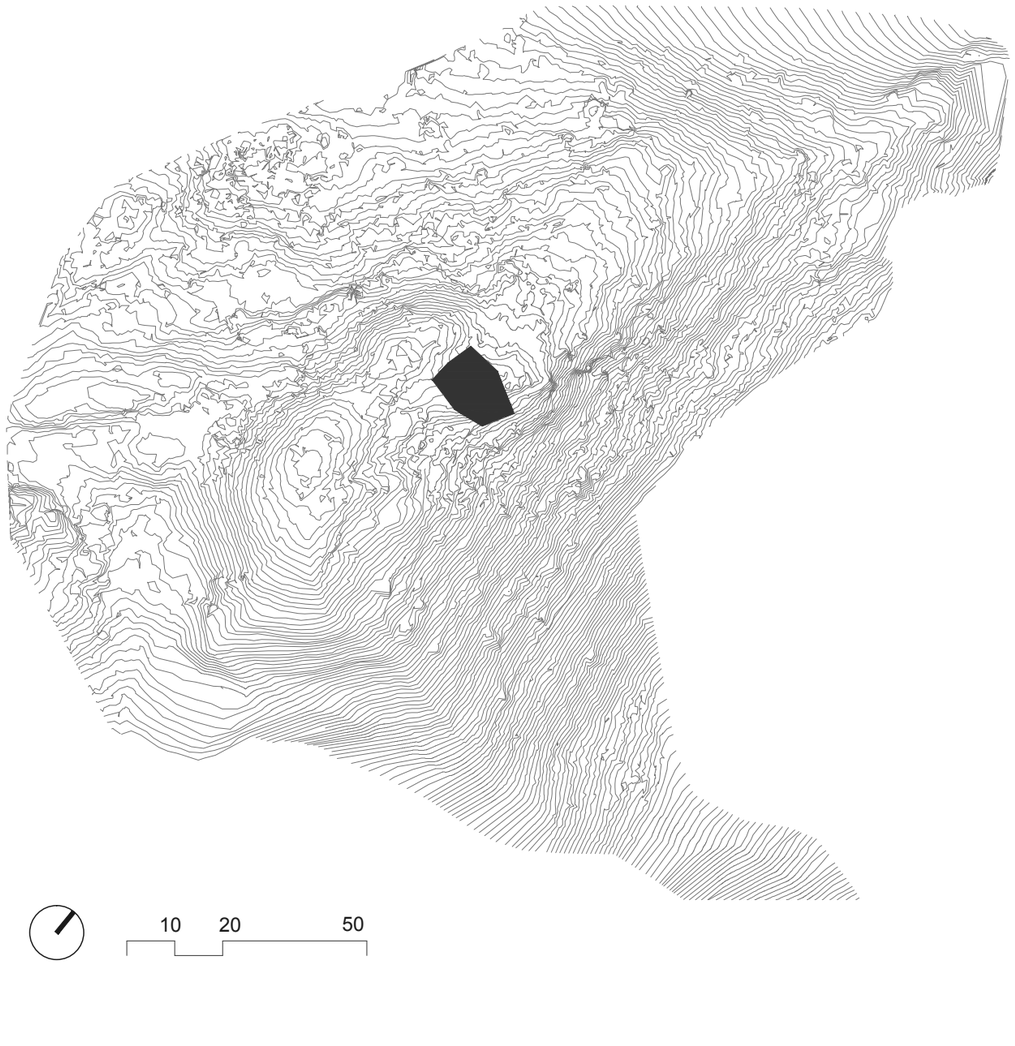

VELUX®
A MOUNTAIN ON THE MOUNTAINTOP
Alpine Refuge, Province of Bozen, Italy

A SURPRISING DESIGN

Answering the needs of the growing tourism sector, the government of the Province of Bozen assigned 10 million EU for construction of 3 new huts and renovation of the other 22.

A 2013 competition among eight invited architecture offices from the region was won by Stifter+Bachmann. The project divided the public opinion - after heated discussions, a year later, the architects could begin working on the execution design. The construction started in June 2016 and continued with great efficiency during the short alpine summers until October 2017.

