

MATERIAL SPECIFICATION

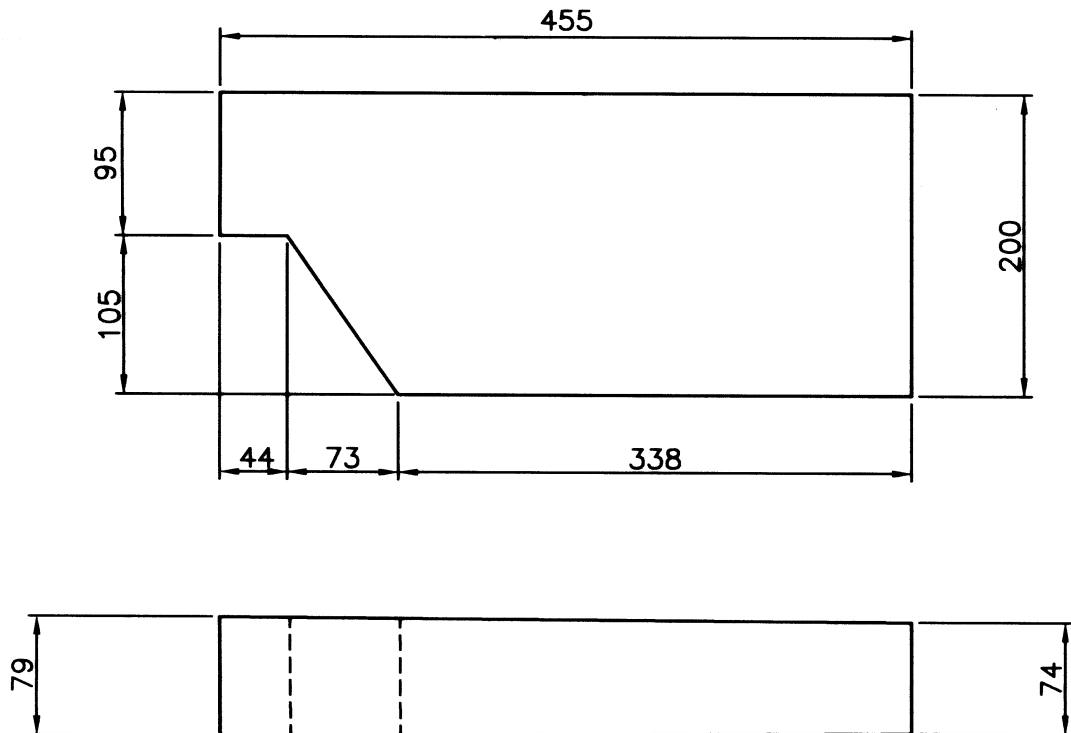
<u>1</u>	HEARTH TOP OUTER SLAB BLOCK DRG NO :4-7-1101-01-06278/00 MATERIAL :80% AL2O3 Specification: AL2 O3 %MIN : 80 +or- 1.5 PCE SK MIN : 36 RUL ta deg C MIN : 1630 PLC %MAX :+/- 0.5 @ 1600 deg C For 1 hour AP %MAX : 16 for M/C, 19 for HM CCS Kgs/ cm sq MIN :800 FOR M/C, 500 FOR HM BD qm/cc MIN :2.8 FOR M/C, 2.7 FOR HM SPALLING CYCLES -MIN :+ 30 air quenching at 1600 C For 1 hr Size tolerance whichever is greater: +or -1% or +/- 2mm
<u>2</u>	HEARTH TOP INNER SLAB BLOCK DRG NO : 4-7-1101-01-06279/00 MATERIAL : 80% AL2O3 Specification: AL2 O3 %MIN : 80 +or-1.5 PCE SK MIN : 36 RUL ta deg C MIN : 1630 PLC %MAX : +or-0.5 @ 1600 deg C FOR 1 hour AP %MAX : 16 for M/C 19 for HM C CS Kgs/ cm sq MIN : 800 FOR M/C 500 FOR HM BD qm/cc MIN : 2.8 FOR M/C 2.7 FOR HM SPALLING CYCLES -MIN :+30 air quenching at 1600 deg C FOR 1 hour Size tolerance whichever is greater : +or-1% or +/- 2mm
<u>3</u>	HEARTH MIDDLE OUTER CIRCLE BLOCK DRG NO :4-7-1101-01-06280/00 MATERIAL :80% AL2O3 Specification: AL2 O3 %MIN : 80 +or- 1.5 PCE SK MIN : 36 RUL ta deg C MIN : 1630 PLC %MAX :+or-0.5 @ 1600 deg C For 1 hour AP %MAX :16 for M/C 19 for HM CCS Kgs/ cm sq MIN :800 FOR M/C 500 FOR HM BD qm/cc MIN :2.8 FOR M/C 2.7 FOR HM SPALLING CYCLES -MIN :+ 30 air quenching at 1600 deg C For 1 hour Size tolerance whichever is greater: + or -1% or +/- 2mm
<u>4</u>	HEARTH MIDDLEA INNER CIRCLE BLOCK DRG NO :4-7-1101-01-6281/00 MATERIAL:80% AL2O3 Specification: AL2 O3 %MIN : 80 +or-1.5 PCE SK MIN : 36 RUL ta deg C MIN : 1630 PLC %MAX :+/- 0.5 @ 1600 deg C For 1 hr AP %MAX : 16 for M/C 19 for HM C CS Kgs/ cm sq MIN :800 FOR M/C 500 FOR HM BD qm/cc MIN :2.8 FOR M/C 2.7 FOR HM SPALLING CYCLES-MIN :+30 air quenching at 1600 deg C FOR 1 hour Size tolerance whichever is greater :+or- 1% or +/- 2mm
<u>5</u>	HEARTH BOTTOM OUTER CIRCLE BLOCK DRG NO :4-7-1101-01-06282/00 MATERIAL :80% AL2O3 Specification: AL2 O3 %MIN :80+or-1.5 PCE SK MIN : 36 RUL ta deg C MIN : 1630 PLC %MAX :+/-0.5 @ 1600 deg C For 1 hour AP %MAX : 16 for M/C, 19 for HM CCS Kgs/cm sq MIN :800 FOR M/C, 500 FOR HM BD qm/cc MIN :2.8 FOR M/C, 2.7 FOR HM SPALLING CYCLES -MIN :+30 air quenching at 1600 C For 1 hr Size tolerance whichever is greater: + or -1% or +/- 2mm
<u>6</u>	HEARTH BOTTOM INNER CIRCLE BLOCK DRG NO :4-7-1101-01-06283/00 MATERIAL :80% AL2O3 Secification: AL2 O3 %MIN : 80+or-1.5 PCE SK MIN : 36 RUL ta deg C MIN : 1630 PLC %MAX :+/-0.5 @ 1600 deg C For 1 hr AP %MAX :16 for M/C, 19 for HM CCS Kgs/ cm sq MIN : 800 FOR M/C, 500 FOR HM BD qm/cc MIN :2.8 FOR M/C, 2.7 FOR HM SPALLING CYCLES -MIN :+30 air quenching at 1600 C For 1 hr Size tolerance whichever is greater: + or-1% or +/- 2mm
<u>7</u>	INNER WALL SUPPORTING BRICK DRG NO :4-7-1101-01-06305/00 MATERIAL : 55%-60% AL2O3 SPECIFICATION : AL2O3 :55-60 % Fe2 O3 :1% MAX P.C.E : 35 ORTON CONE R.U.L ta :1560 deg C APPARENT POROSITY :22-25% C C S :OVER 350Kg/cm.Sq SERVICE TEMP :1600 deg C

<u>8</u>	ANCHOR BRICK DRG NO :4-7-1101-01-06311/00 MATERIAL : 55%-60% Al2O3 SPECIFICATION : AL2O3 :55-60 % Fe2 O3 :1% MAX P.C.E : 35 ORTON CONE R.U.L ta :1560 deg C APPARENT POROSITY :22-25% CCS :OVER 350Kg/cm.Sq SERVICE TEMP :1600 deg C
<u>9</u>	INNER WALL SHAPE BRICK-I DRG NO :4-7-1101-01-06312/00 MATERIAL : 55%- 60% Al2O3 SPECIFICATION : AL2O 3 :55-60 % Fe2 O3 :1% MAX P.C.E : 35 ORTON CONE R.U.L ta :1560 deg C APPARENT POROSITY :22-25% CCS :OVER 350Kg/cm.Sq SERVICE TEMP :1600 deg C
<u>10</u>	INNER WALL SHAPE BRICK-II DRG NO :4-7-1101-01-06313/00 MATERIAL : 55%- 60% Al2O3 SPECIFICATION : AL2O3 :55-60 % Fe2 O3 :1% MAX P.C.E : 35 ORTON CONE R.U.L ta :1560 deg C APPARENT POROSITY :22-25% CCS :OVER 350Kg/cm.Sq SERVICE TEMP :1600 deg C
<u>11</u>	INNER WALL SHAPE BRICK-III DRG NO :4-7-1101-01-06314/00 MATERIAL : 55%- 60% Al2O3 SPECIFICATION : AL2O3 :55-60 % Fe2 O3 :1% MAX P.C.E : 35 ORTON CONE R.U.L ta :1560 deg C APPARENT POROSITY :22-25 % CCS :OVER 350Kg/cm.Sq SERVICE TEMP :1600 deg C
<u>12</u>	INNER WALL SHAPE BRICK-IV DRG NO :4-7-1101-01-06315/00 MATERIAL : 55%- 60% Al2O3 SPECIFICATION : AL2 O3 :55-60 % Fe2 O3 :1% MAX P.C.E : 35 ORTON CONE R.U.L ta :1560 deg C APPARENT POROSITY :22-25% C C S :OVER 350Kg/cm.Sq SERVICE TEMP :1600 deg C
<u>13</u>	OUTER WALL SUPPORTING BRICK-1 DRG NO :4-7-1101-01-06301/00 MATERIAL : 55%-60% Al2O3 SPECIFICATION : AL2O3 :55-60 % Fe2 O3 :1% MAX P.C.E : 35 ORTON CONE R.U.L ta :1560 deg C APPARENT POROSITY :2 2-25% CCS :OVER 350Kg/cm.Sq SERVICE TEMP :1600 deg C
<u>14</u>	OUTER WALL SUPPORTING BRICK-II DRG NO :4-7-1101-01-06302/00 MATERIAL : 55%-60% Al2O3 SPECIFICATION AL2O3 :55-60 % P.C.E : 35 ORTON CONE R.U.L ta :1560 deg C APPARENT POROSITY :22-25% CCS :OVER 35 0Kg/cm.Sq SERVICE TEMP :1600 deg C
<u>15</u>	OUTER WALL SUPPORTING BRICK-III DRG NO :4-7-1101-01-06303/00 MATERIAL : 55%-60% Al2O3 SPECIFICATION : AL2O3 :55-60 % Fe2 O3 :1% MAX P.C.E : 35 ORTON CONE R.U.L ta :1560 deg C APPARENT PO ROSITY :22-25% C C S :OVER 350Kg/cm.Sq SERVICE TEMP :1600 deg C
<u>16</u>	OUTER WALL SUPPORTING BRICK-IV DRG NO :4-7-1101-01-06304/00 MATERIAL : 55%-60% Al2O3 SPECIFICATION : AL2O3 :55-60 % Fe2 O3 :1% MAX P.C.E : 35 ORTON CONE R.U.L ta :1560 deg C APPARENT POROSITY :2 2-25% CCS :OVER 350Kg/cm.Sq SERVICE TEMP :1600 deg C
<u>17</u>	OUTER WALL BASE BRICK-I DRG NO :4-7-1101-01-06306/00 MATERIAL : 55%-60% Al2O3 SPECIFICATION : AL2O3 :55-60 % Fe2 O3 :1% MAX P.C.E : 35 ORTON CONE R.U.L ta :1560 deg C APPARENT POROSITY : 22-25% CCS :OVER 350Kg/cm.Sq SERVICE TEMP :1600 deg C

<u>18</u>	OUTER WALL BASE BRICK-II DRG NO :4-7-1101-01-06307/00 MATERIAL : 55%-60% AL2O3 SPECIFICATION : AL2O3 3 :55-60 % Fe2 O3 :1% MAX P.C.E : 35 ORTON CONE R.U.L ta :1560 deg C APPARENT POROSITY :22-25% CCS :OVER 350Kg/cm.Sq SERVICE TEMP :1600 deg C
<u>19</u>	OUTER WALL ANCHOR BRICK-II DRG NO :4-7-1101-01-06309/00 MATERIAL : 55%-60% AL2O3 SPECIFICATION : AL 2O3 :55-60 % Fe2 O3 :1% MAX P.C.E : 35 ORTON CONE R.U.L ta :1560 deg C APPARENT POROSIT Y :22-25% CCS :OVER 350Kg/cm.Sq SERVICE TEMP :1600 deg C
<u>20</u>	SKEW BACK - RH FOR CHARGING & DISCHARGING DOORS DRG NO :4-7-1101-01-06284/00 MATERIAL: 55-60% AL2O3 SPECIFICATI ON: AL2O3 :55-60% Fe2 O3 :1%(MAX) P.C.E :36 ORTON CONE RUL ta :1560 degree C APPARANT POROSITY :22-25% C C S :OVER 350kgs/cmsq SERVICE TEMP :1600 deg C
<u>21</u>	SKEW BACK - LH FOR CHARGING & DISCHARGING DOORS DRG NO :4-7-1101-01-06285/00 MATERIAL: 55-60% AL2O3 SPECIFICATION: AL2O3 :55-60% Fe2 O3 :1%(MAX) P.C.E :36 ORTON CONE RUL ta :1560 degree C APPARANT POROSITY :22-25% C C S :OVE R 350KGS/CM.SQ SERVICE TEMP :1600 DEGREE C.
<u>22</u>	SKEW BACK - LH DRG NO :4-7-1101-01-04457/00 MATERIAL : 55%-60% Al2O3 SPECIFICATION : AL2O3 :55- 60 % Fe2 O3 :1% MAX P.C.E : 35 ORTON CONE R.U.L ta :1560 deg C APPARENT POROSITY :22-25% CCS :OVER 350Kg/cm.Sq SERVICE TEMP :1600 deg C
<u>23</u>	SIDE BLOCK for RHF Charging & Dis-charging Doors. DRG NO :3-7-1101-01-04699/00 MATERIAL SPECIFICATIONS :- AL2O3 Min. : 70 %. Fe2 O3 Max. : 0.5 % P.C.E. : 36 RUL ta :1720 deg.C APPARANT POROSITY (Min.) : 17 %. C.C.S. (Min.) :600 Kgs/cm.sq. PLC (Max.) : ± 0.20 % at 1550°C/2 Hours. SERVICE TEMP :1700 deg. C
<u>24</u>	SILL BLOCK FOR RHF CHARGING & DISCHARGING DOORS DRG NO :4-7-1101-01-06288/00 MATERIAL :55 TO 60% AL2O3 SPECIFICATION: AL2O3 :55-60% Fe2O3 :1%(MAX) P.C.E :360 RTON CONE RUL ta :1560deg C APPARANT POROSITY :22-25% C.C.S :OVER 350kgs/cmsq SE RVICE TEMP :1600degC
<u>25</u>	END ARCH FOR RHF CHARGING & DISCHARGING DOORS. DRG NO :4-7-1101-01-06286/00 MATERIAL SPECIFICATION: RAW MATERIAL BASE ANDALUSITE MULLITE Fe2 O3 :1%(MAX) P.C.E :36 ORTON CONE R.U.L.ta :1560 degree C APPARENT POROSITY :22-25% C C S :OVE R 350KGS/CM.SQ SERVICE TEMP :1600 DEGREE C
<u>26</u>	END ARCH FOR CHARGING & DISCHARGING DOORS DRG NO : 4-7-1101-01-06287/00 MATERIAL SPECIFICATION: RAW MATERIAL BASE ANDALUSITE MULLIT E Fe2O3 :1%(MAX) P.C.E :36 ORTON CONE R.U.L.ta :1560 degree C APPARENT POROSITY :22-25% C C S :OVER 350KG S/CM.SQ SERVICE TEMP :1600 DEGREE C
<u>27</u>	STD END ARCH SIZE :230X113X75/65mm MATERIAL :55% -60% Al2O3 SPECIFICATION: AL2O3 :55-60% Fe2 O3 :1%(MAX) P.C.E :36 ORTON CONE R.U.L.ta :1560 deg.C APPARENT POROSITY :22-25% C C S :OVE R 350KGS/CM.SQ SERVICE TEMP :1600 DEGREE C

