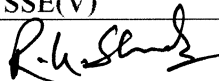
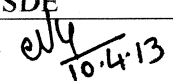
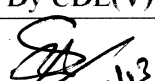
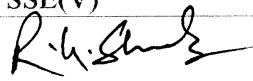
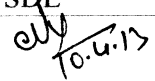

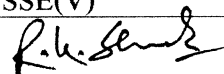
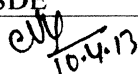
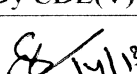
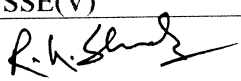
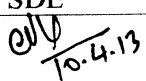
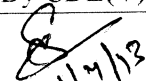


Revision- 1- Spec revised.	MATERIAL STANDARDS DIESEL LOCOMOTIVE WORKS VARANASI		INDEX	SPEC.NO. DLW/DES/ V/ 05/01	
	PURCHASE SPECIFICATION FOR FABRICATED UNDERFRAME (ALCO)		SHEET	1 of 4	
			DATE	12.08.2005	
	<p>1. SCOPE</p> <p>1.1 This specification covers the technical requirements of manufacture of under frame for diesel locomotives.</p> <p>1.2 The under frame assemblies shall be supplied conforming in all respects to the relevant drawings as indicated in the purchase order and this specification. 1.3 The Under frame to be supplied in cambered condition. The allowed twist in the under frame shall be within the limit as mentioned in the drawing.</p> <p>2. SPECIFICATIONS & STANDARDS REFERRED</p> <ol style="list-style-type: none"> 1.IS: 817 Code of Practice for Training and Testing of Metal Arc Welders. IS: 2062 Steel for General Structural Purposes. EMS 93 / SAILMA 350HI Steel plates for General Structural Purposes IS: 2102 General Tolerances (for Untoleranced Linear and Angular Dimensions). IS: 7310 Approval Tests for Welders working to Approved Welding (Part 1) Procedures. ASME-Sec IX Welding Procedure Specification. ASTM E-164 Practice for Ultrasonic Contact Examination of Weldment ASTM A: 435 Straight. Beam Ultrasonic Examination of Steel Plates for Pressure Vessels. AWS-D.1.1 Structural Welding Code Blue Standard of Welding –International Institute of Welding Electrodes used and Gas Welding Rods. <p>3. QUALITY ASSURANCE PLAN</p> <p>3.1 The firm shall submit two copies of Quality Assurance Plan (QAP) outlining all aspects of quality control required to obtain a quality product for approval to DLW.</p> <p>3.2 The manufacturer shall proceed for manufacturing only after approval of QAP. The firm shall follow the stipulations of QAP strictly.</p>				
Issuing Authority : SSE(Records)	PREPARED BY SSE(V)	CKD BY SDE	APPD BY Dy CDE(V)	SPEC.NO. DLW/DES/ V/ 05/01	
		 10.4.13	 11.4.13	REVISION -1	Date 10.04.2013

	MATERIAL STANDARDS DIESEL LOCOMOTIVE WORKS VARANASI		INDEX	SPEC.NO. DLW/DES/ V/ 05/01		
			SHEET	2 of 4		
	PURCHASE SPECIFICATION FOR FABRICATED UNDERFRAME (ALCO)		DATE	12.08.2005		
4. EQUIPMENT (M & P) REQUIRED : The vendor should give documentary evidence of availability of following M&P. which are required to manufacture the Underframe Asm for ALCO locomotives :- a) CNC Profile Plasma cutting (Capacity - up to 50 mm thickness) b) Shearing Machine/ Laser cutting machine (up to 8 mm thick x 2000 mm wide). c) Press Brake/Hydraulic Press of at least span of 2 meters suitable for bending of steel sheets up to 6 mm thick and steel plates up to 45 mm thick. d) Rolling machine for straightening of the plates / sheets / angles. (up to 12 mm thick x 2000 mm wide). e) Drilling Machine for diameter up to 60 mm f) GMAW/FCAW (shielding gas Argon+CO2) welding facilities - Minimum 04 welding plants of 400/600 AMPS capacity. g) SMAW welding plants. h) Shaper / pug cutting machine for chamfering i) Milling and Lathe Machine for manufacture of steel bushes j) Sand / Shot blasting k) Spray painting facility l) EOT Cranes (Minimum 2 nos.) of at least 10T capacity each in each bay. m) Surface plate/ Leveled platform at least of size 20 Meters X 4 Meters. n) Inhouse facilities for Ultrasonic / Radiography testing with level-II qualified operator is preferable.						
5. MANUFACTURING PROCEDURE 5.1 Raw Material The chemical composition & mechanical properties of steel shall conform to IS: 2062 Grade 'B', Semi killed & normalized quality. Fe-410 WC unless some other material is specified in the drawings. Steel plates shall be procured along with their test certificates from SAILI TISCO or other reputed manufacturers. These test certificates shall be correlated with the stamping on plates to be taken up for manufacture prior to commencement of fabrication. All plates to be taken up for manufacture shall be free from rust and scales, cracks, dents, pitting, bends etc. All plates of thickness 12 mm and above shall be subjected to ultrasonic test on the entire surface as per ASTM A: 435/IS: 4225 using angular <i>and</i> normal.						
Issuing Authority : SSE(Records)	PREPARED BY SSE(V)	CKD BY SDE	APPD BY Dy CDE(V)	SPEC.NO. DLW/DES/ V/ 05/01		
		 10.04.13	 11/4/13	REVISION -1 Date 10.04.2013		

