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Mud Architecture

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Abstract-The purpose of writing this paper is to understand the viability of a material like mud in contemporary time, as I had a question that is it viable to think that mud is contemporary material or not, it was the only available building material in the history, Even today it is available in many areas of world and people do build their dwelling using it, but when the modern materials were introduced such as reinforced concrete, steel, and bricks. These materials triumphed over it. Keeping the question in mind, I decided to investigate mud wall construction techniques. To explore the idea, I have gone through different books and articles. So keeping it in mind, I decided to comparative analysis of mud wall construction techniques and some perception.

Keywords: Mud Architecture, Rammed Earth, COB, Compressed Earth Blocks.

INTRODUCTION

Mud has been the most essential building material since the dawn of time. Nature is an example and always inspires human beings. Even though Laurie Baker an Indian architect mentioned in his book that, people think that they can only built a satisfactory house using modern material. So I decided to explore mud as contemporary material and mud architecture in order to understand the wall construction techniques of it. Mud is the only one material fulfills all the criteria to near perfection which is healthy, durable, low energy consumption, nature and low environmental impact for mining, transportation and construction.

Construction of wall in mud brick was economical and relatively technically uncomplicated, and mud brick architecture provided a more comfortable and adaptable living and working space. Better interior climate control given by mud brick structure. Mud brick was fast and easy to built, as a modular and regular construction material.

Rammed Earth: this method of construction is the development of cob wall in order to standardize the thickness of the wall; this is an attempt to increase the strength of the wall by ramming it.

Cob: It is the one of and the oldest construction technique; it has been used since throughout history. It makes use of sand, clay, and straw**.** Large lumps of mud mould it into the shape of huge eggs. (30-40cm long and about 15cm in diameter). This technique is also applied in many rural areas of Pakistan even today

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Compressed Earth Blocks: The compressed earth block is the modern descendent of the molded earth block, more commonly known as the adobe block. The idea of compacting earth to improve the quality and performance of molded earth blocks.

COMPARATIVE ANALISIS OF THE MUD WALL CONSTRUCTION TECHNIQUES



COMPOSITE **COB** **RAMMED**

Wall construction techniques	**speed**	**Skills and numbers**	**Ease of construction**	**Aesthetic and finish**	**Maintenance and renders**
Rammed earth	The technique requires 4-5 days	Moderately skilled and unskilled. 2-skilled 5-unskilled	Formwork required	Straight and smooth finish	Easy to maintain as the surface smooth and even
Cob construction	Layers casted only after a week	Highly skilled and unskilled 1-skilled 4-unskilled	No formwork	Rough and uneven even after compaction	Rough texture make it difficult for maintenance
Composite and mud construction	Layers casted only after a week	Moderately skilled and unskilled 1-skilled 4-unskilled	No formwork	Rough and Patchy finish	Patchy surface make it look untidy if not painted. but straight

SOME OF PERCEPTIONS

S.NO	**ISSUES**	**PEOPLE PERCEPTIONS**	**FACTS**	
1	**STRANGTH**	Mud houses are not strong Mud houses always developed cracks and other structural problems.	Mud houses are strong and gain strength over passage of time. They have been durable and have lasted over centuries. Cracks and other structural problems happen due to unskilled labour, or improper soil type or the mixing and compaction. recently stabilized earth has reduced these possibilities	 **Tabo monastery, India 996 AD The oldest existing mud building in India.**

2	**FINISHES**	Mud houses do not give good finish. Mud houses always have a tiled roof Mud need to be plastered with cowdung	The finish varies depending on the skill and technique employed. the finish can range from rough to a very smooth and leveled surface. with compressed earth block the finishes are comparable to that of normal brick Mud can be roofed with either tile mud or any other material such concrete slabs, wood etc. if mud is used in rainy areas its needs to be well shielded from rains. Mud need not to be plastered with cowdung. Mud can be plastered with any of the finishing renders available in the market ranging from transparent sealants, cement lime, paint to mud plaster.	 **A window opening in modern rammed earth house in Australia**  **Adobe house built in India**
3	**MAINTAINANCE**	Mud needs a lot of maintenance Mud houses always have to be protected annually with 'zhod' Mud id heaven for all creepy crawlies Mud houses have to be protected from rain water	Mud houses need to be protected against the weathering agents, especially water. if properly plastered and rendered earth barely needs any maintenance. Mud houses do not always have 'zhod'. the palm leaf shield is hung on the mud wall which are exposed to the rains. the roofs need to be properly planned such that wall is directly exposed to the splashing rains or they have to be coated with waterproof layer of plaster. Cracks can be avoided. they can be filled in required. Termites and other insects attacking the wall can be kept away by termite proofing or plastering the wall mud wall have to be protected from rain water. the roof and base should be kept free from running water. wall needs to be have sufficient overhang and needs to be plastered.	 **Rammed earth construction in Canada**

4	**HEALTH**	Mud houses are cool and maintain pleasant Temperature. they are healthier	Mud has thicker wall. it is a breathing material. It acts as a good insulator. hence the interior remain cooler when hot outside and maintains some warmth during the cold nights	 **The interior of mud house**
5	**ECONOMY**	Mud houses are cheaper but today nobody is there to built	Mud houses are comparatively cheaper as the material used in form the place. expensive material like cement are not used. however, skill and labor is now dying, hence it is becoming difficult to built in mud.	 **Mud used in combination with other material in a house design in Australia by firm working on stabilized rammed earth**

CONCLUSION

Mud is material that was used throughout the world. Mud techniques exist in different parts of the world, and are often known by varying names. The type of soil determines the kind of technique used.

Mud is a viable and cost effective material found in abundance. Mud can sustain in the modern society and adapt to the needs of the present generation limitation of mud can be overcome by using composite materials.

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