AGGREGATES IN HIGHWAY CONSTRUCTION

by

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SUMMARY

Since aggregates is the basic material used in the construction of a pavement the knowledge of the various characteristics and properties of aggregates, and as well the way these influence the performance of a pavement is of great importance.

Aggregates are used in various types of bound materials in the upper layers, and unbound granular mixtures in the lower layers of a flexible pavement.

Aggregates make a major contribution to the structural strength of the pavement. They provide a stony skeleton upon which the direct traffic loads are supported.

The strength and toughness properties of an aggregate is a function of the petrology of the rock from which they were produced. Igneous rocks are stronger than sedimentary rocks due to the silica content and the intergranular bond. Especially, medium-grained basic igneous rocks, e.g. diabase are of the best roadstones and are widely used in bituminous mixes in Cyprus.

The size and shape also affect the strength and stiffness of a mix. The grading of aggregates is used in the designing of the pavement in determining the strength of the pavement. Angular aggregates provide high strength and stiffness due to the interlocking of particles. The size and shape is a function of the production process. Aggregates are produced from rock deposits. Through artificial crushing jagged edge particles are produced and through screening the crushed material is sorted into the various sizes.

The mechanical properties, and soundness of aggregates influence the performance of aggregates in a bituminous

mix. Aggregates with high resistance to crushing, abrasion and polishing increase the strength, toughness, hardness and durability of a bituminous pavement. These properties contribute to the stability and durability of a pavement.

The quality of aggregates are examined through tests on aggregate samples. The aim of testing is to check whether a certain type of aggregate is suitable to be used in the construction of the pavement.

The quality of aggregates must comply with the standards and specifications according to the use in the pavement. High quality aggregates are required in the upper layers of a pavement due to the higher stresses and the direct contact with the traffic. Aggregates in the wearing course must be dense graded, impermeable with low voids content, strong and tough to resist wear due to abrasion by traffic, to retain the required skid-resistance and stability of the surface. The requirements for aggregates in the lower unbound layers are less strict and aggregates with not as high properties are used, e.g. limestone aggregates.

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