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Performance Behavior of RCC Structure Under Cycling Pushover Load

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Abstract
In this paper, an innovative Performance point , Performance point for CPA, Displacement and Base shear performance point- Time Period at Performance Point- adaptive pushover procedure, whereby a set of laterally applied displacements, rather than forces, is monotonically applied to the structure, is presented. The integrity of the analysis algorithmic rule is verified through an intensive comparative study involving static and dynamic nonlinear analysis of twelve ferroconcrete buildings subjected to four various acceleration records. it's shown that the new approach manages to produce a lot of improved response predictions, throughout the complete deformation vary, compared to those obtained by force-based strategies. additionally, the projected algorithmic rule tested to be numerically stable, even within the extremely dead region, whereas the extra modeling and machine effort, with regard to typical pushover procedures, is negligible. This novel adaptive pushover methodology is thus shown to represent associate degree appealing displacement-based tool for structural assessment, absolutely in line with the recently introduced deformation- and performance minded trends within the field of earthquake engineering.

Keywords: *Cyclic pushover, Performance point, IS 1893-2016,FEMA356, FEMA440, ATC40,ATC 24*

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I. INTRODUCTION

Performance Behavior Of RCC Structure underneath athletics Pushover Load primarily based unstable style unstable hazard within the context of engineering style is usually outlined because the expected level of ground acceleration which might be exceeded with 100 percent chance at the positioning into account because of the incidence of associate degree earthquake anyplace within the region, within the next fifty years. the very fact that earthquake input has been sculptural as forces instead of displacements will solely be explained, by historical reasons, associated with the. development of latest engineering ways in countries of low unstable hazard, like European country and European nation, wherever the foremost vital actions area unit vertical pavity hundreds. Had trendy engineering created its initial step in earthquake-prone regions like New Seeland, American state or Southern Europe, today's code provisions would most likely be supported deformations. Such belief is insured by this drive for development and code implementation of displacement- or, additional usually, deformation-based style and assessment ways, triggered by the work of variety of researchers within the past , it might thus appear that applying displacement loading. However, standard (non-adaptive) displacement-based pushover analysis suffers £ram vital inherent shortcomings that stop its use as a reliable structured analysis tool. so as to verify the integrity of the planned analysis rule, a series of DAP and standard pushover analyses is distributed and compared with the predictions of dead dynamic analysis, using an oversized set of structural models and ground motions of various characteristics. it's shown that, all told applications, the new approach yields response predictions that area unit superior, or at worse equivalent, to those obtained by its force based counterparts.

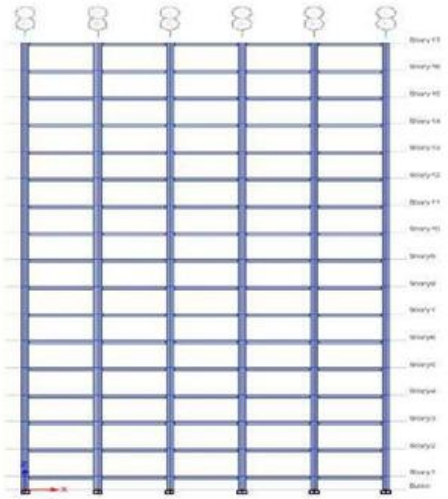
II. OBJECTIVES OF THE PRESENT WORKFORMATTING OVERVIEW

1. To carry out cyclic pushover analysis RCC building as per IS 1893:2016
2. To compare the performance of per cyclic pushover analysis.
3. To show how RCC structure is feasible as compare to at its seismic response by FEMA356, FEMA440, ATC40 and ATC 24.
4. To investigate the performance point of multi-story RC frame structure when subjected to identical seismic condition.

