Application of Prestressed Construction Technology in Municipal Bridge Engineering

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Abstract: With the rapid development of China's economy, many cities in China are accelerating urbanization. One of the most important construction aspects is the construction of municipal bridges. In the construction of municipal bridge engineering, the excellent degree of construction technology directly affects the quality of municipal bridge engineering. As the most basic project in urbanization construction, the quality of municipal bridge engineering must meet people's daily travel and ensure people's travel safety. With the increase of the number of municipal bridge constructions, prestressed construction technology has been widely used in engineering construction. Due to its technical process, there are many problems in application technology. This paper mainly proposes solutions based on the problems, and briefly describe the application direction of prestressed construction technology.

1. Introduction

With the great progress made in the practical application of municipal bridge engineering, the technology used in the construction of municipal bridge engineering has gradually been valued by people, and prestressed construction technology is one of them. Prestressed construction technology is a key technology in municipal bridge engineering. Due to the phenomenon of cracks easily occurring during the implementation of bridge engineering, prestressed construction technology can solve this problem, and fully utilize technology to improve bridges. The degree of damage tolerance, improving the quality of bridge engineering promotes better and faster development of the national economy, and also solves the problems existing in the construction of urban municipal projects in China.

2. How to use prestressed construction technology in municipal bridge engineering

During the construction of the entire municipal bridge project, the construction phase is the stage where the most prestressed construction technology is applied. In this stage, it must be ensured that the use of the prestressed construction technology meets the safety standards to ensure the quality and safety of the municipal bridge project. First of all, it is required to control the quality of the curved shape in the pre-buried stage of the construction of the municipal bridge project. In the actual construction of the municipal bridge project, the inspection of each different process is carried out to determine its own quality and ensure that each process is not completed. It will affect the use of the bellows, and it is also necessary to ensure that the shape of the curve in the municipal bridge project is not deformed to the maximum extent, and the lattice of the elevation can be correctly controlled. Secondly, it is necessary to pay attention to other processes in the municipal bridge project to ensure that the use of the tunnel pipe is not affected during the construction of the municipal bridge project. Finally, the most municipal bridge construction management personnel in the municipal bridge construction once found problems, need to think about solutions in a timely manner, to achieve a random response, can accurately handle the problems encountered in the construction, especially in the municipal bridge engineering In the two stages of tensioning and grouting during construction, all the links must be strictly controlled in the construction of these two stages. The two stages of tensioning and grouting can directly affect the quality of the

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municipal bridge project, and the construction personnel follow the design. Requirements and relevant design specifications in China to effectively control the tensile stress. In the grouting process, it is necessary to calculate the amount required for grouting in advance to ensure that the slurry of the tunnel becomes more full.

The prestressed interface part of the municipal bridge construction is one of the most important parts of the whole construction. In this part of the work, it is necessary to do a good job of sealing work, the connection of the tunnel and the exhaust tunnel in the municipal bridge project, grouting the holes and the venting holes and grouting holes in the municipal bridge project are strictly monitored at different positions to ensure the quality of the sealing work. The purpose of sealing work strictly is to avoid the occurrence of slurry leakage, and at the same time prevent foreign matter from entering the tunnel and causing the blockage of the pipe hole to affect the safety of the municipal bridge project. In the construction of municipal bridges, special attention should be paid to the grouting holes and venting holes in the lower tunnels. Since the length of the pipelines at these locations is long, the angle at which the slabs protrude is too large, so it must be done during the construction process. It is fixed to ensure that there will be no leakage. It is necessary to pay attention to the construction of the municipal bridge project. When the concrete is poured, it must not be connected with the prestressed tunnel. The purpose is to prevent the misalignment of the tunnel due to the pouring of concrete, and at the same time during the construction of the municipal bridge during the vibrating work. The reinforcements applied to the auxiliary tools and the prestressed tunnels in the municipal bridge project are relatively dense relative to other parts, so the work is relatively difficult to implement and even prone to plastic shrinkage cracks in some parts. Therefore, in the construction of municipal bridge engineering, it is necessary to use steel rods for gradual vibration. If the steel bars in the prestressed tunnels of the project are too dense, manual insertion work can be used as an auxiliary treatment to make these parts more robust and durable. higher. After the completion of the pouring concrete process, the staff at the construction site must give a comprehensive inspection of each hole in the construction site to ensure its quality and clean it. In each of the drawings, the location where the sealing work should be done carefully Inspection, preparation for tensioning and grouting work for the construction of the municipal bridge project.

