CHAPTER 1

INTRODUCTION

1.1 GENERAL

Concrete is the most widely used man made construction material in the world. Cement, sand and aggregate are essential needs for any construction industry. Sand is a major material used for preparation of mortar and concrete and plays a most important role in mix design. In general consumption of natural sand is high, due to the large use of concrete and mortar. Hence the demand of natural sand is very high in developing countries to satisfy the rapid infrastructure growth. The developing country like India facing shortage of good quality natural sand and particularly in India, natural sand deposits are being used up and causing serious threat to environment as well as the society. Rapid extraction of sand from river bed causing so many problems like losing water retaining soil strata, deepening the river beds and causing bank slides, loss of vegetation on the bank of rivers, disturbs the aquatic life as well as disturbs agriculture due to lowering the water table in the well etc are some of the examples.

Now a day there is a scarcity of sand and it has become very difficult to get sand easily in economical way. Overcoming of this problem is very essential to research the alternative materials. In order to fulfil the requirement of the fine aggregates, some alternative material must be found. Hence, in this project it is planned to carry an experimental work by preparing concrete blocks with partial replacement of sand by available natural red soil and foundry waste.

Soil is defined as the top most layer of the earth's crust. Soil is the combination rock, minerals fragments, organic matter, water and air. It is mostly made up of grains of rock and humus. The type of soil depends on the mix of the humus and on the size of the grains of rock. As soil formation is an extremely slow process, soil can be considered essentially as a non renewable resource. Red soils generally derived from igneous rock. They are usually poor growing soils, low in nutrients and difficult to cultivate. Red soils denote the second largest soil group of India covering the area of about 6.1 lakhs sq.km. Their colour is mainly due to ferric oxides occurring as thin coating on the soil particles. The local available natural red soil is the most alternatives material of the construction industry. Study on locally available soil to meet the sand specification and also possesses other advantages which makes it potentially a very good and appropriate material for

construction, especially for the construction of rural structures in the developing countries.

Generation of industrial waste as by product of different industries causes environmental problems because of its improper disposal. Thus, industries foundry waste is usage in building material, construction and in other fields is essential for reduction of environmental problems and also produce a low cost and eco friendly concrete. Metal foundries use large amounts of sand as part of the metal casting process. Foundries successfully recycle and reuse the sand many times in a foundry. When the sand can no longer be reused in the foundry, it is removed from the foundry and is termed "foundry sand". Foundry sand primarily consists of silica sand, coated with a thin film of burnt carbon, residual binder (bentonite, sea coal, resins) and dust. Foundry sand can be used in concrete to improve its strength and other durability factors.

The partial replacement of fine aggregate by using natural soil and foundry waste to produce the good quality of concrete. It has become essentially keeping in view of technical and environmental requirements. The proper proportion of mixing sand, soil and aggregate to give the better results.