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	Esmee Kuit
Student number	4566920

Studio		
Name / Theme	Transitional Territories	
Main mentor	Fransje Hooimeijer	Urbanism (Environmental Technology and Design)
Second mentor	Inge Bobbink	Landscape Architecture
Argumentation of choice of the studio	The project I will be working on was brought to me via civil engineering and is stated by the Province of South Holland. It is located in the middle of the *Groene Hart* area and is based around the reopening of the historic towing canals. This exploration will be done alongside a water management student of the faculty of Civil Engineering. What interests me about this project is to see how these biophysical connections could lead to other, nonphysical, connections such as socio-ecological, cultural, and political connections. As the project has been set with an investigative nature, it would suit very well to explore the current and future waterscapes and landscapes, look for their formation and change over time and reflect on their externalities as a trajectory for my thesis. In my opinion, this fits the brief of the studio states that 'Transitional Territories studio works on the present and future conditions of the urban and territorial project in lowlands regions'. As the project is located in between the rivers Rhine and Meuse, it fits within the delta area of the Netherlands and thus connects to the central theme of the studio. Furthermore, I think that the Transitional Territories studio could help me explore the interdisciplinary approach that concerns this project as the studio provides an interdisciplinary platform and is part of the Delta Futures Lab that is also concerned with the overlap between different disciplines. The studio also looks at the complex issues with regards to physical, ecological and political aspects. The complexity of the temporal layers and variety of scales in the context of	

	the project territory can be very well dealt with in the studio. Furthermore, the studio deals with representation in a manner that entices me. The almost poetic touch that the studio has on sometimes very technical aspects appeals to me a lot. It is a challenging way of working, but I feel that this will help me to get the most out of my project. These are all aspects that I feel this project could very well touch upon and that are very close to my heart, which is why this studio was my strong first preference.

Graduation project	
Title of the graduation project	Creating New Values with Old Connections
Goal	
Location:	Zoetermeer region (Zuid-Holland, the Netherlands)
The posed problem,	Firstly, the soil in the project area is sinking. This has always been the case, as this is what has made the area as people know it: the landscapes have retrieved their characteristics from the sinking soil. The two polder types in the area are not sinking equally fast. Because of the clay layer underneath the *droogmakerijen*, this area subsides less fast than the much wetter *veengronden* (Provincie Zuid Holland, n.d.). Given this, subsidence in both these areas is the cause of large costs as houses and critical infrastructure need to be repaired in large parts of the project area. There is a larger chance of nuisance caused by high water or periods of long rain. Currently, costs to solve these incidental issues are lower than tackling subsidence as an integral problem. This is also caused by the division of tasks among the several bodies of government. In the contemporary state of the system, the Water Boards are usually responsible for bringing in solutions with regards to the challenges that are paired with subsidence. They do this mainly in dialogue with the farmers in the affected area. Nevertheless, solutions need to change to include more strategic, location-specific resolutions for a longer period of time. The way these strategies are shaped depends largely on the distance between the location and the city. Tackling subsidence in a more integral way can not only reduce costs but can also reduce CO_2 which is released when oxidation of the peat landscape takes place. An integral way of dealing with subsidence is necessary, as the changing climate and increasing need for houses can cause subsidence to be augmented. In the long run, the current policy is not only

	the most expensive but also the option that will lose the characteristic landscape and its qualities (PBL, 2015). Changes in climate extremes have been reported worldwide since 1950 (IPCC, 2021). In the project area, these changes are exhibited mostly in the periods of the year that have historically been the driest or wettest seasons of the year, thus creating more extreme situations (KNMI, 2021). In the dry summer season, less water than normal is available. This causes freshwater scarcity and results in dry soils that retrieve water to a lesser extend than saturated soils. Droughts in the summer are caused by high temperatures during the summer month, but the problem set in in the spring when temperatures have been increasing and evaporation levels have been historically high over the last several years. In times of freshwater scarcity, subsidence increases. This has effects on agriculture and nature, but also on freshwater availability (PBL, 2015). Because of the expected increasing temperatures in the coming years, the chance of evaporation and thus drought stays high (KNMI, 2021). Whereas summers are dry, winters have become increasingly wet. Research shows that the number of days with rain have not changed, solely the intensity of the discharge has increased. The increase in rainfall causes a large potential for floods in the area (KNMI, 2021; PBL, 2015). This new shift in extremes asks for a new type of water management. Sea Level Rise (SLR) is posing uncertain threats. The rise of the sea level has rapidly been increasing over the last decades and is now set at 3,7 mm per year ((IPCC, 2021; KNMI, 2021). The speed with which the SLR is continuing relies on the decrease of emissions globally. Depending on that, the point on which the critical 1 metre SLR is exceeded, lies between 2150 and 2350 or much earlier between 2090 and 2040 (KNMI, 2021). Until 2050, prognoses about SLR are relatively similar, but after this year the lines of the several prognoses start to diverge. Because of the uncertainty after this year, it is becoming increasingly hard to predict an adequate way of intervening in the problem. This is because the lead time of interventions is steadily getting smaller. This means that the planning and implementation time of measures is just as long, or even shorter, than the time we need a measure to be read. It is thus to an increasing extent more important to implement adaptive measures (Haasnoot et al., 2020).

