

**CONSENSUS AND SOURCE PROPERTIES OF MALAYSIAN AGGREGATES  
FOR SUPERIOR PERFORMING ASPHALT PAVEMENTS**

**INSTITUT PENYELIDIKAN, PEMBANGUNAN DAN PENGKOMERSILAN  
(IRDC)  
UNIVERSITI TEKNOLOGI MARA  
4040 SHAH ALAM, SELANGOR  
MALAYSIA**

**BY:**

**HJH. JURAI DAH AHMAD  
PROF. MADYA IR. DR. MOHD YUSOF ABDUL RAHMAN  
PROF. MADYA IR. DR. ZAINAB MOHAMED**

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Penolong Naib Canselor (Penyelidikan)  
Institut Penyelidikan, Pembangunan dan Pengkomersilan  
Universiti Teknologi MARA  
40450 Shah Alam

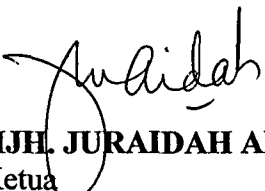
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**LAPORAN AKHIR PENYELIDIKAN “CONSENSUS AND SOURCE  
PROPERTIES OF MALAYSIAN AGGREGATES FOR SUPERIOR  
PERFORMING ASPHALT PAVEMENTS”**

Merujuk kepada perkara di atas, bersama-sama ini disertakan 3 (tiga) naskah Laporan Akhir Penyelidikan bertajuk “Consensus Source Properties of Malaysian Aggregates for Superior Performing Asphalt Pavements”.

Sekian, terima kasih.

Yang benar

  
**HJH. JURAIDAH AHMAD**  
Ketua  
Projek Penyelidikan

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## ABSTRACT

Aggregates and asphalt binder are the two main constituents that determined the performance of hot mix asphalt (HMA). Since a wide variety of mineral aggregate is used to produce Hot Mix Asphalt (HMA), proper evaluation of the mineral aggregate properties is important to ensure good performance of asphalt mixture. Unlike Superpave system, Marshall and Hveem method do not incorporate aggregate criteria into their procedures. The SHRP Asphalt Research Program modified the Delphi process to include aggregate properties which is divided into two categories; consensus and source. The consensus properties include aggregate angularity, flat and elongated particles and sand equivalent to ensure aggregate quality is sufficient to provide satisfactory HMA performance for all design traffic levels. The source properties are often used to qualify local source of aggregate which include abrasion, deleterious materials and soundness test.

In this study, aggregates collected from northern, central and southern region of Peninsular Malaysia. The performance of all aggregates from different source conforms to the criteria set by the Superpave system. Malaysian aggregates show high performance and quality for use in construction of highways especially so, in terms of resistant to abrasion and disintegration. However, aggregates from Kuad Quarry do not meet the requirement of the flakiness index which is slightly above the maximum set criteria. Otherwise most of the aggregates are durable, strong and satisfies both the consensus and source properties testing.

# CHAPTER 1

## INTRODUCTION

### 1.1 Background

One of the Strategic Highway Research Programme (SHRP) was the Superior Performing Asphalt Pavement (Superpave) mix design method. Under the Strategic Highway Research Program (SHRP), performance graded are specified to be critical in achieving high performance in HMA based on two types of aggregate properties needed to be used in Superpave system; consensus and source aggregate properties. These properties are important to meet the various levels of traffic volume and position within the pavement.

Aggregate constitute 90 to 95 percent by weight of the hot mix asphalt (HMA) mixtures and between 80 to 85 percent of the volume of the mixture. The properties of coarse and fine aggregates are very important to the performance of pavement system because aggregate is primarily responsible for the load supporting capacity of asphalt mixtures. A wide variety of mineral aggregate is used to produce HMA. Processed aggregate has been quarried, crushed, separated into distinct size fractions, washed, or otherwise processed to achieve certain performance characteristics of the finished HMA. Regardless of the source, processing method or mineralogy, aggregate must provide enough shear strength to resist repeated load applications. Often pavement distress, such