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	Linde Jorritsma
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Studio	
Name / Theme	Design of the Urban Fabrics
Teachers / tutors	First mentor: ir. L.P.J. van den Burg Chair Urban Design Department of Urbanism Second mentor: N.M.J.D. Tillie Chair Landscape Architecture Department of Urbanism
Argumentation of choice of the studio	▪ This graduation project researches the spatial implications of integrating urban ecological and nature-inclusive principles into densification processes to provide conditions for increasing biodiversity and quality of life in the Zomerhofkwartier in Rotterdam. The motivation to do so is an interest in combining urban challenges that are currently of high relevance, which are densification and biodiversity. The spatial implications to the urban fabric of Rotterdam are researched using a multiscalar planning and design approach. The design interventions will be supported by knowledge gained through studying literature and consulting experts from practice.

Graduation project	
Title of the graduation project	**Nature-inclusive densification of the city** A mutualist planning and design approach towards densification and biodiversity in the Zomerhofkwartier in Rotterdam
Goal	
Location:	Rotterdam (Zomerhofkwartier)
The posed problem,	Until 2035 there is a need for 1 million homes in the Netherlands (ABF Research,

	2018) with the highest demands in large cities in the Randstad, such as Rotterdam (PBL, 2018). Considering sustainable use of scarce space and societal opposition to develop in green (agricultural) space outside cities, most of this demand will have to be realized within existing city boundaries. This results in urban densification which can be an opportunity to increase the quality of the living environment (Nabielek et al., 2012). However, at the same time other problems are influencing the requirements of spatial development of cities. Biodiversity is declining worldwide and is under great pressure in the Netherlands, with urbanization being one of the main causes (PBL, 2014). Biodiversity ensures the health and resilience of the worlds ecosystems, on which people rely through the ecosystem services provided (Vink, Vollaard & de Zwarte, 2017). Future urbanization should therefore prevent loss of biodiversity and can in fact take upon an important role in contributing to biodiversity increase. Preservation, improvement and development of urban green space is the basis of this and makes sure that ecosystem services are provided within cities (Stache, Jonkers, & Ottelé, 2019), becoming increasingly important to cities undergoing densification to ensure high quality of life. Awareness is increasing around the importance of biodiversity and green spaces, but structural changes in the practice of urban planning processes cannot be found yet (Pötz, 2016). Research has shown that densification

	often leads to loss of green space or involves development of minimal amounts of green space that do not contribute to biodiversity (Beer, Delshammar, & Schildwacht, 2003; Haaland & Konijnendijk van den Bosch, 2015). Rotterdam is a city in which biodiversity is likely to become subordinate to densification processes. The municipality has acknowledged that the housing demand is not realized quick enough (Gemeente Rotterdam, 2018) and there are no clear plans yet that formulate how biodiversity and green space and densification can be combined. To prevent that biodiversity, and the indispensable ecosystem services linked to this, becomes subordinate to the urgency of densification, there is a need for changes in the planning, design and decision-making of densification processes of cities (Stache, Jonkers, & Ottelé, 2019).
research questions and	Main research question: *How can planning and design of nature-inclusive densification of the Zomerhofkwartier in Rotterdam provide conditions for increasing biodiversity and quality of life?* Sub research questions: SRQ1 What are biodiversity and densification processes and how do they interfere? SRQ2

	How are processes of densification and facilitating biodiversity currently executed in the Netherlands and Rotterdam specifically? SRQ3A What are urban ecological and nature-inclusive planning and design principles? SRQ3B How can urban ecological and nature-inclusive planning and design principles be applied to the Zomerhofkwartier in Rotterdam? SRQ4 How can the nature-inclusive densification design for the Zomerhofkwartier be translated to principles for planning, design and decision-making on other locations in Rotterdam?
design assignment in which these result.	Zomerhofkwartier in Rotterdam is used as a case study to redefine planning and design of a densification process, through enriching urban planning and design by exploring urban ecological and nature-inclusive planning and design principles. The main outcome will be a nature-inclusive densification design of this location, which is the Zomerhofkwartier in Rotterdam. This nature-inclusive densification design will study possible forms of densification in this area and how this can be combined with providing conditions for biodiversity. This means interventions on the scale of the urban block, public space and buildings. These

	will be embedded within the context through planning and design interventions suggested on bigger scales than the plot of the Zomerhofkwartier. The project therefore has a multiscalar approach, with a focus from the area of the Zomerhofkwartier. Also, through researching the interventions related to the Zomerhofkwartier, at the end of the project there is a wish to formulate findings on how to apply principles to other places in Rotterdam and reflect on changes in decision-making that are needed for this. Contextual aspects will be considered in this.

