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Campus Landscape Planning and Construction Based on the Concept of Sponge City

Xie Chaoyu

Wenzhou Polytechnic , Wenzhou City , Zhejiang Province, China

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Abstract: With the development of science, technology and economy, my country has made great breakthroughs in building cities that can cope with rain and floods. The concept of sponge city has become a relatively important and rapidly developing concept. Building a campus based on the sponge city concept is also a huge and complicated drainage construction project. The project generally has a long period and involves a relatively large amount of money, so the state also attaches great importance to the construction of campus drainage projects.

1. Introduction

Since the 21st century, my country has put forward suggestions on the reform of urban water supply and drainage construction in response to the situation of urban water resources, which have been gradually implemented throughout the country. With the development of computer networks, relevant departments for the management of urban water supply and drainage projects have created a humanized service platform and a more refined supervision platform. In order to respond to the call of the country and actively cooperate with the government to build sponge cities, colleges and universities also need to actively adjust the landscape architecture of campuses according to the concept of sponge cities to achieve the functions of water absorption, storage, seepage, and water purification to the sponge campus.

2. The Main Problems Existing in the Current Urban Drainage System

In recent years, the construction of water resources construction projects in my country has entered a period of rapid development. The state has reformed the existing system of urban water supply and drainage projects from various aspects and carried out modern innovations. Especially in the past two years, some scientific research institutions in my country have learned from foreign advanced technology, connected the most advanced foreign technology with the domestic situation, and made improvements based on the actual situation. There are many problems in the construction of the drainage system of the current college campus, which lead to the inability to discharge sewage and collect water resources in time. These problems make the campus unable to respond to floods, and also make the construction of a new water supply and drainage system more difficult.

3. The Problems That Campuses Will Face in the Context of Building a Sponge City

3.1 Incomplete Address Survey and Pipeline Detection Data

When building a campus, one of the first things we must do is to survey the specific campus construction environment. In order to carry out the construction of campus roads smoothly, we should do a geological survey of the places that need to be constructed so as the work of the construction unit is progressing smoothly. At present, when many campuses are constructing road drainage, the geological conditions of the construction location are not ideal during the construction process, resulting in various environmental problems during the construction process, which have caused the project itself the huge impact to prevented the project from proceeding smoothly.

3.2 The Pipeline Foundation and Design Requirements Do Not Meet

During the construction process, some construction teams will raise various problems, the most common of which is the inconsistency between the actual situation and the design, which makes the construction process encounter major problems and cannot continue. Since the construction of the water supply and drainage system belongs to underground construction, when the underground environment is more complicated, the exploration tool is likely to be deviated, causing the actual environment to be inconsistent with the predicted environment, leading to deviations in the design. To a large extent caused design problems, thus causing difficulties in the construction process.

3.3 Weak Awareness of Construction Quality Control

The construction of the campus water supply and drainage project is different from other engineering projects. From the construction unit to the project's start-up funds, there are unique characteristics. Since all funds are allocated by the state, the local government and the construction unit did not pay much attention to the project, and many people had low quality awareness. Most of them were just rushing to the construction period and ignored the quality problem. Therefore, the quality problems in the construction of the campus drainage system have also led to many problems in the drainage system, which has a short service life and often loses its function after a few years.

3.4 Connection Problems of Urban Drainage Systems

Since the designer did not pay attention to the design of the drainage facilities of the campus in the initial design, the drainage system of the campus was messy, which caused the newly built water supply and drainage system to be connected with the original drainage system. Many problems made it difficult to continue the project. Therefore, if you want to carry out the construction of the campus water supply and drainage facilities normally, it is very important to adjust the old drainage system of the construction site in advance. Only after a thorough investigation of the old drainage system can a reasonable design be made, and the best plan can be found when facing the docking of the old drainage system. Secondly, the pipeline survey for the old drainage system was inaccurate, which caused the pipeline to be encountered during the construction process that was not mentioned in the design, which caused the construction to be unable to proceed further and caused very serious problems in the docking process.

