Construction Technology and Management of Water Conservancy and Hydropower Construction Engineering

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Abstract:

As a complex project, hydraulic construction has the characteristics of complex construction technology, long construction time and tight construction time. In the actual construction, the natural environment has a great impact on the construction. In order to ensure the construction quality of water conservancy and hydropower construction projects, it is necessary to choose construction technology reasonably according to the actual situation of the project, and carry out construction in strict accordance with the specifications to ensure the smooth development of water conservancy and hydropower construction projects.

Keywords:

Water conservancy and hydropower; construction works; construction technology; management

I. Common construction techniques for water conservancy and hydropower projects

1. Concrete rolling technology

In the related construction technology of water conservancy and hydropower construction technology, the rolling technology of concrete has been widely used for many years, and has achieved remarkable development. Related technology refers to the mixture of RCC in order to add buildings. The use of technology requires a clear local environment to ensure that relevant requirements are met and costs can be reduced. However, RCC materials and ordinary concrete materials because RCC is thicker, and less cement, which has coal ash, aggregate diameter is relatively small. RCC involves high fly ash concrete, sand and concrete cement concrete and other types of water conservancy and hydropower construction class, in the case of need to clear the transport situation to make the right choice, the use of concrete rolling construction form, can increase the stability of the construction and the durability of the construction project.

2. Construction diversion and cofferdam technology

As a hydropower project, especially sluice dam construction, construction diversion technology plays an irreplaceable role. This technology is the most common one in the actual construction. At present, the technical means of cofferdam construction are generally adopted. Cofferdam is a kind of temporary water conservancy and hydropower construction project. In order to temporarily build earth dam on the retaining wall, general cofferdam construction needs to occupy part of the riverbed space. Before the construction of the cofferdam, the engineering and technical management personnel should fully investigate the stability and complexity of the river bed structure. The problem of stream damage caused by too narrow flow space or too fast flow rate is avoided. In the actual construction of water conservancy and hydropower construction projects, the use of construction diversion technology can well control the flow direction and speed of river bed. In addition, the application level of construction diversion technology plays a decisive role in the overall construction process of water conservancy and hydropower projects.

3. Anti-seepage reinforcement technology

Water seepage may occur after most water conservancy and hydropower dams, and moisture and drainage may occur, which will cause deformation to the dam repaired by water conservancy and hydropower projects, and water seepage will affect the protection of the dam.

Water seepage will affect the protection of the dam, cause serious damage, and threaten the life and property safety of local

residents. If this happens, we should also take measures to repair and deal with it as soon as possible to avoid hidden dangers of the project. The deformation or leakage problem of earth-rock dam should be dealt with in time, and the bedrock reinforcement and protective support measures should be added to achieve the final stable reinforcement effect. It is possible to drill holes at the bottom of earth dams to expand the flow of water to reduce the pressure of the dam body, and to use the weathering of the grouting holes. The construction of the weathered impervious layer to a small degree or almost imperceptible is blocked under the hole, and the water grouting is adopted and the grouting is circulated from top to bottom. Using this method can reduce the impact of water flow on the dam, thus increasing the service life of the dam.

4. Analysis of prestressed anchoring technology

As a special technology, prestressed anchoring technology appears in the construction process of water conservancy and hydropower construction, which can bring huge economic benefits and profits, and its application range is very wide. In fact, prestressed anchoring technology is a general term that has evolved from the earliest prestressed concrete to the current anchoring technology. The technology can be pre-applied to the prestressed construction site according to the engineering design requirements, standard orientations and dimensions. In order to increase the appropriate pressure of prestressing, so as to improve the foundation of pressure conditions, improve and improve the properties of buildings and grounds, qualitative changes occur under the action of prestress, and play the greatest role. The prestressed anchoring technology can promote the extension of the prestress and the action transmission distance. Before application, it is emphasized that the anchoring technology of water conservancy and hydropower construction projects is very important, and the prestressed anchoring technology of water conservancy and hydropower construction projects has functions that other technologies do not have, and its functions are more complete. Due to the structural differences of prestressed anchors, it is easy to lead to different types of prestressed anchors. The bolt is mainly anchored by the bolt and the bolt, and the main connecting part of the bolt head and the bolt combination is mainly the support tension and the locking prestress. Pre-anchoring, which is directly related to the prestressed anchor cable system and bedrock, is to strengthen the safety and stability of the building, and has a good prestressing effect.