<u>28</u>	<p>STD END ARCH SIZE :230X113X75/50mm MATERIAL :55%-60% Al₂ O₃</p> <p>SPECIFICATION: AL₂O₃ :55-60% Fe₂ O₃</p> <p>:1%(MAX) P.C.E :36 ORTON CONE R.U.L.ta :1560 deg.C APPARENT POROSITY :22-25% CCS :OVER 350</p> <p>KGS/CM.SQ SERVICE TEMP :1600 DEGREE C.</p>
<u>29</u>	<p>STRAIGHT BRICK SIZE :230X113X75mm MATERIAL SPECIFICATION :- AL₂O₃ :55-60% Fe₂ O₃ :1%(MAX)</p> <p>P.C.E :36 ORTON CONE R.U.L.ta :1560 deg.C APPARENT POROSITY :22-25%</p> <p>C.CS :OVER 350KGS/CM.SQ</p> <p>SERVICE TEMP :1600 DEGREE C.</p>
<u>30</u>	<p>HOT FACE INSULATION STANDARD BRICKS OF SIZE : 230x115x75mm</p> <p>SPECIFICATION : AL₂O₃ % : min = 40 PCE SK : min = 32 AP</p> <p>% : min = 65 BD gm/sq.cm : max = 0.9 CCS kg/sq.cm : min = 20 SWT Deg.C</p> <p>min = 1400 THERMAL CONDUCTIVITY VALUE K.c</p> <p>al/m.hr/deg.c : 0.2 @ 600 deg.c SIZE TOLERANCE : +/-0.2% or +/- 1mm</p> <p>WHICHEVER IS GREATER.</p>
<u>31</u>	<p>STD BRICKS OF COLD FACE INSULATION QUALITY SIZE : 230x115x75mm</p> <p>SPECIFICATION AL₂O₃ % min = 30 PCE : OC min = 30 AP</p> <p>% above 70 BD gm/cc max = 0.6 CCS kg/sq.cm min = 10 SWT deg C min =</p> <p>1200 THERMAL CONDUCTIVITY K.cal/m/hr/ deg C : 0</p> <p>.25 @ 600 deg C SIZE TOLERANCE : +/-0.2% or 1mm WHICHEVER IS GREATER.</p>

REV	DATE	ALTERED
01		CHECKED
		APPROVED



NOTES:

1. THE REFRACTORIES SHALL BE COMPACT, OF HOMOGENEOUS TEXTURE AND FREE FROM CRACKS, VOIDS AND OTHER FLAWS, THEY SHALL BE BURNT EVENLY THROUGHOUT, AND SHALL HAVE SUFFICIENT MECHANICAL STRENGTH AND NO SOFT CORNERS.
2. ALL CORNERS TO BE MINIMUM 3 mm. RADII, UNLESS OTHERWISE STATED.
3. TOLERANCE ON SIZE $\begin{smallmatrix} +0 \\ -1 \end{smallmatrix}$

			80% Al_2O_3	600
ITEM NO	DESCRIPTION	DRAWING NO	MATL CODE	UNIT WT
			MATL SPEC	QTY

EQPT: ROTARY HEARTH FURNACE



Bharat Heavy Electricals Ltd
SEAMLESS STEEL TUBE PLANT
TIRUCHIRAPALLI - 620014

DRN	NAME SENJUMAR	SIGNATURE SENJUMAR	DATE 15.12.04
CHD			
APPD	S. SHANMUGASUNDARAM	S. Shanmugasundaram	16/12/04

DEPT MPG	GRADE OF UNTOL DIM G/M/F	SCALE 1:5	WEIGHT (Kg) 17.6	REF TO ASSY DRG	ITEM NO
CODE				REF TO OLD DRG FA-0427-3/2	

TITLE
**HEARTH TOP OUTER
SLAB BLOCK**

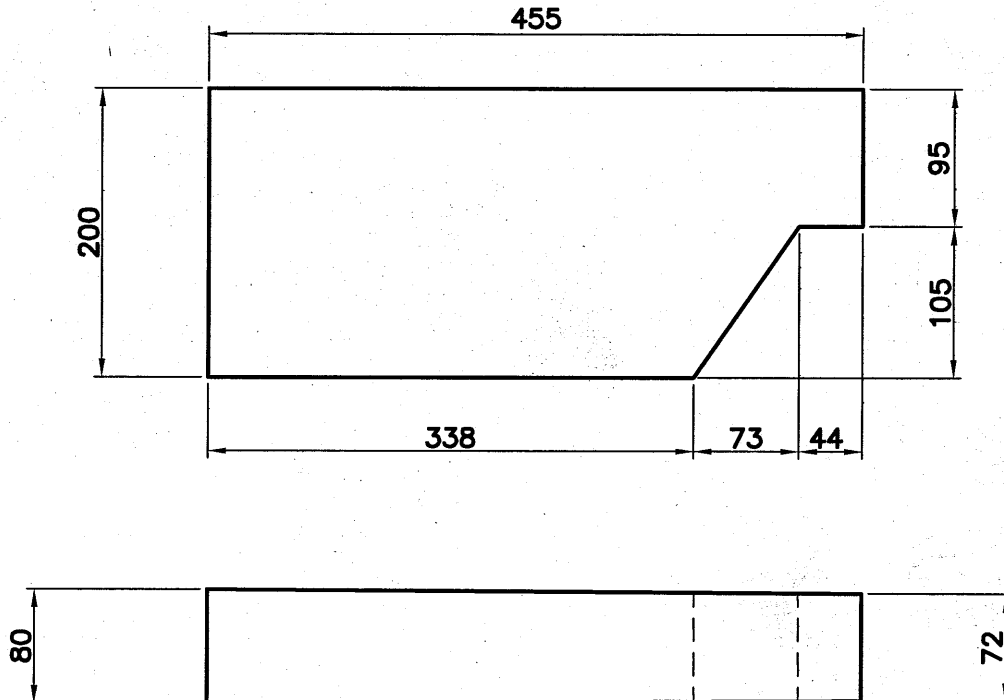
CARD
CODE
U 01

DRAWING NO :
4-7-1101-01-06278

REV
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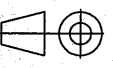
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REV	DATE	ALTERED
01		CHECKED
		APPROVED

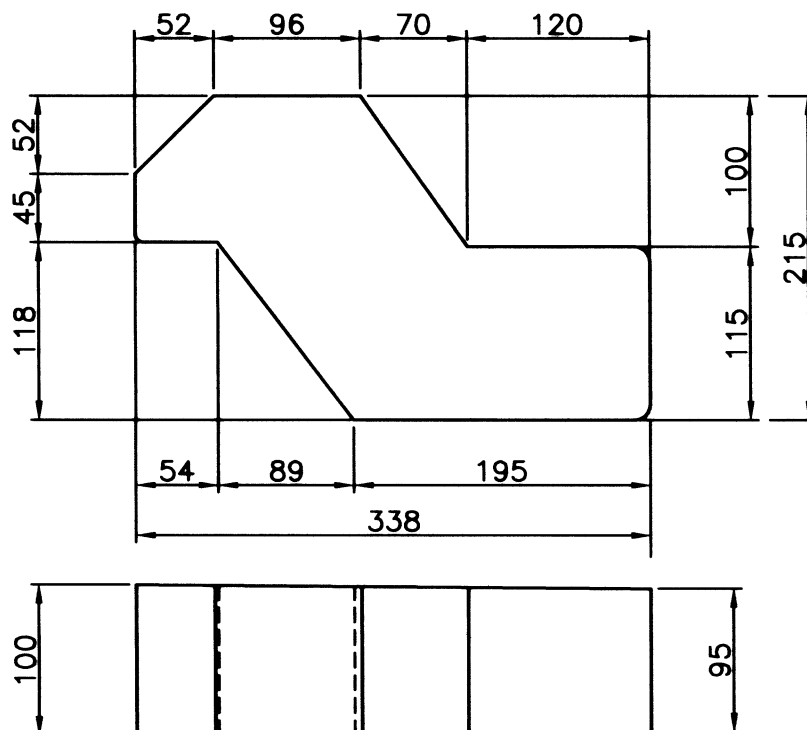


NOTES:

1. THE REFRFACTORIES SHALL BE COMPACT, OF HOMOGENEOUS TEXTURE AND FREE FROM CRACKS, VOIDS AND OTHER FLAWS, THEY SHALL BE BURNT EVENLY THROUGHOUT, AND SHALL HAVE SUFFICIENT MECHANICAL STRENGTH AND NO SOFT CORNERS.
2. ALL CORNERS TO BE MINIMUM 3 mm.RADII, UNLESS OTHERWISE STATED.
3. TOLERANCE ON SIZE $\begin{matrix} +0 \\ -1 \end{matrix}$

				80% AL ₂ O ₃		360	
ITEM NO	DESCRIPTION	DRAWING NO		MATL CODE		UNIT WT	
				MATL SPEC		QTY	
EQPT: ROTARY HEARTH FURNACE							
		Bharat Heavy Electricals Ltd SEAMLESS STEEL TUBE PLANT TIRUCHIRAPALLI - 620014		DRN	NAME SSN.KUMAR	SIGNATURE <i>SSN.Kumar</i>	DATE 15.12.04
				CHD			
				APPD	S.SHANMUGASUNDARAM		
DEPT. MPG	GRADE OF UNTOL. DIM		SCALE	WEIGHT (Kg)	REF TO ASSY DRG		ITEM NO
CODE	φ/M/f		1:5	17.4	REF TO OLD DRG FA-0427-3/3		
TITLE HEARTH TOP INNER SLAB BLOCK				CARD CODE U 01	DRAWING NO : 4-7-1101-01-06279		REV 00

REV 01	DATE	ALTERED
		CHECKED
		APPROVED

**NOTES:**

1. THE REFRACTORIES SHALL BE COMPACT, OF HOMOGENEOUS TEXTURE AND FREE FROM CRACKS, VOIDS AND OTHER FLAWS, THEY SHALL BE BURNT EVENLY THROUGHOUT, AND SHALL HAVE SUFFICIENT MECHANICAL STRENGTH AND NO SOFT CORNERS.
2. ALL CORNERS TO BE MINIMUM 3 mm.RADI, UNLESS OTHERWISE STATED.
3. TOLERANCE ON SIZE $\begin{smallmatrix} +0 \\ -1 \end{smallmatrix}$

			80% AL ₂ O ₃	480
ITEM NO	DESCRIPTION	DRAWING NO	MATL CODE	UNIT WT
			MATL SPEC	QTY

EQPT: **ROTARY HEARTH FURNACE**

Bharat Heavy Electricals Ltd
SEAMLESS STEEL TUBE PLANT
TIRUCHIRAPALLI - 620014

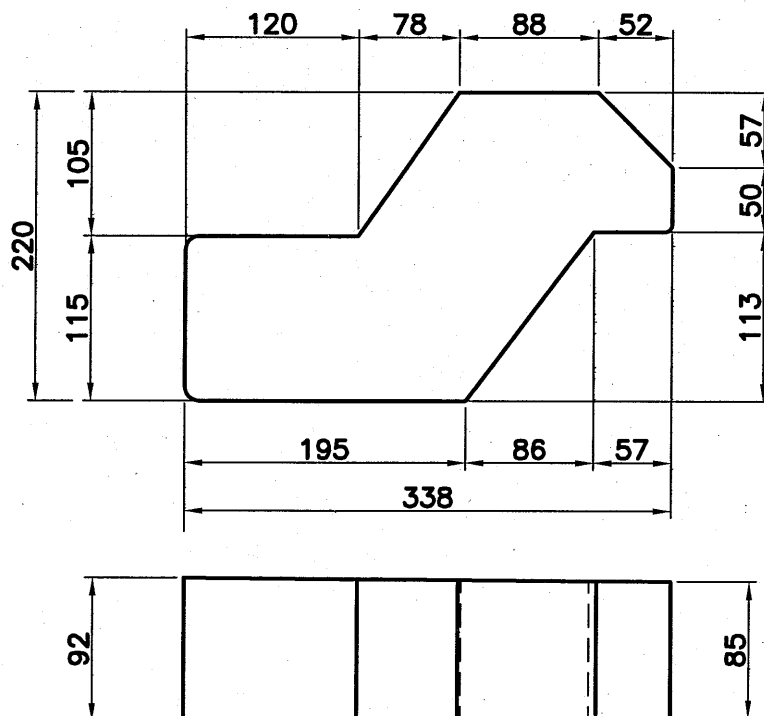
DRN	NAME	SIGNATURE	DATE
CHD	SENJUMAR	<i>SEN. Kumar</i>	15.12.04
APPD	S.SHANMUGASUNDARAM	<i>S. Shanmugasundaram</i>	16/12/04

DEPT MPG	GRADE OF UNTOL DIM G/M/r	SCALE 1:5	WEIGHT (Kg) 12.5	REF TO ASSY DRG	ITEM NO
CODE				REF TO OLD DRG FA-0427-3/4	
TITLE HEARTH MIDDLE OUTER CIRCLE BLOCK				DRAWING NO : 4-7-1101-01-06280	REV 00
CARD CODE U 01					

ALL DIMENSIONS ARE IN MM


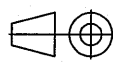
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01	25.3.10	CHECKED
		APPROVED

DIMENSIONS REVISED.



