Reflection P4

Graduation topic: Transparent restoration of historic building by use of structural glass elements

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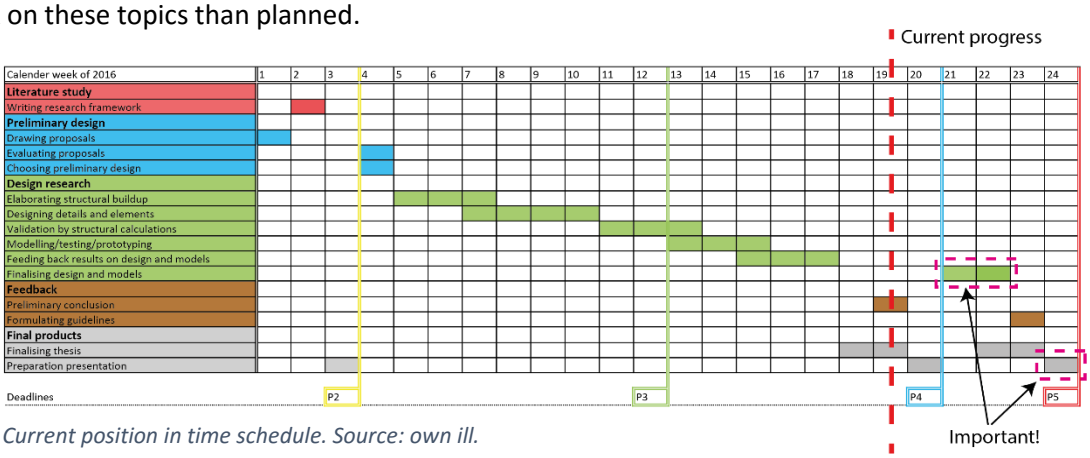
With P4 nearby, the end of the research design process is in sight. An reflection is given on the process and the preliminary results, in relation to the proposed research plan stated a while back at P2.

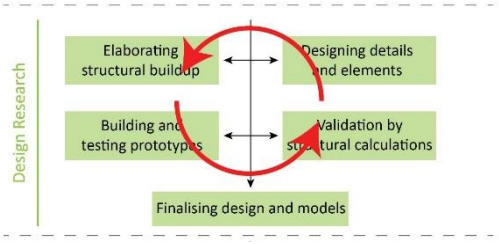
Reflection on process and progress

Nearing the end of the graduation project, the time has come to almost drawn an end to the design research process. The time has come to reflect and evaluate the design results, and draw conclusions formulate guidelines, as planned. As can be seen in the figure below, I am roughly on schedule for P4. After the P3 presentation some major design questions were still left open and had to be answered. In the past few weeks it was hard work to answer to these subjects and to integrate each design decision into one whole. While having now answered to all major subjects, I would have like to had a little more time to further elaborate on topics as structural FEM calculations, making a scale model and making nice renders. Also no prototype have been made of details in the glass lab. Although not all necessary, they would help convince the viewer of the strength of the research and research results. Hopefully I can find the time to work on a well-chosen selection few of these topics in between P4 and P5. Unfortunately the P5 deadline has been move forward 2 weeks in the schedule, leaving less time to work on these topics than planned.



Current position in time schedule. Source: own ill.

Overall the design process has been pretty linear from the start and has followed the schedule quite well. The design process did however pose both many and complicated design choices. Although it was to be expected, the design I am trying to make has enough challenges in both complex geometry as in complex detailing. Many design choices turned out to influence each other, which caused design decisions to come came together. Due to these complexities in the design task a lot of iterative refinements and adjustments had to be made as the understanding of the geometry and the posed challenges were better understood each time. As the design, a better understanding was reached of the detailing, structural workings and also the climatic functioning of the roof. Having to elaborate on so many topics, in order to combine these into one integrated design, this took more time than expected. The results is that the technical drawings are now up to level. However, the presentation and communication of all the detailed design choices still demands attention in order to convince and create a deeper understanding of the design for the reviewer and audience.



