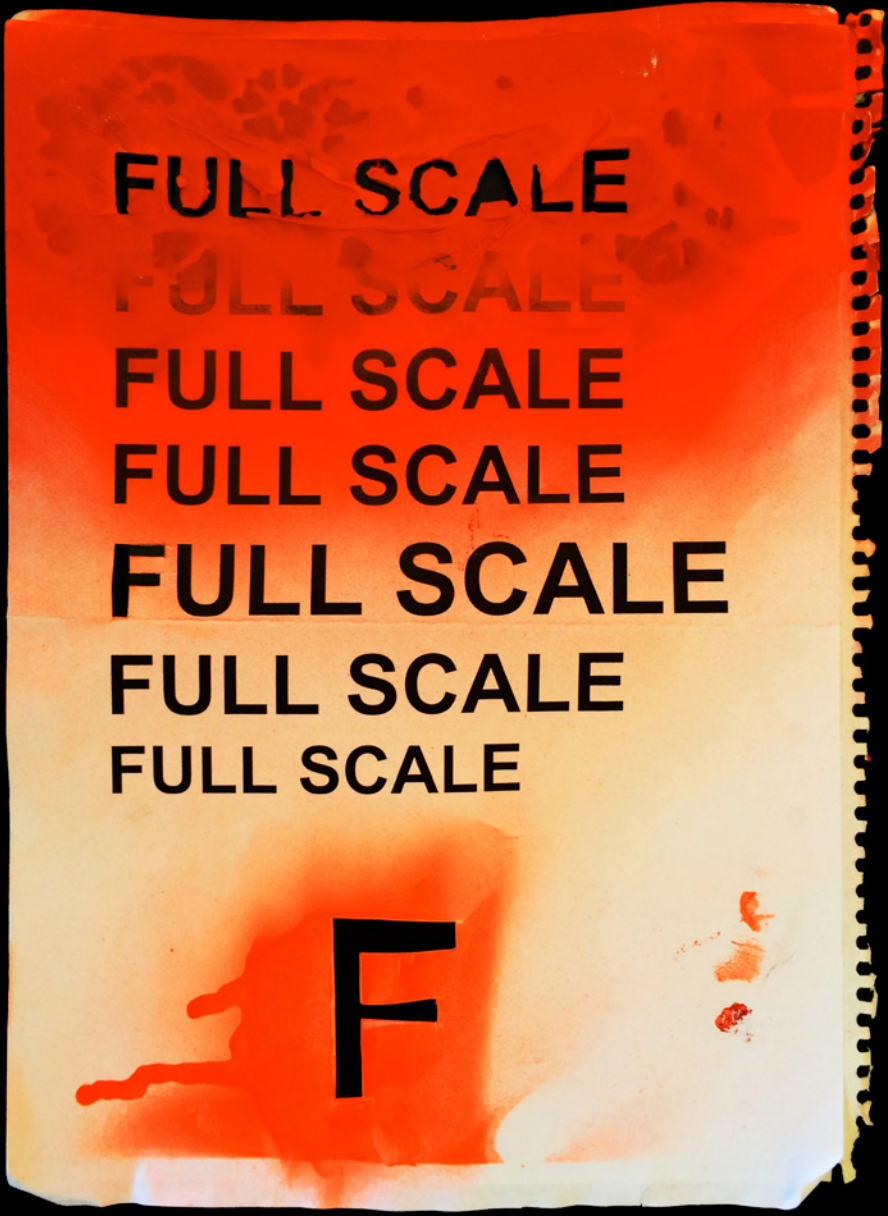


Full Scale Studio First Year 2014-2015

Once upon a time you just did your thing and if you did it well, it looked good and worked good. Then things became more and more complex. To be efficient we created systems with specialists being very good in one subject or in one particular thing. The result became fragments of beauty put together by an organization in a system. If the system worked well and the specialists did their best, beautiful fragments formed one great beautiful thing. It formed the expected. The thing that flawlessly passed the framework providing the system.

If a system continues for a long time we become more and more professional on how to operate in that system. Many small improvements make each little thing more perfect. The risk is however that we take the system for granted, that the purpose of the system becomes some sort of natural law. That no one checks if the system is valid for today's requirements, that no one asks what the purpose of the system was from the very beginning.

If you don't bother to understand the system, it becomes your secret boss. A leader that rules in silence; quiet for as long as you constantly repeat and improve our self within the system. But if you test it by trying something else, the true boss might reveal it self, weather it is the law, nature, opinions or customs.

As an architect you are almost always a part of a system. To test our system and get relevant answers we need to test it for real and in full scale. To do things one to one, build things ourselves, provoke real people and get their real reactions. Build with the system but also outside it. Full Scale Studio is a good virus that keeps the body healthy by testing its immune system. Sometimes the body will see us as vitamins, sometimes not, but if we become a sickness it is our task to also provide the antibiotics.

THIS IS FULL SCALE STUDIO

If Full Scale Studio was a group of Ski Jumpers:
We would probably be like Jan Boklöv

The Swedish ski jumper Jan Boklöv did not become a ski jumper to jump in a nice fashion. He just wanted to jump as far as possible. He studied the rules and tested different techniques to break them. He found an ugly way of jumping, but he jumped so much further then everybody else. His success made it necessary to change the rules of the game Ski Jumping.

If Full Scale Studio was professional Hot Dog Eaters:
We would probably be like Takeru Kobayashi

The Japanese Hot Dog eater Takeru Kobayashi doubled the world record of hot dog eating at his debut competition in the United States - from 25 to 50 hot dogs in 12 minutes. He did that by studying the rules of hot dog eating and inventing the Solomon Method. It is a method where you split the frankfurter in half, dipping the buns in the water and then stuffing both parts in your mouth.

Studio 1

Studio 1/ FULL SCALE STUDIO is a new master studio at KTH School of Architecture. The on-going mission for Studio 1 is the study of building processes in relation to architecture. Our favoured method is that of full-scale testing. We research tools, economy, material durability, production lines, customs, building regulations and all aspects that form the complex reality of constructing buildings today. The purpose is to gain knowledge about architecture through hands-on experiences of the act of building.

Full Scale Studio is formed as a collaborative research. Students are asked to be present at all times and contribute with both labour and brains to common projects. We believe that building is a collective effort and that the experience is invaluable in a future career as an architect. To encounter constructions real-time rather than through simulated cases, makes structural durability, materiality and detailing unavoidable topics early on rather than last minute add-ons. Relations between resources, site, architecture, craft and mass-production are exposed, feeding back into a critical approach and ultimately to a more confident conceptual focus. The idea is to be a player before becoming a coach.

To build is a direct way of acting out architecture. It is to make material perform like it never knew it could. To build is to be a thoroughly active designer with a conscious overview and yet constant flexibility. Engaging in such processes of production and immediacy might be just what the world needs architects to do next.

During its first year Full Scale Studio completed three buildings: **The Friggatto Project**, a rolling, low coast, non-permit building to use as our own studio space at KTH campus, **The Road Kill Project**, a public seating area and entrance to Djurgården park, and **The Mobile Project**, a movable and expandable classroom for the organization Hem.

STUDIO 1: FULL SCALE

INTRODUCTION 2014

There is a tendency of conceptual focus biting its own tail. Academic architecture often fails to reach real testing ground. Because of this Studio 1 is a study in making; an investigation of building processes.

In general, architects have little or no experience of constructing 1:1. We also have limited knowledge of the on-site factors that influence economy and logistics in what we design. Meanwhile the rationalization and large-scale management of today is making it harder to fuse radical ideas with the systems of built reality. But architecture is not an adaptable layer of nice looks. It is the art of building; a synthesis between material and idea. Studio 1 proposes that a return to the site will bring on the architectural masterpieces of tomorrow.

To build is a direct way of acting out architecture. It is to make material perform like it never knew it could. To build is to be a thoroughly active designer with a conscious overview and yet constant flexibility. Engaging in such processes of production and immediacy might be just what the world needs architects to do next.

Through being an active part of building processes of different scales, you will get personal experiences and better knowledge of the production chain. The idea is to encounter constructions real-time rather than through simulated cases. Structural durability, materiality and detailing become unavoidable topics early on rather than last minute add-ons. Relations between resources, site, architecture, craft and mass-production will be exposed, feeding back into a critical approach and ultimately to a more confident conceptual focus. The idea is to be a player before becoming a coach.

The year is divided into four projects, two of them more practical and two more reflecting. The first semester investigates how to construct a building, the second how to build within a city. The projects will be hosted by different collaborators – ranging from the carpenter, to the large-scale construction corporation, to the decision-making municipal organ – presenting a span from private, through corporate, to political. Evaluating the potentials of different systems will strengthen you in finding relevant and updated tools to create a more influential synthesis of architecture, industry and community.

GROUND-BREAKING NEWS

This is the very first round of the newly established Studio 1: Full Scale. Together we will set its standards. We need your help to shape it, and we ask for your cooperation in making this year full-on experimental and fabulous.

The main objective with Full Scale is to create a platform of 1:1 investigations and to study architecture in relation to building processes. We regard the studio work a collaborative research project and we believe that the combined efforts of the team will reach a lot further than individual projects would have. That means you are working more for the team than for yourselves. It also means that you will gain experiences that are far more in depth than if you would have been on your own.

INDUSTRIAL ESPIONAGE

To get to know more about the architect's role in different building processes, we will be interfering with various scales of production. We will map out political, jurisdictional and economical influences in production chains in search of new ways for the architect to be an architect. Can architecture happen where the building materials are produced? How much architecture happens at the drawing board vs. construction site? How much architecture happens by other key players in the building process? Who is the bad guy, who is the god guy and who is the architect in these processes? What is architecture in a building? We ask you to take on the role of a detective in search of clues and evidence to build cases.

TOOLS AND VISIONS

Running a studio of practicing aims at giving you access to a more concrete testing-ground for your ideas. Rather than simulating cases you will be a part of real ones. Both the mistakes and genius strikes you make as a designer will become first hand experiences. You will play both the role as provider and as user. Negotiation and communication will be key parts of your work, as will observing yourself and your fellow team members be.

You will encounter a lot of other professionals that influence architectural work, and look in to buildings and building from other perspectives than the architects'. We are certain that such knowledge will make you more confident and freethinking in your role as designer. We ask you to put your own agenda aside and use yourself as a data collecting research base. We believe it is a long-term investment where you will get plenty of new hand-tools, but also very useful analytical tools.

THE LOG THE BLOG THE BOOK

It is not common that architects work a half semester investigating a specific part of the building process, hands on, 1:1, with critical architectural eyes. Nearing it down to Sweden, you will be unique.

A traditional poster presentation might be suitable for some stages of this year but it's mainly a good way of showing a complete proposal. The question for us will rather be how to document the process of making. As time is a huge factor we need to make it continuous. We believe your adventures and observations on site should be shared with the rest of the world and that the material you generate is of common interest. We believe in three types of documentation:

THE LOG has two purposes: First to get your on-site, at-the-time thoughts and challenges on a day-to-day basis while realizing architecture 1:1. Second to receive data on where and when decisions are made and how much time that is spent on different parts of the building process. Careful notes will make it possible to revisit and recall. The combined data of all project logs will make an important base in our research case.

THE BLOG will be our radio channel to the rest of the world where people can follow the process of making buildings. As it will make the projects accessible to others, the blog also serves as our archive through which we can look back and get overviews. We propose to use the blog as your main place for hand-ins. (http://fullscalestudio.blogspot.se/)

THE BOOK will be our final gift to the world. The last part of every course will compile what has been found and ask how to improve. The different courses will give the book in total 4 big chapters. Each chapter have three under chapters: Espionage, Processes of Production and Re-Makes.

The book is written by all of us and it will be world famous. If not it will be a secret bible where you will own the power of knowledge to make you world famous. If not we can at least promise you it will make you a smart architect that knows the game you're about to play. And by that, making you a player that will be able to change the rules of the game for the better of mankind.

REQUIREMENTS

You need to be a co-writer and a builder in the team. You will be examined when handing in your log, when contributing to the blog and when making pages to the book. And of-course by participating in building amazing architecture.

EBBA HALLIN ebba.hallin@arch.kth.se
ANDERS BERENSSON anders.berensson@arch.kth.se
JOHAN PAJU johan.paju@arch.kth.se

TEAM
Emil Almesjö, Emma Crea, Filip Dans, Simon Estié,
Johan Fransson, Max Fröderberg, Tove Grönroos,
Gusten Hemström, Victor Ingmo, Petter Jysky,
Jesper Levén, Tobias Lidman, Johan Lingmark,
Mandus Lundmark, Rebecca Mooney, Marylou Musat,
Olivia Norlin, Joel Olsgärde, Elin Panzare, Adils Runkvist,
My Sivesson, Anders Törngren, Daniel Van Schaik,
Klara Östlund

Rickard Natt och Dag, Anders Berensson, Ebba Hallin

CONTENT

1

the Friggatto

FOR THE PRESS:
PROJECT FRIGGATTO

Full Scale Studio have designed and built their own studio space - a rolling, low coast, non-permit building thorough investigating regulating laws and building production. The house name is FRIGGATTO – a merge of two Swedish non-permit building types, the 15 m² "Friggebod" and the 25 m² "Attefallshus". The design is based on how these two types can be combined into one larger house. The result is a 40 m² building divided into two parts; the smaller one on wheels, making it a "vehicle" that can attach or detach to the bigger one. With a very limited budget, but an overload of creative brains and hands, many new build ing parts were invented and second-hand materials were up-cycled as a great deal of experimental craftsmanship could be put into each detail.

PROJECT FRIGGATTO

The 25m² house - the “Atto”
The 25m² part is designed as an open studio space with two levels. The house interior walls and roof is made out of Swedish pine tree plywood sheets that are easy to use for pin-up.
The wooden beam that carries the roof is also constructed with plywood and some wooden studs; the affordable way to replace a mass-produced glulam beam with something we could construct on site. The floor is made out of mahogany that was saved from an old factory being demolished. In the upper level floor, the main part of the space, the mahogany floor is built like hatches to be able to store tools and personal things.
The main window frames are constructed from the same mahogany to be weather resistant. Pine plywood tables are attached to the frames with a homemade hinge making a table at day time and a protection from insight when no one is there. Glass sheets, additional windows and fireplace were bought second hand to lower the costs.

The facade of the “Atto” is made out of burnt wood, and old Japanese technique where three wooden boards are put together into a triangle shape. The boards create a chimney of fire burning the surface of the wood and making it weather resistant without additional paint or chemicals.

The 15m² house – the “Frigg”
To get a lightweight structure for the movable 15m² house, it was designed with a sandwich technique of fireproof pine plywood glued to each side of a Styrofoam insulation board. The exterior plywood is treated with tar and the interior is left untreated. The floor is made out of black leather that was a gift. The volume was constructed on wheels that
slide on a flat metal rail. The light structure, combined with fine tuned wheels, makes is possible to move the house single-handedly (with some struggle) or by two people (smoothly).

Swedish Law
When moving the “Frigg” it equals a vehicle. But if it sits still more than six months at the same place, it is labelled a house. If the volume is standing separately, i.e. not physically connected to another house and with the possibility to walk around it, providing the possibility to maintain it, then the volume is permit free and no municipal fee is charged. If it stands next to another house it needs to have a permit. Therefor the 15m² house will stand next to the 25m² for six months before you need to move it a bit and then connect again. This law suits Full Scale Studio quite well since we needed a bigger indoor-space during the winter and a roofed outdoor area during the warmer months to do other full-scale projects.

The fluctuating space in-between serves as good outdoor workspace or a place for lectures during the summer months. In accordance with the non-permit logic, a roof that is 50% transparent covers the space. If it is rainy it is possible to cover it with a tarp. If something is up to 50% transparent in Sweden it is not considered a building and therefor does not need a building permit. Because of this the staircase leading up to the roof of the “Frigg” house do not really exist when looking through the glasses of Swedish bureaucracy. The staircase does however create an entrance to the roof terrace as the same time as being the beautiful end gable of the Friggatto.

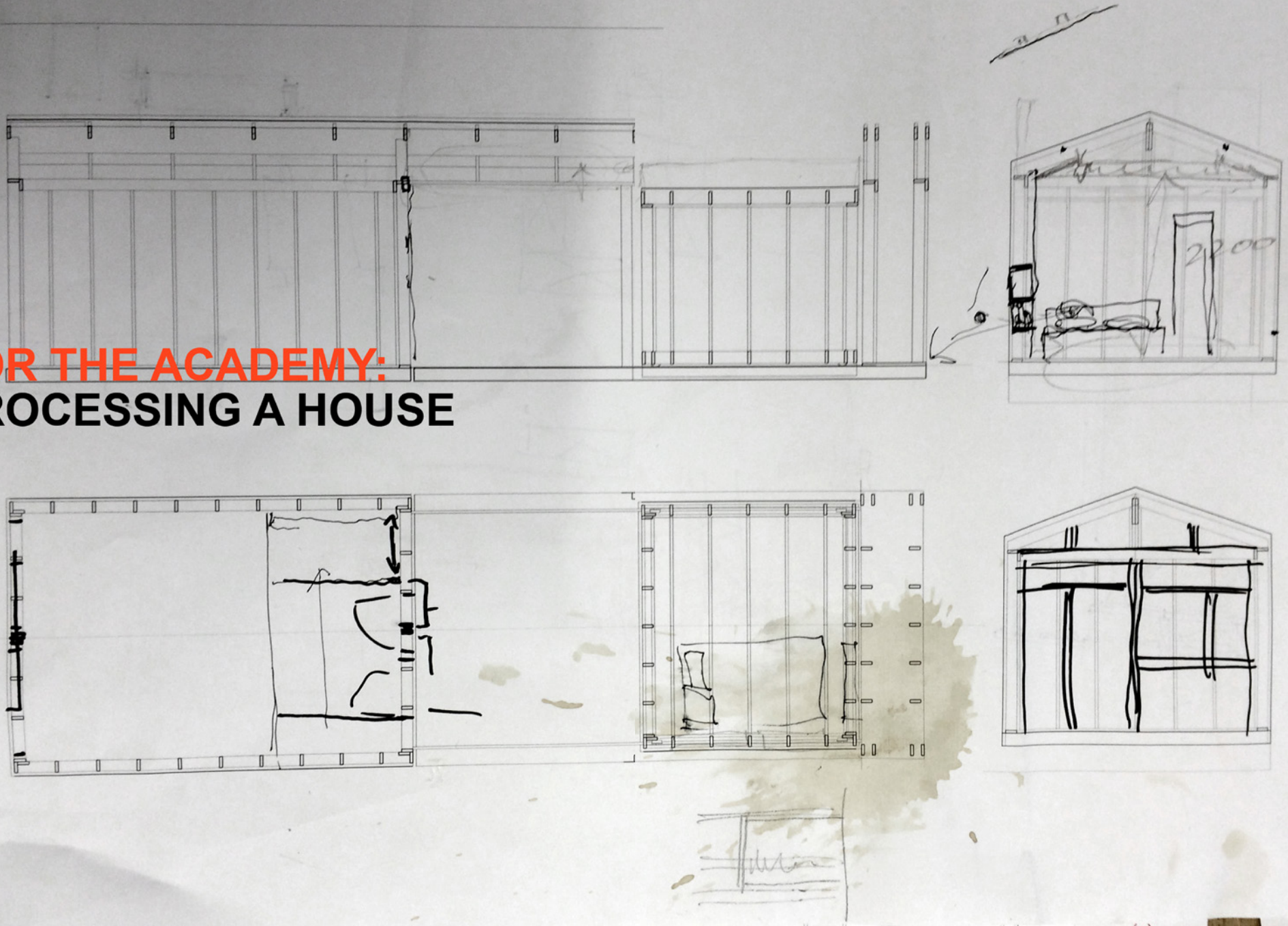
Economy
Since the studio both designed and built the project we were able to analyse the complete economy of a small Swedish building. The Friggatto is perhaps one of the cheapest houses built in Sweden but also one of the most expensive ones depending on how you count.
The total cost of the house was 140 000 SEK which equals about 14 000 €. That gives a cost per square meter that is 350 €/m² That is roughly one third of a common low budget house in Sweden run through a contractor.
The square meter price is only 4% of the price you pay to buy an apartment next to our site in Stockholm.

If we add the cost for tools, we get to a total of about 16 000 €. If we add the cost of two teachers working 40% plus a skilled carpenter in four months, including all taxes we have to ad about 60 000 € making the actual value of the house 76 000 €. (We say value now because this is a cost that would be spent in any course, in any architectural studio educating students in constructing masterpieces.)
If we add the time spent by 24 students working full time in two months and compare it to a Swedish internship salary including tax, we have to add an extra 200 000 € to the value witch makes the following numbers:
Total value of the house = 276 000 €
Value per square meter = 6900 €/m²
So even when counting the massive amount of resources spent on 3 teachers and 24 architectural students thinking, designing, re-designing and questioning coasts, and even if we count the “why and what are we designing talk”, and the building processes in a slow and philosophical pace, we actually end up a bit under the price of what the cost per square meter is in Stockholm today.

The smell
Due to the massive amount of tar added on the building the smell of the studio members could be scented from a far distance, making it somewhat hard to go by public transportation due to the angry eyes of fellow passengers.

About Full Scale Studio
Master Studio 1/ Full Scale Studio is a recently started program for advanced level students at KTH School of Architecture. The studio is devoted to study and interfere with contemporary building processes and to research its relation to architectural processes. The pedagogical approach is to reach experiences through encountering constructions real-time rather than through simulated cases. We aim to create links between team and idea, time and resources, logistics and architecture, craft and mass-production to feed into a critical approach and ultimately to a more confident conceptual focus for the architect. The idea is basically to be a player before becoming a coach.

FOR THE ACADEMY:
PROCESSING A HOUSE



BASE

COURSE INTRODUCTION A42A13/A52A13
STUDIO 1: FULL SCALE 2014

How much is a house? To find out, the studio will realise a climate-shielded space capable of housing the studio for a year. The project involves research, design, planning, and building. The design process will be linked to comfort, timing, and economy in their most practical senses; the idea being to gain knowledge through experience. The main project is collaborative, and the task is to produce and transform the material in order to realise a small masterpiece.

The School of Architecture will move north to KTH Campus next year. Studio 1 will be a year ahead of the rest. We have the chance to work in the greatest studio space ever seen, as long as we can manage to get it built.

The skilled builder Rikard Natt Och Dag is our contractor, client, boss and teacher during the course and you will be working for and with him. You yourselves will be involved as architects, builders and clients since you are actually moving in to the result of our efforts.

Your over-all task is to experience and observe. Use yourselves to try things and find new ways. Map by trial and error; learn by doing. Study how to be a building team, find your special gifts, and finally – analyse your architecture by inhabiting it. For almost a year we will have good chance to understand what we have done. To be able to trace back and re-think, you will be asked to keep a constant record of your observations. More about that in THE LOG section.

The course consists of 5 assignments tightly linked. You will mainly be working in teams of 3 persons. We will divide the teams in consideration of your work on Wednesday.

PROCESSING A HOUSE

What would be an amazing studio space?

A: My favourite studio contains a big place to assemble things, a place to park my horse. From outside I think it should look like a wolverine standing on a stone in a shiny material.

K: Different ideas; A tree-like structure, with a load bearing centre, and branches forming walls, a sequence of activities incorporating the smaller tree, or, movable boxes that form different kinds of open rooms. And a pet cat.

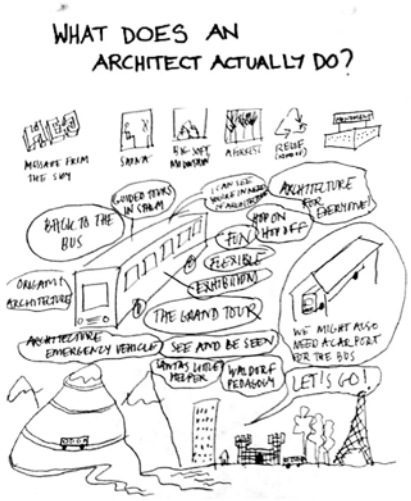
A: 1. Some kind of vertical transportation for material and humans.
2. Start to put ourselves together.
3. Wrap it with wonderful inviting stairs.

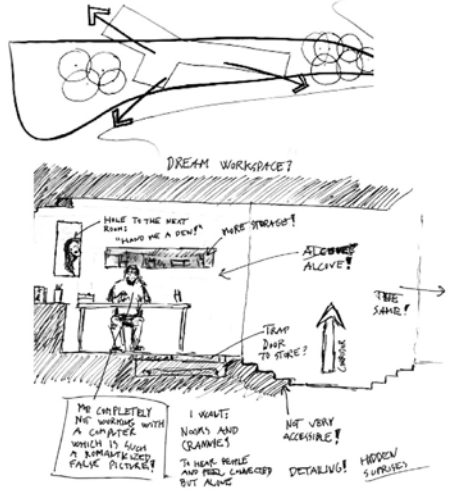
F: By binding together the site vegetation this design seeks to diminish the imposing effect on the brick building. Through the use of exposed timber studs, a collage of non-repetitive facade patterns/materials and the floating effect of a shadow line underneath the building it adheres more to the idea of vegetation or a modern ruin, and not a modern structure encroaching on the parkland.
The building is dimensioned to be fitted on two separate caravan-sized trailers and folding entrance decks, allowing for easy transport without disassembling. One caravan is a space-efficient worktable and exhibition space, with pin-up walls, storage cabinets with space for model displays, tables and chairs. The second space is completely empty and unfurnished, allowing for free-form activities to take place. The facade is arrayed with glazing of different heights and sizes, allowing passers-by's to peek at the work displayed inside.
Structurally it is comprised of timber a sequence of timber portal frames bound together by lateral cross-braces and floor joists, with a skillion roof and insets for operable rear windows for direct light and ventilation. The facade focuses on the idea of a collage and on recycling found materials, either based on individually tailored modules for each person's personal facade segment, or as an educational experiment by encountering a multitude of material joints and their particular detailing.

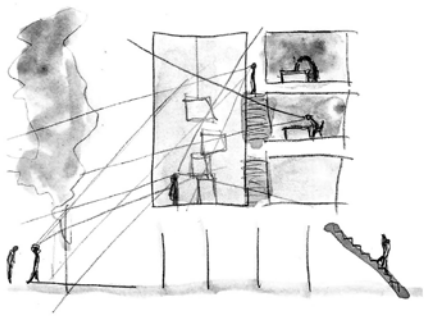
M: Sketch ideas: Studio in level with the tree crowns. High ceiling studio for testing and building that reveals our works for people walking by the site. Smaller working rooms on open terraces creates contact between different rooms in the studio.

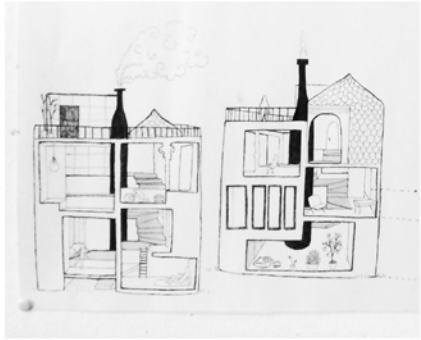
M: I have always fancied having an atelier or studio apartment high up in some old attic overlooking the city roofscape. Since we are lacking the obvious preconditions for such a space, my proposal consists of just the roof placed directly on the ground with a nice view over the park. I imagine a warm wooden interior and perhaps a loft to take advantage of the height.

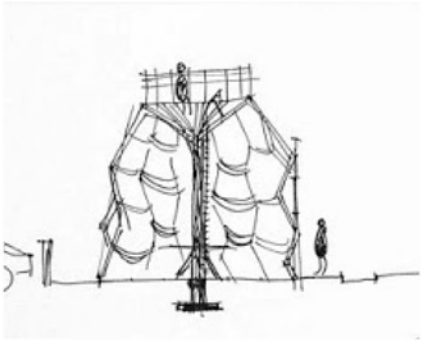
J: A roof that combines two building and two fields together and in same time make a big roof to hang out on. The roof have space for a big net to rest on, solar water heating and will also provide shadows and make it possible to have swinging sofas and tables underneath. The studio space beneath will be a more complex wood structure to take the load bearing of the roof.





