

Chanachat Apichatyakul 2006: Analysis and Verification of Masonry Historical Monument Model. Master of Engineering (Civil Engineering), Major Field: Civil Engineering, Department of Civil Engineering. Thesis Advisor: Associate Professor Benjapon Wethyavivorn, Ph.D. 99 pages.

This research is aimed to study behavior of the main masonry monument at Worachet Thepbamrung in Ayuttaya province constructed during King Egatosrot reign (1605 – 1610 A.D.) approximately 400 years ago. The structure was modeled via the finite element technique and improved by using the first natural frequency as an indication before reanalyzed for verification with the measured dynamic response.

It was concluded that

1. Most internal stress distribution by monument the own weight was all compressive and small, the critical compressive stress was at the entrance area at 34 percents of masonry compressive strength. Moreover, the monument weight induce tensile stress up to 25 percents of its nominal strength at the lower entrance area which could be damaging. A lower level of tensile stress was also found in all surface area could also be critical.

2. It was necessary to include the subsoil into the model to reduce the deviation of measurement in natural frequency from 35 to 5 percents.

3. Increased stress distribution from dynamic force could increase the change of damage of the structure.

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Thesis Advisor's signature

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