

An architectural rendering of a modern building with a prominent wooden walkway extending over a body of water. The building features a mix of dark grey, red, and green panels. The walkway is supported by wooden posts and has a railing. Several people are walking on the bridge. The scene is set in a landscaped area with trees and colorful plants under a blue sky.

Adapting Goedewerf

Graduation report

Graduation studio Revitalising Heritage
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1 Introduction

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Image 1: Goedewerf (Image by author)



Problem statement

Problem statement

To keep good quality housing affordable in the Netherlands we are currently facing two main assignments:

1. Establishment of new homes.

This problem is addressed within the TU Delft in the one million homes project. A relation with the theme of adaptability is laid by among others the Open Building network (Open Building Network, 2020). This group of architects, engineers and developers connected to the TU Delft calls for the reuse of the ideas of structuralist architect John Habraken (Habraken, 1985).

2. The renovation of existing houses to make them more sustainable.

This is done in the so-called renovation wave that the European Union tries to achieve. Within the TU Delft this topic is addressed in the “renoveren met respect” project that investigates value based models for the renovation of housing built between 1965 and 1985.

Within the New Heritage studio both issues are addressed together within the context of nineteen seventies an eighties residential areas. A large part of the Dutch housing stock consists of this type of neighbourhoods, they often have relatively much potential for densification and a their insulation and installations are currently often insufficient or outdated.

In this project adaptability is used as a guiding theme to address these problems. This focus serves both a societal and a scientific purpose.

Contemporary ideas about Open Building can be strengthened by reuse of the ideas of architects from the seventies of which the effect is already visible in their buildings. And on the other hand the adaptability of these existing building has to be strengthened to become more sustainable and house new groups of residents.

Research question:

How can strategies for adaptability and appropriation as used in the experimental housing from the nineteen-seventies be reused in sustainable renovation and densification of neighborhoods from this period?

Research:

- What is adaptable architecture?
- What was the program for experimental housing in the seventies?
- Which strategies for adaptable architecture were applied in the projects that were part of the program?

Design:

- Why and how is densification and sustainable renovation of nineteen-seventies neighbourhoods required?
- How can the found strategies for adaptable architecture contribute to this?

Image 2: Goedewerf (Image by author)

Structure

Structure

The research and design methodology is subdivided in five steps, of which the first two form the research part and the following three the design (image 3). These steps are:

1. Identify different strategies
2. Investigate how they are applied

In these steps information about the cases is distracted from primary sources and secondary literature using literature study and plan analyses. This information is translated into diagrams that show the different strategies that are found and their application. The diagrams are based on the theoretical literature given below.

3. Evaluate effects on design location
4. Define a brief
5. Design an integrated plan

In the design part the outcomes of the research part are combined with the value assessment that was made using the Kamari model (Kamari, Corrao, & Kirkegaard, 2017) and the scenario study. On the bases of this analysis a brief is defined based on different design scenarios. Hand sketches and physical models are used for both research purposes and as a presentation medium. Especially models are investigated as a way to present the design to residents and involve them in the design of their own houses and neighbourhood.

Literature

Theories and methodology on adaptability and appropriation in housing are selected from a ran-

ge of authors on this subject from the last decades. The most important ones are:

Habraken, J. (1985). *De dragers en de mensen, het einde van de massawoningbouw*. Eindhoven: Stichting Architecten Research.

Van der Werf, F. (1993). *Open ontwerpen*. Rotterdam: Uitgeverij 010.

Brand, S. (1994). *How buildings learn, what happens after they're built*. London: Penguin Books.

Leupen, B. (2006). *Frame and generic space*. Rotterdam: 010 Publishers

Clarke, N. (2021). *How Heritage Learns, Dutch Public Housing Evolution in Ecosystemic Perspective*. Delft: TU Delft Open Access

The primary source for the research data were the publications about the experimental houses from the nineteen-seventies by the former ministry of "Volkshuisvesting en Ruimtelijke Ordening" in a series called *Experimentele Woningbouwprojecten / Ontwerpen met Predicaat*.

The following cases from these publications were selected:

1. Patiowoningen Eibergen
2. Bloemendaal-Oost Gouda
3. Molenvliet Papendrecht
4. Sterrenburg III Dordrecht
5. De Vier Vierkanten Alkmaar
6. Kuipershof Apeldoorn
7. Haesselderveld Geleen
8. Aanpasbaar wonen Nunspeet

This information is supplemented with some secondary literature about the involved architects and own experiences from site visits.

Literature

In the design and the group analysis based on a model proposed in an article by Kamari (Kamari, Corrao, & Kirkegaard, 2017) is an important base for the methodology. This model gives a holistic perspective on the valuation of renovation projects. Its functionality for heritage based projects is tested within the context of this studio. Drawings from the archive of the municipality of Almere and housing corporation Ymere as collected for the "renoveren met respect" project are another important source for this part of the project.

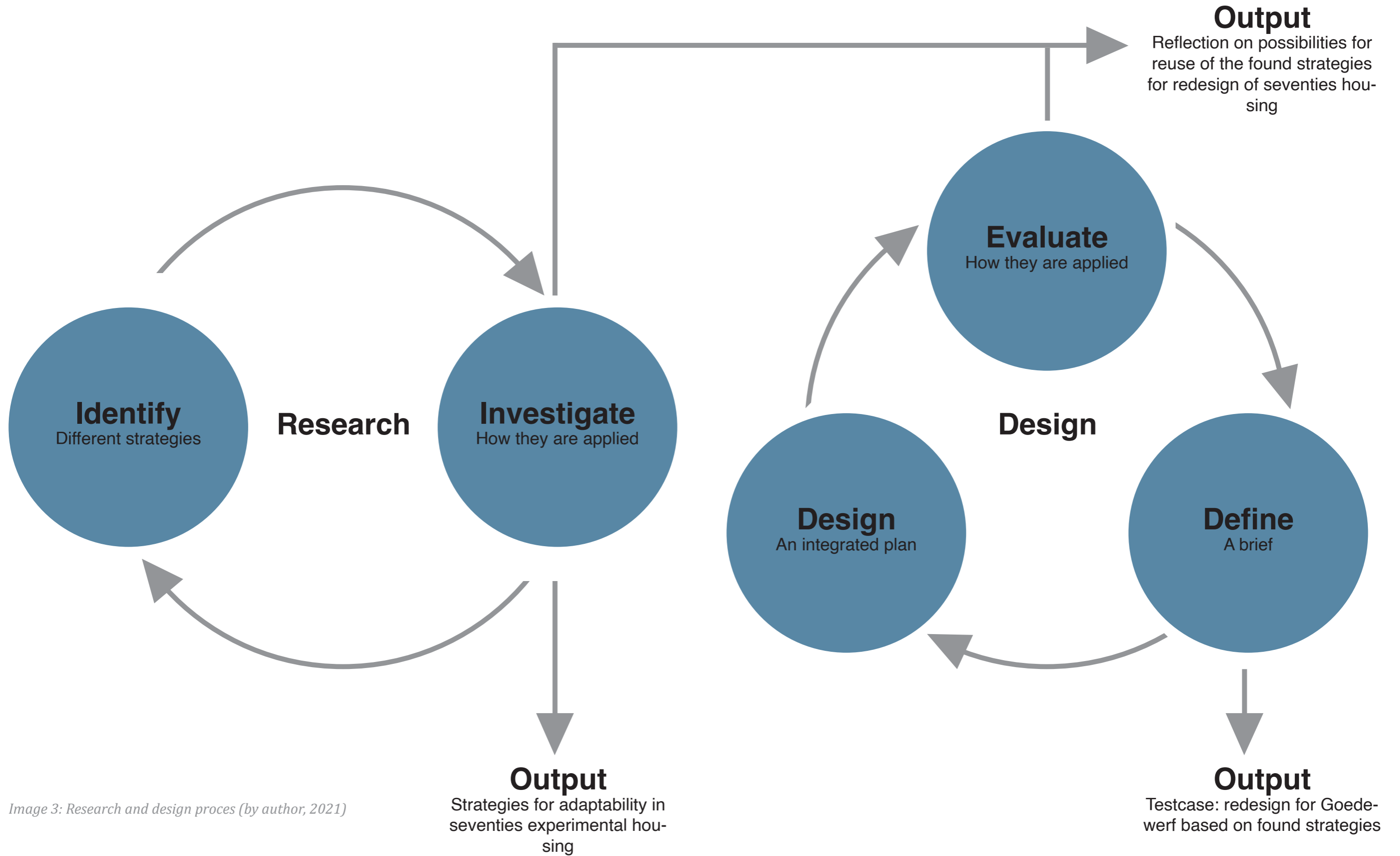
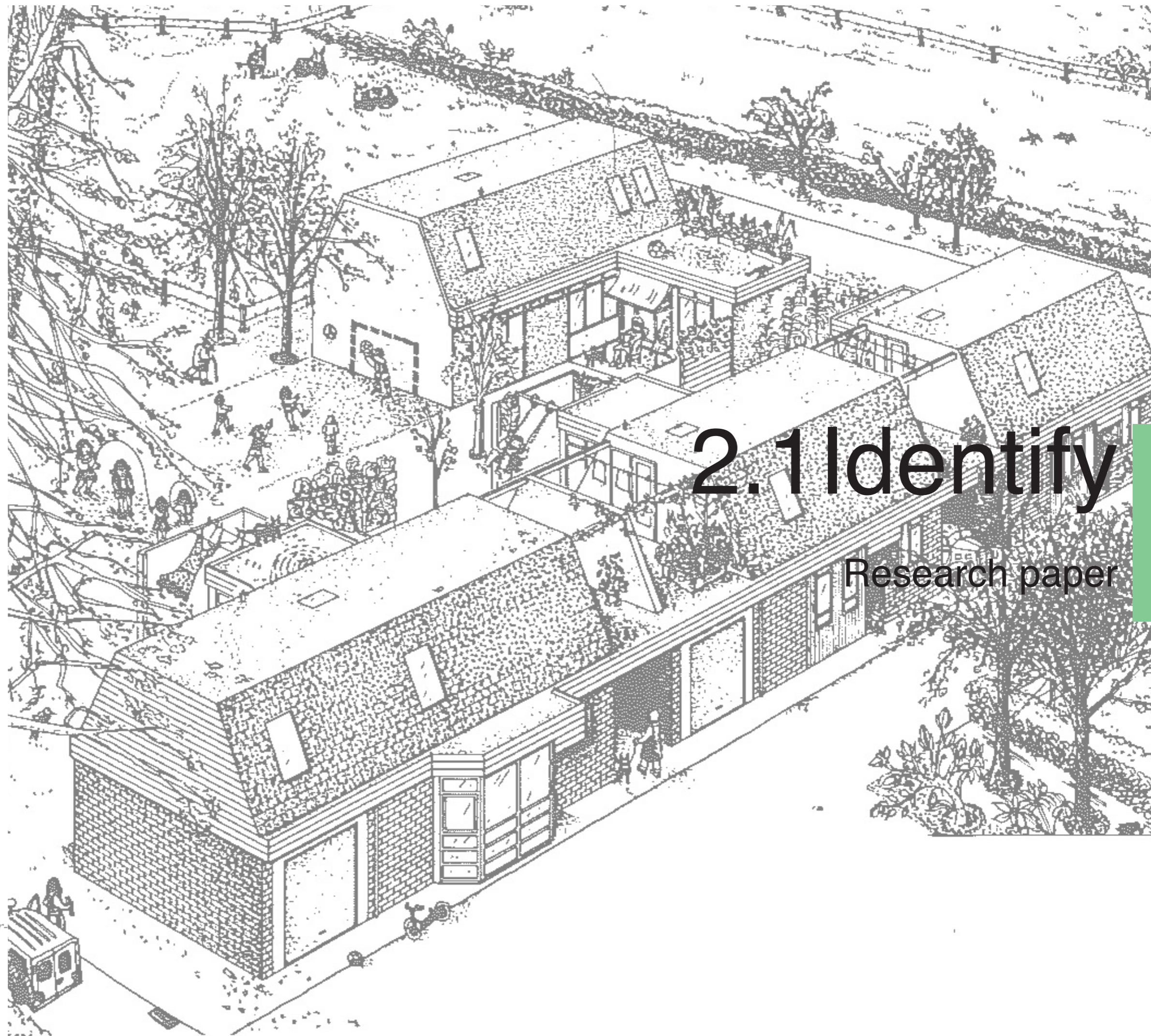


Image 3: Research and design proces (by author, 2021)



2.1 Identify

Research paper

Image 4: Aanpasbaar wonen (Barzilay & Ferwerda, 2022)

Introduction

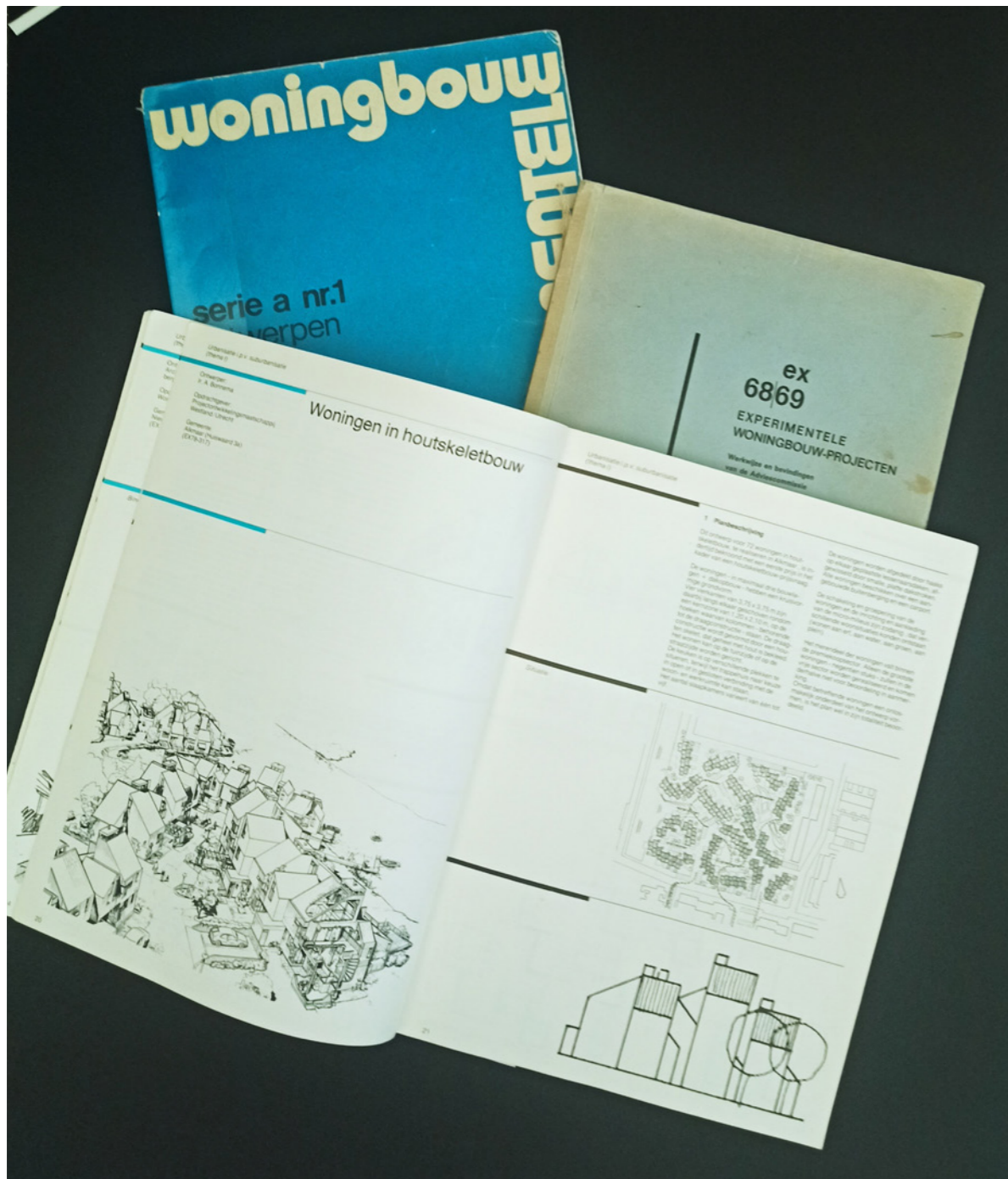


Image 5: Publications from the experimental housing program (Image by author)

Introduction

Climate issues, rising prices of energy, lack of qualitative affordable housing, residents participation etc. A list of hot topics in the architecture sector in the Netherlands that could be written today, but is actually distracted from literature from the nineteen seventies (Lips, Waaldijk, Riepema, Voermans, & Jansen, 2021). And although the exact problems we have to deal with today, as explained in the general introduction, are of course different than they were then it might be valuable too look at the way these issues were addressed in the seventies and if we can learn from it.

For example with regards to the housing crisis the situation is similar in terms of the numbers of new houses that are needed. But in the seventies a previous wave of new housing construction, the reconstruction period after the second world war, was still fresh in the minds of people. A strong sense of dislike for the low quality of the houses that modernist architects build in that period leads to a focus on qualitative housing in the seventies. A popular term is in regarding this is the “menselijke maat”, which had to be brought back. One way of doing this was through the study of historic cities. This interest did also result in the so-called urban renewal, new developments in the at that moment often decayed city centers.

This urge to find new, different, but human forms of housing led to a lot of experiments and research which is executed by among others the Forum Group, the Stichting Architecten Research, an Stichting Nieuwe Woonvormen. But also within the nationwide program for experi-

mental housing, which will be introduced in the next paragraph.

In this graduation project cases from that program are used as a source of inspiration to address current issues regarding housing and climate. The focus is on the theme of adaptability as one of the approaches from the seventies that could help addressing these issues today. In this chapter the research into adaptability in nineteen seventies experimental housing and how we can learn from it is explained.

The program

It was on the 20th of June in 1968 when minister Ir. W. F. Schut installed the “Adviescommissie Experimentel Woningbouw. This expert committee had to advise the minister which projects had to be admitted to the new program for “experimentele woningbouw” (experimental housing). The program was supposed to subsidise initiatives that contribute to the increase of housing quality, especially the living form and environment (Ministerie van VROM, 1971). Minister Schut stated that in the 25 years creative people had too little opportunities in housing, which found problematic. The program was supposed to catch up this problem and give especially young architects the possibility to work in housing.

To make this possible a subsidy of 3000 Gulden per newly built house that was part of the program, and an extra yearly contribution of 200 Gulden to the possibly higher rent of such a house was offered. On top of that the experimental projects would gain more attention and would be evaluated. The purpose of the program was that the successful (elements of) experiments could

Cases

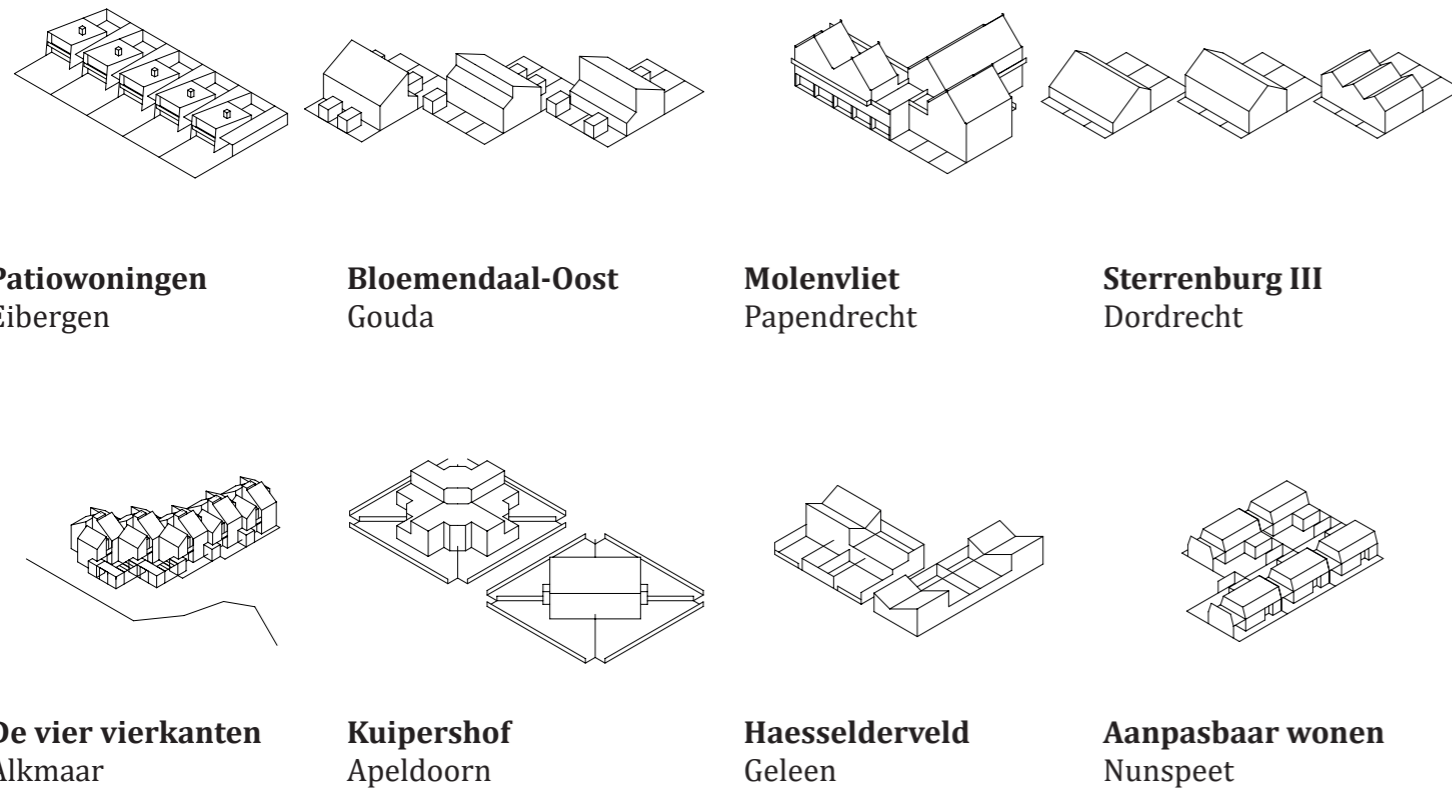


Image 6: The selected cases (image by author)

later be repeated without a subsidy (Ministerie van VROM, 1971).

In the first years the criteria for the program were not strictly defined. Over the years the focus shifted towards more specific themes such as building in existing neighbourhoods (stadsvernieuwing), urbanisation, specific needs, but also residents participation and adaptability.

When the program ended in 1979 it became a bit forgotten and was often labeled as a failure. But in the last years a new interest in the architecture of this period led to rediscovery of the program. This interest comes from among others heritage professionals in municipalities and the national heritage agency who are interested in the potential heritage value of seventies architecture. The most important publication from this side is an overview of the program by (Barzilay, Ferwerda, & Blom, 2019). This book described the projects and shows pictures of their current state. But also in the minds of architecture the idea that there is something to learn from the experiments from this period seems to emerge. This becomes clear from among others the preface of former Rijksbouwmeester in that same book. But also the Open Buildings movement (Open Building Network, 2020) that was mentioned earlier seems to move in that direction.

Cases

From the projects within the experimental housing program in which adaptability played a role eight cases were selected as casestudies. For the selection of the cases the selected projects by Barzilaya, Ferwerda and Blom (Barzilay, Ferwerda, & Blom, 2019) in their chapter about “adapt-

ability and participation” was the starting point. From these the selected cases in their chapter four cases were excluded in my research while one extra was added. This was done on the bases of the own investigation of the original documentation of the program (Ministerie van VROM, 1968-1979).

Two criteria were used to decide whether a project was included or not. At first the cases the cases architects ideas needed to be translated in both the design and the actual building. Secondly they had to be relevant for the design project (Goedewerf, Almere). The project “De nieuwe Weerdjes” in Arnhem was therefore excluded since the underlying ideas were mostly focussed on participation, and had little influence on the buildings. Also the project Vossenkamp in Winsschoten was not selected since, as explained by Barzilay and Ferwerda and in the original evaluation, most of the present ideas on adaptability were for financial reasons not translated into the building. A project in Lunnetten in Utrecht was not analysed because is it is extremely similar to another project by the same architect: Molenvliet in Barendrecht. The project “Hippe Hoogbouw” was not selected because the very different scale and typology makes it less relevant for this design project.

The extra project that was added to the final selection is “De Vier Vierkanten”. This was done because it has a clear ambition on adaptability, next to a number of ideas on other themes, and is quite ambitious. The project is also quite relevant for the design project in the current context because it was one of the first modern project in the Netherlands that used a timber frame structure.

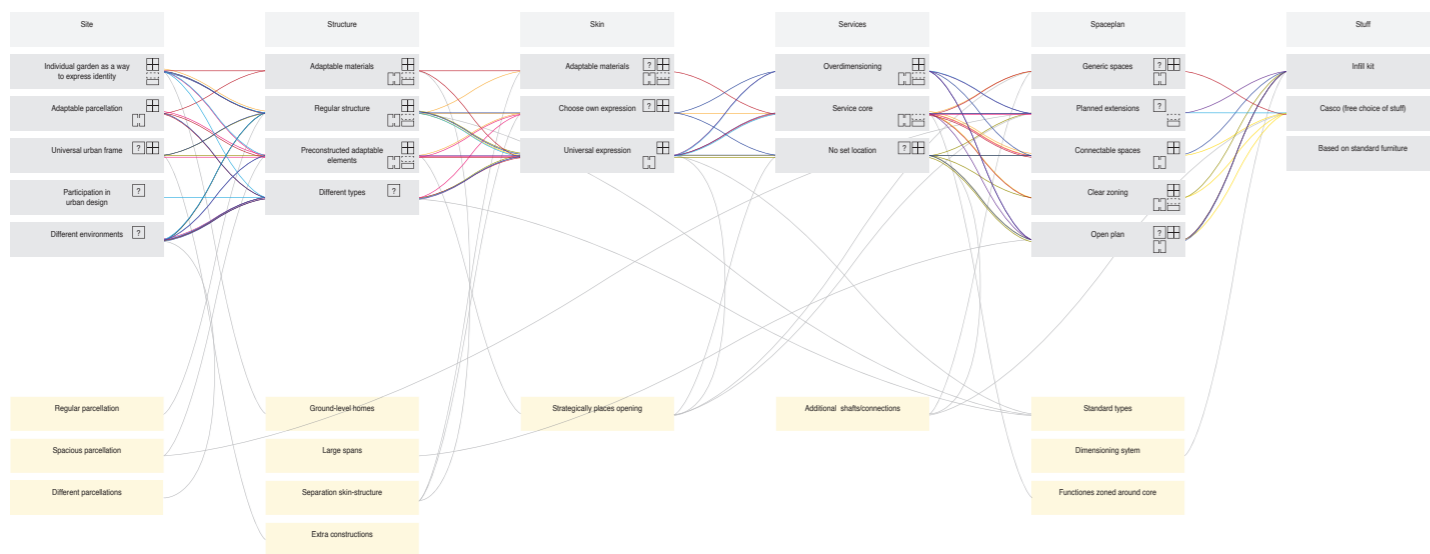
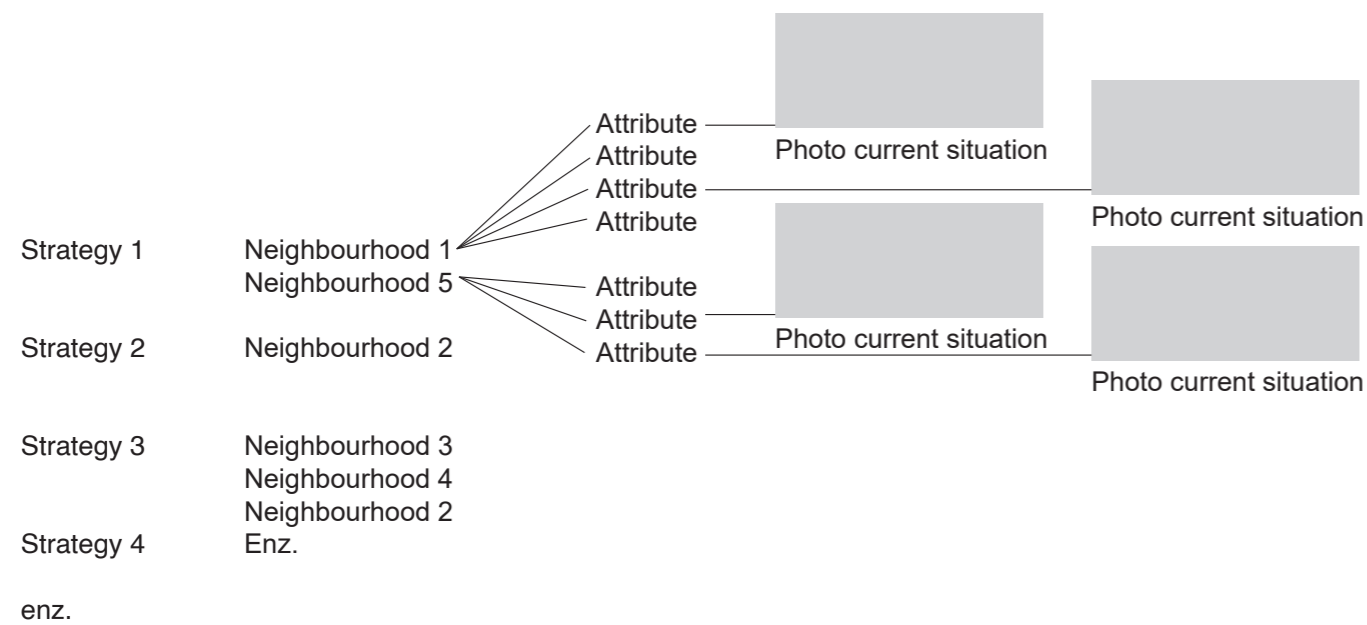


Image 7: Test of different models to map the strategies (image by author)

Methods

This result in the following list of selected cases:

1. Patiowoningen Eibergen
2. Bloemendaal-Oost Gouda
3. Molenvliet Papendrecht
4. Sterrenburg III Dordrecht
5. De Vier Vierkanten Alkmaar
6. Kuipershof Apeldoorn
7. Haesselderveld Geleen
8. Aanpasbaar wonen Nunspeet

Methods

The development of a method to map the intended adaptability in the selected projects was an important step of the research project. In the research plan for the project a first sketch of a possible method (a tree diagram) was shown (image X). In this model the assumption was that a limited set of strategies could be identified before the analysis of the cases was made. To find these strategies beforehand relatively much literature about the ideas behind all projects is required. But since some of the architects that participated in the program are not as well known as others this turned out not to be realistic for all projects. And top of that the first analyses of the projects showed that there was quite a wide variety in approaches in the different projects. That means this approach turned out to be a dead end. Instead a matrix was created on the bases of more a generic subdivision of the projects in different layers on which a building changes that Steward Brand (Brand, 1994) distinguishes in his shearing layers model and set of four different ways of adapting.