II. Water conservancy and hydropower construction engineering technology application

1. Application of cofferdam diversion technology

Cofferdam diversion technology is a kind of protective technology, and it is also the most critical technology in water conservancy and hydropower. This technology can block the water around the building, so that the construction is not affected by the flow of water can proceed smoothly. Therefore, during the construction period, the cofferdam area and water flow change should be accurately calculated, so as to finally determine the cofferdam material and construction method, so that the construction can proceed smoothly. The principle of cofferdam diversion technology is from flow interference to the flow of water at the construction site. Because the construction diversion is very easy to be affected by the soil quality of the construction site, in order to ensure that the diversion meets the specific requirements of the project construction, it is necessary to conduct a detailed investigation of the surrounding environment before construction.

2. Application of grouting technology

The application of dam filling technology is mainly concerned with the following aspects: First, after the completion of flow operation, unloading and flattening operations can be carried out to calculate the specific process quantity and construction time. The second is to take the specific construction content as the basis of the technical construction of the project, and pay attention to the impact of related factors such as the soil filling area, paving method and environmental factors; Third, in the application of grouting technology, we must fully take into account the requirements of construction equipment and dam area, we must strictly control the overall construction time to minimize the cycle time, in order to prevent heat loss.

3. Application of earth dam seepage prevention technology

Usually, some earth dams are built according to the needs of the project in the construction of water conservancy and hydropower projects, but because the earth dams are easy to deform, and even leakage occurs, these will cause serious impact on the smooth progress of water conservancy and hydropower projects. In order to solve the above problems, pure pressure grouting can be used, divided into two stages. Usually, Portland cement is used as the grouting material, which can make the interior of the earth dam more tight, so as to enhance the anti-denaturation and anti-seepage system of the earth dam, greatly reduce the saturation line of the dam body, maximize the stability of the earth dam, and prevent the occurrence of deformation and leakage and other related

hidden dangers.

4. Application concrete rolling technology

This technology refers to the direct pouring of dry hard concrete in the rolling process, often used in dam construction, it does not have any impact on the strength of the concrete, and can play a role in improving the level. Construction is fast and cost effective. In summary, compared with the traditional pouring method, it has the following advantages: first, the rolled surface is very hard and not easy to damage; Second, the dam is not easy to collapse. In fact, the material used in concrete rolling technology is not very different from ordinary concrete, so there is no waste of material, but the specific proportion of ingredients is very different from ordinary concrete, so the concrete configuration must pay attention to: ① In order to ensure the compaction of concrete, the material with small particle size should be selected; ② Can not be too thick, strictly control the amount of concrete cement; ③ Slightly increase the proportion of fly ash. In addition, the use of admixtures can have a direct effect on the performance and thus affect the quality of the work. There are many types of admixtures, which change the physical properties of concrete, change the color of concrete, and improve the surface roughness. We should choose the appropriate admixtures according to the actual engineering.

5. Application of prestressed anchoring technology

This technology is a new technology based on the change of prestress. This anchoring technology has strong extensibility, which is not available in other anchoring technologies. Since the bolt is very vulnerable to groundwater corrosion, in order to avoid the durability of the bolt is affected, it is necessary to strengthen the protective measures of the bolt: (1) Set the corresponding protective layer for the anchor bolt, generally using double layer protection, the first layer is plastic pipe, the second layer is the thickness of at least 20mm above the cement slurry as a protective layer; (2) There will be a gap between the free part and the united part; For this gap, secondary grouting must be carried out, and finally, the anchor head should be closed immediately after the tensioning operation is completed.

