# CONTENTS


1.0 SCOPE

2.0 APPLICABLE STANDARDS

3.0 CLIMATIC CONDITIONS OF THE INSTALLATION

4.0 GENERAL TECHNICAL REQUIREMENTS & CONSTRUCTIONS

5.0 GENERAL CONSTRUCTIONS

6.0 NAME PLATE AND MARKING

7.0 TESTS

8.0 TYPE TEST CERTIFICATES

9.0 PRE-DESPATCH INSPECTION

10.0 INSPECTION AFTER RECEIPT AT STORES

11.0 GUARANTEE

12.0 PACKING

13.0 TENDER SAMPLE

14.0 QUALITY CONTROL

15.0 MINIMUM TESTING FACILITIES

16.0 MANUFACTURING ACTIVITIES

17.0 SPARES, ACCESSORIES AND TOOLS

18.0 DRAWING AND DOCUMENTS

19.0 GURANTEED TECHNICAL PARTICULARS

20.0 SCHEDULE OF DEVIATIONS




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## 1.0 SCOPE:

This specification covers the technical requirements of design, manufacture, testing at manufacturer's works, packing, forwarding, supply and unloading at store/site and performance GI RS Joist Poles (150x150 mm) & (116 x 100mm) with all accessories for trouble free and efficient operation.

## 2.0 APPLICABLE STANDARDS:-

The equipment covered by this specification shall unless otherwise stated, be designed, constructed and tested in accordance with latest revisions of relevant Indian Standards and shall conform to the regulations of local statutory authorities.

The GI RS JOISTS shall comply with the requirements of latest issue of IS – 2062:2006, Grade – A , IS : 808 / 1989 / 2001 , IS : 1608 / 1995 & IS : 12777 / 1989 & their latest amendments if any.

## 3.0 CLIMATIC CONDITIONS OF THE INSTALLATION:

The material shall be suitable for following climatic conditions,

1. Maximum altitude above sea level 1,000m
2. Maximum ambient air temperature 50°C
3. Maximum daily average ambient air temperature 35°C
4. Minimum ambient air temperature 0°C
5. Maximum relative humidity 95%
6. Average number of thunderstorm days per annum (isokeraunic level) 70
7. Average number of rainy days per annum 120
8. Average annual rainfall 150cm
9. Earthquakes of an intensity in horizontal direction - equivalent to seismic acceleration of 0.3g
10. Earthquakes of an intensity in vertical direction - equivalent to seismic acceleration of 0.15g (g being acceleration due to gravity)

11 .Wind velocity: 300 km/hr, 200 km/hr and 160 km/hr.

Environmentally, some of the regions, where the work will take place includes coastal areas, subject to high relative humidity, which can give rise to condensation. Onshore winds will frequently be salt laden. On occasions, the combination of salt and condensation may create pollution conditions for outdoor insulators. Some places are in heavily industrial polluted areas.

Therefore, Outdoor material and equipment shall be designed and protected for use in exposed, heavily polluted, salty, corrosive and humid coastal atmosphere.

The design of equipment and accessories shall be suitable to withstand seismic forces corresponding to an acceleration of 0.1 g.

## 4.0 GENERAL TECHNICAL REQUIREMENTS & GENERAL CONSTRUCTIONS:

### Rolled Steel Joints

a. The Rolled Steel joist (RSJ) support structures shall be fabricated from mild steel, grade A and in lengths dictated by design parameters. The joists, may include, but shall not be limited to the following sizes:

### Dimensions, GTP and Properties

| Sl No . | RSJ DESIGNATION | 150 x 150 mm ISHB | 116 x 100 | To be provided by Bidder |
|---|---|---|---|---|
| 1 | Length of Joist in Mtr with +100mm/-0% Tolerance | 11Mtr,13 mtr | 9Mtr, 10Mtr,11Mtr | |



