Research on Gymnasium Construction Based on Green Environmental Protection Comprehensive Energy Saving Technology

Wei Zhang*
Wuhan University of Technology, Wuhan, China

*Corresponding author e-mail: 2075591387@qq.com

Abstract. In the process of rapid global economic development, people’s living standards have improved. People pay more attention to the quality of life and the role of sports activities. Therefore, the construction of urban gymnasiums will be one of the important construction activities of the city. The construction of the gymnasium can improve the functions of the city to a certain extent. It is a comprehensive systematic project. The construction of the urban gymnasium must be coordinated with the urban gymnasium construction plan, and the resources in the city must be used reasonably. The energy-saving green stadium environmentally friendly building materials were used for the project construction, and very good energy conservation and environmental protection effects were achieved, which meets the needs of society and urban development. This article mainly discusses the gymnasium construction planning of the city gymnasium, and analyzes the energy-saving design, which is of great significance to the overall gymnasium construction planning of the city.

1. Introduction
China's sports industry has made breakthrough progress in recent years. In the past period of architectural design, the construction of many urban gymnasiums requires high-level maintenance in the later period, and high energy consumption has become its synonym. Now that global resources are scarce, energy conservation is one of the important indicators for the construction of urban gymnasiums, and sustainable development strategies also require energy saving in building design and planning. As one of the important facilities to improve the quality of the city, the gymnasium construction planning cannot be ignored [1]. The gymnasium construction planning should complement the city's overall gymnasium construction planning.

2. Analysis of green environmental protection and energy saving technology in gym construction
Analysis of the importance of energy-saving and environmental protection technology in the construction of gymnasiums Energy-saving and environmental protection technology is an important way for the construction and construction of gymnasiums. First, the energy-saving development of stadium construction is a new requirement for construction of the project in the new period, which is to improve the use of various resources and equipment during the construction of the stadium, so that the entire project construction and ecological environmental protection are coordinated. Second, the
application of energy-saving and environmental protection technology can better promote the construction of sports stadiums [2]. The application of green energy-saving and environmental protection technology to the construction of the stadium can save the project cost and speed up the construction progress of the entire project, and then better promote the construction and development of the stadium. Third, the application of energy saving and environmental protection technology can improve people's living environment. With the development of the times, people have put forward higher requirements for the sports environment. Among them, the requirements for the construction of stadiums are how to use advanced science and technology to optimize the use of various materials and equipment [3].

3. The Problems that should be paid attention to in the construction of urban gymnasiums.

3.1. Construction and utilization of new technologies in the stadium
Advanced technology can make the functions of the stadium more diversified. In recent years, new technologies have been applied at home and abroad. After the completion of such a stadium, it can be widely used and can meet different people. For example, the construction of the stadium can also serve music. Will be prepared for application without causing damage to the turf [4].

3.2. The Complex Design of Gymnasium Construction
One of the trends in the marketization and industrialization of the urban sports industry is the compounding of stadium construction. The planning of the stadium construction in urban stadiums needs to consider multiple factors, which must meet the needs of serving the game without affecting people's normal life. People's physical activity time echoes [5]. At the beginning of the gymnasium gymnasium construction planning, full research should be conducted on the active crowd, using the characteristics of crowd activities to carry out gymnasium gymnasium construction planning, clarify the service targets of sports facilities, and at the same time control the scale of gymnasium construction, not that the gymnasium is bigger the better Therefore, the correct location should be selected, the existing resources should be fully utilized, and the enthusiasm of people should be mobilized, so as to realize the functional design of the stadium construction [6].

3.3. The Gymnasium construction implements health concept
The purpose of the gymnasium construction planning of the city gymnasium is to enable people to live a healthy life and improve the quality of life. Therefore, the concept of health must be implemented in the gymnasium construction planning process. The first is the naturalization and humanization of the internal environment. In the external construction of the gymnasium, the concept of green environmental protection should be adhered to, and the concept of integration and development should be implemented to make people's true health activities.

3.4. The Energy-saving and low-carbon environmental protection technology for buildings
Energy saving is one of the important influencing factors in the construction plan of the gymnasium. In the design of the interior space, the various sports venues should be reasonably allocated. The quality of the interior space design greatly affects the energy consumption of the gymnasium. Adhere to reducing unnecessary space on the basis of ensuring sufficient space for each sport, so as to ensure energy saving from the interior design [7]. The outer design of the urban gymnasium is also one of the important links in building energy saving. Minimize the loss of energy. The main use time of the gymnasium is during the day. Therefore, the lighting design of the gymnasium must be reasonable, so as to minimize unnecessary power loss. The thermal insulation effect of the material reduces losses in the air conditioner. Solar energy is the most environmentally friendly and renewable potential resource that we can see at present. In a conservation-oriented society, designers must not ignore the use of solar energy in the design and planning of urban stadiums. The light and heat in solar energy can be fully utilized and reduced. Waste of resources can also ensure environmental protection.
4. The Features of environmentally friendly building materials for energy-saving green stadiums

