Seismic Performance of confined structure with Hard & Soft soils condition

Awanti Lodhi [1], Prof. Satyendra Dubey [2], Prof. Vedant Shrivastava [3]
[1]Dept of Civil Engineering
[2, 3]Professor, Dept of Civil Engineering
[1, 2, 3] Gyan Ganga Institute of Technology and Sciences, Jabalpur (M.P.), India.-482003

Abstract- *At the point when tremors happen a structure experiences dynamic movement .This is on the grounds that the structure is exposed to inactivity power that demonstration inverse way to the increasing speed of quake excitations.These dormancy power called seismic burdens. The motivation behind this paper is to discover most extreme the hub uprooting for inflexible backings under different zones considering Hard and Soft soils types. The present investigation is constrained to RC confined structure in various zones IV and V. The investigation is done the assistance of STAAD PRO.(V8i) series . The structure model in the examination has G+4,G+5,stories of 15m, 18m,heights separately. Three dimensional (3D) models of building were created to break down and analyze the impact of seismic powers on multistory structure by accessible computer program, STADD PRO. This work consist of axial force in column (KN) for confined structure and also detemined the seismic performance at Seismic Zones IV & V of the confined structure.*

Keywords- Excitation, STADD PRO, confined structure, seismic burdens

I. INTRODUCTION

The word seismic vibration is self-explaining the shudders that infers the earth shakes and we feel the vibration realized by these developments. Seismic tremor are caused as a result of numerous clarification anyway most normally term shudder is used when shaking the world's surface is caused due to some exacerbation occurring inside the earth. At whatever point the earth is vexed, vibration are made. These vibration set out all over from the spot of their source. At whatever point these vibrations travel, a seismic tremor is said to have happened. These vibration are progressively remarkable near their sources. As the division manufactures, these become frail and bit by bit disappear.

II. LITERATURE REVIEW

Girum Mindaye and Shaik Yajdani (2001) [2] Seismic Analysis of a Multi-storey RC Frame Building in Different Seismic Zones.

They analyzed a Multi-storey RC Frame Building in Different Seismic Zones. They have considered medium soil types and for all seismic zones. They also considered OMRF for seismic zone- II & III and OMRF & SMRF for seismic zone- IV & V.

Ashis Debashis Behera, K.C. Biswal (2012) [3] 3DAnalysis Of Building Frame Using Staad Pro.

They studied 3D Analysis of building frame using Staad Pro. Building in seismic load combination required more steel than the building under wind load combination but the deflection and shear bending is more in wind load combination compare to seismic. But for lower storey beams more steel is required for wind load combination. For column the area of reinforcement and percentage of reinforcement always greater necessary for wind load combination than the seismic load combination.

In Above Literature Review They actually focused on all the points regarding axial force in columns.For seismic zones IV &V and Hard & Soft soils conditions, there is not much work has been done much.

III. OBJECTIVES

- Modeling of different building frames of different heights.
- To work on STAAD PRO to analyze the structure.
- To find maximum axial force in colume for Seismic Zones IV & V with Hard & soft soils conditions.

IV. METHODOLOGY

This work is carried out to figure out the variation of values of Axial Force in Colume for Hard & Soft soils

condition.Steps to carry out this task in STAAD Pro, are given below:

Firstly go to Run Structure Wizard and select Bay Fram then follow the following steps given below:

V. MODELING

By using following steps the modeling of building frame can be done. The steps are:

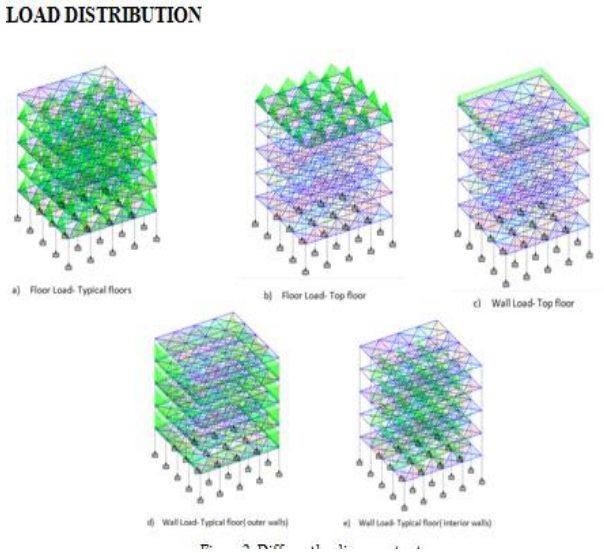
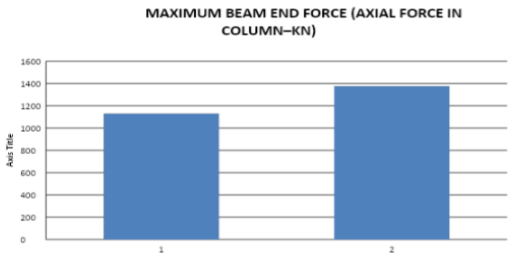


