INTERNATIONAL INSTITUTE OF INFORMATION TECHNOLOGY

SEMESTER PROJECT PRESENTATION BY ARUSHI

Design of Reinforced Concrete Structures

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B.Tech in Civil Engineering and

MS by Research in Building Science and Engineering

Submitted to:-

Prof. Pradeep Ramancharla

ACKNOWLEDGMENTS

I am really grateful that I managed to complete my RCC design semester project within the timeframe.

I would like to express my special thanks of gratitude to the Prof. Pradeep Ramancharla who gave me this golden opportunity to do this wonderful project , which also helped me to know about so many new things.

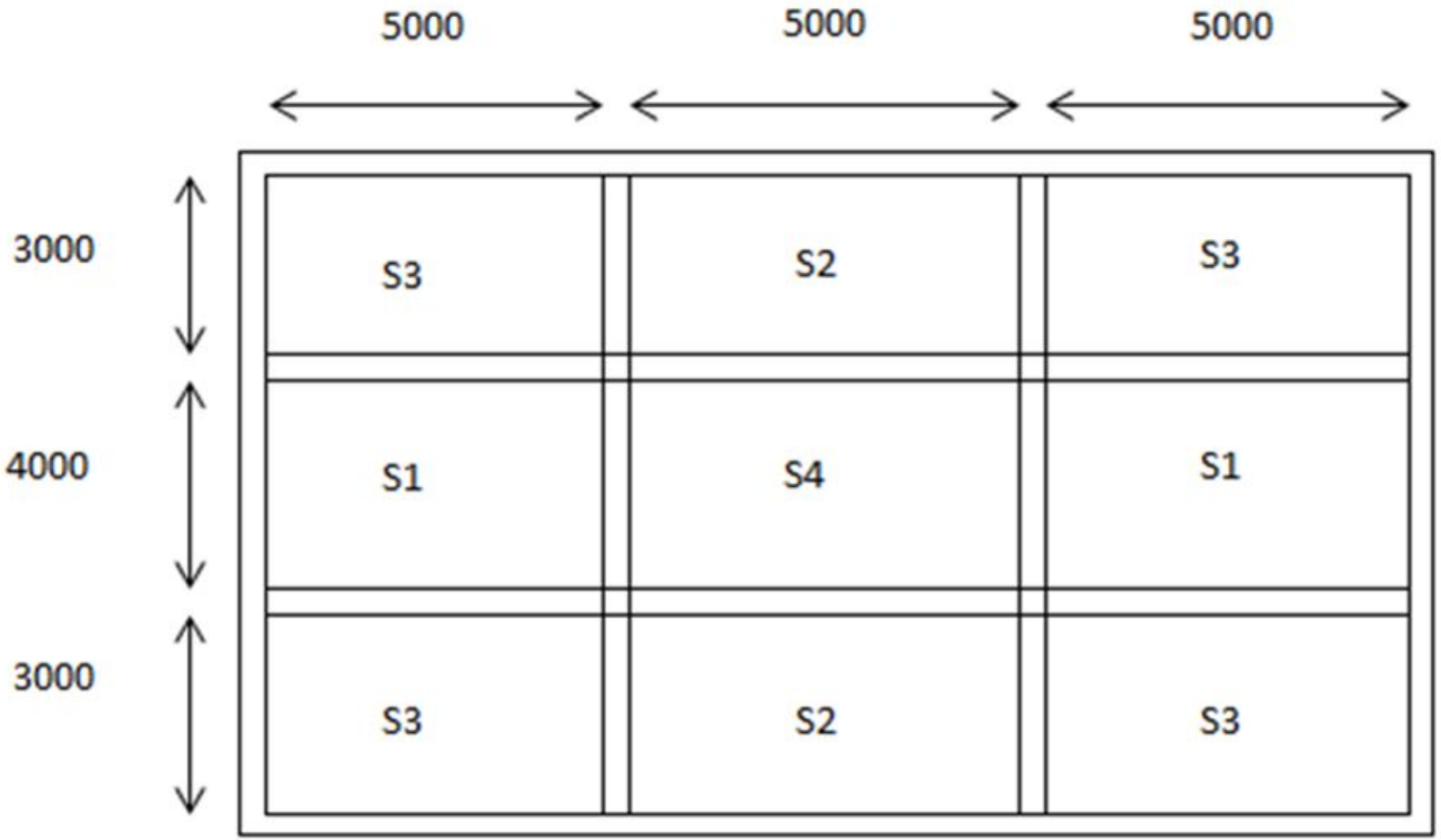
I sincerely thank him for the guidance and encouragement in finishing this project and also for teaching us in this course. Last but not least I would like to express my gratitude to the Teaching Assistant of the course Pulkit Velani for the support, friendly advice during the project work.

