JOINTS

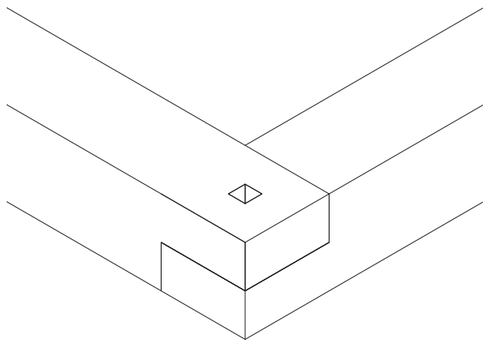
Planning and design for sustainable developement in a local context | Bengtsfors

Erika Klein & Li Wallin | Chalmers tekniska högskola | 2020-12-15

This project is called JOINTS. The aim is to connect people by giving them attractive meeting places adapted to their needs. It is about empowering inhabitants and making them part of the development of their community.

When getting to know Bengtsfors, we learnt about a community with a rich handicraft history and a lot of pride in the beautiful scenery filled with lakes and forests. But also about a lack of things to do and connect to when growing up here.

We believe that through the JOINTS project, with its simple building system, local historical roots, and the social processes of sharing knowledge and ideas, great things can be achieved.



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Background

Bengtsfors today

Today, Bengtsfors municipality is facing social and ecological challenges as well as economical. With an ageing population and a lot of the young people choosing to move, the amount of taxpaying citizens is becoming fewer. This means less meens for welfare and other investments. The shift from a mentality of a society built up on the "bruksortsanda", where big companies supported the communities in all aspects of daily life, to a society left more to itself has also had implications on the self esteem and the sense of identity of the community.

The urban norm

The urban norm has also had and will continue to have consequences for the development of a small municipality like Bengtsfors. Both locally and globally, there is a visible urban trend. More and more of the population of the earth are moving to the big cities. This is also reflected within the field of architecture and planning. During the last century, the focus within architecture and planning has more or less completely turned its focus to the cities. Smaller communities and rural areas and their special needs have been neglected when the discourse has become increasingly urban. This accelerates a development towards more resources going into the cities and rural areas being left to themselves to solve the issues that occur as a result; increasing unemployment, depopulation etc.

Apart from this we are facing huge societal challenges where the effects of the city life are backfiring on the rural areas; climate change, resource scarcity, the need for resilience, diversification amongst citizens and the need for new mobility solutions and citizen participation (Carlow, 2016).

Our project

As an attempt to meet some of the challenges that Bengtsfors is facing today and in the future, we identified some topics that we wanted to address in our project;

1. *Strengthen the identity and empower the citizens by:*

» *Connecting to history*

» *Creating ways for the inhabitants to express themselves, their dreams about the future and their needs today, and make this visible*

2. *Creating meeting places that promotes activity and creates a sense of attractiveness*

Why? Because we believe that by connecting to history we remind the inhabitants of their rich heritage - to be proud of it and to learn from it. We also believe there is a lot to learn from history in terms of sustainability when moving into the future. Therefore, we have spent a lot of time learning about the history of wooden craftsmanship, both in a general sense, but also in connection to the rich heritage of Bengtsfors.

By connecting to history and relating this to today, we also believe that a sense of common responsibility for the future will come. Making people more aware about their heritage and giving them a way of being part of the development of their future can create a sense of belonging in Bengtsfors and a sense of togetherness - strengthen identity both at a personal and collective level.

With this said it is important to emphasise the importance of a participatory process. Our aim has been to make this project together with the citizens of Bengtsfors. The circumstances have, as you know, been very special this year due to the outbreak of Covid-19. This unfortunate fact has made it impossible for us to make a physical workshop together with people from Bengtsfors. With this in mind, we will describe our method further in the next chapter.

However, one of the things we learnt from the analysis was the lack of activities, especially for the youth. Therefore, we wanted to use the knowledge from traditional building techniques that we learned about in the early phase of the project to create attractive meeting places that promote activity and make it possible for different people to meet in the public space.

During the last couple of decades the privatisation of the public room has intensified. This is a development driven by economical interests and of an idea about ownership leading to more responsibility and engagement. A democratic society is based upon the principle of collective ownership and of sharing the public space without any demand for consumption. For every citizen to be able to temporarily make the public space their own, we need to plan for the unplanned and create flexible rooms (Alves, Bonnevies, Kristiansson, 2014).

The result became small public structures built with jointed wood. It's built on a flexible system of different building parts that can be compiled in different ways and changed over time depending on the needs. The traditional technique that inspired the system is called Skiftesverk. It is a flexible system with pillars with notches that can be filled with different kinds of material based on the needs and accessibility. The units can be placed in different locations throughout the municipality and be moved or changed over time. The units are meant to be designed together with the citizens and are then later also to be built by them together with local craftsmen. As the needs change, they can be modified, disassembled and moved to a new location.

The name of the project is JOINTS. It refers both to the historical building technique of jointed wood and to the social connections between people and different actors that are created both throughout the project and after.

Our process

Our methods in the course

The method has been part litterature studies and part designing. The process has been iterative and we have moved back and forth between designing and reading which has helped us a lot. After the analysis part of the course, we started off by reading up on traditional wooden handicraft, different techniques for building with wood and on citizen participation. We also had interviews with a student at Stenebyskolan, Ivo Thomasson, and an active timber craftsman, Jonatan Lövgren. Due to the lack of possibilities of having live workshops, we then used the answers received from a survey made during the early phase of the course to make example projects. The questions were about life in Bengtsfors and were answered by students from the local gymnasium, Strömkullegymnasiet.

If you are interested in taking part in the questions and answers in detail, please contact us and we are happy to help you.

