CHALMERS
UNIVERSITY OF TECHNOLOGY

TO BUILD A HOME

AN EXPLORATION OF SELF BUILDING

ALICE VALINGER - CAROLINE EKBERG

Master's Thesis at Chalmers School of Architecture
Master's Programme Design for Sustainable Development
Department of Architecture and Civil Engineering

Chalmers University of Technology
Gothenburg, Sweden 2017

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SAMMANFATTNING

Idag lider en majoritet av Sveriges kommuner av bostadsbrist. Med en snabb befolkningsutveckling och ett bostadsbyggande som inte mött samhällets efterfrågan på många år har avsaknaden av bostäder blivit allt mer akut. 710 000 bostäder måste byggas de kommande 10 åren, en utmaning som den svenska byggindustrin inte stått inför sedan miljonprogramsåren mellan 1965-1974. Skillnaden mellan Sverige då och 2010-talets Sverige är många, samhället har förändrats och den politiska diskursen med det.

Syftet med detta examensarbete är att diskutera hur självbyggeri kan organiseras på ett sätt som ger prisvärda och omsorgsfullt byggda bostäder. Arbetet kommer att fokusera på hur självbyggeri kan organiseras från finansiering till utförande och senare boende. På så sätt kommer inte enbart självbyggeriets roll i bostadskrisen beröras som ämne, utan även hur självbyggeri kan ge andra sociala fördelar så som självförverkligande, arbetstillfällen samt bidra till en ökad integration.

Målet är att undersöka möjliga tillvägagångssätt för att genomföra självbyggeriprojekt i en större grupp, både byggtekniskt och organisatoriskt. Vidare är målet att utveckla en designmetod för självbyggeri med ett konkret designförslag av bostadsenheter som är enkla att bygga för en lekman med assistans av handledare. Enheterna ska dessutom hålla en social, ekonomisk och ekologisk hållbar profil i en svensk kontext.

Arbetet har utförts genom litteraturstudier, platsbesök, studieresor, intervjuer samt studier av nutida och historiska referenser.

Resultatet är en metod för design och implementering av bostadsenheter för självbyggnation, kompletterat av en rapport som dokumenterar vår undersökning och process.

Nyckelord: självbyggeri, bostadsmarknad, social hållbarhet, bostadsbrist

ABSTRACT

A majority of the Swedish municipalities claim to have a lack of housing. With an influx of refugees and a housing market already in a poor condition, the housing shortage has become increasingly urgent during the past couple of years. This thesis intends to explore the possibilities of self building as a way to complement the housing options on today's housing market.

The purpose of this thesis is to discuss methods on how to organise self building in a way that provides affordable and considerately built dwellings. Can self building help to democratise the construction industry? By concentrating on finding new ways to organise self building from planning to use, the project will not only revolve around how self building could change the building industry, but also how it can provide other social benefits such as self-fulfilment, work and integration.

The aim of the thesis is to develop a design method for self built housing units with an overall social, economic and ecological sustainable profile in a Swedish context. The housing units will be designed in a way that makes them easy to build for a non-professional with the assistance from a tutor.

The method will be to investigate self building techniques, organisation and how to apply them in the setting of a Swedish municipality. This will be done through design, literature studies, site visits, interviews and by studying current and historical references.

The result of the thesis will be a design method for self built housing units combined with a report describing the research and process.

Key words: self building, housing market, social sustainability, housing shortage

ABOUT THE AUTHORS

Last autumn we met during the Academic Writing course. We were in the same seminar group and saw similarities in interests regarding architecture. During the autumn term we both took the studio *Design and Planning for Social Inclusion*. Though, it was not until the middle of November that we decided to put our minds together and write the thesis as a team.

We wanted to find a topic in the area of social sustainability that still was hands-on design. After finding the debate article “Låt flyktingarna bygga sina egna hus” (authors’ translation: Let the refugees build their own houses) by the architect Anders Nyquist we decided on digging deeper into the subject to understand how self building can be carried out in Sweden today.

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1.

INTRODUCTION

BACKGROUND

In the beginning of 2017 a majority of the Swedish municipalities recognised that they had a lack of housing (Hyresgästföreningen, 2016). The Swedish National Board of Housing, Building and Planning (Boverket) estimates a need of 710 000 dwellings to be built between year 2016-2025 (Boverket, 2016). This is a challenge similar to the one Sweden had during the 1960s, which resulted in the Million Homes Programme (1965-1974). The Million Homes Programme was built during a time when the Swedish government had a national housing policy where the aim was to avoid stigma and special treatment for certain groups, with the goal to create a housing sector with equal terms for everyone. The approach was to achieve this through subsidies and a regulated market. In the 1980s subsidies were abandoned during a change of government and ideology (Werne, 2011).

The housing shortage is a threat to the welfare system and together with a market-driven housing supply people with a weaker economy are struggling to find a dwelling (Hyresgästföreningen & Kommunal, 2015).

CONTEXT

The context of this master's thesis is the housing crisis in Sweden. Since many municipalities face a similar problem the aim is to provide a form of housing that is largely general and can be introduced to different localities around Sweden.

To concretise our ideas we have done a case study in the municipality of Lerum, situated east of Gothenburg. The local authority acknowledge a shortage of rental housing and an urgent need of dwellings to assign to newly-arrived immigrants. The site in question was chosen for us by Lerum municipality and is planned to host 20 dwellings in the future. Out of these 20 dwellings half will be assigned to newly-arrived and the rest to the public rental market.

PURPOSE

The purpose of this thesis is to discuss methods on how to organise self building in a way that provides affordable and considerately built dwellings. By concentrating on finding new ways to organise self building from planning to use, the project will not only revolve around how self building can provide options in the housing crisis, but also on how it can give other social benefits such as self-fulfilment, work and integration.

AIM

The aim of the thesis is to develop a design method for self built housing units with an overall social, economic and ecological sustainable profile in a Swedish context. The housing units will be designed in a way that makes them easy to build for a non-professional with the assistance of a tutor.

RESEARCH QUESTIONS

The thesis will explore the following topics:

- Can a more democratic category of housing be introduced on the Swedish housing market through self build projects?
- What role can self building play in an integration process and introduction to a profession?
- How can a house that is adaptable, sensible to the environment and easy to build be designed?

METHOD

The method will be to investigate self building techniques and how to apply them in the setting of a small Swedish municipality. This will be done through sketches, models, literature studies, site visits, interviews and by looking at current and historical references around the world to see how self-building has been applied in similar projects before.

DELIMITATIONS

This thesis will consider the possibilities of self building through methods that are not site dependent. However, a specific site will be used for a case study. The site have been chosen based on the condition that it is located in a municipality with a lack of housing, a circumstance shared by 255 municipalities nationwide. Apart from looking at the statistics of the housing situation, no other analysis of the local surroundings has been made.

The focus of the design proposal has been that the housing units should be easy to build. Our choice of material is based on their availability on the Swedish market as of today. This has excluded experimentation with new materials and technologies. As the time spent on evaluating materials and construction systems was limited, our choices should be seen merely as suggestions.

Building details have only been developed for the semi-detached house. The other units shares the same basic construction principles, but requires further development.

The focus groups of the project have been created from national and municipal statistics and not our own empirical studies. The fictive households are based upon our interpretation of the activities and research we have conducted throughout the process.

The thesis touch upon many different subjects surrounding self building and may foremost be regarded as a first draft of a self build proposal. To make a more complete project, the methods and ideas would have to be tried out and developed through experience gained by a physical building process.

READING INSTRUCTION
LAYOUT OF THE THESIS

This master's thesis begins with a background chapter to give the reader an understanding of social sustainability, the Swedish housing market and what positive and empowering effects self building could have. The next chapter shows our research on self building, which serves as a knowledge base to the next chapters regarding material, construction, design and implementation. The last part of the thesis consists of conclusions and reflections on our research of self building and the proposed design. The reader should have in mind that the process of this master's thesis has not been linear, but rather circular. Research and design have been developed in parallel processes and supported by each other.

A brief presentation and overview of the content in each chapter:

BACKGROUND

In this chapter, background information on sustainable development and social sustainability in architectural practice is presented. Furthermore, the chapter gives a brief introduction to the current state of the Swedish housing situation and construction industry, as well as the history of the country's housing politics from the 1900s until today. The chapter ends with a description of some of the positive impacts of self building.

SELF BUILDING

This chapter serves as an introduction to self building as a concept. Three different subconcepts of self building will be brought up, researched and evaluated. The chapter ends with a reflection on some key points which are brought from the research into the final design proposal.

CONSTRUCTION AND MATERIALS

This part starts with an introduction to the criteria that were used to base the choice of materials on. The chapter moves on to a short recognition of the ecological cost of the building industry. Thereafter, the different construction systems considered for the housing units are presented, together with the choice of insulation material. The chapter ends with some conclusions about the choice of material.

DESIGN PROPOSAL

The first page of this chapter shows the criteria used to design the housing units. On the following pages, a workshop with newly arrived is described. The chapter continues with a presentation of the proposed housing units, followed by an introduction of three fictive households. Each household is presented with a customised adaptation of the housing units.

IMPLEMENTATION

In this part, the site of our case study is presented. A basic site plan of the case study area is shown together with the proposed phases of construction and illustrations of the proposal. It is followed by a proposal of how the strategical, economical and logistical infrastructure of a how a self build project could be set up.

CONCLUSIONS AND REFLECTIONS

The result and conclusions of the master's thesis are discussed here, together with comments about the working process and suggestions for further development.

APPENDIX

A proposed layout for a handbook of the construction made during the process of the thesis is featured in the appendix.

WORKING PROCESS

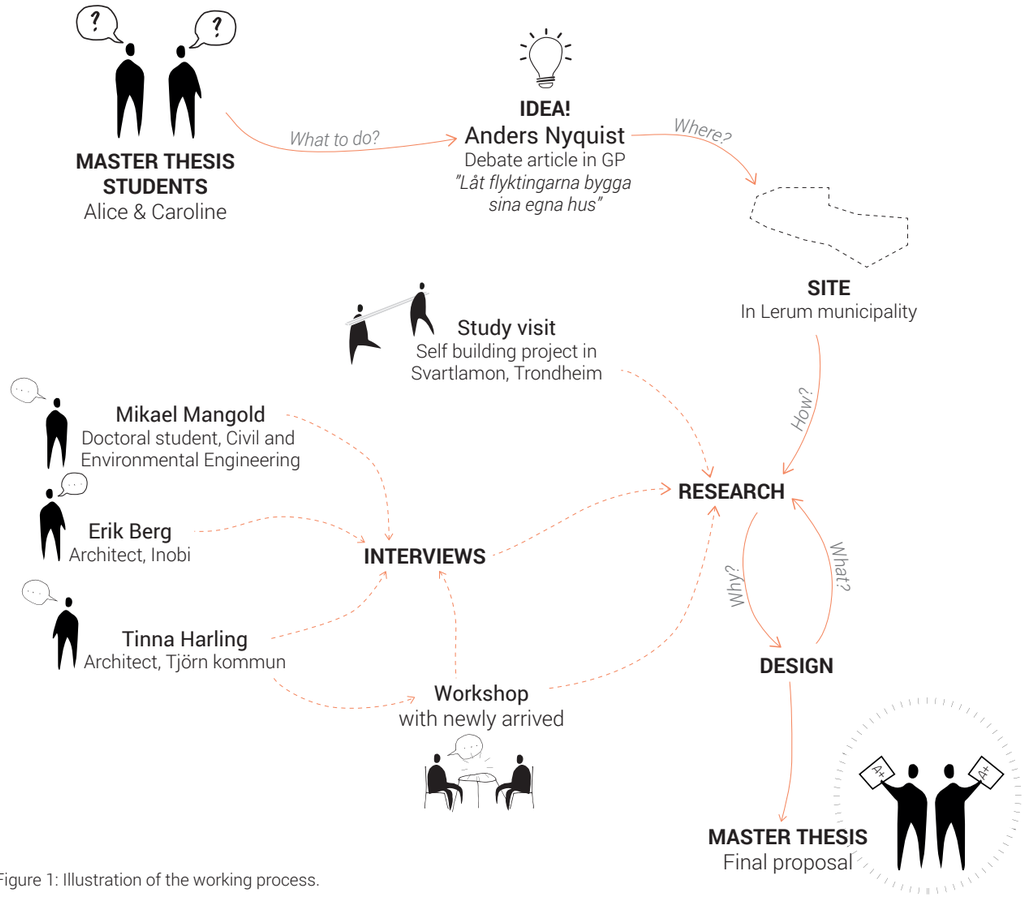


Figure 1: Illustration of the working process.

2.

BACKGROUND

SUSTAINABLE DEVELOPMENT

"Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs".
(WCED, 1987, Towards Sustainable Development, para. 1)

The most widespread definition of sustainable development originates from the UNCED (The United Nations Commission on Environment and Development) report Our Common Future (1987), also known as the Brundtland Report. The definition embraces an intergenerational perspective where long-term conditions are central (WCED, 1987).

THE MISSING PILLAR

The notion of sustainable development is often described in an integrated system of three pillars: environmental, economic and social. The relationship between the dimensions is generally assumed to be compatible and mutually supportive.

The three pillars differ in character and the environmental and economic pillars can be measured, defined, described and analysed in ways that the social pillar cannot. There is a concern in how to understand and define the fluid concept of social sustainability. Despite notable efforts among planners and practitioners in various sectors, the social dimension gathers less attention or is dismissed altogether (Boström, M. 2012).

The three pillars model has been criticised for the division of the different dimensions. The social pillar is marginalized by a sustainability agenda historically rooted in environmentalism that is based in models of global capitalism that thrive upon the exploitation of human and natural capital. Traditionally the sustainability agenda focus on green issues of ecosystem conservation rather than the brown issues of inequality (Boyer et al., 2016).

SOCIAL SUSTAINABILITY – THE ENABLING FACTOR?

There is a need of integrating the social, economic and environmental priorities to reach a sustainable development. Some researchers argue that social issues can be seen as the root of environmental and economic problems. Thus, to address the environmental and economic issues requires a focus on the social dimension.

A SOCIALLY SUSTAINABLE COMMUNITY

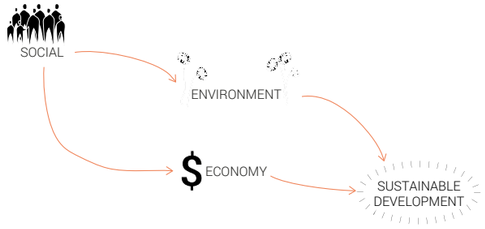


Figure 2: Social Sustainability as the enabler for change (own interpretation from Boyer et al., 2016).

By viewing social sustainability as the driver for the other factors emphasise the importance of social relationships and cultures. Moreover it can broaden the perspectives of a sustainable development and lead to a larger collection of potential policy interventions (ibid). It is argued that an increase in social capital through development will lead to an improved environment, rather than the other way around (McKenzie, S., 2004).

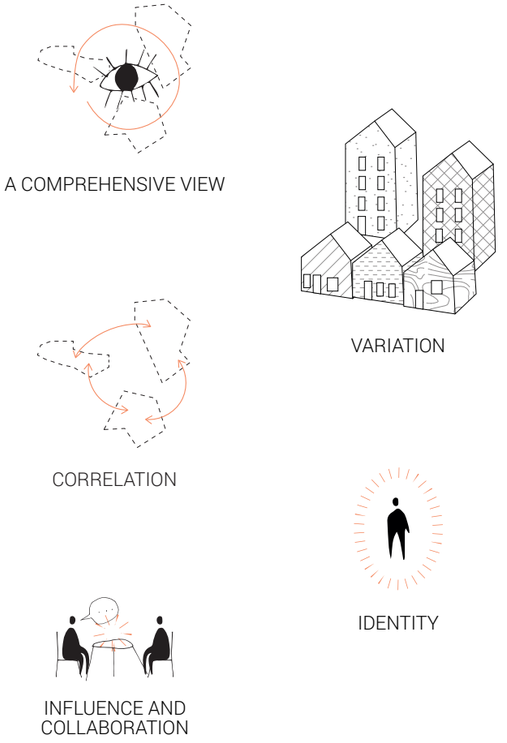
Social sustainability can be viewed as both a process and a condition in a society. It occurs when informal processes, systems, relationships and structures support the capacity of both current and future generations to create liveable and healthy communities. There are different indicators that can be measured and implemented by the community in order to either preserve or increase the current level of social sustainability.

To develop a socially sustainable society the community needs to work on different societal levels in order to ensure that basic needs are met and that there is a good quality of life for all citizens at an individual, group and civic level. The community should encourage an environment that opens up for diversity and social integration and promote open, democratic processes and liable governance structures.

The question of social sustainability is not whether the theories and policies have failed on the macro level but rather to create a well functioning framework to further develop the society towards a more sustainable condition (ibid).

SOCIAL SUSTAINABILITY
IN ARCHITECTURAL PRACTICE

FIVE THEMES FROM BOVERKET



Five themes to create a socially sustainable city development (Boverket, 2010)

In a report from 2010, Boverket presented five main themes to focus on within housing and urban planning to prevent segregation, promote integration and achieve social sustainability:

A COMPREHENSIVE VIEW

A comprehensive view of the city is important for the social aspects of city planning. To only work on site specific interventions cannot abolish the housing segregation. There is a need to work on a development that covers the whole city. A socially sustainable city development covers both neighbourhood renewal and to make areas more attractive. It also implies planning interventions with the purpose of creating a functioning comprehensive city where the different areas are connected.

VARIATION

Variation covers the different levels of city development, from function to dwelling typologies and architectural design. The trend in Sweden today is to create neighbourhoods that are urbane, with a mix of dwelling typologies, businesses, meeting places and services on a neighbourhood level. Mixing different building

typologies, dwelling sizes and types of ownership within an area opens up for a variety of tenants and can decrease housing segregation (Boverket, 2010).

CORRELATION

Correlation, or a coherent city, is a theme that focuses on enhancing the physical connections between the different areas within a city. It emphasises the need of bridging areas in the periphery to the more central parts of the city and to break down barriers between neighbourhoods.

A physically connected city can create the preconditions for a socially connected city. By giving the inhabitants the incentives and possibilities of meeting each other integration is promoted and xenophobia can hopefully be reduced.

IDENTITY

In planning, identity covers both to increase the self-esteem of residents in stigmatised areas and to improve the status of the neighbourhood in other people's eyes. The most obvious dilemma is the negative media coverage that some neighbourhoods face. Negative press contribute to enhance the bad reputation of an area, which has negative effect on the self-esteem of the tenants. A key question is to break the stigmatising spiral and find ways for the tenants to take the power over their own narrative of the neighbourhood. Examples of interventions are neighbourhood events such as festivals and markets as well as community theatres where the residents have the opportunity to tell their own stories.

INFLUENCE AND COLLABORATION

Both renewal projects and new development should originate from the current residents in an area and be implemented together with the concerned actors. The residents have valuable knowledge about how the neighbourhood works and what needs to be further developed. By creating a platform for citizen influence, the development projects tend to get a more positive result (ibid).

THE HOUSING SITUATION IN SWEDEN

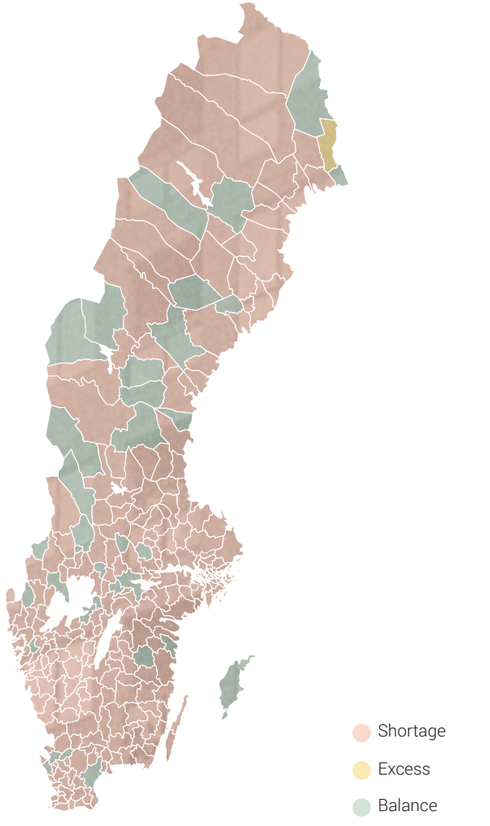


Figure 3: The housing situation in the Swedish municipalities year 2017 (Boverket, 2017a).

A WIDESPREAD HOUSING SHORTAGE

In the beginning of 2017 a majority of the Swedish municipalities, 255 out of 290, claimed to have a housing shortage. The amount of municipalities with a lack of housing has grown drastically during the last couple of years. In the past two years the number has increased by 72. Only 17 percent of the municipalities believe that their housing stock will be balanced within three years (Hyresgästföreningen, 2017).

Earlier the problem was especially urgent in metropolitan areas and university cities where the largest national migration is seen (Hyresgästföreningen & Kommunal, 2015) but today there is also a lack of housing in the more peripheral areas of the municipalities.

The greatest shortage is seen in rental apartments, especially two and three room dwellings. With such an extensive housing crisis there is also a need for single-family housing and tenant owned apartments. Especially youth and newly arrived immigrants have a hard time to get into the housing market. Moreover there is a growing need for adapted housing (Hyresgästföreningen, 2017).

AN URGENT NEED OF NEW DWELLINGS

To estimate the need of new dwellings is hard for many reasons: the prognosis of the population growth might change and the structure of the households as well. The Swedish National Board of Housing, Building and Planning has estimated that 710 000 new dwellings needs to be built between the years of 2016 and 2025. It is a pace of construction that has not been seen in Sweden since the Million Homes Program (year 1965-1975). The largest population growth is expected in the beginning of the period as a result of an increasing immigration to Sweden. Hence, the majority of the new dwellings, 440 000 (88 000 per year), is needed between the period of 2016-2020. The amount of construction can be compared to the existing building stock in Metropolitan Gothenburg (13 municipalities in Västra Götaland) of 429 000 dwellings (Boverket, 2016).

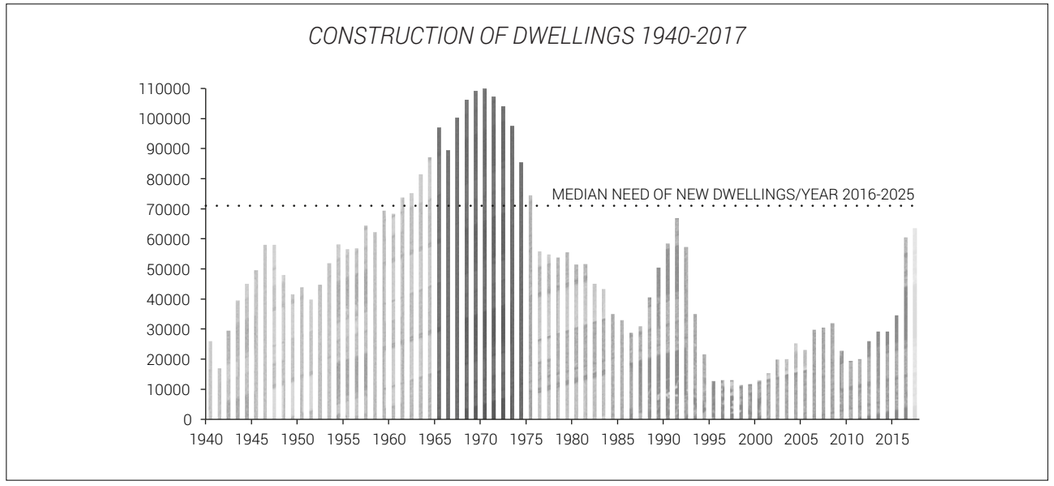


Figure 3: Construction of new dwellings, median need of new dwellings per year 2016-2025 (SCB 2016; Boverket, 2016)

SWEDISH HOUSING POLITICS

The beginning of the 20th century started with a rising urbanisation in Sweden due to the industrialisation. The cities grew, but many of them not fast enough to accommodate all the newcomers (Werne, 2010). The newfound pressure on the housing market lead to rising rents, opportunistic landlords and subsequently the introduction of the first Swedish regulations for rental housing between the years of 1914 and 1918. Because of the acute lack of housing during this period, many municipalities provided emergency shelters and co-established housing companies to stimulate housing construction. After the end of the First World War, the market was quickly deregulated again since the political opinion was that it should regulate itself (Kuljanin, 2010).

In 1923 the Swedish Tenant Association (Hyresgästföreningen/HGF) was formed as a popular movement to fight evictions and halt further rent increases on the housing market. In the same year, the Stockholm branch of HGF established the Savings and Construction Association of Tenants (HSB), an association with the intention for labourers to gather, save money and build cooperatively together. Cooperative building was a way to avoid unnecessary costs which only served as profit to acquisitive building contractors during construction. Members paid a fixed deposit for an apartment, which they later would receive back if they decided to move out. The following resident then payed an equal amount in deposit (Werne, 2010). These cooperative building projects introduced bathrooms, modern kitchens and waste chutes as standard features to the average Swedish apartment (Nylander, 2016).

For a long time, the state tried to stay out of housing issues. This was motivated by the opinion that housing was a non-political concern and an issue for the private market to solve (Werne, 2010). In 1932, a 44-year long reign of the Swedish Social Democratic party began. Shortly after this, new subsidies which supported construction of homes for senior citizens, large families and self-build projects in rural areas (see the Private Home Movement in chapter 4) were introduced.

In 1942 new rental regulations, subsidies and housing norms were enforced as a crisis package to raise the low housing standard. Many of these would stay present in Swedish housing politics for almost 40 years. In the 40's and 50's many of the municipal housing companies were formed, intended to build for "the common good".

