REFLECTION PAPER

ELSE DEKKER
EXPERIENCING ARCHITECTURE

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10/05/2019 Reflection paper P4 aE Graduation studio

PERSONAL INFORMATION

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TITLE:
Experiencing circular architecture: a study into experiential application of reclaimed materials in new building developments

INTRODUCTION

The topic of my graduation project consists of circular economy applied in the architecture. The Amstel III area will be transformed from an office area into a mixed urban district, where the how of transforming is about circular economy. My project in this topic is a community building which will function as learning the residents of the area (and beyond) about circular economy and provide a place to be able to create their new identity. While the building itself will serve as the place to go when people want to express their free time in hobbies, while their own house doesn't provide the space. Before starting with our own projects, in collaboration with Kasper Jensen as visiting professor, our group gained knowledge about circular economy and put the information together in the booklet UPCYCLE AMSTEL III, from which we later on could retrieve the information about circular building to our own research topics.

RELATION RESEARCH-DESIGN

With the Upcycle Amstel III Booklet, the research started with the investigation of circular economy in the building sector, including considering the possibility of upcycling reclaimed materials from the existing building stock. This research gave a broad view on the possibilities of circularity applied in architecture. Working on from this group work we each had our own fascination and personal ambition and vision on circularity of how this could expand the circular economy in the building sector. My fascination consisted of making honest architecture where people experience the building by its material applications and how the community could engage to the topic of circular economy. The research question following this top was:

How can reclaimed materials from the Amstel III area be applied again in (partly) new buildings where they can contribute to the experiences and adaptations of the users in a cultural building?

This resulted in creating a vocabulary of experiences from various materials. As outcome of the research I created a toolbox which can be used during the design process when considering applying reclaimed materials in several atmospheres. The reason to express the circularity in materials came from the analysis of the area and the broader topic of circularity; people, the mass, should know what circular design consists off, by providing a circular experience where people can learn about the topic. With this in mind the design question regarding the project became:

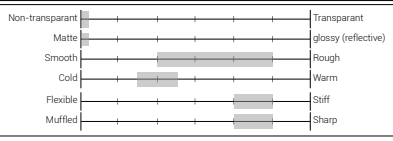
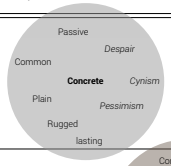
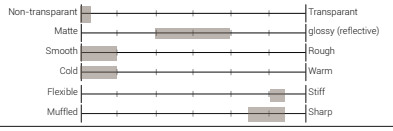
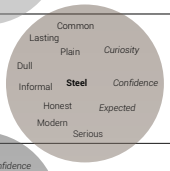
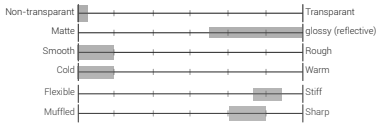
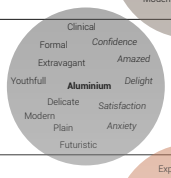
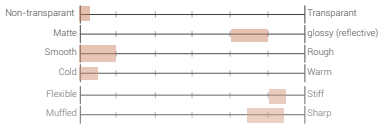
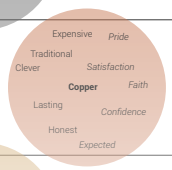
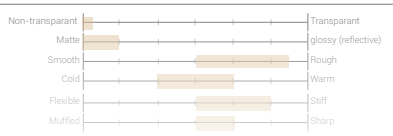
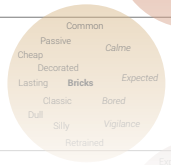
Can people engage to the specific subject of circular economy through the expression of the architectural design by its materials?

The people in this projects are the residents of the area Amstel III, by providing a cultural building which the community can use, they informally get involved with the principles of circular economy. This can happen in various ways, from the building itself by how it is made and the expression of materials, but also from the functionality of the building and the activities one can perform in this building.

The direct connection between the research and the design will follow from the toolbox created with the research, giving an overview of material experiences. The design can define functions with desired atmospheres, and thus, wanted experiences can be stated by the design. Combining these together, an outcome of which materials to use for which function/atmosphere can be found through the toolbox. The process of development of the building was defined by bringing those two lines together, which lead to an outcome of specified materials for the needed experiences. In my process after P2, I followed these steps which gave me a result on the kind of experiences and the chosen materials for each function. However, the chosen materials were not only chosen from the toolbox, as I dealt with the materials which are only available to reclaim from the buildings in the Amstel III area and thus played a big role in the part of material decision.

