1. Framework & description

1.1. Studio theme and goal

‘Housing Heritage’ is one of the main graduation tracks within the ‘Architecture and Heritage’ (former R-mit) studio at the technical university of Delft. The name ‘Housing Heritage’ reveals that this graduation track is primarily concerned with the existing built housing heritage and its related cultural, social and theoretical implications. ‘Architecture and Heritage’ was established to promote multidisciplinary research on the tension between preservation and essential renewal in architectural heritage. Needless to say, the goals and ambitions of the ‘Housing Heritage’ track are closely intertwined with those of the department. In the words of J. Coenen, R. van Hees, P. Meurs and M. Kuipers the main aim of the department is to establish research, product development and knowledge transfer in modification, intervention and transformation in the built environment (Clarke & Spoormans, 2014, p. 3).

The Semester Manual states that Housing Heritage graduation track will ‘focus on the design of new architectural additions, alterations and adaption to old building (housing) complexes of recognised value and the conservation of materials’ (Clarke & Spoormans, 2014, p. 4). The graduation project roughly consist of three interrelated parts, a research report including a thorough analysis on all scale levels and a value assessment, a position paper which can be consider a theoretical exploration of the applicable existing scientific discourse and finally a design for an intervention on the selected site.

Clarke and Spoormans expressly point out the strong relation between research and design. They stated: ‘Design is located in the results of investigation, which in turn lies in all scale levels from urban implementation, architectural design and technological design’ (Clarke & Spoormans, 2014, p. 4). Furthermore they conclude that the value assessment, the strengths and weaknesses and the external threads and opportunities of the selected building of building ensemble should dictate the program of demands and therefore the outlines for the following research by design (Clarke & Spoormans, 2014, p. 4). The research forms the basis for the individual design parameters.

In the last step in becoming an architect a graduate is expected to apply and display certain abilities and qualities. In the Housing Heritage studio a student is expected to develop the ability to synthesise all the necessary informants to effectively respond to a brief set by yourself (Clarke & Spoormans, 2014, p. 4). In general the main goal is to deliver a graduate fit for architectural practice. This implies that the student is expected to develop a set of skills and abilities in architectural design to satisfy both aesthetic and technical/functional requirements (Clarke & Spoormans, 2014, p. 5). During the complete master trajectory skills are acquired to increasingly incorporate an understanding of the design process with regard to three main aspects involved in architectural research and design. The first group is architectural history and architectural theory, art, technology and human sciences. The second, the relation between buildings, spaces and society’s needs, and including environmental aspects. Finally and I quote: ‘skills are acquired to incorporate insights in and knowledge of the design process attained with regard to methods of investigation and designing’ (Clarke & Spoormans, 2014, p. 5).

1.2. Eilandenbuurt Carnisse, Rotterdam

The research area and design location is the Eilandenbuurt in Rotterdam. This neighbourhood is part of a city district called Carnisse situated south of the Maas River near the Zuidplein which is considered the commercial centre of Rotterdam Zuid. Its location close to the old harbours makes the Eilandenbuurt a crucial link in the intended improvement of Rotterdam Zuid. The Eilandenbuurt can be seen as a typical example of Dutch Housing from around the Second World War.

De neighbourhood’s building stock consists mainly of staged houses. The graduation project focusses on the por-tico apartment flats in the Eilandenbuurt designed by the important Dutch architect Jo van den Broek in 1937. In Ei-
landenbuurt a total of 19 strips, ranging from 117 meters to 26 meter in length, of the Van den Broek type portico flat were constructed. The apartment type developed by J.H. van den Broek plays an important part in the development of the famous Dutch housing type called portico dwelling (portiekwoning). The evolving of this type of housing is undeniably illustrative for the development of Dutch family housing in times of crisis and material shortages (Vanstiphout, 2005, pp. 273-280).

These small portico houses were build in two phases just before the start of the Second World War (1939) and were mainly intended for the port workers who often came from out of town or even from abroad. In this time of financial crisis and great housing shortage Van den Broek and many other famous architects explicitly sought to improve the living conditions in terms of hygiene, health and productivity. The need for fast production of houses, a highly standardized building process, combined with a shortage of building materials and adequate financial funds, resulted in the buildings that in our current perspective show quite a few defects and deficiencies.

