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Abstract

This paper proposes the modern passive integrated energy-saving technology of the residential buildings under green building background. The essence of green building is to build a healthy and general environmentally friendly living environment under the premise of reducing the consumption of resources and improving the efficiency of resource utilization in the whole life cycle of construction activities. Green building bearing function is further diversified, integrated, and has a self-initiative. The development of the green building, local isolated from the original single building greening, greening, landscaping site platform, gradually developed for construction area and the surrounding green ecological system of comprehensive, three-dimensional stratified construction and network connection. Its model gradually shows the micro area of the construction of the ecological system and architectural space integration. This paper integrates the passive integrated energy-saving technology to construct the novel construction paradigm.

Keywords: Passive Integrated, Energy-saving, Residential Buildings, Green Building

Introduction

Along with modern science and technology rapid development, people's life style has had the huge change. Modern science and technology development, on the one hand let us enjoy the contemporary civilization fully, simultaneously caused us easy to neglect the nature to grant humanity's sunlight, the air and the water. Relies too heavily on modern science and the technology, on the other hand, the lifestyle and promote the people-oriented too much economic value system, and is easy to weaken the harmonious coexistence of the close relationship between human and nature. And this change is also affecting the modern architectural design concept. In the architectural design of the energy saving and environmental protection thoughts, according to the national standard of energy saving design, design should follow the following principles.

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• Choose to re-use of building materials, building materials can be recycled and re-use; in the process of building design to do people-oriented design concept, it is necessary to meet the people's living needs, but also to protect the ecological environment that of the future living environment to consider.

• To improve on the efficiency of natural resources. Due to the construction in the process of the build and use, consume a large amount of resources, so want to rational use of existing resources to increase the utilization rate of resources.

The construction heating as well as the air conditioning energy conservation design must carry on with the construction maintenance structure energy conservation design synchronization. People's housing request is generally may the diurnal long-term usage, therefore the room temperature as well as the air quality needs to satisfy the very high request, therefore conserves energy to the building the key work is carries on the energy consumption to the heating system which the energy conservation as well as the reduction uses for to decrease the temperature. Before design, we must carry on the reasonable plan as well as the choice appropriate heating equipment, carries on the reasonable design to the heating system, carries on the management to its movement to enable the boiler the operating efficiency to obtain the enhancement carries on the enhancement to the pipeline heat preservation, enhances outdoor pipeline the transportation efficiency and in order to enhance the heating system to give off heat the efficiency must advocate the centralism heats the way, in the greatest degree saves the fuel the consumption. As the demonstration, in the following figure one, we show the green building components and the architectures.

Figure 1. The Green Building Components and the Architectures.
The Proposed Methodology

**Building Energy Efficiency Model.** Energy conservation is the long-term economic and the social development in our country strategy, which is both the inevitable requirement of the scientific development concept that is also a responsibility for the future. Our country is a nation of energy consumption, among them, about a third of the whole social total energy consumption while building energy consumption in the face of increasingly prominent energy crisis, energy-efficient building an eyebrow nimble. In one project, line up and down around the small project line length arranged in a crisscross pattern, not million meters, big project is too many to count, so the loss on the line is considerable, reduce energy consumption on the line must cause the attention of the designer and the design from the following aspects of such note.

- Reduced wire length. When design distribution line walks as far as possible the straight line, little detours, forbid strictly the road back. When high-level design, determined reasonably the transformer vault and the electrical firm well position, cannot have the electrical energy to deliver the phenomenon but actually. For example, the transformer vault is constructing the eastern end, the electrical firm well supposes in the western end. The skeleton line comes out which from the transformer vault from east to west delivers, from west to east returns actually from each electrical firm well branch delivers to uses electricity respectively, the spot, as this phenomenon should drop ceases definitely.

- Resistivity small materials should be chosen as a conductor. Under the condition of the same path, length, cross section, the aluminum core cable is more than the loss of the copper core cable on 1 times which can be reflected from the table one.

Table One. The Temperature and the Energy Consumption.

<table>
<thead>
<tr>
<th>Temperature</th>
<th>City A</th>
<th>City B</th>
<th>City C</th>
</tr>
</thead>
<tbody>
<tr>
<td>22</td>
<td>6635</td>
<td>4332</td>
<td>1864</td>
</tr>
<tr>
<td>18</td>
<td>6895</td>
<td>5124</td>
<td>1975</td>
</tr>
<tr>
<td>16</td>
<td>7155</td>
<td>5156</td>
<td>2236</td>
</tr>
<tr>
<td>14</td>
<td>7623</td>
<td>5696</td>
<td>2576</td>
</tr>
<tr>
<td>12</td>
<td>8179</td>
<td>6100</td>
<td>2785</td>
</tr>
</tbody>
</table>

**The Green Building Background.** The future green construction will be supposed further to adopt the following strategy in the general contemporary green construction practice foundation as the expanded practice criterion, with the region ecosystem conformity, consummates the construction the matter energy circulation. In order to open to design, the renewable material may circulate use to integrate the architectural design and to construct, enables today the building to become the resources mineral resource which the future will construct as the biological climate design took the construction ecology design the foundation and the beginning guaranteed the construction maximum limit uses the natural energy and the natural resource.
Sustainable development requires green cities to balance the relationship between cities and nature, people and the environment at both macro and micro levels. The rapid development of general new technologies, such as message technology, also completely overturns the concept of optimal layout of traditional urban space functions. The distribution of information, logistics and supply to demand has broken through single chain-type organizational relationship increasingly complex and networked. In theory, a building, perfect only when it is in the whole life cycle to achieve a healthy and comfortable, saving energy and reducing consumption, the task of protecting the environment, truly beneficial to human sustainable development as can be called "green building", the pursuit of green buildings also have ultimate significance. Too accommodating the realistic evaluation standard also often masking the real goal for green building this standard is not so much the goal of the green building, rather a practical strategy to promote the development of green building.

