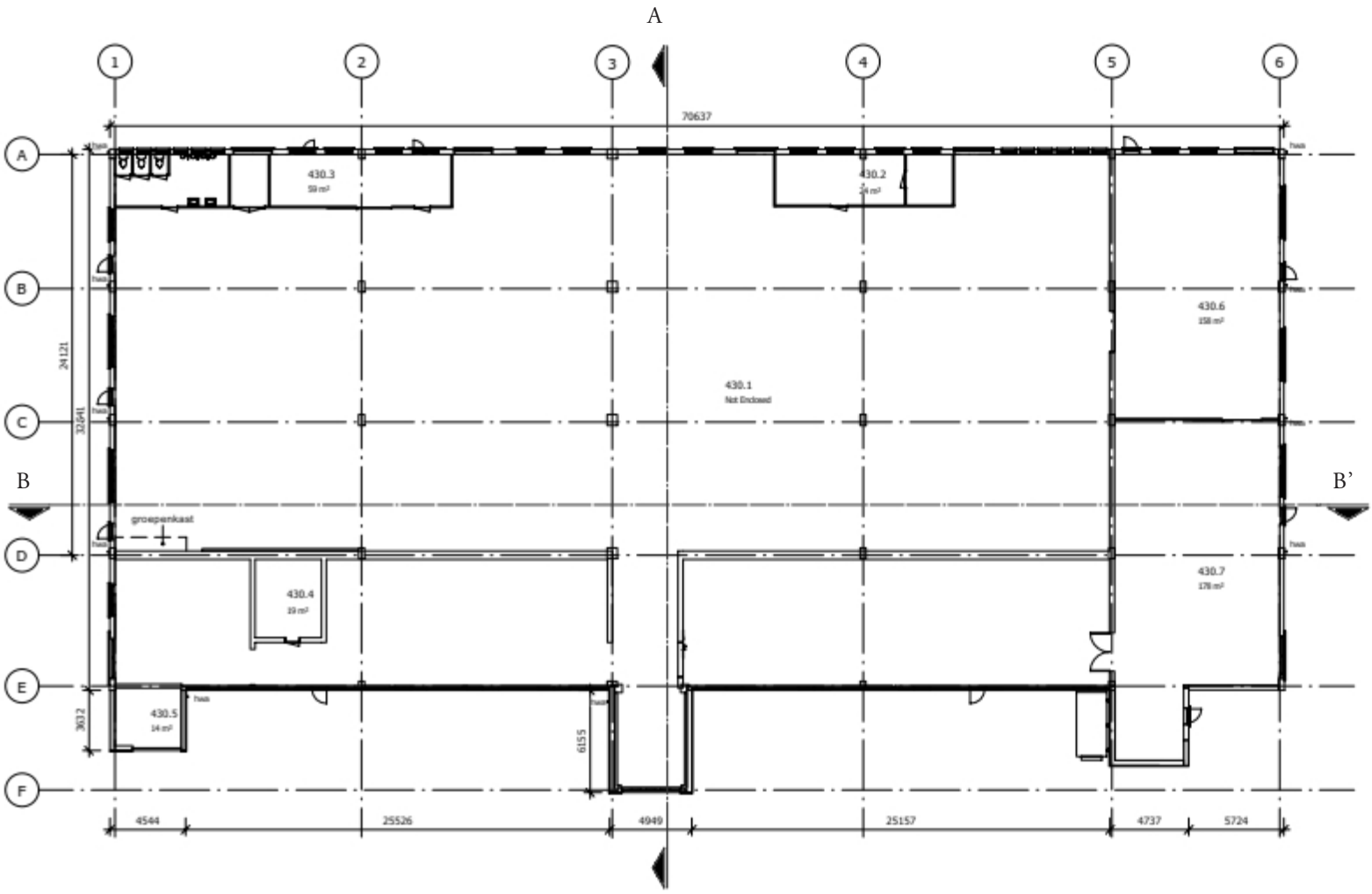
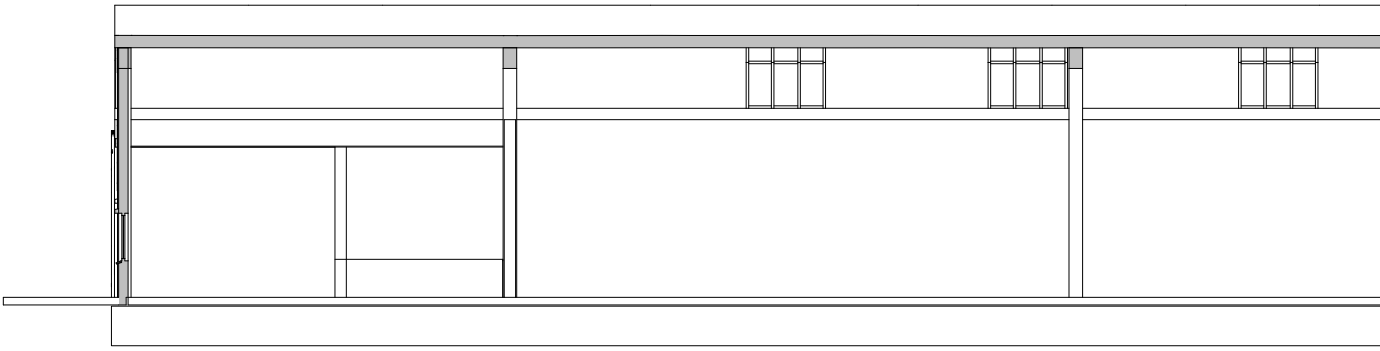


Figure 80.Plan of ammunition factory, 1:400



Plan source:
Factsheet_Gebouwen_Hembrug_v2.2_26-6-2018, p. 22.

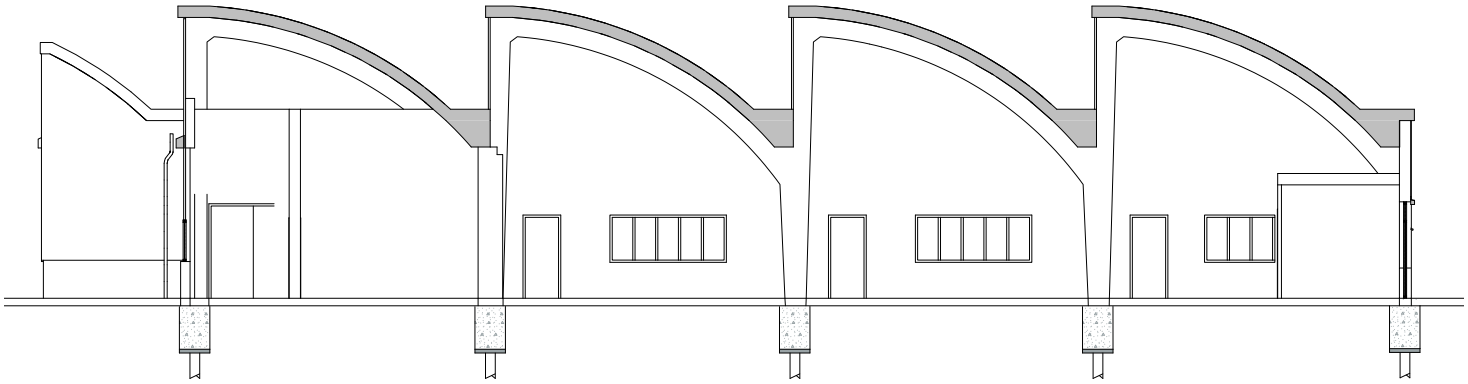


Figure 82. Section A-A' of the ammunition factory, 1:200

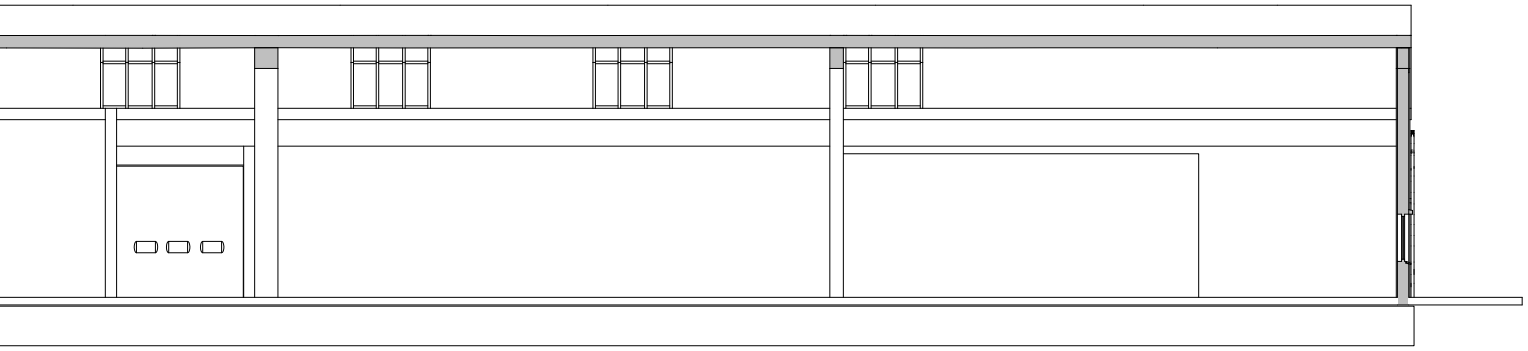


Figure 81. Section B-B' of the ammunition factory, 1:200

Stability

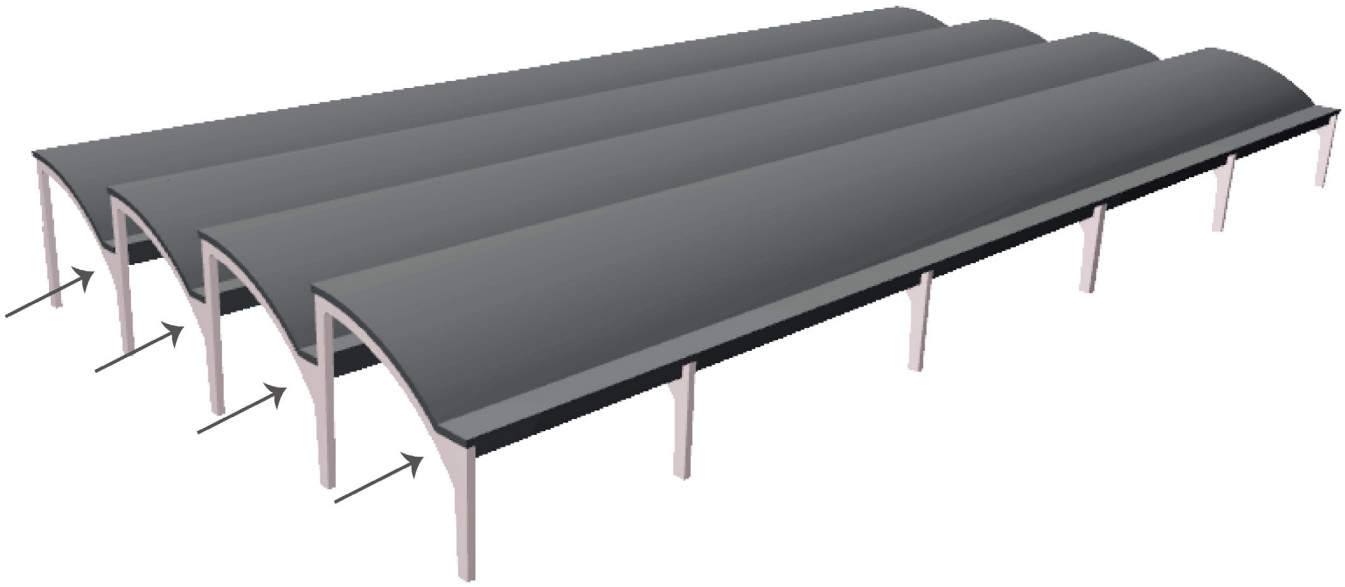


Figure 83. 3D structure of the ammunition factory (building 430)

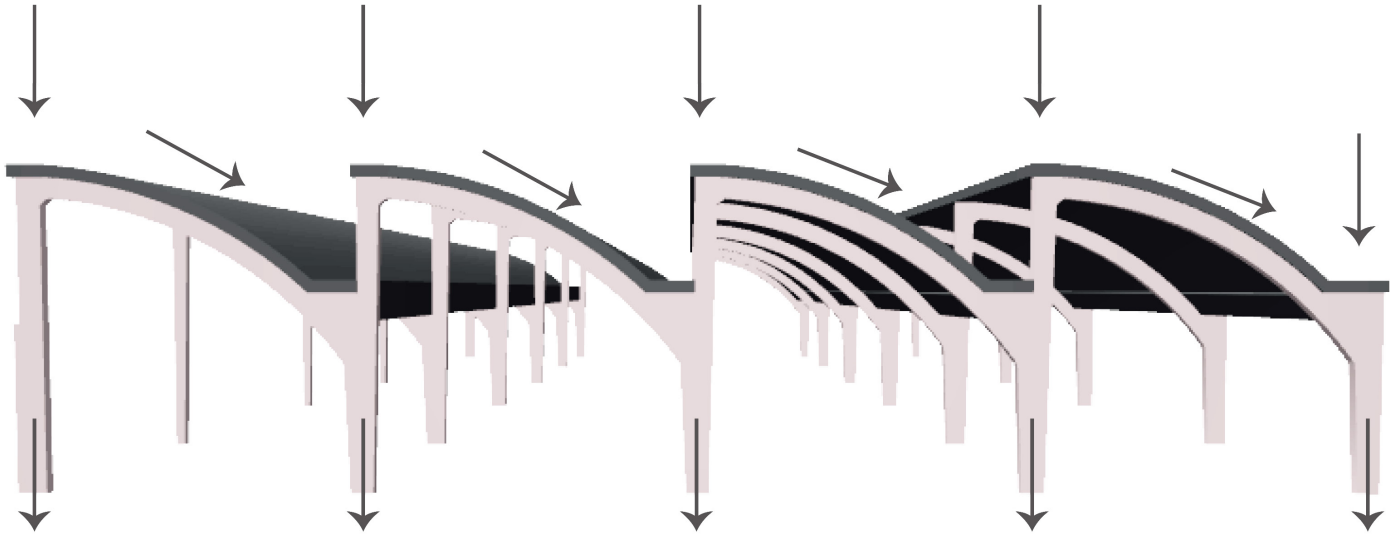
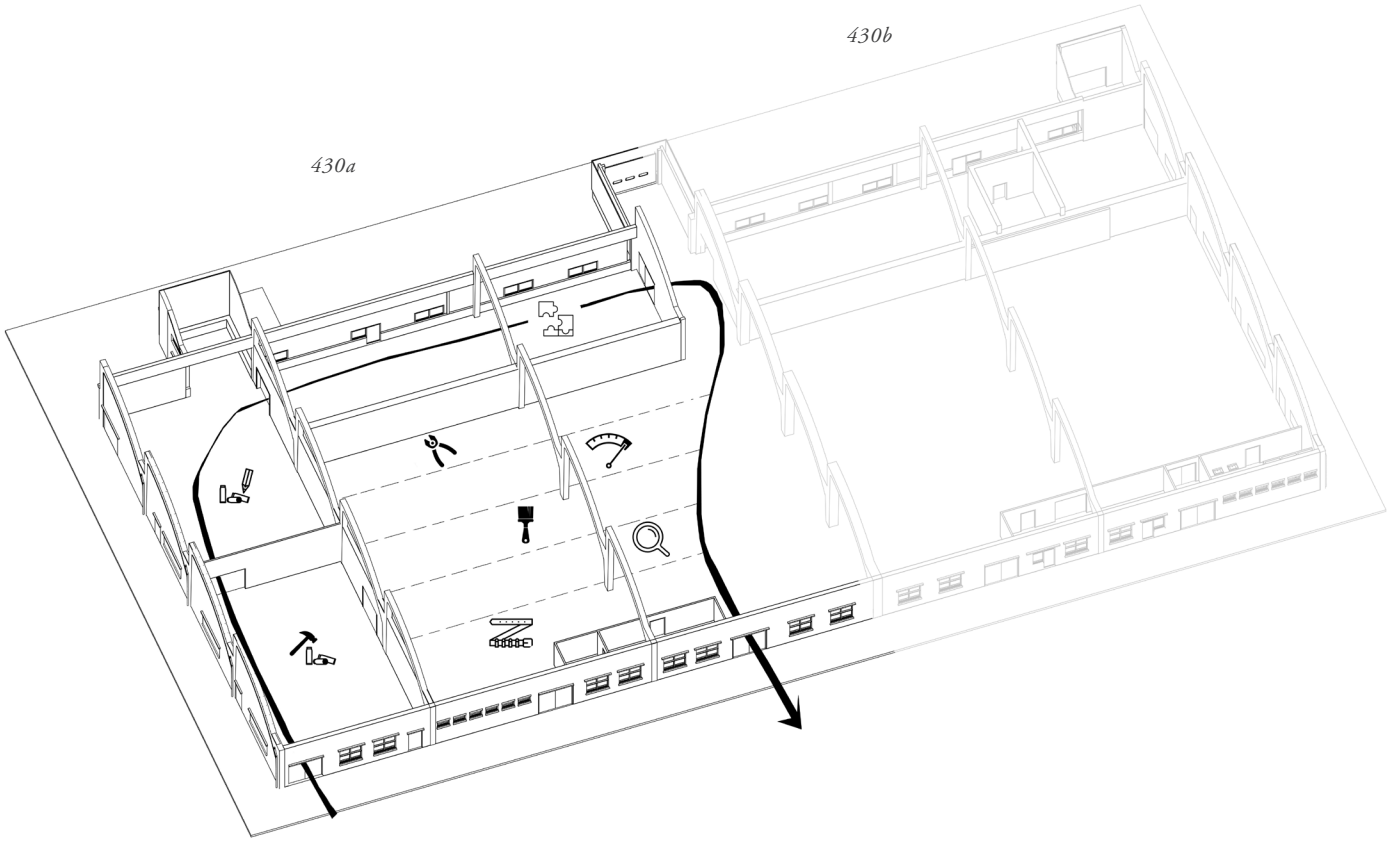


Figure 84. Force diagram of the ammunition factory (building 430)

Former Use and Function

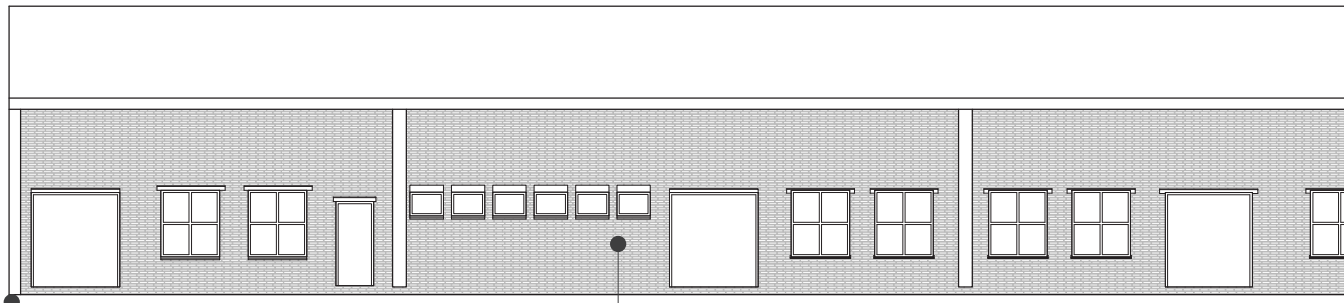


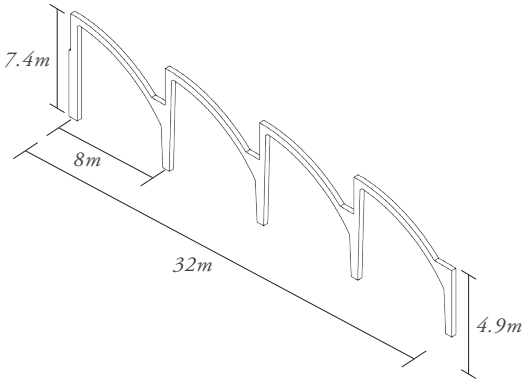
From the National Military Museum archive, one of the drawings shows the purpose of each room of building 430a in 1956. The production probably starts on the left aisle of the building, where workers make, gauge, rivet and varnish the cartridge. Then, the cartridge cases would be transported to the rear space for loading and assembling. The products would be sent to the main hall where final adjustments, quality control and packaging took place.

