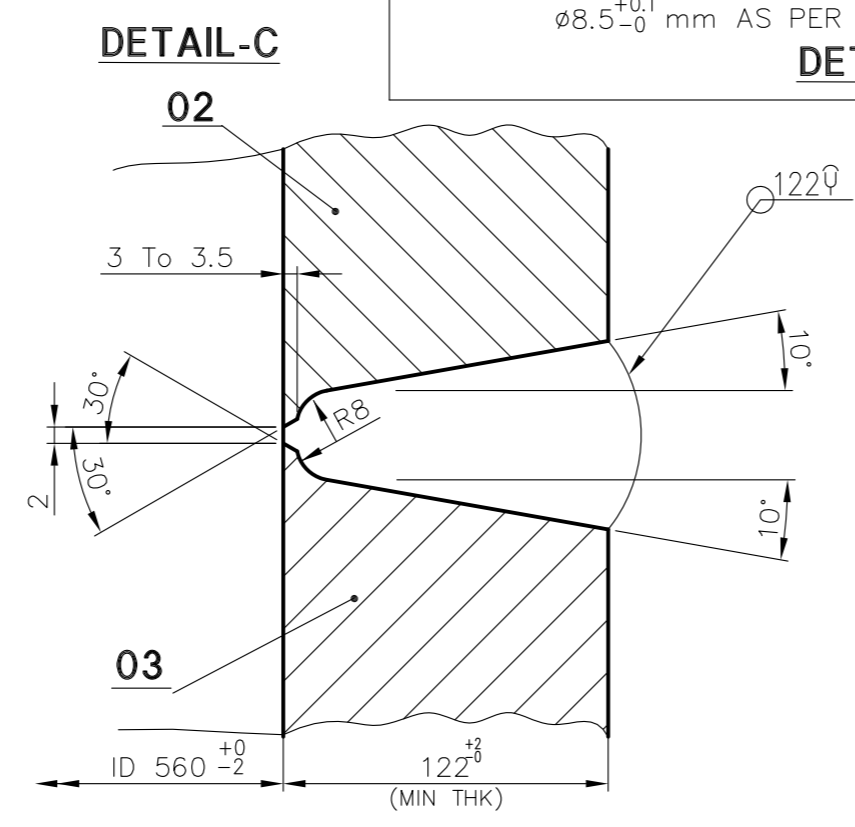
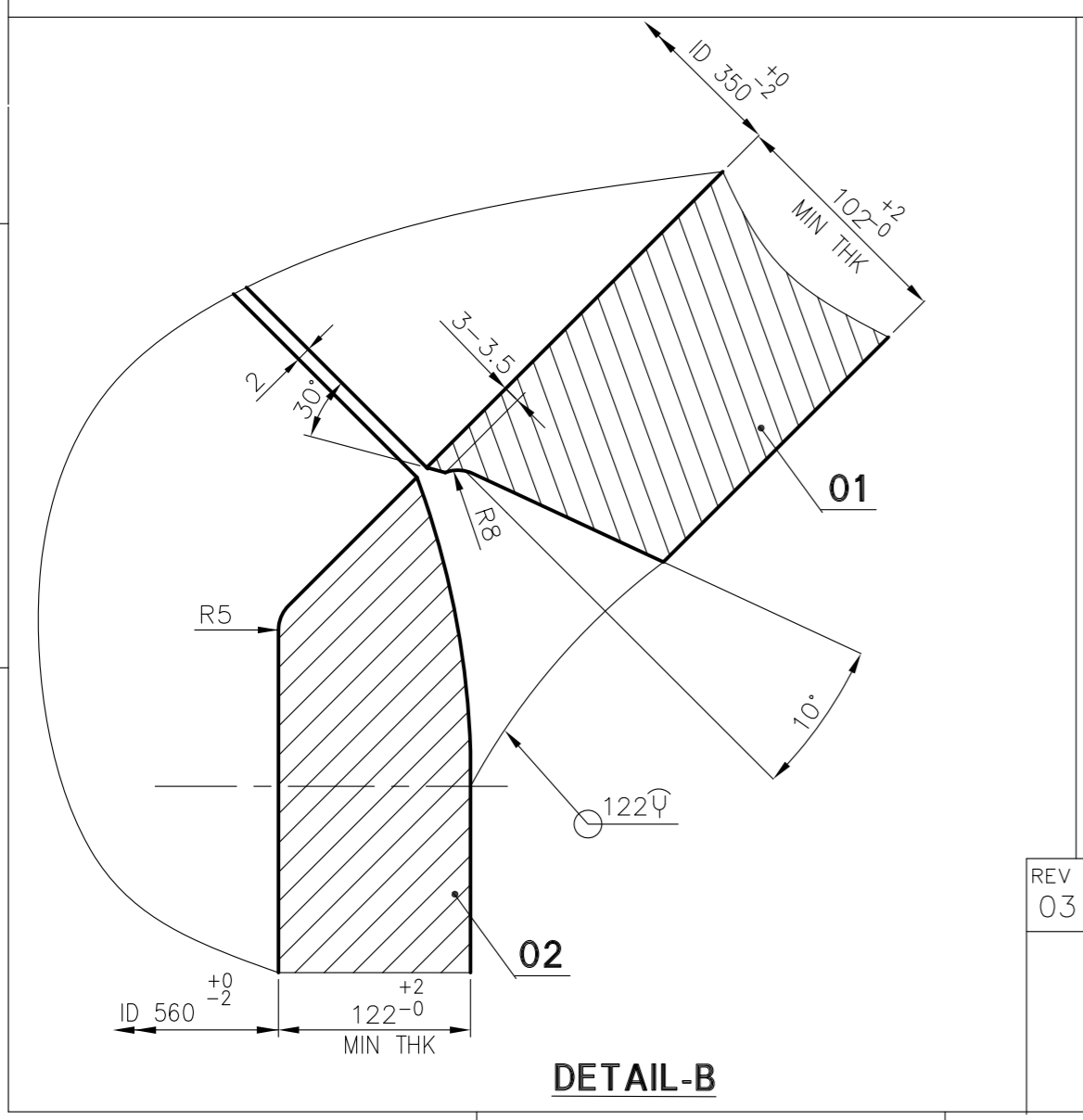
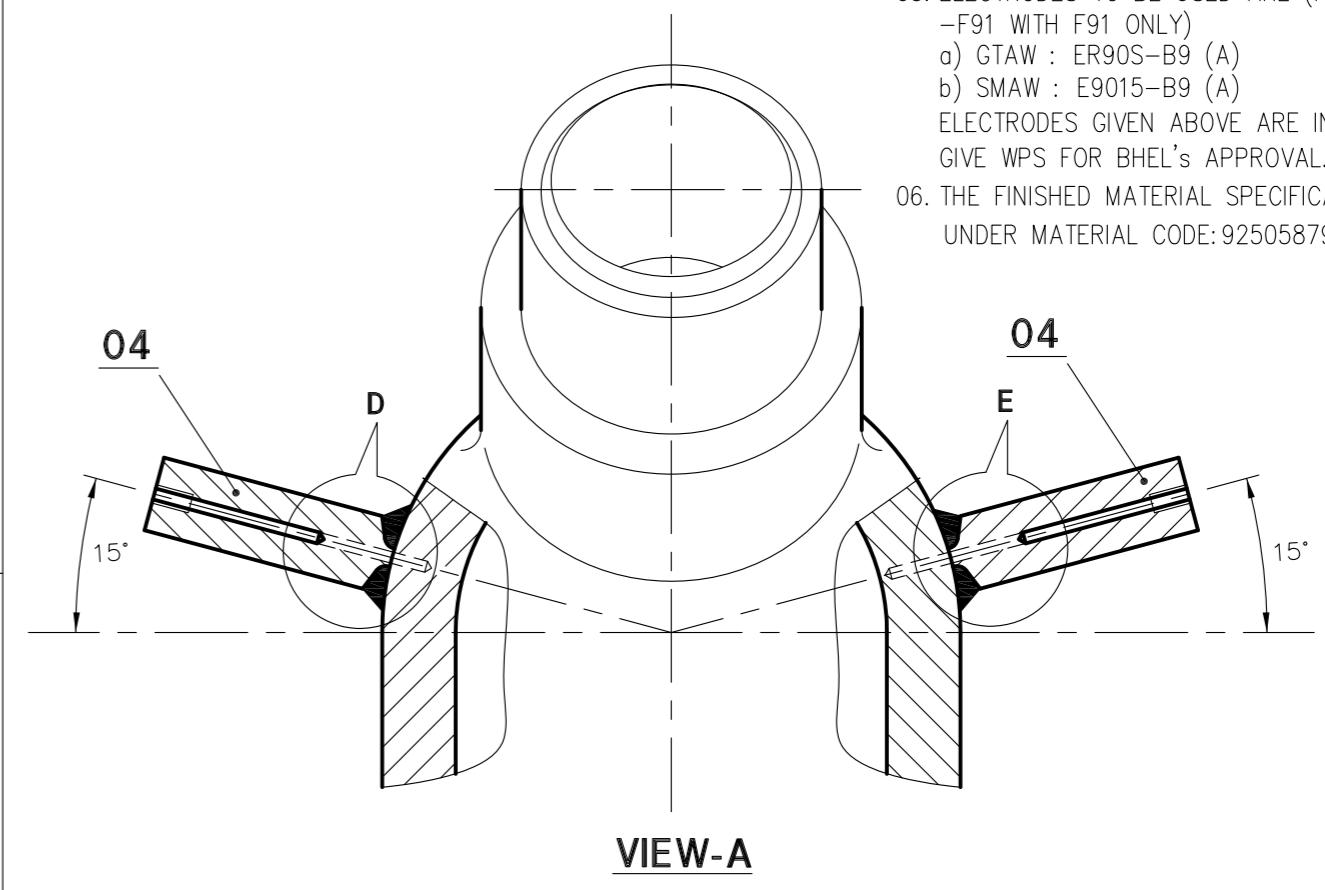
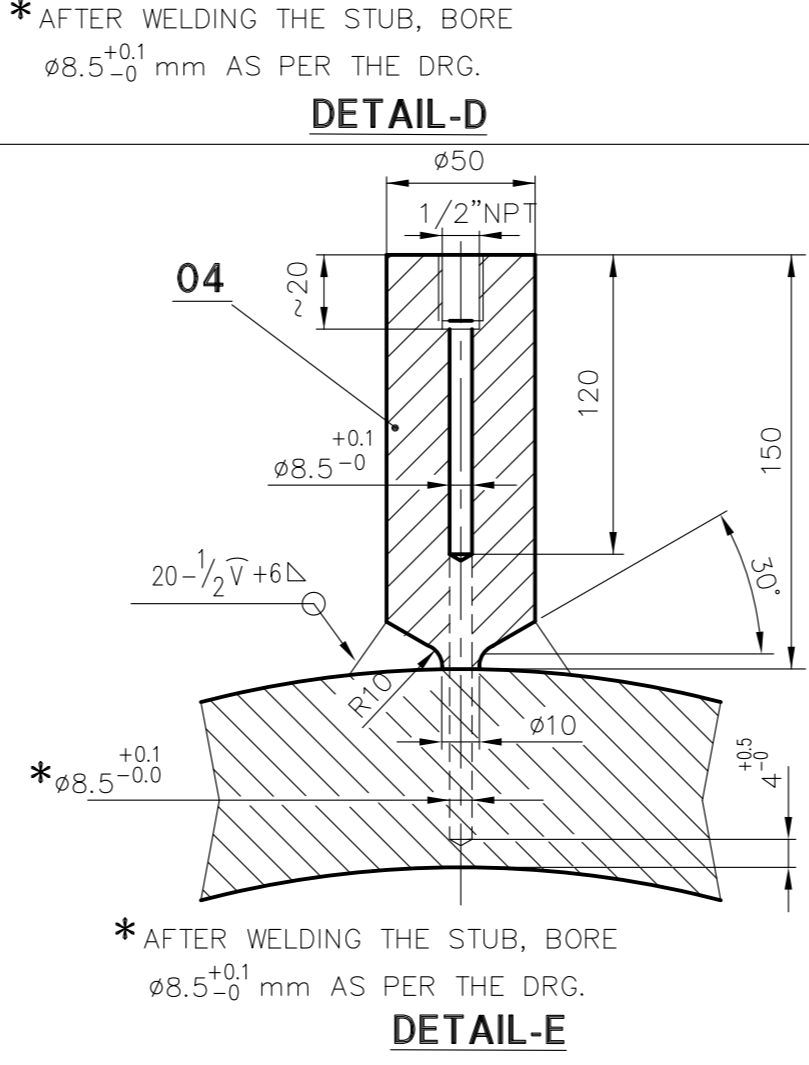
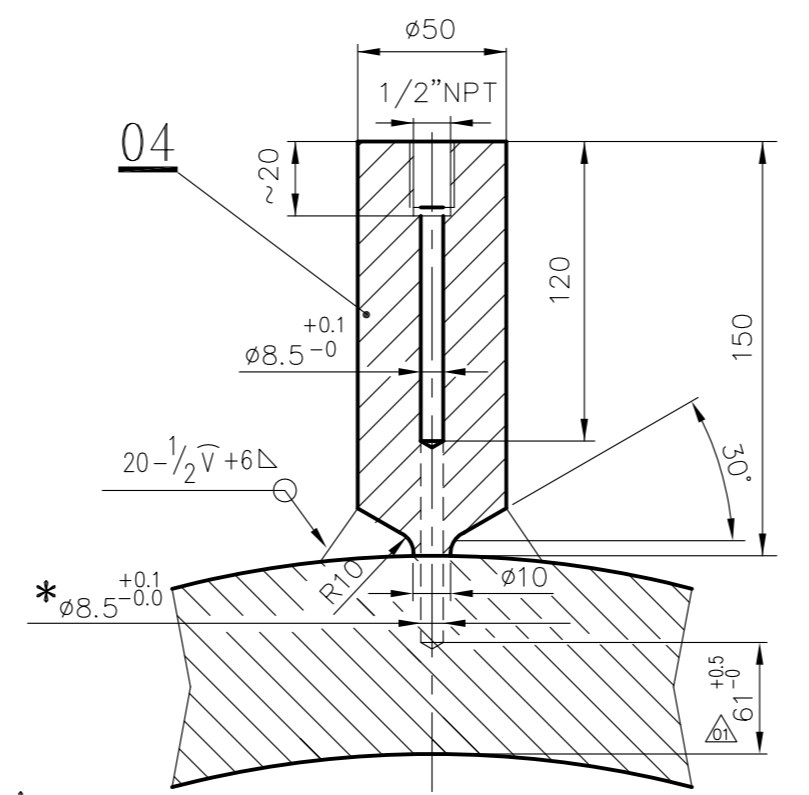
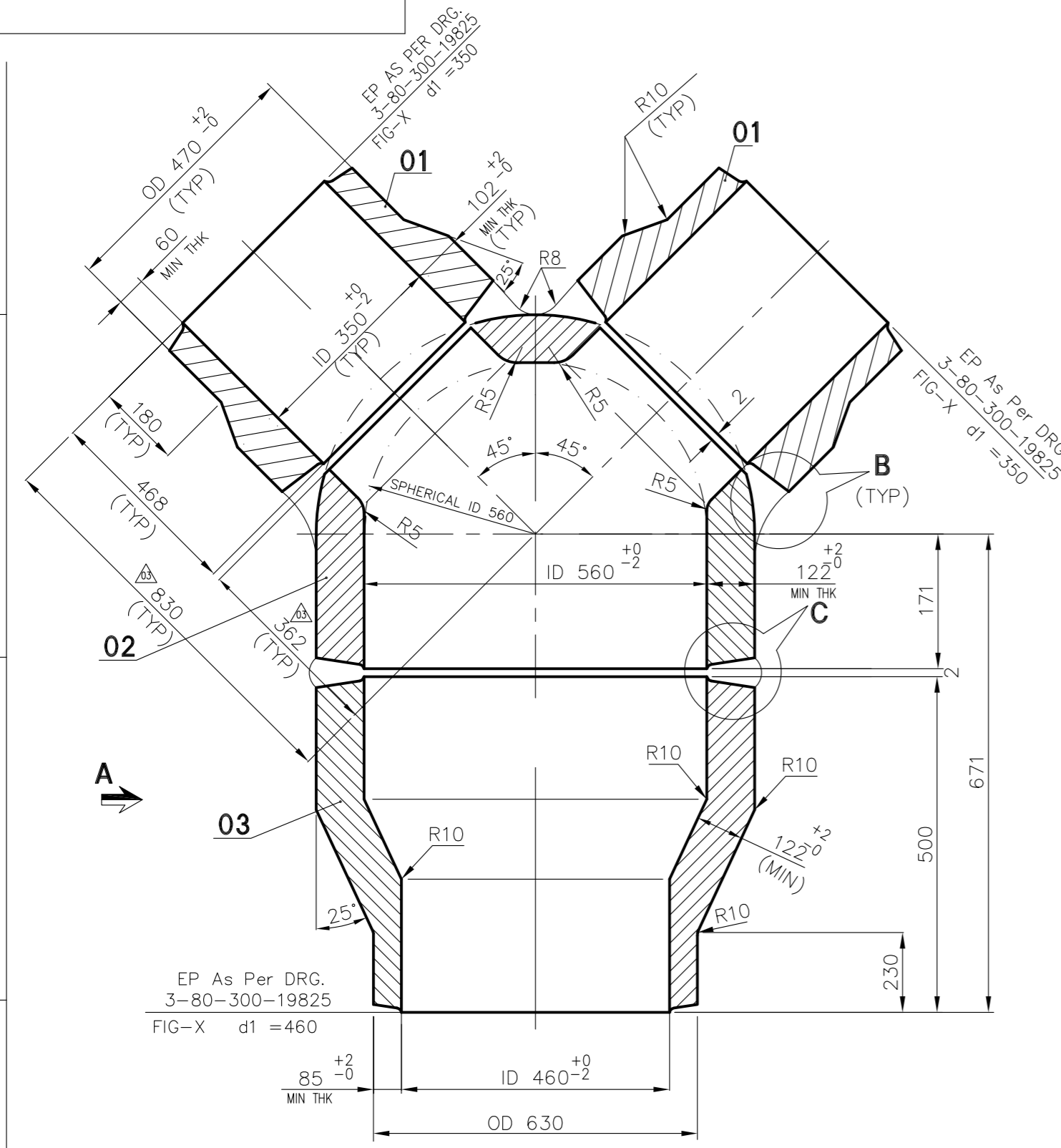