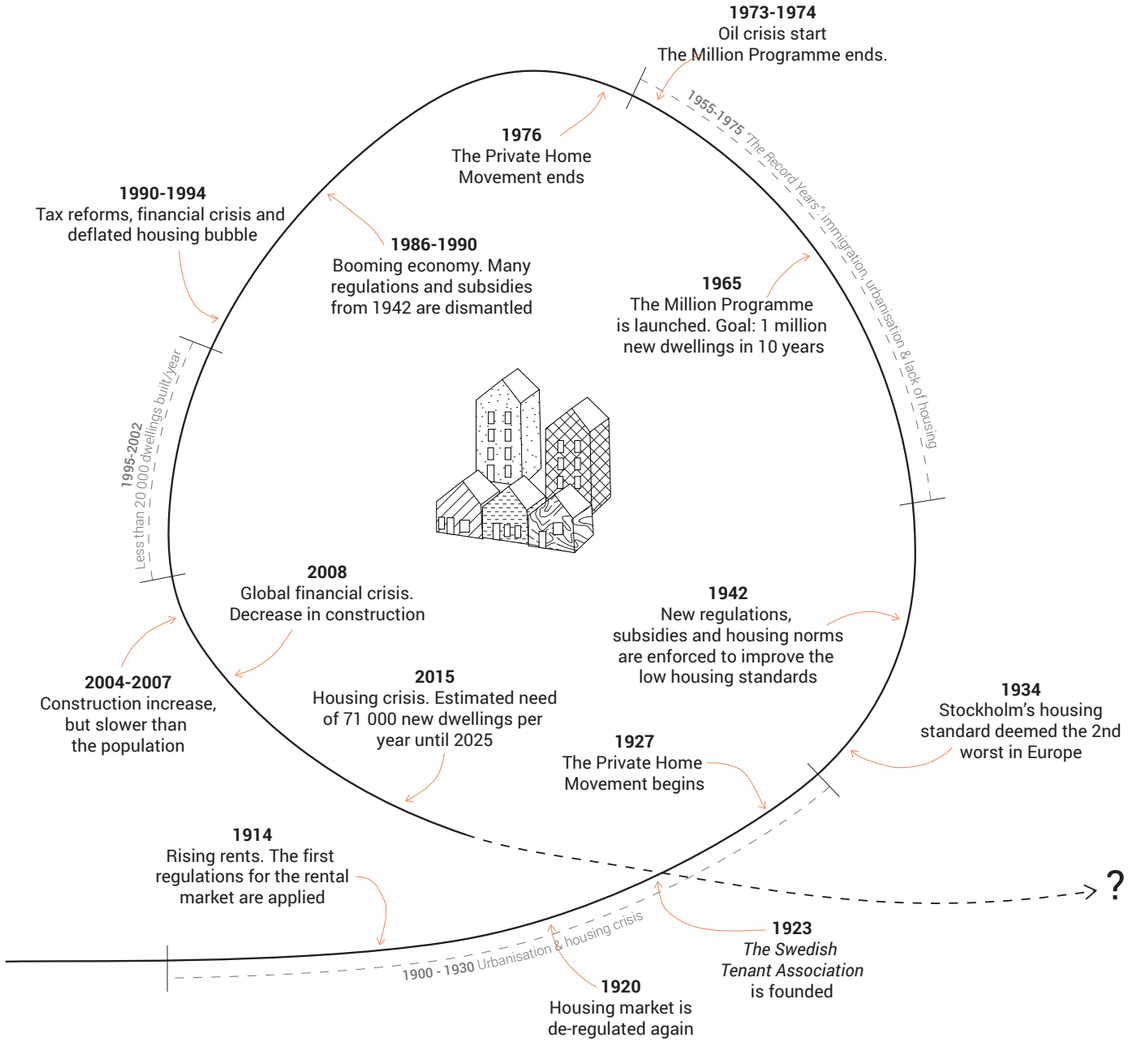


Figure 4: Illustration of the Swedish housing politics from the beginning of the 20th century until today (illustration based upon text).

Between the years of 1955 to 1975 Sweden yet again experienced an urbanisation of great proportions due to the quickly expanding industry. One and a half million people moved to cities for work. In 1967 a new government bill (Proposition 1967:100) was passed to increase the housing standard and quantity (Kuljanin, 2010). It read:

"The entire population should be provided sound, well-planned and adequately equipped quality housing at reasonable cost".
(Proposition 1967:100, freely translated)

This new housing norm concurred with the launch of the Million Programme – a political goal to end the lack of housing by building 1 million new dwellings in 10 years through rational and standardised construction methods (Boverket, 2006).

The Million Programme was finished in 1974 and the need of dwellings had been satisfied. Some municipalities even had an excess of housing at the beginning of the decade. This was the result of a more liberal housing market and favourable tax system which allowed many from the growing middle-class to build their own homes and move away from the high-rises of the Million Programme. The role of municipal housing companies changed. Their main task to provide "common good"-housing decreased, and they began to take on more of a business managing approach (Kuljanin, 2010). Municipal housing companies had a normative role for the rental levels in Sweden, but after 2011 they lost this function and were expected to work as common actors on the market (Boverket, 2017).

Throughout the 80's there was an economic boom and many subsidies and regulations from the 40's were dismantled or replaced (Johansson, n.d.). In 1991, a housing bubble deflated. This was connected to deregulations of the credit market which had been made a couple of years before and made it easier for people to receive housing loans. The housing construction took a steep turn down in productivity. It recovered a bit during mid-2000, only to slow down once again after the financial crisis in 2008 (Kuljanin, 2010).

With a shift in government in 2006 it became easier to convert rental apartments into tenant-owned ones. In Stockholm, 26 000 rental apartments of "the common good" were

converted and sold between 2007 and 2014 (Hellekant & Orre, 2015). The general housing politics of Sweden implies that everyone should have the same opportunities to get a good home, but the imbalance between rental and tenant-owned apartments creates a problem with this ambition. In 2016 the official waiting time to get a rental apartment in Gothenburg through a public housing company was at least 5 years (Loudiyi, 2016). Since 2011, rent levels are decided through a negotiating system between landlords, housing companies, public housing companies and HGF. Stranded negotiations between HGF and other parties have become more common, and voices have been raised about this being one of the factors as to why more rental flats are not built (Boverket, 2017).

Slow processes, systems which makes it easy to appeal against projects, three market dominating construction companies, the highest construction costs in Europe and a general lack of housing – these are some of the problems the Swedish housing market is facing year 2017. The Swedish housing problem is not limited to building more homes, it is also about the quality of construction and how people with capital are prioritised on a money driven housing market (Sprängs, 2015).

THE SWEDISH CONSTRUCTION INDUSTRY

For the past ten years Sweden has had the most expensive construction cost in Europe. The exact reason is hard to find but there seem to be three main factors; lack of competition on the market, difficulties to examine the construction cost and poor access to detail planned land.

LACK OF COMPETITION

The Swedish construction industry is dominated by three main actors: NCC, Skanska and Peab, who together shared 58 percent of the turnover from the market in the year of 2015 (Svensson, 2017). The system of the Swedish construction industry makes it hard for smaller and international companies to position themselves on the market. There are high requirements for construction standards and for economic sufficiency there is a need to have simultaneous projects, which makes it economically risky for smaller companies to build (Ohlin & Magnusson, 2016).

DIFFICULTIES TO EXAMINE THE COST

The cost for building materials covers almost half of a building's cost, but it is hard to examine the actual cost of the products. There is a widespread bonus system when companies buy services and products from subcontractors. The subcontractors might sell the products for a higher price to the construction industry and buy it for a much lower price themselves.

Another factor that affects the construction cost is that the large construction companies build apartments on their own land because the payoff is higher. According to the Swedish Competition Authority the cost is increased by a fifth. Moreover, the construction industry is sensitive to the economical conjuncture and in the current state of the housing market there are no incentives to cut down the expenses for construction.

POOR ACCESS TO DETAIL PLANNED LAND

Land prices have increased drastically in the past ten years. The municipalities have the most buildable land in the country and are criticised for not making land available for construction fast enough. Moreover, larger companies have been criticised for piling up on buildable land and saving it for when the market is profitable and the payoff for construction is high (Svensson, 2017).

THE 10 LARGEST CONSTRUCTION COMPANIES BY TURNOVER IN SWEDEN 2015

2015	COMPANY	TURNOVER IN SWEDEN IN MILLION SEK	NUMBER OF EMPLOYEES
1	Peab	36 780	11 036
2	Skanska	34 124	10 300
3	NCC	32 104	9 718
4	JM	10 880	1 919
5	Veidekke Sverige	7 121	1 378
6	SVEVIA	6 961	1 868
7	INFRANORD	3 947	1 891
8	SERNEKE GROUP AB	3 107	618
9	Strukton Rail AB	2 531	859
10	Erlandsson Bygg	2 529	771

Figure 5: The table shows the largest construction companies by turnover in Sweden (Sveriges Byggindustrier, 2016).

A MARKET-DRIVEN HOUSING SUPPLY

"The starting point is foremost to build as cheap and controlled as possible for the maximum profit. Balconies – the trademark of the exterior – is one of the few efforts that is allowed in the calculation. Unfortunately, it leaves less resources for the interior and the load bearing structure."
(Freely translated from Svensson, J. 2017, para. 6)

The industrialised market-driven construction of dwellings is facing a lot of problems both in the quality of the buildings and in social terms (Svensson, 2017).

LOW QUALITY AT A HIGH COST?

The construction companies who build tenant owned apartments are not going to administrate the buildings in the future, in many cases they build fast and short-sighted. The buildings lack robustness and are often in need of renovations after 10-15 years. Pipes are cast into the structure and if problems arise, whole floor structures need to be demolished (Kvint, 2017). In the long run, it is more profitable to build houses with a higher quality, but the quality guarantee of the housing companies ends after a couple of years - leaving the owners with the risk of reparation, loans and interest rate increase (Svensson, 2017). In a long-term perspective, it can be favourable to live in a newly built rental apartment compared to a tenant owned one since the housing company take the responsibility of the house and therefore build at a higher quality (Kvint, 2017).

WHO ARE WE BUILDING FOR?

There is an absence of government effort in the housing crisis and the politicians trust that the market will manage the housing supply. Though it is clear that the construction companies build for a certain group - people with a high capital (Svensson, 2017).

A THREAT TO THE WELFARE SYSTEM

The building sector constitute a central part in the Swedish economy (Boverket, 2016) and the housing shortage is a clear threat to the welfare system (Hyresgästföreningen & Kommunal, 2015). The Swedish housing supply has been criticised by the international organisation OECD (Organisation for Economic Co-operation and Development),

who recommended a re-organisation of the housing market. Many Swedish households have large mortgages and when the economic rent increase, this will be a threat to the Swedish economy (Svensson, 2017). Lack of rental apartments is also a factor that could jeopardise the economic growth. Many county administrative boards (Länsstyrelser), especially those in the metropolitan regions, stress that access to dwellings is crucial to ensure the supply of workforce. The struggle to find a dwelling might restrain people from taking a new job opportunity.

People with a weaker economy have a hard time to get into the housing market. The queues for rental apartments are often too extensive and to take a housing loan is hard for those who do not have a strong and stable economy. People who cannot afford to buy an apartment, or have been standing in the queue for a rental contract for a short time, are often directed to the second hand market with uncertain forms of tenure and low protection. After a change of regulations in 2014 people can take out higher rents when they sublet their apartments (Hyresgästföreningen & Kommunal, 2015).

WHY SELF BUILDING?

PERSONALISATION AND EMPOWERMENT

In an interview with Ted Radio Hour, Alastair Parvin (creator of Wikihouse) states that architecture and design for a long time have been centralised, disconnected from the user through an idea of "we know best". He argues that since the industrialisation, we have turned to big systems of design and development. Consequently, design and development are done to people, not by people (NPR & TED, 2017, March 17).

"We have always separated design from the process of making, which in turn is separated from the process of use."
(Alastair Parvin, NPR & TED, 2017, March 17)

For a resident to participate in the construction of her own home, it can increase the self-confidence of the builder and raise the aesthetic value of the home. Because of the building industry in Sweden today, where central powers (designers, constructors and company budgets) decides the standard way to live and how it should be built, the user have no genuine connection to the materials and how the buildings work.

Through self building, the future residents get to physically take part in their future home and surroundings. In addition, the final result is a more personalised home, adapted to the certain needs of the residents (personal communication with Erik Berg, 20 February 2017).

In a Norwegian pilot project in Meland, troubled young people in the ages of 18-35 got to build their own homes as a form of vocational training. Through getting their own homes by their own work force, the participators regained self respect and a sense of control of their lives according to a report from Husbanken (2015). Some were also able to receive a certificate of apprenticeship from their experience in the building process. Moreover, the criminality among the participants decreased, and the need of social support was lowered as well (ibid).

Research show that who gets to live where and how is primarily decided by the economic situation and constraints of the household. The economically stronger you are, the more actively you get to decide and control your living settings (Ærø, 2006). If the right, accessible infrastructure is found, self building projects might help to give more options of housing for more people.

THE JOY OF BUILDING

In her doctoral dissertation on living and creativity, Lena Jarlöv (1982) explores the human as a creative being. During her research, she found psychological theories which claim that the human's nature is to create, to process her surroundings and to grow as an individual by creating. However, the human's nature is always covered by a layer of culture, the culture of the society she was brought up in.

According to Jarlöv, the human has created an existence which inhibits her qualities of creation, fantasy and ingenuity. By working full days at a job where one does not get creatively challenged and then arrive back home to a pre-planned and finished house, creation does not come naturally and must be a forced act. In empirical studies, Jarlöv (1982) noticed a pattern where people who spend their spare time doing creative activities seem to be less bored and less eager to travel and change environment in their lives. Independent, constructive work where one puts an imprint on the surroundings is a way of self-realisation. The architect's role in this should be to create circumstances where people's creativity can be expressed and stimulated, without restricting it (Jarlöv 1982).

Photo 1: Painting the facade, Fräntorp (Egnahemsbolaget, n.d.).

3.

SELF BUILDING

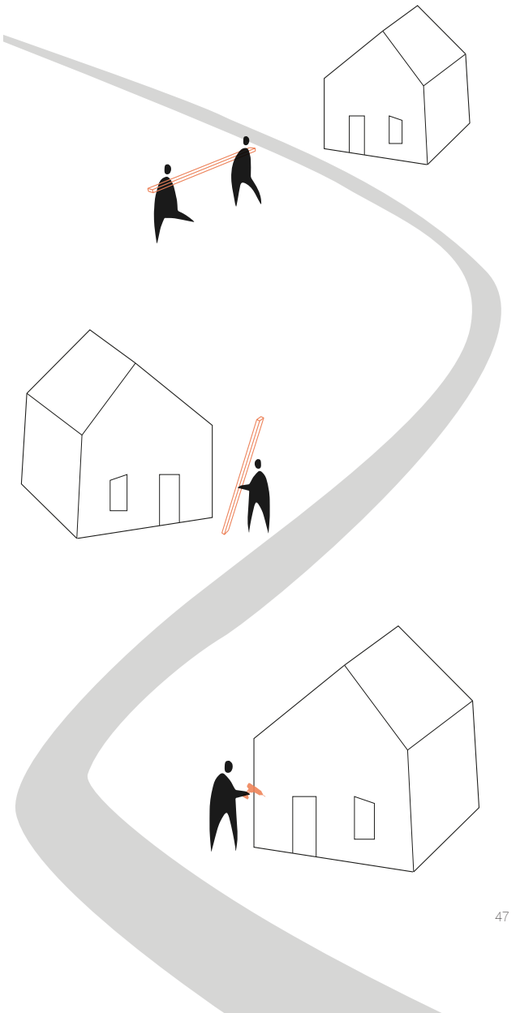
WHAT IS SELF BUILDING?

Self building is a way of building that includes various strategies and approaches. In this thesis, self building will be used as a term to describe when people take the control of the design and construction of their future homes, while holding the responsibility of the financing.

Self building can give financial advantages, but also emotional ones like self realisation and simply the joy of building, as mentioned in the previous chapter. In the following chapter we will take a deeper look into three different concepts of self building which fit our description of the term on different levels: joint building ventures, incremental housing and resident built homes.

The three concepts will be evaluated and serve as reference material to the final design proposal. They will be complemented with reference projects for each concept, interviews and a report from a study visit to a resident built project in Trondheim, Norway.

Finally, a reflection and conclusion will be presented to emphasise the main points we brought with us from the research to the design.



THE CONCEPT OF
JOINT BUILDING VENTURES

HOW DOES IT WORK?

Joint building ventures turn the traditional roles in the building process and makes democratic unions of people to constructors. It is a fairly new client in the building sector that offers individuals an alternative path to a customised home (Föreningen för Byggemenskaper, n.d.)

Joint building ventures are common in Germany and for more than ten years they have been an important tool to create attractive and sustainable neighbourhoods. The projects have increased resident involvement in the planning process and have contributed to social stability in the neighbourhoods.

The interest for joint building ventures is growing in Sweden and the German examples inspire both municipalities and private actors. The projects are based on the preferences and engagement of the tenants and the result is a larger diversity, variation and focus on long-term quality in the construction. Factors that are relevant in Sweden where the construction of housing is dominated by a few large companies and the buildings tend to be quite uniform (Svensson, 2012).

PROCESS

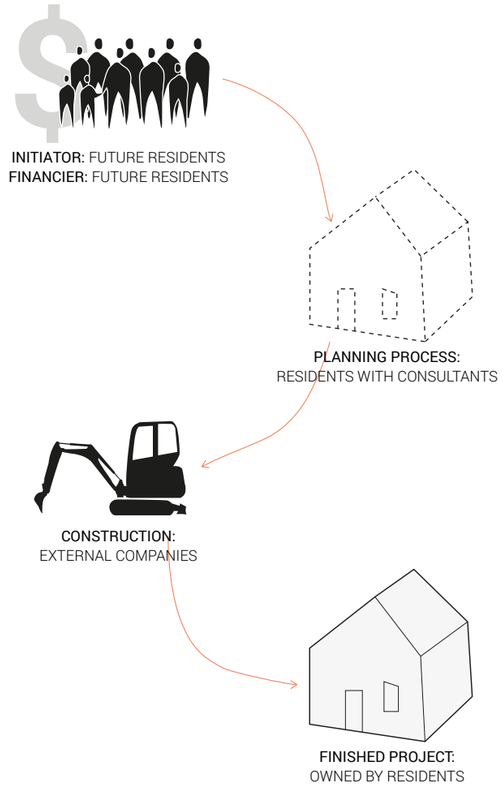


Figure 6: simplified representation of a process for joint building ventures (own interpretation).

THE ROLE OF THE RESIDENTS

In a joint building venture a group of people form a union and collaborate, with support from professionals, to realize a shared residential project. The residents act as the constructor and share the management of the project. In contrast to conventional housing development, the group holds the financial responsibility, as well as the financial risk, early in the process and therefore a maximum influence over the final result (Svensson, 2012).

DRIVING FORCES

There are different reasons for developing a project through a joint building venture. In some cases it is the will of living together with a certain group of people, such as friend or individuals who share the same interests. In other projects it is the ambition of developing a building with certain qualities, such as apartments or premises that are not on the market, or a building with high ecological standard. It can also be the interest to control the cost of the dwelling (ibid) or keep the profit when building on attractive plots (Föreningen för Byggemenskaper, n.d.).

BENEFITS

- *The tenants have the financial responsibility and thereby a high influence over the final result*
- *The amount of intermediaries are reduced and the residents do not have to pay for the project developers' risk and profit charges*
- *Joint building ventures enhance citizen involvement in the planning process (Svensson, 2012)*

CHALLENGES

- *There is a need of necessary institutional support for alternative construction processes in Sweden*
- *There is a lack of infrastructure to find people who are interested to join a joint building venture*
- *The relatively high capital investments excludes groups with a weaker economy (personal communication with Erik Berg, 20 february 2016)*

REFERENCE PROJECTS
JOINT BUILDING VENTURES

UNDERSTENSHÖJDEN EKOBY

Location: Stockholm, Sweden
Finalised: 1996
Architect: Bengt Bilén

Understenshöjden is an ecovillage in Björkhagen, Stockholm. The process of creating an ecological housing project with a resident democracy started in 1989 through the creation of an interest group (EBBA) with a realized project as the common goal. In a collaboration with two housing associations, HSB and SMÅA, the group managed to get a land allocation. After sending out inquiries to the members of EBBA, HSB and SMÅA, the project soon had 75 interested households. These households then got to partake in the development of the project. The planning process was quite intense and complicated, with changes and replacements of some of the original members in the interest group.

Some of the most important criterias during the project planning were to use healthy materials, to spare the nature from too much impact from the buildings and to consider the water cycle.

In terms of space, the residents wished to have “beautiful” windows, wooden floors and a ceiling height of 2.70m. All of the future residents had an hour-long meeting with the architect to individualise their homes.

As a way to consider the variating budgets of the residents, they were given three options of which building state they wanted to take over their house in: with a finished frame, finished frame with floor and walls, or as turn key (Understenshöjden, 1995). All apartments are tenant-owned with comparatively low down payments, but higher monthly costs than average at the Swedish housing market.

Today there are 44 dwellings of varied sizes between 58 to 155 square meters in the village. (Understenshöjden, 2014).

Photo 2. Understenshöjden (own photo)

Photo 3: Understenshöjden (own photo).

Photo 4: Understenshöjden (own photo).

Photo 5: Urbana Villor (Cord & Siegel, n.d.)

URBANA VILLOR

Location: Malmö, Sweden
Finalised: 2008
Architect: Cord Siegel and Pontus Åqvist

The project Urbana Villor was initiated by two architects working together with a landscape architect and a mathematician. The residents organised themselves in a tenant-owner's association, which took the role as client and developer. Since some of the future residents of the building were architects, they could manage the design and construction themselves to a large extent.

The main concept of the project was to combine the idea of living in a detached house (with privacy, a private garden, safety for the children and neighbourliness) with city living (closeness to services and a mix of people). The project resulted in seven apartments of 144 square meters each. All apartments got their individual floor plans based on the resident's wishes, since there are no carrying walls internally. A pair of spiral stairs runs through the balconies and connects the apartments with each other and the shared roof terrace (Svensson, 2012).

INTERVIEW
JOINT BUILDING VENTURES

Photo 6: Erik Berg at his office (own photo).

ERIK BERG, INOBI ARKITEKTER

In the beginning of 2017, a process of starting a joint building venture is taking place in Majorna, Gothenburg. The allocated plot for the project was found by the local architect firm Inobi, who also initiated the plans to use it for a joint building venture. Erik Berg is one of the architects who has been working with the project from the start. He has a background in city planning, with a special interest in questions around sustainability and democratic planning.

Which are the incentives for a joint building venture in Sweden?
There is a great need to look at other ways to build in Sweden than we do today and joint building ventures is one way. It challenges the rigid and standardised ways of the current Swedish building industry. Socially, joint building ventures give a greater power to the residents. Architecturally, they open up for a more variated, different and hopefully more interesting urban environment as the residents get to decide themselves how they would like to live and what design they prefer.

What are the weaknesses of a joint building venture?
One of the most apparent weaknesses is that you as an individual need a certain capital in order to participate, at least in the way this type of project works right now. In the project we are initiating in Majorna, the households need to put in around 500 000 SEK each before the construction loans are in place. This excludes a lot of people who would like to be a part of the project, but does not have the financial means to.

How is the public interest and knowledge around participating in joint building ventures?
Although there are still very few built examples in Sweden, the knowledge about joint building ventures is increasing. In the case of our project, we barely had to do any advertisement for it ourselves. Interested people contacted us on their own initiative, and most of them had heard about it through media or by word of mouth. We have put a big focus on informing how the financing will work, since this might be the most diffuse part for people.

What is Inobi's role as in initiator of the project in Majorna?
Our role is to initiate, facilitate and get the process of a joint building venture going. We have been responsible for the land allocation and the formal applications. Now we are in the process of putting a group of people – the future residents – together. After a while the process will be left in the their hands. Then we will see how they want to proceed with our cooperation, if they want us to keep on being a part of the project or not. Hopefully, we will be there to guide them through the process.

THE CONCEPT OF
INCREMENTAL HOUSING

HOW DOES IT WORK?

Starter house, phased-development house or owner-driven house – the concept of incremental housing goes by many names. The concept itself can be explained as a step-by-step integral urban development process. It is an affordable way to rapidly resettle many families at a minimum housing and service level. The residents are provided with a starter core, preferably including one multi-purpose room, kitchen and toilet facilities. Later on, the resident has the opportunity to continue the expansion of the house by adding rooms according to the household's income and needs.

Incremental housing is mainly associated with slum upgrading and low income areas in the global south where the means to cover construction costs usually are scarce from the beginning. In these cases, incremental housing can be more than housing – it can build communities and citizens (Goethert, 2010). Using projects in the global south as a reference or inspiration for the Swedish housing market and climate might not be relevant nor realistic. Nevertheless, the general concept of incremental housing is still applicable and worth to be mentioned as a method of self building.

PROCESS

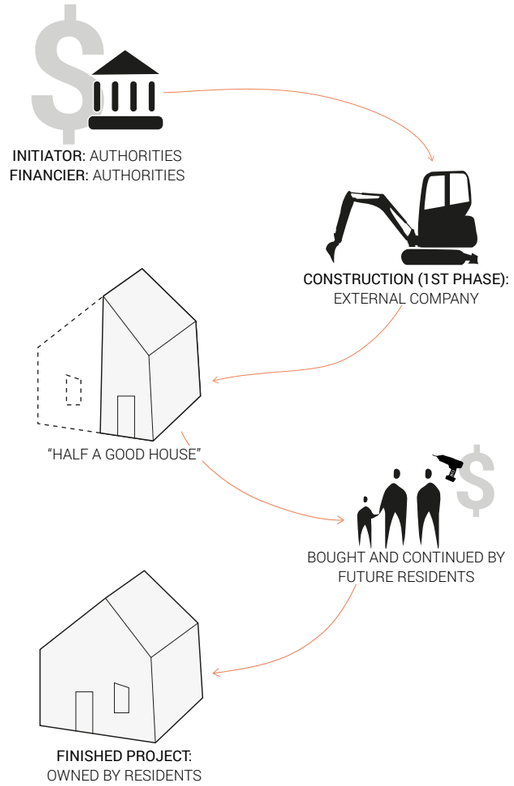


Figure 7: Simplified representation of process for incremental housing projects (own interpretation).

THE ROLE OF THE RESIDENTS

The main intention of incremental housing is not necessarily to give power to the residents during the construction phase, but rather in the post-occupancy phase. Giving a project the opportunity for incremental development allows for a gradual process where the residents themselves can decide upon what to do with their homes depending on funds, resources, time and needs. They might end up adding a wall, a room or even a new housing unit (Mukhija, 2014).

DRIVING FORCES

What makes incremental housing a feasible solution for the less affluent is the ability to provide affordable housing possibilities where the choice of expansion and adaption still remain with the owner. In the global south, it is also used as a way to monitor and give some structure to otherwise improvised and uncontrolled settlements. To provide simple, expandable starter cores makes for a fast way to give shelter to many households (Goethert, 2010).

BENEFITS

- *A gradual process where the residents can decide what to do depending on resources, time and needs*
- *Gives power to the residents in the post-occupancy phase*
- *A branch of social housing where the choice of expansion and adaptation remains with the owner (Mukhija, 2014)*

CHALLENGES

- *Associated institutions of housing finance, property rights and land use regulation have to support the over-time changes of the building (Mukhija, 2014)*
- *The more regulated the building rules of a country are, the harder it is to succeed with incremental projects (Chávez, n.d.)*
- *Might not work as expected in a Swedish context (see Däckshuset i Kallebäck, p. 64)*

REFERENCE PROJECTS
INCREMENTAL HOUSING

PREVI

Location: Lima, Peru
Finalised: 1975
Architect: Peter Land et al.

