Analysis of Construction Technology of All-Steel Structure in High-Rise Prefabricated Building Construction

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Abstract: In recent years, with the rapid development of science and technology and economy, high-rise buildings have gradually become a part of the construction industry in China. The emergence of high-rise buildings meets the actual needs of the development of China 's current construction industry. In the process of high-rise building construction, the construction quality of assembly engineering has been paid more and more attention by people, which needs to show many different contents such as economy and environmental protection. In the process of high-rise prefabricated building construction, the construction technology of all-steel structure is selected, which has the characteristics of green assembly. It can not only solve the original overcapacity phenomenon, but also meet the actual needs of the development of high-rise buildings in China.

Keywords: Construction Technology; Prefabricated Building Construction; High-Rise Buildings

1. Introduction

The steel structure has always been an extremely important part of the assembly system of high-rise buildings. Research and analysis of steel structure technology and construction management is extremely important at present, which is related to the safety and stability of high-rise building projects, and can further shorten the construction cycle and improve the construction quality. At present, the construction technology of prefabricated buildings is becoming more and more mature, which has gradually become a new trend in the development of China 's construction industry, improving the overall quality of the construction industry and meeting the actual needs of the development of high-rise buildings.

2. Advantages of All-Steel Structure Construction Technology in High-Rise Prefabricated Building Construction

In the process of prefabricated construction of high-rise buildings, the construction technology of all steel structure has the following different application advantages: first, it has higher strength, lighter weight, and the bearing capacity is also continuously improved. The strength of steel is higher than that of reinforced concrete. Selecting all steel structure can reduce the weight of the building system itself. At present, after the completion of construction, the weight of steel bars can be reduced by about 50% compared with the traditional use of reinforced concrete residence, which greatly reduces the self weight of the house. The smaller section of the component further increases the usable space of the building itself. Second, the seismic performance is more superior. Steel has always been a kind of elastic deformation material. The use of steel for prefabricated buildings can maximize the safety and reliability of the building itself. Reducing the weight of the building structure and increasing the seismic stiffness can help to improve the seismic performance, and it is also convenient to replace the damaged components in time after the earthquake. Third, the construction period is continuously shortened, which can reduce the consumption of labor, improve the construction quality and efficiency of the project, and further reduce the potential safety hazards of the actual construction. The fabricated steel structure components are selected. In most cases, they need to be prefabricated in the factory and then transported to the site for installation. The degree of mechanization of the site is higher, and the amount of work can also be

continuously reduced at this stage, reducing the probability of safety accidents on site, shortening the construction period, and reducing a large number of waste water, waste products, noise and dust that are harmful to the environment generated in the original construction process. Fourth, the steel structure is selected for layout. Its spatial layout is more flexible, and the modular design and integration involved are higher, which can continuously extend the life of the building. Fifth, to be green and environmental protection can further realize environmental protection, and can resolve the phenomenon of overcapacity in the iron and steel industry itself, so as to meet the sustainable development needs of China's social development. Steel has always been a secondary recyclable material, and the demolition and construction of steel have brought relatively little harm and pollution to the environment. Based on the analysis of energy-saving indicators, the energy-saving effect is up to more than 50%, which is a green building material. Sixthly, realize the industrialization and industrialization management of building housing, and improve the economic benefits of building engineering development.

3. The Construction Technology of All-Steel Structure in High-Rise Prefabricated Building Construction

3.1 Fabrication and Transportation of Steel Structure

In the analysis of the construction process of high-rise prefabricated buildings, the construction process of all steel structure is analyzed. It can be found that this is the most basic and important construction link in the production of steel structure. Once the production of steel structure itself has quality problems, even in the process of subsequent construction operations, the construction is extremely standardized, it is difficult to improve the construction quality, and the construction safety of decoration engineering can not be guaranteed. During the fabrication of steel structures, all designers are required to design the sample drawings of steel structures according to the construction structure requirements of prefabricated buildings, and fully analyze the applicability of the sample drawings in use and the use effect of the sample drawings. Through detection and calculation, we can select materials that are completely consistent with the actual construction of the prefabricated building structure, and form semi-finished products or directly process them into finished products, which are assembled by professional staff. In the process of assembly, it is also necessary to consider the welding process of its assembly. The most appropriate welding process should be selected and the effective treatment between different gaps should be done. Transportation treatment is required in the process of steel structure treatment, which is also an extremely important part of the production and management process of steel structure high-rise prefabricated buildings. All personnel responsible for transportation are required to carry out the production and whole process state management of the whole steel structure according to the specific information of the model and the production process of the steel structure, so as to ensure that further detailed analysis can be carried out for different time points and different contents in the production process of the steel structure, and it is more necessary to clarify that different steel structures have different properties and states. According to the production status of the steel structure itself, the production date and the installation date are determined. The staff also need to select the most appropriate loading specification in combination with the actual carrying weight of different projects and vehicles and the types of components, so as to make clear the statistics of the loading weight. Before the components leave the factory, all staff are required to clarify the types and cores of different components, understand the weight of loading, and determine the date and time of delivery of goods, so as to ensure that the transportation level of steel structure can be improved during transportation, and the whole transportation work will not be disturbed by other adverse factors.

