

Analysis of Key Points and Countermeasures for Cost Control in Construction Engineering Management

Jingjing Zheng

Anhui Hongzhi Construction Group Co., Ltd., Hefei, Anhui, 230000, China

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Abstract: In the new market environment, the construction industry is undergoing transformation, and market competition is fierce. Engineering cost management has become one of the essential factors affecting a company's competitiveness. In light of the current situation of construction engineering (such as economic chaos control, no real-time monitoring), this paper conducted data collection and further research to put forward a systematic rectification method for cost management. Based on the key factors from design, procurement construction to completion and put forward countermeasures of strengthening construction engineering management and control. At each control level, different techniques are employed to achieve cost control.

1. Introduction

The construction enterprise is under increasing pressure as the market matures. The production of quality products has become an important aspect which ultimately decides whether the construction enterprises can have a competitive advantage or not in this era of low funds. Enterprises should put refined cost management concept into practice during the construction process, carefully analyze and study funds needed for projects to ensure rational use of funds. It includes predicting costs, creating budgets, and how you plan to spend the project funds. Its beneficial and extractive scientific use of construction project cost data contributes to a better balance between revenue growth, capital- or spending reduction with quality and safety operational imperativeness. Only by relying on scientific methods and technological innovation to continuously strengthen the level of project cost management can modern construction enterprises gain a firm foothold in the fierce market competition, drive sustainable and stable development of the enterprise.

2. Key Points of Cost Control in Construction Engineering Management

2.1 Key Points of Design Cost Control

In the design stage, cost control is an important step in engineering management; a reasonable design can bring huge cost savings to subsequent construction projects and operation links. Optimizing the building plan can lower project costs by a large margin. To avoid design rework and increased costs due to design errors and improper design methods caused by excessive or unreasonable changes, strict control of the change of design variety is required to go through the agreement process on the application for a change of design. At the same time, high-tech comprehensive modeling of the entire project from design to completion can be carried out, improving the accuracy of the design, the accuracy of material selection and reducing consumption. In addition, investment estimates for both preliminary designs and construction drawings should be made to balance between structural reliability and economy ^[1-2]. Also need to build unified design specifications, clarify cost requirements, avoid over-design and excessive functions, and improve investment efficiency. Meanwhile, communication and coordination between departments should be strengthened to ensure that the architectural department, structural department, electromechanical department and other departments are closely linked, reduce interface conflicts, make the project feasible at a low cost in the early stage of design level to avoid excessive investment in later stages

construction due to insufficient preliminary design ^[3].

2.2 Key Points of Procurement Cost Control

Procurement work for construction projects is found as one of the key links determining the cost of materials & equipment. Overall project cost can be saved by optimizing the procurement work. Fundamentally, we should weigh factors such as quality and price, delivery time and service guarantee when selecting suppliers, establish a complete set of supplier evaluation and entry mechanism to effectively avoid procurement risks. Centralized procurement may leverage economies of scale to realize better unit prices, lessen process links and increase the effectiveness in capital application ^[4]. The procurement strategy should closely follow the construction of the process, and at the same time to achieve the optimal procurement batching and quantity so as not too much procurement generates warehousing costs, occupy funds. When entering contracts, contracting parties should define a pricing formula that enables the risk evaluation and management of the procurement contingencies due to price fluctuations in the market, particularly considering whether this bulk item price affects their larger project bundle prices. For example, during the process of raw material procurement, following raw material testing methods meeting design requirements guarantees that the purchased products meet design standards, and this also avoids repair and replacement costs brought by product defects. In addition, in order to reserve the possibility of improving construction quality and reducing future operating costs, it is suggested to adopt green, energy saving and new building materials ^[5].

2.3 Key Points of Construction Cost Control

It is also important to make good and scientific scheduling of manpower, materials and equipment and other resources as much as possible at this moment in the construction stage, because the investment cost is large. From this point, it is necessary to co-ordinate and optimize the construction process in order not to result in human waste or dual operation and improve the utilization rate of manpower. From the aspect of material cost: it should follow the principle that quota materials should be requisitioned, and supplement materials as per project progress to avoid excessive consumption of materials and waste ^[6]. During the same time, we must intensify on-site supervision to minimize waste caused by unqualified storage. We must control the use frequency of equipment, coordinate the rational arrangement and allocation to avoid idle scrap and waste and secondary investment, eliminate equipment fault rate by conducting regular maintenance works in order to reduce subsequent maintenance operation cost. On the one hand, information technology means (for example, using BIM + smart construction sites) can also be used to obtain real-time data analysis which is advantageous to enhance the solution specialization and control of cost ^[7].

