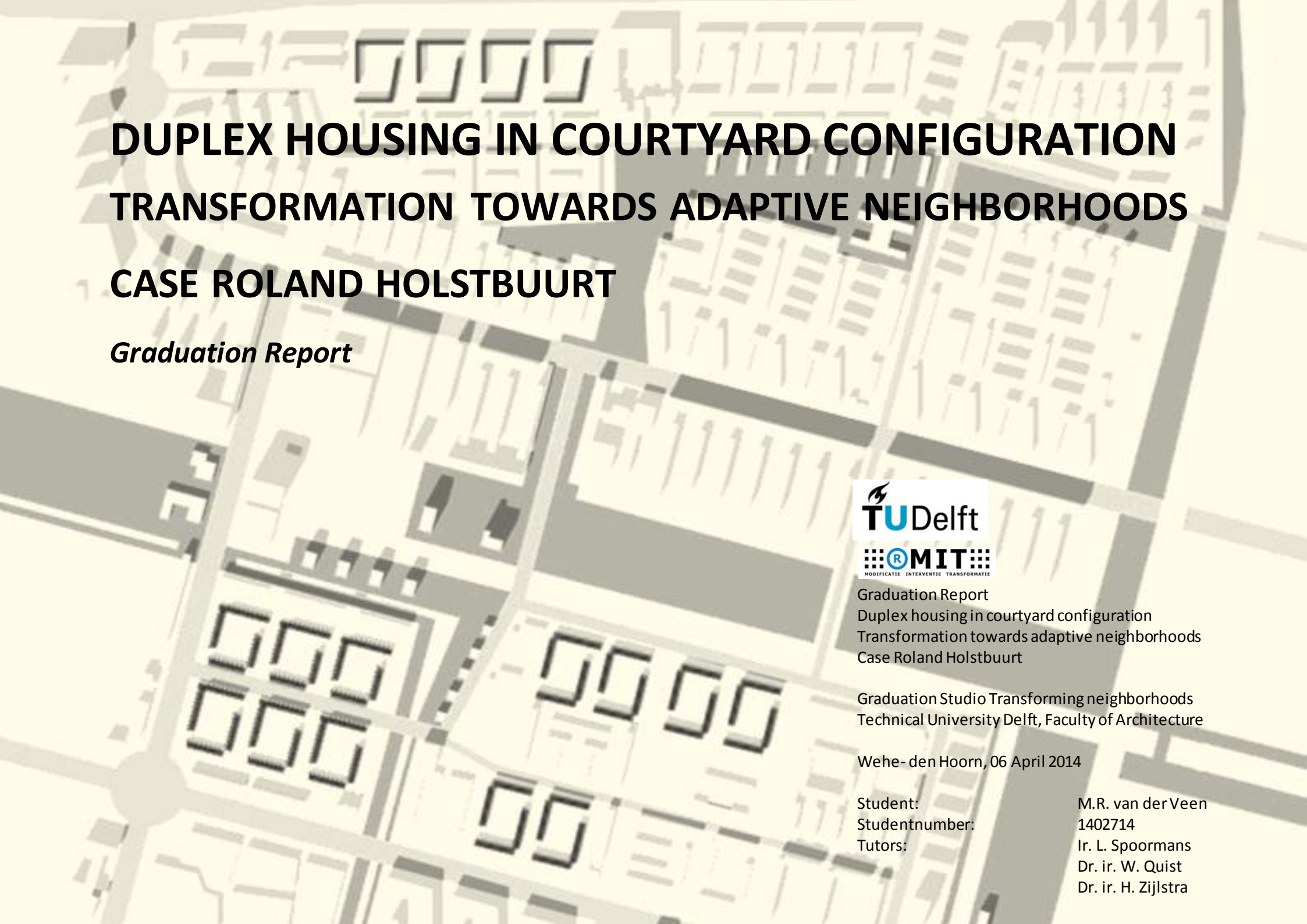
DUPLEX HOUSING IN COURTYARD CONFIGURATION

TRANSFORMATION TOWARDS ADAPTIVE NEIGHBORHOODS

CASE ROLAND HOLSTBUURT

Graduation Report



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Duplex housing in courtyard configuration
Transformation towards adaptive neighborhoods
Case Roland Holstbuurt

Graduation Studio Transforming neighborhoods
Technical University Delft, Faculty of Architecture

Wehe- den Hoorn, 06 April 2014

Student: M.R. van der Veen
Studentnumber: 1402714
Tutors: Ir. L. Spoormans
Dr. ir. W. Quist
Dr. ir. H. Zijlstra

Colophon:

Graduation Report
Duplex housing in courtyard configuration
Transformation towards adaptive neighborhoods
Graduation Studio RMIT: Transforming housing neighborhoods

Technical University Delft, Faculty of Architecture

Delft, 06 April 2014

Michiel van der Veen
Kerkstraat 25
9964AC Wehe- den Hoorn
Netherlands
+31 618729439
m.r.van.der.veen@student.tudelft.nl
michielvanderveen@hotmail.com

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INTRODUCTION

This master thesis illustrates the research and design project I conducted during my graduation project of the master Architecture at the Technical University of Delft within the section of ®MIT (Modification, Intervention, Transformation).

Report structure

This report contains primarily four parts. In part one and two the thesis and the research for design are described which form an summarized version of the P1 Report Thesis plan & Research Report, which is included as appendix 'P1 Report'. The third part forms the illustration and description of the results of the design for research phase. In the last part the relevance of the project is described as well as it contains an reflection on the design results and the process of research and design.

Personal motivation

Studying architecture after obtaining my degree Bachelor of the Built Environment and working aside as a roofer I have obtained a wide view in the attitude and craftsmanship of the disciplines involved in the erection, maintenance and modification of buildings. My bachelor graduation project, Energy neutral monuments – case Fogelsanghstate, was my first confrontation between cultural heritage and preservation and sustainability and continuation, which initially where perceived as classing fields of demands. This duality, and perception of sustainability in terms of performances on energy and materials, was the first step in the alternation of my perception of the built environment and sustainability. Except of perceiving it as the valorization of science and new programmatic desires I became interested in the power of devotion of the urban tissue and the buildings. Which, I believe, is the primary power and concern of the built heritage.

Current society is highly dynamic characterized by consumption, individualism, heterogeneity, emancipation, telematics, mobility and pluriformity on which the built environment has to respond on the one hand. On the other hand the importance of the existing fabric being subject to devotion and as a carrier of tradition and history grows mutually. In which I believe finding continuity based on the DNA of what is, is a highly sustainable method. The intermingling of continuity and change is one of the primary concerns of the section of ®MIT.

Since the economic crisis slowly seems to transform into a stable condition professions within the field of the build environment, like architects, are faced with new challenges. The financial conditions of involved stakeholders sets pressure on one-dimensional 'demolishment and built new' assignments in which the practice shifts towards modifying, intervening and transforming the existing building stock. About two third of the architectural practice in The Netherlands nowadays is concerned with the change and continuity of the existing building stock[1]. One of the biggest assignments are the city expansions erected in the rebuilt period after the second world war, which since the nineties cope with complex social issues and degeneration. The economic crisis put restructuring developments for these areas, based on large investments for regeneration by demolishment and building the new, on hold, which possibly results in further degeneration.

The Msc3 studio Transforming Neighborhoods by the chair of Restoration, Modification, Intervention and Transformation (®MIT) deals with these complex social issues and degeneration processes of post war areas. The current studio is the fourth graduation track

[1] *Website RMIT organization via http://www.bk.tudelft.nl/over-faculteit/afdelingen/rmit-en-mediastudies/rmit/organisatie/, accessed on 20-10-2012*

which is concerned with these postwar housing areas. The current one is focused on the postwar expansion of Amsterdam. Previous studios studied also postwar areas in The Hague and Rotterdam. Thorough research based design with the awareness of cultural historical significance in order to discover degraded housing areas as potential heritage is at the primary concern for regeneration.

