

Reflection paper

Heritage & Architecture

Revitalizing Heritage - Hembrug

Chenna Tabeling

4211928

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Mentors:

Lidy Meijers - Architecture

Ger Warries - Building Technology

Sake Zijlstra - Board of examiners delegate



The Hembrug area was a former military production site serving the defense line of Amsterdam. The Hembrug terrain is situated in between the 'Noordzeekanaal' and the 'Zijkanaal G', near Amsterdam. After the second world war the demand of the weapon industry decreased and the Artillery Establishments continued with the production of civil goods. In the 90's the production diminished and in 2003 the site closed. The site is currently opened to the public and the buildings are standing vacant. The challenge lies in the redevelopment of this terrain.

The Hembrug terrain is divided by Palmhout into several 'ensembles'. The focus of this reflection paper is on the ensemble called "The Green Head of the Cape South". The name is based on the positioning: at the head of the cape; and its green character. This ensemble had been excluded in the production process for a long time, until the early '60's when a storage building (421) was built and eventually a factory for the assembling of ammunition for the NATO (430).

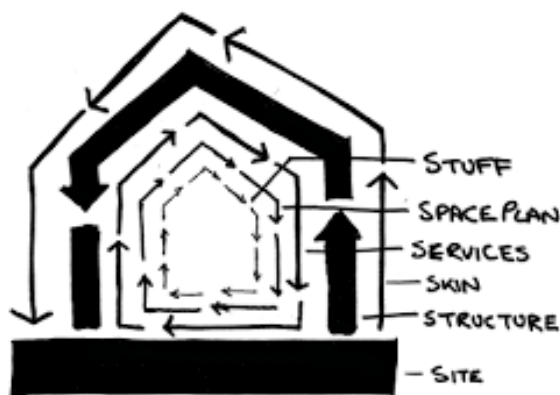
On the Hembrug terrain buildings were set up perpendicular towards the waterfront. When the Artillery Establishments expanded towards the head, they had to deviated from this alignment. The Green Head of the Cape South is typified by the shift of the factory building (430) which creates a triangle shaped green area.

With an ongoing growing population and the aim towards a more sustainable future, revitalizing building is a considerable topic. Architect should take into account the current building stock and look into more possible ways on how to easily reuse buildings. The location of the Hembrug area, makes it an even more attractive area to develop. It can flower as a lively area near Amsterdam. On the contrary, Amsterdam can also make use of these buildings.

The purpose of the project is to revitalize the Green Head of the Cape South and creating attention towards the polluting fashion industry. The challenge lies in preserving the character of the ensemble with its typologies; and also in revitalizing it for future needs. These characteristic typologies on the ensemble can be found at other ensembles as well, suggesting that there was a relation with the other ensembles (1). Including (instead of excluding) the Green Head in the Hembrug terrain. The structure of these typologies is the core to the visual expression of the buildings that can be linked to the similar buildings on the Hembrug area (2). In order to protect the core (structure); exteriors are visibly being adapted with a clear differences between the old and new, with the purpose to show adaptations that can be learnt from. These adaptations being made in line with the existing lay out (3) in order to not be disrespectful to the history of the building. The characteristics of these typologies (for instance skylights), that can be recognized in the total area as well, are being preserved or renovated in order to make the buildings future proof (4). Redesigned elements or additions to the ensemble are supportive elements in order to create sustainable solutions to make the ensemble future proof (5).¹

The position of the project is drawn from the book Reduce, Reuse, Recycle². The focus of the project lies on the reuse of the buildings and making them circular and future proof. The approach towards this assignment is in line with the 'Shearing Layers' of Stewart Brand³. Brand states that buildings are composed out of several layers of change, in which the lifespan of certain layers of the buildings are taken into account next to the values and characteristics of the buildings. In order to make decisions about the interventions needed (or not).

This paper reflects on the project as a test on how a certain position towards circularity can be implemented on heritage; and how architecture can play a role as a problem solver towards a greater society.



Shearing layers by Stewart Brand on How buildings learn

¹ See appendix I: Heritage Position

² Petzet, M., Heilmeyer, F. and Overmeer, E. (2012). Reduce, Reuse, Recycle: Architecture as resource. Ostfildern: Hatje Cantz.

