Reflection

Towards Living with Water

In search of new perspectives towards living with the increasing risk of flooding in the densifying outer dike area of the urban center of Rotterdam

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My graduation project was an opportunity to combine my passion for architecture with a deeper understanding of the growing threat rising water poses to the built environment. Also I saw it as an opportunity to explore the possible qualities living with natural water could bring to everyday life, with in mind the devastating power it can bring as well.

My personal interest for 'living with water', or, 'living with the increasing risk of flooding' provided me with a lot of curiosity towards the subject, which helped me to dive deeper into the research. On the other hand it also provided me with a lot of subjective assumptions and un-argued ideas solely based on my personal experience. As Andrej Radman stated in one of his lectures: *"it can be essential to rid oneself of oneself in order to be able to observe a topic in a scientific manner."* Throughout my research and design process I therefore constantly tried to be aware of this, sometimes unconscious, behaviour and try to train myself to think outside of my personal experience, ultimately leading up to a project based on facts, theories and experiments rather than personal interpretations.

01. *The relationship between research and design*

As all architecture can be seen as a form of inquiry, which takes on different manifestations in different moments in time and space, during my graduation project there was no clear distinction between the research and design part (fig. 1). Whereas I immersed myself into 2 different themes and combined them together (densification in relation to sea level rise scenarios), I looked for connections, starting points, restrictions and other findings. In turn I was able to experiment with these findings and test if they matched with the project goals of my design proposal (fig. 2). While implementing these findings in my design, the design process continuously posed new questions to research into further.

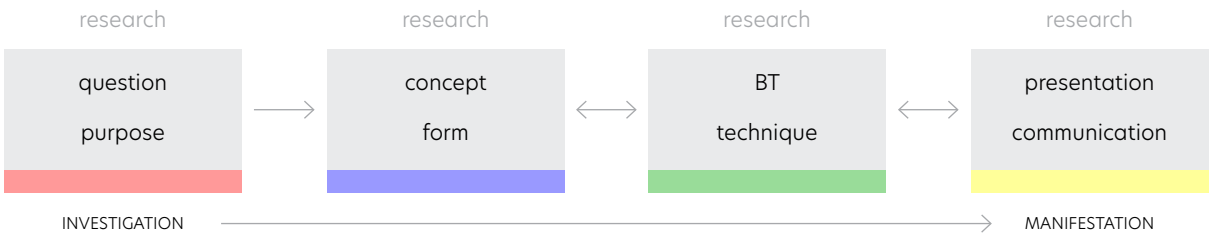
When I look back at the past year I think it can be seen as constant back and forward process between research and design, which makes the two inseparable. I am glad to have had this experience during my graduation year at BK, as to me, most other architectural design exercises during the BSc and MSc programme felt like a more linear, less integrated, process of research and design.

The multidisciplinary character of the research, compared to the other smaller scale design exercises, helped me to establish broader and more clear focus points for the design. Although, at times during the process, the more information I gathered, the more I realised about all the things I did not know yet. This forced me to work in a more structured way than I did before, in order to maintain the overview of the project and come up with adequate questions and design solutions.

02. *The relationship between your graduation (project) topic, the studio topic, your master track, and your master programme*

Whereas the Engineering discipline is aimed at finding a solution to a specific problem, Architecture constantly poses questions on how things could be different. It questions not only what happens, but 'what is going on in what happens'. By constantly posing new problems, new ways of thinking and doing can be achieved. Eventually this does not just result in new types of buildings, but new ways of living as well.

Therefore I came to understand that what is important is not only between true and false solutions, but between true and false problems. How can we be sure that what we have stated is a true problem? After this we wonder, what could be a practical engineering solution to this specific problem?



1. Research/design sequence, own illustration based on (Mejia et al., 2020)

In the case of the proposed hydraulic building typology the material preference gets an extra dimension as the weight of the construction largely determines the characteristics and the floating structure should be able to deal with movement and (in)stability. To determine exactly what choices to be made, material studies had to be carried out regarding buoyancy, weight, manufacturing and water resistance. Regarding the construction the project also utilizes the 'open building' principles examined within the Architectural Engineering graduation studio in order for the project to assure flexibility and durability as well.

03. *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*

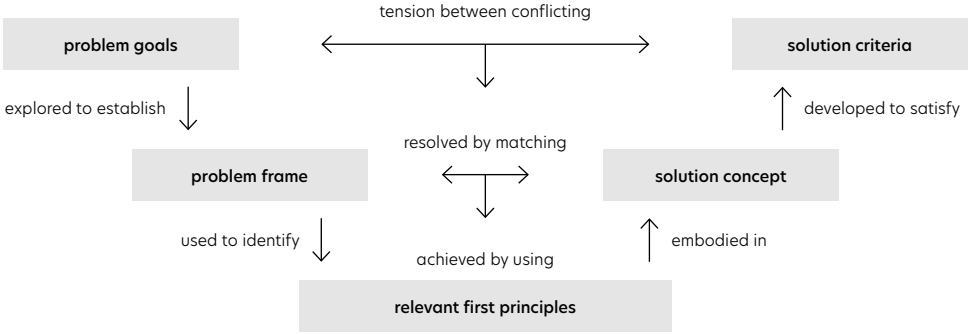
To set the route for future developments I applied various time-based approaches, as introduced by Andy van den Dobbelsteen. The interrelated use of forecasting, backtracking and backcasting enabled me to find solutions from history, the present and the desirable future. This method helped me to cope with the uncertainty of current day predictions, while designing for the future.

