

SOME ASPECTS OF SPACE STRUCTURE'S SHAPING

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The subject of the paper refers to the basic principles of the process of space structures shaping. In architecture and civil engineering the notion of *space structure* usually concerns to the structures composed of straight bars which are appropriately connected together in articulated nodes.

At present the meaning of this notion is larger than it was in the past. It can be used to describe different kinds of engineering works and it may refer to many various types of structures being the nature creations. In both cases it is noticeable the tendency to apply the same simple rules in order to obtain the efficient, lightweight and strong structure. The same basic principles, which are taken into consideration during the creation processes in both cases, have to give in the result the solutions of similar features. Some nature creations are seemingly of very complex shape, for instance the inner structure of bones, but after the comprehensive analysis it becomes clear that they are of very economic shape.

Many types of space structure, designed by an engineer, may consist of optional bars having various lengths and sizes of their cross sections. In that case it can be expected that the obtained structure will be of irregular shape and in its pattern it will be almost impossible to find any regularity. These forms of structures are not considered as good solutions also because of architectonic reasons. The accidental usage of any type of bar will give in the result a space structure, which will have small practice usability or which can not be considered as a building structure. The aim of the engineer's activity is to apply rules of exact sciences in order to obtain desirable product by means of minimum usage of energy, material and the human manual labour. The economic reasons force designers to use simple forms of structures having legible regularities, sometimes called also as the symmetry.

The endeavor to apply structural solutions of visible symmetry may be noticed in many important buildings of great dimensions designed in the historic periods, at present and proposed for the future. The high-rise buildings and roof covers of great span are very spectacular members of that group of architectonic objects.