CHAPTER 3

METHODOLOGY

3.1 GENERAL

Each research needs a lot of attention on the research methods. This part will be discuss about the steps involve in this research in detail. In other words, this research was conducted based on methodology part. The methodology is so important to ensure the research will be study correctly. A constant mix proportion 1:8 cement-aggregates ratio but varies in laterite soil-sand ratios in the presence of an alkaline solution will be used to check either it can gives an impact to the results.
The laterite soil that gets from Kerteh, Terengganu will be testing first before its will be used as a part of cube. The cubes were undergoing air cured and water was sprinkled to cubes twice per day (morning and evening) for 7 days. The total batches in this research are 144 batches. These batches contain laterite soil, fine sand and concrete as stabilizer with proportion of 1:2:6, 1:3:5 and 1:4:4 in the presence of different concentration of an alkaline solution. For this research, there are 2 sorts of test that had been made, that is for the laterite soil itself and for the cubes. To determine the properties of the laterite soil, it will undergo various type of test. As for example, Mineralogy Test, Atterberg limit test and sieve analysis. Compression test, water absorption test, and abrasion test will be conducted after the cubes have been cured for 28 days. The objectives of the tests are as below:

- **Mineralogy** - Sample of soil tested on Central Lab to get mineral content and pH value of the laterite soil.
- **Atterberg Limit** - Basic index information about soil to estimate strength and settlement characteristic as Plasticity Index, Plastic Limit, Liquid Limit and Shrinkage Limit.
- **Sieve Analysis** - To obtain finer percent of laterite soil from 5mm to pan.
- **Water Absorption** - Determine moisture absorption percentage.
- **Abrasion** - Determine durability of the laterite cubes.
- **Compression** - Determine the strength of the cubes.
3.2 MATERIALS PREPARATION AND TESTING

This section will mainly focus on the preparation of raw materials needed to produce the CSEB cubes. These raw materials include Ordinary Portland Cement (OPC), Fresh Laterite Soil, River Sand and Sodium hydroxide (NaOH) as an alkaline solution. The total amounts of the material are:

- Laterite soil - 86.40 Kg
- Mine sand - 144.0 Kg
- Portland Cement - 28.80 Kg

3.2.1 Ordinary Portland Cement (OPC)

There are so many types of Portland cement available in the market. In this study, Ordinary Portland Cement is decided to be utilized as a part of creating the cubes. OPC is being widely used and become popular in construction field.

*Figure 3.1: ‘Orang Kuat’ OPC*