The topic of circularity thus became the focus to apply as concept through the whole building. With every point of decision I could question myself, what does it mean on the level of circularity. So the topic of circular design helped me make decisions throughout the design process. However, this was of course the idealistic situation. Due to the research into the different experiences of reclaimed materials, I focused for quite a long time on the appliances of the direct value of upcycling materials to the experience level of people on circularity subject. This experience depends for the biggest part of people's personal emotions and moods how they will experience environments. So it didn't bring me much further than my on personal view on the atmospheres of the building. These struggles, in combination with the way I learned designing through my studies, made me realize that designing with upcycling materials is in need of a very different design process and thus was completely new for me. Which let me off at the process of trial and error, testing which applications of reference projects could be applied in my own projects or which new principles I could add.

Outcome research material experience

	Applications	Experience | Sensorial	Experience | overall
Concrete	Crushed into parts for aggregate Casted concrete reuse in bloks or structure Casted conrete elements when dry connected		
Steel	Recycled by melting; back in the process loop Reuse of whole construction Reuse of beams, disassembled by dry joints Reuse of beams, by cut off joints		
Aluminium	Melted again to make new components sheets can be bended, cutted, joint into new needs		
Copper	Melted again to make new components Components cleaned and reused, in electricity and plumbing		
Brick	Dependen on the easy individual bricks canbe seperated and cleaned Make new bricks out of crushed old bricks, including cement Cut into 'sheets' of masonry work		
Granite	Reused in the sheet it was applied		

