ANALYSIS REPORT P1
GRADUATION REPORT P5
BOOK WITH DETAILS
REFLECTION P1/P5
INTRODUCTION

The complex of The Artillery Storage House at the Paardenmarkt in Delft has its origin in the second half of the seventeenth century. The 'Statens van Holland en West-Friesland' built one storage house for gun carriages in 1671 at the place where a tower with gunpowder exploded in 1654. Since then, new buildings were added, removed and altered at the site of the Artillery Storage House depending on the needs. This resulted in a complex of nine buildings that encircle a inner courtyard. Although the specific functions of the buildings of the ensemble changed over the centuries, the function has always been related to the storage or production of military equipment. The buildings were adapted to fit their use and have been in motion constantly. This pragmatic attitude towards the buildings of the Artillery Storage House might have been the main reason for its preservation. And it resulted in many visible historical layers in the appearance of the building.

THE ASSIGNMENT

The Army Museum, located at the Korte Geer in Delft, was the last user of the Artillery Storage House at the Paardenmarkt. Objects were stored and maintained in the buildings. When they moved out in 2013 to accommodate the collection in Soest, the building complex was sold by The Rijksgebouwendienst to a private investor. The former military building is waiting for a new function.

The research method for the redesign of the Artillery Storage House is part of the assignment for the Msc 3/4 Rmit graduation studio at the Faculty of Architecture of the Delft University of Technology. The Msc 3 semester starts with research and analysis of the different levels of scale of the existing structures. The investigation focusses on topics like cultural history, social economics, architecture, urban landscape, building technology and building materials. This research report gives an overview of the research and analysis of The Artillery Storage House and relevant conclusions within different subject matters. The research method that is used in general for the chapters is based on research questions and a clear focus on what is essential to know for the next step in the design process. What information is needed as fundament for the redesign of The Artillery Storage House? For this report questions are formulated as starting points for the inquiry at all different scale levels and topics. Some of these research questions are fairly general and apply to the analysis of other buildings as well as the main research theme. The next step in the design process of the graduation project is to define starting points for the redesign based on the conclusions and value assessment in this report. Since this is the next step, this is not part of this booklet.

RESEARCH METHOD

Research and design is based on research questions and a clear focus on what is essential to know for the next step in the design process. What information is needed as fundament for the redesign of The Artillery Storage House? For this report questions are formulated as starting points for the inquiry at all different scale levels and topics. Some of these research questions are fairly general and apply to the analysis of other buildings as well as the main research theme. The next step in the design process of the graduation project is to define starting points for the redesign based on the conclusions and value assessment in this report. Since this is the next step, this is not part of this booklet.

Every assignment has its own quest, a search for the main theme or approach for the redesign that is inherent and inextricably connected to the building and its context. In the opinion of the author the research questions for the different topics should derive from the search for this main theme. Therefore, this report starts with the definition of the context of the building. The conclusions that are drawn from this analysis leads to the main research theme and is a basis for the subquestions prior to the inquiry of several topics and scale levels. Although the table of content of this report might suggest that the topics concern separated subjects, topics and scale levels are many times inter related. This report attempts to make these relations evident in drawings and or text.

During the research I experienced that research questions (the things an architect would like to know for his or her assignment) for certain topics or scale levels are derived from the conclusions of other subjects. In other words, during the research (preliminary) conclusions and crosslinking led to new questions.

The research method that is used in general for the chapters is based on the division between observations, analysis and conclusions. Observations show the actual situation in maps, drawings or photographs. Depending on the research questions the characteristics as functions, dimensions and materials are analyzed. In the conclusions the research questions are answered. The conclusions in text and diagrams are based on facts and give the information behind the actual situation. The division between observations, analysis and conclusions allows the reader to criticize the viability of the conclusions.

STRUCTURE OF THE REPORT

The first chapter of this report starts with an analysis of the broad context of The Artillery Storage House. The urban morphology of Delft, the urbanization of the city, how the site around the Paardenmarkt developed and zones and functions in Delft are the main topics. As mentioned, the findings in this chapter leads to the description of the main research theme: what the new role and position of The Artillery Storage House should be towards the surrounding city. Chapter two explains how the research theme resulted from the previous chapter and explains the next steps in the research.

The subjects of the research in the third chapter are the different ‘faces’ of the city of Delft. What characterizes the touristic cultural and shopping area, the residential areas around the Paardenmarkt and the ecological structures that surround and cross the city? And how are these different aspects in the city connected, or not? And how does The Artillery Storage House relate to these different aspects of the city?

Chapter four zooms in on the site itself and the relation between the building and the direct surrounding. Extra attention is paid to the open spaces and squares of the Paardenmarkt and courtyard. The following chapter, number five, zooms in a little more and addresses the development and architecture of the ensemble. Floorplans, the structure, routing, daylight and materials are analyzed.

The subject in chapter six is the identity of the interior spaces. Materials and details are part of what defines the identity and atmosphere and are part of this analysis. The last chapter of this report is a value assessment of the findings and conclusions in this research. The conclusions in the chapters tend to be neutral. In chapter seven a scheme is used to value and balance the most important and relevant conclusions within different subject matters. The values assessment is based on arguments but still a personal interpretation that provides in material for discussion.

All chapters are preceded by a brief introduction to elucidate the research topic in the specific chapter. In the chapters diagrams and texts are used to explain the research, the relevance and inter relations with other topics. This analysis report ends with the conclusions and a reflection on the research process.

It is the author’s wish and hope that you enjoy studying and reading this report and that it provides you with, at least, interesting new insights about The Artillery Storage House and its relation to the city.
The Artillery Storage House is located in the Netherlands in the city of Delft at the coordinates of 52.01 x 4.36 (latitude x longitude). In the photograph on the left, the outline of the old city wall can still be perceived. Nowadays these borders are articulated by the Rijn-Schiekanaal at the east side and the railway at the west side of the city core. At the right top the recreation zone at the lake is visible.

The ensemble of buildings of The Artillery Storage House is enclosed between the Rijn-Schiekanaal, the Kantoorgracht, a block of houses and the arboreous Paardenmarkt. The ensemble of buildings surround a large inner courtyard that is, in its current function, closed for public.

Photograph of the front facade of building A of The Artillery Storage House that is flanking the Paardenmarkt. The double roof and arched gates of red painted wood are characteristic in the appearance of the building. On the right the fence of the later added entrance gate is visible.

Photograph of the courtyard, seen from the northside.

Interior impressions of The Artillery Storage House when the buildings were still in use as a depot of The National Army Museum in Delft at the Korte Geer. From the left to the right: the attic of building A, groundfloor of building B and the groundfloor of building C.
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The first chapter of this analysis report contains the quest of the assignment, a search for the main underlaying question or approach for the redesign that is inherent and inextricably connected to the building and its context. The research questions in the other chapters are derived from this main theme, although there are other more general research questions part of this report as well.

As the title of this chapter already reveals, this part inquires the context of the Artillery Storage House. The site of the Paardenmarkt and the Artillery Storage House have a rich layered history, visible in the morphology and urban patterns of the city. By researching the context, answers are tried to find about how the city is shaped, why certain developments took place and how this is related to the Artillery Storage House. Chapter one contains four paragraphs. Every paragraph has a specific research question:

1.1 How are the morphological layers in the natural and cultural landscape and the development of Delft interwoven?

1.2 How did the urbanization of Delft develop from the sixteenth century (since the site is in use as gunpowder and storage house), and how did this affect the position of the Artillery Storage House in the city?

1.3 In what way did the site of the Paardenmarkt and Artillery Storage House alter over the centuries, and what are the strong and stable characteristics of the urban tissue?

1.4 What kind of different functional zones can be perceived in the city centre of Delft? And how does these zones relate to the Artillery Storage House?
HISTORY OF URBAN MORPHOLOGY  ca. 1100 - 1657

Delft finds its origin in a settlement near the sandbanks of the creek the Gastel in the 11th century. Around a manor, serfs were living and working as farmers. A market square was the centre of the settlement (Ruimtelijke Plannen, 2013b).

In 1246 Delft received city rights and flourished as a trading centre for beer and draperies. The city transformed into a long-shaped settlement on a mound between de Oude Delft and Nieuwe Delft. In the right-angled direction polder ditches were dug for the water regulation of the agrarian land (Ruimtelijke Plannen, 2013b).

Until the end of the 16th century the amount of inhabitants grew and the city expanded in the west direction. A natural waterway (Verwersdijk) was used to annex a new market square (the current Markt) with the predecessor of the Nieuwe Kerk and a new district at the east of the Nieuwe Delft (Ruimtelijke Plannen, 2013b).

The industry in Delft, for example ‘Delfts Blauw’ grew and the eastern part was realised for the expansion of the city. In the first quarter of the 16th century the city walls and the Oostsingel were built and determined the shape of the city until the 19th century. After the great fire in 1536 the north eastern part of the city was designated for the ‘Lakenveld’ and ‘doelen’ (shootingrange for the infantry). The Clarissenklooster, abandoned after the Reformation and beeldenstorm in 1566, was used for the storage of ammunition (Ruimtelijke Plannen, 2013).

New fortifications were built in 1577 to protect from the Spanish invaders during the 80 year war. The gunpowder tower that was built near the Clarissenklooster exploded and destroyed the part of the city that was left intact after the fire. The district was redesigned for a new ammunition depot and schuttersvelden (Ruimtelijke Plannen, 2013).

Image 7 / 10: Morphology of Delft, observations (own ill.)

Image 13 / 15: Morphology of Delft, analysis (own ill.)

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Answering research question: How are the morphological layers in the natural and cultural landscape and the development of Delft interwoven?

**CONTEXT**

The form of the inner space of the city centre of Delft is defined by a mix of regularity and exceptions. The linear elements of the cultural landscape in the north-south direction and east-west direction of the ditches contrast with the curved lines and diagonal lines of the natural landscape.

**CONCLUSIONS**

The north-south 'delfs' and east-west ditches resulted in a distinction between the urban structure in the west and east side of the city.
Until the 17th century, Delft was a flourishing industrial city (Delfts Blauw porcelain, carpets). In 1540 Delft is the biggest city of Holland, right after Amsterdam. A major part of Delft is destroyed in the great fire of 1536. The Clarissenklooster (dating from 1475) and the surrounding lakenramen and doelen in the north eastern part of the town remain intact (Erfgoed_Delft_e.o., n.d.). During the 80-jarige oorlog and the supremacy of the VOC military depot for artillery and ammunition were needed. Delft had several of these buildings (Armamentarium and Houttuinen) and also the Clarissenklooster was used as gunpowder storage after the reformation in 1573. An explosion in 1654, known as the ‘Delftse Donderslag’, led to a complete destruction of the area and damage to buildings and churches in the whole city (Kamphuis, 1996, pp. 4-9).

In 1921 the municipalities Vrijenban and Hof van Delft were incorporated into the city of Delft. After the 1960’s Delft expanded mainly in the south direction (Wikipedia, 2013). The north eastern part of the city was reconstructed after the explosion for its military function (starting in 1671). Houses replaced the lakenramen and doelen in order to house the growing population until the late 17th century. Then the economy slows down and the industry in Delft almost disappears. Due to the arrival of the trainstation and raise of the citywall in the 19th century, Delft becomes attractive for new industries and scientific institutions (Kamphuis, 1996, pp. 4-9).
Answering the research question: How did the urbanization of Delft develop from the sixteenth century (since the site is in use as gunpowder and storage house), and how did this affect the position of the Artillery Storage House in the city?

The relation between the Paardenmarkt and the urban structure of Delft changed over the centuries. By the time the gunpowder tower was located at the Clarissenklooster, the site was an uncultivated place in the northeast of the city right against the city wall. After the explosion in 1654 the first building of the Artillery Storage House was realized, together with houses for the growing population. The location became part of the urban tissue within the city borders. After breaking down the city walls and the expansion of the city in north and east direction the Artillery Storage House became encapsulated by the city.
The Clarissenklooster was located in the northeast part of Delft at the edge of the city border. Until the 19th century all buildings and functions had to be located within the city walls. The open field next to the cloister was used for the ‘lakenramen’, were wool and fabric (main industry of Delft) were drying after colouring and washing (Kamphuis, 1996, pp. 4-9).

The reformation in 1573 all cloisters were expropriated, and the States van Holland and West-Friesland started to use the Clarissenklooster as a military depot for sulfur and saltpeter. Also a gunpowder tower was build in the yard of the cloister (needed during the 80 jarige oorlog). An explosion in 1654, known as the ‘Delftse Donderslag’, led to a complete destruction of the area. As the population of Delft was growing and teh industry was increasing, new canals were dug to cultivate land and for transportation of trading goods (Kamphuis, 1996, pp. 4-9).

Besides the other military depot (Armamentarium and Houttuinen) the space of the former cloister was still needed after the explosion of the cloister. Between 1671 and halfway the 18th century new buildings, starting with the Affuitenloods for the storage of heavy artillery, were constructed. The reconstruction of the area after the explosion resulted in a new urban set up. The Raamgracht was extended to the Kantoorgracht in order to make transport to the Affuitenloods possible. In front of the Affuitenloods the Paardenmarkt (with trees to protect the animals from the sun) and stables were realizez (Kamphuis, 1996, pp. 4-9).

In 1903 the military depot and pyrotechnic laboratorium moved to Zaandam. Until 1927 the artilleriemagazijn and barracks housed a garrison of soldiers. After that the magazijn was used by the army museum to store objects. In 1914 the Lakengracht was closed, which was a prelude to the current situation with the street between the Affuitenloods and Paardenmarkt. In the 19th and 20th century the area around the artilleriemagazijn as well as the polders on the other side of the Schie Rijnkanaal are built. Since then, the artilleriemagazijn does not accentuate the edge of the city anymore (Kamphuis, 1996, pp. 4-9).
1.3 THE DEVELOPMENT OF THE SITE

Answering the research question: In what way did the site of the Paardenmarkt and Artillery Storage House alter over the centuries, and what are the strong and stable characteristics of the urban tissue?

At the time that the gunpowder tower was located at the former cloister, it was the backend of the city. On both sides of the Schie there were paths in the cultural landscape connecting the city with the rural ommelanden.

Since the artillery storage house was located between industrial and agricultural zones and the horsemarket, waterways were important roads to transport goods. The storage house was actively participating in this structure of waterways.

The Geerweg (current Kantoorgracht) used to be one of the entrances for boats to enter the city from the ommelanden. It was the connection to the outskirts of the city on the eastbank. Transport of goods took place over water.

The entrance to the city by water is now replaced by a bridge and roads to connect the centre and city expansion at the eastside of the Schie. So the crossing at the northeast of the artillery storage house maintained its role but for an other function.

When the artillery storage house was in use to store heavy artillery and the laken industry was flourishing, the Paardenmarkt was attractive by the Boamgracht. After the economy dried up and the industry moved outside the city centre the canal was closed again. Motorized and railway transport became more important, then roads, over asphalt and filled with parked cars. The surrounding of the Paardenmarkt that was characterized by water is now made of asphalt and filled with parked cars. The storage house has a limited role in the urban setting now.
The residential areas in Delft are mostly located outside the old city centre in the postwar neighborhoods, but the northeastern part of the city centre is also designated for residential houses. Of course there are many apartments (student rooms) throughout the historic centre, but these apartments might be above shops, ateliers, bars etc.

