An Assessment of geological and engineering properties of limestone in Dayr Yusuf area, North Jordan.

By

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ABSTRACT

An assessment of geological and engineering properties of limestone in Dayr Yusuf area - North Jordan.

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Detailed geological engineering investigation on the quarried limestone in SW Irbid, North Jordan has been carried out in order to evaluate the quality of these rocks for different construction purposes.

Eleven physical and engineering properties were measured. These properties are: Absorption, Specific Gravity, Density, Magnesium Sulfate Soundness Value, Unconfined Compressive Strength, Tensile Strength, Flexural Strength, Ultrasonic Wave Velocity, and Abrasion Resistance. Data concerning joint orientation, frequency, spacing, and roughness has been measured.

The results show that these rocks have high density values, very low to low absorption, high weathering resistance to freeze-thaw action, and relatively high to very high strength parameters. According to the American Standards for Testing and Material (ASTM), the British Standards (BS), and the Jordanian Standards (JS) classification schemes, these rocks can be classified as Class A.

The overall quality of the quarrying sites was found to be good to very good according to the Rock Mass Rating (RMR) Classification System.

The performance of these rocks as a construction material are significantly influenced by their textural characteristics. The presence of dolomite rhombs, dissolution-recrystallization, and stylolites increase the absorption and reduce the weathering resistance to some extent. The
strength parameters are significantly influenced by homogeneity, compaction, and cementation, while the presence of weakness zones such as stylolites and calcite veins reduce the strength values significantly. Abrasion resistance is significantly influenced by grain size as well as cementation.

The results of the physical and the engineering properties are proportional to each other. Absorption and weathering resistance are directly proportional while absorption and ultrasonic wave velocity are antipathetic. On the other hand, strength parameters are directly proportional to each other.