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

<table>
<thead>
<tr>
<th>Name</th>
<th>Maria Sachsamanoglou</th>
</tr>
</thead>
<tbody>
<tr>
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</tr>
</tbody>
</table>

## Studio

<table>
<thead>
<tr>
<th>Name / Theme</th>
<th>Flowscapes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teachers / tutors</td>
<td>Frits van Loon, Kristel Aalbers</td>
</tr>
<tr>
<td>Argumentation of choice of the studio</td>
<td>Landscape Architecture Studio</td>
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## Graduation project

<table>
<thead>
<tr>
<th>Title of the graduation project</th>
<th>Dordrecht floodscapes. Towards the amphibious city</th>
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## Goal

<table>
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<tr>
<th>Location:</th>
<th>Dordrecht, The Netherlands</th>
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<tbody>
<tr>
<td>The posed problem,</td>
<td>The island of Dordrecht is one of the most flood-prone areas of the Netherlands. The expected sea level rise and the increasing extreme cloudbursts caused by climate change, in combination with the increase of urbanization and the limited evacuation possibilities, pose an extra threat. This problem has been up to now tackled through monofunctional approaches which failed to incorporate aspects of urban life, address other problems (e.g. ecology) or take advantage of existing potential, while they also alienated the city from the water, altering the identity of many watercities. Within the urban fabric, with the ratio of permeable-green surfaces severely decreasing, giving their place to hard, paved areas, the available room for rainwater diminishes. Furthermore, as precipitation levels rise exponentially, the existing sewage facilities become insufficient, often overflowing and necessitating a separate system for rainwater</td>
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management.

Therefore, apart from the evident hazards of river flooding, Dordrecht is now faced with a new risk; that of cloudburst flooding (wateroverlast).

research questions and

In an era of rapid climate change, how can Dordrecht transform into an amphibious, multifunctional spatial entity with increased flooding capacities, but also a testing ground for an attitude shift towards water within the city boundaries?

design assignment in which these result.

To create a blue-green network that can accommodate excessive rainfall, but at the same time acts as a series of public spaces intertwined with urban life, enhancing biodiversity, fostering social dynamics, offering alternative and contrasting spatial experiences and strengthening the identity of Dordrecht as a contemporary watercity, where water is a visible and tactile feature. In this way, the term ‘controlled flooding’ can be introduced, that aims to resolve flooding nuisance, while upgrading the urban environment and the experience of the city, charging the project with a dual meaning and proving that water can, in fact, be a desired quality.

Sustainability, hence, is the first goal of the project, a 3-dimensional goal including ecological, social and dynamic aspects.

Ecology is approached in terms of flood protection and relief of the sewage system, but also in terms of water management, regarding the city as a sponge that can retain, store or dispose higher quality water. A general environmental upgrading can be achieved through this green-blue network with a richer and more diverse urban nature. The ecological aspects will focus on the mapping and analysis of existing problems and potential and on the design of a new urban system for managing rainwater and for establishing more favorable conditions for biodiversity within the city.

The social aspect aims to improve social life in the city, by upgrading the public spaces and offering better recreational possibilities. In these redesigned public spaces, the community spirit can flourish and the city’s identity can be redefined, becoming a place where people will ascribe new, stronger meanings and form an innovative, prosperous society.

The dynamic aspect seeks to highlight the inherent fluidity of an adaptive landscape, such as the one of Dordrecht. The everchanging outline of the island, exposed to the forces of the rivers and the sea, can be a motivation to embrace this dynamism, by introducing it into the urban realm and providing the grounds for a more exciting, unexpected and surprising urban life.
The second goal concerns experiential aspects aiming to discover how materiality and more specifically the presence/absence of water can create totally contrasting spatial experiences in an everchanging, amphibious city. It is, therefore, rather focused on the intangible and the perceived, the senses and the interaction with our surroundings. This part is more of an experiment that seeks to accommodate varying living environments in the same place under different circumstances, for instance how a specific area is perceived in dry, wet and flooded conditions and how humans react to these changes.

**Research sub-questions:**

- How is Dordrecht related to water and how is the flooding nuisance expressed in the city?
- How can we increase a city’s flooding capacities using a set of climate adaptation measures and principles?
- How can Dordrecht transform into an amphibious, multifunctional spatial entity with a redefined relationship with water?
- How can we answer to climate change by testing new approaches, but also contribute to an attitude shift towards water within the city boundaries?

