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A Review on Analysis of Tower on Building with Sloping Ground

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Abstract**—** *The construction of tower increasing day by day therefore to minimize the land use construction of tower on building is in trend to reduce the initial cost and also makes it economical but the construction of tower on building is more difficult on sloping ground. Therefore the seismic and wind analysis on building towers plays an important role in the construction of tower on building on sloping ground surface. By using Staad-pro software seismic and wind load is analysed to make the structure safe against earthquake and heavy wind. .*

Keywords**— seismic analysis, STAAD-PRO, building tower, Response spectrum, Sloping Ground, Step back, Step back set back.**

I. INTRODUCTION

In today's world expansion of cities and human colonies increasing day by day that is causing our agricultural lands and villages. To prevent unnecessary use of land high-rised buildings plays an important role. It reduces extra land use and cost. Therefore now a day towers are shifted upon buildings to save land from unnecessary construction. Tower companies are using building for towers they can use buildings as rental or permanent basis for towers.

The construction and safety of these towers are main issue for the Engineers therefore to prevent it from earthquake and wind load analysis is required. The analysis can be done by using several software's they are-

1. E- TABS
2. SAP 2000
3. STAAD PRO
4. CATIA
5. REVIT STRUCTURE

Modeling through this software's helps to find strength of the structure against lateral and vertical loads. Analysis result shows the safety of the structure against lateral and vertical loads. If the structure is situated on steep or sloping ground the analysis of the structure is more important. There are some images of different-different types of buildings-

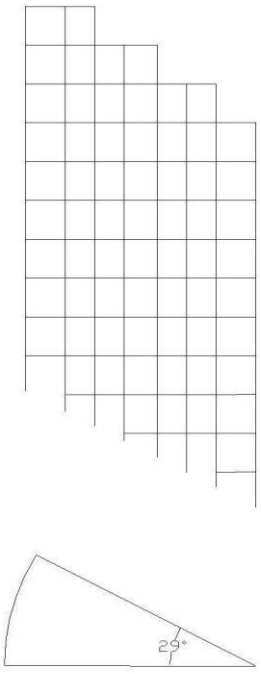

Fig.1 degree building on plain ground

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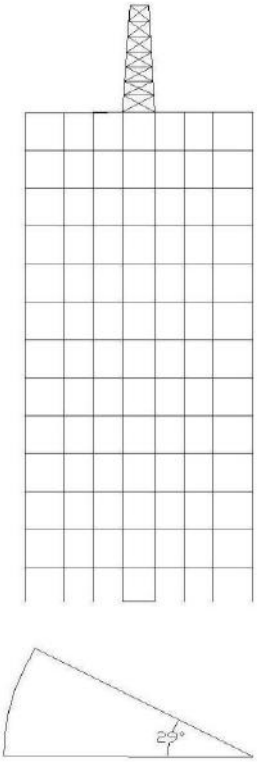

