

Research on design technology and measures of municipal water supply and drainage engineering

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Abstract: Municipal water supply and drainage engineering, as an important component of urban infrastructure engineering, has become a major aspect affecting the process of urbanization. If the relevant departments and construction enterprises do not pay attention to the design technology and management of municipal water supply and drainage engineering, it will produce a series of negative effects such as poor sewage and water quality pollution. Therefore, we should constantly optimize the design technology and measures of municipal water supply and drainage engineering to ensure the sustainable development of the city. Based on the design principles of municipal water supply and drainage engineering, this paper analyzes the common problems and corresponding solutions in the design of municipal water supply and drainage engineering.

Key words: Municipal engineering; Water supply and drainage; Design technique

In the process of urban development in China, the municipal water supply and drainage project occupies a very important position, and has made great contribution to the overall development of the city. Therefore, in the planning and design of municipal water supply and drainage project, we should study according to the characteristics of the city itself, combined with specific problems, and make the planning suitable for urban development. At present, the biggest problem facing urban water in our country is that the reserves are not enough, so it is urgent to solve various water source problems, and the relevant staff should formulate a sound urban sewage plan to promote the healthy development of our economy to make outstanding contributions.

I. The design principle of municipal water supply and drainage engineering

1. Meeting the needs of local production and living

In the overall urban planning, municipal water supply and drainage projects are not an isolated part, but must be well connected with other municipal engineering systems in order to achieve the purpose of promoting the sustainable development of the whole city. Municipal water supply and drainage engineering to municipal roads and green space as the main construction area, therefore, municipal water supply and drainage system should be coordinated with municipal roads and other pipeline layout, to ensure the steady development of the city to provide a reliable guarantee. The relevant staff should do a good job in the planning and design of municipal water supply and drainage projects after sufficient preliminary research, so as to provide a good infrastructure guarantee for the healthy and stable development of the city and the local people's production and life.

2. Harmonious development in line with the ecological environment

In the initial planning and design of municipal water supply and drainage projects, ecological and environmental protection should be the primary objective. The construction of municipal water supply and drainage projects should not cause damage to the public ecological environment of the city. Therefore, in the early planning and design, the staff should pay attention to the reasonable avoidance of urban green space, so as to avoid the phenomenon of crowding out urban green space during the construction process or after completion, which will cause certain harm to the urban ecological environment. Municipal water supply and drainage projects in the design and construction, should be in accordance with the principles of green economic development and environmental resources protection, the protection of urban green space work, do not casually throw construction waste, damage the ecological environment of the city. If there is pollution to the urban environment, it will bring unimaginable consequences. Therefore, the relevant staff should also coordinate the contradiction between ecological environmental protection, energy conservation and the rapid increase of population, do sufficient preliminary research work for the effective use and reasonable conservation of water resources, effectively protect the environment, and improve the effectiveness of the planning and design of municipal water supply and drainage projects.

II. The common problems in the design of municipal water supply and drainage engineering

1. The engineering design management system needs to be improved

At present, most of the municipal water supply and drainage projects in our country have certain quality problems, which are rooted in the imperfect management system of construction enterprises. On the one hand, some construction enterprises do not combine the characteristics of specific projects, scientific and reasonable planning of engineering construction. There are a lot of random construction problems in engineering construction, especially unreasonable construction schedule adjustment, which will directly relate to the quality and duration of the project. On the other hand, the internal management system of some construction enterprises is not perfect. In the construction of municipal water supply and drainage projects, the construction enterprises do not deal with the problems in a timely manner, and lack a relatively sound emergency plan management mechanism, which causes the construction enterprises to lack effective responses to unexpected problems and reduces the professionalism of construction enterprises.

2. The lack of ecological protection concept in the design

In the past municipal water supply and drainage engineering design, the lack of ecological protection concept, resulting in the continuous intensification of water resources and energy consumption, operating costs continue to rise. For example, in the rainy season, because the rainfall can not flow from the drainage pipe into the water, it is necessary to set up a low-pressure area. However, within the low-discharge zone, which contains water that is allowed to discharge itself into the river, many cities pump water into the low-discharge zone. If the waste water is discharged downstream, it cannot be reused and will have a negative impact on the ecological environment downstream.

3. The design and planning are not in harmony with urban development

With the continuous acceleration of urbanization and the increasing urban population, some of the original municipal water supply and drainage systems have been unable to meet the needs of urban development and even daily use, which is likely to lead to a more serious problem of urban water shortage. In the municipal water supply and drainage project, the old pipeline structure has been unable to meet the current drainage requirements, at this time, it is necessary for the relevant staff to seize the corresponding road surface reconstruction opportunity, according to the actual needs and professional design opinions, the sewage pipe network reasonable layout.

III. The main technical measures of municipal water supply and drainage engineering design

1. Strictly control the technical review of design drawings

In the design of municipal water supply and drainage engineering, design drawing is one of the most core work. The accuracy and scientific rationality of design drawings are not only related to the construction of municipal water supply and drainage engineering, but also affect the later use quality and use cycle. Therefore, whether it is the first draft or the final draft of the municipal water supply and drainage engineering design drawings, it is necessary to be carefully reviewed and checked by relevant experts. Comprehensive analysis of the rigor and accuracy of the design drawings, to avoid construction accidents or waste of resources due to drawing problems in the later construction. At the same time, the auditor should also focus on the safety and scientific nature of the municipal water supply and drainage engineering design drawings, so as to minimize all kinds of risks and accident losses that may occur during construction and later use. Under the premise of ensuring the personal safety of construction personnel, the quality and efficiency of construction should be further improved. In addition, in the preliminary work of municipal water supply and drainage engineering design, it is necessary to pay attention to the design drawings, but also to coordinate the communication between the supervision, design and construction, and do a good job in the drawing disclosure before construction. In addition, the municipal water supply and drainage project is different from other projects, so the drawing designer and auditor must understand the corresponding situation of the construction area, ensure that before the design of the drawing, sufficient field research is carried out to understand the various influencing factors that may appear in the construction and later use, and avoid the design of the drawing.