In the 60's, Lima was a city experiencing a huge increase in population due to urbanisation - in eight years the population more than doubled (Lenz & Geuna, 2013). As this created an immense housing problem in the city, the peruvian president (and architect) Fernando Belaúnde Terry together with the UN engaged 13 international and 13 peruvian teams in a social housing architectural competition. Behind the idea of the competition was the British-born architect Peter Land (McGuirk, 2011).

The objective of PREVI, as the project was called, was to improve the conditions in the growing informal settlements of the outskirts of Lima through low-rise, high-density buildings. What made the conditions for the competition unique, was the requirement to develop a sort of middle ground between planned social housing and an informal settlement, which could be expanded, adapted and change with its inhabitants. The competition managed to engage prominent architects of its time like James Stirling, Aldo van Eyck, Christopher Alexander and Candilis among others (McGuirk, 2011).

The competition was intended to end with a winning proposal, but in the end all projects were built, resulting in a varying typology with 500 dwellings based on the different ideas of each architect. The plan was to expand on the successful ones with another thousand dwellings, but this never happened.

Today, more than 40 years after PREVI was built, Lima is 70% self built, and the barriadas of the city has expanded and surrounds the PREVI area (Rodriguez, 2012). The traces of the 60's architecture have diminished, as the inhabitants have expanded their homes in different ways than the architects intended (Herrera et al., 2013, 4:30). As a piece of architecture history though, PREVI still might be used as mirror into the future for the incremental projects that are being built today.

Photo 7: Previ. Locals in front of some extended James Stirling houses (Palma, n.d.).

QUINTA MONROY

Location: Iquique, Chile
Finalised: 2004
Architect: Elemental

Taking the ideas of PREVI into the 21st century, the Chilean architect Alejandro Aravena and his office Elemental did their first incremental housing project in 2004 in the north of Chile.

The project was a social housing project which received a financial contribution from the government. The contribution only covered the cost of land, construction and a studio apartment of 36 square meters (Elemental, n.d.). Elemental then created a proposal for "half a house", which provided the residents with a basic two-story, two-bedroom home with a kitchen and a bathroom together with an equivalent empty space next to it (Kimmelman, 2016). It was then up to the 93 households to build the second half however they wished to, if or when they had the time and the budget for it (Elemental, n.d.).

Photo 8: Quinta Monroy (Elemental, n.d.).

DÄCKSHUS I KALLEBÄCK

Location: Gothenburg, Sweden
Finalised: 1960
Architect: Erik Friberger

Däckshus i Kallebäck is an experimental project where the architect tried to combine the concept of an apartment block with a family house in a way that he figured would give the less affluent similar housing qualities as those who could afford to live in a detached house.

All plan drawings were individualised after discussions between the buyers and the architect. While the housing units were supposed to be built incrementally as the families grew, most buyers chose to build their homes to the full extent at the first stage of construction. This was partially due to the fact that the building attracted buyers with a different economic background than planned. Because of this, the project did not fully comply to the architect's intentions. Though, it still stands out as a symbol of the ideas of flexibility, prefabrication and will to experiment on the Swedish housing industry of its time (Reuter Metelius, 2011).

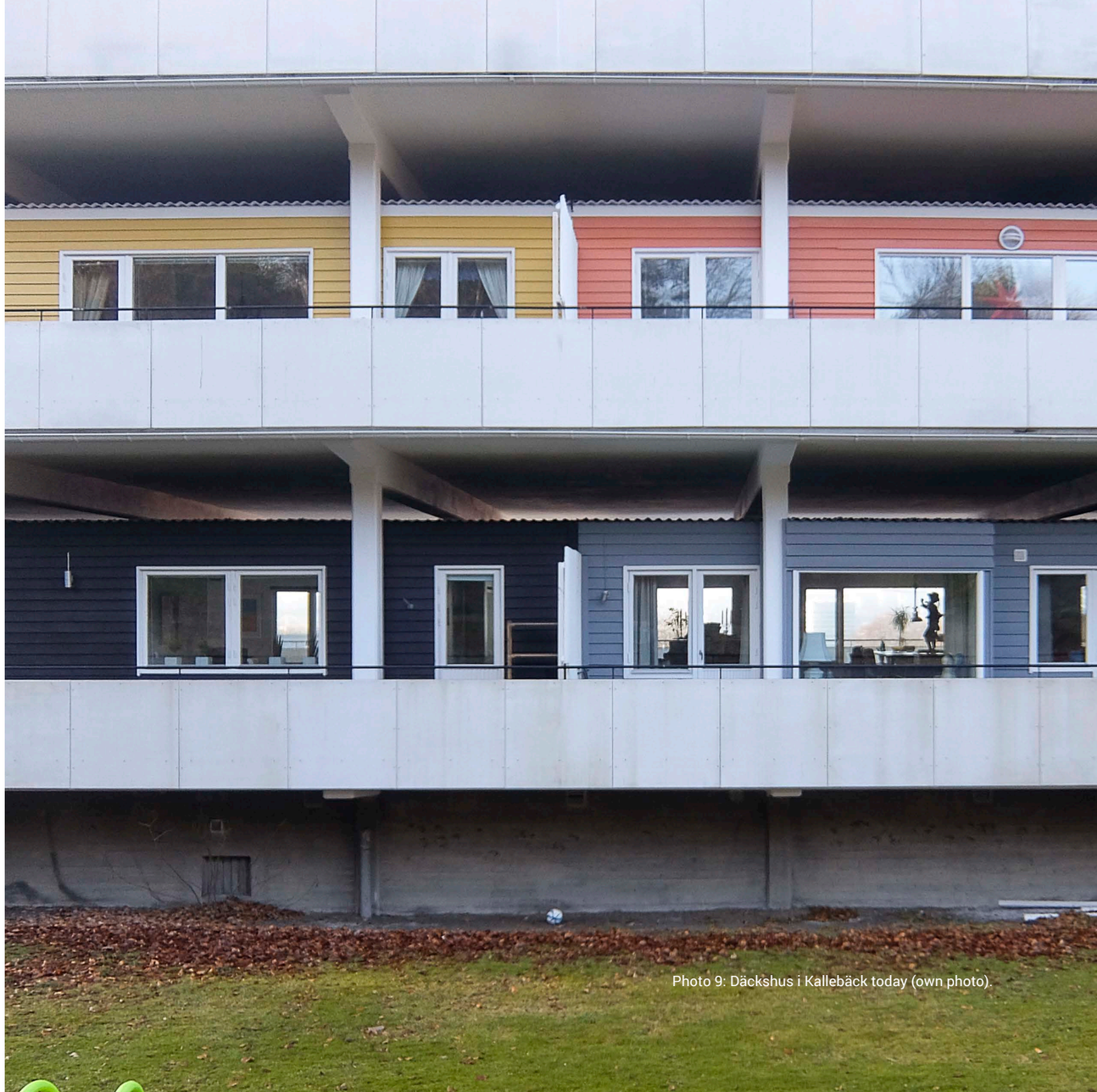


Photo 9: Däckshus i Kallebäck today (own photo).

THE CONCEPT OF
RESIDENT BUILT HOMES

HOW DOES IT WORK?

Resident built homes have always existed on the Swedish countryside and in the 1850s industrial workers built their own dwellings in teams by the harbour of Lindholmen, Gothenburg.

A tougher, expensive housing market and busy lifestyles have made the conditions for the traditional way of resident built homes worse. Though, the expensive construction industry and the lack of certain dwelling typologies have opened up for a more creative and innovative view on the possibilities of self building (Hansson, 2009).

The basic concept of resident built homes is that the resident build their own homes by themselves or with help from a professional. It is a method that allows people to build a home completely adapted to the need of the household and at the same time control the cost of the building during construction and use (Castle media, 2017). The projects open up for innovative solutions and it is a suitable method for testing alternative building materials (Haanes & Ohren, 2015). There are different types of resident built projects and it fits both renovations of old buildings as well as newly produced dwellings (Hansson, 2009).

PROCESS

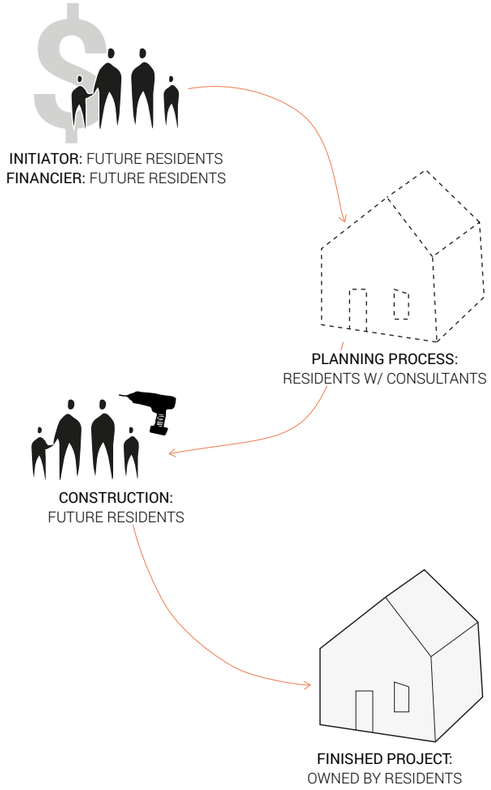


Figure 8: simplified representation of process for owner built homes (own interpretation).

THE ROLE OF THE RESIDENTS

The role of the resident varies when it comes to both financing and the design process. In most cases, the resident is economically responsible for the project but there is a possibility for self built homes where the resident rent the dwelling from an association. Moreover the resident can take part in the process on different stages, from the first sketch of the home or the first phase of construction (Volny, 1976; Haanes & Ohren, 2015).

DRIVING FORCES

The driving forces for resident built homes differ. In the case of the Private Home Movement the construction cost for conventional living was high and through a political vision of quality housing for low-income citizens the method of self building helped to cut down the construction costs (Volny, 1976). The reason can also be an interest of building a dwelling, completely adapted to the own idea of a home and to be able to test an unconventional way of building with reused materials (Haanes & Ohren, 2015).

BENEFITS

- *Makes the process of building cheaper since you cut off the cost of labour*
- *Leaves room for innovation and interesting solutions (see Study Visit Svartlamon, p. 78)*
- *An extended market for owner built homes could help to break down existing hierarchies within the building industry as it opens up to new partnerships and collaborations*
- *Possibility to gain professional skills in construction work*

CHALLENGES

- *The building process might suffer from lack of time from the self builder's side*
- *Might make it harder to live up to the high demands on quality and safety in Swedish regulations*
- *Difficult to value individual work put into building rental housing or a building shared by multiple households (personal communication with Tinna Harling, 23 February 2017)*

Photo 10. Self building in Fräntorp (Egnahemsbolaget, n.d.)

REFERENCE PROJECTS
RESIDENT BUILT HOMES

THE PRIVATE HOME MOVEMENT

In the beginning of the 20th century the social aspects of housing started to become a serious topic in Swedish politics. The question was how the government and municipalities could work together in order to improve the bad housing situation in Sweden (Hansson, 2009). The industrialisation resulted in a increasing national migration to the cities, which lead to over-population, a widespread housing shortage and expanding slums (Volny, 1976). The idea of the Private Home Movement started in the late 1800s and the initiators were liberal and conservative parties that wanted to increase the settledness of the population to guarantee companies, employers and the nation a well-behaved workforce (Ekvall & Kahn, 1996).

ORGANIZED OWNER BUILDING

Organized owner building started in the beginning of the 1900s with beneficial governmental loans (Hansson, 2009) in the depopulating rural areas. The Government focused on dwellings with farmland included to ensure that people of small means could make a living and contribute to society. The cities of Stockholm and Gothenburg contributed with cheap land. Later on, the focus changed towards dwellings for industrial workers in the outskirts of the cities (Volny, 1976).

THE PRIVATE HOME MOVEMENT

During the 1910s there was a widespread housing shortage in Sweden and the cost for construction of dwellings had increased by 75 percent between year 1913 and 1917. Construction decreased drastically and the rents rose, leaving people with lower incomes to live in emergency dwellings (Ekvall & Kahn, 1996). Stockholm City had started the realization of its garden cities and mainly wealthier citizens moved to the neighbourhoods. As a reaction to the bad housing situation for the working class a motion was put forward to the City Council in 1924 with the proposal to make it possible for people with lower incomes to live in the areas. The intention was to let the tenants build their own houses, without a large down-payment and by working themselves to a value of 10% of the building cost (Volny, 1976). Stockholm launched a department for small houses called SMÅA (Hansson, 2009) and the idea sooner spread to other cities, such as Gothenburg. As a result 12’000 families were able to build their own homes during a period from 1927 to 1976.

The main critique to the Private Home Movement was the time pressure; each step was carefully designed in a given schedule. Moreover the system did not open up for the residents to personalise the home to a larger extent than the choice of a few exterior colours (Volny, 1976).

SOCIAL BENEFITS

In the mid 1970s, the architect Olle Volny carried out a survey to various owner built areas to make a comparison between the tenants' expectations and experiences of the project. It is visible that the work promoted a spirit of community and united the owners of the houses.

Another result was self-realisation. In one case a resident saw himself as a failure, but through building his own home he could manifest for his friends that at least he had built his own home. Through knowing the construction process the value of the home increased and the tenants got a feeling of being part of society and the built environment (ibid).

Photo 11: Self building in Fräntorp (Egnahemsbolaget, n.d.).

Photo 12: Self building in Fräntorp (Egnahemsbolaget, n.d.).

Photo 13: Self building in Fräntorp (Egnahemsbolaget, n.d.).

WIKIHOUSE

Location: No specific location
Finalised: Ongoing
Architect: Initiated by Alastair Parvin

Wikihouse is a non-profit open technology foundation based in the UK. It started as an idea of democratising design and as a comment to the modern architecture's detachment between the designer, constructor and user. The project has been developed in a collaboration between architects, designers, engineers, inventors, manufacturers and builders.

At the foundation's homepage one can share and access drawing material for housing units created by the foundation and individuals. Anyone can edit, work on and improve the material at the website. The idea is for the buildings to be modular and easy to build for non-professionals with cheap, abundant and sustainable materials. Through simple instructions, the buildings can be assembled as a jigsaw puzzle by anyone with an access to a CNC router and plywood. The frame can be put up in one day, and is ready to be inhabited when cladding, insulation, wiring and plumbing have been added (Wikihouse Foundation, 2017).

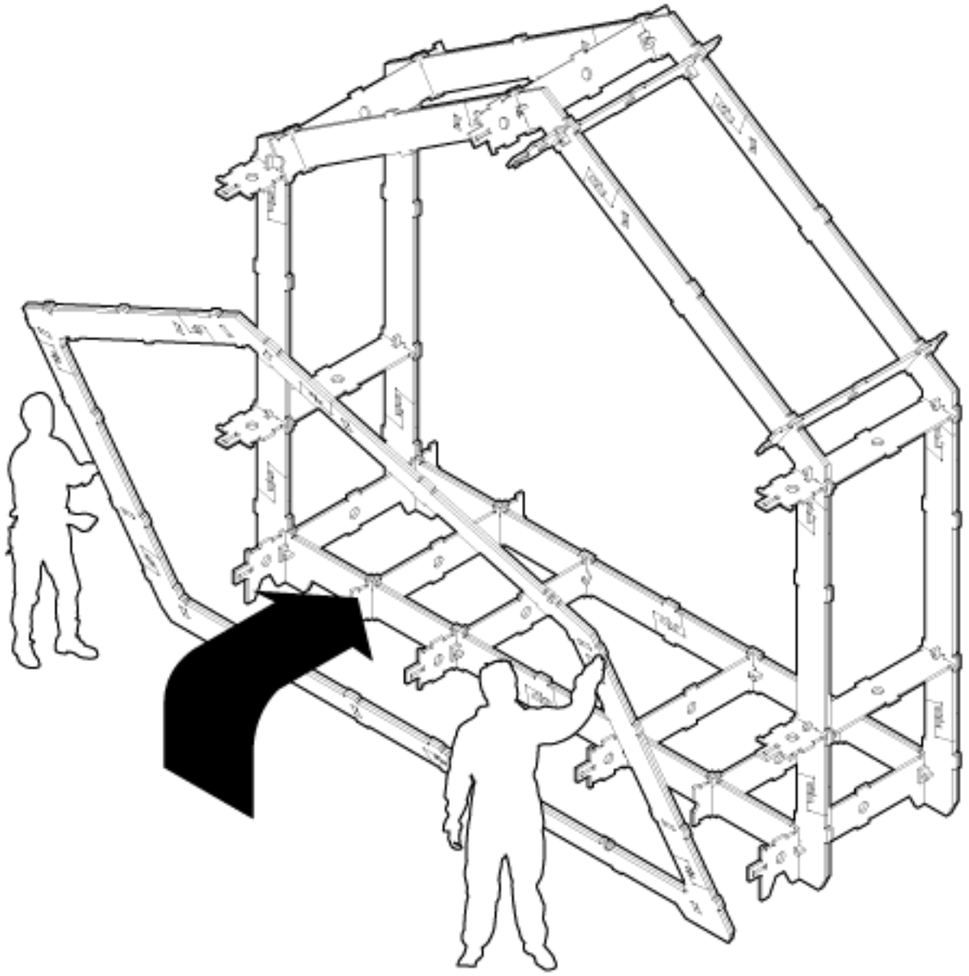


Figure 9: Instructions for putting together a Wikihouse (Wikihouse, n.d.)

ALMERE

Location: Almere, the Netherlands
Finalised: Ongoing
Architect: Various

Apart from being one of the fastest growing cities in Europe, Almere is also the host of the continent's biggest experiment on self building. The area Homeruskwartier in the suburb Almere Poort was initiated as a reaction to the financial crisis in 2008, when the building sector in the Netherlands virtually stopped building.

The local authorities in Almere Poort sell designated plots to individuals, who then secure a mortgage and customize their homes from scratch or ready-made options created in collaboration with architects (Feary, 2015). Since the city has no interest in profiting from selling the land, the price is fixed on 375 €/sqm and some buyers have been able to reach construction costs at less than 100€/sqm (Hopkirk, 2011). Some plots are distributed to people with low income (earning less than 36 000€/year), but there are also plots which anyone can buy. There are different areas with different themes, such as "I build", "I build sustainable", "I build free" and "I build town centre".

Homeruskwartier is expected to have 3,500 self built homes at the end of construction (Roberts, 2016). Each plot comes with specified dimensions and some restrictions, but architecturally the restrictions are none. The coordinators behind the project have noticed how people with a small budget (youngsters, divorcees and pensioners) were more open than they expected to live in small homes compared to the Dutch norm (40 sqm instead of around 80 sqm), if that was what their budget allowed for. The independency of constructing and owning your own home was a strong enough incentive.

Critics of the project say that the process of the development is more interesting than the result. This is mainly criticism towards the architectural and aesthetic result. Others say that the aesthetic aspects does not matter, that the strength of the area is letting people build what they want and the varied aesthetical results come with this freedom (Hopkirk, 2011).

Photo 14: Almere custom build (Feary, 2015).

STUDY VISIT
RESIDENT BUILT HOMES

EKSPERIMENTBOLIGER, SVARTLAMON

Location: Trondheim, Norway
Finalised: Summer 2017
Architect: Nøysom arkitekter

In Trondheim, Norway, there is an ongoing organized self building project in the neighbourhood of Svartlamon, an area known for alternative living. For many years, the municipality and the residents were debating the future of the area. In 2001 the residents and their supporters won and the area was given the status as an urban ecological area. The remaining private land was acquired by the municipality and leased to Svartlamon Housing Association, a non-profit organisation run by elected residents and representatives from Trondheim municipality. The Housing Association runs the daily operations at Svartlamon and has the responsibility to maintain and manage the buildings in the area.

The project Eksperimentboliger på Svartlamon (experimental living at Svartlamon) started in October 2013 when the two architect students, Haakon Hanes and Trygve Ohren, carried out a dialogue process in Svartlamon as a part of their master thesis at NTNU (Norwegian University of Science and Technology). The students arranged three open workshops together with The Resident Association. The focus of the workshops was what a self build project could give back to the area, what the tenants expected from a home and how to live a simpler and more sustainable life at Svartlamon (Haanes & Ohren, 2015).

In the end of March 2017 we had the opportunity to visit the site and talk to Trygve Ohren as well as two of the self builders – Iacob and Siri.

ECONOMY AND BUDGET

The project has a budget of three million Norwegian crowns (NOK) and is financed by the Housing Association through loans from Husbanken. Each row house has a budget of half a million NOK and around half of the budget covers the cost for entrepreneurs, such as electricians. Iacob share the responsibility of the budget together with a person from the housing association.

In the end, the Housing Association will own the dwellings and rent them out to the self builders.

Photo 15: Street view of the row houses (own photo).

Photo 16: Interior view from Per Kristian's home (own photo).

CONSTRUCTION PROCESS

The construction started in the spring of 2015 and the estimated time for moving in is in the summer of 2017. During their work, the self builders have had a guide book made by the architects describing the different steps of construction. The Housing Association has also employed a carpenter who is on site once a week. The builders have not been restrained to a specific amount of construction hours per week. Instead, the intensity of work has varied throughout the process depending on the construction phase and the weather.

A COLLABORATIVE DESIGN PROCESS

The design of the row houses was carried out through a dialogue process in both individual and common meetings. The result was a framework of a wooden stud wall structure in a size that would feel manageable for the tenants to construct. Each dwelling have been personalised according to the need of each individual household.

Per Kristian, who is working as an installation artist, chose to have a more individual design process. He works with conceptual models and takes decisions on site instead of having a fixed floor plan from the beginning (see photo).

Throughout the building process the design has changed, sometimes to make the construction simpler and in other cases to readapt it according to materials that have been found on the second hand market. Most of the windows are reused from other buildings and therefore the design of the facades have been kept flexible.

REUSING MATERIALS

Most of the materials in the dwellings are from the second hand market and the self builders are using a common chat group to share what material they have found online. The load bearing structure is built with new wood, which have been bought from a local supplier. The final cost for the structure was around sixty thousand NOK per dwelling.

The most expensive material is the insulation. The tenants wanted an organic insulation material and a majority of the households chose wood fibre insulation. Iacob decided to test out hemp insulation in his house.

Photo 17: Reused kitchen in Per Kristian's home (own photo).

Photo 18: Iacob is reusing a wooden floor from the 1800s (own photo).

Photo 19: Hemp insulation in Iacob's home (own photo).

Photo 20: Wood fibre insulation in Siri and Torfinn's home (own photo).

CHOOSING THE SELF BUILDERS

The Housing Association had an open application process to which interested people could apply with a personal letter. The self builders were chosen based upon their understanding of the construction process and not their building competence. It was important to find a group that could work well together.

DRIVING FORCES

The driving forces to take part in the project differed for each household. Iacob saw it as his opportunity to sail around the world. Siri and her husband had been interested in building their own home for a long time, mainly because of their interest in materiality but also to have the opportunity to live in a personalised home.

BENEFITS FROM SELF BUILDING

Both Iacob and Siri seemed to be happy about taking part in the project. Through building their own home they have had the opportunity of creating a dwelling personalised to their own needs. Iacob saw a stress in the time schedule since he is combining the construction with a full-time job, but Siri and her husband have the opportunity to share the responsibility as a couple.

The self builders have a common Facebook group that they use to communicate and they meet with the Housing Association once a week. The process started by building a common house for laundry and an extra bedroom for visitors. Siri saw a great potential in getting to know the other self builders through physical work and by being at the site she has met other neighbours in a more informal setting. To build in a larger group was helpful since the tenants share knowledge and help each other.

There have not been any large conflicts during the building process. The main argument was about the energy source where the initial idea was to have solar energy. Unfortunately, it was not possible due to the limited budget so the end result is a system that can be connected to solar panels in the future.

What we could see from the project is that the process has opened up for questioning contemporary dwelling norms. Most households have smaller bedrooms and larger rooms for socialising.

Photo 21: Siri and Trygve are talking about the project (own photo).

REFLECTIONS ON
SELF BUILDING CONCEPTS

JOINT BUILDING VENTURES

Joint building ventures and their increasing popularity show that there is a desire for new, modern housing concepts on the Swedish market. The fact that these kind of projects have been tried out and successful in a German context might be a reason for actors in the Swedish housing industry to regard them as an interesting option. Joint building ventures show that residents can have a stronger role in the development of housing projects. The increased interest around the projects highlights that there is a will to live in another way than what is presented by the developers today.

A problem with joint building ventures and the way they tend to be organised in Sweden is the lack of inclusiveness and diversity. The projects usually appeal to middle-class groups who have a certain economic strength and already possess a degree of freedom on the housing market. The initial costs in the projects that we have looked at (Understenshöjden, Urbana Villor and the on-going project in Majorna) have been quite high, which immediately excludes households with a weaker economy.

INCREMENTAL HOUSING

While we have not seen many examples of incremental housing in a similar, systematic style of Previ and Alejandro Aravena in Sweden, incremental growth of houses is still a familiar concept to us. To let homes grow in stages is as common in Sweden as anywhere else. It might be the addition of a garage, a porch or a room. The parallel to be drawn between this and the South American experiments, is that incrementality – planned or not planned – often is a consequence of a better economy and changing needs.

What we have taken with us from incremental housing is that the possibility of changes can be built in and encouraged from the start, rather than to be improvised later. Instead of the Aravena concept of providing people with "half a good house" which can later be expanded a Swedish parallel concept might be "a full good core house" which later can be developed. Looking at houses from the Private Home Movement the buildings were picked from the same catalogue but throughout the years and different owners they have changed and their original similarity is not as apparent as it was from the start.

RESIDENT BUILT HOMES

A resident built home can be seen as a manifestation of independency and freedom. From the self builders of Almere, who felt that it was worth scaling down their living space in exchange for building and owning their own house – to one of the self builders in Trondheim who said that building his own house was his equivalence of sailing around the world.

The state-initiated Private Home Movement emphasised how the action of self building would lead to a private home and intended to empower the individual. Wikihouse can be seen as a modern adaptation of this sentiment as an open-source self build community, privately funded to enable people on a struggling housing market. Open source, bottom-up movements such as Wikihouse, could have an important role in changing the Swedish building sector where a top-down approach in the housing supply has been dominating for a long time.

The main problem with resident built homes is time. In both Svartlamon and the Private Home Movement the time pressure was brought up as the largest difficulty in the process.

GENERAL CONCLUSIONS

The three concepts of self building described in this chapter are not stand-alone concepts, but can be combined and intertwined.

Resident built homes and the hands-on physical building process they incorporate is the core idea of our project. Joint building ventures are an important inspiration as they show that it is possible to organise a group of people to participate, or even take charge, in the realisation of a building project with successful results. They show the role self building can have to build communities. Incremental housing projects works as a reminder to make a flexible and adaptable core house for future changes.

From Trondheim we learned that as architects, we should help in making the process of self building as smooth and simple as possible. Everything from the size of the building, to the construction process, the drawings and the choice of materials should be made easy, comprehensible and manageable for the self builder.

4.

