



GATHERING THROUGH WATER INTEGRATION

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Architectural Engineering Graduation Studio 'Intecture'*

RELATIONSHIP BETWEEN RESEARCH AND DESIGN

The first semester of the Architectural Engineering graduation studio focuses on doing research on a technical subject related to a personal fascination. The second semester focuses on creating and elaborating the actual design. Obviously, the design process has already started while the technical research is being done. Furthermore, research results are being refined during the design phase. In the past months, I have experienced this process and I can confirm that design and research go hand in hand. My graduation topic focuses on how water can be treated differently within the built environment related to the consequences of climate change to water cycles. As project location, I have chosen 'het Marineterrein' in Amsterdam. Firstly, I researched which typologies have a large water consumption. For example, households use a large amount of water in the built environment. Therefore, it would be possible to validate the research topic with a design related to housing.

However, a disadvantage could be that housing is less accessible than a public building would be, as a result of which the social impact of such a design would be less pronounced. For this reason, I have chosen to design a hotel with a conference function.

The technical research part of my graduation consists of three parts (ill.1). In the first part I examine the water system of Amsterdam and the consequences climate change will have on this system. In the second part I study the water consumption in hotel buildings and in the third part I investigate integrated water systems in practice and how these could subsequently be applied in a hotel building.

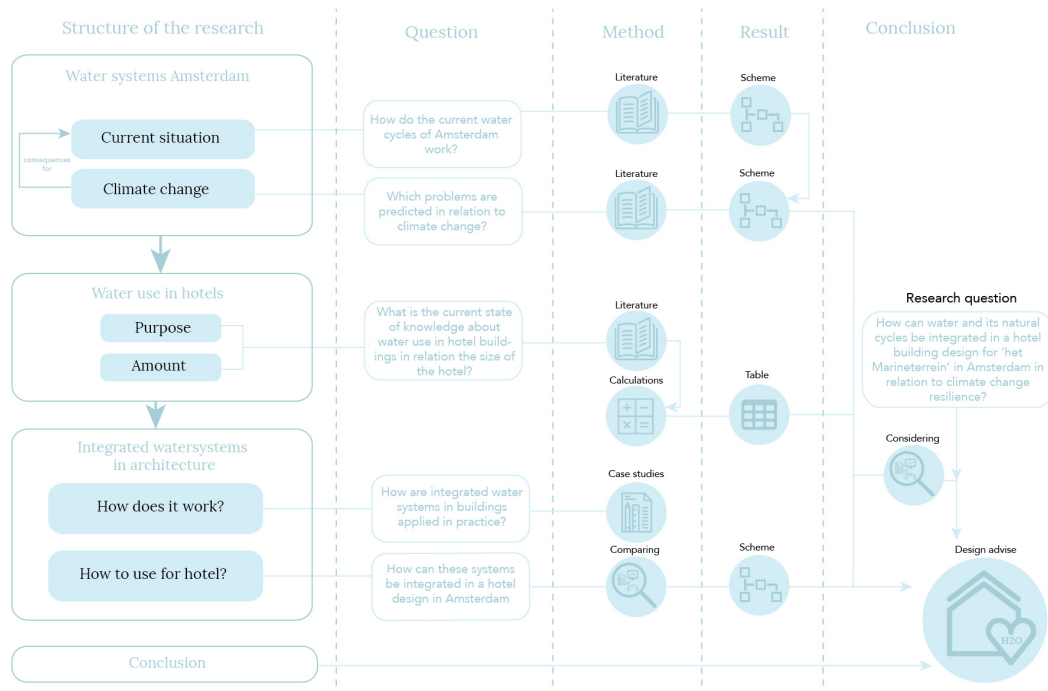


Illustration 1. Research methodology scheme

In my research paper, I concluded amongst others that, in hotel buildings, guest rooms are the biggest water consumers and that it may be interesting to integrate this water flow into a water system of a hotel building. To counteract the effects of climate change and to integrate water and its natural cycles in this design, it is important to find solutions that harvest water, purify water, recycle water and to find solutions that raise awareness for climate change and the consequences for water systems (ill. 2). When a purification system for black and grey water is used, for example by means of a helophyte filter in an atrium, the purified water can be used for watering the plants or for cleaning purposes.