Project introduction

The Western Garden Cities of Amsterdam built in the rebuilt period after the Second World War, which is one of the biggest extension plans in the Netherlands erected, faces complex social issues and degeneration. Other large expansion plans are for example The Hague South West and Rotterdam South. Current restructuring developments are put on hold due to the new economic situation and corporations have generally minimalized their activities into management and maintenance.[2] Slotermeer, as being one of these areas, erected as one of the first parts of the General Expansion Plan (AUP, Algemeen Uitbreidingsplan) is mostly retained by the urban renewal period in which even a large part is recently declared as heritage, called the Van Eesteren Museum. Plans were made to regenerate the area by means of large scale demolishment and building new housing estate, in which this could foresee in a more differentiated housing stock as one of the key arguments to solve further degeneration.[3]

One part of the stock seen as problematic by several stakeholders like the housing corporation and the municipality, is the duplex housing, which forms about twenty percent of the number of dwellings in Slotermeer. Several enclaves are conducted as duplexed ground-bound single family housing in courtyard configurations. In time of erection these were meant as a temporary solution to overcome the housing shortage. After ten years the duplex dwellings would be simplexed which until this day in general did not occur. Over time, due to the filtering down process, their position on the housing market changed. Nowadays, therefore these areas are mainly characterized by small and degenerated typologies with relatively cheap rents and inhabitants with low financial potential. There is an high mutation rate in change of tenants[4]. One of these neighborhoods, the case study for the graduation assignment, is the Roland Holstbuurt. It represents the typical abstract of the development of duplex housing in a post war urban setting through time.

This graduation project tried to find an answer on how to deal with these areas by means of architectural solutions. In the first quarter thorough research on the duplex strategy and the Roland Holstbuurt since the erection to the initial future plans, on urban, architectural and technical scale was elaborated. After this initial research conclusions and design recommendations where drawn as input for the second phase of research by design. In the second quarter by means of design driven research a spatial architectural strategy was developed as an answer on the research question and the initial opposed problem. Which resulted into a strategy for phased revitalization of duplex housing neighborhoods in courtyard configurations towards adaptive neighborhoods. In which the strategy is simulated on the case study, the Roland Holstbuurt.

[2] *Stadsdeel Nieuw-West bewonerskrant mei 2011, via www.nieuwwest.amsterdam.nl/publish/pages/378409/nieuw_west_bewonerskrant_slotermeer_4_mei.pdf (accessed on 20-10-2012)*

[3] *Timár (2009)*

[4] *Timár (2009)*

THESIS PLAN

Problem statement

Before, during and after World war II the government was highly concerned with social housing and its quality on the one hand and provide in the quantity on the other. After the war the duplex housing principle was emerged and elaborated as sustainable short term strategy to solve the housing shortage. Although in time the shortage in social housing was highly underestimated and the principle was therefore erected under false perspectives. The context of the housing after the war was the movement in which the garden city principals, de 'wijkgedachte' and most important 'Het Nieuwe Bouwen', light, air and space where important parameters in which standard housing typologies were developed. In which quality seemed to be the primary concern and secondarily the quantity problem.

Most duplex houses where never simplexed because the conditions after ten years on the housing market where different than anticipated on. Nowadays, after passing the 'fifty years' boundary, most duplex housing still exist. Over time its position on the housing market altered due to the filtering down progress for which it obtained a different position on the housing market. The typologies are outdated, the technical state is poor, but the rents have become relatively cheap. Over time it attracted therefor people from lower income groups and small households with low economic potential or people for a short stay like students. The mutation rate is therefore relatively high. Except for the technical and spatial deprivation of the stock these neighborhoods are facing multiple problems on the sociocultural and socio-economic level which partly has to do with the characteristics of the inhabitants.

Since the economic crisis put the renewal period on hold the housing corporation postponed the plans of phased demolishment and building new typologies, which mainly characterizes the future of the areas with duplex housing. Aiming on diversification in typologies and intensification of housing, in which the hierarchy of the initial urban tissue of the stamp configurations seems to be neglected. Since the future looks different it means that on the physical level the stock will debrief more and thereby probably catalyzes the existing problems on sociocultural and socio-economical level.
Although these areas are considered to be of cultural historical value representing well the principals of het 'Nieuwe Bouwen' en the Western Garden Cities, the performances of the infill of the principle scales of typology towards the green courtyards towards the neighborhood as a whole, does not seem to meet temporary demands. In which there are discrepancies between these layers instead it synergizes each other. Outdated typologies, indistinctive green island and a monotonous repetition of housing ensembles at first glance.

Simplexing the housing, as initially was meant to happen, in which it would become a neighborhood with single family housing, is nowadays considered by the housing corporation to be not feasible on economic grounds, considering the housing stock as one fold. Ignoring the probable potential of the layering of typology to allotment to urban tissue as well as the possible cultural historical values it gained over time which probably could add extended value.

One of these areas which represents well the generic problems of post war neighborhoods with horizontal split duplex housing in a courtyard configuration is the case study, the Roland Holstbuurt in Slotermeer, Amsterdam.

Figure 2 Roland Holstbuurt typical entrance yard, 2008 (www.google.nl/maps, accessed on 12-10-2012)

Figure 3 Roland Holstbuurt typical back façade, 2008 (www.google.nl/maps, accessed on 12-10-2012)

Figure 4 Roland Holstbuurt typical front facades, 2008 (www.google.nl/maps, accessed on 12-10-2012)

Figure 5 Satellite view Roland Holstbuurt, 2008 (www.google.nl/maps, accessed on 12-10-2012)

Research question

Research question:
*How can postwar **duplex housing neighborhoods in a courtyard configuration,** like the Roland Holstbuurt**,** be **improved** by means of a **toolbox for phased revitalization**?*

Sub question research for design phase: What are the merits of the duplex principle elaborated in Slotermeer and more specific the case the Roland Holstbuurt?

Sub question design for research phase:
What are the possibilities of duplex housing neighborhoods for phased and consumer based revitalization by decoupling the sojourn elements?

The main research question, although it focusses on a principle method for redesign, relies on the merits of duplex housing neighborhoods, in search for potential of the DNA, which could give direction to a suitable program for gradual revitalization in which the current inhabitants are not neglected. Initially these are the duplex housing principle and its execution. The used terms and its context are defined as follow:

Definitions:
Merits Duplex strategy: The duplex strategy, splitting a single family house into two houses for a short period concerns an architectural and time-based strategy in one to overcome the housing shortage problem. The architectural strategy concerns the typological configuration of the floor plans and its connection with the surrounding, in which transformability of the floor plan is of primary concern.

Duplex housing neighborhoods in courtyard configuration: The neighborhood is physically defined by the spatial boundaries of the configuration of the sum of stamp allotments with duplex housing in which it is considered to be a whole according the initial principals of 'Het Nieuwe Bouwen', in which these areas are erected, including its current inhabitants.

Improvement duplex housing neighborhoods: The improvement op duplex housing neighborhoods is defined by de conclusions drawn upon the first part of the research phase on duplex housing neighborhoods in which the problems of these areas become clear and defined as well as their potentials as input for the second phase of research by design regarding the toolbox for phased development.

Toolbox for phased development:
Revitalization in which is emphasized on the decoupling of the sojourn levels of the *principal built up of the neighborhood* which are in general living environment (urban tissue), living ensemble (carrier) and dwelling (interior) in which these are considered to be independent levels which can have their own cycles of change and improvement. By decoupling these fields other forms of revitalization above a traditional manner of design and execution becomes possible, in which the more mutual change is the primary advantage. In which a more consumer based approach is possible in which the revitalization of the stock can be catalyzed by micro urbanism interventions.

Principle built up: The principle built up is defined by the layers which form the DNA of such areas which are initially: living environment (neighborhood-courtyard), living ensemble (courtyard-transition) and dwelling (transition-typology).

Research and design methodology

Research for design
In order to answer the sub research question of the research for design phase, 'what are the merits of the duplex principle elaborated in Slotermeer and more specific the case the Roland Holstbuurt', the first step is to understand the theory of the duplex principle thoroughly and thereby its architectural dimensions. This is researched by literature and archive studies.

Chronological situational research started for the case study for which moreover general literature study for the urban level and research and analysis by site visits and archive photos is conducted.

To determine the distinctive characteristics of the Roland Holstbuurt, it was of high importance to understand the generic principles of the set-up of these areas in correlation with the theme. Therefore a comparison research of areas with similar characteristics was conducted.

Basically this is done by literature study to understand the context, and mapping and field research to understand the current situation on generic and specific aspects.

This enables getting a good understanding of the duplex principle, the elaboration and its development through time within the context of the Western Garden Cities. Which finally enables to adequately draw strengths, weaknesses, opportunities and threads as input for the second phase of the project: 'the design research.'

