

Graduation Plan

Master of Science in Architecture, Urbanism & Building Sciences

MSc Landscape Architecture 2024 - 2025

Jiaming Huang



Graduation Plan

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

I Personal information

Full name	Jiaming Huang
Student number	6007643

II Studio / Lab information

Name / Theme	FLOWSCAPES-Lab Landscape-Based Urbanism	
Main mentor	Steffen Nijhuis	Landscape Architecture
Second mentor	Marco Lub	Urban Design
Argumentation of choice of the LA graduation lab	In the process of studying Dutch landscape, I am very interested in the process of Dutch reclamation landscape, which is very particular in the delta metropolitan area of Rotterdam. I am very interested in how to coordinate the contradiction between maintaining a fragile natural system like the delta and the highly urbanized life and trade needs, especially in the context of climate change. I really want to try to study landscape systems in a larger metropolitan context, especially issues related to blue-green infrastructure and climate adaptation	

III Graduation project

Title of the project	Green-Blue Connector - Designing a landscape infrastructure to connect Vorne-Putten Island and the Port of Rotterdam
Context and aim of the project	
Location (region / area / site)	Vorne Putten Island and Rotterdam Harbor
Problem statement	The Rotterdam Harbor and Vorne-Putten Island, as the frontier of the Rhine Delta, have made excellently use of those resources available in the region. The delta region, once abundant in natural resources and characterized by harmonious landscapes and productive relationships, has undergone significant degradation due to land reclamation and port industrialization since

	<p>the 18th and 19th centuries. This transformation has made the area increasingly vulnerable. The expansion of ports and industrial zones has led to persistent conflicts between land development and urban growth, resulting in environmental pollution and heightened risks associated with climate change.</p> <p>The freshwater lakes in the region, crucial for supporting industrial, agricultural, and urban needs, are under immense pressure. Urban expansion has intensified, driven by an influx of port workers, an aging population, and young residents, straining local infrastructure. Fragmented landscapes contribute to limited ecological and recreational diversity and accessibility. Additionally, the unsustainable practices in industrial and agricultural production exacerbate environmental degradation, pollution, and the region's resilience to climate change.</p> <p>The increasingly dense landscape is under greater pressure, and the close relationship with water has become strained. Rising sea levels and soil salinization are affecting freshwater supply which agriculture and industry dependent on.</p> <p>Additionally, extreme precipitation and temperature fluctuations are degrading the quality of living in the urban area, while the strong contrast between the port and the islands diminishes spatial quality. Therefore, this region urgently needs a sustainable transformation along with a vision and planning for the future.</p>
Research question(s)	How to design for a landscape infrastructure that connects Vorne-Putten Island and the Port of Rotterdam and regenerates a robust nature, water and landscape network?
Design assignment	
<p>Landscape infrastructure is a theoretical perspective for understanding relationship between built environment and landscape. When infrastructure is no longer a structure that meets the operational functions of urban and social development, but is integrated into the research space of the entire landscape together with the surrounding space, in the case I studied, there are few traces of the original natural succession. Through the study and analysis of landscape infrastructure, we can understand the flow of materials and people in space and use this flow relationship to design a healthier and more sustainable spatial operation structure and mechanism to create a new landscape.</p> <p>Metropolitan scale</p>	

Analyse the current situation and issues and evaluating the landscape system.

Regional scale

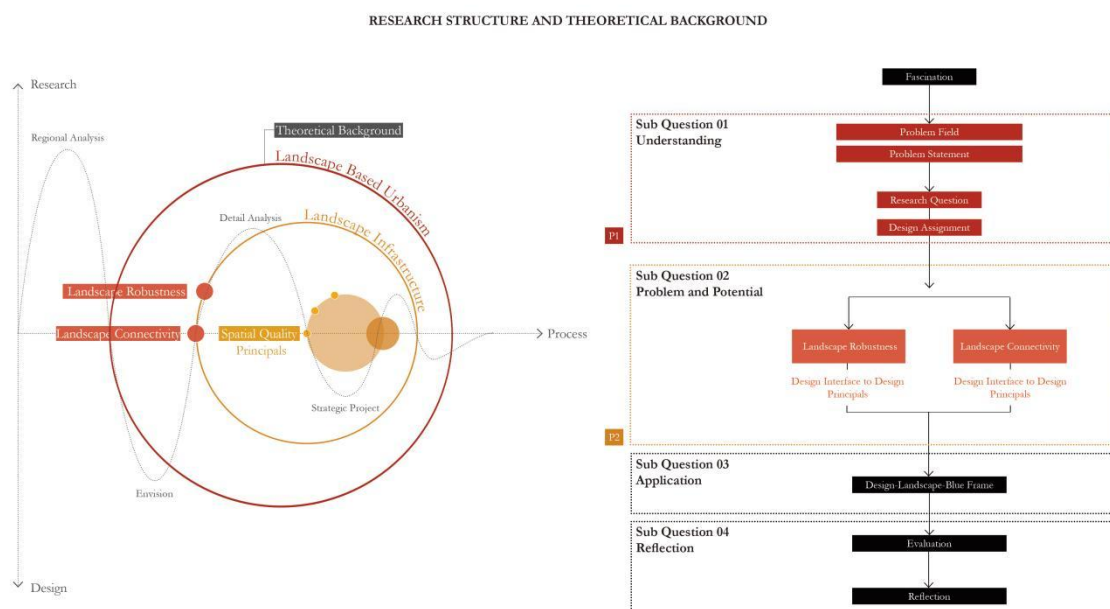
Select the area with the concentrated problem performed in the metropolitan scale, further analyse the site in landscape infrastructure perspectives - water, social green and productive green, and industrial - in layers, and propose design principles and plan the landscape framework accordingly.