The public buildings (shops, theatres, churches etc) are centralized in the old core around squares, markets and shopping streets. It is a dense area, mostly free from car traffic to walk around quietly and safe.

The buildings that flank the oldest canals in Delft house mixed functions (the municipality of Delft named it 'creative canal area') (BRO, 2012, p. 8).

The musea and places of interest for culture and tourism are spread around the zone where the most public activity takes place. The residential areas do not have many cultural sights or museums.

The commercial functions are located in the traffic free zones in the centre of the public zone.

Hotels, restaurants and bars are spread through the city centre, in the direct surrounding of the public and touristic activities. Horeca and shops are mostly located at the canals and streets with the west east direction.

At the A-view locations directly at the larger north east canals the majority of the offices in Delft are located. A slight regularity in the locations of the offices can be perceived: the locations are at the Oude and Nieuwe Delft and also in residential areas.

* The information in these drawings are derived from the website ruimtelijkeplannen.nl, a website that provides information about zoning plans and functions in the Dutch cities. Although it gives a clear overview of the main trends, the information in the maps (and therefore in these drawings) is not complete. On a more detailed level of the city these maps would not be very useful; but for general conclusions it will be sufficient.
Answering the research question: What kind of different functional zones can be perceived in the city centre of Delft? And how does these zones relate to the Artillery Storage House?

In this concluding drawings it is clear that there is a division between zones in the old city centre and in the post war neighborhoods (drawing on the left). A main part of the city centre is assigned for shopping, culture, horeca and offices and the housing zones are situated outside the old city centre. But the area of The Artillery Storage House, which seemed to be part of the city centre as a functional zone, is a residential area as well. When it comes to function zones, the neighborhood of the artillery storage house can identify better with the urban sprawl on the eastside than with the public life in the city centre. The different zones in the city results in quiet and more subdued area’s where the artillery storage house is located, and active area’s with public facilities. This is reflected in the speed of the city life and facilities, but this will be part of chapter three.

Of course, the divisions in the drawings are meant to elucidate the conclusions and will not be that visible and ‘hard’ in reality. But for now, it can be stated in my opinion that the railway and Schie are strong dividing elements between the old city centre and the sprawl. And the Verwersdijk is a more subtle divide within the old old city core.
The conclusions and answers to the research question in chapter one of this report, where the context of the Artillery Storage House is explored, leads to the quest (the main research theme) of this assignment. Considering the conclusions on page 3, 5, 7 and 9 the question arises to what part of the city the Artillery Storage House relates most to. Is it the residential area where the ensemble is located, or the city centre with all the public functions like shopping, culture and horeca? Or should the Artillery Storage House address and serve a city wide or regional function? Or is a combination of these strategies the most one?

In the current situation The Artillery Storage House is a fortress with a hidden courtyard. But when reallocated, should it maintain its closed character or should it open up for the public and the city?

In chapter one the different zones, functions and barriers in the landscape are pointed out. But how strong are these barriers and segmentations, do they exist in reality or can a new function of The Artillery Storage House overcome these dividing lines?

These questions are part of the quest, and the research questions in chapter three and the following chapters are derived from this quest. On the next page will the main research theme explained more in depth. The quest itself will be answered in the final conclusions at the end of this report.
2.1 THE NEW POSITION AND ROLE OF THE ARTILLERY STORAGE HOUSE IN DELFT

The storage house is part of the city centre that is inhabited and visited by many people. Should a new function be added to the old city centre with its urban and touristic activities in order to attract more people? The storage house is part of the city centre and in the current situation, the Artillery Storage House does not attract much attention in the neighborhood and people do not expect to much from it. Is a status quo a viable solution? To maintain the locally embedded character of the ensemble and serve the local community in its new function?

But in order to give answers on the first possible approach a inquiry of the spatial characteristics and activities in the residential neighborhoods is necessary. The earlier conclusions show that the neighborhood of the Artillery Storage House has some affinity with the other residential areas on the other side of the Schie. A research about how strong the barriers in the landscape are is required to make statements about the other two strategies.

In the current situation, The Artillery Storage House does not attract much attention in the neighborhood and people do not expect to much from it. For this possible strategy, the connection of the Artillery Storage House and the Paardenmarkt will be researched in chapter 3.3.

The storage house is part of the city centre that is inhabited and visited by many people. Should a new function be added to the old city centre with its urban and touristic activities? That would mean that the area of the 'public' life should be extended to the residential part where the Artillery Storage House is located. The characteristics of the public life and spatial organization in the active city will be researched in paragraph 3.1. This in order to validate the potential of extending the activities in the city core to the Artillery Storage House and Paardenmarkt.

Delft is bigger than just the old core of the city, and it always have been. This can be concluded from the first chapter in which is pointed out that the site of the Paardenmarkt always have been the door to the ‘ommeland’. And although the ‘ommeland’ is not as rural anymore as it was in the seventeenth century, new ecological main structures arose in order to serve the need of the people in the city concerning leisure activities in ‘nature’. And the city itself benefits from the biodiversity in and around the city.

Nevertheless, the mobility of people and the amount of spare time grows. So maybe the function and role of the storage house is not restricted to the direct surrounding of the city but might address the complete region or people that are willing to travel to reach the Storage House.

For this possible strategy, the connection of the Artillery Storage House and the Paardenmarkt with the regional ecological main structure will be researched in chapter 3.3.

The researcher acknowledge the fact that many more of these three strategies might be possible and that is might seem that choosing these three appears that decisions in the future design approach are already taken. As mentioned in the introduction, researching and designing is a cyclic process. By inquiring these three possible strategies new information and insights will arise that can possibly be usefull for next design. For this possible strategy, the connection of the Artillery Storage House and the Paardenmarkt with the regional ecological main structure will be researched in chapter 3.3.
Each year 2.4 million tourists visit Delft, finding their way through the historical centre of Delft. Besides the Delfts Blauw and Johannes Vermeer people are roaming the streets for the shops and the terraces. The local municipality speaks of a certain area within the city centre that consists of several sub-area's that should serve the needs of the visitors. These sub-area's are shopping area's (divided in special shops and branches of large companies), squares and the 'creative canal area' (creative companies, ateliers and workshops). For this report I summarize all these functions in the city as 'the active city'.

The area that matches with this definition are marked red and orange in the diagram above. Please note that this area is related to the conclusions in chapter one about the division in zones and functions in Delft. And these zones are related to the first strategie described in the main research approach.

In the following chapter 3.1 the inquiry is focused on 'the active city'. In order to investigate the potential to involve the Artillery Storage House as part of the active city the following research questions for chapter 3.1 are formulated:

What are the characteristics of the public space and functions that define this zone as 'the active city'? Is the unifying factor of this zone only determinated by its shared functions, or also by urban elements?
The municipality of Delft defined a certain area in the old city centre as attractive and surprising for tourists (for leisure and shopping). The streets with shops (brancher and extraordinary) connect the squares with historical landmarks (churches, city hall) and touristic / cultural sites (BRO, 2012, p. 8-9) (Geurtsen, 1988, pp. 11-14).

/// CITY OF DELFT

3.1 THE ACTIVE CITY: CULTURE, SHOPPING AND LEISURE

**ROUTES**

The municipality of Delft defined a certain area in the old city centre as attractive and surprising for tourists (for leisure and shopping). The streets with shops (brancher and extraordinary) connect the squares with historical landmarks (churches, city hall) and touristic / cultural sites (BRO, 2012, p. 8-9) (Geurtsen, 1988, pp. 11-14).

**THE ACTIVE CITY: CULTURE, SHOPPING AND LEISURE**

**Vestpoort**

**Brabantse Turfmarkt**

**De Markt**

**Shops**

**Bars and terraces**

**Monumental buildings / landmarks**

Especially the southern part of the city centre (Zuidpoort) is characterized by the shopping streets and shopping windows of the famous branches, where you will find on every trip. The main square of Delft, the Market, is famous for its two monumental buildings: the City Hall and the Nieuwe Kerk. Because of its visibility from all over the centre the Market with its church is of most importance for the orientation of people (Pasveer & Van der Klauw, 2010, p. 62).

**OBSERVATIONS AND ANALYSIS**

Image 43: Routes and squares of the active city (own ill.) based on (BRO, 2012, p. 8-9).

Image 44 / 47: Townscape, serial vision (own ill.) based on (Cullen, 1971, p. 17).

Image 48 / 50: Analysis of serial vision (own ill.)
The spatial experience of the old city centre of Delft (the shopping and leisure part) is defined by the longitudinal (visual) axis that clasp several squares. This composition is accidentally shaped over the centuries and the Markt plays a central role due to its location and position in the cross direction (Geurtsen, 1988, p.11-12).

Sequence of public spaces

A meandering diagonal of historic squares and landmarks are linked (accidentally shaped through the centuries) and bridge the east and west side of the centre (Geurtsen, 1988, p.11-12). This system of nodes, landmarks and paths (especially the Nieuwe Kerk) make people navigate easily through the city and makes this a successful touristic area.

Answering the research question: What are the characteristics of the public space and functions that define this zone as 'the active city'?

The active city is a network of streets, canals and squares characterized ranked by commercial functions, horeca and cultural functions. This part of the city is equipped to host millions of visitors and serve them in their needs for shopping and leisure. Characterizing for the squares in Delft is the arboreous surrounding combined with terraces to relax.

Answering the research question: Is the unifying factor of this zone only determined by its shared functions, or also by urban elements?

The active city is not only defined by the functions but also by the urban structure. Or most likely, the urban structure resulted in the way the city centre is divided in different functional zones nowadays. Nevertheless, The active city consists of longitudinal axes in the north-south direction, connected by squares. The central focus point in this system is the Market. The location of the Paardenmarkt, despite it is also a square, is due to its location not part of the organizing meandering diagonal.
Delft is not only visited by tourists of course, but is a city well appreciated by its inhabitants as well. The conclusions in chapter one show that The Artillery Storage House and the Paardenmarkt are located within a residential area. Also the area’s at the north and east side (other side of the Schie) are residential area’s.

The diagram above might raise the question (at least, according to the researcher it did) if the neighborhood Centrum Oost does concur more with the neighborhoods Centrum Noord and Koepoort than with ‘the active city’ which is inquired in the previous paragraph. The title of this paragraph is called ‘the snoozing city’, since the activity in the residential area’s is limited to a few moments before and after office hours. This name is an opposite of ‘the active city’ with its 24hrs economy. Both names names and pre-assumptions are overexaggerated of course, but will help in my opinion as metaphors that can be interpreted.

For that reason, paragraph 3.2 is a logical follow up of paragraph 3.1 and deals with the second possible strategy described in the main research approach: whether the Artillery Storage House should maintain its local embedded character and have a function for the local inhabitants. In order to make statements about this strategy it is necessary to find out how strong the residential area’s are related. Or does the east side of the Schie reveal a complete different city that functions as an entity besides the city centre?

The research questions that are derived from this main research approach for this chapter are:

What are the unifying elements or characteristics between the residential area’s on both sides of the Schie, what do they have in common?

How strong is the physical morphological border in the landscape (Schie-Rijnkanaal)? Does the river separate both parts of the city or is the boundary overcome?

What is the relation of the Paardenmarkt with the neighborhood and or ‘the active city’?
3.2 THE SNOOZING CITY: RESIDENTIAL AREA'S

CONCLUSIONS

Answering the research question: What are the unifying elements or characteristics between the residential area's on both sides of the Schie, what do they have in common?

Centrum Oost and Koepoort are on paper part of the same zone, or at least have the same function: they are residential area's. In this part of the analysis the research is focused on the extent the residential neighborhoods are alike or an unity. Should the Artillery Storage House address these residential area's rather than the city center?

Besides the function and the fact that the street patterns and canals are based on the same morphological layer there are little similarities. In the Paardenmarkt and the east part of the Schie the houses share the same type, although the houses on the east side of the Schie share the same type. The houses in Centrum Oost are mainly historical, have a wide diversity in their appearance and context to the atmosphere of the old city center. The houses on the east side of the Schie share the same typology of small family houses but consist of long repetitions of the same house.

In the Van der Mastenstraat the shape and the dimensions of the former polder ditch are still visible in the appearance of the street. On both sides there are small residential houses from the 18th and 19th century. Although all houses are from the same type, there is a variety in styles.

The Paardenmarkt is characterized by the trees that form a kind of canopy above the square. In the case of the Paardenmarkt, the square is used as parkbaget. The facades around the square are residential houses varying from the 18th till the 20th century.

The Kantoorgracht is flanked by typical small canal houses, all different in heights. At the south side, the Paardenmarkt side, the small and unique houses made place for larger building blocks from the 20th century.

The east side of the Schie is also a residential area, shaped around the former ditch patterns which are still noticeable. These houses were built in the early 20th century until the late 20th century. Due to the building period the houses are a repetition of the same kind.
3.2 THE SNOOZING CITY: RESIDENTIAL AREA'S

Analyzing borders and bridges

**Fysical borders in the city**
- The Schie, A13, Koninginnebrug, Verwersdijk and railway are physical borders in the landscape and urban pattern between the several residential area's. The Schie and Verwersdijk are concerning this research most since they are 'dividing' (at least on paper) the neighborhoods on both sides of the river. The Plantagebrug is just for pedestrians and bikes.

**Morphological connections**
- The former polder ditches determine the urban pattern of the residential area's on both side of the Schie. In that sense there is a connection between both sides based on the morphology and function (housing).

**Distincting zones**
- As mentioned in the conclusion, the residential area's host a little amount of daily facilities. There are primary schools in Koepeart and Centrum Oost and one small supermarket in Koepeart, but no other shops, hairdressers, bars and horeca. The only connection between the north side and the south side is the bridge which is just for pedestrians and bikes.

**Leaning on the city centre**
- The residential area's are despite their own speed of life, leaning on the facilities in the city centre. In that sense there is a connection between both sides based on their morphology and function (housing).

**Image 74-77: Fysical borders (overcome), analysis and conclusions (own ill.)**

**Image 79 / 81: Paardenmarkt, analysis (own ill.)**

**The Paardenmarkt as a hub**
- Actually, The Paardenmarkt is a hub. People park their car when they arrive from outside the town and make their way to the city centre. They use transport facilities like buses or foot to get there. The Paardenmarkt is a square that is in use as a parking lot. This is a very important function in a city, but therefore it does not meet the quality of squares like the Beestenmarkt or Doelenplein.

**Answering the research question:** What is the relation of the Paardenmarkt with the neighborhood and or 'the active city'?

**Image 78:** The Paardenmarkt is a hub. People park their cars when they arrive from outside the town and make their way to the city centre. They use transport facilities like buses or foot to get there. The Paardenmarkt is a square that is in use as a parking lot. This is a very important function in a city, but therefore it does not meet the quality of squares like the Beestenmarkt or Doelenplein.

