A filament wound pillar for a pedestrian bridge

Reflection

Pierre Mostert
1527398
1. Reflection

This reflections describes the product, process and planning aspects of my design and a short reflection of my research on the graduation studio. As it includes unquantifiable aspects such as my opinion and ambition it is written from a personal perspective. The reflection is not part of the final report as most context has already been described there.

1.1. Research expectations, process and result

Early in the process, before the P1 presentation, I discovered the work by ICD and ITKE of the University of Stuttgart. I became much inspired by the completeness of their projects. It seemed that the research spanned from Scanning Electron Microscope for analysis up to automated manufacturing techniques utilizing robotic arms and high-tech materials resulting in a full scale pavilion. That was what I wanted. To keep the motivation high during the process I knew I should limit the time behind a computer.

The project started with only one week between the final presentation and report hand-in date for the SWAT studio and the P1 presentation. Lack of time for selecting a topic made it quite a gamble. I planned my process in sequential sections. P1 to P2 was fully dedicated to the literature study, P2 to P3 was the design phase and P3 to P4 would be the test phase. This strict separation helped to control the process as I had to present a clearly defined part of the research each presentation.

To have an inclusive process, decisions had to be made fast and decisive. For that, a mean of validating was required starting from an early phase. This was done by digital modelling, physical modelling and peer discussions and reflecting those results on each other. Research was primarily done support the design process. By reducing the complexity of the design, research could be done on most aspects and scales as I saw at Stuttgart University. Contact with additional specialists beside the tutors made the process more exciting and was a fast way to retrieve exclusive knowledge. The specialists came from the faculty of Architecture, Aerospace, Mechanical engineering and the composite manufacturing practice. Specialist consultation can also be demotivating when no one seem to respond.

The models played a central role in the whole process as it validated my literature research and by physical testing the theory applied during the design. Equally important is that models expressed the aesthetic potential which was one of the two key aspects of the design. Having these models around when working initiated all kinds of discussions and suggestions for additional information. This turns out to be both a huge motivator and a constant source of information.

In the end I did reach extended depth and touched most of the process aspects. A full scale mock-up is within reach, however, unpractical in size (it would not fit through a door) and financially undesired. The used research methodology was fun which motivated me through the many evenings and weekends of work. It also convinced me spending some part of my savings on materials, at first attracting funds was suggested. In this, I did not succeed and I chose to spend my energy and time on the research itself.
1.2. **Sustainable design graduation studio**

The studio is divided in the sections; façade design, climate design and structural design. My project is classified as the latter. The project might not directly be labelled as ‘sustainable’ due to the materials used. It does, however, fit in the structural design philosophy of achieving aesthetics from structural principles. This includes new materials and techniques and the reinterpretation of those. It also dictates that a thorough understanding of structural aspects is of paramount importance. The model making throughout the project can be related to the Buckylab methodological approach. This includes making the essential tools for the model making process.

Of equal importance was experiencing all layers required to get a design from the drawing table to practice. Understanding what such research includes is for this project used for a pillar but could in the future be used for other materials and applications.

1.3. **Conclusion**

For me this graduation is what I hoped it would be. My primary objective was obtaining knowledge on composite material and manufacturing techniques. In this I succeeded in my opinion. However, I have to conclude that the research is not done. Many aspects require further investigation, which might eventually even result in the product being impossible for intended use in practice. This is of course a result of research too, but, I cannot verify if it is or is not.

Probably the most influential aspect throughout the process was the fun I had.