Within a matrix like this the design decisions that are intended to make an adaptable building are shown. This results in a good overview of the adaptability of the building on different scales and as a whole. On the bases of this matrix different types of interpretations were made to find underlying strategies. Some of the projects showed a focus on specific layers, while others applied a certain way of adapting on several layers. These kind of characteristics from different projects were compared to each other to find differences and similarities. On top of this a subdivision can be made between elements that were designed to be adapted (infill) or elements that do not change but help adapting the building... (Support). And lastly a list was made of specific designinterventions/elements that occur in many projects. Experimenting with these different ways of analysing the found characteristics led to the final mapping system, which consist of four steps, which are explained in a chronological order in the following paragraph.

Inventory:

In this first step the available information about the projects in texts and drawings is gathered and filtered. A view rounds of sketching and writing are used to come to an axonometric drawing that distinguishes the architectural interventions (related to adaptability) on the six different layers. After this the found elements are named and characterised by placing them in one of the four columns .

Organize:

When this overview is ready the interpretation of the begins. This is done by first making a distinction between elements that are actually adapted, this is what Habraken (Habraken, 1985) calls the

Research outcomes

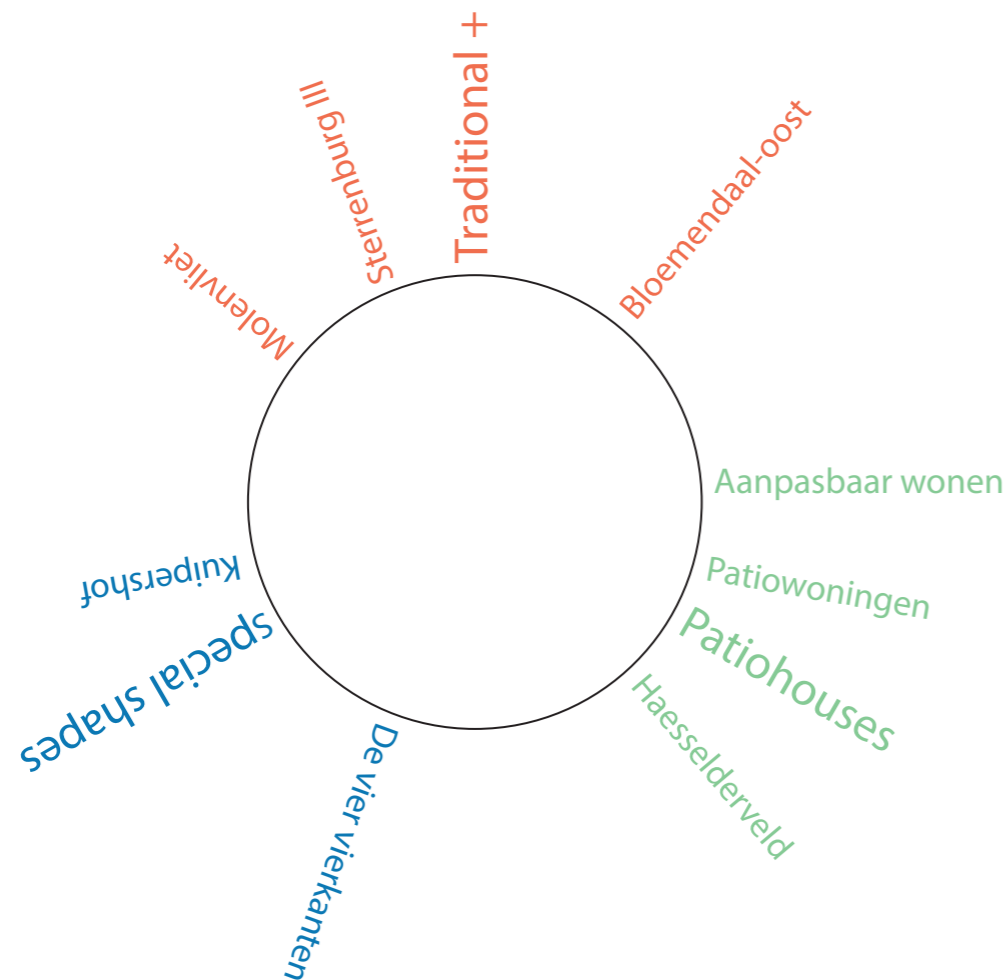


Image 7: Subdivision of the cases in three groups
(image by author)

infill, and the “support” elements that cannot change but serve as a bases for adapting other elements. In the matrix model these two groups are given a different colour. After this the specific solutions in the projects are translated into a general list of substrategies on each layer, that are then added to the matrix to find which of them are present in each project.

Explain:

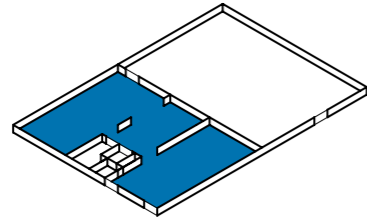
On the bases of the found support and infill elements on the different layers and within the four approaches and based on the present substrategies the projects are compared to find groups of projects that use a similar strategies. This results in subdivision of three groups of projects that each have their own characteristics and strategies. In the outcomes section these will be described in more detail.

Design scenarios:

On the bases of the found groups three design-scenarios were developed. Each scenario uses one of the three groups as a startingpoint and is used to discover in which direction the neighbourhood could develop if strategies from this group are applied. Elements from these three scenarios were used to start developing the final design.

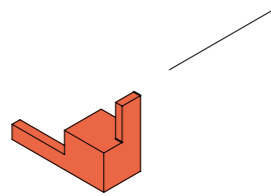
Research outcomes

One of the outcomes of the analysis of the eight cases is a subdivision in three groups with a similar typology and approach towards adaptability. This subdivisions is visible in the diagram in image 7. In the following pages an overview of the most important conclusions and characteristics regarding each group is given.



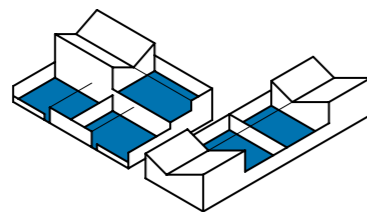
Space plan divided in different zones with flexible infill

Services



Service core

Site



Patiogarden in which the house can be extended

Image 8: Selection of characteristic solutions Haesselderveld (image by author)

Patiohouses

Three different projects within a selection of eight. The patio house clearly was a popular typology in 1970's adaptable housing. It is a good example of a historic typology that is/was not very common in the Netherlands in which seventies architects try to reinterpret and possibly introduce on a larger scale. The use of a patio gives the opportunity of a relatively compact house which still has a qualitative outdoor space. The character of this outdoor space makes it easy to imagine a new wing to be added to the house. This makes it easy to extend the plan of a house of this type. In the cases different types of adaptability are used to do this, varying from an already constructed extra wing that only has to be filled in to a possibility to extend with a wing for which only the foundations and gutter are preconstructed. In all three matrices this results in a focus on the adaptability of the space plan and, to a lesser extent, the garden.

Something similar happens in the main volume of the houses. Within the, for Dutch standards, relatively wide houses structural walls are used to create different zones in which different arrangements of the floorplan can be made. Service spaces such as the bathroom and kitchen are positioned around a service core. From the outside the houses have a relatively closed and universal façade while the façade at the patio side is more open. This results in a relatively introverted house, whose adjustments are not visible from the outside. This is most clearly visible in Haesselderveld.

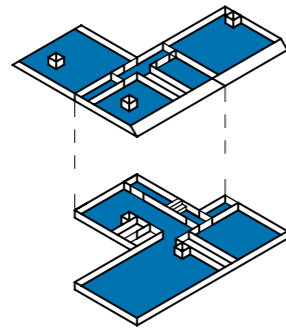
Although the choice for the specific typology of a patio house seems to have prescribed most design choices regarding adaptability there are some other elements that are intended to make

the houses adaptable as well. Examples are the voids in the Patiowoningen and Aanpasbaarwonen, the choice for certain materials and the vertical stacking in Haesselderveld. Participation in the design or selection from different options by the future residents did not play a role in the design of the houses.

Current situation

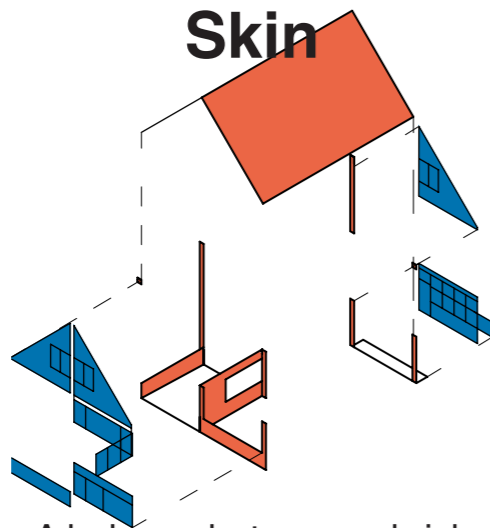


Image 9: Collage of the current situation in Haeseldervelf (image by author)



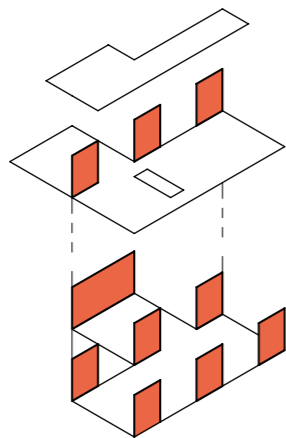
Open spaceplan without set places for services or furniture

Skin



A balance between a brick frame and an adaptable infill

Structure



The loadbearing wall serves as the main support

Image 10: Selection of characteristic solutions Molenvliet (image by author)

Traditional+

In the three projects that are part of this group the methods from the SAR (Stichting Architecten Research) are applied. This research institution located in Eindhoven developed a method for the design of adaptable housing through a participation process based on the ideas of John Habraken (Barzilay, Ferwerda, & Blom, 2019). The architectural typology of the houses in this group may not be as experimental as the other two, but this design process definitely was.

One of the core elements of Habrakens theory was the separation of support and infill. From the selected projects this is most clearly visible in Molenvliet, which has a clear generic structure in which different types of houses are created. But this separation is present in the other two cases as well. Their support structure is relatively simple and based on the traditional row houses but the infill is designed more precisely in the form of a so-called infill kit that can be used in different compositions.

As mentioned earlier participation was another important element in these projects. And again it is used on a different layers in the different projects. In Molenvliet residents participated in the design of the plan of their own apartments, for Bloemendaal Oost the urban plan was designed through a participation process while in Sterrenburg III the residents could choose elements from an infill kit catalogue.

This focus of the projects on different layers is clearly visible in the matrix diagrams. It shows that the underlying strategy was (too) complex to apply in once. The projects within the program did complement each other in this way to test all different ideas. But it still raises the question if

it is possible at all to realise all elements in one project, and what the result would be.

Current situation

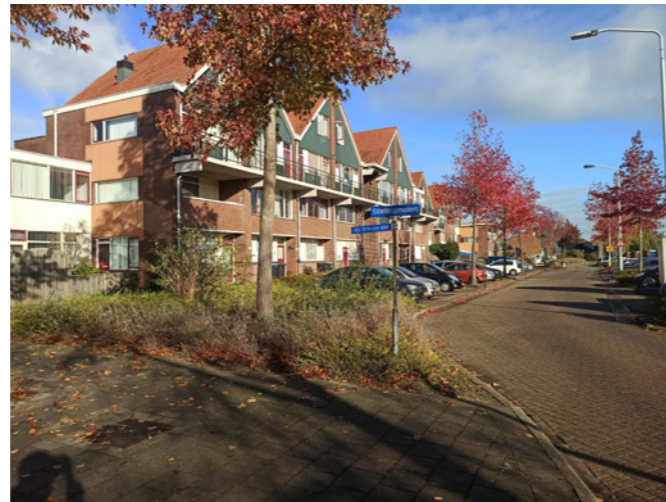
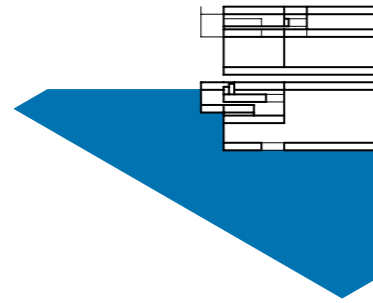
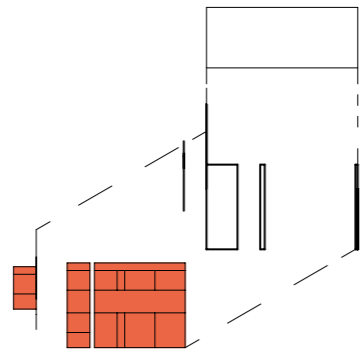


Image 11: Collage of the current situation in Molenvliet (image by author)



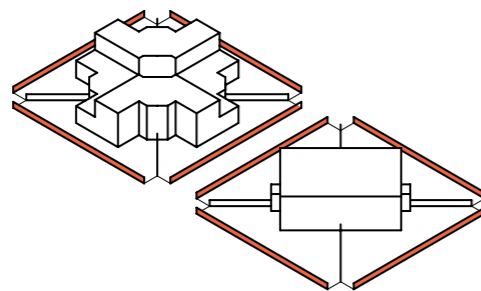
Characteristic shape gives many options for extensions

Skin



Easy adaptable materials in a complex shape

Site



Urban frame around gardens

Image 12: Selection of characteristic solutions Kuipershof (image by author)

Special shapes

One of the purposes of the experimental housing program was the developments of new forms of housing, in which the appearance of the houses played an important role. The designers of the two projects in this group went quite far in this, and came up with completely new typologies. In that regard they may be the most “experimental” of the eight cases. Both projects used a specific element, either a shape or a material, as their starting point and developed a plan that attempts to use the potential of this element to the full. This leads to two very different and characteristic configurations.

The design of the public space plays an important but slightly different role in the projects. In Kuipershof the walled gardens and regular structure of the streets form an “urban framework” that creates unity while the houses might all develop differently. In De vier vierkanten the public space is important for the identity as well but does separate the neighbourhood in different environments with each their own identity. In both cases the possibility for future adaptations lays mostly in possible extensions, that were supposedly easy to construct and not stand out due to the shape of the houses. Both projects focus on the structure and skin of the buildings which results in sometimes unlogic floorplans.

Current situation



Image 12: Collage of the current situation in Kuipershof (image by author)

Conclusion



Image 13: Work in progress model showing the three different scenarios (image by author)

The previous chapter explained how research into nineteen seventies experimental housing was used to find strategies that were used in the design process. At the end of this graduation a reflection will be given on the potential of this approach and the possibilities to use the found strategies in other projects. In this conclusion a short summary will be given of the outcomes of the research part, its scientific relevance and the implications that these outcomes had for the design process.

From the first phases of the research the conclusion can be drawn that within the selected cases from the experimental housing program (Ministerie van VROM, 1968-1979) there is a wide variety of ideas and strategies related to adaptable housing. This variety can be seen as a reflection of the different directions and groups within

the architectural discourse that worked on the topic in the seventies. Different and sometimes overlapping or contradicting ideas can be found within the selection but also in individual projects. And as the title of the program makes clear these projects were experiments and therefore not always successful in implementing the underlying ideas throughout the whole building. In at least one case the committee mentions that a project continues on an idea that was present, but did not yet work out in earlier projects.

This situation makes it impossible to find general strategies that are present within all projects or are completely implemented in one project. In the research this was handled by using three theoretical perspectives that helped analysing the project to distinguish different underlying ideas and where and how they were applied. At

Conclusion

first the concept of shearing layers (Brand, 1994) was used to find out which ideas were applied on which part of the building. Secondly a subdivision between four ways of adapting a building was made to find out what kind of future changes the architect planned to be made to the buildings. And lastly Habraken's (Habraken, 1985) separation of support and infill helped distinguishing the difference between those layers of the building that were supposed to be changed and the ones that were "supporting" that change. These three models were combined in the matrix model that was used to analyse the cases.

This approach resulted in a list of general sub strategies and the division of the cases in three groups that were described earlier. These groups were used to develop design scenarios. One of the purposes of this scenarios was to find out how the different groups of strategies relate to the character of Goedewerf as a none-experimental neighbourhood built in the same period. But there was also a more indirect influence of the conclusions from the research in the design. While studying the cases the cases it became clear how they built on to certain ideas and knowledge that was gained in earlier projects, and the more general topics such as participation, human scale, affordable qualitative housing that were playing at that time. To do something similar and thereby make a stronger connection to contemporary directions for solving for the addressed problems four casestudies were made of projects in which adaptability plays a role. These case studies can be found on page 88-97 of this report.

The research into the selected cases has given an insight into the ideas and strategies regarding adaptability that were present in the projects in

the experimental housing program, but there is still a lot undiscovered. Although the program is getting some renewed attention in the last years (Barzilay, Ferwerda, & Blom, 2019) there is still a lot that could be learned, This could be done by diving into some of the other themes that were present in the program, but also a more in debt evaluation of the current situation in the cases that were investigated in this research and the way that would be very valuable. Hopefully this graduation projects helps to draw the attention to the subject and initiate new experiments in the future.



2.2 Investigate

**Traditional +
Special Shapes
Patiohouses**

Image 14: Haesselderveld Geleen (Barzilay & Ferwerda, 2022)

Designscenario traditional+

VARIANT 1: Versterk het traditionele karakter

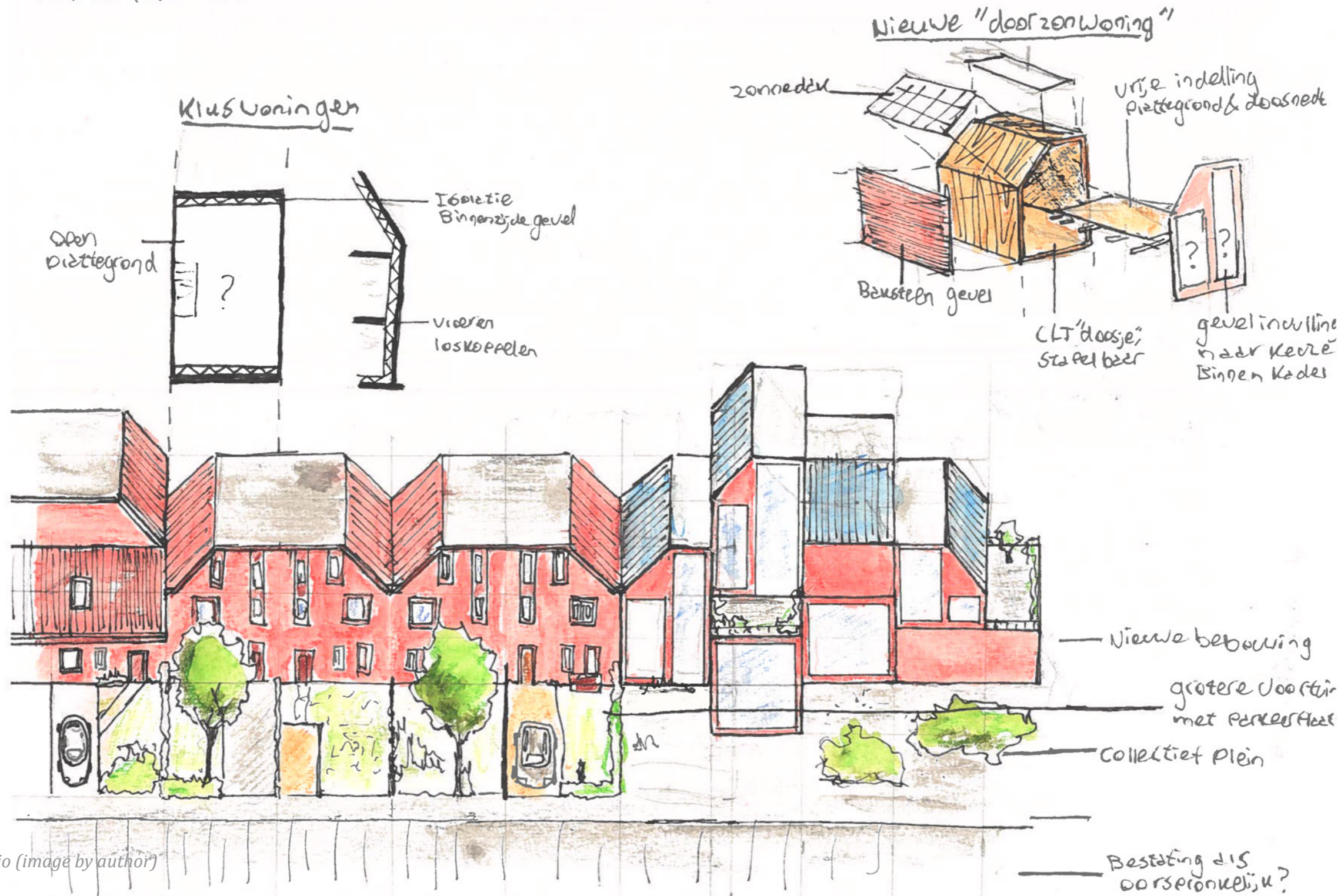
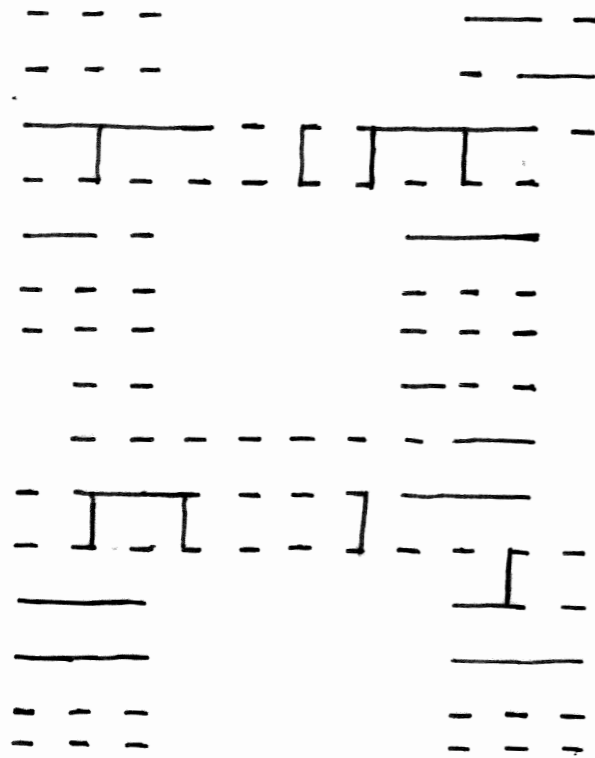
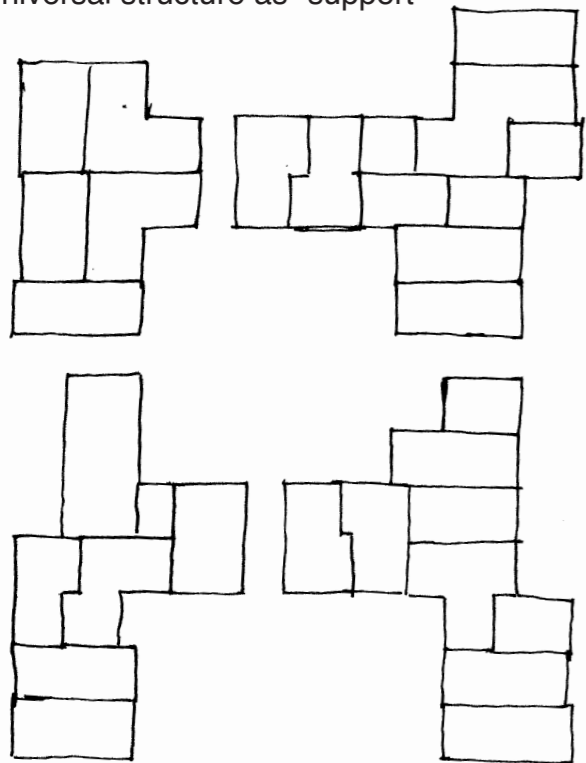


Image 15: Designscenario (image by author)

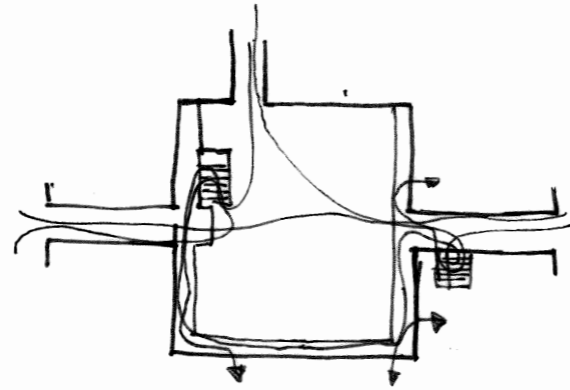


Universal structure as "support"

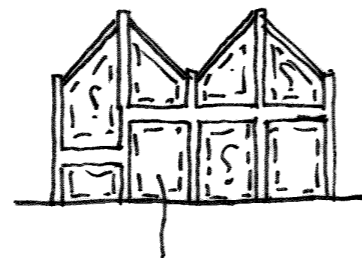


Different sizes of homes within the support

Image 16: Analysis sketches (image by author)



Courtyards serve as meeting spaces that can be appropriated



Residents can choose the layout of the facade

Molenvliet



Image 17 : Molenvliet(image by author)

Architect: F.J. van der Werf
Date: 1969-1973, 1974-1976
Applied strategies: Support-infill, catalogue
Location: Barendrecht

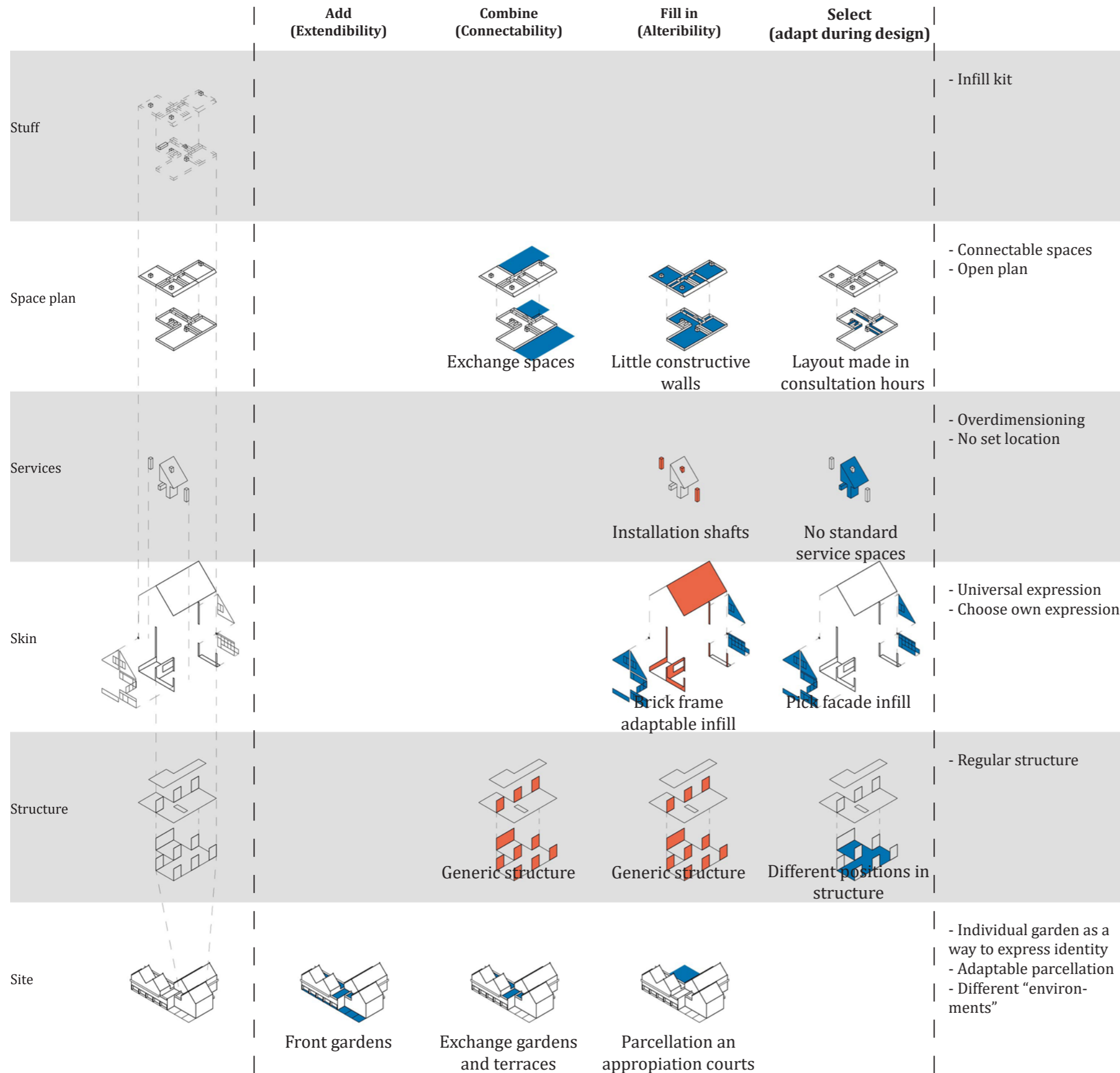
al floorplans in cooperation with the future residents. Also the infill of the facades was chosen by the residents themselves.

Introduction Case

Molenvliet consists of four courtyards with stacked houses around them. The building height differs from two to four stories and the pitched roof are all applied in one direction, which results in a wide variety of dwellingtypes. Apartments and maisonettes on the higher floor are accessible through galleries. Two later projects in the experimental housing program, Lunetten and Sterrenburg III can be considered sequel to this plan (Barzilay, Ferwerda and Blom, 2019).

