

Reflection Graduation Project

Personal details

Name: Kilian Antoon Frans Mol
Student number: 4290097
Telephone number: -
Privat e-mail address: -

Education

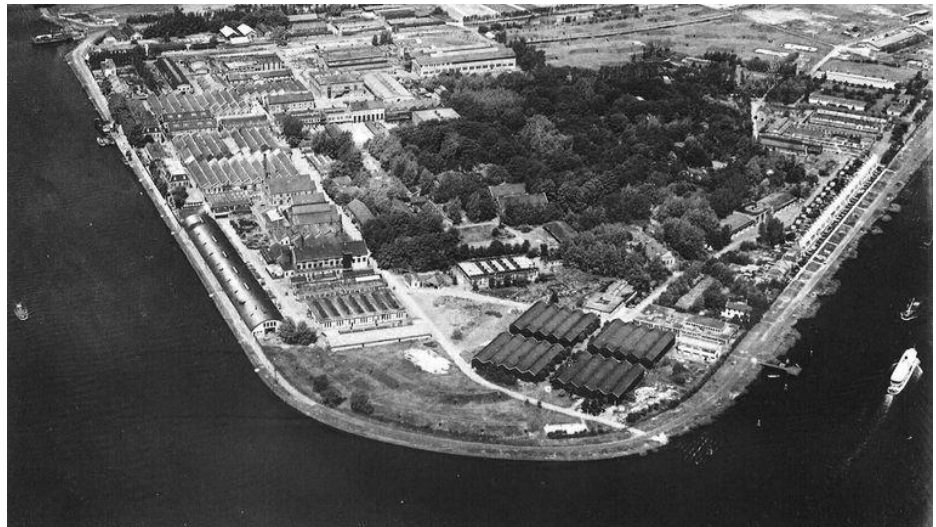
Master programme: MSc Architecture, Urbanism and Building Sciences at the TU Delft
Track: Architecture
Studio: Heritage & Architecture - Revitalising Heritage
Teachers: Architecture: Building Technology: Cultural value:
Lidy Meijers Ger Warries Charlotte van Emstede
(main tutor)

Argumentation of choice of the studio: I have chosen the Heritage & Architecture - Revitalising Heritage studio, because this graduation project challenges me to deal with an existing built environment with a valuable history that should get a new function for future use. I think this is an important exercise for me, as it is becoming increasingly common for architects to preserve and convert heritage. I am convinced that this project will give me a better understanding of how heritage can be adapted to changing needs without losing historical and cultural values.

Graduation Project

Title: Hembrug Peninsula – Revitalising Heritage
Location: Hembrug, Havenbuurt, Zaandam, The Netherlands
The posed problem: Hembrug used to be a military production site that functioned as the logistic heart of the Stelling van Amsterdam (Dutch defence strategy) since 1895, but lost its original function in 2003 when the Eurometaal factory stopped the ammunition production. Since then the site has been abandoned and has become available for new users. In order to make the site suitable for these new users, adjustments will have to be made without losing the military production background.
Personal focus: My focus is on a small part of the Hembrug site which is called Campus North. This part of the Hembrug site was part of the weapon production and lies on the edge of the forest, where the former test area used to be. During the Second World War, small buildings were replaced by large factory halls to produce large machines in addition to weapons. This area is still characterized today by the large industrial halls that at the time were needed for the production of large heavy machinery for self-production and civilian agricultural vehicles. In addition, this is a very green area with large open spaces between these halls. It is close to the new main entrance of the entire Hembrug site that is created in

2016 to make the site more accessible. Currently, a few buildings in and around this ensemble have already been refurbished and put into use by artistic entrepreneurs. Two buildings on this ensemble still have to be redesigned: machine hall and weapon depot. For both buildings I have an revitalization in mind that responds to future developments around the Hembrug site and to the artistic entrepreneurs who have already moved into this area.



Reflection

The “Hembrug Peninsula – Revitalising Heritage” graduation project focusses on a former military production site called Hembrug, which is one of the largest redevelopments in the metropolitan area of Amsterdam. Hembrug was used for the production of ammunition and weapons and as testing site, and functioned as the logistic heart of the Stelling van Amsterdam (Dutch defence strategy) since 1895, but lost its original function in 2003 when the Eurometaal factory stopped the military production. Since then the site has been abandoned and has become available for new users. The aim of this graduation project is to design a redevelopment plan to make the site suitable for future needs without losing the cultural historical values of the site and its buildings. Questions that are central to this graduation project are: *What is the tolerance for change of this cultural historical site of Hembrug? What is the meaning of an ensemble of buildings in the context and planned urban development?* Therefore this graduation project is kicked off by an in-depth analysis of architecture, building technology and cultural values (history, ideology, socio-economical, spatially, structurally, typological), which will form the foundation for the elaboration of the desired redevelopment plan.