	SLR does not only pose a threat to the area with regards to flooding, the rising levels of the sea and the reduced discharge during the progressively dry summers cause the salinization of the groundwater and surface water (Kwadijk et al., 2010). This is the result of salt intrusion that is possible further inland because of the high sea levels. If this happens, salt water can reach the freshwater inlet at Gouda, which is then stopped as salt water has a negative effect on the current agriculture. In the occurrence of such an event, contemporary practice is that the climate-proof water supply (Dutch: Klimaatbestendige WaterAanvoer (KWA)) measure sets in. This means that the fresh water supply for the thesis territory will come from the Amsterdam Rijnkanaal via the Lek and the water system in the polder (Hoogheemraadschap De Stichtse Rijnlanden, 2017). If the sea level continues to rise, this measure will become the new standard and will have repercussions for the navigability of the Gouwe that leads ships to the Rotterdam harbour (Haasnoot et al., 2019). Continuation of the current use of the soil and the water in combination with the salinization of the rivers and groundwater due to SLR will mean that the challenge to supply fresh water to agriculture and consumers will be tough (Haasnoot et al., 2019). A last core issue in the project area is the urgent need for new houses. There is a large pressure on the Dutch housing market, especially around the Randstad, as published by the ministry of Dutch affairs (*Staat van de Woningmarkt. Jaarrapportage 2021*, 2021). The municipalities that border the area need 7390 houses, which translates to approximately 2500 houses in the area, as the number of households will increase until at least 2029 (BPD, 2021). However, building new dwellings in the area is not without risks. Houses will be built in a low-lying part of the country and are therefore at risk of flooding. The area is deemed dangerous, as stated by PBL. An area is dangerous when a potential flood can cause casualties or damage if there are people or capital (PBL, 2015). In addition, building new housing in the area is costly because of the subsidence (PBL, 2015), so the discussion remains whether this low-lying, sinking area is the best place to continue expanding the urban borders. The challenges mentioned in the context chapter of this report are all interconnected, as can be seen in Figure X.

	The interrelatedness, but also the unpredictable nature of these challenges makes spatial planning in the area increasingly difficult (Baptist et al., 2019). According to Haasnoot and colleagues (2019), the emphasis of future measures with to water safety lies on spatial planning. This includes the utilization of chances from other disciplines such as the energy transition, agriculture and housing, as these opportunities can be valuable with regards to water management in the long term. However, during the contemporary process of planning large scale infrastructures to help with water management in the Netherlands, that goal quickly deteriorates into the addition of small bits and pieces here and there. There is little to no regard for adding value with the implementation of large-scale infrastructures at the end of the planning process (Cheung, 2014). Because of the uncertainties that are paired with the challenges, and the way new large-scale infrastructures are most often planned, a new manner of approaching the project and combining functions to tackle the challenges in which the future value of the location is put forward is needed. To ensure the extensibility of the design to different disciplines (water management, agriculture, energy transition, infrastructures, housing), adaptive designs should be developed that are focused on the regional context (Haasnoot et al., 2019).
research questions and	To make the challenges from the problem statement tangible, a research question has been drawn up. In this way, the project can be broken up into separate entities that can be researched apart from and in relation to each other. The primary research question of the thesis is posed as the following: *How can the use of **a territory-oriented approach** in relation to **cultural-historical values** contribute to the **future value** in the Dutch polder landscape?* From the question, three key concepts can be deduced. These are territory-oriented approach, spatial quality, and the Dutch polder landscape. In the thesis these three will be used according to the following definitions: A] Territory-oriented approach (*Dutch: gebiedsgerichte aanpak, GGA*) – the approach is an integral area assignment

	on a local or regional scale that consists of spatial challenges that are consistent with each other and can be solved with added value. B] Cultural-historical values – traces, objects and structures that are part of the environment and shape the image of historical development. C] Future values – representing here and later, the future values refer to the value of functions throughout the time, they are the requirements for development and progress From these concepts, the secondary research questions are derived in the following way: [A]+[B], [B]+[C], [C]+[A]. This results in the following questions: [A]+[B]: How can a territory-oriented approach consider cultural-historical values? [B]+[C]: How can cultural-historical values be translated to future values? [C]+[A]: What future values can be reached by using a territory-oriented approach?
design assignment in which these result.	Following the research question, the projected outcome of the thesis will explain the importance of spatial quality through area development. The specific desired outcomes of the thesis are stated below. For completeness, they are paired with the related methods which can be found on the next page. • Understand what impact the cultural-historical value of the landscape and its historic use can have on the spatial qualities of a developmental area and thereby expand on the knowledge of incorporating cultural-historical values in a design [1, 2, 4, 5, 9]; • Understand what is the process of incorporating spatial quality through a large-scale infrastructure project and thereby expand on the knowledge of adding spatial quality with the creation of large-scale infrastructure projects in the Netherlands [1, 3, 4, 5, 7, 9]; • Translate the social-cultural values of stakeholders in the region into spatial qualities [4, 6, 7, 8];

- Translate the water management aspects of the large infrastructural project into spatial qualities [3, 6, 7, 8];
- Translate challenges as stated in the context into spatial qualities [2, 5, 6, 7, 8, 9];
- With all these insights, design interventions for a new waterway at various scales which consider the current climatic challenges and incorporates the adequate spatial qualities for the context in which the design will be made [region of Zoetermeer, polder landscape, previous use of the surrounding landscape] [3, 4, 5, 6, 7, 8, 9].

