The Katoenveem | A “tailor-made” cotton warehouse

P1 Research report

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A research question

i,Introduction | Industrial Heritage & Functionalism

Definition: *The **industrial heritage** consists of sites, structures, complexes, areas and landscapes as well as the related machinery, objects or documents that provide evidence of past or ongoing industrial processes of production, the extraction of raw materials,their transformation into goods, and the related energy and transport infrastructures. Industrial heritage reflects the profound connection between the cultural and natural environment,as industrial processes – whether ancient or modern – depend on natural sources of raw materials, energy and transportation networks to produce and distribute products to broader markets. It includes both material assets –immovable and movable –, and intangible dimensions such as technical know-how, the organisation of work and workers, and the complex social and cultural legacy that shaped the life of communities and brought major organizational changes to entire societies and the world in general.*[1]

The Industrial structures are, therefore, by definition closely related with the industial processes of production, as well as, accompanied by relevant machinery, transport infrastructure and intangible dimensions. As Gropius stated, the true aim of the 1920s architects and their relation to the world of the Machine Age was "to invent and create forms symbolising that world".[2] This relationship, between industrial building's form and machinery is what concern me, when investigating the Katoenveem building in Rotterdam.

The main architectural debate of the nineteenth century, was focused in the conflict between deterministic rationalism and the Academism introduced by Les Ecole des Beaux Arts and eventually reached a dead end with the statement of 'Form follows function' and the arise of the Modern Movement. The scientific basis for the development of the form in architecture is now replaced by mere functional criteria, such as Le Corbusier's suggested with his work. This is what led the historiographers of Modernism to rename the Structural Rationalism of the nineteenth century into the Functionalism of the twentieth, which is actually based in a quite related concept. One of the widespread notions of twentieth century functionalism is, thus, defined in terms of structural and technological explorations which lead to New Architecture.

The industrial buildings were throughout history utilized as typologies for architectural experimentation, mainly in order to test structural innovations or formal outcomes. The only guiding force was the improvement of the functioning of the building in terms of structural strengh and better working conditions for the users and, hence, industrial buildings were always equal to functional buildings. [4]

The main care by the owners or the designers of those buildings was the well- being of their workers. Thus, this functional driven design existed well before the Modern movement, in the architecture of the industrial structures. The engineers or architects had to consider seriously for their design the lighting, heating as well as the dining and socializing needs of workers.

These aspects and principles are all met in the Katoenveem building, a cotton warehouse in the old harbour of Rotterdam, which was well known in its time, for its innovative transit system. This system is tailor-made for the structure of the building and the other way around.

1 Joint ICOMOS –TICCIH, Principles for the Conservation of Industrial Heritage Sites, Structures, Areas and Landscapes «The DublinPrinciples», 28 Nov. 2011

2 R. Banham, Theory and design in the First Machine Age, London: The Architectural Press, 1960, 320

3. Rogic, T. 2009, Converted industrial buildings. Where past and present live in formal unity, TU Delft, Delft

4 Rogic, T. 2009, Converted industrial buildings. Where past and present live in formal unity, TU Delft, Delft

A

ii. The Katoenveem | Why a “tailor-made” building?

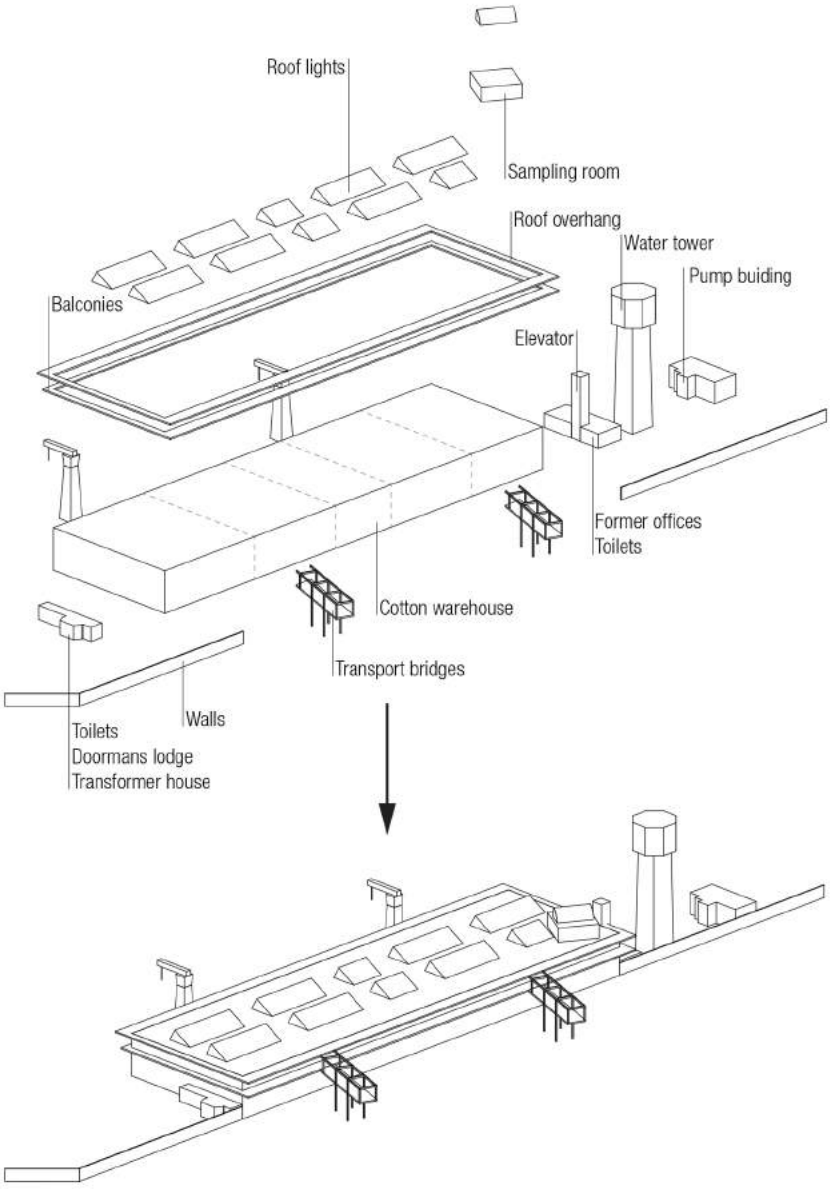
One of my first observation about the Katoenveem is that it is about a design totally adjusted in cotton warehouse’s functional demands. Every element in the building is explained by its innovative transit system and its special fireproof demads. It was not designed as a usual warehouse that could possibly shelter various industrial products, but its interior space was exclusively intented for the storage of cotton.

This exclusiveness of the Katoenveem’s design is visible when noticing many of its parts; the existance of firewalls and a sprinkler system connected with a water tower and a pumping station, the transit system running in the ceiling and serving both the exterior and the interior transport of the cotton bales, but also the skylights in the roof, the sample room and the structural elements themselves.

Therefore, it can be argued that all the particular elements and characteristics of the building throughout different scales, starting from the urban one and toward the most detailed one, can be justified by this “tailor-made” aspect of its design.

Pictures from the beams in the north part of the building; The wholes in the concrete beams are made during the formwork

Katoenveem Rotterdam, view from Keilestraat
Stadsarchief Rotterdam



All the parts of the original design of the Katoenveem by Jelmer van der Poel

A

iii. Conclusions | Research aim

There is a specific framework/ methodology that can help an architect to work with an existing industrial building and integrate it into a new design. The significance of the analysis and evaluation part is always undelined by such methods.

First comes the analysis that lead us to the value assessment. The evaluation has to be personal and it usually follows naturally a careful and substantial analysis of the existing structure in every scale, starting from a broader- urban scale to the most detailed one- building technology. In this phase, it is up to the architect to decide the most important elements of the structure, according to the essential meanings or symbols they do include or represent. It is not about an objective process and this is why a lot of research is needed for it to be convincing and well justified.

A substantial evaluation of the historic structure can also help us to decide about the most appropriate new function. However, the program of a contemporary building is much more fluid and, therefore, it can be much more complex, than it used to be in the past. The future users play an out standing role in this direction, as they eventually interact, adjust or even change the initial programme of a building. So, a user-oriented design is always useful.

Another aspect is related with the uniqueness of each structure and how it is recognized and interpreted by the new design. Working with metaphors and symbols, like Rem Koolhaas, is definitely a useful tool to enhance this aspect of a heritage design. The special and most essential characteris tic of a space can be met in many parts of the design and be communicated in a metaphoric way to the users. Therefore, an experiential way of highlighting the historical value of the building, being introduced successfully, can make the design really powerful.

For all these reasons, this first step of a Heritage design that includes the analysis and the evaluation of the existing, should be done in depth, in order for it to set the foundations for a meaningful and successful intervention. This consists the main aim of my research report.

To become more accurate, via my research I would like to investigate and identify the “tailor-made” aspect of the design in all the scales, in order to be able to utilize this special characteristic and highlight it through my design, afterwards. In this way, I aim to work with this “tailor-made” structure, in order to create “tailor-made” experiences for its future users.

B
location & settings

i. Past: History Timeline

The history of the building itself reveals many information about the functional demands and the requirements of its structure.

More specifically, the introduction of the cotton trade in Rotterdam harbour accompanied by the establishment of the Katoenveem Joint Stock Company, required a specially designed warehouse. The purpose of this building was to secure the safe storing of the cotton bales, which premise special regulations concerning its indoor climate, the fireproof system and their trasport from and towards ships and trains.

The name “Katoenveem” is translated to “cotton storehouse company”. A storehouse company is referring to an enterprise that is specialized in temporarily storing goods without a destination for another enterprise. This compromises the exclusive character of such a building.

Despite, one of the main reasons why the Katoenveem was built, was to prevent the goods (cotton bales) from drying and terefore loosing weight. This would be a disadvantage for the cotton traders, as they did sell the cotton by weight. So, special moisture conditions were needed for the interior of such a warehouse, together with all the other regulations.

1915 — Katoenveem Joint Stock Company is established
Due to WWI the import of cotton in the harbours of Antwerp and Bremen weakened. As a result Rotterdam made the attemp to capture a share of the cotton market by guiding the cotton shipments through Rotterdam’s harbour



1926 — Warehouses “Galveston” and “New Orleans” are sold
They belonged to the Holland-America line and were situated right in the opposite side of the Katoenveem. They used to function together with it, as temporary storages and were connected with it with two bridges and the transit system. The two warehouses were sold to Thomsen;s Havenbedriif in 1926.

1931 — Warehouses “Galveston” and “New Orleans” are presumably demolished.
We assume that both warehouses were demolished between 1927 and 1931 or they were renamed because they disappeared from the Rotterdam address books after 1931.

1920 — The Katoenveem was built
In 1920 designed by architect J.J.Kanters, it consists a rectangular, 12 meters high building, except for the sample room on top of the roof.

1963 — There has been a fire to the building, which is probably related with the its operation end

1964 — Katoenveem closes its doors.
Due to the uprise of synthetic fabrics and the decrease in textile demands, the Katoenveem stopped functioning as a cotton warehouse in 1964

1987 — Cladding was applied to the facade
A. C. Sterba place PVC cladding on the north and east facade and painted them white up to 3m high.

1966 — Cranes and partial water tower were demolished
The cranes were used for the lifting up of the bales directly from the ships towards the building. They were demolished in 1966, but their conrete foundation still remains. The upper part of the water tower was also demolished the same year, due ti its bad state of conrete. The base remained there to serve the central heating system for the building.

1988 — Director’s office and rest of water tower were demolished

2002 — Katoenveem becomes a national monument

1976 — Blaauwhoed sells Katoenveem
to A.C. Sterba. It had been used for exploiting goods since it was closed in 1964

1986 — Offices were built in the west compartment
This resulted in interventions also in the facade of the building


1990 — Offices and cover built on East part

2016 — Verweij Vastgoed
Since the summer of 2016, this company is in management of the building.Before, multiple businesses were settled in it, such as Atelier van Lieshout or M.S. de Visser b.v. whose names are still visible on the facade.

timeline by Charlotte de Boon

B

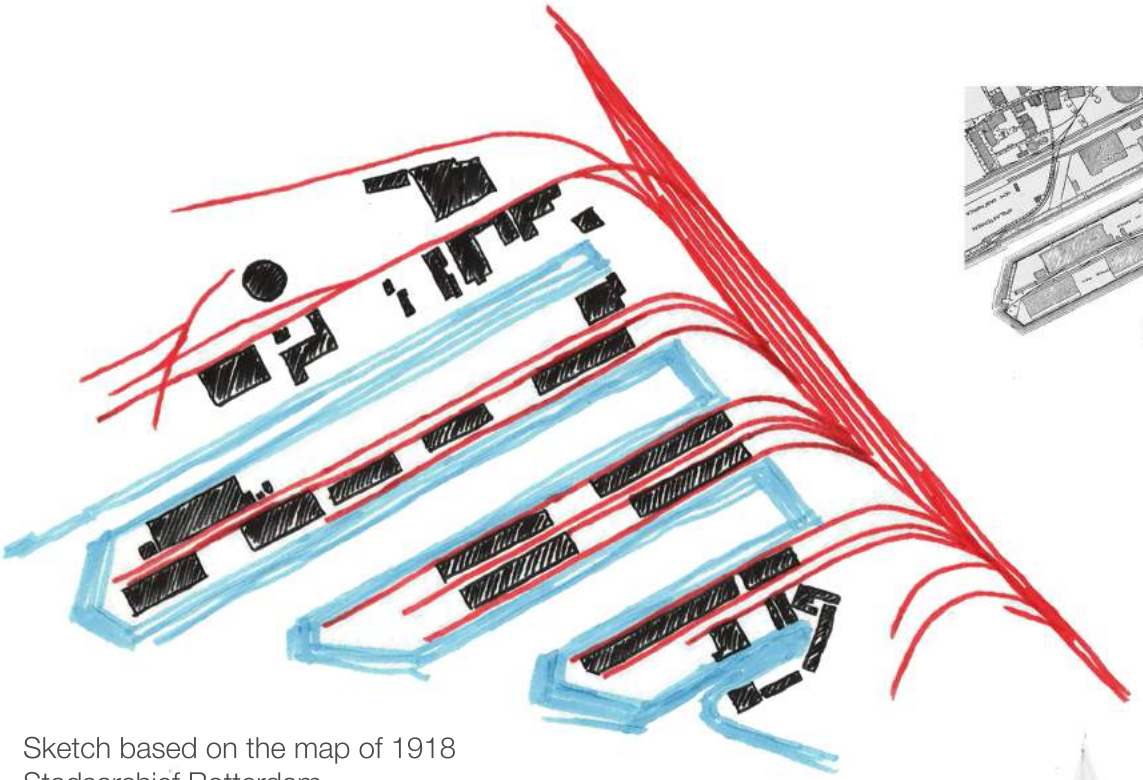
i. Past: Urban settings

When we study an old map of the area, it is pretty clear that the Katoenveem used to function as a transitional storing space between the different means of transports of its time. Located between the two harbours, the Keilehaven that was destined for smaller ship and the Lekhaven for bigger ones, it could serve both of them at the same time. In this framework, the transportation system played a significant role, in conjunction with the two other buildings towards the Lekhaven that were functioning as temporary storages.

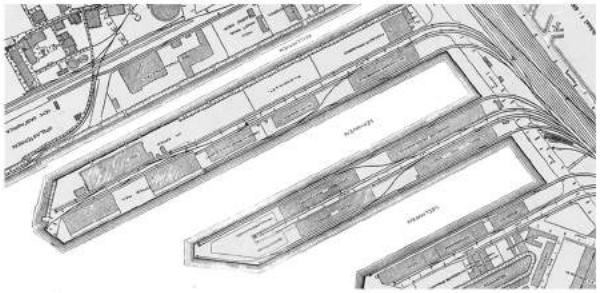
So the process was as described in the sketch:

- First the transsipment of the bales was made via the iron structure towards the temporary storages.
- Afterwards another iron bridge together with the guides of the transportation system was taking them in the Katoenveem for long-term storing or to the train for further transport to the rest of thew country or to Germany.
- Last but not least, the bales could be also transported directly towards the smaller ships parked on the Keilehaven or the other way around.

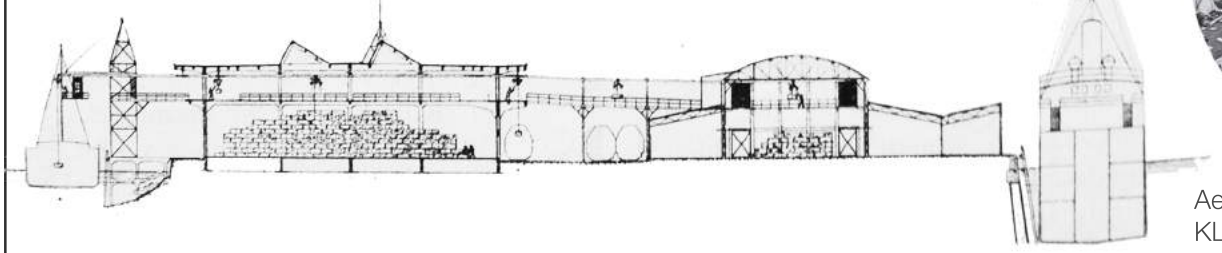
There it comes the innovation of the building: the human effort was reduced to the least possible.