In June 2018 the new Sasso Nero mountain hut opened its doors, causing stir both in the architecture and construction circles and among the stunned hikers.



"Our house is not a design statement, and we did not mean to invent a new language. We have build another stone, on one side standing tall and welcoming the guests, on the other blending in with the surroundings."

all quotes by Helmut Stifter, architect, Stifter+Bachmann

ALL IS ONE

The lower, small underground floor is not visible from the outside and contains technical facilities - a tank for the sewer. The floor above is cantilevered to keep the footprint small. Next to the toilets, a tiny shower and wardrobe, there are technical facilities and storage, accessible from the outside during the summer months.
The main entrance is on the ground floor, as well as the kitchen and dining area. Two upper floors, accessible only in the afternoon, are bedrooms and private flat of the innkeepers.

Every little detail is thought through for maximal functionality and all the comfort needed in alpine conditions. Special attention was given to the team of three, consisting of the innkeepers' couple and a young man from Tibet, coming every summer to help. Perfecting of the workflow lead to innovative use of a standard product: the reach-through bar counter towards the restaurant terrace is also a larger roof window, providing when open at the same time a glazed roof over the counter and allowing the service outside directly from indoors.

The ground floor houses the kitchen and a large dining area with three large windows that carpenter has build to match the VELUX products installed next to them. They look like three distinct paintings - of a stone wall, the plateau in the north and the neighbouring peak.

The understanding of windows as paintings led to a very conscious placement of the openings. The first and second-floor bedrooms, each with one paining-like window, are efficiently equipped with bunk beds. Attic houses one large room with a full-length row of mattresses on the floor.

"There is no division between facade and the roof in this building. It's one big roof, so Velux roof windows were our first choice. We used the same windows as the ones used in single-family houses in the village. All our workers were familiar with the detailing and assembly in copper-clad surface - most roofs here are done like this."

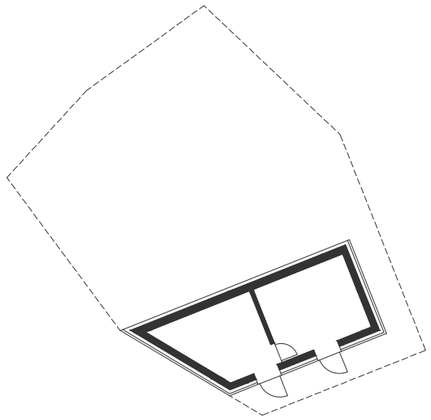
Structure, both floors and ceilings, are made of Cross Laminated Timber panels. The entire interior, including furniture, is made entirely out of untreated spruce wood.

The architects combined their know-how with the experience of the manager of the old hut. His inputs led to a spacious entrance with wardrobe allows alpinists to untangle their equipment inside.
Ground floor contains a kitchen and a large living and dining area. The 2 meter high windows let the sunlight in the depth of the room.

Bathrooms, drying and service rooms are on two levels below the entrance, while the sleeping accommodation opens up on two storeys towards the surrounding peaks. The ribbon-like arranged windows provide each of the sleeping cots - with 2 to 5 bunk beds in each - daylight and ventilation.

The smallest floor on top is occupied by the apartment of the manager. There is also a compact winter area with cooking opportunity, which can be heated outside of the operating season.

"My favourite thing about the house... I like the dining area with the view over the surrounding peaks, the most luxurious thing in the house. But the thing I like most about the project is the team spirit that we had up there. We were like a roped party: the success depended on collaboration and readiness to help. We all learned so much from each other. Because we all wanted to."



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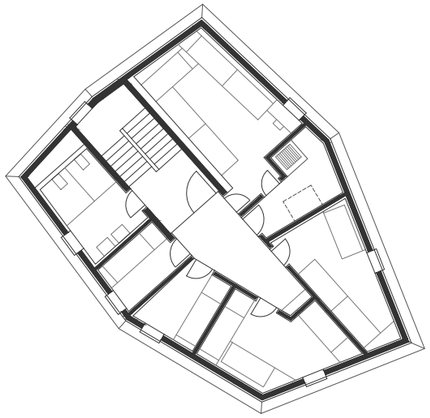