³ Kuipers, M. and de Jonge, W. (2017). Designing from Heritage – Strategies for Conservation and Conversion. Delft: TU Delft – Heritage & Architecture.

Nowadays a few problems in society are inevitable. Energy resources are scarce, water is being polluted and wasted and CO2 waste emissions cause global warming, in which multiple industries have a lot of impact on these emissions. Like the building and fashion industry.

The fast fashion industry gets a lot of attention by the news. This industry is wasting and polluting a lot of water; is having a large share in the CO2-emissions and the pile of clothing waste grows and grows. Sales are seducing people in buying more of these clothing's produced in a bad way. The fashion industry is a problem that should be taken care of.

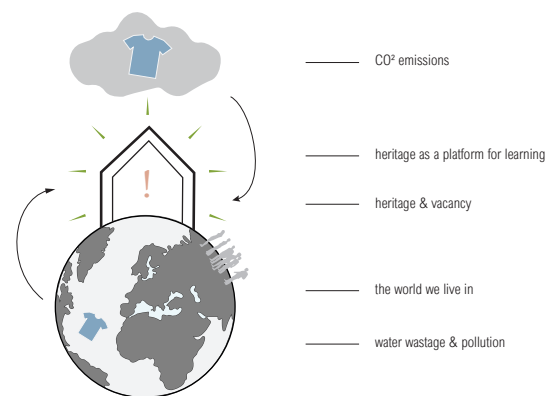
We live in a consumerism world. Where people buy and throw away. This same phenomenon happens in the architects world, buildings are being built in a very fast pace. And in a few years, the building doesn't fit the needs of the current owners anymore, they move towards a new building, the old buildings doesn't meets the needs for the future owners, stays vacant and goes into decay. Why create more buildings when there are already a lot of vacant buildings?

With the aim towards a more sustainable future, revitalizing buildings is a very considerable topic. Architects should not demolish the built with the argument that it's cheaper, since most of the times the carbon footprint of the current building is not taken into account. "The original construction energy should also be taken into account, as should the energy involved in demolition and disposal, in the production and construction of the new buildings, and in the operation of the building (heating, cooling, lighting) as well as the mobility generated by it. Maintenance measures are the only worthwhile solution. Value the existing, become an interpreter and developer.⁴ So is demolition (carbonfootprint-wise) better for the environment? Architects should look into possible ways to revitalize cheaper, respect the past and provide the future. Architects should look into ways of diminishing the waste piles of the world. Like buildings and fashion. How to reuse the waste, instead of waste the waste... and what happens in the future?

How can this problem of the polluting fashion industry be addressed with architecture? How can architecture contribute to a more circular clothing production and recycling? And how can we learn from that?

Tangible aspects in this topic will be: the buildings as an example for future applications. In which it will expose solutions on how to deal with heritage in a circular way. And the *intangible* aspects of this design will result in the creation of awareness on a societal level, a scream for attention, by creating a platform for events. The function as a direct solution for the fashion problem, an institute where research is done in order to find better ways on how to produce and reuse clothing. The waste and emissions of the fashion industry in this project will be taken into account, in order to make this design its own circular 'machine'. But since a lot of buildings in the past have only been made for one purpose, the challenge also lies in the adaptability of the buildings for future uses.

But how can we, as architects, deal with certain problems? And how do these problems get society's attention? *"How can a heritage building be an architectural support in making a contribution on a social and educational level towards a more circular future, with regards towards the fashion industry?"*



How can heritage help in addressing the societal impact of vacancy and the fashion industry on the world? (own illustration)

The relevance of this projects is focused on two aspects. One of them is how to reuse heritage buildings in a circular way and making them future proof. A lot of existing buildings are now staying vacant, are in decay and do not meet the requirements of future users. Nowadays with all the CO₂-emissions architects should take into account the original construction energy, as should the energy involved in demolition and disposal, in the production and construction... Value the existing, becoming an interpreter and developer.⁵ And even more important: building adaptability. What if the function changes? With the layers of Stewart Brand, temporary elements can be designed with demountable features and permanent interventions can be designed more durable. The ensemble (or even the Hembrug area) can contribute as a platform / a trial of approaches on how to revitalize heritage buildings. Instead of all new redesigns.

