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A DETAILED STUDY OF G+12 RCC STRUCTURE UNDER VARIOUS ZONE

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***Abstract:* Seismic analysis is a subset of structural analysis and is the calculation of the response of a building (or non-building) structure to earthquakes. It is part of the process of structural design, earthquake engineering or structural assessment and retrofit in regions where earthquakes are prevalent. Retrofitting is the modification of existing structures to make them more resistant to seismic activity, ground motion, or soil failure due to earthquakes. With better understanding of seismic demand on structures and with our recent experiences with large earthquakes near urban centers, the need of seismic retrofitting is well acknowledged. Time period of the structure in each the direction is retrieve from the software and as per IS 1893:2002-05.**

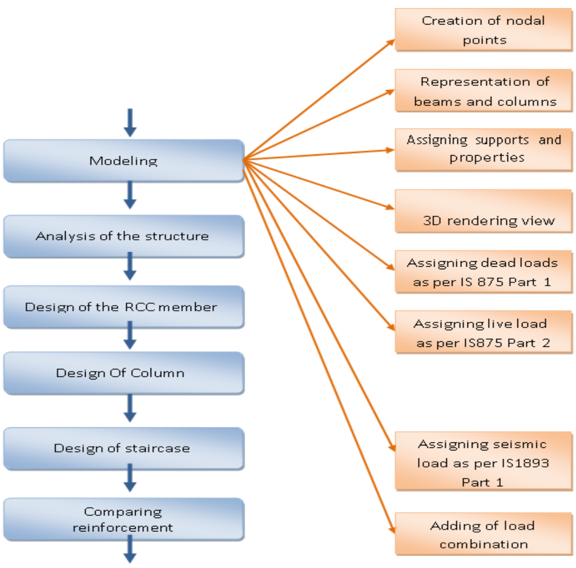
The lateral seismic forces in reinforced concrete frame is calculated by the linear static as per IS 1893:2002-05.

The whole research work is shows that the variation in behaviour of the structure under the gravity loads and seismic load of different zones

The results show the changes in the magnitude of forces, displacements, moments and the results also shows the variations in the quantity and quality of the materials.

***Keywords:* Seismic Analysis, Column Shear, Retrofitting, Jacketing, Damping Ratio, Flexural Strength, Storey Mechanic**

1. METHODOLOGY



2. MODELING

In the investigation work four models of reinforced concrete frame.

Tall structure G+12 floors are made to know the reasonable conduct of working amid tremor. The length of the building is 26m and width is 16m. Tallness of the individual story is 3m. Building is situated in zone II, III, IV & V. Building is created according to IS 456-2000. Concrete material of grade M25 is used, while steel Fe 415 and Fe 415 are utilized. Brick masonry having density 20 KN/m3 is utilized. Direct properties of material are considered. For the investigation work Staad pro. Software is utilized. The column sections are thought to be settled at the ground level.

Details of the structure

s.no.	Particulars	values
1	Size of beam	.6mx.5m
2	Size of column	.7mx.5m
3	Plan size	26mx16m
4	Height of structure	39m
5	Height of individual story	3m
6	Density of brick masonry	20kn/m3
7	Density of concrete	25kn/m3
8	Grade of concrete	M 25
9	Grade of steel	415
10	Soil condition	Medium soil
11	Thickness of outer wall	.2m
12	Thickness of inner wall	.1m
13	Seismic zones	ii, iii, iv, v
14	Thickness of slab	.15m
15	Importance factor	1

Table 2 Details of the structure

Load calculation:-
Dead load:-
Dead load consists of the permanent constructions material load compressing the beam, column, roof, floor, wall and foundations including claddings finishes and fixed equipment. dead load is a total load of all of the components of the building that generally do not change over time.
As per IS: 875 (part -I)

Outer wall load = .2*20*2.4= 9.6kn/m2 Inner wall load = .1*20*2.4= 4.8kn/m2 Parapet wall load = .1*20*1= 2kn/m2

Floor load (SLAB) + floor finishing load= 4.5kn/m2

Live load:-
These loads are not permanent or moving loads. the following loads includes in this type of loadings imposed load, fixed machinery , partitions wall these loads through fixed in positions cannot be re-lived upon to act permanently thought-out the life of the structure.
As per IS: 875 (part –II) Live load = 2.5kn/m2 Seismic load: The design lateral force shall first be computed for the building as a whole. This design lateral force shall then be uniformly distributed to the different floor levels. The overall design seismic force thus obtained at each floor level shall then be distributed to individual lateral load resisting elements depending on the floor diaphragm action. Calculation of seismic load as per IS 1893 (Part 1):2002

3. CONCLUSION

The results it shows that the columns of the G +12 residential building frame structure will face failures due to the lateral displacement and shear and flexure, as initially cracks are generated over the columns and further the column shall fail due to the seismic forces that are acting over the building. In order to overcome these failures in the column, we shall provide RC jacketing technique of retrofitting in the columns of the respective building that we have analysed. Generally, the structural retrofit improved the seismic resistance of the building and it can be considered in the retrofit of moment frame structures to prevent the risk of structural collapse under the design load with much more confidence. This study shows how the RC jacketing can be used in order to reduce the failure of columns of the respective building. One of the most significant advantages

4. PRACTICAL UTILITY OF THE WORK

This project compare the cost of constructing of a reinforced concrete frame in different seismic zones with gravity loading structures it shows that increase in cost the building can be made seismic resistant thus protecting the precious life and property to a great extent which can’t be measured in monitory terms. This awareness will be of great practical importance to encourage people to adopt seismic design for their buildings.

Future Scope
Many reaches have been conducted on this topic and still it is continuing, because more we try to learn more we can minimize the damages and save the lives.
Earthquake engineering gaining popularity. If we introduce the reinforcement in the structure we can increase the ductility of the structure But incorporation of reinforcement in the structure mainly affects the economy of the structure.
If we come to civil engineering an engineer’s job is to provide maximum safety in the structures designed and maintain the economy.
• The weight of the steel is increased with the seismic load intensity.
• The total applied load in all the horizontal direction is increased.
• The cost of the structure is increased.
• The area of steel in the column is increased.
• The weight of the structure is increases with the increase in the seismic load intensity.

REFERENCES

1. IIT Kanpur, Learning Earthquake Resistant Design and Construction, Earthquake Tips.
2. Dr SK Duggal , “Earthquake Resistance Design Of Structure”.
3. IS 456-2000 - Code of Practice for plain and reinforced concrete It is an Indian Standard code of practice for general structural use of plain and reinforced concrete. The latest revision of this standard was done in year 2000, reaffirmed 2005. This code uses the limit state design approach as well working stress design approach. It gives extensive information on the various aspects of concrete.
4. IS 875 : Part 1 : 1987 Code for design loads (other than earthquake)for buildings and structures It deals with the dead loads, Unit weights of building material and stored materials
5. IS 875: Part 2: 1987 Code for design loads (other than earthquake) for buildings and structures. It deals with the various types of imposed load that can come on different types of buildings.
6. IS 1893 (Part 1):2002 Code of criteria for earthquake resistant design of structures.
7. It deals with the Earthquake load that can come on different types of buildings in different seismic zone.
8. "M 5.1, "M 5.5 - Gujarat,", "M 5.3 - Sikkim". "M 5.1 - Uttaranchal, India" "M 4.9 - Maharashtra, India" "M 7.3 - Myanmar"."M 7.3 - Myanmar" "M 5.9 - India-Bangladesh border region". United States Geological Survey.

