Politecnico di Milano

SCHOOL OF ARCHITECTURE, URBAN PLANNIG, CONSTRUCTION & ENGINEERING
Master of Science LM.4 – Sustainable Architecture and Landscape Design

# Between nature and history: new sustainable turism in the Valley of Signs

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# ABSTRACT


**ITA**

Avendo da sempre vissuto in Valle Camonica, sono ben a conoscenza della situazione turistica e ambientale della mia valle. Ho deciso di unire la mia attenzione per l'ecosostenibilità ad una necessità di rinnovamento che molti mi hanno confermato essere presente.
Il mio percorso di studi mi ha permesso di sviluppare le conoscenze e le abilità migliori per sviluppare un progetto che si spero si possa rilevare come il turismo del futuro, non soLo in Valle Camonica, ma anche nel resto del territorio italiano.
Gli studi dell'ambiente e l'applicazione di metodi per la salvaguardia e il recupero di zone a rischio mi hanno portato alla creazione di un edificio che risulta essere utile dal punto di vista ecologico e, allo stesso momento, ben integranto con l'ambiente circostante, rendendo l'esperienza del turista - o del ciclista, in particolare - la migliore possibile.

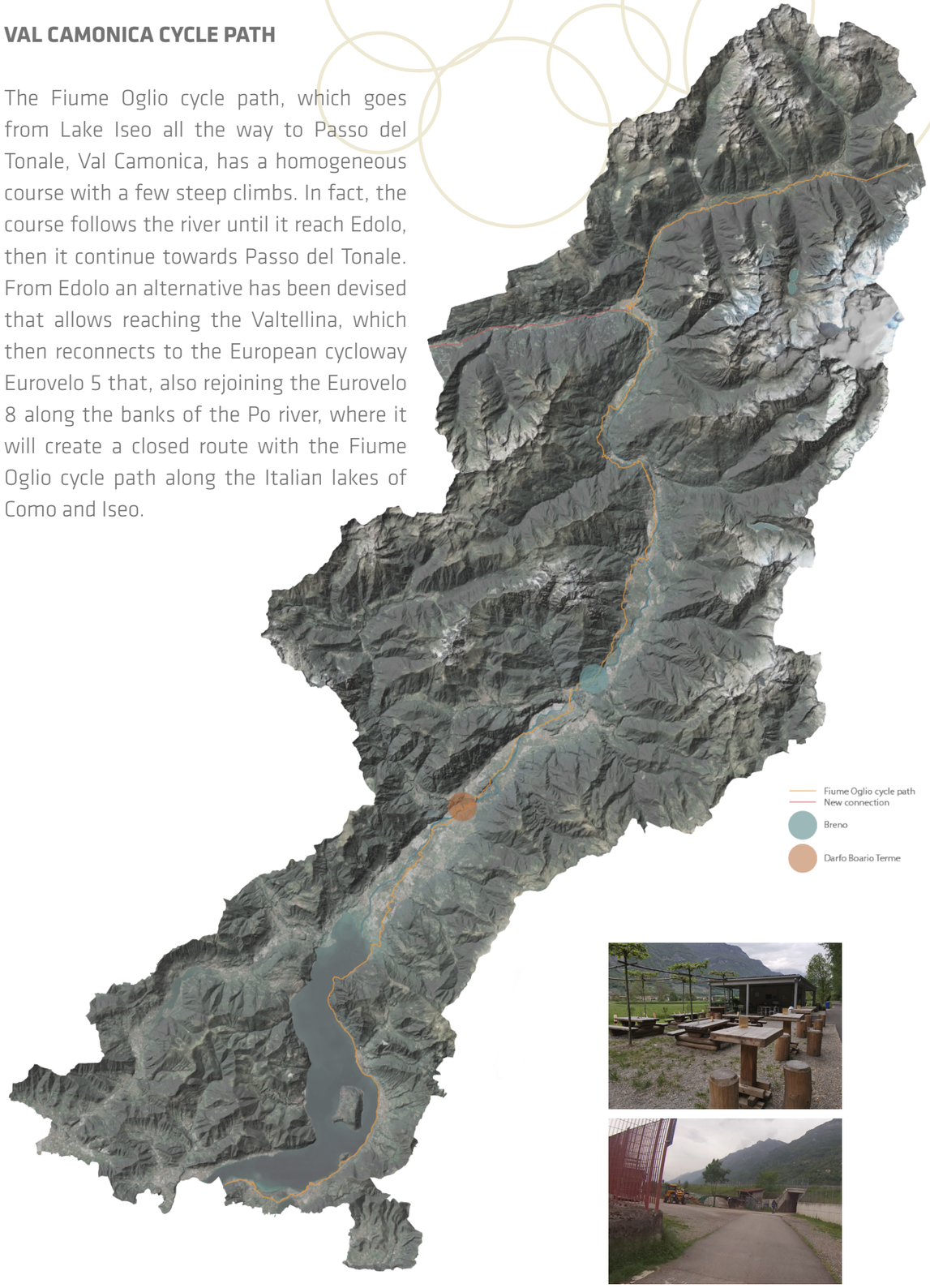
**ENG**

Having always lived in Valle Camonica, I am well aware of the tourist and environmental situation of my valley. I decided to combine my attention for eco-sustainability with a need for renewal that many have confirmed to me to be present.
My studies allowed me to develop the best knowledge and skills to develop a project that hopefully can be seen as the tourism of the future, not only in Valle Camonica, but also in the rest of the Italian territory.
The studies on the environment and the application of methods for the protection and recovery of areas at risk led me to the creation of a building that is useful from an ecological point of view and, at the same time, well integrated with the surrounding environment, making the experience of the tourist - or of the cyclist, in particular - the best possible.

# CYCLE ROUTES

## VAL CAMONICA CYCLE PATH

The Fiume Oglio cycle path, which goes from Lake Iseo all the way to Passo del Tonale, Val Camonica, has a homogeneous course with a few steep climbs. In fact, the course follows the river until it reach Edolo, then it continue towards Passo del Tonale. From Edolo an alternative has been devised that allows reaching the Valtellina, which then reconnects to the European cycloway Eurovelo 5 that, also rejoining the Eurovelo 8 along the banks of the Po river, where it will create a closed route with the Fiume Oglio cycle path along the Italian lakes of Como and Iseo.





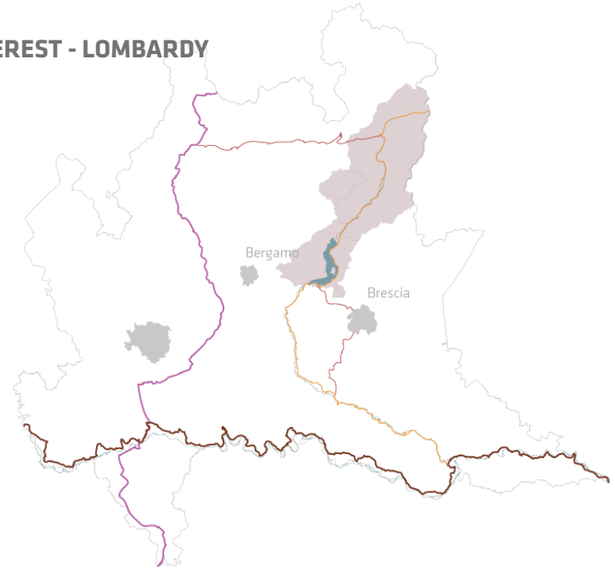



## CYCLE ROUTES OF INTEREST - EUROPE

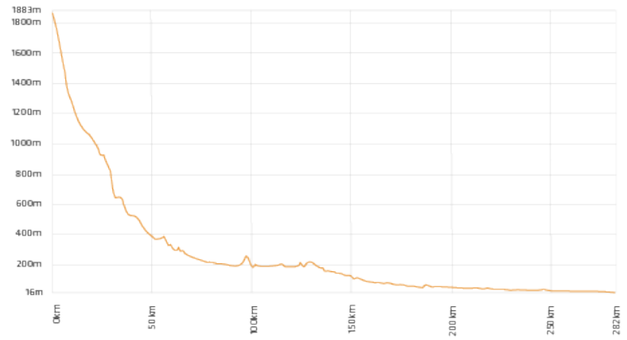

In Europe every year more and more cycloways are born, allowing an ecological connection through the various Countries. Some of them extend throughout the European continent, as in the case of Eurovelo 7, which runs from the extreme north of Norway to the Mediterranean Sea, more precisely to the island of Malta. On the other side the EUROVELO 8 runs through the continent from Seville to Athens, in an East-West direction.

Among the cycling routes that affect Italy, in addition to those previously mentioned, we find the Eurovelo 5 (Ancient Via Francigena) which, passing along the Central Europe, ends on the Adriatic Sea.

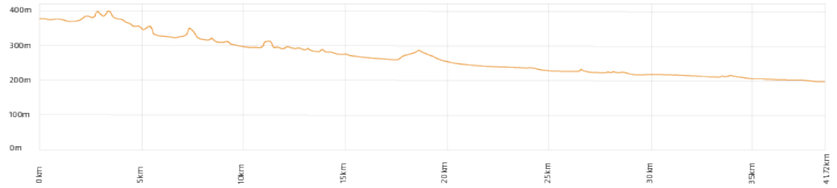
## CYCLE ROUTES OF INTEREST - LOMBARDY



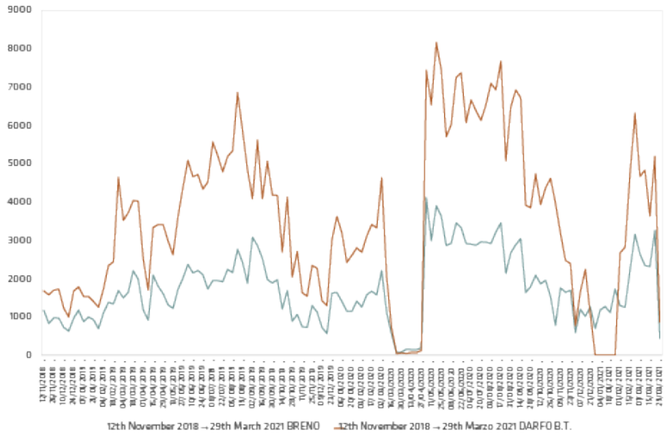

Looking at a smaller scale, there are more cycle routes interesting the whole Lombardy region, other than the Fiume Oglio cycle path. Val Camonica, the main elemen the cycle path goes through, has an extension of about 280 kilometers and an elevation that reaches 1883 meters above sea level near Passo del Tonale (1).




(1) Difference in altitude along the Fiume Oglio cycle path between the Passo del Tonale and the mouth of the river.




(2) Altimetric difference along the Fiume Oglio cycle path along the Val Camonica.




(3) Number of transitions from 2018 to 2021 at the detectors of Breno and Darfo Boario Terme.

The data collected by the Mountain Community at points in both Darfo Boario Terme and Breno (3),however, show a disparity of use by the population, partly due to the qualitative differences of the different sections of the route.