NOTES:

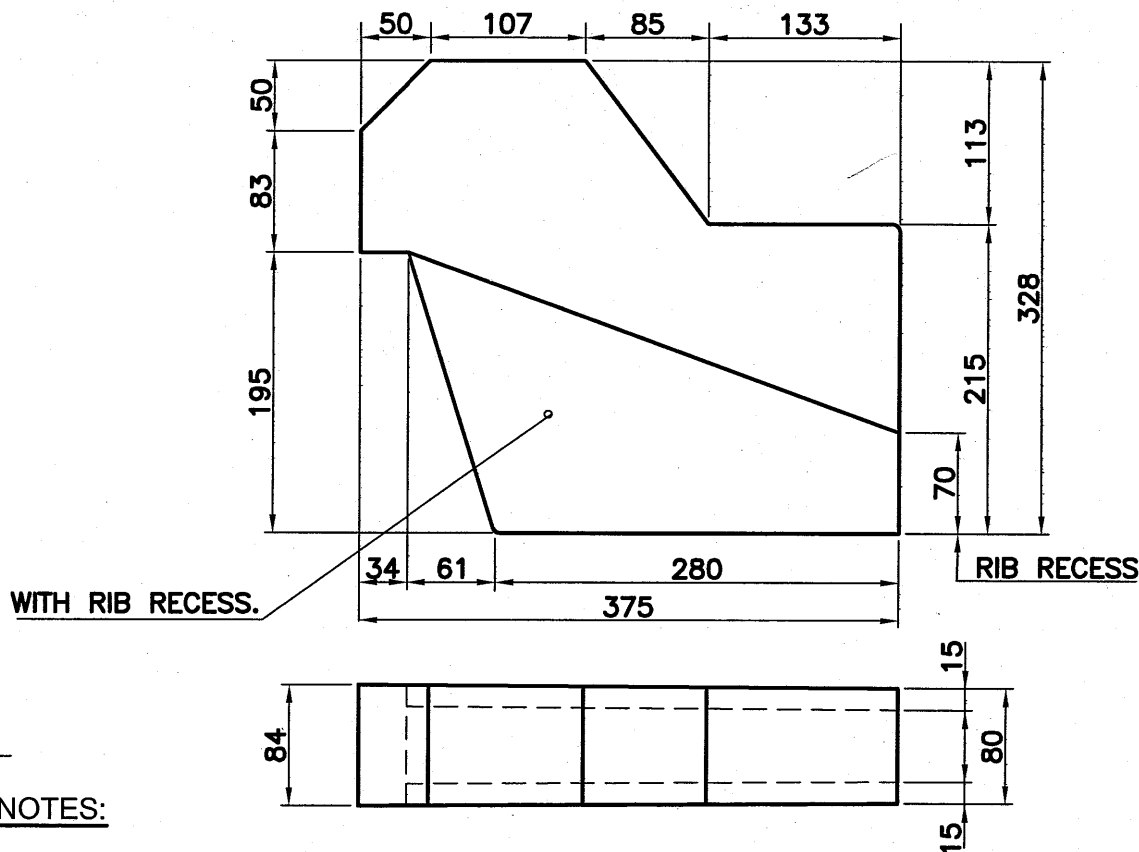
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2. ALL CORNERS TO BE MINIMUM 3 mm.RADII, UNLESS OTHERWISE STATED.
3. TOLERANCE ON SIZE $\begin{matrix} +0 \\ -1 \end{matrix}$

				80% AL ₂ O ₃		300	
ITEM NO	DESCRIPTION	DRAWING NO	MATL CODE		UNIT WT		
			MATL SPEC		QTY		
EQPT: ROTARY HEARTH FURNACE							
 Bharat Heavy Electricals Ltd SEAMLESS STEEL TUBE PLANT TIRUCHIRAPALLI - 620014		DRN	NAME SSN.KUMAR	SIGNATURE <i>SSN.Kumar</i>	DATE 15.12.04		
		CHD					
		APPD	S.SHANMUGASUNDARAM				
DEPT MPG	GRADE OF UNTOL. DIM ¢/M/¢	 SCALE 1:5	WEIGHT (Kg) 11.4		REF TO ASSY DRG		ITEM NO
CODE			REF TO OLD DRG FA-0427-3/5				
TITLE HEARTH MIDDLE INNER CIRCLE BLOCK			CARD CODE U 01	DRAWING NO : 4-7-1101-01-06281		REV 01	

NOT OK.


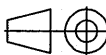
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REV 01	DATE 24.3.10	ALTERED
		CHECKED
		APPROVED
DIMENSIONS REVISED.		



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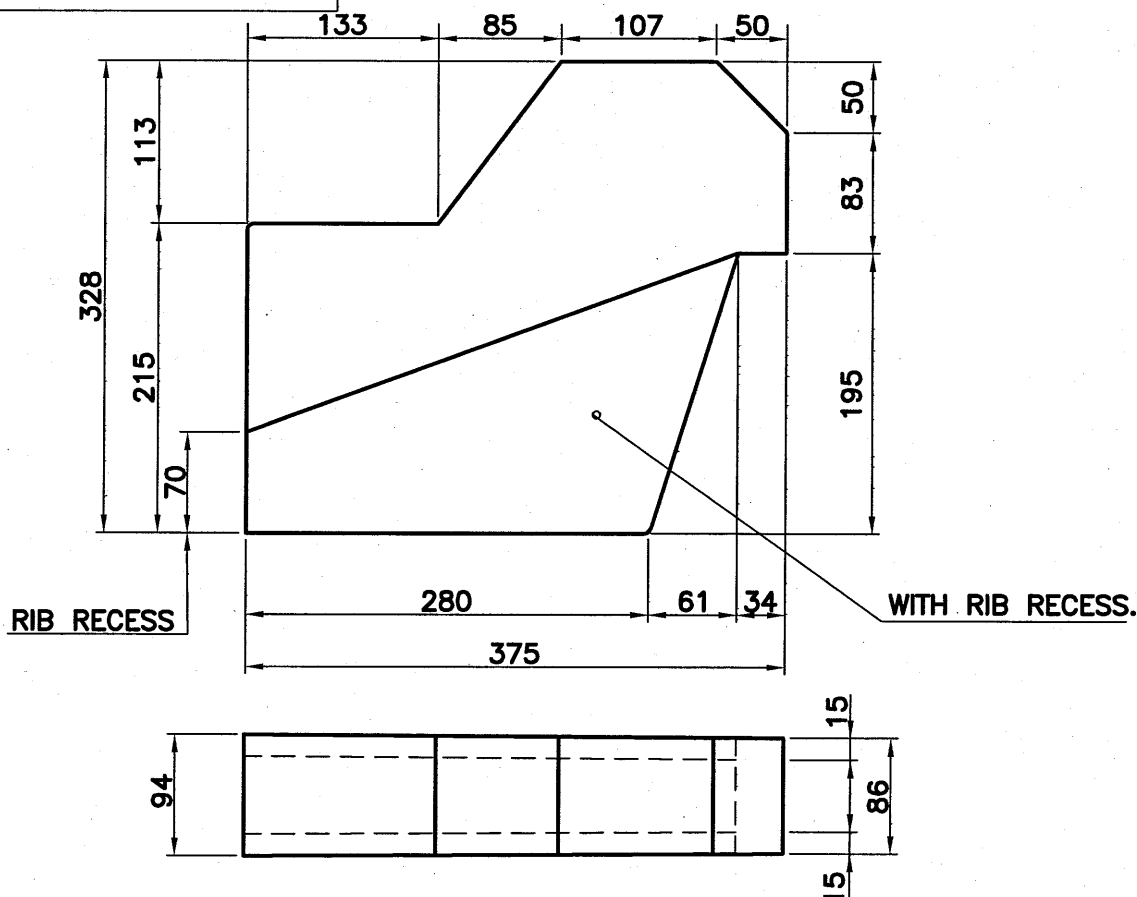
1. THE REFRACTORIES SHALL BE COMPACT, OF HOMOGENEOUS TEXTURE AND FREE FROM CRACKS, VOIDS AND OTHER FLAWS, THEY SHALL BE BURNT EVENLY THROUGHOUT, AND SHALL HAVE SUFFICIENT MECHANICAL STRENGTH AND NO SOFT CORNERS.
2. ALL CORNERS TO BE MINIMUM 3 mm.RADII, UNLESS OTHERWISE STATED.
3. TOLERANCE ON SIZE $\begin{matrix} +0 \\ -1 \end{matrix}$
4. TO BE READ IN ACCORDANCE WITH DRAWING 4-7-1101-01-06278 & 06280
TO BE CHECKED IN ASSEMBLED CONDITION DURING INSPECTION.

						80% AL ₂ O ₃	576	
ITEM NO	DESCRIPTION	DRAWING NO				MATL CODE	UNIT WT	
						MATL SPEC	QTY	
EQPT: ROTARY HEARTH FURNACE								
		Bharat Heavy Electricals Ltd SEAMLESS STEEL TUBE PLANT TIRUCHIRAPALLI - 620014		DRN CHD APPD	NAME SSN.KUMAR	SIGNATURE <i>SSN.Kumar</i>	DATE 15.12.04	
DEPT MPG	GRADE OF UNTOL. DIM		SCALE	WEIGHT (Kg)	REF TO ASSY DRG			ITEM NO
CODE	ϕ / $\sqrt{\text{f}}$		1:5	18.1	REF TO OLD DRG FA-0427-3/6			
TITLE				CARD CODE	DRAWING NO :			REV
HEARTH BOTTOM OUTER CIRCLE BLOCK				U 01	4-7-1101-01-06282			01

not ok.

ALL DIMENSIONS ARE IN MM

REV	DATE	ALTERED
01		CHECKED
		APPROVED



NOTES:

1. THE REFRACTORIES SHALL BE COMPACT, OF HOMOGENEOUS TEXTURE AND FREE FROM CRACKS, VOIDS AND OTHER FLAWS, THEY SHALL BE BURNT EVENLY THROUGHOUT, AND SHALL HAVE SUFFICIENT MECHANICAL STRENGTH AND NO SOFT CORNERS.
2. ALL CORNERS TO BE MINIMUM 3 mm.RADII, UNLESS OTHERWISE STATED.
3. TOLERANCE ON SIZE $\begin{matrix} +0 \\ -1 \end{matrix}$

			80% AL_2O_3	288
ITEM NO	DESCRIPTION	DRAWING NO	MATL CODE	UNIT WT
			MATL SPEC	QTY

EQPT: ROTARY HEARTH FURNACE



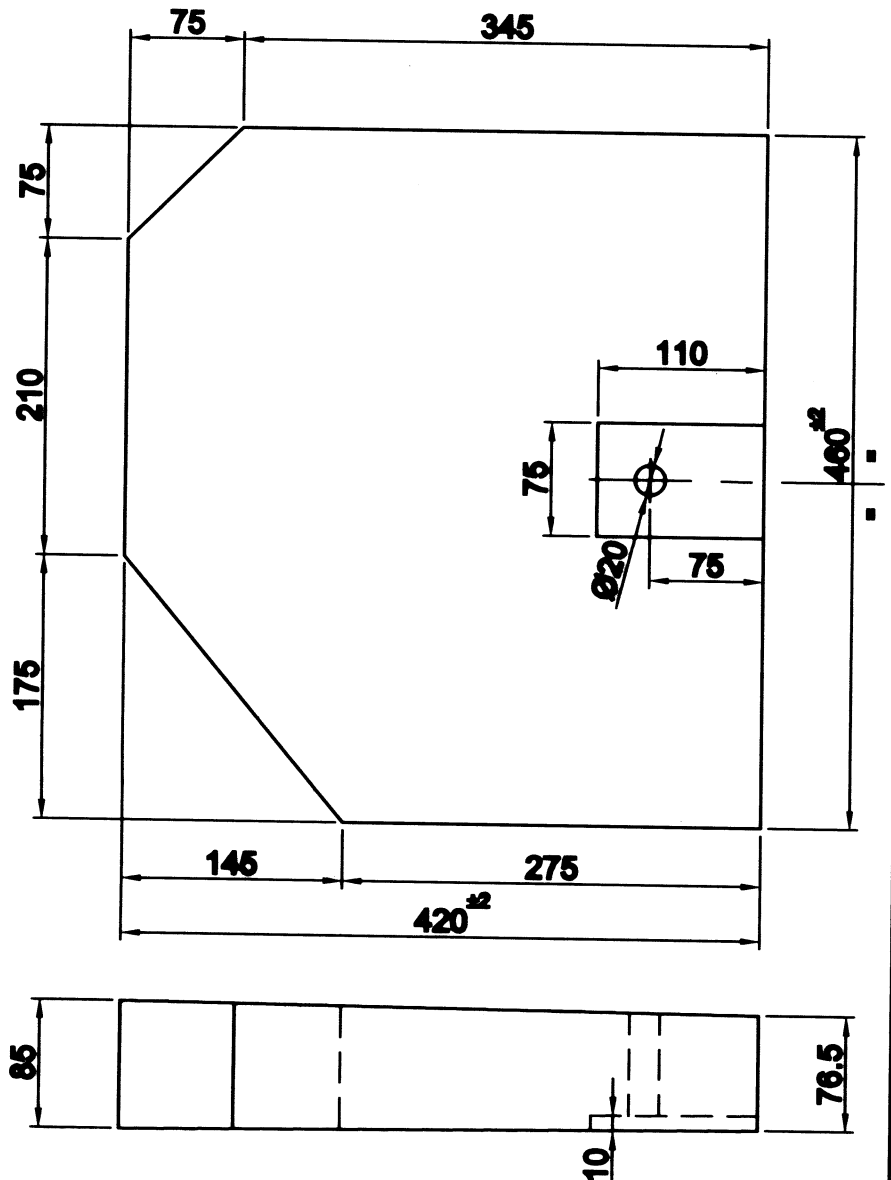
Bharat Heavy Electricals Ltd
SEAMLESS STEEL TUBE PLANT
TIRUCHIRAPALLI - 620014