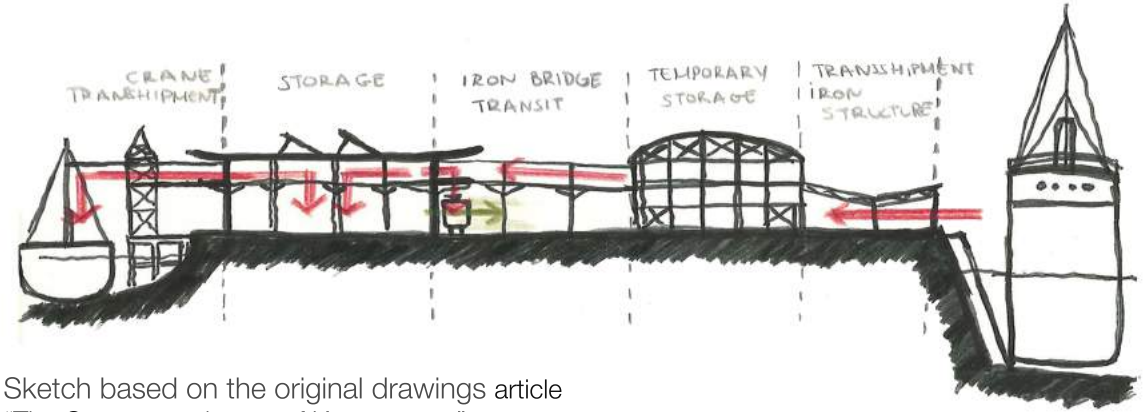


Sketch based on the map of 1918
Stadsarchief Rotterdam



Aerial pictures from 1939 and 1949
KLM aerocarto- Aviodrome





Sketch based on the original drawings article
"The Cotton warehouse of Katoenveem",
The Pioneer magazine, 1919

B

ii. Present: direct surroundings

Today the central role of the building in its context has completely gone. It consists an empty structure surrounded by other industrial structures or vacant former industries, which are all together clearly isolated from the city life. There are some residential neighborhoods on the north west side, but they are stricktly seperated from this area via the dikes.

Another significant feature of this site is the Dakpark, which is recently made close to the building, in the roof of a two storey high shopping centre. However, due to the big height difference and the absence of any connection between the industrial area and this park, it functions now as a clear border in the middle of these two worlds, the residences and the industries.

The Katoenveem seem to be no longer “tailor-made” for its context.

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SECTION

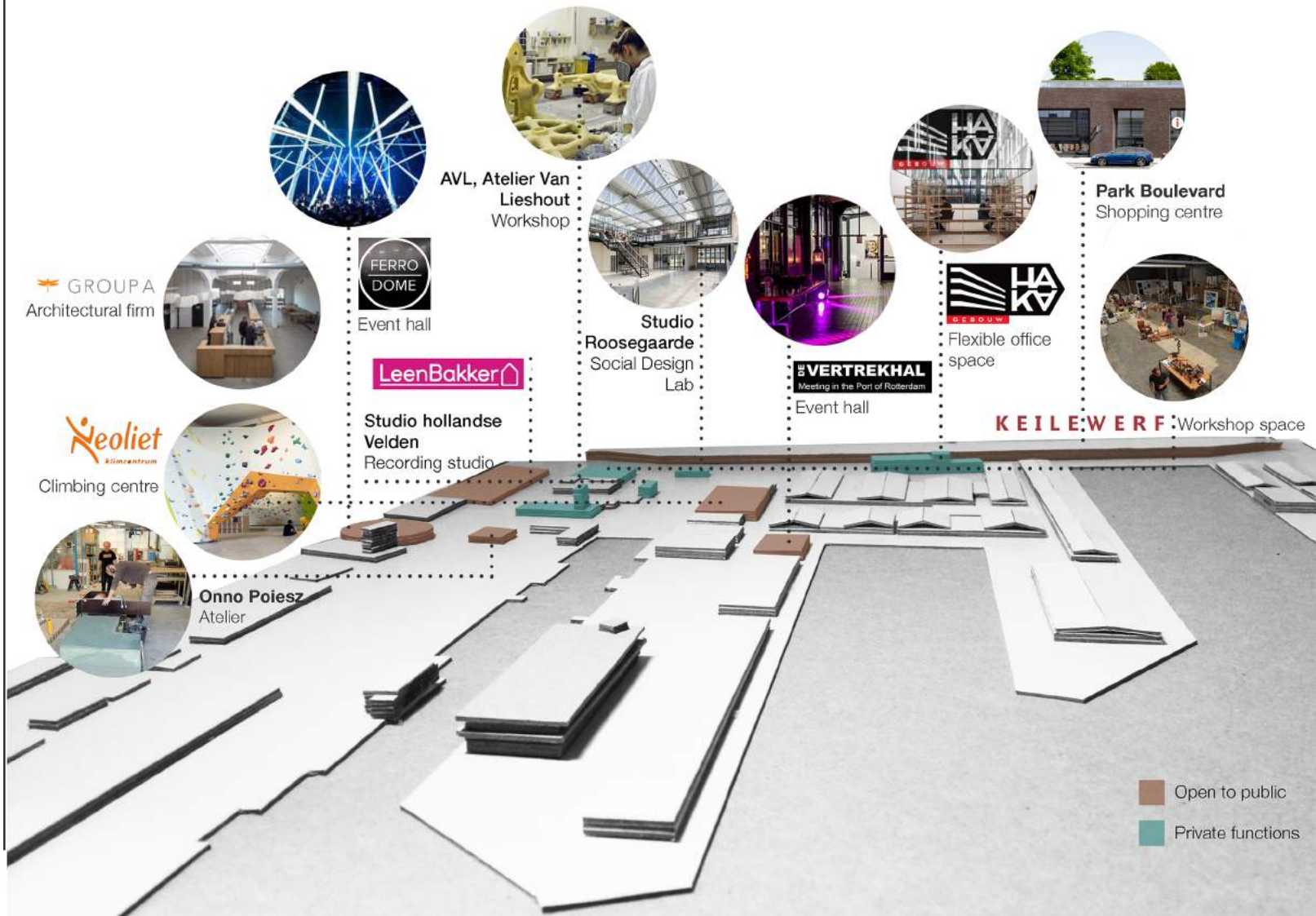
TODAY’S MAP
Dikes dividing residential from industrial area

Views from Dakpark

ii. Present: traces of change

However, when we look closer to the functions integrated in the surrounding mainly industrial buildings, we find out that there is a lot of different thing going on in this “isolated” area.

Event halls, office and workshop spaces, atelier and shops are spread all around the Katoenveem building. The former merely industrial character of the area is changing into a mix of different functions, related to inspiration, creativity and leisure. This is a really important aspect to take into account, when thinking about the most appropriate function for the new Katoenveem.



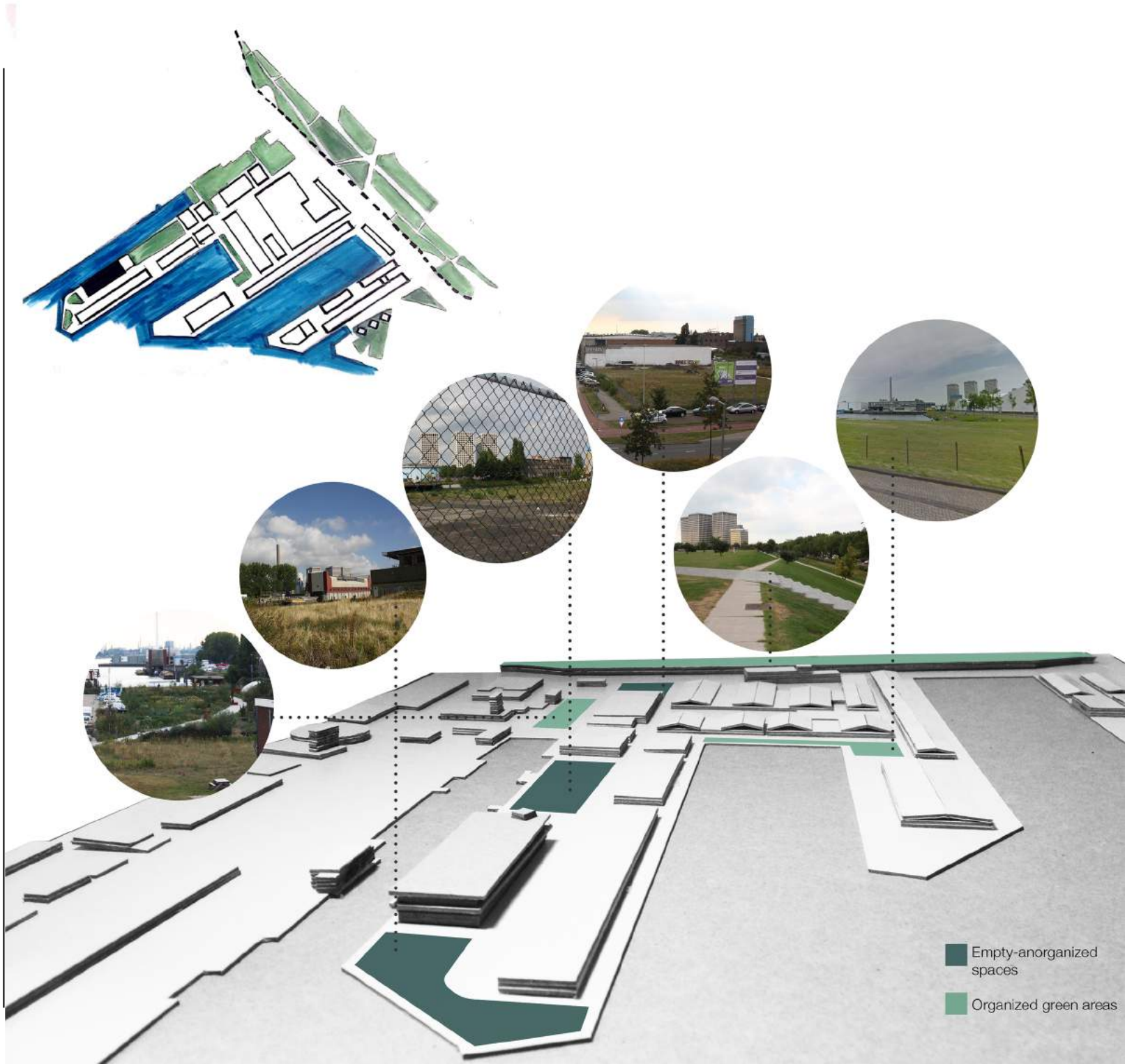
B

ii. Present: traces of change

The quality of the living of each area is also closely related with its public/ green spaces. The amount of open spaces and empty bocks is remarkable in the direct surroundings of the Katoenveem.

The most outstanding green space is eventually the Dakpark, located on top of a two storey high shopping mall and in parallel with the dikes. Allthough the height difference with the old harbour functions now as a border between the the residential and the former industrial area, its existance adds some quality to the whole area.

Both organized green spaces and anorganized empty blocks create interesting possibilities for future plans. All this “openness” around the building leaves space for possible interventions that will bring back the “former glory” of the harbour. Therefore, all these spaces identified in the site, can indicate traces of change about its future.



B

iii. Future plans

The future plans concerning the Katoenveem area include floating housing, innovation lab and a climate campus right next to its quay. A bridge is also going to be built in order to connect the site with the opposite part of the city.

All these plans highly influence the future of the Katoenveem, as it will be a part of a broader redevelopment strategy rather than an abandoned isolated building in the end of a quay.

City's vision of 2030 according to Stadsvisie Rotterdam 2030

New bridges of Rotterdam
http://www.ditiszuid.nl/single-post/2016/02/16/Nieuwe-bruggen-naar-Zuid, Februry 2016

B

iv. Conclusions

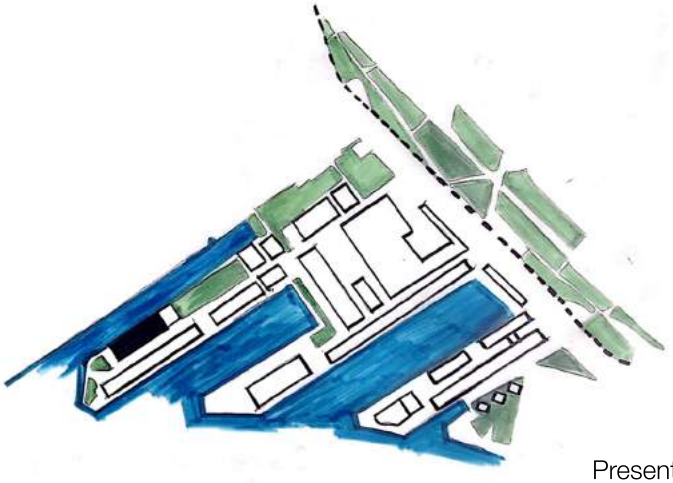
All the information related to the context of the building throughout the different time periods is quite usefull when considering the masterplan of revitalizating its quay. To sum up:

The Katoenveem in the past used to occupy a central position in the harbour, functioning as a transitional storing space between the two harbours and the train tracks. It was also framed by additional structures, such as cranes, bridges and temporary storages and all together functioned as **one industrial "body"**.

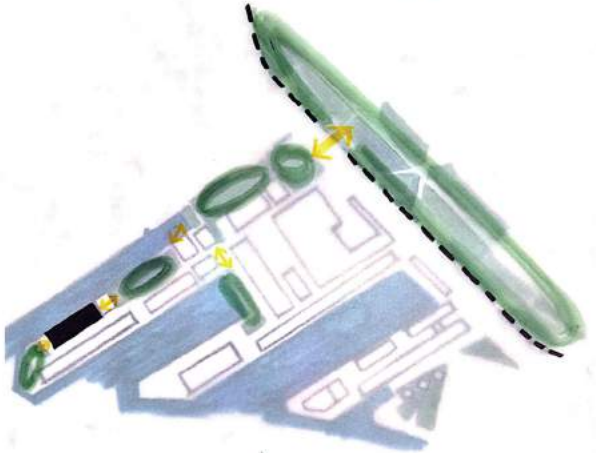
The present situation of Katoenveem surroundings gives an impression of an abandoned isolated part of the city, but on the other hand there are a lot of things happening in it, offering some **traces of change**

The future plans of the area reveal a concerne from the municipality about its redevelopment and "gentrification", which can work as a **fertile ground** for a transformation design.

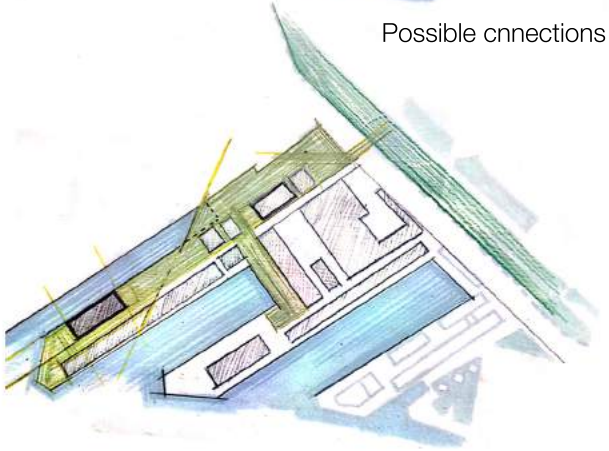
Combining all these conclusions can easily lead to some first gestures/ intentions about the masterplan of the area.



Present



Possible cnnections



United civic park

C
the missing parts

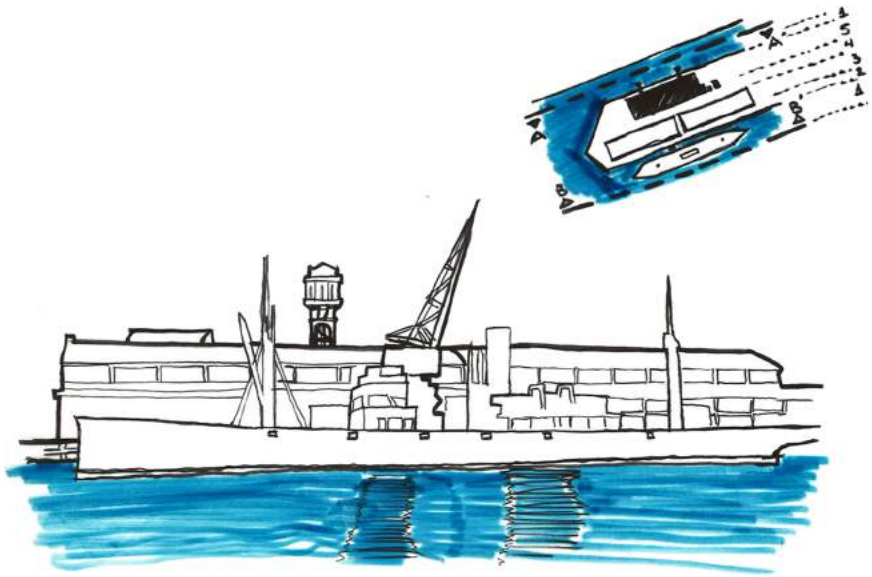
A different chapter about all the “missing parts” identified throughout the study of all the different scales of the Katoenveem is introduced, as there have been a lot of changes, demolitions and interventions in the existing building since its initial design was realized.

ii. Context: The relationship with the water

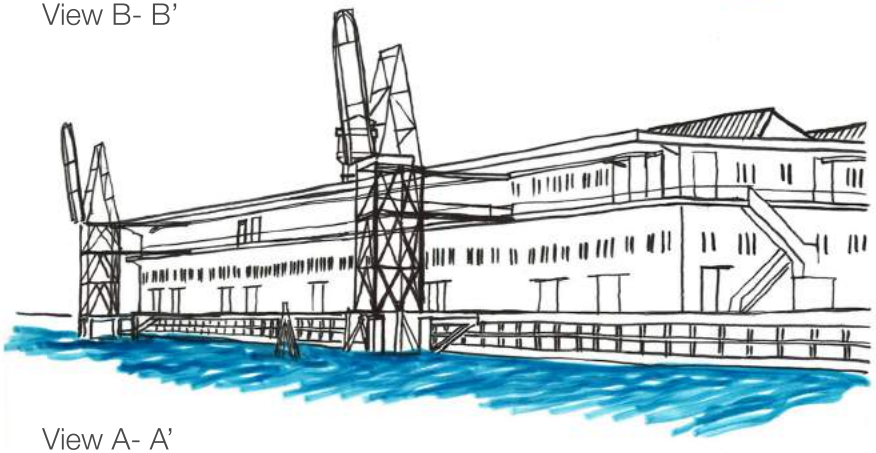
In the past, the relationship between the Katoenveem and the water really interdependent. Direct connections used to exist in both watersides of the Katoenveem, with bigger and smaller ships for the proper functioning of the warehouse.

