Construction technology and quality control of high-rise building

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Abstract

In recent years, with the socio-economic development and speed up the process of urbanization, high-rise building construction issues attracted more and more attention. Under the current social situation, strengthening construction technology of high-rise building and quality control is extremely important practical significance. On one hand, in order to save the land on the other, can improve the people's living standards. However, the construction of high-rise buildings at present there are still many problems to be solved. Therefore, we need to deepen awareness of the key points of construction technique of high-rise building. Based on the above discussion, based on characteristics of high-rise building construction technology, construction points and quality control measures described in three ways.

Keywords

Characteristics of high-rise, building, construction, quality, control.

1 Characteristics of high-rise building construction

First of all, in construction of high-rise building with the ground can achieve relative savings. Characteristics of high-rise building with high floors, space. Because you can greatly save construction land, which for the current world population growth, per capita land for less, you can play a good improvement. Moreover, in addition to saving outside the building, high-rise building optimization of urban environment and can also play a role. City street landscape is made up of dynamic flow, flow and static structures composed of high-rise building with high, the advantages of large street-side scenery, and some high-rise buildings can become a symbol of a city [1].

It is well known that high-rise building construction is an important part of construction. Compared with other forms of construction, it has the following characteristics: first, the large quantity of high-rise building construction in engineering and high technology features. For high-rise building construction is concerned, it has a high safety requirements, it has a certain confined and wind resistance. Secondly, the great foundation of high-rise building construction [2]. Due to the large load of Foundation of high-rise building Foundation of tolerance is within a certain range of relatively safe once overload tolerance, the Foundation bearing capacity cannot meet the loads of the building. Regardless of the method of high-rise building Foundation, but should follow two principles: (1) below the ground as far as possible in the atmosphere can influence depth, (2) Foundation to coincide with the building design. In practice, the construction and the Foundation is closely linked, higher buildings, the higher on the strength of Foundation requirements. Therefore, the construction of high-rise buildings, the Foundation not only for its size and depth, in order to properly solve problems such as construction of floating resistance of structures.

2 Key points of construction technology of high-rise building

2.1 basic engineering

Foundation is an important part of the whole building, is the structure of the building Foundation and anchor, reinforced concrete high-rise buildings pursuant to the relevant provisions of the code for structure design and construction of high-rise building Foundation depth for the construction of a high degree of 1/15 about, therefore, works has become the basis prerequisite for the construction of high-rise buildings. Due to the large high-rise construction load, high requirement for ground

treatment. Therefore, in a densely built area, forms the basis of the use of piles of high-rise building Foundation

Figure 1 high building Foundation

Or pile foundation and other forms of composite Foundation composed of [3]. Many forms of infrastructure design can adapt to the superstructure should be selected when using, to meet the two basic foundation design requirements as well as technically sound infrastructure programmers. As one of the overall structure of the Foundation, its irreplaceable functions of Foundation design in addition to satisfying the superstructure and other requirements, should meet the upper structure on the basis of structural strength, stiffness and durability requirements. Forms the basis of selection is very important stage of structure design, comparison of raft Foundation on natural ground economy, should be preferred, according to the geological survey also box base, or take the form of composite Foundation of pile. Due to reasons of construction technology and methods, pile foundation construction tends to have a greater impact on the environment, such as vibrations, soil compaction effect of construction, and so on. Pile foundation construction technology is the most widely used, is a foundation of more mature forms. Among them, the development and application of construction technology of bored pile is the most extensive, it not only adapt to a variety of complex geology, construction can also be based on load level.

2.2 concrete engineering

High-rise building construction requires a lot of Earth and rock materials, particularly in pouring mass concrete and important indicator is the compressive strength of concrete, affecting the performance of the compression factor is the strength of cement and cement, reinforced concrete factory inspection and detection in concrete preparation, be sure to use the properties of concrete [4]. Strengthening construction of concrete pumping technology, ensure the project progress and quality. Construction unit should be actively developed new technology for concrete, on the premise of ensuring concrete performance, continuously update the existing technology, strengthen the optimization of materials, power lifting equipment research and development, and module development, intensive development of construction technique of dismounting, ensure that the progress in the construction of high-rise buildings.

Because of the deep foundation of high-rise building, floor space, so the selection of construction quality of concrete quality, dosage, mixing ready-mixed pump handle can be of different high pouring construction location. According to the durability of concrete with consideration, durable strength must achieve a high compression strength of concrete standards, according to the concrete construction of the different uses, for some concrete also has special requirements, such as: shrinkage-compensating concrete resistance, vibration-free performance, and so on. You should

Figure 2 concrete of high-rise building project

Concrete construction technology for concrete analysis of concrete situations, solidification condition, vibration technology, such as detailed planning of concrete construction survey and control the State of the environment, such as temperature, humidity and dry conditions on construction sites, and so on, depending on the seasonal cycles of the seasons, select the appropriate construction methods. Construction should pay attention to construction of high-rise building concrete slot reserved for the design, in accordance with the relevant specification for concrete construction. If in the construction process of concrete pouring process needs to be adjusted, the need for adjustment programmers to coordinate with builders, and programmer adjustments.

