Research on the Application of "sponge city" Concept in Urban Drainage Design

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Abstract During the Meiyu period in the summer, the design of urban drainage system is still to be improved in the process of urban development. In response to the incident, the "sponge city" has been proposed, which can improve the urban drainage well and improve the secondary utilization of water. The following is an in-depth analysis of the "sponge city".

1. Introduction

The popular saying of "Sponge City" is to compare the city to a big sponge. When the precipitation is severe, Rain Water can absorb or store it to replenish groundwater resources. When the drought season is encountered, the stored water can be used, so as to achieve the secondary utilization of water resources, improve the utilization rate of water resources, effectively alleviate the problem of water shortage and urban water accumulation, and protect the water resources very well. The following is the reasonable implementation of this scheme and analysis.

2. Present situation of Urban drainage Design

2.1 insufficient ground Rain Water permeability

Through their own personal experience, as well as a variety of social and livelihood reports, we can deeply understand that many cities are facing profound and urgent urban waterlogging and drainage problems. It is obvious that in the rainy season, the water on the ground is quite serious, even in the case of long-term rain, the city road can appear small rivers. Thus it can be seen how serious drainage problems cities face now. If this kind of problem is not solved, it will seriously affect the safety of people's property life and the happiness of residents. One of the important reasons for this kind of waterlogging is that the seepage capacity of the vast majority of cities is strict. Heavy underground. This is due to the excessive use of reinforced concrete in the course of road construction, which directly leads to the infiltration of rain water.

2.2 Fragile urban drainage system

The reason of the serious waterlogging in the city is the material of the construction land on the one hand, and the problem of the present urban drainage system cannot be ignored on the one hand. Many urban drainage systems now have a wide variety of system problems, such as low-capacity and weak flood-resistant water capacity. The accumulation of this problem has resulted in the occurrence of urban flooding. The unsound, unstable and vulnerable situation of such a drainage system, in general, is the most important in several aspects, a first of which is that the designers do not have a deep understanding of the local environmental conditions and do not recognize the decisive role of the environment on the drainage system. The city's drainage does not incorporate the local soil The condition of quality, river and so on, in the process of drainage, in conflict with the surrounding environment, the discharge does not go out. This is the irrationality of the design and construction. The second is the central deviation of the design and construction of the urban drainage system. Many cities pay attention to the construction of the superstructure of the ground, and neglect the construction of the underground system. At the same time, in the construction process, it is not strictly in accordance with the construction requirements. This directly leads to a very light situation in the

city's drainage system.

3. Application of the concept of "Sponge City" in Urban drainage Design

3.1 Design for seepage

For the urban drainage system, the scheme of "urban sponge" can be introduced into the seepage design, which can improve the surface seepage well and is the key to the drainage system. At the same time, it is necessary to give full play to the role of facilities such as municipal garden landscape and water drainage channels. The implementation of this project needs the attention of the relevant designers in the following aspects: on the one hand, for the urban landscape seepage design, the relevant personnel should make a choice according to the actual situation of the landscape area, for the landscape function should use strong permeable materials, to ensure the infiltration of Rain Water. On the other hand, for the current situation in our country, many landscape projects are In crowded areas, public areas, etc. Under these circumstances, the drainage of drainage pipes will also be very complex, which will also bring certain difficulties to the drainage scheme of the drainage system. On this basis, it is not realistic to achieve the ideal drainage effect. It should be combined with the actual situation. For the original drainage channels around those buildings, we should make full use of the original drainage channels. Use those original ditches and sewers to drain Rain Water first to slow down the shallow Rain Water problem. Prevent the occurrence of stagnant water. At the same time, according to the actual assessment, some Rain Water should flow channels can be properly added to those places where Rain Water is difficult to flow and drainage slowly, and these discharge channels can be used. Drain the water out, so as to effectively prevent waterlogging. It also brings sustainable development to the progress of the city.