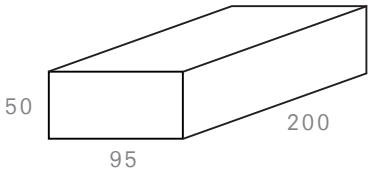
Legend:

- Filling link-belts
- Cartridge loading and assembling
- Marking cardridge cases
- Visual inspection
- Colouring point of bullet
- Gauging on dimension and weighing
- Crimping
- Gauging, riveting and varnishing cartridge cases

Material - Exterior

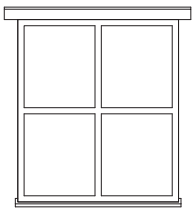




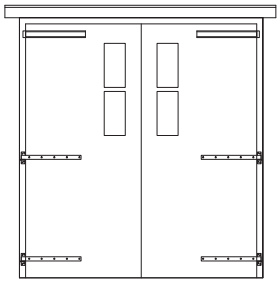


Material	*Concrete Frame*	*Brick*
Size (mm)	*32009l 360w 7430h*	*200l 95w 50h*
Color	*Light red*	*Red*
Bond		*Staand klezorenverband*

Figure 85. South facade of Building 430

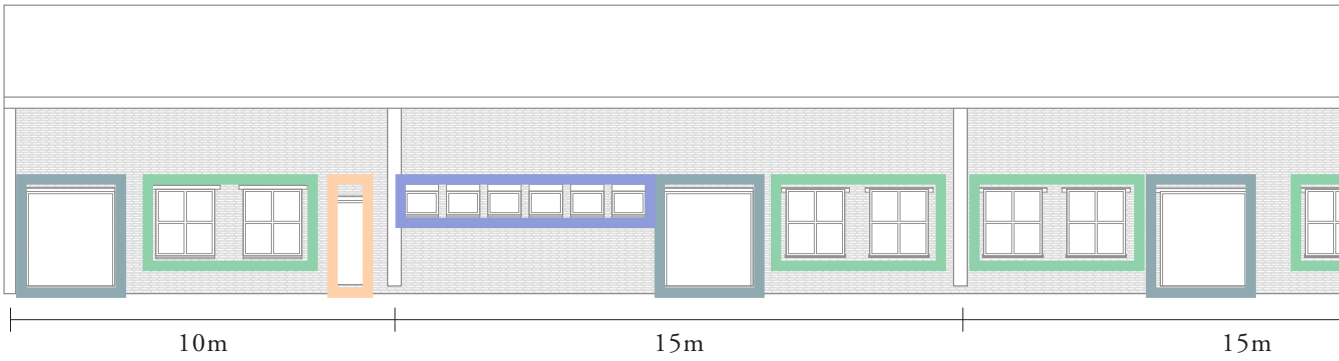


Steel Window Frame with putty
1550w 80d 1760h
Original white paint



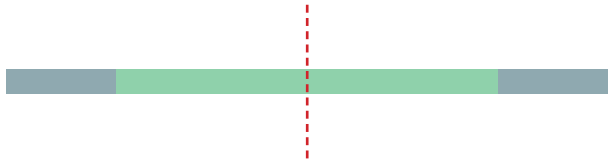
Wooden Door
2300w 100d 2500h
Original green paint

Rhythm and Symmetry



Rhythm

Symmetry



Window Type

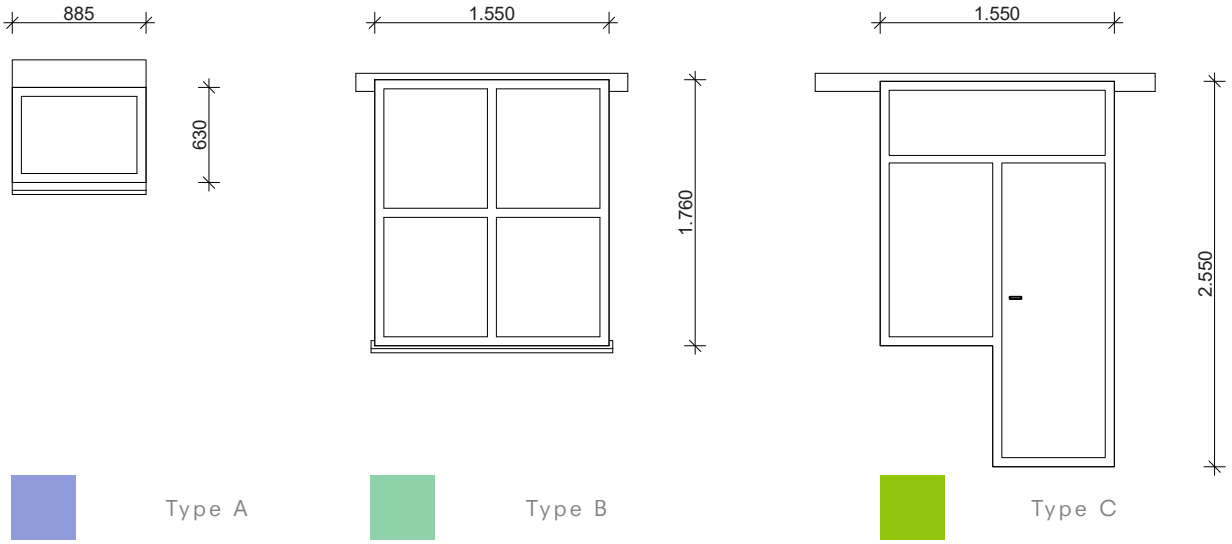
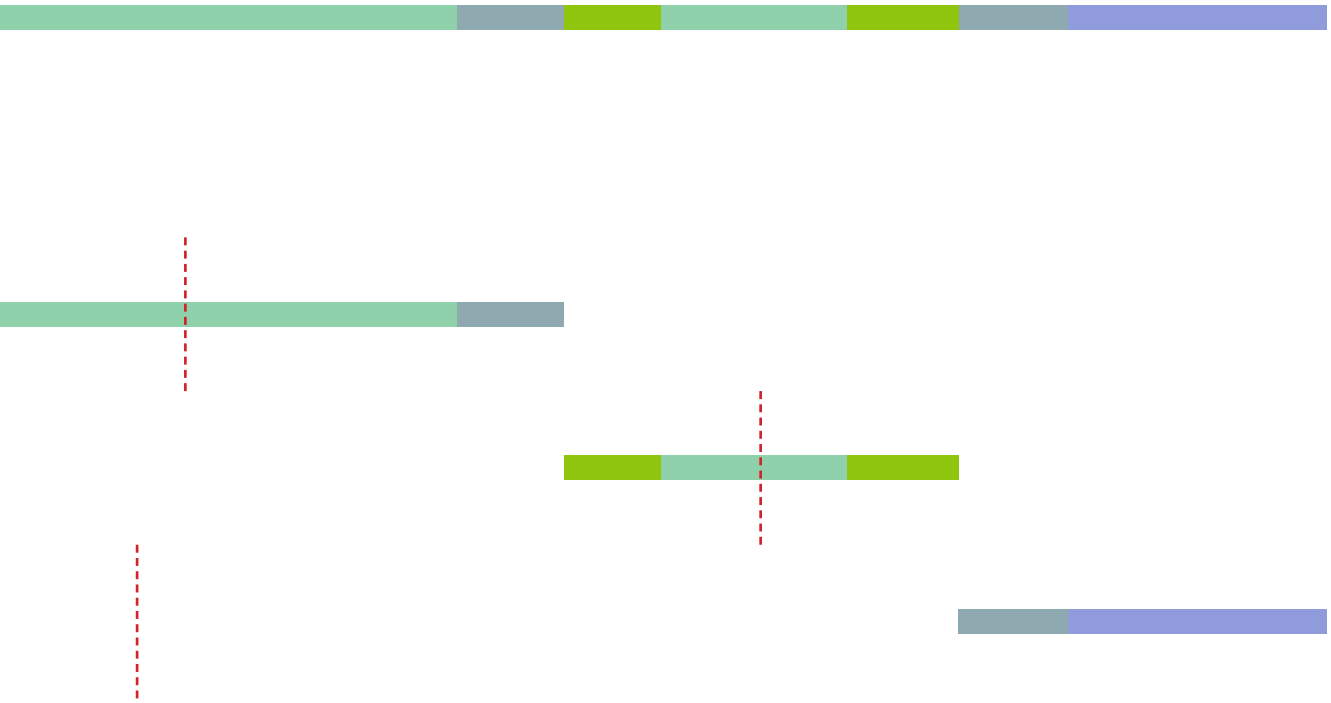


Figure 86.South facade of the Ammunition factory



Material

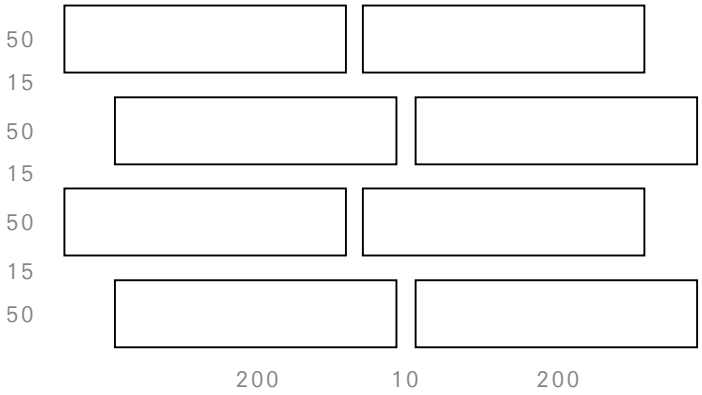


Figure 87. Lagenmaat

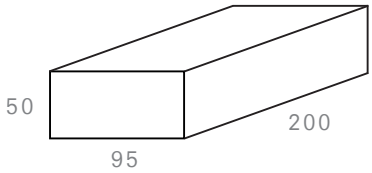


Figure 88. Brick size

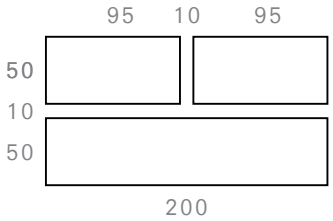


Figure 89. Relation between brick's dimension

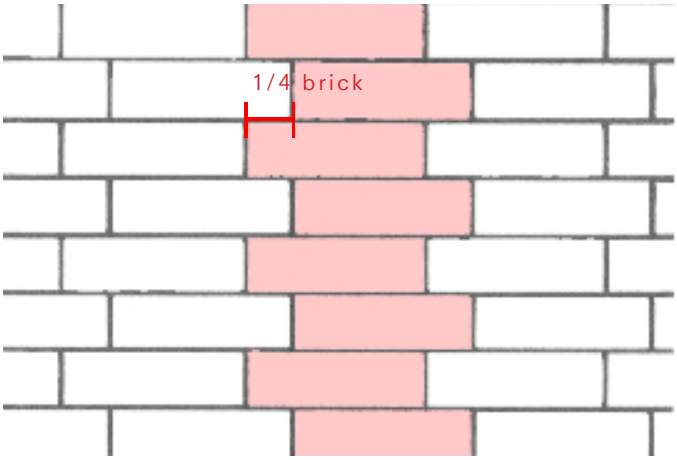


Figure 90. Staand klezorenverband

Building 430 is one of the typical factory buildings of 1950s. It is composed by a few elements, including the concrete saw tooth roof, concrete structural frame, brick infill walls, metal sandwich panels, concrete window frames and wooden doors.

The bricks are mainly laid out in staand klezorenverband. The only exception is the treatment near window openings. The reason behind is to avoid having a quarter brick next to the opening since the structural strength will be weakened.

The *koppenmaat* (head length of one brick plus the width of the joint) is 95+10=105. The width of two headers and the joint is equal to the length of one brick, which is 105+105=210mm.

Photos:
Left: South facade of the ammuntiion factory with brick size dimension
Right top: Header width measured as 9.5cm
Right bottom: Brick height measured as 5cm

Window Types

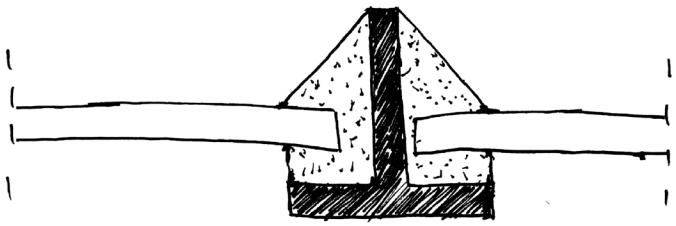


Figure 91. Steel casement to hold glass in place with putty in between

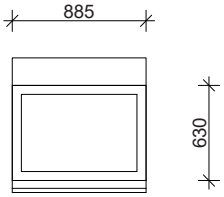


Figure 93. Window (Type A) on the south facade

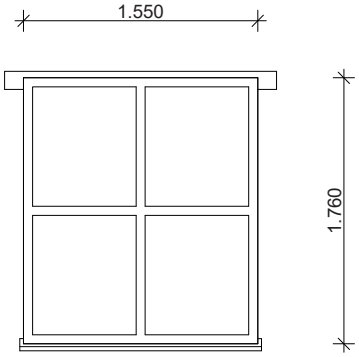


Figure 92. Window (Type B) on the south facade

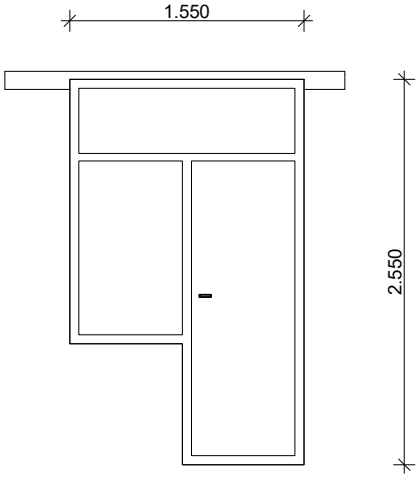


Figure 94. Window (Type C) on the south facade

Figure 95. Window (Type D) on the east and west facades

Light Study

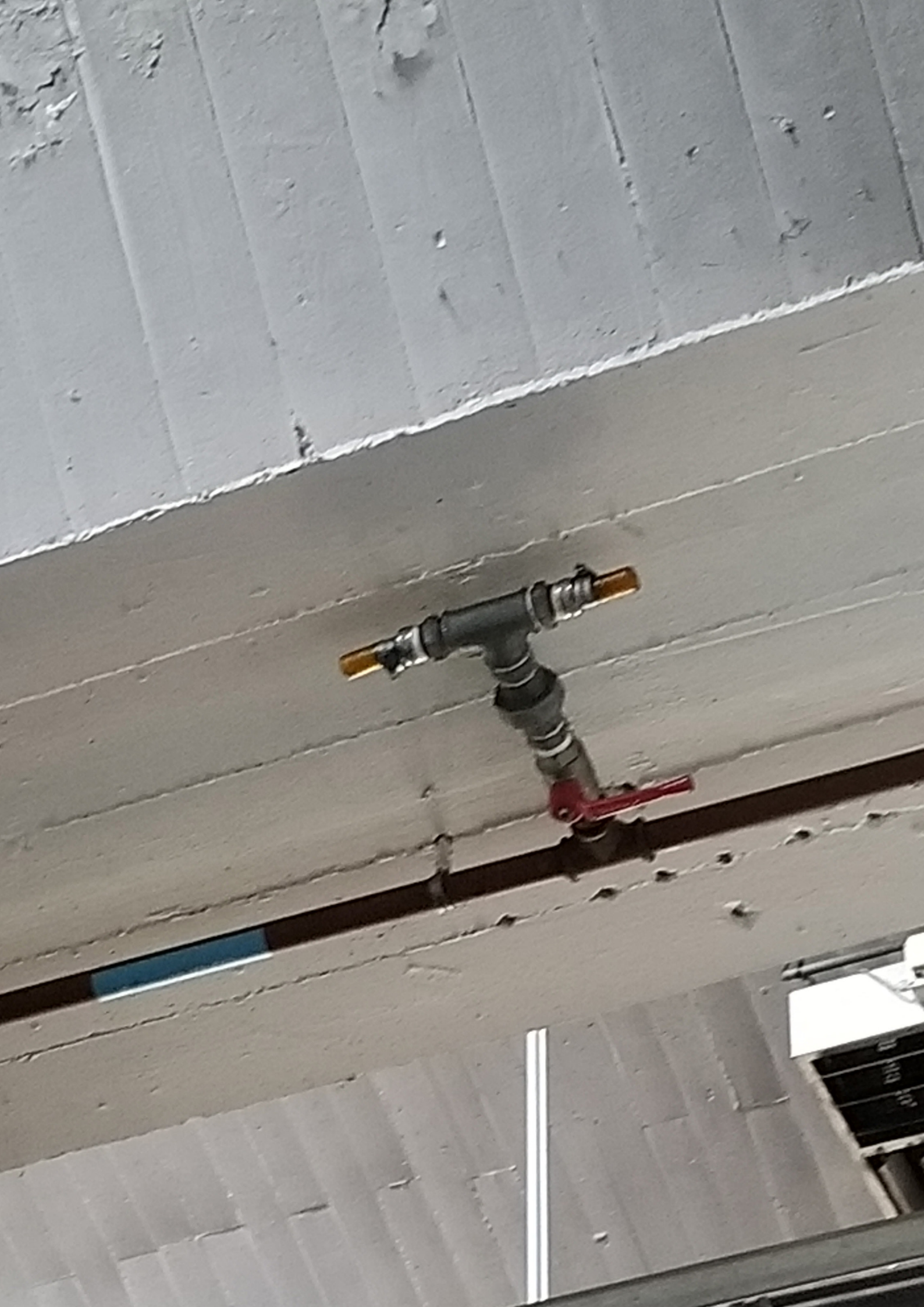







Photos:
Left page
1st row left:
Light coming from window (type D) on west facade
1st row right:
Light coming from window (type B) on south facade
2nd row left:
Light coming from window on north facade
2nd row right:
Light coming from window on north facade
3rd row left:
Light coming from window above on the north facade
3rd row right:
Light coming from window (type B) on south facade
4th row left and right:
Light coming from window (type D) on east facade

This page:
1st row left:
Window type D
1st row right:
Window type B
2nd row:
Window on the north facade
3rd row:
A close up of the window from above, inbetween the metal sandwich panel
4th row:
Window on the east facade



Material - Interior

The texture of the original materials can be seen from both exterior and interior. The trace of wooden form-work on the roof surface reflects the construction method used at that time. Some materials reflect the former function, for instance the wall is clad with tiles in the former washing room. There are still original ventilation ducts, pipes, electricity switches and panels attached on the wall. The exposed structure, rough texture, austere interior and original services reveal its industrial character even the building is defunct now.

Photos:

Left: Roof texture showing traces of wooden form-work

Right (from top to bottom):

1. Wall with tile cladding in the former washing room

2. Water valve switches in the former mechanical room. According to the project manager of Hembrug, Jos van Rijn, the water valve system was used to pump water from the canals for production use in Hembrug back then.

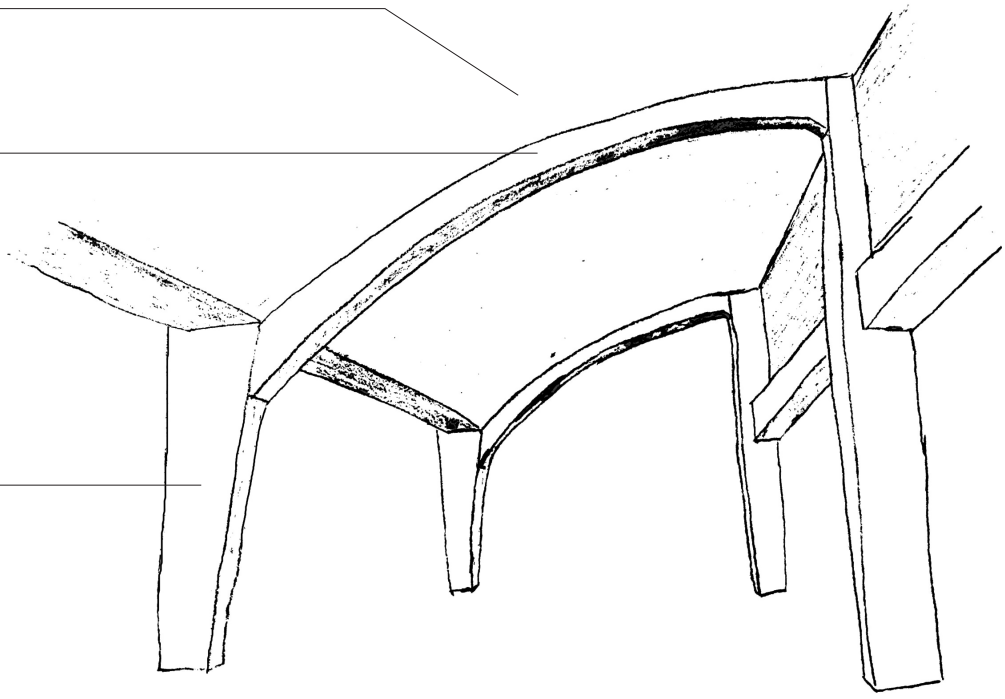
3. Original electricity switches attached on the wall.

Detail

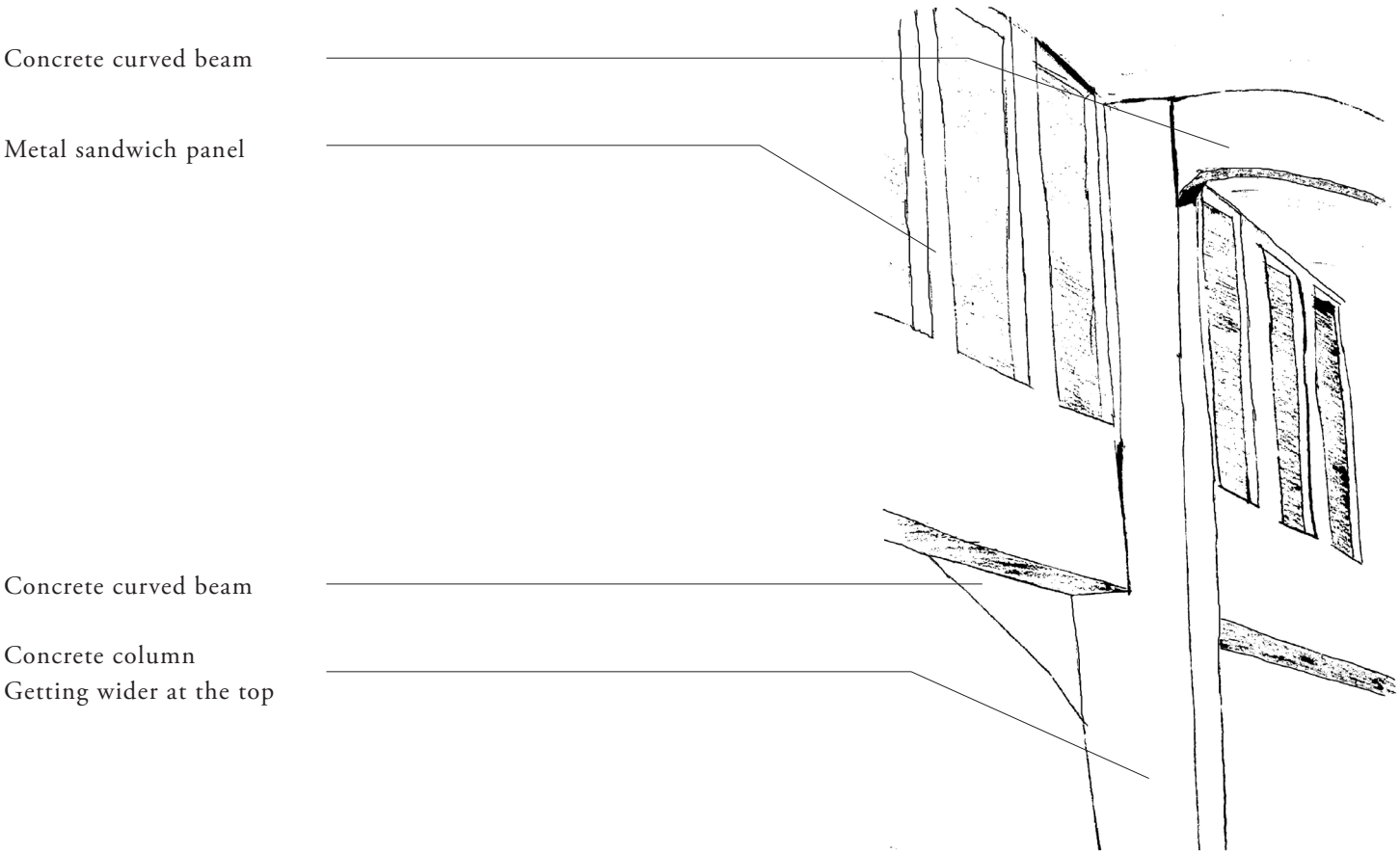
Concrete roof

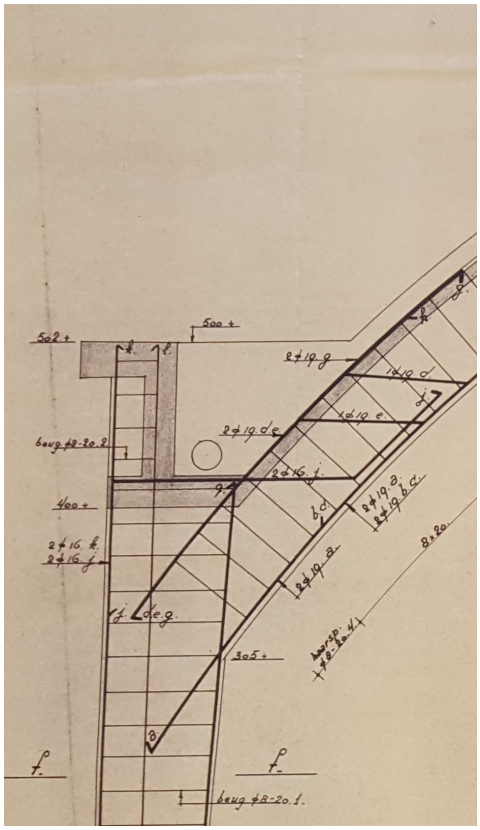
Concrete curved beam

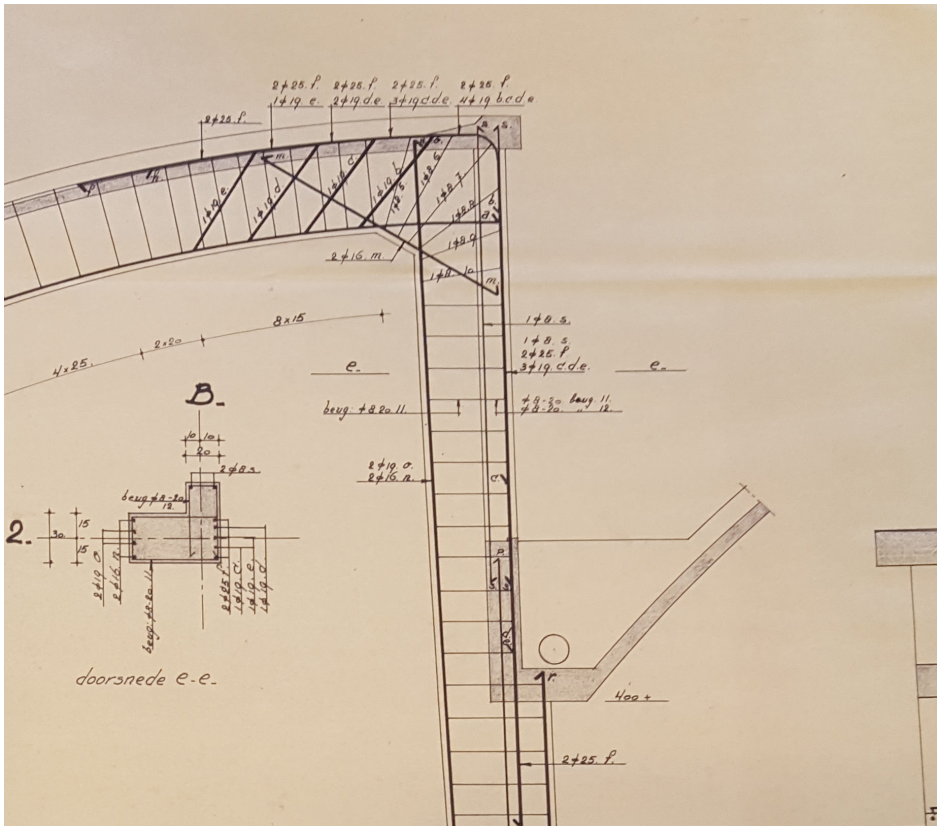
Concrete column
Getting wider at the top




TRLU 234331
US 2210
MAX. GROSS
TARE
NET
CU. CAP.


