

CASTING AND EVALUATING THE INTERLOCKING BRICKS USING ORGANIC WASTE MATERIAL.

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Abstract— Bricks are one of the most significant and major material used for all construction purpose. In many countries, Sludge waste especially, textile sludge is a serious problem which risks environment and human health. The textile sludge is used to make the construction bricks that serve as resolve for solid waste management. This paper reviews on the development of interlocking bricks with addition of textile sludge which includes 5%, 10%, 15% and 20% that grossly reduces the utility of clay which is gradually becoming scarce in many parts of the world while improving their strength in comparison in that of conventional bricks. The interlocking mould size that we took for this experiment was 12 X 8.5 X 6. The test parameters include compression strength, water absorption, efflorescence and soundness are studied and tested as per BOI (Bureau of Indian standards). Thus, the utilization of sludge could produce a good quality of bricks making them one of a reliable alternative disposal methods for the sludge which dumped in open lands and also reduces the use of cement while construction in this interlocking brick method. This study analyse the strength of the interlocking bricks when it is mixed with textile sludge.

Keywords: ETP textile sludge.

1. INTRODUCTION

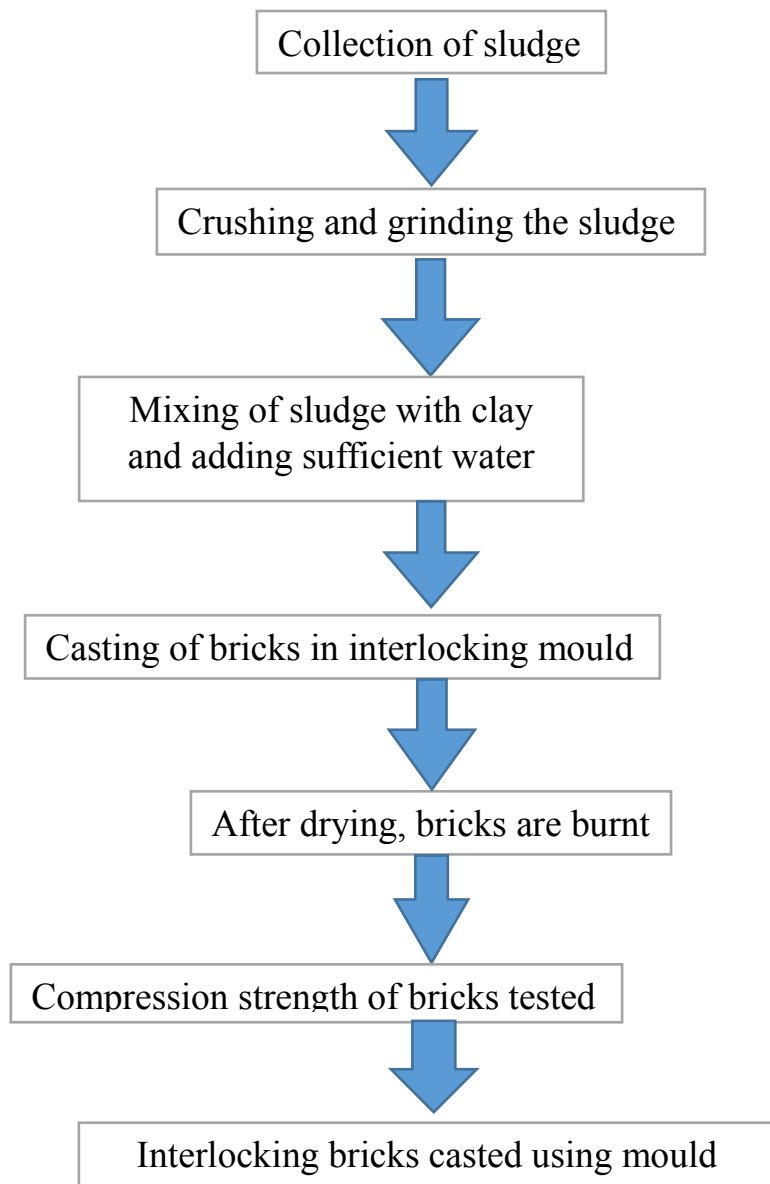
Population scenario comes towards India by means of increasing industries. The fruitful efforts of industries lead to the development of India. As the industries increases, so does the industrial effluents. Recent studies estimate that the amount of industrial waste might amount approximately between 250 and 300 million tons emanating from chemical and agricultural process in India. It is very essential to dispose such wastes in an absolutely safe manner without disturbing the environment and human wellbeing. Build-up of unmanaged wastes particularly in developing countries has endangered their environment. In view of this situation, use of economic and environmental-friendly materials is of a great concern in the construction industry.

The use of recyclable wastes as building materials looks like a viable solution not only to the pollution problem but also benefits the economy in the form of cost-effective buildings.

