Study on Economic and Financial Management in Construction Project

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ABSTRACT: In this paper we study the concept of financial planning in construction Project. And to discussed about the factors affecting financial planning, the methods used in financial planning. And also,discuss the Case Study (Financial Planning and Estimating in Road Project and analysis the case study data.
Keywords: Financial Management in Road Project, Types of Estimation and Its Differences.

I.   INTRODUCTION

The scope of this project is to discuss the financial management of a construction contractor. This paper attempts to approach this subject in a logical and systematic way. It communicates the importance of financial analysis and planning along with cash planning and profit planning. This report is not intended to be an all-inclusive discussion of financial management in construction. Contractor's Financial Management is an extremely important subject. It has been told that a large percentage of bankrupt contractors were profitable at the time of their failure, but due to their poor financial management failure resulted. Good financial management looks at past history of the company as well as planning for its future. Management needs to understand the basics of why they are making or losing money.

I collect the financial data from RR Infraa Constructions, STV Unit – Harur. The project is "Widening from two lane to Four Lane with Paved Shoulder and Strengthening the Existing Carriage way from Km.36/0 to Km.80/0 of Salem - Thirupathur - Vaniyambadi Road(NH- 179A) in the State of Tamilnadu." I analyzed and give a detailed financial statement from past one year to the Project end using MS excel.

1.   FINANCIAL PLANNING
1.1 Objectives of Financial Planning
*   Determining capital requirements- This will depend upon factors like cost of current and fixed assets, promotional expenses and long-range planning. Capital requirements have to be looked with both aspects: short- term and long- term requirements.
*   Determining capital structure- The capital structure is the composition of capital, i.e., the relative kind and proportion of capital required in the business. This includes decisions of debt- equity ratio- both short-term and long-term.
*   Framing financial policies with regards to cash control, lending, borrowings, etc.
*   A finance manager ensures that the scarce financial resources are maximally utilized in the best possible manner at least cost in order to get maximum returns on investment.

1.2 Importance of Financial Planning
*   Adequate funds have to be ensured.
*   Financial Planning helps in ensuring a reasonable balance between outflow and inflow of funds so that stability is maintained.
*   Financial Planning ensures that the suppliers of funds are easily investing in companies which exercise financial planning.
*   Financial Planning helps in making growth and expansion programmers which help in long-run survival of the company.
*   Financial Planning reduces uncertainties with regards to changing market trends which can be faced easily through enough funds.
*   Financial Planning helps in reducing the uncertainties which can be a hindrance to growth of the company.

2.   CONSTRUCTION ESTIMATES
2.1 Preliminary Estimate
A preliminary estimate is the **approximate cost of the project** that is calculated at the **conceptual stage of the project**. When the project drawings and specifications are not available, a preliminary estimate is prepared. **It forecasts the total budgeted cost** of the specific

construction project. Apart from new construction, it can also be prepared for demolition or renovation works.The anticipated cost may vary slightly or greatly depending upon the available information regarding the project. Still, it helps the client/contractor to make the initial budget and cost control plan. QTO Estimating also provides this kind of Estimate service for residential as well as commercial construction works.Depending upon the type of infrastructure, the estimation technique and units may change.

For buildings: The rate per square foot/per cubic foot/per room/per occupant is given

For Roads and Highways: The rate per Km is provided depending upon the thickness of layers and the type of construction material.

For Irrigation channels: The cost per Km is given. It can also be based on a per hectare basis (area irrigation by the canal/water channel)

2.2 Definitive Estimate

The definitive estimate is the most exact type of estimate defined in the PMBOK. Its accuracy ranges from -5% to +10%.This high level of accuracy can normally only be achieved when the project has been planned in detail and the information relevant for a reliable estimation of the work is available. Her PMBOK stands for Project Management Body of Knowledge, and it is the entire collection of processes, best practices, terminologies, and guidelines that are accepted as standard within the project management industry.Thus, definitive estimates are usually developed later in a project while a rough order magnitude is more common in very early stages of a project.

The refinement of rough estimates during the course of the project is sometimes referred to as progressive elaboration. Once a definitive estimate can be developed, it usually replaces the precious, less precise estimate.

