ABSTRACT

The calculation methods of the road pavements can be divided, as it is known, essentially in rational and empirical methods.

The rational methods allow to foresee the performances of a pavement, in relation to its main distresses, by means of the evaluation of the stresses and of the strains caused in the pavement by the motion of the vehicles. The empirical methods, instead, allow to evaluate the number of equivalent single axle load applications that a pavement can support, before to achieve a unacceptable serviceability index, using the results obtained from studies on the behaviour of existing pavements or deliberately built.

The trend toward the use of rational methods derives from the knowledge of the advantages that they present; consisting, besides in the prediction of the fatigue life and of the viscous permanent deformation (rutting), in the possibility to design pavements in various situations. But their greater applicability has not down to disappear completely the empirical methods, above all the "AASHTO Guide" that is based also on theoretical developments.

The design criteria used for the "Italian catalogue of the road pavements" was based on the prediction of fatigue life carried out by means of the rational analysis, and then on the use of the empirical method above said.

Truly, the results obtained using both the approaches did not always coincide. This is to assign to the differences and to the operating limits both of the empirical and of the rational approach. Empirical methods, for example, have some limits when used for cases different from those tested and in the presence of new materials or non-conventional construction techniques. The limits of the rational methods are, besides in the careful evaluation of the material characteristics, in the suitable choice of the design criteria and of the law to predict the fatigue life and the rut formation.

Aim of this paper is to individuate a design criteria with that is possible to have similar pavements using both the rational and the empirical approach.

In order to a critical analysis on the calculation of the pavements has been carried out, individuating in the criteria based on the subgrade elastic strain that is fit to achieve the purpose. This criteria has been then verified carrying out the rational calculation for all the flexible pavements of "Italian catalogue" and comparing the results obtained with the solutions of the empirical approach.