

## *Original Paper*

# An Introduction to Civil Engineering Construction Technology in Civil Engineering Construction

Jiarui Luo<sup>1</sup>

<sup>1</sup> Xihua University, Chengdu, Sichuan, 610039, China

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### **Abstract**

*The commercial demand and urbanization demand brought about by economic development have increased the quantity and quality requirements of construction projects. Civil engineering in the construction process needs to be supported by a number of technologies, such as foundation technology, steel structure technology, concrete technology, etc., the only way to promote the sustainable development of China's construction industry is to accurately master these technologies. With the continuous improvement of China's economic development, people's living standards have also been improved, and therefore also more aspiring to a better life experience, so for the living environment and conditions put forward higher requirements. As the main place for people to live and reside, the quality of the building and its environment have a greater impact on people's living experience, so the quality of the building is given more attention. As the main participant in the implementation of the building, the construction industry in the construction of housing, it is necessary to pay more attention to the quality, while ensuring the quality of construction, but also need to pay attention to the economic benefits. Along with the rapid development of the country, the scale of urban infrastructure is getting bigger and bigger. The breakthrough and innovation of construction technology in civil engineering construction can not only bring more profits for construction enterprises, but also provide a strong guarantee for the smooth progress of construction projects. In order to realize the quality of civil engineering construction projects, building construction units need to be careful and detailed planning for construction details, standardize the corresponding construction technology. Therefore, this paper discusses the construction technology related to civil engineering construction projects, analyzes the relevant problems and puts forward innovative solutions.*

### **Keywords**

*Civil engineering, Building construction technology, Innovation, Building quality*

## 1. Introduction

Building construction is an important work to carry out urban construction, an important way to maintain urban development, civil engineering construction is an important part of building construction, and plays a leading role in it. With the acceleration of the urbanization construction process, people for the construction industry to give greater awareness and attention, not only pay attention to the surface of the construction technology but also pay attention to its construction technology and the theory of the corresponding points (Li, 2024). Therefore, in order to better promote the development of civil engineering construction, so that the corresponding technology can play a greater role in the construction project, it is necessary to study and analyze the corresponding countermeasures, so as to innovatively promote the development of construction engineering. The construction technology of civil engineering directly affects the quality of the project. Construction enterprises should combine the characteristics of construction, according to the requirements of engineering construction, correctly and reasonably use construction technology to ensure the safe operation of construction. Therefore, in China's construction project, the construction unit should fully recognize the importance of technological innovation for the sustainable development of the construction unit, and provide more technical support for the construction unit in order to achieve the purpose of sustainable development of the construction unit. A deep understanding of the importance of construction technology control, and then can effectively promote the efficiency and quality improvement of civil engineering construction technology.

## 2. The Value of Civil Engineering Construction Technology

Accompanied by the vigorous progress of science and technology, urbanization and construction of rapid progress, to a certain extent, to promote the development of civil construction industry. In order to make the overall quality of civil construction and professional construction has been effectively enhanced, construction companies in the construction process need to rationalize the construction, the existing information to be used scientifically, and according to the current engineering construction quality and acceptance system standards for the construction of the planning, management, implementation. Today, with the continuous expansion of the scale of construction projects, the level of construction technology also plays a role that should not be underestimated, in order to improve the quality of construction projects, it is necessary to combine with the actual characteristics of building construction, the provisions of the construction technology standards used, and improve the construction management. Civil engineering building construction technology is the current dominant construction engineering construction. On the basis of traditional construction technology, constantly summarize and optimize, make up for the shortcomings of traditional construction technology, help the innovative technology is more scientific as well as reasonable, for the construction engineering construction is prone to quality problems in the construction technology research, to ensure that the construction technology can be better innovation and application.

### 3. The Characteristics of Civil Engineering Construction Technology

#### 3.1 Diversity

According to the engineering reality, due to the special nature of the construction project, its construction technology is equally diverse. It includes mobility and fixity; fixity, mainly refers to the whole project in a fixed location, in addition to building construction belongs to fixed construction technology, relatively stable. For example: steel structure construction, concrete construction and so on in the construction project. And mobility, is that in the construction process of construction personnel mobility is relatively large, according to the construction workers in the project, with the nature of construction parts and construction technology, the need to carry out large-scale work surface construction, so as to protect the quality of the project.

#### 3.2 Integrity

Construction engineering is to build a house for laymen, but in the spirit of the industry, it is a comprehensive overall project. It is divided from the building division, including foundation construction, main construction, construction of secondary institutions. From the construction division, including concrete construction, template construction, reinforcing steel construction, etc.; from the above it is easy to see, civil engineering construction technology is a multi-faceted integrated project, these projects need to construction workers according to the actual construction of the steps to unify the completion of the project, so as to form a whole project. Therefore, civil engineering construction technology has its integrity.

### 4. Traditional

Engineering construction, due to some construction environment and the limitations of the scientific level, the construction process is still based on drawings, technology, specifications for construction operations, in a sense belongs to the more traditional. Construction workers in the process, belong to a set pattern. This is the traditional characteristics of construction technology.

