

Buncharee Kumma 2010: The Influence of Dam Components and Their Properties of Small and Medium Earth Dams in Thailand on Their Stability during Earthquake. Master of Engineering (Civil Engineering), Major Field: Civil Engineering, Department of Civil Engineering. Thesis Advisor: Assistant Professor Suttisak Soralump, Ph.D. 327 pages.

Nowadays earthquake hazard is an issue that everyone is interested in especially when relates with large engineering structure such as dams. However, for large dams the design and construction standard are always specially well taken care. Therefore this thesis purposely focused on the safety of medium and small dams where the engineering standard is lower. The research started by performing the risk prioritization. The result of the top three rank of the dams that vulnerable to earthquake hazard, out of 245 dams are Tha Thung Na dam, Mae Tha dam and Mae Mok dam. The database of 478 dams has been collected during the process. Then the 79 sections of as-built drawing of dams in Thailand then simplify to ten different cross-sectional types. The soil properties of 37 projects were used for statistical analysis and the result presented according to dam zone which are homogeneous, core and shell zone. The result was found that the permeability of dam materials have the largest variability follow by plasticity index, void ratio, specific gravity and unit weight. While the cohesion has the larger uncertainty than the friction angel. The  $G_{max}$  functions were analyzed by using the average value of the soil properties by the empirical equation. When compared  $V_s$  which converted from  $G_{max}$ , it was found that the  $V_s$  calculated from SPT values gave the lowest, follow by  $V_s$  obtain from this research and from SASW test. For the pseudo-static analysis, found that  $K_y$  of upstream slope is higher than the value at down stream slope. The results of dynamic response analysis has shown that the horizontal and vertical displacement of homogeneous are larger than zoned dam. Finally this thesis found that the most of homogeneous and zoned dam in Thailand will be able to withstand horizontal ground acceleration up to 0.50g with minimal damage.

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Thesis Advisor's signature