4.1. The Classification of Energy-saving, Green and Environmental-friendly Building Materials

Energy saving represents the low energy consumption and low consumption of gymnasium building materials. At present, most of the energy-saving green gymnasium environmentally-friendly building materials have relatively high resource utilization in the production process, achieving low energy consumption production, and waste generated in the production of some materials. It can be processed twice, and the finished material produced has a high utilization rate during the construction of the project. The production process determines that the material can meet the needs of different projects and can reduce energy consumption. Environmental protection means that there is less pollution, even zero pollution, of energy-saving and environmentally-friendly materials. Energy-saving and environmentally-friendly materials have fully taken into account the requirements of environmental protection during the production process, so the level of production technology and material design is relatively high, which can achieve zero pollution to the surrounding environment.

The versatility of energy-saving and environmental-friendly green building materials is also a major feature. During the construction process, the demand for stadium building materials has changed from a single function to a composite function. It is required that in addition to the original functions, stadium building materials also need The function is added according to the actual needs of the project, such as energy saving needs, environmental restoration needs, etc., which determines the development characteristics of energy saving, environmental protection and green building materials.

4.2. The Analysis of environmentally friendly building materials for energy-saving green stadiums

What kind of wall material is used in the construction of the gymnasium is the focus of the engineering industry. The choice of materials must not only meet the needs of energy conservation, but also take into account the cost of construction. Therefore, the development of wall materials has been very rapid in recent years. The first is the use of concrete hollow bricks. Red bricks are used in traditional buildings, but in recent years, concrete hollow bricks have been used more widely in the construction industry. On
the one hand, the production of concrete hollow bricks is mainly based on sand and cement. Excessive waste will be generated, at the same time, the resources of the land will be saved, and the energy saving and environmental protection of the material will be realized. On the other hand, the concrete can be prefabricated in advance during the production process, and can be designed into different specifications according to the needs of the building wall. Realized resource saving and avoided unnecessary waste. The second is the use of new concrete. The use efficiency of traditional concrete is relatively low, and the thermal insulation effect is not very satisfactory. Therefore, in recent years, new concrete materials have been widely used, such as aerated concrete stadium construction materials. This material has a low density during the production process and is economical. Type building materials, and the insulation performance is much better than traditional concrete, so it has been widely used in many buildings. The formwork concrete used in the staircases in the construction of stadiums is also a new type of energy-saving green environmental protection material. Introduced from abroad, it is mainly cast in situ with various specifications of concrete + expanded metal mesh. The construction effect is ideal, in line with the concept of energy saving and environmental protection, and reducing the waste of concrete resources.

5. The Application and optimization of energy-saving green environmental protection technology in stadium construction

5.1. We formulate scientific and reasonable technical solutions for energy conservation and environmental protection

The construction of the gymnasium is deeply affected by various external factors. Therefore, in order to better implement the green construction technology into the entire project construction, it is necessary to formulate a scientific and reasonable green construction plan according to the actual situation of the construction of the gymnasium. When the specific construction plan is formulated, construction technicians must not only consider the construction quality, construction safety and construction progress, but also need to continuously optimize the construction construction plan according to the social requirements for civil engineering construction, enhance green environmental protection construction technology and the entire stadium construction Construction photography.

5.2. A good job of green environmental protection at the construction site of the stadium

The application of green environmental protection technology in the construction of gymnasiums should be concretely implemented at the construction site, especially during the construction process of civil engineering excavation, crushing, mixing, spraying, etc. It is necessary to use green environmental protection technology to prevent and control construction risks. First of all, according to the requirements of green environmental protection, standardize the site investigation and geological monitoring in the early stage of construction of the gymnasium, collect and organize past gymnasium construction data, and provide important data support for the subsequent green construction of the project. Secondly, during the construction of the gymnasium, the construction personnel must always uphold the concept of green environmental protection, actively protect and utilize resources in the entire construction of the project, and take effective measures to reduce the noise pollution and environmental pollution generated during the construction of the gymnasium. The construction of the gymnasium and the surrounding environment are harmonious. Finally, in the later stage of the construction of the entire civil engineering, it is necessary for the construction staff to take the green environmental protection concept as the basic idea, and take the stadium construction unit as the main leader, after the completion of the project, they will actively maintain the surrounding construction environment and restore the surrounding ecological environment.
5.3. The green environmental protection concept is fully implemented in the actual construction of civil engineering