Concrete curved beam
Metal sandwich panel
Concrete curved beam
Concrete column
Getting wider at the top

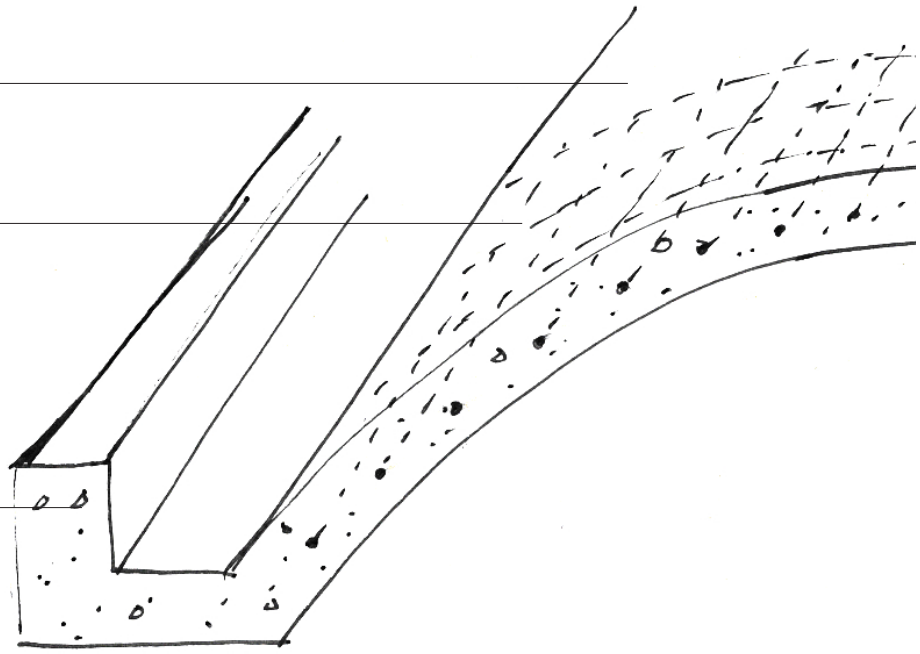


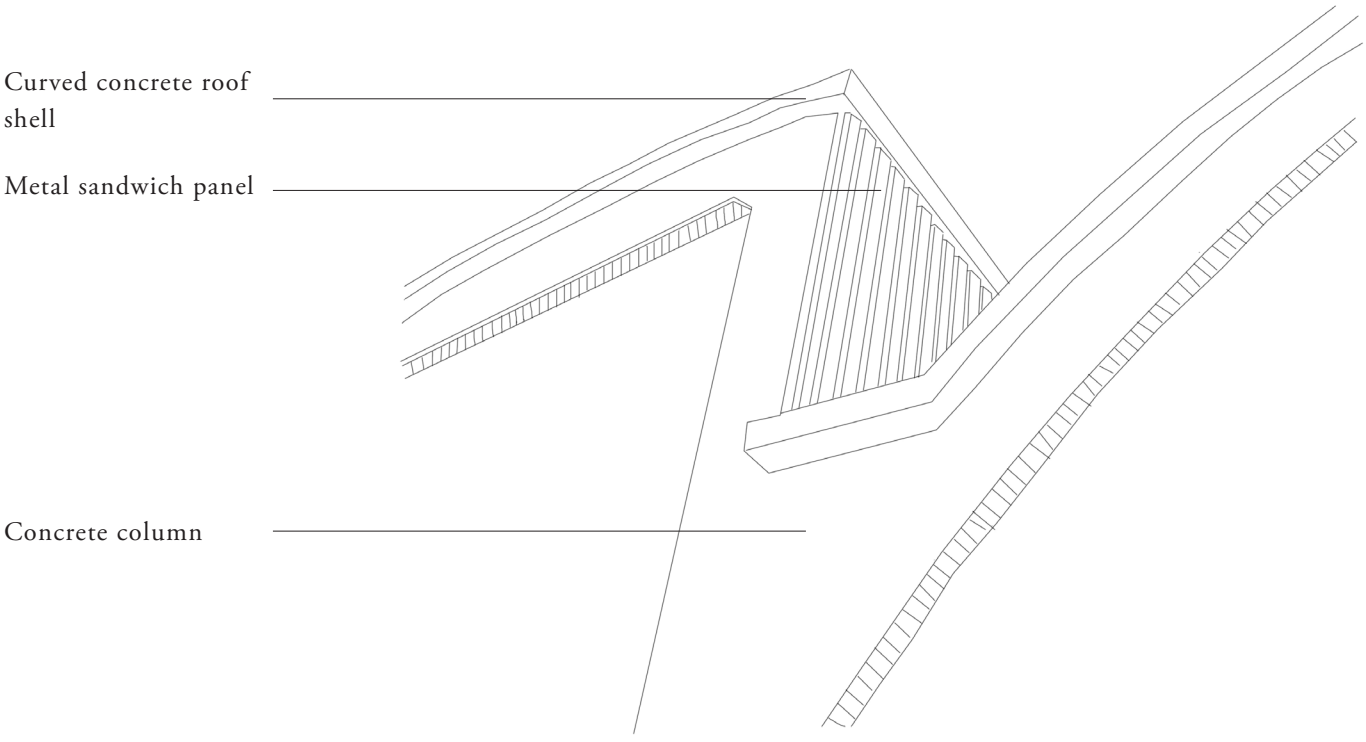


Concrete was sprayed on the steel mesh and smoothened with a spaan

Reinforced steel mesh

Poured concrete shell




Curved concrete roof shell
Metal sandwich panel
Concrete column

Walk Through Experience

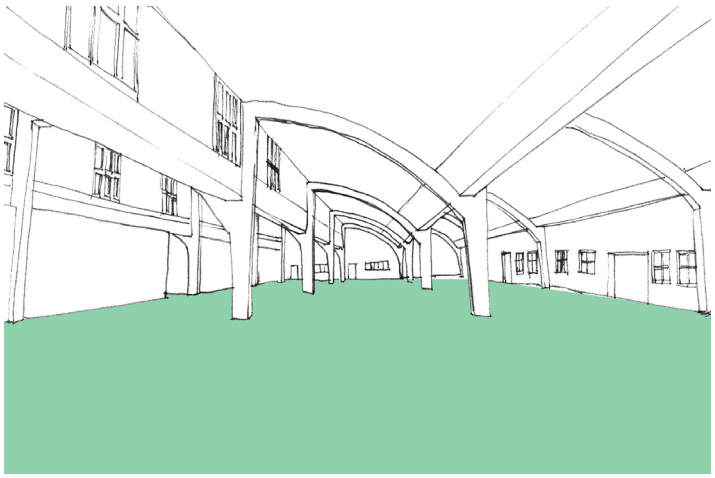


Figure 96. Room 1 Main hall, 60 x 24m, 1,440m²

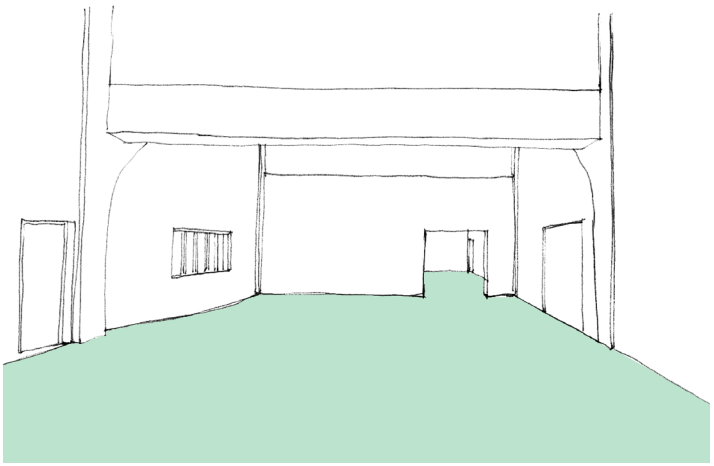


Figure 97. Room2: Mechanical room, 30 x 8m, 240m²

Figure 98. Continuous interior space

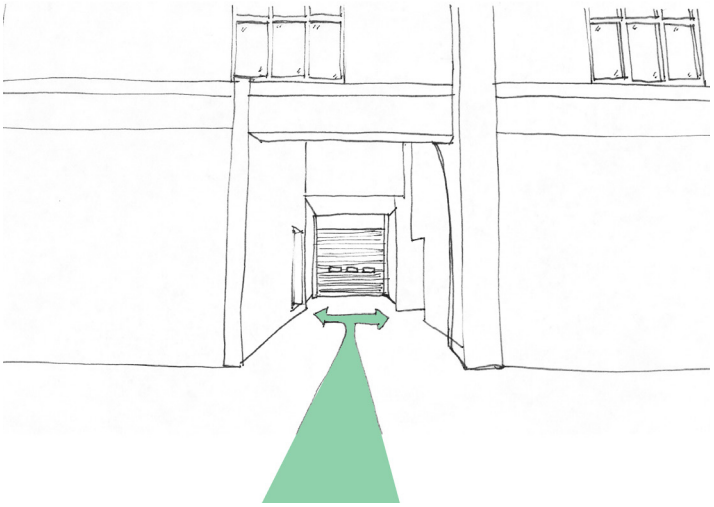


Figure 99. Clear direction for navigation

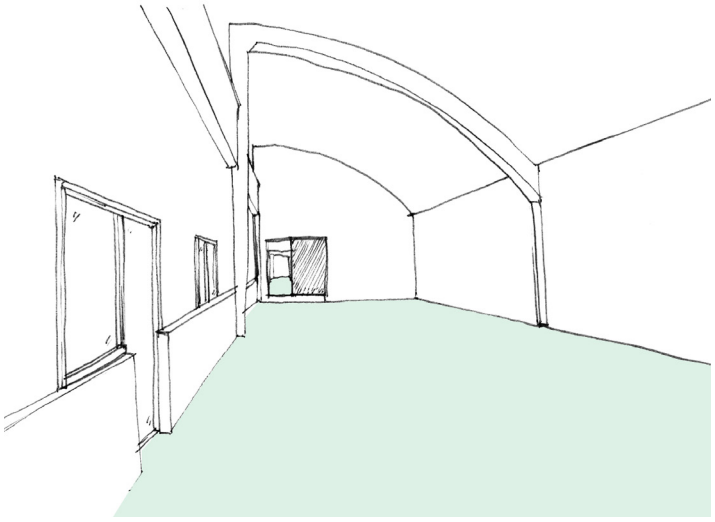


Figure 100. Room 3: Washing room, 10 x 16m, 160m²

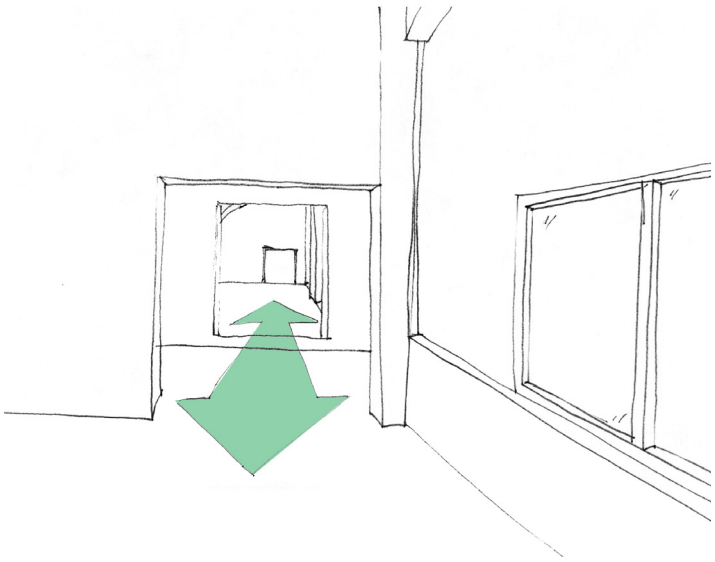
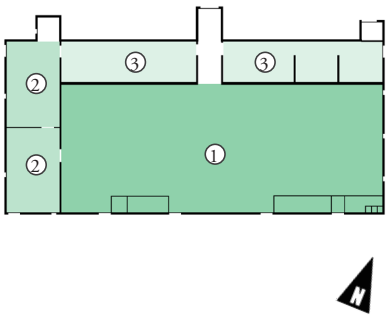


Figure 101. Aligned openings

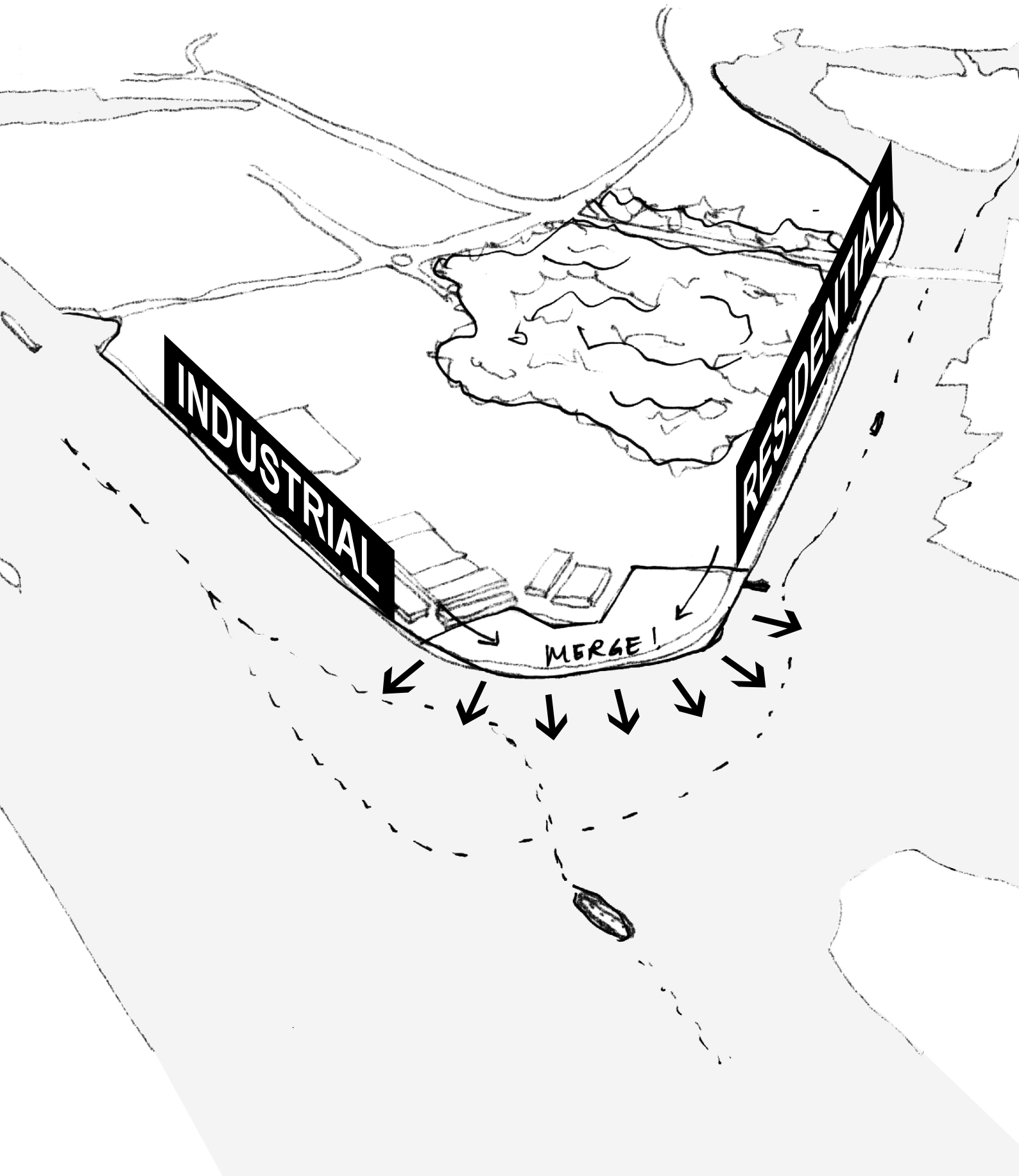
Key plan:




HEMBRUG

4.6 Conclusion

In this chapter, we have covered the technical aspects of all of the buildings on the ensemble the Head of the Cape. We have looked into the building history, building typologies, construction methods and materiality. Among these information, we have valued several important components that are worth to be preserved, for instance the curve shell roof of ammunition factory shaped the characteristic of the Cape. It is also important to beware of the spatial qualities within and around the buildings. Having all these findings, one can made his or her position to value different aspects when dealing with preserving or transforming the existing situation.


INDUSTRIAL
RESIDENTIAL
MERGE!

05 | *Design Consideration*

How can we start to design?

In the previous research, we have discovered that the Head of the Cape is a secluded spot which is hidden from inland and open from the water. Sight lines and accessibility are the reason for this seclusion. Anything is possible, it makes no sense to analyze the whole area and then immediately start to design. Hence the starting points on the next page. These starting points are basically small conclusion of the analysis and will act as a guidance in order to start with the proposal.

Notes:

5.1 Design Starting Points

We have to draft the following starting points or guidelines for the future design consideration:

1. Keep the spirit of former military industrial estate
The atmosphere of the redevelopment has to remind people the former identity of the Cape. The design can incorporate the existing monuments by revealing them to the public, emphasizing the existing structure or recreating the productive atmosphere of the past.

2. Preserve the factory typology
The saw tooth roof is one of the elements which composes the character of the place. The new design should preserve the building typology as much as possible. There can be new interpretation on materiality, however the form of the curved roof is highly suggested to be preserved.

3. Make use of the existing buildings
All existing buildings are in principle considered to be retained as they help to recall the former identity and the atmosphere of the Cape. Besides, the buildings are generally in good shape. New design can make use of the existing buildings. Yet, the bunker is now filled with water. Maintenance should be made to allow possible usage in the future.

4. Design with duality
There are already some contrasting elements presented in the Cape. The quality of duality can be the major design principle. Consideration should be given on how to incarnate duality, relativity and contrast on different levels of design, from large space to small details. New mass(es) can be added with the consideration of making use of the principles of duality.

5. Strengthen visual connection
Visual connection is very important to encourage the visitors to experience the Cape. The current entrance from Middenweg is not obvious. This lowers the visitors' awareness of the Cape. Improvement can be made to indicate the entrance of the Cape. Located next to the waterfront, the value of the site can be increased by making use of the water view. Through enhancing existing sight lines or adding new sight lines towards water, the visitors can relate the Cape with presence of water element.

6. Improve accessibility
There is a dichotomy in accessibility; intensive along the water, traffic-calmed from the inland. The accessibility from the water can be improved by activating the old pier or even making a new pier. On the other hand, in order to preserve the mysterious, secluded atmosphere of the Cape, the area should be maintain as isolate and separated from the main road and continuous car traffic. In order to make the Hembrug site part of the living environment of the Zaandam-Amsterdam urban development, the site should be made permeable to slow traffic by creating more free entrances. By doing so, the scattered pieces of land can be spatially connected. The Havenstraat can turn into a pedestrian promenade, continuous cycling or hiking trails. It makes a leisurely scenario. People can linger along the waterfront and enter the Cape freely. The accessibility, openness and transparency of the edges of Hembrug will be improved.

7. Take current users into account
Since the redevelopment already kicked off in 2014, some of the existing buildings are currently occupied by some tenants. There are also residents living in the houses along the Side Canal G since a long time ago. Some of them are even the former workers of the military production factory.

8. Bind areas with materiality or nature
For the spatial quality and uniqueness of the terrain, not only the form of buildings should be considered, but also the cohesion between buildings. The use of materials is the binding means between different architecture and distinct atmosphere, for instance the color of materials, texture and even road pavement. Greenery, trees and lawns can also be a kind

of texture, the texture of public space. Half of the Hembrug site has taken over by nature. Elements of green can be arranged and maintained the leafy atmosphere of the area.

5.2 Role of the Cape

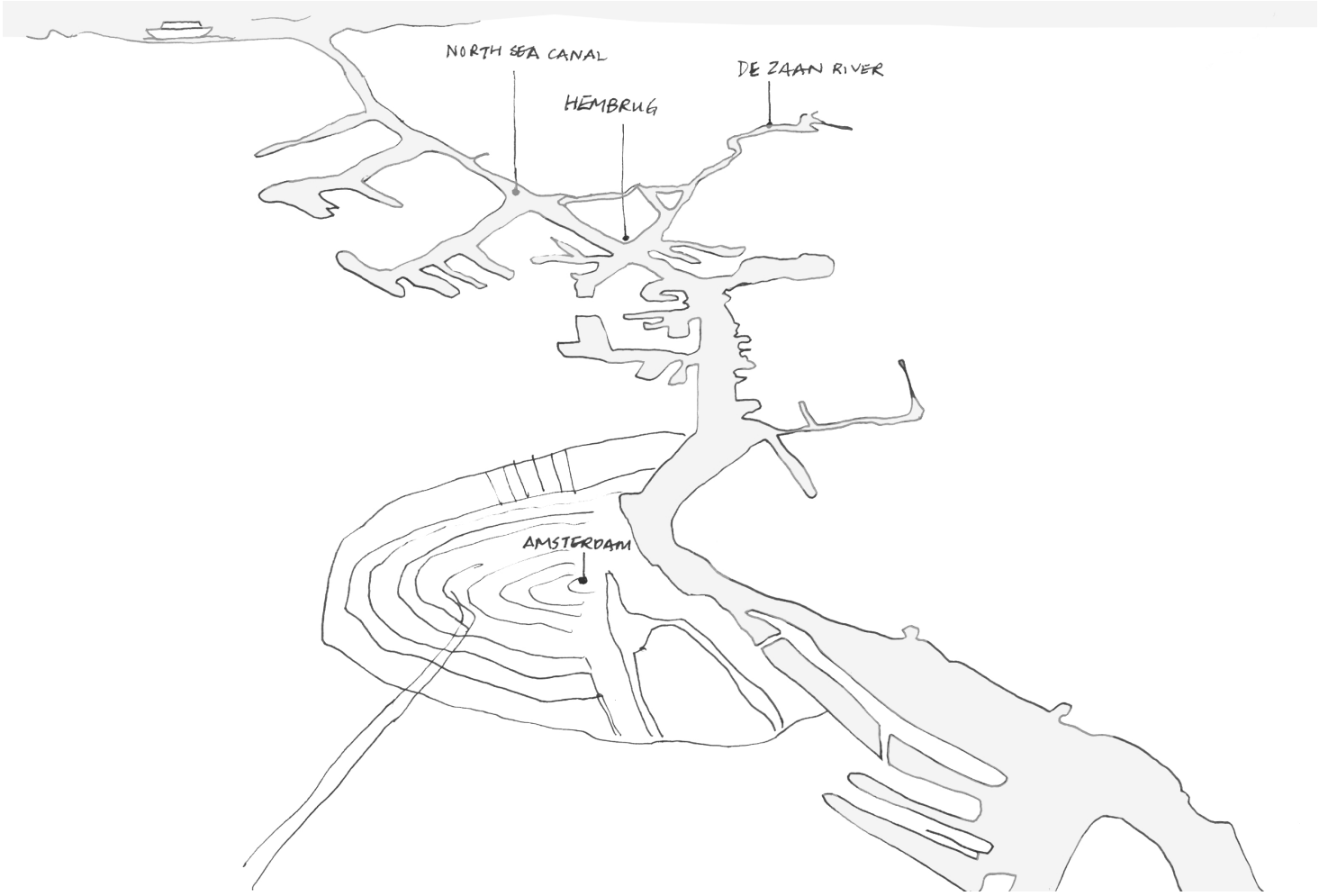


Figure 102. Perspective from Amsterdam

The Hembrug site is at the crossroads of the river Zaan, the river IJ and the North Sea Canal. Within the Zaanstad / Amsterdam metropolitan area, it is a unique green spot in the heavily fossilized industrial landscape.

