

P4 Reflection paper

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Studio: Architectural Engineering
Context: Amstel III

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1. Elaboration on the relationship between research and design;

Joining the studio of visiting professor Kasper Jensen formed the start of my graduation year. The reason for joining, was because of the studio's strong focus on urban mining and the exploration of its potential to facilitate a new type of architecture. I had been interested in this topic for a while, so the choice was easy. I also wanted to find out what kind of architecture could be created from construction waste streams.

While we were doing the research in a team, each of us had their own topic. Because I was largely focussed on analysing the current stakeholder ecosystem, I researched literature on the topic of urban mining and conducted interviews with stakeholders from different practices, all affiliated with the built environment. We combined our shared findings into a book, called 'Upcycle Amstel,' after which concluded that I hadn't found an answer to my question: "With all this knowledge, why are we still not reusing building materials on large scale?"

I had to shift my focus from analysing the stakeholder ecosystem to the actual process of urban mining and its relation to the reuse of building components. I used several research methods as shown in figure 1 (see appendix). While a literary review and stakeholder interviews allowed me to elaborate on how and what urban mining is, I had to do a case study research to gain more knowledge on the topic of reusing building components. What is the current state of the art? What kind of components are suitable for reuse and why? By doing the research and conducting the case studies, I was able to answer most of these questions, giving me a clear overview.

This led to the idea of creating a booklet that could serve as design guide when engaging in the reuse of building components. However, due to a lack of time I have not managed to work this out to the extent I wanted to. Nevertheless, I still feel that creating this book could be of great help for designers, builders and potential clients.

The research allowed me to set a guiding path. Since I was keen on trying to approach my graduation as realistically as possible, I created a so-called development strategy (see appendix, figure 2). This strategy was based on the new construction chain we had created in our combined research and I proposed to treat my graduation process as if it would be a real process. The strategy helped me to stay on track and not fall back in passed phases too much, such as, for example, the phase of inventory. In consultation with my second mentor, Engbert van der Zaag, I forced myself to make assumptions at certain moments. At some point, I had to say: 'Ok, these are the materials that I are available. Make something with it.' In hindsight, I am glad I made this decision, because it is easy to lose yourself. At the same time, this was an important lesson learned: sometimes you need to make assumptions, because you can't know everything exactly.

Additionally, and more importantly, the conclusions derived from the research provided me with clear design principles and goals. Most important conclusions were that: 1) 1:1 reuse is usually most preferred in terms of environmental gains, 2) information on building components is vital if the process of urban mining is to be successful, and 3) most buildings today have not been designed and built to be reused in the first place.

The most important goals that I had set, based on these conclusions, were: 1) an existing office building should be transformed, where 2) all existing building components should be reused and 3) all additionally needed components should be harvested from surrounding buildings that are going to be demolished. The process of urban mining should serve as tool to harvest these building components. Additionally, I wanted my project to set an example and become an inspiration for other architects, but also for builders, developers and municipalities.

This last goal led to the decision that the design should become an eye-catcher and should have an imposing volume. However, while reaching a more and more detailed design, I found that the design I was proposing, did not reflect my initial goals. I had created a building that was large, I had to add an enormous amount of new materials. My first mentor, Mauro Parravicini, agreed and advised me to think about what would actually define my architecture.

I decided to take a step back and to reflect. I reviewed my research and decided to change my design approach. The design changed from a voluminous statement into a more material driven form. I decided to let the availability of harvestable materials from surrounding sources define the design. This resulted in a concept and preliminary design that was more befitting to my initial concept and goals. I would therefore say that my research has been of great influence on the goals I have set for my graduation design, but also for the choices I have made while designing. I feel strongly that this research-based approach has made me feel confident about my concept and design.

2. Elaboration on the relationship between graduation topic, studio topic, master track and master programme;

Although my subject was fitting perfectly within the studio's approach (to my surprise), I had already decided on forehand I wanted to study it. This interest in the circular economy and built environment had grown alongside my interest for the reuse of materials in architecture during an internship prior to starting my graduation. Especially the topic of circular economy is very relevant right now within the realm of the built environment and architecture.

The Architectural Engineering studio focusses on materialization, construction techniques, circularity and similar themes that approach architecture from a more technical perspective. Again, the decision to enter this studio was therefore not a hard one to make. I strongly feel that Architecture can and should be part of the transition towards a circular economy. I feel that architects should show the technical and aesthetical potential of innovative design approaches, in my case focussed on reusing materials. And in the studio of Architectural Engineering, this is stimulated.

3. Elaboration on research method and approach in relation to the graduation studio methodical line of inquiry, reflecting thereby upon the scientific relevance of the work;

Already in the bachelor we learn to analyse contexts, draw conclusions and use these to guide the design process. I think the studio of Architectural Engineering follows that philosophy and I have come to embrace this approach even more. The studio is clearly split into two elements: research and design. Although it was expected that we start designing during the research phase, I had trouble following that approach. This is due to the time-consuming research we conducted for Upcycle Amstel. Although I do appreciate the idea of switching research with design, in this case I preferred to conduct a thorough research first. This investigation of the context and state of the art gave me handles to come up with clear and relevant design goals. This approach resulted in a combination of clear research conclusions and design goals, but a very preliminary design at P2.

