

Reflection

As there is a slow but steady shift into a more sustainable built environment both in practice and academia, Architectural Engineering finds itself at the intersection of its latest developments in all scales of architecture, from urban planning to detailing. In this graduation project many of such relevant subjects cross-pollinate, such as how to approach modernist post 65 urban tissue, the local harvesting of biobased materials and building elements, the balance of prefabrication and in situ construction and the future proofing of new construction through the 'open building' concept coined by Habraken.

The result of this AE graduation studio has been expressed in the design of an 'open building' intended for public use: a sustainable and inclusive community centre with the ability to facilitate its users when faced with changing public demand. The process to come to this final design was not without many considerations and it is thus proper to reflect on to what extent the *how and why* of the research worked and how that influenced the design process.

Research and design

Through site analysis and research into the neighbourhood of Boerhaavewijk in Haarlem, a need was established for more community space. However, when meeting with different locals and their representatives it became clear that it is not so simple to meet the often conflicting needs of a diverse group of people, divided by demographic differences such as ethnic background, wealth, age and sex(uality).

As a response to that the decision was made to design a centrally placed inclusive community centre, 'a roof for all', that would be spacious enough to meet with a diverse public as well as designed in such a way that it would be adaptive to future use. As such the building confronts the problems associated with the neighbourhood: changing demographics, anonymity, segregation and lack of public services, programs and spaces. The decision to design a space for the 'commons' went against the opinion of some of the local representatives, who voiced their want for their own buildings for the demographics they represented.

Thus the design walks a fine line between the private and the public, housing different people with different needs but enabling contact through exposure. This idea of *Inclusivity* has consequences for the design of the building, such as a large symbolic overhanging roof, an open and double height plinth combined with a collonade to improve exposure between building and passerby, the design of public outdoor space to improve interaction between building and visitor & the use of a central atrium to connect both people and spaces that are potentially used for different scenarios, either more public or private.

Because the building needed to be future-proof, the goal was to design an 'open building'. Through the 'layers of change' by Stewart Brand it was determined that depending on the lifespan of such a layer different materials would be appropriate. For the structure, it was very early on decided that a temporary terminal of the Schiphol airport would be harvested for its demountable aluminium space frame. Because this structure would see a re-use in my design and is found in close proximity to the design location, it was determined to be a

sustainable option when faced with the material's large carbon and energy footprint. The decision to re-use elements of this space frame had a far reaching impact on the design, ranging from the grid of the structure to the consequences of a lightweight roof on design elements such as daylight, water storage, energy generation and ventilation. In this case the existing space frame was a starting point for new research and design. Although implementing existing elements into a new building is a major challenge, it will become more and more relevant with circular construction becoming the norm and thus was a worthwhile pursuit even when for example a timber roof would have been an alternative with some major advantages.

Furthermore the structure uses the Circlewood concept for a main skeleton of timber columns and CLT-floors in a box-in-box principle, which are sustainably sourced from Scandinavian forests. Although some steel might be used in the connections, this does allow for demountable connections without degrading the timber in future re-use. Strategically placing walls to stabilise the skeleton structure was one of the bigger challenges when trying to implement an 'open plan'.

For the facade, research from the P2 paper was used to design a sustainable and additively manufactured earthen plinth which would enable future reprinting with the originally used materials. Locally harvested materials such as cellulose insulation and a bio-polymer binder sourced from a local sewage plant would enable the print in place of an insulated wall made of dredge, a loam like material harvested from the local river the Spaarne.

This earthen skin is non-load bearing and thus wraps around the timber skeleton in a free-form way and is protected through erosion barriers, the overhanging roof and a set-back. Although it is non-load bearing and thus might be confused for a simple 'decor', it presents a step forwards in the construction of (partially) earthen structures and the potential that gives for sustainable, local construction. The heavy material informs the architectural expression of the curtain-like facade elements, which taper to the top and have catenary arched openings. As such it does present the material in an 'honest' way.

Since the concept of an earthen facade brings some major disadvantages, especially its weight and size in relation to its ability to insulate and be constructively sound, the facade of the upper floors needed a different materialisation. The choice ultimately fell on hemp lime. Although local production does not exist (yet) it can be sourced from within Europe, and is a material that can be used in a damp open construction improving indoor climatic conditions. Furthermore it can be used in conventional prefabricated wood skeleton construction as used all over the Netherlands, which makes it easy to produce and handle.

The services such as ventilation, floor heating, piping and service shafts are attempted to be made future proof. By locating shafts on strategic positions they might be easily reused in future redevelopment of the building. Floor heating is designed in a 'dry' way, so it may easily be removed beyond its technical lifespan. Ventilation shafts are integrated in the spaceframe and thus exposed, but also easily accessible for maintenance or future replacement. Finally, the space plan takes shape in demountable division walls, also used for the bathrooms which are centred around service shafts, but might be deconstructed for e.g. a kitchen.

Tutoring and feedback

The aforementioned design process was guided by the multiple tutors assigned to the project. It was through them that the concept of 'tasting' different options was coined. In design it often happens that you are blindsided by a current fascination and get stuck. By taking a step back and reconsidering different options it was possible to move on when faced with such a predicament, even if that might sometimes conflict with a stubbornness associated with my creative process. Furthermore, the tutors made it clear that for an academic exercise it can be allowed to forgo some practicality in favour of architectural concepts, which ultimately made my design more coherent. In the end there is, as I believe, a balance to be found between my own imperative and that of the tutors.

Generic vs specific, the act of balancing

One of the main challenges of the project is finding balance between the generic and the specific in all scales of the project. Boerhaavewijk is a modernist district built on top of metres of sprayed sand. Thus on the urban scale we find ourselves dealing with the concept of 'tabula rasa'. Here the generic was taken to its ultimate form in industrial flat typologies and top-down planning that would enable all its users to enjoy 'light, air and space'. Today however, this type of urban planning and its strict separation of functions fails to provide for its inhabitants.

As my approach to architecture attempts to deal with the 'genius loci', this presents a collision of concepts. If I were to take the modernist spirit of 'tabula rasa' to heart, then that would enable me to actually reject the local conditions informed by modernism and design based on a different set of convictions. This however can on one extreme lead to false historicism or on the other extreme to the creation of a 'ufo', both would reject the existing conditions; the site and its people.

Instead, my approach was to take into account the existing, sometimes lacking urban plan and try to understand them by a process of mapping or analysing. As such some elements of modernism could be retained or even strengthened, while others could be discarded or replaced, based on the formulation of the *values* I have given to those existing conditions.

The graduation project mirrors my fascination with the act of balancing and thus I look forward to how it is received both academically and by local stakeholders.

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