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ANALYSIS OF MODERN TRENDS IN CREATING THE IMAGE OF ARCHITECTURAL AND CONSTRUCTION OBJECTS

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Design studio Reiser+Unemoto Architects designed an unusual building in Dubai with a design form in the form of an “Exoskeleton”. The features of the constructive solution are to protect the internal space from external factors – wind, extremely high external temperatures, seismic effects and other adverse conditions (Fig. 1). The building is designed in such a way that all vertical loads are perceived by the external “Exoskeleton”, which allowed to obtain a larger volume of internal space.



Fig. 1. Building in the form of an "Exoskeleton", Dubai

One of the most famous buildings in England in London, designed by the famous British architect Sir Norman Foster. The building is designed and resembles the shape of the "Gherkin". This is the brightest example of modern architectural

bionics, for which the author received the prestigious award of the Royal Institute of British Architects. The 180-meter-high building is designed in such a way that despite the magnificent and curved shape, there is only one element of curved glass in the structure of the building. Due to the efficiency of the design and aerodynamic shape, the effect of wind loads is minimized. And thanks to the shape, the building consumes half as much electricity as similar buildings of this type (Fig. 2).



Fig. 2. Building «Gherkin» – a symbol of London, England



Fig. 3. Design of a building in the form of a traditional Ukrainian "Pysanka"

On the banks of the Dnipro River in Kyiv, architects from the Kyiv office Archimatika have designed a multifunctional complex in the shape of a traditional Ukrainian Easter egg. The facade is planned to be lined with LED screens that will change the patterns of the «Pysanka» (Fig. 3).

In architectural bionics, one of the methods of expressiveness of artistic composition is achieved through the use of frontal accent elements that protrude (recess) from the plane of the main volume. At the same time, frontal elements can be different in geometry, texture, color.

To highlight the form, functional elements of intermediate floors are used - a winter garden, terraces, an observation deck, open areas, technical floors, stairs, etc.

Today, there is no single approach and methodology for designing buildings according to the principles of architectural bionics. In the existing regulatory framework, it is difficult to find clear definitions of this type of construction objects.

At present, in fact, a promising direction of building design according to the principles of architectural bionics has been formed. It consists in combining the style of biological functionalism with organic architecture, which is a productive

connection between man and nature, an appeal to the human essence and individuality.

The study and further development of architectural bionics is a completely directed scientific task, which allows us to go beyond the boundaries of already known, developed architectural images and inspires the creation of new non-traditional forms. Forms in which space and time will be more organically combined, human life will be improved in harmony with the surrounding natural environment.

Analysis of domestic and foreign experience in designing facilities according to the principles of architectural bionics allows us to identify the main trends in the development of architectural and planning solutions and functional organization:

- an increase in the number of functional components;
- integration of "ecological spaces" into the structure of buildings;
- energy independence of designed buildings.

In architectural bionics, the combination of form-forming techniques in organizing the volumetric and spatial solutions of buildings allows for a wide variety of options for harmonious, holistic and dynamic structures in the design of construction objects. It should be noted that the form-forming and architectural and artistic solution of a building cannot depend only on its purpose. The coherence of architecture is a mandatory condition for housebuilding. In architectural bionics, the construction of a volumetric and spatial solution, artistic solutions of facade details, must reveal the purpose of the building itself, creating the appropriate emotional mood of a person. All this consciously determines the uniqueness of the object in the urban planning system. Buildings designed according to the principles of architectural bionics must have the appropriate status, comfortable conditions and consumer qualities.

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