

Graduation Plan

Master of Science in Architecture, Urbanism & Building Sciences

MSc Landscape Architecture 2024 - 2025

[Regina Klinger]



Graduation Plan

Submit your Graduation Plan to the Board of Examiners (Examencommissie-BK@tudelft.nl), your mentors and delegate of the Board of Examiners one week before the P2 date at the latest.

I Personal information

Full name	Regina Klinger
Student number	5939879

II Studio / Lab information

Name / Theme	Design Lab for Landscape-Based Urbanism	
Main mentor	Prof. Dr. Ing. Steffen Nijhuis	Landscape-based Urbanism
Second mentor	Dr. Daniele Cannatella	Urban Data Science
Argumentation of choice of the LA graduation lab	Through my previous studies I have realized that water will play a more and more crucial role in urbanized and rural contexts across the world. On the one hand we must deal with water shortage and store the excess water for dry and hot periods. On the other hand, heavy rainfall causes floods in heavily sealed areas, like old historic city centres that were focusing mainly on Architecture instead of including the landscape into it. Additionally, human behaviour along water edges and -elements is more "space-efficient" as they care less about who is sitting in their proximity, unlike in urban green structures like parks, where humans naturally spread out as far from each other as possible. I came to the hypothesis that water could be the answer for a spatially limited and heavily sealed context, where there is hardly any space for green structures anymore. I want to work on the context of Naples in the Design Lab for Landscape-Based Urbanism, as it unites both: a challenging urban context as well as the possibility to work with landscape-given features like the subterranean (water) landscapes.	

III Graduation project

Title of the project	Vertical Blue Designing the subterranean water system as a landscape infrastructure for socio-ecologically inclusive and climate adaptive public spaces in the city center of Naples
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Context and aim of the project

Location (region / area / site)	Campania, Naples, City Centre
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Problem statement	Around the world, we find fascinating, historic city centres that are heritage to their context-specific culture. Many of them (like Rome, Tetouan, Venice or Naples) have a water story to tell that is linked to the subterranean world of their urban layout. Especially in South-Europe, for example in and around the city of Naples, Italy, through Greek and Roman empires, fascinating city layouts and enormous water systems were built in order to meet the water needs of the city in the mediterranean, urbanized parts. With modern urbanization, the remnants of these systems had been covered, removed or replaced by newer ones and therefore many natural and human-made water systems and features, like rivers, streams, aqueducts, fountains and cisterns started to be detached from the layout of the cities and their importance faded away – out of the water mindset of the city's inhabitants. Now, the subterranean landscape of Naples, Napoli Sotterranea, underneath its city centre and outskirts, is a separate landscape of excavations that is not anymore visually and mentally weaved into the urban form and function of Naples on the surface. The City Centre of Naples is UNESCO World Heritage, it is basically an "untouchable" area in the heart of the city. It includes many structures, from medieval features of narrow, dark streets to Renaissance and Gothic churches and palaces along the broader roads. Naples is facing climate change on many levels. The city centre lacks blue-green spaces and therefore turns into an urban heat island that is confronted with a lack of quality public spaces, fast traffic, litter pollution and loss of identity due to heavy tourism. At the moment, that cannot be mitigated through any spatial form at the moment.
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	The city center, through which tourists, inhabitants and traffic try to hectically move, the heterogenic elements of this unique urban layout altogether miss one certain thing: public spaces that create future-proof conditions. It means spaces to cool down, interact, slow down the pace of the city and improve ecological value. Furthermore, it means enhancing social cohesion amongst the rapidly living and moving people, adding ecological value to the hardscape of the built environment, mitigating climatical vulnerability in challenged areas and above all: re-installs the relationship from the city to its fascinating subterranean structures that are the fundament for Naples' existence and can be rethought as public space. This leads me to the following questions:
Research question(s)	Research Question: How can we utilize the subterranean water system of Naples as a landscape infrastructure for socio-ecologically inclusive and climate adaptive public space structures? To answer this question, the following sub-questions will be addressed by means of design research and research through design: - How does the (subterranean) water-system of Naples work and how is it connected to the city's public space structure? - What are existing design strategies and principles to use subterranean water systems to activate public space? - How can we apply these findings to design a multi-dimensional landscape infrastructure for the city center of Naples? - What lessons can be learned by regarding subterranean water systems as leverage for developing future-proof public spaces?

