



# On the Cost Control in the Whole Process of Project Cost

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**Abstract:** Cost control runs through the whole process of project cost. This paper analyzes and summarizes the common problems of cost control from the perspective of the whole process, and points out specific cost control measures to systematically control the three-over phenomenon to reduce risks and improve benefits, and better meet people's needs for high-quality living.

**Keywords:** project cost, problem, measure

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The problem of flatness and cracking of the exterior wall of prefabricated houses is a new problem in the development of prefabricated houses, and it is gradually developing into a common quality problem that plagues engineers and owners. We need to systematically analyze the cause of the problem, and carry out prevention and governance in an all-round way from the designer, component processing, general contract installation, and professional contracting of exterior decoration. It is necessary to improve the standardization level from in-depth design, component manufacturing, installation process, exterior wall decoration, etc., in order to fundamentally solve this problem. Now, the cause analysis, preventive measures and treatment countermeasures of the prefabricated exterior wall problem are discussed in detail.

## 1. Principle of cost control

### 1.1 The principle of system control

Project construction is divided into investment decision-making stage, planning and design stage, bidding and construction stage, and settlement stage according to stages. According to the components, there are land cost, construction and installation cost, public supporting construction cost, management fee capital cost, etc., which are divided into different stages. For the process of project investment estimation (decision-making stage), project budget estimate (design stage), bidding control price (bidding stage), construction budget (construction stage), project settlement (settlement stage) and completion final account (delivery management unit), etc. The management process is divided into pre-control, in-process and post-control. Cost control also requires systematic thinking in the whole process, in all directions, and gradually deepening, in order to do a good job in cost control at each stage.

### 1.2 The principle of target control

Scientific evaluation determines the project cost control objectives, and with the deepening of construction, refines the control objectives; at the same time, the cost control is used as an important means and support for quality control, safety management, and progress control, effectively promoting or restricting other related management work.

### 1.3 The principle of risk control

Systematically analyze and estimate project risks, and focus on major risk factors, highlight control measures, and actively control project costs by reducing, decomposing, and transferring.

## 2. Common problems of cost management at different stages

### 2.1 Common problems of cost management in decision-making stage

The decision-making stage mainly locates the service group of the building, determines the grade and taste of the building, the investment of the project, and also determines the rental and sale price of the project property. According to statistics, the decision-making stage has a greater impact on the cost, more than 70%. Common problems with this process are as follows. (1) The positioning of the project is inaccurate and imperfect. (2) The project equipment standards, decoration standards, and public facilities do not match the project positioning. The landscaping of some state-owned

investment projects is not much different from that of high-end real estates; the facades of some privately-owned projects can achieve stone curtain wall, metal aluminum curtain wall, interior decoration and greening and gardening are only a few hundred yuan, and the cost is extremely simple. (3) The project's power supply, water supply, central control room, and boiler room are inconsistent with the project construction plan, resulting in unusable unit projects that have been completed early. Temporary replacement equipment still needs to be built, and capital investment is large.

## **2.2 Common problems of cost management in the design stage**

According to statistics, the design fee accounts for less than 2% of the investment, but this link has a greater impact on the cost. Design changes and other methods are used for cost management at this stage. Summarize the problems that often arise in the project as follows.

- (1) Building plane function adjustment. Often occurs such as: structural reinforcement, rework, demolition and reconstruction.
- (2) The adjustment of building decoration and decoration, resulting in rework and secondary construction.
- (3) Adjust the grade of construction equipment, dismantle and repurchase, and install better equipment for the second time.
- (4) The doors and windows do not match the opening, and they can be opened but cannot be opened, resulting in secondary production costs.
- (5) The water, electricity and gas points are inappropriately reserved, interact with each other, and the kitchen electrical points are too few, resulting in later demolition and modification.
- (6) There are errors, mistakes, touches and omissions in the design.
- (7) The specific design scheme is unreasonable and cannot meet the requirements of sound insulation, heat insulation, environmental protection, flame retardant and other requirements of the standard.

## **2.3 The common problems of cost management in the bidding stage**

The influence of the bidding stage on the cost is 10%-15%. A good bidding will recruit powerful units at a reasonable price, rather than winning the bid at the lowest price; common problems are as follows.