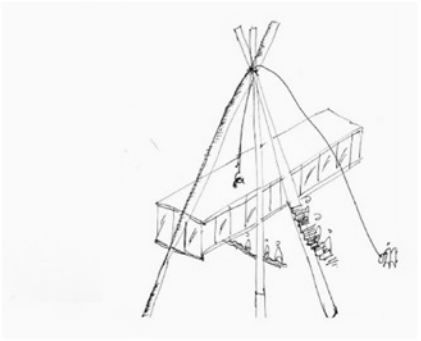




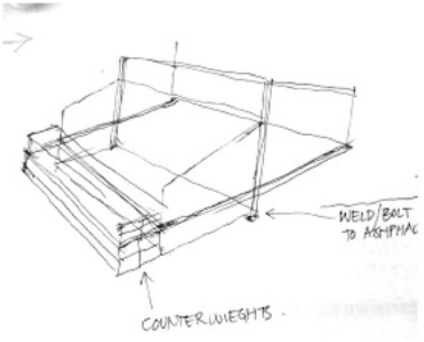


a tree-like structure

with moving walls

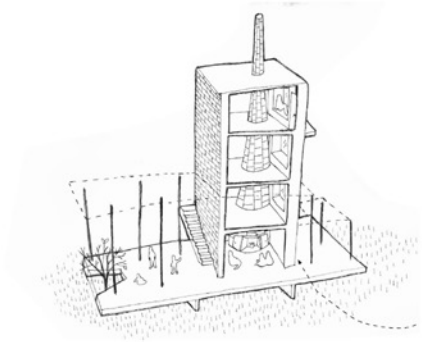


possible to elevate from the ground



or ballance on one side

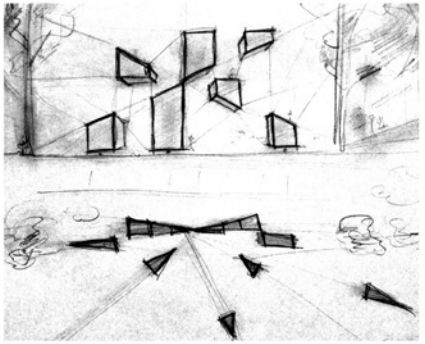
PROCESSING A HOUSE



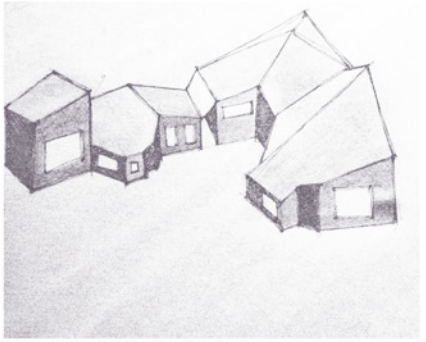
and a chimney

to a great roofscape

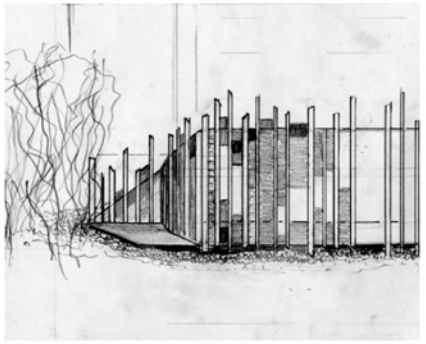
a continously growing framework



casting great shadows as it hangs in the trees

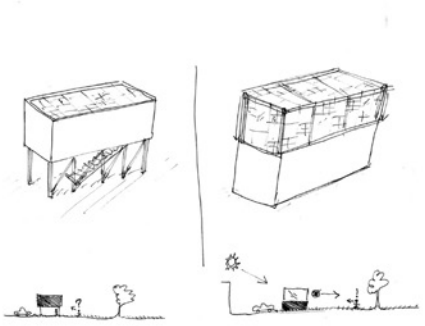


like a small town



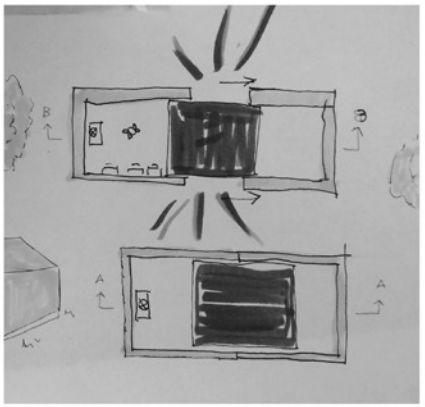
made of beutifully recycled material

or a roof on ground



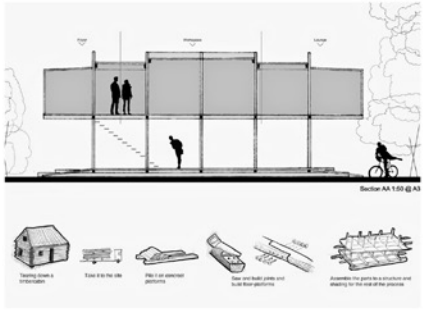
that can open up or be enclosed

the elevated timber cloud

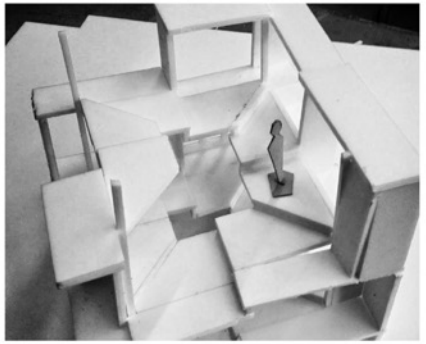


the opening move

PROCESSING A HOUSE

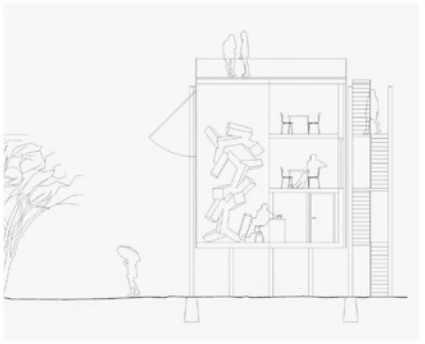


the covered workspace underneath

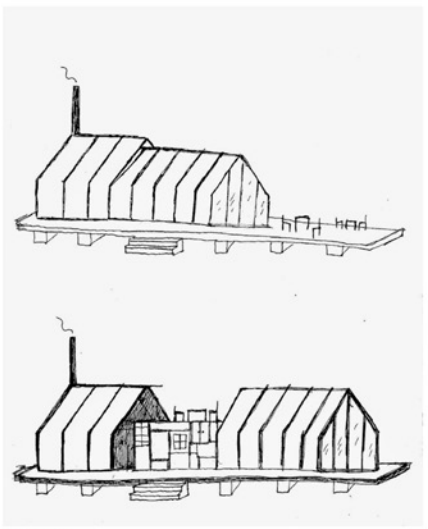


the inhabitable stair

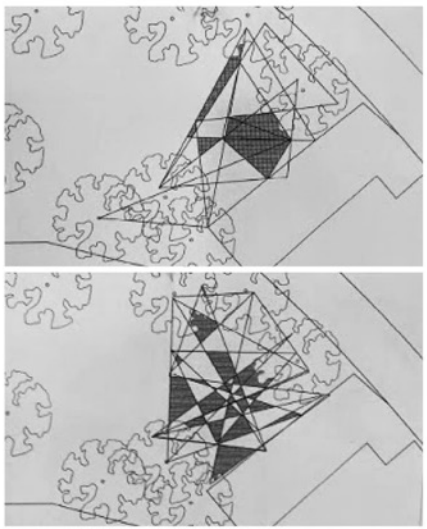
the light in the park



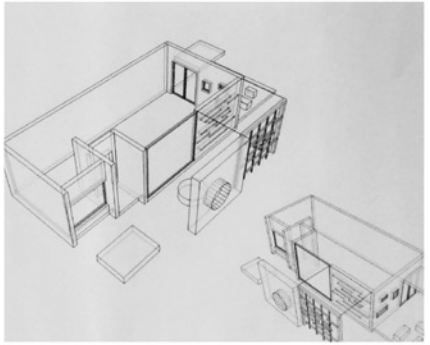
the roof terrass



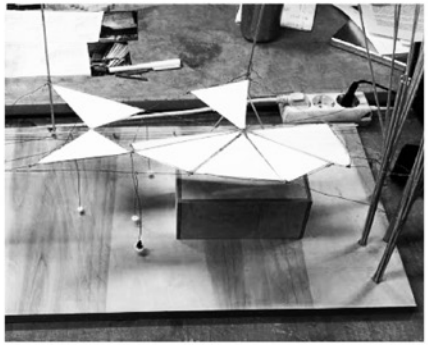
the opening



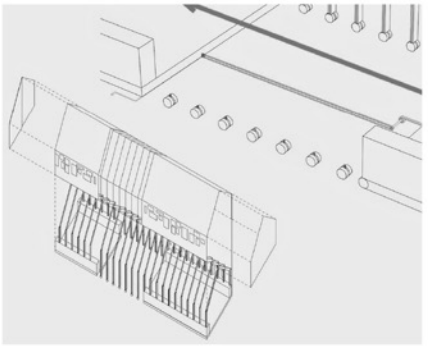
the transformable roof



the folding



the shadows



the rolling

the undefineable in-between space

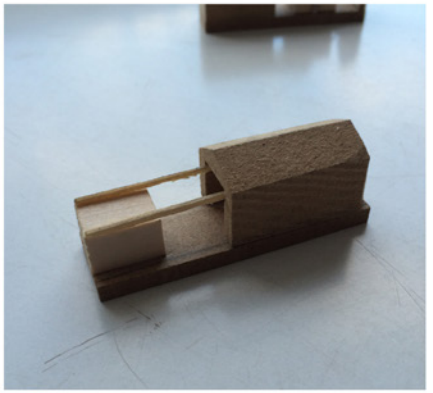
THE BIG MERGE

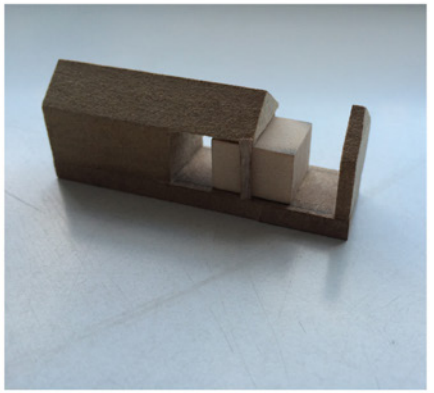
STUDIO 1/ BASE/ VOTE
SEPTEMBER 26 2014 14.00

Study all proposals carefully and pick a winner given the requirements below. Which proposal should be the base for our development? After the vote we will decide what to build, how to go about it, and divide roles and responsibilities.

REQUIREMENTS
From teachers, Rickard and the Swedish law:
1. The *Attefall* and *Friggebod* rules apply (25 m2 plus 15 m2 max 4 meters in total height).
2. Transportable in sections by 2,4 meters in width.
3. The house should take advantage of natural light as far as possible.

From student groups:
Group 3: A public gathering centre with a fireplace.
Group 6: Material research possibilities and recycling ideas.
Group 4: The house should be of a repeatable structure that can expand and contract.
Group 5: A rooftop terrace with temporary covering.
Group 7 and 8: The house should have direct light all year around, a flexible loft solution and a repetitive structure with common elements and lengths. The houses façade should differentiate from different angels.
Group 2: The house should express itself to the rest of KTH and the park to invite the public. The house should be programed as at studio space that can both contain workplaces and exhibition and gathering spaces.





getting it down to two concepts

convincing the client

A3: DOWN TO REALITY

STUDIO 1/ BASE/ ASSIGNMENT 3
SEPTEMBER 26 – --- 2014

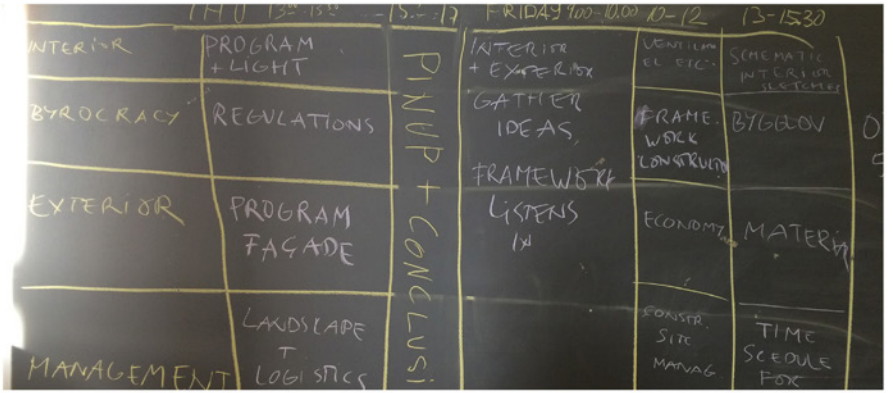
We need 8 teams as follows. It will be critical with close collaborations and we ask all teams to be present in the studio the following week. Tuesday afternoon we'll have a seminar 13.00-17.00 with Rikard the builder and Markus the structural engineer. Look into the realization of our common project and present us with a strategy and critical details, material and an economic assumption for the project. The responsibility of the team should be the main concern for your development.

TEAM LANDSCAPE
> Site Management: Logistics, scheduling, security. Over all responsibility for construction site management.
> Situation and landscaping: Outdoor areas, ground treatment before and after
Responsible team: Tove, Victor, Johan L, Klara, Adlis, X1

TEAM EXTERIOR
> Economy: Orders and supplies. Over all and continuous responsibility for material, recycling and waste.
> Exterior: Roof, façade, windows and doors.
Responsible team: Tobias, Johan F, Olivia, My, X2, X3

TEAM FRAMEWORK
> Regulations: Laws, limits and permits. Over all responsibility for bureaucracy and applications.
> Framework: Slab, main structures and insulation.
Responsible team: Elin, Emil, Gusten, Petter, Joel, Marylou

TEAM INTERIOR
> Infrastructure: Technical systems, internal and external.
> Interior: Inner organisation, surfaces and furnishing.
Responsible team: Emma, Mandus, Max, Rebecca, Filip, Daniel




FOR BUILDERS:
CONSTRUCTION ON SITE

LANDSCAPE

Team: Tove Grönroos, Victor Ingmo, Johan Lingmark, Adils Runkvist, Anders Törngren, Klara Östlund

Two Sites
The landscape design works as a cohesive factor. The building is constructed and built at the KTH Campus and then to be moved to another site within a year. This meant that the landscape design needed to adapt to two sites.

At the first site; a park at the KTH Campus, owned by Kungliga Djurgårdsförvaltningen, nothing could be moved or altered and the ground had to be completely restored; left as it where when we first came there. The second and more permanent site is a small hill in the garden of a private house in northern Stockholm. The first site is very public and the second its opposite. Ground conditions, light and views are very different in the two sites. Our solution became to merge the landscape design with the building platform.

Landscape Approach
When approaching the buildings on the first site you will enter from the park and by stairs reach a deck surrounding the building. The deck circles the building volumes and makes the building reachable from every corner. The deck also creates a kind of bench because of its height above ground.

the site on Brinellvägen

the other site

floating foundation

At the future site the deck will be replaced by a concrete slab. The building will be situated on a stone hill in the garden surrounding the existing building.

The site at KTH is situated between a row of parking lots and a park divided by a wooden fence. The fastest way to get to the house from the main entrance at KTH is to follow the road and then walk directly to the building from behind and jumping over the fence.

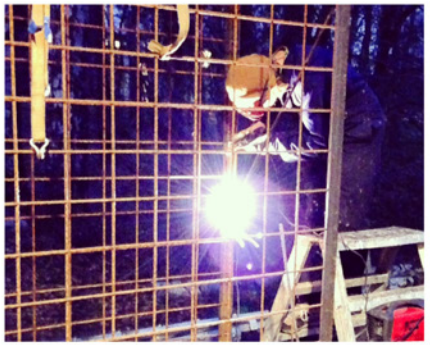
We needed to alter this way of entering the building from behind and place the entrance towards the park. Therefor the building has a closed side toward the parking lots and a more open side toward the park. The deck is wider toward the park making it possible to sit and enjoy the surroundings. All the windows but one is directed to the park. One window and a second door are placed on the gable towards the main road. That window is framing a bush that is growing near the house. The Frigg has only one window witch is directed to the park.

The main entrances of the buildings are in the middle where the Atto and the Frigg meets. There is a parkway that passes right on the

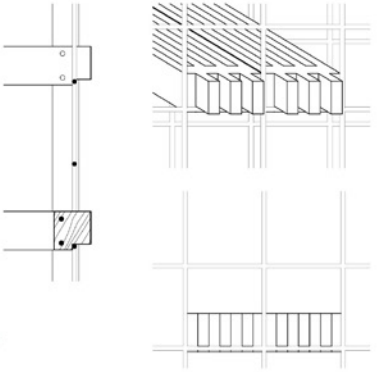
edge of the site creating a natural way to enter the buildings.
When the Frigg is in it's retracted position a space is created on the west side of the building. The sun reaches this place in the wintertime through the birch trees.
The possibility to move the Frigg make the house adaptable to changes over day and season.
Because of the narrow site the house is narrow and placed in a north south axis. The sun is in the back of the house. The house is placed as close as possible to the parking lots to create space on the site towards the park.

LANDSCAPE

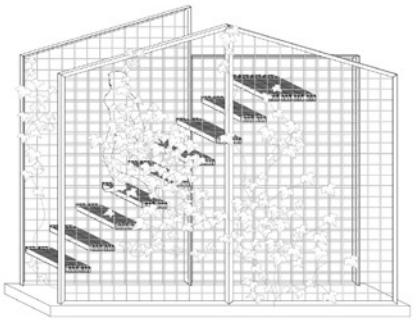
Team: Tove Grönroos, Victor Ingmo, Johan Lingmark, Adils Runkvist, Anders Törngren, Klara Östlund



welding the gable



steps



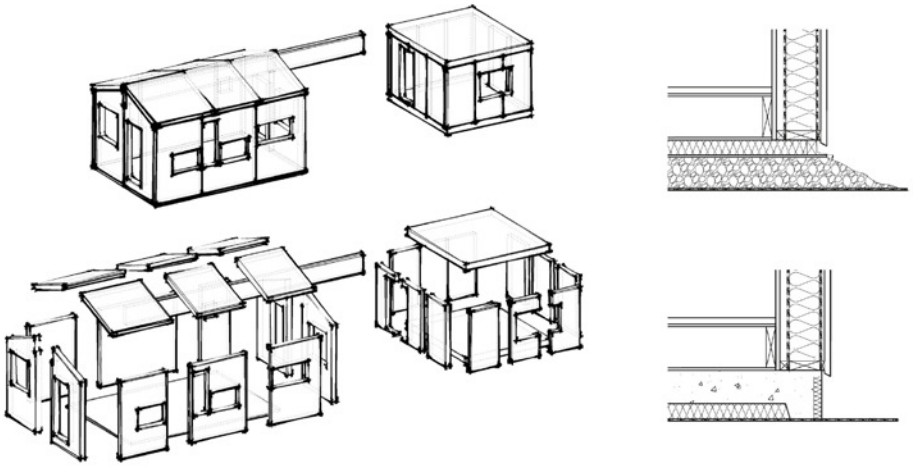
The In-Between Space
When the Frigg is moved away from the Atto, a semi-covered in-between space is created. When the Frigg is connected to the Atto, the space created between the Frigg and the Gable can be used as a terrace.

The Gable
The gable will stop the moveable Frigg from sliding off the platform. It also serves as a staircase to reach the roof terrace on the Frigg. In addition it will be a trellis for climbing plants. The future site has full-grown wines waiting to be directed to a better climb.

The Gable has been constructed of a reinforcement steel-grid to get the right transparency (refer to Rules), which also is a fairly cheap material with good load bearing qualities and is suitable for outside climate and climbing plants. The Gable proportions mirror the Atto to make the building volumes coherent.

Processing the landscape
As a part of the building process the landscape part was, as in many architecture projects, quit neglected. During the construction process the landscape team was involved in more acute parts of the project. The Gable was welded as a

opening night



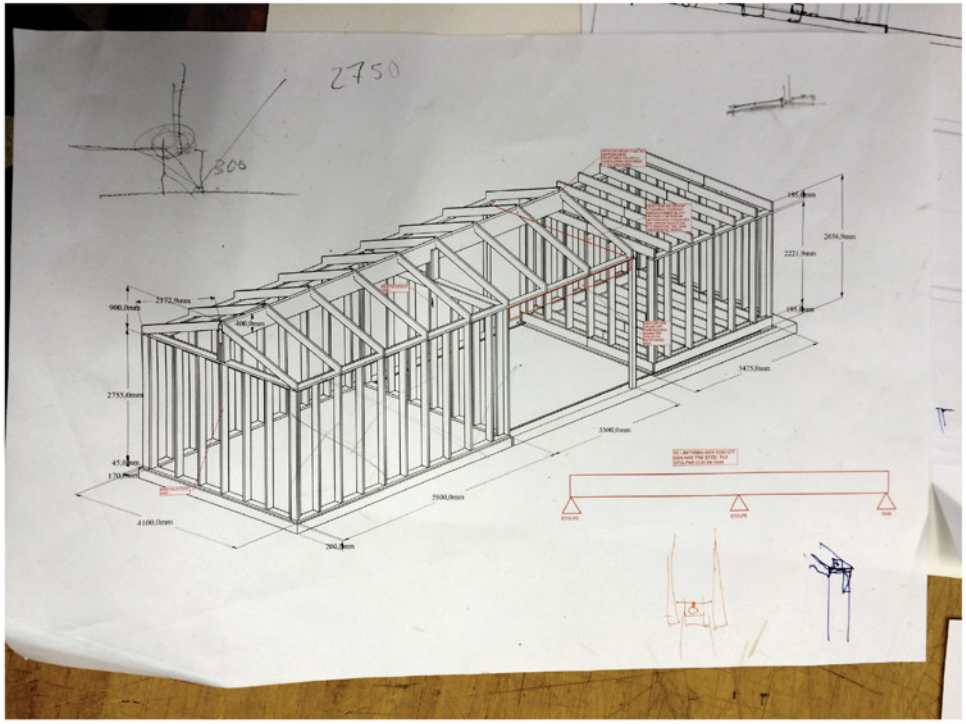
FRAMEWORK

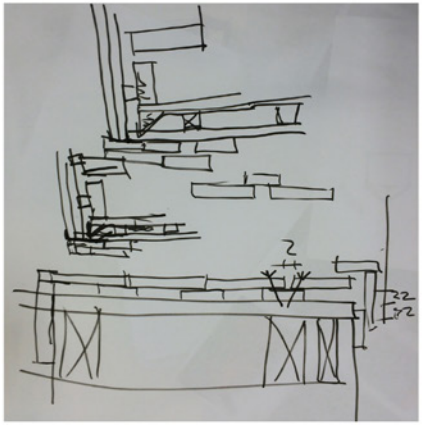
Team: Emil Almesjö, Petter Jysky, Gusten Hemström, Marylou Musat, Joel Olsgärde, Elin Panzare

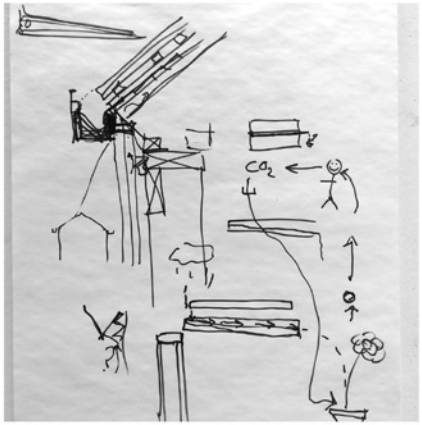
Regulations + Affordability + Demountability = Stabile House + Rolling House + Shared Floor = Wooden Frame + Lightweight + Floating Foundation = Wood + Insulation + Ply + Styro + Ply + Rail + Wood...

Construction guidelines
A basic structure and measurements were developed in accordance to the non-permit regulations (refer to Rules). The volumes were constructed as a simple model to get the dimensions and heights right enough to order material. Further construction drawings where made as we went along. The work was continuously discussed and revised. Drawings were brought to site but often changed and recalculated on site.

Demountable
17 pieces + floor make the Atto, 13 pieces + floor make the Frigg.
The demountable sectioning of the Atto house was decided on site and the two long sides of the frame where cut into six different parts. The gables were constructed as 4 different







FRAMEWORK

Team: Emil Almesjö, Petter Jysky, Gusten Hemström, Marylou Musat, Joel Olsgärde, Elin Panzare

Constructing the Atto

The gables and long sides were put together face down, built up by wooden studs with dimensions 45x145 mm.

Once finished, the walls were raised and temporarily anchored with diagonal studs for stability.

When all the wall parts were raised, the framework was screwed together. Diagonal studs were kept for safety precautions. Two scaffolds for interior work were constructed out of spares and pallets before the last gable part was put in place.

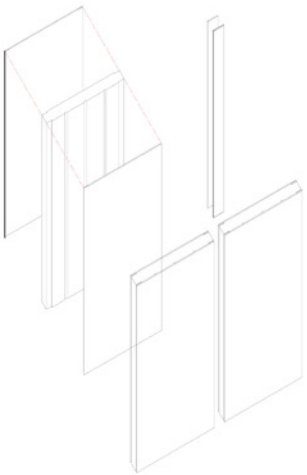
The Beam

When the walls had been raised and the home-made beam put together, we decided on putting in into place before that day was over.

About half of the work force took part in this delicate task.

An advantage with mounting a beam in pitch darkness is the delight the morning after, when realizing that the work was a success!

Rolling house
The Frigg house is on wheels! For different reasons the Frigg part of the Friggatto is a moving house (refer to Rules). It is a simple construction that takes inspiration from trains, constructed in the same way as a train rail with the same kind of wheel but downscaled to fit the size both in the contraction and as a load bearing element. It is mounted with three parts wheel, sprint and locking rings – all integrated in the wooden slab.



MAKING OF
lightweight elements:

1. Profiling the styrofoam, making room for elektrical installation, and the plywood mounting strips.
2. Gluing the plywood onto the styrofoam.
3. Putting the elements under pressure.
4. On site: Mounting the elements together with the plywood mounting strips, and screws.

mounting the walls, screwing the elements to the slab

constructing the openings

FRAMEWORK

Team: Emil Almesjö, Petter Jysky, Gusten Hemström, Marylou Musat, Joel Olsgärde, Elin Panzare

Connecting the Friggatto
The twelve wall elements are connected with strips of plywood and screwed together.
The roof was put together in place. To protect the plywood wall elements they were covered with tar.
The corners were covered and openings for door and window cut out.

FRAMEWORK

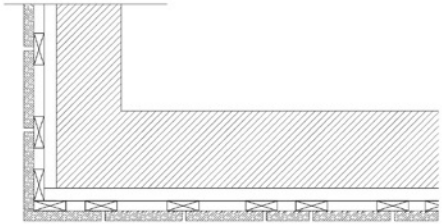
Team: Emil Almesjö, Petter Jysky, Gusten Hemström, Marylou Musat, Joel Olsgärde, Elin Panzare

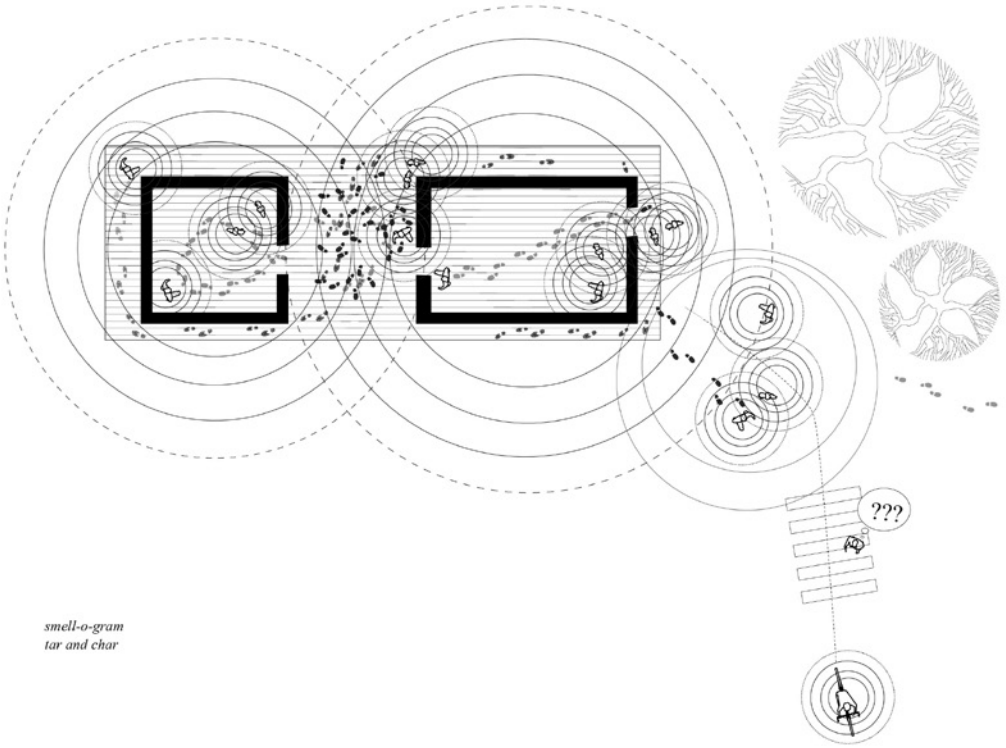
Roof and walls
THE MAIN IDEA for the larger building of 25 m2 was to clad both the roof and the façades with charred pinewood boards. The boards were to be mounted vertically on the walls and continue in the same direction up on the roof. We ordered boards of two different widths, 170 mm and 95 mm, to create variation in the finished façade.
Our goal was to not have to cut into the boards to fit them around windows and doors, but rather to keep the full width of each of them, giving the façades and the roof a fitted look. The drawing and calculation of this had to be done on site since the final position and design of the windows and doors wasn't done until after we started the building process. Since the charred boards was to be fitted on top of an underlying system of narrower, 70 mm wide, laths to really keep the elements out, we had the opportunity to vary the gap between the charred boards somewhat snuggly. In this process it also proved helpful to have the boards of the two different widths. In the end, we calculated the number of needed board and drew it up directly on the framework of the house, as a blueprint for us to follow when the boards was to be put up.

EXTERIOR

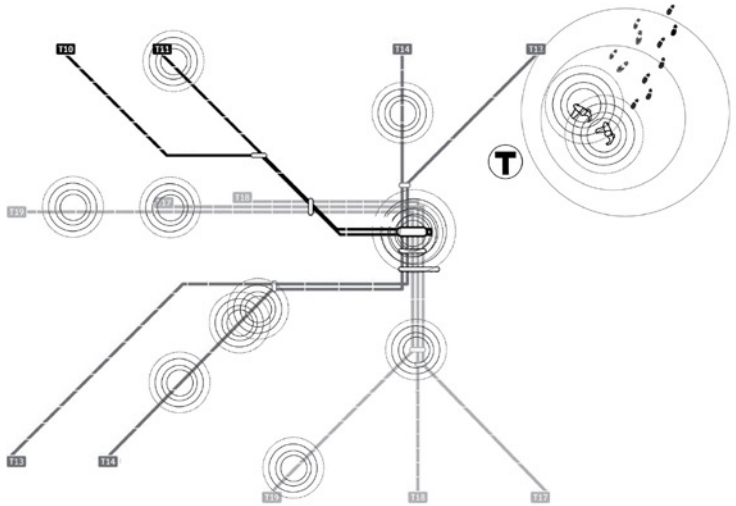
Team: Simon Estié, Johan Fransson, Max Fröderberg, Jesper Levén, Tobias Lidman, Olivia Norlin, My Sivesson

What we didn't end up doing was continuing the same pattern on the roof as we did on the wall. This proved too difficult since our schedule pretty much meant we had to start on both of them at the same time. So we ended up concentrating on fitting the boards on each of the walls well, according to its openings and then letting the roof becoming a system in its own right.
The first boards that went up were the ones closest to the windows and doors, and also the corners of the house, as we wanted them to sit tight towards the openings and cover any visible joints or insulation. The varied gaps, between a few millimetres to a one and a half centimetre wide, would show the underlying laths. These were tarred to disguise them but also to protect them from water. The edges of the façade boards proper, which had not been completely charred, were also tarred. We chose the use of tar due to its resemblance in colour and its material connection to the burned wood.
The facade of the smaller building was mainly a result of its framework being made out of plywood elements. To keep the construction





smell-o-gram
tar and char

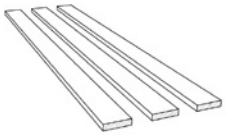


technique visible, the plywood was decided to be kept unclad but tarred. This gave the small house a connection to the main building and the treatment of the plywood will keep it intact.

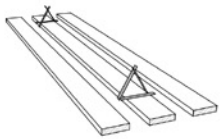
The placement of windows and doors was decisions left to the interior group as to fit the plan of the building and also to make it work with the way the building was oriented towards the sun. A number of the windows ended up being made, by us, with mahogany frames, and their reddish colour worked really well with the charred façade. When it comes to the rest of the colour scheme, it was much born out of the choice of charred wood. That is why we ended up with tar, and also helped us settle on the addition of brass details on the smaller building.

The memory that will really stick with us from this process, both figuratively and also literally, is the smells and the residue of the chosen treatments. The number of clothes, forever tainted with tar, are really staggering. One member of the group bought a new pair of gardening gloves every day to keep up with the constant spread of sticky blackness. And the fact that your hair had to be cleaned from smoke, time and time again, is really etched in our collective memories. Going home on the subway and hearing people, several rows away, talking amongst themselves saying "Should we tell someone there might be a fire on the train?" or going into a restaurant on the lunch break hearing "it really smells strongly

EXTERIOR



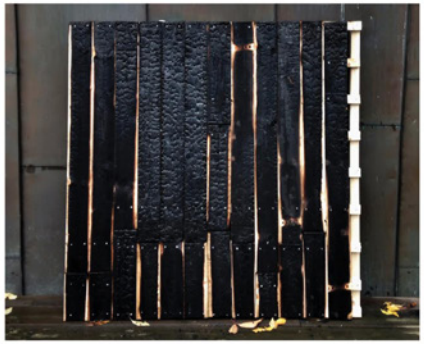
boards



bind

burn

first tests



first results

of boats!" was a constant reminder for us that – yes, we did bring our work home with us, in some way.

Yakisugi - idea to first tests

THE CHARRING OF WOOD for cladding is an ancient Japanese tradition called shou sugi ban or Yakisugi, which translates into "burned cedar". By charring the wood you seal it from rot and protect it from both rain and fire. When used as cladding it is both durable and environmental, as no chemical substances are needed. The extent of the charring is what characterises the texture of the surface. The surface can be brushed or scraped afterwards to achieve different finishes. It can then be kept untreated or be oiled to protect it even further.

Since none of us had ever tried the method before, and that was true for people we spoke to as well, we were left to our own devices trying to find a way to make it work, in a time-efficient and cheap manner. Of course, wood can be burned with whatever fire, be it with a gas burner or on top of a coal bed, but we wanted to try the old technique of using the boards themselves as a chimney. After all – there must be a reason it was done that way back in the days!

Three boards are bound together to form a type of chimney. The chimney is then put on top of a fire. The flames and warm gasses are then sucked into the chimney, starting a fire on the inside with the fire wandering up along the boards, charring them. The chimney is turned over after half the amount of time to ensure an even charring of the boards.

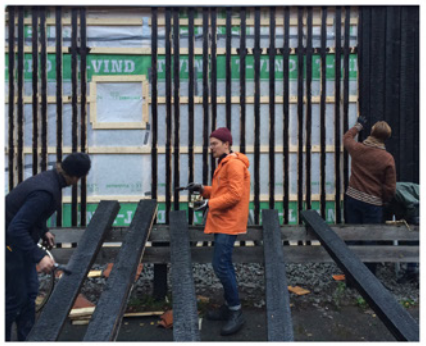
After learning about the Japanese techniques, we began making some first tests with a smaller fire and short boards. Our aim for the finished result was to achieve the reptilian- like texture, which is the result of a longer burning. The boards were bound together with metal wire and during the first experiments we got a sense of how long the burning time was needed for the result we wanted. We also noticed the boards had a tendency to collapse after a while in the fire and that some boards were unevenly charred along the sides, as a result of them overlapping too much when bound together. These problems were solved after trying wedging metal strips between the planks,

creating a distance between them as well as keeping them from collapsing. To think back on the day when we tried it out for the first time, being somewhat nervous of the flaming pillar, is quite amusing. Especially after we later did it on an industrial scale and with much bigger fires. But after all, that is why they call the studio Full Scale, is it not?

Burning big with silent witnesses
NOW WE QUICKLY REALISED that is one thing to burn boards around a meter in length in a school environment, but if we were to burn 5000 mm long ones next to the school, already ravaged by fire once, we might have had to listen to a tirades by people in charge.
We were offered to work on the grounds of a farm outside of Uppsala, and ordered all the materials we needed there. Arriving early in the morning, greeted by red wooden houses and a herd of sheep we got to work. After building a fireplace out of brick and stone we made our first chimney, around 3000 mm high and weighing in at around 24 kg, and hoisted it up on the fire. And waited. Nothing happened. We went back to the drawing board and built an even higher fireplace, that was a lot more airtight, only having the hole in the top and a smaller hole for air rushing in. After a few minutes we started hearing the roar of the fire wandering up inside. Then, a column of fire rising up from the top. We shared a few big grins. The sheep looked quite unimpressed.
After that, we split up into two teams, with some of us were binding boards together, the others burning them. During the day we all started getting better at what we were doing, binding boards quicker, knowing when to turn the boards for the best effect. We got into a good rhythm. Bind, burn, turn, wait, let go, open up, put out.
It took us two days to complete the charring of all of the boards. In the end we were burning 5000 mm long boards in 45 kg chimneys with a huge fire inside like professionals.
Sometimes laughing and sometimes in silence with gritted teeth depending on the mood, that changed with temperature and time of day.
What we learnt? That the old technique is really effective since it utilizes the chimney effect to heat up the boards quickly, even when using just a small fireplace with only a few logs in it.
Turning a burning chimney releases quite a lot of smoke through the little gaps between the boards, so hold your breath. That safety gear is essential, especially fire-proof gloves, because you will have flames around you quite a lot.
That your clothes should not be made out of synthetics or thin cotton, but rather out of wool that doesn't catch fire easily – we have a few holes in the clothes to prove that point.
Lunch was, of course, served charred.