2. Strengthen the application of engineering energy saving and emission reduction technology

In order to strengthen the application of energy saving and emission reduction technology in municipal water supply and drainage projects, it can be carried out in the following aspects: First, design and establish a sewage treatment system designed to save and recycle energy. According to the current situation of domestic water in the city, the use of sewage treatment system for the depth of urban domestic sewage treatment. Secondly, the use of reclaimed water reuse mode. Circulating water usually refers to the domestic sewage that is recycled twice in daily life. After several treatment of professional equipment sewage, although can not be used as drinking water, but can be more common in daily life sprinkler water, car wash water, etc., are the common use of recycled water. The regeneration of recycled water is an important way to achieve energy saving and emission reduction, water conservation and environmental protection. In addition, we must ensure efficient energy saving technology. In this regard, on the one hand, we must strengthen the concept of energy conservation of the whole people. At present, some urban residents lack a good concept of energy conservation, which has caused a lot of water waste in daily life. Therefore, it is necessary to constantly strengthen the awareness of water conservation among urban residents. For example, through TV programs, social media platforms and other media, regularly broadcast public service advertisements on energy conservation, emission reduction, and water conservation, in order to enhance urban residents' awareness of environmental protection. On the other hand, it is necessary to actively use advanced energy-saving technologies and apply them to sewage treatment projects. Relevant government departments should formulate more detailed laws and regulations, and actively promote the implementation of these laws and regulations. Create a social and cultural atmosphere that advocates energy conservation and is glorious. At the same time, energy-saving technology is further applied to municipal water supply and drainage projects, so as to enhance the effective energy saving of municipal water supply and drainage projects.

In addition, the design of systems that collect and treat rainwater to save water can also be strengthened. As existing water sources become increasingly scarce, continued development will be detrimental to recycling. Therefore, in the design of municipal water supply and drainage projects, rainwater collection systems must be set up. Due to the abundant rainfall resources, people's development and utilization level is low in the past, resulting in the loss of rainfall resources. Therefore, in the planning and design of municipal water supply and drainage projects in the future, the staff should pay attention to the reasonable setting to ensure that the rainwater flows smoothly into the underground without causing ground water and obstruction.

3. Matching the engineering design with the urban demand

On the basis of comprehensively considering the development needs of the city and the construction requirements of the municipal

water supply and drainage project, in order to match the design of the municipal water supply and drainage project with the urban needs, the following measures can be taken. First of all, to ensure the most basic domestic water. In the planning and design of the municipal water supply and drainage system, the staff fully understand the social water consumption and domestic water needs through data research and field research in advance, and investigate the water supply location and water demand of industrial, commercial and residential areas, to ensure that the overall water supply network planning and design is more scientific and reasonable. And discuss the future development planning of the city with government departments to avoid conflicts between municipal water supply and drainage projects and future urban planning. Secondly, it is necessary to improve the collection and treatment network system of urban sewage and rainwater. We should not only pay attention to the collection of natural rainwater and the treatment of waste water in all fields of society, but also make clear the needs of social water, comprehensively grasp the natural climate and the accumulation point of rainwater, partition the main sewage treatment areas, and conduct in-depth analysis of the actual situation of sewage enterprises. While knowing the total amount of sewage, we should also master the corresponding sewage sites. Make the planning and design of sewage pipe network more perfect. At the same time, the municipal water supply and drainage system planning, design and construction site combined. In the planning and design of the water supply and drainage system, the specific situation of the construction site is analyzed in detail, and the traffic situation, soil quality and surrounding environmental conditions of the construction site are mastered, so that the planning and design work is more reasonable and scientific.

4. The use of information technology to improve engineering design

Due to the weak concept of environmental protection and environmental protection, some urban domestic sewage is discharged directly into the city without treatment, which poses a major threat to the groundwater system and water quality safety of the city. Although some cities have relatively perfect sewage treatment plants and sewage treatment systems, there are many problems in actual operation due to aging pipe networks and backward technology. This requires in the formulation of urban water supply network planning and design scheme, make full use of information technology, improve the feasibility of urban water supply network, scientific and reliability. Before the municipal water supply and drainage engineering planning and design work, the staff should have a comprehensive understanding of the actual situation of the city, and the use of high precision measurement equipment for data collection, and the use of big data and other information technology for analysis and processing. On this basis, the overall planning and design ideas of municipal water supply and drainage engineering are further clarified, and the design details are constantly optimized. When analyzing the collected data, the use of information technology can better analyze and integrate the data, and then improve the use quality and efficiency of the data, and provide more help for the design and construction of municipal water supply and drainage projects. For example, information technology can make the connection between sewage Wells and pipelines more smooth, reduce the adverse impact of sewage on groundwater, so that municipal water supply and drainage projects can better adapt to the current urban development, and continue to improve the satisfaction of urban residents on municipal water supply and drainage projects, so that the overall planning and design of municipal water supply and drainage projects to play the best benefits.

IV. Conclusion

To sum up, in order to ensure the normal operation of the urban water supply network, the design technology and measures of municipal water supply and drainage engineering should be strengthened and optimized. Based on the design principle of meeting the local production and living needs and conforming to the harmonious development of ecological environment, the quality and service life of municipal water supply and drainage projects should be improved by strictly controlling the technical review of design drawings, strengthening the application of engineering energy saving and emission reduction technology, matching engineering design with urban needs, and using information technology to improve engineering design, etc. To provide more comfortable infrastructure construction services for urban residents.

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