Graduation Plan

Master of Science Architecture, Urbanism & Building Sciences

Graduation Plan: All tracks

Submit your Graduation Plan to the Board of Examiners (Examencommissie-BK@tudelft.nl), Mentors and Delegate of the Board of Examiners one week before P2 at the latest.

The graduation plan consists of at least the following data/segments:

Personal information	
Name	Bregje Walkate
Student number	4575334

Studio		
Name / Theme	Technologies and Aesthetics	
Main mentor	Peter Koorstra	Architecture and Design
Second mentor	Veerle de Vries Koen Mulder	Architecture and Architectural Engineering Building Technology
Argumentation of choice of the studio	The hands on approach that this studio encourages inspires me. You learn by doing and by making your ideas visible in models and hand drawings. I feel happier working with my hands instead of working digitally on the computer all day.	

Graduation project	
Title of the graduation project	When Groningen lets the water flow. A vision for an energy efficient building that makes use of natural elements for its energy supply, situated in the province of Groningen a 100 years from now.
Goal	
Location:	North of Groningen
The posed problem,	At present, the marshland area in Groningen is being confronted with multiple challenges due to the consequences of climate change. The region is experiencing significant water

	inundation from both rainfall and overflowing rivers and lakes. Certain areas have even become impassable due to the high water levels. As the soil is frequently inundated with saltwater, the agricultural sector is confronted with the issue of salinization in the area. It is evident that the Groningen marshland area is pushing the limits of functioning under the current conditions. The region lacks future resilience and if no interventions are implemented to address these issues, the North Groningen area will most likely become uninhabitable in 100 years.
research questions and	What kind of urban development interventions are needed for a village based in North Groningen a 100 years from now? Within this future village, how can you make use of the surrounding water, wind and heat to improve a building its energy efficiency? What consequences would this have for the building typology and its aesthetics?
design assignment in which these result.	A cultural community center that will provide the cultural needs for the future village in the area of North Groningen. It will function as a theatre and community center for cultural activities. Design choices will be based on improving the efficiency of the energy supply by making use of the building its surroundings (water, wind, heat, sunlight, soil).

[This should be formulated in such a way that the graduation project can answer these questions.
The definition of the problem has to be significant to a clearly defined area of research and design.]

Process

Method description

First, the current situation in the province of North Groningen will be examined, focusing on the functioning of the area in terms of water management, heat

exposure, and land use. Based on climate predictions and adaptation strategies, a future scenario will be sketched for each aspect. These results of these aspect scenario sketches will be combined into one comprehensive future scenario, further developed at multiple scales: urban, local, building level and detail.

Subsequently, a more detailed exploration will be conducted into the architectural typology of theaters and community centers. Guidelines will be mapped out that can be followed during the design phase.

Throughout the scales, creative solutions will be explored for the natural elements of the environment (water, heat, sunlight) to benefit the energy provision of the cultural center within the envisioned future scenario.

Ultimately, this research will form a range of principles that can further be developed during the design process. Additional suggestions for subsequent research steps will also be provided.

Literature and general practical references

[The literature (theories or research data) and general practical experience/precedent you intend to consult.]

For creating a future scenario, climate data charts are used of the KNMI that show weather forecasts in the Netherlands in 2100 and more specifically in Groningen. Based on the KNMI'23 climate scenarios, predictions are made for a future climate. KNMI - KNMI'23-KlimaatScenario's. (n.d.). https://www.knmi.nl/kennis-en-datacentrum/achtergrond/knmi-23-klimaatscenario-s

Deltares created four adaption strategies for the spatial planning of the Netherlands. I will explore one of their strategies 'Meebewegen' and adapt it in the Groningen landscape. On the website of the Ministerie of infrastructure and water, lots of sources can be found about their adaption strategies and policies:

Lieke de Jong her concept of creating sweet water sources on saline ground:
De Jong, L. (2021). Zoetwater Erven op zilte bodem. Issuu.
https://issuu.com/bouwkunst/docs/zoetwater_erven_boek_online_small_14-6-2021

More literature and reference sources can be found in the bibliography of the research document.

Reflection

1. What is the relation between your graduation (project) topic, the studio topic (if applicable), your master track (A,U,BT,LA,MBE), and your master programme (MSc AUBS)?

The studio topic explores different future possibilities for living in the wetlands of Groningen. My topic explores the possibilities, takes one and develops it further on an

architectural scale. A scenario is created wherein an architectural design can be positioned. To be able to design for the future and all the challenges that this brings is also in line with the master programme as the description of the Master's programme says it explores innovative ways to create more sustainable development. Which is exactly what I'll be doing with my project.

2. What is the relevance of your graduation work in the larger social, professional and scientific framework.

   My research builds on the spatial adaptation strategies from Deltares and LOLA. While incorporating climate predictions from the KNMI. The Deltares report indicates that creative solutions are needed to make the Netherlands future-resilient. My research investigates the possibilities that Deltares' adaptation strategy can offer in the north Groningen area.