Wasan Pansang 2010: Durability and Strength of Cement-Treated Base Highway Materials in Thailand. Master of Engineering (Civil Engineering), Major Field: Civil Engineering, Department of Civil Engineering. Thesis Advisor: Mr. Barames Vardhanabhuti, Ph.D. 112 pages.

Cement treated base and subbase materials have been utilized increasingly for new highway construction projects as well as maintenance works in order to minimize a problem of decrease in good quality materials, and environmental concern from rock mining. However, in some cases, cracks are found on the highway pavement underneath with cement treated base and subbase after the highway was opened for few years. The damage could be due to low physical properties of the material, and poor quality control during construction, leading to shrinkage crack of base and subbase layers and reflecting to the pavement surface.

This research investigates influences of cement contents on compressive strength and durability of cement treated base and subbase materials. An Empirical relationship between compressive strength and durability properties is developed for crushed rock and soil aggregate. The crushed rock and soil aggregate samples were obtained from 6 locations representing borrowing materials from different parts of Thailand, including Kanchanaburi, Nakorn Ratchasrima, Utaradit, Pechburi, Prajenburi, and Pechabul provinces. The cement content used in the research ranges from 1 to 8 percents by weight. Series of laboratory testing programs consist of unconfined compressive test, wetting and drying test, slaking test, and wheel track test. A cement content determination chart is established for different traffic load designs in which unconfined compressive strength and percent of weight loss were govern.

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