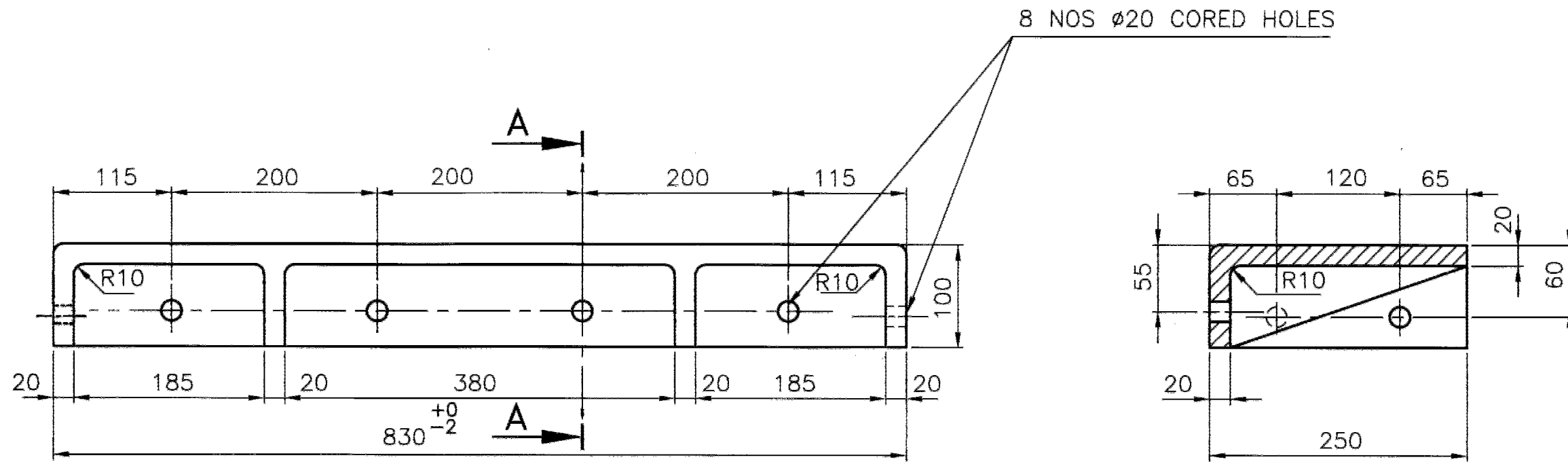


ALL DIMENSIONS ARE IN MILLIMETERS



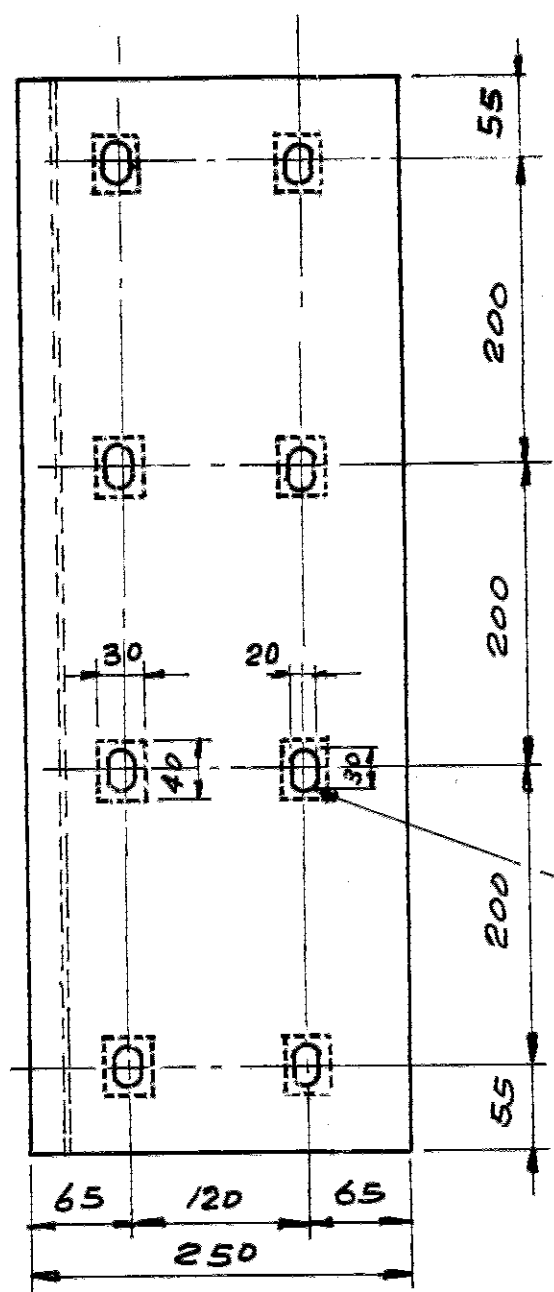
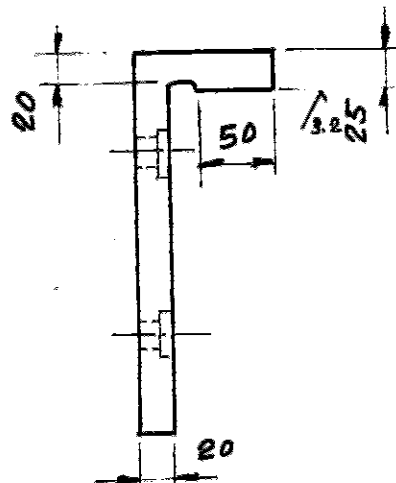
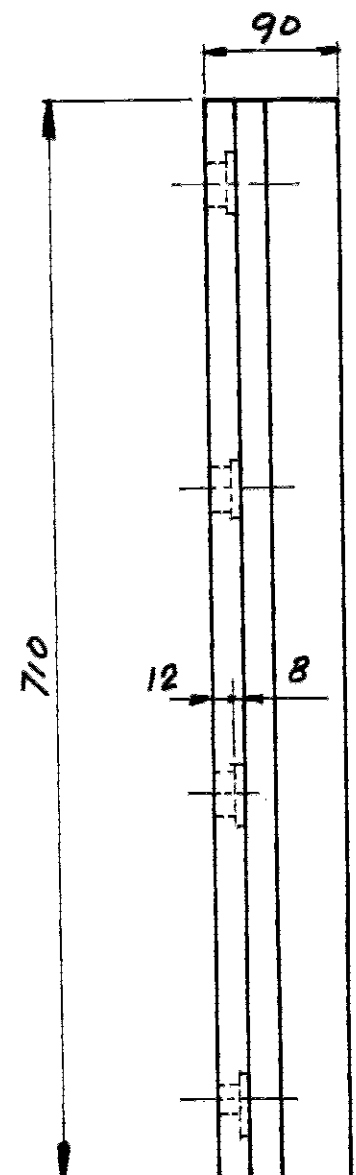
FRONT PLATE BOTTOM SECTION

SECTION -AA

| REV  | DATE | ALTERED :  |
|------|------|------------|
| 01   |      | CHECKED :  |
|      |      | APPROVED : |
| ZONE |      |            |

|                                                                                       |                                 |                                                                                       |              |                            |                                                                         |
|---------------------------------------------------------------------------------------|---------------------------------|---------------------------------------------------------------------------------------|--------------|----------------------------|-------------------------------------------------------------------------|
|                                                                                       |                                 |                                                                                       |              |                            |                                                                         |
|                                                                                       |                                 |                                                                                       |              | C.I GR-3 TYPE-E IS:3355    |                                                                         |
| ITEM NO                                                                               | DESCRIPTION                     | DRAWING NO                                                                            |              | MATL CODE                  | UNIT WT                                                                 |
|                                                                                       |                                 |                                                                                       |              | MATL SPEC                  | QTY                                                                     |
| EQPT: ROTARY HEARTH FURNACE                                                           |                                 |                                                                                       |              |                            |                                                                         |
|  |                                 | Bharat Heavy Electricals Ltd<br>SEAMLESS STEEL TUBE PLANT<br>TIRUCHIRAPALLI - 620014  |              | DRN<br>A.MANIVANNAN        | SIGNATURE<br><i>A. Manivannan</i><br>DATE<br>21.02.98                   |
|                                                                                       |                                 |                                                                                       |              | CHD<br>A.AROCKIAM          | <i>A. Arockiam</i><br>25.2.98                                           |
|                                                                                       |                                 |                                                                                       |              | APPD<br>S.SHANMUGASUNDARAM | <i>S. Shanmugasundaram</i><br>25.02.98                                  |
| DEPT<br>MPG                                                                           | GRADE OF<br>UNTOL. DIM<br>C/M/F |  | SCALE<br>1:5 | WEIGHT(kg)<br>50.000       | REF TO ASSY DWG NO<br>1-7-1101-07-01403<br>REF TO OLD DWG NO<br>3518137 |
| TITLE<br>FRONT PLATE (BOTTOM SECTION)<br>(INSPECTION/CLEANOUT DOOR ASSY)              |                                 |                                                                                       |              | CARD CODE<br>U 01          | ITEM NO<br>4<br>DRAWING NO :<br>3-7-1101-07-04130<br>REV                |