EXTERIOR

Team: Simon Estié, Johan Fransson, Max Fröderberg, Jesper Levén, Tobias Lidman, Olivia Norlin, My Sivesson



EXTERIOR

Team: Simon Estié, Johan Fransson, Max Fröderberg, Jesper Levén, Tobias Lidman, Olivia Norlin, My Sivesson

INTERIOR

Team: Emma Crea, Filip Dans, Mandus Lundmark, Rebecca Mooney, Daniel Van Schaik

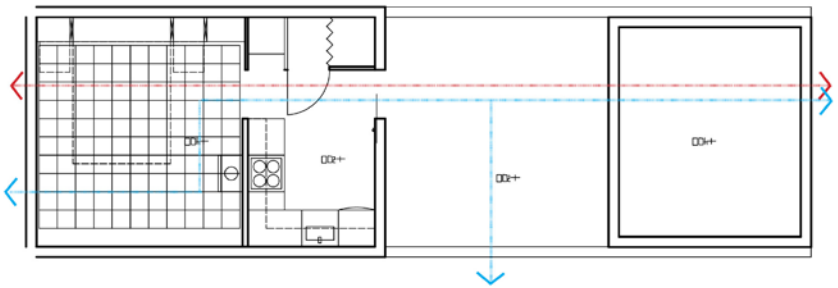
The main idea was to create a flexible space that could be used as a studio space for students and later be converted into an apartment, with 2 bedrooms a kitchen, living room and bathroom facilities. The Atto house, due to its limited space was intended to be more open and minimalist. In the case of the Frigg the aim was to create more of an introverted space that would be in contrast to the Atto. It was to have a flexible open floor plan to allow for freedom in both its current life as a classroom and future as a moving bedroom space.

Our team developed our ideas both in the design stage and on site, whilst the building was under construction. More specifically, construction and material details were figured out during the construction process. This was a result of the quick pace of the build and the need for decisions to be made on site with collaboration with the other groups. For example the windows and desks were designed almost entirely after the building had commenced construction.

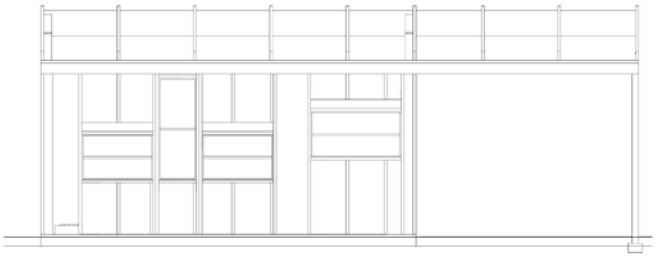
Combining the functionality as workspace, exhibition space and chill-out lounge, a fold-in system fulfilled the first two criteria while allowing space to be made available for regular furniture.
Since 25m² was meant to accommodate at least a portion of the 24 students, worktables were maximized, storage was introduced and the feel of the space was intended to differ from the regular studio.

A neutral selection of cheap and/or recycled timber was opted for, since we were told that we would receive a container with reclaimed furniture. Further storage, mixed tables, colour and stove were introduced.
47m² of mahogany floorboards were experimented with as the flooring solution, with the possibility of fishbone patterns, treated with oils and formed into operable hatches, leading to the desire for a floor storage solution. At this stage they were also being considered for use as window framing along with regular glass panes.

Having visited the future site, the building was rotated to have the Frigg protrude towards the house, with completely shifted sites causing the KTH north facade to become the future southern facade.



Window and door sightline and movement paths



Self-built window placement

INTERIOR

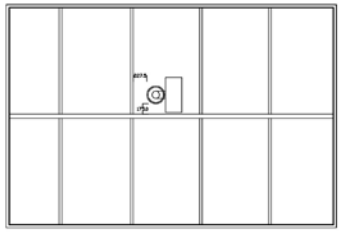
Team: Emma Crea, Filip Dans, Mandus Lundmark, Rebecca Mooney, Daniel Van Schaik

With an actual design brief to work with, the interior was now optimized to function as an independent house rather than just a studio space. Red represents a continuous sightline from one end of the building to the next for the operable windows and some doors. While we had opted for 60cm workspaces to accommodate the lack of time to get the structure up, elongated 110x34 and 140x34 windowpanes were sourced and combined into larger windows to form the next best thing.

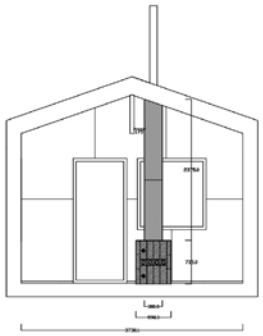
With the receiving of a sourced stove, the intention was to cast a concrete plinth while using mahogany floorboards as the formwork so that the pattern of the floor would carry over. The chimney was intended to be cast in concrete to act as thermal mass that would retain heat and slowly dissipate it into the room even after the fire has been extinguished.

For the buildings initial life as a studio space we saw the desks and windows as important elements in the design and thus went through many changes. These changes were mainly to do with their functionality as desks (size, strength, materiality etc.) and their ability to be folded away when not in use in order to maximize space. The result came in the form of workspaces that folded up into the window cavities of 3 of the 7 windows in the Atto to open up the floor space when not in use.

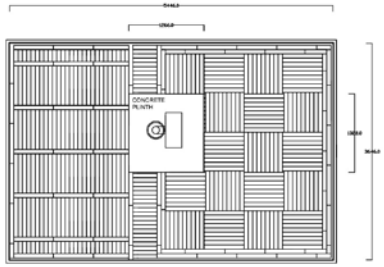
The focus of the Frigg was to counteract the functional Atto workspace with a 'chill out zone' and a moveable bar to make use of the in-between outdoor space as a serving area that the Frigg would open up towards.
The focus was put on turning the low 2.1m ceiling height into a cosy space with low seating - sofas, cushions and/or bean bags, drapes and privacy. Once we engaged with the fire regulations it turned out that opening up towards the middle space would no longer be possible for a fire rated wall, and an egress door would be necessary once the design changed into a moveable house.
After also finding out that it might be used as lodging, it was optimized to fit a double bed and wardrobes and have a bedside window facing towards towards the garden of the future site.
In order to tie in with the middle space and Atto house, the focus was put on matching the doorways and retain a continuous sightline for all of the operable windows.



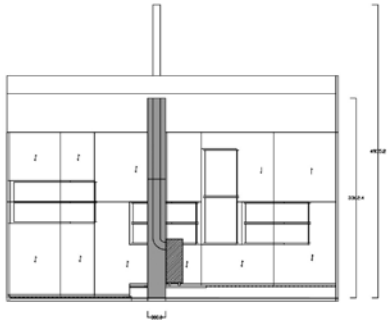
01 REFLECTED CEILING PLAN
1:50



03 WEST ELEVATION
1:50



02 FLOOR PLAN
1:50



04 NORTH ELEVATION
1:50

INTERIOR

Team: Emma Crea, Filip Dans, Mandus Lundmark, Rebecca Mooney, Daniel Van Schaik

What was the idea?
The main idea was to create a flexible space that could be used as a studio space for students and later be converted into an apartment, with 2 bedrooms a kitchen, living room and bathroom facilities. The Atto house due to its limited space was intended to be more open and minimalist. In the case of the Frigg the aim was to create more of an introverted space that would be in contrast to the Atto house. It was to have a flexible open floor plan to allow for freedom in both its current life as a classroom and future as a moving bedroom space.
How has it developed?

Our team developed our ideas both in the design stage and on site, whilst the building was under construction. More specifically, construction and material details were figured out during the construction process. This was a result of the quick pace of the build and the need for decisions to be made on site with collaboration with the other groups. For example the windows and desks were designed almost entirely after the building had commenced construction.

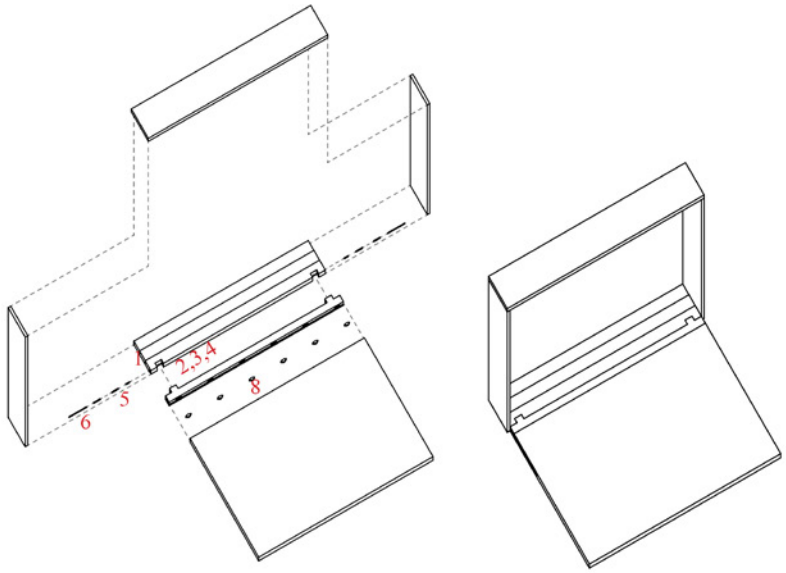
mahogany up-cycling

chimney puzzle

leather floor

And what is the built result?
Our group design process began with differing ideas from each member as to what the interior should look and feel like; and above all how it could be experienced by the occupants. This lead to 3 proposals that embodied the main principles and the final built result is one that has landed in between.
What details are crucial to the design?
For the buildings initial life as a studio space we saw the desks and windows as important elements in the design and thus went through many changes. These changes were mainly to do with their functionality as desks (size, strength, materiality etc.) and their ability to be folded away when not in use in order to maximize space. The result came in the form of workspaces that folded up into the window cavities of 3 of the 7 windows in the Atto house to open up the floor space when not in use.
When considering the buildings future life as an apartment for our client Richard, the element that we saw as most important was the placement of the stove or fireplace. Our intention was to make the fireplace a centrepiece of the Atto house whilst also ensuring it would heat the entire building efficiently.

window and door sightline and movement paths



1.Drill a 4mm wide and 12mm deep hole 1cm into the lip of the internal window sill at the centre depth of the board itself.

2. Saw indentations into the sill piece which are 4cm wide, 2cm deep - starting 4cm from the edge of the board. Then trim another piece of mahogany - which will act as the hinge piece - to match the sill piece.

3. Clamp the two pieces together and redo the drilling of step 1 into the same hole, which ensures that the drill holes match in each piece.

4. Deepen the sill incisions by 4mm, and deepen the hinge piece incisions by 4mm as well. This is the tolerance required for the hinge to swivel 180 degrees around its own axis.

5. Thread a 4mm brass pipe into the hole of the sill piece, and mark so that you can cut out 3 pieces - two for the sill piece and one for the joint piece - using a metal saw.

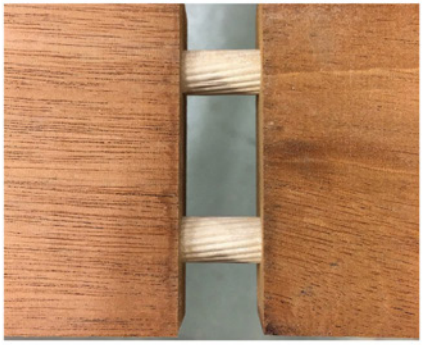
6. Insert a 3mm carbon steel rod through the hole, and cut it at that length using a grinding machine since a metal saw is too weak. Attach the sill and joint mahogany pieces.

7. Use wood glue to attach the sill piece to the rest of the window frame, and finally use a bisquit jointer to attach the plywood tabletop to the mahogany joint piece.

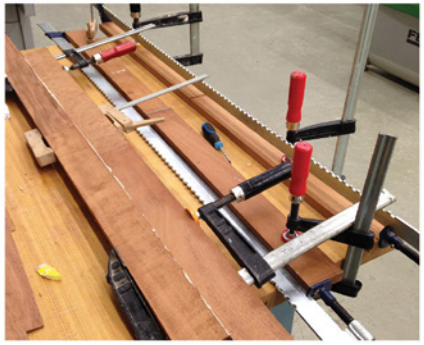
8. Finally, use a bisquit jointer to attach the plywood tabletop to the mahogany joint piece.

1.

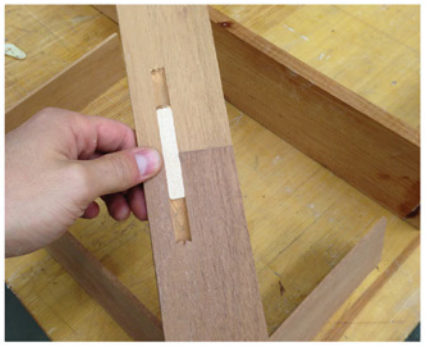
2.



3.



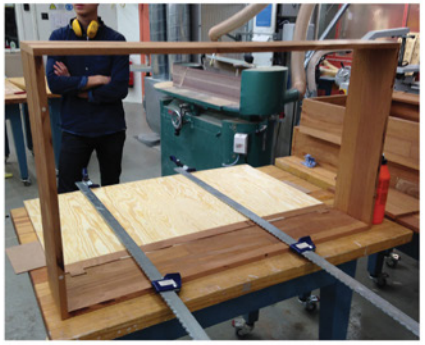
4.



5.

6.

7.



8.

HOW MUCH IS A HOUSE?

How much labour is a common small house?
Diagrams: time on thoughts, production, building,

How much time is a common small house?
Diagram: total time on Harvest, refine, design, build, live

How much money is a common small house?
Diagram: cost for materials, craftsmen, architects, site

How much rules is a common small house?
Building permits, accessibility, fire regulations, Swedish building standards.

How much resources is a common small house?
Number of trees, buckets of irons, machines

How much material is a common small house?
Weight, money, proportions vs. labour

How much tools is a common small house?
Design tools, building tools.

How much poison is a common small house?
Transports, machines, building material, physical problems for the labour.

How much fantastic is a common small house?
Great discoveries, interventions, things that people should know about to appreciate their house more.

How much status is a common small house?
Who gets the credit?

How much useful is a common small house?
Don't we have enough houses? Who profits from a house?

How much education/profession is a common small house?
Carpenters, electricians, wood producers. Architect's years of education.

How much norms is a common small house?

How much is because "That's just how we do it"/ impressing the colleagues/ "Don't disturb the neighbours"/ "Be easy with the client"/ "What if it's wrong"?

How much architecture is a common small house?

How much of the decisions made is architecture?

Who is the key figures in the production of a house?

Who is the most useful and useless person in building production?
Which professions?

Who is to blame for a ugly house?
Professionals, client, money, site, country, climate?

Who is to celebrate for a beautiful house?
Professionals, client, money, site, country, climate?

What is the key aspects for a great house?

Who or what has most to say for the outcome of the house?

Who gets richest on one house?
The architect, the client, the builder, the material producer?

Who is in charge of the design process?
Client, production, architects, norms?

Who is the main suspect for boring and ugly houses in Sweden?
The government, the client, the architect, the builder, the regulations, the industry, the education system?

What is space worth?

Team: Tove Grönroos, Victor Ingmo, Johan Lingmark, Adils Runkvist, Anders Törngren, Klara Östlund

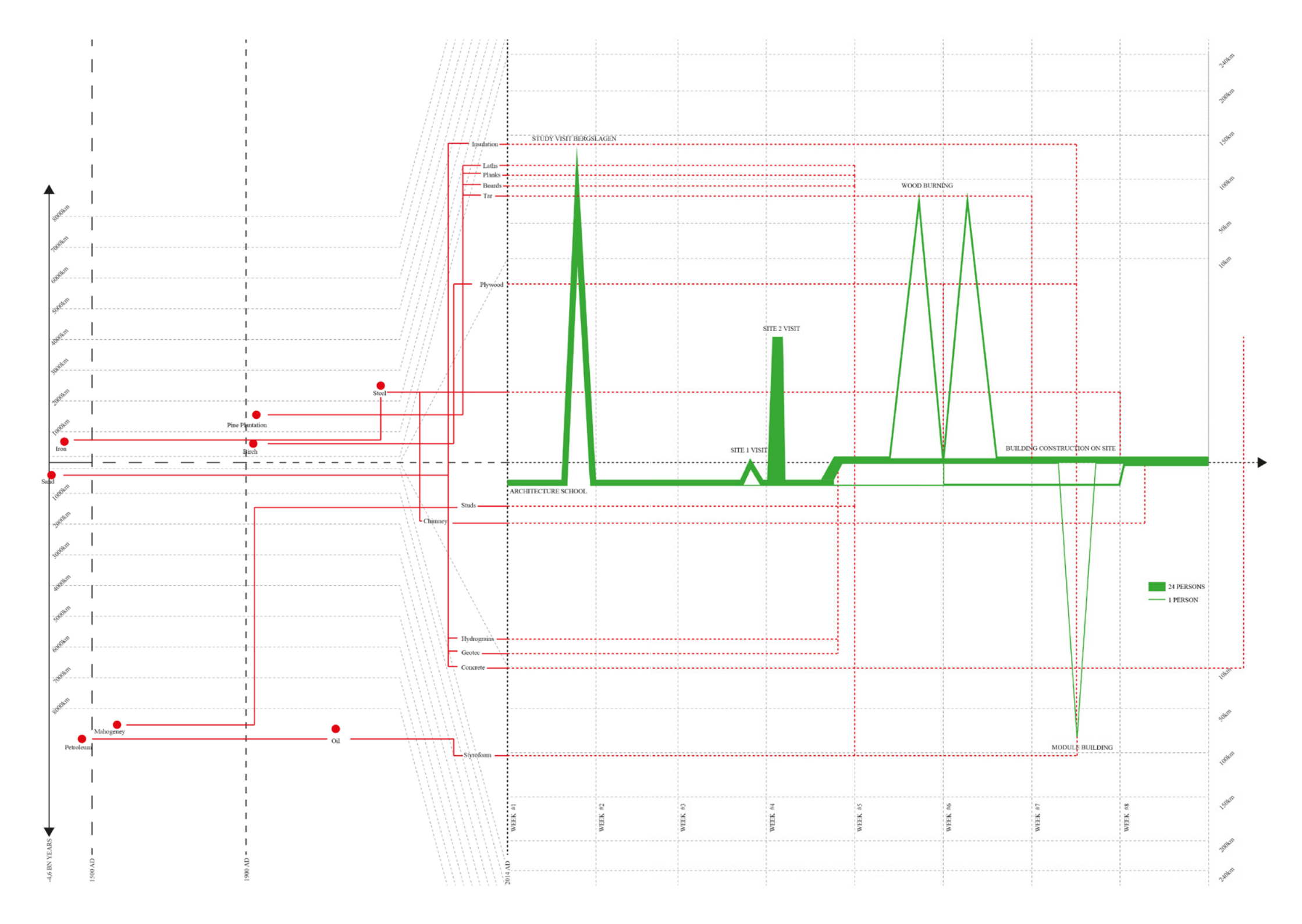
FOR MANAGERS: TIME

Introduction
The project started with three weeks of design process continued with approximately four weeks of construction work. Due to some different factors the project was delayed and ended up at all together eight weeks. During the process the studio consisted of different groups responsible for different parts of the project. These groups more or less vanished/ discontinued during the building process and everyone was involved in different parts of the construction depending on where work needed to be done and who was at site at that time.

Week by week
Week 1: The organisation process started with individual sketches for three days. After which we went on a two-days study trip to industries in Bergslagen.
Week 2: The following week we where grouped in 3-4 persons/group who merged their proposals and came up with new. At the end of that week we decided to go further with one of the groups proposals and try to merge it with ideas from previous proposals. We grouped in four groups; Project management/ Landscape, Framework/Bureaucracy, Exterior/ Economy and Interior/ …… We all had responsibility for those parts and discussed them together in the groups and in the studio as a whole.
Week 3-4: The third and fourth week consisted of construction seminar and site (2 sites) analysis, adapting the proposal to both sites and construction restrictions. In the middle of week 4 we made the ground foundation on site.
Week 5: The fifth week was dedicated to constructing the framework, roof beam, roof casettes, façade burning and windows.
Week 6: In week 6 we continued the façade burning and window construction but also started to insulate the Attefallshus, constructing the sliding floor for the Friggebod, building the modules for the Friggebod and started to mount the façade.
Week 7: The 7th week we mounted the Friggebod walls (the modules) and painted it with tar. The chimney is constructed, windows sanded and mounted, window-tables are constructed, roof laths and roof façade are set on the Attefallshus and the mahogany floor for the Attefallshus is constructed (for the part of the floor containing of floor storage).
Week 8: The last week the gable is being welded, everything is finally put into place and the final finishing is being done.
Altogether the project took 8 weeks including 3½ week of designprocess and 4½ of building process.

Project Managment:
Conclusions
The project was a big experiment in group cooperation. Over 20 architects where, for the first time for most of us, both designing and building a house together. This process was both very organized and very disorganized. Even though everyone was structured into certain groups with certain working areas, in the end a lot was more or less reorganized on site. The design process continued throughout the project resulting in a process where construction and design was worked out continuously. Jumping from design to carpentry to design to carpentry was a new method for most of us and made us realize how much can change at the actual building site, and also how much needs to be really thought through, especially if you're not a professional carpenter. Being 24 architecture students was both an access, due to the great variety of skills and knowledge, but could also be too much to handle on the site. Apparently a small building project as this one doesn't need 24 carpenters at the same time, resulting in difficulties with giving everyone a task at those days when everyone was at the site.

The construction work appeared to be more effective when about 5-10 persons where present at site than when less than five and more than 10 where. This partly had to do with the scale of the project as well as with how the work was arranged and divided. Some students had better carpeting skills than others and therefore where better at taking initiatives than those with less knowledge. Here a clearer peer-instruction pedagogy could have been a tool for a more equal and progressive work load.


-4.6 BN YEARS
1500 AD
1900 AD
2014 AD
9000km
8000km
7000km
6000km
5000km
4000km
3000km
2000km
1000km
Iron
Sand
Steel
Pine Plantation
Birch
Mahogeney
Petroleum
Oil
Insulation
Laths
Planks
Boards
Tar
Plywood
Studs
Chimney
Hydrograins
Geotec
Concrete
Styrofoam
STUDY VISIT BERGSLAGEN
ARCHITECTURE SCHOOL
SITE 1 VISIT
SITE 2 VISIT
WOOD BURNING
BUILDING CONSTRUCTION ON SITE
MODULE BUILDING
24 PERSONS
1 PERSON
WEEK #1
WEEK #2
WEEK #3
WEEK #4
WEEK #5
WEEK #6
WEEK #7
WEEK #8
240km
200km
150km
100km
50km
10km

Team: Simon Estié, Johan Fransson, Max Fröderberg, Jesper Levén, Tobias Lidman, Olivia Norlin, My Sivesson

FOR INVESTORS:
MONEY

Economy
Since the studio both designed and built the project we were able to analyse the complete economy of a small Swedish building. The Friggatto is perhaps one of the cheapest houses built in Sweden but also one of the most expensive ones depending on how you count.

The total cost of the house was 140 000 SEK which equals about 14 000 €. That gives a cost per square meter that is 350 €/m² That is roughly one third of a common low budget house in Sweden run through a contractor. The square meter price is only 4% of the price you pay to buy an apartment next to our site in Stockholm.

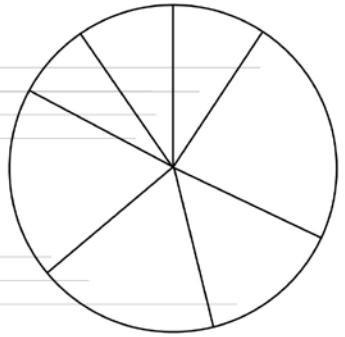
If we add the cost for tools, we get to a total of about 16 000 €. If we add the cost of two teachers working 40% plus a skilled carpenter in four months, including all taxes we have to ad about 60 000 € making the actual value of the house 76 000 €. (We say value now because this is a cost that would be spent in any course, in any architectural studio educating students in constructing masterpieces.)

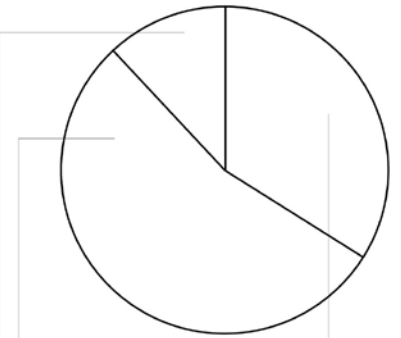
If we add the time spent by 24 students working full time in two months and compare it to a Swedish internship salary including tax, we have to add an extra 200 000 € to the value witch makes the following numbers:
Total value of the house = 276 000 € Value per square meter = 6900 €/m²

So even when counting the massive amount of resources spent on 3 teachers and 24 architectural students thinking, designing, re-designing and questioning coasts, and even if we count the "why and what are we designing talk", and the building processes in a slow and philosophical pace, we actually end up a bit under the price of what the cost per square meter is in Stockholm today.

Material coasts:

Framework	33000 sek
Foundation	14000 sek
Complementary stuff	14200 sek
Windows and doors	11000 sek
Facade	21000 sek
Interior walls	26000 sek
Deck and slab	28000 sek

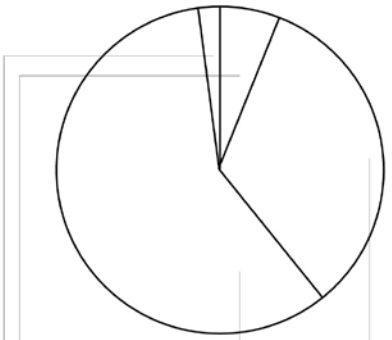




Rikard's calculation:

Material spent 147 200 sek
Time spent 480h á 475 sek 228 000 sek
Transport and reassembling 52 000 kr

In total 427 200 sek or 10 680 sek/sqm



Studio 1's calculation:

Architectural work
24 students for 8 days > 1536h á 875 sek > 1 344 000 sek
Construction work
15 students for 4 days of 6 h/week
4,5 weeks > 1620 h à 475 sek > 769 500 sek
Material spent 147 200 sek
Transport and reassembling 52 000 sek

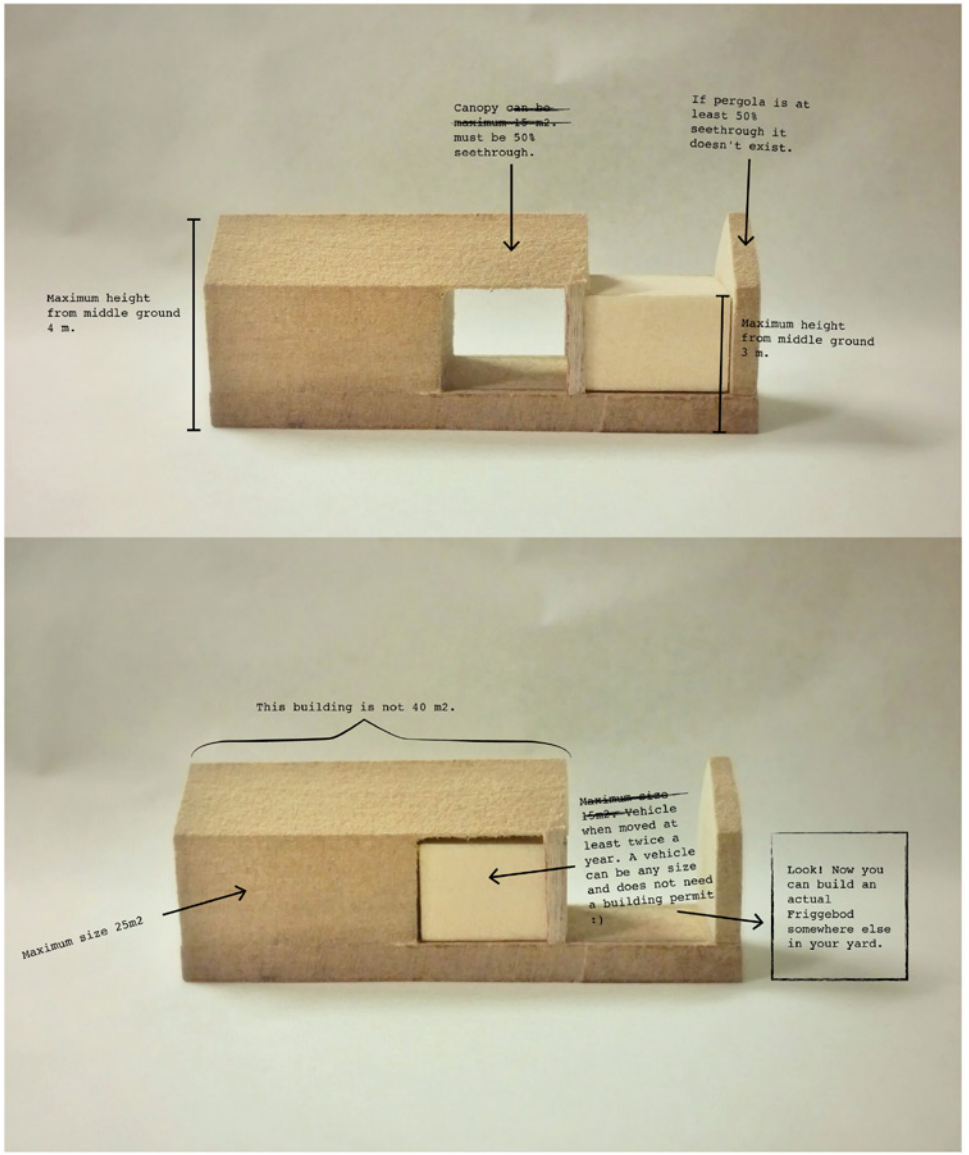
In total 2 312 700 sek or 57 800 sek/sqm

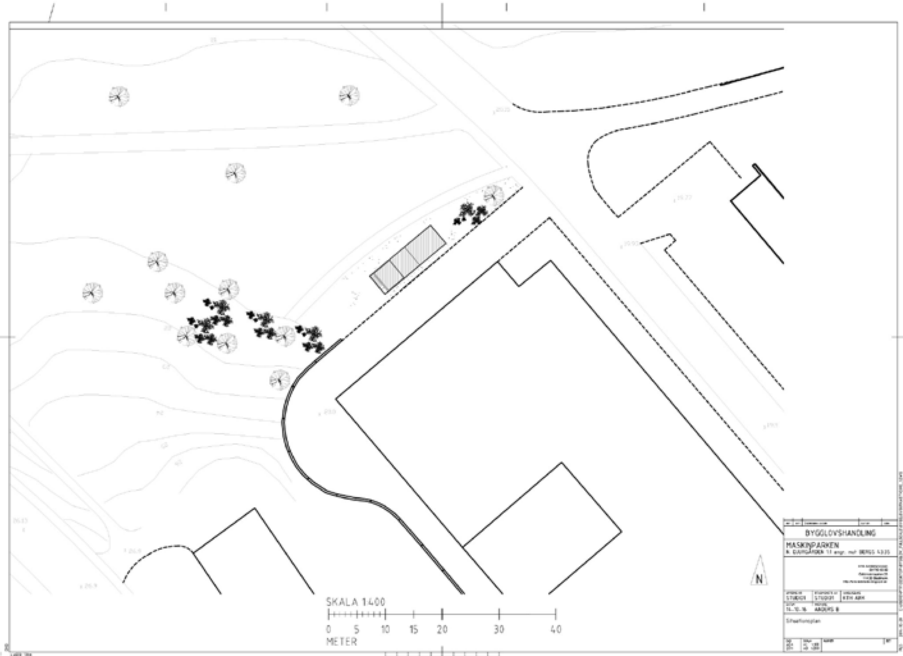
Estimated coasts for the second life of the Friggatto:
Municipal fees: 6270 sek
Transport and reassembling: 52000 sek
Complementary construction work: Foundation, installations, interior modifications and chimney inspection.

