Nattiya Lerdsivanon 2009: A Study of Seismic Response of Belled Shape Masonry Historical Monuments. Master of Engineering (Civil Engineering), Major Field: Civil Engineering, Department of Civil Engineering. Thesis Advisor: Associate Professor Benjapon Wethyavivorn, Ph.D. 112 pages.

This thesis proposed a finite element model of bell-shaped masonry pagodas, the most common type in Thailand. The research has investigated structural behavior under seismic loading including their dynamics properties, the natural frequencies and mode shapes. Behavior of pagodas with different height was analyzed.

It was found from the statics analysis that the vertical stresses were mostly compressive and were not exceeding the strength capacity under its own weight. However, in an event of the earthquake that characterised by 1940 El Centro, horizontal and vertical tensile stresses at the lower of the top portion would exceed its strength capacity for a pagoda model of more than sixty meters height. It was also found that in order to accurately account for their dynamic behavior, soil-structure interaction must be considered.

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