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	T.C.J. (Thomas) Rothschopf
Student number	6071929

Studio		
Name / Theme	Theme 7: The Impact of Environment, Social and Technological Trends on the Value of the Built Environment	
Main mentor	J.W.F. (Hans) Wamelink	Construction Management and Entrepreneurship (MBE Department)
Second mentor	M.U.J. (Michaël) Peeters	Real Estate Management (MBE Department)
Argumentation of choice of the studio	I chose this theme because I am interested in the evaluation of real estate and into the value that a better built environment can create for people and planet. The opportunity to work specifically with the both mentors above also influenced my choice of this theme.	

Graduation project	
Title of the graduation project	Creating a Regenerative Built Environment: The Business Case for Regenerative Residential Real Estate in the Netherlands
Goal	
Location:	The Netherlands
The posed problem,	The year 2030 is the crucial milestone for reducing human-driven greenhouse gas emissions, given that disruptive climate-related events are expected to happen more frequently with consequences beyond the design of the built environment. As a result, the conceptualisation of projects in the built environment should move beyond current boundaries, driven by short-term profit-making motives, to enable sustainable change. This change is crucial, given that the earth has already transgressed almost seven of its nine

	boundaries, which define the safe operating space for humanity. The surpassing of the planetary boundaries clearly shows that the current approach to sustainability is not sufficient in addressing these problems. To counter this, in the past decades, the concept of a regenerative built environment has increasingly been studied and occasionally been applied in practice. The main idea is that instead of trying to make the AEC and real estate industry less bad towards the planet and its people – making it sustainable – humanity has the opportunity to develop the built environment in a regenerative way, benefiting the whole ecosystem of people and planet with net-positive impacts. However, the regenerative approach lacks a clear and universally agreed upon definition, contributing to its slow adaption. Moreover, it is ambiguous which regenerative principles can and should actually be applied in a building project. Based on this, there might be a strong business case for the development of regenerative residential real estate in the Netherlands, which aims to build 100.000 new homes yearly.
research questions and	**Main RQ**: To what extent can a regenerative design and development project become a business case for developers of residential real estate in the Netherlands? **SQ1:** What is the definition of "regeneration" / "regenerative" in the built environment? **SQ2:** What are the principles of regenerative design and development in the built environment? **SQ3:** What are the necessary elements and enablers of regenerative business cases for real estate projects?
design assignment in which these result.	Not applicable (no design assignment)

Process

Method description

This research proposes to use a mixed-method approach, beginning with a literature review to contextualize regeneration and business cases in the built environment. Case studies of Dutch regenerative residential real estate projects, along with international examples are analysed to assess the practical application. Finally, semi-structured interviews with regenerative project stakeholders provide insights into the enabling environment of regenerative real estate projects as a business case.

This master thesis takes an exploratory research approach with inductive reasoning. Its aim is to develop new insights into the concept of a regenerative built environment. Three different but complementary research techniques are used to answer the research questions. Each of the three research techniques target specific sub-questions and ensure a comprehensive understanding of the subject in order to answer the main research question. This happens in the context of a graduation internship.

The literature review mainly serves to formulate the research questions and also to answer sub-questions 1 & 2. It is used is to establish a definition of the key terms (SQ1), which build the foundation for a regenerative built environment and this thesis. Additionally, the existing literature is studied from two perspectives to explore the practical application of regenerative principles (SQ2). Firstly, local and global principles for net-positive impacts of regenerative development on people and planet are investigated. Secondly, the applied principles of the regenerative design process are researched throughout all phases of a typical project life cycle. Furthermore, the literature review serves as an exploration of relevant case studies of regenerative residential real estate developments, both internationally and nationally.

Dutch and international case studies are analysed to build a better understanding of the principles for the regenerative design and development of residential real estate (SQ2). Moreover, the elements of the regenerative business cases for these projects will be explored (SQ3). These elements are investigated through the following five lenses: Purpose, Networks, Ownership, Regeneration and Impact.

Semi-structured interviews with industry professionals are be conducted to explore the enablers of regenerative business cases for residential real estate development in the Netherlands (SQ3). These enablers are categorized into the following eight change areas: Social, Technological, Economic, Political/Regulatory, Uncertainty/Risk, Partnerships and Cultural.

Additional knowledge and data for this research will be provided by the international real estate consulting and project management firm Drees & Sommer. A graduation internship that will start on February 10th 2025 has been agreed upon. The company has the vision of becoming a "regenerative organization", suggesting that regenerative principles are also implemented in their projects, which implies that they can provide valuable data for this research. With about 6000 employees globally, and over 60 offices worldwide it is promising to be a beneficial partner for this master thesis research.

Literature and general practical references

An extensive literature review for this thesis has already been performed. It is part of the P2 report and subject to be adapted in the process of working towards the P5 report.

This literature review begins with exploring the value of real estate and provides an overview of the three kinds of sustainable, circular and regenerative real estate. The need for these kinds of buildings is exemplified by briefly introducing new European regulations that make them necessary. Their interrelations with each other call for life cycle thinking as a perspective of looking at the built environment that can enable regenerative business models, which need to be built on a solid regenerative business case, to advance regenerative real estate development. These business cases are explored in the context of residential real estate development in the Netherlands.

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 aligns closely with theme of the graduation group because it explores if a business case for regenerative real estate development can be made in the Netherlands. A regenerative built environment is a holistic, design-based, value adding process for all stakeholders, which aligns closely with the objectives of the MBE track. Its relation to the general master programme AUBS and its five tracks is that the programme represents this holistic thinking across multiple disciplines.

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

The relevance of this graduation project lies in its objective to establish a universally acceptable definition of regeneration in the built environment. This can serve as "common ground" for researchers and professionals that want to start a regenerative project. The potential advancement of regenerative principles by enabling a business case for regenerative real estate is highly relevant for society. The scientific community can build upon the possibilities for further research which are provided by this thesis.