

Alternative Building Material for Risk Reduction

Sourabh S Patil¹, Nilkesh S Thakare²

^{1,2}MBA-PCM, MIT ADT University, Pune, Maharashtra, India-412201

Abstract— This research provides detailed technical information on suitable earth construction such as stabilized earth blocks production. These include information on suitable soil types for stabilized earth house construction, stabilizers and production of stabilized earth blocks. Related literatures review show that soil types, proportions between soil and stabilizer amount and compaction pressure applied to the moist soil mix affects the quality of the stabilized earth block. Tests were conducted on these samples in order to evaluate their performance such as compressive strength, total water absorption & split test on which the durability of the blocks depend.

Keywords— Stabilized earth blocks, compressive strength.

I. INTRODUCTION

There is a huge variety of alternative construction materials and methods used in the world. Soil is one of the most basic construction material, other than timber or stone. Soil can be used to make shelters and can be recycled back. Soil is suitable for all environmental conditions, and it is a best passive air-conditioning system. Use of soil as a building material can reduce energy usage, harmful environmental impacts. Mud houses are widely used throughout the world.

II. OBJECTIVES

1. To explore local soils to identify their suitability in stabilized earth block production.
2. To build awareness in the community about stabilized earth block production technique as a tool for adequate and affordable house construction.
3. To meet up the economic requirements of the current situation by reducing dependence on outside sources and ensuring low cost alternatives.

III. TEST PROCEDURE AND RESULTS

Production process of samples

The composition of sample is prepared based on volume ratio of each material as given below.

1. 6% cement + 94% soils (3 samples)
2. 8gm coir fiber +6% cement + 94% soils (3 samples)
3. 13gm coir fiber + 6% cements + 94 % soils (3 samples)
4. 17gm coir fiber + 6% cement +94% soils (3 samples)



Water Absorption Test

Immerse the specimens in a single layer tank after weighing so that water can circulate freely on all sides and bottom of the sample. Leave a space of about 10 mm between adjacent samples in the tank.

Remove the specimens after 24 hours, wipe off the surface water while shaking lightly with a damp cloth and reweight each specimen.

Types of sample	Dry mass (kg)	Wet mass (kg)	Water absorption (%)
1	5.355	5.380	0.4
2	5.29	5.400	2.07
3	5.06	5.22	3.02
4	5.250	5.285	3.5

Compressive Strength Test



Based on the results obtained in this test, it was found that the three block samples have compressive strengths greater than the recommended value of the British Standard of 2.80 N/mm² (MPa).

IV. OTHER RECOMMENDATIONS

- Suitable soil which is used for stabilized earth block creation selection using laboratory tests may be costly for small-scale production. Simple field test methods should be produced and be made available.
- Stabilized earth block manufacture technology is not common in India. This technology opens ways for small-scale businesspersons who do not require high investments and skills. The accessory which is used in earth block production can be synthesized in local work shop by small business groups
- Promoting stabilized earth block through publicizing, so that many people could have better information about this technology.

V. CONCLUSION

Production of stabilized soil block using cement and coir fiber as a stabilizer satisfies a number of objectives which are necessary to attain a durable structure from locally available soil. Some of these are: better mechanical property, and better cohesion between particles (reducing porosity which reduces changes in volume due to moisture alterations).

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