[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

To obtain the necessary knowledge to proceed to answer the research questions several methods will be used. These can be found in figure X. The methods that are stated in the figure are not necessarily stated chronologically but can be used in different sequences and variations throughout the various stages of the thesis.

	method	aim	limitation
1	Literature review	to understand and innovate	the literature must be applicable in the Dutch context
2	Monograph series		
a	Accumulation	understand the status quo and figure out the challenges	limitation to the amount of information that can be analysed
b	Clearance	quick exercise to understand potential and future measures in the area	limitation tothe analysis that can be donen into the viability of potential measures
3	TOHOKU method	come to shared values on the project within the disciplines of urban design and water management	the workshop outcomes are limited when carried out with solely two people
4	Visual documentation	analyse the current situation in regards of landscape and functionality	some locations in the project area are not accessible to the public
5	Mapping		
a	analytical	inform the project contextually	limited by the available information
b	projective	build on scenarios; see what can be	limited by the creativity only
6	Scenario building	look for scenarios that are diverge from realistic and wanted, to improbable and undesired.	limited by available information; not diverging too far from the project
7	SWOT-analysis	analyse the potential of the area and what to look out for; find potential synergies	limited by available information; not diverging too far from the project
8	Stakeholders	collect data about values of the end-users of the site	limited access to people and organisations within the project area
9	Case studies	analyse how various designs handle cultural-historical values through design of a infrastructure project.	limited by the existing frame of reference of the author

Literature and general practical preference

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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 focus of the thesis project is aligned with the Transitional Territories studio as the project discusses the relationship between water and water-related landscapes, in part of the delta region of the Netherlands. The studio stresses the importance of the interrelations between natural processes, societal practices, and geopolitical frameworks, this aligns with the thesis as well. In addition, the studio recognizes design as the carrier of the convolution of these complexities. Here, the connection to the larger scale master programme can also be found. The aim of the thesis is to provide a design for a vision on the spatial development of the area with regards to the knowledge base of environmental, societal and political circumstances while also keeping in mind the temporal-spatial component of the territory. The thesis argues the need for design to provide spatial quality in the matrix of values in the event of the creation of a large-scale infrastructural project. This connects the design back to the societal practices and political circumstances. Relevance can also be found in the representation of the design. The role of the designer is to translate complex issues, in this project the convolution of contextual and climatic challenges and the outcomes of a water management research, into a clear vision that represents the different disciplines working on the project so the design can be understood by a broader public.

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

Societal

The societal relevance lies in the creation of awareness of the issues that are at hand in the area. Creating awareness and seeing the possibilities of the area can decrease the future risks and that is essential for the prolonged liveability of the area.
In addition, the aim of the thesis is to contribute to the knowledge base about creating added value in an area in which building is necessary or wanted. Through the territory-oriented approach, the possibilities of doing so increase. In this way, the current local population and the future uses are considered so that the alteration of parts of the area are not solely the addition of infrastructures in a top-down manner, but the project can provide leverage for the local population.

The location is perfect because all the problems that are found on the larger scale – subsidence, water nuisance, and effects of the housing shortage – are present in the area. The findings can therefore be extrapolated to the larger scale.

Scientific

The current practice of implementing a territory-oriented approach to infrastructure projects assumes the need for a large-scale infrastructure project and then starts to consider its surroundings to see where potential synergies lie. Even though the implementation of new infrastructure projects is proactive, as it anticipates the need of the future, the contemporary practices are still reactive, because of the previously mentioned issue – the consideration of the environment and its qualities is subordinate to the creation of infrastructure. It is important to consider the creation of infrastructures as an integral part of the development as an area, as it can help in the proactive way of dealing with climate issues that give rise to complications in the project area on the short and long term. The aim with this thesis is to add to the awareness and close the gap that exists between current research and practice. In this way, the thesis can also add in the task to close the gap in the socio-cultural dimension in development of areas in relation to infrastructures.

Professional

During my masters in Urbanism, there were little chances to work together with students from other disciplines. The collaboration in this project is thus an opportunity to learn to work together better with a student from a different discipline and see where synergies and limitations between the fields of study lie. These decisions and the communal knowledge base can then lead to a well-informed design as the need to make estimates on the size of waterways and waterflows will be eliminated. Furthermore, the chance to work on a project as stated by the province is interesting as it is a way to see how projects like this are stated and I am keen to see how exactly that will work out.
That is why, working together in a communicative approach on a joint project as stated by the province in the coming half year will teach me a lot of valuable aspect that I can take with me into my professional career.