

INTO THE WALL

SKI CABINS IN STÖTEN

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Master thesis at Chalmers Architecture, Matter Space Structure



CHALMERS

ABSTRACT

The Swedish alpine ski resort Stöten is expanding and a new area with ski cabins is planned. To minimize the environmental impact and to satisfy the different groups of people visiting Stöten, the new cabins should be sustainable and flexible.

Ski cabins play an important role in the whole skiing experience since a lot of time is spent socializing in the cabins after a day in the slopes. The groups of people visiting ski cabins are of varying sizes, and it is common that a bigger group needs to be split and live in two apartments or cabins without connection.

The aim of this thesis is to propose four compact and transformable ski cabins in Stöten, where the amount of social exchange between two groups living in each cabin is variable.

As guidelines for the design, a typical time line of a day in the building is set up, as well as

a scheme over the life cycle of a house. Sustainability and carbon storage are guidelines when it comes to material choices.

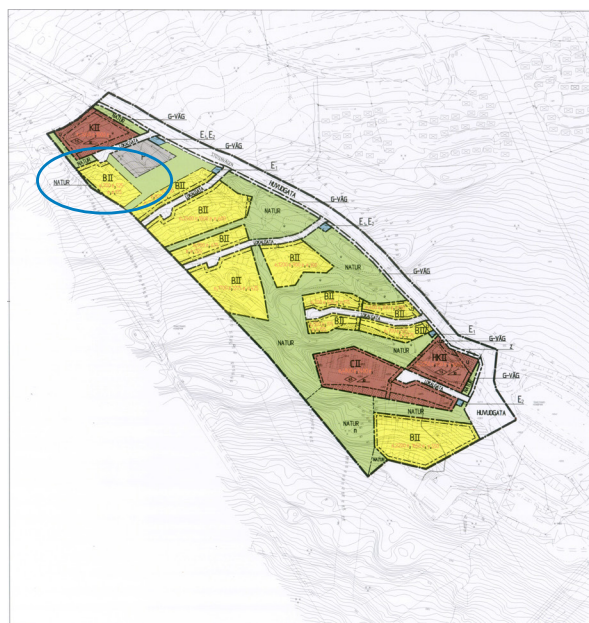
By letting the interior walls of the cabins be the main design element, it is investigated how walls can be used to hold functions and rooms. The use of cross-laminated timber as building material gives a big freedom when it comes to the design of the walls. Zones of social flexibility in the cabins are generated by the use of movable wall parts.

The outcome is four small wooden ski cabins where good friends can go for a week to have fun and to try the life in the walls. The cabins offer a variety in apartment set-ups, and show lots of small flexible interventions and new ways of thinking when it comes to walls and architecture. The cabins are sustainable, adjustable and can be moved to new locations if the demand changes.

SITE



View from Granfjällsbranten



PLANBESTÄMMELSER
 Planen ska ses över och med nödvändighet ändras i samband med ändringar i lagstiftning eller tekniska förändringar som kan påverka förhållanden eller omständigheter som är av betydelse för planens tillämpning.

GRÄNSZONER
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ANVÄNING AV ALTERNATIV PLATS
 Om det inte finns någon annan plats som är lämplig för planens tillämpning ska den plats som är mest lämplig för planens tillämpning användas.

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ANTAGANDEHANDLING
 PLANARBETE MED BESTÄMMELSER
 DETALPLAN FÖR
 KULLEN OCH BACKEN
 MALLINGS KOMMUN, DALARNAS LÄN
 GENOMFÖRT AV SÄBEO FÖR ARBETET I JULI 2008 OCH S.E.

MAST LÖNNER SÄBEO
 ÅRE 2008
 SÄBEO

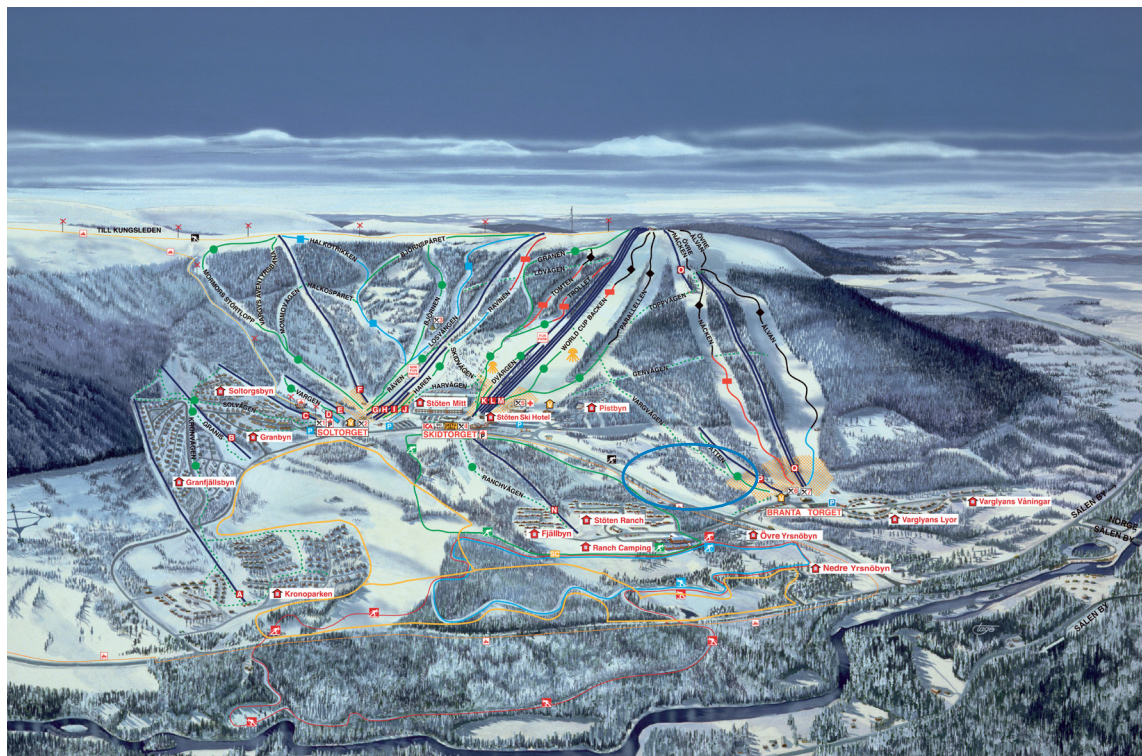


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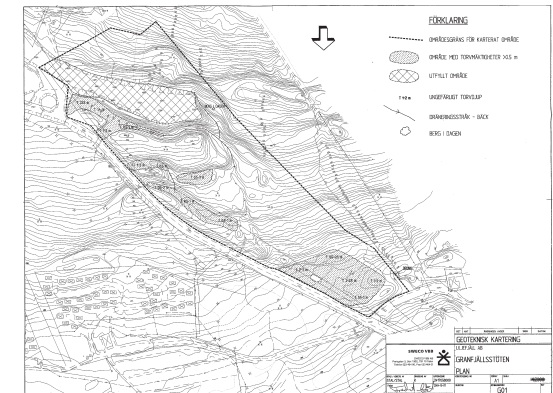
MAST LÖNNER SÄBEO
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Development plan

Illustration plan



Trail map of Stöten



The site was decided in collaboration with Liljefjäll, a company that exploits areas for ski cabins in the Swedish mountains. The area is called Granfjällsbranten, which is a planned ski holiday village in Stöten.