2.4 Key Points of Acceptance Cost Control

After the construction is completed, all cost information generated should be sorted out so that all data meet the pre-set budget standards (including checking problems in settlement stage and analyzing reasons for differences), forming an effective feedback mechanism to guide later construction projects. Also, the increase or decrease in engineering quantities must be strictly checked against the contract to avoid unnecessary problems, disputes and increases in costs due to wrong values during settlement. When processing data, standardized standards should be adopted to facilitate operation and maintenance management in the later stage ^[8]. On the other hand, in order to prolong the life of the building service and less bad equipment management mode, energy consumption reduction or maintenance improvement work must be modified. End, post-construction cost control not only concerns the long-term direct benefits of a project end, but also determines the overall benefits of an enterprise over a long period. Under the condition of reasonable formulation of business plans, the economic benefits of assets can be significantly improved to ensure the optimal cost effect throughout the entire life cycle ^[9].

3. Optimization Countermeasures for Cost Control in Construction Engineering Management

3.1 Improve Budget Preparation for Cost Control

Firstly, implement whole-life-cycle management, including all cost expenses from planning, design, construction to operation and maintenance, and conduct a comprehensive assessment to avoid under-budgeting or omission in cost estimation. Analyze the cost structure of the budget at each stage, predict possible additional cost expenses, and preset countermeasures as early as possible. For example, there is a possibility of cost increase in the use of building materials, so when writing the budget, continuous cost considerations should be taken into account to support the long-term economic development strategy of the project. It is necessary to ensure that the project budget includes not only the investment during the construction period but also various costs of the building during the operation period, and establish a more comprehensive and reasonable budget system.

Secondly, make accurate predictions, which refer to a comprehensive assessment of market demand surveys, accumulated project experience, and the current economic situation. By investigating and analyzing the old status of comparable ventures progressively, a wide scope of costs can be enhanced with more prominent accuracy. Simultaneously, cost budgeting should adapt to market changes (changing S & P prices or changing labor costs), etc. In contrast, the prices of building materials like steel or cement are sensitive to changes in supply and demand conditions on the world market. So, need to formulate the range of adjustment when preparing cost budgeted, and according to the special needs of the project and local market conditions determine to use in the cost budget information is up-to-date so that estimates can guarantee accuracy.

Finally, plan the budget scientifically. These projects at different stages will require different cost requirements. So, when preparing and designing the budget, reasonable funds should be allocated according to different actual situations to prevent problems such as excessive fund concentration or uneven distribution of funds. During the construction period, there are many costs incurred such as purchasing raw materials and equipment for lease. Then, more expenditures are incurred for operation and maintenance after the project. Not to make any large amount of investment in the early stage to cause the later stage insufficient fund, normal flow and reasonable allocation of funds due to high capital input. On the contrary, you should gradually pay them according to different construction progress and practical needs.

3.2 Optimize Construction Cost Control

Firstly, establish a dynamic cost monitoring mechanism. The stage where cost dynamics are most obvious is the construction stage of the project, so it is particularly crucial to implement an efficient dynamic cost monitoring mechanism. For the cost data obtained by mining with natural science and technology means, managers can carry out monitoring and statistics in advance — Including raw material costs, labor costs, machinery rental costs (etc.) related to the project. This kind of method allows real-time understanding of the fund investment situation under management while adjusting timely when problems are found. For instance, when the price of a certain material in the project suddenly rises sharply, the dynamic monitoring mechanism can immediately perceive it and conduct practical adjustments to the purchase strategy accordingly. This lowers the likelihood of overspending the budget and increases transparency and controllability of financial control during the project process.

Second, the control of material cost and labor cost is very critical, where labor costs can consider 30%-60% of the total project cost. The limited use, storage and purchase of materials enables effective control over resource costs and ultimately reduce waste in funds. With respect to material procurement, an optimization of process control prevents losses from overstocking or improper storage, associated with cost savings in addition. For labor, by establishing a direct correlation between the amount of work done and completed with salary based on the various factors such as workload, weekly working hours, and skill levels for all employees enabling a decent task list that allows everyone to maximize their potential while designing an automatic mechanism that reduces costs from overtime pay in order to control useless monetary outflows.