This was also expessed by a composition of different structures that were there to support this specific process. Therefore, by observing the old pictures one can immediately understand the way the transportation of the cotton bales used to take place, via the transit system embedded in the building, which was corresponding to the spatial composition of all the supporting port structures.

Countless cranes, temporary storages and other smaller temporary construction were framing the harbour landscape, with its most significant element, the water. Water used to be the mediator between the different harbours and, at the same time the “spine” of the different structures on the quay.



View B- B’



View A- A’

Pictures taken from the water | Stadsarchief Rotterdam

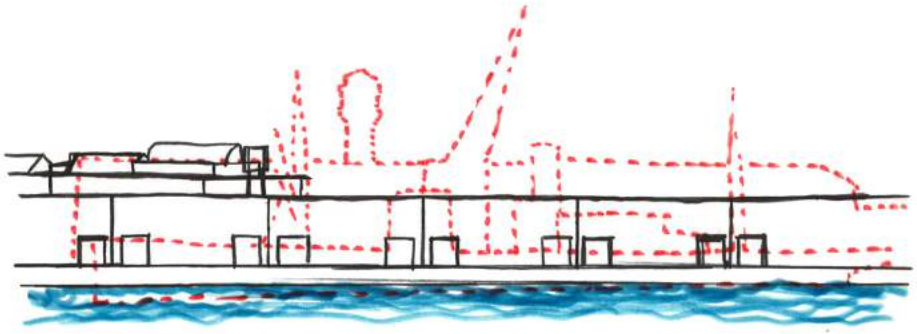
B

iii. Context: The relationship with the water

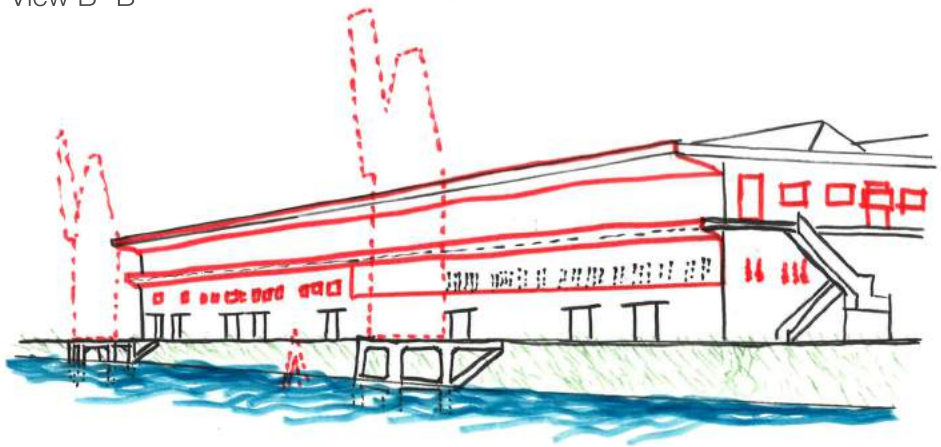
The relationship between the water and the building has completely changed nowadays. All the missing parts, such as the cranes and the temporary storages result in intermittent connection between the Katoenveem and the harbour. The ships do no longer consist the primary mean of transportation for goods, so there are less ships coming to the harbour and there is no connection between them and the building needed as it is now vacant.

Moreover, the waterfornt of the building itselft is completely modified today. There are some steel elements added in the water facade of the building that make the building “turning its back” to the water. Most of its openings are now covered or filled with other materials, while the quay edge is now left in its fate and has some grass. However, the foundations of the cranes are still there, to remind us a bit the past situation.

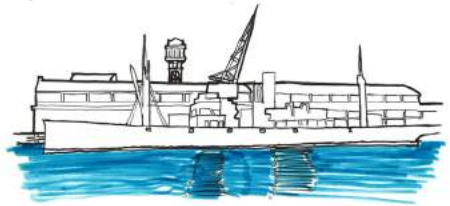
Everything feels like there is something missing amongst the building and the water, something that used to be there but it is not needed anymore. A nostalgia characterize today the relationship amongst water and the Katoenveem.

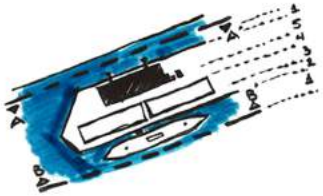


View B- B’



View A- A’





C

iii. Building level

All the aforementioned missing parts identified in the close environment of the Katoenveem are becoming even more evident when considering the initial design of the building itself.

There used to be an around 30 meters high water tower very close to the main volume of the building, corresponding its fireproof efficiency, but at the same time consisting a landmark for its location in the quay. In the view from Keilestraat this really stands out from the ridge of all the surrounding buildings.

The cranes on the north side and the bridges on the south one are also gone, while they used to make the building look integrated in its environment. Moreover, all the added steel cladding, together with all the various modifications made in the old openings of the facades, they result in a misleading appearence of the Katoenveem, as the old coherence and repetiotion is now missing.

Today, the building looks like an unfinished puzzle, whereas some evidence is still there to remind the old situation.

View from Keilestraat, 1946 | Analysis of the Keilepand building, Gemeente Rotterdam

PAST (1920)

TODAY (2016)

Views form 1920 | Historisch Centrum Overijssel

C

iii. Detail level

All the modifications, as well as, the cropped connections with the rest parts are visible in many parts of the current structure of Katoenveem.

The hanging transit system is limited now only in the interior of the building and we can still identify its cutted edge on the former opening in the south gallery of the structure. In the same gallery, there is still the attached steel beam that used to support the bridge leading to the temporary storages on the other side of the street.

On the north side of the structure, the openable elements in the railings remain in the place where the cranes used to be. Moreover, in the ground level there are a lot of intense interventions made in the windows, such as breaking the cement partition that used to divide them in different openings.

Collage of different pictures of the current situation | personal archive

C

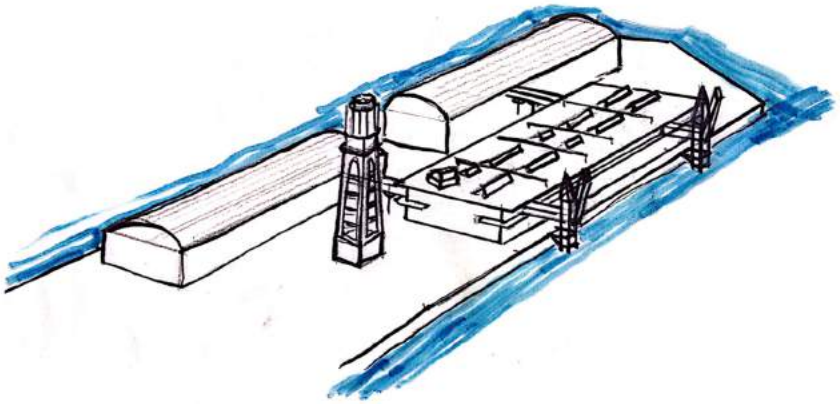
iv. Conclusions

To sum up, the former “glamour” of the building and its strong interrelationship with its environment are now missing.

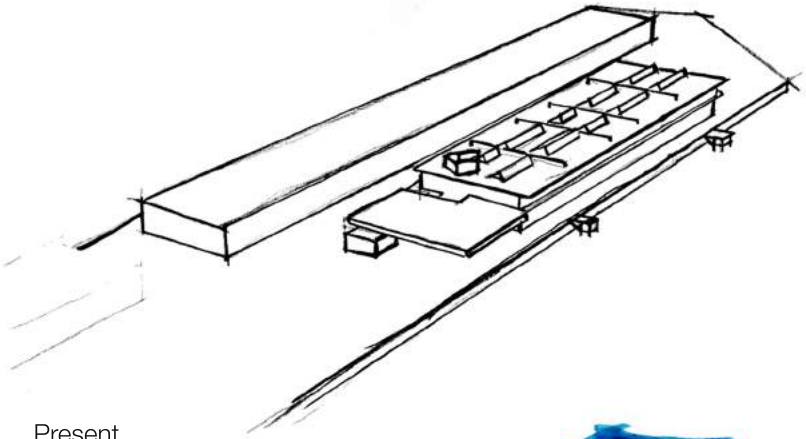
This result in a completely broken image of the current structure, turning its “back” to both the waterside and the street, while trying to specify its role again in the present situation.

One way could maybe be to reintroduce all these connections and volumes again in the current situation. However, all these specific parts were there to serve the old functioning of the Katoenveem, so they were “tailor-made” as well, for the specific context, infrastructure and needs of the past situation.

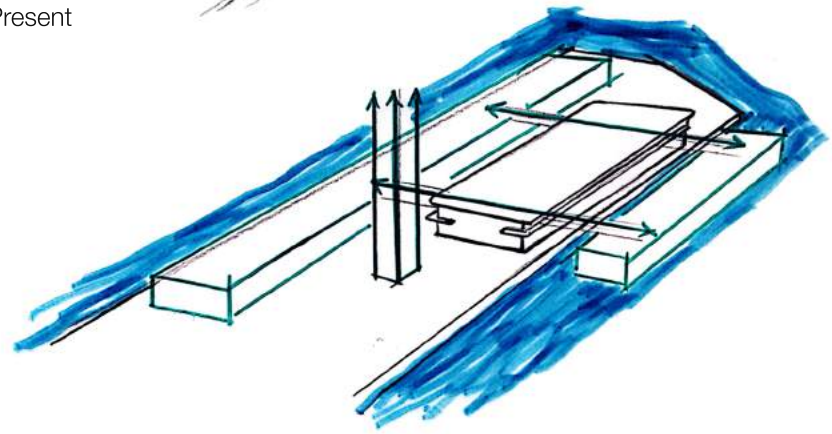
Thus, the question is, now that both the context and the function are missing, what could be done to identify the building in its contemporary context again?



Past



Present



Reintroducing old connections/ volumes

D
structure & design

i. The architect

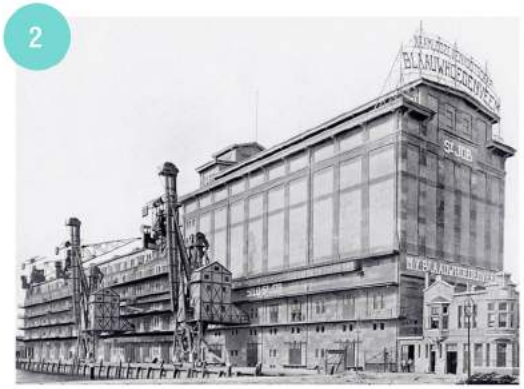
Jan Jeronimus Kanters was born in 1869 and he studied at the “Academie of Beeldende Kunsten en Technische Wetenschappen” in Rotterdam. In 1890, J.J. Kanters became a member of the union “Bowkunst en Vriendschap”, where his father was one of the cofounders. This union focused on the newly built buildings, organizing relative excursions, events and exhibitions.

In 1894 his father initiated a long lasting relationship with the Blaauwhoedenveem, designing and contructing their warehouses. In this framework J.J. Kanters was involved in constructing many industrial warehouses, with his most known works Santos, St. Jobsveem and Katoenveem. During the construction of both Katoenveem and St. Jobsveem he worked together with Van Waning.

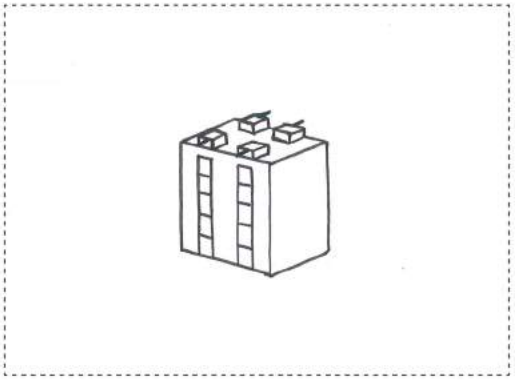
In most of his work the functional aspect of his design is highly recognised, while the facade are much more articulated than the interior. The proximity to the water and the additional structures that used to support the transport process of the goods is also noticeable in all the warehouses. Exterior galleries, openings in the facade and mechanical installations characterize J.J. Kanters designs.

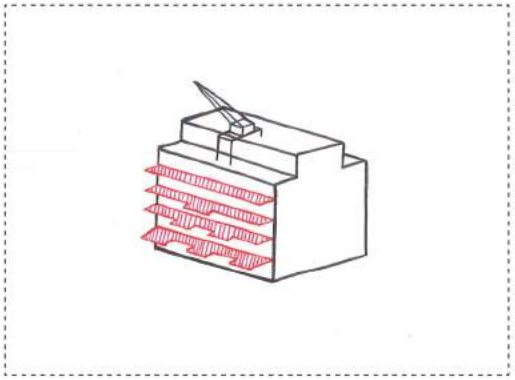
Santos 1903

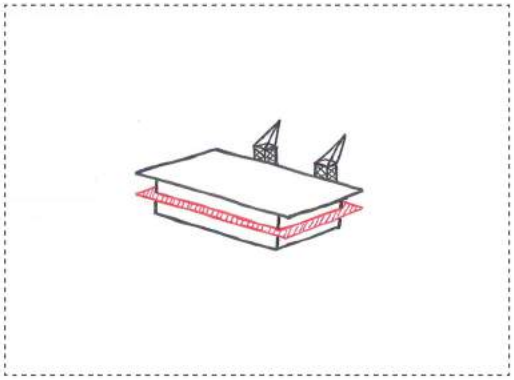
St, Jobsveem 1914

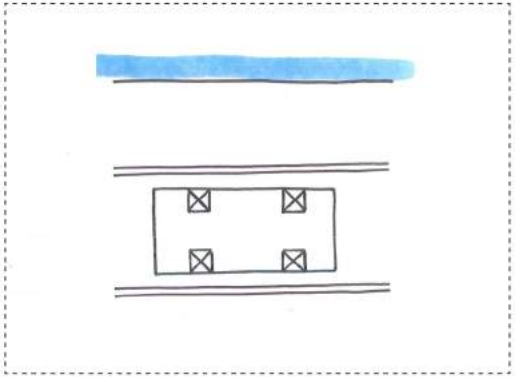


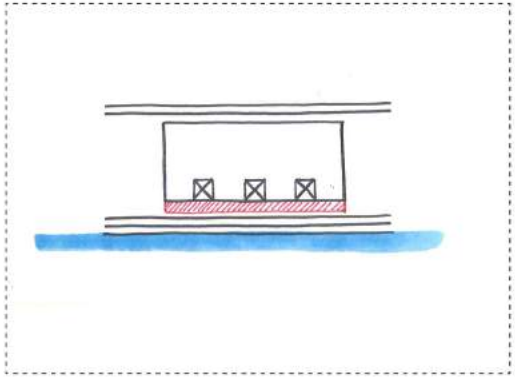
Katoenveem 1920

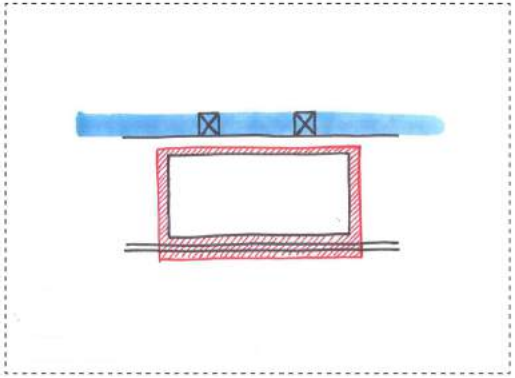












by Charlotte de Boon

D

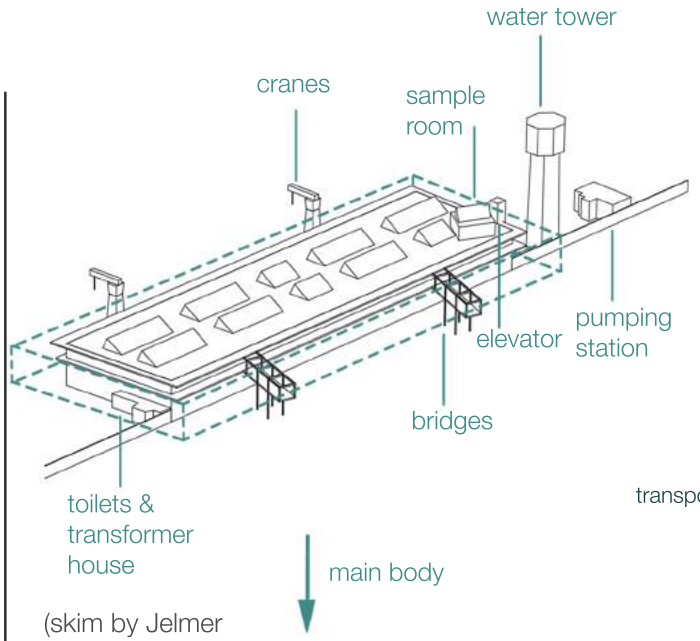
ii. Structural elements

All the particular structural elements of the building are shaped in a way that they could better serve the proper functioning of a specially designed cotton warehouse.

