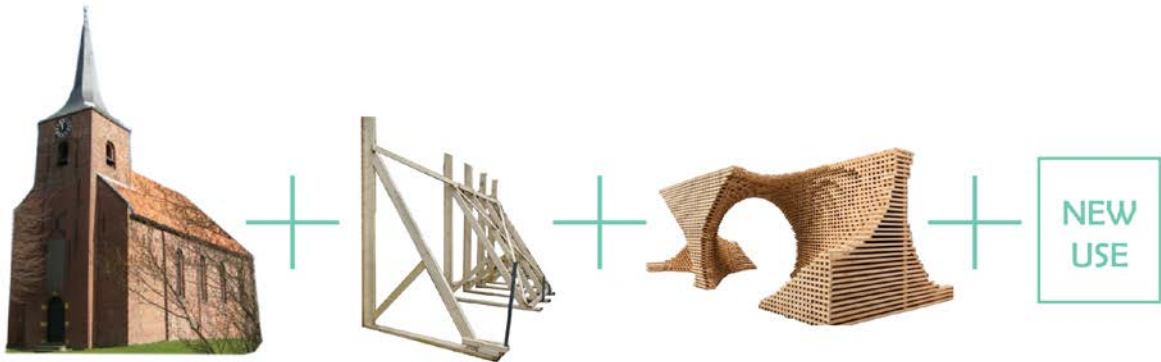


Religious heritage protected

Seismic reinforcement for the church of Heveskes



Reflection on the graduation process of Paul Versteeg

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Introduction

This research is all about the seismic activity that threatens the province of Groningen. Recent developments according to this threat target mostly the safety issues of the inhabitants. This is of course a logical reaction to the imminent danger, but there is a topic that is in danger of being snowed under. The province has much to offer in the sense of historical and cultural heritage, in the form of old farms and churches. The subject of being safe in these kinds of monuments isn't the only challenge. It can be said even that it is equally important to preserve the heritage, because it's often a carrier of highly valuable knowledge in the sense of building technologies and cultural history.

The problem of this challenge lays in the contradiction of the prevailing desire to keep a monument authentic, while earthquake-proof interventions often ask for rigorous interventions. Recently developed solutions are balancing on this contradiction, mainly because most of the interventions are initiated by heritage-minded institutions. The thing is that if you don't allow rigorous actions, the heritage can be destroyed forever...

This interesting contradiction has led me to the following overall design question I wanted to answer with my graduation process:

How can the adaptive reuse of the church of Heveskes be done, in such a way that it is integrated within a temporary wooden structure that serves as a structural reinforcement in order to withstand seismic activity?

Now it is time to reflect on my process and products, in order to understand how and to what extent I am able to give a valid answer to this question.

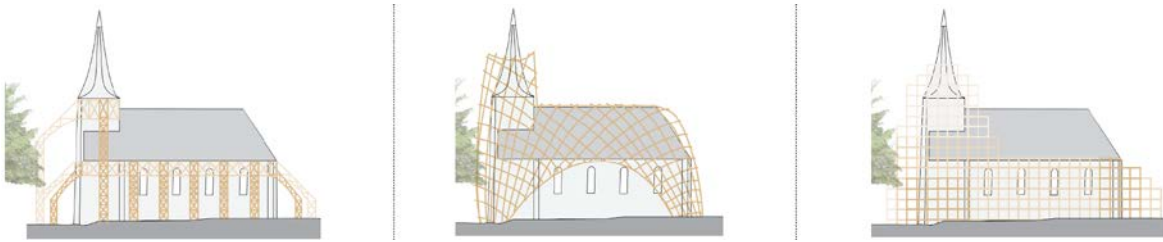
Research and design

In the beginning I was really struggling with the relation between research and design, and especially between the research paper and the following design process. Before I started with the research paper I had the desire to really connect the paper with the design, instead of being it two completely different products. Soon it became clear that two things made me abandon this desire.

The first thing was that I found out that I needed a lot of knowledge before I could answer the question I was trying to ask myself. The first idea was in fact to develop a certain timber joint that can be used for a seismic-proof structure. This joint could then be used in the design process to create the actual structure. But this turned out to be impossible to answer in just a couple of months, because this asks for knowhow about timber joints, seismic behavior of masonry buildings and the specific weaknesses of my church. It forced me to take a step back and therefore I decided to write a research paper on exploring different ways to combine a timber structure with a masonry church. Later on I will reflect upon the methods I used.

The second thing that made it difficult to precisely connect the research paper with the design process was that the outcome of a research isn't knowable in advance. So I've learned to just let go my expectations and see to what direction the research would lead me.

When I finished my research paper, it turned out that I could work on with the results of the paper. A couple of starting points for my design are derived from the research paper, as for example the use of an orthogonal grid for the support structure.



Results of the technical research paper: three different kinds of timber support structures.

Besides the research I've done for the paper, I've also done research that was more directly related to the actual design process. Literature study taught me the principles of seismic engineering, reference studies have helped me to think about multiple solutions to solve a problem and research by design helped me through the whole process from sketching to the technical drawings.

Method of working

The TU Delft website that shows information about the Architectural Engineering studio states the following:

"If you choose for Architectural Engineering, you choose for architecture as a complete design discipline in which technical possibilities are an inspiration and an important contribution to the architectural design."