OBJECTIVE

- Design and Analyse building members.
- Design for Reinforcement.
- Design members safe for shear, deflection and cracking.
- Cost effective design.

Project Description

- G+2 building is designed.
- Grade of steel and concrete used are Fe 415 and M20 respectively.
- For design software used is SAP2000.
- Code followed Is IS 456.
- Floor to floor height is 3m.
- Members designed are Slabs, Beams, Columns and Footing.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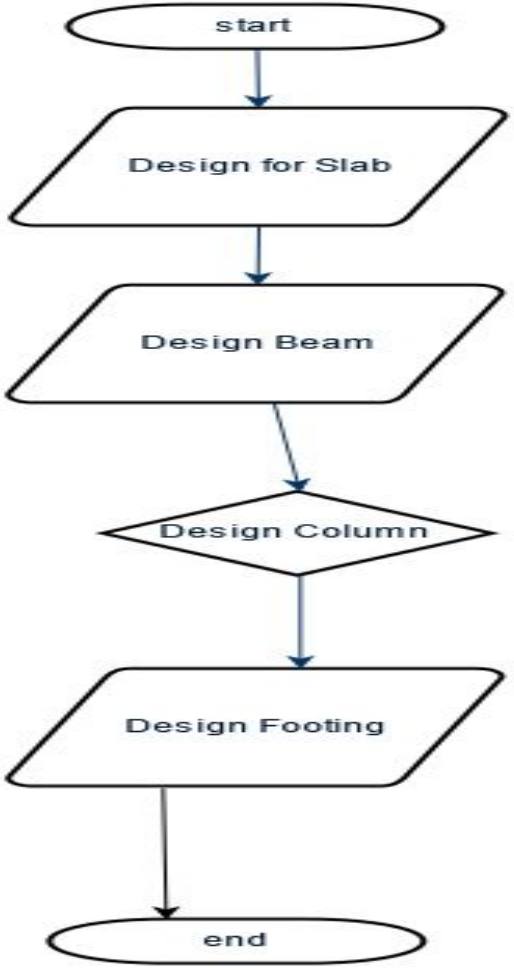
WORKFLOW FOR THE PROJECT



Design for Slab

Assumed thickness.

Assumed thickness should be safe for shear, Deflection and Cracking.

Dead,Live and Floor Finished taken into consideration while designing.

Design is as per IS 456.

Dead Load = Floor Finish (1 KN/m^2)+ Self weight of Slab.

Live Load = 3 KN/m^2.

Thickness of Slab = 125 mm thick.

Reinforcement

For Beam

4 bars of 20mm diameter

Stirrups

10 mm links at 350mm.

For Column

8 bars of 25 mm.

For footing For long direction 7-25 mm bars

And In short direction 5-25 mm bars.

Beam

After Designing of slab using Yield line theory load on beam was calculated.

Let slab has shorter length = L_x and longer equals = L_y

Load along shorter side is = $wL_x/3$ and along longer is $wL_x/6(3-(L_x/L_y)*(L_x/L_y))$

Also considering Wall load and Self weight of beam apart from slab load the total load is calculated and designing is done..

After combining all the loads, design load is calculated and obtaining maximum moment value from the SAP on the beam.

Design for reinforcement and find suitable depth.

Beam is 300*550 mm.

COLUMN

All the loads from the beam transfers to the column. We find axial load, Moments for the column and check for dimension of the beam. And also find the reinforcement for the beam.

Designing is different for long and short column.

If slenderness ratio is greater than 12 then it is long column else it is short column.

Footing

After Designing the column we will design footing for the column which helps in transferring of load of column uniformly to the soil(earth).

The aim for designing is to check for depth for suitable depth and for the corresponding depth check if it is failing for one way shear, two way shear and bending.

Then provide reinforcement to the footing.