FIRST ANGLE PROJECTION (ALL DIMENSIONS IN MILLIMETRES)



8 NRS CORED HOLES  
AS DETAILED

**MATERIAL :**  
HEAT RESISTANT CAST IRON  
GRADE I TYPE-'E' OF IS:3355

**CHEMICAL COMPOSITION**  
C min : 3.5%  
S max : 0.15 - MAX%  
P max : 0.4 - MAX%  
CY : 1.21 - 1.4%  
C eq : 3.31 ~ 4.4

|          |             |             |             |          |
|----------|-------------|-------------|-------------|----------|
| ITEM NO. | DESCRIPTION | DRAWING NO. | MATL. CODE  | UNIT WT. |
|          |             |             | MATL. SPEC. | QTY.     |

EOPT: RHF

|  |                                |  |      |             |             |          |              |
|--|--------------------------------|--|------|-------------|-------------|----------|--------------|
|  | Bharat Heavy Electricals Ltd., |  | DRN. | NAME        | SIGN        | DATE     | NO. OF ITEMS |
|  | SEAMLESS STEEL TUBE PLANT      |  | CHK  | SSN. KUMAR  | [Signature] | 20.12.91 |              |
|  | TIRUCHIRAPALLI-620 014         |  | APPD | [Signature] | [Signature] | 6.2.92   |              |

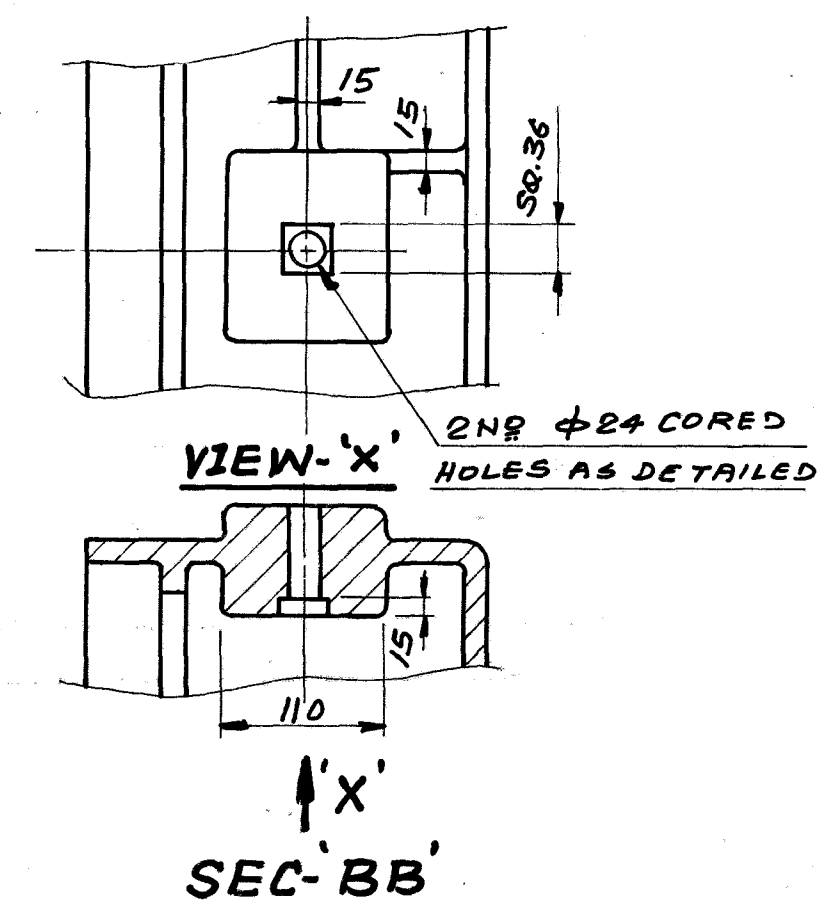
|       |                    |       |             |                       |          |
|-------|--------------------|-------|-------------|-----------------------|----------|
| DEPT. | GRADE OF UNTO. DIM | SCALE | WEIGHT (Kg) | REF. TO ASSY/OLD DRG. | ITEM NO. |
| CODE  | C/M/F              | 1:5   | 36.0        | 1-7-1101-07-01402     | 03       |

|                                                                |           |                   |     |
|----------------------------------------------------------------|-----------|-------------------|-----|
| TITLE                                                          | CARD CODE | DRAWING NO.       | REV |
| FRONT PLATE<br>INTERMEDIATE SEC.<br>CLEAN OUT DOOR ARRANGEMENT | U 01      | 3-7-1101-07-03383 | 01  |

REV 01 DATE 21-4-95  
ALTD: [Signature]  
CHD: F. J. [Signature]  
APPD: [Signature]  
ZONE MATERIAL HEAT RESISTANT  
CAST IRON GY I TYPE-'E'  
IS:3355 WAS H.R.C.I  
WITH 25% NI + 20% CY. CHEMICAL  
COMPOSITION ADDED

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.

|   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |
|---|---|---|---|---|---|---|---|



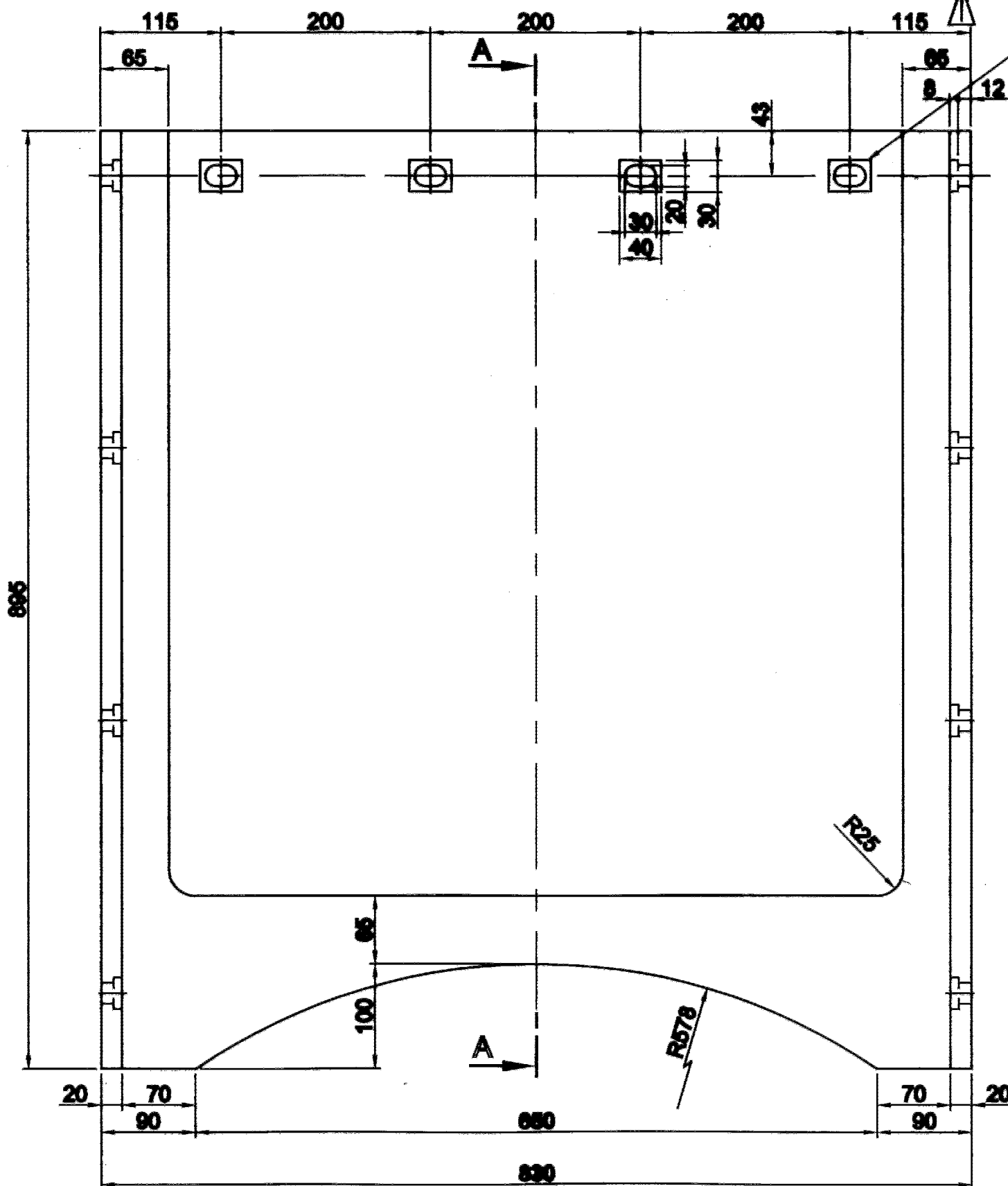
FOR OLD DESIGN REFER DRG. NO. 2-7-1101-07-00026