On hindsight, I am glad we focussed on the research the way we did, because my design goals have not changed during the entire process. These goals allowed me to constantly reflect and check if my design was answering to the goals, I had set. As I stated before, I feel that a concept or design becomes more powerful and relevant when it can be either partially or entirely scientifically justified.

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;

My initial goal was to tackle relevant societal and environmental challenges. Since the city of Amsterdam is coping with the need for dwellings and vacant office buildings, there are plans to tackle these issues by transforming the offices into dwellings. However, since many of the building owners and developers are keen on developing new high-rise towers, it is to be seen to what extent the vacant buildings in the area will actually be transformed and not simply demolished.

The larger overarching challenge I want to address, is that of global material depletion. We are mining raw materials in such a speed, that it is predicted we might run out of them. The built environment is responsible for a

significant amount and needs to be aware of this. I believe we should reconsider the way we design and build buildings in terms of materialization.

Since it is predicted that a lot of buildings are to be demolished in the area, I proposed to see these buildings as material mines (or: material sources) and use these materials to transform other buildings into dwellings. This way, the transformation of the area will not only address the local societal challenges but will also contribute to our global challenges. Of course, Amsterdam is not the only city that is coping with vacant buildings. The proposed approach is therefore scalable to other cities and countries.

According to case studies and literature, the interventions I propose are technically realistic. If they are financially interesting is something else... I therefore believe that the design alone will not be enough to address these challenges. We need to rethink the way we use materials and where these materials come from. I should therefore add, that I do not believe my design is the solution. It merely shows that we should look differently at the buildings and materials we already have, instead of casting them away as waste once they no longer serve their intended function.

5. Elaboration on how the final phase of the graduation will be filled in;

The final phase of my graduation will for a great part consist of finetuning the design and creating a final coherent story. On the one hand, this means making the concept crystal clear. On the other hand, this means visualizing that concept through the design. I want to be able to answer questions like: "how circular are the interventions I propose?" and try to quantify this.

My goal is to end with a project, that says: "Look, this is what you can do with buildings that no longer serve their intended function. You can demolish them and build something new, extracting all new kinds of materials from the earth and throwing away the old to be downcycled in some kind of way, but you can also make something partially new, reuse everything you have, create beautiful architecture and extend the building's life for another 30 years. Be conscious about what you have and reuse it in an effective way."

6. Appendix

	Upcycle Amstel	Literature review	Stakeholder interviews	Case study research
1. Urban Mining	●	●	●	○
2. Building component reuse	◐	●	○	●
3. Relation between both	◐	◐	○	◐

Figure 1: An overview of the methods used to conduct my research, specified per topic.

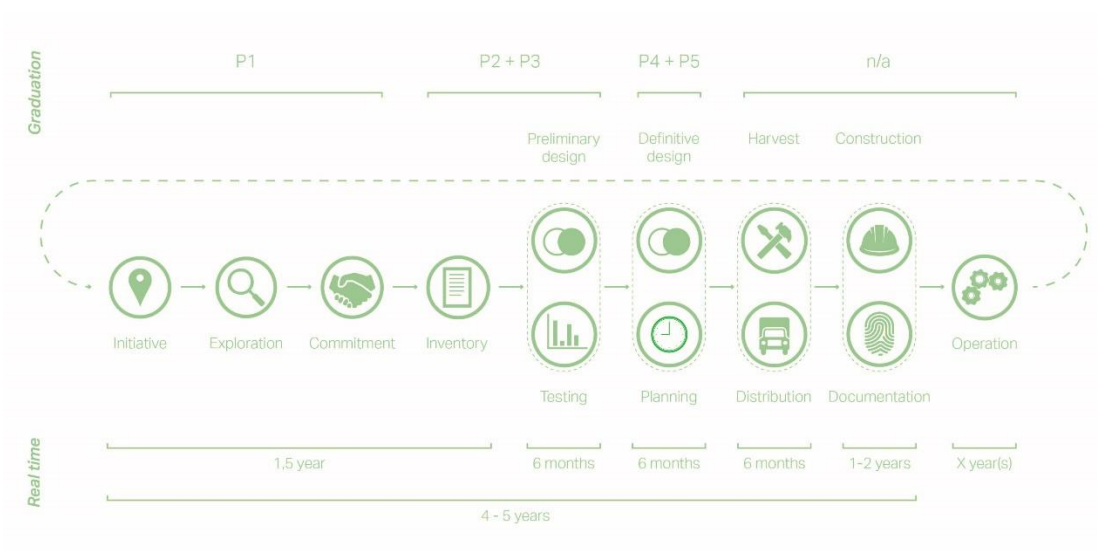


Figure 2: The development strategy.