Research on Construction Management and Quality Inspection of Assembled Buildings

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Abstract: The traditional construction management has a long construction period and many hidden safety hazards. To adapt to the green sustainable development road, the best choice is assembly building. However, the development of prefabricated buildings is relatively slow. In order to guarantee the comprehensiveness of construction management and improve the quality of prefabricated construction, this article first introduces the prefabricated buildings, analyzes the differences between traditional production methods and prefabricated buildings, and discusses on-site hoisting mode. According to the drawbacks of the construction problem, the concurrent engineering theory was put forward and the design process diagram was elaborated. For the problem of resource and energy consumption, the EPC management model and quality inspection were proposed. Finally, the full text was summarized.

1. Introduction

The prefabricated components are mainly used in the assembly building [1]. It often uses mechanical hoisting to connect scattered prefabricated components to a whole building. In the design stage, the traditional construction method usually considers the building construction structure first, but does not consider the construction method; the construction generally adopts the open-air site and manual work form. In recent years, standardized design is often chosen for new type of assembled buildings. When producing components, it usually chooses prefabricated field. Construction mode usually adopts on-site hoisting operation. Assembled buildings [4] are often used in standard office buildings, industrial buildings and standard residential buildings. Because of its high cost and technical difficulty, it is difficult to guarantee quality. This makes it difficult to popularize. Figure 1 shows the difference between the traditional production mode and the assembly building [5].

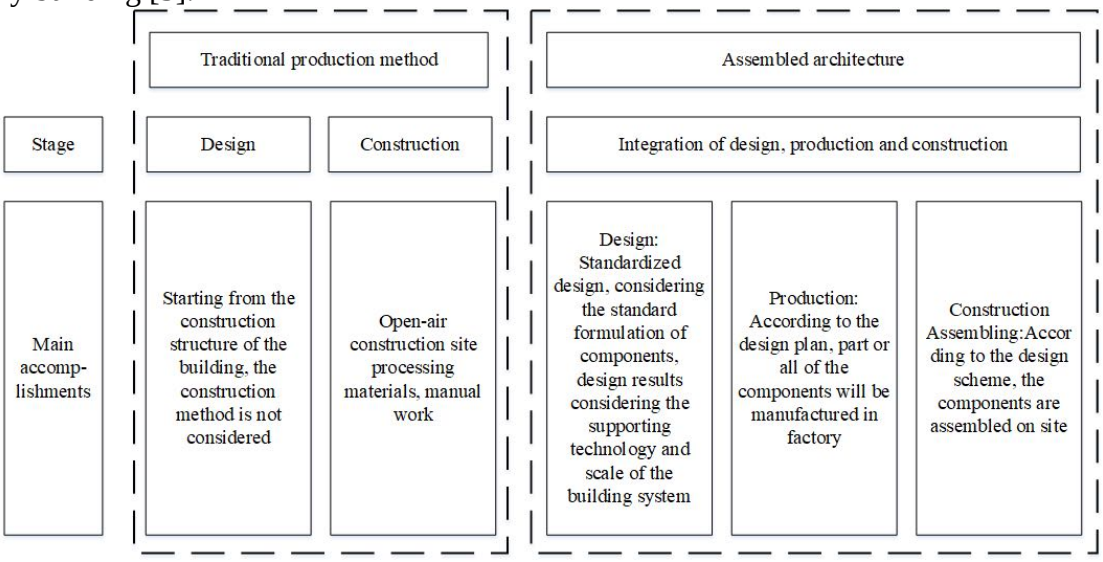

Figure 1 The difference between traditional production mode and assembled building

The characteristics of the construction of assembly building [6] are mainly manifested in the fact

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that the original on-site construction has been transformed into the production line of the current factory. In construction, the cast-in-situ structure of the original three-dimensional intersection operation has changed into prefabricated assembly building [7]. The hoisting technology used in the original field operation is mainly completed through a large number of manual labors, and now simple training can be achieved. The original construction site was in a mess, but now it has become green construction, saving water and electricity, reducing noise. As shown in Figure 2, it transforms the traditional cast-in-place mode into the field hoisting form.

