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3. Athletics Building, Magglingen / BE

Owner: Swiss Federal Gymnastics and Athletics Training Center, Magglingen
Architect: Max Schlup, Biel
Engineers: Schaffner & Dr. Mathys, Biel
Steel Construction: Geilinger Stahlbau AG

Construction year: 1976

For many years the school had lacked covered training areas. The plant now completed is situated in a valuable public recreation zone that is typical of Magglingen. The idea of integrating the training center in this setting strongly influenced the selection of the present project. Spectators and users can follow the events on interior galleries, passageways, grandstands, or from external terraces and walks. The landscape features were also determinative for the general planning conception. The slope permitted the unobtrusive integration of basement structure and annexe wing.

In the first instance, the polyvalent plant is envisaged only for training purposes as well as instruction, and only by way of exception for public events and competitions. The utility area of 44 x 84 m with a clearance of 11 m is used for the major track events (track 190 m, throwing and jumping, etc.) and as a playing-field (football, handball, volleyball, tennis, etc.). The 4.20 m-high framed concrete walls of both ends are reserved for ball training.

There is available to the public, during events, more than 2000 seats and standing-places on grandstands and galleries – the latter also being employed for games and training.

The training field is located 4.20 m beneath the elevations, which are bounded on three sides by forest. Nevertheless, depending on the weather, events can easily be held using natural daylight illumination. For bad weather and evening events, there has been installed on the ceiling a visible, artificial lighting system, with mercury vapour lamps (230 lamps, 400 Watt, approx. 300 Lux average vertical illumination) plus 42 spotlights (2000 Watt) for TV transmission, which increases the intensity of illumination to 750 Lux.

The arena has standard ventilation and hot-water heating (up to 18 °C). The built-in avocado-green plastic flooring has to meet the following requirements set by the experts: elasticity 45 ° Shore, spike resistance, hardened surface, ideal slide properties, good reinforcement, far-reaching prevention of injuries owing to falls, fireproof, noiseless. A 20 mm-thick natural coloured sisal carpet was selected to protect the flooring in the annexes from spikes.

Because the new building is 1000 m above sea level, the support-free spanning of more than 50 m presented ticklish problems to the engineers, since there are snow loads of 300 kg/m2 here. An important aim of the planning was the integration of the supporting construction as an essential part of the planning in the general conception. The five-chord girders developed jointly by architect and engineer constitute a stable grid structure, and each of them has three upper chords and two lower chords, which are interconnected by diagonals.

The height of the above structure, which is slight in relation to the span, is 210 cm, and corresponds to one half the geometric grid system. All diagonals in the projections can be kept under 45 °. In order to keep down the dimensions of the five chords, prestressing was required. This system consists of six cables per stringer, which take up to 300 tons outside the supports at the end of each stringer. These cables are anchored in the bedrock; this entails an additional load on the terminal diagonals and main supports, but it does lead to relief from tension in the centre.

The large-scale elevation elements, measuring 420 x 220 cm, were assembled in a short time by means of a pneumatic crane, along with tubular steel frames and insulating glass (2 x 8 mm), and bolted to steel rungs. All caulking was effected on dry sections.

Section supports serve as wind reinforcement; they are fixed in position at the bottom, but above permit vertical shifting of the grid structures. The two 8 mm panes have stood up to impact tests.

The general costs of the arena, including the external facilities, amount to SFr. 13 million, the arena alone costing 11'436 million (cost per cubic meter according to SIA = 98.).

