CHAPTER I

INTRODUCTION

1.1 GENERAL

In view of the ever-growing population and with expanding urban centers, escalating levels of construction are forecast in the forthcoming years in India as a developing country. The construction Industry has the largest drain of natural materials. Like water the construction materials cannot be recycled naturally. The construction industry needs to be suggest the measures with the approval of environmentally good natured and more sustainable technology. Industrial wastes have continued to increase due to the continued demands of resource used by humans and increasing amount of pollution. But also to the problem of the high cost of building materials is currently faced by our nation. It is essential to effectively use the industrial waste in order to conserve the non-renewable natural resources.

1.2 USE OF INDUSTRIAL WASTE IN CONCRETE MAKING

The main hope of the use of waste materials is to minimize environmental impact and reduce the huge consumption of natural resources used for concrete applications. A review of earlier research showed that industrial as well as other wastes have been used in concrete making to improve the properties of concrete and to reduce cost. The use of recycled aggregates for concrete-making has been successfully implemented and gaining wider acceptance.

Another important aspect to consider is the depleting nature of the concrete aggregates has led to recycling of waste aggregates will prove to be economically beneficial and sustainable. In this study the use of the ceramic waste as coarse aggregate and bottom
ash fine aggregate as a partial replacement of river sand of its suitability and mechanical properties of concrete were investigated.

1.3 USE OF OTHER WASTE IN CONCRETE MAKING

It has been estimated that about 30 percent of daily production goes as waste in a ceramic industry. Ceramic waste which is durable, hard and highly resistant to biological, chemical and physical degradation forces, is not recycled in any form at present. The rate of growth in waste has put pressure on the ceramic industries to find a solution for its disposal and also the pollution control board does not permit disposal of the waste in the open land. Wastes like construction and demolition waste (C&DW), milled glass waste, rubber waste, crushed bricks, crushed red clay ceramics, oil palm shells, quarry waste, fired ware scrap, agro waste (saw dust ash) rice husk ash, municipal waste, etc. were used as aggregate in concrete making.

In this study it is proposed to use ceramic waste (waste from ceramic electrical insulator industry), bottom ash (by product from thermal power plant) and silica fume (by-product of silicon industry) in concrete production. While taking into account these waste materials as an ingredient in concrete, the following two major considerations are relevant:

i. financial saving

ii. matching with other constituent materials

In a ceramic electrical insulator industry near Cuddalore, daily 3 tonnes of waste of different shapes and sizes is disposed off within the industry area and it is available free of cost and also large quantity of material will be possible. In Neyveli Lignite Thermal
power plant near Cuddalore, bottom ash is available free of cost and also huge quantity is available.

1.4 SUSTAINABLE CONCRETE TECHNOLOGY

Taking the concept of sustainable development into consideration, the concrete industry has to implement a variety of strategies with regard to future concrete use, for illustration, improvements in the durability of concrete and the better use of recycled materials. According to the living planet report” (WWF) Taipei the concrete industry globally consumes 8 ~ 12 billion tones, annually of natural aggregates after the year 2010. More recently there has been a growing social and political awareness of environmental issues, particularly where this relates to the deterioration of the environment. This has lead to the passing of laws and regulations of all kinds in an attempt to control and reduce the amount of natural aggregates extracted from quarries and to encourage recycling and reuse.

1.5 SUMMARY

The concept of multiple use, future modification, and efficient deconstruction and re-use of materials are intrinsic to green design. Utilization of ceramic waste, bottom ash and silica fume in concrete production will preserve the earth and its environment and optimize the use of natural resources.