

Quality Control Measures in the Construction of Water Supply and Drainage Pipes in Municipal Engineering

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Keywords: Municipal Engineering, Water Supply and Drainage Pipe, Construction, Quality Control.

Abstract: It is well known that water supply and drainage engineering is an important content of municipal engineering in the process of urban construction, which can affect the life of urban residents, the water demand of urban development and the discharge of sewage. With the continuous progress of urbanization in China, the scale of water supply and drainage project is expanding, and the length of pipeline is also increasing. The construction quality of water supply and drainage pipeline can directly affect the operation effect of the whole municipal project, so the construction quality of water supply and drainage pipeline should be strictly controlled. Based on this, this paper briefly summarizes that water supply and drainage is the problem encountered in the construction process, and provides corresponding measures for its quality control for reference.

1. Introduction

At present, the process of urbanization in China is accelerating, the scale of municipal engineering is expanding day by day, and the status of water supply and drainage engineering as a basic project has been greatly promoted. With the expansion of the construction of water supply and drainage projects, the quality problems in the construction process have been widely paid attention to, because the project itself has the characteristics of wide scope, complex pipeline layout lines and poor construction conditions, coupled with the influence of many factors, it is easy to appear quality problems in the construction process, which is not conducive to the normal operation of the project in the later stage. Therefore, in order to improve the effectiveness of this project, the relevant departments need to strictly control its pipeline quality and construction quality in the process of its construction.

2. The Significance of Strictly Controlling the Construction Quality of Water Supply and Drainage Pipes in Municipal Engineering

At present, the construction quality of water supply and drainage pipeline of municipal engineering has attracted extensive attention, the direct reason is that the guarantee of construction quality of water supply and drainage pipeline can guarantee the construction quality of municipal engineering, and then push forward the construction of urbanization in reaction. Strictly controlling the construction quality of water supply and drainage pipeline is the basis of making relevant solutions to improve the operation efficiency of drainage project. In addition, by strictly controlling the construction quality of municipal engineering water supply and drainage pipeline, the relevant construction personnel can better improve their own ability, that is, mastering more advanced quality control methods and strengthening the comprehensive application of theory in the practical process, so as to provide a good and reasonable operating environment for the operation of water supply and drainage pipes.

3. Current Problems in the Construction of Water Supply and Drainage Pipes in Municipal Engineering

Municipal engineering water supply and drainage pipeline construction is mainly divided into

reserved, pre-buried, laying, connection, pre-loading and other multiple processes, as shown in figure 1.



Figure 1 Main construction processes for water supply and drainage pipes in municipal works

In the face of many problems in the construction process, they must be solved in these processes. The common pipeline problems are as follows:

3.1. Pipe Offset

During the construction process of water supply and drainage pipeline in municipal engineering, the problems of water supply and drainage pipe deviation or water accumulation due to measuring error or construction deformation often occur. If it is not found and dealt with in time, the deviation degree of the pipeline will be aggravated, which will lead to the occurrence of the reverse slope phenomenon and threaten the safety of the whole project.

3.2. Pipe Blockage

Water supply and drainage pipe blockage is a common pipe problem and an important factor affecting normal water supply and drainage. There are many reasons for pipe blockage. For example, after the above pipeline is offset, a large number of sediment and stone enter the pipeline, thus causing obstruction; the same nature also includes the failure to carry out relevant protective measures on the pipeline during the installation process, which not only makes the sediment and so on into the pipeline, but also the items left by the construction workers and other sundries together to block the pipeline, which has a serious impact. In addition, another important reason for the blockage is that the design is unreasonable, that is, the pipe diameter design is small and does not match the pipe diameter required in the actual use process. This causes some food residue or other bulky items to clog up after entering the pipeline. In the event of a blockage in the pipeline, the relevant staff failed to deal with the problem in a timely manner, in the cumulative situation, and then lead to more serious blockage.

3.3. Pipe Leakage

Pipeline leakage as another common pipeline problem, mainly occurred in the rainy season, according to the existing data show that its causes are mainly caused by three aspects. One is the pipe material problem, such as the pipe elbow, valve, water nozzle and other accessories in the early transportation process suffered damage but did not find, plus the late immersion in water for a long time, the phenomenon of loosening, resulting in leakage[1]. The second is the problem of construction personnel, because the current water supply and drainage pipeline soybean is longer, so the connection of two pipes has become the main process in the construction of water supply and drainage pipeline. However, in the actual construction process, there are some construction personnel professional skills not up to the standard, failed to tightly docking the two pipelines, thus leakage in the subsequent use of the situation. In addition, the construction staff do not pay attention to the inspection and maintenance of the pipeline, failed to find some of the aging pipeline in time. The third is the construction unit problem, at the present stage, the corruption phenomenon in our country has not been cured, so there are some construction units blindly pursuing the interests and using the construction materials that do not conform to the national standards, thus greatly affecting the quality of the pipeline.

3.4. Deformation of Inspection Well

Inspection wells (now the Government encourages the use of plastic inspection wells, as shown in Figure 2) as an important part of the maintenance of municipal works are generally located at the junction of the pipeline, at the corners and at the change of pipe diameter and slope, and at certain

4.2. Strengthening Quality Control in the Construction Phase

For the quality control of the construction stage, the emphasis is on paying attention to trench excavation, pipe installation, earthwork backfill and closed water inspection, etc.

The trench excavation is the initial working procedure of the formal construction, the setting of the trench is decided by the layout of the water supply and drainage pipe in the past and the design scheme of the first construction. In the course of the trench excavation, it is necessary to set up the drainage ditch in advance to ensure the timely removal of the water at the bottom of the foundation pit and to avoid the phenomenon of floating pipe in the later stage of laying the pipe.

The quality control of pipe installation is mainly reflected in two aspects: one is the performance requirements of the pipe, that is, to ensure the strength, stiffness, water conservancy, sealing and anticorrosion and wear resistance of the material. The quality of water supply and drainage pipe can be guaranteed to a great extent. The second is the pipe installation technology, because of the engineering nature of the reasons, in the pipeline laying, the pipe needs to be certain treatment to meet the construction standards. For example, for the small damaged pipe, it should be repaired, for the larger pipe diameter can take mortar grinding measures to prevent its leakage.

Earthwork backfilling refers to the backfilling of the trenches after the completion of the installation of the pipeline and after the layered treatment. The main points of this operation are to ensure the backfilling density ($\geq 90\%$) and the height difference on both sides ($\leq 0.3\text{m}$)[3].

Closed water inspection is the inspection of the quality of the pipeline after the completion of construction, and its test results affect whether the water supply and drainage works need to be repaired or not. Therefore, in view of this inspection process, the relevant departments need to ensure the rationality of the test results. At the same time, in order to fundamentally reduce the failure rate of the test results, the government and the construction units need to strengthen the supervision and supervision mechanism in the construction process to ensure the overall quality of the water supply and drainage construction pipeline.

4.3. Strengthening the Post-Inspection and Maintenance Work

The purpose of the inspection and maintenance work is to prevent and treat the pipeline or to solve the minor problems, and then to avoid the serious damage of the water supply and drainage pipeline to affect its service life and operation effect. If more serious problems are found in the inspection process, the pipeline needs to be replaced in time to ensure the overall quality of the pipeline.

5. Conclusion

To sum up, the construction of municipal water supply and drainage pipeline as a city infrastructure is closely related to people's life, and its quality problems need to be widely paid attention to by the society. In view of the many problems that appear in it, the relevant departments should focus attention and devote themselves to the research and solution measures, and at the same time, the quality control measures should not be ignored.

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