

## **TECHNICAL SPECIFICATIONS AND SPECIAL CONDITIONS FOR SUPPLY OF CEMENT FOR CONSTRUCTION WORKS**

### **1.0 SUPPLY OF CEMENT:**

1.1 Supply of cement to various specifications as required for various items under different schedules will be paid under the items in Schedule "C".

1.2 The cement required for various items of work under Schedule A shall be supplied by the Contractor at the site of work in accordance with the requirements and specifications. The payment for the cement supplied and used by Contractor for SSR items (Standard Schedule of Rates of items of the Railway) and Non SSR items shall be based on the norms for use as prescribed in the Technical Specifications/Special Conditions/Cement Schedule etc., and shall be made as per relevant items under Schedule 'C'. However, Railway reserves the right to supply departmental cement to the extent available which shall be transported by the Contractor from depot to the workspot. Payment towards such transportation will be made under relevant item of Standard Schedule of Rates of the Railway. Any temporary structure required for storage of cement etc., has to be provided by the tenderer at his cost and should be removed after completion of the work. The Railway will only provide suitable land for construction of the above temporary shed free of cost wherever available.

1.3 For supply and use of cement in various works, relevant IRS codes, specifications, IS Specifications and Railway's specifications will be applicable. Wherever, relevant specifications are not available, decision of the Engineer-in-charge is final and binding on the contractor.

### **2. SPECIFICATIONS FOR CEMENT :**

2.1 The cement used shall conform to any of the following standards.

- (i) 33 Grade Ordinary Portland Cement conforming to IS:269
- (ii) 43 Grade Ordinary Portland Cement conforming to IS:8112
- (iii) 53 Grade Ordinary Portland Cement conforming to IS:12269
- (iv) Rapid Hardening Ordinary Cement conforming to IS:8041
- (v) High Strength Portland Cement conforming to IRS:T:40
- (vi) Portland Slag cement conforming to IS:455(See note 1&4 below)
- (vii) Portland Pozzolana Cement conforming to IS:1489(See Note 2&4 below)
- (viii) Sulphate Resistance Cement conforming to IS:12330(see Note 3 below)

Note: (1) Use of any cement other than OPC Grade 43/53 shall have the pre-approval of the DY.CE-in-charge. Mixing of blast furnace slag with OP cement at site shall not be permitted.

(2) Portland Pozzolana cement/Portland slag cement shall not be used for PSC works. When Portland Pozzolana cement is approved for use in plain and reinforced concrete by the Engineer-in-charge, proper damp curing

of concrete at least for 14 days and supporting form work till concrete attains at least 75% of the design strength shall be ensured.

(3)The sulphate resisting cement conforming to IS:12330 shall be used only in such conditions where the concrete is exposed to the risk of excessive sulphate attack e.g., concrete in contact with soil or ground water containing excessive amount of sulphate. It shall not be used under such conditions where concrete is exposed to risk of excessive chlorides and sulphate attack both.

(4)The rate of development of strength is slow in case of blended cement i.e., Portland Pozzolana cement and Portland slag cement, as compared to ordinary Portland cement. This aspect should be taken care while planning to use blended cement. Accordingly period of removal of form work and period of curing etc., should be suitably increased.

5)Compatibility of chemical admixtures and super plasticizers with Portland Pozzolana cement and Portland blast furnace slag cement shall be ensured by trials before use and with pre approval.

## **2.2 SOURCE AND PACKAGING:**

2.2.1 Cement to be used on the works shall be procured from the main / reputed cement plants or from their authorized dealers. Decision of Engineer-in-charge regarding reputed firms shall be final and binding on the contractor.

2.2.2 Cement bags preferably in paper bags and packings should bear the following information in legible markings:

- i) Manufactuerer's name
- ii) Registered Trade Mark of manufacturer, if any.
- iii) Type of cement
- iv) Weight of each bag in Kgs. Or No. of bags/Tonne.
- v) Date of manufacture, generally marked as week of the year/year of manufacture eg., 30/01 which means 30<sup>th</sup> week of 2001.
- vi) IS Code No. to which the cement conforms.