Within the regular concrete "support" structure (Habraken, 1985) the architect developed individu-

Molenvliet



■ Adaptable
■ Supports adaptability

Bloemendaal-Oost

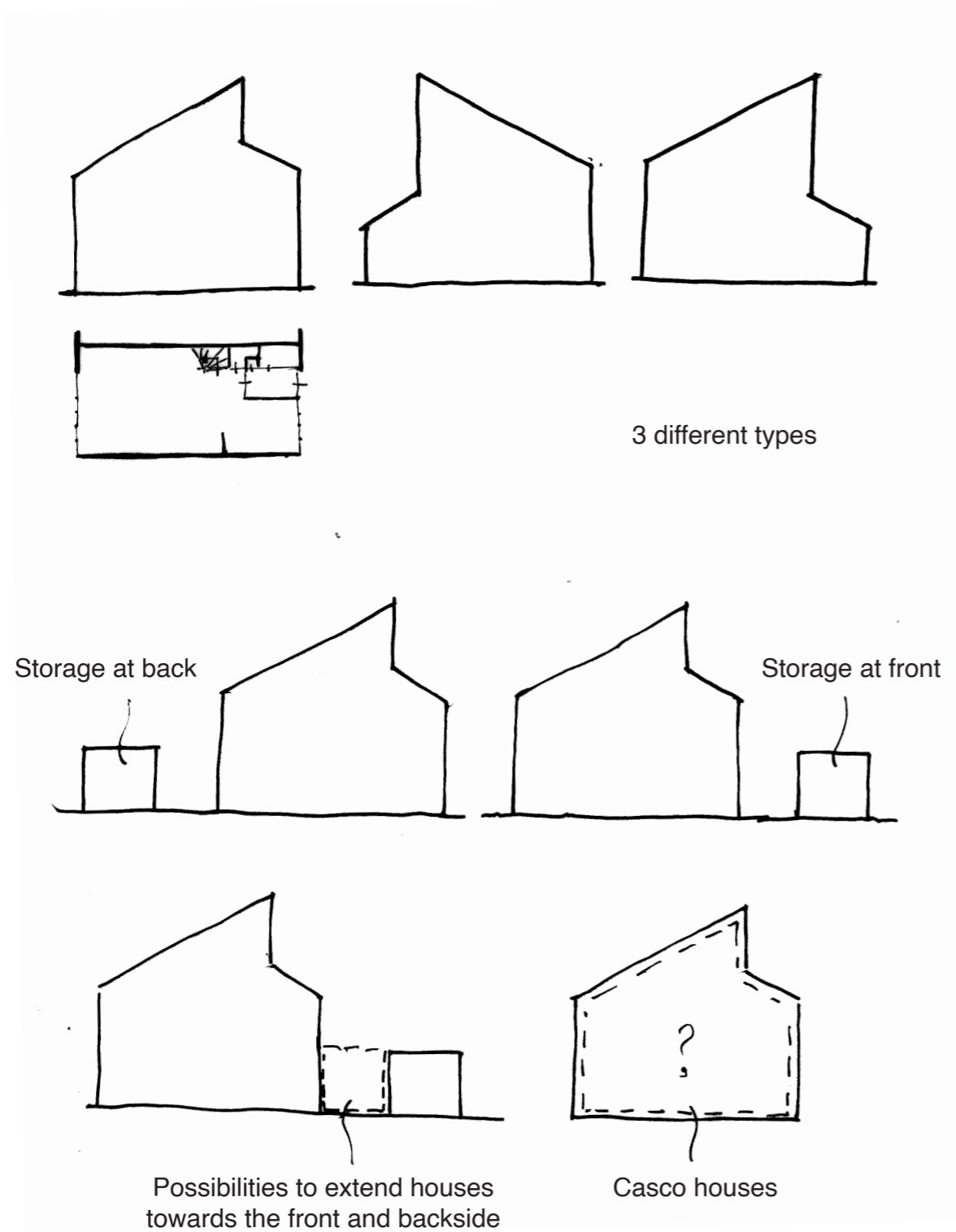


Image 18: Analysis sketches (Image by author)



Image 19: Bloemendaal-Oost (Barzilai & Goedewerf)

Architect: De Jong, Van Olphen and Bax
Date: 1971-1976
Applied strategies: Casco, extendable, participation
Location: Gouda

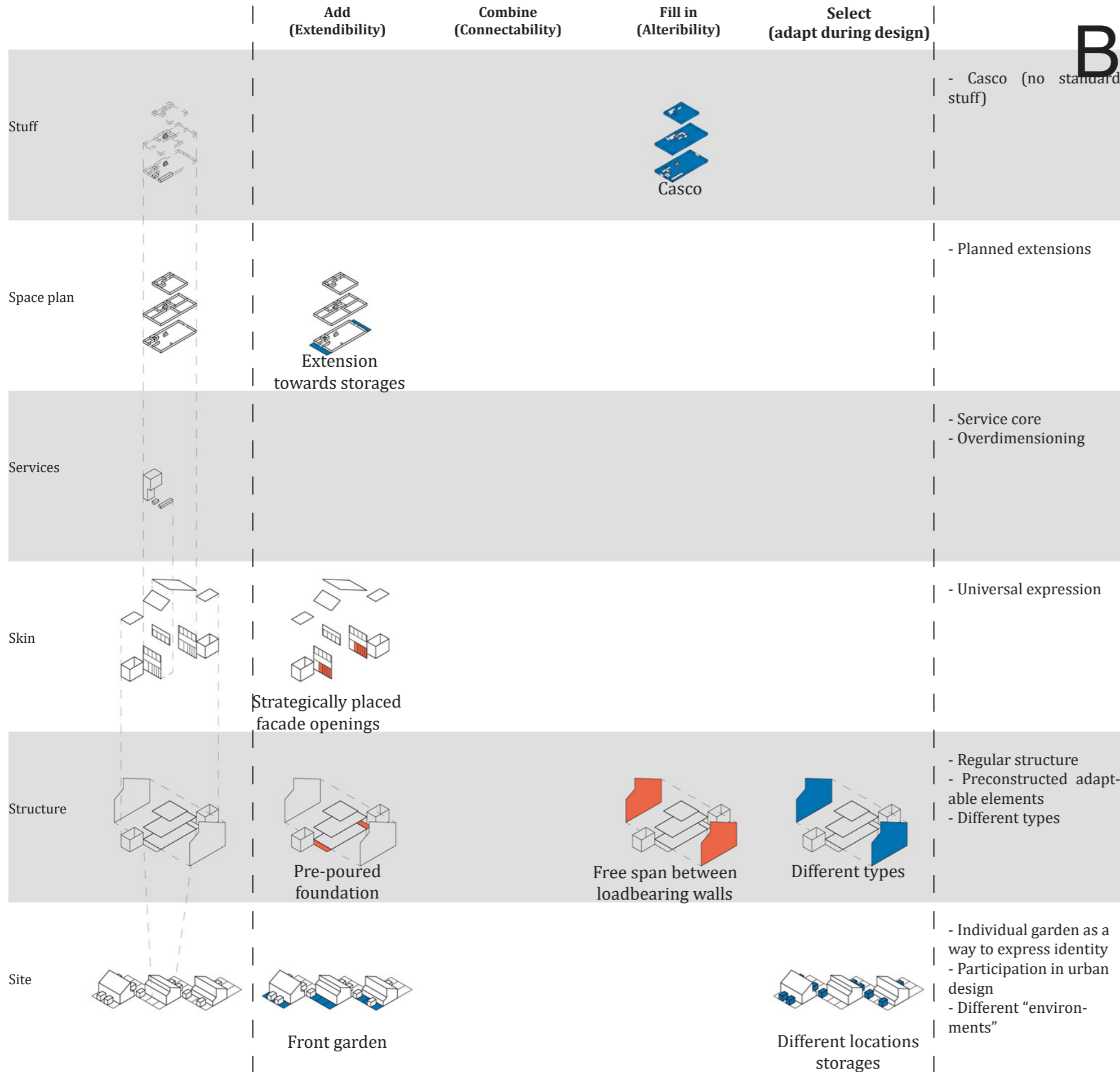
Introduction Case

Bloemendaal Oost in Gouda was special because of the participation process that led to its design. This process was structured according to the ideas of the SAR, which prescribed a strict phasing of the design process. The participation process led to a design for the neighbourhood that consists of three parts which each have a different character. On top of that the houses offered possibilities for future extensions.

This process was not the official reason to give

the plan the certificate: this was only based on a judgement of the final design. The committee had quite some criticism on the urban plan, because of its lack of coherence and relation to the surroundings. The diversity in housing types and variation, extendibility and variations in floor-plan were appreciated more.

Bloemendaal-Oost

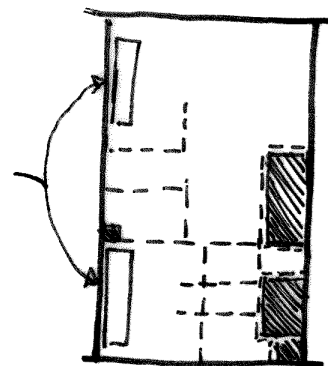
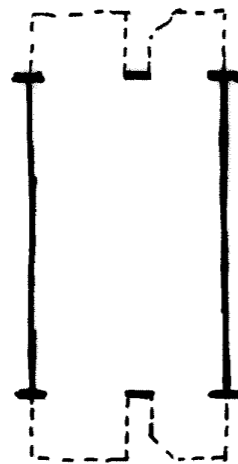
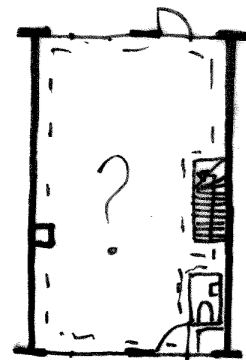


■ Adaptable
■ Supports adaptability

Sterrenburg III



Three different types of houses, which all can be extended on the front and backside



Flexible layout with "infill" package

Image 20: Analysis sketches (Image by author)



Image 21 : Sterrenburg III (Barzilay & Ferwerda)

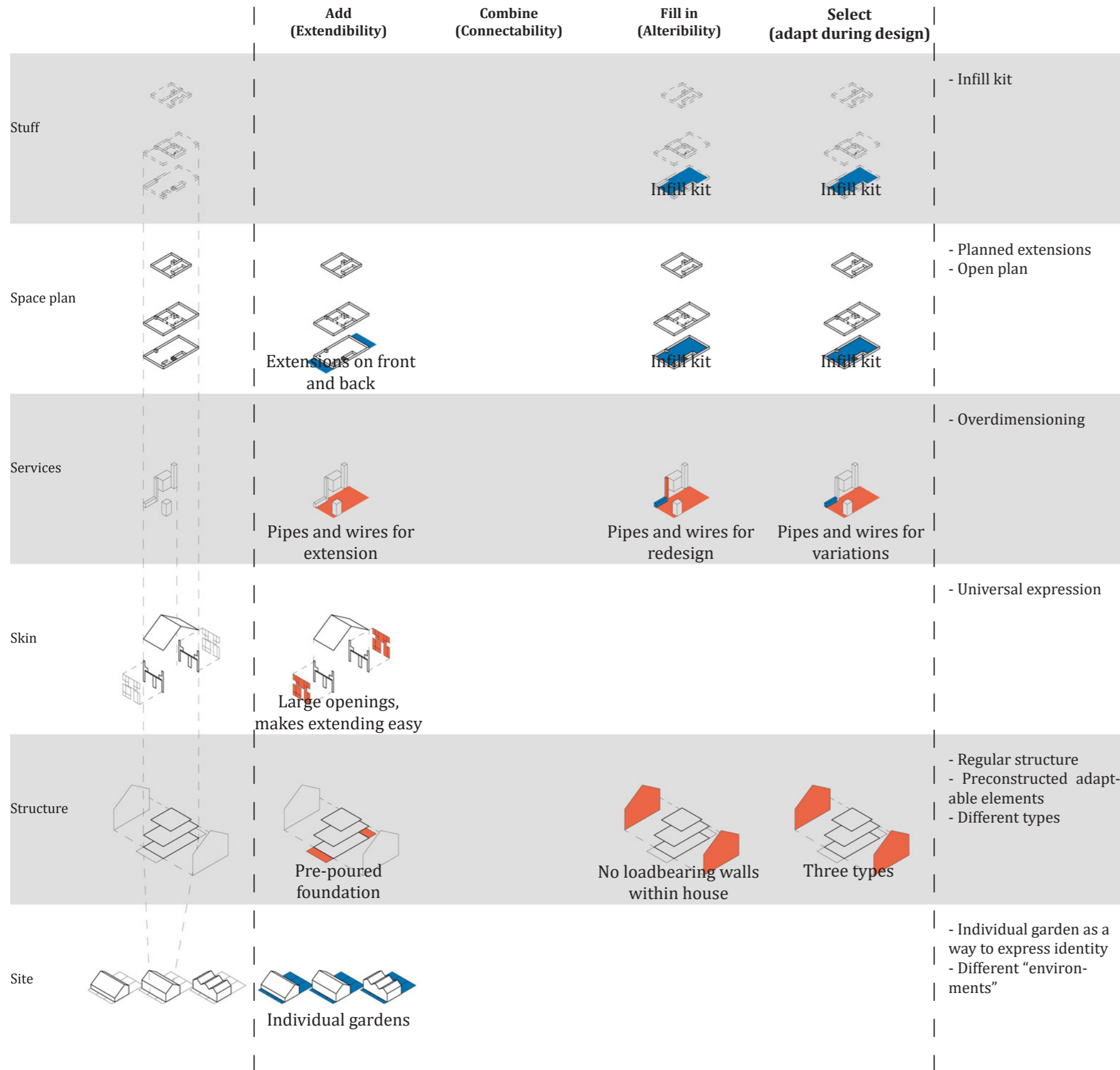
Architect: F.M. de Jong and H. van Olphen
Date: 1977-1979
Applied strategies: Support and infill, extendable
Location: Dordrecht



Introduction Case

Being the latest project in this group Sterrenburg III was based on the Bloemendaal-oost and Molenvliet project. The main focus for the project was on the further development of the infill package, which was developed by Bruynzeel. The houses were built in three base types. On the bases of a catalogue the future residents chose their floorplan, which was then realised by placing the infill package. Sterrenburg was the first plan in the series in which this infill package was actual-

ly realised. Future extensions and redivions were prepared in the servcis and structure of the houses. The committee praises the diversity of floorplan variations within the same system but does also comment that all options are relatively traditional.

Sterrenburg III



 Adaptable
 Supports adaptability



2.2 Investigate

Traditional +
Special Shapes
Patiohouses

Image 21: De vier vierkanten Alkmaar (Barzilay & Ferwerda, 2022)

Designscenario special shapes

VARIANT 2: Nieuwe vormen & Materialen

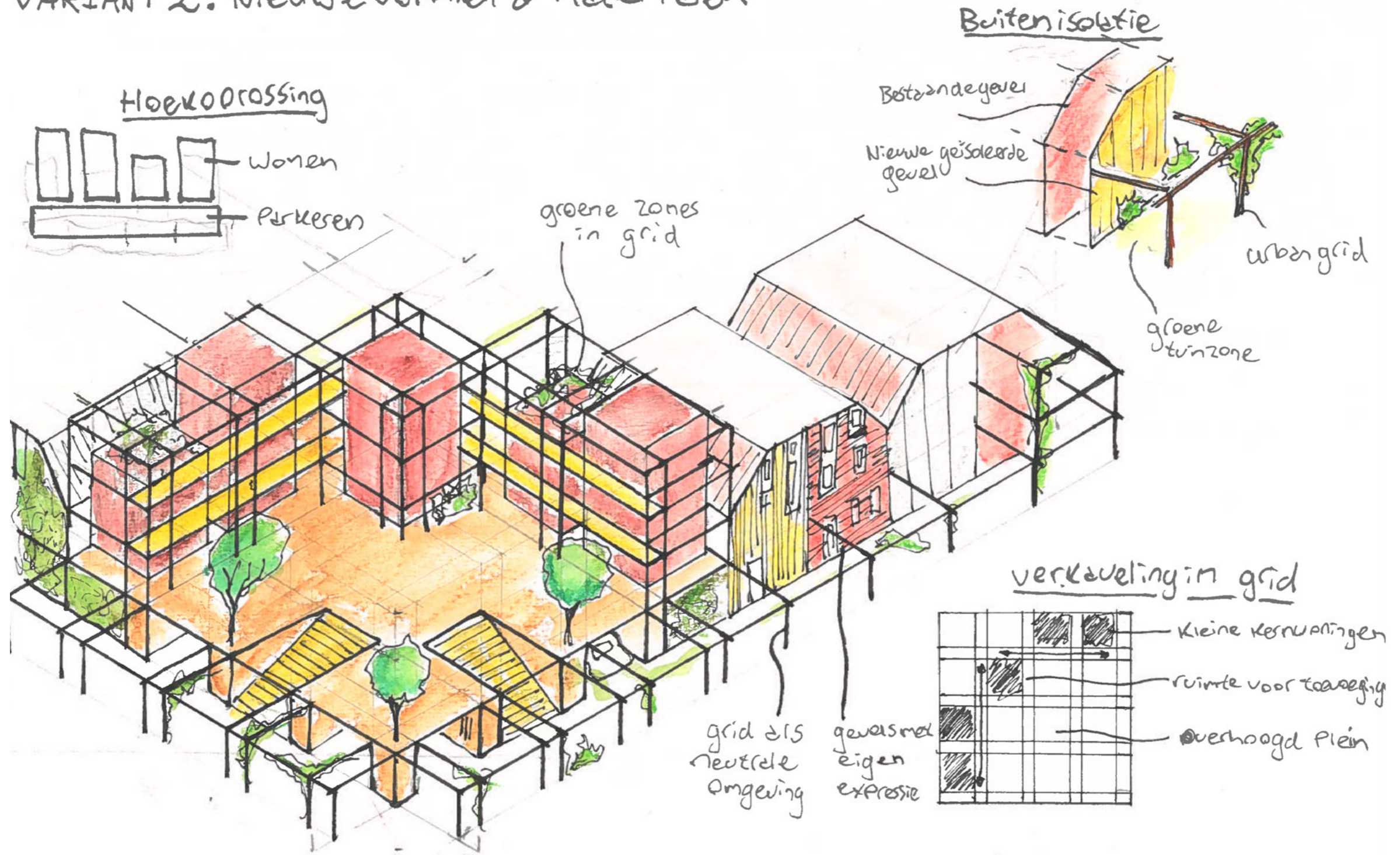
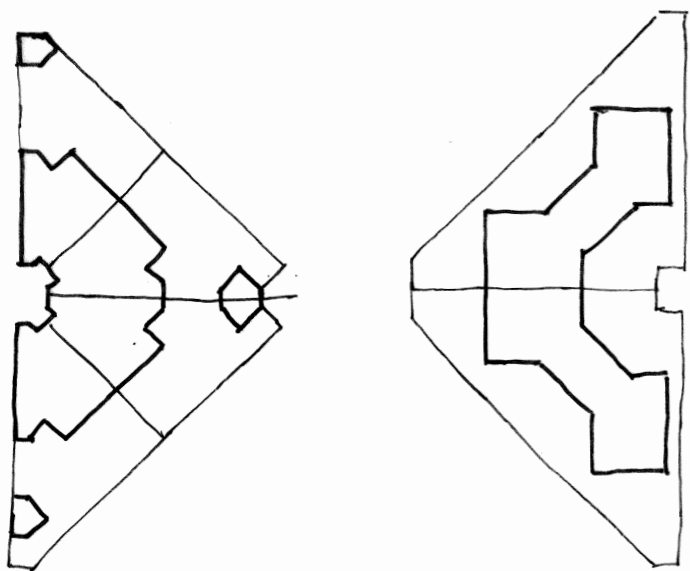
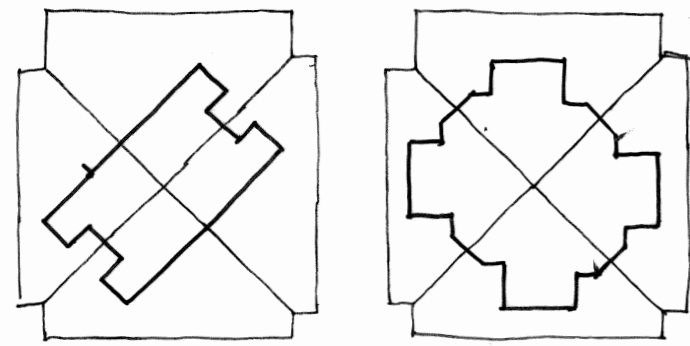
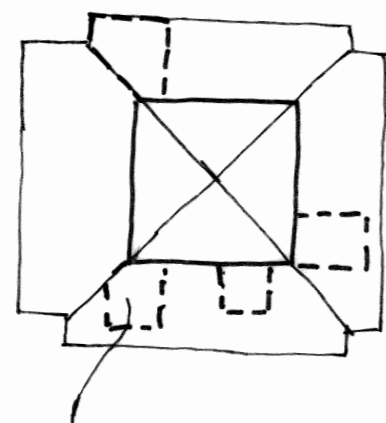
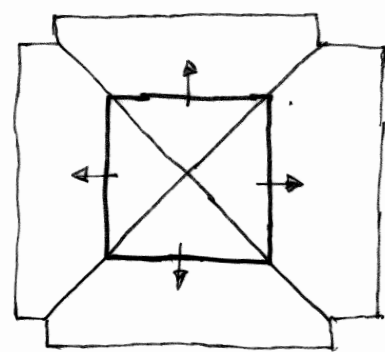


Image 22: Designscenario (Image by author)

Kuipershof



Four different types based on the same parcelation principle



Houses can be extended in different directions

Houses can be extended in different directions

Image 23: Analysis sketches (Image by author)



Image 24 : Kuipershof (Image by author)

Architect: De Wit and Van Duivenboden
Date: 1976-1978
Applied strategies: Extendable, urban framework
Location: Apeldoorn

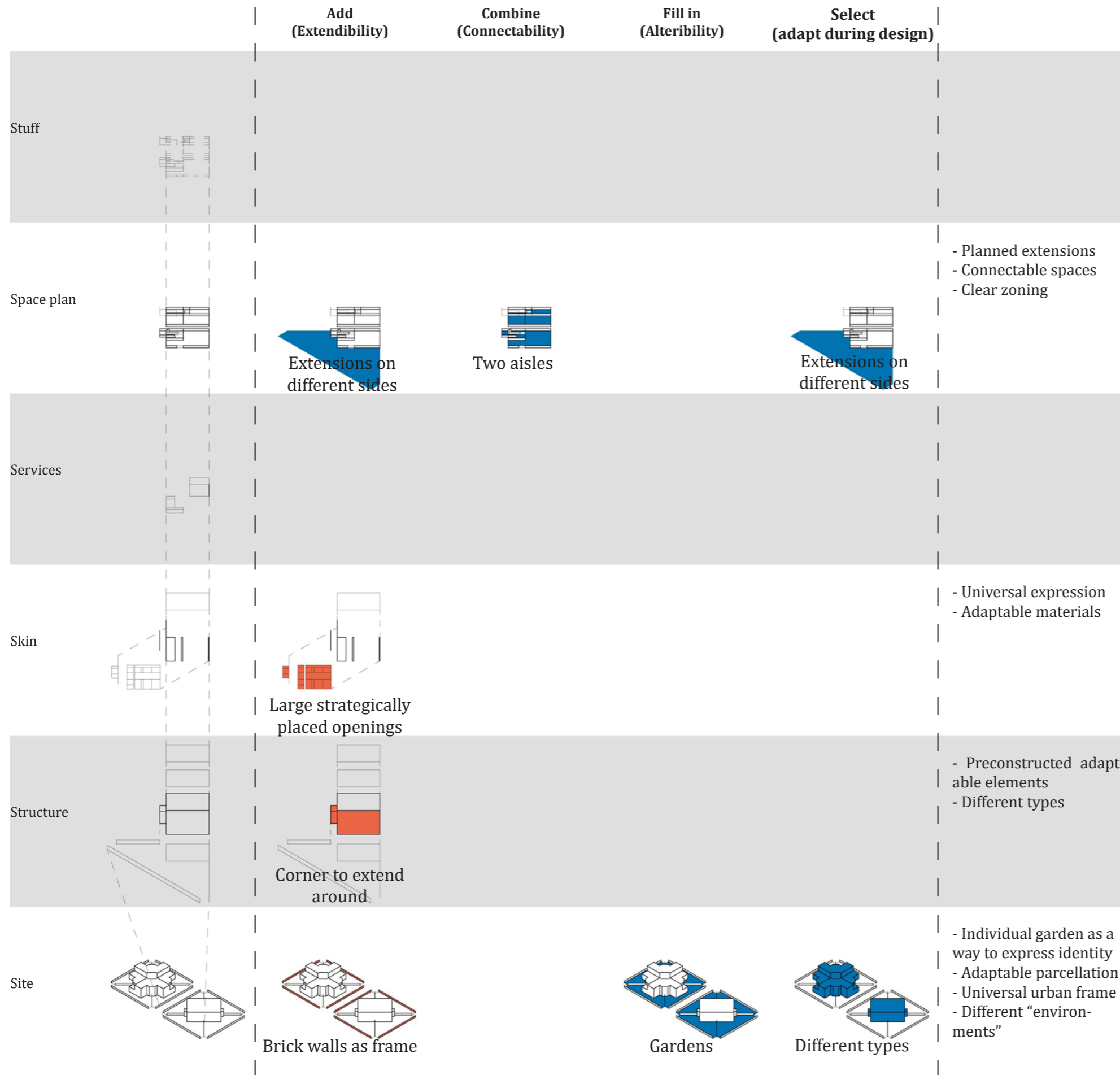
ated by the committee, although they give some practical remarks about the livability of the different types. The maximum planned extensions, 80% of the lot, is considered undesirable.

Introduction Case

The forty houses in Kuipershof in Apeldoorn were supposed to be small base homes which could be extended in multiple ways. Characteristic for the project is the parcelation, the site is subdivided in squares that are splitted in four quadrant shaped parcels. Four different standard housing types were developed within this urban plan. Due to their shape all these types should be easily expandable.

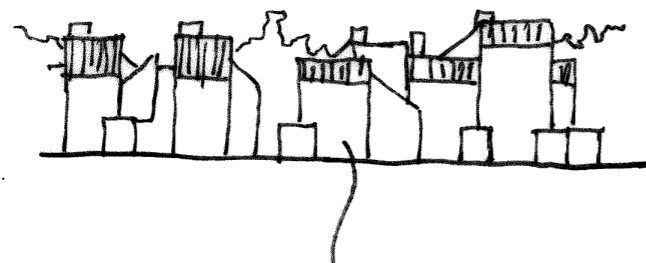
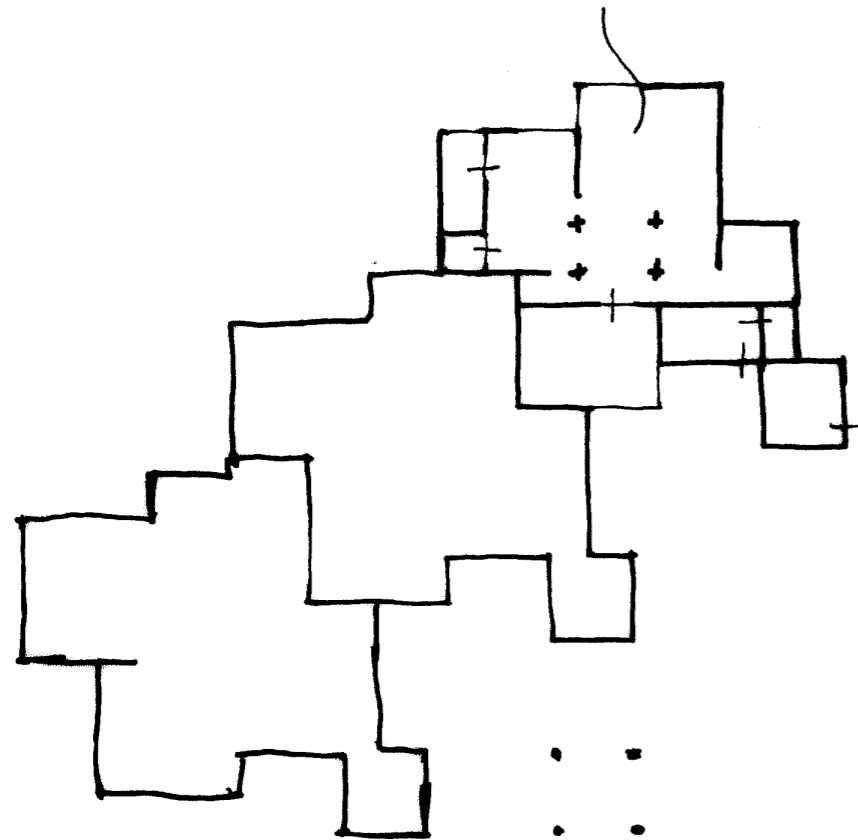
The unusual typology of the houses is appreci-

4.6 Kuipershof



■ Adaptable
■ Supports adaptability

Open space plan divided in four generic squares



Complex shape and universal materialisation hide extensions

Image 25: Analysis sketches (Image by author)

4.5 De Vier Vierkanten



Image 26 : De Vier Vierkanten (Image by author)

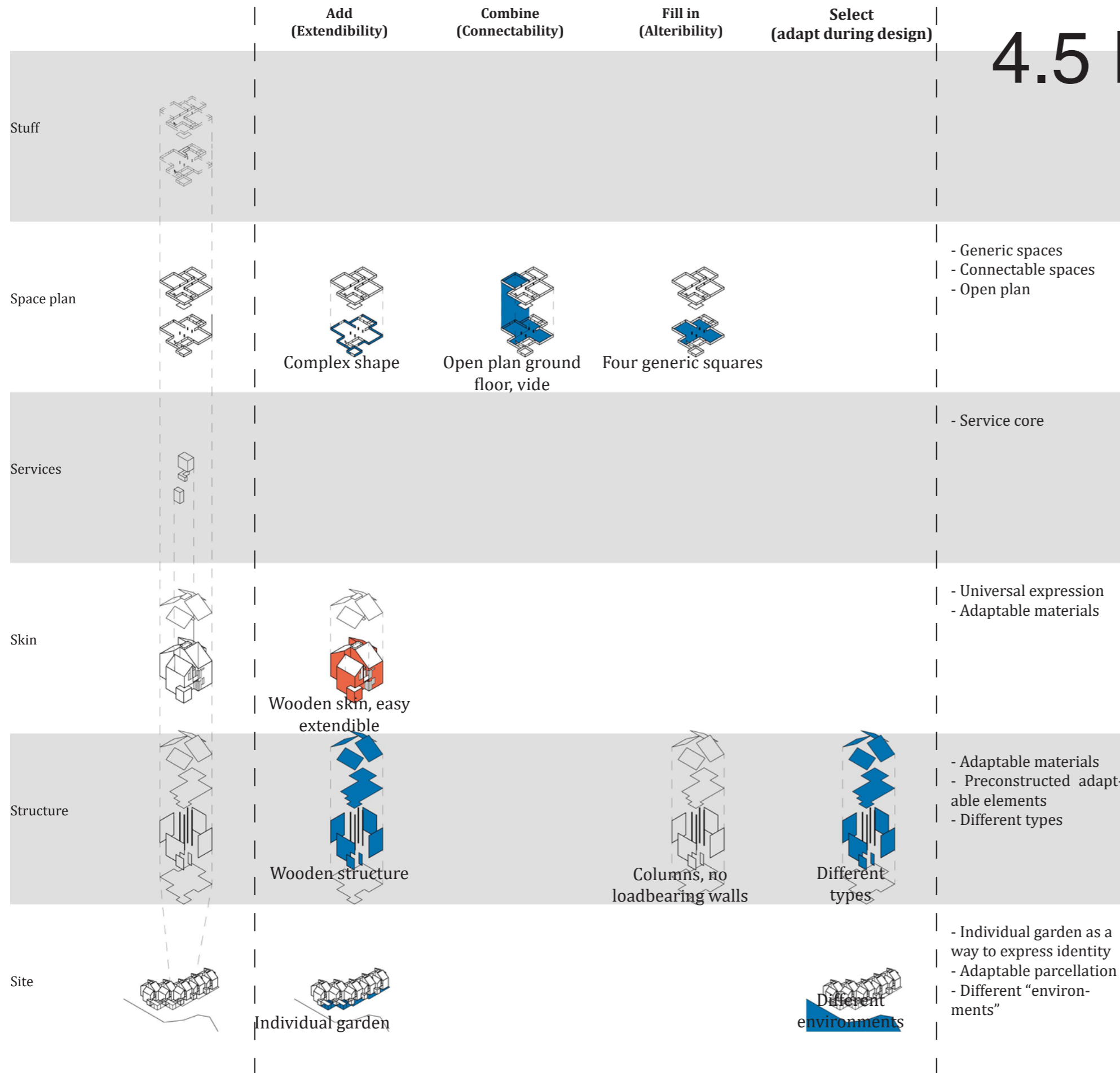
Architect: A. Bonnema
Date: 1978-1980
Applied strategies: Timber frame,
Location: Alkmaar
Characteristics:

Introduction Case

In the case of De Vier Vierkanten is not only the shape but also the material special: it was constructed completely in a timber frame structure. With the new possibilities that this material offered an interesting cross shaped plan was designed. This shape could be applied in different heights and compositions to create a diversity of housing types and public spaces. Within the neighbourhood the 72 houses were built is smaller groups in which the public space had a

different character. Some of the largest houses were falling in a higher price class and therefore excluded from the subsidy that the program offered. The committee awarded the certificate to the plan because of the way the design using the potential that timber constructions offer and the attractive and recognizable shape in which this results.

