DESIGN AND ANALYSIS OF G+4 MULTI STOREYED USING STAAD PRO

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ABSTRACT

The main aim of structural engineer is to design the structures for a safe technology in the computing field; the structural engineer can dare to tackle much more large and complex structure subjected to various type of loading condition. Earlier the loads acting on the structure are considered as static, but strictly speaking, with the exception of the self-weight (dead load) no structure load is static one now a day large number of application software’s are available in the civil engineering field. All these software’s are developed as the basis of advanced. Finite element analysis which includes the effect of dynamic load such as wind effect, earth quake effect bets etc. in the present work, an attempt has been made to study the efficiency of certain civil engineering application software’s For this purpose an on-going project has been selected.

Keywords: Earthquake, Foundation, Soil Structure Interaction, Seismic load.

I. INTRODUCTION

Our project involves analysis and design of multi-storeyed [G +4] using a very popular designing software STAAD Pro. We 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. STAADPro features a state-of-the-art 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 STAAD analysis and design engine: It is a general-purpose calculation engine for structural analysis and integrated Steel, Concrete, Timber and Aluminum design.

To start with we have solved some sample problems using STAAD Pro and checked the accuracy of the results with manual calculations. The results were to satisfaction and were accurate. In the initial phase of our project we have done calculations regarding loadings on buildings and also considered seismic and wind loads.
Structural analysis comprises the set of physical laws and mathematics required to study and predicts the behaviour of structures. Structural analysis can be viewed more abstractly as a method to drive the engineering design process or prove the soundness of a design without a dependence on directly testing it.

II. STAADPRO
Staad is powerful design software licensed by Bentley. Staad stands for structural analysis and design. Any object which is stable under a given loading can be considered as structure. So first find the outline of the structure, where as analysis is the estimation of what are the type of loads that acts on the beam and calculation of shear force and bending moment comes under analysis stage. Design phase is designing the type of materials and its dimensions to resist the load. This we do after the analysis. To calculate S.F.D and B.M.D of a complex loading beam it takes about an hour. So when it comes into the building with several members it will take a week. Staad pro is a very powerful tool which does this job in just an hour’s staad is a best alternative for high rise buildings. Now a days most of the high rise buildings are designed by staad which makes a compulsion for a civil engineer to know about this software. These software can be used to carry rcc, steel, bridge, truss etc according to various country codes.

III. ISOLATED FOUNDATION
There are different types of footing based on no of factor, isolated footing is one of the most popular and simplest type of foundation used worldwide. Foundation are very important to the building. ultimately the entire load of the building is transferred to ground through foundation.

IV. RAFT FOUNDATION
- RAFT FOUNDATIONS are a large concrete slab which can support a number of columns and walls.
- The slab is spread out under the entire building or at least a large part of it which lowers the contact pressure compared to the traditionally used strip or trench footings.

V. ADVANTAGES OF RAFT FOUNDATION
- If bearing capacity of soil is too low.
- If walls of the structure are so close that individual footings would overlap.
• It is used for large loads.
• It covers more than half of the construction area.
• It is economic due to combination of foundation and floor slab.
• It requires little excavation.
• It can cope with mixed or poor ground condition.
• It reduces differential settlement.

VI. STATEMENT OF PROJECT
• Utility of Building : Residential Building
• No of storey’s : 4
• Shape of Building : Rectangular
• Type of Construction RCC Framed Structure
• Our Project is based on Design and Analysis of Multi storied Building.
• Analysis is done through using the STADD PRO.
• Notation is adopted throughout the project is same as in IS- 456 -2000.

