KATOENVEEM
Several architectural studio’s were dealing with heritage tasks but not as much and extensive as the graduation studio “Heritage & Design”. This studio was and is mainly focused on dealing with a realistic and credible heritage assignment on different scale levels, such as: urbanism, culture, history, architecture and building technology. Furthermore the studio gives the freedom of figuring out a new utilization for a building influenced by its past and bounded by the current situation.

In this particular studio we had the option of redeveloping one of five different industrial buildings. I chose to redevelop the Katoenveem building.

The Katoenveem immediately for me was a fascinating building and site. This large oblong building maybe seems boring and ready for demolition for the untrained eye, but the eyes only see what the mind is prepared to comprehend.
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LOCATION

map of the Netherlands and location Rotterdam

map of Rotterdam and location Katoenveem

4 drawing(s) by Joost van den Berge
RESEARCH
1000
First time Rotterdam is named in a document; Rotta. It's an ensemble of housing and farms along the river.

1250
One solid dike is build along the river to protect the land against the water. Because of this the river Rotte is not directly connected to the river Maas anymore.

1358
A sluice and a dam is built where the rivers meet. Around these two elements Rotterdam arises.

1500
In 1340 the city becomes an official city and by that earns several privileges. The inhabitants are allowed to dig a branch of the Schie river (Rotterdamse Schie)

1572
In 1572 the city gets involved in the eighty years war and taken by the Spanish. This resulted in a bloodbath.

1580
Rotterdam is a transshipment and fishing city and has a fierce competition with Dortrecht on trade. Rotterdam becomes more and more important and starts being a trading city

25.000
Because of the blockade of Antwerp and Amsterdam Rotterdam grows rapidly and has a booming economy. Especially because of trade with England, France and America.

1750
The 18th century is for the whole country a period of stagnation and decline. Rotterdam also stops growing in terms of economy but the population keeps growing and results in an extremely dense city inside the walls. However for the first time industrial buildings are built and moved outside the city walls and harbors. Mostly they become situated along the shores and creeks of the river.

TIMELINE
A huge growth of harbor activity and construction of harbors occurs. At the same time the city grows rapidly outside of the old city center whereas the center itself is being modernised.

The city trade changes to a more system where goods are transported to the final destination as fast as possible. Next to that the railroad tracks are being built moving.

The city population grows extremely fast and large neighbourhoods are built in the end of the 19th century especially across the river and to the west of the city center.

Habors are at first built in the Waalhaven area. A little bit later the Pernis harbors and industrial area is being built and after that the Botlek area.

Because of the new industry’s enormous and much deeper harbors are built more and more to the west along the river.

Due to the explosive economic growth a lot more labourers are needed. At first they come from Spain and Italy but later the most come from Turkey and Morocco. This leads to a similar explosive growth of the population. Hereby a lot more dwellings are needed and enormous neighbourhoods are built in all directions until the end of the nineties.

In 1863 the New Waterway is finished which stimulates and improves the reachability and growth of the city and its trading capacity greatly. Next to that the city for the first time starts to build on the south side of the Maas.

Rotterdam needs more labourers for the booming economy and harbor activity. Workers mostly come from Zeeland, Brabant and Holland.

The city clearly changes to a more system where goods are transported to the final destination as fast as possible. Next to that the railroad tracks are being built moving.

The economy stagnates because of World War 1 until 1926. However three years later the economic recession starts and has a large impact on Rotterdam. A few years later the second World War starts which again hurts the city by the destruction of the old city center, the harbors and the infrastructure. Moreover most trade was with the Germans and the industry in the Ruhr area which also was mostly destroyed during the war.

Rotterdam is slowly rebuild in the years after the war after a functional design. The city also decides to become less dependent on Germany by investing and focussing on the trade in the sector of the petrochemical industry.

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Rotterdam grew around a dam in the river Rotte and the church of Saint Lawrence. The dam and village was a place for transshipment, trade and fishing. The city was however difficult to reach because of constant silting of the river.

There was an outer and an inner harbour. The outer harbour was used by larger ships and fishing ships. The inner harbour was used for shipments inland.

At this creek Delfshaven grew. It was connected by a canal to the city of Delft and by this became the harbour of Delft. Next to this the village became one of the foremost places for the building of ships for trade and war during the Golden Age.

Along the water dikes were raised to protect the people from the water, to use the freed land for agriculture or building or to sell the land to earn money.

Where creeks met with dikes often villages grew because of the possibility of transshipment to the inland by using the canals behind the dikes. For example this is the place where Katendrecht arose.

The flow of the river and its branches constantly changed because of silting, floods and the constant tides of the sea. Because of this the harbour was difficult to reach most of the time. One of the reasons why Amsterdam in this time became the main port of the Netherlands.

HISTORIC PERSPECTIVE
In the beginning the harbour grew around the city center. But later on a movement to the west became the trend. This to make the distance smaller for the ships coming from sea. Moreover these ships became bigger and had much greater drafts.

