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Review Paper on Study on Conventional Slab & Flat Slab System using Overhanging Column

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INRODUCTION

The economic growth and rapid urbanization in hilly region has accelerated the real estate development and resulted in increase in population density in the hilly region enormously. Therefore, there is popular and pressing demand for the construction of multi-storey The main objective of the analysis is to study the behaviour against different forces acting on components of a multistoried building. The analysis is carried out using STAAD Pro software. the conventional slab & flat slab structure modeled with and without over hanging column are analyzed for the different combinations of static loading seismic zone III .The comparison is made between the conventional slab & flat slab structure of G+8 stories with & without over hanging column.

Literature Survey

General

1. **Surmi R.S, GreeshmaS. And Jaya K.P [2015]:** reviewed developments in structural wall –floor slab connections for high rise building. They investigated the effect of extending the slab reinforcement as cross inclined bars at the joint on the behaviour of exterior shear wall – floor slab joint. The analysis included modeling of exterior shear wall- slab joint with conventional and non-conventional reinforcement detailing. Specimens with cross inclined bars at the joint exhibited higher ultimate strength. Type specimens with cross inclined bars at the joint exhibited an increase in average ductility of 58%and 39% during positive and negative loading respectively than that in specimens with conventional detailing. The energy dissipated for specimens with cross inclined bars at the joint was 49% higher than the energy dissipation capacity of conventionally detailed specimens. It was found that the exterior shear wall –slab joint with 45° cross slab bars can be effective in moderate to high seismic risk region.
2. **Chandurkar and Pajgade (2015)** conducted a study on seismic analysis of RCC building with and without shear wall using software ETAB v 9.5.0. They compared parameters like lateral displacement, story drift and cost required for economy and effectiveness of shear wall. 10 story building model with 3m height for each story was studied on the software. The buildings were assumed to be fixed at the base. Four models were prepared and the models were, Model 1 was bare framed structure, Model 2 was dual system with shear wall one on each side, Model 3 was with shear wall on corner with L=4.5m and Model 4 was with shear wall on corner with L=2m. The analysis was done for zone II, III, IV and V. The results obtained were: displacement of all models for zone II, III, IV was reduced upto 40% as compared to zone V. Story drift was maximum for Model 1 whereas it was minimum for Model 3. The corner shear wall in 2m was economical among all models. Quantity of concrete was more for model 3. After analysis it was concluded that shear wall was effective for buildings with 10+ storey and it was not effective for buildings below 10 stories. Also shear wall was proved to be effective and economical at adequate locations only.
3. **R. P. Apostolska, G. S. Necevska-Cvetanovska, J. P.Cvetanovska and N. Mircic [2016]:** presented the flat slab system with certain modifications (design of beam in the perimeter of RC walls) can achieve rational factor of behaviour considering EC8 and can be considered as a system with acceptable seismic risk. Modifications with additional elements improved strength and stiffness and seismic behaviour of flat-slab construction system.
4. **Amit A. Sathwane 2016** studied that the among flat slab , flat slab with drop and grid slab which is economical for the nexus point opposite to vidhan bhavan and beside NMC office. The analysis of flat slab, flat slab without drop and grid slab done both manually by IS 456-2000 and by STAAD PRO V8i. It is found in the study that flat slab with drop is economical then rest of other considered slab for the nexus point. It is also revealed in the study that concrete required for grid slab is more than the flat slab with and without drop and steel required for the flat slab without drop is more than the flat slab with drop and grid slab.
5. **Navjot Kaur Bhatia (June 2016)** studied that dynamic performance of flat slab and grid slab in compare to conventional slab. In the study of the project the writer perform the dynamic analysis for seismic and wind

forces of multistory reinforced concrete building with different plan like square, hexagonal, orthogonal for flat slab , grid slab and conventional slab. The above analysis done for different story like 10, 20 and 30 and also for the different earthquake zone as per the Indian standard code of practice is 1893 – 2002. They made the relation between earthquake responses and intensities. It is revealed from the study that the performance and structural behavior of flat slab & grid slab is superior in compare to conventional slab. It is show in term of deflection and cost of material.

6. **D. Ramya (October 2017)** analyzed the multi-story (G+10) building by both STAAD PRO V8i and ETABS software. In the study comparison between these two software is done to find out which give economy of multi storied (G+10) building. It is show that in the study STAAD PRO is much simple to work with as compare to ETABS software. It is also show that quantity of steel given by the ETABS is 9.25% less than by STAAD Pro when analyzed G+10 multistory building. The quantity of concrete show by both the software's is found same for multistory building. In the study it is revealed that the most economical section given by ETABS.
7. **K.N.Mate (June 2018)** analyzed the flat slab .Flat slab system is simple structure of RCC which provide long clear space, a good height, simple formwork and no delay time in construction. It is shown that why the flat slab is more feasible and flexible in comparison to other slab. This study includes complete analysis and design of flat slab as per Indian code of practices IS456:2000. Flat slab is more flexible and economical as compare to conventional slab. This paper guide us how to select drop, panel width, thickness of slab and detailing of reinforcement.
8. **Sudhir Singh Bhaduria 2019** Structural Engineering is a branch of Civil Engineering where the study is done to know how the structure behave when building is constructed at real environment and to identify the various forces like axial force and shear force, bending moment and displacement etc. acting on the structure. When the analysis come to complex structure or multi-story structure the manual calculation will be difficult to perform and hence there is various software available to perform these calculations, this software are STAAD Pro V8i, ANSYS, ETAB, SAP-2000 etc.

