

The Cost Control Based on the Whole Process Management of Hydraulic Engineering Construction

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Abstract. The whole process cost management of hydraulic engineering construction is studied through project supervision, the elements and reasons of impacting cost control in construction stage is analyzed, and aiming at the engineering construction preparation, engineering construction implementation and project completion inspection and acceptance and other projects, the contents, methods and measures of engineering cost control in different stages is put forward in whole construction process, and it ensures good control effect of hydraulic engineering construction cost.

Keywords: Hydraulic engineering, construction stage, whole process management, cost control.

1. Introduction

As a project supervisor of hydraulic engineering, cost control of construction stage is one of the core content of the work, it is also one of the three objectives in the construction project, the success or failure of construction project is closely related with the implementation of this goal or not. To achieve the purpose of the cost control in construction stage, hydraulic project supervisor should adopt dynamic management and control method, namely aiming at project preparation, project construction implementation and project completion acceptance process respectively adopt in advance, middle and afterwards control measures, and it ensures that the actual cost of the construction project shall not exceed the planned investment.

2. Cost control in advance

2.1 Be familiar with the construction requirements and design drawings

Design drawings is main basis of form construction drawing budget cost and the project construction, which also is the premise of guaranteeing construction quality and project cost, but when consulting diagram before construction, some problems in the design drawings are often found, for example, architecture diagram and structure diagram size marking of specific hydraulic engineering hydraulic structures is inconsistent., the reserved hole location is unknown, the axis position has a deviation, or lack detailed drawing of node and construction practice, the specifications and types of main equipment material are not clear, and practice of designing each matching profession contradict. If these problems are not solved as soon as possible, it will make engineering change increase in the construction process, thereby causing extra waste of money and loss of project duration, in view of this, the project supervisor should be familiar with design drawings and sort out design issues list, organize relevant unit to check drawing before construction, and integrate the opinion of each units form drawing joint checkup summary. Try to solve the problems existing in the design drawings in construction preparation stage, thus effectively reducing the resulting changes and the increasing cost.

2.2 The important documents of studying construction stage.

The bidding documents and construction contract and other materials as main content of project of agreement, this agreement is reached by engineering construction both parties, which is the main basis of project supervisor carrying out the work. Before the construction, project supervisor should do a comprehensive analysis and research on this kind of information, Our country's current contracting mainly adopts parallel contracting mode, To this kind of project, we should notice that the

determination of the project scope, the contract price, quality requirements of construction period and payment mode of the project cost is reasonable or not; In addition, when dividing joint responsibility relationship among the contractors and the interface among the contract is clear or not, so you can have a base in solving engineering cost disputes that may occur at any time, and ensure that in the event of accident, the supervisor can judge the responsible party more quickly, so as to effectively control the project loss.

2.3 Check and improve the construction scheme and technical quality assurance measures.

In the hydraulic engineering construction process, each part adopt different construction scheme and technical quality safeguard measures, so the required costs are also different, even vary widely, it will directly influence the construction quality and economic benefit of engineering, if select and use are unreasonable, it will cause errors occurring in the actual cost and the planned investment of the project, it will make investment out of control. Therefore, supervisor in the review process of construction scheme and technical quality safeguard measure of project, we should focus on checking the scheme is feasible in technology or not, the process can be operated whether or not, scheduling is balanced whether or not and economy is reasonable whether or not. To unreasonable plans and measures, reasonable suggestions should be put forward and further optimize, achieve the result of active control in advance, thus ensuring the investment goals are achieved and the investment control effect in the construction stage.

2.4 Take preventive measures to strengthen the active control.

The factors of influencing investment control in construction stage, the supervisor should make comprehensive analysis on various factors, find out the key working procedure of investment control, and the, and formulate the corresponding investment control preventive measures for key point, strengthen the active control. In the formulation of preventive measures, first, formulate reasonable money payment plan according to the requirements of construction progress, and then build cost control target system according to constitution level of project and contract price, and finally through the organization measures, according to the supervision and inspection system, actual cost of risk project and deviation of target value are tracked, and adopt corresponding measures and correct in time, in order to ensure deal with issues before they happen.

3. Cost control in middle

3.1 emphasis on contract management, and improve the performance rate

The investment control is one of the important content in the hydraulic engineering contract management, strengthening the contract management is important ways and means to improve investment control level. In the process of engineering construction, supervisor should establish a contract management system, implement contract performance tracking check, strengthening process monitoring, improve the performance rate of contract, if find problems, it must be rectified in time, assist the construction unit make contract change management, and fully consider the influence of contract change on investment, avoid or reduce the condition of investment increase caused by the contract variations as far as possible.

3.2 Do a good job of quality and price determination of construction material.

In the hydraulic engineering cost composition, the cost of raw materials and machinery often accounts for more than 70% of the whole construction cost, which is the main component of engineering direct cost. In the process of construction, engineering material selection is reasonable whether or not, the product material is passed test whether or not, equipment performance of construction machinery is good whether or not, these will directly affect the construction progress and process quality of the project, and then influence the project cost. Therefore, supervisor should assist the owner optimally choose material and equipment supply unit by bidding, supervisor also check individually quality certification of materials machine and inspection, testing, test report and so on, at the same time, according to construction materials plan, all kinds of raw materials, mechanical

equipment and order list of machined part should be strictly checked, and determine the reasonable price structure.

