Research on Design and Application based on Bridge Inspection and Maintenance Scheme

Lingye Tan¹, *, Ziyang Zhang¹, a, Xin Wang²,b

¹Faculty of Engineering, University of New South Wales, New South Wales, 2032, Australia
²School of Environment and Civil Engineering, Jiangnan University, Wuxi, 214000, China

*Corresponding author e-mail: tanlingyet@126.com, azyy967230@gmail.com,
b1101180128@stu.jiangnan.edu.cn

Abstract. Under the background of the rapid economic and social progress and development of the market economy in China, the cause of traffic construction has also been built and carried out like a raging fire. There is also a direct relationship between traffic engineering construction and the rapid development of science and technology and the national economy, which plays important technical support and driving role in the development of social and national scientific and technological and economic traffic engineering construction. Under the background of the current market economy with the rapid development of science and technology and the economy, a large number of large-scale bridge designs and buildings have been put into use and obtained the latest bridge scientific detection technology. In the process of bridge construction, the structural complexity of the detection technology and the span of the bridge have been improved to a great extent. This paper mainly discusses the bridge detection technology, specific maintenance, and bridge reinforcement technology in the process of design and construction of all kinds of large bridges, and makes a technical analysis on the maintenance life of all kinds of large bridges, to increase the safety and maintenance life of all kinds of large bridges and promote the realization of their greater economic and social benefits and value at the same time.

1. Introduction

Based on the continuous and rapid development of China's bridge construction, the number of bridges is increasing, which effectively relieves the pressure of highway traffic, promotes modernization, and improves the operation and management capabilities of vehicles. And, bridge inspection technology is also increasing. China has further strengthened the management process of highway and bridge construction. In order to better explore the application of bridge inspection technology.

Based on the analysis of the implementation of highway bridge building reinforcement and maintenance, this paper discusses the widely used detection technology of highway bridges, strengthens the reinforcement and maintenance evaluation of highway bridges, and puts forward more ideal design schemes, detection and maintain highway bridges.
2. Analysis and Application of Bridge Detection Technology at present

2.1. Evaluation of bridge reliability

After the completion of the construction of the main structure, the bridge project may be affected by the interaction of a variety of natural factors in the whole process of its operation. In many cases, the corrosion of bridge steel bar, the aging of bridge concrete and the fracture of bridge deck caused by an earthquake may occur directly. To effectively improve the reliability and service life of the main structure bridge, the reliability degree of the main bridge structure should be evaluated comprehensively under the guidance of the theory of modern bridge structure detection technology. To see whether the actual bearing capacity of the current bridge main structure is consistent with the technical requirements for bridge reliability design and whether the bridge main structure can fully meet the needs of normal bridge operation functions. And according to the specific operation status of the bridge to formulate and design an effective bridge reinforcement and maintenance plan. The design and formulation of the bridge maintenance and maintenance bridge reinforcement plan should be carried out according to the needs of the actual bridge structure evaluation. Under the guidance of the theory of the modern bridge reliability design scheme, the bridge structure and route should be re-planned and designed and the structure should be selected to minimize the damage caused by impact to the main structure bridge. The main consideration in the process of bridge design for reliability evaluation of bridge reliability is the reliable detection of bridge load and main structure resistance. According to the existing reliability evaluation and design methods and statistical standards of bridge engineering's main structure, the calculation formula of the random calculation process model of bridge main structure load and resistance is obtained. The structural material of the bridge is a uniform entity that exists in practical application, and each structural variable in the process of structural design is also fixed, so it is impossible to have any random variable change phenomenon. The calculation and acquisition of the values of each variable can be obtained by theoretical and experimental methods. Because the bridge materials selected and used in bridge structure design are non-uniform to a certain extent, they will be different in the structural properties of bridge materials to a certain extent. The specific uniformity is a process that increases and attenuates gradually with the strength and resistance of the bridge materials used to the structure [2].

2.2. Analysis of concrete content of Bridge Detection

To provide the most basic transportation infrastructure and its construction guarantee for the sustained and steady development of China's socialist market economy and the deepening and development of reform and development in the new historical period. It provides a guarantee for the normal traffic travel of the people and the masses and maintaining the harmony and development security of the socialist economy, therefore, our country has further strengthened the research, establishment, and perfection of a modern transportation technology testing system in the construction and development of transportation in our country. The state strengthens the setting of bridge testing service content in our country, which includes two parts: regular testing and detailed testing. Regular inspection mainly refers to the regular maintenance of the basic situation and components of the bridge in the process of construction and use of the bridge at a certain date and time after the completion of the construction and use of large bridges in our country. Either one year or several years, professionals have been organized to repair and maintain the basic testing institutions, construction and use of large bridges in our country, as well as parts. Based on the comprehensive detection and analysis of the instrument and its basic structure and components, the main cause of the damage is accurately found and repaired. Secondly, the material is repaired in detail. In the process of inspection, it is found that the main causes of the damage of the bridge structure are comprehensively analyzed after the stability and damage degree of the bridge structure reaches a certain degree. The methods of drilling core and non-destructive testing are used to strengthen the risk assessment and detection of damaged bridge structures in the process of construction. In the aspect of evaluation and testing items, firstly, the overall damage of the material in the bridge and the structural stability of the material in the bridge are analyzed, and the specific damage and damage of the material in the bridge structure are obtained. The physical properties and dynamic properties of the bridge during
the construction of the material in the bridge structure are measured respectively. The chemical properties of the bridge structure of the damaged materials and the corrosion resistance mechanical properties of the bridge were tested respectively. After that, the overall damage performance of the material in the bridge structure and the stability of its operation in the bridge are analyzed. The specific contents include the stability and geometric shape of the material in the bridge structure, the inherent modal parameters of the bridge structure and the internal forces that directly affect the bridge members.