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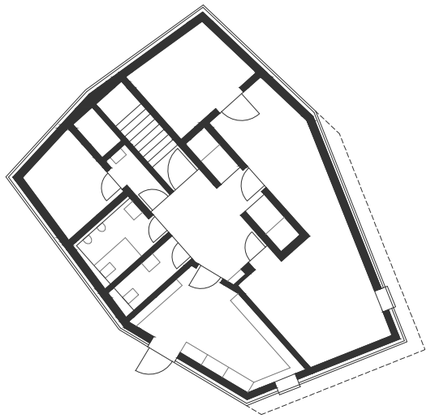

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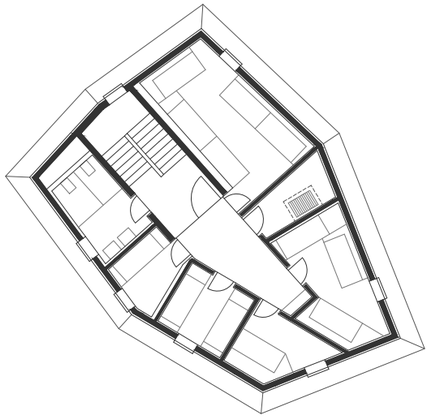

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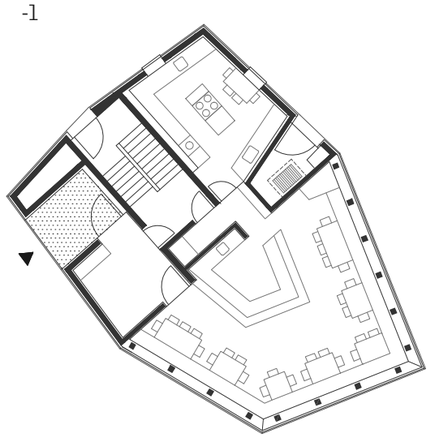

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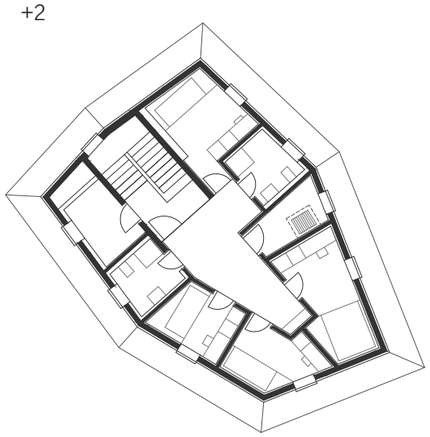

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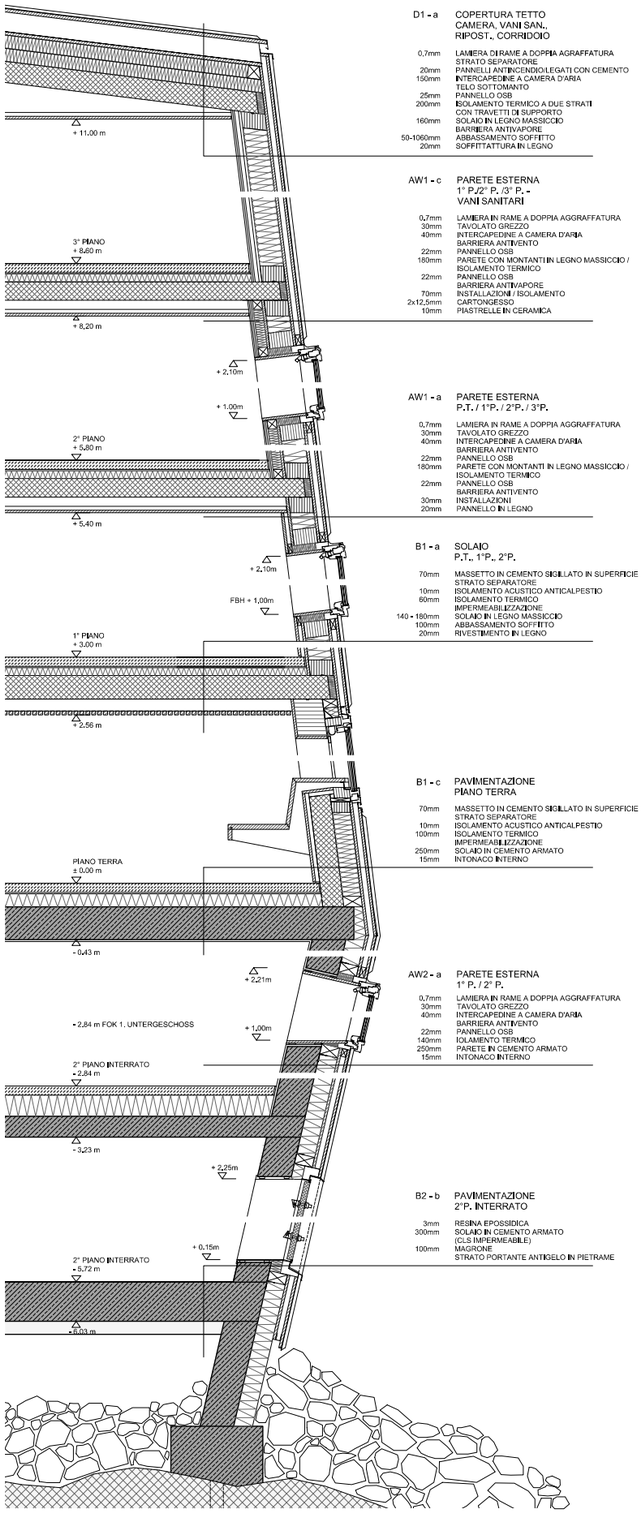
1 2 5