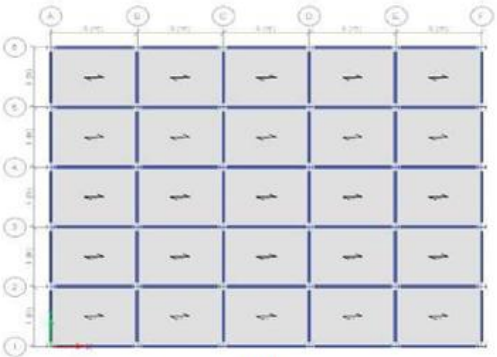
SYSTEM DEVELOPMENT &
DETAILS OF MODELS

Building Details-

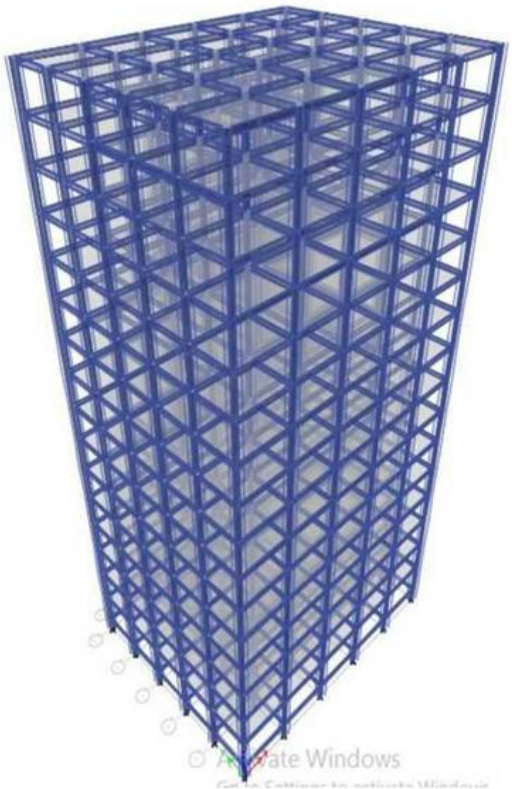
Items	**RCC Framed**
NO OF STORY	G+15
TOTAL STORY HEIGHT	48 m
BEAM SIZE	230 x 300 mm
COLUMN SIZE	500 X 600mm
SLAB	130 mm



General Plan View



General Plan



General Elevation View

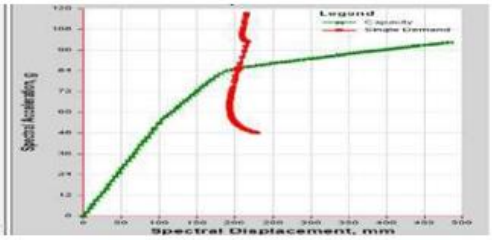
Specification

PARTICULARS	**RCC Frame**
Building Height	48 m
Height of each story	3m
Plan of the building	25m x 20m
Thickness of walls	230mm
Live load	3.0 kN/m^2
Grade of Concrete	M-25
Rebar	HYSD 500

Density of RC Concrete	25 kN/m^3
Density of brick masonry	20 kN/m^3
Zone	V
Soil type	Type II medium soil
Importance factor	1.0
Response reduction	**5.0**
Seismic zone factor	0.36 For zone V

III. RESULTS AND ANALYSIS

Performance point-structure was analyzed and the results were drawn on the basis of performance point which represents the relationship between spectral displacement and spectral acceleration.



Performance point for CPA-

Pushover curve of G+15 RCC

Displacement and Base shear performance point-

The results of displacement and base shear for structure is as shown in table The number of storey, base shear and displacement for RCC frame structure was presented in table below

No. of storey	**RCC G+15**	
	Displacement in	Base shear mm in kN
(1)	(2)	(3)
G+15	258.9	8222.06

Time Period at Performance Point-

No. of Storey	RCC
	Time period in sec
(1)	(2)
G+15	2.439

IV. CONCLUSION

Alexander Kagermanova) and Robin Geeb,"Cyclic Pushover Method for Seismic Assessment Under Multiple Earthquakes" Erol Kalkan, Sashi K. Kunnath,"Assessment of current nonlinear static procedures for seismic evaluation of Environmental Engineering, University of California, Davis, CA 95616, United

Following conclusion are taken out from my research work.

buildings" Department of Civil and

1. Displacement is found as 258.9mm at performance point for RCC G+15 structure.
2. Base shear at performance point is found 8222.06KN.
3. As per pushover curve performance point is found at I O level for G+15 RCC Structure.
4. Natural time period found as 2.439 second.

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