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Planning and estimation of G+1 structure of the residential building

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ABSTRACT

Estimation is the scientific way of working out the approximate cost of an Engineering Project before execution of the work. The project deals with the plan and estimation of a residential building. Since planning, drawing, estimation of any building structure by manual method using pencil, sheets etc. takes more time and also there is possibility of having mistaken while calculation. With advanced technology we can reduced time used for drawing and calculation and also human error. The principal objective of this project is to Plan and Estimate Residential Building (G+1) structure. Microsoft Excel helped us by giving accurate measurements for estimation and AutoCAD helped us in drawing accurate measurements for planning of proposed building plan. With the help of Microsoft Excel and AutoCAD we successfully found the estimated area of Plot area = 252.84 m², Ground floor area = 124.24 m², First floor area = 107.92 m², Total floor area = 232.16 m², F.S.I Permitted = 1.0, F.S.I consumed = 0.92 &let; 1.0.

Keywords: Planning, Microsoft Excel, AutoCAD, Estimate, Residential Building, Measurements, (G+1) Structure, Drawing, Calculation

1. INTRODUCTION

The aim of the project is to know and understand the various aspects like planning and estimate we have planned a residential building of two floors (G+1). The planning is done as per the requirements and regulations given by the National Building Code (NBC).

1.1 Planning Considerations

The plan and detailing were drawn using Auto CAD. The building is rectangular in shape. The building consists of ground floor, first floor and terrace floor. Enough parking space is provide around the building and staircase is also provided with enough safety in the building .

1.2 Estimation

Estimate means to calculate the various items to be included on a perpendicular work or project. There are different types of estimates used- Approximate, Detailed, Quantity, Supplementary estimate. The approximate estimate to find out the approximate cost in a short time before the starting of the project.

2. OBJECTIVE OF PROJECT

- To Plan G+1 structural Residential Building.
- To draw plan of G+1 Residential Building Using Auto cad.
- To find cost of G+1 Residential Building using Excel

3. METHODOLOGY

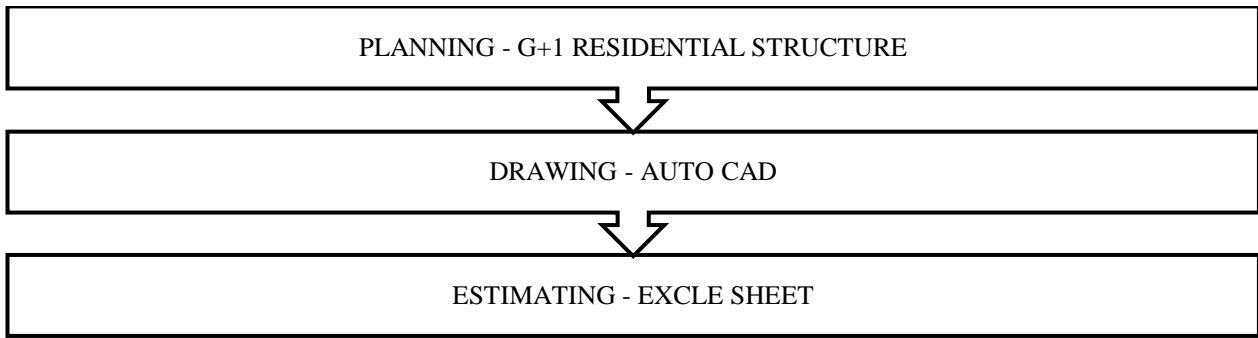


Chart 1: Methodology Chart

3.1 Planning - G+1 Residential Structure

Planning is the first step of construction project management philosophy of planning, organizing and controlling the execution of the projects. Construction project planning is the function in which project and construction managers and their key staff members prepares the master plan.