|          |             |             |           |         |
|----------|-------------|-------------|-----------|---------|
|          |             |             |           |         |
|          |             |             |           |         |
|          |             |             |           |         |
| ITEM NO. | DESCRIPTION | DRAWING NO. | MATL CODE | UNIT WT |
|          |             |             | MATL SPEC | QTY     |

|                                                                                                                                                                                      |  |                            |                            |                  |                |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|----------------------------|----------------------------|------------------|----------------|
|  <b>Bharat Heavy Electricals Ltd.,</b><br>SEAMLESS STEEL TUBE PLANT<br>TIRUCHIRAPALLI - 620 014 |  | DRN<br>SSN: KUMAR          | NAME<br><i>[Signature]</i> | DATE<br>31-12-91 | NO. OF<br>ITEM |
|                                                                                                                                                                                      |  | CND<br><i>[Signature]</i>  | 6-2-92                     |                  |                |
|                                                                                                                                                                                      |  | APPD<br><i>[Signature]</i> | 6-2-92                     |                  |                |

|                                |                       |                                                                                       |              |                      |                                  |             |
|--------------------------------|-----------------------|---------------------------------------------------------------------------------------|--------------|----------------------|----------------------------------|-------------|
| DEPT                           | GRADE OF<br>UNTO. DIM |  | SCALE<br>1:5 | WEIGHT (kg)<br>205,0 | REF TO ASSY/OLD DRG              | ITEM<br>NO. |
| CODE                           | C/M/F                 |                                                                                       |              |                      |                                  |             |
| TITLE<br><b>CLEAN OUT DOOR</b> |                       |                                                                                       |              | CARD<br>CODE<br>U 01 | DRAWING NO.<br>2-7-1101-07-02119 | REV<br>01   |

ALL DIMENSIONS ARE IN MILLIMETRES



4 NOS-CORDED HOLES  
AS DETAILED

16 NOS-CORDED HOLES  
AS DETAILED

SECTION-AA

QTY. 3Nos.

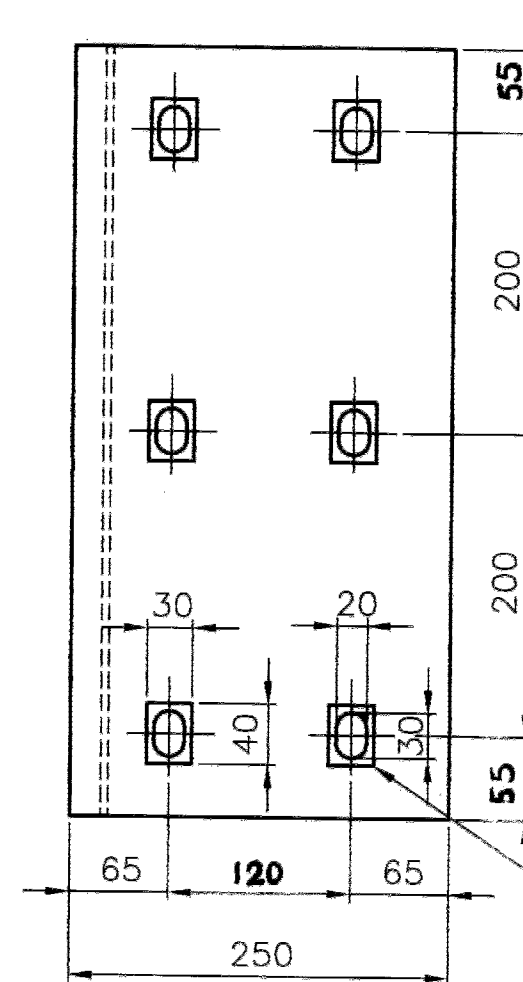
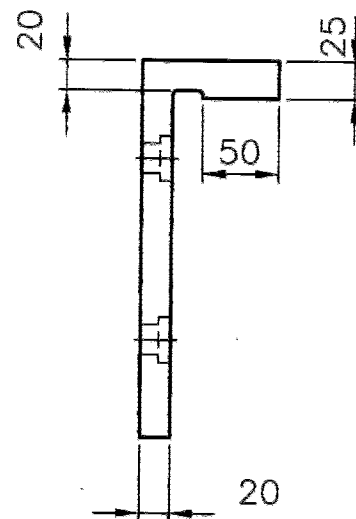
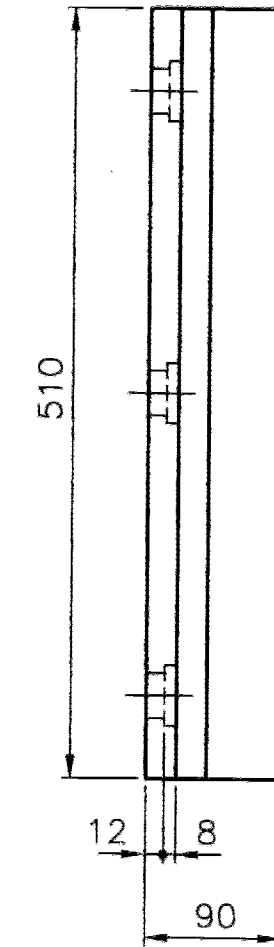
MATERIAL  
H.R.C.I COMPOSITION  
C.I Gr.25  
2% CHROMIUM  
1% COPPER

| REV  | DATE | ALTERED : | REV  | DATE | ALTERED : |
|------|------|-----------|------|------|-----------|
| 02   |      | CHECKED : | 01   |      | CHECKED : |
|      |      | APPROVED  |      |      | APPROVED  |
| ZONE |      |           | ZONE |      |           |

|                                                                                                                                                                                   |                                 |                      |                                          |                    |                  |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|----------------------|------------------------------------------|--------------------|------------------|---------------|---------------|
| EQPT: ROTARY HEARTH FURNACE                                                                                                                                                       |                                 | NAME P. RAMANURTHIAN |                                          | SIGNATURE          |                  | DATE 20.12.04 |               |
|  <b>Bharat Heavy Electricals Ltd</b><br>SEAMLESS STEEL TUBE PLANT<br>TIRUCHIRAPALLI - 620014 |                                 | DRN                  | SEN. KUMAR                               |                    | SIGNATURE        |               | DATE 20/12/04 |
|                                                                                                                                                                                   |                                 | CHD                  | SHANMUGASUNDARAM S.                      |                    | SIGNATURE        |               | DATE 20/12/04 |
| DEPT<br>MFG                                                                                                                                                                       | GRADE OF<br>UNTOOL DIM<br>φ/M/T | SCALE<br>1:5         | WEIGHT(kg)<br>175                        | REF TO ASSY Dwg NO |                  | ITEM NO       |               |
| TITLE<br><b>FRONT PLATE UPPER SECTION</b>                                                                                                                                         |                                 | CARD<br>CODE<br>U 01 | DRAWING NO :<br><b>3-7-1101-07-04710</b> |                    | REV<br><b>00</b> |               |               |

