

# REFLECTION

Master of Science Architecture, Urbanism & Building Sciences

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## **1. What is the relation between your graduation project topic, your master track (Ar, Ur, BT, LA, MBE), and your master programme (MSc AUBS)?**

The principles of a circular economy are widespread through all the different master tracks. One of the approaches to achieving a circular building environment is to look at the possibilities of urban mining and building component reuse. This topic fits in the studio of Architectural engineering because of its focus on developing innovative technical solutions for the sustainable buildings of the future.

Within the studio, the Boerhaavewijk is one of the two proposed site locations because of its social and technical challenges. Building component reuse is a great opportunity in these post-war neighbourhoods to reduce construction waste. And reusing components in a school building will be valuable to the community. The reuse of building components brings multiple difficulties in different aspects of the design process from logistics to technical challenges.

## **2. How did your research influence your design/recommendations and how did the design/recommendations influence your research?**

The goal of my research was to define all factors that influence the value of building components in order to increase the reuse rate of post-war building components. The research showed the difficulties and possibilities within the process of component reuse. Reusing structural concrete components have a large environmental impact, saving energy and reducing waste but it also has a large impact on the design of the new building. Transportability, demountability and storage capacity are important factors that need to be taken into account. On the other hand, non-structural components have a higher value due to less risk, more availability, and easier deconstruction.

After evaluating the building components of the post-war flat, the site area should be arranged to facilitate the urban mining process. I chose that it should not be necessary to build a temporary school, which led to the fact that locations of the current schools were not available. Next to this, nearby the site should be place for component storage. These decisions led to the location of the new school building. The shape of the building resulted from the number of concrete slabs available. Due to the large amounts of concrete used in the building, its bio-based structure needed to be stronger than a "usual" bio-based building. During the process I learned that if you want to keep circulating components at their highest value, a designer needs to be very flexible and willing to change its design according to the components available.

### **3. How do you assess the value of your way of working (your approach, your used methods, used methodology)?**

In MSc 3 I really focussed on exploring component reuse and the process of urban mining from a broader perspective through a literature review and case studies. This approach led to the list of factors that can be applied to any design project. However, by doing so, I focussed less on researching the technical aspects of reuse, I did this later on during MSc 4 through research by design.

### **4. How do you assess the academic and societal value, scope and implication of your graduation project, including ethical aspects?**

The building industry is responsible for one-third of the world's annual waste and it uses 30% of the natural resources. Which makes the topic of urban mining relevant in many countries. The Dutch government even published a document called "Nederland circulair 2050". This shows the importance of looking into the possibilities to make our society and our built environment circular. Urban mining will not be the only solution, but it can certainly play a role in the transition to a circular built environment. To make reuse more common it should be more stimulated by the government. For example, if there is a CO2 tax on new building materials, and a lower tax on labour by construction workers then reusing becomes more attractive.

Deconstructing a residential building has a big impact on people living in the building and the surrounding community. In the case of a portico flat, due to its bad energetic and spatial quality people are often more willing to move to a better dwelling. Provided that it is near or in the same neighbourhood, so they could still be part of their community.

### **5. How do you assess the value of the transferability of your project results?**

The factors that are described in the thematic research paper can be applied to any material or component in any situation. It gives a designer an overview and helps to identify the value of reclaimed components. By doing so, I hope that I can inspire people to look at buildings, especially post-war buildings, differently. Perhaps, the strategies of urban mining on a neighbourhood scale can inspire housing corporations to change their view on the demolition of social housing and encourage them to deconstruct instead of demolish. The design of the new school building is an example what would happen if you really want to minimize waste and design with the components that are available.

### **6. What if a residential building was designed with the post-war flat components?**

The reuse of building components from a residential building in a school building had positive and negative effects on the value of the components. For example, there are different regulations for schools compared to residential buildings. Dwellings have often smaller spaces, so the small span of the concrete slabs of the portico flat are less a problem. However, by designing a public building, there is more opportunity to show the community and young generation about reuse.

## **7. How does the design reflect the value of the reclaimed building components?**

In the project, as much 1:1 reused as possible is done to keep the components at their highest value. Although this was not always possible, efforts were made to look into the possibilities how the component could have a new function which adds value to the building, for example for thermal comfort. Finally, most of the components are visibly reused so it increases awareness for the people using the building and effects the spatial experience.

## **8. Elaboration on how the final phase of the graduation will be filled in;**

In the final phase of my graduation, I will focus on finetuning the design and making the story more coherent and convincing. This means developing meaningful images and drawings to show the consequences and design decisions more clearly. Next to this, I want to find out what the real impact of my project is and if it's possible to quantify this. For example, what if you build a school of the same size with only bio-based components and without the reused components? What will be the main differences in terms of costs, energy and waste?

The goal of the design should be to show another perspective on components that are usually considered to be "low-value". Reusing components brings its challenges but it can lead to interesting architecture with sometimes delightful solutions. Finally, I want to make a model (maquette) with the main focus on how reclaimed components are combined with bio-based components.