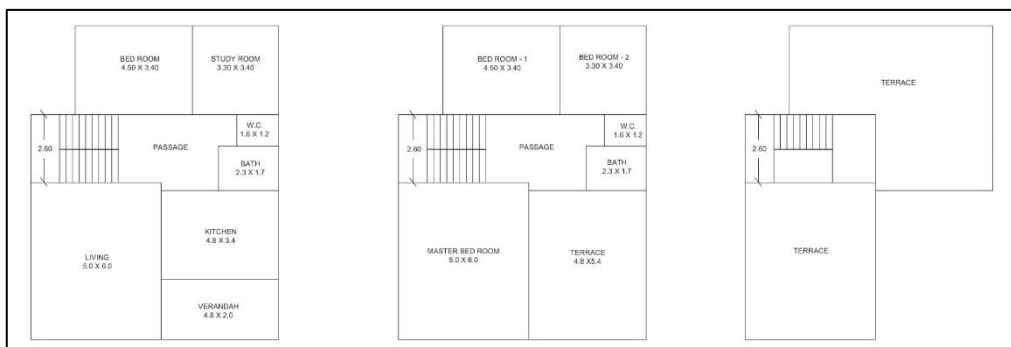


Fig 1 : Final line Plan

3.2 Drawing - Auto Cad

AutoCAD is a computer-aided design software developed by the company Autodesk (hence the name AutoCAD). It allows you to draw and edit digital 2D and 3D designs more quickly and easily than you could by hand. Ground floor consists of Veranda, Living Room, Passage, Bath Room, W.C., Staircase, Bed room, Study Room. First floor consists of Staircase, Mater Bedroom, Terrace, Bath Room, W.C., Bed Room 1, and Bed Room 2. Terrace plan consists of Staircase and 2 terraces. front elevation plan consists of ground floor windows, first floor windows, door and chajja the height of plan is 9.10 m. if the plan is cut at X-X the we get section at X-X which consists of foundation, step footing, brick work, construction of staircase which is done by using method of dog leg, concert filling in staircase. In foundation plan the column are mark by initial letter C1 or C2. stie plan consists of the planning of sewer line, water line placement of G.T, I.C, M.H, F.S.I, E.P, W.T and Index consists of full form of G.T, I.C, M.H, F.S.I, E.P, W.T. construction notes, schedule of doors and windows, area statement consists of over all information which cannot be mention at some place and some detailed information regarding this plan. This are some images of our plan that can easily and with full detailed define the above summary.

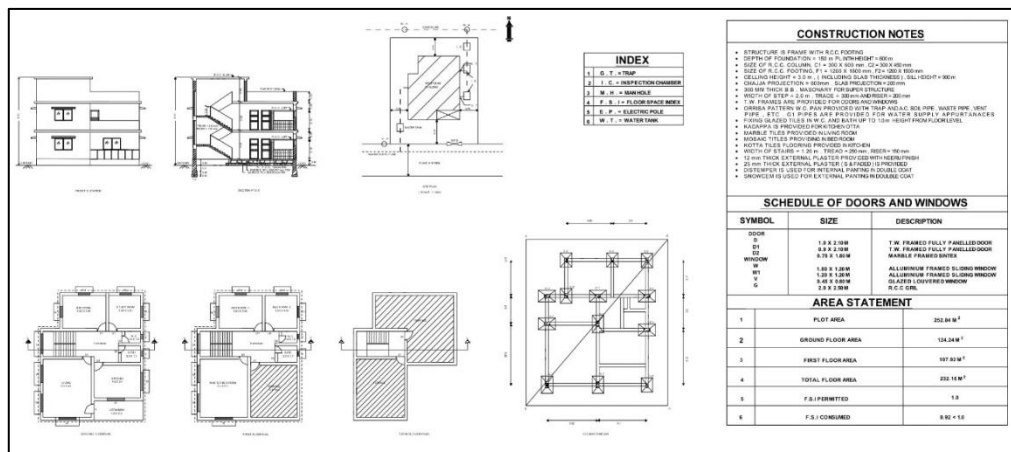


Fig 2 : Develop Plan , Front Elevation , Site Plan , Foundation Plan , Construction Notes , Schedule Of Doors And Windows , Area Statement

3.3 Estimating in Excel Sheet

Estimate is the process of finding the approximate value of the item in the construction project . estimate in excel is the easy and simple process of finding quantity as in excel calculating or computing of the item consume reduces the time used for the work by any other method .

