

Sponge city theory and its application in landscape planning

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ABSTRACT: *With the development of national economy and the progress of science and technology, the process of urbanization is advancing faster and faster. The construction of sponge city has gradually become a very important part of urbanization. Paying attention to the construction of sponge city can not only effectively solve the problem of diseases caused by rainwater in the city, but also make more efficient use of water resources and adjust the whole. Therefore, in the process of urbanization, paying attention to the planning and construction of sponge city plays a very important role in the whole landscape planning.*

KEY WORDS: *Sponge city; Landscape planning; Application*

1. Introduction

With the development of economy and the progress of science and technology, the process of urbanization is advancing faster and faster. In the process of urbanization, more and more projects need to be built. In terms of urban landscape architecture, the construction of sponge city can promote the construction of urban ecosystem.

The application of sponge city theory can improve the city's precipitation absorption capacity and play a positive role in solving the problem of urban waterlogging. Therefore, strengthening the application of sponge theory in landscape planning can better promote the landscape construction.

2. Rainwater collection

The application of sponge city theory in landscape architecture mainly focuses on the problem of water. Therefore, in the process of landscape architecture construction, rainwater should be put in the first place. In the design of landscape architecture, we should take this as the design center to carry out the design.

On the one hand, rainwater collection can keep groundwater resources in a relatively stable state, on the other hand, it can save urban water and make more efficient use of water resources. In the construction of garden square, special water storage system should be designed to collect and utilize the surface water, so as to achieve the purpose of irrigating garden and supplying water pool [1].

The application of sponge city theory is mainly reflected in the use of water. The better design of rainwater collection system in the design of buildings can carry out the role of sponge theory in the urbanization construction. It is also based on the use of sponge theory to collect rainwater, which can reduce the loss of water resources in the garden.

In the actual operation process, the installation of rainwater collection device is not necessarily in the fixed building location, it should be installed according to the actual architectural design situation, to better improve the efficiency of rainwater collection.

In the process of square design, it is the application of sponge theory that can make full use of the water resources inside the garden and reduce the diseases caused by rainwater. Collecting rainwater can also better build the ecological circle in the garden.

3. Design of buildings

The application of sponge city theory in landscape architecture planning should focus on its sponge nature, and pay attention to the rationality of layout [2].

In order to achieve this, it is necessary to systematically understand the terrain where the building is located. No matter what kind of landscape design is based on the terrain where the building is located, it is necessary to sort out the terrain characteristics and relevant data into the necessary building data for reference in the garden forest design, so as to continuously improve the perfection of rainwater collection system construction.

In general, when designing buildings, we should take into account the different characteristics of rainy season and non rainy season, and design buildings according to different urban precipitation. For example, in rainy season, the urban precipitation is relatively sufficient, especially in some southern cities. After the southern cities enter summer, the precipitation is sufficient. In these areas, more hidden channels can be designed to Rainwater collection, the so-called hidden channel, is the design of water channel in some inconspicuous places of the building. The main function of the hidden channel is to collect rainwater. After rainwater is collected in the hidden channel, it flows into the filter tank, and then puts gravel and other materials into the filter tank. Through this method, the preliminary filtration of rainwater is completed. It is necessary to know the impurities and microorganisms of rainwater before filtration Very much, it is difficult to use directly. In the sponge city theory, it is necessary to make full use of the rainwater resources to form the infiltration mode to carry out the daily use of some enterprises and families, so it is necessary to filter

the rainwater. Through the preliminary filtration of rainwater, most of the impurities in the rainwater are filtered. In this case, rainwater can be used in the construction of the city. Generally speaking, the filtered rainwater will be connected with the reservoir, which provides sufficient water for irrigation plants.

There is no fixed installation location of rainwater collection devices. In some buildings, rainwater collection devices will be placed on the top of the building, which is also a reflection of sponge theory. Installing the rainwater follow-up device on the top of the building can permeate the collected rainwater downward. In the process of infiltration, it will gradually enter the water storage pipeline and collect with the participants in the Garden Road, and then flow into low-lying places such as green space.

4. Road planning in the application of sponge city theory

In the previous article, we mentioned that hard work in the design of buildings and rainwater collection devices can reflect the application of sponge theory. In addition to these two aspects, road planning is also an important embodiment of sponge city theory. The planning of the garden road is an important part of the whole garden design, and also the maximum display of the ecological and environmental characteristics of the garden design, so we should pay attention to the design of the road.