III. Construction management strategy

1. Establish and improve the construction technology innovation system

In the process of construction, construction enterprises should establish and improve the construction technology management system. During the construction process, technical personnel are organized to carry out technical exchange meetings regularly, so as to continuously improve their engineering construction technical literacy and innovate engineering design ideas. In the meeting, the management personnel should analyze and file all kinds of situations that occur in the construction. Through the analysis and reflection of the construction process to improve the subsequent construction quality, to achieve the simultaneous development of technological innovation and engineering quality. In the operation process of the technical management system, the management personnel should analyze the construction data, and establish the corresponding index and reference system, and the professional management personnel should systematically organize the data, so as to facilitate the follow-up reference and research of technical personnel and management personnel, and improve the efficiency of technical research.

2. Improve the management level of participating units

In the current construction process of water conservancy projects in our country, the main project participating units include construction units, supervision units, legal entities and quality supervision units. Only on the premise of ensuring the management quality of each participating unit, the construction quality of water conservancy projects can be improved to the greatest extent.

2.1 Construction Unit

In order to improve the management level of the construction unit, in the process of project construction, the construction party and the construction party should give sufficient attention to the quality management department, and a good construction project can only be completed under the full cooperation of the two sides to ensure its quality clearance. Therefore, the importance of project management can not be underestimated, it guides the process of all aspects of the project, and ultimately ensures the safe, high-quality and timely operation of the construction project, and realizes the economic and environmental benefits of the country.

2.2 Supervision unit

In order to improve the supervision role of managers on projects, it is necessary to improve the understanding of supervisors on the construction process and construction technology of water conservancy and hydropower projects, and improve the

professional knowledge of supervisors on the implementation of water conservancy projects. The supervision department should study and train the supervisors in professional knowledge, improve the professional quality and technical level of the construction management personnel, and enable them to play a greater role in the supervision of the construction site.

2.3 Legal Entity

In order to improve the management level of the project legal person in the construction of water conservancy projects, in the actual construction, the legal person must strictly perform their duties, the project legal person is the main body of the responsibility of the project construction, the project construction quality, progress, funds, safety production is responsible for the overall responsibility. Therefore, the quality of the project legal person is a primary constraint factor for the smooth progress of the construction project. In the stage of project implementation, the main task of the project legal person is to create conditions for many contract performers on the basis of fully entrusting the supervision engineer to carry out contract management. At the same time, according to the contract terms, contract management is carried out from the aspects of cost, schedule, technology, quality, etc., to check the implementation of the contract, and the use of contract means to deal with the relationship between the parties, prevent and reduce disputes between the contract parties, so as to speed up the project construction progress. Project legal person is the center of engineering technology management and quality management, and is the embodiment form of project legal person responsibility system in engineering quality management. The project legal person is responsible for the technical quality management of the design, supervision, construction contractors and other parties in the project construction.

2.4 Quality supervision unit

The quality supervision and management of construction engineering mainly includes three aspects, which are the quality supervision and management before the construction, the quality supervision and management during the construction and the quality supervision and management after the completion of the project. Only by doing the quality supervision and management work in these three aspects at the same time can we ensure the quality of the entire construction project. In the whole construction process, quality supervision and management is an important part of the construction project, which plays a crucial role in the overall quality of the construction project. At present, with the increasing expansion of the scale of construction projects, it is also required that the quality supervision and management institutions of construction projects should constantly improve their quality supervision and management level, so as to provide a stable guarantee for the quality of construction projects, so that the construction projects can be implemented smoothly and orderly while achieving maximum economic efficiency

3. Improve the management system

In order to improve the quality of construction, the management personnel of the enterprise should perfect the construction management system in the actual construction. Strengthen management during operation, and establish sound construction regulations for water conservancy and hydropower projects. From the perspective of law and system, the use of technology and construction quality in construction are regulated and controlled. During the construction, through field investigation and management, the management system suitable for the project is formulated, and the norms adapted to the production management requirements are strictly done to ensure the construction quality.

Conclusion

In summary, with the water conservancy and hydropower construction engineering project increasing day by day in our country, the construction technology requirement is also getting higher. During the construction, the construction period, construction quality and construction cost should be strictly controlled. Also it is necessary to formulate a global, efficient and rigorous construction technology scheme, do a good job in technical management, and strictly control the construction quality to ensure the smooth development of hydraulic construction projects.

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