Reflection **Tijmen Smith** *15/05/2023*

At the start of the academic year in the Architectural Engineering studio, I looked for societal and environmental issues that could be solved through architecture. I became interested in reusing decommissioned cruise and container ships as dwellings in areas affected by rising sea levels and land subsidence due to the Covid epidemic. This sparked the idea of utilizing water as a means of transport for sports facilities. Eventually, this idea evolved into a modular stadium concept that would benefit the hosting country and its residents. Through this process, I researched the evolution of modularity in architecture.

The approach to research modularity during the 1960´s was to take a look back into history of why architects saw modularity and how they interpreted it into their designs. The research was helpful in understanding the socioeconomic issues that the architects of the era attempted to address through modularity as well as the reasons why these attempts occasionally failed or remained in the form of drawings rather than actual structures. Today modularity can be seen as a means to solve not only socioeconomic issues but also environmental issues. It helped me develop a concept that could be as out of the box as some of the projects of Archigram, Metabolism and Cedric Price were at that time.

Relevance

The essence of my project is to present a prototype as a statement against the ridiculousness of building a permanent stadium used only or mostly during a major international temporary sports events. In which the inhabitants of the place gain no real benefit from the investments of such a building after the tournament is finished. My prototype of a modular stadium aims to be that benefit for locals of all ages. Where they can play a wide arrange of different sports and enjoy different events organized in the year. This could range from a food festival to extreme sports, from daily sports and leisure activities to being a platform for experimentational architecture or art exhibitions. The stadium provides the building blocks to form that basis.

Designing a modular stadium was a challenging task, as it requires careful consideration of various factors such as the initial positioning, the intended usage, the needs of the users during and after an event, but most importantly how, in my concept of imitating the logistical plan of the Rotterdam Harbour, each module can be reconfigured for another program. This meant to design and reflect back on every decision of adding components which had to fit in a stadium configuration as well as in a pavilion or something else. I found myself constantly reflecting on these factors, as well as my own design choices and how they would impact the overall functionality and aesthetic of the system in different scenarios, continuously throughout the design process.

Throughout this process, I found it invaluable to seek feedback from a wide range of sources. This included consulting with a Director at VML Technologies, who provided me with valuable insights on creating a relatively low-cost media facade, as well as seeking input from colleagues in other fields and from my research, design, and building engineering mentors. This helped me refine my ideas and consider alternative perspectives, ultimately leading to a stronger and more effective design. I also found it important to remain open to new ideas and approaches, recognizing that the design process is an iterative one that requires continuous reflection and refinement.

Forming a modular standard posed a challenge due to the varying scales involved. Determining the ideal size of the module was a crucial aspect, as larger spaces are required for a stadium, but smaller or bigger rooms may be suitable for other programs. To address this, the module's proportion was initially developed based on the form of the grandstand, which was optimized for the best viewing quality to the field. However, it may have been more logical for other scenario’s to base the module's proportion on a different criterion, rather than the c-value slope of the grandstand.

The chosen context of the Merwevierhavens influenced the way in which the whole area was setup and the means by which the modules could be moved and reconfigured, with the help of present movable harbour cranes. The decision on the shape of the modules could have been explored more in depth from the beginning. I, rather quickly, opt for a rectangle shaped volumetric module, which seemed the most obvious because of the ease of transport of moving a volume with its floors, roof and façade elements. A table configuration could reduce the material usage or a module consisting of joints and pipes and less of a volumetric module could have been explored and experimented with a bit more extensively. But I had to make a relatively quick decision and did my research into the way these modules could be stacked and fitted. The research I presented at the P3 consisted of Beam-to-Beam, Column-to-Column and Fitting-to-Fitting connections and eventually I have designed my own steel joint. I was inspired by the Natural Pavilion at the Floriade that had a simple yet effective solution of stacking volumetric modules and thought that this system could also be applied in the design of a stadium. With larger volumes, sturdier columns and beams, and better joints that could accommodate other building elements such as facades, floors and roofs.

During the P3 presentation, I proposed a plan for a modular stadium that utilized a hybrid of permanent and temporary structures. Throughout my research I discovered that a permanent core is often necessary to provide essential features that cannot be solved through a modular design alone. Fixed and permanent structures offer entry points for crucial climate design elements, such as waterpipes, ventilation, electricity, sewer systems, city heating networks, as well as spaces for match-related facilities like changing rooms and media rooms, to which modular units can connect. I demonstrated a stadium in which various facilities were designed as a permanent structure to address these challenges. However, the feedback I received from both mentors led me to think twice about my design choices and find a focus. I took a few days to reflect and saw, to make an even more coherent concept, I had to focus even more on temporary event architecture and reduce the overall footprint. The focus from then on was more on the modular elements and thinking of what else it could be. Thus, everything was initially designed from the permanent stadium perspective and all the corresponding requirements, however I deviated from that eventually to achieve more design freedom where my modules can be everything people want it to be.