DRN	NAME SSN.KUMAR	SIGNATURE <i>SSN.Kumar</i>	DATE 15.12.04
CHD			
APPD	S.SHANMUGASUNDARAM		

DEPT MPG	GRADE OF UNTOL DIM $\phi/M/f$	SCALE 1:5	WEIGHT (Kg) 20.4	REF TO ASSY DRG	ITEM NO
CODE				REF TO OLD DRG FA-0427-3/7	
TITLE HEARTH BOTTOM INNER CIRCLE BLOCK				DRAWING NO : 4-7-1101-01-06283	REV 00
				CARD CODE U 01	


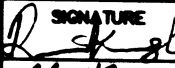
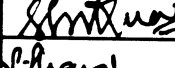
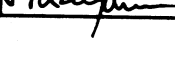
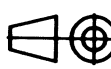
ALL DIMENSIONS ARE IN MM

REV	DATE	ALTERED
01		CHECKED
		APPROVED



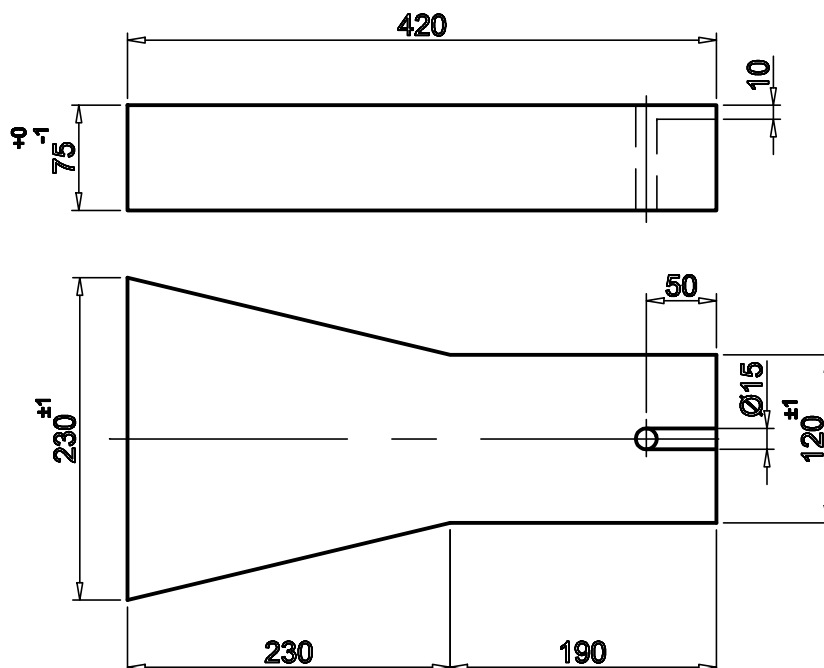
NOTES:

- 1) THE REFRACTORIES SHALL BE COMPACT, OF HOMOGENEOUS TEXTURE AND FREE FROM CRACKS, VOIDS AND OTHER FLAWS. THEY SHALL BE BURNT EVENLY THROUGHOUT AND SHALL HAVE SUFFICIENT MECHANICAL STRENGTH AND NO SOFT CORNERS.
- 2) ALL CORNERS TO BE MIN. 5mmRADII.

				55%-60% AL ₂ O ₃		320	
ITEM NO	DESCRIPTION	DRAWING NO		MATL CODE		UNIT WT	
				MATL SPEC		QTY	
EQPT: ROTARY HEARTH FURNACE							
		Bharat Heavy Electricals Ltd SEAMLESS STEEL TUBE PLANT TIRUCHIRAPALLI - 620014		DPN CHD APPD	NAME P. RAMAKRISHNAN SONKUMAR S. SHANMUGASUNDARAM	SIGNATURE   	DATE 28.12.04 1/1/05 01/01/05
DEPT MPG	GRADE OF UNTOL DIM C/M/F		SCALE 1:5	WEIGHT (Kg) 35.5		REF TO ASSY DRG	
CODE						REF TO OLD DRG 388105 1/2-5	
TITLE INNER WALL SUPPORTING BRICK				CARD CODE U 01	DRAWING NO : 4-7-1101-01-06305		REV 00

ALL DIMENSIONS ARE IN MM

REV 01	DATE 01.09.14	ALTERED	<i>M. Ganesan</i>
		CHECKED	<i>R. K. Singh</i>
		APPROVED	<i>S. Loganathan</i>
New border inserted			



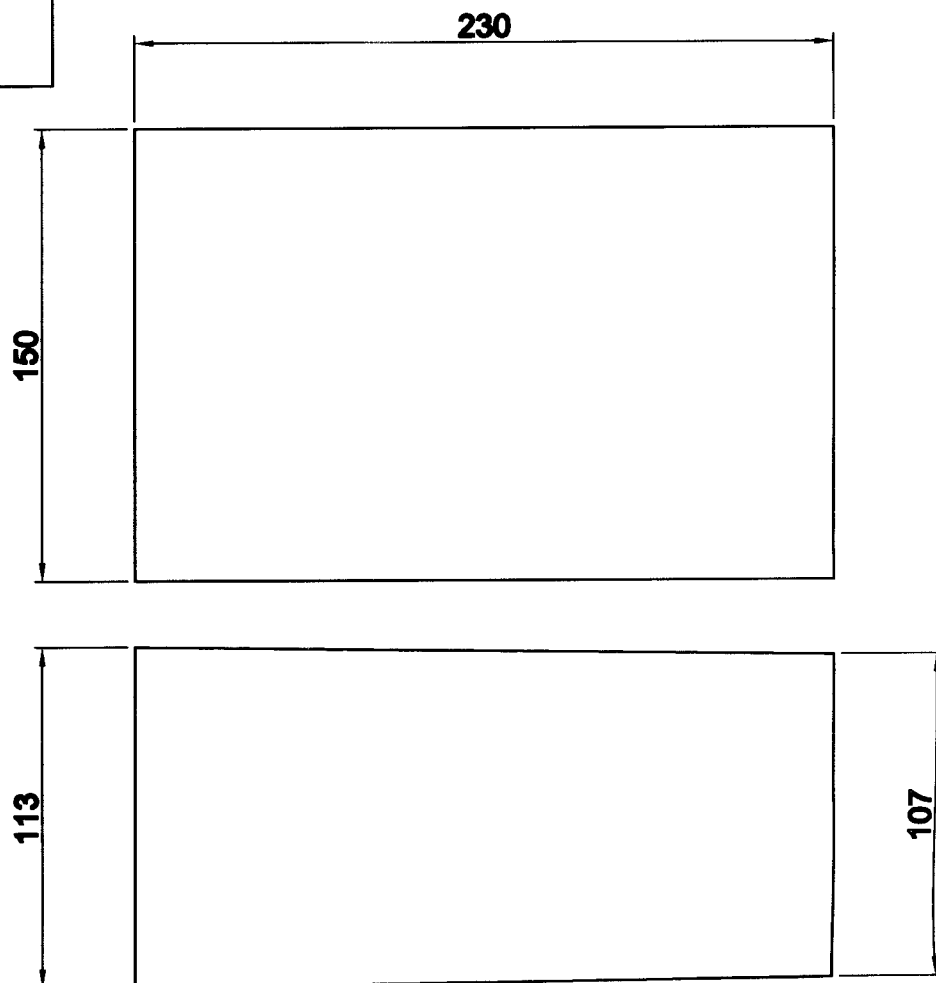
NOTES:

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- 2) ALL CORNERS TO BE MIN. 5mmRADII.**



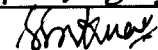
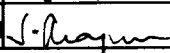

CAUTION: THE INFORMATION ON THIS DOCUMENT IS THE PROPERTY OF BHARAT HEAVY ELECTRICALS LIMITED. IT MUST NOT BE USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTEREST OF THE COMPANY.

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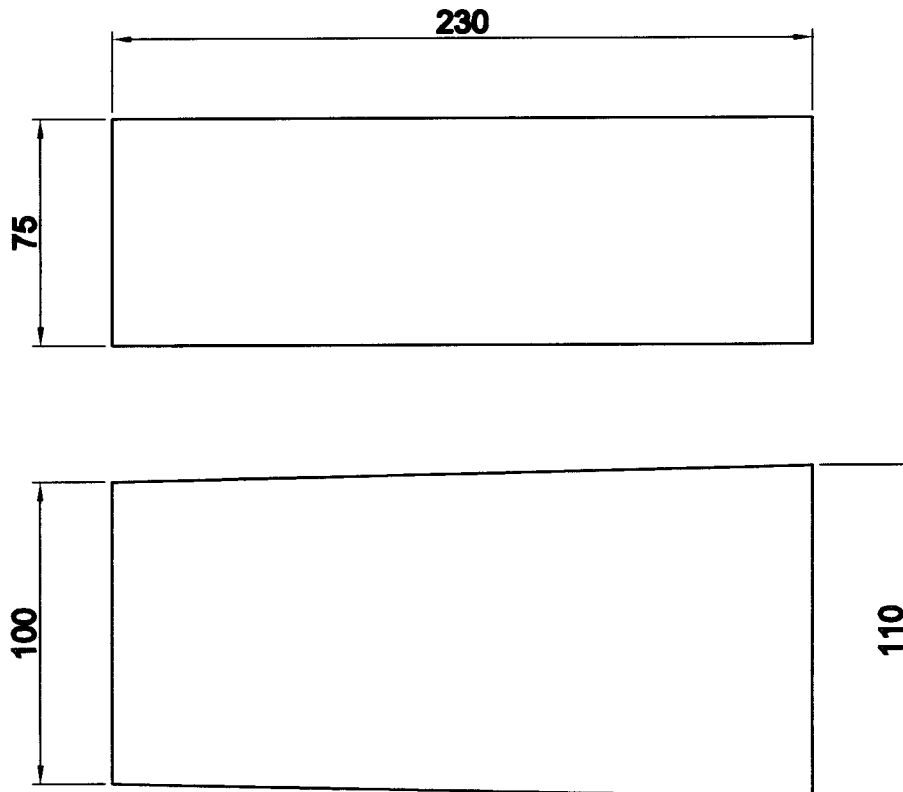
A4-SIZE

[illegible]

- 1) THE REFRACTORIES SHALL BE COMPACT, OF HOMOGENEOUS TEXTURE AND FREE FROM CRACKS, VOIDS AND OTHER FLAWS. THEY SHALL BE BURNT EVENLY THROUGHOUT AND SHALL HAVE SUFFICIENT MECHANICAL STRENGTH AND NO SOFT CORNERS.
- 2) ALL CORNERS TO BE MIN. 5mmRADII.


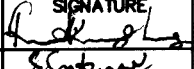
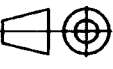
						55%-60% AL ₂ O ₃	220
ITEM NO	DESCRIPTION	DRAWING NO				MATL CODE	UNIT WT
						MATL SPEC	QTY
EQPT: ROTARY HEARTH FURNACE							
		Bharat Heavy Electricals Ltd SEAMLESS STEEL TUBE PLANT TIRUCHIRAPALLI - 620014		DRN	NAME P. RAMAKRISHNAN	SIGNATURE 	DATE 29.12.04
				CHD	SSELKUMAR		1/1/05
				APPD	S.SHANMUGASUNDARAM		01/01/05
DEPT MPG	GRADE OF UNTOL. DIM C/M/F		SCALE 1:2.5	WEIGHT (Kg) 9.5	REF TO ASSY DRG		ITEM NO
CODE					REF TO OLD DRG 358105 1/2-12		
TITLE INNER WALL SHAPE BRICK-I				CARD CODE U 01	DRAWING NO : 4-7-1101-01-06312		REV 00

REV	DATE	ALTERED
9		CHECKED
		APPROVED

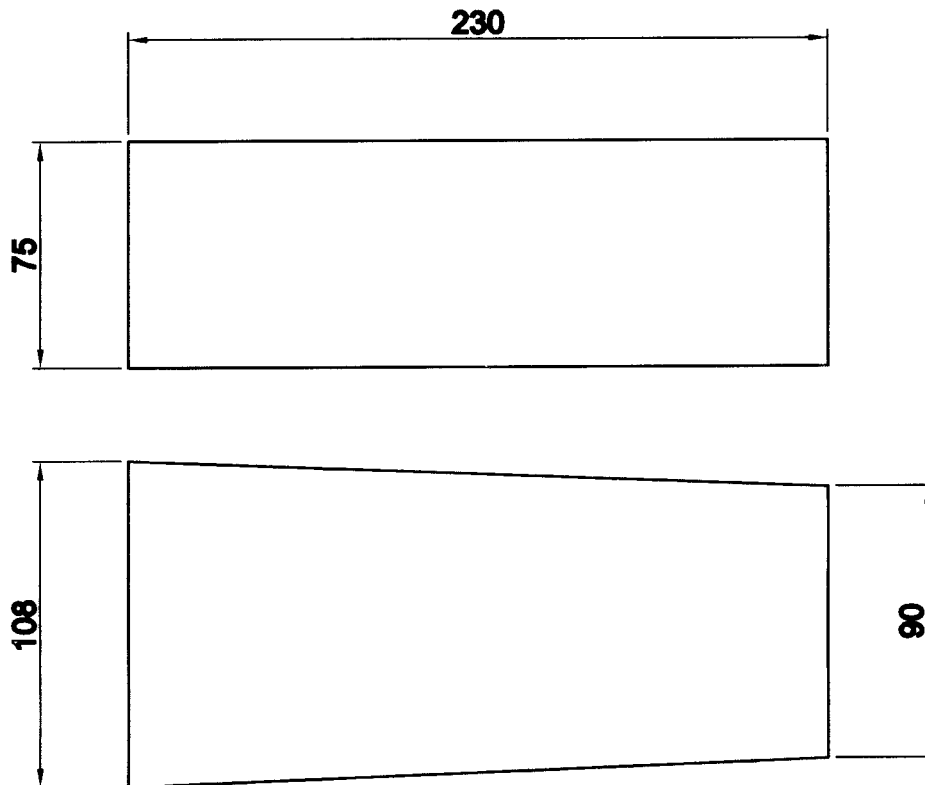


NOTES:

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- 2) ALL CORNERS TO BE MIN. 5mmRADII.