Figure 1: Different loadings on structure

VI. RESULTS & DISCUSSIONS

SEISMIC ZONE-IV
MAXIMUM BEAM END FORCE (AXIAL FORCE IN COLUMN–KN)

SOIL CONDITION	MODEL-1	MODEL-2
Hard	1129.533	1373.48
Soft	1129.533	1373.48



SEISMIC ZONE-IV
MAXIMUM BEAM END FORCE (AXIAL FORCE IN COLUMN–KN)

SOIL CONDITION	MODEL-1	MODEL-2
Hard	1129.533	1373.48
Soft	1129.533	1373.48

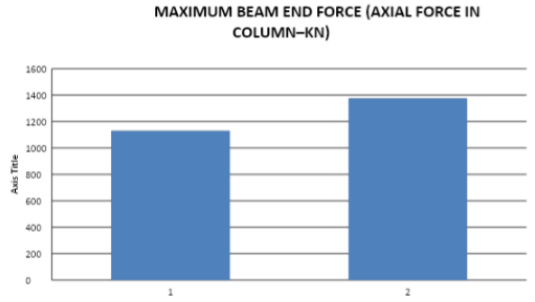


Figure 2: Maxmium Axial Force in Column For Seismic Zone IV for Hard & Soft Soils Condition

SEISMIC ZONE-V
MAXIMUM BEAM END FORCE (AXIAL FORCE IN COLUMN–KN)

SOIL CONDITION	MODEL-1	MODEL-2
Hard	1129.533	1376.588
soft	1129.533	1376.588

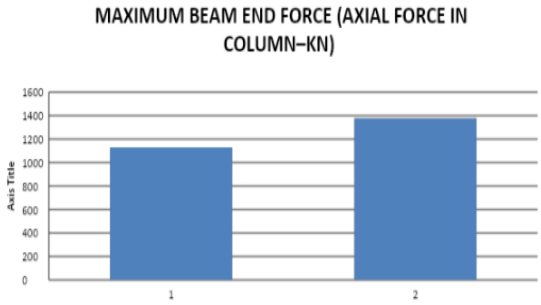


Figure 3: Maxmium Axial Force in Column For Seismic Zone V for Hard & Soft Soils Condition

VII. CONCLUSIONS

- For maximum Axial Force in Column, Seismic Zone-IV & Seismic Zone -V shows almost same for G+4 (model 1) at Hard & soft soils conditions.
- There are some variation in axial force for seismic zone-IV and seismic zone-V in Hard soil G+5(model 2).

REFERENCES

[1] Girum Mindaye and Shaik Yajdani (2001) Seismic Analysis of a Multi-storey RC Frame Building in Different Seismic Zones.

[2] Ashis Debashis Behera, K.C. Biswal (2012) 3DAnalysis Of Building Frame Using Staad Pro.
[3] V Ratna Priya and N jitendra Babu (2017) Seismic reaction of building frame under various zones considering flexible and rigid supports.
[4] Sudhir K. Jain and R.K. Ingle Explanatory Examples For Ductile Detailing Of RC Building.
[5] Ashiru Muhammad, Chhavi Gupta, Ibrahim B. Mahmoud (2015) Comparative analysis of Seismic Behaviour of Multi-storey Composite Steel and Conventional Reinforced Concrete Framed Structures.
[6] Aman, Manjunath Nalwadgi , Vishal T, Gajendra (2016) Analysis and design of multistorey building by using STAAD Pro.
[7] IS: 1893-2002 (part-1) "criteria for earthquake resistant design of structures" fifth revision, Bureau of Indian Standards, New Delhi.
[8] IS: 456-2000(Indian Standard Plain Reinforced Concrete Code of Practice)– Fourth Revision.