4.5 De Vier Vierkanten



■ Adaptable
■ Supports adaptability



2.2 Investigate

Traditional +
Special Shapes
Patiohouses

Image 27: De vier vierkanten Alkmaar (Barzilay & Ferwerda, 2022)

Designscenario Patiohouses

VARIANT 3: Tweezijdige (Patio) Woningen

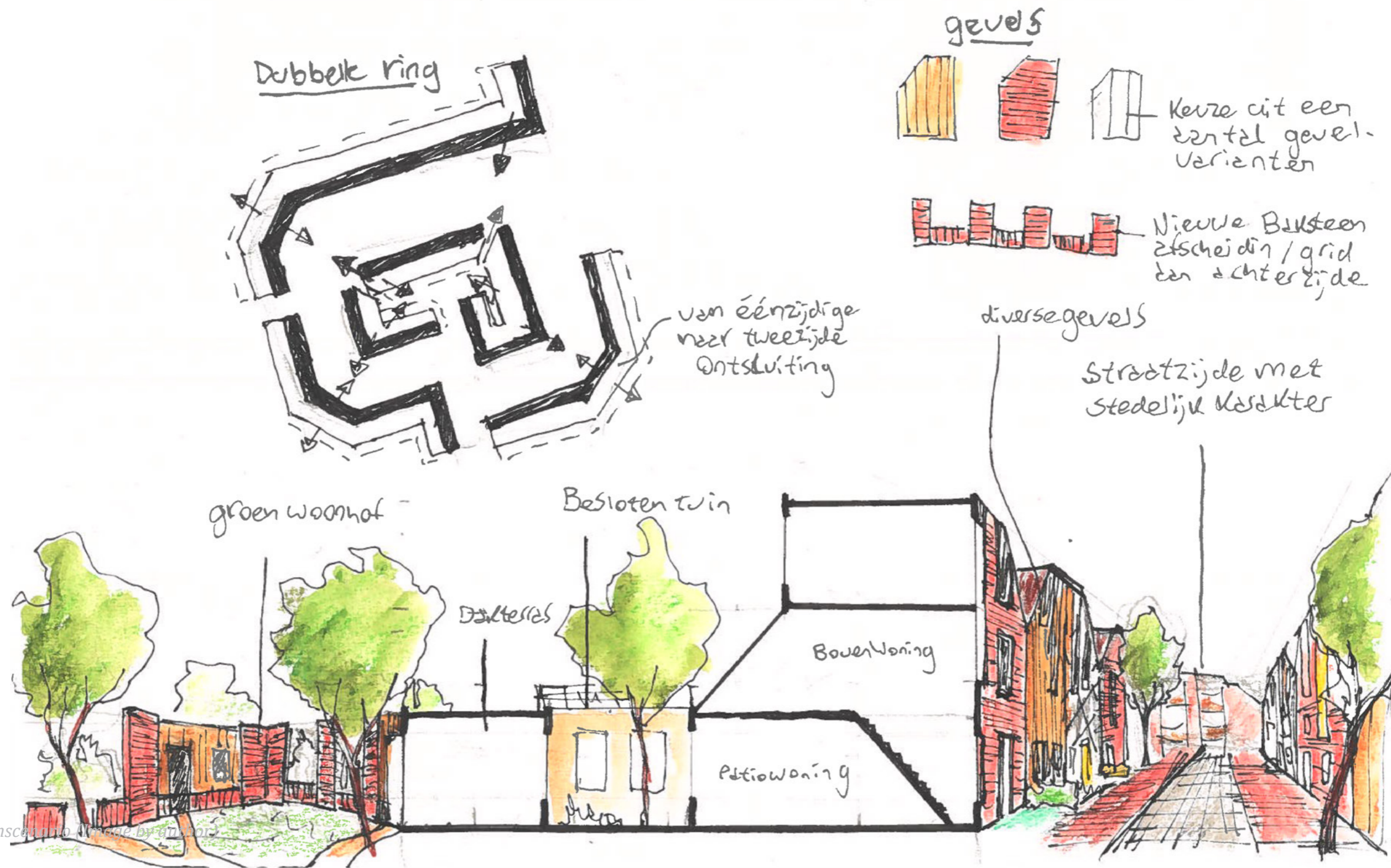


Image 28: Designscenario. Image by [unintelligible]

Patiowoningen

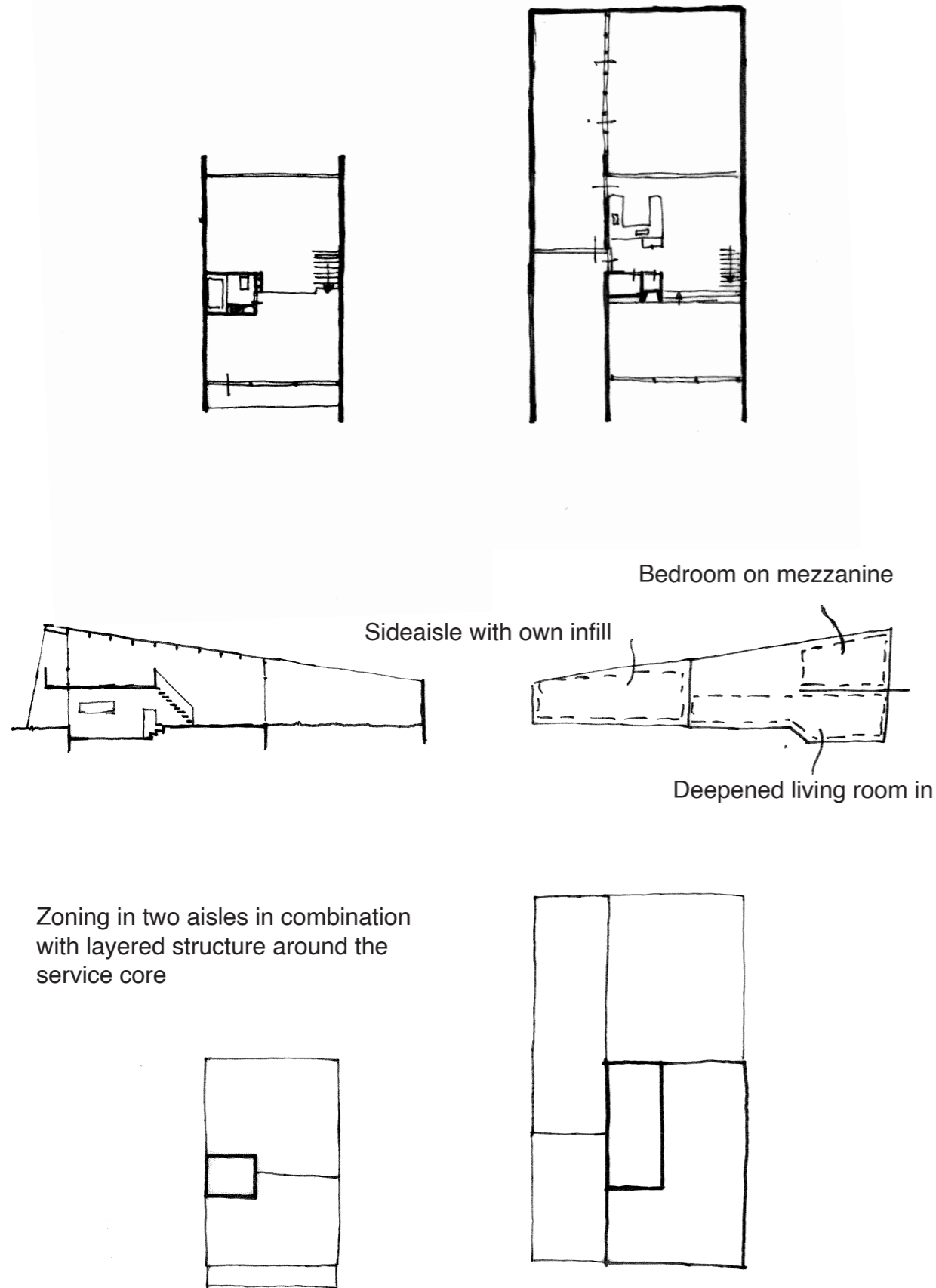


Image 29: Analysis sketches (Image by author)

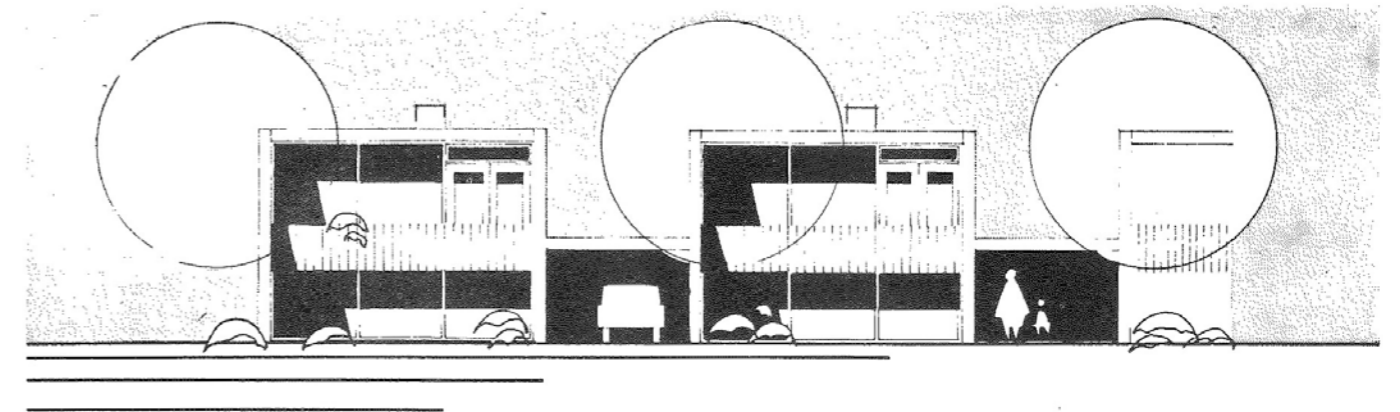


Image 30 : Patiowoningen (Barzilay & Ferwerda)

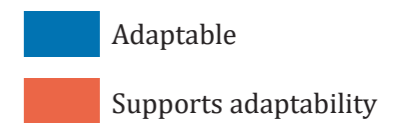
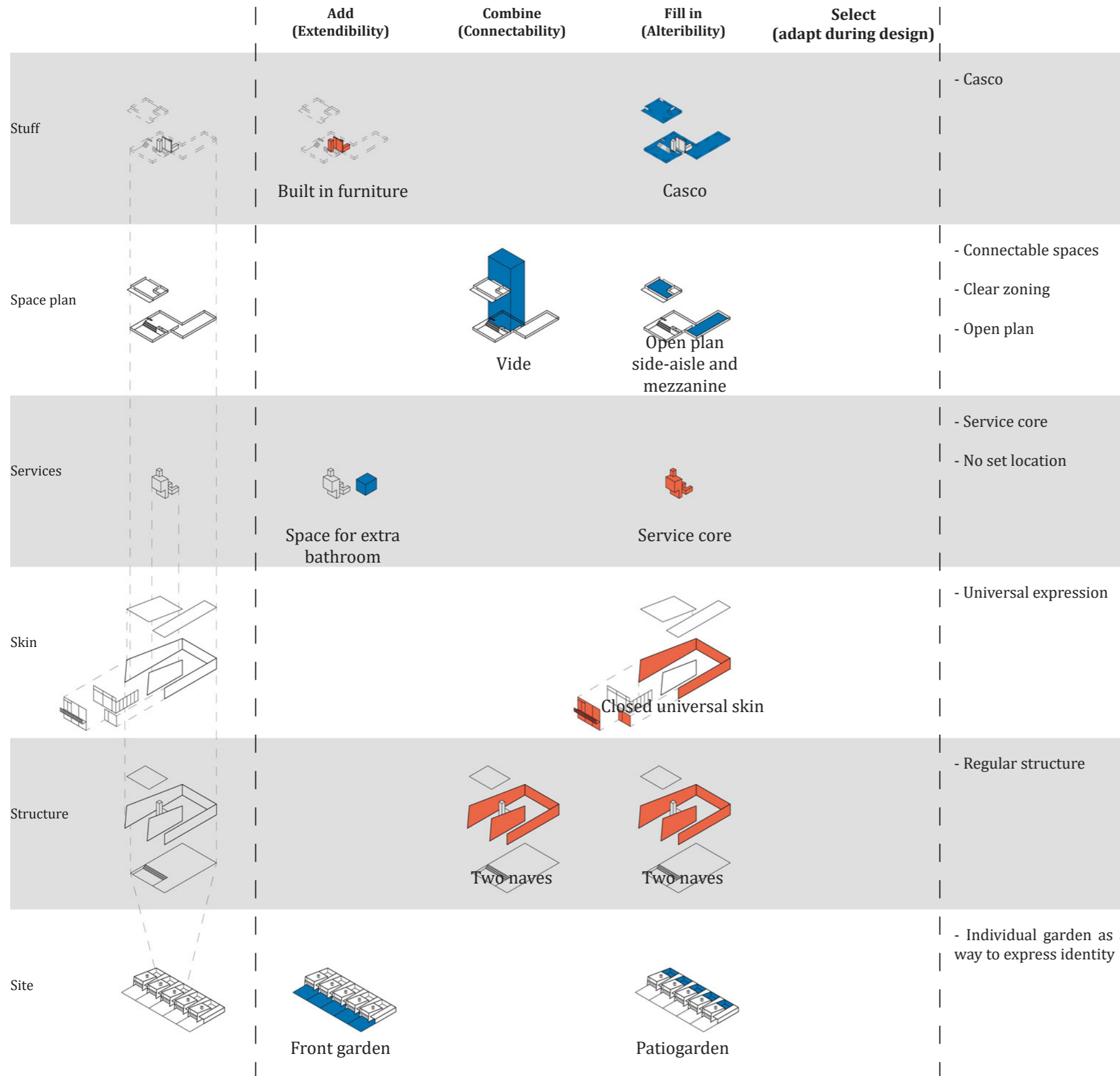
Architect: G. Schouten and G. de Jonge
Date: 1969-1970
Applied strategies: patio, casco, flexible plan
Location: Eibergen
Characteristics:

Introduction Case

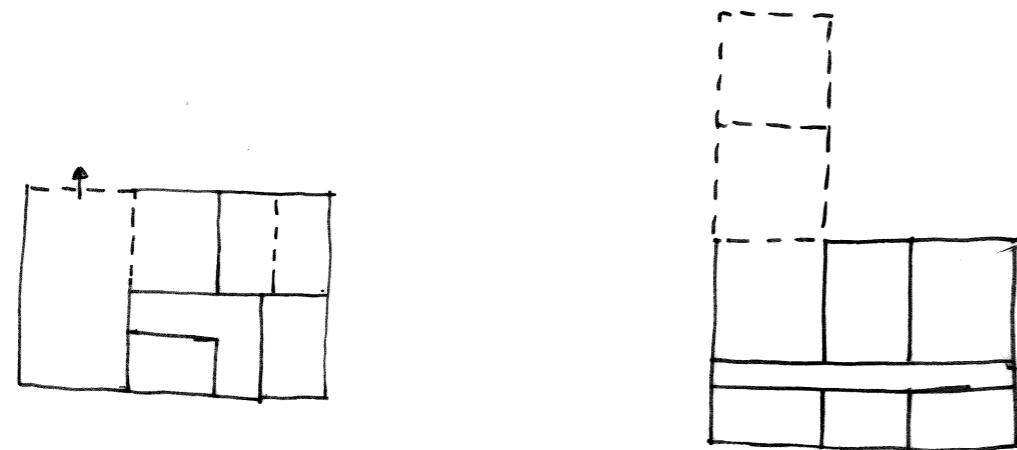
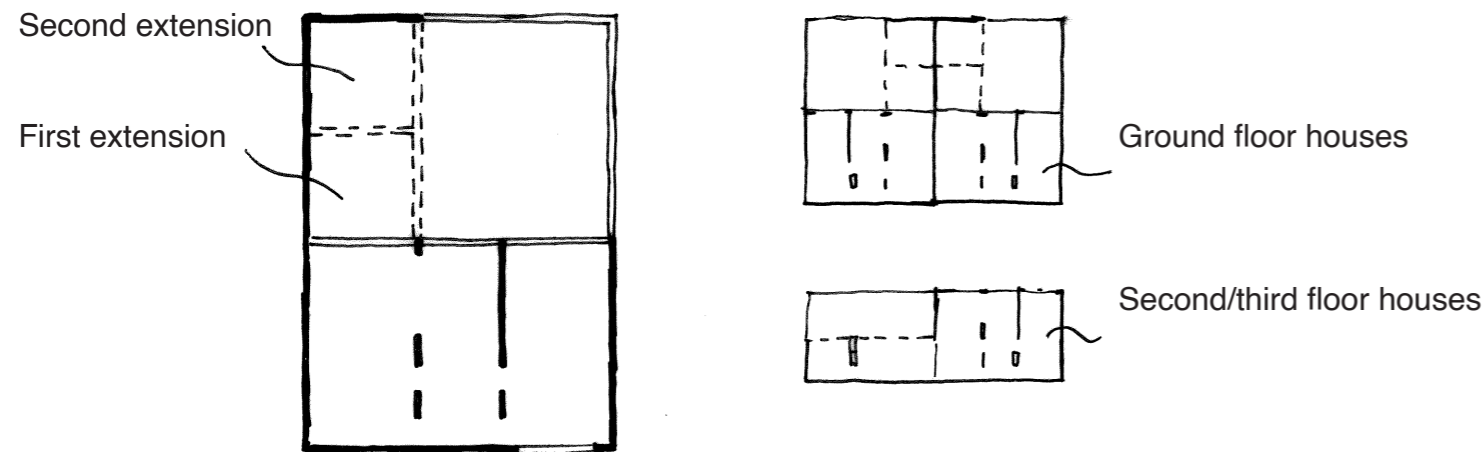
The Patio houses were submitted as an idea before a location and client was found. It was first executed in Eibergen and repeated on several other places. The design consists of series of simple main volumes with a pent roof, which are connected through a shifted lower volume behind the carport. In the main volume a mezzanine is positioned above the sunken living room. On the backside a wall between the lower volumes encloses the patio.

De commitee mentions the free layout of the building as one of the reasons to subsidise the project, next to its spatial experience. The combination of the patio, the mezzanine and the "casco" finish of the house gave the residents the opportunity to use/finish the space in the lower volume and the first floor the way they wanted.

Patiowoningen



Haesselderveld



Living room with strategically placed openings for future extensions

Flexible floor plan in three aisles combined with possible extensions for one aisle

Image 31: Analysis sketches (Image by author)



Image 32 : Haesselderveld (Image by author)

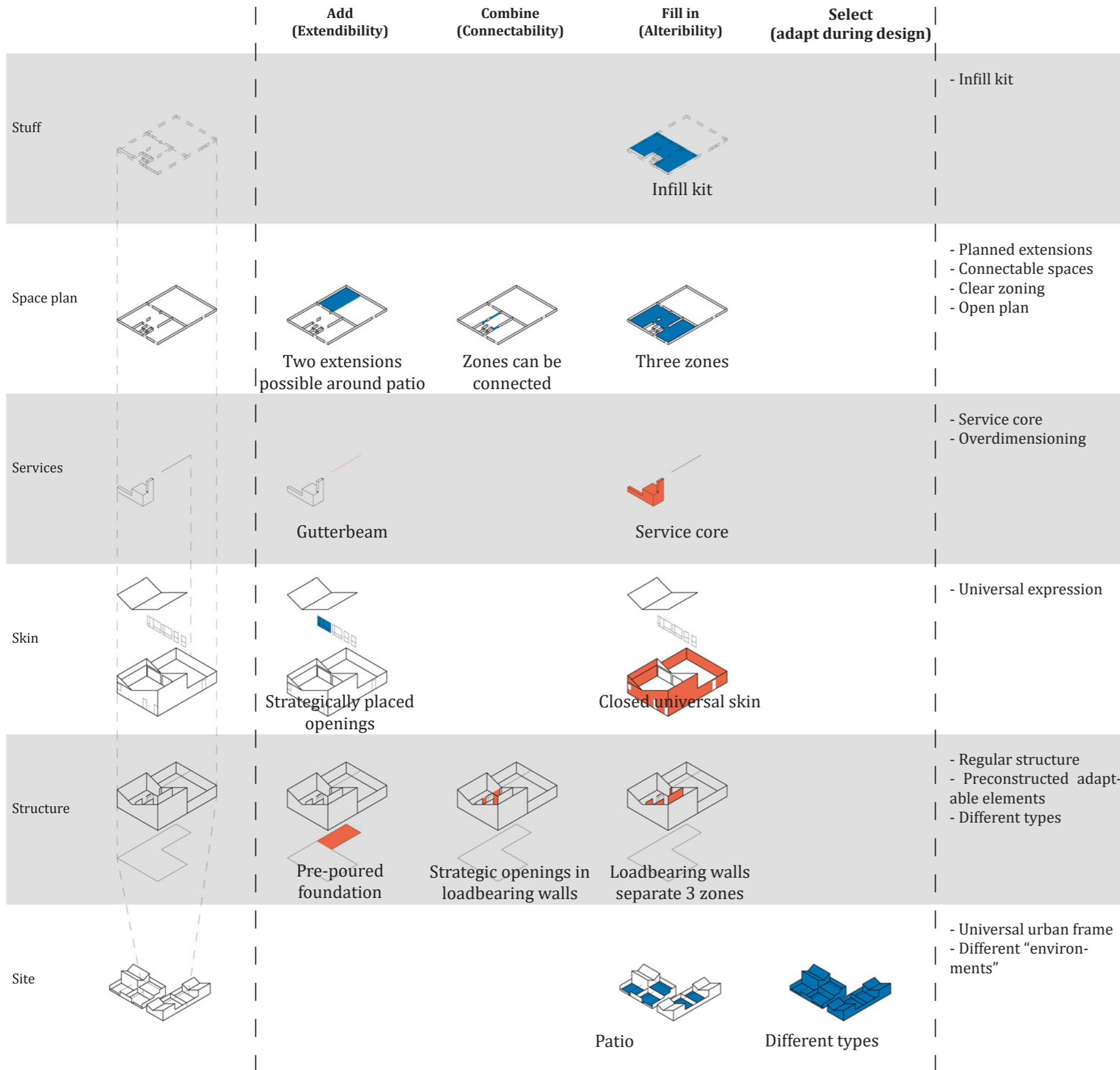
Architect: B. Wauben
Date: 1975-1979
Applied strategies: Patio, extendable
Location: Geleen

Introduction Case

Haesselderveld in Geleen consists of 141 extendible patiohouses. The plan was based on the graduation project of Bart Wouben, a student of Habraken. The houses consist of three aisles with tilted roofs and a patiogarden of about the same size as the house. Within the patio the house can be extended. In five buildingblocks the houses are stacked to create a "living hill" while the other houses are ground-bound. Within the three zones of the houses different variations of the for

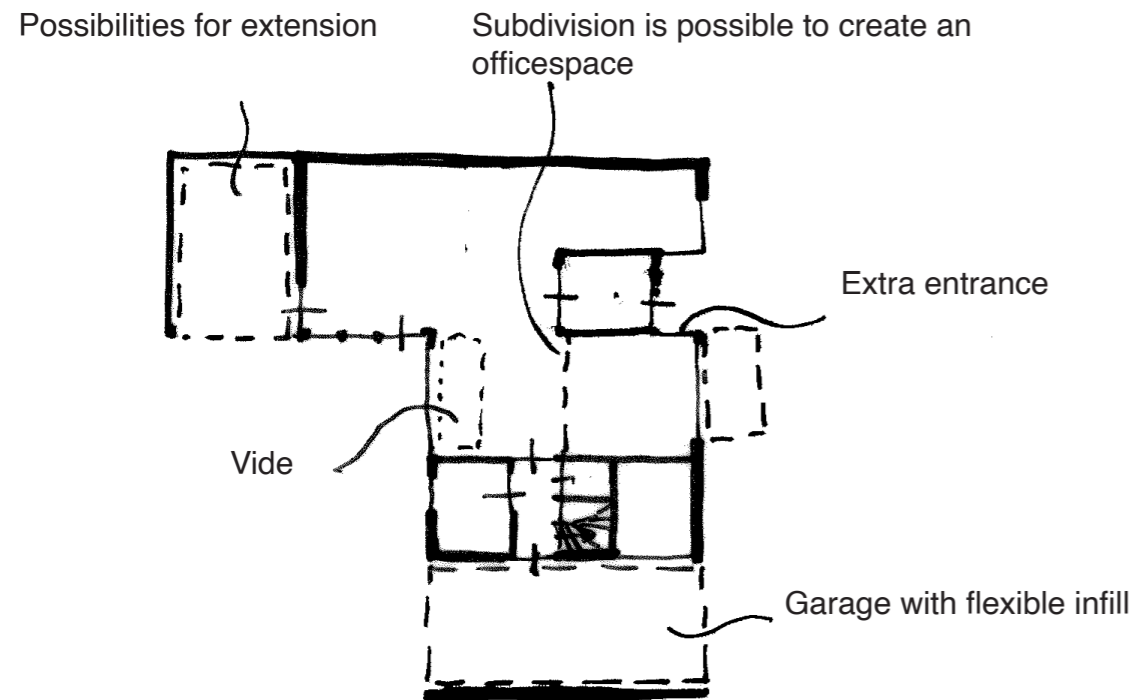
the floorplan were developed. In their comments the committee describes especially the stacked version as a welcome alternative for the traditional multiple-family housing types. A negative remark is made about the fact that the individual dwellings are not recognizable within the building block.

Heasselderveld



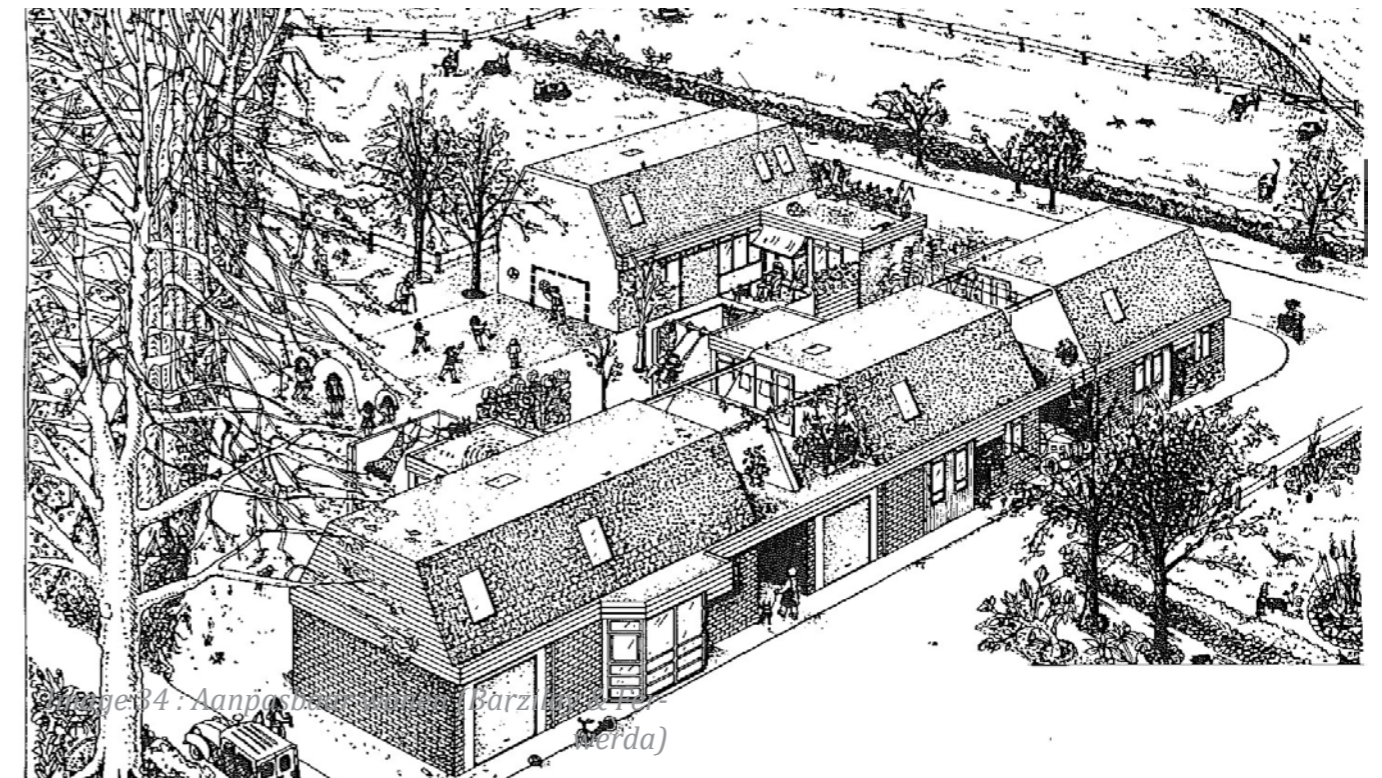
■ Adaptable
■ Supports adaptability

Aanpasbaar wonen



Different potential extension

Image 33: Analysis sketches (Image by author)



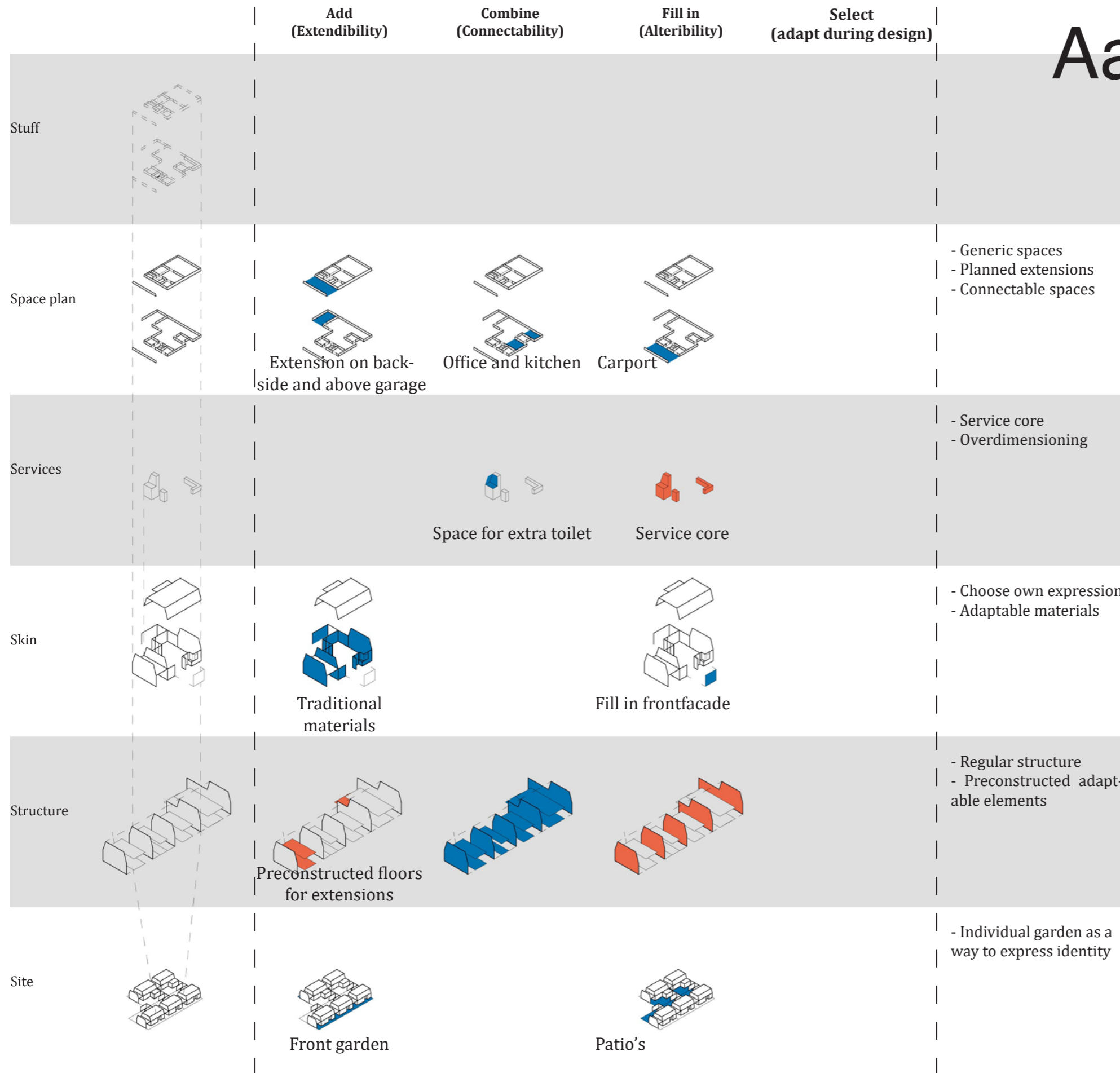
Architect: H. Schotman
Date: 1975-1976
Applied strategies: Extendable
Location: Nunspeet



Introduction Case

The five adaptable houses of this type that were built in Nunspeet were meant as a prototype for a larger neighbourhood of similar houses in Almere that was supposed to be built. But although the plans were their this larger project was never realised. The relatively simple houses could be extended in multiple directions. The plan of the house had a strict zoning and a service core to enable maximum flexibility in the livingspaces, in which a homeoffice with and own entrance could

be realised as well. A deliberate choice was made to use traditional building materials to make it easy to actually realise an extension. The committee mentions the diversity of possibilities to extend or adapt the houses as the main reason to make the project part of the program.