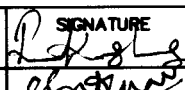
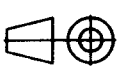
				55%-60% AL ₂ O ₃		575
ITEM NO	DESCRIPTION	DRAWING NO		MATL CODE		UNIT WT
				MATL SPEC		QTY
EQPT: ROTARY HEARTH FURNACE						
		Bharat Heavy Electricals Ltd SEAMLESS STEEL TUBE PLANT TIRUCHIRAPALLI - 620014		DRN	NAME P. RAMAKRISHNAN	SIGNATURE 
				CHD	SSN.KUMAR	DATE 29.12.04
				APPD	S.SHANMUGASUNDARAM	01/01/05
DEPT MPG	GRADE OF UNTOL. DIM C/M/F		SCALE 1:2.5	WEIGHT (Kg) 4.5	REF TO ASSY DRG	
CODE					REF TO OLD DRG 358105 1/2-13	
TITLE INNER WALL SHAPE BRICK-II				CARD CODE U 01	DRAWING NO : 4-7-1101-01-06313	
					REV 00	

REV	DATE	ALTERED
01		CHECKED
		APPROVED

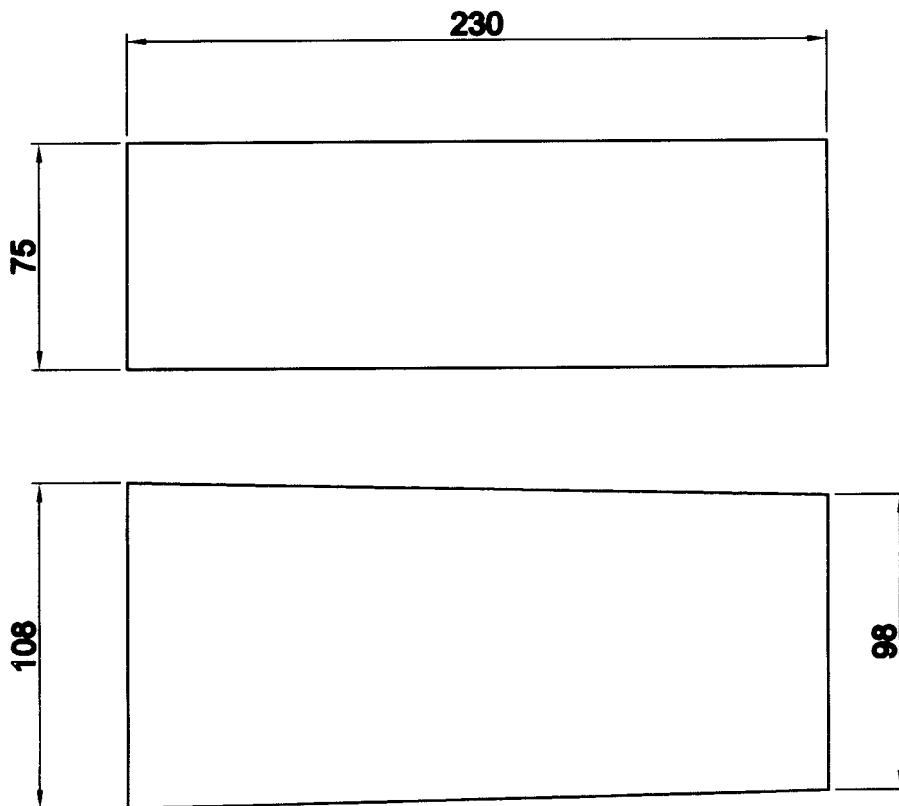


NOTES:

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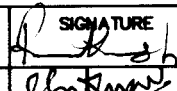
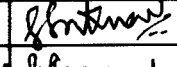
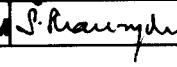
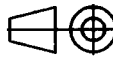
				55%-60% AL ₂ O ₃		620
ITEM NO	DESCRIPTION	DRAWING NO	MATL CODE		UNIT WT	
			MATL SPEC		QTY	
EQPT: ROTARY HEARTH FURNACE						
		Bharat Heavy Electricals Ltd SEAMLESS STEEL TUBE PLANT TIRUCHIRAPALLI - 620014		DRN	NAME P. RAMAKRISHNAN	SIGNATURE 
				CHD	SSN.KUMAR	DATE 28.12.04
				APPD	S.SHANMUGASUNDARAM	DATE 01/01/05
DEPT MPG	GRADE OF UNTOL DIM C/M/F		SCALE 1:2.5	WEIGHT (Kg) 4.3	REF TO ASSY DRG	ITEM NO
CODE					REF TO OLD DRG 358105 1/2-14	
TITLE INNER WALL SHAPE BRICK-III				CARD CODE U 01	DRAWING NO : 4-7-1101-01-06314	REV 00

REV 01	DATE	ALTERED
		CHECKED
		APPROVED



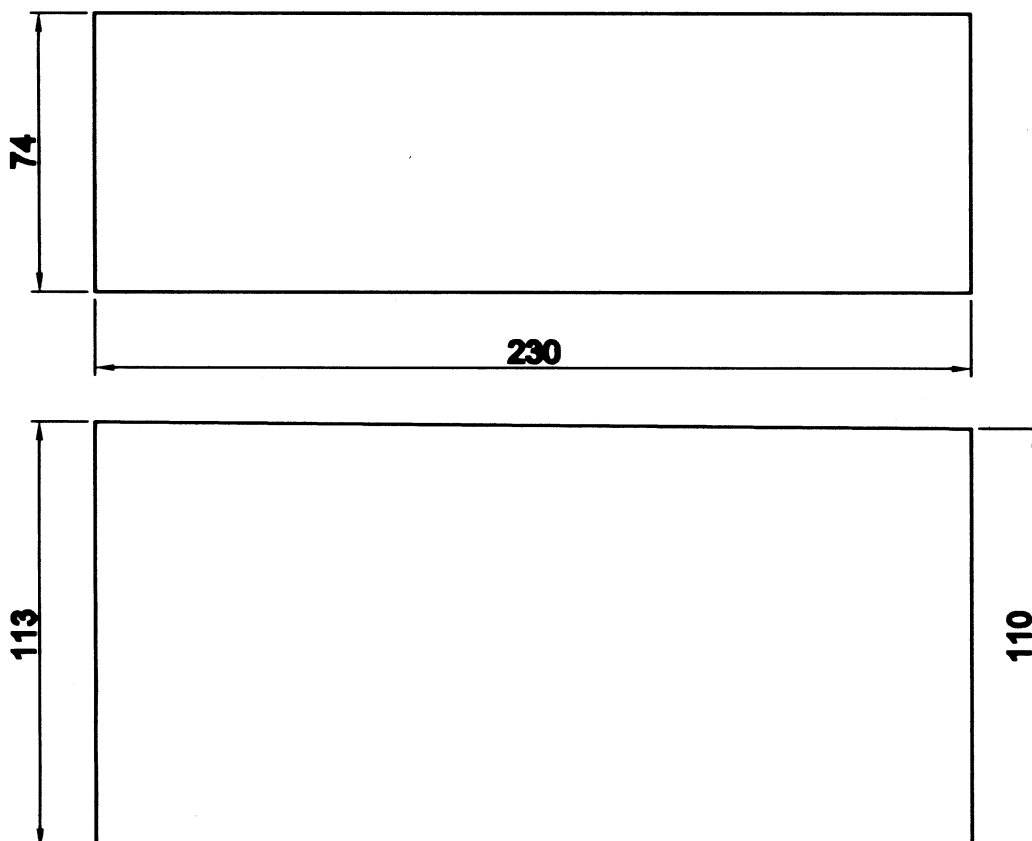
NOTES:

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- 2) ALL CORNERS TO BE MIN. 5mm RADII.

				55%-60% AL ₂ O ₃		2850	
ITEM NO	DESCRIPTION	DRAWING NO		MATL CODE		UNIT WT	
				MATL SPEC		QTY	
EQPT: ROTARY HEARTH FURNACE							
		Bharat Heavy Electricals Ltd SEAMLESS STEEL TUBE PLANT TIRUCHIRAPALLI - 620014		DRN	NAME P. RAMAKRISHNAN	SIGNATURE 	DATE 29.12.04
				CHD	SSNKUMAR		1/1/05
				APPD	S.SHANMUGASUNDARAM		01/01/05
DEPT MPG	GRADE OF UNTOL DIM C/M/F		SCALE 1:2.5	WEIGHT (Kg) 4.4	REF TO ASSY DRG		ITEM NO
CODE					REF TO OLD DRG 358105 1/2-15		
TITLE INNER WALL SHAPE BRICK-IV				CARD CODE U 01	DRAWING NO : 4-7-1101-01-06315		REV 00

ALL DIMENSIONS ARE IN MM

REV 01	DATE	ALTERED
		CHECKED
		APPROVED

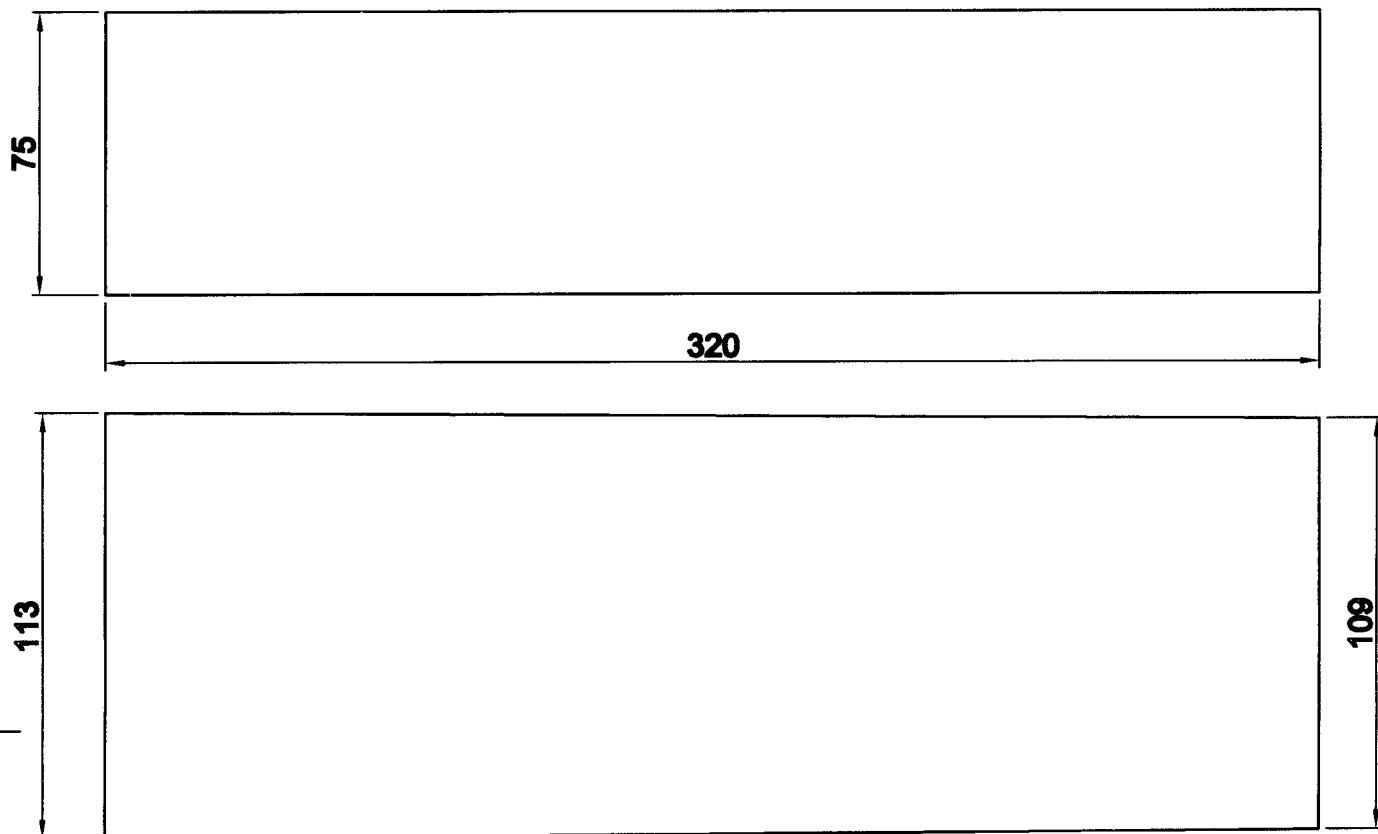


NOTES:



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- 2) ALL CORNERS TO BE MIN. 5mmRADII.

[illegible]

REV	DATE	ALTERED
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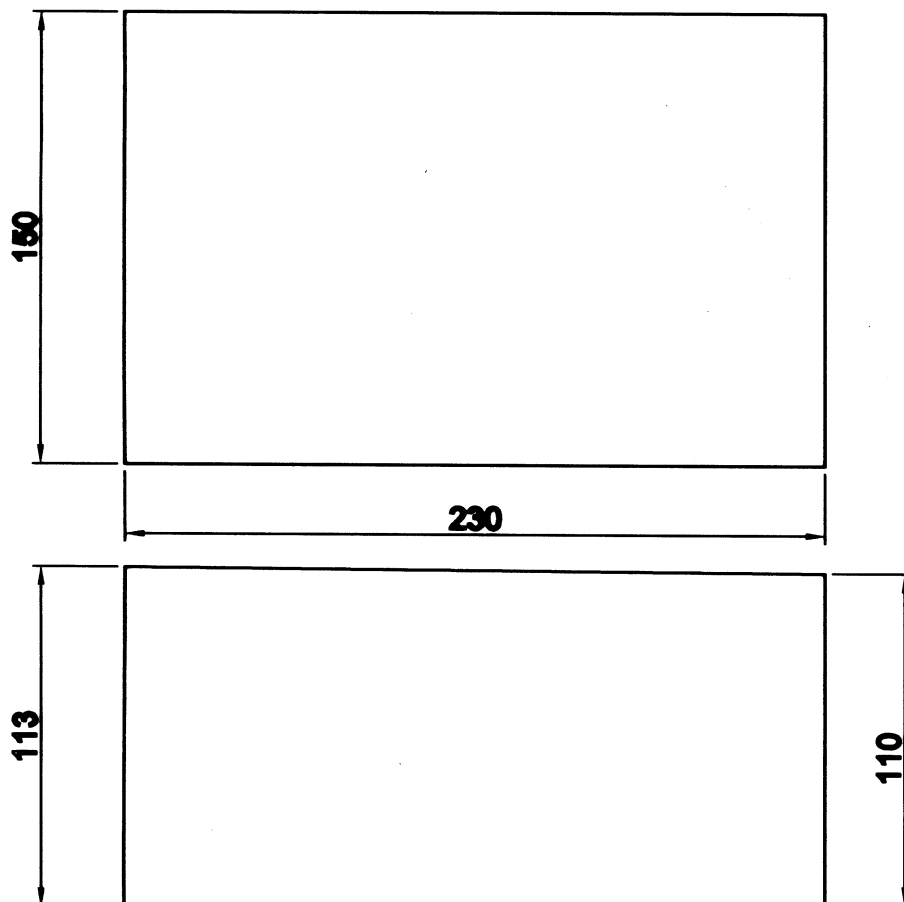
**NOTES:**

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- 2) ALL CORNERS TO BE MIN. 5mm RADII.