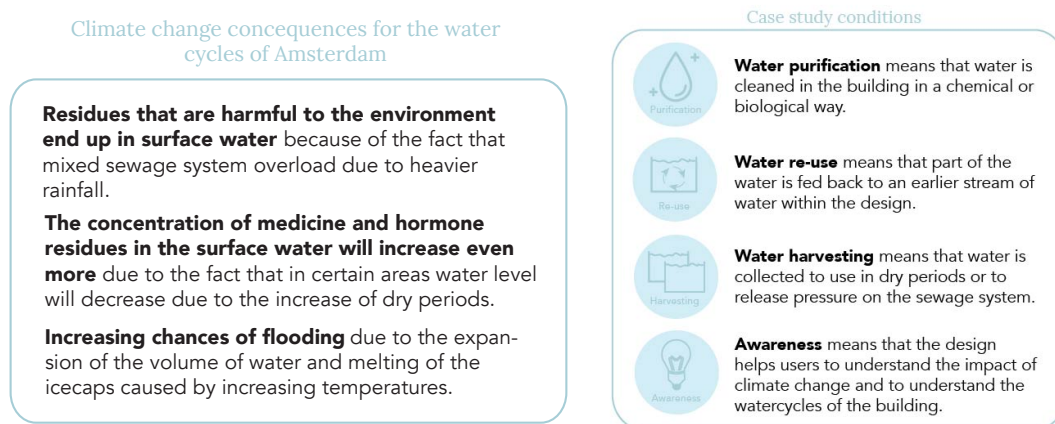


Illustration 2. Research sub conclusions and conditions

The process of finding the right hotel typology for my graduation was quite a search. During the first semester of my graduation, while I focused on writing the research I paper, my design intentions were to design a high-quality, modern and luxurious hotel. However, when I started the second semester, I found out that this typology wouldn't fit well to the research results or the context. During the design process, I searched for a hotel typology which had a better fit in the overall idea and the message of my design (this will be explained in detail, further on in this paper). While developing this typology further, I had to keep an eye on my research results, to continuously check if they were still applicable.

RELATIONSHIP BETWEEN GRADUATION TOPIC, STUDIO FOCUS AND MASTER PROGRAMME

My graduation topic fits into the focus of the studio because of the fact that it improves the awareness about the consequences related to climate change. During the design process, I focused amongst others on the integration of a water recycling system, a reusable load bearing structure, eco-friendly materials or materials with a low footprint

and passive climate systems. Furthermore, these principles had to match the architectural image and ideas. Moreover, during the design process I integrated different topics such as the context, technical research, sustainability and social integration. The use of these topics in a scheme gave the design structure and depth. This way of searching for integrated solutions agrees with the ideas and the teaching approach of my MSc-programme.

RELATIONSHIP BETWEEN RESEARCH METHOD AND THE METHODOLOGICAL LINE OF THE STUDIO

After doing technical research, I searched for a way to integrate my research results. A drawback of my research was that it didn't generate much recommendations for the program of the hotel yet. In the Architectural Engineering graduation studio students are given a large amount of freedom in the design process, due to the fact that they can choose their technical fascination, programme and context. However, this freedom can also have confusing effects during the design process. First, I started with different concepts, which unfortunately did not work very well. Furthermore, the search for a suitable hotel typology was a laborious process. My first intentions for the hotel design were to design a hotel that appeals to as many people as possible. This raised the question in which class the hotel should fit. It seemed very obvious to choose a high-class hotel. However, I have found that this would create inconsistencies. For example, how can a luxurious hotel with active systems, raise awareness for climate change in a credible way? After doing more research on hotel typologies I found a specific type of hotel, namely a bio hotel. This typology made that all the pieces fell together. I developed a design for a bio hotel which ensures a climate friendly city trip to Amsterdam and can be used for conferences (for example conferences related to climate change).

RELATIONSHIP BETWEEN GRADUATION PROJECT AND THE WIDER SOCIAL, PROFESSIONAL AND SCIENTIFIC FRAMEWORK

During the Paris climate conference in December 2015, 195 different countries recognized the dangers of climate change. One of the key points on which the participants of the conference agreed was that cities should build resilience against the effects of climate change (United Nations, 2017). The changing climate has, amongst others, major consequences for water systems. According to J.M. de Vries, Secretary of State for Transport, Public Works and Water Management, in a country

such as the Netherlands – which is extremely vulnerable to the consequences of flooding – water should be treated and used differently to keep the population safe and the country livable. Our climate will change considerably in the coming decades. Cities and their buildings will be affected (de Vries, 2000). Due to the fact that we cannot avoid the consequences of climate change, it is important that awareness is raised for its consequences and for possible solutions. The goal of my design is to raise this awareness by means of an inspirational hotel building.

However, designing a hotel building for 'het Marineterrein' in Amsterdam can be a difficult choice looking at social integration. Amsterdam has an overload of visiting tourists, that is why building a new hotel might seem undesirable. Because of this contradiction, I have chosen to give the hotel a social function (the possibility to organize conferences related to climate change and the environment). Even more, the restaurant area and the laundry area can be opened for local residents, so they can use the facilities as well and therefore may also experience how the water system in this building works. As an additional possibility, the purified and recycled water can be used for the irrigation of an urban greenhouse.

In order to prepare the building for the future, the hotel rooms and the balconies have been constructed in such a way that they can easily be transformed into housing.

RELATIONSHIP BETWEEN GRADUATION PROJECT AND ETHICAL ISSUES AND FURTHER DEVELOPMENT

During the design process, I regularly encountered situations with regard to regulations and safety. It is of great importance that users are safe. Additionally, there is generally a fear or caution for the use of recycled grey water. As a result, certain ideas that resulted from the literature study, turned out to be less suitable. For example, a rain water swimming pool, which was used in one of my case studies, was less suitable. Furthermore, an urban greenhouse, watered with recycled grey water, involves more parties, extra uncertainties and extra conditions. Therefore, this option will be introduced as a future possibility. Further research is needed to reduce the uncertainties when they are implemented in the design.

Furthermore, the variability of the system should be researched into depth. In my design, I will introduce a suggestion to flush the system with rain water. However, how this system would work exactly and what the right quantities would be, should be investigated more.

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