Project Report on

ABRASION CHARACTERISTICS OF RAILWAY BALLAST

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ABSTRACT

Railway ballast is a coarse granular medium (usually hard rock ballast) placed above the sub ballast, below the rails. The rail ballast bed acts as the main foundation above the capping layer and performs many roles for the proper functioning of the railway network. Hence it becomes important to test and study the suitability and stability of ballast. The most important test performed on ballast is the abrasion test. Los Angeles abrasion is the most important among the other tests prescribed by the Indian Railway. The test gives the best result that can be used to reduce ballast fouling and derailment.

Ballast fouling is one of the main Geo technical reasons for the derailments of the trains. Ballast contamination or the filling of voids of ballast due to ballast breakdown (finer particles) and infiltration of other materials from the ballast surface or infiltration from the base of the ballast layer is called "ballast fouling".

Different grade of ballast affect the abrasion value differently. This is also true when external materials are added to the ballast. It is very important to study the effect of all these factors on the age, strength and stability of ballast. This work studies all these effects on the ballast to provide a better grade of ballast which will result in a longer life span and strength of the same. The degree of particle breakage was estimated by sieving the entire ballast through different sieves after the abrasion test have been done. This gives an overall observation of how much abrasion been taking place in each sieves. The procedure revealed the size effect on abrasion value. The external materials added (coal, iron ore and screened ballast) to fresh ballast was studied and the effect of the same was noted. The result developed in this study hence can effectively be used to judge the ballast grade which is best even in the adverse condition.

Indian Railways have different specifications for the Track Ballast. They have set of values for the Physical properties of the Ballast like Aggregate Abrasion Value, Aggregate Impact Value, Size and gradation and Water Absorption. In our study gradation and water absorption of ballast is found and the study mainly focuses on the abrasion characteristics.