

## Key points of pile foundation technology in civil engineering construction

Zhang Lili

School of Civil Engineering, Jinan Engineering Vocational Technical College, Jinan, Shandong, 50014, China

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**Abstract:** With the changes of the times, the construction industry has become a supporting industry in China's economic market and plays an important role in promoting China's economic growth. Pile foundation technology is an important technology in the civil construction of construction projects. The application of this technology is a sign of the development of the construction industry. The application level of pile foundation technology in civil engineering construction process directly affects the quality of civil construction, can effectively improve the bearing capacity of building foundation, can effectively prevent and control the deformation of building foundation, and improve the earthquake resistance of the overall construction project. The decompression function, which to some extent effectively improves the safety and stability of construction projects, can create a good living environment for people.[1-2]

### 1. Introduction

Along with the rapid development of China's scientific information technology, many new construction technologies have been developed and widely used in the construction of construction projects. Pile foundation technology is a very important technology in the construction process of construction projects, and has a good application effect. The application of this technology can effectively improve the overall bearing performance and seismic performance of construction projects. The most important thing is to upgrade the project. The safety and stability of the building show that the application of this technology has been deeply optimized and improved. In addition, compared with other construction engineering techniques, pile foundation construction technology has certain advantages, the pile foundation construction steps are relatively simple, and it has good economics, which can obtain higher economic benefits for the construction unit.

### 2. Pile foundation technology connotation

#### 2.1 Pile foundation technology concept

Pile foundation technology has a good application effect in the construction process of construction engineering, which can effectively improve the bearing performance, seismic performance, stability and safety of the overall construction project. The pile foundation is composed of several parts, mainly consisting of pile foundation and some connecting parts. There are two main types of pile foundations, namely low pile pile foundation and high pile pile foundation. Firstly, the low-seat pile foundation refers to the entire pile body buried in the ground, and the bottom of the pile platform is in contact with the ground; the high-seat pile foundation refers to the upper part of the pile column exposed to the ground, and the bottom of the pile platform is at the bottom of the pile. Upper ground. At this stage, pile foundation technology is widely used in the construction of high-rise building projects, especially in some buildings with poor quality and shallow foundations. By applying the pile foundation technology in the construction process of the construction project, the durability and strength of the foundation of the construction project can be effectively improved to a certain extent, thereby prolonging the service life of the construction project and making it more economical when put into use. And social benefits.[3]

#### 2.2 Analysis of the meaning and role of pile foundation technology

During the actual construction and construction of the construction project, the rock stress always

changes to a certain extent at the construction site. At the same time, the lower part of the basement of the construction project is likely to be affected by the building load, resulting in a lower base. Large deformation phenomenon. Pile foundation technology is one of the important types in basic technology, and it is widely used in the process of modern construction engineering construction, and has a good application effect. In the process of construction engineering construction, the application of pile foundation technology can effectively improve the bearing capacity and balance performance of the building foundation to a certain extent, and also has the functional effect of suppressing the deep subsidence of the foundation. Compared with other technologies, pile foundation technology has strong adaptability. This technology can be applied in harsh geological environment and construction conditions, and can exert good results. In the process of civil engineering construction, the geotechnical layer has good bearing capacity. The effective application of pile foundation technology can effectively concentrate most of the pressure on the rock layer, thus improving the bearing capacity of the building foundation. Reduce the probability of serious safety accidents such as subsidence or collapse.

### **2.3 Analysis of application conditions of pile foundation technology**

Pile foundation technology has a good application effect in the process of civil engineering construction. Due to the relatively large scale of construction engineering, the engineering field involved in pile foundation technology is also relatively large, so it requires a large amount of capital investment. In order to effectively improve and exert the effectiveness of pile foundation technology in construction engineering, the application of pile foundation technology needs to meet the following conditions: First, pile foundation technology can effectively improve the overall performance of the building foundation. The technology is usually applied to construction projects with very high requirements on the quality of foundation construction; the second point is that in the higher-rise and relatively small-scale construction projects, compared with other common technologies, the pile foundation technology is more suitable for this type of engineering project; the third point, in the engineering project with strict special requirements for the construction site, the pile foundation technology can be used; the fourth point, because the pile foundation technology can effectively improve the seismic performance of the building And stability, so this technology can be applied in the construction process of seismic area construction.[4]