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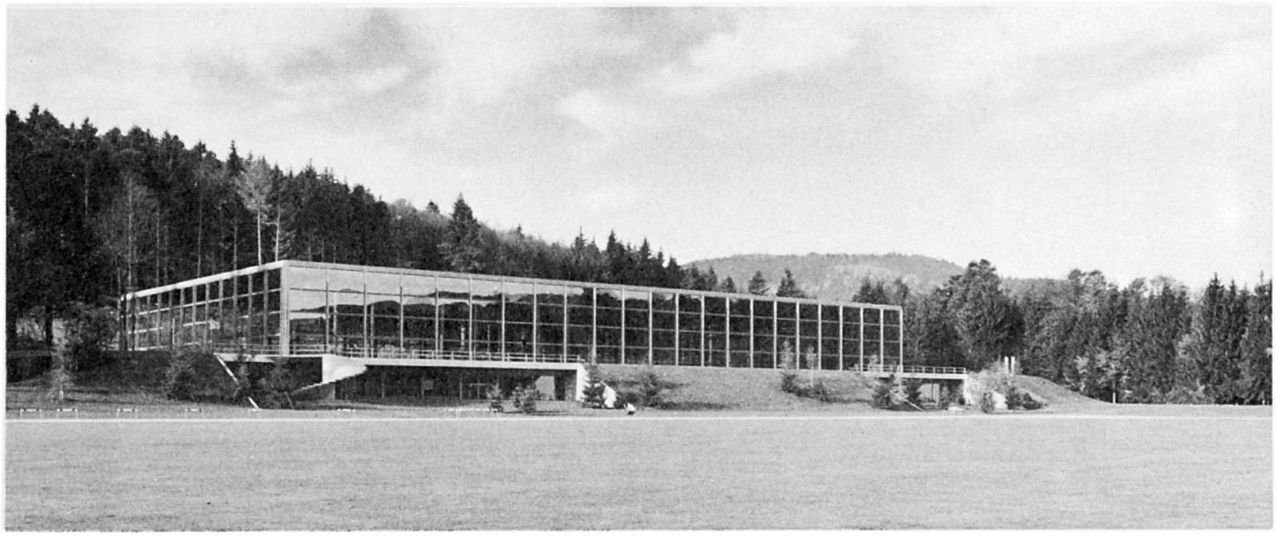