** ANALYSIS AND CONCLUSIONS **

**Answering the research question:** How strong is the fysical morphological border in the landscape (Schie-Rijnkanaal)? Does the river separate both parts of the city or is the boundary overcome?

**Image 78:** The answer to this question is partially related to the answer on the previous page. The Rijn-Schiekanaal has been a barrier for the city extension to the east until the nineteenth century. The early buildings on the east side of the Schie are completely different from the buildings on the west side. But the gap in differences with the post war sprawl is huge. The fact that both sides are connected (until a certain extent) by the morphological layer of the cultural landscape does not change anything in this.

The only physical connection between Centrum Oost and Koepeart is the Plantagebrug, which is only a pedestrian bridge. As mentioned on the previous page, the boundaries of the Schie and the Verwersdijk are known by the fact that in the residential area's on the east side of the Schie almost no facilities are available. People do have to go to the city centre for shopping. But this does not connect Centrum Oost and Koepeart, they are just both leaning on the facilities in the city centre.

There is just one unambiguously answer to the first two questions in this paragraph. If you like, similarities and differences between the city parts can be found. That just depends on the scope. I think that the fysical borders do not really exist, but there is no reason to think that Centrum Oost and Koepeart (nor Centrum North) have a strong connection. People who live there are assigned to their specific house.

**Answering the research question:** What is the relation of the Paardenmarkt with the neighborhood and or 'the active city'?

**Image 78:** In its dimensions and characteristics, the Paardenmarkt could pass for a city forest-like square as the Beestenmarkt. It is planted with Platanen and the facades around the square are historic and appealing. Except the function of the square and the function of the buildings around the Paardenmarkt are completely different. The buildings around the Paardenmarkt are completely non-functional. Most of them are the Artillery Storage House (until now a locked fortress for inhabitants of the neighborhood) are surrounding the square that is in use as a parking lot. This is a very important function in a city, but therefore it does not meet the quality of squares like the Beestenmarkt or Doelenplein.
Delft is not just history, nice shopping streets and technology. Just outside the build environment nature spreads out. It is remarkable how short the distance between the city and the ommelanden is. The municipality tries to enlarge the amount of biodiversity within the city, and nowadays people are more aware of nature, ecology and durability. City ecologists are working for the municipality and education and leisure programs can be found at the other side of the A13. The Artillery Storage House is at the crossing of the ecological structure and the city. Right at the place where the city, ecology and leisure meets.

The ecological main structure transcend the city borders and fulfill a regional role between The Delftse Hout and Midden Delfland with the city as a part of this structure. The conclusions in chapter one show that the location of the Artillery Storage House always have fulfilled the role of gateway to the ommelanden. The third possible strategy in chapter two is focused on a connecting role of the Artillery Storage House and the region. This leads to the question of a new function could address this connecting role. The research questions in paragraph 3.3 are:

What are the characteristics and functions of the ecological main structure in- and outside the city, and how is this structure connected?

How did the function of the gateway to the ommelanden change, and what is preserved in this function?

What are the strong and the weak points of the site of the Artillery Storage House as a node within the ecological main structure (also keeping the recreational function in mind)?
3.3 THE ECOLOGICAL CITY: CONNECTIONS BETWEEN THE CITY AND THE OMMELAND

**Delft** is from its origin leashed to the surrounding green landscape. Green means space, rest, play, meeting and education. The green / blue fingers are the ecological connection between the city and the ommeland. Nowadays the municipality is focused on re-enforcing the ecological main structure and increasing biodiversity in and around the city (Pasveer & Van der Klaauw, 2010, p. 62).

**Delftse Hout** is an ecological recreation zone where people can walk, bike, enjoy nature and relax at the beach and grass at the lake. The lake is a result of sand excavations for housing production (Wikipedia, 2013b). The park was designed in answer to the wish of the people in Delft for more nature for recreation.

**The Tweemolentjeskade** is the former barge road next to the canal (Tweemolentjesvaart). This historical ribbon in the landscape used to be the road to Rotterdam and enters the city at the Duyvelsgat (Kantoorgracht) and continues into the city.

Closer to the artillery storage house, the Tweemolentjeskade is flanked by residential houses creating a suburban atmosphere. The name of the Tweemolentjesvaart is derived from the two windmills that were faced on both sides of the canal at the sluice ‘Aan’t Verlaat’. The monumental lockkeeper house is still present.

For this analysis it is interesting to see how many rural, educational and urban functions are related to the ecological mainstructure. Especially inside the city they might not even be noticeable as such. The sites on the maps are found on the internet and a selection made by the researcher. There might be more relevant ecological sites that can give insight in how the city and ecology are interwoven, these will be added later.

**Ecology related places**

- **Delftse Hout (KNUS)** - rural leisure
- **Tweemolentjeskade** - suburbs
- **Kantoorgracht** - city centre
- **Doelenplein** - urban leisure

**Observations and Analysis**

For this analysis it is interesting to see how many rural, educational and urban functions are related to the ecological mainstructure. Especially inside the city they might not even be noticeable as such. The sites on the maps are found on the internet and a selection made by the researcher. There might be more relevant ecological sites that can give insight in how the city and ecology are interwoven, these will be added later.

The Delftse Hout is an ecological recreation zone where people can walk, bike, enjoy nature and relax at the beach and grass at the lake. The lake is a result of sand excavations for housing production (Wikipedia, 2013b). The park was designed in answer to the wish of the people in Delft for more nature for recreation.

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Close to the artillery storage house, the Tweemolentjeskade is flanked by residential houses creating a suburban atmosphere. The name of the Tweemolentjesvaart is derived from the two windmills that were faced on both sides of the canal at the sluice ‘Aan’t Verlaat’. The monumental lockkeeper house is still present.

The Tweemolentjesvaart continues into the city as the Kantoorgracht. The suburban atmosphere makes way for a dense urban pattern of canalhouses and characteristic streetprofiles. Both the water and the lines of trees are extended into the city centre.

Also inside the city centre does the ecological main structure play a role in recreational functions. At squares like the Doelenplein and Bentinckmarkt the rows of trees creates a comfortable zone with green roofs above the terraces.
The ecological main structure of water and green are connecting the different parts of the city and the ommelanden. It means that this structure as nature is used in a functional way for leisure, sports, recreation or education. Probably for many people ecology and city life are supposed to clash: nature is hidden behind trees and the earth wall for the traffic. Nowadays a modern version of the Duyvelsgat can be found. It is still in function for cleaning the canalwater. But it is not allowed to pass the gate with boats.

A bridge is introduced since the city expanded to the east side of the Schie. This made the location of the artillery storage house a functional point of view. Building B was the first building that people would encounter. As can be seen, the two buildings are positioned towards the water and the paths along the buildings.

On this drawing of Johannes Huibert Prins the ‘Quayvleg’ is visible. The name comes from the strong current that used to be in the water. At this place the water from the canal was refreshed with water from the Schie. This made the location of the artillery storage house a functional point of view. The artillery storage house is almost covered behind trees and the earth wall for the traffic.

This drawing of an unknown artist dating from 1782 shows how a ‘vlet’ (low and flat boat) enters the Duyvelsgat. Also the people that enjoy a walk at the eastbank are shown. By then the measure of the traffic on the Schie itself is large, so not a main gate but a functional point of view.

Since the current road runs over the modern version of the Duyvelsgat it is lifted a few meters on top of a earth wall. Building C disappears behind the wall and trees. The eastbank, although part of the city now, is still a functional place for sports and recreation (rowing, hiking, biking, running).

The ecological main structure (the green and blue historical ribbons in the east west direction) are slowly transforming together with the urban landscape. In the rural east direction the polder ditches and polder landscape with its recreational function in a certain way. In the eighteenth century people were gallivanting at the paths along the Schie itself or are on their way to the recreational area The Delfste Hout. The Oostsingel, the road alongside The Schie also preserved its function in a certain way. In the eighteenth century people were gallivanting (walk) at the paths outside the city wall. Nowadays people are for sports at the water or for walking through the landscape (see images and text on top of this page). What are the strong and the weak points of the site of the Artillery Storage House as a node within the ecological main structure (also keeping the recreational function in mind)?

First of all, The Artillery Storage House is the closest point to the ommelanden from the historical city. Seen from a historical point of view and based on its location it has the right to claim the recreational function in this area. The Plantagebrug as a node between the city, the ommelanden, the historical ribbons and the Schie itself, already have a great recognizability. The building is hidden behind a line of trees and do not expose or present itself to the public, as would be expected from a gatekeeper.

The ecological main structure (the green and blue historical ribbons in the east west direction) are slowly transforming together with the urban landscape. In the rural east direction the polder ditches and polder landscape with its recreational function in a certain way. In the eighteenth century people were gallivanting at the paths along the Schie itself or are on their way to the ommelanden. For a daytrip on a bike in the region or to the Delfste Hout and Schie, the Oostsingel is a functional point of view. It is a location that people will pass when they enter or leave the ommelanden. Two party lines on a bike in the region or to the Delfste Hout and Schie, the Oostsingel is a functional point of view. It is a location that people will pass when they enter or leave the ommelanden.
The previous chapters dealt with the historical context and the current characteristics of the city centre of Delft. This chapter zooms in at the site itself. How does the Artillery Storage House presents itself and is it perceived by people who live there or walk by? This perception and relation with the public space is important information to answer the quest in the conclusion at the end of this report. For this it is essential what the characteristics and potentials of the ensemble are, the positive and negative aspects, for a future redesign.

This chapter has two paragraphs. 4.1 has a focus that is divided in two methods. On the first page of paragraph 4.1 the perception of the building from an external point of view is inquired. From a serial view a tour around the building is staged. On the second page sections are used to research the relation between inside and outside and what elements establish or block this physical or visible relations.

Paragraph 4.2 researches the open spaces inside and the ensemble and the spaces that surround the building. This part starts with a serial view and draws conclusions in diagrams at the second page of paragraph 4.2.

The research questions in this chapter are:

4.1a How does the building ensemble presents itself to the public and how is it perceived?

4.1b How are the physical and visual relations between inside and outside the building established or prevented?

4.2 What are the characteristics of the open spaces in- and outside the building ensemble and how do they relate to each other?
4.1 RELATION WITH THE DIRECT SURROUNDING

The building ensemble has a very closed off character seen from the outside. This distant relation with the public area is logical since the building used to be a storage house for ammunition and weaponry. People were not supposed to get in. In that sense it is a fortress. This character is interesting but questionable when the Artillery Storage House should get a new function.

Windows and heavy wooden doors are permanently closed, some even removed in the last decades (in building B for example). The openings, routing and activities are focussed on the courtyard, which is only reachable for the current owner of the buildings. Only through the gates people can have a glimpse of what is happening inside. The appearance of the building is like it is since centuries: strong and even representative towards the Paardenmarkt, but clear in its message that you have to stay out. It is positioned as it is still standing at the edge of the historical city, ignoring the east side of the Schie.

Observations

Answering the research question: How does the building ensemble presents itself to the public and how is it perceived?

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View at the facade of building A from the Paardenmarkt

Building A seen from the Kantoorgracht

Vision at building B from the Plantagebrug

Oostsingel

View at the main entrance in front of building A

Peak in at the gate at the Kantoorgracht

When standing in front of the entrance of building A people can have the best observation of the building ensemble. But even then a full sight at the facade (short side) is blocked by additional buildings and walls. The walls and gates make clear that without permission you are not allowed to go in.

The gate at the Kantoorgracht (what used to be a wall with a heavy wooden door like the others in the facade of building A) gives the only opportunity to have a peak inside the courtyard. From here the facades at the courtyard are visible, but again it is clear that entering the ensemble is not permitted.
THE SITE
4.1 RELATION WITH THE DIRECT SURROUNDING

On the previous page some elements of how the building ensemble its closed of character and distant character with the public are already mentioned. In the facades on the outside of the ensemble, doors and windows are permanently closed (= not openable) and not in use. Everywhere the slightest view inside one of the buildings would have been possible this visual connection is eliminated. For this, see the .

Windows at the outside of the ensemble are positioned above eyeline. So even if the hatches are opened, only daylight could enter and curious passengers would be stopped in their attempt to see what is happening inside. Building B has an extra barrier for establishing visual contact: the interior walls are cladded with steel panels to prevent the former collection of The Army Museum, see  .

Only between the buildings and the courtyard are visible and physical connections possible due to glass windows and openable doors (the actual entrance to the buildings from the side of the courtyard). This makes the ensemble a introvert oriented building. As mentioned before, but more clear in these sections are the obstructing elements of the trees and houseboats at the Oostplantsoen and in the Kantoorgracht. The closed off and distant character of the building served its function for centuries. For a new function the Oostplantsoen, the Kantoorgracht and of course the Paardenmarkt offer good opportunities to connect with the public area. But this remark might be more suitable for the next stage in the design process.

Answering the research question: How are the physical and visual relations between inside and outside the building established or prevented?

Go to the previous page some elements of how the building ensemble its closed of character and distant character with the public are already mentioned. In the facades on the outside of the ensemble, doors and windows are permanently closed (= not openable) and not in use. Everywhere the slightest view inside one of the buildings would have been possible this visual connection is eliminated. For this, see the .

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These drawings are concluding diagrams that add extra visualized information to the conclusions on the previous two pages.

A barrier of closed buildings and walls prevent people from having a look inside. This was the purpose of the building, since it used to be a depot for weapons and artillery. Unless its size the function and courtyard remain hidden for public from most viewpoints.

Only at the later installed gates with iron fences people can have a glimpse of what is happening inside. But it is impossible to oversee or experience the complete complex from outside.

Image 112 / 114: Relation with the direct surrounding, conclusions 1 / 3 (own ill.)

It is not only due to the closed character of the building that the Artillery Storage House is hidden or closed off to the public. The functions around the building do not attract visitors and the building is wrapped between the houseboats, trees, buildingblocks and the kazerne at the Paardenmarkt. If it had a certain grandeur in the 17th century, it is not exposed in the current situation.

CONCLUSIONS
The Paardenmarkt, a city forest used as parking lot, is characterized by the large Platanen that shape a roof above the square.

The Schie-Rijnkanaal is the main commercial route over inland water from Rotterdam to Amsterdam. But it is also used for leisure boats and sports. On both sides the green banks provide routes for cycling and running. The dimensions are visible in the 1:500 section on the previous page.

When entering the ensemble, you first encounter a forecourt surrounded by building A, E and JK. From here you can enter the main court (which you can already partially see) and the garden behind building E.

The garden behind building E actually has the characteristics of a garden due to the facades of the buildings that are (or were intentionally) in use as houses. It is a completely different atmosphere than in the main courtyard that is surrounded between the storage houses.

The Paardenmarkt is seen from the Van der Mastenstraat.

The Schie-Rijnkanaal is the main commercial route over inland water from Rotterdam to Amsterdam. It is also used for leisure boats and sports. On both sides the green banks provide routes for cycling and running. The dimensions are visible in the 1:500 section on the previous page.

When entering the ensemble, you first encounter a forecourt surrounded by building A, E and JK. From here you can enter the main court (which you can already partially see) and the garden behind building E.