White War museum (IWW)

Rock carvings

Gleno dam

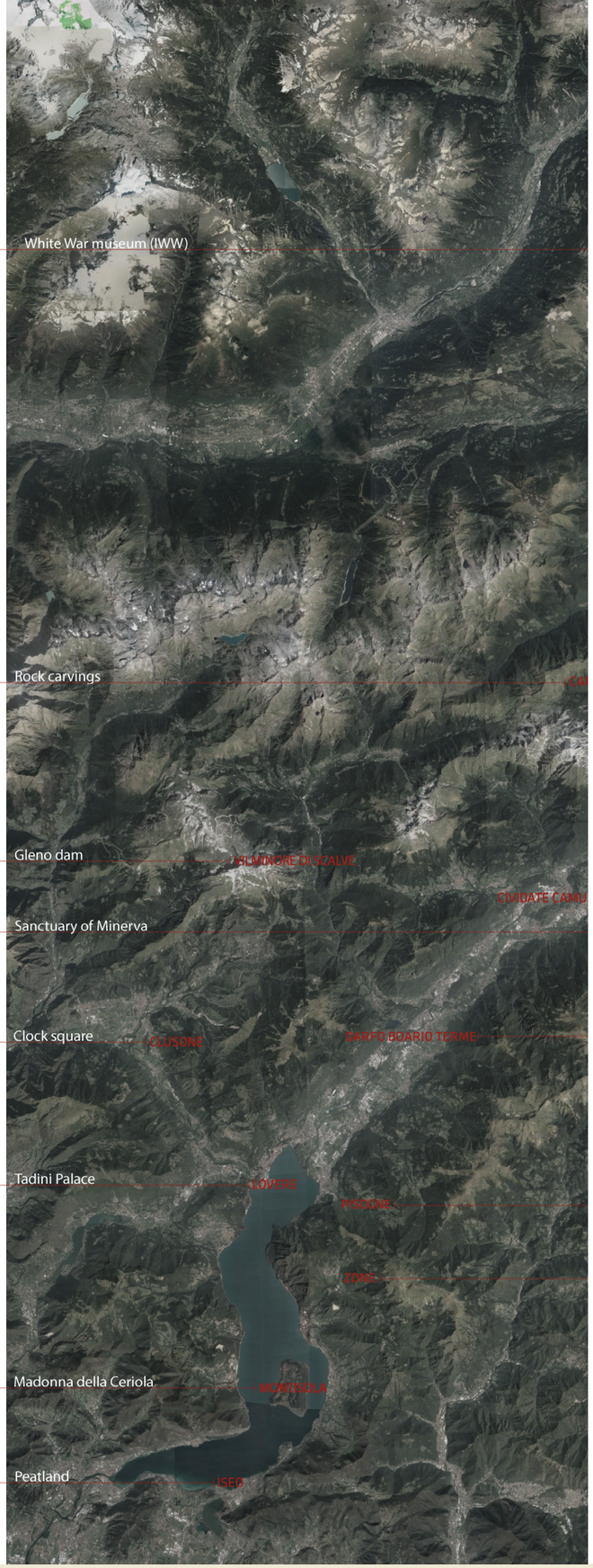
Sanctuary of Minerva

Clock square

Tadini Palace

Madonna della Ceriola

Peatland




Military shrine of the Tonale

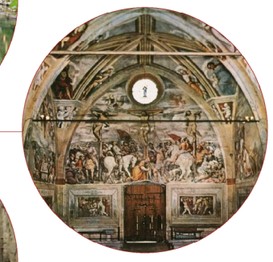
Natural reserve of Adamello

Castel of Cimbergo

Roman amphitheatre

Village of Artists

Roman bridge



Church of Romanino

Pyramids natural reserve

# ANTHROPOLOGICAL LANDSCAPE

## CONNECTIONS

As for the connections that stem from the main neighbouring cities of Brescia, Bergamo and Milan, large infrastructures allow a considerable connection on both wheel and rail.

Arriving on Lake Iseo, these connections reduce considerably in size due to morphological and environmental issues, still given that the towns remain well connected and in each of them the respective railway stop can be found.
By 2023, the railway between Brescia and Edolo will have a full set of hydrogen trains, which will help to diminish air pollution.

## BUILT

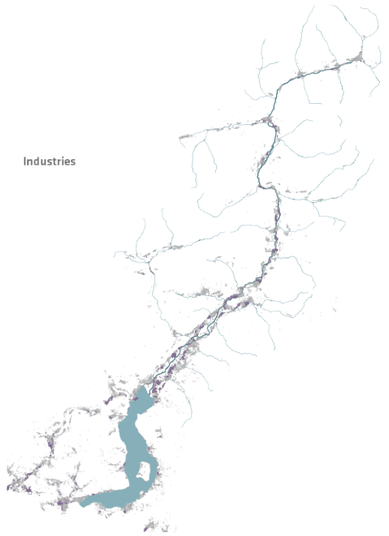
As you can see from the maps, the anthropized landscape develops mainly along the valley bottom and in the areas adjacent to the water streams (1).

These urban agglomerations are divided into small villages that extend from Lake Iseo to Passo del Tonale, at the foot of the Presena glacier.

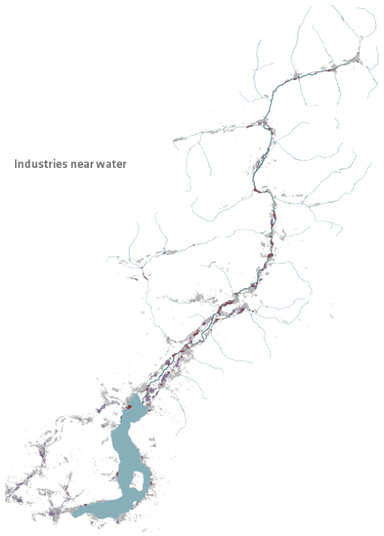
Over time, these small towns have developed industrial areas that have gradually expanded, reaching the River Oglio and its tributaries, building immediately close to the water, as in the case of steelworks, very present in this area (2).

Because of the use of water in steel processing, spills can occur, causing damage to the entire ecosystem. This problem will concern not only the Val Camonica, but all the land that the river Oglio will touch, until it flows into the Po (3).

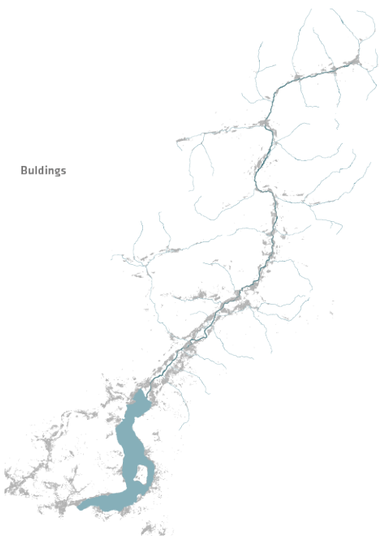
Industries



Industries near water



Buildings



# GEOMORPHOLOGY OF THE LANDSCAPE

## COMPOSITION

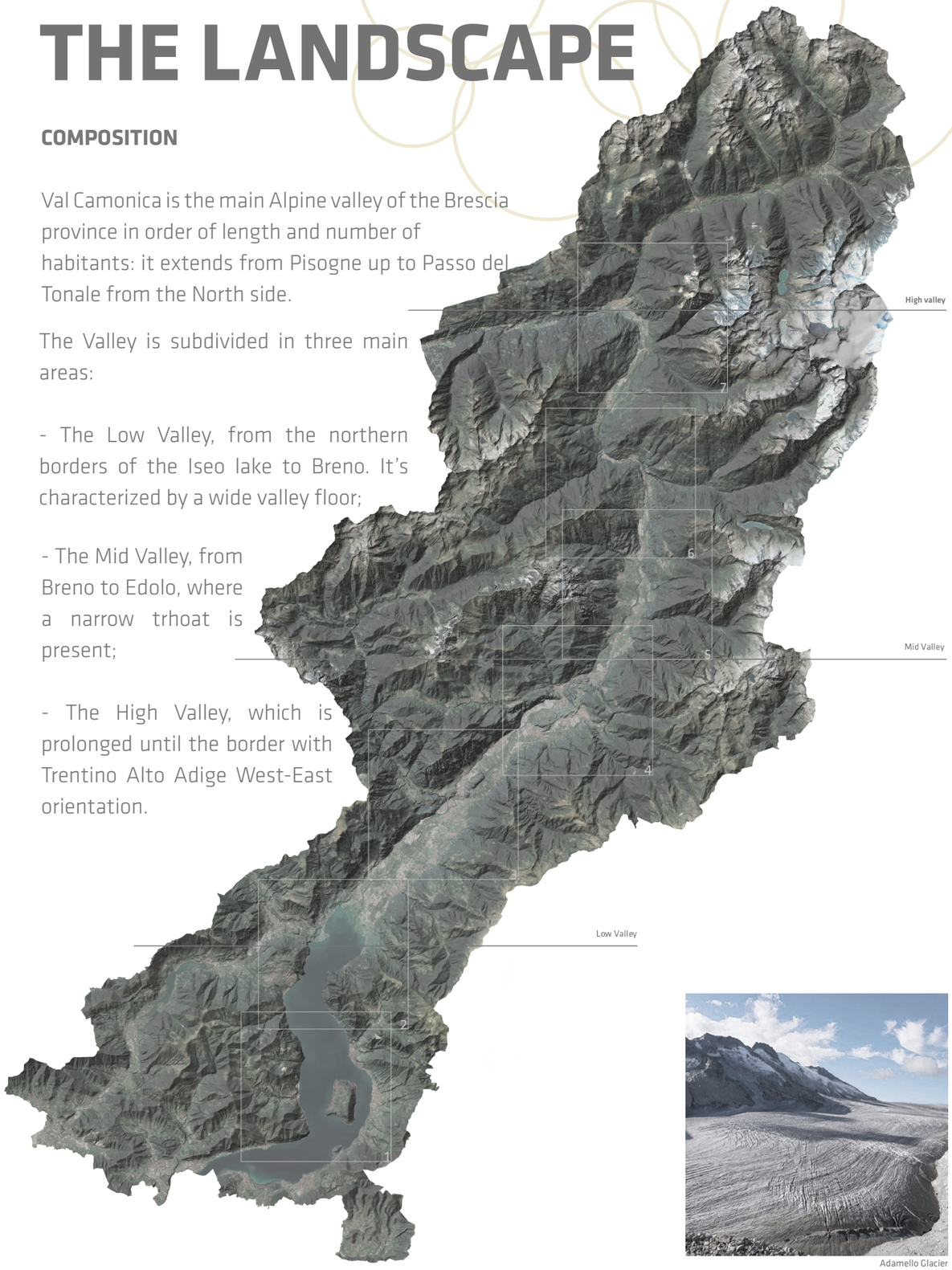
Val Camonica is the main Alpine valley of the Brescia province in order of length and number of habitants: it extends from Pisogne up to Passo del Tonale from the North side.