Because of reclamation and the harvest of peat during the Golden Age the former higher grounds became large water surfaces and very low because of the holes that were left and the constant descend of the land.

Large harbours were dug at the south side of the river together with large living area’s. These harbours were more for factories and the shipping inland than for the ships coming from sea.

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Because of the industrialisation, especially in the Ruhr-area in Germany large amounts of ore were needed for the steel production. Rotterdam was the perfect spot for the importation and the transport of the ores over the Rhine river. Large harbours were dug around and over living area’s and villages like Katendrecht here and later Pernis.

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At first small harbours were dug at places where already natural coves and creeks were present. Later on the harbours were dug in the most cheap and uninhabited places. Mostly in direction West to East. This to make it easier for larger ships coming sea to enter and leave the city and it’s harbours.

Around 1870 the New Waterway was dug. A canal and the straightened river now went straight through the dunes to make Rotterdam much more accessible. The distance to the harbour became much smaller, there was almost no silting anymore and far more larger ships could enter the harbours.

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The former industrial and living area at the south side of the river became ragged after most companies left to the west. In the last two decades it has been and is being transformed into a modern urban living area. With Kop van Zuid as main example.

Rotterdam's old city center was almost completely destroyed during World War II. At the former dense city center high, functional and modern buildings arose along wide roads, big roundabouts and broad tramways. The water became redundant and the amount of canals was greatly reduced.

The Maasharbour on the south side of the river and the Marconi- and Veerharbours are slowly going empty but are still in use. These last two harbours are also destined for an urban living environment along the water. This process has already been started by the construction of the Dakpark, an improved infrastructure and some new company's starting their business.

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After the war the trade in petrol became much more important for Rotterdam. Next to that the technique improved greatly and larger and larger ships, like oil tankers came in use. They needed a great depth and very large harbours. That's why new larger harbours were constructed even further to the west. During the 60's and 70's almost all quays along the rivers were used. This was the time the city decided to build in the former dunes (Europoort) and later even to build artificial harbours in the sea, Maasvlakte and the Nieuwe Maasvlakte.

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Former busy harbours like the Maas- and Rijnhaven became less and less functional and used over time. Almost all ships and activity went to the west of the city and therefore so busy harbours and quays became empty and silent. Currently these hardly in use harbours are now destined as an area for a trendy and urban living environment by the municipality together with the still present factory's and storages.

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Daalder R. & Ter Bruggen J. (2008). Havens van Amsterdam en Rotterdam sinds VIERHAVENS DESIGN
PART OF A COMPLEX 1930
WHY?
To understand the type and sort of transportation over land reaching the ends of the quay between the keilehaven and Lekhaven connecting it to water transport.

HOW?
by researching the history of the construction of the railway system and its travel company.

TRANSPORTATION OVER LAND
After storage of the cotton in the warehouse, transportation proceeded over land by goods-trains (ill. 4.2). These trains were traveling over a railway system along the harbour activity of the Maas River. It was the goods-railway system ‘Havenspoorlijn Rotterdam West’ which started to develop after negotiations from the municipality of Rotterdam between the Rijk and the Hollandsche IJzeren Spoorweg Maatschappij (HIJSM or HSM) to connect a harbour railway line onto the general passenger railway line between Schiedam and Rotterdam. In 1908 this ‘havenspoorlijn’ route was opened.

After both the Keilehaven and the Lekhaven were constructed, the building of a new emplacement started in 1914, from the Hudsonstraat (with a walking bridge) to the harbour area of the Vierhavenstraat. It was the emplacement of Rotterdam RMO (Rechter Maas Oever), shown in illustration 3.

The goods-trains were now able to reach the warehouses of Katoenveem and New Orleans and Galveston at the end of the Keilestraat. It was most likely that these trains were locomotives running on diesel oil. A part of the railway is still present at the site (ill. 4.1).

DISTRIBUTION SYSTEM KATOENVEEM
CIRCULATION SYSTEM

Illustration 8.4: Organisational situation in cross section
Illustration 8.5: Process of storage and transport in cross section
Illustration 8.6: Types of move in cross section

by Audrey Loef (own illustration according to The pioneer for the shipping and trade of the Netherlands and her colonies (1919) nr. 3 march, 68.)
here you can clearly see the enormous scale and oblong mass of the Katoenveem. The large horizontal and rectangular volume 1 to 5 can be one block but actually is sliced into 5 pieces (see numbers) for fire protection, division in quality and act as dilatation for expansion and shrinkage of the large concrete masses. The 5 volumes all have the same measurements except the middle one, which is less wide.
When you would explode the building in its main elements you could clearly see the five compartments (1), the gallery as one element (2), the roof, also cut up in five pieces, with holes for skylights (3) and the skylights themselves (4). Last but not least; some smaller volumes are built against the main structure (5) as you can see on the left of the illustration.
IN WHAT ORGANISATION IS THE GROUND FLOOR USED?

