

Safety Management and Quality Control in Hydraulic Engineering Construction

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Abstract

Water conservancy projects are important infrastructure projects related to the national economy and people's livelihood, which have great help for the development of transportation and agriculture, and can bring great economic benefits. In the construction of water conservancy projects, due to the complexity of construction technology and the difficulty of construction, it is easy to form safety hazards. In addition, due to the large scale of construction, the large number of construction units, and the complex construction methods, it will also have a negative impact on the quality control work. The importance and existing problems of safety management and quality control in water conservancy project construction are analyzed. On this basis, safety management strategies and quality control strategies are discussed respectively, with a view to providing reference for safety management and quality control in water conservancy project construction.

Keywords

Water Conservancy Engineering; Construction; Safety Management; Quality Control.

1. Introduction

China is rich in water resources, but the uneven distribution of water resources in time and space has led to serious water shortages in many regions of China, and water resources have become a bottleneck restricting the development of the region's economy, agriculture, and ecology. Therefore, strengthening the construction of water conservancy projects and constructing water conservancy projects at suitable locations can effectively regulate and control water resources. The constructed water conservancy projects can not only effectively prevent the occurrence of floods and waterlogging disasters, but also meet the demand and supply balance of regional water resources, achieve water conservancy benefits for the people, promote the coordinated development of local economy and ecology, and provide basic guarantee for the overall management of mountains, rivers, forests, fields, lakes, and grasses in the region, and build beautiful villages. However, in the construction of water conservancy projects, the construction sites are generally located in the middle and upper reaches of the river, located in mountainous areas, with great difficulty in construction, and extremely complex construction techniques, which are prone to form potential safety hazards. Moreover, during construction, the foundation excavation surface on the construction site is large and all of them are open construction. Construction enterprises cannot implement closed management on the construction site, which greatly increases the difficulty of safety management for personnel, equipment, and materials. In addition, in the construction of water conservancy projects, the construction objects are complex and diverse, and the forms of management also present a state of ever-changing. If construction in the rainy season is extremely prone to flooding, the construction enterprise must ensure the safety of construction in the event of flooding; For example, a large number of large-scale mechanical equipment will be used in construction, and it is also extremely prone to safety accidents. Therefore, it is necessary to

ensure the safety of large-scale mechanical equipment during use; Finally, the large-scale construction of water conservancy projects, with complex construction methods, involves many types of work, and the construction site is relatively scattered. The transportation distance between the construction site and the stock yard is relatively long, and the transportation is not convenient. This makes the safety management of the entire construction work more difficult.

2. Problems in Safety Management and Quality Control in Water Conservancy Project Construction

2.1. Incomplete Safety Management System

In any construction project, developing a complete and scientific construction safety management system is the foundation and prerequisite for ensuring the smooth progress of construction, and water conservancy project construction is no exception. However, at present, when constructing water conservancy projects in surrounding counties and districts, they have not developed a complete on-site safety management system, and even many construction projects have borrowed safety management systems developed by other projects, resulting in a mismatch between the safety management system of the project and the construction site. This leads to the inability to ensure the safety of construction in these water conservancy projects. In addition, in the construction of water conservancy projects, the construction process is relatively complex, requiring mutual cooperation among various types of work, and the safety systems of various processes are nested. However, some construction enterprises do not attach importance to safety management work, treating the safety management system as a joke, and the safety management work is superficial, resulting in the occurrence of safety accidents during construction.

2.2. The Construction Process of Water Conservancy Projects is too Complex

In the construction of water conservancy projects, the scope of construction is generally large, and the construction technology involved is relatively complex. In actual construction, the general contractor and the construction management team need to dynamically adjust the on-site construction, which leads to changes in the construction process at any time, posing a great challenge to on-site safety management. In addition, in the construction of water conservancy projects, the forms of construction present diverse characteristics, and there is no unified safety management standard between different construction methods. The existence of these problems has brought great challenges to the construction safety management work.

2.3. There are Many Difficulties in Construction Quality Control

In the construction of water conservancy projects, the complexity of the construction process not only brings great challenges to the safety management work, but also brings great difficulties to the construction quality control work. In actual construction, the construction quality control work is mainly faced with the following problems. First, in the field of project bidding, there are problems with non-standard bidding management and process, and even the phenomenon of bid containment; Secondly, the survey and design work in the early stage of the project is not perfect, and there is a problem of inaccurate data; Thirdly, there is a phenomenon of illegal subcontracting and subcontracting in project construction, resulting in the lack of corresponding construction qualifications for the final construction enterprises, and the construction quality cannot be guaranteed; Finally, there is a lack of supervision during the construction process. The existence of these problems has seriously affected the quality control of water conservancy project construction.

