

A Brief of the Control of the Construction Period and Cost by the Management Mode of the Owner Unit in the Engineering Construction Impact and Suggestions

Xiaoxiao Chen¹, and Dingyu Ni^{2,*}

¹ The First Affiliated Hospital of Wenzhou Medical University, Wenzhou, 325016, China

² College of Civil Engineering and Architecture, Wenzhou Polytechnic, 325000, Wenzhou, China

*Email: 2021000126@wzpt.edu.cn

Abstract

Construction progress control and investment control are important contents of engineering construction management. For the problems such as the delay of the construction period and the over-estimation of the final account of the project in the current construction.

Keywords

Construction Period Lag; Cost Control; Construction Progress Control.

1. Introduction

There is a close relationship between project investment and project progress control, which is directly related to the vital interests of the owner and the construction unit. Therefore, how to optimize the construction period cost and save the project cost is particularly important.

At present, project cost control has been widely studied and discussed at home and abroad, and many achievements have been achieved. In developed countries, such as the United States, the United Kingdom, Japan and other developed countries, the focus of research is on the management of engineering cost in the whole life cycle of construction projects, and there are many theoretical studies in this area. Whole life cycle cost management was mainly established by some scholars and practitioners in the engineering cost community in the UK and the US in the late 1970s and early 1980s [1-3]. Later, under the direct organization and vigorous promotion of the Royal Institution of Surveyors, extensive and in-depth research and promotion were carried out, and a relatively complete modern engineering cost management theory and method system was formed [4-7]. Since the beginning of the 21st century, in the process of deepening the reform of the market economy system in China, the construction project cost management system has also been gradually improved through continuous adaptation. Qiu Xiuping pointed out that under the condition of market economy, China's engineering cost control needs to strengthen investment control in the decision-making stage and design stage, and form an all-round dynamic cost control mode in the whole process [8]. On the eve of China's entry into the WTO, Dong Shibo analyzed the main gap between China and foreign engineering cost control models [9]. Wu Gang and Jiao Binquan clarified the role of the supervising engineer in cost control in the implementation stage, and pointed out that the supervising engineer can help strengthen the control of construction cost by strengthening construction contract analysis, claim management and settlement control [10]. Huang Xin compares and analyzes the advantages and disadvantages of the quota pricing method, the quota-list transition pricing method and the list pricing method, and points out that the list pricing method will become the mainstream pricing model [11]. Zhang Xueqin and others studied the theory and application of the bill of quantities pricing

model, and proposed to improve the laws and regulations on a macro level, strengthen the construction of cost management associations, and expand the service scope of cost consulting units [12]. Zhen Ruimiao proposed the application of the separation method of quantity and price to determine the project cost, and pointed out that the optimization design in the decision-making stage and the design stage should be strengthened [13]. Sun Xiao carried out a study on cost control in the implementation stage of the project. The research shows that the cost problem in the implementation stage of the project is mainly concentrated in the three links of bidding, construction process and completion settlement. The cost control of these three links should be strengthened to effectively control the implementation. stage cost [14]. An Zaiguo carried out the research on cost control under the project general contracting mode, and proposed to strengthen the contract management, concurrent engineering, and procurement management in the design stage to achieve the purpose of effectively controlling the cost [15]. Peng Hongtao believes that it is very necessary to strengthen the application of follow-up auditing methods in the bill of quantities pricing method. The application of this method can improve the efficiency of capital use and achieve the purpose of effectively controlling the project cost [16]. Zhang Hongbiao analyzed the relationship between the substitution and complementarity between the government and the market, and the relationship between the government and society in the transformation of the pricing basis [17]. Peng Damin and Shen Hua analyzed the problems of uneven development, imperfect system, incomplete facilities, and backward methods in China's engineering cost information management [18]. In 2016, the full implementation of the policy of replacing business tax with value-added tax has had an impact on China's cost and pricing system, resulting in a decrease in project cost. Therefore, measures such as strengthening bidding quotation management, adjusting tax rate, and strengthening contract management need to be taken to effectively control cost [19]. With the development of national science and technology and social and economic progress, China has begun to promote the reform of the construction industry. Advanced technologies such as big data, Internet+, and BIM have unique advantages in improving the level and efficiency of China's engineering costs, and realizing the information management of engineering costs and even the entire life cycle of engineering projects [20].