HOW?

BY DEFINING AREAS ACCORDING TO THEIR USE.

ORGANISATION & USE OF SPACE

The inside area of the building is separated in five compartments. The middle one is the smallest, two rows of columns to three rows on the other four compartments.

Within the compartments on the ground floor (ill. 11.1) we recognize areas where to place the cotton, done by tiling a pattern on the floor (ill. 11.3). In between these zones there were walkways connected to the openings in the facade. These are the relations between inside and outside and guide to either the waterside where the ships were moored or the side where the goods-train were driving. On the short facades bigger openings were located as well as the elevation points.

Arriving at this next floor level (ill. 11.2), a gallery is running along the complete facade, again with entrances on both sides guiding to the cotton. By a system of galleries running over the grid of the structure of the building interaction between the two levels is enabled. It was possible to see both the zones with stored cotton and the walkways in between, possibly the keep the communication of organisation of use of space optimal.

WHY?
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In what organisation is the ground floor used?

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By defining areas according to their use.

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PROGRAM FIRST FLOOR

This page contains a diagram labeled "PROGRAM FIRST FLOOR." It shows a layout of the first floor, detailing the organization and use of space with various zones and pathways.
CONVEYOR SYSTEM

The basis of the system is that it allows the cotton bales to be transported from the dockside on either the north or the south side. The system consists of a network of conveyor belts that connect to different tracks. By defining areas according to their use, the system can select the route. Moving the frame in which these tracks are placed, one can connect the monorail to different tracks. By a simple switch system in which a set of 3 or more tracks are connected to the big loop running alongside the wall, the cotton can be moved from one compartment to the other. The monorail is equipped with a radiant panel system, 10-kilometer long, that can heat the bales to the desired temperature. The cotton that arrived would have been stored some time in the building, either from the inside to the outside or vice versa. The process of storage and transport is illustrated in figures 8.7 and 8.8.

HOW?

By looking at pictures of the site, on the inside and outside, we understand the working of the conveyor system installed in the Katoenveem. In what organisation is the ground floor used? Within the compartments on the ground floor (ill. 11.1) we recognize areas where to place the cotton, done by a system of galleries running over the grid of the structure of the building. There were walkways connected to the openings on both sides guiding to the cotton. By a system of runners and tracks, we can move the cotton from one place to another. The layout of the system follows the construction; 14 loops surround the 14 rows of columns. These loops are connected to the big loop running alongside the wall. The layout of the system is illustrated in figure 11.1.

WHY?

The inside area of the building is separated in five compartments. The middle one is the smallest, two rows of columns to three rows on the other four compartments. In the inside area, the cotton is transported from the dockside on either the north or the south side. The inside area is divided into zones, rows of columns to three rows on the other four compartments. The cotton is transported from the dockside on either the north or the south side.

The conveyor system is assumed to be the most efficient way to transport the cotton. Running on these tracks were devices called "loop-kat-ten." These machines are controlled by a simple switch system, which allows the cotton to be transported from one place to another. The conveyor system is illustrated in figures 8.7 and 8.8.
STRUCTURAL SYSTEM

ground floor plan by Jan Huis in 't Veld
(own illustration)
MAP OF THE KEILEPIER

drawing(s) by Joost van den Berge
WHAT DOMINATES?
- how do you experience the place
- what is the relationship of the site with its surroundings

VISTA’S
vista 1 shows the view at the end of the pier over the harbour and the main waterways. The view consists of 4 main elements:
1. at the end of the pier some built structures are present together with grassland and some bushes
2. on the other side of the Maas you can see large built structures of industrial buildings together with green structure; mainly trees
3. the main element clearly is all the water. The waterway here is very wide and full of activity. A relationship between Katoenveem and the harbors and ships is clearly established.
4. in front the Keilehaven is still very present. The relationship between the harbor and Katoenveem is still intact but needs a push
5. on the end of the harbor you can still clearly see the old industrial buildings and other built structures
6. between the built structures at the end of the harbor you can see fragments of the main road, the Dakpark and the many green structures it offers

vista 2 shows the view from Katoenveem along the Keilehaven and the other side of the harbor.
At no. 5 you can see the other side of the harbor with large open fields with an abundance of trees and in front of the quays some small ships and pontoons.
WHAT DOMINATES?
- how do you experience the place
- what is the relationship of the site with its surroundings

VISTA’S
vista 3 shows the view of the roof and the relationship Katoenveem has with the city on a larger scale.
No. 9 shows the old and newer industrial buildings and other built structures.
10. Above the small built structures at the end of the harbor you can clearly see of the main road, the Dakpark and the many green structures it offers.
11. From the roof an impressive view unfolds on Rotterdam and its high-rises.
No. 12, the last vista (no. 4) is the view from Katoenveem to the north-east along the Keilestraat.
As you can see at no. 12 asphalt, stone and trucks dominate the view here. There is practically no relationship with the city, water or green. However this area and sightline is very active. Here trucks are coming and going all the time and people are walking along the road to reach their cars and trucks.