None of the cabins in the surrounding area in Granfjällsbranten are built yet, but preparations on the site has begun. The main concept for all cabins in the area is “ski in ski out”, meaning that every cabin in some way lies in direct contact with the ski slopes.

CONCEPTS

FUNCTIONAL WALLS

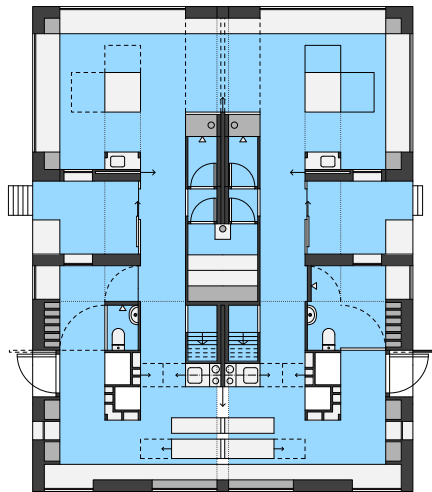
What happens if, instead of using walls to divide the building in different spaces and functions, we let the walls be the rooms and functions?



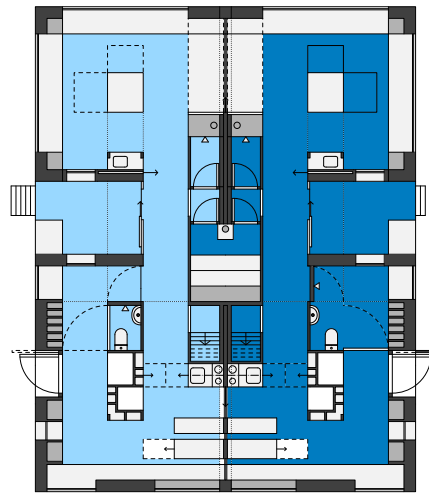
TRANSPORTABLE MODULES

By producing the cabins off site in 3 modules, each module can be carried on a truck and the final assembly takes place on the site.

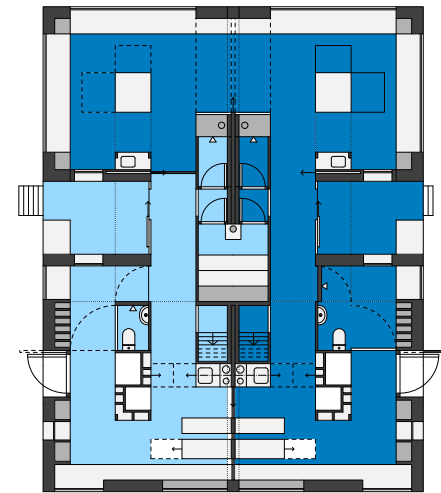
The cabins can be placed anywhere near the slopes in a ski resort, and can easily be moved some place else if the demand changes.



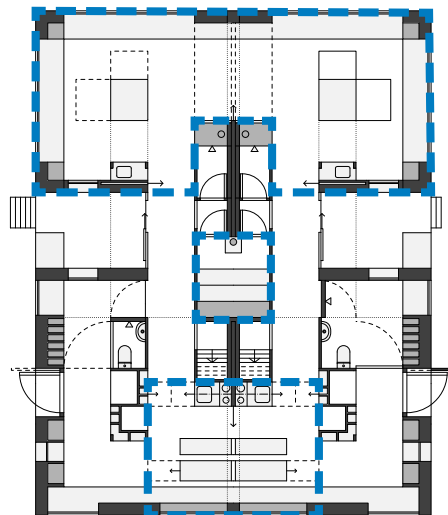
No split - live all together



Equal duplex



Party and sleep split



Zones of social exchange

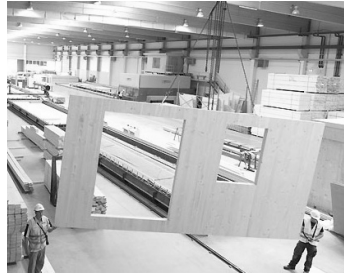
SOCIAL FLEXIBILITY

The notion of a duplex cottage is explored, to see how a bigger group of people could live together in the whole cabin, or how two smaller groups of people could live separately or with a varying degree of social exchange.

By adjustable walls, the duplex can change depending on how the group of people look and how they want to use the building.



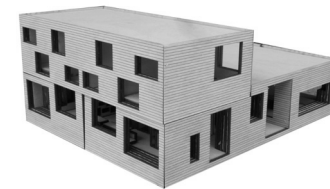
Wood from local forests



Off-site production of parts



Transportation by truck



Assembly and usage on site



Recycling of the cabins

LIFETIME OF THE BUILDING

By using local pine wood no unnecessary carbon gases are created due to transportation.

Fabrication and assembly of building parts at the factory enables a higher quality control, thus a more environmental friendly building.

The three building modules are transported by truck to the site, where they are put together. Each module is within 4900*12500*3580 mm, the maximum measurement for “standard

transports” on truck.

Wooden houses normally last up to a hundred years. The more houses built in wood, the more carbon is stored. When the demand changes, the cabin can be disassembled and moved to a new location.

When the cabin is worn out, most of the material can be recycled and serve as pellets for warming other cabins in the area.

07:00 08:00 09:00 17:00 20:00 21:00 22:00 LATE



Deep sleep..



Breakfast view



Wake up view



Ski waxing



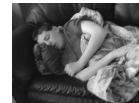
Skiing all day



After ski



Backyard skiing



Power nap



Dinner



Relaxing



Beer and relax



Cook



House bar



Party



Sauna



Relax



Snow rolling



Sleep



Deep sleep..

ONE DAY IN THE BUILDING

In a building like this, where many people live on a small area, it is important to think of what different kinds of activities can go on at the same time in order to place rooms and functions in a good way.

The main conclusions from this schedule are that early in the morning you want to wake up and see the skislope from your bed. This gives motivation to get up early even if you had a

beer to much yesterday. The same goes for the kitchen and the breakfast table, where the slope should be well visible.

Around 5 o'clock, the activity collisions start. The most important issue is that there is always someone who wants to rest or sleep, so the bedrooms should be as far away as possible from the living room where the louder activities goes on.

PROJECT

Into The Wall is a small concept cabin for alpine skiers and snowboarders. This proposal introduces four cabins in the planned holiday village Granfjällsbranten in Stöten, Dalarna.

The massive wood walls are the main design element in the cabins, and most functions are integrated in the walls. The cabins work close with the nature. Environmental friendliness and carbon storage are leadwords for the materiality.

Into The Wall can visit any site, wherever there is a demand.



The proposal contains four buildings that are placed as close to the ski slope as possible. The orientation of the buildings follows the height curves on site, as does the connecting paths to the street.

Between the cabins are paths with stairs which can be used as rails to make tricks and ski on after closing time of the ski slopes. The people living in the cabins can comfortably watch the skiers from the living room.

The entrances lie in the southwestern and southeastern corners, where the buildings are in level with the ground.

A small hotel is planned north of the cabins, and to the southeast more cabins are going to be built.

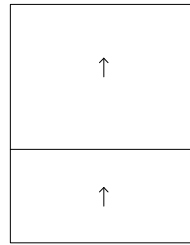


STÖTENVÄGEN

SKI LIFT

Site Plan 1:1000





Roof plan 1:400

- | | |
|--------------------|-------------------------|
| 1. Entrance | 8. Balcony |
| 2. Clothing | 9. House bar |
| 3. WC (expandable) | 10. Living room |
| 4. Dining room | 11. Clothing |
| 5. Kitchen | 12. Balcony |
| 6. Sauna | 13. Bedrooms (flexible) |
| 7. Shower | |

In the plans, the walls are the main elements. The visitor is always either inside a wall, or using one, and there are no freestanding furniture. The walls become benches, sofas, a sauna, staircases, storages and other functions.