Rotterdam Zuid (south) or more specifically Oud-Zuid (old-south) is the target area of many social economical and architectural intervention and improvement plans. A large number of reports, studies and analysis on this part of Rotterdam emphasize the need for improvement. ‘Nationaal programma Rotterdam Zuid’, ‘Zuid Werkt!’, ‘Bloeienend Cranisse’ and ‘Profielering VIP Oud Zuid’ are just a few titles among many. In each report the problems in Rotterdam Zuid and the Eilandenbuurt are expressed differently. One of the reports states that the socio-economic problems in terms of size and intensity are unknown to the Dutch scale (GemeenteRotterdam, 2011, p. 1). The report called ‘Profielering VIP Oud Zuid’ tells us that 58% of the inhabitants in Rotterdam Zuid, live in a neighbourhood that struggles with a social and economic disadvantage. In the same chapter it is noted that Rotterdam has the largest number of so called ‘probleemwijken’ (trouble neighbourhoods), of all large cities in the Netherlands (Dudok et al., 2009, p. 11). The main objective of the graduation project can therefore be formulated as improvement of the living conditions (technical, spatial, aesthetical) and emancipation of the neighbourhood in a social economical sense, through an architectural intervention.

1.3. Concise research description

1.3.1. Research product

Walking through the Eilandenbuurt in the south of Rotterdam the eye is caught by the many subtle differences in the expression of the building volumes, facades and individual homes, while the architectural and urban language was originally very uniform. The number of changes and extent of architectural adaption clearly varies per dwelling, portico or block. Most of the portiek houses are privately owned, which is exceptional for this very small type of home in the Dutch context. Some of the dwellings represent large expenditures and great efforts while other houses look neglected and outdated. These differences reflect an interesting history of change.

Architecture is often imagined to be permanent. But in fact architecture is often changed and adapted without the supervision of an architect. These events occur when the property no longer meets the user’s contemporary requirements and ambitions. Different layers of adaption are introduced by homeowners, homeowners associations and policy implementers. The question arises why is privately initiated adaption less valuable than the original design? After all they are the result of a mismatch between the current user’s requirements and the available urban, architectural and technological structures and facilities.

The goal of this analysis was to describe and illustrate the various changes and adaptions to the original situation. The research focused on the most frequent and remarkable adaptions to the build environment, which are still observable in the current situation. The main research question

![Diagram timeline research scope](02)

**Diagram timeline research scope, 2014, D. Lagerberg, from own illustrations.**

![Diagram shearing layers of change](03)

was formulated: ‘what different adaptions of the original situation as finished around 1940 following the designs by J.H. van den Broek and W.G. Witteveen, are currently observable’? The research report also included an interpretation of the emotion, desire, physiological need or impulse that acted as an incitement to an act of adaption. Therefore the following sub-question was formulated: ‘what was the motive for these changes and adaptions’?

The study of private adaptions at various scale levels and various rates of change, derived from the research by Stewart Brand (Site, structure, skin, services, space plan and stuff), acted as a guide in the process of analyzing the buildings context, technical operation and constructive principles. The assumption was that by linking each investigated adaption to a certain motive one could gain insight in the user’s changing demands and requirements. Cognizance of these changes could form a solid basis to assess and predict the current and future urban, architectural and technical demands and requirements.

1.3.2. Research process

As mentioned before the primary focus research process was developing the requirements, demands and conditions for the design phase which are based on newly acquired and present information and knowledge. Together these aspects form the input for the design process. The input formation in my case, is characterized by incessant switching between general analyses of for example the urban situation but also the construction of the apartment blocks and investigation into observable amateur or homeowner initiated adaptions. Every architect dealing with existing buildings should become highly acquainted with the current and historical architectural, constructional and urban context. To state that the research process and the design process are two strictly separate phases would be incorrect. In reality, the two proceed side by side for a long time in the middle of the projects complete timespan.

Pre-defined acquired levels of investigation have greatly influenced the process as the project moved from a large to a more detailed scale. Starting from an urban perspective it slowly moved towards analysing the window frame constructional detail. After formulating a research question the quest for evidence could start. Observations on site, sales advertisements, historical architectural drawings and literature on the life of buildings and inner city transformations are a few types of sources I consulted during this quest. By applying comparative analysis between the original architectural, technical and urban situation and the current observable situation I gained insight into aspects from both periods while assessing changes in the user’s demands and requirements.

1.4. Concise design description

1.4.1. Design product

The research report shows that in many cases homeowners set very high demands with regard to living comfort in the sense of thermal comfortableness, household convenience and personal hygiene care. The bathroom and kitchen are by far the two most adapted rooms in de Van den Broek portiek dwellings in de Eilandenbuurt. Since the original bathroom and kitchen spaces are extremely small for modern day requirements homeowners have tried to extend their homes to create larger rooms for the installing of updated and high-end kitchen and sanitary services. Another common strategy is trying to squeeze all the modern services and machinery into the originally available space. The current comfort demands extend beyond the available space.

