CHAPTER 3

METHODOLOGY

3.1 INTRODUCTION

This chapter explained the test conducted and also the material used in this experiment. In this study, four different percentage of palm oil fuel ash (POFA) are added into the concrete. POFA are added about 0%, 10%, 20% and 30% by the weight of cement. The main objective of this research is to determine if the growth of DEF in existing concrete can be reduced or even prevented with commercial products (POFA). These researches also are to study the effectiveness of POFA as a partial cement replacement towards compressive strength and determine the microstructure of POFA in concrete.

3.2 EXPERIMENTAL PROGRAM

The experiment process flow for test the effectiveness of using POFA as partial cement replacement as outlined in Figure 3.1.
Figure 3.1: The experiment process flow
3.3 MATERIAL SELECTION

Material selection is the most important step in the designing any physical object. In the context of product design, the main intention of material selection is to reduce the cost while accommodating product performance goals. The raw material that has been used in this study is as follow:

i. Fine aggregate

ii. Coarse aggregate

iii. Cement (Ordinary Portland cement - OPC)

iv. Palm oil fuel ash (POFA)

v. Water

3.3.1 Fine Aggregate

Fine aggregate is used in prepare the concrete. Fine aggregate is referring to sand. A good concrete should be well graded so that it contains a mixture of fine aggregates. Fine aggregate used for concrete should pass through a 5mm sieve. Based on ASTM C33 (Mark Alexander, 2010) , fine aggregate shall consist of natural sand. Fine aggregate shall be graded within the following limit shown in Table 3.1: