International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395-0056
Volume: 06 Issue: 11 | Nov 2019 www.irjet.net p-ISSN: 2395-0072

STUDY ON SOIL CEMENT BLOCKS

Mr. CH. Saikumar[1], Mr. J. Shyam Sunder Reddy [2], Mr. B. Sairam[3], Mr. CH. Mani Shiva[4], Mr. A. Saikumar[5], M. Prudhvi Raj[6]

[1,2,3,4,5]Sree Dattha Institute of Engineering & Science JNTUH & Hyderabad
[6]Assistant Professor Civil Engineering Department, JNTUH, Telangana

---

Abstract - Soil-cement blocks also known as compressed earth blocks or stabilised mud blocks are used for load bearing masonry. The paper focuses on the study of various characteristics of soil-cement blocks using highly sandy soils through an experimental investigation. Characteristics of soil cement blocks having three different cement contents (6%, 8% and 12%) have been examined. Paper reports results of influence of cement content on compressive strength, tensile strength, the initial rate of absorption (IRA), water absorption, rate of water absorption, surface porosity and pore size, stress-strain relationships and elastic properties of soil-cement blocks. The results indicate that there is 2.5 times increase in strength for doubling of cement content from 6%. IRA decreases drastically with the increase in cement content of the block. Saturated water content of the blocks is not sensitive to cement content, whereas rate of moisture absorption greatly depends on the cement content. Pore size decreases with increase in cement content of block, whereas surface porosity is independent of the cement content. Soil-cement block modulus varies between 2000 and 6000MPa. Elastic modulus increases by 2.5 times when the cement content is increased from 6 to 8%, whereas the increase in modulus is marginal when cement content goes from 8 to 12%

Key Words: cement, compression testing machine…

1. INTRODUCTION

To address the large house building demand in developing countries, soil can be used as an alternative building material bcz of its high availability as a source material, it ease of processing, and its low environmental impact. In this work, soil cement blocks (SCBS) with three different contents of mineral wool waste and soil cement block with three different contents of sisal fibre were fabricated, microstructally characterized, and tested after curing for moisture abortion, abrasion resistance, compressed, banding, and accelerated erosion. Am I in Crewe compression resistance was found when 1% of mineral wool was loaded into the SCBS whereas an increase of rupture modulus. From the result it is observed that both bending strength and compressed resistance with the addition of mineral wool waste and sisal fibre. This paper presents the use of waste mud from ceramic tile production as the main component in paving blocks. Compressive strength values of the blocks were compared with the standard value as prescribed by the TIS value as prescribed by the laser diffraction practices size analyser and sieve analysis. Paving blocks were subsequence prepared by mixing the waste mud with ordinary red cement and compared using a hydraulic press. Water was added to the cement mud mix to assist compaction and to strength the blocks by hydration of OPC. Effects of water and cement content, immersion in water as well as compaction pressure on compressive strength were subsequence studied. Increasing compaction pressure and also immersion in water for 5min every 24h were found to exchange and thus compressive strength of the samples. The block containing 15 wt.% cement required a long cuing period of up to 28 days for their compressive strength to reach the standard requirement while the compressive strength of the blocks containing 25-30 wt.% cement exceed the standard requirement after curing for only 7 days

1.1 General objectives of soil cement blocks

Soil cement blocks are cost effective and energy efficient alternative buildings to the normal burnt clay bricks used for construction of buildings. Soil cement blocks are also known as stabilized mud blocks (SMB) or stabilized compressed earth blocks (SCEB).

White cement is the most usual stabilized added 5 to 10% by weight to the soil. Other stabilized like lime, puzzolana or a combination of cement and lime are also used.

Soil cement blocks being usually 2 ½ times largest in sized the normal burnt clay bricks, the construction is faster and the joints are consequence reduced. The less number of soils also cutting down the amount of mortar required for its manufacturing.

While in general buildings construction, soil cement blocks may be used as substituted saving burnt clay bricks, their use should be avoided in the isolated load bearing coloums.

