

# Research on Cost Control throughout the Whole Process of Hospital Construction Projects

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**Abstract:** Controlling the engineering cost of hospital construction is an important indicator for measuring the comprehensive management level of hospital engineering construction, and also a major indicator of reflecting the investment efficiency of the project. It is a topic worth exploring. The level of engineering cost control in hospital project construction not only reflects the comprehensive management ability of hospital infrastructure, but also reflects the investment and social benefits of the project. It is also the key to controlling project investment and improving the efficiency of construction fund utilization. How to make reasonable use of human, material, and financial resources to achieve optimal results is the fundamental purpose of engineering cost. How to do a good job in cost control from various stages and links? This article takes the construction of Liangjiang Campus of Chongqing Medical University Affiliated Children's Hospital as an example to explore how to carry out good engineering cost control in project construction.

**Keywords:** engineering cost, control, effectiveness

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## 1. Preface

During the construction process of a hospital project, due to the difference in construction content from other construction projects, the hospital building must not only comply with medical and nursing procedures, but also meet functional standards. The most important thing is to highlight comfort and scientificity. Based on the actual management of hospital construction projects, we should recognize the advantages of whole process cost control management, so that the whole process cost control management work can be effectively carried out, provide effective management methods for hospital construction projects, and provide strong support for hospital construction projects in cost control work.

## 2. Full process engineering cost control

### 2.1 Decision stage

The investment estimation in the decision-making stage is an important component of preparing project proposals and feasibility study reports in the early stage of project construction. It is one of the important basis for selecting investment plans and plays a very important role in the decision-making and success of construction projects. We should strictly control the engineering cost during the project decision-making stage. 1. Collect basic information well. Conduct market research, collect relevant basic data, and carefully analyze the accuracy and reliability of the information to ensure the accuracy of investment forecasts and economic analysis. 2. Make a good technical and economic demonstration. Organize communication and coordination between the design institute and experts, and organize professional engineers to carefully review and provide opinions on the estimated content. 3. Optimize the plan well. After completing the market research, combined with the actual situation of the new campus project, multiple options will be compared and selected.

### 2.2 Design phase

The design phase is an important stage that determines the cost of engineering, and it is also the leader of cost control in construction projects. Only by controlling the engineering cost in the design phase can we ensure that the engineering cost of hospital construction projects is reasonably controlled. Due to the large overall investment and high construction costs, hospital construction projects are more difficult to construct than ordinary residential and office buildings. Therefore, in the design stage, there should be sufficient understanding of the uniqueness of hospital buildings, fully considering the specific requirements of using departments. A large amount of energy and time must be spent

on effective communication with various departments to avoid the waste of continuous rework and modification in the later stage. According to the particularity of hospital construction, the design scheme should be reviewed and demonstrated during the design phase to ensure that the hospital building design scheme can meet practical needs in terms of functionality, overall investment, scientificity, effectiveness, and rationality.

### **2.3 Bidding stage**

The cost control of bidding for infrastructure projects is an important part of the entire process cost control. Although the current bidding work is entrusted to the engineering bidding agency, as a construction unit, it is necessary to standardize the management of various bidding, understand the qualifications of participating bidding units, the performance of enterprises, and the ability to fulfill contracts. The preparation of the bidding list and control price must be standardized and reasonable, and attention should be paid to whether the pricing method is reasonable, whether the list is missing items, whether the feature description is complete, whether the cost of measures is reasonable, whether the setting of temporary funds, temporary estimates, and daywork is reasonable, and whether the prices of main equipment and materials are reasonable. And combined with the market, reduce disputes during and after the construction process and settlement, avoid construction units taking advantage of loopholes, control prices not to be too high or too low, ensure construction quality, give reasonable profits to the construction party, and also control the hospital's financial investment, making good use of every penny. Promptly modify any issues discovered during the process of reviewing drawings and compiling lists to ensure the accuracy of the bidding engineering quantity list; Focus on contract pricing terms, such as changing pricing principles, material adjustment, progress payment, and unbalanced quotation modification clauses; The construction unit shall clarify the functional requirements and technical parameters, and the bidding documents shall specify the grade and brand of construction materials and equipment.

### **2.4 Implementation phase**

The engineering cost control during the construction phase is the most important part of engineering cost management in the entire construction project management, which has a huge impact on the overall cost control of the entire project. Due to the particularity of hospital construction, professional personnel and teams must be present at the construction site to strictly control design changes, construction period, quality, and safety. During the construction process, the Traditional Chinese Medicine Hospital should strengthen on-site construction management, supervise the construction party to follow the drawings, strictly implement relevant construction techniques and standards, avoid increased investment due to design changes and non-compliance with drawings, achieve effective control of engineering costs, and meet the actual needs of engineering cost control.

