Revitalising heritage through food

The social greenhouse

An example of circular food production within urban areas

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Introduction

The graduation studio of Heritage and Architecture evolves around the revitalisation of the Hembrug area, which is located between Amsterdam and Zaanstad along the North Sea Canal. The site functioned as military production stores, testing site and as the logistical heart of the "Stelling van Amsterdam", the defense line of Amsterdam. This former military industrial site comprises of several different building ensembles, which include fifty monuments, historical green and water structures and remains of the former infrastructural system. The set-up of the military site followed a functional approach which, in combination with the former exclusive functions, led to a closed-off, inwards oriented character. Nowadays Hembrug is located in an industrial, excluded area. But the city of Amsterdam is expanding rapidly, growing towards Zaanstad and the industrial areas around Hembrug will be transformed into residential areas. Hembrug will also be connected to the public transport by the metro network. Within this project the aim for Hembrug is to transform the site into a vivid part of the developing Amsterdam-Zaanstad metropolis. The area should not only provide amenities and diverse qualities to the individual area, but also to the upcoming residential neighborhoods that will surround Hembrug.

The so-called Plots in the Woods ensemble is the main subject of the design project. This ensemble is located in the center of Hembrug and can be described as an open structure of buildings interlocked within the landscape. Nowadays it is quite a romantic scene with the different building typologies, the natural elements and the historical traces. Still the design of this ensemble, similar to the entire Hembrug, came from a functional approach. This means that also the landscape, which is an integrated element in this ensemble, was all planned and functional. This wide-ranging presence of the greenery is not only exceptional within the former military terrain, but also within the larger area around Hembrug.