Fig.2: Degree building on step back building

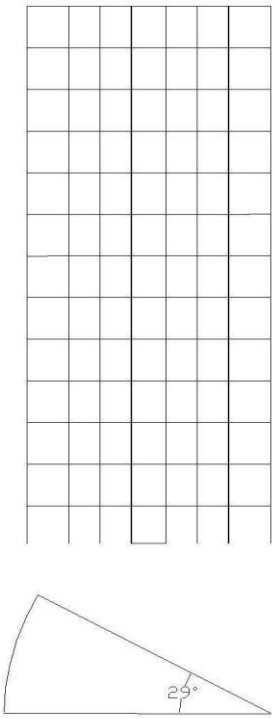

Fig.4: Degree building with tower on step back building

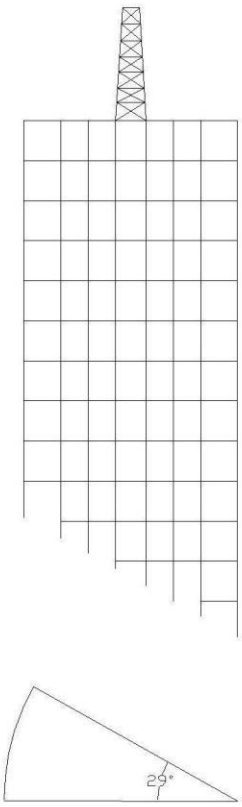

Fig.3: Degree building with tower on plain ground

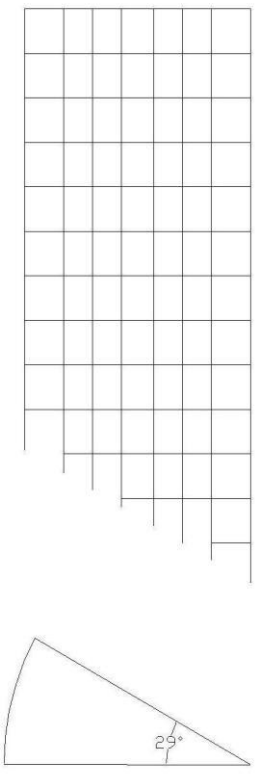

Fig.5: Degree building with tower on Step back Set back building

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II. LITERATURE REVIEW

Nitin Bhosale, Prabhat Kumar, Pandey

Mobile communication growth has increased from last three years. Therefore the need of communication towers and buildings is increased. The competition between mobile operators is also increased therefore the need of rooftop antenna has increased from last three years. The operators are adopting rooftop antennas now a day because it cost less than cost of land. In the present study, the comparison is shown in between ground tower members and rooftop tower at the same elevation.

M.A. Barkhordari, G. Ghodrati Amiri, M.R. Vafaei and S.R. Massah

Telecommunication towers are steel structure and their seismic response against seismic loads is different than concrete structure therefore an analysis is carried out against seismic loads on steel telecommunication towers in iran. This analysis is done on four legged telecommunication tower of height of 18 to 67 meters. The Dynamic, shear and vertical reaction of the tower are calculated.

Ghyslaine McCLURE, Laura GEORGI and Rola ASSI

In today's modern world telecommunication business at its top and the need of telecommunication rooftop towers increasing day by day because of increasing Teli-users. And they are obviously builted in dense populated areas therefore it safety against seismic loads, lateral loads, wind loads is more important.

The study shows the time history analysis for maximum seismic base shear and also for the overturning moment of rooftop towers by showing correlation between them.

K. Jagan Mohan and C. Preeti

Transmission towers consume about 28 to 42 percent of the transmission line cost. The requirement of electricity is increasing rapidly all over the world therefore to meet its demand economically development of light weight tower is in use. In this paper, the effort is made to make cost effective transmission line by converting the shape and type of transmission line structures. By Using STAAD-PRO software analysis is carried on three towers. The wind load calculation is carried out and repeated again and again for the analysis and design of the towers.

S. R. MASSAH, G. GHODRATI AMIRI, M.A. BARKHORDARI

The telecommunication structures are basic structures now a day all over the world. Therefore it seems important to keep it safe from natural disasters like earthquake and heavy wind loads. This paper shows the investigation of seismic reaction of four legged self supporting towers. Total ten no. of telecommunication towers are studied in Iran under the seismic and wind effect with the help of Iranian seismic code of practice.

Vafaei,Azlan Adnan, Gholamreza Soltanzadeh, Hossein Shad, Mohammadreza

The design codes say wind load is the major lateral load except for some cases in the design of telecommunication towers. This study shows the seismic performance of total no. of 10 four-legged telecommunication towers. The investigation is done on towers whose height is in between 18 to 67 meters and the origin of investigation is country Iran.

Shailesh S. Goral,Prof. S. M. Barelikar

The telecommunication industry is the fastest growing industry in human society and therefore it catches more attention than any other industry. The earthquake and wind analysis plays an important role in telecommunication structure like towers. Natural hazards like earthquake and wind storms are the major issues for the safety of towers.In this research the staad-pro software is used for the analysis of seismic and wind loads. The square shape plan and different bracing systems has been used in the design of these towers. Non linear dynamic method is used in the analysis of these towers.

Mohd. Arif Lahori, Sagar Jamle

The plain construction land is not available easily now a day's therefore it is shifted on hill sites. On hill sites it is not easy to construct on steep slopes and also it is not easy to maintain structure under seismic loads. The main aim of the paper is to study and analysis and comparison between buildings on plane ground and sloping ground.

Sagar Jamle, Mohd. Arif Lahori

The construction of R.C. structures are commonly assymetrical in shape on slope of mountains. The main aim of the study is to investigate, compare and earthquake analysis of the structure under five different configurations like stept back building 200, regular building, step back building 300 And the response spectrum method is used in it.

Hemal J shah Dr. Atul K Desai

The television towers are constructed for the purpose of transmitting signals from one place to another they also transmit the radio signals and telecommunication signals. Therefore their design and construction are most important

under seismic zones. This study presents seismic response of 4 towers of different height and different bracing system of towers. The SAP 2000 software is used to analyse these towers

III. CONCLUSION

After reading all of the research we can conclude that tower on building saves the extra land cost and if the analysis and modeling of the structure is accurate we can easily find out the safety of the structure against lateral loads and against sliding

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