

Discussion on Optimization Measures of Building Construction Management Technology

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Abstract: Building construction needs have expanded in line with people's demands and the quality of life in today's society. Therefore, the traditional construction management technology can no longer meet the current management and construction requirements, so it is necessary to further optimize the construction management technology. Therefore, this paper focuses on exploring measures regarding building construction technology optimization. Firstly, the paper briefly expounds its optimization value, then systematically analyzes some problems faced by the current housing construction management, and finally puts forward some targeted management optimization measures for future reference.

Keywords: Building construction; Construction management; Technology; Optimization

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1. Introduction

With the acceleration of urbanization construction, the scale and speed of housing construction are constantly on the rise. People are paying more attention to the construction work and are putting forward new requirements for its development, which leads to the mismatch between the construction management technology and management objectives of housing construction, affecting the overall construction management. In this regard, measures need to be taken according to the specific situation and the problems faced, so as to improve the technical level of construction management and ensure the quality of construction management of the housing project, all of these which will be further discussed in this paper.

2. The importance of optimizing building construction management technology

The technology of housing construction is constantly evolving along with the development planning of the city, the project management concept of housing construction engineering, and the construction technology, which means that innovation and optimization are very important for the construction industry. The importance of optimizing building construction management technology can be embodied in the following two aspects:

On one hand, it is beneficial to establish a good work foundation. During the key construction of housing construction and civil engineering, construction management and construction safety management need to be carried out according to the actual construction situation and explore the construction management technology based on the overall requirements of project construction. It is necessary to accurately use the construction technology for different construction projects and phases, reasonably utilize construction technology, and then tamp the construction foundation, lay the foundation for the smooth progress of the project, reduce the hidden dangers of construction, and improve the quality of construction

specification management ^[1].

On the other hand, it is conducive to the innovation of housing construction management technology. According to our experience in building construction, in this paper, we will summarize the problems faced by the construction, and establish a sound construction organization management system with quality, safety, technology and cost management as the center, which is conducive to guiding the construction personnel to establish a high sense of responsibility, achieve fine control, and then improve the efficiency and quality of the construction management. In this way, not only can the hidden dangers in construction can be reduced, but the construction efficiency can also be improved, and the competitiveness of the construction sector can also be enhanced.

3. Problems faced by housing construction management

3.1. The management system is imperfect

The construction management of housing construction projects optimizes the utilization of construction technology according to the characteristics of engineering projects, provides guidance for the management of housing construction projects, and helps establish the construction foundation in combination with the national and industrial requirements as well as the relevant norms and systems of standardized construction ^[2]. However, in the actual construction of housing construction projects, the construction department does not pay attention to the system construction and national policies. Besides, the actual characteristics of the project the management and control of housing construction projects are not considered. The same construction management system is used for different projects without considering the characteristics and needs of each project. Besides, the system is lacking, the construction foundation standards, norms, control measures are not strict enough, which affects the standard of construction management.

3.2. Lack of refined control

Building construction involves many phases and management contents. For example, the construction requirements of quality, schedule and safety are different for different projects, so the construction personnel should carry out fine control according to the project type, so as to improve the comprehensive efficiency of the construction process. At present, the quality of construction personnel needs to be further improved. They generally lack the knowledge of fine management, and the strict control of material procurement, without integrating the management concepts of quality, safety, and budget. Therefore, in the construction process, various factors are not considered in the perspective of fine management, and prevention and control measures are not formulated. Moreover, and quality management of materials, machinery, society and other aspects is not carried out according to the actual situation ^[3]. During the engineering design phase, the specific construction situation and site environment were not fully considered when setting the budget, nor was comprehensive analysis work carried out in advance to improve the bidding management, which led to problems in the project and affected the implementation of project design standards. In addition, there is lack of professionalism among workers, the investment for talent management is insufficient. In turn, the quality of the overall staff is lacking, and they do not have much sense of responsibility, hence affecting the quality and progress of the project. At the same time, there will also be more safety risks during construction without well-qualified staff and proper safety awareness. Lastly, the construction technology management has not carried out fine management according to the actual situation; the schedule, quality and safety management links are not balanced, the construction management technology applied by the construction personnel is relatively simplistic, lack of innovation and flexibility, affecting the overall effect of construction.