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 MILLIMETERS

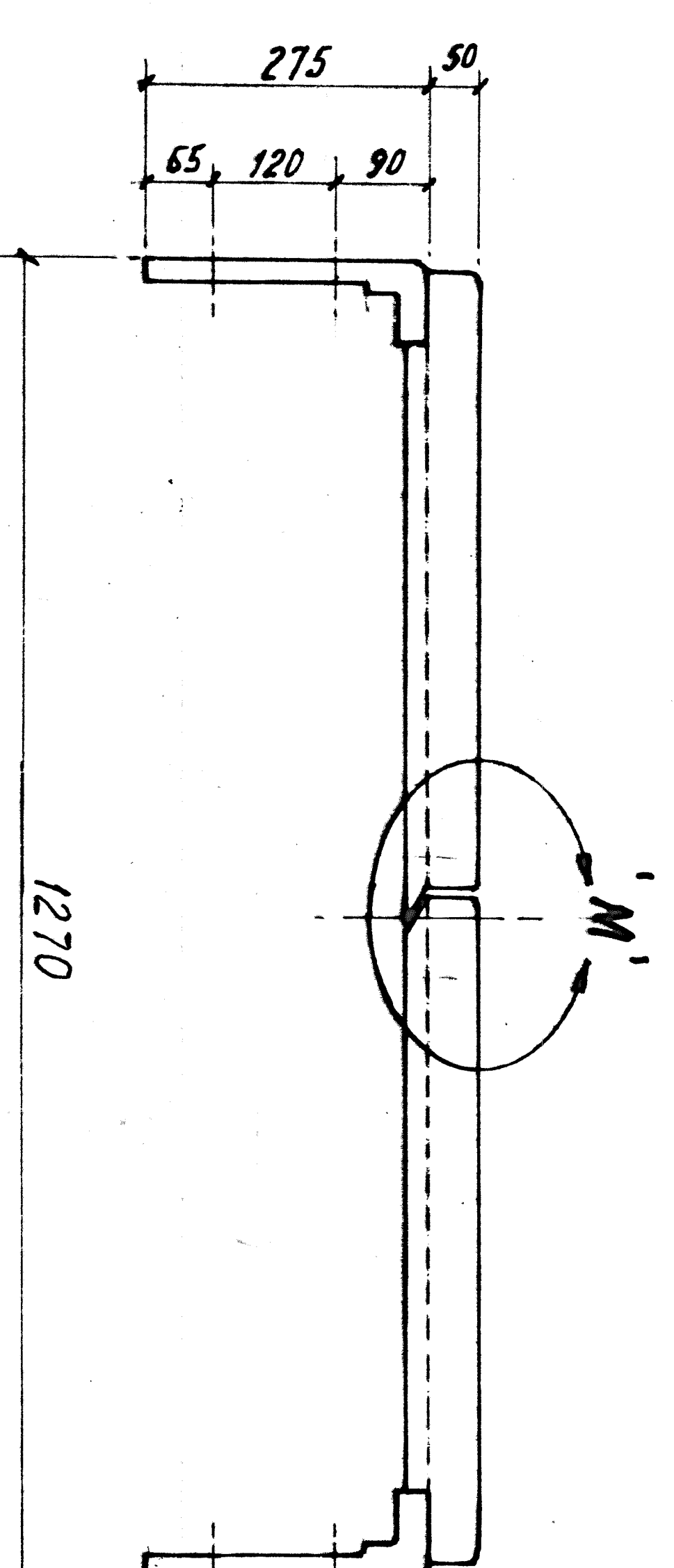


6 NOS CORED HOLES DETAILED SHOWN

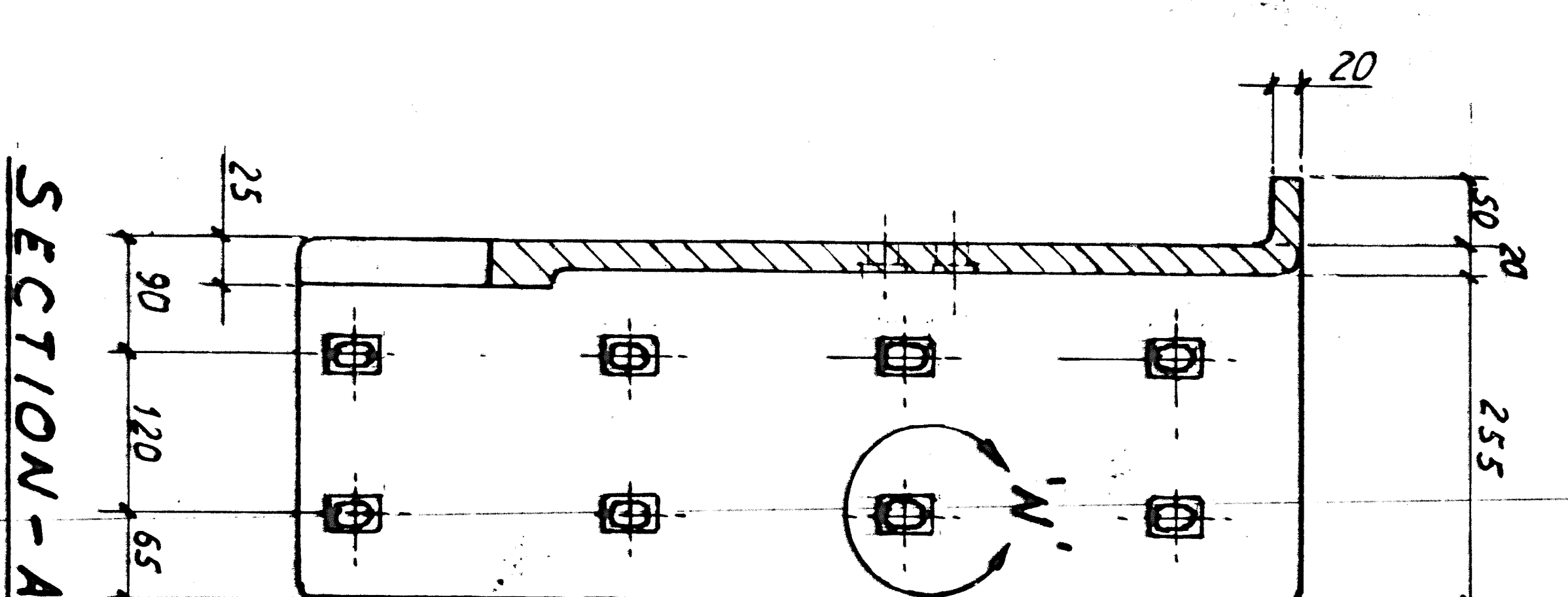
## INSPECTION DOOR INTERMEDIATE SECTION

| REV  | DATE | ALTERED : |
|------|------|-----------|
| 01   |      | CHECKED : |
|      |      | APPROVED  |
| ZONE |      |           |