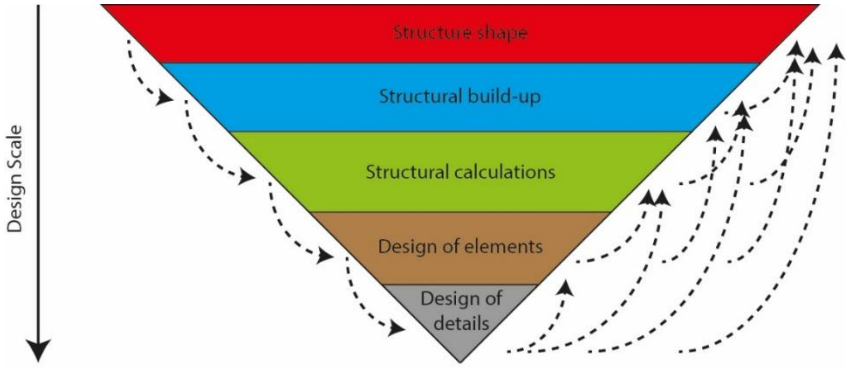
Iterative design process. Source: own ill.

Although it easy to comment on the general state of affair that could have been approached better afterwards, earlier on the process the design complexities should have been grasped better to be able to make important decisions earlier in the process. In this way the design process could have progressed faster, leaving more time for formulating conclusions and for making drawings to communicate the design. The graduation project is however for some part also an black box, where it is difficult to decide on forehand where the design or project to lead to.

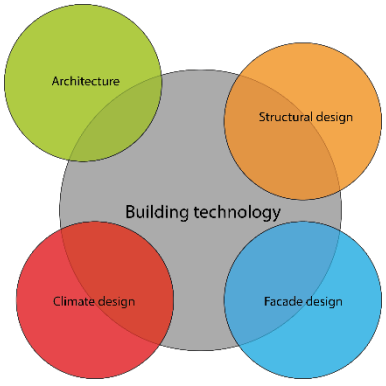
Reflection on specific aspects

In a reflection on the relationship between research and design, there are sometimes questions about the scientific value of the design study, and into what amount the research will provide generally applicable guidelines. This conclusion is flowing out of the detailed design process that has been conducted the past two months.. Many typical solutions or engineering challenges in this design project are project-specific. One of the main objectives of this research was to eventually provide general applicable design guidelines for restoring historic buildings using structural glass elements. This is possible, however the guidelines will likely not be very elaborate.
The design is however research-driven, since engineering solutions are applied that proved safe or reliable out of scientific research. Therefor the relationship could be described as a design by research, but not so much as a research by design. On forehand it was preferred that the design research process would have had a more practical approach, where prototype's would have been made, and more test would have been in done in the glass lab. This would have led to a design by research which is also based on own findings during experiments. In the end this however did not appear to be necessary or possible since the design did not have a practical element or detail which could be build or modelled easily.

In a reflection on the relationship between the methodical line of approach of the graduation lab and the method chosen in this framework, I think the process is very typical for a ''classic'' building technology project. As already noted previously, the design process is flowing pretty linear. The design flows from the large scale of an almost landscape/urban proposal in the first part of the research, into the conceptual design proposal with architectural arguments, finally into a technical design and towards smaller and smaller detail, continuously iterating design choices and decisions on every level. This is also the approach as described in the graduation lab, and the method I have chosen is so far working successfully. However, something that proved to be difficult was the determination of the focus on the different technical fields. Although the main emphasis of the research was on structural design, with a smaller focus on façade design, also the climate design proved to be necessary to properly elaborate. Leaving out a certain topic could leave to an unconvincing design, since an important topic was left untreated. In the end a ''strategic'' decision was made on the topics and the depth of each topic in order to create a complete story. It should however be noted that this inevitably means that certain topics are simply not addressed, or not in enough detail. But, since the field of building technology is about creating integrated architectural designs with an good first technical elaboration, we as designing engineers are meant to be all-round designers. Since the exact detailing will in a real project later be done by the focusing specialists engineers, it is acceptable to deliver an overall integrated design which has a sound and realistic capability of becoming reality.



The decreasing design scale and iterative design process. Source: own ill.



Relation of the different fields of topics. Source: own ill.