CONSTRUCTION & MATERIALS

CRITERIA
CONSTRUCTION

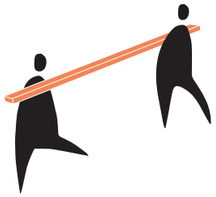
As seen in the Trondheim project, our task as architects should be to facilitate the self builders with a design that is simple and comprehensible.

For a self build project, the most important characteristic of the structure is that it is made of a lightweight material which can be handled on site without help from any machinery. A lightweight construction also lower the need of heavy foundations, which in its turn lessen the impact on the surrounding environment.

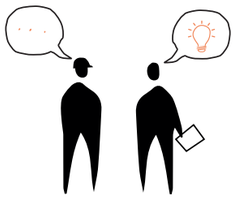
Another precondition is that it should be easy to learn how to assemble for the untrained self builder, with some instruction and guidance from a trained professional.

Since materials decay at different rate, all elements and material layers should be separable from each other. That goes for the skin, structure and services. When one element or material then needs to be changed, it can be done without making an impact on the other layers.

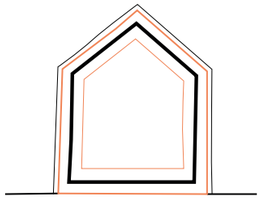
The materials should also be accessible, healthy and kind to the environment. Affordable materials should be combined with quality, with as few compromises as possible.



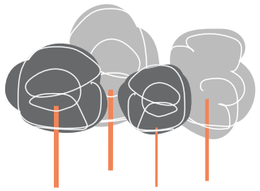
LIGHTWEIGHT



EASY TO LEARN



SEPARABLE LAYERS



ACCESSIBLE

ECOLOGICAL COST
OF THE BUILDING INDUSTRY

MATERIAL

In Scandinavia, space use per person has doubled since 1960 (Berge, 2009). In 2012, the average use of living space was 42 square meters per person in Sweden. During the last two decades, the country has seen a rise in single households as well, raising the need of dwellings (SCB, 2013). Developers and product producers often pride themselves with exceedingly energy efficient buildings techniques and materials. Though, the reality is: if our living space and number of households increase, so does the energy and material consumption.

As the building industry is the second largest consumer of raw materials in the world today, the choice of materials for a building is critical. The material's life cycle, not only during production, but also during operation and demolition should be considered when weighing materials against each other (Berge, 2009). As an example, the Swedish building and construction subsectors use 1,2 million tonnes of hazardous chemical products yearly (Toller et al, 2011). A condition for recyclable or reusable materials is that they do not incorporate any of these products. If clean materials with low embodied energy are prioritized over energy-demanding and non-organic materials, it would help to lower the building sector's impact on the carbon footprint and the health of our planet.

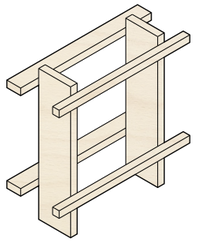
The generation of solid waste is another main problem of the building and real estate sector. A solid, flexible design is a way to avoid material waste and increase the possibility of recycling when it comes to personal adaptation and refurbishment later in the building's life (Berge, 2009).

ELECTRICITY AND HEAT

In 2015, the energy consumed by the building sector (not including material production) corresponded to 40% of the total amount of energy used in Sweden. Out of this number, half of the consumed energy was used for heating (Energimyndigheten, 2015). Although the energy consumption for the built environment has stayed quite persistent from the 1970s until 2015 (about 160 TWh per year), the oil crisis forced the society to turn to energy sources less harmful to the environment. From the beginning of the 1990s until 2015 the energy consumption per square meter stayed consistent regardless of the expressed environmentally ambitious energy politics, programs, municipalities and construction companies.

The electricity of today is predominantly based on hydroelectric and nuclear power and the district heating come from biomass or waste, which turns the impact on the overall carbon footprint of heating to about 5-10%. This number might not look bad, but neither does it include the production of building materials, biomass and waste.

STRUCTURAL
ELEMENTS



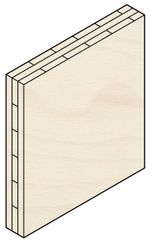
WOODEN STUD WALL FRAMING

Local sawmills, Hållanders Sågverk AB, Levene Såg AB etc.

The most commonly used construction method for detached houses in Sweden. Sawn timber.

Light to work with, availability is high, wood absorbs carbon dioxide, it is a renewable resource and biodegradable. Can be combined with many insulation materials.

Construction not as quick and efficient as pre-fabricated alternatives.



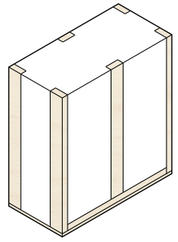
CROSS LAMINATED TIMBER (CLT)

Martinssons and KLH Sverige

Sverige Softwood plank layers, layered on top of each other perpendicularly and glued together under high pressure. Produced as carrying panels that can be assembled quickly.

Efficiency in construction (time saver), it absorbs carbon dioxide, renewable resource and biodegradable, very little loss of material at site (since they are pre-fabricated), the use is getting more widespread in the Scandinavian countries. Can be combined with many insulation materials.

Few producers, high prices, heavy to work with.



STRAW BALE SYSTEMS

No Swedish production of prefabricated panels yet

A cradle to cradle optimized product. The elements are self-carrying with a stud wall frame filled with straw.

Renewable resource, by-product from agricultural practices, biodegradable, good thermal properties and low embodied energy. Can be bought as prefab elements.

Is currently an agricultural rather than a manufactured product. The elements are still uncommon in Sweden and there is no Swedish production.

STRUCTURAL INSULATED PANELS (SIP)

Zenergy, Novasip, Partelow hus, IQ hus, Prefabriken, SIP hus, Sju små hus

Self carrying elements, incorporating the abilities of studs, joists, insulation, vapor barrier and air barrier. Most commonly made of OSB panels sandwiched around a foam core made of polystyrene.

Cost and time efficient during construction. The elements are built indoors and delivered to the site, which leads to very little loss of material. High insulating properties.

Heterogeneous materials with different conditions of decay. Polystyrene is not an environmentally friendly insulation material.

INSULATING
MATERIALS

Our ambition is to design a low-energy house that combines affordability and sustainability in a good way. To achieve this insulation is a critical factor. In Sweden, the recommended u-value for an exterior wall is 0,18 W/m2K. The u-value measures the insulation capacity of a material and looks at the overall thermal transmittance through a structure. The better insulated a structure is, the lower the u-value will be. The u-value is calculated by dividing the λ-value together with the thickness of the material. (Boverket, 2012). When looking at the sustainability of an insulating material it is important to not just look at the insulating capacity, but its overall environmental profile. The material with the best insulating capacity, can still be the most harmful to the environment. The embodied energy sum up all the energy required to produce a product; from the extraction of the raw material, refining, processing and various stages of transport to the finished product at the final factory. The embodied energy of materials usually covers about 85 to 95 % of the total energy input of a building (Berge, 2009). Out of the materials on our list, polystyrene and Rockwool has the best insulating capacity, while straw has the best overall environmental profile.

ENVIRONMENTAL PROFILE FOR INSULATING MATERIALS

MATERIAL	λ-VALUE	GWP*	ENVIRONMENTAL PROFILE*
STRAW	0,052	-13	1
ROCKWOOL	0,038	7,5	2
CELLULOSE RECYCLED	0,04	-4	2
CLT	0,13	n.a	-
CELLULOSE NEWLY PRODUCED	0,04	3	2
HEMP	0,045	4	2
FLAX	0,04	5,5	2
POLYSTYRENE (EPS)	0,038	22	3

* GWP (Global Warming Potential) includes carbonation (50 years), storing of carbon dioxide (50 years) and emissions from incineration of products based on fossil fuels.

** Environmental Profile is an evaluation of the material's effect on resources, pollution and their environmental potential (recycling and/or local production). The materials are rated from 1-3 where 3 has the highest negative impact.

Figure 10: the table shows the environmental profile for insulating materials (Berge, B., 2009). The table is illustrated based upon source.

EMBODIED ENERGY IN BUILDING MATERIALS (MJ/KG)

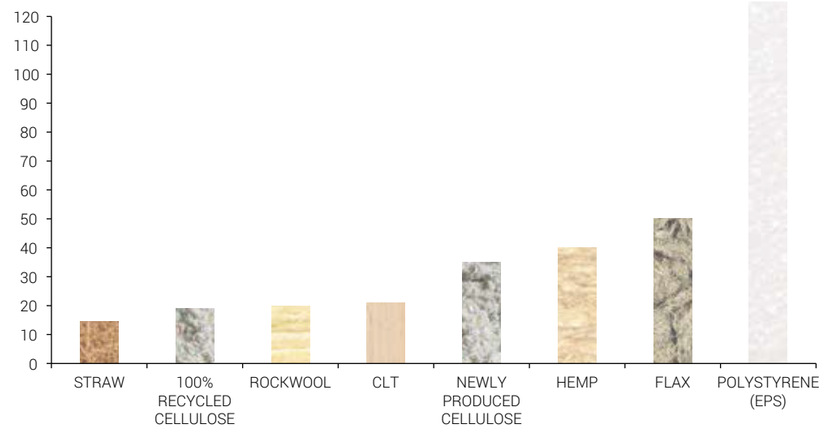


Figure 11: The table shows the embodied energy (MJ/kg) in insulating materials (Berge, B., 2009). The table is illustrated based upon source.

CONCLUSION
CONSTRUCTION

STRUCTURE

Comparing the four different structural systems, we quickly disregarded SIP-panels as an option. As lightweight and quickly assembled as they might be, in terms of sustainability their case is hard to argue for. The use of polystyrene is the main issue here, as a non-organic, energy demanding material to produce, and without many options of recycling.

Strawbale, on the other hand, performs high in terms of ecological sustainability and is biodegradable. Unfortunately, there are no producers of straw bale systems in Sweden at the moment. Another disadvantage is that it is a material that Swedish construction workers still are quite unfamiliar with. Cross laminated timber has the same issue, combined with the fact that the elements could be too heavy for a self builder to handle.

A traditional wooden stud wall frame is, in our opinion, a good method to use for this project. It incorporates the qualities of being a well-known method among Swedish construction workers, while also being a lightweight material and ecologically sustainable.

INSULATION

With a wooden stud wall frame as the structural framework, no insulation material is truly excluded. This means that the insulation material technically could be changed from project to project.

To exclude some of the researched insulation materials as alternatives for our project, we started with considering their GWP (Global warming potential). In this field, polystyrene stood out with a far higher number than the rest. The runner-up to the least environmentally friendly material was Rockwool. Eliminating these two, the materials left were those based on natural resources: cellulose, hemp, flax and straw.

Our final choice fell on hemp, with cellulose as a backup. Hemp is still quite expensive as an insulation material, but if the industry expands, it has great potential. Hemp offers a natural resistance to mildew and has the same fire resistant as wood. It can be given extra fire resistance with a non-toxic chemical compound. Both hemp and cellulose buffers moisture, but cellulose needs protection against mildew and has less fire resistance (Ekobyggportalen, n.d.).

FINAL CHOICE

A wooden stud wall frame combined with a hemp insulation creates a natural, breathing shell for the buildings. They are materials that are easy to handle, combined with their great sustainable and renewable qualities. Wooden studs can be ordered from the local sawmill or bought in a building department store. Hemp might not be the most used material on the Swedish market, but it is installed and handled in ways that are familiar to Swedish builders.

The weakness of hemp is the availability and as a consequence the price, and if it is deemed to expensive by the builders, cellulose would be a sufficient alternative. Cellulose is also available as loose fill, but as boards are easier to install for a self builder, this is what we suggest. A wall with a thickness of 360 mm of cellulose or hemp insulation reach about a u-value of 0,11.

As there are many other materials during a construction process which could contain products which are hazardous to the environment, the self builders should be handed a list with products that are appropriate to use for an ecological sustainable project.

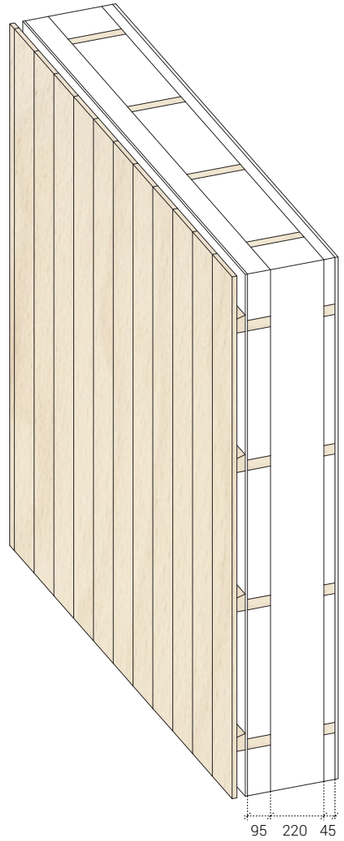


Figure 12: Illustration of wall section.

5.

DESIGN PROPOSAL

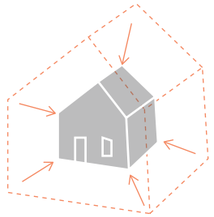
CRITERIA
DESIGN PROPOSAL

As the choice of structural system and materials have been made, we move on to how to design the dwellings. In this case, we have worked with three main concepts: compactness, adaptability and the possibility to change over time.

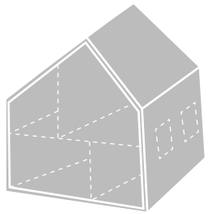
After the study visit in Trondheim we understood that it is important to design compact dwellings to make the scale graspable for the self builders. If the houses are smaller, it is possible to reduce the stress of time pressure as well. Moreover, smaller dwellings need less materials and can be seen as more resource efficient.

In order to enhance resident influence the self builders should have the opportunity to adapt their homes to the own interest and needs. Hence it is important to find a framework that is flexible enough to personalise, but still fixed enough to create a coherent neighbourhood.

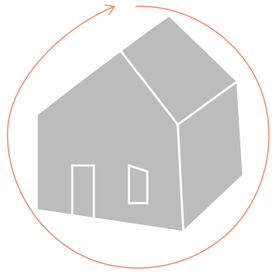
Lastly, the houses should be able to change over time. The given structure should have the possibility to be built upon and change in the future.



COMPACT



ADAPTABILITY



CHANGES OVER TIME

WORKSHOP
MAT & PRAT, TJÖRN

INTRODUCTION

Through our contact with Tinna Harling (planning architect at Tjörn municipality) we got the opportunity to have a workshop with refugees living in the areas around Tjörn, an island in the archipelago about one hour from Gothenburg. Harling is an architect based in Tjörn and she is engaged in questions surrounding self building for newly arrived immigrants. Tjörn has a civic network of people who help and engage in the integration of newly arrived through different activities. For example, once every month Harling organizes Mat & Prat (English translation: Food & Talk), an event where local people and newly arrived gather to cook dinner together. Our workshop took place in connection to a Mat & Prat-event at Harling's facilities, Art Institute, at Tjörn. We had one and a half hour together with the participants before the event to do our workshop.

The workshop worked as a great occasion to speak with newly arrived about their living situation. Since they represent a group in the Swedish society which is very affected by the lack of housing, we wanted to get their perspective of this problem. We also wanted to investigate if our different cultural backgrounds show in the way we perceive housing.

THE WORKSHOP QUESTIONS

- How do you live at the moment, are you happy with your living situation?
- How would you prefer to live in the future?
- Would you be prepared to build your own home?
- Could you imagine to share household with others than your family in your future home (co-housing)?
- When do you prefer to be alone, and when do you prefer to be social?
- What are your views on privacy in the home environment?

PARTICIPANTS

The workshop had six participants, all were men. Five were from Syria and one from Palestine. They arrived to Sweden between one to three years ago and are living in Stenungsund or Tjörn at the moment. Some are going to SFI classes on full-time and others combine half-time SFI classes with work. The participant who had been in Sweden the longest time was working as an integration coordinator. Two of the participants still have their wives and children living in Syria.

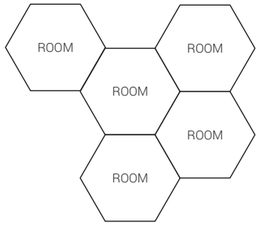
Photo 22: Discussion at Mat & Prat (own photo).

THE WORKSHOP METHOD

To initiate a conversation around the workshop questions we created a simple game.

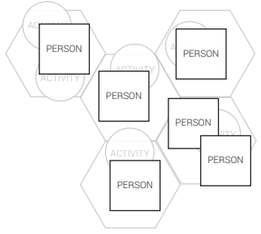
The first part of the game was about placing out different functions of a home in the participants' chosen way. This was a method to look at how they chose to connect the functions, and to discuss in which context they would put their home and whom they wanted to live there with. The second part was about placing out activities in the rooms, to lead the discussion into what they want to do where. The third part connected to this by leading the discussion into who you invite where in your home. We wanted to see if their privacy boundaries within the home differed from what we as Swedish-born are used to (and if they did - how?). Each participant performed the game individually, while the result of each part was discussed in the group.

The game worked well as an initiator to discussion. The steps were not followed to 100%, but we got our questions answered. Our intention was to also talk about the surrounding spaces of the home (outdoor spaces and the common house) but unfortunately we did not have enough time for this.



PART 1: CONFIGURATION
HOW ARE DIFFERENT FUNCTIONS CONNECTED?

PART 2: ACTIVITIES
WHAT ACTIVITIES TAKES PLACE WHERE?



PART 3: PEOPLE AND PRIVACY
WHO ARE INVITED TO WHICH PART OF THE HOME? WHAT IS PRIVATE? WHERE DO GUESTS STAY?

WHAT WE LEARNED

Speaking to the workshop participants about how the housing crisis is affecting them was very helpful. Two of the partakers were sharing a 40 sqm basement apartment for 6000 SEK a month, and the rest had similar housing situations. When talking about the future, they mainly wished for a reasonably sized apartment for a reasonable price. Where or how (apartment, house etc.) they were going to live was not very important as long as the first two conditions were fulfilled. The two men with wives and children still in Syria wanted to get accommodations with at least one additional room, since this is the size required for family member immigration.

All our participants would be prepared to build their own homes. The ones without a family felt more inclined to live in a co-housing situation than those with family, but no one was totally against it. Co-housing was an option as long as there was space for privacy as well. They all enjoyed a social living environment, referring to the hospitality and friendly neighbourhoods in their native countries.

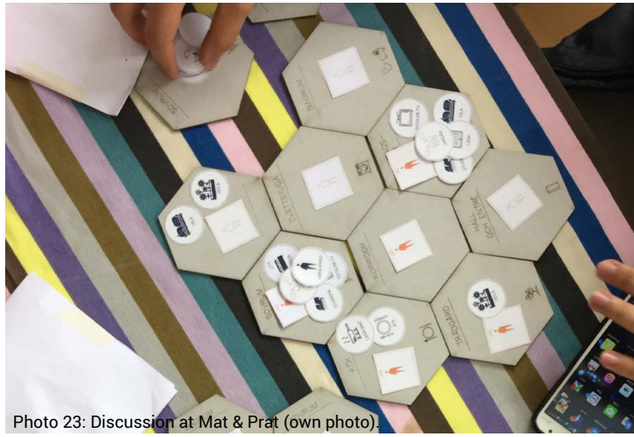


Photo 23: Discussion at Mat & Prat (own photo).

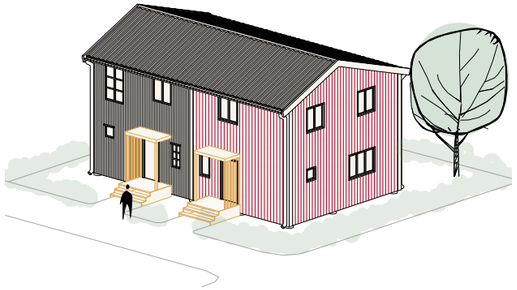

Photo 24: Discussion at Mat & Prat (own photo).

THE HOUSING UNITS
& FLOOR PLANS

To make a self build project seem doable for the inexperienced self builder, it needs to have a simple shape and structure. In building terms, this often comes down to straight lines and square angles. The aim with this is to simplify the building techniques and make them easier to understand. For our units, we have chosen a structure that eliminates the existence of any carrying walls. This enhance the possibility to adapt and change the building over time. Many of the dwellings are attached to each other. This means that the shell of the house involves more people and can be raised quicker. It can hopefully also create a better connection between the future neighbours.

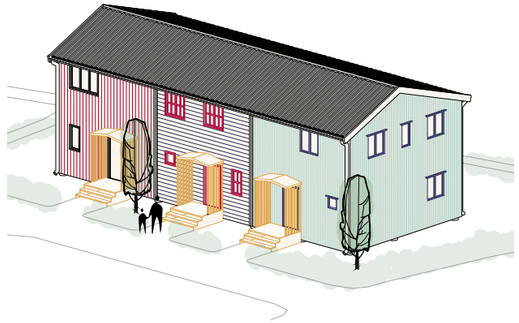
The units shown here are the ones suggested for our site of implementation in Lerum. They are meant to fulfil the needs of the housing market, which are to get more two to three room dwellings and small apartments for single households.

Openings, such as doors and windows, can be switched out according to the preferences of the builder. The basic units includes openings for standardised windows fit to the cc600 measurements, but if the builder prefer to use other windows it is easily solved.



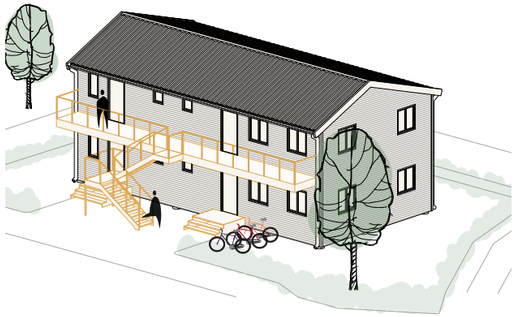
UNIT 1 – THE SEMI-DETACHED HOUSE

The semi-detached house can fit one to two households. It can expand exteriorly or the subdividing walls within the unit can be taken down. The dwellings are suitable for households of two or more people.



UNIT 2 – THE ROW HOUSE

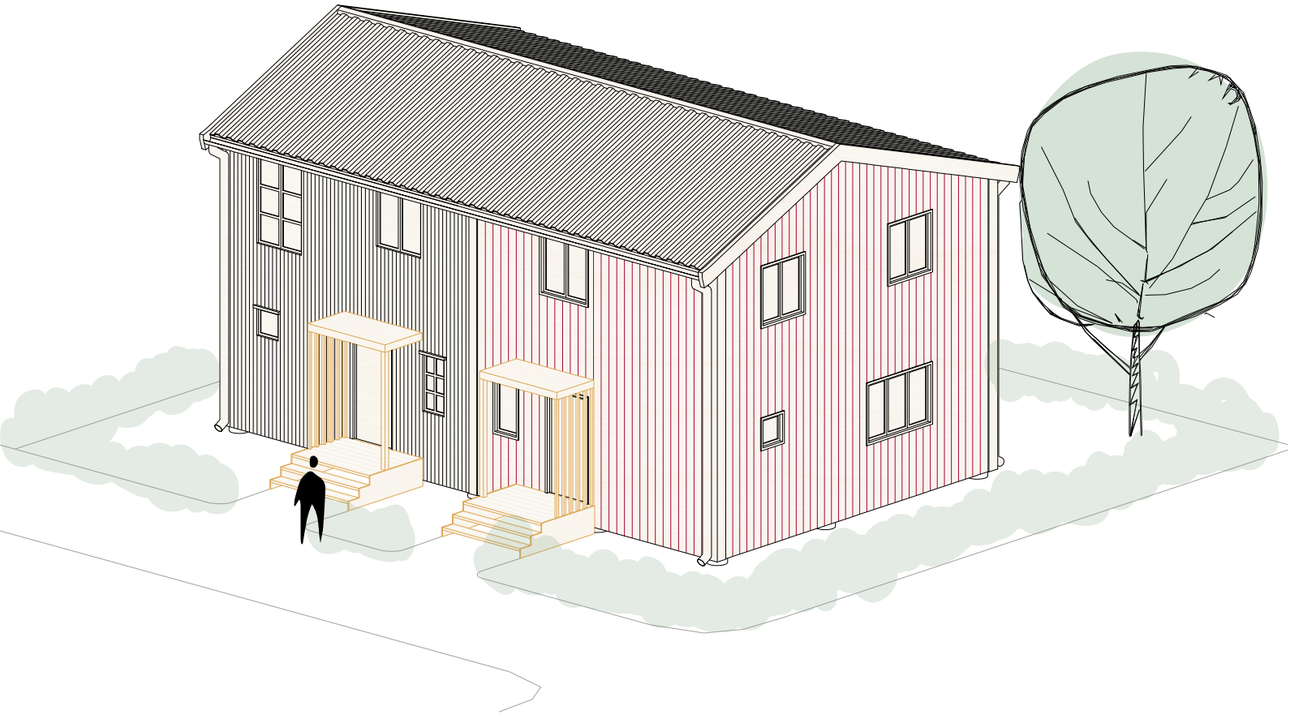
The row house is an extended version of the semi-detached house. More dwellings can be added along the volume, and the internal subdividing walls can be taken down with time. The dwellings are suitable for households of two or more people.



UNIT 3 – THE APARTMENT BUILDING

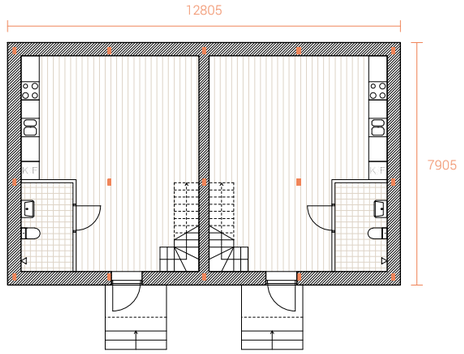
The apartment building contains smaller single floor dwellings. It can fit four to six apartments and is suitable for smaller households.