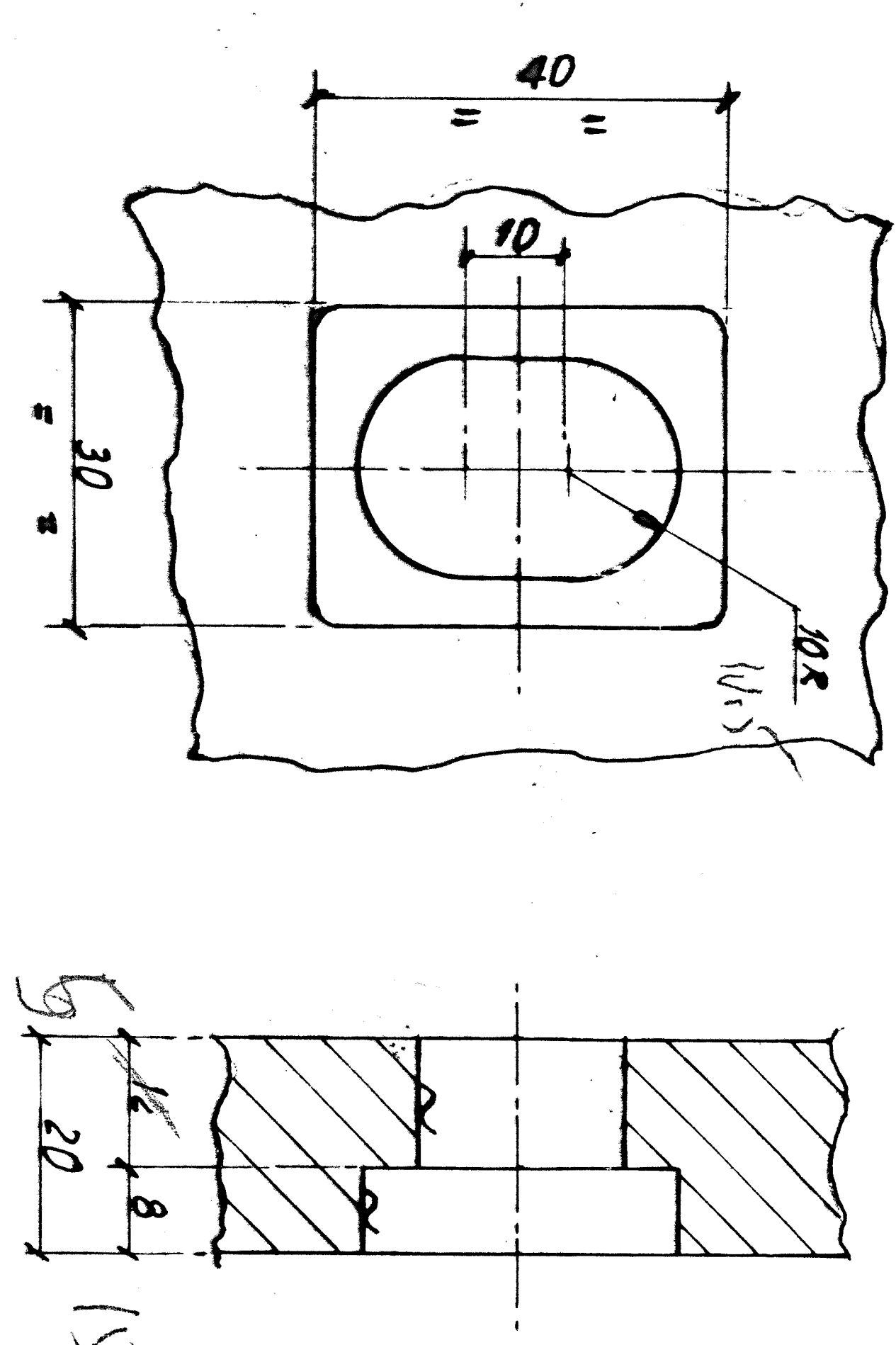
|                                                                                       |                                 |                                                                                                       |                         |                                   |
|---------------------------------------------------------------------------------------|---------------------------------|-------------------------------------------------------------------------------------------------------|-------------------------|-----------------------------------|
| ITEM NO                                                                               | DESCRIPTION                     | DRAWING NO                                                                                            | C.I GR-3 TYPE-E IS:3355 | UNIT WT                           |
|                                                                                       |                                 |                                                                                                       | MATL CODE               | QTY                               |
|                                                                                       |                                 |                                                                                                       | MATL SPEC               |                                   |
| EQPT: ROTARY HEARTH FURNACE                                                           |                                 |                                                                                                       |                         |                                   |
|  |                                 | Bharat Heavy Electricals Ltd<br>SEAMLESS STEEL TUBE PLANT<br>TIRUCHIRAPALLI - 620014                  |                         |                                   |
| DRN                                                                                   | NAME<br>A.MANIVANNAN            | SIGNATURE<br><i>A. Manivannan</i>                                                                     | DATE<br>21.02.98        |                                   |
| CHD                                                                                   | A.AROCKIAM                      | SIGNATURE<br><i>A. Arockiam</i>                                                                       | DATE<br>25.2.98         |                                   |
| APPD                                                                                  | S.SHANMUGASUNDARAM              | SIGNATURE<br><i>S. Shanmugasundaram</i>                                                               | DATE<br>25.02.98        |                                   |
| DEPT<br>MPG                                                                           | GRADE OF<br>UNTOL. DIM<br>C/M/F | SCALE<br><br>1:5 | WEIGHT(kg)<br>25.700    | REF TO ASSY DWG NO<br>3518137     |
| TITLE<br>FRONT PLATE<br>INTERMEDIATE SECTION<br>(INSPECTION DOOR ASSY)                |                                 |                                                                                                       |                         | REF TO OLD DWG NO<br>3518137      |
| CARD CODE<br>U 01                                                                     |                                 |                                                                                                       |                         | DRAWING NO :<br>3-7-1101-07-04129 |
|                                                                                       |                                 |                                                                                                       |                         | REV<br>00                         |



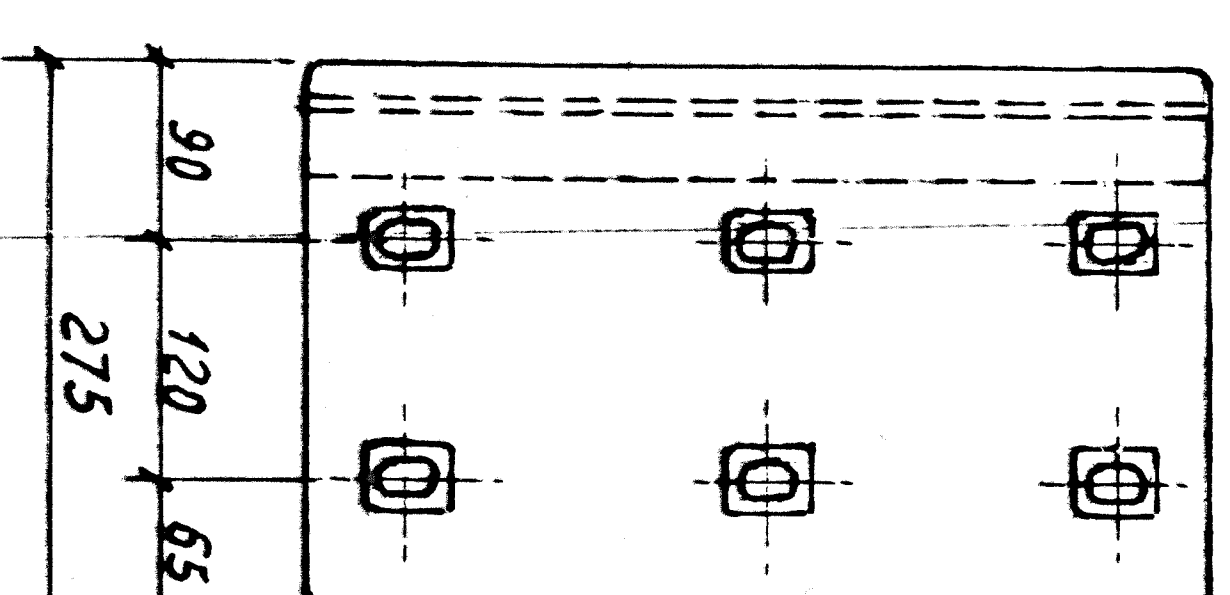
ASSEMBLY FOR CHARGE & DISCH. DOOR FRONT PLATE  
2 SETS REQUIRED



ENLGD. SECTION - C-C  
(TYPICAL)



ENLGD. SECTION - B-B



DOOR FRONT PLATE CASTING  
MATL. - HK ALLOY (25% Cr, 20% Ni)  
WT./PIECE = 106 KG.  
QTY. - 2 NOS.

DOOR FRONT PLATE CASTING

DOOR FRONT PLATE CASTING  
MAY 6. - H K ALLOY (25% Cr, 20% Ni)  
WT./PIECE = 27.4 KG.  
QTY. - 4 Nos.

DOOR FRONT PLATE CASTING  
MATL. - HK ALLOY (25% Cr, 20% Ni)  
WT./PIECE = 30.7 KG.  
QTY. - 8 Nos.

DOOR FRONT PLATE CASTING  
MATL. - HK ALLOY (25% Cr, 20% Ni)  
WT./PIECE = 25 KG.  
QTY. - 8 NOS.

