

Zeitschrift: IABSE structures = Constructions AIPC = IVBH Bauwerke
Band: 3 (1979)
Heft: C-7: Structures in Switzerland

Artikel: Skating rink roof, Arosa / GR
Autor: Koblet
DOI: <https://doi.org/10.5169/seals-15769>

Nutzungsbedingungen

Die ETH-Bibliothek ist die Anbieterin der digitalisierten Zeitschriften auf E-Periodica. Sie besitzt keine Urheberrechte an den Zeitschriften und ist nicht verantwortlich für deren Inhalte. Die Rechte liegen in der Regel bei den Herausgebern beziehungsweise den externen Rechteinhabern. Das Veröffentlichen von Bildern in Print- und Online-Publikationen sowie auf Social Media-Kanälen oder Webseiten ist nur mit vorheriger Genehmigung der Rechteinhaber erlaubt. [Mehr erfahren](#)

Conditions d'utilisation

L'ETH Library est le fournisseur des revues numérisées. Elle ne détient aucun droit d'auteur sur les revues et n'est pas responsable de leur contenu. En règle générale, les droits sont détenus par les éditeurs ou les détenteurs de droits externes. La reproduction d'images dans des publications imprimées ou en ligne ainsi que sur des canaux de médias sociaux ou des sites web n'est autorisée qu'avec l'accord préalable des détenteurs des droits. [En savoir plus](#)

Terms of use

The ETH Library is the provider of the digitised journals. It does not own any copyrights to the journals and is not responsible for their content. The rights usually lie with the publishers or the external rights holders. Publishing images in print and online publications, as well as on social media channels or websites, is only permitted with the prior consent of the rights holders. [Find out more](#)

Download PDF: 14.12.2025

ETH-Bibliothek Zürich, E-Periodica, <https://www.e-periodica.ch>

5. Skating Rink Roof, Arosa / GR

Client: Kurverein Arosa

Architects: A. + A. Rocco, Arosa

Engineers: P. Messerli, St. Blaise

H. Schad, Arosa

Contractors:

Piles: Brunner & Co., Zürich

Concrete and masonry work: Brunold AG, Arosa

Steel construction: Geilinger AG, Winterthur

Pre-stressing: Spann Stahl AG, Hinwil

Roofing: L. Waidacher, Arosa

Construction year: 1978

General

In order to offer its guests the additional comfort of ice skating, regardless of the changing weather conditions, and to satisfy the requirements of the Ice Hockey Clubs, the Kurverein Arosa decided to roof its existing rink.

Choice of Construction

Interested parties were given the possibility of submitting projects together with price offers. Particularly valid were aesthetical and technically perfect projects, whereby to a certain extent, the very restricting existing conditions had to be taken into consideration (existing buildings, installations, surroundings, ground conditions).

The lengthwise spanned cable-supported steel construction of Messerli/Geilinger was selected.