**The Residential Building Features.** The planning and design of the building should emphasize the principle of "people first, environment first", maximize the efficiency of energy and material use, reduce the environmental pollution during construction and use, and then meet the suitability and durability of the building as emphasizing the "good nature", pay attention to environmental, energy saving, environmental protection three themes, so that the building and the environment have reached sustainable and harmonious development, improve the living space grade enhance the city's brand. From the aspects of contract, organization, technology, economy and so on, we should take measures to control the project cost effectively, and analyze the whole life cycle by considering the factors of the location, energy, indoor environment quality and operation and maintenance as the follows.

- Architectural form. The architectural form of the design not only on the building's body size requirements, but also need to help the winter shelter in summer to reduce the daily radiant heat. The need for heat and heat loss according to the specific circumstances of the building after the optimal combination.
• Building space. The distance between the buildings on the human psychology and the spirit has the great impact, so in the design can not only simply consider the sunshine spacing, according to the health line of sight and the impact of human design.

• Green design. Community greening and water should also be considered, not only meet the government requirements of the basic minimum rate of the greening, but also to understand the performance of vegetation applications, such as in the building environment, the use of tall trees to cover the winter cold wind can be combined in summer shade, medium and small trees and shrubs can reduce noise. This can not only improve the microclimate of the district, but also reduce the heat island effect and improve the local climate.

• Location and layout of the buildings. The construction community's arrangement is whether reasonable that obtains the solar radiating heat and the summer to the winter ventilates the temperature decrease to be extremely important. If it constructs in the selected location, the construction chooses not suitably in the marsh land, as the mountain valley and so on place, should choose in the land sector which toward the sun, takes shelter from wind strives for the sunshine creation essential condition for the building.

**Passive Integrated Energy-saving Technology.** Passive form design is based on the dynamic interaction between architectural form and energy and makes full use of natural energy, rather than equipment, save energy consumption of the goals is met. Using natural energy technology referred to as passive and passive technology in collaborative form is called passive form. The energy and the material flow in the media of environment (architecture) and medium to a large extent determine the speed and flow of energy and matter flow. By shaping the media environment, can guide the flow of the energy. The passive form the energy conservation construction is uses the passive form energy conservation technology the construction. The passive form energy conservation technology, is refers through constructs own conjunction climates and so on the layout, material, procedure auxiliary achieves comfortable and the energy conservation technology by the air conditioning equipment batch operation. Distinguishes the space and the nature isolates in driving-type energy conservation technology the room in, again uses the air conditioning equipment creation pleasant environment procedure which conserves energy highly effective that can be separated into the listed aspects.

• Extreme weather conditions using air conditioning equipment to satisfy people's demand for indoor thermal comfort environment and because of the intermittent open air conditioning equipment, for equipment can quickly cooling or heating, so as to shorten the time from open air conditioning to indoor comfort.

• In line with people's traditional way of life and customs. Traditional lifestyle, people used to open the window in the morning ventilation, winter sunny sun, summer sunny night cool and passive energy-saving building comprehensive utilization of natural
ventilation and passive heating and other measures for residents to establish a convenient, comfortable lifestyle.

- Create a comfortable, healthy indoor environment, compared with the continuous operation of the building closed doors and windows, air conditioning, passive energy saving construction through reasonable layout for indoor natural air fresh and clean.

Based on the discussions on the prior sections, we can then summarize the passive integrated energy-saving technology from the following perspectives. In the hot summer and cold winter, winter roof cooling in the total loss of enclosure structure heat occupies a considerable proportion of intense radiation from the sun in summer and will cause the top room overheating, air-conditioning energy consumption increase. Hot summer and cold winter, summer heat is the main task, and therefore requires the higher roof insulation. In order to obtain the ideal thermal insulation performance of the roof, the following measures can be taken.

1) Choose suitable thermal insulation material, its coefficient of thermal conductivity as thermal inertia index should meet the standard requirements:

2) In the form of aerial insulation roofing or upside-down roofing, etc.;

3) The roof greening slope roof, water storage roof, light-colored roof, etc.;

4) Use ventilated housetop, attic housetop, etc.

**Conclusion**

This paper proposes the modern passive integrated energy-saving technology of the residential buildings under green building background. People's housing request is generally may the diurnal long-term usage, therefore the room temperature as well as the air quality needs to satisfy the very high request, and therefore conserves energy to the building the key work is carries on the energy consumption to the heating system which the energy conservation as well as the reduction uses for to decrease the temperature. Starting from these ideas, this paper proposes the novel countermeasures to deal with. In the future, we will apply the proposed method into more scenarios.

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Reference


