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Project Details

Aircraft hangar of The Yugoslav Airlines

The basic system of construction comprises three prestressed main roof girders with the span 135.80 m positioned paralelly to the longer side of the base, and six main reinforced concrete pillars.

- **Employer:** Yugoslav Airlines - JAT
- **Location:** Belgrade
- **Total cost of project:** N/A
- **Years of construction:** 1984 - 1986
- **Category:** Transport
- **Status:** Finished
- **Area:** 0 m2
- **Contractor:** GP Rad

Detail design:
The Institute for Material and Structures of the Civil Engineering Faculty, University of Belgrade, GP Rad

Designer:
Academician Prof. Ivan Antic

Structure Designer:

Prof. Milorad Ivkovic

Photo Gallery

Information

The main roof girders are positioned at the distance between them 22.40 m, and on both ends they are freely supported by two reinforced neoprene bolsters, placed over the beam on top of the main pillars.

§ The main roof girders of two-band construction system are with span 135.8 m and boom 9.70 m. The upper, reinforced concrete band is box cross section with exterior width 4.00 m and 2.80 height, and the thickness of walls and the lower slab is 20 cm each, and the upper slab 35 cm, MB 45. The bottom band system consists of 27 polygonally led cables of 11 ropes each with dia Ø 15.2 mm. Each three cables together are put into one protecting polyetlrylene tube. The polygonal configuration of the main girder

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cables is formed by seven pyramidal steel pipe "chairs". The cables rest onto the chairs via separate rotational bearings - rollers, so that the friction coefficient is considerably decreased when cables move. The main pillars, about 36 m high, consist of two parallel bands each, with the dimension in cross section 60/300 cm, at the clear space between them of 4.20 m. The roof deck construction - ceiling, which is prefabricated, was hung on the main girders via the system of steel suspenders, so that minimum volume of useful space and minimum area of the facade was achieved, and thus it enabled a very big reduction of energy for maintaining micro climate in the hangar. The hung roof construction is also composed of the system of two-band linear reinforced concrete girders over which the reinforced concrete binding rafters are placed.

§ The conceptual design for the hangar construction, as an original idea, won the first prize in the very keen competition for designs in steel. It was about 25% cheaper than the others, and for one third it decreased the energy expenses for maintaining micro climate and practically incurred marginal expenses for the maintenance of the construction.

§ The designed and manufactured prestressed main girders are authentic solutions which have been completely adopted in engineering practice because of their considerable technical-technological and economic advantages for they largely extend the domain of application of concrete constructions, especially in span increasing (over 250 m). These are compound systems with steel elements outside the transverse portion of the concrete cross section, for which the authors received the October Award of the city of Beograd for the best achievements in the field of mathematical-physical and technical sciences in 1985. The hangar construction was proclaimed the most successful constructors' accomplishment in Serbia and Serbia at the congresses of constructors during 1987.

§ In the course of the designing and execution and afterwards, the hangar construction was in the focus of interest of many domestic and world experts and scientists. The theoretical grounds of compound systems with steel elements outside the concrete cross section, on which the hangar roof construction calculation was based, was presented by the authors-designers at numerous scientific and expert gatherings (Vancouver, Roterdam, Vienna, New Delhi, Nanying, London, Huston, etc.).

Press clipping

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