99001-103-08-2

ALL DIMENSIONS ARE IN MILLIMETRES

**NOTES :-**

- 01. DESIGN PRESSURE : 272 Kg/Cm<sup>2</sup> (g)
- 02. DESIGN TEMPERATURE : 568° C
- 03. FOLLOW TDG:108. LATEST
- 04. PIPE SA335P91(A) CAN ALSO BE USED IN PLACE OF SA182F91(A).
- 05. ELECTRODES TO BE USED ARE (FOR WELDING OF -F91 WITH F91 ONLY)
  - a) GTAW : ER90S-B9 (A)
  - b) SMAW : E9015-B9 (A)
 ELECTRODES GIVEN ABOVE ARE INDICATIVE. VENDOR TO GIVE WPS FOR BHEL'S APPROVAL.
- 06. THE FINISHED MATERIAL SPECIFICATION WILL BE SA182F91(A) UNDER MATERIAL CODE:925058790000



VAR NO	ITEM NO	DESCRIPTION	DRAWING NO	MATERIAL CODE	UNIT WEIGHT
	04	TEMP. STUB. Ø50 L=150	2-80-301-10066	SA 182 F91	4 000
	03	OUTLET FORGING ID560 x THK122 MIN / ID460 x 85 MIN THK	2-80-301-10066	SA 182 F91	845 000
	02	BODY FORGING ID 560 x THK 122 MIN	2-80-301-10066	SA 182 F91	555 000
	01	INLET FORGING ID 350 x THK 102 MIN	2-80-301-10066	SA 182 F91	312 000
					2

REV	DATE	ALTD	BY	REASON
04	14.08.2012	ALTD : K.BOOPALAN -SD.-	APPD : S.PANDA -SD.-	DESIGN PRESSURE ALTERED REVISION INDICATED AS 04
03	04.03.11	ALTD : LALIT-SD.-	APPD : C.SARAVANAN-SD.-	DRAFTING ERROR CORRECTED REVISION INDICATED AS 03
02	17.10.10	ALTD : LALIT-SD.-	APPD : C.SARAVANAN-SD.-	DRAFTING ERROR CORRECTED REVISION INDICATED AS 02
01	17.09.10	ALTD : LALIT-SD.-	APPD : C.SARAVANAN-SD.-	DIMENSION REVISED IN DETAIL D REVISION INDICATED AS 01

TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT		BHEL PO REF. NO.		ITEM No.	
Bharat Heavy Electricals Ltd., Piping Centre, Chennai 600 017		2-80-301-10066		04	
DEPT.	GRADE OF UN TOL. DIM	SCALE	WEIGHT (Kg)	MSE DRAWING NO.	REV
	C/M/F	N.T.S.	1632.000	2-80-301-10066	04
TITLE			CARD CODE	REV	
Y-PIECE (ID460x85/ID350x60) SA182F91			U 01	04	