This graduation project is provided by the Heritage & Architecture studio which focusses on the preservation and renewal of existing architecture. *“Heritage & Architecture defines research and design on all levels of scale: the use of materials and technology, the reuse and redesign of a building or a building complex, and the development of landscape and urban structure. For all scale levels the value of the entire context is taken into account, which is of vital importance to address the challenges and face the responsibilities of working on existing built structures. Particular attention is paid to values regarding architecture, urbanism, construction and interior, related to architectural history and current questions on sustainability.”*¹ The valuable military history of the Hembrug site that is situated in the metropolitan area of Amsterdam makes this graduation project really unique, but perfectly suited for the focus of the heritage and architecture studio. Because the unique background of Hembrug an in-depth analysis of the cultural historical values of the site and the buildings is of vital importance and at the same time it’s necessary to take the planned urban developments of the metropolitan area of Amsterdam into account as well, which forces students to research and design on both small and larger scale levels.

The Heritage & Architecture studio is one of the many studios that are part of the Architecture track. The Architecture track itself is one of the master tracks that belong to the MSc Architecture, Urbanism and Building Sciences programme at TU Delft. The Architecture track *“encourages students to develop creative and innovative building projects that use design as a means to deal with the technical, social and spatial challenges encountered in the built environment.”*² The relationship between this track, the Heritage & Architecture studio and my graduation project is that this project challenges me to deal with an existing built environment in which I have to create an innovative design that reacts to the cultural historical values of this environment and to its future needs. What sets this studio and project apart from other studios that are part of the Architecture track is that the Heritage & Architecture studio challenges students to create a redevelopment design to preserve and renew existing architecture, instead of designing just new architecture. As it is becoming increasingly common for architects to preserve and convert heritage I think this project is a really valuable exercise, not only for me, but also in finding new innovative ways of dealing with heritage and its cultural historical values.

¹ Heritage & Architecture. (n.d.). Consulted on December 6, 2019, from <https://www.tudelft.nl/onderwijs/opleidingen/masters/aubs/msc-architecture-urbanism-and-building-sciences/master-tracks/architecture/programme/studios/heritage-architecture/>

² Track: Architecture. (n.d.). Consulted on December 6, 2019, from <https://www.tudelft.nl/onderwijs/opleidingen/masters/aubs/msc-architecture-urbanism-and-building-sciences/master-tracks/architecture/>

When dealing with heritage, there are five different approaches that can be distinguished: preservation, restoration, renovation, intervention and redesign. In preservation existing elements that are cultural valuable will be preserved and only the necessary will be demolished. In restoration existing elements will be cleaned and repaired to its original appearance. In renovation elements will be improved to make them more suitable for future use. With intervention I mean adding new elements to the existing situation and with redesign I mean that existing elements will be used in another way. These approaches are often applied in combination, but the extent to which an approach is applied depends on the cultural values of the specific project.

As said before, the renovation and renewal of existing buildings is an growing practice within the field of architecture. One of the reasons for this is that the *“vacancy of real estate is an increasing challenge in the Netherlands, as it is in many other European countries. [...] Office buildings in particular are prone to obsolescence, due in part to the general economic downturn of the last years, but also, and more structurally so, due to new work formats that are being adopted.”*³ Besides this, Sustainability is becoming an more and more important topic due to the increasing awareness of climate changes. *“Of course our society cannot afford to simply demolish every building that has lost its use, be this due to economic reasons [...] or the environmental effects in terms of sustainability. Demolition leads to a huge amount of resources being discarded and wastes large quantities of embedded energy. [...] As the number of obsolete buildings is likely to remain very high in future, this will define the professional field of architects for the coming decades.”*⁴ Therefore research is needed in finding ways to improve the preservation, adaptation and transformation of existing buildings and in this way making our building stock more sustainable for future societal needs. Reduce, reuse and recycle are three important approaches that should be considered in every design project to succeed in making a building more sustainable for the future.

