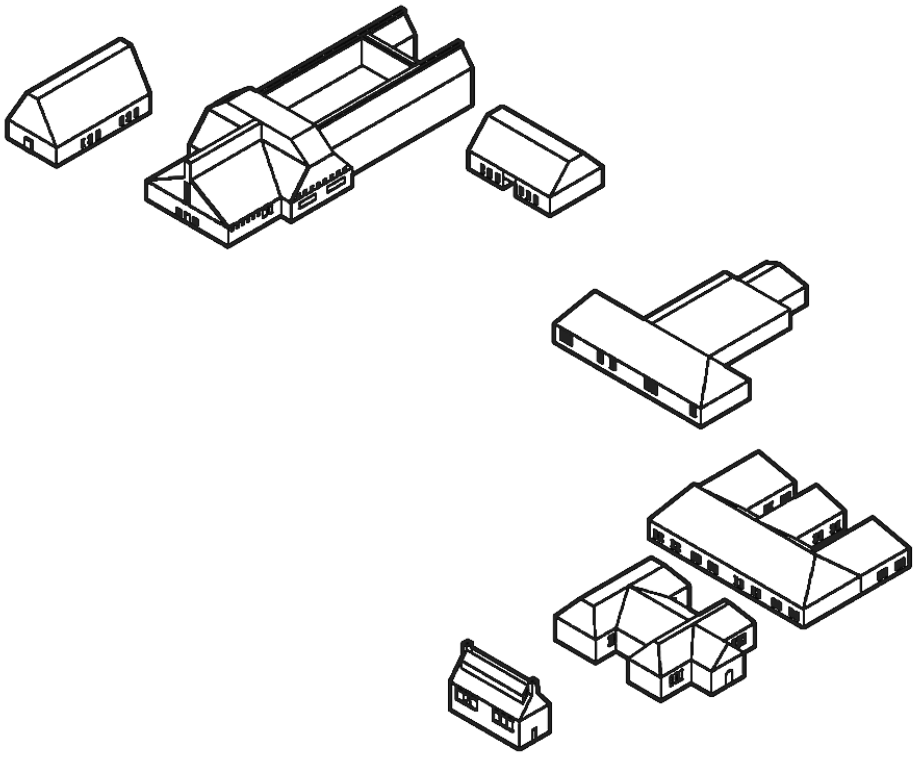
# QUARANTINE ARCHITECTURE



**History Thesis**


Student: Bugra Atciyurt
5248035
Course: Architectural History Thesis
Tutor: Jean-Paul Baeten
Date: 14-04-2022

# INDEX

Abstract ..... 3
Introduction ..... 4
Study topic ..... 4
Research frame ..... 4
Academic context ..... 5
Methodology ..... 5
The limitations ..... 5
Chapter 1: The origin of quarantine stations and islands ..... 6
1.1 Introduction ..... 6
1.2 The Origin ..... 6
1.3 Italian Lazzarettos ..... 6
Chapter 2: Dutch policy on quarantine measures ..... 7
2.1 Introduction ..... 7
2.2 The Plague ..... 7
2.3 Epidemy and quarantine laws ..... 8
Chapter 3: Quarantine station Heijplaat ..... 9
3.1 Introduction ..... 9
3.2 Site ..... 9
3.3 Buildings ..... 11
3.4 Architecture & Materiality ..... 13
3.5 Spatial organization of the decontamination building ..... 14
3.6 Heijplaat after quarantine ..... 16
Chapter 4: Other quarantine stations in the Netherlands ..... 17
4.1 Introduction ..... 17
4.2 Quarantine Station Zeeburgerdijk ..... 17
4.3 Quarantine Station Wieringen ..... 19
Conclusion ..... 20
Bibliography ..... 22
Image Sources ..... 25
Appendix 1 ..... 27
Appendix 2 ..... 27
Appendix 3 ..... 28
Appendix 4 ..... 28
Appendix 5 ..... 28

# Abstract

The deadly COVID-19 virus is wreaking havoc throughout the globe. In the past two years, architects had to rethink certain forms of spatial organization to contain the spread of the pandemic. This thesis explores how pandemics and deadly diseases were dealt with and shows the forgotten design principles of the past. To prevent infectious diseases from coming ashore and affecting cities, several institutions were established throughout the Netherlands. Quarantine stations are created as architectural representations of isolation with impenetrable areas at a country entrance. This leads to the main question adressed in this thesis: *How were Dutch quarantine stations for humans organized from a geographical and architectural point of view?*

This study first looks at the origin of quarantine stations. Furthermore, research is done into the legislation and policy in the Netherlands. This part explains the reason for building Quarantine Stations in the Netherlands. Finally, Quarantine Station Heijplaat and two additional Dutch stations will be researched as a case study.

**Key words** Quarantine Station, Lazzaretto, Pandemy, Heijplaat

*Figure 1.1.2 – Contamination suits through the years (Made by Atciyurt)*

# Introduction

## Study topic

Throughout history, there have been many contagious diseases and pandemic situations in the world. Even now, the world is dealing with the deadly COVID-19 virus. Many measures are taken to counter the spread of the virus. The battle against diseases is the same as in past pandemics, but occurs at a different time and had a different way of thinking. To suppress a deadly virus from spreading, it is important to contain the virus with quarantines. Pandemics cause a certain type of spatial structure in buildings.

This research will explore how pandemics and deadly diseases were dealt with in the past. To further specify, Dutch quarantine stations made for humans will be studied to find the geographical and architectural reasoning and measures that acted as a response to the past pandemics and illnesses. These quarantine stations had specific reasons, measures, and design principles that led to interesting typologies containing viruses and healing patients. The stations were often very isolated from the outer world.

## Research frame

The research question addressed in this history thesis is: How were Dutch quarantine stations for humans organized from a geographical and architectural point of view? As a maritime nation, quarantine stations were commonplace in the Netherlands until the twentieth century. To prevent infectious diseases from coming ashore and affecting cities, several institutions were established throughout the Netherlands.

To find an answer to the research question, this thesis will firstly elaborate on the general background of quarantine stations and a short historic study about stations abroad. Then, the official Dutch policy made by the government will be researched. The reasons and laws to make use of quarantine stations will be stated in this part. Thereafter, insight into various quarantine stations in the Netherlands and the geographical and architectural reasoning behind them will be given. This part will link to the previous chapter and is like a cause-effect resulting in the building of the quarantine stations. In the end, the pivotal findings will be summarized and the research question will be answered.

The focus of the study will be Quarantine Station Heijplaat. This station is near the port of Rotterdam and was meant to contain traders with possible diseases from abroad. Heijplaat is the most recent station (1919-1934) and has the most information to gather. The other two Dutch quarantine stations will be compared to see possible similarities and differences. The first quarantine station in the Netherlands was Wieringen (1806) and station Zeeburgerdijk (1916) in Amsterdam is from the same period as Heijplaat.

## Academic context

On this subject, studies about foreign quarantine stations have previously been done. However, not many focus on architectural measures. Information about Dutch quarantine stations is scarce and there is a lack of studies on the architecture. For this reason, the history thesis will focus on architectural measures and design principles that led to interesting solutions to contain viruses and heal the patients.

## Methodology

The main research methods used in this thesis are literature and analysis of historical and archival materials from case studies (drawings and pictures). Both primary and secondary sources are used. The primary sources are archival documents from the time frame of the case studies. Magazine articles, pictures, and technical reports will be researched to understand the context. Archival drawings of Quarantine Station Heijplaat like floorplans, sections, and maps will be used to understand the design choices. The secondary sources are used to explore the context and support the case studies.

## The limitations

As this research is bound to a certain timeframe and a limited number of resources, there are some constraints regarding the quantity and quality of this research. However, this thesis aims to minimize the influence of these limitations on the performed research.

The first limitation is, that due to time restrictions, this thesis only looks at three case studies. Only one (Heijplaat) will be an in-depth analysis. The archival research takes time and contains a lot of information that has to be carefully selected. The other two Dutch quarantine stations are analyzed with information found on the internet. This selection is a small portion of stations in the Netherlands and is only focused on quarantine stations for humans. This choice is also made to determine the scope of the study.

The second limitation is the availability of information about quarantine stations in the Netherlands. Primary sources for the two additional stations are scarce, so the information will be mostly from secondary sources. These additional studies will be complementary and won't go in-depth like Heijplaat. The purpose of this complementary information is to support the findings from Heijplaat. Lastly, sometimes there is no information about the context of drawings and pictures from the archival research. In this situation, assumptions will be made to form a conclusion.

# Chapter 1: The origin of quarantine stations and islands

## 1.1 Introduction

Before the deadly outbreak of the COVID-19 virus, the term ‘quarantine’ was not something you heard every day. Strict measures combined with vaccines and quarantines are key aspects to battle the virus. The purpose of quarantine and isolation is to reduce the risk of spreading diseases. The term quarantine has been known for a long time. In the past, There was not always a medicine or vaccination to heal sick individuals. Every port city had to have a quarantine station for seafarers who were potentially infected with a dangerous tropical disease. These seafarers had to wait in isolation until a potential disease was found and could leave if they were healthy or healed.

## 1.2 The Origin

The Bible mentions the isolation of people with contagious skin diseases and in the 11th century, the Persian philosopher and physician Avicenna wrote about the importance of quarantine in his "Canon of Medicine" (Mertens, 2020). In the fifteenth century, the earliest architectural practices of quarantine stations were created throughout Europe at ports, harbors, and other entrance sites. The term "quarantine" comes from the Italian phrase "quaranta giorni," which refers to the quarantine of a ship suspected of carrying illnesses for roughly "40 days." In 1377, The Venetian authorities quarantined ships from plague-stricken regions for 40 days to guarantee there were no latent illnesses (Tuncbilek, 2020). The choice of this time period is thought to be inspired by Christ's and Moses' isolation in the desert (Oxford Medicine, 2016). The quarantine stations are created as architectural representations of isolation with impenetrable areas at a country entrance.