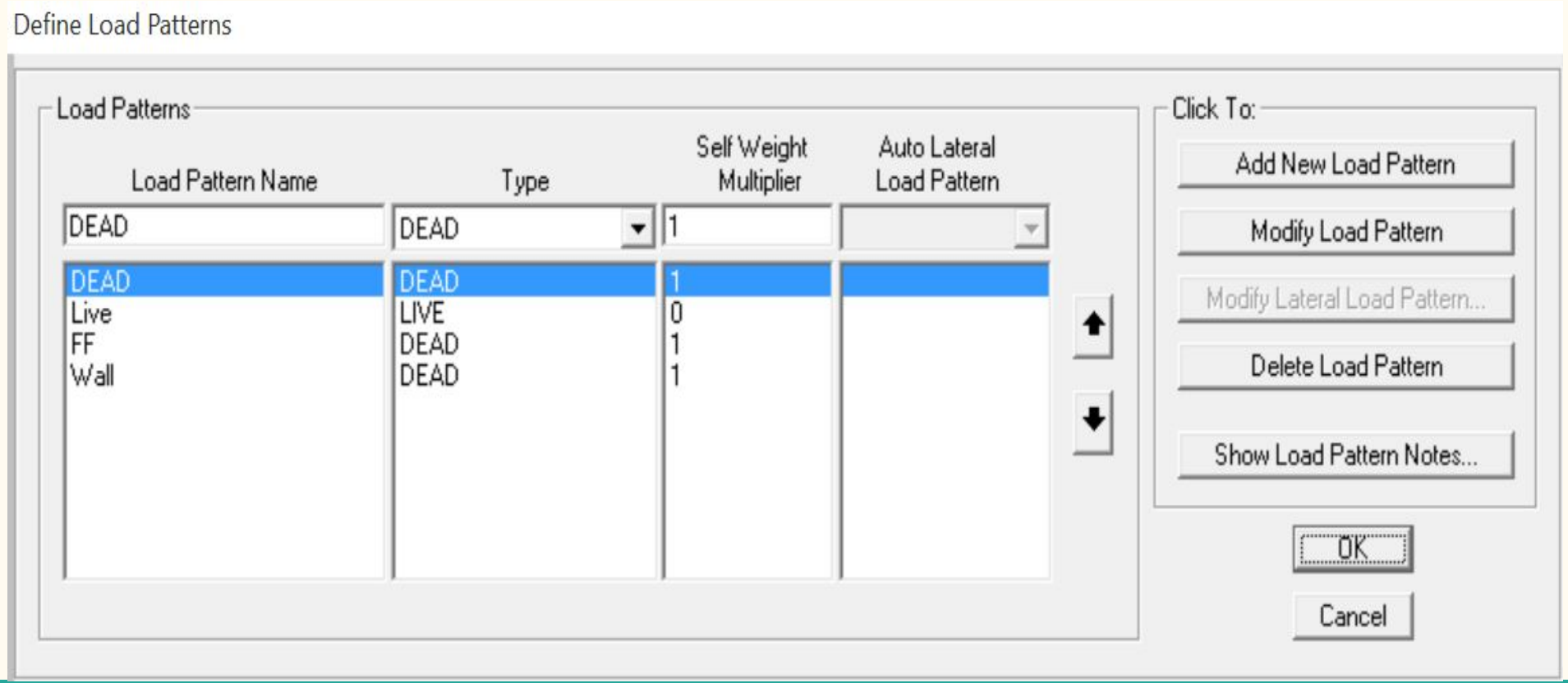
Designing in SAP2000

SAP2000 is a structural analysis and design software produce.

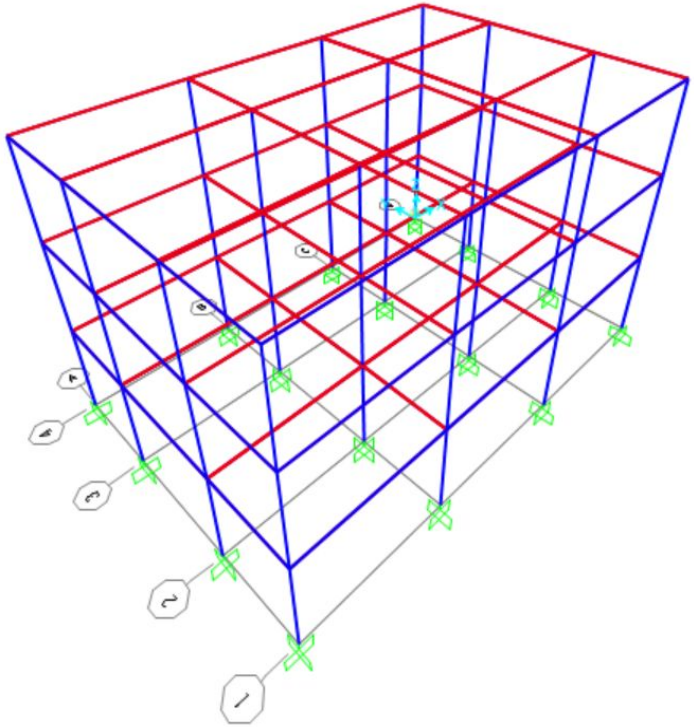
It is produced by Computer and Structures, Incorporated (CSI), a structural and earthquake engineering company.