UNIT 1
SEMI-DETATCHED HOUSE

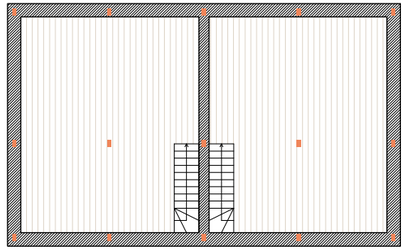


2-4 PEOPLE
82 SQM/DWELLING

2-4 PEOPLE
82 SQM/DWELLING



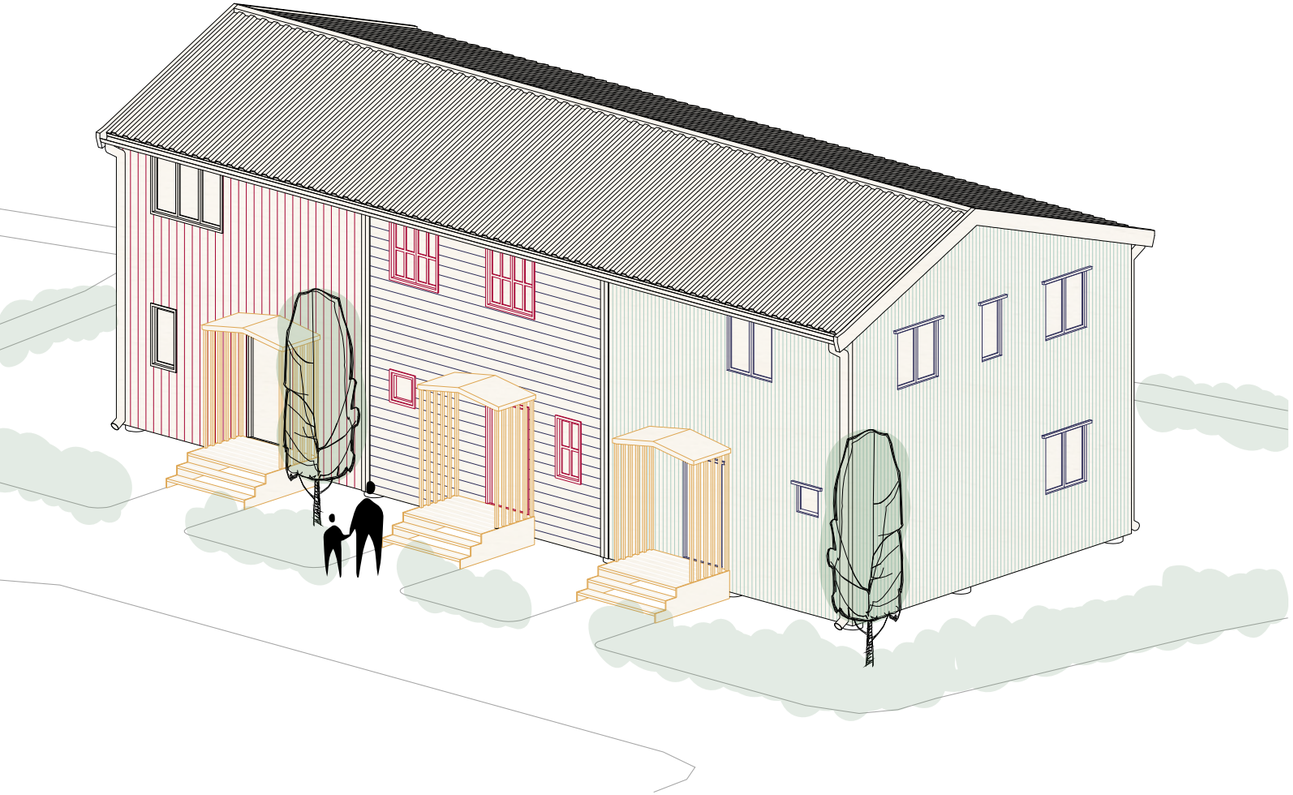
GROUND FLOOR



FIRST FLOOR

SCALE 1:200

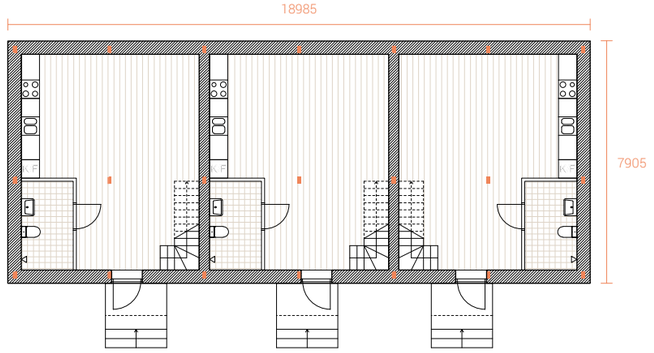
UNIT 2
ROW HOUSE



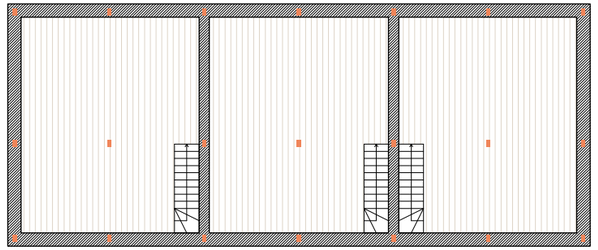
2-4 PEOPLE
82 SQM/DWELLING

2-4 PEOPLE
82 SQM/DWELLING

2-4 PEOPLE
82 SQM/DWELLING



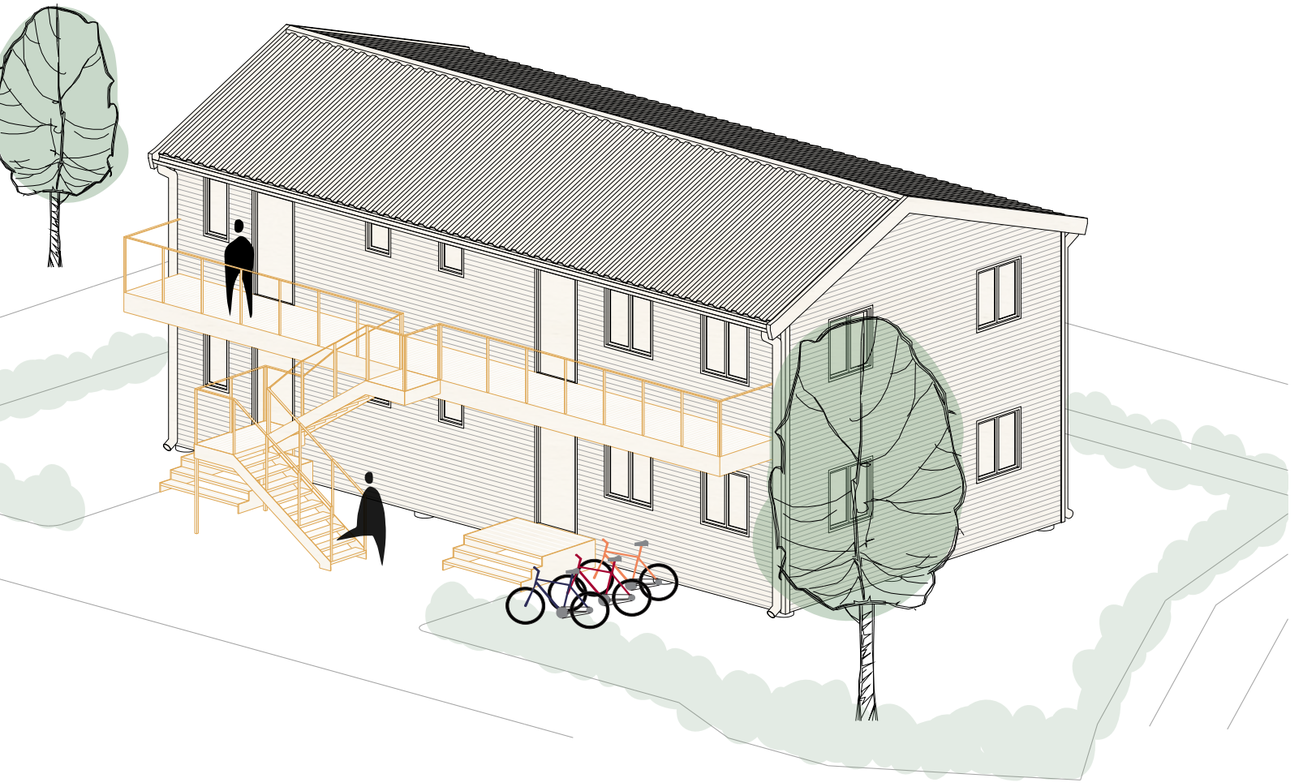
GROUND FLOOR



FIRST FLOOR

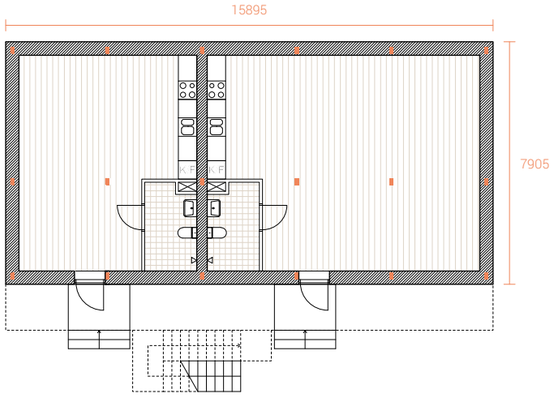
SCALE 1:200

UNIT 3
APARTMENT BUILDING

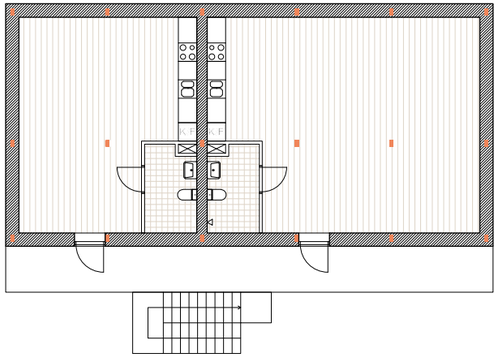


1-2 PEOPLE
41 SQM/DWELLING

2-4 PEOPLE
63 SQM/DWELLING



GROUND FLOOR



FIRST FLOOR

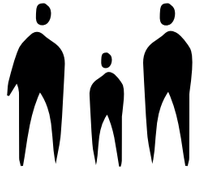
SCALE 1:200

TARGET GROUP
& FICTIVE HOUSEHOLDS

Building is an activity that most people can participate in regardless of background and pre-existing knowledge. After speaking to the self builders in Svartlamon, Trondheim, we understood that self building is a great way to get to know future neighbours and to find new ways of communication.

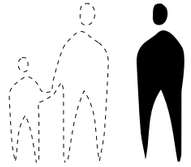
A conclusion we have come to during our research is that it is important to strive for a mix of participants with different backgrounds if the aim is to also promote integration. As an example, to mix newly immigrated people and people who have been living in Sweden for a long time or are Swedish-born increase the possibility of integration into the local area and the Swedish society in general.

Our three fictive household are based on the statistics and knowledge we have gained throughout our research. Newly immigrated and young people are often in an exposed situation on the housing market since they cannot always choose where they want to live. The third group is people who are interested in a different type of living that is not offered on the current housing market.



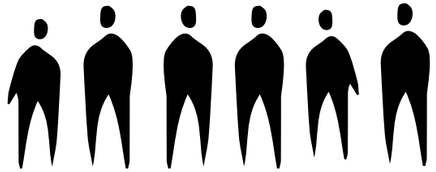
HOUSEHOLD 1 – THE CONSCIOUS FAMILY

Household 1 is the conscious family who consists of two parents and a younger child. Their main interest in taking part in the project is to be able to participate in an interesting process where they have the possibility of getting to know their neighbours at an early stage. They want to live a more minimalistic and resource efficient life and a smaller dwelling is suitable for their lifestyle. Moreover, they see the potential in self building to reuse old materials and to be able to personalise their home to their own family situation. They stay active on the second hand market to find windows and other materials to their house.



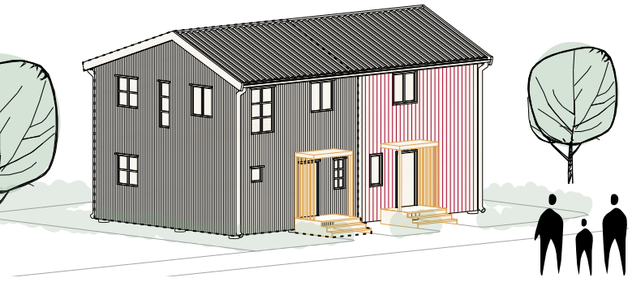
HOUSEHOLD 2 – MAN WAITING ON HIS FAMILY

The man in household 2 has lived in Sweden for two years and is currently waiting for his family to be able to come to Sweden. With the current housing situation and regulations from the Swedish Migration Board he is in need of an extra room for family immigration. The Swedish housing crisis makes it hard for him to find a suitable dwelling and he wants to take part in the process both to get a larger dwelling but also to strengthen his bond to the Swedish society and the neighbours in the area. He wants to install new windows and avoids the second hand market.



HOUSEHOLD 3 – THE COLLECTIVE

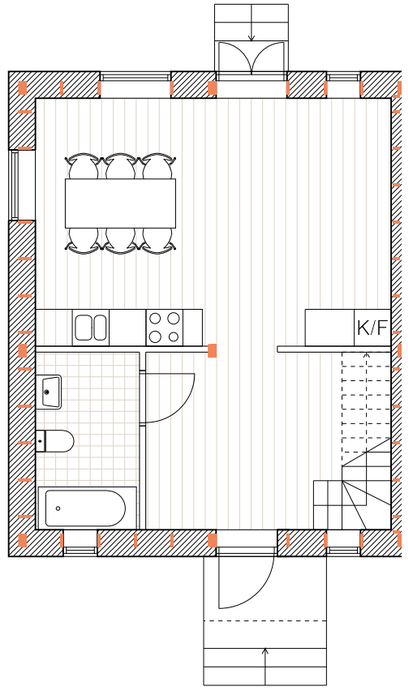
The collective are six people who are acquainted to each other and in search of a dwelling where they can live together. By building together they want to strengthen the bond in the group but also to get to know the neighbours. By taking part in an organised self building process they get a smaller down payment per person if they would decide to buy the house in the future. They also receive a dwelling that is suitable for their lifestyle. They want to have larger rooms for socialising mixed with smaller, private dorms. They want to build with a mix of old and new materials.



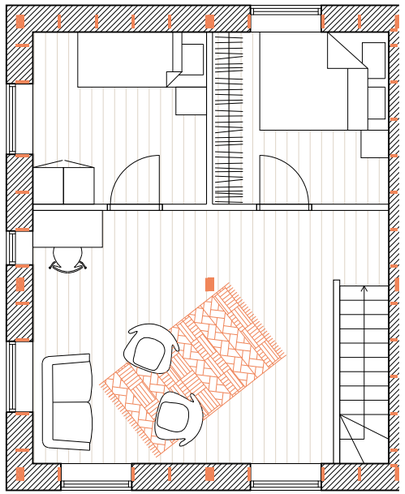
HOUSEHOLD 1

CHANGES OVER TIME

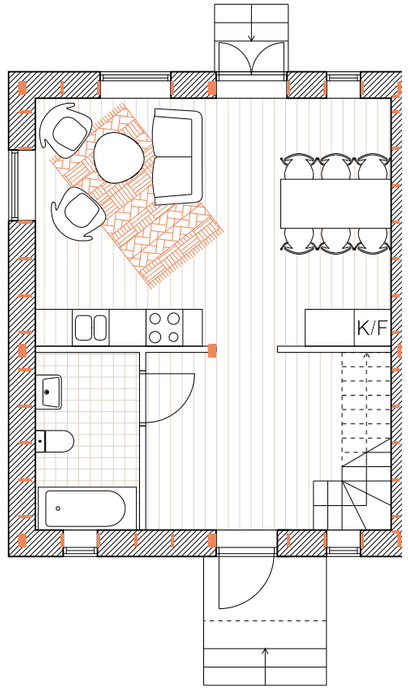
SCALE 1:100



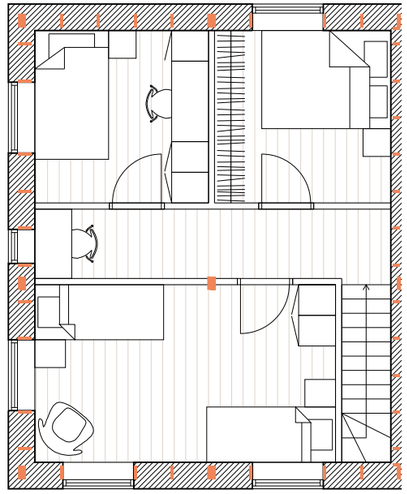
GROUND FLOOR TODAY



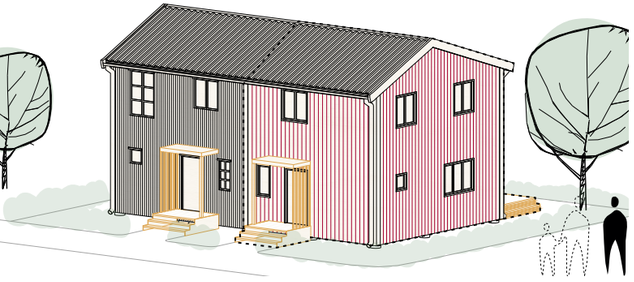
FIRST FLOOR TODAY



GROUND FLOOR IN TEN YEARS



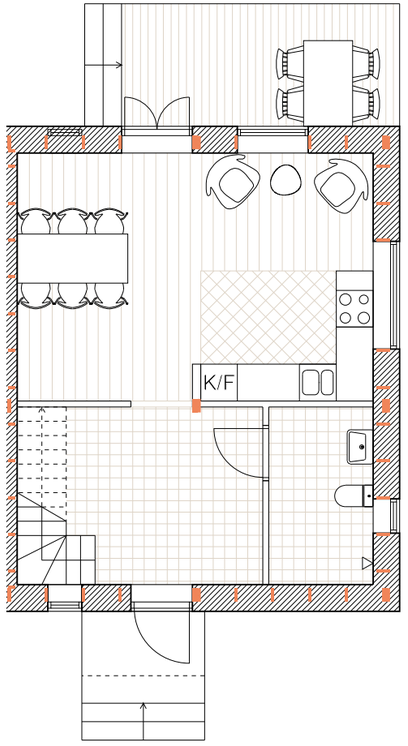
FIRST FLOOR IN TEN YEARS



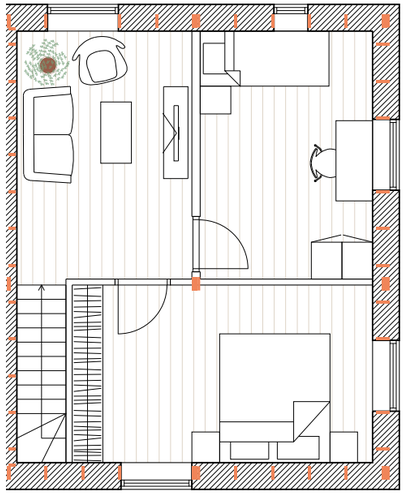
HOUSEHOLD 2

CHANGES OVER TIME

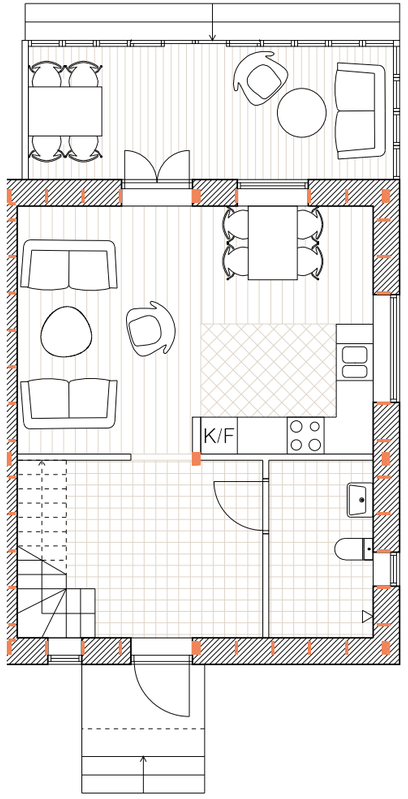
SCALE 1:100



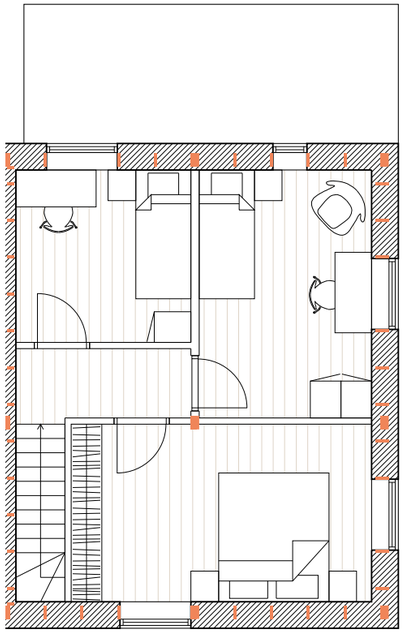
GROUND FLOOR TODAY



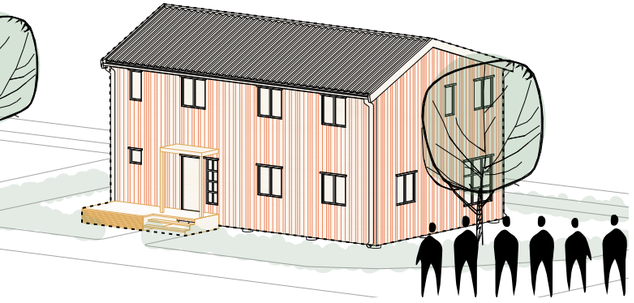
FIRST FLOOR TODAY



GROUND FLOOR IN TEN YEARS



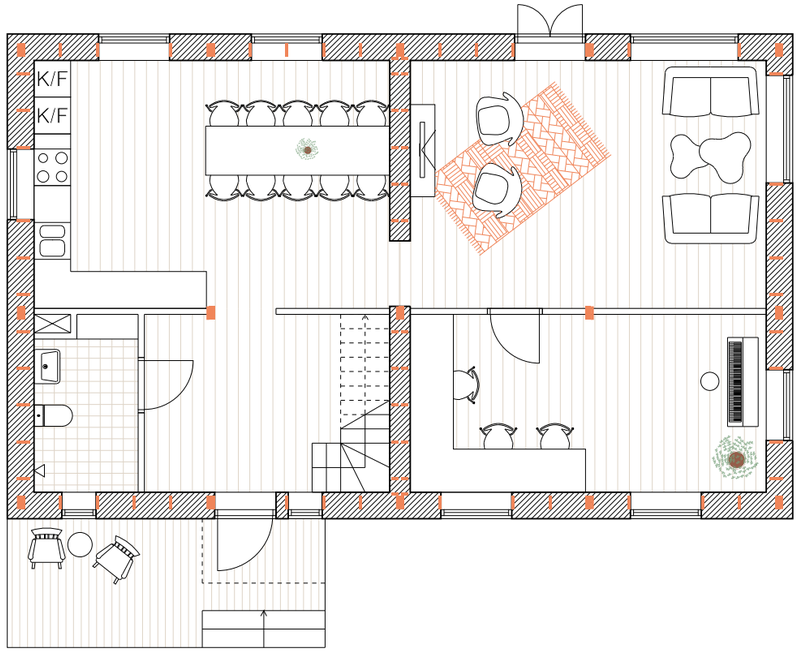
FIRST FLOOR IN TEN YEARS



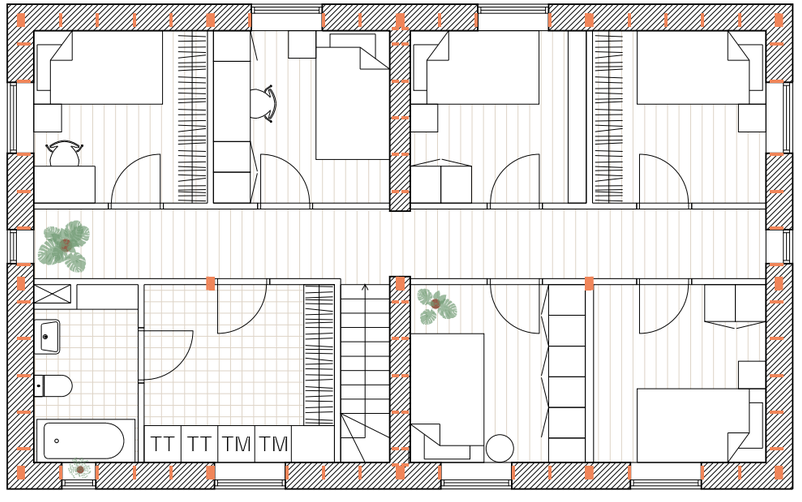
HOUSEHOLD 3

CHANGES OVER TIME

SCALE 1:100

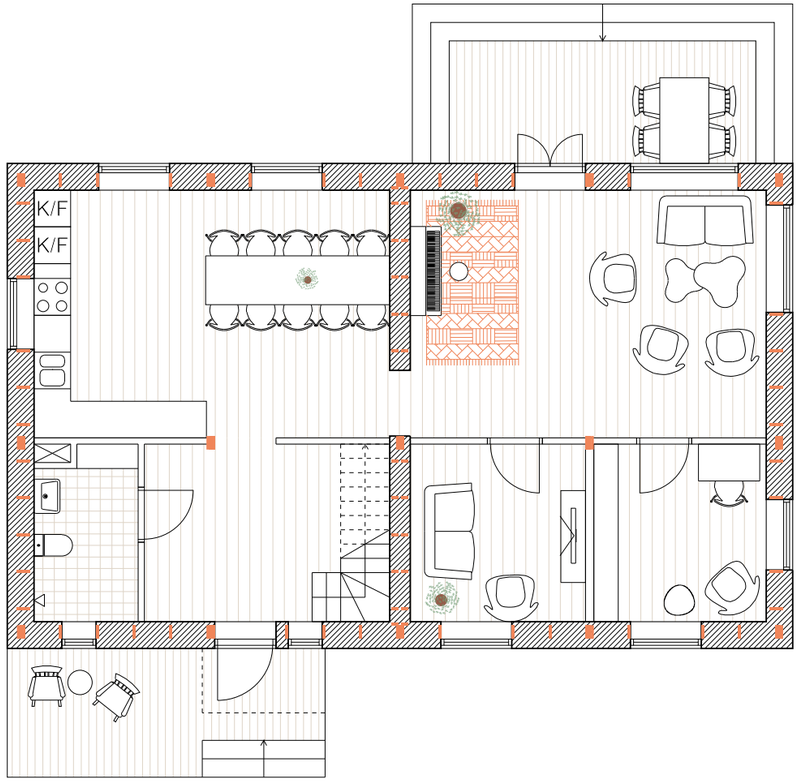


GROUND FLOOR TODAY

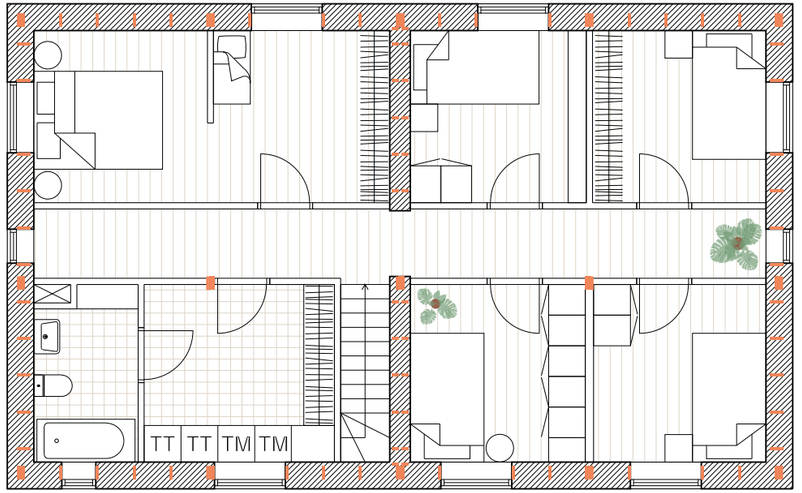


FIRST FLOOR TODAY

SCALE 1:100



GROUND FLOOR IN TEN YEARS



FIRST FLOOR IN TEN YEARS

CONSTRUCTION
DESIGN

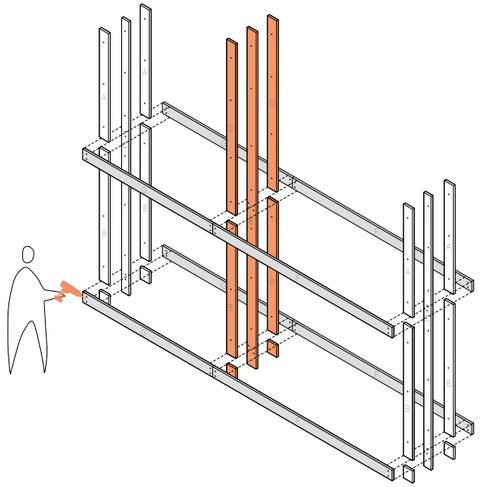
Our goal for the structure was to design a simple structural module which could be repeated an endless amount of times and do as little impact on the surrounding terrain and nature as possible.

