

**S.E.Railway  
Kharagpur Division**

**SPECIFICATIONS FOR MACHINE CRUSHED DEPOT TRACK BALLAST**

(as per latest Railway's standard specification issued by RDSO up dated till date. In case of any discrepancy original document shall be deciding factor)

**1. DETAILED SPECIFICATION.**

**1.1 GENERAL**

- 1.1.1 Basic quality: - Ballast should be hard, durable and as far as possible angular along edges/corners, free from weathered portions of parent rock, organic impurities and inorganic residues.
- 1.1.2 Particle Shape: Ballast should be cubical in shape as far as possible. Individual pieces should not be flaky and should have generally flat faces with not more than two rounded/sub-rounded faces.

**1.2 PHYSICAL PROPERTIES**

- 1.2.1 Ballast sample should satisfy the following physical properties in accordance with IS:2386Pt.IV 1963.
  - Aggregate "Abrasion" value = 30% Max.
  - Aggregate "Impact" value = 20% Max.
  - Water absorption = The water absorption tested as per IS:2386Pt.III 1963, should not be more than 1%.

**1.3 SIZE AND GRADATION:**

- 1.3.1 Ballast should satisfy the following size and gradation criteria:-
  - (a) Retained on 65 mm, square mesh sieve --- 5% (Max.)
  - (b) Retained on 40 mm square mesh sieve --- 40% to 60%.
  - (c) Retained on 20 mm square mesh sieve --- Not less than 98%.

**1.3.2 Oversize ballast**

- i) Retention on 65 mm. Square mesh sieve: - A maximum of 5% ballast retained on 65 mm sieve shall be allowed and no deduction in payment shall be made for this. In case the ballast retained on 65 mm sieve exceeds 5% but does not exceeds 10%, payment at 5% reduction in contracted rate shall be made for full wagon/wagons having more than 10% retention of ballast on 65mm sieve shall be rejected.
- ii) Retention on 40mm square mesh sieve:-
  - In case ballast retained on 40mm square mesh sieve exceeds 60% limit prescribed in 1.3.1 (b) above, payment at the following reduced rates shall be made for full wagons.
  - (a) 5% reduction in contracted rates if retention on 40mm square mesh sieve is between 60% (excluding) and 65%( including).
  - (b) 10% reduction in contracted rates if retention 40 mm square mesh sieve is between 65% (excluding) and 70% (including).
- iii) In case retention on 40mm square mesh sieve exceeds 70% the wagon shall be rejected.

**1.3.3 Under size ballast:**

The ballast shall be treated as undersized and shall be rejected, if –

- i) Retention on 40mm square mesh sieve is less than 40%
- ii) Retention on 20 mm square mesh sieve is less than 98%.

**1.3.4 Method of sieve analysis**

- i) The screens for sieving of ballast shall be square mesh and shall not be less than 100 cm. in length and 70 cm in breadth and 10 cm on height on sides. The following tolerances in the size of holes in all the sieves viz. 65 mm, 40mm, 20mm shall be permitted.

65mm square Mesh sieve	Plus Minus 1.5 mm
40mm Square Mesh sieve	Plus Minus 1.5 mm
20 mm Square Mesh sieve	Plus Minus 1.0 mm.

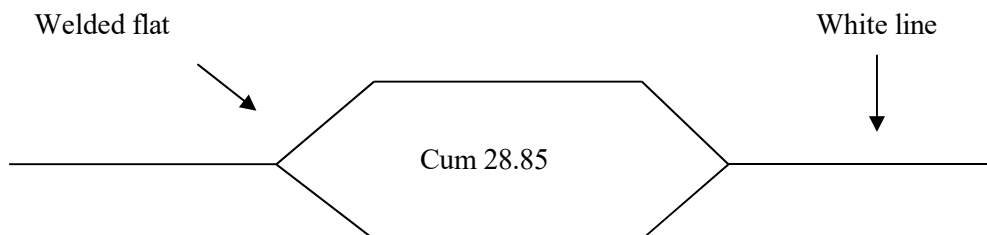
The squareness of the individual holes in the sieves viz 65mm, 40mm and 20mm should be ensured.

