At this era of energy crisis and resource depletion, availability of conventional materials throughout the year in quantity and quality, pose a hectic problem for the builders. Adding fuel to the fire, the demand of these materials increases day by day, since the housing and habitat requirements exponentially increase time to time. There is an international concern over this crisis and researchers are reorienting themselves, so as to evolve appropriate masonry units, using locally available cheap materials and technology. The concept of green material and construction has been well conceived in the research so that marginal materials and unskilled labour can be employed for the mass production of building blocks. In this context, considering earth as a sustainable material, there is a growing interest in the use of it, as a modern construction material. Solid waste management is one of the current major environmental concerns in our country. Our country is left with millions of cubic metre of waste plastics. One of the methods to satisfactorily address this solid waste management and the environmental issues is to suitably accommodate the waste in some form (as fibres). Their employability in block making in the form of fibres (plastic fibre- mud blocks) can be investigated through a fundamental research. Also, the review of the existing literature shows that most studies on natural fibres are focussed on
cellulose based/ vegetable fibres obtained from renewable plant resources except in very few cases, where animal fibre, plastic fibre and polystyrene fabric were used.

At this context, for the plastic fibre-mud blocks to be more widely applicable, a systematic quantification of the relevant physical and mechanical properties of the fibre masonry units is crucial, to enable an objective evaluation of the composite material’s response to actual field condition. This research highlights the salient observations from the detailed investigation of a systematic study on the effect of embedded fibres, made of plastic wastes on the performance of stabilised mud blocks.

The study on the influence of composition and block making mechanism on mud blocks described here basically come under four stages viz. (i) The density and the strength (ii) Sorption characteristics such as Water absorption and Sorptivity (iii) Erosion studies and (iv) Study on Mud block masonry. The input variables selected for the study to evaluate the above parameters, are (i) Cement as a chemical stabiliser (ii) Moulding pressure for mechanical stabilization (iii) Plastic fibres from carry bags(Kit fibres) and PET bottles(Bottle fibres) as an embedment or internal reinforcement.

Compared to the raw soil samples, Fibre reinforced Cement stabilized soil samples have shown an increase of 21 to 121% in the
Compressive strength. However in reality, the effect of fibres is pronounced in Kit fibres having 2cm length and 0.1% by weight of the dry Soil. An optimum Cement content of 7.5% by weight of the dry Soil is required to meet the minimum requirement of strength. The maximum quantity of Cement may be limited to 10% by weight of the dry Soil, considering the rate of increase in strength and the cost. Compared to the stabilised samples, the Fibre reinforced stabilised samples showed an increase of 59 to 89 % in the Compressive strength, for a Cement content of 7.5% and 64 to 118%, in the case of a Cement content of 10%, for the range of Moulding pressures varying from 1.25 to 7.5MPa. Stabilised samples and fibre reinforced stabilized samples at higher moulding pressures showed strength values of 3.5 to 4.41MPa when tested on cylindrical samples and 3.7 to 5.5MPa when tested on the moulded soil blocks. These values are conforming to the standards of minimum compressive strength of 3.5MPa for a well burnt brick as per BIS 1077-1992 and minimum compressive strength of soil block for general building construction as per BIS: 1725-1982(reaffirmed in 2002). The Kit fibres exhibit consistent behaviour and produce reliable results on the Soil, which was selected for the study.

One of the major advantages of the addition of fibres is the increase in the Tensile strength. From the observations of failure
pattern, it can be concluded that benefits of fibre reinforcement includes both improved ductility in comparison with raw blocks and inhibition of large crack propagation after initial formation. The Compacted Reinforced Cement Stabilized specimens show an increase of 4.5 times the tensile strength of the raw Soil specimen.

The performance of the Masonry prisms made out of these blocks was also studied and a correlation with Masonry strength to Block strength has been made. For given Cement content, the ratio of masonry strength to block strength was found to vary from 0.38 to 0.52 and 0.45 to 0.72, for specimens subjected to low and high Moulding pressure respectively.

The water absorption of the samples with 10 to 15% Cement content was less than the specified value of 15% by weight as per IS 1725-1982(reaffirmed in 2002): Specifications for Soil based blocks used for general building construction. Erosion test indicates that the stabilized plastic reinforced blocks possess adequate resistance against rain erosion. It is also possible that, these stabilised blocks can be used in walls without any water-proof coatings and plaster.

**Key Words:** Mud Blocks, Cement Stabilisation, Moulding Pressure, Plastic Fibres, Compressive Strength, Split Tensile Strength, Mud Block Masonry, Sorptivity, Erosion Studies