

OPTIMIZATION OF COST AND STRUCTURAL RESPONSE OF DUAL FRAME SYSTEMS BY USING REDUCED DEPTH-OUT-RIGGERS

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ABSTRACT

This paper presents the analytical results for dual frame system using the reduced depth outrigger technology. A 30 storey square plan symmetrical building is considered in this research for analysis and design and different models were made to optimize the structural stability with respect to inter storey drift. Full depth outriggers are compared with different reduced depth outriggers and their cost comparison are also made. The reduced depth out-riggers ranging from 3 ft to 8 ft are employed in this research and optimization is made with respect to variation in concrete strength which varies from 3 ksi to 7 ksi. The concrete strength is varied in both the frame members of columns and beams. The effect of increasing concrete strength in shear walls are also observed. UBC-97 design manual is incorporated in the study to determine the seismic performance of the structure. Although the building is purely design for moderate seismic zones (typically zone 2B) but for the sake of future recommendation all the seismic zones were analyzed. The results are concluded for moderate seismic zones and some suggestions are made on over all response of the building analysis with an optimized design parameters.

Keywords: Reduced Depth Outriggers, Optimization & structural stability.