Aanpasbaar wonen



 Adaptable
 Supports adaptability

3.1 Define

Selection criteria
Casestudies
Residents



Image 35: Wikihouse Almere (imag by author)

Building systems

Building systems	Modules	Lifecycle	Values + Characteristics	References	System
1. Zelfbouw (DIY)	A. Service Core	10 years	- Ventilation shafts - Personal interiors	- Patiowoningen - Aanpasbaar wonen - Bloemendaal Oost	3
2. Casco (Support & infill)					
3. Catalogue (Prefabricated)	B. Extension	5-20 years	- Ringstructure - Unity of volumes (roofshapes) - Connection to existing facade	- Haesselderveld - Bloemendaal Oost - Sterrenburg III - De Vier Vierkanten - Kuipershof	2
4. Participation (Collective choice)					
	C. Skin Insulation	20-50 years	- Brick facades - Connection to windows - Details	- De Vier Vierkanten - Aanpasbaar wonen - Molenvliet	3/1
	D. Densification (new houses)	50+ years	- Urban structure (woonerf) - Social structures	- Sterrenburg III - Bloemendaal Oost - De Vier Vierkanten - Stadsvernieuwing	2
	E. Public Space	20-50 years	- Woonerf - Ecological values - Parking	- Molenvliet - De Vier Vierkanten - Haesselderveld	4

Image 36: Diagram building systems (Image by author)

Scenario's/residents



Wouter, Anne, Sophie & Stijn



Alisha + 3 children



Bep and Jan



Susan



John & Tamara



Lucas



Ed



Sam & Esra

Image 37: Fictional residents within the neighbourhood (image by author)

3.1 Define

Introduction
Casestudies
Residents

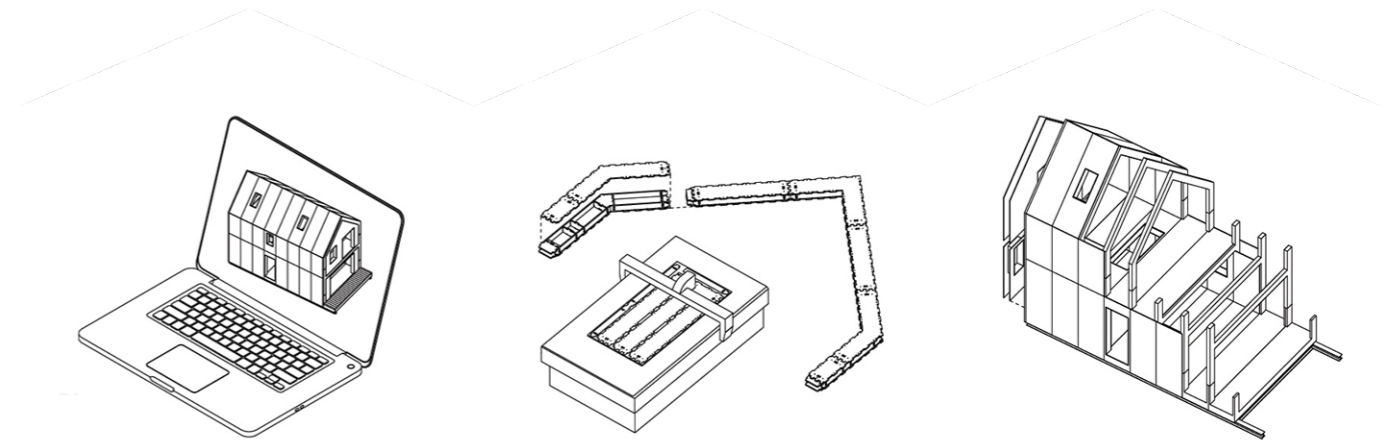


Image 38: Wikihouse Almere (own image)

Wikihouse



Image 39: Collage wikihouse (WikihouseNL, 2022)

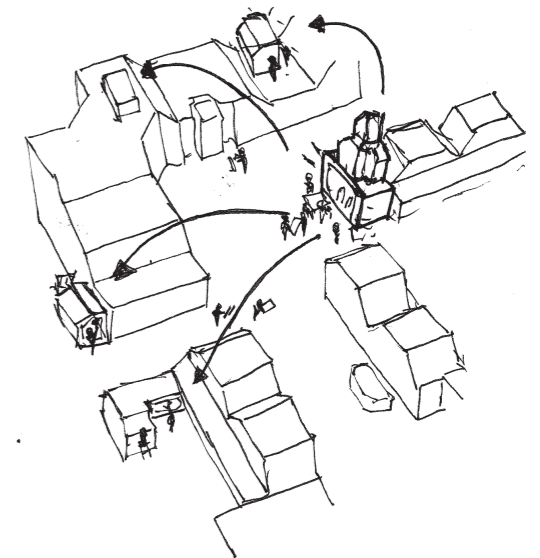


Concept

Wikihouse is an open source concept for the construction of simple DIY houses. The construction of the houses consists of CNC milled multiplex panels that can be build up without the involvement of professionals. Only dry joints are use for this construction. The structure is filled with (natural) insulation material and finished on the in and outside with vapour-tight materials.

Ingredients:

- DIY
- Temporary constructions
- Local manufacturing (digital design)
- Open space plan



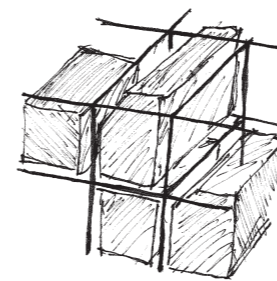
Potential application in modules:

New houses

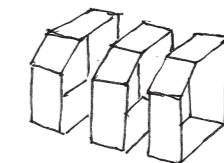
Skin insulation

Extension

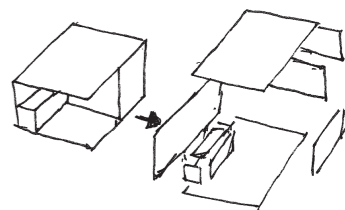
Service core



Wikihouse in grid?



Connectable elements



Deconstructable



Image 40: Collage Superloft (Mark Koehler Architects, 2022)

Superloft

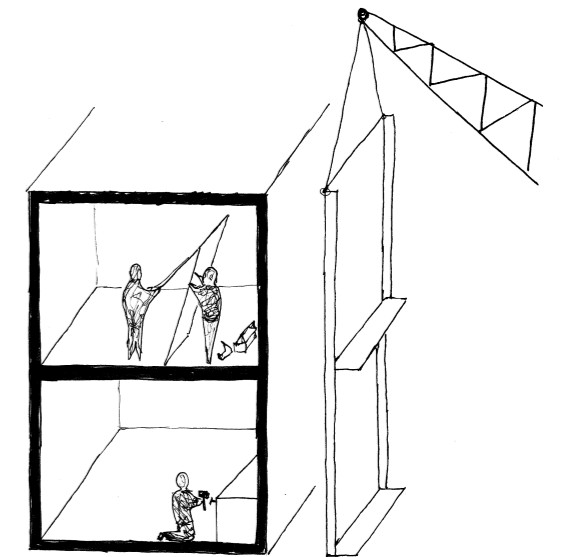


Concept

The idea behind Superlofts is to combine a standardized prefabricated module with a wide variety of different apartment types. Within the gridlike structure of the building each residents can pick the number of modules that he wants. To keep the program of the modules flexible for the future a strict separation between different layers (structure, services, space plan) is applied .

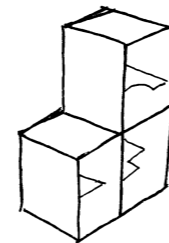
Ingredients:

- Standardized modules
- Different locations/combinations
- Open space plan
- Universal skin
- Separated layers



Potential application in modules:

New houses



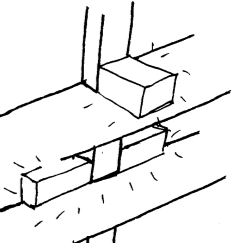
Lofts

Skin insulation



Separate system

Extension



Custom design around shaft

Service core



Adapting Goedewerf



Image 41: Collage Samenvoegen en vergroten (Urbannerdam, 2022)

Adapting Goedewerf

Samenvoegen & vergroten



Concept

Samenvoegen en vergroten is a program organised by Urbannerdam and the municipality of Rotterdam that aims to enlarge the diversity in certain neighbourhoods in Rotterdam. This is done by either enlarging existing houses or combining houses, residents are approached actively to get a subsidy to do this and in some cases the municipality buys houses that can then be combined.

Ingredients:

- Actively approaching residents
- Changing resident composition
- Selling current and buying new houses
- Long trajectory

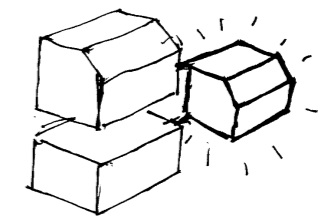
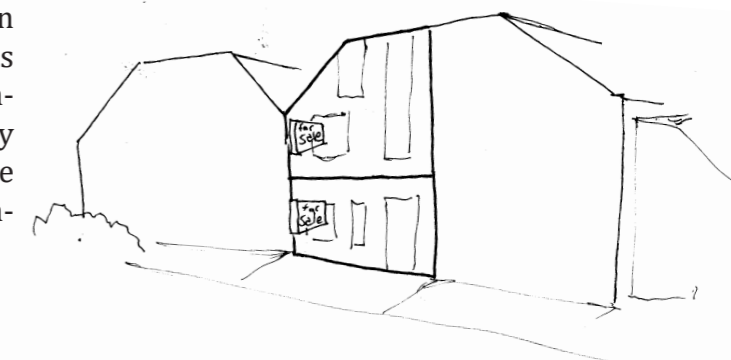
Potential application in modules:

New houses

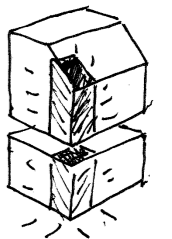
Skin insulation

Extension

Service core



Built by corporation



For all houses



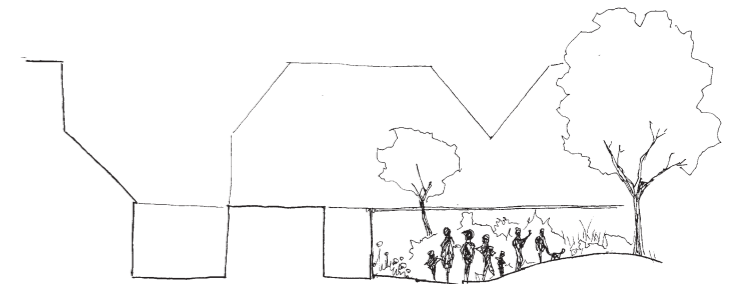
Image #2: Collage Space-S (Inbo, 2022)

Space-S



Concept

The design of Space-S was made with a high level of participation. The architect cooperated with future residents of the social rental apartments to define the brief, make the plans choose materials, design the public space etc. The result is a complex of buildings that offers living space to a wide diversity of people, from students to elderly. Residents were selected on the bases of their active participation in this proces.



Ingredients:

- Participation
- Diversity of housing types
- Flexible within certain frames
- Shared services and greenery

Potential application in modules:

New houses

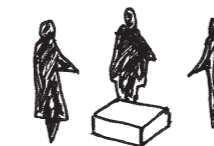
Skin insulation

Extension

Service core



Involve current residents



Collective choice materials



3.1 Define

Introduction
Casestudies
Residents

Image 43: Wikihouse Almere (Image by author)

Scenario's/residents



Wouter, Anne, Sophie & Stijn

(35)
(33)
(3)
(0)

Currently living in an apartment in Goedewerf

- Wishes:
- Garden
 - Extra children's bedroom
 - Space to work from home

Bep and Jan

(74)
(68)

Currently living in a single-family home in Goedewerf

- Wishes:
- Bedroom and bathroom on the ground floor
 - Still want to live independently
 - Less maintenance

Sam & Esra

(24)
(25)

Currently living separately in different places

- Wishes:
- Living together
 - Apartment with balcony
 - Extra bedroom / space to work from home
 -

Alisha + children

(42)
(18)
(15)
(12)

Currently living in an apartment in Goedewerf

- Wishes:
- A home that is both suitable to be on her own and with her children
 - Extra bathroom

Scenario's/residents



Susan

(38)

Currently living in Amsterdam

Wishes:

- Green environment
- Near to services, shops etc.
- Balcony

Ed

(58)

Currently living in a single-family home in Goedewerf

Wishes:

- His current home feels to big and to empty now that he is on his own
- Loves working in his garden

Lucas

(24)

Currently living in a student house in Utrecht

Wishes:

- Living in Almere
- Balcony or garden
- Meeting neighbours

John & Tamara

(54)

(47)

Currently living in a different part of Almere

Wishes:

- Larger house/apartment
- Space to work from home
- Large kitchen to invite friends

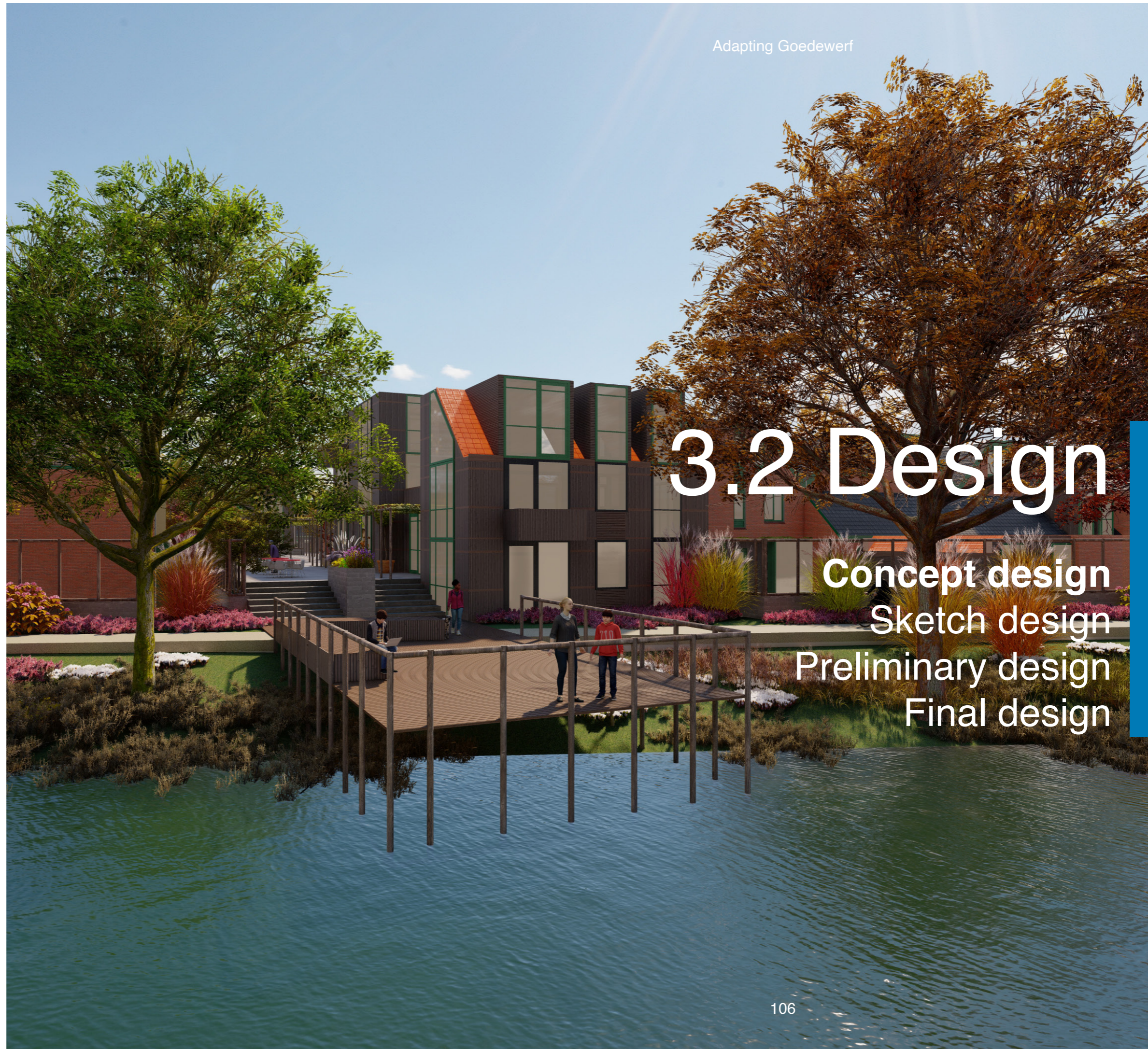
All design drawings, sketches and images are made by and belong to the author

Adapting Goedewerf

3.2 Design

Concept design
Sketch design
Preliminary design
Final design

Image 44: Final design (Image by author)



Concept design

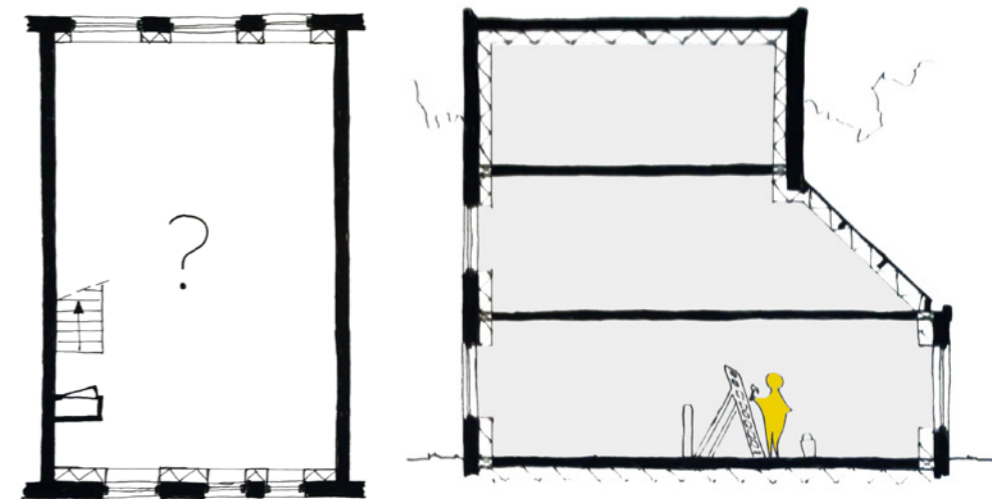


During the first period of the project the focus was on the collective work on the analysis and scenariostudies and the research plan. To test the methods that were proposed in the research plan a first analysis of the potential strategies was made.

These strategies were based on a first intuitive inventarisation of the different ways in which the referenceprojects were adaptable. On the bases of this first list an evaluation of the already present strategies in Goedewerf was made and a series of five potential intervention was developed. The outcomes of this study are visible on the following pages. For each of the proposals an indication is given of the applied strategies (dark) and whether they were already present in Goedewerf (yellow) or newly introduced (grey/black)

These first ideas had a large influence on the later development of both the content and process of the project. In the process the a similar cycle of research and design was applied throughout the year (see introduction). And when comparing the outcomes of the project to these first design-ideas it is clear that several element are still present. On an overall perspective the subdivision of the project in a different interventions on diffent scale level was something that started in this first approach. But also more specific elements such as the catalogue concept and the idea of connectable houses stongly influenced the final design.

1. DIY houses



Applied strategies:

- Catalogue design
- Undefined spaces
- Extendability
- Open spaceplan
- Mixed functions
- Appropriation of the public space
- Reuse of traditional typologies
- Built in variations
- Connectable houses

2. Connectable apartments



Applied strategies:

- Catalogue design
- Undefined spaces
- Extendability
- Open spaceplan
- Mixed functions
- Appropriation of the public space
- Reuse of traditional typologies
- Built in variations
- Connectable houses

Facade catalogue



Applied strategies:

- Catalogue design
- Undefined spaces
- Extendability
- Open spaceplan
- Mixed functions
- Appropriation of the public space
- Reuse of traditional typologies
- Built in variations
- Connectable houses

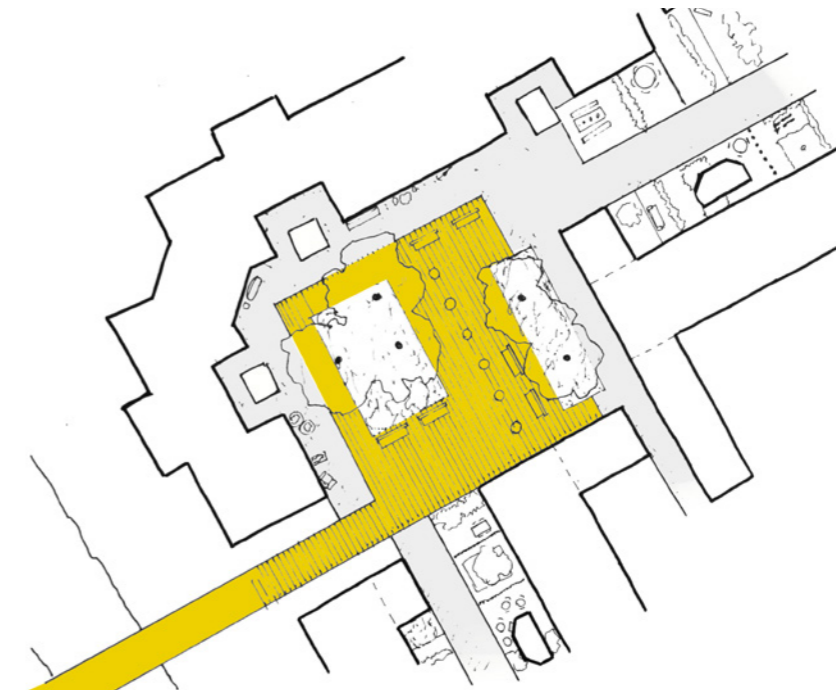
4. Flexible use storages



Applied strategies:

- Catalogue design
- Undefined spaces
- Extendability
- Open spaceplan
- Mixed functions
- Appropriation of the public space
- Reuse of traditional typologies
- Built in variations
- Connectable houses

5. Strengthen identity public space



Applied strategies:

- Catalogue design
- Undefined spaces
- Extendability
- Open spaceplan
- Mixed functions
- Appropriation of the public space
- Reuse of traditional typologies
- Built in variations
- Connectable houses

All design drawings, sketches and images are made by and belong to the author



3.2 Design

Concept design
Sketch design
Preliminary design
Final design

Image 45: Final design (Image by author)

Sketch design

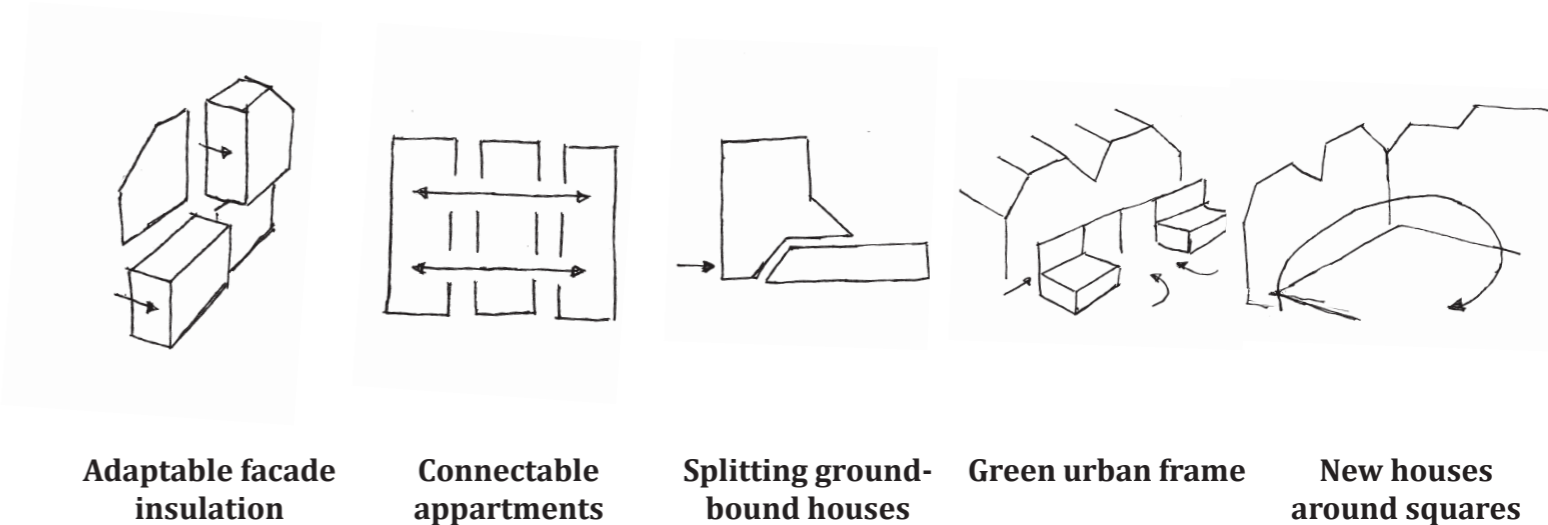


In this second phase the attention started to shift from the group work towards the individual projects. The main part of the research was executed and a start to the actual design was made. This part of the process was important because the personal vision on the design was formed.

The outcome of this phase was not a complete design yet, but was supposed to give direction and show the ambitions for the second half of the project. This was for example done by setting up the requirements for each module. This resulted in a clear, but not always realistic plan.

While in the personal research the different strategies for adaptable housing were identified a design had to be developed based on them. As explained in the final reflection a scenario based way of working was applied to implement the outcomes of the research. On the bases of the developed scenarios three modules were designed to adapt the existing houses. The technical and architectural design in this phase focused on the development of these elements, while the design of the new houses and public space was kept on a more abstract/conceptual level.

