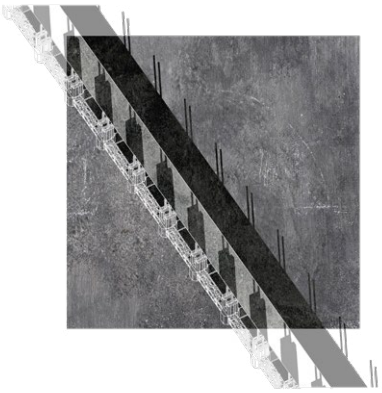

REFLECTION

Master of Science Architecture, Urbanism & Building Sciences

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Building technology tutor: Pierre Jennen
Research tutor: Luca Iuorio
The Delegate examiner: Hugo Legoux

THE LIVING BARRIER

The architectural adaptation of existing flood barriers on Zeeland's biodiversity synergy.

AR3AE100 | aE Graduation Studio |2022-2023

REFLECTION

BACKGROUND

From Bangkok to Delft. Studying in a different environment and culture provided tremendous opportunities to learn new knowledge and extend my perspective to see the world differently. Notably, In the Netherlands, the concern about climate change and environmental issues in architectural fields was significant at every step, from the conceptual design and construction process to the material selection. Because of environmental concern, both in the academic and professional sectors, has considerably influenced and motivated my graduation topics associated with climate change and environmental impacts, such as the acceleration of Sea level rise and the impact of the massive construction on biodiversity. When it comes to the topic of Sea level rise in the Netherlands, it is inevitable to mention “The Delta works.” Even though flood barriers successfully protect the country for seven centuries, Sea level rise will not stop. Therefore, it is time to reconsider the adaptability of existing flood barriers to deal with future uncertainties.

This graduation project is primarily concerned with the further innovative stage of the existing flood barriers, which is essential to comprehend the existing structural systems and identify a new structure that can apply in specific proportions, climates, and surroundings. It also includes investigating the possible solution on how these existing flood barriers can be adaptable to future uncertainties from the point of view of an architect. In order to achieve the goal of the project, The architectural engineering graduation studio and the studio theme of Second Life and Stock are the best support for my graduation project. “The Living Barriers: The architectural adaptation of existing flood barriers on Zeeland’s biodiversity synergy.” This is because the studio provides knowledge that involves multiple aspects, from urban scale to technical detail.