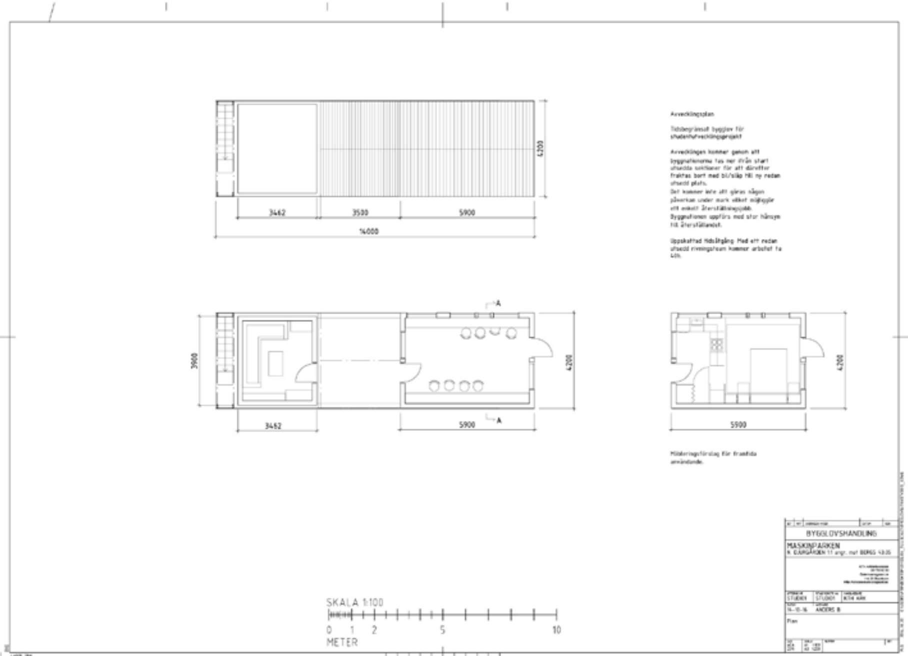
Team:Emil Almesjö, Petter Jysky, Gusten Hemström, Marylou Musat, Joel Olsgärde, Elin Pantzare

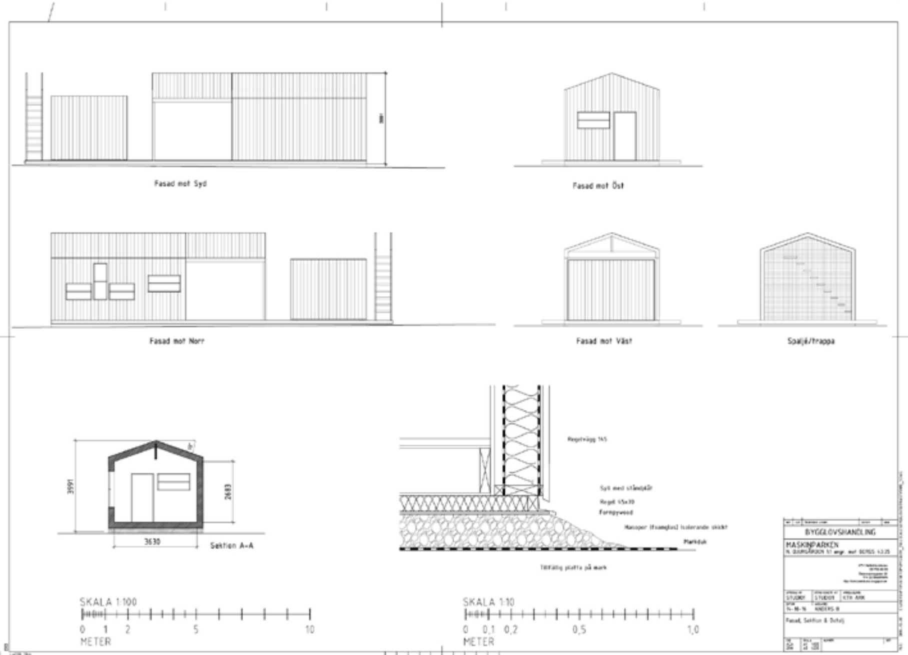
FOR BUREAUCRATS: RULES

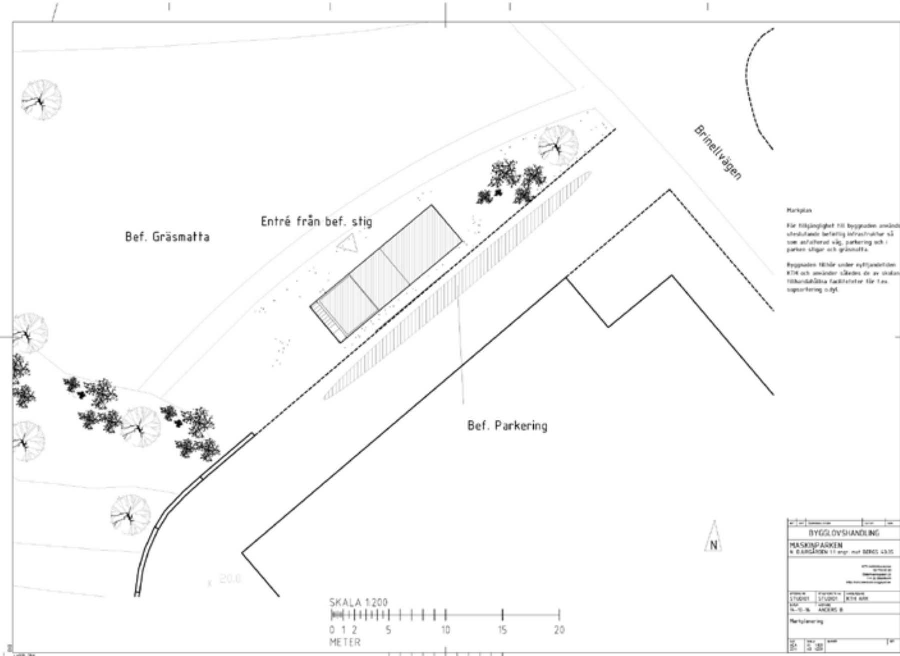
Swedish Law
When moving the “Frigg” it equals a vehicle. But if it sits still more than six months at the same place, it is labelled a house. If the volume is standing separately, i.e. not physically connected to another house and with the possibility to walk around it, providing the possibility to maintain it, then the volume is permit free and no municipal fee is charged. If it stands next to another house it needs to have a permit. Therefor the 15m² house will stand next to the 25m² for six months before you need to move it a bit and then connect again. This law suits Full Scale Studio quite well since we needed a bigger indoor-space during the winter and a roofed outdoor area during the warmer months to do other full-scale projects.




BYGGLOVSHANDLING
MASKINPARKEN
SKALA 1:400
0 5 10 15 20 30 40
METER


3462
3500
5900
14000
4200
3900
A
BYGGLOVSHANDLING
MASKINPARKEN
SKALA 1:100
0 1 2 5 10
METER


Fasad mot Syd
Fasad mot Öst
Fasad mot Norr
Fasad mot Väst
Spaljé/trappa
3991
2683
3630
Sektion A-A
Tillfällig platta på mark
BYGGLOVSHANDLING
MASKINPARKEN
SKALA 1:100
0 1 2 5 10
METER
SKALA 1:10
0 0,1 0,2 0,5 1,0
METER


Brinellvägen
Bef. Gräsmatta
Entré från bef. stig
Bef. Parkering
Markplan
BYGGLOVSHANDLING
MASKINPARKEN
SKALA 1:200
0 1 2 5 10 15 20
METER

SVENSKA TURISTFÖRENINGEN

Stockholm

2015-05-08

Statens fastighetsverk
Dnr 234-1378/15
Inkom 2015 -05- 18
Objekt AB
Hand-läggare

Till: Kungliga Djurgårdens Förvaltning,
Statens Fastighetsverk,
Länsstyrelsen i Stockholms län,
Stockholms stadsbyggnadskontor, bygglovavdelning

Olovligt byggande i Nationalstadsparken på Norra Djurgården 1:1

STF Stockholm skickar här in uppgifter om ett troligen olovligt byggande av en träbyggnad m.m. intill Tekniska Högskolan vid Brinellvägen 25, inom Kungliga Nationalstadsparken på fastigheten Norra Djurgården 1:1.

Foton och utdrag ur fastighetsregisterkarta och ortofoto över området bifogas.

Vi önskar besked att ni agerar för att få bort byggnationen!

För STF Stockholm

Gunnar Eriksson
styrelsen/omvärldsbevakning

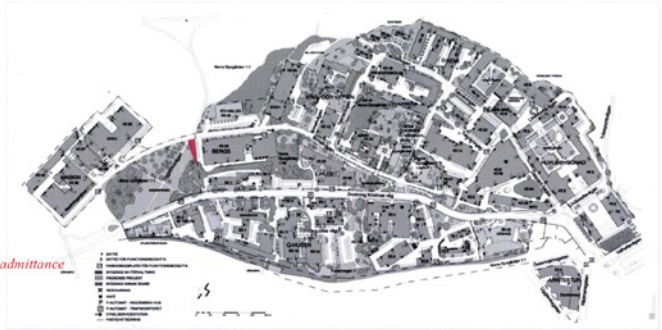
Ing-Britt Källman
ordförande

official complaints

STF Stockholm lokalavdelning, Själagårdsgatan 13, 1tr, 111 31 Stockholm stockholmskretsen@stfturist.se

ANSÖKAN FÖR TIDSBEGRÄNSAT BYGGLOV
FÖR TEMPORÄR BYGGNADSSTUDIE PÅ KTH CAMPUS
Läsåret 2014/15

Alla mått angivna i mm. Format A3.



official admittance

Medgivande till projektet av berörda parter

Kungl. Djurgårdens förvaltning genom Henrik Niklasson

Akademiska Hus genom Jan Kron

KTH Universitetsförvaltningen, Miljö- och byggnadsavdelningen genom Maria Granath

Stadsbyggnadskontoret
Inkom 2014 -09- 16
Reg.
Dnr: 2014-14677-575

official advice

Team: Emma Crea, Filip Dans, Mandus Lundmark,
Rebecca Mooney, Daniel Van Schaik

FOR FOLLOWERS:
TOOLS

Take care of screw machine bit! Hold the screwdriver and the screw in a straight line.

Nailing Tips
Avoid the risk by not nail near the materials edges.
Avoid nailing in knots, the nail will bend.
If you must nail in places with a risk of material cracking, flatten the nails head , it reduces the risk of material ruptures.

Each thing has its place! Use the pockets of the working clothes for what they are supposed to. Then it becomes much easier to work and the tools do not disappear at the construction site.

Protect the electrical machines against rain! A simple plastic bag can save the miter saw.

Have order at the construction site! Avoid having open toolboxes; they are easily filled with crap. Collect trash on garbage heaps it reduces the risk of tripping.

To build straight corners measuring should 600mm x 800mm at a right angle be 1000mm

If there is little space and its difficult to nail with the hammers head then use the hammer's long side.

Keep the tools clean! For example, if the screwdriver is used and becomes dirty outdoors, it will certainly be used again indoors.

New hammer or a widely used such have a coating on the surface and can be difficult to nail with. Grind off the coating, for example, against a rock and the nailing should be easer

If you are working with metal, the shaft of the hammer can be used as a rubber mallet.

The hammer is advantageously placed upside down in your back pocket. It will by easily accessible and will not be in the way.

If a nail must be pulled out and there is no nail puller, use two hammers.

Full Scale Studio members involved in building the Frigatto
Left to right up on the frigg: Anders, My, Adils
Left to right behind the fence: Noa, Dan, Johan, Emma, Petter, Klara, Rebecka, Ebba
Left tonrightnonnthe fence: Mandus, Filip, Emil, Tove, Joel, Jesper, Victor, Loes, Simon, Tobias,
Johan, Olivia, Anders, Elin, Mary Lou
From top to bottom Hammering in the front: Max, Gusten, Rikard


USING THE FRIGGATTO


BASE FOR 1:1 STUDIES

SHOTGUN SHELL Emil Almesjö
AMORPHOUS JOINT Johan Lingmark
PRE-PAP Adils Runkvist & Klara Östlund
RESIDUE RESCUE Anders Törngren
INTER (B)LOCK Emma Crea & Daniel Van Schaik
STACK JACK Marylou Musat & Elin Pantzare
CEMENT BOUND WOOD WOOL Jesper Levén
OSIP Joel Olsgärde
TITANIUM DIOXIDE CLEANER Johan Fransson
FORMED PLINTHS Max Fröderberg
TEXTILE CEMENT Tove Grönroos & My Sivesson
ORNAMENTED CASSETTES Olivia Norlin
MAGNEER Petter Jysky
LIGHTWEIGHT ELEMENTS Simon Estié
TIMBER BLOCKS Victor Ingmo & Mandus Lundmark
SCRAPKRETE Rebecca Mooney

Materialism

Polyethylene (abbreviated PE) or polythene is the most common plastic. The annual global production is approximately 80 million tones. Its primary use is in packaging (plastic bag, plastic films, geomembranes, containers including bottles, etc.).

For common commercial grades of high-density polyethylene the melting point is typically in the range 120 to 180 °C.

Brass is an alloy made of copper and zinc; the proportions of zinc and copper can be varied to create a range of brasses with varying properties. Melting point for brass is 927 °C.

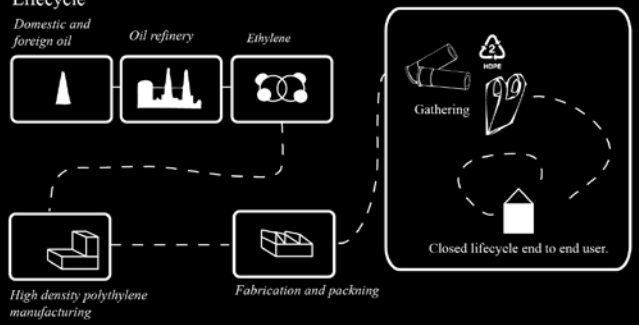
A non- shot shotgun cartridge costs around 1.5 SEK, which gives 7500 SEK for 5000 pc. A plastic bag from a grocery store also costs about 1.5 SEK, which is 112.5 SEK for 75 pc. It provides a total amount ca. 7600 SEK for the first hunting hut. But since all the material already exists , it means that the cost will be close to zero by reusing materal .

High density polythylene manufacturing. Over 60 million tones of HDPE is produced and thrown away every year. Even through HDPE and LDPE can by easily recycled, most of it still ends buried in waste pits is about 2% of discarded municipal solid waste by weight. It may seem like a small amount put plastic will never compost or degrade.

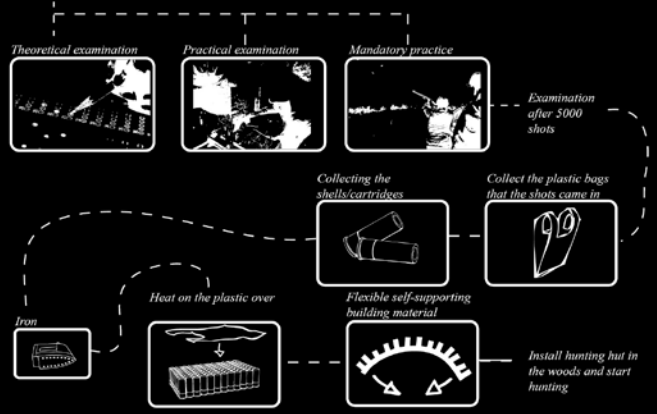
In Sweden 2011 was 55% of the plastic recycled thou requirements level was 70%.
HDPE is down cycled into plastic lumber, tables, benches, truck cargo liners, trash receptacles and other durable plastic products and is usually in demand.

SHOTGUN SHELL Emil Almesjö

Lifecycle



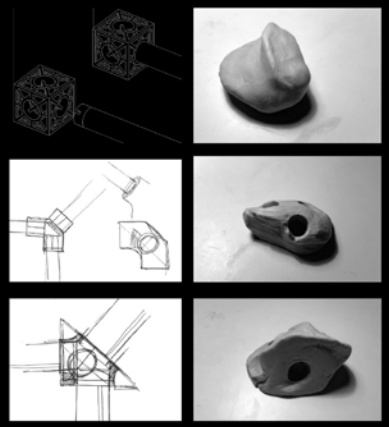
Hunter education



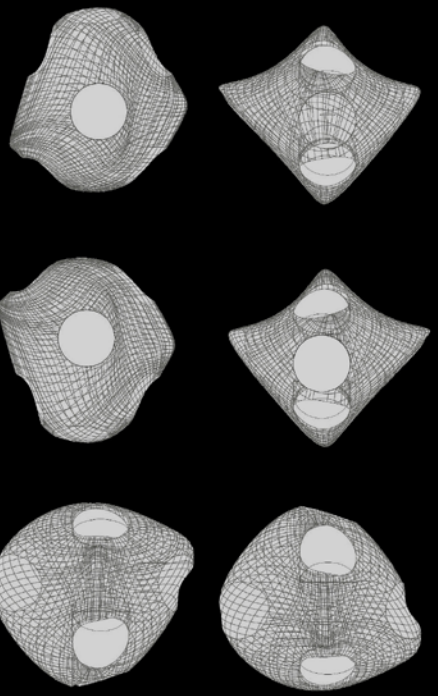
AMORPHOUS JOINT

Johan Lingmark

The initial aim was to conceive a module system that enhances the flexibility in a space, such as extra rooms, lofts, room divider and furniture's. The tricky part was not to make a system that will work; the difficult was that there were no smart adaptable joints to even build the module system with on the market. The existing ones are only made for compositions without the ability for flexibility. I believe we will be even more dependent on suppleness in the future; therefore we need more products that can transform and follow our needs. So my answer on that scenario will be a 3D printed connection that allows everyone to build their own furniture's, walls and constructions based on their requirements.



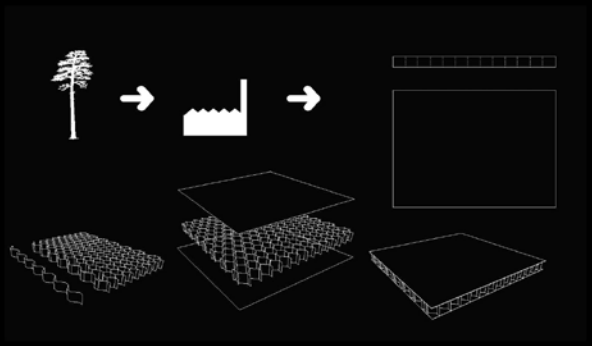
Designing a joint with 90°, 45° and 60 ° degrees angles that will made enough space for the round bars and in the same time make the system work as a fractal have been the main design issue. The solution is a formless object with carefully calculated and placed holes with precise angle for the round rods. That exactitude in an amorphous plastic structure is possible with 3D printing methods.

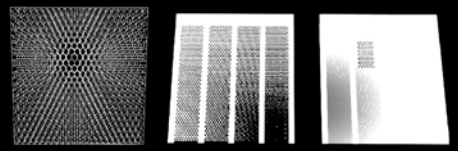


The two most common plastic materials to 3D print with is PLA and ABS. PLA is more rigid then ABS. If you compare them by applying a progressive force ABS will start to bend when PLA hold its shape. PLA also have much lower shrinkage factor then ABS when 3D printing. PLA is also better in indoor environment because of the degradable material. ABS on the other hand is not bio gradable and will therefor be better choice for outdoor use.

3D printing is another name for additive manufacturing (AM) is the process to make three-dimensional objects with layering. That means that the successive layers of material are laid down based from a 3D model in a computer or other electronic data source. The models can be of almost any shape or geometry, which means that we now can produce much, more complex forms and geometry that our previously technic was to limit to fabricate.

PRE-PAP Adils Runkvist & Klara Östlund



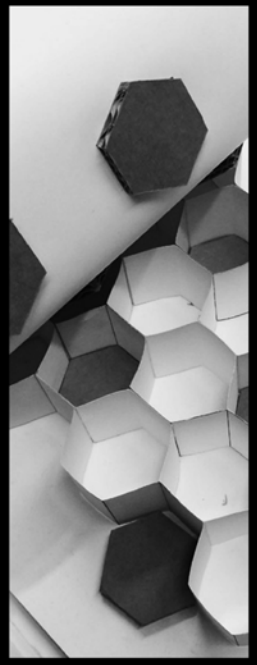


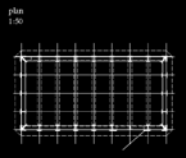
PRE-PAP - A structural, light-weight, prefabricated building element made out of paper

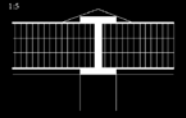
Production: The production will take place in a factory, to make sure the precision is all there. This could be a new area for the paper-industry to explore.

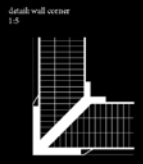
Component Properties: The life expectancy is set at 100 days, with the capacity of spanning at least 1 m with a 100 kg load on top. The cost should be 100 SEK for 1 m2, and the production time for every module - 100 minutes. It is also recyclable.

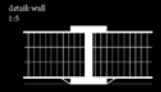
Assembling: The structural component will be light as a feather, so light that you can practically throw the parts to each other on the building site.
You do not need any tools to mount everything. Each module is put together with a joint that both secures the pieces, and seal the edges if each component.
Economy: Using paper makes it biodegradable, and it is even possible to use recycled materials, and also recycle the structure once you do not need it anymore.











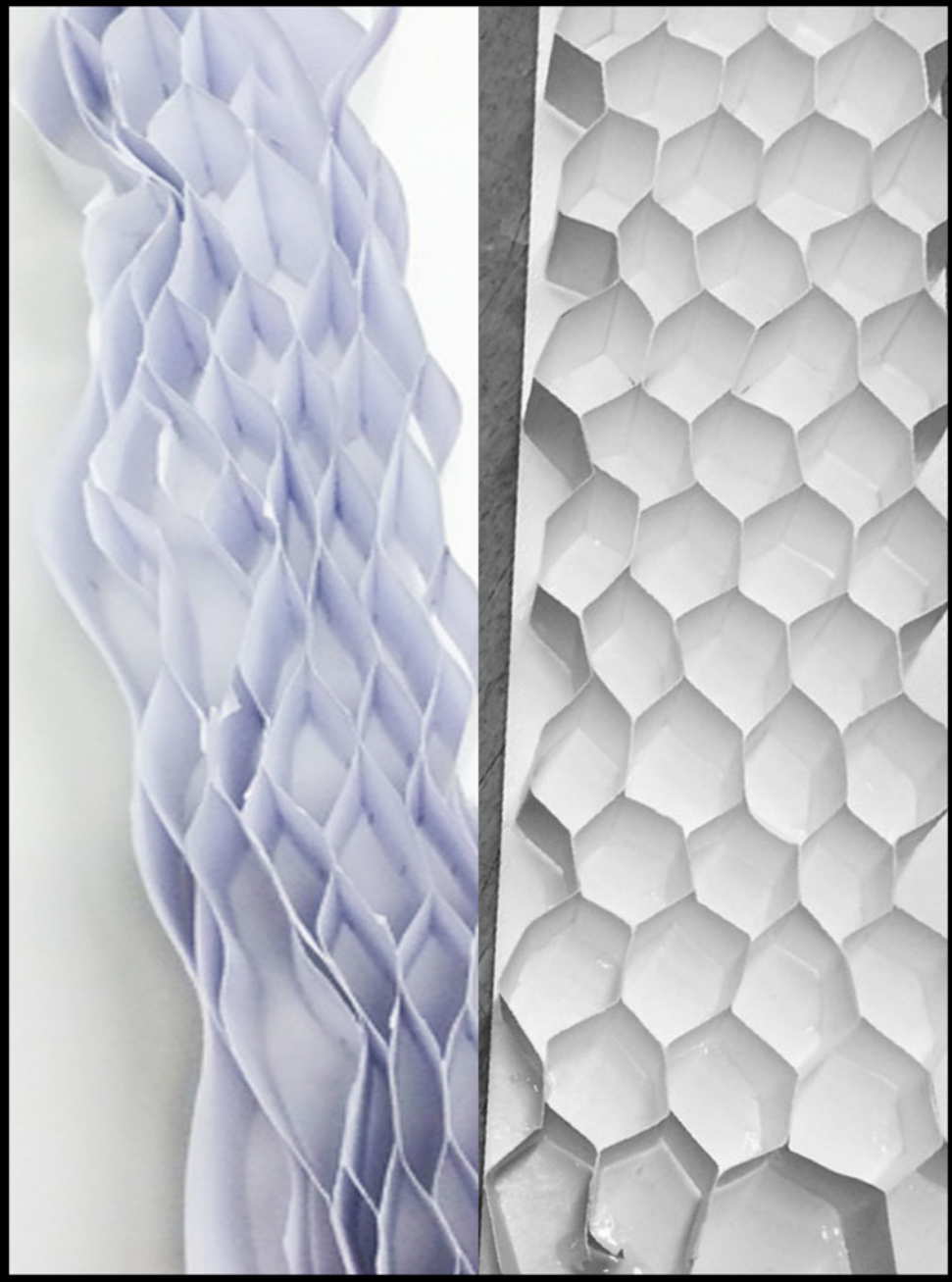
Abilities: Abilities that this type of structure will have are that it is easy to assemble, you do not need machines or heavy vehicles to transport the components. The material in itself also has the ability to carry loads in both directions:

Areas of use: This type of building element will be used for temporary structures. Because it is so easy and cheap to assemble, it does not matter that the structure has a limited lifespan.

Spatial qualities: The spatial qualities depends on the level of transparency, and amount of insulation. This affects both light and sound inside the structure.

Each component is flexible in the way that you do or do not cover the hexagonal pattern. Windows for example will have the same appearance, only that the covering material is transparent. Openings will all have covered sides, to make sure no water gets into the folded paper structure.

As extra insulation you can fill up the empty spaces with whatever you have at hand, be it cotton balls, shredded newspapers or wood shavings. This would also make the building elements have a variety of expressions.



RESIDUE RESCUE - Lightweight wood-cement-blocks

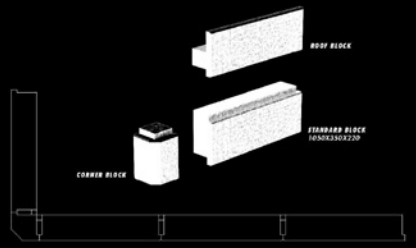
Wood flakes are cheap, accessible, overabundant and can provide varying properties of insulation, reinforcement etc.

Combine wood flakes with cement, pigment and sand/gravel in just the right way for the right properties. Gather material build the mould cast.

The building block has many desirable properties: cheap, easy to use, insulating, carrying, standard measurements, weather resistant & expressive.

Three types wall blocks:
Standard block (1050x350x220)
Corner block
Roof block

		FLAKES	CEMENT	SAND	TWIGS
WEATHER/EXPRESSION		30%	40%	40%	0%
INSULATION/CARRYING		50%	30%	10%	10%
ATTACH		4%	30%	30%	0%



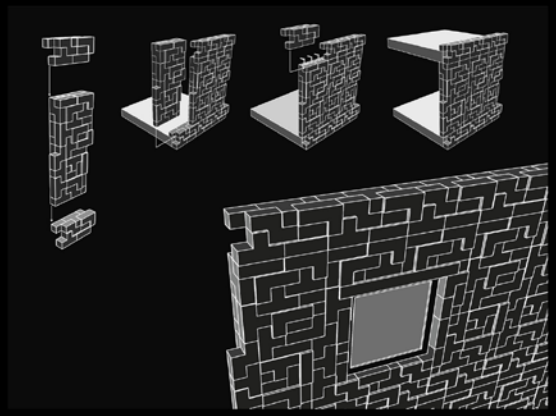
RESIDUE RESCUE Anders Törngren

Inter (b)Lock - a light-weight, all-in-one building block.

Performance:
- Structural
- Self-supporting
- Self-insulating
- Exterior & Interior finish
- Combination material (wood & concrete)
- Light weight
- Easily altered on-site (can be cut and screwed into)
- Building & Landscape material
- DIY use

Composition: Sawdust (50%) Gypsum (33.3%) Cement (16.6%) and Colour pigment to a ratio of 1 (cement) : 2 (gypsum) : 3 (saw dust POWDER)

Benefits of using sawdust:



INTER (B)LOCK

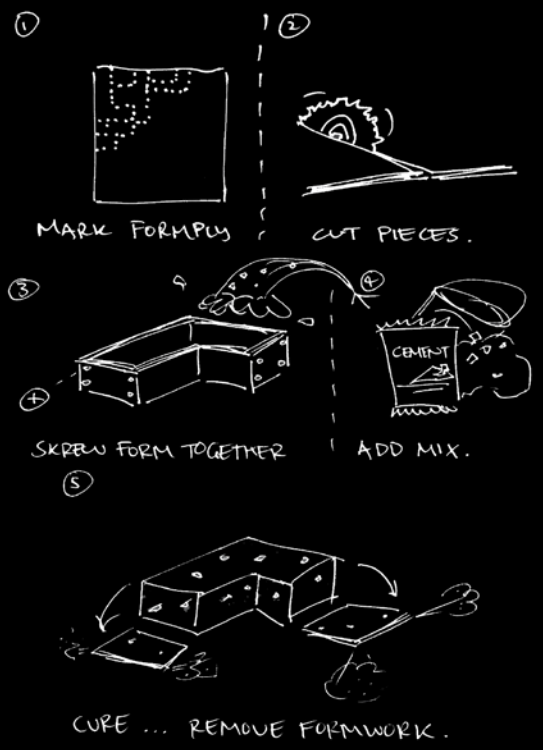
Emma Crea & Daniel Van Schaik

- Increased acoustic performance (when compared to standard concrete panels)
- Increased fire resistance
- Increased insulation
- Enables cutting, gluing, nailing and screwing of the block when dry
- Delays the setting time and increases plasticity during pour
- The natural colour of the sawdust is imparted into the block
- Reduces the overall weight of each block; approximately 50% lighter than standard concrete
- Locks up carbon from the waste timber

NOTE: Components will not bond to required strength if sawdust exceeds a ratio of 3 (50-60%)

Benefits of using gypsum:
- The use of gypsum bonds the sawdust and cement together consistently
- Creates a lighter finished color
- Reduces overall weight of product

Production Method
1) Mix loaded into feeder
2) Mix is released into tray
3) When full, tray is slid over mould
4) Tray shudders and drops mix into mould
5) Tray is slid back to starting position
6) Pneumatic ram applies pressure to mix
7) Blocks are placed on factory floor to dry
8) Machine moves forward and process is repeated



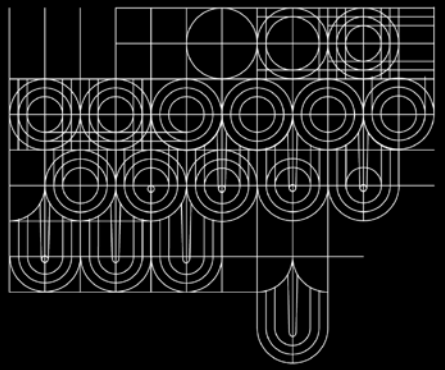
Stack Jack is a sound absorbing, self-bearing and ornamental building module. Made out of wool felt it is hypoallergenic, washable and sustainable. Since felt is simply matted, condensed and pressed fibers it is 100% recyclable – when worn out the felt can be ground, matted and pressed into new felt. The felt is soft, rigid, damping and flexible, and it has great sound absorbing capacity. The Stack Jack optimizes the sound absorbing capacity of the felt, by its multiple folds, and is an ideal muffler for sound frequenzes between 125-500 Hz. Great for offices, daycare centers, conference rooms and home studios.

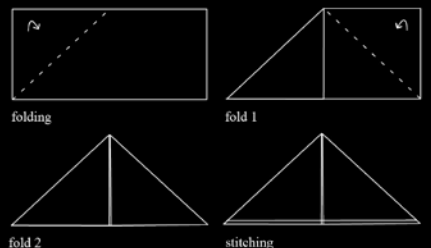
Stack Jack is based on a simplified version 3D-origami – the versatility is the same as for 3D-origami, but the folds are reduced from ten to two. This reduces material need, production cost and retail price of the Stack Jack.

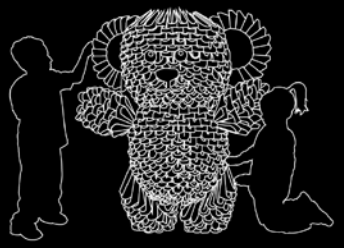
Stacking Jacks, Fun and Flexible
Stacking Jacks is fun and possible to do in a million different formations - from free formed ornaments to fun figures. Since it is based on 3D-origami, diagrams of assemblance are applicable also to your Stack Jacks. Do you wish to stack your Jacks into a sound absorbing dog, bird or chair? Anything is possible. Stacking diagrams are all over internet, just google!

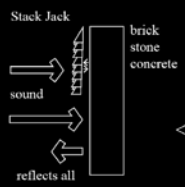
The Stack Jack ships flat in boxes of 500 pcs. This covers 1m2 wall surface, or allows you to make a simpler figure. Assorted colours or monochrome is up to the costumer. At a retail price of 3 SeK/pcs the cost per m2 is 1500 SeK.

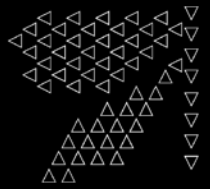
STACK JACK Marylou Musat & Elin Pantzare







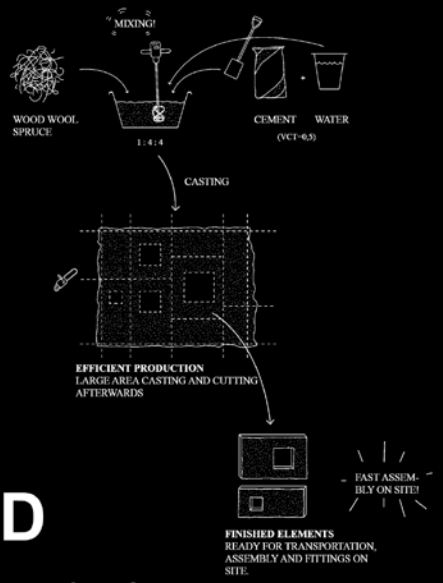




The goal was to development of a cement bound wood wool element with variable density. Why? To create a homogeneous building element with both weather proof and isolating properties.

Notes on the casting process:
· Wood wool is prepared by wetting it (by weight) to 25% moisture
· Curing time between casts aprox. 2-3 hours
· Density and result depending on pressure

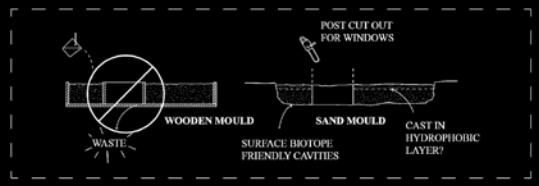
Renewable sand mould vs. wooden/ metal mould?
· The sand mould could be re shaped (by hand or by tools) and quickly used for a new cast witout any waste material.
· The windows is either cut out by hand or created by standard block dimension lay out in the sand mould before casting.