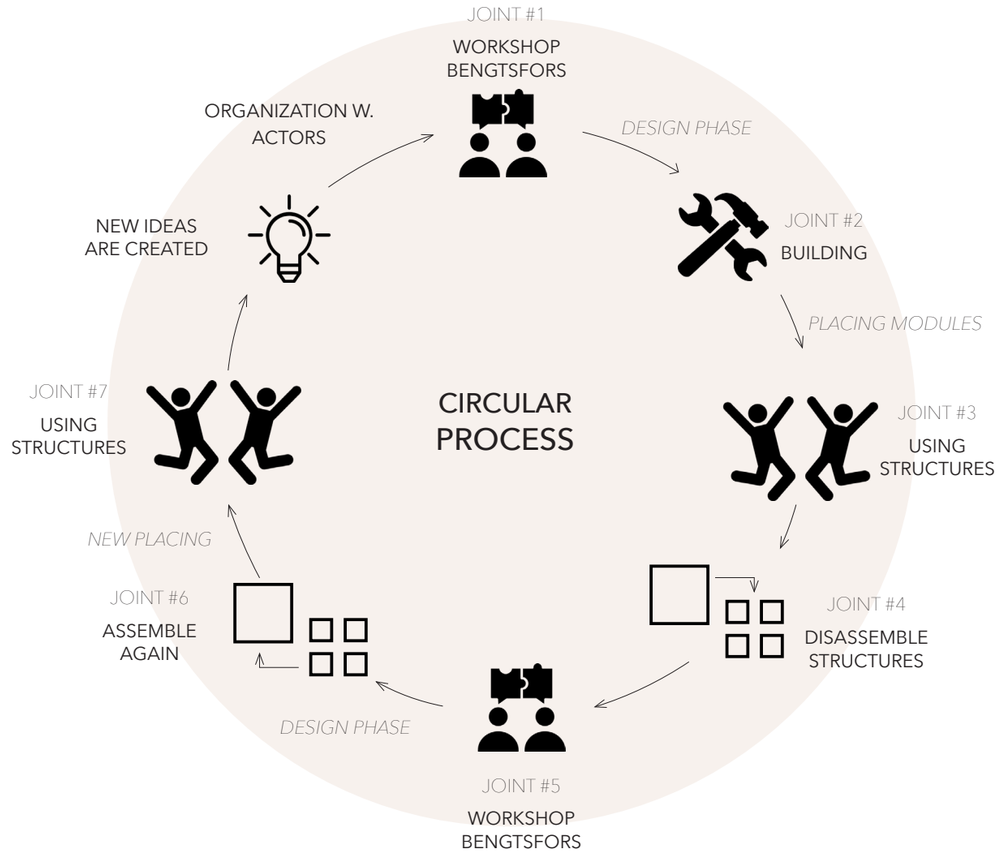
The JOINTS method

Implementation of the created method if the project was to be realised

Apart from our method in this project, we also want to describe how the process would take form if it were to be realised in reality later on.

The project takes off with a workshop where inhabitants in Bengtsfors can bring their thoughts to the table. What are their ideas on what the building system can be used for? Are they lacking a specific function in their neighbourhood? What visions do they have for the future?

After the workshop specific designs are being developed and the participants can bring feedback on the proposals. The next step in the process is common building sessions led by local craftsmen and maybe supported from local associations and stakeholders. After the units are built, they are placed in their location and support local activity and connections between the citizens. When the needs change they can be modified, disassembled and moved to a new location.



Three dimensions

The project stands on three legs. The historical, the social and the physical. The historical stands for the connection to history in choices of building techniques and material, the social stands for the empowerment of the inhabitants, identity building and creation of social bonds, and the physical stands for the built as means of creating these connections - both to history and socially.

The historical dimension

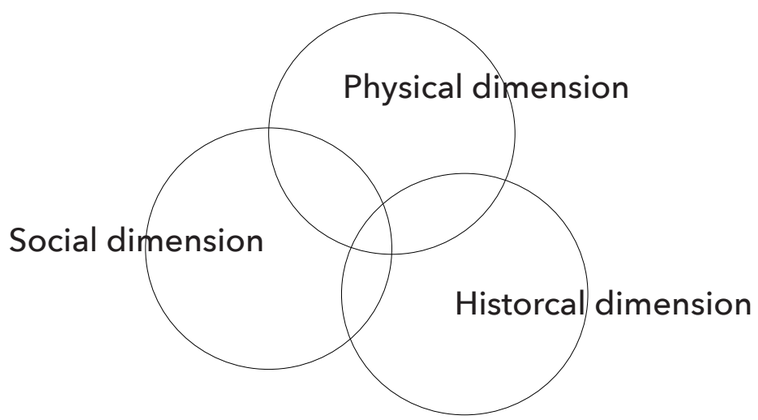
For thousands of years, wood has played a big part of swedish development. From the material, which was always close at hand, people made their houses, tools, furniture and boats. In this project we want to embrace the rich history of handicraft in Bengtsfors and spread knowledge and empowerment that is found within the historical building heritage.

The social dimension

To create a socially sustainable future, the inhabitants need to be included in the process. Through a dialogue with the inhabitants throughout the process, a sense of trust, ownership and impact is created.

The physical dimension

Through a physical wooden structure, that works as a building kit, we want to create a democratical tool for dialogue. Something physical to gather around and build together. The structures will act as meeting places in the municipality that the inhabitants can use and be proud of.



Historical background

History of building in wood in Sweden

For thousands of years, wood has been a precondition for the development of the swedish society. People built their house, tools, wagons, boats, furniture of what was nearby, and since Sweden has always been a country rich in wood, the choice of material was easy. Nature, the economy, the tools and the dimensions of the logs are some of the conditions that formed the shape of the houses.

Through experience the timbermen taught us how the wood should be split, how its twisting, how it dries and breaks, how the direction of the fibres affects the structural integrity, which parts of the log that are soft and which are hard. The knowledge was passed on throughout generations while new techniques and methods were added.

Pine and spruce are the most commonly used wood species. Another common type is birch, and in the southern parts of Sweden also oak and beechen. The timber could be grown slowly and mostly mature on the root, which meant that a bigger part of the tree trunk could be used as heartwood. During the winter the tree was taken down and dried after sawing. It was then kept at a lumberyard for one to two year before it was sold. Today, the knowledge about the attributes of the wood is less spread, both by the ones selling wood and by those who buy it. (Malmborg & Månsson, 2016).

Lost knowledge

Until the middle of the 19th century, the techniques used in traditional timber houses were most common in Sweden (Ernstarnd, 2017). Logs are stacked upon each other and jointed by knots (Malmborg & Månsson, 2016). After this, the use of this technique is drastically increasing. The reasons for this are many and complex, however, the industrialisation and the mills are some factors that led to it not being part of the expansion of the cities (Ernstarnd, 2017).

In the countryside and the outskirts of the cities the technique was still being used, while the laws in the cities more or less completely forbade the wooden craftsmanship to be spread. Due to some big fires amongst other Sundsvall and Umeå in the late 19th century, a new law was implemented that forbade building in massive wooden construction. In a new statue from 1874, many new rules were implemented that radically changed the preconditions for building in wood (Ernstarnd, 2017).

This development has moved building methods from a traditional way to a more industrialized one. These techniques are harder for common people to get knowledge about which makes the distance between the built and the citizens bigger. The urban norm also affects what type of ideals that are visible and raised as good and modern examples, which in turn reflect the development of the society (Carlow, 2016). All of this has contributed to a lot of the craftsmanship and wooden building knowledge that was once a big part of our society gone lost.

Craftsmanship in Bengtsfors

Bengtsfors has a long and rich history of craftsmanship that in many ways is possible to enjoy today. For someone interested in looking closer into the building techniques mentioned in the last chapter, there is a group of houses of cultural and historical value collected at Gammelgården on Majberget in Bengtsfors (Gammelgården. com, 2020).

Next to Gammelgården, there is also Halmens Hus (The house of Straw), where the history of handicraft with straw is displayed and courses are held. Straw has had a big impact on the history of Dalsland and has throughout the time been used as diversely as for roofing and insulation to cloths, rugs and hats. The tradition of making hats from straw came through a woman called Märta-Stina Gottman. She came from Ärtemark parish and went to Norway in search for work opportunities. In Norway she learnt to make hats of straw and then took the craftsmanship with her home to Bengtsfors. The hats soon became popular, partly because the cheap material that made it accessible for a lot of people (Harrison, 2018).

One town in Bengtsfors municipality that has had a big impact on traditional craftsmanship during the last century is Dals Långed. Steneby handicraft association was founded in 1929 by the teachers in the elementary school Josef Andersson and Erland Borglund. The association was the initiative that was to become Stenebyskolorna just a couple of years later. The association held study groups and courses in handicraft after the principles of Carl Malmsten. Through selling the products, more teachers could be hired and the courses expand to include different forms of handicrafts. Courses were held in metal, straw, clay and textile. When Stenebyskolorna was founded in 1934, there were also four year long apprentice programs in painting, forge and cabinetwork ("Josef Andersson", 2018).

Still today, Stenebyskolan is an important actor amongst education on craftsmanship in Sweden. Part of the education is nowadays part of the school of arts and design at the Gothenburg university.

Historical building techniques

Timber technique

When talking about timbered houses, we often refer to lying timber (liggtimmer). It is a simple technique where the logs are stapled on each other, layer after layer. In the corners where the logs meet each other in carved joints that fixates the logs and gives stability to the construction. Vertical plugs (dymlingar) are used to keep the logs in place and to keep them from falling. For the logs not to move sideways by doors and windows vertical stops, sward (svärd), are places in notches, so called "gåtar". The timberhouse is a stable house even though the joinery technique makes it possible to disassemble and build up again. It is also well insulated and gives a good indoor climate thanks to the hefty dimension of the logs (Malmborg & Månsson, 2016)

Boule house - Skiftesverk

Boule house, or post-and-plank technique is an older type of construction that's been used as early as in the Iron Age. Boule houses are characterised by the two components of the posts and the boules. The posts are vertical with notches and make the foundation for the construction. These are places with even gaps and then the boules, planks in different dimensions, are placed in between, horizontally. These are stapled on each other and give the construction stability and make the house tight. Houses built with this technique commands lower demands on the lumber and is easy to restore because shorter lumber parts can be used. In this sense, it can be a cheaper and more accessible way of building than with timber technique. Boule houses are commonly found in southern parts of sweden, including Gotland and Öland, but can also be found further up north (Malmborg & Månsson, 2016).

Half timber - Korsvirkeshus

Half timber is another building technique associated with southern parts of Sweden, that can also be found in more northern parts of the country. This method is even more low in material use than the boule houses. It's built by a frame that is strengthened by diagonal and horizontal support (buttresses). The frame is often built with oak and the gaps are filled with bricks or wattle and daub (clay and reed) (Malmborg & Månsson, 2016).

Timber frame - Träregelstomme

During the middle of the 19th century it became common to build with a timber frame, like the ones we use today. The framework revolutionized the building of smaller houses in many ways. The costs for building decreased because the construction managed with small and neat timber dimensions, as opposed to the timbered houses. Mass Production of special dimensions was also possible to produce which standardized the building sphere. Timber framed houses are built with standing and lying posts and are stabilized with diagonals in the corners. The gap is filled with insulation and most commonly a lying panel nailed on the frame with a windisolating tar paper in between. This construction method made it possible for a new type of house in the beginning of the 20th century - the villa (Malmborg & Månsson, 2016).

Our building system

A system inspired by building tradition

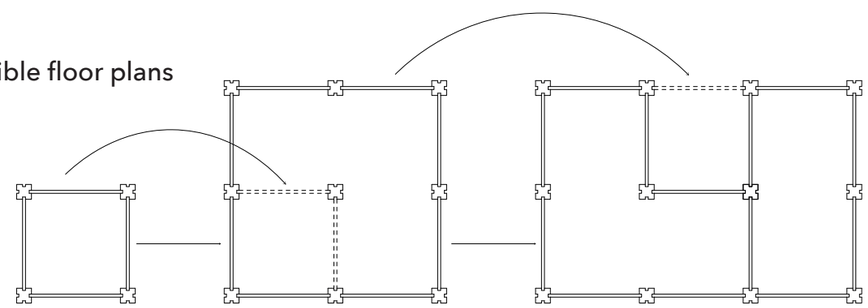
The building system is inspired by an old swedish building technique called "Skiftesverk" (boule house). Skiftesverk consist of pillars with tracks in them, that you fill with timber or wooden planks, often referred to as "bulor". It is a joint method where screws and nails are not needed, which makes it possible to disassemble and rebuild a structure without damaging the material. Our building system is simplified and more flexible, while it keeps the main characters of the Skiftesverk method.

Below you can see how a structure can be changed over time through tree scenarios.

Scenario 1: "We need a place to store our volleyball net and my balls"
Scenario 2: "Now the club has grown and we need more storage"
Scenario 3: "The club now needs a indoor space with a separate changing room"