Housing is one of the three basic necessities of human life. Demand for housing is always far exceed the supply. There is bound to be bound to be good scope for projects of this nature.

Soil cement blocks are the ideal construction materials for low cost housing projects undertaken by the government under various housing schemes for upbringing of the common man. A number of government agencies are promoting the usage of these alternative buildings materials in the construction activities.

Sand and crushed stone dust may be added to the soil depending on the type of soil. Lime and puzzolana cement and lime are also used as soil stabilized.

A semi permeable pavement was built with a coating layer of soil cement blocks made of construction debris (stabilized with 30% sand) and cements (20% of the mix) and manufacture with a press. This type of blocks does not rely on addition studies dealing with changes in the machines properties over time: so, for these studies, a certain number of blocks were selected (2) to measure the machine properties (durability, water adsorption and simple compressive strength). The results showed no changes in the blocks absorption and durability properties after. The compressed strength slightly increases of 40 mph

Red soil

METHODOLOGY

A soil contains four components: gravel, sand, and clay in concrete, the binder of gravel and sand is cement. In a soil the binder is silt and clay in concrete are not stable in water. Thus the aim stabilized is to stabilization the silt and clay against the water, so to give lasting properties with the minimum of maintance.

The great soil of impact cause mineral production has forced mining and ornamental stone industrial to acquir new concepts and technical solution in order to develop eco-friendly and sustainable activities. In this context, this work aims to study the durability of soil cement blocks with the incorporation of limestone residues forum the processing of marbles an ornamental stone. Specimens were prepared with 30% of restudies added to the soil cement blocks mixture and analysed for their physical, chemical amnd mineralogical properties. After the curing period, the specimens were subjected to mechanical analysis and the established experimental program showed that the addition of resides in the mixture becomes for the preparation of soil cement blocks.

The as collected residues were in the form of mud and had to be naturally dry outdoors temperature for 7 days in order to eliminated the exceeds of moisture. The dry mud has further beneficiated by sieve to 1.18 mm the production of soil cement blocks choice was due to desirable characterised regarding the initial fast resistance gain with time, which allowed a better transportation logistics of the block after moulding to carry out the testes.

Initially the marble processing limestone resides was physically characterised by specific loss of mass, particle size and atterbeg boundaries. It was also chemically characterised by equipment.

The methodology is used to perform the acceleration test (durability by wetting and drying) was based on the brazilin test standard other tests were performed to better evaluation there degradation parameters, the water absorption determination and the simple compression resistance the water absorption testers and 6 units where compressed

3. CONCLUSION

The dynamic behaviour can be found from shake table test by constructing reduced scale model of real buildings. To construct the model materials like building blocks should be reduced to scale. The review conducted emphasizes on the advantages of using CSEB for better living. As it promotes healthier building material and is cost reducing not only in production but also in service cost. From the above literature review, a number of conclusions can be made. A lot of research has been done on earth based technologies in dry-arid regions. The review shows that earth technologies like adobe, rammed earth and wattle daub have been successful in hot climates. And also shows that when the same earth blocks are stabilized, they behave better in humid climates as compared to other technologies. But still some research needs to be done to increase the mechanical strength of the blocks. The literature review shows that when the soil is stabilized with cement, lime, micro silica. It increases the strength of the blocks to some extent. Though the properties of the CSEB masonry are well known, information regarding its dynamic behaviour is scant. The seismic behaviour analysis of various types of CSEB masonry building was not carried out by experimentally so far

ACKNOWLEDGEMENT

The authors can acknowledge any M.Prudhvi Raj(Assistant Professor) civil Engineering Department

REFERENCES

1. Minimizing the cement required of stabilizing soil cement walling
2. Author:-Mr D E Montgomery and Dr T H Thomas march 2001
3. Sustainable building technologies B.V. Venkata ramana reddy
Department of civil engineering and Centre for sustainable technologies Indian institute of science, Bangalore
4. Chasten, F.N., “soil cement progress in Austria”, the Indian concrete journal 26 (12) December 1952