In the process of welding each process in the municipal bridge project, the prestressing tendons should not be used as the connecting wires. In order to ensure the smooth running of the welding work, all the prestressing tendons that need to use the welding process need to be protected before the construction. The welding process can be used only for the prestressed tendons after protection. Firstly, the prestressing tendons need to be tied in the order of the process. After the beam ribs are used, the lashing of the bottom ribs needs to be carried out. Before the ribs are tied, the prestressing tendons need to be added. In the construction of municipal bridge engineering, it is necessary to ensure that the pouring concrete can be effectively completed. It is necessary to use concrete pouring in all the tension ends of the municipal bridge engineering and the position of the beam-column joints. It is required that the work is completed smoothly, and only then can the work be completed. You can do the next step. When making slurry in the process of pouring concrete, it is necessary to strictly control the amount of water added by the construction personnel. If the effect of water quantity control is poor, it will directly affect the fluidity of the slurry, and the completion effect of the next work. It also has an impact, so it is necessary to ensure that the water volume meets the actual demand and prevents excessive addition. When stirring the slurry, in addition to the amount of water that needs to be controlled, it is also necessary to control the amount of the admixture to prevent uneven agitation of the slurry. The constructor may not add unused materials to the slurry before the slurry is discharged, preventing problems with the grout. Before the municipal bridge project carries out the grouting process, it is necessary to thoroughly clean the pipeline to be selected and check whether it is damaged or cracked. If any debris is found in the pipeline, it must be completely removed by air compressor to ensure the pipeline is clean. At the same time, it is guaranteed to be safe to use.

3. Special application of prestressed construction technology in bridge engineering

With the rapid development of science and technology, the current prestressed construction technology is applied in all aspects of China's construction and has achieved relatively good results. It is more comprehensive in municipal bridge engineering, and many aspects of municipal bridge construction need to be applied. To the prestressed construction technology, the development of bridge deck construction has been greatly improved due to the emergence of prestressed construction technology. In the current construction of municipal bridge engineering, the application of prestressed construction technology should be strengthened, and the prestressed construction technology can ensure the stability of bridge deck construction quality and ensure that the municipal bridge project can meet people's needs when it is put into use. And directly improve the service life of the municipal bridge project. When the concrete produced by the prestressed construction technology is poured on the bridge deck, the construction personnel need to configure the prestressed steel bars according to the requirements of the municipal bridge engineering according to the local conditions. The binding force generated by the prestressed steel bars can be directly avoided. Bridge deck cracks that have often occurred in municipal bridge projects. After using the prestressed construction technology to complete the bridge deck construction, it is required that all construction workers in the municipal bridge project should gradually improve their own quality. As a construction personnel, they must be proficient in all theoretical knowledge and flexible in the theoretical knowledge they have learned. Applying to the municipal bridge project, combined with the work experience gained in the actual work, the bridge deck shrinkage and fracture that often occur in the municipal bridge project are minimized, and the pre-stress construction technology is used to ensure the safety of the people and improve the municipality. The social and economic benefits of bridge engineering.

