

Research on Residential Architecture Design under the Concept of Green Ecology

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Abstract: China's rapid economic growth at the same time, the development of the construction industry is also on the rise, in order to ensure the use of people's needs, in the process of building construction not only to consider its practicality, but also to consider its environmental performance. Based on the current background of the concept of green ecological residential building, this paper first summarizes the design of green ecological residential building, analyzes its main features, and explores the realization path of green ecological building design.

1. Introduction

China today, in order to achieve the city's new look good wishes, and engineering of the cities, and not the ecological environmental phenomena produced by the huge economic interests appear to have enabled us to forget the past has been promoting ecological environmental protection concept, we can't stop immediately built large-scale demolition activities, we can look at the issue from a new perspective: since and engineering can't stop, then we can take this to replace the high energy consumption of building in the world, the pursuit of low energy environmental protection building concept. In order to achieve long-term sustainable development of China's construction industry, lower in the course of construction, the destruction of ecological environment, the implementation of the green environmental protection and must be from the design of architectural design corresponds to the way, effectively reduce the environmental impact of construction process, at the same time on the development and application of the new building energy saving technology, better quality to reduce the wastage of the energy, through use of renewable energy, to achieve the effect of saving energy and reducing consumption, green environmental protection.

2. Overview of Green Ecological Residential Building Design

2.1 Concept

Green ecological architecture is a building as a highly efficient operation of the ecological system, within the system, through the methods of building indoor and outdoor design, environmental and ecological connotation, in the construction industry under the vision of the high, with green environmental protection for the idea, to energy saving and renewable energy (energy, heat energy, solar energy, wind energy development and utilization, embodies the perfect combination of architecture and ecology; At the same time, the architecture should also consider the surrounding social environment, artistic environment and material environment, and reflect the natural balance between the architecture and the environment with the view of cyclic symbiosis.

So green ecological housing is not the literal meaning, not to say simple green or garden-style building model, green ecological housing represents more of an idea, a sustainable green cycle concept. Green ecological residential cater to people's lives are not just pursuing, but also by the government's high attention, with the support of the government, green ecological management system has made great development and improvement of the power of the government as a strong enforcement agencies, believe that the government policy guidance, support and supervision and management, green ecological residential building will towards institutionalization and legalization, the road of scientific and effective, the desire of the implementation of the green ecological

buildings in China about just around the corner.

2.2 The Characteristics of

2.2.1 Energy Conservation and Consumption Reduction

Because our country did not consider the factor of energy saving in the design of traditional buildings, the construction of the high energy consumption and high pollution in the process of malignant consequence, greatly influenced the quality of people's lives, therefore, in the design of new type of green construction, the target of energy saving and consumption reducing is first on the design of planning, in the process of continuous development of science and technology, human in depth for renewable energy development and utilization, such as wind, solar, water, etc., because of its low carbonization index of the renewable energy was deeply loved by people, suitable for use in building design content, motivation and support for building design.

2.2.2 Environmental Design

Green building design advocates the characteristics of green environmental protection in the whole life cycle and the whole process. First of all, in terms of building materials, with consideration of green environmental protection materials as the main starting point, try to choose renewable building materials to increase the comfort of people's living on the basis of vigorously promoting environmental protection building materials. Secondly, in the construction of the use of technology, the use of environmental protection high-tech means, such as: indoor environment control technology, lighting technology, intelligent system. These new research and development technologies have further improved the technical content in the construction process and added new contents of environmental protection technology. Thirdly, the rational use of the space environment, under the premise of extremely limited land resources, how to use the limited land resources for in-depth development and utilization, is one of the issues to be considered in the building environmental design. To make the building and the surrounding environment integration, on the basis of the optimal allocation of resources, reduce the building land as far as possible, realize the reasonable layout of the building space, create the maximum value of the building project.

2.2.3 Cultural Regions

In order to meet people's living comfort and practical needs, the content of environmental protection architecture design must adapt to the local climate and environmental characteristics, not be separated from the local geological conditions, cultural features of the characteristics of the local features, to avoid the “flashy” construction process phenomenon, to focus on the local features and human characteristics. Residential areas also want to pay attention to do as the Romans do, not and the surrounding environment. Different regions, nationalities, times and customs determine different architectural styles. We should stick to the basic elements of green housing, but also on such a basis to ensure that the residential area can reflect the local context and characteristics, and become a representative building to inherit and carry forward the local cultural customs.

2.2.4 Virtuous Cycle

Design a relatively perfect green ecological house, not only to consider the local natural environment factors, but also to apply to such as architecture, ecology and other fields of basic principles and the current advanced scientific and technological means. Among the design concept of green ecological residential area, residential area for each room standard of indoor air should be good, and the living area should have strong ability of ecological climate regulation, so as to meet the residents' pursuit comfortable residential environment, the purpose of let the residents really feel oneself and room, and residential area, and the ecosystem environment formed a benign ecological circulation system, can be in harmony with each other, a sense of green ecological residential districts and ordinary modern high-rise residential area there is a difference between.

3. Basic Elements of Green Ecological Residential Building Design

Green ecological housing is based on the modern housing from a macro point of view to pay attention to people's lives, attention to the relationship between the environment and resources. It not only pays attention to the use efficiency of the space pursued by the modern residence, but also pays attention to the efficiency of resources and environment. The basic elements of green ecological housing mainly include the following:

Reasonable planning and design to create a truly green and ecological residential space, to ensure the harmony between the building and the surrounding environment, to maximize the preservation of valuable ecological elements around, and to pursue the harmonious coexistence of the built environment and the natural environment. In the early stage of the design, we should have a comprehensive understanding of the surrounding environment, including terrain, vegetation, hydrology, sunshine and other necessary elements, so as to ensure that the room can have sufficient lighting time and a good ventilation environment.

