عنوان مقاله:

DAMAGE CONTROLLED-PERFORMANCE-BASED -OPTIMUM DESIGN OF STEEL MOMENT FRAMES,
CONSIDERING LIFE-CYCLE COST

محل انتشار:

هشتمین کنفرانس بین المللی زلزله شناسی و مهندسی زلزله (سال: 1398)

تعداد صفحات اصل مقاله: 2

نویسندگان:

Hashem DADASHI - *Ph.D. Student, IIEES, Tehran, Iran*

Majid MOHAMMADI - *Associate Professor, IIEES, Tehran, Iran*

خلاصه مقاله:

Major earthquakes of recent decades indicate the devastating power of earthquakes to destruct structures and cause severe economic losses. They display the need to enhance structural performance by introducing a new design methods e.g. performance-based design. This design method expresses the expected performance of a structure for a considered hazard level. According to FEMA302, structures are categorized in three design groups. These groups determine the expected performance for a given hazard level based on the type of usage of a building and the extent of its importance. The supposed hazard levels are earthquakes with %2 probability of occurrence in 50 years (MCE) and (2/3 of MCE) and %50 in 50 years. Each building is categorized based on its type and level of occupancy. Most commercial, residential and industrial buildings are in the Seismic Use Group-I, Buildings with high occupancy or hazardous materials are in the Seismic Use Group-II and finally buildings that need to maintain their operation after earthquakes belong to Seismic UseGroup-III. The performance of the buildings in these group are different; for example residential, commercial and industrial buildings which are in Group-I, should satisfy IO and CP performance levels for earthquakes with %50 and %2 probability of occurrence in 50 years, respectively. In regular design procedure of structures, determination of dimensions of structural elements consists of a repetitive procedure of structural analysis with continual changes in dimensions of structural elements. Especially the trial and error cycle in nonlinear analysis leads to a large volume of calculations thus the design of structures would be practically a hard and tough process. To resolve this problem, a reliable and efficient automatic method for the analysis and design of a structure would be useful. Therefore one can assign optimization methods for designing in order to reduce the design process; in other words, one can consider the optimization as a minimization or maximization process of the objectivefunction incorporating the constraints of the problem. There are different optimization methods and in this paper, the improved PSO method, named as Rupso, will be used.Up to now, the optimization process focused on minimizing the structural cost. However, it is clear that non-structural elements of a building should also be considered. They are mostly more valuable than the building structure and they are divided into two groups of drift- ... sensitive and acceleration sensitive (HAZUS-AEBM). In other words, total damage cost of a b

کلمات کلیدی:

Performance-based seismic design of structures, Optimization, Structural and non-structural element,Life-cycle cost

لینک ثابت مقاله در پایگاه سیویلیکا: