

# 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](mailto: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	Gary Gilson
Student number	4762479

Studio		
Name / Theme	Urban Ecology and Ecocities Lab	
Main mentor	Nico Tillie	Landscape Architecture
Second mentor	Arjan van Timmeren	Urbanism
Argumentation of choice of the studio	<p>As an architect and landscape architecture student, my responsibility lies not only in learning about designing and improving conditions for humans in the Anthropocene but also for other living beings, i.e., flora, and fauna. In a rapidly urbanizing world dominated by man, with increasingly varying climate, demographic, and urban structures, it is necessary to respect, protect, and promote these species and their living habitats as well. The ecological chain and nutrient cycle are highly dependent on their presence and mobilization. Urban ecology promotes resilient and sustainable urban spaces where humans and nature coexist. When integrated in the right way, it can help in decreasing the air and water pollution while enabling new ways of food production, transportation, and housing for people as well.</p> <p>I believe I have been able to create a good foundation in looking at landscape design with an ecology-based approach in the first year. Even though the four quarters concentrated on different themes, something that intrigued me the most was the inclusion of ecology as a very important component for sustainable and spatial metabolism in all of them. I would like to further build upon this base and explore strategies for an ecology-based design for urban tissues like Rotterdam. I believe it is an opportunity to look through different systemic scales of processes and flows happening in a rapidly globalizing city at macro to micro levels of spatial synthesis, perception, and functioning. The 14th Ecocity World Summit 2021 in Rotterdam also beholds an opportunity for us to exhibit and discuss the research and design on a global platform. I hope to use the year to contribute to the ongoing research of the Lab and also learn from mentors and colleagues on designing and envisioning Ecocities for a sustainable future through spatial principles for site-specific design, spatial quality, and quality experience.</p>	

Graduation project	
Title of the graduation project	Symbiotic Urban Voids

<b>Goal</b>	
Location:	Rotterdam Urban Area
The posed problem,	<p>The Rotterdam urban fabric is built in an area of amalgamation of very interesting landscape conditions surrounding it. Defined by the rich natural and cultural history, this structure has been home to different habitats for a variety of flora and fauna. The urban core however, disconnects these areas due to lack of ecology supporting green and blue networks. The urban core of Rotterdam is abundant with characterless and unused spaces, that can be termed as urban voids. The paved and stony surfaces in these spaces heat up the unbuilt (or are they really 'unbuilt') spaces and creates hotter environments. This, with the changing climate also poses a risk of disasters like flooding, heat islands and habitat loss. These Urban voids are not designed for ecology and resilience to the changing climate. Therefore, the main research question is:</p> <p><b>The urban fabric of Rotterdam disconnects the ecological network around it by creating identity-less and unused voids that are not welcome for biodiversity. Such spaces also pose a threat of disasters like flooding and heat islands.</b></p> <p>In the book 'Finding Lost Space', Roger Trancik brings up inquiries on undesirable urban area that makes no positive contribution to the surroundings and which is ill-defined, without measurable boundaries and fail to connect elements in a coherent way, by calling them 'lost space' (Trancik, 1986). In this project, urban voids are unused, underused or underutilized spaces. This project explores the possibility of using these voids to create a new design language with urban ecology as the main theme.</p> <p>Climate resilience can be defined as the capacity for a socio-ecological system to: (1) absorb stresses and maintain function in the face of external stresses imposed upon it by climate change and (2) adapt, reorganize, and evolve into more desirable configurations that improve the sustainability of the system, leaving it better prepared for future climate change impacts. (Wikipedia) In this project</p>

	resilience is towards urban heat islands and flooding in the Rotterdam urban areas.
research questions and	How to create an ecological spatial design framework through landscape architectural principles for the urban fabric of Rotterdam by making use of the urban voids, thereby also making it resilient to climate change?
design assignment in which these results.	
<p>The assignment results in creating a landscape design framework for the Rotterdam urban area connecting the ecological biotopes around the region and catalyze climate change resilience in the region, by making use of the urban voids. The design will look at creating a network through the urban area on a regional scale by studying the overall regional ecological composition. This is important to create a larger network for biodiversity and ecosystem services in the Rotterdam region that is home to different types of habitats, evolved through historical natural and cultural processes. This will be followed by detailed spatial design on local scales in the urban voids by taking into account the various characters native to these voids, like the morphological, sociocultural and ecological values. This will result in the creation of a toolbox of different typologies that could be used to reanimate these voids ecologically as well as for climate resilience. These new spaces will bring identity to these spaces and use them to create new local flows respective the area of design.</p>	
<b>Process</b>	
<b>Method description</b>	
<ol style="list-style-type: none"> <li>1. Studying the evolution of the landscape: Mapping the landscape evolution of the Rotterdam period from the beginning of the Holocene till today helps in understanding the geomorphological characters, habitats and ecology linked to it.</li> <li>2. Mapping the urban history of Rotterdam: This helps in understanding the evolution of the urban core and the socio-cultural aspects linked to it. It is important to understand this so that the new design interventions are contextual and respects the history as well.</li> <li>3. Mapping Ecology: Mapping ecological aspects of the region like the various kinds of habitats present around and inside the urban areas, list of species and their livability in the environments, various landscape heritage sites, landscape patterns and processes. This helps in curating the design in a way that it fits the current ecological setting and paves way for more room for new species as well.</li> <li>4. Mapping Climate Change related issues: Mapping of urban heat islands and flooding zones in the urban area, and understanding the reason for it by analyzing the material compositions, use, tree cover, green-blue networks etc.</li> <li>5. Studying Typologies: Classification of the urban areas into different typologies based on their morphological, sociocultural and ecological characters. Studying the green-blue composition of these typologies, material composition, building structure, use, thereby formulating strengths, weaknesses, opportunities and threats in these spaces related to ecology and climate change. The Terrain label assessment survey is used to make a list of these hotspots. Using these typologies to create an inventory of urban voids that are prevalent in Rotterdam where interventions can be done.</li> <li>6. Making a Toolbox: Creating toolbox of spatial design defined from the typologies studied previously. These designs are responsive to the type of ecological and spatial conditions prevalent in the voids. They respond differently to the need of the space depending on morphological,</li> </ol>	