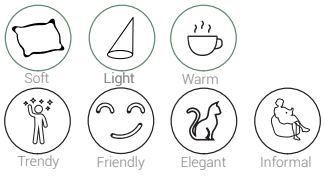
Desired experiences for each function

Meet

Cafe + Exhibition/Library

FUNCTION

EXPERIENCE



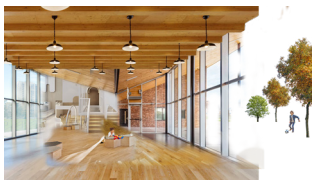
MATERIALS

Wood
Textile
Plastics
Ceramics
Glass

Learn

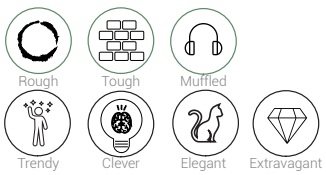
Kindergarten

Wood
Textile
Plastics
Glass
Aluminum



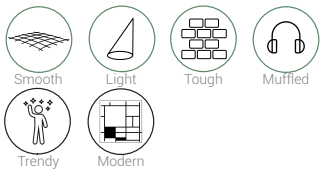
Cre-

Workshop/Atelier



Concrete
Aluminum
Glass
Wood

Rehearsal/Performance



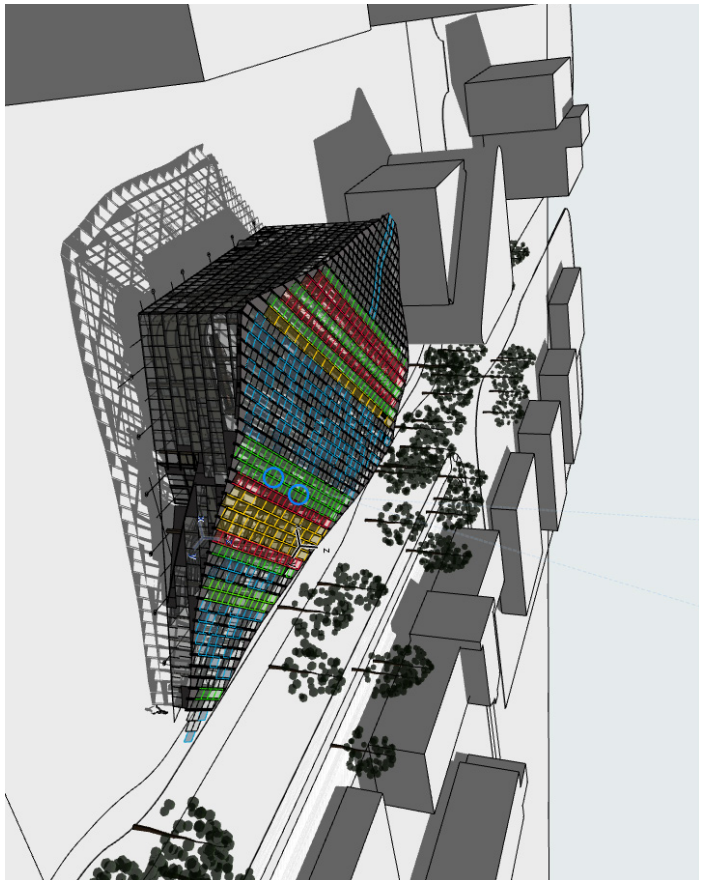
Aluminum
Textile
Concrete

METHODS USED GUIDING THE PROCESS

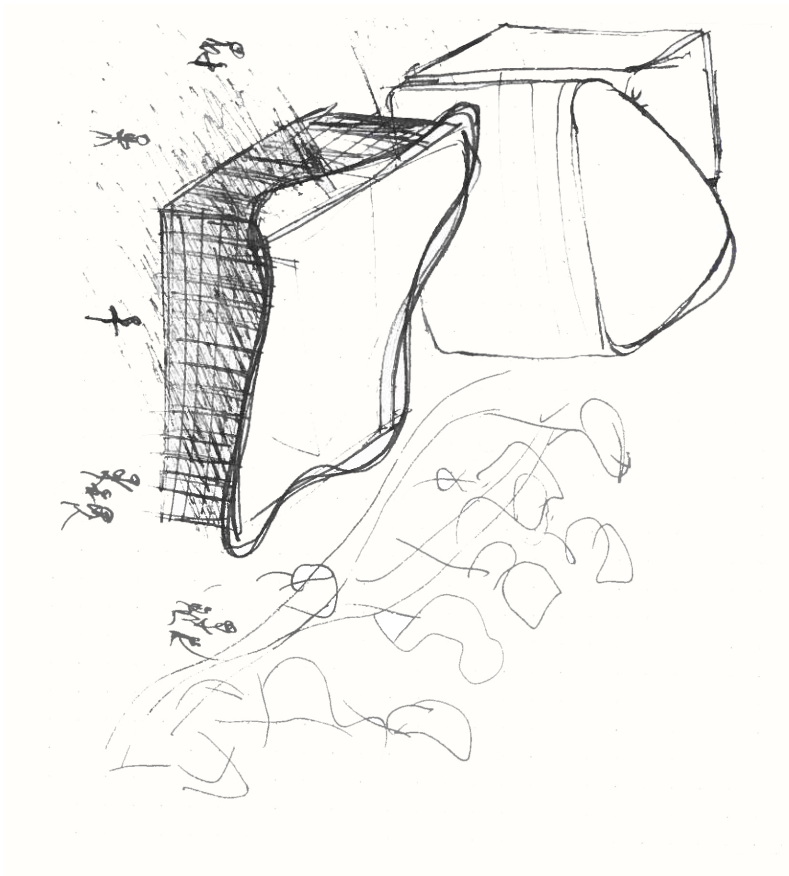
During research the method I used to gain information consisted of reading literature about the topic and analyze case studies which contained a circular approach. For the booklet Upcycle Amstel III, readings were done into multiple fields of circularity, from stakeholders to material level. Along with a field trip to Copenhagen to visit multiple circular designs our view on circularity was broaden. This method I also used for my own research paper, to conclude all the information into one paper, together with creating a toolbox it provided a starting point of the design. The toolbox provided a way to map out choices to be made during the design process. Together with the small scope of materials to choose from due to the availability in the area, it helped me in making quick decisions on which materials to apply at each function in the building.

At the start of research, I thought I would find the new solution of applying the circular principle to the whole existing building stock. Of course, this was a bit too overambitious, so I narrowed the topic down into making a toolbox for the specific available materials in the Amstel II area. This problem I found myself doing with a lot of topics on the graduation project. Every time making things too big, or deepen out too much while forgetting to look at the overall picture of the design project. From my tutors I luckily got feedback on this part with the question; “but what does in mean on the level of circularity?” This question helped me to stay focused on the design and the decisions to make considering everything in the building to be contributing positively towards the circularity. As well as the principal concept I stated at the beginning of the design phase, the building should be inviting architecture where people feel welcome. Reflecting back on this process comparing my first sketches to the 3D model they don’t differ that much in form language. Where together with the circular thought, the inviting atmospheres guided me through the project and was a topic to question myself on constantly.

