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ANALYSIS OF HIGH RISE STRUCTURE BY STADD

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ABSTRACT
Reinforced concrete (RC) (also called reinforced cement concrete or RCC) is a composite material wherein concrete's fantastically low tensile power and ductility are counteracted by the inclusion of reinforcement having higher tensile energy or ductility. The reinforcement is typically, even though not always, steel reinforcing bars (rebar) and is commonly embedded passively within the concrete earlier than the concrete sets. the increasing in height of the high-rise building structure is a great challenge for the engineers and researchers in this field. Although there are many difficult technical problems in design, the most critical issues are definitely the effects of wind and earthquakes on these structures. The removal coasting section building is more when contrasted with without skimming segment working, on moving of drifting segment from first story towards top story of the structure brings about expanding storey drift, from dynamic investigation it was seen that gliding segment at various area results into variety in powerful reaction, It was additionally seen that moving of coasting segment from first story towards top story of the structure brings about expanding base shear.

INTRODUCTION

Reinforcing schemes are typically designed to resist tensile stresses especially regions of the concrete that would reason unacceptable cracking and/or structural failure. Modern bolstered concrete can incorporate various reinforcing materials product of metallic, polymers or exchange composite fabric in conjunction with rebar or no longer. Reinforced concrete will also be permanently burdened (concrete in compression, reinforcement in tension), for you to improve the behavior of the final structure below running loads. In the US, the most not unusual strategies of doing this are known as pre-tensioning and put up-tensioning. Reinforced concrete (RC) is a versatile composite and one of the maximum extensively used substances in contemporary production. Concrete is an extraordinarily brittle material that is sturdy underneath compression however less so in tension. Plain, unreinforced concrete is fallacious for plenty systems as it's far quite negative at withstanding stresses brought about by way of vibrations, wind loading, and so on.To increase its typical power, metallic rods, wires, mesh or cables can be embedded in concrete before it sets. This reinforcement, often known as rebar, resists tensile forces. By forming a sturdy bond collectively, the two substances are capable of resist a variety of applied forces, successfully performing as a single structural detail.

Use in construction

Many different types of Systems and components of structures can be built using reinforced concrete consisting of slabs, walls, beams, columns, foundations, frames and more. Reinforced concrete can be labeled as precast or solid-in-area concrete. Designing and implementing the most green floor device is fundamental to creating greatest constructing systems. Small changes in the layout of a floor system will have widespread impact on cloth fees, creation schedule, last strength, running fees, occupancy levels and stop use of a constructing. Without reinforcement, constructing contemporary systems with concrete material could no longer be viable and sometimes errors in concrete placement may occur.

FINITE ELEMENT METHOD

Sometimes, it becomes difficult to contemplate the behavior of a system when it is studied as a whole. On the other hand, it becomes relatively easier to study such system, by dividing it into its individual components and subcomponents. The behavior of every small issue can be easily understood and incorporated to explain the behavior of entire gadget. This is the primary concept in the back of finite detail approach (FEM).

Development in theory of finite element approach (FEM) started in early Nineteen Forties when need became felt for stepped forward aircraft structural analysis. By 6ties, FEM turned into being utilized by engineers for pressure analysis, Fluid waft analysis, heat switch analysis and so forth. By 1960s, FEM turned into getting used to resolve complicated, non-linear troubles. Fast improvement within the subject of laptop hardware and software, caused development of a number of application software's that may be used for FEM based analysis. Examples of such software programs are NISA, ANSYS, NASTRAN, Hyper mesh, COSMOS, Pro/E and so on. These software programs are being considerably used to clear up complex, real lifestyles, design and analysis troubles. In truth, FEM is now an imperative a part of computer-aided engineering (CAE). It is a technique for mathematical answer of extensive range of engineering issues. Today, the approach has observed huge recognition in vehicle industry for deformation and strain analysis of vehicle our bodies and optimizing the weight. Other regions of application encompass deformation and pressure analysis of building and bridge systems, subject evaluation of magnetic flux, warmth flux, fluid glide, acoustics, radiation analysis and seepage etc.

RESULTS

It is very difficult to sum up this type of work, which contain the large amount of values and graphs. So I decided to go with floor wise summary. This will help in better understanding of my work.

In this work 2 Building (G+5) are taken into consideration with 5 flooring. One is ordinary building and the alternative is with floating column. Mainly this work will focus on the building with floating columns. Under the static loading situation both the building are safe. In dynamic load; with floating column structure is discovered dangerous. i.e. In earthquake this building observed risky. The discern beneath display the normal building without floating columns bending second, shear pressure and axial force while the constructing is beneath any kind to loading condition.

PLOT OF RESPONSE OF BUILDINGS FOR TIME HISTOREY ANALYSIS

Two cases have been considered to plot the response of building for the time history analysis.