Floorplans. The entrance level contains the kitchen and the living area. Below, on levels -1 and -2, are all technical facilities as well as the storage and toilets. Upper floors - except for a minimal escape route on the northern facade - are devoted to providing a maximal number of sleeping opportunities. The efficient bedrooms for tourists are placed on 1. and 2. floor, whereas the 3. level houses the tenant's team.

"A dusk in the mountains is a very special and calm time,.
I think it's beautiful to watch the spectacle also from the inside of the building. Some people wanted us to mount TV screens, but we refused - one goes up to be immersed in nature."



D1 - a COPERTURA TETTO
CAMERA, VANI SAN., RIPOST., CORRIDOIO

0,7mm	LAMIERA DI RAME A DOPPIA AGRAFFATURA
	STRATO SEPARATORE
20mm	PANNELLI ANTINCENDIO LEGATI CON CEMENTO
150mm	INTERCAPEDINE A CAMERA D'ARIA
	TELO SOTTOMANTO
25mm	PANNELLO OSB
200mm	ISOLAMENTO TERMICO A DUE STRATI
	CON TRAVETTI DI SUPPORTO
160mm	SOLAIO IN LEGNO MASSICCIO
	BARRIERA ANTIVAPORE
50-1060mm	ABBASSAMENTO SOFFITTO
20mm	SOFFITTATTURA IN LEGNO

AW1 - c PARETE ESTERNA
1° P.,2° P., /3° P. -
VANI SANITARI

0,7mm	LAMIERA IN RAME A DOPPIA AGGRAFFATURA
30mm	TAVOLATO GREZZO
40mm	INTERCAPEDINE A CAMERA D'ARIA
	BARRIERA ANTIVENTO
22mm	PANNELLO OSB
180mm	PARETE CON MONTANTI IN LEGNO MASSICCIO /
	ISOLAMENTO TERMICO
22mm	PANNELLO OSB
	BARRIERA ANTIVAPORE
70mm	INSTALLAZIONI / ISOLAMENTO
2x12,5mm	CARTONGESSO
10mm	PIASTRELLE IN CERAMICA

AW1 - a PARETE ESTERNA
P.T. / 1°P. / 2°P. / 3°P.

0,7mm	LAMIERA IN RAME A DOPPIA AGGRAFFATURA
30mm	TAVOLATO GREZZO
40mm	INTERCAPEDINE A CAMERA D'ARIA
	BARRIERA ANTIVENTO
22mm	PANNELLO OSB
180mm	PARETE CON MONTANTI IN LEGNO MASSICCIO /
	ISOLAMENTO TERMICO
22mm	PANNELLO OSB
	BARRIERA ANTIVENTO
30mm	INSTALLAZIONI
20mm	PANNELLO IN LEGNO

B1 - a SOLAIO
P.T., 1°P., 2°P.