The homeowner seems to suffer from a lack of expertise with regard to adequate adaption of the ventilation system, heating and improvement of the overall technical performance of the house. The observed amateur interventions in this area express a scrupled and clumsy way of going about. Adaptions are often implemented with use of widely available, easy accessible and easy applicable products and systems. These are both aspect in which an architect can
provide guidance and expertise. The fragmented ownership and inactive homeowner association's form the last aspect of the design problem statement. Interventions on the scale of the portiek, street or neighbourhood are highly obstructed by lack of correspondence and cooperation.

The design consists of an easy to install prefabricated overhanging extension of the narrow bay in the house, a pre-fitted high efficiency ventilation/heat exchanger unit and a required network of ventilation duct to each room. This plugin extension comes with incorporated photovoltaic cells and a double glass façade system to preheat intake air. The extension is applicable per individual property without too much inconvenience for neighbours. The homeowner is able to stay in his or her house during construction. While the exterior of the extension is set, the interior can be customized to suit the buyers liking. The extension presents itself as an irregular shaped parasite which introduces a new direction of sight and therefore extra eyes on the streets. The parasite acts as a chameleon when it comes to its colour and acts as a paradise bird when it tries to stand out and form a contrast to the existing monotonous, orthogonal and flat portiek facades.

The design for the extension, the climate system and the ventilation network is of generic value for early and mid-twentieth century portiek housing. Morphologically and exterior finish of the extension can be adjusted to match/suit any portiek dwellings façade or bay width. Depending on floor plan layout and total living area of each different type of portiek house the character of the intervention varies between absolute necessity and luxurious addition.

1.4.2. Design process

Alijd van Doorn stated that each individual design process is characterized by its own approach, priorities and emphasis (Van Doorn, 2003, p. 29). Obviously this also applies to the individual design process for the ‘Housing Heritage’ graduation studio. The three main phases in the design process, input, process, output, also described by Van Doorn, are elaborated separately (Van Doorn, 2003, p. 15).

The input of the design process was largely developed in the research phase of the graduation project. The input normally consists for the most important part of the program of requirements and demands. This also applies to the current project. The process or design process itself is, according to Van Doorn, the spatial translation of the input (Van Doorn, 2003, p. 15). In my case the design process is dominated by constant testing of the new design hypotheses to the constructional and building executional demands. The design hypotheses, mostly focussing on aesthetics, image and spatial experience, were often developed and evaluated using physical models, sketching techniques, computer renderings and elevation drawings. Analysis of the technical feasibility was examined in 2D computer drawings (one to twenty or a larger scale).

It’s clear that the separation between input and process phase is vague and shows overlap. During design the trainee architect constantly searches for new input. During the design process reference projects, design theories and literature about constructional possibilities of cantilevered constructions, material properties and the possibilities of prefabrication in relation to mass customization were used.

The generic value of the design was investigated in a few test cases. A number of small portiek dwelling types from all over the Netherlands where used to evaluate the adjustability and the added value of the intervention. These test cases were analysed using small design process cycles with their own input, process and output.

The output is the final design result (Van Doorn, 2003, p. 15). This design result is already described above. Representations of this design like drawings and descriptions are characterized by a division between climate-technical, constructional and construction process aspects and aspects displaying spatial perception, moods, appearance and aesthetics.
2. Evaluation & reflection

The terms reflection and evaluation are often used interchangeably. What is meant by the verbs 'reflect' and 'evaluate' in the context of an approaching graduation presentation? When we repeat this question to a dictionary we get following answers. Reflect (up) on means ‘to think seriously about’ or ‘to express carefully considered thoughts’ (Dictionary). Evaluate is defined as ‘to ascertain or fix the value or worth of’ or ‘to examine and judge carefully; appraise’. The first definition of the word evaluate seems to be the most useful.

In the light of an educational purpose the definition of the verb reflect changes slightly, at least in Dutch language. Wikipedia tells us a reflection is often used in didactics as a way to understand, analyse and give certain significance to an experience (Wikipedia). In other words reflecting is to think about a particular experience, thought or action with the aim to learn from it, to improve.

2.1. Research vs. design

As mentioned earlier the research phase resulted in a number of important requirements, conditions and demands for the design product. In that sense the requirement set by the graduation studio where met. By formulating categories for the motives for adaptation (usage, image, comfort, maintenance, sustainability) I looked for users demands in all aspects of the research scope. Concluding one can say the design starting point and parameters where located in the results of the investigation phase.

Using Stewart Brands ‘layers of change’ the research was guided through all architectural scale levels (Brand, 1994, p. 13). The urban research approach was derived from the investigations by Rutger Smook into changing existing urban structures in the Netherlands (Smook, 1984, p. 11). Therefore I met the requirement that the research results should lie in all scale levels from urban implementation, architectural design and technological design. In retrospect this wide analytical coverage of the selected urban ensemble and building turned out to be nothing less than necessary in the design process.

