

**TECHNICAL SPECIFICATIONS AND SPECIAL CONDITIONS  
FOR SUPPLY OF REINFORCEMENT AND STRUCTURAL STEEL**

**1.0 SUPPLY OF STEEL FOR VARIOUS WORKS:**

1.1 Supply of steel to various specifications as required under various schedules in the contract are governed by the Technical specifications and Special Conditions specified hereunder.

1.2 All steel shall be supplied by the Contractor at the site of work and stacked, stored, protected and maintained by him at his cost till they are put into use. However, Railway reserves the right to supply departmental steel to the extent available which shall be transported by the Contractor from depot to the work spot. Payment towards such transportation will be made under relevant item of the Standard Schedule of Rates of the Railway. Payment for cutting, fabrication etc., done on the Railways steel will also be made as per the SSR or as per relevant items available in schedules. Any temporary structure required for storage of steel etc., has to be provided by the Contractor 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 steel in various works, relevant IRS Codes Specifications, IS Specifications and Railways specifications will be applicable and wherever, relevant specifications are not available, decision of the Engineer-in-charge is final and binding on the Contractor.

**2.0 SPECIFICATIONS FOR STEEL:**

2.1 The steel supplied by the contractor must satisfy any of the following material specifications as required for the work along with other concerned specifications.

- i) The reinforcement steel shall be High Yield Strength Deformed steel conforming to IS 1786 (upto date) and in case of mild steel rods it shall conform to IS 432 (Part-I Upto date) as specified. The steel to latest code and of latest manufacturing technique, as approved, shall be made available by the contractor and the agreement rate applies to the same.
- ii) The structural steel shall be conforming to IS 2062 (upto date) as specified.
- iii) HTS wires/strands shall be conforming to IS 14268 (Upto date) as specified.
- (iv) Relevant other IS and IRS Specifications with regard to properties, testing and use of the above steel items also shall govern.
- (v) Only steel of grades Fe 500/ Fe 500D / Fe 500S / Fe 550 / Fe 550D shall be used in bridge construction. Fe 415 or its variants Fe 415D / Fe 415S, if used, shall have pre-approval of Dy. Chief Engineer-in-charge. For special cases and in seismic zones III, IV and V, only Fe500D/Fe550D shall be used. For other concrete, Fe415/Fe 500/Fe550 / their variants shall be used as specified in the respective schedule items and as decided by the Engineer-in-charge.

2.2 The contractor shall produce the manufacturers test certificate for each lot of supply satisfying the requirements of relevant IS specifications and at the specific frequency as laid down.

2.3 The Contractor shall arrange to carryout additional tests on physical properties of steel for every 50 metric tonne (t) of steel and for every change in lot/batch for reinforcement steel and structural steel at his cost. For HTS wires and strands, Contractor shall arrange to test the steel at a rate of one test per 3 metric tonne (t). The same shall be submitted to the Railways and approval taken of the Engineer-in-charge before using in work. No extra payment will be made for conducting such tests and the agreemental rate is inclusive of above testing charges.

2.4 Further, specimen of the material shall be tested before it is put to use in recognized laboratory and the cost of testing shall be borne by the Contractor, whenever directed by the Engineer-in-charge. The Engineer-in-charge reserves the right of testing of specimen at his own discretion and the cost of testing will be borne by the Contractor.

### 3.0 **PROCUREMENT OF STEEL:**

3.1 Structural steel for the work shall be procured from following manufacturers:

1. Steel Authority of India Ltd (SAIL)
2. Tata Iron & Steel Company Ltd .(TISCO)
3. Indian Iron & Steel Company (IISCO)
4. Rastriya Ispat Nigam Ltd. (RINL)
5. JSW Steel Ltd.
6. ESSAR steel Ltd.

In case of non-availability of steel from above sources, it can also be procured from any other manufacturers if so approved by Chief Engineer (Construction) concerned, duly satisfying that Structural steel procured is as per specifications mentioned in BIS's document – IS: 2062,. In this case independent tests shall be conducted, to ensure that the materials procured conform to the specifications. Manufacturer's test certificate shall be obtained along with invoice / bill

3.2 All reinforcement steel (TMT Bar) and structural steel as per IS: 1786 and IS2062 with the latest amendment should be procured from the primary producers of steel i.e.

- a. SAIL
- b. TISCO
- c. RINL
- d. Any other Primary Steel Producer having an Integrated Steel Plant (ISP) and using iron ore as the basic raw material and having in-house iron rolling facilities, followed by the production of steel through the process of DRI-EAF, BF-BOF, and Corex-BOF only.