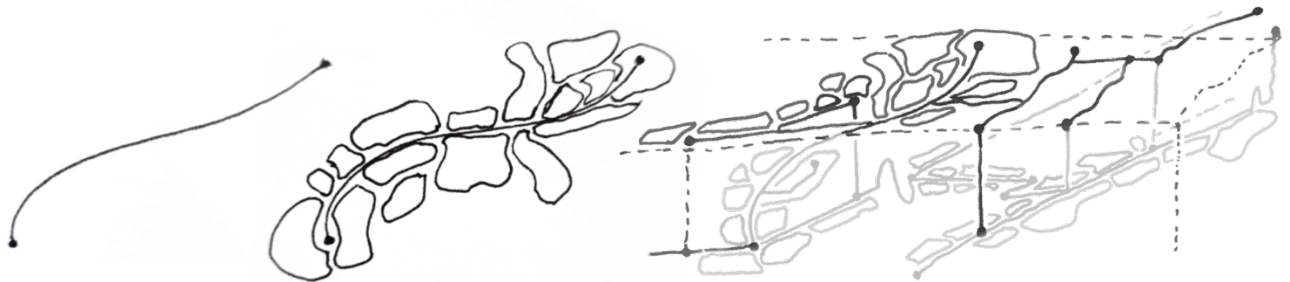
Design assignment

To elaborate on the design assignment, it is important to introduce the theoretical background of the design approach: An Urban Landscape Infrastructure (Nijhuis & Jauslin 2015) is the idea of creating a multi-purpose infrastructure, meaning that a linear, single-purpose infrastructure turns into a longitudinal space continuum of zones and conditions that come with the infrastructure. The infrastructure becomes a landscape and the landscape becomes an infrastructure. In the case of Naples, water is the infrastructure with its diverse zones alongside it, inheriting different purposes. Furthermore, the infrastructure runs not only horizontally but also in the vertical direction. The landscape infrastructure is based on the flow of water, that connects to different zones and spaces above and below the ground and creates conditions that improve the urban public spaces. Because of the vertical movement of water being brought back up from the underground but also surface water being potentially introduced into the subterranean spaces, the title of the thesis is "Vertical Blue".

Single-purpose infrastructure

Multi-purpose Landscape infrastructure

Three dimensional Landscape infrastructure



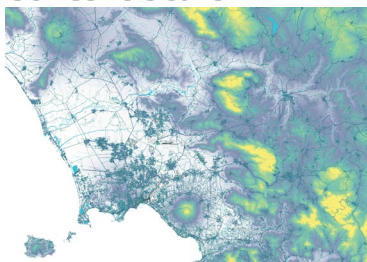
From line – to zone – to vertical landscape infrastructure

To create this kind of landscape infrastructure, the **Design Assignment** is the following:

How can we design a subterranean water system as a landscape infrastructure for socio-ecologically inclusive and climate adaptive public space structures for a future-prove city center of Naples?

The design will be carried out on different scales to link the overall context and influential processes to the concrete experiential design outcome on the plaza scale.

Context Scale



Water system + Climate Challenges



Between Mountain and Coast

District Scale



Infrastructural elements + Spatial Networks

Plaza Scale



Micro Interventions + Spatial Sequences

IV Graduation process

Method description

01.09.2024 – 07.11.2024 (P1)

1. Key-Topics: Defining Research Questions, First Vision Ideas, Landscape Infrastructure
2. Methods: Case Studies, Literature Review, Mapping, Drawing, Google Street View, Sketching
3. Outputs: Precedent Analysis, Nolli Plan, Vision Drawing, Challenges Map, Theoretical Framework (Landscape Infrastructure), Glossary, Thesis Draft, Rhetorical Précis, Abstract, Problem Statement, Define Analysis Scales, Define Final Design Products

07.11.2024 – 28.01.2025 (P2)

1. Key-Topics: Site Visit, Thesis Draft, Section-Model, Collaboration Partner "LAN/CoolCity"
2. Methods: Site Visit, Interviews, Gather (GIS) Data, Conferences, Photo documentation, Mapping, Sketching, Drawing, Design Experiments, Modelling
3. Output: Structure Maps, Challenges Map, Opportunities Map, Narrative Map, Site Model, Quick Design Sketches, Position Paper, Finalize Thesis Draft, Mapping Public Space Typologies, Define Design Area and Scales

1. Sub-Question:

-(GIS)Mapping (Regional Water System, Nolli Plan, Challenges, Water features, Water Narratives)