Design for research
In the second quarter of the graduation track, in order to answer the sub question of the design for research phase, 'what are the possibilities of duplex housing neighborhoods for phased and consumer based revitalization by decoupling the sojourn elements', a principle time based strategy, the design concept, is defined.

A programmatic draft is made for the possible diversification on the level of housing typologies, the courtyard and the neighborhood. Parallel is investigated to what extend individual change of the typology could foresee in the desired program and to what extend it could be reached by individual or collective change expanding the carrier of the housing ensembles.

With regards to the desirable improvements and potentials as derived from the initial research phase, these two fields then are combined into one time based architectural strategy, which forms an answer on the main research question, how duplex housing neighborhoods in courtyard configurations can be improved by means of phased change.

During the third and fourth quarter of the graduation studio the strategy becomes more defined and reshaped due to the design elaboration of this strategy on the case study, the Roland Holstbuurt.

Design research is mainly conducted by computer modelling and sketching, as well as continuing research, continuously reshaping the strategy and design outcome. The process therefore is, instead of the process of research, more cyclical and iterative.

PLANNING

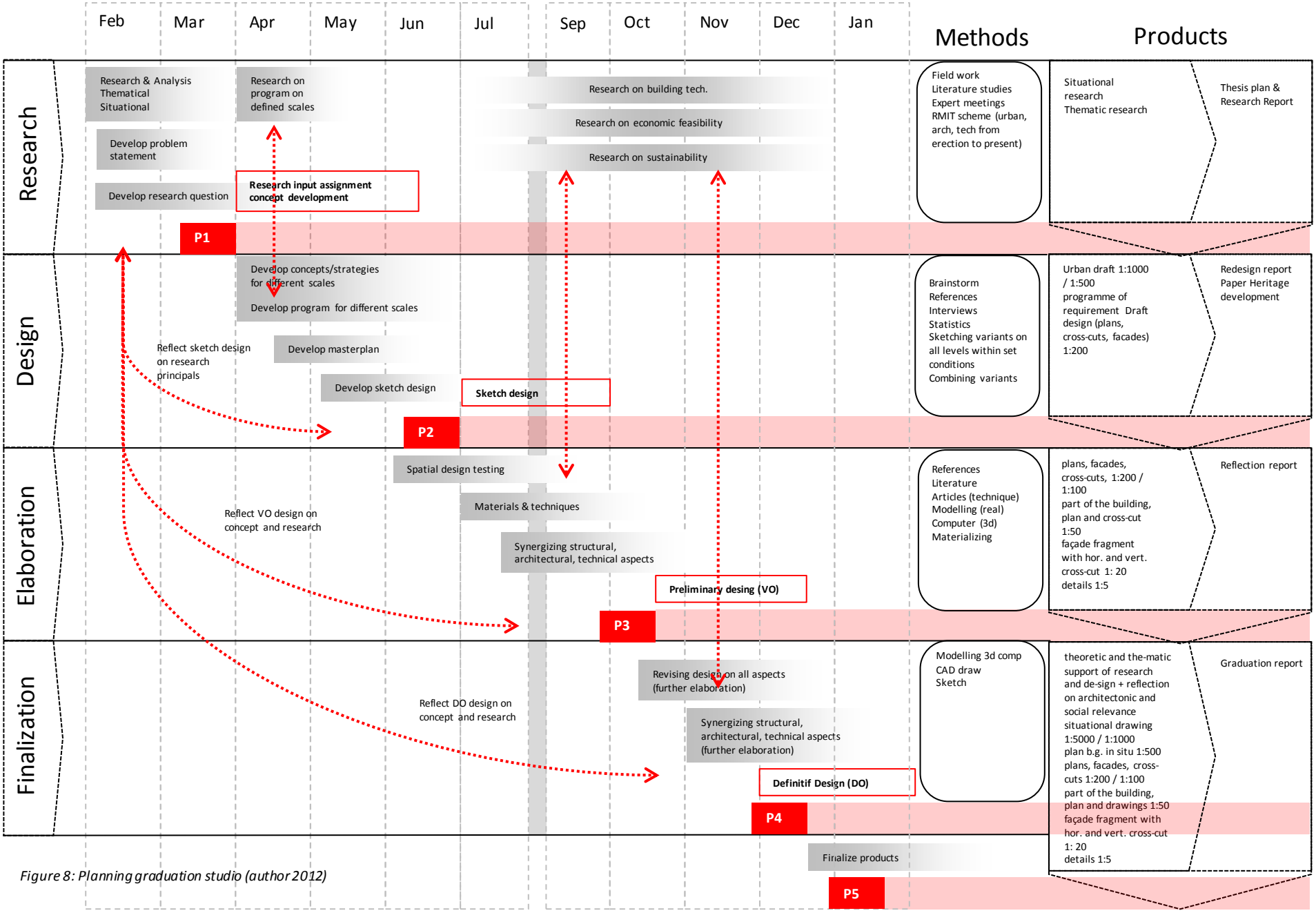


Figure 8: Planning graduation studio (author 2012)

RESEARCH
for design

Duplex housing principles

The following research results as desrcibed are the conclusions of the research on the topic of 'duplex housing principles.' See for the fully elaborated research and literature referred to the chapter 'duplex housing principles' of the P1 Thesis plan & Research Report.

The duplex housing principle, a time based architectonic strategy, splitting a 'normal' typology into two temporarily houses was a strategy intended to overcome the housing shortage after the second world war. The most popular 'normal typology' was de ground bound single family house with an usable surface of approximately 80 square meters. This typology could be easily split horizontal into two temporarily dwellings.

According to the findings in the literature, little research has been done into the reasons for the failure of not simplexing the duplex stock. Based on the discussions in the journals, assumptions can me made. Undoubtedly, it is not due to a singular motive or problem. A combination of changes in development and conditions in the housing market, the economic condition, and social psychological appreciation turned duplex housing into housing with attractive cheap rents. Which lead to the unduplexed situation of nowadays.

In literature and articles in the time of erection the duplex principle is mainly concerned with the typology. In this regard the urban context was implicit in the normal typology. Nevertheless there is no connection drawn between the possible program differences due to the duplexing for the direct urban surrounding, for which one could state this was not regarded as it would make a real difference in that time, since the the inhabitants of such neighborhoods did not significantly differ from the inhabitants within not splitted neighborhoods. Nowadays it seemingly does since duplex housing neighbourhoods are mainly characterized by households, often one or two persons, with low financial potential, in which there is an relatively high mutation rate.

In the concerns on the duplex principle it is pointed out that, although it seemed to be an topic of no real importance since in the erection time they believed de duplex housing would be simplext after ten years, the deviation of duplex housing over the several areas was crucial since otherwise social problems could emerge more easily. The duplex housing neighborhoods would not only atract small household but moreover would also be regarded as depreciated neigborhoods with a depreciated stock characterized by overpopulation. In the actual case this became to an high extend the actual situation.

In Amsterdam there are several neighborhoods with duplex housing elaborated. That all duplex housing is conducted as horizontal split ground-bound duplex housing is logically since this typology was the easiest to simplex and thereby all were developed within the same urban context of the Western Garden Cities within the allotment principals of 'Het Nieuwe Bouwen.'

The Western Garden Cities & Slotermeer

The following research results as described are the conclusions of the research on the topic of 'The Western Garden Cities & Slotermeer.' See for the fully elaborated research and literature referred to the chapter 'The Western Garden Cities & Slotermeer' of the P1 Thesis plan & Research Report.

The Western Garden Cities can be seen as the elaboration of a modern postwar city expansion plan in which ideas of garden city, the wijkgedachte and Het Nieuwe Bouwen are intermingled and interpreted in a practical manner. The erected plan shows differences concerning these thoughts with the initial general expansion plan in which the main elements of allotment principals, the hierarchy and penetration of roads and green from the large scale to the small, are preserved.
Although due to the housing shortage directly after the second world war the percentage of ground bound housing actually built, which is about 30%, is lower than envisioned, which was about 70%. Nowadays the main structure and hierarchy of green and allotment are still visible, although the renewal period altered parts of the plan, especially on stamp level, In which often the original relationship of allotment and the hierarchy of public and private, streets and green are neglected. It is especially this discrepancy between attention for the stock and the urban public space. While in contradiction the urban structure is in general appreciated in most developments it seems to be neglected.
Nowadays social and economic conditions are changed for the area. On the one hand the spreading of commercial program over the districts. Initially hierarchal and programmatic spread over the districts according the 'wijkgedachte' it changed to centralization of functions in clusters. On the other hand the characteristics of inhabitants, which nowadays are more multicultural and in general below the average potential social-economical. But also due to the change of demographics the extension is changed into a more central area of the city. In which it therefore strengthens the feel of a village in a city moreover within the core of the housing neighborhoods.

