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Review on Proposed Planning and Estimate of 1 BHK Residential Building

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ABSTRACT: The principal objective of this project is to planning designing and estimation of Residential Building. the first objective of this project is to realize sufficient knowledge in planning, designing and estimating. Our project deals with the plan and style of Residential Building. Designing involves identifying the hundreds which influence a structure and therefore the forces and stresses which arise within that structure thanks to those loads, perform analysis to urge moments and shear forces on different elements of the structure then design the structure for ultimate loads and moments. The hundreds are often self-weight of the structures, other dead loads, live loads, moving (wheel) loads, wind load, earthquake load, load from natural process etc. Auto CAD may be a software tool to style functional design of plan. Estimation includes finding the quantities of materials required for the development of the structure and requirements of labour etc., finally determining the general cost of the structure before execution of labour. During this project work, an effort is formed consistent with Building by laws and style of residential building as per is: 456-2000, IS1200 and SSR. The layout planning may be a part of urban development it includes planning of residential houses, commercial complexes, service roads, primary health centres, school...& other amenities sewerage system for whole layout (includes treatment, sewer main, storm water drains), water distribution system. This article includes design& estimation of residential building in plot of layout planned

KEYWORDS: Planning, Designing, Estimating, Building, Residential Building

I. INTRODUCTION

Estimate is nothing but the probable cost of the work. An estimate can be defined as the procedure or method of working out the probable cost of the work. An estimate, as it relates to the creation of financial statements, is a calculation of a financial transaction for which no exact value is determinable, and is based upon judgement, historical understanding, and experience. An estimate is a document that provides approximate costs for a project for a project to a potential client. An estimate isn't binding, but you should still include terms and conditions to clarify details like payment terms. This will make sure that the client is fully informed and there will be no surprise down the road. An estimate can be prepared by working out the quantities and then calculating the cost at suitable rate. Before the construction of any work or structure started. Calculation of quantities of various items of work and its probable cost is done. This is known as Estimating. A problem with a cost overturn can be avoided with a credible, reliable, and accurate cost estimate. A cost estimator is the professional who prepare cost estimates. There is different type of cost estimators, whose title may be preceded by a modifier, such as building estimator, or electrical estimator, or chief estimator. The project estimate file should follow the project through the various stages so that each new estimate can be easily tied to the previous one.

Shelter is the one of the basic needs of the habitation. In this project we have complete the planning designing and estimating of the residential building. The project is completed with the references to the Indian standard codes. In our project we are introducing our topic "Planning, Designing and Estimating of Residential Building". Structural design is an art and art and science of designing with economy and elegance, a safe, serviceable and a durable structure. The entire process of structural planning and style requires not only imagination and conceptual thinking but also sound knowledge of science of structural engineering besides knowledge of practical aspects, such as relevant design codes and bye-laws, backed by sample experience, institution and judgment. In this project, an attempt is made on planning, design and estimation of residential building. The main object of our project is to know the various aspect of building like planning, designing and estimation. Before construction of any residential building, we required making plan on AutoCAD, normally AutoCAD software is used for planning of residential building in 2D drawings form that we can draw elevation and sections of buildings and Revit is used to draw 3D drawing. The design of residential building is



administered as per Limit State analysis. The various IS code are used for design of Residential building. Estimations are completed by using rates from schedule of Rate (2020- 21) by Public Work Department.

II. PROBLEM DEFINITION

Planning: Planning of the residential building is the arrangements of the various components of units of a building in systematic manner so as to form a meaningful and homogeneous structure to meet its functional purpose. Building planning is the graphical representation of a building will be looked like after construction.

Design: The design is process of section percussion from the analysis results by using suitable analysis method. The aim of design is to achievement of an acceptable probability that structures being designed will perform satisfactorily during their intended life

Estimation: A cost estimate is defined for this report/project as the initial projected building construction cost figure. Cost estimation is the process by which, based on information available at a particular phase of project development, the ultimate cost of a project is estimated. This quantification of cost is the initial figure that allows the project to proceed to the next phases for final design and construction.

Aim of Project: The aim of the project is to plan, design and estimation of framed structure of a residential building

III. REVIEW OF LITERATURE

Murat Gunduza et.al (2015) have studied an early cost estimation model for hydroelectric power plant projects. The main indicators considered and studied in this paper are the amount of energy generated in a hydroelectric power plant and the cost of investment and there by decide whether a project investment is feasible or not. Cost of the project is calculated by detailed hydrological study, site investigation, good basin planning, geotechnical survey and various tests of the soils. Multiple regression method and artificial neural network analysis are taken for the validation. The models are developed by the data collected from forty-nine hydroelectric power plant projects and five projects are used for the validation of the models. Comparisons of validation results revealed that the regression model had a 9.94%, and neural network model had 5.04% prediction accuracy. In this paper the neural network shows more prediction accuracy than the regression analysis.

Alfredo Serpell et.al (2013) studied about the cost estimation of new construction projects using an integrated, computer-based approach. The paper studies the limitations of computer programs based on parametric estimating methodologies and CBR. Historical data was effectively reused in the modelling which is used by the CBR method. 17 historical data's of construction were selected for the validation purpose. The system produced a suitably detailed and accurate cost estimate for each of the tested projects. This method generates estimates of construction projects with more accuracy and in an efficient way. The automation and support of CBR problem solving seems to make possible to carry out the scope definition process of a project in a short time and without too much effort. Each stage of the process can be assisted without the participation of manual information handling.