- ii) While carrying out sieve analysis, the screen shall not be kept inclined, but held horizontally and shake-vigorously. The pieces of the ballast retained on the screen can be turned with hand to see if they pass through but not be pushed through the sieve.
- iii) The percentage passing through or retained on the sieve shall be determined by weight.
  - a. Two sets of sieves and weight balances etc. to be supplied by contractor for sieve analysis.

## 2.0 METHOD OF MEASUREMENT

### 2.1 WAGON MEASUREMENT:

- 2.2 In case of ballast supply taken by direct loading into wagons, a continuous white line should be painted inside the wagon to indicate the level to which ballast should be loaded. The cubical content in cubic meter corresponding to white line should also be painted on both sides outside the wagon.
- 2.3 In addition to painted line, mentioned in para 2.2 short pieces of flats (cut pieces of tie bars or otherwise) shall be welded at the centre of all the four sides as shown below as permanent reference.



- 2.4 The ballast supply shall be taken by direct loading into wagons.
- 2.5 The measurement of ballast should be taken at destination only, by insertion of steel rod and keeping the wooden planks on the surface of the ballast.
- 2.6 Measurement will be taken by Assistant Engineer of the quality and quantity checks in wagons in presence of the contractor or his authorized representative.
- 2.7 The issue cum receipt notes and challans for this purpose shall be made by the AEN-in-charge in 06(six) copies on identically numbered foils one additional copy of the challan should also be prepared as contractor's copy.
- 2.8 Test checks with respect of quality & quantity will be done by Sr.DEN/DEN at the destination. In case of rejection, the cost of ballast and transportation cost will be recovered. To avoid this contractor should supply ballast as per Railways specification.

## 3.0 TESTING OF BALLAST DURING SUPPLY

- 3.1 A minimum of 3 samples of ballast for sieve analysis shall be taken for measurement done on any particular date even if the numbers of stacks to be measured are less than three.
- 3.2 The test viz. determination of Abrasion Value & Impact value and water absorption should be got done through any of the approved laboratories enlisted in para 3.3.4 below.
- 3.3 In order to ensure supply of uniform quality of ballast, the following norms shall be followed in respect of sampling, testing and acceptance.
  - 3.3.1 On supply of the first 100 cum, the test for size graduation, Abrasion value, Impact value and water absorption, shall be carried out by Railway. Further supply shall be accepted only after this ballast satisfies the specification for these tests. Railway reserves the right to terminate the contract as per GCC at this stage itself in case the ballast supply fails to confirm with any of these specifications. Subsequent test shall be carried out as follows:

a) Size and Gradation Tests	SUPPLY IN WAGONS
	One for each wagon ** 0.027 cum.
b) Abrasion value, impact value and Water absorption Testing Frequency	* One for every 2,000 cum.

\*\* This sample should be collected using a wooden box of internal dimension 0.3m x0.3mx0.3 m from different parts of the stack.

\* These tests shall be done for the purpose of monitoring quality during supply. In case of the test result not being as per the prescribed specifications at any stage, further supplies shall be suspended till suitable corrective action is taken by the contractor and supplies ensured as per specifications.

The above test may be carried out more frequently, if warranted at the discretion of Railway.

- 3.3.3 All tests for Abrasion value, Water Absorption and Impact value conducted subsequent to award of contract shall be done at Railway's cost in any of the laboratories as listed in Para 3.3.4.
- 3.3.4 The tenderer has to submit along with the tender recently issued test certificate of ballast issued either by S.E.Railway's Geo Engineering Laboratory, Visakhapatnam (A.P.) or Indian Institute of Technology, Kharagpur or Regional Engineering College, Rourkela. or VRCE, Nagpur or GE Laboratories of construction Organisation/BSP or Jadavpur University, Kolkata or National test house, Alipur, Kolkata or CAO (Construction's) Laboratory at Chandrashekharpur for Impact value, Abrasion value and water absorption. However Railway's reserves right to get the ballast tested in any specific Govt. approved laboratory in case of any doubt or dispute.

If the tenderer/tenderers does/do not submit the ballast test report his/their tenders shall be rejected and not read out during opening. However, in case the delay is due to Railway's GEO Laboratories in submitting the test result, then a certificate from Railway authority has to be submitted along with tender that he/they has/have already submitted the ballast sample for test at \_\_\_\_\_ GEO Laboratory on \_\_\_\_\_.

\*\*\*\*\*