The Valley is subdivided in three main areas:

- The Low Valley, from the northern borders of the Iseo lake to Breno. It's characterized by a wide valley floor;

- The Mid Valley, from Breno to Edolo, where a narrow trhoat is present;

- The High Valley, which is prolonged until the border with Trentino Alto Adige West-East orientation.



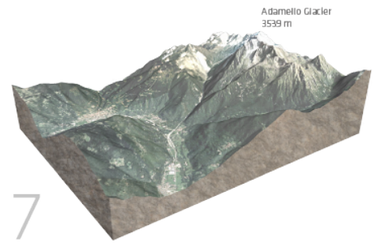


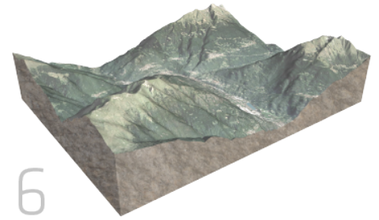
Adamello Glacier

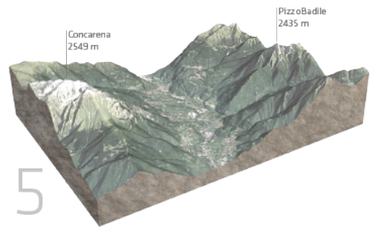
## FORMATION

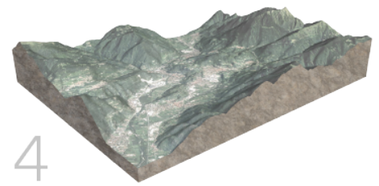
The valley furrow formed during the last glacial period, the glaciation of Würm, 15 000-10 000 years ago. During this period the ice of the Adamello Glacier extended until the Po Valley and measured 1 500 meters high in the current Low Valley. When it advanced, it created the Iseo Lake and formed the hills of Franciacorta.

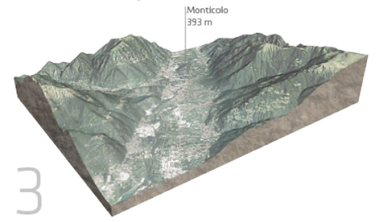
Sandstone suffered the major effect of the work of the glacier, becoming flat and smooth. On this tipical stone the first hunters who lived in the area sculpted scenes of daily life, hunting and religious simbols.
However, there is a harder kind of sandstone, called Simona Stone, that forms the Monticolo and other hills in the Low Valley. This particular stone contrasted the strength of the erosion and is still well visible nowadays in the valley.

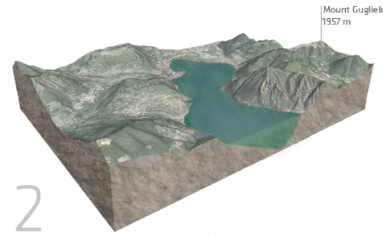


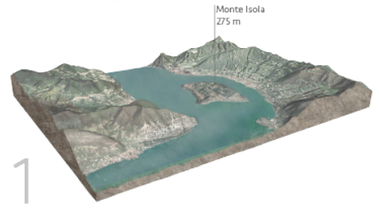



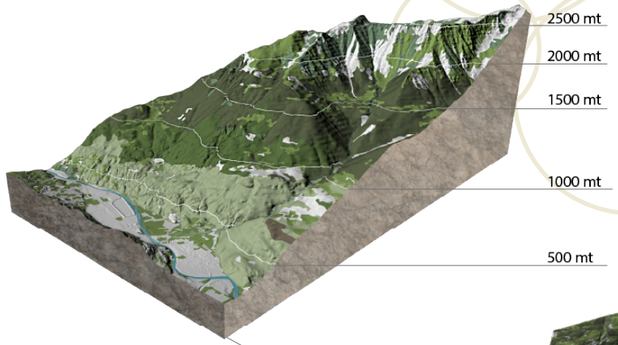



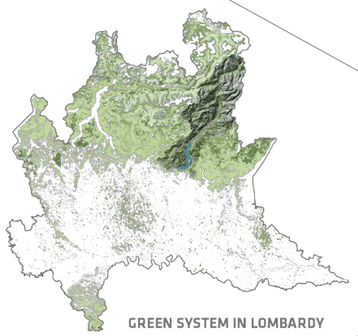



# NATURAL SYSTEM





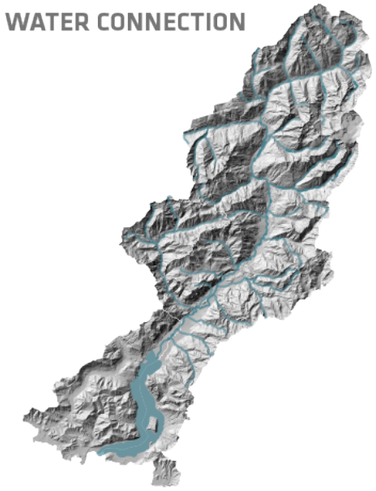


Being an alpine landscape, in Val Camonica there is a predominant biodiversity, especially considering the vast difference in height between the valley floor and the snow-capped peaks. This biodiversity has been divided, for classification purposes, into six main types of vegetation: from simple grass to coniferous forests.

## NATURAL PARK

**Natural Park**: this area is rich in natural parks, such as the regional Adamello park - the largest in terms of size and importance. Furthermore, there are traces of old river parks along the Oglio river.

## WATER CONNECTION

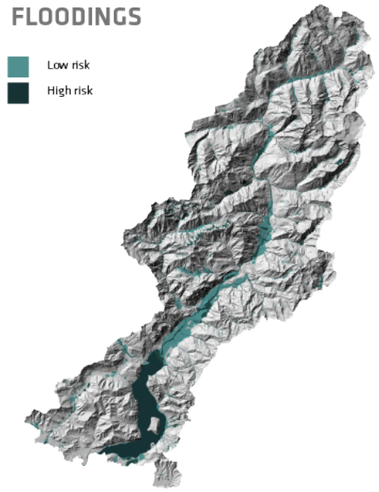


**Water connection**: with the melting of snows and glaciers, numerous temporary streams are created during the spring and summer seasons that form an intricate water network. This flows from the upper valley down to Lake Iseo, increasing the area's water reserves

## LANDSLIDES

**Landslides**: due to the steep slopes, especially in the upper valley, there is a risk of landslides in the mountain areas, which are mitigated by the abundant vegetation

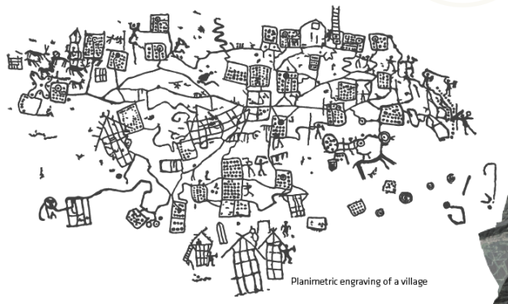
## FLOODINGS




**Flooding**: there is always a flood risk, which however remains very low, except at the bottom of the valley in the areas adjacent to the lake.

The vegetation goes from the Po valley one to the typical alpine environment. The first is made up of poplars, elderberry and locust trees; the second from chestnut, fir and beech trees.

# ANTHROPOLOGICAL HERITAGE



Planimetric engraving of a village

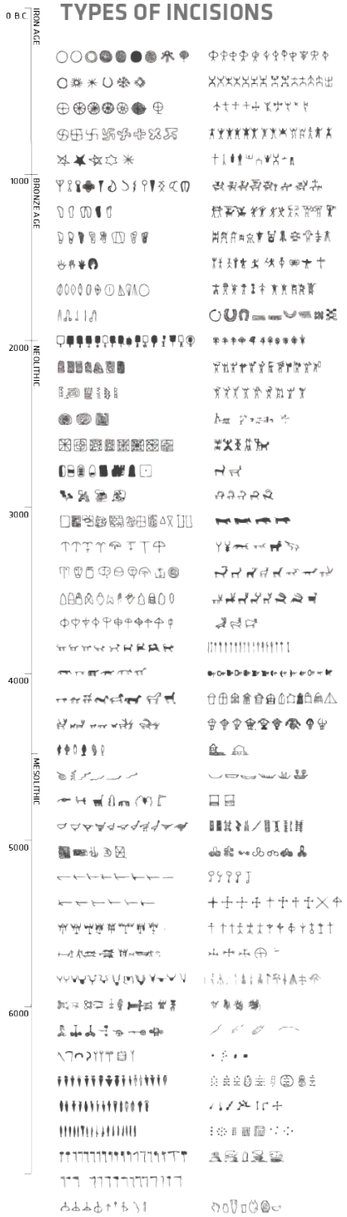



## BUILDINGS DURING THE AGES

More than 6000 years ago the first men arrived in Val Camonica, initially for short periods in search of animals to hunt and for the collection of spontaneous fruit. Only around 5000 B.C. they settled where they found natural shelters, organizing for a stable permanence.
Over the next 4000 years they built real and proper buildings that formed small villages, first shelters and huts along the headlands. In the Bronze Age, thanks to new technologies, they were able to inhabit - reclaiming it - the low valley that made necessary the construction on stilts. It is only during the Iron Age that the building typologies changed again, the villages were fortified moved to the coast of the mountain to allow a visual connection.

## INCISIONS

During the millennia in which man settled in the valley, they have produced hundreds of thousands of rock engravings that are now part of the UNESCO heritage.
These works of art vary greatly in size and theme: in fact, you can find small signs depicting things from human figures and animals, to sacred symbols or large composite drawings of village plans that can reach almost 20 square meters.



# STRATEGY PLAN

## Strenght

- great biodiversity
- cultural heritage
- already existing and used cycle path
- landscape relevance

## Weakness

- lack of support points for cyclists
- abundance of man-made places
- dangerous spots along the cyclepath

## Opportunities

- tourist potential of the valley
- use of renewable sources for construction

## Threats

- growth of the urban fabric
- pollution of the natural environment

# PROJECT SOLUTION

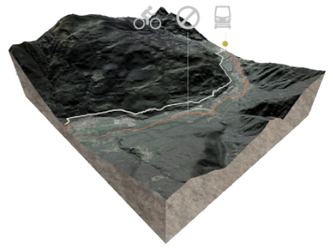
New connections to uniform with the European Cyclepath system

Solve the dangerous spots changing the path with safer solutions

Increase the cyclepath in order to improve the quality and create shadow zones for a better use also during the summer

Creation of spots to support the traveller along the cycle path

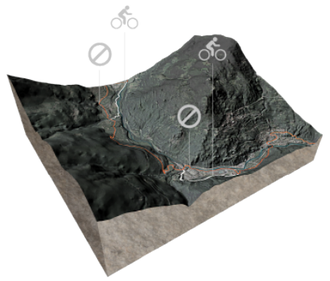

**7**



The cycle path is flanked by the SS42, a dangerous strecth of road, without any type of barrier or protection for cyclists.

The new section of the cycle path will run along the west side of the valley, using an existing agro-pastoral route.

