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REVIEW PAPER ON PLANNING, DESIGN AND ESTIMATION OF G+3 BUILDING IN UTTARDHOUNA

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ABSTRACT

we can estimate the cost of the building before we construct . In any construction project, the probable cost of construction which is known before hand is known as the estimated cost. And hence it is quite essential for the arrangement of financial resources for the completion of any construction project. In this project, the main aim was to find out the detailed estimate of quantities of all the structural aspect of G+3 building. It also helps in finding out the probable cost, or the estimated cost of the project based on the computation of these quantities. The structural aspects considered for the estimation of quantities are earthwork in excavation and backfilling, concrete work in foundation and in R.C.C structures such as beams, columns, slabs, staircases etc., steel reinforcement in beams, columns and other R.C.C structures and brickwork in superstructure. The computation of quantities was carried out based on the drawings of various structural elements, such as the each floor plan, footings and columns layout, beams layout, staircases layout, footing specifications and column specifications ,These details provide an idea for requirement of quantities for a particular project and also the likely expenditure which would be needed to be arranged .This documentation also provides the abstract of the estimated cost for the structural aspects.

I.INTRODUCTION

Estimation in civil engineering is the process of determining the number of materials, resources, and money needed to operate during a construction project. This is usually done before the start of the project, so you can procure estimated materials and gather the funds as the project progresses. It's pretty close to the actual cost of your project requirement.

Cost estimation in civil engineering is one of the most important aspects of construction management, so great care should be taken when calculating costs. Future quote engineers need to show their skills. It may seem like a trivial task, but it requires careful analysis, proper procedures, and the most appropriate method

Estimates are developed from observations and knowledge of past experience. The accuracy of an estimate often depends on the level of detail available and the amount of time for which data are available for analysis.

Structural analysis is the backbone of civil engineering. During recent years, there has been a growing emphasis on using computer aided softwares and tools to analyze the structures. There has also been advancement in finite element analysis of structures using Finite Element Analysis methods or matrix analysis. These developments are most welcome, as they relieve the engineer of the often lengthy calculations and procedures required to be followed while large or complicated structures are analyzed using classical methods. But not all the time such detailed analysis are necessary to be performed i.e. sometimes, just approximate analysis could suffice our requirements as in case of preparing the rough estimates and participating in the bidding process for a tender. It may even happen that sometimes the analysis software or tool is not available at hand? Or the worst case, the computer itself is not available

II.LITERATURE REVIEW

1. Mohammad waffy Fazil 2021 –

In this research they have focused to avoid cost overrun in the project.Their aim is to provide a basis to improve cost estimation performance in construction. Their primary objectives was to synthesize the factors that are affecting cost estimation performance in construction projects and propose future directions regarding cost estimation performance based on the identified factors.

2. Alisha Sket.al 2020 –

The aim of this project was to provide the residential building as economical as possibleand also to reduce theseismic effects on it,because shelter is one of the basic requirement for anyone , they have followed various rules and regulation on construction of residential building authorised by the government, they have the structure is analyzed both manually and in STAAD pmas per (IS: 456-2000)With a different load condition on it

3. Manoranjan Roy et.al- 2018 –

This project contains Details Estimate For G+2 Storied Building presentation , they have done the designing using STAAD Pro and estimated from sub structure to super structure, they also estimated interior designing and wooden work required in the completion of the project , they solely followed national building codes for the construction o the building so that it does not violate any governments norms.

4. Uday Kumar et.al- 2017 –

As Manual design and analysis of structural elements of buildings is time consuming, it can be reduced by using software such as STRUDS. They have used Civil engineering software to reduce human labour work , AutoCAD plans can be easily imported to STRUDS. Detailed report of analysis and design of all the structural elements can be obtained. The advantage of STRUDS is that the detailing of the structural elements can also be obtained as an AutoCAD file report. The design values of the structural elements as obtained from STRUDS are slightly on higher side compared to the manual design calculation.

5. E. RakeshReddy, S. KailashKumar 2009 –

In this project we are detailed explanation how do we design and modelling of G+5 commercial building by Autodesk revit architecture, which renders complete vision of construction. In general, for building design and model can be employed by the architecture of Autodesk Revit. In addition, it can give you an exact vision via design, construction and documentation. · With the BIM new technology it is easy to model the building and we can connect to revit architecture, Revit MEP, Revit structure, Built for Building Information Modelling (BIM).