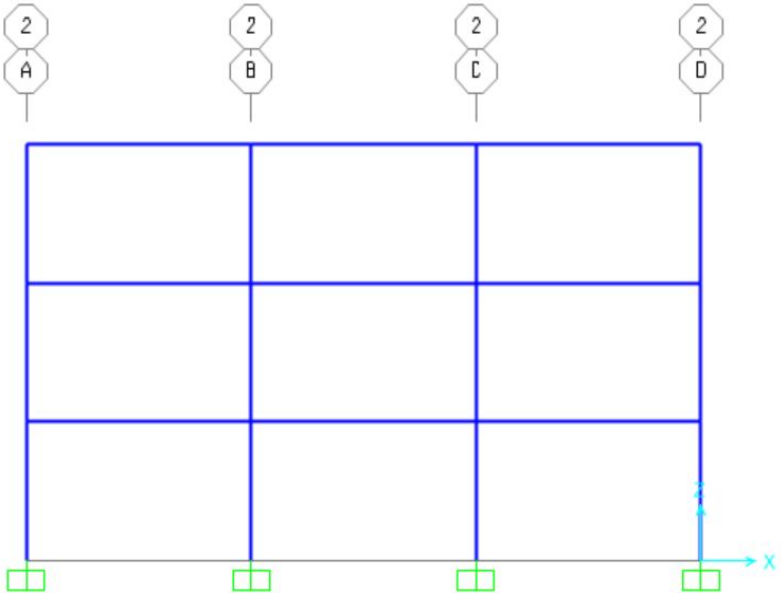
SAP2000 is a general purpose finite element program which performs the static or dynamic, linear or nonlinear analysis of structural systems. It is also a powerful design tool to design structures following AASHTO specifications, ACI and AISC building codes.