In the construction of municipal bridge engineering, the concrete box girder is also one of the most important parts of the whole prestressed construction technology. Through many actual constructions, it can be found that the span of the concrete box girder itself is about 40cm, and the relevant regulations in China require under normal circumstances. The length of the concrete box girder cannot exceed 60 cm. In most cases, the prestressed construction technology is applied to the concrete box beam. The main components are strong steel strands and low-relaxed steel strands. The longitudinal prestressing is used to fix the tension tonnage in the municipal bridge project. However, in different cities, due to the different geographical locations of the municipal bridge engineering, the bridge construction technology required for the municipal bridge engineering is not the same. It is necessary to carry out specific analysis in combination with specific conditions. In most cases, it is necessary to strengthen the prestressing. The application of longitudinal prestressed steel bundles in construction technology uses longitudinal prestressed steel bundles to determine the anchorage configuration and to determine the number of combined box girder and strands required for the municipal bridge project. If the length of the suspension of the bridge box girder cantilever is relatively long in a municipal bridge project, the number of steel strands required will also increase. If the length of the cantilever plate is 5 m, then in the municipal bridge project The steel strands to be used are at least 4-6. In addition, in the construction process of the municipal bridge project, it is necessary to appropriately improve the working efficiency of the cantilever casting in the municipal bridge project. With the application of current prestressed construction technology, the prestressed construction technology is used in the construction of municipal bridge projects in many areas of China, and the highway bridges under construction are also constantly changing, especially the structural changes of highway bridges. The “two-way” prestressed structure of 40m~60m in highway bridges constructed by China Municipal Bridge Engineering Institute plays an increasingly important role, but more powerful tonnage is needed as a support when applying prestressed construction technology.

From the current statistical analysis of highway bridges built in China, data can be obtained. Most of the highway bridges currently used are concentrated in 16cm~25cm. In the face of this situation, it is necessary to strengthen the application of concrete hollow slabs in municipal bridge

engineering. The prestressed construction technology can effectively improve the application of the municipal bridge engineering to the concrete hollow slab in the construction. To ensure the quality of the municipal bridge project, it is necessary to fully exert the hollow slab, prestressed steel and low relaxation steel in the municipal bridge engineering. The role of stranded wire and other materials, the application of prestressed construction technology in concrete hollow slabs, the main techniques used include the following two points: First, the first method. The so-called pre-tension method refers to the application of a single copper strand in the municipal bridge project to strengthen the application effect of the concrete hollow slab; second, the post-tension method. It mainly strengthens the application of flat anchors and group anchors in municipal bridge engineering, in which different tonnages need to select the most suitable prestressing construction technology according to their own tonnage.

In order to ensure the quality of the municipal bridge project and increase the service life of the municipal bridge project after it is put into use, and to ensure the safety of life and property of the people during the trip, it is necessary to strengthen the bridge of the municipal bridge project, and the reinforcement of the bridge is the whole One of the most important aspects of municipal bridge engineering is one of the links that directly affect the quality of municipal bridge engineering. After completing the reinforcement work of the bridge, it can lay a very solid foundation for the subsequent links of the municipal bridge project. As a municipal bridge project, the construction personnel must attach great importance to the problem of bridge reinforcement in the municipal bridge project and strengthen it in the municipal bridge project. Application of prestressed construction techniques. If you want to steadily improve the bearing capacity of the bridge in the current municipal bridge project, whether it is the relevant department in China or the construction unit responsible for the construction of the municipal bridge project, it is necessary to conduct an in-depth analysis of the structural performance of the concrete, only to understand more in the municipal How to better apply prestressed construction technology to bridge engineering can continuously extend the life of bridge engineering in use. During the whole construction process, the construction personnel who are the municipal bridge project need to increase the importance of each component of the construction site and improve the strength of the components to improve the structure of the bridge. By using the prestressed construction technology to improve the strength of the components, In order to improve the strain capacity of the concrete itself, the only way to provide better protection for the bearing capacity of the bridge in the municipal bridge project, and also to enable the construction personnel to have a deeper understanding of the prestressed construction technology.

4. Conclusion

In summary, the rapid development of China's economy has led to the development of bridge engineering, bringing convenience to people's travel and bringing more challenges to the construction unit. As the bridge project will be completed, it will be the daily life of the people. The work has an impact. To this end, it is necessary to ensure the safety of people's travel and improve the importance of prestressing technology in the construction of municipal bridges. According to the actual problems in the construction area, the relevant departments also need to formulate relevant regulations according to the use of prestressing technology to ensure that the construction unit can meet the needs of people in China by using prestressing technology, and ensure the safety and stability of the construction project. To meet the needs of social development.

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