THESIS TITLE : A STUDY ON THE USE OF SANDSTONE FOR CONCRETE AGGERGATES

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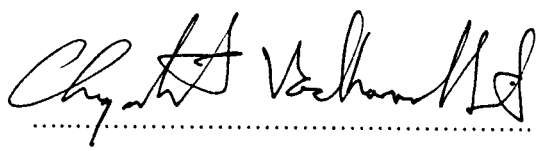

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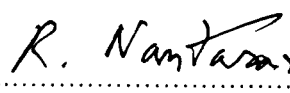

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ABSTRACT

At present, limestone has been widely used for concrete aggregates. The natural reserve of limestone has been greatly reduced, making its cost a lot higher than before. The objective of this thesis is to investigate if sandstone can be a substitute to limestone. A local stone mill named Nutakitruj co., Ltd. which is located at Huaike Chonnabot khonkaen was chosen as the site supplying crushed sandstone for this investigation.

The sandstone was divided in to two groups, a selected sandstone and a general sandstone. The group called a selected sandstone has a compressive strength of more than 700 ksc while the general sandstone group has the strength of less than 700 ksc (classified by the Schmidt hammer test). Furthermore geological properties and other essential properties of materials for concrete mix design were also studied. Concrete of the strength of 180, 210 and 280 ksc. were tested at the age of 28 days and 90 days.

Geological test result of sandstone revealed that the materials categorized into Khok kruat formation in Khorat Group category. The selected sandstone is classified as calcareneous arenite and the general sandstone is calcareneous-micaceous laminated graywacke sandstone or lithic sandstone.

The sandstone sample have low soundness with higher percent absorption and have an alkaline – aggregate – reaction potential. The workability of fresh concrete using sandstone as aggregates is lower than that of concrete using limestone. The modulus of elasticity, compressive, tensile and bond strength are 71 – 94 %, 60 – 96 %,67 – 86 % and 43 – 100 % respectively of those of concrete using limestone as aggregates.

It can be concluded that the sandstone is not suitable for concrete aggregates for the construction of concrete structures.

However, sandstone may be suitable for low strength concrete components such as walkway, concrete blocks and paving blocks etc.