2.3 template project

High-rise building structure of higher force is more complex, verticality of the structure has a very big influence, plus equipment for high building to the verticality of the structure also has very strict requirements, so the template on high-rise building engineering systems, it is necessary to have high construction precision [5]. Due to high building construction most ladders-vertical flow, and the other guide is the core tube construction, so other parts of structures and even entire high-rise building construction speed depends on the core. Because of this, template project requires high-rise buildings have high construction efficiency. Generally speaking now of high-rise frame-tube and tube-in-tube structure system, core tube structure of reinforced concrete, with steel frame and for horizontal structures are generally made of profiled steel plate as a template, so that the core of the largest amount of formwork in construction of high-rise building structure. In high-rise buildings, generally within the core mechanical and electrical equipment hoistway and elevator, horizontal structure workload is much narrower than vertical structures and lack of floor or more, leading to horizontal templates are much smaller than the vertical template area. Therefore, the high-rise building project focuses on vertical template, and its construction plan goal is to accelerate the construction of the vertical structure. Can see from the above characteristics, characteristics of super high-rise building project was in a vertical structure as the main body, with a focus on core tube, ensure the accuracy of its efforts to improve the efficiency of construction.

Figure 3 high-rise building project

2.4 steel structure engineering

In the construction of high-rise buildings, steel structure construction technology is widely used, thanks to steel construction high construction speed and industrialization of high strength characteristics. Construction of high-rise steel buildings include many types, such as top heavy long-span space steel structures, steel structures, steel-and-concrete composite construction, and so on. Steel is a very strong heat transfer material, steel structure of high-rise building has outstanding heat conductivity [6]. Through fire, this structure will bring devastating damage to high-rise buildings as a whole. Thus, when applied construction technology of steel structure, we must strengthen the design and construction of fire-prevention facilities. In addition, the steel construction depends on large cranes, in a sense, tower crane lifting capacity directly determines the efficiency of steel structure installation. Therefore, the lifting of steel structure, control and welding technology is important content of the construction technology of steel structure.

Figure 4 steel structure of high-rise building project

Large super high rise steel structure is usually high, and other salient features and commonness of the last more than 10 years, large and super high steel structure they are oblique, twisted, suspension, and more specific characteristics. Therefore, large construction technology of super high rise steel structure lines, it should first have fully understanding of the structure of the construction object, and technical, economic and environmental factors to consider. Accurate understanding about the structure itself and the environment, adequate awareness of own resources is a prerequisite to

determine general construction technology. Main factors to be considered are: (1) to understand the basic structure and the load-transfer approach. Only analyses the structure of basic components, can be properly divided into lifting elements, only the structural load transfer path analysis clearly to determine the reasonable construction sequence, ensure the completion of construction and design requirements. For super high rise steel structure, steel columns, steel beams, steel truss is usually part of the structural analysis of the main object. (2) familiar with the construction site conditions and the surrounding environment is the rational selection of construction equipment, effective construction organization and planning the construction of an important precondition. (3) understanding of the resources and technical capabilities, it is also an important prerequisite for installation.

3 Quality control measures in construction of high-rise building

3.1 tall buildings "three lines" control

On high-rise buildings, due to the wide, difficult operation, often shift or not. "Three lines" control of high rise building is a major difficulty, and the focus of its control. "Three lines"[7] refers to: (1) control of verticality; (2) axis control (3) elevation of line of control.

3.2 strength control of concrete of high-rise building

Due to the large amount of concrete of high-rise building, long construction period, factors affecting the climate and conditions of work, with occasional large discreteness of concrete strength, even failed, and the concrete strength is directly related to the reliability of high-rise building structure, concrete construction quality checks and determines the quality of high-rise building construction and control of concrete strength is particularly important. For the concrete selected, first involving different experimental materials should be based on regional markets, aims to ensure the ratio adjustments in a timely manner in the course of construction. Ratio in the laboratory, should be adjusted by the ratio of water and sediment, is designed to ensure that the proportion of laboratory practical versatility, in the construction of high-rise buildings, to strengthen the control of raw materials, appropriate adjustment measures can be taken in a timely manner to avoid poor sand gradation. Strict maintenance of high-rise building system, in General, by pumping concrete of high-rise building, which not only improve the concrete construction of the concrete performance and to shorten the construction period, but even under very stringent conditions, occasional consequence of insufficient strength of concrete, so it should be a strict conservation systems of high-rise buildings.

3.3 safety control of high-rise building construction

High-rise building construction, the need for safe construction of Foundation pit support, and high-rise construction site environment and the reality and take effective support scheme. Meanwhile, you also need to secure control of high-rise building construction scaffolding, fixed scaffolding construction of scientific programmers, ensure the safety of construction workers. In the course of construction, need to control the quality of all aspects of the construction, in order to effectively ensure the template removal, installation and design construction operation up and running. In high-rise building construction site, will introduce a three-tier distribution, two-stage protection to ensure electrical safety. During the construction process, to continue to enhance the safety awareness of construction workers, increasing the ability of staff to improve construction safety prevention. Before the construction, topographic and geomorphologic surveying and recording to do the work, find out terrain safety factor, safety technical disclosure, in accordance with the requirements of drawings for construction. Construction personnel to always put safety first approach, to improve their knowledge about security, laws and regulations, further improve the legal system, effectively ensure safety and quality.

4 Conclusion

In the construction of high-rise buildings, should always put quality first, and ensure the quality of construction is construction technology. At present, around high-rise buildings have mushroomed as more and more, using more and more powerful, which has put forward higher requirements for

construction technology. With the development of China's scientific and technological level and progress in the future should develop some new construction technology for high-rise buildings, and during the construction process using new materials, new equipment, new technology, new methods, which can effectively improve the quality of the whole building, and continuously improve the economic benefits of construction enterprises, can be described as two birds with one stone.

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