3.2 Design for water storage

In the concept of "sponge city", designers should combine the functions and characteristics of water storage module, and then design the urban water storage scheme scientifically and feasible in these two aspects. The design of water storage module in urban drainage should be in accordance with the following two points: high pressure and strong water storage capacity. As a general urban sponge, the design and construction of the water storage module should be particularly strict, and the relevant departments should also strictly guard against errors. For its design, we should first investigate the actual situation of the city, the area occupied by the city, the hollowed-out area within the city, and the layout structure of the city should be determined. Secondly, it is necessary to find out whether there is effluent from the interior of the building. The pipe, the water pump, the water pipe, the well and the like can be used for effectively storing the rainwater. The final purpose of the water storage module is to ensure the recycling of the rainwater, which is far enough or insufficient, and should be used with the waterproof cloth and the wood cloth in the construction. The relevant departments shall also use the relevant water purification technology and the water purification and storage method to store the water, so that the water can be used in the aspects of city cleaning or green maintenance and the like. In this way, water resources can be used well, and the utilization rate of water resources can be improved, so that the water problem can be effectively solved to a certain extent.

3.3 Design for stagnant water.

The following aspects of the urban drainage system for stagnant water design are as follows:

3.3.1 The design of urban greening.

In general, it is the rational use of a large number of plants in the city to use them to effectively absorb the water resources and waste of the city.

3.3.2 The design of the building roof of the city.

The design of the roof of the city should also be reasonable, it should be very good to flow down the rainwater, the other side can also improve the water storage capacity of the ground, so that the rainwater can evaporate well, and has a certain role in purifying the air of the city and protecting the environment.

3.3.3 Design of urban ecological areas.

The ecological retention is mainly to store the shallow water in the surface, and then to absorb and reduce the surface runoff through the root of the plant, so as to bring some prevention to the problem of water logging in the city.

3.4 Design thought

There are three ways of rainfall treatment: one is through permeable paving and storage, and then collected into the storage pool through permeable pipe trench; the other is through impermeable paving part of permeable trench into seepage storage storage, finally through permeable pipe trench into storage pool, the other part is discharged outward from pipeline overflow; the last one is direct discharge from Rain Water's mouth overflow flow to the outside of the storage pool, and finally to the storage pool through permeable pipe trench, and then to the storage pool through permeable pipe trench, and then to the storage pool through permeable pipe trench, and then to the storage pool through permeable pipe trench.

4. The combination of "Sponge City" and practice

4.1 Contact with the actual and reasonable scientific planning and design

The design of urban drainage system is relatively other project, this project is professional, systematic and more rigorous, the things involved are also more, the covered range is also wider, not only is the simple drainage design system, but also to the city development planning, environmental protection and other aspects. The long-term consideration should be made to design a scientific, reasonable and feasible solution. So that the plan does not conflict with the planning of the long-term development of the city, and the effect of the drainage system can be better played, rather than a one-step one.

4.2 advance planning of roads and related materials

For the urban drainage system, the design of the road is also particularly critical. The seepage and environmental protection of different materials are different, and the materials with hard and poor environmental protection can not be used. The theory that conforms to the concept of sponge city should be selected to ensure the drainage and seepage of the road. Designers can also make some plans according to the situation, such as designing point drainage holes in road concrete paving to promote Rain Water's penetration, and laying stones in road soil layer to reduce pavement water accumulation. The designer can design the road according to the situation, and the selected material should also be permeable, and the design scheme must conform to the "sponge city". The design concept of.

4.3 improve the design level of relevant personnel

For urban drainage design, this is not only the challenge to the city, but also the challenge to the designer's self. The scheme is a very difficult task. The relevant staff should design, study and master the core idea under the concept of "sponge city", so that the drainage system can be in existence with the city. The development of the city's future should be taken into account, so as to guarantee the drainage quality of the city.

5. Conclusion：

Throughout the full text, we can see that the urban water has a certain hindrance to the urban development, which makes the urban traffic pressure more serious, which is also a challenge to the city, and the frequent flood phenomenon will also directly affect the future development and investment of the city. The concept of sponge city will inject new blood into the city. This scheme can comprehensively enhance the urban drainage problem, further promote the development of the city, and can also provide sustainable development for urban greening and environment.

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