

# INVESTIGATING THE ADEQUACY OF IRANIAN SEISMIC FOR DESIGN OF STEEL STRUCTURES NEAR- FAULT AREA CASE STUDY: AHAR AND VARZEGHAN CITIES OF EAST AZARBAIJAN

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## ABSTRACT

The recent studies have shown that there are differences between near-fault and far-fault earthquakes. Considering that, the seismic design code of Iran has not provided specific rules and regulations for designing structures in near-fault area and with regard to the geological studies and the distribution of faults throughout Iran, in a way that many faults are given the name of their cities surrounded them including, Ahar fault, Tabriz fault and ..., it seems necessary to consider the design of structures in near-fault areas. In this research, by study in the seismic regions and major earthquakes that have occurred in the given area, as well as, getting necessary information about the near-fault area and choosing the proper attenuation relation, it was attempted to calculate the Peak Ground Acceleration (PGA) using both deterministic and probabilistic methods. And then by calculating the base shear coefficient of three types a low-rise, mid-rise and high-rise structures with special and intermediate steel moment frame systems in the study, it was considered that according to standard No. 2800 and the rules of UBC97 regulation for near-fault areas on various types of soils and their comparison in all cases, the values of the base shear coefficient near-fault were greater than those obtained from standard No. 2800. This issue can indicate that the near-fault structures designed based on standard No. 2800 do not have enough resistance and need to be improved. In order to verify the above three structural types of low-rise, mid-rise and high-rise, they were designed once using the 2800 code, and again by coefficient near-fault. And then all three types of structures using design spectra of 2800 and the special spectra of the site in near-fault area were performed by pushover analysis and the results of both near-fault and far-fault were compared. The results of the study obtained from the area near the site of Ahar and Varzeghan shows that the current criterion of standard No.2800 cannot meet the seismic requirement of structures in the near-fault areas.

## INTRODUCTION

The structure design codes have been constantly changing and editing until now which have been changed as the time passed and experience gained. But gaining the experience should not lead to loss of the human life. Geological studies indicate that many Iranian cities are built near or on active faults. It is obvious that faults are one of the major factors that will cause an earthquake. Near-fault earthquakes have done great damage to structures. However, due to differences in characteristics of near-fault earthquakes with far-fault earthquakes and regarding that no criterion is issued for designing the structures in near-fault areas in Iranian seismic design code, it is clear that these rules and regulations should lead to reduce the damage to structures, the