



A New Approximate Method for Earthquake Behaviour of Worship Buildings

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Abstract

Turkey is in seismically active region, so many earthquakes occur in this country in the last decades. Ancient worship buildings are vulnerable to seismic activity, as many historical buildings. So, it is important to understand that building's behavior under seismic actions. In this paper, fifteen masonry worship building has been selected which are located and built in different region in Antalya. The main reason for the paper is to assess the seismic vulnerability of worship building by using a new approximate method. The method which is proposed in this paper aims at a simple and fast procedure based on a simplified geometric approach for immediate screening of masonry buildings at risk.

Keywords: Worship Buildings; Seismic Risk Assessment; Simplified Approximate Method.

1. Introduction

Historical structures have a very important role to carry cultural inherit of the country and they are one of the most valuable pieces of cultural accumulation [1]. There are many historical buildings, religious monuments and ruins of our ancestors [2]. Many historical buildings are quite vulnerable because they were built with low resistance materials. However, these buildings have insufficient connections between the various construction parts; masonry walls, floors, etc. [3]. These problems of historical masonry buildings lead to an overturning collapse of the perimeter walls under seismic horizontal acceleration. For this reason, seismic vulnerability assessments are very important and essential to care for historic masonry structures [4].

Turkey is located on one of the most active several tectonic plates that name is the Alpine–Himalayan earthquake belt. This plate is still active, and many earthquakes occur each month. The city center of Antalya, lying in the second seismic zone of Turkey. When the province is considered in general, the western part of Antalya located in the 1st and 2nd-degree seismic zone, the eastern part of located within the 3rd and 4th-degree seismic zone [5-6]. Antalya is the fifth biggest city in Turkey according to the population. The population of Antalya is approximately 1.2 million. Besides, Antalya is the first rank according to the population growth rate in Turkey. So it is very important to know seismicity of Antalya [7, 8]. Turkey Earthquake Regions Map and Seismic zones map of Antalya is shown in Figure 1.

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