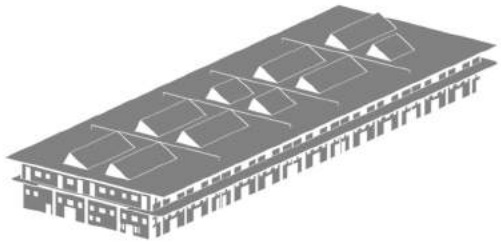
The structure consists a monolithic concrete and follows the quidelines of the “hennebique system” family, which means that roof, floors walls, columns and beams were poured all together during the construction phase.

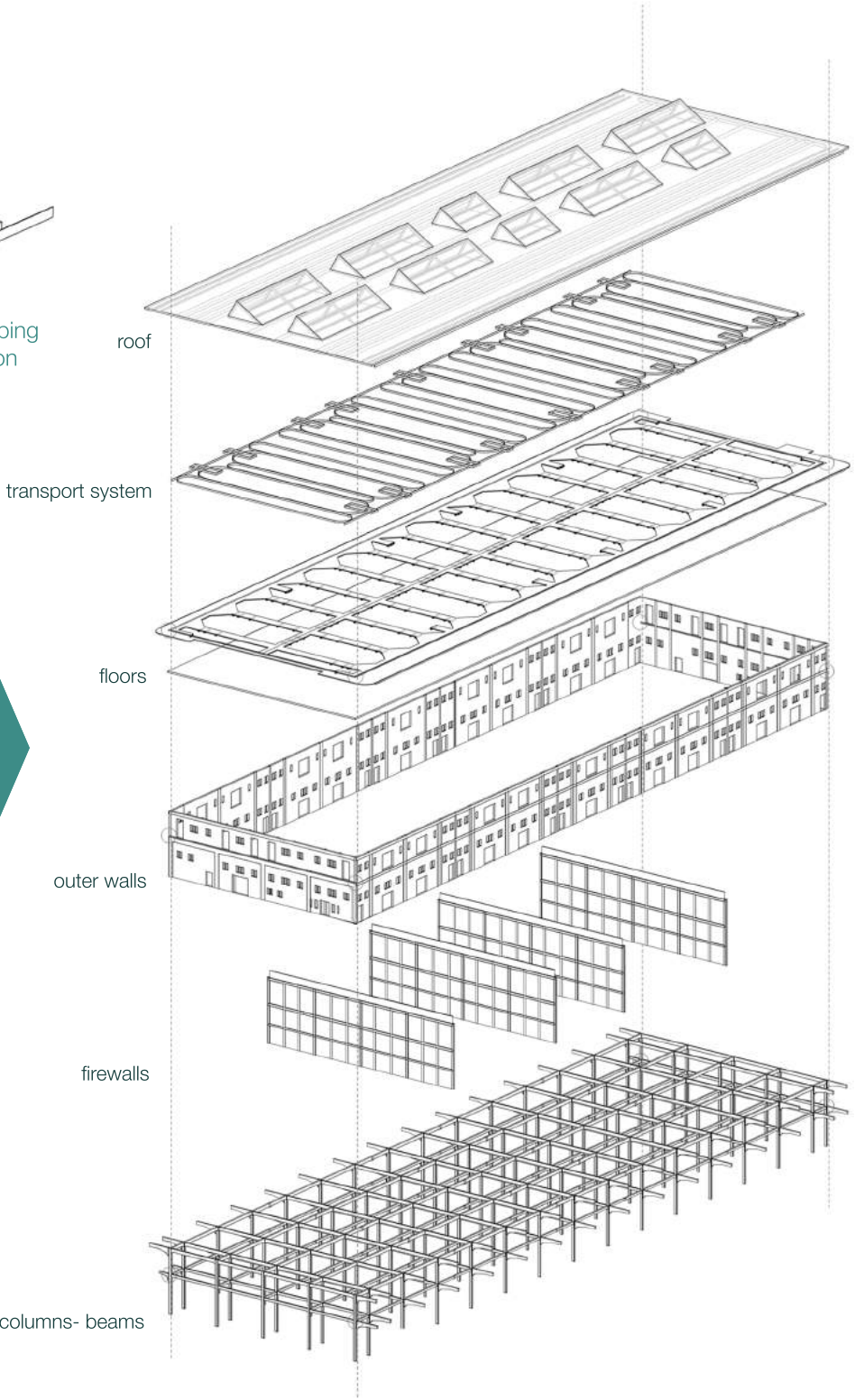
However, it is worth illustrating it in different layers to distinguish its characteristics. The transit system is illustrated, as well, because it consists a really important element for the design of the structure. More specifically, most of the secondary beams were designed not to support the roof, but to hold the guides of the innovative transit system. Moreover, all the galleries and walkways served the worker’s circulation, in such relationship with the system to be able to control it and at the same time, they contribute to the rigidity of the structure.

All the openings are also explained by the functional demands of the worker’s and goods circulation. Another interesting part of the structure are the openings on the roof that are specially oriented to the south-west, with a specific inclination in order to bring only the necessary amount of daylight - and not more than this- in the interior space.



(skim by Jelmer van der Poel)





D

iii. Spatial characteristics

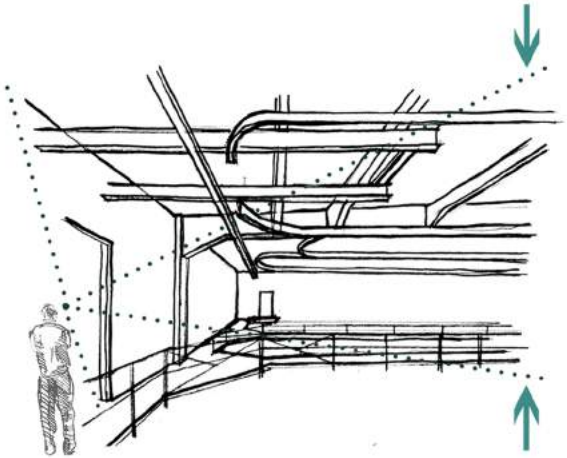
An interesting remark when it comes to the construction of the building itself, is that it is strictly divided into five different compartments. This happens due to the fire proof regulations concering the cotton industries. However these different compartment are seperated, they have exactly the same interior spaces and atmospheres.

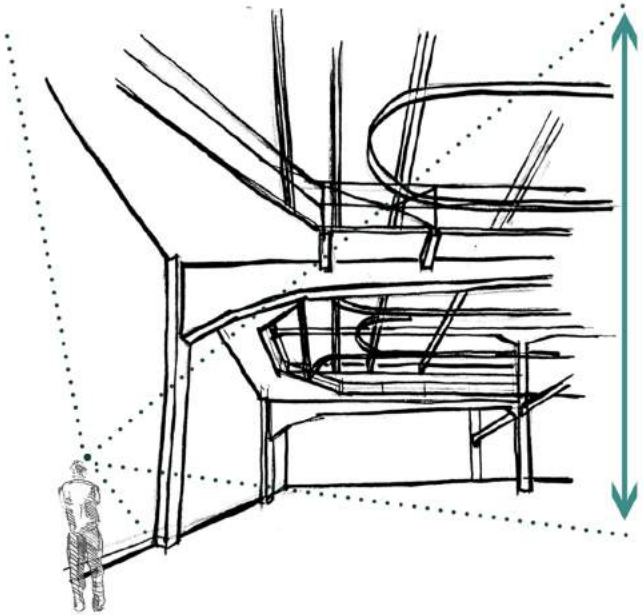
Markus argued that "all factories have three structures - social, spatial and power transmission."108 He explained that the components of the social structure were the owner of the mill, one supervisor on each floor and a worker at each machine. The spatial structure encompassed the space of the whole building "containing all its processes"109, the space of each floor, accommodating a single process, and the spaces occupied by each machine, dedicated to the fragment of the process. Technologically, there was one water wheel, subsequently a steam engine, which drove one vertical shaft. The vertical shaft in turn drove the horizontal shafts at each floor to which individual machines were connected by belts.[5]

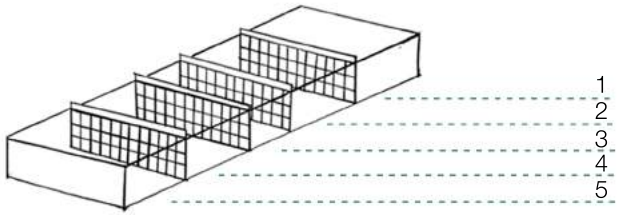
Such kind of processes characterize the interior spaces of the Katoenveem, as well. And of course there is a big difference between the past perception of the interior and the current one.

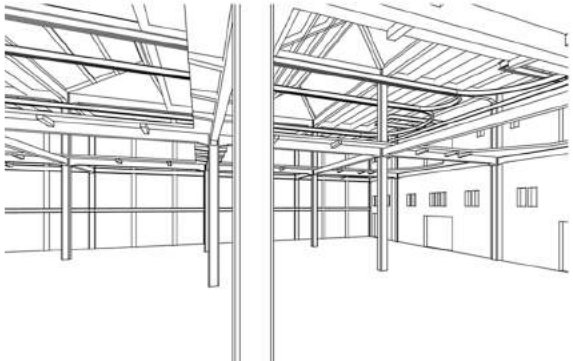
5 Markus, T.A. *Buildings and Power: Freedom and Control in the Origin of Modern Building Types*, London: Routledge, 1993

PAST Vs PRESENT









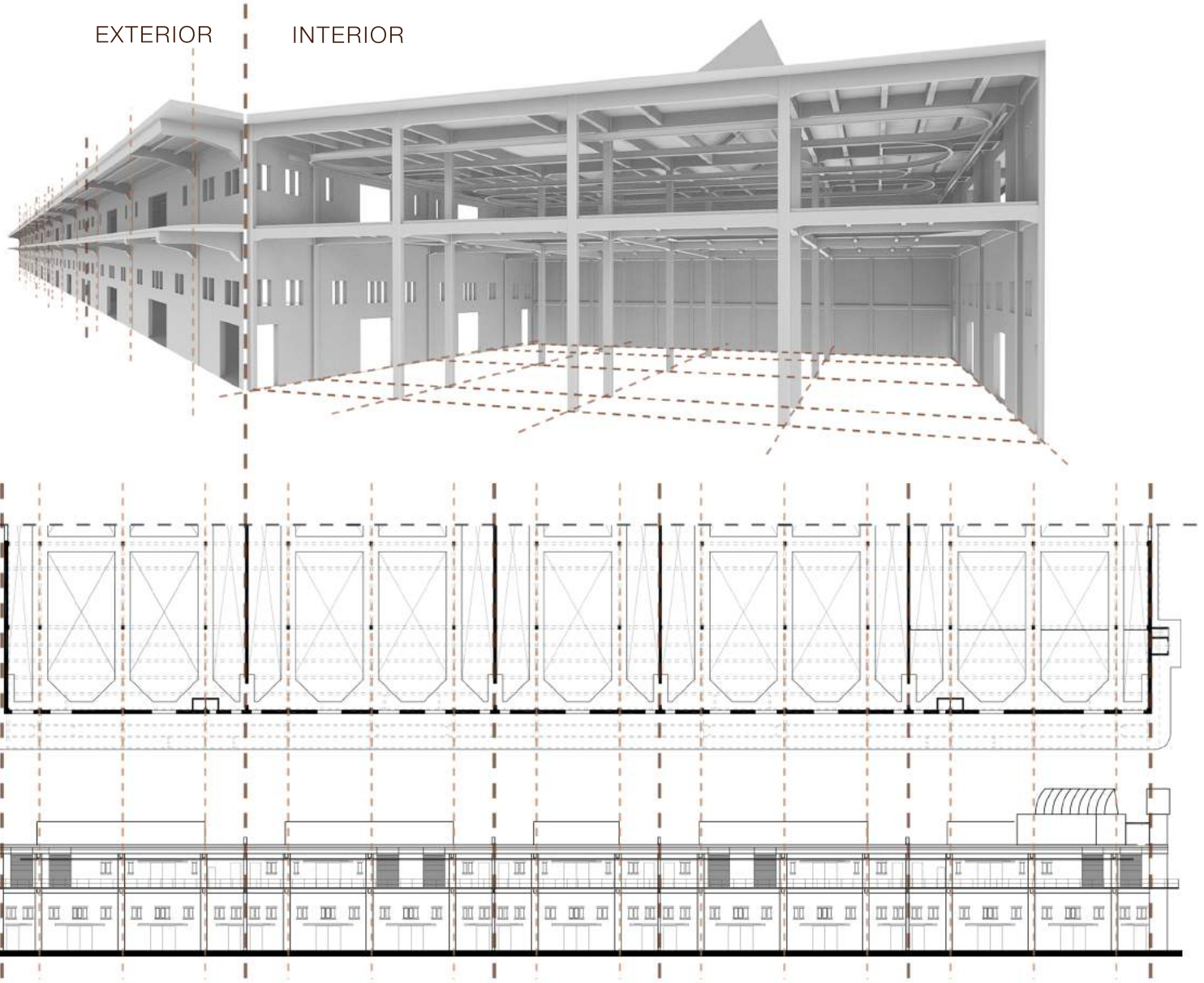
D

iv. Typology

Another observation concerning the design of Katoenveem is the repetition and the rythm of every structural element both in the exterior and the interion. The only volumes that break this rythm are the sample room in the roof and the additional rooms on the sides.

Moreover, a clear contrast exists between the exterior and interior views of the building. This is actually a broad phenomenon started from the 19th century focused on rationalism movements. In the interior spaces, walls started to disappear particularly in building types like industrial structures and the essential element in architecture was the column. The way to express the essence of the building externally was by placing the decoration on such places on the façade as would mimic the extension of the structural system outside the building's perimeter. In this way the wall became the communicator of the building's character, its representational face. Therefore, symbolically, the wall was still needed as a canvas, a background for expressing the building's status through the decorative elaboration of places where the essence of the building revealed itself to the public. [6]

6 Rogic, T., Converted industrial buildings. Where past and present live in formal unity, TU Delft, 2009



D

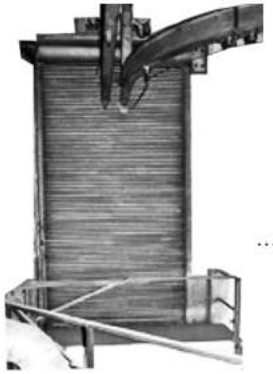
v. Circulation

Many parts in the design of this building are adjusted to the circulation of the transit system of the cotton bales and the movements of the workers. They had to be able to walk everywhere, close to the transit system in order to control the landing and the shifting of the bales.

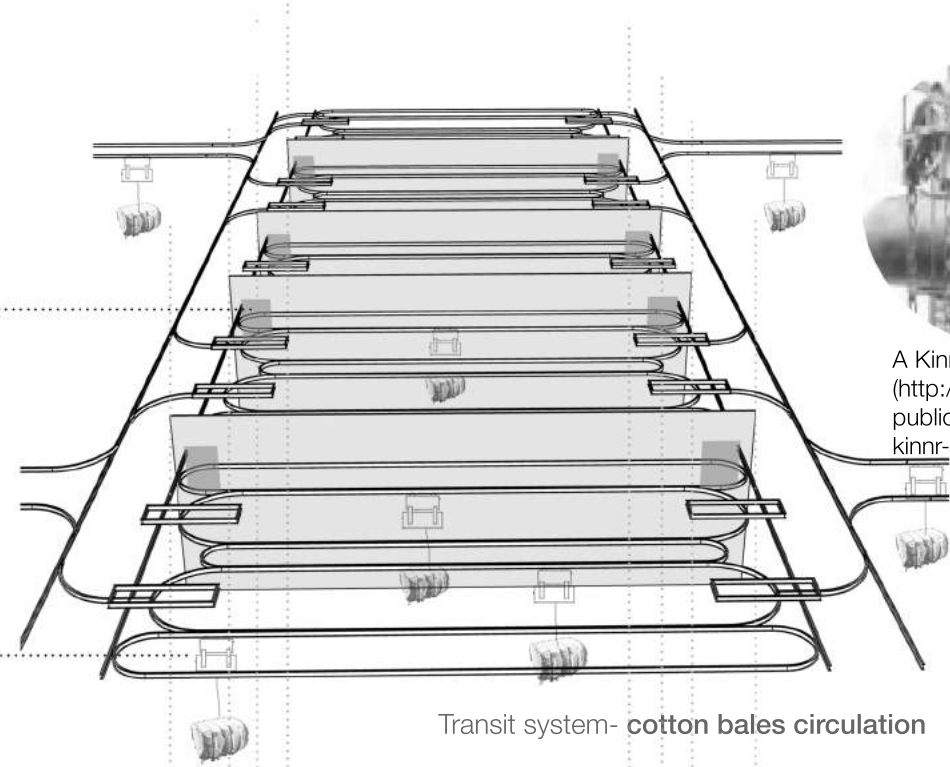
This is why the upper floor of the building is consisted only be narrow galleries and the balconies in the exterior. The access in this floor is only realized by the exterior staircases on the two small facades of the building, probably for safety reasons in case of a fire and also for maximizing the storage space in the interior. The firewalls are a significant element in the arrangement of the plan, which the transit system could only cross through curtain Kinnear type iron doors.

These doors were quite innovative for their time, if we consider that the Kinnear Manufacturing company was founded only few years before the construction of th Katoenveem, in 1895 in Columbus of Ohio. In its cataloques and advertisements, industrial structures are visualized, to show its applica tion and fame in this sector.

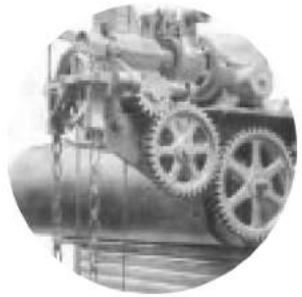
Almost every opening and detail in the building is explained by the two innovative systems of the Katoenveem; the transit system and the sprinkler system.