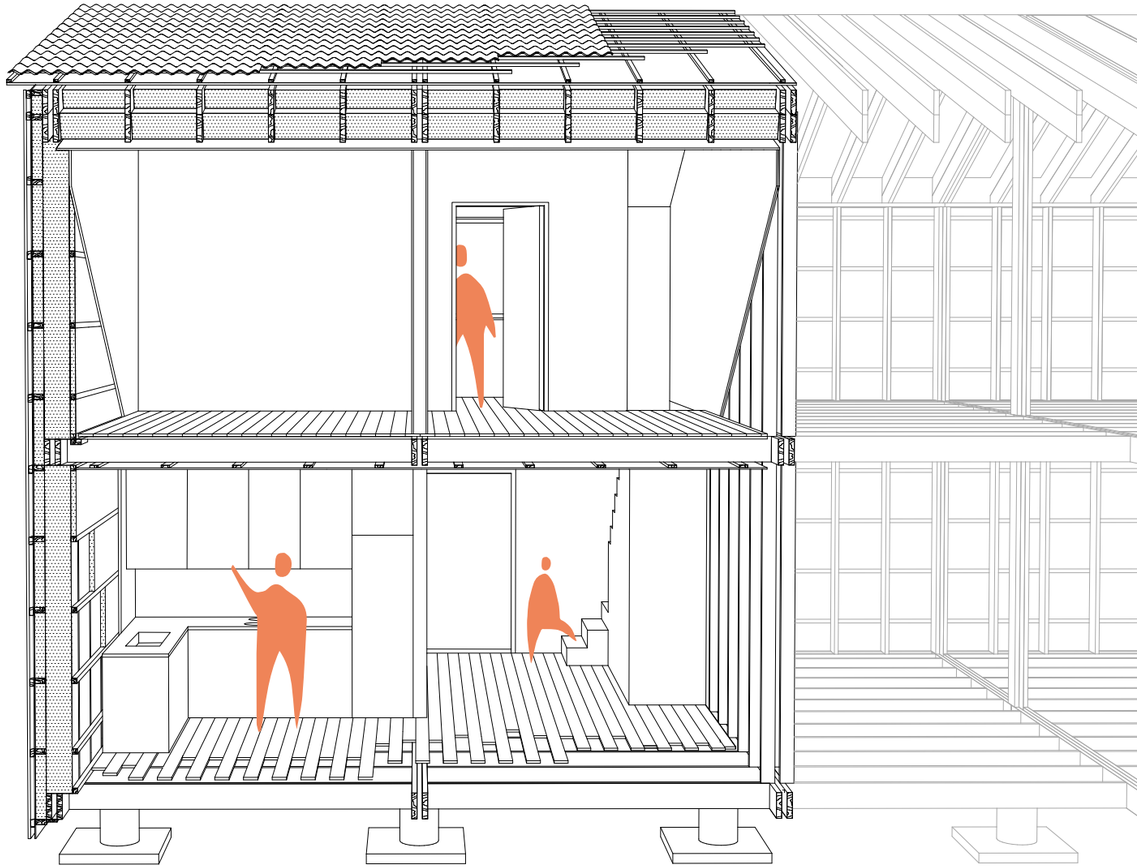
Inspired by the ideas of the Segal method (described on page 130-131) and a later readaptation by the Irish architect Dominic Stevens, we saw the potential in combining the Segal system with traditional Swedish stud wall building methods.

The loads of the structure are carried by the columns, which means that both exterior and interior walls are flexible and do not carry any loads. Volumes can be added and rooms can be changed without much trouble.

Most of the steps of construction does not require more than two to three people. Certain steps, such as raising the frames, will require about six or more people.

The simple building instructions and schemes that Segal provided to his self builders were also an inspiration. In the appendix (Appendix 1) a basic guide to our construction can be found.





CONSTRUCTION
REFERENCE: THE SEGAL METHOD

ORIGIN AND IMPLEMENTATION

In 1962, facing the challenge of providing a temporary home for his wife and their six children within a short time frame, the German-born architect Walter Segal developed a method which simplified traditional timber frame techniques using modern materials. With a total cost of £800 (equivalent to about £16400 in 2017) the carpenters managed to complete the temporary house in only two weeks (Broome, 1986). Although it was considered a temporary structure, it lasted for over 50 years and received a lot of attention.

Segal kept on developing the method for self builders, which resulted in the small neighbourhood of Walter's Way in the UK built in the 1980's. In this project, people mainly worked on their own, individual homes but came together when it was time to raise the frames of the houses.

Today there are about 200 Segal houses in the UK. After his death in 1985, the Walter Segal Self Build Trust was set up with the intention to spread the system and it has been tried out and further developed in many projects since (Grahame, 2015).

THE METHOD

Essentially, the Segal method is an open, modular system based on material and techniques already available. As a modular system, the Segal system is beneficial from a time and economic perspective since there is no need for any specially manufactured components. Segal meant for the method to be one which could absorb new techniques and be adapted to increased material performance with time (which it turned out to do). Waste is kept to a minimum by using a modular grid based on the standard industrial measurements of the materials. Materials are chosen by their performance, cost, size, weight and the fact that they can be worked with simple hand power tools. Foundations and groundwork should be reduced to a minimum. Walls can be moved and the homes can be easily extended.

The instructions Segal provided together with his system were kept efficient, but minimal: small diagrams of the layout and structure with standard details of junctions, a schedule of materials together with a set of instructions. The documentation was meant to be easily understood for anyone without earlier building experience (Broome, 1986).

Photo 25. The Segal Method (Broome, n.d.)

6.

IMPLEMENTATION

INTRODUCTION
IMPLEMENTATION

Our aim is to provide a form of housing which is possible to introduce to different municipalities in Sweden. To concretise our ideas we have chosen to do a case study in the locality of Lerum, east of Gothenburg.

Lerum has, as a majority of Swedish municipalities, an urgent housing shortage. The municipality has had a policy not to own land and today there is a great lack of rental apartments. The main groups who are affected by the lack of housing are newly arrived immigrants and youth.

To solve housing for newly arrived immigrants and refugees the municipality have, as a short-term solution, put up trailers. Though, the municipality is currently working with finding areas that are suitable for new dwellings in different parts of the municipality.

The site has been chosen for us by the planning office in Lerum and the idea from the municipality is to construct a modular, rental apartment building with 20 dwellings. Half of the dwellings will be assigned to newly-arrived and the rest to the public rental market (personal communication with Lars Palmeby, 9th of February 2017).

THE HOUSING SITUATION IN LERUM

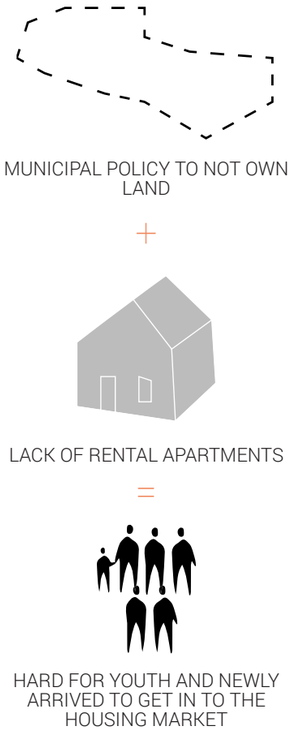


Figure 13: The housing situation in Lerum 2017. Illustration based upon a meeting at the planning office (9th of February 2017).

LERUM MUNICIPALITY

Lerum Municipality is situated in Västra Götaland County in the western part of Sweden. The administrative centre Lerum is located approximately 20 kilometres east of Gothenburg. Lerum municipality consists of four parishes: Lerum, Skallsjö, Stora Lundby and Östad (Wikipedia, 2017).

Lerum has a quite strategic location in the County and good communications to both the city of Gothenburg and the airport of Landvetter (Lerum, 2015).

LERUM IN NUMBERS

County: Västra Götaland
Land area: 25 861 ha
Population: 40692
Population density: 157,4 ppl/sqkm (Sweden: 24,5)
Average age: 39,7 yrs (Sweden: 41,2)
Average income: 332,1 tkr (Sweden: 290,3)
Unemployment: 6,7% (Sweden: 6,9) (SCB, 2016)

POPULATION DEVELOPMENT

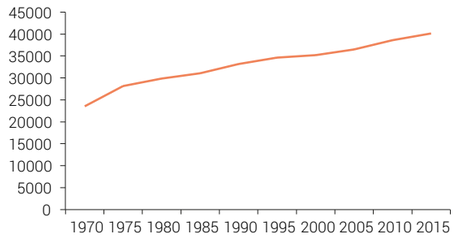


Figure 14: Development of population, Lerum municipality between year 1970 to 2015 (Wikipedia, 2017).

OWNERSHIP OF HOUSING

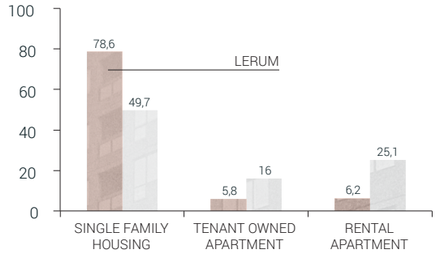


Figure 15: The graph shows ownership of housing in Lerum in comparison to Sweden year 2016. A clear majority lives in single family housing (SCB, 2016).


PROJECT SITE
WALK TO CENTRE: 20 MIN
TRAIN STATION
TIME TO GOTHENBURG: 20 MIN
LERUM CENTRE

THE SITE

SITE PLAN

The plot is located at the outer border of Lerum. It is placed by a small road, surrounded by greenery and undisturbed by noise and other buildings. The few buildings nearby are a mix of double story detached and row houses. The terrain is sloping down towards a valley in northeast.

In our proposed site plan, there are nine housing units, one common building and one green house. The housing units contains 21 dwellings.

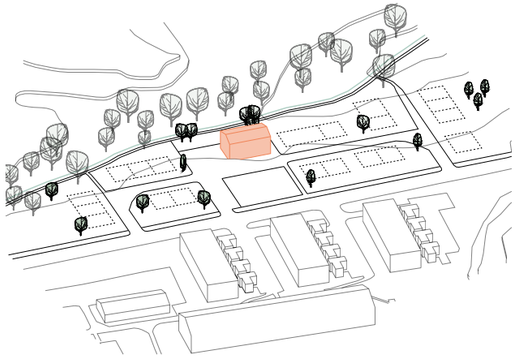
PRIVATE AND SHARED SPACES

Each dwelling has a small, private outdoor space. Entrances are facing each other along the small street. The streets are accessible by car, but are covered in gravel to give the impression that the road belongs to the pedestrians rather than cars. The common space in the middle of the area works as the hub for the residents. There will be a small kitchen, laundry room, guest room and a bigger room for dinner and activities in the common building. The community building together with the cultivation plot, green house and playground can be used by residents in the neighbouring areas as well.

PARKING AND TRANSPORT

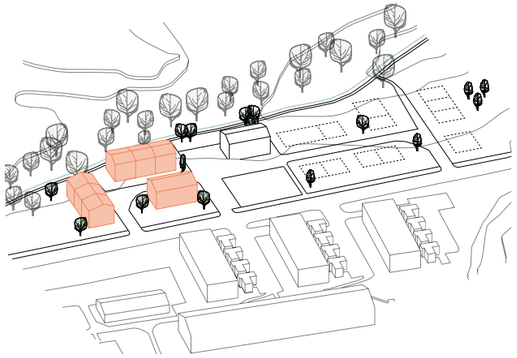
There are just a few parking spaces on the site, but more are to be found in a shared parking lot 50-100 meters away. Since there is a bus station only 100 meters away, and a short biking distance to the centre and train station, we believe that a car is not necessary to have here. Though, all our decisions should be up for discussion with the residents in a future project.

PHASES
IMPLEMENTATION



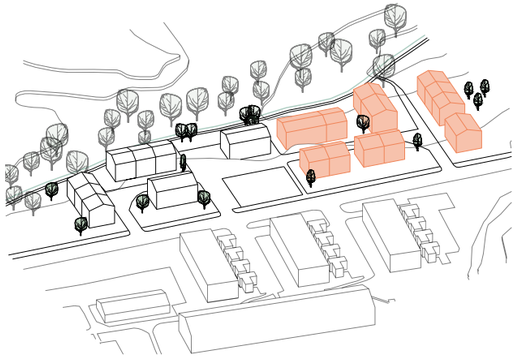
PHASE 1: THE COMMUNITY BUILDING

The first phase of the construction starts with the community building in order to have a more hands-on education in the basics of construction. The common house can be used for storage, meetings and indoor carpentry during the construction and later on turn into a neighbourhood meeting place.



PHASE 2: AREA 1

The second phase is the start-up of the first dwellings. We propose that the process starts with fewer houses in order to be able to evaluate the construction and understand the building process. It is important that the construction start simultaneously in order for the self builders to be able to help each other.



PHASE 3: AREA 2

The last phase is the construction of the largest area. It can start when area 1 is still under construction and hopefully there have been some valuable learning outcomes from the previous areas, which can make the process more efficient.

ACTORS
IMPLEMENTATION

THE LOCAL PROJECT GROUP

The project group is the initiator of the project and can consist of people from both the private and public sector. The project group hires consultants with diverse competence to help with the process, such as project leaders and architects.

THE MUNICIPALITY

The role of the municipality is to make sure that there is detailed plan land available in order to get a faster process.

THE SELF BUILDER TRUST FUND

The project group can apply for money from the self builder trust fund. The fund is ideally established by the public sector, but the initiative can also come from engaged citizens.

THE SELF BUILDERS

The self builders share the responsibility of the construction. Through a dialogue process with professionals they design and build their neighbourhood together.

THE TUTOR

The tutor starts up each new phase of construction and is available once per week for meetings with the self builders. The tutor should be able to reach during all work days for questions.

ENTREPRENEURS

The role of the entrepreneurs is to help with the groundwork and control each step in order to guarantee the quality of the construction

ECONOMY
THE SELF BUILDER TRUST FUND

Self building has the potential to work for both rental and private owned dwellings. In Sweden today, the most common is that self build projects result in private ownership. It is hard to value the work the self builders have put in the construction and decide a rent that reflects the amount of work. Though, it should be possible to find a model that opens up for people with diverse economy to take part in a self build project.

A trust fund is proposed in order to enable for people with little own capital to participate. The trust fund can hold the financial responsibility of the project and help with initial loans for building permit and projection. The fund can work either as a landlord or bailee during construction.

For the initial capital the trust fund can apply for money from institutes such as Mikrofonden i Väst and Boverket.

RENTAL DWELLINGS

The self builders build to rent the dwelling from the trust fund. The trust fund decides the budget for the area and covers all costs from materials to entrepreneurs. The value of the self builders work will be reflected in the rent.

PRIVATELY OWNED DWELLINGS

The trust fund is used as a bailee during the construction. Each individual household decide on a budget depending on the household economy. The finished house is owned and taken care of individually.

COLLECTIVELY OWNED DWELLINGS

The self builders use the trust fund as a bailee during construction and share the financial responsibility of the project. The households share the down payment and decide on a budget for the area. When the project is finished the self builders own and take care of the neighbourhood together.

TIMELINE
IMPLEMENTATION

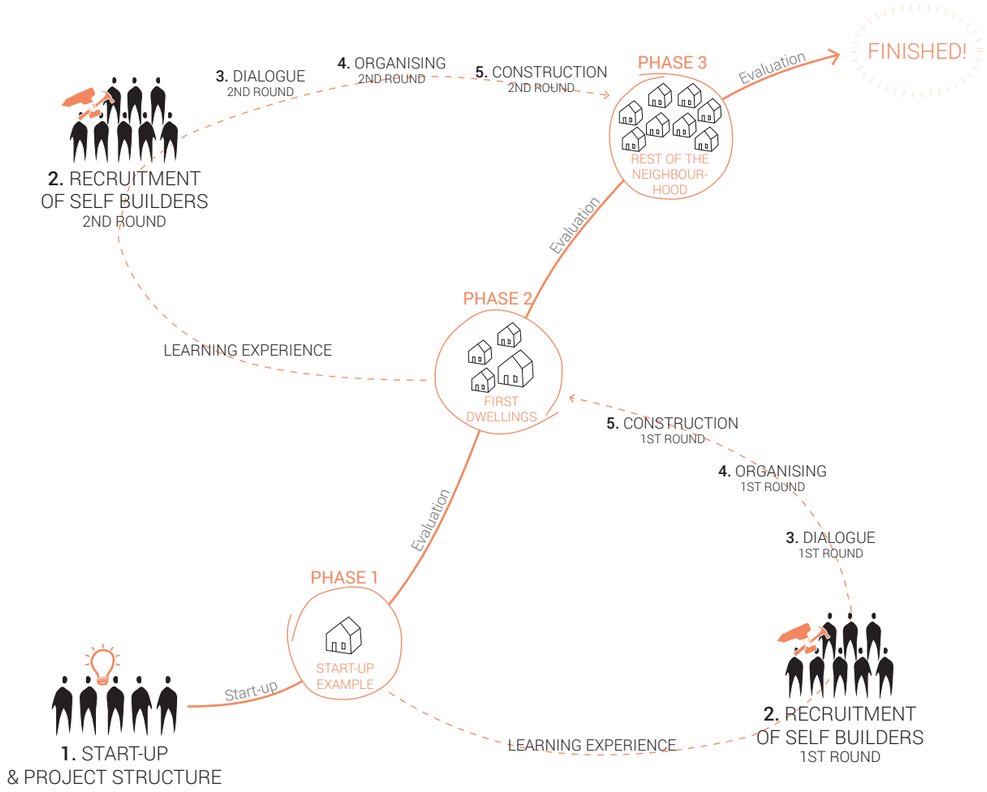


Figure 16: Illustration of the project time line for the implementation at the site in Lerum.

1.
START-UP & PROJECT STRUCTURE

SHAPE A LOCAL PROJECT GROUP

The project starts with an initiative by individuals who see a need for or are interested in a self build project in their municipality.

FIND A SUITABLE SITE

Independently, or together with the municipality, the project group finds a suitable site for the project.

DEFINE THE TARGET GROUP

The project group defines the target group and the amount of households that will participate based upon the situation in the municipality and the size of the site.

THE ECONOMIC FRAMEWORK OF THE PROJECT

The economic framework of the project is decided as well as the form of tenure. The self builder trust fund is contacted for financial support.

COMMENTS

One of the main challenges for starting up a resident built project is the absence of cheap, detailed planned land. The planning process in Sweden is long and can slow down the project. Though, self building opens up for construction of housing in less attractive locations that have been disregarded by construction companies for financial reasons.

There is not yet a financial infrastructure that supports resident built projects. In order to open up for a more diverse group of people to be able to participate, there is a need to find an alternative economic model. We propose the trust fund as one of the answers.

There is a lack of a Swedish platform where information about resident built projects and the process can be found. Though, there are successful, contemporary projects (such as Svartlamon and Almere) that can serve as an inspiration.

2.
RECRUITMENT OF SELF-BUILDERS

SEND OUT INFORMATION

Information about the project is spread to find people who match the target group and are interested to partake in the process.

People who already live in the neighbourhood should be informed about the project.

SELECT THE SELF BUILDERS

The selection of self builders is based upon a personal letter where they demonstrate an understanding of the project and the process. Pre-knowledge in construction is not necessary.

COMMENTS

It can be difficult to find people who match the target group and are interested and have time to take part in a self build project. Though, by using different media outlets there is a possibility to reach out to a more diverse group.

Without an actual built example people can have a hard time to understand the final result and hesitate to take part in the project with the consequence of fewer applicants. But, we believe that the process can begin with fewer households than intended. The construction of the units can serve as a showcase for the project. Another solution to attract people is to build one housing unit that can serve as an example.

Existing neighbours should be invited to participate in the process. If existing residents are neglected there is a larger risk of negativity and appeals against the project.

3.
DIALOGUE

TEAM BUILDING

It is important that the group get to know each other in this phase in order to lay out a foundation for a good collaboration throughout the process.

COMMON GROUNDS

The group have a dialogue process together with architects and planners to define the common grounds of the project and design the site plan of the neighbourhood.

INDIVIDUAL MEETINGS

The self builders have individual consultations with an architect to personalise the home according to the households' need.

COMMENTS

The self builders have the possibility to design a neighbourhood together that reflects its residents. If the people who participate have different goals and expectations the professionals in charge of the dialogue should help to sort out and define the common grounds of the group.

The individual consultations with the architect will help the self builders to design and build a home adapted to the household's needs. The design and layout of the floor plan will help the self builder to visualise the future home, though it can be seen as a process as well. When the construction starts changes can be made in order to fit second hand materials or to make the construction easier.

In this stage it is also important to set a back-up plan for possible defection among the self builders.

4.
ORGANISING

SCHEDULE

A schedule for the construction is decided and entrepreneurs for groundwork, plumbing and electricity are hired.

MEETINGS

The self builders set up a structure for meetings with the project group and tutor. One meeting per week is proposed, where experiences from the past week can be discussed.

TUTORING

The structure for tutoring is set up. In the initial phase of construction and education it is important that the tutor is on site daily. Later in the process, it will be possible to only meet up with the tutor once in the beginning of each new construction stage.

COMMENTS

The organisation between the actors is a critical point for the collaboration throughout the process. Together the self builders and project group should decide on a clear, realistic time schedule in order to reduce the amount of stress amongst the self builders.

In this stage the self builders should create a platform for discussion. A proposal is an online forum where the self builders can communicate and share information.

Feedback sessions throughout the process should be decided in order for the self builders to be able to talk freely about challenges they are facing. It is possible to beforehand contact a person that can serve as a conflict solver during the project if needed.

5.
CONSTRUCTION

EDUCATION THROUGH BUILDING TOGETHER

The education in construction starts by hands-on building. Supposedly the construction starts with a common house that can serve as an education in the construction principles. During the construction the common house can be used for storage, indoor carpentry and a place for meetings during the construction.

GROUND WORK

Together with the self builders entrepreneurs help with the groundwork, electricity, water and plumbing. The entrepreneurs check the more critical parts of the construction in order to guarantee the quality.

CONSTRUCTION TEAMS

If the project site is large, there is a possibility to divide the self builders into different construction teams that help each other throughout the process.

COMMENTS

The construction is the hands-on part of the process where the self builders will see tangible results and have the opportunity to show their creativity in decision making and building.

A critical point in the construction is that everyone is properly introduced to the building methods. A construction handbook can be used to guide the self builders in the different steps of construction. The tutor will be available and start up each new phase. Since the self builders build simultaneously they have the possibility to help each other throughout the process when the tutor is not available at site.

6.
EVALUATION & RESULT

EVALUATION

When the project is finished, an evaluation will sum up experiences from all actors which can be used to improve the process in projects to come.

DWELLINGS

The participants now have their own homes.

SOFT VALUES

The self builders have started to know their future neighbours during the process. Hopefully this will contribute to a neighbourhood with a stronger sense of community.

PROFESSIONAL KNOWLEDGE

The self builders have gained knowledge from the construction process which potentially could be used for professional advances.

COMMENTS

Evaluations should be made throughout the project in order to improve the process. The evaluation should be critical and give the self builders an opportunity to speak freely about discontents. The evaluation can serve as a base for future projects.

The self builders have gained knowledge from the construction process which can be used in later professional life. It can be seen as a trainee program for those interested to work in carpentry, but it has other outcomes that are important for the work life, such as the ability to collaborate and be a part of a complex process.

Through building together the residents have a neighbourhood and dwelling that reflects its inhabitants. Hopefully the experience have strengthen the bond in the group and increased the sense of community.

FUTURE DEVELOPMENT

AN UMBRELLA ORGANISATION

We discovered early in our research that there is a lack of infrastructure and information about how to start up an organised self build project. In the future, we believe there is a need for an umbrella organisation, such as the Swedish Association for Joint Building Ventures (Föreningen för Byggemenskaper), that can serve as a database with information and experiences from self built projects. It can be seen as a user based online meeting place where self builders can read about materials and techniques, share drawings and contact other self builders and professionals.

THE PUBLIC SECTOR

The value of the self builders' work has to be accounted for. To value the own work of the self builders as a down payment for the dwellings (such as in the Private Home Movement) would be an interesting, yet idealistic, idea to try out.

In the future we believe that the public sector should be involved in the project. The government and municipalities should be open for any potential improvements revolving social sustainability on the housing market. If the public sector can see and understand the potential with resident build projects there are possibilities for other, stately based, economic models in the project than the self builder trust fund

A PILOT PROJECT

A way to convince the public sectors (and others) about the benefits with resident building is to do a pilot project where the method is tried out. It does not have to be in the scale of our case study in Lerum, it can be smaller. An infill project in a neighbourhood or an area with 3-4 houses would be sufficient.

A smaller project requires less investment, but can still be valuable in the later discussion about self building in a larger and more systematic scale.

8.

CONCLUSION & REFLECTIONS

This master thesis has been a learning process and a chance for us to dig deeper into subjects that we are interested in. The investigation has focused on understanding the complexity of the Swedish housing market and how different self building concepts and techniques can help to change the roles in the construction industry.

The main purpose of the thesis is to discuss methods on how to organise self building in a way that provides affordable and considerately built dwellings and how self building can aid the housing crisis and provide other social benefits.

The overall aim is to develop a design method for self built housing units with a social, ecological and economical sustainable profile. The units should be designed in a way that makes them easy to build for a nonprofessional with assistance from a tutor.

