CONSIDERATIONS FOR PAVEMENT DESIGN

E MUKANDILA[1] and N BUSAKWE[2]

[1]Real Baobab; Email: estime.mukandila@gmail.com
[2]Gauteng Department of Roads and Transport

ABSTRACT

Road pavement is the structure part of the road constituted with different layers of materials.

The main purpose of the road pavement is to receive the road loading (traffic and climatic load) and to distribute it through the ground. The load distribution ability of the pavement minimises any resulting stress concentration.

Four main elements play a role in the design of the pavement:

- The traffic.
- The climatic condition of the road area.
- The pavement materials.
- The life cycle cost of the road.

The development and the interaction of these elements lay the background of the understanding of the pavement design. In this regards, the following detailed:

The traffic is expressed in terms of Equivalents Standard 80 KN Axle (E80), which represent the unit damage of a road. The failure of the road is assumed to be caused by fatigue and measured in terms of cumulative E80.

The climatic factors related to the road environment such as weather conditions, (e.g. wet & dry conditions, cold & hot conditions) induce to the road addition effects and stress.

Different pavements materials require certain characteristics (such as stiffness and durability) to withstand the traffic loading and climatic actions. These characteristics are a function of material properties (e.g. bearing capacity, plasticity, grading, compatibility). Standard tests are performed to evaluate these properties and characteristics of materials to allow their classification. The classification makes it easier to design the pavement.

The pavement design is essentially the determination or verification of different pavement layer thicknesses based on the traffic, climate condition, type of materials and the life cycle cost of the road.

The pavement design can be empirical, mechanisitic (based on stresses and strains) or mechanical - empirical.

The performance of the pavement during the life of a road is strongly affected by the maintenance regime and planning.