THE ENERGIZED MONUMENT
REFLECTION & CONCLUSION

AN ENERGY CONCEPT, COLLECTIVE HOUSING CONCEPT
AND A MONUMENT MEET AT THE BINNENGASTHUIS AREA
IN AMSTERDAM.

Reflection: The energized monument
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INTRODUCTION

This paper reflects on the research and design approach and the outcomes of my graduation project.

The graduation project developed into an assignment in which three elements are brought in relation: monument, collective housing & near zero-energy. The elements meet at the Binnengasthuisarea in the city centre of Amsterdam. This former hospital is nowadays domain of the University of Amsterdam.

The elements are continuously interrelated and have resulted in the creation of a very energy-saving monument with a collective housing function in the city centre of Amsterdam.

My project is reflected through four aspects:

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

2. The relationship between the methodical line of approach of the graduation lab and the method chosen by the student in this framework.

3. The relationship between research and design

4. The relationship between the project and the wider social context
The main theme of the studio is heritage & housing at the Binnengasthuis area in Amsterdam. In general, all projects of the studio have the goal to create housing in the historic inner city centre of Amsterdam. The main focus lies in transforming (a) monument(s) to housing at the Binnengasthuis area. Monuments are buildings with historical or scientific value (Rijksoverheid, 2014). In addition to the main goal, a specific theme, related to housing is chosen by the student. As a result, a more specific project is created.

This led in my project to the introduction of near zero-energy. Near zero energy is defined as the balance between consumption and production of energy (Voss & Musall, 2011, p. 6). The transformation of a monument to housing is brought in relation with near zero-energy. The housing concept is more specified in collective housing, which is defined as housing for like-minded people who can benefit from the same collective functions (VROM-raad 2009).

Monument, collective housing concept and near zero-energy concept are three main elements in the project that are highly interrelated (see figure 1). The result of combining these three elements is the design assignment of collective, near zero-energy housing in monuments. Besides energy, this includes creating a healthy, green living environment.

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**Figure 1.** Main elements of project and their relationship
As can be seen in the method framework in figure 2, research and design are interrelated. Monument, near zero-energy and collective housing concept are the elements that meet while answering the main research question. Both research approach and design approach contribute to combining these three elements. The research question: Which strategies are appropriate for the transformation of monuments with a non-housing function from around 1900 in the Netherlands to monuments with near-zero energy housing?

The research is divided in theoretical research and design research. The theoretical research started with my initial fascination: combining near zero-energy with monuments. The results of theoretical research and site-specific analysis were initially steering in the direction of designing with passive energy techniques. I forced the search into an energy related design. During the design phase I enriched my theoretical research about near zero-energy by looking at case studies of transformed monuments into near zero-energy monuments with housing. Different energy related design solutions were tested on the kraamvrouwenkliniek, the chosen monument. As a result, the design added information and influenced the research. The preconditions of monument and housing program did not allow the passive techniques initially thought of, such as building an atrium on the south of the monument to reduce the heating demand.

It showed that different energy-related design concepts were not suitable for creating comfortable housing due to lack of daylight and ventilation. Besides energy-monument related design solutions, the function was as important as the energy concept. Therefore before it was possible to answer the research question on near zero-energy, the collective housing concept had been researched. This function has influence on the monument as well as on the energy concept. By defining this function it helped me finding energy solutions for the monument. The energy solutions are integrated in the design of the function, such as for example solar cells in the balconies. Collectivity brought energy and monument more together as the building functions as a neighborhood. Indirectly the third element, collective housing, was needed to come up with answering the research question. Strategies that are appropriate for the transformation of monuments with a non-housing function from around 1900 in the Netherlands to monuments with near-zero energy housing are mostly inconspicuous. These inconspicuous design solutions would have a more positive effect on the cultural carrying capacity of the monument as well as on the comfort of the collective housing. Solar collectors out of sight, a heat pump underground and climarad® ventilation out of sight were all having big impact on the energy demand of the building. Insulation and replacing/placing new window frames were more visible and have resulted in creating a comfortable modern living environment in a monumental building.

The collective in collective housing concept is not present in the research question. Nevertheless it had a positive influence in combining the energy concept with the monument. Therefore it is important to see the three elements as a triangle in which monument and collective housing concept form the basis to decide the extent in which the energy concept can occur. It took me a while to realize this. The near zero-energy concept should never negatively influence the quality of the collective housing in this monument.
ASPECT 3 THE RELATIONSHIP BETWEEN THE METHODOLOGICAL LINE OF APPROACH OF THE GRADUATION LAB AND THE METHOD

The approach of the department of heritage & architecture at the TU Delft is development oriented. Three elements form the base of heritage & architecture and are strongly interrelated, which are cultural value, design, and technology. The function of transformation had been defined by the graduation studio heritage & housing. Therefore, the general methodical line of approach was different from other heritage & architecture projects, containing a general site analysis followed by a research based on the area, resulting into a possible function for a design. In contrary, different elements of housing were studied in a theoretical research and followed by a site-specific research on this theme. In my case this theme evolved into near zero-energy.

