International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395-0056
Volume: 06 Issue: 07 | July 2019 www.irjet.net p-ISSN: 2395-0072

A Review on Comparative Studies on Seismic Analysis of Multi-story Building using IS 1893:2002 and IS 1893:2016

Hari Shankar[1], Shubhranshu Jaiswal[2]

[1]PG Student, Department of Civil Engineering, Babu Banarsi Das University, U.P., INDIA
[2]Assistant Professor, Department of Civil Engineering, Babu Banarsi Das University, U.P., INDIA

Abstract – *Numerous progressions and improvement in the Earthquake safe plan of structure is done in past late years. It brings about the adjustments in the Indian seismic code IS 1893 which is overhauled and drafted in year 2016, after a period slipped by of almost 14 years. In this paper we speaks to the seismic burden evaluation for multistory structure according to May be: 1893-2002 and IS: 1893-2016 suggestions. Considering and breaking down the G+14 story RC confined multi-storey structure. It is presumed that such investigation is done on individual RC encircled structure which is planned utilizing before code. To anticipate the seismic helplessness of structure and to check because of amendments and changes in the IS codal arrangements the structure is protected or perilous. It is presumed that such investigation is done on individual RC confined structure which is planned utilizing before code. To anticipate the seismic defenselessness of structure and to check because of amendments and changes in the IS codal arrangements the structure is protected or dangerous.*

Key Words: IS 1892:2000, IS 1893:2016, RC multi-story structure, ETABS, Seismic Analysis, Revised clauses

1. INTRODUCTION

Seismic code help creator to develop and improve the conduct of structure. So it can withstand during Earthquake impact and decrease loses. Seismic code are interesting for specific nation and district**.** The seismic codes are set up with thought of seismology of nation, acknowledged degree of seismic hazard, properties of development materials, development strategies, and structure typologies and so on. Moreover, the arrangements given in seismic codes depend on the perceptions, tests and scientific contextual analyses made during past seismic tremors specifically area. In India, IS 1893 (Part1) Criteria for Earthquake Resistant Design of Structures is utilized as code of training for examination and planning of quake safe structures. In the most recent decade, the nitty gritty and propelled investigate, harm study was completed by the Earthquake Engineering Sectional Committee of Bureau of Indian Standards. At the point when quakes happen, a structure experiences dynamic movement. This is on the grounds that the structure is exposed to idleness powers that demonstration inverse way to the speeding up of seismic tremor excitations. These latency powers, called seismic burdens, are generally managed by accepting powers outside to the structure. Along these lines, aside from gravity stacks, the structure will encounter overwhelming parallel powers of impressive size during seismic tremor shaking. It is basic to evaluate and indicate these sidelong powers on the structure so as to plan the structure to oppose a tremor. Indian seismic code IS: 1893 has likewise been overhauled in year 2016. This paper displays the seismic burden estimation of multi storied structures according to May be: 1893(part) – 2016.

The objective of this paper is to ascertain the seismic forces following up on the structure according to May be: 1893-2002 and IS: 1893-2016. And furthermore correlation of seismic forces is finished utilizing the two codes.

2. LITERATURE REVIEW

Mayur R. Rethaliya [1] presented a comparative study of seismic loads on four multi-storey RC framed buildings (3 storey, 5 storey, 7 storey & 9 storey) as per IS 1893- 1984 & IS 1893- 2002 codal recommendations. In this paper seismic coefficient, response spectrum & modal analysis methods were adopted to compute the seismic forces on these buildings. The conclusion includes comparison of lateral load & base shear for each building calculated as per both mentioned IS codes.

Anoj Surwase [2] Considerable improvement in earthquake resistant design has been observed in recent past. As a result, Indian seismic code IS: 1893 has also been revised in year 2016, after a gap of 14 years. This paper presents the seismic load estimation for multistorey buildings as per IS: 1893-2002 and IS: 1893-2016 recommendations. The method of analysis and design of multi-storey (G+4) residential building located in zone III, IV. The scope behind presenting this project is to learn relevant Indian standard codes are used for design of various building element such as beam, column, slab, foundation and stair case using a software E-tab under the seismic load and wind load acting the structure. We have to find out the values in project base shear, time period, maximum story displacement.

Prof. M. S. Kakamare [3] This paper worried about examination on amendment of IS 1893-2016.The static investigation of multi-storied structure is finished by utilizing FEM based programming. In present examination,

the static investigation is completed according to IS 1893-2016 and results, for example, horizontal dislodging, base shear, story float are contrasted and IS1893-2002. This paper manages the correlation of configuration powers for multi-storied structures, acquired by utilizing IS 1893-2016 code, with those gotten by the past IS1893-2002 form. From the consequences of seismic investigation of structures it is inferred that the IS1893-2016 is progressively traditionalist for quake examination of multi-story structures.