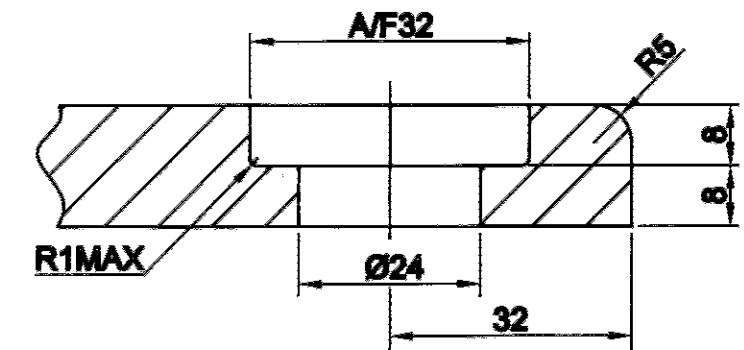
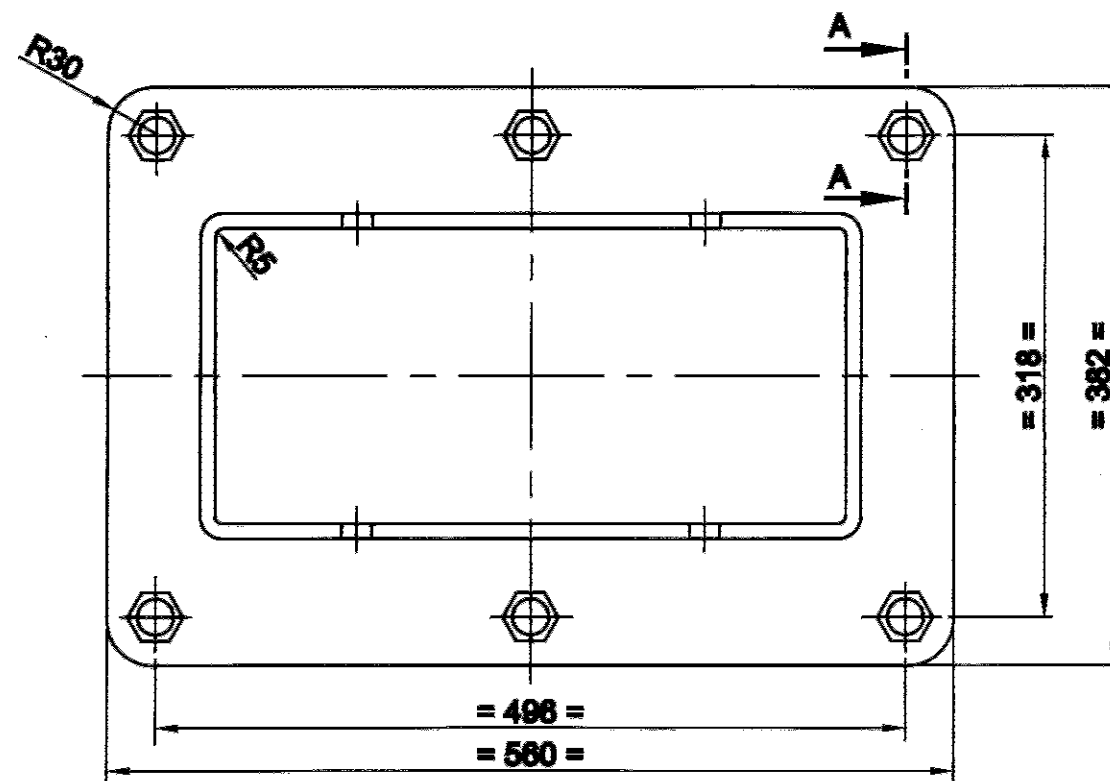
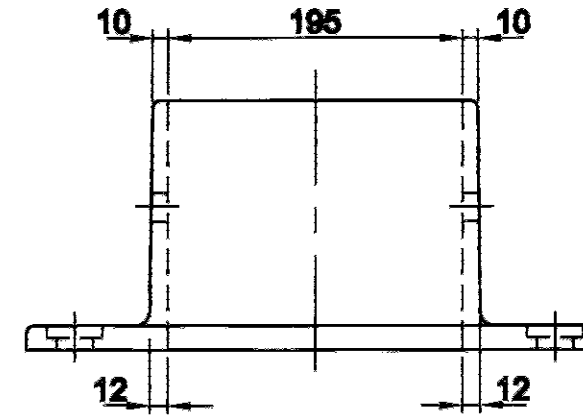
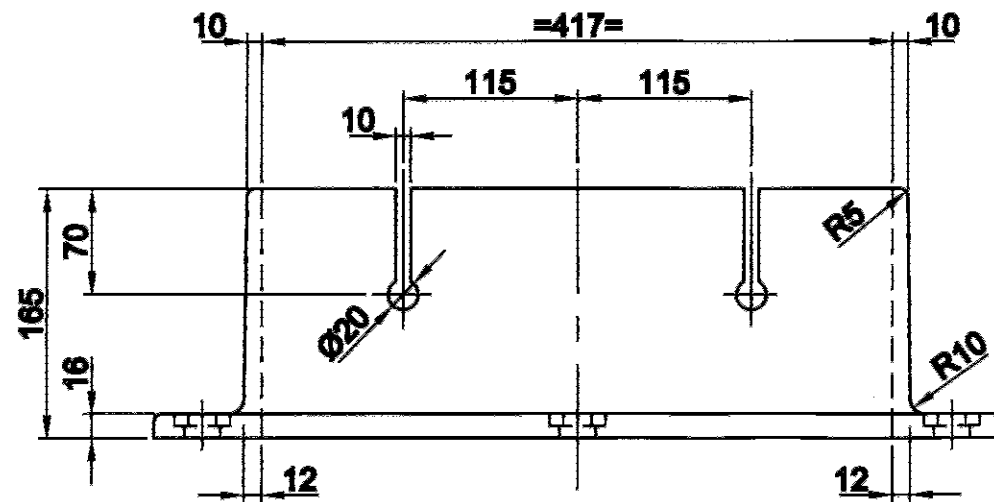
1. CASTINGS TO BE MADE STRAIGHT, SMOOTH, TRUE TO DIMENSIONS AND FREE FROM FINS, SCABS, BLOWHOLES & COLD SHOTS.
2. SURFACES TO BE FINISHED SMOOTH BY SHOT BLASTING OR GRINDING
3. ALL CORNERS TO BE 5MM RADIUS UNLESS STATED OTHERWISE.

4 DENOTES GRINDING ~

|         |         |         |         |
|---------|---------|---------|---------|
| REV     | DATE    | REV     | DATE    |
| ALTERED | ALTERED | ALTERED | ALTERED |
| CHECKED | CHECKED | CHECKED | CHECKED |

|                                                                                                                                                                                                                     |      |                                                                                     |       |               |                   |      |      |      |  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-------------------------------------------------------------------------------------|-------|---------------|-------------------|------|------|------|--|
| <div style="display: flex; justify-content: space-between;"> <div> <b>EXP. ROTARY HEARTH FURNACE</b> </div> <div>  </div> </div> |      |                                                                                     |       |               |                   |      |      |      |  |
| <div style="display: flex; justify-content: space-between;"> <div> <b>SEAMLESS STEEL TUBE PLANT - TIRUCHIRAPPALLI-620 014</b> </div> <div> <b>BHARAT HEAVY ELECTRICALS LIMITED,</b> </div> </div>                   |      |                                                                                     |       |               |                   |      |      |      |  |
| DEPT.                                                                                                                                                                                                               | CODE |  | SCALE | WEIGHT (KGS.) | REF. TO Dwg.      |      |      |      |  |
| 53P1                                                                                                                                                                                                                | 456  |                                                                                     | 1:10  |               | FA-04279.         | ITEM |      |      |  |
| TITLE                                                                                                                                                                                                               |      |                                                                                     |       | CHECKED       | DRAWN             | NAME | SIGN | DATE |  |
| CHARGE & DISCHARGE DOWR                                                                                                                                                                                             |      |                                                                                     |       | APPROVED      |                   |      |      |      |  |
| FRONT PLATE CASTING                                                                                                                                                                                                 |      |                                                                                     |       |               |                   |      |      |      |  |
| ASBRT. & DETAILS                                                                                                                                                                                                    |      |                                                                                     |       |               |                   |      |      |      |  |
| DIMENSIONS TO BE CONTROLLED WITHIN LIMITS AS SHOWN<br>MAXIMUM TOLERANCE : 0.25MM (DRESS OVERSIZE)                                                                                                                   |      |                                                                                     |       |               | DRAWING NO.       |      |      |      |  |
| NO. MACHINING TOLERANCE :                                                                                                                                                                                           |      |                                                                                     |       |               | 1-7-1101-07-01697 |      |      |      |  |
|                                                                                                                                                                                                                     |      |                                                                                     |       |               | Rev               |      |      |      |  |
|                                                                                                                                                                                                                     |      |                                                                                     |       |               | 50                |      |      |      |  |

