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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.

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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.

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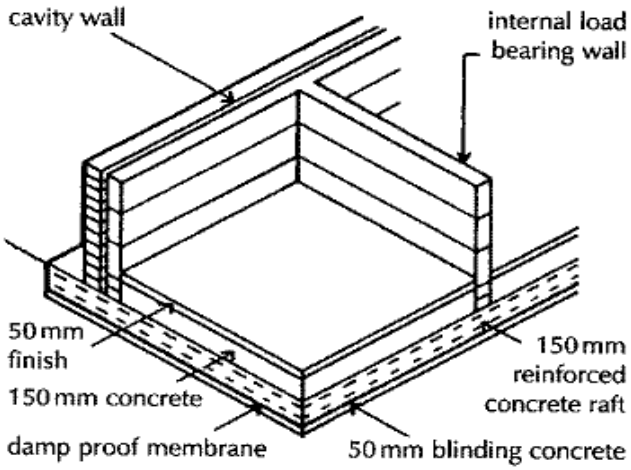
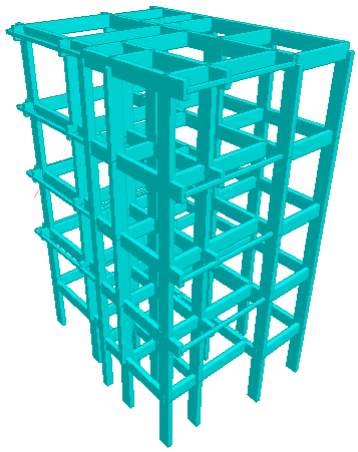
- It is used for large loads.
- It covers more than half of the construction area .
- It is economic due to combination of foundation and floor slab.
- It requires little excavation.
- It can cope with mixed or poor ground condition.
- It reduces differential settlement.



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



Render View

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VIII. STAADPRO RESULTS AND DISCUSSION

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     1. STAAD SPACE
INPUT FILE: C:\Users\SINDHU\Desktop\SVSS MAJOR PROJECT 2017 FULL FILES\svss final project 3.STD
     2. START JOB INFORMATION
     3. ENGINEER DATE 03-MAY-17
     4. END JOB INFORMATION
     5. INPUT WIDTH 79
     6. UNIT METER KN
     7. JOINT COORDINATES
     8. 1 0 0 0; 2 6.7 0 0; 3 0 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 9.4 0 14.9; 19 9.4 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 2.9; 37 10.1 0 5.5; 38 10.1 0 2.9; 39 2 0 8.7
    15. 40 0 -3 0; 41 6.7 -3 0; 42 0 -3 5.5; 43 6.7 -3 5.5; 44 0 -3 8.7; 45 0 -3 10.4
    16. 46 3.6 -3 5.5; 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 8.7
    20. 66 0 3 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 3 14.9; 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 14.9; 87 4.7 3 14.9; 88 7.6 3 13.4; 89 5.9 3 13.4; 90 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 3 2.9; 97 2 3 8.7; 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 6 5.5; 105 3.6 6 8.7; 106 2 6 10.4

   118. 324 243 244; 325 244 242; 326 242 228; 327 239 241; 328 241 240; 329 209 172
   119. 330 211 174; 331 213 176; 332 214 177; 333 219 182; 334 218 181; 335 216 179
   120. 336 215 178; 337 210 173; 338 212 175; 339 244 207; 340 243 206; 341 242 205
   121. 342 228 191; 343 227 190; 344 226 189; 345 224 187; 346 222 185; 347 223 186
   122. 348 220 183; 349 249 247; 350 246 247; 351 246 248; 352 248 252; 353 252 253
   123. 354 248 250; 355 250 251; 356 251 256; 357 250 282; 358 282 253; 359 282 254
   124. 360 251 255; 361 255 257; 362 256 257; 363 268 269; 364 269 266; 365 269 270
   125. 366 270 267; 367 257 259; 368 255 258; 369 259 258; 370 273 274; 371 274 271
   126. 372 272 275; 373 275 274; 374 260 262; 375 261 259; 376 262 261; 377 262 264
   127. 378 264 263; 379 261 263; 380 264 265; 381 265 249; 382 280 281; 383 281 279
   128. 384 279 265; 385 276 278; 386 278 277; 387 246 209; 388 248 211; 389 250 213
   129. 390 251 214; 391 256 219; 392 255 218; 393 253 216; 394 252 215; 395 247 210
   130. 396 249 212; 397 281 244; 398 280 243; 399 279 242; 400 265 228; 401 264 227
   131. 402 263 226; 403 261 224; 404 259 222; 405 260 223; 406 257 220
   132. DEFINE MATERIAL START
   133. ISOTROPIC CONCRETE
   134. E 2.17185E+007
   135. POISSON 0.17
   136. DENSITY 23.5616
   137. ALPHA 1E-005
   138. DAMP 0.05
   139. TYPE CONCRETE
   140. STRENGTH FCU 27579
   141. END DEFINE MATERIAL
   142. MEMBER PROPERTY INDIAN
   143. 39 43 47 48 52 54 97 101 105 106 110 112 155 159 163 164 168 170 213 217 221 -
   144. 222 226 228 271 275 279 280 284 286 329 333 337 338 342 344 387 391 395 396 -
   145. 400 402 PRIS YD 0.2 ZD 0.45
   146. 1 TO 38 40 TO 42 49 TO 51 53 55 56 58 TO 96 98 TO 100 107 TO 109 111 113 114 -
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REFERENCES

- The design and analysis of multistoried G+2 building.
  By, V.VARALAXMI
- The design and analysis of multistoried G+2 building.
  By, P.JAYACHANDRAN
- The design and analysis of multistoried G+2 building using composite structure at earthquake zone-3.
  BY, L.G.KALARKUR

BIOGRAPHAICAL 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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