ISSN: 2710-0723

Briefly Discuss the Design, Bidding, Construction, Completion and Settlement of Construction Projects Cost Control of the Stage

Jianzhou Shi

Chinese People's Liberation Army Factory 5719 Division, Chengdu, China

Abstract

Cost control in the process of engineering construction is one of the goals of engineering control, this paper takes the whole process of project construction as the starting point, based on practice, lists some examples, and describes the cost control methods of construction projects in the stages of design, bidding and bidding, construction, completion settlement and other stages.

Keywords

Project Cost; Whole Process Control; Control Method.

1. The Whole Process of Project Cost Control

The investment control of engineering projects is related to how to achieve high-quality, efficient and economic benefits of engineering projects. To this day, this has been a topic of unremitting exploration by project cost managers. The implementation of the whole process control of project cost is an effective way to achieve investment control of engineering construction projects. The whole process control of project cost refers to controlling the cost of the construction project within the approved cost limit in the whole process of investment decision-making stage, design stage, bidding stage, construction stage, completion settlement stage, etc., and correcting the deviations at any time to ensure that the goal of project management can be achieved. The whole process cost management requires us to start from the preliminary work of the construction project, carry out all-round reasonable pricing and effective control of the project cost in the whole process, and improve the social and economic benefits of investment. This article will discuss the cost control in the design, bidding, construction, and completion settlement stages.

2. Cost Control in the Design Stage

(1) Characteristics of cost control in the design stage

The cost control in the design stage belongs to the pre-control, and the control at this stage can be countermeasured

The use of gold is maximized and the effect of getting twice the result with half the effort. Statistics show that in the project decision-making stage and design stage, the possibility of affecting the cost of the construction project is 30%-75%, while the possibility of affecting the cost of the construction project in the implementation stage is only 5%-25%. Obviously, the key to controlling the project cost lies in the project decision-making and design stage before the project implementation, and the project decision is the determinant, and the design is the key factor. In the general design stage, efforts should be made to control the estimated budget within the commissioned design investment according to the requirements of the design task book and the provisions of the design contract. The design stage is generally divided into two stages. 1. In the preliminary design stage, prepare the preliminary design estimate according to the preliminary design drawings and specifications and the estimated budget quota. For projects with complex technology and large engineering volume, the technical design stage can

ISSN: 2710-0723

be added[1]; In the construction drawing design stage, the construction drawing budget should be prepared according to the construction drawings, instructions and budget quota, which is used to check whether the cost of the construction drawing stage exceeds the approved preliminary design estimate. The cost of the design stage is mutually restrictive and interconnected, with the former controlling the latter and the latter supplementing the former.

(2) Cost control method in the design stage

The key to cost control is in the design stage, but it has been generally ignored for a long time

The cost control at this stage, and the main focus on the construction stage to review the construction drawing budget, construction and safety project settlement, etc., resulting in the project cost remains high, resulting in the phenomenon of overestimation of budget estimate, budget overestimate, and settlement over budget. In practice, the cost of the project will vary greatly depending on the construction scheme, the design standards, the materials selected, and the structural forms used. Therefore, in the design stage, the value engineering theory can be used to compare the design scheme economically and put forward opinions on unreasonable design, so as to effectively control the scale of investment and save investment. For example, there are many differences between brick concrete buildings and frame structure buildings, generally the steel content of brick concrete structure is ≤25kg/m2, while the steel content of frame structure is ≤50kg/m2. For deep foundation buildings, box (basement) foundations can be considered to improve the utilization rate of buildings and achieve the purpose of saving. Choosing a reasonable design scheme can significantly reduce the investment cost.

