Design Features and Construction Measures of Green Building

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Abstract: Along with the rapid economic development and urbanization in our country, the green building requirements gradually increase, the original green building has become the focus of people, but as a result of building energy consumption occupies more than thirty percent of the total energy consumption, the energy shortage problem, need to be solved in the implementation of the concept of sustainable development, based on this background, the green building can effectively environmental harmony with nature, this article is based on analyzing the present situation and problems of green building research, from the green building design characteristics, aims to better development.

1. Analysis of green building development

Green building takes “energy saving, land saving, water saving and material saving” as its objective and aims to protect the environment. It is to ensure health and create harmonious development with nature to the maximum extent, and its building comfort is one of the main considerations. Make full use of solar energy in China for renewable resources, meet lighting, save luminous efficiency. Green buildings have certain building performance index evaluation rules, which can reasonably judge the energy saving comfort level and environmental pollution degree of buildings. Figure 1 shows the green building diagram.

Figure 1 Green Building Representative Picture Source www.vanke.com

1.1 Analysis of green building characteristics

The characteristics of green building development are dynamic, flexible and flexible. Is based on the environmental characteristics of a full range of development, in the production design of the overall coordination. Considering the overall factors through the building shape, orientation, envelope structure and building structure system, and using green building materials to minimize the impact of environmental pollution through green construction and energy conservation. In the maintenance process, through scientific and reasonable management mode, the building overall efficient operation. In the process, green buildings are designed to save energy, save resources,

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return to nature and create a comforTable and healthy environment. Energy conservation refers to the renewable use of wind and solar energy, and energy-saving design of building envelope to reduce the utilization rate of heating and air conditioning. In terms of resource conservation, the utilization rate of resources will be maximized through building planning and selection of building materials to reduce energy consumption and ensure the reuse of resources. In the aspect of returning to nature, it emphasizes the integration of the exterior and the environment of the building, so as to achieve the harmony of movement and movement and maintain the natural ecological environment to the greatest extent. At the same time, make sure indoor air is pure and fresh temperature, humidity is controlled even, be able to assure habitant body and mind is cheerful. In order to present the characteristics of green building more clearly, the hakka tulou in yongding, south China, will be taken as an example to analyze, so as to obtain the characteristics of green building. Figure 2. Diagram of hakka earth buildings in yongding.

Fig. 2 Yongding Hakka soil building map, picture source beijing.lotour.com

As shown in figure 2, earth buildings are mainly made of soil, sand, wood, gravel and bamboo. In the construction process, unburned earth and sandy clay are mixed according to the proportion of the building. The main body is built with laminated wall panels to form a regular whole. Its role is to reduce the heat, to ensure living comfort. Ventilation and lighting can be done best through its patios. The building environment is in hot zone, can use the earth exterior wall to build solid, to achieve the role of warm in winter and cool in summer.

1.2 green building evaluation standards

In China, “green building evaluation standard” can formulate standard evaluation for building materials, construction process and maintenance of green buildings. In its “green building evaluation standard”, the green building index system is clearly introduced, as shown in FIG. 3 below. There are four major components in the green building evaluation system. The first one is energy conservation and energy utilization, material conservation and material resource utilization, land conservation and outdoor environment utilization, and water conservation and water resource utilization, which include essential indicators in green building.

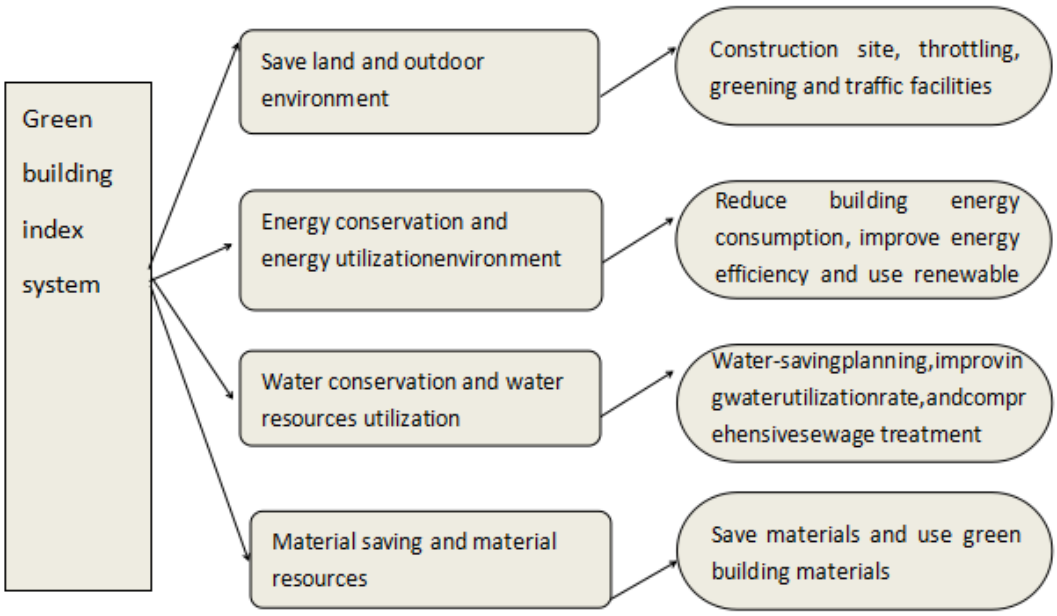

Fig. 3 green building index system

In the green building index system, which involves residential buildings and public buildings, green buildings can be generally divided into three levels, and their specific requirements are shown in Table 1 and Table 2 respectively

