

Analysis of Difficulties and Technical Countermeasures in Construction of Road and Bridge Tunnels

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Abstract: With the development of the times, people's economic level is improving, the urban construction is accelerated, the road, bridge and tunnel construction as the focus of the urban construction scale of construction projects and the construction quantity is also growing. Subsequently, people pay special attention to their quality problems. At the same time, there are many difficulties and technical problems waiting to be solved in the construction process. These difficulties and technical problems are the important factors influencing the quality of tunnel construction. Only strictly and comprehensively control it so that the roads, bridges and tunnels can be well and rapidly developed. Next, the paper will make a comprehensive analysis of the difficulties and technical countermeasures in the construction of road bridge tunnel.

Keywords: Road and bridge tunnel engineering; difficulty and technology; countermeasures analysis

Introduction

With the continuous development of China's economic development and the continuous improvement of economic construction, the construction of road and bridge tunnels in China is also coming. Landscape in China, the state of the complex for road, bridge and tunnel construction, tend to be combined with the actual situation of around the different construction operations, all kinds of construction difficulties and the technical problems appeared. At the same time, because of the complicated and changeable construction environment, it poses a great challenge to the construction party. At this time, the construction party is required to analyze various difficulties in the project and take effective measures to solve them. It is an important step to promote the construction of road and bridge tunnels in China's economic construction. Then analyze the difficulties and technical solutions of the construction of roads, bridges, and tunnels, as well as the relative solutions proposed, hoping to provide certain help to those who need it^[1].

1. Construction characteristics of road and bridge tunnels

1.1 Variability

First of all, geological conditions in tunnel construction are difficult to predict. Because it is difficult or even impossible to predict the construction area during tunnel construction, whether there is debris flow and special geology such as underground gas, the geological factors of these tunnel construction are very important.

Secondly, the safety of construction is relatively low. Because the geological conditions of the construction area

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cannot be predicted, various problems such as collapse of the engineering tunnel can easily occur during the internal construction of the tunnel, which is difficult to be predicted and prevented.

Finally, it is extremely difficult to repair. The technical links of the road and bridge tunnel project are closely linked. The latter project will directly cover the previous construction, so that it will be extremely difficult to reconstruct the quality of the project^[2].

1.2 The construction method is difficult and difficult to handle

With the development of national economy, the construction quantity and requirement of road and bridge tunnel are greater. In this way, the requirements of construction geology are increased in the process of progress. In the construction process, relatively effective safety measures must be taken to deal with accidents such as landslides, mudslides, etc. caused by various uncertainties.

2. The present situation of construction and construction of road bridge tunnel project in China and some difficult problems

2.1 It is very easy to develop steel corrosion in construction

In the whole road and bridge tunnel project, the steel bar is the skeleton of the whole project, which supports the whole road bridge tunnel project, which is a very important engineering construction material. But the biggest fear of reinforcement is the problem of rust. In the road and bridge tunnel project, as the reinforcement of the important building materials, the impact on the whole project quality is devastating and the impact is very serious. It will not only shorten the overall quality and service life of the project, but also seriously endanger the safety of people's lives and property. Therefore, the construction workers of the project must be careful about the problem of rusted steel. The present construction personnel generally did not mention the strict attitude to the coating protection of steel reinforcement, the operation behavior is not standard. Enabling steel bar in the external environment of long-term exposure, plus a knock against, damage, the impact and so on in the process of handling storage behavior are easy to destroy the coated steel, easy to make the steel bar corrosion problems^[3].

2.2 The problem that the paving layer falls off easily in the construction

For the problem that the paving layer falls off easily in the construction, it is a kind of problem that appears easily in the actual construction of road bridge tunnel project. Generally, the construction personnel will excessively pursue the appearance and aesthetics of the tunnel project. At the same time, there is not enough attention to detail and quality in the whole construction process. During the construction process, construction work cannot be strictly performed in accordance with the standards, resulting in the appearance of cracks and loosening in the final pavement, and even the phenomenon of pavement shedding. This has greatly affected the quality of road and bridge tunnels impact.