The garden behind building E actually has the characteristics of a garden due to the facades of the buildings that are (or were intentionally) in use as houses. It is a completely different atmosphere than in the main courtyard that is surrounded between the storage houses.
4.2 SQUARES AND OPEN SPACES

Chain of open spaces

The open spaces inside and around the Artillery Storage House

The Schie and river banks: public recreational space

Courtyards: hidden / locked off private space

Paardenmarkt: public functional space

In dimensions and characteristics (facades and Platanen): the courtyard and Paardenmarkt have similarities with other squares in the active city. The main difference is the surrounding functions. A square becomes an interesting place for the public based on its function. The parking lot surrounded by family houses is not interesting for a Horeca function as the Doelenmarkt, but might be suitable for a residential garden as the Doelentuin. And the new function of the ensemble of the Artillery Storage House can determine the attractive value of the inner courtyard. But these considerations about strengths and weaknesses of the site will be discussed in the conclusions at the end of the report.

Building E divides the inner courtyard of the Artillery Storage House into three different kinds of spaces (also see image 3, 4 and 5 on previous page):

1. main courtyard
2. forecourt
3. garden

Answering the research question (part 2): What are the characteristics of the open spaces in- and outside the building ensemble and how do they relate to each other?

The ensemble of the Artillery Storage House is surrounded by open public spaces and contains a big open space itself. In the diagram in the left top the situation (the chain) of the Paardenmarkt, the courtyard and the Schie and its riverbanks is visible. The diagram in the left bottom shows the disconnection between the open spaces and the fact that the inner courtyard of the Artillery Storage House is a hidden domain. The drawing in the middle at the bottom of the page describes (not as a design solution, but to show the possible connecting role of the ensemble of the Artillery Storage House) that there is a future possibility to connect the chain of open spaces.

According to this, the functions of the open spaces might be reconsidered. The hidden courtyard and the parking lot at the Paardenmarkt might be suitable for other functions as well. They have the dimensions and characteristics of other squares in the city. This potential viability will be discussed in the conclusions at the end of the report.
This chapter is concerning the architecture of the ensemble of the Artillery Storage House. The ensemble is a result of a continuous series of adaptations and repairs. The adaptations are clearly visible in the structure of the buildings, the facades, the openings in the walls and the masonry. It also influenced the routing in and around the building. All the repairs and changes that were executed were intended to extend the functional life cycle of the building. And the scars that are left behind are reminders of the reason that the Storage House survived: it is preserved by using it and adapting it to fit its use. The result is a layered building with traces from the past. That is the reason that the title of this report is 'A collaged monument'.

Chapter five starts with a research of the development of the ensemble. Despite all the transitions of the last 350 years, the ensemble has always been a walled complex from the 17th century. But within these walls a lot has changed, and can change in the future. The brief mass study shows how the ensemble is composed of the main buildings, additional buildings and surrounding walls. Imagine what it would look like if only the main buildings were existing?

But that is a question for a later stage in the design process. The first paragraph focuses on how the composition of the ensemble arised and changed into its current state. The research question of paragraph 5.1 is: How did the composition, the functionality and the external routing of the ensemble change from the building of the Affuitenloods until its current situation?

The conclusions of paragraph 5.1 are explained and illustrated on a separate page, as in the previous chapters.

The following paragraphs are more general and not necessarily related to the quest and main research theme. For this reason these chapters will not have a individual introduction or explanation of the research questions. These questions will be noted below and the answers will be found in the texts and drawings. Of course, this information is essential and valuable for the next steps in the design process and it will be used in the conclusions and value assessment to strengthen the arguments of the researcher.

Paragraph 5.2 is a reproduction of the existing floorplans. The rather superficial but useful research question is: What are the dimensions and brut floor spaces of the buildings?

Paragraph 5.3 concerns the structure and routing in building A, B and C, and the research question is: What are the main structural elements, how is the structure composed and what were the major adaptations?

In the fourth paragraph the major facades are analyzed. The research question is: What are the major characteristics of the facade, regarding symmetry and appearance, what elements are added or removed over the years and what are the most notable materials and details in the facade?

The incoming daylight is subject of paragraph 5.5. The underlying question of the research is: Where is daylight entering the building and what elements are blocking the possible incoming daylight?

Since the openings in the facades are a collection of interventions of the last centuries paragraph 5.6 gives an overview of the types of openings. The research question, supported by literature, is: What types of wall openings are present in the Artillery Storage House and how are the forces transferred to the foundation?

The last paragraph of this chapter, 5.7, gives an overview of the types of masonry and stones that are used in the buildings. The aim is not to name all the types and dimensions of the bricks, mortar and natural stones but to give an idea about the collaged character of the masonry. If necessary, a more detailed research of the masonry will be executed in later a stadium.
Answering the research question: How did the composition, the functionality and the external routing of the ensemble change from the building of the Affuitenloods until its current situation?

External routing

In the 17th century there was only the Affuitenloods and the precursor of building B. The Affuitenloods was the access to the terrain behind the ringwall and the goods that needed to be stored in the Affuitenloods arrived by water or road and could be lifted and brought in at the level of the first floor at the frontside of the building.

When the salpeterloods was build, the open terrain started to become the current courtyard. To reach the courtyard and salpeterloods, the goods functioned as the access building.

When the terrain was extended to the southeast and the ringwall was moved there was space available for an entrance gate. The pyrotechnic laboratory had its own entrance.

Halfway the 19th century the artillery depot became more and more a multifunctional ensemble of buildings. Since the main entrance was located at the Paardenmarkt, a courtyar is needed to enter the separate buildings.

In the current situation two gates are in use to enter the courtyard from there the separate buildings are accessible.
Answering the research question: How did the composition, the functionality and the external routing of the ensemble change from the building of the Affuitenloods until its current situation?

The facade of the affuitenloods used to be the main entrance of the building. Although it was a utilitarian building, it is expressive with its symmetric facade, heavy wooden doors and decorative stone carving above the middle door. From the Paardenmarkt it stood brave alongside the Raamgracht. Nowadays the presentation to the city is less impressive because of the building block and trees in front of the affuitenloods and the fact that the entrance has moved from the old wooden doors to a gate on the right side of the affuitenloods.

During the last centuries the routing between the different buildings of the ensemble has changed. First the buildings were approached from the doors in the facade on the Paardenmarkt, closed here alongside the Raamgracht. Nowadays the presentation to the city is less impressive because of the building block and trees in front of the affuitenloods and the fact that the entrance has moved from the old wooden doors to a gate on the right side of the affuitenloods.

The functions inside the buildings of the ensemble changed over the centuries. But what is remarkable is that the zone with the laboratory and production functions moved from the northern part to the southern part in the later added buildings.
5.3 STRUCTURE AND ROUTING BUILDING A

Structure, floorplan 1 : 500

Segment of structure

Observations and analysis

3d diagram structure

Routing, floorplan 1 : 500

OBSERVATIONS AND ANALYSIS

1. 350 mm thick masonry wall.
2. HE200A steel profiles replaced the original studs (standvinken) in the 1940's. Two studs are replaced by one steel column.
3. HE300A steel beam replaced the tie (hanenbalk) that supports the floorbeams.
4. 240 mm x 100 mm pinewood floorbeams 800 mm centre to centre. The end is placed on top of the masonry, the other on the tie.
5. Two 'schaargebinten' made of pinewood beams, placed next to each other on top of the floorbeams. The 'zakgoot' between is raised to a level of 2.3 m in the 1930's. This makes the space between the 'schaargebinten' passable.
6. The cramp-irons connect the 'schaargebinten' and the floorbeams with the masonry wall.
7 & 8. The gutter is placed on top of the wall at the side of the Paardenmarkt. At the courtyard side, the gutter is supported by decorated protruding beams at every 1 m (Kamphuis, 1996, pp. 18-19).
5.3 STRUCTURE AND ROUTING BUILDING B

STRUCTURE AND ROUTING

ARTILLERY STORAGE HOUSE

Structure, floorplan 1 : 500

3D diagram structure

Routing, floorplan 1 : 500

Segment of structure

OBSERVATIONS AND ANALYSIS

1. 300 mm thick masonry wall, 450 mm where the roof structure is supported. Inside, steel retention walls were placed to protect the collection of the former army museum.

2. 200 mm x 300 mm pinewood floorbeams. The beams between the roof rafters are added in 1950 to reinforce the structure.

3. Philibertsparren: arches of ‘kantstaande’ shelves, made of separate curved elements that are nailed together to form one span. The spanten are connected to and mainly supported by the floorbeams (but also placed on top of the masonry).

4. Gutters

5. Protruding decorated beams at every 800 mm to support the gutters (Kamphuis, 1996, pp2).
3d diagram structure

Segment of structure

1. 400 mm thick masonry wall.
2. 'standvink' (stud): 300 mm x 300 mm pinewood column placed on a hardstone block. 220 mm x 220 mm corbels connect the column with the 'hanenbalk'.
3. 'Hanenbalk': 350 mm x 300 mm pinewood beam.
4. The floorbeams are alternately sized 310 mm x 225 mm and 230 mm x 175 mm. One end is placed on top of the masonry wall, the other end on top of the 'hanenbalk'.
5. Philibertspanten: arches of 'kantstaande' shelves, made of separate curved elements that are nailed together to form one span. The spanten are connected to and mainly supported by the floorbeams (but also placed on top of the masonry).
6. The cramp-irons connect the Philibertspanten and the floorbeams with the masonry wall.
7. Protruding decorated beams at every 1150 mm to support the gutters (Kamphuis, 1996, pp. 21-22).
The southwest facade of building A has a modest longitudinal composition. The three gates, windows and dormers centers the symmetry of the facade. Additional buildings are situated behind walls, extending the southwest facade of building A, and characterized by the same gates to maintain the unity in the main facade at the Paardenmarkt.

The importance of the gates and dormers are expressed by their position, size, colour and decoration. Above the central gate a stone plaque states the grandiosity of the building. But the clarity of the long facade with entrance gates alongside a square is disturbed by new elements as buildings and trees at the square. As mentioned before in this report, the function of the gates and dormers are in disuse and not of the same importance anymore.

The southwest facade of building A has been modified several times over the centuries. The row of seven dormers with beams for lifting materials are replaced by two doors at the level of the attic. The openings / hatches that have been added in the 20th century still do not enable people to have a look inside.

During WOII the Artillery Storage House was used as horse stable. The rings to tie the horses to are still visible.

1. Detail of the entrance fences. The fences were originally part of the Affuitenmakerij at the Westtoren in Delft.
2. The escutcheon of Holland, with the red lion on a golden background. In this case of the Artillery Storage House surrounded by cannon barrels. The text sais: 'Vigilate deo confidentes,' 'Maak vertrouwen op God'.
3. Decorated gates, placed on top of wall
4. Ring for horses
5. Cramp-iron
7. Original gates

Observed and Added Elements

The southwest facade of building A has been modified several times over the centuries. The row of seven dormers with beams for lifting materials are replaced by two doors at the level of the attic. The openings / hatches that have been added in the 20th century still do not enable people to have a look inside.
5.4 NORTH EAST FACADE BUILDING A

Observations and Analysis

Facade 1: 500

Both facades, the Paardenmarkt and inner courtyard side, of building A had a fairly similar composition. But the removal, renewal and addition of gates, dormers and windowframes gives a different expression. Several elements are disturbing the symmetry of the facade.

Entrances

From the courtyard, the three gates in building A are clearly the elements with the most importance, determining the approach of the building. Contrary to the southwest facade, the doors are still in use as entrances. The main central gate with the stone plaque above the door has been altered and differs in size.

Removed and added elements

The southwest facade of building A has been modified several times over the centuries. The row of seven dormers with beams for lifting materials are replaced by two doors at the level of the attic. The windows that were replaced during the 1940’s are numerous, large and enable a visual relation between inside and outside. They are also the only openings for daylight.

1. Gutters

1. The gutters at the courtyard side are not placed on top of the wall, but against the wall supported by the floorbeams sticking out of the facade.

2. Concrete bolkozijnen

2 and 3: The concrete bolkozijnen (frames) are placed halfway the last century. The details of the hook-shaped hinges are a remarkable aspect of the windows (Kamphuis, 1996, pp. 19).

3. Hinges

4. Gates

4. The doors and windowframes at the courtyard differ from the Paardenmarkt facade. On the inside the woodwork, except from the gutters, has the same green colour as the hatches at the Paardenmarkt side.

5. Stone plaque

5. Stone plaque above main gate: ‘Op den 13 july is van dit gebouw den eersten steen geleydt door Cornelis Reyners Van Der Burch. Franc Reyners Van Der Burch was the commies of the artillery storage house.’

OBSERVATIONS AND ANALYSIS
5.4 NORTHWEST FACADE BUILDING B AND I

OBSERVATIONS AND ANALYSIS

Discontinuity in ensemble

Although all the buildings of the ensemble vary in height, size and details there is a great distinction between building B and building I. The other buildings are part of the enclosing wall of the complex or incorporated in the wall. Building I was a trial, and still has this aberrant character due to the different colour of rooftiles, plastered walls and door types. The variety of the closed storage house building B and the residential building I shape the appearance of the northwest facade.

Unorganized back alley

The facade at the Kantoorgracht looks and feels like a back alley at the location of the Artillery Storage House. Doors and windows in building I are barricaded with wood, and building B has no entrances in this facade at all. The view at the facade is distorted by poor looking houseboats. An interesting element is the gate, that replaced a part of the enclosing wall and opened up the ensemble at this specific point. But the gate is mainly used for cargo transport.

Blind wall

Although there are openings in the facades, the northwest facade is a blind wall. There is no chance to see what is happening inside the building due to closed and removed doors and windows above eye level. The building has a potential interaction between inside and outside.

OBSERVATION & ANALYSIS

2. Entrance fence and detail

A detail that was expected but not found in building B are cramp-irons. The reason for this is not clear yet.

3. Windowframes

The wooden windowframes with the wooden hatches are similar as the ones in the front facade of building A. But these are added in 1950 and there is a difference in the windowsills and masonry (see chapter 5.5).

4. Hinges

The details of the iron hinges of the wooden hatches and boltjunctions are the same as in the facade of building A.
Facade 1: 500

Over the centuries, quite some alterations have been made in the facade of building C. But this facade contains still a lot of original elements.

1. Enlarged entrance
2. Old hinge for fence
3. Arched windows
4. Detail hinge
5. Lifting beam and gutter
6. Ventilation grid
7. Cramp-iron

The scars in the masonry of enlarging the gate is still visible. On the inside, a heavy wooden beam is added to the masonry wall, because the door is id wider than the span of two dakspanten. The beam is needed to lead the forces around the door opening. See p...

The three gates opposite to the gates in building A form the main focus zone of the facade. The added entrances on the side and behind building E are tucked away.

Most of the windows in the southwest facade in building C are original and ensure visual contact between in and out.
// ARTILLERY STORAGE HOUSE

5.5 DAYLIGHT

Observations, Analysis and Conclusions

Entrance of direct sunlight

Sun and shadows on ensemble

Oostplantsoen courtyard

Kantoorgracht

Paardenmarkt

Building A

Building B

Building C

Page 100 / 209: Sections, diagrams and sketches (1:1000) based on own photos

Image. 198/ 209: Sections, diagrams and sketches (1:1000) based on own photos

Attic 1 : 1000

Groundfloor 1 : 1000

morning

afternoon
ARTILLERY STORAGE HOUSE

5.6 OPENINGS AND FORCES IN THE FACADE

Types of openings found at artillery depot

1. Half circle arch with natural stone springers and keystones on the outside and inside in Building A and C, dating from 1750.

