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## Estimation of public building (office building) in Google spreadsheet

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### ABSTRACT

*Traditionally, estimating meant using Microsoft Excel to create a spreadsheet on your desktop or server. With the rise of cloud-based tools, today you might use Excel online, which allows you to collaborate with others in an online spreadsheet or Google Sheets which is a similar online tool. Which version you choose will likely depend on your company setup and whether you use Outlook (Microsoft) or Gmail (Google) for your general company email and functions. If you do happen to find any mistakes you can simply go back and edit the drawings and reprocess your file. About estimating, it is done to find out quantity of materials required for a particular project, also rate analysis if done for the same work which needs to be done. Rate analysis includes finding out cost of materials, labours with extra charges which are included in further chapters. The plans is made using AutoCAD, which are given at the end of project in appendix. This plans were made and estimation was done of the building in plan.*

**Keywords:** Estimating, Spreadsheet, Rate Analysis

### 1. INTRODUCTION

Estimation (or estimating) is the process of finding an estimate, or approximation, which is a value that is usable for some purpose even if input data may be incomplete, uncertain, or unstable. The sample provides information that can be projected, through various formal or informal processes, to determine a range most likely to describe the missing information. Estimate is the techniques of calculating or computing the various quantities and expected expenditure to be included on a

perpendicular work or project. There are different types of estimate are used Approximate, Detailed, Quantity, Supplementary estimate. The approximate estimate to find out the approximate cost in short time before the starting of project. The preliminary estimate should be produce accurate cost of project these varies up to 10 to 15%. The Office Building will be three story town hall out of which two stories will be leased for office space or commercial purposes.

### 2. ESTIMATION

Estimation is the scientific way of working out the approximate cost of an engineering project before execution of the work. It is totally different from calculation of the exact cost after completion of the project. Estimation requires a thorough Knowledge of the construction procedures and cost of materials & labour in addition to the skill, experience, foresight and good judgment. An estimate of the cost of a construction job is the probable cost of that job as computed from plans and specifications.

### 3. NEED FOR ESTIMATE

1. It help to work out the approximate cost of the project in order to decide its feasibility with respect to the cost and to ensure the financial resources.
2. Requirements of controlled materials, such as cement and steel can be estimated for making applications to the controlling authorities.
3. It is used for framing the tenders for the works and to check contractor's work during and after the execution for the purpose of making payments to the contractor.

#### 4. EXCEL SPREADSHEET

Uses of the program almost every construction company has its own computer. It has become a powerful tool for those who use it. The problem is that many builders don't take time to use this great technology. Many large construction companies are set up with estimating programs and integrated systems that cost thousands or even tens of thousands of dollars to purchase most small to—more money than medium size builders can afford.

#### 5. EXISTING SYSTEM

List of software that will help you prepare a precise estimate :

- 1) Candy
- 2) CostX
- 3) Sage Estimating
- 4) B2W Estimate
- 5) HCSS Heavy bid
- 6) ProEst Estimating software

#### 6. LIMITATIONS OF EXISTING SYSTEM

The current estimator software available software in the market come with a price, most of the software are paid or have few days free trial and to use them an initial investment needs to be made in order to purchase the software. Proponent of the Excel approach is quick to tout the many benefits. There's no need to pay for a new piece of software, since if you already have Microsoft Office installed on your computer, you also have Microsoft Excel or Google Sheets installed too.

#### 7. PROPOSED SYSTEM

To know the approximate quantity of various material and labour required. To know the approximate cost of work. To have an idea about the time of completion. Its help in financial planning to once before going construction. For invite tender and arrangement of contract. To justify the investment from benefit cost ratio. An estimate for an existing is needed to valuation.

#### 8. METHODOLOGY

Autodesk, Inc. is an American multinational software corporation that makes software for the architecture, engineering, construction, manufacturing, media, and entertainment industries. One of Autodesk's software is AutoCAD. Preparation of Building Layout using AutoCAD: The layout for the propose building was prepared, discussed and approved. AutoCAD is used in this project to plan and make the office building we had some plans about and designs about it. Various plans such as center line plan, Developed plan of ground floor, 1<sup>st</sup> and 2<sup>nd</sup> floor plan was also made, foundation plan, section type plan of one floor which from walls to slab was assumed same for 1<sup>st</sup> and 2<sup>nd</sup> floor too. Plan are mentioned further in this project. Same for 1<sup>st</sup> and 2<sup>nd</sup> floor too. Plan are mentioned further in this project. After drawing various plans we started noting quantities we were required to estimate of office buildings.

