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	Berend Langenberg
Student number	4655265

Studio		
Name / Theme	Management in the Built Environment	
Main mentor	Vincent Gruis	Housing Management
Second mentor	Hilde Remoy	Real Estate Management
Argumentation of choice of the studio	During the Architecture Bachelor, I noticed that my main interest for the courses was towards the management courses. Planning and managing has always been one of my strengths. Therefore, MBE caught my interest.	

Graduation project	
Title of the graduation project	Circularity potential in building adaptation projects
Goal	
Location:	Organization in the Dutch context
The posed problem,	There uncertainty about the meaning of circularity and what it means to implement this in the built environment, specifically in building adaptation projects.
research questions and	What are circularity potential factors and how can these factors be applied within building adaptation projects?
design assignment in which these result.	A tool/checklist which can be used to quickly scan adaptation projects on their circularity potential. This helps to make it clear what types of interventions can be taken to construct circularly.
Process	
Method description	

First, a literature research will be conducted which researches the exact meaning of building adaptation and circularity in the built environment. Regarding circularity, the 9R model and the six dynamics of Brand will be explained. Furthermore, building adaptation and newbuild and rebuild will be compared to see what makes projects suitable for adaptation in the first place. Lastly, the Transformation Potential Meter will be researched, as this is the main inspiration for the circularity tool that is aimed to be developed in this research.

After this literature research, the first basic knowledge is acquired to start developing the new circularity potential tool. However, practical knowledge and applications are essential in order to develop the tool further. Empirical research in the form of in depth interviews and case studies will be conducted to test out and further develop the tool in an iterative process.

The empirical research will consist out of 5 to 10 interviews with employees of Arcadis and also with essential stakeholders within the circularity industry, such as deconstructing companies or design bureaus focused on transformation or renovation projects.

The case studies will be selected from a large assignment of the revitalization of the Defence in the Netherlands. A vast amount of square meters needs to be renovated and/or repurposed within their real estate portfolio.

Literature and general practical preference

The purpose of the literature study is to get a better understanding of key concepts such as building adaptation and circularity. This is essential to know how the circularity potential tool should be built up. It has to be structured based on theoretical frameworks set up in the past in literature research. The 9R framework by Potting et al. (2017), gives an elaborate explanation of what circularity consists of, and shows how it can be structured and scaled. Furthermore, the 6 layers of a building, theorized by Stewart Brand (1994), shows what layers a building consists of, and can therefore also be used to structure the circularity potential tool.

Reflection

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 Master track is Management in the Built Environment (MBE). My thesis theme is circular-adaptable real estate reuse to react to societal changes. These two are linked because of the remaining question on how to deal with existing real estate and newbuild real estate. Building adaptation is a strategy to make use of existing real estate to satisfy demands in other parts of the market.

The MSC Architecture, Urbanism and Building Sciences is also strongly related to real estate strategies and sustainable and circular interventions that need to take place.
What is the relevance of your graduation work in the larger social, professional and scientific framework.

Societal relevance
Climate change is a fact, and the built environment pays a large contribution to this. 37% of the total emitted CO2 emissions can be contributed to the construction sector. Therefore, the construction sector can also have a large influence in the task to reduce CO2 emissions for climate restoration. Circularity and building adaptation are part of the solution to reduce CO2 emissions in the construction sector. Therefore, researching how circularity can be applied in such projects has a large societal relevance.

Scientific relevance
The uncertainty about what the meaning of circularity is, makes it difficult to apply these circularity principles in the built environment. Therefore, the proposed tool that will be developed in this thesis has significant scientific relevance. It places many circularity based interventions which can be taken in building adaptation projects in one clear scheme. This makes it easy to grasp the concept of circularity and how it can be applied.