

Nuova serie / New series n. 10 - 2023

# ARCHALP

Rivista internazionale di architettura e paesaggio alpino / Revue internationale d'architecture et de paysage dans les Alpes / Internationale Zeitschrift für Alpine Architektur und Landschaft / Revija za alpsko arhitekturo in pokrajino / International journal of alpine architecture and landscape



## Le altre montagne

Les autres montagnes / Die anderen Berge  
/ Druge gore / The other mountains



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## 2. PAESAGGI







# Architecture in Japan's mountainous areas: shapes determined by external factors, the natural environment

For nearly 30 years, I have been fascinated by architecture built in mountainous areas and have been conducting research and analysis mainly in Japan. Many of the mountain lodges located in hostile natural environments are devoid of decoration because of their setting, and the bare form of the space appears inevitable. Beauty can be found in such simple and sturdy construction, and it can be said that this is the strength of architecture that emerges from the confrontation with harsh natural environment.

In Japan, when building in national or semi-national parks, there are often regulations on forms, such as "gabled roofs with a slope of 3/10 to 5/10" and color, such as "no more than two colors out of dark brown, red rust color, or soft brown". Architecture in Japan uses a timber-frame construction method in which the structure is built with columns and horizontal beams, and roofs are built by adding trusses on top of the structure. In addition, due to Japan's rainy and typhoon seasons, which bring heavy rainfall, most buildings traditionally have sloped roofs with large eaves. The gabled shape of mountain buildings is a natural form in this respect. In this article, I would like to introduce some of the mountain architecture like *Karasawa hütte*, *Tateyama mountain villa*, *Nozawa-Onsen lodge* designed by the late Prof. Takamasa Yoshizaka, one of Japan's leading postwar architects, as well as other architectures in mountainous areas such as *Mt. Ontake visitor center*, *Gokayama Cross Base*, *Hüt-TENT* designed by the author.

## Yujin Hirase

Professor at Waseda University and founder of yHa architects. He was born in Tokyo in 1976 and graduated in Architecture from Waseda University. After working as assistant at the same University, he founded yHa architects with Yuko Hirase in 2007 and worked in Switzerland from 2007 to 2008. He has been associate professor at Saga University from 2008 to 2023, and is professor at Waseda University since 2023. <http://yha.jp>.

## Keywords

*Mountain architecture, Japan, Takamasa Yoshizaka, yHa architects.*

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For nearly 30 years, I have been fascinated by architecture built in mountainous areas and have been conducting research and analysis mainly in Japan. Many of the mountain lodges located in hostile natural environments are devoid of decoration because of their setting, and the bare form of the space appears inevitable. Beauty can be found in such simple and sturdy construction, and it can be said that this is the strength of architecture that emerges from the confrontation with harsh natural environment.

Modern mountaineering was introduced in Japan in the 1890s by the Englishman Walter Weston and others, who introduced the Japanese Alps (Northern, Central, and Southern Alps) to the world. *Hakuba mountain villa* was opened in 1905 at an altitude of 2,832 meters, just below the summit of Mt. Hakuba. At the time of its opening, the hut was about 10 x 7m in size, but today it is the largest in Japan, with a capacity of 1,200 people. In the 1950s, an unprecedented boom in mountaineering

led to various technological innovations and improvements in facilities and services, and today there are more than 170 lodges in the Japanese Alps alone (Fig. 1).

In Japan, when building in national or semi-national parks, there are often regulations on forms, such as “gabled roofs with a slope of 3/10 to 5/10” and color, such as “no more than two colors out of dark brown, red rust color, or soft brown”. Architecture in Japan uses a timber-frame construction method in which the structure is built with columns and horizontal beams, and roofs are built by adding trusses on top of the structure. In addition, because of Japan’s rainy and typhoon seasons, which bring heavy rainfall, most buildings traditionally have sloped roofs with large eaves. The gable shape of mountain architecture is a natural form in this respect, and it is fascinating to see architecture like *Hakuba Ooike mountain villa*, with its simple exterior and bright red exterior walls and roof, con-



Opening picture  
Hakuba Ooike  
mountain villa.

Fig. 1  
Hakuba mountain  
villa.



trasting with the green of the trees, standing in a dignified natural setting (Opening picture). In this article, I would like to introduce some of the mountain architecture designed by the late Prof. Takamasa Yoshizaka, one of Japan's leading postwar architects, as well as other buildings in mountainous areas designed by the author.