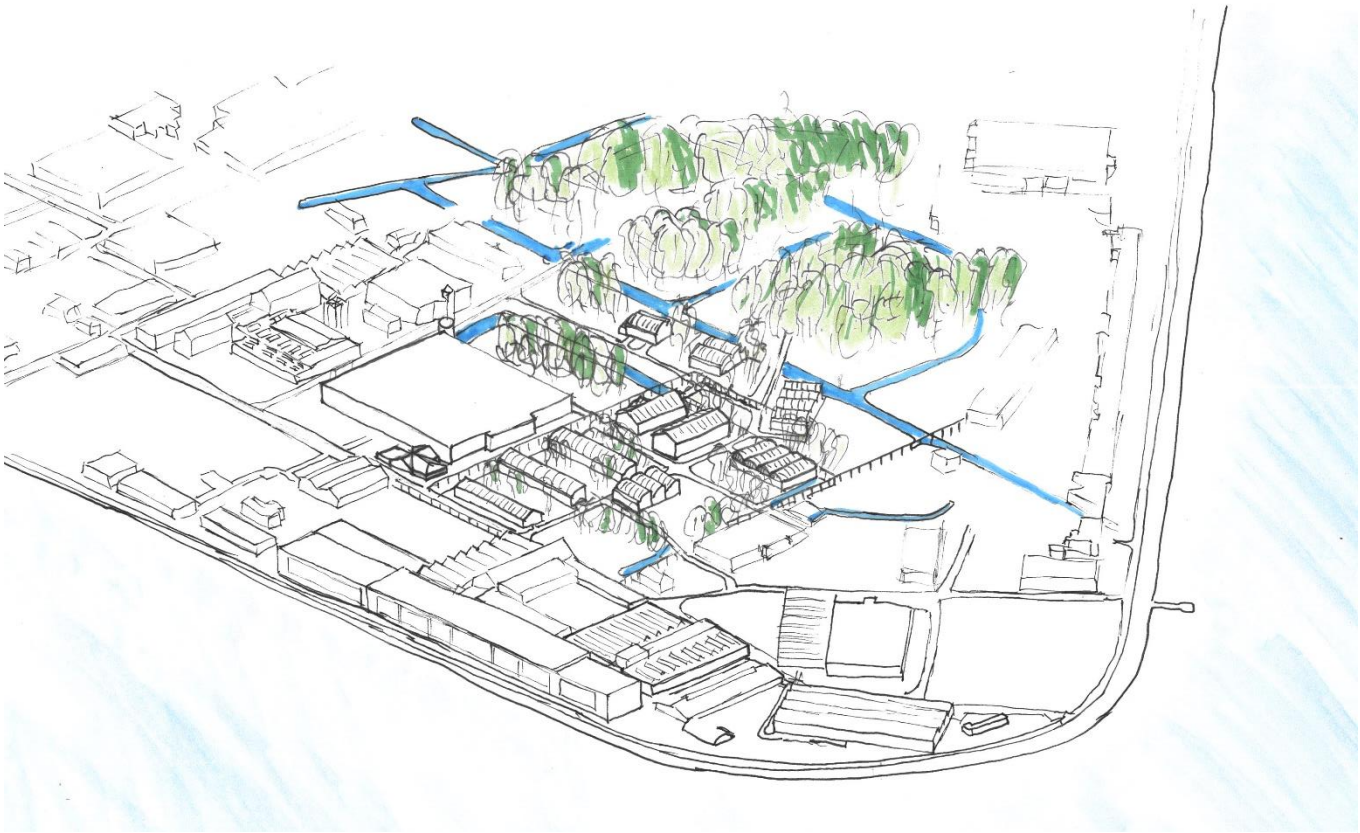

Figure 1 The Hembrug peninsula

The new design for the Plots in the woods aims to connect people and nature through food and thereby strengthen the relationship between food consumers and producers. Functioning as a platform for urban farming, by means of providing space for food production, education/ innovation and social interactions. To accomplish this the plots in the woods will house the following functions: a food market containing a greenhouse along the south façade with innovative techniques for food production which are accessible through workshops combined with a food market with all kinds of food and market stands; office space ranging from permanent offices to public workspaces with reservable meeting rooms and other needed facilities to study or work; diverse food joints ranging from a small coffeebar to a luxurious restaurant using the local products; an education center which will be used to give workshops, exhibitions and lectures about possibilities to grow your own food within the city and an event hall which will function as a flexible, big open space for all the functions on site. The landscape was just as important for the functioning of the factory as the buildings. Therefor in the new design the earlier mentioned functions are not strictly binded to the interior spaces but will also flow towards the open spaces. There will be a vegetable garden, public square and flexible furniture which can be used in multiple ways.

The challenge for the former military site will lay in maintaining the historical character while readjusting the site to accommodate new functions. Hembrug needs to be transformed from a private, industrial area to a public place. Thus, the experience is an important element of this design project. Phenomenology is the study of the structures of experience and consciousness as experienced from the first-person point of view. Leading to the following research question:
"*How can a phenomenological design approach contribute to a better understanding of the experience of space in order to transform the former, closed-off military site of Hembrug into a place which is part of everyday life?*"

[1] D.W. Smith, *Phenomenology* in The Stanford Encyclopedia of Philosophy (Stanford: Metaphysics Research Lab, Stanford University, 2018)