Third, the problems in civil engineering building construction

#### 4.1 *There is a Gap between the Theoretical Study of Construction Technology and Actual Construction*

Civil engineering in the construction, often need multiple disciplines and specialties to cooperate, such as water and electricity, drafting and other professional matching. However, in the actual construction, some designers often lack of knowledge of other professions and disciplines, their theoretical knowledge and building construction site there is a cognitive gap, coupled with the lack of knowledge of other disciplines, so that the lack of innovation in the process of carrying out building construction. For example, in the analysis of building space utilization, some designers do not have enough knowledge of nonlinear analysis, feedback analysis and optimal control, and there are limitations in the above knowledge areas. In particular, the combination of basic theoretical understanding and applied theoretical research is poor, and it is difficult to be comprehensively promoted in the application of actual engineering, thus limiting the innovative development in the actual construction engineering.

#### *4.2 Acceptance Standards and Norms Have a Large Lack*

In civil engineering, a single field of knowledge is difficult to realize the construction of high-quality construction projects for the purpose of building, so in the actual construction process needs to be open-minded to pave the way. However, often due to the lack of construction control concepts and thinking, so that the construction thinking is more limited, for some building construction standards are not clearly defined. Even in some areas of the existence of some conventional standards, but in the practical application of promotion is still difficult to unify. At the same time for construction projects, construction standards are often related to long-term development and operability and other aspects of the problem, especially in the acceptance of the project, for construction projects, the lack of unified acceptance criteria is serious, often difficult to learn from each other between different projects, in time for the existence of construction control concepts, but also due to the lack of comprehensive promotion and difficult to implement, so it is easy to lead to decision-making errors.

#### *4.3 The Confusion of the Management System*

In the civil engineering construction projects, often require a number of professional and departmental co-operation, so in the specific distribution of work there are a number of departments co-management of the problem, the above cross-cutting management is most likely to lead to the division of responsibility is not clear. Many managers do not understand their own responsibilities, the implementation of the main body of work is not in place, so in the actual construction control is not enough to pay attention to the timely existence of the problem is also difficult to find. For those mega-projects there is not enough forward-looking research, the actual refinement of the project is not enough consideration. At the same time in the construction side of the construction, its control is difficult to accurately grasp, especially in the application of raw materials, often prone to jerry-built and other mistakes, in the actual management of the lack of responsibility, the right to unity and coordination.

### **5. Technological Innovation Strategy for Civil Engineering Construction**

#### *5.1 Improve the Concept of Innovation*

Reflect the value of technological innovation. Civil engineering enterprises should pay attention to the innovation of technical concepts, and implement technology in accordance with the principle of high efficiency and simplicity. In civil engineering management activities, the construction unit should change the inherent thinking of the staff, carry out ideological education activities, based on the needs of engineering technology innovation, and design technology suitable for the project. 2.2 Innovative project management to improve resource utilization. The construction project management process should also focus on innovation. Through innovative management, improve the utilization rate of resources, transform management advantages into development advantages, transform development advantages into technical advantages, and realize the innovative development of construction technology. Civil engineering building construction is comprehensive and complex, and the

construction involves a wide range of issues including construction site layout, material deployment, construction personnel arrangements and many other issues. Innovative civil engineering construction management is conducive to greatly reduce the occurrence of management problems, optimize the allocation of resources, and improve the efficiency of the use of various resources such as human, material and financial resources. For example, innovative talent management. The use of specialized personnel post mechanism, to avoid the phenomenon of one post more than one person. Many people a post to reduce the construction efficiency, job specific duties are difficult to clarify, easy to lead to each other to shirk their responsibilities, the formation of a bad work ethic.

### *5.2 Construction Process*

According to the number and standard of existing 2D drawings, technicians can create and develop according to the plan, while professionals can create a database to create 3D drawings. BIM technology, as a stand-alone management software, allows for direct data modeling to incorporate color into the 3D building, thus providing a comprehensive analysis of the dialysis model and design. The structure and detailed parameters of the building will be fully demonstrated in the program. Currently, a large amount of data or information is generated during the construction of a building. There are thousands of images with different structural characteristics, each link constructed in an independent mode. When there is an error in a specific project, the unknown construction process of other construction contractors can cause serious construction damage, thus affecting the technical construction project. Using the basic design model as a reference, BIM technology is integrated into various design information system programs, and the parameters of each design unit are executed according to the information data provided by the design model. BIM technology can compare the data generated by different design connections in real time to ensure the quality of the entire project design. During the actual construction process, BIM technology can provide data standards related to the construction project. Costs must be strictly controlled according to the characteristics of each operation in the construction process. Civil engineering and quality control to improve construction efficiency.

