

**E.10/3 : BALLAST CLEANING**

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## **1. SCOPE**

This specification covers the work necessary for the cleaning of ballast, by mechanical or by hand methods.

## **2. INTERPRETATIONS**

### **2.1 SUPPORTING SPECIFICATION**

2.1.1 Where this specification is required for a project, the following specifications, shall, inter alia, form part of the contract documents:

- a) The E.10 Gen - General
- b) The E.10/4 - Ballasting and tamping
- c) The E.10/11 - Survey and setting out of track alignment and referencing

2.1.2 In addition the following specifications, inter alia, may be required:

- a) The E.10/9 - Slewing and alignment
- b) The E.10/10 - Drain cleaning

### **2.2 DEFINITIONS**

Void.

## **3. MATERIALS**

### **3.1 BALLAST SPECIFICATION**

Ballast returned to the track shall comply with Transnet specification S406.

### **3.2 SUPPLY OF MATERIAL**

Refer to the sub-specification for Ballasting E.10/4 if additional ballast is required.

## **4. PLANT**

Ballast forks only shall be used for handling ballast when it is cleaned by hand.

## **5. CONSTRUCTION**

### **5.1 GENERAL**

Void.

## 5.2 SAFETY

Void.

## 5.3 PROGRAMME AND METHOD STATEMENT

Void.

## 5.4 METHODS AND PROCEDURES

### 5.4.1 GENERAL

5.4.1.1 If ballast cleaning is to be done in conjunction with other operations on track, the cleaning must be done before or concurrently with the other operations if at all possible. The Contractor shall not offload new ballast prior to or during cleaning unless instructed to do so by the Engineer.

5.4.1.2 The Contractor shall clean the ballast and shall excavate the formation material or import approved formation material to the levels and shapes designed and specified by the Engineer.

5.4.1.3 The Contractor shall have at least three track thermometers in continuous use while ballast is being cleaned and, when the temperature is rising, he shall keep a written record of temperature at fifteen-minute intervals and be prepared to stop work and make the track safe against kickouts before the rail temperature attains the upper limits of temperature ranges B or C shown in Annexure H of specification E.10 Gen., whichever range is decided upon by the Engineer.

5.4.1.4 During ballast cleaning, the Contractor shall square any sleepers which are obviously skew. He shall tighten the sleeper fastenings on all sleepers and reposition any displaced elastic pads between the rails and sleepers.

5.4.1.5 The Contractor shall give special attention to the run out at the end of the working area before the line is opened to traffic. He shall ensure that the run out from partially tamped track to fully tamped track is applied at a slope with a grade of not more than 1:500 with respect to the existing grade, or as specified in the Project Specification.

5.4.1.6 The ballast shall be boxed in on completion of the day's work.

5.4.1.7 Should the Contractor contend that there are any adverse track or site conditions he shall record all relevant information prior to and after working.

### 5.4.2 CLEANING BALLAST BY HAND.

5.4.2.1 Cleaning of ballast shall be carried out only under one sleeper and between it and the next sleeper in any group of eight sleepers. The ballast shall be packed before work between the next pair of sleepers is commenced. At the end of the days work, ballast under all sleepers in the specific work area shall have been cleaned to prevent rail damage over solid sleepers.

5.4.2.2 Ballast cleaning shall not take place when the rail temperature exceeds the maximum of the following ranges specified in Annexure H of specification E.10 Gen. :

- a) For wood-sleepered track, range B.
- b) For concrete-sleepered track, range C.

#### 5.4.3 CLEANING BALLAST BY MACHINE.

5.4.3.1 Ballast cleaning by machine shall be done under total occupation.

5.4.3.2 Ballast cleaning machines may not be used on track laid with long welded rails when the temperature is outside temperature range B as specified in Annexure H of specification E.10 Gen. Special care shall be taken against kick-outs when the temperature is outside destressing range A in Annexure H of specification E.10 Gen.

5.4.3.3 Boxing in and tamping of ballast shall be done immediately behind the ballast cleaning machine, and additional ballast provided if necessary.

#### 5.4.4 DISPOSAL OF FOULING MATTER AND MATERIAL EXCAVATED.

5.4.4.1 Fouling matter and excavated material shall be disposed of as directed by the Engineer in the Project Specification.

### 5.5 STANDARDS

Void.

### 5.6 COMPLETION

Void.

## 6. TOLERANCES

6.1 The actual depth of ballast cleaning shall not differ by more than 30 mm from the depth of cut specified by the Engineer.

6.2 The actual width of ballast cleaning shall not differ by more than 100 mm from the width of cut specified by the Engineer.

6.3 100% by volume of the cleaned ballast shall pass a 63 mm sieve and not more than 5% shall pass a 19 mm sieve.

6.4 Material disposed of by the ballast cleaning machine shall not contain more than 5% by volume of acceptable ballast.

6.5 The adjustment of the standards described in 6.3 and 6.4 hereof, applicable to the cleaning of wet ballast, will be as specified in the Project Specification.

**7. TESTING**

- 7.1 Before any length of track on which ballast cleaning has been done is presented to the Engineer for take-over, the Contractor shall open the work for inspection and testing of the cleaned ballast in the track, at every 500 m or as directed by the Engineer. Any ballast samples taken shall be picked up with a shovel.

**8. MEASUREMENT AND PAYMENT****8.1 SCHEDULED ITEMS****8.1.1 Clean ballast ..... Unit: m<sup>3</sup>**

Quantities of ballast cleaned will be measured from cross sections by the method of end areas.

## 8.1.1.1 Separate items will be scheduled for the following:

- a) Different ballast profiles (class of line).
- b) Different sleeper types.
- c) Ballast in tunnels, on bridges, under bridges and at platforms.

## 8.1.1.2 The rates tendered shall include for the following:

- a) Measuring the rail temperature as described.
- b) Squaring sleepers requiring squaring.
- c) Tightening the sleeper fastenings on all sleepers.
- d) Repositioning any displaced elastic pads between the rails and the sleepers.
- e) Boxing in the ballast.

**8.1.2 Formation correction ..... Unit: m<sup>3</sup>**

Quantities of formation correction will be measured as the volume of formation material excavated calculated from cross sections by the method of end areas.

## 8.1.2.1 Separate items will be scheduled for the following:

- a) Formations in cuttings.
- b) Formations in tunnels, on bridges, under bridges and at platforms.
- c) Formation on banks.
- d) Formations in station yards.

## 8.1.2.2 The rates tendered shall include for the following:

- a) Excavating formation material to the specified depth.
- b) Importing and compacting approved material.
- c) Grading the formation to the specified profile and levels.

**8.1.3 Disposal of fouling matter and material excavated ..... Unit: m<sup>3</sup>**

The volume of fouling matter will be taken as 35% of the volume of ballast cleaned, unless otherwise specified in the Project Specification.

**8.1.3.1 Separate items will be scheduled for the following:**

- a) Ballast in tunnels and on bridges.
- b) Single tracks.
- c) Multiple tracks.
- d) Disposal with wagons.
- e) Disposal with lorries.

**8.1.3.2 The rates tendered shall include for the following:**

- a) Loading fouling matter and material excavated on wagons.
- b) Loading it on lorries.
- c) Transporting it over the free haul distance.
- d) Offloading it at designated place.

**8.1.4 Open work for inspection and testing ..... Unit: Each**

Every location opened for inspection at which the work is found acceptable will be counted. Locations at which the work is unacceptable will not be counted.

**8.1.4.1 The rate tendered shall include for the following:**

- a) Opening work for inspection.
- b) Making good after inspection by the Engineer.