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**IDENTIFICATION OF  
STANDARD LOCAL SAND FOR CEMENT TESTING**

PROJECT REPORT PRESENTED BY

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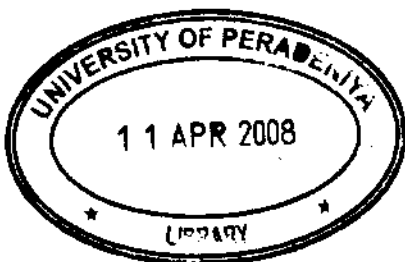
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## IDENTIFICATION OF STANDARD LOCAL SAND FOR CEMENT TESTING

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Standard sand is an important ingredient for cement testing. In all cement standards specified standard graded sand for strength testing. With the development of the technology various types of cement are being manufactured and mainly categorized based on the 28 day mortar strength. To define the standard sand for mortar strength testing, various standards are used worldwide. Such standards are American Society for Testing and Materials C 778, (ASTM C778), British Standards 4550, (BS 4550), European Norms 196-1 (EN 196-1), Bureau of Indian standards 650 (IS 650), International Standards Organizations 679 (ISO 679) etc. But most of the standards in addition to the requirements, sources are clearly defined such as Leighton-Buzzard for BS, Ottawa for ASTM, Ennore for Indian standard etc. However in the case of BSEN or ISO norms instead of the source of sand, development criteria is well defined as these standards are common for most of the countries. The aim of this project is identifying the local standard graded sand based on BSEN or ISO methods. This project consists of two parts, one is to ascertain the chemical requirements mainly the silica ( $\text{SiO}_2$ ) content and the other is to verify the particle size distribution and the consistency of the test results when compared with the standard graded sand. To verify the consistency statistical criteria is defined in BSEN196-1 or in ISO 679 standards:

For this sand project all fractions were collected from natural sand dunes, beaches and river sands available in North-western province. It was noted that fine fraction of the sand from Deduru-Oya were contaminated with black coloured particles which may be ilmanite and which affects the total silica content of the sand. It was also found that this sand was not complying with the compressive strength statistical criteria described in developing this standard graded sand.

However, the coarse fractions were suitable and used for the project. For the fine fractions, sands from dunes at Daluwa along Puttalam-Kalpitiya road and beach sand from Talawila also along Puttalam-Kalpitiya road were tried. The major problem encountered was the contamination of sand with black coloured particles which affects silica content of the sand. To overcome this, several purifying methods like washing and gravity separation (panning) were used and the results obtained were satisfactory. Finally Nathandiya sand dune was selected and performed a series of tests and found suitable. It was also found that mixing coarse fractions from Deduru Oya sand and fine fractions from Nathandiya were better than using the pure Nathandiya sand.

- Furthermore, it was observed that mixing coarse fraction of sand from Deduru Oya and fine fraction of sand from Nathandiya provided better standard sand for cement testing. This combination of sand was found to be even better than the pure Nathandiya sand.