6. **MVK. Satish (2017)**

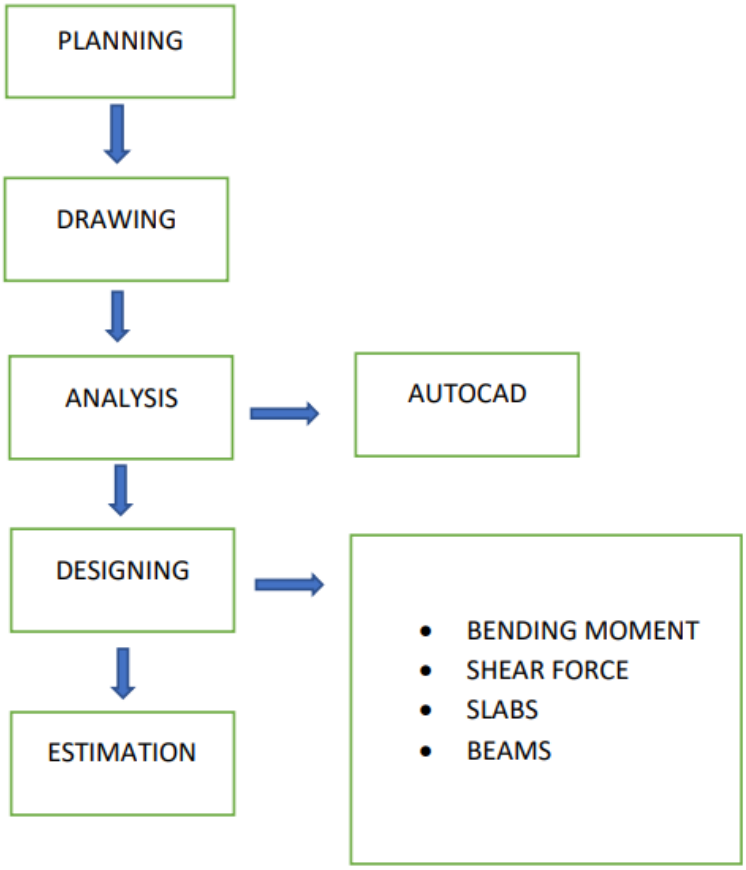
he examined and designed a G+3 hospital building and its facility arrangement reaction to seismic load were studied using STAAD.Pro and after were investigated through a 3Dnon linear reaction history examination and corrected with non-linear static working methodology (NSP), this study recommends utilization of modular NSP rather than first mode NSP as it gives better result while comparing building structures.

7. Safwanahmad (2017)

designed a G+2 hospital building using STAAD.Pro by applying suitable loads and sectional details to component within the main aim of this factor was to study the extent of credibility of using STAAD.Pro for analysis Dr. Ashokkumar et.al (2017) designed a G+3 hospital building using substitute frame method in STAAD.Pro the efficiency of analyzing using software over manual method was analyzed and a comparative analysis was carried out.

III.METHODOLOGY

First we would be visiting the site where we have have to buit the residentital building after that we measure the dimensions of the field then planning will be started according to the dimensions of the plot. A drawing will be made for the plan of the plot after that we will do our analysis on the basis iof the plan made and it can be done manually or through software but we will be doing it with the help of AutoCAD. Designing will be started after this bending moment , shearforce , slabs , beams and others factors will be taken into account while designing the residential building at last estimation of the building will be done by taking all the material used while building the residential building and it will also inculde the labour charge on it.we will be using AutoCAD for creating 2D, and Staad pro for analysis of the residential building.Revit can be used to create the 3D view of the residential building



PROVIDED DATA TYPE :

1. Floor to floor height=3000mm
2. Height of plinth=450mm above ground level
3. Depth of foundation=1000mm below ground level
4. Bearing capacity of soil=300KN/m2
5. External Walls:200mm thick
6. Internal wall:100mm thick
7. Assumed imposed loads:
8. Roof: roof finish =1.5KN/m2
9. Live load=1.5 KN/m2
10. Total Load=3.0 KN/M2 (Excluding Self weight of slab)
11. Floor: Floor Finish=1.0 KN/m2
12. Live load=2.0 Kn/m2
13. Assumed materials:
14. Concrete M20
15. Steel: Main-Fe 415 ,Secondary-Fe250
16. Unit weight of Concrete= 25KN/m2
17. Design Basis: Limit State Method based on IS:456-2000

Utility of Building : Residential Building

1. Area of the site: 54.8 X 51.83 (ft)
2. Building Height: 47 ft
3. Number of Storey: (G+3)
4. Type of construction: R.C.C Framed Structure

V.CONCLUSION

With the use of several softwares it made very easy for us to analyse , plan and design the residential building it saves lot of time and it made us easy to edit the documents in between without interuptiing the other process.

Our calculation it is based on precise measurements which gave us approximate and accurate values. The structural estimate had been prepared in detail such that the values can be used in the actual project being carried out. Also, the abstract of the estimated cost was prepared such that the current rate per unit of each item of work were considered. Hence the estimated costs of the structural requirements of the project are accurate too. The main object of estimate is to know the required quantity of material, labour and cost before actual execution. Therefore

Total cost of the labor work -16113300rs

Miscellaneous work is the 10% of the whole cost - 16133000x10/100 =1613300Rs

Project Manager 10% of the whole cost 17746300x10/100 = 1774630Rs

Total labour charges required for completion of the project - 1,95,21,000 Rs

Total cost of the material used -53,41,000 Rs

Total cost of G+3 Residential building 2,48,62,000 Rs

REFERENCES

- Rashmi Agashe, Marshal Baghele, Vaishanvi Deshmukh, Sharad Khomane, Gaurav Patle, Kushal Yadav, “To Study Analysis and Design of Multi-Storey building using STAAD-pro. and Comparing with Manual Calculations,” Apr 2020.
- Dunnala Lakshmi Anuja, V.S.Nagasal, PG Scholar, “To Study of Planning, Analysis and Design of Residential Building(G+5) By using STAAD Pro,” ISSN 2321-9939 Year 2019.
- Narendra Kumar adapa Assistant Professor, “Static Analysis and Design of Multi-Storied (G+4) Residential Building Using StaadPro,” Issn 2348–2370 vol.09,issue.03, march-2017.
- Ashok K. Jain (2012) “Reinforced concrete limit state design ”, Nem Chand & Bros., Roorkee
- IS:875, Part 1,Part 2,Part 3,Part 4, Bureau of Indian Standards.
- SP:16(1980), Design Aids for Concrete to IS:456-1978, Bureau of Indian Standards
- IS:1893(2002), Indian Standard Criteria for Earthquake Resistant Design of structures Part 1(Fifth Revision) General Provisions of Building, New Delhi, Bureau of Indian Standards.
- IS:13920(1993), Ductile Detailing Of Reinforced Concrete Structures Subjected to seismic forces, Bureau of Indian Standards