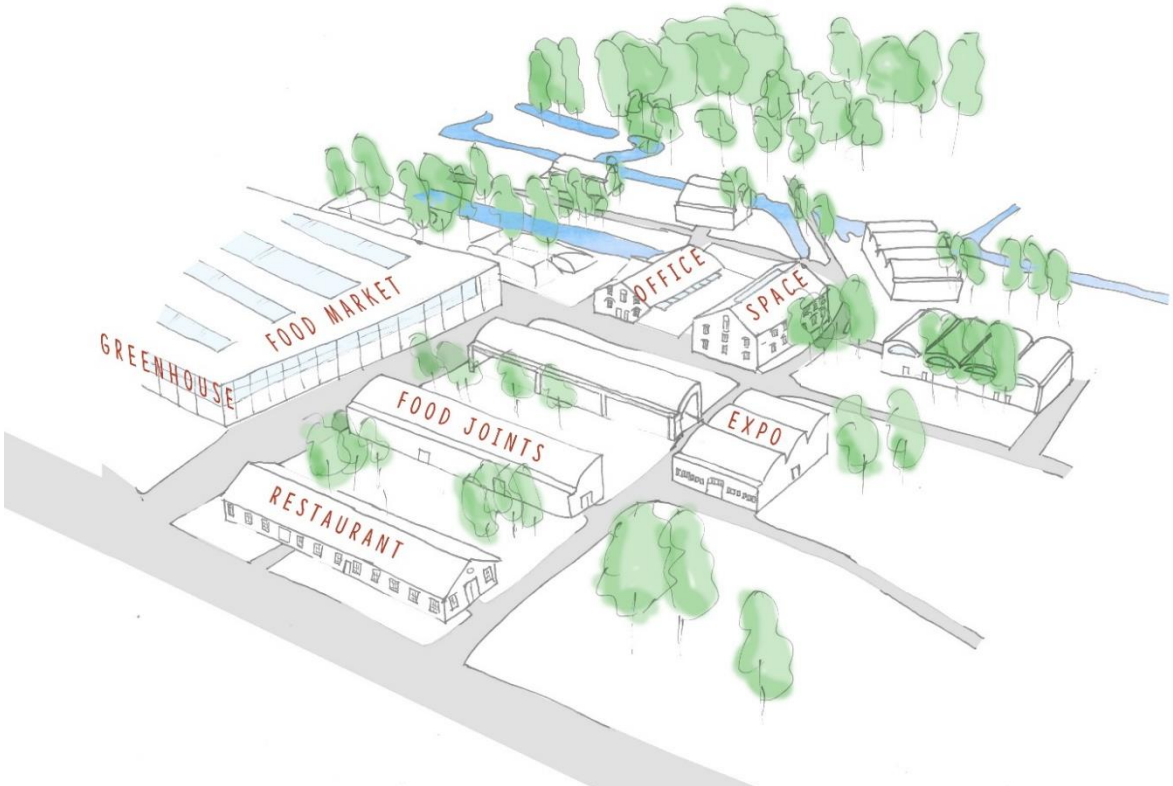

Figure 2 The new masterplan for the 'Plots in the Woods' ensemble

Aspect 1: The relationship between research and design

The Hembrug site can be seen as an already painted canvas with the different spatial elements embedded in it; the trees, the ditches, the functional open spaces, the different buildings, the gates and so on. The history is an important layer which is visible all over the site: the old train tracks connecting different buildings show the traces of the old production lines, the pipelines show the supply of water and electricity into the buildings, the different roof shapes reveal the kind of activities which took place in the buildings, the cracks in the walls of the buildings show the passing of time. All these physical remainders are traces of the past shape of human usage of the site and thereby contribute to the character of the site and its surroundings.

A design project based on built heritage has a different process than projects based on completely new buildings[2]. There is already an existing object with its own values and characteristics that need to be identified to enable the architect to find the right strategy for the design project. Some of the values can be easily identified by just looking at the object, but not all existing historical/cultural, architectural and/or technical qualities are immediately obvious at first glance. Therefore, research is necessary to understand the context of the Hembrug site. The historical context gave a clear overview of how the site was used, what the different time layers are and how it developed into the current state. One of the interesting findings was for example the fact that the military had a very practical attitude. Starting from the decision to place the production of weaponry on Hembrug in the first place to the set-up of the production process on site. The functional design approach is similarly visible on the scale of the ensemble. The plot was designed to produce ammunition and had to deal with all the risks that came with this kind of production. This resulted in the low density of the buildings, the abundance of green, the lay-out of the site and the placement of spatial elements such as earthen walls and ditches.

The result of the analysis was an extensive booklet with not only architectural aspects of the ensemble, but also a building technological analysis and a cultural value research. Through this analysis values could be identified which were hidden at first glance. An example will be the concrete roof structure of the so-called shell-roof typology. This concrete structure is a direct consequence of the original function of these buildings and of the way of constructing, which was very innovative for that time. This resulted in a set of conclusions that show why this structure is important to understand these buildings within their time and function and has certain values which need to be preserved. These values serve as an important input for the design and are translated into starting points. Hereby defining limitations for interventions, but also capacity for change.

The research does not end instantly when the design phase begins. To understand every detail of the entire site regarding cultural value, architecture and building technology, one could research endlessly. During the project certain main focusses are chosen and when necessary additional research has been conducted. As well as on the topics of circularity, urban farming, activating public space and heritage intervention methods additional literary research has been conducted during the design phase. Herewith exposing that this research-based design process has an iterative character; the design and research phase are closely linked to each other and are providing each other with input.

[2] M. Kuipers & W. de Jonge, *Designing from heritage (Delft: TU Delft, 2017),p 27.*

Aspect 2: The relationship between your graduation (project) topic, the studio topic, your master track and your master program (MSc AUBS)

