

# Application of Concrete Structure Construction Technology in Civil Engineering

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**Abstract:** In civil engineering, the construction quality requirements of civil construction projects are getting higher and higher. There are still problems with uneven surface or unreasonable structural design in existing construction projects. Therefore, the article chooses concrete structure templates according to the construction type and characteristics. The system uses direct and indirect methods for formwork installation and concrete pouring, so as to complete the application of concrete structure construction technology in civil engineering construction. The experiment proves that this method has higher construction accuracy and better construction effect.

**Keywords:** Concrete structure; Civil engineering; Construction technology; Construction engineering

## 1. Introduction

In civil construction engineering, with the continuous improvement of its construction quality requirements, the requirements are not only limited to cost performance, but also put forward higher requirements for its beauty<sup>[1]</sup>. But in the past civil engineering, there are often defects such as uneven surface and unreasonable structure design, which affect the overall beauty of the building<sup>[2]</sup>. Based on this, the concrete structure construction technology should come into being, through this technology, it can play a certain auxiliary role for the improvement of engineering quality, and improve the building surface smoothness, which can meet the practical needs of the aesthetic degree in civil engineering<sup>[3-4]</sup>. Therefore, this paper takes the technology as the core and applies it in civil engineering.

## 2. Construction method of civil engineering based on concrete structure construction technology

### 2.1. Selection of formwork system based on concrete structure construction technology

Through the reasonable selection of the formwork system of concrete structure, the quality of the construction project can be greatly improved. Therefore, before the construction of civil construction, the model of formwork system should be selected based on the actual type and structural characteristics of the construction<sup>[5]</sup>. First, based on the construction technology of concrete structure, when selecting the shear wall structure of civil construction engineering, the steel concrete formwork system should be selected. Secondly, the construction type and size of concrete structure are defined. For example, for shear wall structure, large steel formwork structure should be selected when selecting formwork; for beam structure, bamboo plywood system template should be selected because of its large size and specification changes. Thirdly, in the process of actual construction, the formwork system should be selected according to the actual engineering quality requirements of civil construction contractors, and the suitable concrete structure construction formwork system should be selected according to the parameters in the standard requirements<sup>[6]</sup>. Finally, when choosing the formwork system, we should also take into account the expected design effect and artistic style of civil construction designers, so as to provide reliable guarantee for the subsequent construction.

### 2.2. Formwork installation and concrete pouring

According to the above different construction requirements and concrete structure, after the selection of the formwork system is completed, the formwork system is installed and the concrete pouring is completed. In the installation process, in order to ensure the overall quality of civil engineering, it is also necessary to strictly control the allowable deviation<sup>[7]</sup>. Table 1 is the

corresponding table of allowable deviation of formwork installation taking a specific civil construction project as an example.

Table 1 Corresponding table of allowable deviation of formwork installation

Structure name	Allowable deviation range	
	For decoration	Common use
Building cross section	±1.2mm	±2.5 mm
Building axis	±1.5 mm	±2.6 mm
Building elevation	±1.8 mm	±2.0 mm
Building flatness	±2.0 mm	±1.5 mm
Reserved hole space	2.2 mm	±1.2 mm

In the process of measuring the allowable deviation of formwork installation, direct method and indirect method can be used. In order to ensure the quality of civil engineering, level or stay wire can be selected. After confirming that the deviation after the formwork installation is within the allowable range, the concrete material shall be poured. In the pouring site, most of the construction personnel and management personnel pursue faster construction progress, but ignore the vibration effect in the process of concrete pouring<sup>[8]</sup>. Therefore, in the process of pouring, the pouring materials should be fully mixed and vibrated before the construction can be started. At the same time, the maintenance period should be strictly planned, so as to improve the final setting quality of concrete, and further improve the construction quality of civil engineering.

### 3. Contrast experiment

Based on the above discussion, this paper completes the design of civil engineering construction method based on concrete structure construction technology. In order to further verify its practical application effect, this paper carries out the following comparative experiments:

Select a civil engineering project in a construction enterprise as the experimental object, respectively use the proposed construction method and traditional construction method to carry out the actual construction of the project, record the construction error of different structures after the two construction methods, and take it as the experimental comparison index, verify the two construction methods, and record the experimental results as shown in Table 2.

Table 2 Comparison of experimental results of two construction methods

Structure name	The error of this method	Error of traditional method
Building cross section	0.18mm	1.26 mm
Building axis	0.16 mm	2.15 mm
Building elevation	0.15 mm	3.35 mm
Building flatness	0.26 mm	2.69 mm
Reserved hole space	0.52 mm	5.23 mm

From the experimental results in Table 2, it can be seen that the error of the civil engineering construction method based on concrete structure construction technology proposed in this paper is smaller, which proves that the construction method in this paper has higher construction accuracy and better construction quality.

### 4. Conclusion

In this paper, through the application research of concrete structure construction technology in civil construction engineering, a new construction method is proposed and applied to practice, which proves that this method can effectively improve the construction quality of civil construction engineering.

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