CHAPTER 3

RESEARCH METHODOLOGY

3.1 INTRODUCTION

In this chapter, details on the constituents that made up for geopolymer concrete mortar, the mixture design, and preparation of the geopolymer concrete mortar are described. After that, the process of preparation for each materials is explained in details before mix up all the materials. The process of batching, mixing and casting of the mix is illustrated continue with oven curing. After the geopolymer concrete mortar is hardened after 1day of oven curing, the engineering properties in terms of compressive strength (ASTM C 109) and porosity test (ASTM C 642-69 T). Each of the testing is illustrated and elaborated to obtain the result.

Figure 3.1 shows the flowchart of the whole process flow for this study, from propose title, literature review, material preparation, trial mix, tests, result & analysis and conclusions & recommendations.
3.2 MATERIAL PREPARATION

The constituent materials for geopolymer concrete mortar mainly are fly ash, fine aggregates, NaOH solution and Na$_2$SiO$_3$ solution. All the materials need to be prepare and selected according to the specification in order to reduce the defects on the geopolymer concrete.
3.2.1 Fly Ash

The fly ash was obtained from Manjung Coal-Based Thermal Power Plant, Malaysia and categorized as Class F fly ash. The fly ash will be sieved through 150μm and must pass the sieve in order to be use in mixing. The fly ash then need to be keeps in a closed container or packet under room temperature to avoid any humidity went into the ash. Figure 3.2 shows the example of fly ash used in this study.

![Fly Ash Image]

Figure 3.2: Fly Ash

3.2.2 Fine Aggregates

The fine aggregates use is normal sand and this sand will be sieve with 5mm sieve and the must pass the sieve before can be mix. The fine aggregates are then put under air dry condition one day before mixing. Figure 3.3 shows the sieve analysis that achieve after sieved.

![Sieve Analysis Image]

Figure 3.3: Sieve Analysis of Fine Aggregates-Sand