CEMENT BOUND WOOD WOOL

Jesper Levén

· Casting of a large area on the factory floor allows several elements to be produced in one cast, which means efficient pro duction time and cost.
· The sand mould allows for ir regularities great for insects in areas in need of biodiversity.

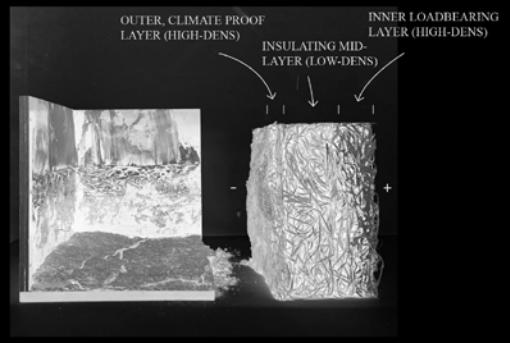


Cement Bound Wood Woll is up to 85% lighter than concrete!

Pros
+ homogeneous material
+ same free form props as Concrete
+ low weight
Lower costs for foundations
More efficient transport
+ use of waste material (wood)
+ sound absorbing
+ mold resistance due to high ph
+ non combustible

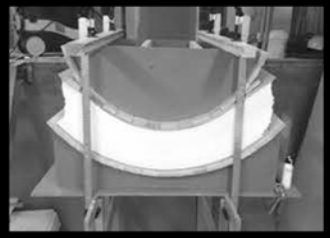
Cons
- more fragile than concrete in transport/handling before assembly

Possibilities/ Further development
· variable density for even lower weight and better use of materal
Outer, climate proof layer (high-dens)
Insulating mid-layer (low-dens)

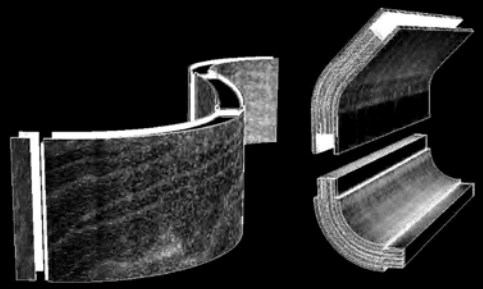


OSIP Joel Olsgärde

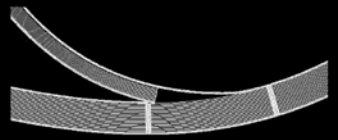
OSIP - Organic Structural Insulated Panel System.
The building module system called sips, structural insulated panels systems, has been popular in the United States since the 1930's and is the build system that increases most each year. The system consists of sandwich panels of OSB, which is glued on a core of insulating foam. The modules can be used as walls or ceilings. OSB-panels can without difficulty be replaced by other sheet materials of wood or metal. The advantages of building with sips are many. It is an inexpensive system that is durable, easy and quick to install with insulating performance enough to build passive houses.

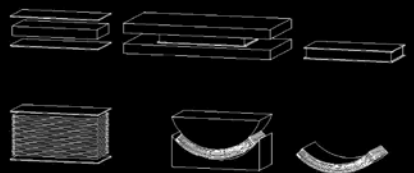


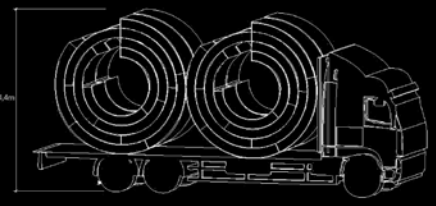
Laminated wood consists of several layers of veneer and form different types of sheet materials, such as plywood. The possibilities when working with veneer is that it is very flexible and can be bent. Veneer boards are glued together in a form and when the glue is dry, the shape is kept. Furniture Designers and architects have long used this technique but in a small scale.
OSB-plate was replaced with several layers of a 5mm flexible plywood and the thick foam against a 10mm thin and bendable. The first test was done on a small scale and created a prototype that demonstrates that the technology works. Second test consisted of larger discs plywood and much more insulation. The size of the insulation decided size of the wall element (600x1200mm)

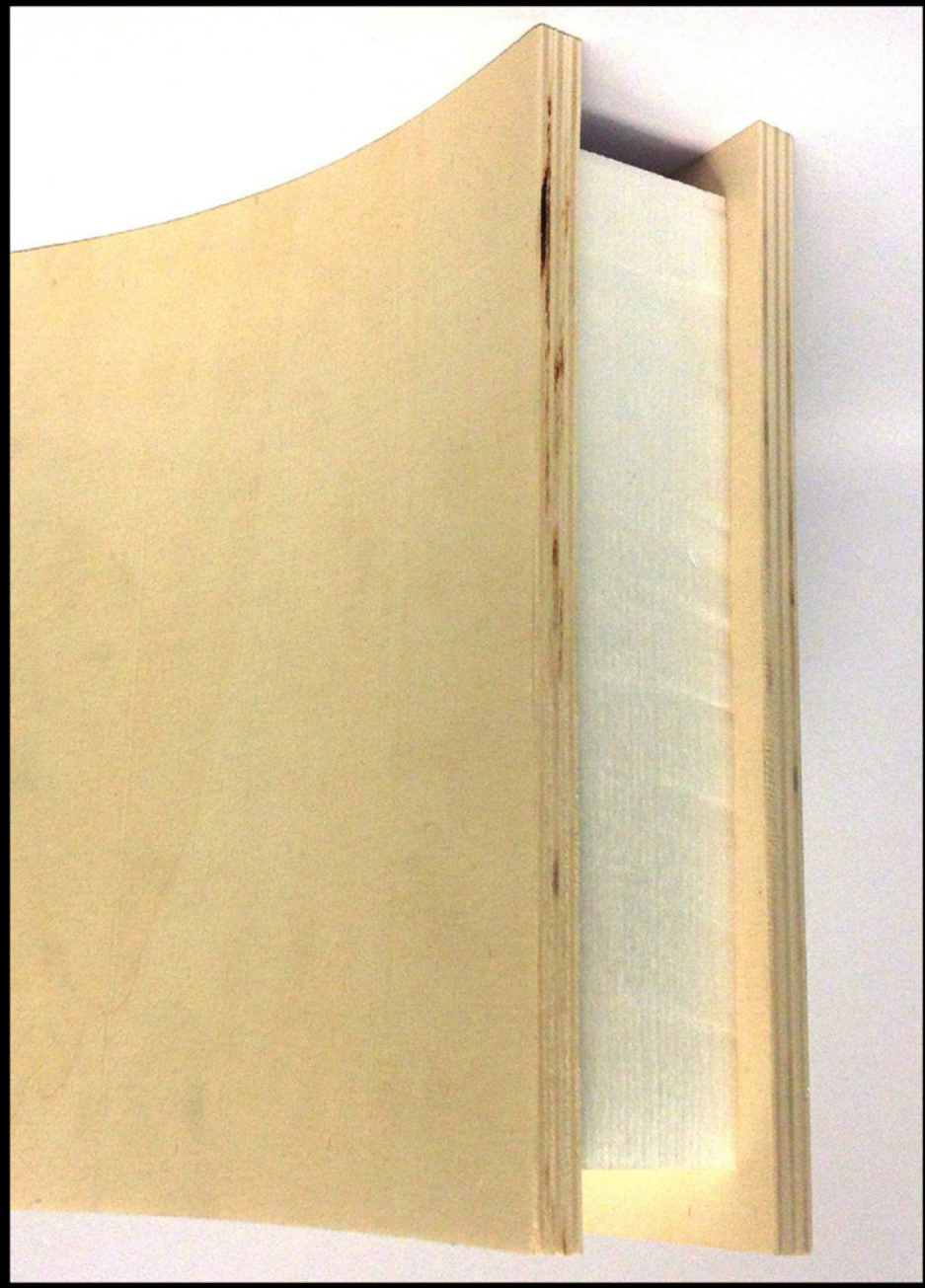


First a template of the wall, 90 degrees and 250mm thick. The template was then used to build the press out of the MDF and wooden slats. Plywood glued with glue and foam with a special adhesive that is flexible before it is solidified, which is advantageous in laminating. Finally everything was put under pressure overnight, and the result was a curved element and two curved plywood boards.









TITANIUM DIOXIDE AIR CLEANER

Johan Fransson

TiO2 is a nanoparticle and is commonly used for cleaning water. A thin layer of TiO2 is applied on the inside of a pipe and the pipe is light by UV-light. The toxic-particles is demolished and the water becomes clean. TiO2 can also be used to clean the air. If you for example mix it in to the concrete of a façade of a building it makes the polluted air a little bit cleaner. TiO2 I found in for example white pigment.

The process is a so-called photcatalytic process. The TiO2 is activated by the UV light. The energy of the UV-light makes the TiO2 molecule "exited" and it reacts with other particles. TiO2 is only the catalyst and it will not be consumed. If you explain it very simplified on could say that TiO2 + toxic particle + UV-light = TiO2 + smaller non-toxic particles.

The fact that TiO2 is a catalyst and that it will not be consumed makes the amount of TiO2 irrelevant, especially if you talk about an indoor-environment. A lager amount of TiO2 cleans the air faster but not better. The process continues as long as the TiO2 is exposed to UV-light.

30 % of all the buildings in the western world is suffering from SBS – Sick Building Syndrome. These buildings are perceived as having a bad effect on the people that inhabits them. WHO – World Health Organization believes that the indoor-environment is one of the main reason why a building is suffering from SBS. We are constantly surrounded by synthetic materials that emit toxic particles and polluted air. The average person spends 90% of his time inside.

T.D.A.C is delivered in a half empty tin can. You can use the can to mix the TiO2 powder with the material/ fluid you desire. If you want to sprinkle the powder over a material you can use the small strainer attached to the tin can.
One easy way to use T.D.A.C is to mix the powder with white oil paint and apply it to a regular lampshade and replace the light bulb with a UV-light...

1: The TiO2 is permanently fixed to the oil-paint which makes it more tolerant to friction and use. Not all the TiO2 particles is exposed to the air, some are encapsulated by the paint, which makes it less effective. Can be used on surfaces that are more likely to be worn out.

2: The TiO2 is sprinkled over white oil-paint which makes it less tolerant to friction and use. All the TiO2 particles is exposed to the air which makes it more effective. Should only be used on surfaces that hardly ever are exposed to friction

3: The TiO2 is permanently fixed to the oil-paint which makes it more tolerant to friction and use. Not all the TiO2 particles is exposed to the air, some are encapsulated by the paint, which makes it less effective. Remember that the TiO2 has the same effect as white pigment. This makes the primary colour lighter. Can be used on surfaces that are more likely to be worn out.

4: The TiO2 is sprinkled over black oil-paint which makes it less tolerant to friction and use. All the TiO2 particles is exposed to the air which makes it more effective. Should only be used on surfaces that hardly ever are exposed to friction

5: The TiO2 is permanently fixed to the oil which makes it more tolerant to friction and use. Not all the TiO2 particles is exposed to the air, some are encapsulated by the oil, which makes it less effective. Remember that the TiO2 has the same effect as white pigment. This makes the transparent oil to turn white. Can be used on surfaces that are more likely to be worn out.

6: The TiO2 is sprinkled over the oil, which makes it less tolerant to friction and use. All the TiO2 particles is exposed to the air which makes it more effective. Should only be used on surfaces that hardly ever are exposed to friction

7: The TiO2 is permanently fixed to the concrete which makes it more tolerant to friction and use. Not all the TiO2 particles is exposed to the air, some are encapsulated by the concrete, which makes it less effective. Remember that the TiO2 has the same effect as white pigment. This gives the concrete a more white/light-grey tone. Can be used on surfaces that are more likely to be worn out. When the top layer of the concrete is worn out, the next layer will have the same amount of TiO2 particles.

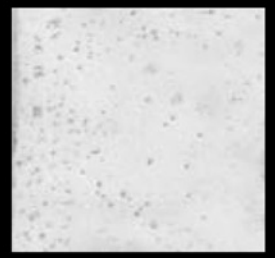
8: The TiO2 is sprinkled over the concrete before it dries. This makes it less tolerant to friction and use. All the TiO2 particles is exposed to the air which makes it more effective. Should only be used on surfaces that hardly ever are exposed to friction. When the top layer is worn out there is nothing left but ordinary concrete.

4: TiO2 sprinkled over black oil-paint

3: TiO2 mixed in to black oil-paint

2: TiO2 sprinkled over white oil-paint

1: TiO2 mixed in to white oil-paint



8: TiO2 sprinkled over concrete.

7: TiO2 mixed in to concrete

6: TiO2 sprinkled over finishing oil

5: TiO2 mixed in to finishing oil

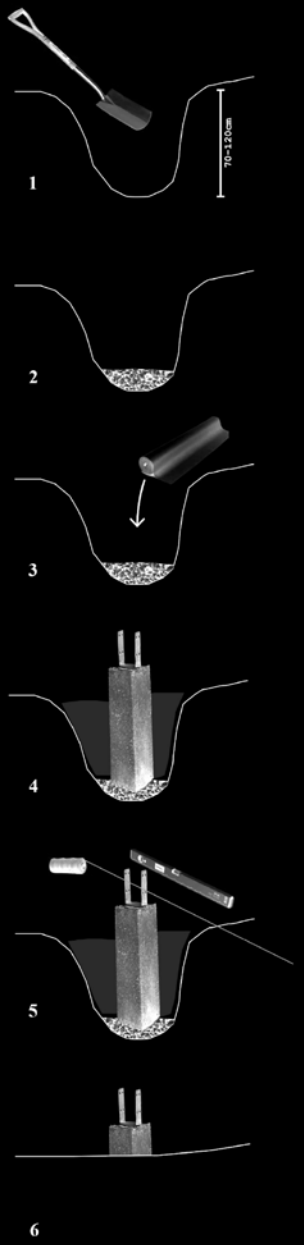
FORMED PLINTHS

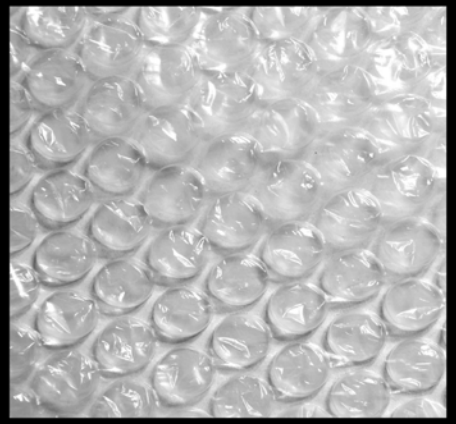
Max Fröderberg

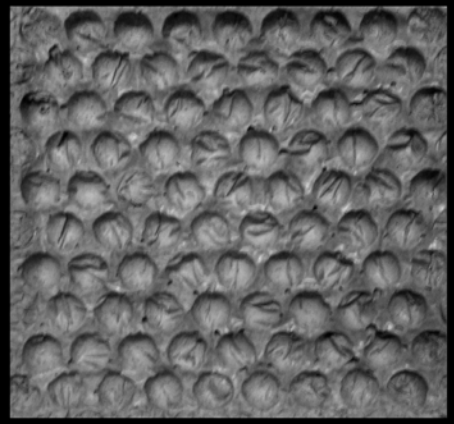
Making plinths green
Plinths are often grey and boring, why not make them green? By adding a texture and some curdled milk to the concrete, the surface can be covered in green moss and other plants!

GENERAL
Plinths are used as a foundation in lighter constructions as porches, fences, garages, storehouses and pergolas. They can be bought precast in different sizes (500mm and 700mm are most common) or as form tubes in different diameters (150-302mm in inside diameter). On the top of each plinth a ”stolpsko” is placed (48- 96mm depending on beam/pole) that will carry the load of the construction above.

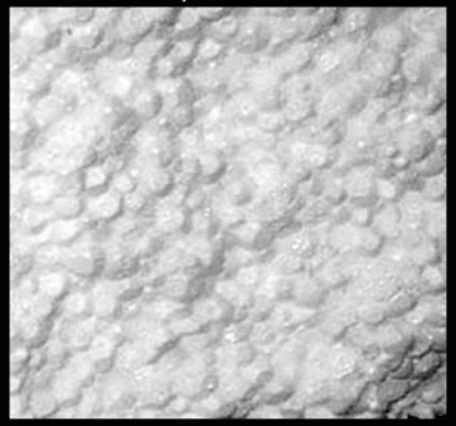
(1) During installation a pit is dug down to frost-free depth (70-120cm depending on where you live). (2) The bottom is filled with a 10 cm thick layer of macadam. (3) Then some ground cloth is used to cover the inside of the pit and afterwards more macadam is added. (4) On top of this the plinth or the form tube is placed. (5) It is then measured in with a spirit level to become vertical and with laser or thread to achieve the correct height. (6) The pit is then filled up and if you are using a form tube it is filled with concrete and a ”stolpsko” is cast with it in the top. Done!

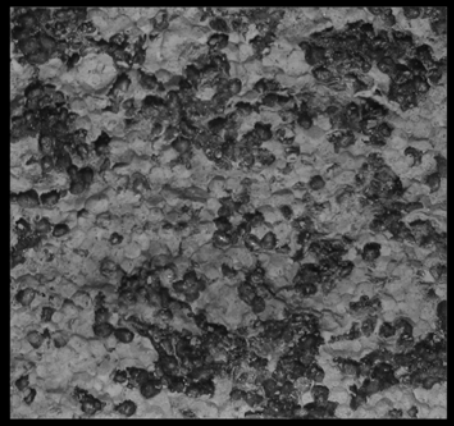




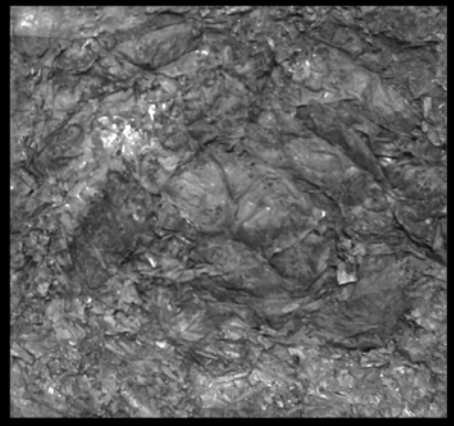


TEST 1: Bubble wrap





TEST 2: Styrofoam



TEST 3: Aluminium foil

Textile Cement
We are searching for new ways to use the qualities of textiles to improve processes, create curved surfaces, lightweight concrete walls and to transfer the textile appearance into different architectural expressions. By investigating the techniques of soaking textile in cement we have come up with three different ways to use soaked textile in the building process.

Basic textile spaces
The basic shape of the building is made with frames. The textile building parts are created beforehand at home or in textile factories by sewing, knitting etc. Depending on the characteristics, the wall should have, different methods can be used. The thicker and more irregular the fabric is - the more stable it gets. If needed the fabric can be reinforced with steel wire. On site the textile is being soaked and hung from the frames to dry and stabilize.

TEXTILE CEMENT

Tove Grönroos & My Sivesson

This technique is better suited for warmer climates but can also be used as framework for additional layers such as insulation - thereby creating buildings suitable for colder climates as well. Different characteristics of the fabrics, such as patterns, can be used to control the density of the walls – thereby creating either a dense, closed, or a light - see-through wall.

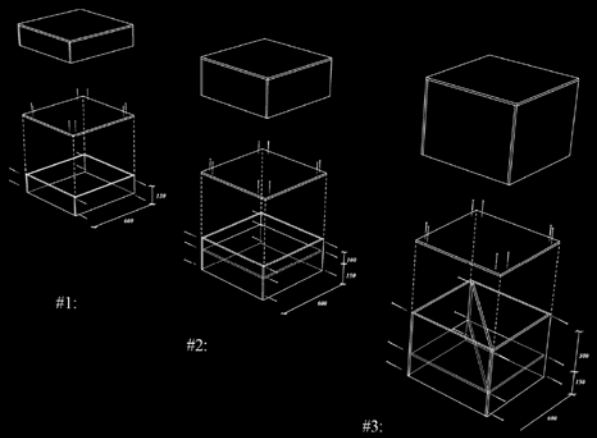
Textile Moulds
By sewing the casting mould, soaking it in cement and when dried use it as a casting mould for the entire wall, the process of casting concrete walls can be improved. The sewed moulds can be created in textile factories and shipped to the construction sites – since they are really lightweight the work and shipment is easier then the traditional ways to create moulds. At site the moulds are soaked in concrete directly in the cement mixer and hung up to dry. Curved walls can be created by shaping the mold before it has dried. When the mould has dried the wall is casted directly in the mould.

Textile Facades
This technique uses prefabricated concrete wall elements and adds textiles soaked in concrete in the process to give the façade a textile expression. The soaked textile is mounted as the last layer in the casting mold and is creating the surface that is going to be the facade.

The plywood cassette consists of 12 mm plywood parts assembled into a square box of four sides and a top using glue and nails or screws. The base of the cassette is 600 mm by 600 mm. Additional square parts of plywood can be added to divide the box and create hidden cases and spaces in which other functions can be added.

Cassette #1 creates a frame and a box with space for ornament. This is mounted underneath an already existing loadbearing roof construction. Its function is to create depth and to decorate the ceiling.

Cassette #2 has an additional piece of plywood which divides the box into a hidden upper case with space for installations and a lower visible case with room for ornamentation. This cassette is also mounted on a separate loadbearing construction.

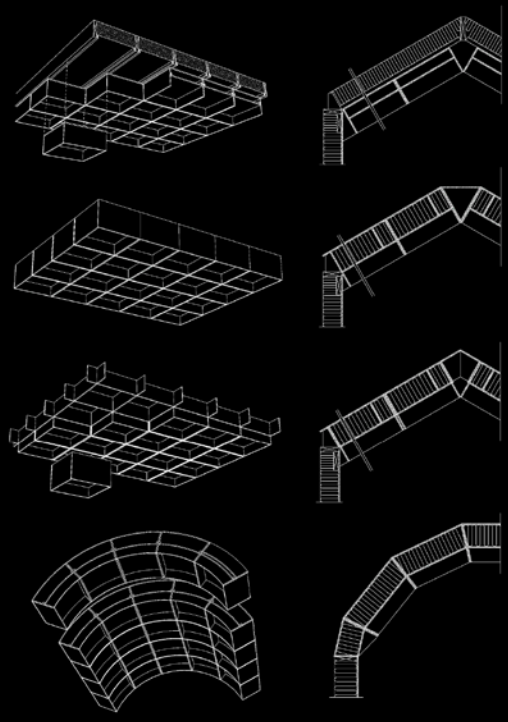


ORNAMENTED PLYWOOD CASSETTES

Olivia Norlin

Cassette #3 works as an ornamented ceiling and roof cassette. It is also divided into a lower visible part, which can be kept as it is or ornamented, and an upper part which holds the insulation. The upper part contains a diagonal plywood piece, which helps with the stability of the square cassette, making it into more of a truss structure. Connecting these cassettes together forms a roof slab which can carry the loads of the roof. On the inside it creates an ornamented ceiling and on the outside a roof cladding is attached. The plywood sides of the cassettes can be made deeper or shallower, depending on the required span of the slabs.

The cassettes can be made yourself, assembled and mounted on site. The dimension are so that the parts are suited to be cut out of a sheet of plywood which is 1200 mm by 2400 mm. Cassettes #1 and #2 can possibly be mounted by only one person or at least with little help. The cassettes could also be mass-produced in a factory and then delivered as single cassettes or as already assembled roof slabs or elements.



Short facts on magnetism
Magnetism is a physicl phenomena mediated by magnetic fields. There are permanent states and non-permanent states of magnetism. Permanent magnets are inherent magnetic abilities within the material itself, such as ferrite (iron) magnets and the type that is used in this project, so called Neodymium magnets. Non-permanent states of magnetism is applicable in the use of electro magnets.

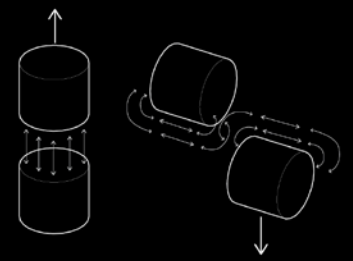
Neodymium magnets
Neodymium magnets are one of the strongest that is available, and is an alloy of the elementals Neodymium, Iron and Boron. NdFeB-magnets oxidate easily, therefore the magnets are normally manufactured with a galvanic coating of nickel or zink.

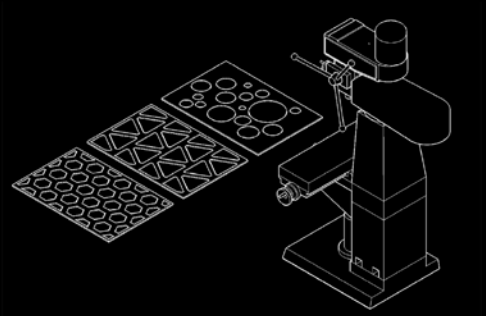
Partition size, form and spacing
The partitions inside the board can, when using milling, be made completely according to the needs of the customer. More anchor points require smaller partitions and more magnets. If the purpose is to hang larger things, fewer partitions are preferable but can then be made larger to fit larger magnets.

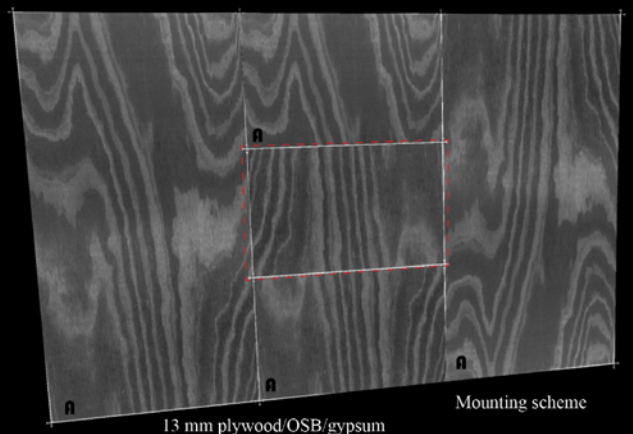
Cover material
The material to cover the magnets may vary. In the test, birch veneer has been used. The two most crucial factors that will determine the suitability of a material is the magnetic force and the friction of the cover material. A certain amount of friction is crucial for mounting vertically.

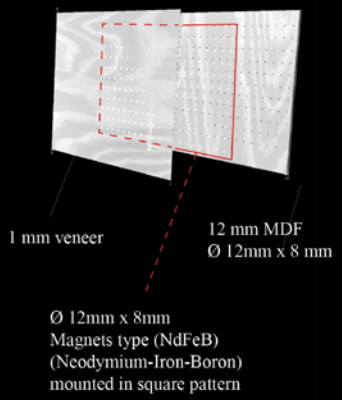
Standard dimension
The magnetic wall board is made with standard board width, 1220 mm and 13 mm thick to match the standardized structural framework for both inner and outer walls.

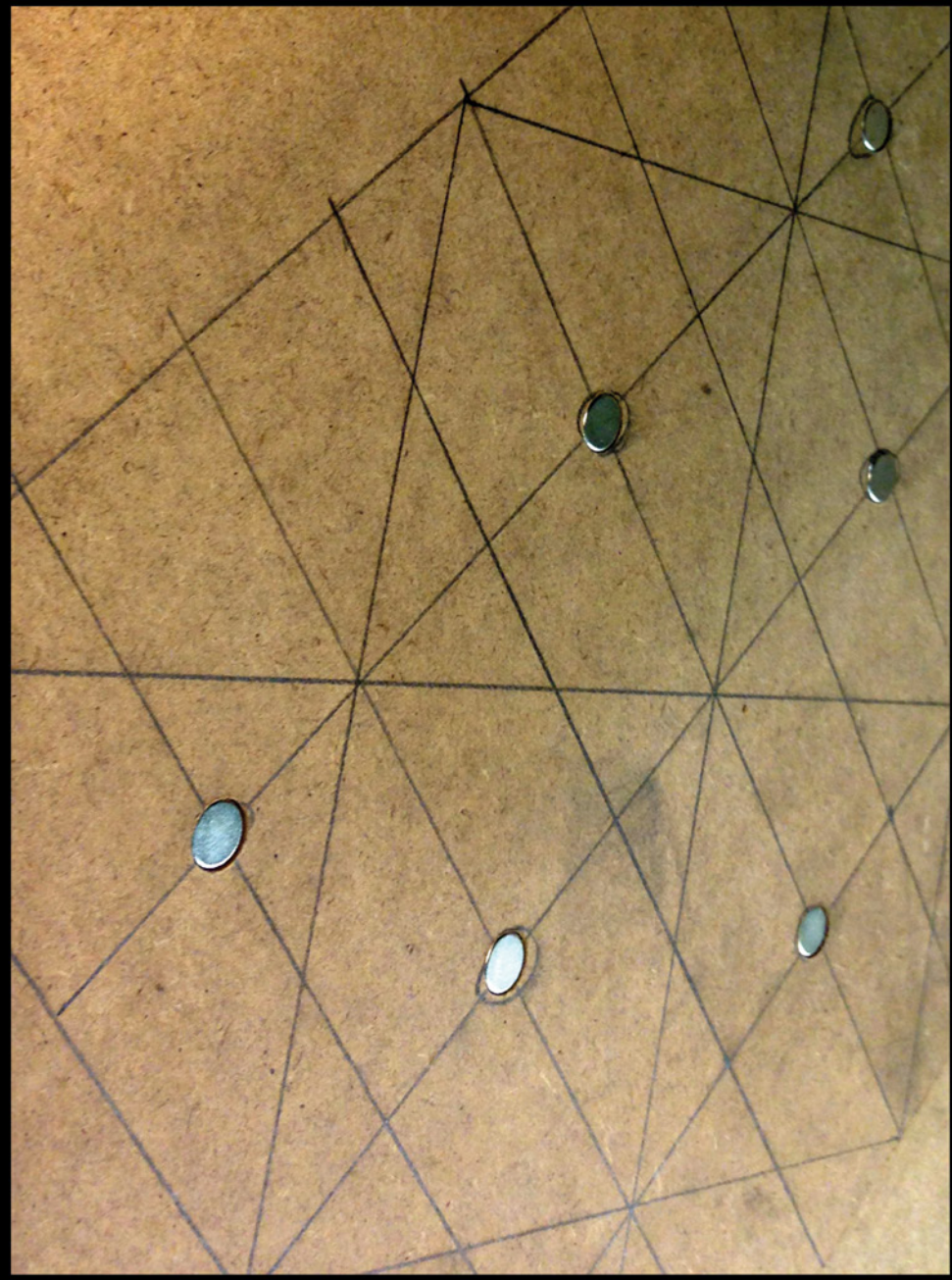
MAGNEER Petter Jysky











LIGHTWEIGHT PREFAB ELEMENTS

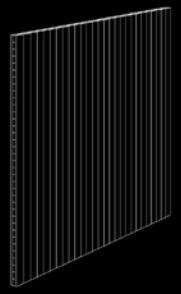
Simon Estié

Standard Swedish timber buildings contain lots of materials. Mineral insulation, drywall boards, plastic and timber. These prefabricated elements contain nothing but wood. Wood as in CLT-panels made of spruce, insulation made of cellulose fibre and a timber facade. That's it, apart from some glue and stainless steel screws.

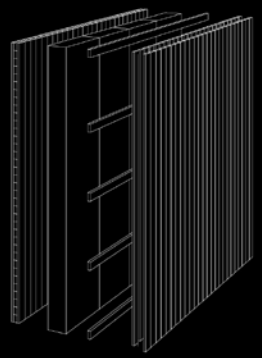
The idea is very simple. The basis for the lightweight prefab elements are the common CLT-panels manufactured by e.g. Martinssons. The panels are cnc-milled in the factory to fit the specific requirements of the building. They are then transported to another off site production facility where they are finished. Plastic pipes for electrical wiring are put into pre-milled tracks and pavatherm boards of insulation are spread out on top of the CLT-element and fastened by screwing the battens through them. Windows are installed and the timber facade is screwed in place.
On site the elements are put in place with a crane and nailed together. The last pieces of the timber facade is put in place in the corners and covering the joints. A private house is put up in a day.

Neither the CLT nor the insulation are cheap materials, this is on the other hand balanced by the fact that they are organic, natural and long lasting and that the assembly on site is very fast and the waste is minimized. The building will last for long and due to the properties of the timber it's easy to remodel the building or strip it down.

