

Analysis and Design of Multi Storeyed Building Using Staad Pro and Manually for Two Seismic Zones

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Abstract- in this paper concerned on seismic analysis of G+9 multistoried building which is subjected to dead load, Live load and seismic load as per is codes. Structural analysis is a branch in which involves the determination the behavior of the structure. When the different types of loads like live load, wind load, dead load, seismic loads, earthquake loads etc. are acting on the structure then the structure should bear all the loads safely. This is possible only in case of when we design the structural components like beam, column, footing, slab etc. safely and with more accuracy. Staad pro is a software which is uses for all the measure analyze engine that is static, dynamic, linear and non linear etc. and specially this software are used to analyze and design the buildings. This project "analysis and design of multistoried building using staad pro and manually calculation for tow seismic zones". Is an attempt to analyze and design of building using staad-pro G+9 building is considered for study. analyse and design is done as per IS456:2000 code. Also design the structural elements manually.

Indexed Terms -- STAAD PRO, Building Analysis, Design, Seismic Zones, manual design.

I. INTRODUCTION

Now a day's construction of multistoried building is basic need because large increasing population day to day. We are used conventional design of manual method of building is time consuming and more possibilities of errors. So it is necessary to use of software are getting more accurate results. The design is made using software are structural analysis design (staad pro). The building subjected both the vertical load as well as horizontal loads. The vertical loads consist of dead load of structural component such as beam, column, slab footing etc. So it is necessary to use of software for getting more accurate results. Staad-pro is structural software accepted by much civil engineering. This can solve typical Problem like seismic analysis using various load combination to confirm various code like IS 456:2000, 1893:2002, IS875:1897etc. For multi-

storied buildings, the conventional load bearing structures tends to distribute the loads more uniformly and eliminate the excessive effects of localized loads. Become uneconomical as they require larger sections to resist huge moments and loads. But in a framed structure, the building frame consists of a network of beams and columns which are built monolithically and rigidly with each other at their joints. Because of this rigidity at the joints, there will be reduction in moments and also the structure Therefore in non-load bearing framed structures, the moments and forces become less which in turn reduces the sections of the members.

II. LITERATURE REVIEW

A significant amount of this research work on various structural aspects of use of structure and their mechanism has been published by many investigators. Reviews of some of the technical papers are briefed below.

Mohit Sharma and Dr. Savita Maru (2014) [12] in this paper study about the G+30 storied building. This building is regular. The size of building plan area is 25 m by 45 m with storey height 3.6 m. each floor and depth foundation is 4 m. the dynamic and static done by staad pro. This building design for zone 2 and zone 3.

Mukundan H. et al. (2015) [7], he analyzed G+9 storied building structure for zone 4. which have high frequency of earthquake he found that the shear divider arrangement for the structure. He concluded those shear dividers are more impervious to the parallel loads in this structure and for safe plan. Also he concludes that the thickness of shear divider is about 150 to 400 mm.

Anirudh Gottala, Kintali Sai Nanda et al (2015) [10] he was carried out comparative study of dynamic and static analysis of multistoried building. The analyze the frame structure as a G+9 multistoried building. Linear seismic analysis calculates for the building for static method and dynamic method using staad pro. He also calculated bending moment, shear force, deflection for various structural components like beam, column.

Sayed O. et al. (2017) [4], he work on study of impact of in filled mass inconsistency. In reinforcement concrete structure for various floors. He said that the different floor of structure have different seismic load and for different seismic zones also. It can be done easily by using staad pro software. In This project are completely deals with scrutiny of the building using the STAAD.Pro software. The results are compared with physical calculations. The elements are created as per IS: 456:2000 codes.

Khan et al. (2016) [5], in this paper he work on impact mass consistency on various floor in Reinforced concrete structure its they undertaking for works for seismic investigation for reinforced concrete section in this paper he has done work for analyze and design for seismic zone.

Reddy A. et al. (2015) [6], he was analyze the building G+15 storey for zone 5. Which have high seismic efficiency of earthquake he performs for static and dynamic techniques for analyze he was also considered staad pro programming which utilized show also recreate building reaction. It was take investigation for static and dynamic performance.

K. Rama Raju et al., (2013) [2] he said that the taller buildings is the need for the new generation so the taller the structure, the loads comes on the structural members also huge. So by using staad pro we can analyze easily all the structural components easily and for that less time will be required. Has explained that the objective of the paper is to detect and scan a multi-storey building. Load calculations are done manually and STAAD.Pro software is used for analyzing the structure and their structural components. STAAD.Pro is the recommended

software. STAAD.Pro is software which allows the users to make the mounted the loading values to be given and dimensions.

Mayuri D. Bhagwat et al.(2014) [8], she was considering analyze and design of G+12 multistoried R.C.C. building considering bhuj and koyna tremor are completed. This is examining the time history and reaction range investigation. Seismic reactions of the building are considered display with staad pro software. Koyna and bhuj have been utilized to create distinctive satisfactory criteria.

T.Mahdi et al. (2012) [9], he was done seismic analysis for 5 storey, 7 storey and 10 storey building. He using non linear static methods and unequal system method for analyze different storied building. The outcomes from the dynamic system are very powerful examination indicate marginally outcome over the non linear static investigation.

V.Varalakshmi: [3] he has done analyze and design of multistoried building. In this study included analyze and design of structural component like column, beam footing slab by using staad pro and get result bearing capacity of soil is to be safe. He designs structural components like column, beam, footing, and slab. He has check all necessary data like bending moment, shear force And the result from staad pro are safe in all necessary checks.

B. Srikanth and V. Ramesh (2013) [11] he was done analyze for seismic response for seismic coefficient and response spectrum method. He was study on zone 2 and zone 4. The zone 2 have less frequency of earthquake and zone 4 have high frequency of earthquake. As for is recommendation he include spectrum method and he done model analyze by response spectrum method Of IS code where dynamic degree of freedom generated by idealizing the building as a shear building. Which is corresponds to the stiffness matrix. By using above method he comparing result like base shear lateral forces and storey moments for zone 2 and zone 4.

Deevi Krishna Chaitanya (2017) [1] has indicate that in his paper, now a days where competition is more there time is most important factor for civil engineers

it is requirement of saving time by using staad pro software in the replacement of manually calculations Where much accuracy is required by using staad pro it becomes easy to calculate and analyze various frames where different dead loads, live loads are applied. This software involves all the criteria of kanies method, portal frame method matrix method etc. for analyze frame structures.

III. OBJECTIVE AND SCOPE

To study the difference for same structure for two different seismic zones by comparing beam, column, footing, design and seismic data by using staad pro software and manually calculations. The analyze are done for G+9 building. Staad pro software is applicable for all types of structures which may be situated any zones. By comparing same structure for different zones we can get all different parameters which make same structure as a different structure for different seismic zones. It is more time saving. Because we have put the data in software and get the result after run analysis directly as a output. In manually calculation so much time is required and more mistakes may be occurs.

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