In Slotermeer, being part of the Western Garden Cities and considered to be the best representation of van Eesteren thoughts, is almost not altered due to the renewal period.
In Slotermeer a part is conducted as ground bound housing of which a great part originally was erected as duplex housing, which is about 66%. Not spread mutually over the stock but allocated to specific areas. Since these areas in general have not been changed by the renewal period or before these areas have become moreover representable areas of intimate villages in a city which was one of the primary concerns of the AUP in the first place.
Although these areas are preserved, socio economic problems as well as decay of the stock are still at concern and will probably continue and even increase if new strategies and interventions more suitable to the economic present situation will not be conducted.

Duplex housing in Slotermeer

The following research results as desrcibed are the conclusions of the research on the topic of 'Duplex housing in Slotermeer.' See for the fully elaborated research and literature referred to the chapter 'Duplex housing in Slotermeer' of the P1 Thesis plan & Research Report.

The principles of the original subdivision and the hierarchy between plots, roads and green is structurally unchanged for the duplex housing neighborhoods in courtyard configuration in Slotermeer. However, the original implementation of program through the different layers is lost.

Initially the inhabitants of the duplex housing courtyards where small autochthones families in which it by means of lifestyles did not diver as much from the inhabitants of normal ground-bound housing. Nowadays, the neighborhoods are characterized by elderly people as well as people from a low socio-economic strata, in which a part see the home as temporary, for which the mutation rate is relatively high.

Today, the courts especially seem to be a serial repetition of uniform clusters while they were meant to be different through program; i.e. interweaving of the clusters. Infill of the courts as well as the functions in the corners of the courtyard allotment do not contribute anymore to programmatically interweave the neighborhood to catalyze social cohesion. The corners operate more specifically with a greater range then only serving the neighborhood and the courts are limited to the block.

Between programs, the courts, allotment and transitions are today discrepancies. The allotment around the court should in this respect not be seen as houses around a courtyard like a traditional block. The orientation of the houses with entrance to the garden side have their living area and garden on the other side of the house orientated outwards de block. And for the northern and eastern dwellings exact opposite. This means that the houses with garden oriented to the court have to walk around the block in order to reach the courtyard.

On top of this the green barriers initially where low, guaranteeing visual contact. Nowadays this barrier changed in a more fragmented stroke in which sometimes the barrier is still open and sometimes closed by green or fences. But also increased parking pressure puts its stamp on the layout of the streets on the one hand but more over on the streets in the courts, making the green field even more visually separated from the southern and eastern situated homes.

The duplex housing in general is outdated in size, which they were considered to be fundamentally. But also in terms of technical conditions which therefore makes simplexing complicated. Since by doing so it should meet present regulations and demands for which many modifications should be done. Compared with the normal ground-dwelling it should be noted that the front façade with the entrance of the duplex houses are relatively inactive since on these sides sleeping rooms are situated and incidentally a kitchen on the first floor. For the houses on the south and east side this is an additional barrier between the courtyard and the dwelling.

The case Roland Holstbuurt

The following research results as desrcibed are the conclusions of the research on the topic of 'The case Roland Holstbuurt.' See for the fully elaborated research and literature referred to the chapter 'The case Roland Holstbuurt' of the P1 Thesis plan & Research Report.

The Roland Holstbuurt as part of Slotermeer is erected following the principals of the western garden city, based on the theories of 'het nieuwe bouwen' elaborated within stamps of the courtyard configuration containing almost only duplex housing.

The neighborhood faces the same generic problems of duplex housing configurations conducted in Slotermeer on the level of the interweavement of program elaborated through the yards and de functions in correlation with de transition zones and the dwellings.

Regarding the duplex housing the architecture is sober and minimal and affected over time, in which the expression of the block has flattened which is enhanced by the fragmentation of the transition zones due different manners of appropriation. Which is in general the case due to the pragmatic eighties renovation period.

Identifiable distinctive architectural characteristics are mainly the balconies and its connection with the coal cupboard on the ground floor. The overall value of distinctive architectural values is poor. Although the side as the sum of urban principals, architecture and technique very well represent typical matters on each level and therefore can be suggested to be a representable part of the Western Garden cities as it was meant and contributes to the overall identity of the city expansion.

The typical problems of the small spans and optimalized floorplans in combination with the building technique and detailling causes problems regarding feasibility for in practice standard renovation measurements in correlation with the benefits for improvement on usable surfaces, regarding the typology as onefold.

CONLUSIONS & DESIGN RECOMMENDATIONS

Merits of duplex housing neighborhoods
Duplex housing neighborhoods strongly embodies the fundamental principles of the Western Garden Cities.

Such neighborhoods where in regards to the urban allotment initially not perceived different then neighborhoods with single family housing. For which it was not concerned with the urban programmatic deviation of duplexed housing through the neighborhoods. The population was more homogeneous then nowadays and the stock would be simplexed within ten years.

Opponents of the duplex principle stated these neighborhoods could become depreciated neighborhoods with a poor social economic situation if they would not be simplexed, which has become the actual situation. There are relatively much elderly people and young people for whom in general the house is considered to be temporary. Therefore, mutation rates are high. Due to the concentration of duplex housing in which the smallest concentration in Slotermeer is 192 houses, socio economic problems catalyzes itself, due to saturation. The high fluctuation rate enhances degeneration, since it does not enhance care, ownership nor responsibility towards the neighborhood.

Research and analysis reveals discrepancies between duplex typologies and its living environment. The relationship between the structural layers have been altered over time on infill and program. The original implementation of program through the courts and commercial functions, connecting the several blocks stimulating social cohesion is gone. ‘The blocks’ nowadays operate moreover as individual islands inhabiting another indistinctive green island.

The different appropriations of the private garden, from fenced to open, revealing different ways of use, fragmentizes the clarity of the transitions zones and dismantles the initial clarity of private, collective and public zones.

Duplex housing is characterized by traditional building techniques like masonry and pitched roofs, esthetically marginal and sober, but had delicate detailing. Due to the ‘80s renovation period the architectural expression changed in which its expression in general is flattened due to changed color use, different window framing and shortening of the expressive chimneys.

Regarding the typology, typical problems of the small spans and optimalized floorplans in combination with the building technique and detailing causes problems regarding feasibility for renovation measurements regarding energetics in correlation with improvement of usable surfaces.

Design recommendations
Due to the economic situation, renewal plans, characterized by phased demolishment and building the new, are put on hold, For which socio-economic problems as well as decay of the stock are still at concern and will probably continue and even increase if new strategies and interventions more suitable to the economic present situation will not be conducted. Therefore, the aim of a re- design should focus on phased change of these neighborhoods, in which it should aim to provide in a positive future perspective, a regeneration cycle.

This by means of gradual diversification of the stock, in which mutual change and the possibility of making a housing career would be desirable, to overcome the high fluctuation rate and enhance the appropriation and identification with the neighborhood. In which programming the collective courts as usable spaces could enhance social cohesion.