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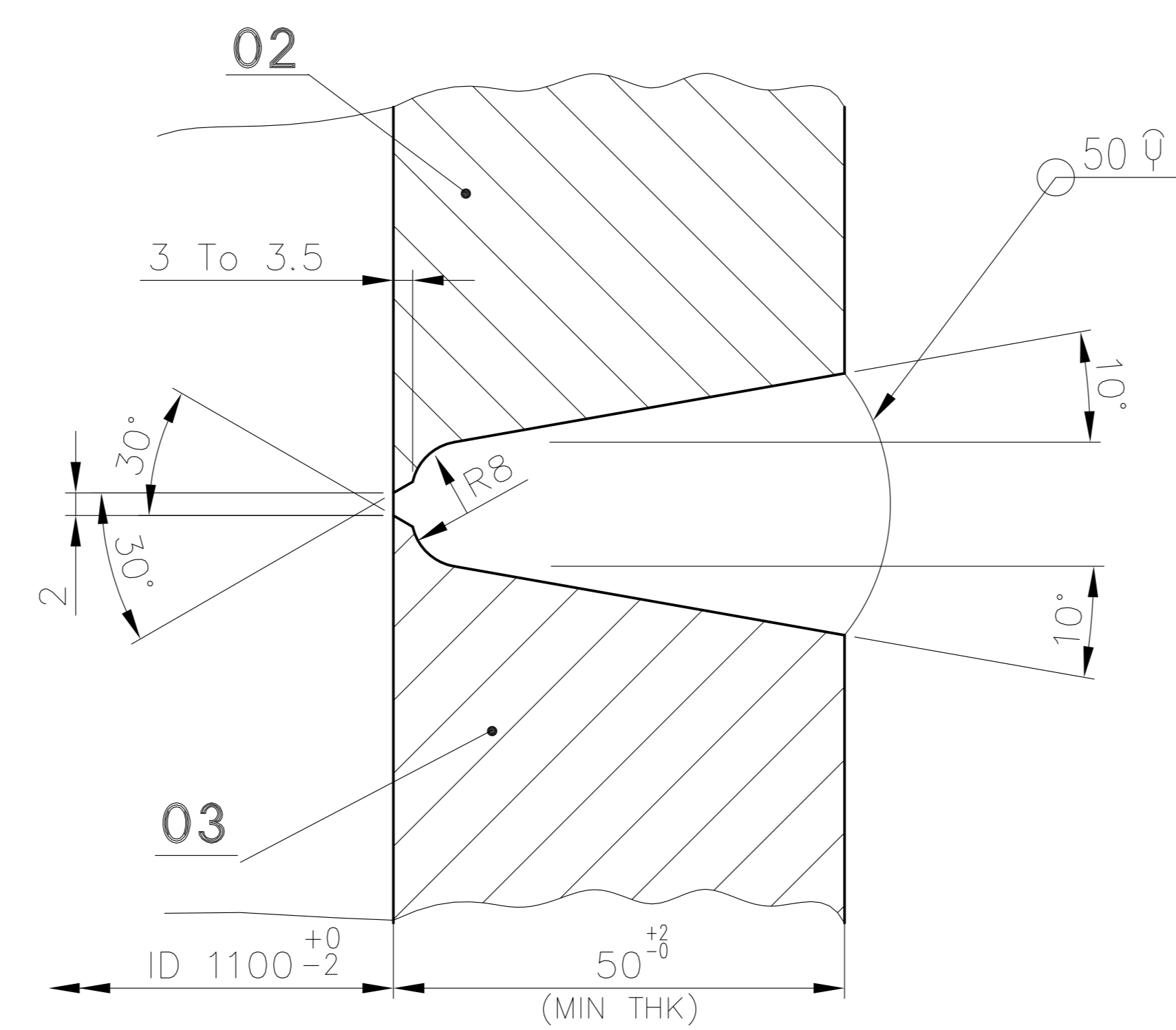
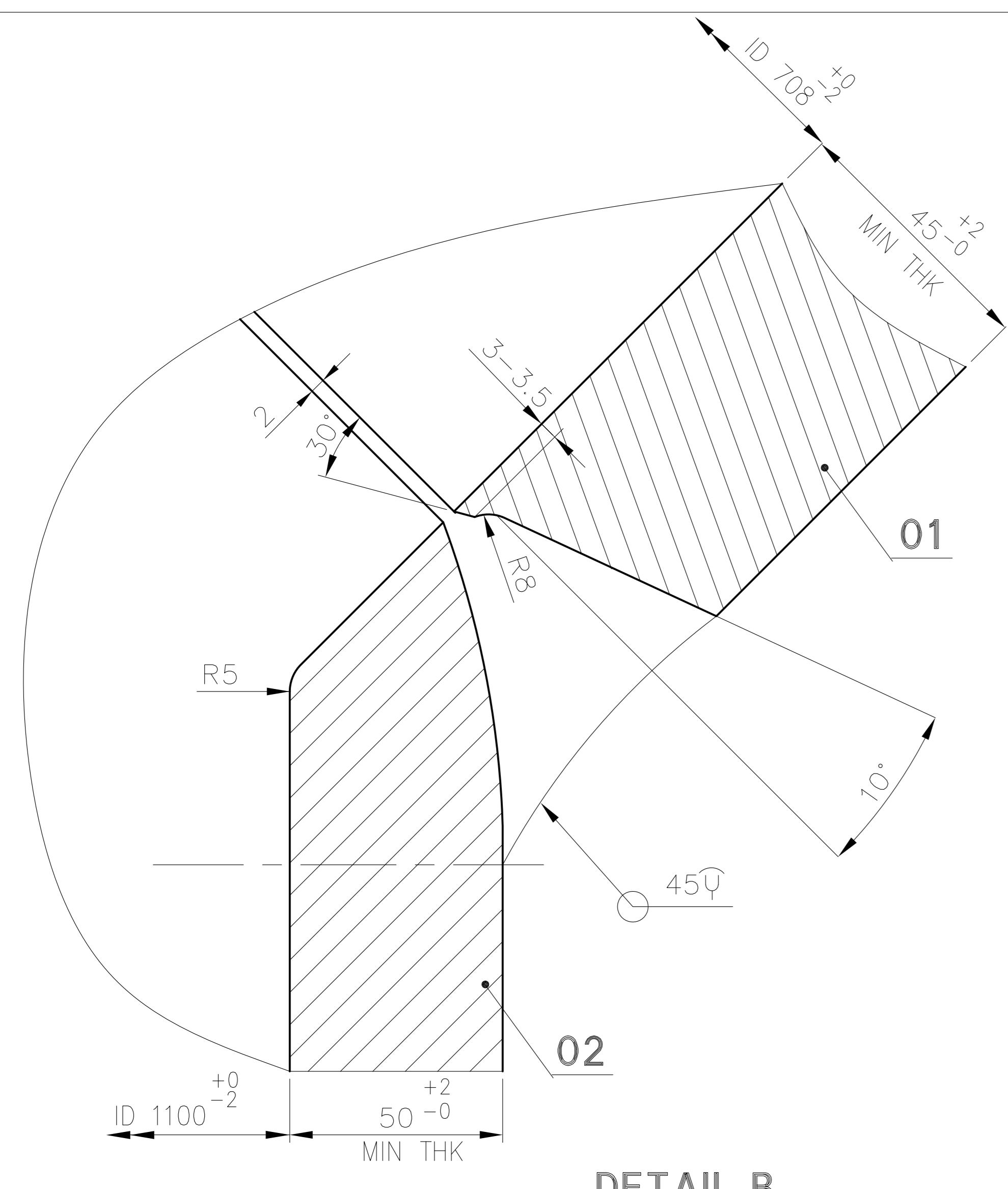
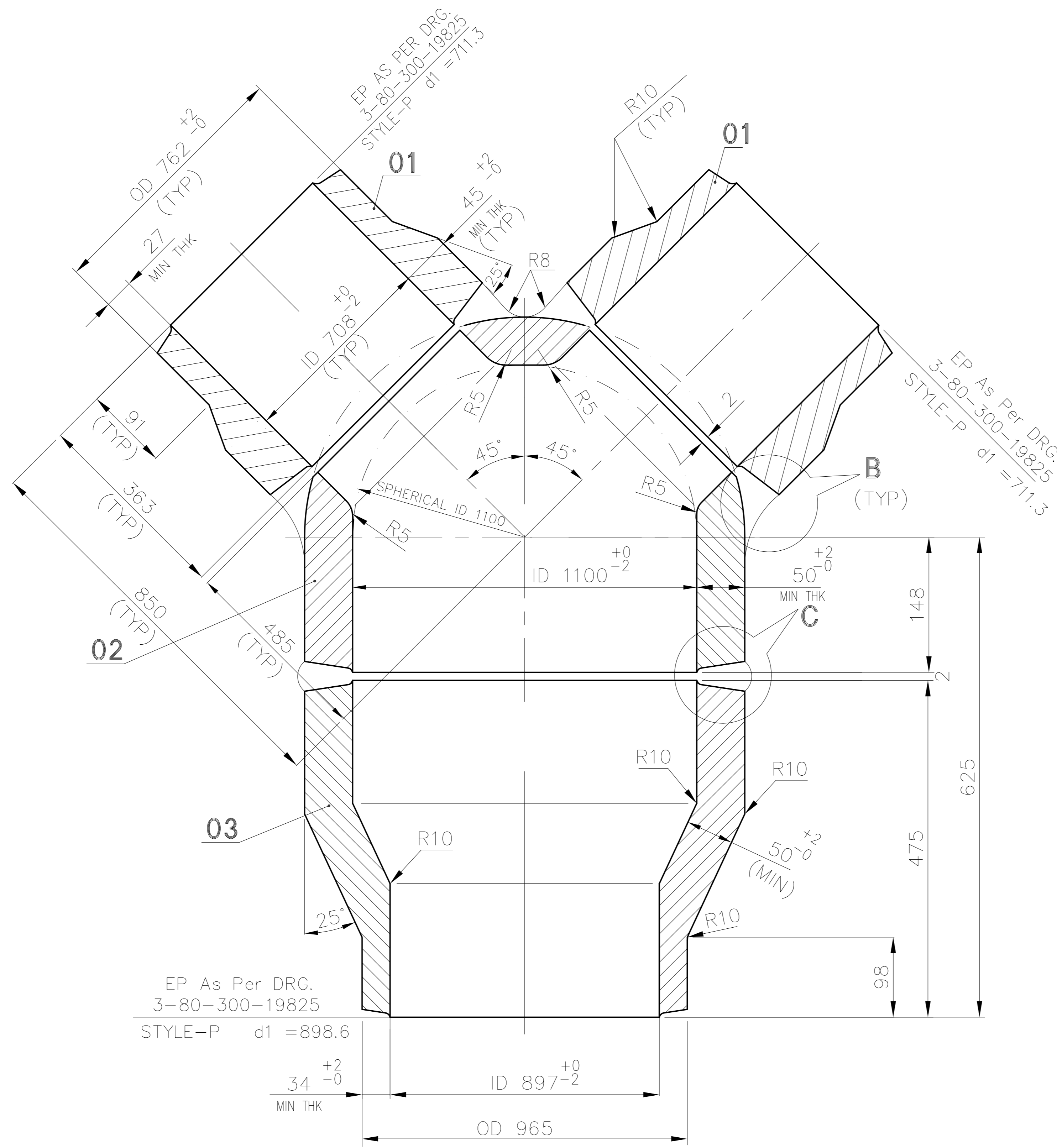
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2-80-320-12694

ALL DIMENSIONS ARE IN MILLIMETRES

**NOTES :-**

- 01. DESIGN PRESSURE : 75 Kg/Cm<sup>2</sup> (g)
- 02. DESIGN TEMPERATURE : 375° C
- 03. FOLLOW TDG:108.
- 04. PIPE SA106GRC(A) CAN ALSO BE USED IN PLACE OF SA105(A).
- 05. FINISHED STOCK CODE FOR THIS ITEM IS 925055010000



VAR NO	ITEM NO	DESCRIPTION	DRAWING NO	MATERIAL CODE	A	UNIT WEIGHT
				MATERIAL SPECN	C	QUANTITY
	03	OUTLET FORGING ID1100 x THK50 MIN / ID897 x THK 34 MIN	2-80-320-12694	SA 105	A	568   792 1
	02	BODY FORGING ID 1100 x THK 50 MIN	2-80-320-12694	SA 105	A	717   300 1
	01	INLET FORGING ID 708 x THK 45 MIN	2-80-320-12694	SA 105	A	265   100 2

JOB NO.		REL NO.		DATE	
TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT					

BHARAT HEAVY ELECTRICALS LTD.,  
PIPING CENTRE,  
CHENNAI 600 017

DEPT.	GRADE OF UN TOL DIM	SCALE	WEIGHT (Kg)	BHEL PO REF. NO.	ITEM No.
CODE	C/M/F	N.T.S.	~1820		
TITLE			CARD CODE	MSE DRAWING NO.	REV
FABRICATED Y-PIECE (OD965x34/OD762x27)			U 01	2-80-320-12694	01