The historic significance of the Hembrug site makes this a very special project that distinguishes itself from the more common redevelopment projects within the field of architecture. Because of this historic significance the preservation of historic values within this project is even more important for cultural reasons. Preservation, adaptation and transformation projects are naturally sustainable projects, since reusing existing buildings saves materials and energy, but sustainability has also been an important starting point in the elaboration of my redevelopment strategy in means of materiality, climate control, energy consumption and flexibility of my design interventions.

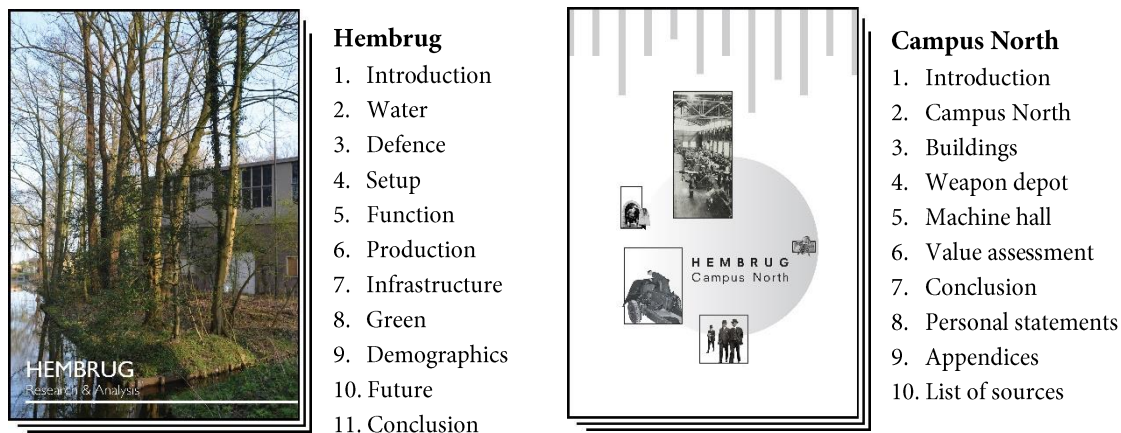
Now follows a summary of my own design process during the graduation project, dividing the entire process into four periods. Each period consists of eight up to ten weeks in which different research methods have been applied. My design process and the conducted research are summarized in the following chapters.

³ Marieke Kuipers & Wessel de Jonge, *Designing from Heritage – Strategies for Conservation and Conversion* (Delft: TU Delft - Heritage & Architecture, 2017), p28.

⁴ Marieke Kuipers & Wessel de Jonge, *Designing from Heritage – Strategies for Conservation and Conversion* (Delft: TU Delft - Heritage & Architecture, 2017), p29.

First period - Research on Design, Technology and Cultural Value

To fulfil the design assignment of this graduation project, I first had to delve into the project site Hembrug by analyzing the location from multiple perspectives, of which architectural design, building technology and cultural value have been the three distinguishable main themes. This analysis has been performed in groups and conducted according to the conservation and conversion methodology of Marieke Kuipers and Wessel de Jonge explained in their book *Designing from Heritage – Strategies for Conservation and Conversion*⁵. Kuipers and de Jonge have defined four steps that should help architecture students in analyzing heritage. First students have to compile the building history of a heritage site (jointly). With the whole group of students (23 students) participating in the Revitalising Heritage studio we created an analysis report about the Hembrug site and its context, in which we analysed multiple themes separately in groups of two students or more. In smaller groups we analysed the Hembrug site more in detail by dividing the heritage site in multiple ensembles. These ensembles have been analysed more carefully by groups of students who have chosen the same ensemble. In my case seven other students⁶ had chosen the same ensemble like me, i.e. the Campus North ensemble, so together with those seven students I produced an more extensive analysis report about the Campus North ensemble as well, where we focused on two buildings in particular: a former machine hall and a former weapon depot. By compiling both reports (see Ill. 1), we used multiple ways of analysing the project site. We didn't only gather as much drawings and information from the internet and archives, but we also analysed the site by several kinds of mapping and documenting during site visits. In order to organize the heap of information, we have identified various themes and divided the work so that each of us focused on a few themes only, allowing us to individually delve deeper into these themes.


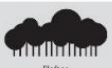


































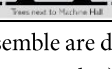






Ill. 1: Analysis report about the Hembrug site and its context and a more detailed analysis report about Campus North.

