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International Journal of Research Publication and Reviews

Journal homepage: www.ijrpr.com ISSN 2582-7421

A Parametric Analysis of G+2 Hostel Building : An Overview

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ABSTRACT:

Structural analysis is a branch which involves determination of the behaviour of structures in order to predict the responses of real structures such as buildings bridge Design and estimation of multi-storied building has been taken up for Basement+G+2 Building thereby depending on the suitability of plan, layout

KEYWORDS: Multi-storied Building, Beam, column, Analysis

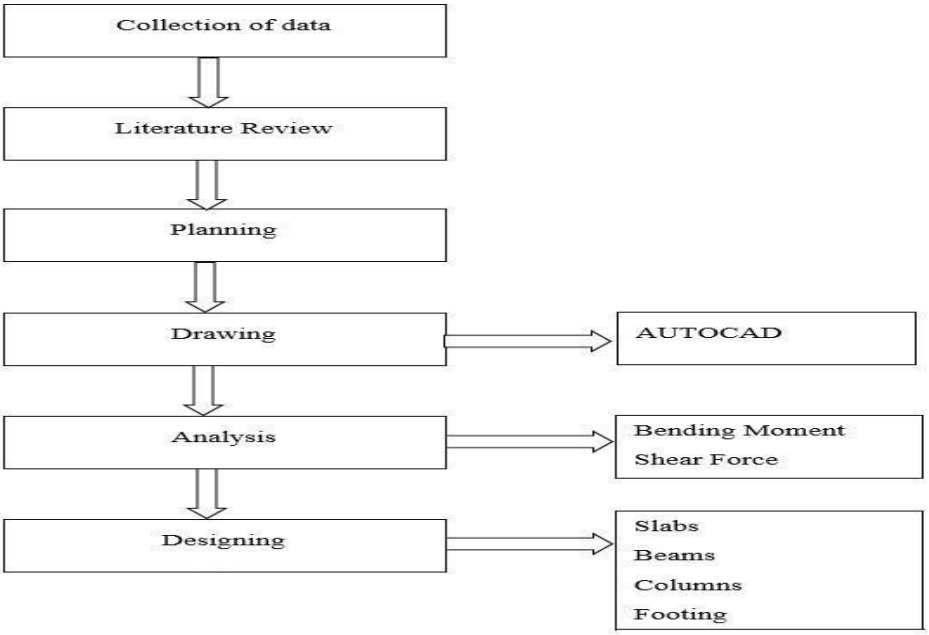
1.INTRODUCTION

The aim of the structural design is that structure should be safe, durable, serviceable and economical with respect to initial cost and maintenance cost. Structural analysis is a branch which involves in the determination of behaviour of structures in order to predict the responses of different structural components due to the Each and every structure will be subject to either one or the groups of loads. The various kinds of loads normally considered are dead load, live load earth The analysis and design for the structure is done by using a software package STAAD PRO. In this project Multi-storey construction is proposed with We have adopted the limit state method for the analysis and design of the structure. The design is confirmed with IS456:2000. The analysis of one

It is an educational institution requires a hostel building to accommodate minimum 200 students. The building shall be RCC multi-storied, with each room accommodating two students. Common toilets of required number may be provided in the building. The building is limited to G+2, however a truss roof shall be provided above the RCC roof to use this area. The building Section II describes the methodology used for the design and analysis of a G+2 structure. The flow diagram represents the step of methodology. After that the

2.METHODOLOGY

The figure shows the methodology used for the design and analysis of building. For designing various activities are carried out. The fig 1 (a) shows the flowchart of various methods used in the proposed designing and analysis.



To achieve the objectives of the study that is to plan, analyse and design the hostel building which meets the basic requirements it has been proposed to follow the method

General Principles of Design

The design of a structure must satisfy three basic requirements.

- Stability To prevent overturning, sliding or buckling of the structure or part of it under the action of loads.
- Strength – To resist safely the stresses induced by the loads in the various structural members to resist the stresses induced by the loads.
- Serviceability – To ensure satisfactory performance under service load condition which implies providing adequate stiffness and reinforcement to contain deflection, crack widths and vibrations within acceptable limits, and also providing impermeability and durability.

Dead load and Live Load are assigned to this structure. The first vertical load that is considered is dead load. Dead loads are permanent or stationary loads which are transferred to the structure throughout the life span of the structures. Live load is either movable or moving loads.Analysis of the structure is done to know the deflection details of the structure or also by the analysis of the structure Shear force diagram and Bending moment diagram can be obtained. And the structure is designed to obtain the value of total amount of steel and concrete required for the construction.
The procedure of structural analysis is simple in concept but complex in detail. It involves the analysis of a proposed structure to show that its resistance or strength will The plan shows the details of dimensions of each and every room and the type of room and orientation of the different rooms like bed room bathroom hall etc. The three apartments have similar room arrangement. The entire plan area is about 1156.44 sq.m. There is some space left around the building for