2. The openings for the added windows at the front facade of building A are made of single stone segment arches with sober tympanum.

3. One of the three gates at the facade at the courtyard in building A. The half circle arch, that masoned completely around the gate, is not original but dates from 1754.

4. The window frames placed in the 40's of the 20th century are made out of concrete. The window frames are supporting the wall above the opening.

5. To compare with the enlarged door at the arched windows, the forces from the roof and the floors are directly directed to the ground alongside the window opening.

6. The enlarged door in the courtyard facade of building C has a hidden structure to transport the forces of the dakspanten (recognizable due to the position of the cramp-irons). The arch above the gate is used for transferring the load of the brickwork on top of it.

7. The span between two rafters in the roof seems to be the limit to make openings in the walls with masonry only.

Historic types of openings in masonry walls (literature)

- 'strek' 'segment' arch
- Arch half circle arch with springers and keystones
- Ellips-arch
- Half circle arch with natural stone springers and keystones
- Half circle arch with tymanum

Image 210 / 217: 3d model and sketches (own ill.) based on own photos

Image 218 / 222: Types of openings (own ill.) based on (Kooren, n.d. pp. 1-6)
Walk around the Artillery Storage House

Collage of the brick, stone and masonry that was found

The Artillery Storage House is literally a collage of different types of brickwork. It is a mixture of colors, sizes, patterns, ages, origins, textures and mortars. The scars, repairs, extensions and removals are clearly visible. This way, the masonry becomes some kind of an atlas that makes the different time layers of the building ensemble readable. The carpenters (and designers?) haven’t been very careful with the building when it comes to unity in its expression. Alterations and repairs have been made with material and skills that were available. Now, this diversity in the appearance of the masonry gives the ensemble its current character.
This is probably the most intangible theme of this analysis report. But most of us can agree with the idea that one space differs from the other. This has to do with dimensions, shapes of the space, openings in the walls etcetera. It is an architect’s job, I believe, to recognize the elements that gives a space a certain identity. Here, structure, materials, colour, details and textures work together to result in a certain experience for the observer.

By being able to recognize the elements of the space that determine the identity the architect is able to use them to create his or her vision of a design. This counts for a redesign as well, where the existing elements should be valued and balanced in a decision for a possible intervention. The last chapter before the value assessment is concerning the identity of the spaces in building A, B and C. The research question is:

What are the characteristics, elements, materials and details that determine the identity of the space?

The answer to the question will be found in the texts that accompanies the sketches and photographs.
6.1 IMPRESSIONS, SPACE AND MATERIALS BUILDING A

ANALYTICAL DRAWINGS

The structure with the two gable roofs creates two tunnels. The beams make it feel like there is some kind of a ‘ceiling’.

Both sides of building A has windows and doors, but they are only open (not locked and glass) at the side of the courtyard. This makes the connection to the courtyard very clear.

Both sides of building A has windows and doors, but they are only open (not locked and glass) at the side of the courtyard. This makes the connection to the courtyard very clear.

The steel structure that bears the load of the roof and floor divides the space in two longitudinal spaces with cross connections.

The roof has only openings at the side of the courtyard with a view at the open space and other buildings.

In the cross direction there is a view at the courtyard and building C through the doors and windows.

INTERIOR SKETCHES

Details and materials

1. The pinewood beams are marked (‘telmerken’) because the fabrication of the structure took place somewhere else. The marks were made by the carpenters connected the eight pieces on the site (Janss, 2012, p.30).

2. The repairs and adjustments in the wooden construction are very visible. The appearance of the construction with all the different origins express a part of the history of the building like a storyline.

3. Since the building was used for storage of army materials, the construction is numbered and places were assigned for specific materials. What was stored where in the building is written on the beams.

4. Detail of the connection between the wooden structure and the masonry wall.

5. The steel construction is less present than the former wooden studs. The space is more open but lost a part of its character that is still present in building C.

6. The heavy wooden doors to the Paardenmarkt and the courtyard have imposing slides and locks for barricading the entrance.

OBSERVATIONS AND ANALYSIS
6.1 IMPRESSIONS, SPACE AND MATERIALS BUILDING B

IDENTITY OF INTERIOR SPACES

Analytical drawings

The roof structure with the Philibertspan can create a tunnel shaped by interesting wooden elements.

Interior sketches

The attic is not very spatial, because of the limited height and width it feels a little oppressive.

The roof has only openings at the side of the courtyard with a view at the open space and other buildings.

The groundfloor is a narrow but high space. The space continues around the corner behind the door.

From the outside windows and hatches are visible, but on the inside they are covered with insulation and wooden panels. There is no connection with outside.

Image 238 / 250: Sketches and diagrams (own ill.) based on own photos

OBSERVATIONS AND ANALYSIS

Details and materials

1. Detail of the connection between the wooden Philibertspan and the masonry wall and the floorbeams. The segments where the Philibertspan is made of is visible.

2. Detail of the segments of the Philibertspan in the top of the rafter. The strength of the rafter is gained by nailing the separate arched shelves together into one layered element.

3. The wood that is used for the boardedfloor is just functional, not architectural. The shelves are reused and the paint of the former function is still visible.

4. The masonry walls are clad inside with steel panels and visor for extra protection of the museum objects that were stored. The windows were layered and there is no visual connection with outside.

5. Building B is the only main building in the ensemble with a installation to condition the air inside. One of the partitions of the attic is designated as installation space.

6. Also at the groundfloor are the installations very present, not doing any good to the appearance of the space.
6.1 IMPRESSIONS, SPACE AND MATERIALS BUILDING C

IDENTITY OF INTERIOR SPACES

Analytical drawings

Interior sketches

The attic of building C reveals a space that is uninterrupted from the outside. The Philibertspanten make the wide spans possible and create the impressive large space.

Because of the Philibertspanten the roof could be spanned from wall to wall, which meant that the height of the roof is increased as well (in contrary to the double roof of building A).

The roof has only openings at the side of the courtyard with a view at the open space and other buildings.

Both sides of building C have windows and doors, but they are only open (not locked and glass) at the side of the courtyard. This makes the connection to the courtyard very clear.

The original standviken are elements that breathes the atmosphere of the time the building was constructed. The construction is quite heavy and almost divides the space in two long corridors: one at the courtyard side with natural light and a dark one at the Oostplaatsen side.

1. The locations of the former roofwindows are still visible in the roofconstruction. The disappearance of these elements made the space less usable due to the lacking of daylight.

2. Detail of the layered wooden shelves of the Philibertspanten.

3. Detail of the connection between the wooden rafters and the masonry wall and floorbeams. The clamp-irons and the beams that support the gutters on the outside are visible.

4. There is a difference in height between the attic floors of building B and C. These buildings are the only ones that are connected together internally.

5. The interior walls in building C are made of brickwork that is placed free from the wooden rafters.

6. The pinewood studs are one of the most original elements that can be found in the ensemble of the Artillery Storage House. These characteristic elements are sturdy and do not reveal that they are bearing the load of the roof and the floor.

Both sides of building C have windows and doors, but they are only open (not locked and glass) at the side of the courtyard. This makes the connection to the courtyard very clear.

The original standviken are elements that breathes the atmosphere of the time the building was constructed. The construction is quite heavy and almost divides the space in two long corridors: one at the courtyard side with natural light and a dark one at the Oostplaatsen side.

Image 251 / 263: Sketches and diagrams (own ill.) based on own photos.
To what extent a research report is useful depends imprimis on the quality of the inquiry, but secondly on the structure of the report itself. Facts, interpretations and value assessments should be clearly distinguishable in images and words. This allows other people to verify, audit and, if desirable, reproduce the research (Hendriks & van der Hoeve, 2009, p.14). For this reason the observations, analyses and conclusions are separated in previous chapters. The next chapter is the value assessment.

A value assessment contains statements about the values of the research object, based on interpretations at different scale levels and points of view. The interpretations are derived from the analysis and conclusions of the data and characteristics within the context of the research questions.

For the value assessment of The Artillery Storage House the methodology described by the Rijksgebouwendienst in ‘Richtlijnen bouwhistorisch onderzoek’ is used as inspiration (Hendriks & van der Hoeve, 2009). The motivation behind this publication is how the architectural history of buildings can be recognized and taken in account when buildings are (re)used, adapted or maintained. The scale levels and points of view in the ‘Richtlijnen bouwhistorisch onderzoek’ are useful, but written from the perspective of a historicus and not to the full extent of a designer. I believe that a combination of the perspectives of a historicus and a designer with a broad range of interests (architectural and social) is needed to value the Artillery Storage House. Therefore I added three points of view to the ones of the Rijksgebouwendienst. All these points will be explained on the next page in the reading guide. After this guide the actual value assessment can be found.

Again, the value assessment contains my interpretations of the analysis and conclusions in this report. Although I tried to be analytical in the report and based the work on facts, this last part of the report and the values are personal opinions. In the next stage of the graduation assignment these values will be used to define starting points for the redesign and new function of the Artillery Storage House.
The scale levels vary between the scale of the city and the scale of the details. The top down notation does not mean that there is a certain ranking of values.

Points of view

The range of subject matters allow to make balanced and layered propositions about the values of the conclusions in the report. A topic in the analysis report might be valued in different ways for several subject matters or be combined with other matters to strengthen or weaken values.

Where the conclusions are placed underneath the points of view on the horizontal axis defines which point of view has a dominant role in the value.

The scale level of the conclusion in this example is focused on the 'area and the context' and on the 'building and ensemble'.

The conclusion is valued from two different points of view, the 'ensemble / urban values' and the 'social values'.

The combined assessment of the conclusion resulted in a medium value.

Where the conclusions are placed underneath the points of view on the horizontal axis defines which point of view has a dominant role in the value.

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Where the conclusions are placed underneath the points of view on the horizontal axis defines which point of view has a dominant role in the value.
VALUE ASSESSMENT

7.2 PROPOSITION SCHEME

Gate to the ommelanden

Degenerated front facade

Philibertspanten

Stand-off relation with public

Paardenmarkt and courtyard

Lack of open space

Mass vs open space

Daylight

The location of the Paardenmarkt is located at a historical connection of the city with the ommelanden. Unfortunately, the current entrance looks messy and the Artillery Storage House is not the representative building as people might expect at a certain location.

The location of the Paardenmarkt is not connected to the routes of the active city, but this leaves the opportunity to create a new value. For instance, the position of the Paardenmarkt is a node in the ecological main structure and can play a role within that structure.

The Artillery Storage House has strong relations to the morphology and historical green and blue ribbons in and outside the city. The location is the connection between ecology in and outside the city.

Mass vs open space

Daylight

The diversity of the ground/floor spaces and attics of building A, B and C is a high value. The dimensions, materials and structures give the six spaces all a different identity.

The original details and materials of the construction and components have a high value. To show the craftsmanship of the time it was build, these components give the ensemble a higher economic value as well as it is a building with a historic expression and atmosphere that people want to visit when it has a new function.
The first chapter of this report started with an inquiry of the context of The Artillery Storage House. The morphology, history of the urbanization of Delft, the development of the site and the zones and functions in the city were researched in relation to the Artillery Storage House. From these conclusions the main theme of the research was formulated in the second chapter. The subquestions that derived from the main theme were answered in chapters 3, 4, 5 and 6. These answers should enable the researcher to answer the main theme at the end of this report. In this part of the conclusion the pros and cons for each strategy will be briefly summarized, resulting in a balanced answer for now.

First strategy for The Artillery Storage House: function within ‘the active city’

‘The active city’ is characterized by streets, canals and squares with commercial, cultural and leisure functions and horae. The area of the Paardenmarkt is clearly different: mainly family houses and no public functions. Although the Paardenmarkt and Artillery Storage House have the physical characteristics of the squares in the city centre, I do not think that it is a viable strategy to make the Artillery Storage House part of ‘the active city’. Not only The Artillery Storage House, but also the streets leading there should be redeveloped to make a connecting with the meandering diagonal (page 14). The urban structure of ‘the active city’ consists of a strong chain of squares with public functions connected by shopping streets. Redeveloping the Artillery Storage House with the aim to become part of ‘the active city’ will result in an unlinked part of this chain. At least, this is my conclusion.

Thereby, the city centre is not only divided in different zones and functions. Also the coincidentally grown organization of squares and axes resulted in a situation that the location of the Paardenmarkt is located in a corner just outside the busy touristic area. That should be considered as a quality and not as a defect in my opinion and can be used in the next steps of the design.

Second strategy for The Artillery Storage House: residential neighborhood function

This strategy was based on the hypothesis, resulting from the conclusions in chapter one, that the residential neighborhoods on both side of the Schie would have an independent and self-sufficient position within the city of Delft. The question was to what extent the Schie is a barrier between the neighborhoods. And how would this influence the strategy to reallocate the Artillery Storage House in a function for the residents in the area?

The conclusions in this report show that the independent position of the residential neighborhoods do not exist. People just live there, go to their work and come home. The neighborhoods are relying on the functions in the city centre for shopping and leisure. In a way this is a argument to create a function in the Artillery Storage House especially for the local residents. Thinking the other way around: there is almost no bar, restaurant, shop or anything else to be found in the residential areas. This supports the idea that people are comfortable with the fact that they have to go to the city centre for leisure and shopping. Also the residents from the eastbank go to the city centre for their daily needs. So, the physical barriers in the landscape seem to be no real obstacles. But the strategy of the Artillery Storage House as a function solely for the residential neighborhoods has a low potential in my opinion.
SWOT ANALYSIS
STRENGTHS, WEAKNESSES, OPPORTUNITIES AND THREATS

In this second part of the conclusions, the strengths, weaknesses, opportunities and threats for the redesign of the Artillery Storage House are discussed. This scheme does not only addresses the conclusions related to the main theme but also the conclusions of the general research questions.

STRENGTHS
The ensemble of The Artillery Storage House is embedded in the historic morphologic layers and urban patterns of the city.

Although the ensemble is centrally located in the city (within the old city borders) it is part of a quiet neighborhood that is not absorbed by the touristic city centre, but can identify with the ommeland in its serene character.

The position alongside the Schie-Rijnkanaal and the green historical ribbons is a AAA-location.

Although the appearance of the building is not as indefeasible as it was by the time it was standing along the Raamgracht, the heavy wooden doors and stone escutcheon gives the building a powerful expression.

The characteristic details of the structures that are visible inside are appealing.

WEAKNESSES
The buildings of the ensemble have a low amount of incoming daylight.

The buildings are unrecognizable from some important viewpoints (Oostsingel).

The parking lot at the Paardenmarkt might be a strong or a weak point. Parking space for a possible future function is a great good in a city. But the Paardenmarkt has more potential than being a parking lot. But what is the solution for the current car parking?

The vertical connections between the ground/floor and the attics are insufficient in all the buildings.

OPPORTUNITIES
The closed ensemble is composed of main buildings, additional buildings and walls. Adjustments in this composition are possible to open up the ensemble.

The currently secluded courtyard has the potential of becoming a public open space. The courtyard is divided in three different outdoor spaces with their own characteristics.

The interior spaces of the ground/floors and attics of building A, B and C all have different dimensions and characteristics. This results in a great variety of spaces and opportunities.

The collaged-like expression of the building (due to the functional adaptations over the centuries) is a motivation for new interventions. When designed thoroughly of course, this will enrich the layered history of the monument even more.

THREATS
The ensemble has a introvert character. Very logical and interesting considering its original function, but it is not inviting for the public.

The building physics (isolation), details for water drainage (leakings) and measures to prevent rising damp are poor. This is a limiting factor for future functions of the building.

The large open attics define the identity of these spaces. Making compartments (for the redesign of a new function) destroys these qualities.
This analysis report marks the end of the first quarter of the Msc 3/4 Rmit graduation studio 'The Paardenmarkt' at the Faculty of Architecture of the Delft University of Technology. Based on the conclusions of the research questions an answer to the main theme is provided. The next step will be to define starting points for the redesign and make a sketch design. The insights and information that this report provides also raises new questions to investigate in depth. Since my conclusions is that the most viable approach for the redesign of The Artillery Storage House will concern the connection of the city with the ommelanden, that will be subject of my research at the beginning of quarter two.

The ecological main structure

One of the topics will be ecological main structure. What is the function of this structure of green and water for the city, what are the components and how is it used as educational and recreational area? Who are the (potential) users and what are their needs? What is the vision of the local municipality and national government related to ecology and the city? And particularly, what are functions related to architecture that can be the bridge between the city and the ommeland?

Connecting the city and the ommeland

If the building ensemble of the Artillery Storage House needs to be a bridge between the city and the surrounding nature, what are the specifications of such a function and building? Is it a passengers terminal where people stay for a short period and move on? Is it a place for education, to play for children or also a place where people can sit down and relax? These questions are related to the questions who the potential users or visitors will be and how the topic 'ecology and the city' will be transformed in a tangible program and architecture.

A in depth research of the composition of the ensemble (main buildings, additional buildings and walls) and its limits is needed to find out how the building ensemble can open up and bridge the open spaces on both sides: The Schie (nature) and the Paardenmarkt (the city). In this study not only the scale level of the ensemble is the subject, but also the scale level of the buildings and the structural elements.

Combining the region function with the local function

As mentioned in the conclusions, choosing one of the strategies of the main research theme does not mean that a redesign does not involve the other strategies. The Artillery Storage House is part of a residential area (ignored and tolerated) but a redesign will influence the relation between the building ensemble and the surrounding as it is right now. It is the duty of a socially engaged architect to take the needs of the local residents into account in the redesign. Therefore, part of the follow-up research will be how the redesign of the Artillery Storage House can give an impulse to the neighborhood in a satisfying way for the families who live there.

Needless to mention, but these three approaches for further research to come to starting points for the redesign are just a start. In the discussion with the professors and fellow students new subject will arise.
The first quarter of the MSc 3/4 Rmit graduation studio 'The Paardenmarkt' at the Faculty of Architecture of the Delft University of Technology resulted in this research report. This extensive research gave me a large amount of information and insights about the buildings of the ensemble, the surrounding area and the history of the place. By doing this research the building and its context started to become alive for me and during the process I noticed that I got some ideas for a new function and starting points for a redesign. And moreover and important for this stage of the design project, I developed my position towards the assignment and how to deal with this 'collage monument' at the node of the historical ecological main structure. This will be described in the approach for the second quarter.

WORK PROCESS

The first step of the research was defining research questions, what do you want to know of this building? I got to the main theme of the inquiry at an early stage, but the subquestions for each chapter arose during the process. In a way this is understandable, since I think researching and designing is cyclic process. Along the way new insights develop that might conflict with what you have been doing and might make you decide to do it (partially) all over again. But still, I think that defining the research subquestions in an earlier stage would have been a better base for the research. This would have saved me from doing a lot of re-editting of this report. And it would have led to a better structure of the story and findings I tried to visualize in this work. On the other hand, this report is a visualization and story of what I did in the first quarter that needs to provide me in information and arguments for the next steps in the design process. Researching is exploring and I tried to take the reader with me to find the quest in this report.

LIMITATIONS OF THE RESEARCH

The analysis is focused mainly on building A, B and C of the ensemble. Especially in the analysis of the architecture and structures of the buildings. However, there are more buildings part of this ensemble and part of the assignment. The other buildings deserved more credits and attention too. But the students had only two possibilities to visit the site and not all the buildings were accessible. Analysing the floorplans and sections would have been possible, but considerations about time and the extent of this report made me focus on buildings A, B and C. When the next phases in the design process requires an analysis of the other buildings, I will be capable of researching them the same way as can be read in this report.

This concerns the analysis of the masonry as well. Much more data could have been produced about sizes of the bricks, types and origins, the bonds and the mortar joints. I decided to postpone this research to the stage when I need this information.

An other blind spot in this research so far, and truly necessary for the plea for the possible new function of the building is the demography and functions in the surrounding area. What kind of people live there and what are their needs and desires? This will be fair questions to start with in the first week of quarter two.

FINAL WORDS

Nevertheless, this report discusses a wide range of topics on different scale levels and ends with my personal value assessment that can serve as discussion material for my fellow students and professors. The analysis resulted in surprising discoveries and useful full conclusions for the next quarter. I am looking forward to take my work of the first quarter to the next level of starting points and a sketch design.
// REFERENCES


// IMAGE CREDITS


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transformation of the former Artillery Storage House into The Delft Climate Centre

Clemens van der Linden
october 2014
tutors: Nol Hermkens & Wido Quist
external examiner: Jan Arends
Paardenmarkt, view at Artillery Storage House
LOCATION
Oostplantsoen (blocking sight at building C)
LOCATION

courtyard, view at building B
LOCATION

courtyard, view at building A
courtyard, view at building C
PAERDE-MARCT.

ARTILLERY ofe geschut MAGAZYN van HOLLANDT

Stadis Paerde-Stallen

Caryus Clarissen Cloosfeer
// HISTORY
urbanization of Delft since 1575

1575
From open field...

1649
(great explosion of Delft)

1860
to the edge...

2007
and enclosed by the city
// HISTORY

development of the Artillery Storage House

1671 - 1741
1750
1847
1867
1920

DEVELOPMENT OF THE COMPLEX

1410

founding of the Clarissenklooster

storage of gunpowder

construction affuitenloods

1573

1671

construction 'vuurwerkers' and pyrotechnic laboratory

storage of heavy artillery, granates, bullets and saltpeter

production and assembly of ammunition

1824

1847

storage of heavy artillery, granates, bullets and saltpeter

redevelopment

OWNERSHIP / USE

1867

1920

1903

1927

1945

1989

2013

horsestables

German Army

storage for legion

departure infantry

storage Army Museum Delft

redevelopment

sell of ASH to private owner

// page 12
Delft Climate Centre
NEW FUNCTION AND PROGRAM

research

commercial / local products

lifestyle

urban farming / gardening

learning

kids science sustainable development leisure / horeca

Delft Climate Centre
The outer facades of the ensemble are closed, openings are covered with wooden gates and hatches.

The inner facades reveal the most interesting details of the monument with the windows, gutters, hinges etc.

The treeline at the Oostsingel blocks the sight at the Artillery Storage House.
research question: how does the Artillery Storage House act as an intermediair between the two worlds of the city and the ecological structure on both sides of the complex?
THE SITE
relation direct surrounding

Paardenmarkt: dead end square

hidden by treeline at Oostsingel

conclusions

At the side of the Paardenmarkt the square is a unattractive dead end

From the Schie-side the Artillery Storage House is almost invisible
The courtyard is almost invisible when walking around the Artillery Storage House.

Because the courtyard is unaccessible the only thing to see is the outer facades, that are different for every building.

From within the courtyard, the complex reveals itself as one ensemble.
The formerly closed and hidden space becomes a public area for the people of Delft for leisure. People can experience the entire monument in once, overseeing the complete ensemble.

The Paardenmarkt becomes the prelude to the courtyard. Entrance and visibility from the east side at the crossing with the Huybrechtstoren.

A new connection between the city and the ommelanden, with The Artillery Storage House as an intermediair.
THE COURTYARD(S)

defining the qualities and weaknesses

1. Dodgy alley between the garage and building I
2. Garage dating from the '80's pasted against building A
3. Connection of varying volumes of building B and C
4. Wall closing of the space between building C and E
5. Additional buildings distort the appearance of the monumental facades of building A and E
6. Narrow corridor between building C and H
By demolishing the unsightly garage the unedged part of the courtyard becomes empty and makes space for a new addition to the existing building blocks.
removing disturbing elements

creating extra space at the entrance

The walls at the entrance and the additional volume in front of building E will be removed in order to create more space at the entrance and routes to the main courtyard and Schie.

Also the monumental facades will be in plan sight.
removing building H and restore wall

Defining new route from Paardenmarkt to Schie

Althought building H is a quite nice house in the current situation, it will be removed to make place for clear route from the Paardenmarkt to the Schie
the new building will connect 4 of the separate buildings of the complex in an U-shape.

the indoor connected buildings form together the main part of the new program.

the facade of the entrance building form, together with buildings A, C and E a clear and well defined outline for the courtyard / garden.

this re-strengthens the historic composition of the opposite position of building A and C.

the building is the main entrance to the public parts of the complex, reachable from the courtyard.
1 main entrances
2 parking
3 lobby offices and research space
toilets
4 research space
5 auditorium
6 technical space
toilets
7 study room
8 book collection
café
terraces
9 shop
garderobe
toilets
10 start of exhibition: ‘how did we get here?’
exhibition: ‘changing atmosphere’
exhibition: ‘changing ice and oceans’
exhibition: ‘changing land’
11 restaurant
food market
tools for gardening
gardening shop
coffee, juices and pastries
tools for gardening
non food shop
get in / out car area
parking
12 public exhibition: ‘history of the artillery storage house’
tickets
ARCHITECTURE

colors, application and atmosphere of wood in the interior
// ARCHITECTURE
robust black wrought iron frames in doors, windows and stairs
ticketbox in entrance hall, lowered floor, sitting stairs at the cafe and auditorium and doors in facade of building B

Glulam wooden arches composed of two driehoekspanten that are connected with scharnierverbindingen at the top and at the floor
The shape is a continuation of the roof shape of building A, cladded with western cedar wood (greying). The slats continue from the roof to the floor of the roof garden to the lamellen in front of the windows of the café, creating a closed but from close by an open appearance.

A glass connection between the existing buildings and the entrance hall is a light and transparent transition from the old to the new.
door openings in facade B

heighten the wall between building A and I

// DESIGN
entrance building, photos existing situation
entrance building, front facade
WRC bekleding interieur 90 x 20 mm RAL 9016
regel
multiplex 30 mm RAL 7026
isolatiemateriaal
multiplex 30 mm
waterdichte dampdoorlatende laag
bevestiging pennen/pen roostervlecht
WRC bekleding 90 x 20 mm

aanzicht
houten vliesgevel 200 x 80 mm
vulhout
koplat
dubbel glas 8 – 16 – 8 mm
houten latei 40 x 20 mm
watervast multiplex 15 mm
waterdichte dampdoorlatende laag
houten regel
WRC gevelbekleding 90 x 20 mm

buis 20 mm op lip (voor
openen terrasdeur)
rubber tochtdichting
espagnolet
espagnolet
rubber tochtstop
aanzicht

houten vliesgevel 200 x 80 mm
without
Kaplat

houten vliesgevel 200 x 80 mm
waterdicht multiply 15 mm
waterdichte dampdoorlatende laag
houten regel
WRC gevelbekleding 90 x 20 mm

nabij tochtstop
Aqua marine

rubber tochtstop
espagnolet
rubber tochtstop

entrance building, details of the facade
ARCHITECTURE
facade cladding, red cedar wood
sneldekpan
panlat
waterdoorlatende dampdoorlatende laag
isolatieschijf
spantbeen (deel van philibertspar)
stucwerk
gezocht
blok
zinkbekleding (nieuw)
waterdoorlatende dampdoorlatende laag
hardisolatieplaat
zinkbekleding (oorspronkelijk)
goot (oorspronkelijk)
draagarm goot
gehard dubbelglas 16-6 mm
afdekruisrubber
staalprofiel 130 x 50 mm
staanders ter steuningspunten van staalprofiel
staanders ter vorming van staalprofiel
blok 180 x 180 x 15 mm
Entrance building, details of facades and roof terrace

- Multiplex 30 mm waterdicht en dampdoorlatende laag voor hemelwater
- Waterretentielag en substraatlaag
- Glasvezel versterkte betonnen plantenbak (geperforeerd)
- Stalen schoen voor balklaag 280 x 80 mm
- Ventilatieknaal afvoer
- Hard isolatieplaat op afschot
- Multiplex 15 mm
- Waterdicht en dampdoorlatende laag
- Houten vliesgevel 200 x 80 mm
- Vuller
- Koplat
- Douceur met rails voor beweging houten lamellen
- Houten lamel 40 x 20 mm op rails 12 mm

// BUILDING TECHNOLOGY
Photograph of the existing walls, floor, steel construction, windows and gates

The attic is an interesting space with the original spanten. The heightened lower part in the middle is high enough to walk underneath.
Building A: office space in attic

- attic
- entresol (showcase)
- printers
- office space
- seats
- lounge
- meeting room
- door to solar energy deck

Building A: lobby and research space at groundfloor

- entrance
- lobby & desk
- showcase
- door to corridor of research space (public)
- door to research space (private)
- toilets
- research space
- machines & tools
- research space
Steel columns are replaced by a modern version of the standvinken and the floor is partially removed to open up the sight to the construction of the roof.

Walls are insulated with new windows on the inside, and inside the portals of the gates steel framed doors are installed.

In the lobby a desk, a block with the stairs to the entresol and toilets are realized.

The office space in the attick is mainly realized underneath the lower part between the two shedded roofs.
building A, research space
building A, details of insulated wall and windowframe

- Stalen afwerkprofiel met geïntegreerde inbus
- Hard plastic laag
- Staalprofiel met dubbel glas als voorzetraam
- Multiplex afwerklaag met geïntegreerde inbus
- Kitrand
- Staalkozijn met 3 mm enkel glas
- Stalen afwerkprofiel met geïntegreerde inbus
- Hard plastic laag
- Staalprofiel met dubbel glas als voorzetraam
- Multiplex afwerklaag met geïntegreerde inbus
- Kitrand
- Staalkozijn met 3 mm enkel glas
gietvloer:
PU toplaag 5 mm RAL 9006
gietlaag 15 mm
dekvloer met wapeningsnet 40 mm
membraan
warmte isolerende laag
betonnen stortvloer 200 mm
harde isolatieplaat op gestabiliseerde zandlaag

속, 20 mm (voor openen deur)
naaipatronen doorsnijden

klos op stelijzer
flexible isolatieschik
bestaand metalenwerk 355 mm
(bestaand informeren
flappen voor oude hekken)

stucwerk
gipsplaat 12 mm
nieuw stalen scharnier op arm
stenen schuifgat
stalprofiel
hard plastic met tochtrubber
epaulette
buis op lip
watervast multiplex
kitrand

BUILDING TECHNOLOGY
building A, details of steel and glass frame in gates
The groundfloor of building C is the most ‘original’ one. The standvinken, windows and gates are the most eyecatching elements.