This implies that a process should start from a technical fascination and that this fascination should work as an inspiration for the architectural design. In the beginning of our graduation process we were softly forced to think about a technical fascination, so from the beginning it was quite clear that the described method is present in our graduation studio. The structure of the overall process is also based on this principle, since the first half is focused on the technical research paper, while the second half is more focused on the architectural design.

OK, so much for the vision about this studio, now I want to reflect on the used methods and to what extent they are contributing to the overall vision on the relation between technique and architecture.

One of the main suggested methods to use for our graduation is the method of research by design. In theory this is a nice method, because it shows directly a link between research and design. Interesting, because I had to be aware of the fact that my focus shouldn't go too much to either technique or architecture. It is recommendable to keep the balance between these two components. I will shortly explain how I did this, first for the research paper and second for the design.

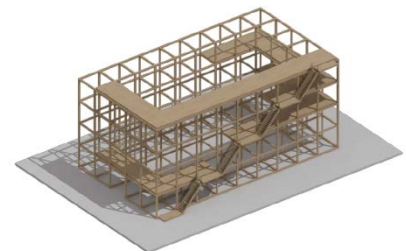
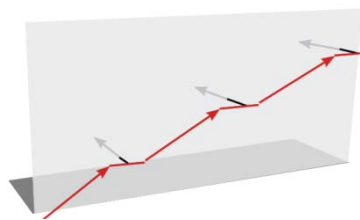
For the research paper I came up with a two-parts-structure. The first part was more focused on technical characteristics of different timber structures in relation to earthquakes. For every structure a literature study is done combined with case studies. The obtained knowledge was then used in the second part that consists of testing three types of timber structures by applying them to the chosen church. This was done in a very explorative way by research by design. I designed for all the structures an application to the church in order to find out the (im)possibilities of the different structures. This way of working assured me of the right balance between (research to) technique and design.

For the architectural design it was a bit harder to use a very strict method, because this is a more informal process. A research paper has to meet specific requirements and rules, but an architectural design process isn't that strict. Looking back now I could recognize two predominantly used methods, namely research by design and analysis of case studies. Research by design took mainly place by means of using a model to test design decisions. My way of working isn't one of building physical models in the first place, but building digital 3D-models. This gives me the possibility of testing quite fast a certain choice or option.



Research by design for the development of a façade

The use of case studies I used for example in the situation of developing a walkway through the added timber structure. First I collected different typologies of walkways in or around buildings, then I analyzed them to concepts and the last step consisted of the application of these concepts to my design. An example of this can be found underneath, where Centre Pompidou is used as a case study. This way of working forced me to think about totally different solutions, something that can be hard for me in certain situations. It is in my nature to be quite rectilinear in my process; testing of possibilities happens often in my mind already, resulting in solutions that aren't that much out of my box. This has also its pros of course. My process is almost always steady and without too much concerns. I'm constantly focused on the final goal, in order to try to do the things that need to be done to get to that goal.



The use of case studies – Centre Pompidou, from building to concept.

Embedment of context

I want to place my project into a wider perspective by means of two viewpoints. The first one has to do with the actual tangible context. The church of Heveskes was in former times the center of a small vilage, built upon a man made mound. As a result of expanding industry the municipality decided half a century ago to completely destroy the vilage, together with its monumental church. Fortunataly, the demolition of the church could be avoided, but the tangible reminder of the vilage was destroyed forever. This intriguing history has affected the design on multiple levels. The most obvious one lies in the story I want to tell to the visitors of the church. Multiple parts of the design

are focused on keeping the story of Heveskes alive, because I believe that such a history must not be repeated. Especially when you consider that the footprint of the former village is still an empty plot, because the ground is now assessed as protected archeological ground...

However, this compelling context brings also opportunities. The industrial environment opens up the possibility to experiment. Compared to a church that is located in the center of a village, this church has much less people who feel involved with the building and its purpose. I can imagine that a church surrounded by a village isn't suitable for such a radical, appearance-changing intervention I designed.



Collage of the industrial context where the church is located.

The second viewpoint is the one that refers to the social context of the earthquakes. Organized initiatives of citizens of Groningen point out that the people feel wronged by the way they are ignored by the government and companies involved. Damages to their properties are not recognized and compensation is hard to obtain. Therefore my big and eye-catching structure can be seen as a statement, as a symbol for the problems that are present in Groningen as a result of the earthquakes caused by the extraction of gas. A lot of problems and damages are not directly visible to the general public. By creating such an eye-catching structure, I embrace that the problems aren't small and that they can't be ignored. A visible and radical intervention like this could provoke the debate about measures that must be taken.

Conclusion

It is always interesting to look at the point where you stand now and ask yourself questions like: would you do it different the next time, assumed the exact same assignment? Are you satisfied with the results? To me, both of these questions can be answered with a 'yes'. This requires some explanation. Yes, I would choose a different approach the next time I have to deal with a church that needs to be reinforced in a seismic area. This has to do with the knowledge I have now, obtained by following this complete graduation process. Design principles like reinforcing with wood and don't affect the existing building seem not to be so efficiently when dealing with such a problem. However, these unconventional design principles have left a positive mark on the process. The experimental approach gave me a lot of positive and refreshing insights and feedback, something that is worth a lot during a graduation project.

And still, I am really satisfied with the results I've achieved. Maybe an outsider might raise his eyebrows when seeing my design, but that doesn't bother me that much. When you know and understand the process, the cultural and industrial context and the design principles I used during this graduation project, I think that a better understanding of the design will be the result. I see it as one big experiment that has led to an interesting outcome and most of all it has led to a big generation of knowledge.