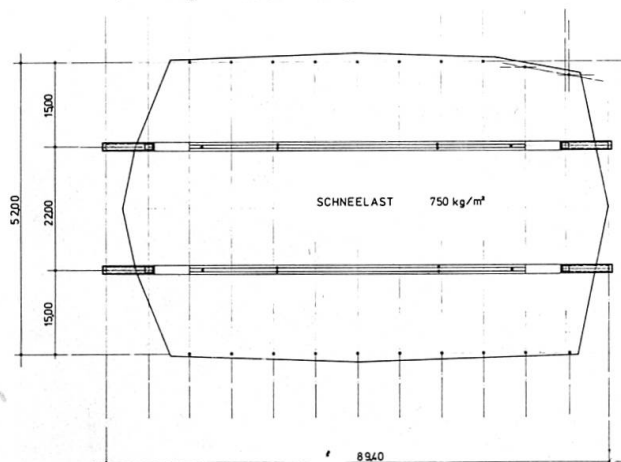


Fig. 1 Situation

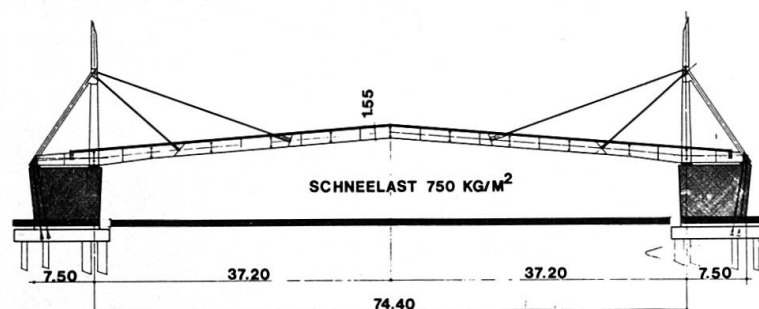


Fig. 2 Section



Fig. 4

Criterion for the Project

- good blending in the beautiful, natural surroundings
- minimum disturbance to the views for the surrounding buildings and to their sunshine conditions
- solid ground starts at a depth of 6 m
- high weight of snow (7,5 kN/m²)
- extreme climatical influence (− 30 °C)
- extremely difficult approach road; lorry without trailer, or narrow gauge railway
- maximum weight on ice surface 60 kN/m²

Foundation

The large tension and pressure forces are introduced into the solid ground at a depth of 6 m by means of a big concrete wall and piles. The spreading of the force over the pile groups made an unusually complicated concrete construction necessary.

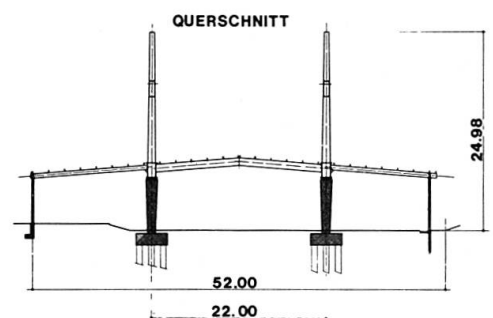


Fig. 3 Cross section



Fig. 5



Fig. 6

Steel Construction

The primary construction consists of two steel-cable supported girders, lengthwise spanned (fig. 2). The three-span transverse girders are supported by the main girders and wall columns. To avoid additional forces due to the vertical displacement of the main girders (up to 30 cm), a hinge was placed in each of the two end spans.

The steel-cable supported girders are 1,55 to 2,00 m high and have a total length of 90 m, whereby the free span between the supports amounts to 74,4 m.

The girder ends are restrained for vertical loads by means of the concrete walls (fig. 4). This has been achieved by means of twenty pre-stressing rods with a total force of 16'000 kN which prevents lifting of the box girder ends.

This anchorage is placed at a slight angle and in foamfilled tubes. This allows an elastic movement in the longitudinal direction of ± 40 mm without introduction of additional forces into the anchorage and the foundation.

The Dywidag system has been chosen for the inner supporting rods. Every girder is supported at four points with these Dywidag rods, which are fixed to the pilons.

A careful analysis was necessary to find the best positioning of the suspension points, in order to obtain an economic design of the main girders. An additional condition was that due to the pre-stressing, a vertical deflection of -100 mm had to be achieved.

The pre-stressing rods are imbedded in a plastic pipe injected with cement mortar, the elements thus being permanently protected and maintenance free.

For technical reasons, the pilon forces were anchored by flats towards the outer side of the concrete wall.

The pilon head is of a very complicated construction, due to the fact that maximum vertical force of 25'000 kN has to be introduced.

Two supports are placed under the pilons allowing movement in both horizontal directions and the two remaining supports allow horizontal movement in one direction only.

The welded transverse girders (fig. 5) are 7,5 m apart and 1,1 m high. The force transmission at the crossing points through the main girders is achieved through high strength bolts.

The continuous purlins are bolted onto the transverse girders and carry the 100 mm thick sandwich plates of the roof. The entire construction is stiffened by bracing (fig. 6).

Important Technical Data

- roof surface 4'300 m²
- max. building length 90 m, max. width 55 m
- roof drop on all four sides 8 %
- max. height of roof over the ice surface 12 m
- actual free height over the rink 7,5 to 10 m
- girder length 90 m, free span 74,4 m, girder height 1,55 to 2,00 m
- max. snow load 7,5 kN/m²
- steel quality mostly used RSt. 52-3
- steel weight 5'500 kN (1,28 kN per m² of covered surface)
- suspension of the main girders: Dywidag System; 12 bundles of 8 rods each, rods \varnothing 36 mm St. 85-105
- supports Mageba

(Koblet)



Fig. 7