Several investigators have already attempted to include sludge such as paper processing residues, cigarette butts, fly ash, polystyrene foam, plastic fibre, cotton waste, dried sludge collected from an industrial wastewater treatment plant, rice husk ash, granulated blast furnace slag, rubber, Kraft pulp production residue, limestone dust and wood sawdust, processed waste tea, petroleum effluent treatment plant sludge, welding flux slag and waste paper pulp, Cotton and limestone powder wastes in the use of textile sludge in the process of interlocking production of bricks. In this paper we are investigating the brick manufacture and its strength compared to that of existing conventional bricks. The non-degradable used material was utilized for utility-based product. The efforts have been taken to utilize the powdered textile sludge in conventional burnt clay brick thereby revolutionizing the manufacture of interlocking bricks in the field of construction.



2. METHODOLOGY



The materials for manufacturing of interlocking bricks consists of sludge and clay 1:2 (clay: sludge) by volume. Volume is calculated instead of weight is due to simplicity of manufacturing clay and sludge were mixed together in manual mixer and water was gradually added until having right consistency which ready for moulding.

TABLE:

SLUDGE (%)	SOIL (%)	WATER
5%	95%	NEEDED
10%	85%	NEEDED
15%	75%	NEEDED



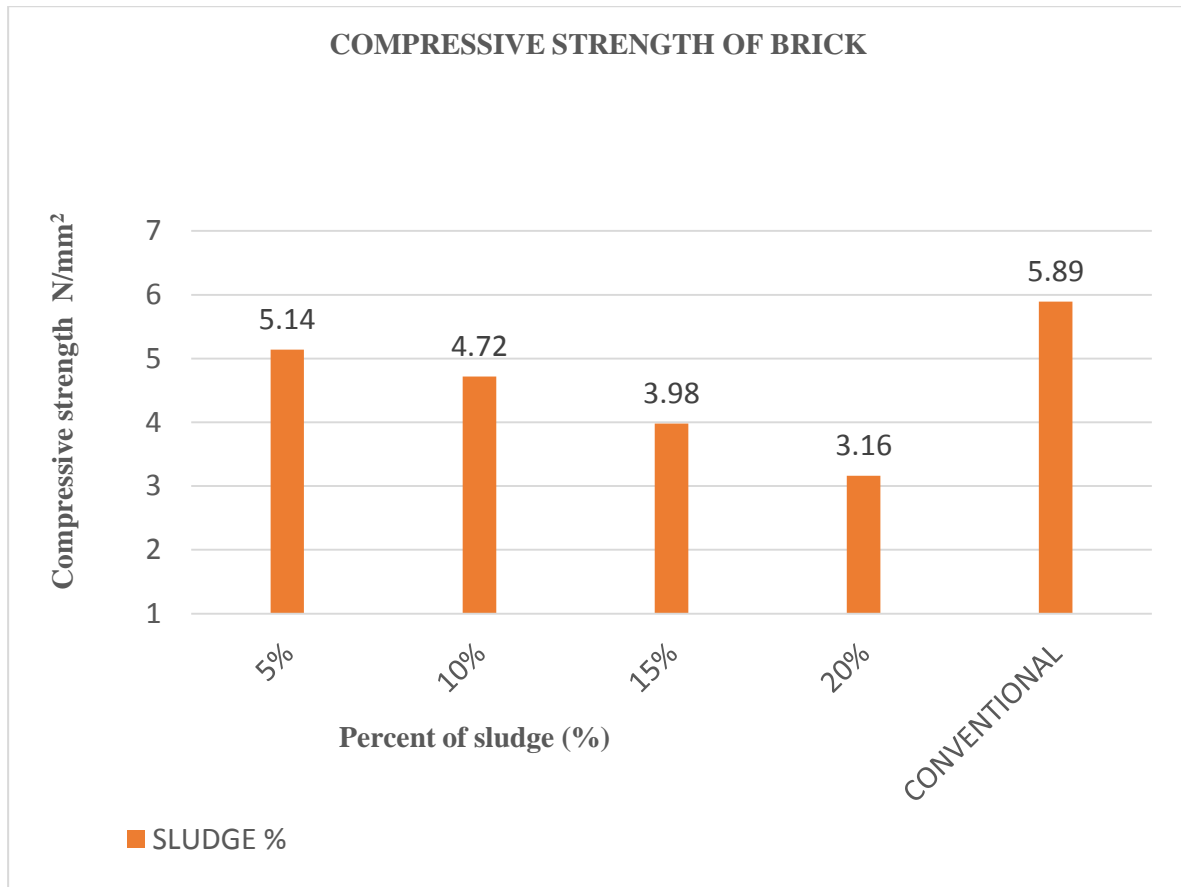
3. RESULTS AND DISCUSSION

In this topic the results from experimental investigation are proffered. The results from the research are used to study and compare the compressive strength of interlocking bricks using sludge.