				55%-60% AL ₂ O ₃		1290
ITEM NO	DESCRIPTION	DRAWING NO	MATL CODE		UNIT WT	
			MATL SPEC		QTY	
EQPT: ROTARY HEARTH FURNACE						
 Bharat Heavy Electricals Ltd SEAMLESS STEEL TUBE PLANT TIRUCHIRAPALLI - 620014		DRN	NAME P. RAMAKRISHNAN	SIGNATURE <i>[Signature]</i>	DATE 29.12.04	
		CHD	SSN.KUMAR	<i>[Signature]</i>	1/1/01	
		APPD	S.SHANMUGASUNDARAM	<i>[Signature]</i>	01/01/05	
DEPT MPG	GRADE OF UNTOL. DIM C/M/F	 SCALE 1:2	WEIGHT (Kg) 6.7		REF TO ASSY DRG	
CODE					REF TO OLD DRG 358105 1/2-2	
TITLE OUTER WALL SUPPORTING BRICK-II			CARD CODE U 01	DRAWING NO : 4-7-1101-01-06302		REV 00

ALL DIMENSIONS ARE IN MM

REV 01	DATE	ALTERED
		CHECKED
		APPROVED



NOTES:

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- 2) ALL CORNERS TO BE MIN. 5mm RADII.**

			55%-60% AL ₂ O ₃	455
ITEM NO	DESCRIPTION	DRAWING NO	MATL CODE	UNIT WT
			MATL SPEC	QTY

EQPT: ROTARY HEARTH FURNACE



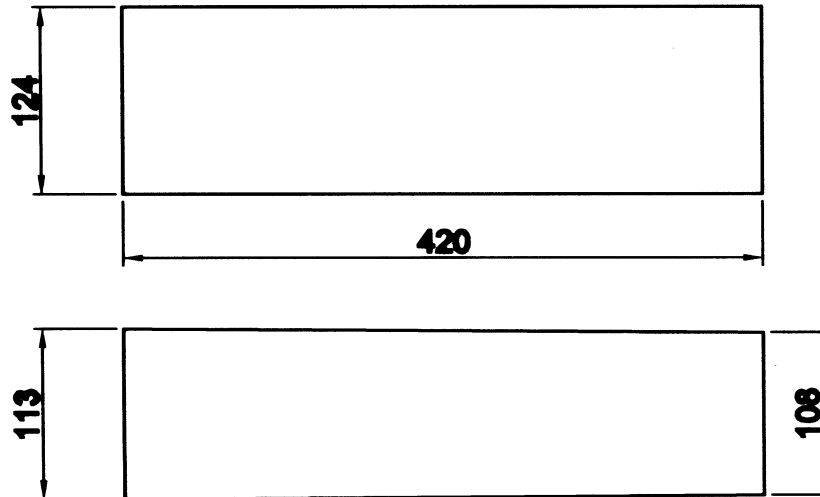
Bharat Heavy Electricals Ltd
SEAMLESS STEEL TUBE PLANT
TIRUCHIRAPALLI - 620014

DRN	NAME	SIGNATURE	DATE
CHD	P. RAMAKRISHNAN	<i>[Signature]</i>	28.12.04
APPD	S. SHANMUGASUNDARAM	<i>[Signature]</i>	01/01/05

DEPT MPG	GRADE OF UNTOOL DIM C/M/F	SCALE	WEIGHT (Kg)	REF TO ASSY DRG	ITEM NO
CODE		1:2.5	9.6	REF TO OLD DRG 388105 1/2-3	
TITLE OUTER WALL SUPPORTING BRICK-III			CARD CODE U 01	DRAWING NO : 4-7-1101-01-06303	REV 00



ALL DIMENSIONS ARE IN MM

REV 01	DATE	ALTERED
		CHECKED
		APPROVED



NOTES:

- 1) THE REFRACTORIES SHALL BE COMPACT, OF HOMOGENEOUS TEXTURE AND FREE FROM CRACKS, VOIDS AND OTHER FLAWS. THEY SHALL BE BURNT EVENLY THROUGHOUT AND SHALL HAVE SUFFICIENT MECHANICAL STRENGTH AND NO SOFT CORNERS.
- 2) ALL CORNERS TO BE MIN. 5mmRADII.

			55%-60% AL ₂ O ₃		730
ITEM NO	DESCRIPTION	DRAWING NO	MATL CODE		UNIT WT
			MATL SPEC		QTY
EQPT: ROTARY HEARTH FURNACE					
		Bharat Heavy Electricals Ltd		DRN	NAME P. RAMAKRISHNAN
		SEAMLESS STEEL TUBE PLANT		CHD	SIGNATURE <i>P. Ramakrishnan</i>
		TIRUCHIRAPALLI - 620014		APPD	DATE 28.12.04
					S. SHANMUGASUNDARAM
					01/01/08
DEPT MPG	GRADE OF UNTOL. DIM		SCALE	WEIGHT (Kg)	REF TO ASSY DRG
CODE	C/M/F		1:5	14.5	REF TO OLD DRG 388105 1/2-4
TITLE OUTER WALL SUPPORTING BRICK-IV			CARD CODE U 01	DRAWING NO : 4-7-1101-01-06304	REV 00

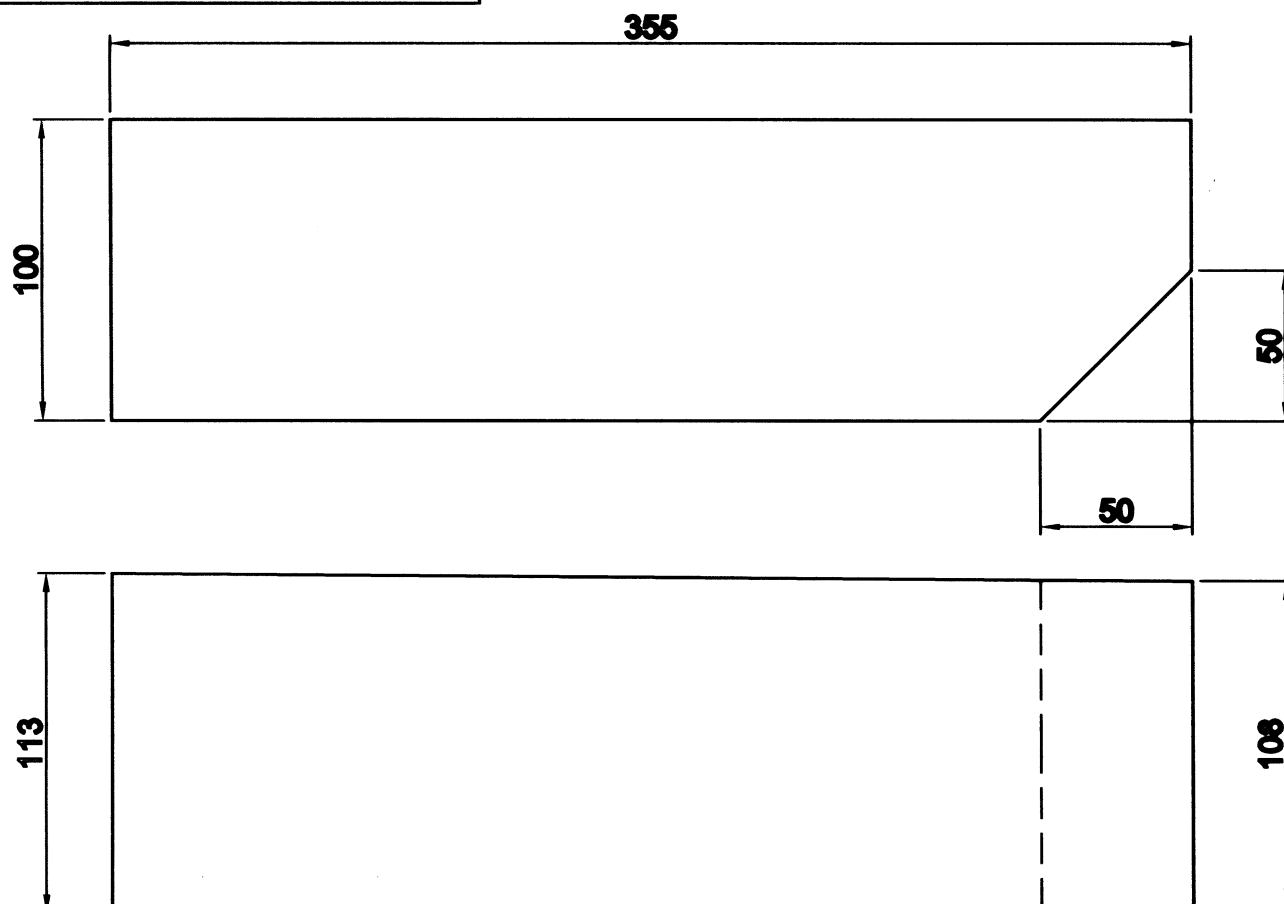
Technical drawing of a rectangular plate. The overall dimensions are 435 (width) and 100 (height). A chamfered corner is shown on the right side, with a width of 50 and a height of 50.

- 1) THE REFRACTORIES SHALL BE COMPACT, OF HOMOGENEOUS TEXTURE AND FREE FROM CRACKS, VOIDS AND OTHER FLAWS. THEY SHALL BE BURNT EVENLY THROUGHOUT AND SHALL HAVE SUFFICIENT MECHANICAL STRENGTH AND NO SOFT CORNERS.
- 2) ALL CORNERS TO BE MIN. 5mmRADII.

[illegible]

ALL DIMENSIONS ARE IN MM


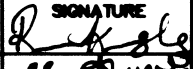
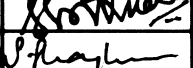
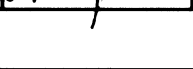
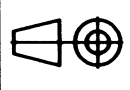
REV 01	DATE	ALTERED
		CHECKED
		APPROVED

**NOTES:**

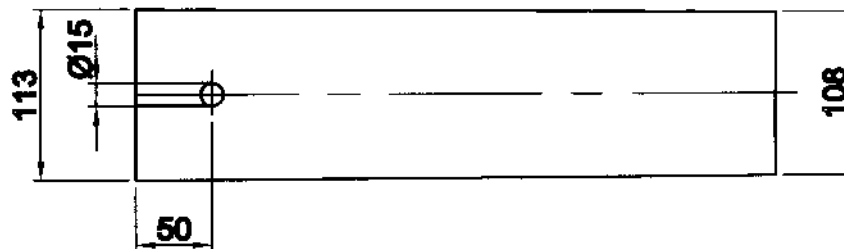
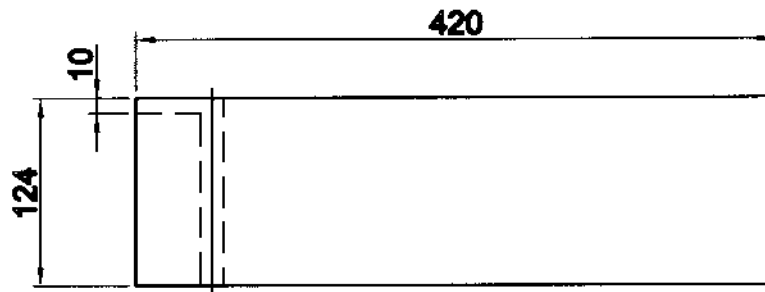
- 1) THE REFRACTORIES SHALL BE COMPACT, OF HOMOGENEOUS TEXTURE AND FREE FROM CRACKS, VOIDS AND OTHER FLAWS. THEY SHALL BE BURNT EVENLY THROUGHOUT AND SHALL HAVE SUFFICIENT MECHANICAL STRENGTH AND NO SOFT CORNERS.
- 2) ALL CORNERS TO BE MIN. 5mmRADII.

			55%-60% Al_2O_3	460
ITEM NO	DESCRIPTION	DRAWING NO	MATL CODE	UNIT WT
			MATL SPEC	QTY


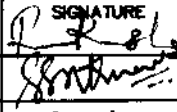

EQPT: **ROTARY HEARTH FURNACE**

		Bharat Heavy Electricals Ltd SEAMLESS STEEL TUBE PLANT TIRUCHIRAPALLI - 620014		DRN	NAME P. RAMAKRISHNAN	SIGNATURE 	DATE 28.12.04
				CHD	SONJUMAR		1/1/05
				APPD	S.SHANMUGASUNDARAM		31/01/05
DEPT MPG	GRADE OF UNTOL DIM C/M/F		SCALE 1:2.5	WEIGHT (Kg) 10.3	REF TO ASSY DRG		ITEM NO
CODE					REF TO OLD DRG 388105 1/2-7		
TITLE OUTER WALL BASE BRICK-II				CARD CODE U 01	DRAWING NO : 4-7-1101-01-06307		REV 00

REV	DATE	ALTERED
		CHECKED
		APPROVED

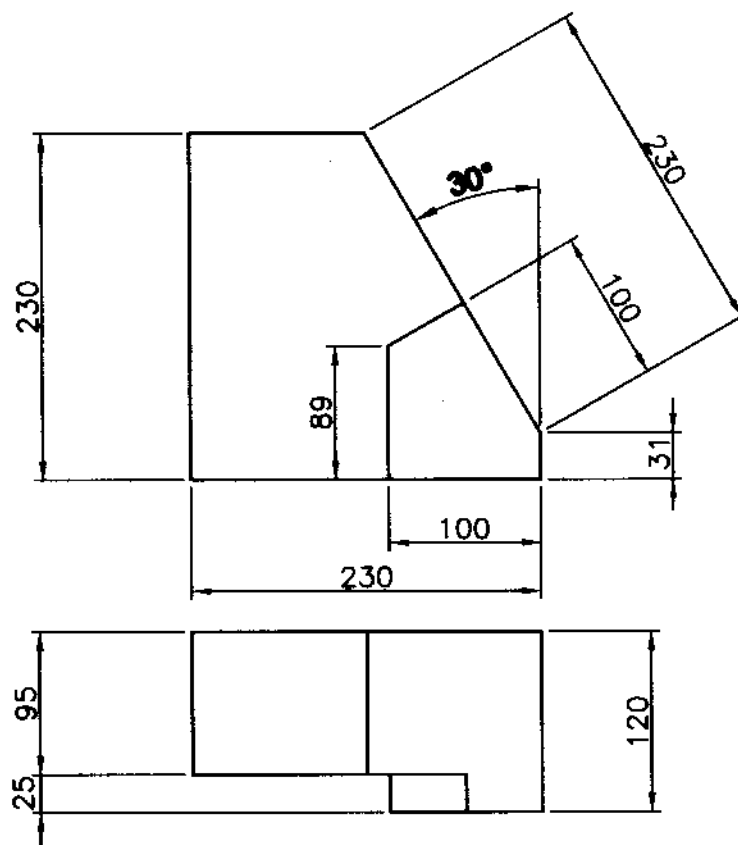
**NOTES:**

- 1) THE REFRACTORIES SHALL BE COMPACT, OF HOMOGENEOUS TEXTURE AND FREE FROM CRACKS, VOIDS AND OTHER FLAWS. THEY SHALL BE BURNT EVENLY THROUGHOUT AND SHALL HAVE SUFFICIENT MECHANICAL STRENGTH AND NO SOFT CORNERS.
- 2) ALL CORNERS TO BE MIN. 5mmRADII.