Hopefully this thesis can work as an inspiration and background for further investigations in the area of self building and how self building can enhance citizen involvement in the housing industry and provide neighbourhoods with stronger social bonds.

The main questions that we have investigated are:

Can a more democratic category of housing be introduced on the Swedish housing market through self build projects?

What role can self building play in an integration process and introduction to a profession?

How can a house that is adaptable, sensible to the environment and easy to build be designed?

CONCLUSION

CAN A MORE DEMOCRATIC CATEGORY OF HOUSING BE INTRODUCED ON THE SWEDISH HOUSING MARKET THROUGH SELF BUILDING PROJECTS?

We find that self building projects can have a crucial role for democratising the market driven housing supply of Sweden. These kind of projects have the possibility to increase citizen involvement in the planning process, to change existing hierarchies in the construction industry and to give the residents the power to shape their own dwellings.

A “democratic category of housing” aims at including as many and as diverse groups of people as possible. This means that efficient ways to collaborate between actors needs to be found, together with an economical system which open up for people with a smaller income to participate. As the interest for joint building ventures is growing in Sweden, we see a possibility for organised resident building projects as well. Unfortunately for any kind of project stepping out of the Swedish housing norm, there are many obstacles to be found in the less than flexible system with strict building rules and long detail planning processes.

WHAT ROLE CAN SELF BUILDING PLAY IN AN INTEGRATION PROCESS AND INTRODUCTION TO A PROFESSION?

Throughout our research, we did not find a self build project which focused on integration. After discussions and meetings with knowledgeable people in the field and a workshop carried out with newly arrived, we could see that self building has the potential to help in an integration process.

For example, by building together the residents in Svartlamon started to shape bonds before moving in, both within their own group as well as with neighbours in the area. Through working on something hands-on with tangible results, they found new ways of meeting and communicating. Moreover, work is important in an integration process. The building process can help to create competence within the construction field and may work as a trainee program for those who are interested in working in the construction industry later on. A self building process can have other outcomes that are important for a future work life, such as learning how to collaborate, handling a budget or being part of a complex process.

HOW CAN A HOUSE THAT IS ADAPTABLE, SENSIBLE TO THE ENVIRONMENT AND EASY TO BUILD BE DESIGNED?

An important goal for the construction and design was that it should be simple and easily built with as clean materials as possible. We wanted to design dwellings which could be built tomorrow with accessible materials. This condition quickly excluded the idea of custom made prefabricated materials. Through research of different construction systems, we decided on a stud wall frame inspired by the Segal method. It is a construction principle based on standard measurements and built with components available to buy in a building department store. The stud wall frame system, adapted to the standardised cc60-measurements makes it easier to use cladding materials and insulation without having to cut the materials. The system hits a spot between traditional building methods and modern, modular efficiency. It is also easy to extend, rebuild and adapt in years to come.

We have chosen materials that are kind to the environment and the framework allows for the residents to personalise both the exterior and the interior of the house.

FINAL REFLECTIONS

SWEDISH HOUSING MARKET AND SELF BUILDING

The Swedish housing market is incontestably in deep trouble. Of this, politicians, the housing sector and especially the thousands of Swedes searching for a home are sorely aware.

The current states of the Swedish housing market and construction industry are covered in the background chapter of this thesis. From these studies, it is obvious that the political approach to the housing supply has changed a lot since the days of the Private Home Movement and the Million Homes Programme. Somewhere along the line, the driving forces behind the housing market moved from the government building for the common good to the market building for profit. Consequently, the less profitable types of housing (like affordable rental apartments) have been built in less quantities, leading up to a lack of housing.

Along with this, there is a tendency on the Swedish housing market to disregard quality in favour of economic gain. Due to the urgent need of new, affordable dwellings, modular housing and trailers seems to be the quickest answer for many Swedish municipalities. There is not necessarily anything wrong with standardised modular dwellings, but it many cases it is a short-term solution to a long-term problem.

A look at historical trends implies that in good times, society tends to turn to the ideology which claims that the market forces (or, as you will, the "invisible hand") will somehow solve large, societal problems. Consciously or by accident does not matter, inequalities will be evened out by some unspecified law of nature. Today, people who cannot afford to buy a tenant owned apartment are struggling to get a home at all, which in every way should indicate that the Swedish housing market needs a major change. It seems like the prevailing circumstances behind the crisis are not questioned enough by the politicians to initiate a structural change, at least not nearly fast enough. Instead, we stay in the hands of the market and profit-hungry construction companies who, in fact, have no real obligations to save us from a lack of housing. That *"the entire population should be provided sound, well-planned and adequately equipped quality housing at reasonable cost"* should not be a government proposition belonging to another era, but something that should always be strived for.

What happens when the market does not live up to the expectations put on them, when a home becomes a privilege rather than a right? Are companies' good-will, individuals' solidarity or the government's obligations the expected saviours? Is the answer maybe in the hands of the affected people themselves? Maybe it is a combination of all, and perhaps this is where organised self building can enter as a solution.

CREATING COMMUNITIES

Buildings and communities are reflections of the times they belong to. Today, a lot of people in Sweden live in single households. These households are typically put in buildings where the residents run in to their neighbours occasionally, perhaps with a polite greeting. These types of buildings contain people, but do not facilitate or encourage any contact between said people. It is possible to argue that we prefer to live in this way, but it may as well be caused by a lack of options.

In earlier days, individuals were more dependent on each other due to reasons that we do not have to be concerned about today. Nowadays, most people get money from an employer, buy food from the supermarket instead of exchanging goods and the state provides support if they become ill or face other inconveniences. Neighbourhood communities are not needed for survival, but is that to say that they are not needed at all?

When we spoke with the newly arrived during our workshop, we talked about the cultural difference between the social life in Syria compared to the one in Sweden. In Syria, they felt, there was a greater sense of community. Greeting, talking and being hospitable to neighbours and strangers was a part of the general behaviour. The participants agreed on that while there was a lot for them to learn and appreciate in the Swedish culture, Swedish people could also learn from their culture – especially in social aspects.

By bringing people together and involving them in a process like self building, new ways of connecting and sharing experience ensue. The self build project in Trondheim is an example of this. However, one should be aware that the small size of this specific project has helped to avoid arguments. The participants in this case, are quite a homogeneous group of people and idealists, relating to many issues in similar ways. In the joint building venture in Understenshöjden where 44 households were trying to cooperate and agree, more quarrels occurred. Quarrels, on the other hand, is a

natural element in a larger group and a proper way to manage them should be worked out. Additionally, it is important to establish a proper procedure for choosing between the applicants for a self build project. All participants should understand the conditions for the building process.

By creating communities, you create a sense of belonging. It will be important to generate this feeling after the building process is finished as well. To maintain a communal spirit, there is a need for people to meet and interact. As one measure to do this, we suggest shared spaces at our test site in Lerum. A community building would hopefully spark more spontaneous interactions between the residents and surrounding neighbours. In conversation with the inhabitants other shared spaces could be added as well, such as a cultivation plot or playground.

DESIGN PROPOSAL AND FLEXIBILITY

We believe that it must be possible to create affordable housing with quality in mind, preferably while strengthening individuals and the communal bond between individuals at today's market.

We find that in a self build project, the buildings should manifest the identities of the individuals living inside. In other words, the design of a self build project requires that we as architects leave some decisions beyond our own control, as the creativity of the builder should be encouraged. The framework of the design should be both comprehensible and adaptable and this is what we tried to achieve with our design proposal.

Although, one should calculate with the possibility that some self builders do not want to make creative decisions. The process of building could be rewarding enough, without making any active aesthetic changes in the design. The choice of using recycled material or new standard production should be up to the self builder.

Leaving the design open for individual choices will create a variated exterior and interior look between the units. Examples of this freedom in expression is to be shown in the self build projects of Trondheim and Almere. As cited in the self build chapter, the area of Almere received some critique from architects who were dissatisfied with the aesthetic result. The design results in Almere are very scattered due to the complete freedom of design. In our proposal, the changes in design will happen within the same structural framework, more similar to the project in Trondheim. This includes a variety and freedom of choice in doors, windows, cladding and added exterior volumes like porches and balconies.

A self build project might not live up to the aesthetic norms of the architect profession. On the other hand, how many industry-built projects do today? The intention with a self build project is not to win design awards, but to empower citizens and let them build with an engagement and passion for the project.

Self building in a more systematic way might not be the sole answer to how we can sensibly build our way out of the housing crisis, but we argue that it is one of them. Through handicraft and personalisation of homes, a greater variation in the housing stock can be achieved. Beyond this, self building can open a door for stronger communities, more job opportunities, initiate an integration process and help to reach self-realisation.

IMPLEMENTATION

The site in Lerum was given to us by the municipality and is situated in the outskirts of the city. A case study was important to carry through to test out the proposal in a context. Though, the housing units are intended to be placed in many different contexts around Sweden

Historical and current projects show that it is possible to carry out neighbourhood projects through resident built homes. However, there are obstacles on the way. It is important to find a well-functioning economy around the project. The kind of affordable self build project we propose is not common in Sweden, and we have not found any existent references to use for the economic layout of the project. Hence, the infrastructure around this would have to be created from scratch. This is unfortunate, but we hope that the government and financial institutions will be open enough to engage in new solutions.

We believe that the project should not depend on the municipalities, who in many cases have a hard time to operate projects that are unconventional due to strict guidelines and regulations. As mentioned in the implementation chapter, we suggest that a trust fund should have the financial responsibility. We imagine that the trust fund could work as a landlord or a bailee. Then, there are different ways of structuring the ownership of the dwellings. There are three main scenarios: rental dwellings, collectively owned dwellings or private owned dwellings. For these scenarios to become more than guesswork, a person with a background in economy should evaluate the prospects of each. We believe that, if it is possible, the self builders should own their dwellings after construction in order to have a clear position in today's housing market.

OUR PROCESS AND FURTHER DEVELOPMENT

Out of the five themes of social sustainability in the architectural practice (as defined by Boverket and presented on page 29-30) our thesis has revolved mainly around three of the themes: identity, variation together with influence and collaboration. Due to our project's small scale and the delimitations we defined for ourselves, we put little focus on the comprehensive view of city planning and correlation.

Since we decided on what material and construction system we found the most appropriate for the project quite fast, the chapter on construction and material was kept very basic. We are aware that the choice of insulation material and the use of second hand material could be discussed further. As the structure itself does not restrict the use of any insulation material, our specific choice can be seen as a suggestion and not a final decision. The application of different sustainable systems for heating, solar panels, stormwater management etc. on the site should be developed as well.

As we are quite inexperienced as builders, we have been left to make a lot of assumptions based on our research along with ideas, opinions and thoughts about self building of more experienced builders. To make a fully realistic self build project, we believe that one should have far more building experience than we do. Additional competence would have to be taken in and help with the aspects that are not necessary within an architect's knowledge base (economical aspects and so forth). The design and construction methods would have to be tried out in an actual building process, maybe in a smaller scale.

To take this project further, decisions about the construction system, materials and sustainable building solutions should be developed and discussed. Though, even in the proposal's current state, we believe that it is adaptable to more types of units than we had time to produce. Other units could be in a smaller or a bigger scale, depending on the context they would be placed in. For example, infill projects would be an interesting addition. If we would have had enough time, we would have liked to try to implement our design in more than one context.

Regardless, we are happy with what we have accomplished within this limited time frame. This master's thesis has been a great learning experience for us, and hopefully we will be able to develop our proposal further in the future.

- Caroline Ekberg & Alice Valinger, June 2017

9.

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10.

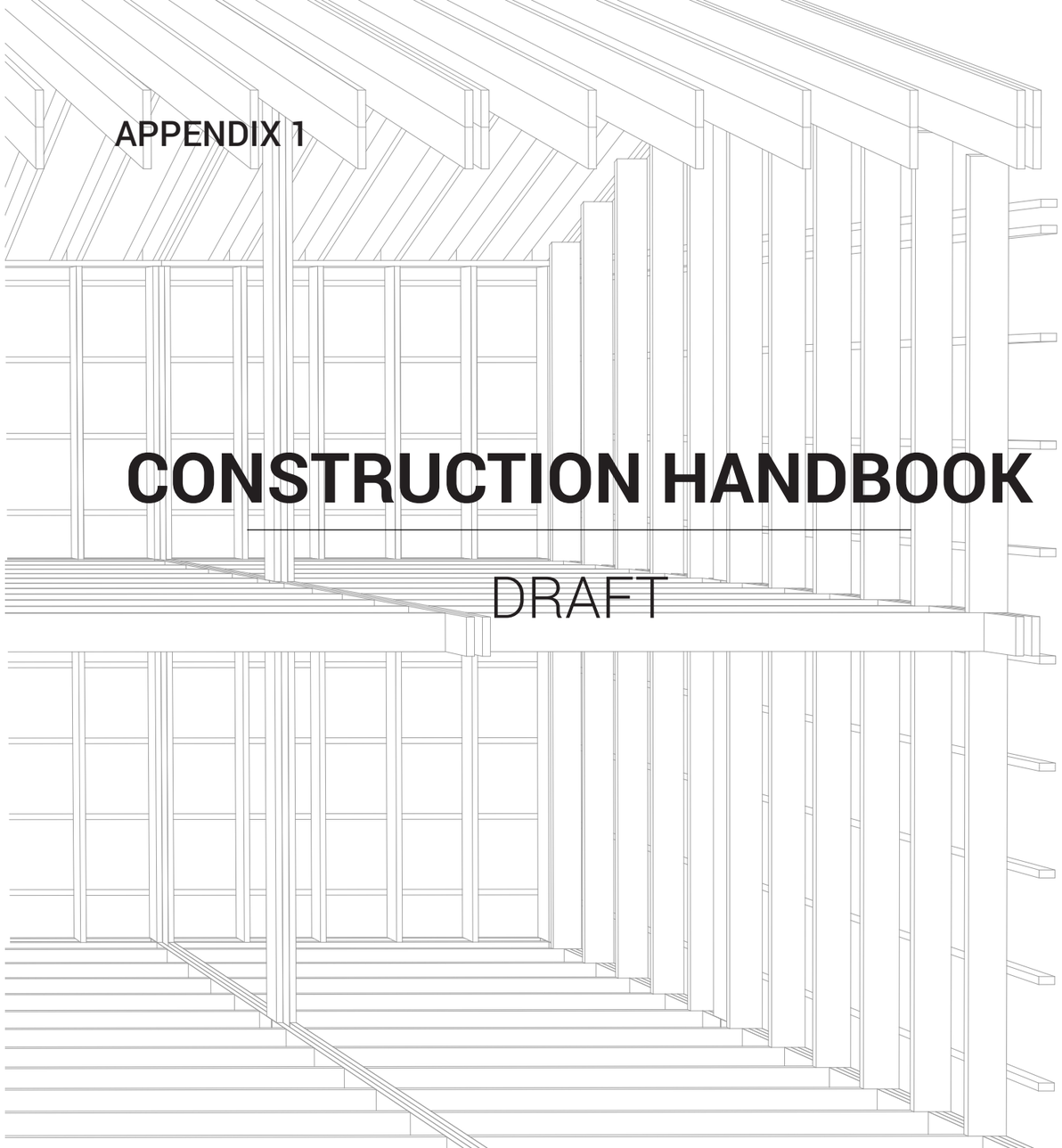
APPENDIX
CONSTRUCTION HANDBOOK

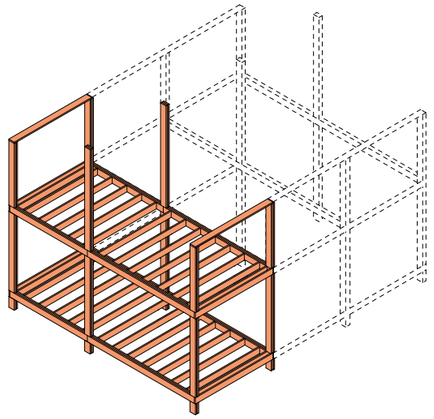
CONTENT

APPENDIX 1

CONSTRUCTION HANDBOOK

DRAFT

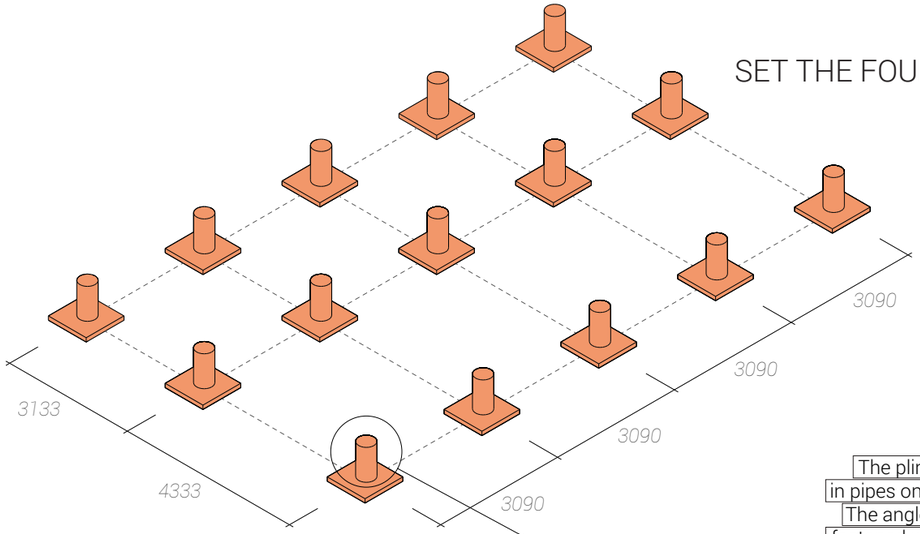


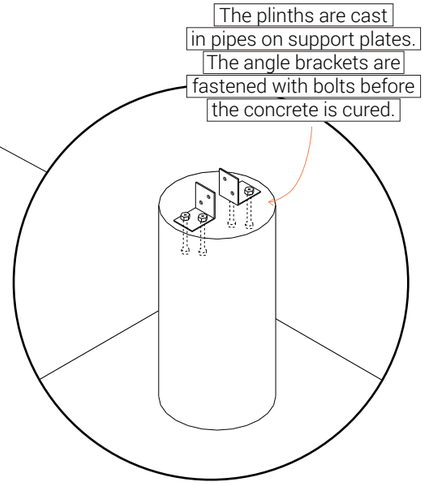


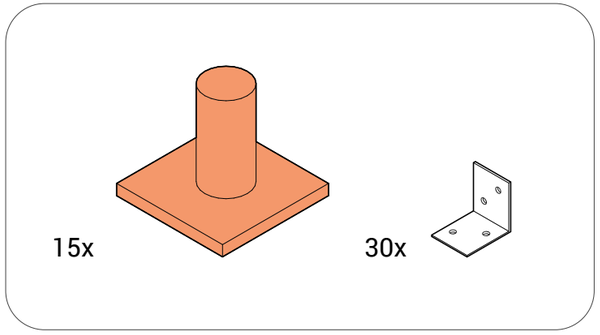
Our goal was to design one, simple structural module which could be repeated an endless amount of times and do as little impact on the surrounding terrain and nature as possible.

The structural system is inspired by the ideas of the German-born architect Walter Segal, who in the 60's reinvented the traditional timber frame to fit a more modern and modular approach. Essentially, the Segal method is an open, modular system based on material and techniques already available.