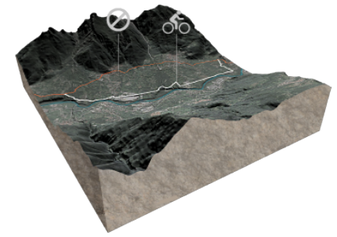
**6**



This stretch passes within the industrial area, taking advantage of the main road in some sections.

The new section will use existing roads along the side of the mountain which will improve the visual perception of the route.

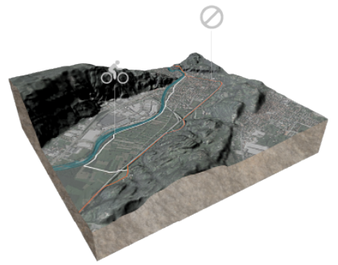
**5**



The currently existing stretch passing through the villages of Ono San Pietro and Cerveno represents a deviation from the logical path of the cycleway, increasing its difficulty

The new section will be on the valley floor, allowing a faster and more characteristic journey along the river.

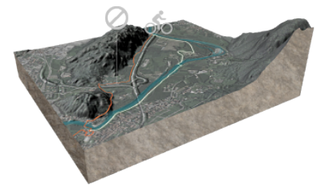
**4**



This stretch is flanked by SS42 for a long stretch, creating disturbance to the user of the cycle path.

The new section, passing through the historic centre of the town of Cividate Camuno is then flanked by the Oglio river.

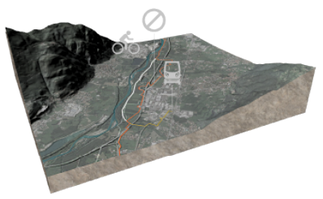
**3**



This stretch is flanked by SS42, ending in an area that is not easily recognizable, causing confusion in the cyclist, also due to the absence of signs

The new section will follow along the river and the adjacent fields, re-joining then an existing section.

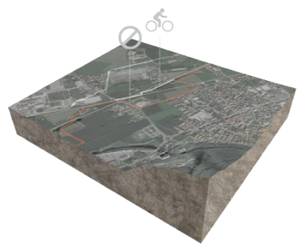
**2**



This stretch at the same level as a main part of SS42, resulting in noise and air pollution

The new section will run parallel to the SS42, more than 150m from the road and near the river.

**1**

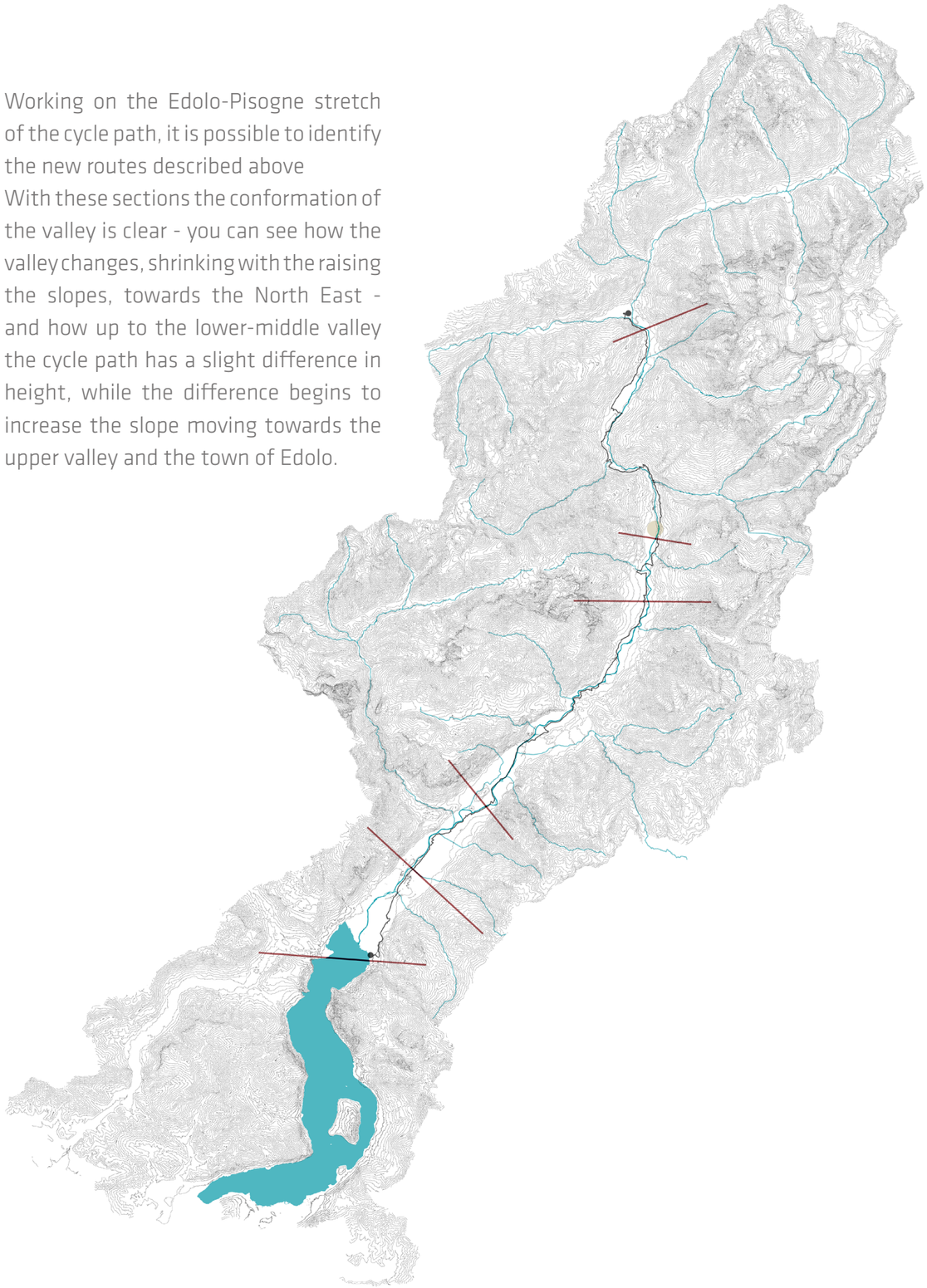


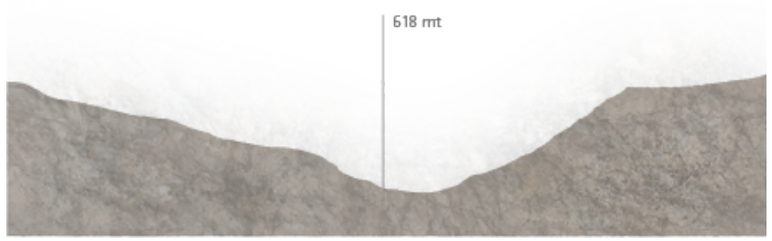
This stretch crosses the main road in a particularly dangerous point for the safety of cyclists, and then enters the center of the village of Gratacasolo.

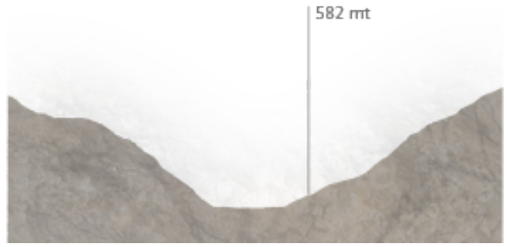
The new section uses an existing road, with little traffic, without excessively changing the trail

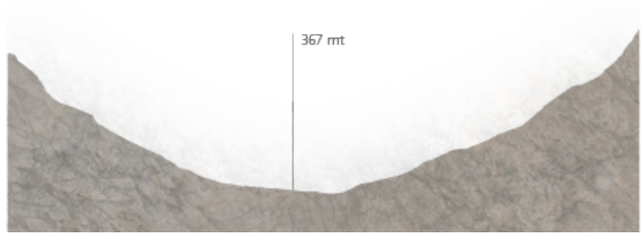
# CYCLE PATH PROJECT

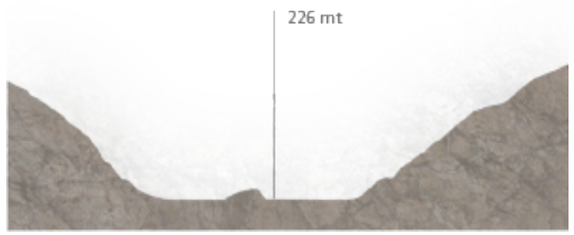
Working on the Edolo-Pisogne stretch of the cycle path, it is possible to identify the new routes described above
With these sections the conformation of the valley is clear - you can see how the valley changes, shrinking with the raising the slopes, towards the North East - and how up to the lower-middle valley the cycle path has a slight difference in height, while the difference begins to increase the slope moving towards the upper valley and the town of Edolo.

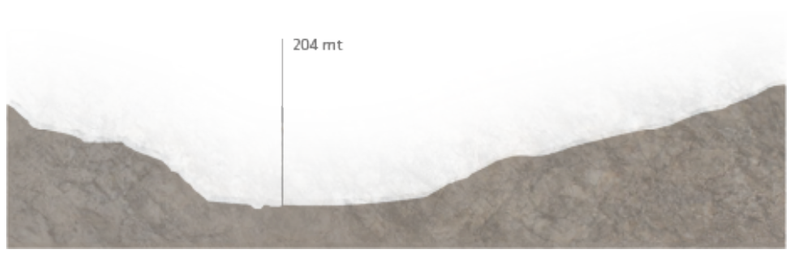


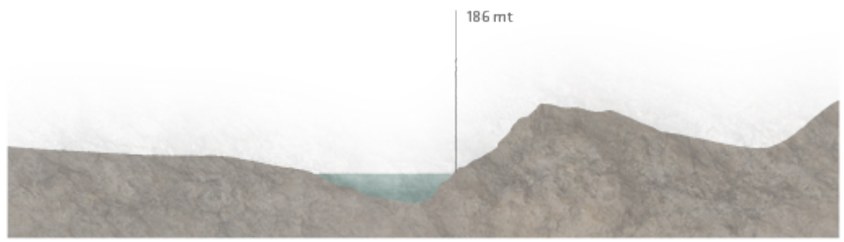


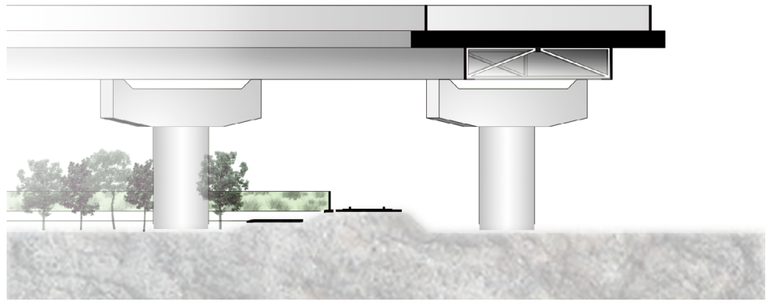





**1** The first section of the cycle path is built under the long overpass of the SS42 near Gratacasolo and, due to the nearby railway, a green barrier will be built to mitigate both the sight and the noise of the trains It will then flank the high embankment, where black locust trees will be planted, up until it re-joins the old path. An illustrative notice board about the route, historical notes and cultural information of the area will be placed at the intersection of the two routes.