2.2.3 All cement bags shall have company stitches intact and if any sign of tampering with company stitches is noticed, the same will be rejected without any test and no compensation shall be payable in this regard.

## **2.3 TEST CERTIFICATE REGARDING QUALITY OF CEMENT:**

2.3.1 The contractor should submit the bill/ Voucher of purchase of cement brought to site of work to the Railways for Verification and record. Contractor shall also submit a test certificate issued by the manufacturer for standard properties of cement for verification & record.

2.3.2 The Railway reserves the right to take samples during the course of the work and get the cement tested in reputed laboratories to ascertain the conformity to the specification. Cost of such testing shall be borne by the contractor with out any extra payment.

2.3.3 Tests on cement are to be done as per relevant IS Codes. Some of the tests which may be carried out are:

- i) Compressive strength
- ii) Initial and final setting time
- iii) Consistency
- iv) Soundness.
- v) Fineness

2.3.4 The Contractor shall arrange to carry out above tests for every 100 Tonnes of cement and for every change in lot/batch and the same shall be submitted to the Railways and take approval of the Engineer-in-charge before using in work. No extra payment will be made for conducting such tests.

2.3.5 Any temporary structure required for storage of cement, steel etc., has to be provided by the tenderer at his cost. The Railway will only provide suitable land/shed for construction of the above temporary shed free of cost wherever land/shed is available and is free for use. Double lock arrangement (Contractor and Railway) for the temporary stores shed should be provided by contractor. On completion of the work or as directed by the Engineer-in-charge, the shed if put up by the Contractor, should be removed by the contractor and site cleared at his cost.

#### **2.4 CONSUMPTION OF CEMENT:**

2.4.1 The cement consumption for the works shall be as per the "Specifications for Materials and Works 1969" of Southern Railway along with the "Cement Schedule" of the Railway or as per the approved design mix and as per the Minimum and Maximum content specified for various grades. Excess cement used will not be paid for and the decision of the Engineer-in-charge is final and binding on the Contractor.

2.4.2 In case of design mix (M20, M30, M40 mix etc., or similar mix design), the quantity of cement will be decided based on the approved design mix and the decision of the Engineer-in-charge is final and binding on the contractor. The Contractor should submit design mix details at his cost from the approved laboratory to the Engineer-in-charge before getting the trial mix approval / use in construction.

2.4.3 The minimum grade of plain cement concrete shall be M20 and reinforcement cement concrete shall be M25. Minimum grade of concrete shall be M-35 for Prestressed concrete structures normally unless otherwise specified in approved drawings or as directed by the Engineer-in-charge.

#### **3.0 PAYMENT FOR CEMENT:**

3.1 Cement supplied for the work and measured under the Schedule "C" will be paid only after its use in various works under the Schedules of the contract as per conditions and no advance payment for supply will be admissible.

#### **4.0 GENERAL:**

4.1 No wastage of any of the materials supplied and used in the work by the contractor including cement is payable by the

Railway, contractor will make his own arrangements for storing cement for use in work.

- 4.2 Contractor should take proper precautionary measures to store the cement in good condition against rains, cyclones. Railway is not responsible for any loss of cement due to clodding on account of defective storage or delay.
- 4.3 53 Grade/43 Grade/any other types of cement should be stacked separately in countable manner.
- 4.4 Admixture / Plasticizers of approved specifications will be permitted to be used in concrete wherever required and into the approval by the Engineer-in-charge. However, no extra payment for the admixtures used shall be payable unless otherwise specified in the Schedule.
- 4.5 Cement for temporary and enabling works shall be arranged by the contractor at his own cost and no extra payment will be paid on this account.
- 4.6 Empty Cement bags on release from the work is the property of the Contractor and shall be disposed off by the Contractor himself.

Signature of Tenderer / Contractor	Chief Administrative Officer
Name of Tenderer / Contractor :	Construction, S W Railway,
Date :	18, Millers Road,
Address :	Bangalore - 560 046