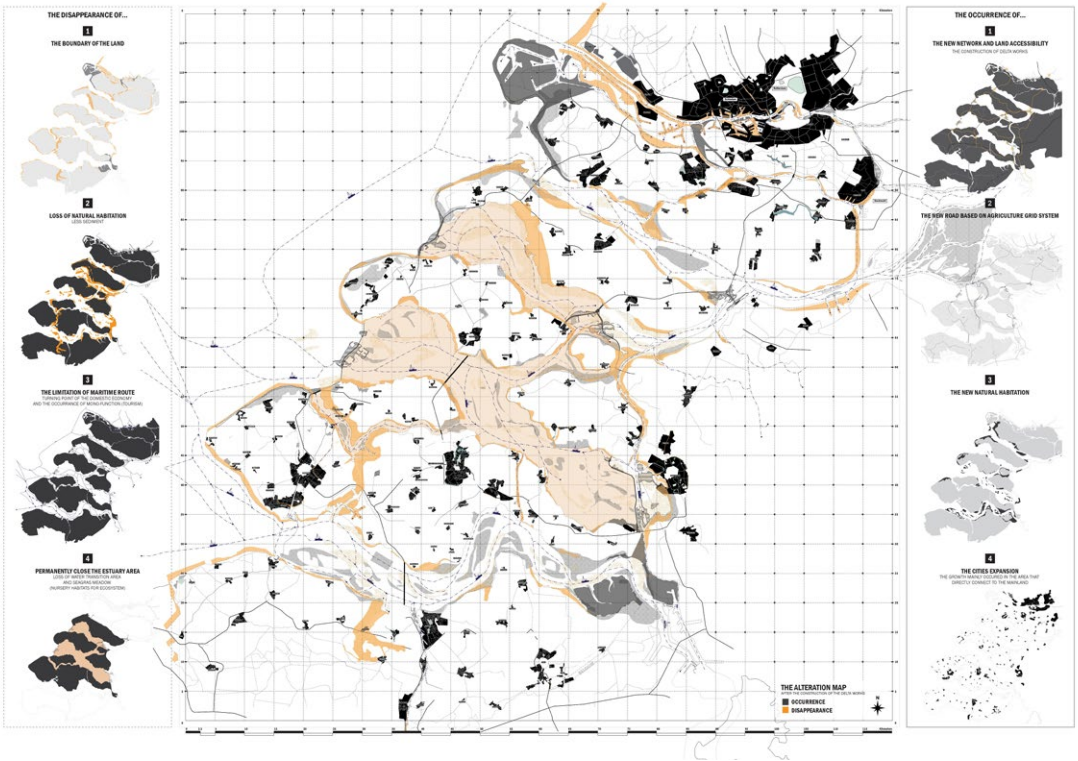

Fig.1: The alteration maps indicates the change on the surrounding before and after the construction of the Delta Works— Illustrator by the author

THE CHOICE OF THE METHOD

THE TRANSITION FROM RESEARCH TO DESIGN

The massive scale of the flood barriers in The Delta works on the surrounding influenced the way of this graduation project process. The methodology in the research and design was intentionally planned to bridge the gap between research and design. It began from XXL to XXS, from the urban scale, architecture scale, and detail level.

Because of the involvement of multiple aspects of flood barriers, the methodology required a particular configuration. Therefore, there are three phases of overall research and design: two phases of the research part and one phase of the design. The first two phases mainly focus on the urban scale of the flood barriers in order to understand the principle from the past, investigating the potential for the future and the impact of these barriers on the surrounding. The main point of the research part is understanding the existing systems' characteristics before designing something further. After understanding all of the systems as a consequence of the research phase, The outcome of the research indicated, Site selection, The characteristics of each type of flood barrier, and The multifunctionality of flood barriers on an urban scale. Especially the multifunctionality is the main point of the last phase but not only on the urban scale. The investigation of the design part focuses on how multifunctionality can be applied on every scale. Thus, the last phase focuses more on the new solution on what and how we can reuse the existing flood barriers in architecture and human scale.

LEARNING BY DOING, MAKING, THINKING,..

My method of comprehending my project is to learn through doing, thinking, making, reading, sketching, modelling and other means. Trying several methods during the process allowed me to observe the project from many angles and better comprehend it.

The complexity of the project in detail sometimes overwhelms others with the information. Dividing the method into three phases, starting from a larger scale and gradually zooming in, helps read the project. Nevertheless, having only three phases might be missing some detailed information, and the project is quite a large scale for a one-year graduation project. Even though it can complete on time, dedication for weekends and hard work are needed. This project has a lot of hidden information and additional knowledge. It requires an expert from different expertise to guide, such as a hydraulic engineer, structural engineer, landscape architect, urban designer, architect, or ecologist. Another point to underline is that additional research should be included in the design part because the research section was solely focused on the urban scale—for example, the extra investigation about the extreme climate, nature dynamics force, wind simulation, material use, joinery, and more.

Although many struggling moments came through during the year and challenged my ability every week, I did discover new knowledge since the beginning of the project. Thanks to the project's complexity, it forced me to learn a new area of expertise. For example, I Learned how the Netherlands systematized and protected the country from flooding, such as the Delta Works, Reusing the existing structure and concern about the environment on every scale. I was challenging myself to design architecture in a specific context. Even the detail of the floor and wall insulation systems is also part of my new learning because of the different climates between Thailand and The Netherlands.