Hossein Shams Mianaei et.al (2012) have studied about the estimated cost for drilling wells using the cost estimation method Case Based Reasoning. It is obtained by studying the historic data's and their problems and uses the data's to solve new similar problems. The major findings of his study are that in the proposed CBR model despite limited data, the error of method according to the performance indicators was very low. Therefore, obtained estimation accuracy of the proposed CBR model is high and the model is useful. On the other hand, given that the available estimation methods spend much time to estimate cost, we could save time using the CBR method. In his proposed CBR method, if a feature doesn't have the value, it does not affect the model. While in other methods, if a feature doesn't have the value, then the model is not solved. By this method the speed of drilling which is very important is increased.

Abdulrezak Mohamed et.al (2001) have discussed about the Knowledge based-system for alternative design, cost estimating and scheduling. In this study, an automated construction cost estimating and scheduling was presented. The automated system addresses the integration of cost estimating and scheduling at two stages; at predesign stage and after detailed design stage. More notable is its timeliness and accuracy which makes a true valuable value engineering.

Alice E Smith et.al (1997) discussed about Cost estimation predictive modelling: Regression versus neural networks. The research paper studies the stability, performance and ease of cost estimation modelling using regression versus neural networks to develop a cost estimating relationships. Neural networks have advantages when dealing with data for which there is little a priority for knowledge of the appropriate cost estimating relation to select for regression modelling. However, in cases where an appropriate Cost estimating relation can be identified, regression models have



significant advantages in terms of accuracy, variability, model creation and model examination. The Neural Network model is an attractive substitute for regression.

IV. OBJECTIVES OF COST ESTIMATION

The main objectives of cost estimation are listed as follows: -

1. Cost estimation enables the manufacture to fix the selling price of product will be in advanced of actual production.
2. Cost of estimation indicates to the manufacture whether the contemplated programme of production and distribution will be economical or not.
3. To determine whether the product and its parts can be manufactured economically in the plant itself for to be purchased from outside.
4. To determine the most economical, material, tooling method to manufacture the product.
5. To standardize the performance in order to control costs involved.

V. SCOPE OF PROJECT

This project is about Planning, Designing and Estimating of Residential building. Building planning is the arrangement of various component or unit of a building in systematic manner so as to form a meaning and homogeneous structure to meet its functional purpose. It is by builder and contractor to construct buildings of all kinds. Building planning is also useful when it is essential to estimate how much a project will cost and preparing project budgets building planning is also useful. When approaching the designing of residential building, the thing to consider is occupants, lighting and ventilation. By considering all these factors the scaled plan is designed. This ensures efficient use of floor space without wasting it. If done right, it accounts for all possible use of a given space. An estimate is process by which based on information available at a particular phase of project, the estimate is determining the feasibility and profitability of a potential project. An accurate estimation keeps all parties focused on delivering a project on time and under budget.

Table - 1: Details of the Project:

Type of Building	Residential Building
Type of Structure Frame	Frame Structure
Number of Floors	3 (G + 2)
Floor to Floor Height	2.9 m
Height of Plinth	0.6 m.
Plot Area of Building	1548.00 Sq.m.
Plot Detail	Front – Service road followed a green zone from the between Dodamarg and Bhedasi.
Type of Apartment	1BHK

Arrangement of Rooms

Living room – This is the area for general use where family spends much of their time. It is usually near the entrance of the house. During winters, this area receives much of the sunshine and in summer, the sunrays enter from southern part.

Kitchen – this is usually made in the eastern side of the plot for morning sunshine, which refreshes and purifies the air.

Bedroom– this area should provide privacy to the members and should provide provision for table, chairs, and cupboards. Attached toilets may be provided for ease of convenience.



Bath & W.C. – Usually, bath and W.C. are combined in a single room and attached to bedroom for increase of convenience and privacy. The bathroom is usually made white with glazed tiles with complete showers, bathtubs etc.

Verandah– A residential building must be provided with open verandahs at the front and rear side of the home. This verandah provides protection to the home from sunrays, wind and rain. It also provides with a place to sit and enjoy. This area varies between 10%-20% of the total area.

Stair case– The staircase should be placed in the front of the building if it is intended for visitors and should be placed at the back of the home if family members would use it more. Rises & treads should be uniform to smooth movement.

VI. CONCLUSION

This project includes the planning of Residential Building using AutoCAD, Design using Is Code and concludes with the cost estimate for the entire project. The cost estimate for the project has been calculated using Long Wall Short Wall Method in Microsoft Excel. For the Abstract cost CPWD Schedule of rates has been followed. In this project Planning, Designing, and Estimating of Residential Building. We all the member of our team has learned to plan a building with reference of National Building Cod of India- 2005.

Planning, designing and estimating, these are the three steps which are very important while constructing any structure. In this project we have detailed discuss about the planning, designing and estimating of the residential building. In future may be there are different methods are adopted to do the planning designing and estimating. For example, there are newly software are coming in future to create plan. New software and advance option are generated to do these processes easily as we think that in future there are new software's, methods and advance option are developed. Especially for students to do their work easily.

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