REV	DATE	ALTD : DHINESH
01	31.12.13	APPD : S.R.M.
NOTE 5 ADDED		
REVISION IS MARKED AS		

05-228/C

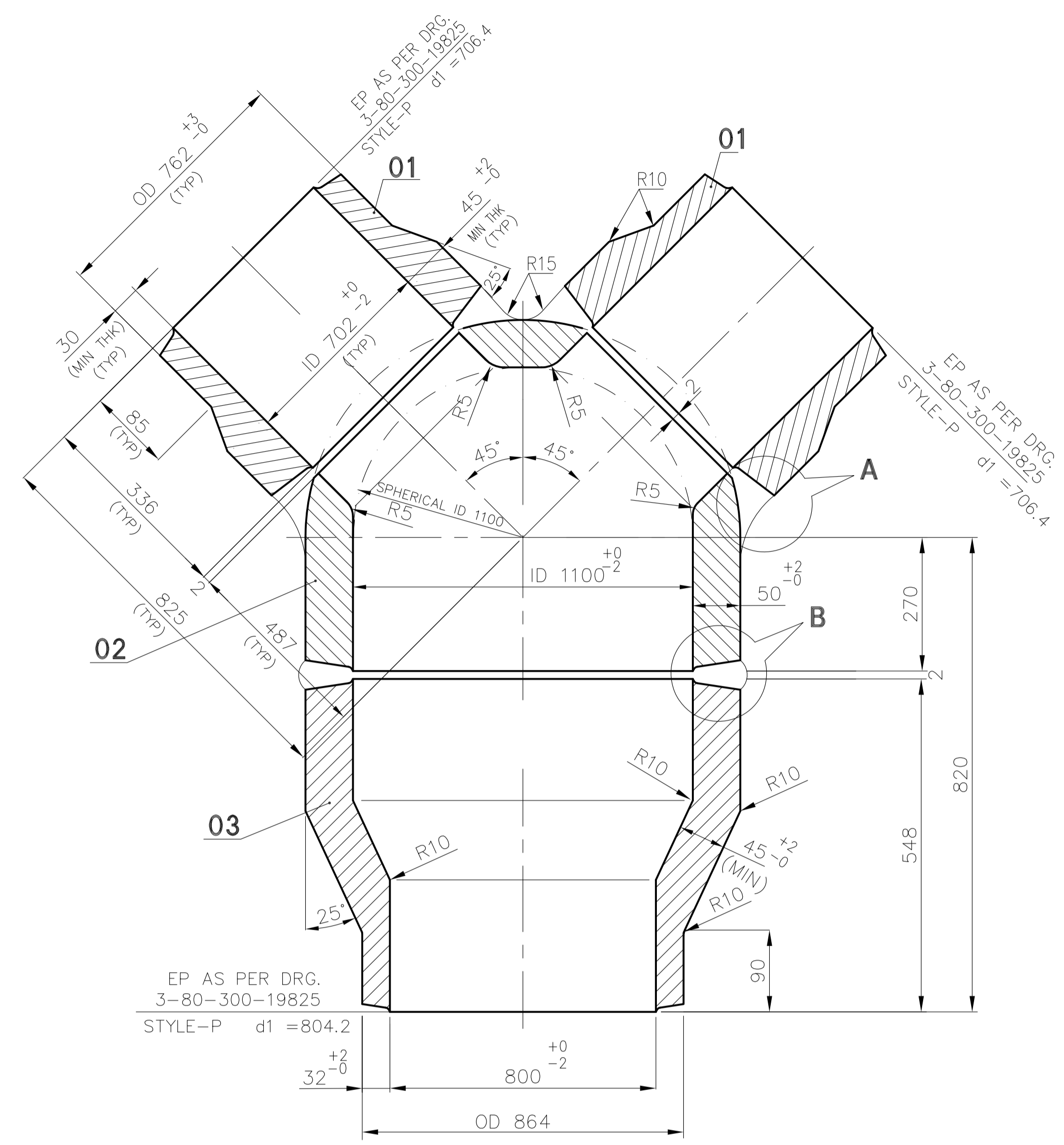
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2-80-320-12813

DRAWING No.

FIRST ANGLE PROJECTION (ALL DIMENSIONS IN MILLIMETRES)

ALL DIMENSIONS ARE IN MILLIMETRES



**NOTES :-**

- 01. DESIGN PRESSURE : 75 Kg/Sq.Cm (g)
- 02. DESIGN TEMPERATURE : 380° C
- 03. FOLLOW TDG : 108 LATEST
- 04. PIPE SA106GRC(A) CAN ALSO BE USED IN PLACE OF SA105(A).
- 05. THE FINISHED MATERIAL SPECIFICATION WILL BE SA105 (A) UNDER MATERIAL CODE: 92 505 695 0000

VAR NO	ITEM NO	DESCRIPTION	DRAWING NO	MATERIAL CODE	MATERIAL SPECN	UNIT WEIGHT	QUANTITY
	03	OUTLET FORGING ID 1100 x THK50 MIN / ID 800 x 32 THK	2-80-320-12813	SA 105	A	627.000	1
	02	BODY FORGING ID1100 x THK50 MIN	2-80-320-12813	SA 105	A	900.000	1
	01	INLET FORGING ID702 x THK45 MIN	2-80-320-12813	SA 105	A	263.000	2

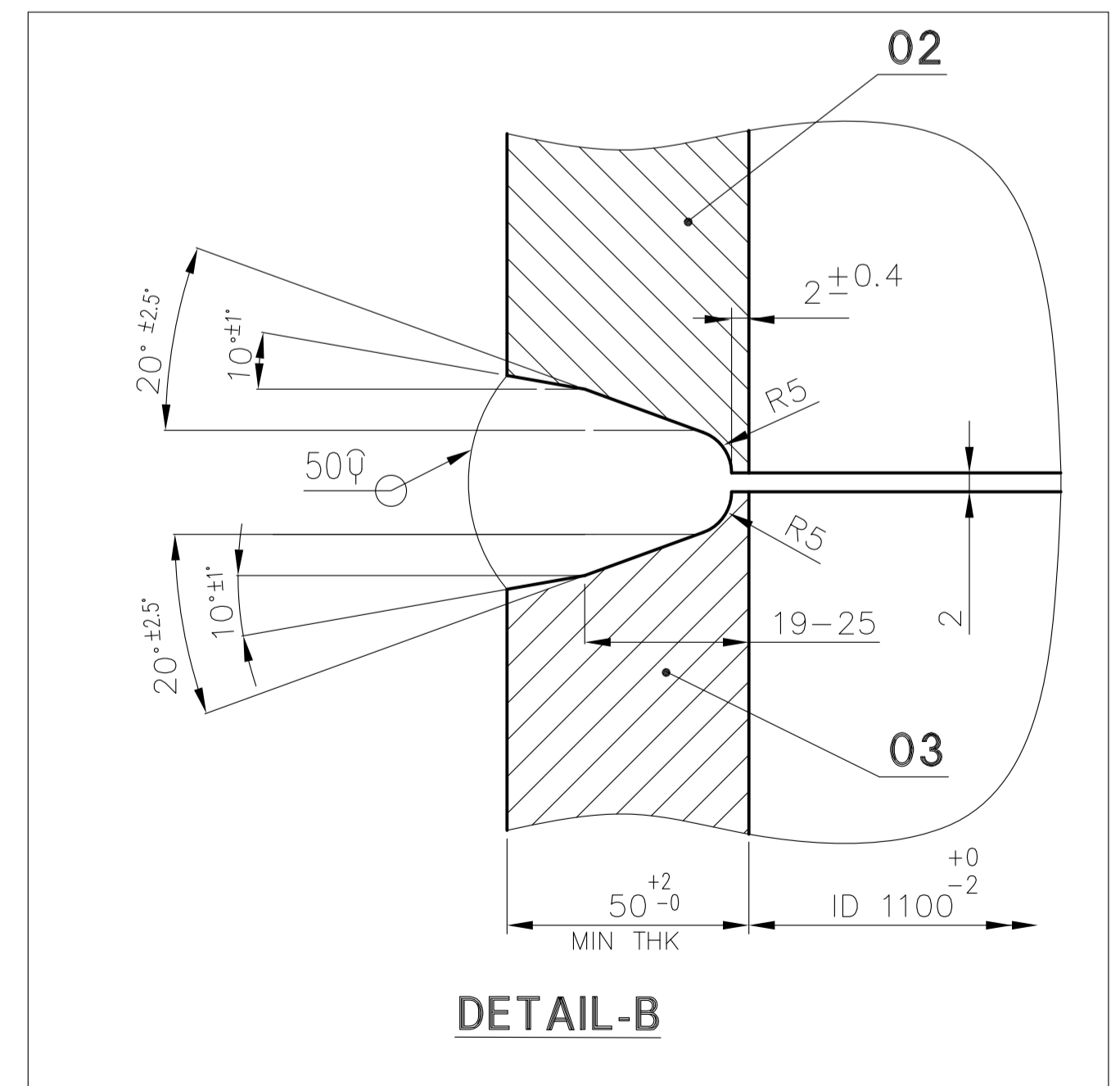
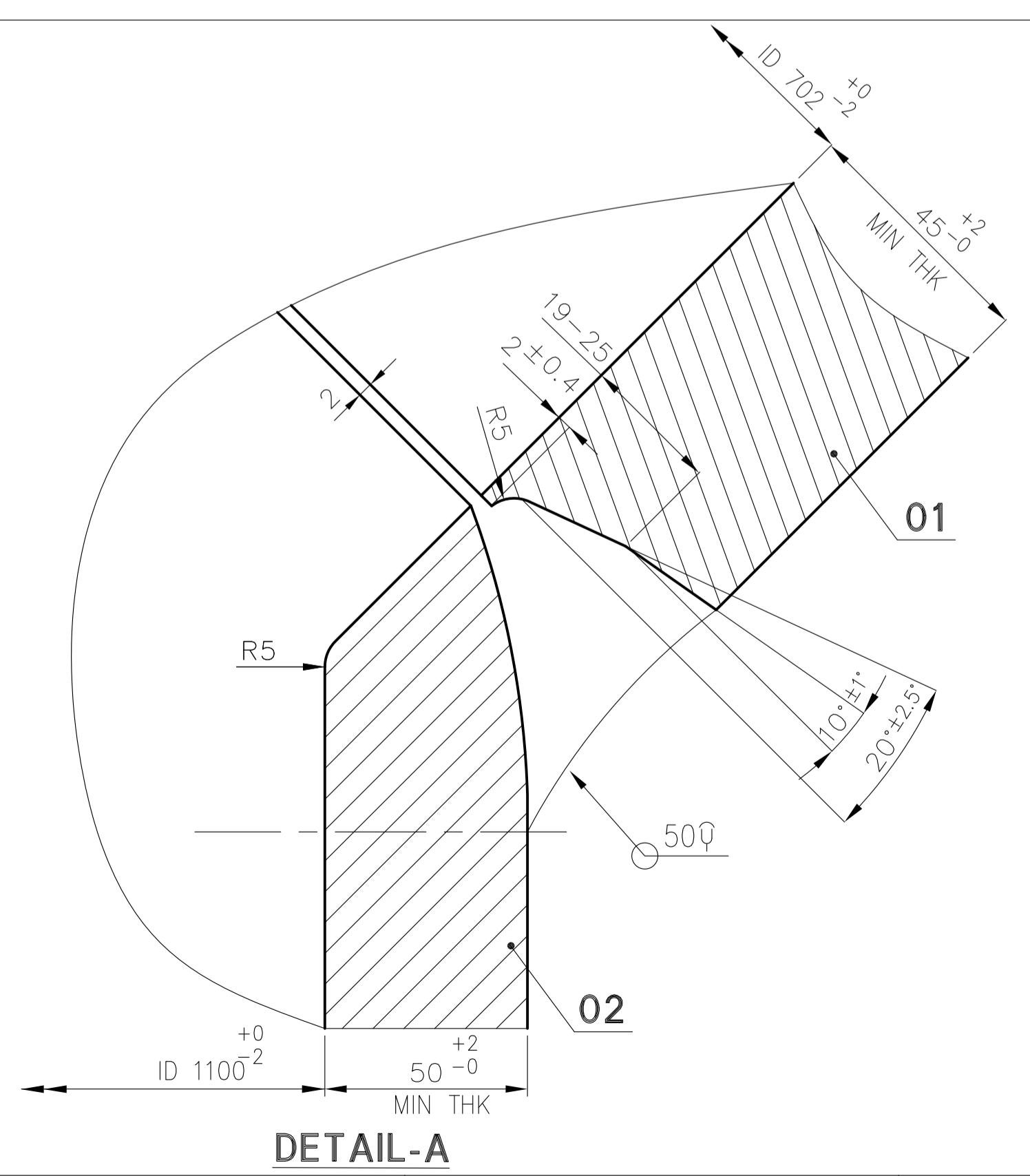
JOB NO.	REL NO.	DATE
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TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT

DRN	NAME	SIGN	DATE	NO OF ITEMS
CHD	KONDAPA		03.01.14	
APPD	R.SESHAGIRI		03.01.14	

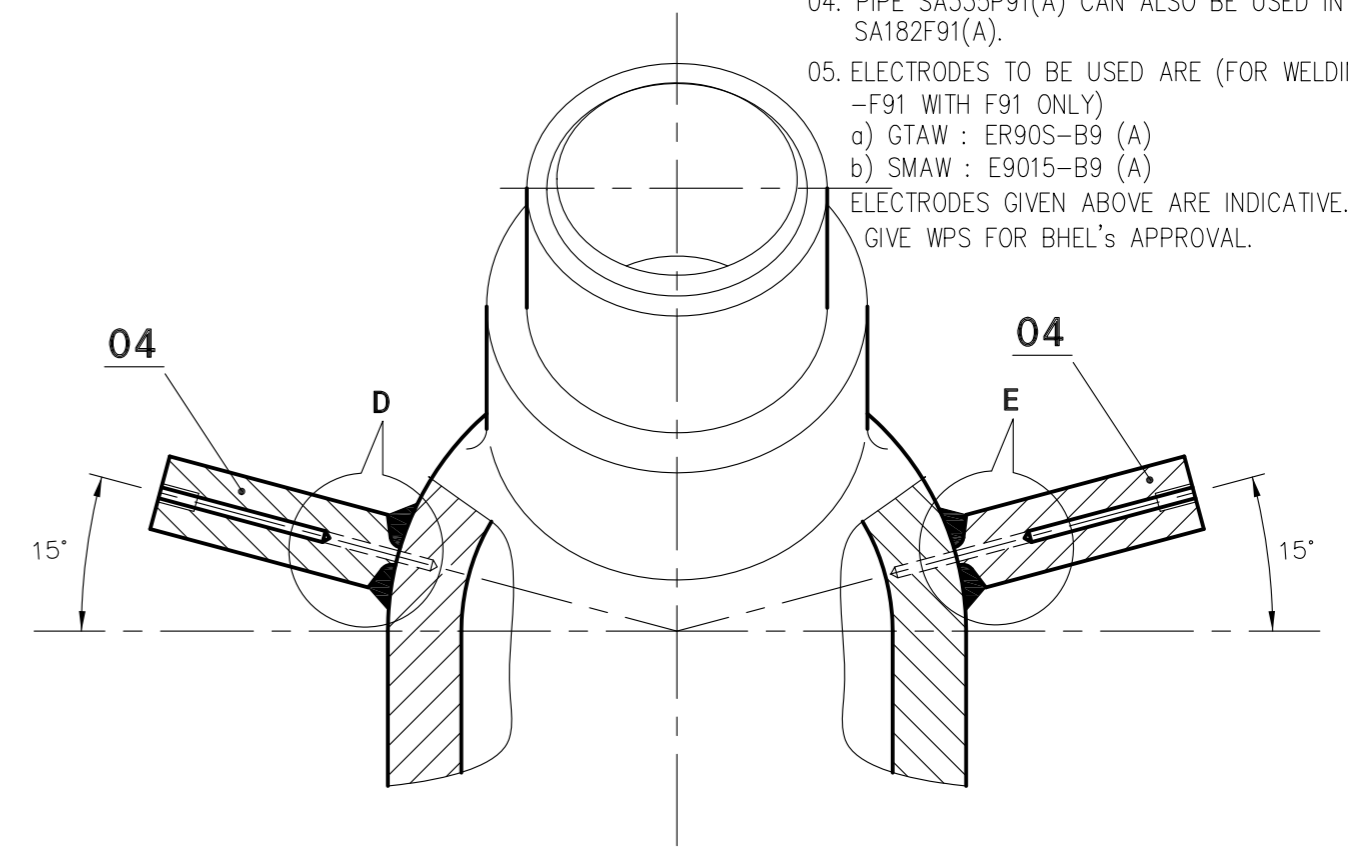
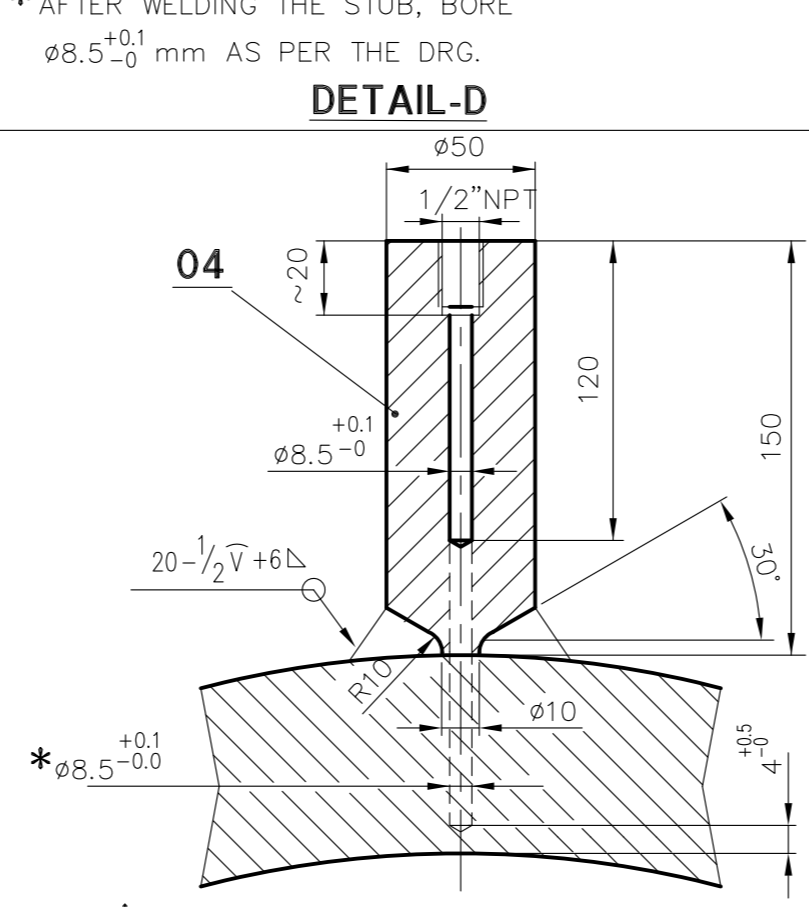
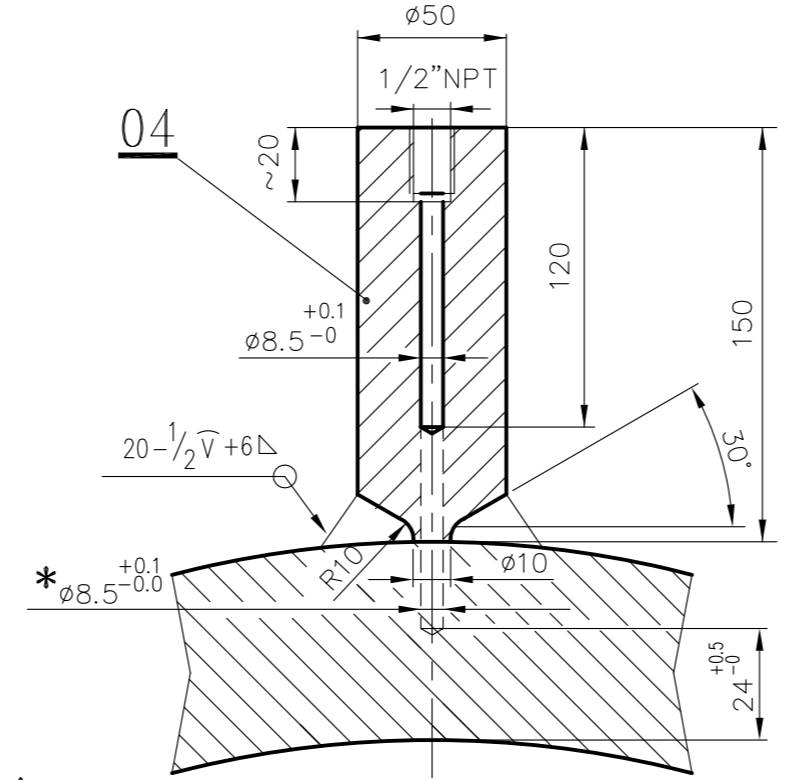
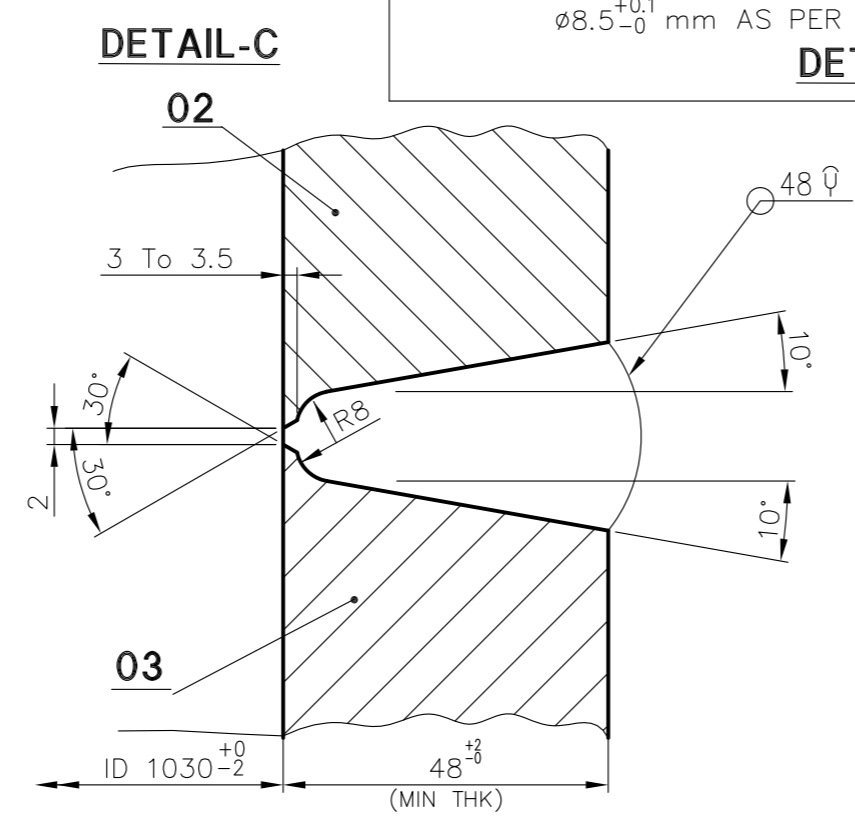
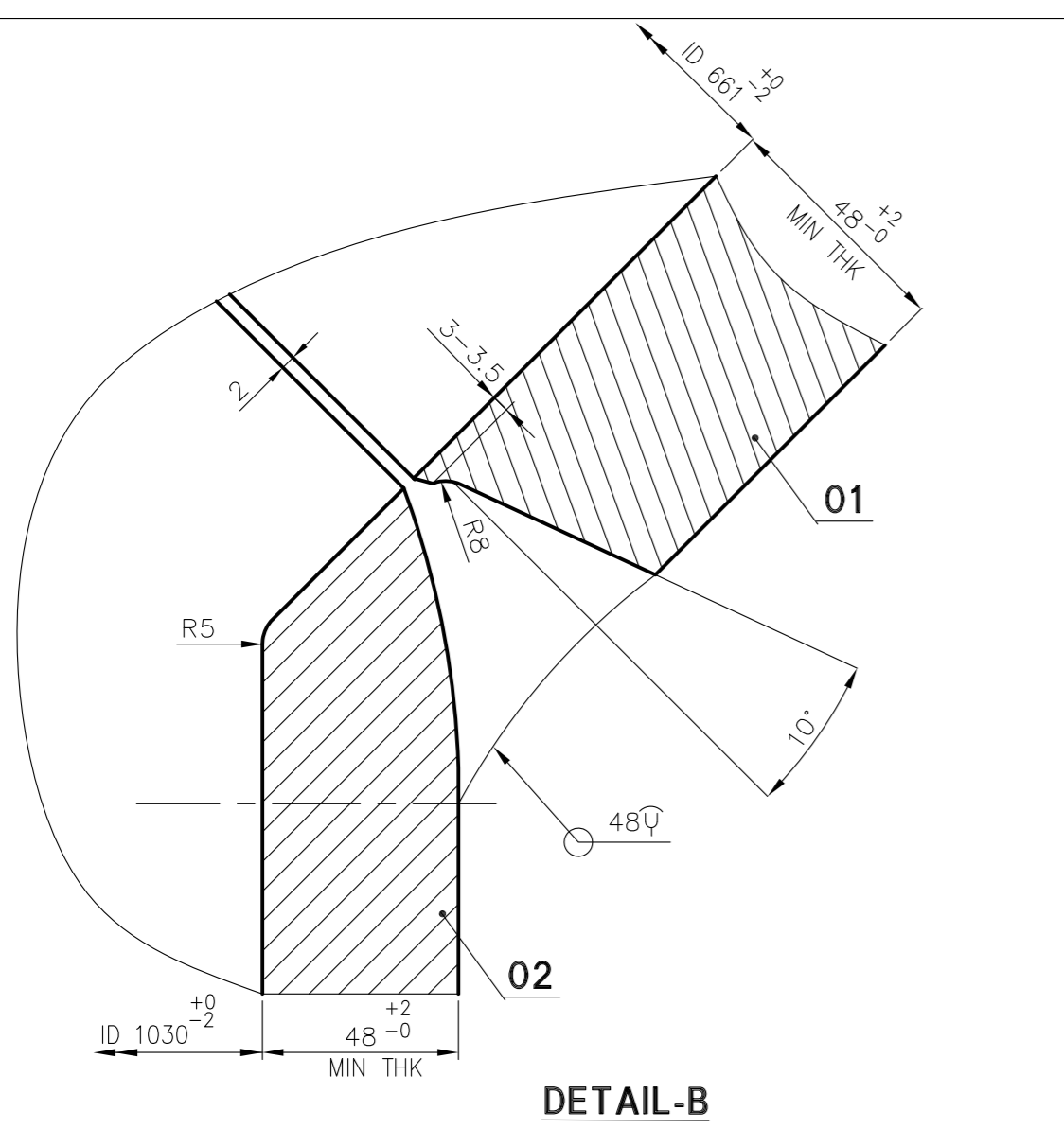
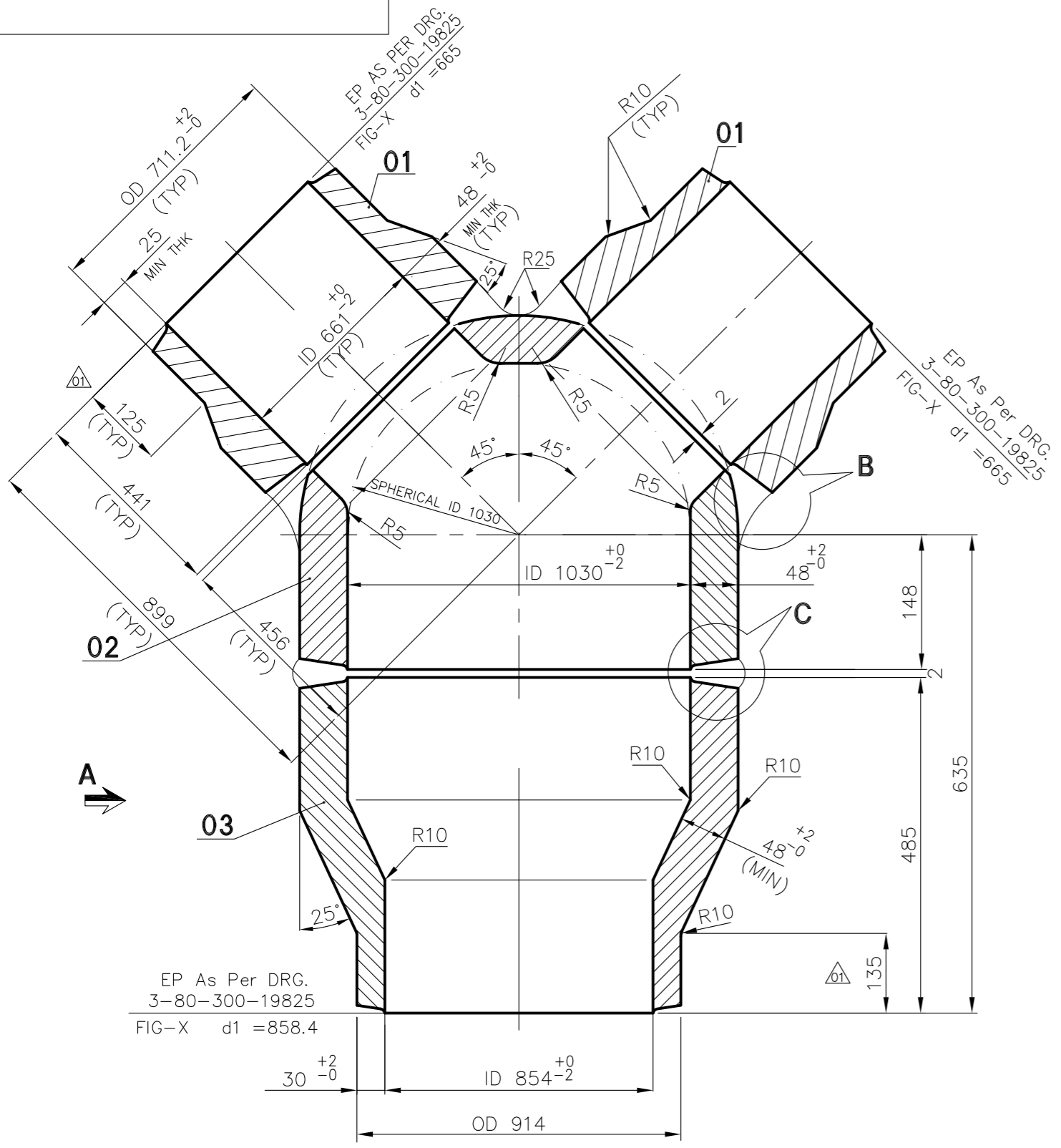
DEPT.	GRADE OF UN TOL DIM	SCALE	WEIGHT (Kg)	BHEL PO REF. NO.	ITEM No.
CODE	C/M/F	N.T.S.	2053		
TITLE			CARD CODE	MSE DRAWING NO.	REV
CRH Y-PIECE (OD864X32/OD762X30)SA105			U 01	2-80-320-12813	00