3. Safety Management Strategy in Hydraulic Engineering Construction

3.1. Develop a Complete Safety Management System and Strengthen its Implementation

In the construction of water conservancy projects, in order to strengthen safety management and avoid safety accidents, it is first necessary to establish a sound safety management system and ensure its effective implementation. When formulating safety management systems, some mature work systems can be used for reference, but they cannot be completely copied and applied. Instead, relevant systems must be optimized and improved according to the specific situation of this construction to ensure that they meet the actual situation of the project construction and are practical. After the development of the safety management system, it is necessary to publicize it at a prominent location on the project construction site, requiring all construction personnel to firmly remember these safety management systems, such as measures such as on-site publicity of the safety system by the safety administrator, competition of safety specifications at the construction site of each construction team, and implementing the safety management system in actual construction.

3.2. Strengthen Safety Management During Construction

In the construction of water conservancy projects, on-site safety management is very important, directly related to the probability of safety accidents. In actual construction, the process, equipment, personnel, and other factors involved in the construction of water conservancy projects are relatively complex. If there is a mistake in one of these links, it is easy to lead to safety accidents. Therefore, before the construction of each link of the project, the safety management personnel must conduct safety technical disclosure to the construction personnel to ensure the safety of the construction. In addition, there are many mechanical equipment that need to be used at the construction site. During the use process, improper operation can also lead to safety accidents, and even personal injury and death. Therefore, during the construction process, it is necessary to ensure the safe use of construction machinery and equipment. In actual operation, it is necessary to ensure that the operators of mechanical equipment have corresponding qualifications, and inspections must be conducted during equipment use to ensure that the equipment can operate normally. At the same time, after use, it is necessary to carry out necessary maintenance to maintain the performance of the equipment and avoid safety accidents.

3.3. Thoroughly Identify Potential Safety Hazards During Construction

In the construction of water conservancy projects, in order to strengthen safety management and avoid safety accidents, it is also necessary to comprehensively investigate the safety hazards existing in the construction. For this reason, on-site safety management personnel must shoulder their responsibilities and be able to conduct comprehensive on-site inspections in strict accordance with the requirements of safety management regulations. For potential safety hazards found during inspections, a rectification notice should be issued in a timely manner, and the person responsible for safety should be identified to carry out safety rectification within a limited period of time, so as to effectively avoid the occurrence of potential safety hazards.

4. Quality Control Strategy in Hydraulic Engineering Construction

4.1. Improve the Project Construction Plan

In the process of water conservancy project construction, in order to ensure the quality of construction, it is first necessary to improve the project construction plan. In actual construction, the construction scheme is directly related to the quality of water conservancy

project construction. Therefore, the scheme designer must conduct on-site survey of the construction site according to the requirements of the project construction, master the corresponding parameters in detail, and then scientifically plan the construction scheme based on the survey data, design all aspects of the project construction, and scientifically plan the construction schedule [3]. In addition, in the construction plan, the scheme designer should clearly mark the key points that require quality control, requiring the construction enterprise to strictly control the application of the construction plan to ensure that the project construction can meet the quality standards, so as to proceed with the construction of the next project, thereby ensuring the quality of the project construction.

4.2. Strengthen Supervision of On-Site Hydraulic Material Quality

During the construction of water conservancy projects, the quality performance of hydraulic materials is one of the main factors that affect the construction quality of water conservancy projects, and it is also the object that quality control work should focus on. Therefore, in order to ensure the quality of construction, it is also necessary to strengthen the supervision of the quality of on-site hydraulic materials. In practical operation, the selection and purchase of hydraulic materials must first be carried out in strict accordance with the requirements of the construction scheme. Therefore, it is necessary to actively adopt the bidding method and select qualified material suppliers; Secondly, when materials enter the site, various supporting documents should be strictly checked, and quality sampling should be conducted. All materials with quality problems should be returned; Finally, it is necessary to attach importance to the storage of materials, store them in strict accordance with their performance and storage requirements, and conduct regular quality testing to ensure the quality of hydraulic materials.

4.3. Improve the Construction Quality Management System

During the construction of water conservancy projects, in order to ensure the quality of construction, it is also necessary to improve the construction quality management system and strengthen the quality supervision during the construction process. In practical operation, various factors affecting the construction quality of water conservancy projects should be carefully analyzed and broken down, and then the decomposed influencing factors should be handed over to management personnel at all levels for management and control. If quality problems occur, the relevant responsible person should be directly held accountable. At the same time, it is necessary to combine construction quality with reward and punishment strategies to improve the sense of responsibility and enthusiasm of construction personnel, promote them to strictly follow the construction management system for construction operations, and ensure that the construction quality can meet the acceptance standards.

5. Conclusion

Water conservancy project is an infrastructure construction that is related to the national economy and people's livelihood. It is very important to strengthen safety management and quality control during construction. In practical operation, in order to do a good job in safety management and quality control of water conservancy projects, it is necessary to understand various factors affecting construction safety and quality in detail, and take targeted measures based on this, develop a sound management system, improve the comprehensive quality of the construction team, and ensure that they can operate in strict accordance with the construction plan during the construction process, so as to ensure the safety and smooth progress of construction, Improve the quality of construction.

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