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Point Load Strength of Calcitic Marble from the Kuala Lumpur Limestone, Peninsular Malaysia

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ABSTRACT Diametral tests on fine grained calcitic marble cores from the Kuala Lumpur Limestone, with loading parallel, and perpendicular, to an inherent colour banding, yield point load indices [$Is_{(50)}$] of 3.14 MPa, and 3.93 MPa, respectively, whilst similar tests on medium grained cores yield indices of 3.41 MPa, and 4.44 MPa. Diametral tests on coarse grained marble cores, with loading parallel and perpendicular to the inherent banding yield indices [$Is_{(50)}$] of 3.57 MPa, and 5.03 MPa, respectively. These variations in point load strength are considered to result from differences in the preferential alignment and number of inter-granular borders; the coarse grained marble with relatively fewer borders showing the highest strength. It is concluded that the point load test allows for an effective strength classification of the calcitic marble, though the results need evaluation with reference to inherent textural features.

ABSTRAK Ujian-ujian diametris ke atas teras-teras marmar berkalsit yang berbutir halus dari Batu Kapur Kuala Lumpur memberi indeks beban titik [$Is_{(50)}$] bernilai 3.14 MPa, dan 3.93 MPa, apabila pembebanan dilakukan selari ataupun mencangcang kepada belangan warna yang sedia ada di dalam sampel-sampel. Ujian-ujian sama ke atas teras-teras marmar berkalsit yang berbutir sederhana memberi indeks beban titik [$Is_{(50)}$] bernilai 3.41 MPa dan 4.44 MPa manakala ujian-ujian ke atas teras-teras marmar berkalsit yang berbutir kasar memberi indeks beban titik [$Is_{(50)}$] bernilai 3.57 MPa, dan 5.03 MPa. Perbezaan kekuatan beban titik ini diakibatkan oleh perbezaan aturan dan bilangan sempadan antara butir-butir mineral di dalam batuan marmar. Marmar berkalsit yang berbutir kasar mempunyai bilangan sempadan yang rendah sekali dan menunjukkan kekuatan beban titik yang tertinggi. Disimpulkan bahawa ujian beban titik adalah satu ujian yang baik untuk mendapat pengkelasan kekuatan batuan marmar berkalsit tetapi keputusan perlu mengambilkira ciri-ciri tekstur yang sedia ada.

(Point load strength, Kuala Lumpur Limestone, variable point load indices from 3.14 to 5.03 MPa due to inherent fine, medium and coarse grained textures)

INTRODUCTION

The Point Load Test has gained widespread acceptance as an index test for the strength classification of rock material and as a means of estimating other strength parameters as the uniaxial compressive strength [1, 2]. Experience over the years, however, has shown that there are some short-comings with the accepted practice, including the variability and scatter of test results on anisotropic rock material, the influence of core sample geometry on axial tests, and the correlation of the point load strength index with the uniaxial compressive strength [3]. Notwithstanding these short-comings, in view of the absence of meticulous sample preparation, and the possibility of carrying out the test both in the field and in the laboratory, the Point Load Test is acknowledged to be generally the most convenient test for the strength classification of rock material [4].

The most widely known version of the Test involves the diametral testing of rock cores and the determination of the Point Load Index [$Is_{(50)}$] which is related to a reference core diameter of 50 mm. Where cores with other diameters are tested, a size correction factor needs to be introduced, whilst both shape and size correction