2. Project Decision-making

2.1 Problems Existing in the Project Decision-making Stage

At present, in the project proposal stage, in order to launch the project as soon as possible, the owner usually does not make in-depth refinement of the project's functional settings. The investment estimation plan is quite simple, and the plan is reported hastily, which often results in project omissions, resulting in frequent design changes after the project starts. The "three sides" phenomenon of design, modification and construction during the construction process greatly affects the overall project construction period.

2.2 Optimization of the Construction Period Plan in the Decision-making Stage of the Project

In the project proposal stage, the owner unit should be forward-looking in the functional settings after completion. The construction period of large-scale projects is generally long. It is necessary to fully consider some functional changes after completion, minimize the functional changes after the project starts, and avoid the "three-sided" phenomenon of design, modification and construction during the construction process, especially For large-scale public construction projects such as hospitals, the development of medical technology and the renewal of medical equipment must be fully considered, and adequate plans must be made for some processes, layouts, and even the total amount of water and electricity reserved.

3. Project Design

3.1 Improve the Understanding of Cost Control in the Design

The designers generally pay more attention to the safety and practicality of the design, emphasize the completion of the design output value, but have insufficient understanding of the economy of the

designed product. According to experience, the design cost is generally less than 1% of the whole process cost of the construction project, but the impact of the design stage on the project cost accounts for more than 75%. The quality of the design directly affects the amount of construction cost and the length of the construction period. According to statistics, the technical and economical design can reduce the project cost by 5%-10%, or even up to 10%-20%. The technical chief engineer of the owner unit should proceed from the actual project, and after communicating with the design institute, on the basis of safety, try to use the upper limit of the safety factor and the standard design scheme as much as possible, not blindly pursue advanced technology, etc., and follow the benefit first, Choose from multiple options.

3.2 Improve the Understanding of Cost Control in the Design

A major design is usually completed by several professionals. Due to insufficient connection with each other, the content of the entire professional system may conflict with each other. As a result, the design content must be repeatedly checked during construction, resulting in a delay in construction. It is recommended that the owner unit make corresponding economic constraints on the economic terms of the design contract. If the cost of design changes (caused by defects in the design itself) exceeds a certain percentage of the total contract price (assuming 6%), a certain design quality deposit will be deducted. , in order to improve the designer's sense of responsibility.

4. Bidding

After the design is completed and before the construction starts, it is the bidding stage of the project construction. Project bidding includes two aspects: equipment and material procurement bidding and construction bidding. The following content only explains the owner's project cost management in project bidding:

- 1) Strictly review the qualifications of bidding units, and conduct on-site inspections if necessary. Prevent construction units with poor construction quality, poor financial status and poor reputation from being mixed into the list of bidding units;
- 2) The owner unit should raise the entry threshold of the investment standard, in order to let the powerful manufacturers and units be shortlisted, and prevent other companies with poor strength from being shortlisted and finally win the bid by lowering the winning price. improve. For example, improve the technical requirements; or increase the bid bond to prevent bid-collision.
- 3) Win the bid at a reasonable and low price. The owner should be aware of the "reasonable low price" of the project, so as to avoid malicious bidding by bidders at a price lower than the cost. Otherwise, the construction and service quality of the construction unit may be discounted after entering the site, or the brand and materials may be constantly required to be changed for various reasons. In order to examine new brands and new materials, the owner had to spend time and energy to conduct market research, which resulted in a delay in the construction period; the supervision unit was unable to implement the investment in the entire project because the bid price was too low, which lowered the quality of supervision services. Supervision and control of progress, quality and safety.

5. Reduction of Construction Period and Construction Cost from the Perspective of Construction Management of the Owner

5.1 Minimize the Number of Materials Supplied by Supplier

In order to save the cost and prevent the construction unit from reducing the quality of the project, the owner often chooses to purchase some engineering materials independently, that is, the materials supplied by A. However, in the actual operation project, the construction party often tries to set up obstacles to the entry of materials because the equipment and materials are not supplied separately. Or because the cooperating fee does not reach the expected amount and refuse to enter the site; or after entering the site, materials and equipment are piled up arbitrarily, resulting in a reduction in the service life of the equipment due to damage to internal parts; or the use of materials is wasteful,

causing Costs increase and state assets are lost. Therefore, the construction unit should reduce the quantity of materials supplied by A for the procurement of engineering materials, so as to prevent the construction unit from reducing the construction quality and increasing the construction cost on the grounds that the materials and equipment are not up to standard.