3.3. Poor dissipation of information

It is necessary to carry out information management according to the actual project in the process of carrying out housing construction projects. However, the information management technology is not strictly implemented in the current construction, the relevant information collection is not timely and comprehensive, nor targeted analysis is carried out. The established project model does not fully reflect the characteristics of construction, and information real-time cannot be dissipated in time, causing inconsistencies among workers. As a result, scientific decisions cannot be made, which affects the construction effect and is not conducive to the implementation of the project [4].

4. Optimization measures of building construction management technology

4.1. Improving the management system

A suitable management standard and system is established according to the construction characteristics of housing construction project. In the management of project, no matter how innovative construction technology is, corresponding support management should be established to ensure smooth construction. Therefore, it is necessary to clarify the project construction requirements, organizational management objectives, management and control standards, and construction methods when establishing the management system. Besides, it is necessary to guide the construction personnel to analyze the relevant policies according to the actual situation of the project, and strictly implement the construction system. The management department should also pay attention to the changing trend of the market, improve the construction management standards according to the requirements of policies and regulations, and ensure that the construction quality of construction projects meets the standards [5], as shown in **Figure 1**.

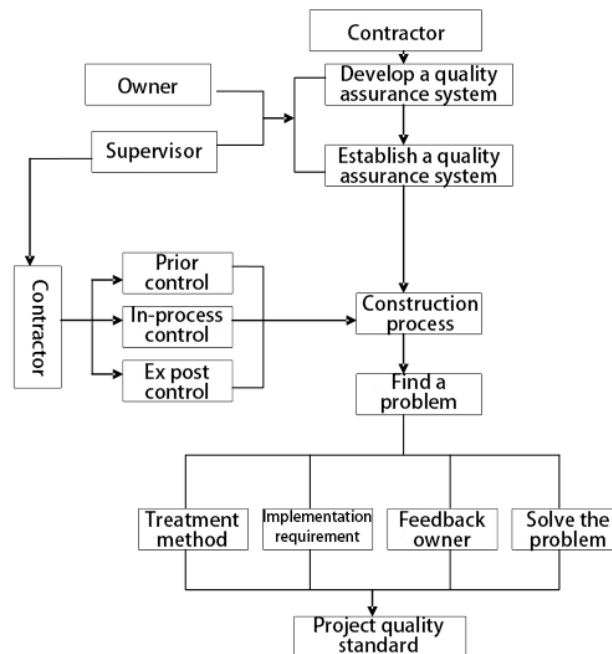


Figure 1. Project construction management process

4.2. Strengthen refined management and control

During the construction of housing construction projects, it is necessary to establish a refined management concept, establish a comprehensive management system focusing on progress, safety, quality, cost, and so on, and strengthen process supervision to ensure that the project can be carried out according to standards. For this, the construction personnel need to scientifically analyze the overall construction goals, establish and improve the bidding management mechanism in the design phase, and select high-quality suppliers.

Before the construction of the project, the construction design needs to be fully certified, the construction site environment and original data should be comprehensively analyzed, and various elements of the construction process should be analyzed, calculated, and studied based on the corresponding data model, so as to formulate a complete design scheme and organization scheme. During the construction, it is necessary to control the cost, strengthen budget management of materials, equipment and personnel at various stages, such as preconstruction, construction, and completion. Moreover, the budget implementation needs to be quantitatively evaluated, make it meet the requirements of the design drawings, optimize the allocation of various resources, and prevent wastage [6]. The management of materials, cost, progress, quality, and safety shall meet the requirements described below.