3.3(i) The contractor shall have to submit the cash memo and challans along with the lot / batch of steel purchased in token of proof of purchase of steel from reputed dealers. Steel shall be approved by Engineer-in-charge only after production of necessary certificates before use in works.

3.3.(ii) The contractor shall produce the certificate issued by the plant manufacturer/plant consultant (with documentary proof of process) establishing process being used at the plant is either of DRI-EAF, BF-BOF, and Corex-BOF route only, for manufacturing TMT reinforcement bar using iron ore as basic raw materials.

### 4.0 **PAYMENT FOR REINFORCEMENT, HTS, STRUCTURAL STEEL:**

4.1 Payment for supply of all types of steel will be made for the quantity required / used as Indian Railway Unified Standard Specifications (Works & Materials) 2010 and as per drawings issued from time to time and as per approved designs for the completed and measured quantity of Prestressed concrete/Reinforced concrete works. No payment will be admissible for quantity supplied in excess of the required quantity as per designs/drawings. However, contractor will be permitted to take the excess quantity back by his own means, but no claim for payment for transportation so involved will be admissible. No payment will be made for more supply of steel at the site/excess used in Construction. No payment will be made for steel used in temporary or enabling works unless explicitly provided for in the Schedules. Steel for enabling/temporary works shall be arranged by the Contractor at his own cost.

4.2 Payment for reinforcement steel will be as per reinforcement actually utilised in the work based on approved designs/bar bending schedule. Payment for HTS will be made for the length between the bearing plates in the pre-stressed structures as used only. Structural steel will be paid for the weights of steel work calculated from final working drawings based on nominal weights given in the producer's hand books and using minimum square overall dimensions, no deductions being made for skew cuts, holes or notches. The drawing office dispatch lists (D.O.D.Ls) when prepared according to above procedure shall be the basis and shall be submitted by the contractor to the Engineer-in-charge for approval. Each gusset shall be measured as equivalent to the dimension of the smallest enclosing rectangle. The wastage of steel in the form of skew cuts etc., shall be the property of the contractor. An addition of 1.5% shall be made to the member quantities as arrive above, to account for the weight of rivets and welds. Nothing extra will be paid for wastage or for cut rods/wires/steel sections which will be the property of the contractor. The weight of the steel will be calculated from the nominal weight as per relevant IS Specifications or the actual unit weight whichever is less based on linear measurements. GI wire or other binding material used in Construction shall not be covered under this supply schedule.

4.3 Any steel work the weight of which differs by more than 2.5% from the calculated weight determined from the nominal weight of the sections shall be liable for rejection. Should the actual weight fall short of the calculated weight by more than 2.5%, the material if accepted, will be paid for the actual weight only. Should the actual weight exceed the actual calculated weight, payment will be made for calculated weight only. In the event of a dispute arising as to the weight of a portion of steel work, a weighment shall be made in the presence of the inspecting officer/Engineer.

4.4 The cutting, bending and placing of reinforcement or other types of steel shall conform to relevant IS/IRS codes and instructions on detailing of reinforcement or other types of steel as directed by Engineer-in-charge. However, payment for the same will not be made under this schedule.

4.5 Payment for steel overlap will be limited to a maximum limit of **5%** of the total consumption of steel irrespective of whatever over lap provided actually even with approval. Unauthorized overlaps will not be paid for. Over laps in critical locations shall not be permitted.

#### 4.6 **STAGE PAYMENTS:**

4.6.1 Stage/Advance Payment will be made by the Railways for steel physically brought to site by the contractor, before actual use in the work against irrevocable Bank Guarantee or Indemnity Bond (as the case may be ) and on production of necessary records.

4.6.2 In case of contracts of values upto Rs.15 crores, Stage/Advance payment will be made on submission of irrevocable Bank guarantee covering the stage/advance amount. The Bank guarantee shall be valid upto the period covering actual use of steel in the work.

4.6.3 In case of contracts of values more than Rs.15 crores, Stage/Advance payment will be made on submission of Indemnity bond covering the stage/advance amount.