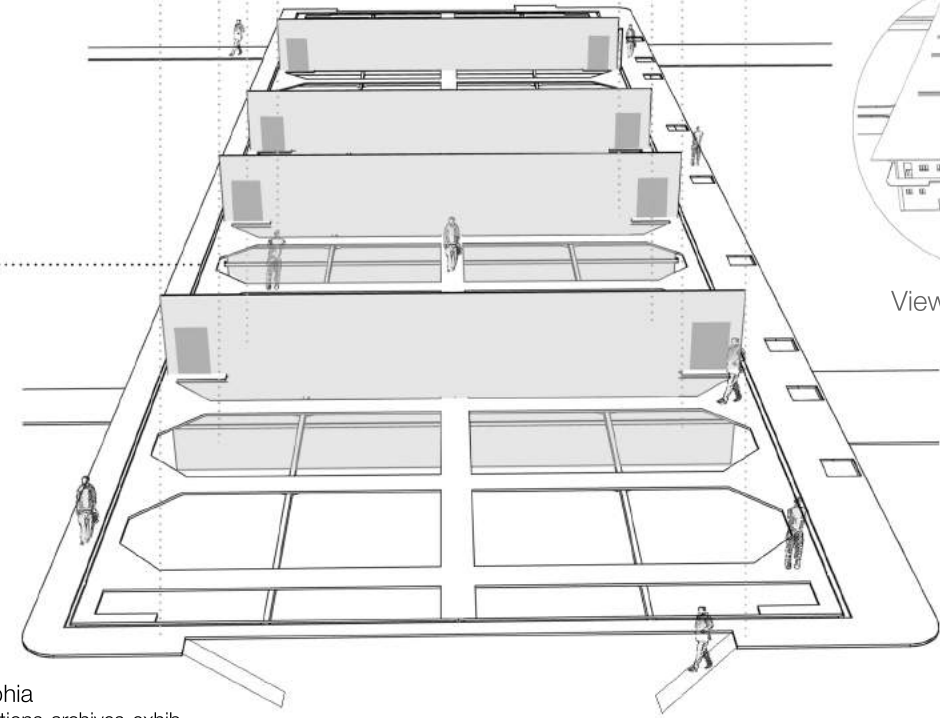
Advertisement of Kinnear Manufacturing co. in 1911, Philadelphia
(http://www.historicnewengland.org/collections-archives-exhibitions/collections-access/collection-object/capobject?refd=EP001.12.006.003.003)



Transit system- **cotton bales circulation**

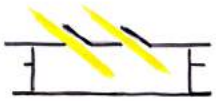


A Kinnear operator
(http://www.dasma.com/pdf/publications/pagesofhistory/kinnr-summ2001.pdf)



Balconies and galleries- **worker's circulation**

View from outside



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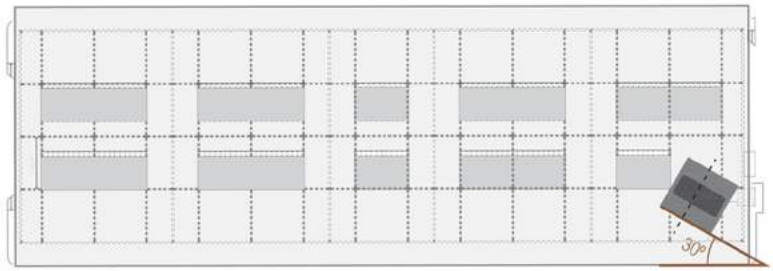
vi. Interior light

A very remarkable quality of the interior space of Katoenveem is the physical lighting mainly deriving from the roof openings. In each complartment there are two long skylights, oriented toward the north-west in order to let the indirect sunlight enter the interior space and help the workers to control the bales efficiently. A more intense lighting wasn't welcome for this kind of work.

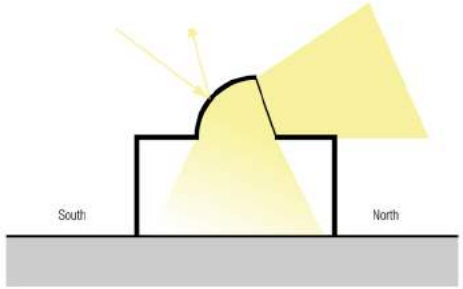
This sunlight which is also filtered from the wire glass openings, creates a very interesting atmosphere in the interior, causing a diffuse effect in the shadows of all the elements to the walls and floors.

Moreover, really nice electrical lights, possibly dated from the initial design of the building, are still hanging from the ceiling of the interior space. Those were probably intented to offer efficient lighting for the workers, when the sunlight was not enough or during the dark hours.

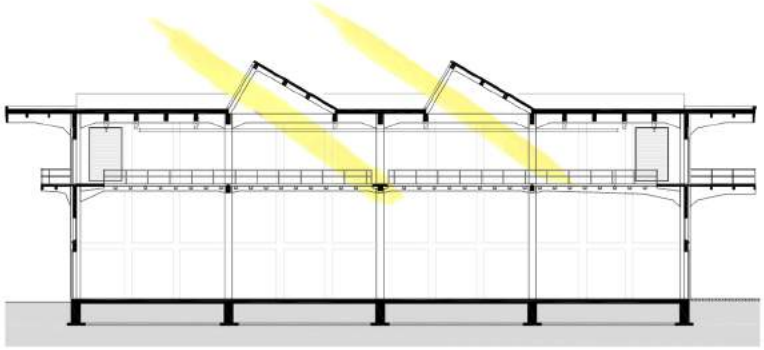
This special design aiming to secure ideal physical lighting conditions in the interior working space, is even more notable in the sample room that is located on top of the roof structure. Its structure is rotated by 30 degrees, in order for its skylight to have the ideal orientation to secure the most appropriate sulight for the sampling of the cotton.



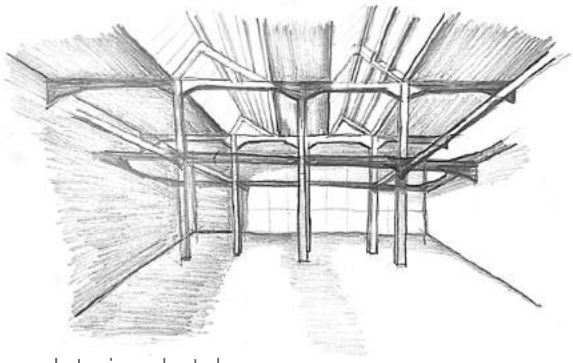
Roof plan | by Jelmer



Lighting in the sample room| by Jelmer



Cross section with skylights



Interior sketch

Interior picture with diffuse daylight

Electrical light & skylight in the ceiling

D

vii. Materiality

Concerining the materiality of the Katoenveem, there are mainly rough materials used on both the facade and the interior surfaces.

A sand cement finishing layer is used to cover the wall from the outside, whose the initial colour is beige, but due to deterioration and the fire of 1963, today there are also grey coloured parts mainly in the long facades of the building. All the windows are made from wire glass place directly to the cement and the heavy sliding door are made from steel that we find today in a light green colour. The Kinnear type doors of the firewalls are also iron ones. Moreover, there are steel railings running through the balconies and the interior walkways and all the equipment, mechanical installations and the transit system are made out of steel exclusively. In all the interior surfaces we see conrete, with the formwork also visible in it, while some parts are now plastered in white. The floor is also made by conrete.

In overall, the selection of materials in the building is highly influenced by the fireproof provision, so we do not find any flammable materials, such as wood, except from the added elements which were introduced after the end of its functioning as a cotton warehouse. The “tailor-made” aspect is, thus, visible also in the materiality of the building.



STEEL ELEMENTS




WIRE- GLASS




PLASTER CONCRETE SAND CEMENT CONCRETE

D

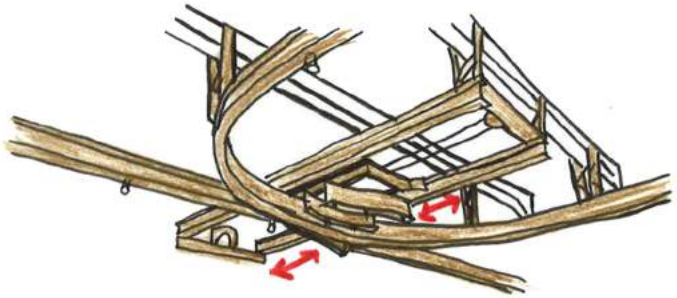
viii. Mechanisms

The main mechanisms that run in the Katoenveem building are related to the transit system and to the fireproof Grinnel system.

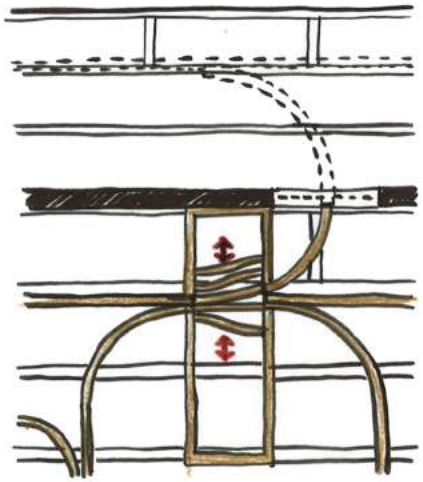
The transit system was attached to the ceiling of the building, with special joint elements and it included a specific mechanism to control the routing of the bales. As it is shown in the sketches, there was a rectangular element holding movable steel parts with different shapes in order to con nect or disconnect the existing guides leading to different routes in both sides. This elements were placed in all the positions, where more that two guides were met and thus made every corner of the building accessible by the system.

Controling of the system was probably possible via some cables running in the guides that were moved with electricity. Electrical switches were placed in columns along the walkways of the upper floor. Therefore the workers that were accessing these walkways could check and control the circulation of the bales in both the interior and the exterior of the building.

The Grinnel system was connected with both the water tower and the pumping station on order to be always supplied with water. This connection was probably realized via the ground, but we cannot be sure about it as today the tower is missing.



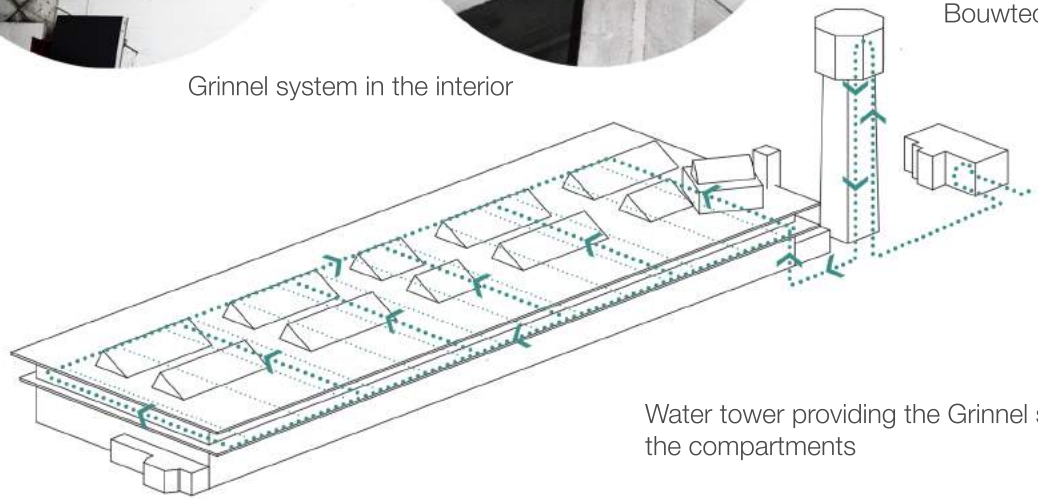
Sketch based on the picture, showing the mechanism



Sketch plan of the ceiling

Picture from the walkeways
Bouwtechnisch rapport Katoenveem

Grinnel system in the interior



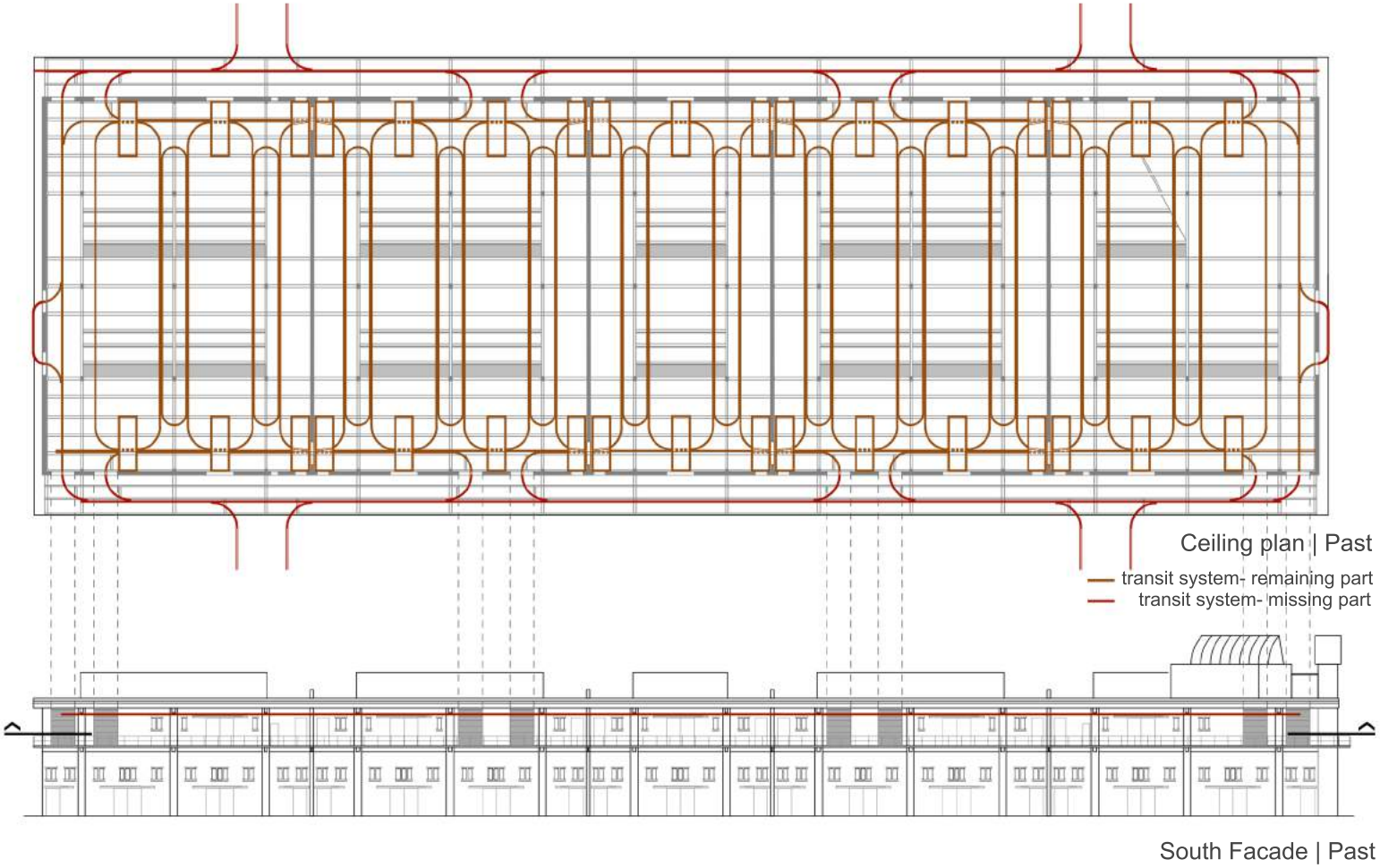
Water tower providing the Grinnel system running through all the compartments

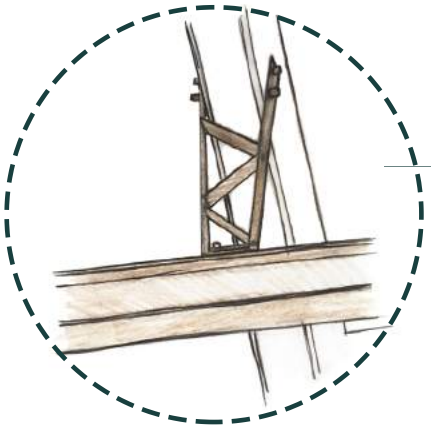
D

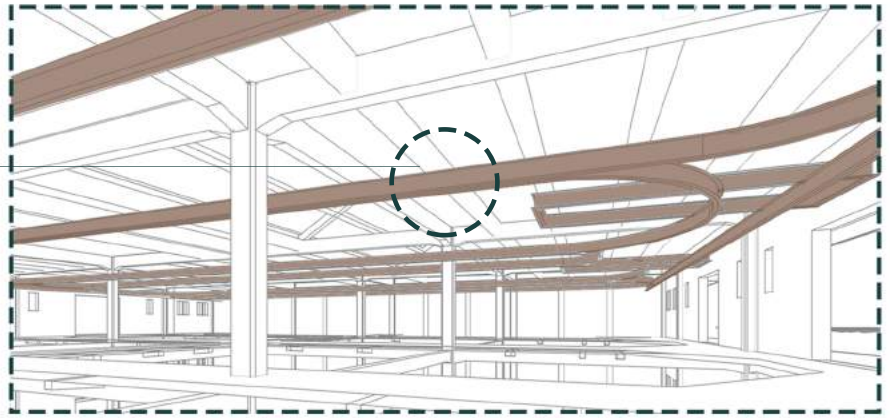
ix. Transit system

The transit system consists an essential element for the initial design and the structure of the Katoenveem. Today all of its parts located in the interior of the building remain there intact, but the exterior parts are removed and we can only identify their traces in the beams. Moreover the openings in the facade that used to serve the circulation of the cotton bales via the system are filled up with cement. It is assumed that there used to be Kinnear doors in these openings, similar to the ones placed in the firewalls, as they seem to have the same dimensions.

