



Implementing Resilience in Practice: Design for All in Anticipation of Earthquake Disaster

Jon Moseley

Consulting Civil and Structural Engineer, Patras, Greece

Stephanos Dritsos

University of Patras, Patras, Greece

Contact: dritsos@upatras.gr

Abstract

In the last twenty years, earthquakes and their tsunami sidekick have been responsible for more fatalities than all the other natural disasters put together. Furthermore, it has been shown that destructive earthquakes cause disproportionately many more fatalities among susceptible groups when compared to the rest of the population. This article asserts that, to achieve resilience, the built environment must be specifically designed with vulnerable groups in mind, following design for all concepts. To achieve the highest resilience, both high infrastructure performance and high peoples' behaviour are required. This paper contains practical solutions concerning how to implement and design for built infrastructure disaster resilience. It is concluded that resilient societies can be achieved by explicitly designing for and actively involving the most vulnerable groups in society and, in this way, the whole of society will benefit.

Keywords: Earthquake; disaster; resilience; vulnerability; design for all.

1 Introduction

The statistics are startling. The Centre for Research on the Epidemiology of Disasters has stated that in the last 20 years earthquakes and their tsunami sidekick have caused more fatalities than all the other natural hazards put together [1]. According to the Atlas of the Human Planet [2], from 1975 to 2015, the population in earthquake prone areas has increased by 93%. 2.7 billion people (roughly 37% of the world's population) are now living in seismic areas. The United Nations Office for Disaster Risk Reduction [3] estimates that 70% of the world's population will be living in urban areas by the year 2050 and the risk of

disaster from natural hazards is increasing exponentially with this population shift. In addition, it is the vulnerable groups such as people with disabilities, which by far suffer the most during and after destructive earthquakes [4], [5], [6]. It has been reported for the Whittier Narrows and Loma Prieta earthquakes [7], [8] that the majority of fatalities and injuries were due to how people behaved during or immediately after the earthquake and the fatalities and injuries were caused by people being hit by non-structural elements and building contents or by people falling down. Considering that there are many other vulnerable groups (non-registered people with disabilities, children, the elderly, the infirm,