3.3.2 Approximate Quantity Method Cost Estimate: The Approximate Quantities method of estimating the cost of a construction project is regarded as the best because it's more accurate and more reliable than other methods of estimating. This estimate is based on measurement groups where Bill items with the same dimensions (in metres or square metres) are grouped together. This essentially means that items occupying the same area or perimeter are measured together at once using a Group unit of measurement.

3.3.3 Following Is the List of Items Estimated in Excel Sheet

- 1) Excavation
- 2) P.C.C for Foundation
- 3) Brickwork (300 mm Thick)
 - Total Ground Floor Brickwork
 - Total First Floor Brickwork
 - Terrace Brickwork
- 4) Internal Plaster
 - First Floor Internal Plaster
 - ground Floor Internal Plaster
- 5) Flooring
 - Ground Floor Flooring
 - First Floor Flooring
- 6) External Plastering
- 7) Skirting
 - Skirting For Ground Floor.
 - Skirting For First Floor

Table 1 - Excavation

Sr. No.	Item	No	Length	Breadth	Height	Quantity	Total Quantity
1	Excavation						
	Colum C1	8	1.5	2.1	2	37.8	
	Colum C2	5	1.5	1.8	2	20.5	
	Total Excavation						58.3

Table 2 - P.C.C For Foundation

2	P.C.C For Foundation						
	Colum C1	8	1.35	1.95	0	3.16	
	Colum C2	6	1.35	1.65	0	2	
							5.16
	P.C.C For Plinth			133.8	0	13.3	
	Total P.C.C						18.54

Table 3 - Brickwork

3	Brickwork						
1)	Total Ground Floor Brickwork					136.3	
2)	Total First Floor Brickwork					118.4	
3)	Terrace Brickwork					70.14	
	Total Brickwork						324.8

Table 4 - Internal Plaster

4	Internal Plaster						
	Total Ground Floor Internal Plaster						344.9
	Total First Floor Internal Plaster						294.9

Table 4 - Flooring

5	Flooring						
	Total Ground Floor Flooring						974.6
	Total First Floor Flooring						799.0

Table 5 - External Plastering

6	External Plastering						
	Total External Plastering						339.2

Table 6 - Skirting

7	Skirting						
	Skirting For Ground Floor						11.27
	Skirting For First Floor						11.97
	Total Skirting						23.24

4. CONCLUSIONS

- ❖ Construction of residential building should be providing safety and economical. This project includes the layout of G+1 structure, planning using auto cad and estimate using Microsoft excel sheet.
- ❖ Getting familiar with Civil Engineering software Auto Cad. :-
Auto Cad has been used for planning the various activities that surround the construction of a building. Using Auto cad, we were able to formulate a working schedule and also a progress bar for constant monitoring of the project. Using Auto cad, we were able to assign various resources as well as responsibilities on various people related to the various stages of the project there by increasing accountability.
- ❖ The Estimate for the project has been calculated by using Approximate Quantity Method in Microsoft excel. Below are the Quantities which are calculated using Microsoft Excel: -
 - Excavation -58.3 m³
 - PCC For Foundation -18.543 m³
 - Brickwork: - 324.94 m²
 - Internal Plaster: -
 1. Internal Plaster for Ground Floor: - 344.948 m²
 2. Internal Plaster for First Floor: - 294.96 m²
 - Flooring: -
 1. Flooring For Ground Floor: - 974.6116 sq. ft
 2. Flooring For First Floor: - 799.0376 sq. ft
 - External Plaster: - 339.224 m²
 - Skirting: - 23.24 m²

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