

Study on Construction Technology of Municipal Road and Bridge Concrete

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Abstract: With the continuous development of social economy and the accelerating process of urbanization, municipal road and bridge projects have also shown a trend of rapid development. Municipal road and bridge work can fully reflect the economic and cultural development level of cities and is also an important symbol of urban development. As a basic material of construction, concrete is widely used in engineering construction. This article will analyze the municipal road and bridge concrete construction technology, put forward corresponding measures.

1. Introduction

With the continuous development of social economy and the accelerating process of urbanization, urban road construction will also become a new trend of social development. Among them, municipal road and bridge engineering are an important part of urban infrastructure construction, it also has an important role in daily road traffic travel. The general municipal road and bridge projects mainly include the construction of rational bridges and municipal roads. The construction projects are also complicated. In the process of construction, there are many uncertainties that affect the construction quality. The most common construction materials are concrete and concrete. The construction technology will affect the construction quality of the project. We need to strengthen the study of concrete construction technology, improve concrete construction technology, improve the quality of municipal road and bridge engineering.

2. The Importance of Municipal Road and Bridge Construction

As a city infrastructure and projects, municipal road and bridge projects can promote the rapid development of urban life and provide great convenience for people's daily travel. In the construction of municipal road and bridge projects, the construction projects are complicated, and the general construction environment is bad, there are many uncertainties will affect the quality of construction [1]. In the construction of municipal road and bridge projects, the choice of construction materials is also the basis for improving the quality of construction, concrete is the most widely used construction materials, concrete construction technology will affect the construction quality of the project, the construction of the project, need to full control concrete construction quality, which can fully guarantee the overall quality of the project, provide greater help for people's social life and production.

3. Preparatory Work of Municipal Road and Bridge Construction Projects

3.1 Selection of Concrete Materials

For municipal road and bridge projects, they will not only need to pay attention to the practicality of the project, but also need to take into account the aesthetics of the overall architecture, municipal road



and bridge engineering project is a symbol of urban economic and cultural , the quality of the project also represents the level of urban development , so choose high-quality concrete is very important [2] . In the construction process , the use of construction concrete is clear water concrete , with high-end atmospheric morphology , the construction of clear water concrete is more detailed , per square meter costs 1,000 yuan or more , but its low maintenance costs , it can't meet the municipal road and bridge quality standards in the whole . The current new construction material is steel fiber reinforced concrete, which is a new type of composite materials , in line with the construction quality standards , the current steel fiber reinforced concrete is widely used in construction , the use of this new type of material can satisfy the current high quality needs .

3.2 Early Construction Preparatory Work

For the initial construction of municipal road and bridge construction, are: (1) Acceptance of the construction quality of the concrete, and determine the construction planning and design content to ensure concrete construction quality to a certain standard; (2) The relevant engineering design unit, design drawings for review, improve the overall consideration of municipal road and bridge projects in various aspects, including the location of steel, reinforced protective layer material selection, to ensure that the construction design is reasonable; (3) Measurement and inspection of the various parts of the construction project, to fully ensure the template joints, panel joints and other design locations reasonable, for bolts and other design locations to be corrected; (4) Develop the appropriate construction programs for the specific construction of the project, including the latter part of concrete conservation, reinforced construction program and some materials protection measures.

3.3 Preparation of Construction Materials

In the construction of municipal road and bridge project, all materials need to be selected according to industry standards, to comply with national norms, the quality of the material only after passing the test it can enter the construction site, as well as in the construction we need to do internal clean-up for concrete formwork, control the number of concrete vibrations, the concrete cement materials need to choose to meet the standards of the manufacturer.

4. Problems of Concrete Materials in Use

In recent years, with the accelerating process of urbanization, the development of urban transportation construction industry also shows an upward trend. Concrete materials play an important role in engineering construction. They are widely used in the construction of municipal road and bridge projects. Concrete materials are easy to get, they are cheap and have strong mechanical performance [3]. However, due to some of the properties of concrete itself, the construction technology of concrete has not reached the standard, it is easy to crack in the late, the quality of construction of concrete works is currently more concerned. Ordinary concrete due to the impact of the construction environment, there will be a variety of cracks, because maintenance is not in place or its own attributes and other reasons.

