

Reflection

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A re-study of the Atocha memorial in Madrid using interlocking cast glass components

The goal of the studio is to make elements in the built environment more sustainable in an innovative way and on different scale sizes. This thesis is adding to that by using the material glass, which is already indispensable in our everyday life, and apply it in a way that its advantageous properties, such as high compressive strength, transparency and recyclability, are exploited as much as possible. Without losing its transparency, this recyclable material is used to build structures that are under compression and can be disassembled, using interlocking cast glass bricks. It is therefore an innovative solution to build transparent buildings in a sustainable way. This research is continuing on the research of other people and will be an addition to what has already been done.

As the Atocha memorial functions as a case study, this research focusses on designing the structural elements in order to make the structure feasible with another building system, rather than the actual design. In this building method, the advantages of the design are central and should be maintained, thus the transparency and the brick geometry that can be used to build the whole structure so only one mould is needed. The structure should be built in a more sustainable way and to achieve this, different methods and materials are researched. The design of the details is important for the stability of the structure, but also for the aesthetics.

The approach for the design of the different structural elements is different and also different than expected in the beginning. Some parts of the research took more time than expected and some parts turned out to be more or less important than assumed. For example, the exact shape of the interlocking brick was determined much later than anticipated, the importance of the shape of the connectors was underestimated beforehand. Sometimes it was difficult to let go of the idea to come up with something new. For example, with the interlayer I looked into possible materials and assessed these options. However, in the end I apply the same material as other people before me did. They already researched the topic very thoroughly so it would have been strange if I had found something better. It is difficult to set a border, because without looking further you will never find something new.

The use of cast glass bricks is relatively new and not very common. Sometimes I wondered why the building should be made of glass. Of course, it is a sustainable building material, but the acoustic and especially the thermal properties of the material are poor. It does not provide insulation and does not absorb sound. These problems need to be tackled first, before we can think of building for example houses with interlocking cast glass bricks. However, this does not make the research less interesting, because it is looking into a method to build a structure that is sustainable. Maybe nowadays this method using glass blocks is not very feasible for housing, but future developments could change that. As long as there is a demand for structures made of glass, why not make them sustainable and more feasible.

The results give an idea of the different aspects that need to be researched when an interlocking cast glass structure is designed. However, to build it in practice, further structural modelling and physical tests need to be done. A small pavilion for a neighbourhood could be built with the interlocking cast glass bricks. This could give a neighbourhood a common space and gives the opportunity to research the behaviour and feasibility of the structure on a realistic scale.

Ultimately, the research into interlocking cast glass bricks can give architectural design a new dimension and provides many new possibilities at different sizes. Small projects could be built together with a community and showcase the recyclability of glass without compromising the amount of daylight. Because the bricks can be repeated and reused numerous times, many configurations and sizes are possible.