

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	Ziyue Yu	
Student number	5987423	
Studio		
Name / Theme	AR3AW005 Architectural	Wood Design Studio
Main mentor	Loes Thijssen	Design
Research mentor	Mo Smit	Research
Second mentor	Pierre Jennen	Building Technology
Argumentation of choice of the studio	Because of its specific focus on timber structure, bio-based material, and future-oriented amphibious habitats for urban densification.	
Graduation project		
Title of the graduation project	Reconstructing synergetic networks - Landscape-based amphibious community of Amsterdam in a floating scenario	
Goal		
Location:	Nieuwe Houthaven, Amsterdam, Netherlands	
The posed problem,	Due to industrialization, the synergetic network among regional landscapes, human living, and construction systems are disconnected, while the ‘Copenhagen lesson’ highlights the importance of embedding local-sourced material into architectural practices. At the same time, Amsterdam is undergoing urban densification and facing a floating scenario due to the rising sea level. Therefore, it is necessary to rethink the possibility of living on water and to reconstruct the synergetic networks between human living and nature driven by landscape-based materials.	
research questions and	How does wetland landscape-based material add value to synergetic living in	

	amphibious communities under a floating scenario of Amsterdam? - Q1: How do landscape-based materials shape or limit the construction system? - Q2: How do human activities interact with landscape-based material supply chains in wetland environments to enhance the system's synergetic value? - Q3: How does the construction system accommodate human needs under the synergetic context? - Q4: How can construction systems be designed to maximize the efficiency of wetland landscape-based materials?
design assignment in which these result.	These considerations result in designing an amphibious community in Nieuwe Houthaven, integrating residential uses and manufacturing workshops for landscape-based material. The community aims to involve harbor makers and residents in the supply chain of local bio-based materials and at the same time, to embed natural dynamics and growth cycle of landscape material to urban living. Hence it involves an open architecture construction system using mainly locally sourced material, flexibly adapting to seasonal activities and towards end-of-life scenarios for bio-based material in different construction hierarchies.
The research aims to explore relations among landscape-human-construction synergetic systems within a wetland context. It results in contextualized design parameters reflecting on materiality; functional programming and construction systems based on the amphibious scenario of Amsterdam, which provides guidelines for designers to evaluate during the schematic design phase to make more informed decisions.	
Process	
Method description	
1. 2 Case studies of vernacular amphibious communities are selected to understand how landscape-based materials add value to the synergetic system	

throughout the material supply chain and how this reflects on social/spatial implications. A cross-scale value scheme is applied to analyze the creation of multiple values. Design guidelines related to materiality, functional programming, and construction systems are driven based on the value scheme.

2. Design guidelines are applied to the Amsterdam context. Material-related data and information are collected through a literature review and a site visit.
3. Design parameters related to functions and construction systems are further refined through prototyping and are compiled as final design guidelines.

Literature and general practical references

1. Understanding the potential of landscape-based material:
 - Material Reform (Material Cultures, 2022)
 - Naar een Nieuwe Streekarchitectuur (Groenendijk et al., 2022)
2. Application of regional landscape-based material in construction:
 - Circular Construction - Material Architecture Tectonic (CINARK, 2019)
 - Natuurlijk bouwen met hout (Fraanje, 1999)
 - Timber structure I (FT Architects, 2013)
3. Prototyping open architecture construction system adapting landscape-based materials:
 - Open Architecture (Drexler, 2021)
 - Holistic housing (H. H. Drexler & Khouli, 2012)
 - Ecococon Construction System (<https://ecococon.eu/us/>)
 - WikiHouse Modular System (<https://www.wikihouse.cc/>)

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 graduation topic of reconstructing a synergetic network among landscape, human living, and construction systems for the amphibious community in Amsterdam, provides a regenerative and sustainable solution for the housing demand and urban densification, in response to the studio topic. It also explores the applicability of landscape-based material, especially timber, to open architecture construction systems within a high-density urban context, which meets the call of creating a sustainable and carbon-neutral built environment.
2. What is the relevance of your graduation work in the larger social, professional and scientific framework.

The graduation works explore the possibility of living on the water under the floating scenario due to rising sea levels. The open architecture construction system could embed the properties of local source material and embrace the flexibility and changeability of living in an urban wetland context. Furthermore, the exploration of the supply chain from local material harvesting, community-based manufacturing, open construction systems, and end-of-life consideration, provides a concrete solution for regenerative construction under such a floating scenario. Essentially the reconstruction of the synergetic network meets the call

of the 'Copenhagen lesson': when sourcing materials for construction, local renewable materials come first, orienting towards a post-carbon future.