70mm	MASSETTO IN CEMENTO SIGILLATO IN SUPERFICIE
	STRATO SEPARATORE
10mm	ISOLAMENTO ACUSTICO ANTICALPESTIO
60mm	ISOLAMENTO TERMICO
	IMPERMEABILIZZAZIONE
140 - 180mm	SOLAIO IN LEGNO MASSICCIO
100mm	ABBASSAMENTO SOFFITTO
20mm	RIVESTIMENTO IN LEGNO

B1 - c PAVIMENTAZIONE
PIANO TERRA

70mm	MASSETTO IN CEMENTO SIGILLATO IN SUPERFICIE
	STRATO SEPARATORE
10mm	ISOLAMENTO ACUSTICO ANTICALPESTIO
100mm	ISOLAMENTO TERMICO
	IMPERMEABILIZZAZIONE
250mm	SOLAIO IN CEMENTO ARMATO
15mm	INTONACO INTERNO

AW2 - a PARETE ESTERNA
1° P. / 2° P.

0,7mm	LAMIERA IN RAME A DOPPIA AGGRAFFATURA
30mm	TAVOLATO GREZZO
40mm	INTERCAPEDINE A CAMERA D'ARIA
	BARRIERA ANTIVENTO
22mm	PANNELLO OSB
140mm	ISOLAMENTO TERMICO
250mm	PARETE IN CEMENTO ARMATO
15mm	INTONACO INTERNO

B2 - b PAVIMENTAZIONE
2°P. INTERRATO

3mm	RESINA EPOSSIDICA
300mm	SOLAIO IN CEMENTO ARMATO
	(CLS IMPERMEABILE)
100mm	MAGRONE
	STRATO PORTANTE ANTIGELO IN PIETRAME

A section shows the facade layers and the details of the protruding windows. The first two floors were casted in concrete, as they are partially submerged beneath the ground and serve as a foundation, wheras the upper floors are constructed out of wood. The metal cladding on a thick insulation layer unites both types of construction into one object, looking like a shiny rock.

QUESTIONING THE EXISTENCE OF ALPINE TRADITION

As the project was published, part of the public opinion was shocked with the form and accused architects of breaking with tradition. But there is no actual tradition of alpine buildings in South Tyrol. The first mountain huts were erected in late 19th century by German alpine clubs and copy of urban bourgeois houses - only constructed with locally sourced stone. Stifter + Bachmann were not trying to invent a new typology nor come up with particular aesthetics. Many of the spectacular spacial features of the house, among them the 180 degrees panorama and placement of the windows, were result of precise embedding in the landscape.

"I was happy to return to my roots 40 years later and build a new hut where I come from. Alas, knowing the place, I realised that the glacier shrunk horribly, revealing a field of huge rocks. Actually, our house is just one of those rocks."

VELUX specialists were consulting the project from an early stage, and assured the architects that there is no need for underwater windows nor other extreme solutions. Apart from the gas pressure compensation and slight alteration of sealings, no other customisation to a standard VELUX window was necessary.

Following the suggestion of KUB Ingeneure, an experienced facade planner, the windows are slightly protruding the facade to allow water and snow to run off smoothly. The architects achieved a spectacular appearance with affordable, accessible materials. The beauty of the building is the result of the precise form elegant detailing - the only thing that increased the cost is the extreme alpine location of the house.

The windows are also easy to use for the guests, as everyone knows how to operate them for airing. They have no sun protection: the climbers go to bed at dusk and get up with the sunrise. The whole house follows the rhythm of nature.

"We didn't expect to be able to use an uncustomized product, and in fact, the adjustments were minor. The sealings were changed, but actually, I guess that a 100% standard window would do the job as well."

AN EXTREME CONSTRUCTION SITE

The materials were transported with a temporary cable car from where the road ends at 1800m above the sea level, while the workers were brought up by helicopter. They stayed in the old hut and walked down to the valley once a week.

