

Reflection paper

Architectural Engineering studio 2016/2017

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THE RELATIONSHIP BETWEEN RESEARCH AND DESIGN

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For the Architectural Engineering studio, the graduation year is divided into two distinct parts: the research period and design, both one semester. Since the research period precedes the design, one could integrate the findings in the design. But in reality, the research and design are two elements that are closely intertwined from beginning to end. The research period for me was also a period of defining the actual graduation project. Where in the beginning my intentions for the graduation were way too broad to be tackled in a single graduation year. The research helped me to get my main graduation topic not only to be clear, precise and focused, but it also gave me the opportunity to really dive into a particular subject of interest.

In order to give an answer to the overall research question of *how a vacant office can be transformed into a building that can adapt to future needs and house a variety of different functions, in a way that it improves its energy efficiency and performance*, the research did an in-depth analysis of how the design could be integrating change as one of the major design parameters and how a mix of different functions (and therefore uses and users) could exist in the same building. The research has led to a number of different strategies in adaptable design and showed their relationship with the different layers of the building, the cause of the change and the scale, both physical and in time. All these different strategies have been applied to a number of different aspects in the design. On the level of the entire building, the strategies have led to a hierarchy in building scales, starting from the entire mass of the building, all the way to the (dividing) walls of the individual units. The design has incorporated the different strategies in a way that the scale and effort of any particular change are consistent with the possibilities of the building. For instance, an entire floor will change in a different rate than the use of a single room and the design is taking these differences into account.

Also the conclusions of the sub-question into the mix of functions are used in the design of the case study. In order to have a truly *mixed-use* building, the combination of the individual parts, in this case the individual functions, have to be more than the mere sum of the parts. This means that within a building that houses multiple functions, there has to be looked for a way they can interact and therefore strengthen each other. On the biggest scale, the different zones of the building have been placed in such a way, that there is always a connecting zone in between two seemingly separated zones. For instance, the residential zone is separated from the office zone by the leisure zone, which has functions both of the other zones will be using. Another mean in order to connect the

different functions in the building is that of routing. There is a virtually continuous route stretching from the basement level, all the way up to the roof. Highlights in connecting different levels with each other are the *pockets*, big cantilevered spaces that are stretching 3 stories and connecting different zones visually and physically.

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THE RELATIONSHIP BETWEEN THE THEME OF THE GRADUATION LAB AND THE SUBJECT

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As for the relationship between the theme of the graduation studio, in this case *Beyond the Current*, there are a lot of aspects that have similarities with that of the graduation studio. Even though I am not specifically dealing with post-war housing estates, it does share the same initial values. The first and probably most important one is that of sustainability. There has to be a change in the way we design and construct our built environment. Climate change is indeed happening and even though we are one of the causes, we can also really make a change. This means that not only new buildings have to be different, also the way we deal with the existing built environment has to change. In both *Beyond the Current* and the graduation project, there is a certain appreciation for the existing and gives an idea of how we could deal with this. By performing an upgrade to the building, instead of demolishing it and start over, we reduce the impact in architecture and urbanism, but also on the environment. This upgrade of the existing is necessary, because if we want to really make a difference in terms of climate change and CO2 reduction, it is simply not enough to only built new buildings with these ideas, since we have a lot of existing stock that also doesn't perform good enough. This happens on climatic and energy efficient levels, but what the *Beyond the Current* lab also entails, is to actually *add* value to this existing stock. Just designing a solution isn't going to do it, and that is exactly what the graduation project is doing as well. It upgrades the building on numerous levels, including energy efficiency, usability and functionality and eventually also upgrades the building's image.

On a broader scale, that of *Architectural Engineering*, or the way of integrating

engineering with architecture, my graduation project shows how one could use, in this case, the climate systems as part of the architecture of the building. The before mentioned *pockets* of the building are not only part of the route through the building, but also, in addition to a *roof forest* on top of the main core, form the lungs of the building. These lungs are providing the whole vertical city with clean, fresh air that is also pre-heated or cooled, while also forming the major architectural interventions to the building and anchors to the context.

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THE RELATIONSHIP BETWEEN THE METHODOLOGICAL LINE OF APPROACH OF THE GRADUATION LAB AND THE METHOD

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Different from other graduation studio's, the Architectural Engineering studio relies on the student to define his or her own graduation project, with a couple of main directions the student gets to choose from. This begins with the definition of a personal (technical) fascination of something in architecture or the (architectural) process. For me, this fascination is that of the city of tomorrow, and in particular the challenges it embodies for us as architects. For a very long time, architecture was based on ideas and needs that were in the present, defined by studying and learning from the past. Change and the means necessary to achieve this within architecture, is often frowned upon and has been given the label of non-architecture in more than one case. With the focus, time and support Architectural Engineering puts into the research, it really gave me the opportunity to explore how to deal with change in the world around us, and how to use this only constant factor in something like architecture, that for too long has had the objective to be permanent.

One of the examples of this is the actual approach of the case study I chose to graduate on. From previous experience in both university and the architecture profession, one would almost always have a certain brief with requirements the design has to meet in order to be successful, or would result in the client being happy. The research, however, suggested a different approach: one that not only takes into consideration the present needs, but also that of the future. This made it hard to define a brief for the building, since this could all be changing, but it forced me to look for leads in the design somewhere else. Eventually this has led to a better integration of different elements of the design to become larger than the mere sum of its parts. For instance, because there was no brief to start off with for the functions of the building, they had to be looked for in different places, one of them being the actual place the building is located. By analysing the place, or *genius loci* with the (conclusions of) the research in mind, the building now hosts a mixture of different functions that are based on the city in which it is located, in this case

Rotterdam. The project almost becomes a smaller, vertical version of it, therefore connecting it even more to its surroundings, one of the important conclusions that could be drawn from the research.

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THE RELATIONSHIP BETWEEN THE PROJECT AND THE WIDER
SOCIAL CONTEXT

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in addition to the relationship the project has with the theme of the graduation lab, this graduation also shows my ideas of how to deal with the ever growing number of people that are and will be inhabiting our cities. With a steady growth in the world population and the ongoing migration to the city from the countryside and suburbs, cramped cities have been expanding in a horizontal motion away from the city centres. Back when this was the necessity, the Modernist approach of dividing work, living and leisure was an idea that made a lot of sense, especially with the rise of technology that made distances less and less, even for the ordinary man. But today, we see that this way of expanding cities is not the right way to go forward. My graduation project shows what in my opinion is a better direction: that of *inward verticality*. I truly believe that if we want to make our cities bigger in order to house more people, we have to first look what the present city has to offer. A change in every of the three divisions as proposed by the Modernists, is visible today: we live and work different and therefore the way we spent our free time is also changing. Cities like Rotterdam, that for a great part have been built around the Modernists ideas, is one that has a lot of space that *used* to house people for the period they would be working, and therefore were also designed to do just that. These are the places we have to find opportunities to change these buildings from mono-functional, barely-used buildings into dynamic, 24/7 miniature cities. This also means that these cities will also need to rely on themselves, rather than importing necessities. Buildings will need to grow their own food and produce their own energy in order to be part of the city of tomorrow.