Analysis and Design of G+5 Residential Building Using STAAD Pro
Gourav Kumar Soam¹ Kartik Sharma²
¹²Meerut Institute of Engineering and Technology, Meerut, India

Abstract—Structural planning and design can be termed as art and science of designing with economy elegance and durable structure. This complete process requires imagination and conceptual thinking and mainly require sound knowledge of structural engineering as well as knowledge of practical aspects such as relevant design codes and by-loss backed up by example experiences. The motive of standards is to ensure careful balance between economy and safety. In the present study G+5 building of *21*15.5 metre. Area 325 sqmetre is designed (Beams, Columns and Footings) using STAAD PRO software. In the process of designing them, firstly it is important to obtain the plan of the particular building that is, positioning of the particular rooms (Drawing room, bed room, kitchen toilet etc.) so that they serve their respective motive and also suiting to the requirements and comfort of the inhabitants. Thereby depending on the suitability; plan layout of beams and the position of columns are fixed.

Keywords: G+5 Residential Building, STAAD Pro

I. INTRODUCTION
A building frame includes various bays and storey. A multistorey, multi-paneled frame is a complicated statically intermediate structure. The building in plan (21*15.5) consists of columns built monolithically forming a network. The size of building is 21*15.5 m. The numbers of columns are 30. It is residential complex. The structure is designed by using staad pro and staad foundation. The building subjected to vertical loads. The vertical load includes dead load of structural components such as beams, columns, slabs etc. and live loads. Thus building is designed as per IS 875(part-1 for dead load and part-2 live loads). The building is designed and analysed for the maximum and minimum bending moments and shear forces as per IS 456-2000.

II. METHODOLOGY:
Salient features of Building properties:
Utility of building: residential complex
No of stories: G+5
Shape of the building: 5 FLOORS
No of staircases: 1
No. of Flats: 20
Type of construction: R.C.C framed structure
Types of walls: brick wall
Geometric details: Ground floor: 3m
Floor to floor height: 3m.
Depth of foundation: 500mm
Materials:
Concrete grade: M25 and M40
All steel grades: Fe500 and Fe415 grade
Bearing capacity of soil: 200KN/M²

III. LOADS CONSIDERED:
Types of loads on a hypothetical building are as follows.
1. Dead (gravity)
2. Live (gravity)
IV. REINFORCEMENT DETAILS:

![Reinforcement details of beam after designing](image1)

![Reinforcement details of column after designing](image2)

![Plan of Footing](image3)

V. CONCLUSIONS

1) Using STAAD.Pro the analysis of multi storey building has completed much quicker when compared with manual analysis.
2) It is observed that the reinforcement percentage in the sections is more in the case of software design when compared to manual calculations.
3) Designing using Software's like Staad reduces lot of time in design work.
4) Reinforcement Details of each and every member can be obtained using staad pro.
5) All the List of failed frame sections can be obtained in the report given by Staad Pro so that we can change the property data for a better section.
6) Variation of Shear and Bending Moment of every section can be easily observed in the building.
7) Accuracy is improved by using software.
8) Reinforcement details of each member can obtain directly after analyzing the building.

REFERENCES

[5] IS 875 - code of practice for design loads