

Proposals for the redevelopment of the Balicco refuge in the Orobie Alps – a cutting-edge example

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This thesis is focused on the study of the current state of the **Balicco all'Azzaredo** refuge, the analysis of its critical issues and its strengths, the research and proposal of ideas to redevelop it in an innovative and eco-sustainable way in order to make it a prototype that can be replicated in other high-altitude contexts.

This project is part of an agreement stipulated in 2024 between the Lombardy Region and ERSAF (Regional Agency for Services to Agriculture and Forestry), which provides for a **redevelopment activity** of the 3 regionally owned refuges in order to make them models of sustainability, accessibility and modernity replicable in other similar contexts. Of the 3 regional refuges, Balicco all'Azzaredo, is the smallest and the highest, in altitude therefore it is the one potentially most exposed to the risks of the mountain environment and the one with the worst conditions in which to operate.

Thesis project

The *first part* of the thesis is dedicated to the presentation of **ERSAF**, an excursus on the history of mountain refuges and the presentation of the regional list of refuges.

The *second part* presents the **agreement** between the Lombardy Region and ERSAF.

The refuges involved in the project are: the “*Tironi E. – Rosello di Sopra*” refuge (1.700 m) in Esine (BS) in the “*Val Grigna*” Regional Forest, the “*Campei de Sima*” refuge (1.017 m) in Toscolano Maderno (BS) in the “*Gardesana Occidentale*” Regional Forest and the “*Balicco all'Azzaredo*” refuge (1.963 m) in Mezzoldo (BG) in the “*Azzaredo – Casù*” Regional Forest.

The *third part* focuses on the historical, cultural and landscape framework of the Azzaredo – Casù Regional Forest and on the current state of the refuge, built by

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ERSAF in 2015. The structure, located at 1.963 m above sea level, is very simple and consists of a small building with 3 bedrooms and a shared internal bathroom equipped with two toilets and a shower. There is a lack of an adequately ventilated and illuminated room for staff, as well as a dedicated bathroom.



Figure 1: Front view of the refuge

The refuge is not accessible to disabled people as the current shape of the path allows access only on foot. The supply of supplies takes place, initially, via cableway and subsequently with the aid of a motor wheelbarrow.

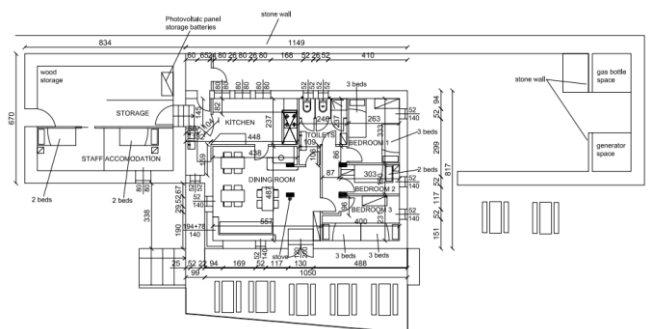


Figure 2: Current state of the refuge

The *fourth part*, after the description of the regulatory horizon relating to renovations and new constructions of structures at high altitude and the requirements and performance aspects of an alpine refuge, obviously different from those encountered in ordinary design activity, was carried out a multidisciplinary research activity of **virtuous examples** from the point of view of sustainability, originality and construction technologies, which can be inspiration for the redevelopment of the Balicco all'Azzaredo refuge. Among these are: the *Monte Rosa Hütte*, the *Sasso Nero refuge*, the *Clapier bivouac*, the *Horizon 2020 SWAMP project* and the *Energianova project of the Angelini Foundation*.

Finally, some possible improvement proposals for the refuge have been listed, divided into regulatory, structural and plant adaptation.

The most urgent action that will be taken will be a redesign of the spaces in the cabin adjacent to the refuge to create a habitable area for the staff.

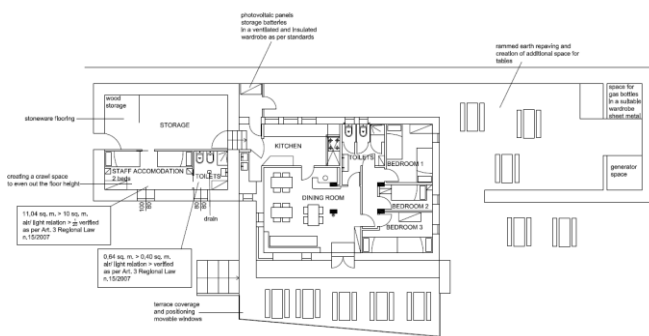


Figure 3: Project proposals

Other actions to be undertaken would be: the replacement of the external cladding wood, the insulation of the roof of the hut, the strengthening of the solar thermal system and the photovoltaic system, modernization of the current wastewater discharge system which involves dispersion in sub-irrigation.

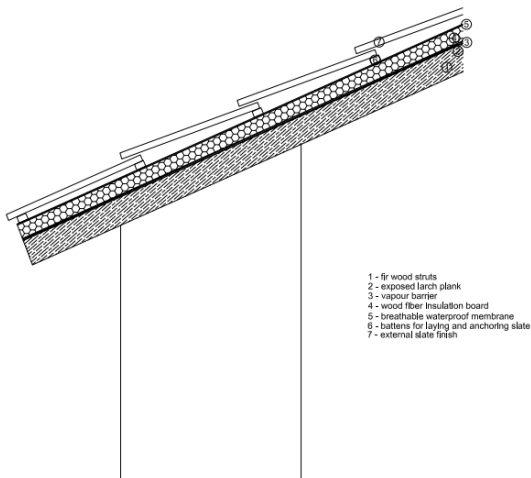


Figure 4: Proposed insulation package for the cabin roof

Conclusions

To achieve the objectives previously described, we started from the study of the current state of the refuge, also analyzing the context in which the structure is located, and then moved on to a research activity aimed at proposing possible design solutions that take into account the regulations, the needs of the structure and with a multidisciplinary approach.

The fact of operating in a complex, but culturally and landscape-rich environment forces us to pay greater attention in the design phase, however, although intervening on alpine refuges represents quite a challenge, the effort is rewarded by the possibility of keeping a precious and increasingly rare ecosystem.

References

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