CHAPTER 3

METHODOLOGY

3.1 INTRODUCTION

This chapter will review the methodology of this research which includes all methods and techniques that may apply to get data collection and data analysis in the performance of synthetic lightweight coarse aggregate (SYLCAG) concrete. This chapter also will further discuss the detail of the procedure involve in carrying out the experimental work and laboratory test to archive the objectives of this study. The test involve in this study will be compressive strength test and flexural strength test.

There are preparation of 2 different type of concrete mix design involve which are SYLCAG concrete with density of 1600kg/m³ with target strength of 25 to 30 MPa and control concrete with strength of 30 MPa. All experiments in this work will be carried out in the laboratory of structures Faculty of Civil Engineering and Earth Resources, Universiti Malaysia Pahang (UMP). Several experiment were implemented using the criteria according to Eurocode (EC). Figure 3.1 represent the overview of the flow chart of this research for the entire work.
FIGURE 3.1: Flow chart for research methodology
3.2 COLLECTING INFORMATION AND RESEARCH MATERIALS

This phase includes the collecting information from previous studies and planning of the laboratory works. Identifying the materials that will be used in this study also will be included in this phase. Literature reviews from previous study was done to find the related information and understand more on the lightweight aggregate concrete and also SYLCAG concrete properties.

The materials that will be used in the SYLCAG concrete study are cement, sand, water and offshore sand as synthetic lightweight coarse aggregate. The offshore sand is obtained from reclamation project at Pantai Klebang, Malacca. The SYLCAG will be used as a full replacement of coarse aggregates. Structural and Concrete Laboratory of Faculty of Civil Engineering in University Malaysia Pahang will be used to proceed the testing.

3.3 PREPARATION OF SAMPLE

This section will focused more on the raw materials needed for the lightweight aggregate concrete production. These raw materials include Ordinary Portland Cement (OPC), fine aggregate, SYLCAG and water. All of these materials were well prepared to avoid from any shortage when conducting the experiment.

3.3.1 Cement

Generally, cement can be described as a material with bonding agents and cohesive properties, which makes it proficient to bond mineral fragments into a solid whole. Ordinary Portland Cement (OPC) is type of cement in accordance to BS 12 :1958 that commonly used in civil construction if it is not exposed to the sulfate in soil or in the groundwater. Additionally, OPC is readily available in the laboratory.