No. 13 shows further on the street bicycles and cars crossing the junction between the Keileweg and the Benjamin Franklinstraat. Finally on the end of the street you can see, if you look very good, the Dakpark, some green and the Vierhavensstraat.
WHY?
The goal of this research is to understand the spatial sequence going from the street towards our building. This is done to show the approach and to determine what spatial qualities can already be found at the location.

HOW?
By sketching and tracing photographs of the surrounding it is possible to reduce the amount of information in the image to the most important elements.

VIEW OVER THE KEILEHAVEN
This first view show the Katoenveem as it is situated next to the Keilehaven at the end of the pier. This image clearly shows its harbour identity.

Although this harbour used to be a very busy area, the Keilehaven is now hardly in use. Only a few ships come here to be cleaned at the facility (6) on the other side of the harbour. Trees hide the industry still remaining facing the Katoenveem.

Notable elements:
1. Breakwater
2. Wooden posts
3. Fruit transshipment with loads of trucks
4. Katoenveem
5. Keilehaven
6. Ship cleaning station
7. Water taxi docking point
8. Breakwater

EXPERIENCE/ATMOSPHERE OF THE PLACE
KEILEWEG

At the beginning of the Keileweg, one might already see the Katoenveem; behind all the trucks moving about, the top of the elevator shaft and the sample room are visible.

The left side of the image shows the Vertrekhallen, a party centre. The name and location refer to the original departure halls of the Holland America line, of which multiple warehouses were also present further down the pier.

The markings on the road suggest where the vehicles should be free to move. However, the trucks and cars tend to be parked wherever they might be, waiting in line to deliver or gather their goods. At number two, underneath the Vertrekhallen, the parking of the local offices is shown.

On the right part, the office of the fruit transshipment is shown. This function is therefore connected to the warehouses further down the pier.

Notable elements:
1. Vertrekhallen (party centre)
2. Car parking for the offices
3. First dock of the fruit transshipment warehouses
4. The Katoenveem, showing only the roof, elevator shaft and the sample room.
5. Marking on the street, showing which part of the road to keep clear
6. Office of the fruit transshipment

SPATIAL SEQUENCE 2

1. Vertrekhallen (party centre)
2. Car parking for the offices
3. First dock of the fruit transshipment warehouses
4. The Katoenveem, showing only the roof, elevator shaft and the sample room.
5. Marking on the street, showing which part of the road to keep clear
6. Office of the fruit transshipment
Further down the road, a clearer view of the Katoenveem is showing. This is also the gap between the two large fruit transshipment warehouses as is shown on the left. The gate guards the entrance to the quay where the international ships dock to deliver their fruit.

Number two marks one of the truck docks. One might notice that there are three trucks in this image that are just standing around; these are waiting for their turn to go to the docking station.

The Katoenveem is now easier to be seen. The sample room on the roof clearly stands out from the rest of the horizontal building. In front of the Katoenveem, a shed is also visible. This metal roof is an addition to the complex built in 1991 (see the chronomap for more information).

From this distance one can also see the balcony running around the building, for the first time. This striking element gives great character to the building and makes it recognisable.

**Notable elements:**
1. Gate to the quay
2. Fruit transshipment warehouse
3. Katoenveem
4. Metal roof in front of Katoenveem
5. One of the parked trucks

**EXPERIENCE/ATMOSPHERE OF THE PLACE**
KATOENVEEM - GATE ENTRANCE

This image shows the main entrance to the Katoenveem, through the gate (behind the parked truck). Next to the gate is the pumping station of the old sprinkler installation of the Katoenveem (for more information see the chapter on the sprinklers). This building is empty now but used to house the pumps to maintain the water pressure for the sprinklers. The building stands apart from the main warehouse but is also listed as a monument.

The markings on the street continue all the way to the end of the pier, showing where the trucks can temporarily park. With the continued movement of trucks on the street, it is a unsafe environment to be just walking around; you need to pay attention to all the trucks in the chaos of loading and unloading.

Beyond the gate of number five an oasis of calm starts. The area underneath the metal roofing has been cleared and nothing remains there anymore except for the concrete flooring and traces of activity.

Notable elements:
1. Fruit transshipment warehouse
2. Markings on the street
3. Katoenveem
4. Parked truck
5. Metal roof added in 1991
6. Pumping station, added with the complex in 1920

Katoenveem - Gate Entrance

Spatial Sequence 4

Important element:

Shade determines order of importance:

Water
KEILEWEG 1
Once outside again, we continue towards the end of the pier. In this image one can clearly see the old and new coming together; both warehouses have doors to allow goods to be moved to whatever medium can transport them elsewhere (more on this later).

The balcony of the Katoenveem is now seen from below, showing it’s slimming structure. The function and hidden treasures of this balcony are discussed in a later chapter.

