Analysis on the Application of Energy Saving Technology in Residential Planning of Green Realty

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ABSTRACT

The planning and design of residential buildings has a significant impact on the energy consumption. Therefore, it is clear that the residential planning and design of energy-saving technology, and its application to the residential area, which can effectively save energy and form a good living conditions. This paper defines the concept of green realty, and puts forward the main planning and design methods of green realty, in order to optimize the micro climate environment of the residential district.

THE CONNOTATION OF THE GREEN REALTY

Green Realty mainly focuses in three aspects: Lower energy consumption, more sustainable to form a stable function, long-term ecological factor system of settlements.

APPLICATION STATUS OF ENERGY SAVING TECHNOLOGY IN GREEN REALTY

Now, most of the real estate business in order to packaging development, mainly focus on the active energy-saving technology in real estate development, and ignored the high rate of return on investment in the application of passive technology, which both spent a lot of investment, but also failed to achieve a very good energy saving effect. Therefore, the application of green realty energy saving technology should be further deepened, it should be convenient to implement and can effectively improve the energy utilization of residential energy-saving technologies to promote.

PLANNING AND DESIGN OF GREEN REALTY ANALYSIS

Planning and design is the most important part. Energy saving technology in real estate development is mainly in the following areas: Land selection, Planning...
Building Site Selection

The reasonable construction site is an important premise to achieve energy efficiency in residential, although in engineering design for plots of choice is very limited, however, in the plots within a reasonable layout of the residential building, while avoiding disadvantages, still can to improve the micro climate of the District, for the follow-up design and lay a good foundation. The main strategies are as follows:

(1) Building houses towards the sun

Human survival, physical and mental health, work efficiency has a close relationship with the sun. Statistics show that the winter heating energy consumption accounts for about 65% of the total energy consumption in the cold area. As far as possible the use of sunlight is the most basic, economic and effective way. In certain plots, residential base should be chosen in sunny locations (flat or slope), for sunshine provides the prerequisite conditions.

(2) Avoid “Radiation interference"

A large area of the surrounding area of the glass curtain wall construction (especially high-rise buildings), will be reflected by the way the summer local block heat load increase. In addition, the formation of light pollution will affect the normal activities of households, is not conducive to physical and mental health. Therefore, the residential base should try to avoid the above areas, and the use of green and other means to reduce its impact.

Building Layout

(1) To strive for the sunshine

The type of residential on the plane, the length should not be too large, otherwise the middle unit's sunshine will be affected, even can not meet the minimum requirements, not conducive to the overall energy saving.

(2) Base and Building ventilation planning

In the planning and design, rational and efficient use of natural ventilation is an important means of energy saving. Planning toward (orientation) the best control in 30 degrees to 60 degrees in summer monsoon direction and leading, and there is sufficient space to ensure. First, residential building can block cold wind. By properly arranging the residence, reducing the wind speed, the heat loss of the outer surface of the building and the field can be reduced, and the heat energy can be saved. Residential compact layout, the building spacing in 1: 2 within the scope, you can give full play to the effect Fengying, so that the rear housing avoid of tailings flow wind vortex area, reduce the effect of the invasion of cold air. Using a combined building, will be a high-rise residential, especially residential type back to the cold winter wind, reduce the effect of wind on the medium and low layer building and courtyard. Second, setting the windbreak.

Building Orientation

First, the layout should not be closed in the summer leading wind direction.
Second, South Street, multilayer type should not be used in long shape (especially the top). Third, the East and West Street should not use multilayer or high-rise type, such not only residential unit toward bad and influence into the wind, should adopt the type or strip type low layer (as a commercial outlets, such as non residential use). Fourth, the surrounding layout is not conducive to the summer ventilation, such as the East, West and South of the ground floor of the building overhead, can play a certain role to make up for.

Fifth, the building height should be low in and high in north, north facing street construction can adopt a longer strip type multi-storey or even high level (can improve the volume rate, but also does not affect the distance between the sun). Sixth, non Street building should be staggered, so that the ventilation (Road) through the poor.

From the single residential ventilation conditions, the housing and the dominant wind direction are perpendicular to the best effect. However, from the perspective of the whole house, this situation is not entirely favorable, and people often want to form a point of view, so that each row of houses can be more satisfied with the ventilation conditions. According to the above mentioned two aspects should be taken into consideration, the best choice for the local residential and suitable towards. Through the analysis of the meteorological data of many years, the scholars of our country have made a summary of the orientation of the main city building. The following table lists the best, suitable and not suitable for the urban housing in some areas of our country.

