

# Exploration of the Key Technical Control Points and Quality Control Ideas of High-rise Buildings

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## Abstract

With the rapid development of social economy and the continuous deepening of urbanization construction, the society has entered a new stage of development, which has also played a good role in promoting the development of the construction industry. From the perspective of the actual situation, the current high-rise buildings, both in terms of continuous improvement, show a state of quantity, but the overall height of high-rise buildings, although the reasonable use of space, but also further improve the overall difficulty of construction.

## Keywords

High-rise building; construction technology; key control points; quality control measures

## Introduction

As the number of high-rise building projects continues to increase, major engineering companies have accumulated more work experience in the actual work process and have become more mature in technology and structural construction. The unique structural characteristics require that in the subsequent construction phase, in addition to following the basic technical points, all-round quality control should be carried out to significantly reduce the probability of various quality problems.

## 1. Basic characteristics of high-rise building construction

### 1.1 High requirements for foundation construction

Among high-rise buildings of different levels, there are significant differences in the depth of pile foundations. The speed of some buildings is relatively high, which also makes the depth of the foundation exceed 20m, and the specific types of high-rise buildings It is not the same. In order to steadily improve the stability of the structure, the more excellent box-type foundations are generally used. If the construction is carried out on unweathered or slightly weathered rocks, strip foundations must be used. In most podiums on the ground floor connected to high-rise buildings, separate pile foundations plus foundation beams or cross-beam foundations are used in most cases. Therefore, in the subsequent construction stages, since the pile foundations are not the same, the construction techniques used are also different.

### 1.2 High construction technology requirements

Among high-rise building projects, there are significant differences between them and general engineering projects. After determination, targeted project construction technology and construction system should be adopted, which requires focusing on structural materials, construction technology and Basic technical requirements such as structural type to achieve comprehensive optimization of construction technology and construction process. In addition, during

the specific construction process of high-rise building projects, we must focus on ensuring the construction quality and providing relatively excellent building materials. Only in this way can we ensure that all major aspects of high-rise building construction can be performed as expected. carry out according to the requirements and promote the steady improvement of overall project quality and efficiency.

### **1.3 Construction equipment requirements are high**

In any high-rise building project, the mechanical equipment used in the actual construction process is mainly heavy machinery. The required mechanical equipment should be selected based on a full consideration of various factors such as the project schedule, construction process and construction technology. In recent years, the equipment required for the construction of high-rise building projects is mainly construction cranes and concrete transport pumps, while the equipment used in foundation projects is pile drivers and pile drivers [1].

## **2. Key points of control in high-rise building construction technology**

### **2.1 Pile foundation construction technology**

First of all, for the bored pile construction technology, in the actual application stage of bored pile construction technology, the main application method should be optimized in combination with the actual situation of the project, and the necessary leveling of the land at the construction site should be carried out during construction. After the pile hole is set, the subsequent transportation method of the coating should be comprehensively considered, so that the safety of the concrete can be more comprehensively controlled. After the hole is completed, the specific situation of the hole should be checked to ensure that its quality can meet the basic needs of high-rise building construction.

If various mechanical equipment is used when drilling holes, necessary management work should be done on the construction site for drainage and other facilities; the second is precast pile construction technology, which can be divided into two types: concrete piles and steel piles during application. During the construction of the project, these two types of precast piles must adopt corresponding pile sinking measures when sinking piles. This requires the selection of corresponding construction technologies based on the actual situation of high-rise building projects, such as vibration pile sinking and hammer driving. These two methods can be used to stably control the deformation of the foundation and the ground surface around the operation, and gradually reduce the impact of various quality problems.

### **2.2 Concrete construction technology**

Concrete construction technology plays a very important role in the construction process of the overall high-rise building project. At the same time, the construction quality and efficiency of concrete will also have an adverse effect on the subsequent completion quality, which requires the scientific and reasonable use of concrete construction technology. Before the construction of high-rise building projects, relevant staff should enter the construction site in time for a comprehensive inspection to determine the specific amount of cement and other materials, so that the subsequent concrete configuration has higher strength and steadily improves the overall quality of the building. From the perspective of actual conditions, the technical points involved in the actual process of using concrete construction technology are mainly the following: First, the application of ingredients should be designed in full accordance with the basic needs of the project; second, during construction, the pouring construction technology of the oil workers should be systematically analyzed, and supervision and management should be carried out in accordance with the construction needs of the project; finally, necessary maintenance work should be done for concrete materials. After the concrete is poured, in order to avoid adverse effects on the quality of the concrete, targeted maintenance work should be done to ensure that the stability of the concrete structure can be comprehensively improved. When curing the concrete, the temperature of the concrete must also be controlled. If the concrete is cured in summer, water should be sprinkled on the concrete surface to prevent shrinkage cracks caused by excessive temperature. If the curing work is carried out in winter, straw mats should be laid on the surface of the concrete to reduce the probability of concrete freezing [2].