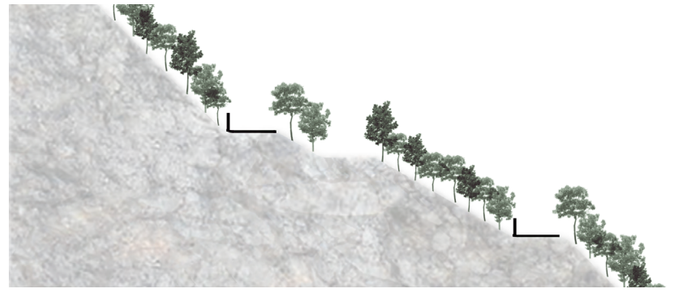
**2** Along this new stretch of the cycle path, positioned along a tree-lined barrier running along the Oglio river, will be created a resting area with a bar, information centre and various services for cyclists and tourists (mechanics, etc.).

**3** The new section is overpassed by the SS42 in order to limit the visual and acoustic impact of the latter. In addition, the current presence of trees and the future afforestation in the South will create shady areas where tourists can rest during the hottest periods.

**4** A new section will distance itself from the SS42, flanking the river. As its tree-lined embankments to the north block the presence of a nearby industrial area from view, but do not allow shaded areas during the day. Plane trees will therefore be planted south of the cycle path to overcome this problem.

**5** The new stretch, passing through Capo di Ponte, runs along the Oglio river and crosses the prehistoric rock engravings theme park of the same name. The hospitality project described in this thesis will also be found in this area.

**6** The new stretch runs along the river, where a mix of trees will be planted, including firs, chestnuts and locust trees. In addition, a rest area with parking spots will be created to allowa easy access to the route.

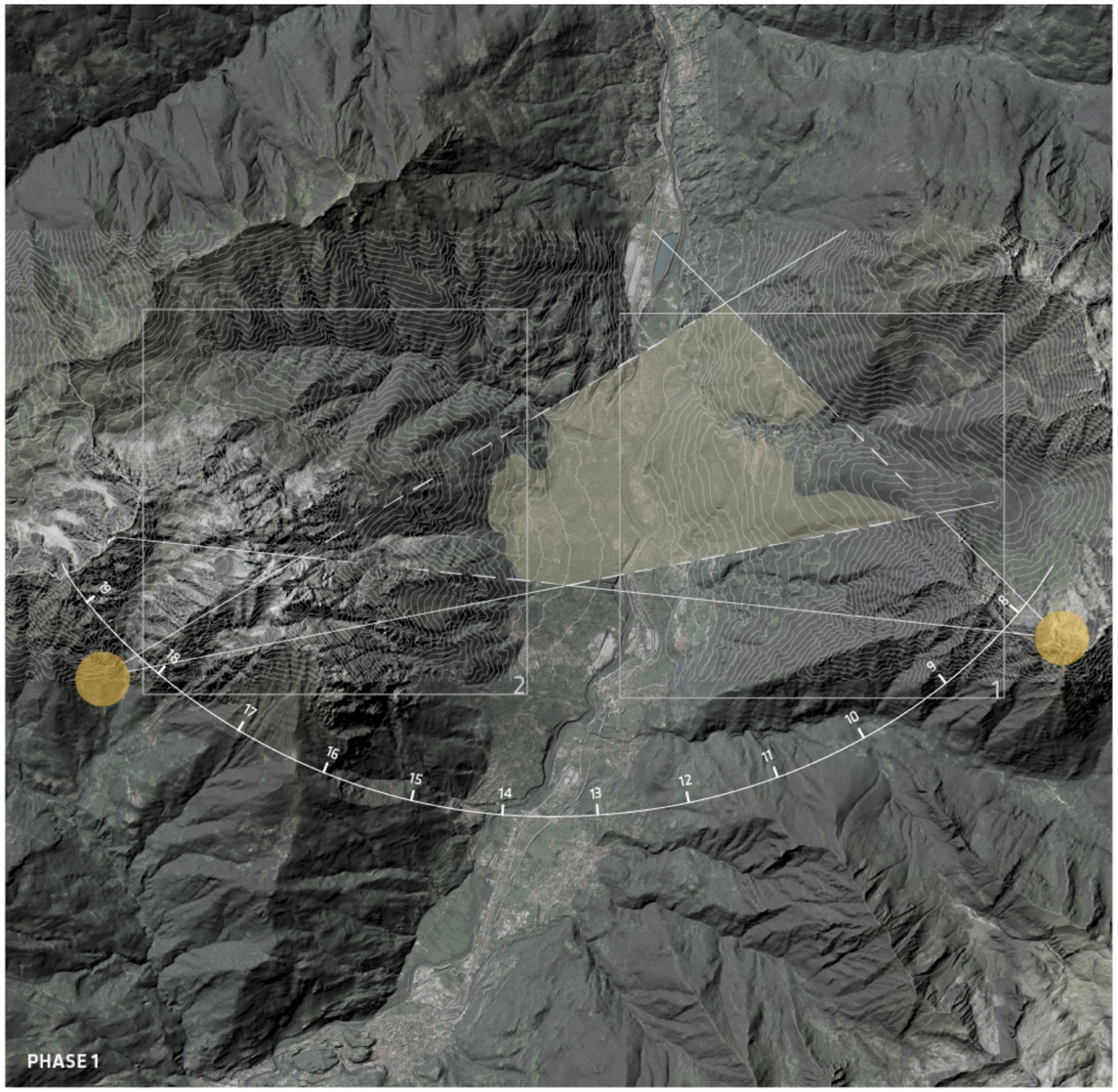


**7** The new section, created using an existing pastoral road, unravels along the west side of the valley until it reaches the Edolo train station. Given the slope of the mountainside, some containment walls will be built along the route to avoid landslides.

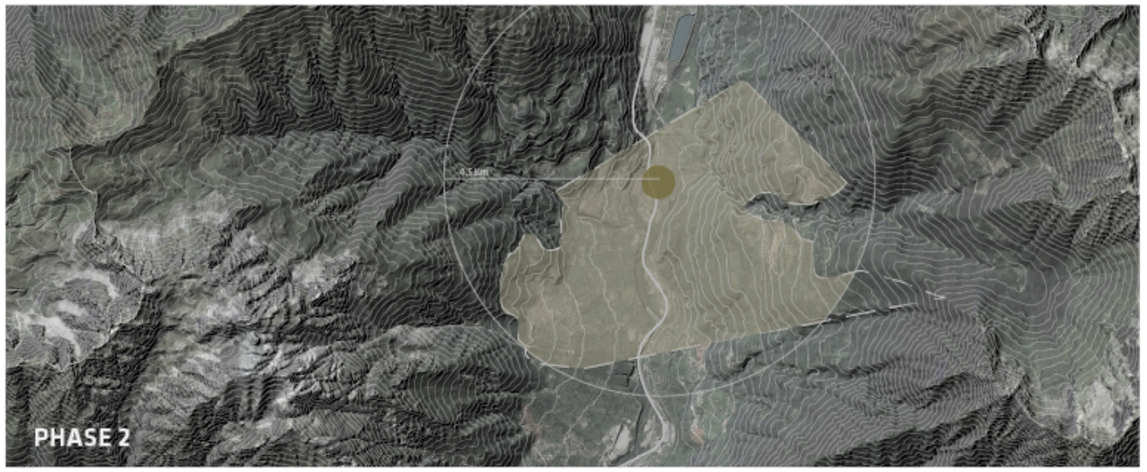
# AREA DETECTION

## HOW THE AREA IS DETECTED

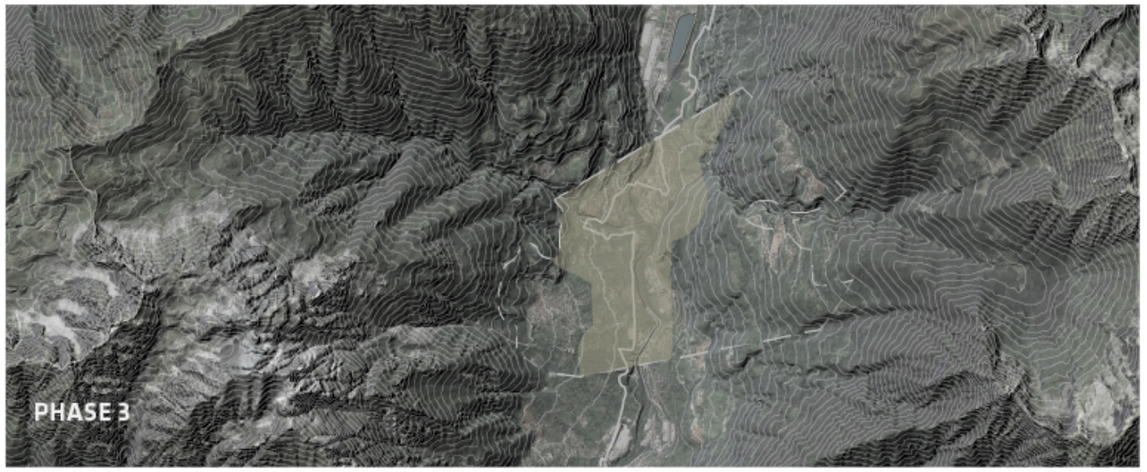
Analyzing the area of the Val Camonica has decided the area adjacent to the village of Capo di Ponte to intervene in the project, creating a place where cyclists can stop and refresh. This area was chosen based on the presence of two mountains considered sacred by the ancient Camuni, the Pizzo Badile to the east and the Concarena to the west that, during the equinoxes create spectacular plays of light and shadow. The identification work is divided into four phases:



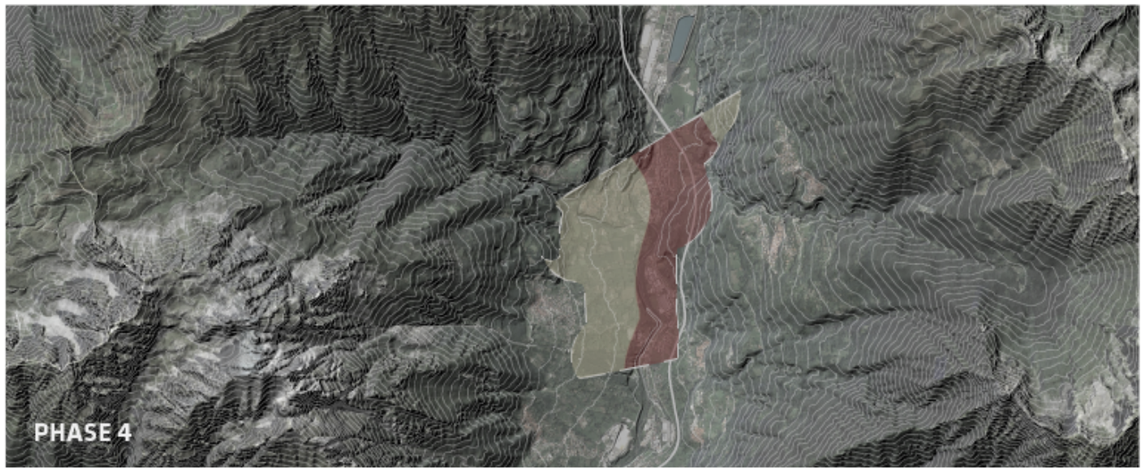

**PHASE 1** - After having identified with the two optical cones the area affected by the light games during the equinoxes, some areas have been subtracted which, because of the course of the ground would not allow full sight.




