

Review Paper on Fundamental Natural Period of Irregular Rcc Framed Structure

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ABSTRACT: It is understood that building which are regular in elevation (regular building) perform much better than those which have irregularity in elevation (irregular building) under seismic loading. Irregularities are not avoidable in construction of building however a detailed study to understand structural behavior of the building with irregularities under seismic loading is essential for appropriate design and their better performance. From past earthquakes it is proved that many of structure are totally or partially damaged due to earthquake. so, it is necessary to determine seismic responses of such buildings. The Main objective of this study is to understand the effect of elevation irregularity and behavior of 3-D R.C. Building which is subjected to earthquake load. As per IS 1893:2002 The approximate fundamental natural period of vibration (T), in seconds, is a function of height of a building and plan dimension of a building. In this Research work objective is to show that natural time period is also a function of number of floors and not only the height of the building, which is not mentioned in Is 1893:2002.

KEY WORDS: Seismic analysis, Fundamental Natural period analysis, Mass irregularity, Vertical irregularity, Time Period.

INTRODUCTION:-

1. The word earthquake is used to express any seismic occurrence whether natural or caused by humans that can produce seismic influence around any particular area. Earthquakes are caused generally by rupture of geological faults inside the earth, but also by other events such as volcanic movement, landslides, mine blasts, and atomic tests.

2. During an earthquake, failure of structure starts at points of weakness. Generally weakness is due to geometry, mass discontinuity and stiffness of structure. The structures having this discontinuity are termed as irregular structures. These structure contain a large portion of urban infrastructure. Hence structures fail during earthquakes due to vertical irregularity.

3. Vertical irregularities are characterized by vertical discontinuities in the geometry, distribution of mass, rigidity and strength. Setback buildings are a subset of vertically irregular building where there are discontinuities with respect to geometry. However, geometric irregularity also introduces discontinuity in the distribution of mass, stiffness and strength along the vertical direction.

4. When this type of building are constructed in high intensity zones, the design and analysis of structure become complicated. There are two types of irregularities-

1. Plan Irregularities.

2. Vertical Irregularities.

a) Stiffness Irregularity – Soft Storey-A soft storey is one in which the lateral stiffness is less than 70 percent of the storey above or less then 80 Percent of the average lateral stiffness of the three storey's above.

b) Stiffness Irregularity- Extreme soft storey- An extreme soft storey is one in which the lateral stiffness is less than 60 percent of that in the storey above or less than 70 percent of the average stiffness of the three storey's above.

ii) Mass irregularity-Mass irregularity shall be considered to exist where the seismic weight of any storey is more than 200 percent of that of its adjacent storey's. In case of roofs irregularity need not be considered.

iii) Vertical Geometric Irregularity- A structure is considered to be Vertical geometric irregular when the horizontal dimension of the lateral force resisting system in any storey is more than 150 percent of that in its adjacent storey.

LITERATURE REVIEW:- Seismic analysis is a major tool in earthquake engineering which is used to understand the response of building due to seismic excitations in a simpler manner. In the past the buildings were designed just for gravity loads and seismic analysis is a recent development. It is a part of structural analysis and a part of structural design where earthquake is prevalent.

Mayuri D. Bhagwat et.al [1] In this work dynamic analysis of G+12 multistoried practiced RCC building considering for Koyna and Bhuj earthquake is carried out by time history analysis and response spectrum analysis and seismic responses of such building are comparatively studied and modeled with the help of ETABS software. Two time histories (i.e. Koyna and Bhuj) have been used to develop different acceptable criteria (base shear, storey displacement, storey drifts).

Himanshu Bansal et al [2] in this study the storey shear force was found to be maximum for the first storey and it decreased to a minimum in the top storey in all cases. It was found that mass irregular building frames experience larger base shear than similar regular building frames. The stiffness irregular building experienced lesser shear and has larger inter storey drifts.

Mohit Sharma et al [3] In this study a G+30 storied regular building. The static and dynamic analysis has done on computer with the help of STAAD-Pro software using the parameters for the design as per the IS-1893-2002-Part-1 for the zones-2 and 3.

P.P. Chandurkar et al [4] in this study shear walls, is considered as major earthquake resisting member. Structural wall gives an effective bracing system and offer good potential for lateral load resistance. So it is important to determine the seismic response of the wall or shear wall. In this study main focus is to determine the location for the shear wall in multi storey building.

Prof. S.S. Patil et al [5] This study gives seismic analysis of high rise building using program in STAAD Pro. with considering different conditions of the lateral stiffness system. Analysis is carried out by response spectrum method. This analysis gives the effect of higher modes of vibration and actual distribution of force in elastic range in good way. These result include base shear, Storey drift and storey deflection are presented.

METHODOLOGY:- if the structure not properly constructed with required quality they may cause large destruction of structures due to earthquakes.

- 1) Extensive literature survey by referring books, technical papers, carried out to understand basic concept of topic.
- 2) Selection of type of structures.
- 3) Modeling of the selected structures
- 4) analysis of me selected structure.
- 5) Interpretation of result and conclusion.

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