

Several Suggestions for Popularizing and Applying Prefabricated Buildings

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Abstract: Prefabricated buildings will be used in factory production for more periods. It refers to the construction of building forms built in various ways to connect the construction site, to protect the environment in traditional ways, to provide reliable quality improvement effects for promoting facility construction, and to promote a new era. Facility work has injected strong impetus into the development. Aiming at the problems existing in the promotion of prefabricated type, this paper puts forward construction suggestions and suggestions based on the actual development of the work.

1. The Bottleneck Problem Faced by the Promotion and Application of Prefabricated Buildings

1.1 The development goals are not clear, and there are no standard guidelines for work development

At present, the application research on prefabricated buildings is not deep enough, and the understanding of the industry is not comprehensive enough. The promotion of prefabricated buildings is still in the pilot stage, and there is no specific plan for the application scope and development goals of prefabricated buildings in facility construction. Due to the lack of experience in the application of prefabricated buildings, the preparation of bidding documents, project procurement documents and bid evaluation rules can only be referred to the local area temporarily, and there is no institutional norm and operation process suitable for the characteristics of facility construction work. The construction work has just started, and the preparation of the construction standards for prefabricated facilities should be further improved in combination with the results of the pilot construction. In addition, the pilot work of prefabricated buildings in the early stage did not make clear requirements for how much value it can play and what kind of efficiency it should have, and lacked directional and standardized guidance.

1.2 The system construction is not perfect, and the top-level design urgently needs scientific deployment

At present, although the general idea and relevant requirements for the application of prefabricated

buildings have been clarified, there is still a lack of scientific top-level design to coordinate the application of the entire prefabricated facility, and facility construction departments at all levels have no reference to the implementation standards to carry out related work. Although there is a basic working idea of "pilot first, then deploy", there has not been a comparison of the specific responsibilities that the facility construction departments at all levels should assume, and the estimation of the assembly rate that each unit should achieve according to the actual local conditions. A comprehensive and effective development plan is needed to meet the guidance requirements. Therefore, facility construction units, colleges and research units at all levels can only exert themselves. There is a lack of coordination among various departments, and the entire work has a certain blindness.

1.3 The design concept is lagging behind, and the cutting-edge technology has not yet been mastered

The construction method and design method of prefabricated buildings are different from traditional cast-in-place buildings, emphasising the concept of "technical pre-position", which requires that from the planning stage, the technical capabilities and production strength of component manufacturers, and the various components of component transportation routes will be integrated. The basic situation, the layout of the general construction plane, the overall project cost and the project construction organisation are taken into consideration. Under the condition of long-term extension of traditional architectural design methods, it is difficult for each unit to complete the change of design concept for a while. If the inertial thinking formed by traditional cast-in-place buildings is designed and implemented for a long time, the final design result will definitely be unfavourable for the design of prefabricated facilities. production and construction. In addition, based on the characteristics of prefabricated buildings focusing on design and

Emphasizing accuracy, it is necessary to use BIM technology to solve problems in the design stage. However, at present, each facility construction unit can proficiently operate BIM software for design, and there is an extreme shortage of personnel with relevant experience. The training is basically in its infancy, and most of them rely on temporary self-study by business personnel, and the effect is not ideal.

1.4 The management model is immature, and the project unit lacks application experience

In order to effectively control the planning, design, organization, construction, acceptance and commissioning of construction projects, all facility construction projects adopt the EPC project general contracting management mode in principle according to the requirements. At present, most of the contractors on the market are only doing prefabricated buildings, and the management still follows the traditional general contracting mode of construction. There are very few prefabricated enterprises that truly have the ability of independent innovation and the integration of prefabricated building design. It is easy to see bad money driving out good money. In the current facility construction projects, the practical experience of the EPC project general contracting management mode is still relatively small, and the construction units of many projects still have problems such as insufficient management experience. It is not clear, and there are potential safety and quality risks.

1.5 The target traction is not outstanding, and the building efficiency does not meet the requirements

Currently, prefabricated buildings are not universally applicable. Some alpine islands and plateau alpine regions exceed the coverage of the transportation radius of prefabricated building

manufacturers, and parts and components cannot be delivered quickly, which greatly affects the construction quality and construction progress. In addition, the prefabricated buildings produced by local enterprises are designed according to the needs of general civil buildings. Some facilities cannot meet the requirements of concealed camouflage, protection and anti-destruction performance, and customized production for special needs needs further research. Inspection is still required. According to the results of the interview and discussion, prefabricated buildings cannot be applied to caverns, underground works, airport runways and other projects at present.

