

# Graduation P4 reflection

Unitized membrane envelope

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In this reflection I would like to look back at the past couple of months and analyse my approach to the graduation project, which led to the research and design results I have at the moment. I will do this along relationships that can be identified in the project and asking the question: Did my approach work?

Answering this question can be very simple and short. Yes, the approach that is explained in the figure on the next page worked. With help of some guidance and nudges in the correct direction by my mentors. However, the final steps have not been finished yet. I cannot help but feel that another approach would have gotten better results. Maybe only slightly better, but an improvement nonetheless. This is off course easy to say after the fact, when all important question are discovered and most answers are found.

What I would have liked is to have a final design or final concept earlier in the process. This could open up more time for the testing phase before the P4. The current concept that resulted from my research has potential for another full graduation project on its own. This time wasn't left anymore when the final concept was chosen, but I would have liked to have it.

What should have been different in the approach to get the desired results could be sought in the choice of subject at graduation when choosing a lab, social context or the design phase.

### **Graduation lab**

For me the graduation project started by choosing a graduation lab and this put me on the right or wrong path. The graduation lab I chose has a very open theme. The theme is membrane envelopes. I had the freedom to explore what a membrane envelope is in my project. This became my main guide in the development of my graduation project and in any decision making process. Because I made this decision early in the process I didn't got lost in different subjects later on, but the theme was still too broad. I believe that a more specific research question could speed up the decision making process.

### **Social context**

The project is only superficially related to any social context. Current topics like innovation and sustainability are the core of the project and an actual location and building has been chosen to give a frame and grounded structure for the designed envelope. This influenced the decision making process heavily, but not as much as an actual project, that would be executed, would do. This wasn't strived for at the start of this graduation project.

### **Research and design**

The methodology I used in developing my project can be seen in the figure on the following page. Put simply, I started with literature research, followed by design and research evaluation loops of numerical calculations or mock-ups. Designs were created and refined from ten designs to three designs to one final design.

The second phase of this approach has a very strong relationship between research and design. The two switch constantly. The designs were based on research. However, the research often gave multiple options, which needed to be chosen and applied by me. Therefore the final product is both a product of research and my own opinions. If this is a truly scientific method I cannot answer, but it was a very pleasurable approach for me.

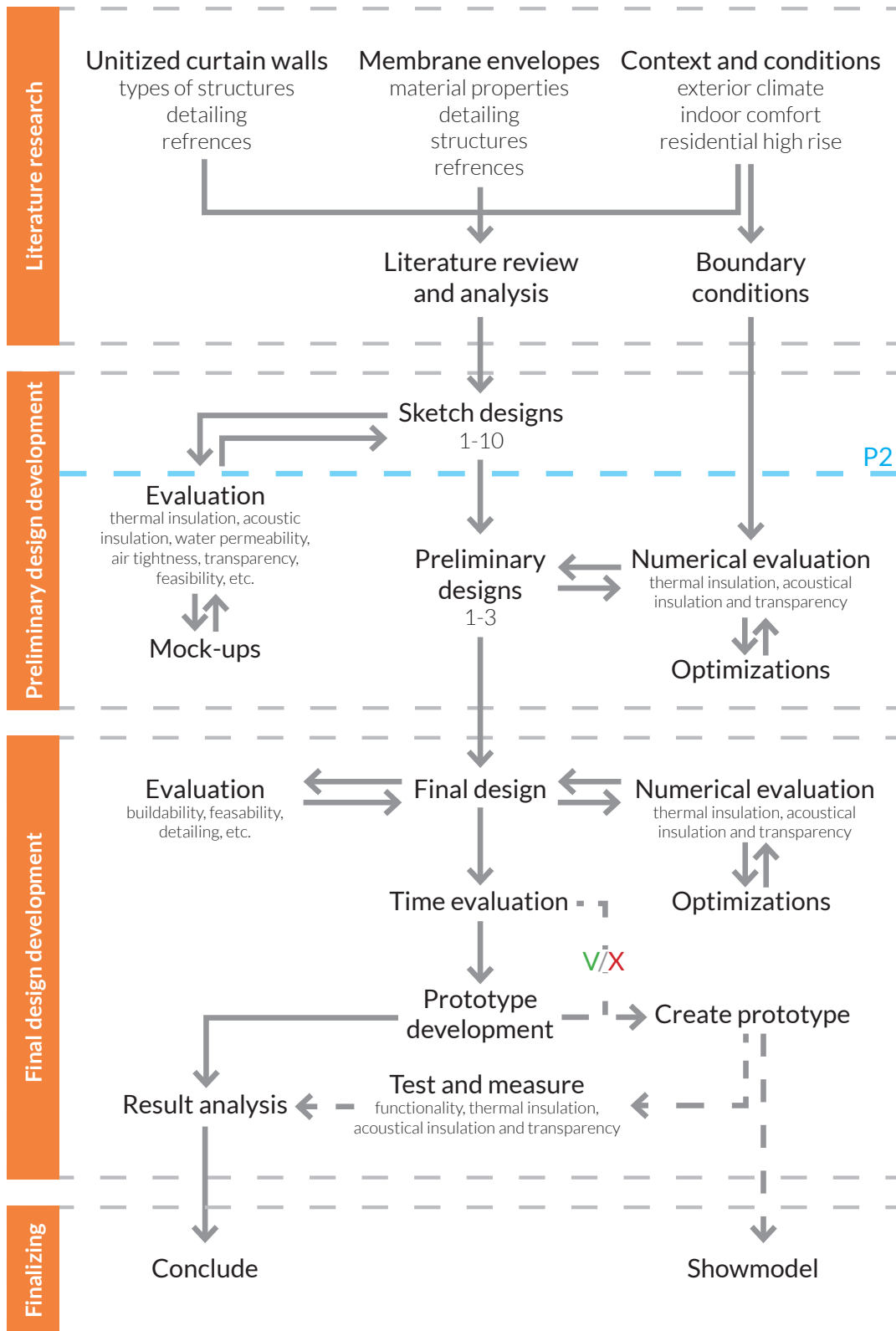
I even believe that I learned more through designing and prototyping than with the initial literature study. Therefore my approach should have started with designing far earlier. A few weeks before P2 would be advisable.

### **Looking ahead**

All in all, I think my approach was sufficient. The research and design phase was very effective, but it should have been involved a bit earlier in the process and this should be combined with a more specific theme to help in the decision making process. Almost everybody already says this and I feel nobody really listens anymore. At least I didn't truly listen. It is really important to have a good, concise theme for the graduation. Combined with an end goal where you can work towards. A clear start makes in everything going much more smoothly.

The last couple of weeks of this graduation project will be used to conclude the evaluation of the design through physical tests. The model is already built, but the tests need to be done. A show model will also be built to show the view

through the designed façade and to see the detailing. In the end, realistic 3D models will be rendered to visualize every aspect of the design and show how the sail at marina bay will look and function with the membrane envelope.



Graduation project methodology and approach