OBJECTIVES

- Comparative study on conventional slab & flat slab system using overhanging column for seismic zone-3 using staad pro software.

CONCLUSION

- In other remaining two building the flat slab is provided and those of one building all the columns are supported directly to the ground and in other second building some columns are supported in shear wall in first floor not to the ground. These columns are termed as overhanging columns.

REFERENCES

[1] Agarwal. P. and Shirkhande. M, "Earthquake resistant Design of Structures" Printice- Hall of India Private Ltd. New Delhi, India.

[2] Apostolska1 R.P and Necevska-Cvetanovska G. S, "Seismic performance of flat-slab building structural systems" The 14th World Conference on Earthquake Engineering October 12-17, 2008, Beijing, China.

[3] B.C. Punmia, Ashok Kumar Jain, Arun Kumar Jain (2003), "Soil Mechanics and Foundations", Published by Laxmi Publications (P) Ltd.

[4] Bhavikatti S.S, "Advance R.C.C. Design" , New Age International (p) Limited, Publishers, New Delhi, India.

[5] Bryan Stafford Smith Alex coull., "Tall Building Structures analysis and design", published by John Wiley and sons, New York, 2000.

[6] Dhiman Basu and Sudhir K. Jam (2004), "Seismic Analysis of Asymmetric Buildings with Flexible Floor Diaphragms", Journal of Structural Engineering, Vol. 130, No. 8, pp. (1169-1176).

[7] Ema COELHO, Paulo CANDEIAS, Raul ZAHARIA and Artur V. PINTO, "Assessment of the seismic behaviour of R C flat slab building structures", 13th World Conference on Earthquake Engineering Vancouver, B.C., Canada August 1-6, 2004 Paper No. 2630

[8] ETAB 2009, "Technical Structural Software and Reference Manual".

[9] Fuji, K., Nakano, Y. and Sanada, Y. (2004), "Simplified Nonlinear Analysis Procedure for Asymmetric Buildings", Proc. of the 13th World Conference on Earthquake Engineering, Vancouver, Canada, Paper No. 149

[10] G. Birajdar & S. S. Nalawade (2004), "Seismic Analysis of Buildings Resting on Sloping Ground" 13th World Conference on Earthquake Engineering, Vancouver, B.C., Canada, Paper No. 1472.

[11] *I.S. CODES*

[12] IS 1893(Part 1):2002 - Criteria for Earthquake Resistant Design of Structures, BIS, New Delhi

[13] IS 1893-2002 "Indian standard criteria for earthquake resistant design of structures", published by Bureau of Indian Standards NEW Delhi,.

[14] IS 4326:1993 - Earthquake Resistant Design and Construction of Buildings - Code of Practice, BIS, New Delhi

[15] IS 456:2000 - Plain and reinforced concrete – Code of Practice, BIS, New Delhi.

[16] IS: 456-2002, "Code of practice for plain and reinforced concrete", published by Bureau of Indian standards, New Delhi,

[17] IS: 875(Part 1-3)-1987, "Code of practice for design loads(other than earthquake) for buildings and structures", published by Bureau of Indian standards, New Delhi,

[18] IS: 875(Part 1-3)-1987, "Code of practice for design loads", published by Bureau of Indian standards, New Delhi,

[19] K. Navyashree and Sahana T. S., "Use of Flat Slabs In Multi-Storey Commercial Building Situated In High Seismic Zone", International Journal of Research in Engineering and Technology, Vol.03 Issue 08, 2014,pp. 439-451.

[20] Lan N. Robertson, "Analysis flat slab structures subjected to combined lateral and gravity load", ACI Structural Journal.

[21] N. Krishnaraju "Structural Design and Drawing: Reinforced Concrete and Steel", published by Universities Press (India) Private Limited Hydrabad, 3rd edition,

[22] Pankaj Agarwal and Manish Shrikande (2007), "Earthquake Resistant Design of Structures", Prentice Hall of India Private Limited, New Delhi, India.

[23] S. S. Patil, Rupali A. Sigi "Flat Slab Construction in India", International Journal of Engineering and Innovation Technology (ISSN: 2277-3754), Vol. 3, (10), April 2014, pp. 138-141.

[24] Shyh-jiann Hwang and Jack p. moehle, "Models for laterally loaded slab-column frames", ACI Structural Journal, March- April 2000.

[25] V. L. Shah and S. R. Karve "Illustrated Design of Reinforced Concrete Buildings", published by Structure Publications Pune, India.

[26] Y. H. Luo and A. Durrani "Equivalent Beam Model for Flat-Slab Buildings: Exterior Connections," American Concrete Institute (Structural Journal), vol. 92(2), January 1995, pp. 250-257.