- (1) The construction was won at a low price, the construction site performance was not in place, and the construction quality was difficult to guarantee.
- (2) Party A often uses nail subcontracting, nail equipment, and nail subcontracting to save costs, resulting in illegal subcontracting often being dealt with by the competent authorities.
- (3) The depth of the drawings is not enough, and the content is only imperfect, resulting in the omission of items in the list. For example, the use of preliminary drawings or schematic design drawings for bidding means that the depth of the design drawings does not meet the requirements of the construction drawings, resulting in missing items or inaccurate engineering quantities by the list compilers. For example, the large-scale drawing is only a schematic diagram of the method, without materials, specifications, dimensions and text descriptions.
- (4) Bidding units of different grades bid on the same stage, resulting in unreasonable bidding.
- (5) The division of the bidding section is too large and the construction force is insufficient, which is not conducive to the progress management.
- (6) The contract interface is not clear and specific, and there are many disputes in the later construction. For example, the interface between the CFG pile and the earthwork, the glue on the inside and outside of the outer window is for decoration or the outer window, the security door is blocked around, and the wooden door sleeve is closed around the edge.
- (7) The budgetary personnel have no construction experience, and the description of the features of the bill of quantities is often unclear, the description of the content is not detailed or even omitted; the division of the contract interface is not carefully planned, and the content of the list is not well connected.
- (8) Many people who use simulation list bidding have huge deviations in the amount of work, and the progress payment in the process is not enough.
- (9) The general contractor cooperation fee is not detailed in the bidding documents, and no penalty will be imposed if the general contractor fails to cooperate or does not cooperate properly in the later stage.
- (10) The responsibility system for design changes is not clear during design bidding. If there is no contractual agreement on the amount of change in design responsibility, there are no restrictions on excessive changes.
- (11) The payment ratio stipulated in the contract is too low. Some consulting contracts are paid up to 60% before the completion and delivery, and the construction cost is about 70% of the completed amount, which brings great difficulty to the operation of the enterprise.
- (12) Bid rigging to drive up the bid price.

(13) The bidder bids maliciously and cannot perform the contract normally after winning the bid.

(14) The review of the bill of quantities is seriously lacking [1].

## 2.4 Common problems of construction cost control

Timely and accurate cost control in the construction process is an important in-process control of cost control, and it is also the fundamental guarantee for the construction unit to complete the construction. Too tight or too loose cost control is not conducive to the high-quality and smooth progress of project construction. Problems often arise with this process:

(1) The contract should specify the payment ratio of safe and civilized construction costs, and the payment conditions are not clear; the process payment should be clearly defined as the completed amount of the image progress or the completed amount of qualified projects under supervision;

(2) The lack of a clear understanding of the process and the omission of items in the list have resulted in an increase in the number of construction change visas. Contract practice generally tends to pay for project change visas at the time of completion and settlement, which brings great financial pressure to the construction unit.

(3) Due to the large discrepancy between the re-measured quantities of both Party A and Party B, the completed quantities cannot be measured smoothly, resulting in great financial pressure on the construction unit.

(4) The approval process for changing the visa is too long, and the change is often implemented according to the electronic version first. Often there is no formal change before the construction, and the change visa is still being processed after the completion of the construction.

(5) In a few cases, the negotiation was an oral order from the construction party, and the supervisor was not notified.

(6) The visa was not allowed to be recognized at the time, and the supervisor signed it afterward;

(7) The implementation of the change visa is completed, and the acceptance process for the change visa has not been established for the on-site implementation.

(8) Insufficient visa certification materials, falsely reporting the amount of work or workload;

(9) The quantity of relevant personnel, materials, and engineering quantities was not timely delivered when the claim occurred.

(10) Supervision and approval of large funds should be directly approved by effective communication with the construction party.

(11) If the material difference is adjusted by time, item and time period, or by the average index, it will be handled in strict accordance with the contract.

## 2.5 Common problems in cost control of completion settlement

Completion settlement is very important to both parties A and B, and it is an important gate for Party A to control the three supercharges; for the construction unit, the final profit data of the project shows the economic benefits of the project. The problems that often occur in the project are as follows:

(1) The settlement information is not complete, the time is too long, and some projects cannot be settled within two years;

(2) The list of the total price contract is missing items, and it is difficult to negotiate;

(3) Visa and claims are very different, and the project payment cannot be agreed.

(4) The basis of material price adjustment and the agreed risk assumption are not clear;

(5) The price of labor costs is adjusted, and the risk bearing is not clear.

## 3. Discussion on cost control measures

### 3.1 Supervision cost control measures in investment decision-making stage

Project investment estimation is based on the feasibility study report, comprehensively analyzes the economic, technical, financial and other aspects of the project, and correctly determines the investment estimation of the project. The following suggested actions are proposed. (1) Assist the owner to stand on an objective standpoint, send special personnel to conduct research on projects of the same type and in the same region, and master a large amount of data and use the data in the previous database reasonably; (2) It is recommended to introduce cost consulting or technical, economic and financial supervision agencies Professionals will follow up and review; (3) Assist the owner to adhere to the scientific, rigorous and flexible principles of combining qualitative and quantitative, dynamic and static, macro and micro to determine the project estimate; (4) Assist the owner to conduct project positioning analysis. The grade of the project, the group of people served, and whether the key advantages of similar projects are conducive to project sales will largely affect the price of the project. Of course, it is also subject to the location, the surrounding environment and supporting facilities. (5) Assist the owner or design to do project coordination analysis. The main projects, internal and external

decoration, supporting facilities, and municipal gardens should match the positioning of the project, and the improvement of one aspect alone will cause a large increase in cost. (6) Assist in the planning of the preliminary project development and construction sequence to prevent the waste of funds. (7) To help the owners to analyze the financing channels, to achieve a reasonable match between equity financing and bank loans as much as possible, and to develop steadily.

