

A STUDY OF COST CONTROL TECHNIQUES FOR CONSTRUCTION PROJECT

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ABSTRACT

It is necessary to implement cost control technique to successfully manage infrastructure project. All of the tasks required to complete a project must be identified and organized in the sequence to complete the project. Cost control is directly linked to the project's WBS because costs for schedule activities are estimated for all resources charged to the project. In this paper we try to identify the the different cost control techniques use on site so that we can control the cost. Preliminary Literature survey and data collections have identified the way of cost control in construction project. In this paper we focus on one activity which clear the idea if we use alternate material then we can save the cost of project.

Keywords— Cost Control, Cost Control Technique, Literature Survey, Problem Identification, Comparison of activity by alternative methods.

1. INTRODUCTION

The cost control is a process that should be continued through the construction period to ensure that the cost of the project is kept within the agreed cost limits. The cost control can divide into two major areas; the control of cost during design stages and the control of cost by the contractors once the construction of project has started. Cost control is directly linked to the project's work breakdown structure because costs for schedule activities are estimated for all resources charged to the project. The main objective of cost control of a project is to gain the maximum profit within the designated period and satisfactory quality of work.

One of the reasons why cost overrun and delays occurs in majority of construction projects in India is the absence of a good cost control mechanism for different parties involved in a project, namely the owner, the contractor and the client's consultant. The accuracy with which activity resources and activity duration are estimated will largely determine the magnitude of the cost control challenge. Assured project cost estimation is essential to securing an adequate budget that, in turn, establishes the baseline that will serve as a cost control reference.

2. OBJECTIVE

To identify the various activities and resources required for carrying out the activities through literature survey. To identify the cost control methods frequently used by contractor during the construction stage. To compare the different methods for construction project without affecting quality.

3. LITERATURE SURVEY

The cost control is a process that should be continued throughout the construction period to ensure that the cost of the project is kept within the limit. All expenditure limit control must be related to the functional requirements of the particular project type.

As per Jamshid, estimation of cost for road project like highways is depends upon the proper planning and to study the feasibility of project. It is a very crucial job to accurate estimation. This



paper elaborates the new methods of cost estimation like Arithmetical Neural Network method which a more accurate estimation method for highway projects in developing and developed countries at the conceptual phase. According to author lack of preliminary information, lack of database of road works costs, and lack of up to date cost estimation methods its seems major problem for cost estimation during the conceptual phase of project. So we need to minimize cost at this level.

According to Ritz cost control though namely easy, but it gives a different meaning to different people. As per some of the people cost control means engineering cost, some people states that it is a cost report, value engineering, cost management system etc. But, Cost control is the activity which involves all such kind of parameters at different time phase of project. All the stakeholders like project manager, worker, owner etc. who are involved in a project have their own responsibilities and roles in reducing and controlling the costs before project start, during project execution and at the time of project completion.

As per Kern and Feroso, the measurements from traditional cost control systems are not linked to the goals and objectives set for each project. This is because those systems have their own internal functional operation and that they present considerable complications in adjusting to the unique and often one-off circumstances of the project.

As per W.K. tang, Cost Control systems are composed of the following cost techniques:-

- 1) Cost Planning and Control
- 2) Estimating
- 3) Budgeting
- 4) Cash Flow Identification
- 5) Financial and Cost Reporting
- 6) Value Management
- 7) Judgment

According to Dharwadker, cost control can be achieved by selecting the exact material, manpower, methods and machinery for exact work or project so that wastages will be minimize. The project manager must have all kind of Manpower, Material, Money, Machinery and Methods with due consideration to the quality of work, yet within the estimated cost and limits for cost control.

According to George Otim et.al. The construction industries suffered from cost and time overruns during the design and project implementation stages. The author was identified commonly used cost control techniques which include schedules, budget, inspection, meetings, reports, records, monitoring & evaluations. Most of higher authority on project who work on site find the difficulty in controlling project costs due to problems like delays by clients regarding money, delay to decision making, availability of materials and equipment on site will be less, bad weather condition, overlapping of activities, complex, unclear and incomplete drawings, and generally failure to control the productivity of resources. As per author following are the activity where we need to control,

Project Resources a Control—in this segment Man, Money, Material, machinery and method to complete the work is important to control the cost in infrastructure project.

Cost Control Techniques Used on Sites-- Work Programmes, Inspection of Works, Monitoring Work and Cost Performance Evaluation of Works Carried Out

As per Vacharapoom Benjaoran et.al., A cost control of an Infrastructure project is an important task which is a key to success of the business. From the survey the researcher found out that in small and medium company there is neither special department nor specialized persons available to control the project costs but usually it maintained by the company owners themselves. The researcher developed a model call as Barcode-based Cost Control System [BCCS] for the controlling of cost. So that the bills, materials are to be managed as per records. So this is new concept in construction industries to use a barcode system to control the cost.