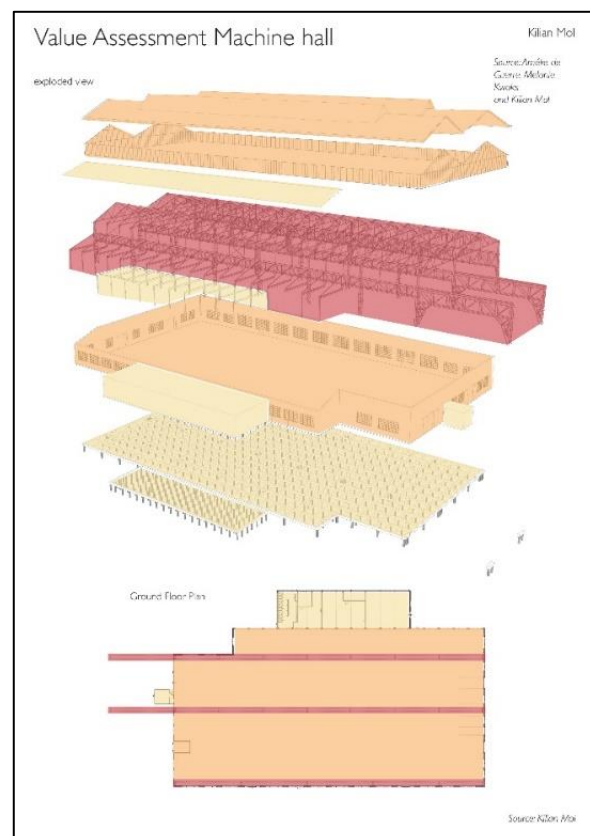
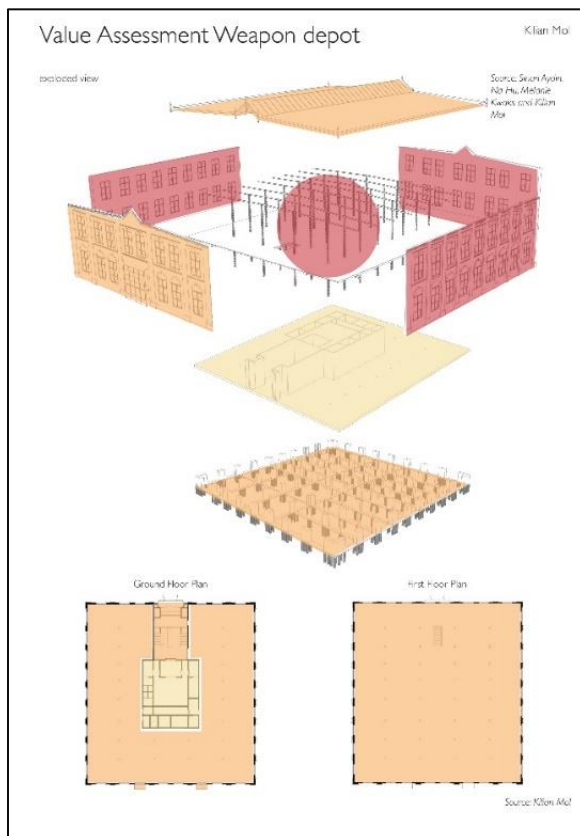
Secondly Kuipers and de Jonge argue that the site-specific heritage features have to be identified and classified (jointly), thirdly the identified features need to be differentiated on three levels of significance (individually) (see Ill. 2 and 3), and finally opportunities for possible interventions and crucial dilemmas for the continuation of the heritage site have to be identified based on the outcomes of the first three steps (individually). These four steps helped me in formulating a well-grounded cultural value assessment, which contributed in substantiating my intended interventions in built heritage.

⁵ Marieke Kuipers & Wessel de Jonge, *Designing from Heritage – Strategies for Conservation and Conversion* (Delft: TU Delft - Heritage & Architecture, 2017)

⁶ The seven other students are Amélie de Guerre, Job van den Berg, Mays Al-Korany, Melanie Kwaks, Na Hu and Sinan Aydin.