### ORIENTATION RECOMMENDED TO THE TABLE.

<table>
<thead>
<tr>
<th>Region</th>
<th>Best Direction</th>
<th>Proper Direction</th>
<th>Bad Direction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beijing</td>
<td>SE, ≤30°W</td>
<td>SE, ≤45°W</td>
<td>NW 30°~ 60°</td>
</tr>
<tr>
<td>Dalian</td>
<td>S, ≤SW 15°</td>
<td>SN 45, W</td>
<td>W</td>
</tr>
<tr>
<td>Shijiazhuang</td>
<td>SE 15°</td>
<td>SN30</td>
<td>W</td>
</tr>
<tr>
<td>Taiyuan</td>
<td>SE 15°</td>
<td>SE,E</td>
<td>W</td>
</tr>
<tr>
<td>Xi’an</td>
<td>SE 10°</td>
<td>S, SW</td>
<td>W, NW</td>
</tr>
</tbody>
</table>

### EXTERNAL ENVIRONMENT DESIGN

At present, the intensity of land use in residential area of relatively large. External activity space is limited, for the external environment, mainly is the rational design of the interface can be in winter is effective against the winter cold air invasion, reduces the housing monomer air infiltration energy consumption; in the summer effectively reduce the "heat island" phenomenon caused by the development of high strength, reduce the temperature of the building envelope, and provide a more comfortable outdoor activity space for residents. Therefore, the rational design of the external environment is an important part of the planning and design of residential green property.

(1) Increase the planting area, the key is to emphasize Ratio with windproof ability of tree species are Sabina chinensis, ginkgo, willow, ash, sycamore and other. Studies show that the effective wind distance of the tree is about 2 times of the
height of the wind, the wind is reduced by about 50%, which can make the loss of the house's osmotic heat loss by 75%.

(2) Reduce the hard floor, the floor of the field ecological design, has the characteristics of "breathing". At the same time, the use of green water for summer heat. In the design of outdoor environment planning, in order to play the role of summer heat, experience and practice are common: First, the outdoor ground as much as possible the use of permeable, semi permeable materials, water surface as far as possible to use light colored light or appropriate reflectivity (0.5 ~ 0.3) of the ground material, and as far as possible to provide shade. Second, outdoor greening should pay attention to the abundance of vegetation, the trees, grass and other organic combination of water features design. Outdoor green design is the focus of community design, ecology believes that the diversity of species is the key factor to maintain the stability of the system. The diversity of plant species can also play its ecological function better. Tall trees can effectively block the solar radiation, and the heat flux of the external wall of the climbing vines can significantly decrease, and the large area of the lawn and shrub has obvious influence on the local infiltration and latent heat. A large number of data of Tsinghua University indicates that the temperature in sunny weather, no shade, cement brick, grass, sand, etc. over 1.5 meters of almost no difference; under the shade of a tree, the temperature of 1.5 meters to about 180℃ is low, human feeling is very obvious. As a result, the cooling effect of the trees is the most effective one. Studies have indicated that the main effect of the lawn is to improve the air humidity in the vicinity of the main function of the lawn, which is improved by blocking the solar radiation and improving the thermal environment. Shrub has stronger ability to improve the local penetration. Therefore, based on the above factors, it is recommended to use different types of plants, multi-level three-dimensional green. Third, in the construction of the external space configuration of water systems, pools, fountains and so on can make the temperature stable. Summer absorb heat during the day evaporation temperature reduced; in the evening, water cooling is slow, hard ground heat faster, land and water caused by thermal effects of different, the formation temperature, causing local heat pressure difference is formed during the day to land, at night to water the alternation of day and night wind of land and water, improve the local thermal environment. The evaporation of water can maintain the stability of the relative humidity. However, we should pay attention to the efficient use of water resources.

SUMMARY

The implementation process of green realty needs to be in the initial stage of design, planning, conceptual design process, it should be energy saving as one of the main guiding ideology, weigh all aspects of factors, reasonable design. Lay a solid foundation for the next phase of the energy saving design. Green real estate in our country has a very broad prospects, the green community will become an important trend in the future development of residential areas. Planning and design from the perspective of spatial attention life and design based on the concept of green real estate is from a more macro environment and resources point of view about the life of human beings, and will eventually get to the human and natural organic symbiosis.
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REFERENCES