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Performance Assesment Of Column By Using Retrofitting

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Abstract – The Few decades ago the buildings were constructed without any consideration of IS Codes and without considering future plan. But peoples wants to add more storeys without demolishing the existing structures for like residential, commercial purposes. The present work is based on the weakening columns by using retrofitting technique by using ETABS 2016 software. When the floors are added on the previous constructed building the strength of previous constructed buildings are become lesser, that's why to regain its strength back retrofitting method is used The parameters checked before and after retrofitting technique the structure are displacement, story drift.

Key Words: column, retrofitted column, RC Jacketing, ETABS2016

1. INTRODUCTION

Jacketing is the most popularly used method for restoring of building columns. Jacketing is the process by which a section of an existing structural member is restored to original dimensions or increased in size by encasement using suitable materials. Jacketing of columns consists of added concrete with longitudinal and transverse reinforcement around the existing columns. Because of excessive loading, errors in design or construction, seismic damage also structural cracks, corrosion due to penetration and honeycombing retrofitting is needed. Reinforced concrete jacketing can be employed as a repair or strengthening scheme. Damaged regions of the existing members should be repaired prior to their jacketing.

2. OBJECTIVES

- The main objective is to study the increase in strength of building by the application of concrete jacketing so as to either achieve the expected life of the structure.
- To determine percentage increase in strength by the application of reinforced concrete jacketing of column.

3. METHODOLOGY

An existing four storey RC framed residential building situated in zone II is taken for this study.An existing FOUR storey RC framed residential building situated in ZONE II is taken. When this building was analyzed (i.e FOUR storey), none of the columns failed. When one more storey was added, 1 columns failed, after adding one extra storey 9 columns are failed. The failed columns were retrofitted using concrete Jacketing.

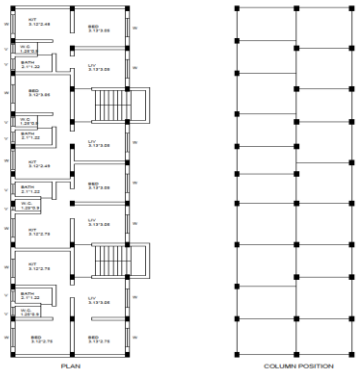

Fig -1: plan and column positions

3.1 DETAILS OF COLUMN

Size of column=250mm*400mm

Concrete=m25

Steel=HYSD415

The number of vertical bars=10bars

The diameter of stirrups=8mmdia@150mm c/c

3.2 DETAILS OF RETROFITTED COLUMN

Size of column=350mm*550mm

Concrete=m20

Steel=HYSD415

The number of vertical bars=10bars

The diameter of stirrups=8mm dia@150mm c/c

3. RESULT

Table -1: Max storey drift of g+6 x direction

		withoutretro	with retro
elevation	location	x dir	x dir2
18	Top	1.63E-05	2.42E-07
15	Top	3.57E-05	3.23E-07
12	Top	0.00036005	5.22E-07
9	Top	0.000554597	6.74E-07
6	Top	0.000663802	8.26E-07
3	Top	0.002329143	2.77E-06
0	Top	0	0

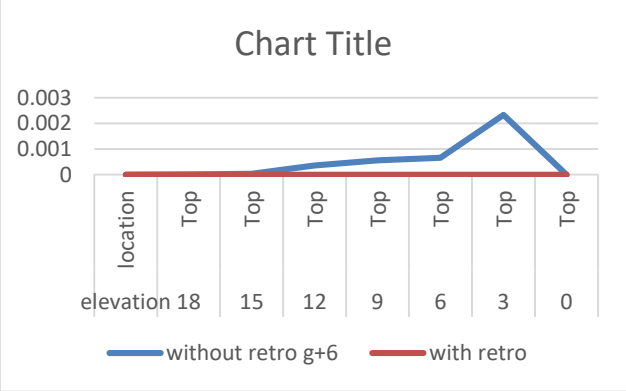

Fig -2: max storey drift x dir

Table -2: Max storey drift of g+6 y direction

		withoutretro	with retro
elevation	location	y dir	y dir3
18	Top	1.10E-06	1.64E-07
15	Top	8.59E-07	1.77E-07
12	Top	9.67E-07	2.98E-07
9	Top	1.42E-06	4.01E-07
6	Top	9.77E-07	5.16E-07
3	Top	3.40E-06	1.55E-06
0	Top	0	0

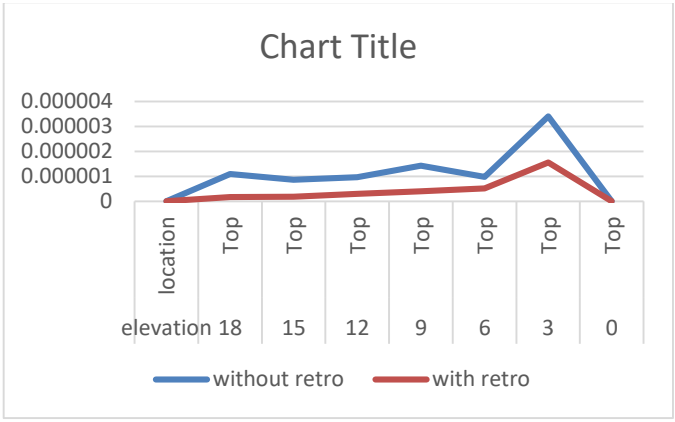

Fig -3: max storey drift y dir

4. CONCLUSIONS

1. The study was to investigate the response of an existing building. It showed that the building was in danger after adding two stories and after that RC jacketing was provided. It was analyzed in ETABS 2016.
2. Storey drift is decrease as height increase as retrofitting is done.
3. Percentage of reinforcement/column sizes increase after retrofitting is done for existing structure
4. From completing the project it was concluded that retrofitting provides existing structures long life and it makes safe for live purposes.

5. FUTURE SCOPE

Future scope of work from present study can be as follow

1. In the current work of study, analysis performed out for six storey buildings. This research work study can further be performed for high rise buildings
2. Storey levels can also be be studied.
3. Different properties can be altered.

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