The beautifull arched windows at the garden side are the only windows in building A, B and C with a low windowsills.

When the gates are openend it becomes clear how much extra light enters the space.
attic C with Philibertspanten
Building C: ‘kids science’ and movie theatre in attic

1. entrance restaurant
2. restaurant
3. bar
4. kitchen
5. dishwashing
6. storage / cooling
7. stairs to movie theatre / attic floor seats
8. toilets
9. corridor
10. exhibition
11. stairs to kids science centre
12. restaurant
13. doors to movie theatre
14. movie theatre
15. projection room
16. kids science centre
17. emergency exits
18. technical space

Building A: exhibition and restaurant at groundfloor

1. entrance restaurant
2. restaurant
3. bar
4. kitchen
5. dishwashing
6. storage / cooling
7. stairs to movie theatre / attic floor seats
8. toilets
9. corridor
10. exhibition
11. stairs to kids science centre
At the groundfloor the corridor next to the facade at the garden side is the route to the exhibition spaces, the stairs to the Kids Centre in the attic, the toilets and the restaurant. The gates and insulating glazing in front of the windows are similar to the ones in building A and respects and emphasizes the monumental qualities of the building.

The Kids Science (that is housed in a small village / group of wooden boxes (referring to the storage function of the building) and the movie theatre are located here.

The entresol of the restaurant is used for seating, but is also the entrance to the theatre from the restaurant side (in the evening).
building C, corridor
building C, exhibition
building C, details kids science and art centre
building C, movie theatre
Building C, details of roof and wall insulation and new floors with heating.
// HIMPRESSION

to the Garden

// HIMPRESSION

garden
TEKENINGENLIJST

DOORSNEDEN 1:50, PLAATSAANDELINGEN DETAILS

GEBOUW A

A.1 Nieuwe vloer en muurisolatie 1:5  v  6
A.2 Goed, dakisolatie en zoldervloer 1:5  v  7
A.3 Dakraam 1:5  v  8
A.4 Verlaagd plafond boven de werkplekken 1:5  v  9
A.5 Voorzetraam voor oorspronkelijke kozijn 1 1:5  v  10
A.6 Voorzetraam voor oorspronkelijke kozijn 2 1:5  h  11
A.7 Staalkozijn in poortopening 1 1:5  v  12
A.8 Staalkozijn in poortopening 2 1:5  h  13
A.9 Moderne standvink 1:10  v  14

ENTREEGEBOUW EN GEBOUW B

EB.1 Glasverbinding tussen gebouw B en entreegebouw 1:5  v  15
EB.2 Draagconstructie van de glasverbinding in de langsrichting 1:5  v  16
EB.3 Dakopbouw, goot en dakligten van het entreegebouw 1:5  v  17
EB.4 Systeem van de gevelbekleding en interieurafwerking 1:5  h  18
EB.5 Verbinding tussen gebouw B en het entreegebouw op de begane grondvloer 1:5  v  19
EB.6 Centrale hal 1:5  h + v  20
EB.7 Gelamineerde spanten 1:5  h  21
EB.8 Opbouw van het dakterrass en plafond van het climate centre cafe 1:10  v  22
EB.9 Gevel (tuinzijde) en balustrade van het entreegebouw (bovenste deel) 1:5  v  23
EB.10 Gevel (tuinzijde) en balustrade van het entreegebouw (maaiveld) 1:5  v  24
EB.11 Balustrade van het dakterrass 1:5  v  25
EB.12 Vliesgevel, terrasdeuren en houten lamellen op rekken aan de tuinzijde 1:5  h  26
                           1:5  h  27

GEBOUW C

C.1 Staalkozijn in poortopening 1 1:5  v  28
C.2 Staalkozijn in poortopening 2 1:5  h  29
C.3 Voorzetraam voor oorspronkelijke kozijn 1 1:5  v  30
C.4 Voorzetraam voor oorspronkelijke kozijn 2 1:5  h  31
C.5 Goed, dakisolatie en zoldervloer 1:100 en 1:20  v  32
C.6 Kids Science 1 1:100 en 1:20  v  33
C.7 Kids Science 2 1:100 en 1:20  v  34
gietvloer:
- PU toplaag 5 mm RAL 9006
- gietlaag 15 mm
- dekvloer met wapeningsnet 40 mm
- membraan
- warmte isolerende laag
- betonnen stortvloer 200 mm
- ingestort ventilatiekanaal

harde isolatieplaat op gestabiliseerde zandlaag

ventilatiekanaal met rooster, aanvoer

bestaand metselwerk 350 mm
- stelijzer met schuifgat
- isolatielaag
- ventilatiekanaal
- multiplex 20 mm
- stuclaag

Ongeroerde klei

Bestaande fundering op puinbed
**DETAILS: BUILDING A**

**A.2 Goot, dakisolatie en zoldervloer 1:5**

- Bestaand betonkozijn
- Kitrand
- Afwerklat
- Staalprofiel met dubbel glas als voorzetraam
- Hard plastic laag
- Staalprofiel afwerklat met geïntegreerde inbus
- Bestaand kozijn met 3 mm enkel glas
- Kitrand
- Stelijzer met schuifgat
- Flexibele isolerende laag
- Bestaand metselwerk 350 mm

**Gietvloer:**
- PU toplaag 5 mm RAL 9006
- Gietlaag 15 mm
- Dekvloer met wapeningsnet 40 mm
- Membraan
- Warmte isolerende laag
- Betonnen stortvloer
- Zwaluwstaart plaat
- Bestaande houten vloerdelen
- Vloerbalk
- Muuranker
- Ventilatieknaal, afvoer

**Verlaagd plafond:**
- Gespoten multiplex paneel

- Stelijzer met schuifgat
tengel 40 x 20 mm

- Bestaand houten luik
- Betonkozijn
- Ventilatieunit met warmte terugwin systeem

- Sneldekpan
- Waterkerende dampdoorlatende laag
- Isolatelaag
- Bestaand dakbeschot RAL 7026

- Afwateringsprofiel
- Bestaande klos
- Stelijzer met schuifgat
- Houten regel
- Multiplex 20 mm
- Stucwerk
A.3 Dakraam 1:5 v

raamuitzetter zwart gepoedercoat staal

tocht rubber laspaumelle afwateringsprofiel

staalprofiel hard plastic laag afwerklat afwerklat
A.4 Verlaagd plafond boven de werkplekken 1:5 v

verlaagd plafond

gehard glas 2x 8mm

staalprofiel

stalprofiel met schuifverbinding

geperforeerde gespoten multiplex plaat

stalprofiel

bestaande balklaag

gehaard glas 2x 8mm

gehard glas 2x 8mm

verlaagd plafond

ventilatiekanaal afvoer

waterkerende dampdoorlatende laag
isolerende laag
bestaand dakbeschot
bestaande balklaag
multiplex afwerking 20 mm
spot
geperforeerde gespoten multiplex plaat
A.5 Voorzetraam voor oorspronkelijke kozijn 1 1:5 v

bestaand betonkozijn
kitrand
afwerklat
staalprofiel met dubbel glas als voorzetraam
hard plastic laag
staalprofiel afwerklat met geïntegreerde inbus

bestaand kozijn met 3 mm enkel glas

kitrand
stelijzer met schuifgat
flexibele isolerende laag
bestaand metselwerk 350 mm

bestaand betonkozijn
stalen afwerksprofiel met geïntegreerde inbus
hard plastic laag
staalprofiel met dubbel glas als voorzetraam
afwerklad
kitrand
bestaand metselwerk

staalprofiel met dubbel glas als voorzetraam
hard plastic laag
staalprofiel afwerklad met geïntegreerde inbus

bestaand kozijn met 3 mm enkel glas

stalijzer met schuifgat
flexibele isolerende laag
bestaand metselwerk 350 mm
bestaand betonkozijn

A.1 Voorzetraam voor oorspronkelijke kozijn 2.5 h
gietvloer:
PU toplaag 5 mm RAL 9006
gietlaag 15 mm
dekvloer met wapeningsnet 40 mm
membraan
warmte isolerende laag
betonnen stortvloer 200 mm
harde isolatieplaat op gestabiliseerde zandlaag

buis 20 mm (voor openen deur)
natuurstenen dorpel
isolatieplaag
A.8 Staalkozijn in poortopening 2:5 h

- Bestaande houten poorten
- Watervast multiplex kitrand
- Buis op lip
- Stucwerk gipsplaat 12 mm
- Nieuw stalen schakier op arm stelijzer met schuifgat
- Klos op stelijzer
- Flexibele isolatielaag
- Bestaand metselwerk 350 mm
- Bestaand scharnier (buiten voor oude hekken)
- Staalprofiel hard plastic met tochtrubber epaulette
vervanging van de oorspronkelijke houten standvinken in de lobby van gebouw A, uitgevoerd in staal voor de stabiliteit van het gebouw

stucwerk
gipsplaat 12 mm
isolatielaag
stalen lip op balk
stelruimte
muurplaat
bestaand metselwerk 340 mm
muuranker

stalen ‘hanenbalk’
300 x 330 mm
verbinding tussen laggers

glasste poot-verbindingen

bestaand kozijn met 3 mm enkel glas
EB.1 Glasverbinding tussen gebouw B en entreegebouw 1:5 v

geheve dubbeglas 8-16-6 mm
afdekkingrubber
stalen peddel 160 x 10 x 15 mm
staanders ter ondersteuning van staalpeddel
EB 2 Draagconstructie van de glasverbinding in de langsrichting 1:5

tabel profiel 160 x 120 x 15 mm
staande onderbouwing van staalprofiel
staalprofiel 130 x 50 mm
afdichtingsrubber
gehecht dubbel glas f r 8 - 16 - 6 mm
DETAILS: ENTRANCE BUILDING AND BUILDING B

EB.3 Dakopbouw, goot en daklichten van het entreegebouw

- Dakopbouw
- Goot en daklichten van het entreegebouw

WRC dakbedekking 90 x 20 mm
Tengel 40 x 20 mm
Waterkerende dampdoorlatende laag
Multiplex 30 mm
Isolatielaag
Multiplex 30 mm RAL 7026
WRC bekleding interieur 90 x 20 mm RAL 9016
Gelamineerde houten spant 450 x 100 mm

Vast raam:
- Dubbel glas 8 - 16 - 6 mm
  - met afdichtingsrubber
  - en afwateringsprofiel

Gording:
- Vast raam:
  - Dubbel glas 8 - 16 - 6 mm
    - met afdichtingsrubber
    - en afwateringsprofiel

Bevestigingslat 40 x 20 mm

Gietvloer:
- PU toplaag 5 mm RAL 9006
- Gietlaag 15 mm
- Dekvloer met wapeningsnet 40 mm
- Membran
- Warmte isolerende laag
- Betonnen stortvloer

Stalen oplegprofiel
- Harde isolatieplaat op gestabiliseerde zandlaag

Kantstrook
- Paalfundering
- Ongeroerde klei

Voorgevormde keramische treden RAL 9006
- Houten deklaag op balken
- Multiplex onderlaag
- Keramische tegels 8 mm (mozaiek)
- Gietlaag 15 mm
- Dekvloer met wapeningsnet en vloerverwarming 40 mm
- Membran
- Warmte isolerende laag
- Betonnen stortvloer 200 mm

Gehard dubbel glas 8 - 16 - 6 mm
- (beloopbaar voor onderhoud)
- Afdichtingsrubber
- Afwateringsprofiel
- Staalprofiel 130 x 50 mm
- Stalen I-profiel 190 x 90 x 12 mm
- Stalen T-profiel 160 x 120 x 15 mm

Zinkbekleding t.b.v. goot voor hemelwater
- Waterkerende dampdoorlatende laag
- Harde isolatieplaat
- Multiplex 40 mm
EB.4 Systeem van de gevelbekleding en interieur afwerking 1:5 h

- WRC bekleding interieur 90 x 20 mm RAL 9016
- regel multiplex 30 mm RAL 7026
- isolatiemateriaal multiplex 30 mm
- waterkerende dampdoorlatende laag bevestigingsprofiel gevelbekleding
- WRC gevelbekleding 90 x 20 mm

- onzichtbare bevestiging WRC latten op regels via achterzijde
- bevestiging regels met latten op achterwand
- aanzicht gording

- gelamineerde houten span 450 x 100 mm
EB.5 Verbinding tussen gebouw B en het entreegebouw op de begane grondvloer 1:5 v

DETAILS: ENTRANCE BUILDING AND BUILDING B

- Gietvloer:
  - PU toplaag 5 mm RAL 9006
  - Gietlaag 15 mm
  - Deklaag met wapeningsnet 40 mm
  - Membran
  - Warmte isolerende laag
  - Betonnen ondervloer 200 mm
  - Harde isolatieplaat op gestabiliseerde zandlaag

- Vloerverwarming

- Bestaande fundering op puinbed

- Ongeroerde klei
DETAILS: ENTRANCE BUILDING AND BUILDING B

EB.6 Centrale hal 1:5 v

gietvloer:
PU toplaag 5 mm RAL 9006
gietlaag 15 mm
dekvloer met wapeningsnet 40 mm
membraan
warmte isolerende laag
betonnen stortvloer
stalen opleg profiel
harde isolatieplaat op gestabiliseerde zandlaag

koelvloer:
voorgevormde keramische treden RAL 9006
houten deklaag op balken
multiplex onderlaag
keramische tegel 8 mm (mozaiek)
gietlaag 15 mm
dekvloer met wapeningsnet
en vloerverwarming 40 mm
membraan
warmte isolerende laag
betonnen stortvloer 200 mm
harde isolatieplaat op gestabiliseerde zandlaag

paalfundering
ongeroerde klei

kantstrook

gelamineerde houten spant met ingelijmde staalverbinding

harde isolatieplaat op gestabiliseerde zandlaag
EB.7 Gelamineerde spanten 1:5 v and h

Horizontale doorsnede gelamineerde houten spant met ingelijmde stalen vinnen

Verticale doorsnede gelamineerde houten spant met ingelijmde stalen vinnen in betonvloer voor scharnierverbinding
EB.10 Gevel (tuinzijde) en balustrade van het entreegebouw (bovenste deel) 1:5

Houten vliesgevel 200 x 80 mm
Vulhout
Koplat
Deuvel met rails voor bevestiging houten lamellen
Houten lamel 40 x 20 mm op rails 12 mm

Randbalk 280 x 80 mm
Watervast multiplex 15 mm
Waterkerende dampdoorlatende laag
Profiel tbv goot voor hemelwater
Gevelbekleding 90 x 20 mm
Staalprofiel 60 x 20 mm voor balustradehek
Balustrade stijl 80 x 20 mm met geïntegreerde inbus 8mm

