

# Graduation Plan

Master of Science Architecture, Urbanism & Building Sciences



Personal information	
Name	Alejandro Mendiola De la Peña
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Studio		
Name / Theme	AR3CS100 Graduation Studio Cross Domain City of the Future	
First mentor (Design)	Joran Kuijper	Architecture
Second mentor (BT)	Craig Martin	Building Technology
Third mentor (Research)	Diego Andrés Sepúlveda Carmona	Urbanism
Argumentation of choice of the studio	<p>The approach to the city as a set of complex systems, as well as addressing conflicts from the present that will impact the future represented the initial arguments for my decision. Being interested in the issue of water management, it was essential to approach to a studio that would motivate me to develop my project from an interconnected urban and ecological systems approach. Although the studio is intended to produce an architectural project, its guidance would facilitate my understanding of landscape water flows in my project area.</p> <p>On the other hand, before the beginning of the academic year, I had the intention of carrying out a project in Mexico City, my home city. I sought to enroll in a studio where research would have an important role in the final delivery in order to contribute an academic research result to the city. City of the Future, therefore, is an ideal choice because of its flexibility in deciding the project site and the topic to delve with. The organization of the study permits to choose a third mentor for the research report, which meant an important reason for my decision. The freedom of the third mentor would then permit me to choose an expert from a range of different areas to achieve a holistic research result.</p>	

Graduation project	
Title of the graduation project	Conquering Water Flows The Recovery of Aztec Inspired Water Values towards a Hydric Sensitive Paradigm in Mexico City
Goal	
Location:	Tláhuac-Xico Lake, former Chalco Lake in Mexico City
Problem Statement	Water has been an essential energetic resource for the growth of human settlements throughout time. Since the earliest settlers in the endorheic basin of Mexico, until its conquest from the newly born Kingdom of Spain in 1521a.D., the concept of water had served as central axis for the birth and growth of civilization. Based on this

	<p>guiding principle, the Aztec cosmovision of the built environment was, therefore, closely embedded to its surrounding nature. Aztec cultural beliefs were translated into complex urban waterworks that served as ecosystem services for the cities in the basin, consolidating the foundations of hydraulic societies. Through the practice of a meticulous anthropo-ecological interlaced relationship, and by taking advantage of its adaptive properties, the region headed towards a socio-ecological dynamic equilibrium.</p> <p>Since the Spanish arrival, the value systems which had previously guided the region were supplanted by those introduced by the newcomers. The cultural transition necessarily implied a paradigm shift of values and practices in territorial understanding in between the natural basin and its built environment. Since the Spaniard's re-foundation of Tenochtitlan as Mexico City, pre-Hispanic water values were banished through a materialized series of draining infrastructure projects to catalyze the plans for cultural change. The endorheic basin of Mexico was then reconceptualized as a dry valley. The ancient water values were overrun and those implanted during the Spanish occupation remained, however, after the independence and persist until our days.</p> <p>Nowadays Mexico City, with a population of over 20 million people, is suffering an existential paradox from a never-ending need to manage its natural and unitary man-made water cycles. Following the systematic imposition of values during colonial times, there is a direct relationship between the diminishing role of ancestral water practices and the growing dislocation between natural and human systems. Since then, anthropogenic practices have sought to conquer the basin's ecological cycles with an extractive centralized state-centered systematic approach. After relying on this methodology, and despite several infrastructural projects throughout the last decades, Mexico City is still suffering a significant generalized shortage of water, as well as constant seasonal flush flooding. The basin of Mexico is witnessing a daily confrontation between ecological and social cycles that are, in consequence, constantly degrading both the natural and built environment.</p>
Research Question	How to identify and implement vernacular Aztec-inspired water values and practices to spatially enhance the process of regeneration and expansion at Tlahuac-Xico Lake, formerly known as Chalco Lake?