Both Zaanstad and Amsterdam are expanding due to a significant pressure in the housing market. To meet such demand, it is planned by the municipality that a total of 300,000 new houses will be built by 2040. This is a huge urban development project.

To accommodate this growth, Zaanstad and Amsterdam have to be closely related. One mean is to connect the two places by miles and miles of waterfront, from river Zaan to river IJ to downtown Amsterdam along North Sea Canal.

It is undoubtedly that Hembrug will become a new landmark along the connected water. Being at the tip of Hembrug, where the river Zaan and the North Sea Canal come together, the Head of the Cape is facing towards the water with a beautiful view of the harbor.

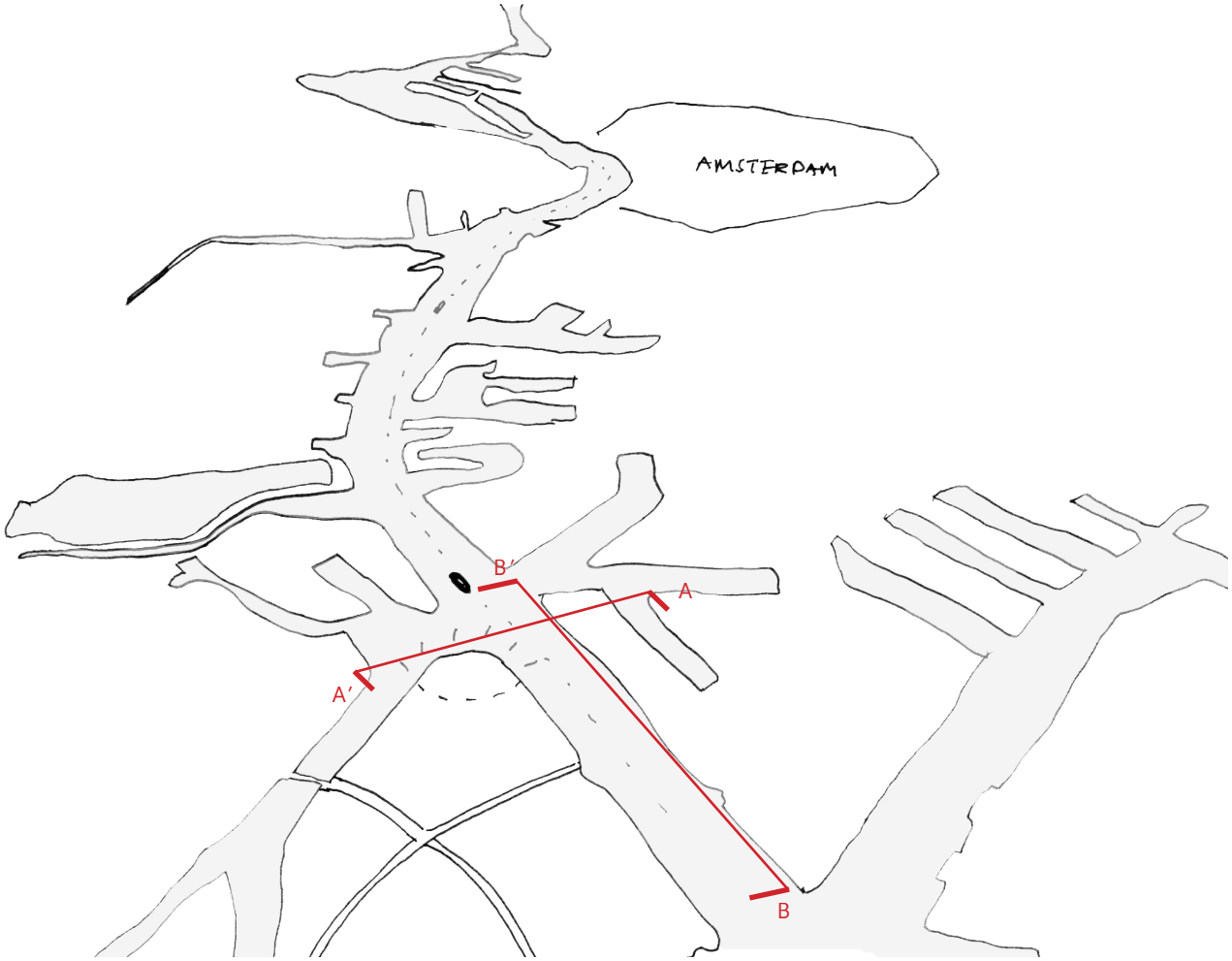


Figure 103. Perspective from Hembrug

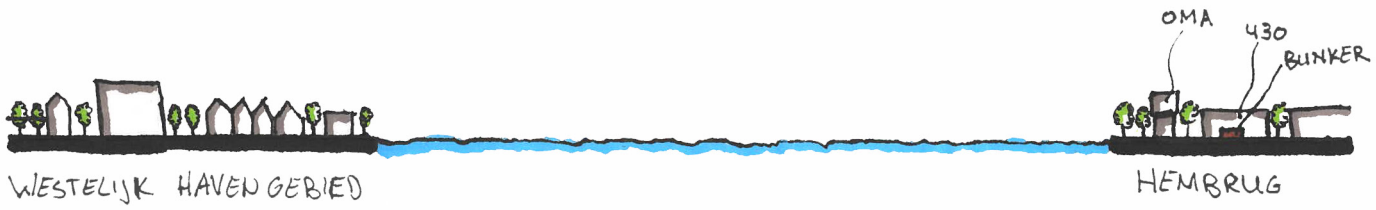


Figure 104. Section A-A'

Figure 105. Section B-B'

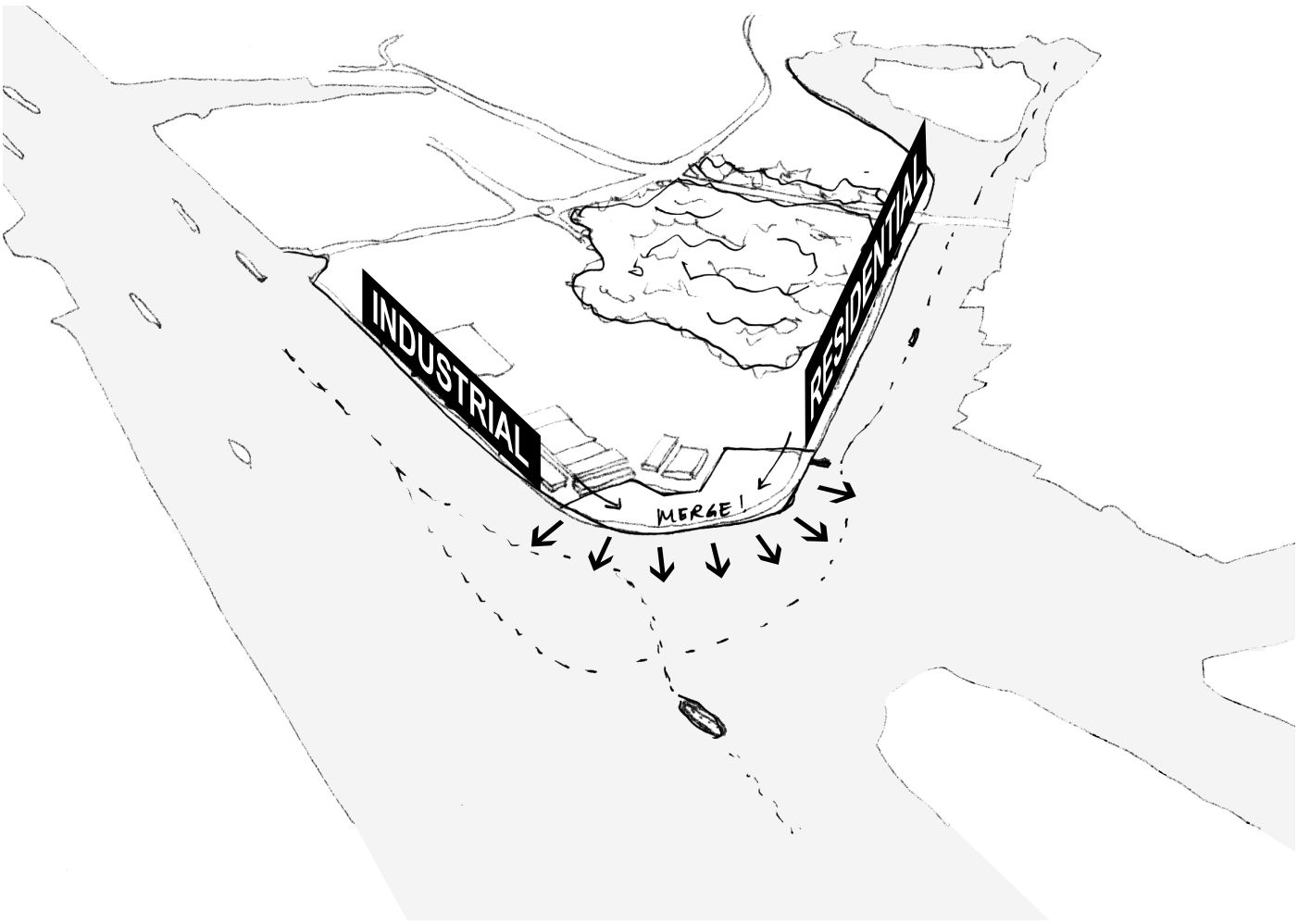


Figure 106.Industrial and residential front of the Cape, author's illustration

Role of the Cape

1. Bring together industrial and residential waterfront
2. Connect the shore and water
3. Coexist with the surrounding
4. Activate Hembrug redevelopment
5. Fulfill residential needs

Suggestions

- Common programs shared by the two areas
- Common public space
- Paths to connect the two areas
- Create sight line between shore and water
- Improve water transports
- Extend paths towards water
- Extend water into shore
- Build continuous or similar mass
- Similar materials
- Connect with the water
- Improve accessibility, function and sight line
- Accommodate housing

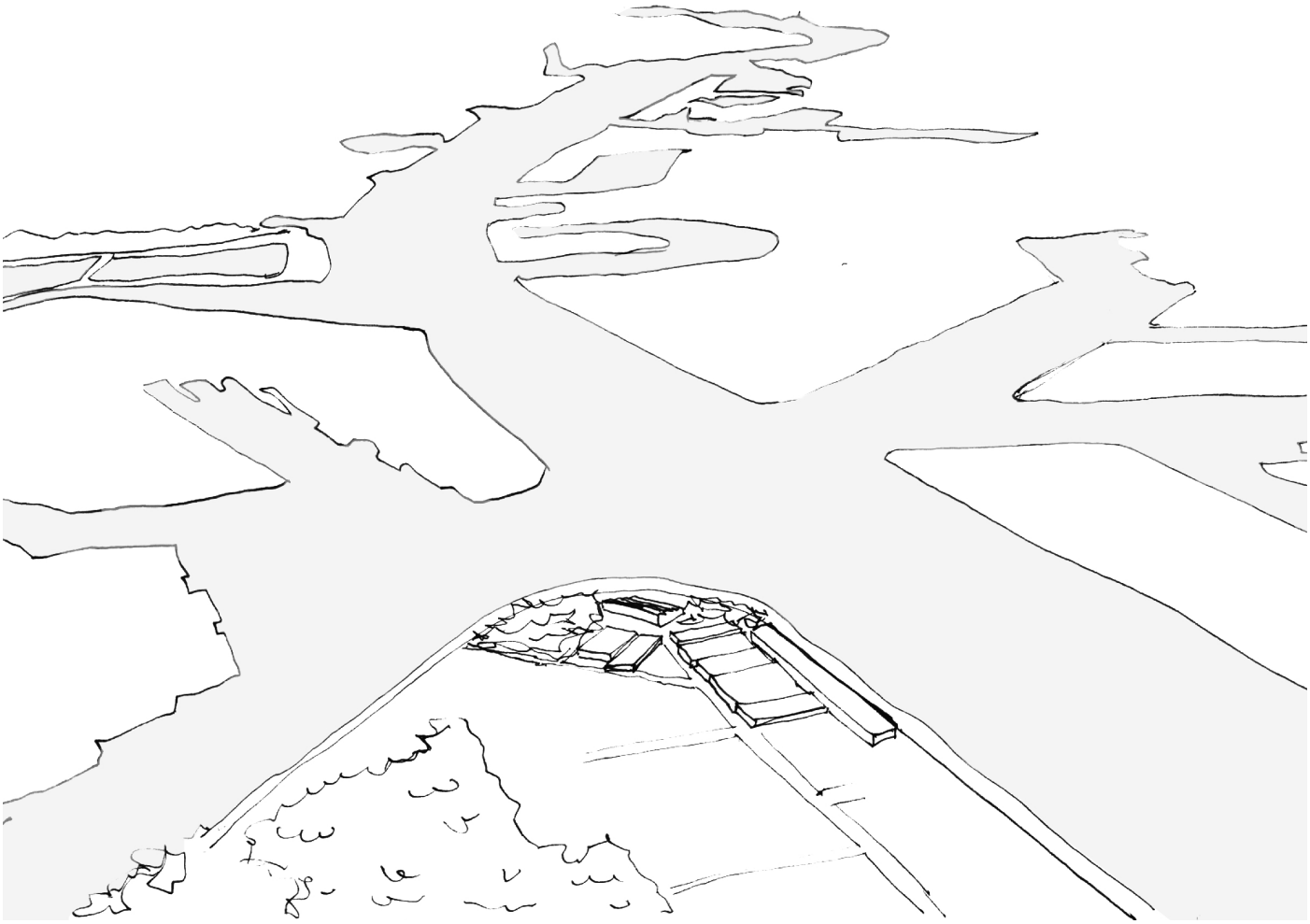


Figure 107.Atmosphere of the Cape, author's illustration

Atmosphere of the Cape

1. Half green, half built
2. Open and closed; Vibrant and peaceful
3. Public and private

Suggestions

- Extend residential area into green zone; build along North Sea Canal to fit industrial waterfront

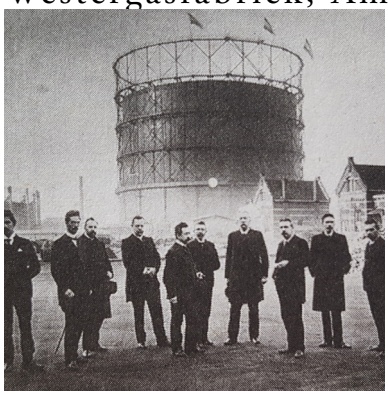
- Create an open and vibrant gesture observe from water; maintain the mysterious and tranquil atmosphere from inland

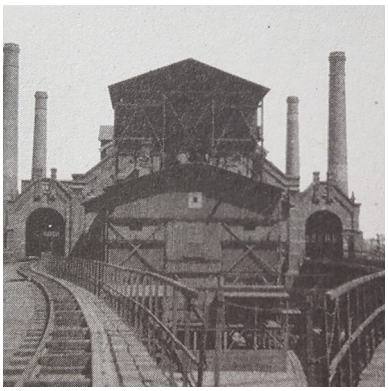
- Define public and private zones for distinct atmospheres

- Indicate public or private function by the form of the mass

5.3 Case Studies

Westergasfabriek, Amsterdam



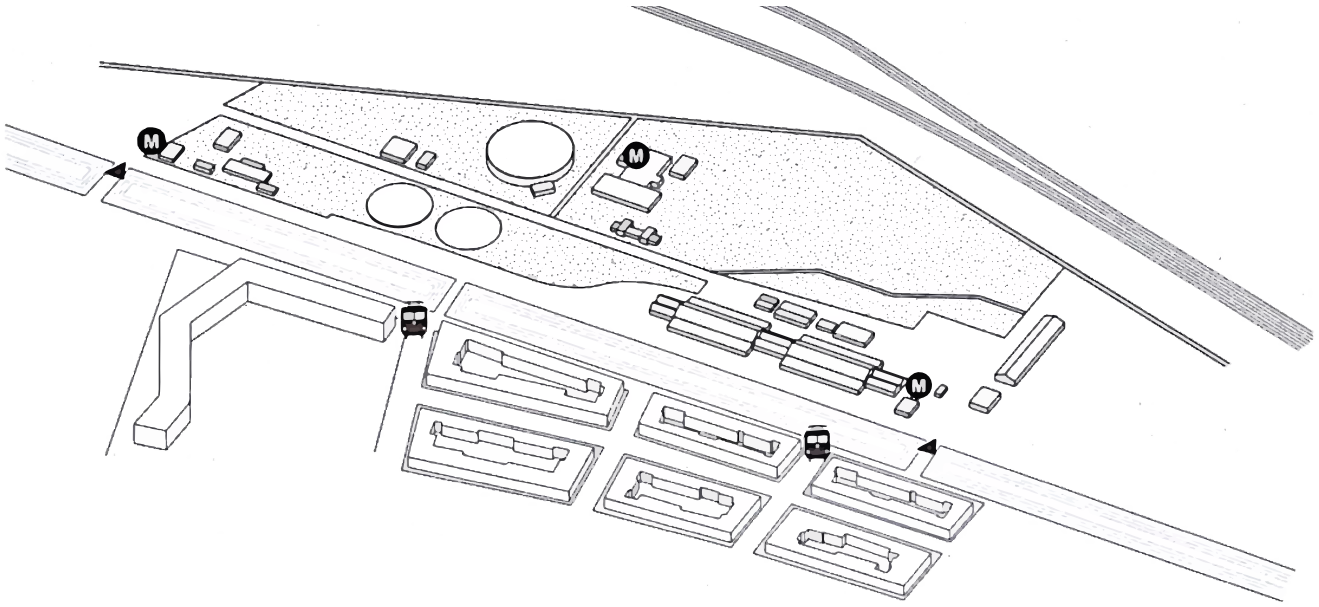


1850 1883 1900 1950 1993 2000 2003

Gas factory

Temporary cultural uses

Park, workspaces and cultural activities



Program

Gallery Leisure Museum Institutional

Catering Creative industry Cultural activities

Usage of outdoor space

Park Playground Sports

Events Leisure

Daily Life

24/7

Cultural activities

The Westergasfabriek has several functions which help to revitalize the area. The main function of this area is focused on the cultural activities. Adding events and festivals during the day, evening and night makes this area lively around the clock. The heavily polluted outdoor area was transformed into a modern park.

Size

14 ha.

Distance

C

2.5km 15min

Source: Baum, Martina, and Kees Christiaanse, eds. City As Loft : Adaptive Reuse As a Resource for Sustainable Urban Development. Zürich: ETH Zurich, 2012.

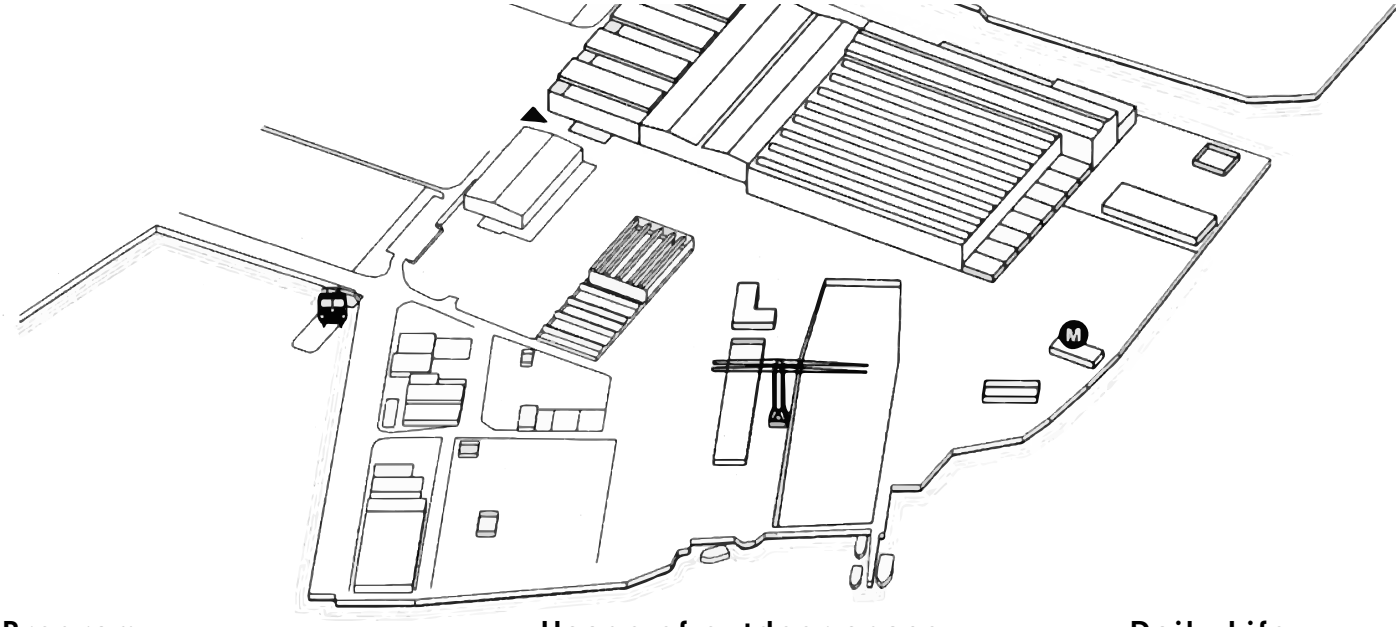
NDSM-Werf, Amsterdam

1850 1900 1950 1960 1984 2000 2002

Ship dock

Industrial companies

Artist studios, workshops, restaurants



Program

Gallery

Leisure

Creative industry

Catering

Museum

Cultural activities

Usage of outdoor space

Events

Parking

Daily Life

24/7

Breeding ground for artists

When the NDSM-Werf had a lot of vacancy, several target groups came to this area to slowly transform it. Focus of the transformation is the cultural activities. Artists, architects, skaters and theatre makers turned the area into a breeding ground for artists. A former ship dock got transformed into studios at daytime, with space for exposition, and an event venue during the night.

Size

8.6 ha.

Distance

C

2.5km

15min

Source: Baum, Martina, and Kees Christiaanse, eds. City As Loft : Adaptive Reuse As a Resource for Sustainable Urban Development. Zürich: ETH Zurich, 2012.