Load Pattern

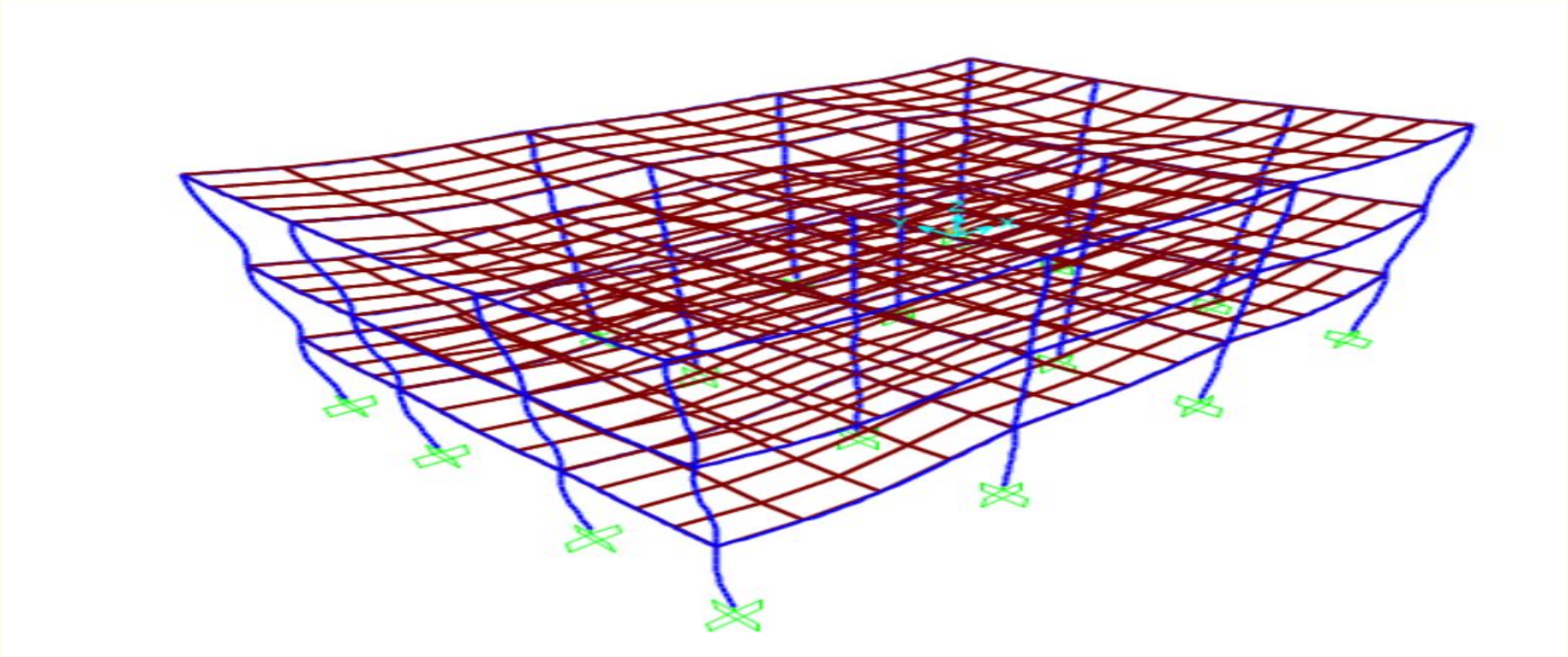


Design

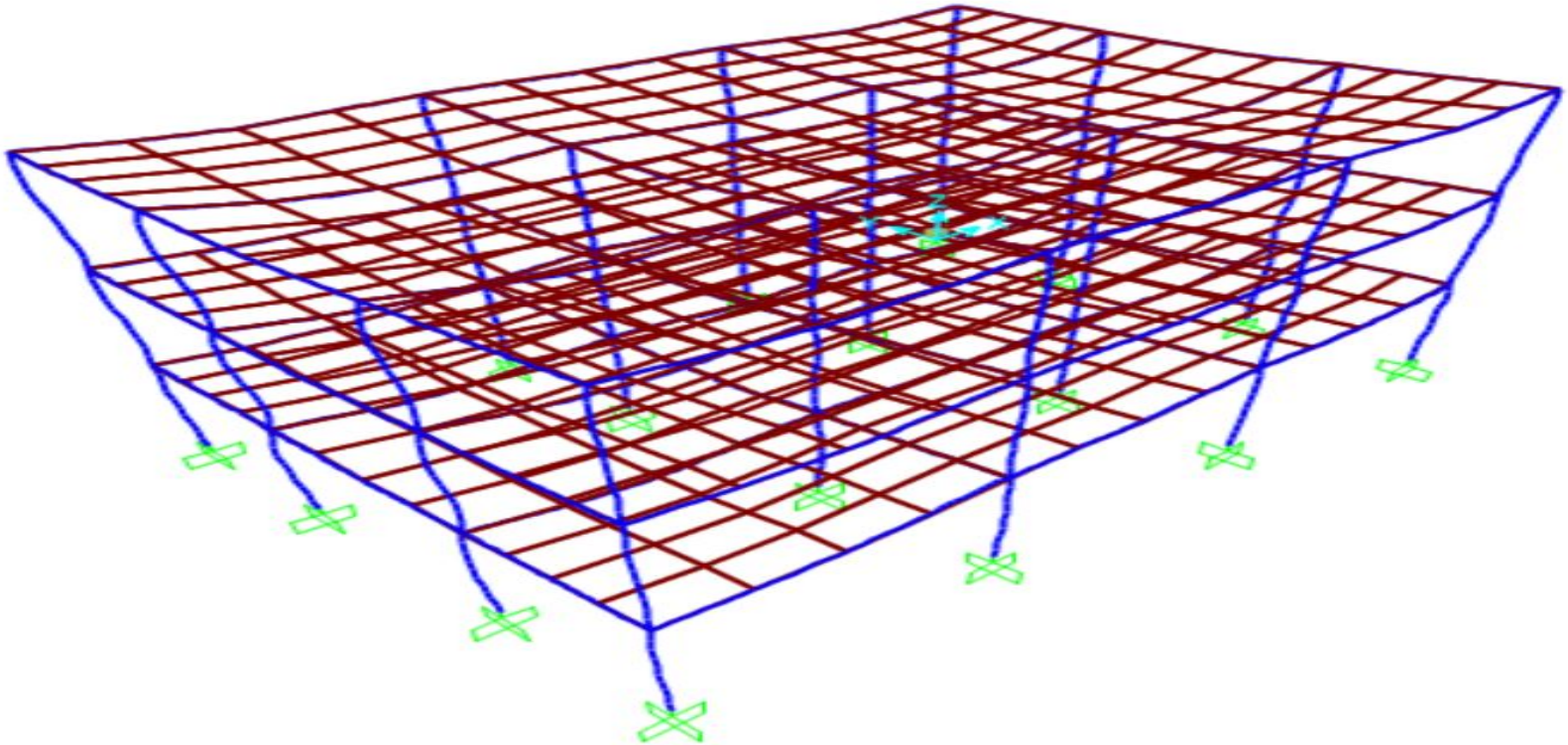




