

Some Suggestions on the Application of Prefabricated Buildings in the Army

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Abstract

In view of the problems existing in the application of prefabricated buildings in the army, firstly, through policy guidance, typical guidance and clear development. Then start with paying attention to sustainable development and optimize the Top-level design. At the same time, the concept of refinement is introduced to change the way of architectural design and improve the scientificity of design. And explore the use of EPC project management mode to improve the project management level. Finally, focus on combat traction, improve the quality of battlefield construction and expand the efficiency of prefabricated buildings.

Keywords

Army; Prefabricated Building; Military Installation; EPC.

1. Introduction

Prefabricated building refers to the building that transports the prefabricated components produced in the factory to the construction site and assembles them through reliable connection. Compared with traditional cast-in-place buildings, prefabricated buildings have the advantages of energy saving, consumption reduction and shortening the construction period, which is in line with the needs of military facility construction transformation, quality improvement and efficiency improvement in the new era. Aiming at the problems existing in the application of prefabricated buildings in the army, this paper puts forward a series of countermeasures and suggestions.

2. Problems

2.1. The Development Goal is not Clear, and the Work Lacks Standard Norms and Guidelines

At present, the military's Application Research on prefabricated buildings is not deep enough, and the understanding of the industry is not comprehensive enough. The application of prefabricated buildings is still in the pilot stage, and there is no specific planning for the application scope and development goal of prefabricated buildings in military facilities construction. Due to the lack of experience in the application of prefabricated buildings, local governments can only be referred to temporarily in the preparation of bidding documents, engineering and procurement documents and bid evaluation rules. There are no systems and specifications suitable for the types and characteristics of military facilities construction, and the pilot construction work has just begun, The compilation of standards for the construction of prefabricated buildings and military facilities should be further improved in combination with the results of pilot construction. In addition, the pilot work in the early stage of prefabricated buildings does not make clear requirements on how much military facilities can

play the value of prefabricated military facilities and what military facilities should have the efficiency, and there is a lack of directional and standardized guidance.

2.2. The System Construction is not Perfect, and the Top-level Design Urgently Needs Scientific Deployment

Although the general idea and relevant requirements for the application of prefabricated buildings are put forward in the relevant documents for the promotion of prefabricated buildings, there is a lack of Top-level design to coordinate the application of military prefabricated buildings. Military facility construction departments at all levels do not have reference implementation standards to carry out relevant work, although there is the basic working idea of "pilot first, then carry out", However, there is no comprehensive and effective development plan to meet the requirements. Therefore, military facilities construction units, colleges and universities and scientific research units at all levels can only give full play to themselves, lack of coordination among various departments, and there is a certain blindness in the overall work.

2.3. The Design Concept Lags behind, and the Cutting-edge Technology has not been Mastered

The construction mode and design method of prefabricated buildings are different from the traditional cast-in-situ buildings. It emphasizes "technology first". It is required to take into account the technical capacity and production strength of component manufacturers, various basic conditions of component transportation routes, general layout of construction, overall project cost and project construction organization from the early demonstration stage of the project. Under the condition of long-term use of the traditional architectural design method, it is difficult for all units to complete the design transformation at one time. If the inertial thinking formed by the traditional cast-in-situ architecture is implemented according to the design for a long time, the final design result must be not conducive to the production and construction of prefabricated military facilities. In addition, prefabricated buildings pay attention to integrated design, emphasize the accuracy of production and construction, and require the use of BIM Technology to solve the problems in the design stage. However, at present, the military facilities construction units at all levels of the army are extremely short of personnel who can skillfully operate BIM software for design, and the training of professionals has not started yet. Relying on the temporary self-study of business personnel, the effect is not ideal.

2.4. The Management Mode is Immature and the Project Unit Lacks Application Experience

In order to effectively control the planning, design, organization, construction, acceptance and use of the construction project, the military facility construction project adopts the EPC project general contracting management mode in principle according to the requirements. At present, most of the contractors in the market are only engaged in prefabricated buildings, and the traditional general contracting mode of construction is still used in management. Few prefabricated enterprises really have the ability of independent innovation and the integration of prefabricated building design. It is easy for bad money to expel good money in bidding. At present, the practical application of EPC project general contracting management mode in military facilities construction projects is still relatively small. The construction units of many projects still have problems such as lack of management experience. When some construction units subcontract, the definition of contracts and related responsibilities is not clear, and there are hidden dangers in safety and quality.

2.5. The Battlefield Traction is not Outstanding, and the Building Efficiency can not Meet the Requirements of War Preparation

At present, prefabricated buildings are not generally applicable in the army. Some high mountains, islands and plateau cold areas exceed the transportation coverage of prefabricated building manufacturers, and parts and components cannot be transported quickly, which greatly affects the construction quality and progress. In addition, the prefabricated buildings produced by local enterprises are designed according to the requirements of general civil buildings. There is a lack of general standards for the performance requirements of military facilities, such as protection and destruction resistance, concealment and camouflage. The customized production for the special needs of the army needs to be further studied, and the survival support ability of military facilities in wartime needs to be tested. According to the results of interview and discussion feedback, prefabricated buildings can not be applied to national defense projects such as caverns and underground command projects.

