Impact Factor Value 4.046 e-ISSN: 2456-3463
International Journal of Innovations in Engineering and Science, Vol. 3, No.7, 2018
www.ijies.net

Analysis and Design of (G+100) Storied Building By Using Software

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Abstract– *The principle objective of this paper is to analyze and design of multi-storeyed building (G + 100) storeyed building for seismic load and wind load by using software STAAD-Pro. The design involves load calculations manually and analyzing the whole structure by using STAAD-Pro. The design methods used in STAAD-Pro analysis are Limit State Design conforming to Indian Standard Code of Practice.*

Key Words - *RCC Framed structure, Response spectrum analysis, Wind analysis, RCC Design.*

I. INTRODUCTION

This project involves analysis and design of multi-storeyed [G + 100] using a very popular designing software STAAD Pro. I have chosen STAAD Pro because of its following advantages:

- Easy to use interface,
- Conformation with the Indian Standard Codes,
- Versatile nature of solving any type of problem,
- Accuracy of the solution.

STAAD-Pro Features a state of art of user interface visualization tools, powerful analysis and design engines with advanced finite element and dynamic analysis capabilities. From model generation, analysis and design to visualization and result verification, STAAD-Pro is the professional's choice for steel, concrete, timber, aluminum and cold-formed steel design of low and high-rise buildings, culverts, petrochemical plants, tunnels, bridges, piles and much more.

STAAD-Pro consists of the following:

The STAAD. Pro Graphical User Interface: It is used to generate the model, which can then be analyzed using the STAAD engine. After analysis and design is completed, the GUI can also be used to view the results graphically. The STAAD analysis and design engine: It is a general-purpose calculation engine for structural analysis and integrated Steel, Concrete, Timber and Aluminum design.

In general analysis and design of high-rise structures, both wind and earthquake forces need to be considered. Governing load criteria carrying out for dynamic analyses for earthquake loads and wind loads, According to the provisions of Indian Standards codes of practices for analysis of earthquake and wind loads.

II LOADS CONSIDERED:

A) Dead load

Floor finish: 1.0 KN / m2
Partition wall load : 1 KN/m2
AAC Block wall 115 mm. Thk. 1.15 KN/m/m height
AAC Block wall 230mm. Thk. 2.3 KN/m/m height

B) Live load

All rooms and kitchens: 2 KN/m2
Toilets and bath: 2 KN/m2
Corridors, passages, staircases: 3 KN/m2
Balconies: 3 KN/m2

C) Wind load

D) Seismic load

III. PHYSICAL PARAMETERS OF STRUCTURE

Multi-storey RCC space framed structure with fixed joint is considered in the present study

- Use of building :Residential purpose
- No of floors :G+100
- Floor height: 3.3M each

- Total height of the building: 333.30 M
- Shape of the structure :Ellipse
- Type of structure : R.C.C framed
- Seismic zone: Zone II is considered
- Grade of concrete and steel: M60 and Fe 500

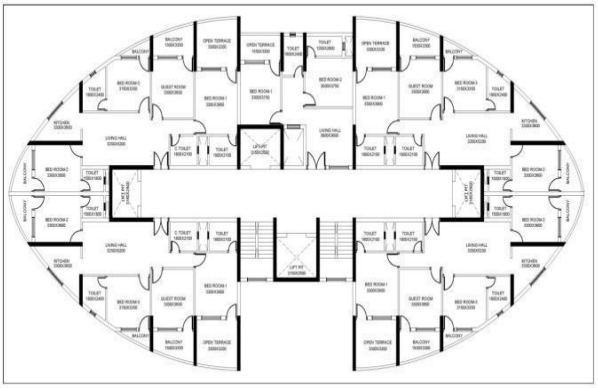

Fig-1 Plan of typical floor.

IV RESULTS:

Some of the samples of analysis and design results have been shown below.

Table: Design wind pressure at various heights

Height in m	K2	Vz= k1*k2*k3	Pd=0.6*Vz^2 N/m^2	Pi=Cf*Pd (kN/m^2)	
				X-Direction	Z-Direction
50	1.15	54.14	1758.81	0.88	1.58
100	1.22	57.44	1979.45	0.99	1.78
150	1.25	58.85	2077.99	1.04	1.87
200	1.28	60.26	2178.93	1.09	1.96
250	1.31	61.67	2282.27	1.14	2.05
300	1.32	62.15	2317.25	1.16	2.09
330	1.34	63.09	2388	1.19	2.15

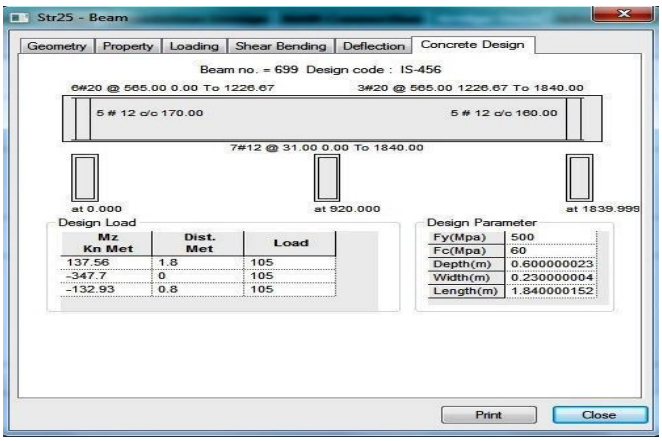

Fig-2: Design of beam

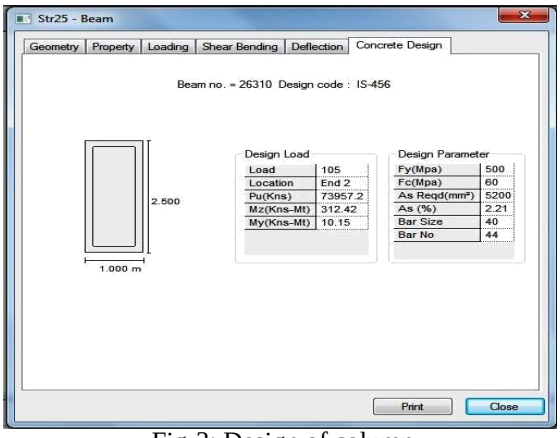

Fig-3: Design of column

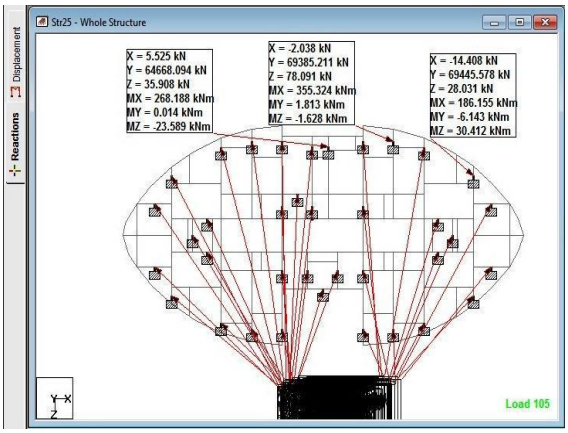

Fig-4: Column reaction for design of foundation

V. CONCLUSION

STAAD-Pro software has capable to calculate reinforcement required for any R.C.C section. STAAD-Pro program contains a various parameters which are designed as per Indian standard code of practices.

VI. REFRENCES

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