In the design stage, the owner, designers, and cost control personnel should cooperate closely. First of all, designers should implement design standards and specifications, adopt standard design, and formulate reasonable design plans. Establish a cost control system, implement quota design at each stage of design, and compare and select the schemes at each stage, so that the final plan meets the control objectives and meets the requirements of the owner. For example, in the scheme design of a commercial and residential building project in Pengzhou City, there are two options to choose from: the first scheme is a brick-concrete structure, and the second option is an internal pouring and external masonry structure. The brick concrete structure is adopted, the outer wall is a 370mm thick clay brick wall, and the inner wall is a 240mm thick clay brick wall; The outer wall is a 240mm thick hollow brick wall with an insulation layer, and the inner horizontal wall is 140mm thick and the inner longitudinal wall is 160mm thick C20 concrete. During the design, the two schemes were compared with the use area, the cost per unit area and the total selling price converted into the used area, and the result was that the second option was about 3% more income, and finally the second option was chosen. Quota design is one of the effective ways to control the cost in the design stage, but the goal of the quota should be reasonable, otherwise the quota will lose its due role.

The construction drawing review system that has been implemented in recent years is also one of the methods of cost control in the design stage. However, the current drawing review agency only reviews the correctness of the design documents, but does not review whether the design is the best and optimal, so that the cost control effect of this method is not particularly obvious.

3. Cost Control in the Bidding Stage

(1) Close the praise bid and select the winning bidder with a reasonable low price

In actual bidding, different contractors will naturally produce different quotations, and the bidding quotations not higher than the bid base are generally not considered, and the bidding quotations below the bid base should be treated differently. Experts and owners can compare and review the bidding materials through the comprehensive analysis of the bid base, benchmark price and quotation, and select a reasonable and reliable minimum quotation as the winning bidder. The bid price below the cost price should be rejected by one vote. Because once

ISSN: 2710-0723

the bid is won, it will cut corners and reduce costs by any means during the construction process, causing harm to the project and leaving hidden dangers[2].

(2) Limit subcontracting, eliminate subcontracting, and strengthen the project legal person responsibility system

At present, some contractors rely on low prices to win the bid, and then subcontract the project to other low-qualified enterprises or individual construction teams, from which they charge management fees, which will invisibly increase the project cost. Such illegal subcontracting and subcontracting should be seriously dealt with by administrative law enforcement.

4. Cost Control in the Construction Stage Cost

Cost control in the construction stage Cost control in the construction stage belongs to the control in the event, which is the longest-lasting, most complex and changeable stage, which requires cost control personnel to often go deep into the site to understand and check the implementation of the project, and strictly verify. Cost control at this stage should pay attention to the following aspects:

(1) Visa control

In the settlement process, there are often many non-standardized, incomplete and non-compliant economic visas that do not meet the requirements of mandatory specifications, and even some construction units take advantage of the owner's lack of understanding of the construction process and quota to increase the content of the project visa at will, which can be avoided through the control of the counterfeiter on the site, the specific methods are: 1. The engineering changes proposed by the owner and the design unit should be verified and determined by the cost control personnel, and then the project change visa should be carried out; Visas will not be granted for the construction unit's own reasons. 2. During the construction process, for the hidden project, the cost personnel should work with the owner, the supervisor and the construction unit to provide the same measurement and determination in time; For the project acceptance record, the cost control personnel should strictly verify and grant a visa after confirming that it is correct, and will not grant a visa if it does not meet the specifications and is unreasonable.

(2) Material cost control

The material cost of construction projects generally accounts for more than 60% of the entire construction and safety cost, and the price of materials will fluctuate in a certain period of time, so the control should pay attention to the following aspects: 1. In the process of material procurement, it is necessary to make full use of the advantages of the information age, pay attention toresource sharing, even if you master the industry information, be familiar with the price of common materials, you can consider the selection of appropriate materials from the aspects of practicality, beauty, high quality, low price, etc., and sign the relevant order contract. For bulk materials such as cement and steel, it is necessary to carefully analyze the price trend and choose the right purchase time to reduce costs. 2. A series of reward and punishment systems should be formulated in the process of material use to encourage the rational use of materials, reduce waste and save costs.

