INVESTIGATION OF A REALATIONSHIP BETWEEN SOAKED CBR AND DCP CBR VALUE FOR DIFFERENT TYPES OF SOILS

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DECLARATION OF THE CANDIDATE AND SUPERVISOR

"I certify that this thesis does not incorporate without acknowledgement any material previously submitted for degree or diploma in any university to the best of my knowledge and believe it does not contain any material previously published, written or orally communicated by another person or myself except where due reference is made in the text. I also hereby give consent for my dissertation. If accepted, to be make available for photocopying and for interlibrary loans and for the title and summary to be made available to outside organization "

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ABSTRACT

When planning and design a highway. Assessment of subgrade shear strength is very important. General practice is to measure the subgrade strength in terms of California Bearing Ratio (CBR). However CBR is an empirical method to assess the strength of compacted layers and it is possible to obtain the CBR through either laboratory or field test. But there are several limitations to the current method such as compromising the location itself and danger to the personnel performing the evaluation in hostile environments. In addition, both laboratory and field CBR methods are time consuming methods. Standard laboratory testing process requires sampling and transport of soil to laboratory and takes at least four day period for the testing procedures. Due to these reasons Dynamic Cone Penetrometer (DCP) is used in the field to minimize the CBR testing frequency and assess CBR of soil to a reasonable accuracy.

The significant advantages of the DCP test that it is a low cost, robust, quick and simple to use. Very little damage is made to the pavement being tested (effectively nondestructive) and very useful information can be obtained. One of the major advantages of the test is that the pavement is tested in the condition at which it performs under actual compaction level. The simplicity of the test allows repeated testing to minimize errors and also to account for temporal effects but it should never be used as an absolute indicator of the insitu CBR of a material in a pavement. The results should be assessed in terms of the insitu condition of material, it must always be remembered that the DCP CBR is determined at the insitu moisture contents and density of the pavement layers at the time of testing.

It was found that effect of following factor are mainly affect to change both D.C.P , field CBR, Field moisture content, Field Density ,Plasticity Index and Instrumental and manmade errors. From this research it is reveal that when PI of soil is less than ten reliable linear relationship can be formulate between Lab CBR vs. DCP CBR.

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LIST OF ABBRIVIATIONS

Abbreviation	Description
ASTM	American Society for Testing and Material
CBR	California Bearing Ratio
DCP	Dynamic Cone Penetration Test
DN	DCP Number
DS-CBR	Disturbed Soak CBR
DU-CBR	Disturbed Unsoaked CBR
E	Elastic Modulus
FD	Field Density
FMC	Field Moisture Content
GW	Well Graded Gravel
MC	Moisture Content
LHS	Left Hand Side
MDD	Maximum Dry Density
M.S	Mean Square
OMC	Optimum Moisture Content
PR	Penetration Rate
PI	Plasticity Index
R-Sq	Coefficient of Determination
RHS	Right Hand Side
SCBR	Soaked CBR
S-W	Well Graded Sand
SS	Sum of Squares
TRL	Transport Research Laboratory

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UCBR	Unsoaked CBR
UK	United Kingdom
UU	Undisturbed Unsoaked

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