2.3 Detailed Estimate

A business can convert a preliminary estimate to a detailed estimate. A detailed estimate is drawn up when there's more information available or the scope of the project is better known. Detailed estimates include incredibly detailed information on quantities, costs and rates in fact, all items necessary to complete the project. All the line items are added together to reach the final cost, according to Civil engineering Daily.
Besides these line items, detailed estimates can also include:
- Information on the rates used to calculate costs (see quantity estimate below)
- Specifications
- Drawings for the areas included in the project (including an index and key)
  Detailed estimates are often used as a contractor's budget estimate. This planning tool helps him know how much cash flow he needs and whether he requires financing, according to Carnegie Mellon university.

3. Case Study

The data of a Road Work, Structure Word, Crusher Report, Aggregate Procurement, Receipt of Bulk Materials, NMR work force and Sub agency work Force will be represented in Following Charts.A chart is a diagram, picture, or graph which is intended to make information easier to understand. A chart is a map of the sea or stars.

The main functions of a chart are to display data and invite further exploration of a topic. Charts are used in situations where a simple table won't adequately demonstrate important relationships or patterns between data points.Charts and graphs elevate your data by providing an easy-to-understand visualization of numeric values. While the terms are often used interchangeably, they are slightly different. Graphs are the most basic way to represent data visually, and typically display data point values over a duration of time.

Preliminary Estimate for Highway work

S.No	Summary	Quantity	Unit	Rate / Unit	Estimate	Accepted Bid/GST	Actual Cost
1	Subgrade/Embankment	48542	m	503	24416626	12%	27346621.12
2	GSB	45829	m	1398	64068942	12%	71757215.04
3	WMM	45489	m	2018	91796802	12%	102812418.2
4	Emulsion	43525	m	45	1958625	12%	2193660
5	DBM	43525	m	6122	266460050	12%	298435256
6	BC	33126	m	7627	252652002	12%	282970242.2
7	Median kerb	43525	m	225	9793125	12%	10968300
						Total Rs.	796483712.6

Preliminary Estimate for Structure work

S.No	Summary	Quantity	Unit	Rate / Unit	Estimate	Accepted Bid/GST	Actual Cost
1	Excavation	20501	Cum	351	7195851	12%	8059353.12
2	RCC Drain	10152	m	3736	37927872	12%	42479216.64
3	Culverts (Pipe, Box, Slab)	198	m	6209	1229382	12%	1376907.84
4	PCC Grade M15	710	Cum	5385	3823350	12%	4282152
5	RCC Grade M20	1083	Cum	5426	5876358	12%	6581520.96
6	RCC Grade M25	11250	Cum	5552	62460000	12%	69955200
7	RCC Grade M30	11582	Cum	5565	64453830	12%	72188289.6
8	RCC Grade M35	4350	Cum	5662	24629700	12%	27585264
9	RCC Grade M40	2120	Cum	5766	12223920	12%	13690790.4
						Total Rs.	246198694.6

Definitive estimates for Highway work

S.No	Summary	Linear Length (m)	Quantity	Unit	Rate / Unit	Estimate	Actual Cost
1	Subgrade/Embankment	48542	48542.000	m	562	27280604	27280604
2	GSB	45829	16065.356	MT	4438	72261971.1	72261971.06
3	WMM	45489	27884.757	MT	3686	102783214	102783214.3
4	Emulsion (RS1)	43525	105765.750	KG	5	528828.75	528828.75
5	Emulsion (SS1)	43525	332966.250	KG	5	1664831.25	1664831.25
6	DBM	43525					
	Aggregate & dust		71503.360	MT	1120	80083763.1	80083763.11
	Bitumen (VG-40)		29870.661	MT	9868	294763681	294763681
7	BC	33126					
	Aggregate & dust		26384.383	MT	1120	29550509.2	29550509.16
	Bitumen (VG-40)		15090.339	MT	9868	148911461	148911461.5
8	Median kerb	43525	2176.250	Cum	4485	9760481.25	9760481.25
9	Machinery and Vehicle rent		4.8% rate of each work (including diesel)			15547881.7	15547881.74
					Total Rs.	783137227.1	

Definitive estimates for Structure work

S.No	Summary	Linear Length (m)	Quantity	Unit	Rate / Unit	Estimate	Actual Cost
1	Excavation	20501	20501.000	Cum	351	7195851	7195851
2	Pipe Culvert	101	101.000	m	3736	377336	377336
3	Concrete	31095	19061.235	Cum			
	Cement		3049.798	Cum	2850	8691923.16	8691923.16
	Aggregate		16011.437	Cum	2940	47073626	47073625.96
	Steel		2659.360	MT	36300	96534768	96534768
4	Man Power (Over all)		155780.000	No's	500	77890000	77890000
5	Machinery and Vehicle rent		4.8% rate of each work (including diesel)			6778979.33	6778979.334
					Total Rs.	244542483.4	