3. Countermeasures and Suggestions

3.1. Adhere to Policy Guidance, Typical Guidance and Timely Summary

In order to accelerate the transformation and development of military facilities construction, it is necessary to issue normative documents as soon as possible to guide and encourage the military facilities construction departments to change their construction concepts and working methods. We should give play to the role of pilot demonstration and combine the results of pilot construction with the requirements of military facilities construction. After the completion of the pilot construction, it is necessary to analyze and summarize the overall military facility efficiency, project cost, construction period and other data information of the pilot construction, and summarize and form a guiding application and operation guide for prefabricated buildings by comparing the traditional construction methods.

3.2. Adhere to Top-level Design and Focus on Strengthening Sustainable Development

The application of prefabricated buildings in the army is a long-term work, which should be firmly grasped from the initial stage. On the one hand, adhere to the Top-level design in the first place, make overall planning from the aspects of leadership, organization and command, work implementation steps, talent team construction, technical force reserve, construction project evaluation and life-cycle management, and strive to achieve efficient organization and command, standardized work process, professional talent team, scientific planning and demonstration and refined project management. On the other hand, adhere to sustainable development, establish a military civilian cooperation mechanism and quality supervision mechanism for prefabricated buildings, and truly form a prefabricated building development system that meets the needs of military facilities construction by improving the standard system, solidifying business processes and strengthening technical capabilities.

3.3. Adhere to the Concept of Refinement and Change the Way of Architectural Design

Most of the work of prefabricated buildings needs to be organized and implemented in the design stage, integrating the design from the aspects of architecture, structure, electromechanical and decoration, so as to maximize the integration of resources in all links in the design stage and ensure the accuracy of design coordination. For general military facilities, such as squadron barracks and their ancillary structures in general areas, it can adopt universal, modular Standardized design method to realize large-scale production, reduce component production investment and improve production efficiency; For special military facilities, such

as barracks in Plateau and alpine areas, border squadrons, heliport stations, ports and docks, professional design can be carried out in conjunction with local assembly enterprises to realize customized production and meet the needs of military tasks. We should make full use of digital and information means to improve the accurate design of prefabricated buildings, give full play to the auxiliary design decision-making function of BIM software, remove the obstacles in the construction stage in the design stage and improve the construction efficiency.

3.4. Adhere to Practical Exploration and Optimize the Project Management Mode

Compared with the general contracting mode, EPC has less restrictions on construction details such as construction drawings and bill of materials. On the one hand, it provides enterprises with more space to play, which can stimulate the scheme design innovation ability of enterprises to the greatest extent. At the same time, it is also conducive to the army to continuously explore and summarize the beneficial experience of EPC mode in the application process, and learn the scheme design ideas of high-quality enterprises, Explore and form a set of application guidelines for EPC management mode applicable to military facility project construction. On the other hand, the EPC model has high requirements for the construction unit and the enterprise to maintain mutual trust, which is the focus of project risk prevention and control. Under the condition of gradually improving the policies and systems, we should strengthen the feasibility review of project EPC, control the risks to the greatest extent, and ensure the completion of the project with quality and quantity.

3.5. Adhere to Combat Traction and Improve the Quality of Battlefield Construction

The application of prefabricated buildings in the army should be combined with the requirements of battlefield construction of military facilities, focus on improving the battlefield survivability of prefabricated military facilities, and continuously improve the protection ability of prefabricated military facilities for accurate and efficient enemy fire attack; Continuously improve the concealment and camouflage capability of assembled military facilities for various reconnaissance technologies; Aiming at the repeatedly damaged battlefield environment, continuously improve the emergency repair and construction capacity of assembled military facilities. Give play to the modular production, installation, integrated construction and other characteristics of prefabricated buildings, use the diversified structural forms of prefabricated buildings to meet the diversified needs of military functional rooms and ancillary facilities, and improve the maturity and universality of the construction standard system of prefabricated buildings through the customized production of relevant components of military facility functional rooms. For example, for areas with complex terrain conditions such as high mountains, islands, plateaus and high cold, which are difficult to be covered by inland enterprises, it is necessary to conduct targeted research with assembled enterprises for special areas and key areas, starting from the actual problems such as the transportation mode of components, the overall stability of assembled military facilities, roof load requirements, wear resistance, salt and alkali resistance of prefabricated components, Research on materials, construction technology and standards in special areas; Through the comprehensive use of various protective materials and technologies, the military efficiency of prefabricated buildings is continuously improved.

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