CHAPTER 3

RESEARCH METHODOLOGY

3.1 INTRODUCTION

The research methodology in this study more based on experiments and testing to investigate the workability and the strength of the PKS concrete. The PKS concrete cube and beam specimens were produced by partially replace the fine aggregate with 1%, 2% and 3% of palm kernel shell. First, the collection and preparation of raw materials were discussed in details followed by mixing and testing process of the specimens.

3.2 METHODOLOGY

Methodology flowchart were presented in Figure 2.1. This study involved two main phases consist of seven stages. The first phase is laboratory work and the second phase is writing. Material preparation, concrete mixing process, curing process and testing were conducted under the first phase, laboratory work phase. In the writing phase, the result will be analyse and detail discussion and conclusion will end this writing phase.
Figure 3.1: Methodology for evaluating the effectiveness of three different percentages on the performance of palm kernel shell as partially replacement of fine aggregate in concrete
3.3 PREPARATION OF MATERIALS

The making of concrete with partially replacement of fine aggregate consist of five types of raw material, namely palm kernel shell, fine aggregate, coarse aggregate, ordinary Portland cement and water.

3.3.1 Palm Kernel Shell

As mentioned earlier, palm kernel shell was the shell fractions left after the nut has been removed after crushing in the palm oil mill. Figure 3.1 showed the palm kernel shell that had been sieved passing through 2.36mm. Palm kernel shell which were obtained from the Lepar Palm Oil Mill with various size were washed and dried for one day to prevent the palm kernel shell to cling each other and easier for sieve process. Then, it were sieved by using sieve shaker with range between 1.5mm to 2.36mm as shown in Figure 3.2.

Figure 3.2: Palm Kernel Shell with size between 1.5mm to 2.36mm