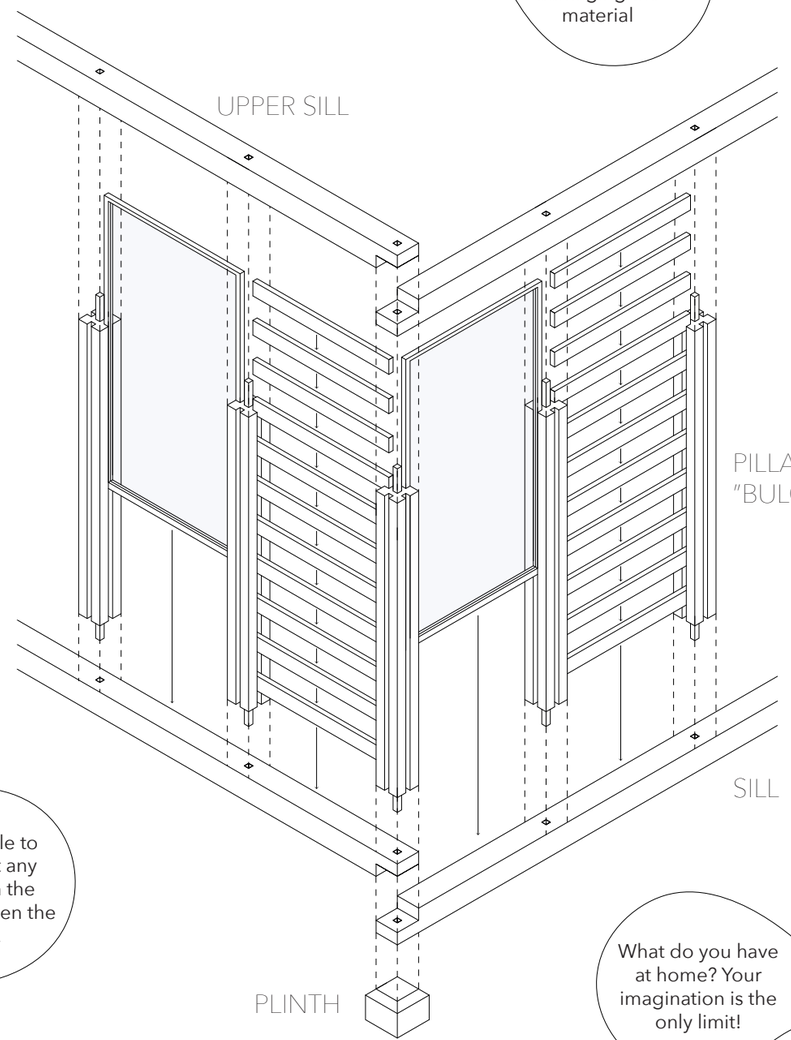
Thanks to tracks on all sides of the pillars you can simply put walls according to your needs!

Flexible floor plans



Simple joinery without screws and nails

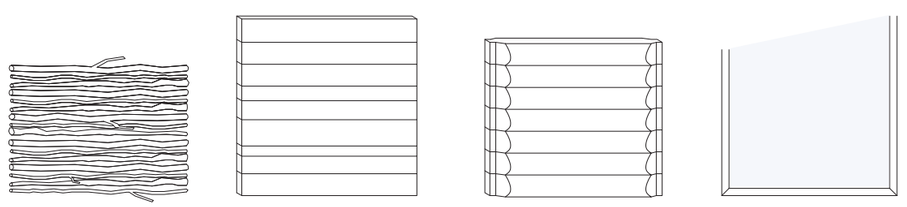
This way it is possible to disassemble and rebuild without damaging the material



It is possible to put almost any material in the tracks between the pillars.

What do you have at home? Your imagination is the only limit!

Multiple fill options ("bulor")



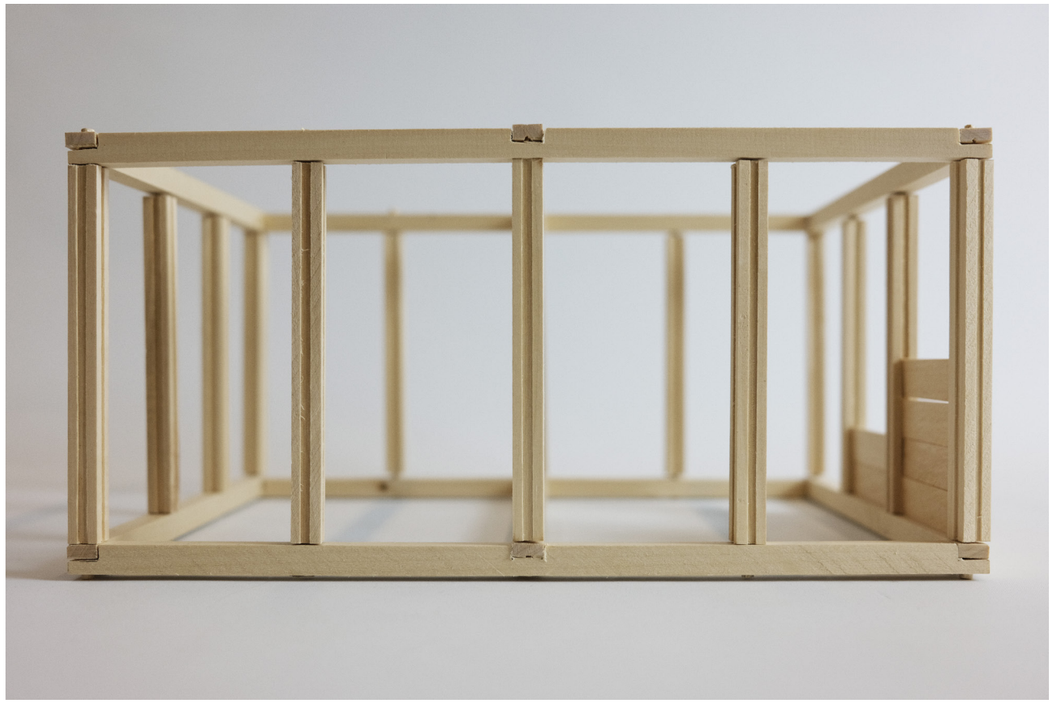
Testing the system

1:10 model

As soon as we had come up with an idea for the building system and done the first sketches of possible structures, we went to the wooden workshop at Chalmers to try our ideas out in a physical model.

When planning out and making the model , we had to think through every part of the building system. How would the tracks be made? Does the jointed sill work? How does the scale of the building parts work? And so it went on.

Luckily the basic ideas of our system seemed to work, even though it was a little bit difficult making all the joints fit smooth in the small scale of 1:10.



Testing our building system in a wood model helped us develop it further and gave us confidence in our design.

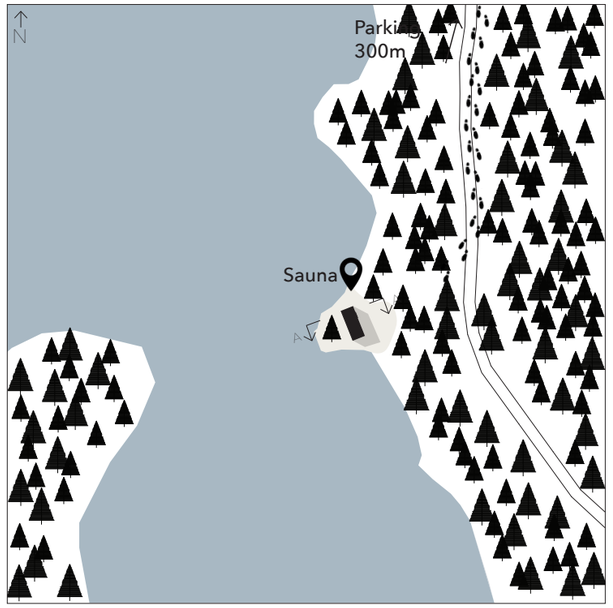
Sauna in Bäckefors

The sauna is a building with a long history of being a space where you meet despite differences. A serene public place, in this case by the water, that can enhance the richness of the beautiful surrounding nature. If you follow the road through the area of the old mill in Bäckefors you will end up at a small parking lot by the lake. Walking up the small hill through the forest you will glans the sauna in the cape in the lake. Here people from town and other parts of the municipality can meet and feel close to the nature and perhaps make new acquaintances.

