



Seismic Behavior Of Strong Concrete Buildings Within Variable Repeating Materials

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Abstract: The earthquake is the result of a sudden earthquake of energy that causes seismic waves. Earthquakes and seismic contraction have major implications. It has social and economic consequences such as death and injury to living beings, especially at the expense of humans and the built and natural environment. It is important to understand the characteristics of the Earth's movement, and to be careful when losing lives due to the movement of the Earth and damage to structures. The most important dynamic features of an earthquake are Earth's Peak Acceleration (PGA), frequency and duration content. These features play a major role in studying the behavior of structures under earthquake. The force of the Earth's movement is measured on the basis of the PGA, the frequency content and the duration it moves. Ground motion has different frequency content such as low, medium and high. It presents the task of studying the Earth's frequency of motion on the proposed concrete (RC) buildings. The linear date of time is analyzed in the Structured Design and Analysis Program (STAD Pro). The proposed method is to study the response of low-, medium-, and high-frequency concrete buildings to the ground hoax of low-, medium-, and high-frequency materials. Two regular and irregular 3D and two-storey 3D RC buildings with six ground motions of low, medium, high frequency and peak ground acceleration (PGA).

Keywords: Reinforced Concrete Building; Ground Motion; Peak Ground Acceleration; Frequency Content; Time History Analysis;

1. INTRODUCTION:

A brief definition of the earthquake is presented, then the three most important kinetic features of the earth's motion, namely the peak mean acceleration (PGA), the content of the frequency and the duration of the earthquake, in addition to the earthquake [1]. Is explained. Buildings with six and left floors consisting of regular and irregular concrete that are constructed as three models and corresponding models of low medium and high frequency materials and six ground movements in real time. Gives an overview of the project's introduction to the project and a brief description of the importance of the research process. The purpose and scope of the present work is very clearly stated in Section 1.5. Finally, the processes used to complete the task are presented. The earthquake is the result of the rapid release of energy release into the earth's straw producing earthquake waves. Se planers are subject to seismic ground movement and structural damage. In order to use caution for damage to structures due to ground movement, it is important to know the characteristics of ground movement. The most important dynamic features of an earthquake are Earth's Peak Acceleration (PGA), frequency content, and duration. These features play a key role in studying the behavior of structures under earthquake ground motion.

Severe earthquakes are rare. Although it is technically possible to design and construct structures for these earthquake events, they are often considered non-economic and repetitive for doing so. The earthquake is designed in the hope that severe earthquakes will do some damage, and the philosophy of earthquake design has been founded on this concept for years. The purpose of an earthquake design is to limit the damage to the structure to the extent it is intended to be [2] [3]. The Rust structure is designed in such a way that they can resist secondary earthquakes without the possibility of secondary earthquake damage, without the possibility of structural damage, and some levels of high-level ground movement against structural and additional damage. Must be able to resist.

In the present work two, six, and twenty regular and irregular floors of RC buildings are subjected to 6 ground moves of low, medium, and high frequency materials. The buildings are designed as three dimensions and the textile history is analyzed using rust structured design and analysis (STAAD Pro). Some researchers are made to study the content of the ground motion frequency. Wacker studied by assessing the impact of earthquake frequency content on cantilever wall earthquake behavior, including differences in soil structure. In addition, Kawak and Biswal studied the earthquake behavior of partially

filled solid rectangular tanks under low, medium, and high frequency ground movements.

There is no work on the seismic behavior of RC buildings under changing material ground moves. The present study deals with the earthquake behavior of concrete buildings under low, medium, and high frequency ground movements.

REGULAR RC BUILDINGS

The reinforced concrete buildings consisting of two and twenty six floors are considered low, medium and high. The length of the beam in the transverse direction (x) is 4 meters and (h), and the length of the beam is 5 meters. Figure 1 shows a diagram of three buildings that have three bases in the X direction and five bases in the Z direction. Each building has a story of 3.5 meters high. Figure 2 shows the tires (A-A) and (01-01) for the twenty- and six-story RC buildings, respectively. For simplicity, the cross-section of the beams and columns is 300 mm x 400 mm.

