AEG • 2007
ASSOCIATION OF ENVIRONMENTAL & ENGINEERING GEOLOGISTS
GOLDEN ANNIVERSARY IN THE GOLDEN STATE
Los Angeles, California • September 24 – 29, 2007

DETERMINATION OF MECHANICAL PROPERTIES OF NEW YORK CITY ROCKS USING A SCHMIDT REBOUND HAMMER

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Attempts to correlate Schmidt rebound hammer values with engineering geological properties of different rock types has been reported in geotechnical literature (Dinçer et al. 2004; Bilgin et al. 2002; Katz et al. 2000). These attempts have yielded correlation equations that have been used to determine the mechanical properties of rock specimens. Yet, few if any published studies have previously addressed the use of a rebound hammer on the predominant rock types that are characteristic of the New York City region.

Rocks of the New York City Metropolitan region are characterized by diverse mineralogy, metamorphic grade, and exhibit complex geological structures. The structures are dominated by crosscutting surfaces of foliation and gneissic layering formed by the preferential alignment of platy and linear minerals within the rock. All of the features that help break out units in the field (composition, texture, metamorphic grade, fabric orientation, and mica content) also have been observed to control penetration destiny in TBM excavations (Merguerian 2005a, b; Merguerian and Ozdemir 2003) and to control means and methods in shallow construction excavations.

This paper will present on-going research by the authors to estimate the engineering geological properties rock core component examples of the complex geology of the New York City region. Preliminary results (Vellone and Merguerian, 2007) indicate that a reasonable relationship is shown between the geologic sequence of NYC rocks and the average recorded rebound measurement. Early results from our on-going research indicate that the Schmidt hammer may have practical applications in field measurement of geological engineering properties of the diverse rocks of the New York City region.

Citation: in Association of Environmental and Engineering Geologists, Program and Abstracts, 50th Annual Meeting, September 24-29, 2007, Los Angeles, CA, pg. 297.

Keywords: Engineering geological properties, Schmidt rebound hammer, New York City