The whole process made me realize that designing a circular building requires a whole new way of design process and thinking differently about the application of reclaimed materials, in a way they would express the circular principle in themselves. Throughout the process, I learned that one needs to respect the reclaimed materials and find a system to apply them in the same kind of form language in a new building project in order to apply the circular economy in architecture. This is also the outcome of my design project, regarding the reclaimed materials as valuable pieces which, if applied again in the same language, can alternate together into a new piece of architecture.



3D view of building 1 week before P4



First sketch to express design concept

RELATION TO THE STUDIO

As the studio of Architectural Engineering connects the architecture with the (building) technology and gives the freedom to apply innovations to different aspects in the design, the context of Amstel III with its circular building aspects fits perfectly in this studio. Its innovative aspects of this quite new approach of upcycling materials connects to the studio's vision on creating architecture with the future in mind. With the upcycling of materials from the existing building stock, it requires to think about the technical details of applying these materials in a different configuration. In this way, it also reacts to the future of architecture where it gives an answer to the great amount of existing building stock which will maybe lose its functionality in the future and is in need for renewal.

The first part of the process, the group work, was very technical and thus connected to the studio, with inventorying the available materials and the way how to reuse them. This was combined in the booklet Upcycle Amstel III. After this group work, the topic of my own fascination was a bit further away from the studio's topic as it concerned how people experience this circular architecture and the way the community could engage to it, it was a very social aspect. However, the structure of the studio is in such a way one can explore their own fascination guided with the topic of architectural engineering in mind throughout the whole process. After P2, when the implementation of the materials experiences in the design was needed, the technical aspect of construction was very important in my project. When dealing with reclaimed materials, a new way of application needed to be found, so every step the question was raised on which materials could be used and how it could be applied. This approach of designing was about the integration of all the technical (building) aspects and when integrating them into the design it made the project very characteristic for an aE graduation project.

RELATION TO THE WIDER SOCIAL, PROFESSIONAL AND SCIENTIFIC FRAMEWORK

The relevance of this project in the larger social context is easy to connect to the vision of the Municipality of Amsterdam for the Amstel III transformation. At the beginning of the project, we had multiple meetings with the municipality talking about their visions for the approach of transforming Amstel III, where they gave away the go-to approach was circular economy. My graduation project The Cultural Lab connects perfectly their wishes to create an own identity in this new to be developed city district. The circular economy topic itself reaches way further than only the city of Amsterdam. With the booklet Upcycle Amstel III we investigated the possibilities of the specific area of Amstel III. However, in this booklet, we also state what is needed in general to implement a circular economy in the building sector, so it can be a handbook for different areas. This booklet combined with my elaboration of circular economy into the architectural design gives a clear statement on what is needed to go further from the first implementation of the first circular design projects nowadays. Including encouraging multiple stakeholders in the building sector to work with circularity as the booklet was given away at a circular symposium at the TU Delft.

My graduation project as end result became a showcase of what, at this stadium with the existing building stock, is possible to do with reclaimed materials from to be demolished buildings. On the other hand, it gives an insight into what to do with the existing building stock when it doesn't function any longer to the purpose it once had. In a way the project shows the difficulties of applying circular economy to the existing architecture, but it also shows a way how to deal with the materials and let people, or especially architects, think about the way they design buildings nowadays, so in the future the implementation of circular economy becomes easier to reclaim materials and reapply them through upcycling.

FURTHER DEVELOPMENT

In the period from P4 till P5 I tend to explore more on the looks and feel of the described experiences in the circular building approach. In the planning I made from P2, the idea was to elaborate more on the kind of experiences and different atmospheres the application of reclaimed materials can be. As in most plannings, I made during design processes, some things are always left behind to be explored on a different time, so for the coming weeks after P4 and work out the project I want to test different materials together, in computer images as well as physical models. With a physical model I can show the interaction of the different types of materials with each other, and most of all with taking pictures from this detailed model, it can show the designed experience concerning the circular building. With having the focus on the presentation of these material experiences I will be able to show the design on how it will work out with applying all the different types of reclaimed materials from the Amstel III area and show a type of architecture belonging to the concept of circular design.