## **3. Technical points analysis of pile foundation for civil engineering construction**

### **3.1 Preparation of pile foundation technology before construction**

Fully and comprehensively preparing for the construction of the pile foundation of the construction project can effectively ensure the smooth development and stable implementation of the pile foundation technology construction, and ensure the stable and orderly construction process. First of all, in the preparation stage of pile foundation technology construction, the construction unit should first organize the corresponding survey personnel and design personnel to conduct in-depth investigations on the construction site and the hydrogeological conditions around the construction site, and fully construct the construction. Investigate and analyze the soil, water system and rock formation on site, and predict the unfavorable environmental conditions and interference factors in light of the actual conditions of the project. It is necessary to fully implement the corresponding preventive measures, according to the actual conditions of the pile foundation construction and related The construction requires an in-depth analysis of the properties of the soil layer, especially the strength and bearing performance index of the soil layer, which can effectively improve the safety of the pile foundation construction and reduce the occurrence of serious safety accidents such as collapse and collapse. Secondly, it is necessary to do a good job in the construction plan and drawing design of the construction project. The construction plan and drawings are the guiding documents for the construction of the pile foundation technology, which will directly affect the overall quality of the construction project. Only the design plans and drawings of the construction project have been approved by all parties and fully completed the technical work, and the foundation technology

construction can also be carried out. First of all, the construction plan and drawing design personnel should negotiate and communicate with the parties involved in the project construction, and build a good and long-term communication and communication mechanism with the construction team, and be good at listening to their opinions on the construction of the project, mainly because of the construction. The team is a direct participant in the construction of the project, they can easily find problems in the construction of the project. The designer should continuously optimize and perfect the construction drawings and the overall design plan, and be good at discovering the problems that are still good and unscientific. By participating in the friendly communication and negotiation of all parties involved in the project construction, the defects and deficiencies of the joint efforts can be realized. In this way, it is possible to effectively prevent and respond to problems such as safety risks and quality damage of engineering construction. In addition, in the preparation stage of construction project pile foundation construction, it is necessary to scientifically and scientifically determine the weight and height index of each pile according to the actual needs of the project construction, and fully carry out the planning work of pile foundation construction. Scientific and reasonable management and control of the load of the pile can effectively avoid the occurrence of safety hazards.[5-7]

### **3.2 Pouring pile construction technology**

Cast-in-situ pile construction technology is an important construction technology in pile foundation construction. It is an important technical method for pile foundation construction. It has a good application effect in the process of civil engineering construction and plays an important role in improving the quality of engineering construction. There are usually two types of working methods for pouring pile construction technology, namely drilling and digging holes. In special cases, immersed pipes are also used for injection pile construction. Only when the work of the pouring pile construction preparation stage is fully completed can the construction of the pouring piles be effectively carried out smoothly and stably. First of all, in the preparation stage of the construction of the bored pile, the material of the main structure should be strictly carried out in accordance with the relevant procedures to carry out the corresponding quality inspection and evaluation work to ensure that the used material of the pile material can meet the requirements of the project construction, according to the pile structure The important indicators such as the hardness of the material are scientifically and reasonably set and planned. In addition to the quality inspection of the pile structure materials, it is also necessary to carry out the relevant quality and performance testing of the mixed concrete materials used in the backfill construction work, and never allow the construction materials whose quality is not up to standard to be applied to the construction of the bored piles. . Different construction techniques have different effects in the process of engineering construction. In the construction process of cast-in-place piles, there are also many technical options. The construction personnel must be scientific and reasonable according to the construction environment and construction. The actual requirements are scientific and reasonable selection of pouring pile operation technology, and the standard system of pouring pile operation technology is continuously optimized and improved, which can effectively improve the scientific rationality, reliability and feasibility of the selection of cast-in-situ technology, and technology Select to conduct a comprehensive evaluation, in order to avoid hidden troubles and quality diseases, it is necessary to carry out scientific and rational planning and operation procedures for important construction links such as drilling, immersed pipe burying, steel installation, and concrete material use, and then improve Construction quality of cast-in-place piles.