### *5.3 Improve the Construction Technology Innovation Mechanism*

If the overall construction process is to be improved, the problems in construction need to be improved. Establish a specialized, high-quality construction team, combined with the characteristics of the development of construction enterprises, improve the construction technology innovation mechanism, give full play to the advantages of the enterprise, and enhance the competitiveness of the enterprise market. Under the development of the new era, all walks of life have been updated faster, and civil engineering construction technology is no exception. However, the comprehensive quality level of personnel within the construction enterprise can not well adapt to the development of construction technology. The further innovation of construction technology and the development of enterprises are constrained. Construction enterprises should pay attention to the introduction of various types of construction industry professionals, train the existing staff of the enterprise in professional skills, invite or hire industry experts to give lectures, improve professional competence, and promote the innovation

of construction technology. Construction enterprises can establish a corresponding reward system. Employees with poor work attitude and few work results will be reminded and urged to make corrections. In serious cases, penalties will be imposed. For employees with serious work attitude and excellent performance, material and spiritual encouragement will be given. When carrying out construction technology innovation, building construction enterprises must give full consideration to the climatic conditions of the construction site, soil conditions, water conditions, comprehensive factors that may affect the construction and the environmental hazards that the construction may bring, and give comprehensive consideration to the environmental protection of the construction technology and reduce the number of construction teams. Adverse effects on the environment. During the construction process, strengthen the supervision of the construction site, implement the construction process and ensure the quality of construction.

#### *5.4 Strengthening the Wind Control System*

Before the project was launched, relevant risk points were carefully studied and relevant management norms and plans were formulated. Through the establishment of a perfect risk control system, constantly optimizing the rich management mechanism, the organization and management process further ensures the timeliness and systematicity of control. In the formation of the management team of the project department and the selection of each team, the public insurance management database is utilized to form the team on the basis of merit, so as to minimize the risk. In response to the management loopholes appearing at the site, timely organization of meetings to carry out criticism and self-criticism, identify the root causes of the problems, and actively resolve the organizational and management risks. Strengthening the control and deployment of on-site costs and project funds can effectively prevent the problem of uncontrolled costs, and ensure both the construction progress and the quality of project construction fully.

## **6. The Necessity of Civil Engineering Building Construction Technology Innovation**

Carry out building construction, the whole process will involve civil engineering building construction technology, in the above complex environment, there are a variety of environmental and factor constraints, so there is a need to carry out the work of innovation so as to improve the construction progress of the guidance and enhancement of the role.

### *6.1 Innovation Helps to Promote the Development of the Construction Industry*

Regardless of the industry, innovation is an important factor that can help the development of the industry, for the construction project, in order to enhance the economic benefits it is necessary to innovate, thereby promoting high-quality development. Civil engineering to achieve high-quality development, you need to realize technological innovation, and foreign civil engineering construction technology compared to China's construction technology still exists a big gap, especially in the innovative thinking is a huge gap. For civil engineering, if you want to achieve high-quality development needs to be realized in the technical development of innovation, through the development

of technology, to achieve growth in economic benefits. Only in technology to achieve innovation, in order to achieve results in the quality of construction projects, in order to promote the sustainable development of construction projects.

### *6.2 Is Conducive to Enterprises to Improve Their Competitiveness*

In recent years, the civil engineering construction industry to achieve rapid development, but in the civil engineering construction industry still exists within the greater competitiveness. Therefore, in the current market, in the face of such fierce market competition, it is necessary to use some methods to improve their own strength, so as to occupy a certain market position in the economic market. In order to improve the competitive strength of construction enterprises, must be through the technical means of innovation and technical concepts of the amount of innovation to improve the strength of the enterprise itself, and under the conditions of the introduction of external advanced machinery and equipment, so as to better cope with the current competition elimination system, thereby promoting the benign development of civil engineering building construction.

### *6.3 Help Enterprises Realize Cost Control*

Construction enterprises in the realization of civil engineering construction projects, the need to cooperate with a number of disciplines, thus requiring the collection and statistical analysis of information on a number of engineering aspects. In the actual building construction, for the management also need to give attention, so it is necessary to introduce some management software, so as to analyze the data of the project, in the analysis of the above data on the basis of the realization of management innovation, and ultimately realize the enhancement of the cost efficiency, for the accuracy can also get a wide range of enhancement, for the cost of the factors affecting the cost can be accurately predicted, so as to realize the construction cost control.

## **7. Conclusion**

In conclusion, in urban construction, it is necessary to comprehensively analyze the construction technology and combine design and construction to ensure the rationality of the building construction technology and the safety and high-quality development of the building. With the development of China's society and economic progress, the requirements of civil engineering building construction technology are also increasing, and the innovation ability of construction technology has an important role in improving the quality of construction of building projects. Therefore, in the actual construction of the project needs to accumulate experience, analyze the shortcomings of the traditional technology, and constantly innovate the application of construction technology, so as to better optimize and improve the construction technology. Thus effectively enhance the innovation ability of civil engineering construction, construction quality, construction safety and construction efficiency for comprehensive protection. Civil engineering construction technology for engineering construction is more complex, so for the technology of the higher requirements, only with a high technical construction ability to realize the safety of civil engineering construction of high quality objectives.

And the face of the current complex economic market form, to obtain a larger market competitiveness, must be in the current form of the relevant building construction technology innovation, improve the progress of building construction enterprises in the construction, so as to obtain economic benefits for the building construction enterprises.

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