

# 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](mailto: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	Jules van Hoof
Student number	4653033

Studio		
Name / Theme	Architectural Engineering + Technology	
Main mentor	Mauro Parravicini	Architectural Engineering
Second mentor	Fransje Hooimeijer	Environmental Technology and Design
Argumentation of choice of the studio	<p>Because of the omnipresent challenges within the <i>societal, environmental and economic</i> systems that the world is currently facing, I chose 'Architectural Engineering' as my graduation studio. The role of the architects' profession has been subject to change in regard to these challenges, and the building industry lags far behind compared to other more industrialized industries. Therefore, there lies great potential for <b>innovation</b> and creative solutions in order to overcome these challenges for the better. Within the studio I would like to be more involved with innovation and thinking about architectural solutions in relation to the <b>housing shortages</b> and <b>sustainability</b> challenges of today. As of now, I believe that having the freedom to do research on the topic of my preference is present within this studio.</p>	

Graduation project	
Title of the graduation project	Water inclusive 'Open neighborhood'
Goal	
Location:	Havenstad, Amsterdam
The posed problem,	Although <b>water</b> is the most valuable resource on our planet, it is not being used to its full potential. It stands at the basis of all life on earth as we know it, yet it is hardly implemented within the physical appearance of the built

	<p>environment. Due to climate change, an increase in <b>precipitation</b> and land <b>subsidence</b> is measured. Simultaneously, increasing temperatures result in the dehydration of soil and the urban heat island effect. To achieve a sustainable world, buildings and neighborhoods need to be <b>resilient</b> and designed for change to be able to withstand the increasingly becoming more extreme conditions of the environment. Therefore, the usage and implementation of the water cycle should be made more efficient and inclusive in order to contribute to a healthier and circular living environment. Together with environmental challenges, the Netherlands is also dealing with a <b>housing shortage</b> and an urgent need for <b>affordable</b> housing solutions in order to build <b>1 million homes</b> before 2035. Real estate speculation and its economic consequences result in a highly competitive and inaccessible housing market for part of the Dutch population.</p> <p>Changes and potential disturbances in <b>sociological compositions</b> are likely to be a result of these issues. To meet the needs of future generations, not only the production and <b>quality</b> of houses should be considered, but also the <b>affordability</b> and <b>flexibility</b> of housing within the built environment and its challenges with regard to the <b>energy transition</b> and <b>climate change</b> should be planned carefully. Unfortunately, the current relationship between buildings, the environment and its waters is in poor condition. Although the implementation of an 'Open Building' approach can possibly be a risk regarding this relationship, it can also be a design opportunity to complement one another.</p>
<p>research questions and</p>	<p>"How can GreenBlue infrastructure be integrated within the 'Open Building' concept to create/ contribute to a 'net positive (circular) water cycle' which simultaneously achieves nature inclusive public space in a mixed use, high density neighbourhood?"</p>
<p>design assignment in which these result.</p>	<p>Water inclusive/ GreenBlue 'Open neighborhood'</p>

To accomplish the beforementioned, the objective is to create a high density, mixed use (circular) neighbourhood based around the principles of GreenBlue infrastructure combined with the 'Open Building' concept to transform the Western Harbour Area into a publicly oriented nature inclusive environment.

## **Process**

### **Method description**

A division between research, design and study coexist throughout the graduation project in order to complement each other. Whereas the first part of the graduation studio will mainly focus on conducting research, the second part will be about translating the performed research into a final design. Nevertheless, there will be a cross-pollination between research, design and study throughout the entire process.

Four different methods are being deployed to be transposed for implementation in the second phase. Proven to be established methods, this implies: contextual analyses, literature studies, data analyses and case studies.

Contextual analyses: morphology, material culture, ecology, historic research, mapping

Literature: epistemes, foundations, justification, facts & figures

Data: numbers, water system analysis, water cycle analysis, water properties analysis, open building

Case studies: greenblue, open building, systems options

The research structure will be followed in order to answer the subquestions which eventually lead up to answering the thematic research question. During the process simulation research is always present by prototyping and building (digital) models and sketching. Research by design will be combined with the research carried out according to the research structure in order to bring about reciprocal feedback.

## Literature and general practical preference

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## Reflection

### Relation

Due to strong urban densification currently happening worldwide, the implementation of the water cycle in the built environment is at risk. There exists an ubiquitous misconception of creating a high density neighbourhood while simultaneously achieving nature inclusive public space. The usage of water within the built environment is evident, but needs to be improved drastically in order to contribute to these challenges. In relation to the technical nature of the graduation studio it is the objective to strive for a net positive water cycle in the built environment. An attempt to incorporate the water cycle to create qualitative nature inclusive public spaces within the 'open building' concept to change and renew the relationship of residential neighbourhoods with their environment. This project strives to bring back the balance between liveability and socio-political, environmental and economic behavioural patterns within the city. The interrelation between a small neighbourhood and architecture as built form will be of central importance.

### Relevance

The increasing exposure of cities to the effects of climate change are a major part of today's architectural discourse. An increase in precipitation, flood risk and land subsidence within the contexts of Amsterdam is measured. Simultaneously, increasing temperatures result in the dehydration of soil and the urban heat island effect. Together with environmental challenges, the Netherlands is also dealing with a housing shortage and an urgent need for affordable housing solutions in order to build 1 million homes before 2035. Evidently, the need for housing also applies to the

city of Amsterdam, given that it is the biggest city in the Netherlands and currently very popular among a variety of people. In order to achieve a sustainable addition to the housing stock, buildings and neighbourhoods need to be resilient and designed for change and diversity to be able to withstand the societal, environmental and economic challenges of today. Regarding the plans of the municipality of Amsterdam for the Western harbour area, this graduation project seeks to respond to these challenges by finding and exercising design interventions within this area. Combining the concept of 'Open Building' with the optimisation of the water cycle, a new resilient neighbourhood is sought after in order to complement each other towards an inclusive, affordable, and resilient healthy living environment. Summarised it addresses:

**Societal:**

Climate change

Current housing shortages

Different scales

Contributes to future proof healthy living spaces

Connects liveability, socio-political, environmental and economic problems of Amsterdam to broader context

**Scientific:**

Various studies have been carried out and published on the water cycle as well as on open building.

To my knowledge however, none have been studying the possibility of combining these topics.

Research will contribute to future developments related to water circularity and open building.

**Professional:**

Providing insight in the challenges and opportunities of water circularity and the built environment.

Providing possibilities for future developments related to water circularity and open building.

Determining a 'blueprint' for implementing outcome of research into the built environment.