Process

Method description

The graduation project builds upon theory and principles from the fields of urban ecology and nature-inclusive design (a pioneering practice that integrates ecological principles with design (Vink, Vollaard & de Zwarte, 2017), which are outside my current field of knowledge. Many of the methods used therefore are aimed at learning about these fields.

A. LITERATURE REVIEW

To understand the problems and gain input for developing planning and design principles, literature review is used. Provide an overview of research that has already been done concerning the relevant themes such as: densification, biodiversity, urban ecology, nature-inclusive design and all of these themes in relation to each other.

RESOURCES/TOOLS:

- books
- papers
- reports
- websites

B. EVENTS AND (ONLINE) LECTURES

Because of the current relevance of both densification and biodiversity of cities and themes such as urban ecology and nature-inclusive design, lectures and events around

these topics have been and are being organised in and outside the faculty. Attending these lectures and events has already been very useful input and have provided contacts and meetings with several experts.

Lectures and events:

12/02/2019	Groenbouw Location: Pakhuis de Zwijger
13/02/2019	Wereld zonder Insecten Location: Pakhuis de Zwijger
06/05/2019	Research week 2019: 1 Million Homes Research Group Location: faculty of Architecture and the Built Environment TU Delft
22/05/2019	Natuurinclusief ontwerpen / Dag van de Biodiversiteit Location: Architectuurcentrum Amsterdam
29/05/2019	Lecture Jacques Vink, writer book Stadsnatuur maken Location: faculty of Architecture and the Built Environment TU Delft

It is likely that more lectures and events will be organised during the research, which will be visited.

Online lectures:
Many lectures and explanatory videos (related to specific events or held within universities in and outside the Netherlands) have been published on Youtube or other platforms and can therefore easily be used to learn about especially urban ecology and nature-inclusive design.

Lectures and videos:
- Robbert Snep (researcher green cities, Wageningen University): several lectures and videos related to urban ecology
- Jelle Reumer (Dutch biologist): Stadsnatuur maken and several other videos
- Charles Waldheim (Professor of Landscape Architecture at Harvard Graduate School of Design): Landscape as Urbanism

- Mohsen Mostafavi (architect, educator, Dean of the Harvard Graduate School of Design Harvard School of Design): Ecological Urbanism

C. EXPERT INTERVIEWS

To gaining theoretical knowledge, to understanding the problems and developments and input for planning and design solutions. Experts include the city ecologist of Rotterdam, other ecologists, Vogelstichting and architects, urban planners/designers and landscape architects that write, lecture and talk about urban ecology and nature-inclusive design and work on these topics in practice.

D. MEDIA STUDY

Because of the current relevance of both densification and biodiversity and growing interest in themes such as urban ecology and nature-inclusive design, almost on a daily basis something is published in the media about this topic. Paying attention to the news and (subscribing to) other media platforms is crucial to understand the problems and current developments that can be built upon.

Resources/tools:
- newspapers
- websites related to the building sector (such as stadszaken.nl)
- magazines
- podcasts

E. SPATIAL ANALYSIS

Spatial analysis is a key method to understand the spatial manifestation of the problems in Rotterdam and in the Zomerhofkwartier and to help coming up with ideas for planning and design solutions. This method mostly consists of mapping data. A start has been with mapping on a city scale, the next phases will incorporate extensive research into the context of the Zomerhofkwartier. Research towards other development plans surrounding the Zomerhofkwartier will also be done.