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| | | | | |
|---|---|---|---|---|
| 2 | Make | SAIL/TATA/ RINL/JINDAL **(Billet with re rolling not allowed)** | | |
| 3 | Weight in kg/m with ±2.5% | 34.6 Kg./ Mtr. | 23.0Kg/Mtr | |
| 4 | Sectional Area (cm2) | 44 | 29.29 | |
| 5 | Depth(D) of Section (mm) with +3.0mm/ -2.0mm | 150 | 116 | |
| 6 | Width(B) of Flange(mm) ±4.0mm Tolerance for 150 x 150 mm ISHB IS 1852-1985 | 150 | 100 | |
| 7 | Thickness of Flange (Tf) (mm) with ±1.5 mm Tolerance | 9 | 10 | |
| 8 | Thickness of Web(Tw) (mm) with ±1.0 mm Tolerance | 11.8 | 8.5 | |
| 9 | Corner Radius of fillet or root (R1) | 8 | 15 | |
| 10 | Corner Radius of Toe (R2) (mm) | 4 | 3 | |
| | Moment of Inertia | | | |
| | Ixx (cm4) | 1635.6 | 643.80 | |
| 11 | Iyy (cm4) | 494.9 | 143.50 | |
| | Radius of Gyration (cm) | | | |
| | Rxx | 6.09 | 4.69 | |
| 12 | Ryy | 3.35 | 2.21 | |
| | Modulus of Section Zxx(cm3) | | | |
| | Zyy(cm3) | 218 | 111 | |
| 13 | Zxx(cm3) | 63.2 | 28.7 | |
| 14 | Flange Slope( ) in Degree | 94 | | |
| 15 | Tolerance in Dimension | As per IS:1852 | As per IS:1852 | |
| 16 | Supply of GI Base plate with Stiffener | 300X300X12 mm | 300X300X12 mm | |
| 17 | Galvanization | 705 gms per sq.mt / 100 Micron with 6 Dips(min) | 705 gms per sq.mt / 100 Micron with 6 Dips(min) | |

**Mechanical Properties:**

| | |
|---|---|
| Tensile Test : | Requirement as per IS:2062/ 1999 Grade-A |
| Yeild Stress(Mpa) | Min 250 |
| Tensile Strength(Mpa) | Min 410 |
| Lo=(5.65 So)Elongation% | Min 23 |
| Bend Test | Shall not Crack |

**Chemical Properties:**

| | | |
|---|---|---|
| Chemical Composition | Requirement as IS:2062/ per 1999 Grade-A | Permissible variation over Specified |
| Grade | A | - |



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| | | |
|---|---|---|
| Chemical Name | Fe-410W A | - |
| Carbon(%Max.) | 0.23 | 0.02 |
| Manganese(%Max.) | 1.5 | 0.05 |
| Sulphur(%Max.) | 0.050 | 0.005 |
| Phosphorous(%Max.) | 0.050 | 0.005 |
| Silicon(%Max.) | 0.40 | 0.03 |
| Carbon Equivalent(%Max.) | 0.42 | - |
| Deoxidation Mode | Semi-killed or killed | - |
| Supply condition | As rolled | - |

However, In case of any discrepancy between the above data & the relevant ISS, the values indicated in the IS shall prevail.
The Acceptance Tests shall be Carried out as per Relevant ISS.

150x150mm GI RS Joists:
RS Joists of Specific Weight 34.6kg/mtr with length of each type of pole being 11mtr & 13 mtrs long and each pole weighing 380.6 & 449.8 Kg respectively for specified number of poles with specified weight in MT as given in the NIT table given above shall have to be supplied as per IS:2062;2006 Grade"A", IS:808;1989/2001, IS1608:1995 & IS:12779-1989 and their latest amendment if any complying the required Dimension, Weight, Chemical & Mechanical properties confirming to the relevant IS, as per the Tolerance given Below
The approved makes are SAIL, JINDAL, RINL & TATA (Billet with re rolling not allowed).

