

ESTIMATION OF PRINCIPAL BLOCK AT GMC ANANATNAG, J&K, INDIA

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ABSTRACT- Estimation is the key process of construction after designing, as this step determines the cost in a project. During construction project planning and implementation, we need to know the quantities and costs of various items required to meet the objective of the project. That is, construction project manager has to anticipate the cost of project. The process of calculation of quantities and costs of various items in connection with the construction project is called an “estimate”. An estimate is prepared by first obtaining the quantity of the items required to complete the project and multiplied by unit cost of the items. Details of the estimate depend upon the purpose of carrying out estimate. It is important to find the pre-construction cost of principal block (government building) so that the owner of the business can analyze the profit/ loss margins. The construction manager and the owner should always keep in mind that the investment cost should not precede the future income. It is important to maintain a balance between planned costs, both direct and overhead, and wished profit. Through this project we aim to calculate and analyze the abstract of cost of a government building, more over we also aim to prepare and analyze the bar bending schedule. The type of estimation used is detailed estimate by total quantity method. The calculation of material and bar bending schedule is done in MS excel.

KEYWORDS: LONGWALL-SHORTWALL, ESTIMATION, MS excel, BARBENDING SCHEDULE, DETAILED ESTIMATE

1.

INTRODUCTION

As we all are aware about the current situation that covid-19 had hit the market very badly, as its consequences will directly reflect from the current situation of the state government. So it becomes necessary to estimate the pre-construction cost of the project.

For total abstract of cost, the parameters required are current market rate of materials, drawings and estimation of beams, slabs, columns we will find out in the estimation of the paper.

In our project we decided to take the key components of structure like columns, beams, slab etc and thus do an estimate of the building. The estimate would then be compared to the one done by the Govt. officials and we wish to find out the places of cost variations and subsequently the causes for the variation. Though the estimate of the buildings would remain more or less same particularly due to the quantity and material cost being the same, but surely we will be able to learn the different materials to be used in the construction of a building and more importantly their orientation be it the different types of bars in columns, beams, slabs or the orientation of beams, columns, slabs etc themselves. We would further understand the change in material quantity at different heights.

A. Objectives of the project

- To understand and analyze various structural and architectural drawings of a particular structure i.e. Principal Block.
- To compare the cost obtained by our estimation with that of the govt. cost for the required building.
- To learn about various key components of building and perform their Estimation.
- To know the approximate cost of work

B. ESTIMATION

The calculation of various quantities of a construction project and the expected expenditure that can incur on a specific project is called estimation. Sometimes a situation may arise that funds available are less than the estimated cost. Then the work is done in part or by reducing and altering the specifications. Also this gives a clear picture why pre-construction estimation becomes very necessary.

C. REQUIREMENTS OF ESTIMATION

- An estimate helps decide whether the proposed plan coordinate with the available funds are not
- It is additionally needed to control the expenditure during the execution of work
- An estimate is important for getting into a contract by inviting tenders
- It helps the quantity surveyor with measurement of materials during pre and post contract operations
- It helps very useful in helping detect inconsistencies
- It can help save cost by handling reinforcement

D. DATA REQUIRED

I. Rates : it will include rates of

- Labor, bender, and blacksmith etc.
- The rates of various construction materials

It is to be in mind that the labor and cost of materials may vary from place to place and time to time.

II. SPECIFICATIONS:

- **GENERAL:** it gives a general idea of class, nature, quality, work and materials to be used in the project
- **DETAILED:** it gives description in a detailed manner of the different items of work with regards to quality and quantity of materials, workmanship and execution of work

III. DRAWINGS:

It is basically the plan of the project that will include the structural and architectural drawings for beams, slab, column, staircase and foundation etc.

E. BARBENDING SCHEDULE:

A Bar Bending Schedule, or BBS, is a large list that outlines the form, position, duration, mark, height, number, and bending information of each bar in Reinforcement drawings of a structure.

2. LITERATURE REVIEW

Estimation of structure or plan plays significant part in achieving successes, estimation can be depicted as the way of assessing and predicting the total expense of executing activities of work in known time by utilizing all accessible project data and assets. Estimates are firstly developed at the order-of-magnitude level with an accuracy of -30 to +50%, cost estimation helps in decision-making

Alfredo Respell et.al (2013) learned about the expense assessment of new development projects utilizing an incorporated, computer based approach. The paper examines the constraints of PC programs dependent on parametric assessing approaches and CBR. Recorded information was viably reused in the demonstrating which is utilized by the CBR strategy. 17 chronicled reports of development were chosen for the approval reason. The framework delivered an appropriately definite furthermore, precise quote for every one of the tried tasks. This strategy produces appraisals of development projects with more precision and in a proficient manner. The mechanization and backing of CBR critical thinking appears to make conceivable to complete the degree definition cycle of a task in a short time and without a lot exertion. Each phase of the cycle can be helped without the interest of manual data taking care of.

Tariq S Abdel hamid (1999) have examined the Time arrangement investigation for development efficiency. This paper gives a concise outline of time arrangement examination and exhibits its application utilizing recently distributed information. Paper has exhibited the benefit of utilizing time arrangement investigation for assessing development profitability tests.