Cultural Value Matrix	Age value	Historical value	Non intended commemorative value	Use value	Art value	Rarity value	Other value
Surrounding/ setting	 Water structure	 Rifles	 The roads where the train tracks used to be	 Parking lot	 Lighthouses	 Homburg as military terrain	 Connection to the main road
Site	 Monumental area	 Avenue of Honor North	 Prison Weapon Depot by demolition of 309	 Connectivity of buildings through public space	 Avenue road view to Weapon Depot	 Ensemble on border of Homburg	 Steel Avenue Carous Structure
Skin (exterior)		 Rampage of facade Weapon Depot		 Clashing of entrances Weapon Depot	 Decorative facade Weapon Depot	 Reconstructed facade Weapon Depot	 Uniform facade Weapon Depot
Technical Structure	 State of the art engineering	 Concrete & columns Machine Hall	 Excluded crane as visual guide landmark		 Assembly of the trusses		
Space plan		 Longhouse Machine Hall		 Spiral freedom			
Surfaces (interior)			 Floor tiles of Weapon Depot	 Skylight	 Entrance hall Weapon Depot	 Tree Weapon Depot	
Services	 Integrated visitation Weapon Depot	 Mixed forests Weapon Depot	 Technical crane Machine Hall		 Transport doors Weapon Depot	 Entrance doors of Machine Hall	
Stuff		 Warehouse 2-7			 Hole beams Weapon Depot		
Spirit of place		 Viewpoint to Machine Hall	 Low density	 Moving crane Machine Hall	 Lighting	 Loading doors of Weapon Depot	

Ill. 2: Identified features of the ensemble are differentiated on three levels of significance (red: most important value, orange: important value, yellow: less important value).



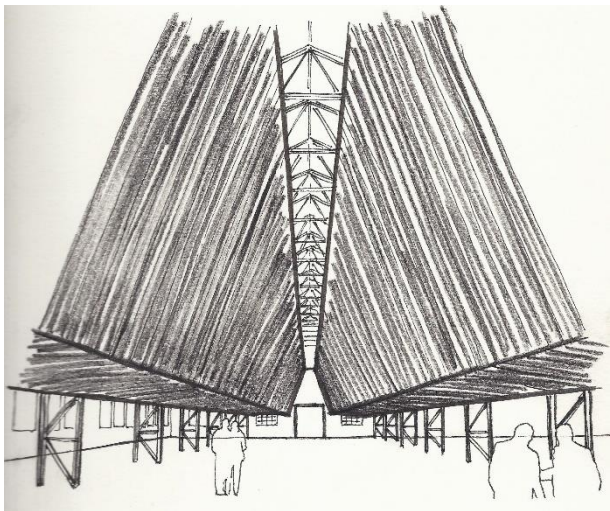
Ill. 3: Identified features of two buildings are differentiated on three levels of significance (red: most important value, orange: important value, yellow: less important value).

Second period - *Defining individual design proposal*

After finishing the first period by bundling and presenting (P1) our findings to our teachers and the other students, we kicked off the second period by formulating individually a future scenario and an intended new program. After ten weeks of research and analysis, the time had come to translate the conclusions of our analysis into personal starting points that would provide guidance during my design process. In order to formulate these starting points, it was necessary for me to first look back on our analysis and delve into the research carried out by my fellow group members. By combining the individually researched themes, we as a group of eight students have been able to produce an extensive analysis report. However, this meant that I had to take some time, after finishing the analysis itself, to get a better picture of the overall analysis of the area.

The starting points derived mainly from my value assessment, since I wanted to emphasize the aspects that I had given the highest value in my redesign. These starting points have changed as the design process progressed, but the main points I stuck to during this second period were – **emphasizing the construction and spatiality of both buildings – emphasizing the crane track and large scale of the machine hall – embracing the symmetry of the weapon depot - emphasizing the different time layers - finding a new program that suits both buildings and the location.**