sociocultural and functional aspects. These can be reproduced in other spaces of similar characters as well. This also makes use of new technologies like the i-Tree, Ebben app.,

7. Detailing local and regional flows:

The new design interventions are detailed as to how they respond to the existing conditions of the designed areas. Technical details represented in plans, sections and flow diagrams.

8. Regional landscape Framework:

A new regional landscape design framework that connects to the surrounding habitats and connects the voids in the urban core.

### Literature and general practical preference

1. Trancik, R. (1986). *Finding lost space; Theories of urban design*, (1st ed.)
2. Rotterdam Municipality (2020). *Working together on rich Rotterdam urban nature: Implementation agenda*. <https://www.rotterdam.nl/nieuws/biodiversiteit/>
3. Strootman Landscape Architects (2016). *Landscape Framework: River as a Tidal Park*
4. Swaffield, S (2002), *Theory in Landscape Architecture: A Reader*, University of Pennsylvania Press.
5. Rotterdam Climate Initiative (2013) *Rotterdam Climate Change Adaptation Strategy* [www.rotterdamclimateinitiative.nl](http://www.rotterdamclimateinitiative.nl)
6. Lee, Seog & Hwang, Soewon & Lee, Dongha. (2015). *Urban Voids: As a Chance for Sustainable Urban Design*. 474-489. 10.3390/ifou-D007.
7. Rathi, K. (2016), *Urban Voids-adaptive Use Of Public Spaces Under Flyovers*
8. Vakarelov, Y., Fracasso, S. (2015), *Urban Voids Unpacked*
9. Omar, Nermeen & Saeed, Engy. (2019). *Urban Voids As Potential Resources For The City Development*. JES. Journal of Engineering Sciences. 47. 585-600. 10.21608/jesaun.2019.109853.
10. Tillie, Nico. (2020). *From Urban Green Structure to Tidal River in Rotterdam: Testing Grounds for Urban Ecology*. 10.1007/978-3-030-26717-9\_6.
11. van der Hoeven, F., & Wandl, A. (2018). *Hotterdam: How space is making Rotterdam warmer, how this affects the health of its inhabitants, and what can be done about it.. BK Projects*, <https://journals.open.tudelft.nl/bkprojects/article/view/1972>

### 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 lab Urban Ecology and Ecocities focuses on research and design revolving around the whole of interactions of organisms, built structures, and the physical environment where people are concentrated. My graduation project titled 'Symbiotic Urban Voids' focuses on using the urban unbuilt (or are they really unbuilt?) to create a network for ecology and thereby creating resilience to climate change through ecosystem restoration strategies through a landscape architecture approach. The goal is to contribute to the larger vision of Rotterdam as urban ecosystems developing towards ecocities. The ecocity principles are used to create spatial design, spatial quality and spatial experience that are contextual and temporal to the ever-changing world.

This involves understanding the history of the site, both materialistic and cultural qualities which forms the departure of the design. The layers of scale, time and process will be addressed in regional and local scales of the Rotterdam urban area. The design is situated at the formation of a larger ecological design framework as well as curated architectonic ensembles. Palimpsests are layered, ordered and spatially transformed to create new meanings which creates a continuity in the story of the region, both physically and culturally.

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

The process and method of this project can also be replicated with a new language to similar urban contexts suffering from rapid urban sprawl, ecological decay and climate change related issues. The project also takes into account the vision for the Rotterdam region by the Municipality and therefore hopes to add to the existing research of the professional bodies. Incorporation of state-of-the-art features like the i-Tree also makes use of modern technology into solving issues related to urbanization and climate change. The project can propose certain design components at local scales by studying the urban, social and functional characteristics of the same, which would be helpful in real time design interventions as well.