EUROPEAN JOURNAL OF LIFE SAFETY AND STABILITY (EJLSS)
ISSN2660-9630
www.ejlss.indexedresearch.org Volume 23, November-2022 ||

The Significance and Features of Sports Building Structures in Construction

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Annotation: *The article describes the features of the structures of sports facilities, their dependence on the form-wind, functional-technology, accepted material of the sports facility.Constructive solutions used in sports buildings were evacuated and proposals were made to take them into account in the process of silencing.*

Keywords: *sports facilities, constructions, functional-technology, architectural solution, constructive requirements, factors.*

Date of Submission: 29-10-2022 ***Date of Acceptance: 30-11-2022***

Features of structural solutions of sports facilities are associated with functional-technological processes in structures of this type.

The forms of the main halls and their covers – the shape of the halls, the capacity and the features of the location of the stands, are selected according to the nature of the technological processes associated with training and training sessions and competitions (the flight trajectory of the ball, the trajectory of athletes jumping into the water and with a bat, the features and

Special requirements are imposed on the floor (density, dynamic loads), barrier structures, internal decoration and filling of light holes (mechanical, ball impact resistance, coating damage, sanitary and hygienic requirements, etc.).

Special requirements for general solutions of barrier structures and sports facilities are the need to provide optimal conditions for physical and sports activities in the weather conditions of the optional season of the year.

There are significant differences in the simple conditions of operation and the requirements for the dimensions of sports facilities, the composition and equipment of rooms for holding competitions.

In addition to the listed characteristics, structural solutions of these structures must meet the requirements for the unification of lifting and blocking structures of civil buildings.

The most complex for a constructive solution of sports facilities is the overlap of the requirements for creating optimal conditions in different seasons and weather of the year, as well as for conducting simple training and large classes.

To create the best conditions for Physical Culture and sports in optional weather, winter and summer, spring and autumn, or to create a single self-propelled, prefabricated, air-sprinkler, awning and other types of structures are envisaged.

In order to create the necessary conditions for regular training and holding large competitions, various methods of transformation are used (stands, main sports grounds and pool baths, barrier and lifting structures of external walls, fences, etc.).

Thus, it is advisable to use both stationary and transformative structures for sports facilities. The use of transformation can provide optimal conditions for athletes and spectators. At the last time, transformative structures are more used in sports facilities, such as the Olympic pool in Munich, a large number of pool facilities in France, transformative pools, among others.

Technical progress with high intensity provides an opportunity for sports facilities, wide application of transformable structures.

On the basis of its composition lies a single space of large-span coatings. In the sports facilities of the hall, all rooms and stands are placed under the general coating of the main hall (for example, sports palaces, indoor sports arenas, pools, catwalks).

Small-sized unsurprised lift-walled sports facilities (or reinforced concrete with a uniformed set and as well as reinforced concrete-coated colonnades) are used as devices for utility rooms, which include separate locker pavilions for outdoor sports facilities, as well as gyms with a proletariat of no more than 24 m.

Mixed systems located in one volume with gyms, auxiliary rooms in devices are desirable for indoor arenas, Manege, pool and other large sports facilities.

The advantage of such structures is precisely the volumes corresponding to the functional task and the possibility of using structural elements that are optimal for each volume size.

For sports facilities, the unification of volumetric-planned parameters and constructive solutions is characteristic. For utility rooms, uniformed building details are widely used, in which it is advisable to design the plan parameters in a multi-size format into a large module of 3 and 6 m.

At the same time, for a number of auxiliary rooms of indoor sports facilities, it is not always advisable to use columns with a Enlarged module and a unified set. In some cases, the areas of these rooms are increased or decreased according to the necessary dimensions according to specific area standards and functional requirements for one person. Accordingly, the decision to use the enlarged module for auxiliary rooms will have to be justified by the technical and economic accounting books confirming it.

For the main halls with a spacing of up to 24 m, factory-made unifisirated (including reinforced concrete) details are widely used, in which the Hall sizes are designed to be multi-layered into a 6 m enlarged module. However, the requirements for the dimensions of the hall, which are determined by the order of competitions in different sports, often differ from multi-fold sizes to the enlarged module. Therefore, for large-span halls, as well as based on the local conditions of construction (if it is advisable to use metal, polymer and other material structures), it is recommended to solve the problem of the project of halls with a multi-span size of 6 m modules, as well as on the basis of feasibility books.

It is advisable to carry out such calculations in the process of comparing options for Hall projects.

Training and sports-demonstration facilities depend not only on the task, but also on what material they are built from and the solutions adopted in construction. Currently,structural schemes used in construction differ in their diversity, starting with systems with flat balconies, frames, railings and

arches, and ending with spatial thin-walled systems – prefabricated and waveguide coatings, suspension and Vantage structures and pneumatic (inflatable) beams. The choice of one or another structure depends to some extent on the shape of the structure in the plan. If the structure has the shape of a circle in plan, it can be closed with a light dome, as well as suspension structures with radial or cruciform troughs, overlays with a template folding element. The plan ofdecompact structures is easier to use prefabricated elements. In recent times, suspension and Vantage structures have been widely used, which make it possible to close structures of various shapes: lens-shaped, oval, polygonal, etc.

Not too big 10,5-12,0-15,0 for coatings of training halls with an interval of m, it is best to use template coating structures known in construction. For example, for the coatings of school gymnastics halls, it is very convenient to use light, steel stercene hole farms, bending profiles or pipes, installed with a step of 1.5 or 3.0 m.

Steel covers made of Lattice farms were applied in the building of the Olympic swimming pool in Melbourne. A modern solution to cladding structures is where the dimensions and characteristics of individual parts of the structure were used to work together with the cladding in a single system. The deviation lift construction of the stands was also used at the same time as the holding supports of the coating farm. Such a solution made it possible to abandon the construction of lifting vertical walls. Only a four-ball system was formed, which was stable at symmetrical loading. To eliminate this drawback, anchor steel pullers were added to the structure to the ground. In one-sided loading, only one of the pullers works. The feasibility of the construction is one of the important factors in the architectural and artistic advantages of this building.

When the coating range increases, the weight of the structure initially also increases. If, for example, the walls of an indoor stadium are built of heavy material, such as concrete, it is useful to use arched structures for cladding, in the section of these structures there are compressive movements that are well perceived by reinforced concrete.

Arches are made of lifting structures that hold the ribs and plates of the roof covering. Arcuate overlays in the stadiums of Bucharest, Lodza, Krakow and Stockholm were built according to this system. Currently, according to aesthetic and economic views, such reinforced concrete structures are not used. It is useful and convenient to build them from lightweight materials.

In the Turin Palace, the arches were lightened to the supports, which significantly improved the showroom hexogonal plan in relation to the palace in Paris. In order to ensure rigidity, the arches were built in a thin-walled two-Torah section. Styaches receiving the raspor (acting forces) are placed underground. The stiffness of the arches and the spatial performance of the entire structure can also be obtained by the diagonal intersection of flat deviation arches. In this, a very light, aesthetic lattice dome is formed, which makes it possible to use industrial-prefabricated methods of construction. The coating of the ice palace in Turin is built in such a way that the arches with an edge deviation transmit the entire raspor in the structure to the corners, where horizontal stretching voltages are diagonally or zatyajkas passing underground around the perimeter of the building (receiver.enveloping) accept.

Arches are not used independently as a compression-processing, non-expensive construction, are used in conjunction with other spatial structures. SVOD (Dome-shell) diaphragms, vantli and suspension structures are often given the shape of an arch.

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