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Interlocking Rigid Pavement

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ABSTRACT—*Several methods of designing of interlocking rigid pavement for roads and streets are available .All recognize the need to consider the subgrade soil, paving materials, environment and anticipated traffic. There are number of limitations associated with each, including inadequate characterization of the subgrade soil and paving materials, lack of pavement performance prediction capabilities , and inability to specify desired pavement failure and reliability level . This paper presents a solution to overcome these limitations. The AASTHO rigid pavement design methodology was used as the fundamental framework for developing the procedure. Several modifications allow for the characterization of interlocking concrete pavers as well as for various levels of engineering analysis depending on the availability of information .The proposed design methodology is demonstrated through various practical solutions*

Keywords— Interlocking rigid pavement , Subgrade soil, Pavement performance ,AASTHO

1, INTRODUCTION

The concept of pavers tightly set on flexible granular base is as old as Roman Empire .The modern version , interlocking rigid pavement, originated in the Netherlands in the late 1940's as a replacement of clay bricks streets . This technology quickly spread to Germany and western Europe as a practical and attractive pavement for both pedestrian and vehicular traffic .In this pavement structure ,both the base and subbase are comprised of unbound aggregate. Base and subbase layers stabilized with asphalt or concrete mix can also be used .Edge restrictions are required along the edges of the pavement to prevent the outward migrations of pavers from the force of traffic , which would result in the opening of joints and loss of interlocking between the units .After the pavement has been in service , the joints between the pavers become sealed .Therefore, surface drainage must be provided in the normal way (surface gradient).If the water gets trapped between the pavers and a stabilized layer ,this water can be drained through the sand layer under the units at an appropriate drainage outlet such as catch basin are manhole

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2 DESIGN METHODOLOGY

The design is an eco-friendly manner which allow to penetrate water to the subgrade layer inside the joining layer of pavers (I-shaped) which distributed the equivalent wheel load (EWL) in uniform manner and the pavers are manufactured by a mix ratio 1:7 by INDIAN ROAD CONGRESS (IRC Guidliness)

2.1 Design functions

This design methodology is easy to replaceable and maintanence cost efficient

2.2 Interlocking Function

This procedure performs the design operation

The urban roads of streets have been designed by concrete rigid paver to consolidated the rain water which penetrate through the small minor joining gaps inbetween two pavers and the joints are fixed by a bitumen –asphalt mixture to manipulate the equivalent wheel load pressure

3,LOAD ANALYSIS

3.1 Existing System

Unbound granular or asphalt-treated base layer; modulus of 45,000 and 3,50,000 psi ,(310 and 2410 base and subbase paving materials

Unbound granular subbase ; modulus of 14,000 psi (95MPa)

4, MAIN FEATURES OF INTERLOCKING PAVEMENT

4.1 Serviceability:

The initial serviceability (P0) represents the serviceability value of a pavement immediately after the construction because sufficient data is not presently available to establish this value for interlocking rigid pavement ,a P0 value 4.0 is recommended .Alternately ,the terminal serviceability (pt) represent the lowest serviceability value that will be tolerated before major rehabilitation of the pavement .For rigid pavement the recommended pt value is 2.5 for all road classes

4.2 Maintanance:

To often rework on joints such as replacement of asphalt-bitumen mixture
Replacement of pavers every 5-6 years

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VIII. CONCULSION AND FUTUREWORK

The basis for developing a design procedure for the structural design of interlocking rigid pavements . In order to extend its use to pavers, a strength model to characterize the concrete pavers and bedding sand layer was developed based on findings reported in the literature .Also, multiple input options for the key pavement performance factors were developed in order to allow for various levels of engineering analysis

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