## 1.3 Italian Lazzarettos

The Italian Lazzaretto was a turning point in the evolution of public health (Anoyatis-Pelé, 2016, p.1). The plague led to many deaths in the Italian cities. Preventive measures were needed against the diseases and outbreaks. The epidemic outbreaks had an impact on politics, the economy, and the military. The Venetian Republic had high geographical importance because it acted as a major gate between East and West. Because of this, a lot of diseases were spread here through trade and military campaigns. The Venetian Republic built the first Lazzaretto in 1423 on the island of Santa Maria di Nazareth. This quarantine station had monasteries, charitable institutions, several warehouses for contaminated goods, and a hospital for treatment. These buildings are separated by courtyards in between.

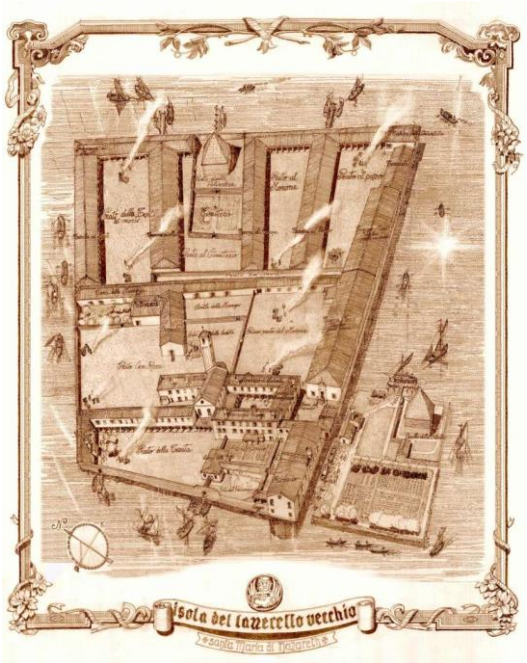



*Figure 1.3.1 –Drawing of Venetian Lazzaretto Vecchio (Lazzaretti Veneziani, n.d.)*

# Chapter 2: Dutch policy on quarantine measures

## 2.1 Introduction

In past centuries, the Netherlands was plagued by epidemics such as typhus, smallpox, tuberculosis, and cholera. The sick were isolated in quarantine institutions in the big cities. In addition to the diseases brought by sailors from faraway places, many contagious diseases were also spread over the land. The Dutch Quarantine Act of 1877 changed this and introduced measures to combat infectious diseases using the most modern methods.

## 2.2 The Plague

Throughout history, there have been many plagues and diseases in the Netherlands. From the 15th to the second half of the 17th century, the plague was a deadly epidemic that caused many casualties. The deadly plague bacterium originated from infected rats and fleas and was transmitted to humans (Van Gulik, 2020, p.3.). Rats sneaked along with merchants from China through trade routes over land and sea. This was the first time Dutch official policy required new measures to stop these diseases. Meetings were prohibited, plague victims were kept isolated at home or in plague homes, and ships were quarantined. The diseases spread easily In the densely populated cities because distancing and isolation were not very feasible. Isolation, distancing, and quarantines were the key principles to battling the deadly plagues. (Marian, 2020)

In the 15$^{th}$ century, it was soon discovered that the plague bacterium was contagious and spread through bad fumes in the dirty cities. Isolation of the infected population was the first measure the city council took. The infected and other occupants of the house were obligated to stay at home. The houses of the infected were marked with the letter ‘P’ on the front door. This ‘P’ stands for ‘Plaag’ in Dutch and was done by the occupants or by the neighbors. The people that came in contact with an infected, had to walk with a white stick outside. This way everyone knew and could take precautions. (Noordegraaf & Valk, 1996, p.96.). The poor population in the dense areas of the cities were not able to stay in isolation. To contain this infected group of people, plague houses were built. These plague houses were built in a remote area outside the city. Ships from foreign countries also had to stay in quarantine for up to 40 days (Marian, 2020)

The total disruption of society and the severe measures taken had a major impact on work and trade in the plague-ridden cities. The government had a constant dilemma between containing the plague and decreasing the financial loss. Social anxiety grew, especially in the hard-hit cities. Due to the lack of monitoring of the rules and enforcement, the regulations imposed were often evaded. (Van Gulik, 2020, p.6.).

## 2.3 Epidemy and quarantine laws

The Dutch Quarantine Act of 1877 states that every seagoing ship that is in Dutch territory must be subjected to a health inspection. This is done when it is in circumstances as described in that Act (Gemeentelijke Geneeskundige- en Gezondheidsdienst, 1934, p.1). These circumstances may include certain cases of diseases, origin from infected ports, or lack of a valid certificate of detoxification. When it was determined that a health investigation was necessary, the ship had to fly a yellow flag at the top of the flag pole (Frijlink, 1837). This was necessary until free traffic was allowed again.

*Figure 2.3.1 – Observation house in Rotterdam (Nationaal Archief, n.d.)*

The Netherlands had 16 municipalities that were accessible to sea-going vessels coming from foreign ports. The State appointed a quarantine doctor for each municipality who was responsible for the health examination under the supervision of the State Inspectorate. In Rotterdam the hygienist of the Gemeentelijken Geneeskundigen - en Gezondheidsdienst also functioned as quarantine doctor. If the health survey conducted by the quarantine doctor did not lead to the imposition of quarantine measures, the ship was admitted to free circulation. If this was not the case, he advised the mayor to take the necessary measures. (Moscoviter, 1993, p.11)

Only the ports of Rotterdam and Amsterdam were equipped with the necessary resources to carry out the prescribed measures in full (Gemeentelijke Geneeskundige- en Gezondheidsdienst, 1965, p.4). Ships that had to undergo quarantine measures in other Dutch ports, which could not be applied, were forced to sail to one of the two ports mentioned above. The diseases that were eligible for quarantine according to the law were the plague, yellow fever, Asian cholera, smallpox, and spotted fever. The main measures to which the ship and those on board could be subjected when ill were isolation, disinfection, cleaning, and nursing. The quarantine station in Rotterdam was managed by the Municipal Health Service instead of the State. The cost of construction and operation was contributed by the State.

According to Aristide Zolberg (Koren, 2019), Western authorities discovered that the existing laws and regulations until 1880 were insufficient to control the increasing migration caused by globalization. Therefore, they started to develop new control mechanisms to manage these migration flows. From 1891, medical inspection became part of immigration control. Migrants suffering from contagious diseases were refused entry and the shipping companies were obliged to pay the costs of treatment, stay and return. When the United States discovered ill migrants, the Americans imposed quarantines for arriving passenger ships. The Quarantine Act of 1893 was introduced (Koren, 2019). This law stipulated that specifically, Russian immigrants had to undergo a medical inspection and several days of quarantine before being allowed to leave Europe. This resulted in more quarantine stations in port cities in Europe.

# Chapter 3: Quarantine station Heijplaat

## 3.1 Introduction

In the middle of the busy port of Rotterdam lies a remote green enclave with a village character and a beach. Quarantine Station Heijplaat is a cultural heritage site that provides insight into how contagious illnesses were managed a century ago. Sailors and passengers with infectious illnesses were isolated here, between the Waalhaven and the Eemhaven. The quarantine facility conveys a story about Rotterdam's port history as well as our public health.

The quarantine facility is built in 1934 and was constructed to meet the port's transformation into a world-class facility. Rotterdam became a popular departure and arrival site for emigrants. The fear of bringing infectious illnesses back from tropical nations grew as the number of international visitors increased.

## 3.2 Site

The quarantine station is situated on the southern bank of the Nieuwe Maas, downstream from Rotterdam and far from the city. Ships bound for Rotterdam were required to transit via Station Heijplaat. The quarantine area measures 350 meters in length and 182 meters in width. The long side runs parallel to the river. There were 10 structures on this landscape, with a large portion of it still undeveloped. This vacant space was set aside for future expansions and sports grounds. (Moscoviter, 1993) When the station was built in 1934, there was no peninsula yet. Back then it was surrounded by agricultural areas mixed with communal gardens (see figure 3.2.2). The small port dock next to Heijplaat grew into the big Eemhaven which resulted in digging the surrounding area. Quarantine Station Heijplaat transformed into a peninsula and is now only connected with a road. (Ministerie van Onderwijs, Cultuur en Wetenschap, 2020).