2. Suggestions to Help the Promotion and Application of Prefabricated

2.1 Adhere to step-by-step progress, and summarize typical guides in a timely manner

In order to speed up the transformation of the facility working methods under the traditional construction mode and promote the smooth transformation of facility construction work, a series of incentive documents with mandatory measures should be formulated and implemented, and facility construction units at all levels should be urged to change their construction concepts and development methods as soon as possible. The pilot demonstration effect combines the pilot construction effect with the facility construction requirements. After the pilot construction is completed, it is necessary to summarise the data and information of the pilot building's overall facility efficiency, overall cost input, and construction schedule arrangement. Comparing the methods, draw intuitive conclusions on the important indicators of construction. Together with the whole cycle of the project construction process, it will be recorded into text and made into manuals, and each facility construction business department will be organised to visit the pilot construction results. Through typical guides, further strengthen Awareness of this new way of building.

2.2 Adhere to sustainable development and focus on strengthening top-level design

The promotion of prefabricated buildings is a long-term and innovative work, and it must be firmly grasped from the initial stage. Top-level design must be given top priority, and efforts must be made in the same direction from the aspects of internal organization and implementation, talent team, technical reserve, project evaluation and life-cycle management, etc., to achieve professionalization of the supervision team, standardization of operation procedures, scientific planning and demonstration, and scientific project management. Focus on the applicability and standardization of the system; adhere to the perspective of sustainable development, establish and improve the prefabricated building cooperation mechanism, quality supervision mechanism and other all-round and full-cycle development system of prefabricated buildings. process, strengthen technical capabilities, and truly form a prefabricated building development system that meets the needs of facility construction.

2.3 Adhere to the concept of refinement and change the way of architectural design

Most of the work of prefabricated buildings is completed in the design stage. The design stage needs to be supported by fine calculation and detailed planning. It is necessary to change the previous extensive design concept, innovate the design methods of architecture, structure, electromechanical and decoration, and form it as soon as possible. The integrated integrated design method maximizes the integration of resources in all aspects of the design stage, improves collaborative design capabilities, and can adopt generalized, modular, and standardized designs for general-purpose facilities, such as squadron barracks and their ancillary structures in ordinary areas. In this way, large-scale production can be carried out, thereby reducing the investment in component production and

improving production efficiency; and for special facilities, such as alpine islands, airports, etc, can be combined with prefabricated enterprises for professional design and customized production to meet diverse needs. . It is necessary to enhance architectural design methods, improve the ability to use digital and information-based methods for accurate design, actively learn BIM technology, assist design decisions through the diversified functions of BIM software, remove obstacles in the construction stage in the preprocessing stage, and improve construction efficiency.

2.4 Adhere to exploration and practice, optimize project management mode

Compared with the general construction contracting mode, EPC has less restrictions on construction details such as construction drawings and bills of materials, provides more room for contractors to play, can maximize the contractor's ability to innovate in plans, and is also conducive to the application of In the process, the experience of EPC mode was continuously explored, and a set of application guidelines for EPC management mode suitable for facility project construction was explored and formed by learning the scheme design ideas of high-quality EPC enterprises. In addition, the EPC model has high requirements for construction units and contractors. While maintaining mutual trust with enterprises, it is necessary to strengthen project risk prevention and control. On the one hand, a reasonable policy environment is needed for support, and on the other hand, both parties must have experience in using this model. In the early stage of the project, the feasibility review of the general contracting of the project must be completed to control risks to the greatest extent and ensure that the project is completed with quality and quantity.

2.5 Adhere to demand traction and improve the quality of facility construction

The design of prefabricated buildings should combine the requirements of facility construction, focus on improving the preservation ability of prefabricated buildings, and continuously enhance the protection ability, concealment performance, and emergency repair and construction capabilities of prefabricated facilities. To give full play to the efficiency of prefabricated buildings, use the various structural forms of prefabricated buildings to meet the diverse needs of functional houses and auxiliary facilities, and improve the standard system of prefabricated building construction by realizing the customized production of related parts and components of functional buildings. maturity and versatility. It is necessary to cooperate with prefabricated enterprises to conduct targeted research on special areas and key areas. For example, in areas with complex terrain conditions such as mountains, islands, plateaus and alpine conditions, the transportation radius of inland enterprises is difficult to cover, from the transportation mode of components and the overall stability of prefabricated facilities. Based on practical problems such as roof load requirements, and the wear resistance of prefabricated components, conduct research on materials, construction techniques and special regional standards; for key areas such as Beijing, southeast coastal areas, Guangdong, Hong Kong, Macao, Xinjiang and Tibet, it is necessary to upgrade prefabricated buildings. Fire and explosion-proof performance, anti-nuclear and anti-chemical performance, moisture-proof and anti-corrosion performance, and through the comprehensive use of various protective materials and technologies, the survivability of prefabricated buildings has been continuously improved.

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