**PHASE 2** - it has been identified the nearest railway station and tracing a radius of 4.5 kilometers it has gone to define an area that will allow rapid access for travelers who decide to arrive in Val Camonica using the train;




**PHASE 3** - With regard to the cycle path, a buffer area of 500 meters has been designed in which the project can be inserted, thus keeping it close to the passage;

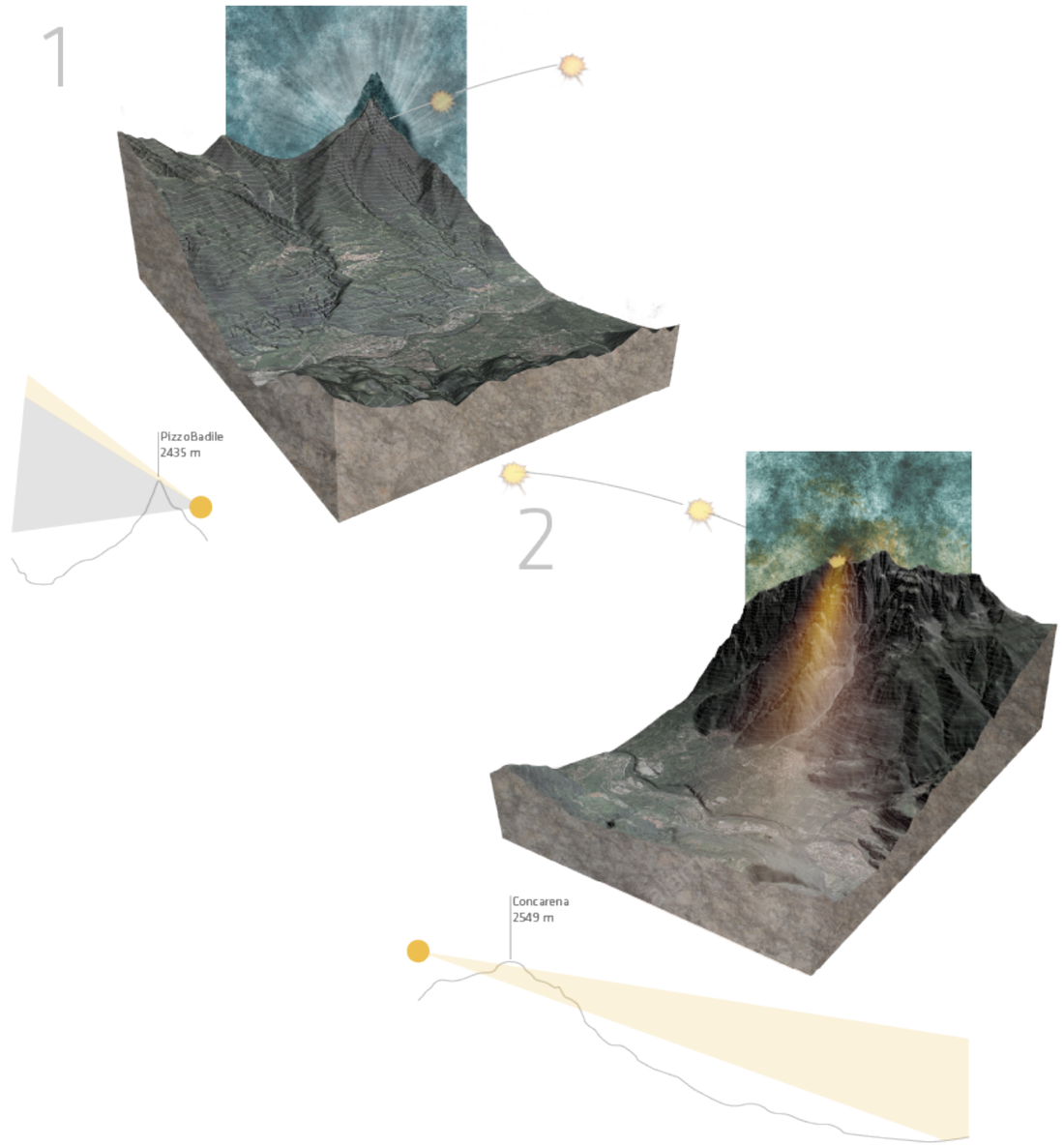


**PHASE 4** - In the last phase we started from the identification of State Road 42, the main connection of the place, and also in this case a ‘buffer area of 500 meters has been drawn which, however, will be removed from the selection to minimize the visual and noise pollution that cars and trucks would create during the passage.

Cycle path

SS 42


Train station in Capo di Ponte





The new building, which will rise near Capo di Ponte, will be a new construction concept for the Valle Camonica. The main building (1) will be a platform on which eight apartments of almost 30 square meters will be positioned, each of which will have the necessary for a short stay (small kitchen, sleeping area and bathroom). From each apartment you will have a different view of the valley that can vary from Monte Adamello with its glacier, or on Concarena and Pizzo Badile.

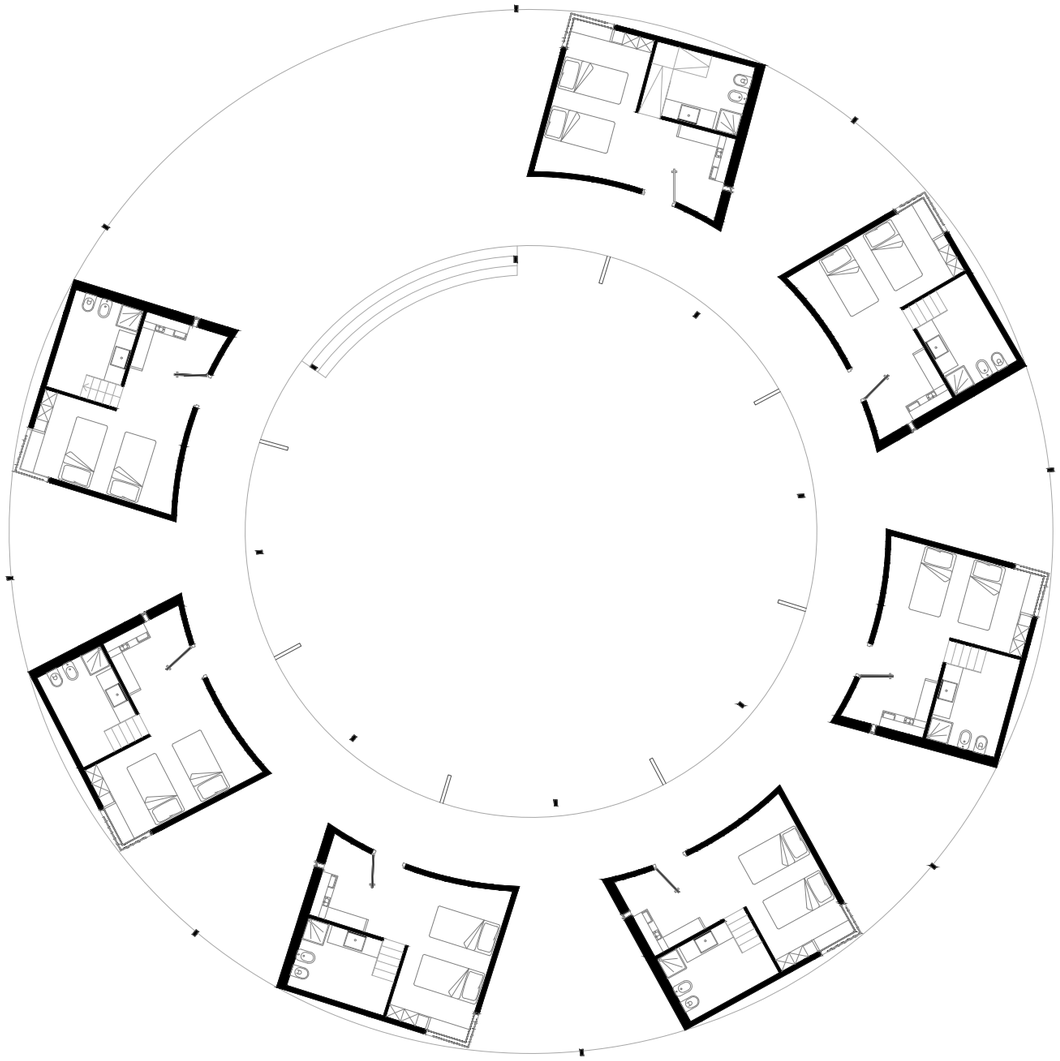
In addition to the building described above, we also find an area for spending the night outside (2) with camping tents and equipped with services and showers.

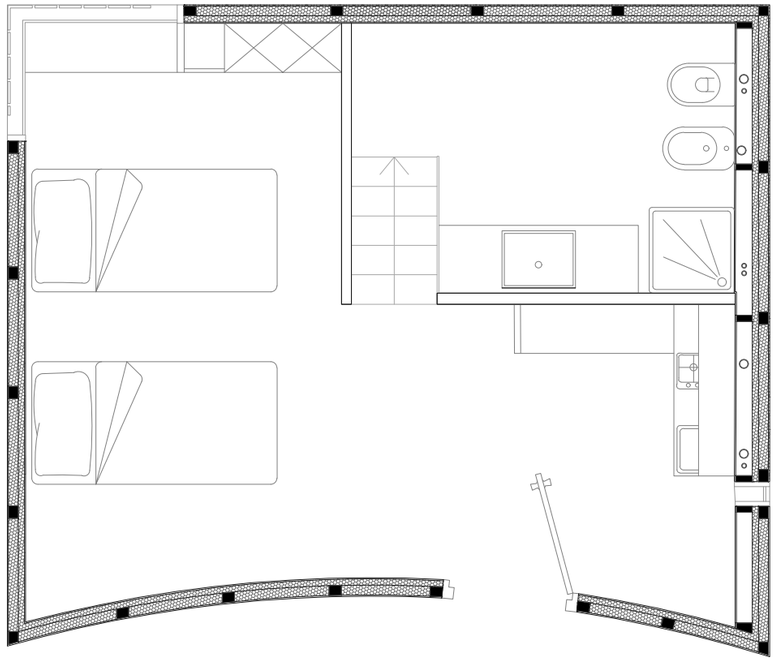
An amphitheater (3) positioned far from the inhabited part and immersed between the river and the dense and high vegetation allows a view on the phenomenon of light and shadow that occurs during the equinoxes between Pizzo Badile and Concarena.