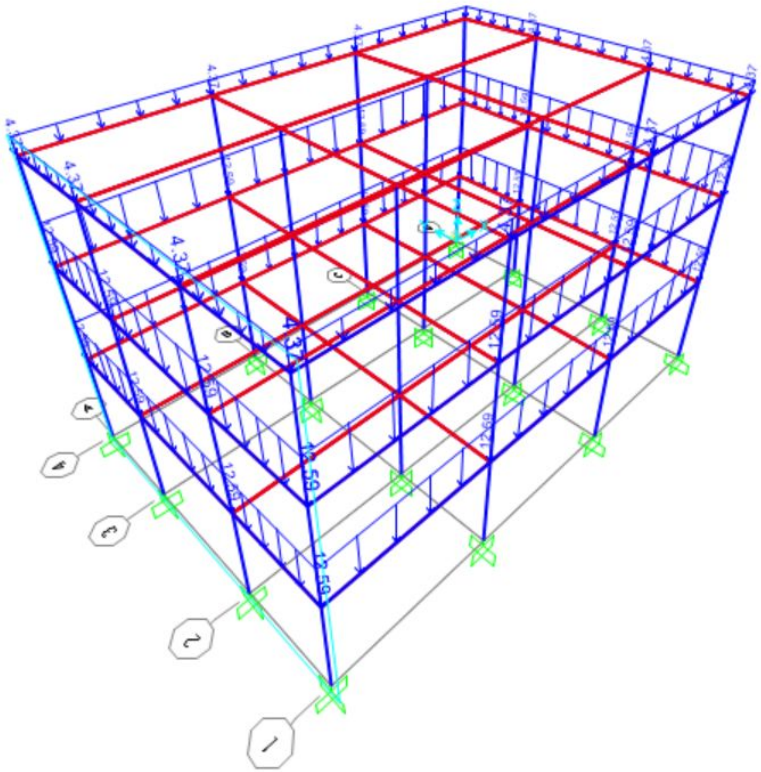
DEFORMED STRUCTURE DUE TO DEAD LOAD

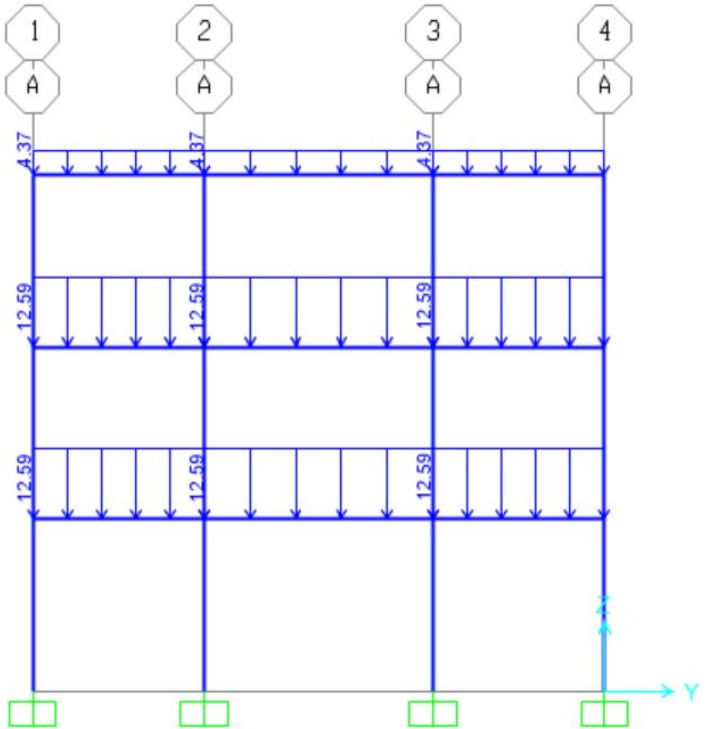


DEFORMATION DUE TO LIVE LOAD