**Process**

**Method description**

Throughout the whole project, a continuous loop between research and design will be carried out, with the one informing the other and vice versa and with the objective gradually narrowing down to more specific ideas and solutions.

**Working through scales** (design research and research-by-design)

In this project, research will be conducted on all scales: On a macro-regional scale (province), I will try to understand the wider framework and the conditions that may affect in any way the subject. On a meso-local scale (city), I will research on flows, such as water, ecology and people, to understand how they are related to the subject and to reveal interrelations and establish/restore connections between them. Finally, on a micro scale (neighborhood), I will dive into the experiential part to discover how the concept of the amphibious city can provide an alternative urban experience, challenging our idea of the conventional street, park or square.

The first two scales will be mainly used for reading-analysing the site, while the third will also be employed to edit the site through the detailed design. This does not imply in any case that the scales serve a one-sided purpose; on the contrary, research will not stop at the city scale, while, similarly, design does not only concern the neighborhood scale, but has more or less direct impacts on the city or even the province scale.

**Discovering correlations** (research-by-design)

Time and scale will be correlated in a matrix, that will record the changes over the years (now, in 10 years, in 50 years) through the different scales (neighborhood, district, city), in order to better express the various implications of the project and its evolution. Furthermore, three different situations will be compared; the current one (year 2018), and two future situations (year 2048); one that will emerge if we do not intervene and a desired one that includes the detailed design. In this way, design choices will be justified on the grounds that, they not only provide a better future but also improve or solve the
shortcomings of the present.

**Mixed methods approach** (design research)

The research methods I will use will be both quantitative, including numerical data and calculations (flooding probabilities, expected maximum precipitation levels, additional retention space etc.), but also qualitative ones, through e.g. study and application of social sciences theories or personal observations (psychology of space, perception, human behavior etc.), incorporated into a mixed methods approach (Creswell, 2009) for data collection.

**Precedents study** (design research)

A separate chapter will be devoted to the study of precedents that have in the past addressed similar cases and, mostly, to how they tackled them. This study will reveal correspondencies among projects seemingly different at first; correspondencies originating from common principles, which defined the fundamental choices in each project. Through a process of generalization, knowledge will become detached from the context and, hence, generic and applicable to other contexts. This generic knowledge, the extracted principles, can eventually inform the research in question and be applied to the case of Dordrecht, becoming again specific and context-related.

**Literature and general practical preference**


Meyer, H. and Nijhuis, S. (2013). Delta urbanism: planning and design in urbanized deltas – comparing the Dutch delta with the Mississippi River delta, in: Journal of Urbanism, 6(2)


https://english.deltacommissaris.nl/delta-programme

http://www.urbangreenbluegrids.com/

**Reflection**

**Relevance**

This research can be seen as part of an ongoing global discourse concerning climate change and its widely discussed manifestations; scientists talk about global warming, sea level rise and extreme weather events, such as sudden and heavy downpours or prolonged periods of drought, and politicians organize summit conferences to discuss on possible adaptation measures and prevention of natural disasters, while at the same time another part of the globe is struck by a storm, completely flooded or buried under tons of mud, because a stream was infilled or because a forest was recently burnt; after centuries of human over-exploitation, nature strikes back, reclaiming its lost territory. The reclamation process is fierce, often leaving hundreds of casualties on its way.

In this sense, the project is expressing the fears and desires of a society that dreams of a sustainable future and of responsive, adaptive new environments. Having a clear, climate-proofing orientation, it aspires to become part of a global agenda, contributing the least in the aforementioned discourse. It can, therefore, become a starting point towards cloudburst treatment and urban resiliency, highlighting the role of landscape architecture among the disciplines involved in this purpose and demonstrating how design can provide sufficient answers to major societal issues. Despite the site-specific features addressing the city’s unique character, this research aims to develop a framework and an approach, the principles of which can be extracted and applied in any flood-sensitive urban context, transforming it into a resilient spatial entity.