				55%-60% AL ₂ O ₃	190		
ITEM NO	DESCRIPTION	DRAWING NO	MATL CODE		UNIT WT		
			MATL SPEC		QTY		
EQPT: ROTARY HEARTH FURNACE							
		Bharat Heavy Electricals Ltd SEAMLESS STEEL TUBE PLANT TIRUCHIRAPALLI - 620014		NAME P. RAMAKRISHNAN	SIGNATURE 	DATE 29.12.04	
				DRN			
				CHD	SSN.KUMAR	1/1/05	
				APPD	S.SHANMUGASUNDARAM	01/01/05	
DEPT MPG	GRADE OF UNTOL DIM C/M/F		SCALE 1:2.5	WEIGHT (Kg) 14.5	REF TO ASSY DRG	ITEM NO	
CODE					REF TO OLD DRG 358105 1/2-9		
TITLE OUTER WALL ANCHOR BRICK-II				CARD CODE U 01	DRAWING NO : 4-7-1101-01-06309	REV 00	



ALL DIMENSIONS ARE IN MM

REV 01	DATE	ALTERED
		CHECKED
		APPROVED



NOTES:

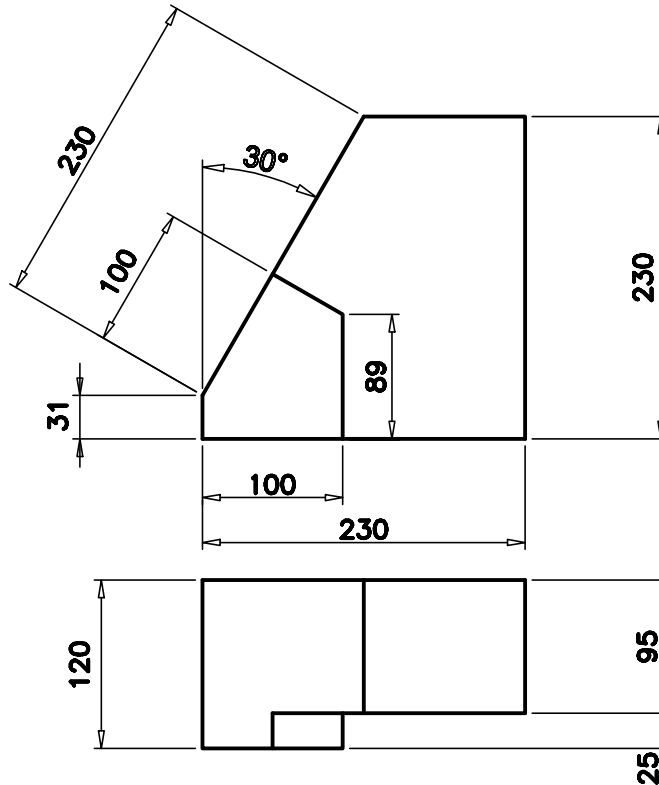
1. THE REFRACTORIES SHALL BE COMPACT, OF HOMOGENEOUS TEXTURE AND FREE FROM CRACKS, VOIDS AND OTHER FLAWS, THEY SHALL BE BURNT EVENLY THROUGHOUT, AND SHALL HAVE SUFFICIENT MECHANICAL STRENGTH AND NO SOFT CORNERS.
2. ALL CORNERS TO BE MINIMUM 3 mm. RADII, UNLESS OTHERWISE STATED.
3. TOLERANCE ON SIZE ± 0.1

				85-90% AL ₂ O ₃	2
ITEM NO	DESCRIPTION	DRAWING NO		MATL CODE	UNIT WT
				MATL SPEC	QTY
EQPT: ROTARY HEARTH FURNACE					
	Bharat Heavy Electricals Ltd SEAMLESS STEEL TUBE PLANT TRUCHIRAPALLI - 620014	DRN	NAME SENJUMAR	SIGNATURE <i>SENJUMAR</i>	DATE 15.12.04
		CHD			
		APPD	S. BHANUMUGASUNDARAM	<i>S. Bh...</i>	16/12/09
DEPT MPG	GRADE OF UNTOL DRG 2/N/T		SCALE 1:5	WEIGHT (Kg) 10	REF TO ASSY DRG
CODE					REF TO OLD DRG FA-0427-3/8
TITLE SKEW BACK-R.H CHARGING & DISCHARGING DOORS			CARD CODE U 01	DRAWING NO : 4-7-1101-01-06284	
				REV 00	

ALL DIMENSIONS ARE IN MM

REV	DATE	ALTERED	<i>A. Suresan</i>
01	28.08.14	CHECKED	<i>S. S. Sundaram</i>
		APPROVED	<i>S. S. Sundaram</i>



New border inserted



NOTES:

1. THE REFRACTORIES SHALL BE COMPACT, OF HOMOGENEOUS TEXTURE AND FREE FROM CRACKS, VOIDS AND OTHER FLAWS, THEY SHALL BE BURNT EVENLY THROUGHOUT, AND SHALL HAVE SUFFICIENT MECHANICAL STRENGTH AND NO SOFT CORNERS.
2. ALL CORNERS TO BE MINIMUM 3 mm. RADII, UNLESS OTHERWISE STATED.
3. TOLERANCE ON SIZE ± 1

CAUTION: THE INFORMATION ON THIS DOCUMENT IS THE PROPERTY OF BHARAT HEAVY ELECTRICALS LIMITED. IT MUST NOT BE USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTEREST OF THE COMPANY.

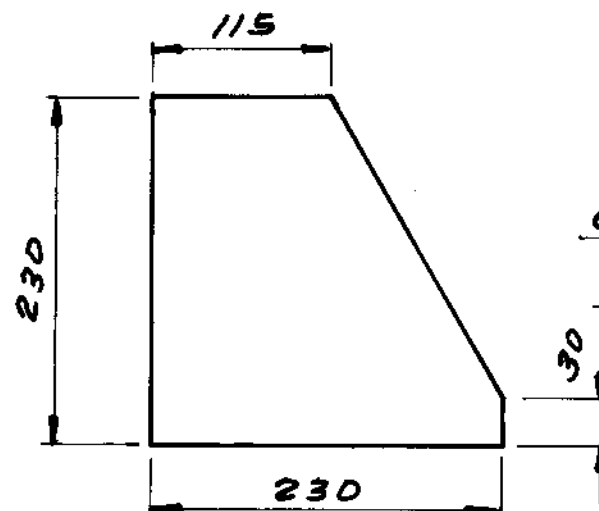
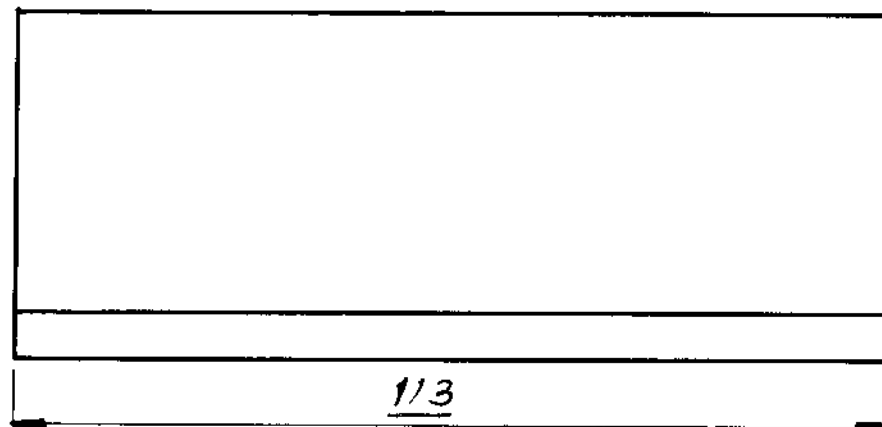
				85-80% AL2O3		2
ITEM NO	DESCRIPTION	DRAWING NO		MATL CODE		UNIT WT
				MATL SPEC		QTY
EQPT: ROTARY HEARTH FURNACE						
		Bharat Heavy Electricals Ltd SEAMLESS STEEL TUBE PLANT TIRUCHIRAPALLI - 620014		DRN	NAME SSN.KUMAR	SIGNATURE <i>SSN.Kumar</i>
				CHD	SSN.KUMAR	<i>SSN.Kumar</i>
				APPD	S.S.SUNDARAM	<i>S.S.Sundaram</i>
DEPT SSTP	GRADE OF UNTOL DM		SCALE 1:1	WEIGHT (Kg) 10	REF TO ASSY DWG NO -	
CODE 456	ϕ M/F IS: 2102				REF TO OLD DWG NO FA-0427-3/9	
TITLE RHF - SKEW BACK-LH CHARGING & DISCHARGING DOORS				CARD CODE U 01	DRAWING NO : 4-7-1101-01-06285	
					REV 01	

A4-SIZE

CAUTION THE INFORMATION ON THIS DOCUMENT IS THE PROPERTY OF BHARAT HEAVY ELECTRICALS LTD. IT MUST NOT BE USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTEREST OF THE COMPANY.

REV 01	DATE 31.12.91	ALTERED <i>[Signature]</i>
		CHECKED <i>[Signature]</i>
ZONE		APPROVED <i>[Signature]</i>
MATL SPEC REVISED AS PER WESHMAN REVISION		

P
↓



VIEW 'P'

QUALITY:-

55-60% AL2O3

SILLIMANITE.

ITEM NO.	DESCRIPTION	MATL CODE	UNIT WT
		MATL SPEC	QTY

EQPT: RHF



Bharat Heavy Electricals Ltd.,

SEAMLESS STEEL TUBE PLANT

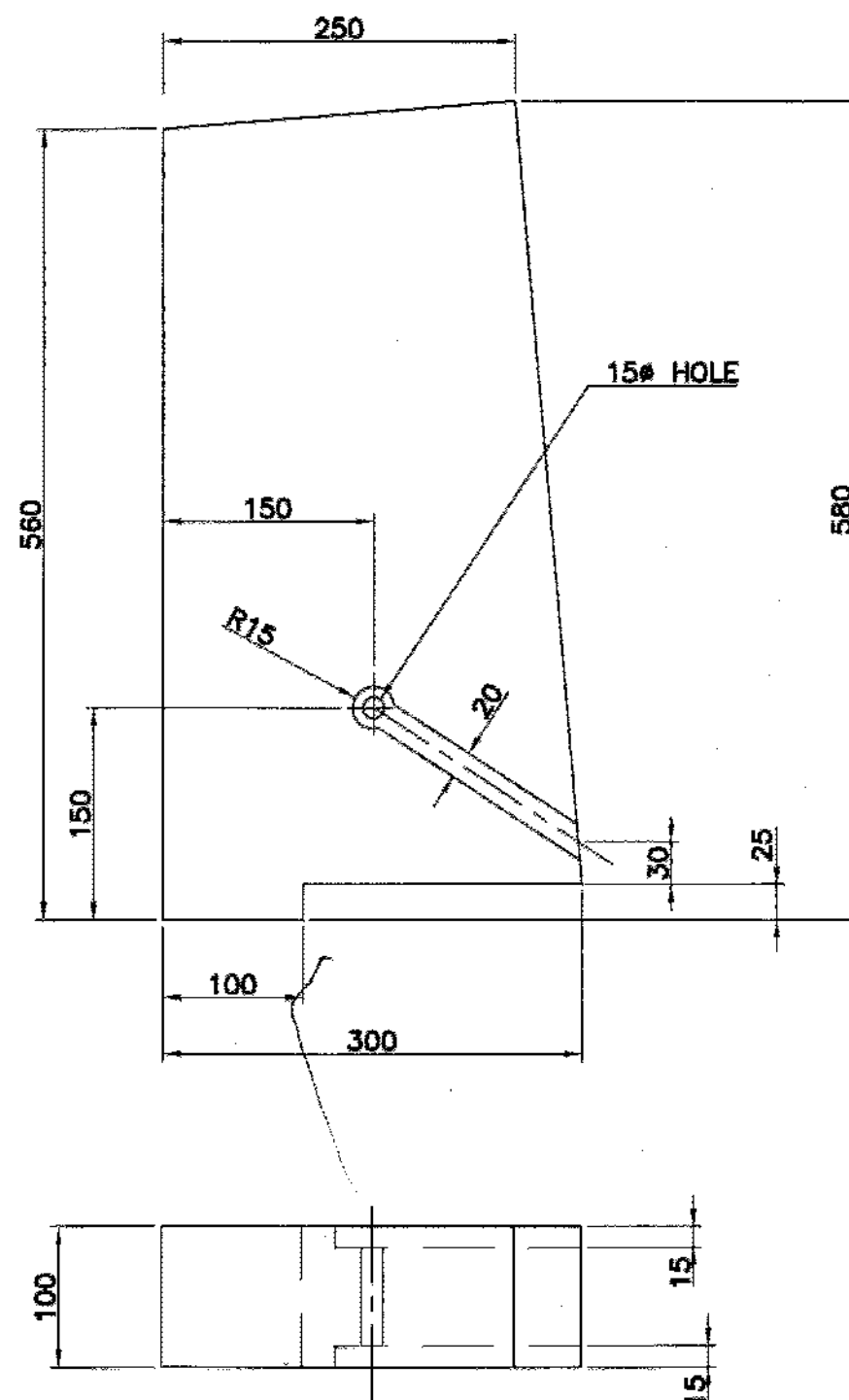
TIRUCHIRAPALLI - 620 014

DRN	NAME SBN KUMAR	DATE 10.7.91
CHD	<i>[Signature]</i>	11.7.91
APPD	<i>[Signature]</i>	11.7.91

DEPT CODE	GRADE OF MATERIAL G/M/P	WEIGHT (kg)	REF TO ASSY/OLD DRG 4-1101-58-48*	ITEM NO.
TITLE SKREW BACK		CARD CODE U 01	DRAWING NO. 4-7-1101-01-0445701	REV