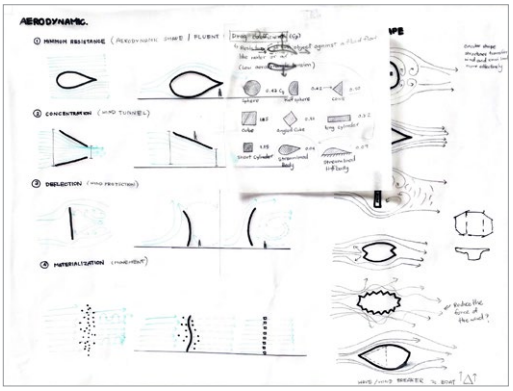

Fig.2: Additional research of Aerodynamic— Sketched by the author

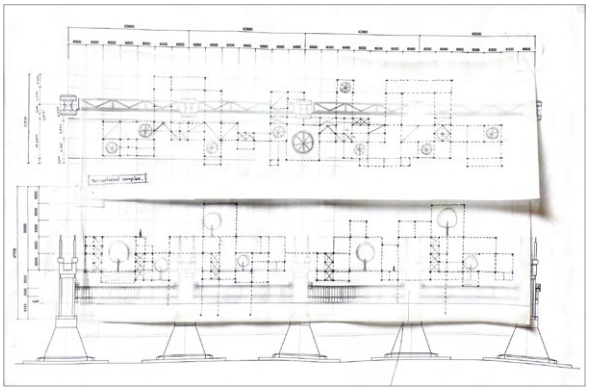

Fig.3: Schematic Sketch— Sketched by the author

THE FINAL PART OF GRADUATION THESIS

THE ACADEMIC AND SOCIETIAL VALUE

From the beginning of the project, the aiming is to find the method of how the architectural designs can deal with the future unpredictability of rising water levels and the adaptation of the existing structure. The research part focuses more on the past, and the design part is about the present problem and near future. The final part of this graduation project is about adaptability in the prospective future of 10 or 20 years. As one of the research results is that everything is not permanent and will need continuous adaptation. The potential of this area of flood barriers provides both land and water accessibility. It would be a great opportunity as a floating communities hub with the projection of the future would be more and more floating houses. Thus, the last part will demonstrate how this architecture could evolve through time, either multiplying or adjusting to a new purpose based on the structure joinery design that allows for an expanded area.

The value in the academic term. The dedication of this graduation project is to demonstrate that architecture design is not limited only in the urban area. If we see the opportunities, architecture can be much more than a building for living. Architecture can be a middle ground that connects different fields, such as biodiversity, engineering, landscape, and urban design. Because everything is connected, it is better to incorporate all the expertise in the project to see the different views and find the best solution together.

The value in the societal term. The project about climate change is not only to find the solution but also to raise awareness in society. We have lived with the term climate change for more than a century; it has been normalized, and people may begin to believe that nothing has happened or that there is nothing we can do about it. It is time that we have to turn adverse outcomes into opportunities. In the professional area, climate change matters come after money. This project also encourages people to reconsider what we should do for our planet.

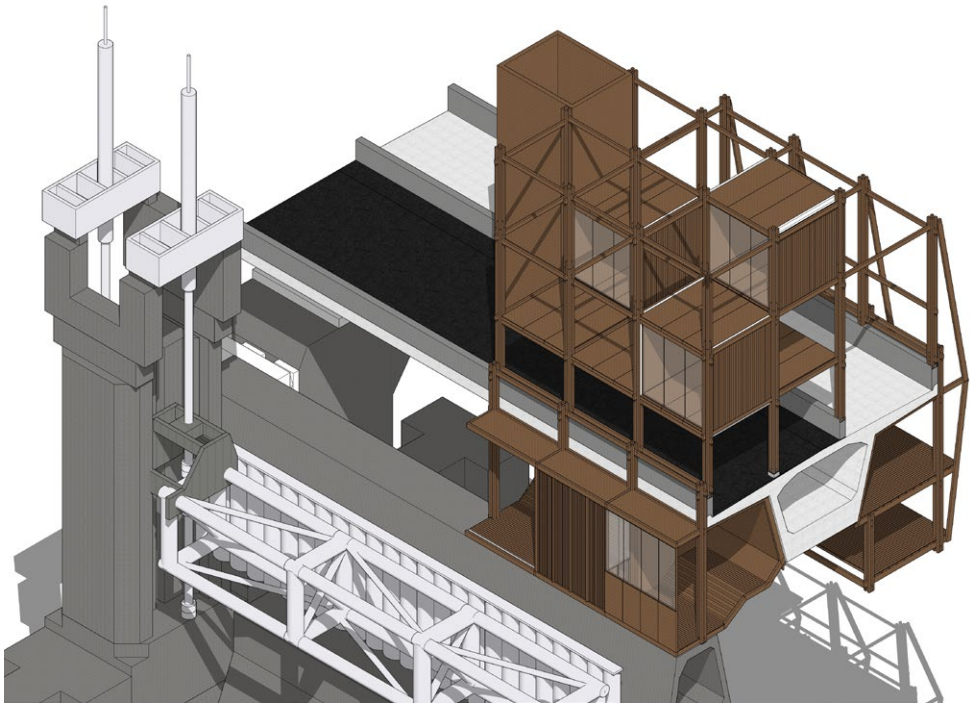

Fig.4: The diagram of the space typology — Illustrator by the author