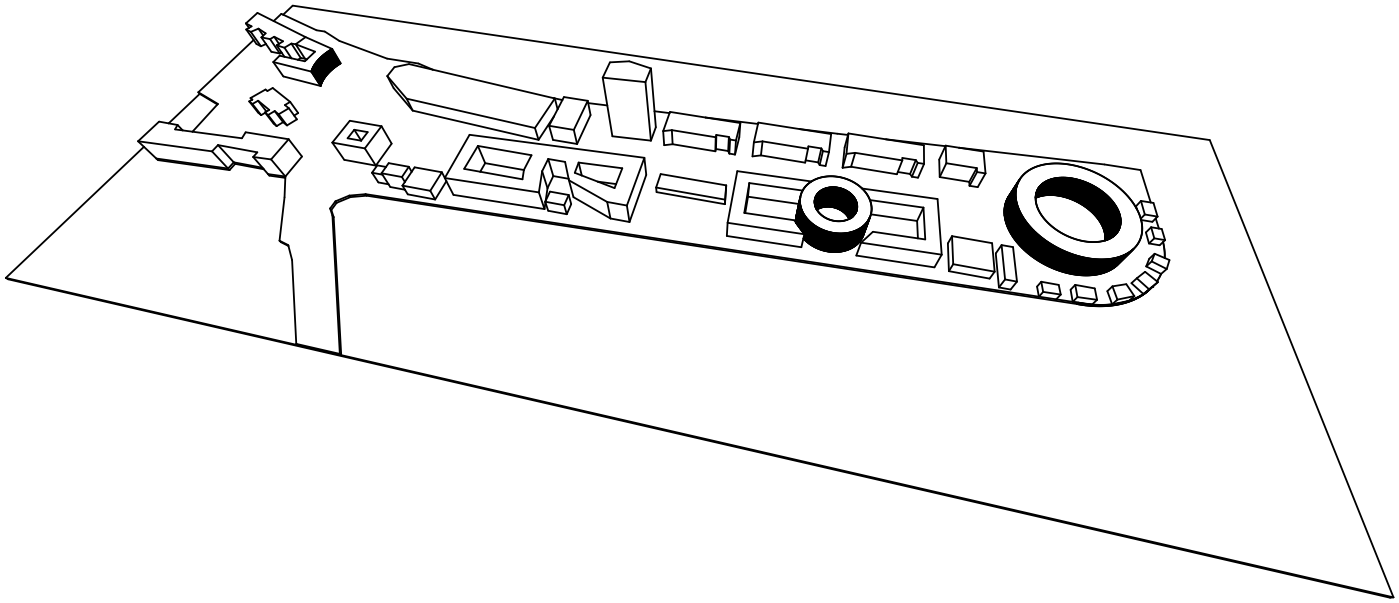
KNSM Island, Amsterdam

1850 1856 1900 1950 1977 1988 2000

Port activities

Temporary squatters

Residential area



Program

Catering Retail Housing

Usage of outdoor space

Park Playground

Daily Life

Low nightlife activity

Central axis and a landmark

The quality of the transformation of KNSM Island can be found on the central axis. In order to crown the tip of the peninsula, there's one main axis in the site. At the end of this axis is a landmark which is an eye-catcher from the water and inland. This landmark attracts visitors to the tip of the peninsula as well as activating the whole island.

Size

13 ha.

Distance

C

4.2km 13min

Source: KNSM case study, MSc.3 Heritage and Architecture, 2018-19

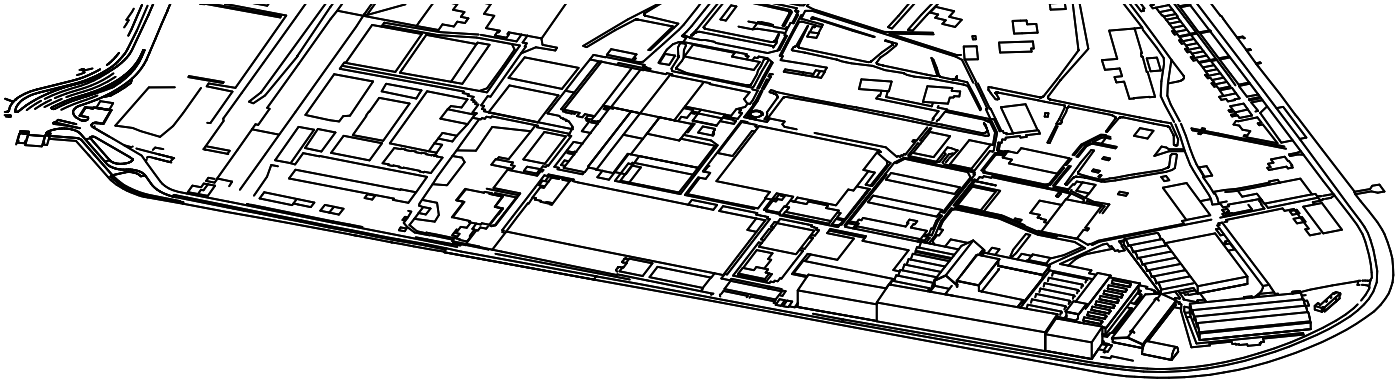
Hembrug, Zaandam

1850 1900 1924 1950 2000 2003 2018

Military terrain

Park, workspaces and space ground

Active area with a variety of functions



Possible future program

Retail Playground Leisure Creative industry Museum Sports Cultural activities Institution Prison Water activities

Program

Gallery Attraction Housing Catering Production

Usage of outdoor space

Park Events

Daily Life

Low nightlife activity

Opportunities for Hembrug

Previous projects have shown that residence makes the area more vibrant. Besides that, a landmark could attract more visitors to the cape of Hembrug. Also, the shores and greenery offers chances to make the area lively with public activities. Some cultural activities are already occurring at Hembrug. Further enhancement could improve the vibrancy of the area.

Size

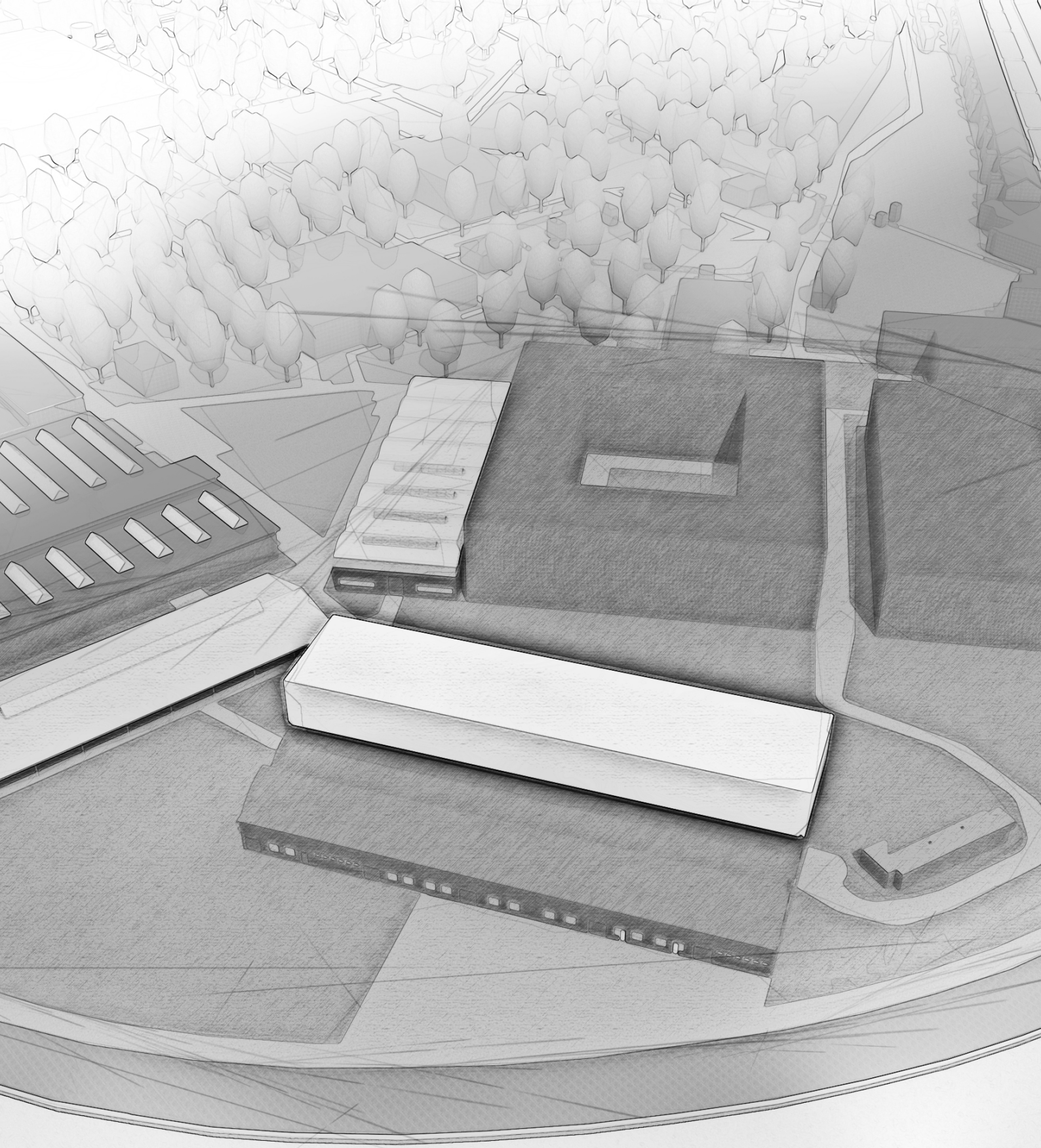
42.5 ha.

Distance

C

2.9km 9 min

Source: photos from Google images; drawings by authors



06 | *Master Plan*

Future vision

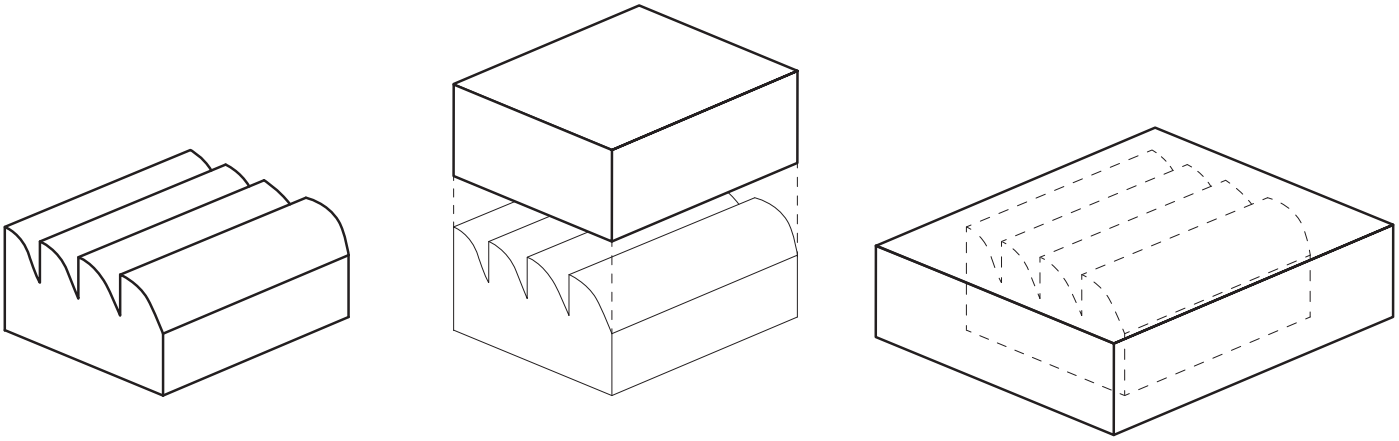
After analyzing the Head of the Cape, we come to a conclusion that the character of the Cape is composed by three elements, which are history, location and spatial quality.

Departing from the research, we can ask ourselves the following design question:

How can the history, location and spatial quality enhance the character of the Head of the Cape?

This chapter includes some ideas that we have had during the preliminary stage of designing a master plan. We tried to produce variations of master plans based on the three elements and the starting points mentioned before. By comparing the outcomes, we discovered strengths and weaknesses in each of the option. They served as inspirations for further design process.

6.1 Design Options



Minimal Changes

Add On

Reinterpretation

Figure 108. Three options for redevelopment

Pros
- Keep original building

Cons
- Limited space and height
- Limited possibilities of use and function
- Possible problems of improving sustainability

Pros
- Keep original building
- Larger space
- New icon
- High flexibility
- Add new time layer

Cons
- Tough connection with existing building
- Risk of losing original character
- Loading capacity risk

Pros
- New icon
- Highest flexibility
- Sustainable design

Cons
- Loss of original building
- Loss character of the area
- Unsustainable act of demolish

The site of Hembrug is too large and diverse to come to one definitive master plan for the whole area. Therefore, it is important to redesign the area according to its own characteristics and requirement. In brief, there are three options of redevelopment, keeping the existing building with minimal changes, adding new volume to the existing building and demolish the existing building to give way to a totally new design. The advantages and disadvantages are listed on the left.

Before choosing any of these three options, we have to know our stance. What is the objective behind the redevelopment? What does the redevelopment want to achieve?

From one of the advisory reports, it suggested to maintain as many existing buildings as possible in order to preserve the trace of the former identity. Although the past should be commemorate, one should not ignore the fact that the site is redeveloped for a new generation.

There are also possibilities to add new construction as well. New buildings will shape a new appearance of the place. These new buildings or additions can be the eye-catchers of the new era, with respect to the existing monuments and character of the site.

Minimal Changes

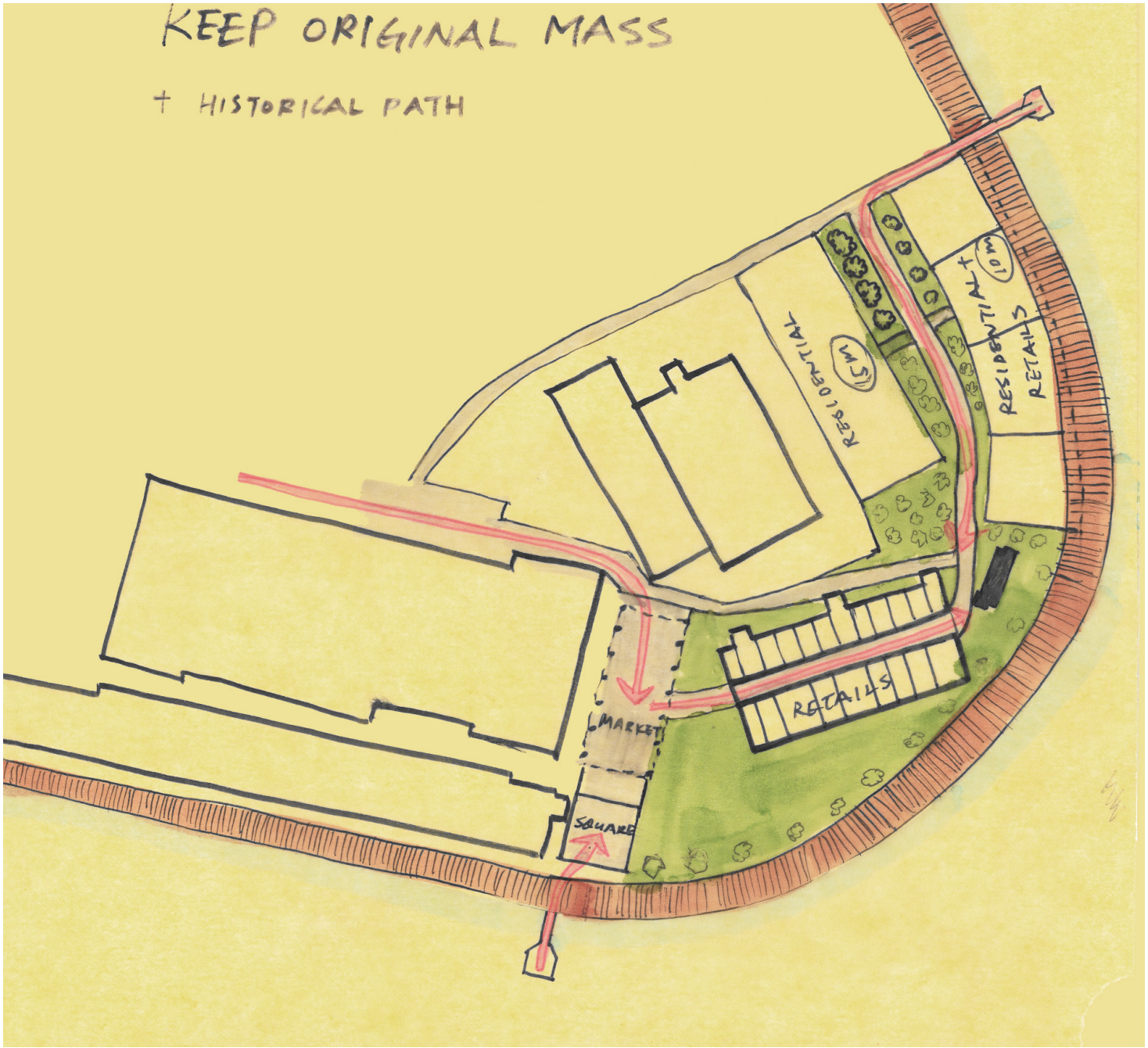


Figure 109. Sketch: Minimal changes option

Pros

- Cater residential and commercial needs
- Building facades open to water
- Improve accessibility
- Connect green space
- Link separate buildings with a historical path
- Public, vibrant the Head of the Cape and private, tranquil Cape North

Cons

- Possible problems with new pier
- Unsustainable to demolish building 429
- Lack of private outdoor space for residence

Add On Option 1

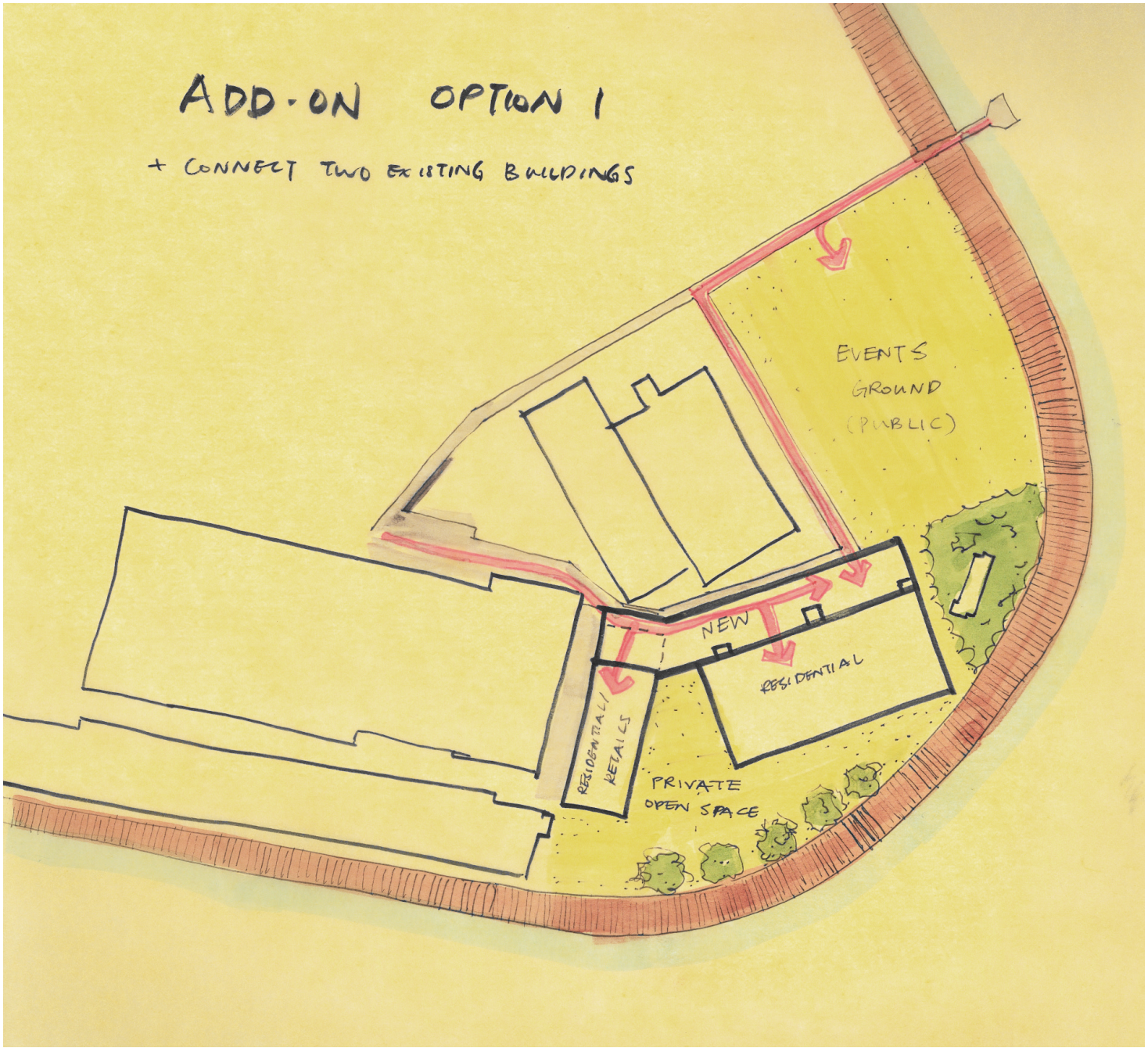


Figure 110. Sketch: Add on option 1

Pros

- Cater residential and commercial needs
- Building facades open to water
- Link separate buildings with a new mass
- Improve accessibility
- Defined green space for private and public use
- Hidden bunker

Cons

- Insufficient housing
- Have to demolish part of building 421
- Low utility rate for event ground

Add On Option 2

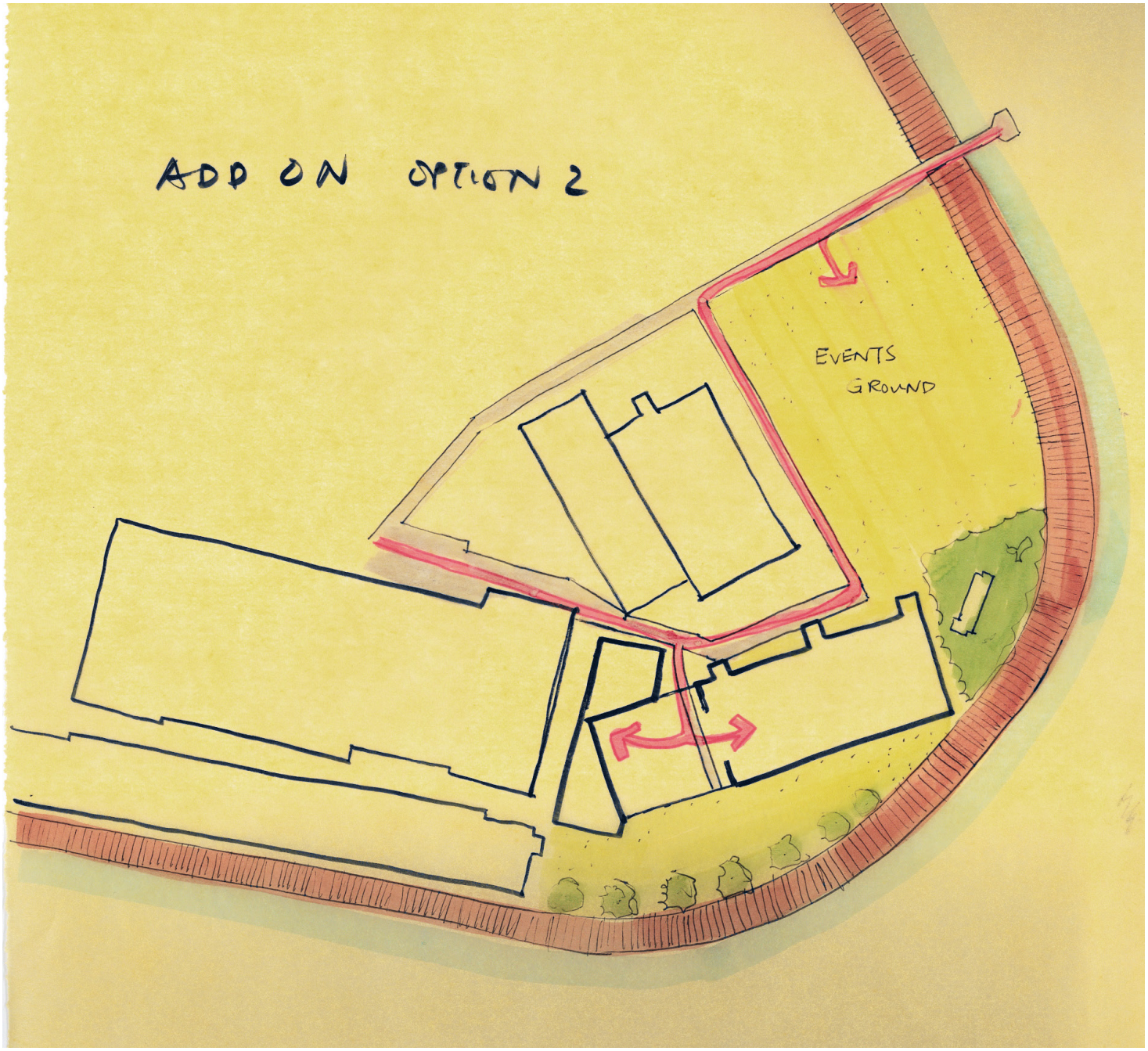


Figure 111. Sketch: Add on option 2

Pros

- Cater residential and commercial needs
- Building facades open to water
- Link separate buildings with a new mass
- Maintain mysterious character
- Defined green space for private and public use
- Hidden bunker