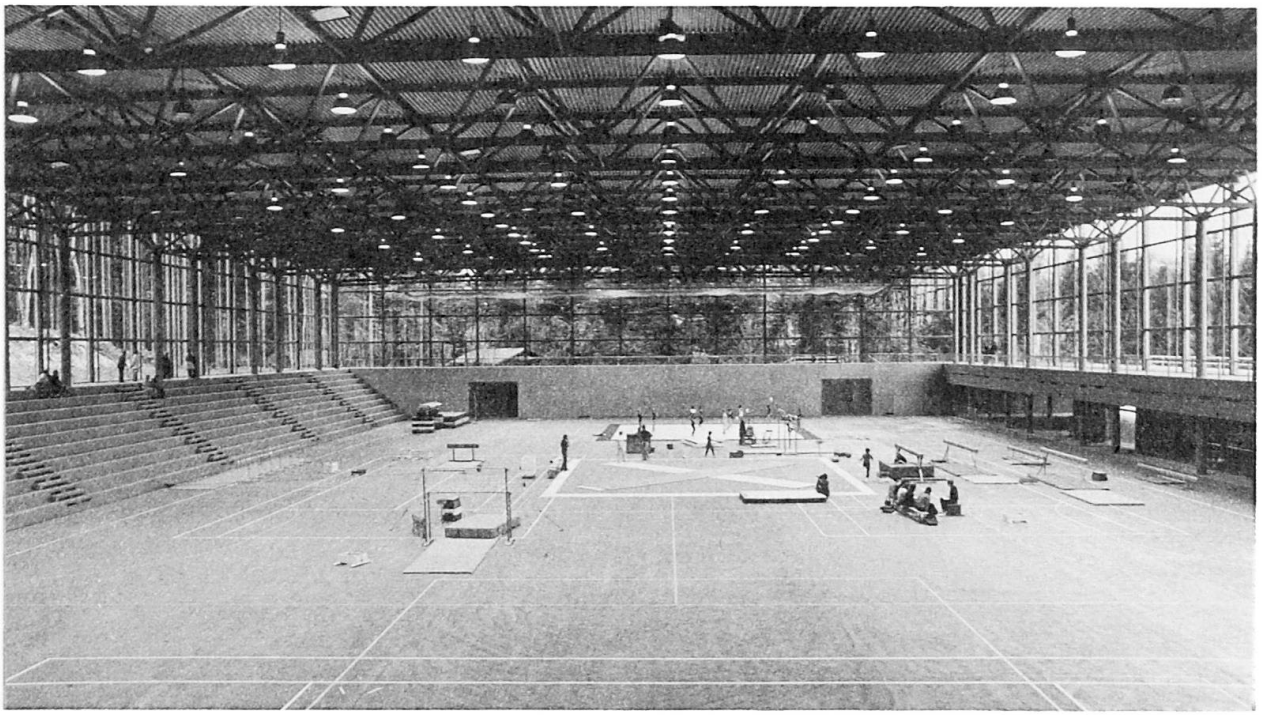

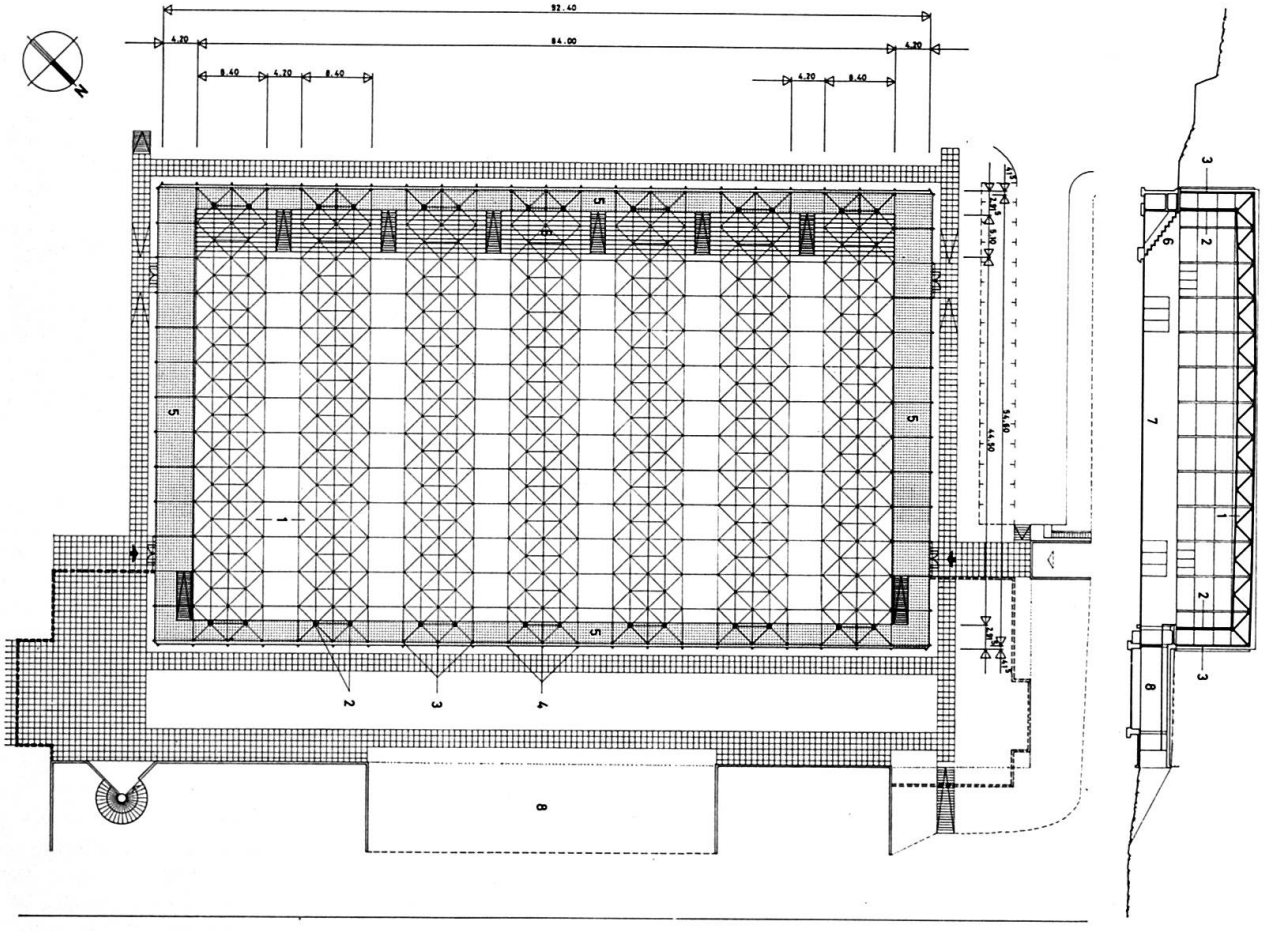

Drawings SZS