

**DEGRADATION OF AGGREGATES AND SAND
WITH GEOTEXTILE INTERFACE**

**A REPORT SUBMITTED TO THE DEPARTMENT OF CIVIL
ENGINEERING, MARA INSTITUTE OF TECHNOLOGY SHAH ALAM IN
PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE
ADVANCED DIPLOMA IN CIVIL ENGINEERING**

By

MOHD AMIRUDIN BAHARUN

90011205

**DEPARTMENT OF CIVIL ENGINEERING
SCHOOL OF ENGINEERING
I.T.M., SHAH ALAM**

MAY 1993

ACKNOWLEDGEMENT

All praise to ALLAH, Lord of the Universe, the Merciful and Gracious. Salam to Nabi Muhammad s.a.w, his companions, his friends and the people who follow his path.

The author wishes to express extreme gratitude to his advisors, Ir. Ibrahim Kamaruddin and Ir. Haron Ismail for their highly valuable guidance and stimulating suggestions which was enabled him to complete his thesis.

Heartfelt thanks are also due to those friends and staff of the Department of Civil Engineering who gave their unselfish assistance in the carrying out of the experiment and those who have helped in one way or the other towards the completion of this study.

Finally, the author wishes to express his special gratitude to his beloved parents who have given him much encouragement, understanding and support during his period of study in ITM

Mohd Amirudin Baharun

(May 1993)

ABSTRACT

The objective of this study was to investigate the degradation behaviour of aggregates and sand by using the MBR (Modified Bearing Ratio) mould with a geotextile interface.

The MBR mould measures 400mm in diameter and 500mm high. The mould is separated into two halves each of 250mm height. The large size of the mould is to reduced the confining effect of a smaller mould like that of the CBR on the behaviour of aggregates and sand under test.

The study on degradation was done in dry condition. Granite aggregates and river sand were used throughout the study. The materials used were of three different gradation i.e well graded, gap graded and uniformly graded. Compaction of the materials were carried out conforming to B.S. 1377:1975.

The geotextile used as an interface was the DUPONT 3407 non-woven type. The geotextile was placed at the center of the mould with the different gradations of aggregates tested filling the upper half and the sand at the lower half of the MBR mould. The resulting degradation behaviour of the aggregates and sand upon compaction was determined from the resulting grain size distribution curves.

TABLE OF CONTENTS

		Page
ACKNOWLEDGEMENT		i
ABSTRACT		ii
LIST OF TABLES		iii
LIST OF FIGURES		iv
TABLE OF CONTENTS		v
Chapter One	INTRODUCTION	1
	1.1 Problem Statement	6
	1.2 Objectives of Study	7
	1.3 Scope of Study	8
Chapter Two	LITERATURE REVIEW	10
	2.1 Geotextiles	12
	2.2 Measure of Degradation	13
Chapter Three	EXPERIMENTAL PROCEDURE	15
	3.1 Sampling of Aggregates and Sand	15
	3.1.1 Sand Fraction and Sampling	16
	3.1.2 Aggregates Fraction and Sampling	18
	3.2 Grain Size Analysis	20
	3.2.2 Sieve Analysis	20
	3.2.2 Particle Size Distribution	22
	3.2.3 Initial Particle size distribution curve	22
	3.3 Compaction	23
	3.3.1 Ordinary Compaction Test(Standard)	24
	3.3.2 Heavy Compaction Test(Standard)	24
	3.4 Compaction Energy	25
Chapter Four	RESULTS	35
	4.1 Analysis and Discussions of Results	38
Chapter Five	CONCLUCIONS	72
	5.1 Recommendations	74

CHAPTER ONE

Introduction

A highway pavement is usually built up in several layers as shown below and each layer serves their specific function in the distribution of the applied vehicle load to the subgrade. The subgrade usually consist of weak soil and the strength of which can be improved by compaction and occasionally by stabilization.

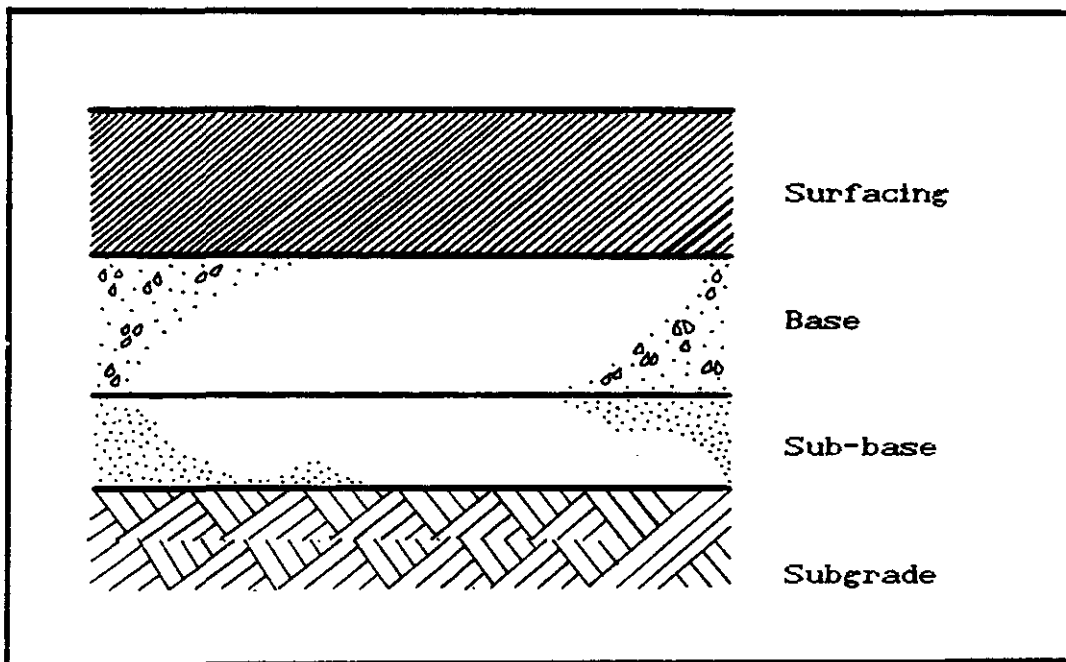


Figure 1.0 Basic structural elements of a pavement.