REV 02	DATE	ALTD :
		APPD :
REV 01	DATE	ALTD:
ZONE		APPD:



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2-80-999-99494



- ALL DIMENSIONS ARE IN MILLIMETRES
- NOTES :-**
- DESIGN PRESSURE : 48.4 Kg/Cm<sup>2</sup> (g)
  - DESIGN TEMPERATURE : 568° C
  - FOLLOW TDG:108.
  - PIPE SA335P91(A) CAN ALSO BE USED IN PLACE OF SA182F91(A).
  - ELECTRODES TO BE USED ARE (FOR WELDING OF -F91 WITH F91 ONLY)
    - GTAW : ER90S-B9 (A)
    - SMAW : E9015-B9 (A)
 ELECTRODES GIVEN ABOVE ARE INDICATIVE. VENDOR TO GIVE WPS FOR BHEL'S APPROVAL.

VAR NO	ITEM NO	DESCRIPTION	DRAWING NO	MATERIAL CODE	UNIT WEIGHT
	04	TEMP. STUB. Ø50 L=150	2-80-999-99494	SA 182 F22 CL3	4 000
	03	OUTLET FORGING ID1030 x THK48 MIN / ID854 x 30 THK	2-80-999-99494	SA 182 F91	540 000
	02	BODY FORGING ID1030 x THK48.0 MIN	2-80-999-99494	SA 182 F91	1222 000
	01	INLET FORGING ID 661 x THK 48.0 MIN	2-80-999-99494	SA 182 F91	325 000

JOB NO.	REL NO.	DATE

**STANDARD**

TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT

	BHARAT HEAVY ELECTRICALS LTD., PIPING CENTRE, CHENNAI 600 017		DRN	NAME	SIGN	DATE	NO OF
	CHD	R.ANANTH		R.ANANTH		06.02.08	ITEMS
	APPD	S.JAYAKUMAR		S.JAYAKUMAR		06.02.08	

DEPT.	GRADE OF UN TOL. DIM	SCALE	WEIGHT (Kg)	BHEL PO REF. NO.	ITEM No.
	C/M/F	N.T.S.	2420.000	2-80-310-08123	
TITLE			CARD CODE	MSE DRAWING NO.	REV
Y-PIECE (OD914x30/OD711.2x25)			U 01	2-80-999-99494	01

REV	DATE	ALTD : R.SESHAGIRI
01	07.04.08	APPD : S.JAYAKUMAR
STRAIGHT LENGTH NEAR WELD END REVISED FOR INLET & OUTLET FORGINGS.		
ALL REVISIONS INDICATED AS Δ		