The current state of this balcony is very poor; it is due to the degradation of this balcony and especially the falling off of concrete is the reason this building is no longer safe to use. As a safety measure netting has been added along the entire underside of the balcony.

The yellowed sliding doors on the right side, are the original metal doors that were installed nearly a hundred years ago. Although they show clear signs of rust they are in relatively good state.

At the end of this road is the end of the pier, giving a grand vista over the harbour area.

Notable elements:
1. Fruit transshipment
2. Marking on the street
3. End of the pier, opening up to the Maas river
4. Structure of the balcony, nets protect against falling concrete
5. Thickening of the wall, resembling a column
6. Original steel sliding doors

SPATIAL SEQUENCE 5

EXPERIENCE/ATMOSPHERE OF THE PLACE
**END OF THE PIER**

Shown here is the view of the end of the pier, looking back at the Katoenveem and the Keilehaven. On the far right of the image the end of the pier is visible, but another sketch will show its view. The location of this viewpoint is on a small green field located at the very end of the pier.

Between the water of the Keilehaven and the pier is a quay of roughly three meters high, making the connection with the water only a visual one. The concrete quay, which was built around 1920 as well, is protected from the waves by breakwater.

At five, the original foundation of the two cranes is visible. This is the position of the dismantled cranes that used to connect the interior conveyor system to the ships that docked next to the building (more on that later).

The head of the building is obscured by a few temporary container units, used as a barrack or shack of the previous users.

Notable elements:
1. Wooden posts to guide the ships
2. The Keilehaven
3. Industrial ship cleaning facility
4. Breakwater
5. Foundation of the demolished cranes
6. Derelict barracks and containers
7. Katoenveem
8. Empty grass field
9. Fruit transshipment warehouse
10. End of the pier, with view over the Maas river

**SPATIAL SEQUENCE 6**

- **Important element:**
  - Water

- **Shade determines order of importance:**
INSIDE THE KATOENVEEM
This sketch shows the interior of the warehouse. As is clearly seen at first glance, there is a lot going on. There is a complex network of construction, walkways, installations and roof beams obscuring the room. Due to the complexity of the image it is easy to forget the size of the space, the walkways start at a height of seven and a half metres, allowing for a grand and open ground floor area.

At the back of the room there are some later additions to the warehouse. Built in structures that suited the needs of the users at the time. They hold no value and are damaged in parts (see value assessment).

On the right side of the image, a yellow wall shows the first of four fire proof walls that separate the longitudinal building into five compartments. The breakthrough that is shown in this image is a later addition, it compromises the integrity of the fire proofing and also breaks with the transverse direction of the compartments. The functioning of the walkways and the compartments will be discussed further on in this research.

Notable elements:
1. Roller door to the outside (previous image)
2. Later additions to the interior (not original)
3. Walkways
4. Monolithic concrete structure
5. Original sprinkler installation
6. I-beams of the conveyor system
7. Fire proof wall
8. Roof beams

SPATIAL SEQUENCE 7

EXPERIENCE/ATMOSPHERE OF THE PLACE
VALUE ASSESSMENT
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<th>AGE</th>
<th>HISTORICAL USE</th>
<th>ART</th>
<th>RARITY</th>
<th>BEWINDING-WAARDE</th>
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**VALUE MATRIX**

36 | drawing(s) by Katoenveem Group
the relationship with its environment/being part of the harbor

the skin is part of the Katoenveem principle/system

traces of wooden formwork and the way of construction

harbor atmosphere & traces of a larger complex

the structure is directly linked to its original function

the still present services and building technology

the relationship with its environment/being part of the harbor

harbor atmosphere & traces of a larger complex

the skin is part of the Katoenveem principle/system

traces of wooden formwork and the way of construction

the structure is directly linked to its original function

the still present services and building technology

VALUE SECTION
OBLIGATIONS

REPAIR AND/OR RESTORE THE KATOENVEEM

without reperation historical value will be lost and the building with it’s possible new function can not be redeveloped

TRACES KATOENVEEMCOMPLEX

restore and/or show traces of former ensemble to maintain historical value

SERVICES AND TECHNOLOGY

maintain, preserve or/and restore original services and technology as a remembrance to the use and functionality of the building

COMPARTMENTATION

preserve, use and/or revive the original compartimentation of the building as it is it tells about the functionality and purpose of the building

RELATIONSHIP WITH THE WATER

reconnect the Katoenveem with the water as it once was and played a huge role in it’s origins and hole system
OPPORTUNITIES

TRACES KATOENVEEMCOMPLEX
increase historical value and value as a hole by restoring and/or reviving components of the former complex

SERVICES AND TECHNOLOGY
re-use and revive services and building technology of Katoenveem for new functions and purposes of the building redevelopment

ROOF
use the strong roof for the redevelopment of the building

THE KATOENVEEM AS MISSING LINK
make Katoenveem a place full of activity as it once was and the place where people come together in the new proposed mixed urban area of the Merwe-Vierhavens by choosing a strategic function and redevelopment strategy

RELATIONSHIP WITH WATER AND QUAY
restore and/or revive the once so clear and present relationship with the water
PROGRAM
RESEARCH FUNCTION & PROGRAM

Maxim Museum - Zaha Hadid

Liebeskind - museum Dresden

van velzen - design combination

42 | drawing(s) by Joost van den Berge
“How to redesign the Katoenveem into a cultural public center?”