4. How to Build a More Complete Campus Water Supply and Drainage System

The campus water supply and drainage project is a relatively large and complicated project. The most important part of the campus water supply and drainage project is the construction preparation work. This work needs to fully consider the geographical, climate, topography and other external

environmental factors to build the campus water supply and drainage facilities designed based on the concept of sponge city.

4.1 Update the Design Concept of Urban Drainage System

Design and construction personnel should fully understand the concept of sponge city, fully understand the connotation of the concept of sponge city, and strictly follow this concept to design to ensure the normal operation of the water supply and drainage system. The specific implementation can be divided into the following aspects: First, in the usual design, the height of the green belt is often higher than the height of the ordinary road, and the same is true in the ordinary planning of the campus landscape. Therefore, the height difference between road surface and the green belt should be reduced. The height difference between the two makes the rainwater of heavy rainfall enter the drainage system too much, which cannot provide sufficient water to the green belt, which in turn leads to the waste of rainwater resources. And it can not only make full use of water resources after rainwater enters the green belt, but also protect the soil in the green belt to prevent rainwater from taking the soil away and wasting soil resources after entering the green belt. Second, in the further improvement project in the later stage, we should focus on the construction of artificial rainwater gardens. This special structure can fully store water resources and make use of water resources in times of drought. In this way, the construction of the sponge campus is realized and the water resources are fully utilized.

4.2 Do a Good Job in the Field Survey

Before proceeding with the construction of the water supply and drainage system of the campus, do a good job of on-site survey of the construction area, and the survey must be carried out before the construction of the drainage pipeline; the survey mainly refers to the data collection and analysis of the local geographical conditions and the sampling of soil quality. Choose a suitable place for construction punctuation forecasting. In the actual operation and treatment of urban water supply and drainage projects, it is reflected in its construction and design. On-site survey work is equally important, and we have encountered various problems. We have learned that when it comes to engineering problems, we must learn to grasp the main points of the problem, analyze the specific situation in detail, and deal with the problems in a targeted manner, in order to complete the project.

4.3 Optimized Design of Sunken Green Belt

In the design of the campus green belt, the main engineering design in the design of the sunken green belt is the design optimization of the urban road drainage system. In the drainage system engineering design, the sunken green belt of the drainage system has an advantage which traditional urban drainage system does not have - new function of rainwater absorption and recycling. In the process of traditional green belt design, the design is often unsatisfactory, and urban governance problems such as large runoff on urban roads and poor storage capacity of urban drainage systems and flood storage systems often occur. The existence of underground drainage system can alleviate this embarrassing problem to a great extent. The construction of underground drainage and flood discharge system is time-consuming. Generally, this method is suitable for those tropical areas (large annual precipitation, frequent rain, and long duration); The advantage of this optimized design is that it can handle excess runoff from the road surface. The purpose is to filter and purify the urban water into the reservoir after the green space. This method is suitable for various areas in the current construction area.

4.4 Strengthen the Design of the Drainage System of the Campus

When designing the campus drainage system, it is first necessary to carry out a comprehensive sewage discharge design, improve the level of sewage treatment, and flexibly use new science and technology to achieve reasonable sewage discharge and improve the comprehensive environmental protection level. For the construction of sewage treatment plants, the requirements for timely sewage treatment must be met. In addition, a comprehensive flood control and drainage design is needed to prevent the campus from flooding in summer and increase the rate of rainwater discharge. For different campuses, when designing flood drainage, it is necessary to specifically consider the rainfall and characteristics of the cities where different campuses are located, combined with the specific topography of the campus, and carry out a comprehensive and reasonable design to ensure compliance with urban drainage requirements.

5. Discussion

The campus drainage system is to fully respond to the country's call to build a sponge city and strengthen the use of water resources. The campus under the concept of building a sponge city should be scientifically constructed in the construction phase based on the preliminary work, and the planning and construction of the campus landscape should be completed through new technology and new design methods.

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