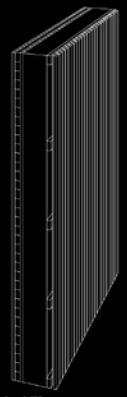
The lightweight prefab elements are preferably used in housing-projects where time on building site is an important factor or where it's hard to keep a stock of materials on the building site. While the CLT can be used for



CLT-Panel

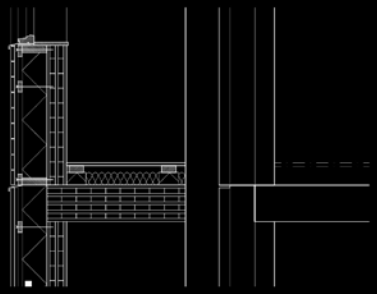


CLT- Insulation - Battens - Cladding

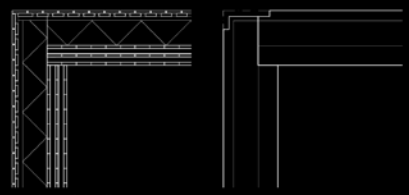


Finished Element

70 mm	CLT
160 mm	Pavatherm
28 mm	Battens
22+22 mm	Timber facade
302 mm	
70kg/m2	U=0,20
Material cost: 800kr/m2	
120 mm	CLT
240 mm	Pavatherm
28 mm	Battens
22+22 mm	Timber facade
432 mm	
105kg/m2	U=0,12
Material cost: n/a	



Vertical detail



Horisontal detail

A new way to timber
The prefab industry has many benefits; it is efficient and the quality is good but the user is often left out of the building process as the assembly method demands machines and educated staff. The aim with this project has been to design a user friendly prefab. product that offers freedom. Timber blocks is the result. It is a system that is manageable like brick but has quali¬ties like timber logs. It is a new concept; to brick with logs.

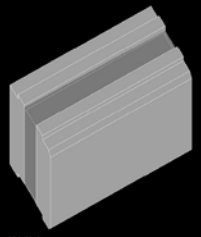
Economy
Spruce/ Price for uncut: ca 400kr/m3
Block: 21x20x40cm = 0,02m3
Raw material cost for one block 8 kr
Linen Wool / Price: ca 500kr/m3
Block circumference 1,2m
Incision: 5,5 x 0,3 cm
Material cost for one block = 0,099
Total cost 0,099+8 = 8,1kr/block

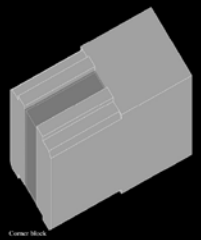
TIMBER BLOCKS

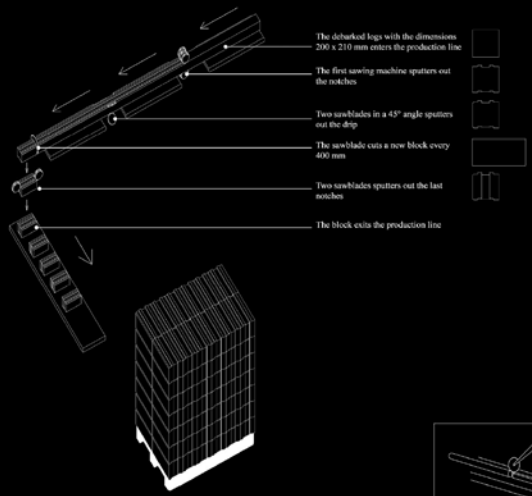
Victor Ingmo & Mandus Lundmark

Logistics
The Timber Blocks has been de¬signed, not only to be manageable for the user, but also to be logistically smart. One EUR-pallet can easily fit 96 Timber Blocks, which can make a 7,68 square meter wall.

Lifecycle
The construction of timber houses is a well-proven method that has been used during a very long time. The life span of a timbered house is very long and there are examples of timbered houses that have lasted for hun

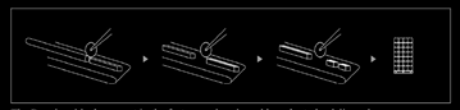

Main block

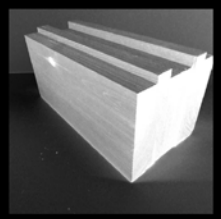

Corner block

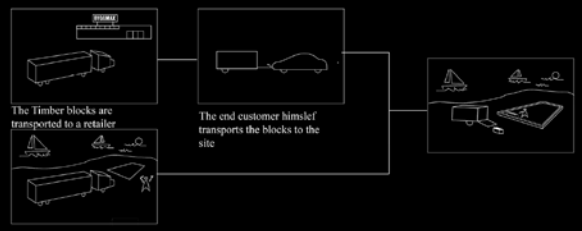



Trees are cut down


Transport to the factory


The Premium blocks are cut in the factory and packaged in order to be delivered

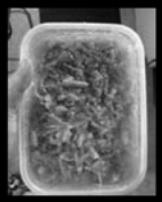










SCRAPKRETE

Rebecca Mooney

Plastic, wood scrappings (sawdust) and water are few of the many materials that are in abundance. I am looking to create a struc¬tural material by using these cheap, plentiful elements.

Test 1
Materials and equipment used: Sawdust + plastic resin (a substitute to plastic bags), Wooden stirring stick, Extractor fan (necessary!), Mask to prevent inhalation.
Conclusion: Unsuccessful. The plasticresin was poured onto the sawdust. I added a few drops of hardener and mixed the elements together forming a mixture. The two elements set after 6 hours and turned into a sticky plastic casing. Unfortunately the smell of the plasticresin was far to toxic and had to be thrown out. As you can see in the last image, the reaction between the 2 elements caused the plas¬tic cup to dissolve.

Test 2
Materials used: Sawdust 50% + Water 50%, Freezer for 6 hours.
Conclusion: Successful! But needed extra time in the freezer. Water was sprinkled across the sawdust until the water rose to the top and there was a visible lay¬er of water on the top. I then put the container in the freezer. After 6 hours I checked on the mixture to see was it stable. Unfortunately, the mixture had not set and the middle part of it was still quite wet.

Pykrete is a frozen composite material made of approximately 14% sawdust or some other form of wood pulp (such as paper) and 8% ice by weight (6 to 1 by weight). Pykrete has some interesting properties, notably its relatively slow melting rate (because of low thermal conductivity), and its vastly improved strength and toughness over ice; it is closer in form to concrete.
Pykrete is slightly more difficult to form than concrete, as it expands during the freezing pro¬cess. However, it can be repaired and maintained using seawater. The mixture can be moulded into any shape and frozen, and it will be extremely tough and durable, as long as it is kept at or below freezing. You can mold pykrete into blocks from the simplest materials and then plane it, just like wood. It has tremendous crush resistance: a one-inch column of the stuff will support an automobile. Moreover, it takes much longer to melt than pure ice. But as strong and eco-friendly as it is, pykrete remains forgotten today save among glaciolo¬gists, who express bafflement over why no one has made use of it.

After leaving the pykrete in the freezer over night to solidify, I made some tests to see how strong the material was.

The Strength Test
Firstly i stood on the sawdust for 2 minutes. It barely melted and didn't leave cracks.

The Melt Test
The material is clearly tough and much stronger than regular ice, as after being left out at room temperature for 2 hours, only a small amount is melted. This is a complete different reaction to regular ice which would have completely melted after 2 hours.

IN LAW OUT LAW

ASSIGNMENT 1: CITY SCALE

Two public interventions will be built further on in this course. To find out how to go about it in the best possible way, the first mission is to investigate what a *public intervention* actually is. What provides the possibilities and what are the parameters that influence a building project in Stockholm?

Your task is to map the framework that defines building processes in this city. The topic is huge and seemingly abstract, but we believe in approaching the city as if it was an organism. By asking direct questions and organising answers and data in relation to each other, new pattern of cause and effect will be visible.

You are divided into research teams with given starting points, but your findings should be developed and combined into a common map/ drawing/ diagram. Approach it as a detective's suspect map or a genealogical tree, and regard yourselves as digging journalists or detectives. We propose to use assumptions and speculation, maybe even gut feeling, as a driving force in your search for clues.

How does it work if you wish to exploit a site? Can you build on common ground? Who takes the initiative to build something? Who are the main actors in the development? The main responsible? The main drivers? The main suspects?

Follow the line of an imagined project to find out where the influences are located. Call stakeholders for an interview. If they don't answer your question, if they lie or blame someone else, it might be equally useful in understanding the way decision-making works. Pose simple questions to reveal complex answers.

Who decides what is being built in Stockholm? Who decides what can not be built? Who are in-laws and where is that line that you cross when becoming an out-law?

INITIAL ISSUES AND TEAMS:
1. Who owns Stockholm? (Natalia + Max)
2. Who gets to build the most? (Roxanne + Tobias)
3. Who has the greatest influence? (Brendan + Elin)
4. Who earns the most? (Samantha + Johan)
5. Who controls time? (Loes + Noa)

If teams are non-functional we count on you to form alternative collaborations.

CALENDAR:

2015-02-03 13.00	Optional meeting/ Studio
2015-02-05 13.00	Discussion on strategies and collaborations. Bring material/ Studio
2015-02-09 09.00	Tutorial in teams/ Studio
2015-02-12 13.00	Pin-up of full map structure/ Studio
2015-02-13 13.00	Visit to Exploateringskontoret/ Development Administration Tekniska Nämndhuset, Fleminggatan 4. Meet up 10 min before.
2015-02-16 09.00	Intro Assignment 2/ Tekniska Nämndhuset, Fleminggatan 4.
2015-02-16 10.00	Visit to Plankontoret/ Planning Department Tekniska Nämndhuset, Fleminggatan 4. Meet up 10 min before.

IN SIDE OUT SIDE IN

ASSIGNMENT 2: SITE SCALE

You have been mapping large-scale power structures and their influence on building in Stockholm. When zooming in on specific sites, such structures usually become more concrete and also more diversified. Factors that are very influential on a city scale might be irrelevant on a site scale, and vice versa. To research contextual parameters of building further, you are now asked to investigate two contrasting cases in parallel: an area and a boundary; a property and a no-man's-land.

Site A is a defined area with a high value. It has a strong integrity and a lot of attention. It is the *Nationalstadsparken* park, a natural reserve. Site B is undefined as a place but clearly forms a landscape of jurisdictional and economical factors. It is the border of Stockholm's municipality and it has never been pronounced a site before.

Both sites are too large to overview or generalize about. As a starting point you will have to learn enough about them to find interesting places to zoom in further on. A general theme is accessibility, but your initial task is to investigate specific aspects more thoroughly. Step 2 is to compile the research into an analysis and propose a strategy for each of the two projects to come. The aim with the assignment is to find localisation and program for a public intervention on each of the two sites.

RESEARCH
Divide the work in the group and map important aspects. This should be represented:
1. History and future plans (as in development over time)
2. Resources (as in assets, geographies and productions)
3. Movements (as in flows, directions and traffic types)
4. Interests (as in users, owners and actors)
5. Regulations (as in law, customs and habits)

Prepare a brief presentation for Monday 2015-02-23 09.00.

STRATEGY
Analyse the information of the group and propose a strategy for one or both of the sites. Work individually and prepare a brief presentation for Thursday 2015-02-26 09.00.

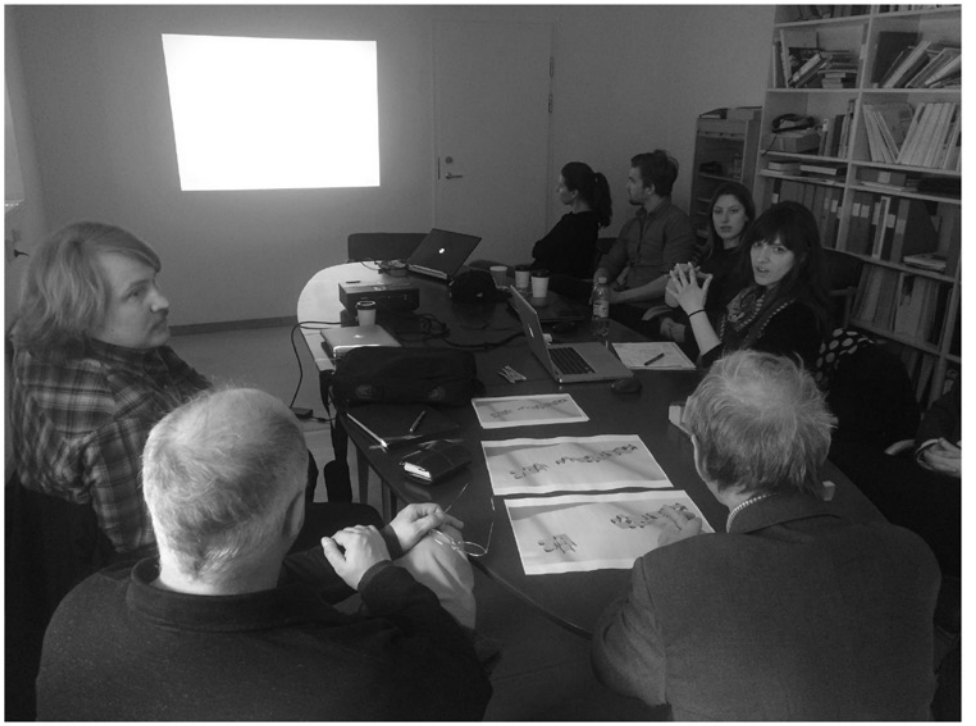
Everything you do now will be developed and fine-tuned later on. Work rough and fast to bring all ideas and interpretations into play.

TEAM
Natalia Daukszewicz
Roxanne De Raeymaecker
Max Fröderberg
Johan Lingmark
Samantha Mofflin

Anders Berensson
Ebba Hallin

2

Limber Timber



LUMBER TIMBERS

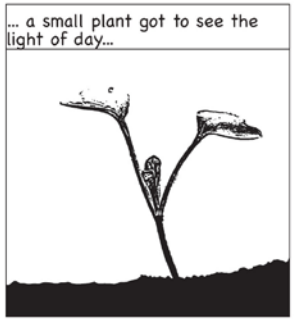
LUMBER TIMBERS

or

A tale of
five students,
seven trees,
three hammers,
and one Royal Park

THE TREE

Once upon a time in the forest of Nationalstadsparken...



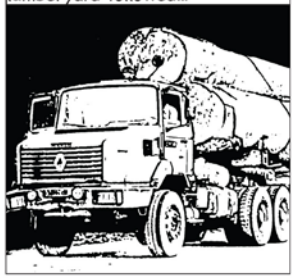
... a small plant got to see the light of day...

... and over hundreds of years...

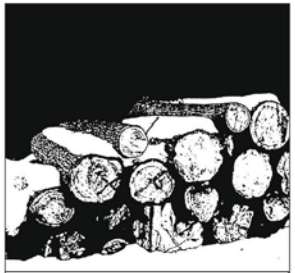
... it grew into a majestic tree...

... until one day:

VWWRREEE



a transport of the wood to the lumberyard followed...



... where it would wait for better times to come.

And the time came, as a group of students heard at a KDF meeting in the park...

SITE VISIT

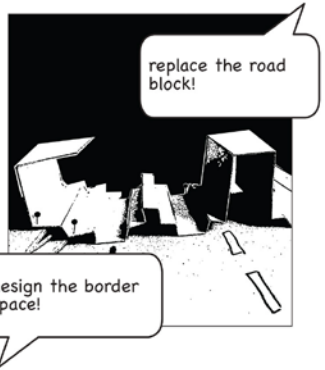
...that a road has been closed off.

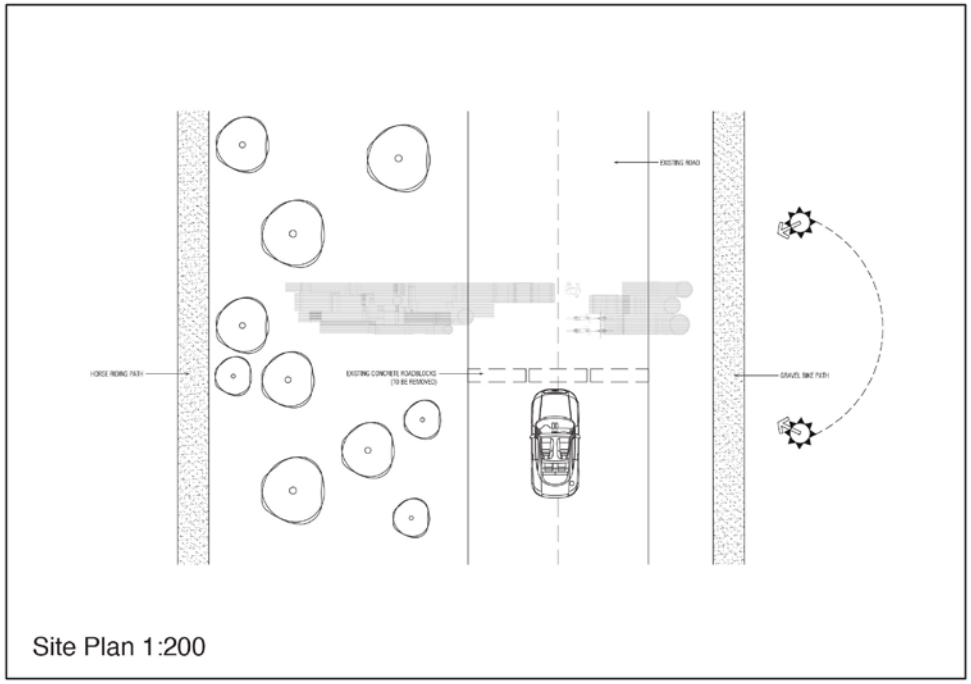
What a lovely place to enjoy the sun...

... allowing five students to dream about a better place.

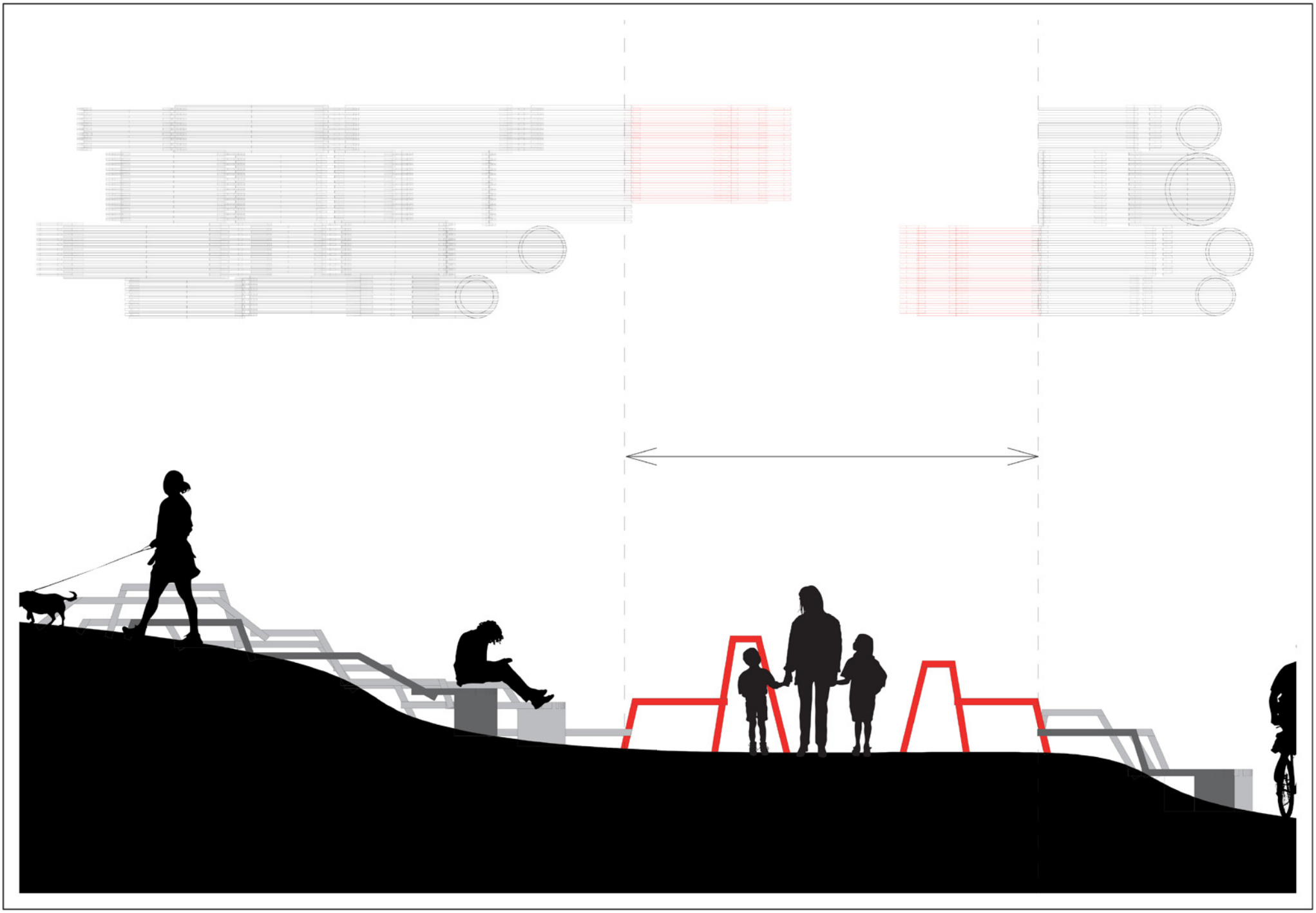
DESIGN PROCESS

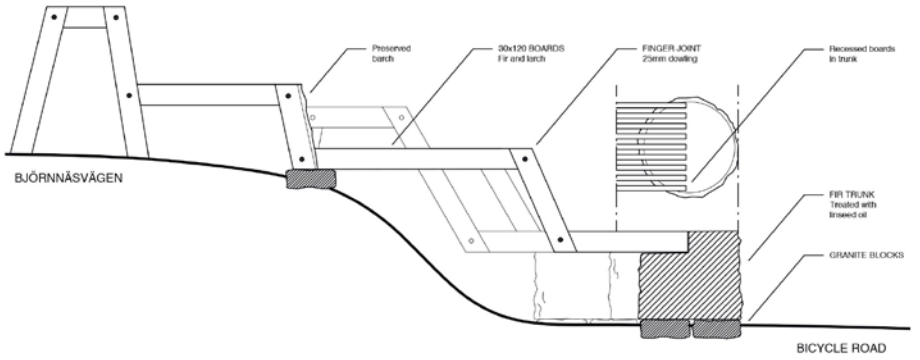
...and 10.000 sketches...



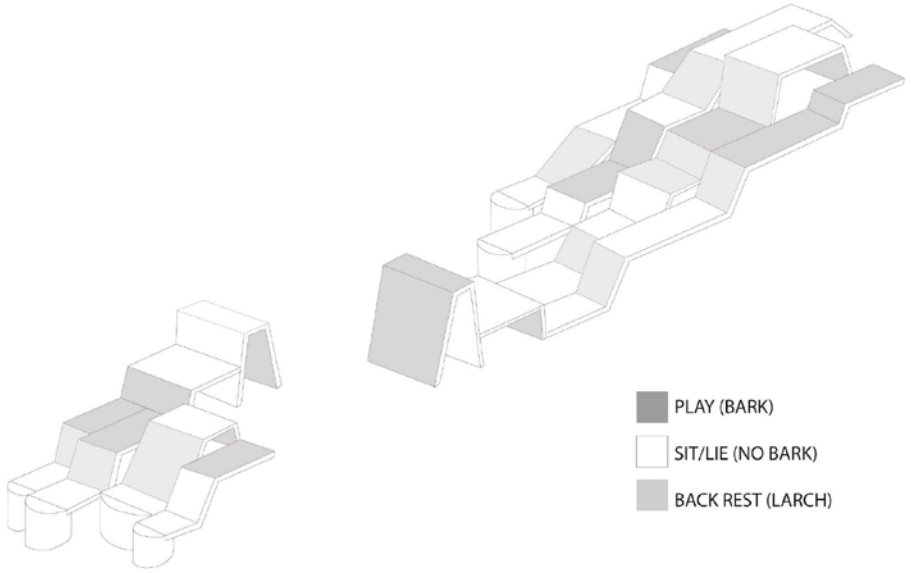


Site Plan 1:200

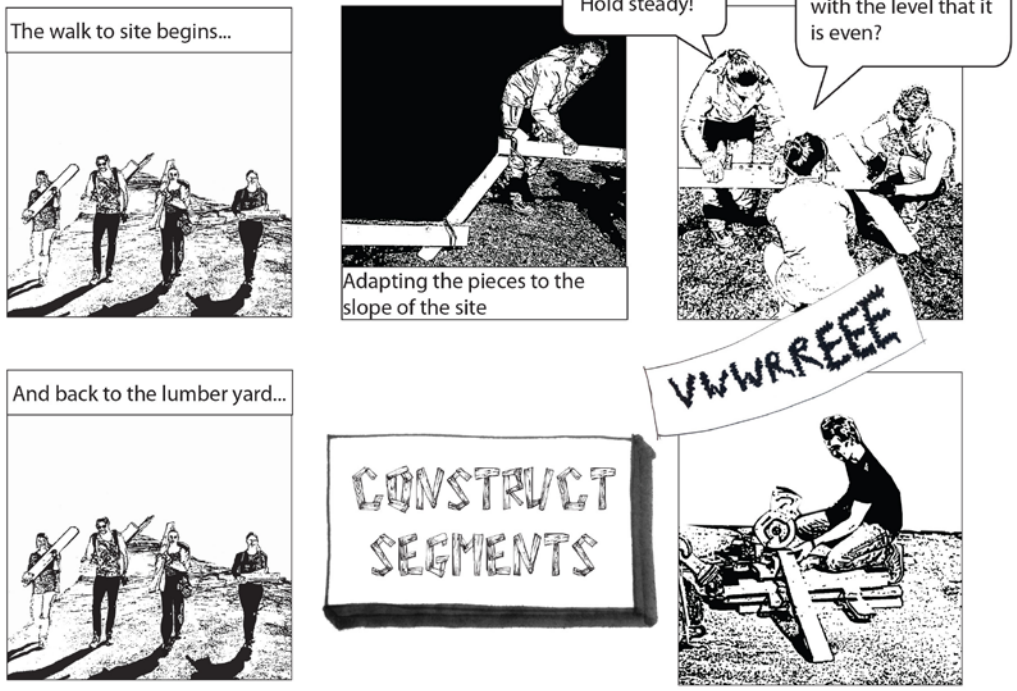




Construction Details

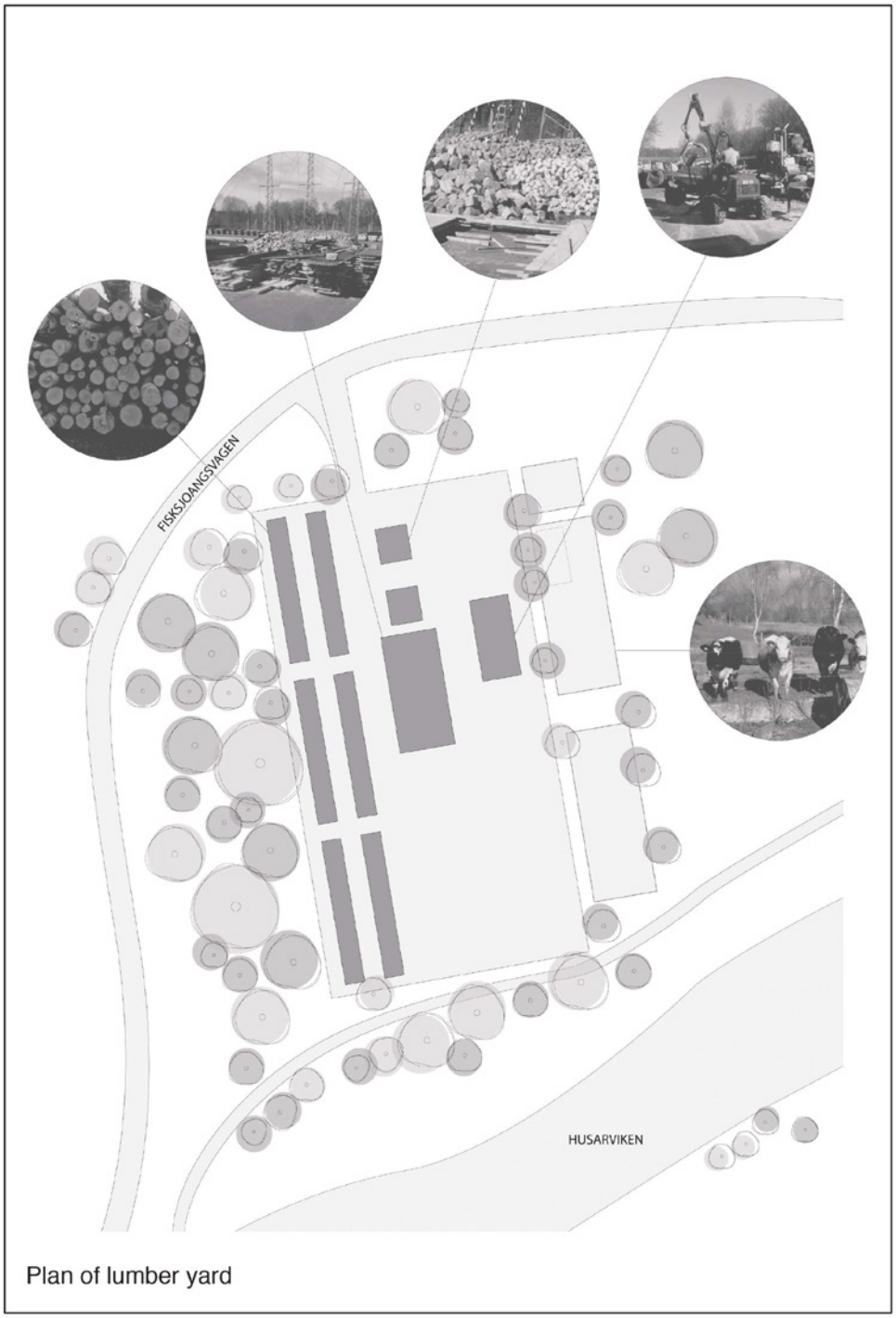


Bark Diagram

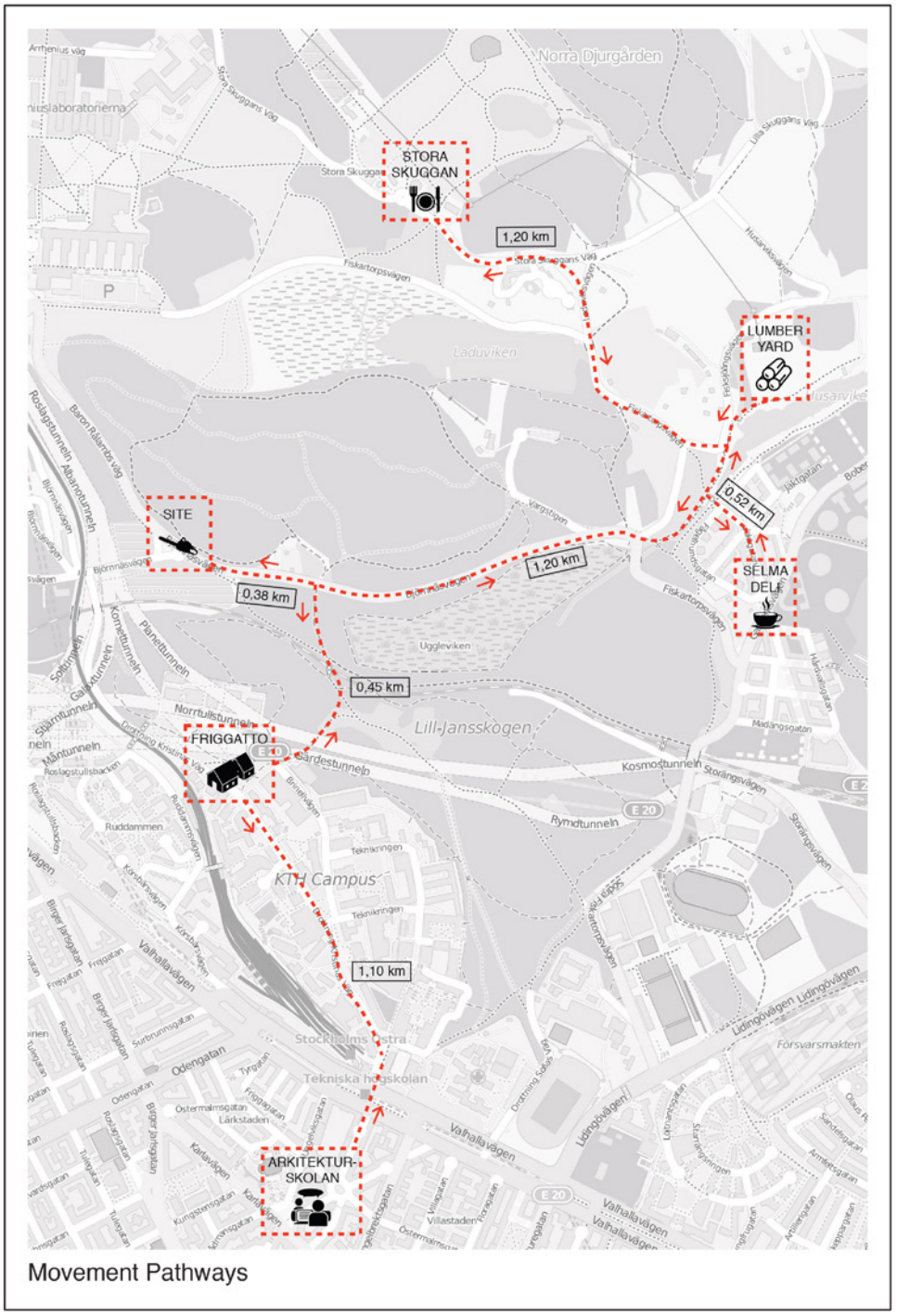


A5	9	11	Fir	780	1014	x			
A6	9	11	Birch	2000	2300	x			
A7	9	11	Fir	830	1079	x			
A8	9	11	Fir	1210	1391.5	120		x	
B1	14	16	Fir	690	897	x			
B2	15	17	Fir	1270	1460.5				
B3	14	16	Birch	830	1079	x			
B4	14	16	Fir	1090	1253.5	x			
B5	14	16	Birch	440	572	x			
B6	15	17	Elm	690	793.5	x			
B7	14	16	Elm	570	741				
B8	15	17	Fir	1040	1196				
B9	15	17	Birch	430	559	x			
B10	15	17	Fir	1710	1968.5	120		x	
C1	11	13	Fir	650	845				
C2	11	13	Fir	1980	2277				
C3	11	13	Birch	880	1144	x			
C4	10	12	Elm	890	1023.5				
C5	11	13	Elm	760	988	x			
C6	11	13	Elm	1250	1437.5	x			
C7	11	13	Elm	380	494				
C8	10	12	Fir	1430	1644.5	120		x	
D1	8	10	Fir	270	351	x			
D2	9	11	Fir	1380	1587	x			
D3	8	10	Elm	540	702				
D4	8	10	Fir	1470	1890.5				
D5	9	11	Birch	1210	1573	x			
D6	9	11	Fir	1030	1184.5	120		x	
E1	19	21	Fir	490	563.5	>120	x		
E2	20	22	Fir	1250	1437.5	>120			
E3	19	21	Fir	1260	1449	>120			
E4	21	23	Fir	450	517.5	>120	x		
E5	19	21	Fir	1260	1449	>120	x		
F1	18	20	Fir	950	1092.5	>120	x		
F2	19	21	Fir	480	552	>120			
F3	18	20	Fir	920	1058	>120			
F4	18	20	Fir	1000	1150	>120			
F5	18	20	Fir	490	563.5	>120	x		
G1	9	11	Elm	1190	1368.5	x			
G2	9	11	Elm	690	897				
G3	9	11	Fir	860	989	120		x	
H1	15	17	Elm	340	442	x			
H2	15	17	Elm	770	885.5				
H3	16	18	Birch	970	1261	x			

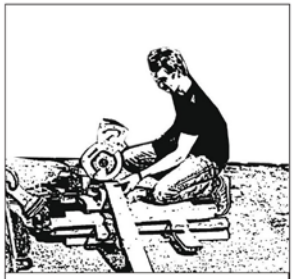
The cutting spreadsheet



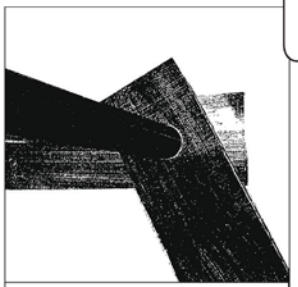
Plan of lumber yard

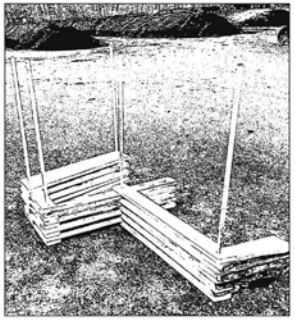


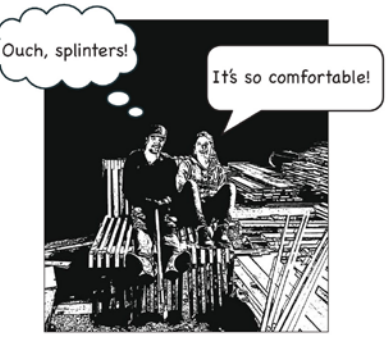
Movement Pathways


On the marked segments, the angles are being cut off...