Design concepts



Adaptable facade insulation

Connectable apartments

Splitting ground-bound houses

Green urban frame

New houses around squares

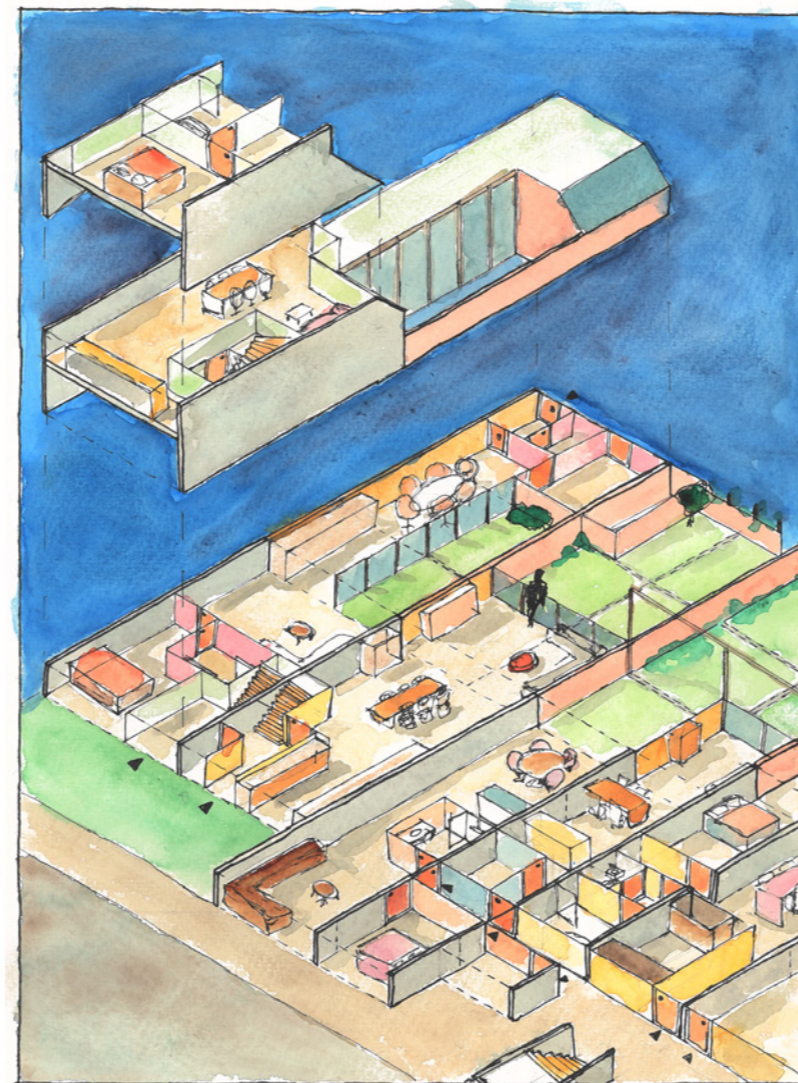
Modules

Skin insulation module



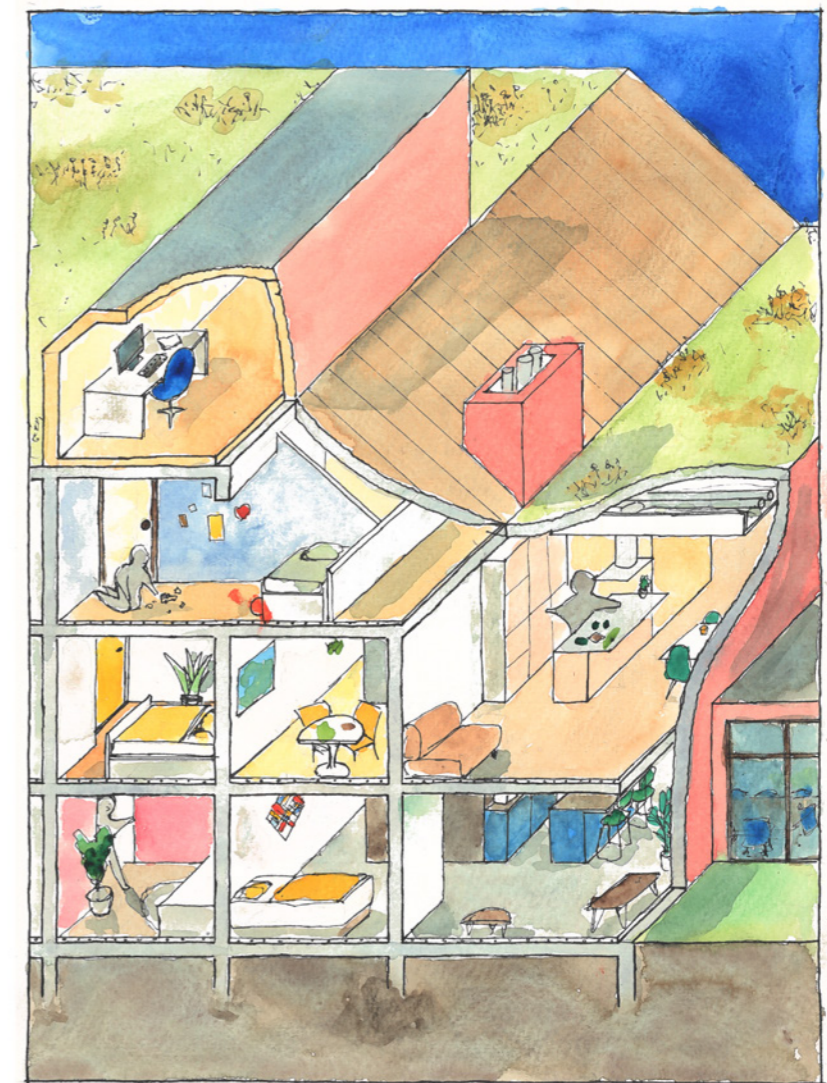
Site + Skin

Extension module



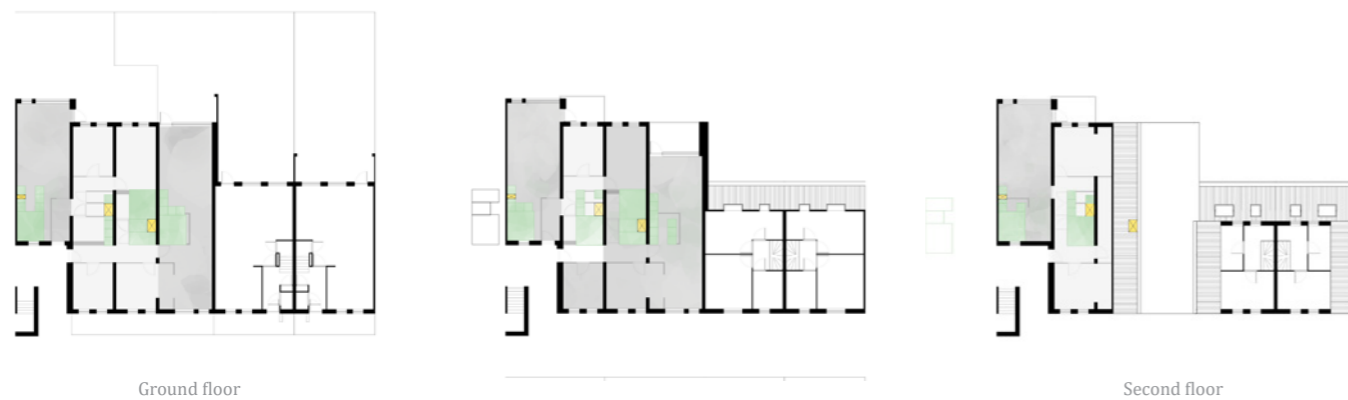
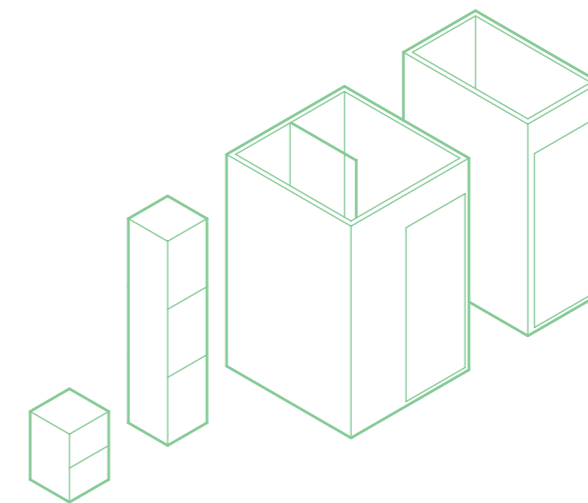
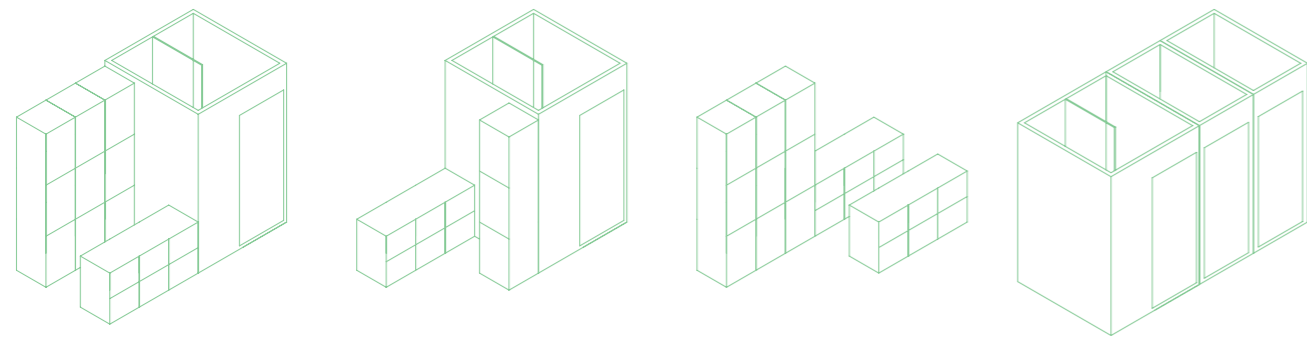
Structure + Space plan

Service core module



Services + Stuff

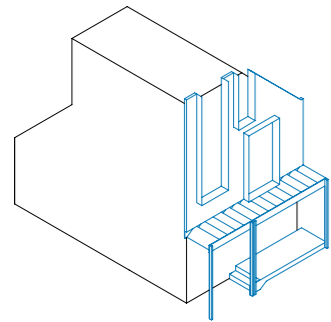
Service core



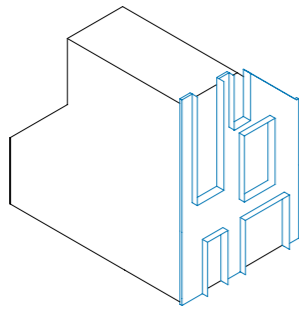
Requirements

- Combination of modules for bathrooms, kitchen and toilets
- Connectable to existing shafts
- Should be suitable to make combinations for both small and large apartments

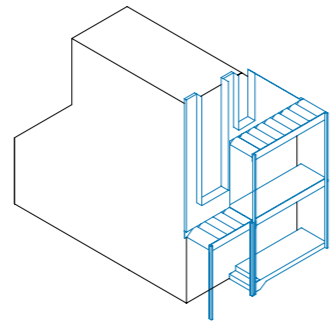
Skin



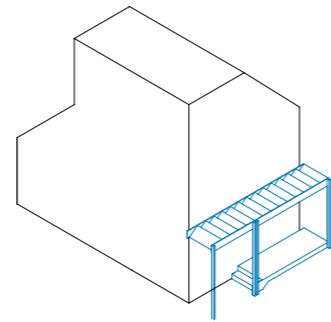
Second skin + insulation



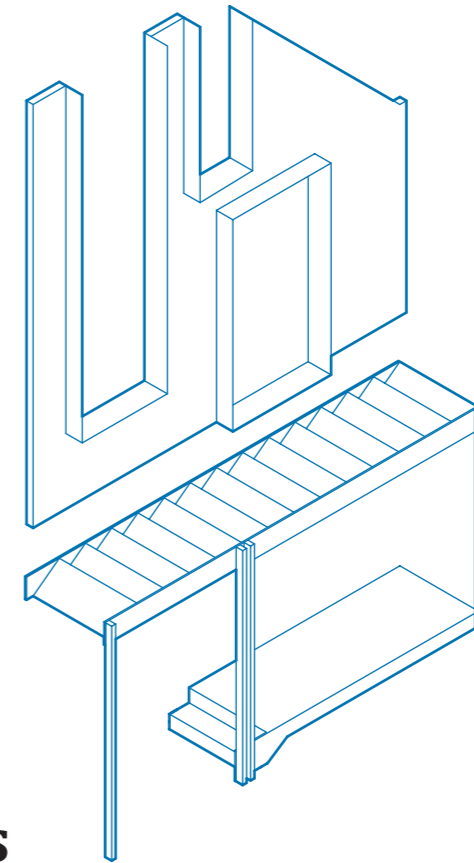
Insulation



Second skin + insulation



Second skin

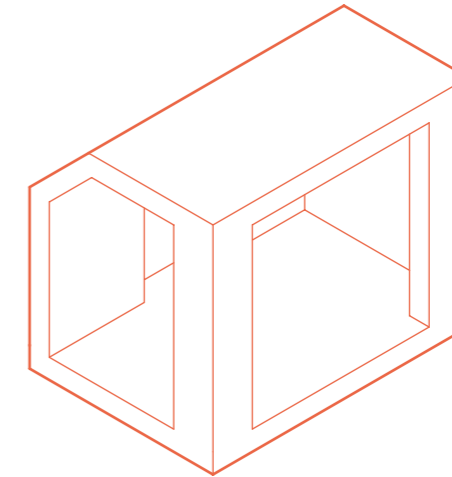
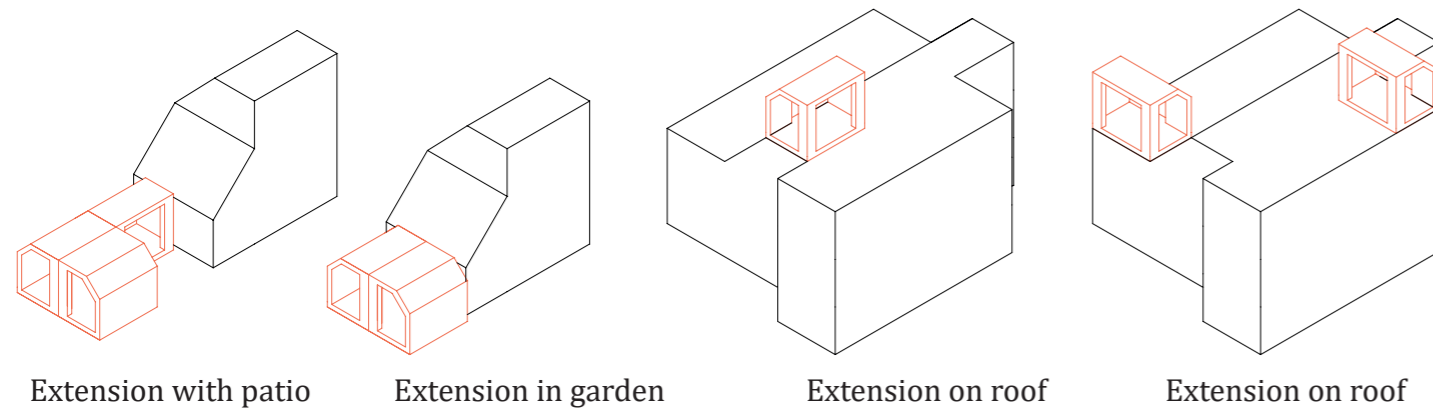


Requirements

- Affordable module that can used by both Ymere and individual homeowner
- Universal expression of the facade should be maintained up to a certain level
- Rc value: minimum 4,5
- Relates to other interventions in the public space



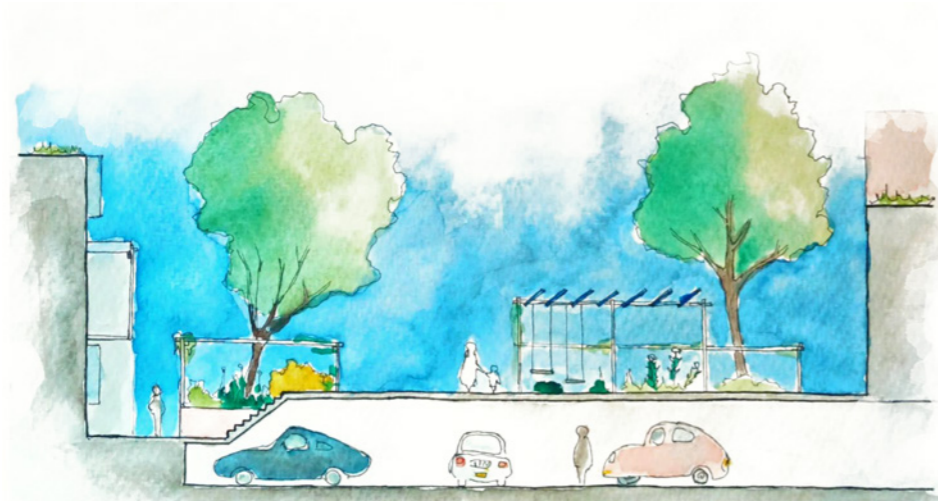
Extension



Requirements

- Suitable for topping up or extending
- (partly) prefabricated, to be placed easily
- Facades and interior finished according to own preferences
- Functional dimensions

Public space



Square: raised square with parking spaces underneath and new houses on top



Street: New trees, pergolas and planters combined with lowered parking spaces and roads shift focus from cars to greenery and create more intimacy



Park: Small park in courtyard offers a green view, a new entrance for the patiohouses and a space to play or walk



Garden: A diversity of plants and flowers improve attractiveness and biodiversity of the outer zone towards the water

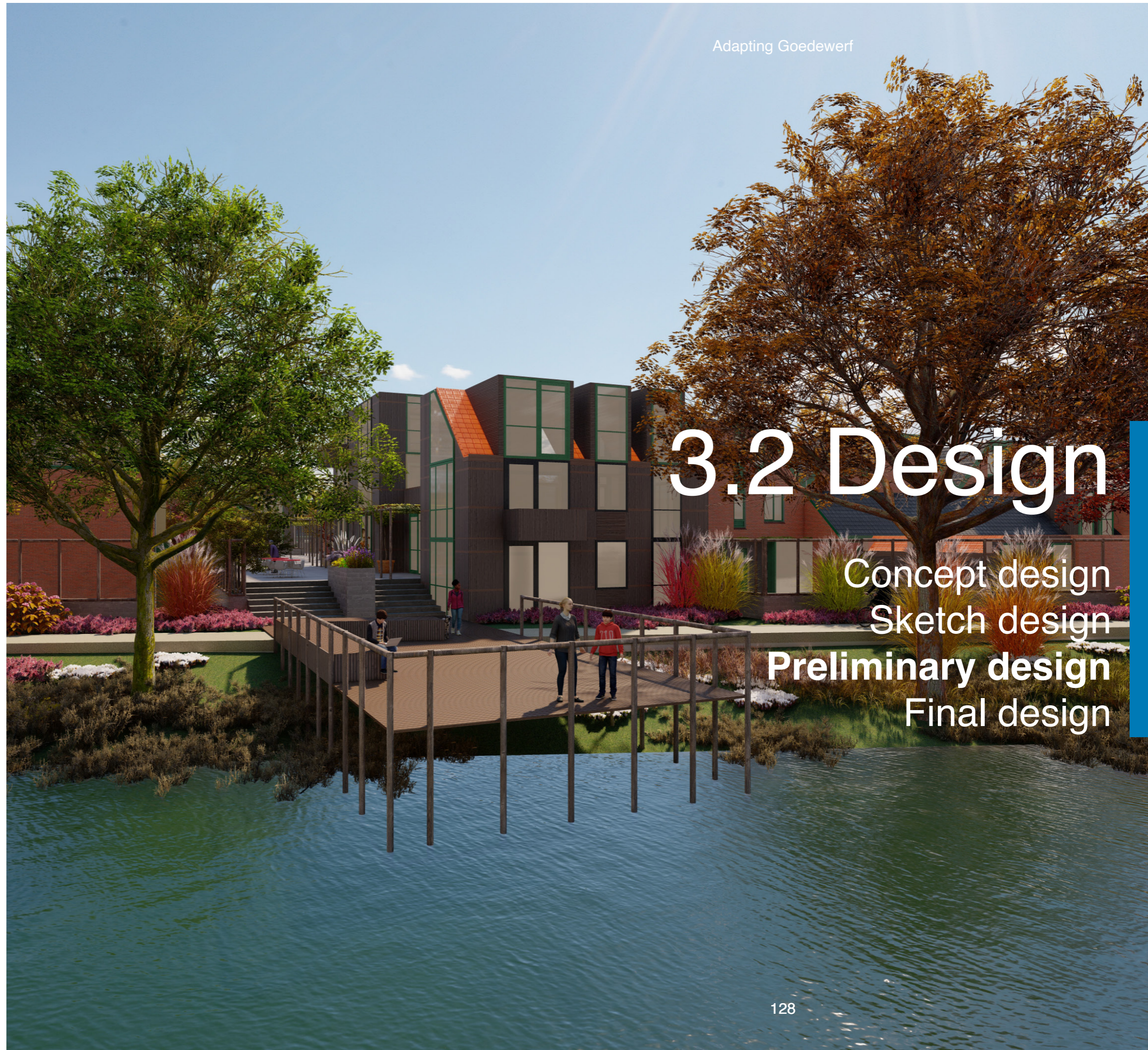
All design drawings, sketches and images are made by and belong to the author

Adapting Goedewerf

3.2 Design

Concept design
Sketch design
Preliminary design
Final design

Image 46: Final design (Image by author)



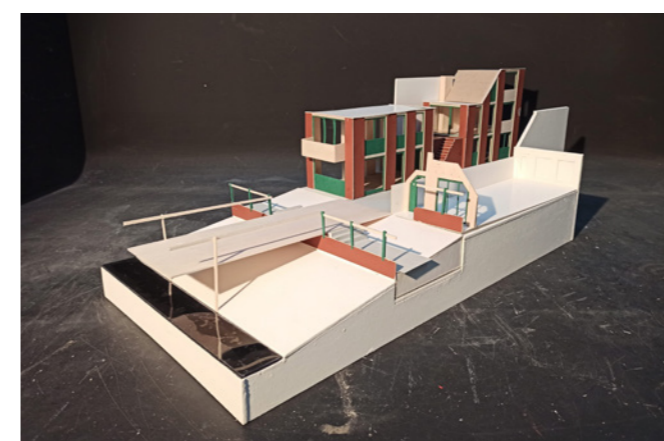
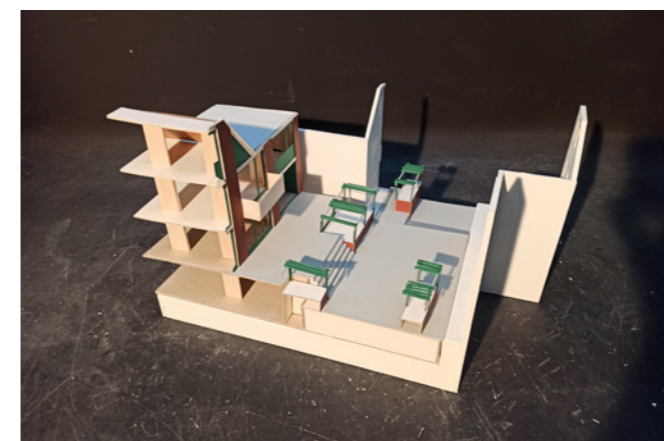
Preliminary design



During the P3 period the sketch design was elaborated en deepened towards a complete and coherent plan. This required a lot of design work, including some more or less succesfull form-studies in physical and digital model. But there was also some research to do. Since the design as it was developed in the previous designphase was not quite realistic a set of more contemporary cases was to investigate which approaches towards adaptability are successfully applied nowadays

In this phase a lot of attention was given to the appearance of the new houses and the public space, which tended to be a bit underdeveloped so far. This strengthened the design as a whole but might also have made the assignment too big too solve within this graduation studio.

Public space



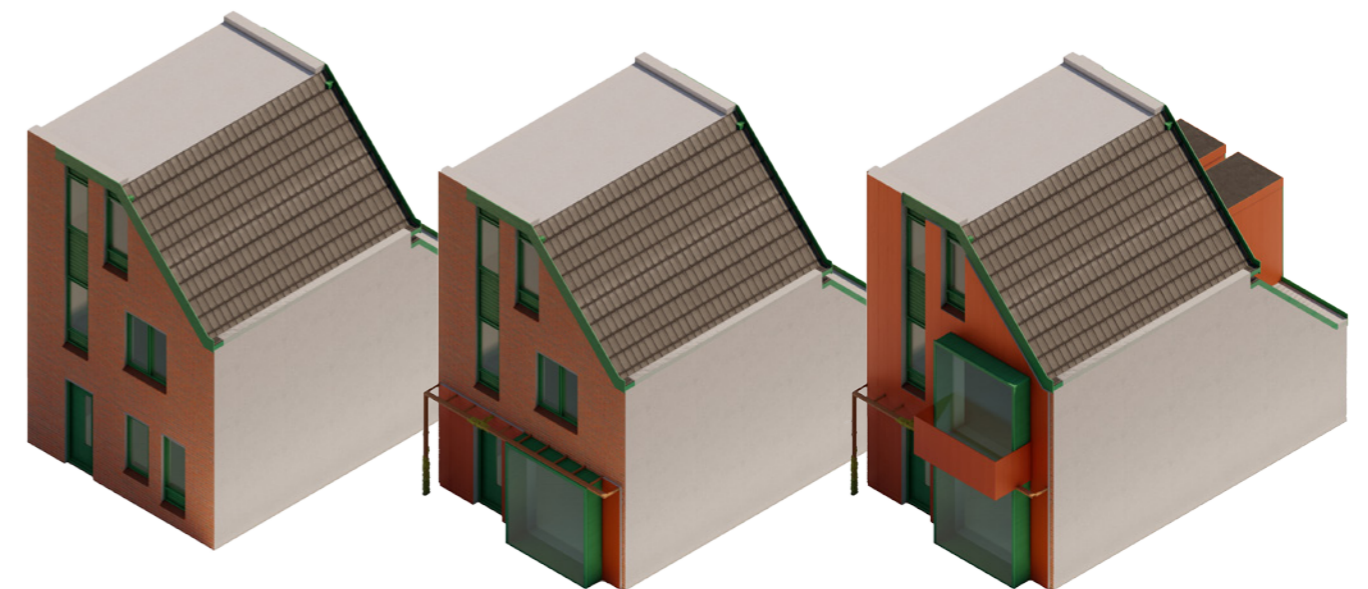
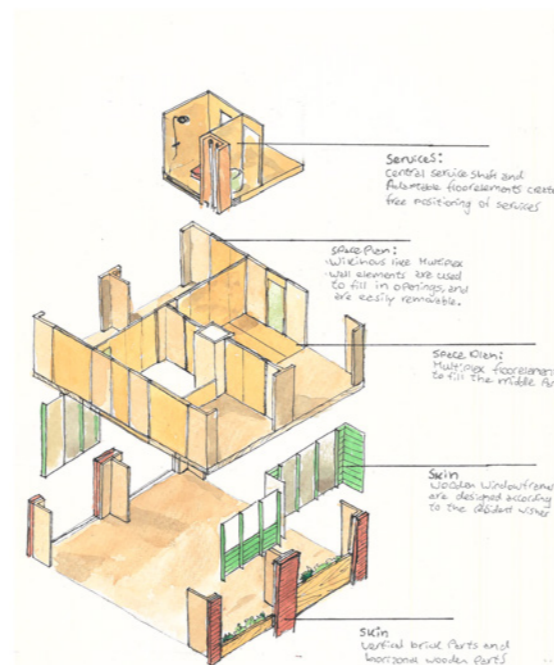
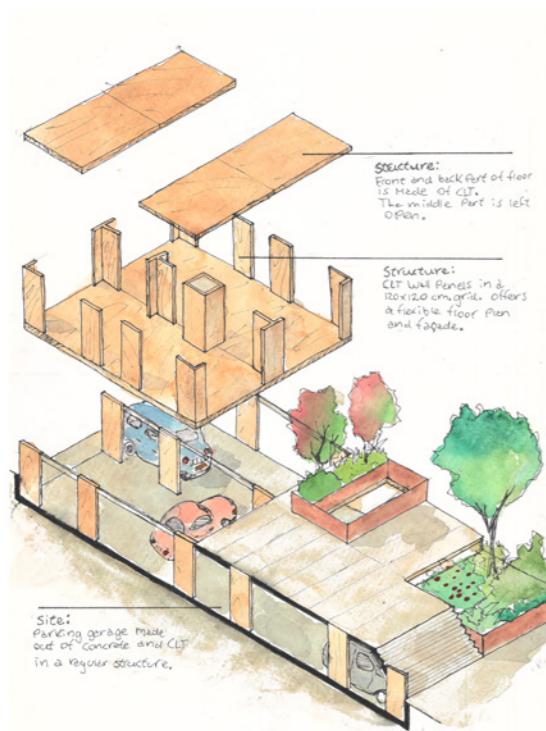
Public space