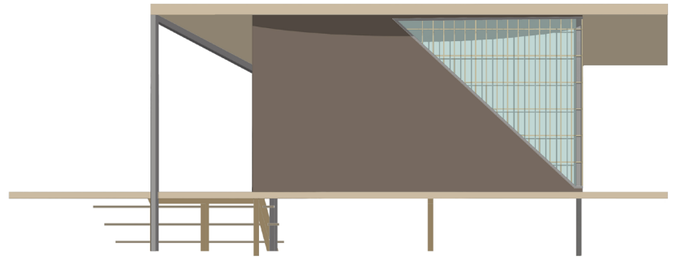
The forms described by the ancient Camuni in their engravings were the basis for the construction of this project. Using that of the sacred circle as the main form, symbolizing the sun, I went on to define a starting point, which, when intersected with the symbol 2, creates the intermediate form (3). On the internal rays of said figure there will be some ad hoc apartments.

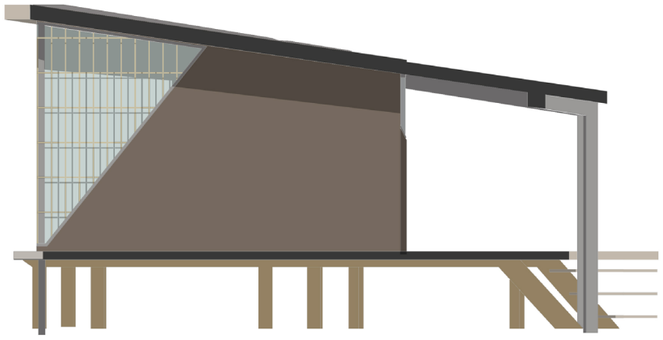
As for the materials, it will be used mainly wood from the forests affected by the 2018 storm Vaia, which created a surplus of fallen trees left unused.
The supporting structure will be in wood and galvanized iron, which will be treated this way to protect it from atmospheric events. The roof will be covered with slate tiles, a construction method very common in Alpine villages.

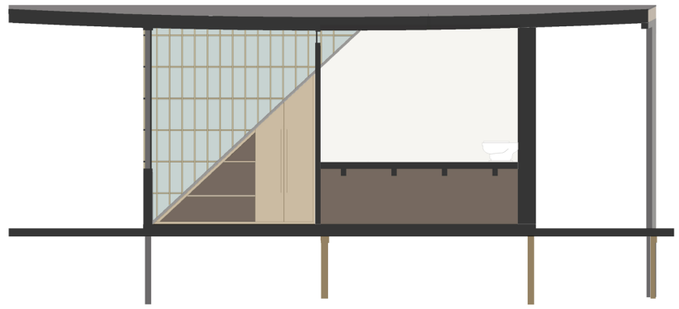
Given the shape of the building, which creates a void in the centre of the circle, a common green area will be created.

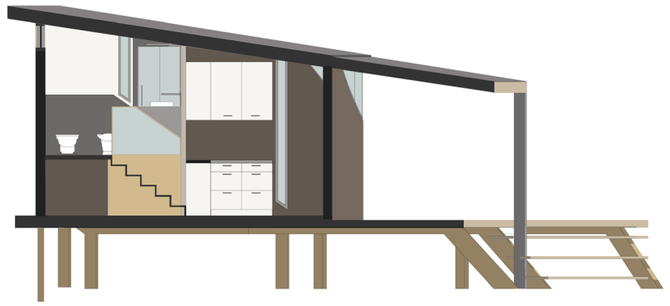












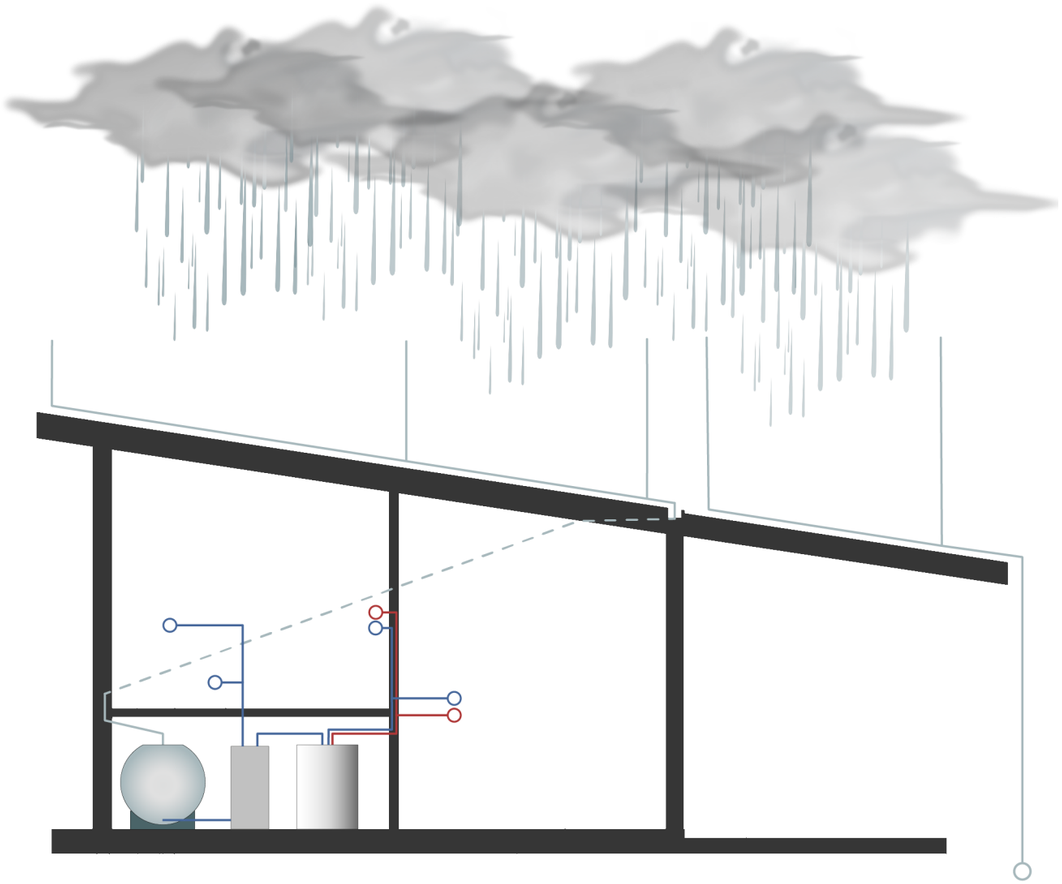
The building has a wooden frame structure, on which the insulation and the external wooden finish will be attached. The outer wall has a thickness of 15cm. The wall on which the kitchen and bathroom systems will be placed will instead have a greater thickness, 28cm, to allow the insertion of the pipes without compromising the integrity of the insulation, reducing thermal bridges.

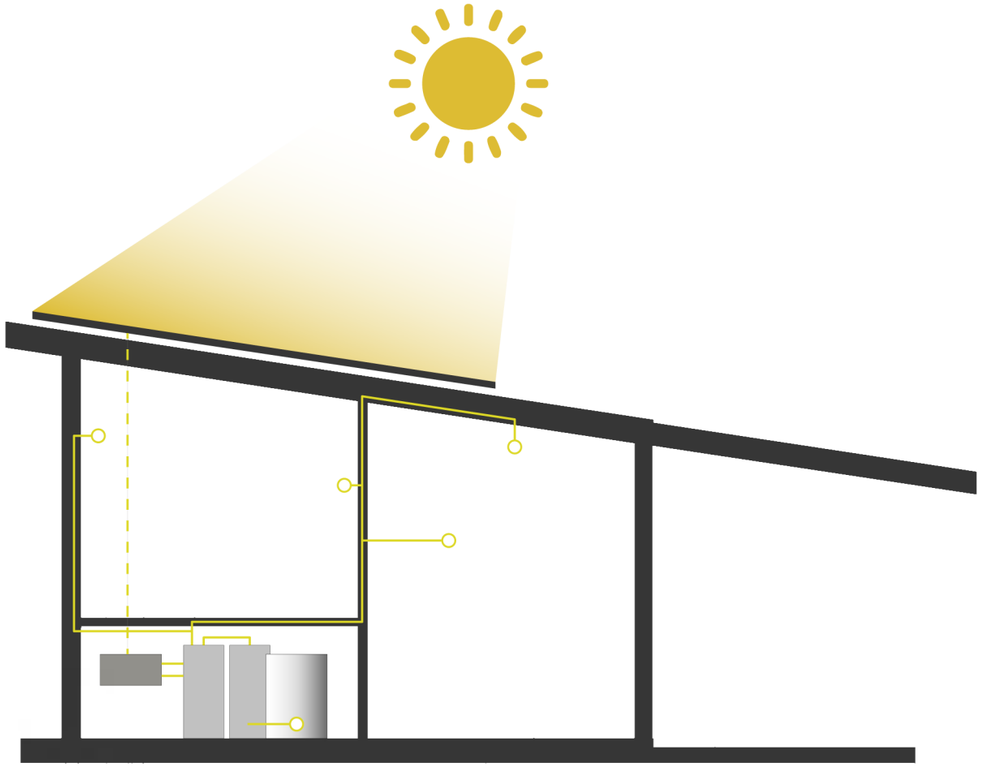
As can be seen from sections and prospects, the main building is placed on pillars that raise it from the ground, recalling the traditional ancient pile dwellings and making it even safer in the event of flooding. The large windows allow excellent natural lighting, and, given their shape which develops on two sides, also allow a wider view of the valley.

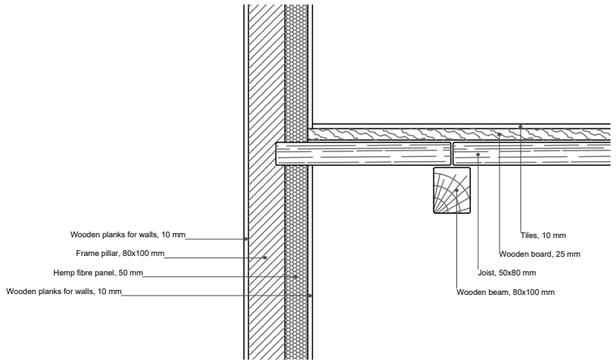
The building, thanks to the pitch of the roof, inclined towards the centre, allows a large collection of water that will be used in two ways: one more practical and one more visual.

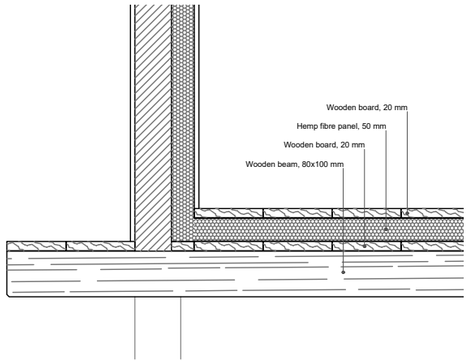
The first: a gutter will be placed on the roof near the building which will convey the rainwater into a small cistern in the compartment under the bathroom. This water will be purified to be used in the building and conveyed to an electric boiler, powered by the solar panels used for all the building's electrical needs.