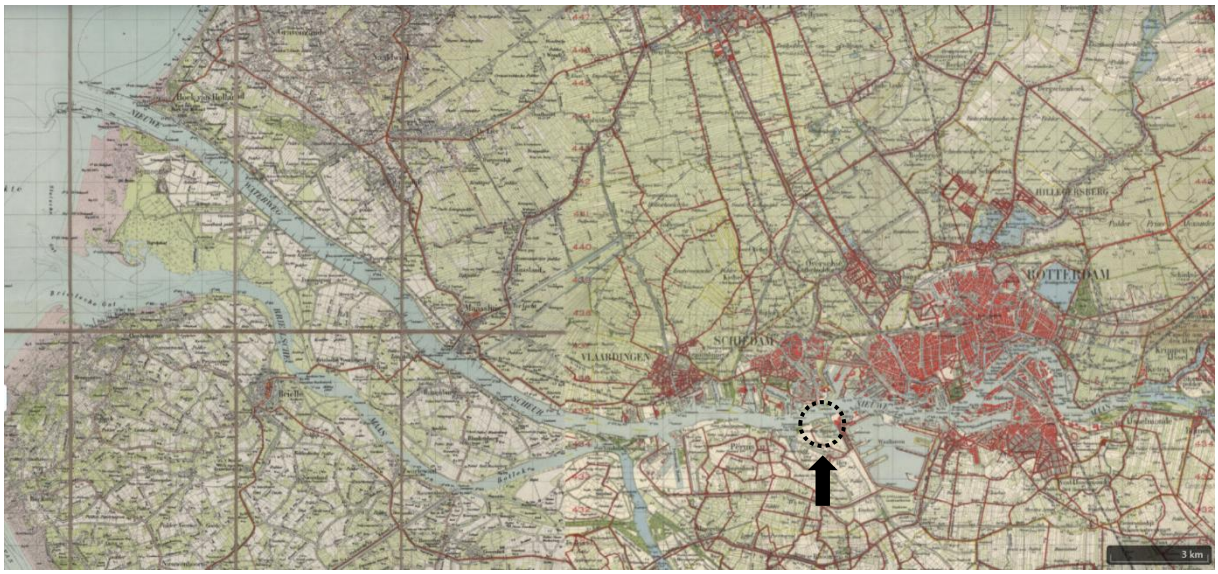
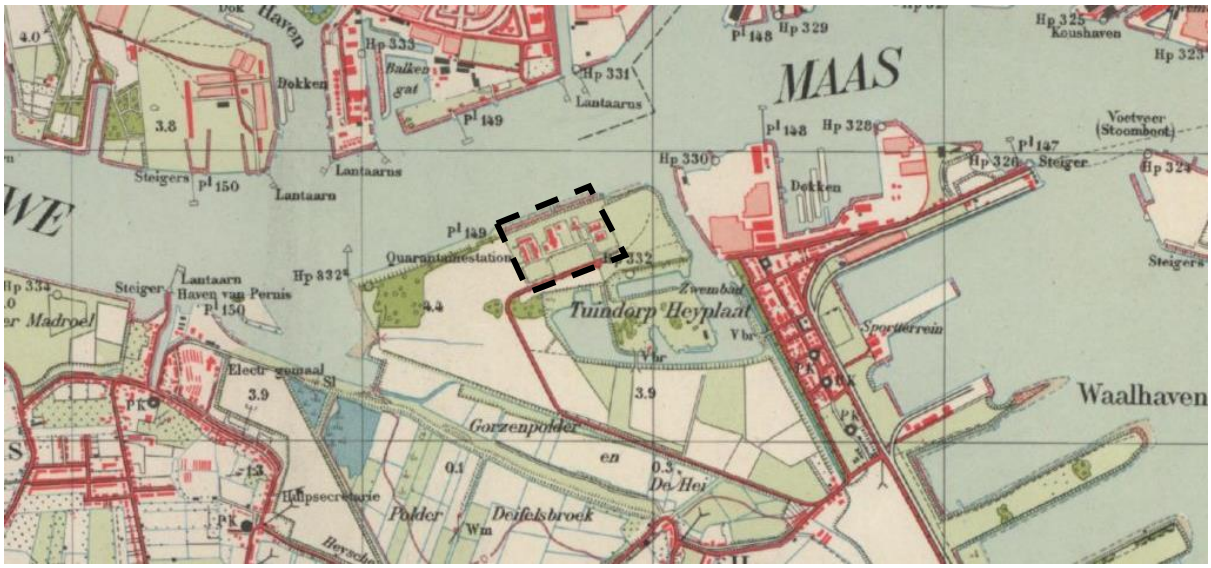



*Figure 3.2.1 – Map of Rotterdam and the Nieuwe Maas (TopoTijdreis, 1940)*

The layout of the station is strict and geometric, with a clear hierarchy in the system of paths with the main route, secondary routes, and the planting (see figure 3.2.3). The design is strengthened by the greenery. Outside, the area was walled in and separated into four portions by hedges. Each structure was given a grass to provide a green border. The residential houses were surrounded by attractive plants and had views of verdant meadows or the water. (Ministerie van Onderwijs, Cultuur en Wetenschap, 2020).

The eastern part was intended for the nursing of the sick and suspects. In this part, there are two barracks for the sick, one of which is an isolation barracks, a nursery, and a morgue. There was still enough space left here to build new barracks or to temporarily set up emergency barracks (Het Quarantaine station, 1934). Barracks for people who have come into touch with the ill may be found in the western part. An administration building, disinfection, and cleaning facility, and the central kitchen are all located in the northern section of the central area. An enlarged landing stage on the riverside allows access to this part. The sports field is located in the southern section of the center area.



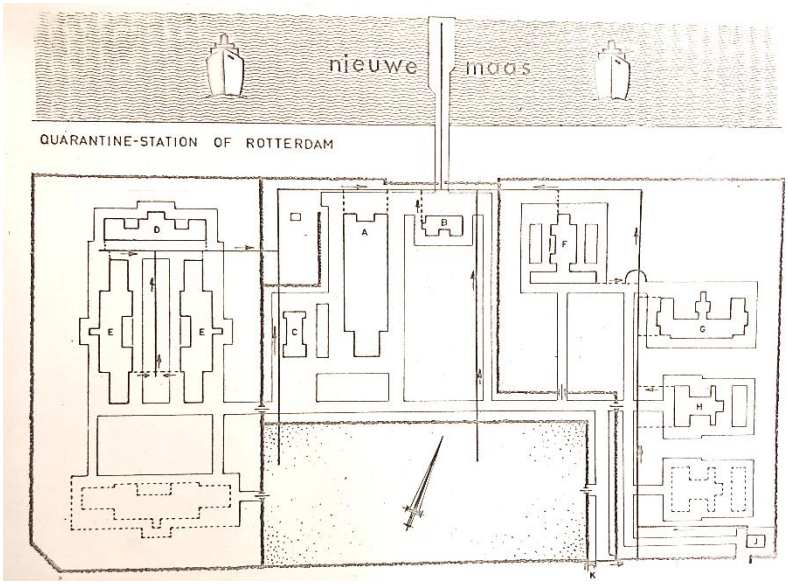




*Figure 3.2.2 – Map of Heijplaat (TopoTijdreis, 1940)*

*Figure 3.2.3 – Map of Quarantine Station Heijplaat (Stadsarchief Rotterdam), (edited by Atciyurt)*

## 3.3 Buildings

The complex's initial design included the 10 structures listed below, which were arranged at right angles or parallel to one another:
A. Decontamination building B. Staff residence C. Kitchen building D. Captain's barrack E. Contact barracks F. Nurses' quarters G. Isolation barracks H. Hospital barracks J. Corpse house K. Porter's lodge.

The organization of the site is done by subdividing these buildings into three categories. 'Zieken-afdeling' for sick people, 'Contacten-afdeling' for people who had been in contact with sick people, and 'Afdeling voor ontsmetting and toezicht' for all logistical functions (see figure 4.2.3). Later, the contact barracks and the captain's barracks have been demolished.

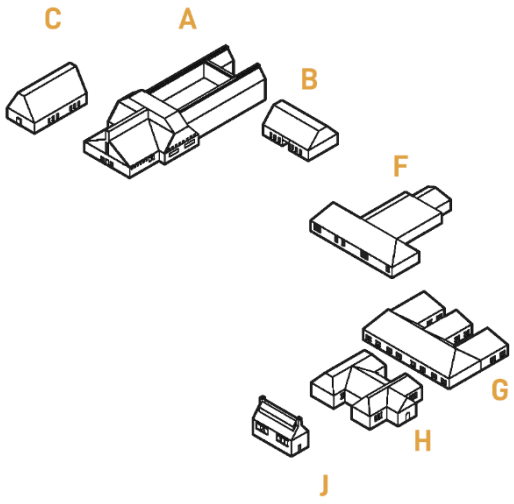



*Figure 3.2.4 – 3D typology of Station Heijplaat (Lambers, 2020), (edited by Atciyurt)*

**Zieken-afdeling**
The hospital barracks allowed patients to be admitted to a 10-person ward and nursed in rooms with two patients each. As a result, 12 patients could be accommodated. A living room, a rinse and service kitchen with a heating plate, a bathroom, a nurses' room, a laundry room, toilets, and a storage room are all included in this barrack. (Gemeentelijke Geneeskundige- en Gezondheidsdienst, 1934, p.3)

The isolation barracks are split into two symmetrical parts, each of which may be utilized independently and hence has its own entrance. Each half contains single cubicles, a room for three patients, two nursing rooms, and all essential equipment. 12 patients could be accommodated here. (See appendix 1)

One head nurse, a housekeeper, ten nurses, and three orderlies were housed in the nurses' quarters, which included all of the essential rooms and amenities. Finally, the corpse-house has two rooms, one of which is dedicated to autopsies. (See appendix 2)

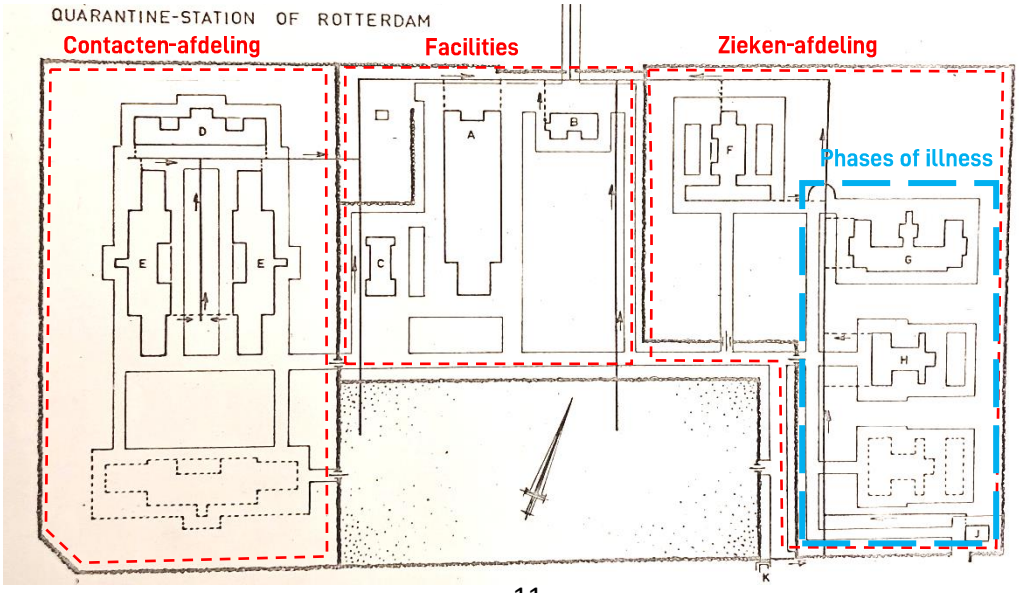



*Figure 3.2.5 – Map of Quarantine Station Heijplaat (Stadsarchief Rotterdam), (edited by Atciyurt)*