In the conclusion of the P1 report is written that perhaps it was a misconception to figure out a main motive behind each privately initiated amateur adaption in the Eilandbuurt. These adaptions are rather driven by, and I quote myself: ‘a decisive combination of factors that distinguishes them from one another’. An amateur architectural adjustment or adaption is not autonomous and neither are its motives (D. Lagerberg, 2014, p. 68). This interrelatedness of adaptations often blocks attempts to rallying them under a certain category. However, using a categorization of motive for adaption as a tool to structure analytical and investigational effort can be advisable.

Finally, an attempt to answer the following question is included within this subchapter. What are the beneficial effects of writing a position paper on the design process and design result? The position paper is an attempt to become familiar with different research methods within the episteme in which the researcher lingers. It has been useful to see how a number of architects and researchers draw conclusions from investigating private amateur adaptions (D. Lagerberg, 2014). I discovered some new ways to derive changes in user’s requirements and demands from research on this theme. For example Venturi and Scott Brown introduce an approach in which they perceive adaptions as a set of signs and symbols which refer to historical analogies in sense of style and architectural language.

2.2. Studio theme vs. graduation subject

The Semester Manual written by Clarke and Spoormans includes two questions which in their words, ‘let at the heart of the research undertaken in the studio’. The questions, ‘what possible future potentials lie latent in the fabric and ideas that past generations have left to us?’ and ‘how and why do we transform this housing heritage?’ should both be answered in the research proceedings (2014, p. 7). The chosen subject, amateur privately initiated adaptions, relates to these questions very well. By comparing originally in-
tended and current observable situations on different levels one can discover possible future potentials within the fabric and ideas of past generations and the current users. This comparative strategy forces a distribution of attention over the historical situation and ideas and the reality of today. By seeing the differences, changes and adaption hidden qualities, potentials, strengths and weaknesses in terms of flexibility, aesthetics, technical performance, liveability and maintenance come to light. These outcomes form the basis or input to formulate an answer to the second question, what was the motive for adaption.

My design intervention can be labelled small. It focusses mainly on improvement of the individual dwelling. But the studios theme emphatically implies an intervention which affects the whole neighbourhood and its social properties for the good. This apparent gap between the studios theme on one side and the students design on the other side forms the most important reflective aspect. Through offering a solution for easy accessible and easy applicable improvement of the liveability and home comfort for each individual dwelling, the overall satisfaction with the dwelling can be increased. Satisfaction with the dwelling lead to residential or housing satisfaction. This is a fact presented in a research report by students from the University of Utrecht on residential satisfaction in Tarwebuurt and Carnisse. They state that as the duration of the period of living in a certain place increases so does the attachment to the home and the immediate environment. This effect is caused by related enhanced familiarity with the living location. (Bilderbeek, DeCeuster, Verest, & Velmers, 2014, p. 16).

People who are not satisfied with their home are significantly more inclined to move. This can be concluded with 95% certainty (Bilderbeek et al., 2014, p. 34). The propensity to move amongst inhabitants of a certain area or neighbourhood is an important parameter in the determination of the social economic status and in particular the social cohesion within the neighbourhood. The intentions of the design intervention certainly reach out to a wider social context albeit in an indirect manner.

Up to now the alterations of the street façade by application of the designed extension types have not been discussed. Introduction of new directions of sight through new tilted window openings increases the number of eyes on the street, something social monitoring of the public domain in the Eilandenbuurt may benefit from.

2.3. Approach & methodes

Although the research for the P1 project resulted in a lot useful insights which formed the basis for the program of requirements, practical tools / technical knowledge to begin the design process with a kick start were still missing. In the period between the P2 and P4 presentation the search for input for the design process went on. These efforts included studying theories about mass customization in relation to prefabrication, collecting knowledge on fully balanced ventilation systems/ heat exchanger modules for small dwellings and integrating climate design calculation skills. The quest for new useful input and information should not stop once the design process is started, on the contrary. It is an necessity to keep feeding the creative process. However, it would in my opinion be desirable to acquire more of the above mentioned practical and technical handles during the period towards the presentation of the P1-report. Acquiring more practical knowledge in the early project phase might have increased the level of technical elaboration of the final design at the P4 en P5 presentations.

Setting the outlines of a personally desired final design result early in the graduation project could positively contribute to previously described ambitions. Currently the studios methods only ask the student to take possible design assignments into account during the research process. Research that provides a set of demands and requirements combined with efforts to gain knowledge and skills for technical translation of these requirements into a spatial design could be the way to go.
Sources