The second issue is how to address and create an awareness towards the polluting fashion industry. What can a building achieve in a movement? How can it be a support in a movement? This being worked out as a (temporary) program for the ensemble and the total Hembrug area.

Research and analysis are a very important things to do in order to understand the assignment and the built environment. The graduation project started with an analysis on the Hembrug area with a small group, focused on the Green Head of the Cape South. Different research questions were investigated. My focus was on the former function(s) of the building aspects; why the buildings layout changed over time; and if these changes were related to a broader context. The findings of the analysis were organized in a Cultural Value Matrix⁶, an often used tool in the chair of Heritage & Architecture. The cultural value matrix planks the values of a building (by Riegl) in relation to the layers of the building (by Stewart Brand). The matrix can be filled in with texts and images, both tangible and intangible.

On the basis of the research question, the building has been investigated on how it was used and how the use and layout changed over time. These changes reflect very well on how a building can be deployed in multiple ways. The structure played a big role in this (valued high), which ultimately provides great flexibility to a building. This flexibility makes it possible for a building to host multiple functions or different lay-outs, which ensures a longer lifespan of a building resulting in a more circular and durable building providing its 'future proofing'.

Researching these different aspects in relation to the history and current state of the buildings create a perspective on whose element of the buildings had a value to its history and which elements have a value on future perspectives. These values summarized in the matrix formulated the highly valued, starting points for the design, which have been taken into account and created a framework. With these values, arguments can substantiate the interventions that have been made.

BRAND +	RIEGL +	AGE value	HISTORICAL value	INTENTIONAL 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 (+)										

Cultural Value Matrix (Kuipers & De Jonge, 2017)

5 Petzet, M., Heilmeyer, F. and Overmeer, E. (2012). Reduce, Reuse, Recycle: Architecture as resource. Ostfildern: Hatje Cantz. 9-11

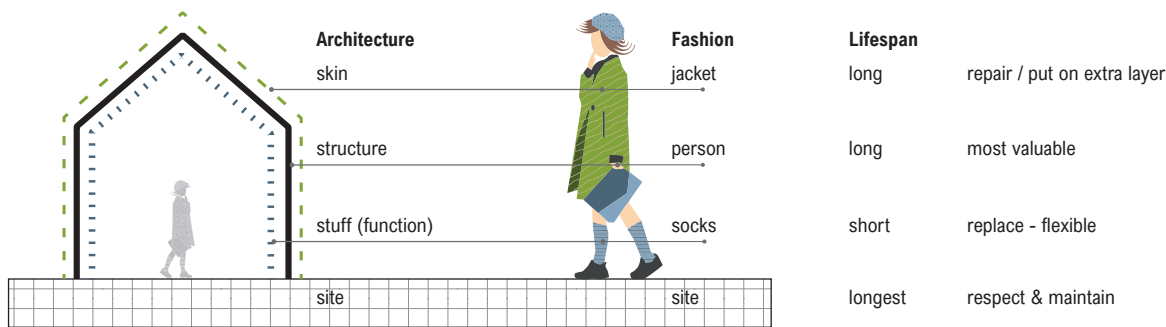
6 Kuipers, M. and de Jonge, W. (2017). Designing from Heritage – Strategies for Conservation and Conversion. Delft: TU Delft – Heritage & Architecture.

The research being done in order to sustain a more circular fashion industry in combination with architecture inspired to link buildings and clothing in a figurative approach. In which the layers of Stewart Brand can be linked to humans and clothing. And a different view on buildings and 'repair' (renovation).

The contribution of my design project to the architectural profession is one solution on how to deal with heritage buildings and societal problems; how to value heritage; and how can interventions be applied with respect towards heritage buildings. It demonstrates an approach towards revitalizing heritage buildings and making buildings fit new and future requirements.

The project shows a way on how to deal with CO2 emissions and water wastage. Its shows a way on how a building can be revitalized in a circular way and how water in the future can be handled and filtered, how these elements can be a part of the design. And how a design can be one holistic solution towards multiple elements. Hopefully architects will become more aware of a holistic design mindset.