1. COMPRESSIVE STRENGTH :

S.NO	BRICK NAME	SLUDGE (%)	COMPRESSIVE STRENGTH (N/mm ²)
1	1	5 %	5.14
2	2	10%	4.72
3	3	15%	3.98
4	4	20%	3.16

CONVENTIONAL BRICK = 5.89 N/mm²



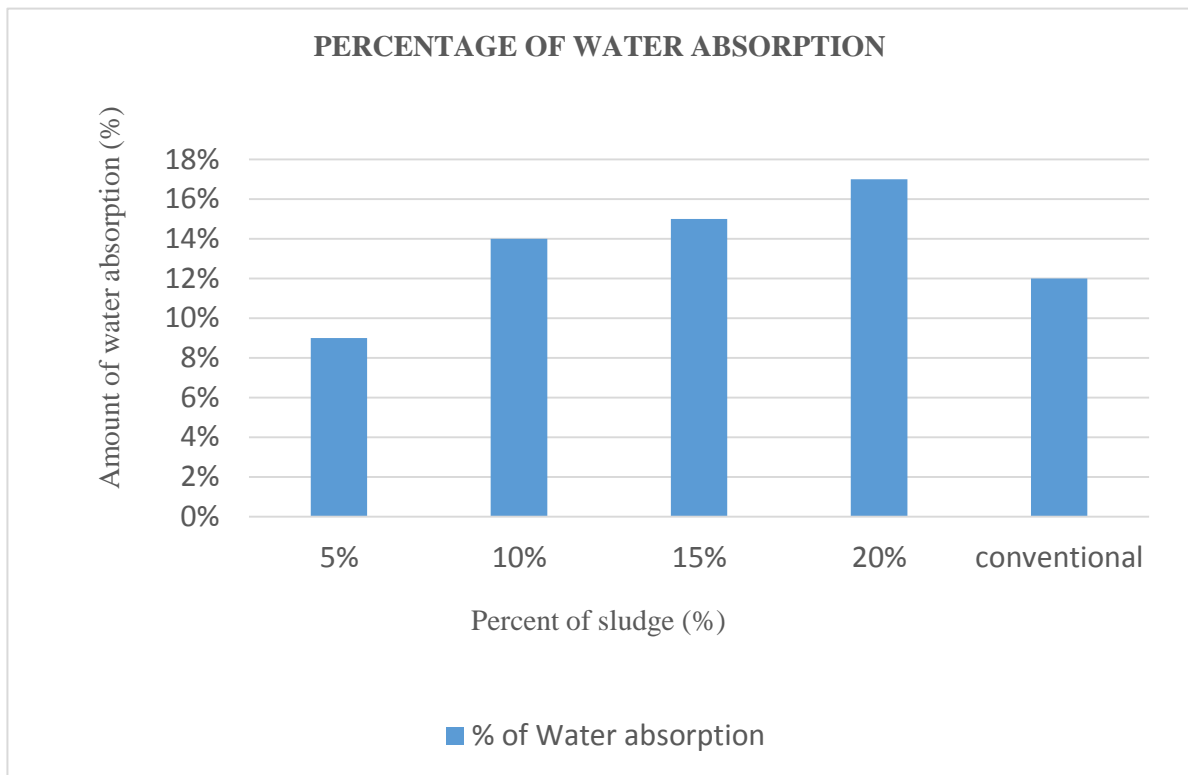
3.1.1 Discussion on Result:

- The interlocking bricks shows best outcomes when compared to conventional bricks and also with other percentages of sludge. In 20%, it possess low compressive strength.
- As the strength should not less than 3.50N/mm², the average compressive strength for interlocking bricks having 15% of sludge about 3.98 is grasps.

2. WATER ABSORPTION :

S.NO	PERCENTAGE OF SUDGE (%)	WEIGHT BEFORE TEST(kg)	WEIGHT AFTER TEST(kg)	WATER ABSORPTION(%)
1	5%	2.96	3.24	9%
2	10%	2.94	3.37	14%
3	15%	2.87	3.30	15%
4	20%	2.74	3.28	17%

CONVENTIONAL BRICK = 12%



3.2.1 Discussion on Result:

- As water absorption should not exceed 20% in normal, 15% of water absorption can be laid off in 15% of sludge is considerable.
- Conventional bricks own less water absorption when compared to 15% of textile sludge in interlocking bricks.

3.EFFLORESCENCE TEST ON BRICK :

- RESULT – NO EFFLORESCENCE.

4.SIZE AND SHAPE :

- WITHIN STANDARD LIMITS.

5.SOUND TEST:

- CLEAR BELL RINGING SOUND AND BRICK DOESNT BROKE.

OPTIMUM SLUDGE PERCENTAGE CAN BE USED FOR CONSTRUCTION – 15%

5. CONCLUSION

This study thus concludes that the objectives have been adequately met ensuring that the revolutionary idea of interlocking bricks incorporating textile sludge will succeed in producing environment safe cost effective bricks for the purpose of modernized and innovative constructions as some percent of sludge material is added with clay.

1. The experimental work has been devoted to evaluate the compressive strength and water absorption, when ETP textile sludge were added in clay while casting. The following are the conclusions drawn from the investigation.

2. The average compressive strength for interlocking bricks having 15% of sludge shows greater results when compared to conventional bricks and other percentages.

3. The percentage of water absorption for interlocking bricks having 15% of sludge achieved when compared to other percentage with conventional bricks.

4. From our theoretical study, we include the ETP textile sludge in making interlocking bricks will be effective.

5. It is both economic and environmental concern where clay and cement can be reduced while casting and construction respectively.

6. And further addition of sludge will directly reduce the strength was also studied.

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