# Graduation Plan

Master of Science Architecture, Urbanism & Building Sciences



# **Graduation Plan: All tracks**

Submit your Graduation Plan to the Board of Examiners (Examencommissie-<u>BK@tudelft.nl</u>), 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	Maria Lakoumenta	
Student number	5483646	

- II			
Studio			
Name / Theme	Design of the Urban Fabric / Embracing Plurality – Growing Porosity		
Main mentor	Birgit Hausleitner	Urban Design	
Second mentor	Luca luorio	Environmental Technology and Design	
Argumentation of choice			
of the studio	As an architect and future urban designer, I investigate the power of architecture in the cohesion of the city. Climate change, the hectic pace of life and social inequalities dominate the world and they have contributed to the change of the urban environments and their rudiments. The possibility of developing new city patterns, the interpretation as well as the redefinition of the existing urban fac- tors and the revitalization of decadent landscapes in the urban core all constitute the main research topics I am passionate about. The pattern investigation as a multi-scalar regeneration strategy in metropolitan areas as well as my reading stimuli motivated me to choose Manhattan as the urban context of my graduation thesis. Manhattan itself is the epicenter of patterns, from the grid to the skyscraper. External forces such as the impending housing crisis, social segregation and flood risk will reconfigure the pattern image of the city in the future. The cross-scalar approach of the Design of the Urban Fabric Studio starting from the regional scale and ending at the neighborhood scale is the ideal procedure in order to identify important elements for future interventions in a local scale. The objective of the future public space, the redefinition of the urban landscape in the framework of growing porosity and plurality constitute a challenging variante for mean and the mean force through my theorie		

Graduation project			
Title of the graduation	"New Mannahatta" 2100: Re-interpreting the urban patterns and		
project	expanding the Lower Coast		
<b>A</b> 1			
Goal		Manhattan Now York City	
		Manhattan, New York City	
i ne posea problem,		having grisis, assist approaction and flood risk	
		The limited new horizontal development, social	
		inequalities and the threatening rising sea	
		levels make vital the re-interpretation of the	
		existing urban patterns and the potential for a	
		future expansion.	
research questions and			
		Research Question	
		What is the interpretation of the grid in the face	
		of housing crisis, social segregation and rising	
		sea levels in Manhattan in order to achieve a	
		social inclusive and flood adaptive system of	
		interventions?	
		Research sub-questions	
		- What is the densification potential of	
		the grid towards housing development?	
		- How can the grid foster the interaction	
		hetween diverse economic and cultural	
		backgrounds?	
		backgrounds:	
		llow on the swid winforce the	
		- How can the grid reinforce the	
		resilience of the metropolitan area	
		against flood vulnerability?	
design assignment in which these result.		The project aims to mitigate the housing crisis,	
		social segregation and flood risk in Manhattan	
		through the grid interpretation and the	

unraveling of the forgotten palimpsest natural landscape. The grid redefinition in combination with an urban expansion will reconfigure the existing patterns bringing people closer to nature.

# Process Method description

The methodology used for the entire graduation thesis can be divided into the following main sections: Motivation-Project Definition, Problem Statement – Challenges, Research objective, Conceptual and Theoretical Framework, Analysis and Design Implementation

The first section presents the motives of the author towards the involvement with the specific topic based on personal research interests and reading stimuli. The influence of New York City in a global context has shaped the notion that the megacity is the center of the world. The impending challenges of housing crisis, social segregation and flood risk in Manhattan define the main pillars of the thesis. This section includes the problem statement and the analysis of the three challenges through data collection and interpretation, analysis mapping and literature review. The analysis indicated the extent of the housing shortage, social inequalities and flood vulnerability in the metropolitan area.

The section of the Research objective delves into the Manhattan Grid, the correlation of the grid with the three challenges, the hidden streams of Manhattan, the Research Question and the Research Aim. From the historical Evolution of the island, it is clear that the application of the grid structure fostered the building and economic development of the metropolitan area, while not taking into great consideration the natural elements and forces of the landscape. The extensive dialogue around the grid including both supporters and opponents as well as the impact of the structure in shaping the whole metropolitan area indicate that Manhattan is the grid. The next part of the chapter deals with the investigation of the grid per challenge. The methods used include data collection, interpretation, mapping and literature. The conclusions were derived from both the analysis and the relevant theories. The outcome that the application of the grid distorted the natural landscape mechanisms including streams and wetlands had as a result the lack of resiliency of some areas towards flood. The burial of the streams seems worsened the water storage capacity in the specific areas. The reference to the hidden streams and the investigation of crucial ones that are buried, show the importance of stream daylighting and thus the grid re-definition. It is important to say that the methods used for the analysis include data collection, interpretation, mapping, VR lab and literature. The grid is an important element towards the spatial organization and using the proper design applications while revealing its inherent intelligence including the freedom of the 3 dimensional space, it is possible to mitigate the three challenges. The conclusions formulated the

Research Question and the Research Aim of the graduation project, making vital the grid interpretation in order to achieve a social inclusive and flood adaptive system of interventions through unraveling the lost natural forces, thus bringing people closer to nature.

