<h1 style="text-align:center">Experiment No. 3: AGGREGATE IMPACT TEST</h1>

Aim: To determine the aggregate impact value of the given specimen

Theory and Scope:

Toughness is the property of a material to easiest impact. Due to moving loads the aggregates are subjected to pounding action or impact and there is possibility of stones breaking into smaller pieces. Therefore, a test designed to evaluate the toughness of stones i.e., the resistance of the stones to fracture under repeated impacts may be called Impact test on aggregates. The test can also be carried on cylindrical stone specimen known as Page Impact test. The aggregate Impact test has been standardized by Indian Standard Institution. The aggregate impact test is conducted as per **IS- 2386 Part IV**.

The aggregate Impact value indicates a relative measure of the resistance of aggregate to a sudden shock or an Impact, which in some aggregates differs from its resistance to a slope compressive loading crushing test.

Various agencies have specified the maximum permissible aggregate Impact values for the different types of pavements. IRC has specified the following values:

The maximum allowable aggregate Impact value for water bound Macadam; Sub-Base coarse 50% whereas cement concrete used in base course is 45%. WBM base course with Bitumen surface in should be 40%. Bituminous Macadam base course should have A.I.V of 35%. All the surface courses should possess an A.I.V below 30%.

Apparatus:

- Impact testing machine: The machine consists of a metal base. A detachable cylindrical steel cup of internal diameter 10.2 cm and depth 5 cm. A metal hammer of weight between 13.5 to 14 kg, 10 cm in diameter and 5 cm long. An arrangement for raising the hammer and allow it to fall freely between vertical guides from a height of 38 cm on the test sample in the cup.
- A cylindrical metal measure having 7.5 cm and depth of 5 cm for measuring aggregates.
- A tamping rod of circular cross section, 1cm in diameter and 23cm long, rounded at one end.
- I.S. sieve of sizes 12.5 mm, 10 mm and 2.36 mm.
- Balance of capacity not less than 500 gm to weigh accurate up to 0.01 gm.

Procedure:

1. The test sample consists of aggregates passing 12.5 mm sieve and retained on 10 mm sieve.
2. The aggregates are filled up to about 1/3 full in the cylindrical measure and tamped 25 times with rounded end of the tamping rod.
3. The rest of the cylindrical measure is filled by two layers and each layer being tamped 25 times.
4. The overflow of aggregates in cylindrically measure is cut off by tamping rod using it has a straight edge.
5. Then the entire aggregate sample in a measuring cylinder is weighted nearing to 0.01 gm.
6. The aggregates from the cylindrical measure are carefully transferred into the cup which is firmly mixed in position on the base plate of machine. Then it is tamped 25

times.

7. The hammer is raised until its lower face is 38 cm above the upper surface of aggregates in the cup and allowed to fall freely on the aggregates. The test sample is subjected to a total of 15 such blows each being delivered at an interval of not less than one second. The crushed aggregate is then removed from the cup and the whole of it is sieved on 2.36 mm sieve until no significant amount passes. The fraction passing the sieve is weighed accurate to 0.1gm. Repeat the above steps with other fresh sample.

8. Let the original weight of the sample be W1gm and the weight of fraction passing 2.36 mm I.S sieve be W2 gm. Then aggregate Impact value is expressed as the % of fines formed in terms of the total weight of the sample.
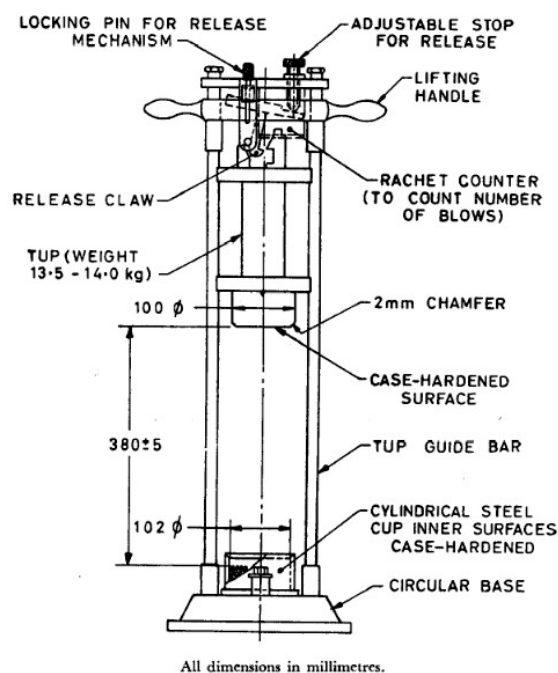
Aggregate Impact Value = (100 * W2/W1) %.

Figure: Aggregate Impact Test Apparatus

Observation and Calculation:

Sl. No.	*Details of sample*	*Trial 1*	*Trial 2*	*Trial 3*	*Average*
1	*Total Weight of aggregate sample filling the cylinder measure = W1 g*				
2	*Weight of aggregate passing 2.36 mm sieve after the test = W2 g*				
3	*Aggregate Impact Value = (W2/W1)*100 %*				

Result: The mean A.I.V is _____ %.