Case I: Without floating column for earthquake

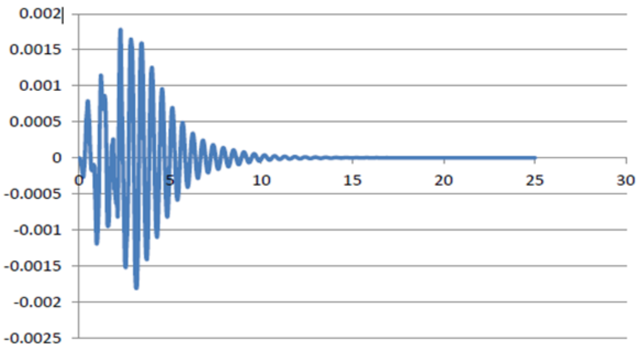

Figure Plot of graph Displacement (on y axis in M) Vs. Time (on x axis in sec)

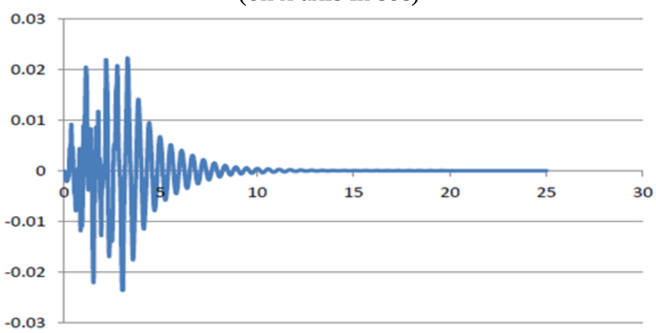

Figure Plot of graph Velocity (on y axis in m/sec) Vs. Time (on x axis in sec)

Case II: Floating column at 1st floor for earthquake

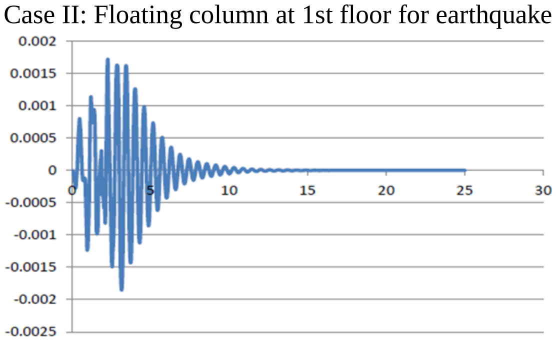

Figure Plot of graph Displacement (on y axis in M) Vs. Time (on x axis in sec)

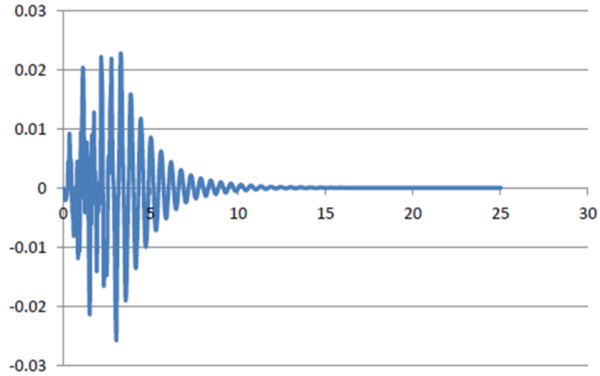

Figure Plot of graph Velocity (on y axis in m/sec) Vs. Time (on x axis in sec)

Case III: Floating column at 2nd floor

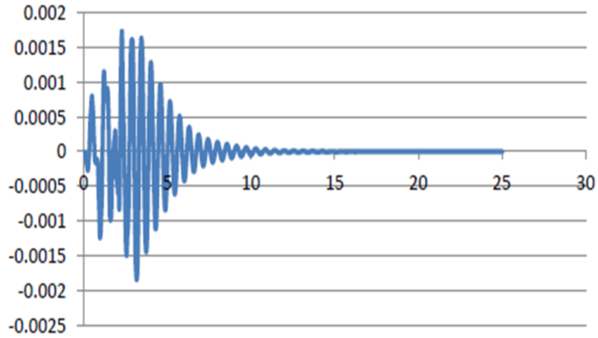

Figure Plot of graph Displacement (on y axis in M) Vs. Time (on x axis in sec)

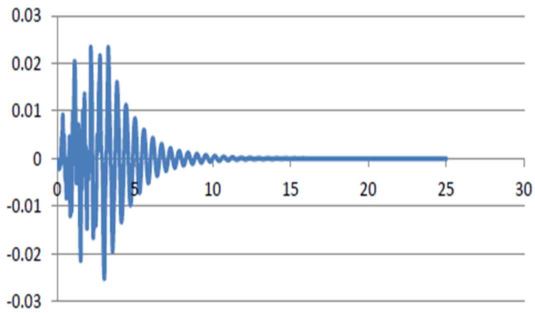

Figure Plot of graph Velocity (on y axis in m/sec) Vs. Time (on x axis in sec)

GENERAL CONCLUSION

The objective of the simulation study to obtain the result of the displacement, acceleration and mode shape for the three degree of freedom building has been achieved. Columns are designed for axial forces and biaxial moments at the ends. All active load cases are tested to calculate reinforcement. The loading which yields maximum reinforcement is called the critical load. The column design is done for the square section. Square columns are designed with reinforcement distributed on each side equally for the sections under biaxial moments and with reinforcement distributed equally in two faces for sections under a uni-axial moment. All major criteria for selecting longitudinal and transverse reinforcement as stipulated by IS: 456 have been taken care of in the column design of STAAD.

The results show that in simulation study, that are conducted which the masses of the floor and stiffness are variable. Thus the result obtains shows that the third floor has the highest displacement and highest acceleration. The mode shape obtained also has been analyses to know the movement of each floor during vibration. STAAD Pro V8i advanced software, which provides us a fast, efficient, easy to use, and accurate platform for analysing and designing structures

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