Local scale

Select typical sites within the landscape framework for specific landscape design, combining and utilising the design principles from each perspective.

IV Graduation process

Method description



Sub-question1-Understanding/Problem

What are the key spatial, ecological and functional characteristics of the regional landscape system, as well as the challenges and opportunities for designing a connecting green-blue infrastructure?

- Mapping

Gain a deeper understanding of the landscape characteristics and categorise the types by making structural maps. At the same time, problems and landscape potentials are localised by making a map of challenges and potentials.

- Layer approach

The landscape is analysed systematically in different landscape system and landscape infrastructures.

- Design through scales-envision

Landscape characteristics are analysed and categorised in a cross-scale

approach, so that sites with clear and rich problems can be selected to zoom in for deeper study.

Sub-question2-Potentials/Application

How can the design of a robust nature and landscape network connect Voorne-Putten Island and the Port of Rotterdam as well as regenerate a climate adaptive water and ecological system?

- Case study

Research river management, eco-agriculture, mangrove restoration and other relevant case studies, and extract design principles that can be applied to design

- Literature review

Read articles on water management, eco-agriculture and distil design principles from them.

- Design through scales

Regional scale sites with a rich variety of landscape typologies are planned and typical local scale sites are designed. The design results can be applied at the regional scale and projected to the entire basin scale.

- Mapping

Use mapping to show the plan for region scale in different layers, and the whole vision after plan.

- Scenario design

As landscapes are developing and changing, design needs to respond to different scenarios. Contexts such as seasonal water level and quality changes, sea level rise, etc. need to be considered and responded to in the design.

Sub-question3-Reflection

What lessons can be learned by the application of the landscape infrastructure-concept to re-connect Voorne-Putten Island and the Port of Rotterdam by developing a robust nature, water and landscape network?

Literature and more applied references

Wandl, A. (2020) 'Territories -in- between: A Cross-case Comparison of Dispersed Urban Development in Europe', A+BE | Architecture and the Built Environment, (02), pp. 1-392. Available at: <https://doi.org/10.7480/abe.2019.14.4340>.

Nijhuis, S. (2022) 'Landscape-Based Urbanism: Cultivating Urban Landscapes Through Design', in R. Roggema (ed.) Design for Regenerative Cities and Landscapes: Rebalancing Human Impact and Natural Environment. Cham: Springer International Publishing, pp. 249-277. Available at: https://doi.org/10.1007/978-3-030-97023-9_11.

Braae, E. and Diedrich, L. (2012) 'Site specificity in contemporary large-scale harbour transformation projects', Journal of Landscape Architecture, 7, pp. 20-33. Available at: <https://doi.org/10.1080/18626033.2012.693778>.

Roggema, R. (ed.) (2020) Nature Driven Urbanism. Cham: Springer International Publishing (Contemporary Urban Design Thinking). Available at: <https://doi.org/10.1007/978-3-030-26717-9>.

Huisman, P. (1998) Water in the Netherlands. Delft: Netherlands Institute of Applied Geoscience (NHV-special, 3).

Nijhuis, S., Jauslin, D., 2015. Urban landscape infrastructures: Designing operative landscape structures for the built environment. Research in Urbanism Series 3, 13-34. <https://doi.org/10.7480/rius.3.874>

V Reflection on the project proposal

1. What is the relation between your graduation topic, the lab topic, and your master track?

My graduation topic is landscape infrastructure, climate change and territories in between, to study how landscape as approach to strengthen the connection and robustness in TiB areas of metropolitan. The relation between my research topic and lab topic(LBU) is that they both sharing the same idea is put landscape elements and networks as the first priority of urban development to enhance the flexibility and resilience when facing future uncertainty. My plan is to explore the possibility of using current landscape structure to bring back its as a new powerful frame to enhance the connection of fragmented territories and stimulate the spacial and functional transformation of this area. Both of us prioritized landscape as the base for further urban development and transition.

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

In applying the theory of "landscape infrastructure" to framing and design my thesis, It enlightened me to no longer divide landscape and infrastructure based on a utilitarian perspective but rather see them as a complex spatial framework. This approach not only broadens the scope of research in the design field, shifting from purely civil engineering and technical design to a multidisciplinary field that includes sociology, ecology, and urban development studies, but also enhances the role of landscape as a method for understanding, conceptualizing, and designing space with significant potential to promote urban development and transformation. In re-designing these static, flowspace as a complex yet stable landscape framework, I am able to recognize the relationships and interactions between landscape and other disciplines, further guiding me to explore and connect with broader fields of knowledge.