### Projects

*Karasawa hütte* (Figs. 2-3)

Architect: Takamasa Yoshizaka

Location: Kamikochi, Nagano

Completion: 1963

Structure/Scale: 2-storey wooden structure, 450 m<sup>2</sup>  
Surrounded on 3 sides by the Hotaka mountain range of the Northern Alps, it is situated on the moraine of the dry riverbed, where glacier-borne rocks have accumulated at an altitude of 2,350 m. In winter, avalanches from the surrounding area flow through it. By burying the building in the ground, avalanche damage is minimized. The lodge consists of 3 buildings, distributed in a way that reduces the surface exposed in the direction of the avalanche.

Therefore, the avalanche passes over the snow accumulation on the roof and prevents it from destruction. The *Karasawa hütte* is surrounded on 2 sides by a stone wall with a gabion (a basket made of woven iron wire filled with boulders) that cannot be buried, giving it the appearance of a stone fort. However, it is invisible and blends in with the surrounding environment, mimicking a living creature. The building has 12-15 centimeter pillars and 15 centimeter beams that can be carried by one person on foot, and the vaulted dining room has trussed beams to span of the building. Every year in April, the lodge is dug out from more than 3 meters of snow and opened to the public.

*Tateyama mountain villa* (Fig. 4)

Architect: Takamasa Yoshizaka

Location: Midagahara, Toyama

Completion: 1963

Structure/Scale: 3-storey reinforced concrete structure, 1,301.76 m<sup>2</sup>

This national dormitory stands on the plateau of Midagahara, Tateyama, at an altitude of 1,940 meters. The shape of the building is intended not to obstruct the passage of wind and seems to be in-

**Figs. 2-3**  
Karasawa hütte,  
Takamasa  
Yoshizaka, 1963.

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**Fig. 4**  
Tateyama mountain  
villa, Takamasa  
Yoshizaka, 1963  
(photo Hiroshi  
Miyazawa).

**Fig. 5**  
Tateyama mountain  
villa, Takamasa  
Yoshizaka, 1963  
(photo Hiroshi  
Miyazawa).

**Figs. 6-9**  
Mt. Ontake visitor  
center Yama-terrace  
Otaki, yHa architects,  
2022 (photo Takeshi  
Yamagishi).



spired by the shape of the mountain behind, but its generous size stands dignifiedly in response to the scale of the Tateyama Mountain range. In this area, snow blows heavily from the Sea of Japan, and the wind often causes many snowdrifts. The roof has a simple shape with minimum unevenness to cope with the wind, and its arched, streamlined line is designed to sweep away the snow. The walls are rhythmically dotted by deeply carved windows of various sizes.

*Nozawa-Onsen lodge* (Fig. 5)

Architect: Takamasa Yoshizaka

Location: Nozawa Onsen, Nagano

Completion: 1968

Structure/Scale: 1 reinforced concrete basement structure + 3-storey wooden structure, 225.54 m<sup>2</sup>

The acorn shape eliminates the need for snow removal, and the green roof stands out against the snow-white landscape. In the center of the hexagonal plan is a spiral staircase that allows to reach each room directly. In addition, since the entire building consists of one room with an atrium, the warm air from the stove on the first floor rises to heat the entire building. The central space gives the building a centripetal effect that draws people together.

*Mt. Ontake visitor center, Yama-terrace Otaki + Sato-terrace Mitake* (Figs. 6-10)

Architect: yHa architects (Yujin Hirase + Yuko Hirase)

Location: Kiso, Nagano

Completion: 2022

Structure/Scale: 1-storey reinforced concrete + steel + wooden structure, 498.30 m<sup>2</sup> / 2022 (Yama-terrace Otaki) + 1-storey wooden structure, 431.52 m<sup>2</sup> / 2022 (Sato-terrace Mitake)





This project was selected by Nagano Prefecture and the city of Kiso in a joint public proposal in July 2020 for reconstruction after the Mt. Ontake eruption disaster in September 2014 and for the revitalization of the region. Nagano Prefecture developed the project in Tanohara (mountain area Yama-terrace Otaki / altitude: 2,180m), the trailhead of Mt. Ontake. The city of Kiso developed the project adjacent to the “Mitake” roadside station at the foot of the mountain (village area Sato-terrace Mitake / altitude: 742m). The main exterior walls of both the mountain and the village area are made of gabion filled with local rocks mixed with lava, and the building has a “red roof” that blends in with the surrounding landscape and is highly visible to visitors. The two facilities on separate sites are linked to each other, creating different landscapes for each location. In the mountain area, the long, sloped roof of the *Yama-terrace Otaki* creates a landscape that corre-