##### Various quantities are

1. Earthwork Excavation under columns.
2. PCC bed of foundation
3. RCC for foundation
4. RCC for Plinth
5. Damp proof course
6. Tiles quantity
7. Internal Plastering
8. External plastering
9. Quantity RCC for Columns
10. Beam

11. Slab
12. Internal Painting
13. External Painting
14. Brickwork

#### Method of estimate

There are three different method of estimate:

- 1) Centre line method
- 2) Long-wall short-wall method
- 3) Crossing Method

Method used by us is Centre line method.

#### Centre line method

In this method of estimate the total Centre line length of wall in a building is first calculated then the Centre line length is multiplied with the breadth and depth of respective items to get the total quantity at a time. The Centre line length for different section of wall in a building shall be worked out separately.

Length for an item (l) = Total centre line length – n \* (1/2 \* width of item)

Procedure for finding out quantity of an item using centre line method:

- Prepare foundation Plan of given drawing. Write centre line length of each wall in it.
- Add all length together to get Total Centre line (TCL)

	A	B
1	Slab	(m)
2	Length	1.5
3	Breadth	1
4	Depth	0.1
5	Volume	L x B x H
6		0.15

- Calculate number of junctions of cross walls with main or external walls.
- Multiply number, length, width/breadth, height of an item to get quantity of it.

After Plans, Estimation of various works, and quantity of steel, the next thing in procedure is Rate analysis. Rate analysis is method of determining the rate of an item of work from the cost of materials, cost of labours, tools and plants charges and other miscellaneous petty expenses .A reasonable of 10% for the contractor is included in rate analysis. Water charges of 1.5% are also added wherever needed. Bill of quantity (BOQ) is prepared after Rate analysis of above material, labours and other expenses, etc. is done.

Other expenses included in BOQ apart from materials, labour, tools and plant's charges are:

1. Electrification: - 8% of total cost of materials and labors
2. Sanitary and water supply works: - 8% of total cost of materials and labour
3. Contingencies: - 4% of total cost of materials and labour
4. Work charge establishment: - 2% of total cost of materials and labours
5. Centage charges: - 10% of total cost of materials and labours.

#### 9. CALCULATIONS

All Calculations are done in Google spreadsheet. It includes Estimation of quantities of various items, Quantity of steel, Rate

analysis of various materials, Labours, extra charges. Quantities have been estimated with the help of plan made on AutoCAD.

The Estimation of G+2 commercial building (office building) is carried out successfully. The Estimation is done manually in Excel. The quantities were calculated with the help of center line method and the Rate analysis was performed with respect to the rates of CSR 2018-19 excluding GST. The total Estimation cost was found to be Rs. **1319873** one crore thirty one lakhs ninty eight thousand seven hundred and thirty one rupees and 11 paisa

## **10. CONCLUSION**

The spreadsheet we made can also used for future estimation of similar type of building. The price of a building with different dimension can be calculated. The given plans can be used as reference for making new plans

## **11. FUTURE SCOPE**

The spreadsheet we made can also be used for future estimation of similar type of building. To use same sheet the person will have to just change some of the values and dimensions and the final price will be estimated automatically at the end This happens as we have added formulas to make the work easy of estimation. The plans made also can be used as a reference to build up new plans better than this.

## **12. REFERENCES**

[1] Imam Soeharto (1995), puts forward an estimated cost would be complete if contains the following elements:

- [2] The Purchase Cost of Materials and Equipments Prepare cost estimates of materials and equipment purchases are very complex, ranging from creating specifications, looking for the source, conducting an auction or tender, until to pay the cost / price. There are various alternatives available to these activities, so that when less precise handling can cause project costs to be uneconomical. Estimate Estimating Data Base Time and Quality field reports
- [3] Rental Cost or Purchase Cost of Construction Equipment In addition there are also construction equipment's those are used as an auxiliary means of construction that are not permanent, such as trucks, tower cranes, fork lifts, graders, scrapers and others.
- [4] Labor's Wage Labor consists of the headquarters labor that consisting of engineering expertise, supervision and labor in the field. Identifying labor cost / hour / person is a further elaboration of the scope of the project. Given the portion of labor to reach a percentage of 35% of the total project cost.
- [5] Subcontractor Expense subcontracted work is generally work package consisting of services and materials provided by subcontractors.
- [6] Transportation Expense Transportation costs include all costs of transportation of materials, equipments, and labors associated with project implementation.
- [7] Overhead and Administration this component consists of the operating expenses charged to the project, such as office rent, paying electricity, telephone, marketing costs, and expenses for taxes, insurance, royalties, security deposits and others.