Reflection Anne Leeuw, P5

This reflection has been written after completion of the thesis

Aspect 1: The relationship between research and design
Whenever I start a project, I start with an idea and then begin researching fragments of this idea in order to get an overview of whether the idea is any good. The starting point for a graduation project is often described as 'research by design' or 'design by research'. In general I take on projects with a design by research approach and I did so with my graduation project as well. This is because I want to be informed about all aspects of the project before I can design something. The research question 'how can high rise envelopes be utilized as energy production units' is very broad. So before a design for a high rise envelope complete with energy production system is made, knowledge is needed on how energy can be produced. After that, the design process could start. However, what is the intention of the design and what makes it a good and efficient design are questions that can already be analysed beforehand. Thus, the research continues before the design process starts. This is how I have taken on the project and when I look back I think that I could have started the design process earlier. The danger of research combined with a broad topic is that you can get lost in research and stray away from the core, and this is what happened. It would have been useful to take a break from research a little sooner, start designing in sketch detail and then get back to research. I also think that the presentation and deadline structure of the faculty does not assist the student in this respect. The structure is good for other tracks, where after P1 it is obvious what the end-product will be. With Building Technology the actual 'framework' becomes clear later on, at P2 and after P2 (because you present your idea and change it due to critique and consult input). The literature review should be done somewhere between P2 and P3, but depending on the topic, it can always be useful to get back to research. In this manner, 'research by design' or 'design by research' becomes a cycle instead of a one-way street.

Aspect 2 The relationship between the theme of the graduation lab and the subject/case study chosen by the student within this framework
Building Technology consists of three labs: Construction technology, Climate design and Façade design. The topic of energy production on facades has a clear relation to Façade design and façade design is strongly related to climate design. I chose De Rotterdam as a case to study because it is a new building that is controversial, but built to modern standards. I found it interesting to see how this design could be changed to facilitate energy production. De Rotterdam also features some 'sustainable' climate installations, but its façade looks like every other high rise office building known from New York or London. The topic of energy production on buildings and using De Rotterdam as a case should introduce a social aspect to a technical project. On the technological side, De Rotterdam provides a casco for redesigning the façade which of course has consequences for the energy demand of the building. The research question and final products strongly relate to the departments of façade and climate design.
Aspect 3 The relationship between the methodical line of approach of the graduation lab and the method chosen by the student in this framework

I started with the idea of following a path of design by research for which I planned to explore the topic, formulate a goal (to create a strategy), and show to what the strategy could lead. For this I wanted to use a real example (De Rotterdam), in order to link the project to the real world and it would put restrictions on the design process which I could not influence (like climate installations, floor area, building shape, etc.).

The methodical line of approach of the graduation lab is still too architecturally focussed and because of the products that have to be delivered at the formal and informal P1-P4 presentations, I was sometimes steered away from what I really needed to do to follow a logical line of work. However, the mentors of the graduation lab also realise this and helped me to find a balance between what was asked of all students and what was required for my graduation project.

Aspect 4 The relationship between the project and the wider social context

In formulating a simple strategy and creating a catalogue for design options that implement energy production on facades, it is shown that energy production should not have to be an issue for any building project. By using De Rotterdam as an example, I wanted to show that these buildings could make a big difference in energy consumption. It is not necessarily important to make all buildings completely energy neutral, because this would limit architectural freedom for some building types and energy neutrality can be achieved over a bigger context. But, energy production should not be disregarded when energy neutrality is not obtainable. It should always be part of a building design, because clean energy technology reduces the CO₂ emission and when the efficiency is high enough, the installation will pay itself back to owners or investors. The project showed that high rise buildings like they are built now, cannot be built in the future, unless policies concerning net-zero energy buildings or comfort demands concerning indoor climate change. The first means that urban structure might change and that ‘stacking’ functions in dense cities needs to find a different solution that building really tall. The latter means that social norms relating to indoor environment change. People should expect to have less comfort in terms of indoor temperature than they are used to, or the national holidays could change from Christianity related free days to Extreme temperature related free days for example.

Understanding the “how and why”

The P1-P5 are used to provide a time based structure for graduates to assist them in planning their project. For me, this structure was useful especially between P3 and P4, when the graduation project should be in its final form. From P2 to P3 I was concerned about answering all sub-research questions I formulated around P1. However, I did not realise then that these questions could change because you gain a lot of knowledge from the literature study. Some questions become irrelevant or require an alternate formulation. I found out that formulating a strategy was a good way to answer part of the main research question and would also help myself to find the truly relevant sub-research questions somewhere between P2 and P3, so halfway graduation. Before the project started, I intended to choose a topic with a high social relevance and in fact the technological relevance was less clear from the start. Because the topic can be seen as taking an inventory of available systems, façade design and its relation to indoor climate, I focussed heavily on literature and got into slight time problems after P4 when I still had to work out almost the entire technical design. It helped that I already started energy simulation before P3, I got lost there a little at first, because I was still figuring out what exactly were the answers I required from simulation (there are 100 outputs, and only 3 or 4 are important), but then at P4 I had thought out what the technical design should be, I could
complete the simulations really fast. So the structure with the P-deadlines works really well in terms of keeping on the right path, because you need to re-focus around every presentation. Without the P-structure I think the project might have taken me two months longer, because I had problems with wanting to simulate and research every detail, while in fact it is important to cut some branches, but explain why you did so.