### **3.2 Supervision cost control measures in the design stage**

The design stage is the starting point of the construction of the project, and it is the most important stage in forming the blueprint and determining the cost. This stage is accompanied by the finalization of the design plan in the design stage. The process of expanding the initial design determines 70%-90% of the project cost of the project. It is also an important stage where the budget exceeds the investment estimate. It is the most important stage for the supervision to implement active cost control. The unreasonable design drawing scheme and the problem that the errors and omissions in the drawings affect the construction have not been well resolved for a long time, resulting in many changes in the later period, resulting in a passive state of all aspects of the work in the later period. The following measures are proposed to address the problems at this stage: (1) Introduce design supervision and send technical and economic professional supervisors to review the technical solutions and practices of the design; (2) Adopt the value engineering method to optimize the design scheme and reduce the project cost; (3) Adopt the limit design method to refine the subsections of project cost, colleagues set aside 5% to 10% flexibility.

### **3.3 Cost supervision and management measures in the bidding stage**

The important outcome documents formed in the bidding stage are one is the bidding list and the blue price, the other is the contract document. If this work is handled scientifically and rigorously, it can save about 10% of the construction cost of the project, which is very important for the subsequent construction work. The following measures: (1) Strengthen the review of bidding documents. Introduce engineering legal professionals to participate in the review of bidding documents, comprehensively review the standardization of cost risk management, contract performance, engineering claims and order terms, and clearly agree on substantive terms. (2) Pay attention to the bid evaluation link. Strictly review low quotations and unbalanced quotations, select bid evaluation experts with high reputation in the industry to form a bid evaluation committee, carefully review the quotation documents, and select the winning bidders with strength and credibility. (3) Considering the financial strength, management strength, team personnel organization, and construction quality, the bidding section shall be divided reasonably, so as to avoid the small team working on the big bid and the slow progress and poor quality. (4) The depth and completeness of construction drawing design or preliminary design must be reviewed to meet the actual needs of the construction budget. (5) Find a strong consulting company and an experienced cost engineer to compile the list, and try to avoid the phenomenon of missing items, unclear description of the list features, and too much engineering volume. (6) Do a good job in the interface division of different contractors of the contract, and formulate the principle of contract interface division in detail. (7) In the bidding documents, the construction party should be clearly given the opportunity to correct errors in the bill of quantities within a certain period of time [2]. (8) Clarify the adjustment method for the price difference of main materials between people and workers. (9) Do a good job of inquiring at a high level, and both parties A and B will work together to prepare the bidding documents for subcontracting projects, tentatively estimated materials, and control the transparency of tentative evaluation materials and tentative evaluation projects to Party A. (10) Master the impact of the project site and surrounding environmental characteristics on the cost.

### **3.4 Cost control measures in the construction stage**

The cost control in the construction stage is mainly based on the construction contract and design drawings to implement effective cost management for the construction of each construction participating unit. This stage is the process of on-site cost formation and payment, and it is very important to do a good job in this management. , the following measures have been accumulated during long-term work:

(1) Familiar with and thoroughly understand the contract documents and each important clause, which is the premise and basis for our work.

(2) Analyze the risk points of cost management, the size of the risk, and accurately find the key points of risk control to focus on. Such as provisional valuation, provisional valuation project, provisional amount, Party A's subcontracted projects, etc.;

(3) Estimate the price of materials and conduct multi-channel inquiry, and grasp the price information of the actual transaction;

(4) Strictly manage the approval and acceptance procedures for changes, negotiation, and visas. The visa verification cost supervision on-site participates in mastering the first-hand original data. All changes, negotiations, and visas are subject to a single inspection, and each order must be inspected.

(5) The management of the subcontracting project contract interface is detailed and clear, and there is less work

without the contractor, thereby reducing the number of visas;

(6) Strengthen the performance assessment of management behavior, strictly approve the scheme, material acceptance, and engineering acceptance, to ensure that the materials used on site are all accepted and qualified materials.

### **3.5 Cost control measures for supervision in settlement stage**

The settlement work involves the major interests of the participating parties, and all parties attach great importance to this work, but the actual work is often not very smooth. Whether the settlement check is in place can affect about 5%-10% of the project cost. Summarizing the past work, the following measures are proposed:

(1) At ordinary times, pay attention to the collection of economic and business data, and handle changes, negotiations, and visas in a timely manner; collect construction, supervision and other instructions in a timely manner, and timely collect environmental warnings and instructions to stop construction issued by cost-related government departments; Party A's work rush instructions ;

(2) Regularly check the signature status of the visa change once a week or two to avoid delays in this work.

(3) The claim should be filed and handled in a timely manner within the time limit of the contract, with sufficient reasons and reasonable compliance;

(4) Deal with the problem of missing items in the list in a timely manner;

(5) If a simulated list is used, check and solve the remeasurement problem on a regular basis and in a timely manner;

(6) Separately or according to the contract, clarify the material price difference and labor price difference in time;

(7) The lease negotiation outside the construction red line requires Party A's participation and approval, so that the follow-up cost problem can be dealt with.

(8) The use of unaccepted roads should be subject to Party A's participation and approval.

## **References**

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