Another less obvious challenge was the difference in air pressure between the site and the Velux factory. The gas in the chamber between the glass layers would have exploded in high altitude.
In each glazing unit a hole of 3mm was drilled, to enable a fluid adjustment of the gas volume during the transportation. The holes were opened three times during the transport: at 1100 in the village, 1800 at the cable car station, and finally at 3000 meters on site.

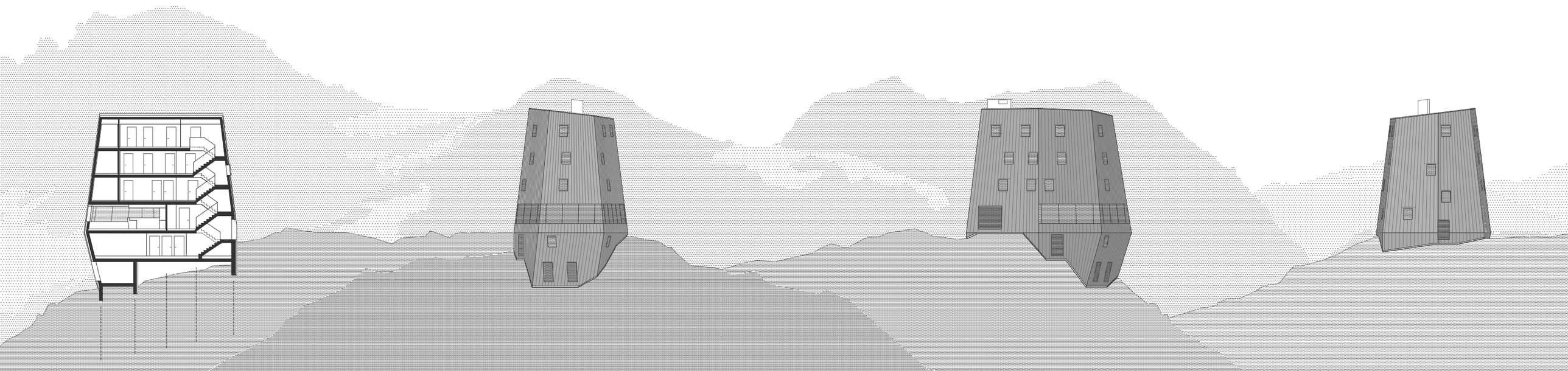
"One cannot predict how the weather evolves up in the mountains, and as a result, what work can be done in a particular week. The whole construction team had to coordinate every day. We were on the phone with each other more often than with our families."

A DAYLIGHT IS THE MOST EFFICIENT ENERGY SOURCE

Following the new trend of energy self-sufficient alpine buildings, the Sasso Nero hut is to 80% well insulated without further heating system. Passive solar gains through the roof windows secure a comfortable indoor climate on each floor from June to September. The strategic placement of the windows additionally facilitates natural ventilation.

90qm solar panels on the roof, connected to energy storage in the basement provide electrical energy which activates the heating and ventilation system for the kitchen and the dining area.
Gas, transported up in little bottles, is used for cooking.
A biodiesel-powered power generator backs up the system for long bad weather periods: the hut stands sharp on the meteorological divide, so cloudy weeks happen often.

Section and facades embedded in the landscape.
© all plans Stifter + Bachmann








Filmstills from a movie documenting the construction process.






PROJECT DATA

Design:	2012 - 2015
Construction:	8 months between June 2015 - October 2017
Gross area:	716.40 m2
Usable area:	510 m2
Volume:	2070 m3
Cost:	2.970.000 EU, including equipment
Elevation:	3026 m a.s.l.
Capacity:	50 beds
Client:	Province of Bozen, IT
Architects:	Stifter + Bachmann
General planner:	Stifter + Bachmann
Building services:	Ingenieurteam Bergmeister GmbH
Facade engineering:	KUB - Ingineure, Gerhard Böhler
General contractor:	Oberlechner & Messner + Burgerbau KG & Co
Structural engineer:	Ing. Stefano Brunetti
Supervision:	Ing. Stefano Brunetti
Photos:	Oliver Jaist

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