DESIGN
for research

Starting points & concept strategy

The sub research question for the design research as initially formulated is: *What are the possibilities for phased revitalization of duplex housing neighborhoods in courtyard allotment by decoupling the normative scales: living environment, living enclave and interior?*

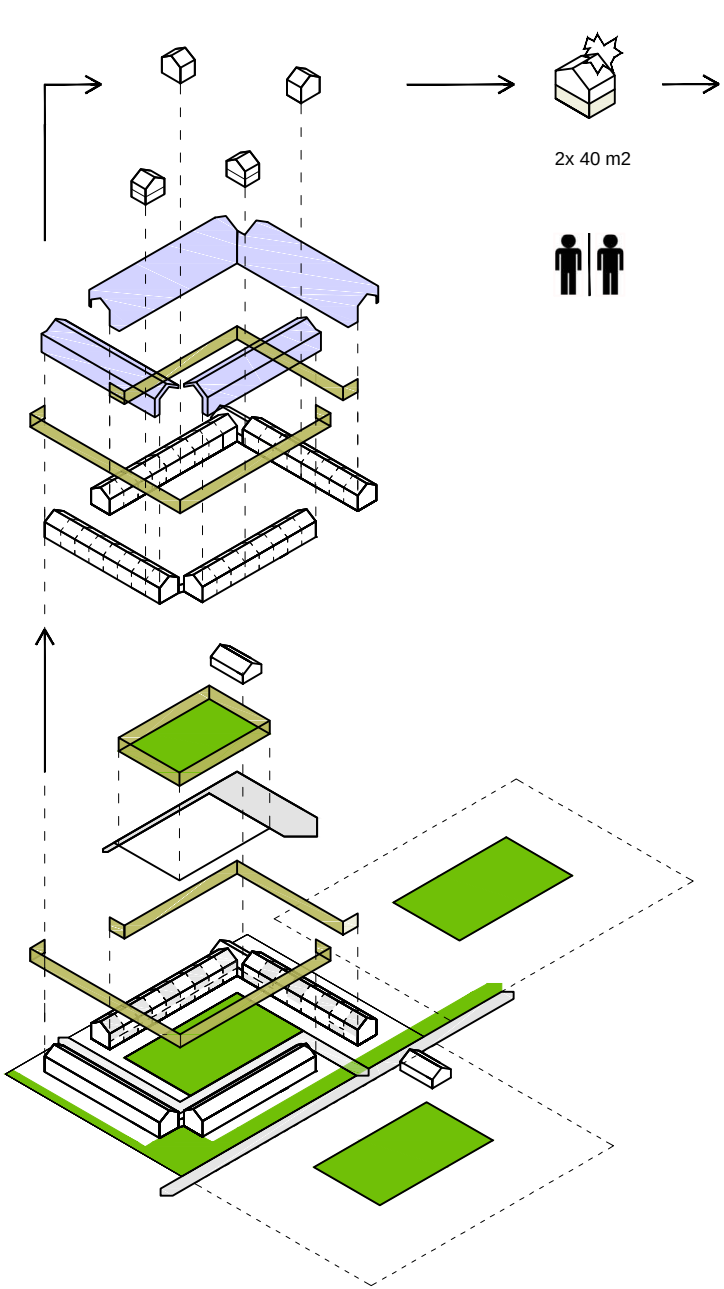
In the initial investigation on duplex housing neighborhoods conclusions and recommendations where drawn in order to improve duplex housing neighborhoods in courtyard allotment. These are translated into a time-based conceptual architectural strategy in which decoupling and phasing are key.

The strategy for revitalization provides in a regeneration cycle (figure 9). It consists of two fundamental phases. The first phase involves the revitalization of the environment, the courts and corner buildings (level of living environment) and adding a second skin to the residential enclaves, (level of living enclave) in order to achieve a first improvement for the whole neighborhood.

The second phase concerns the possibility of gradual change of the houses, the corner buildings and the courts themselves. For which the adaptivity of such neighborhoods increases on each scale since, due to this decoupling, several cycles of change can coexist.

It is the primary answer to the question how duplex residential neighborhoods can be transformed mutually.

In order to test, develop and validate the generic steps of the strategy they are applied on the casus the Roland Holstbuurt. The results can be seen as an design simulation of the concept strategy.



Wrapping housing enclaves for initial improvement and enabling possibility for gradual mutation of de individual dwellings

Adding hybrid fence element regulating transition and enabling different usage and infill private spaces

Decoupling and zoning the courtyard to make it usable as part of the neighborhood network and enabling different infill and change over time

Corner building transform by mutation into flexible unit capable to accommodate different functions

Figure 9. Diagram principle revitalization strategy

Living enclave, environment & home

The primary steps for the revitalization of duplex housing neighborhoods are:

- *Wrapping housing enclaves enabling gradual change of stock*
- *By mutation inbuilt renewal of the homes in itself in which the dwelling will be simplext and in which ongoing mutation and growth of the primary home is possible*
- *Adding hybrid fence element regulating transition and enabling different usage and infill private spaces*
- *Connect and program yards enabling usability and distinctive character*
- *Gradual mutation of northern corner buildings to flexible spaces*

Wrapping housing enclaves

A second skin is added to the housing enclaves, maintaining the coherency of the strip, enabling the possibility of gradual change of the dwellings in itself. The second skin also adds usable extra space to the homes, contributes to a significant reduction in energy costs, and allows for a gradual transition from private to public. In addition the dialogue with nature is enhanced, due to the penetration off 'light, air and space' into the dwellings, since the areas under the greenhouse and its use are closely linked to the weather circumstances. For which it greatly enhances the symbolic value of the concept 'light, air and space' as intrinsic character of such neighborhoods.

Inbuilt renewal by mutation

In a second and ongoing phase, the individual duplex houses will be simplext by mutation, in which the inbuilt will be renewed. In this phase it becomes the single ground bound family house which it was meant to be, though with the added value of the second skin. Insulation and installation measurements are taken to upgrade the dwellings to nowadays standards. Due to the extra created space on the second floor it initially provides in usable extra semi outdoor space with the possibility to confiscate a part and add it to the primary home, which for example could be desirable if the family expands. Therefore they can literally grow in their own home, which makes the individual homes adaptive and flexible.

Hybrid transition element

A transition element as spatial demarcation of the private gardens is introduced in order to ensure a coherent look at neighborhood level and to facilitate between open and closed. The element can be filled with smaller elements. Depending on location, this element can be completely open or closed, and so the aspirations and wishes of the individual contributes to adaptive usage.

The public-collective space: de yard

The courts are made useful for the residents an can catalyze and increase social cohesion. First, for this purpose, the housing adjacent to the courtyard is made accessible from the courtyard while in the same time the new routes disconnect the court from the private outside spaces by which the court becomes moreover a collective domain while accessibility is increased. A route, which also includes places e.g. domains, runs through the courtyard in order to increase usability on neighborhood level. This strengthens the original layering and transitions of the existing pavement and green structures. The courts are within the spatial elements flexibly furnished. The multipurpose nature allows different ways of usage. If there is reason for in the future, within the framework, this area can, due to the decoupling of the significant elements, be easily transformed. Vegetable gardens, playgrounds and similar are among the possibilities.

Northern corner buildings

The corner buildings, which occupy a prominent place at neighborhood level, are

primarily renovated. In a second phase, and by mutation, because they operate at the neighborhood level, it is important that they should have an transparent character towards the neighborhood. By cutting in the façade surfaces, and a flexible inbuilt, it may have such an appearance and at the same time be capable to facilitate different functions.

The corner buildings are adaptive and can be modified by mutation; flexible installation with a solid block for sanitation. The facade is opened by cutting to provide transparency and to illustrate activity which increases the feel of dynamism and liveliness on neighborhood level.

Figure 15: Impression Courtyard

Figure 14: Impression Northern corner

Figure 17: Impression backside

Figure 16: Impression second floor

Figure 18. Floorplans current, plus second skin, plus inbuilt renewal basic, plus inbuilt renewal plus variant

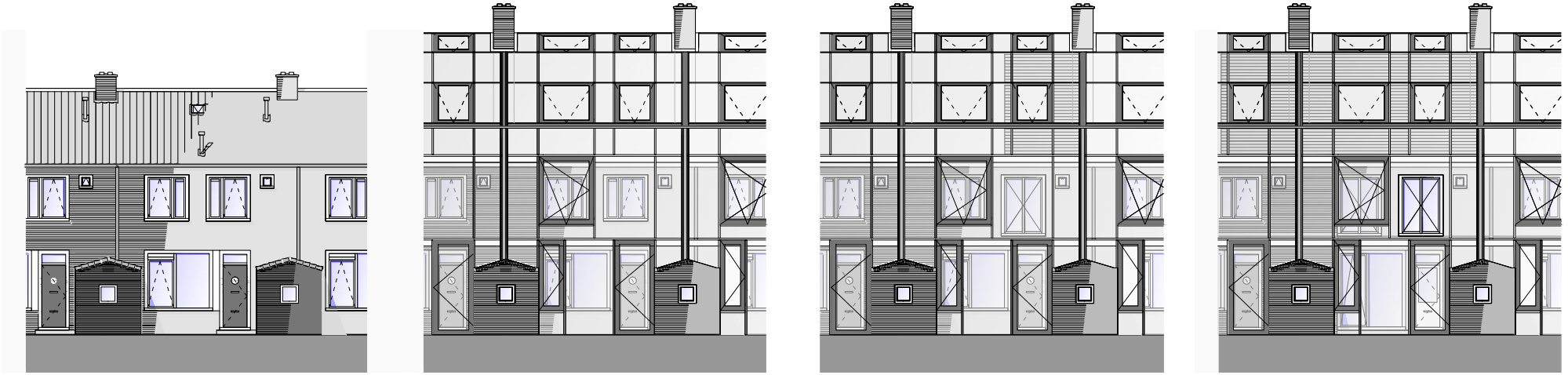


Figure 19. Elevation front facade current, plus second skin, plus inbuilt renewal basic, plus inbuilt renewal plus variant

