

Reflection on
SOLAR ENVELOPE AS
AN ARCHITECTURAL TOOL

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The relevance in wider context

Football is a popular sport worldwide, whereby the events are more a social events where the expression of civilization takes place. Worldwide and especially in Europe are many stadiums located in the city. Specifically the old stadiums are located in the city center. Furthermore stadiums are also one of the most visited buildings in the urban environment. However the stadium is mostly visited during games. This results in an empty/vacant building for a big part of the week. An empty stadium, particularly those located in the city center, will have a negative influence on the liveliness of the direct surrounding area and therefore becomes more a barrier. One other important aspect of existing football stadiums is that they don't fit in the sustainable philosophy of the 21st century. Therefore it is important to redefine these temples of the 21st century. I have chosen the transform the existing Philips Stadium, because it is a perfect example of the problems that existing stadium have in the city center.

The focus

I have focused during my graduation to formulate a strategy to reinvent the existing (football) stadiums in the 21st century. This is done by transforming the Philips stadium into a multi-purpose building in which the ground floor and the first floors are public floors. The upper levels are the football stadiums. Furthermore the skin of the stadium is transformed into a solar envelope that can optimize the solar energy production and at the same time is also integrated in the architecture instead of an addition to the skin

The process

During my first phase of the graduation I had primarily focused on the gaining knowledge part. This was achieved by using literature and 3d simulation of solar insolation analysis. At the same time the gained knowledge's where used to analyze the context and making sketches. This was very helpful because it used as a feedback to the gaining knowledge part. It showed where information was lacking and how the gained knowledge could be translated into guidelines and therefore be implemented in the design.

During this phase I did not encounter any mentionable problems due to two reasons. First of all my thematic focus was from the beginning very clear and specific. This helped me to draw a research scheme in which the route of my research was clearly formulated. The clear focus and the research scheme helped me to know exactly what kind of literature I should search for. It also helped me to filter the found literatures on the information I needed. There was one discovery I made during the gaining knowledge phase. Most of the information that I found were all similar and described the technical aspect of the solar envelope. There was limited information available on the use of the solar envelope as an architectural tool. This means that there is still a lot to explore in this area. In conclusion of the research phase I was able to translate the research of the program, context and thematic into clear guidelines. This helped me to find the right design solutions during my design phase. However I had one problem during my design phase. I found it difficult to handle a building of this scale. Sometimes I focused too much on aspects of the building that were not relevant to my graduation. The design of the transformation of the Philips stadium was achieved by using the design by research method. This method helped to achieve a well-argued design. However there is a problem with this approach. It can sometimes result in only pragmatic solutions and neglecting the architectural aspect. I'm grateful for my tutors who reminded me of other aspects when I was too focused on one aspect during my process.

The graduation & Architectural Engineering studio

In my opinion is my graduation project very suitable for Architectural Engineering Studio. The design of my façade was based on the guidelines of the technical aspect. The design guidelines helped me to translate the technical requirements so that it can be implemented in an architectural way. Furthermore I believe that the research by design, which is a very typical design method for Architectural engineering studio, is also a very suitable method for my graduation project. A football stadium is a very big and complex building. The chosen design method helped me to get a grip on the complexity by researching the different aspect separately first and in the end combining them.

Conclusion

I'm very satisfied about my graduation process. Most of the time I had a clear view of the direction I wanted to go to. Sometimes the view became blurry, which led to confusion in the process. However I think that is all part of a design process, because confusion can help to reshuffle your thoughts and approach. This will result in a more clear vision and direction during the design process. There are still some weak parts in my design. For example the less developed parts of the design are my floor plans, especially the upper floors. During my graduation I have only focused on the ground floor and the first floor, because only these two were relevant for integrating the building with the public domain. For my graduation is the less developed upper floors not an issue because my focus of the graduation was primarily the façade and the integration of the stadium with the city. However the floor plans will be on of the first aspect that I want to design further if I continue with this project after my graduation.