Stalen bevestigingsbeugel balustrade

// DETAILS: ENTRANCE BUILDING AND BUILDING B

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EB.11 Gevel (tuinzijde) en balustrade van het entreegebouw (maaiveld) 1:5

- Houten vliesgevel 200 x 80 mm
- Vulhout
- Koplat
- Deuvel voor bevestiging houten lamellen
- Houten lamel 40 x 20 mm op rails 12 mm
- Randbalk 280 x 80 mm
- Watervast multiplex 15 mm
- Waterkerende dampdoorlatende laag pro/fiel tbv goot voor hemelwater
- Gevelbekleding 90 x 20 mm
- Staalpro/fiel 60 x 20 mm voor balustradehek
- Balustrade stijl 80 x 20 mm met geïntegreerde inbus 8 mm
- Stalen bevestigingsbeugel balustrade

- Dubbel glas 8 - 16 - 8 mm
- Houten vliesgevel 200 x 80 mm
- Vulhout
- Koplat
- Deuvel voor bevestiging houten lamellen
- Houten lamel 40 x 20 mm op rails 12 mm
EB.12 Balustrade van het dakterras 1:5 h

- Watervast multiplex 15 mm
- Stalen bevestigingsbeugel balustrade
- Stijl balustrade 80 x 20 mm

- Goot
- Staal profiel 60 x 20 mm
- Stijl balustrade 40 x 20 mm
EB.13 Vliesgevel, terrasdeuren en houten lamellen op rekken aan de tuinzijde 1:5 h

- Dubbel glas 8 - 16 - 8 mm
- Houten latei 40 x 20 mm
- Waterdicht multiplex 15 mm
- Waterdoorlatende laag
- Houten regel
- WRC gevelbekleding 90 x 20 mm
- Kunststof strip
- Laspaumelle
- Espagnolet
- Buis 20 mm op lip (voor openen terrasdeur)
- Rubber tochtddichting
- Vulhout
- Koplat
gietvloer:
- PU toplaag 5 mm RAL 9006
- gietlaag 15 mm
dekvloer met wapeningsnet 40 mm
- membraan
- warmte isolerende laag
- kantscheiding
- betonnen stortvloer 200 mm
- harde isolatieplaat op gestabiliseerde zandlaag

afwerkprofiel dorpel
- watervast multiplex
- klos
- stelijzer met schuifgat
- vulhout

kitrand
- flexibel isolatiemateriaal
- bestaand metselwerk 500 mm

buis 20 mm op lip

bestaande houten poort

bestaand scharnier buiten voor niet aanwezige hekken

// DETAILS: BUILDING C //

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C.2 Staalkozijn in poortopening 2: 1:5 h

- Klos op stelijzer
- Flexibele isolatielaag
- Bestaand metselwerk 350 mm
- Bestaand scharnier (buiten voor oude hekken)
- Stucwerk
- Multiplex 20 mm
- Nieuw stalen scharnier op arm
- Stelijzer met schuifgat
- Staalprofiel
- Hard plastic met tochtrubber
- Epaulette
- Buis op lip
- Watervast multiplex
- Kitrand
C.3 Voorzetraam voor oorspronkelijke kozijn 1:5

- Bestaand kozijn met 3 mm enkel glas
- Bestaand metselwerk
- Kitrand
- Afwerklad
- Staalprofiel met dubbel glas als voorzetraam
- Hard plastic laag
- Multiplex afwerklat met geintegreerde inbus
- Stalijzer met schuifgat
- Isolatelaag
- Multiplex 20 mm
- Stuclaag

 DETAILS: BUILDING C

// page 30
multiplex afwerklak met geïntegreerde inbus
hard plastic laag
staalprofiel met dubbel glas als voorzetraam
afwerklak
kitrand
bestaand metselwerk

bestaand kozijn met 3 mm enkel glas
**Details: Building C**

C.5 Goot, dakisolatie en zoldervloer 1:5 v

- **Gietvloer:**
  - PU toplaag 5 mm RAL 9006
  - Gietlaag 15 mm
  - Dekvloer met wapeningsnet 40 mm
  - Membraan
  - Warmte isolerende laag
  - Betonnen stortvloer
  - Zwaluwstaart plaat
  - Bestaande houten vloerdelen
  - Vloerbalk
  - Muuranker

- **Sneldekpan:**
  - Waterkerende dampdoorlatende laag
  - Isolatielaag
  - Bestaand dakbeschot RAL 7026

- **Afwateringsprofiel:**
  - Bestaande klos
  - Stelijzer met schuifgat
  - Houten regel
  - Multiplex 20 mm
  - Stucwerk

- **Bestaand dakbeschot RAL 7026:**
  - Stucwerk
  - Multiplex 20 mm
  - Stucwerk
  - Bestaande vloerbalklaag

- **Ventilatieknal, toevoer:**
  - Bestaand metselwerk 500 mm
  - Isolatielaag
  - Multiplex 20 mm
  - Stucwerk
  - Bestaande vloerbalklaag
langsdoorsnede over een deel van de zolder van gebouw C bij Kids Science 1:100

trap vanuit gang BG naar zolder
P5 Reflection RMIT Graduation Studio ‘Paardenmarkt Delft’
Student: Clemens van der Linden, 4025970
Tutors: Nol Hermkens, Wido Quist
External examiner: Jan Arends

Aspect 1
The relationship between research and design

The RMIT Graduation Studio 'Paardenmarkt Delft' started with the analysis of the building, the site and its context. I believe that in my case this resulted in an extensive and usable report. The research report displays much information about the history of the site and the several buildings of the complex of the Artillery Storage House. But also the characteristics of the surrounding area's, as well as the physical elements and materials of the buildings are described. The analysis report has been an useful tool in the beginning of the research and design process since it covers general and specific research questions about the building at a large and detailed scale.

When I reflect on how I used this report for my design, I think that the general topics (the context of the building) and the research at the scale level of the city and the neighborhood delivered the input for the new function of the complex. My conclusion is that the Artillery Storage House is a closed and hidden complex at the edge of the old city centre at the crossing point of the ecological and recreative routes. This screamed, in my believe, for a publically accessible function that works as a node between the city and nature (Delftse Hout). I am satisfied with how the analysis worked as a supercharger in defining the new program of the complex of the Artillery Storage House. The report also has been a good base for the value assessment and the starting points for the redesign. Although my design of the masterplan changed during the process, the starting points and best values of the monument (defined by me) are still alive. About this part of the project I can be contented.

For the actual redesign, the physical translation of the starting points and concept, I found out that I lost the context of the Artillery Storage House and large scale topics of the research out of sight during last academic year. I focussed mainly on the courtyard, the buildings of the ensemble and the existing structures and materials itself. Maybe the reason for this is my decision to build a new volume that connects the separate buildings of the ensemble. Designing the new volume became one of the main focusses in the project and my research became too limited to building methods and facade and interior claddings in wood. Before the summer this resulted in a design that was focussed on the ensemble itself and was not so much embedded in its surrounding (although I desired to do so).

But in the summer months I managed to bring in my ideas for the larger scale of the project again and created a fine coherence between the large and small scale levels of the project and turned it into a 'complete story'. I am satisfied with my research of the existing buildings of the Artillery Storage House and how I could connect them with a new volume. I think that my interventions and new building volume respects the monument, makes the complex usable as one large entity, emphasizes the existing buildings and courtyard and adds a present-day element that relates to the buildings of the Artillery Storage House.

Aspect 2
The relationship between the theme of the studio and the subject/case study chosen by the student

To reflect on this aspect I first have to define what the theme of the RMIT studio is about and what my position is concerning this. I think that RMIT is about the appreciation of the existing, and the strength of change. In redesigning and intervening in existing buildings to make them fit for their use again it is the challenge to draw a line between treating historic buildings with respect and subjecting them to cultural vandalism. In a city, history is never static and meant to be kept in a museum but it manifests itself as an aspect of our contemporary built environment, as Paul Meurs describes this. What is important is that the essential cultural historic values will be preserved. The history of The Artillery Storage House is expressed in its collaged appearance. Changes in function, knowledge about building techniques and periods of wealth and poverty are readable like a book. For this reason, it is my opinion that a too convulsive attitude concerning the current state of the monument is unwanted. The Artillery Storage House has been the subject of the process of change, it is the subject of redesign now and it will be adapted in the future for new functions.

The new function of the Artillery Storage House in my project is a Climate Centre that provides space for research and development of sustainable products and techniques as well as an education and exposition centre for children. Climate change influences our world: our natural and ecological surroundings and the cities we are living in. To fight the cause and effects of climate change research, innovation, education and understanding of how our way of living is affecting the world is needed. All these elements are brought together under the roofs of the former Artillery Storage House. The ensemble of buildings are located at the border between the old city centre and the recreational and natural ommelanden. This makes the complex of buildings very suitable to act as un umbrella for the new program related to climate change. By creating a public function and new routes the Artillery Storage
House can connect both sides of the buildings (the city and nature) literally and in a figurative sense. The public accessible place will become a lively centre in the present-day city of Delft and will take position in the challenge we face concerning climate change. The monument will be preserved (instead of conserved) for the future by using it for its new use in a bigger societal framework.

Aspect 3
Reflection on the design

Redesign
For realizing the new function I tried to make a redesign that is in line with the statements mentioned above. I removed additions to the ensemble from the 19th and 20th century that were mainly practical but from an architectonic point of view a degeneration of the monumental buildings. By removing them (the garage, the trafo-building, house H and volume in front of building E) I gave space to the 17th and 18th century buildings and realized new routes through the courtyard of the complex and between the Paardenmarkt and the Oostsingel. This reveals the monumental characteristics in the facades for the public and gives the open space of the courtyard back to the city. I believe that these design decisions strengthens the monumental values of the complex and justifies the fact that some parts of the current complex will be demolished.

Modification
The modifications inside the buildings are mainly related to the usability of the complex. To transform the old storage barns (that are not insulated in terms of energy and sound and which are dark) into spaces that fit the norm for offices, exhibitions and horeca new floors, rooflights and insulated walls (on the inside of the brick walls) and roofs are designed. In these new walls, floors and roofs the sustainable heating and ventilation systems are incorporated. I think that this way the modifications influence the current situation in a minimal and smart way and will be a polite but clear and distinctive addition to the existing materials. The comfort level inside the buildings will be improved significantly without destroying the monumentality of the buildings. For example, the rooflights in building A will not be visible form the outside and the insulating glazing in front of the original window frames and in the door portals will maintain the view at the monumental elements (instead of replacing them).

Transformation
The Artillery Storage House has been transformed many times in the past. These transformations were mainly functional and some turned out to be successful (the philibertsdepannen in building C) and others less successful (the brickwork and openings of building B) from an architectonic perspective. The transformations I suggest are also meant for the practical use of the new program, but should respect the spatial and material qualities of the buildings. The interior walls and elements as the the bars in the cafés and Kids Science and Art Centre I added are realized in wood and glass and shackle to the materials that are present in the buildings now and keeps the large open spaces and wooden constructions as they are now observable. In the public entrance zones, like in the lobby of building A and the restaurant I partially removed the floor planks to give visitors plain sight to the original construction of the floor and roof. At the places where the public might enter the monumentality of the buildings can be perceived as a whole. By painting the walls and the interior side of the roofing in a light neutral color the wooden construction is highlighted extra.

Intervention
The new building I added in place of the garage and the corner of building B is the public entrance of the Climate Centre from where visitors can reach the main existing buildings of the complex. This addition connects the buildings of the ensemble internally (instead of going in and out the buildings separately as in the current situation). The appearance of the new building is in line with the existing shapes and structures (it continues the shape of one of the roof sheds of building A and outlines the courtyard in a clear way). The new building with the glass connection to building B and I transform the current outer facades of B and I in interior walls but maintain a certain distinction between the original buildings and the new entrance building. There is a division between old and new represented by the glass panels. The construction of the glued laminated arches refer to the philibertsdepannen but are a present-day example of using wood techniques (like the construction of the monumental buildings were at the time they were constructed). Also the interior and exterior of the entrance building are designed in wood to blend with the interior of the existing buildings. The cedar red wooden cladding facade of the exterior is distinctive from the masonry walls and rooftiles of the other buildings, but suits the new function of the Climate Centre (in the way of sustainability and appearance). Thereby the wooden facade will become more grey over the years what will give the entrance building a more worn out expression. This way the new addition will takes it place within the century old monument.

In general, I think that the intervention and redesign improves the usability of the complex. I think that my
intervention at the scale of the city and the ensemble (the new public route from the Paardenmarkt to the Oostsingel, that connects the city with the recreational routes and nature at the east side of the city) works very well. The monument can be used as a new route in the city, and whether people use the ensemble as a destination (the functions in the Climate Centre) or just for trespassing, everybody can marvel the beauty of the monument now that has been closed off for centuries. At the scale of the buildings and elements I think that the ensemble of separated buildings are connected and turned into one entity without loosing its identity and with respect for the monumental values of the Artillery Storage House.

Aspect 4
The relationship between the methodical line of approach of the studio and the method chosen by the student

In my opinion the methodical line of approach of the studio is visualized in the scheme below. The proces is non-lineair and during the proces the design should be reflected upon based on the starting points, the concept and the masterplan. For the design itself tools and methods as researching reference projects and details, 3d modeling on a computer and in a physical model and sketches are used. As mentioned in the first aspect in this reflection, up to the starting points and program the design proces was pretty flawless. After that I found myself struggling with the right concept and design for realizing my ideas. This took more time than it should need and the non-lineair proces stopped moving forward. Last may, during the P4 period, the overall plan for the redesign was almost finished but not everything was worked out to the required scale level. This left some important elements and topics underexposed. It made me feel like I failed myself since my other projects during my Bachelor and first year of the Master went very well without being confronted with design problems during the proces. But my plan at that time gave me confidence that I could finish it during last summer. By the time I write this reflection I am in the final stage of preparing my presentation for october 29th and I am proud of how my plan developed and looks like now. I found out that I should be more confident about my ideas and that I should not let my doubts interfere with my design process. Although, my doubts and reconsiderations brought my plan to what it is at this moment and improved it a lot. That makes the delay in finishing the project less relevant in the end.
Aspect 5
The relationship between the project and the wider social context

The meaning of the redesign and intervention is to make the building ensemble of The Artillery Storage House a lively part of the city and the ommelanden again. The analysis showed that connecting The Artillery Storage House to the ecological main structure in and around Delft as well to the city centre might be a viable strategy to give the ensemble new meaning for the city and its visitors. The building should be transformed into a place where solutions for climate change can be researched and engineered. Thereby it should function as a place where people can learn about and experience the interrelation of human activities, climate change and its effects to our planet. The position of the Artillery Storage House at the rupture between the city and nature at the node of the ecological main structure is a suitable place for this. Climate change is one of the biggest challenges of our era. Adapting the Artillery Storage House to fulfill a role in dealing with this challenge is allowed. It is better to add new layers to the collaged monument for a contemporary function, rather then trying to preserve the building as a museumpiece of bygone times.