Application of Construction Management Control in Architectural Engineering Management

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Keywords: architectural engineering management; construction management control; application; development trends

Abstract: This article is about Construction management control over architectural engineering management First, it introduces the status of construction management control in architectural engineering management, and then analyzes its specific applications in three stages of architectural engineering projects: stage of construction preparation, stage of the construction process, and finally stage of completion acceptance. Finally, it analyzes potential problems of construction management control in the way of execution completing phase and gives corresponding solutions, like strengthening personnel training and improving management mechanism so as to provide references for a certain level architectural engineering managerial parties.

1. Introduction

Construction management is a systematic and complex part of managing construction projects and to manage it construction project control is one of the major elements for that. The effective management control of construction is closely related to the key indicators of quality, cost and schedule during the implementation of construction projects, which is an extremely important part to enhance the benefits and core competitiveness of construction projects. As the construction industry is developing rapidly and market competition continues to intensify, strengthening construction management control has become an inevitable choice for construction project managers.

2. The Significance of Construction Management Control in Construction Project Management

2.1 Ensuring Project Quality

The most important thing about constructing projects is the quality of the project, because it is closely related to the working of building construction and safety. The construction management control uses a series of scientific methods and strict steps to fully supervise the whole process of construction. From the quality inspection of raw materials to the specific operating rules and procedures of each construction process, and then to the acceptance criteria for finished product quality, every link is strictly regulated. Regular inspections and spot checks are held to detect and solve the quality problems at any time, ensuring that all construction quality hazards can be discovered and dealt with in a timely manner, which creates conditions for ensuring the quality of construction projects [1].

2.2 Controlling Project Costs

Managing the cost of a construction project is directly related to economic benefits in practicality. Construction management control is an effective way to plan and monitor project costs. At an early stage, in a little pre project way– the estimation of different things is principally based on sensible budgeting and these give some progressive detail to different cost measures inorder to control the cost. As far as the construction phase is concerned, managers check on material consumption, labor scheduling and rental of equipment to avoid wastage of resources but also money. The strict

  DOI: 10.25236/icacel.2025.214

screening and management of suppliers can win better material prices and payment terms, further reducing procurement costs, controlling project costs in the budget basically, and improving the economic benefit.

2.3 Ensuring Project Schedule

Project schedule is a key goal of construction project management, directly related to how long the project delivery time affects the return on investment. The definition of a construction schedule that is comprehensive in nature, clearly specifying work tasks and time nodes corresponding to each stage of the construction schedule, is essential for implementing management control over any construction project. In the execution phase, managers continuously analyse the schedule performance of the ongoing works, proactively identify reasons that impact on schedule and take corrective actions. The goodwill generated by the simple act of communication creates coordination and collaboration between all parties working on a project, so when issues arise during construction that may cause delays in the schedule due to miscommunication, these should be resolved as soon as possible.

3. The Practical Application of Construction Management Control in Each Stage of Construction Projects

3.1 Construction Preparation Stage

3.1.1 Technical Preparation

At the initial stage of preparation for construction, first of all, technical preparations need to be conducted by Construction Management Control. This includes understanding construction-related drawings, managing design disclosures and drawing reviews, clarifying construction methods and quality requirements, establishing the organization of construction designs as well as professional construction plans, comprehensively preparing the entire process of construction work in terms of planning and coordination implementation procedures to disclose all the technical details required for conducting work; conveying techniques on how to do things and quality requirements so that every worker can understand [2].

3.1.2 Resource Preparation

Resource preparation is another important part of the construction preparation phase. Construction management control must ensure timely availability of the human, material and financial resources necessary for construction. For human resources, the number of construction workers and job titles that need to be assigned should be arranged according to the scale and schedule of a specific project. In terms of material resources, the procurement transport and storage of materials components and equipment needs to be managed so that stuff meets relevant requirements. From the aspect of finances, usage ensure appropriate allocation of project funds.

3.1.3 Site Preparation

Site Preparation WorkThe foundation of smooth construction depends on site preparation work. The purpose of construction management control is to plan and organize the construction site in a reasonable way, which includes site cleaning, setting up temporary support facilities (office areas, living areas, material storage areas), establishing construction roads and drainage systems to ensure the smooth opening of traffic between sites and smooth drainage on the pavement; surveying and laying out operations are used to check heights or locations where buildings are located.