After galvanizing no drilling or welding shall be performed on the galvanized parts of the equipment excepting that nuts may be threaded after galvanizing. To avoid the formation of white rust galvanized materials shall be stacked during transport and stored in such a manner as to permit adequate ventilation. Sodium dichromate treatment shall be provided to avoid formation of white rust after hot dip galvanization.
The galvanized steel shall be subjected to test as per IS-2633.

## 5.0 NAME PLATE AND MARKING:

### Embossing on each GI R.S JOIST :

Following distinct non-erasable embossing is to be made on each R.S Joists to be supplied to TPSODL under this Tender.
Name of the Owner – TPSODL
B.I.S Logo (ISI Mark).
Size of the R.S Joist : Name of manufacture: WO No & Dt.

## 6.0. INSPECTION, DESPATCH, Acceptance & TESTING:

**(a) INSPECTION:**
The supplier shall submit their offer for inspection of materials at least 10 days before actual date of inspection proposed at their factory premises. The Inspectors duly authorized by the purchaser shall be deputed to conduct the Inspection & Testing of R S Joists at the suppliers' works before dispatch, on receipt of offer for inspection from the supplier. The purchaser at his discretion may engage a third party for above inspection. The Pre-dispatch inspection shall be carried out as per relevant ISS / Tender Specification / GTP enclosed in the Purchase Order. The supplier shall extend all necessary assistance / co-operation to the authorized inspectors of the buyers.
**(b) DESPATCH INSTRUCTION:** The authorized inspectors shall furnish their Inspection Report to the undersigned for approval. On receipt of successful Pre dispatch inspection, the undersigned shall issue dispatch instruction to the supplier. On receipt of such dispatch instruction the materials shall be dispatched by the supplier to the consignee.



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**(C)ACCEPTANCE OF MATERIALS**: However the lot of materials dispatched as above shall be accepted after due physical verification at our Stores in respect to dimensions & weight as per our GTP. 23

**(d) RANDOM TESTING OF MATERIALS SUPPLIED AFTER DELIVERY / ACCEPTANCE:** In case any doubt arises in the quality of materials supplied, the authority reserves the Right to take out a Sample Test Piece of the RS Joists from a lot delivered at our Stores, for relevant tests in the Govt. approved Testing Laboratory of their choice for confirmation of the Chemical & Mechanical properties of the materials supplied as per IS. The sample test piece so collected by the authorized representative of CESU shall be done in presence of the authorized representative of the supplier. If the materials fail to confirm the specified tests given in the relevant IS, the entire lot of the supplied materials shall be rejected & the financial loss incurred by the purchaser as ascertained by the authority shall be recovered from the supplier.

**7.0 REJECTION OF MATERIALS:**

In the event, any of the materials / equipment supplied by the Contractor is found defective due to faulty design, bad workmanship, bad materials used or otherwise not in conformity with the requirements of the Specification, the Purchaser shall either reject the materials / equipment or ask the Contractor in writing to rectify the same. The Contractor on receipt of such notification shall either rectify or replace the defective equipment free of cost to the Purchaser. If the Contractor fails to do so, the Purchaser may :

a) At its option replace or rectify such defective equipment and recover the extra costs so involved from the Contractor plus fifteen percent and / or.

b) Terminate the contract for balance work / supplies with enforcement of penalty Clause as per contract for the un-delivered goods and with forfeiture of Performance Guarantee/ Composite Bank Guarantee.

c) Acquire the defective equipment / materials at reduced price considered equitable under the circumstances.

**8.0 INSPECTION AFTER RECEIPT AT STORE:**

The material received at the Purchaser store shall be inspected for acceptance and shall be liable for rejection, if found different from the reports of the pre-dispatch inspection and one copy of the report shall be sent to Project Engineering department.

