

**STUDY ON FLEXIBLE PAVEMENT ADDED WITH CERAMIC WASTE IN SUB BASE LAYER**

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**ABSTRACT:**

Disposal of waste ceramic tile is a huge problem. Increasing the waste ceramic waste may causes many environmental issues. In order to avoid such environmental issues, we can reuse this broken waste ceramic material in construction field itself. This paper is Makes an approach to the road construction activity to become green, durable, hard and highly resistant to biological, chemical and physical degradation forces and to reduce dumping of ceramic waste and there by pollution

**Keywords:**

Ceramic waste, durable, environmental issues, pollution.

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**1.INTRODUCTION**

Waste ceramic tiles from construction field is increasing day by day. The disposal of these ceramic waste is a main problem. It cause many environmental issues. To avoid such issues we can reuse these waste ceramic tile Here we study on flexible pavement added with ceramic waste in sub base layer. Though this we can give a solution to disposal of waste ceramic tile. The main objective of this study is to evaluate the suitability of ceramic waste as a flexible pavement material in sub base layer, to find the optimum ceramic waste content to be added in the sub base layer, to compare conventional sub base layer and ceramic added sub base layer and to study the construction cost effectiveness.

**2.AIM**

To study the effects on flexible pavement added with ceramic waste in sub base layer

**3.MATERIAL USED**

- **Natural aggregate**
  - **Properties**
  - Hard
  - Durable
  - Tough
  - Good thermal resistance
  - Resistance to bio-degradation
- **Ceramic tile waste**
  - Collected from Lakshmi Marbles, Paravur
  - **Properties**
  - Hard
  - Durable
  - Good thermal resistance
  - Resistance to bio-degradation



Fig 3.1

**4.METHODOLOGY****4.1 Tests for physical properties of natural and ceramic aggregates**

- a.aggregate impact test
- b.aggregate crushing value test
- c.los angles abrasion test
- d.specific gravity
- e.water absorption

**4.2 Tests for aggregates with added various percentages of waste ceramic material**

- a.aggregate impact test
- b.aggregate crushing value test
- c.los angles abrasion test
- d.california bearing ratio

**4.3 Percentage selected : 2.5%,5%,7.5%,10%,12.5%**

a.Aggregate Impact Test for aggregates added with various percentage of waste ceramic material

- Aggregates + 0% of waste ceramic
- Aggregates + 2.5% of waste ceramic
- Aggregates + 5% of waste ceramic
- Aggregates + 7.5% of waste ceramic
- Aggregates + 10 % of waste ceramic
- Aggregates + 12.5% of waste ceramic

**5.RESULTS****5.1 Properties of natural aggregate**

Property	Result	inference
Impact value (%)	22	Satisfactory for road surfacing. Can be used for WBM sub base course,WBM base course,cement concrete base course,WBM surfacing course etc.
Abrasion value(%)	30	Can be used for WBM subbase course,WBM base course with bituminous surfacing etc.

Table 5.1

**5.2 Properties of natural aggregate**

property	result	inference
Crushing value(%)	28	Can be used for soling,WBM in flexible pavement and can be used for other than wearing course ,wearing courses in rigid pavement
Water absorption(%)	0.9	Can be used in pavement construction

*Table 5.2***5.3 Properties of ceramic aggregate**

property	result	inference
Impact value(%)	18	Strong. Can be used for WBM sub base course,WBM base course,cement concrete base course,WBM surfacing course etc.
Abrasion value(%)	29	Can be used for WBM sub base course,WBM base course with bituminous surfacing

*Table 5.3***5.4 Properties of ceramic aggregate**

property	result	inference
Crushing value(%)	40	Can be used for soling,WBM, Bituminous macadam in flexible pavement and can be used for other than wearing course in rigid pavement
Water absorption(%)	17	Can be used in pavement construction

*Table 5.4***5.5 Effect of ceramic waste in impact value of aggregates with various Percentages**

% of ceramic aggregates	Impact value
0	21.49
2.5	20.8
5	15.74
7.5	15.5
10	22.7
12.5	19.5

*Table 5.5*

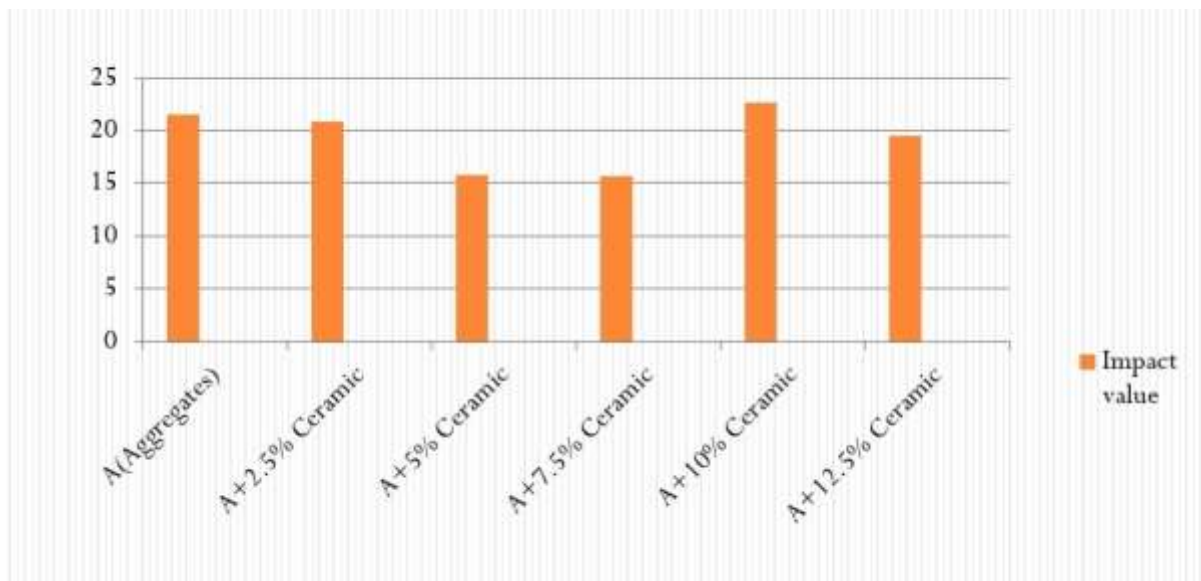


fig 5.1 Impact value with various percentages of waste ceramic aggregates

## 6.CONCLUSION

For natural aggregate impact value 22 % is satisfactory for road construction ,abrasion value 30% Can be used for WBM subbase course,WBM base course with bituminous surfacing etc.crushing value 28% Can be used for soling,WBM in flexible pavement and can be used for other than wearing course ,wearing courses in rigid pavement and water absorption 0.9 can be used in pavement construction. For ceramic aggregate impact value 18% Can be used for WBM sub base course,WBM base course,cement concrete base course,WBM surfacing course etc, abrasion value29% Can be used for WBM sub base course,WBM base course with bituminous surfacing , crushing value 40% Can be used for soling,WBM, Bituminous macadam in flexible pavement and can be used for other than wearing course in rigid pavement and water absorption 17% can be used in pavement construction.

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