4. CONCEPT OF COST CONTROL

Cost control is not only overlook of costs like income and expenditures and recording data, but also analyzing the data in order to take corrective action before the loss. Cost control means good cost management, which must include:

- Cost estimating
- Cost accounting
- Project cash flow
- Company cash flow
- Direct labor costing
- Overhead costing

4.1 Different Cost Control Techniques

Following are the different way to control the cost,

- Cost Control by Material Management
- Cost Control by Machinery Management
- Cost control by Manpower Management
- Cost control by Method Management

4.1.1 Cost Control by Materials Management

Materials Management i.e. Materials management is a system which ensures that right quality of material in the right quantity at the right time and right place with the right amount of investment.

For the material control following system to be used,

- [1] Level setting
- [2] Economic order quantity
- [3] ABC analysis
- [4] VED analysis
- [5] Material (or inventory) cost reports

1] Material Cost Comparative Report

Herewith we focus a case study which uses different material for construction of building on site. We select the site of Gagan Nulife in Pune area and here we compare the techniques use for construction of brick work with the help of different types of material. We just consider only one part of building for comparison purpose,

Description	Area	Constants	Constants Unit
Total Slab Area	390209.00		
Masonry Work Quantity	362894.37	0.930	Sft / Sft Slab Area
Internal Plastering to walls (In case of Fly Ash Brick Masonry)	595068.73	1.525	Sft / Sft Slab Area
Internal Back coat Plastering for Dado Area (In case of AAC Block)	90138.28	0.231	Sft / Sft Slab Area
External Plastering Area	505710.86	1.296	Sft / Sft Slab Area
Reinforcement Steel	1494500.47	3.830	Kg / Sft Slab Area

Sr. No.	Particulars	With Fly Ash Bricks Masonry			
		Quantity	Unit	Rate	Amount
A	RCC Works				
1	Reinforcement Steel	1494500.47	kg	₹ 40.00	₹ 5,97,80,018.80
	Total A - RCC Works				₹ 5,97,80,018.80
B	Masonry Works				

1	Fly Ash Brick Masonry	33713.71	Sqm	₹ 687.00	₹ 2,31,61,318.49
2	AAC Block Masonry				₹ -
	Total B - Masonry Works				₹ 2,31,61,318.49
C	Internal Plastering Works				
1	Back Coat Plaster	55283.23	Sqm	₹ 345.00	₹ 1,90,72,715.54
2	Gypsum Application to Walls	55283.23	Sqm	₹ 237.00	₹ 1,31,02,126.33
	Total C- Internal Plastering Works				₹ 3,21,74,841.88
D	External Finishing Treatment				
1	Double Coat External Plaster	46981.69	Sqm	₹ 553.00	₹ 2,59,80,872.15
2	Single Coat Plaster				
3	Synthetic Pigmented Plaster				
4	100 % Acrylic Paint	46981.69	Sqm	₹ 150.00	₹ 70,47,252.84
	Total D- External Finishing Works				₹ 3,30,28,124.99
	Grand Total (A+B+C+D)				₹ 14,81,44,304.15

Sr. No.	Particulars	With AAC Blocks Masonry			Difference	% Diff
		Quantity	Rate	Amount	Amount	
A	RCC Works					
1	Reinforcement Steel in kg	1434720.45	₹ 40	₹ 5,73,88,818.05		
	Total A - RCC Works			₹ 5,73,88,818.05	₹ -23,91,200.75	-4.0%
B	Masonry Works					
1	Fly Ash Brick Masonry					
2	AAC Block Masonry in sqm	33713.71	₹ 814	₹ 2,74,42,959.60		
	Total B - Masonry Works			₹ 2,74,42,959.60	₹ 42,81,641.12	18.5%
C	Internal Plastering Works					
1	Back Coat Plaster in sqm	8374.05	₹ 345	₹ 28,89,047.40		
2	Gypsum Application to Walls in sqm	55283.23	₹ 269	₹ 1,48,71,189.80		
	Total C- Internal Plastering Works			₹ 1,77,60,237.21	₹ -1,44,14,604.67	-44.8%
D	External Finishing Treatment					
1	Double Coat External Plaster					
2	Single Coat Plaster in sqm	46981.69	₹ 330	₹ 1,55,03,956.25		

3	Synthetic Pigmented Plaster in sqm	46981.69	₹ 165	₹ 77,51,978.13		
4	100 % Acrylic Paint in sqm			₹ -		
	Total D- External Finishing Works			₹ 2,32,55,934.38	₹ -97,72,190.61	- 29.6%
	Grand Total (A+B+C+D)			₹ 12,58,47,949.24	₹ -2,22,96,354.91	- 15.1%

The above comparative table focuses on alternate technique used on construction project of Gagan Nulife in Pune. From the comparative study on site it has been found that using ACC block for masonry work with joining mortar is cheaper than Fly ash brick masonry by 15% i.e. about 2.2 Crore saved for 3,90,209 sft of slab area.

5. CONCLUSION

With the help of literature survey we can say that cost control is important for any project. The measurements from traditional cost control systems are not linked to the goals and objectives set for each project. At the project of Cost Control by Material Management, Cost Control by Machinery Management, Cost control by Manpower Management, Cost control by Method Management is important. As per case study its shows that if we use alternative material without compromising the quality and aesthetic effect we can save the cost of construction project.

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