3. METHODOLOGY

A. DESCRIPTION OF THE PROJECT

the plan of building used for this research purpose is a principal block (government building), which is located in Anantanag J&K. the building will operate as various activities for medical college and is single storey building

B. PREPARATION OF BUILDING LAYOUT

The layout for the proposed building was prepared using AutoCAD. The dimensions of the plan are in mm

The layout drawing contains all the necessary detail to complete the estimation and compared it with govt. estimate

C. METHODS OF ESTIMATE

Long wall- Short wall: The walls along the length of room is considered to be long wall while the wall perpendicular to long wall is said to be short wall

Centerline method: The total center line length of walls in a building is first, the calculated, the centerline length is multiplied with the breadth and depth of respective item to get the the total quantity at a time.

The method we used to do estimate is long wall- short wall method. Calculation can be done manually and using MS excel. ,Ms excel reduces the chances of calculation errors.

D. TYPES OF ESTIMATE

1. Approximate method: it is a rough estimate made in the initial stage of project. its motive is to give an idea to the client regarding the cost needed and for acquiring approval from the sanctioning bodies
2. Plinth area estimate: it is calculated by multiplying the values of plinth width, plinth length and plinth area rate.
3. Detailed estimate: this type is calculated in two phases. First the quantities of different works such as excavation and reinforcement. afterwards all the data is summarized in abstract of cost

4. DATA ANALYSIS

S. NO	Description	Rate	Quantity	Total Amount
1	Earthwork in excavation			
	Excavation for footing (using Excavator)	90	199.6387	Rs 17967.48
	For plinth beam	90	17.963	Rs 1616.67
				Rs 19,584.15
2	P.C.C			
	For Footing	3400	13.309	Rs 45250.6
	For Plinth Beam	3400	3.991	Rs 13569.4
				Rs 58,820
3	Plinth Beam			
	a) Formwork	280	159.64	Rs 44699.45
	b) Steel	43	1938.92	Rs 83373.58
	c) Cement	440	86 bags	Rs 37840
	d) Sand	1250	5.883	RS 7354
	e) Aggregate	1130	12.1	Rs 13678.76
				Rs 1,86,585.73
4	R.C.C			
	a) Cement	440	411 bags	Rs 180840
	b) Sand	1250	28.32	Rs 35400
	c) Aggregate	1130	56.67	Rs 64039.36
				Rs 2,80,279.36
5	Reinforcement of footing	43	2911.43	Rs 1,25,191.59
6	Column			
	a) Steel	43	5959.52	Rs 256259.36
	b) Cement	440	458 bags	Rs 201520
	c) Sand	1250	31.922	Rs 39902.5
	d) Aggregate	1130	61.85	Rs 69890.5
				Rs 5,67,572.36
6	Beams			
	a) Formwork	280	135.387	Rs 37908.36
	b) Steel	43	1617.551	Rs 69554.71
	c) Cement	440	72 bags	Rs 31680
	d) Sand	1250	4.953	Rs 6191.87
	e) Aggregate	1130	10.245	Rs 11577.41
				Rs 1,56,912.35
7	Staircase			
	a) Cement	440	59 bags	Rs 25960
	b) Sand	1250	8.2	Rs 10250

	c) Aggregate	1130	16.44	Rs 18577.2
	d) R.C.C volume of staircase	3400	38.3	Rs 130220
	e) Steel	43	117.9	Rs 5069.7
				Rs1,89,806.9
8	Slab			
	a) Cement	440	140	61600
	b) Sand	1250	9.59	11987.5
	c) Aggregate	1130	14.48	16362.4
	d) Shuttering	450	125.73	56578.5
	e) Steel	43	543.21	23358.03
				Rs 1,698,86.43

Therefore the total amount is = **Rs 17,54,639**

Labor Charges

S.NO	Description	Rate	Quantity	Total
1	Head Mason	800	60	48000
2	Mason	600	120	72000
3	Labor	450	480	216000
	TOTAL			336000

Therefore total amount required = **Rs 3,36,000**

Therefore total amount= 17, 54,639+3, 36,000= **Rs 20, 90,639**

Adding 5% contingency charges and 2% water charges= $20, 90,639+20, 90,639*(5/100) +20, 90,639*(2/100)$

=Rs 22, 36,983.73

5.

RESULTS

- The Estimation of principal block (government building) is carried out successfully.
- The Estimation is done manually
- The quantities were calculated with the help of long wall-short wall method and the Rate analysis was performed with respect to current market rates
- The total cost required for the construction of the building is Rs 22,36,983.73
- the estimation, BBS schedule was carried out successfully
- the quantities were estimated using the long wall –short wall method and the estimate prepared is detailed estimate

6.

CONCLUSION

The estimate of the residential building was prepared successfully. In this report a review on the methods of estimating has been done. From this review, we have come to a conclusion that long wall-short wall method is the best and error less method.

- i) The total cost required for the construction of the building is Rs 22,36,983.73
- ii) The contract given by the govt. was a lump sum type of contract and the govt. had to pay Rs 29, 60,000 for its construction.
- iii) The Govt. budgeted was nearly 24% greater than the amount of money required in the construction of structure.
- iv) Because of lack of estimation a lot of extra money was spend in this project.

7.

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