Detailed estimates for Highway work

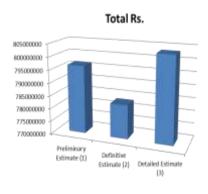| S.No	Summary	Linear Length (m)	Quantity	Unit	Rate / Unit	Estimate	Actual Cost
1	Subgrade/Embankment	48542		m			
	Cutting		122525.840	Cum	110	13493842.4	13493842.4
	Filling		52425.360	Cum	145	7601677.2	7601677.2
2	GSB	45829	16065.356	MT	4235	68036782.4	68036782.4
3	WMM	45489	27884.757	MT	3568	99492813	99492813
4	Emulsion (RS1)	43525	105765.750	KG	5	528828.75	528828.75
5	Emulsion (SS1)	43525	332966.250	KG	5	1664831.25	1664831.25
6	DBM	43525					
	Aggregate & dust		71503.360	MT	1020	72913427.1	72913427.1
	Bitumen (VG-40)		29870.661	MT	9668	288789549	288789549
7	BC	33126					
	Aggregate & dust		26384.383	MT	1021	26938405.2	26938405.2
	Bitumen (VG-40)		15090.339	MT	9668	145893594	145893594
8	Median kerb	43525	2176.250	Cum	4085	8889981.25	8889981.25
9	Test As per MoRTH		0.02% of Each Work			146845.116	146845.116
10	Man Power		109046.000	No's	500	54523000	54523000
11	Machinery and Vehicle rent		4.8% rate of each work			14378046.7	14378046.7
					Total Rs.	803273473	

Detailed estimates for Structure work

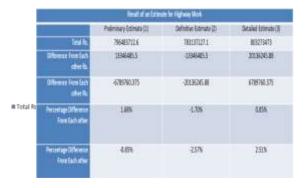| S.No	Summary	Linear Length (m)	Quantity	Unit	Rate / Unit	Estimate	Percentage of Rate Increase / Decrease	Actual Cost
1	Excavation	20501	20501.000	Cum	351	7195851		7195851
2	Pipe Culvert	101	101.000	m	3736	377336		377336
3	Concrete	31095	19061.235	Cum				
	Cement		3049.798	Cum	2850	8691923.2	0.16%	8705830.2
	Aggregate		16011.437	Cum	2940	47073626	0.16%	47148944
	Steel		2659.360	MT	36300	96534768	0.16%	96689224
4	Man Power (Over all)		155780.000	No's	500	77890000		77890000
5	Machinery and Vehicle rent		4.8% rate of each work (including diesel)			6778979.3	0.30%	6799316.3
						Total Rs.	244806501	

II. CONCLUSION

With an understanding of the economics, it is possible to get an insight into what kind of factors that can affect the building industry and the parties within. Further, the outlined phases in a construction project makes is possible to understand how cost estimation is carried out in the procurement phase. Cost estimations hold many uncertainties and have many factors which must be considered. A critical factor has been emphasized such as the time effect on money and project appraisal with focus on income a probability. To finalize the economic, understand accounting has been accounted for. Taking all these areas into account, an overall picture of the economical aspect has been highlighted. To improve the building industry and the different project initiated by investors, a system has been proposed for implementation.
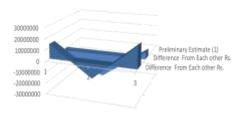
The above Estimate for a Road Project we know the Different types of estimates are mostly nearby +- 5% to +-10%. The Comparison of a result is follows.

Result of an Estimate for Highway Work

	Preliminary Estimate (1)	Definitive Estimate (2)	Detailed Estimate (3)
Total Rs.	796483712.6	783137227.1	803273473
Difference From Each other Rs.	13346485.5	-13346485.5	20136245.88
Difference From Each other Rs.	-6789760.375	-20136245.88	6789760.375
Percentage Difference From Each other	1.68%	-1.70%	0.85%
Percentage Difference From Each other	-0.85%	-2.57%	2.51%

In this Project I clearly learned the Cost estimation of a Construction Project is not same and did not accurate. And it varies for every method also the following factors are affected or make direct impact on Estimation,

- Construction Material Cost
- Construction Site Condition
- Inflation Factor
- Regularity Requirements
- Location of Construction
- Engineering Review
- Central Government

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