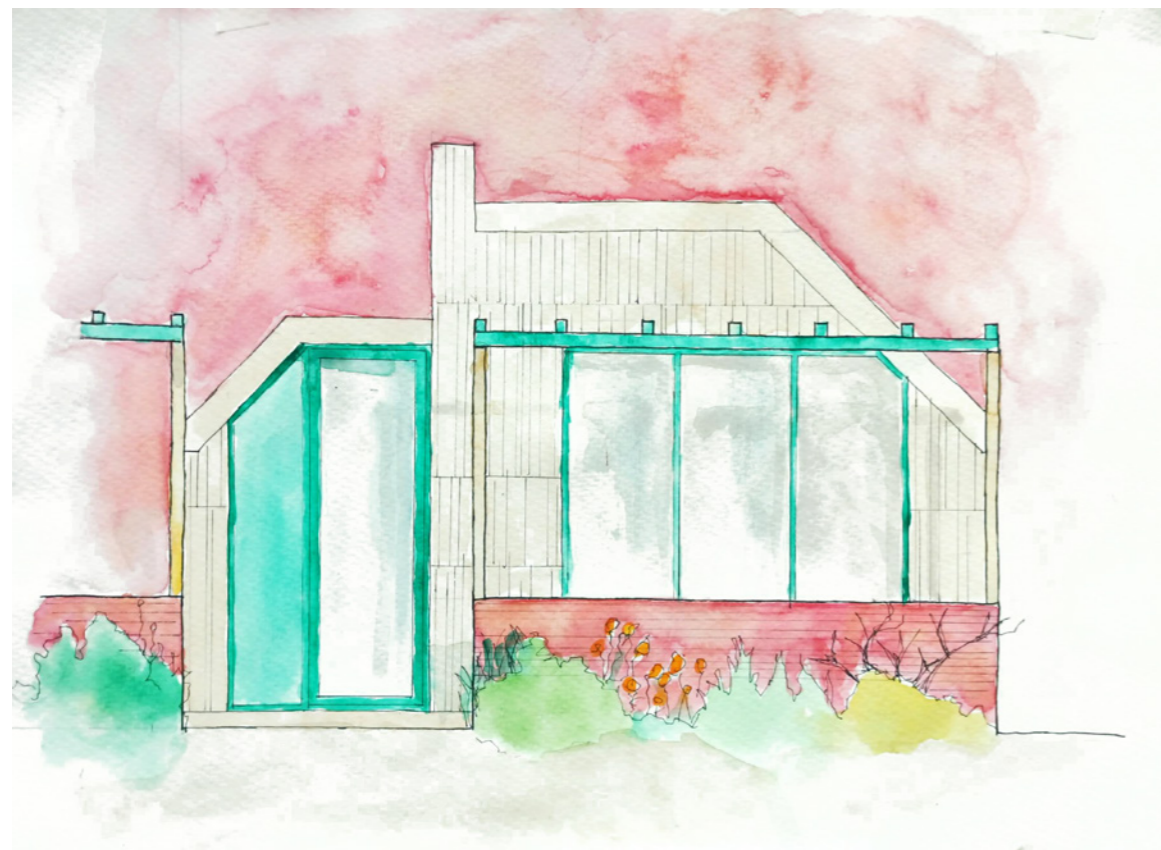
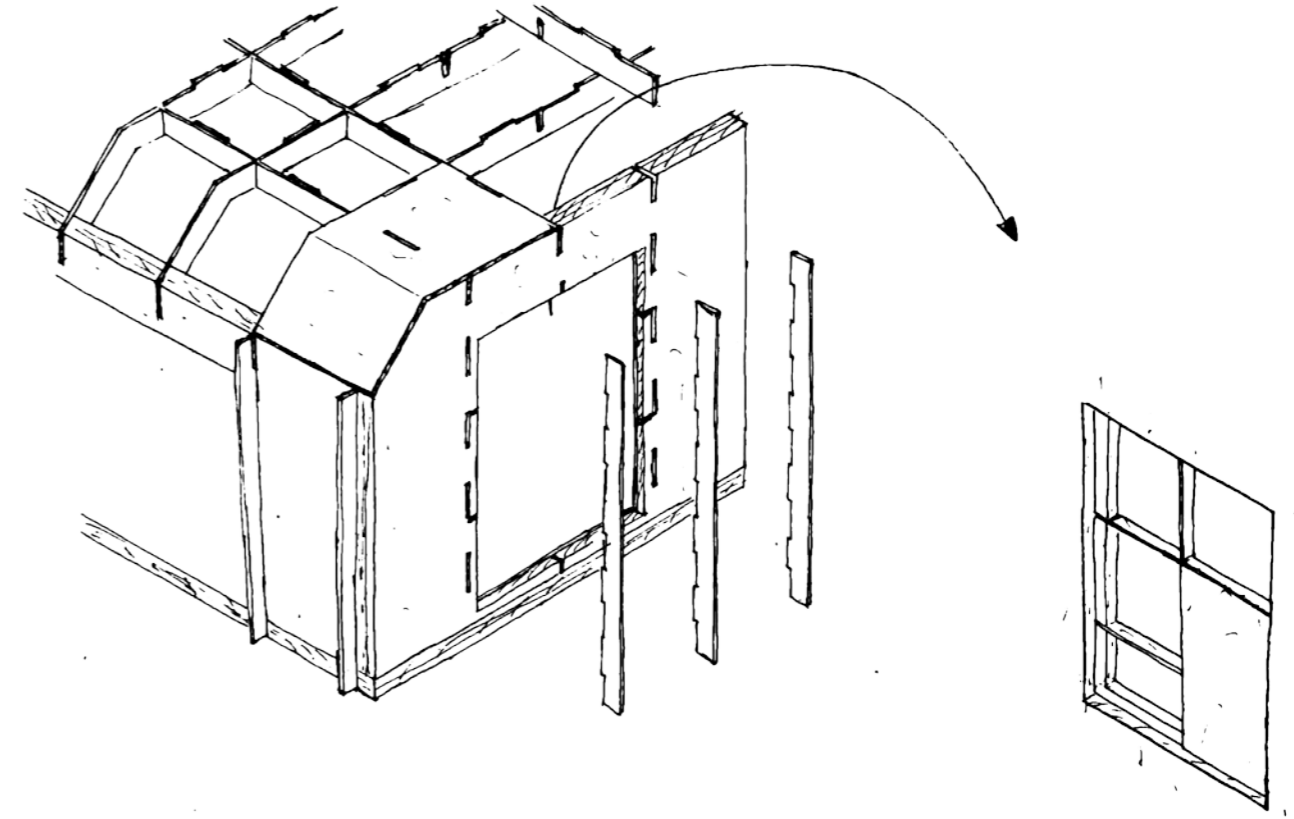
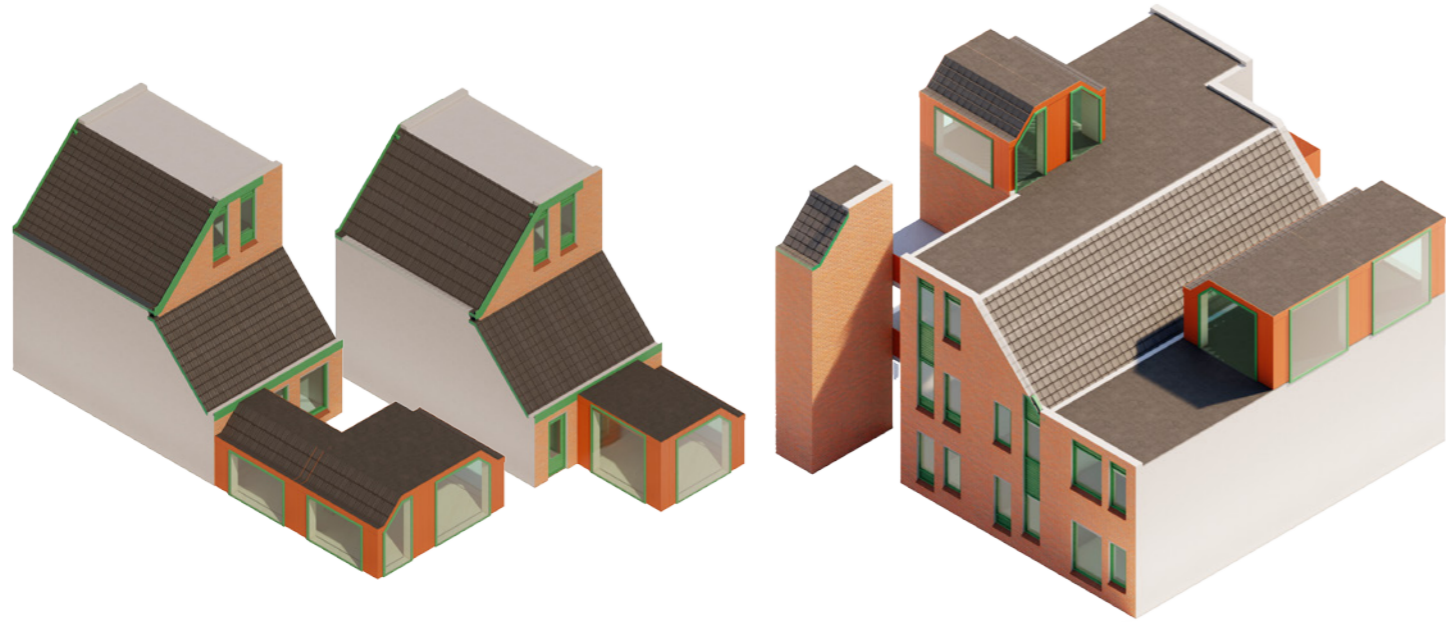
New houses



Skin



Extension



Extensions



All design drawings, sketches and images are made by and belong to the author



3.2 Design

Concept design
Sketch design
Preliminary design
Final design

Image 46: Final design (Image by author)

Final design (P4)



The pictures of the final design that are shown on the following pictures are taken from the P4 presentation. In this last part of the design process the focus was on the materialization of both the houses and liveability of the houses and development of the floorplans. This was visualised through a number of adapted and new models, but also renders of the public space and for example the series of strip-like floorplans used to explain the adaptability of the patiohouse is practice.

The focus on these elements during the last design phase on these elements was based on the design criteria makeability and functionality that were developed in the previous phases and came back in the P3 and P4 evaluations as well. Due to the limited amount of time it was necessary to focus on certain criteria in some modules. For

example the makeability of the service core module could have been elaborated more. A parallel can be drawn with the reference projects, which often focused on certain layers as well.

At the same time the evaluation of the design and research process and results was taking place. This led to the realization that although the design was an important part of the project, and essential for the graduation trajectory it is not the main outcome of the project. Instead it should be seen as a way to test the found strategies and find out how they can contribute to current issues. Thinking about the project from this perspective helped making choices and focussing on the most important elements.

Public space





Public space



Materialization



North facade

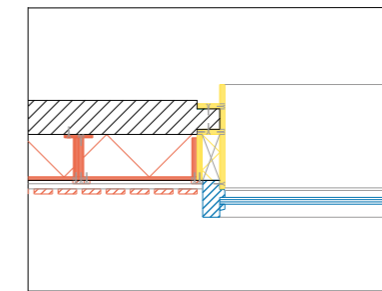


West facade

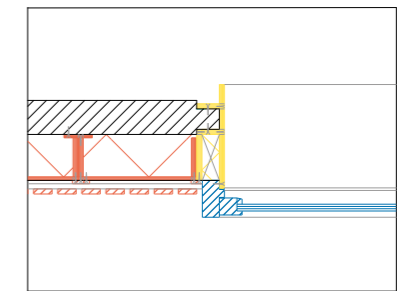
Materialization



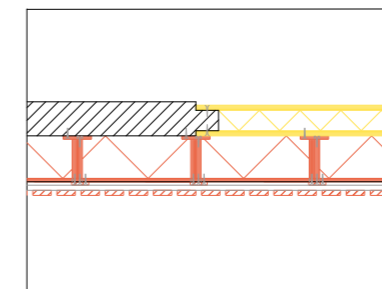
East facade



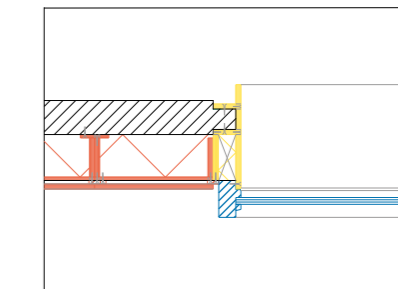
Start situation



Different windowframes



New infill wall

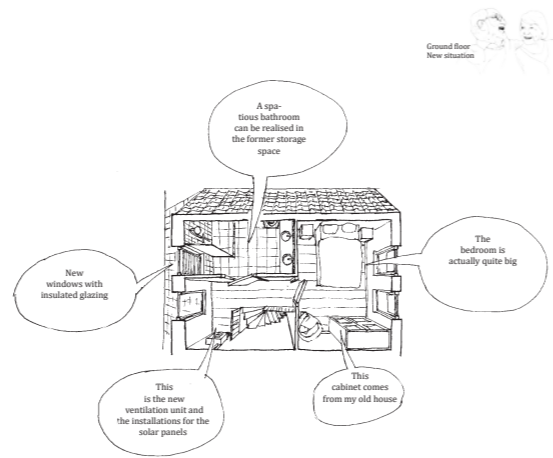
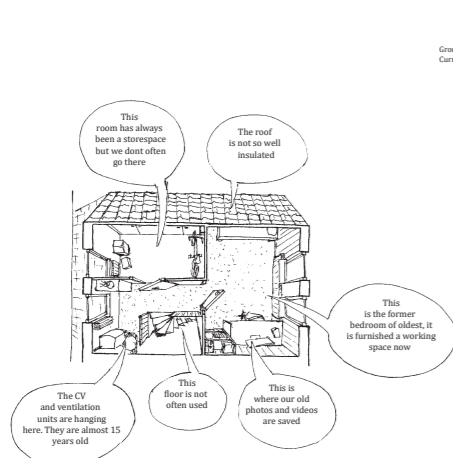
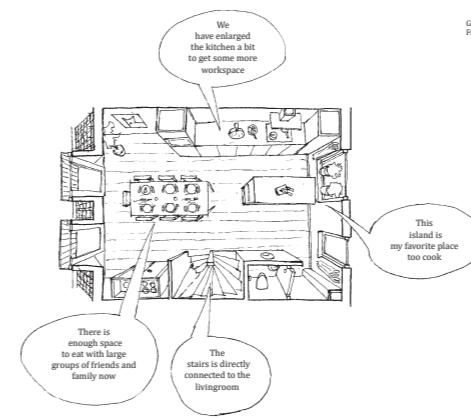
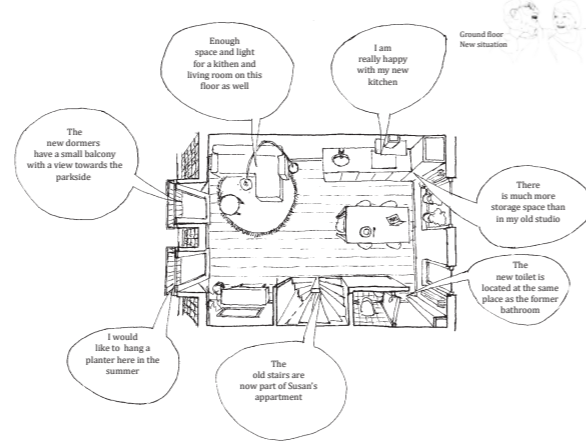
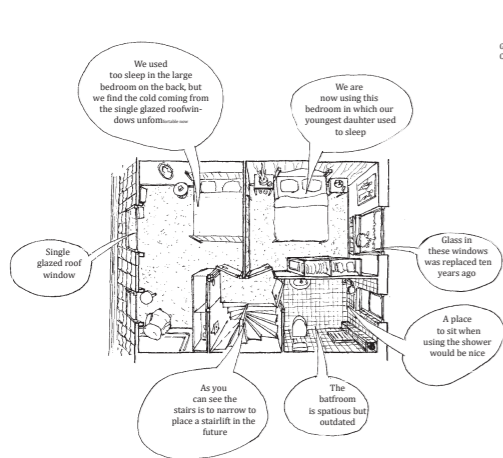
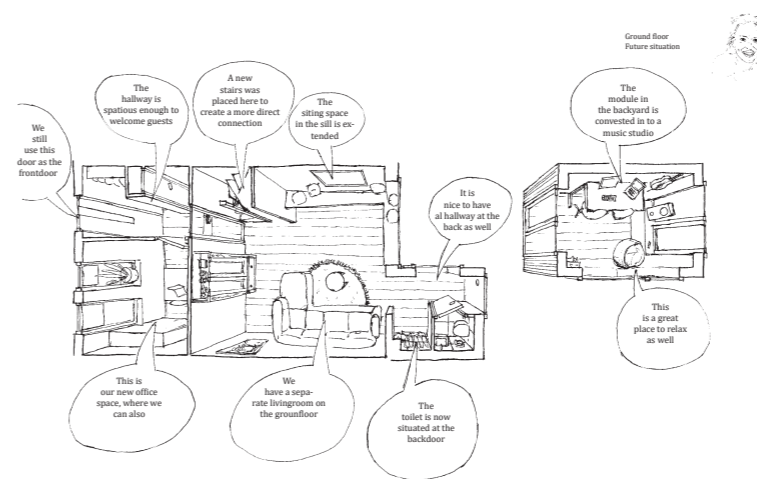
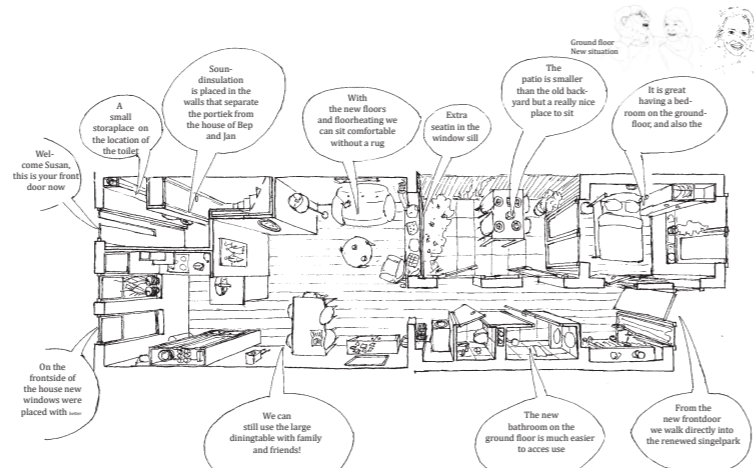
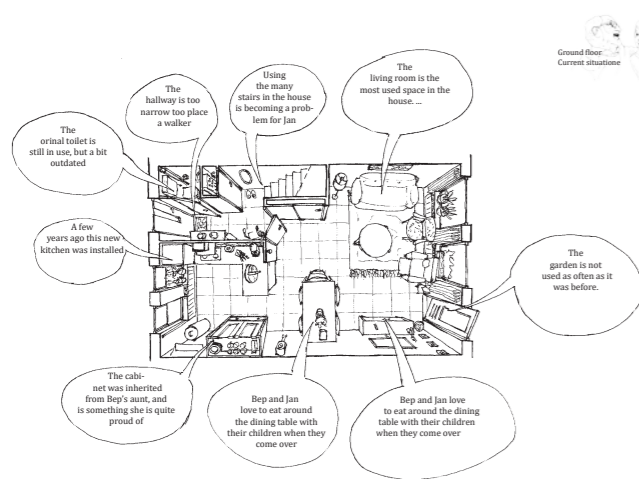


Different facade material

Detailing - horizontal detail

Floorplans

Floorplans



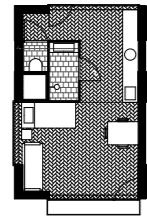
Current floorplans

Adapted floorplans

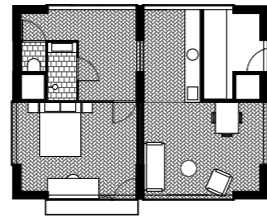
Future floorplans

Floorplans

Lucas

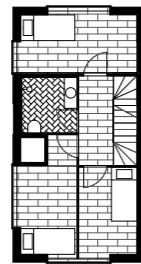
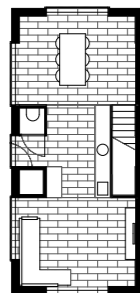


Now



Future

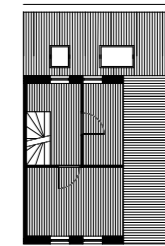
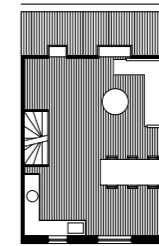
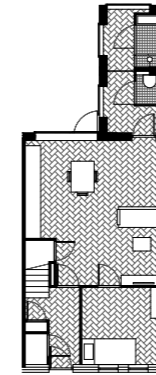
Alisha & children



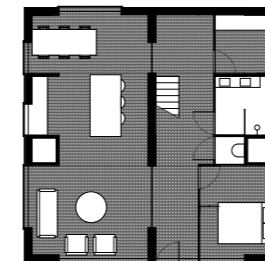
Apartment/single family house mix

Floorplans

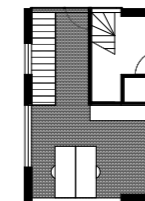
Ed, Sam & Esra



John & Tamara

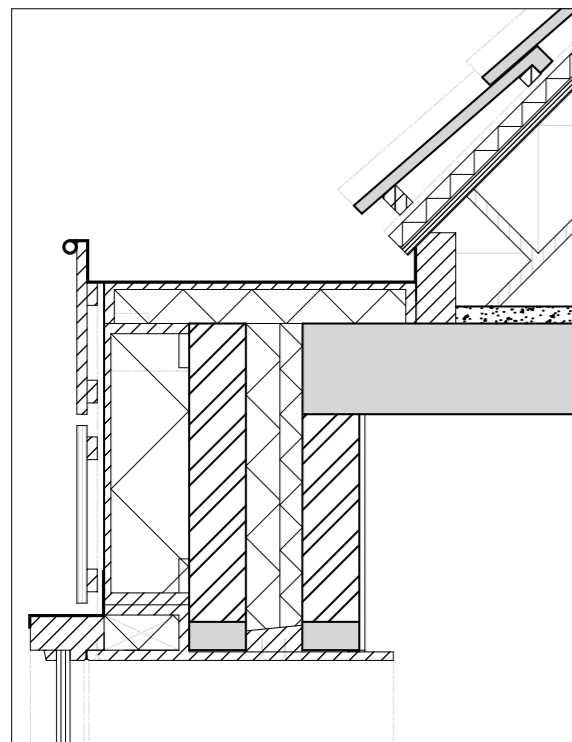
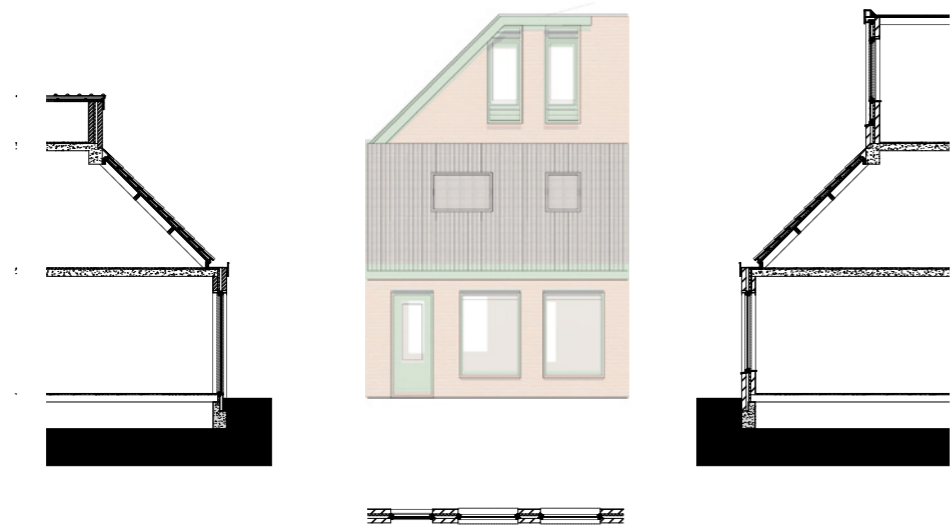


House - long term



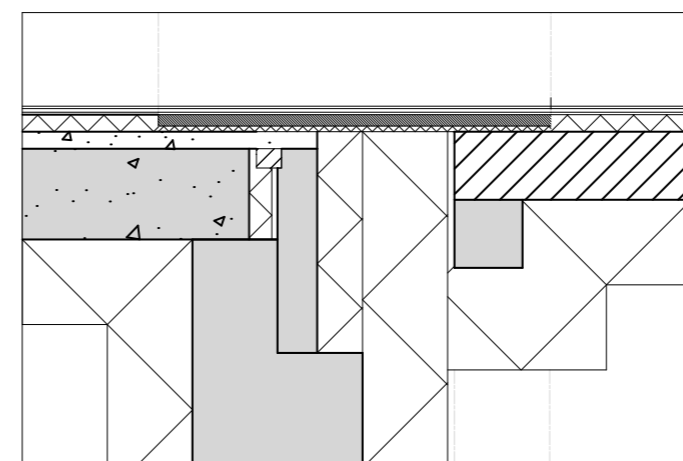
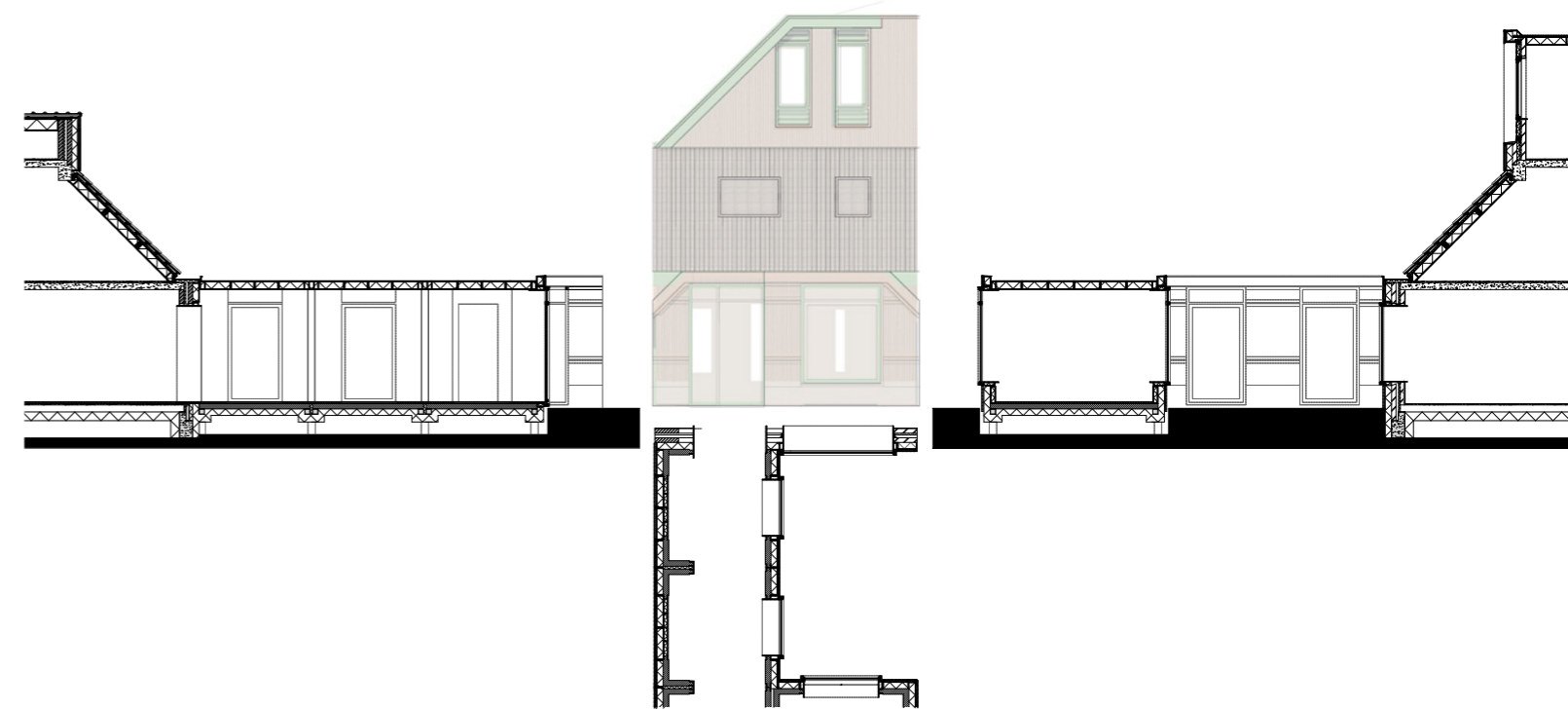
Workspace - Long term

Materialization



- Wall:**
- 18 mm Platowood
 - 20 mm horizontal and vertical slat
 - vapor permeable foil
 - 150 mm prefab element (hamp insulation and multiplex)
 - 100 mm brickwork
 - 50 EPS cavity insulation
 - 40 mm glass wool insulation
 - 100 mm brickwork
 - 10 stuc layer

Materialization



- Floor:**
- 168 mm steel tubular piles
 - 150 mm waterproof insulation
 - 120 mm CLT floor
 - 30 mm floor finishing with floor heating
 - 12 mm parquet

4.1 Evaluate

Design evaluation
Reflection paper

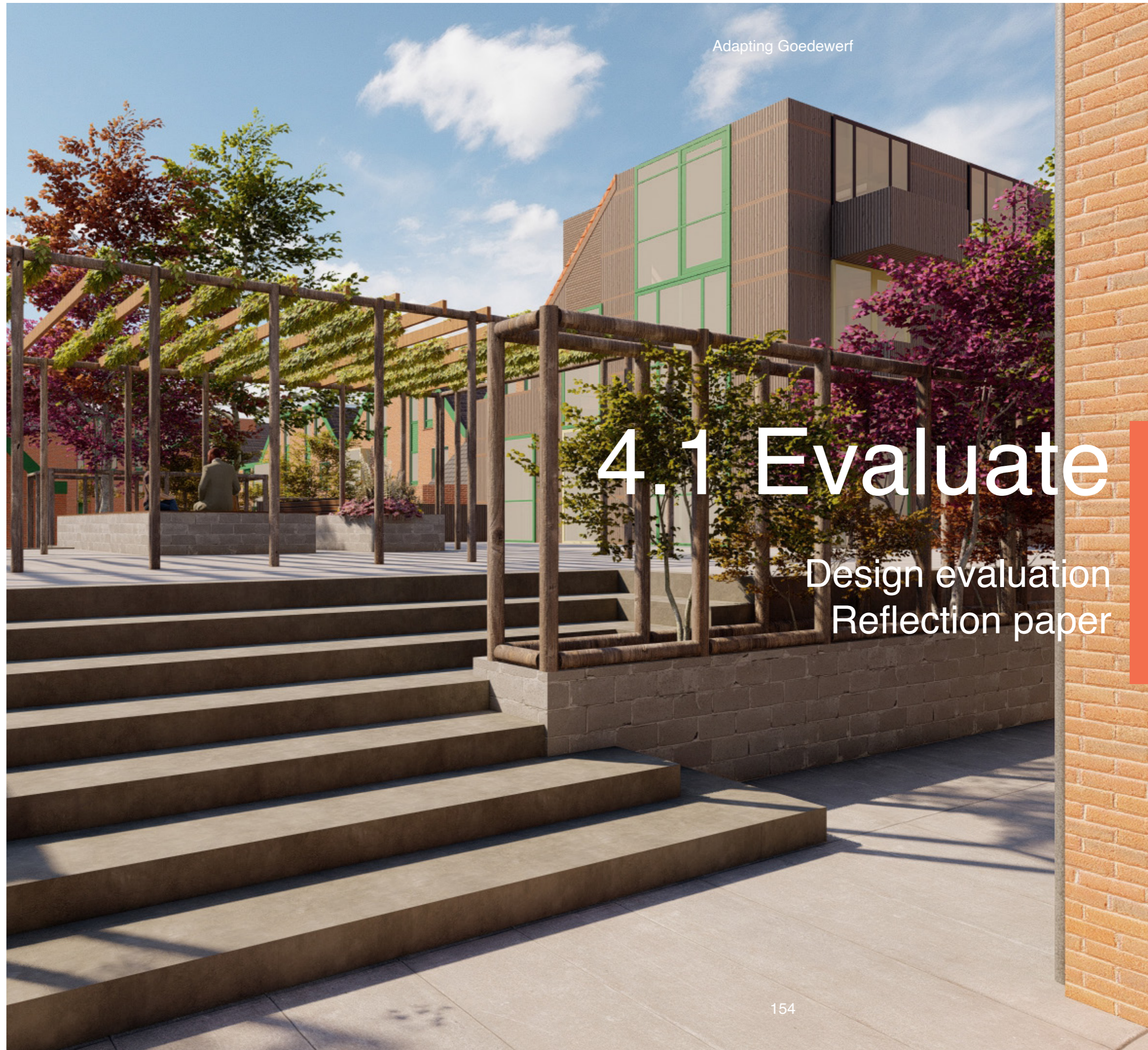


Image 47: Design modules (Image by author)

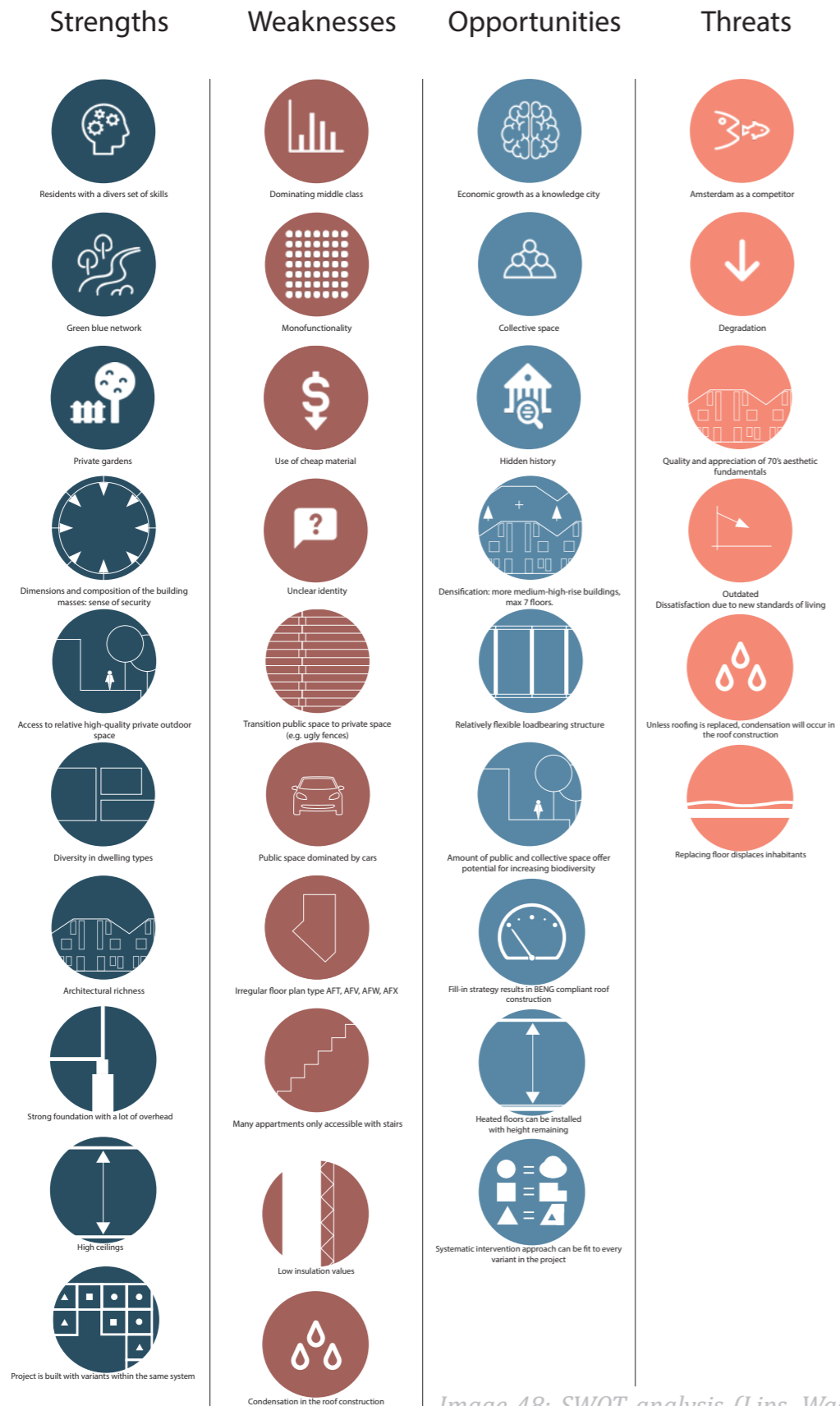


Image 48: SWOT analysis (Lips, Waaldijk, Riepe-ma, Voermans, & Jansen, 2021)

Introduction

Introduction:

A graduation project within the New Heritage studio, as a part of the architecture track, consists of two interwoven parts. At first the research part, and secondly the actual design project. In this project the personal part consisted of the research into adaptability in nineteen-seventies experimental housing, and the design part focussed on the densification and renovation of Goedewerf. The research question for the whole project is: *How can strategies for adaptability and appropriation as used in the experimental housing from the nineteen-seventies be reused in sustainable renovation and densification of neighborhoods from this period?* This question shows that the final purpose of the project was neither the redesign of Goedewerf nor the analysis of the casestudies. But rather to find out how the lessons from these Experimental housing Program (Ministerie van VROM, 1968-1979) can be implemented in contemporary renovation and densification of similar neighbourhoods. It is therefore essential to make a good evaluation of the final design and the way the research contributed to it. Throughout the whole graduation report it was tried to lay this connection. In this final chapter a short summary of the conclusions will be given.