THE INFORMATION ON THIS DOCUMENT IS THE PROPERTY OF BHARAT HEAVY ELECTRICALS LTD
CAUTION: IT MUST NOT BE USED DIRECTLY OR INDIRECTLY IN ANYWAY DETERMINAL TO INTEREST OF THE COMPANY

ALL DIMENSIONS ARE IN MILLIMETRES




NOTES:

1. THE REFRACTORIES SHALL BE COMPACT, OF HOMOGENEOUS TEXTURE AND FREE FROM CRACKS, VOIDS AND OTHER FLAWS, THEY SHALL BE BURNT EVENLY THROUGHOUT, AND SHALL HAVE SUFFICIENT MECHANICAL STRENGTH AND NO SOFT CORNERS.
2. ALL CORNERS TO BE MINIMUM 3 mm. RADII, UNLESS OTHERWISE STATED.
3. TOLERANCE ON SIZE $\begin{smallmatrix} +0 \\ -1 \end{smallmatrix}$

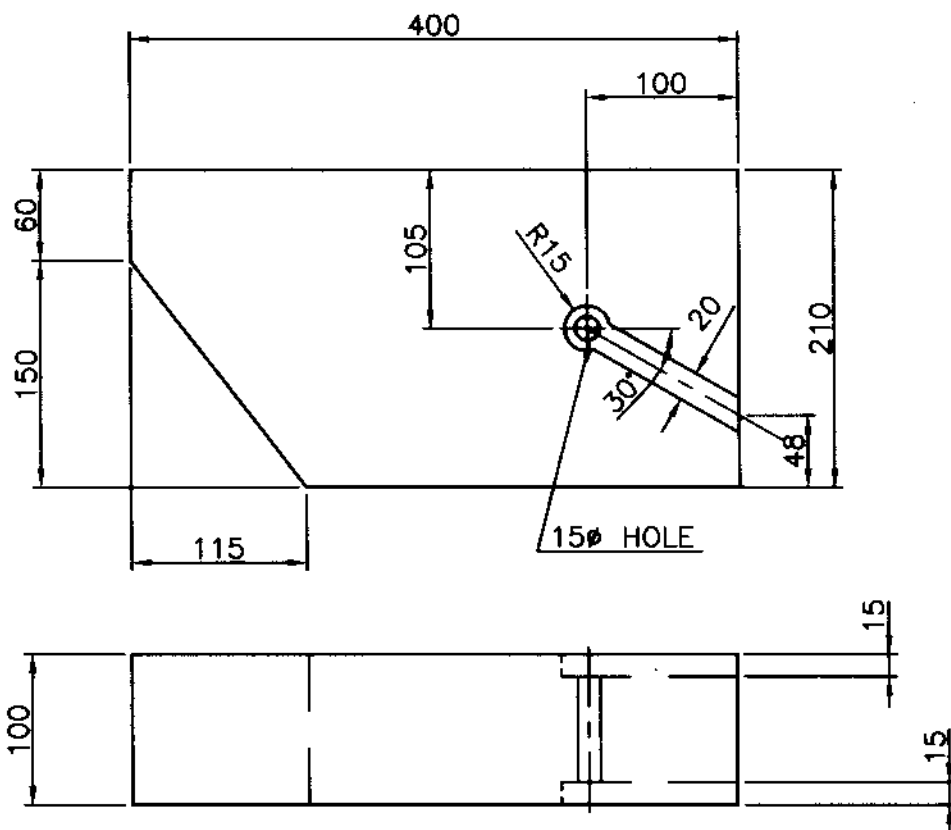
REV	DATE	ALTERED :
02		CHECKED :
		APPROVED
ZONE		

REV	DATE	ALTERED :
01		CHECKED :
		APPROVED
ZONE		

				55-60% AL ₂ O ₃		56
ITEM NO	DESCRIPTION	DRAWING NO		MATL CODE		UNIT WT
				MATL SPEC		QTY
EQPT: ROTARY HEARTH FURNACE						
		Bharat Heavy Electricals Ltd SEAMLESS STEEL TUBE PLANT TIRUCHIRAPALLI - 620014		DRN CHD APPD	NAME SSN.KUMAR	SIGNATURE <i>SSN.Kumar</i>
					DATE 15.12.04	
DEPT	GRADE OF UNTOOL DIM	SCALE	WEIGHT(kg)	REF TO ASSY DWG NO		ITEM NO
CODE	2/M/1	1:5	38	REF TO OLD DWG NO		
				FA-0427-3/14		
TITLE			CARD CODE	DRAWING NO :		REV
SIDE BLOCK			U 01	3-7-1101-01-04699		
CHARGING & DISCHARGING DOORS						


ALL DIMENSIONS ARE IN MM

REV	DATE	ALTERED
01		CHECKED
		APPROVED



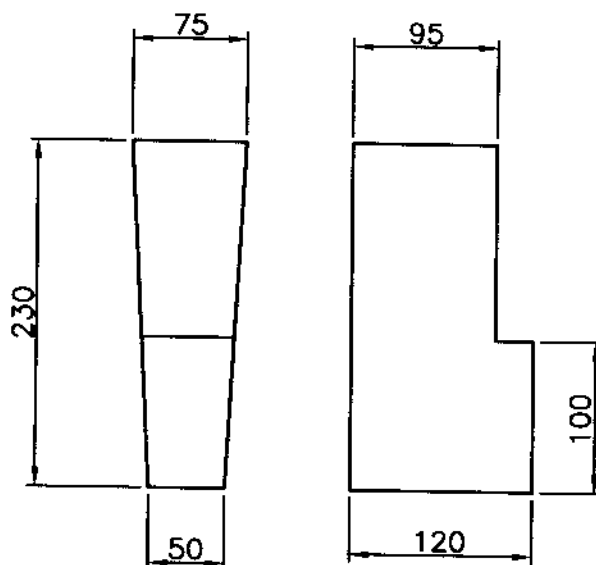
NOTES:

1. THE REFRFRATORIES SHALL BE COMPACT, OF HOMOGENEOUS TEXTURE AND FREE FROM CRACKS, VOIDS AND OTHER FLAWS, THEY SHALL BE BURNT EVENLY THROUGHOUT, AND SHALL HAVE SUFFICIENT MECHANICAL STRENGTH AND NO SOFT CORNERS.
2. ALL CORNERS TO BE MINIMUM 3 mm. RADII, UNLESS OTHERWISE STATED.
3. TOLERANCE ON SIZE ± 0.1

ITEM NO	DESCRIPTION	DRAWING NO	85-85% Al_2O_3	28
			MATL CODE	UNIT WT
			MATL SPEC	QTY
EQPT: ROTARY HEARTH FURNACE				
		Bharat Heavy Electricals Ltd SEAMLESS STEEL TUBE PLANT TIRUCHIRAPALLI - 620014		
DEPT	MPG	GRADE OF UNTOOL DIM	SCALE	WEIGHT (Kg)
CODE			1:5	18.6
TITLE		CARD CODE	REF TO ASSY DRG	
SILL BLOCK		U 01	REF TO OLD DRG FA-0427-3/12	
CHARGING & DISCHARGING DOORS			DRAWING NO : 4-7-1101-01-06288	
			REV 00	

ALL DIMENSIONS ARE IN MM

REV	DATE	ALTERED
1		CHECKED
		APPROVED



NOTES:

1. THE REFRRACTORIES SHALL BE COMPACT, OF HOMOGENEOUS TEXTURE AND FREE FROM CRACKS, VOIDS AND OTHER FLAWS, THEY SHALL BE BURNT EVENLY THROUGHOUT, AND SHALL HAVE SUFFICIENT MECHANICAL STRENGTH AND NO SOFT CORNERS.
2. ALL CORNERS TO BE MINIMUM 3 mm. RADII, UNLESS OTHERWISE STATED.
3. TOLERANCE ON SIZE ± 0.1

ITEM NO	DESCRIPTION	DRAWING NO	85-90% Al_2O_3	10
			MATL CODE	UNIT WT
			MATL SPEC	QTY

EQPT: ROTARY HEARTH FURNACE

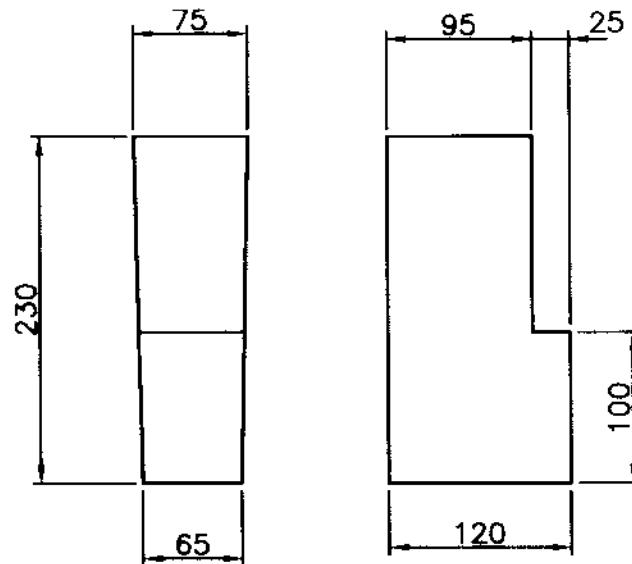


Bharat Heavy Electricals Ltd
SEAMLESS STEEL TUBE PLANT
TIRUCHIRAPALLI - 620014

DRN	NAME	SIGNATURE	DATE
CHD	SENJUMAR	<i>SENJUMAR</i>	16.12.04
APPD	S. BHANMUGABUNDARAM	<i>S. Bh...</i>	16/12/04



DEPT	MPG	GRADE OF UNTOOL DIM	SCALE	WEIGHT (Kg)	REF TO ASSY DRG	ITEM NO
CODE		2/1/1	1:5	3.8	REF TO OLD DRG	
TITLE					DRAWING NO :	REV
END ARCH					4-7-1101-01-06286	00
CHARGING & DISCHARGING DOORS						

REV	DATE	ALTERED
5		CHECKED
		APPROVED



NOTES:

1. THE REFRACTORIES SHALL BE COMPACT, OF HOMOGENEOUS TEXTURE AND FREE FROM CRACKS, VOIDS AND OTHER FLAWS, THEY SHALL BE BURNT EVENLY THROUGHOUT, AND SHALL HAVE SUFFICIENT MECHANICAL STRENGTH AND NO SOFT CORNERS.
2. ALL CORNERS TO BE MINIMUM 3 mm. RADII, UNLESS OTHERWISE STATED.
3. TOLERANCE ON SIZE $\begin{smallmatrix} +0 \\ -1 \end{smallmatrix}$

					88-60% AL ₂ O ₃	10	
ITEM NO	DESCRIPTION	DRAWING NO			MATL CODE	UNIT WT	
					MATL SPEC	QTY	
EQPT: ROTARY HEARTH FURNACE							
		Bharat Heavy Electricals Ltd SEAMLESS STEEL TUBE PLANT TIRUCHIRAPALLI - 620014		DRN	NAME SENKUMAR	SIGNATURE <i>S. Sen Kumar</i>	DATE 15.12.04
				CHD			
				APPD	S. BHANUGABUNDARAM	<i>S. Bhanu</i>	16/12/04
DEPT MPG	GRADE OF UNTOOL DIM 2/1/1		SCALE 1:5	WEIGHT (Kg) 4.2	REF TO ASSY DRG		ITEM NO
CODE					REF TO OLD DRG FA-0427-3/11		
TITLE END ARCH CHARGING & DISCHARGING DOORS				CARD CODE U 01	DRAWING NO : 4-7-1101-01-06287		REV 00

BID NO:

DATE:

TECHNICAL DELIVERY CONDITIONS

- Materials to be delivered through pallet packing to prevent damages during transit. Acceptance of material is based on condition at receipt only.
- Original Test Certificates for all specifications and Chemical Composition to be produced along with supply. If the submitted specifications do not meet the lab test conducted at BHEL Plant lab (NABL Accredited) or any independent lab, the entire lot is liable to be rejected and is to be taken back by the vendor at his own cost.
- Dimensional reports to be provided by random sampling of 1% of total shaped refractory brick, including weight. Weight of each shaped refractory brick can be referred from the reference drawing No.
- Material Inspection will be carried out by M/S. BHEL Inspector or BHEL authorised third party Inspection at Supplier's works if necessary prior to dispatch of all materials. Relevant parts IS: 1528 will be reference standard during inspection.
- Offer is considered only on free door delivery at SSTP STORES including unloading charges

ANNEXURE-I

BID NO:

Date:

SL NO	PRE QUALIFICATION REQUIREMENT	VENDOR'S COMMENTS
1	Vendors shall be Manufacturer of Refractory bricks containing alumina minimum 55%. The vendor shall be in the field of refractory manufacturing for a minimum period of 5 years from the date of tender. Udyam certificate/registration certificate to indicate the experience in refractory manufacture for past 5 years or more to be provided.	
2	Vendor should have supplied similar Refractory shape bricks containing alumina minimum 55% to projects with operating temperatures exceeding 1500°C within the past 5 years. The proof of such supply (Executed Purchase Order Copy along with TDS (Tax Deducted at Source) certificate issued by the organization or Form 26 AS or Bank statement for transaction of payment for completion of supply), along with technical specifications of the supplied bricks to be provided as proof of experience and shall be submitted with the offer.	
3	The vendor shall submit detailed technical specification of Refractory bricks containing alumina minimum 55%, and of their make, equivalent to BHEL required specification.	
	COMMON FOR ALL	
4	If the submitted specifications of vendor supplied material do not match the lab test of supplied bricks conducted at BHEL Plant lab (NABL Accredited) or any independent lab, the entire lot is liable to be rejected and is to be taken back by the vendor at his own cost within 3 months, failing which the material will be disposed off by BHEL.	
5	Offers not meeting the above requirements shall be liable for rejection. Kindly submit only one OR two relevant document related to Pre-Qualification requirement of previous supply. Avoid sending multiple documents which is liable for rejection.	

ANNEXURE -II

SL NO	Documents requirements	VENDOR'S COMMENTS
1	Signed copy of technical specification and drawing with organization seal/ stamp	
2	Executed Purchase Order Copy of Refractory bricks containing alumina minimum 55%, Form 26 AS or Bank statement for transaction of payment for completion of supply to meet the requirements in Annexure I Sl No 2A. Copy of the tax invoice / Delivery challan from the customer for the purchase order should be submitted as the documentary proof	
3	Filled in & signed copy of Annexure I - PQR details with organization seal / stamp	
4	Filled in & signed copy of Annexure B & C (BHEL Technical Cum Commercial Terms And Conditions) for Indigenous Vendor with organization seal / stamp	
5	The vendor shall submit detailed technical specification and MSDS of bricks of their make, equivalent to or better than BHEL required specification.	