The cabin has a total gross area of 152 square meters, including balconies. and is dimensioned for up to 12 people.

BOTTOM FLOOR

The entrance space in the cabin lies between two walls for storage of ski gear and clothing. To the left and right it is possible to see all way through the building, and the kitchen is visible through holes in the wall. In relation to the entrance is also the small bathroom, which is expandable if a bigger one is needed.

There are two ways to continue into the building and meet the next wall that contains the 9-12 people sauna, the showers and the stairwell to the upper floor. The sauna has close access to the balcony to encourage rolling in

the snow and to avoid soaking of all the cabin. The windows in the sauna give a good view out from the building even though it is the very central point of the cabin. On each end of the central wall, there is an extendable wall that can be used to split the cabin into two apartments.

The kitchen is located on the end of the central function wall. Two small kitchens with extendable working benches that can be used together, gives good space for cooking for every hungry skier after a hard day in the slopes. The dining table in massive wood, optimal for 8-10 persons, also has extendable parts if a bigger table is needed or so that a disabled can roll up with a wheelchair. When the visitors of the cabin are tired and eating their breakfast in the morning they have a great view over the ski slope, which is right outside the window.

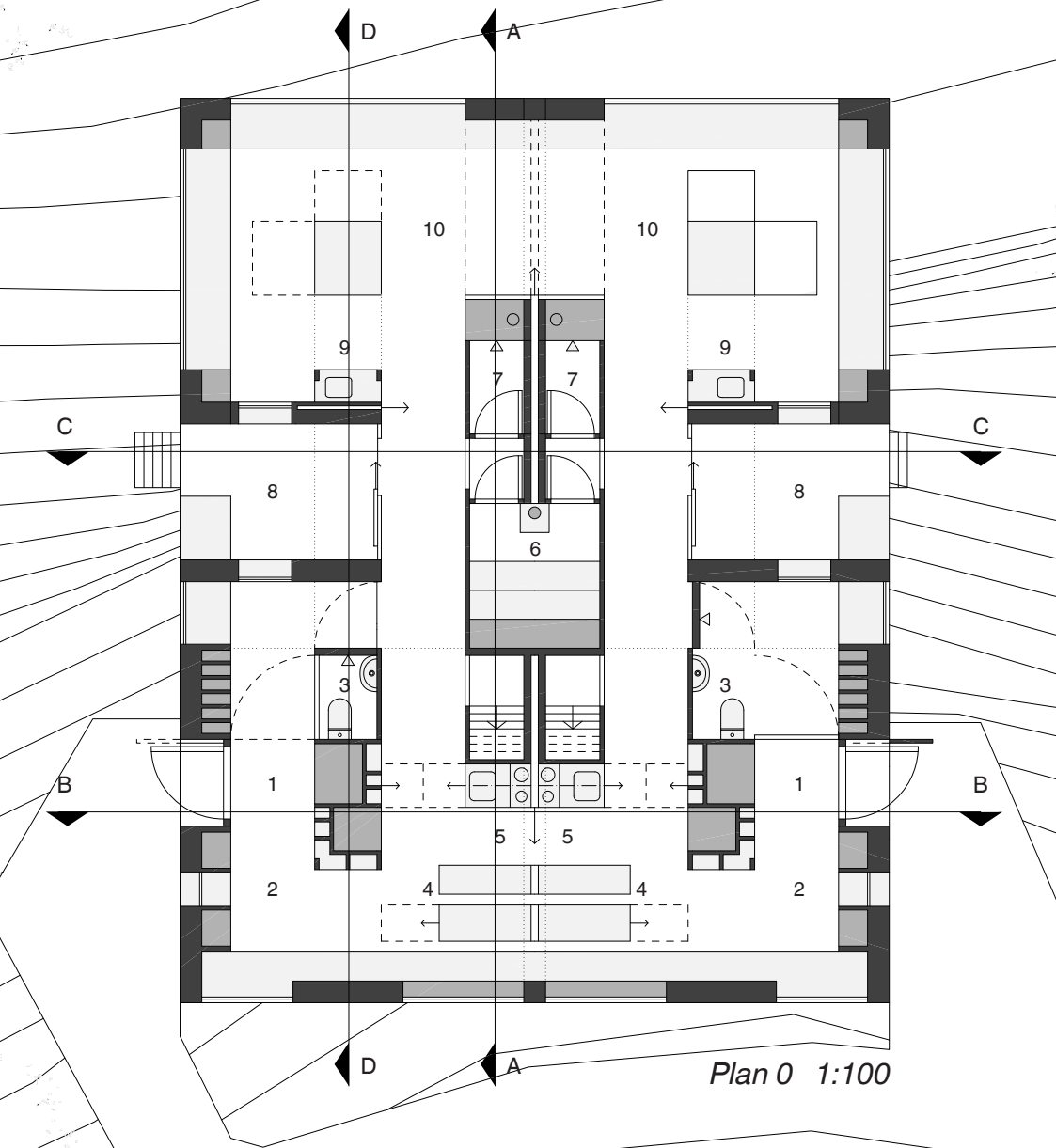
In the other end of the building is the living room with a magnificent view over the opposite mountains. In the living room there is a central table in massive wood in the end

of the wall line, that has extendable parts. Above the table is a projector shelf so that ski movies can be shown on the extendable wall between the apartments. In the living room lies also the minibar where the thirsty skier can grab a beer or mix a drink at nighttime. In the contrary wall lies the fireplace, mandatory for a ski cabin. Should someone want to sleep down in the living room, a bed can be folded down next to the split wall. This bed can also be used as a sofa if the cabin is split in two.