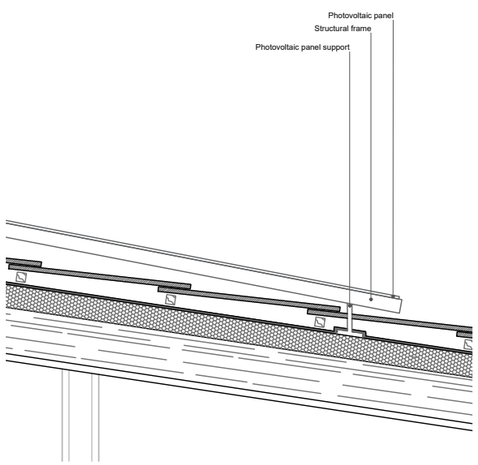
The second: the excess water that is not used will create a small waterfall from the roof, which, being projected outwardly with respect to the walkway, does not disturb the underlying passage.

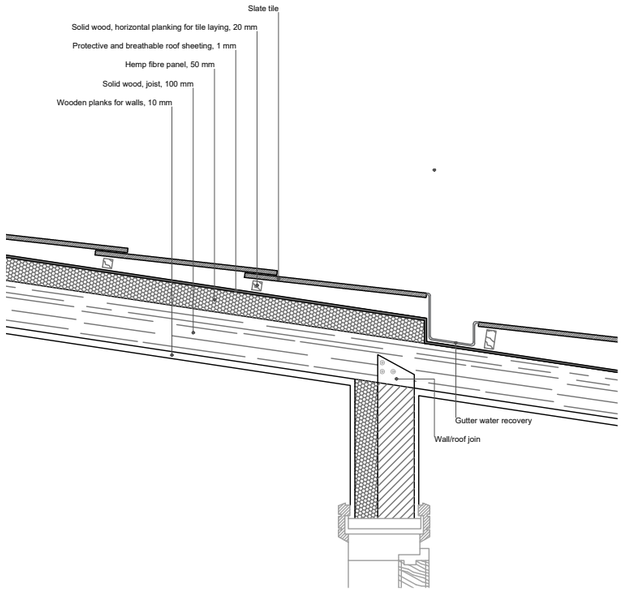


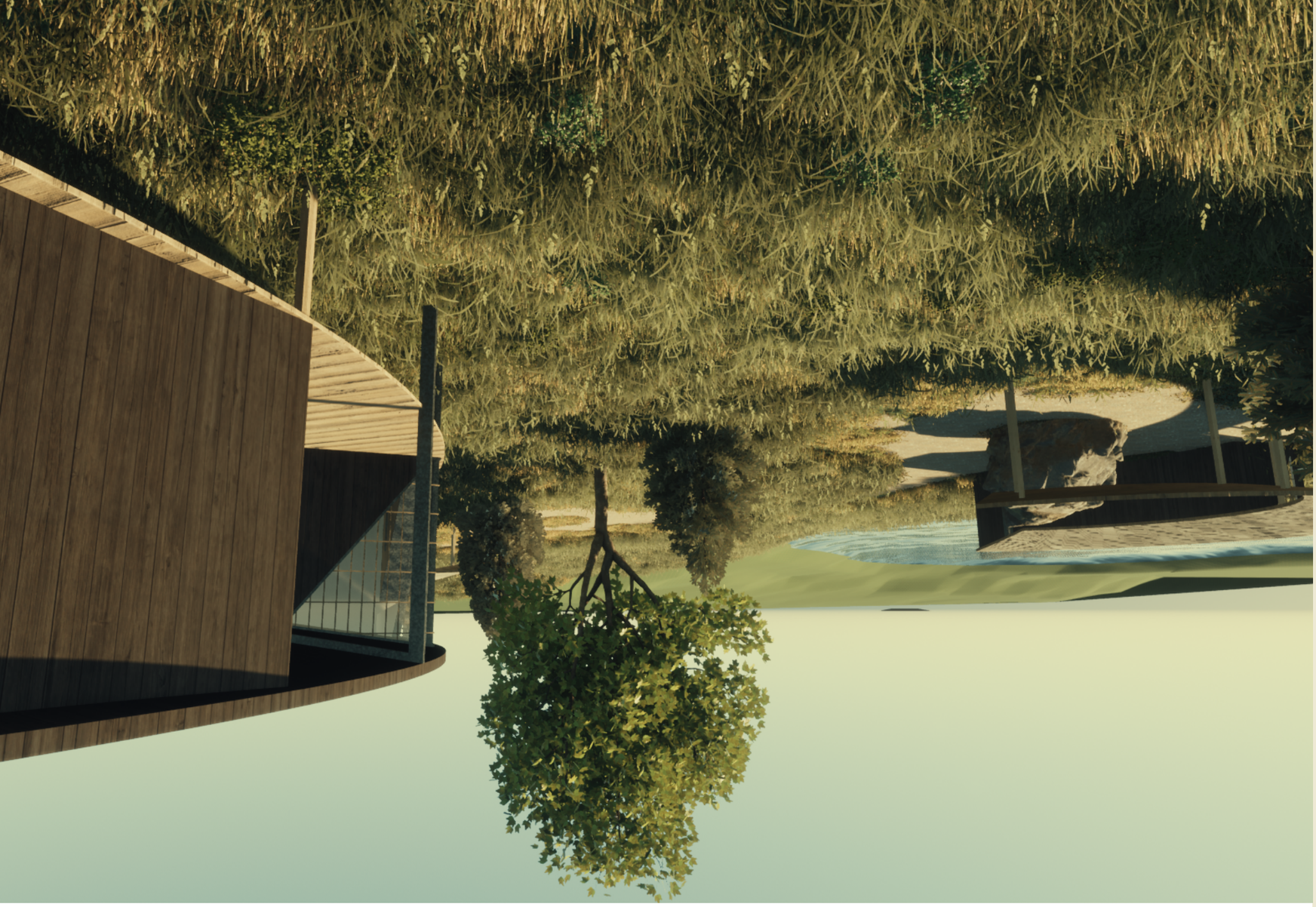


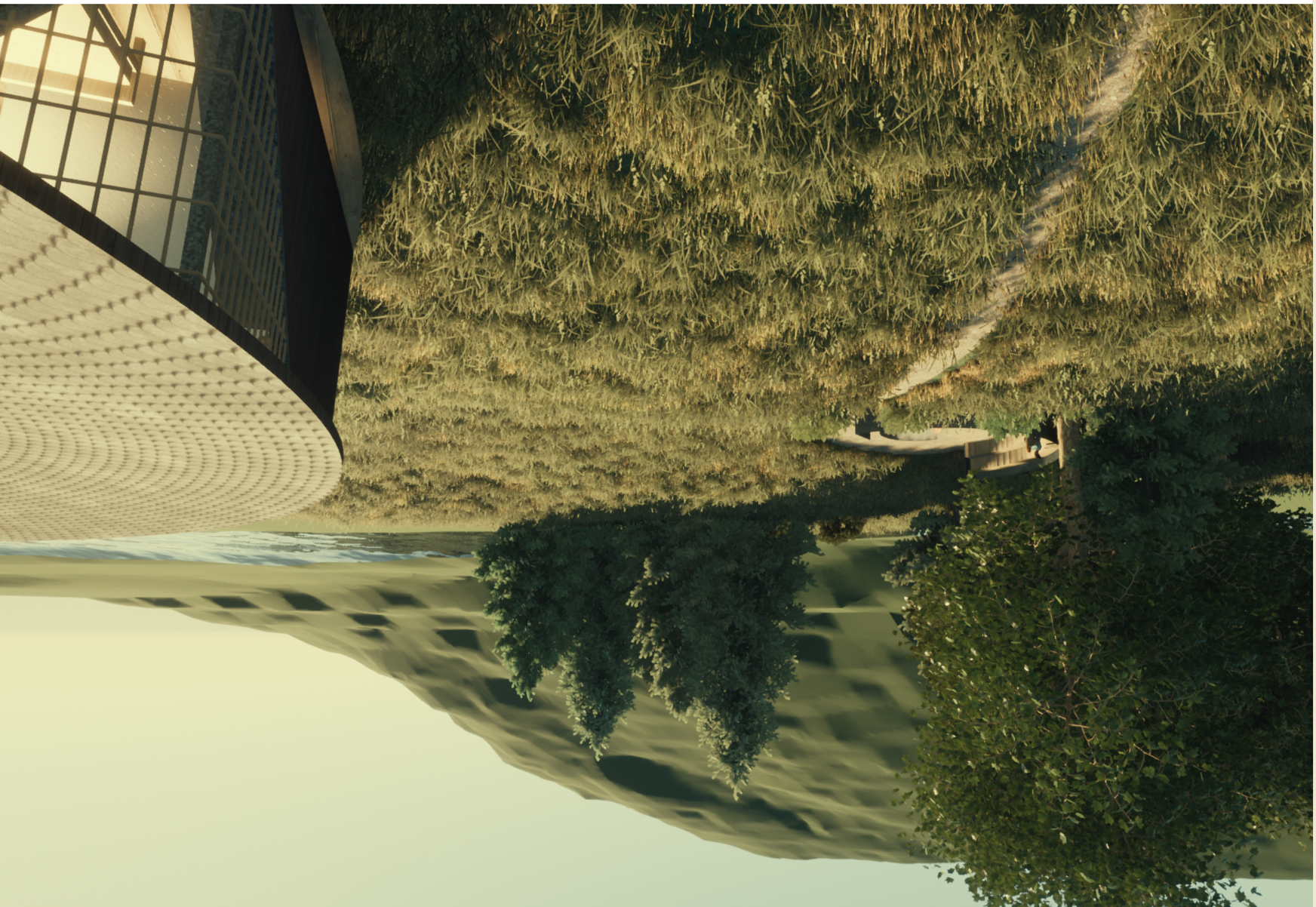

Wooden planks for walls, 10 mm
Frame pillar, 80x100 mm
Hemp fibre panel, 50 mm
Wooden planks for walls, 10 mm
Tiles, 10 mm
Wooden board, 25 mm
Joist, 50x80 mm
Wooden beam, 80x100 mm


Wooden board, 20 mm
Hemp fibre panel, 50 mm
Wooden board, 20 mm
Wooden beam, 80x100 mm


Photovoltaic panel
Structural frame
Photovoltaic panel support


Slate tile
Solid wood, horizontal planking for tile laying, 20 mm
Protective and breathable roof sheeting, 1 mm
Hemp fibre panel, 50 mm
Solid wood, joist, 100 mm
Wooden planks for walls, 10 mm
Gutter water recovery
Wall/roof join





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- https://images.google.it


Data provided by Comunità Montana di Valle Camonica