4.6.4 Stage/Advance payment for steel will be released subject to the following conditions:

- (i) The material shall be strictly in accordance with the contract specifications.
- (ii) The steel shall be delivered at site and properly stored under covered sheds in measurable stacks and separately maintained for various sizes, sections and dates of supply.
- (iii) The quantities of steel shall be brought to the site only in such instalments that would facilitate smooth progress of work and consumed in reasonable time. The payment will be restricted to a maximum of 30% of the schedule quantity at any point of time.
- (iv) Proper accountal in the Steel Register is to be maintained in the prescribed format at the site for the receipt and use of the steel.
- (v) Ownership of such steel shall be deemed to vest with the Railways.
- (vi) Before releasing the stage payment, the contractor shall insure the steel at his own cost in favour of Railways against theft, misuse, damages, fire etc., and submit the insurance along with Indemnity bond /Bank Guarantee covering the Stage/advance amount for steel.
- (vii) Stage/Advance payment shall not be more than 75% of the rate of steel awarded in the contract. The balance payment shall be released only after the material is actually consumed in the work.
- (viii) The price variation claim for steel will continue to be governed as per extant PV clause and with reference to delivery at site.
- (ix) The Stage/Advance payment will be made, only when the Engineer-in-charge or his authorized representative certifies that the said quantity of steel is received at site and entered in the register and that in his opinion the steel is actually required in accordance with the contract.
- (x) No Stage/Advance payment is permitted for steel required for temporary and enabling works.

4.6.5 Any Stage/Advance payment found to be made against the materials brought to the site in excess over the actual materials consumed in work shall be recovered from the contractor dues.

## **5.0    OTHERS:**

5.1     Steel, reinforcement and other types, shall be stored in such a way so as to avoid distortion and to prevent deterioration by corrosion. All steel used should be free from loose Mill scale, loose rust, paints and oil covering / coating etc.

5.2     Steel material, for which stage payment has been availed by the Contractor, shall be property of Railways and will be issued to contractor by Engineer-in-charge whenever required for the work. Contractor will be solely responsible for guarding against theft/misuse of the consignment due to any cause what so ever. The stage payment will be made, only when the Engineer-in-charge certifies that in his opinion that the materials are actually required in accordance with the contract. It is the responsibility of the agency to ensure that steel as per the requirement is brought to site as per approved drawings/requirements.

5.3     The contractor shall be bound to store the materials at site of work earmarked for the purpose by the Engineer-in-charge and shall not remove from the site nor use for any other purposes than exclusively for execution of the work for which the materials are intended for. Safe guarding of the materials is the responsibility of the contractor even if the material is deemed to be owned by the Railway and insurance etc., have been arranged by the contractor.

5.4     Welding of reinforcement will not be generally permitted except in special circumstances under the written approval of the Engineer-in-charge.

5.5     Contractor shall remove from site any steel materials rejected by the Engineer-in-charge within reasonable time as specified by him. In case of failure to remove the rejected material within reasonable time as specified, penalty @ Rs 100/-per ton per day will be imposed and recovered from subsequent running bills.

5.6     A register shall be maintained by the contractor with full details of reinforcement provided for accountal and payment of steel reinforcement. The contractor should sign a similar register maintained by Railway before undertaking concreting works, as a token of acceptance of the details of reinforcement steel provided in works , failing which the details as recorded by Railway are binding on the contractor for the purpose of payment and no dispute will be entertained by Railway on this account.

5.7     The prestressing steel shall be used not later than 6 months from the date of manufacture or 3 months from the date of arrival at site and shall be Uncoated stress relieved low relaxation strand conforming to IS 14268-1995 or as specified.

5.8     Stock piling of Prestressing steel in the open at the work site will not be allowed under any circumstances. Special care shall be taken by the contractor to store the H.T. steel under suitable covered shed as approved by the Engineer. The Engineer/his representative shall always have an easy access to store yard for inspecting the H.T. Steel for satisfying themselves regarding the condition thereof. Any modification/protection suggested by them shall be scrupulously followed by the Contractor.

5.9     In addition to manufacturer's certificate, the acceptance of H.T steel shall be subjected to the independent testing of steel for the following characteristics by the Contractor at his cost, and nothing extra shall be paid on this account.

- a) Mechanical properties like diameter, mass of strand.
- b) Ultimate tensile strength and lead extension curves, yield point, proof stress and modulus of elasticity.
- c) Elongation after fracture.
- d) Relaxation after 1000 hour test.

5.10 Before the test pieces are selected, the Contractor shall furnish copies of the mill records of the H.T steel giving number of coils in each cast with sizes and identity marks to enable identification of the material with the bill produced.

5.11 Wires/strands shall be supplied/brought to site in reels or in reel-less packs having a minimum core diameter of 600mm. The coil shall be securely strapped to prevent distortion in transit and handling.

5.12 The wires/strands shall be coated with water soluble oils to prevent corrosion.

Signature of Tenderer / Contractor  
Name of Tenderer / Contractor.  
Date :  
Address :

Chief Administrative Officer  
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