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ASSESSMENT OF STRUCTURAL PERFORMANCE BY USING DIFFERENT BEAM SIZE THROUGH PBSD METHOD

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INTRODUCTION

In recent decades Performance Based Seismic Design (PBSD) is widely used for evaluation of structural performance because of its capability and simplicity to estimate inelastic response of structure. On the other hand some times in construction, based on architectural decision, size of beams are being decreased. The aim of this attempt is to study the effect of beam size on structural behavior based on PBSD method. Capacity Spectrum Method (CSM) was conducted by modeling set of RC frames (2, 4, 6, 8 and 10 story with three bays) using ETABS2000 to determine the weakness of the frames system due to their reduced beam size. The performance of the frames was measured at Life Safety damage control level.

MAIN RESULTS



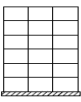
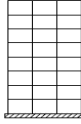
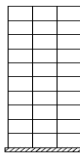




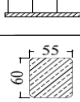




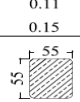




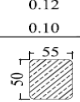
	2 Story	4 Story	6 Story	8 Story	10 Story
					
Beam Size (1)					
Δ_{TARGET}	0.05	0.09	0.11	0.128	0.11
Δ_{LS}	0.05	0.10	0.12	0.136	0.15
Beam Size (2)					
Δ_{TARGET}	0.05	0.09	0.13	0.144	0.12
Δ_{LS}	0.05	0.09	0.12	0.130	0.10
Beam Size (3)					
Δ_{TARGET}	0.06	0.11	0.15	0.170	0.13
Δ_{LS}	0.06	0.11	0.13	0.120	0.11

Figure 1. Graphical summary of the results .

Figures 1 illustrates a comparison of two sort of plastic displacements (Target and Life Safety) that points out their dependence on amount of beam section size. As the Figure shows in second and third step the amount of Target Displacement is not less than Performance Point Displacement. Therefore, it can be said that reducing beam section size causes inappropriate structural performance regarding to Life Safety damage control level. However the ductility of the structure has been increased.

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