“what role can the valuable still present services have in the design proposal”

“how to deal with the distinctive compartmentation of katoenveem”

“how can i improve the relationship with the environment without losing the buildings character”

“how to cope with the lack of daylight and building circulation without decreasing the cultural value of the building”
URBAN PLAN
WATER STRUCTURES
infrastructure 1930

infrastructure 2018
Program 2025

- high educated
- peaceful urban living
- catering, atelier, exhibition spaces, shopping centre (retail) and temporary markets for food and climate campus
- small companies related to the Climate Campus
- innovative companies
- fruit cluster (transformation to an urban area on long term)

Infrastructure 2025

- water
- design location (Katoenveen)
- public area
- new bridges
- roads
- tram
- study westtanggent (metro/ car)
- existing aquanet stop
- new aquanet stop
- metro stop

Functions 2025

- water
- green
- design location (Katoenveen)
- study westtanggent (metro/ car)
- study location (Katoenveen)
- peaceful urban living
- urban economy
- opportunity peaceful urban living
- fruit industry (transformation to urban area on long term)
- dakpark
- floating city - peaceful urban living
- innovation yard where can be experiment with floating buildings and energy recovery
- floating offices
- public facility and hospitality
- innovation lab
- study energy supply
- climate campus

URBAN PLAN MUNICIPALITY
sketch Vierhaven area/urban plan

sketch urban plan/Katoenveem as hinge and main focal point

URBAN PLAN

drawing(s) by Joost van den Berge
ARCHITECTURE
CONCEPT

a large street is created through the building and compartments to make the building more practical and act more as one solid building.

Compartmentation divides the building into 5 parts which makes it difficult to put in a new
a large entrance hall and distinctive entrance are created in such a way that respects the building and its many valuable elements and structures.

climatised and usable volumes are placed in the building around the street and main hall but separated from the original structures to keep the building as intact as possible and functional for the new program as well.
CONCEPT CHANGES

removals and connections

circulation
ENTRANCE EVOLUTION

drawing(s) by Joost van den Berge
air handling unit

roof garden
IN BETWEEN FLOOR 1/200

1.01 backstage 1.02 toilets 1.03 shower 1.04 changing rooms 1.05 office/administration 1.06 black box theater 1.07 storage/technical space 1.08 bar/café 1.09 wardrobe 1.10 classrooms 1.11 waiting/looking space 1.12 changing rooms dancing 1.13 dancing hall 1.14 teacher lounge 1.15 entrance hall/atrium 1.16 patio 1.17 performance hall 1.18 kitchen 1.19 restaurant bar 1.20 grand-café 1.21 terrace 1.22 main entrance
drawing(s) by Joost van den Berge
STREET STUDY

drawing(s) by Joost van den Berge

Kunsthuis, Rotterdam

BK CITY, Delft

Katoenveem, Rotterdam
CONCEPT CHANGES

WHY?
In what organisation is the ground floor used?

HOW?
By defining areas according to their use.

ORGANISATION & USE OF SPACE
The inside area of the building is separated into five compartments. The middle one is the smallest, two rows of columns to three rows on the other four compartments. Within the compartments on the ground floor (ill. 11.1) we recognize areas where to place the cotton, done by tiling a pattern on the floor (ill. 11.3). In between these zones there were walkways connected to the openings in the facade. These are the relations between inside and outside and guide to either the waterside where the ships were moored or the side where the goods-train were driving. On the short facades bigger openings were located as well as the elevation points. Arriving at this next floor level (ill. 11.2), a gallery is running along the complete facade, again with entrances on both sides guiding to the cotton. By a system of galleries running over the grid of the structure of the building interaction between the two levels is enabled. It was possible to see both the zones with stored cotton and the walkways in between, possibly to keep the communication of organisation of use of space optimal.