**Contacten-afdeling**
The captain's barrack had ten rooms and could accommodate 20 people. A dining and discussion room, a reading room, and two covered patios were also available. (See appendix 3)

The contact barracks could accommodate two groups of 40 individuals, for a total of 80 people. Each structure may be divided into two completely symmetrical half, each having a dormitory for 40 people, a dining and chat area, a guard room, and storage. If required, bunk beds were possible to be used to double the number of persons that could be housed here (Moscoviter, 1993, p.18). (See appendix 4)

**Afdeling voor ontsmetting and toezicht (Facilities)**
The administration building was built for the on-site person in charge of continual oversight and maintenance. It had a two-bedroom apartment, a bedroom, and a kitchen with a bath. The large attic gives much-needed extra space. A doctor's bedroom and office are also included.

The cleaning and disinfection facility is divided into two sections: one for thorough disinfection of people (20 at a time) and another for disinfecting and disinsectizing items. There is a full distinction between filthy and clean in both parts. As a result, a large number of persons (land movers, Vektyphus contacts) will be able to be disinfected every day. (Moscoviter, 1993, p.19)

The small kitchen building provided food for about 600 people (See appendix 5). The porter's lodge is located at the entrance to the land side and is intended to house the person in charge of surveillance.

**Phases of illness**
It is noticeable that the isolation barracks, hospital barracks, and corpse house are all placed in a row in said order on the East of the terrain (see figure 4.2.5). The suspicious patients with possible infections were watched and kept isolated in the isolation barracks. If the disease went worse, the patient was transferred to the hospital barracks and treated there. The corpse house was the final destination if the patient passed away. This corpse house is located at the bottom and is the nearest building to the road. This made the transport easier.

## 3.4 Architecture & Materiality

The complex of the former Quarantine-Station Heijplaat was built in a business-expressionist style. The architect responsible for the design of Quarantine Station Heijplaat was Ad van der Steur. In his design, Van der Steur was inspired by the Amsterdam School. All buildings on the quarantine station were made out of red brick and tile roofs instead of the traditional wooden barracks. The foundation was made out of reinforced concrete with wooden poles. This was a measure against the harsh weather- and wind conditions of the terrain along the Maas (Moscoviter, 1993, p.23). This also indicates that the quarantine station was meant for long-term use instead of a temporary time.

Under high, far-overhanging hipped roofs covered in red tiles, the structures have one floor and one story of roof. The expressionistically inspired rooftops are covered in a unique crimson tile. The roofs of the structures have tall brick chimneys. The red brick barracks are designed in a symmetrical form. The window frames are made out of steel, which is exquisitely detailed. (Rijksdienst voor het Cultureel Erfgoed, 2019). The entrances of the buildings are highlighted with concrete awnings, natural stone steps, and wooden doors with zinc plates on the outside. The buildings have distinctive characteristics like tiled parapets and granite window sills.

The decontamination building, which was the focal point of the system, has a functional and monumental design. The wooden structure of the decontamination building also stands out from the others. This is the largest and highest building on the station. The disinfection ovens caused steam and formaldehyde damp and needed space to escape the building. The double wooden beams carrying the roof were not connected by dowels but by screws. The structural engineers have assumed that huge differences in temperature and humidity would require this (Marinus, 1935). When the whole building is exposed due to drying out and shrinkage, the bolts can be tightened again. If beams expand or crack, they can easily be adjusted or replaced.

The higher roof also resulted in considerable height in the changing rooms, large hatches in the goods area, and air vents in the boiler room.

*Figure 3.4.1 – Picture beams Decontamination building (Moscoviter, 1993)*

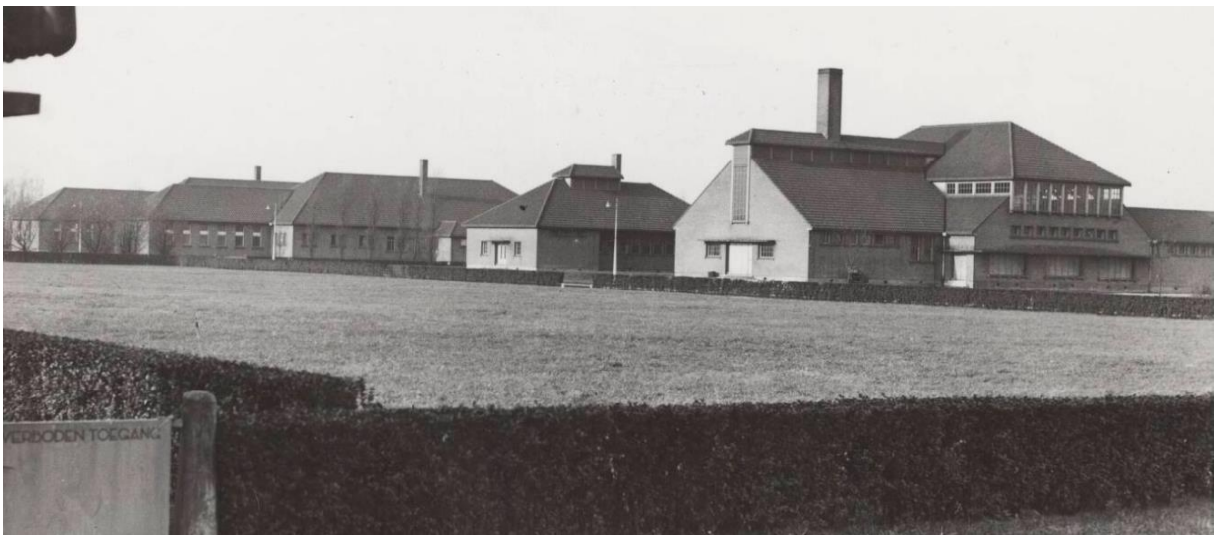



*Figure 3.4.2 – Picture quarantine station Heijplaat (Nationaal Archief, n.d.)*

## 3.5 Spatial organization of the decontamination building

The decontamination building, was the focal point and the most complex building of the system as told earlier in paragraph 4.4. In this building, specific measures were taken to prevent further contamination. This building is divided into three parts. The bathhouse, disinfection room, and boiler room. The bathhouse is a symmetrical space divided into two parts. These are the clean and unclean sections. The patients enter the building and sit in the waiting room. The personal items also got handed over. When a group of patients was done, the next group entered the research area through a wide hall with changing rooms. Here, the patients had to undress, wear a bathrobe and put their clothing in a bag (Marinus, 1935, p.3.). The patients also went to the shaving room.

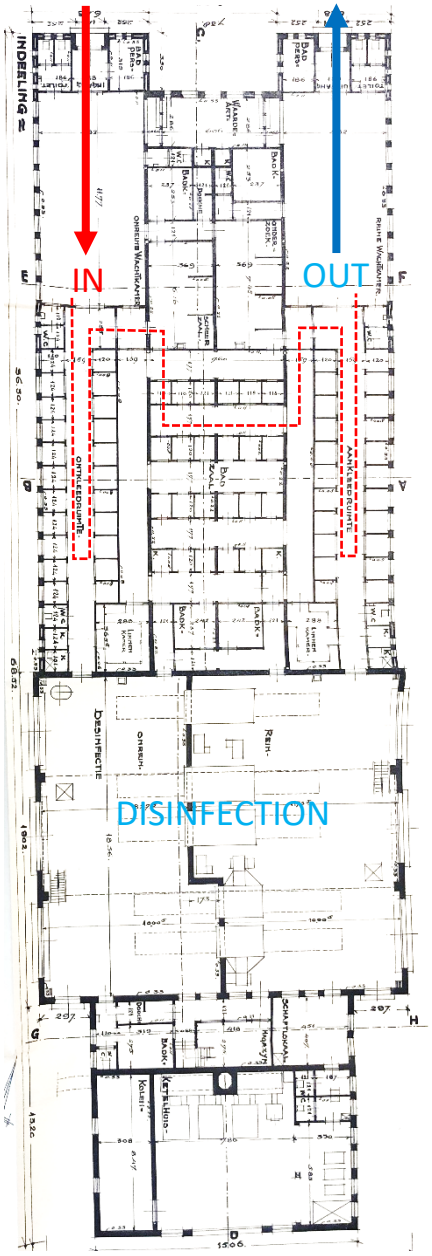



*Figure 3.5.1 – Floor plan of Decontamination building (Stadsarchief Rotterdam), (edited by Atciyurt)*

**The Bathhouse**

After the patients gave their bags of clothing to the personnel, they went into the bathing cell. These bathing cells were inbetween the clean and unclean sections. The bathing cells had hot and cold water and disinfectant was used to fully disinfect and clean the patients. After this step, the patients left through another door into the clean section with changing rooms. This room is a mirrored version of the unclean part. The distinction between the clean and unclean patients could also be made by their bathrobes. The unclean robes were red and the clean ones blue (Moscoviter, 1993, p.16). In total, there were 26 bathing cells. After they dress up, the patients could pick up their disinfected clothes and leave.