Materialisation, technique and physics

The concept for materialization depends on the principle of decoupling of the inbuilt and the hull and continuation of the existing technology and aesthetics. The principles are:

Architectural:

- *Add second skin with its own identity which conceptually redefines the meaning of light, air and space.*
- *Appearance second skin such expressive that it can maintain the consistent appearance of the strip while it can facilitate extreme changes of the individual homes underneath*
- *Connection to the existing by symbiosis in terms of composition of the layered façade and continuation of existing material use by extrapolation of the hull.*

Building Technology:

- *Decoupling of the hull and inbuilt, i.e. use of reversible and dry construction methods and materials, in order to increase adaptivity of the de house for future mutations; sustainability through flexibility*
- *Prefabrication to ensure a fast construction and minimally burden the current residents.*
- *Application maintenance-free and reversible materials in order to reduce maintenance costs*

Architectural

Architecturally a new layer is added whit its own identity: the second skin. This is not done by freezing the existing layers uplifting the historical sense searching for a simplistic contrast. On the contrary, continuation and symbioses is strived for which it can uplift the meaning of light, air and space as main conceptual character of such housing neighborhoods.

The second skin which is initially folded around the housing strips turns the stripes from stripes previously with a poor expression into stripes with a richer multi-layered expression. By means of material usage, articulation and color usage the second skin responds to the original façade.

The origin of subtly refined articulation in the frames is repeated in the added shell. The second section of the skin refers to the original archtypical terraced house shape with the typical roof construction and composition of fenestration involving the expressive gutter.

The existing hull is "bluntly" extrapolated due to the addition of new masonry, which is on the head represents as such and thus complies with the existing tectonics.

A symbiosis is created. The continuity is clearly reflected in the persistent obstinacy of the added and the existing, by which due to interaction in terms of composition and coupling of materials a tectonic whole is created.

Technical

In order to make the dwellings adaptive decoupling of sojourn elements is essential, which primarly is about the decoupling of the carrier, the hull and the inbuilt. All the elements of the second skin are therefore reversible in nature in order to facilitate maximum flexibility in the long run. Thereby the materials have a high degree of prefabrication in order to ensure a fast construction and minimally burdening the residents.

The demolition phase can be done without the need to temporarily house residents elsewhere. By prefabrication of the new loft floor, which is also wind and waterproof, and leave the old

floor adding the new one above the process is optimized while intervention into the existing home is minimalized. Only when placing the precast floor residents will have to move out for a day due to security measurements. The second floor then acts as a climber for building up the party walls, and also ensures that the ceiling can be uplifted in the inbuilt renewal face. For the second skin a frequently in the market used and developed aluminum curtain wall system used. Adaptivity of the skin and weight, low level of maintenance and speed of construction herein are decisive. The steel frame construction design ensures a minimum impact on the existing house. In addition, it is sufficient to use a low weight reversible foundation technique; galvanized steel screw bored piles. The inbuilt consists mainly of reversible box in box renovation techniques.

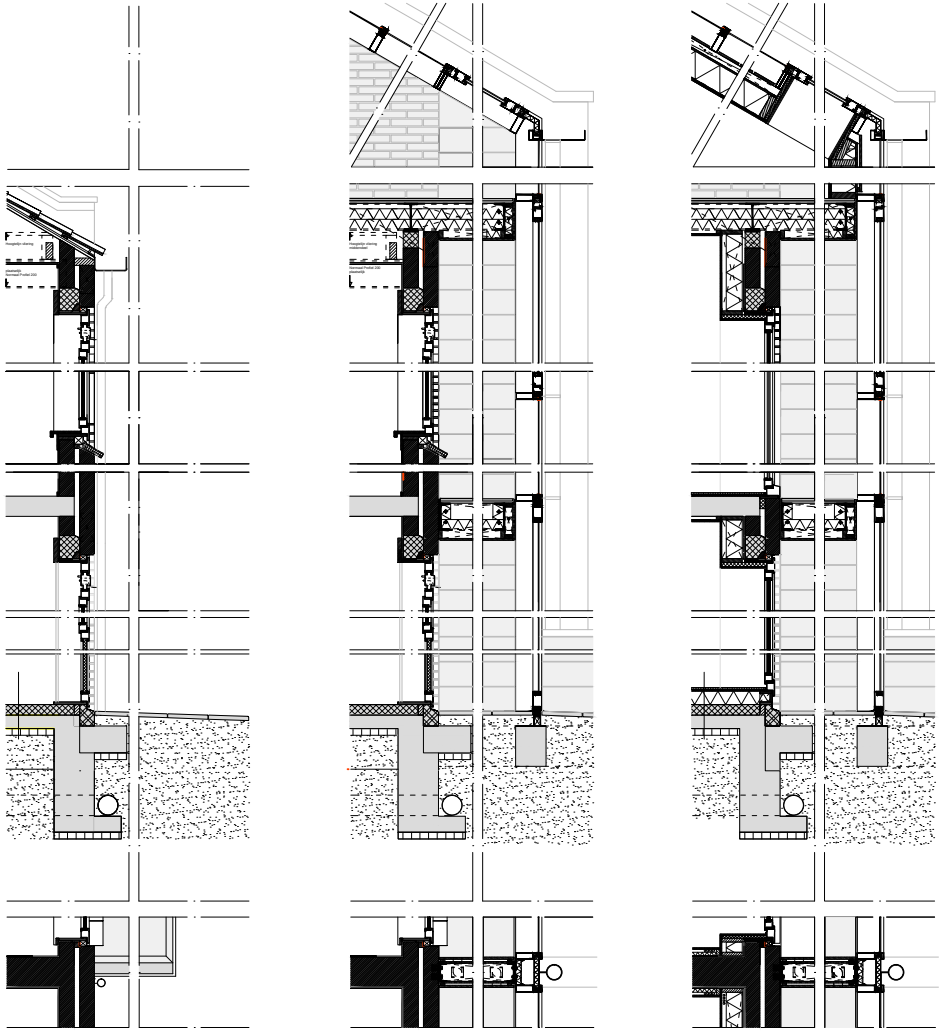
The concept for the building physics is in alignment with the principle of decoupling the inbuilt and the hull and thus the possibility of upgrading the house over time by mutation. The principels are:

- Initial low tech solution with minimal interference with the existing climate functioning
- In correlation with the inbuilt renewal energy demands are highly reduced and the heated air is recycled for energy supply.
- Possibility to combine smart systems in the new installation technical concept

In the first phase it is not desirable to intervene in the existing homes. Therefore, and though due to financial motives, the solution for functioning of the building physics is low-tech. The system concept therefore fits in well with the existing principle of climate control. Openable windows and blinds are hand driven. Ventilation is guaranteed by by natural supply through a ground pipe for preheating and mechanical removal. The mechanical removal will provide the necessary tension. The secondary living space is therefore, except in extreme cold and / or heat, the majority of the year very useful. The energy reduction which will be reached is approximately 30% to 70%.

In the second, continuous phase, the inbuilt will be renewed and thus optimize the physical building performances. Internal insulation through double walls will not only provide a reduction in energy use, but also enhance the acoustic quality, as the noise between the houses will be taken away, enhancing the comfort. Thereby the new installation technical infrastructure can be placed between de double walls. Now the possibility is there let ventilation air directly into the primary dwelling through the de earth pipes. Though, for heating the air can be upgraded with the air below the second skin by use of an air-air heat pump. It is also possible, by means of an air/water heat pump or a solar water heater, to harvest energy for hot tap water or low temperature cooling.