Prof Ravikant Singh and Vinay Kumar Singh [4] Many changes and improvement in the Earthquake resistant design of structure is done in past recent years. It results in the changes in the Indian seismic code IS 1893 which is revised and drafted in year 2016, after a time elapsed of nearly 14 years It is concluded that such study is done on individual RC framed building structure which is designed using earlier code. To predict the seismic vulnerability of building structure and to check due to revisions and changes in the IS codal provisions the structure is safe or unsafe.

Urunkar S. S. , Bogar V. M. , Hadkar P. S [5] The clauses provided in seismic code guide the designers to improve the behaviour of structures during an earthquake & withstand against it without significant loss of life & property. For India, Indian Standard Criteria for Earthquake Resistant Design of Structures (IS 1893 Part 1) provides the required clauses to structural designers for designing earthquake resistant buildings. As a result of continuous research, gained knowledge & experiences, the IS 1893 Part 1 has been revised whenever required. The comparative study of codal provisions is required to be made whenever the code is revised. This paper contains the comparative study of an IS 1893 (Part 1):2002 & IS 1893 (Part 1):2016. The paper mainly focuses on the revised codal provisions in IS 1893 (Part 1):2016

Ajay Kumar [6] M. Tech. Structural Engineering, Chandigarh University, Mohali-140413, Punjab, India In present study, different storied building has been modeled using staad.pro software and analyzed with gravity and seismic loads to compare the results of seismic analysis as per IS:1893-2002 and IS:1893-2016.The design has been done for 4 storey, 8 storey & 11 storey buildings. The maximum height of the aforementioned buildings is 39.6m, therefore, according to previous seismic code (IS:1893-2002) static seismic analysis was performed and as per new seismic code (IS:1893-2016) dynamic seismic analysis was performed.

3. CONCLUSIONS

[1] The seismic design approach, in both the versions, is based on designing a strong and ductile structure. Unlike previous version of 2002, the latest 2016 version clearly reflects that design seismic force is much higher than what can be expected during strong shaking

[2] According IS coade 1893-2002 if Stiffness of masonry infill is not considered in analysis because it will increase the sizes of lateral load resisting elements like-columns/shear walls

[4] As per IS 1893-2002 full section, i.e. full M.I. of columns and beams is considered. In code IS 1893-2016, cracked section with 70% MI of columns and 35 % MI of beams is considered

[5] According to new IS 1893-2016 Equivalent static investigation will be appropriate for customary structures with tallness < 15m in seismic Zone II. For example Dynamic examination is necessary for practically all structures in all zones.

[6] According IS coade 1893-2002 the design force obtain at base x and y direction decresei and as per new coad IS 1893:2000 increase along x,y direction.

[7] As per IS 1893-2002 story drift found decrease and according to is 1893-2016 found increase.

REFERENCES

[1] IS:1893-2016, Criteria for Earthquake Resistant Design of Structures, Bureau of Indian Standards, New Delhi, India.

[2] IS:1893-2000, Criteria for Earthquake Resistant Design of Structures, Bureau of Indian Standards, New Delhi, India.

[3] Mayur R. Rethaliya A Comparative Study of Various Clauses of New IS 1893 (Part 1):2016 and Old IS 1893 (Part 1):2002.

[4] M. S. Kakamare Static analysis of multistoried building as per IS 1893-2002 AND IS 1893-2016.

[5] Ravikant Singh and Vinay Kumar Singh Analysis of Seismic Loads acting on multistory Building as per IS: 1893-2002 and IS: 1893-2016:- A comparative Study

[6] Nagaratna. S.A, Ranjita. N.H, Asif. R.S, Vijaykumar. K.J, Sudha. P.H, Prof. D.S. Maganur6 Analysis and design of multistory building (G+3) by using ETABS softwear.

[7] Rakeshkumar Gupta, Prof. D.L.Budhlani Review of IS 1893:2016 with IS1893:2002 for high rise structure with irregularities.

[8] K. KIRAN MAI Analysis And Design of Residential Building C+G+7 using E-Tabs

[9] Narayan Malviya, Sumit Pahwa Seismic Analysis of High Rise Building with is Code 1893: A ReviewComparative.

[10] Shubham Kasat, Prof. Vinesh S. Thorat Study of Multi Storey Building under Action of Shear Wall Using ETAB Software.

[11] Ajay Kumar A comprative study of static analysis(as per code IS: 1893-2002) & dynamic analysis as per IS:1893-2016) of a building for zone V.