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Sustainable development of high-rise building

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Abstract

The purpose of this thesis is to discuss the sustainable development of high-rise building in Chinese cities. As the construction climax of high-rise building has arrived in China, many constructed or constructing high-rise buildings are still in the state of environment-unfriendly, low standard and efficiency, high consumption and pollution, and featureless. This kind of development is not sustainable. The method used in this study is analysis of environment protection, safety, and efficiency of the high-rise building, which tend to solve these above problems and make a sustainable development. The paper suggests that it is necessary to establish the green high-rise building system, which to be composed of external environment, internal floorplan and Architectural Form.

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Keywords: high-rise building; sustainable development; green system;

1. Creation in external environment

1.1. Climate considerations

Climate is the first considerations in constructing. Under the condition of meeting the general distance requirement of sunshine, we can reduce buildings density and increase external space of high-rise building, so that to improve the external natural illumination, landscaping and microclimatic of external environment, then creating a more fresh and pleasant space to habitat. As far as the wind environment, it is necessary to make a model and test in wind tunnel for the high-rise building which has the special demand for environment. Discovering the best figure and size, and adjusting the design. At the same time,

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it is very effective that virescence, making holes on shell and gradient height backing, which can improve the external wind environment obviously.

1.2. Optimal utilization of land

Because of the high land prices in modern city, the density of buildings is high in many regions. It has caused the city "Canyon" and the congestion public space. The controlling of plot ratio and building density is an effective way. On the one hand, plot ratio controlling can restrict the target of land area utilization of high-rise buildings. On the other hand, the height of high-rise buildings can be controlled through the interaction of plot ratio and building density. So, the optimal utilization of land is very helpful to achieve a good relationship between buildings and surrounding environment, then an enough public space could be saved to improve the quality of external environment[1], see Fig 1(a); (b). Therefore, architects should attach great importance to the intrinsic link of architecture and natural environment.

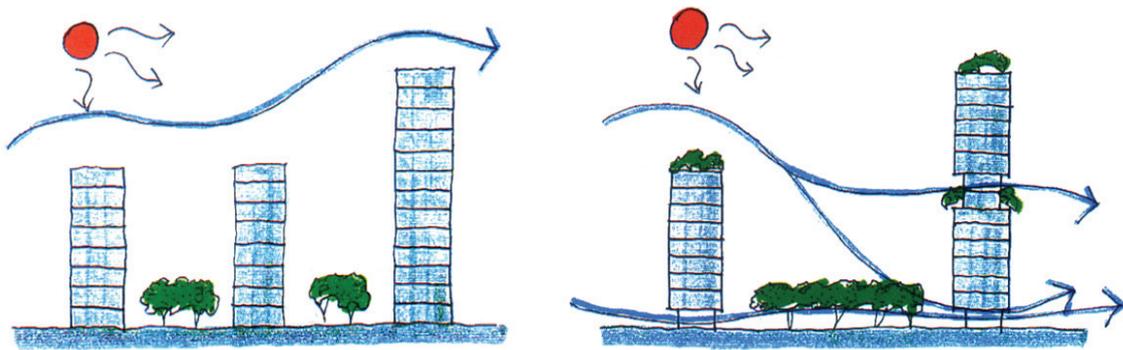


Fig. 1. (a) traditional land utilization; (b) ideal land utilization

1.3. Organizing the efficiency transport network

The reasonable entrance, fire passageway and parking place which set by information technology, is guarantee for an unobstructed, safety and efficiency traffic network. In the concrete jungle city, more emphasis has been placed on intelligent transport network which use the system of interchange, vertical conversion and real time supervision.

2. Floorplan and spatial constitution

2.1. Floorplan and Efficiency

The direction toward of high-rise building is significance to the rational using of natural resources. Studies have shown that the same building which towards to east or west will have more energy load than to north and south. So the cores of building should be arranged at the east-west direction to keep the main body from direct sunlight, thus saving air conditioning energy consumption and minimize the heat loss. Rational direction will help the building to receive sufficient natural light and ventilation. The more layers mean the more staff and greater requirements of energy consumption. So, the efficiency of standard

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