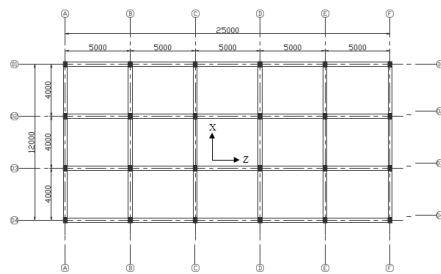


Figure 1: Plan of two, six, and twenty-story regular RC buildings (all dimensions are in mm)

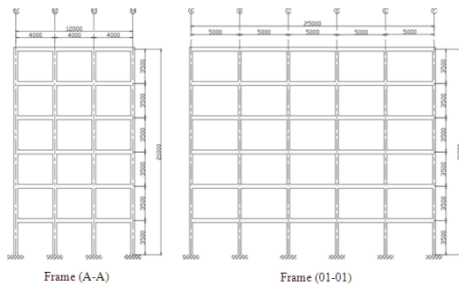


Figure 2: Frame (A-A) and (01-01) of six-story regular RC building (all dimension are in mm)

IRREGULAR RC BUILDINGS

Two, six, and twenty-story irregular reinforced concrete buildings, which are low, mid, and high-rise, are considered. The beam length in (x) transverse direction is 4m and in (z) longitudinal direction 5m shows the plan of the three buildings having five bays in x-direction and five bays in z-direction [4]. Story height of each building is assumed 3.5m. Frame (01-

01) and (06-06) of the twenty, six, and two-story irregular RC buildings respectively. Shows frame (A-A) and (F-F) of the twenty, six, and two-story irregular reinforced concrete building respectively. For simplicity, both the beam and column cross sections are assumed 300 mm x 400 mm.

GRAVITY LOADS

Slab load of 3 kN/m² is considered for the analysis and wall load of 17.5 kN/m is applied both on exterior and interior beams of the RC buildings as per IS 875 (Part1) [28]. Live load of 3.5 kN/m² is provided in accordance to IS 875 (Part2) [29]. Table 1 shows the gravity loads.

Gravity Load	Value
Slab load (dead load)	3 (kN/m ²)
Wall load (dead load)	17.5 (kN/m)
Live load	3.5 (kN/m ²)

Table 1: Gravity loads which are assigned to the RC buildings

II. GROUND MOTIONS AND LINEAR TIME HISTORY ANALYSIS:

Earthquake is the enzyme caused by the earthquake caused by sudden earthquake discharges into the Earth's lysosphere. This intentional leave can come mainly from the tension created during the tectonic processes, which involves the coordination between the crust and the inner crust of the earth's crust. The energy released inside the earth will be released, maximum heat and sound will change, and earthquake waves will remain. Seismology is called seismology. The source and nature of the earthquake is the earthquake.

The sources of the earthquake are the natural sources and earthquakes of tectonics, volcanoes, rocks or falls and collapse, which are mining, earthquake-caused earthquakes, and man-made sources (explosives). In fact, 90% of earthquakes are caused by tectonic plates [5]. There are six continental-sized paintings that feature African and American cuisine, Antarctica, Australia, India, Europe and Asia Pacific.

The board has four bounded boundaries such as different boundaries (the inner surface contains a new plate material), rotation boundaries (the plates are uniform and the lower boundaries consumed), the confinement boundaries (the areas of the former freed areas). Breaks), and boundary changes (two sheets that are separated))

Geologists are concerned with the nature and properties of the earthquake; They use seismographs

to record seismographs, while engineers are concerned with the nature and characteristics of the speed of the earth; They use acceleration to measure the earth's acceleration (drawing acceleration). Seismic waves are classified as P waves, S waves, Love waves, and Relay waves.

III. TWO-STORY REGULAR RC BUILDING:

Expansion, acceleration and acceleration of the regular two-storey RC building due to GM11, GM22, GM3, GM44, GM5 and GM66. The story descent is higher due to GM4 ground speed and at least due to GM3 ground movement [6]. The story speed is increased by the movement of the Earth GM2 and at least the movement of the Earth GM3. The acceleration of the story is the maximum due to the movement of the Earth GM2 and at least the movement of the Earth GM3 and GM6. This indicates that the building is experiencing a breakout in the high story due to the low frequency content, ground speed and high speed of the story.

