Reflection

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Process:

In what way has the research changed with respect to the initial plan?
In general, the plan was to do more and in a more structured way. At the beginning of the research, I thought the subject of the research was quite narrow. In reality it isn't, and the result reflects that. The research is exploratory, and to a large extend open-ended. Now, at the end of the research, I feel like I know enough to start a carefully planned research into vertical prestress.

The approach that is preached to the students at the start of the thesis, is one of meticulous preparation and planning. In general, this is a good thing, it forces you to think about the result of the thesis, and how to get there. It also serves as a tool to see if the research is possible in the time allotted to it. However, it suggests a rigid process. This is fine, when the result and process of the research is known in detail. When you, for instance, have a hypothesis that needs to be tested.
If the research is more open-ended, the planning it is much harder to make a good planning, because you need to make decisions during the process. This is something that I had some problems with, to the point where the planning that was initially made, was for the most part useless.

Looking back at the timing of some of the decisions. The choice to focus on one typology came during the P3 presentation. This might have been too late. After P3 there is only 2 months to work on the chosen typology, which in hindsight could have been a bit longer. Then again, it is always nice to have a bit more time.

Doing research vs developing a product
This thesis comes relatively close to the building practice. The results can quite literally be toughed. However, if the research would actually be conducted in practice, the result would probably be a lot different. Different in how decisions are made, and how the process progresses in general.

After conceiving several typologies for the lintel, one was chosen to continue with. The basis for this decision was mostly on what was the most interesting to work on. Maybe even the most unusual type. The sales potential of the lintel was not a consideration at all. If the research was done of a company money would need be a consideration, and probably would have led to a different typology being chosen to focus on.

The process in general would be different as well. In practice, it is much more excepted to discard things that aren't feasible. The typologies can be presented in an informal manner, discussed and a decision is made to continue or not. The typologies that you don't continue with, don't necessarily need to show up in the rest of the process.

In academia you always write for people who have not been involved in the process and may use your research to further their own. Therefore, you need to present the whole process in a formal manner. It takes time to do this. Time that could have been used to go deeper into a single type.

Product:

The product of this research is an overview of possibilities for spanning structures in dry stacked masonry. The overview is in no way complete, nor could it be. Hopefully, the report is able to spark other ways of solving the same problem. The list of typologies can in that case be expanded. The emphasis of the explorations is on the understanding of the structure and the relationship with the details. Often, the impact of small things, characteristic for dry-stacked masonry, is discussed.

The usefulness of the thesis is therefore mostly in the beginning of a development project. To speed up development, to spark ideas, for seeing what could be possible, but also to get acclimatized to the specifics of working with dry stacked masonry. These are the things that I learned from doing this research, and hopefully this has been transferred into this document. The thesis does not provide hard numerical data on the impact of certain decisions. The usefulness for later stages of development therefor might be limited.

At the beginning of the project, I though I would use more digital tools to work on the structural design of the lintels. In the end, this kind of structural design software was used very sparingly, while mostly relying on physical models to understand the structure.
The thesis, therefore, doesn't really produce numeric data on the typologies at all.
By doing this, the results of the research have remained mostly in my comfort zone, discussing the structures qualitatively rather than quantitatively. I may have needed someone to push me a bit, to go out of my comfort zone.
On the other hand, I probably overestimated the usefulness of these digital tools and the work I would be able to do in the allotted time.

Is vertical prestress going to be the new standard?
No, it isn't.
As stated before, the decision to focus on typology 7 was made because it was the most interesting for research. It had the most unknowns. For vertical prestress to become the new standard lintel, or at least get significant use, it would have to have some sort of compelling advantage. If the rest of the masonry in the façade isn't prestressed, the vertical prestress doesn't make a lot of sense.

The vertically prestressed lintel uses less steel than normal steel lintel, but it also requires a lot more work. If materials were expensive and labor cheap, that would be fine, but it isn't. Add to this the fact that nobody really looks at lintels, except for some architects. It would be difficult to convince a client to use this type of lintel.

But what if the whole façade is prestressed? For instance, if we want some of the advantages of Brick-BENG in a single wythe wall. Less connections to the inner cavity leaf. Or if a pre-fabricated dry stacked masonry façade needs to be hoisted into place without the need for a sub-construction. If that is the case than it could become quite interesting to use vertically prestressed masonry lintels.