-Quick-Sketch Session

-Site Visit (Human behaviour along water elements, Interviews, Gather Subterranean Data, Conferences, Green structures + water, Photogrammetry, Public Space Typologies, Mapping water Narratives)

-Literature Review

2. Sub-Question:

-Precedent Studies (Rome, Tetouan, Venice, Istanbul + Dive into historic/modern examples of how water is used as an element in public space)

-Site Visit (Interviews, Local design examples in Naples)

-Design Experiments

3. Sub-Question:

-Design of a subterranean water-system (water monuments, museums, accessible underground space) as a landscape infrastructure that connects to the surface and reaches out to green structures (ecological value, cooling), connects to former fountains (social element, acoustic) and binds the public spaces together to create a fluid and vivid public space structure that adds value to the heritage and the city, both on the surface and the subterranean level

Sub question 4:

-Climate analysis before and after the design (to measure the climatical improvement of the design)

-Interviews with the finished project to understand if the design ideas would improve social cohesion

Literature and more applied references

- Corner, J., & Bick Hirsch, A. (2014). Recovering Landscapes as a Critical Practice. In *The landscape imagination: Collected essays of James Corner, 1990-2010* (pp. 111-129). Princeton Architectural Press. (Original work published 1999)
- Corner, J., & Bick Hirsch, A. (2014). Terra fluxus. In *The landscape imagination: Collected essays of James Corner, 1990-2010* (pp. 305-315). Princeton Architectural Press. (Original work published 2006)
- Nijhuis, S., & Jauslin, D. (2015). Urban landscape infrastructures. *Designing operative landscape structures for the built environment. Research In Urbanism Series*, 3(1), 13-34.
doi:10.7480/rius.3.874
- Comune di Napoli. (1967). *Il sottosuolo di Napoli*. Agif.
- Whyte, W. H. (Director). (1980). *The social life of small urban spaces* [Film]. The Municipal Arts Society. Available at <https://www.dailymotion.com/video/x8mpdo3>

V Reflection on the project proposal

1. What is the relation between your graduation topic, the lab topic, and your master track?

The Graduation Topic contributes to the lab topic by finding a landscape-based approach to make an urban, historic, protected and conservative city centre, future-proof through landscape-given and forgotten subterranean landscape elements. Water is the landscape infrastructure – the driver – for better social, ecological, climatical and mental conditions in an urban environment.

My thesis contributes to the Master Track of Landscape Architecture by emphasizing the transformative potential of landscape when regarded as equal to architecture – both as a design element and as infrastructure. The term "Landscape-Architecture" itself already embodies the integration of these disciplines, highlighting the capacity of landscape to function as a critical, adaptive system within urban environments. In the context of Naples, known for its protected historic architecture, landscape often lacks the consideration it deserves. While the architectural heritage is celebrated, the absence of a landscape-based approach leaves the city vulnerable to ecological and social challenges. By reimagining landscape as a foundational layer of the city, my thesis proposes solutions to enhance urban resilience, mitigate climate vulnerabilities, and improve the quality of life for its inhabitants. This approach aligns with the core values of the TU Delft Master Track, which encourages innovation, sustainability, and the integration of landscape systems into urban design. By addressing the challenges of a dense, historically significant urban environment, my work aims to demonstrate how landscape-driven solutions can coexist with and even enhance architectural heritage, ensuring a future-proof city that supports flora, fauna, and human life alike.

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

In the larger context, understanding and being aware of the subterranean landscapes of our environment is an important step to unveil remnants of the past that we might have forgotten as a valuable source to work with - whether embedded in a rural or urban context. Especially when it comes to heavily urbanized area, which are – as in the case of Naples – even protected as a UNESCO world

heritage, it becomes even more important to think further, through levels, scales and surfaces. It is about daring to think vertical in order to have positive horizontal changes in public space structures. When it comes to make our environments future-proof in the face of climate change, social differences and extinction of flora and fauna, it becomes crucial to look into the history, learn how to work with what is already existing and how to (re)activate these systems in a way to connect it to the people again – as they are the producers of value for these systems in the end.

Exploring the historic center of Naples and its subterranean world offers unique research potential by redefining what we understand as landscape and public space. The subterranean landscape, with its water systems and underground spatial structures, introduces a new layer to landscape-based urban design, transforming it into a dynamic, connective infrastructure. It is about how we can define, create and design landscape as a landscape infrastructure, which is a new way of thinking about landscape as a connecting element between scales, natural processes, urban and rural contexts as well as disciplines and architecture(s).