**Disinfection room**

The disinfection area is also separated into clean and unclean areas. The separation is done by a ceiling height wall, with the disinfection ovens integrated. This area is higher and has two layers. The ovens have doors on both sides. The unclean clothing goes in through the unclean area side and goes clean out on the other side. The ground floor has the disinfection ovens and the upper floor has hot air cells for dissection. The vacuum formaldehyde ovens were chosen because the steam ovens shrank everything that went in (Marinus, 1935, p.6.). These ovens were big because a high volume of clothing, sheets, and mattresses were disinfected.

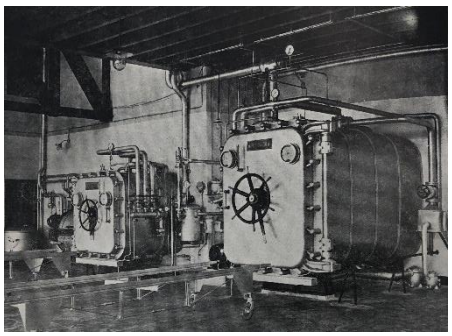


*Figure 3.5.2 – Floor plan of Decontamination building (Marinus, 1935)*

**Variants disinfection room**

Through the design process of Van der Steur, there were several different designs. Van der Steur worked together with a hygienist to optimize the design. Critical measures like separate traffic flow in routing and connection of the functions were important focal points. In the early designs is noticeable is that the disinfection rooms are centered in the building and the bathhouse is formed around it. This made the internal movement clash with the disinfection rooms. All of the designs are also symmetric. Early designs also had a separation between men and women and had different entrances for them. In the final design there is no separation between men and women, but only in clean and unclean. The internal walking route and the functions in the final design are also more linear and efficient. The disinfection room and bathhouse do not clash this way and get separated. This also results in less internal traffic and interactions with working personnel.

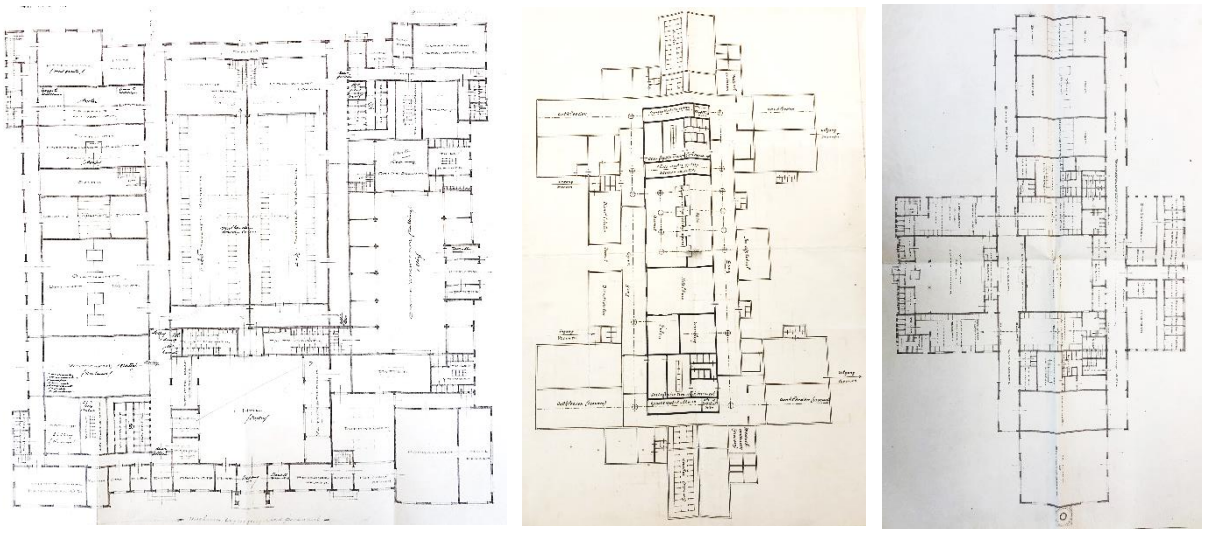


*Figure 3.5.3 – Sketch designs of Decontamination building (Stadsarchief Rotterdam)*

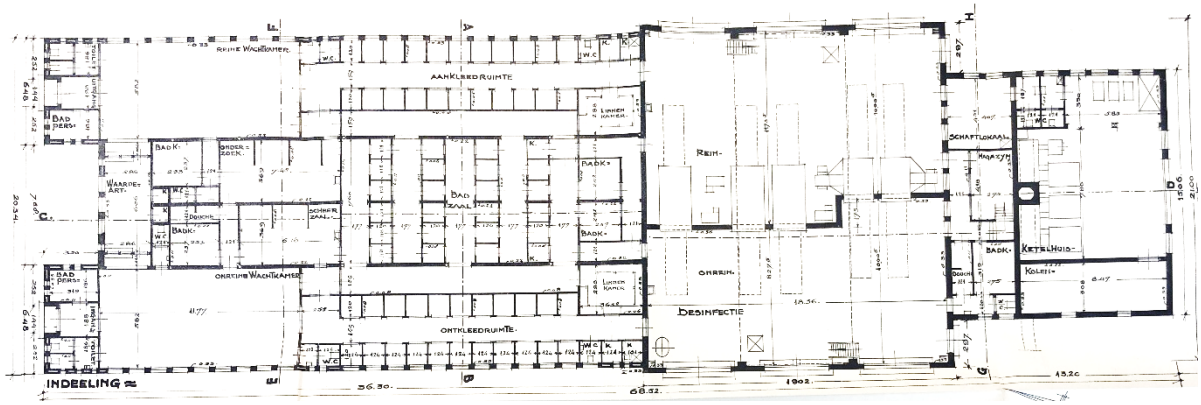



*Figure 3.5.1 – Final floor plan of Decontamination building (Stadsarchief Rotterdam)*

## 3.6 Heijplaat after quarantine

Seven years before the opening of Quarantine Station Heijplaat, concerns regarding the terrain's flexibility arose. People wondered if the structures may be used for alternative purposes if they were left unoccupied. However, because the landscape had to be available for infected patients at all times, this was not taken into account. 1,5 years after the opening, the same topic was also raised. (Moscoviter, 1993, p.25). A lot of progress had been made with antibiotics and given the possibility to successfully treat tropical diseases. The fast growth of Rotterdam moved the borders of the urban area closer to the station. As a result, contaminated ships were detained off the coast of Hoek van Holland, and patients were flown to the Havenziekenhuis' isolation unit by helicopter (Mertens, 2020, p.88.).

From November 1938 until 1940, many Jewish refugees from Eastern Europe were accommodated at the station. Nearly 1700 refugees were kept in two years. Later on, in the second world war, the Germans Kriegsmarine confiscated the area and used the terrain. After the war, the station had several uses for decontamination and treatment for smallpox, typhoid, and tuberculosis. (Heijplaat, 2020).

The contact barracks were dismantled between 1986 and 1991 and plans were made to develop new structures on the site. Objections from the residents to the Rotterdam Municipality prevented the demolition of the additional structures. The surviving portion of the Quarantine-institution had just recently been added to the provisional list as the Netherlands' last remaining Quarantine Institution. Based on this provisional monument status, there was no way to demolish the buildings after that (Heijplaat, 2020).

The residential function on Heijplaat will expire in 2024. The terrain will be transformed into a cultural and working environment. The precise historical layout of straight walkways and hedges will be restored and a new colorful layer of flowery gardens, plants, and sustainable trees will be added to the landscape (BVR Adviseurs, 2019).

*Figure 3.6.1 – Future plan for Heijplaat (BVR Adviseurs, 2019)*

# Chapter 4: Other quarantine stations in the Netherlands

## 4.1 Introduction

Besides Quarantine Station Heijplaat, there were other stations from different eras. Quarantine Station Zeeburgerdijk was from the same time frame and functioned next to Heijplaat. As told earlier in chapter 2.3, only the ports of Rotterdam and Amsterdam were equipped with the necessary resources to carry out the prescribed measures in full. Quarantine Station Wieringen will also be researched in this paragraph. This was the first quarantine station in the Netherlands and had an important role in keeping cities safe.

## 4.2 Quarantine Station Zeeburgerdijk

In 1916, a quarantine station consisting of wooden barracks was established at Zeeburgerdijk in Amsterdam. It was originally designed to keep an eye on sailors, but it was quickly adapted to care for those suffering from infectious illnesses including TB, scabies, and lice.

Because people with these diseases posed a risk of spreading them, the facility was fortified with a high fence. This meant that the ill were isolated from the rest of society. The quarantine facility functioned in this capacity for many years. In the aftermath of WWII, a children's sanatorium was built in the barracks, which later became a maternity unit for the Wilhelmina Hospital in the 1950s. (Heijdra, 2000)

*Figure 4.2.1 – Fortified high fence of Zeeburgerdijk (Heijdra, 2000)*

The health staff ensured that infectious illness patients' belongings were thoroughly cleansed. In 1914, on the Zeeburgerdijk near the Eastern Docklands' entrance road, a disinfection oven was built for this purpose. To destroy all germs, infected things, such as bedding and clothing, were exposed to boiling water vapor for half an hour. The conditions for the refugees in the emergency hospital were far from ideal. Reports were made about complaints describing the barracks as cold and draughty and the food as bad. Only with written permission, you could move outside the area (Opvang, 2020).

*Figure 4.2.2 – The steam oven and the barracks of Zeeburgerdijk (Heijdra, 2000)*

**Site**

Quarantine Station Zeeburgerdijk was situated by the water. Ships arrived at the landing stage via the water and dropped off the people with diseases. The station terrain has a narrow and linear layout. This terrain is far smaller than Heijplaat and offers no space for sports or recreation. The buildings are also spread out on the terrain but have fewer functions. The isolation barracks were on the west area of the station and the facilities were on the east. The bathhouse and disinfection room are separated and far apart from each other. This is less efficient than the example from Heijplaat because it resulted in more traffic. The station also had a de-lousing building, because there was a major lice infestation in Amsterdam at the time. At this station, 500-600 people could be treated a day. All kinds of groups of refugees who arrived in Amsterdam first ended up in this institution (Zeeburgerdijk, n.d.).