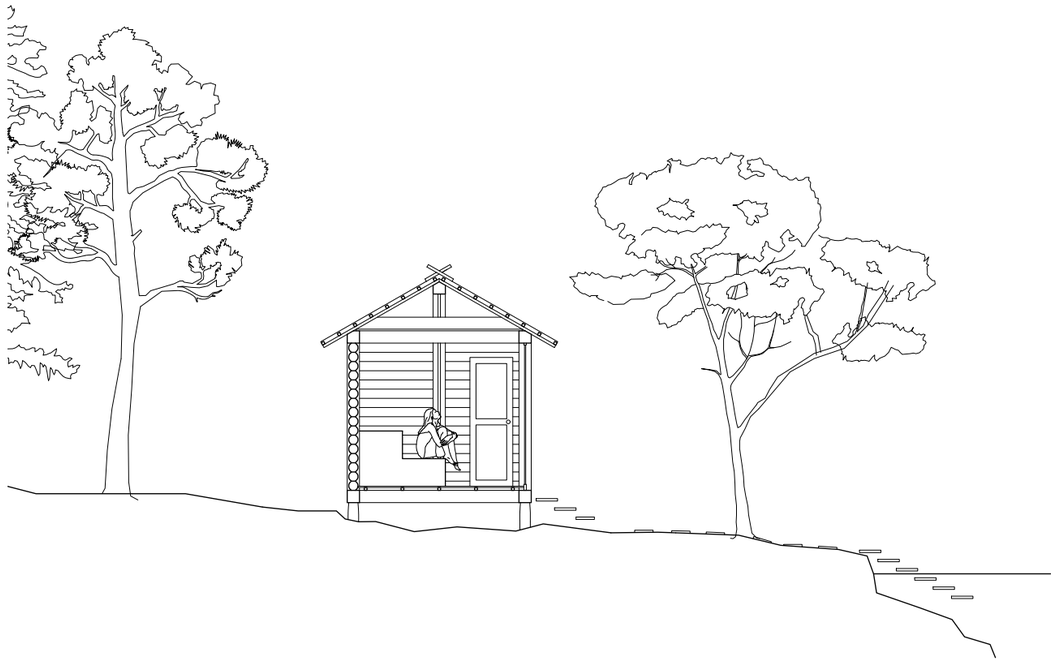
The structure has a open part in the middle, where users can have a fika under the roof. It also frames the beautiful nature and the tree in front of the sauna.

The sauna is located on a small headland, by a calm little lake close to Bäckefors. It has a gabled roof of straw, and reminds us of the old timber buildings that are found in the area. When using the building system, it is possible to make different kind of roofs, all depending on the needs of the structure and skills of the builders.

