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Partial Use of Bakelite Powder in Concrete Structures as an Alternative to Natural Sand

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***Abstract:** As we know that construction is a very important and basic part of development. In todays scenario every developed or developing are more focused in developing their infrastructure , which should be aesthetically beautiful, durable ,last but but not least Economical also. Specially in India which is a developing nation is going through lots of infrastructure development needs a durable and also economical construction materials specially sand, cement and concrete.so in this project more focus is on making the construction more cheaper and affordable to all the classes of society.so in this we have used Bakelite powder as adultrent in concrete to check its effect on its durability and effectiveness.as Bakelite is a thermoplastic material. It can not be reused to manufacture a modern products, so therefore it is either dumped or burnt both are which are harmful to the environment. As we have seen that influence of water on Bakelite best determined by oxidisabilty of the material and presence of phenol in water, so as if Bakelite powder is dumped in water it causes very serious sewage problem, so using Bakelite partial in place of sand may be a another way of treating problem of both construction and disposal of Bakelite. We have encountered problems in digging sand illegally like dregeing the sand from river beds and lakes which causing the thinning of rivers and lakes, this also leads to various environmental problems .*

***Keywords:** Concrete, Bakelite Powder, Thermoplastic, Adultrent.*

I. INTRODUCTION

Construction is the most important a part of normal life. It calls for all of the production fabric which specifically encompass cement and sand. Cement provides the basic energy to the building. The manufacturing of cement is a main trouble as it includes pollution on a huge degree as well as value of construction additionally increases. This cement may be changed by way of a production fabric known as fly ash. Sand provide bulk, strength and other houses to the building. Sand could be a granular fabric composed of finely separated shake and mineral flotsam and jetsam. It is characterized by utilizing period, being better than rock and coarser than sediment. . The composition of sand shifts, depending on the nearby shake property and conditions, be that as it may the most extreme commonplace constituent of sand in inland mainland settings and non- tropical coastal settings is silica (silicon dioxide, or SiO2), regularly within the shape of quartz.

II. HISTORY AND PROPERTIES OF MATERIALS

All through records, cementing fabric have completed a fundamental work and have been utilized broadly in old universal. The Egyptians utilized calcined gypsum as a cement and the Greeks and Romans utilized limestone and conveyed sand to form, mortar, with coarser stones for concrete. The romans situated that a cement may be made which set underneath water and this changed into utilized for the development of harbors . This cement have ended up made with the valuable asset of counting beaten volcanic fiery remains to lime and altered into afterward alluded to as a “pozzolanic” cement, named after the town of Pozzuli near to Vesuvius. In areas wherein volcanic ash dumped into rare, along with Britain, beaten brick or tile altered into utilized as an opportunity.

The romans were in this manner likely the number one to control methodicallly the homes of cementious materials for special application and conditions. Joseph Aspin took out obvious in 1824 for “Portland Cement”.

III. OBJECTIVES

1) To find alternative building material.
2) To find strength of concrete blocks at various proportions of Bakelite powder.
3) To reduce the dumping problem of Bakelite Powder.

IV. METHODOLOGY

1.	Collection of materials	Cement,Sand,Aggregate, Bakelite powder.
2.	Prepration of modified Concrete	Mixing of above materials at different proportions of Bakelite powder.
3.	Testing of prepared concrete in cubes of size 15*15*15cm3.	1.checking of compressive strength, Finess test.
4.	Comparing the modified concrete specimen with the standard specimen by comparing their compressive strength	

A. Materials

1) Cement
2) Sand
3) Bakelite powder- Bakelite powder of synthetic resins, it is produced by reaction between phenol and formaldehyde.
4) Coarse aggregates

V. TESTS-

A. Tests For Aggregates

1) Crushing test
2) Impact test
3) Water absorbtion test

B. Test For Cement

1) Finess test
2) Setting Time

C. Test For Concrete

1) Slump test
2) Compressive strength test

VI. RESULT

A. Finenss Test

Sieve size -90micron (IS-9 number) According to IS-4031-1996.
Average finess comes out to be 3%

B. Compressive Strength

Increment of strength ranges from 25.2Mpa to 27.4Mpa upto 15% of Bakelite, further increasing its proportion causes declining of its strength.

Sr.No	Bakelite powder in different proportion of Sand (in grams).	Strength obtained in(Mpa)
1.	0%	25.2
2.	5%	25.8
3.	10%	26.5
4.	15%	27.4
5.	20%	26.2
6.	30%	24.9

VII. CONCLUSION

A. It is clear from the above results that by the replacement of the natural sand with bakelite powder in the concrete mixture the compressive strength of the concrete increases.