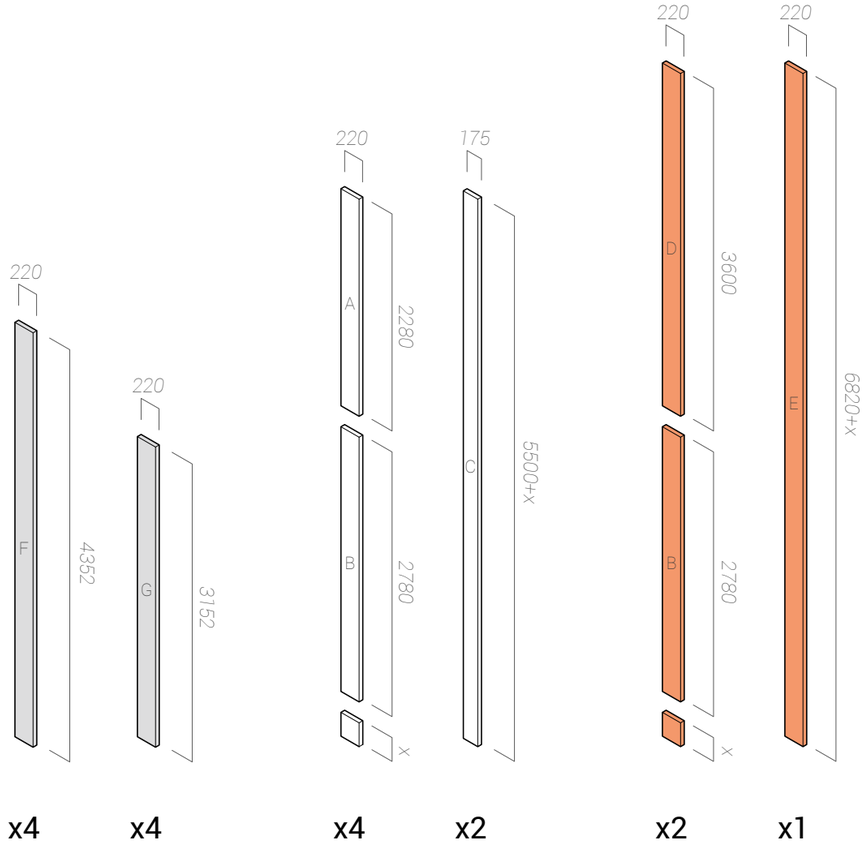
1.
SET THE FOUNDATION

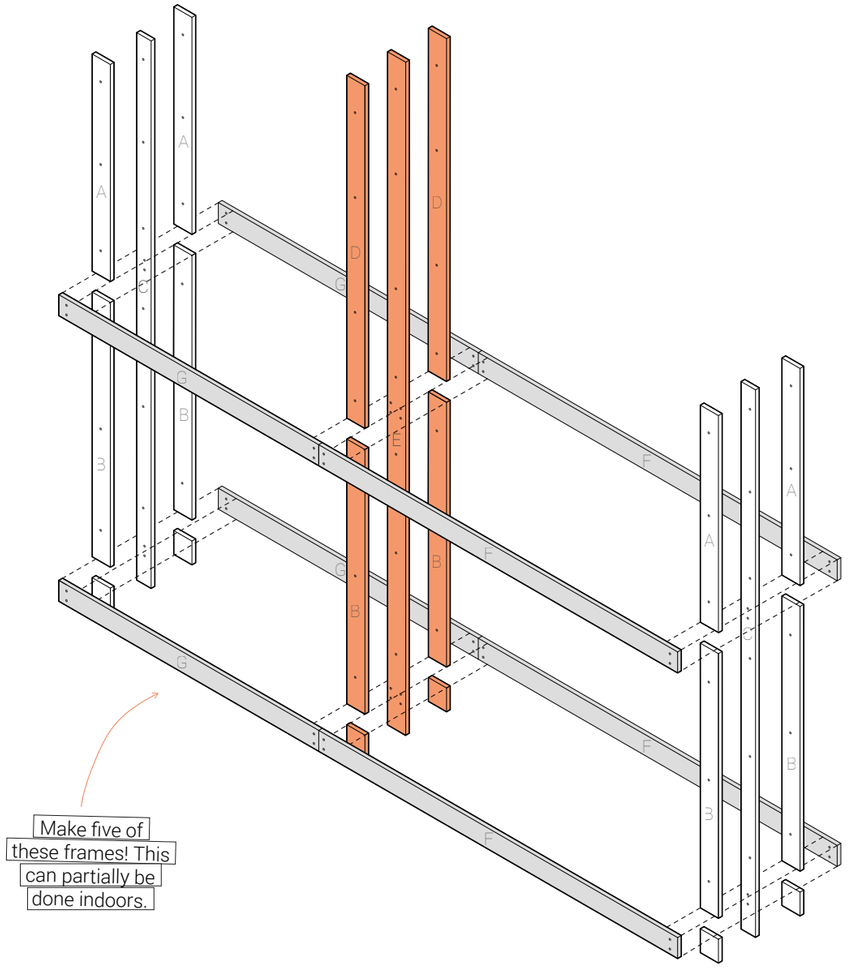




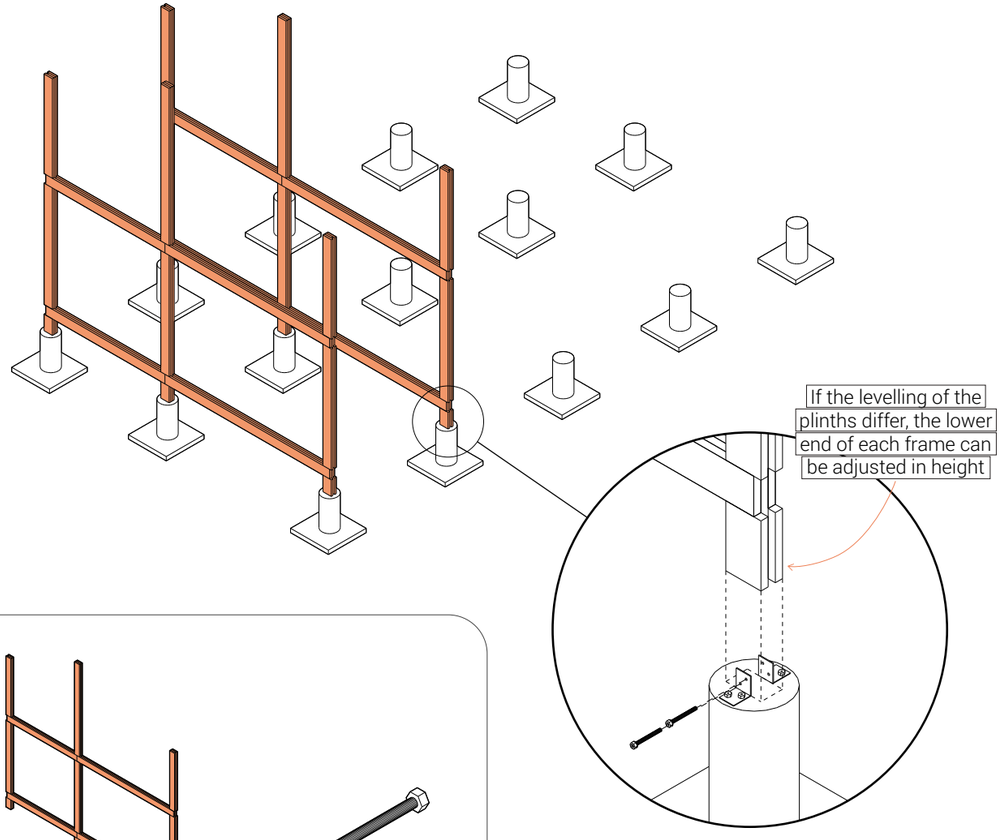


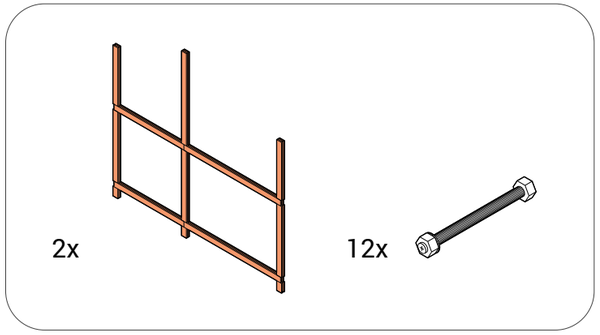
2.
ASSEMBLE THE FRAMES



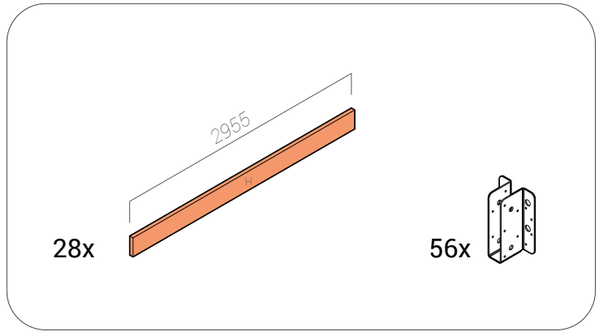


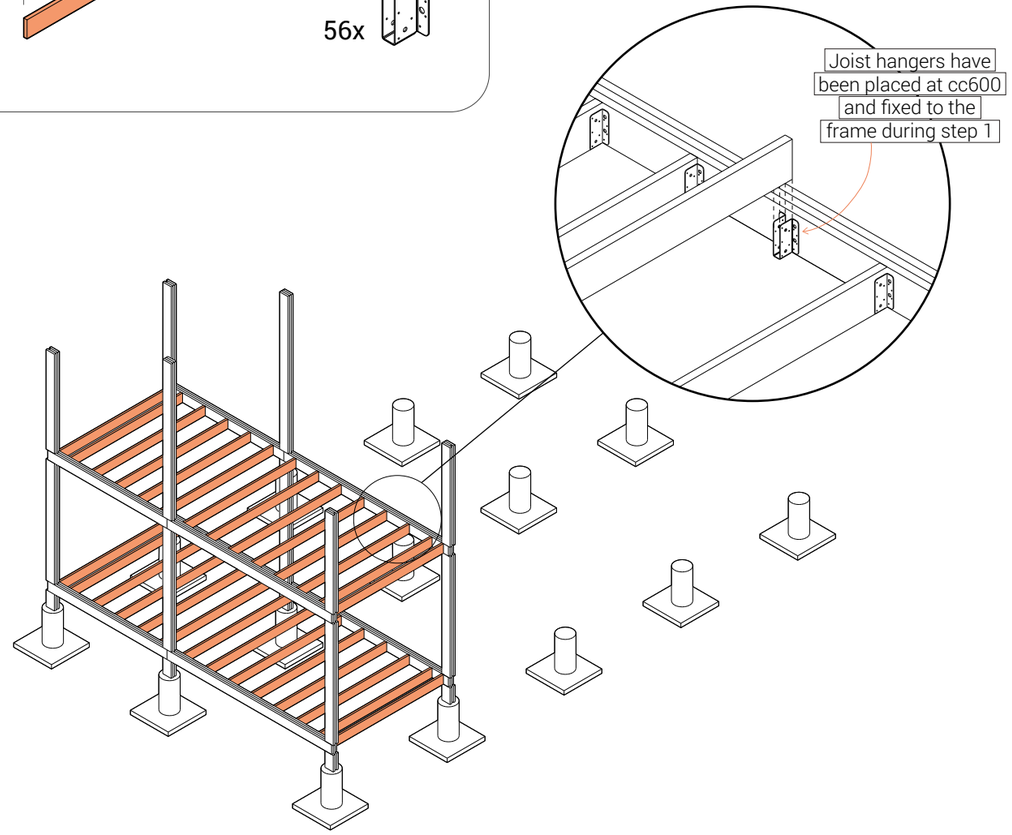
3.
MOUNTING THE FRAME



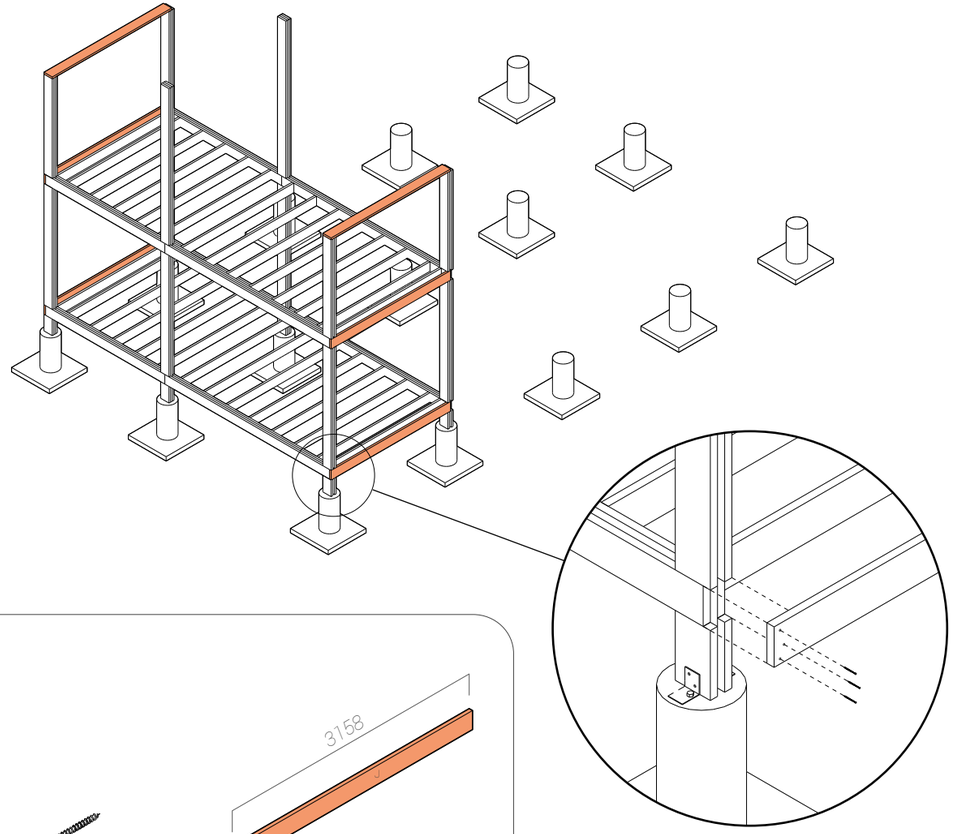


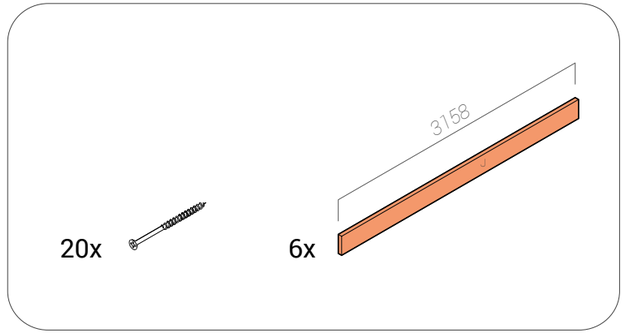
4.
FASTEN FLOOR JOISTS

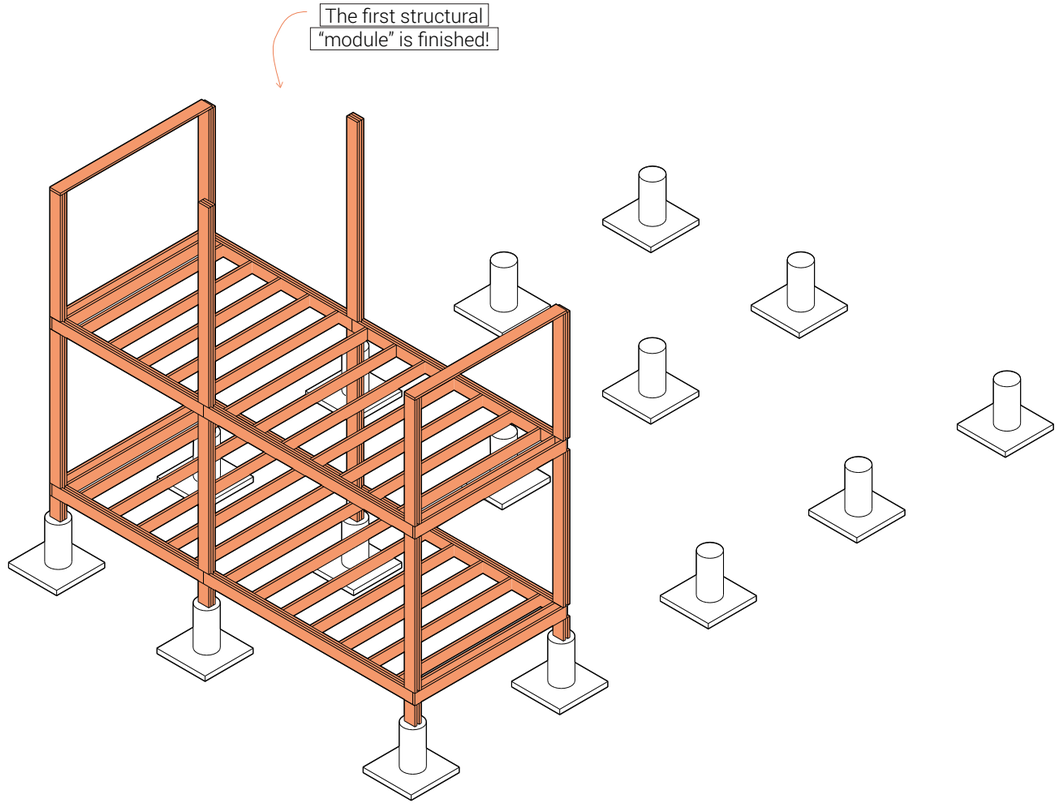


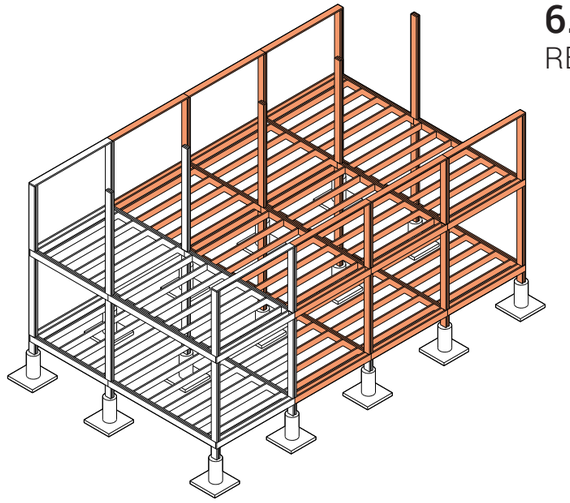


5.
PERIMETER PIECES & WALL PLATE



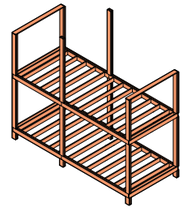


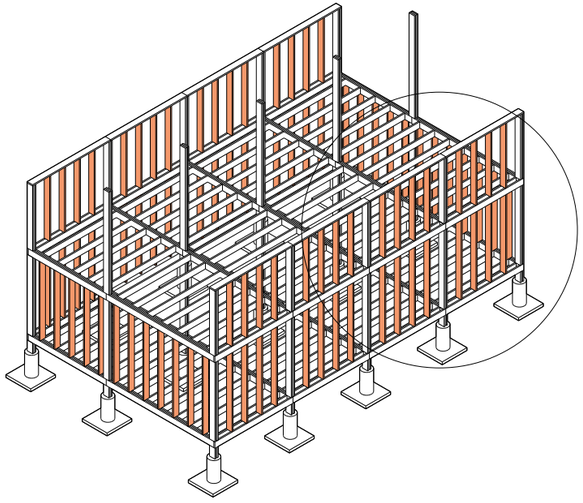




6.
REPEAT STEP 2-5

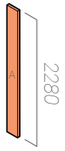
3x



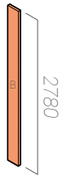


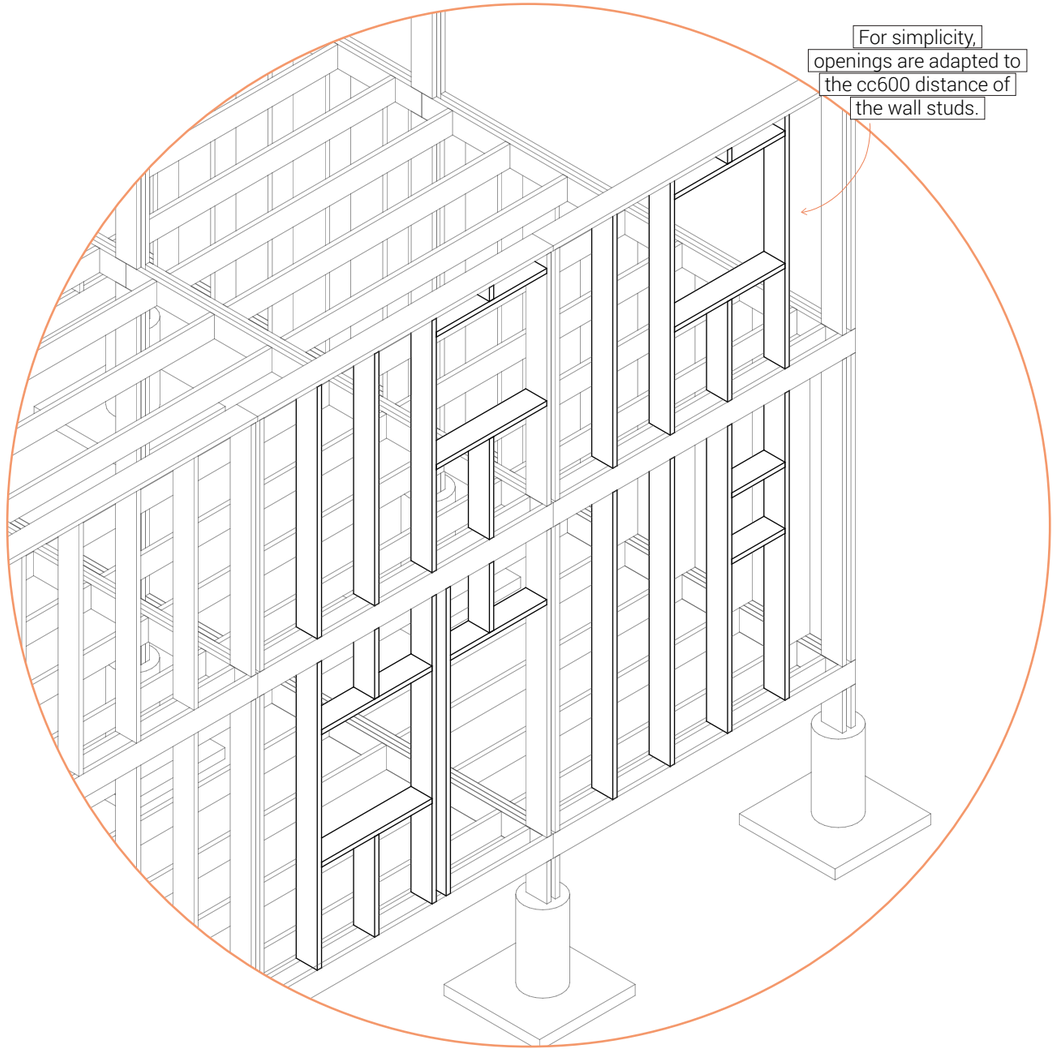
7.
WALL STUDS 220 MM

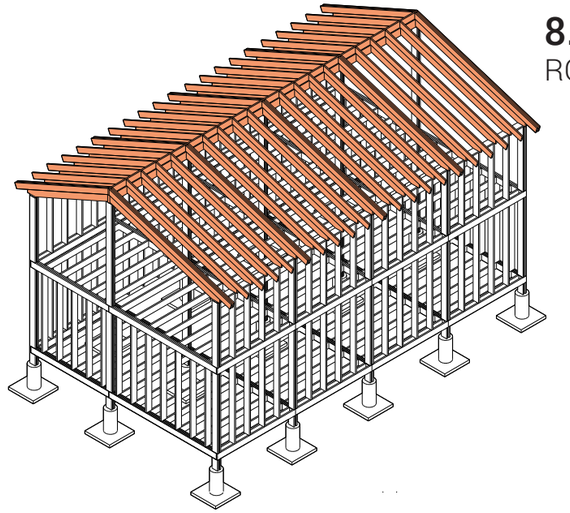
32x



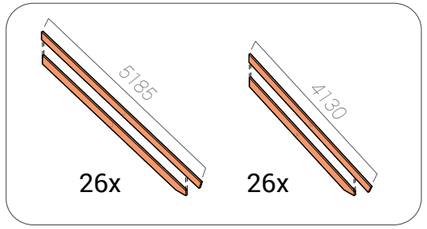
46x



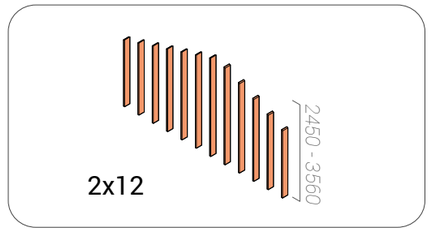


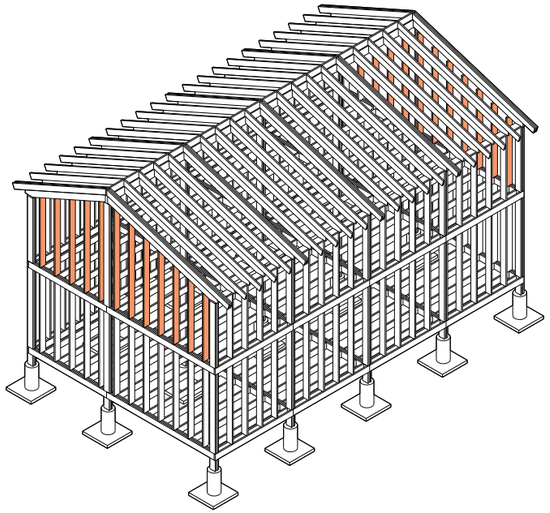


8.
ROOF BEAM & TRUSSES

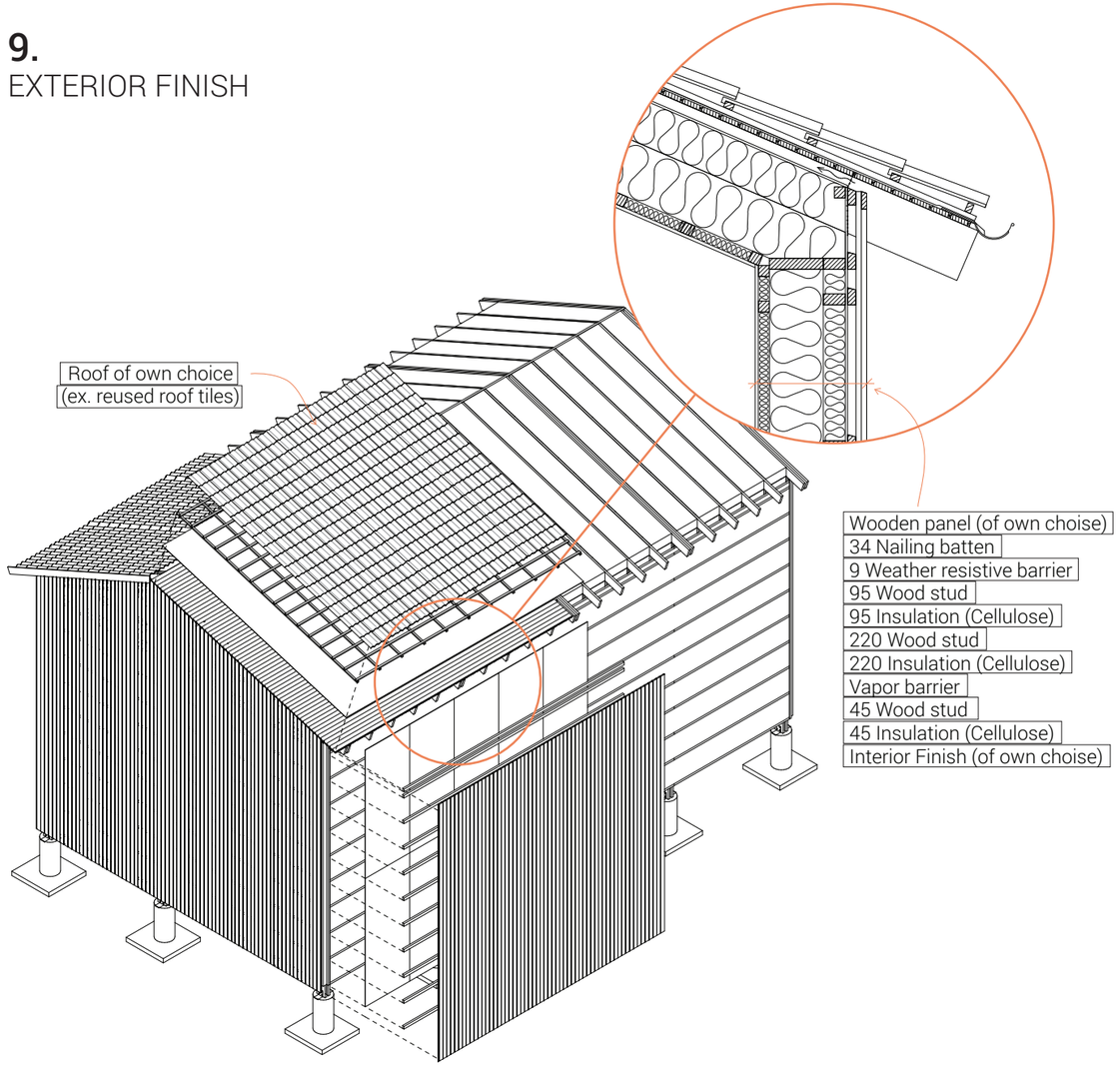


8.
WALL STUDS AT GABLE 220 MM





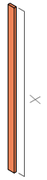
9.
EXTERIOR FINISH

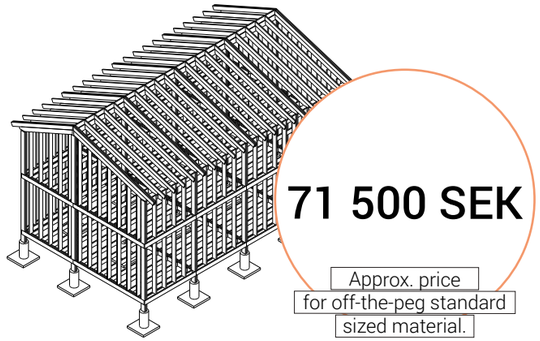


WOODEN COMPONENTS

ESTIMATED COST FOR STEP 1-9

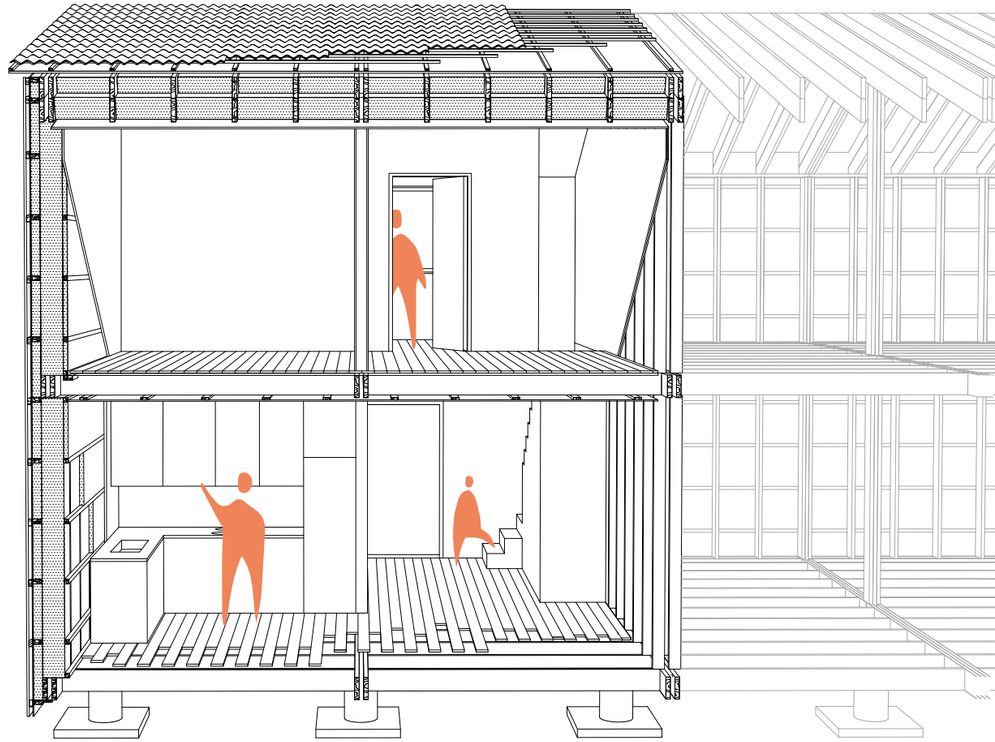
Wall stud	Width (mm)	Depth (mm)	Length (mm)	Amount	Est. price (SEK/m)
A	45	220	2280	52	35,40
B	45	220	2780	76	35,40
C	45	175	5500	10	66,20
D	45	220	3600	34	35,40
E	45	220	6820	5	66,20
F	45	220	4352	20	35,40
G	45	220	3152	20	35,40
H	45	220	2955	112	35,40
I	45	220	3158	28	35,40
J	45	220	5185	26	66,20
K	45	220	4130	26	35,40
L	45	220	3600	110	13,95
M	45	220	3090	4	35,40





71 500 SEK

Approx. price
for off-the-peg standard
sized material.



The master's thesis is the final part of the architectural education at the Master's Programme Design for Sustainable Development, Chalmers University of Technology. The education comprises a total of 300 credits and the master's thesis stands for 30 of them. This thesis has been carried out during the spring term of 2017 to the end of May.

To Build a Home is discussion about methods on how to organise self building in a way that provides affordable and considerately built dwellings. This master's thesis aim is to develop a design method for self built housing units with an overall social, economic and ecological sustainable profile in a Swedish context.

The housing units will be designed in a way that makes them easy to build for a non-professional with the assistance from a tutor. The design proposal will be showcased through a case study on a site in the municipality Lerum in the west of Sweden.