4.2.1. Material management

In housing construction, good material management can help save construction costs and improve construction quality, which is also the main purpose of construction management technology. At present, in the process of material management of housing construction engineering, in order to obtain benefits, some material manufacturers cut corners, resulting in inconsistent material quality. In fact, some purchasing personnel deliberately buy substandard materials for their own interests, falsifying prices, resulting in material problems, affecting the quality of construction, which are prone to cause engineering accidents. This poses serious safety risks when the building is in use. In this regard, in order to improve the management quality of building construction materials, first of all, it is necessary to control the purchase price of materials, strictly prohibit the phenomenon of shoddy work and shoddy work in the construction process, strengthen the management of raw material purchase process, formulate a scientific purchase plan, purchase the required raw materials according to the plan, ensure that the materials meet the construction quality requirements as far as possible, and reduce the construction cost [7]. Secondly, the performance of materials shall be tested. During procurement, the procurement personnel shall carefully check the quality certificate and warranty of the purchasing manufacturer and test the quality of construction materials to ensure that they are up to standard. For example, the surface of reinforcement shall be cleaned before construction, and its deviation shall be controlled. The allowable deviation is shown in **Table 1**. It is necessary to improve the quality of materials required for construction and avoid using of subpar products. Finally, it is necessary to strengthen the management of material use, pay attention to material management in the process of housing construction, ensure that the material use method and quantity meet the requirements, and improve the construction quality. The construction unit needs to set up a warehouse for storing materials separately on the site, so that the performance and appearance of materials will not change, mix the materials using proper methods, and carefully inspect the construction equipment and machinery regularly.

Table 1. Allowable deviation range of steel bar processing

Deviation item	Allowable deviation range (mm)
Length of stress reinforcement and anchor bars	± 10
Length of parts	± 5
Starting point of steel bar bend	± 2
Steel bar turning	± 3

4.2.2. Cost management

In the process of building construction management, cost management is one of the key and difficult components. Appropriate cost management can effectively use construction funds, reduce construction

costs, and make construction activities go smoothly. Therefore, in order to optimize the cost management technology, it is necessary to first strengthen the cost management before construction, define the construction contract, then sign the corresponding contract according to the bidding documents. The terms and conditions of the construction should be clearly reflected in the contract in detail to ensure that they are reasonable and favorable. After determining the cost, it is necessary to establish and improve the assessment system and accountability mechanism and take effective measures to control the construction cost^[8]. Secondly, it is necessary to optimize the budget plan, ensure that the budget plan is scientific, and avoid affecting the construction management quality and project cost level. For this, it is necessary to comprehensively investigate the situation of the whole construction project while preparing the construction budget, and comprehensively analyze the situation of the construction site and the construction organization. At the same time, it is also necessary to carefully study the construction drawings, and then prepare the construction budget, and combine the construction site and manual drawings to make the budget preparation more scientific and reasonable. Lastly, it is necessary to pay attention to the cost management at the completion stage. There are many risk factors in a housing construction. If a safety accident occurs, it may delay the construction period, cause casualties, and thus increase the project cost. In view of this, the management of construction safety needs to be strengthened, relevant personnel should be allocated for safety management, and prevent construction accidents altogether. At the same time, all kinds of data should be strictly reviewed after the construction is completed, so as to prevent cost increase caused by accident omission.

4.2.3. Progress management

The construction progress management technology is also an important part in construction management. Through scientific control of the construction progress, the construction project can be completed on time, various resources can be optimally allocated, and the construction cost can be reduced. In order to optimize the construction schedule management technology, we a scientific construction schedule should first be prepared. The construction process should be planned according to the construction scheme while fully considering the influencing factors and the contract provisions. When formulating the construction plan, we should pay attention to the preparation of components that are difficult to construct and ensure their qualities as much as possible. We also need to pay attention to the effective application of construction materials and equipment. Secondly, to manage the construction progress, the construction personnel need to conduct a comprehensive and systematic analysis of the construction characteristics of the housing construction project, identify the problems that might occur during the construction and the factors affecting the progress, and also strictly monitor the compliance with the construction schedule to effectively control the construction process. In this regard, the construction unit needs to build a high-quality construction progress management team, rely on professionals to solve the problems that may occur during construction, standardize the construction management methods, effectively standardize the construction activities, and guide the orderly implementation the activities according to the schedule. At the same time, the construction unit also needs to improve the level of the housing construction scheme and join forces with the supervision unit to strictly analyze the feasibility, scientificity, and rationality of the design, and put forward appropriate modifications if necessary, so that the construction can be completed on time, and prevent project delay.

