ANALYSIS & DESIGN OF MULTI-STOREY RESIDENTIAL BUILDING (G+10) BY USING STAAD PRO

T. Naidu[1], A. Bhanoji Rao[2], K. Satish Kumar[3], S. Mohan Rao[4]

T. Naidu[1], Asst. Professor, Civil Engineering Department& NSRIT College
A. Bhanoji Rao[2], Student, Civil Engineering Department & NSRIT College
K. Satish Kumar[3], Student, Civil Engineering Department & NSRIT College
S. Mohan Rao[4], Student, Civil Engineering Department & NSRIT College
Department Of Civil Engineering, NSR Institute Of Technology, Sontyam, Visakhapatnam, A.P, India.

ABSTRACT

This Project is Generally Based on Analysis and Design of structural framed building. Planning, Analysis and design of G+10 residential building structure by using IS-Code method by using STAAD PRO software. For any type of building planning is done by National Building Code (NBC) in India. Hence, this residential building is properly planned in accordance with the National Building Code of India. The reinforced concrete framed structure consisting of G+10 with adequate facilities. All the structural members are designed using limit state method with reference of IS: 456-2000. Different load active on the member (beam, column) are considered according to the IS CODE: 875 (Part1, Part2, Part3).

Keywords: Geometry, plan, supports, loads & definitions, material property, analysis, shear force, bending moment, design of beam and column.

1.INTRODUCTION

In this present increasing population and industrialization there is a huge demand for residential buildings in cities. In cities there is more population and less land area for their residential sector. This lead to development of high rise buildings in these respective areas. So considering all these aspects there is more demand for structural engineers. In order to compete in the ever growing competent market it is very important for a structural engineer to save time. As a sequel to this an attempt is made to analyze and design a multistoried building by using a software package STAAD Pro. For analyzing a multi storied building one has to consider all the possible loadings and see that the structure is safe against all possible loading

conditions. The present project deals with the analysis and design of a multi storied residential building of G+10 consisting of 4 flats in each floor. The dead load &live loads are applied and the design for beams, columns, footing is obtained STAAD Pro. We conclude that STAAD Pro is very powerful tool which can save much time and is very accurate in Designs. Thus it is concluded that STAAD Pro package is suitable for the design of a multistoried residential building.

2. LITERATURE REVIEW

D. Bhosale, Archit Pradip Hatkhambar, Rupesh Vinayak Katkar (April 2018), analyzed and Designed a Multi-storey building

using STAAD Pro V8i. After the analysis and design of their structure, they concluded that STAAD Pro could save a lot of time and is very accurate in design. They considered Dead load, live load, combination, and wind loads in the designing process.

Varalakshmi 2016 The design and analysis of multistorey G+5 building at Kukatpally, Hyderabad, India. The Study includes design and analysis of columns, beams, footings and slabs by using well known civil engineering software named as STAAD.PRO. Test on safe bearing capacity.

Pabba Mounika, MarojuNavya, Syed Viqar Malik (February 2016) has designed a Residential Building and analyzed it using STAAD Pro. In their design and analysis, the manual calculations were compared to STAAD Pro results. The results of both manual and software matched and were accurate.

P.Jayachandran 2016 The design and analysis of multistoried G+4 building at Salem, tamilnadu, India. The study includes design and analysis of footings, columns, beams and slabs by using software named as STAAD Pro. Short term deflection of all horizontal Members is within 20mm. The structural components of the building are safe in shear and flexure.

3. BASIC DATA
(i)Type of building - Residential Building
(ii)Type of structure - Mutli storey rigid framed structure
(iii)Number of storey – G+10
(iv)Floor to floor height – 3.0m
(v)External wall – 300mm
(vi)Internal wall – 150mm

NOTE : Other required data assumed using NBC for planning and IS:456 2000 for concrete (R.C.C) design work.

4. METHODOLOGY
(i) Assumptions on geometric properties on the basis of preliminary calculations.
(ii) Preparation of plan in AutoCAD.
(iii) Modelling of building and assigning of Loads in STAAD Pro.
(iv) Analysis of building.
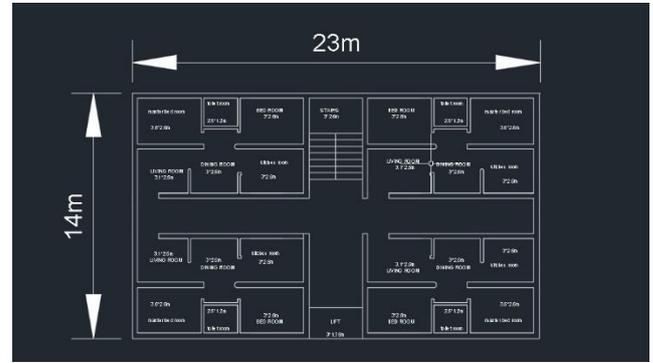(v) Design of building components.
(vi) Detailing.

5.PLAN

Fig 1 : Plan

Fig 2 :3D View of Building
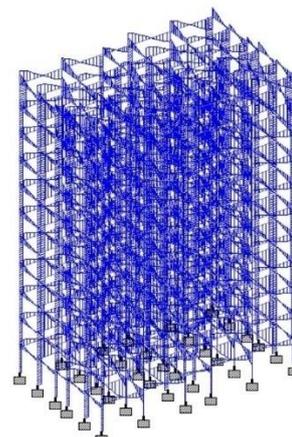

Fig 3 : Reactions

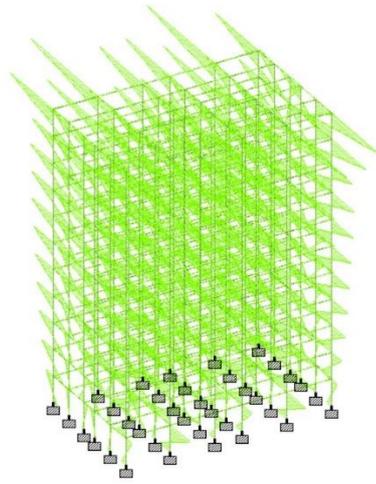

Fig 4 : Shear Force of Structure
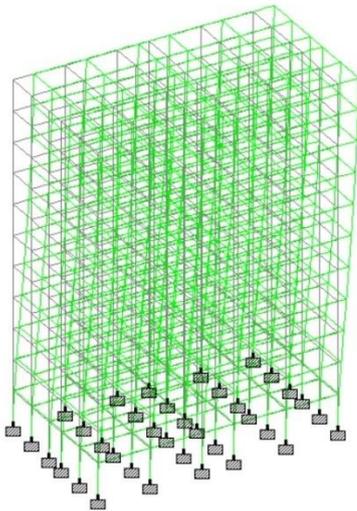
Fig 5 : Bending Moment of structure

Fig 6 : Displacement of structure

6. CONCLUSION

The project was aimed on the analysis and design of High Rise Building. This project gave an example exposure to various field practice in analysis and design of multi storied building. The analysis was done using the software package STAAD Pro which p roved to be premium software of great potential in analysis and design of construction industry. All the structural components were designed manually and detailed using AutoCAD.

7. REFERENCE

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