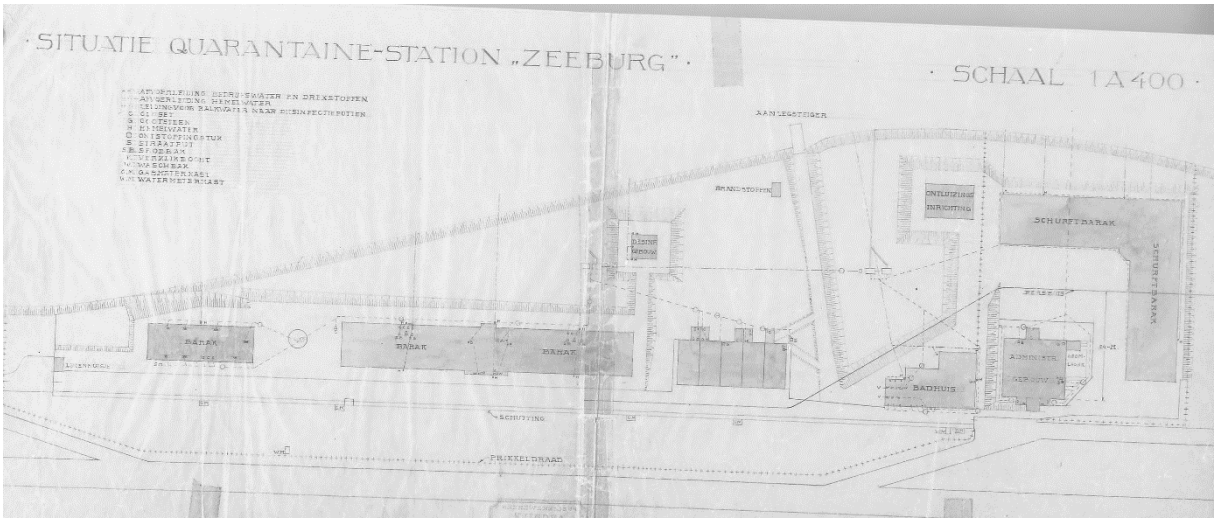



*Figure 4.2.3 – Site plan of Quarantine Station Zeeburgerdijk (Stadsarchief Amsterdam)*

**Buildings**

Because of the smaller nature of the barracks on Zeeburgerdijk, the internal layout is rather simple. The small windows offered daylight in the spaces in the wooden barracks. The bath and decontamination building has no separation between clean and unclean. The bathhouse is internally only accessible by one narrow corridor and offers 9 bathing cells. This decontamination building also has a higher roof so the steam and damps could escape.

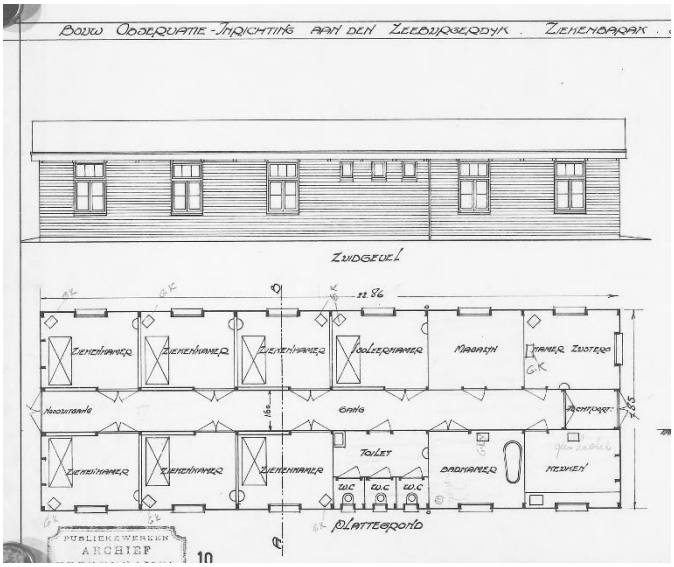



*Figure 4.2.4 – Floor plan of a barrack at Quarantine Station Zeeburgerdijk (Stadsarchief Amsterdam)*

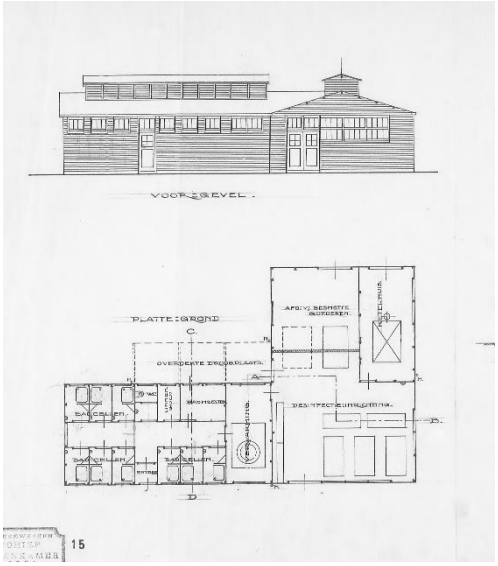



*Figure 4.2.5 – Floor plan of a decontamination building at Quarantine Station Zeeburgerdijk (Stadsarchief Amsterdam)*

## 4.3 Quarantine Station Wieringen

On the old North Holland island of Wieringen, a quarantine hospital was established in 1806. This was done at the request of King Lodewijk Napoleon. To store contaminated products, an area of 11 hectares was cleared. There was a place where sailors could relax. The station contained a hospital, barracks, storage buildings, and a manager's residence. On Wieringen, ill sailors were treated without concern of disease spreading further. (De Haan, 2020)

*Figure 4.3.1 –Photo of building at Station Wieringen (ONH, n.d.)*

To prevent residents from contracting contagious illnesses, the entire region was shut off from the rest of the island. The island residents named the barracks pest houses. During the cholera epidemics in Europe, there have been a lot of patients on the station. In the life span of 25 years, 200 ill patients have died (De pesthuizen op Wieringen, 2020). These have been buried in a cemetery nearby on the island. In 1920, the quarantine station wasn't used anymore and was demolished.

**Site**

The site of Station wieringen was on the east corner of the Island. It is noticeable that the station was surrounded by two rows of fences and security was a high priority. In the inner part of the station, the barracks and facilities were located. Some were warehouses to store contaminated goods. There is a hospital for the ill and houses were provided for doctors and the director. Also at this quarantine station, ships arrived at the landing stage via the water and dropped off the people with diseases. The buildings are separate from each other and are all positioned in one direction. Three gardens were inside the walls for recreation purposes.

*Figure 4.3.2 – Site plan of Quarantine Station Wieringen (Noord-Hollands Archief, 1838)*

# Conclusion

The deadly COVID-19 virus is still wreaking havoc throughout the globe. In the past two years, architects had to rethink certain forms of spatial organization to contain the spread of the pandemic. Many steps are being made to stop the virus from spreading. This thesis explored how pandemics and deadly diseases were dealt with in the past. The results of the research are not innovative or surprising, but they are relevant and informative. This study shows the forgotten design principles of the past. To further specify, Dutch quarantine stations made for humans have been studied to find the geographical and architectural reasoning and measures that acted as a response to the past pandemics and illnesses. This leads to the main question of this thesis: *How were Dutch quarantine stations for humans organized from a geographical and architectural point of view?*

As a maritime nation, quarantine stations were commonplace in the Netherlands until the twentieth century. To prevent infectious diseases from coming ashore and affecting cities, several institutions were established throughout the Netherlands. The Dutch Quarantine Act of 1877 obligated to undergo a health inspection for every seagoing ship that is in Dutch territory. Every port city had to have a quarantine station for seafarers who were potentially infected with a dangerous tropical disease. The quarantine stations are created as architectural representations of isolation with impenetrable areas at a country entrance. Only the ports of Rotterdam and Amsterdam were equipped with the necessary resources to carry out the prescribed measures in full.

The quarantine stations were all situated by the water and placed far from the cities. Ships arrived at the landing stage on the shore and dropped off the people with potential diseases. The layout of the quarantine stations was often strict and geometric, with a clear hierarchy in the system of paths with the main route, secondary routes, and green areas. The quarantine stations were walled in with high fences, so no patients could escape and spread a virus. Security was a high priority. The design of Heijplaat was strengthened by the greenery. The idea was to create a village character that felt familiar. The residential houses were surrounded by attractive plants and had views of verdant meadows or the water. Empty spaces were left on the terrain for future expansions.

Buildings on the stations were spread out on the terrain and had many functions. These buildings were organized on the terrain by subdividing their functions into three categories. Medical department for sick people, Contacts department for people who had been in contact with sick people, and department of decontamination and surveillance for all logistical functions. Functions concerning each other are placed together. At Heijplaat, the isolation barracks, hospital barracks, and corpse house are all placed in a row in said order on the East of the terrain.

The buildings were often one story and made out of wood. Heijplaat had a lot of attention to detail. All buildings on this quarantine station were made out of red brick and tile roofs instead of the traditional wooden barracks. The quarantine station was meant for long-term use. The layout of the buildings was often symmetric. Buildings were flexible and could be split up. Each of which could be utilized independently and hence had its own entrance.

The decontamination building was the focal point and the most complex building in the system. In this building, specific measures were taken to prevent further contamination. The disinfection ovens caused steam and formaldehyde damp and needed space to escape the building. This resulted in higher spaces. Specific building techniques were also required for this building. The wooden structure carrying the roof was not connected by dowels but by screws. Due to huge differences in temperature and humidity, the structure could be damaged. If beams expanded or cracked, they could easily be adjusted or replaced.