Apart from that, however, the project has also great value in terms of ecology and biodiversity, since it seeks to maximize the potential of urban nature, by creating a green-blue network and, therefore, room for flora and fauna to thrive within the city; it will eventually enable, thus, the creation of new and more diverse plant or animal communities, but will also allow migration processes and species flows to and from Dordrecht.
The project is also an attempt to foster community spirit and social dynamics, by designing public spaces of high quality, where personal engagement and sense of belonging will be top priorities; these attributes can, hence, transform them into “places”, to which new, stronger meanings will be ascribed and where a future, prosperous society can flourish and evolve.

This climate-driven research can, furthermore, trigger economic development, by introducing the concept of the “innovative watercity”, that can provide a role model for sustainable urban design and can, therefore, attract investments and capital, thanks to new permanent residents, professionals, tourists or researchers; consequently, the role of Dordrecht itself within its wider area might significantly change in respect to other cities, allowing for an upgrading from Rotterdam’s “satellite city” to a major, self-reliant city of South Holland.

At the same time, the research can contribute to an attitude shift towards sustainable, multifunctional practices, rather than the conventional, monofunctional ones, as well as towards the re-integration of water into the urban realm, which is no more considered as an unwanted feature, but on the contrary a desired quality that strengthens the identity of the city. Most of all, it is a research that can prove how design can subvert deeply-rooted mentalities and strongly established conventions, in a way that it can greatly influence our worldviews and the ways we perceive our surroundings.

### Time planning

**P1: Project hypothesis, approach and site analysis**
- Project idea, provisional project title and outline
- First theoretical and methodological structure (problem statement, research question and objectives, research design, methods)
- Start of glossary
- Literature and policies study (waterplan, structuurvisie etc.)
- Precedent research and design principles (SLA, Trdje natur, Urbanisten, Effect, Studio Dreseitl)
- Site visits
- Initial site analysis – maps:  
  - scale 1:200,000 (context, green)
  - scale 1:100,000 (context, mobility)
  - scale 1:50,000 (blue, green, mobility, characters, flood-related features)
- Initial concept & design thoughts (maps scale 1:10,000 blue, green, water flows & vision collages)

**P2: Diagnosis and concept design**
- Choice of focus site
- Site visits
- Revision and elaboration of analysis-maps:  
  - scale 1:200,000 (context, blue, green)
  - scale 1:100,000 (context, mobility)
  - scale 1:50,000 (blue, green, mobility, characters)
  - scale 1:10,000 (flood-related features)
- Start inventory of streets & public spaces (profiles scale 1:300, plans, materials, views, facades, details, flooding scenarios, potential)
- Results of analysis (overlay-conclusion map scale 1:50,000)
- Start of graduation report  
  - Abstract  
  - Contents  
  - Foreword  
  - Introduction (problem statement, research objective, site selection, relevance, reading itinerary)  
  - Research framework (theoretical background, research methods, research design)
- Elaboration of Glossary
- Concept and principles
- Graduation plan

**P3: Elaborated design**
- Finish inventory of streets & public spaces (profiles scale 1:300, plans, materials, views, facades, details, flooding scenarios, potential)- 10 streets and 10 public spaces (parks, squares, parking lots etc.) & draw conclusions
Calculation of extra retention space needed using relevant formula in focus site

Start design
- detailed drawings (masterplan & bird-eye view scale 1:2,500, plans & sections scale 1:200 for 2 spots, chosen detail(s) scale 1:20)
- 3D images/collages/sketches for 2 spots

Draft report (abstract, contents, foreword, introduction, research framework, precedents study, site description, analysis & diagnosis, design principles, initial design proposal)

Elaboration of reflection

Glossary

Start models for 2 spots (scale 1:200)

**P4: Final design**

Almost final reflection as part of final report

Final design
- detailed drawings (masterplan & bird-eye view scale 1:2,500, plans & sections scale 1:200 for 2 spots, chosen detail(s) scale 1:20)
- 3D images/collages/sketches for 2 spots

GIFs (transformation of masterplan scale 1:2,500 and 2 spots scale 1:200)

Matrix time-scale: (now, 2048, 2088) Vs. (1:2,000, 1:50,000, 1:100,000)

Comparison of 3 situations (now, 2048 no intervention, 2048 with intervention in scale 1:2,500)

Models for 2 spots (scale 1:200)

**P5: Public presentation**

Final integral report

Public presentation
- Storytelling (2 different people-users)
- 2 models (scale 1:200) and hanging projector showing the transformation process on the models (projection of GIFs/video)