

Reflection Paper

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- Looking back chronological:

The first quarter was crucial in establishing the approach of the project. This period is characterized by constantly needing to narrow down the main topic, see figure 1. This proved some difficulties, which I also later encounter in my design fase. This was also reflected in the feedback I received which encourage me to narrow down my scope to keep my research manageable.

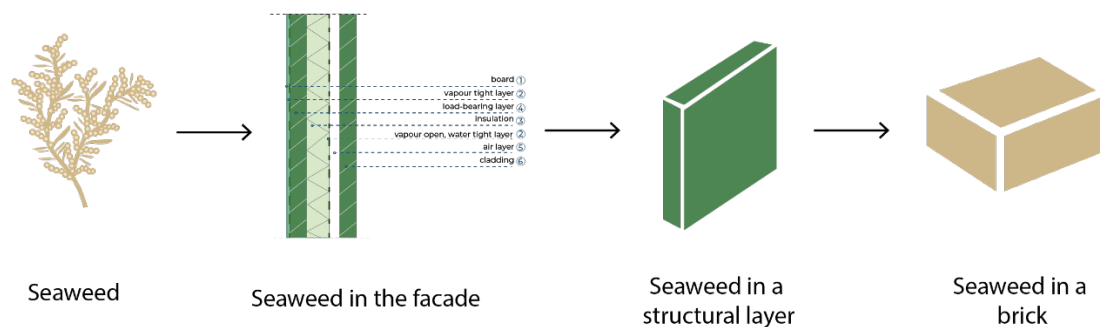


Figure 1, The steps in narrowing down research topic

Whereas the method of the research was still quite vague at this point, why seaweed building materials where interesting on the other hand was quite clear. As the Dutch Government have big plans to invest in Dutch Seaweed (Het ministerie van Infrastructuur en Waterstaat et al. 2019, p13-16). Besides that, the relevance of creating sustainable building options to combat many factors contributing to climate change was also obvious.

The how, or method, became more clear in the second quarter, where the research deepened. It was always the goal to do some hands-on testing but because of my tendency to take a (too) broad topic, it was unknown if this was feasible. I had severely underestimated how much time it takes to gather materials, equipment and other necessities for experimenting on this scale. Which made me derive from the beforehand created planning. Nevertheless the hands on approach created a lot of data and understanding of the material which was incredibly valuable for the research and design later on. It however created minimal time to write the final chapters and conclusion. Writing (academically) is already not my forte and the final lack of time did not help it. This was also reflected in my final feedback. Although it is difficult to improve my academic writing style in a instance, it is a active learning goal in my general skill development to learn to structure text more formal and academic (in cases where it is needed of course).

During the whole research period I sometimes found it difficult ask stranger for help. Sometimes they never reacted to my emails or calls but when they did they became my most important resources. I met Kathryn Larsen, which helped me to learn everything about seaweed. With her I got the chance to visit a seaweedfarm, which is much more difficult than it seems. Rokus Oskam invited me to see his loam brick machines and provided many of the base materials for the loambricks. Without them I could have never achieved the final results.

Important for my own understanding of the location I started to map the Westpoort area along a timeline of 30 years. This big scale along with the starting point of a brick as smallest scale, allowed me to work on different scales at the same time. Although there was a good grip on the different scales as mentioned before narrowing down my design topics was difficult. During feedbacks tutors tend to mention a lot of ideas and precedents to you. I found it difficult to filter these and use just the ones that were most suited to my project and vision, instead I tried to incorporate too many ideas. This sometimes made me lose the overview of what I was doing. What helped to organize these ideas was visualizing my concept and ideas in pictograms, see below.

