

Project Construction Cost Control under the Mode of Bill of Quantities

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Abstract

Under the bill of quantities pricing model, the price of the contract is determined in advance, making the focus of enterprise project cost management be to control the expenditure of construction costs on the premise of established revenue, reduce the risks brought about by the bill of quantities pricing model, strengthen cost control, give play to the advantages of strategic cost management, and ultimately minimize project risks to maximize the benefits obtained by the enterprise. This paper mainly analyzes the problems existing in the cost control and cost management process of construction enterprises under the bill of quantities pricing mode, and proposes corresponding solutions based on the existing problems, hoping to increase the profits of enterprises from cost control and improve their market competitiveness.

Keywords

Bill of Quantities; Construction Project; Cost Management; Cost Control.

1. Introduction

Engineering cost is the foundation of project decision-making, investment planning, and investment control, and is an important indicator to measure investment benefits. The construction stage is the key link to implement project decision-making, start, end, and effective operation, and is also the largest investment stage in project operation. Engineering construction is an important stage of entity development and use value. During the construction phase, the length of the construction cycle, capital investment, and resource consumption will directly affect the quality management costs of the project. The construction phase is undoubtedly the key stage for controlling costs. Under the bill of quantities pricing model, the price of a contract is determined in advance, making the focus of enterprise project cost management is to control the expenditure of construction costs on the premise of established revenue, reduce the risks brought about by the bill of quantities pricing model, strengthen cost control, give play to the advantages of strategic cost management, ultimately minimize project risks, and maximize the benefits obtained by the enterprise. [1]

2. Overview of Valuation with Bill of Quantities

In the bidding of construction projects, bidders generally list the comprehensive unit price based on the physical bill of quantities and pricing rules of the project in the contract, combined with a series of influencing factors such as their own actual situation and the actual market situation, which is called the bill of quantities. The physical bill of quantities of the project is included in the bidding documents, and is prepared by the tenderee or commissioned by relevant intermediary agencies. It can reflect the physical consumption and measure consumption of the project. In reality, there are generally two forms of contract signing between the contractor and the employer: lump sum contract and unit price contract. The

former refers to the contract signing stage, in which both parties determine the total contract price based on the construction project, and the project construction party completes all project contents under this total price. The latter refers to the determination of the engineering costs of each sub project by the bidder according to the bill of quantities listed in the bidding document for some project projects, so that each link of the entire human engineering is separated, and the risks of each link are also separated. In order to improve their own profits, construction enterprises have to start from reducing costs and improving work efficiency. Therefore, in engineering projects using the bill of quantities pricing method, the latter is obviously more suitable than the former, and unit price contracts can be divided into fixed unit price contracts and adjustable unit price contracts.[2]

(1) Fixed unit price contract. The adoption rate is relatively high, generally led by both parties. The advantage lies in the flexibility of engineering quantity changes, that is, only the unit price of the project is fixed, and the engineering quantity is not fixed. In this way, during the actual construction process, the engineering content or engineering quantity can be appropriately increased according to the actual construction conditions such as geology, weather, labor, and other needs. During settlement, the total engineering price will be finally settled based on the actual engineering quantity.

(2) Adjustable unit price contract. The core is that the contract unit price is not fixed, which is a special situation that is generally noted and specified in the bidding documents. During actual construction, adjustments can be made according to treaty provisions, such as price changes during actual construction. Or when signing a contract, it is temporarily impossible to determine the unit price of certain parts of the project. When the actual project is settled, the actual project total price will be settled based on actual conditions such as market factors and contractual provisions.

