

CHAPTER 3

METHODOLOGY

3.1 INTRODUCTION

This chapter is discussing about the test that has been conducted in order to achieve the objectives of study. The data and result was obtained through the experimental in the laboratory. All the steps and procedures in conducting the test must be properly handled to ensure that the results obtained are accurate as required in JKR/SPJ/2008.

There are several tests that have been conducted. For aggregates, Los Angeles Abrasion Test (ASTM), Aggregate Impact Value Test, Aggregate Crushing Value (ACV), Ten Percent Fines has been done in order to get the properties of aggregate that will be used in the asphalt mixtures. Besides that, bitumen with grade of 80/100 has been test with Softening Point of Bitumen and Penetration of Bituminous Material.

In order to get the optimum bitumen content, Density and Voids Analysis has been used. Last but not least, Indirect Tensile Stiffness Modulus Test (ITSM) and Repeated Load Axial Test (RLAT) have been done in order to investigate the stiffness and permanent deformation of modified asphalt mixture.

3.2 SAMPLE PREPARATION

Waste High Density Polyethylene (HDPE) was used in modified samples. The waste HDPE was added as coarse aggregate replacement in different percentage in range of 2% until 10%. Out of all the sizes of the aggregates, the size of 1.18mm retained on sieve has been chosen to be replaced by the HDPE in flakes form. The numbers of samples required are as follows:

- i. to find optimum bitumen content:
3 samples for five different percentage of bitumen content ($5 \times 3 = 15$)
- ii. to find the stiffness modulus and permanent deformation of control samples:
3 samples for five different percentage of HDPE content with PC as filler ($5 \times 3 = 15$ samples)
- iii. to find the stiffness modulus and the permanent deformation of modified samples:
3 samples for five different percentage of HDPE content with Kaolin as filler ($5 \times 3 = 15$ samples)

So, total samples for this study is 45 excluding damage samples. Five different percentage of bitumen that was used for this study are 4%, 4.5%, 5%, 5.5%, and 6% as stated in PWD Standard while percentage for waste HDPE are 2%, 4%, 6%, 8% and 10% (by weight). The flowchart for methodology of this study is shown in Figure 3.1.

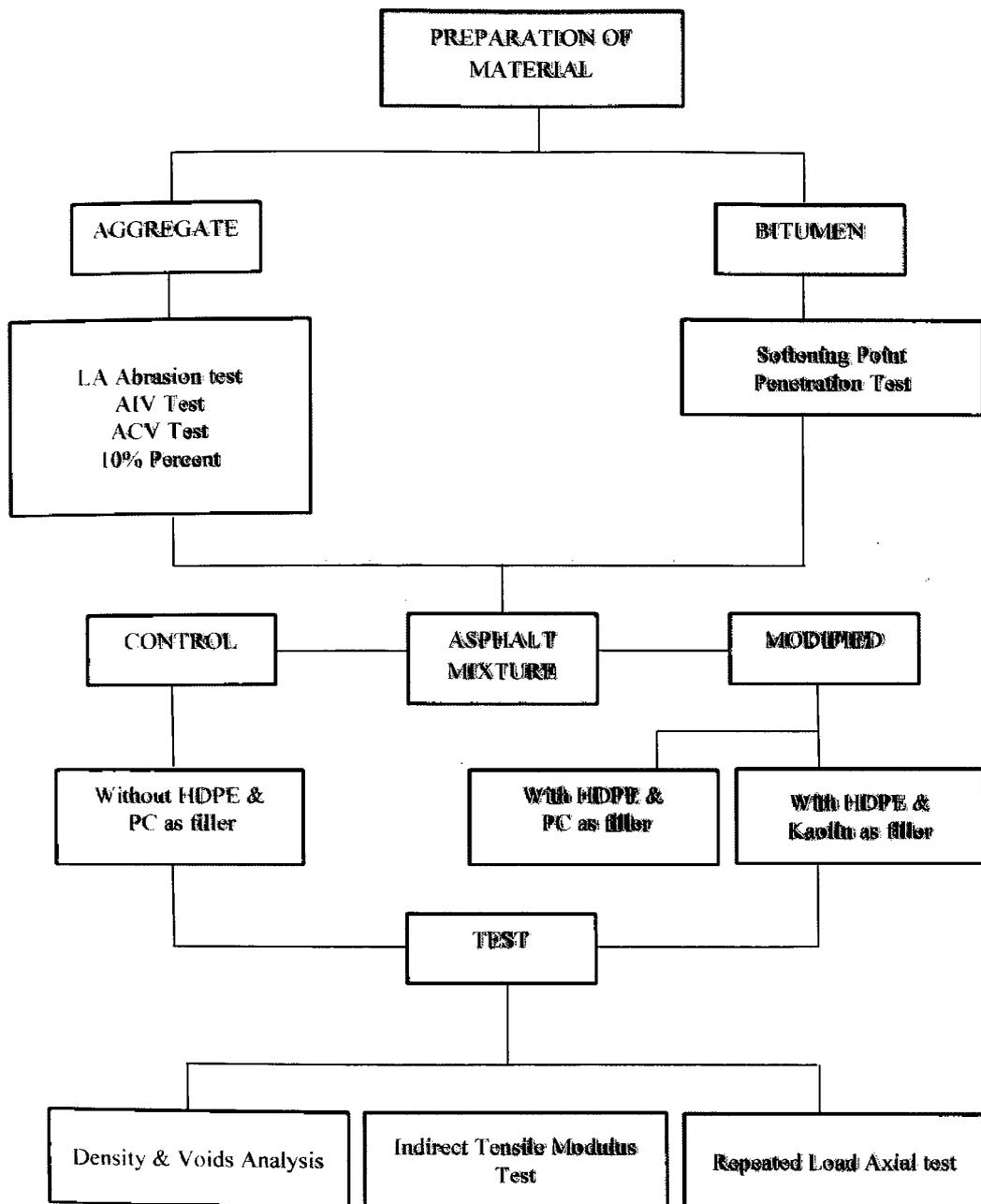


Figure 3.1: Methodology Flowchart