Qualities of the final design

In the group analysis that was made at the beginning of the project a collective SWOT analysis was created that gave an overview of the qualities and problems of the neighbourhood. In the final design a number of these issues were addressed using the strategies found in experimental housing. In this conclusion I would like to highlight

a number of successes but also some risks of the chosen approach.

The traditional character of Goedewerf that refers to historic cities and attempts to create a human scale result in qualities such as architectural richness, a diversity of variations within the same system, diversity in dwelling types and a sense of security. In the design these qualities were taken as a guideline to develop the new housing and extensions. This approach resulted in a recognisable visual unity within the neighbourhood, while there is This could be a first lesson for future projects: to make a neighbourhood more adaptable it is essential to understand its current character and the way it was intended to change. The three groups that were found in the analysis and the matrix method might be helpful in identifying what the character of a neighbourhood is. Taking these existing qualities seemed to be a successful strategy, at least in this project.

One of the bigger weaknesses, but also opportunities within Goedewerf was the quality of the public space. Currently it is very car dominated at the streetside while on the other sides fences are creating an unattractive backside. In the design the solution for this is sought in two strategies. On the large scale a subdivision is made between different environments in the neighbourhood: a park, a garden, streets and squares. In the design of the interventions in each zone unity is created by making an "urban frame" in the form of walls, planters and pergolas that separate private and public and different traffic flows. The potential of the public space is also used for the densification by adding new houses on top of the elevated squares on top of parking garages. In this way the improvements of the quality of the public space

Qualities of the design

that is required for the densification can also be financed. Nevertheless it means quite a large intervention that also has a negative effects for the residents on a short term and may not be desirable in every situation. To apply such a strategy in practise it would be important to develop a good participation process. In such a trajectory residents should be able tell what they like about their neighbourhood, for example by filling in a “speurtocht” like the one that was done for the “renoveren met respect” project, and what problems they experience. But even more important may be to actively involve them in the design process, the Molenvliet project might give some inspiration of how this was done in the seventies while . An approach like this would also fit within the spirit of the Faro convention, and thereby suit the current ideas regarding post 65 heritage.

Despite all the inspiration that the found strategies can offer, there are also some risks. One of the weaknesses of Goedewerf, and seventies architecture in general, is the sometimes cheap and low quality materialisation. This is partly due to the economic situation in the construction period but also caused by the complexity and lack of refinement of the design. The experimental character of the new design with relatively new materials and techniques that are intended for a relatively short lifespan and intended to be adapted might cause a similar appearance. Although the preservation of qualitative elements of the existing buildings, the relatively clear structure of the new houses and design are intended to tackle this risk it might come up again in the future. For future projects this might be a risk as well, especially in neighbourhoods with a current quality of materialization that is lower than it is in Goedewerf. To prevent this it is important to not

only pay attention to the adaptable elements in the design, such as the modules in this case, but also design a solid bases. Habrakens separation of support and infill could be a good tool when thinking about this.

Kamari evaluation

In the same way as it was done with the collective scenario studies that were done in the beginning of the project the final design can also be evaluated using the Kamari model (Kamari, Corrao, & Kirkegaard, 2017). This was done after the pre-final presentation of the design and gives an insight in the potential of the design and the used approaches from a wide variety of perspectives. The outcomes can be found in image 49. This evaluation is not supposed to be hundred percent accurate but helps getting an insight in the strengths and weaknesses of the projects. In the case of this project it shows how it focussed on the social and energetic elements, while aesthetics and economic components played a smaller role.

Conclusions

To answer the research question that was mentioned in the introduction of this chapter a number of conclusions can be drawn.

How can strategies for adaptability and appropriation as used in the experimental housing from the nineteen-seventies be reused in sustainable renovation and densification of neighborhoods from this period?

Lesson 1: Position the neighbourhood and find its current qualities

The analysis of eight case studies from the ex-

Conclusions

perimental housing program showed that there was a variety of ideas and solutions regarding adaptable housing. It also is a topic that stood on itself but was part of the a larger search for affordable qualitative housing. By subdividing the architecture in different groups or families one can gain insight in this whole spectrum. The redesign of Goedewerf showed that framing a neighbourhood as part of one of these groups helps understanding current issues.

Lesson 2: Learn from contemporary precedents
Learning from seventies is definitely valuable and shows the potential of different approaches. But once we know how adaptable buildings were designed in the seventies and how this relates to the project at stake is also important to look at the way the in which the desired approach is already executed in contemporary projects. This is important because both the case studies and the design made it clear that developing a whole project only based on abstract strategies is not realistic. Taking solutions from other projects on a certain layer while developing new ones one others ones would be a more valuable strategy.

Lesson 3: Residents participation

As said in an earlier paragraph residents participation is important to come to a successful projects. Adaptability depends on people and the chosen strategies should be based on the needs and wishes of the residents. Also the desired level of densification, which is defining for the approach for the public space can be discussed.

Lesson 4: Think about lifecycles and quality of materials

The experimental and temporary character of a project like this one makes it vulnerable for de-

cay and misuse. This might have happened in some of the casestudy projects as well. Further research into the way they have been adapted over time and what kind of maintenance was required might be valuable to prevent similar problems in new projects.

Kamari evaluation

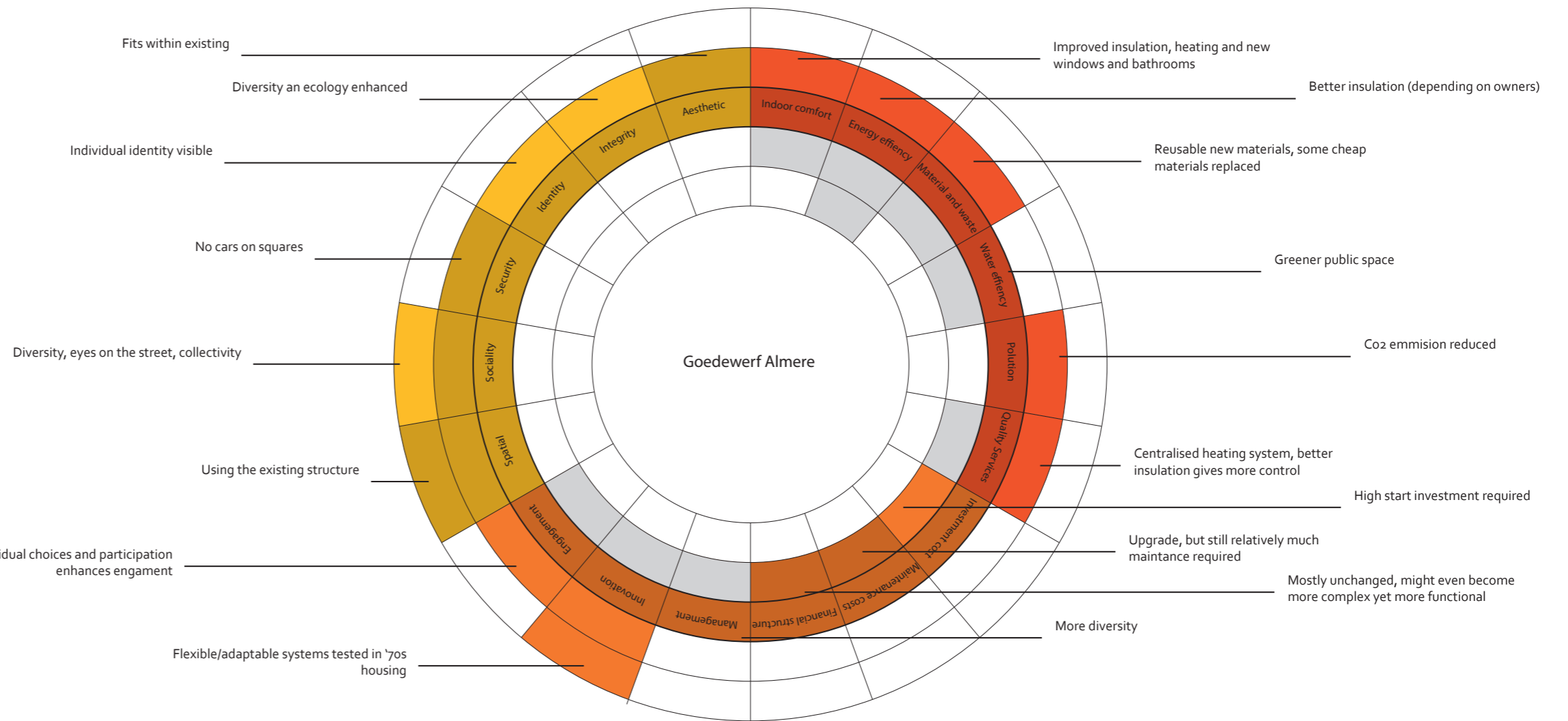
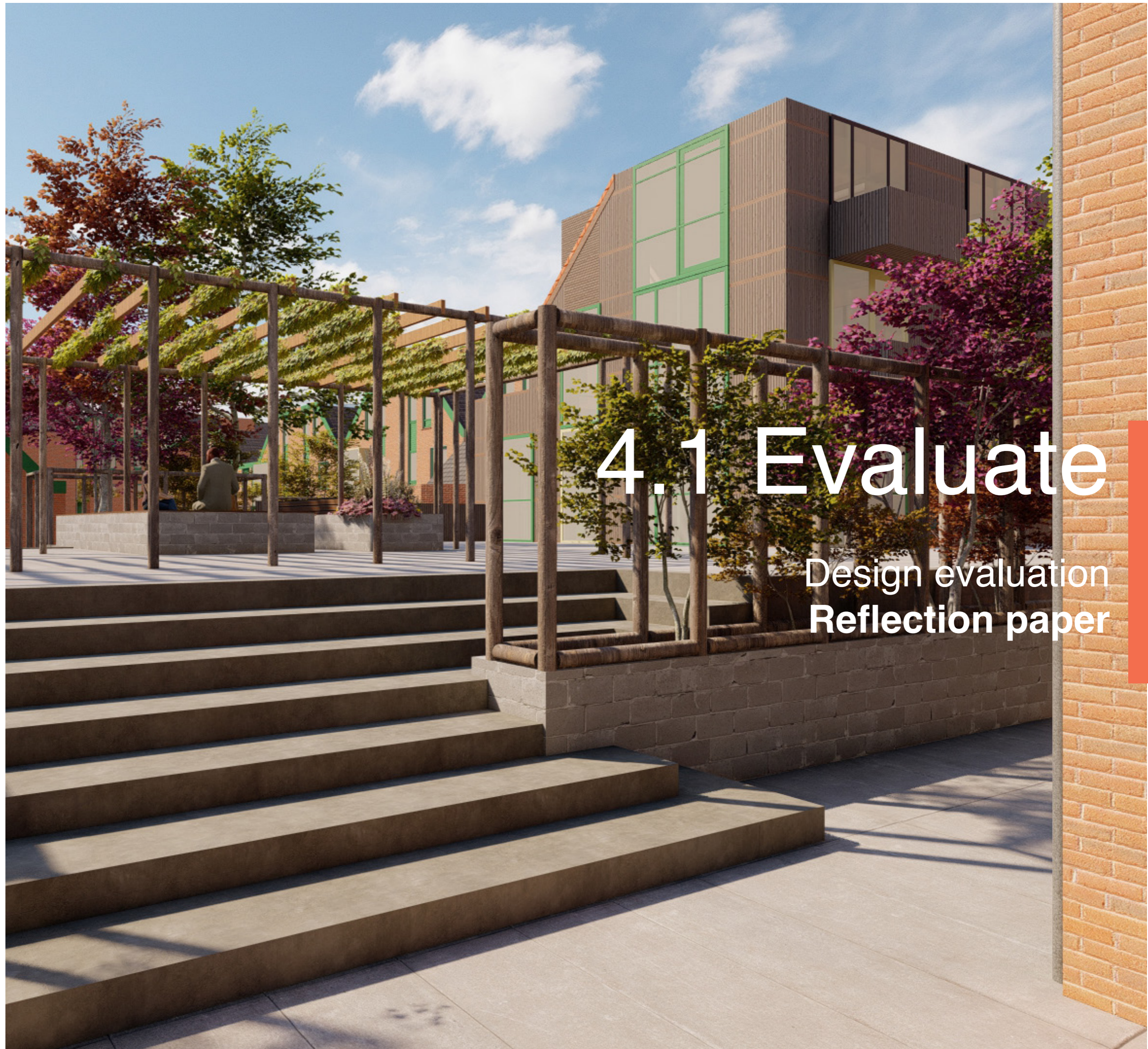


Image 49: Kamari evaluation (Image by author)



4.1 Evaluate

Design evaluation
Reflection paper

Image 50: Design modules (Image by author)

1. Introduction

Introduction

This graduation project was executed in a year in which the world around seemed to go from crisis to crisis. The Covid-19 pandemic had hardly passed by when a war started in the east of Europe. These urgent crises need all of our attention, but at the same time there are also slower and less visible disasters taking place caused global warming. On a more local level are rising prices of both housing and energy causing trouble for especially lower-income households in the Netherlands.

The New Heritage graduation studio tries to address societal issues around the climate crisis and the need for more housing within the context of a group of buildings that contain a large part of our housing stock: post-65 housing. These houses, built between 1965 and 1990 are currently about 30-50 years old and often in need of a first round of round of renovations. This offers opportunities to improve the technical qualities of the often poorly insulated houses, but also gives opportunities for densification by adding new houses within existing neighbourhoods. Within the studio research is done in the architectural qualities and potential heritage value of housing from this period, and how they relate to current interventions. These values and qualities are often not (yet) recognised by the main public and might be threatened by the current interventions.

In the studio two neighbourhoods were used as casestudies: Goedewerf in Almere Haven and Bijlmerplein in Amsterdam Zuidoost. Both cases are chosen as representatives the different types of housing that were built in this period and are considered characteristic for the whole housing

stock from this period. These neighbourhoods were also used as cases for the research project *Renoveren met Respect* in which the mentors of this studio also collaborate. This project is executed by the TU Delft supported by the Dutch Cultural Heritage Agency. In the studio collective research was done into both neighbourhoods in the form of an analysis and through the development of so-called “renovation models” that were also used as input for the *Renoveren met respect* project.

Next to the collective research the graduation studio also consists of an individual research and design part that focusses on specific themes and one of the case studies. On the bases of the collective research I concluded that the potential heritage value/quality of Goedewerf (and similar neighbourhoods) is not only in its architecture but also in the value that they have for the people that lived there and their personal memories and the way they use their neighbourhood. To preserve and even strengthen that personal relationship between the residents and their houses the point of departure of this project is to enable them to adapt their own houses and neighbourhoods to their future needs.

In this research I chose to investigate the theme of adaptability and test if improving the adaptability of post 65 neighbourhoods could help solving climate and housing related problems in these neighbourhoods. The main question for this individual part of the project is: How can strategies for adaptability and appropriation as used in the experimental housing from the nineteen-seventies be reused in sustainable renovation and densification of neighbourhoods from this period?

Image 51: Goedewerf (Image by author)

2. Methods

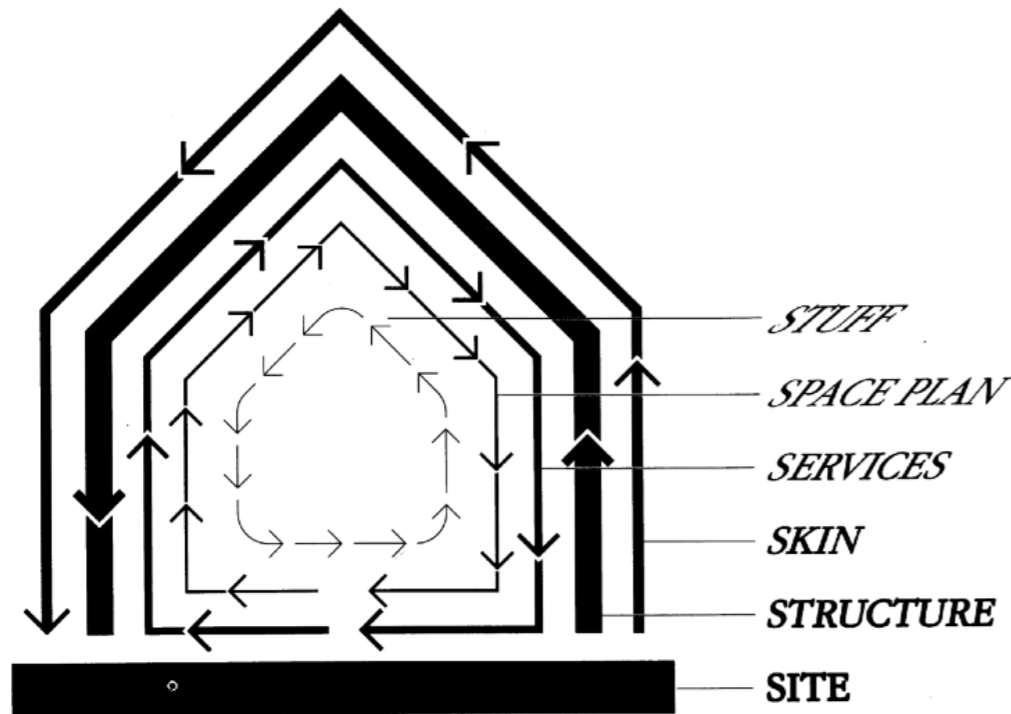
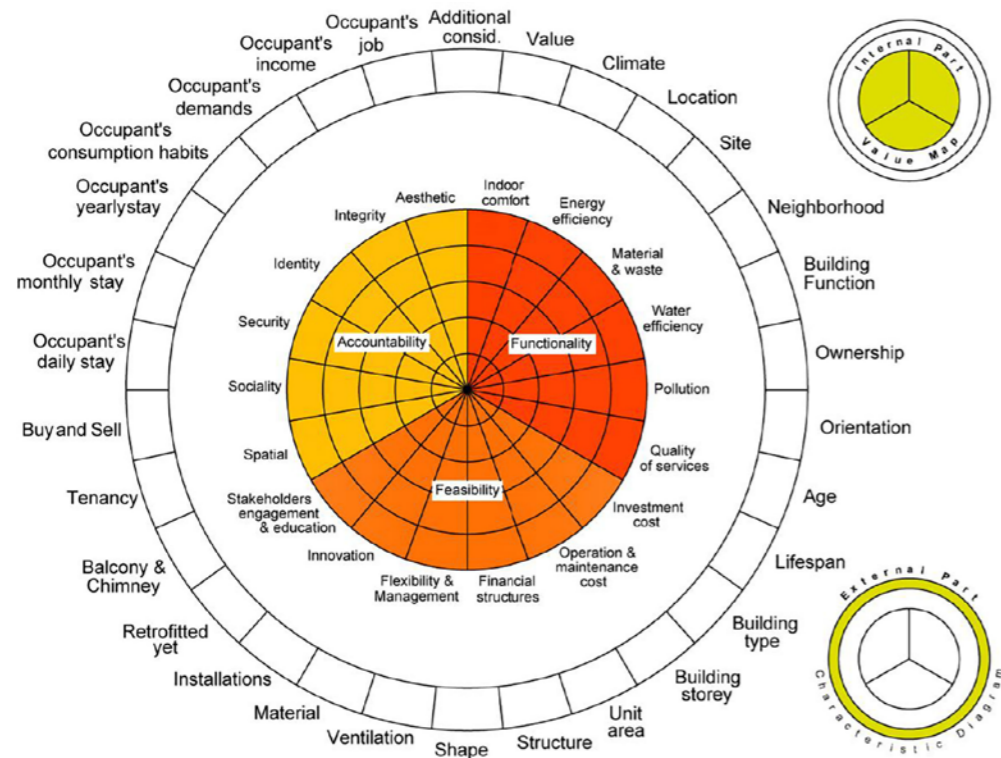


Image 52: The Kamari model (Kamari, Corrao, & Kirkegaard, 2017)

Image 53: Shearing layers of change (Brand, 1994)

This reflection paper summarises the research and design process that was followed to answer this question and addresses the significance and quality of the outcomes, ethical dilemmas and the relation to the studio, chair, and mastertrack. Thereby it works as a self-evaluation for me as a student and gives insight in the process that led to the graduation project.

Methods

Within the chair of Heritage & Architecture a value based design approach, in which research into heritage values and technical characteristics of an existing building are the bases for a (re)design is common. This is different from most renovation projects that are currently taking place in post-65 neighbourhoods in which a more pragmatic approach is followed, technical improvements are made on the bases of practical and financial arguments.

In the collectively made renovation models an attempt was made to combine those different perspectives on renovation in a more holistic way of working. Therefore, a model by (Kamari, Corrao, & Kirkegaard, 2017) was used to assess the current value of both neighbourhood from different perspectives (referred to further as the 'Kamari'-model). This was done by all the students together, and also discussed in a Renoveren met Respect zoom meeting. In this meeting the approach and preliminary findings of the project were shared and tested with a group of representatives from relevant stakeholders in the transformation of post-65 neighbourhoods (such as architects, housing corporations and municipalities). On both occasions it turned out that some confusion may be caused by the different terms

used in the involved disciplines, and the ones introduced by Kamari. On the bases of the value assessment different scenarios were developed in which the influence of different (extreme) interventions on all values was shown. Again it turned out to be hard to determine exactly what each value meant and how to measure the way they would change as a result of a certain intervention. Nevertheless the scenarios would form important input for the design process in at least two different ways. They firstly served a kind of toolkit of different interventions to choose from but also the scenario-based way of thinking would have a big influence on the design process.

In the personal research on adaptability Steward Brands Shearing Layers model (Brand, 1994) and Bernhard Leupen's ideas about different types of adaptability (Leupen, 2006) served as a theoretical bases for the analysis of eight case studies. In each case different ways of adaptable designing on the different layers were identified and mapped in different ways. The initial purpose of this research was to find a set of strategies for adaptable design that were used in the nineteen seventies. However, throughout the research process it became clear that the diversity in projects was too big too define one set of strategies. This made the mapping process more complicated than expected. To solve this problem the decision was made to subdivide the cases in three different groups based on the applied strategies and their architectural characteristics. For each of these groups some typical adaptable elements were described and used in three scenarios for the future development of Goedewerf. These scenarios formed the start of the actual design process.

3. Approach/relevance

In the design process the scenario based way of thinking in combination with the layered way of thinking based on Brand's sharing layers model was again important. Investigation of different scenarios through study models and sketches, after which they were evaluated. The purpose of these scenarios in the design was not to choose the best one put to pick and combine elements from each of them to come to a real design. Another method that I am using in the design is testing through the wishes of (fictional) residents, the wishes of these residents are in this way becoming part of the design brief.

Approach and relevance

During the first weeks of the graduation studio an important task next to the collective work for each student is to find their own fascination within the field of the studio. While walking through Goedewerf and Bijlmerplein an reading the documentation I got interested in the way the housing in the neighbourhood were already adapted by their users. I started to wonder if it was possible to make a plan that would not bring back the original design, and thereby erases the traces of the life in the past 50 years or create something completely new but which uses the different wishes and qualities of all residents to adapt the existing buildings. This would potentially create a more layered architecture comparable to the way historic cities "organically" developed. My first fascination was found.

This idea would also be relevant from a societal and scientific perspective because a more flexible use of the available spaces and structures, in combination with possibilities to build within existing city can help addressing climate

and housing issues. If my idea would be realistic it could also help to use the potential of existing communities within the neighbourhoods rather than disturbing them. My research and design project would become a testcase to see if enhancing this adaptability would really be effective in addressing these issues and which strategies for adaptability are the most effective in doing this. As explained in the previous chapter I used historic references as inspiration for my own design. In the original research plan I selected a set of references based on my own preference, after some feedback by the design and main mentor I decided to use a set of eight cases from a nineteen-seventies housing program. This program executed by the former ministry of "Volkshuisvesting en Ruimtelijke Ordening" was called Experimentele Woningbouwprojecten / Ontwerpen met Predicaat. All projects in this program were documented in a series of booklet with the same name (Ministerie van VROM, 1968-1979) and therefore better documented. This saved me a lot of time and made me realise that my original plan may have been too ambitious. During the design process I have faced similar situations in which it I found it hard to choose which elements of my plan were really important and had to be worked out and which were not. The weekly meetings really helped to tackle these issues.

The original plans of the selected projects were analysed to identify the applied strategies were supposed to lead to an adaptable architecture. As mentioned in the previous paragraph this resulted in an overview of three groups of buildings with a similar approach. One project from each group was visited to get an impression of their current state. This approach resulted in an interesting overview of the wide variety of attitudes

4. Ethical issues

towards adaptability that were presented in the cases and a good starting point a source of inspiration for the design process. However it does not give a representative insight in the actual effects that the approaches have on the way these buildings were adapted in reality.

Ethical issues and dilemma's

The design of housing does by definition have a huge impact on society and people's personal life. Frans van der Werf (Van der Werf, 1993) describes how he used consultation hours to design the plan of each house in Molenvliet in corporation with the future resident, and how they told him about rather personal preferences they had for their home. It was hard for me to reach this level of sensitivity for residents wishes within a "fictional" graduation project. The use of a more generic modular system that could be applied in different ways in combination with the introduction of a group of fictional residents offered a way out for this project. On the other hand this thrives the project away from a reality in which residents may have more specific wishes which influence the design process and outcomes.

The relationship between financial aspects, residents wishes and heritage values did also give some dilemma's. For example, the aesthetic unity within the neighbourhood was important from a heritage perspective, but does limit residents in their personal freedom. My personal preference in this case would be to keep or even strengthen this unity, which would also give the most attractive design on paper but would again not necessarily work in reality.

Conclusion and recommendations

The main question for the personal project was: How can strategies for adaptability and appropriation as used in the experimental housing from the nineteen-seventies be reused in sustainable renovation and densification of neighbourhoods from this period? To answer that question a set of case study projects were used to investigate which approaches towards adaptability were present in seventies (experimental) housing. In the design project in Goedewerf the potential of these approaches in the current situation was tested. This was done within the New Heritage studio framework in which a scenario-based way of working in combination with the holistic evaluation of potential interventions were important factors. Throughout the project it became clear that the variety of strategies present in the selected cases was quite wide. This made it complex to come to a complete overview of all strategies, and a complete scientific evaluation of them turned out to be a too ambitious purpose. However the combination of a subdivision of the strategies in different groups in combination with a more designerly, scenario-based way of thinking turned out to be quite successful.

In this graduation project the evaluation of different scenarios for Goedewerf led to the decision to continue with modular system that matches both our contemporary way of thinking about sustainable and adaptable building and the spatial structure of Goedewerf and many similar so-called "bloemkoolwijken". This does not mean that using a modular design is the only strategy from the seventies that we can or should reuse in the renovation and densification of this type of neighbourhoods. The choice to focus on one approach was necessary to come to an actual design that meets the requirements of a graduation

5. Conclusion

project within the mastertrack Architecture, but other strategies might have worked as well. The real answer to the research question should therefore not be sought in this design outcome, but in the process that led to it.

There are a number of lessons that can be learnt from the process of this project, and that could be valuable for future renovation and densification of nineteen-seventies neighbourhoods. At first it turned out to be important to investigate the spatial typology of a neighbourhood and position it within the diverse range of typologies from that period. For this the outcomes of the casestudies in this research but also the work of other students within the studio is helpful. Hopefully these efforts will contribute to a better understanding of the divers of the architecture of this period. Another lesson is to not only preserve the elements that were supposed to last but also look at the way a neighbourhood has already developed, to preserve social values that it has. Subsequently the scenario based way of working is also something that could be applied in practise. The development of scenarios based on existing strategies and the character of the neighbourhood did help finding out of the box solutions throughout the project. And although applying them in practise might seem complex the experimental housing program (Ministerie van VROM, 1968-1979) showed that it is possible. To conclude, it should be clear now that this research does not offer a ready-to-use solution for the future of post-65 neighbourhoods but can hopefully encourage others to really study all the small and big crises that architecture can cause but also solve within the rapidly changing world around us.

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