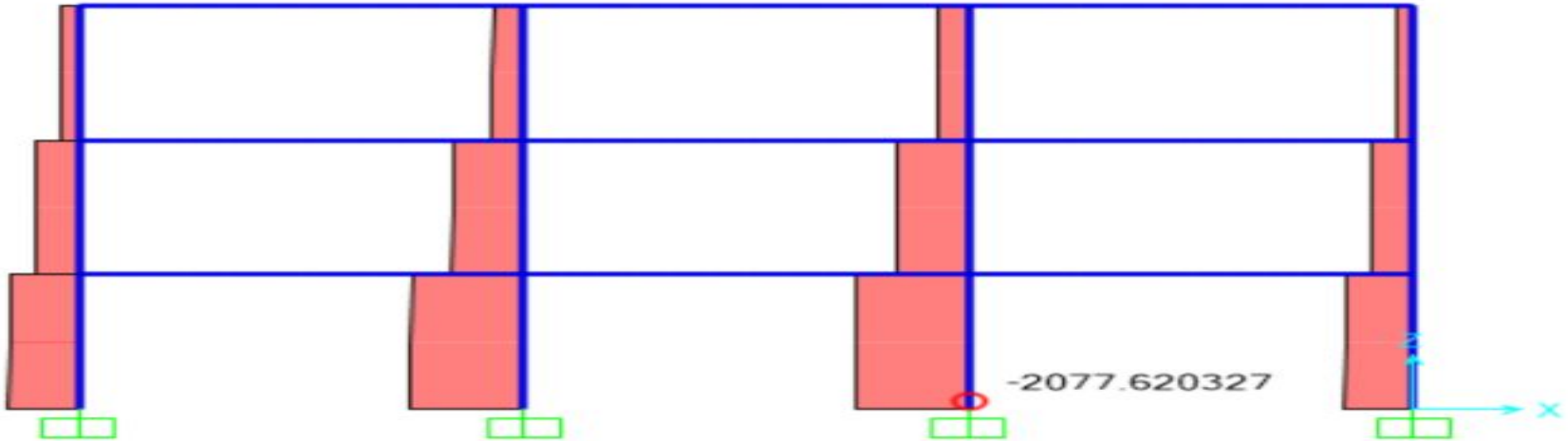


LOAD DUE TO WALL

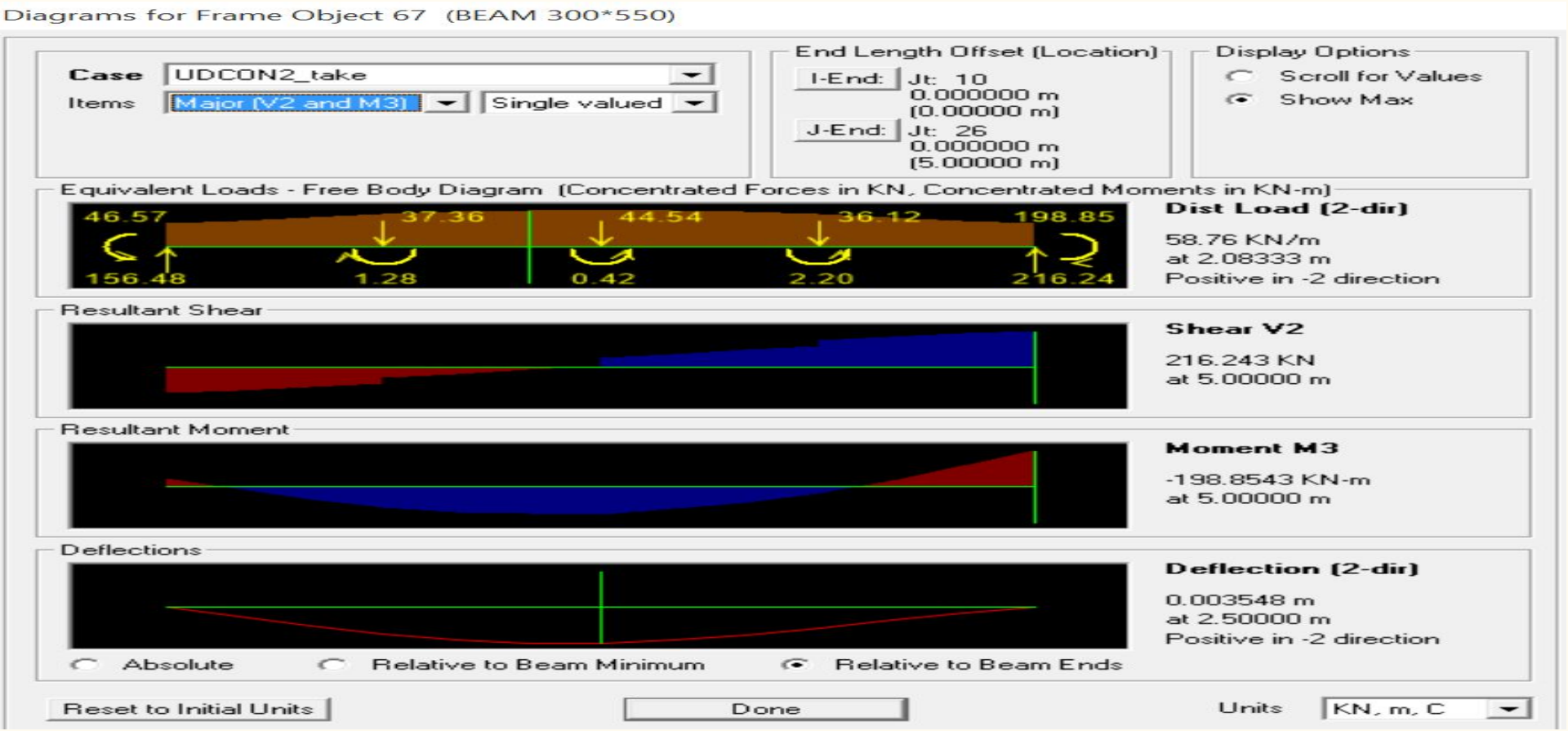




