

**Schedule of Technical Requirements For Under Frame
Complete For LHB coaches**

Specification No. MDTS 21320, Rev-01

Date: 25.10.2018

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- 4.4. The tenderer shall have adequate manufacturing facilities mentioned in Para 5.
- 4.5. The front part assembly shall be manufacture as per tendered drawing and specification no. MDTS 21261 Rev-01 or latest as applicable.
- 4.6. The forging/casting must be procured/bought out only from approved sources of RDSO, ICF Chennai & RCF- Kapurthala as per clause-08 of MDTS 21261 Rev-01 or latest.

5. AVAILABILITY OF INFRASTRUCTURE FACILITY AT MANUFACTURER PREMISES IN WORKING ORDER:-

5.1. ESSENTIAL M&P REQUIREMENT :

- 5.1.1. CNC High definition PLASMA or CNC LASER profile cutting machine with capacity up to thickness of 14 mm.
- 5.1.2. Minimum 4-axis CNC machining centre with probing facility (for reference and inspection) for machining the body bolster with front part having minimum bed size 1.5MX3.0MX0.8M suitable for machining of body bolster in single setting. Machine should have 3-axis movement in X, Y, Z axis and one rotational movement of milling head for drilling and facing in range of $\pm 90^\circ$ with least count of 2° .
- 5.1.3. CNC Press brake of 700 ton capacity to handle Minimum 7 meter bed length or should have cold roll forming machine.
- 5.1.4. Hydraulic press/Straightening machine for Straightening plates and components.
- 5.1.5. Minimum Four MIG/MAG welding sets (400 Amp. or more) and suitable shielding media.
- 5.1.6. Suitable degreasing/de-rusting facilities other than SS items.
- 5.1.7. In-house sand blasting plant or equivalent facility for surface preparation.
- 5.1.8. In-house Suitable Painting facility with guns and air compressor.
- 5.1.9. Level surface table of size 1000mm x 3000mm or equivalent facility.
- 5.1.10. Sufficient hand grinders for removal of fins & burrs.
- 5.1.11. Potable drilling machining up to dia 20 mm
- 5.1.12. Two Numbers Over-head crane of minimum 5 ton capacity each in one way or two mobile crane of minimum 5 ton capacity each .
- 5.1.13. Manipulator for carrying out down hand welding.
- 5.1.14. Calibrated measuring steel tape 5 and 30 meter length
- 5.1.15. Calibrated digital vernier Calipers of size 300 mm.
- 5.1.16. Calibrated micrometers - Ranging from 0 to 50 mm

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5.1.17. Calibrated welding gauges (Go and No Go).

5.1.18. Calibrated thread gauges (Go and No Go)..

5.1.19. Dye penetration test facility.

Note- Facility mentioned at 5.1.3 above, Tie-up arrangement for Combination of tandem CNC Press brakes of 700 ton capacity to handle Minimum 7 meter bed length or cold roll forming machine is acceptable)

5.2. The manufacturer shall have in house/ tie-up arrangement for carrying out spectro and mechanical analysis of the material with NABL certified labs:

5.3. The firm shall be ready for carrying out chemical and mechanical analysis of the material from NABL certified Lab at their own expense as and when required.

6. **SOLEBAR & TROUGH FLOOR:** The Sole bar and Trough floor to be manufactured as cold rolled formed section.

OR

To be manufactured on CNC press brake of suitable capacity as per clause 5.1.3.

7. **FIXTURES AND MANIPULATOR :**

7.1. The tenderer shall have facilities for edge preparation and also have adequate jigs and fixtures as per the requirements to ensure dimensional controls before commencement of bulk manufacturing.

7.2. Under frame complete tack welding jig.

7.3. Under frame turning mechanism of suitable capacity is desired for consistency in quality of product for regular build-up of under frame production.

7.4. Calibrated fixtures for front part should be available before commencing production as per clause -10 of MDTS 21261 Rev-01 or latest.

8. **Working instruction:** Coach Wise process planning fabrication working instructions to be followed for fabrication of under frame complete.

9. **ELECTRODES :**

9.1. Required electrodes shall be procured from RDSO approved sources only.

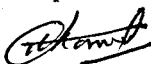
9.2. Welding wire to be used for welding of corten as DIN 8556 1.4370 with C% 0.08 max (In red color packing) from RDSO approved sources only.

9.3. Welding wire to be used for welding of Ferretic to Corten and Ferretic to Ferretic as DIN 8556 1.4316 with C% 0.025 max (In Green color packing) from RDSO approved sources only.

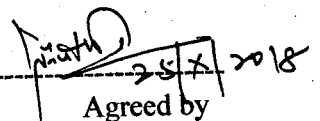
10. **MAN POWER :**

Only qualified welders with ITI or equivalent shall be deployed. Supervisors with minimum qualification of diploma in mechanical engineering, Industrial engineering and production technology shall be deployed for monitoring of production and quality control respectively.

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11. QUALITY CONTROL REQUIREMENTS :-

There shall be a system to ensure traceability of the product from raw material stage to finished product stage. Quality Assurance Plan (QAP) for the following aspects shall be ensured and approved by CDE/RCF.

10.1 Process flow chart.

10.2 Stage wise inspection details from raw materials stage to finished product stage.

10.3 Various parameters to be checked and level of acceptance of such parameters indicated and method to ensure and control over them.

10.4 Disposal system of rejected raw material and components.

12. COVERED AREA AND SEPARATE AREA FOR WORKING :

The tenderer shall have adequate covered area for storage of raw material, finished products and work in progress clearly segregated. The stainless steel items should be stacked separate from other steel and iron products to avoid contamination. No person should walk on material stored, in process or finished assembly.