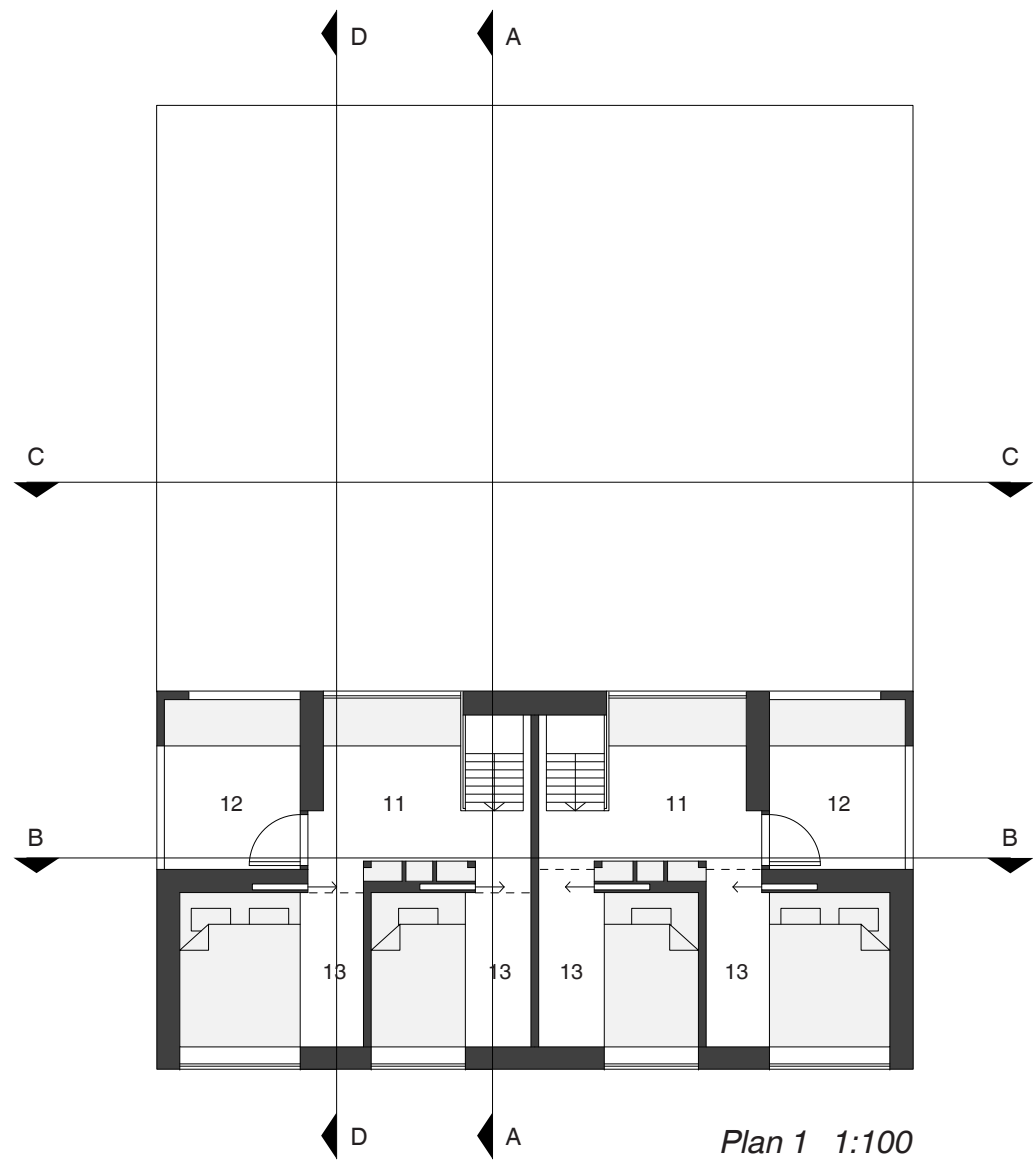
The entrance floor works fine for a disabled as it is possible to have a big bathroom and to use the living room as bedroom.

UPPER FLOOR

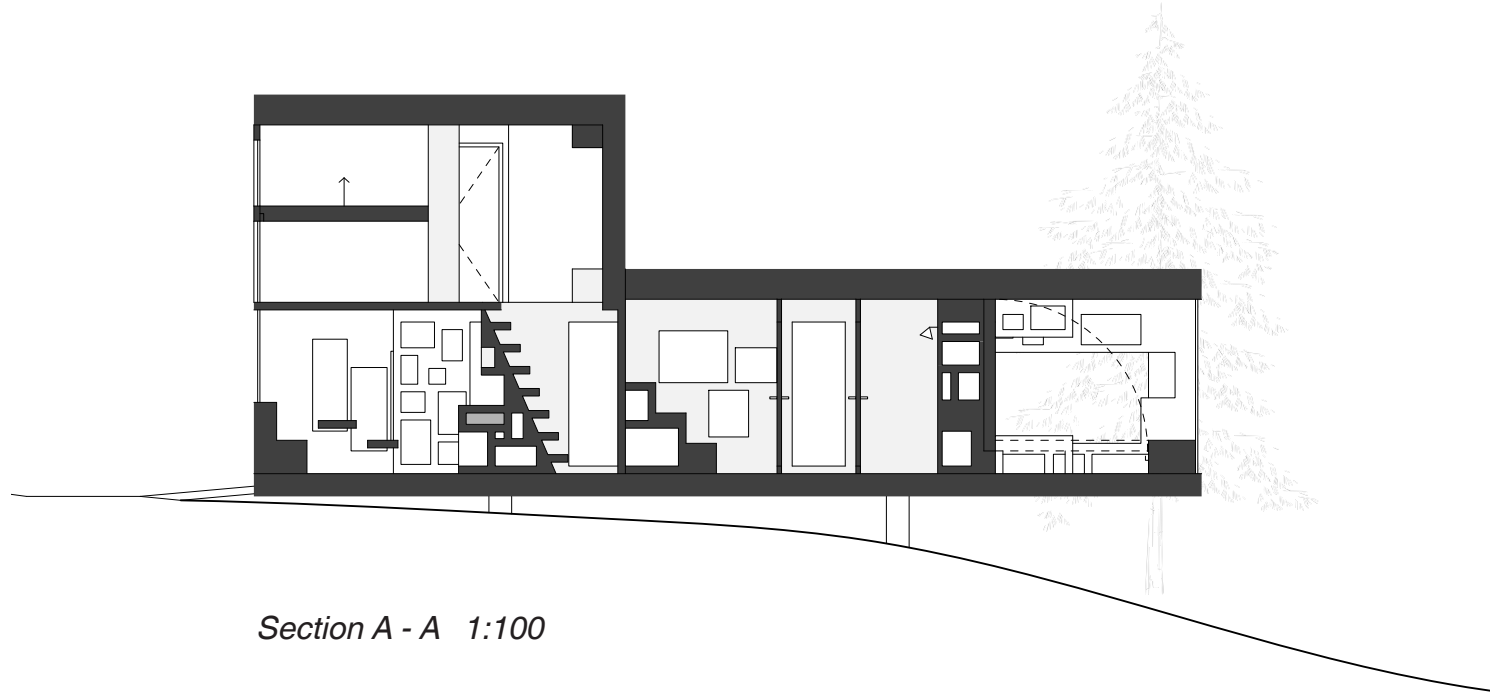
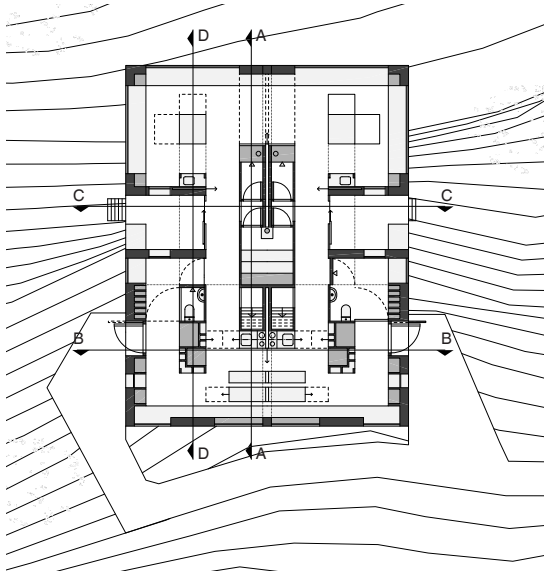
Upper floor is for sleeping and changing. There are two to four bedrooms in each apartment, inspired by japanese capsule hotels. Either two full height bedrooms with the bed in floor level, or four bedrooms with one meter in height. The upper bed can be pushed up in the ceiling. On the upper floor is also a small balcony.