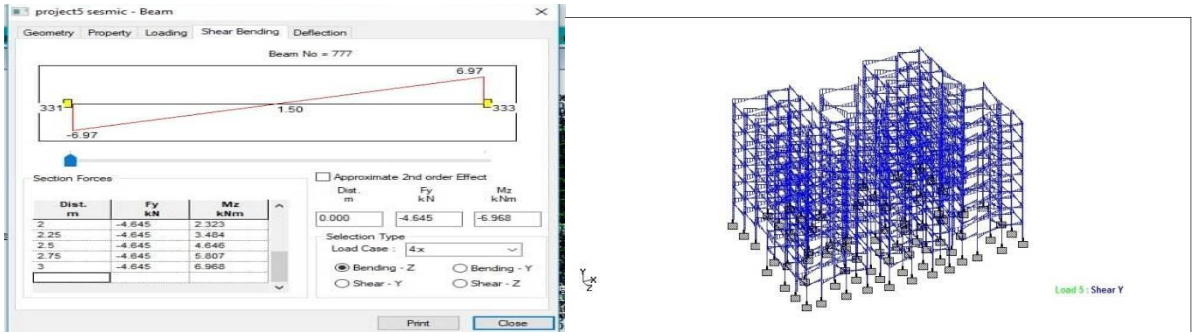
BUILDING DETAILS

The building consists of three storeys. All three apartments have similar room arrangement. The plan also gives details of location of stair cases in different
The building is actually constructed and all analysis and design work is completed before the beginning of the project. The building is not designed for increasing the number of rooms
The number of floors is fixed for future also for this building due to unavailability of the permissions of respective authorities. Also special materials like fly
This is regarding the plan and details of the site and the next section deals with the design part of the building under various loads for which the building is designed

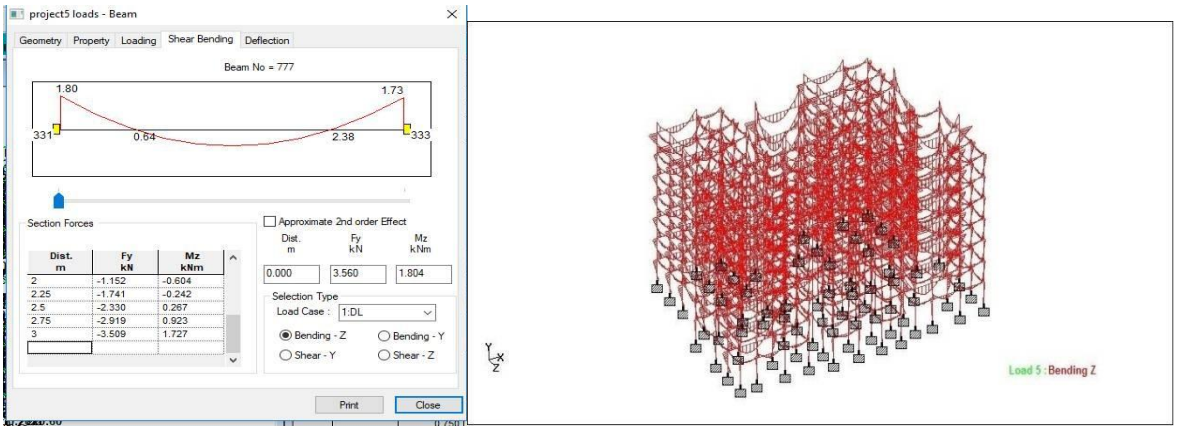
DESIGN RESULTS

- Design of beam

A beam is a structural member subject to a system of external forces at right angles to the axis. Beams are usually provided for We designed a single reinforced beam for vertical bending and shear. After the analysis using STAAD it is compared with manual designing. Figure The figs 2 (a) and (b) show the shear force diagram and bending moment diagram of beams.Selected beam is



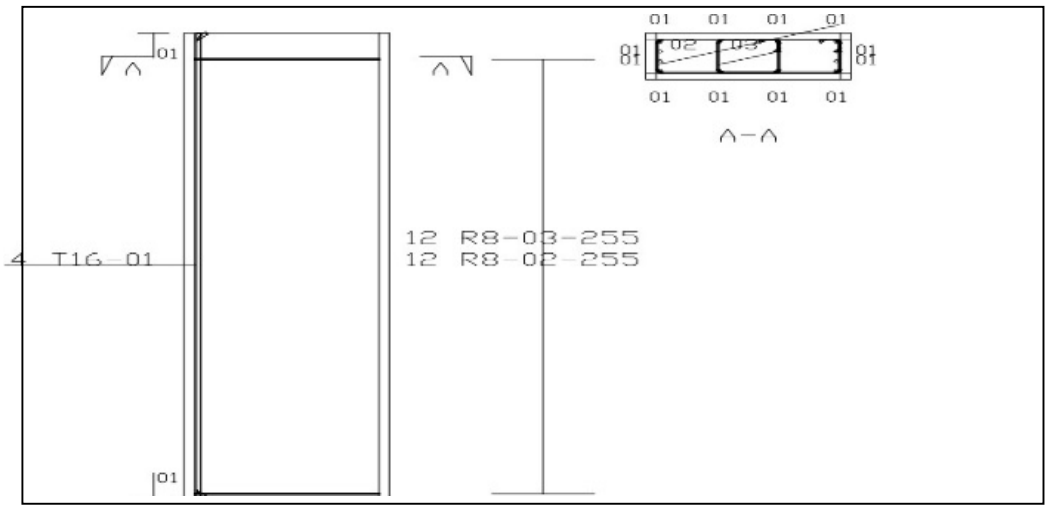
(a)



(b)

Design of column

A column is an important component of RC structure. A column in general may be defined as A member carrying direct axial load which causes compressive stresses The column is considered as short when the slenderness ratios lex/d or lex/b are less than 12 otherwise it is



(a)

CONCLUSION

Our project mainly consist of two objectives first objective was to study and analyse the various component of building and their importance and second objective was to design the superThe given proposed project is an educational institution at Nagaland which requires a G+2 hostel building. The plan consists of 100 rooms which are After the analysis of the entire structure was done by STAAD Pro the structure was found to be safe. The design of the structure was done manually. It should also satisfy the stability against overturning sliding and buckling. Designing using software like Staad reduces lot of time in

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