13. DOCUMENTATION :

Following documentation should be maintained:

13.1. Incoming raw material register.

13.2. Stage inspection results including finished products results as per QAP.

13.3. Record of internal rejection and its analysis vis-à-vis action plan.

13.4. Record of final products inspection by external agencies.

13.5. Record of maintenance schedule of machinery and plant.

13.6. Record of training imparted, Quality assurance, safety parameters and maintenance of machinery etc.

14. PROTOTYPE INSPECTION :

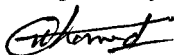
Prototype inspection will be done by RCF or its authorized agency in stages. Successful tenderer would be required to submit quality assurance plan (QAP) and stage wise inspection plan (SWIP) before prototype manufacture is undertaken. Bulk supply will be made after prototype sample approved by CDE/RCF.

15. Surface Preparation:

15.1. Under frame complete to be grit/garnet blasted to achieve required surface finish Sa 2.5 of ISO:8501 Part-1 before primer. Proper masking of machined surfaces to be ensured.

15.2. It should be ensured before welding that the items which are bought out from trade and are received protected by coating of primer & oil for temporary corrosion protection, the cleaning should be ensured with wire brush in such a manner that bare metal surface is visible before welding work is done.

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16. PAINTING :

The under frame is to be supplied primer/painted as given below details:-

16.1. Primer the hidden section i.e. ribs, lower flanges & sole bar.

16.2. Apply epoxy metal primer on Under Frame complete as per MDTS 094 with minimum DFT 60 micron.

16.3. All threaded /machined portions should be protected/masked before painting in all coaches.

16.4. The masking of front part shall be as per drawing no. MI005396 ALT-c or latest.

16.5. Apply aluminum based primer to MDTS- 28272 Rev-00 at hidden sections (which can not be painted after fabrication) being under frame as more prone area to corrosion.

16.6. Apply aluminum based primer on supporting surface of under frame which touches with corrugated sheets to avoid bimetallic corrosion before the corrugated sheets are mounted.


17. MARKING :

The tenderer name or initial with month and year of manufacture shall be marked in the finished products as specified in the relevant drawings.

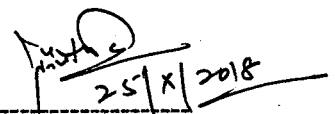
18. PACKING INSTRUCTION :

The supplier to ensure the safe transit and delivery of material up to consignee by adopting suitable mode of transport and handling transit damage if any shall be the cost of supplier. Corten steel parts like sole bar and cross member of under frame should not be in contact or rub against any iron surfaces during transportation by use of wooden/nylon blocks.

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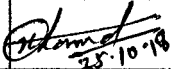
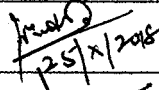
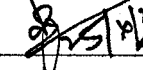
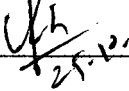
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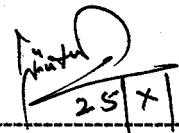
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Name	Designation	Signature	Date	Level
Ramesh Chandra	SSE/UF/Design	 25.10.18	25.10.2018	Prepared
Pardeep Luthra	ADE/Shell & Bogie Design	 25/10/2018	25.10.2018	Agreed
Kamal Kumar	Dy. CME/D-1	 25/10/2018	25.10.2018	Reviewed
Manish Bhimte	CDE	 25.10.18	25.10.2018	Approved

Issue/Rev.	Detail of changes	Date
01	Bulk order will be placed on firm's who have successfully executed at least one regular order placed by MCF/ICF/RCF for supply of any type of complete under frame of LHB coaches or BG mainline Diesel/ Electric locomotive under frame to Railway production units i.e. DLW/DMW/CLW and should have complied minimum infrastructure mentioned in clause 5 .	25.10.2018



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1. GENERAL :

This schedule covers infrastructure requirements for manufacture, testing and supply of completely finished fabricated under frame complete for LHB coaches.

2. SCOPE OF SUPPLY :

The completely finished fabricated under frame complete for LHB coaches is to be supplied conforming in all respect to the relevant drawing & schedule of requirement of tender schedule.

3. ELIGIBILITY CRITERIA :

3.1. BULK ORDER :

Bulk order will be placed on firm's who have successfully executed at least one regular order placed by :

MCF/ICF/RCF for supply of any type of complete under frame of LHB coaches
OR

Railway production units i.e. DLW/DMW/CLW for supply of BG mainline Diesel/ Electric locomotive complete under frame.

Firms should have complied minimum infrastructure mentioned in clause 5 .

3.2. DEVELOPMENTAL ORDER : Developmental orders will be placed on tenderer meeting any of following conditions :

3.2.1. Approved vendors of RCF Kapurthala for any type of Front Part complete for LHB coaches.

3.2.2. Tenderer should have manufactured and supplied successfully BG mainline Locomotive/coaches under frame to Railway/ Production units. The firm shall have to procure front part from approved source of RCF Kapurthala.

3.2.3. The firm's shall complying to infrastructure requirement as per clause 5 and dealing with heavy fabrication work subject to assessment and approval by CDE/RCF

3.3. The tenderer shall be responsible for submission of requisite document & Para-wise compliance to STR, failing which offers are likely to be ignored. The tenderer shall bring out the deviations, if any from the schedule of technical requirements & drawing with adequate justification.

RCF or its authorized nominated agency shall verify the availability of requisite infrastructure & M&P as per the STR, before tendered is considered eligible for award of developmental order.

4. OTHER REQUIREMENT :

4.1. The tenderer shall have valid ISO 9001-2008 series certification.

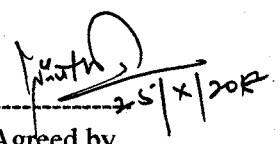
4.2. It is desirable that the tenderer is accredited with ISO-3834 certificate.

4.3. The tenderer shall provide list of M&P's and past performance.

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