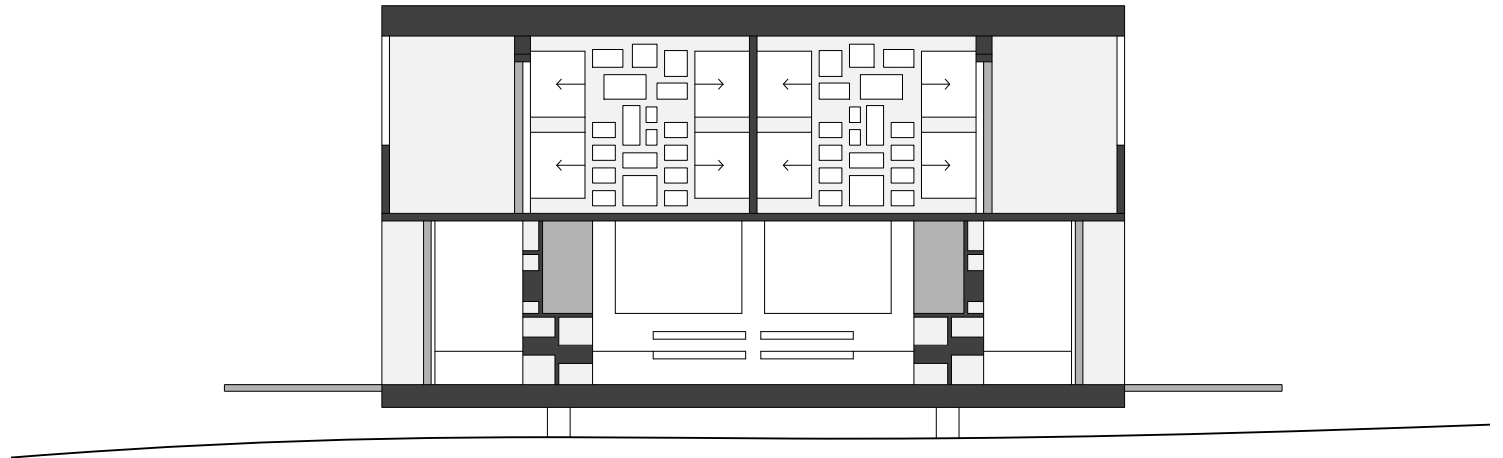
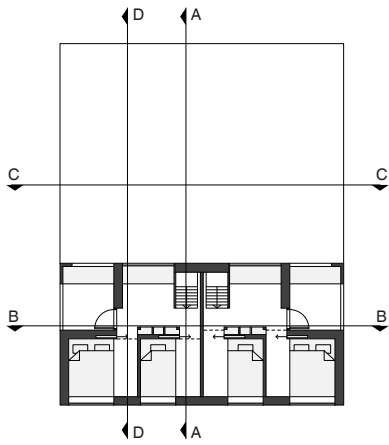
Plan 0 1:100



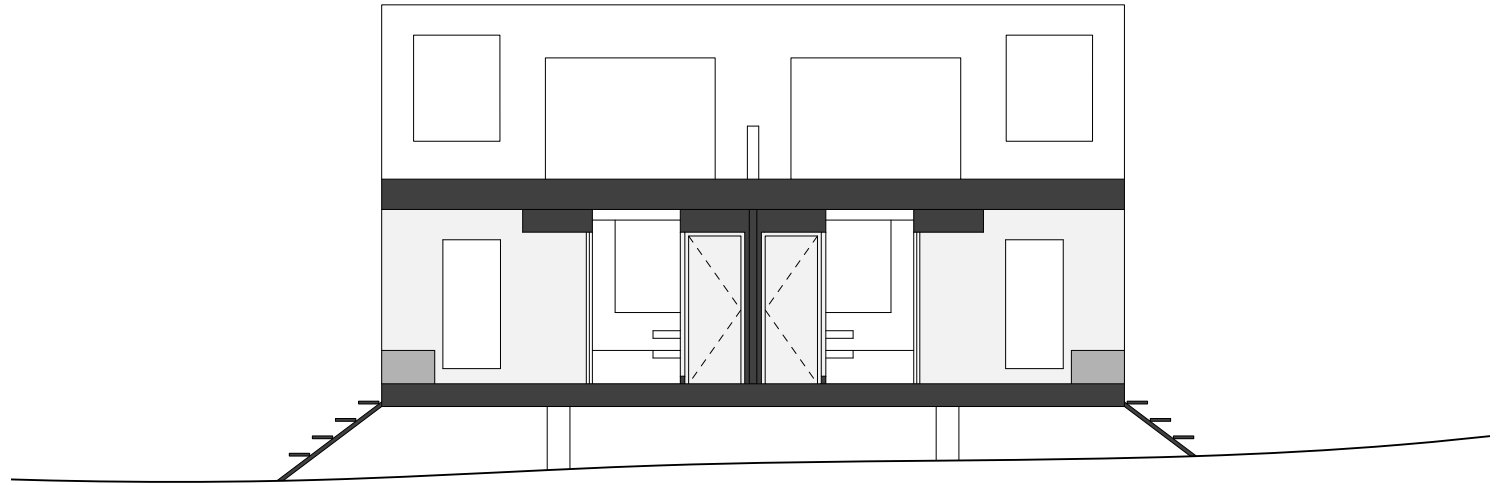
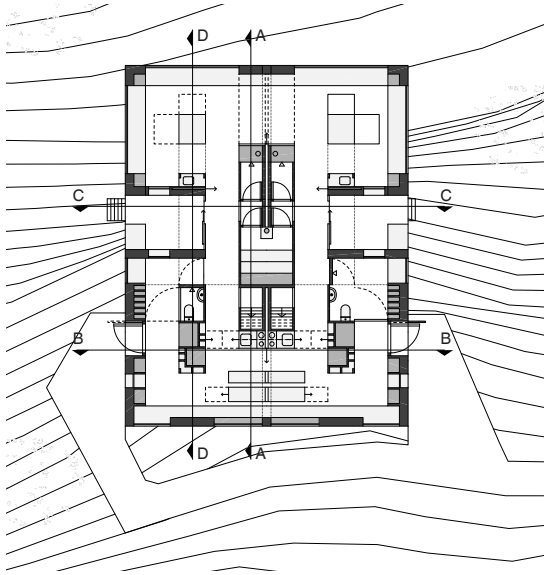
Plan 1 1:100



