

Table 5: Water Absorption Test Results at Varying River Sand Replacement

River Sand (%)	Sample number	Initial Wt. of Specimen W_1 (g)	Final Wt. of Specimen W_2 (g)	% Water Absorption	Average. % Water Absorption
0	A	2498	2813	12.61	11.94
	B	2546	2833	11.27	
5	A	2323	2553	9.91	9.97
	B	2453	2699	10.02	
10	A	2450	2772	13.14	13.45
	B	2472	2812	13.75	
15	A	2350	2675	13.83	13.91
	B	2395	2730	13.99	
20	A	2458	2804	14.08	14.50
	B	2401	2759	14.91	
25	A	2505	2878	14.89	14.79
	B	2485	2850	14.69	

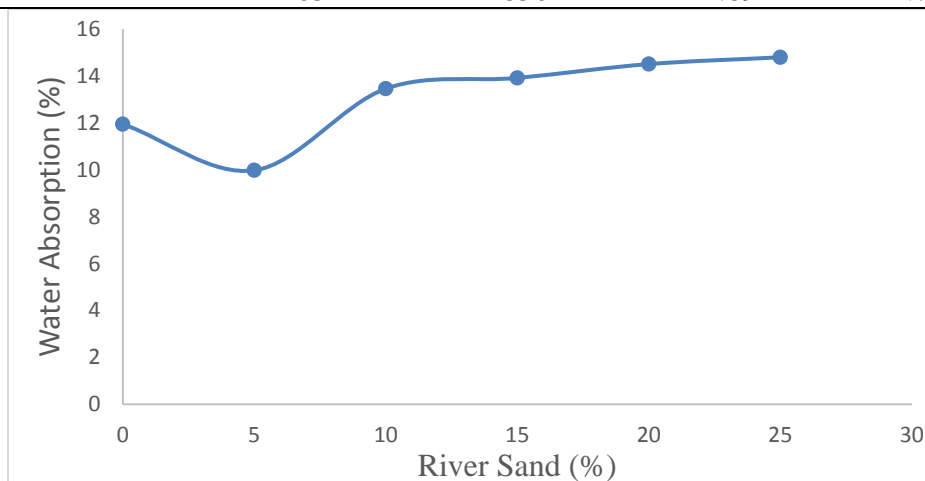


Figure 3: Water Absorption of Clay Burnt Bricks Replaced with River Sand

3.3 Compressive Strength

Table 6 and Figure 4 show the compressive strength result. The compressive strength results ranges from 2.94 and 5.76 N/mm². It can be seen that the value of the compressive strength increase from 5.11 at 0% replacement to a value of 5.76 N/mm² at 5 % river sand replacement. After the increment, a steady decrease was observed in the compressive strength as the percentage replacement of river sand increases in the brick produced.

Table 6: Results of Compressive Strength Test

River Sand (%)	Average Mass (kg)	Average Crushing load (KN)	Specimen Area (mm ²)	Compressive Strength (N/mm ²)
0	2.37	113.2	22145	5.11
5	2.42	127.6	22145	5.76
10	2.43	103.6	22145	4.68
15	2.48	91.2	22145	4.12
20	2.49	79.4	22145	3.59
25	2.51	65.0	22145	2.94

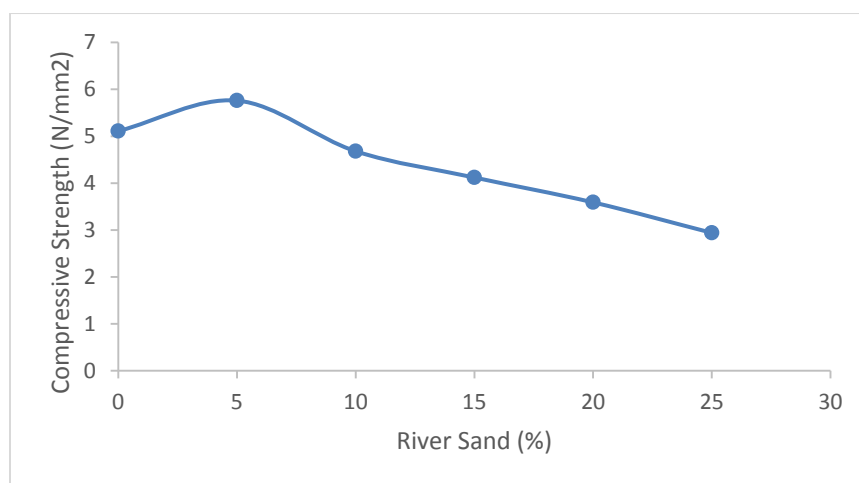


Figure 4: Compressive Strength of Burnt Clay Bricks Doped with River Sand

The compressive strength of all the clay burnt bricks produced exceed the minimum strength specified by Nigerian Industrial Standard (NIS) 87:2004 which is 2.8 N/mm² for the construction of low-rise buildings like residential houses.

4.0 CONCLUSION

The replacement of burnt clay bricks with river sand at varying ratio has been carried out in this research. The various preliminary tests performed show satisfactory results. The experimental test which includes the density, water absorption capacity and the compressive test carried out shows that at 5% river sand replacement; the density increase with increase in sand content but gave the least value in water absorption capacity. Also, for the compressive test carried out, the samples at 5% river sand replacement gave the maximum compressive strength. It can therefore be established that 5% river sand replacement with clay gives the best possible outcome in the production of fired clay bricks.

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