Table 1 residential building grade classification Table

level	Control items	Save land and outdoor environment	Landconservation and outdoor environment utilization	Energy saving and energy utilization	Water Saving and Water Resources Utilization	Saving material and Utilization of material Resources
☆	27	4	2	3	3	3
☆☆	27	5	3	4	4	4
☆☆☆	27	6	4	5	5	5

Table 2 classification Table of public buildings

level	Control items	Save land and outdoor environment	Landconservation and outdoor environment utilization	Energy saving and energy utilization	Water Saving and Water Resources Utilization	Saving material and Utilization of material Resources
☆	26	3	4	30	5	3
☆☆	26	4	6	4	6	4
☆☆☆	26	5	8	5	7	5

2. Analysis of green building construction improvement measures

2.1 Analysis of factors affecting green construction

Factors affecting green construction mainly explore the surrounding green ecological technology as the main, want to consider four factors, including the first, is based on a reasonable investigation on land resources, land as a main save the important factor of environmental protection, from the

rural residential land to build the city and countryside integration, fully exploit the underground space use of green materials. Second, in terms of energy, we pursue high efficiency and energy conservation. We make use of natural wind and natural lighting to further optimize the energy structure and realize green energy. Third, through the efficient use of water resources in the aspects of water conservation and rational treatment of groundwater, to achieve small displacement of no discharge of waste water and other requirements. Fourth, in terms of green building materials, lightweight steel structure will be adopted to reduce natural resources and further optimize waste products to reduce the high utilization rate of wood and cement. Based on this, the most important factor is its economic factor. From the perspective of economy, the contradiction between economic development and environmental protection is worsening day by day. The relationship between environmental pollution and economic development can be reflected in the famous kuznets curve, as shown in figure 4 below.

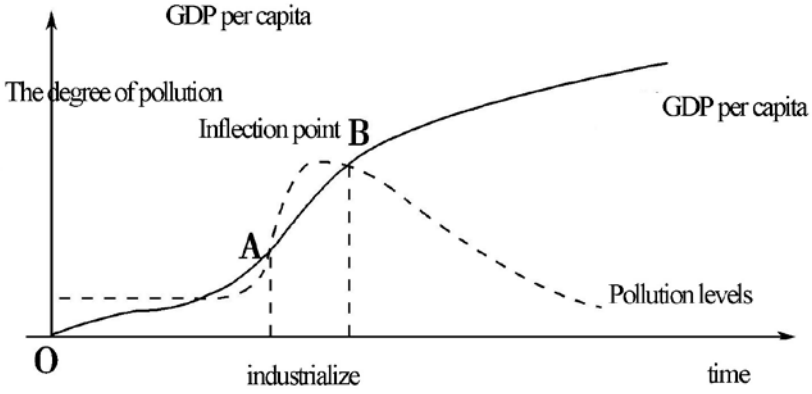

Figure 4. Kuznets curve

According to the figure above, land saving, water saving and energy saving are the three main economic effects of green building. To save land, the change measures are to use intensive land to build green buildings, further use of waste materials to save and protect the land area, use land resources, and expand the greening of the main purpose. Water saving, the focus is on the use of water-saving vessels, water saving habits to change, in terms of energy saving, to make full use of natural conditions around the natural light and natural ventilation, the use of lighting and air conditioning to reduce.

2.2 Renovation based on green building construction measures

Building exterior wall is one of the important parts of the building, which has strict requirements for technology, and the energy-saving transformation of the exterior wall is an important part of the green transformation. Take China's public buildings as an example to analyze the green transformation of the exterior wall. For the green transformation of the external wall, the effect of thermal insulation and energy saving should be considered first. In the traditional building envelope structure, the heat loss of the external window area occupies about 40%, so the external wall insulation technology should be focused on.In order to show more clearly and intuitively, this paper summarizes the application of three insulation technologies in external wall insulation, as shown in Table 3.

Not only that, although the external wall heat preservation technology can play the effect of heat insulation in summer, but for hot areas, heat insulation technology should be adopted to reduce indoor temperature. Among them, “back ventilation technology” and “wall greening” as the main heat insulation technology for construction. Among them, figure 5 “back ventilation technology” is used in the construction of Longshi International District, figure 6 Hong Kong Bihui Hotel uses “wall greening” technology.

