

Sustainable sportscares



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Graduation Plan

Personal Information

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Studio

Name of studio	Architectural Engineering Intecture
Tutors	Emiel Lamers (design), Marcel Bilow (research and building technology)

Argumentation of choice of the studio

During my studies I developed an interest in multifunctional design, smart solutions and new technologies. In the architectural engineering studio this all comes together. Problems of the future are tackled with techniques and innovations of the future. They are integrated with thoughtful design. This results in buildings that solve problems, using solutions that create extra value for the building itself and the built environment. I think this is very much needed in the architectural practice and therefore find this studio highly relevant.

Title

Sustainable sportscapes

Location

Marineterrein, Amsterdam, The Netherlands

Problem Statement

Until it recently opened up to the public, the Dutch Navy used the entire area of the Marineterrein in Amsterdam. Now they use part of it. Water was always vital for the functioning and success of the area. First, it was a shipyard, where workers tested and improved many innovations. Craftsmen, plumbers and mast makers built modern war ships and helped the Netherlands become the powerful nation that they were during the 17th century.

Now, the area has once again become a place of innovation. As Bureau Marineterrein Amsterdam, the organisation involved in its development, states (2018a): "The Marineterrein will be developed into a

future-proof city district featuring open innovation, accessible and flexible living and working spaces, unique housing, sports, recreation, and greenery."

Water used to be an important part of the terrain's innovative character and actually of the Netherlands in general. Currently, water still surrounds the site but its function has not changed significantly in a long time. The water is crowded with boats, and in summer, people dive in for a refreshing swim. A water retaining roof is being tested on site: Smart Roof 2.0 and the water quality is being closely examined with the goal of achieving swimming water quality (Bureau Marineterrein Amsterdam, 2018b). Aside from that,

however, the potential of water to innovate, to make buildings more sustainable, to make the area more comfortable and attractive and create an interesting user experience, remains underexplored.

The questions that Bureau Marineterrein asks regarding water are mainly looking for straightforward solutions to problems. Most research serves to improve or further examine existing, more commonly known technologies. In conclusion, there is research into water but the innovation of water use falls behind and its opportunities regarding climate, experience and architecture are not utilised to the fullest.

Objective

The objective is to find ways of implementing water into the built environment, specifically into sports buildings or landscapes on the Marineterrein, that innovate, improve comfort, create a pleasant user experience, and ideally contribute to the sustainability and architectural quality of these buildings.

Additionally, the aim is to bring sports back to the city, specifically to the Marineterrein in Amsterdam, in a way that follows the trend of sports becoming more individual and flexible, and increases the use of the public space for sports. The Marineterrein promotes innovation and a healthy environment. By creating not only several sports buildings, but also a route that connects them, as well as outdoor sports (sport landscapes), an innovative approach to

At the same time, a change is taking place. Sports are disappearing from the city centre. This has to do with the high prices of land in the city. Sports are not as lucrative as luxurious residences and are therefore moving to the outskirts of the city, quite frequently ending up next to highways or railways. Those locations can make the sport facilities unattractive and inaccessible (Aquina, 2013). This shift in location is happening despite the fact that there is an increasing wish to integrate sports into the public space, where it can contribute to the social cohesion. (Aquina, 2013; Bont, Distelbrink, & Kessel, 2017). Thus, sports in the working and living environment are lacking.

sports architecture is taken. The proposed plan will ensure that sports are ingrained in the entire built environment on the Marineterrein.

A final goal is for these new places of sports to function as a meeting space for the different users of the area. People from the surrounding neighbourhoods, the marine, new residents or office workers should all be able to use them and come together there.

Overall Design Question

How can a collection of sports buildings along a route at the Marineterrein in Amsterdam be sustainable, making use of water, while also creating a comfortable experience and meeting spaces for the users of the area?

Thematic Research Question

How can water be used in an innovative way to contribute to the sustainability of a building but also help boost the image of water and the experience of the location or building that the solution is applied to?

