

# New construction sports hall Ebnet, Gstaad-Saanen

2004



The executed project, a 3-fold gymnasium with combined steel-wood trusses, emerged from an architectural competition in 2002. With the orientation of the shed roof to the south, it is possible to directly use solar energy passively.

## The project

On the part of the architects, a truss with slender members was required, which would have little effect on the window area. The enormous snow loads of around 400 kg/m<sup>2</sup>, the spans of 31.25 m and the truss spacing of 8.40 m spoke against this. For the structural design, several beam variants in steel and wood were examined. An all-steel truss construction was almost chosen. Only the return to proven construction methods (compression members in wood, tension members in steel) finally brought the breakthrough and was also economically competitive. The primary load-bearing element is a truss inclined at 20° from the vertical and spaced at 8.40 m intervals. Of the intervening "rafters", every other one is sub-span. The sub-span continues horizontally across the entire hall and also forms the suspension for the gymnastics equipment. The 31.25 m long girders were manufactured with a cant of 100 mm and have a static height of 3.75 m.

## The construction

The bottom chord is made of a steel tube (ROR 193.7 x 8), the struts (ROR 114.3 x 16) as well. Glulam was chosen for the top chord (2 x 19 / 56 cm) and the posts (22 x 40 cm). The "rafters" (220 / 400) are also made of glulam. The 20° inclined roof surface transmits about 20% of the shear forces and is therefore provided with a fully nailed pane in OSB 22 mm. This also solves the horizontal bracing of the trusses. Great attention was paid to the design of the force transmission suitable for the construction site. The west side of the hall was built in timber frame construction, with the roof girders supported on reinforced concrete columns in each case. The walls on the north and south sides are of timber frame construction, while the east wall is of reinforced concrete. The roofing consists of rear-ventilated large-format Eternit panels. The entrance wing (foyer, checkrooms and multi-purpose room) is also of timber construction. The roof structure consists of columns and cross beams as well as the acoustically effective optiholz board stack layer above. The roof above the entrance wing is extensively greened on compact insulation.



Assembly of lattice girders



View of exposed rafter position



Main entrance



Entrance area

### Construction Data

- Minergie: BE-342
- Dimensions: 33 x 45 m
- Useful area 1480 m<sup>2</sup>
- Wood main structure: 106 m<sup>3</sup>

### Services of Timbatec

- Structure planning
- Project planning
- Tendering
- working plans for the timber construction

### Timber Construction Contractors

Brawand Zimmerei AG  
3818 Grindelwald

### Timber construction engineers

Timbatec Holzbauingenieure Schweiz AG, Thun  
3600 Thun

### Timber construction contractors

Wenger Holzbau AG  
3613 Steffisburg

### Supply BSH

Neue Holzbau AG  
6078 Lungern

### Architect

ARGE Tschanz Architektur AG  
3600 Thun

### Client

Community of Saanen  
3792 Saanen