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Design of Multi Stored Residential Building

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ABSTRACT:
The primary objective of this project is to gain sufficient knowledge in planning, analysis, and design of multi stored residential building. Our project deals with the plan and design of design of multi stored residential building. It is a reinforced concrete framed structure consisting of G + 8 with adequate facilities. IS 456:2000 codes is the basic code for general construction in concrete structures, hence all the structural members are designed using limit state method in accordance with the IS 456:2000 code and design aids.

The building includes the following:

1. living room
2. bed room
3. rest rooms
4. Bath rooms
5. hall …ets..

The design of multi stored residential building has proper ventilation, it is provided with sufficient doors, windows. Water supply and electrification are also provided. The ceiling height is provided as 3m, for assembly buildings as is a using software.

INTRODUCTION:

General:
The main objective of our project is to know the various design aspects like planning, analysis and design etc. We have planned to design a design of multi stored residential building consisting of five floors (G+8).The planning is done as per the requirements using **staadprovi8** software.

Practical Considerations:
Besides all the fundamentals of planning discussed, following practical points should be additionally considered:

1) The elements of the building should be strong and capable to withstand the likely adverse effects of natural agencies.
2) Strength, stability, convenience and comfort of the occupants should be the first consideration in planning.
3) Elevation should be simple but attractive. The number of doors and windows provided should be less for a office building.
4) The provisions of built in furniture at proper places are useful from the point of view of utility.
5) Since the plan is for a office building, the locker rooms must be secured with thicker walls than usual.

Planning Considerations:
The plan and detailing was drawn using &Design STAADPROVi8. The proposed area of the building is 3300 sq.m. The shape of the building is rectangular in plan. The building consists of ground floor, first floor and second floor. Third floor, fourth floor ,fifth floor The parking space is provided around the building.The floor height of the building is 3m.The height of the parapet wall is 1m.The staircase is provided with enough safe.

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Area of each floor is given below

Ground floor	= 115.225sqm
First floor	= 115.225sqm
Second floor	= 115.225sqm
Thrd floor	= 115.225sqm
fourth floor	=115.225sqm
fivith floor	=115.225sqm
sixth floor	=115.225sqm
siveen floor	=115.225sqm
Eight floor	=115.225sqm
Total area	**=1037.025sqm**

Specifications:

Footing:

Earth work excavation for foundation is proposed to a depth of 1.50m.below the ground level. For design, the safe bearing capacity of soil is assumed as 200KN/m^2.Isolated footings are provided with a concrete grade of M20. The maximum axial load 2000KN as arrived from analysis result is taken for the design of the footing.

Damp proof coarse:

The damp proof course is to be provided around the plinth level using C.M 1:3 with a thickness of 20mm. The column below the ground level are also provided with damp proof course of C.M 1:3

Plinth:

The plinth beam will be at a level of 0.5m above the ground level. M20 grade of concrete is used and Fe415 steel was used for plinth design.

Frames:

All the R.C.C. structural components are designed using M20 grade steel. Each member is designed separately for its loading condition. And its location as per the IS 456:2000 and SP 16 codes. The dimension of slab, beam, column and footing are designed according to the IS 456:2000 code. The column is designed as per the design principles given in SP-16 and the axial load was taken from the analysis results.

Super Structure:

The super structure is proposed in CM.1:6 using second class brick work. Brick partition walls of 110mm thick are also proposed using the C.M 1:4 with a width of 300mm as a safety measure.

Roof:

R.C.C Roof in M20 concrete is to be laid. A layer of weathering coarse using brick jelly lime mortar is to be used. Considering the future expansion of the structure, the roof slab is also designed as same as that of the floor slabs.

Flooring:

In each floor, all the rooms are to be provided with P.C.C. 1:5:10 as flooring base. The floors of entrance, toilet floors, staircase and entire flat are to be finished with granite tiles over the P.C.C. 1:2:4 flooring.

Plastering:

All walls and structural members including the basement will be plastered smooth with C.M. 1:5 externally and internally, using 12mm thick plastering mortar.

Doors and windows:

The main door will be of steel having a sliding shutter. The other doors inside the bank are to be provided with aluminum panel. The windows are to be provided with steel and glazing is provided to supply a good light from outside.

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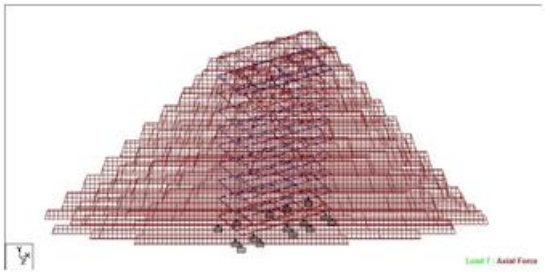
Staircase:

The stair will be of M20 grade concrete and Fe415 steel with a rise of 150mm and tread of 300mm. The staircase is designed as spanning parallel to landing slab referring to IS 456-2000.