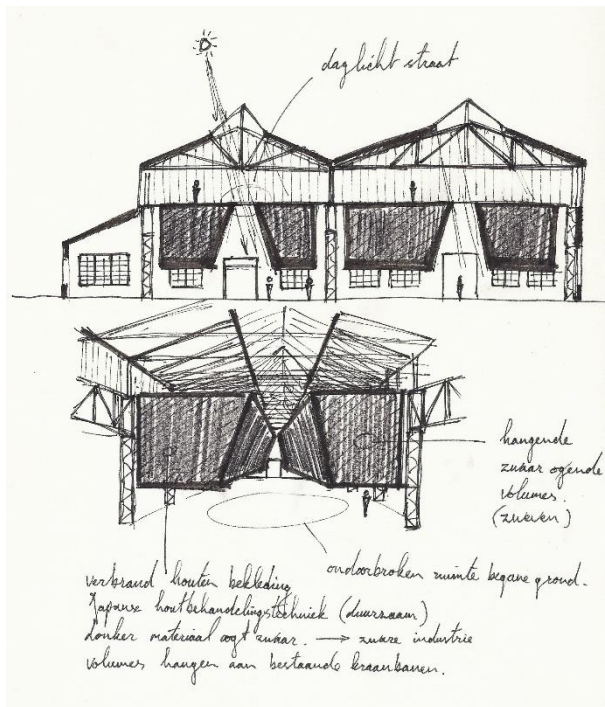
In defining my design proposal these starting points helped me to make my first design choices on different scale levels. In finding a new program that suits both buildings and the location I mainly relied on the economical spatial vision for the Northern ZaanIJ banks presented by the municipalities of Amsterdam and Zaanstad (2017). According to this vision the Northern ZaanIJ banks, including Hembrug, are regarded as the driving force for creative industries within the metropolitan area. Hembrug would distinguish itself from other developments in the creative sector and lends itself to (craft) workshops, studios and office activities (in creative, knowledge and research sectors). At the moment a few buildings in and around the Campus North ensemble have already been refurbished and put into use by artistic entrepreneurs. Therefore I decided to introduce a new use in both buildings that responds to these future developments around the Hembrug site and to the artistic entrepreneurs who have already moved into this area. So halfway through this period I started to do research in flexible co-working spaces, since this is currently also an emerging shift in the way of working within the creative sector.



Ill. 4: Own sketch introducing new volumes.

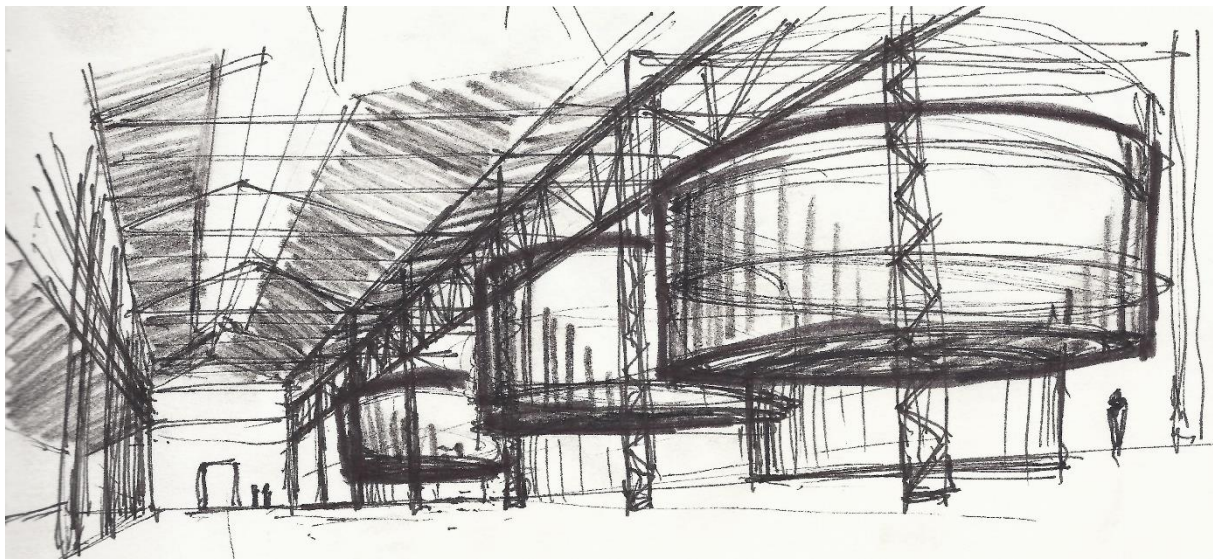
At this point in my design process I mainly focussed on the spatial consequences my design intervention would have on the existing spatial qualities of the ensemble and both buildings. By doing so, I did research in the typology of both the machine hall and the weapon depot and looked for similar heritage projects that I could use as references.

At the end of the second period I presented (P2) an design proposal in which I added several new buildings to the ensemble in order to increase the density of the area, what had to respond to the future developments and to refer



Ill. 5: Own sketch introducing new volumes.

to the closed nature of the area. After I presented this first proposal I received negative feedback from my teacher where they argued that my design for the Campus North ensemble introduced some spatial issues that are crucial and haven't been explained or mentioned. They asked me to take a critical look at the defined design goals and the current design proposal and to present a new design proposal. For this new design proposal I decided to present a more conservative approach where I had discarded much of the intended new added buildings and looked better at what kind of use would fit into the current situation by making less major adjustments to the site. My teachers agreed on this new approach and were convinced that I could proceed my design process in this way.