The next section includes the Conceptual and Theoretical Framework. The research question "What is the interpretation of the grid in the face of housing crisis, social segregation and rising sea levels in Manhattan in order to achieve a social inclusive and flood adaptive system of interventions?" as well as the sub-questions 1) What is the densification potential of the grid towards housing development ? 2) How can the grid foster the interaction between diverse economic and cultural backgrounds? 3) How can the grid reinforce the resilience of the metropolitan area against flood vulnerability?, can be answered through the Conceptual framework. The Conceptual framework poses the three main concepts of Porous City, Social Inclusion and Flood Resilience in order to mitigate the challenges of Housing Crisis, Social Segregation and Flood Risk respectively. The grid is interpreted through the incorporation of design strategies in order to achieve the Research Aim. The strategies are investigated through Reference Projects. The Theoretical Framework includes the key literature for analysis of the urban context, the grid and the three challenges as well as the strategies towards their mitigation.

The overlap of analysis mapping in combination with the most vulnerable sites will lead to the conclusion map of metropolitan analysis in order to identify potentials for specific site selection. The design will follow a multi-scalar approach starting from the metropolitan scale and then delving into specific areas for city scale and local scale. The multi-scalar approach is important since we are referring to water and natural systems in correlation with urban design. It is notable that the thesis is driven by the idea" Research by Design and Design by Research" in combination with Literature.

## Literature and general practical preference

The graduation thesis is constructed through a theoretical framework based on key literature related to the investigation of the three challenges of housing crisis, social segregation and flood risk in Manhattan context

A combination of urbanism, social science and climate resilience theories constitute the core of the thesis. It is important to note that the theoretical framework is incorporated into the whole range of the report as a means of argumentation.

The key literature includes remarkable notions of Rem Koolhaas from Delirious New York: a Retroactive Manifesto for Manhattan regarding the historical evolution Manhattan island, the mass building development and the application of the gridiron plan. The spatial structure of the plan and its organization intelligence is addressed by Busquets, Yang and Keller through the Urban Grids Handbook for Regular City Design . The need for social inclusion and diversity is widely analyzed by Jacobs in the Death and Life of Great American Cities as well as by Zukin in the Naked City: The death and life of authentic urban places. The emergence for landscape incorporation in the urban processes as a successful means towards the mitigation of flood vulnerability is investigated by Keenan & Weisz in Blue Dunes Climate Change by Design.

The investigation of Manhattan Grid turnes out to have both critics and supporters. Reuben in Mythologies of the Grid in the empire city 1811-2011 refers to the plan as a fast and economic efficient solution promoting real estate development (Reuben, 2011). Ballon on the other hand in the Greatest Grid: The masterplan of Manhattan 1811-2011 explained the flexibility of the grid for future growth and change. (Ballon, 2013)

The correlation of the grid and the mitigation of housing shortage is framed according to the notion of Koolhaas and Mau in S, M, L, XL for the potential of the grid to provide three dimensional anarchy despite the fixed plan. It seems that the grid is able to incorporate various intensifications in order to mitigate the housing crisis.

The interpretation of the grid along with the social segregation is based on the theories of Stanislawski about the equitable and democratic distribution of property of the gridiron plan as well as the social surveillance (Stanislawski, 1946). The challenge for social inclusion and the distribution of resources among all economic classes in the grid structure is widely analyzed by Cerda (Cerdá 1867). The elements of the grid if properly designed can bolster the social interaction between all economic classes.

The urban layout of the grid affects the flood resilience of a metropolitan area. The notions of Mustafa and Napierlaski show that the grid is beneficial towards flood (Mustafa, et al., 2020), (Napierlaski, et al.2015). However, the burial of the streams and the distortion of natural landscape

has negative effects on water capacity, making vital the incorporation of green patches and stream daylighting. Kadinsky shows the importance of unraveling the hidden water network towards the sustainability of Manhattan and the connection with the forgotten Dutch past (Kadinsky, 2016). In this direction, James Corner puts forward the emergence of the contemporary cities to adapt into a terra fluxus instead of a terra firma (Corner, 2006).