Cons

- Insufficient housing
- Have to demolish part of building 421
- Difficult connection details
- Low utility rate for event ground

Reinterpretation

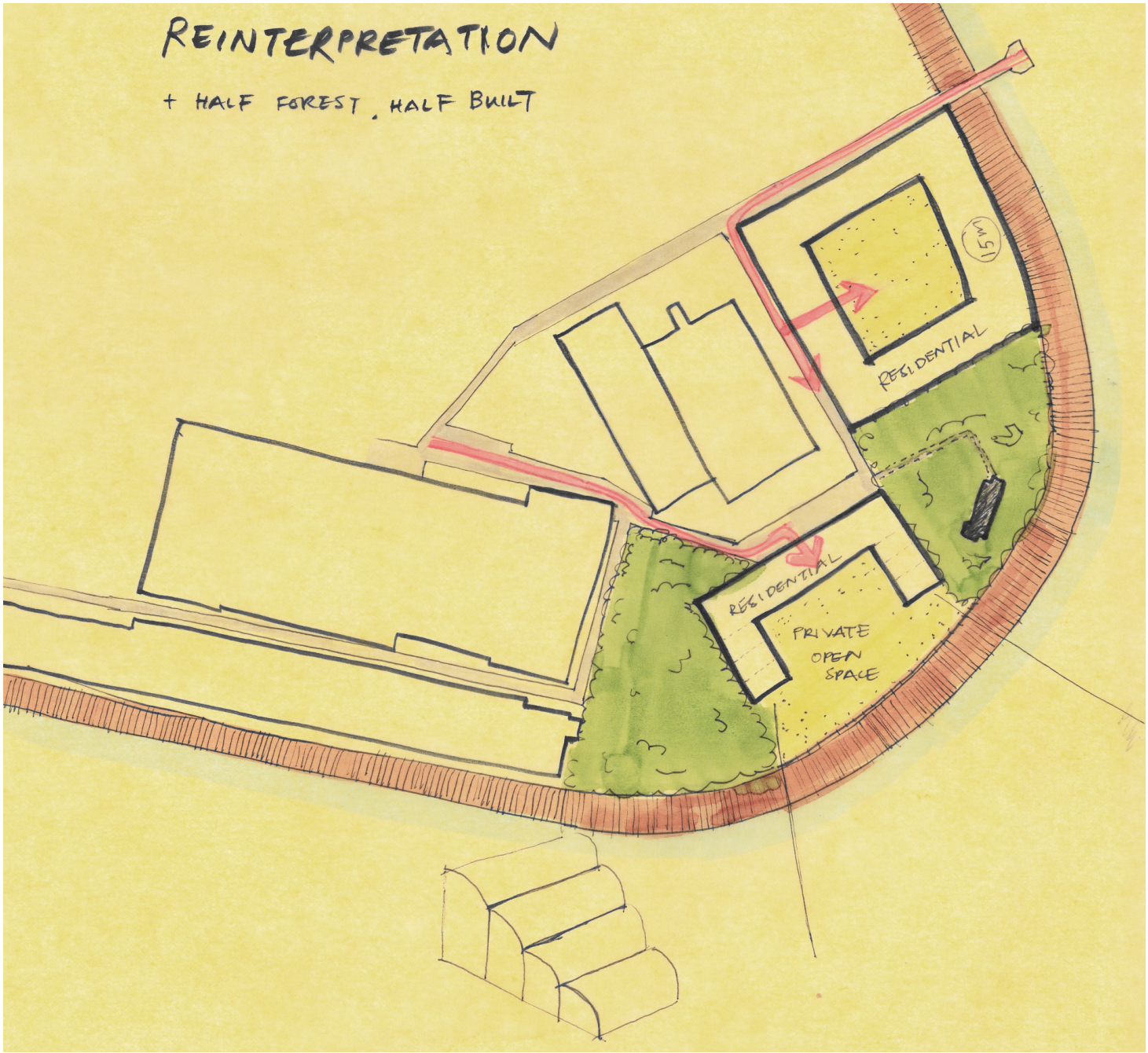


Figure 112. Sketch: reinterpretation option

Pros

- Cater residential needs
- Maintain mysterious character from inland
- Half green, half built
- Provide private outdoor area for residence
- Provide exploration for visitors to discover the bunker

Cons

- Lack of public open space
- Incompatible with OMA's design

6.2 Master Plan

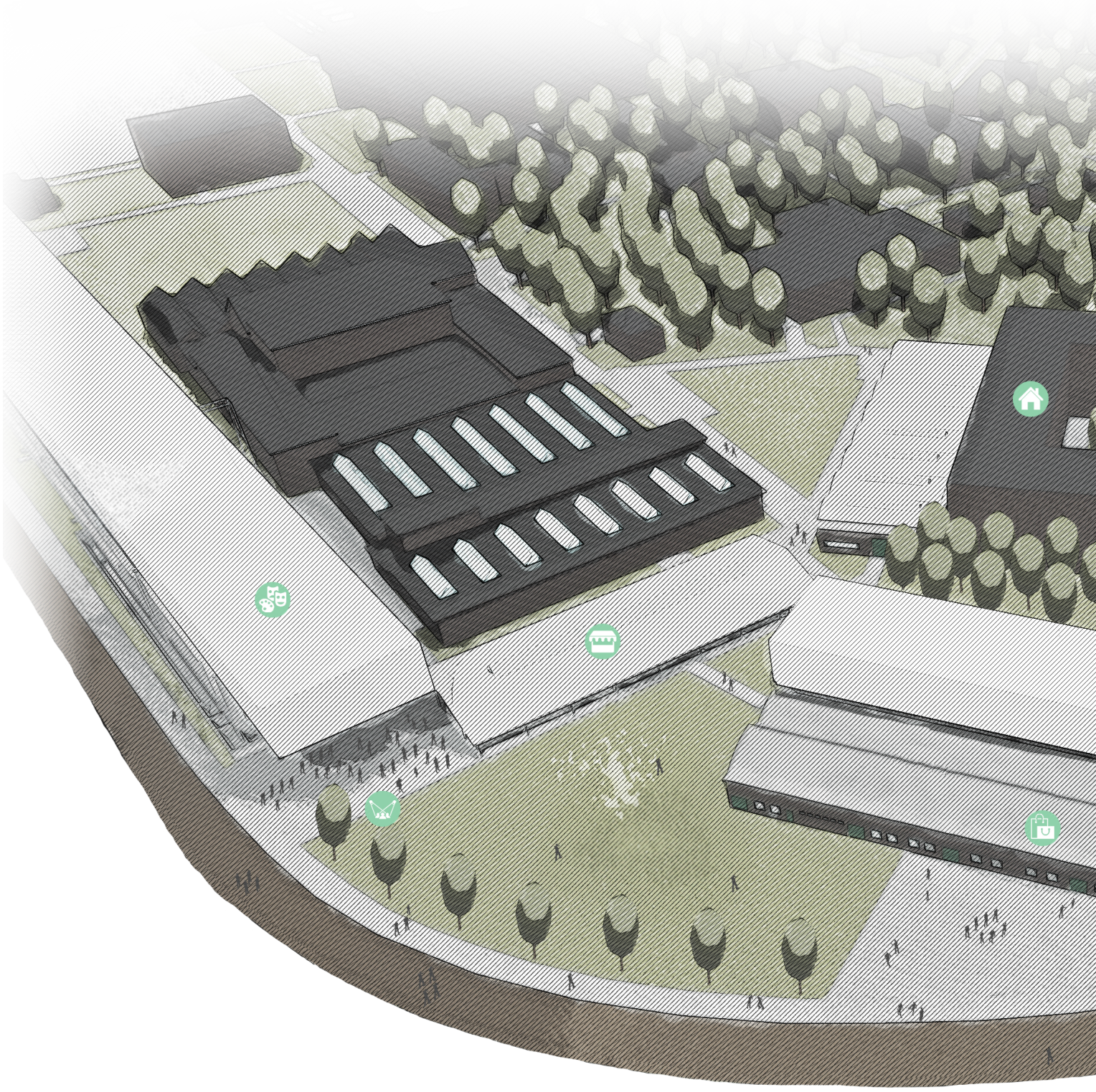
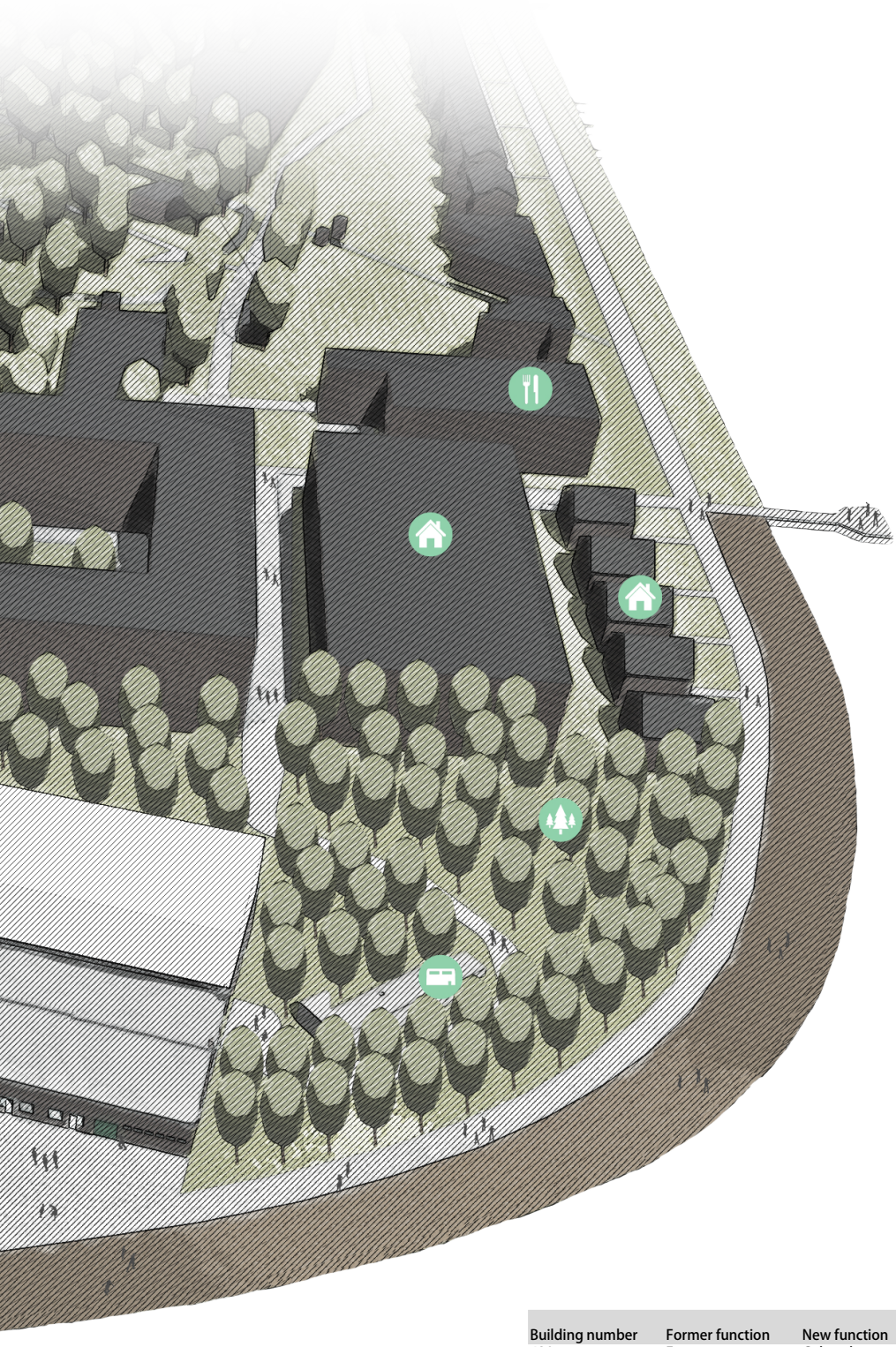


Figure 113. Proposed master plan

The current proposed master plan is a mix of two options, minimal change and add on.

The idea is to use a historical path to link up different zones of the Cape. The path starts at the market (transformed building 421) then turns into a mall (transformed building 430). The meandering path guides the visitors to the residential area.



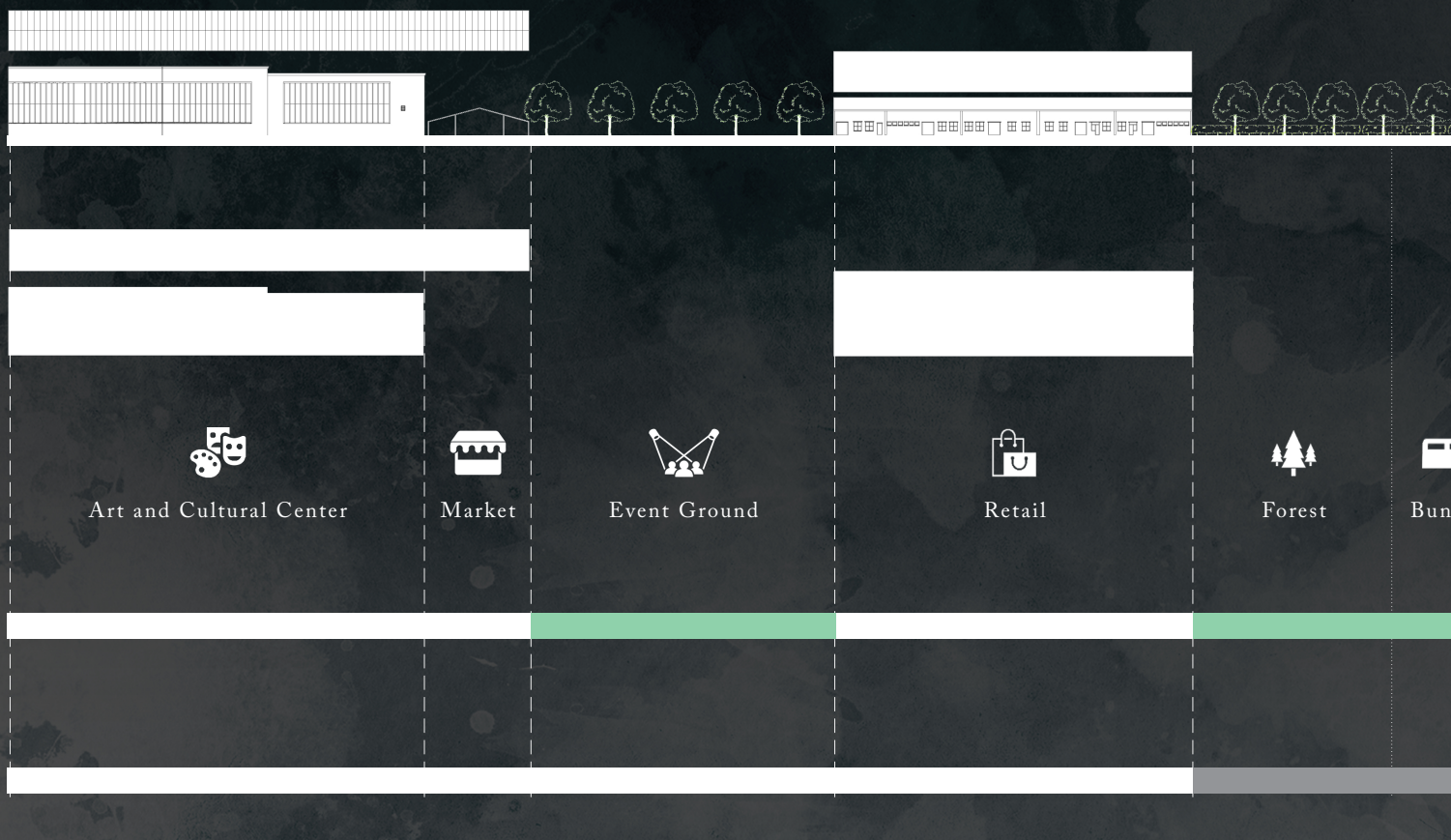
Legend:

- *Housing / Hotel*
- *Restaurant*
- *Forest*
- *Bunker*
- *Retail*
- *Market*
- *Event ground*
- *Art and cultural center*

Building number	Former function	New function	Existing mass	New mass + existing	Added GFA (%)
430	Factory	Cultural center	2369	4659	96.6652596
421	Warehouse	Market	1129	1129	0
512	Storage	Demolished	220	0	-100
511	Factory	Residence	1913	10200	433.1939362
382	Bunker	Monument	107	107	0
Empty plot	-	Hotel	0	5713	-
		Residence	0	827	-
Total			5738	22635	294.475427

Figure 114. Calculation of the percentage increase of new masses

Function of proposed master plan



In the proposed master plan, there is a well mixed of programs, turning the Cape into a self-sufficient community with its own housing, market, mall, restaurant and open space. The newly added masses fit with the existing scale of buildings, growing from small houses at the residential side into bigger masses towards the industrial area. The proposal attains the atmosphere of half built, half green environment. There is also a gradual increase of privacy along the path. The area is public and open in the beginning of the path and become more enclosed and private in the end.

Figure 115. Proposed functions distribution of the Head of the Cape

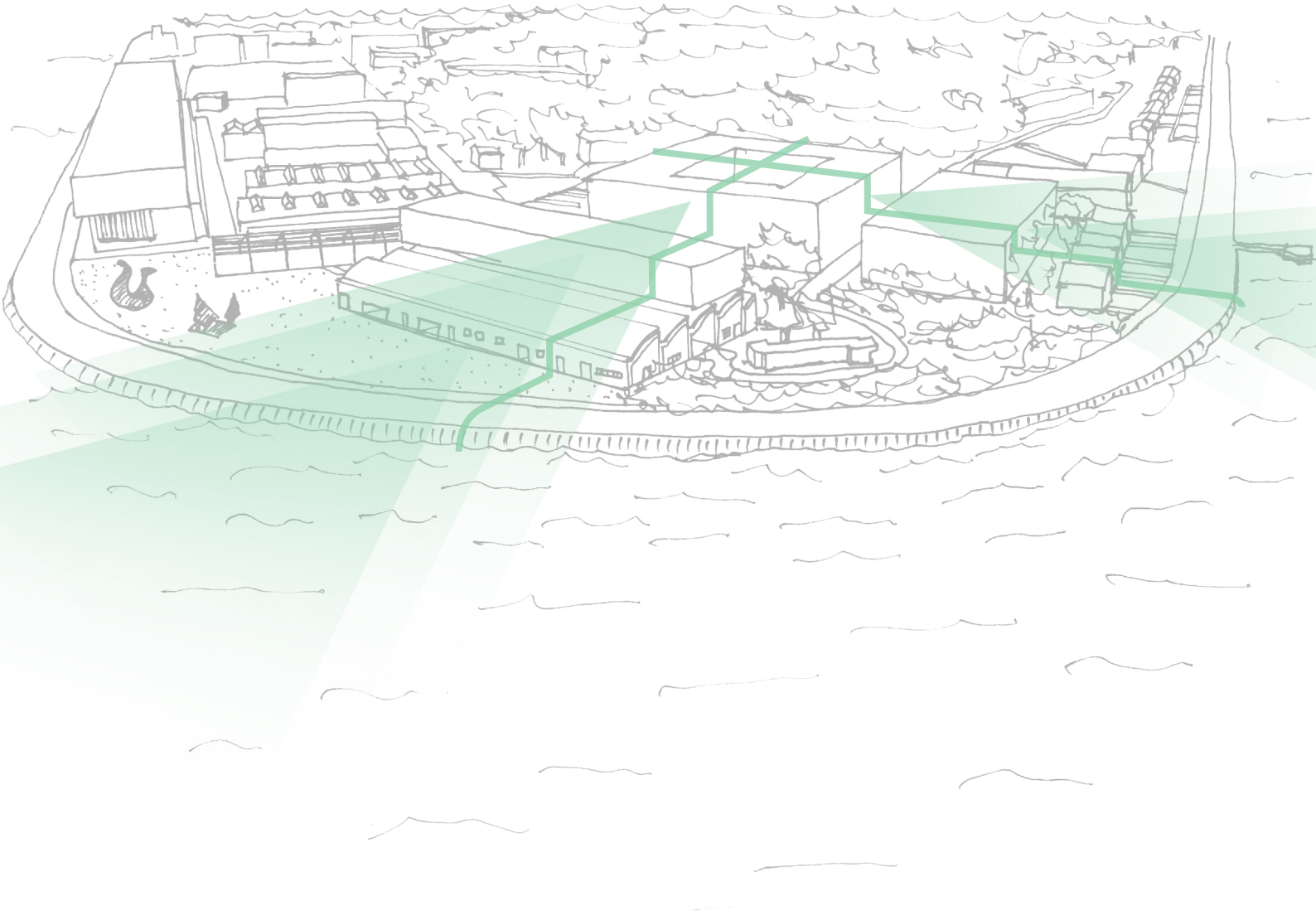


Figure 116. Sketched scenario for the overview of the Head of the Cape

6.3 Sketch Scenarios

Stepped profile of the Cape

The residential area is laid out in three layers, the villas in the first row along the waterfront, the hotel cum parking facility in the middle and a residential block at the back. The stepped profile allows more residents to enjoy the water view. There will be new add on above building 430 for extra residential units.