Observing both the ceiling plan and the south facade of the past situation, we can recongnize the correspondance of the facade with the system itself. Moreover, a really important remark is that there is a strong interrelationship between the roof beams and the transit system, while the wholes for the screws of the joint elements, were made already during the formwork of the concrete, as back in this time it was not possible to drill the concrete afterwards. So, if we combine this information with the fact that the concrete structure was poured all in once as a monolithic one, the “tailor-made” character of the building is revealed.







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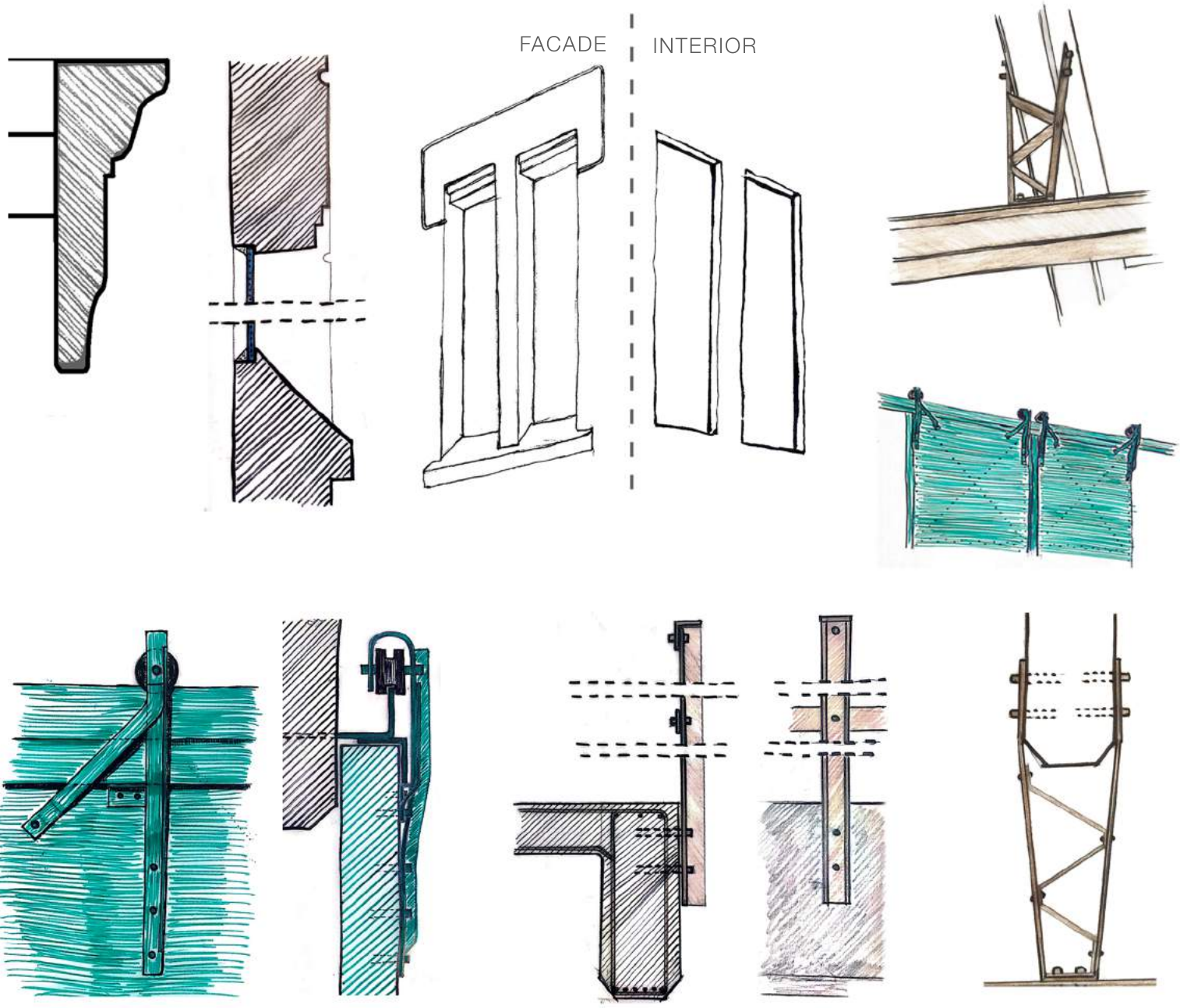
x. Detailing

Looking closer, to the detailing of the Katoenveem it is quite remarkable that there are many articulated details in the exterior skin of the structure. Details that they are not expected to be found in an industrial warehouse, as they were probably designed as such to reflect the fame of the cotton trade to the public.

However, at the same time the articulated details are placed next to rough details, like the steel sliding door or the railings in the balconies. In the interior, of course, everynthing is less articulated, like the joints between the concrete beams and the guides of the transit system. Moreover, the same window that looks very detailed in the facade consist a mere rectangular opening in the view from the interior.

Therefore, this identified contrast between the details also depend on the functional aspect of the design and mainly on the public or private visibility of each part.



E
evaluation

i. Matrix

This matrix is made in order to offer an overview of all the aspects of the analysis of the Katoenveem and its features. I would like to refer more to the dilemma section, as it constitute a crucial part for both the value assessment and the transformation frame work that will be analyzed afterwards.

About the site, the dilemma is related to the lost relationship of the building and its surroundings and how it can be manipulated in the present/future.

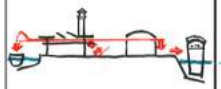
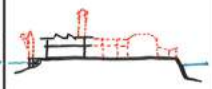
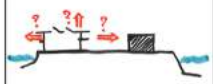
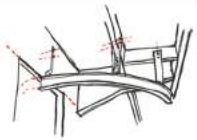
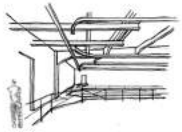
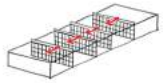
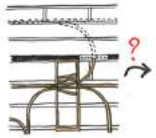
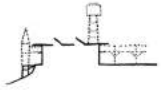
About the skin, the dilemma has to do with all the interventions and partly demolitions that are made in it, and whether we should go back to the original state.

About the structure, there is the increased deterioration issue.

About the spatial qualities, how they can be kept when we introduce something new.

About the services and stuffs the questionmark is referring to their integration in the new design.

Last but not least, the story is closely related with the missign parts.

	Artistic	*Historical*	*Use*	*Newness*	*Conflict*	*Commemorative*	*Dilemma*
Site							
Skin							
Structure							
Spatial plan							
Services							
Stuff							
Story							

E

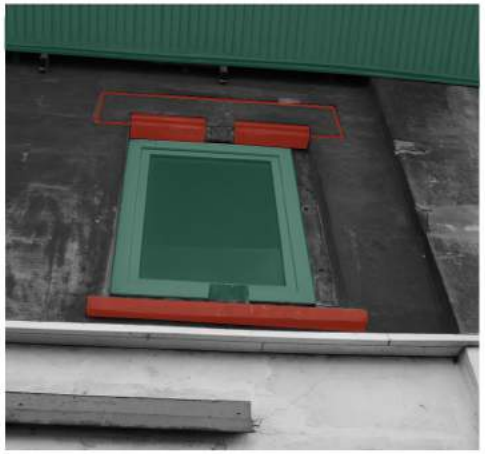
ii. Value assessment

The Katoenveem includes actually a lot of highly valued original parts in its structure, which are worth being kept as much as possible. The main reason is that the building's structure itself consists a system, just like the transit system in its interior. If you remove a piece you loose a part of the story.

Therefore in my value assessment the only parts that I do consider not only of limited value, but they need to be removed are the added ones, both in the facade and the interior of the building. The reason behind this, is that they do consist vile constructions with very cheap materials and they are not follow any desing or show any respect to the values of the building.

There have been done also some demolitions in parts of the building, such as the firewall and the small windows in the facades. These are all corresponding to the new functional needs of the building, after it stopped being a cotton warehouse in 1964.

In the following drawings, accompanied by pictures, all the different parts of the building are evaluated by using these three coloura.



Floors, beams, columns and walls are all valuable for the interior space. Only some few added constructions and openings or new windowframes are less valuable

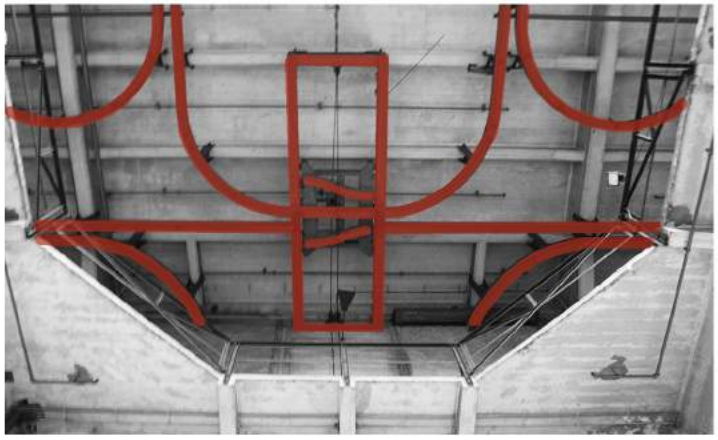
Doors and original windows are highly valued, but all the alouminum windowframes and interventions need to be removed.

The white steel cladding in the around the building needs to be removed in order to reveal significant part of the facades.

High value, essential- original parts

Significant value- changes can be made

Limited value- changes need to be made

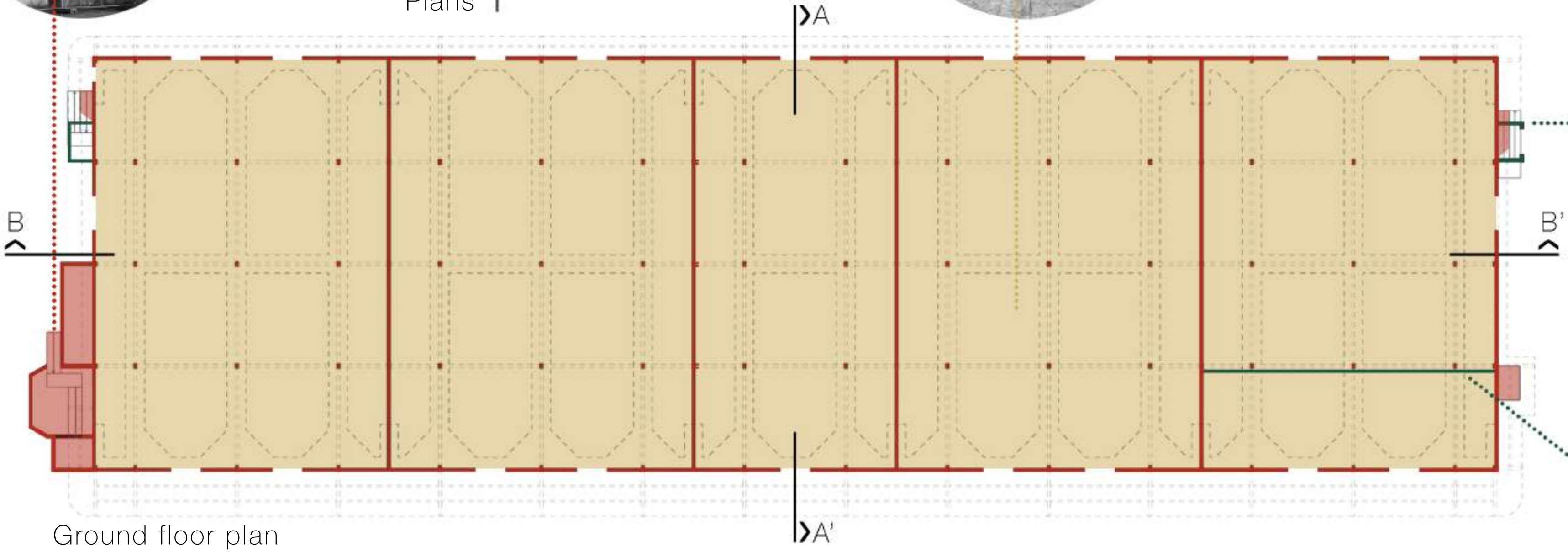


I do evaluate the transit system as highly valuable, because it is an integral part of the structure.

