

**Zeitschrift:** IABSE reports = Rapports AIPC = IVBH Berichte  
**Band:** 83 (1999)  
  
**Artikel:** Block panel structures with the prestressed membrane  
**Autor:** Roujanski, Ilia L.  
**DOI:** <https://doi.org/10.5169/seals-62960>

### **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:** 05.09.2025

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



## Block Panel Structures with the Prestressed Membrane

**Ilia L.ROUJANSKI**

Dr

Melnikov Res. and Design Inst. of Steel Struct.  
Moscow, Russian Fed.

Ilia L.Roujanski, born 1938,  
received his Dr. degree from  
Kujbishev engineering Building  
College of Moscow in 1975 Council  
of Ministers Prize Winner, 1980.

### Abstract

During the last 15 years in Russia carrying metal structures of the coverings of the new type appeared to become widely spread: space block panel systems, in which prestressed membrane works as a part of the block's chords and as a boarding surface simultaneously.

The main element of the prestressed coverings of this type is a panel of the maximum transport overall dimensions factory of the ultimate factory readiness. This panel is presented as a tough frame with the membrane tightened on it (thickness - 1--2,5 mm).

In accordance to constructive shaping such a panel can work as a part of the covering on the square, rightangular, round, elliptic or other more complex plane. Up to the present time similar coverings are carried out in the form of spans from 24 to 84 m. Project elaborations show its rationality for the spans up to 120 m, including the production buildings with a suspended cranes.

The usage of the given structures enables to solve the following problems: the uniting of carrying and boarding functions; factory elaboration of the large elements on the automatised lines; industrial erection up to the ultimate factory readiness in the form of large elements; reducing of the expenditure of the steel on the covering at the expense of excluding boarding construction proper.

The choice of the way, consequence of erection and the level of preliminary stress are accounted for by calculating and depend on the possibilities of elaboration, conditions of erection and exploitation.

When designing elements of the prestressed steel structures of the given type one has to take into account not only the norm requirements, but also the peculiarities of constructing, production and erection, described below.

The realisation of panel prestressing with a thin sheet plating leads to combining the carrying and boarding functions.

The choice of the method and the level of prestressing is accounted for by the calculation and the production considerations.

The design of such structures must contain, firstly, the scheme of works production, that are connected with the panel elaboration and their prestressing, secondly, information on the control of the level of prestressing, and also calculations needed.

In the Melnikov Central Research and Design Institute of Steel Structures complex experimental--theoretical investigations are made. The present report is devoted to the original methodics of the calculating of the prestressed membrane and the structure as a whole on the stages of elaboration, erection and exploitation.

Leere Seite  
Blank page  
Page vide