Table 3 summary of external wall insulation technology

practice	disadvantages	advantages
External wall external insulation	(1) wide scope of application, applicable to different building thermal zone (2) basically eliminate the phenomenon of thermal bridge, insulation effect is obvious. (3) improve the durability of the structure, reduce the damage of the external environment to the envelope structure. (4) the impact of indoor use area is small 5) is conducive to the transformation of existing buildings, indoor personnel activities less interference.	(1) insulation exposure in the outdoor, easy to damage, leading to material durability (2) in the construction of high-rise buildings in the process of greater difficulty (3) relative to the external wall insulation, the quality of the material requirements are higher, the cost is greater.
External wall internal insulation	(1) insulation durability, effectively avoid the outside environment of the insulation layer broken (2) construction is convenient, do not need to set up scaffolding, indoor construction can (3) insulation material strength requirements are low, save costs, and fire performance is good	(1) by the external wall structure layer surface temperature stress larger shadow, easy to lead to the cracking of insulation layer (2) thermal bridge phenomenon is almost ineviTable, poor insulation effect (3) take up indoor use area
Exterior wall sandwich insulation	(1) insulation material strength, durability requirements are not high. (2) the construction season and construction conditions are relatively low requirements (3) insulation performance is better than the external wall internal insulation	(1) inside, outside the wall between the need for connecting pieces, relatively complex structure, construction technology High. (2) easy and ring beam, constructional column and other components affect the insulation performance of materials (3) thickness compared with the traditional wall slant thick, reduce the effective use area (4) affect the seismic performance of the structure

Fig. 5 back ventilation technical effect map of Nanjing Longshi international block www.najalc.cn

Fig. 6: The technical image of wall greening of the Hong Kong Bee Hotel www.idsrf.com.

The use of the above two technologies for green building transformation can effectively achieve environmental protection and architectural purposes at the same time.

3. Technical analysis of building construction under green building evaluation and certification

Through the green building certification, Shanghai museum of nature is the main representative building, which has designed and applied a number of new energy and green building technologies such as “ground source heat pump, photovoltaic power generation, new water utilization, natural ventilation, active light transmission, three-dimensional greening, structural optimization, intelligent metering system”. In the use of land resources, the underground space can be reasonably developed, and can be integrated with the track to facilitate travel. In terms of landscape, it can achieve harmony and unity with other buildings. In terms of recyclable resources and structural design, meet the green building standards. See figure 7 below.

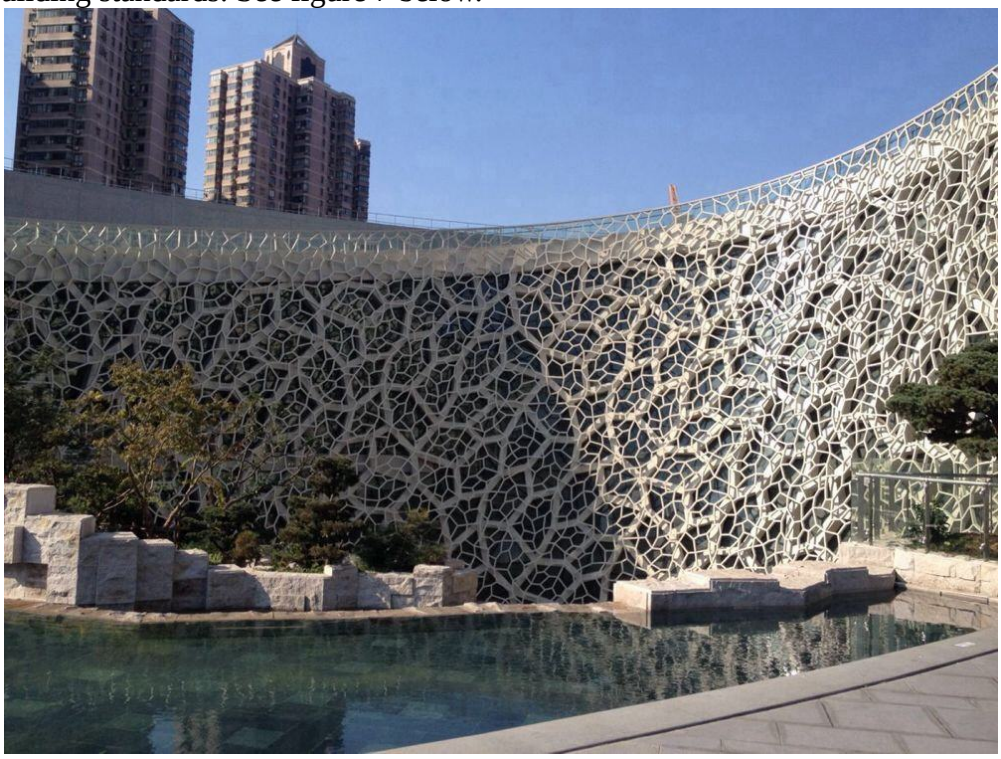

Figure 7 Shanghai museum of nature photo at you.ctrip.com

4. Conclusion

Under the sustainable development strategy of our country, we should keep pace with the theory and technology of green building. In the process of transformation, green building technology should perfect the energy saving, water saving and material saving of the building, so as to ensure the sustainable development of ecological environment. In the process of green building construction, we should fully consider the influence of related factors, such as energy, land, water resources, environment, economy and so on. Not only that, but also for the green building index system involved in the relevant requirements for full consideration, so as to achieve a qualified green building.

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