Critical measures like separate traffic flow in routing and connection of the functions in the quarantine stations were important focal points. The separation between clean and unclean had to be kept to contain the further spread of the diseases. The internal walking route and the functions at Heijplaat are linear and efficient. This also results in less internal traffic and interactions with working personnel.

The quarantine stations were well thought out and offered many facilities to isolate and cure patients. These are from a time when medicine and vaccinations were not developed enough and acted as the only preventive solution against pandemics. When science caught up, these quarantine stations were not very relevant anymore. Although Heijplaat never fulfilled its purposed function, it served many other functions through the years.

# Bibliography


- Anoyatis-Pelé, D. (2016). Cartographic Heritage in the Historical Study of Public Health: The Case of Mediterranean Lazzaretos. https://docplayer.net/40913802-Cartographic-heritage-in-the-historical-study-of-public-health-the-case-of-mediterranean-lazzaretos.html

- BVR Adviseurs. (2019) Toekomst Quarantaineterrein Rotterdam https://www.bvr.nl/archieven/portfolio/toekomst-quarantaineterrein-rotterdam

- De Haan, M. (2020). Quarantaine: ging Nederland al eens volledig op slot? EWmagazine.nl. https://www.ewmagazine.nl/nederland/achtergrond/2020/03/quarantaine-in-nederland-743090/

- De pesthuizen op Wieringen: Quarantaine in de 19e eeuw. (2020). IsGeschiedenis. https://isgeschiedenis.nl/nieuws/de-pesthuizen-op-wieringen-quarantaine-in-de-19e-eeuw

- Frijlink, H.A. (1837) Nederlands tijdschrift voor geneeskunde, Volume 11. https://books.google.nl/books?id=FnIGAQAAIAAJ&pg=RA1-PA193&lpg=RA1-PA193&dq=quarantaine+etablissement+nederland&source=bl&ots=FnLIO58Gy6&sig=ACfU3U1yXpVK5zXYajbrUMeQ9--dEptcuQ&hl=nl&sa=X&ved=2ahUKEwiYj728ybj1AhXJ1qQKHayuBXkQ6AF6BAglEAM#v=onepage&q&f=false

- Gemeentelijke Geneeskundige- en Gezondheidsdienst (1965)
  Quarantaine Station : Municipal medical and public health service of Rotterdam
  Publication in the archive about Quarantine Station Heijplaat
  (Stadsarchief Rotterdam, G000021741)

- Gemeentelijke Geneeskundige- en Gezondheidsdienst (1934) Het Quarantaine station.
  Publication in the archive by Gemeentelijke Geneeskundige- en Gezondheidsdienst about Quarantine Station Heijplaat
  (Stadsarchief Rotterdam, G000003765)

- Heijplaat. (2020). Quarantaine Inrichting 1. https://www.heijplaat.com/2020/09/29/quarantaine-inrichting-1/

- Heijdra, T., Buurt, W. I., & Wijkopbouworgaan Indische Buurt (Amsterdam). (2000). Zeeburg. De Milliano.

- History of the Lazzaretto Vecchio. (n.d.). Lazzaretti Veneziani, https://lazzarettiveneziani.it/en/lazzaretti/history-lazzaretto-vecchio

- Koren, C. (2019, February). Nederland als doorreisland: De controle op transmigranten in Nederland tijdens het Interbellum. Universiteit Leiden. https://hdl.handle.net/1887/70734

- Leeuwen, J. Quarantaine op Heijplaat. (https://www.voortvarend.info/content/various/zoom/Voortvarend%205-2019%20Quarantaine%20op%20Heijplaat.pdf

- Lazarettos of Venice. (2016). Oxford Medicine. https://oxfordmedicine.com/oxford/fullsizeimage?imageUri=%2F10.1093%2Fmed%2F9780199596614.001.0001%2Fmed_9780199596614_graphic_013-full.gif&uriChapter=%2F10.1093%2Fmed%2F9780199596614.001.0001%2Fmed-9780199596614-chapter-1

- Marian, M. (2020) Epidemieën door de eeuwen heen Publication in the archive about plagues and illnesses (Stadsarchief Rotterdam, 5213)

- Marinus, M. (1935) De ontsmettings- en desinsectie-installatie der nieuwe quarantaine-inrichting aan de Beneden-Heyplaat te Rotterdam Technical information in the archive about Quarantine Station Heijplaat (Stadsarchief Rotterdam, 1974133)

- Mertens, P. (2020). Help ik ben besmet! Biowetenschappen & Maatschappij. https://www.biomaatschappij.nl/product/help-ik-ben-besmet-7/

- Moscoviter, H. (1993) Kunstenaars in plaats van tyfuslijders : de bewogen geschiedenis van de Rotterdamse Quarantaine-inrichting, Book in the archive about Heijplaat (Stadsarchief Rotterdam, G000009054)

- Ministerie van Onderwijs, Cultuur en Wetenschap. (2020). Tijdschrift van de Rijksdienst voor het Cultureel Erfgoed, (2020, February) Magazine | Rijksdienst voor het Cultureel Erfgoed. https://www.cultureelerfgoed.nl/publicaties/publicaties/2020/01/01/tijdschrift-van-de-rijksdienst-voor-het-cultureel-erfgoed-februari-2020

- Noordegraaf, L., & Valk, G. (1996). De gave Gods. [Book].

- Opvang. (2020). Stadsarchief. https://www.amsterdam.nl/stadsarchief/themasites/vreemdelingenkaarten/opvang/

- Rutten, W. (1997). “De vreselijkste aller harpijen”. Afd. Agrarische Geschiedenis, Landbouwuniversitet.

- Rijksdienst voor het Cultureel Erfgoed (2019). Quarantaine-Inrichting. https://monumentenregister.cultureelerfgoed.nl/monumenten/530104

- Schepelingen in quarantaine op Wieringen. (n.d.). ONH. https://onh.nl/verhaal/schepelingen-in-quarantaine-op-wieringen

- Tuncbilek, G. Z. (2020). Quarantine(d) Space: Urla-Izmir (Smyrna) Island. Space and Culture, 23(3), 246–252. https://doi.org/10.1177/1206331220938639

- Van Dissel, J. T., Van Everdingen, J. J. E., Bruins, B. J., Van de Graaf, A., Steenbergen, J., Te Hennepe, M., Van Steenbergen, J., & Stichting Bio-Wetenschappen en Maatschappij. (2020). Help, ik ben besmet! Stichting Biowetenschappen en Maatschappij (BWM).

- Van Gulik, T. M. (2020). Isolatie en afstand houden in tijden van pest. Nederlands Tijdschrift voor Geneeskunde. https://www.ntvg.nl/artikelen/isolatie-en-afstand-houden-tijden-van-pest#

- Zeeburgerdijk. (n.d.). joodsamsterdam. https://www.joodsamsterdam.nl/zeeburgerdijk/

# Image Sources

1.1.1 Lambers, S (2020). Nocturnal Animals [Graduation project] (edited by Atciyurt)

1.1.2 Cover Photo (Made by Atciyurt) Photos from:
Museum Rotterdam. (n.d.). Collectiestuk: Lichtbruin quarantaine-pak van glad textiel, met cupuchon, aangenaaide handschoenen en voeten, ritssluiting aan de voorzijde. Museum Rotterdam - van de stad. [Photo]
https://museumrotterdam.nl/collectie/item/79486?itemReturnStart=0&objectrow=1&itemReturnSearch=QUARANTAINE

1.3.1 History of the Lazzaretto Vecchio. (n.d.). Lazzaretti Veneziani, https://lazzarettiveneziani.it/en/lazzaretti/history-lazzaretto-vecchio

2.3.1 De mannen die in aanraking zijn gekomen met lijders aan vlektyphus worden in het. . .. (n.d.). Nationaal Archief. [Photo]
https://www.nationaalarchief.nl/onderzoeken/fotocollectie/detail?limitstart=3&q_searchfield=Quarantaine

3.2.1 Topotijdreis: 200 jaar topografische kaarten. (n.d.). Topotijdreis. https://www.topotijdreis.nl/

3.2.2 Topotijdreis: 200 jaar topografische kaarten. (n.d.). Topotijdreis. https://www.topotijdreis.nl/

3.2.3 Stadsarchief Rotterdam

3.2.4 Lambers, S (2020). Nocturnal Animals [Graduation project]

3.2.5 Stadsarchief Rotterdam (Modified by Atciyurt)

3.4.1 Moscoviter, H. (1993) Kunstenaars in plaats van tyfuslijders : de bewogen geschiedenis van de Rotterdamse Quarantaine-inrichting, Book in the archive about Heijplaat (Stadsarchief Rotterdam, G000009054)

3.4.2 Nationaal Archief, Picture quarantine station Heijplaat. (n.d.). [Photo].
https://www.nationaalarchief.nl/onderzoeken/fotocollectie/8239ca13-e615-22b3-ba5b-4c38e0645af8

3.5.1 Stadsarchief Rotterdam (Modified by Atciyurt)

3.5.2 Marinus, M. (1935) De ontsmettings- en desinsectie-installatie der nieuwe quarantaine-inrichting aan de Beneden-Heyplaat te Rotterdam (Stadsarchief Rotterdam, 1974133)

3.5.3 Stadsarchief Rotterdam

3.6.1 BVR Adviseurs. (2019) Toekomst Quarantaineterrein Rotterdam https://www.bvr.nl/archieven/portfolio/toekomst-quarantaineterrein-rotterdam