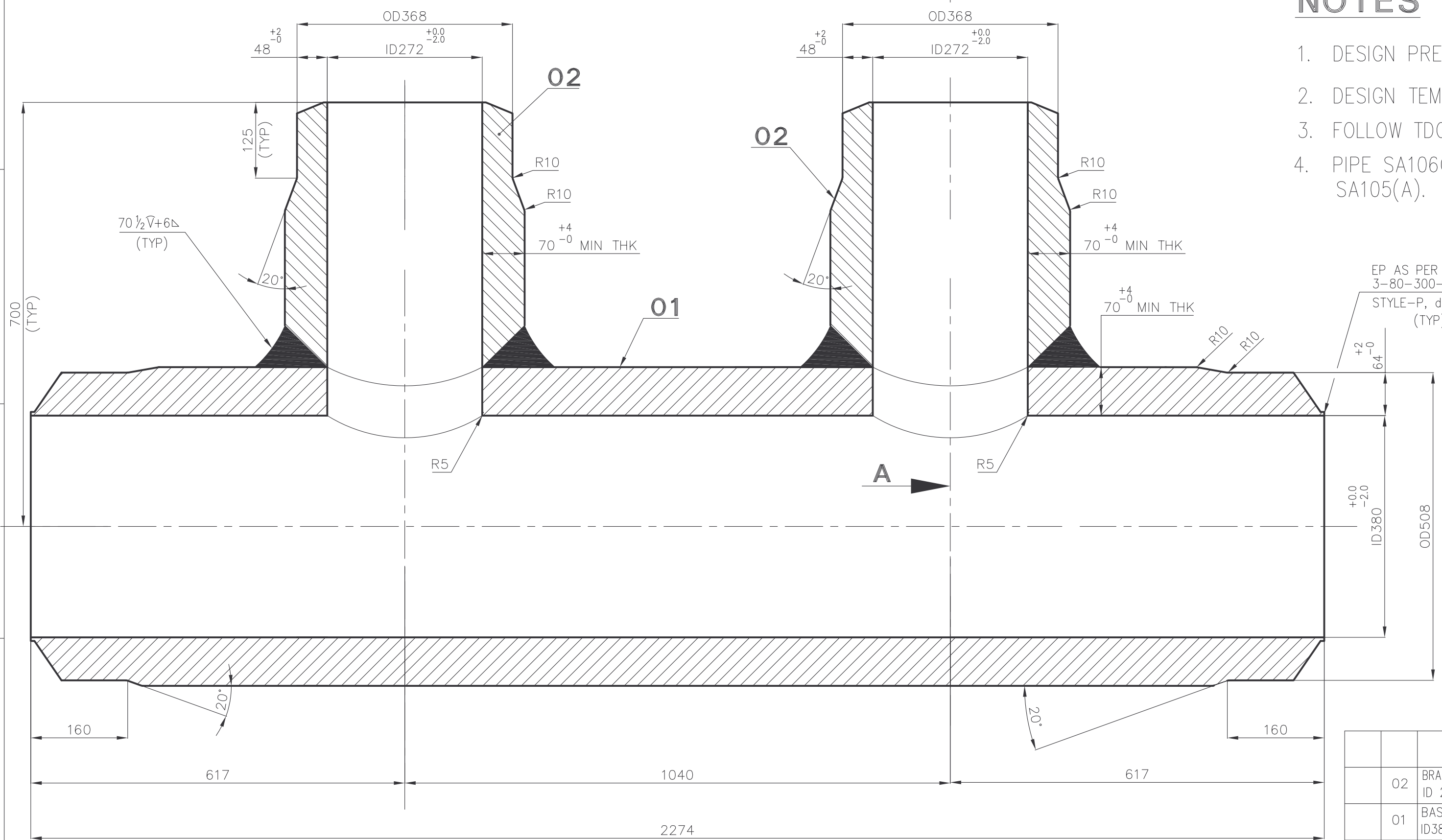
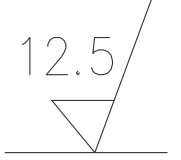
86766-666-08-2

DRAWING No.

ALL DIMENSIONS ARE IN MILLIMETRES

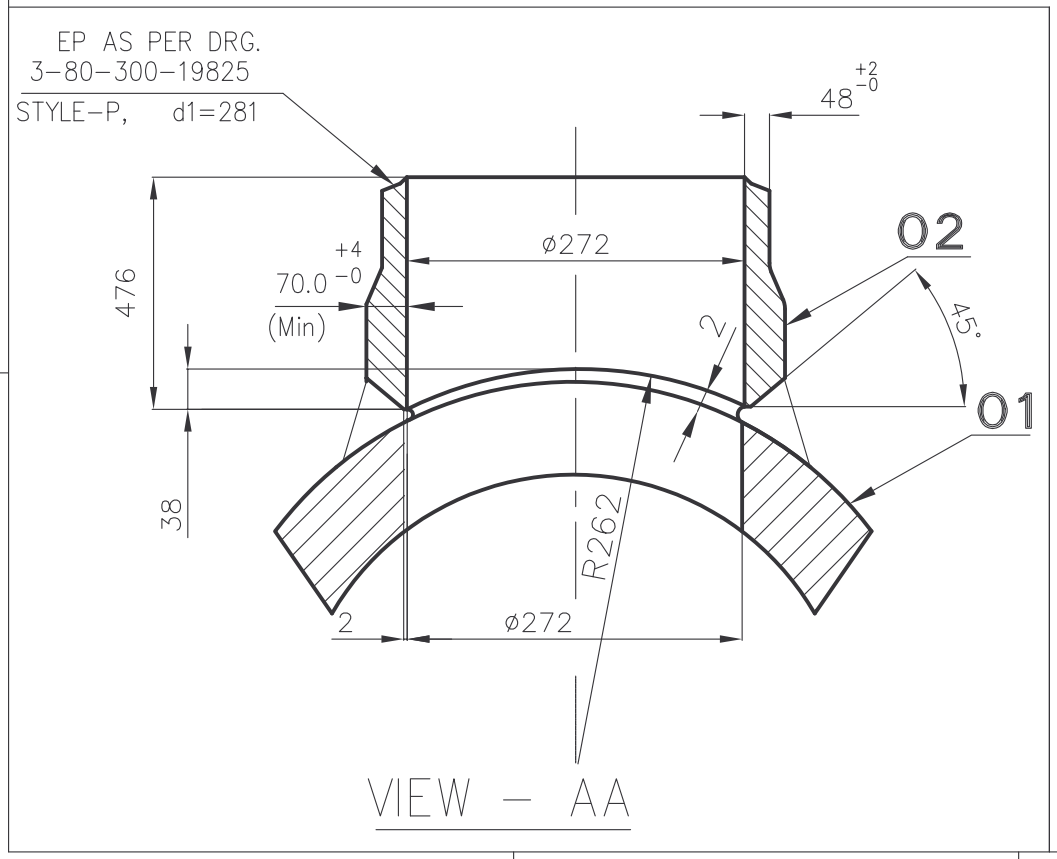
**NOTES :-**

- DESIGN PRESSURE : 320.0 Kg/Sq.Cm (g)
- DESIGN TEMPERATURE : 260° C
- FOLLOW TDG : 108
- PIPE SA106GRC(A) CAN ALSO BE USED IN PLACE OF SA105(A).



EP AS PER DRG NO  
3-80-300-19825  
STYLE-P, d1=392  
(TYP)

VAR NO	ITEM NO	DESCRIPTION	DRAWING NO	MATERIAL CODE	MATERIAL SPECN	UNIT WEIGHT	QUANTITY
	02	BRANCH NOZZLE L=476 ID 272 x THK 70 min	2-80-999-99498	SA105	A	295	180
	01	BASE PIPE L=2274 ID380 x THK 70 min	2-80-999-99498	SA 105	A	1786	600



**STANDARD**

TYPE OF PRODUCT  
OR NAME OF  
CUSTOMER/PROJECT

	BHARAT HEAVY ELECTRICALS LTD., PIPING CENTRE, CHENNAI 600 017	DRN	NAME UBAITHULLAH	SIGN	DATE 07.02.08	NO OF ITEMS
		CHD	R. ANANTH		07.02.08	
		APPD	S. JAYAKUMAR		07.02.08	

DEPT.	GRADE OF UN TOL. DIM	SCALE	WEIGHT (Kg)	REF TO ASSY / OLD DRG	ITEM No.
	C/M/F	N. T. S.	2081.780	2-80-423-07845/00	

TITLE	CARD CODE	DRAWING No.	REV
<b>HEADER L-2274</b> OD508x64/OD368x48	U 01	<b>2-80-999-99498</b>	<b>00</b>