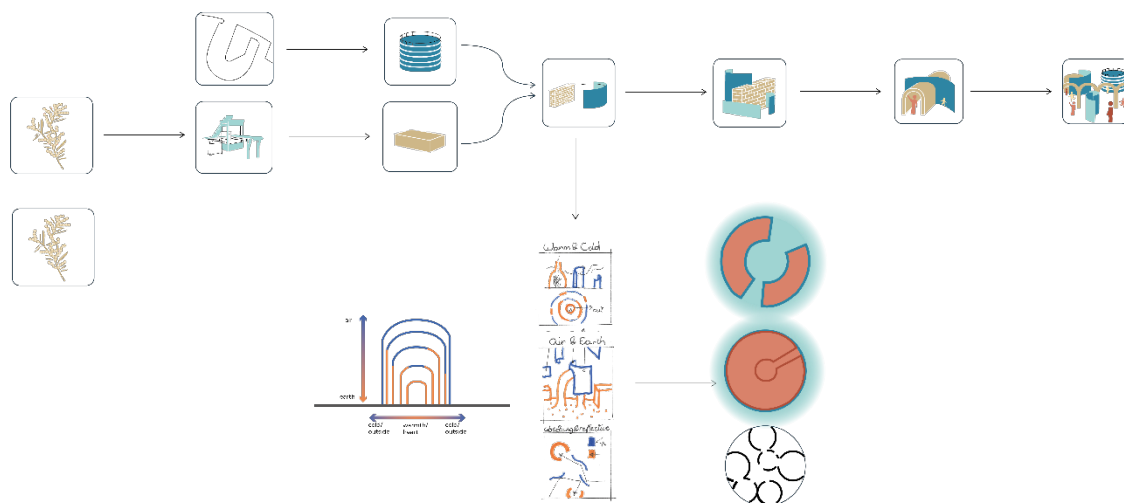


Figure 2, Figuring out how my topics and ideas connect

Because the graduation studio is so long compared to the standard studio length. I found it quite difficult to keep an overview on what I did and what I still needed to pay attention to. My planning that I made for the P2 was a bit too general to help in this situation. Making plans for shorter periods of time helped sometimes. I also use a blank-paged a4 book to paste and draw everything in to keep all my drawings together, this was also quite beneficial as it gave an overview of things I had done. Nevertheless I would next project like to pay more attention to my planning beforehand and keep updating this along the way to prevent not knowing what to do and ease stress..

• Lessons learnt:

Start small/choose clear points to focus on. You cannot do it all, although you might want to. I often have fallen down the rabbit hole wanting to solve it all, during my paper, design phase and even in my general life.

Don't be scared to ask strangers for help. Although your contact might result to nothing it, when it does it can impact your project immensely!

Planning are an important tool but still stay a guideline not a deadline. Especially keep an active updated planning would helped me in knowing what to do and ease stress.

- **Aspect 1 the relationship between research and design.**

The result of the research was a seaweed loam brick. This brick and its production method became the focus of the design. The brick was the main material in which the buildings were built and the production method became a big part of the programming.

- **Aspect 2 the relationship between your graduation (project) topic, the studio topic (if applicable), your master track (A,U,BT,LA,MBE), and your master programme (MSc AUBS).**

My research looks into seaweed based building products and how these can be locally sourced and how we can build with these materials. The material study into seaweed as a building product fits within the architectural engineering scope. Because of the focus on local resources and production, the studio Harvest lends itself greatly to create flow diagrams and discover how to locally resource this. Lastly this research into seaweed is done to discover its usefulness as building material and how we can use and design with it. It's essential as an architect to know the materials you are designing with and let them inspire you. Although material knowledge is not only interesting for Architecture but also for the whole built environment.

- **Aspect 3 Elaboration on research method and approach chosen by the student in relation to the graduation studio methodical line of inquiry, reflecting thereby upon the scientific relevance of the work.**

During the research: literature study, visiting production facility, talking to experts and in person material testing was used as methods. These methods are not that unique, although in person testing is not often seen within the Architectural engineering studio. Little research is done so far to seaweed as a building material but is gaining traction in the recent years. The seaweed loam brick and the use of unbaked bricks and seaweed additives in building materials show promise for future testing. For the design part, also literary sources were used besides testing through modelling and drawing. The main materials seaweed and loam are not new building material but in a way unconventional/forgotten. By reintroducing them to the public these vernacular building products might relive popularity.

- **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 final design project will be an exemplary project of the local production and how we can use of more sustainable building materials. Although we are doing good work in researching, we need to make the next step to setting up bigger scale projects to start living more sustainable and responsible. Although in this case, seaweed is quite specific for the Westpoort and location or areas with similar climates and resources. It still promotes new ways of living that would influence the environment less negatively and focuses on circular economies, local materials and communal commitment. The research into new building materials widens the scope of options for designers and builders. It also gives new insights in old and new materials as building material and their impact on the world.

- **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 reason for a brick-like element was my interest in vernacular architecture and how it characterizes itself partly by simple man-made construction. This opens up the possibility to employ workers from different skill levels, and easily re-train former workers of the fossil fuel facility that is currently on the location. Although I don't want to at all suggest that bricklaying is an easy trade, with some good guidance trial and error enough experience can be quickly created to create a sturdy enough structure

with loambricks according to the *The act of building* (Lefebvre, 2018). The production process of the bricks is also simple enough to be learned to a crew of 5 man in 2 days according to Oskam, owner of a loambrick production company (Oskam V/F, n.d.). Even though some parts of this building require a low skill level to create, the complexity introduced by certain architectural experiences and definitely requires high skilled people. This created the dilemma in the design where complex could take over simple to reach certain building and architectural standard. In the end this became quite material-linked, the seaweed loambrick introduced a low skill level whereas for example the other main material in my project, steel, often introduces a high skill level.

1. Het ministerie van Infrastructuur en Waterstaat et al. (2019). Uitvoeringsprogramma circulaire economie 2019-2023. [online] Rijksoverheid. Available at: <https://www.rijksoverheid.nl/onderwerpen/circulaire-economie/documenten/rapporten/2019/02/08/uitvoeringsprogramma-2019-2023>.
2. Lefebvre, P. (2018). BC architects & studies. The act of building. Biennale Architectura 2018. Antwerpen: Vlaams Architectuurinstituut.
3. Oskam V/F (n.d.). Clay blocks are unbaked uniform building bricks pressed from clay containing earth. [online] Oskam V/F. Available at: <https://oskam-vf.com/en/clay-products/compressed-earth-blocks>.