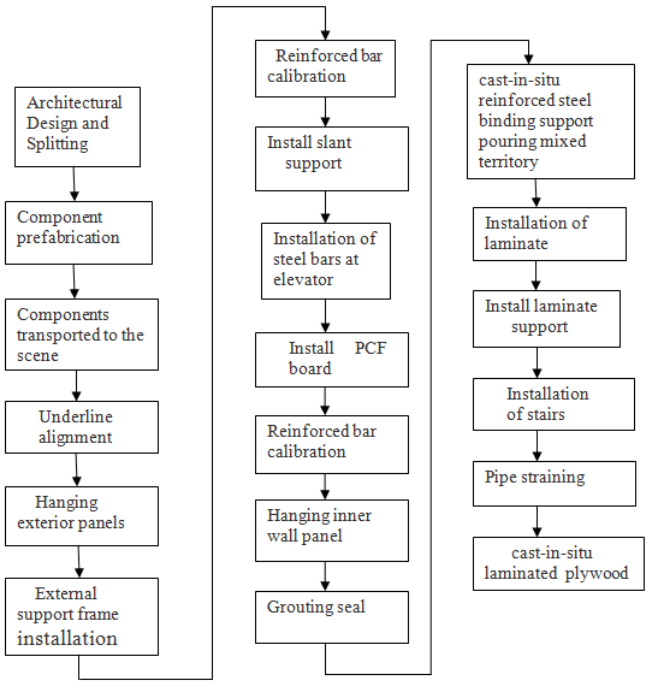

Figure 2 Field hoisting mode

2. Concurrent engineering theory

Due to the advocacy of our government, prefabricated assembly building [8] is becoming more and more popular. However, in the process of implementation, there is often a situation of "immature technology and inadequate management". Most of the construction units know that prefabricated fabricated buildings think that they are based on the traditional cast-in-place structure. They mainly split the traditional building components through certain rules, then turn to the factory production, and then re-hoist the components through the original form. However, this results in low prefabrication rate, poor treatment of connection joints, resulting in poor quality and economy. Low efficiency. The new construction method brings new problems and challenges to the construction management. The main management problems are: component processing and preparation, construction site coordination, design and low degree of informatization.

Concurrent engineering theory is a new theory of enterprise organization and management. It is also an integrated and concurrent design method. Its purpose is to shorten the construction period, reduce the cost and improve the quality.

In order to shorten the design and manufacturing time, the idea of concurrent design, design, construction and bidding can be adopted in design. Before the design is completed, when the construction design of the main structure or even the basic part of some projects is basically completed, bidding or even construction can be carried out first, so that the construction products can be divided into design and construction separately at the same time in the process of subsequent design, so synchronization can be achieved.

In order to complete concurrent engineering in the design process of assembly building, the most important thing is to improve the design process. The process of adopting concurrent engineering mainly includes the following steps:

(1) Understanding and mastering the design process of cast-in-place construction project in the serial aspect;

(2) In view of this design process, the components are divided and the appropriate specifications and sizes are determined.

(3) The process of subdivision, then parallel planning, and finally reorganization. Figure 3 shows the assembly design process based on parallel theory.