3. Overview of Project Cost Control

Project cost control is a management process that ensures that the actual cost of completing a project does not exceed the budgeted cost during the actual implementation of the project, including resource allocation, cost budgeting, and expense control. It is a comprehensive management work involving the control of factors that can cause cost changes before project construction, cost control during project implementation, and control of actual cost changes during project settlement.[3]

Budget, planning, control, adjustment, accounting, analysis, and evaluation are the core contents of project cost management. Budget: Cost budgeting refers to the process of selecting the best cost control plan based on historical data and personal work experience before the construction of a project. It is the rough prototype and foundation of the entire project cost plan. Plan: It is the embryonic form of project cost management responsibility system for construction enterprises, requiring construction departments at all levels to strictly control the cost of each divisional project in a planned manner on the premise of overall project budget. Control: As the core part of project cost management, it runs through the entire process of the project. The specific content is to manage and supervise various actual on-site expenses (labor, materials, machinery costs, etc.) during the project implementation process, timely prevent and correct deficiencies in on-site management, and ensure that the entire project operates on the approximate track of the cost plan. Analysis: The main purpose of analysis is to find out the actual cost changes and their causes during project implementation. Generally, project cost accounting data are used to compare them with the actual costs during the actual construction process, to scientifically analyze the factors that cause cost changes and provide a basis for subsequent assessment stages. Accounting: Calculate the total cost of a project based on the

actual expenses of the project. It is divided into two parts. Firstly, the actual expenditures of each item of the project are collected and classified, and then the actual total cost and unit cost of the construction project are calculated using reasonable and scientific methods based on the collected actual incurred amount. Assessment: Cost assessment refers to summarizing and evaluating the cost management work of construction units at all levels during the construction process according to the cost target responsibility system during or after the completion of a construction project, comparing the actual cost completion with the planned and budgeted cost indicators, assessing the completion of the cost plan, and providing corresponding rewards and punishments. After signing the contract, the bidder should strictly follow the contract price and carry out cost control for each stage of the construction project to achieve true profitability.

4. Problems in Cost Control during Construction Stage

4.1. Negligence in Personnel Management Leads to Cost Waste

During the construction preparation stage, many enterprises will recruit many new personnel to enter the company in order to ensure the smooth progress of the project. These new personnel are directly involved in the construction work without any professional training. Due to lack of construction experience and understanding of the project, a large amount of material is wasted during the construction process. In addition, procurement personnel of enterprises are generally selected because they are trusted. These personnel do not actually understand the details and needs of construction, but only to save money unilaterally for the enterprise. In addition, due to the negligence of personnel from the "trusted" engineering supervision department, some unqualified or unsuitable construction materials entered the construction site, and it was only during the construction process that they were found to be unusable, It is a waste both in terms of shipping costs and materials themselves. In addition, some on-site material management personnel lack professional knowledge and experience, and construction materials are stacked randomly, resulting in some chemical reactions between some materials, resulting in deterioration, damage, and unusable materials, which undoubtedly increases the cost of the project.

4.2. Problems in the Design of Construction Schemes

The final determination of the project construction plan is very complex. After winning the bid, enterprises need to carefully investigate the construction site, combine economic and technical conditions, and develop several sets of effective and feasible plans. These plans can be finally determined through internal screening at various levels. However, in reality, many construction enterprises do not realize the importance of cost planning during the construction preparation period for the entire cost management, and they still start the project immediately after winning the bid, as in the era of planned economy, lacking thorough planning and construction organization design. Therefore, in the project preparation stage, the most reasonable design scheme can be formulated to make the cost control of the entire project more reasonable and complete.

4.3. Problems in the Means and Methods of Cost Control

Currently, due to the lack of systematic construction cost control methods and advanced schemes, the financial department responsible for enterprise cost control, even if the system is very strict, is difficult to play a significant role in actual construction. The basis for enterprise cost control is various types of data and information during construction, but its collection and processing are very difficult. Therefore, it is difficult to grasp and analyze the cost changes during construction, and it is impossible to formulate an effective cost control plan.

