

Reflection P3-P4_AE Graduation Seismic Studio

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Introduction

In this reflection a short but substantiated explanation will be given to account for the results of the research and the design in the graduation phase during the periods P3 and P4. Several aspects of the process will be taken in account, that is, relations between: research and design; studio theme and personal subject; the project and the wider social context.

Before analyzing in some detail those aspects a caveat is due concerning the preliminary results shown and the process during P3 and P4.

Process P3-P4

Since P2 I have been working on the relation design-research trying as much as possible to establish a significant link between the preliminary theoretical considerations and my design. The often unexpected outcomes of this process made me adjust the general graduation planning almost every week. Starting with a lot of iteration studies about volumes, volumes composition and volumes on site I have been working gradually from a rough/conceptual layer towards a more detailed one. The products that arose from this process were: floorplans (with a detail of 1:200) that show the relation between the spaces and the related functions; conceptual drawings and diagrams which explain the main architectural idea from a spatial organization point of view and from a spatial experience point of view; volumetric sketch 3ds show how the volumes relate to one another and more detailed sections show the construction method chosen for this specific project.

After P3 I analysed the production of the previous weeks and I tried to extract the main ideas from it. Considering the drawings shown at the P3 presentation as a "blank coloring" I started to point out for myself the main aspects I should work on during the coming weeks. It occurred to me that the story line, from research to design and from concept to drawings, was clear but there were unfilled gaps on each different layer of the story itself. In other words, there was (only) a rough idea of what the design could eventually become. This situation suggested new research studies and research through design in order to fill those gaps working towards a plan and a design with depth. Sketch try outs were needed in order to make decisions on the field of landscape and architecture. After a long research process in the fields of wooden joints constructions and climate control in greenhouses, I had in the end sufficient knowledge to make deliberate decisions for my structural design, building technology detailing and climate design.

The complexity of the functions in the building (bamboo visitor centre - research - production - fabrication) made the combination of all those layers (landscape, architecture, construction) a challenging designing task. After all those months of work I realize that a design like this may develop *ad infinitum* and might always require further research and work. Accordingly, some choices had been made in the detailing phase. The greenhouse design is fairly developed in

every single part with a detail of 1:20 and 1:5, while the other two volumes (research visitor centre - fabrication) are designed with a detail of 1:200 and in some parts with a detail of 1:50.

Aspect 1: The relationship between research and design

The process of translating the results of the research of the 1st semester into a design has been challenging and rather tricky, because making the switch between theory and practice is not an easy task. Those difficulties triggered "unexpected" extra research in order to find answers to questions that might facilitate the switch between the two phases.

The aim of my research was to come up with a new and locally implemented solution for the recent earthquake phenomena in the Netherlands focusing on the sustainable energy production and on the new antiseismic building industry. The outcomes of my research allow to establish that from a theoretical point of view the local production of laminated bamboo in the Netherlands as a sustainable earthquake proof material is indeed possible.

By consequence, my design is a quite accurate practical outcome of my theoretical statement/assumption. My Project "BAMBhOuse" will be the first earthquake proof greenhouse in the Netherlands reaching a height of 20 meters. Here bamboo will be locally produced. Two extra volumes definitely show that the use of this material as a local antiseismic material is feasible.

In the entrance volume there will be research laboratories and workshop areas that focus on the application, use and production of this vegetation in the Netherlands. In the second, the actual fabrication process (as researched in my technical research paper) will take place, in order to produce earthquake proof laminated bamboo elements.

Aspect 2: The relationship between the theme of the graduation lab and the subject/case study chosen by the student within this framework (location/object)

My research started with the study of light weight materials looking for materials with a good antiseismic performance. Among these bamboo came out as the best option. But in order to let this material be a solution for the earthquake problem in the Netherlands, a lot of other studies had to be carried out. Local production methods, sustainability, yield and application were all themes that precede the seismic application theme. Thus, it became a broader and challenging research with an alternative solution. To be sure, this solution for earthquake proof buildings in the Netherlands is rather distant from the masonry reinforcement studies or heritage renovation and transformation studies. These are in fact the main seismic research fields at the moment, looking for solutions for the Groningen area. Nevertheless, I stick to my position where I state that this research with its innovative and new opportunities could be a start for further interesting developments in the architecture and engineering realm.

Aspect 3: The relationship between the project and the wider social context

At the very beginning of my research I started with the following overall design questions: How can antiseismic design improve the livability of north east Groningen? Can architecture be the tool to achieve a systemic change in the area?

My study about the Phyllostachis Aurea field production for bioenergy purposes states that compared with fossil fuel production (such as the NAM in Groningen) bamboo production could generate a positive impact on the local economy with the creation of sustainable jobs. But in the

actual design only a more restricted field of *Phyllostachis* has been included. This will be just enough for the energy demand of the greenhouse itself. Therefore it does not involve larger areas nor does it have an immediate social impact.

And yet, the industrial location of this "green" building could have a positive impact on the chemical industry context of Delftzijl where this building will be built.

Delftzijl is an important harbour in the north of the Netherlands and a significant industrial zone. At the borders of this area there are some small urban environments and heading south one is absorbed in the typical northern Dutch landscape of apparently boundless fields. My building is located right in the middle between the industrial zone and the green fields, suggesting its sustainable production function of the bamboo plantation. I am aware of the enormous size of the building I designed, a 20m high greenhouse was never built before in these areas. However, the focus in this process was not on landscape design. Some height studies were made in order to have an idea of what it would look like locating such a building in the landscape, but much more attention has been paid to architecture, construction and climate design. This was a deliberate choice in the design process. As an experimental kind of building for an experimental building material fabrication I focused more on how to make this "experimental" part as real as possible.

Self Reflection and Conclusion

Graduating is a long and not at all painless process. One starts with the intention to make 'a piece of beauty' (Keats) but pretty soon you discover that you still have to learn a lot in order to reach that goal. It is not only a long academical learning process but also a long journey inside one's own personality and character. In a one year long solo-project you do not only have to learn to deal with the difficulties of the architecture world but also with the pro and contra of your own character that might sometimes influence the process with ups and downs.

In a (best possible) world without deadlines I think that we, as graduate students, could keep going on designing and changing and erasing etc etc. In a year like this one has to pay carefully attention to the time – quality ratio in a design process. Postponing or procrastinating does not always help you to reach the quality you initially aimed at. You always have to be aware of the choices you make and try to be confident that the final product will be the marvelous picture you used to dream of at the beginning of the year.

At the end of this process I see that my building is inspired by a maybe too ideal and yet realistic solution for the earthquake problem in the Netherlands. Indeed, this ideal concept of producing bamboo in the Netherlands has become a very real and tangible design. Thus, in my view, it is important to continue "seeing the good in it" and to be aware of the possible new ideas that some experimental study may generate in the architecture world in the future.