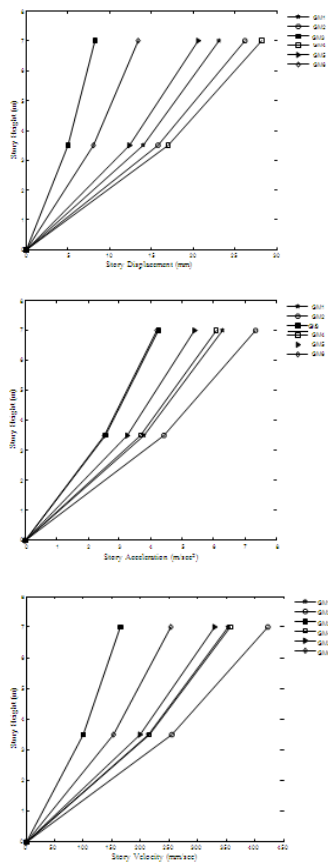


Figure 3: Story displacement, velocity, and acceleration of two-story regular reinforced concrete building due to ground motion GM1, GM2, GM3, GM4, GM5, and GM6 in x-direction

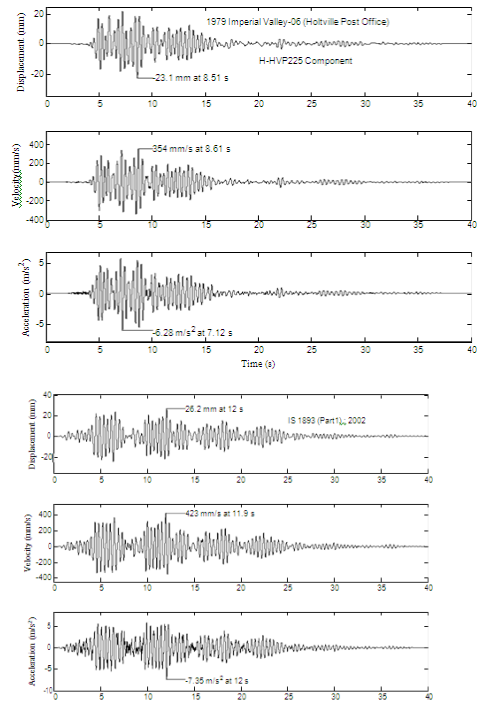


Figure 4: Roof displacement, velocity, and acceleration of two-story regular RC building due to (a)1979 Imperial Valley-06 (Holtville Post Office) H- HVP225 component, and (b) IS 1893 (Part1) : 2002 ground motion in x- direction

IV. CONCLUSION:

The general downward motion of the lower frequency content in both directions x and z in two directions from the normal RC building facing the least displacement of the story due to the ground movement with high frequency content in the x and z directions. The RC building faces maximum shear displacement. Speed of the story due to the ground motion of the frequency seven frequency content in the ground movement along the low-frequency content in the X-direction. The normal two-storey RC building in the x and z directions faces the maximum acceleration of the story due to the ground motion of the frequency seven frequencies in the two-way ground movement - low frequency in the x and z directions - two-way regular two- The floor faces the least acceleration of the story due to the RC building. Ground motion with high frequency content in the X and Z directions in the two directions in the normal RC building is characterized by maximum shear based on the low frequency. Ground movement in the x and z directions - the direction of the normal two-storey RC building characterized by at least the main basic shear due to movement. Ground with high frequency content in X and Z direction.

REFERENCES:

- [1] "Structural Analysis And Design (STAAD Pro) software," Bentley Systems, Inc.
- [2] A. Baghchi, Evaluation of the Seismic Performance of Reinforced Concrete Buildings, Ottawa: Department of Civil and Environmental Engineering, Carleton University, 2001.
- [3] T. Cakir, "Evaluation of the effect of earthquake frequency content on seismic behaviour of cantiliver retaining wall including soil-structure interaction," Soil Dynamics and Earthquake Engineering, vol. 45, pp. 96-111, 2013.
- [4] S. K. Nayak and K. C. Biswal, "Quantification of Seismic Response of Partially Filled Rectangular Liquid Tank with Submerged Block," Journal of Earthquake Engineering, 2013.
- [5] "Pacific Earthquake Engineering Research Center: NGA Database," 2005. [Online]. Available:
<http://peer.berkeley.edu/nga/data?doi=NGA0185>. [Accessed 2013].
- [6] IS 1893 (Part1), Indian Standard CRITERIA FOR EARTHQUAKE RESISTANT DESIGN OF STRUCTURES PART 1, 6.1 ed., New Delhi 110002: Bureau of Indian Standards, 2002.