

Study on Use of Recycled Aggregates in Pavement Construction

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Abstract— The availability of natural aggregates is get decreased and the demolished building materials is get increased in now a days. These demolished materials can be get recycled and can be used as construction materials in both buildings and pavements. The recycled aggregates can used in the pavement construction. For assessing the suitability of using recycled aggregates in pavement construction three test were conducted. The results obtained from the aggregate crushing test, impact test and specific gravity test are within the desirable limit. From the test result, the recycled aggregates can be used in both base course and the surface course of a pavement.

Keywords — Recycled aggregates, Pavements, Aggregate crushing value, Impact value, Specific gravity

I. INTRODUCTION

Many old buildings were get demolished and new buildings were constructed. The demolished building materials were produce environmental pollution. To avoid that all these demolished waste materials are used as landfills. The demolished construction materials like aggregate, bricks ceramic tiles, steel etc. can be reused as construction materials. Recycled aggregates are used in building construction. In this study recycled aggregates are used as pavement construction material. For constructing a pavement or road mainly used materials are aggregates, bitumen and soil. Desirable properties of road aggregates are its strength, hardness, toughness, durability, shape of aggregate and adhesion with bitumen. In this study properties of aggregates such as strength, toughness and specific gravity of recycled aggregates.

II. EXPERIMENTAL INVESTIGATION

The recycled aggregates were collected from a demolished building. Firstly the collected aggregates were cleaned and get free from clays and other impurities. Mainly three tests were conducted to check the properties of these recycled aggregates. The tests conducted are aggregate crushing test, impact test and specific gravity test.

A. Aggregate crushing test

The strength of the aggregate can be assessed by conducting this test. The aggregate crushing value gives a relative measure of the resistance of an aggregate to crushing under a gradually applied compressive load. Size of recycled aggregates taken for conducting test was between 12.5mm and 10mm. Aggregate crushing value is the percentage of the crushed material passing through 2.36mm sieve in terms of original weight of the sample taken. The crushing value of the taken sample was 24.75%. The crushing value of the sample

below 30% and 40%, therefore the recycled aggregate can be used in both the base course and surface course of a pavement.

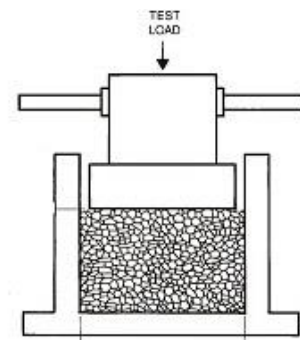


Fig. 1 Test setup for crushing value test

B. Impact test

The property of a material to resist impact is known as toughness. Impact test is done to assess the toughness of the recycled aggregates. For conducting this test also the size of the sample collected was between 12.5mm and 10mm. Aggregate impact value is the percentage of the crushed material passing through 2.36mm sieve in terms of original weight of the sample taken. The impact value of the taken sample was 26%. The obtained impact value of the sample was below 30%. Hence it can be satisfactorily used for road construction.

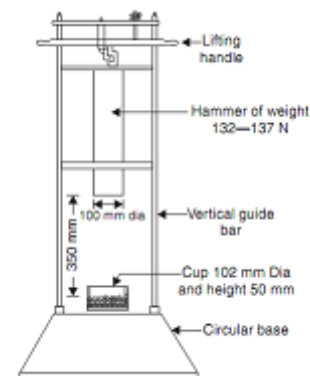


Fig. 2 Impact Test Setup

C. Specific gravity of recycled aggregate

Specific gravity test was done to specify the strength or quality of the aggregate. Specific gravity test was done using wire basket. The specific gravity of the recycled aggregated taken was 2.76. The obtained value was between 2.5 to 3,

therefore the aggregates can be used for pavement construction.

III. CONCLUSION

The experimental results shows that all the three test results are within the desirable limits. Hence the recycled aggregates can be used in pavement construction.

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