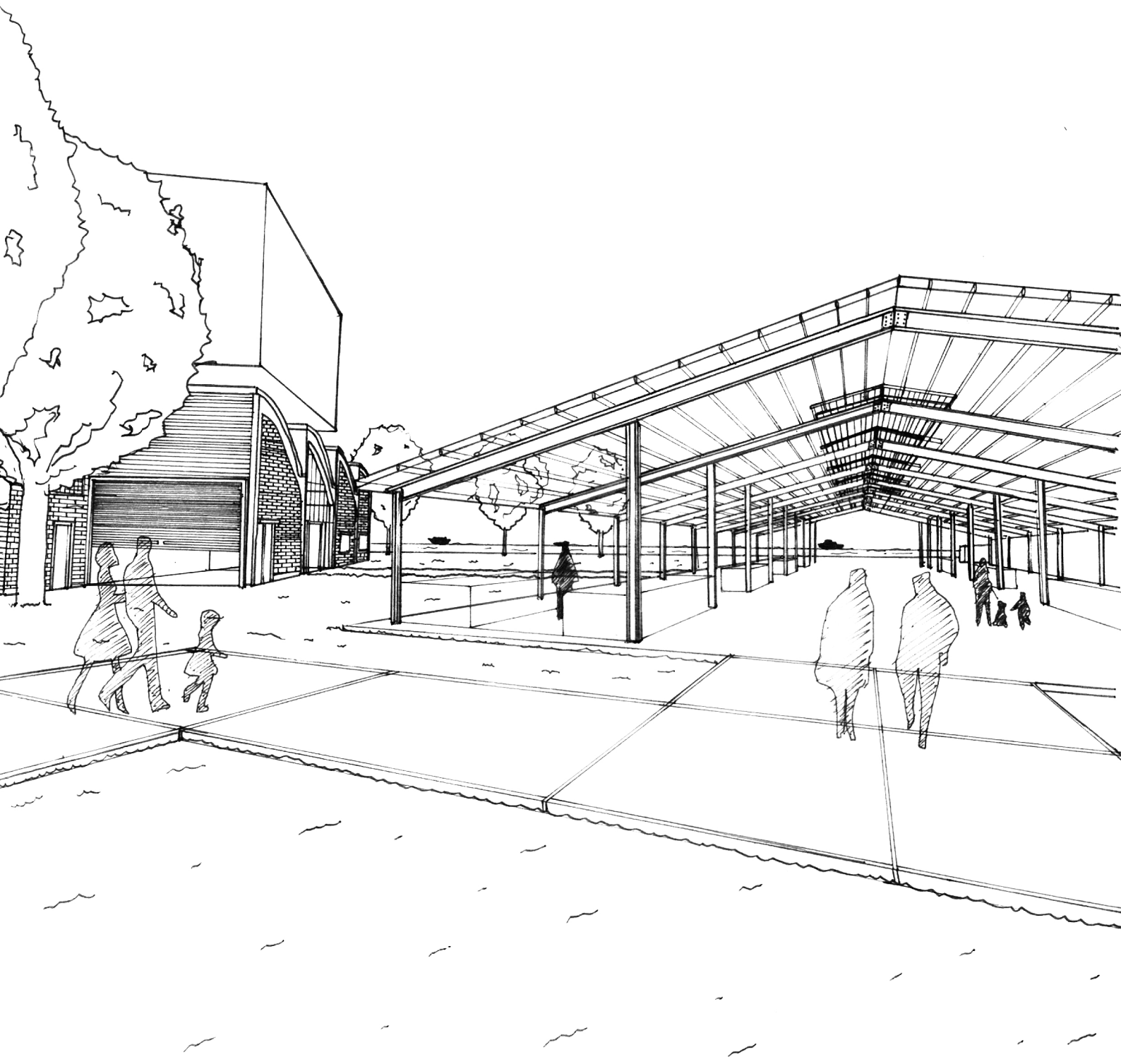


Figure 117. Sketched scenario for an open structure transformed from the projectile workshop

Open market as a welcoming entrance

This sketch shows the perspective at the end of the main road. The building 421 will be transformed into a market with an open plan. Brick facade, partition walls will be taken down to create an inviting and welcoming gesture for visitors. Only the existing steel structure will be preserved.

The market sells vegetable and fruits during day time and turns into an extended event ground for the art and cultural center (building 429) at night. The idea of the transformation is to make 421 open, transparent and flexible.

Figure 118. Sketched scenario for the interior of the ammunition factory

Visual connection of the ammunition factory and bunker

Building 430 is composed by repeated curved concrete frames, brick infill walls and four concrete roof. One can perceived the building as four consecutive long tubes. In the sketch, the building is transformed into a mall cum exhibition space. The east and west facades of one of the aisles are demolished. This creates a long corridor throughout the building. The visitors can see the bunker surrounded by woods at the end of the corridor.

07 | *Conclusion*

What's next...?

7.1 Self Positioning

After analyzing the Cape, we have an idea about the location and history of Hembrug and the Head of the Cape. Being a former military terrain, it still has an industrial character despite its vacancy since 2003. The Head of the Cape was not developed as an intensive production area, it carries a sense of tranquility and mystery. To answer the research question - what composes the character of the Head of the Cape - we have learned that its character is defined by three elements, including the history, the location and the spatial quality.

For the history, the Cape bears traces of the former military industrial identity, which is manifested through the national monument (the Commander bunker), as well as the typical curved shell roof ammunition factory. Despite the long history of the site, one can also consider to add a new time layer to the existing condition. The orchestration between old and new pays tribute to the origin of Hembrug. The original structures and materials are useful elements to illustrate the history.

For the location, being in the mid way of the metropolitan cities, Zaandam and Amsterdam, Hembrug is a special green spot in the heavily fossilized industrial landscape. The Head of the Cape will be an important facet of Hembrug when perceived from the canal which should be taken into consideration when designing for the future. Meanwhile, it remains secluded from the inland. However, the current situation is not ideal as the road junction becomes narrower from the main road (Middenweg), together with the fence erected around the Cape, thus the accessibility is not optimal at the moment.

For the spatial quality, the off grid character pops out when one compares the Cape with its surrounding plots. Due to the same reason, unique framed spaces are generated as a result of the composition of buildings. These spaces provide another spatial experience when compare to the prevailing industrial atmosphere of Hembrug terrain. These spatial qualities contain high cultural value.

The research question points out the answer of the three aspects that one have to pay attention during design. Together, they define our position towards the transformation of the Head of the Cape. Emphasis should be placed on history, location and spatial quality. Yet, individual interpretation of the balancing among three aspects can result in different transformation processes and outcomes.

08 | *Appendix*

8.1 Five Elements of Kevin Lynch

According to Kevin Lynch there seems to be a public image of any given area which is the overlap of many individual images. Perhaps there is a series of public images, each held by some significant number of citizens. These images are needed if one wants to operate successfully in his environment and to cooperate with other individuals. Each individual image is unique, yet it approximates the public image, in different environments. The contents of the city images are referring to physical forms. These forms can be classified into five types of elements: paths, edges, districts, nodes and landmarks.

Paths are the channels along which the observer moves. They may be streets, bridges, transit lines, canals or railroads. These are the predominant elements in their image. People observe the city while moving through it, and along these paths the other environmental elements are arranged and related.
The image changes during the movement through the city.

Edges are the linear elements that aren't classified as paths by the observer. They are the border between two faces, linear breaks in continuity such as: shores, railroad cuts, edges of development and walls. Such edges may be barriers which creates a distinction between two different regions. These edge elements, although probably not as dominant as paths, are for many people important organizing features, particularly in the role of holding together generalized areas, as in the outline of a city by water or wall.

Districts are the medium-to-large sections of the city which the observer mentally enters "inside of", and which are recognizable as having some common, identifying character. Most people structure their city to some extent in this way, with individual differences as to whether paths or districts are the dominant elements.

Nodes are strategic spots in the area which an observer can enter and observe where he or she is traveling. They may be primarily junctions, places of a break in transportation, a crossing or convergence of paths, moments of shift from one structure to another. Or the nodes may be simply concentrations, which gain their importance from being the condensation of some use or physical character, as a street-corner hangout or an enclosed square.

Landmarks are the fifth element. They are usually simply defined physical objects: building, sign, store, or mountain. Some landmarks are distant ones, typically seen from many angles and distances, over the tops of smaller elements, and used as radial references.

After discussing the five elements proposed by Lynch, we tried to apply them to analyze the existing situation of the Cape.

Paths
In Cape South, paths are limited. The fences seal the site, it is important to make it more open, accessible and transparent. This can be achieved by improving sight lines. Visitors must be able to observe the environment while moving along the paths.

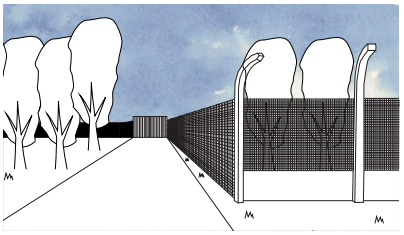


Figure 119. Paths

Edges
The ensemble of the Cape has very clear edges since it is surrounded by water and fence. The Cape is currently inaccessible so there is possibility to open it up.

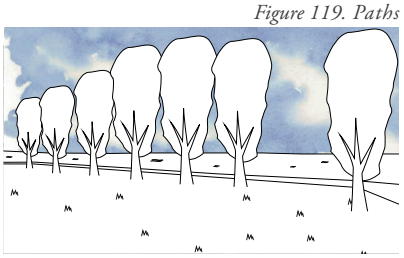


Figure 120. Edges

District
As mentioned before, Cape South is a hidden enclosed space. It can be experienced as a district which the pedestrians can enter mentally and physically. It is an unique spot where someone has to discover. It is important to keep this quality for future transformation.

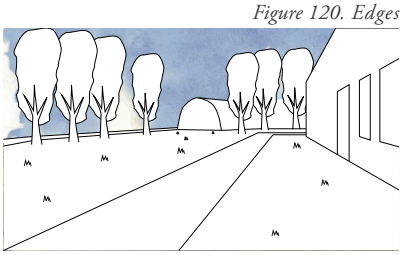


Figure 121.Districts

Nodes
There are a few spots in the Cape which lead to movement from one place to another. Once the visitor goes around the corner, he or she will discover a completely new scenario beyond his or her imagination. These experience are valuable. However, it is important to drop some hints for orientation.

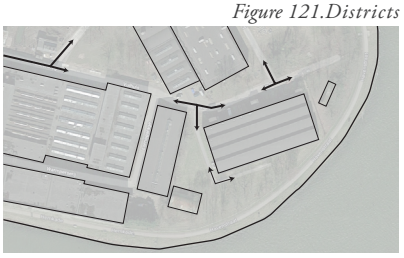


Figure 122. Nodes

Landmarks
In Cape South, having a landmark or not is a controversial topic. In terms of a larger scale, a landmark at the tip of Hembrug allows the area to be noticed from afar. Yet, from a local perspective, the area is hidden. Interventions can be done by incorporating smaller features such as door knobs, green posts or other urban details. A decision has to be made between creating a recognizable landmark and keeping the hidden character.

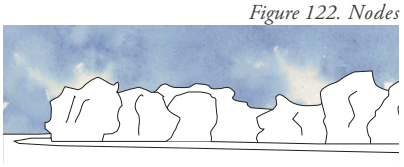


Figure 124. Current image of the Cape

Comparing the Head of the Cape with the five point, proposed by Kevin Lynch, it is clear that some elements are present. The edge and district are clearly noticeable in the ensemble. This means that the area is secluded and hidden from the inland, while being open from the water. However, due to the borders, the accessibility is low. That means that applying the theory of Kevin Lynch on the Head of the Cape resulted in having the insight of the lacking capabilities of the accessibility. The node and landmark element aren't strong visible within the ensemble, which means that building 430 isn't making a big gesture. There are a lot of possibilities but decision has to be made whether the area should be an access point with a distinctive landmark or it should stay as a hidden spot.

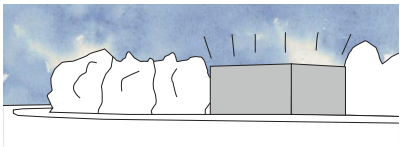


Figure 123. The Cape with a landmark

8.2 Value Matrix

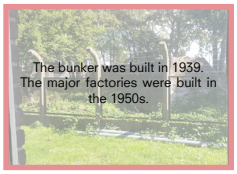
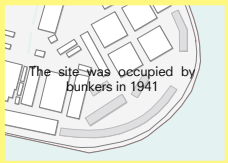
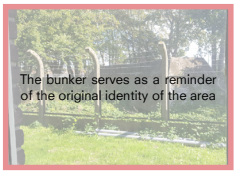
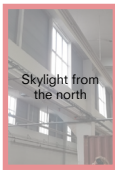
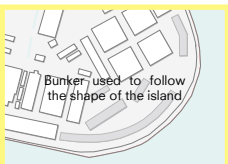
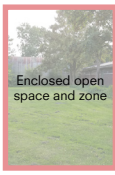
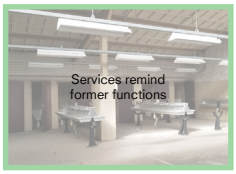
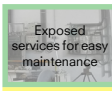
	AGE VALUE	HISTORICAL VALUE	INTENTIONAL COMMEMORATIVE VALUE	NON-INTENTIONAL COMMEMORATIVE VALUE	USE VALUE
SURROUNDINGS / SETTINGS	 Dredging depot of De Hem transformed into Hembrug terrain	 Former military ammunition site		 A closed society for workers	 Military defense  Water for transport
SITE	 The bunker was built in 1939. The major factories were built in the 1950s.	 The site was occupied by bunkers in 1941		 The bunker serves as a reminder of the original identity of the area	 Former ammunition assembly factory, storage and fire brigade  Not accessible Fenced off
SKIN (EXTERIOR)	 Original facade	 Typical Dutch brickwork		 Typical typology for that period	 Skylight from the north  Defensive use of the bunker  Large door for logistics
STRUCTURE	 Original structure	 Structure as architectural element		 Typical typology for that period	 Defensive use of bunker against air bomb  Steel construction for building 421
SPACE PLAN		 Bunker used to follow the shape of the island			 Enclosed open space and zone  Continuous interior  Grid columns
SURFACE (INTERIOR)		 Exposed structure			 Different material surfaces for different functions
SERVICES	 Original lights, heater and washing basins	 Services remind former functions		 Services remind former functions	 Exposed services for easy maintenance  Insulation  Former washing room, garage and fire brigade
STUFF	 Old fire truck	 Old fire truck			
SPIRIT OF PLACE		 Sense of productivity			

Figure 125. Value Assessment Matrix

Knowing that a heritage can embody a lot of different values, it is very crucial to list out all of them that we value the most. By doing this we can make sure no values will be lost during the design phase.

On the vertical column of the matrix, all building element are divided according to different building layers as described by Stuart Brand. We added a 9th one in order to implement the spirit of the place or the experience in the matrix as well.

In the horizontal column we listed out all the value that the buildings possibly embody according to our observation and previous research.

The red color indicates things that have high value to us. Yellow means the evaluated item is indifferent to our consideration. Green color stands for least value or even negative value.

Source:
Kuipers, Marieke, and W. De Jonge. Designing from Heritage: Strategies for Conservation and Conversion. Delft: TU Delft - Heritage & Architecture, 2017.

8.3 Weather Condition

The Head of the Cape is located at the Southeast of the Hembrug terrain. Without tall buildings or forest in the waterfront, the area enjoys abundant of daylight in both summer and winter. The diagram on the left shows the sun paths on Summer solstice (21 June) and Winter solstice (21 December) respectively.

The wind rose diagram for Hembrug shows how many hours per year the wind blows from the indicated direction.

Example SW: Wind is blowing from South-West (SW) to North-East (NE). The strong Southwest-wind makes crossings from East to West along IJ River very difficult especially for sailing boats.

Both the intensity and amount of wind are very mild in the Head of the Cape. The speed of the Southeast wind is mostly between 5-19km/h. It only blows for around 250 hours per year.

