

# Research on the Problems of Road and Bridge Design

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**Abstract:** Bridge design is the soul of bridge engineering quality. With the rapid development of economy, the scale of the road and bridge construction is increasing, which puts forward higher requirements for the design of the bridge. In this paper, the problem of road and bridge design problems are studied in detail.

**Keywords:** Road and bridge; Design; Hidden danger

## 1. Introduction

In recent years, many bridge design surfaces have reached the design specifications, but the actual use of some bridges in only a few years, there have been varying degrees of structural safety problems. Therefore, in the design of road and bridge, we should consider the structure, material and other factors, and take practical measures to strengthen the durability design of bridge structure. In addition, we should also note that the environment is different, the use of different conditions, different design objects, design requirements are different, and the layout and structure of the bridge structure and so on. Bridge design specifications cannot be detailed and cannot cover all the problems that should be solved by bridge designers. Bridge design specification update will not be fully adapted to the new technology, new ideas, new materials for the rapid development of the new requirements of the bridge design. Therefore, scientific and reasonable structure of road and bridge design in bridge design specifications must meet the basic requirements, professional quality, rich design experience and practice the correct judgment also requires bridge designers with high.

## 2. Problems in the Design of Road and Bridge

### 2.1. There are defects in the design of road and bridge

In the course of road and bridge design, it is easy to consider that the design of the bridge is not comprehensive. which appear to design defects. In reality, designers will seriously consider the structural strength of road and bridge design to meet the requirements of the specification. But in the structural system, structural material, structure, structure, maintenance and durability of bridge design and construction that often used in the process of various human factors such as a comprehensive consideration is

not comprehensive enough. For example, in the process of bridge design, the calculation of the road and Bridge schematic and practical route is not clear enough, which makes the local force is too large. The problem and concrete grade is too low, the thickness of the protective layer is too thin, the bar diameter is too small, it will cause a serious threat to the safety and durability of road and bridge. In addition, the road and bridge design process, if the design personnel work attitude is not rigorous, the calculation of errors and so on will directly cause the safety problems of road bridges.

### 2.2. Road and bridge design is too old

With the rapid development of economy, the scale of road and bridge construction is increasing day by day. At the same time, the society has put forward higher requirements to the design standard of road and bridge. However, in terms of design, many cities are still in use in the past, the road and bridge design, which naturally cannot meet the needs of reality. In the face of the rapid development of the cause of traffic, the original design concept has been unable to meet the actual traffic conditions. Design is the soul of the road and bridge engineering, which largely determines the quality of the bridge project, cost, construction difficulty and the length of the construction period, etc..

Lack of awareness of innovation, economic indicators cannot keep up with the waste of resources and the design concept behind the waste of resources, security issues have been a lot of negative impact on the progress of China's bridge engineering technology. Road and bridge design needs to be innovative, but the reality is not optimistic. Our road and bridge design in the new materials, new structures and new technology and other aspects of the use of inadequate. The reason about the following factors: one is the bridge design cycle time is too short, to undertake the tasks of overweight, the blind pursuit of economic benefits, resulting in the bridge design unit does not have enough time on how to create

and optimize comparison. The design scheme can only imitate or copy existing, it will only make the design work stop; two is the lack of real sense of fair competition mechanism. Although there are strict bridge design audit system and supervision system, but the design innovation and economic index difference in effect without certain unfair external factors can also be through the stately and put into practice. The three is all kinds of appraised awards event evaluation mechanism is not perfect. Existing design work only pay attention to the size of the project, regardless of the design innovation awareness and economic indicators, which seriously affect the enthusiasm of the design work.

### **2.3. There are hidden dangers in the construction of road and bridge**

Today's road and bridge construction speed is amazing, and the construction cycle is getting shorter and shorter. However, it is not necessarily a good thing to have a short design cycle and construction period. Which also left a lot of hidden problems. As the construction side as the contract price is too low, even without a contract package material, and even construction equipment have by the owners of rental and purchase. The construction contractor only less than fixed wages. In order not to lose money, they can only be forced to subcontract to the low quality, less experienced engineering team construction. Such sub layers will appear down, reduce costs, shoddy work, shoddy phenomenon, which resulted in the poor quality of the project, but not up to the standard specification and design, but also poses a serious threat to the safety of road and bridge. In addition, the current material market also has a different degree of fake and shoddy problems. Steel, cement, equipment, formwork and basic engineering materials all have different degrees of quality problems. In the process of construction, although the construction supervision system and quality supervision system, but the vulnerability and unwholesome tendencies. To achieve a high degree of responsibility and strict control is difficult.

## **3. Suggestions for Road and Bridge Design**

### **3.1. Improving design level of road and bridge design level**

To improve the design level of road and bridge design level is the key to determine the success or failure of road and bridge engineering. To bridge design unit time, and conscientiously carry out scientific and reasonable design, it must follow the principle of design with mature technology, and never allowed to take the success of the project to do the test, in order to prevent the emergence of engineering quality problems. Design process, but also to deal with the relationship between

the use of mature technology and technological innovation, but also do not advocate for innovation and adventure. In the design of the embodiment of innovative consciousness. As a bridge designer to be familiar with the construction work, so as to select the construction risk is small, construction quality and easy inspection, control of the structure and construction methods. For major projects and key parts of the project, be sure to use rigorous attitude. The spirit of science is carefully calculated. To eliminate the accidents caused by incorrect calculation results. At the same time, pay attention to make optimization comparison with similar projects to ensure no danger of anything going wrong.

### **3.2. Improve the quality of road and bridge engineering**

To examine the safety and durability of the road and bridge with the view of science and the view of sustainable development. Improve the service life of the bridge structure, and strengthen the monitoring efforts. Timely maintenance and repair of the bridge. Bridge design should fully reflect the comprehensive cost of bridge in the life span of the bridge to evaluate the economic and social benefits of the bridge. Bridge design, computer aided design means unit take highly developed elaborate design, and rapid optimization and simulation analysis of the effective components, but also used in the production of intelligent manufacturing system, and using GPS and remote control technology of bridge construction. To overcome the design, construction cycle is short, low prices and low prices, and to build quality projects. Construction quality, the construction unit to the overall planning of the whole project. The construction unit should be targeted. Do not take the method of low price, to the construction enterprise survival space. Low cost successful construction enterprises if you want to survive, only by changing the design to reduce losses. In that way, the construction quality, safety and progress cannot be guaranteed. Construction process, the construction unit to design, construction, supervision unit service, in order to let them work to ensure quality and safety.

## **4. Conclusion**

Road and bridge design is a complex system engineering. The hidden trouble in the design is worthy of our attention and consideration. As road and bridge designers, we should comprehensively consider various factors, and make scientific and reasonable engineering design according to the concrete bridge. For example, the need to pay attention to the design of the bridge in the process of using the natural environment, harmful chemical substances, to withstand the vehicle, earthquake, natural conditions, human factors and other external effects. At the same time, the construction

materials used in the bridge will also cause structural damage and deterioration. In short, the road and bridge design problems have become a major threat to the safety of the bridge is an urgent need to solve the problem. Bridge designers should actively learn from the successful experience and practices at home and abroad. In bridge design, structure system and strengthen the construction of quality management and other aspects to nip design. Only in this way can we solve the hidden dangers of the bridge and ensure the durability and safety of the road and bridge.

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