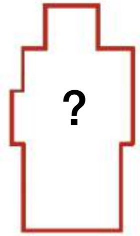
E

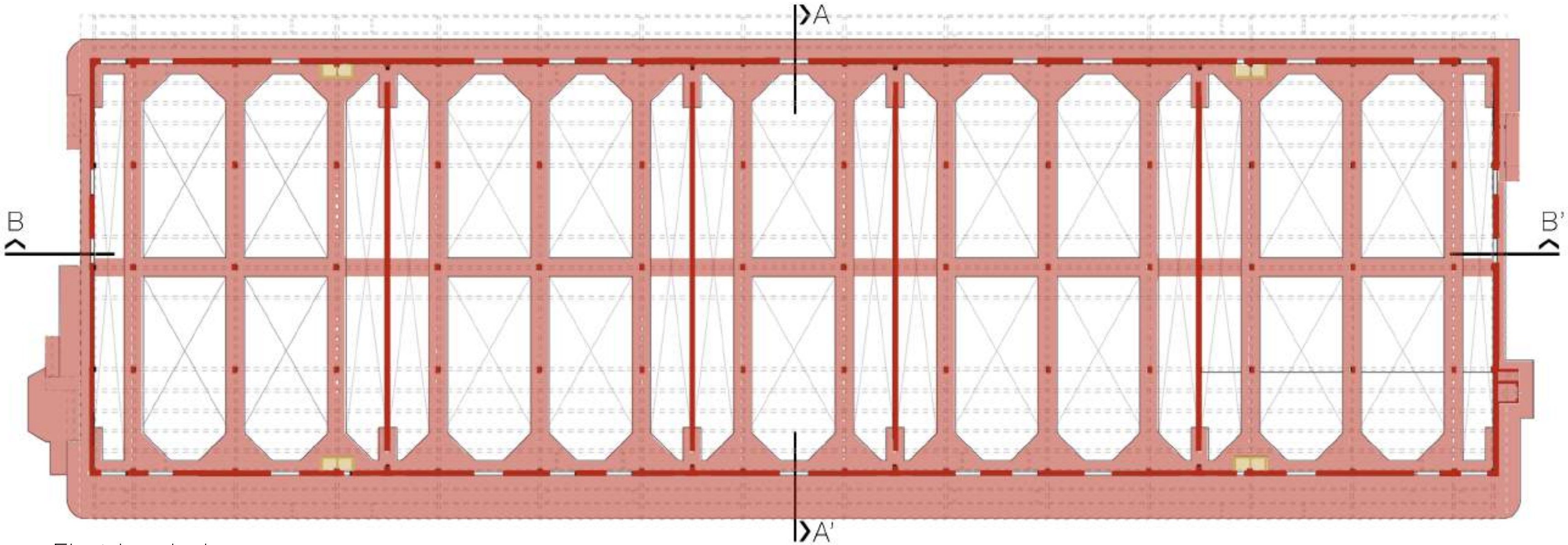
ii. Value assessment

Plans

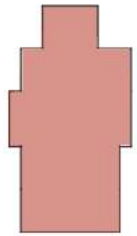


Ground floor plan

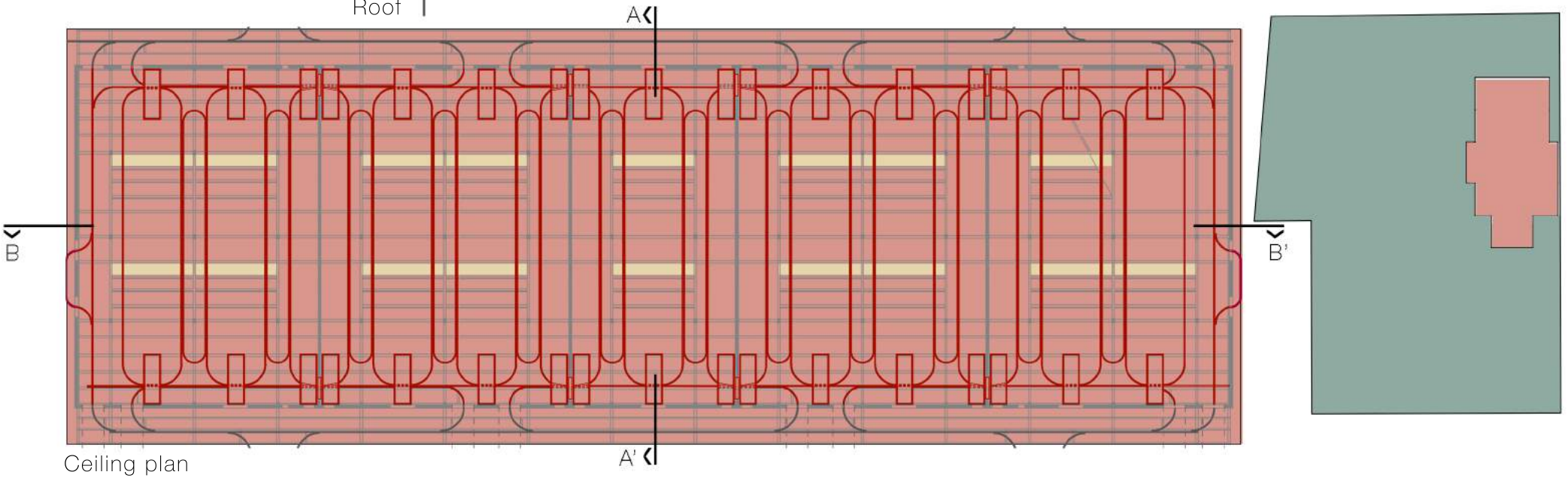




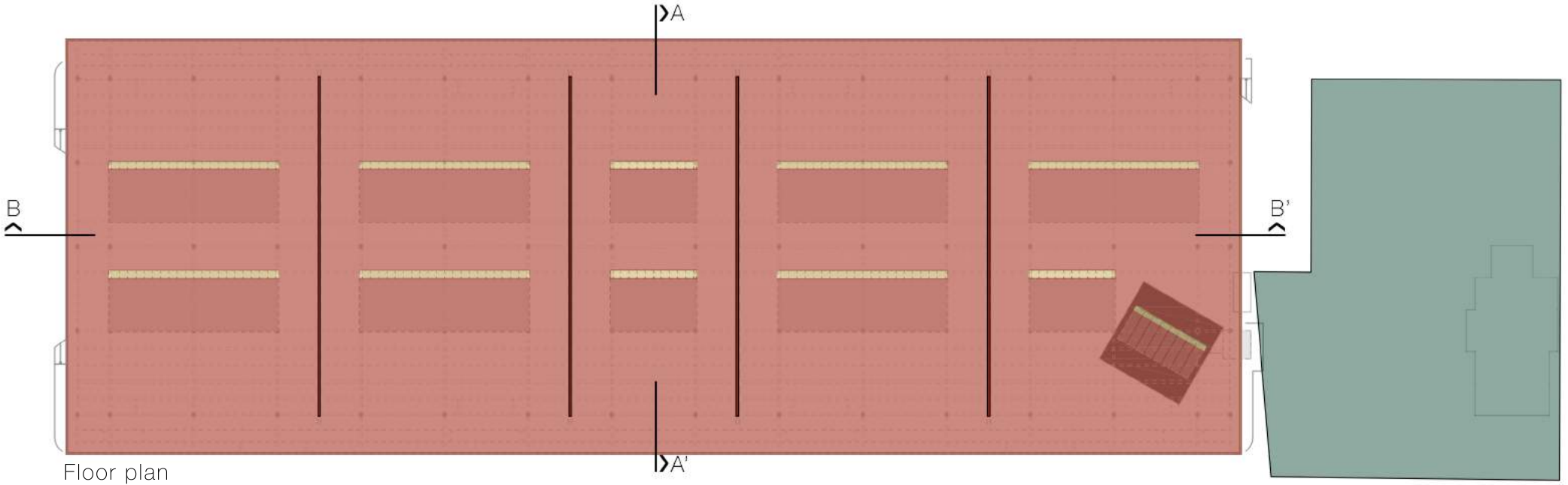
First level plan



Roof



Ceiling plan

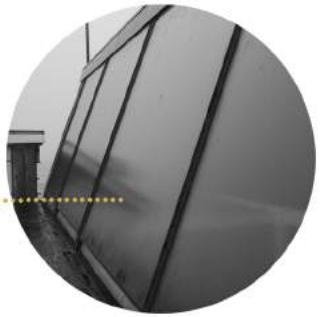


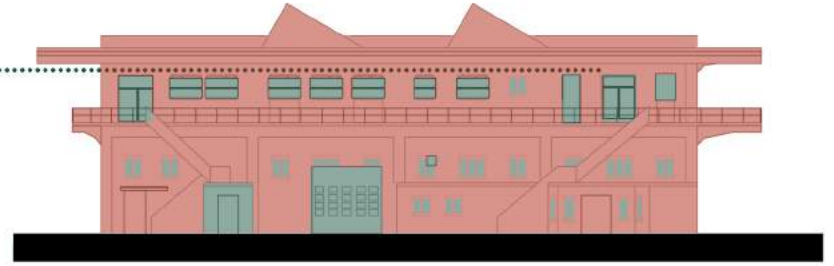
Floor plan

E

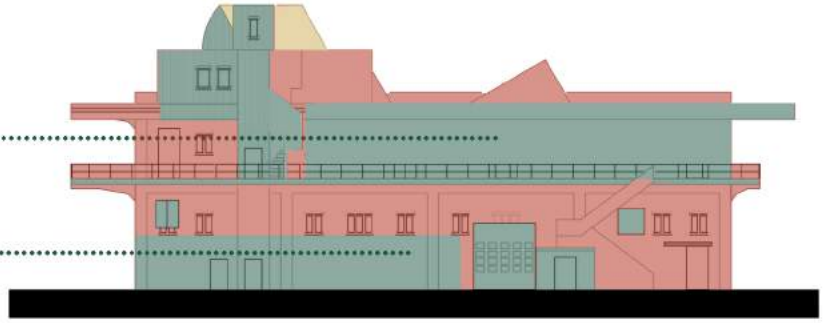
ii. Value assessment

Facades

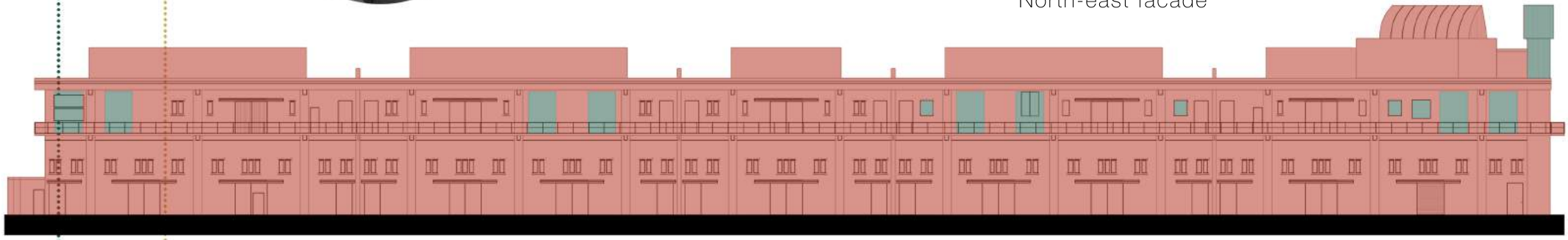




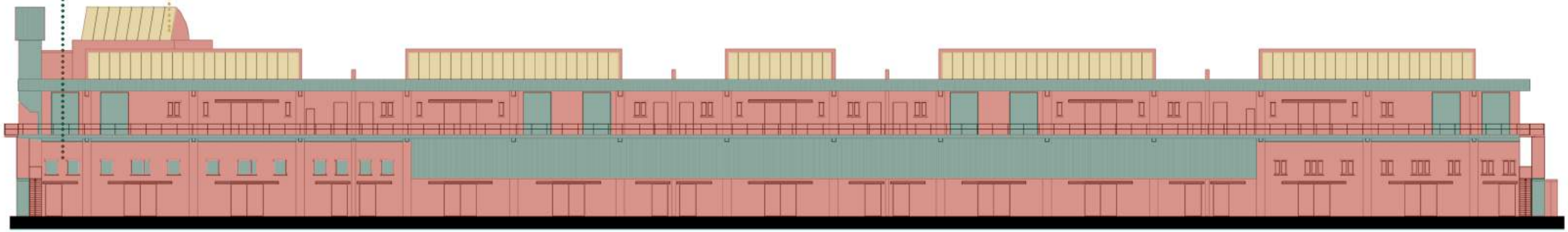
South- west facade



North-east facade



South-east facade

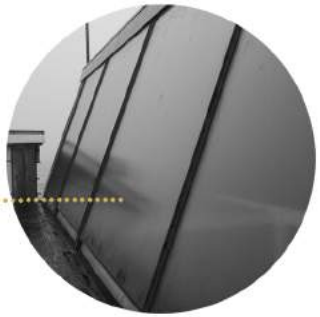


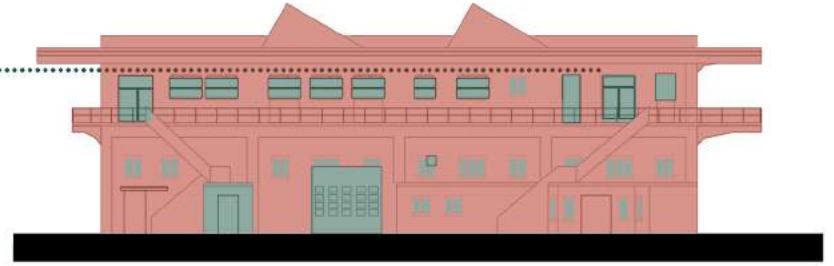
North-west facade

E

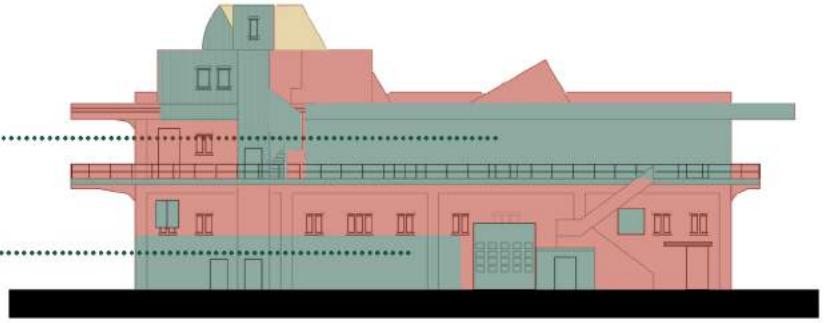
ii. Value assessment

Facades

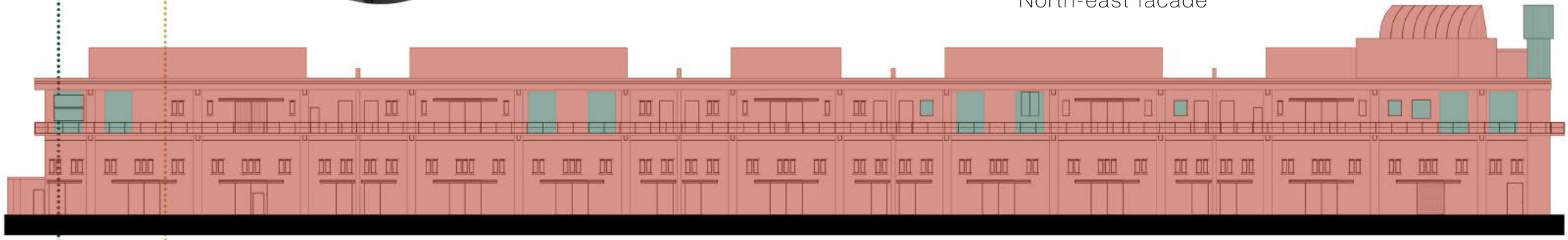




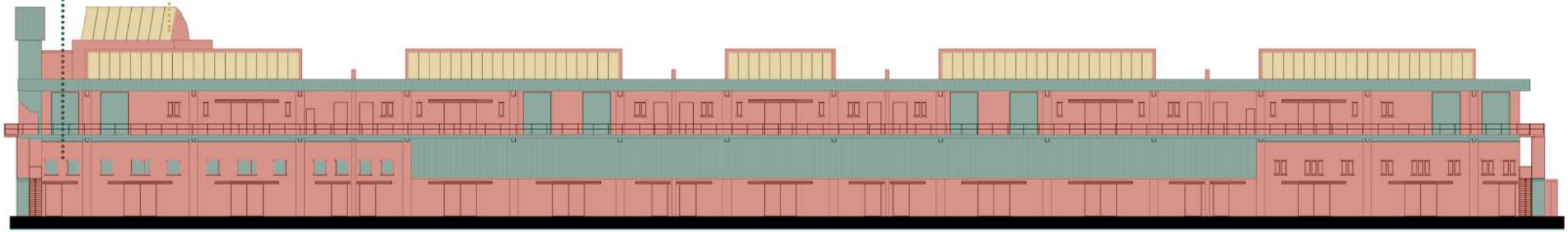
South- west facade



North-east facade



South-east facade



North-west facade

E

iii. Starting points

To sum up, with my design that will transform the Katoenveem into a theater centre, I would like to highlight all the values that I do distinguish in the existing structure.

The starting points that came out from the analysis themselves, set a framework about some significant decisions about the new design.

“Play” with the missing parts,

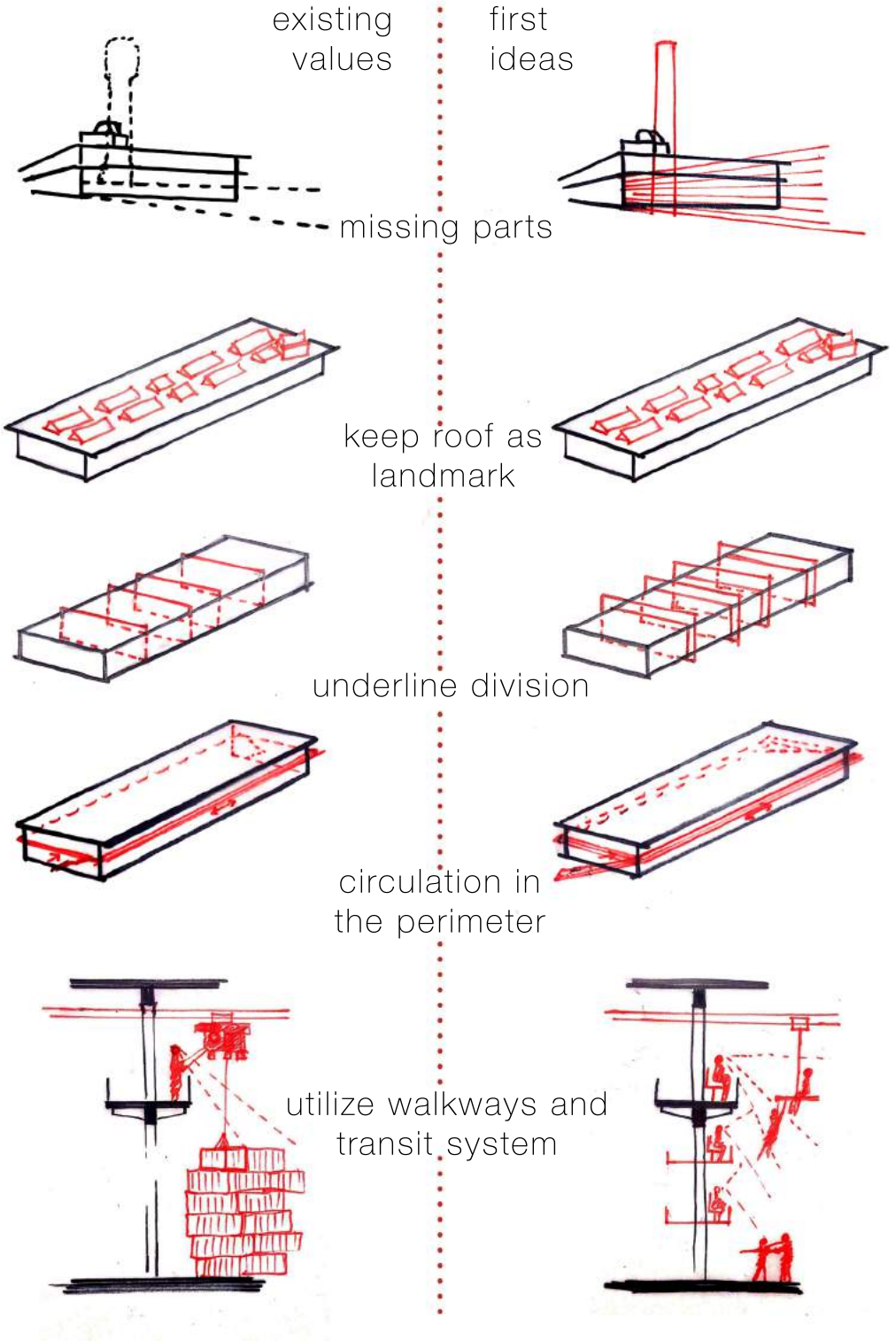
keeping the maximum of the roof structure,

externalise the characteristic interior division into five compartmets,

keep the main circulation mostly in the upper lever and the perimeter of the building

and make use of the existing walkways and the eye contact between the two different levels of the interior,

are some of my first remarks/ ideas about the introduced transformation design.



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iv. Conclusions

To sum up, throughout both the analysis and evaluation process I tried to identify the essential features of the Katoenveem and utilize them as an outstanding tool for my transformation design.

My individual value assessment aims to underline the significance of revealing the initial design in contrast with the worthlessness of most of the later interventions, not due their smaller age, but because of the disrespect and the non- aesthetic criteria that they did follow when they were made. However, in the part where demolitions took place, as well, I am not sure whether it is better to built back the past situation or to modify it into something new, that somehow reminds the old state.

In any case, as it is already mentioned, I do consider the whole building as a machine/ system that used to function all together and was “tailor-made” for its specific purpose; to shelter cotton bales and their innovative transit system. My ambition is to make use of this feature and “play” with the symbols of the past, in order introduce an innovative “tailor-made” theater, where the audience/ visitors and the actors/ dancers/ musicians can interact with each other and with the space at the same time.

literature

Joint ICOMOS –TICCIH, Principles for the Conservation of Industrial Heritage Sites, Structures, Areas and Landscapes «The DublinPrinciples», 28 Nov. 2011

R. Banham, Theory and design in the First Machine Age, London: The Architectural Press,1960, 320

Rogic, T. 2009, Converted industrial buildings. Where past and present live in formal unity, TU Delft, Delft

Bloszies, C. 2012, Old buildings New Designs. Architectural transformations, Princeton Architectural press, New York

Cramer, J. Breitling, S. 2007, Architecture in existing fabric. Planning Design Building, Birkhäuser, Berlin

DOUET, J. 2013, Industrial Heritage Re-tooled: The TICCIH Guide to Industrial Heritage Conservation, Left

Stratton, M. 2000, Industrial buildings: conservation and regeneration, Taylor & Francis.