### **2.3 Comprehensive pipeline balancing technology**

Among the construction technologies used in high-rise buildings, comprehensive pipeline balancing technology plays a very important role. The staff at the construction site should clarify the specific contents of the design drawings,

and use this as a basis to scientifically and reasonably arrange various pipelines to achieve efficient installation of various pipelines. At the same time, try to avoid installing pipelines in the central parts of those buildings to ensure that there is more sufficient space to install corresponding lamps in the subsequent work process.

When constructing the building's vents, lamps and other parts, it is necessary to pull wires around the building's corridors to ensure that the final installation position can maintain a straight line with the equipment. In the subsequent installation of fan coil units, it should be ensured that the specific installation position can be close to the floor slab, so that the slope of the condensate water pipe can meet the design requirements, greatly reducing the probability of subsequent overflow of the water collection pan and other problems.

### **3. Quality control measures for high-rise building construction technology**

#### **3.1 Ensure the overall quality of building materials**

During the construction phase of a high-rise building project, the quality of the construction materials used internally will have a serious impact on the overall process of the project construction. Therefore, the project must carry out comprehensive management and control of the quality of the materials during the construction process. When selecting construction materials, relevant regulations must also be followed so that they can better match the design requirements. In the subsequent management of project materials, a more professional management department should be established to carry out more efficient acceptance of various types of construction materials used, ensuring that all major staff can follow the work specifications and prevent materials that do not meet the quality standards from entering the construction site.

At the same time, it is also necessary to ensure that the various types of building materials used can meet the construction needs. Only in this way can the subsequent construction work be carried out to ensure that the overall quality of the project can be steadily improved. It is necessary to achieve stable control of the construction process during the construction process to ensure that the project can operate more stably. The managers and staff involved must also follow the industry's rules and regulations during the construction process and find the basic points of the work in the subsequent quality supervision and management process. In this way, various problems can be fundamentally solved. In the process of construction management, the more important work content within the project should be comprehensively managed, especially those work contents that are prone to risks. It is necessary to increase the level of attention and take targeted measures to control them in a timely manner [3].

#### **3.2 Optimize the specific construction plan of the construction project**

Regardless of the type of engineering project, it needs a better construction plan to provide support in the subsequent implementation process. Only in this way can the subsequent construction of the project be more stable. The managers and technicians involved in the project should also fully improve their understanding of the content of the drawings. Based on the basic content of the project, they should optimize the various technical means used in the subsequent construction. This will also help the subsequent work departments to better play their actual role in the process of professional regulation and guidance. At the same time, the specific details of the project construction should be clarified, so that the construction plan used can be improved on the basis of continuously improving the content of the construction organization design, thereby promoting the overall improvement of the overall management level. The safety construction of the internal foundation pit support of high-rise buildings should also be gradually strengthened, which is also the basic content of the construction of high-rise building projects.

First of all, the support management method to be adopted should be determined according to the actual situation of the construction site, and based on this, the design of the scaffolding should be comprehensively optimized so that all staff members can have higher stability and safety in the subsequent work stages. When carrying out management work, the construction quality of each major work link should also be stably controlled to promote the improvement of overall quality [4].

### **4. Conclusion**

In summary, in the current social environment, in order to achieve efficient use of various land resources, high-rise buildings have become the main building type in the current development of the construction field. This requires further improvement of the level of attention paid to construction technology, and timely improvement of quality

control measures, which should be carried out throughout the entire process of construction. At the same time, it is also necessary to fully combine the specific conditions of the building and take corresponding management and construction measures to ensure that the overall construction efficiency and quality level of the project can be steadily improved.

## References

- [1] Dong Yinghong. Key technical points and quality control of high-rise building construction[J]. Brick and Tile, 2022(03):165-167.
- [2] Dai Suhan, Huang Chuangcheng, Wang Fahong. Key technical points and quality control of high-rise building construction[J]. China Housing Facilities, 2021(12):123-124.
- [3] Zhang Chaozong. Key technical points and quality control of high-rise building construction[J]. China Building Decoration, 2021(11):64-65.
- [4] Chen Liangming. Key technical points and quality control of high-rise building construction[J]. Green and Environmentally Friendly Building Materials, 2021(08):116-117.