Within the master studio Heritage and Architecture balance is the keyword. Initially between the existing and the new, but heritage also consists out of the different disciplines: architecture, building technology and cultural value. A second life for the buildings will be established through new building functions, which are part of the new masterplan that focusses on food production and circularity. To accomplish the masterplan the ensemble needs to be altered to meet its new function and related (technical) requirements without compromising the existing cultural values and architectural/ building technological qualities. Finding the right balance was hard, especially at first when all the elements seemed to have cultural value and thereby needed to be preserved. This made it extremely hard to make interventions in the buildings and to adjust them to their new functions. After concluding that interventions can strengthen the cultural values of the buildings and therewith create possibilities to conform to the requirements of the new function. My design attitude gradually started to change from preservering to intervening and moving towards the transformation goals. To make the right decisions on which values to strengthen and which were less important the analysis was of great importance. The two buildings which were the main focus of this design project contained a big contrast. The so-called 'Farms' are two buildings built between 1895 and 1905 with ornamental brickwork facades, gabled roofs and on the interior the big farm contains a modern steel structure and both buildings contain wooden floors. The other building, the so-called 'Box' is a typical industrial building from the 1990s. A low-sloped roof building built as a big production hall. It mostly had to be cheap and provide a lot of space, this can be seen in the design and the applied materials. Both buildings have their specific character and contain different cultural values and qualities. Combined with the new assigned functions and related transformation goals a different approach is needed to find the right balance between the disciplines, the old and new for each of the buildings.

Plots in the woods will connect people and nature through food and strengthen the relationship of food consumers and producers. Functioning as a platform for urban farming providing space for food production, education/innovation and social interactions. As mentioned before circularity is an important element of the masterplan. Establishing a second life for the buildings could be considered as an important part of this overall strategy. The circularity strategy is focussed on four main aspects; food, energy, water and materials. But off course these are not independent processes per aspect, but the resources are linked into a multidisciplinary, circular process. Making the different elements of the site work as one system.

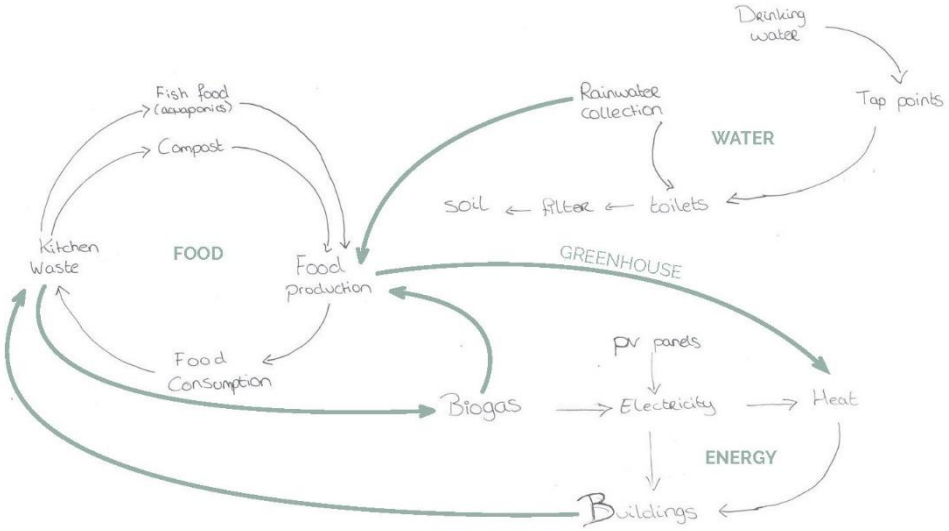

Figure 3 Circularity strategy

Aspect 3: Elaboration on research method and approach chosen by the student in relation to the graduation studio methodical line of inquiry.

The first semester focused mainly on achieving an understanding of the past, present and future of the Hembrug area and its role through time in a wider context. The analysis and research have been conducted on an urban, ensemble and building scale with a focus on architecture, building technology and cultural value. This research has been conducted through literary and archive research and analytical mapping. To discuss and compare these values the Heritage studio developed the value matrix (figure 5). The value matrix is based on two theories[3] which are used to order the values. The first one is the theory from Alois Riegl. He spoke about heritage as a sacred relic of the past and divides the type of values into commerative and present-day values. The second theory is from Steward Brand and can be summarised in a scheme with the different layers of a building (figure 6). This value matrix could be translated in opportunities, obligations and dilemmas for the area and will function as a guideline for the design.

To make Hembrug part of everyday life, it needs to be transformed from a private, industrial area into a public space: the inwards-oriented atmosphere of the site needs to be changed into an open, inviting atmosphere. Atmosphere exists where architecture and humans, the embodiment of daily use, interact. After all, architecture and buildings are designed and built for human occupancy and use. Norberg- Schulz uses the concept of the Genius Loci[4] to describe the meaning of a place. Heritage related places already contain a certain character derived from the combination of the physical reminders and the intangible traces of the past and therewith also meaning. Places that are meaningful are giving an existential foothold to humans by providing the basis for everyday experiences to occur, which is the task of an architect according to Norberg-Schulz.