2.3 The problem of concrete cracks that can easily occur during construction

In the road and bridge tunnel project there is a common but very important building material, that is concrete. Its quality directly affects the quality of the project. Many factors will affect the concrete results, which will lead to cracks, which will lead to cracks in many buildings after completion. Most of crack problems are caused by the construction homework personnel's operation is not standard, because its non-standard operation, leading to insufficient standard concrete structure, and cracks. In addition, the quality of concrete in China's market is uneven, which has a great influence on the quality of the final concrete structure. And concrete has long been exposed to the air; the unscience of post-maintenance management of concrete; the incomplete concrete ingredient and so on are the important factors that affect the crack of the structure quality^[4].

2.4 The safety awareness of construction workers is weak

In the course of the construction of road and bridge tunnels in China, there is still one of the biggest problems, that

is operators generally lack safety awareness, their own safety awareness is weak, and their safety awareness and safety concepts are not strong. So much so that operators often misbehave. At the same time, the construction workers are mostly migrant workers, with low cultural quality and lack of knowledge of professional operation skills. At the same time, the lack of awareness of safety management of construction units, the system is not perfect, and the management of the operating personnel, mechanical equipment, building materials, etc. during the entire construction process is not strict enough, and it also aggravates the potential safety hazards in the construction of the entire road and bridge tunnel.

2.5 Shield construction technology is difficult

In road and bridge tunnel construction, shield construction is a very common technique for preventing groundwater intrusion. It is used as a support for shields through the shield shell of a shield machine, and then it is ground through the cutterhead at the front end of the shield machine. Layer to form a tunnel. This technology can effectively prevent the invasion of groundwater, and at the same time, it can completely realize the automatic operation of machinery, greatly improving the safety factor of construction workers. However, this technology has a very serious technical problem. The main problem is that the earthen surface of the shield machine is changed when it has not yet reached the soil. The main reason for this problem is that the shield tunneling machine generates considerable pressure when it enters the soil and changes the soil quality. In addition, the construction difficulty is greatly increased in the soft formation with more water content^[5].

3. The measures to optimize and perfect the technology in the construction of road bridge tunnel

3.1 Strictly control the quality of concrete materials to prevent cracks

In the tunnel project of road and bridge, the concrete structure is unstable and cracks are easy to appear. The relevant departments of the government should adopt mandatory system to strengthen the quality supervision and control of the market building materials, especially the monitoring of the quality of concrete materials. At the same time, the purchasing personnel of the construction unit must make good quality control when making concrete materials, and carry out material purchase according to the construction standard. Then, during the construction process, the operators must strictly abide by the construction standards and deploy them in proportion. The grade strength of the concrete is calculated according to the different tunnel construction sites. At the same time, it is necessary to accurately measure the number of steel bars in concrete, so as to effectively protect the structure quality of concrete and reduce the generation of cracks^[6].

3.2 To support the road and bridge tunnel project and waterproof work

In the process of construction of road and bridge tunnels, support for road and bridge tunnel works and waterproof work should be done well. This is to ensure the quality and safety of the tunnel after the completion of the project. The support and protection of the tunnel can effectively prevent the external pressure on the tunnel and the deformation of the tunnel structure. At present, the main technology adopted is anchor-spray support. During the construction of this technology, the staff must pay special attention to the quality of raw materials, and strictly follow the precise design of the construction program to carry out the construction work. In addition, the waterproof work of the tunnel mainly prevents the leakage of the tunnel. The drainage pipeline should be checked and tested correctly for the drainage system. And it should be checked regularly after completion of construction, so as to avoid all possible safety problems^[7].

3.3 Control and prevent the construction quality of the paving layer

The shedding of pavement layer is another difficult problem in the construction of road bridge tunnel. In order to avoid this situation effectively, we must strengthen the rigid structure of bridge paving layer. Especially in the rapid development of economy in our country under such a situation, the increasing pressure of bridge road, overweight, overload problems appear constantly, have greatly increased the pavement load of road, bridge and tunnel engineering.

In order to effectively solve this situation, will require staff on pavement layer cladding, the good must be calculated in different places of surfacing layer thickness of pavement material to choose the standard material very easy bending, thus effectively solve the problems of the pavement layer peeling and cracking. At the same time, construction can also be carried out by selecting a waterproof material with good quality. If necessary, a layer of 8 to 10 cm thick waterproof concrete can also be applied to the pavement. At the same time, some dry areas can also lay a layer of asphalt materials, can effectively prevent cracks appear, so also can try to improve to the service life of the project, softness of reinforced concrete.

