

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE

(A Govt. Aided UGC Autonomous & NAAC Accredited Institute Affiliated to RGPV, Bhopal)

Gwalior, Madhya Pradesh - 474005



A SKILL BASED MINI-PROJECT REPORT
ON

“OPTIMIZING OF THE PROPORTION OF RECYCLED BRICK AGGREGATES IN CONVENTIONAL AGGREGATES BASED ON THE ABRASION VALUE CRITERIA”

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CERTIFICATE

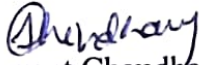


Madhav Institute of Technology & Science
Gwalior

This is to certify that the skill based mini project entitled " **optimizing of the proportion of recycled brick aggregates in conventional aggregates based on the abrasion value criteria** " presented by the students of group- in incomplete satisfaction of the necessity of the recompense of Bachelor of Technology degree in Civil Engineering at Madhav Institute of Technology & Science, Gwalior is a genuine work completed by the students under my watch and direction.

To the best of my insight, the matter epitomized in the theory has not been submitted to any other college/Institute for the recompense of any Degree or Diploma

Under the Guidance of-


Guide Name – Prof. Jayvant Chaudhary
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ACKNOWLEDGEMENT

It offers us a great pleasure to thank and offer appreciation to each and every one of those people who have specifically or by implication helped us through the course of this study. This undertaking would have never been finished without the commitment of those individuals.

Unfortunately, the long list of acknowledgement, regardless of how extensive is constantly fragmented and lacking. To be sure this page of notice should never have the capacity to touch the generousness of the individuals who tendered their assistance to us.

As a matter of first importance I wish to express my profound feeling of appreciation and obligation to **Prof. Jayvant Chaudhary**, Department of Civil Engineering – MITS, Gwalior for appointing me the undertaking "**optimizing of the proportion of recycled brick aggregates in conventional aggregates based on the abrasion value criteria**" and for his motivating direction, helpful feedback and significant proposal all through this venture. We also want to extend our appreciation to every one of our companions and senior understudies who have constantly empowered and bolstered us in doing this work. We want to thank all the individuals from Department of Civil Engineering who have dependably been agreeable with us.

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2. Objectives of Study
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MAIN BODY

1. Introduction :- Reuse of construction and demolition (C&D) waste as aggregates is becoming increasingly popular for a number of environmental and economic reasons. The purpose of this paper is to explore this topic. Design/methodology/approach - In this study, structural- and pavement-grade port land cement concrete (PCC) mixtures were developed using crushed recycled brick masonry from a demolition site as a replacement for conventional coarse aggregate. Prior to developing concrete mixtures, testing was performed to determine properties of whole clay brick and tile, as well as the crushed recycled brick masonry aggregate (RBMA), and a database of material properties was developed. Findings - Concrete mixtures exhibiting acceptable workability and other fresh concrete properties were obtained, and tests were performed to assess mechanical properties and durability performance of the hardened concrete. Results indicated that recycled brick masonry aggregate concrete (RBMAC) mixtures can exhibit mechanical properties comparable to that of structural- and pavement-grade PCC containing conventional coarse aggregates.

2. Objectives of Study :- In this study, brick masonry from demolition waste was crushed and graded to be used as a recycled aggregate in port land cement concrete.

feasibility of this potential sustainable reuse application. The objectives of this work were to characterize the components of the brick masonry wall system at a local demolition site characterize RBMA produced from brick masonry demolition waste develop RBMAC mixture designs that achieve acceptable strengths for use in structural- and pavement-grade

applications; and. assess the mechanical properties and durability performance of RBMAC in a laboratory.

3. Procedure Followed

- 1) The test sample consists of clean aggregate dried in oven at 105°C - 110°C. The sample should conform grading B with abrasive charge of 11.
- 2) Take 5 kg of sample and for first reading no brick aggregate is mixed with stone aggregate.
- 3) Take 2500g sample out off 5000g of aggregate pass from 20 mm sieve and retained on 12.5 mm sieve and 2500g sample out off remaining sample from 5000g passes from 12.5 mm and retained on 10mm sieve.
- 4) Put the sample of 5000g with abrasive charge 11 balls into the abrasion machine, ensure the rotation of 33 rpm of abrasion machine.
- 5) start the machine and set 500 revolutions . After 500 revolutions switch off the button and take out abrasive material from the machine.
- 6) sieve the sample with 1.70mm and note weight of aggregate retained on it as W2.
- 7) followed the same steps above for replacing of aggregate of 20% to 60% , 80%, and 100%.

OBSERVATION TABLE :-

S.No.	Weight of stone aggregate (W1)g	Weight of stone aggregate (W2)g	Brick aggregate mixed (%)	Abrasive value (%)
1	5000	4530	0	9.4
2	5000	3940	20	21.2
3	5000	3565	40	28.7
4	5000	2880	60	42.4
5	5000	2470	80	50.6
6	5000	2120	100	57.6
			Average	34.98

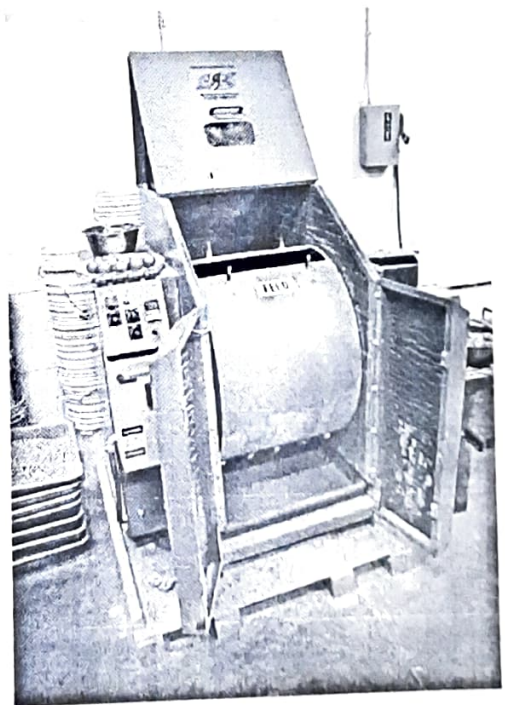
Let the original weight of aggregate = W_1 g

Weight of aggregate retained on 1.70 mm IS sieve after the test = W_2 g

Los in weight due to wear , g = $(W_1 - W_2)$ g

Los Angeles abrasion value, % = percentage wear = $\frac{(W_1 - W_2)}{W_1} \times 100$

Sl. No.	Type of Pavement	Max. permissible abrasion value in %
1	Water bound macadam sub base course	60
2	WBM base course with bituminous surfacing	50
3	Bituminous bound macadam	50
4	WBM surfacing course	40
5	Bituminous penetration macadam	40
6	Bituminous surface dressing, cement concrete surface course	35
7	Bituminous concrete surface course	30



4. Results & Conclusion:-

The replacing of stone aggregate by bricks is well performed only when the total stone aggregate to replaced by 40% then only the desired properties were obtained by through the brick aggregate as well .the brick aggregate is strong in abrasion but we can replace it with aggregate by replacing it with 40% stone aggregate and can minimize the cost of construction by using broken or destroyed bricks.

