CHAPTER 1

INTRODUCTION

1.1 BACKGROUND

Concrete is a widely used construction material that consists of cement, aggregates, water and admixtures. Aggregates such as gravel and granite were used to produce normal concrete therefore this situation drastically reduces the natural stone deposits and disturb the ecological balance. In order to solve this problem, Yogesh (2013) demonstrated that the aggregates made by crushed coconut shells can be used in concrete by partially replacing the coarse aggregate up to a 25% and it also produce light weight concrete.

Coconut shell is moisture retaining material and the water absorbing capacity is higher compared to the conventional aggregate. Therefore, the amount of cement used may be more when coconut shells were applied as an aggregate compared to conventional aggregate. The presence of sugar in the coconut shell will not affect the setting and strength of concrete as long as it is not in a free sugar form.

The concrete produced by replacing 25% of coconut shell as coarse aggregates known as Coconut Shell Concrete (CSC) and this percentage of replacement satisfies the minimum necessities of concrete mix. CSC has few advantages such as good impact resistance compared with conventional concrete and higher workability due to the smooth surface on one side of the coconut shells (Manindar, 2012).

Even though the coconut shell is moisture retaining material, the curing process still important to maintain the suitable moisture content and temperature in concrete.
during its early stage so that desired properties may develop. The strength and
durability of concrete will be fully achieved if the concrete pass through the curing
process. The cement hydration process caused losses of water from concrete due to
evaporation since of the self-desiccation by consumption of water during hydration
process. Therefore, the losses of water must be prevented and replaced by water from
outside.

There are six common types of concrete curing method which is shading of
cement work, covering concrete surfaces with hessian or gunny bags, sprinkling of
water, water immersion method, membrane curing and steam curing. In this study, two
out of six curing methods were studied which is wet covering method and immersion
method. Different curing method will show different concrete strength development.

1.2 PROBLEM STATEMENT

A concrete element must be long lasting until a certain number of years. In order
to meet this expected service life, it must be able to withstand structural loading, fatigue,
weathering, abrasion, and chemical attack. The materials required to achieve the high
level of quality determined by the duration and type of curing method.

Curing is the process in which the concrete is protected from loss of moisture and
kept within a reasonable temperature range, (Ahlawat, 2013). The result of this process
is increased strength and decreased permeability. Curing is also a key player in mitigating
cracks in the concrete, which severely impacts durability. Cracks allow open access for
harmful materials to bypass the low permeability concrete near the surface. Good curing
can help mitigate the appearance of unexpected cracking.

This study will help to solve the problem by compare the concrete curing method
which can increase the strength of concrete. In doing so, three concrete samples need to
be required to observe the changes and the readings of the flexural strength for each type
of concrete. In general, this investigation needs a lot of laboratory works and also
literature review. The outcome of the study will be the comparison and recommendation
on best method of curing used for CSC in construction industry.
1.3 OBJECTIVES OF STUDY

The objectives of this study are:

i) To determine the flexural strength of coconut shell concrete in between wet covering and immersion curing method.

ii) To investigate most effective curing method for CSC to be used in construction industry.

1.4 SCOPE OF STUDY

This study will focus on laboratory test to determine the flexural strength of coconut shell concrete due to different curing method and to investigate most effective curing methods used for CSC:

i) Use normal concrete and CSC with 25% of coconut shell replaced in coarse aggregates, (Aruna, 2014).

ii) According to Amrita,2015 the concrete should be cast as a prism in the mould with size of 150mm x 150mm x 600mm to gain the best flexural strength.

iii) Normal concrete and CSC will go through two different curing method which is wet covering method and immersion method. The curing process will be done for 7 days and 28 days.

iv) The flexural strength of the prisms will be tested by flexural strength test under centre point loading

1.5 SIGNIFICANT OF STUDY

Curing of concrete plays a major role in developing the microstructure and pore structure of concrete, (Burg, 1996). On other hand, curing of concrete means maintaining moisture inside the body of concrete during the early ages and beyond in order to develop the desired properties in terms of strength and durability. However, good curing practices are not always consistently followed in most of the cases. Hence, this can lead to a weak concrete strength. This study summarizes two type of curing method for concrete which can help to achieve the highest flexural strength of CSC and also can differentiate the