

## Study on Sustainable Development Strategy of Civil Engineering

Lina Lu

Changchun University of Architecture and Civil Engineering, Changchun, Jilin, 130607, China

**Keywords:** Civil Engineering, Sustainable Development, Strategic Research.

**Abstract:** Civil engineering covers a lot of construction contents, including bridge design, road laying, construction and so on, which is the basis of the continuous development of the national economy and the continuous acceleration of the process of social modernization. Civil engineering is widely distributed in all fields of human activities, which has an important influence on the utilization of human resources and the change of people's living environment. Based on the analysis of the scientific connotation and development status of civil engineering industry, this paper puts forward some strategies to realize the sustainable development of civil engineering.

### 1. Introduction

From the stone age of primitive society to the information age of modern society, civil engineering exists in every stage of the development of civilization of human society, which is the most basic behavior activity for human beings to overcome the natural transformation of nature. Modern civil engineering construction has the characteristics of huge scale, advanced technology, diversified use and so on. At the same time, it also has problems such as affecting living environment, endangering ecological balance and consuming a lot of resources. Nowadays, with the growth of the global economy and the increasing environmental problems and the formation of the concept of human destiny community, the ability of civil engineering construction is not only confined to engineering technology, but also more focused on adhering to the principle of people-oriented, how to achieve green sustainable development on the road. Therefore, for the engineering construction units, it is necessary to adhere to the concept of development to actively explore the green construction technology and seek the direction of sustainable development in order to adapt to the competitive environment of the contemporary industry and improve the economic benefits[1].

Green sustainable development requires civil engineering to objectively evaluate the economy of the project before construction, whether there is a construction necessity, whether it can meet the applicability of production, whether it can control the production cost by using advanced technical means and high-end construction materials, so as to avoid the waste of human resources production resources, and at the same time to prevent enterprises from wasting resources, space and time for the pursuit of economic benefits. On the other hand, sustainable development requires the project to actively explore more advanced engineering technology, more complete engineering concept, the material selection of the project, structural design, construction means, personnel use comprehensive control to achieve resource conservation for sustainable development.



Figure 1 Civil engineering construction

## 2. Current Situation Analysis

Our country is unique in the field of civil engineering, and the construction technology is at the advanced level in the world, with the implementation of the national concept of green environmental protection and sustainable development strategy. At the present stage, most civil engineering units can respond positively to the national policy and carry out the guidelines in depth. In the process of project construction, civil construction units pay more attention to how to reduce pollution, advocate civilized construction, strengthen environmental protection and improve resource utilization. For example, the Hong Kong-Zhuhai-Macao Bridge runs environmental protection and economy through the whole project stage from design to construction. Technologists have realized the expected goal of facilitating regional transportation, promoting regional economic development and not affecting the hydro-ecological environment, producing a large amount of resources and not causing excessive use of costs through innovative exploration of construction plans, thus setting a benchmark for the pursuit of green construction and sustainable development in the field of civil engineering. Although the civil engineering field of our country has made a lot of gratifying and amazing achievements, because of the limitation of the regional economy, personnel and technical level, there are still many problems in the civil engineering projects in various regions of the country that need to be solved by the vast number of engineers and technicians.



Figure 2 Civil engineering

## 3. Problems in the Sustainable Development of Civil Engineering in China

### 3.1. Engineering Design Issues

Civil engineering, as a very systematic project, usually must design the execution plan scientifically and reasonably before launching the project construction. The whole design work includes the whole engineering design, the construction technology method, the construction drawing design and so on. At the same time, the relevant designers should fully investigate the feasibility of the project construction, the construction site and the main contents of the construction, for example, in the process of completing the design of individual buildings, the construction site, the materials required in the construction, the material specifications and other major factors to carry out preliminary design and planning.

### 3.2. Project Management Issues

At present, in many civil engineering construction enterprises lack of relatively perfect construction management system, management personnel team, enterprises in the fierce market environment competition, it is difficult to enhance the ability to resist risks, reduce the ability of sustainable and healthy development of enterprises, therefore, management problems are also a stumbling block to achieve sustainable development strategy in the industry.

### 3.3. Technical Aspects of Construction

In the process of civil engineering development, its scale is gradually expanding, and the use of

various materials and equipment in the process of engineering construction is also increasing[2]. At the present stage, although the reform and opening up has brought the rapid development of the economic market, it also brings a great threat to the ecological environment on which we depend, because the materials with high energy consumption and high pollution are used in the process of civil engineering construction, which will cause incalculable pollution to our environment in the long run and bring some negative effects on the life and health of social groups.