Green ecological residential will adhere to the design concept of saving energy, water, land, in the aspect of construction site must be guaranteed in harmony with environment at the same time as much as possible, make full use of every inch of the land, in addition, the residential water supply and drainage system must be installed water-saving appliances, set up the water supply system, realize the depth of the drainage purification, must achieve the secondary environmental regulations of the state.

The interior decoration in the residential area adheres to the simple and practical principle to ensure that both chemical pollution and radiation are lower than the environmental protection standards. The pursuit of green ecological housing is to use the least energy consumption to achieve the effect of green ecological, so the use of building materials is very critical, the use of high-efficiency pollution-free building materials is to ensure that the green ecological housing plan can be carried out on the premise.

4. Realization Path of Green Ecological Residential Building Design

4.1 Application of Energy Saving Technology in Shape Design

The design scheme of any building is of vital importance. The scale, orientation, shape and function of the building are directly related to the energy consumption of the whole building. The smaller the trapezoid coefficient is, the smaller the surface area is, and the smaller the energy consumption of the air conditioning and heating system is. At the same time, considering that the heat consumption of curved buildings is lower than the technical theory of straight buildings, the corresponding energy-saving technology should be adopted in the design stage to minimize the convex and concave curve of the building shape, and the regular plane shape structure should be adopted. On the other hand, the height of the building should be controlled to reduce energy consumption with relatively small exterior wall area. For modern buildings, energy conservation is also the most important topic. In order to effectively promote the construction of high-rise buildings. We can do this in terms of the overall layout, the individual design, and how the related constructs are handled. We can integrate with the surrounding buildings as a whole, and then ensure the design of high-rise buildings with low energy consumption and low pollution by combining the lighting and wind direction of the surrounding environment. At the individual design level, we can also standardize the design by designing related structures. This standard design ensures the safety and comfort of the interior of the building. For relevant structural treatment, we can also regulate the building temperature by introducing relevant emerging systems. This can maximize the overall energy efficiency of high-rise buildings.

4.2 External Wall Design Green Environmental Protection Scheme

In order to reduce energy consumption, the exterior wall is designed with natural light as far as possible to achieve thermal stability of the interior space environment under good lighting

conditions. With respect to material, choose heat insulation brick to replace clay brick as far as possible; In terms of building envelope, coated glass is selected to improve the thermal stability of the interior. In the air tightness design of the building, it can be appropriate to adopt flexible heat insulation device, in order to reduce the heat exchange between indoor and outdoor; In the use of electrical equipment in buildings, the induction device of intelligent system is selected to effectively use the automatic switching device of power supply to save electric energy. In terms of the water use scheme of the green ecological design of the building, the sewage of the building should be treated centrally according to the structure of the local drainage system.(As shown in Figure 1)



Fig.1 Exterior Wall Environmental Protection

4.3 Outdoor Green Ecological Environment Scheme

Building indoor and outdoor environment should reflect the design concept of combining, strengthen the environment greening, create a good climate, the protection on the basis of the existing green space, expand the lawn area, planting tall trees used to heat and air purification, laying the floor tile of lattice, good permeability of ecological floor construction, and introduce the concept of “land of space, three-dimensional surface of the green environmental protection design of buildings, such as: Balcony afforestation, exterior wall afforestation, roof afforestation and so on, make new green design idea is integrated into the design, with borrow scene, group scene, cent scene and add scene of different design technique, build the green building environment of ecology harmony. The energy of light can be applied to other places by cooling the building or absorbing the light through its internal structure. In addition, the environmental air humidity is also very important to the impact of the building, how to reasonably reduce or increase the air humidity to the most suitable degree of humidity is very important.(As shown in Figure 2)

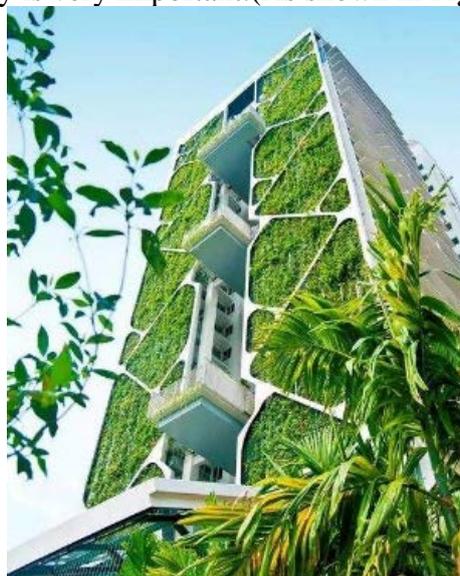


Fig.2 Ecological Design

5. Conclusion

Ecological green residential construction is a very long-term task, but also a difficult task, in the process of continuous development of architecture how to design the building industry is the human society and the natural environment as a whole, is a new problem for architecture, is also a major development intention. Therefore, under such circumstances, we should fully consider the concept of green ecology and realize the balanced development of architecture and ecological environment in architectural design. And the concept of green ecology will not only stay on the construction of residential areas, but also continue to expand its scope, truly achieve sustainable development.

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