3.3 Specify engineering measurement and payment procedures of progress payment.

Engineering progress payment are generally paid in accordance with contract, they are settled according to practical completion engineering quantities, measurement payment is the important content and link in the process of construction supervision, whether engineering measurement is accurate or not, it will directly influence the settlement amount, so supervisor must be fair, to do a good job of engineering measurement and checking carefully. First of all, need to define measurement content and procedures, according to the design drawings and the content of the bill of engineering quantities, according to the method of the contract, on-site measurement are carried out, second, to measurement of concealed engineering, supervision engineer must be strictly controlled, and completes the measurement work in advance. Finally, when check project progress payment settlement report, the actual cost and planning amount must be compared, the reason for the emergence of moderate deviation must be analyzed, formulate corresponding corrective measures; If severe deviation happen, the construction progress plan and project investment plan should be adjusted in time, then avoid project delays or engineering progress payment overpay caused by the lag of engineering progress, at last, it guarantee implementation of overall project plan.

3.4 Strictly control engineering change and on-site visa.

In the process of hydraulic engineering construction, due to the long construction period and complicated environmental factors, many engineering contents and so on, the engineering change is inevitable, therefore, check the bill of change engineering quantities and offer part in the contractors' settlement reports, which also is the main content of construction supervision cost control.

The supervisor should strictly control engineering change and on-site visa, and supervise the process of the construction, cooperated-building parties increased engineering content randomly, through the design changes to expand the scale of construction or improve design standards without authorization and so on, prevent the resulting project cost increase and the project expenses increase. For what must be changed, it must be agreed by both parties and the supervision party, and in writing records. On-site changes part does not included by construction contract for and construction drawing budget, it should apply for a visa in time, to ensure that settlement are listed in real time.

Meanwhile, Supervisor should do economic accounting of engineering change at any time, on the one hand, can grasp the capital investment increased caused by the change, improve the initiative of owners' investment control, timely adjust the investment plan of the project; On the other hand, when choosing engineering change plan, provide owners with effective economic data for reference, prevent the increase economic investment affected by changes to affect planned investment entire project.

3.5 Actively deal with engineering claim events.

Hydraulic engineering due to the long period, large scale, complex technology, and unpredictable factors are many, the construction claim events often happen. Once claim events are established, it would lead to additional engineering quantities and charges, the treatment of claim event is the key point of project supervisor controlling costs.

First of all, the supervisor should pay close attention to possible claims reason in the construction site, do the prevention and control measures, take the initiative control, reduce the occurrence of the claims as far as possible, eliminate the unreasonable claims. Second, when the claim happens, supervising personnel should according to the contract timely make collection and analysis for evidence of claim events, on the fair position, determine the responsibility of the claim event, check the rationality of claim expenses, refer treatment report of claim event timely within the time limit prescribed by the contract, really safeguard the legitimate interests of the owner and the contractor. Finally, the on-site supervisor should also be timely, accurately, continuously record details in claims event occurrence process, and provide the necessary basic data for the accounts of claim payment.

4. The cost control after construction

4.1 Sorts out all kinds of information involve the construction price.

After the hydraulic engineering complete and accept, because settlement application, statement, report, and other data between contracting parties are passed through the supervision institution, so all kinds of data involve the project price, whose sorting is also the focus of the cost control of project supervision in time. These data include project completion figure, design change notice, on-site visa and claims treatment report, and measurement data of concealed project, the list of equipment materials supplied by a party, treatment data of all kinds of special process, etc. Project supervisor should take advantage of these information, and cooperate the owner to check preliminarily settlement provided by contractor, and timely put forward the project settlement first trial report for owner as payment reference proof.

4.2 Carefully and timely check completion settlement.

Project supervisors participate in the whole management process of the construction stage, to the performance condition of the contractor's contract, have a comprehensive understanding on construction site engineering change and visa content and so on, this is the necessary prerequisite that supervisor by check the project completion settlement and make cost control. Therefore, in the completion acceptance stage, the main cost control work of supervisor is to check the settlement are formed in accordance with the valuation model prescribed by contract whether or not, and combining with the supervision diary and the on-site inspection data, check engineering change price, the increase or decrease of engineering quantities, material substitution and change situation item by item. At the same time, comprehensively consider, analyze and calculate the advance payment, settlement price, engineering change cost of the whole project, check settlement report of construction engineering contractor, if it conform to the payment terms, report the construction unit to pay.

5. Conclusion

Construction stage is a stage of hydraulic engineering design drawing achieving and forming engineering entity, which is decisive stage of implementing the project contract and investment control, and the project supervisors make cost control in construction stage is the authority and responsibility given by construction and supervision contract, which is the key link of the hydraulic engineering investment control. In construction stage, supervisor by advanced, middle and later control method make cost control in whole process of construction, it has great significance on guaranteeing the project investment, improving economic and social benefits of project.

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