sponds to the scale of the mountain against the backdrop of the majestic Ontake mountain range (3,067m above sea level). The grand staircase on the axis, reminiscent of the old road along the ridge, frames the impressive landscape of Mt. Ontake. In order to create an exhibition plan that is connected to this location, we have combined a “learning” exhibition room where visitors can concentrate on the exhibits inside, and a “thinking” exhibition space where visitors can look at Mt. Ontake through the balustrade on the upper exterior wall, and at the gabion through the glass. The roof structure is made of Japanese cypress and Japanese larch, both local timbers, and the box-shaped reinforced concrete exhibition hall is a double-roofed shelter with a higher level of safety, as a precaution against the possibility of ashes from Mt. Ontake. The area surrounding the site is used as a ski resort in winter. With an estimated



snowfall of 2.4 m, the architecture could be buried under the snow.

In the village area, *Sato-terrace Mitake* is set against the backdrop of Mt. Kiso-komagatake (2,956m above sea level), which can be seen from the site. The trapezoidal roof echoes the gable roof of the adjacent “Mitake” roadside station to create a unified landscape. The overall structure is made of local cypress and larch. The trapezoidal truss structure of the grand staircase has been designed with

as few columns as possible, creating a semi-outdoor space that frames the impressive scenery of the Otaki River and Mt. Kiso-komagatake.

*Gokayama Cross Base* (Figs. 11-12)

Architect: yHa architects (Yujin Hirase + Yuko Hirase)

Location: Nakagawa, Fukuoka

Completion: 2019

Structure/Scale: 1-storey reinforced concrete + steel structure, 889.42 m<sup>2</sup>



**Fig. 10**  
Mt. Ontake visitor center Sato-terrace Mitake, yHa architects, 2022 (photo Takeshi Yamagishi).



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This project is a tourism base facility selected by the city of Nakagawa through a public tender in September 2016 to promote tourism as part of a development project around the Gokayama Dam Lake, the largest in the prefecture, completed in 2018. In order to harmonize the design with the Sefuri Mountains range and the large scale of the dam, the building is offset from the shape of the site and consists of a large curvilinear surface that

echoes the huge 102-meter-high dam embankment. There is a roof terrace with a natural wood deck that can be seen near the dam lake, and a gentle sloping staircase resembling a bench where people can take a break; the parking lot and the roof terrace are smoothly connected. We have created a landscape with a sense of unity between landscape and architecture. On the car park side of the roof terrace, a natural wood louver was in-

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**Figs. 11-12**  
Gokayama Cross  
Base, yHa architects,  
2019 (photo Takeshi  
Yamagishi).

**Fig. 13**  
HütTENT, yHa  
architects, 2021  
(photo Yousuke  
Harigane).



stalled, made of heat-treated Nakagawa cypress modeled after the shape of the mountain, so as to become a new symbol of the Gokayama area. The design of the building follows that of civil bridge architecture, with large steps on both sides and a reinforced concrete core and others made of steel columns and beams. The aim is to have a land-form architecture with large, coarse resolution details in line with the large scale of the dam's civil engineering.

*HütTENT* (Fig. 13)

Architect: yHa architects (Yujin Hirase + Yuko Hirase)

Prototype

Completion: 2021

Structure/Scale: 1-storey wooden structure, 8.75m<sup>2</sup>, 2021

*HütTENT* is a small 2.5 x 3.5m mountain hut designed as a shelter for mountaineers and a base for forest maintenance. We designed a system that can be built in a short period of time by combining a new construction material: “square panels” designed to use standard of wooden pallets for transporting goods, to be installed in places where it

is difficult to build or transport them. While conventional wooden architectures generate a large amount of waste when dismantled, the ability to reuse them as pallets for logistics makes it possible to drastically reduce the amount of waste. In order to ensure some degree of permanent use as living space, a tent membrane with excellent impermeability and weather resistance can be easily applied to the roof and exterior walls. Being translucent, such membrane becomes highly visible at night, gently diffusing light like a lantern. Moreover, they are easy to install in places where transport is difficult, such as mountains, or remote islands where transport costs are high. This project was a prototype developed as part of a joint research project to propose a highly design-oriented and innovative mobile architecture by integrating the various know-how of experts in wood experimentation, building material development, tent membrane development, branding, and architectural design.

The project was carried out in collaboration with Shimura Lumber, Umino Construction, Yamaguchi New Shelter Industry, TETUSIN DESIGN, yHa architects, yHa laboratory. ■