White washing, Color washing, Painting:

All the inner walls are to be finished with a first coat of white cement wash and then coloring as required. All the joiners and iron works are to be finished with two coats of synthetic enamel paint. The toilet walls are to be provided with mat finishing

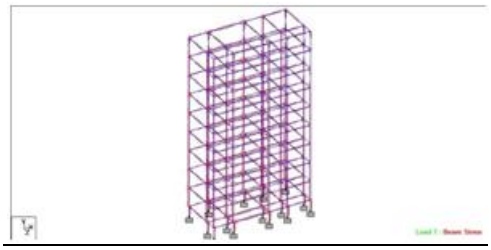
AXIAL FORCE:



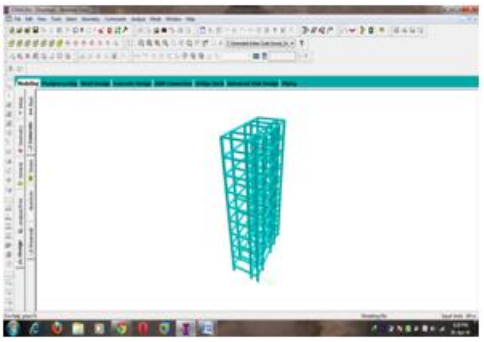
SHEAR-Y

BENDING-Y,Z

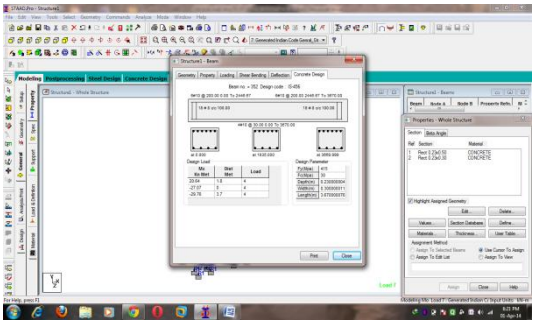
BEAM STRESS



3DVIEW:



BEAM REINFORCEMENT DETAILS



DEAD LOAD 1

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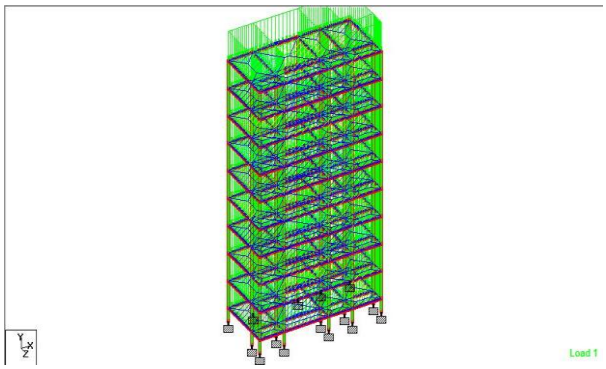
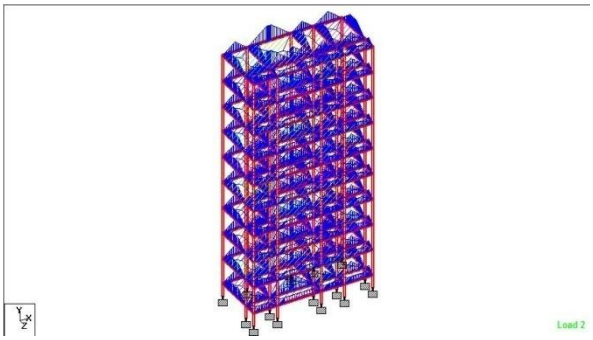
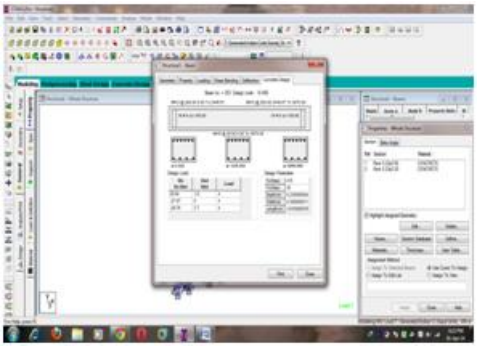
DEAD LOAD2



LIVE LOAD



COULMN REINFORCEMENT DETAILS



CONCLUSION:

In this project, **DESIGN MULTI STORE RESIDENTIAL BUILDING** we all the members of our team has learned to plan a building with referring to National Building Code of India -2005 &**STAADPROVi8.** This Office building project has made us to learn Drawing and drafting the building plans using Auto cad software. In this office building project we learnt to create the models by giving nodes and property to the structural elements using analysis and also we learnt to the same structure with corresponding loads as given **IS 875 part 1&2** using analysis. This project is very useful in making us learn the design by referring to the IS 456:2000 for each slab and beam. SP: 16 codes alone are used for easier design of columns yet we learned to design the columns. The important thing that we done was referring to a lot of books for designing and we are very much satisfied with exposing to field of design.

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