5.2 The Construction of Public Construction Projects Should be Carried Out by a Professional and Meticulous Team as Much as Possible

For public construction projects, the owners are often the government or public institutions, and the project construction is generally in charge of the infrastructure department of the unit, and the department generally has only a small number of professional engineering personnel. However, for large-scale construction projects, in order to save costs and improve work efficiency, it is recommended to find a project construction company, or set up a headquarters with a clear and detailed division of labor before project construction. Technical Department, Engineering Department, Contract Cost Department and other departments, recruit experienced staff, fully study the contract, drawings, etc. before the start of construction, and the staff positions are relatively fixed, so as to avoid the reduction of work efficiency due to excessive staff turnover.

5.3 Strengthen Management and Establish a Modern Management Model

The headquarters must establish a more effective and scientific management system in terms of technology and personnel system, clarify the responsibility objectives of each person, further improve the management level and save costs.

(1) Establish a special coordination system. 1) During the construction of a large hospital, there are generally many construction units involved. Management can be used to reduce the coordination problems of various majors in the construction, establish a unified leadership with Supplier and supervisors as the mainstay, and set up a general coordination office to coordinate and solve various problems. Cross-coordination between construction units. 2) During the construction, Supplier and the supervisors shall regularly organize coordination meetings to solve the coordination problems during the construction. For more complex parts, a special coordination meeting should be organized before construction, so that the construction unit can further clarify the construction sequence and responsibilities. Before the sub-construction is carried out, a technical coordination meeting will be held, and a drawing review will be held. Questions are raised and implemented during the drawing review. At the same time, during the joint review, the crossover and coordination among various disciplines should also be listed as the focus of work, and the technical problems existing in the design should be further identified, and then the problems should be solved from the drawings, so that the construction team and the team can fully understand the design intention and understand the construction. All links, thereby reducing cross-coordination problems.

(2) Establish a problem responsibility system. As the management personnel of Supplier, first of all, we must fully understand and master the procedures and design requirements of each profession, and urge the supervision unit to supervise the construction unit to supervise the construction unit in accordance with the construction procedures. Whether it is countersignature, joint trial or concealed acceptance, all the established systems must not be a formality, but should be real, or all technical management personnel should be responsible for their own work and signatures.

(3) Establish a performance appraisal system, and there should be incentives for measures to effectively save costs and reduce costs. By improving the "economic" concept of engineering and technical personnel, it is more effective to control costs and save costs in the construction process.

5.4 Strengthen the Overall Management of the Project to Avoid Claims

In the process of project implementation, the contractor's own claims caused by the owner's own reasons also occur frequently. How to effectively avoid the construction unit's claim is also an aspect of controlling the project cost. As far as the actual situation of the current project construction is concerned, the owner fails to provide the corresponding construction conditions as agreed; the construction content of the contract is changed at will; the payment of the project progress payment

is delayed; the owner directly appoints many subcontractors, and the subcontractors often delay Poor engineering or quality, etc., are also the main reasons for the contractor to file a claim. Although there are various reasons for claims, the ultimate purpose is to prolong the construction period and increase the cost, and the extension of the construction period is often accompanied by an increase in the cost. Therefore, in the process of project implementation, strengthening the overall management of the project and regulating the owner's own behavior will play a very important role in controlling the project cost.

5.5 Do a Good Job in Collecting and Sorting Out the Data of All Relevant Factors in the Investment Control in the Construction Stage, and Prepare and Perfect the Conditions for the Smooth Completion of the Settlement and the Reduction of Claims

The project cost control during the construction period belongs to the scope of process control. During this period, the project measurement, visa, change and claim approval of each link control point need to be re-collected and summarized at the time of completion and settlement. In addition, the contractual content that can be converted into price responsibility will be reflected in monetary form after the completion of the project. Handling the collection and sorting of data related to various costs in the construction process will have a multiplier effect on the settlement of the project completion. At the same time, the standardized registration of the receipt and issuance of documents, drawings and other materials should be done in a timely manner, and the content of the documents, the time of sending and receiving, and the person who signed the documents should be specified in detail, which can also effectively avoid part of the construction party's claims and achieve the purpose of counter-claims.

Project cost control involves many aspects of project construction and is closely related to each stage of project construction. Improve the quality of engineering personnel in construction units, enhance economic awareness, and improve technical and economic analysis capabilities, so as to truly save investment costs and avoid waste of state-owned assets.

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