The following sub-questions will serve as a means to answer the posed thematic research question:

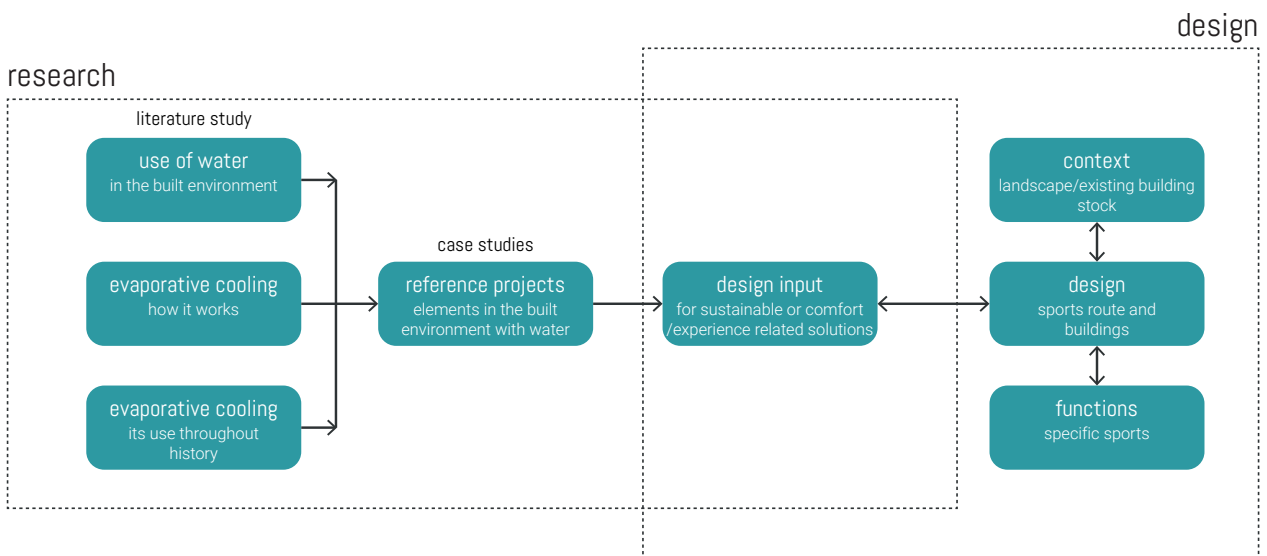
- What different **types of water** are there in the built environment?
- How do they **affect their surroundings** and how do people **use** them?
- How does **evaporative cooling** work?
- How was evaporative cooling **used before and** how is it used **now**?
- What design principles regarding water do several **reference projects** apply?

Methodologies

A combination of a literature review and case studies will be the main method to answer the research question. Firstly, a literature study of several appearances of water in the built environment throughout history will aim to give an insight into the characteristics of water and its effects in the built environment, and distill certain design guide lines or opportunities that water offers for a building or sports facility. Secondly, a short examination of evaporative cooling will provide a thorough understanding of the principle. A review of the use of evaporative cooling throughout history will intend to uncover ways of use in the built environment and of making it part of the architecture. Aside from a literature study, the

research will look at and analyse several reference projects. These will all use or relate to water differently and range from gardens to fountains. The goal is to collect design solutions and ideas from these case studies, which can perhaps be combined in smart ways or function as input for the final design.

Furthermore, for the design other reference projects will be analysed and organised. These projects will comprise at least sports halls, indoor and outdoor sports facilities and swimming pools. From these examples design strategies will be extracted and arranged in a systematic overview to be used during the design phase.



Relevance

While water in regards to sustainability has received attention on the Marineterrein and in general the past few years, this has been mainly to solve problems.

For example, the Smart Roof 2.0 aimed to help find a way to deal with alternately heavy rain and droughts. However, it could be rewarding to obtain a broader view of the possibilities that water has in the built environment. Perhaps in solving other problems that water has not yet been considered a solution to, but also in the way that it solves those problems. With my research and design I hope to find certain guidelines for designing (sustainably) with water. These strategies should change the use of water from merely dealing with problems to adding value. This value can be increasing the comfort of the user,

creating a more interesting experience, or increasing the aesthetic quality of the architecture.

With the changing ways that people exercise, a sports facility provides an opportunity to experiment.

The Marineterrein is an ultimate testing ground with its innovative character and ideal for sports in the public space with its high ratio of empty land and plenty of green. Some of the design solutions should also be applicable in more densely built areas. They could offer ideas of how to interweave sports throughout the city and create a sports landscape that better responds to the developments in how people play sports, and of how to use water to increase aesthetic quality, comfort, experience, and sustainability.

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