Last but not least, real-time construction progress and cost control. Changes during the construction planning due to changes in weather, machinery breakdown or even plan changes lead to a change in the project process and thus an increase in funds. This scenario can be avoided by establishing a management system which connects the project progress with project funds. In this way, whenever a project progress change occurs, its associated cost plans can also be immediately adjusted to realize the maximum utilization value of the project cost.

3.3 Introduce Modern Information Technology

Benefits of using modern information technology means for cost budgeting and cost management in construction engineering projects. It can improve the accuracy of cost forecasting, implement price management in a comprehensive and detailed manner for construction projects, and provide real-time assistance for project management. Construction enterprises should further strengthen their internal information construction, establish a sequence of databases, continue to collect, process and analyze construction data and market data. They should understand and control the price trends of various building materials and labor and conduct real-time monitoring of important factors affecting cost budget control, fully demonstrating the advantages of information management, enabling cost budget managers to better tap the value of information and improve the efficiency of using information. In addition, a cost budget management platform can be established with modules as units. The platform has many functional modules, which are conducive to connecting various units, aggregating all resources, and enabling smoother communication among departments through information management. It clarifies responsibilities and jointly carries out cost budget supervision work, disperses the risks in project construction, and ultimately improves the project investment return rate.

3.4 Optimize the Salary System

For construction enterprises, the salary system in each project must be scientific and reasonable. Firstly, attention should be paid to human resource management, especially the optimization of the workforce. An advanced project management backbone team should be built, and a clear and transparent project management system and assessment and reward standards should be established so that everyone has clear task responsibilities and can receive reasonable salary rewards. Secondly, it should be understood that improving the salary system is to mobilize the enthusiasm of employees. Construction enterprises should formulate reasonable and fair wage distribution regulations and salary standards to ensure the equality and fairness of the salary system, avoid construction enterprise with employees engaged in disputes. The development of common prosperity & the construction and construction industries can be promoted by linking the income of employees with their contributions. Third, performance appraisals should be consistent and construction enterprises need to ensure this. In the actual situation, there must be a true and clear-cut analysis of the performance of each employee's work results, and employees should get certain rewards or punishments according to their own performance, so that they can develop in a positive direction. It will enable the enterprise to be more powerful in controlling labor cost spending, and finally, labor contract control improves construction enterprise profits while realizing a win-win situation between construction enterprises and employees.

4. Conclusion

In summary, at present, construction enterprises developing in the new era have developed a certain degree of attention to construction cost management and construction cost control. Many of these facets are complicated factors. At this stage, it should exert the comprehensive management concept a foundation on the system of measure systems, advanced information project technology effectively integrate into to effect cost control practice and select accurately pre design plan and treat design change with severe prudence. In this paper, the strategy points of cost management in construction projects are introduced and a set of effective implementation methods for optimizing strategies is proposed to improve the profit margin level of construction projects and reduce

enterprise operating costs. Advancing continuous progression in not only effective but also innovative construction cost management is favourable for construction enterprises to achieve higher financial returns, forcing law firms with unrelenting power of progress and thus attaining high-efficiency development.

References

- [1] Wang Geng. Analysis of Key Points and Countermeasures for Cost Control in Construction Engineering Management [J]. China Science and Technology Journal Database Industrial A, 2022(5): 3.
- [2] Hu Xibin, Pan Haifeng. Analysis of Key Points and Countermeasures for Cost Control in Construction Engineering Management [J]. Security Science and Technology, 2021, 000(1): 123-123.
- [3] Xu Jun. Common Problems and Countermeasures for Cost Control in Construction Engineering Projects [J]. China Market, 2024(20): 150-153.
- [4] Lu Shi. Key Points and Countermeasures for Cost Control in Construction Engineering Management [J]. Modern Property, 2023(4).
- [5] Li Xingchen. Cost Control Measures and Countermeasures in Construction Engineering Project Management [J]. Construction Engineering and Management, 2023(4).
- [6] Tian Kun. Current Situation, Problems, and Countermeasures of Cost Control in Construction Engineering Projects [J]. Architectural Design Management, 2023(12).
- [7] Lin Miaoqun. Cost Control Countermeasures for Construction Engineering Budgets in Construction Engineering Costs [J]. Architectural Design & Research, 2022, 3(5).
- [8] Li Guozheng. Discussion on Common Problems and Countermeasures in Construction Engineering Cost Control [J]. Building Materials Development Orientation, 2023, 21(1): 43-45.
- [9] Bao Yi. Analysis of Cost Control Problems and Countermeasures in Construction Engineering Project Management [J]. Decoration and Renovation World, 2023(10).