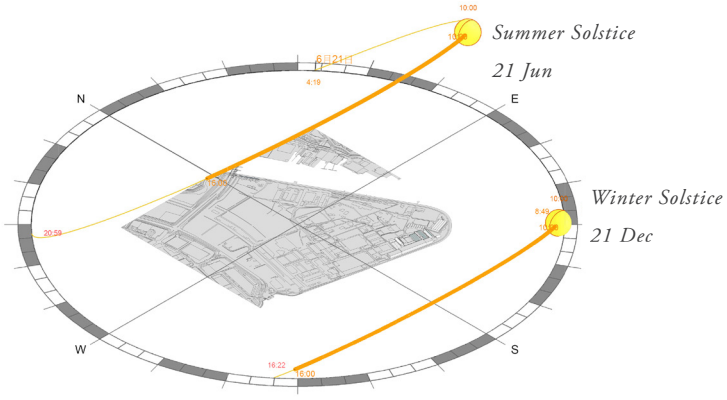


Figure 126. Sun path diagram

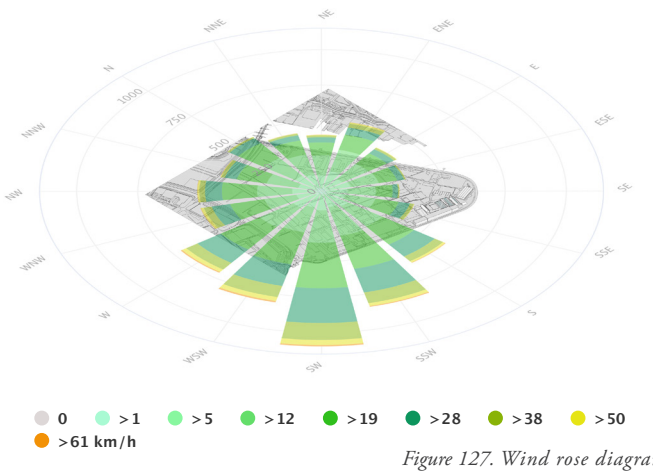


Figure 127. Wind rose diagram

8.4 Model Photos

Existing situation

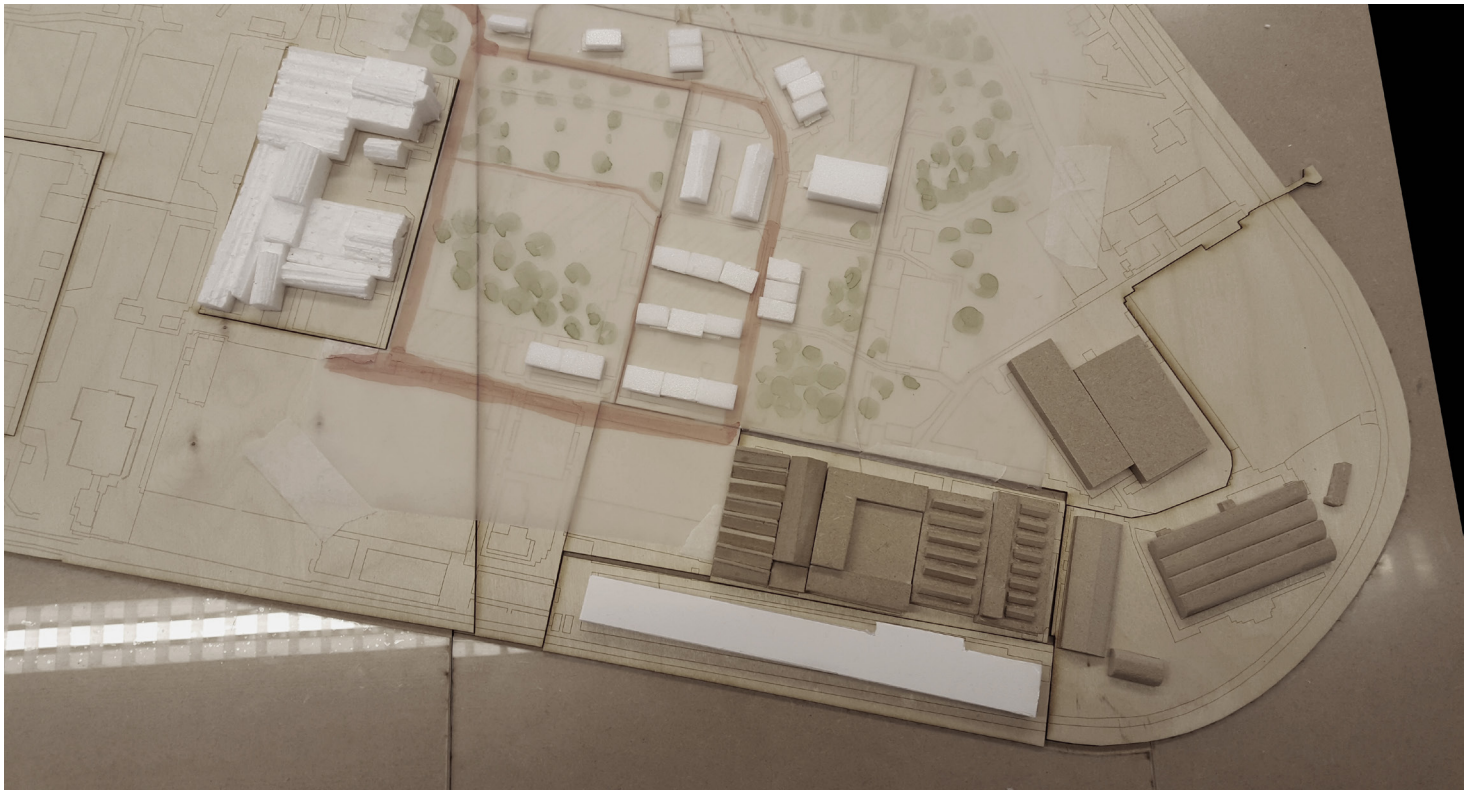


Figure 128. 1:1000 site model

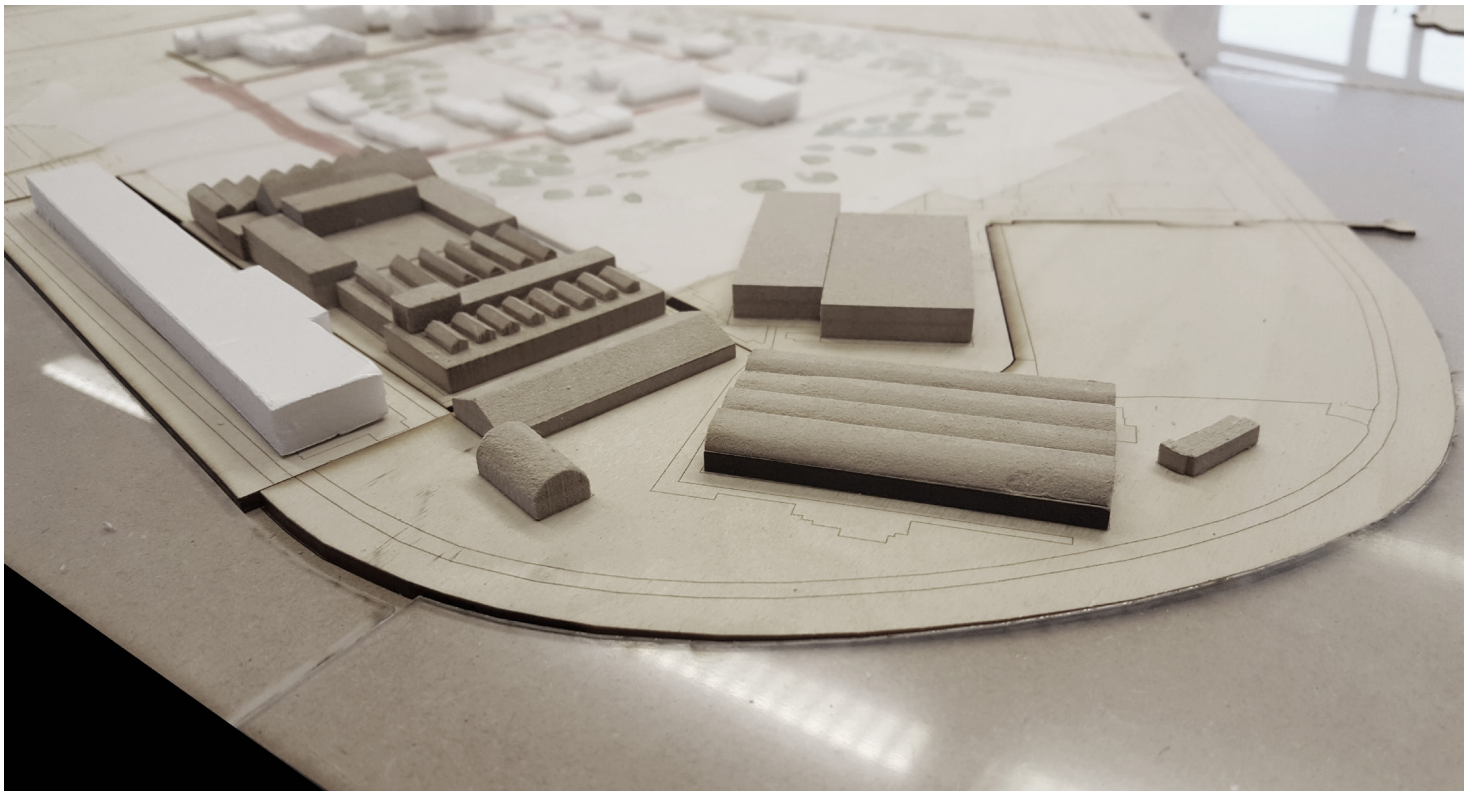


Figure 129. 1:1000 site model

Proposed situation

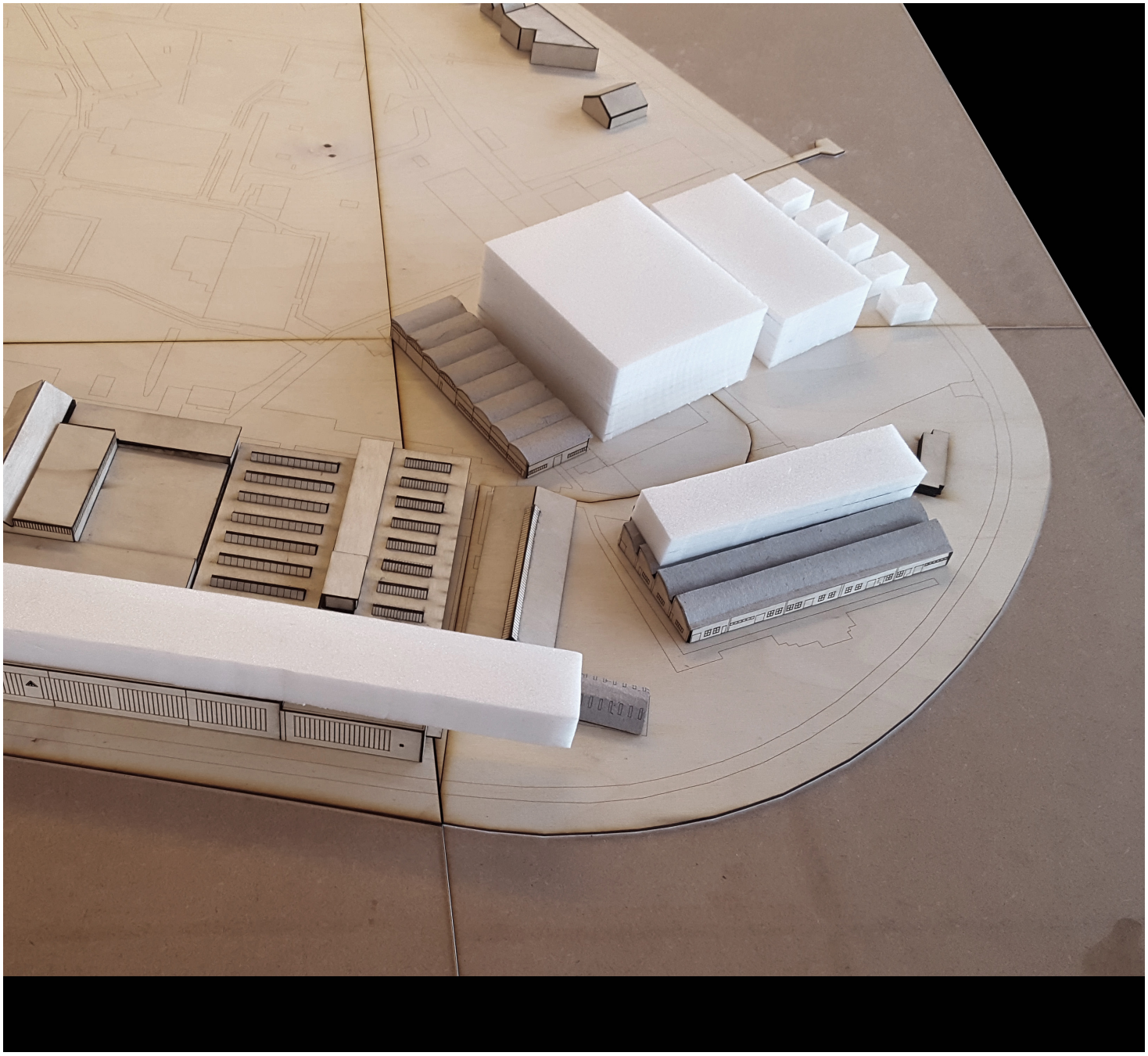


Figure 130. 1:500 model

Existing situation

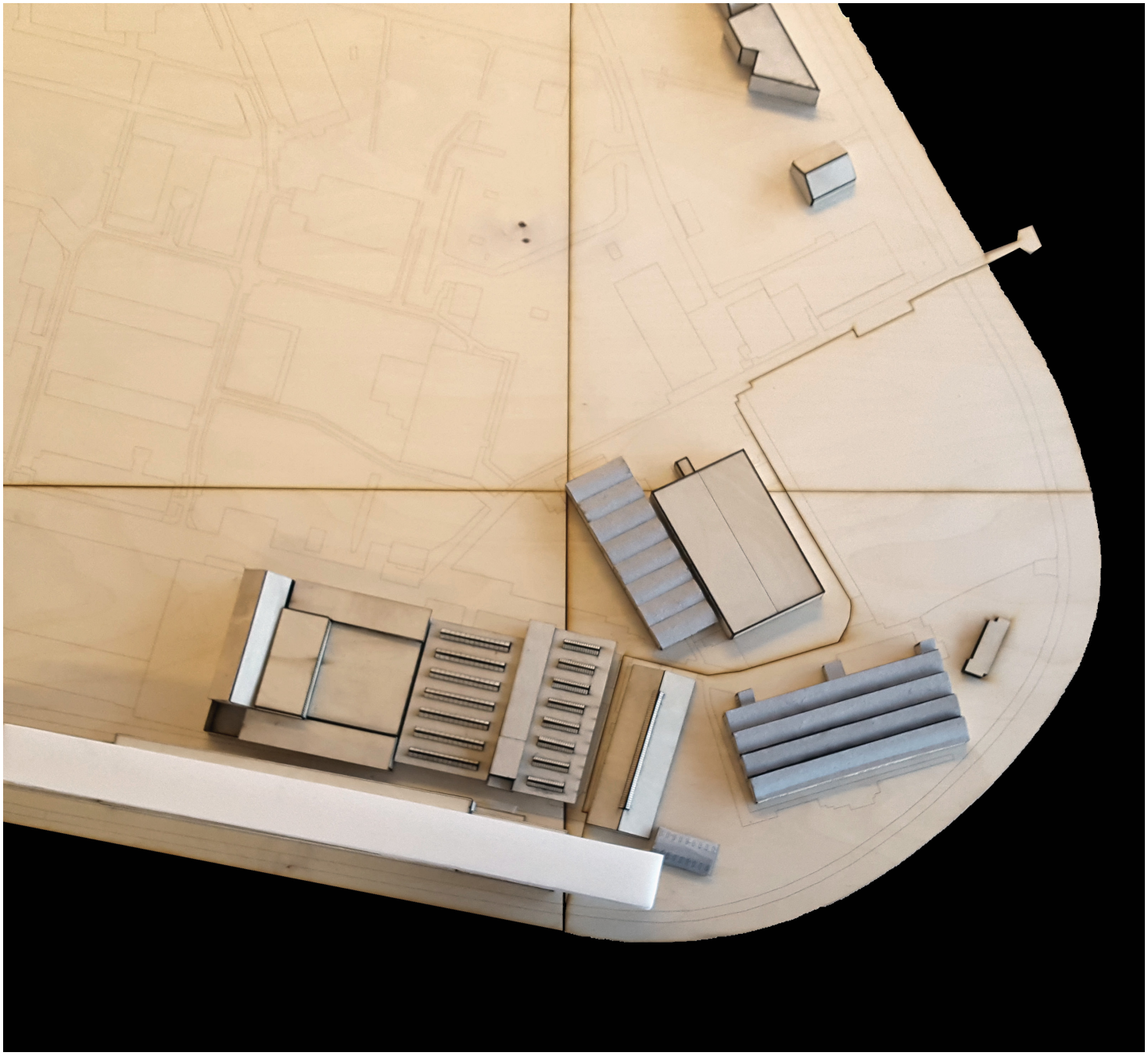


Figure 131. 1:500 model, existing condition

Proposed situation

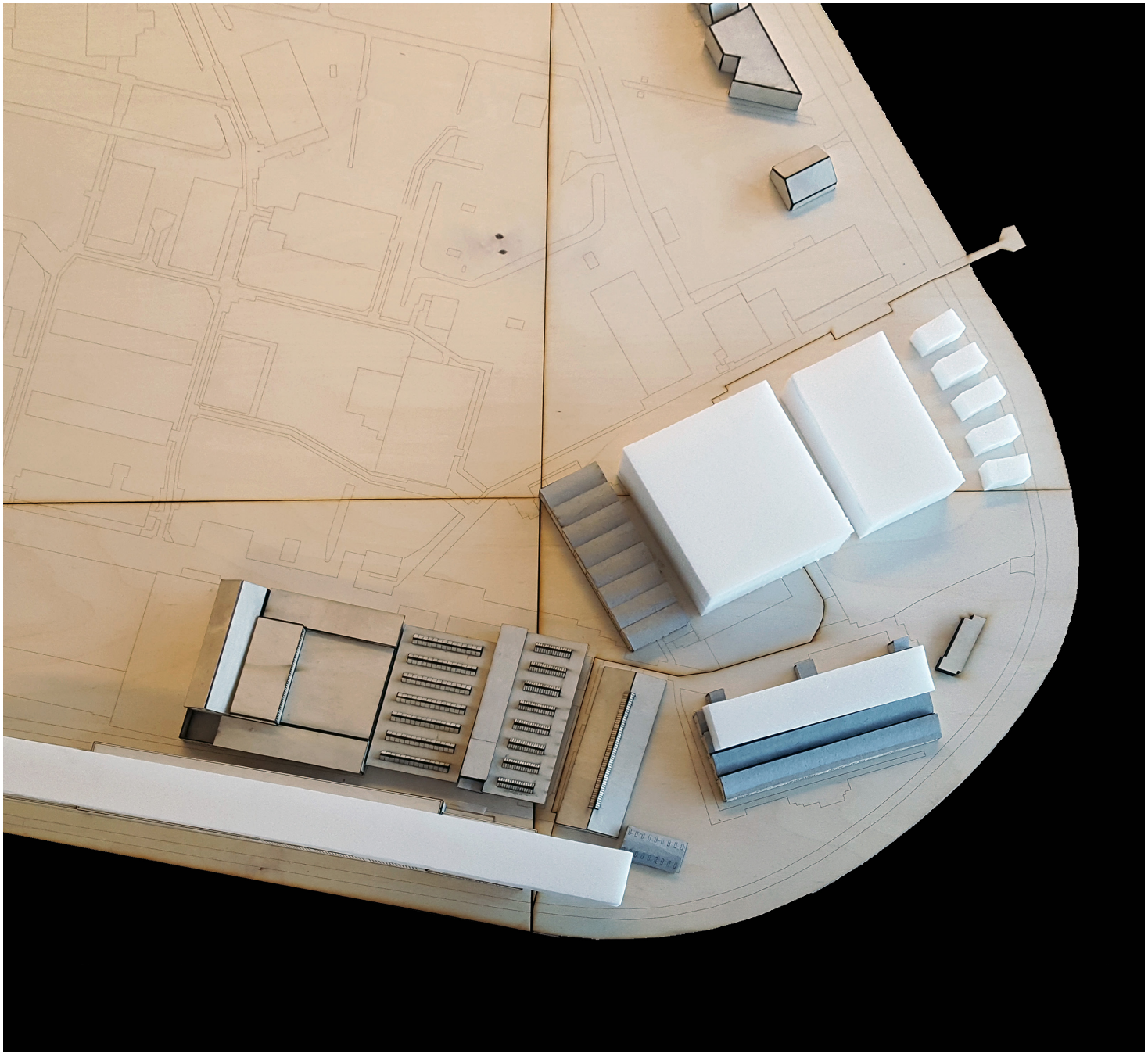


Figure 132. 1:500 model with the new masses

Existing situation

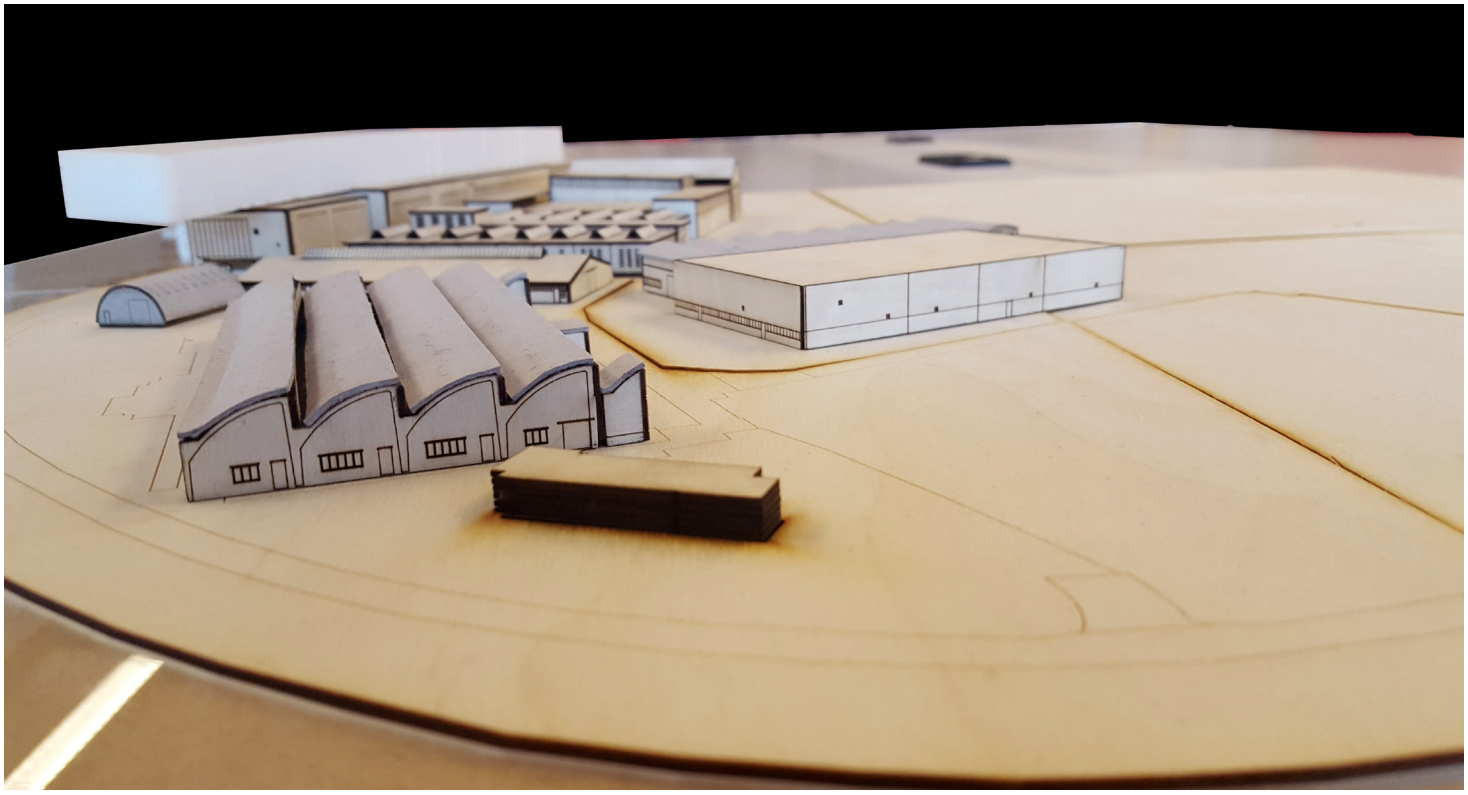


Figure 133. 1:500 model, existing condition

Figure 134. 1:500 model, existing condition

Proposed situation

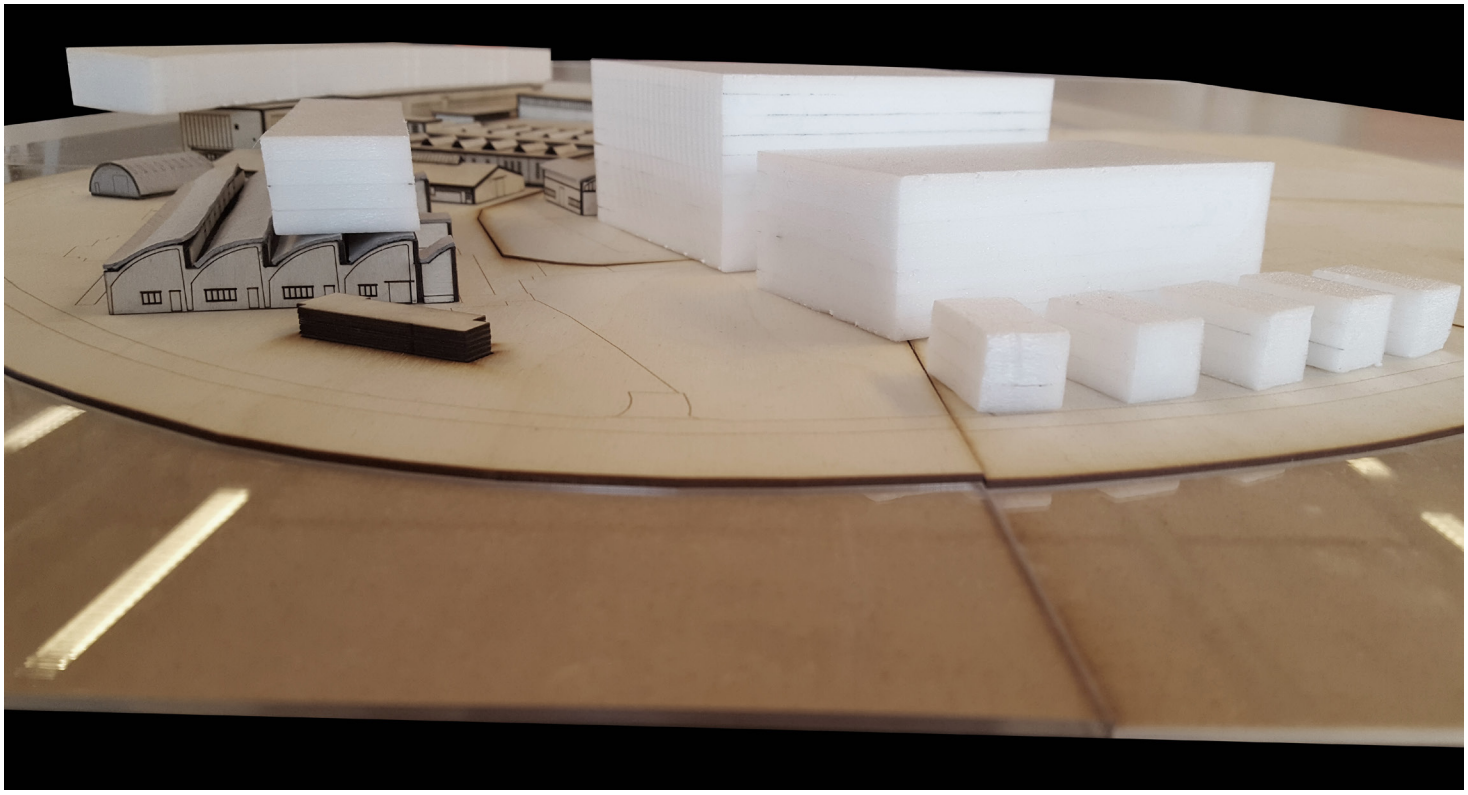


Figure 135.1:500 model with new masses

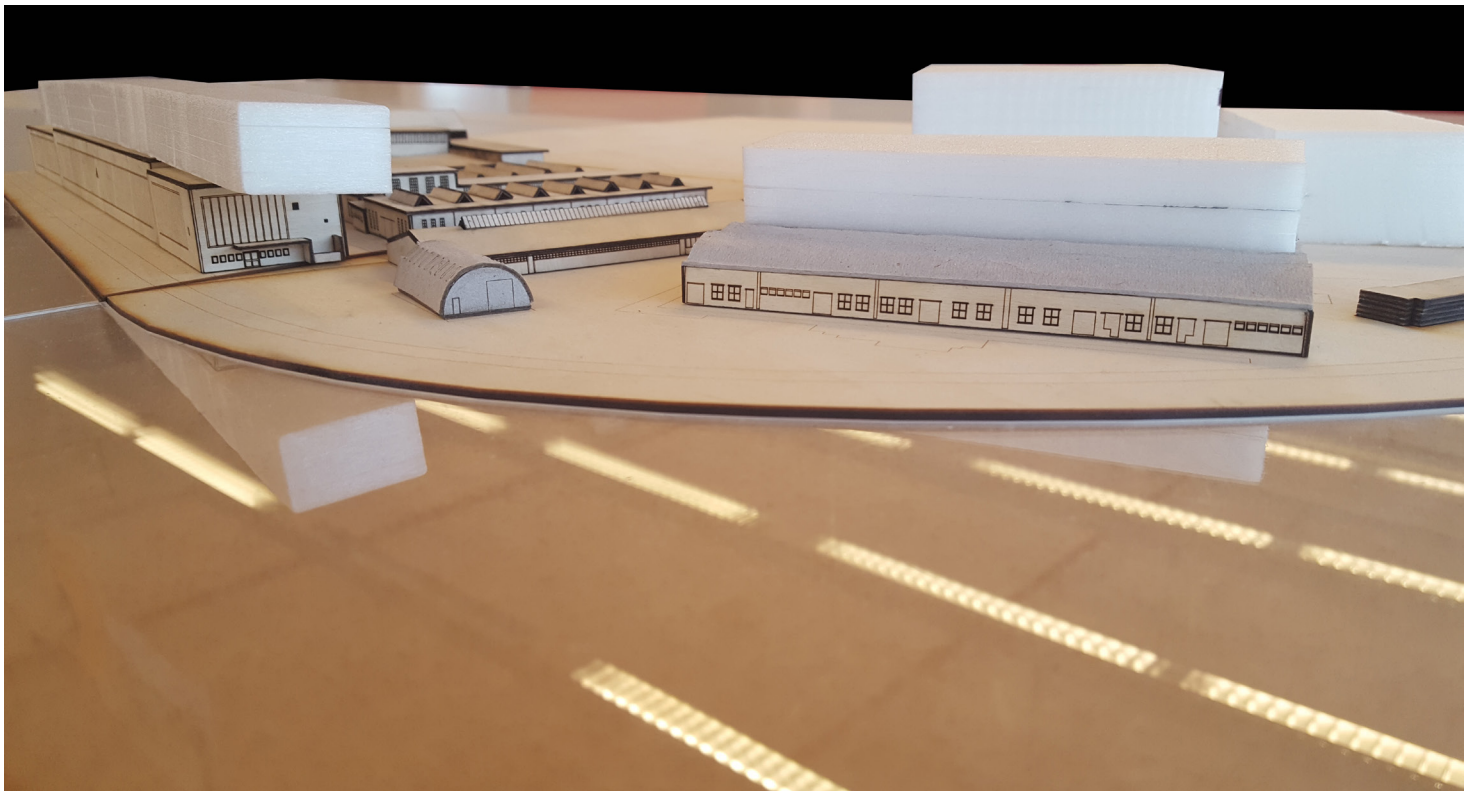


Figure 136. 1:500 model with new masses

List of Figures

Unless otherwise specified, all the photos, figures, diagrams and models are all authors' creation.

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