B. The compressive strength of the concrete increases from 25.2Mpa to a maximum compressive strength of 27.4Mpa at the 15% replacement of natural sand with bakelite powder.

C. At 20% replacement of natural sand with bakelite powder the compressive strength of the concrete decreases but it is still better from the normal M25 concrete with 0% replacement, but at 30% replacement the compressive strength 9f the concrete is below 25Mpa so we can replace the sand with bakelite powder to an extent of 20% only.

D. The range of replacement of natural sand with bakelite powder should be between 5% to 20% in which maximum compressive strength is obtained at 15% replacement.

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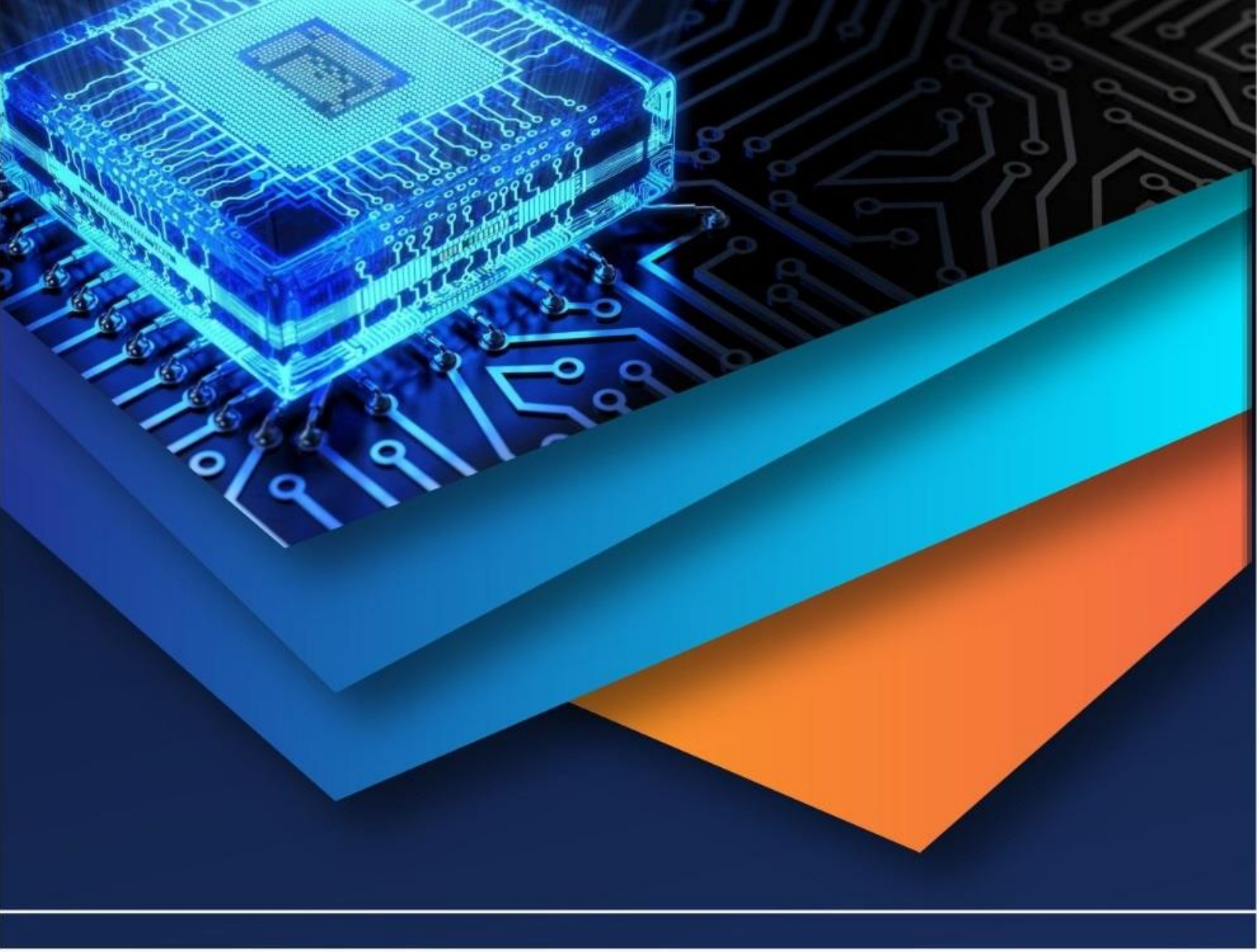

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