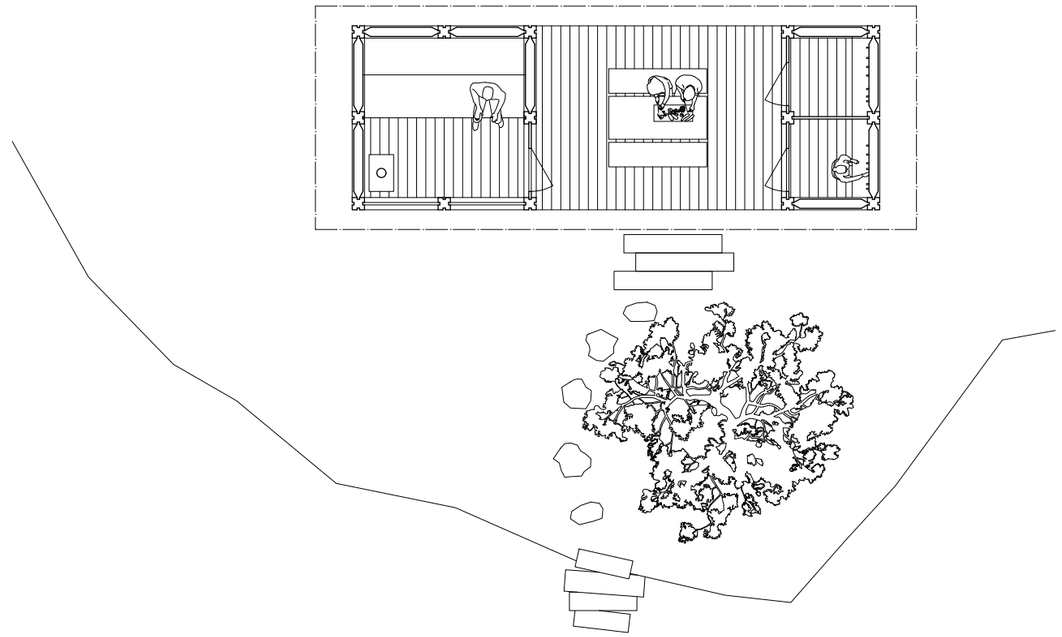
Area map and situation plan



Section A-A, scale 1:100



Floor plan, scale 1:100



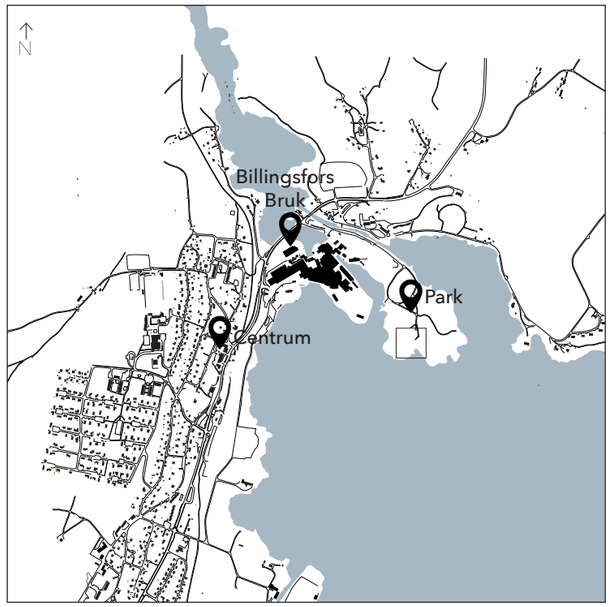
Outdoor cinema in Billingsfors

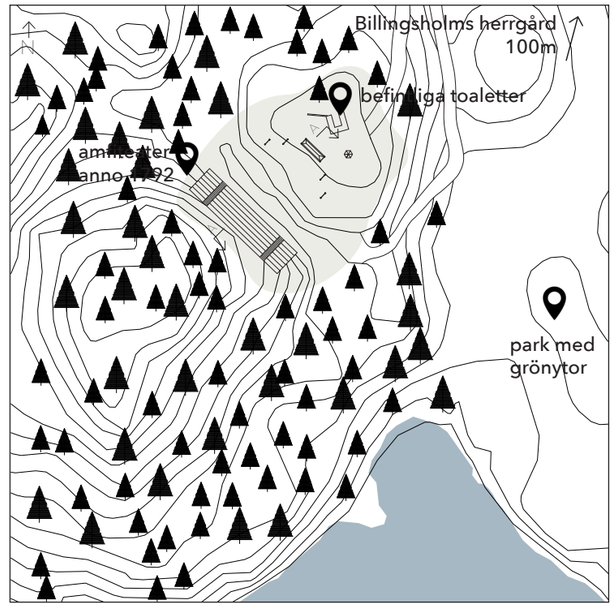
The new outdoor cinema in Billingsfors is an attempt to bring new life to the outdoor theatre. Its located on the small peninsula next to the factory and the surroundings are beautiful. This is meant to become a meeting place in town, where different people meet and make connections. The area itself has great potential of becoming a new city park with a lot of different activities.

The shades in front of the film screen are filled with branch-es.They have a spatial impact on the place and have interesting effects on the light.

The outdoor cinema is an example of how new life can be given to a place by very small means

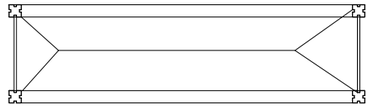
Area map and situation plan

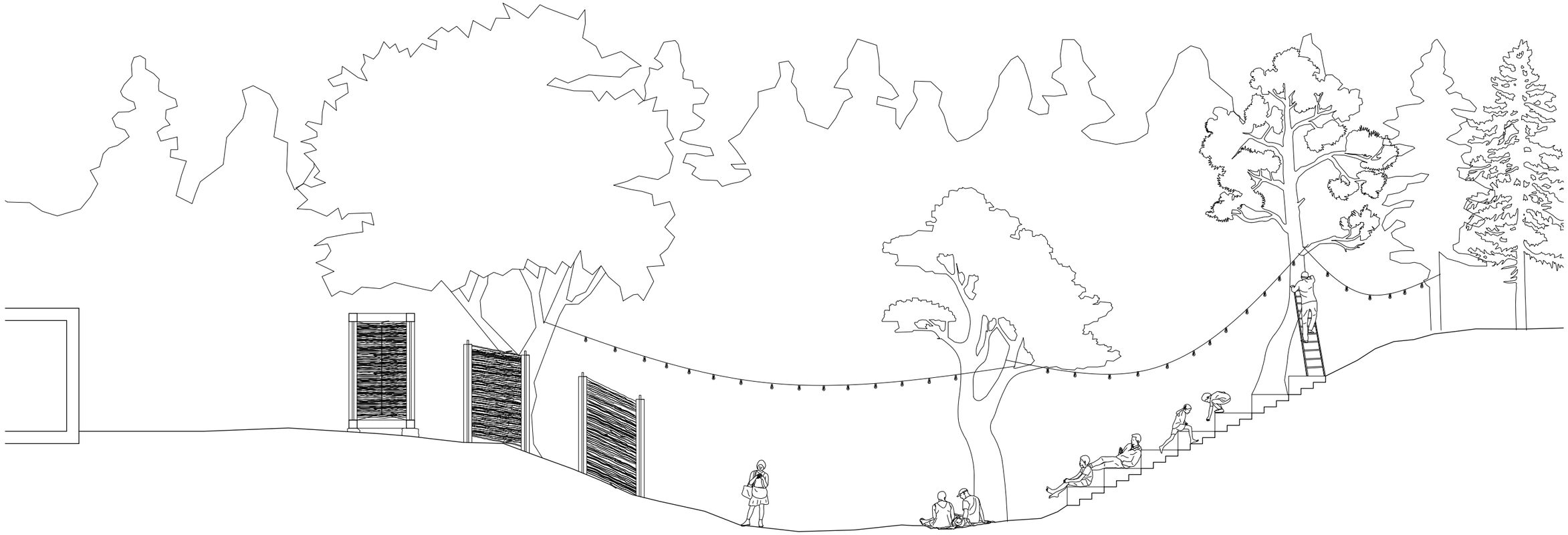




Section B-B, scale 1:100

Plan, scale 1:100





EPA-workshop in Bengtsfors

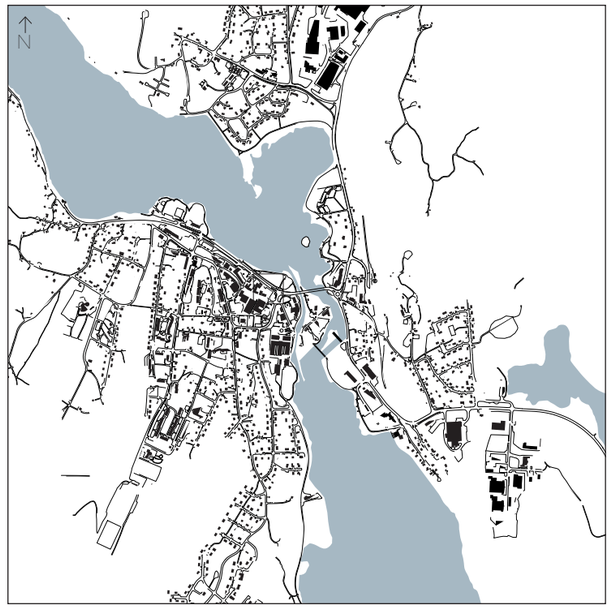
The EPA-workshop is located in the middle of town, on a parking lot by the square. This is a place where you can hangout with your friends and work on your car/bike. Apart from the built in workshop, there is a small loft with a net for chilling out and chatting with your friends downstairs while enjoying the view of the lake.