Instead of what we need right now, the question should therefore be about what is needed on the long term. While keeping in mind the transition requirements and a clear overview of recent scientific predictions, how can a flexible far-future solution be determined towards which can be navigated?

In order to distill from relevant architectural reference projects usable design principles in a responsible way the following questions posed by professor Carola Hein I kept in mind: How can we use interpretations of the past to propose certain design decisions which will shape the future built environment? How to avoid findings to be based solely on personal interpretation? Therefore in this analysis what I found to be important is to explore the thoughts behind existing water management projects, to try and understand which reasons led to its creation. In this way not the form or function will be analyzed, but the resulting capabilities, that can be redeveloped and used again.

04. *Elaboration on the relationship between the graduation project and the wider social, professionall and scientific framework, touching upon the transferability of the project results*

The starting point for this research is based on the assumption that a new building typology can contribute to reducing the housing shortage while generating resilience instead of vulnerability to flooding. The overarching goal is to reduce the flood risk in densifying outer dike areas and contribute to a changing mindset towards living with the increasing risk of flooding. In the context of the current defensive mentality, communicating through architecture a new perception, which embraces and benefits from the qualities natural water can bring to the built environment, will ultimately aid transition through increasing awareness.



2. Research by design, Diagrammatic model of creative strategy, own illustration edited from (Cross, 2006)

The typology will be designed to be part of a bigger network of spatial interventions and function along with other existing water management solutions. The diagrammatic design will be used to introduce a housing typology which can be use performed in different ways. The detailed design targeting the project site is a manifestation of the diagrammatic design which shows the possibilies inside a specific context. For the purpose of this detailed design the research will focus on experimenting with design principles rendering visible and utilizing natural water to enhance spatial qualities benefitting everyday life. The final design will be presented as an imaginative case-study and can be seen as an experimental form of research. Therefore my aim is not necessarily to solve the complex issue on my own, but rather to investigate into, and add to, the growing amount of possible architectural solutions generating resilience, which, in turn, could be implemented or used as food for thought in the near future.

05. *Discuss the ethical issues and dilemmas you may have encountered in doing the research, elaborating the design and potential applications of the results in practice*

Regarding the effects of sea level rise and increasing flood risk, there are a couple of ethical dilemmas on a national scale concerning the various pathways we could collectively choose for. On the long term, with the new phenomenon of rising sea levels and more extreme weather conditions, is it at all wise to even further densify a flood sensitive area below sea level? As many people do not seem to be aware of the current situation and the challenge ahead, however unrealistic it may sound: To prevent a catastrophe which could cost the lives of thousands of people, isn't it wiser to house ourselves elsewhere? For both ethical but also economical reasons: How long will it be worth the investment to preserve our own territory?

More specific on the approach of my own research, whereas I am doing research into how to combine flood barriers with housing: Is it desirable as an architect to contribute to experiment with people living in densifying flood prone areas? Although the project is aimed at generating flood resilience and trying to understand how living with water can add quality to everyday life: Are these spatial qualities, which may turn out to be partly subjective, worth the risk, investment and effort on the long term?

06. *Planning towards P5*

During the final period of my graduation project I will mainly be focusing on the development of the technical and social aspects of the design proposal. A necessary next step is to further develop the 'human touch' and visualise the variety of flexible infills the design has to offer. By working on the integration of the flexible infill scenario's, related to the open building principles, and the additional detailing that comes with it, my design proposal can (and should) take the next step. Also, personally I think this would be more educational than spending weeks on a physical model, as much as I would like to do that.

Preparing my P4 has been a good exercise, also regarding my design process. It gave me a clear overview of the parts I still need to focus on. Right after P4 it is therefore wise to determine exactly which other aspects to detail further. This will be the aspects that are most characteristic about the project and the corresponding construction philosophy. Inevitably there will be some aspects of the project left less defined. Regarding these aspects I think in order to tell a realistic and complete story at my P5, I should provide a proper perspective.

Finally I plan to spend this time to further test if my approach has worked and reflect on the goals I have set for my project in relation to the scientific framework.

Next to my graduation project I spend quite some time on (architecture related) work and side projects. During the last period of my graduation I choose to fully focus on my graduation project as I think there are still lots of aspects to improve on. Knowing myself, I think it is worth the effort to make sure I finish my studies with a project I am proud of and can look back at with satisfaction.