The project highlights the implementing demountable and recyclable materials and can have an impact on the way how architects choose materials and applications. For instance using panels in facades that can be replaced when the panels are harmed. And these panels made of an recyclable material (bio-based). It also shows a way of how to deal with building waste. How can we reuse certain building materials in the project? Architects should not simply demolish, but they should think about creative solutions to reuse. Connecting the chain of circularity, instead of making it a one way road. Architects therefore should always keep the future in mind.



Stewart Brand layers vs. humans and clothing (own illustration).

Different methods have been used in order to do research and get a better understanding on heritage. *Learning by 'reading'.*

By the reading the book 'Reduce, Reuse, Recycle'⁷ I came to an understanding on how to position myself towards heritage buildings and how to gain arguments for interventions. An inspiring quote I read by M. Petzet on architects was that we architects don't base our value a building for what it was, but on what it can be in the future. How a building can become something else, that is the value. This is something I relate to very much, since I wanted the buildings to be flexible, in order for them to be future proof.

The books gained from the studio, Heritage based design⁸ and Designing from Heritage⁹, taught me ways on how to approach the assignment. For instance with the layers of Stewart Brand; and the Cultural Value Matrix, as explained earlier.

A different kind of research has been done during site visits to Heritage projects. Visiting a heritage project is like reading a book, but then figuring out yourself how the book is written. Direct problems and solutions in architecture show different ways on how to solve challenges in my own project. The application of visible interventions make them readable, which makes it easier for people to understand what is applied and why. Giving the building an intangible purpose, next to tangible solutions. This realization positioned me in a way that I want to make interventions visible in order for people to learn from it. My research question is partly based on this perspective: *"How can a heritage building be an architectural support in making a contribution on a social and educational level towards a more circular future, with regards to the fashion industry?"*

Site visits had impact on the design and understanding of the program. For instance the visit towards the Waag, in which a lab is placed in a heritage building, made me realize that not many climate transformations need to be done in order to run a fashion lab.

The transformation of the Ploeg, Bergeijk, which has a similar aesthetics as building 430, made me look more critical towards design solutions I had been making in the past of the design. In which I changed my approach of interventions. It also gave me a lot of insight in the problems being experienced by the users of the building. Problems among acoustics and heating, which I could take into account in my design.

Visiting the Future Fashion Show in De Hallen Studio's in Amsterdam; was two birds with one stone. De Hallen Amsterdam has the same typology as building 421; and the event happening at that time is the same as I want to deploy in that building. This gave me the insight on how to approach the building when hosting different events. Temporary furniture can be deployed in order to create different spaces and these objects do not necessarily need a permanent system. It can be an easy application like ropes and knots... The event itself gave me insight in the logistics of this fashion event. Like the entrance (foyer) of this space; the dressing rooms and the event hall itself.

A visit to the Textilemuseum in Tilburg showed new innovations in the techniques in the production of textiles. And the finding of the company 'Texperium', which not let me visit them; 'confirmed' the topic I am addressing with my graduation project. They are currently researching on how to recycle clothing and what the best techniques are. Next to that they are creating clothing from textile waste and enter into collaborations with (fashion) companies who want to do better for the world.

In order to find solutions on how to produce better (plant based clothing) I had to go on the internet in order to find reference projects. The numbers on how many plants are needed in order to create an 'x' amount of kilo textiles, and how many water is needed have not yet been established.

Every site visit I tried to find what the approach of the architect was towards the relationship between the old and the new. I tried to establish what the architect did in order to make the building fit the current needs of the users and I looked at acoustic solutions and climate installations. In every building I tried to figure out what the holistic approach was towards the architecture and the heritage values.

The use of models helped in order to get a grip on the dimensions of the building. How to create spaces within spaces in the building, and how to position these spaces in the space.

Implementing different aspects gained from; books, site visits, talks, models etc. will contribute to a more comprehensive design. Site visits will provide architects and students at any time with direct solutions on how to deal with multiple aspects among; heritage, sustainability, reuse, society, program, acoustics, and many more.

⁷ Petzet, M., Heilmeyer, F. and Overmeer, E. (2012). Reduce, Reuse, Recycle: Architecture as resource. Ostfildern: Hatje Cantz.

⁸ Meurs, P. (2016). Heritage Based Design. Delft: TU Delft – Heritage & Architecture.

⁹ Kuipers, M. and de Jonge, W. (2017). Designing from Heritage – Strategies for Conservation and Conversion. Delft: TU Delft – Heritage & Architecture.