4.1 Ordinary Reinforced Concrete Problems

In the current construction of municipal road and bridge projects, due to cracks in concrete and cement caused by the phenomenon of water heating which caused municipal road collapse is also frequent, commonly used ordinary concrete materials are mainly composed of gravel, cement and some additives one of the stones, cement compressive performance is better, under strong pressure, its bearing capacity will exceed a certain limit and produce cracks. The current air pollution is serious, the concrete is susceptible to acidic substances, cracks, the harmful substances will enter the concrete structure, causing corrosion on the reinforcement.

4.2 Problems with High Performance Steel Fiber Concrete

High-performance steels fiber construction material is a new type of concrete material. The

manufacturing methods of steel fiber reinforced concrete to include cutting steel fiber and cutting steel fiber. This high-performance steel fiber reinforced concrete can effectively prevent the extension and expansion of cracks and reduce the serious consequences caused by cracks. The basic principle is that steel fiber and cement share the pressure after severe stress on steel fiber reinforced concrete [4]. After the concrete cracks, the steel fiber will withstand the main pressure, when the external pressure continues to increase, the steel fiber is still under pressure as a whole, until the pressure is too large, the steel fiber is broken so far, high-performance steel fiber is in ordinary concrete incorporation of appropriate amount of steel fibers, mixed with 0.7% of steel fibers, the overall toughness of concrete will increase 50-95 times, the probability of concrete cracks will be reduced accordingly. For example, in the construction of municipal road and bridge concrete works, the use of steel fiber reinforced concrete, can reduce the number of horizontal shrinkage, shrinkage distance will be increased to 25-40 meters, the construction process, need to strictly control the quality of construction, to ensure that raw materials can meet the standard. The application of high-performance steel fiber reinforced concrete to the construction of municipal road and bridge can effectively ensure the quality of construction. This is a high standard and high quality new composite material, which can improve some disadvantages of common steel fiber. It also belongs to a kind of comparison lightweight and energy efficient materials.

5. Municipal Road and Bridge Concrete Construction Technology Control Measures

5.1 Do a Good Job of Concrete Production and Matching

Concrete because of its own properties, need to carry out the construction under specific environmental conditions, it can effectively prevent the problem of concrete cracks, concrete mixing process is also an important measure to fully ensure the quality of concrete construction, the choice of cement materials in concrete need to follow industry-related standards, to ensure the quality of various materials. (1) In the pouring process, we must first ensure the quality of the material, to properly control the water gray and slump which can effectively reduce leakage, the general control of the initial solidification time in 6-8 hours, the choice of cement to ensure a certain degree of strength, the use of cement must be the same manufacturer and the same type of cement which can not be doped with other brands of cement, (2) the choice of aggregate should be the same color which can not contain any impurities, mud the amount of it is less than 1%, aggregate grit content can not be less than 2%, can not be mixed with any impurities, manufacturers are to choose more reliable manufacturers for the brand[5]. (3) In concrete generally need to add admixture, admixtures generally use water-reducing agent, the most important mineral admixture, to take its activity into account, which can effectively fill the internal voids, improve the tightness of concrete, and in order to ensure the quality of concrete at the late stage, which can be mixed with more than two fly ash without any impurities that can effectively ensure the stability and quality of concrete. (4) In the process of concrete proportioning, it is necessary to feed in strict accordance with the provisions of the ratio, to ensure the unity of the use of materials in the process of mixing, we must strictly control the mixing time, the appropriate amount of water, concrete production during the process, the water-cement ratio will affect the hardness of the concrete, the color of the aggregate will have an impact on the appearance of the building, and the color of the aggregate needs to be evenly distributed.