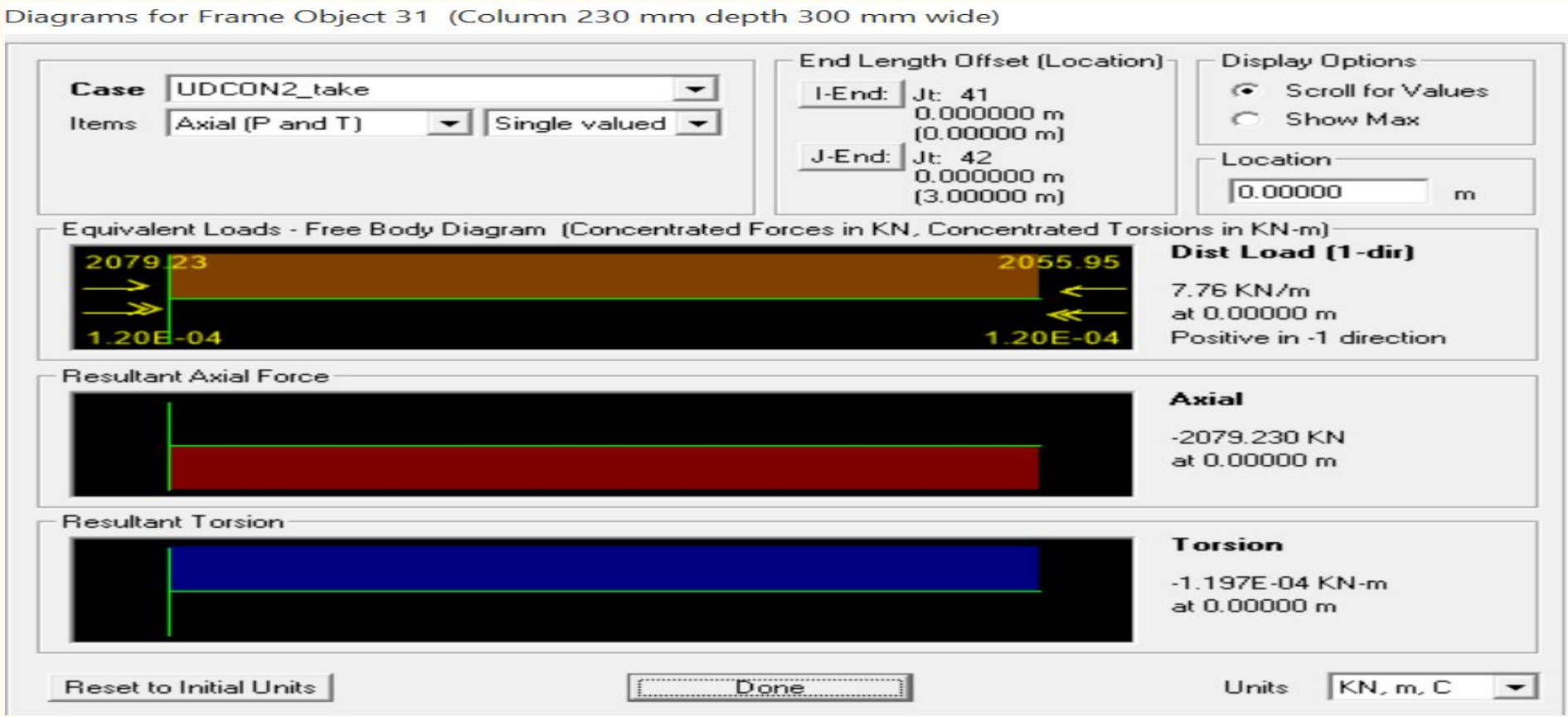
LOAD DUE TO COLUMN



MAXIMUM MOMENT AND SHEAR ON BEAM



MOMENT AND AXIAL LOAD ON COLUMN



THANK YOU....