DOWNLOAD PDF GROUP INDEX METHOD OF FLEXIBLE PAVEMENT DESIGN

Chapter 1 : Civil Engineering Notes: Group Index Method of Pavement Design

Group Index method of flexible pavement design is an empirical method which is based on the physical properties of the soil sub-grade. Table of Contents Determination of Group Index Value of Soil Subgrade.

Lecture notes in Transportation Systems Engineering 3 August Overview Flexible pavements are so named because the total pavement structure deflects, or flexes, under loading. A flexible pavement structure is typically composed of several layers of materials. Each layer receives loads from the above layer, spreads them out, and passes on these loads to the next layer below. Thus the stresses will be reduced, which are maximum at the top layer and minimum on the top of subgrade. In order to take maximum advantage of this property, layers are usually arranged in the order of descending load bearing capacity with the highest load bearing capacity material and most expensive on the top and the lowest load bearing capacity material and least expensive on the bottom. Design procedures For flexible pavements, structural design is mainly concerned with determining appropriate layer thickness and composition. The main design factors are stresses due to traffic load and temperature variations. Two methods of flexible pavement structural design are common today: Empirical design and mechanistic empirical design. Empirical design An empirical approach is one which is based on the results of experimentation or experience. Some of them are either based on physical properties or strength parameters of soil subgrade. An empirical approach is one which is based on the results of experimentation or experience. An empirical analysis of flexible pavement design can be done with or with out a soil strength test. An example of design without soil strength test is by using HRB soil classification system, in which soils are grouped from A-1 to A-7 and a group index is added to differentiate soils within each group. CBR test is widely known and will be discussed. Mechanistic-Empirical Design Empirical-Mechanistic method of design is based on the mechanics of materials that relates input, such as wheel load, to an output or pavement response. In pavement design, the responses are the stresses, strains, and deflections within a pavement structure and the physical causes are the loads and material properties of the pavement structure. The relationship between these phenomena and their physical causes are typically described using some mathematical models. Along with this mechanistic approach, empirical elements are used when defining what value of the calculated stresses, strains, and deflections result in pavement failure. The relationship between physical phenomena and pavement failure is described by empirically derived equations that compute the number of loading cycles to failure. Traffic and Loading There are three different approaches for considering vehicular and traffic characteristics, which affects pavement design. Thickness of pavement is governed by single load and number of load repetitions is not considered. The heaviest wheel load anticipated is used for design purpose. This is an old method and is rarely used today for pavement design. In the fixed vehicle procedure, the thickness is governed by the number of repetitions of a standard axle load. If the axle load is not a standard one, then it must be converted to an equivalent axle load by number of repetitions of given axle load and its equivalent axle load factor. Variable traffic and vehicle: In this approach, both traffic and vehicle are considered individually, so there is no need to assign an equivalent factor for each axle load. The loads can be divided into a number of groups and the stresses, strains, and deflections under each load group can be determined separately; and used for design purposes. The traffic and loading factors to be considered include axle loads, load repetitions, and tyre contact area. Equivalent single wheel load To carry maximum load with in the specified limit and to carry greater load, dual wheel, or dual tandem assembly is often used. Equivalent single wheel load ESWL is the single wheel load having the same contact pressure, which produces same value of maximum stress, deflection, tensile stress or contact pressure at the desired depth. The procedure of finding the ESWL for equal stress criteria is provided below. This is a semi-rational method, known as Boyd and Foster method, based on the following assumptions:

Chapter 2 : Flexible pavement design by group index method - civilQA

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Group Index Method can use it in two ways: 1- Mathematically. 2- Graphically. In this video we will learn how to design a Flexible Pavement using Group Index Method mathematically by Equation.

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Group Index method of flexible pavement design is an empirical method which is based on the physical properties of the soil sub-grade. To design the thickness of the pavement you have to go through the following steps.

Chapter 4 : Seal Coat and Surface Treatment Manual: McLeod Design Method

a method of design, based mainly on group index and heavy traffic, has been used by the missouri state highway department to determine total thickness to recommend for flexible pavements. UP UNTIL A 6-IN.

Chapter 5 : Flexible pavement design

An empirical analysis of flexible pavement design can be done with or with out a soil strength test. An example of design without soil strength test is by using HRB soil classification system, in which soils are grouped from A-1 to A-7 and a group index is added to differentiate soils within each group.