Sub-Questions	<ul style="list-style-type: none"> <li>• Why does Mexico City keep on following the principles towards water management established by the Spanish occupation of the Endoreic Basic of Mexico five centuries ago?</li> <li>• How to manage the natural hydrological cycles in the Basin of Mexico, where water doesn't follow an arrival-departure cycle, but an arrival (precipitation &amp; run-off) - absorption (infiltration &amp; evapo-transpiration) one?</li> <li>• As a consequence of climate change, how would Mexico City's settlements placed on the former Chalco lake evolve after long-lasting periods of floods?</li> <li>• How have the ancient Aztec foundational principles of water in the basin evolved and which role do they play in contemporary life?</li> <li>• Which are the factors that led to the reappearance of the ancient Lake Chalco?</li> </ul>
Design Assignment	<p>Based on Aztec inspired water values and practices, specifically those of the Chalcas, and taking into consideration the physical flows of water in the Tlahuac-Xico lake, propose a design project that reconnects the dislocated spatial gap between the lake and the city. To propose a design that promotes the recovery of the lake from a socio-environmental perspective. To direct the design towards the first stage of the regeneration process, where, from an architectural program based on community reactivation on the edges of the lake, unify the interests of neighboring groups surrounding it. The design project will strive to promote the hydric Aztec values and practices through the implementation of water harvesting spaces and amphibious productive spaces to enhance social cohesion. Both, the ecological recovery and the management of the hydric cycles present in the region, through the implementation of spaces embedded to the site's ecosystem services, will represent guiding principles during the design process, as well as the final delivery.</p>
<b>Process</b>	
<b>Method description</b>	
<p>The project will focus on the socio-environmental strategy, where cultural (social) and ecological (environmental) aspects of the region will guide the design and research process. For a holistic proposal for the recovery of the water cycles in Chalco, these will be taken into account, which will allow results towards ecological equilibrium.</p>	

Based on mapping and photographic evidence from site visits, the intervention area will be defined. Likewise, the multifactorial problems of the area will be evidenced in order to prioritize the hypotheses for the possible results of the spatial design. The pre-Hispanic practices that are still present, and of which there are territorial vestiges, will be exposed, with the purpose of using this knowledge for the impulse in the definition of the architectural project.

In parallel to the design process, a spatial study in territories with similar conditions within the Mexico Basin will be conducted, such as Xochimilco and Texcoco. This will be to assess the water management strategies already implemented, along with their ecological and social results.

### **Literature and general practical references**

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- Torres-Alves, Gina Alexandra, O. Morales-Nápoles, "Reliability analysis of flood defenses: The case of the Nezahualcoyotl dike in the aztec city of Tenochtitlan". *ScienceDirect*, 2020. <https://doi.org/10.1016/j.res.2020.107057>.
- Aztec Codex such as the Mendoza Codex (1541) and the Boturini Codex (XVI century)

### **Reflection**

Water management has always been an issue to be addressed in cities and urbanized spaces. TU Delft, as well as the Netherlands as a whole, has been a reference for the study of water management and its application to its cities. This university has made great efforts to understand its flows and how to limit its risks for societies. The

Graduation Studio Cross Domain City of the Future, therefore, represents a source for the study of water, which is closely related to the urban fabric and the human-ordered landscape. On the other hand, this studio maintains a perspective towards the future, where water management, due to the global warming crisis, will severely impact the entire world, which will require ideas to formulate solutions towards this conflict.

I consider that my graduation project represents a clear example on how every territory must be addressed according to its characteristics. For instance, specific alternatives must be sought for water management in the endorheic basin of Mexico where, Mexico City, one of the most populated cities on the planet is located. The socio-environmental stance of this project, therefore, produces a series of questionings towards the contemporary approach that exists in diverse regions of the world towards the dislocated relationship between water flows and the concept of a productive dry city. Therefore, this project, together with its academic research, seeks to establish the framework for future studies of design processes in specific territories, such as an endorheic basin, in order to propose spaces that promote a socio-ecological equilibrium in locations where water represents the main component the environmental ecosystem.