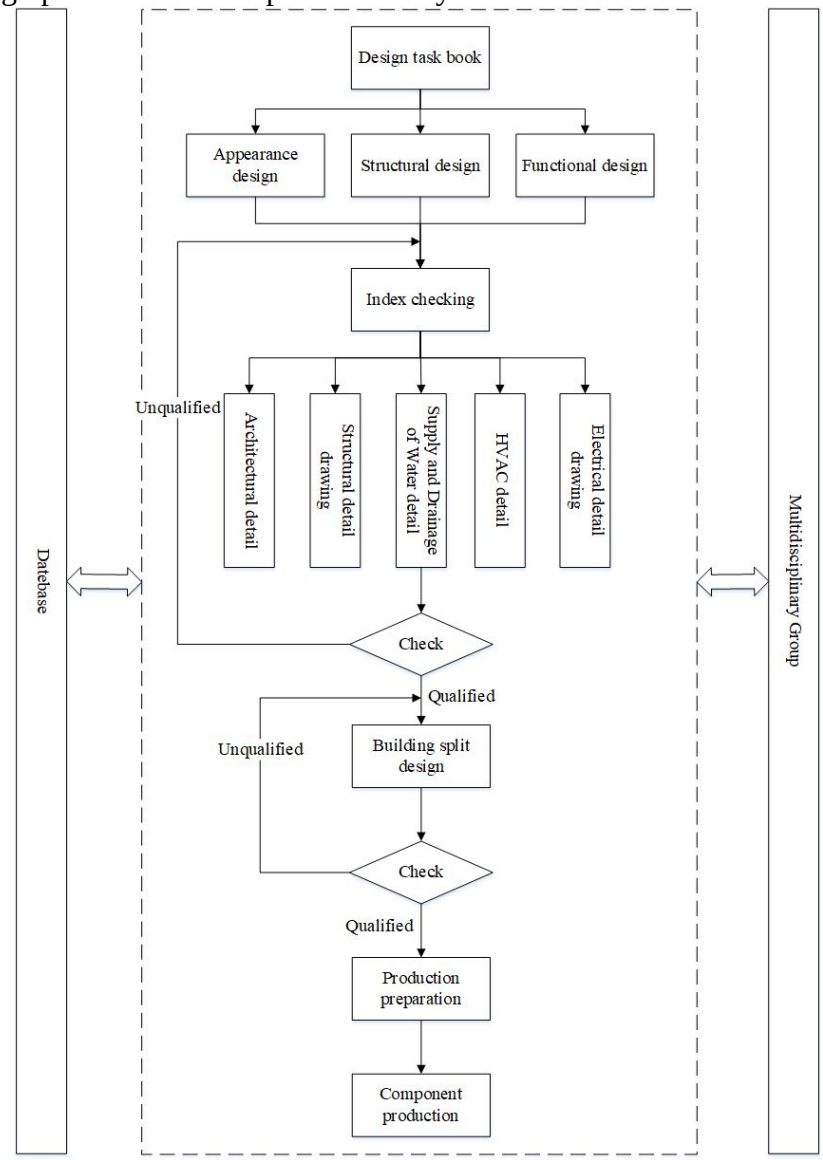

Figure 3 Design process diagram of concurrent engineering theory

3. EPC management model and quality inspection

Traditional assembly structures usually use two-dimensional construction drawings as the delivery target. The construction party needs to have the ability to read and identify drawings before making the next arrangement. But this process is easy to make mistakes and may lead to later rework. However, the management mode based on EPC mode can change this state, as shown in Figure 4. Under EPC mode, it can be constructed concurrently, multi-work and multi-equipment are used at the same time. Usually, information management is used to optimize the construction process continuously, so as to speed up the construction progress and reduce the cost.

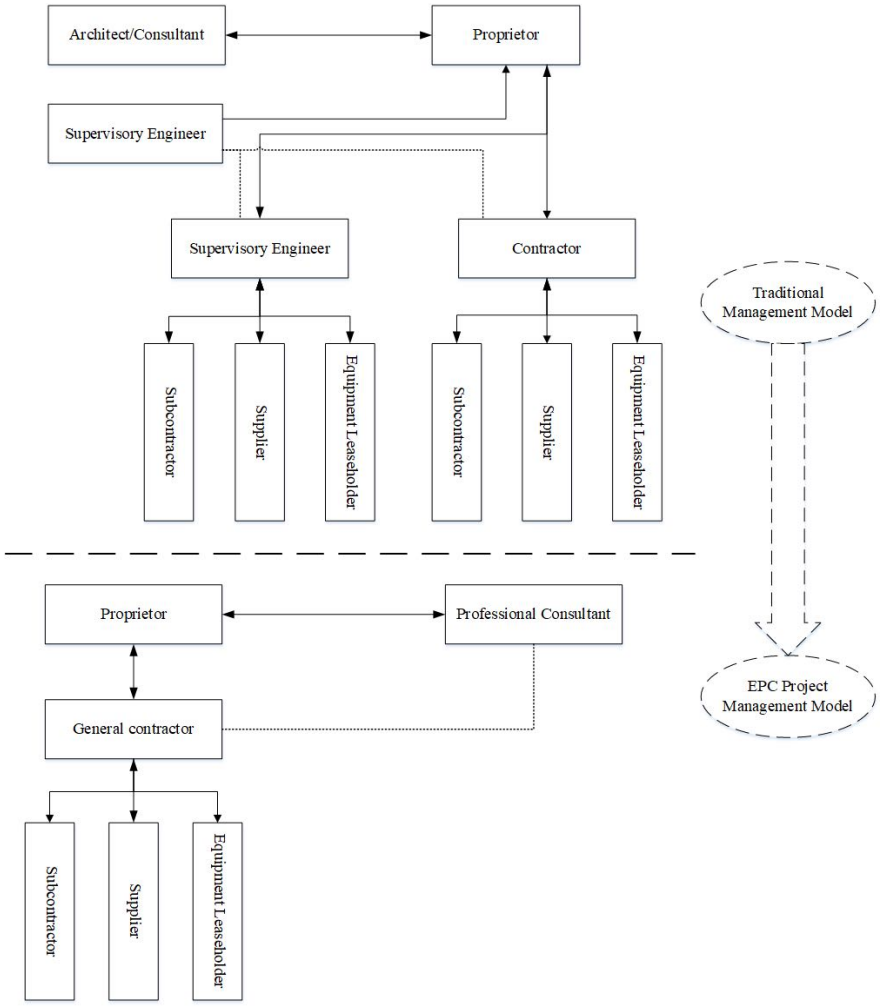

Figure 4 EPC management model

At present, the process of assembly building lacks a complete quality supervision system, which leads to the failure of assembly building to achieve the desired results. Therefore, it is necessary to establish a sound supervision mechanism to urge all links to comply with the regulations. Mainly from the following aspects:

(1) Optimizing the approval process and establishing special management channels. An integrated supervision mechanism should be established to strengthen the main body of the general contract, so as to enable the general contractor to monitor and improve the responsibility of the project.

(2) Improving the management of the general contracting project. When the project is established and preliminary design is completed, the EPC model is selected for bidding, relevant units are invited to submit bids, and quality supervision and examination are carried out to ensure fairness and fairness.

(3) Strict implementation of quality supervision. According to the relevant norms, strict control, strengthen the management of prefabricated parts, establish quality assurance system, and then improve the quality of the project, and gradually establish the certification system department.

4. Conclusion

High technology is constantly being applied to the construction industry. The traditional construction cycle is long and the operation is difficult, which cannot adapt to the development of modern buildings. Assembled building is recognized by the industry because of its unique advantages. But its technology is not mature and its management is not in place. This paper probes into some problems of assembly building in construction, puts forward concurrent engineering

theory, elaborates its design process diagram in detail, and puts forward EPC management mode and quality inspection, hoping to play a reference role in this field.

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