

NOTE : The shell bar material should be supplied as per latest issue of the specification. All features should be governed by the specification except otherwise stated in the Drawing.

CONDITION OF SUPPLY OF SHELL BARS :

1. Material Specification : As per BS:970 EN9 in 'T'condition

C%	CHEMICAL COMPOSITION			
	Si%	Mn%	P%	S%
0.50-0.60	0.05-0.35	0.50-0.80	0.06 Max.	0.06 Max.

PHYSICAL PROPERTIES

Tensile strength : 55 TSI : (min.)

0.2% P.S. : 34 TSI : (min) : Elongation (4 VA) = 15 min.

Separate test sample 1 1/8" dia from the billet to be heat treated as below to meet the above properties

- a) Harden in oil from a temp. 810-840 °C
- b) Temper at a suitable Temp. 550-660 °C

2. Macro Etch Test : "Macro etch test to be carried out from top and bottom of the 1st. & last Ingot of each cast".  
Acceptance Standard :  
S2 R2 C1 as per Specn. ASTM F-381 Plate I & II & freedom from flake, splashes, gassy, flute, cracks, butt, cracks shrinkge, microporcity, blow holes, foreign inclusion, rippled surface other qualitative requirements are as per specification.

3. Quality : "Billet should be free from harmful surface defects, final dressing of the bars may be carried out by cold chipping or grinding But the amount of such dressing must be limited to the depth of 2mm from the surface. Billets are to be straight and free from twist".

4. Supply Condition : "Stores should be supplied in Hot rolled & normalised condition".

5. Certificate of Compliance : "Certificate of compliance for the bulk supply duly authenticated by the inspector showing details of chemical composition & other requirements of the specification are required to be furnished alongwith the bulk supply".

6. Condition of Acceptance : "Notwithstanding the acceptance of the material as complying with the specification/order the bulk will be liable to subsequent rejection should it fail, in whole or in part to meet the specification or should presence of any harmful defects be revealed at O.F.Amabhari".

7. Warranty of the Store : "The steel billet supplied against this S.O. shall be deemed to have been warranty against defective material and/or workmanship by the manufacturer /supplier for a period of twelve month

8. Shape : "Straight bars with end cuts square. One end of the bar may be saw cut & the other end gas cut or both the ends saw cut. Ends to be deburred".

9. Marking : "One end on cross flat surface, marking of suppliers name cast no, should be stamped properly. Lot/Code no. If any to be painted on the same cross section end".

10. Bundling : "Steel bars to be bundled cast-wise with 5 to 6mm dia. M.S. wire with 3 strands. Each bundle should not weight more than 3 to 4 Tonne".  
Cast no./Lot no. stamped/painted on the bars should be arranged at one end of the bundle for easy identification Despatches are to be made cast-wise.

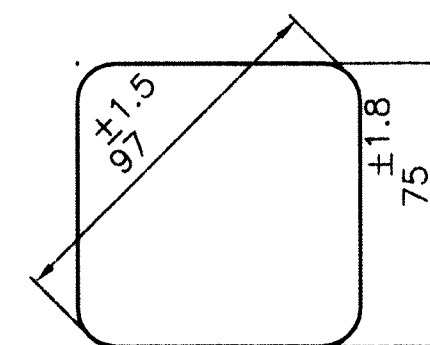
11. Colour Code "25mm to 50mm wide 'WHITE' colour band to be painted throughout the length of each billet on one side.

12. Permissible inclusion rating will be as under.  
"2/1(Thin/Thick) as per IS : 4163-1982 for each type of inclusion A,B ,Cand D."

13. Steel is to be manufacrure through EAF/BOF-LRF-VAD/VD bottom poured ingot route.

14. The reduction ratio should be atleast 6:1

15. Supply is to be made in the length of 4m to 6m plus 25 to 75mm extra in multiple of 270mm & 5% shootdown length up to 1.5m in multiple of 270 mm is acceptable



AMENDMENTS				DIMENSIONS ARE IN mm			MATERIAL: AS ABOVE		ORDNANCE FACTORY AMBAJHARI	
218/05 B	25/08/05	NOTE NO 13 & 15 AMENDED	WM/SF	THIRD ANGLE PROJECTION			NOMENCLATURE:		DRG. NO: F-531 B	
201/05 A	13/08/05	New Drg. no. allotted previous it was F-522 A New tracing made with adding all notes. and tolerance on Billet dimns. In note no 15 length 270mm was 265mm plus 25 to 75mm extra was 100mm	WM/SF	SCALE :	NAME	DATE	STEEL BILLET		SHEET NO: 1	
REV.	DATE	DESCRIPTION	SIGN	2005	R. J. BASDE				NO. OF SHEETS: 1	
				TRACED					OPERATION NO:	
				CKD.		07-06-05			COMPT: F-519 PRACTICE	
				1/C-CDD		08-06-05	M/C: VERNON LINE IV			
				APPVD		08-06-05	STORE: 76.2mm Naval Ammn.			