

REFLECTION PAPER

Graduation Studio Architectural Engineering

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The most interesting part of this master to me is learning how architecture positions itself in the natural as well as social environment. I believe the objective in architecture is to improve the lives of people in a way that takes consideration of the environment and deals with its specific location. The design objective for my project is twofold: the building should reduce problems arising from climate change (water nuisance and urban heating) and at the same time be an addition and improvement for the users of the space and building and its surroundings.

Process & Results

My research investigated the role of water in the built environment and what systems are part of the route of the water in a city, with the objective to give buildings a larger role in this system and have a positive impact. The research into storing, harvesting, and reusing water in climate systems was more general, not specific for the location or program of the project. When the decision of designing a theatre was made, an extra challenge was included in the process. A theatre building has quite specific requirements, some examples are high cooling demand, the need for full trucks to park in the building and a distinct routing of people and objects. For a while, it was difficult to balance and especially combine the two themes that were important: water and theatre design.

Around P2, it was a bit like I was handling two challenges, I started with my research into the urban water system, followed by deeper research into theatre design and the existing theatre building. It would have been helpful if the influence of the design challenge on the research conducted before P2 had already been stronger. Some applications of water for climate systems in buildings later appeared to be insufficient for the particular requirements of the theatre building. If I could have investigated those requirements earlier in the process, it would have been possible to seek for more suitable solutions sooner. Some solutions presented in the research paper are more applicable for smaller scale buildings with lower cooling and heating demands. However, even though my research was quite practical and straightforward, and involved creating schemes and classifying solutions in a more general way, it highly influenced my design choices. Working on the two topics a bit parallel, the process felt a bit unstructured and chaotic. I did have a lot of ideas, but they were not coming together in the right way. It was very helpful to have tutors from various backgrounds to approach the project from different perspectives and help me rethink issues. Several times, I got stuck in a problem and a small comment from a tutor helped me look at the issue from another angle, not only helping me solve the issue but also inspiring me think in possibilities and use these challenges to work towards unique building features. It was useful to switch back and forth between disciplines to solve problems and rethink design choices. My tendency to be hesitant in making decisions sometimes stalled the

process. This became clear when shortly after P3 I had not completely defined the shape of my building and did not feel content with the direction it was moving towards. I decided to take a step back in the process and re-evaluated the shape and building concept. Going back to previously established design objectives (double use, flexibility, connection with the neighbourhood, etc.) helped me redirect the design. From then on, the story became more evident, and separate elements were more integrated into one design concept.

As mentioned before, the most important challenge for my design was to create a connection or even symbiosis between the two themes of the project: water and theatre design. Both my literature research and design research used the method of analysing case studies and examples for these themes. Comparing and combining concepts presented in reference projects helped to find fitting solutions. This was a challenging and long process, in which finally all fell into place. I was looking for integral design elements that could have a positive influence on both the urban water system as the climate, functionality, and character of the theatre. Finally, the design includes several interventions which have this layered purpose.

The most important design interventions are the water storage below the building and lifted terraces, the rain curtain facades, and the rainwater retention roof ponds. Each solution has a function in the water system: collecting, retaining, draining, and storing rainwater. This function is combined with a climatic function: buffering the sunlight hitting the flat roofs, cooling down the environment with evaporative cooling or pre-cooling (and pre-heating) the ventilation air. Finally, all solutions improve the spatial quality and aesthetic character of the building. The water storage places the complete theatre building on a stage, creating possibilities for urban life on its elevated terraces, slopes and stairs. The rain curtains provide dramatic and theatrical façades with the possibility to open and close in different places when needed, while at the same time showcasing the water dripping down from the roof. The roof ponds create characteristic skylights and flickering daylight for the interior, as well as views on the water. This way, the interventions are not only beneficial for the urban water system, but also serve the building and urban environment by improving the exterior and interior climate and have a role as aesthetic elements that shape the character of the building.

Value & Transferability

My project displays how future designs should deal with problems of the future, water nuisance, drought, and subsidence. It was important to not only withstand these challenges, but turn them into strongpoints of the design. This way, a building can exist longer, and not only take from, but also serve its environment (for example by cooling the surroundings and preventing flooding). A question that rises here is to what extent we should keep building in places which are maybe not suitable for living any longer. Should we make complex buildings to be able to live in problematic areas, or should we move to safer ground and leave the other areas to nature? For this project, I have made use of the PARA framework for resilience (Doberstein et al., 2018). The framework presents three main approaches to reduce flood risk and resilience: Protect, Accommodate, Retreat and Avoid. Moving to our (built) living environment would be the *retreat* approach. With the accommodate approach the abundance of water is understood as a given fact which we must deal and design with. The accommodate approach can also be described as 'living with water'. The main take from this is that we have to accept new situations and design with them, instead of fight against them. That is what this project is also aiming for, the final

design showcases how water can serve a building instead of being a threat. The whole theatre design is very specific for this location, influenced by the shape of the surrounding buildings, sunlight, existing routes etc. However, the implementation of water elements in the design can be an inspiration for other projects. The concept of creating a place for water in several parts of the building (roof, façade, below the ground floor) can quite easily be transferred to new projects or even renovations. The emphasis lies on not only collecting and storing rainwater for the sake of lowering the impact on the sewer system, but at the same time utilizing the characteristics of the water for the benefit of the building. This can be done in the way I did in my project (buffering sun, evaporative cooling of the environment, pre-cooling ventilation air, etc.) but in many other ways. It is important to shift the way we think about water in buildings.

Furthermore, the project aspires to create a bigger 'water awareness' for the users. It is not unimportant to realize the role of water in our surroundings. Instead of draining rainwater as soon as possible, it is deployed a decorative and playful element for people to enjoy. Making water and its movement through our built environment more visible can improve the relationship between humans and water. It should create awareness of the influence of water and start discussion on how we should live and deal with it now and in the future.

Towards P5, I will work on visualizing the character I have in my mind for the building. The final presentation should showcase the approachable and lively character I envision. It should be theatrical and welcoming for new visitors, but also pleasant and comfortable for frequent users. The water has to be visible as a subtle but unique and functional design element. The symbiosis of the several themes in my gradation project should be clear and inspiring.