C-07: Estimation of compressive strength of some local metamorphic rocks using point load strength and ultrasonic properties

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Point load apparatus is popularly used in the classification of strength of rock masses, with the simple testing procedure and the applicability to irregular samples making it more attractive. The point load strength of a rock mass is known to have close correlation with the uniaxial compressive strength. The velocity measurements of ultrasonic compression or shear waves through a rock may be carried out in the laboratory. In the absence of material discontinuities and within elastic range, these velocities are directly related to the elastic properties of the material at low strains, particularly to the initial tangent modulus.

This paper describes the results of point load tests and ultrasonic tests carried out on 15 samples of metamorphic rocks selected from the hill region of Sri Lanka. For the interpretation of the test results uniaxial strength has been empirically estimated as 23 times the point load strength; the tangent modulus has been estimated from a relation between ultrasonic initial tangent modulus and tangent modulus empirically known for the rocks in Upper Kotmale area. The variation of estimated tangent modulus with the estimated uniaxial compressive strength of the test specimens showed modular ratios consistent with the rock composition and agreed with the other existing data from the region.