Figure 20. Fragment of section and elevation backface



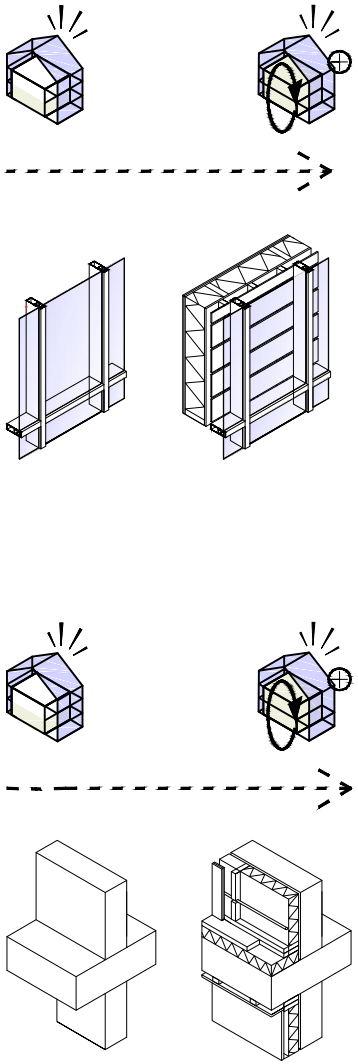


Figure 21. Detailling initial, plus second, plus inbuilt renewal plus

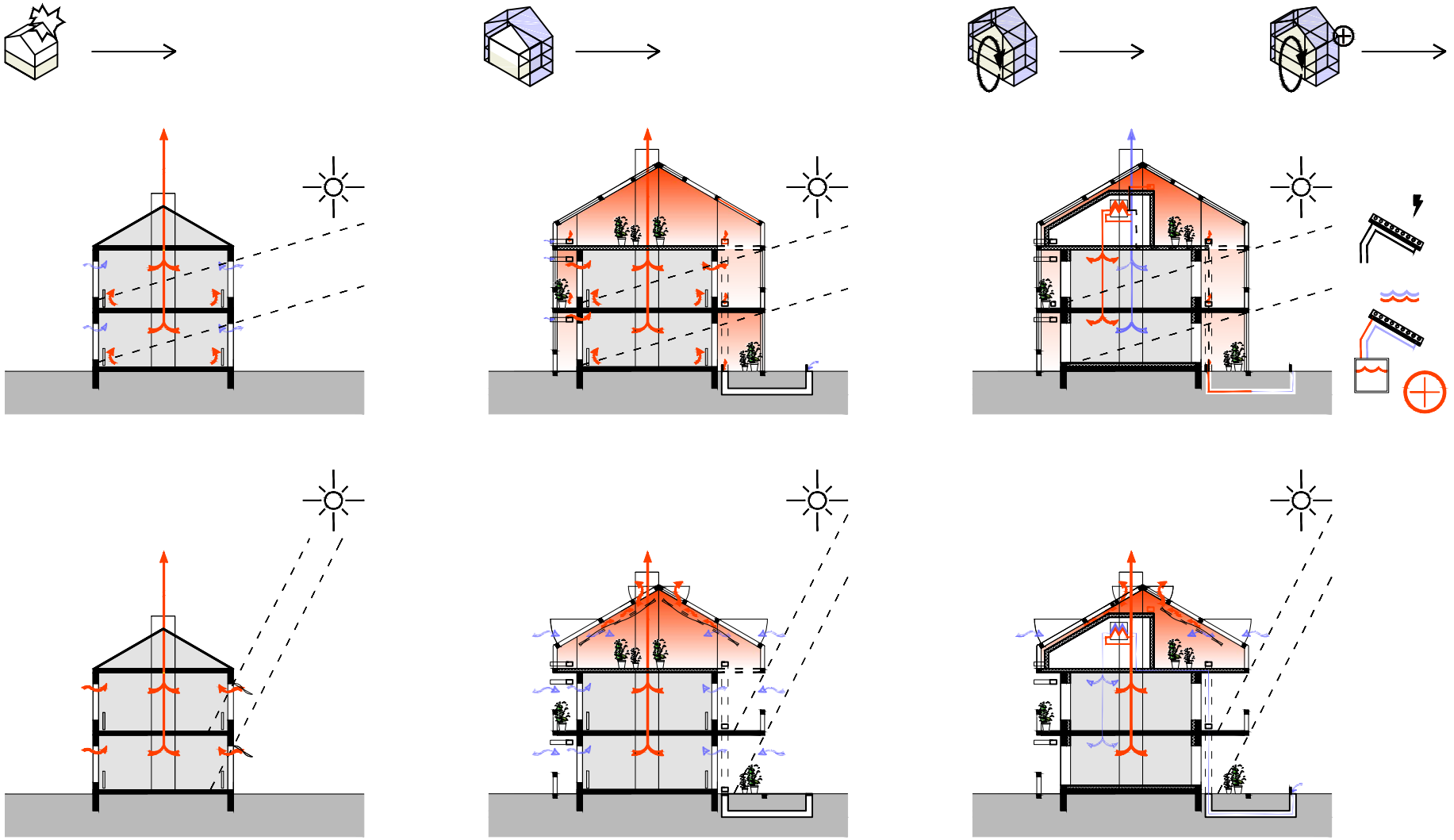


Figure 22. Diagram building physics principals

Management & adaptivity

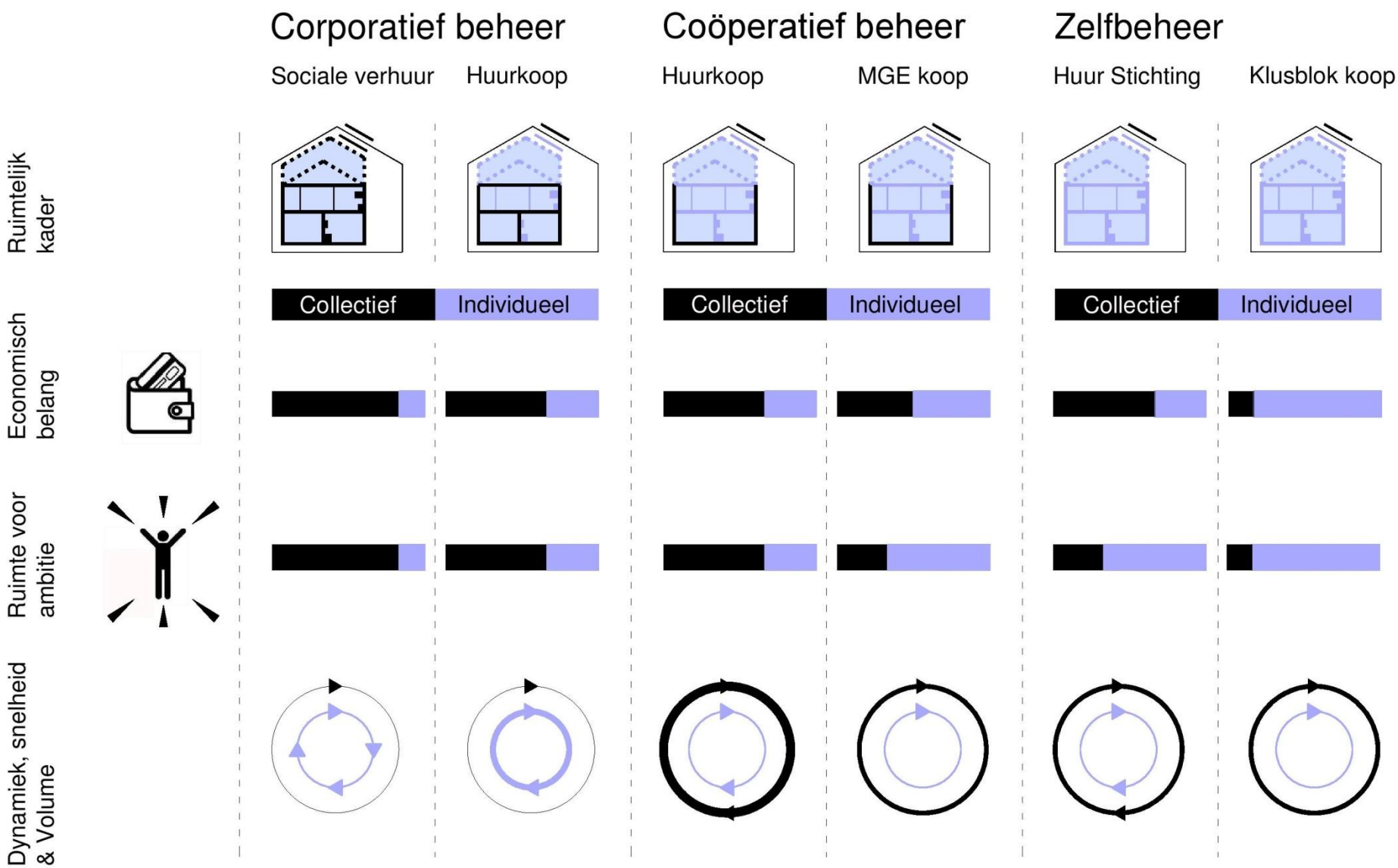
In the case study the strategy is presented in which the social housing corporation stays the main stakeholder in which the inbuilt will gradually change. In which the duplex housing will be merged over time into a simplex dwelling with a basis inbuilt renewal. However, the strategy gives room for the possibility of different forms of administration and hence the degree of adaptability and dynamics of the neighborhood.