The grid is both interpreted and reinforced through strategies that aim into the Porous City as described by Paola Vigano (Viganò, 2016), the Social Inclusion and the Flood Resilience. The strategy investigation is based on design principles extracted from relevant papers and reference cases as a means towards the mitigation of Housing shortage, Social segregation and Flood vulnerability.

All in all, the grid shows great potential but the elements inside the structure need to be both intensified and redefined. In terms of natural landscape, the grid needs to incorporate the beneficial natural elements of the forgotten palimpsest landscape in order to be more resilient in the years to come.

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

# **Reflection 1**

Manhattan constitutes a complex urban environment with multiple drivers of change. My focus on mitigation of housing crisis, social segregation and flood risk will be approached across scales with specific focus on Design on local level through the redefinition of the grid in the framework of creating a pattern language.

The cross-scalar approach of the studio starting from the regional scale and ending at the neighborhood scale is a fascinating pro-cedure for me. The objective of the future public space, the redefinition of the urban landscape in the framework of growing porosity and plurality constitute a challenging voyage for me to explore through my thesis.

Bearing I mind that through the thesis I am dealing with multiple scales od intervention, I think that it has close relation to most of the tracks in the master's program. The local scale has to do with Architecture and built environment through the design patterns. The Landscape track is much related since I am dealing wit solutions towards flood resilience using landscape elements and building with nature techniques. Building technology is probably related since the revival of hidden streams would involve a more detailed study of the flows in the urban core. The MBA track has to do with management, so in a sense it has a close relationship with the thesis the close supervision of the interventions in the public realm.

Last but not least, the topic incorporates the principles of Urbanism aiming to benefit both the society and the environment.

#### **Reflection 2**

#### Scientific Relevance

The graduation thesis explores mechanisms for mitigation of housing crisis, social segregation and flood risk in the dense building environment of Manhattan. Although there has been an extensive scientific research per challenge separately, the project aims to address for the first time the three challenges at once as a holistic approach towards the porous city, social inclusion and flood resilience through the unraveling of palimpsest natural elements using the grid as a tool for interpretation.

The grid study per challenge led to useful conclusions for design implementation. The revival of the hidden streams and their incorporation in such an extremely compact building environment like that of Manhattan is also investigated through research and design.

All in all, the projects aims to bring the natural elements in the urban core, thus contributing to the revival of the forgotten Dutch identity through building with nature operations as social and flood adaptive infrastructures.

#### **Societal Relevance**

The emergence for social inclusion as an aim towards the mitigation of social segregation and the porous city as an answer towards the housing shortage, constitute the main points for the societal

relevance of the thesis. However, the social impact of flood risk would lead to the notion that the environmental factor is much related. Since the aim of the project is to create flood adaptive social infrastructures, it is important to note that the building environment, the social justice and the flood resilience are parts of societal relevance.

The need for housing units is not only addressed in the framework of housing development but in the wider scope of porosity which fosters the collective living through the reinforcement of porous parts in the urban core. Moreover, the demand for more public space and the interaction between all economic classes through mixed use areas are crucial parts of the thesis.

Bearing in mind that the urban projects are the products of politics of a topos, the thesis delves into the conversion of current capitalistic logic into a socialistic vision for the future of Manhattan.

## Professional Relevance

The project deals with the wider term of Landscape Urbanism, aiming to propose solutions through the incorporation of the natural river flows in the fixed artificial grid. Being and architect with passion towards the development of new city patterns, the redefinition of the existing urban factors and the revitalization of the decadent landscapes in the urban core, I hope that through this thesis I will prove that Architecture, Urban Design and Landscape architecture should not be conceived as separate fields but as one entity aiming for research of the future urban ecologies.

I guess the seed for this combination came through my architecture studies in Greece and my internship in Barcelona where I had the opportunity practice in these fields as a holistic approach from metropolitan to local scale.

Through the cross – scalar redefinition of the grid pattern as a tool towards the mitigation of housing crisis, social segregation and flood risk in Manhattan, I am confident that I will evolve as a student and professional. This specific graduation thesis incorporates my entire concerns firstly as a person and then as an architect – urban designer trying not only to stay in the "fixed" form of things but leave the "flow" show the way of design.