### **3.3 Precast pile technology**

Precast pile technology is one of the important technologies in pile foundation construction technology. When applying precast pile technology in the actual construction engineering civil construction process, it is necessary to pay attention to the following problems: point 1, the orientation of the pile tip. The orientation of the dealer under normal conditions depends on the order of piling; point 2, the order in which the precast piles are poured. Under normal conditions, casting is usually started from the top, which can effectively guarantee the quality of the pouring construction.

Precast pile construction mainly includes two types of working methods: static pile and vibration pile. In the actual construction process, manual excavation is often used, which can effectively achieve the pile hitting to the standard position. This manual digging method has strong adaptability and can minimize the adverse effects of pile foundation construction on the surrounding environment. Can reduce energy consumption. At this stage, in response to China's sustainable development strategy, many companies have applied manual digging construction technology to the construction of civil pile foundations. In addition, in the process of civil foundation pile construction, manual digging construction is adopted. It is necessary to fully perform safety precautions and implement the corresponding construction safety management system and planning into the actual construction of the project. To strengthen the safety management of the construction site, thereby improving the safety of manual digging construction and protecting the life safety and property safety of construction workers. [8]

### 3.4 Static pile technology

In the whole stage of civil engineering construction, the surrounding environment of the construction site will be affected to a certain extent. Compared with other construction links, the construction of civil foundation piles has a greater impact on the surrounding environment of the construction site. However, the use of static pile construction technology in the construction of civil pile foundation can effectively reduce the impact on the surrounding environment of the construction site. The static pile-pushing technology mainly applies the pressure test to the precast pile, fully combining the weight of the static pressure pile machine and the pile frame, and can effectively complete the work of pressing the pre-cast pile into the soil layer. In the application of static pile technology, it is very likely to cause a certain degree of damage to the original structure of the soil layer. Try to avoid repeated it as many times as possible, and it should be completed correctly.

Conclusion: Pile foundation technology has a high use value in the civil engineering construction process, and its application level directly affects the quality of its civil construction. The application of pile foundation technology can effectively improve the bearing capacity of the building foundation, effectively realize the prevention and control of the deformation of the building foundation, and improve the seismic decompression function of the overall construction project, which effectively enhances the construction project to a certain extent. Safety and stability. In the application of civil engineering pile foundation technology in construction engineering, it is necessary to fully prepare the work before construction, and scientifically and rationally apply the construction technology of cast-in-place piles, precast pile foundation and static pile-pile technology to improve the application of foundation technology of civil engineering piles in construction engineering. Level, and thus improve the quality of civil engineering construction.

### References

- [1] Mu Wentao, Li Xiaoying. Discussion on the application of pile foundation technology in civil engineering construction [J]. Shandong Industrial Technology, 2018, 05: 95.
- [2] Li Haipeng. Technical points of pile foundation in civil engineering construction [J]. Building materials and decoration, 2018, 23:49.
- [3] Wang Pengqi. Application of pile foundation technology in civil engineering construction [J]. Green building materials, 2018, 11: 141-142.
- [4] Huang Hailin. Technical analysis of pile foundation in civil engineering construction [J]. Jushe, 2018, 31:42.
- [5] Li Zhen. Application and role analysis of pile foundation technology in civil engineering construction [J]. Chinese and foreign entrepreneurs, 2018, 26: 109-110.
- [6] You Liang. Exploration of pile foundation construction technology in civil engineering construction [J]. Building materials and decoration, 2018, 49:14-15.
- [7] Wang Ning. Discussion on the construction technology of pile foundation in building construction [J]. Heilongjiang Science and Technology Information, 2016, 07:259.
- [8] Chen Yu. Application Analysis of Pile Foundation Technology in Civil Engineering Construction Engineering [J]. Building Materials and Decoration, 2016, 18: 37-38.