ALL DIMENSIONS ARE IN MILLIMETERS



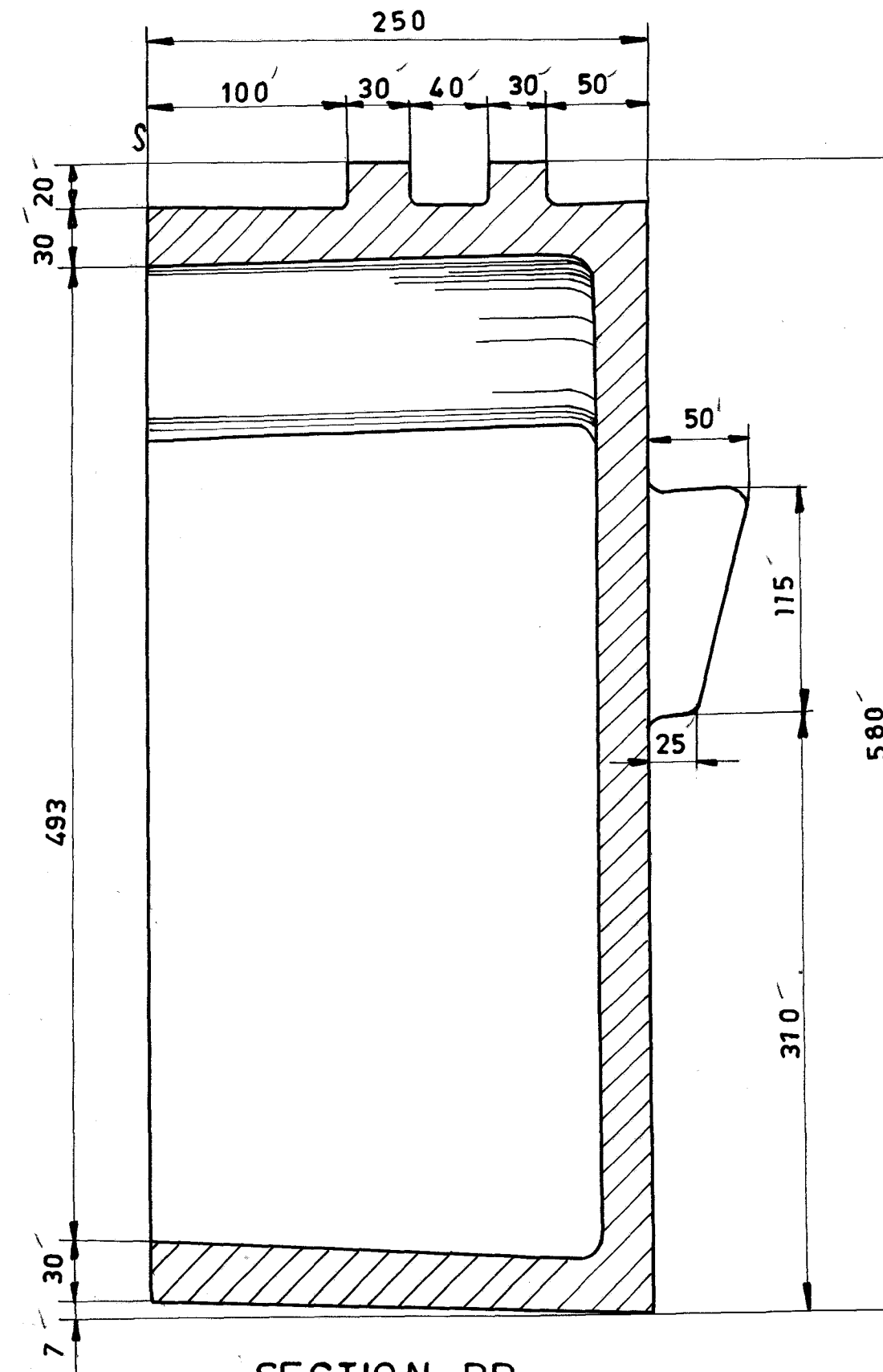
SECTION-AA

TOTAL WEIGHT VARIATION : 5 % Kg.

| REV  | DATE | ALTERED : | REV  | DATE | ALTERED : |
|------|------|-----------|------|------|-----------|
| 02   |      | CHECKED : | 01   |      | CHECKED : |
| ZONE |      | APPROVED: | ZONE |      | APPROVED  |

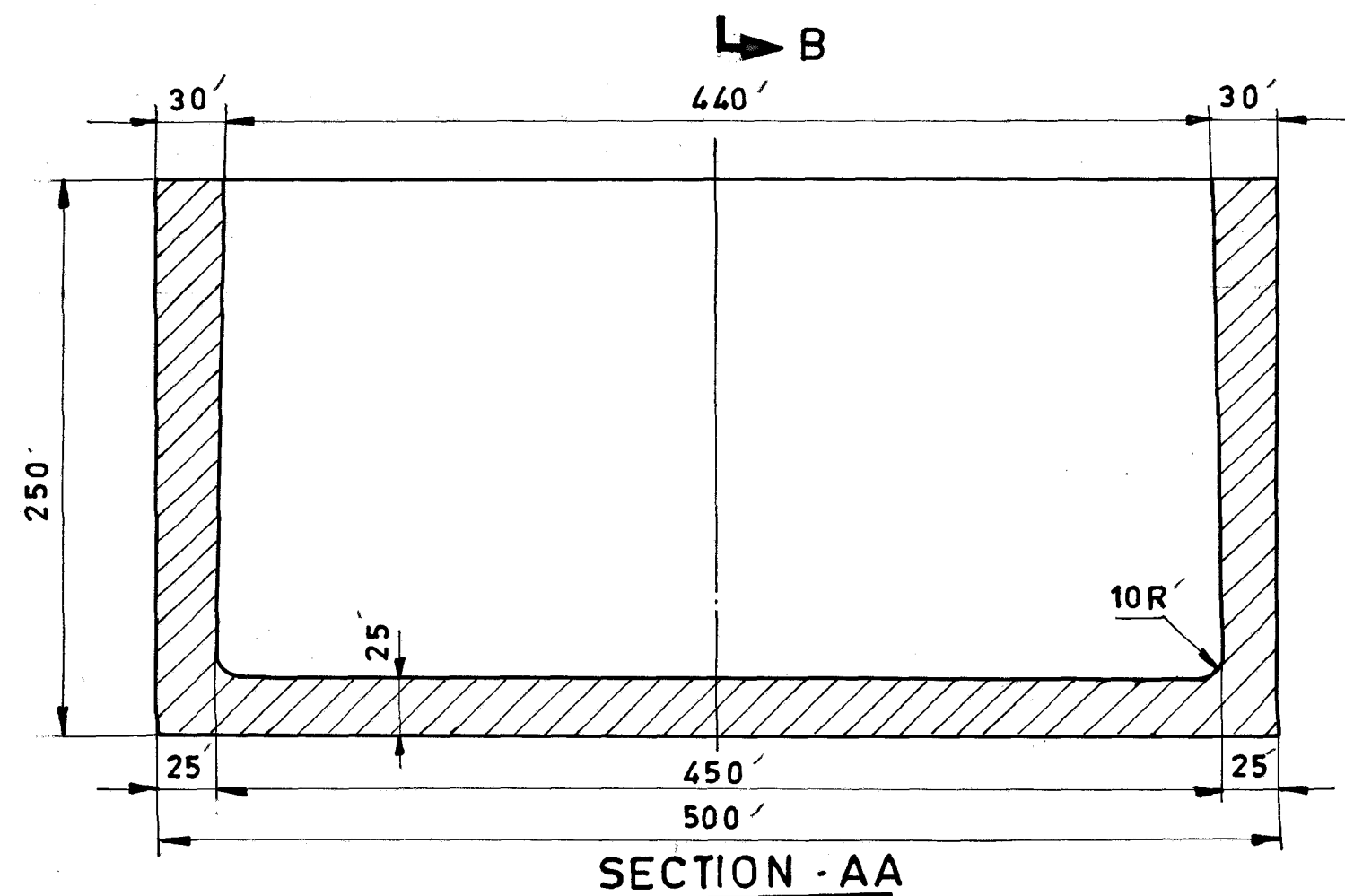
|                                                                                      |                                |                                   |                                    |
|--------------------------------------------------------------------------------------|--------------------------------|-----------------------------------|------------------------------------|
|                                                                                      |                                | Gr.4 IS:4522<br>CAST STEEL        |                                    |
| ITEM NO                                                                              | DESCRIPTION                    | DRAWING NO                        | MATL SPEC                          |
| EQPT: WALKING BEAM FURNACE                                                           |                                | UNIT WT                           | QTY                                |
| Bharat Heavy Electricals Ltd<br>SEAMLESS STEEL TUBE PLANT<br>TIRUCHIRAPALLI - 620014 |                                | NAME<br>BASHOKKUMAR               | SIGNATURE<br>18.06.02              |
|                                                                                      |                                | CHD<br>SENJUMAR                   | 30.502                             |
|                                                                                      |                                | APPD<br>SHANMUGASUNDARAMLS        | 30.5202                            |
| DEPT<br>MPG                                                                          | GRADE OF<br>UNTOL DIM<br>C/M/F | SCALE<br>1:5                      | WEIGHT(kg)<br>32                   |
| TITLE<br>CASTING FOR WALKING<br>BEAM OPENING                                         |                                | CARD<br>CODE<br>U 01              | REF TO ASSY DWG NO<br>7821 / 410-3 |
|                                                                                      |                                | DRAWING NO :<br>3-7-1150-05-01363 | REV<br>00                          |

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.