(3) Contract control

Contracts play a very important role in cost control, and as a cost manager of the construction party, they must fully understand and be familiar with the terms of the contract. On the one hand, it is necessary to use the contract clauses to resolve disputes over project cost at any time to avoid claims; On the other hand, if the construction unit fails to perform or does not fully perform the agreed obligations, it can also file a claim against the construction unit to reduce its own losses and costs. For example, the construction organization design and schedule

ISSN: 2710-0723

formulated by the construction unit in the bidding documents can be used to compare with the actual project, eliminate the unreasonable requirements put forward by the construction unit, avoid the occurrence of over-allocation of project funds, and ensure that the progress funds are paid in a timely manner according to the contract.

5. Cost Control in the Completion and Settlement Stage

The cost control in the completion settlement stage is a post-event control, which is the final control of the project cost, and it is necessary to put an end to overestimation, false calculation, and random review, so as to ensure that the project cost is accurately reflected and true. Cost control at this stage should pay attention to the following aspects:

(1)In-depth on-site audit of the project quantity The project quantity is the basis of the project cost calculation, the accuracy of the project quantity is one of the important factors affecting the completion settlement, and the project quantity in the actual work is also an important link in the construction unit to calculate the project cost. The author believes that the audit of the project quantity should pay attention to the following aspects: the calculation of earthwork and rock should pay attention to the determination of the excavation depth, and the personnel participating in the on-site measurement should sign and approve; The calculation of masonry engineering quantity should pay attention to whether door and window openings, beams, columns, etc. are deducted; Reinforced concrete projects should pay attention to deducting the overlapping parts of columns, beams and slabs; The steel bar engineering should pay attention to the overlap and hook length of the steel bars, the spacing between beams and columns, the bottom bars of the plate, and the number of ribs distributed by the plate. the number of various prefabricated components[3]; The decoration project should be combined with the drawings and the site to review whether the places that should be deducted are deducted.

(2) Review of the reasonableness of material price difference The material price review mainly examines whether the unit price of steel, wall, cement, wood and other main materials is reasonable, which constitutes an important part of the project cost. At present, the price of building materials varies due to factors such as time, origin, and quality, and the construction unit often fills up the price of materials with inferior goods in the completion settlement. The material price can be reasonably determined according to the following methods: First, based on the price information provided by the municipal cost station, on the basis of accurately determining the construction date, adjust the material difference according to the weighted average price of the entire construction cycle span; Second, for materials that do not publish the guide price in the price information and the construction unit does not participate in the purchase, the invoice provided by the construction unit should not be used as the basis for pricing, but should be conducted to conduct market research and adjust the material price difference through tripartite investigation.

(3) Review of hidden acceptance records The main content of the acceptance is whether the drawings meet the design and quality requirements, and the design requirements include the components of the project cost that meet or meet the design requirements of the drawings, which means that the cost meets or meets the design requirements. Therefore, making a good record of concealed project acceptance is the prerequisite for project settlement. At present, there is no acceptance record of hidden projects in many construction projects, and the construction company only finds relevant personnel to make up the records when the completion is settled, and then included in the settlement. Some even do not even occur and are included in the settlement, this kind of hidden project acceptance record not only has serious quality hazards, but also increases the cost of the project, and there is serious corruption and corruption, therefore, when reviewing the price of the hidden project, the completeness and legality of the acceptance record procedures must be strictly reviewed. In addition to the

ISSN: 2710-0723

signature and approval of relevant personnel on the acceptance record, it should also be stamped with the official seal of the construction unit and indicate the date of the record to prevent the occurrence of re-issuance or false records after the fact, and effectively control the project cost.

(4) Review of design change visa The design change shall be issued by the original design unit with a design change notice and modified drawings, signed by the design and proofreading personnel and stamped with the official seal, and reviewed and approved by the construction unit and the supervising engineer. Major design changes should be approved by the original approval department, otherwise they should not be included in the settlement. When reviewing design changes, in addition to complete change procedures, it is also necessary to pay attention to the calculation of engineering quantities, adjust the calculated engineering quantities, and do not meet the requirements of the change procedures cannot be included in the settlement.