3. Analysis and Application of current Bridge maintenance and reinforcement Technology

As the society and the country attach great importance to the development of this new material technology and strengthen its environmental protection, in the structural and construction material design of concrete bridges, we use a new type of carbon fiber composite construction material with carbon fiber resin as reinforced plastics. The carbon-fiber structure of concrete bridge can not only play a strong stability and reinforcement role to the test beam but also effectively promote the renewal and reconstruction of concrete bridge engineering. This new type of carbon fiber composite is composed of resin and millions of new carbon fiber common materials, and the length and diameter of the fiber can generally reach 6-3 \( \mu \)m.

Therefore, under the premise that the FRP of carbon fiber has a certain tension compensation, the fiber can generally withstand a strong load-bearing force, which urges the carbon fiber resin to transfer the stress of the test beam directly to the neighboring fiber, and at the same time effectively control and protect the position and environment of the fiber itself, to prevent the fiber from being directly damaged by the surrounding harmful gases and ions. Under this ultimate stress condition, according to the stability and failure characteristics of the reinforcement test beam, the fiber of the steel bar under stress can yield easily, and the carbon fiber fracture phenomenon will occur at the same time of the stress failure phenomenon of the test beam, so in the current code for the structural design of concrete bridges, The bending stability and strength of the strengthened test beam are also effectively calculated by breaking the carbon fiber of the steel bar. To promote the national support and guidance for the improvement and promotion of bridge construction quality, it should be carried out strictly by the requirements of the construction process of carbon fiber cloth leveling rubber paste reinforcement in the process of bridge base construction maintenance and reinforcement. the specific steps of the technical analysis scheme are as follows. At present, the main fields of construction technology analysis and technical application of bridge base maintenance and leveling rubber reinforcement in our country include bridge base maintenance and reinforcement construction, bridge bottom glue construction, carbon fiber cloth leveling rubber reinforcement construction in the process of bridge construction and carbon fiber cloth leveling rubber paste reinforcement construction in the process of bridge maintenance and reinforcement. The following article makes some corresponding technical analyses of the bridge from these four technical aspects.

3.1. Construction of bridge base

In the process of bridge concrete construction, a certain degree of depression and inferior layer phenomena such as corrosion, honeycomb and spalling may occur in the treatment and performance of concrete, which should be found and dealt with in time. When the phenomenon of the inferior layer becomes more serious, we can consider using the construction method of polymer cement mortar to repair the concrete effectively after the concrete is eradicated. When there are some cracks in concrete, the construction of concrete sealing members can be carried out in these places. The construction methods of cement grinding wheel and concrete angle grinder can also be used to clean up the oil pollution that may occur in the performance of concrete in the construction of leveling members, as well as concrete such as cement floating paste. after that, the part of the concrete performance on the concrete surface of the flat member is effectively polished, and the part of the concrete slightly protruding from the surface of the flat member is polished in a circular arc focusing on the corner. The key arc concrete of the chamfer can be polished at other locations where the concrete corner is pasted. After the leveling
member has completed the above process, a hairdryer is used to effectively clean the performance of the concrete. [5]

3.2. In terms of bridge primer coating
In the process of bridge concrete construction, according to a certain mixing ratio, the curing agent and the main agent of concrete are uniformly mixed under the action of the mixing container, and the curing agent is evenly mixed under the action of the mixer. According to the different air temperature in the working environment of the specific bridge, different amount of curing agent should be used, and the mixing time of the curing agent should be controlled accordingly. The bridge concrete coating and surface components are evenly smeared on the drum under the interaction of the concrete brush and the drum brush, and the coating thickness of the glue is appropriate between 0.4mm. To give full play to its role, the phenomenon of flow and leakage of the mixing glue should be avoided as far as possible, and the mixing work of the bridge construction should be started after the mixing glue is completely solidified [4]. To give full play to its role, we should try to avoid the phenomenon of flow and leakage of the mixing glue, and then start the bridge construction mixing work after the mixing glue is completely solidified.

4. Conclusion
The construction of infrastructure and the growth of its national economy are inextricably linked, and the early construction and maintenance of highways and bridges are an important part of the construction of social and national public transport infrastructure. As society and the country attach great importance to the cause of public transport, the cause of public transport in various countries and regions has been significantly promoted and developed. the research and development and application of technologies related to the pre-detection and maintenance of highways and bridges have also been promoted and developed rapidly. In the process of construction and inspection of highway bridges, we should design and carry out strictly by the basic principles of its correctness, scientificness, and practicability. To effectively prolong the construction and service life of highway bridges, we should actively develop and design reasonable plans for the construction and maintenance of highway bridges. Scientific formulation and strict compliance with the construction technology of highway bridges can finally achieve the balance and unity of scientific and technical benefits and social and economic benefits achieved in the construction and construction of highway bridges.

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