"How can a heritage building be revitalized into a future proof, circular building in which applied techniques can be learnt from; but on the other hand, be respected and used for its historical qualities?"

The buildings were originally designed from a functional need. This was something what interested me the most in the analysis. Although these former activities aren't visible in the building, but both buildings (430+421) embrace themselves as building which had adjusted to changes in activities.

The dilemma for me was how to change these buildings in order to fit the new program and future unknown programs and at the same time maintaining the original idea of the building. The solution was given by the shearing layers of Stewart Brand, in which the short and long lasting elements of the building have been determined. When approaching layers with an short lifespan as exchangeable and demountable elements and layers with a long lasting character as more permanent and durable interventions. Opportunities will be created in order for the building to change over time, which will result into a longer lifespan of the building.

First it felt rather disrespectful to demolish parts of buildings and adding a new skin. But the wise words of M. Petzet made me realize this isn't always the case. He said in his book: "In architecture, there are cases when complete remodeling is appropriate due to the significance of the task and its specific characteristics or on grounds of a precise and, as far as possible, objective analysis of the existing structure. He also wrote that care & repair are material expressions of how much the existing structure is valued.¹⁰ So rather no interventions will be done and the building will decay, or the building gets revitalized in order to give it a new purpose in which people can experience the past and live for the future... This moral lesson gave me the inspiration not to be afraid to change elements of the building. This in combination with the Cultural Value Matrix gave me the push to make design choices. During this process I tried to distinguish the difference between the old and new. Taken into account the shearing layers of Stewart Brand: valuing the structure the highest. Newly applied facades need to be easily repaired in the future. The 'stuff' brought in (spaces; furniture elements), need to be demountable for a supposedly future owner. Resulting in a building which needs to stand on its own, the building functioning as a machine which already functions well for its future owner.

Dilemma's in the design encountered are for instance, when renovating a floor and implementing floor heating and ventilation ducts underneath and inside the new floor; the energy with the demolition of parts of the floor and making it a whole again sometimes are not profitable. But when looking at it from the long run perspective, it seems more reasonable. A different dilemma: is the preservation of the current window framing reasonable to keep it if has a dramatical impact on the heating of the building, when already a second skin is applied? No of course not... But from a circular perspective, simply wasting these frames seems not reasonable. What to do with these old window framings? These chains of thinking constantly stimulated me while designing in order to make this project as circular as possible.

As concluding questions I asked myself: What is needed in the end in order to make these buildings useful? And are these interventions profitable? The answer is two-faced...

We live on the world. The world nowadays is being polluted. Design can be a response to these problems, design in which methods on circular construction and development can be implemented. To address problems in architecture, we can include these in our program, in which the demand hopefully will be something that arises naturally.

Research on the history of a building can help understand how a building was used and how it can function most optimally in the future; the cultural value matrix can be used in order to discover the most valuable aspects of the building.

At first I thought that the project would have been more focused on fashion and the program. But after a while the focus shifted from fashion towards architecture as a circular machine. In which it shifted from program to materialization and schematic cycles in the design (like water and energy). The project gained a more holistic approach in which program and design merge together with circularity as a big player.