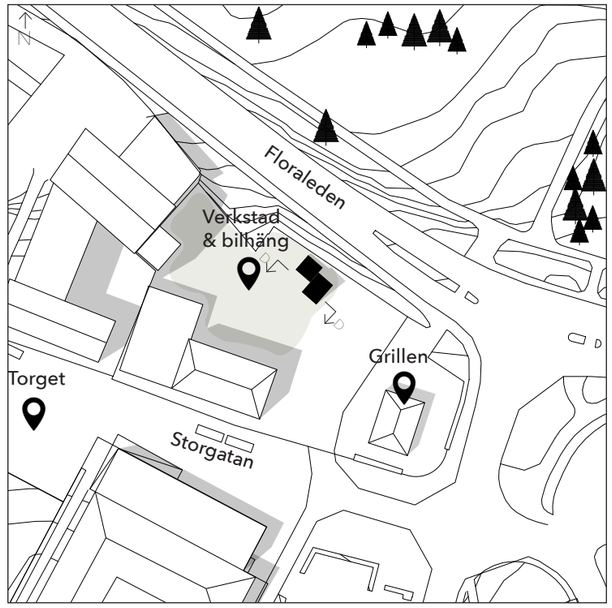
Embracing the local

The project name JOINTS refers both to the historical building techniques, and the social joints (meetings) that can take place when developing, ideas, building and using the structures. Our idea is, like in this example of the epa workshop, that existing cultures and identities will be brought to attention through the projects, to strengthen and take pride in what is actually Bengtsfors.

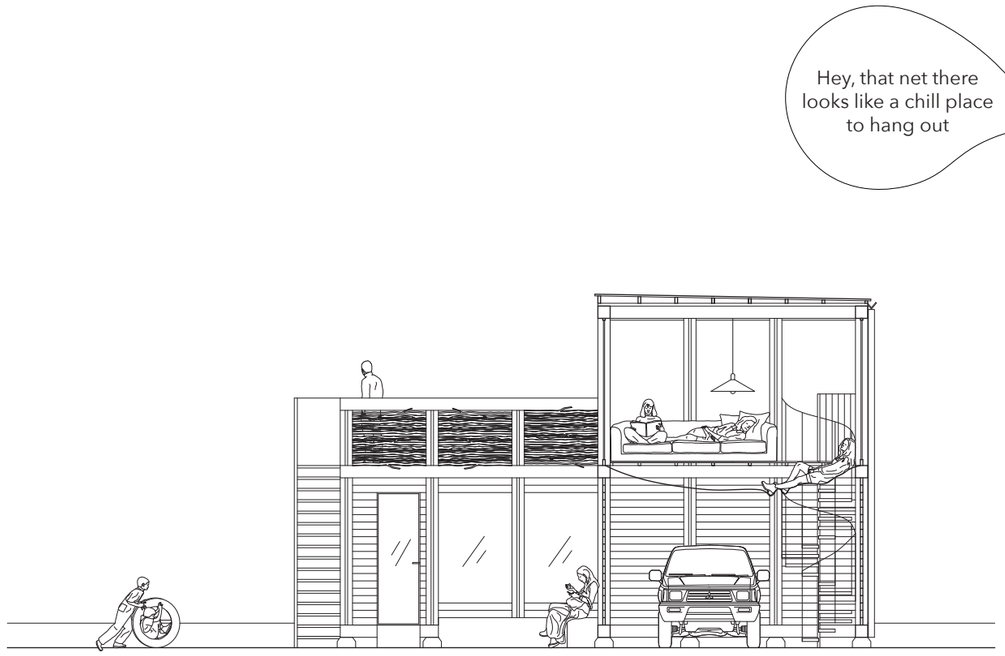
To be honest, we don't know that much about EPA-culture. There might be other ways to design the structure than we did in this case. Good! Next time you might be the one who decides what kind of place is really needed. Something that will bring out the best of Bengtsfors and meet the actual needs of the people who live here.