The Nizhny Tagil charter for the industrial heritage, July 2003, http://www.icomos.org/18thapril/2006/nizhny-tagil-charter-e.pdf

Dam, H.H. van, `The Cotton warehouse of "Katoenveem"', in: The Pioneer for the shipping industry and trade of the Netherlands and her colonies, 3 (1919), march, p. 65-70

Heinemann, H. A., & Van Hees, R. P. J. (2013). Historic Concrete: From Concrete Repair to Concrete Conservation.

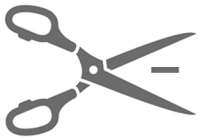
Webpages:

https://www.vopak.nl/onze-historie

http://www.rotterdam.nl/tekst:het_nieuwe_bouwen

https://rotterdam.buurtmonitor.nl/homerotterdam.aspx

http://www.topotijdreis.nl/



“TAILOR- MADE” BUILDING

“TAILOR- MADE” EXPERIENCES

Position Paper | Alexia Ntella 4509986

December 2016

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I. INTRODUCTION

"Function does not follow form, form does not follow function. However form and function certainly interact, if only to produce a shock-effect."

Bernard Tschumi, 1997

Today the widely recognized principle expressed in Modern Architecture with the slogan "Form follows function" is becoming less and less significant in the architectural discourse, while its place is taken by various other positions concerning Architecture and event, space and act. This paper explores the new approaches about this ambiguous relationship between form and function that mainly focus in the experiential aspect of a design rather than in the functional one and whether they can be applied in heritage projects. Such approaches are many times formulated through correlations with other fields, such as scriptwriting or cinema / theater that do consist expressive systems, including all as a commonplace, the space. Therefore, they all follow similar processes and can share common tools during their conception phase.

However, such techniques are more difficult to be implemented in heritage projects, and especially in industrial heritage buildings. The contrast between the merely functional design of an industrial structure and the contemporary "experientially driven" approaches poses the problem of how those two can coexist and lead to one final design. It is no coincidence that industrialization is closely related with the formulation of the Modern Movement, as industries were buildings been built for one and only purpose; to serve the process of industrial production and, therefore, they were amongst the first structures that introduced the functionalism in architecture. All these structures do consist machine-buildings, in a sense that they are tailor-made to serve their specific function and, thus, we can say that their flexibility about any transformation is quite restricted. Furthermore, this "tailor-made" character is what we always find most valuable today, in the evaluation of such structures. So how is it possible to maintain it, in a contemporary transformation design?

In this framework, a research and analysis in depth is needed in order to evaluate the significant elements and symbolisms of the existing structure, formulate a framework of transformation and then translate everything into a new meaningful design.

Via my research and therefore my graduation project, I would like to investigate whether a tailor-made cotton warehouse can be transformed into a public building with a modern function by keeping at the same its uniqueness deriving from its functional oriented design. My subject, the Katoenveem building, is designed not only for its function, but more than that to shelter its innovative transit system (p.1), bringing the cotton bales directly from the ships to the interior of the building and towards the terrain transport. So my main research question is:

"How can a tailor-made building being transformed properly create tailor-made experiences for its users?"

So, which architectural and/or literary tools can be utilized in order to transform this machine-like building into a completely new one responding to nowadays' needs?

And how an individual position can be formulated to support a design that introduces new events into an existing structure?

To give an answer to all these questions, I will first analyze different approaches stated by contemporary architects and their relevant tools. The flexibility of historical structures will be questioned, afterwards. Then, I am going to formulate and explain my own approach compared to the other stated ones and at the end I will come up with specific conclusion concerning my position towards my graduation project in Heritage and Architecture studio.

p.1 The tailor-made aspect of the Katoenveem's structure; the concrete beams were formed with wholes during the formwork in order to support the transit system

II. MAIN BODY | STATE- OF- THE- ART

a. Architectural discourse

In the past and especially during 19th century, the essence of "space" and its influence in architectural experience was defined in a quite different way than in recent times. For Heidegger, "the boundary is that from which something begins its presencing ...Space is in essence that from which room has been made, that which is let into its bounds. That for which room is made is always granted and hence is joined, that is, gathered, by virtue of a location.... Accordingly spaces receive their being from locations and not from "space"."[1] Frampton therefore concludes that space matters in the creation and experience of architecture to the extent of "*how* something is realized as on an overt manifestation of form. This is not to deny spatial ingenuity but rather to heighten its character through its precise realization." Hence, space manifests itself through precise tectonic articulations.

According to Klaske Havik[2], there are various literary tools utilized in the architectural discourse nowadays. Such methods can enhance the experiential aspect of spaces and provide us with a broader set of architectural dimensions. Some of those tools are the metaphors, the characters, the narrative and the scenario, all helping, in conjunction with the traditional architectural tools, to understand and further investigate the spatial qualities and the way users will experience the different spaces introduced by a conceptual design of a building or a planning in an urban scale. Besides, the contemporary tools of 3d programs and graphic editors can contribute more in this direction, of attributing the atmosphere and the spatial aspect of the architectural space in detail.

Moreover, the relationship between the architecture and the filmmaking, the literature or even the theater, is referring to different expressive and creative processes that all have as a commonplace the dimension of the space. It is not a coincidence that contemporary architects choose to describe their concept with literary terms. This new tendency is probably related with the impact of the "Information Age" that we are now going through. The buildings and their form are more and more invisible, as all activities are now also virtually possible, and so the spaces tend to be more interactive and intelligent, while the circulation is becoming more fluid and flexible. Thus, architecture and form is consisted today by a combination and fluidity of spaces, events and movements. [3]

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[1] Frampton, K., *Studies in Tectonic Culture: The Poetics of Construction in Nineteenth and Twentieth Century Architecture* (Cambridge, MA, London: MIT Press, 1995)

[2] K. Havik, *An introduction to literary methods in architectural design,* article included in *Delft lectures on architectural design,* academic year 2015-2016

[3] Izham Ghani, *Function defies form: a thought for architecture in the new information age,* Archnet-IJAR, International Journal of Architectural Research, Vol. 1, Issue 3, Nov. 2007

b. Positions

In this framework the position of **Bernard Tschumi** is worth mentioning. According to his opinion, architecture is referring equally to the event that happens in a space and to the space itself. The main character is the user of a space that can actually perceive the architectural environment in a fragmented way, interact with it, transform it or even abolish it. The narrative, seen as a sequence of different events within a design, consists the main tool of Tschumi's architecture and can lead to the composition of spaces or even to their interpretation.

The character, in Tschumi's case, is given an active and outstanding role. Thus, the past theories about conventional organization of spaces and the "canonical cause-and-effect relationships" between the form and the function of a building are now replaced by an experiential way of designing, where even surrealistic set of activities can take place in the same building, where the circulation is the workhorse representing the dynamics of moving subject. The allocation of the main functional areas is designed afterwards the movements' areas, forming this game of fragments, while special attention is paid to what is absent and falls outside the rational process.

An example of his work formed within this framework, is the cultural center Le Fresnoy in Tourcoing. In this project the most significant space is the leftover between the existing building and the huge roof designed above it. By highlighting this "in-between" space, the architect wants to enhance the potential of areas that are almost absent and neglected to offer unique experiences and let people eventually interact with the space. This is the end of the hierarchical relationship between form and function; the most extraordinary events can take place in the most impossible spaces within an architectural project.

"*In keeping with the Surrealist image of the meeting of the umbrella and the sewing machine on the dissecting table, the scheme of the project aims to accelerate chance events by combining diverse elements, juxtaposing the great roof, the school and the research laboratory, and the old Fresnoy, a place of spectacle. The whole is precise and rational in its concept and varied and poetic in the resulting spatial richness*"

Description of the project in the official webpage of Bernard Tschumi Architects (http://www.tschumi.com/projects/14/#)

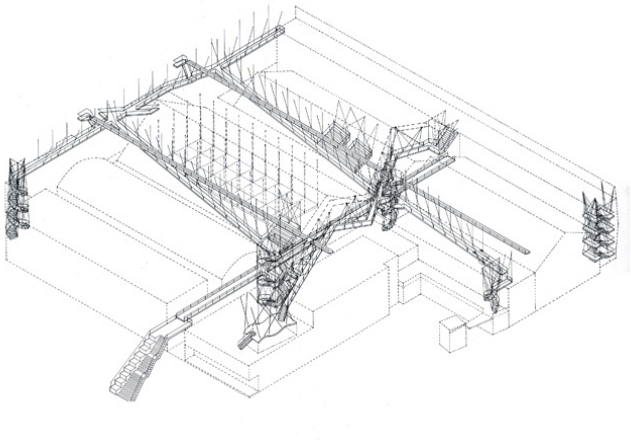


Diagram and picture of the cultural center Le Fresnoy in Tourcoing (http://www.tschumi.com/projects/14/#)

Another outstanding figure in the architectural discourse of the latest decades is Rem Koolhaas and his office OMA. Koolkaas utilized a lot of literary methods in his projects, while it is no coincidence that he first worked as a journalist, editor and scriptwriter in Amsterdam before starting his architectural career. He considered architecture and scriptwriting as really close processes due to the fact that both of them work with episodes linked together in order to create suspense. However, architecture results in real spaces rather than imaginary ones. Within his approach he confronts buildings as unique characters that can develop independently inside their block-island. He utilizes metaphors establishing a game between reality and imagination and thus highlighting selected aspects of reality. [4]

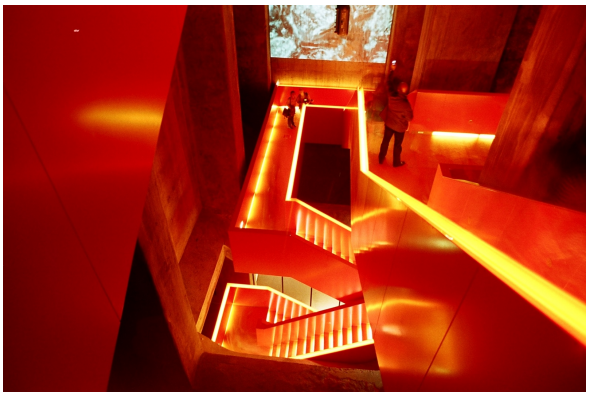
Koolhaas focuses more on the "metropolitan condition", in terms of a system of fragments and multiple realities and via architecture it is possible for him to reveal, construct, manipulate and transform urban situations. [5]Throughout his architectural and literary work, he juxtaposes the current "culture of congestion", the ambiguity and contradiction with the past mere functionality. Another

[4] K. Havik, Juhani Pallasmaa (foreword), *Urban Literacy; Reading and Writing Architecture, NAi 010, Rotterdam, 2014*

[5] K. Havik, Juhani Pallasmaa (foreword), *Urban Literacy; Reading and Writing Architecture, NAi 010, Rotterdam, 2014*

intriguing aspect found in most of his projects is the game of different symbolisms. Many times he seeks for symbols found within the context or an existing structure and translate them into spaces or forms via his design. Koolhaas has clearly positioned himself towards heritage buildings and conservation. In one of his interviews he mentions that "the beauty of historical architecture is that it is so big, with so many symbolic extra space and dimensions that it turns out to be much more flexible than modern architecture, which is always trying to be very precise about programme and about organization."[6]

An example of a project that OMA did in the field of architectural Re-use is the Ruhr Museum in the Zollverein World Heritage Site near Essen. This design is a combination of various symbolic elements referring to the functioning of the former coal industry, resulting on an almost discreet architectural intervention focused on the visual representation of the past coal's consumption. More precisely, the main concept is restricted to a specific routing for the visitors, including slipways and escalators designed in such way, to resemble and visualize the old procedure of coal's consumption. Everything is focused in the way visitors approach and experience the space with an absolutely symbolic and metaphoric way.



View from the staircase in Ruhr Museum (google.images)

[6] Architecture Biennale - OMA Office for Metropolitan Architecture (NOW Interviews) by Hans Ulrich Obrist at La biennale di Venezia Channel, found at https://www.youtube.com/watch?v=iJnOtlGbZDk

III. DISCUSSION- POSITIONING

Industrial buildings; Are they flexible?

As it is already mentioned, the beauty of the historical structures according to Rem Koolhaas is concentrated to their highly flexible spaces. However, historical buildings and especially industrial structures are designed exclusively in order to shelter a specific function, a factory or a warehouse. Every door, window, wall and beam is there to serve this specific purpose, which is probably related to the necessity of different equipment/ machinery for the transport of goods or their production itself. Aesthetics are of course, of a secondary importance for such designs.

On the one hand, those structures are usually of great dimensions, with good lighting conditions in the interior, while being today neglected and thus completely or partly empty, they seem to offer a lot of flexibility for various future interventions and new functions. On the other hand though, such buildings with their specially designed form, they "carry" their own story which is mainly related with their former function and which a visitor should be able to perceive immediately by observing their interior spaces or even from the outside. Historically, also, there is a lot of value in many elements embedded in their structure or equipment. Thus, in this case the architect's job is probably to enhance the cultural value of the building and communicate this story to the future generations, which leads to the conclusion that monumental industrial spaces have restricted flexibility. They are **tailor-made** to their industrial use.

Conclusions; Individual approach

Dealing with historical structures in both academic and professional level, I realized that there is a lot of analysis needed, in order for an architect to come up with a conscious reuse design. There are specific methodologies and tools that can help us to decide on a specific transformation framework and as a next step on a strong concept. There is a chain leading from the analysis to the main concept and then to the final design and a determinant is, of course, the future user of the building.

First comes the value assessment, which has to be personal and it usually follows naturally a careful and substantial analysis of the existing structure in every scale, starting from a broader- urban scale to the most detailed one- building technology. In this phase, it is up to the architect to decide the most important elements of the structure, according to the essential meanings or symbols they do include or represent. It is not about an objective process and this is why a lot of research is needed for it to be convincing and well justified.

When it comes to the decision of the most appropriate program for a historic structure, this always consists a tricky part. However, as it is already explained before, the program is much more fluid nowadays and it can be much more complex than in the past. It will be also nice for it to be innovative and flexible as well, in order for it to be able to be transformed again in the future. In any case, as far as I am concerned I do believe that the new program should not be contradicted with the essential value of the monument.

As a next step of this procedure, investigating the way future users will perceive the coherence of the "old" and the "new" is of primary importance. In my point of view, the user should be able to understand the coexistence of the different layers of time, both the past and the present situation in order to experience the uniqueness of the place, which is closely related with its history. Therefore, an intervention needs to be strictly distinguished from the original structure, in order for them to be well legible, as well as, for a dialogue between them to be established and offer a different quality to the space. The user of a historical building needs to be well aware of the pre-existing and the added parts, in order to actively interact with them and evaluate objectively the architecture of the space. This interaction, which is also underlined by Tschumi's architecture, is something that I would like to introduce in my design. Offering the users the freedom to interact with the transformed space and make their own interpretation about its uniqueness and values will enhance the experiential aspect of the design.

Another aspect is related with the uniqueness of each structure and how it is recognized and interpreted by the new design. Working with metaphors and symbols, like Rem Koolhaas, is definitely a useful tool to enhance this aspect of a heritage design. The special and most essential characteristic of a space can be met in many parts of the design and be communicated in a metaphoric way to the users. Therefore, an experiential way of highlighting the historical value of the building, being introduced successfully, can make the design really powerful.

Moreover, introducing complexity in the empty simple "box" of an industrial building is quite challenging for an architect. The complexity can result in various spatial experiences and a sequence of different event, as well as, in transitional spaces "in between" these events that can be also really interesting. Such techniques establish a contrast between the existing structure and its simple functional shape and the new complicated one and thus enhance again the power of intervention.

The aforementioned aspects and ideas can potentially form a framework for my intervention in the Katoenveem building in Rotterdam, that consists a repetitive simple structure subdivided into five compartments, having special qualities in both its interior and exterior space. The most outstanding one for me, is related to the transit system, which consisted itself the innovation of the warehouse in the past. So my main idea is to re-use this system, as well, in order for it to serve its new function and continue having a unique role in the spatial arrangement of the building. Now the reason why the structure was "tailor-

made", will be used as a tool to create "tailor-made" experiences for the users. Thus, I decided to design a theater as the most appropriate function for something like this, due to the demand of moveable elements, like sceneries, curtains, lights and spaces that can be adjusted to different performances. The users and the actors will be given the first place in the spatial arrangement and the interaction of every performance.

To sum up and to position myself towards my project, I am in favor of the contemporary experimental approaches and I do find the literary tools useful to enhance a powerful "re-use" design. These techniques, in conjunction with the identification of the essential values of the existing structure and their introduction in the spatial experience of the user can lead to very successful interventions.

LITERATURE

- K. Havik, *An introduction to literary methods in architectural design,* article included in *Delft lectures on architectural design,* academic year 2015-2016

- K. Havik, Juhani Pallasmaa (foreword), *Urban Literacy; Reading and Writing Architecture, NAi 010, Rotterdam, 2014*

- Frampton, K., *Studies in Tectonic Culture: The Poetics of Construction in Nineteenth and Twentieth Century Architecture,* Cambridge, MA, London: MIT Press, 1995

- T. Avermaete, K. Havik, H. Teerds, *Architectural Poistions; On Architecture, Modernity and the Public Sphere,* Sun Publishers

- Rogic, T.,Converted industrial buildings. Where past and present live in formal unity, phd thesis TU Delft, Delft, 2009

- B. Tschumi, *Architecture and Disjunction,* Massachusetts Institute of Technology, 1994

- R. Koolhaas, *Generic city,* The Monacelli press, New York, 1995

- Izham Ghani, *Function defies form: a thought for architecture in the new information age,* Archnet-IJAR, International Journal of Architectural Research, Vol. 1, Issue 3, Nov. 2007