3.2 Construction Process Stage

3.2.1 Quality Control

The core work of construction management control during the construction process is quality control. So the quality inspection of construction management control is that a strict system need to be established separately for each procedure, and specific arrangements should also be made. The

inspection and monitoring of such key procedures, as well as concealed works, must be conducted with increased detail to ensure the quality of work meets design requirements and applicable standards. Strengthen the quality control of raw materials and components, strict inspection of incoming materials and parts to prevent unqualified materials and components from entering the construction site three [3].

3.2.2 Schedule Control

Schedule control is a key target of construction management control. Construction management control should arrange the construction schedule according to the construction organization design and schedule plan in an appropriate way. Regular inspections and analysis of the construction schedule should be performed during the construction process, so that factors affecting the project delay can be found in a timely manner and corresponding adjustment measures can be taken to avoid delays in significant work such as increasing personnel, adding equipment and optimizing the current construction plan by coordinating relationships between parties involved in the project.

3.2.3 Cost Control

Cost is a key link in the construction management control. Calculate project costs Management control in construction should realize and establish the necessary cost management system to comprehensively control and account for the costs of the project. Material usage and labor costs should be strictly controlled during real construction, and the arrangement of construction machinery needs to be reasonable so that it can reduce construction costs. The management measures related to change and claims should be strengthened, and the project omission through effective handling of project change and claims procedures in a timely manner [4].

3.2.4 Safety Management

Construction management control involves various aspects, one of which is Safety Management. Construction management control should form a perfect safety management system and land construction site safety management focus. It includes safety training and education of managers and construction workers to improve the awareness of self-protection, the establishment of safety warning signs, providing necessary safety protective equipment and materials such as: safety helmets, security belts, protective nets, perform regular timely inspection to identify and eliminate hidden dangers force measures prevent unsafe accidents.

3.3 Completion Acceptance Stage

3.3.1 Organizing Completion Documents

At the stage of acceptance completion, when construction management should arrange relevant personnel to organize completed documents such as construction drawings, construction records, quality inspection reports, material certificates and so on. These papers are the most appropriate evidence for the acceptance of project completion. Construction management control must prepare the completion documents as complete and accurate to receive acceptance of ultimate project completion [5].

3.3.2 Organizing Completion Acceptance

Construction management control should organize project completion acceptance in accordance with relevant regulations and procedures. Relevant personnel from the construction unit, design unit, and supervision unit should be invited to participate in the completion acceptance to conduct a comprehensive inspection and evaluation of project quality. For issues identified during the acceptance, prompt rectification should be carried out to ensure that the project meets acceptance requirements.

3.3.3 Handling Project Settlement

The progress settlement of the project is one of the last links in construction management control. Construction management control shall manage project settlement by following the construction

contract and applicable regulations. In dealing with project settlement, you should accurately compute the project quantity and project cost to guarantee the rationality and accuracy of project settlement.

4. Problems Faced by Construction Management Control and Solutions

4.1 Problems Faced by Construction Management Control

4.1.1 Uneven Personnel Quality

Many positions are filled within construction projects spanning from front line workers on the job site to project team members with vast differences in personnel quality. However, some of front-line construction workers have not taken systematic professional skill training and don't know about the construction techniques and operational specifications well, thus they may conduct operations that do not conform to requirements or regulations which would affect project quality and safety in construction [6]. Some project managers have some theoretical knowledge but no practical management experience. When the supervisors need to face some complex construction conditions, they may find it hard for scientific and reasonable decision-making abilities, and low efficiency of management. Moreover, there are also some personnel work mentality differences and sense of responsibility pale in contrast to professional dedication, which makes construction management trouble a great deal from ignore.

4.1.2 Incomplete Management Mechanism

A complete management mechanism is an important support for construction management control. However, at present, many construction projects have incomplete management mechanisms with loopholes. The unclear responsibilities and work processes mean that the work is shared between team members to equal effort, which decreases overall efficiency. There exists imperfect evaluation and supervision mechanism appropriate for personnel post work performance, which make it impossible to fully stimulate the enthusiasm of the personnel. The communication and coordination mechanism is not smooth, with departments being slow to respond and transmitting significantly inaccurate information, which causes an increase in work errors as well as a negative impact on the progress of the entire project.

4.1.3 Limited Technical Level

The construction industry is an industry with continuous development, and new technologies, new processes and new materials constantly appear in the market, which puts forward higher technical requirements for the construction enterprise. part Lack of technological innovation ability, inability to use new technology and new process in construction units. They continue to use traditional construction methods and techniques, leading to an overall slower construction process with difficulties ensuring project quality. Most enterprises have thus invested very little in technology development and have few profession technical personal to help the timely acquisition of advanced technologies within the industry which pushes most enterprises behind competitors in even market competition scenarios.