5.3.1. The green environmental protection concept applied to the construction of doors and windows. The doors and windows of the gymnasium are an important part of the gymnasium construction, and because of its simple design structure and low technical requirements, it has become the most suitable project for the construction of the gymnasium. The application of green environmental protection technology in the energy-saving construction of doors and windows is specifically reflected in the following aspects, and measures are taken to improve the quality of door and window production. Second, install seals on doors and windows and use broken bridge aluminum components for construction. In the entire project construction, the ratio of the area of the window to the area of the outer wall of the window must be strictly controlled. For the door and window structure materials, it is necessary to choose insulating glass and thermal insulation materials as much as possible to enhance the air-tightness of the entire door and window structure.
5.3.2. The applying the concept of green environmental protection to the construction technology of circulating water pump heating. Heating technology is also an important content of stadium construction. From the actual development situation, most of the heating technology applied in civil engineering is concentrated hot water heating or district floor heating heating technology, but from the actual operation situation, these two technologies are It will consume a lot of resources when it is applied, especially a lot of water is wasted. Therefore, it is necessary to actively introduce the green construction concept in the civil engineering heating construction, and the circulating water pump heating technology is a form of green technology, that is, the circulating pool at the construction site of the gymnasium. Sewage is separately discharged into the pool, so that the reuse of sedimentary water is realized while effectively treating the sewage drainage.

5.3.3. The applying green environmental protection concepts to wall construction. The wall is an important link in the construction of the gymnasium and plays a very important role in the green construction of the project. The application of the concept of green environmental protection in wall construction mainly refers to the improvement of thermal conductivity by installing thermal insulation materials on the outside of the wall, and then reducing the consumption of indoor and outdoor resource circulation and transmission in the stadium construction to achieve stability. Effect of room temperature. The energy-saving technology of the wall mainly includes two points: The first is the external insulation technology. Placing a layer of gypsum board or thermal insulation material on the exterior of the building with good thermal insulation performance can reduce the temperature loss in the building and also have a good moisture-proof effect. During the construction process, the external surface of the building needs to be pretreated to ensure the flatness and cleanliness of the external surface of the building, and then a layer of adhesive is applied to the external surface of the building, and holes are drilled at appropriate locations. After the position of the heat shield is determined, the expansion bolt is used for the secondary fixing of the heat shield. Second, internal insulation technology. Internal insulation technology is completed inside the building, which means that the inner surface of the building is coated with thermal insulation material to prevent the temperature inside the building from spreading to the outside in a short time. During the construction process, it is necessary to ensure that the application of the thermal insulation material is uniform and the thickness is uniform. After the application is completed, professional equipment must be used to inspect the wall. If there are missing coatings or uneven areas, it should be re-made.

5.3.4. The energy-saving technologies using clean energy. In the process of project construction, natural resources such as solar energy, geothermal energy and wind energy can be fully utilized. These resources are the gift of nature and clean energy without pollution. Therefore, the use of these energy sources should be strengthened during the construction design of the stadium. Rate to meet the requirements of energy conservation and environmental protection. By rationally designing the orientation of the building, the size of the window, and the distance between the two buildings, the utilization of solar energy can be increased, and solar panels can be installed at appropriate locations in the stadium construction to store electrical energy. China has already mastered the application of geothermal energy. The most common one is the ground source heat pump technology. The application of this technology can obtain thermal energy from the ground, and apply this thermal energy to people's clothing, food, shelter and other aspects. During the design process, according to the difference in the location of the building and the local wind direction, the wind energy can be used reasonably, and the use of summer refrigerant and winter heater can be effectively reduced. Applying these clean energy can effectively save energy and protect the environment.

5.3.5. The water recycling technology. The application of water circulation technology in the construction of the gymnasium mainly includes two points: first, the recovery and reuse of the precipitation in the foundation pit. The recovery and reuse of precipitation in foundation pits mainly includes water storage tanks and pumping sections. The pumping part extracts the water from the
foundation pit and transports it to the water storage tank for storage. Since the water resources in the water storage tank are not polluted, it can be used as daily water for the construction personnel. Second, the rainwater collection system. Generally speaking, the construction period of the gymnasium is relatively long, and it will inevitably encounter rainwater during the construction process. Rainwater is also one of the important water resources. It should be used reasonably. The collected rainwater can be used as a construction site for cleaning. Equipment or handling dust. The rainwater collection system collects rainwater and stores it in a water storage tank. A complete sensor is set up at the construction site of the stadium. When the sensor detects that the dust concentration in a certain area of the construction site exceeds the standard value, it will cause an alarm. This is the corresponding nozzle at the position will receive the command to perform watering operation to reduce the dust concentration. The cleaning of the equipment at the construction site is mainly on-demand.

![Energy-saving classification of gym windows](image)

**Figure 4.** Energy-saving classification and effect analysis of gym windows

6. Conclusion
Energy-saving green gymnasium environmentally friendly building materials are an inevitable choice for the construction and development of gymnasiums, an inevitable requirement to improve the competitiveness of the industry, and also the development needs of building a conservation-oriented society in recent years. Therefore, during the development of the stadium construction, it is necessary to combine the needs of engineering development, optimize and design the environmentally friendly building materials of the energy-saving green stadium, and continuously introduce new energy-saving green environmentally-friendly materials to improve the energy-saving and environmental protection functions of the materials and achieve the industry's sustainability development of. The application of energy-saving and environmental protection technology in civil engineering construction is not only necessary for the development of modern society, but also a factor necessary to maintain the quality of human life and promote the stable development of society.

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