Ill. 6: Own sketch researching spatial effects new volumes.

Third period - Elaboration of the individual design

The third period of my design process began after a break of ten weeks. Therefore I started this third period by looking back on the second period and the feedback I received from my teachers on my P2 presentation. I determined that the issues that required more research during this third period were the coherence of my design interventions and the spatial aspects of the design. So I took a critical look at the internal consistency and the spatiality of my design and made many alterations in the composition of my intended new use of both buildings. Especially for the design of the machine hall I paid extra attention to the composition of the different functions within the building and tried to come to a strong

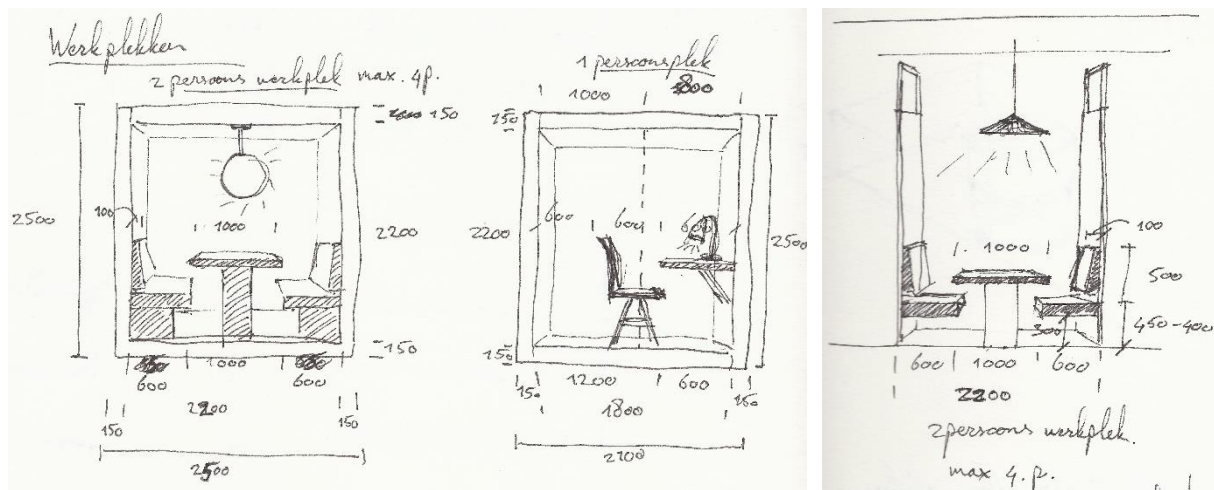
and clear design. In order to do so, I made a physical model of the structure of the machine hall to see how my design intervention would fit the rhythm of the existing structure. Besides this I drew a lot of different floor plans in which I was looking for this clear layout. As the end of this third period approached, I have used the last few weeks for elaborating my design and focused on materials and the technical aspects.

However I succeeded in producing multiple different design options, I experienced that I was struggling in making choices and could not properly substantiate my design interventions based on my starting points. After my P3 presentation the lack of arguments coming from the design concept turned out to be the biggest point of criticism by my teachers. Personally I think that the cause of my struggle has been too many loose starting points, because of this I didn't have a clear direction that I could hold on to. Therefore I decided to take a big step back and rethink my starting points and the essence of my design, before I continued to collaborate my design. This will hopefully help me in making more grounded design decisions and a stronger overall design.

Fourth period - *Finalisation of the individual design*

The fourth period is initially meant for making the final adjustments and working out the details of the final design. However, I used first some time to take this step back and rethink my starting points and the essence of my design. By doing I decided that the program of my design that time was mainly focussed on designers, but lacked spaces suitable for artists who use old crafts. So therefore I changed the program of both buildings in which I shifted some of the functions of the machine hall towards the former weapon depot and the other way around and made in that way the machine hall more suitable for artist that create physical art objects. After I redefined the different functions in both buildings, I did research into the design of workshops and studios for artists and cooperating spaces by searching for references, since the requirements for the several crafts differ. During this fourth period, I visited several buildings including the LocHal and museum De Pont in Tilburg, and Loods6, NDSM Loods (Stichting Kinetisch Noord) WeWork and multiple buildings of Spaces in Amsterdam. These visits helped me in understanding the design of flexible workspaces for artists and designers and the different approaches in dealing with heritage.