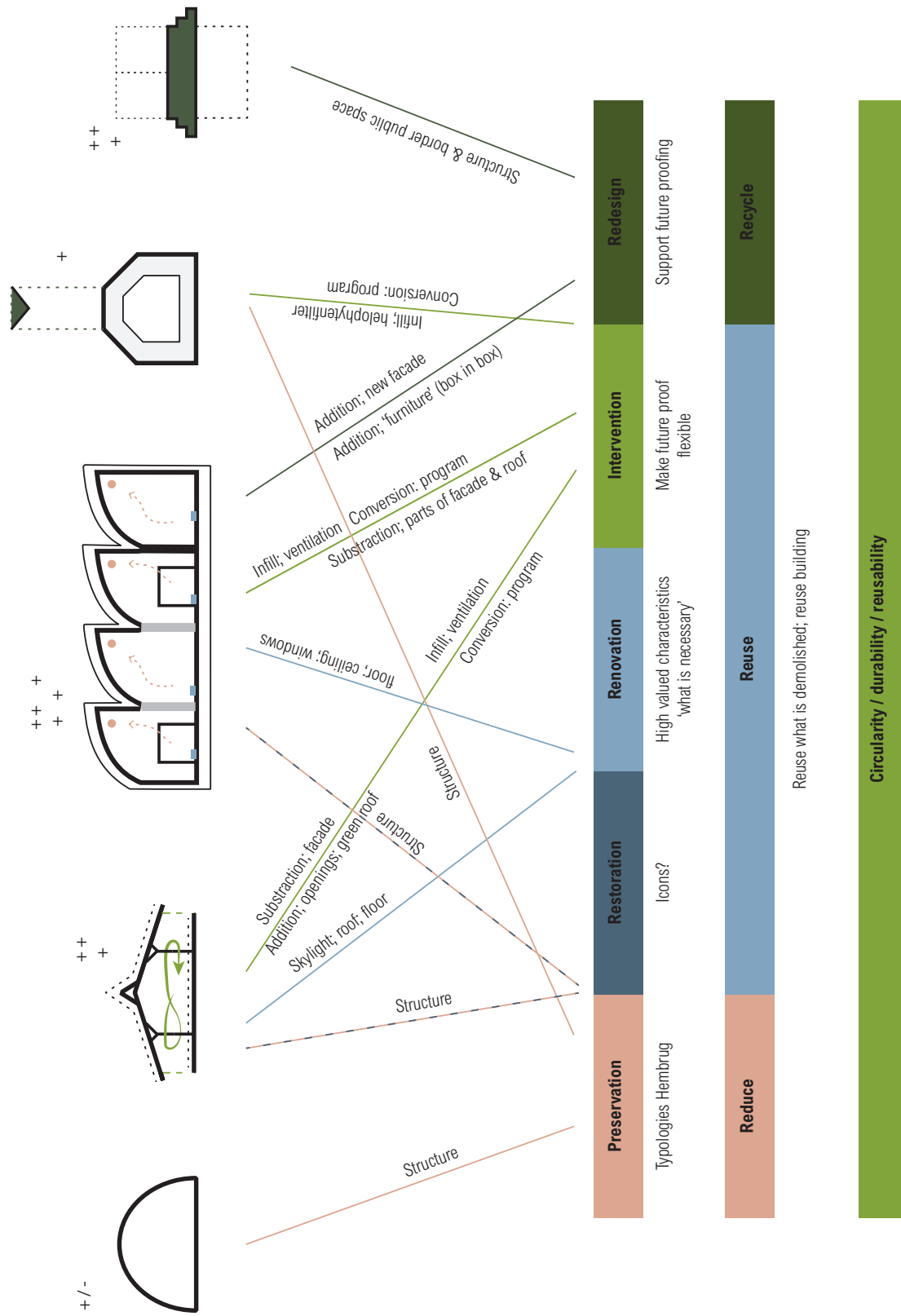
Due to the size of this ensemble only a part of the Hembrug area is worked out. The design for the Green Head of the Cape South functioning as a different starting point than the plans of Palmbout, offers possibilities for following studies. Questions that can be further developed in the future research in this project can be: "How can different, but yet similar, problems (for instance; food wastage and building wastage) also be implemented in the Heritage area in order to develop the Hembrug area circular on multiple levels?"

Kuipers, M. and de Jonge, W., (2017). Designing from Heritage – Strategies for Conservation and Conversion. Delft: TU Delft – Heritage & Architecture

Meurs, P. (2016). Heritage-based design. Delft: TU Delft – Heritage & Architecture.

Petzet, M., Heilmeyer, F. and Overmeer, E., (2012). Reduce, Reuse, Recycle: Architecture as resource. Ostfildern: Hatje Cantz.

Steenhuis & Meurs, (2010). Cultuurhistorische analyse Hembrugterrein.



Care & repair are material expressions of how much the existing structure is valued

Not for what it is but what it can be (in the future)

How a building can become something else; that is the value

- 1 Preserve typologies – Variety of typologies as character of Hembrug
- 2 Structure as base for an typology; keeping visible (preserve / restore)
- 3 Exterior protects structure (typology) > addition (intervention)
- 4 Characteristics of typology renovated (making functional / future proof)
- 5 Redesign (ensemble) supports future proofing