Area map and situation plan

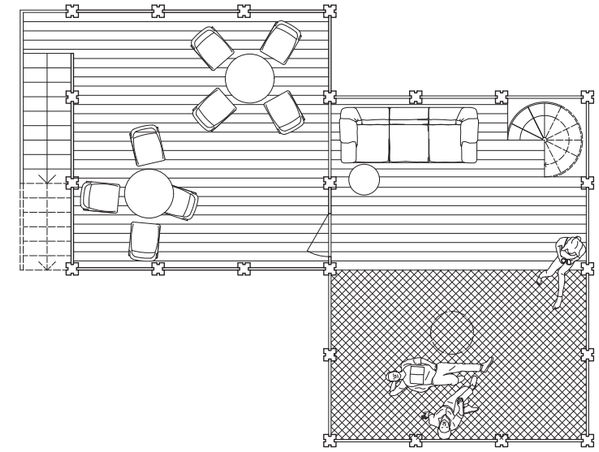


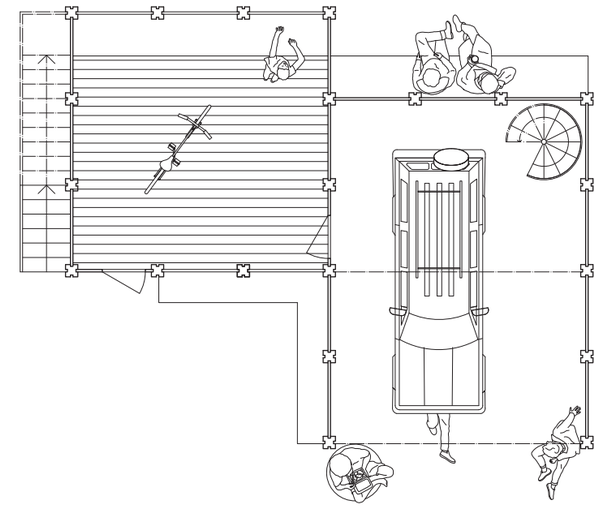


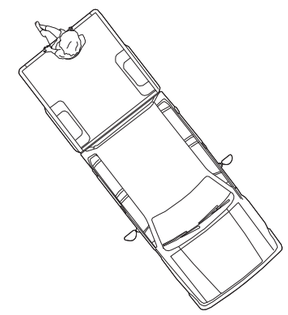
Section D-D, scale 1:100



Floor plan 2 & 1, scale 1:100







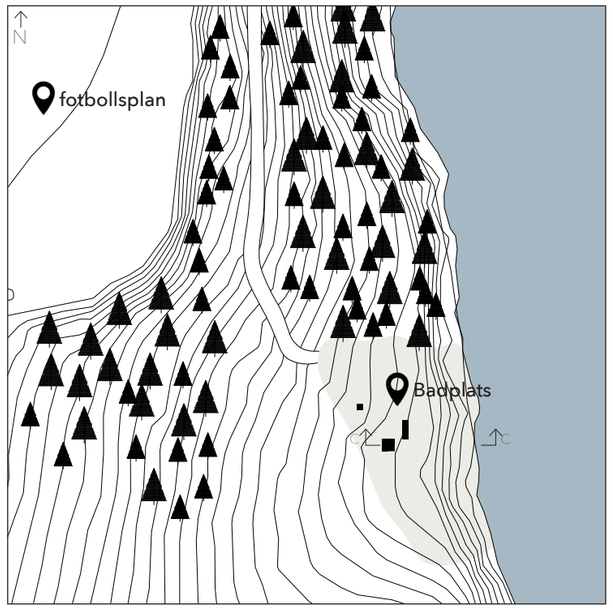
Sunbeds in Skåpafors

Located by the famous soccer field in Skåpafors you find the popular bathing site. This is a pupular hangout during the summer and by giving it some extra care in the form of some sun loungers we wanted to make this an even more social hot spot. Here you can find space to be on your own or meet your friends for a fika by the lake. Hopefully this addition will make this a more attractive place both to the people from Skåpafors but also to people from other parts of the municipality.

These sunbed structures are as simple as it gets! Maybe the big one here could be used as a small performance stage on an open mic night in Skåpa a warm summer evening.

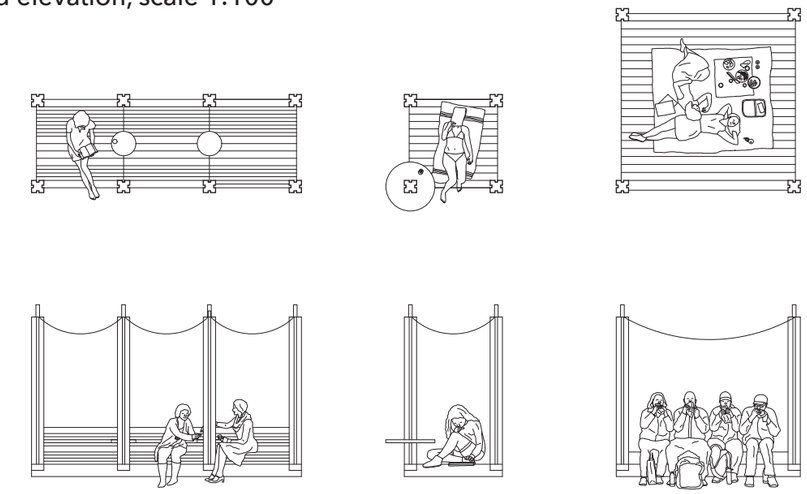
A sunny day in Skåpa. Who needs to go to Greece or Italy anyway?

Area map and situation plan

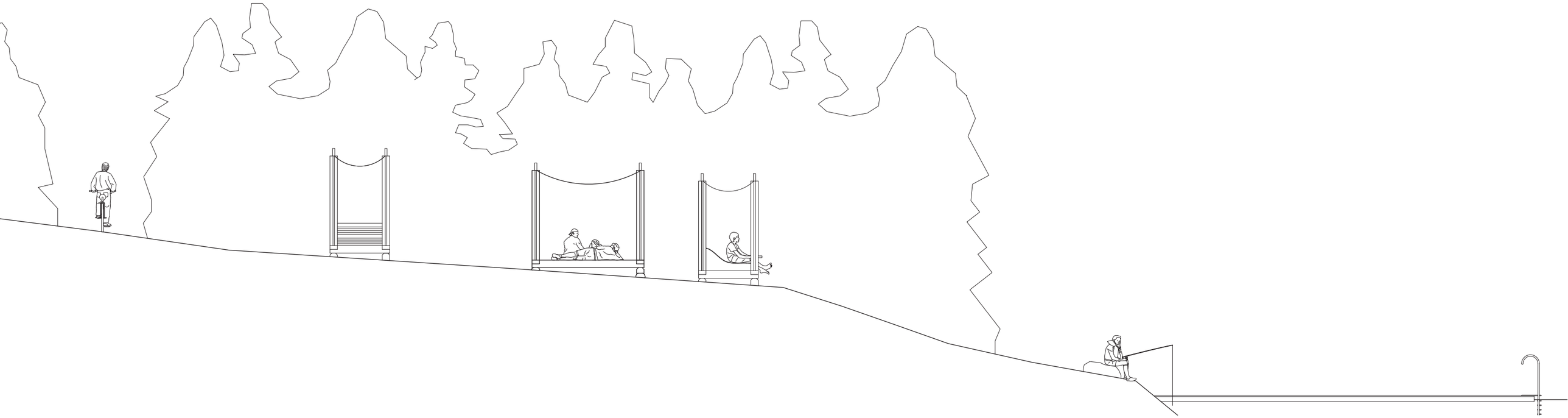


Section C-C, scale 1:100

Plan and elevation, scale 1:100



Or how about bringing your workmates here for lunch after a long morning shift at the factory? We imagine the body shaped seats in the long structure up over there in the drawing could give a good moment of rest to your lunch crew



Reflections

During these few couple of months, we have learnt a lot about living a life in Bengtsfors. About how life in a small town can be both frustrating in some ways and wonderful in others. We developed a strong connection to the community and the beautiful nature that is always present. It was very rewarding having time to really dig deeper into questions concerning the urban norm, social issues and our role as architects in this ever changing world. We also enjoyed working on a smaller, more human scale, than what we do in many other design projects. It feels intimate and relatable.

We really enjoyed working with traditional techniques and would wish for the education to turn more to history in terms of knowledge. We believe there is a lot to learn, especially in terms of sustainability, when moving into the future. Can these sustainable methods be implemented in the building of today and in that case how? Just like hundreds of years ago wood is still our biggest asset in terms of building material, and most people growing up in Sweden have a strong connection to wooden houses.

Our biggest disappointment was that we were not able to meet more people in Bengtsfors and to arrange our workshop. Due to the situation with Covid-19, this was of course impossible, but we cannot stress enough that this was always our intention. We believe that, for the project to be successful, making the inhabitants participate in the process is key, and therefore, the project could be said to be only halfway finished.

If we would continue to develop the project further, there are a few things that we would want to continue to explore; the roof and the possibilities in developing a system for that, stability in the construction, details in terms of moist and different solutions to address this issue.

If given a chance we would love to continue working on this project together with people in Bengtsfors, the municipality and local craftsmen.

Big thanks to the people at the municipality for taking time to meet us and to making this course possible. Thanks also to all the people taking their time to answer our questions, including Nils and Ida. Last but not least, a special thanks to the student at Strömkullegymnasiet for answering our survey - without you we would have been completely lost!

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