4.4. Problems with Design Changes

Some construction enterprises started construction in a hurry due to incomplete procedures and insufficient preparation, resulting in many problems during the construction process. Before construction, it is necessary to ensure that the commencement procedures are complete, the required investment is in place, the construction standards are clear, and the engineering design is qualified. Problems at each stage can lead to a reconsideration of the resulting design. This will increase the amount of inefficient or repetitive labor, extend working hours, and significantly increase project costs.[1]

4.5. Problems in on-site Visa Management

The construction visa is designed to address construction delays. During the construction process, if there are any problems, they can be approved by the on-site responsible person on site, saving approval time and being a favorable condition for construction. However, in the specific operation process, some responsible persons or on-site supervisors do not attach importance to declaration management, are not familiar with relevant management rules and regulations, and do not understand the prior settlement, which has brought many negative impacts to the site through on-site visa management, and also caused confusion in the declaration management during the construction process.[1]

5. Project Cost Control Strategy in the Construction Stage

5.1. Control of Labor Costs

Labor costs account for approximately 15% to 20% of the total project cost, and fluctuate with market changes. Labor costs mainly include the costs of on-site construction management personnel and labor costs. Generally, personnel at the operational level are subject to labor subcontracting, which requires strict control over the amount of work. The second is to improve the overall technical and management level of the labor team, effectively avoid ineffective labor, organize reasonably, and improve overall work efficiency.[4]

5.2. Control of Material Costs

During construction, the cost of materials accounts for approximately 60% to 70% of the entire construction cost, which shows that the control of material costs is the top priority in the entire project cost control. Generally, the control of materials is based on "quantity" and "price". In terms of quantity control, the main pursuit is to save materials and eliminate waste. In addition, in the management of on-site materials, attention should be paid to selecting experienced personnel who are relatively professional and have knowledge of material properties, to prevent chemical reactions and hazardous accidents from occurring in the inventory of materials, resulting in losses. Price control generally refers to controlling procurement. Procurement personnel should be experienced and have a certain amount of scientific knowledge, and have an understanding of the nature of materials and whether they are suitable for the actual construction site, to avoid repeated purchase, return, and waste of materials.[4]

5.3. Control of Machinery Costs

With the rapid development of science and technology, there are more and more shadows of various sizes of machinery in construction. The improvement in the use of mechanical equipment has greatly improved the construction progress and efficiency. Reasonable and scientific management of mechanical equipment has also become an important component of improving production efficiency, reducing costs, and improving enterprise economic benefits. Firstly, it is necessary to control the expenditure of machinery costs, secondly, it is necessary to conduct scientific and effective maintenance of machinery at all times to reduce the expenditure on machinery maintenance, thirdly, it is necessary to have strict requirements for

the operators of machinery, and the operators must have a certain degree of scientific knowledge and literacy to minimize the loss of machinery. Fourthly, it is necessary to establish a professional machinery and equipment management team to conduct comprehensive and scientific maintenance and evaluation of the machinery on the construction site at regular and quantitative intervals.[4]

5.4. Effectively Control Engineering Changes and On-Site Certification

In construction projects, technical changes and visas are inevitable, but they must be effectively controlled. In order to prevent defects in the construction design, in addition to auditing, engineering design inspection and consultation by all parties should be excluded from the drawings. Relevant units need to effectively control project costs around reducing design changes, avoid expanding construction scale through design changes, and comprehensively improve design standards and enrich project construction content. Design change management needs to be improved and controlled as soon as possible. Especially for major design changes that have a significant impact on construction costs, effective control of construction costs must be followed. Review and approve the construction budget based on the actual plan and schedule. If the design cost exceeds the budget, analyze the details, identify the reasons, communicate with the project director, adjust or modify the target control, and dynamically control the project cost.

5.5. Strengthen Project Cost Control

Effective project cost control must establish reasonable plans and arrangements, manage personnel, construction materials, machinery and equipment, and funds, accelerate the progress of project construction, and effectively promote project implementation. When there are problems in the construction of the project, immediately contact the construction unit to choose economical and scientific practical solutions, avoid waste and blindly follow orders, and set specific matters for optimizing investment.

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