4.2.4. Quality management

In the new era, in order to meet the new requirements for housing construction, the construction unit needs to pay attention to quality management. In order to optimize the construction quality management technology, it is necessary to establish and improve the quality management mechanism, in which the standards of construction accident report, problem accountability, quality control, and so on are clearly

formulated. Relevant personnel need to be assigned for different tasks, so as to timely deal with the engineering quality problems that may occur in the construction, ensure that the construction problems are effectively controlled, and ensure the economic benefits of the project. At the same time, it is also necessary to allocate supervisors to actively carry out quality warranty, project inspection, production and construction, material procurement, construction preparation, and other related work, so as to optimize the construction quality. Secondly, it is necessary to optimize the construction method. In building construction quality management, it is necessary to ensure that the construction technology and scheme are scientific and advanced. In order to manage the construction quality, the construction personnel need to carry out scientific construction according to the relevant requirements of construction standards, procedures and schemes. However, although the use of modern technology can improve the construction efficiency and quality, it will lead to an increase in construction costs. Therefore, managers need to analyze various economic factors, and select appropriate construction processes and methods in combination with the characteristics of the project, so that the construction quality can meet the standard requirements, thereby reducing costs. Finally, the key components of quality management should be clearly defined. In order to prevent the construction progress from being affected, causing delays, resulting in project default, the key points of quality control for each sub project should be clarified. For example, the key points of quality control for reinforcement construction are shown in **Table 2**.

Table 2. Key points of quality control

Sub-project	Components of quality control
Reinforcement	Connect quality and order
Concrete	Concrete label, forming quality and maintenance construction of beam-column joint
Welding	Weld joint
Bolted connection	Torque assurance

4.2.5. Security management

The safety management in the construction process needs to reduce safety risks faced by the construction according to the safety guarantee goals of the “national livelihood project,” construct an ideal safety risk level control system, ensure the scientific allocation of safety protection facilities, and then improve the construction safety awareness and safety skills, so as to make the construction project orderly.

4.2.6. Personnel management

Usually, migrant workers account for a large proportion in a construction team. The quality of their work is rather inconsistent compared to those of local technicians, and there is deviation in the implementation of construction technical requirements and specifications. The quality of personnel leads to problems in construction management. Therefore, proper technical training needs to be provided for construction management personnel, strengthen construction technical disclosure, and strengthen training for key post construction personnel, so as to ensure professionalism in thinking and technical skills.

4.2.7. Advancing IT management and control

During the construction of housing construction projects, innovative construction concepts and methods are implemented, and more efforts are made to build informatization. The construction management system shall carry out comprehensive information management and control around technology and management according to the specific requirements of the project construction, build project management software and

digital models through modern Internet and information technology, simulate and analyze the overall situation of the project design, and timely use information software to collect various information involved in the construction process. At the same time, comprehensive information applications should be created to identify all kinds of hidden dangers and optimize the construction plan after comparative analysis. In addition, the management department will also need to consider the ecological and environmental aspects in the development of new materials and new technologies, establish and improve the innovation management system, guide the construction personnel to innovate the construction process according to the actual situation, summarize the construction experience, constantly optimize the construction technology and process, integrate the ecological energy conservation and environmental protection concept into it, and improve the overall effect of the project construction. In addition, the information platform can be used to supervise and detect all segments of the construction, and subsequent construction can only be carried out after each segments passes the inspection. The management personnel can ensure the construction progress and attendance, find construction problems in a timely manner, and make corrections. The problems in construction should be recorded and summarized to avoid repeated occurrence of the same problem and reduce the incidence of problems. Besides, building information modeling (BIM) and other technologies are used to understand the key monitoring points of the project, solve the fault collision points, attach importance to the feedback of personnel, and timely solve the problems in the feedback.

5. Conclusion

In short, the scientific and rational application of management technology during the construction of housing construction projects affects the construction cost, construction progress and construction quality. In this regard, the construction unit needs to comprehensively analyze the influencing factors of construction management technology, and then select appropriate management technology. This paper proposes optimization measures such as improving the management system, strengthening refined management and control, and promoting information management and control, to control the construction progress, improving manual efficiency, ensuring project quality, reducing project costs, providing a good construction environment, optimizing the economic and social benefits of the housing construction unit, and promoting the sustainable development of housing construction.

Disclosure statement

The author declares no conflict of interest.

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