[Diagram: organisation and use of the ground floor by Audrey Loef (own illustration)]

[Diagram: organisational situation in longitudinal section]
[Diagram: process of storage and transport in longitudinal section]
[Diagram: types of move in longitudinal section]

(by Audrey Loef (own illustration according to The pioneer for the shipping and trade of the Netherlands and her colonies (1919) nr. 3 march, 69.))
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STREET PLACEMENT
LIGHTSOURCES

drawing(s) by Joost van den Berge
VOLUMES (COTTONBALES) ORIGINALLY
EXTERIOR INSULATION

PRO’S
- building is completely insulated with no thermal bridges
- original facades are not exposed anymore to weathering from outside
- original facade on the interior is completely visible
- services and other valuable elements will be visible on the interior

CONS
- very expensive due to large amount of insulation
- exterior original facade is not visible anymore

INTERIOR INSULATION

PRO’S
- building is completely insulated without thermal bridges
- original facades are protected from possible damage or weathering from inside
- original facade on the exterior is completely visible

CONS
- very expensive due to large amount of insulation
- interior original facade is not visible anymore
- weathering still occurs on the exterior facade
- services, structural elements and all other valuable leftover elements will be at least partly covered or unseeable due to insulation

INSULATION PRINCIPLES
VOLUME PRINCIPLE P2
INSULATION PRINCIPLES

EXTERIOR INSULATION WITH SECOND FACADE

PRO’S
- building is completely insulated with no thermal bridges
- original facades are not exposed anymore to weathering from outside
- original facade on the interior is completely visible
- original facade on the exterior will be partly visible

CONS
- exterior original facade will be partly unseeable
- exterior original facade will be visible mostly when it is dark or when you are standing inside (glass is not always transparent, also depends on type of glass/facade)
- characteristic rhythm and horizontality of the building will at least be disturbed and probably unrecognizable

INTERIOR INSULATION WITH SECOND FACADE

PRO’S
- building is mostly insulated with some thermal bridges
- original facades are protected from possible damage or weathering from inside
- original facade on the exterior and interior are completely visible
- services and other valuable elements will be visible on the interior

CONS
- weathering still occurs on the exterior facade

78 | drawing(s) by Joost van den Berge
BOX IN BOX

PRO'S
- building and facades are untouched and by that mostly visible
- services and other valuable elements will be visible on the interior
- climate of boxes is very manageable
- this principle is easily reversible

CONS
- parts of the building become difficult to see
- weathering still occurs on the exterior facade
- spaces created will be very dark
- potential of building is unused

GLAS BOX IN BOX

PRO’S
- building and facades are mostly untouched and by that mostly visible
- climate of boxes is very manageable
- this principle is easily reversible
- spaces created will be very light

CONS
- weathering still occurs on the exterior facade
- services, structural elements and all other valuable leftover elements will be at some spots covered or unseeable due to insulation

- drawing(s) by Joost van den Berge
INSULATION PRINCIPLES

DOUBLE BOX WITH ROOF INSULATION AND CEILING

PRO’S
- building and facades are untouched and by that mostly visible
- services and other valuable elements will be completely visible on the first floor
- climate of boxes is very manageable
- this principle is easily reversible
- ground floor box is more quiet and more at ease/less distracting

CONS
- weathering still occurs on the exterior facade
- services, structural elements will be partly covered by ceiling on ground floor

DOUBLE BOX WITH INTERIOR INSULATION WITHOUT CEILING

PRO’S
- building and facades are mostly untouched and by that mostly visible
- climate of boxes is very manageable
- this principle is easily reversible
- spaces created will be very light

CONS
- weathering still occurs on the exterior facade
- services, structural elements and all other valuable leftover elements will be at some spots on the first floor covered or unseeable due to insulation and/or ceiling
LOAD BEARING SYSTEM STUDY
FLOOR STRUCTURE PRINCIPLES

IN BETWEEN BEAMS FLOOR

PRO'S
- minimum possible height/thickness

CONS
- bad sound and thermal insulation
- difficult to reverse

IN BETWEEN BEAMS FLOOR

PRO'S
- small thickness

CONS
- bad sound and thermal insulation
- does not fit or not possible to assemble
- difficult to reverse

FLOOR BETWEEN BEAMS, FINISHING ON TOP

PRO'S
- very good sound and thermal insulation
- small thickness

CONS
- does not fit or not possible to assemble

FLOOR ON TOP OF BEAMS

PRO'S
- very good sound and thermal insulation
- more easily to reverse and assemble

CONS
- great thickness

ASSEMBLE SKETCH OF NEW INTRODUCED STRUCTURAL ELEMENTS
ASSEMBLY PRINCIPLE VOLUMES

current state

structure placement around and over existing structure together with floor slabs

placement of curtain walls and panels

placement of finishings and roof
ADDITION PRINCIPLE
new foundation for columns that carry the roof
> screw injection pole
closed off box for sound insulation

SECTION COMPARTMENT 1 SOUND BARRIER 1/100
SECTION COMPARTMENT 5 1/100
east facade - new situation

west facade - new situation

north facade - new situation
BUILDING FRAGMENT 1/200

drawing(s) by Joost van den Berge
the relationship with its environment/being part of the harbor

harbor atmosphere & traces of a larger complex

the skin is part of the Katoenveem principle/system

the structure is directly linked to its original function

traces of wooden formwork and the way of construction

the still present services and building technology

IMPORTANT/VALUABLE ELEMENTS
WHERE OLD MEETS THE NEW HORIZONTALLY

drawing(s) by Joost van den Berge
WHERE OLD MEETS THE NEW VERTICALLY

meeting point existing column and new floor

meeting point existing column and new floor finished
WHY?
Question of the research, to understand which different sizes of cotton there were and what process it underwent in transport.

