

Thermal Conductivity of Trinidad 'Guanapo Sharp Sand'

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Abstract

The thermal conductivity variation of "sharp sand" with moisture and grain size was investigated using a thermal probe method. The probe used for testing was built in accordance with ASTM D 5334 and calibrated using heat-flow meter data. Calibration tests demonstrated repeatability $\pm 3.5\%$ for a 95% confidence of the $dT/d \ln t$ slope. Experiments were conducted on two sand specimens with grain size ranging from 150 μm to 300 μm (fine) and 301 μm to 600 μm (coarse). Test density was maintained at approximately 1400 kg/m^3 for each specimen and data were recorded for specimens with 0%, 2.5%, 5% and 7.5% wt.% water. The experimental results showed a well defined increase in λ with water content for both specimens. The fine sand has a more rapid increase in λ with water content than the coarse sand.