

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	Eefke Huisman
Student number	5503418

Studio		
Name / Theme	Gamechangers in Transitions	
Main mentor	Daniel Hall	Design and Construction Management
Second mentor	Angela Greco	Real Estate Management
Argumentation of choice of the studio	Exploring the transition towards industrialized construction	

Graduation project	
Title of the graduation project	Double Trouble: Industrialized Construction in the Digital Age
Goal	
Location:	Rotterdam
The posed problem, research questions and design assignment in which these result.	See below
	How can practices of change facilitate VORM 2050's transition towards industrialized construction using digital technologies?
	Strategic roadmap with practices of change based on the case of VORM 2050
<p>Problem statement: VORM 2050 is undergoing an ongoing transition from a traditional project-oriented model to a product-oriented approach, driven by industrialized construction principles. This shift aims to address the Dutch housing shortage by enabling more efficient and scalable construction practices. To support the transition, VORM 2050 aims to integrate digital technologies to enhance efficiency and streamline processes, though practical implementation remains a challenge.</p>	
Process	
Method description	

This study starts with a literature review to establish a theoretical foundation. Academic papers from Google Scholar will be analyzed.

The empirical research is based on qualitative methods and involves conducting semi-structured interviews as part of a single-case study. These interviews will be guided by abductive reasoning, allowing for an iterative process of aligning empirical observations with theoretical insights.

In addition to interviews, organizational ethnography is used as a second data collection technique. This method involves observing daily practices, attending meetings, and reviewing project documentation at VORM 2050.

The final phase of the study involves the development of a strategic roadmap through a research through design approach. To ensure its applicability, the roadmap will be tested and refined through two stages of validation: a focus group with internal stakeholders and an expert panel consisting of industry academics.

Literature and general practical references

Theoretical Frameworks and Concepts:

- Industrialized Construction: Foundational theories on prefabrication, modular construction, and process standardization (e.g., Lessing, 2006; Gann, 1996).
- Digital Technologies: Studies exploring the role of technologies such as BIM, IoT, digital twins, and automation in transforming construction practices (e.g., Fan et al., 2024; Oesterreich & Teuteberg, 2016).
- Practices of Change: Organizational change theories, including frameworks for analyzing transitions in construction workflows (e.g., Wang et al., 2012).

Practical References:

- Case Study Insights: Lessons learned from VORM 2050's projects, particularly focusing on their ongoing efforts to integrate industrialized principles and digital tools.
- Industry Reports: Documents and datasets on housing challenges in the Netherlands, with a focus on scalability and efficiency in construction (e.g., ABF Research, 2019; CBS Statistics Netherlands, 2021).
- Best Practices: Examples of successful implementation of industrialized construction and digitalization in other contexts, such as Sweden's timber house manufacturing sector (e.g. Maxwell, 2016).

Reflection

1. The graduation lab Gamechangers in Transitions aligns closely with the focus of this thesis on VORM 2050's transition from traditional construction methods to industrialized construction practices, supported by digital technologies. This transition exemplifies a game-changing shift in the construction industry through the megatrends of industrialization and digitalization. It also aligns with the master track Management in the Built Environment, since it examines a shift in management practices related to

innovative construction principles. This thesis contributes by looking into the combination of organizational management, process optimization, and technological advancements in the built environment.

2. This study combines societal and scientific perspectives to address the Dutch housing shortage by exploring how industrialized construction and digital technologies can deliver affordable, sustainable, and efficient housing solutions. From a societal perspective, it emphasizes resource efficiency, waste reduction, and reduced environmental impacts. Scientifically, it bridges the research gap by investigating the integration of digital technologies into industrialized construction practices through a case study of VORM 2050.