(5) Review the application of project quotas

High quota is a common phenomenon in the settlement of projects by construction units, especially in the category of earthwork and stone, mortar labeling of masonry, concrete, painting and other sub-projects, the construction unit often sets quotas high or low. Therefore, the review set of quotas should be based on the on-site visa records of the construction unit and the as-built drawings signed and approved by the builder, comprehensively consider the quality of the project, and accurately apply the quota.

Review the calculation of various costs The fee standard for construction and installation projects shall be in accordance with the contract requirements or the construction and safety project cost quota and relevant regulations used in conjunction with the pricing quota during the project construction period. During the review, it should be reviewed whether the rates, price indexes or conversion coefficients are correct, whether the price difference adjustment calculation meets the requirements, and the following points should be paid attention to when verifying the cost calculation procedures: whether the determination of the fee collection standard is consistent with the regional classification project category; whether the fee quota is matched with the adopted budget quota; According to the regulations, some visas should be placed in the independent fee, whether it is included in the fixed direct fee to calculate the fee; whether there are any expenses that should not be calculated; whether the expenses are calculated in accordance with the provisions of the relevant national and local adjustment and settlement documents. whether there are any omissions in the expense accounting; whether the construction enterprise qualification level fee collection project is affiliated with the high set phenomenon; whether the unit price of labor costs is arbitrarily adjusted, etc.

(7) Prevent various calculation errors The completion settlement of the project is a very meticulous work, due to the large number of sub-items of the settlement, the workload is large, the content is complicated, there are inevitably one or another calculation error, but many errors are overcalculated. Therefore, it is necessary to carefully account for each item in the settlement to achieve horizontal and vertical calculations to prevent overcalculation or undercounting of project prices due to calculation errors. The problems analyzed above are only the most common problems encountered by the author in my work, but in fact they are far more than these problems. In short, to do a good job in the completion settlement review work and control the project cost, not only need the auditors to have high professional quality and rich audit experience, but also need to have good professional ethics and high ideological awareness, but also need the active cooperation of the construction unit, the supervising engineer and the construction unit and other three aspects of the personnel, the information issued should be true and reliable, only in this way can the project completion settlement work be carried out smoothly, reduce the disputes between the two parties, and comprehensively and truly reflect the reasonable project cost of the construction project. Maintain the economic

ISSN: 2710-0723

interests of construction units and construction units, so that our country's current construction market can operate in a more standardized and orderly manner.

6. Conclusion

To sum up, the whole process control of project cost is a comprehensive science integrating technology, economy and management. The design and bidding stages are controlled in advance, which is the focus of the whole process of project cost control; The construction stage is controlled during the event and is the core of the whole process control of the project cost. The completion settlement stage is the final result of the whole process of project cost control. The concept of pre-active control of project cost throughout the whole process of construction project management is the basis for achieving control goals. The cost system of the whole process of construction projects is not only conducive to strengthening the cost management in the construction stage, but also helps to strengthen the cost management in the investment decision-making stage and the design stage, so as to promote the continuous improvement of investment management and improve investment efficiency.

References

[1] Hongbiao Zhang. (2019). Discussion on the Bill of Quantities Pricing Specification for Construction Projects.Engineering Cost Management, 24-29.

[2] Baosheng Zhao.(2018).Some Thoughts on the Adjustment of Policy-based Labor Costs during List Pricing Settlement. Engineering Cost Management, 69-72.

[3] Liyun Liu, Xiao Shi, Mingyu Zhao, Zhoudong Ning.(2024)Discussion on the Compilation Method of the Highest Bid Limit Price for Construction Specialized Equipment Projects. . Engineering Cost Management, 33-38.