The method that has been used in the continuation of the studio is research by design with an focus on the experience, done through:
Sketches to examine different variations and design solutions. By making rough sketches by hand, instead of technical drawings, the focus will lay on the experience of the space and not only on the practicalities of the buildings.
Soft maps which are hand drawn perspectives consisting out of a combination of sketches and keywords which spring to mind when observing or showing the experiences of different users.
Models on different scales which will make it possible to investigate the consequences of different design decisions onto the perceptual experience of the entire project and not solely on an isolated element within the project.
Case studies of transformation projects that faced similar challenges. The aim is to physically visit these projects to get the full experience, since photographs will not evoke the same bodily engagement with a certain place due to the already framed, two dimensional sights.

[3] M. Kuipers & W. de Jonge, *Designing from heritage (Delft: TU Delft, 2017),p 68-70&85-91.*
[4] C. Norberg-Schulz, *Genius Loci: Towards a Phenomenology of Architecture* (London: Academy editions London, 1980), p.5.

BRAND +	RIEGL +	AGE value	HISTORICAL value	INTENTINAL COMMEMORATIVE value	NON INTENDED COMMEMORATIVE value	USE value	NEW-NESS value	(relative) ART value	RARITY value [+]	OTHER relevant values [+]
SURROUNDINGS / SETTING [+]										
SITE										
SKIN (exterior)										
STRUCTURE										
SPACE PLAN										
SURFACES (interior) [+]										
SERVICES										
STUFF										
SPIRIT of PLACE [+]										

Figure 5 The value matrix as used in the H&A studio.

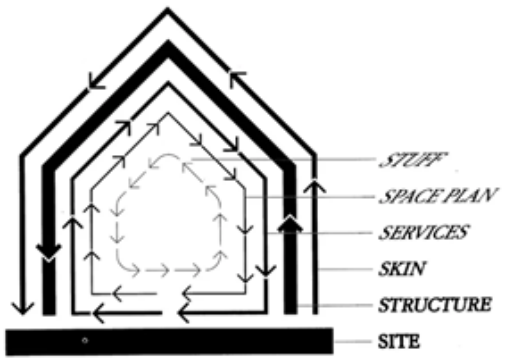

Figure 4 The shearing layers of change by S. Brand

Aspect 4: Elaboration on the relationship between the graduation project and the wider social, professional and scientific framework, touching upon the transferability of the project results.

The worldwide trends of an increasing population and the ongoing urbanisation lead to bigger cities where space for greenery becomes limited and the food demand increases. This is already the case for the plots in the woods ensemble, the wide-ranging presence of the greenery is not only exceptional within the former military terrain, but also on a bigger scale within the area around Hembrug. Nowadays Hembrug is still located in an industrial, excluded area. But the industrial areas around Hembrug will be transformed into residential areas and Hembrug will be connected to the public transport by the metro network. These developments will result in a different role for Hembrug: from an excluded area to an area that is well connected to the Amsterdam-Zaandam metropolis and probably in the further future will become part of this metropolis.

The proposed masterplan aims to:

Preserve the green character of the ensemble

Greenery becomes scarcer within the expanding cities with increasing populations, so the green enclave needs to be preserved as recreational green area. Additionally, the greenery and the earthen walls played a crucial role in the way the ensemble functioned and contain high historical value.

Stimulate a circular economy

The city of Amsterdam wants to become a circular city and aims to use 50% fewer primary raw materials by 2030 and become 100% circular by 2050[5] at the latest to decrease their associated environmental impacts. Amsterdam will focus on three value chains: Construction, Biomass and Food, and Consumer goods.

Create sustainable food production within urban areas

In cities, there is a growing disconnection between the production and consumption of food, since mainly nonurban land is used to produce food. Nevertheless, with 40%[6] of the world's farmland located in peri-urban areas (the land within 20-50 km radius around urban boundaries) cities could source substantial amounts of local food. Local food chains can reduce food-miles and related climate emissions. Additionally, the food production can be a more integrated element within the (peri-)urban areas, therewith strengthen the relation between producer and consumer.