Besides this, I talked to Ina Pronk who is responsible for the management of foundation Kunstwerk Loods6 as one of the foundations directors. Foundation Kunstwerk Loods6 is the operator and manager of creative-cultural building Loods6. This building houses several kind of artists, designers and stores, and consists of a big rentable space to host events. Ina told me that demand for art studios is very high and that the waiting list to rent a space is very long. She explained to me how the building is used by the artists and designers and said that there is nowadays only little interaction between the artist and the designers that own a space in the building. I mentioned that I thought that was a pity since the building should form a breeding place for artists. She agreed and said that in the beginning the building was more lively, but that this decreased over time. I noticed that the majority of the spaces within this building had no visual connection and that the building could only be entered by renters or during an event. Both the conversation and the visit to the building contributed to the progress of my design.



Ill. 7: Own sketch designing flexible workspaces.

At the same time I continued on elaborating the climatizing of both buildings and looked more into detail on how I could make the existing outer shell more sustainable without losing the historic valuable traces of aging. I valued these traces of aging high since they contribute to my concept of creating a clear distinction between the different time layers. By making both buildings more sustainable for future needs and introducing a completely new use I had to make adaptations, but looked into ways of making these adaptations as minor as possible. Filling the cavity of the existing walls with insulation material won't change the appearance, but will reduce the energy demand since less warmth will escape the building. Besides this, new thin window frames will be installed behind the existing steel frames and the steel frames of the windows under the roof will be replaced by aluminium frames that have almost the same appearance as the historic frames. Since the use of these buildings might change in the future I created the new interventions that I add to the existing building out of demountable elements. In this way, the added construction can be dismantled once my intended use is lost in the future and be rebuilt somewhere else. In doing so I looked into how I could repeat as many elements as possible and design them as modules, so that they can be replaced, removed or added relatively easily. The adjustments that I make on the historical skin, however, will be permanent and will have consequences for the cultural and historical values of the building. Although these consequences I do think that these interventions will give the building more quality for future perspective, since it will make the building more suitable for future use and will extend the buildings lifespan.

When I look back on my research/design approach I am convinced that the cultural value assessment composed according to the steps of the conservation and conversion methodology of Marieke Kuipers and Wessel de Jonge can form a well-grounded base that you can fall back on when making design decisions. However, halfway through my design process I struggled in substantiating my design interventions, since the starting points I had drawn up from my cultural value assessment were too vague and there were too many. After I took a step back and had reformulated my starting points I noticed that my design process went more smoothly and it became easier for me to make design choices. In the future it would be more efficient to take more time for formulating these starting points that should derive from the cultural value assessment instead of quickly jumping into the design process.

Besides this, I experienced that the conversation with Ina Pronk, one of the directors of foundation Kunstwerk Loods6, helped me a lot in designing my desired use for my project buildings. She shared her and users their experiences of a building that houses artists, designers and events, which gave me more insight and confidence in making design decisions and strengthened my design. The project visits of also contributed to a better understanding of how people make use of these buildings and how I could strengthen my design interventions.

Through my research into the Hembrug site, I have discovered that this site has a very special past and has undergone various developments over the years. With the departure of the military industry, a new development has recently started, whereby this historic military industry area must be redeveloped to make it suitable for new users. The challenge for me was therefore to redesign a small part of this site, in which I wanted to stimulate the transformation of this former military industrial site into the center for art, craft and design without the valuable historical character of the Hembrug lose ground.

That is why this project called for a thoughtful approach, in which I made a cultural valuation, in which I explained the different aspects of this area and determines how valuable each aspect is for the historical character of the site. For each aspect I looked at what kind of intervention was necessary to comply with future use. For example, I asked myself in every aspect whether it should be preserved, whether it can be restored, whether it should be renovated, whether a new intervention should be added or whether an existing aspect can be used in a new way. In my design I have retained as many valuable aspects as possible and where necessary restored and renovated. In addition, I have added new interventions to shape the new use, with which I wanted to emphasize these valuable aspects. I wanted to design this redesign in a sustainable way by thinking about how I can reduce, reuse and recycle materials and energy use. And by designing my design in a flexible and demountable way, I want to prevent the materials and energy from being lost if the use of these buildings changes in the future. For example, I have redeveloped both buildings in a responsible manner to meet the uncertain needs of the future.