VII. STAADPRO IMAGES
VIII. STAADPRO RESULTS AND DISCUSSION

1. STAAD SPACE

INPUT FILE: D:\vases\vases\desktop\VSS MAJOR PROJECT 2017\FULL FILES\vases final project 3\STAADPRO kostenlos Kết quả và thảo luận

2. START JOB INFORMATION

3. ENGINEER DATE 05-MAY-17

4. END JOB INFORMATION

5. INPUT WIDTH 79

6. UNIPER NKR

7. JOINT COORDINATES:

8. 1 0 0 0; 2 6.7 0 0; 3 0 5 5; 4 6.7 0 5.5; 5 0 0 8.7; 6 0 0 10.4; 7 3.6 0 5.5

9. 8 3.6 0 8.7; 11 2 0 10.4; 12 3.6 0 10.4; 13 0 0 14.9; 14 3.6 0 14.9

10. 15 7.6 0 10.4; 16 7.6 0 14.9; 17 7.6 0 11.3; 18 8.4 0 14.8; 19 8.4 0 11.3

11. 20 12.7 0 14.9; 21 12.7 0 11.3; 22 12.7 0 5.5; 23 1.7 0 10.4; 24 2.8 0 10.4

12. 25 0 0 11.6; 26 1 7 0 11.6; 27 2.8 0 11.6; 28 5.9 0 14.9; 29 4.7 0 14.9

13. 30 7.6 0 13.4; 31 5.9 0 13.4; 32 4.7 0 13.4; 33 10.7 0 5.5; 34 12.7 0 7.4

14. 35 10.7 0 7.4; 36 12.7 0 2.3; 37 10.1 0 5.5; 38 10.1 0 2.3; 39 2 0 8.7

15. 40 0 -3 0; 41 6.7 -3 0; 42 0 -5.3; 43 6.7 -3 5.3; 44 0 -3 8.7; 45 0 -3 10.4

16. 46 3.6 -3 5.3; 47 3.6 -3 8.7; 48 3.6 -3 10.4; 49 0 -3 14.9; 50 3.6 -3 14.9

17. 51 7.6 -3 14.9; 52 7.6 -3 11.3; 53 9.4 -3 14.9; 55 12.7 -3 14.9

18. 56 12.7 -3 11.3; 57 12.7 -3 5.5; 58 12.7 -3 2.9; 59 10.1 -3 5.5

19. 60 10.1 -3 2.9; 61 0 3.0; 62 6.7 3 0; 63 0 3 5.5; 64 6.7 3 5.5; 65 0 3 0.7

20. 66 0 0 10.4; 67 3.6 3 5.5; 68 3.6 3 8.7; 69 2.3 10.4; 70 3.6 3 10.4

21. 71 0 16.9; 72 3.6 3 14.9; 73 7.6 3 10.4; 74 7.6 3 14.9; 75 7.6 3 11.3

22. 76 9.4 3 14.9; 77 9.4 3 11.3; 78 12.7 3 14.9; 79 12.7 3 11.3; 80 12.7 3 5.5

23. 81 1.7 3 10.4; 82 2.8 3 10.4; 83 0 3 11.6; 84 1.7 3 11.6; 85 2.8 3 11.6

24. 86 5.9 3 14.3; 87 4.7 3 14.3; 89 7.6 3 13.4; 90 5.9 3 13.4; 91 4.7 3 13.4

25. 91 10.7 3 5.5; 92 12.7 3 7.4; 93 10.7 3 7.4; 94 12.7 3 2.9; 95 10.1 3 5.5

26. 96 10.1 2 2.9; 97 2 0.7; 98 0 6 0; 99 6.7 6 0; 100 0 6 5.5; 101 6.7 6 5.5

27. 102 0 6 8.7; 103 0 6 10.4; 104 3.6 5 5.5; 105 3.6 8 7.7; 106 2 6 10.4
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BIOGRAPHICAL DATA:

Prof. Mahadeva M is working as assistant professor in civil engineering department form last 2 years and he also worked as assistant professor in k s institute of technology. He received is B E in civil engineering and M.Tech with specialization in CAD structures from visvesvaraya technological university. He is national advisory board member for international conference and he secured “Active Young Research Award” in international journals for his continuous contribution in research field. His research interest is in the field of soil structure interaction, structural

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