4.2.1 Heijdra, T., Buurt, W. I., & Wijkopbouworgaan Indische Buurt (Amsterdam). (2000). Zeeburg. De Milliano.

4.2.2 Heijdra, T., Buurt, W. I., & Wijkopbouworgaan Indische Buurt (Amsterdam). (2000). Zeeburg. De Milliano.

4.2.3 Stadsarchief Amsterdam. https://archief.amsterdam/inventarissen/scans/10057/38.65/start/0/limit/10/highlight/3

4.2.4 Stadsarchief Amsterdam. https://archief.amsterdam/inventarissen/scans/10057/38.65/start/0/limit/10/highlight/3

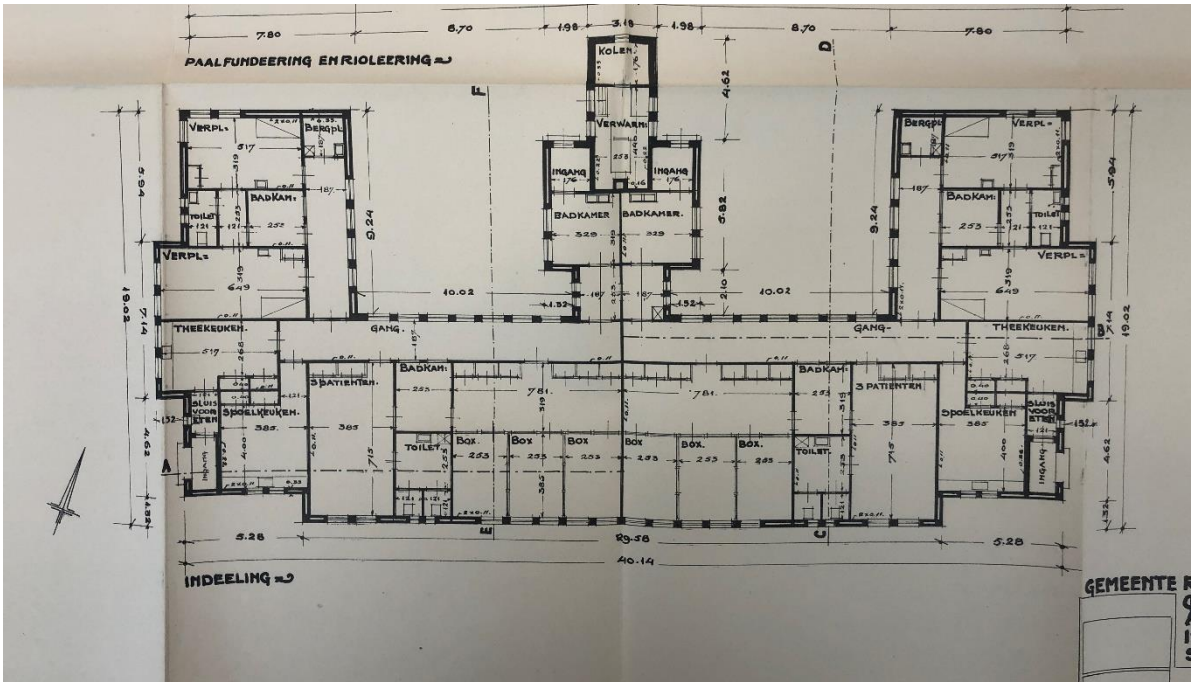
4.2.5 Stadsarchief Amsterdam. https://archief.amsterdam/inventarissen/scans/10057/38.65/start/0/limit/10/highlight/3

4.3.1 Schepelingen in quarantaine op Wieringen. (n.d.). ONH. https://onh.nl/verhaal/schepelingen-in-quarantaine-op-wieringen

4.3.2 Kaarten van Rijkswaterstaat Noord-Holland vóór 1850, Collectie van. (1838). Noord-Hollands Archief. https://noord- hollandsarchief.nl/bronnen/archieven?mivast=236&miadt=236&mizig=210&miview=inv2&milang=nl&micols=1&micode=269&mizk_alle=quarantaine%20wieringen

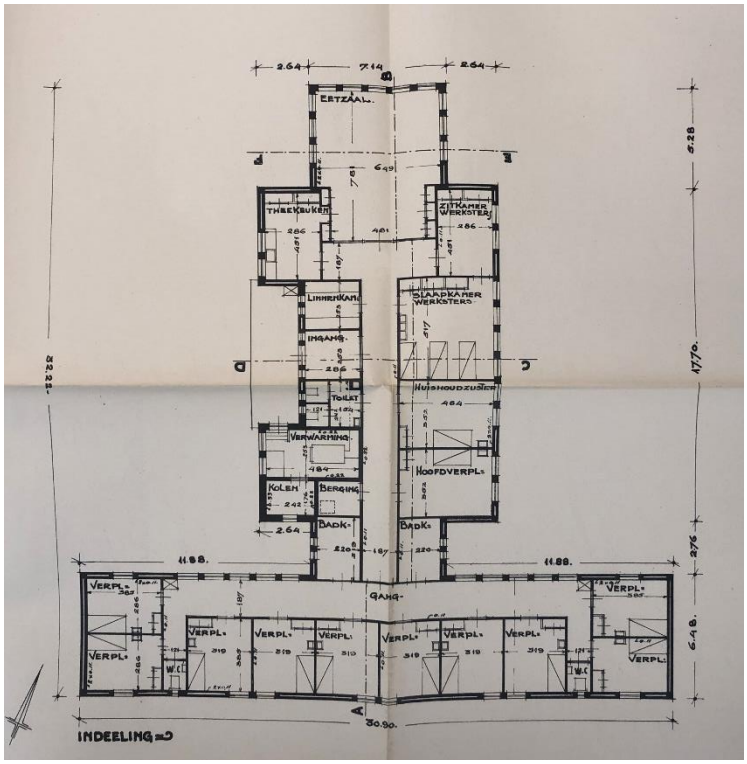
# Appendix 1

Content: Floor plan of isolation barrack on Heijplaat
Source: Stadsarchief Rotterdam




# Appendix 2

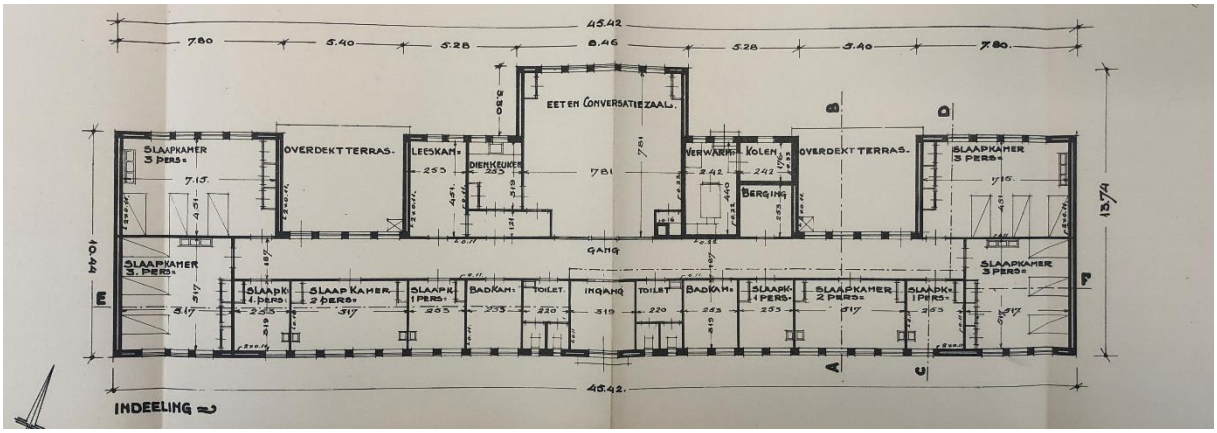
Content: Floor plan of nurses' quarters on Heijplaat
Source: Stadsarchief Rotterdam



# Appendix 3

Content: Floor plan of captain's barrack on Heijplaat

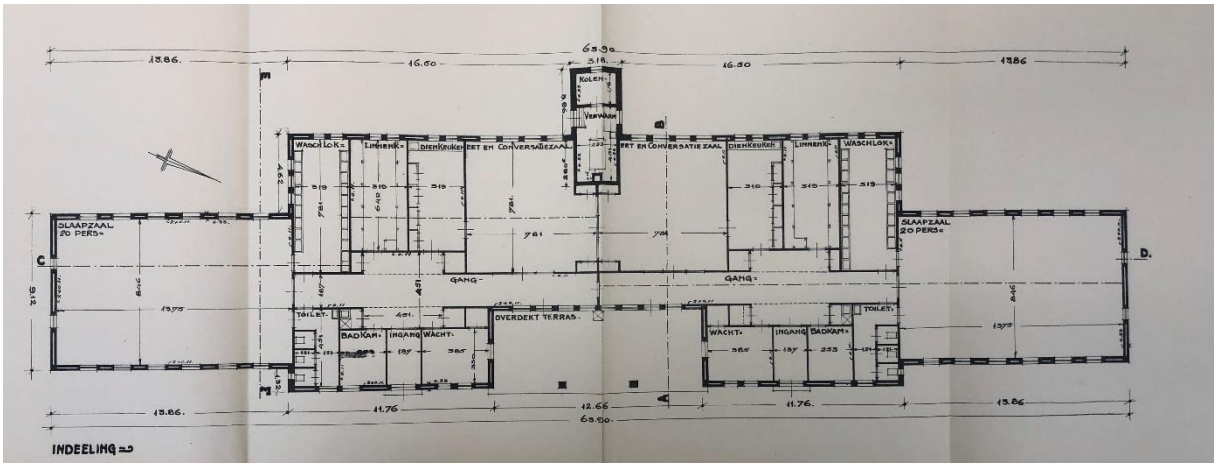
Source: Stadsarchief Rotterdam




# Appendix 4

Content: Floor plan of contact barrack on Heijplaat

Source: Stadsarchief Rotterdam




# Appendix 5

Content: Floor plan of kitchen on Heijplaat

Source: Stadsarchief Rotterdam