Resources/tools:
- GIS data
- maps made by the municipality and other sources
- information and plans concercing densification/greening found in (municipality) documents
- development plans of the surrounding areas

F. FIELDWORK

Fieldwork is an emperical form of research that will be used in this project to understand the spatial implications of the problems and solutions. This is done on both the scale of the city and on the scale of the Zomerhofkwartier. It consists of observations, documentation through photography and possibly interviewing/surveying people on location.

G. REFERENCE CASE STUDIES

As input for planning and design principles reference case studies that have already worked with urban ecology and nature-inclusive are researched. These include case studies directly in relation to densification and applied to other contexts.

H. RESEARCH BY DESIGN

This will be a synthesis of all the knowledge obtained through the more theoretically related research methods and will provide new (context-specific) insights on how to achieve nature-inclusive densification. Considering the multiscalarity in this can provide interesting insights.

Research by design involves conducting several design studies and evaluate them towards desired outcomes (vision and program of requirements) that will be formulated. From this the best example can be chosen or the different options could be used as examples for nature-inclusive densification.

I. Evaluation and reflection

The nature-inclusive design will be evaluated towards goals that are defined in the design phase. This will be done individually towards the end, but while still in the design process the expertise of the contacted ecology and nature-inclusive design experts will be consulted (some have offered this already). Consulting their expertise of ecology and nature-inclusive design can help to improve the design. Also, the transferability to principles for planning, design and decision-making on other locations in Rotterdam will be reflected upon towards the end of the project.

Literature and general practical preference

The main literature consulted is regarding the topics of:

Urban ecology and nature-inclusive design

- Vink, Vollaard & de Zwarte
- Pötz
- Van Stiphout
- Snep
- Reumer

Densification

- Jenks
- Meta Berghauser & Per Haupt

Many documents and maps from the municipality of Rotterdam are also consulted, as well as GIS data provided as open data by Rotterdam and other institutions in the Netherlands (such as PDOK, BGT, BAG).

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)?
   In literature researchers from different fields (ecology, urbanism, landscape architecture) have expressed the need to redefine urban planning, design and decision making to better facilitate ecological processes in urban development, to ensure sustainable development towards nature and humanity. My graduation project researches how densification, an urbanism challenge at heart, can be redefined to provide conditions for biodiversity and better quality of life. The research looks at how urbanism can be enriched by learning from other disciplines.

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

SCIENTIFIC RELEVANCE

Traditionally urban planners and designers mostly focus on the built-up part of cities. For the integration of green space and other interventions aimed at increasing biodiversity very often ‘’the emphasis is on what is still possible within the constraints set by the design” (Snep & Opdam, 2010). The ecological aspects are not always the focus from the start of the design process or even is the role of someone else, for example a landscape or public space designer who comes in later in the design process. As an urbanist it is valuable to learn about the integration of urban ecological and nature-inclusive principles in the planning, design and decision-making process to be better capable of creating sustainable, liveable and biodiverse cities.

Nature-inclusive design is a pioneering practice. It is a topic that is increasingly discussed and written about, but there are limited examples (that have been realized) (Vink, Vollaard & de Zwarte, 2017). Moreover, ecology is very context-specific, so what works in one location does not always apply to other locations. Therefore there is a need to keep on studying the principles of urban ecology and nature-inclusive design in different contexts and types of development. Densification can be an interesting case in this.

SOCIETAL RELEVANCE

Since urban populations are increasing in the Netherlands (PBL, 2018), providing high quality of life in cities becomes increasingly important. At the same time urbanisation is one of the main cause for pressure on biodiversity. The need for liveable, green cities

in the form of nature -inclusive cities has been emphasized recently in a 'motie in de Tweede Kamer' by politicians, also in relation to preventing biodiversity loss. Biodiversity ensures the health and resilience of the worlds ecosystems, on which people rely through the ecosystem services provided (Vink, Vollaard & de Zwarte, 2017). Addressing biodiversity and ecosystem services provided in cities is of high societal relevance to quality of life now and in the future. The project researches how housing demands as well as biodiversity can be addressed through nature-inclusive densification. Densification processes will flourish greatly while conditions for biodiversity and high quality of life are provided simultaneously.