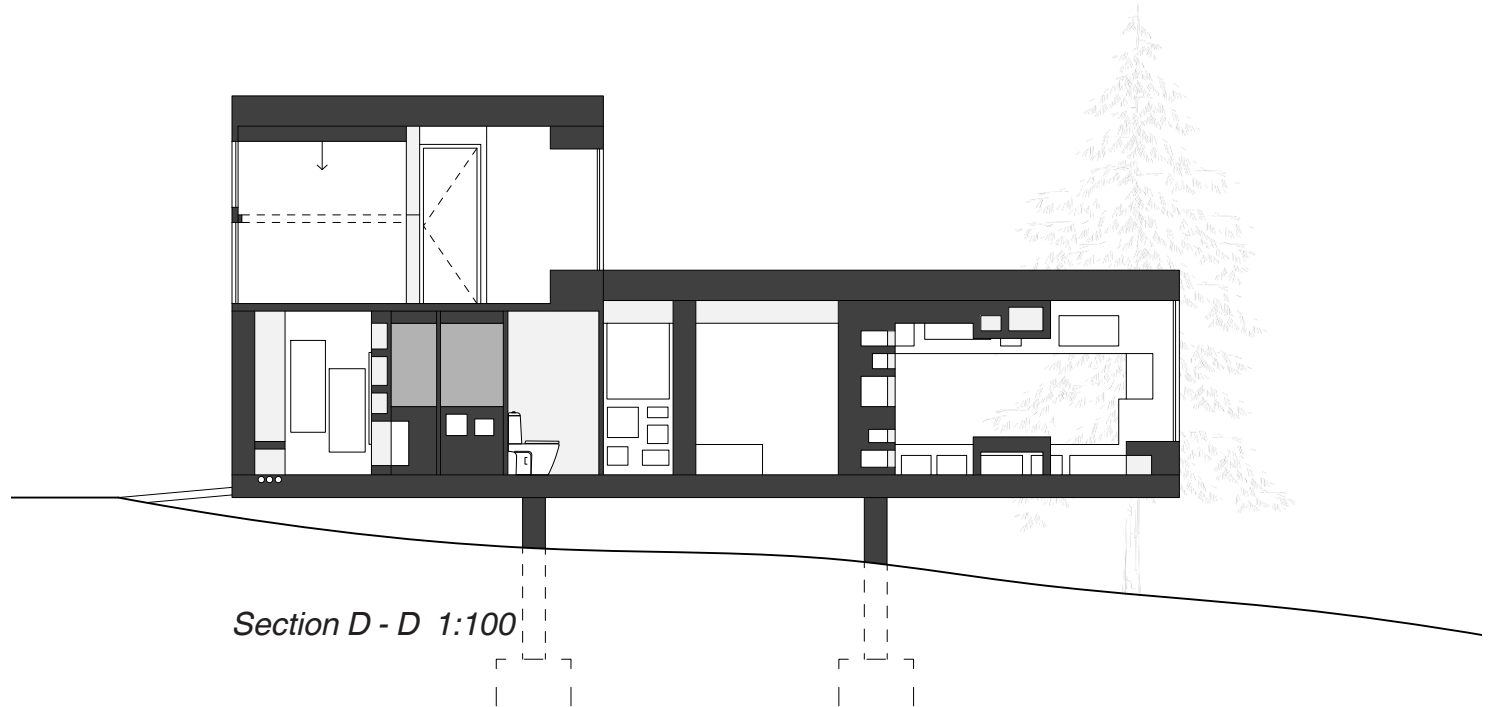
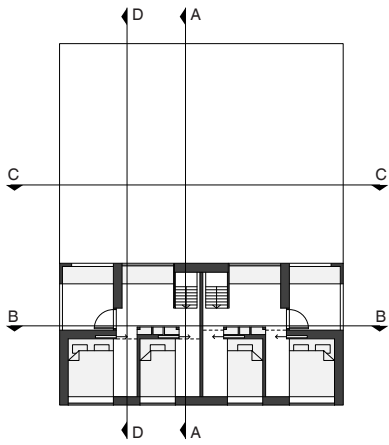
Section A - A 1:100