HOW?
By looking at documents from the time of the construction of the Katoenveem, as that gives the most accurate description of how the cotton could influence the building.

COTTON
Cotton is a natural product grown in the warmer climates around the world. The top producing countries at the time were the United States and Egypt, these were also most frequently exported to Europe.

After picking the cotton from the plant on the plantations, the cotton is gathered in bales that are compressed in order to move the most amount of cotton at a time. The size of the bales comes from the packaging machines used, and therefore differ in size per country as each country holds its own standards. The material used to cover the cotton is mostly burlap.

In transport the Egyptian bales are preferred because of their higher quality and also their higher compression, holding the same amount of cotton but at a smaller size bale than the American counterpart.

The reason the bales tend to look badly packaged in the images from around the 1920’s, is because of the sampling that took place. In order to grade the cotton, up to half a kilogram of material was removed by inserting a knife into the fabric. The samples were then compared to the standardised sample kit originating from the USA. On the bill that was signed to acknowledge the standardized using of this kit, Rotterdam is also not noted as a participant.

In order to use the standardised USA grading kit, the lighting qualities needed to be similar all over the world, calling for northern faced windows and special yellow paint in the sampling room, hence the specially build sample room on top of the Katoenveem.
1. PV-Cells
   > converting light into green energy

2. Grey water system
   > use the flat large roof for water collection for use in the building

3. Reflecting roofing
   > minimize heat gain

4. Floor heating/concrete core conditioning
   > influence and use the building mass with the aim of creating a more pleasant and comfortable indoor climate

5. Natural lighting through skylights
   > make the most effective use of the skylights as possible

6. Heat-cold storage installation
   > this installation stores and re-uses hot and cold water in the ground with the purpose of heating and/or cooling the building in a sustainable way

7. No climate ceiling
   > climate ceilings work on radiation - ceiling is too high

CLIMATE SCHEME
CLIMATE ZONES

1st floor

- Climate zone 1
- Climate zone 2
- Climate zone 3
- Climate zone 4
- Climate zone 5

ground floor

- Climate zone 1
- Climate zone 2
- Climate zone 3
- Climate zone 4
- Climate zone 5

drawing(s) by Joost van den Berge
<table>
<thead>
<tr>
<th>CLIMATE ZONE 1</th>
<th>complete space ventilated per hour</th>
<th>minimal amount of lighting (lux)</th>
<th>ventilation speed</th>
</tr>
</thead>
<tbody>
<tr>
<td>transition zone, stairs wardrobe, hallway</td>
<td>1 m3/h per person</td>
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<tr>
<th>CLIMATE ZONE 2</th>
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<tbody>
<tr>
<td>classrooms</td>
<td>20 m3/h per person</td>
<td>4</td>
<td>500</td>
</tr>
<tr>
<td>shower rooms</td>
<td>50 m3/h per person</td>
<td>10</td>
<td>150</td>
</tr>
<tr>
<td>dressing rooms</td>
<td>11 m3/h per m2</td>
<td>6</td>
<td>150</td>
</tr>
<tr>
<td>performance rooms</td>
<td>3.6 m3/h per m2</td>
<td>2</td>
<td>800</td>
</tr>
<tr>
<td>teacher lounge</td>
<td>54 m3/h per person</td>
<td>6</td>
<td>500</td>
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<tr>
<th>CLIMATE ZONE 3</th>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>offices/workspace</td>
<td>36 m3/h per person</td>
<td>4</td>
<td>500</td>
</tr>
<tr>
<td>toilets</td>
<td>35 m3/m2xh</td>
<td>3</td>
<td>100</td>
</tr>
<tr>
<td>wardrobe</td>
<td>9 m3/m2xh</td>
<td>5</td>
<td>75</td>
</tr>
<tr>
<td>cafe</td>
<td>20 m3/m2xh</td>
<td>8</td>
<td>375</td>
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<th>CLIMATE ZONE 4</th>
<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>grand cafe/restaurant</td>
<td>20 m3/m2xh</td>
<td>8</td>
<td>375</td>
</tr>
<tr>
<td>theater/concert hall</td>
<td>8 times per hour</td>
<td>8</td>
<td>375</td>
</tr>
<tr>
<td></td>
<td>complete space ventilated</td>
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</tbody>
</table>

<table>
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<tr>
<th>CLIMATE ZONE 5</th>
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<tbody>
<tr>
<td>kitchen</td>
<td>75 m3/h</td>
<td>10</td>
<td>500</td>
</tr>
<tr>
<td>office</td>
<td>36 m3/h per person</td>
<td>4</td>
<td>500</td>
</tr>
<tr>
<td>toilets</td>
<td>35 m3/m2xh</td>
<td>3</td>
<td>100</td>
</tr>
</tbody>
</table>

**CLIMATE DIAGRAM**