4.1.4 Complex External Environment

Construction projects are embedded in a dynamic and complex environment, determined by the natural environment, policies and regulations, as well as social relations. For natural environment, the bad weather including heavy rains, strong winds and high temperatures can negatively affect construction schedule and quality. In terms of policies and regulations, the frequent promulgation of new national building regulations and related standards may lead to risk exposure for construction enterprises in case they do not timely comprehend and adapt to these changes. In terms of social relations, construction projects may compete and build conflicts with surrounding residents and government departments due to other issues such as noise pollution and traffic jams. These problems can affect the smooth delivery of the project if not managed well.

4.2 Solutions

4.2.1 Strengthening Personnel Training

On the one hand, construction enterprises should further strengthen personnel training in response to the uneven quality of personnel. The systematic training of professional skills should be carried out for front-line construction workers, including construction techniques, operational specifications and safety knowledge, to improve their practical operational skills and the ability to prevent various types of accidents. Training can be done in various ways, including conducting training courses, guidance on the site, and evaluation of practical operation to ensure that construction workers master relevant skills [7]. It is most important that project managers should be trained on management knowledge and skills, and employees are encouraged to participate in industry training and exchange activities to learn advanced management methods and experience. An incentive mechanism can be constructed to reward the exceptional employees and chunky their learning enthusiasm and working motivation.

4.2.2 Improving the Management Mechanism

Solution Implementation , A complete management mechanism is the key to improving the effectiveness of construction management control. A sound management system should be established to clarify job responsibilities and work processes of each department, elaborate and apply detailed work standards and specifications, so as to form the basis for work tasks. A project progress, quality- and safety management system should be developed to ensure that the project develops in accordance with set objectives [8]. Optimize supervision and evaluation methods, establish scientific and reasonable performance assessment system. Personnel work performance should be checked on a regular basis, and the results of assessments linked to salaries, promotions and rewards for employees in order to effectively mobilise enthusiasm. Strengthen the supervision and inspection of project implementation, find out problems as soon as possible, and put forward suggestions on how to solve them in a timely manner, so as to ensure the quality of the project. In order to facilitate the interval and coordination mechanism, there should be a convenient communication channel where information can be communicated easily through an effective information sharing channel from one department to another. Conduct project coordination meetings regularly to resolve any issues related in work and maintain a tight work.

4.2.3 Enhancing Technical Level

Improving the technical level is the main way to enhance the construction management control capability. Construction enterprises should further increase investment in technological research and development, establish technological research and development centers, introduce and cultivate professional technical personnel, and carry out research and application of new technologies, new processes, and new materials. Cooperation with scientific research institutions and universities should be strengthened to jointly carry out technological research and development projects. By leveraging the resources and advantages of scientific research institutions, enterprises can enhance their technological innovation capabilities. Industry-leading new technologies, new processes, and prefabricated building technologies should be actively promoted and applied to improve construction efficiency and quality. Technical personnel should be regularly arranged to participate in technological training and exchange activities to timely understand and grasp the latest technological trends in the industry and continuously improve the enterprise's technical level.

4.2.4 Responding to Changes in the External Environment

For the complex external environment, construction enterprises should adopt effective response measures. In terms of the natural environment, communication with meteorological departments should be strengthened to timely grasp weather changes and implement preventive measures in advance. Before the arrival of adverse weather such as heavy rain and strong winds, outdoor operations should be suspended, and appropriate protection measures should be taken for construction equipment and materials on site. Thus, as to policies and regulations, a system for

tracking of new policies and regulations by the national and local governments that are released should be present within a distribution-compatible shortened time frame wherein they could obtain information on any newly adopted incentives or restrictive measures quickly. The personnel relevant to enterprise construction should be organized for learning and training continuously, to make the enterprise construction activities comply with all current policies and regulations.

5. Conclusion

In conclusion,construction management control is a systematic and complicated work which will encounter all sorts of problems including inconsistent quality of human resources, imperfect management mechanism, low conversion level of technical talents facing complex external environment. Through the four aspects of strengthening personnel training, scientific management mechanism construction, promotion of technical level and response to changes in external environment, we can greatly enhance the control ability in construction and promote engineering projects to smoothly achieve preset goals. Construction enterprises should deeply realize the importance of construction management control work, and constantly explore innovative management methods and means according to the development needs of construction industry, so as to effectively enhance the market competitiveness and economic benefits.

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