3.2 High Altitude Bulk Technology

Due to the high-rise fabricated construction, it involves high-altitude bulk technology, so it can adopt two different technologies, namely cantilever installation and full support installation. The effective splicing between bulk components and supports can further

optimize the cantilever structure of the grid structure and form a mechanism for the installation of small parts at high altitude at present. In the whole installation process, the application of actual construction technology is required to meet the actual needs of segmented construction. While ensuring that the stiffness and stability of the cantilever can be effectively controlled, it can also ensure that the application effect of the construction technology can meet the standard requirements. In the construction process of high-rise prefabricated buildings, the different bolt nodes involved need to be tightened and the bolts should be fixed. In most cases, in the application process of fabricated steel structure components for high-rise buildings, whether cantilever installation technology or full support installation technology is selected, it is necessary to cooperate with the support beam structure for assembly. In the actual construction, it is also necessary to select the corresponding support work mode and the corresponding lifting equipment in combination with the actual state of the project, so as to avoid construction errors as much as possible, and it is necessary to control all positions of construction operations in an all-round way. The construction and installation should meet the technical requirements of high-rise building construction, reduce the error problems in the assembly process, or carry out a comprehensive inspection of the installation quality of parts, do a good job of comprehensive adjustment, and improve the overall quality of construction.

3.3 Do Well in Construction Preparation

It is also necessary to make preparations before construction. Adequate preparations can improve the overall quality requirements of the high-rise prefabricated building engineering all steel structure construction process. The staff responsible for this construction conducted a field visit to the construction site, recorded the specific situation, and used it as a reference for the design drawings, which can ensure the scientificity and reliability of the construction drawings in the use process. As a construction enterprise, it needs to hire corresponding experts to evaluate the drawings in the first time. If it is found that the drawings do not match the actual needs of the construction, it needs to be adjusted in the first time to ensure that the construction can meet the construction standards. In addition, it is also necessary to check the quality of all the raw materials involved in this assembly project. If it is found that there are some bending, damage or rust on its surface, it is necessary to contact the supplier to replace it at the first time. If it is found that its model does not match the raw materials of this construction, it is also necessary to adjust it. Only by ensuring that all the quality contents in this construction process meet the requirements can it enter the site. In order to further improve the overall progress of the construction, it is also necessary to place the construction materials in sequence according to the application of construction materials, so as to improve the overall quality of the construction. In the process of high-rise prefabricated building construction, it is necessary to do a good job in the construction site management, play the role of various contract management, and do a good job in quality control. First of all, it is necessary to standardize and restrict the construction behavior of all the staff responsible for the construction. During the whole construction operation, it is necessary to implement the corresponding responsibilities, make a good division of responsibilities, and clarify the responsibilities and work cores of each construction link, so as to ensure that the different construction errors of the high-rise prefabricated building structure construction are controlled within a reasonable range. After the completion of the construction, it is also necessary to detect and compare this construction, so as to improve the construction accuracy of this construction. In the process of carrying out the construction of prefabricated buildings, it is also necessary to make clear that its construction machinery includes a variety of different construction machinery, and it is necessary to carry out the management of different construction machinery and do a good job of maintenance. It is more necessary to control the quality of construction materials involved in the prefabricated building project, do a good job in procurement, compare the same type of materials in the market, and select materials with higher quality and better performance. It is also necessary to do a good job in material mobilization acceptance and material storage management. It is also necessary to improve

the professional quality of all construction management personnel, so as to ensure that the staff responsible for the construction process of high-rise prefabricated building construction all steel structure understand the key content of the construction, and do a good job in the innovation management of construction technology. Master the most advanced construction technology, clarify the technical development status, regularly organize construction professionals to carry out construction training, master the latest technology, and flexibly apply these technologies to prefabricated building engineering, which can better meet the actual needs of China's current building development and improve the construction quality of high-rise buildings.

4. Conclusion

To sum up, the steel structure technology of prefabricated building engineering is one of the most important contents in the whole building construction process, which not only affects the progress of building engineering in the actual construction, but also has a certain impact on the construction quality. It is necessary to fully understand the characteristics and technical points of high-rise prefabricated building engineering, improve the use effect of high-rise prefabricated building engineering, and ensure that the all steel structure construction technology can always bring a positive impact on the development of building engineering in China.

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