3.4 Strict and full name quality control of the overall construction quality

In the process of construction, there will be various geographical environments, complex surface environment and various factors influencing project quality, which will have a great impact on project quality. At this time, a great difficulty was raised for the construction workers, who were required to have high mental and physical requirements. For the overall quality of the project, it is necessary for the construction party to establish a comprehensive and complete supervision system. In the construction process, it strictly checks, controls every construction process, and is not sloppy. It supervises and evaluates the quality of the work personnel, and protects and maintains the construction equipment, reducing as much as possible the impact of various objective factors on the project.

4. Effective solution to problem solution

4.1 Solution to the problem of pavement shedding

In order to solve the problem of the coating layer falling off, the first solution is to start from the material. No matter it is the material purchasing personnel or the construction personnel, no one can take it lightly. We should carefully check the thickness of the paving layer and then select the appropriate high-quality paving materials. Secondly, to solve the problem of the off the pavement and to solve in the process of construction, construction personnel should note waterproof materials used in construction process of the scientific and reasonable, and to restrict the phenomenon of surface water seepage, thus protecting surfacing, extending using life. In the last aspect, the construction environment and geographical location should be solved, and reasonable and scientific construction countermeasures should be designed according to the actual situation in the area so as to effectively and effectively solve the problem of shedding of the bedding layer^[8].

4.2 The solution to corrosion of reinforcing steel

Because steel reinforcement is of great importance to road and bridge tunnel engineering, its corrosion problem is also a big problem to be solved. The construction unit should first establish a good steel storage management system and plan. At the same time, strict requirements for workers and coating operations in strict accordance with standards, so as to conduct scientific and effective coating operations. Professional training for construction personnel at the same time, put an end to sloppy, make construction personnel from psychological understand reinforced the importance of defense work, implement the responsibility to each construction personnel, to effectively increase their sense of responsibility. To the steel handling process can not be careless, handle light, pay attention to bump; Storage makes attention to dry ventilation to reduce the damage to the steel coating and reduce the occurrence of corrosion problems^[9].

4.3 Control cracks in tunnels

The problem of cracks in the tunnels in the country is mainly due to insufficient quality of materials, inaccurate formulas, etc. This requires the state to strengthen the research and development of construction technology and investment to improve the quality of concrete materials as soon as possible. The construction personnel strictly abide by the proportion formula and scientific proportion. At the same time, in the actual construction process, it is necessary to match according to different actual conditions, and different proportion intensity is adopted for different requirements. In addition, the construction personnel must use the correct formula to calculate the number of steel bars in the concrete.

Finally, after completion, the maintenance work should be carried out regularly to extend its service life.

4.4 Full attention to construction safety management

Construction safety has always been a very troublesome problem in road and bridge tunnel engineering. Due to the low level of geographical environment and professional quality of personnel, safety hidden danger has always been high. Before the start of construction, it is very necessary to conduct certain professional knowledge and safety knowledge training. Effectively improve the safety awareness of construction workers, strengthen the safety supervision methods in the construction process, and formulate appropriate and appropriate safety management systems, which are very effective for improving the safety of construction personnel.

4.5 Pay attention to the engineering survey work

Before the start of the construction process, it is very necessary to carry out a comprehensive and reasonable engineering survey. Effective and good engineering survey can effectively reduce safety risks and improve work efficiency. The construction unit selects experienced survey and design personnel to carry out effective pre-project surveys. This effectively avoids difficult-to-construct road sections, improves construction efficiency, reduces the accident rate, and increases the stability of the project^[10].

Conclusion

To sum up, we can know that China's road and bridge tunnels currently have great difficulties and technical difficulties. Their construction is difficult and dangerous, and the project quality also has a variety of factors to influence. The quality of the project can be said to have a direct impact on the economic development of a region, and even affect the country's economic level. As the construction party, we must be strict with ourselves and realize the importance of the whole project to the country and society. According to the key and difficult points in the project, sufficient analysis and key solutions can be made so as to effectively and rapidly complete the project construction in the actual construction and improve the project quality of the whole project. This article makes a simple analysis of the current road and bridge tunnel project in China and puts forward corresponding countermeasures. It also hopes to be helpful to relevant persons.

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