MATERIAL SPECIFICATION CELL

TECHNICAL SPECIFICATION

OF

VARIOUS SIZES OF HOT ROLLED STEEL BEAMS (JOISTS)

Tech. Spec. No. CE/T-QC/MSC-II/RSJ Pole, DATE: 10.07.2019 (Revised dt. 10.11.2020)

Page **1** of **7**

TABLE OF CONTENTS

Tech. Spec. No. CE/T-QC/MSC-II/RSJ Pole, DATE: 10.07.2019 (Revised dt. 10.11.2020)

Page **2** of **7**

TECHNICAL SPECIFICATION OF VARIOUS SIZES OF HOT ROLLED STEEL BEAMS (JOISTS)

1. SCOPE:

This Specification covers the manufacture, testing at works and supply of various sizes of Hot rolled steel beams.

2. SERVICE CONDITIONS:

The materials used in the construction of the steel shall be suitable for use under following tropical conditions.

Environmental conditions

a)	Maximum ambient temperature	50^0 C
b)	Maximum ambient temperature in shade	45^0 C
c)	Minimum temperature of air in shade	35^0C
d)	Maximum daily average temperature	40^0C
e)	Maximum yearly weighted average temperature	32^0C
f)	Relative humidity	10 to 100%
g)	Maximum Annual Rainfall	1450mm
h)	Maximum wind pressure	150 Kg/m^2
i)	Maximum altitude above mean sea level	1000 meters
j)	Isoceraunic level	50 days/year
k)	Seismic level (Horizontal acceleration)	0.3g

l) Climate : Moderately hot & humid tropical climate, conducive to rust and fungus growth

3. APPLICABLE STANDARDS:

The Mild Steel shall be conforming to IS: 2062-2011 GRADE 'A' modified upto date or its equivalent international standard for steel materials. The document for which shall be made available at the time of inspection to the MSEDCL's representative.
The dimensions of Hot Rolled Steel Beams shall be conforming to IS: 808 / 1989 amended upto date and tolerance as per IS: 1852 updated for dimensions and weight.

4. GENERAL REQUIREMENTS:

4.1. Material shall be supplied as per the sizes and technical details as per GTP and Drawing enclosed.

4.2. The Hot Rolled Steel Beams shall be coated by Hot Dipped Galvanization as per IS 2629 for coastal area & Mild Steel for rest of the areas.

As per AS/NZS4791: Hot Dip Galvanized (zinc) coatings on ferrous open sections applied by an in-line process, Hot Dip Galvanizing shall provide over 80 microns of zinc coating while zinc electroplates are normally less than 25 micron.

4.3. Hole arrangement for LT Pole:

i) Pole with designation MB 125 & size 125mmx70mm is covered in LT Pole.

ii) For LT pole, a hole shall be provided at a distance of 75 mm from top portion of the pole. Next 4 No. of holes shall be provided at an equal distance of 260 mm from top

Tech. Spec. No. CE/T-QC/MSC-II/RSJ Pole, DATE: 10.07.2019 (Revised dt. 10.11.2020)

Page **3** of **7**

hole in such a way that last hole is at a distance of 1115 mm from top portion of the pole.

iii) Thus, total 5 No. of holes with diameter 12 mm shall be provided on width of the flange (B) from top in such a way that the first hole on right side of the flange and second hole on left side of the flange & so on.

4.4. Hole arrangement for HT Pole:

i) One No. of hole shall be provided on top portion of HT pole for top pin, at a distance of 75 mm from top portion of the pole.

ii) One No. of hole shall be provided on top portion of HT pole for V cross arm (bracket fitting arrangement), at a distance of 1.22 m and 1.78 m from top portion of the pole for 11 kV and 33 kV respectively.

iii) The diameter of hole shall be 18 mm.

5. TEST REPORTS:

The material should have been successfully tested at NABL Laboratories for following tests to conform as per IS: 2062-2011 GRADE 'A' modified upto date or its equivalent international standard for steel materials & technical specification within the last 5 (five) years from the date of opening of tender.

The bidder shall be required to submit complete set of the following test reports along with the offer.

1. Freedom from defects
2. Chemical Composition
3. Mechanical Properties
   - Tensile Strength
   - Yield Stress
   - Percentage Elongation
   - Bend Test
4. Dimension Test & Weight (kg/M)

For HDG RSJ Pole following test report is required to be submitted along with the offer in addition to above test reports.

5. Test in respect of Hot Dip Galvanization i.e. Thickness of zinc coating in microns

Successful bidder shall submit all above test reports as per relevant IS & technical specification to the office of the Chief Engineer (Testing & QC) Cell & get approved as per Tender conditions. The original Test reports should be made available for verification.

6. DOCUMENTATION:

The bidder shall be required to submit Drawings of offered sizes of RSJ Poles/HDG RSJ Poles to the office of the Chief Engineer (Testing & QC) Cell & get approved as per Tender conditions.

7. INSPECTION

7.1. Following Acceptance/Routine tests and inspection shall be made at the place of manufacturer unless otherwise specially agreed upon by the manufacturer and the MSEDCL.