Realise an efficient usage of resources

In a circular economy, all biological residual flows should be reused at their highest potential value. This can be done through the recovery of nutrients such as phosphates from sewage, or through fermentation of biomass. Residual food and biomass, such as food waste and plants, can be transformed into a wide range of valuable products, including new food items, inputs for agriculture and new bio-based materials

Create awareness with the public

To realise a circular economy, a fundamental shift in the present ways of producing and consuming is necessary, especially towards food production. One of the biggest challenges is to reduce the loss of food in the systems. In the Netherlands, people throw away 41 kg of edible food per person per year, equivalent to wasting €140 per person per year[7].

Create social cohesion

Urban farms can offer a range of societal benefits such as providing educational opportunities (from the environmental, to entrepreneurship) as well as strengthening social cohesion through citizen involvement by supporting and implementing local initiatives.

[5] City of Amsterdan, Circle Economy & K. Raworth, *Building blocks for the new strategy Amsterdam Circular 2020-2025* (Amsterdam, 2019).

[6] City of Amsterdan, Circle Economy & K. Raworth, *Building blocks for the new strategy Amsterdam Circular 2020-2025* (Amsterdam, 2019) p.28.

[7] Milieu Centraal and Voedingscentrum, *Feiten en cijfers over verspillen van voedsel door consumenten* (2017),

Aspect 5: Discuss the ethical issues and dilemmas you may have encountered in (i) doing the research, (ii, if applicable) elaborating the design and (iii) potential applications of the results in practice.

The plots in the woods ensemble has an unique character which will not be expected of a former military production site. The ensemble lends its name to the rich presence of greenery on site. This greenery and the other spatial elements belonging to the landscape were crucial for the historical functioning of the ensemble. Nowadays it is quite a romantic scene with the different building typologies, the natural elements and the historical traces. At the beginning of the design phase I was fixated on maintaining this current atmosphere the same. However, atmosphere is hard to grasp and to analyse. Within my paper for Research Methods the following is stated about atmosphere:

"When places are analysed from an architectural perspective, the focus is mainly on the tangible aspects of a space which permits that the atmosphere is excluded in most cases. This may seem strange since "atmosphere seems to be overarching qualities of our environments and spaces" according to professor Pallasmaa. He describes the atmosphere of a place as "an exchange between material or existent properties of a space and the immaterial realm of human perception and association, which will be grasped as a unity before the details are identified". This is similar to the definition of atmospheres by philosopher Gernot Böhme as a dynamic interaction between architectural elements (objective) and the subjective perception of the observer. Böhme also agrees that atmospheres are in the first place a total experience, not a sum of individual aspects, based on personal and emotional impressions of space. Within these definitions the complexity of the concept is shown, since the perception of space is largely unconsciously and instinctively derived".[8]

After the initial analysis with the extensive booklets, as a result, I was still not able to recognise the most important values and characteristics of the ensemble. This, in combination with the fixation on the current atmosphere resulted in a preservative attitude which held me back in the beginning. It was hard to see the opportunities for interventions, especially because all the elements seemed to contribute in the same level to the existing atmosphere. Consequently, finding a new program was challenging, since initially the program had to fit the current ensemble exactly. Meaning that the buildings, exterior spaces and spatial elements would not require large interventions to adjust to their new function.

After additional research through literary reviews and reference projects I could move forward to a program for the ensemble where the function of the landscape and the functions of the buildings still supported each other. This program conducted new architectural and building technological requirements. These helped me eventually to find the right balance between the different disciplines within heritage and to locate the limitations and opportunities for interventions.

[8]A.Verschuur, *Designing architectural experiences through a phenomenological approach* (TU Delft, 2019). Paper written as part of the course: Methods and Analysis – Lecture series Research Methods

Conclusion

As stated before atmosphere exists where architecture and humans, the embodiment of daily use, interact. The experience of atmosphere is something intuitive and unconscious. It is in the first place a total experience, not a sum of the tangible and intangible aspects, based on personal and emotional impressions of space. The phenomenological approach within this design project encouraged an incorporated design by granting a better understanding of the intangible aspects of the current atmosphere of the ensemble.

Within an architectural and/or building technological analysis in general the focus lays on the definite elements as described in the six shearing layers of Brand (site, structure, skin, space plan, services and stuff). One of the layers that is added in the cultural value matrix is the spirit of place, which can be interpreted as the genius loci or atmosphere. With the use of phenomenological methods the intangible aspects of the ensemble have been researched.

This enabled a design where the different elements strengthen each other. Thereby resulting in an ensemble where the functions are not limited to the interior spaces of the buildings, but they will flow into the exterior, open spaces of the ensemble. Consequently, making the ensemble function as a unity, similar to the historical program.