

The Design of Safe Spaces in Healthcare Facilities Vulnerable to Tornado Impact in Central US

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Abstract : In the wake of recent disasters happening around the world such as earthquake in Italy (January, 2017); hurricanes in the United States (US) (September 2016 and September 2017); and compounding disasters in Haiti (September 2010 and September 2016); to our best knowledge, never has the world seen the need to work on preemptive rather than reactionary measures to salvage this situation than now. Tornadoes are natural hazards that mostly affect mid-western and central states in the US. Tornadoes, like all natural hazards such as hurricanes, earthquakes, floods and others, are very destructive and result in massive destruction to homes, cause billions of dollars in damage and claims many lives. Healthcare facilities in general are vulnerable to disasters, and therefore, the safety of patients, health workers and those who come in to seek shelter should be a priority. The focus of this study is to assess disaster management measures instituted by healthcare facilities. Thus, the sole aim of the study is to examine the vulnerabilities and the design of safe spaces in healthcare facilities in Central US. Objectives that guide the study are to primarily identify the impacts of tornadoes in hospitals and to assess the structural design or specifications of safe spaces. St. John's Regional Medical Center, now Mercy Hospital in Joplin, is used as a case study. Preliminary results show that the lateral base shear of the proposed design to be 684.24 ton (1508.49kip) for the safe space. Findings from this work will be used to make recommendations about the design of safe spaces for health care facilities in Central US.

Keywords : disaster management, safe spaces, structural design, tornado, vulnerability

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