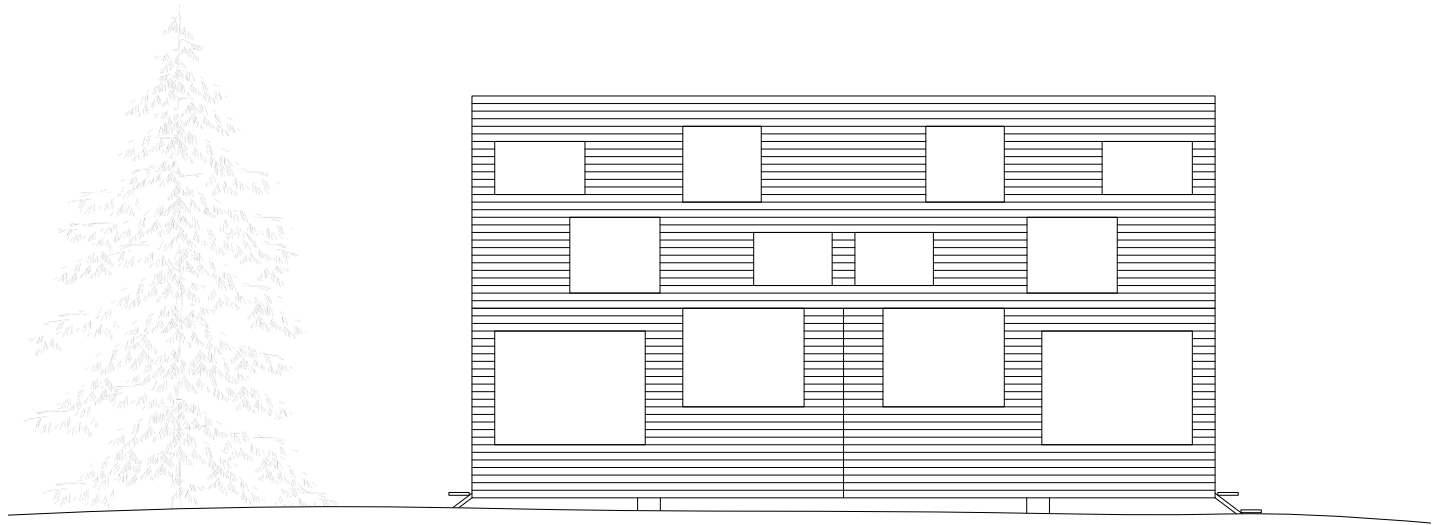
Section B - B 1:100



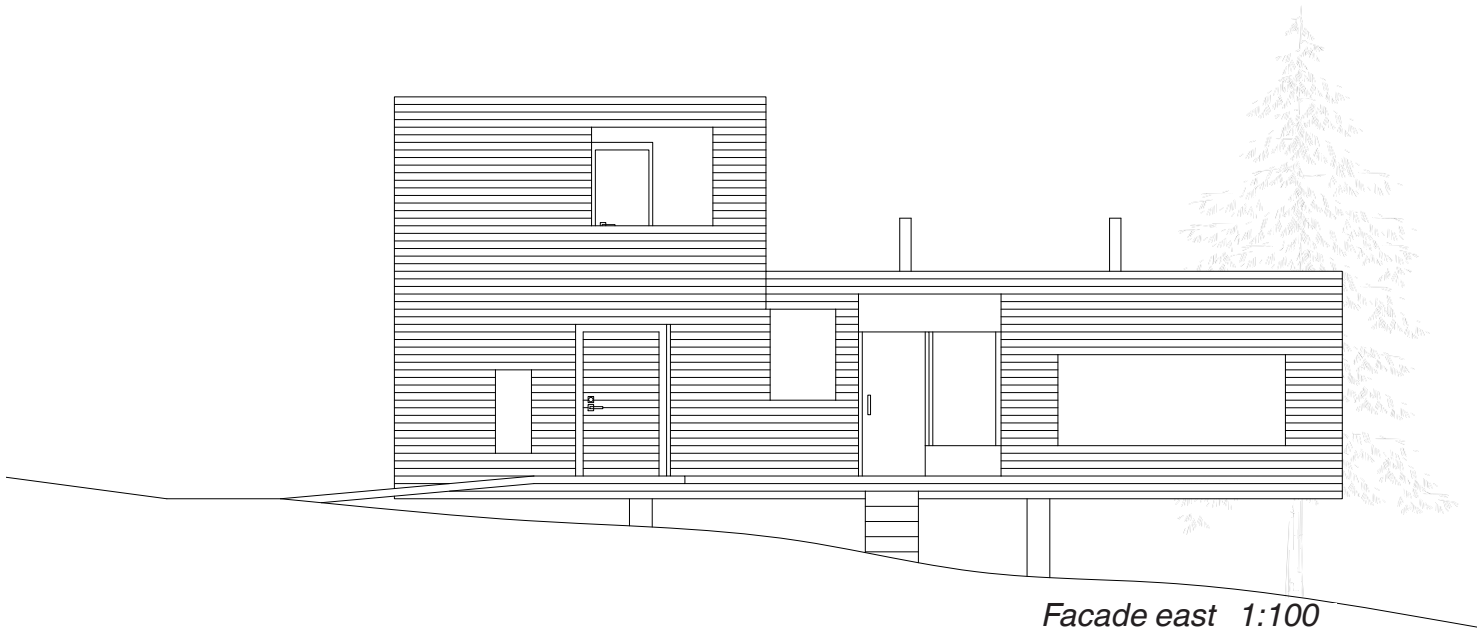
Section C - C 1:100



Section D - D 1:100



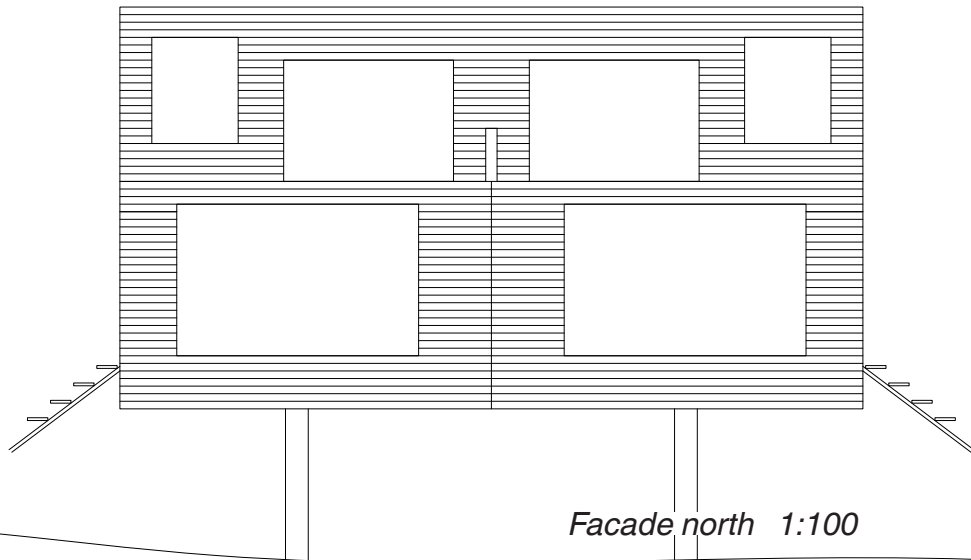
Facade south 1:100



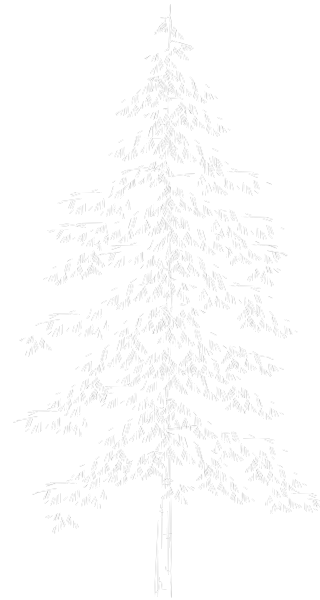
Facade east 1:100



Facade west 1:100



Facade north 1:100



The facades have similar formal language as the inner walls. Placing openings in a way that appears more or less random contributes to the uniformity inside the building, and erases the boundaries between rooms and functions.

The wooden panel goes all the way out to the edges, both vertically and horizontally.

The house is standing on four pillars that are well anchored in the rock beneath the soil, and the cantilevering building is self supporting with its timberfloor supported by the walls.



WOODEN INTERIOR

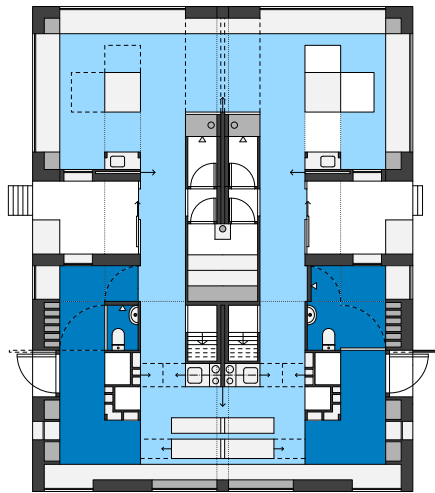
Cross-laminated timber (CLT) is the main construction material. The material is all wood except for the adhesive that binds it together. CLT stores lots of carbon and is therefore an environmental friendly choice. It is structurally good performing, and gives a big flexibility in the design as pieces can be cut to individual shapes without increasing the cost.

The CLT lies as inner layer in the building envelope, except for on the floor where an extra layer is added. When you enter the build-

ing, you are met by a warm and gentle landscape of pine wood.

By exposing the cutting ends of the CLT boards, the rawness of the material is shown. All material in the walls lies in the same direction, giving all cuts and ends a striped look and showing the material layers.

When the walls and furniture are worn, they can easily be polished and restored to good shape.



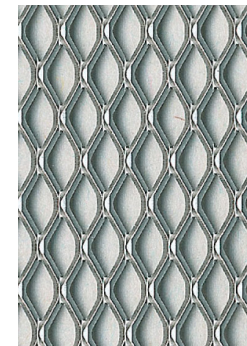
Floor material zones



Aged wood panel



Sedum roof



Expanded metal



Wood fiber insulation

EXTERIOR MATERIALS

The lying facade panel of aged wood is inspired from beautiful dry pines in the vicinity of the site. The color makes the warm wood on the inside more present when the building is seen from outside.

The sedum roof brings the building closer to the nature. It will be visible from higher up in the skislope and from the second floor in the cabins.

Outside the cabins, in front of the entrances, you walk on expanded metal. Snow can fall through and you do not slip.

Wood fiber insulation boards are used as main insulation in all the cabins surrounding parts.

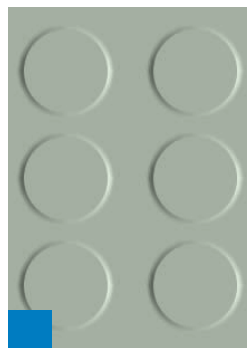
FLOOR MATERIALS

Oiled pine floor is used on top of the CLT floor board. The floor in a ski cabin is worn quickly, and by adding a floor layer it is possible to change it.