NOTES :

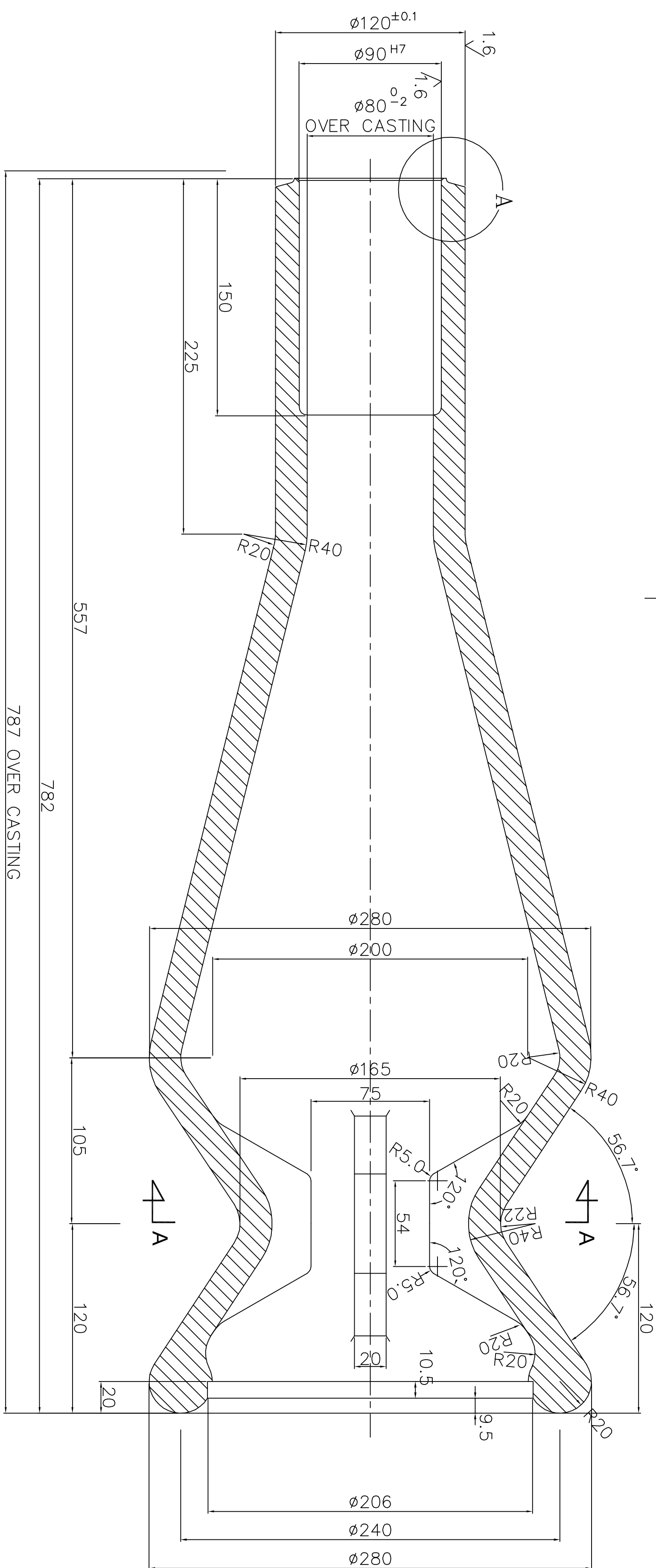
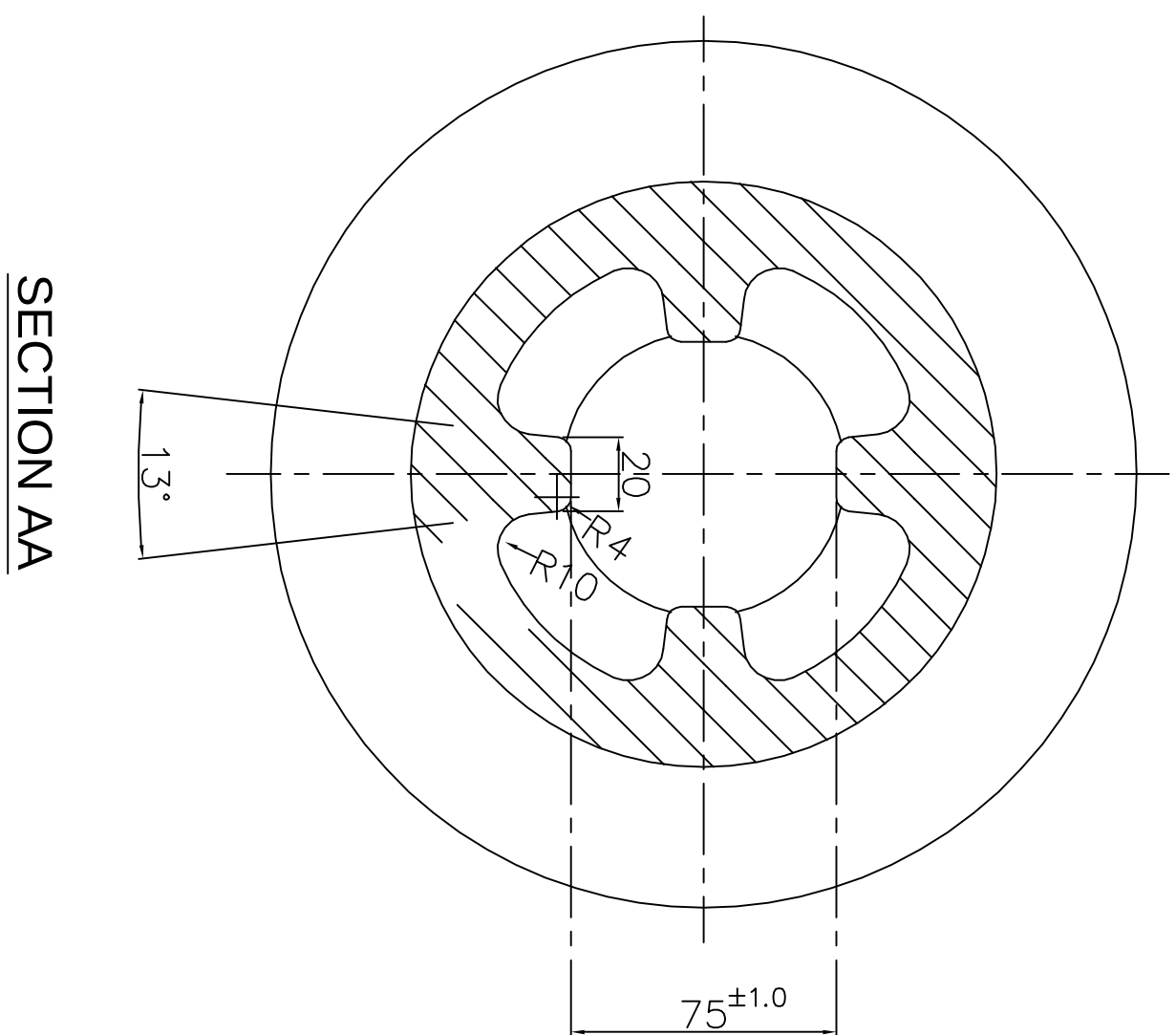
ALL CORNERS TO BE ROUNDED OFF



SECTION - AA

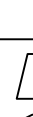
[illegible]

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



# DETAIL OF CHARGE ROLLER MATERIAL - HP45Nb

# MATERIAL - HP45Nb

|                                                                                                                                                                                  |          |                                      |              |                   |              |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|--------------------------------------|--------------|-------------------|--------------|
| EQUIPMENT:                                                                                                                                                                       |          | WALKING BEAM FURNACE                 |              | DATE              |              |
| <br><b>Bharat Heavy Electricals Ltd</b><br>SEAMLESS STEEL TUBE PLANT<br>TRUTHRAPALLI - 820014 |          | DRN                                  | NAME         | SIGNATURE         | DATE         |
| DEPT                                                                                                                                                                             | PLANT    | DESIGNS                              | CHD          | REQUISITIONER     | R. Rajagover |
| DATE OF INSTR. DWN                                                                                                                                                               | IS: 2102 | SCALE                                | 1:2          | WEIGHT (KGS)      | —            |
|                                                                                               |          | REF TO ASSY DWG NO                   | —            |                   | REVISION     |
| TITLE                                                                                                                                                                            |          | CHARGE & DISCHARGE<br>ROLLER CASTING | DRAWING NO : | 1-7-1150-00-10001 |              |
|                                                                                                                                                                                  |          | REF TO OLD DWG NO                    | FAC0286      |                   | REV          |
|                                                                                                                                                                                  |          |                                      |              |                   | 00           |