Tech. Spec. No. CE/T-QC/MSC-II/RSJ Pole, DATE: 10.07.2019 (Revised dt. 10.11.2020)

Page **4** of **7**

Acceptance/Routine Tests:

1. Chemical Composition
2. Mechanical Properties
   - Tensile Strength
   - Yield Stress
   - Percentage Elongation
   - Bend Test
3. Dimension Test & Weight (kg/M)
4. Test in respect of Hot Dip Galvanization i.e. Thickness of zinc coating in microns (additional test for HDG RSJ Pole)

The manufacturer shall afford inspector (representing MSEDCL) all reasonable facilities without charge to satisfy him that the material is being supplied in accordance with this specification.

7.2. In random sample testing inspector may can pick up samples from the lots supplied at MSEDCL store office at random for quality check only. The sample will be tested as per respective IS for acceptance test as decided by MSEDCL at NABL or Government approved laboratory in presence of representative of supplier and MSEDCL. The test results will be binding on the supplier and MSEDCL, resampling will not allow in any case. If the material fails in any of the acceptance test, the full lot of material will be considered as rejected.

In case if the sample does not confirm to specifications or fails at NABL or Government approved laboratory decided by MSEDCL for testing and if subsequent testing are to be carried out (which will solely at MSEDCL discretion), then all testing fees , expenses of inspector and other expenses incurred by MSEDCL plus GST as applicable will be in suppliers account. The decision in this regards for acceptance as above of MSEDCL shall be binding on the supplier.

7.3. Following Tests are to be carried out in Random Sample Testing at NABL or Government approved laboratory decided by MSEDCL for testing.

1. Chemical Composition
2. Mechanical Properties
   - Tensile Strength
   - Yield Stress
   - Percentage Elongation
   - Bend Test
3. Dimension Test & Weight (kg/M)
4. Test in respect of Hot Dip Galvanization i.e. Thickness of zinc coating in microns (additional test for HDG RSJ Pole)

8. SCHEDULE

The tenderer shall fill in the following schedule which form part of the tender specification and offer. If the schedule is not submitted duly filled in with the offer, the offer shall be liable for rejection.

SCHEDULE 'A' : GUARANTEED TECHNICAL PARTICULARS

Tech. Spec. No. CE/T-QC/MSC-II/RSJ Pole, DATE: 10.07.2019 (Revised dt. 10.11.2020)

Page **5** of **7**

TECHNICAL SPECIFICATION OF VARIOUS SIZES OF HOT ROLLED STEEL BEAMS (JOISTS)

SCHEDULE 'A'

GUARANTEED TECHNICAL PARTICULARS
RSJ POLE/HDG RSJ POLE

Sr. No.	Particulars	MSEDCL's Requirement/ To be offered by the Bidder				
1.	Designation (DxB) (mm x mm)	116x100	MB 125x70	MB 175x85	SC 152x152	UC 152x152
2.	Length of joist-Meter with ±100 mm tolerance	9m/10m/ 11m/13m	8m/9m	9m	11m/13m	11m/13m
3.	Weight (kg/M)	23.0	13.3	19.6	37.1	37.0
4.	Sectional area (A) (Sq.cm.)	29.3	17.0	25.0	47.4	47.11
5.	Depth of section (D) (mm)	116	125	175	152	161.8
6.	Width of flange (B) (mm)	100	70	85	152	154.4
7.	Thickness of flange (Tf) (mm)	10	8	9	11.9	11.5
8.	Thickness of Web(Tw) (mm)	8.5	5	5.8	7.9	8.0
9.	Radius of fillet or root (R1)(mm)	15	9	10	11.7	7.6
10.	Radius of tow (R2) (mm)	3	4.5	5	3	--
11.	Moment of Inertia (i) I_{xx} (cm^4) (ii) I_{yy} (cm^4)	643.8 143.5	445 38.5	1260 76.7	1970 700	2210 706.2
12.	Radius of Gyration GR_{xx} (cm)	4.69	5.16	7.13	6.45	6.85
13.	Modulus of Section (i)Z_{xx} (cm^3) (ii)Z_{yy} (cm^3)	111 28.7	71.2 11	144 18	259 91.9	273.2 91.48
14.	Tolerance in dimensions and weight	--------------As per IS: 1852 Updated-----------------				

Tech. Spec. No. CE/T-QC/MSC-II/RSJ Pole, DATE: 10.07.2019 (Revised dt. 10.11.2020)

Page **6** of **7**

TECHNICAL SPECIFICATION OF VARIOUS SIZES OF HOT ROLLED STEEL BEAMS (JOISTS)

Tech. Spec. No. CE/T-QC/MSC-II/RSJ Pole

FOR MB / SC POLE

FOR UC TYPE POLE

NOTE:- 1) All dimensions are as per Annexure-I.
2) Drawing is not to the scale.

SP No: DIST/MM/I/RSJ SPEC-2006

R.S.J. POLE				M.S.E.D.C.L.
				DISTRIBUTION SECTION.
DRN. BY J.E. (MM-I)	CHK. BY E.E. (MM-I)	SUB. BY S.E. (MM)	APR. BY C.E.(DIST.)	DRG. NO.: DIST./MM/63.812

Tech. Spec. No. CE/T-QC/MSC-II/RSJ Pole, DATE: 10.07.2019 (Revised dt. 10.11.2020)

Page **7** of **7**