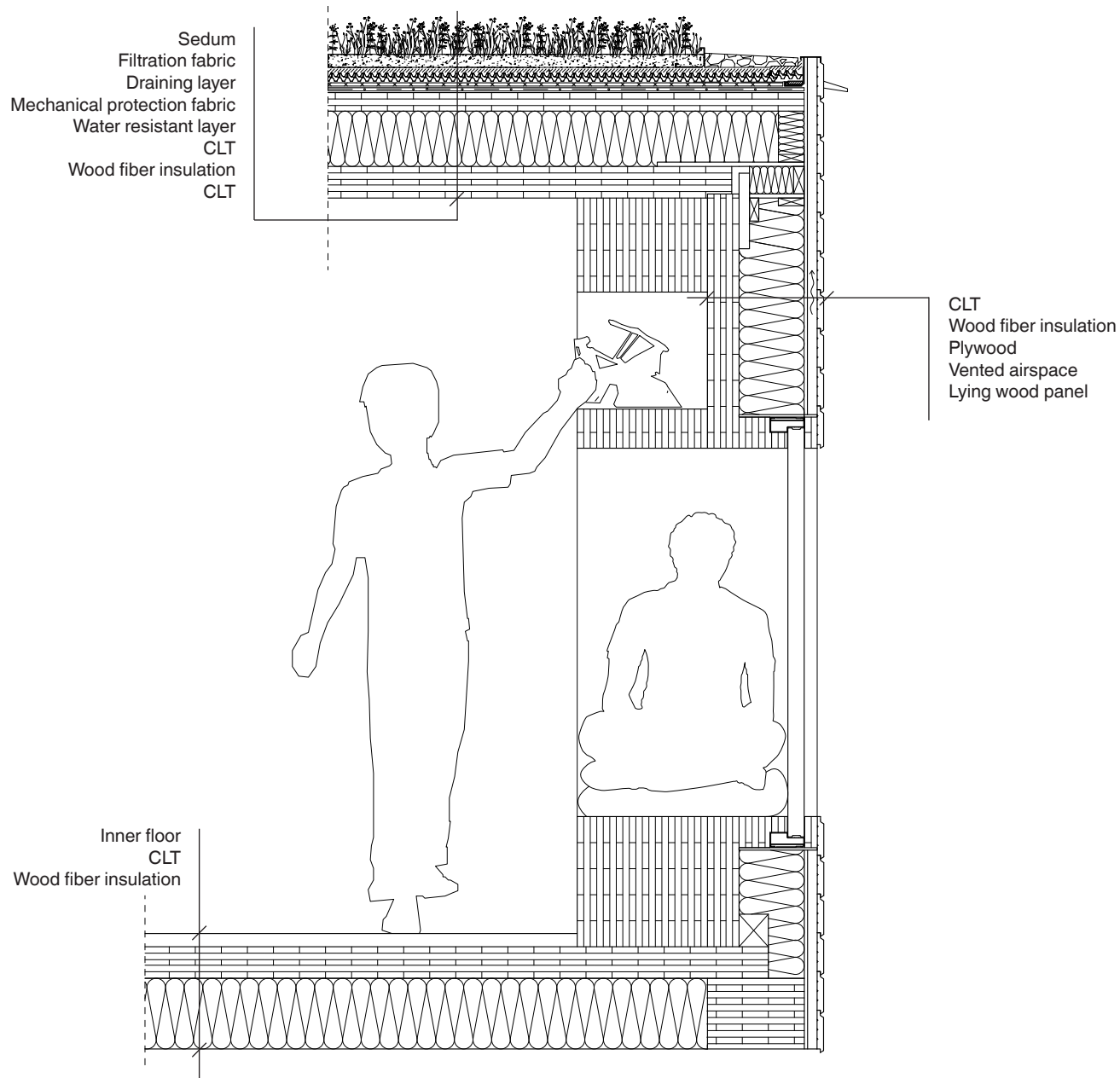
In the rough zone a rubber floor is used to make it water resistant and durable. The rubber also makes it easy to walk with ski boots, without slipping.



Treated pine floor



Pastille rubber floor

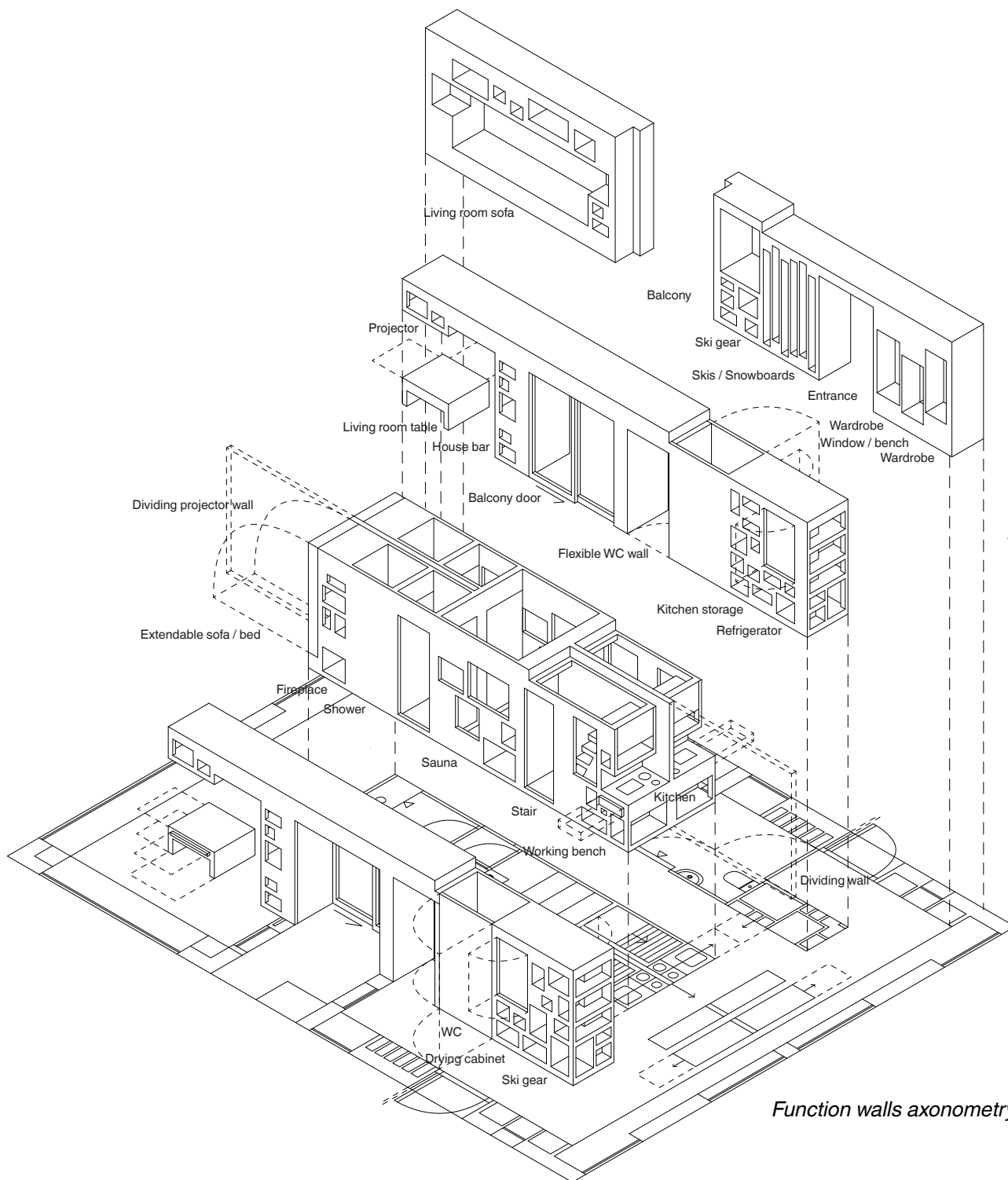


Building envelope principle section 1:20

On top of the insulated CLT roof is the sedum layer combined with a filtering fabric, a draining layer and a good waterresistant layer because of the flat roof. Otherwise stillstanding water may harm the building.

The wall has the insulation outside the CLT, after which there is a layer of plywood before the panels.

The principle for the openings such as windows, is that the wood should continue all the way out to the glass to erase the boundaries between inside and outside. When you sit in the window the closeness to skiing and nature is great.



Function walls axonometry

In the entrance there is storage of ski gear and a drying cabinet. There are also integrated spaces for ski clothes, skis and snowboards in the wall next to the entrance. Further away the same wall becomes one of the living room sofas.

In relation to the kitchen you have the southern part of the first inner wall, which contains refrigerator and kitchen storage. The same wall then passes the toilet and the balcony to become the housebar and end in the living room.

The middle wall shows the stairs, sauna, showers and the fireplace, together with the extendable walls and the extra bed.



The dining room (above) has light coming in from all directions. Light passes through the building in the direction of the walls. Here you can eat, socialize or just watch the skiers outside the window.

The living room (to the right) is the most social space in the cabin. There is a minibar, a projector, a fireplace and a magnificent view over the opposite mountains.



MODELS