The design should be based on the geomorphic characteristics of the area, respect the actual situation, and make reasonable planning for the road. As far as the practical process is concerned, the ring road network can be designed. Different from the traditional road planning mode, the use of mesh design can make different road elements interpenetrate among them, making the road more practical and better drainage performance. Therefore, in road design, the use of mesh design is most in line with the sponge city construction theory.

When designing the road, we should not only aim for economic benefits, but also consider the construction of the ecological environment of the whole garden, and expand the area of the green belt as much as possible on the premise of ensuring economic benefits.

It should be noted that in the design of green belt and road, it is not allowed to design only one element together, such as centralized design of green part or centralized design of non green part. It is necessary to pay attention to the interval application of road to ensure that the road planning and actual drainage requirements are always met.

In addition to the road design, we should also pay attention to the design of trees on both sides of the road. When designing trees, we should change the previous rigid and orderly arrangement, pay attention to the dispersion of vegetation, and ensure that the relevant standards of vegetation density improve the water storage performance of the road [3].

In order to achieve such a road construction effect, in addition to a reasonable layout planning, the choice of road construction materials is also very important. Whether water resources can be fully utilized, road materials play a decisive role. In the selection of materials, we should make full use of sponge theory and choose materials with better infiltration effect to plan and construct the road, so as to alleviate the rainwater runoff and improve the water quality. In addition to the traditional road construction materials, such as some turf bricks, porous concrete and loose granular materials can also be used in road construction. These materials are well in line with the relevant theory of sponge City, which can guarantee the water permeability of the road and improve the ecological quality of the road design.

In the construction process of Garden Road, the convex green belt can also be used to reduce the area of Garden Road and achieve the purpose of efficient storage of rainwater while the runoff speed is effective.

5. Green space design based on sponge theory

In the process of landscape engineering design and planning, the back and forth change of design is a big taboo in the whole design process. When designing and planning the green space based on sponge theory, we should pay attention to the efficient and reasonable use of the geographical location of the garden, and consider as many difficulties as possible before the design. If there is low-lying terrain in the construction of green space, we can make full use of it Use it as a drainage area or reservoir [4].

In the actual operation process, the designer can not blindly design, to specific problems specific analysis, in the actual operation to different types of garden plants for reference, according to the water pit to carry out scientific planning and design.

The design and application of green space is different from that of buildings and other design and application. In the design and planning of green space, it is necessary to clearly grasp the specific distribution of groundwater outlets and pipeline network, take this important data as a reference, combine it with the design scheme, and ensure the rationality of low-lying land water flow to the planning. This is also an important measure to improve the drainage effect of garden green space [5].

The most important thing for the construction of sponge city is to make green play its role. After rainwater collection, rainwater purification and utilization should also be carried out to make efficient use of water resources. At the same time, low water return of the city should be considered. Because the filtration of rainwater ensures the quality of rainwater and becomes the main irrigation water source, which not only ensures the water ecological balance of groundwater, but also makes it more economical and improves the urban ecological benefits.

The construction of green space can not only provide better ornamental for the garden, but also provide more lessons for many plants. For example, the root microorganism of some plants has a very good decontamination effect, which can

help the city to be more environmentally friendly and clean in the process of urbanization. Therefore, in the actual process of sponge City, through the above theoretical research results, the plants can be reasonably selected and configured. What can better maximize is that green space can play its due purification effect.

6. Conclusion

With the development of economy and the progress of science and technology, the process of urbanization is advancing faster and faster. In the process of urbanization, more and more projects need to be built. In terms of urban landscape architecture, the construction of sponge city can promote the construction of urban ecosystem. The rational application of sponge city theory. It can promote the harmonious coexistence of human and nature, and promote the harmonious development of human and nature. In landscape planning and design, based on the theory of sponge City, investigation and investigation should be carried out first according to the landform characteristics of the construction to find out the trend of the underground drainage outlet and design reasonably according to the actual situation. In particular, it is necessary to consider the overall design of buildings, road planning, green space planning and other aspects, elaborate the process of engineering construction, and infiltrate the sponge city theory into every point of every project. Different construction aspects have different construction requirements, but the main purpose is to make full use of water resources, ensure the construction of urban ecosystem, and make efficient use of water Resources. In addition, the construction of green space is also very important. Based on the relevant theory of sponge City, green space planning should be more environmentally friendly. According to the different distribution of different vegetation in the project location, green space design should be carried out, and the characteristics of plants should be used to help the city to build the urban ecosystem.

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