	MATERIAL STANDARDS DIESEL LOCOMOTIVE WORKS VARANASI		INDEX	SPEC.NO. DLW/DES/ V/ 05/01		
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	PURCHASE SPECIFICATION FOR FABRICATED UNDERFRAME (ALCO)		DATE	12.08.2005		
5.2 Welding Procedure Metal Inert Gas (MIG) welding process using CO2/Argon gas as shielding media and DLW approved brand of filler wire shall only be adopted for welding. Manual Metal Arc (MMA) welding may be permitted for welding of some brackets etc. Approval from the inspecting agency for use of welding consumables prior to commencement of manufacture of the under frame is required.						
5.3 Welders Qualification Only qualified welders should be deployed for the fabrication of Under Frame Asm. Welder shall be qualified to AWS welding code D.15.1 / section IX of ASME B & PV code / IS: 7310 (Part-1). Approval of Inspecting Agency to specific welder(s) to be engaged for this fabrication job is / are required based on valid certificate from reputed organization and / or trial welding done by welder in their presence.						
5.4 Quality of Weld Joints Weld joints shall have uniform beading and smooth change over from weld deposit to parent metal. Weld joints shall be free from cracks, craters, undercuts, and overlaps. Porosity, inclusions, blowholes etc. Butt weld joints shall be subjected to Radiographic tests. Ultrasonic testing shall check butt weld joints not accessible to radiography. Acceptance standard shall be as per Blue Standard of IIW for Radiography and ASTM A435/ IS: 4225 for Ultrasonic test.						
5.5 Sand / Shot Blasting : After manufacture the under frame shall be cleaned by sand / shot blasting.						
5.6 Cracks in Welding After cleaning by sand / shot blasting the critical areas shall be checked for any presence of cracks in welding.						
5.7 Anti Corrosive Paint After sand / shot blasting and crack detection & acceptance of the under frame the same shall be painted Epoxy Primer to DLW Spec. No Misc-077 of M/s MRF/Asian Paint.						
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	MATERIAL STANDARDS DIESEL LOCOMOTIVE WORKS VARANASI		INDEX	SPEC.NO. DLW/DES/ V/ 05/01					
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	PURCHASE SPECIFICATION FOR FABRICATED UNDERFRAME (ALCO)		DATE	12.08.2005					
6. STAGES OF INSPECTION Prototype Inspection: 6.1 Inspection shall be carried out by the Inspecting Agency at the end of the following stages of manufacture: 6.1.1 Inspection for raw material, approval of welders, welding consumables. Gauges and fixtures. 6.1.2 Inspection of plates in cut and machined conditions to check edge preparation. 6.1.3 Inspection of Sub assemblies like I-beam, bolster & draw head assembly etc. 6.2 Final Inspection.									
6. QUALITY CONTROL PROCESS 7.1 Dimensions and tolerances:- All dimensions / tolerances shall be as per details given in the drawings. 7.2 Detailed dimension control charts shall be prepared for stage inspection during manufacturing of under frame in which measurements of critical dimensions shall be recorded and kept for evaluation and verification by the Inspecting Agency. 7.3 All non-toleranced dimensions shall be maintained in accordance with IS: 2102 (Medium) or as indicated in the drawing. 7.4 Gauges, fixtures, templates and accurate measuring instruments shall be used to ensure the correctness of the dimensions.									
8. Identification MARKS Each under frame shall be provided with an identification plate at an easily visible location. The identification plate shall contain: a) Manufacturer's Monogram. b) Contract No./P.O. No. c) Serial No. d) Month & Year of Manufacture.									
9. Transportation: The Under frame to be supplied in cambered condition it is to be ensured that camber do not get disturbed during transportation. The cambered limit is specified in the drawing.									
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