In my project, the elements that contain the carrying capacity of the monument are the informal and formal facades in combination with its organizational structure. The exterior facades on the corner of the Oude Turfmarkt and the Grimburgwal are of urban value for the city centre of Amsterdam (Rijksdienst voor cultureel erfgoed, 2015). The importance of the exterior facades lies in the difference between formal and informal facades. The formal facades are part of the representative image of the Binnengasthuis area. The informal facades are facing the inner part of the Binnengasthuis area. The informal facades were originally surrounding a garden of the hospital. The third element that is important is the organizational structure of corridor and hospital rooms. In the design, these differences in formality of the facades result in a new language of architecture on the informal side of the building. The orientation of this facade on the south has resulted in a positive influence on the near zero-energy concept. Here the collective and near zero-energy design meet with the cultural value of the monument. The element technology explains in more detail the design solutions. A good example is the part where near zero-energy concept, collectivity, and monument meet: the collective balcony. This balcony is an extension of a big collective area which is derived from enlarging the original corridor structure of the monument. The balcony functions as a winter garden which can easily be warmed up in winter while its glass facade is closed and warmed up in summer while its glass facade can be opened. But also more simple solutions such as replacing window frames with new ones and placing sunshade out of sight is a design solution which is going through in detail. The energy performance or nowadays energy index is calculated by the Uniec2 program. Translating this calculation in an energy design which is regulated per floor, is part of the relation between technology, cultural value, and design. Cultural value corresponds with the cultural value of the kraamvrouwenkliniek. The three elements (monument, collective housing concept, and near zero-energy concept) meet in the design part of the triangle of heritage & architecture. Cultural value and technology are used in designing.
The goal of my project was creating near zero-energy housing in monuments. The location and my fascination have created the ingredients for the design project. The goal was not complete without a specific function in the design project: collective housing.

Collectivity and energy are two elements that connect people on different scales. The goal of my project is to find a combination of these elements with a monument transformed to housing. The carrying capacity of a monument is used as a starting point for possibilities in collective and energy-related design solutions in this monument. The collectivity in combination with housing anticipates on the location and spirit of time. Collectivity anticipates on living in the city center of Amsterdam. Cities are growing and people stay living in the city, while starting a family, instead of moving to the suburbs. The city center of Amsterdam is conversely restricted and determined with houses. New houses do not arise and transformations are the option to contribute to create more housing in the city center.

To anticipate to this phenomenon, the idea of creating collective housing for families rises. In collective housing concepts, collective areas are shared and more time is spend in collective areas than in the private space. The amount of functions in a building rises. It is possible to have all modern conveniences in your own building, while living in the city center. Having more together, than less alone. Creating playing areas for children and having a collective garden is unique in the city center of Amsterdam, but affordable if shared with other people.

The Binnengasthuis area functions as a case study where these elements are combined. Considering the Binnengasthuis area as domain of the University of Amsterdam, it is not very likely that the function of these buildings are easily changed to housing. Therefore this case study will have theoretical intentions which has solutions that can be applied in the broader context on other, likely transformed monuments.

My project showed that collective housing and energy in combination with a monument leads to a monumental, collective energy smart grid. In this concept the elements collectivity, energy and monument are connected. The monument functions as a neighbourhood in which floors are similar to streets. Collectivity can be found on the same floor but also on another floor (as going through a park a few streets away when comparing to a neighborhood). In addition energy is generated for the complete monument and regulated per floor (as in a street).

Another example of an energized monument is the Justus van Effenblok. This monument belongs to the style of het nieuwe bouwen and is a different kind of monument (Vakgroep restauratie, 2015). The Justus van Effenblok is originally built as a housing block. My design introduces the category of traditional monumental buildings with a non-housing function from around 1900.

Other monuments in the Binnengasthuis area such as the Klinisch ziekenhuis, the tweede chirurgische kliniek of het vrouwenverband also fit in this category. They also have the potential of being transformed into energized monuments and have similar characteristics as the Kraamvrouwenkliniek.

On a bigger scale, looking at the city of Amsterdam, all monuments from the same category have the potential of being transformed into energized monuments. This could be seen as a solution for new housing solutions in existing monuments in inner city centers.

The Kraamvrouwenkliniek will be an iconic example of transforming traditional monuments to energized monuments, where a near zero-energy monument can easily be created by simple energy measurements and collectivity is found in the original corridor structure of the monument.
Figure 2. the monumental, collective, energy smart grid
CONCLUSION

Energizing monuments can be done by hand of a monumental, collective, energy smart grid. The design that I made fits for the category of traditional monuments from around 1900 with a non-housing function that are transformed into housing.

The creation of an energized monument is dependent of three important elements:
- a difference in representative and non-representative, more informal facade (figure 3 and 4).
- the orientation of the non-representative parts of the building (figure 4)
- the presence of wide corridor structures. (figure 5)

The first element gives opportunity for design solutions in the facades. The orientation will influence the extent in which the monument can produce energy. The presence of wide corridor structures gives the possibility of creating open collective functions in the corridor structure and therefore an opportunity of creating collective areas in the monument.
LITERATURE LIST