Figure 3 Contamination

## **4. Strategic Research**

### **4.1. Deepening the Concept**

The large number of civil workers exposed many problems. On the one hand, there are great differences between the cultural and water quality of construction workers and their personal qualities, and it is a common phenomenon that the understanding of the concept of green construction and sustainable development is not deep enough. On the other hand, under the influence of the unhealthy atmosphere of economic interests, the management of many engineering units put the principle of work behind them, and it is also a broader problem to take more benefits for enterprises or individuals regardless of the overall situation. For this kind of personnel, it is necessary to carry out active propaganda and education to give them a long-term development perspective to consider the problem, to recognize the problem, to have a deeper understanding of green and sustainable development, so as to prevent the occurrence of such phenomenon at the leadership level[3]. In a word, the implementation of the concept of green and sustainable development into every civil engineering practitioners is the basic conditions to ensure its effective implementation.

### **4.2. Optimization of Engineering Design**

In the early stage of project construction, optimizing the design of the project will help to reduce the project cost and ensure the healthy and stable operation of the enterprise. In the early stage of project design, all the factors affecting the project cost should be fully controlled. The traditional design mode is low in efficiency, slow in speed and low in conversion rate from theory to practice. And the engineering project design with modern technology such as BIM technology can simulate the construction process from space, time, construction difficulty and so on, study all the details of the project in depth, and effectively control the construction cost with the help of BIM's powerful calculation ability, so as to avoid unnecessary waste of funds, and help the technicians to greatly improve the construction efficiency of the project.

### **4.3. Rational Use of Resources**

First of all, how to maximize the utilization of resources in the process of sustainable development is the most direct means to achieve the established goal. Specifically, in engineering

construction, the construction technicians should make full use of the maximum utilization efficiency under the condition of limited funds by optimizing the engineering structure design and strengthening the construction management system. On the one hand, to prevent the waste of construction materials, on the other hand, to ensure the quality of construction materials. Second, the use of new energy and materials under modern scientific and technological conditions has largely provided more options for the sustainable development of civil engineering construction. For example, the use of lightweight composite materials in construction materials cannot only guarantee the quality of engineering projects, but also save earth and rock materials by reducing the load-bearing pressure. For example: in the use of new energy, the use of solar energy instead of electricity in the full use of engineering design, for lighting, power, security and other systems to provide a continuous stream of energy. The rational use of resources includes the conservation of existing resources and the development of new energy resources. The active exploration of related technologies will greatly benefit the green and sustainable development of civil engineering[4].

#### **4.4. Improving Technical Water Quality for Construction Management**

First of all, it is an important measure to control the construction schedule and construction quality in real time to avoid material waste due to engineering quality problems. Construction technicians should make full use of various high-tech means derived from modern science to enhance the monitoring of engineering quality. Once the factors that may affect the quality of the project are found, it is necessary to deal with them in time to prevent the accumulation effect from causing major safety accidents. Second, perfect construction management system is the premise to ensure that the project can advance in the direction of green and sustainable construction. On the one hand, the relevant government departments should carry out the supervision and management of enterprises, and put an end to the emergence of bad ideas and improper behavior from the level of enterprise leadership. On the other hand, the whole stage of civil engineering construction needs all departments to communicate and cooperate well, therefore, the unit should establish and perfect the green and sustainable development construction system in order to restrain the personnel behavior standard, and fundamentally guarantee the guiding ideology to the grass roots.

#### **5. Conclusion**

To sum up, this paper puts forward some ideas to realize the sustainable development strategy of civil engineering from the aspects of deepening development concept, rational utilization of resources and improving construction management, with a view to providing reference for the industry.

#### **References**

- [1] Zhang, Zhenchuan. Study on Sustainable Development Strategy of Civil Engineering. *Sichuan Cement*, no. 10, pp. 251-252, 2019.
- [2] Choi, Ning. Sustainable development strategy in civil engineering. *Building Materials and Decoration*, no. 01, pp. 35, 2018.
- [3] Cui, Yulei. A Preliminary Study on Sustainable Development Strategy of Civil Engineering. *Housing and Real Estate*, no. 19, pp. 161, 2015.
- [4] Ban, Zhao. Research and Discussion on Sustainable Development Strategy of Civil Engineering. *Brand* (second half month), no. 01, pp. 18, 2015.