5.2 Concrete Construction Technology Control

In the process of municipal road and bridge concrete construction, the quality of the formwork, concrete to mix ratio and construction technology are important factors that affect the quality of the project. The quality of the formwork which can ensure the overall structure of the concrete, which is a key factor. (1) For the choice of formwork, toughness and strength, to resist the pressure in the outside world, the structure of the design should be simple, convenient, with a certain degree of solidity, the template selection should try to avoid splicing, the template height and width should be maintained in 1mm, the template selection should be sufficient taking the transport distance and

deformation of the template into account , need to do the gap between the template control to ensure the connection between the flatness . (2) Before pouring the concrete, it is necessary to fully check the mixer, check the exact position of the reinforcement and support, and ensure its rigidity and strength. During the pouring process, the measurement rod needs to be used for measurement to ensure that the thickness of each layer is less than 50cm. In the process of pouring, there must be some continuity, pay attention to the time difference between the pouring, while the vibration of the process, you need to start from the middle of the edge of the distribution, pouring needs throughout all parts, consistent with the rhythm of vibration, vibration should be based on the absence of bubbles [6]. (3). The vibrating process of concrete should be fast and slow. The quick vibrating is to compaction all the concrete to prevent the occurrence of faults and segregation phenomenon. The slow out is to fill the void in the concrete. In order to ensure the smoothness of the concrete surface, use wood trowel to wipe the top more than two times to ensure the formation of the surface, but also need to use iron roller compaction to prevent bubbles.

5.3 Late Concrete Conservation and Finishing Work

After the completion of municipal road and bridge construction, post-construction concrete maintenance work is very important, in concrete construction, the most common problem is the surface cracks, which is due to the lack of moisture on the concrete surface cracks , will affect the quality and durability of the concrete. Therefore, in the early concrete construction, concrete maintenance work needs to be fully done. In the early engineering maintenance, it is very important to strengthen the conservation of concrete, which can effectively prevents the emergence of concrete cracks at the later stage. After the concrete reaches a certain level of strength, the concrete formwork are removed and the plastic film are used for moisturizing coverage. The general maintenance time needs to be maintained above 14 hours.

In the later stage of concrete engineering, the maintenance of concrete works will reduce the occurrence of cracks to a great extent. However, the long-term use of concrete is easily influenced by many factors under complicated environmental conditions and will occur on the concrete surface some small holes, need regular maintenance work. After dismantling the concrete formwork, the sand in the surface layer needs to be cleaned. For the cracks appearing, it needs to be repaired. The fine sandpaper is used to polish the surface of the component to ensure the smoothness of the surface. For example, the following figure shows the concrete pavement.



Figure 1 Concrete Construction Pavement

Concrete maintenance, concrete is a porous material, the surface is easy to absorb a lot of water, in the adsorption of water, the color will have a great change, there will be a great color difference which will lead to poor overall municipal highway. For example, bridges and subgrade on municipal roads will cause great chromatic aberration of concrete after being exposed to rain and will be polluted by

ultraviolet rays and oil pollution , losing their original appearance . With the long-term pollution and destruction , the surface of municipal road concrete will gradually become uneven, increasingly cracking , in order to ensure the concrete that is not affected by the natural environment of the outside world , you need to apply a layer of protective paint on the surface of the concrete pavement, concrete pavement to be protected . In the actual construction process, you need to paint a similar pigment in order to ensure that the concrete surface can always maintain a uniform color.

6. Conclusion:

In summary, in the construction of municipal road and bridge projects, concrete construction technology is very important, in the construction of concrete works, the quality of raw materials of concrete will also affect the quality of municipal roads, with the current concrete construction technology is not constant perfect, high-performance steel fiber reinforced concrete is widely used in the construction of road works. In the process of construction, the ratio of concrete, construction techniques and the conservation of concrete engineering in the later period are all very important, which can fully guarantee the overall quality of concrete engineering and ensure that the construction materials conform to every detail in concrete engineering industry standards.

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