...and the holes for the joints are drilled, and then...


...the assembling can begin.

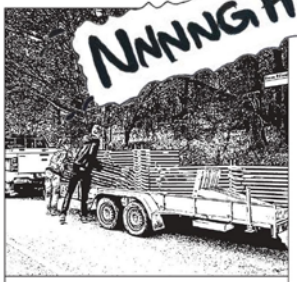




REPEAT PROCESS FOR ALL SEGMENTS

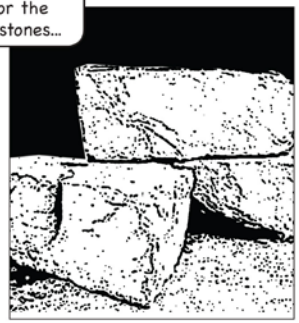
Only ten more sections to go.

ASSEMBLE ON SITE

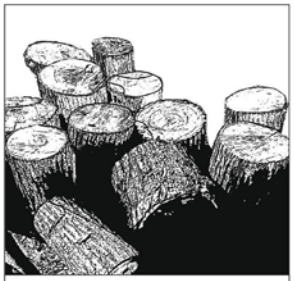


The tension is high on the day of transporting the sections to site...

Last adaptations to the site...



After the completion of the foundations...

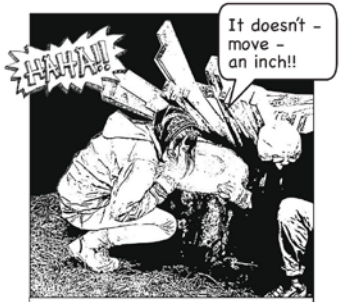


...the trunks are prepared to be cut to the right height.

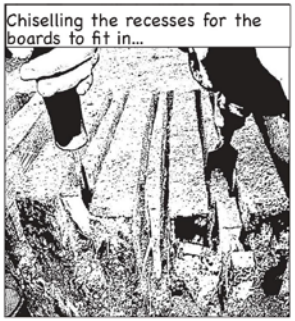
more sawing is done...

...under professional supervision.

Important questions, followed by:

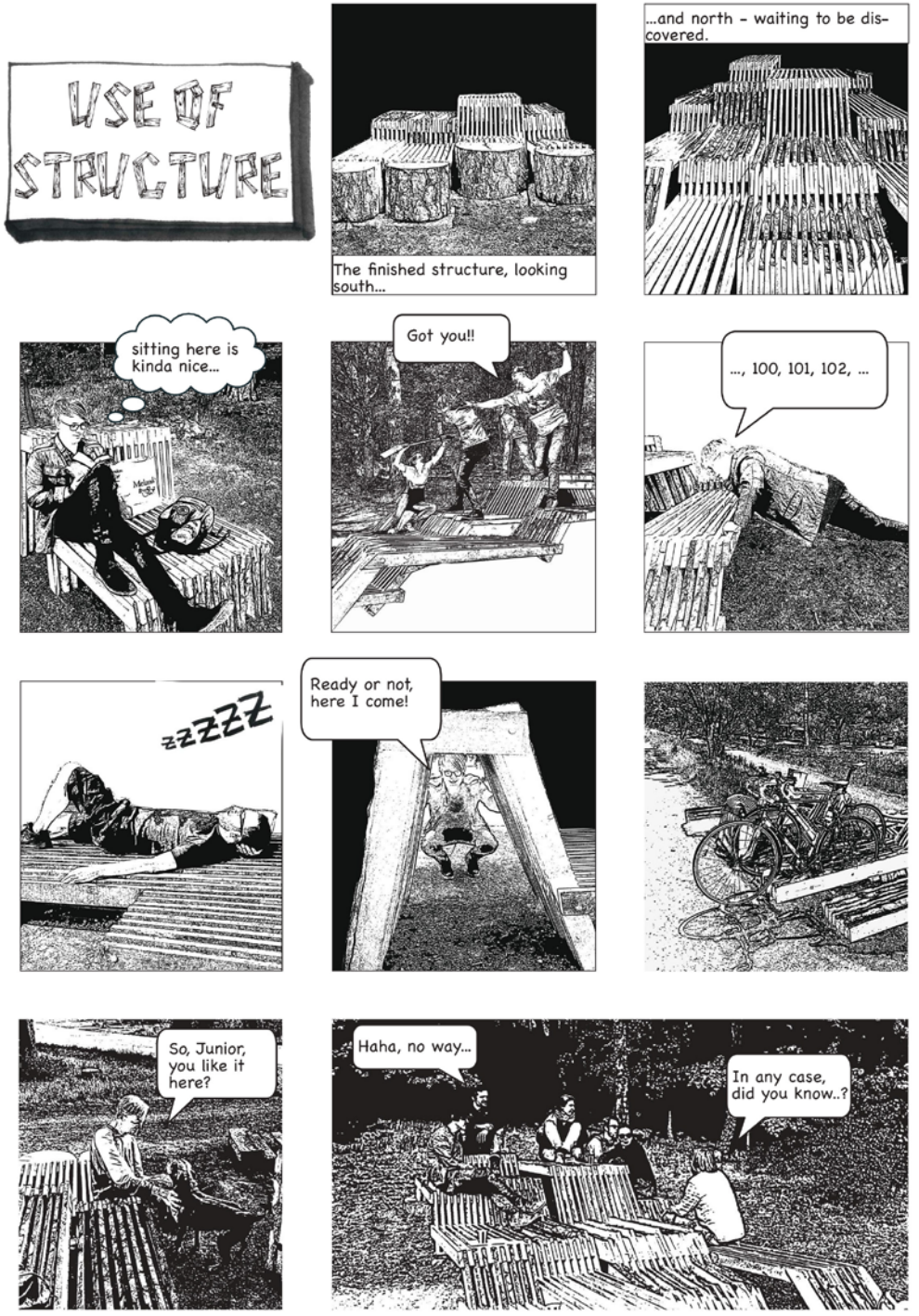


more hard work: moving trunks...



Chiselling the recesses for the boards to fit in...

...six hours later, the trunk is ready, but still needs refinement:


USE OF STRUCTURE
The finished structure, looking south...
...and north - waiting to be discovered.
sitting here is kinda nice...
Got you!!
..., 100, 101, 102, ...
zzzzzz
Ready or not, here I come!
So, Junior, you like it here?
Haha, no way...
In any case, did you know..?

THE FUTURE

After six months, the bark begins to fall off...

After 200 years, the structure begins to fall apart...

After 500 years, the structure crumbles to dirt...

... and the cycle is complete.

THE END

TEAM
Emil Almesjö
Noa Ericson
Brendan Josey
Tobias Lidman
Elin Pantzare
Loes Thijssen

Anders Berensson
Ebba Hallin

3

1 to 1 Mobil

one to one mobil

Studio 1:1
Master program

emilkarl@kth.se
noae@kth.se
Emil 070 5351439
Noa 073 5787272

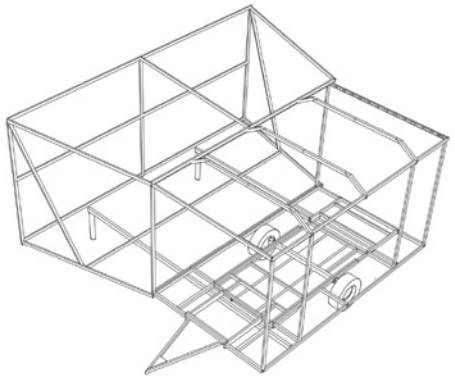
En workshop på hjul.

Vi är en grupp arkitekt studenter på KTH som i vår lärarledda studio ritar och bygger i skala 1:1. Denna vår planerar vi att bygga ett flexibelt utrymme på hjul, för att stödja EU-migranter via svenska undervisning och möjlighet att skapa hantverk.

De står utanför svenska skyddsnät och vi ser vagnen som hjälp till självhjälp.

Projektet byggs till föreningen HEM som dagligen jobbar med EU-migranternas situation.
HEM kommer facilitera vagnens förflyttning runt Stockholm.

Vi söker i detta skede stöd till framförallt material för att kunna realisera projektet.



öppnades 2013 och är ritad av landskapsarkitekt Thorbjörn Andersson och arkitekt PeGe Hillinge, Sweco Architects.

Studenterna Tobias Lidman, Emil Almersjö, Noa Ericson, Brendan Josey och Loes Thijssen har skapat det rullande huset för verksamheter som stödjer EU-migranter.

De bygger för EU-migranter

Crowdfunding De ritar, bygger och analyserar samtidigt. Studenterna i nya masterstudion Studio 1: Full Scale har i uppgift att bygga i skala 1:1. På KTH:s campus har fem av dem den senaste tiden byggt intensivt på en rullande byggnad för EU-migranter i Sverige. Bygget har de finansierat med crowdfunding på sajten Kickstarter och sponsring av material från företag. Snart lämnar studenterna över sin hopfällbara och rullande byggnad till organisationen HEM som de samarbetat med under projektet. Huset som är konstruerat på ett husvagnschassi är registrerat och ska snart besiktigas för att kunna flyttas ut till tillfälliga bosättningar och användas för svenskundervisning och andra projekt.

2601 **... personer hade som högsta önskan att börja på någon av landets arkitektutbildningar till hösten.** Det är

What is 1to1 Mobil?
1to1 Mobil is an expandable multipurpose mobile space aimed at supporting EU-migrants currently residing in Sweden. It will act as a multipurpose space for Swedish language instruction, workshop activities and market stall from which products can be sold. This mobile structure aims to empower and provide service to some of the most vulnerable members of society and facilitate their economic and social development.

The project was designed and built for the Stockholm-based organisation HEM whose mission organises volunteers and efforts aiming to better the situation of EU-migrants in Sweden.

The structure´s mobility allows it to work within existing realities of transitory, ephemeral communities and its association with HEM provides continual support and facilitation, providing a flexible infrastructure to be utilised as circumstance dictates.

The situation
Today there are a record number of migrants arriving in Sweden, living in extreme poverty. There are many issues surrounding this, so the project is based on a ground-up strategy aiming at education, manual skills and basic services. It is a project providing a pathway for economic and social empowerment for EU migrants.

The mission
The structure will provide a lecture space for teaching Swedish to migrants, furthering existing efforts from HEM and other organisations. Additionally, it may act as a facilitation point, used to create contact between the EU-migrants and society at large, providing a much-needed social and cultural link by way of a market stall, meeting space or information installation.

The structure will also provide access to basic amenities - simple medical supplies, fresh water, electricity and warmth.

Building Process
We have revitalised a reinforced caravan chassis to act as a base for the 1to1 Mobil structure. The process has involved extending the existing frame using RHS steel to provide a platform for the building. The external frame for the structure is also comprised of RHS, chosen for its material performance, durability, strength-to-weight ratio and flexibility in construction method.

The primary frame was welded independently to the base trailer frame, lifted into place and then fixed, creating the bones of the structure. Subsequently, a timber floor frame was attached, insulated and clad with timber decking.

Concurrently, wheel housings were constructed, and the folding element of the frame was designed and fabricated.

The project includes a high level of technical details required for the expandable capacity of the structure. As such, each component of the structure required a great deal of foresight and custom fabrication. This helped us mitigate future problems, including water proofing, aesthetic detailing and overall functionality. Due to the mobile nature of the building the rigid joints are subject to a high level of stress, and as such the frame required a significant amount of bracing and reinforcement, designed to maintain a relatively light-weight structure with appropriate robustness to withstand harsh weather conditions, movement and folding.
As the construction process continued, walls were insulated using a high density, closed cell Styrofoam. The structure is clad in aluminum profile sheeting, chosen both for its material properties (lightweight and durable), as well as its aesthetic, accentuating the juxtaposed internal/external materiality and architectural language of the project.

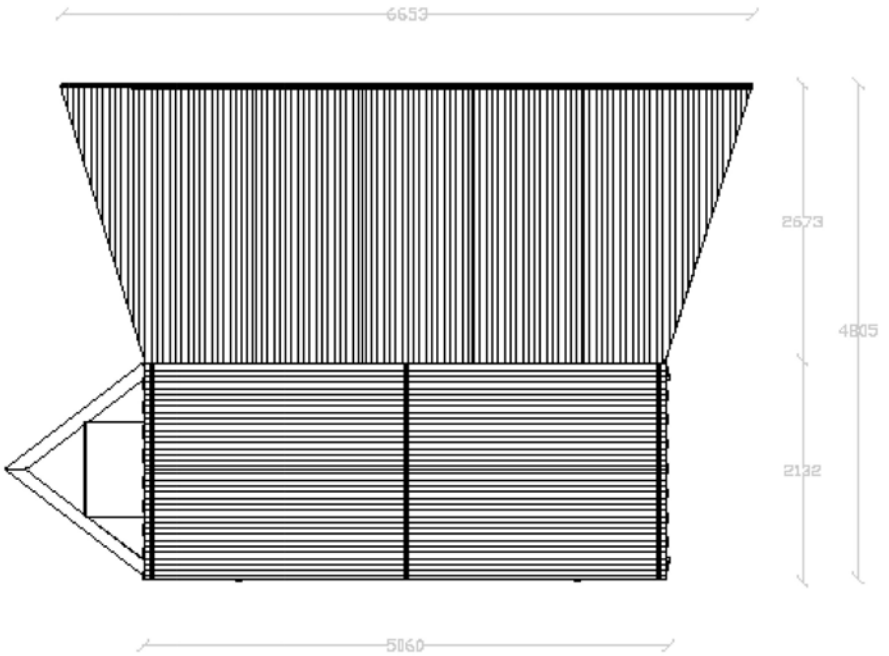
Through the building process a continual tension of maintaining a high quality of workmanship, an extremely tight schedule, budget restraints and on-the-fly problem solving presided over the project. This added a sense of enjoyment and innovation to the project and kept an element excitement and purpose. Throughout the construction process, daily challenges emerged, including fixing points for winches, hinge design and the ever difficult waterproofing. The sealing of the 1to1 Mobil presented an interesting challenge due to the multiple positions the structure assumes and ways in which water run-off was to be directed and dealt with.

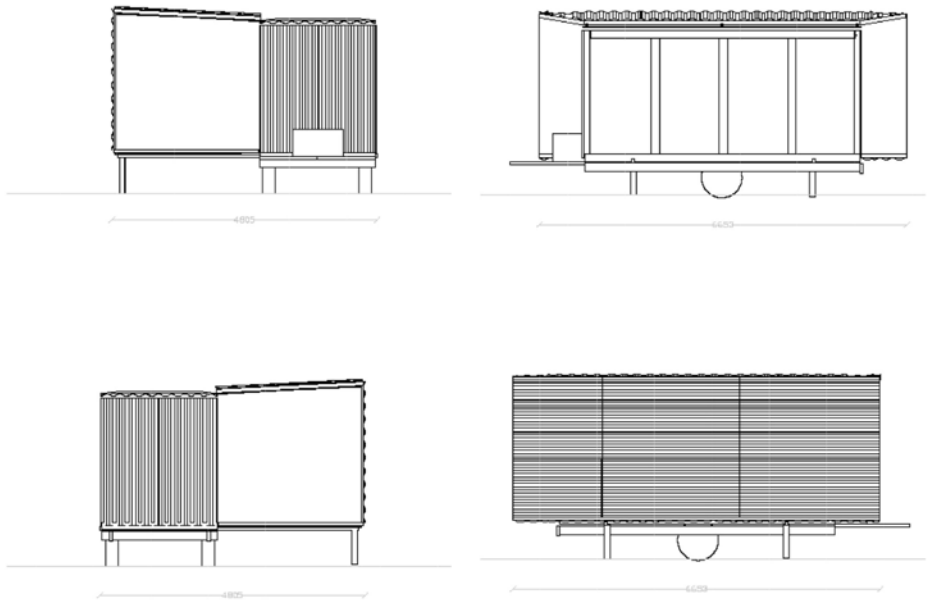
With the external cladding in place, and the foldable walls fixed, the final stages of the project were begun. This consisted of additional insulation of the folding element, waterproofing flexible joints, internal cladding and flooring, all presenting unique challenges. The addition of winches allowed the structure to be opened and closed, as well as providing a visual signal that the structure is a functional, utilitarian and expandable space. The final fit out saw the completion of detailing with the addition of cover-strips, skirting boards and storage space.

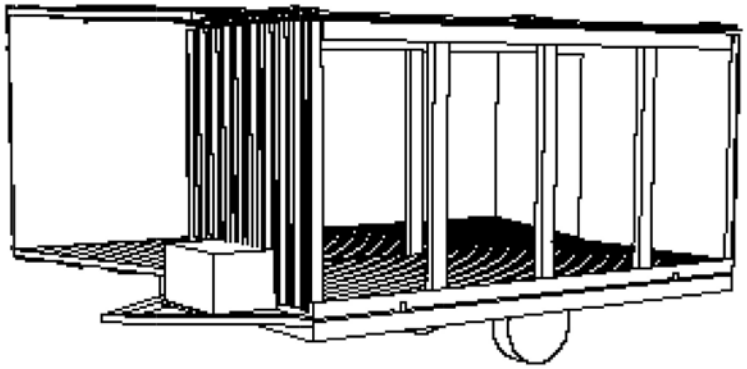
The construction process for the 1to1 Mobil was an exceptional learning experience that presented an array of trials and experience, ranging from client interaction, sourcing sponsorship and funding, design, practical construction and innovation, legal constraints and a sensitive political and human situation. At no point during this process was it possible to loose sight of our initial aims – providing a space for vulnerable members of society. It is with pleasure that we finalize and hand over the project with air to provide a positive input and influence to the greater community.

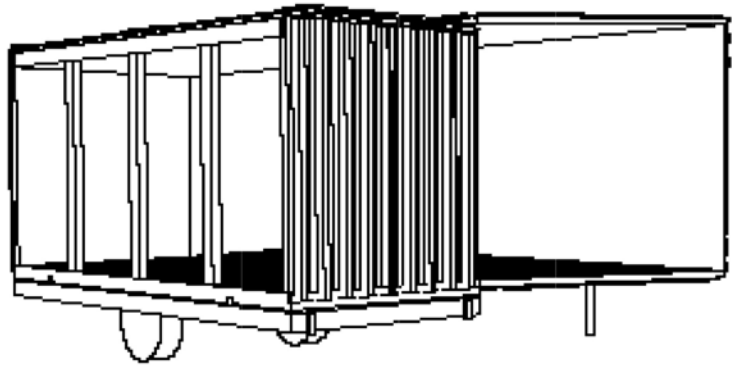
Who are we?
We are a group completing our Masters of Architecture degrees at the KTH Royal Institute of Technology in Stockholm. We are currently participating in Studio Full Scale, a studio dedicated to not only design architecture but also rigorous and practical actualisation of projects.

Our team has a broad range of practical and theoretical experience and look forward to putting our skills to use for the betterment of the social standing of some of society´s most vulnerable.


6653
2673
4805
2132
5160







MICROMOBILE Adils Runkvist
BEING WITH WATER Mandus Lundmark
THE TREE HOUSE PROJECT Klara Östlund
THE CITY AS A THEATRE Tove Grönroos
SQUARE ROYAL Victor Ingmo
USING HISTORY Olivia Norlin & Johan Fransson
WHAT MAKES THE HOUSE Joel Olsgärde
40 MINUTES Petter Jysky
FROM 0 TO 100 Simon Estié
ARCHITECTURE & MOBILITY Filip Dans

Thesis Projects 2015

MICROMOBILE

Adils Runkvist

Why am i doing this project?
One reason for me is to explore architecture from the start to have full control over every step from sketch to final result. To do so the architecture has to be small to handle everything and do things by my self. For me the big architecture projects are good to learn from but the get very abstract in the understanding of them. It has made me think about the role of the architect. Would the architecture be better if we where more involved in the building process?

One thing that i have noticed when i have been doing this project is that when I drawn something or gotten an idea, i know that i have to solve that problem later when i am building the project and that has made me a little hesitant to be really free and challenge myself. The most important thing is still to have a strong idea or vision and to fulfil that vision no matter how we work, in which media, full scale or drawing. I also think my project is a reaction to the high level of development in this part of the world, the society today when we as architects step out to the world outside the school so much is taken for granted because it has been developed under long time. The architecture is based on technics and knowledge that is rooted long time ago. But some times i think we need to discover things for ourselves to not feel completely lost. To have our own experiences of the whole process. The final part of the project is to test the structure in different environments, to see how it works?

I have tested my drawings and ideas in full scale. The projects small scale architecture have made it necessary to work with mockups and full-scale technical solutions. The drawing has still been an important tool, i have been sketching a lot. The things i have been exploring in full scale is measurements, it has been easy to use the full-scale mockup as a drawing and test the ideas that i have drawn before. It has been a tool to investigate the mechanical and structural properties of the project. By using cartoon, a wood frame, ropes and tape i have been able to do fast tests and evaluate the result. I have used the full-scale model as a drawing tool, sketching cutting adding material.
The design is based on measurements and experiences from the full scale testing. Aerodynamics has been part of the design as it is as slim as possible when folded together. I have had no limitations in width or length. The folding of the structure has been important in the design process. The structure is made out of a aluminum sandwich that is glued together, and the aluminum is riveted together. It weighs about
45 kg. I have done all the construction myself which has ruled out some materials and solutions, Aluminium is relatively easy to work with.

The project has been about the home. It is for me a place where I feel comfortable and safe and where a can do the things I want. but it is also a symbol, a place where I decide, make it personal, keep my personal belongings. That in combination with a functional and personal architecture is close to being a home for me unless the scale of the architecture. Is it possible to build a home and live a good life in a small space?
My project does not have all the technical basic comfort systems that we have in the developed world parts of the world. What is enough to be able to live a good life, I want to explore the importance of them.

BEING WITH WATER

Mandus Lundmark

The sea level rise
In a report called ‚Lake Mälaren in 100 years, the county government in Stockholm has proposed three options to the problem.
1. Do nothing
2. Raise Lake Mälaren
3. Build barriers in the archipelago
If nothing was done Stockholm would phase two direct consequences; flood¯ing and salt water intrusion which would destroy the city water source (Mälar¯en).

By raising Mälaren salt water intrusion would be prevented but we would still have problems with flooding in the city and this would also result in flooding around lake Mälaren.

What would be the consequences of building barriers in the archipelago?
The project is divided in two parts; Extra large and small where “XL” talks about the consequences and a possible scenario on a bigger scale and “small” concerns an intervention; one of the barriers.
A leap in scale
With the intention to end up working with the shoreline in Stockholm the project started with a thorough investigation where I looked at water on a molecular level, its history as well as its contemporary role in the city; urban water spaces and how public buildings relate to them. After having discovered that the bigger part of the shoreline in Stockholm is car parking I started to come up with ideas on how it could be remodeled. However, as I started to learn more about the water level and its behavior I quickly understood that there is a bigger problem to tackle than a poorly designed quay side; the rising sea level.

Concept
“Phenomenon” quickly became the concept from which the design ideas derived. Waterfalls, clouds and other water related wonders became inspi¯rational and from having sketched on a more conventional “wall” a new space was created within the barrier itself. An ellipse shaped wall became the form concept which would work well both constructionally as well as in the landscape.
The idea is that water from Lake Stockholm starts to fall over the edge of the ellipse as the water level starts to increase during December. As the space within the barrier gets filled up with water the pump in the middle starts the suction process. When the catchment in Mälaren is at its peak the suction will be the strongest and hence a drain vortex could be expected.

The crater space
The ongoing water activity within the barrier will reshape the landscape through erosion and by bringing soil which will stick to the barrier walls which would result in a crater like space

THE TREE HOUSE PROJECT

Klara Östlund

The tree house manual:
Step 1: Find a tree.
To build a tree house like mine, you need a relatively straight and tall tree. Keep in mind that slow growing trees maintain added structures better than faster growing trees.

Except for timber, you also need:
hammer and 4 inch nails, screwdriver, drilling machine, oudoor screws, angle iron, screw pins, nuts and disks + spacer, masking tape, a tree, a level, tar, handsaw, jigsaw, cutting table, sketch pad, yardstick, pencil, chisel and mallet and climbing equipment.

The ladders are made by cutting out notches in the siderails, like this: Measure by using the parts for the steps with a distance of about 30 cm apart. Secure them with one screw, and watch out so they do not crack.

Put two 4 inch nails in the tree at the height where you want the structure. And while holding the board in place, but a third nail at over it to secure the tilting.
Drill a hole through the plank all the way to the bark, maybe a 6 mm wide. Now you have your points of entry for your attachments in the tree.
Drill a hole with an 8 mm in diameter in the tree, and enlarge the holes in the studs to 12 mm to make room for the screw pins.
Remove everything and start putting the screwpins into the tree. Using a pipe wrench helps because a living tree has a very high density, and that makes it really tough.

Every screw pin also needs 3 metal disks, something to hold the distance to the tree, preferably a metal pipe sawed in to 2 cm pieces. And a 12 mm nut at the end.

Do the same thing on the other three sides, make sure you leave a distance
of a couple of centimeters to the tree.
Now you should have a square around the tree. Fix them together with a screw in each of the joining points.

Put the studs back up, try to get them on level, and screw them together with two of the 80 mm long, 6 mm wide outdoor screws.

Now it is time for the supporting stilts, saw them as shown in the illustration, and hold them in place to get the position for the notches, which will hold them in place, and take up the up-down forces. Use the same method as before, to drill the holes through the studs and into the tree.

When the load bearing structure is secure you can climb on top and start with the decking of the floor.
If you saw the planks up with a bit of a margin it is easier to put them in place. Now you need to think about keeping a reasonable air-flow in the construction. Screw the wood in with decking screws with a gap of about 1 cm.

Finally use a jigsaw, and cut away the edges to create the shape you want on your platform.

Southeast of the city centre in Malmö in southern Sweden, you find the remains of an industrial area called Norra Sorgenfri (Northern free-of-Sorrow). Most of the industries have left the area – leaving vacant plots and buildings behind awaiting something else. Most of the plots remain untouched, whereas citizens lacking space temporarily occupy others. Animals, plants, graffiti artists and homeless people find shelter here. As detailed plans are developed for the area, free spaces for public sleep, common gardening and secret escape

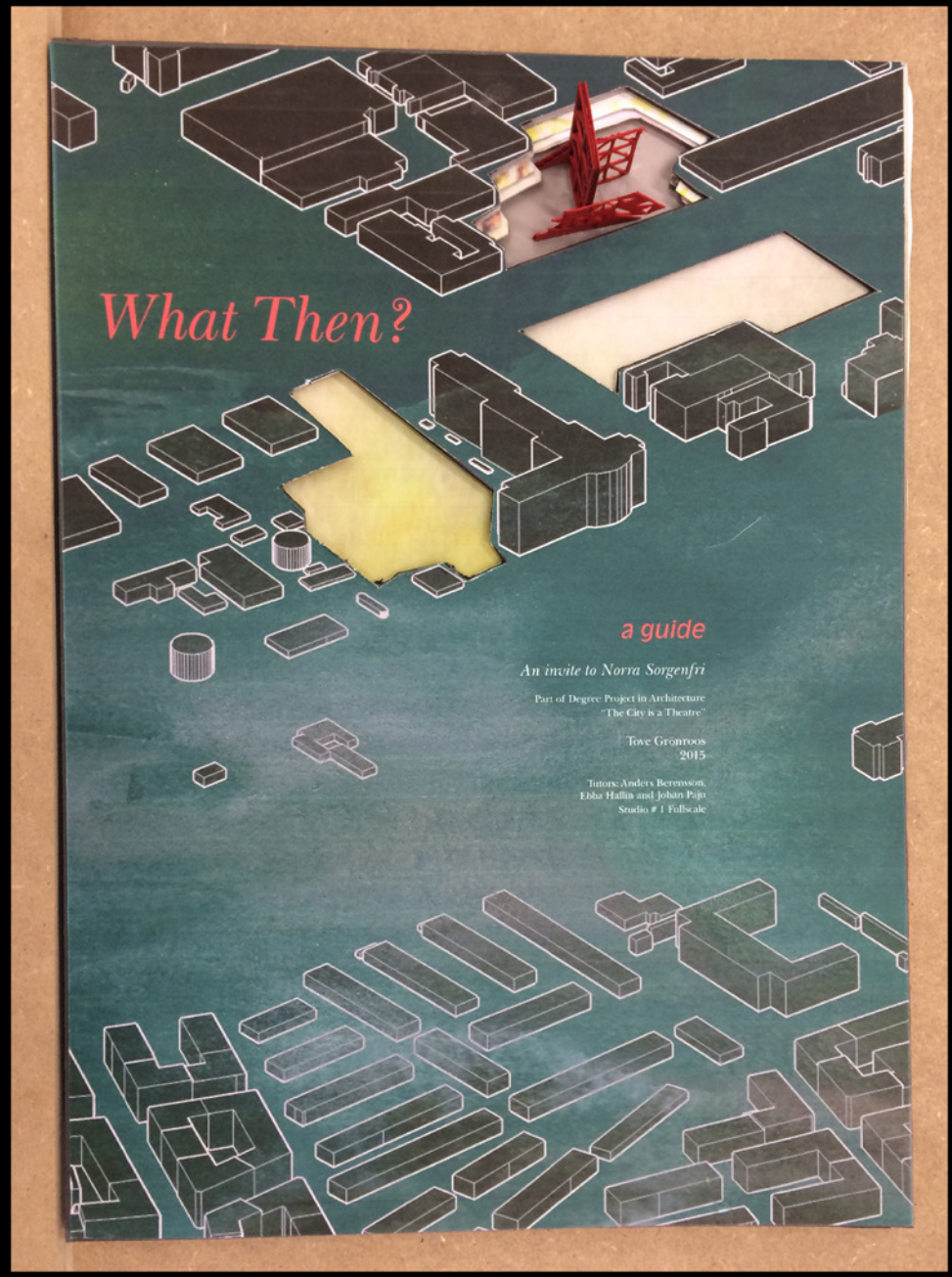
THE CITY AS A THEATRE

Tove Grönroos

paths will slowly disappear, leaving behind yet another homogeneous and predictable neighbourhood. Are there alternative ways for more organic planning processes, allowing for different citizens to take part, or is the city doomed to the dictatorship of profit?
This project aims, through spatial organization, to propose alternative development processes in Norra Sorgenfri. Processes where citizens are actively included and where the municipality listens and allows for more or less unexpected outcomes. This project looks at existing openings and assets in the area to generate public space through processes of participation and conflicts.

