PROPORTIONAL LOCATION OF BRACES TO REDUCE TORSION EFFECT AND WEIGHT OF STRUCTURES

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ABSTRACT

According to the fundamental role of lateral resistance elements in tall structures, to cope with the earthquake forces and sort the elements constrains, present research as for the asymmetric posture braces is performed in the steel structures. In this study, after reviewing the effect of eccentricity of center of stiffness towards the center of mass and torsion caused by it in a building that has been implemented in the past. Also by changing the arrangement of braces, the amount of steel consumption is an important economic indicator in each of the Items is analysed. Then the displacement parameter is the criterion used for the detection of structural damage was evaluated. Finally, the base shear changes, is examined according to eccentricity.

Due to the size and geometry of the ground reality is such that Makes have an irregular structure in plan that placed under torsion. In this study, we examine a building that has been implemented in the past, and we show that near the center of mass and stiffness, and reduce the eccentricity of the appropriate layout braces, how much base shear and structure weight (steel consumption) is reduced. And also we start type of analysis to the sensitivity of the irregular structure under torsion.

In this study, two types of analysis included quasi-static and dynamic spectral analysis is studied.

INTRODUCTION

One of the important issues today in the analysis and evaluation of the structural behaviour plays an important role, is one of the biggest causes of failure of buildings, in past earthquakes, the irregularities in the structures. Looking at the statistics for 1985 earthquake devastation in Mexico the importance of this issue can be stated. 42% of the buildings in the earthquake due to torsional effects caused by asymmetric structures were destroyed or damaged generally. That 15% of the failures were due to the asymmetry of the difficulty. Most irregular due to the architectural and aesthetic issues and technical issues sometimes applied to structures

It is well-known that the lateral drift of a frame, accordingly the total structural weight, can be drastically reduced by placing braces, provided that the stiffness and strength of the beams, columns and braces are appropriately distributed. Takewaki et al. (1990) optimized a frame with K-braces at the specified locations. Kameshki and Saka (2001) optimized frames with different kinds of braces, and compared the