**9.0 Guarantee:**

The bidder shall guarantee for satisfactory operation of the equipment for a minimum period of 12 months from the date of Commissioning or 18 months from the date of receipt of last consignment whichever is earlier. In the event of any defect in the equipment/ materials arising out of faulty design, inferior quality of raw material used or bad workmanship within the guarantee period, the Seller shall guarantee to replace/ repair to the satisfaction of the purchaser the defective equipment's free of cost. Should however, the manufacturer fails to do so within a reasonable time, the purchaser reserves the right to recover the amount from the seller either from the bills pending or may recover from the Performance Guarantee submitted by the firm.

If during the defect liability period any services performed found to be defective, these shall be promptly rectified by seller at its own cost (including the cost of dismantling and reinstallation) on the instruction of Purchaser.

**10.0 PACKING:**

Bidder shall ensure that all the equipment covered under this specification shall be prepared for rail/road transport in a manner so as to protect the equipment from damage in transit. The material used for packing shall be environmentally friendly.

**11.0 Tender Sample:**

NA

**12.0 QUALITY CONTROL:**



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The bidder shall submit with the offer Quality assurance plan indicating the various stages of inspection, the tests and checks which will be carried out on the material of construction, components during manufacture and bought out items and fully assembled component and equipment after finishing. As part of the plan, a schedule for stage and final inspection within the parameters of the delivery schedule shall be furnished. The Purchaser's engineer or its nominated representative shall have free access to the manufacturer's/sub-supplier's works to carry out inspections.

**13.0 Minimum Testing Facilities:**

Bidder shall have adequate in house testing facilities for carrying out all routine tests, acceptance tests as per Indian /International standards.

**14.0 Manufacturing Activities:**

The successful bidder will have to submit the bar chart for various manufacturing activities clearly elaborating each stage, with quantity. This bar chart should be in line with the Quality assurance plan submitted with the offer. This bar chart will have to be submitted within 15 days from the release of the order.

**15.0 Spares, Accessories and Tools :**

Not applicable

**16.0 Drawing And Documents:**

Following drawings and documents shall be prepared based on TPSODL specifications and statutory requirements and shall be submitted with the bid:

a) Completely filled in Technical Particulars
b) General description of the equipment and all components including brochures.
c) General arrangement
d) Experience List
e) Type test certificates

After the award of the contract, four (4) copies of following drawings, drawn to scale, describing the equipment in detail shall be forwarded for approval.

| Sr. No. | Description | For Approval | For Review Information | Final Submission |
|---|---|---|---|---|
| 1 | Technical Parameters | √ | | √ |
| 2 | GA Drawing | √ | | √ |
| 3 | Installation Instruction | | | √ |
| 4 | Manual/Catalogues | | √ | |
| 5 | QA & QC Plan | √ | | |
| 6 | Test Certificates | √ | √ | √ |

Bidder shall subsequently provide four (4) complete sets of final drawings. Soft copy (Compact Disk CD) of all the drawing, GTP, Test certificates shall be submitted after the final approval of the same to purchaser.

All the documents & drawings shall be in English language.
Instruction Manuals: Bidder shall furnish two softcopies (CD) and four (4) hard copies of nicely bound manuals (In English language) covering erection and maintenance instructions and all relevant information and drawings pertaining to the main equipment as well as auxiliary devices.



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## 17.0 Guaranteed Technical Particulars:

Bidder shall submit guaranteed technical particulars.

## 18.0 Schedule of Deviation:

The bidders shall set out all deviations from this specification, Clause by Clause in this schedule. Unless **specifically** mentioned in this schedule, the tender shall be deemed to confirm the purchaser's specifications.

**(TO BE ENCLOSED WITH THE BID)**

All deviations from this specification shall be set out by the bidders, clause by Clause in this schedule. Unless specifically mentioned in this Schedule, the tender shall be deemed to confirm the purchaser's specifications:

| S. No. | Clause No. | Details of deviation with justifications |
|---|---|---|
| | | |

We confirm that there are no deviations apart from those detailed above.

Seal of the Company:

Signature:

Designation:



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