The strategy can due to the decoupling of living environment, enclave and interior be managed under different management models, which moves between full corporative management to complete individual management. The degree of adaptivity and dynamics is thus the result of the ratio of the spatial outlined framework, the economic interest and scope for ambition of the possible management modes as illustrated in fig.20.

The viability of the neighborhood in this will be determined by the present dynamic on the different scales as it affects the degree of ambition, commitment and appropriation.

A combination of these management practices is also possible, since the spatial frameworks and decoupling of the normative elements can accommodate this. The corporation can decide to manage a part in cooperative management in order to fund the other part which will stay social housing.

The strategy is therefore on neighborhood level receptive to different or composite forms of management which, depending on the ambitions of the stakeholders will be decided an therefore is adaptive in itself.


Corporatief beheer
Coöperatief beheer
Zelfbeheer
Sociale verhuur
Huurkoop
Huurkoop
MGE koop
Huur Stichting
Klusblok koop
Ruimtelijk kader
Economisch belang
Ruimte voor ambitie
Dynamiek, snelheid & Volume
Collectief
Individueel
Collectief
Individueel
Collectief
Individueel

REFLECTION

Relevance: Scientific & Societal

Initially, the conducted 'research for design' adds information on the body of knowledge about postwar duplex housing in the Netherlands and more specific post war duplex housing in courtyard configurations. Concerning its theoretical principles and its implantation in practice since its erection and its development over time. Secondly, more specific, it adds information about the development and actual situation of the case study, the Roland Holstbuurt.

Regarding duplex housing as part of post-war housing little research is done on the principle itself, an architectural time based strategy, and its merits on architectural scale in relation to the urban scale. In the research these relationships are investigated.

The research method and results reveal potential value and concepts as well as hidden problems which have become out of side, which can be beneficial as input for the regeneration of duplex housing neighborhoods in generic.

The conducted 'design for research' in first instance adds information on the body of knowledge about the possibilities for phased revitalization of existing duplex housing neighborhoods in courtyard configuration towards adaptive neighborhoods. This by means of decoupling the living environment (urban tissue), the living enclave (casco) and the individual home (inbuilt) to enable independent cycles of change in combination with the usage of a novel renovation principle, 'active renovation', adding a second skin as buffer around the entire primary home.

The method of 'active renovation' is scarcely investigated in theory as renovation method, especially in combination with phased change.

In first instance, the approach for redesign and the redesign strategy and test on the case study itself can be beneficial as reference for areas with equal characteristics.

Besides the study can be beneficial for further research on specific topics addressed in the 'redesign', which is the 'active renovation' method as well as de approach of decoupling the sojourn elements of phased change.

The social relevance of the research phase lies primarily in the fact it is concerned with the current social problems of duplex housing neighborhoods in a courtyard configuration with horizontal split duplex housing. Thereby, the urban an architectural fabric is subject to devotion and can be considered as valuable, for which the initial research concentrated on the merits, the deficits and potentials, of such neighborhoods.

The approach as well as result of the design for research has a strong social dimension. Since it aims on providing a strategy for gradual improvement of the neighborhood making such neighborhoods more adaptive, which initially will turn the bad future perspective into a positive one. In the first phase of revitalization it aims on improving the existing neighborhood and housing enclaves in which the inhabitants can keep their 'homes'. Secondly, the strategy enables the possibility for gradual change of the stock, the individual homes, enabling the possibilities to grow within the neighborhood, creating more space for personal preferences and ambitions which will enhance the live-ability of the neighborhood due to the increased level of commitment and care.

Design: possible problems and recommendations

Critically assessing the implementation of the design strategy several problems might become apparent. Regarding the strategy for revitalization in itself, the strategy and management models as well as curtain aspects of the design elaboration.

Regardless of the type of management of the housing stock within the strategy, it is essential that the initial current residents can continue to live in their homes in which the rental costs should not rise more than the reduction in energy costs yield due to the second skin. For this project such an investigation was not feasible. Although such a study would be highly relevant to investigate the feasibility of the strategy.

Nevertheless, a negative balance could be levelled due to the possibilities in management. A part of the stock could be managed differently such as a hire purchase combination or selling so the cost on neighborhood level could be levelled out.

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The strategy offers several possibilities under different management modes. Key is making the neighborhood adaptive. A serious threat could be that the implantation of the strategy only will be partially executed. The housing corporation could decide not to simplex the homes and only to implement the second skin. For which there would be an initial impetus to the neighborhood, but the long-term goals for an adaptive neighborhood would not be realized and therefore would not hence engagement, appropriation and space for seated occupants ambitions.

The implantation of the second skin has not been used in design practice and is as renovation concept insufficiently explored empirically. This could make it unattractive to apply since the likelihood of unforeseen complications is relatively large. Especially it could therefore be unattractive to employ on a large scale like the neighborhood In total. Further research on crucial aspects of energy performance in correlation with the behavior of the residents would be desirable. Possibly in combination with an empirical study on a small scale. In order to validate the strategy and make it generic applicable.

The process: Research & design

In the first phase of the research the ambition was not to devise a one-dimensional plan but a time-based architectural strategy for revitalizing duplex residential neighborhoods. This due to the changed circumstances of the architectural challenge in architectural practice, where large-scale restructuring plans, often characterized by demolition and new construction, are currently often financially unfeasible. And thereby also neglecting potential heritage value.

The ambition was an open strategy in which the outcome would not be designed as a fully established fact, but more so a strategy characterized by adaptivity which was open to various development scenarios based on the generic characteristics, values and potential of duplex residential neighborhoods in courtyard allotment. In the studio, the emphasis is on in-depth research of 'what is' to derive significant values and potentials to adequately intervene.

In the research for design phase the merits of such neighborhoods where studied systematically through time for which the generic characteristics, values and potentials of such neighborhoods are well mapped. The methodology for the study was thus initially independent of the design brief.

Since in the conclusions of the research for design phase rough guidelines and recommendations where drawn for improvement of these neighborhoods, the translation to a conceptual design was difficult.

The design brief did not start with a traditional program of requirements but a conceptual idea which could ensure gradual improvement of these neighborhoods, as well as potentials and fractures of the existing.

In the design process that followed it was mainly on the one hand the strategy, the desired phasing and flexibility therein, and on the other hand the design, the spatial-architectural enhancements in response to the inferred problems, which in turn sought preemption to answer the research question. Therefore, the process was very cyclical and iterative of nature in contradiction to the initial research which was mainly analytical processed.

On top of this a renovation concept, known as active renovation, completely enclosing the property with a second skin to create a buffer, was used for phased revitalization, which entailed difficulties. Since in practice it is not a validated strategy for which problems raised for which there was a lack of sound reference material.

To find in the aforementioned parameters a consensus in the design process was the greatest difficulty. Due to the contradictions in assumptions an preconditions often decisions based on concession had to be made either in favor of de strategy or in favor of the spatial architectonic redesign. For which it can be stated that the presented strategy for redesign for revitalization of duplex housing neigbourhoods in courtyard allotment towards adaptive neighborhoods is continuously been reshaped. Putting the strategy to practice by means of redesign simulation on the case the Roland Holstbuurt which lead to the final result. A simulation of the strategy and its implications on architectural spatial and aesthetical design.

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APPENDIX