#### *2.4.1 Optimize construction organization design and implementation plan*

In the construction of the new courtyard, due to the special nature of on-site environmental factors, construction is restricted and it is necessary to readjust and optimize the construction plan. Several prominent examples are as follows: (1) The implementation plan of the reverse construction method is adjusted through multiple technical and economic analyses to achieve investment savings; (2) Optimization of retaining wall support, from original anchor retaining wall to gravity retaining wall; (3) Comparison and selection of prefabricated hollow floor plans, understanding the process, examining the manufacturer's effectiveness, and drawing on the cost and economic analysis of prefabricated hollow floor plans from other hospitals.

#### *2.4.2 Strengthen contract approval and tracking management*

One is to implement standardized management, the second is to draft contract texts rigorously, the third is to manage contracts in accordance with the law, the fourth is to strictly enforce the contract review system, and the fifth is to strengthen the tracking and inspection of contract execution. Pay attention to the consistency between the contract and the bidding documents, and the principle of adjusting the project price; Agreement on settlement and payment methods; Construction period and quality assurance, quality requirements; Division of liability for breach of contract and punishment; And agreements on the brand level of materials.

#### 2.4.3 Develop and improve management systems

During the construction process of the new campus, various investment management systems and measures have been formulated, such as change management measures, quality and price recognition management measures, recipient visa management, investment dynamic management requirements, progress payment review management, claims, etc. During the implementation process, strict adherence to requirements and management processes has been implemented. (1) Within one month after the entry of each professional project, clear the standards in a timely manner and establish a ledger with number 0; (2) Strictly manage the design change program to ensure the feasibility of technical proposal demonstration, controllable investment calculation, and timely completion of procedures; No implementation is allowed without following the change procedure; (3) Strengthen material and equipment management. Management of sealing samples for incoming materials; Model guide; Strictly control the management of material and equipment quality and price recognition; Proactively resolving price disputes, such as comparing and selecting samples after decoration on-site; (4) Visa recipient management. On site image recording, on-site receiving party's complete signature, and timely cost estimation; (5) Establish a dynamic investment ledger. According to the bidding situation of professional engineering, timely verify and establish the No. 0 ledger; Real time negotiation and visa based on changes, increase or decrease costs, and grasp changes in professional engineering investment amounts.

#### 2.4.4 Strict design change management

All design changes during the construction phase of the new campus adhere to strict management and standardized review. The main approach is to establish the principle of design changes. The new campus construction adheres to the principle of no or minimal design changes, but only limited design changes can be made due to construction conditions, construction processes, design defects, engineering costs, and other reasons. The reasons for the changes should be explained in detail when submitting the design changes; The second is to standardize the approval process, propose the unit of change intention, collect relevant information based on the change items, and fill out the Engineering Change Negotiation Form; The construction agency shall organize pre evaluation by all participating parties; If drawings need to be issued by the design unit, the design unit shall issue revised drawings; The contractor shall prepare a construction plan and estimate the cost of the change according to the change intention; The construction agency, in conjunction with the supervision unit, tracking and auditing unit, and relevant parties such as the hospital, shall conduct audits and sign off; Finally, a signed Engineering Change Negotiation Form and relevant attachments will be formed to ensure the rigor of design changes.

#### 2.4.5 Completion settlement

Completion acceptance is the final procedure of the entire construction process of a construction project, which is an important link in comprehensively assessing the construction work, checking whether the design and engineering quality meet the requirements, and reviewing whether the investment and use are reasonable. The cost control in the completion settlement stage of the new campus focuses on reviewing the authenticity, reliability, and rationality of the completion settlement and final accounts to prevent unplanned expenses that should not be included in the cost from being included in the construction cost. Control the basis for engineering settlement preparation, strictly review various unreasonable factors in engineering settlement, such as overcalculating engineering quantity, high unit price, and duplicate calculation of fees.

### 3. Conclusion

In summary, the cost control management of hospital construction projects runs through various stages of engineering construction, and is a comprehensive cost management throughout the entire process. The focus and effect of cost control are completely different in different stages. Only by adopting scientific pricing methods and practical pricing criteria at each stage of project construction, and reasonably determining investment estimates, preliminary design estimates, and construction drawing budgets, can investment efficiency be improved and effective cost control of construction projects be achieved.

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