The City is a Theatre
This project states that the city is not a postcard, made up by views to attract outsiders, but an organism made by and for its citizens. It's a stage for conflicts but also a stage for monuments of actions, hideouts and volatile meetings between strangers.
Through using openings, appearing between the old and new, this project searches for spaces to meet the demands for a socially sustainable city using conflict as a tool for sustainable city planning. Instead of avoiding contradictions it wants to highlight antagonism and use it as a tool throughout the planning process to avoid the modernistic pitfalls.

Openings
As a method to shed light on existing conflicts, as well as to propose alternative spaces, this project proposes for using activities and traditions, already existing in the city, to activate the openings and create non-commercial, public spaces.
This project is not a new proposal for the area, but rather an offset of, and additional method to, the municipal proposal. It questions the rigidity in the later and looks at ways to meet the municipal goals for densification in the area but at the same time meet totally different municipal goals set up by the commission for a socially sustainable Malmö.



SQUARE ROYAL

Victor Ingmo

This project started when I got in touch with the non-profit cultural centre Royal in Eskilstuna, a small city 1,5 hours west of Stockholm. They had just moved in to their new premises, an old cinema from the 30's, and were gaining influence over the cultural scene of Eskilstuna. The first time I visited them was late autumn last year and I quickly realised that I could develop a cooperation with them during my thesis project. I was interested in the phenomenon of cultural centres since I believed it to be a programmatic padding or alibi used by politicians to gain popularity instead of more specifically paying culture a greater overall attention. Royal were keen to let me know that I had freedom in doing whatever I wanted as my project, but they also told me that they were interested in a renovation and conceptualisation of their premises as well as a wardrobe, office space and conference room which were likely to be built if it was what I decided to do.

As I began the project with a scepticism towards cultural centres in general I wanted to look if it was any need of Royal in Eskilstuna, and if it was – what kind of culture Royal should focus on. I realised that Eskilstuna had its cinema, theatre, concert stage etc., but there was no cultural centre that combined the different activities, and there wasn't anyone who did it non-profit. Further analysis of the cultural atmosphere in Eskilstuna also showed that Royal were focusing on the right kind of culture attracting a wide range of people from different ages, genders and backgrounds.

I understood that part of the success of Royal was probably because it was driven by ambitious people residing in Eskilstuna and not by the municipality, and I realised that I had little to add in terms of cultural content. I felt as Royal was doing something good and my motivation to contribute as an architect grew. Solely to restore their premises and do what they told me to felt like taking the easy way out, hence I focused on what they needed but didn't tell me.

By then I had visited Eskilstuna a few times, and had become familiar with the location of Royal in relation to the city. The area is called Nyfors and is located just south of the central station. Geographically in the centre of the city, however, the railway that separates Nyfors from the city centre works as a barrier reducing the importance of Nyfors to the point where it is regarded to be a suburb. Since there isn't much activities in Nyfors there is no point for people not residing in that particular part of the city to go there, which is one of the big reasons for why many people doesn't even know that Royal exists. I figured that was one thing they didn't tell me.

While looking at the social aspects of Nyfors, I found that it had bad reputation due to high criminality. Much of the criminality was focused on a shady restaurant very close to Royal. I, however, discovered that the same restaurant had closed and reopened with new owners which had started a cooperation with Royal. At that point I started to see Royal as a beginning of a development of the area already causing a ripple effect.

From that point my focus turned from being a restoration project of an old cinema to be more of a city planning project. Through my investigation I came to see that the square where Royal was located needed a lift that in turn would draw attention to the cultural centre.

USING HISTORY

Johan Fransson & Olivia Norlin

Hur kan vi inspireras av historien för att rita bostäder idag? Projektet är en studie av den svenska bostadens historia från forntid fram till modernismens genombrott, vilket resulterar i fyra typhus som undersöker hur den historiska bostaden kan vara aktuell idag.

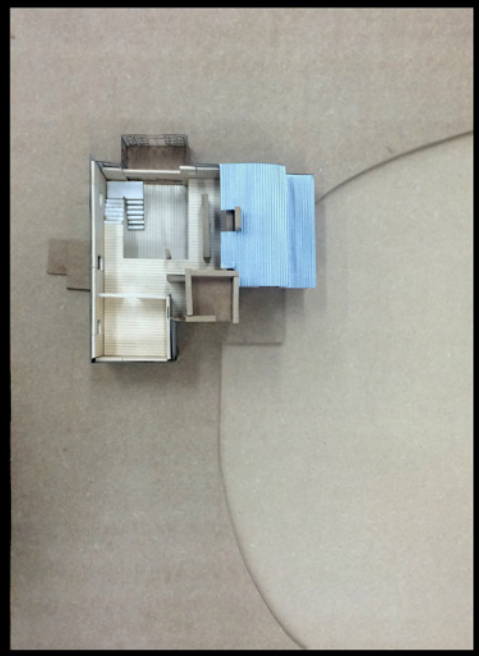
Framtida Flexibel Forntid
Byggnaden uppbyggd av väggar och golv gjutna i betong. En stolpkonstruktion av stålpelare bär upp taket, som är beklätt med takpapp och solpaneler. Byggnaden består av ett enda stort rum som helt saknar väggar. Möjlighet att addera väggar mellan pelarna, eller ett lätt på det stabiliserande horisontella stålbalkarna, finns och gör rummet flexibelt.
Bilen har tagit djurens plats i långhuset och är tillsammans med en verkstadsdel, förvaring och wc placerad i "grovzonen". Den renare zonen separeras från den grövre genom att vara upphöjd. Ännu en zon skapas kring sängen genom ytterligare en nivåskillnad. I mitten av bostadsdelen finns en öppen eld. Köket, matplatsen och umgängesytor är orienterade kring elden.

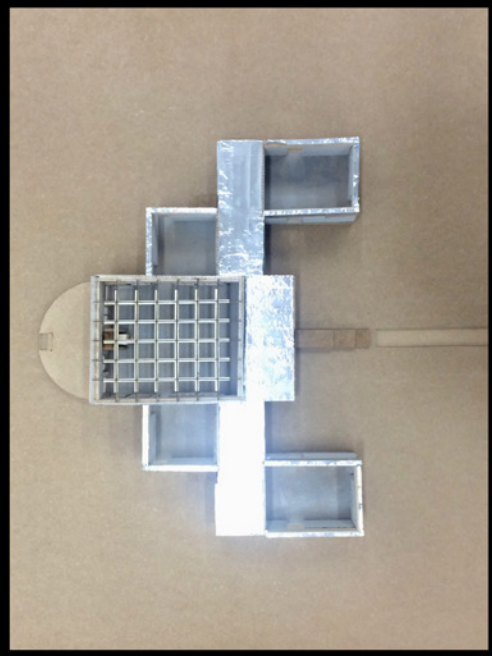
Modern Festlig Medeltid
Bostaden består av två våningar. Den nedre utgör en privatare del med sov- och arbetsrum. Ovanvåningen används som en socialare del med plats för matlagning, middagar samt umgänge och benämns festvåning.
Byggnaden består av bärande ytterväggar och en kärna av massiv betong, vilka bildar en parstugeliknande form. Väggarnas tjocklek används för att skapa nischer och plats för väggfasta möbler. Tak, innertak och golv består av lättare träkonstruktioner i form av synliga takbjälkar och valv. Även icke bärande väggar är byggda av trä.
Taket är beklätt med plåt och har formen av ett tredingstak. Konstruktionen vilar på två limträbalkar som spänner mellan byggnadens trappgavlar.

Ny Representativ (Ny)Klassicism
Bostaden har en sexdelad plan med en representativ del, salen, i mitten. Rumssviter med förmak och rum utgår från salen. Ytterligare två rumssviter, i form av flyglar, har adderats till bostaden och kopplas samman till salen via förmaken, vilka även fungerar som korridor.
Byggnaden består av betongelement där skarvarna ger en pilasterliknande ornamentik. Varje element är försett med plywoodpaneler, för att underlätta upphängning och montering på väggarna, samt för att förtydliga väggens indelning. Byggnaden är symmetriskt ordnad enligt två huvudaxlar och sex sekundära axlar.

Byggnadens logik bygger på betongelementets dimensioner och axlarnas bredd, vilket i sin tur ger glaspartier och dörrar dess mått.
En tolkning av säteritaket har använts för att ge överljus till salen och rummen. På betongelementen vilar en träkonstruktion och ett parti av glasbetong. Salen är i dubbelhöjd och synliga, korsande takbalkar bildar ett kassettliknande innertak.

Samtida Sammansatt Vardags Romantik
Byggnaden har en intention att visa en striktare fasad mot gatan och att ha en mer uppbruten, sammansatt karaktär in mot tomten. Byggnaden öppnar sig mot trädgården genom en terrass och en inglasad veranda. Rummen i bostaden orienterar sig kring en stor hall, där köket, det nutida hemmets sociala mittpunkt, ryms. De övriga umgängesrummen på den nedre våningen (matsal, vardagsrum och uteplats) ligger i fi l kring hallen. Hallen är i dubbelhöjd och omsluts av en loftgång på den övre våningen. Loftgången bildar ett tak över entrén och från den nås de separata sovrummen.
Byggnaden är byggd av en träkonstruktion beklädd med träpanel exteriört och pärlspont interiört. Panelens utförande skapar en ornamentverkan i fasad.





WHAT MAKES THE HOUSE

Joel Olsgärde

Detta projekt handlar om en undersökande process om vad det är som formar det byggda huset. Att genom att ifrågasätta arkitektens roll som konsult under en byggherre med en allt mer marginaliserad roll försöka hitta nya vägar till ett projekt. Viljan att så snart som möjligt efter examen få vara med och forma ett byggt projekt har varit drivkraften. Viljan att få förverkliga sin arkitektur. Metoden har varit att undersöka arkitektens roll i relation till andra i branschen. Genom intervjuer och texter skapa mig en bild av de olika rollerna och vilka man kan tänka sig inta som arkitekt. Kan man verka som byggherre? Mäklare? Hur är det att genomföra ett projekt i egen regi? Vad är för- och nackdelarna? Vad är i så fall ett passande projekt att börja med som byggande arkitekt?

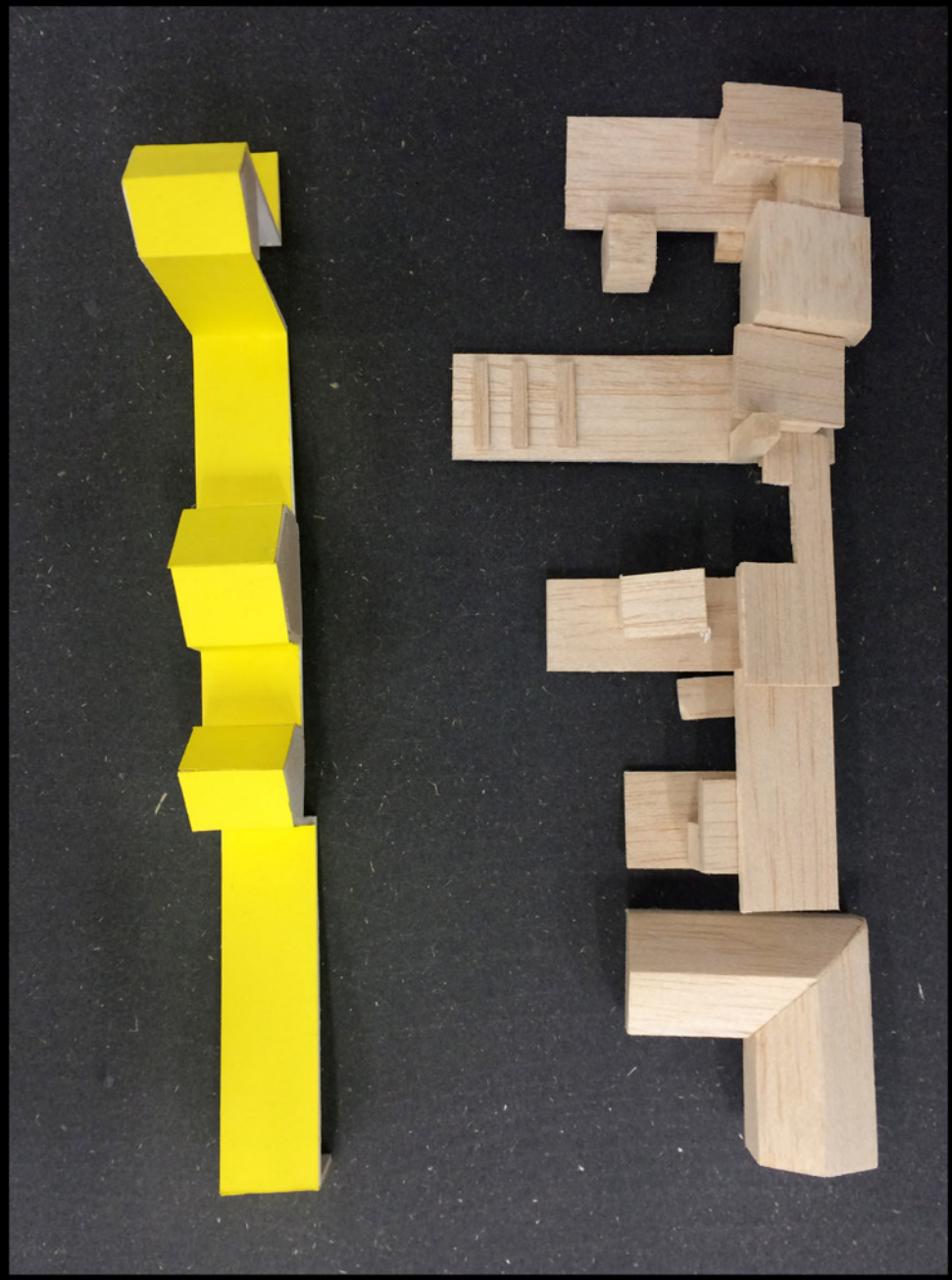
Under projektets gång har fyra roller utkristalliserats vilka har sina drivkrafter och prioriteringar. Projektet har hela vägen brottats med rollerna och det har varit en övning att försöka få ihop en helhet. Resultatet är därför dels en karikatyr av de olika rollernas vilja och ett förslag på en målbild på vad jag vill genomföra i verkligheten.

Arkitektstudenten: "Vill skapa intressanta mellanrum och sekvenser där människan kan leva och verka tillsammans med natur och ljus, material och funktion. Detta hus ska visa att man får ett bättre hem om man anlitar en arkitekt."

Brandingkonsulten: "Gör något fantastiskt som sticker ut! Våga ta plats och skapa något unikt för platsen och situationen. Vad skapar publicitet för att kunna få nya kunder efter detta projekt?"

Byggherren och snickaren: "Se till att projektet kan byggas billigt och hållbart. Hitta en billig tomt och sikta på en konstruktion som kräver få snickare med begränsad erfarenhet."

Mäklaren och marknaden: "Läget gör allt! Gärna havsutsikt och söderläge. Bilavstånd till Stockholm. Huset måste vara åretruntbonat med en hög standard liknade en permanent villa med gärna en öppen planlösning med vedspis, uteplats med kök samt en gäststuga."



40 MINUTES

Petter Jysky

På sträckningen för Ostlänken, Sveriges första höghastighetsjärnväg som ska vara färdig 2028, placerar sig staden Nyköping precis i mitten mellan Linköping och Stockholm. Satsningen syftar till att knyta samman arbetsmarknaderna i regionen som utgörs av Östergötland, Södermanland och Storstockholm.

Idag är vi vana vid begreppet resecentrum som med stort utbud av service i anslutning till tågplattformar ska kunna tillgodose resenärernas behov i samband med deras resa. De ofta gallerialiknande miljöerna riktar in sig på kommers, mot målgruppen köpstarka individer, men som i realiteten kanske inte spenderar så mycket tid på platsen. En van dagpendlare kommer troligtvis till stationen ett par minuter innan avgång, och har knappast tid att frottera i en bokhandel eller kolla in de senaste kylskåpsmagneterna på designtorget.

I en stad av Nyköpings storlek vore det riskabelt att föreslå en station med en galleria så centralt i staden, då det riskerar att konkurrera ut den väl fungerande och levande centrumhandeln. I en jämförelse jag gjort mellan några stationsmiljöer har jag funnit att byggnaderna i städer och orter som är jämförbara med Nyköping ofta har ett väldigt litet program vilket riskerar att man går miste om potentialen i en viktig knutpunkt i staden.

Mitt förslag går ut på att göra Nyköpings centralstation till en plats för i första hand de som faktiskt vistas där allra mest – ungdomarna! Många skolungdomar från högstadiet och uppåt bor utanför Nyköping men går i skolan i staden. De åker också kollektivtrafik och kommunen bekostar busskortet. Därmed kommer många ungdomar att vistas vid Nyköpings nya station dagligen.

En oöm, tillåtande känsla klingar väl med de miljöer man förknippar med stationen. Graffiti, parkour och skatekulturen har länge tagit dessa platser i anspråk. Om inte den typen av kulturyttringar tillåts en plats i staden, kommer den med största sannolikhet att utövas där ändå. En grafittivägg i min station är därför så självklart att den får en framträdande roll.

En station kombinerad med ungdomsverksamhet är en kanonstart för omvandling av området, som definitivt har potential att utvecklas ytterligare i och med att underlaget växer, vilket om man får tro prognoserna, det kommer att göra när snabbtågen väl börjat rulla.

FROM 0 TO 100

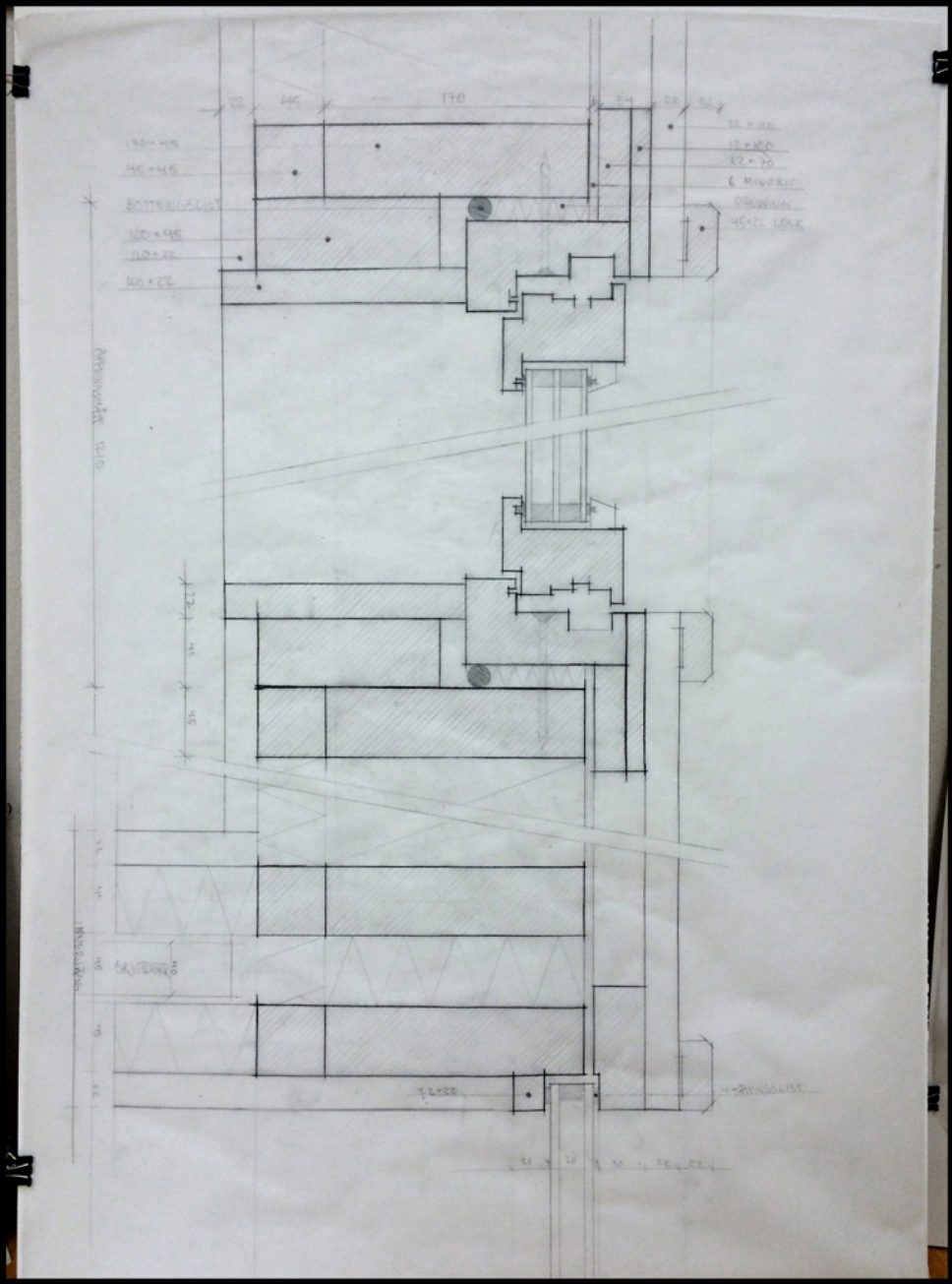
Simon Estié

The role of the architect has been marginalized during the last century. From artistic project manager and the client's right hand to just another consultant. We have a better view of the project than all other involved, and yet we have moved away from the building site to our drawing boards and are seen more and more rarely the later in the process we get. It is of course natural as we are planners, not builders, but as we are the ones creating most value in each project it is problematic when we are not there to see our ideas being realized.

How can we as architects take a bigger part in the building process?

What is a summer house?

And how do you build when there is no road?



ARCHITECTURE & MOBILITY

Filip Dans

Instead of creating a lengthy archive, the research and design process was compiled into a large mind-map in the hope of displaying the factors that influenced the outcome in a thorough and connected manner.

The historical research largely consists of three categories of precedents - mobile housing (e.g. Nakagin Tower, Metabolists, Archigram, LOT-EK, Trailer Parks), participatory/free design (e.g. Torre David, Quinta Monroy, Bo 100, Kallebäckshuset, WikiHouse) and a dip into modular prefabrication (Moshe Safdie, Shigeru Ban, Bjarke Ingels Group, Moelven). The mindmap was then used to document the steps of the design process and influencing factors such as transportation, assembly, materials and spatial arrangements. Most mobile projects are fully prefabricated, severely constrain themselves to maintain their mobility and appeal more towards a niche lifestyle. Permanent construction, on the other hand, either uses prefabrication on a scale that makes it impossible to be employed by an everyday person. Or is done by hand through contractors who can handle the complexity involved, yet at a higher degree of customization.

Taking on the phenomenon of the trailer home and its use as permanent housing, this project also attempts to emulate the feeling of ownership, low entry costs and – while trailers are designed to move yet rarely actually do – there is a sense of security in the possibility of moving if deemed necessary.

So this project attempts to find the sweet spot right in the center of all this:
- Prefabrication to solve the complex construction aspects, yet allowing people to define the material finishes, have their own layout and assemble it themselves.
- Being able to modify the apartment envelope - expanding, contracting, swapping.
- Moveable, but only based on doing so, rather than taking on restrictions to make it more feasible for hyper-mobility.

MISSION COMPLETED

The studio started with the aim to be an active part of building processes of different scales, to study and interact with constructions real-time rather than through simulations. The idea was to work with relations between resources, site, architecture, craft and production, creating practical and material experiences to support a more confident approach to designing buildings.

Time, logistics, economy, assembling principles, content, context and resources have become very central topics. There have been unexpected opponents such as weather, dirt, smell, complaints and other surprises – things that are of uttermost importance in real life. Hopefully the lesson learnt is enough to be daredevils also after leaving architecture school.

We see that spatial sensibility has grown by working beyond drawings; by being able to see, feel, smell and test the creations. Studio 1 now has a body memory of what a building is. There is a physically knowledge on how many kilos, calories, degrees, sweat and force it takes to assemble a building.

THINGS TO IMPROVE

Just like most building projects in Sweden we also suffered from prolonged construction time and exceeded budget limits. Attention often had to be put elsewhere than we expected. A slight bit of chaos is unavoidable but in a project where you always have to act on new things, the analytical development of the work will suffer. Next year we will improve our ways of analysing and conceptualising our buildings. We need to find time and concentration enough to really use, observe and evaluate all the actions we have taken. The time and effort put into the construction phase deserves more attention. On the other hand, we have all of next year to study what we built this year, so time is on our side.

We also need to get rid of some dirt and bad weather. The Friggatto site was a cold and smelly hell-pit of clay. That is unnecessary, even though it made some good stories. Next year we will make the construction site a project in itself. This will probably lead to interventions with the ability to revolutionize the building industry.

We have realized that we need a car if we want to become a more mobile actor in society, quite a big car with room for tools and building material. Big enough to host a unit of Full Scale Architecture Makers.

We need more tools, we have some now but we need more.

We need more cash, but lets face it, it's not gonna happen.

We might also need to sharpen up a hundred other things, but despite all the things we can do better we did some really amazing stuff this year that exceeded our expectations.

THINGS TO ADMIRE

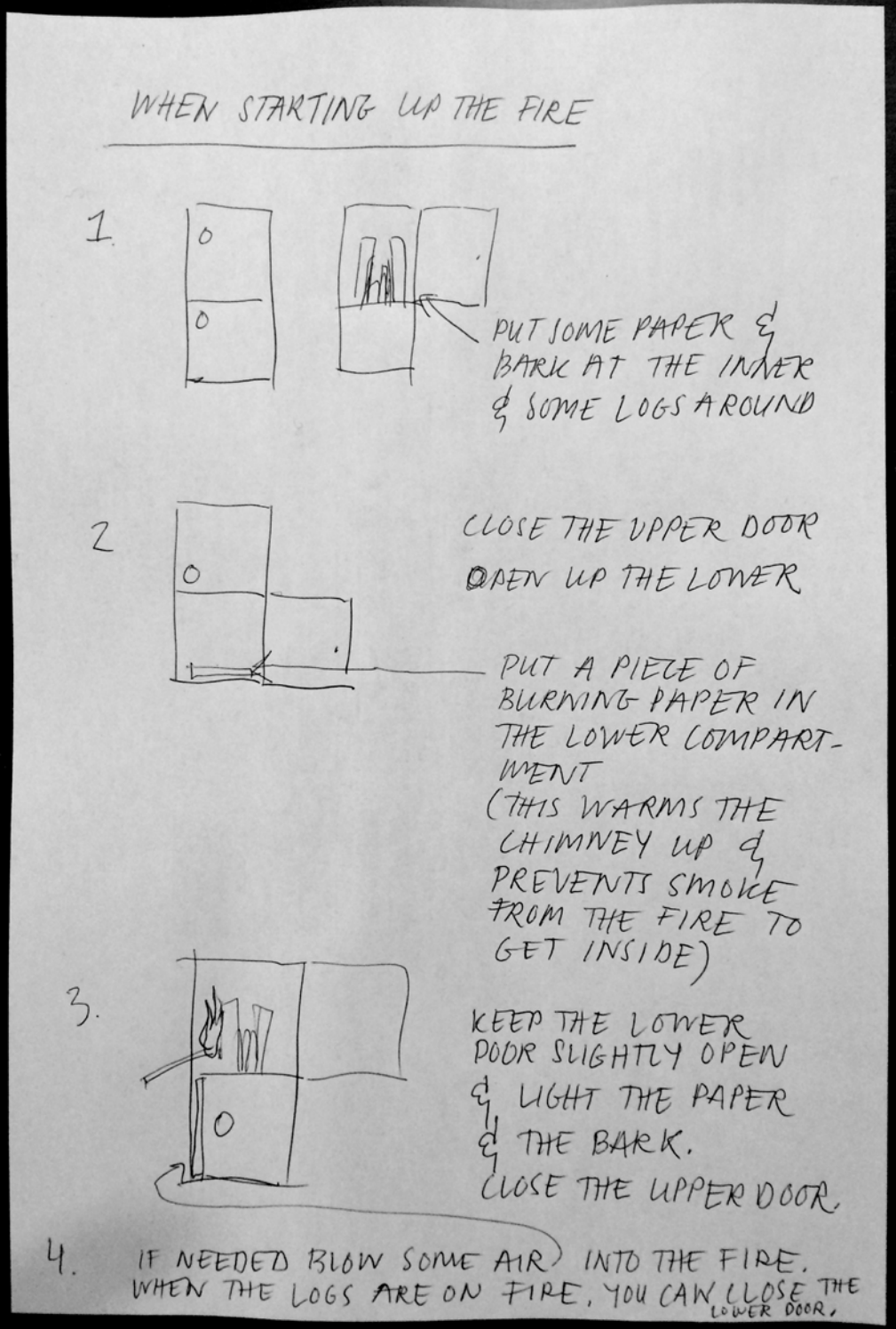
Braveness was never our problem. Full Scale Studio has produced some really beautiful, weird, bold and complicated buildings. Moving/ rolling/ sliding/ folding effects seems to be a speciality in our architecture. When a house moves, joints, weight, stability and safety become top concerns as well as three-dimensional and structural problem solving. Full Scale Studio never stood on the safe side and has through all projects balanced on a thin line between success and failure. To be creative is to take those risks and we have stayed creative throughout the year. All our projects could easily have got the quite common architecture school criticisms that "It looks great but would not work in reality, therefor I'll talk about it as an idea". But our projects work! Sometimes they have some small Frankenstein flaws, or they don't work exactly the way we intended. But they always work, and most important – strange ideas have been realized. Our projects are ready to use and actually some people already appreciate them. Some people became FSS fans some became FSS disapprovers, but we believe that we helped our fans more than we disturbed our enemies. The suspicious have probably already moved on to disliking something else, while our followers still have bold and fun architecture to use.

When building 1:1 it actually seams like you students are more risk-taking then when making a paper project. We hope this boldness bounce back if you become normal architects again and that it stays if you continue to work in the full-scale way.

After one year completed it is clear that Full Scale Studio is not just a Master degree program. Full Scale studio is a new player in the game of making architecture. Full Scale Studio is not an office but almost. We also do buildings but with the promise of making it a bit too complicated and with too many work hours. Full Scale Studio cannot compete with a normal office when it comes to making large grand buildings. But no office can compete with Full Scale Studio when it comes to putting a huge amount of time and love into a smaller building. We are another kind of architects than the usual ones and we create another type of architecture. As part of a university we do not only reproduce what is already known. Neither are we a bound by commercial or political interests. In comparison to a normal moneymaking office that needs to be convenient, our primary duty is to being curious and risk-taking and to invent new ways of processing buildings. We are happy that we got off to such a flying start thanks to everybody's devotion!

Thanks for being a part,

Anders & Ebba



THANK YOU!

For helping with the Friggatto:

Rikard Natt Och Dag, Bromma Bygg & Förvaltning for being teacher and client
Henrik Niklasson and the Royal Court for lending us their land
Maria Granath at KTH for helping us with permits
Ylva Kvist Trelje at SBK Bygglov for advice and lecturing
Marcus Lagerwall at Ramböll for tutoring
Magnus Frost, Frost Maskin AB, for technical advise concerning the moving Frigg
To the following companies and persons that has helped us with different materials: Aurubis, ASSA, Tärnsjö garveri, Norrtäljefönster, Carl Karlsson
For study visits in production: Haga Tegelbruk, Setra Sågverk, Outocompu
Stålverk Avesta, Nordkalk Köping

For helping with Materialism:

Andreas Falk, Erik Stenberg, Mats Öberg and Lars Höglund for lecturing
For study visits in production: PEAB, NCC, Finja Betong, Sapa i Vetlanda, Myresjö Hus, Moelven

For helping with Limber Timber:

KDF for giving us timber and Henrik Niklasson for helping with all sort of things
Sture Koinberg for landscape mentorship and an introduction to the park
Anders for mobile sawing, Daniel for motor sawing, Mark for lifting
Ylva Kvist Trelje at SBK Bygglov for advice

For helping with 1to1 Mobil:

The organisation HEM and especially Sven
Jules for manpower and lecturing
The Arkitekturbaren for co-funding
Designavd. Friberg & Palmér AB for co-funding
To the following companies and persons that has helped us with different materials:
Bromma stål, Räfsnäs såg AB, Bewi insulation, Planja, Collett
All people crowdfunding trough Kickstarter

For other things:

Bo Bergman at SBK Planavdelningen, Victor Marx for tutoring and lecturing, Ivo Waldhör for an inspiring talk about architecture and freedom of speech, Pontus Åqvist for showing us his great home and project Urbana Villor, Erik och NilsPetter for showing Piren and giving input, Jesús Azpeitia for renting the Friggatto


BESÖKARE

KTH
VETENSKAP
OCH KONST

Studio 1/ Full Scale Studio is an advanced level studio at KTH School of Architecture devoted to study building processes in relation to architecture.