REV	DATE	ALTD
		APPD
ZONE		

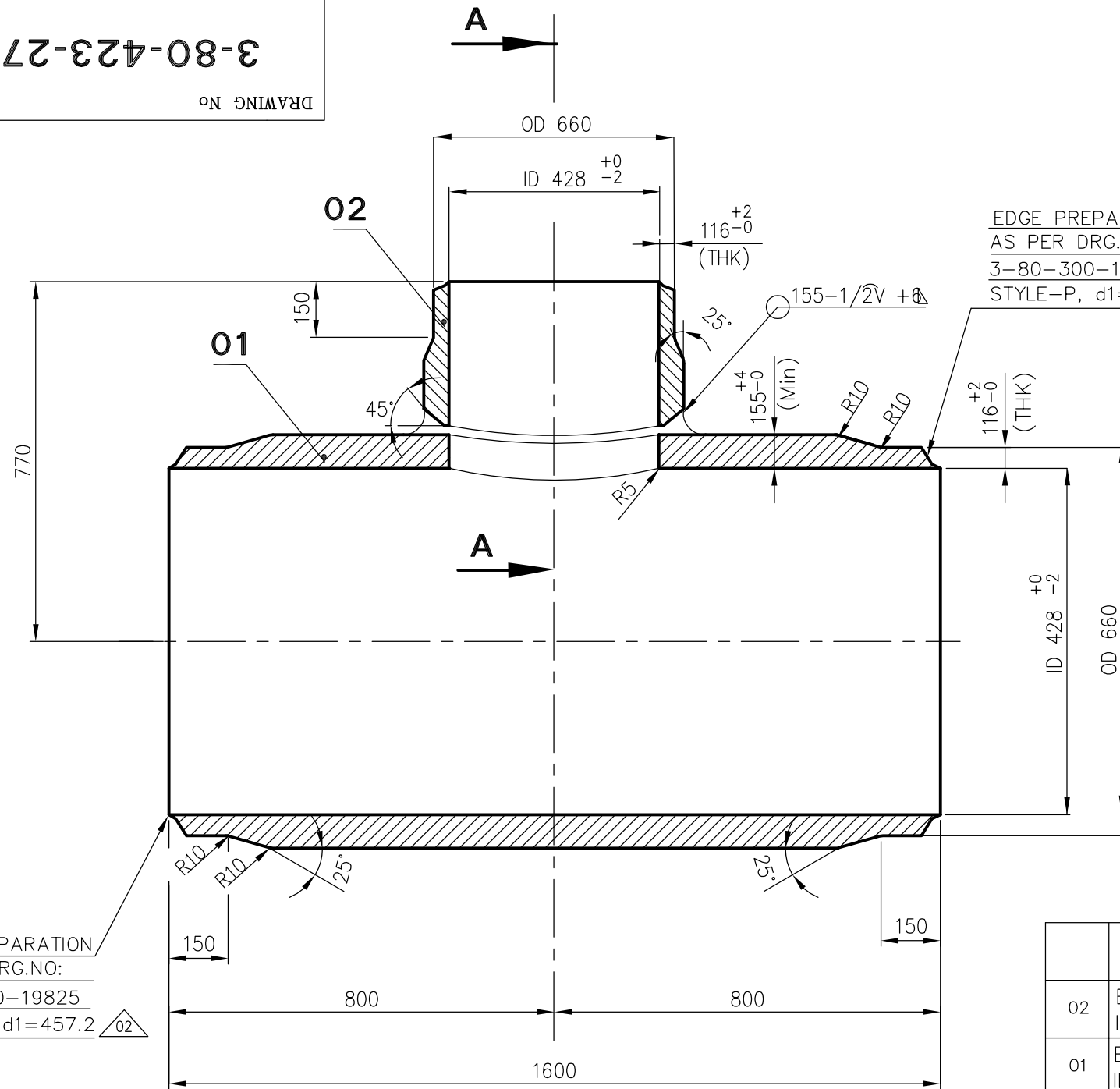
05-228/C

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3-80-423-27270

DRAWING No



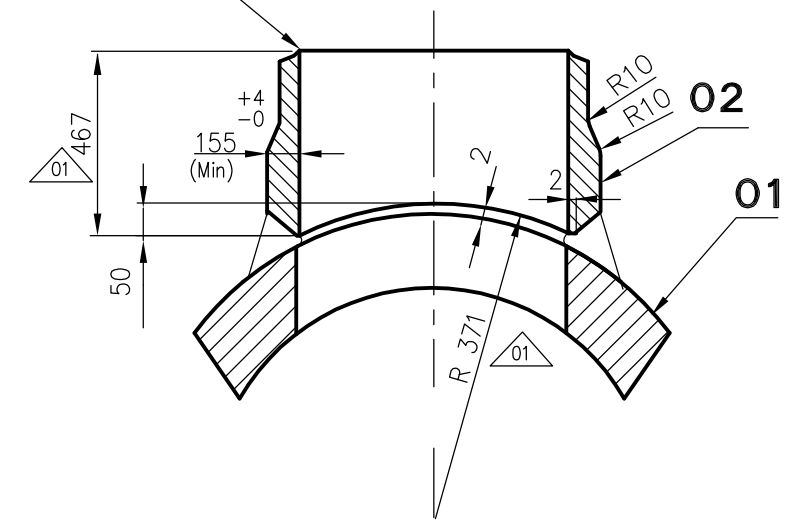
**NOTES :-**

- DESIGN PRESSURE : 480 Kg/Sq.Cm (g)
- DESIGN TEMPERATURE : 200° C
- FOLLOW TDG : 108 LATEST
- PIPE SA106GRC(A) CAN ALSO BE USED IN PLACE OF SA105(A)
- THE STOCK CODE FOR THE FINISHED EQ. TEE:925058680000

12.5

EDGE PREPARATION  
AS PER DRG.NO:  
3-80-300-19825  
STYLE-P, d1=457.2

EDGE PREPARATION  
AS PER DRG.NO:  
3-80-300-19825  
STYLE-P, d1=457.2



**SECTION-AA**

EDGE PREPARATION  
AS PER DRG.NO:  
3-80-300-19825  
STYLE-P, d1=457.2

02	BRANCH NOZZLE L=333 ID 428 X Thk 155 Min	3-80-423-27270	SA 105	A	735,044 1
01	BASE PIPE L = 1600 ID 428 X Thk 155 Min	3-80-423-27270	SA 105	A	3563,851 1
ITEM NO.	DESCRIPTION	DRAWING NO.	MATERIAL CODE	UNIT WT.	
			MATERIAL SPEC.	QTY.	

TYPE OF PRODUCT  
OR NAME OF  
CUSTOMER/PROJECT

	BHARAT HEAVY ELECTRICALS LTD., PIPING CENTRE, CHENNAI 600 017	DRN	NAME	SIGN	DATE	NO OF ITEMS
		CHD	T.RAJASEKAR	-SD.-	10.05.10	
		APPD	LALIT	-SD.-	10.05.10	
			C.SARAVANAN	-SD.-	10.05.10	

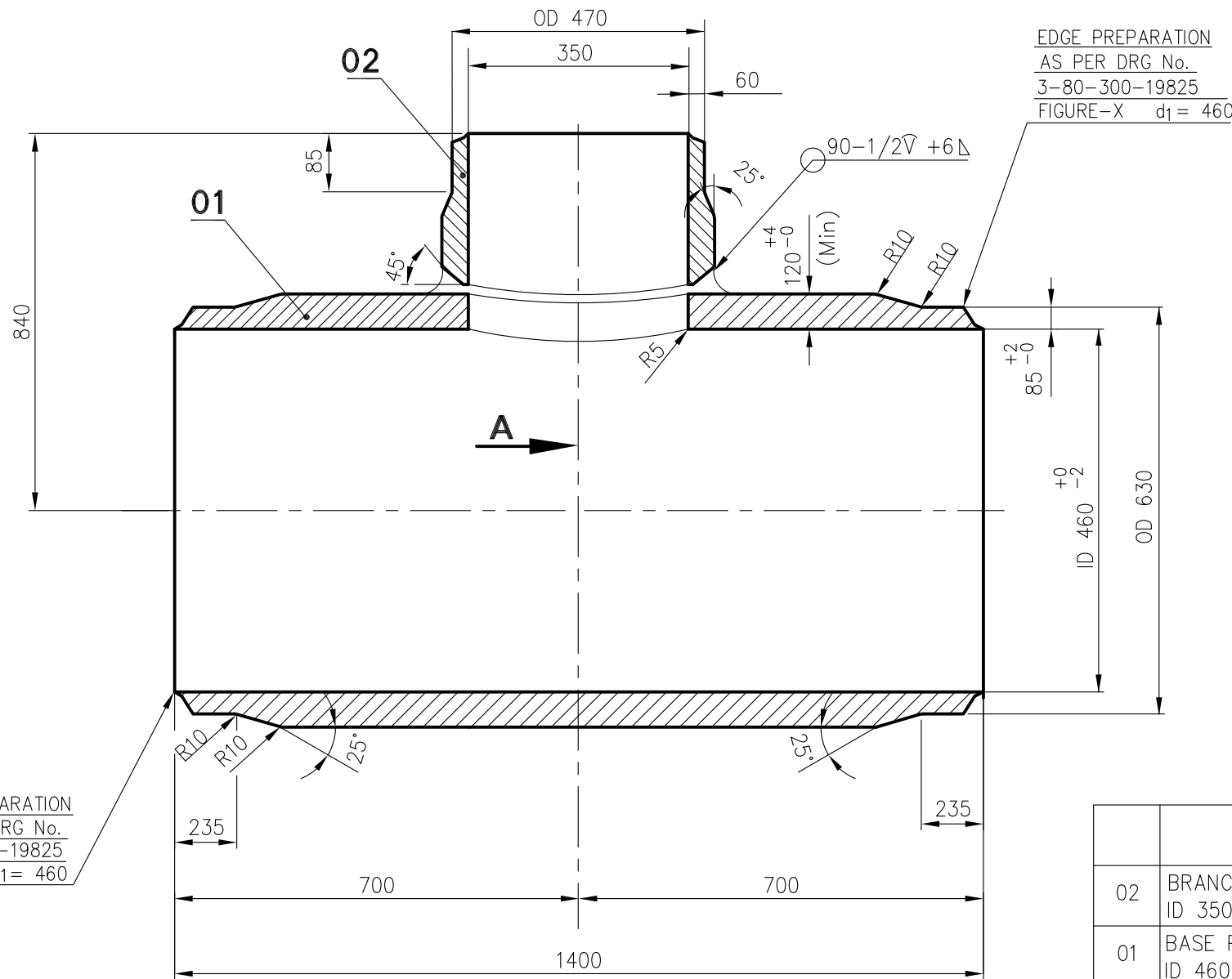
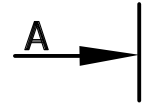
REV 02	DATE 19.02.11	ALTD: LALIT -SD.- APPD: CS -SD.-	REV 01	DATE 21.07.10	ALTD LALIT -SD.- APPD C.SARAVANAN-SD.-
ZONE	d1 VALUES REVISED		ZONE	RADIUS OF RUN PIPE REVISED REVISION MARKED AS 01	
	REVISION MARKED AS 02				

DEPT.	GRADE OF UN TOL DIM	SCALE	WEIGHT (Kg).	BHEL PO REF.NO:	ITEM No.
CODE	C/M/F	N.T.S.	4300		
TITLE	FABRICATED EQUAL TEE (OD660x116) SA105		CARD CODE	DRAWING No.	REV
			U 01	3-80-423-27270	02

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3-80-301-27185

DRAWING No

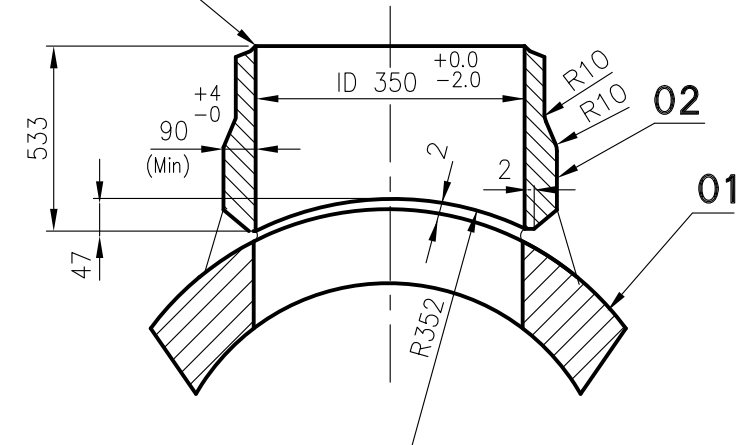


**NOTES :-**

1. DESIGN PRESSURE : 272 Kg/Sq.Cm (g)
2. DESIGN TEMPERATURE : 573° C
3. FOLLOW TDG : 108 LATEST
4. ELECTRODES TO BE USED ARE,
  - a) GTAW : ER90S-B9 (A)
  - b) SMAW : E9015-B9 (A)
 ELECTRODES GIVEN ABOVE ARE INDICATIVE. VENDOR TO GIVE WPS FOR BHEL's APPROVAL.
5. PIPE SA335P91(A) CAN ALSO BE USED IN PLACE OF SA182F91(A).
6. THE STOCK CODE FOR FINISHED UEQ. TEE: 92508810000



EDGE PREPARATION  
AS PER DRG No.  
3-80-300-19825  
FIGURE-X d1= 350



**SECTION-AA**

EDGE PREPARATION  
AS PER DRG No.  
3-80-300-19825  
FIGURE-X d1= 460

ITEM NO.	DESCRIPTION	DRAWING NO.	ITEM NO.	MATERIAL CODE	A	UNIT WT.
VAR NO.	MATERIAL SPEC.	C			QTY.	
02	BRANCH NOZZLE L=531 ID 350 x Thk 90 Min	3-80-301-27185		SA 182 F91	A	518,310 1
01	BASE PIPE L = 1400 ID 460 x Thk 120 Min	3-80-301-27185		SA 182 F91	A	2401,800 1

TYPE OF PRODUCT  
OR NAME OF  
CUSTOMER/PROJECT



BHARAT HEAVY ELECTRICALS LTD.,  
PIPING CENTRE,  
CHENNAI 600 017

NAME	SIGN	DATE	NO OF ITEMS
DRN LALIT		07.05.10	
CHD C.SARAVANAN		07.05.10	
APPD C.SARAVANAN		07.05.10	

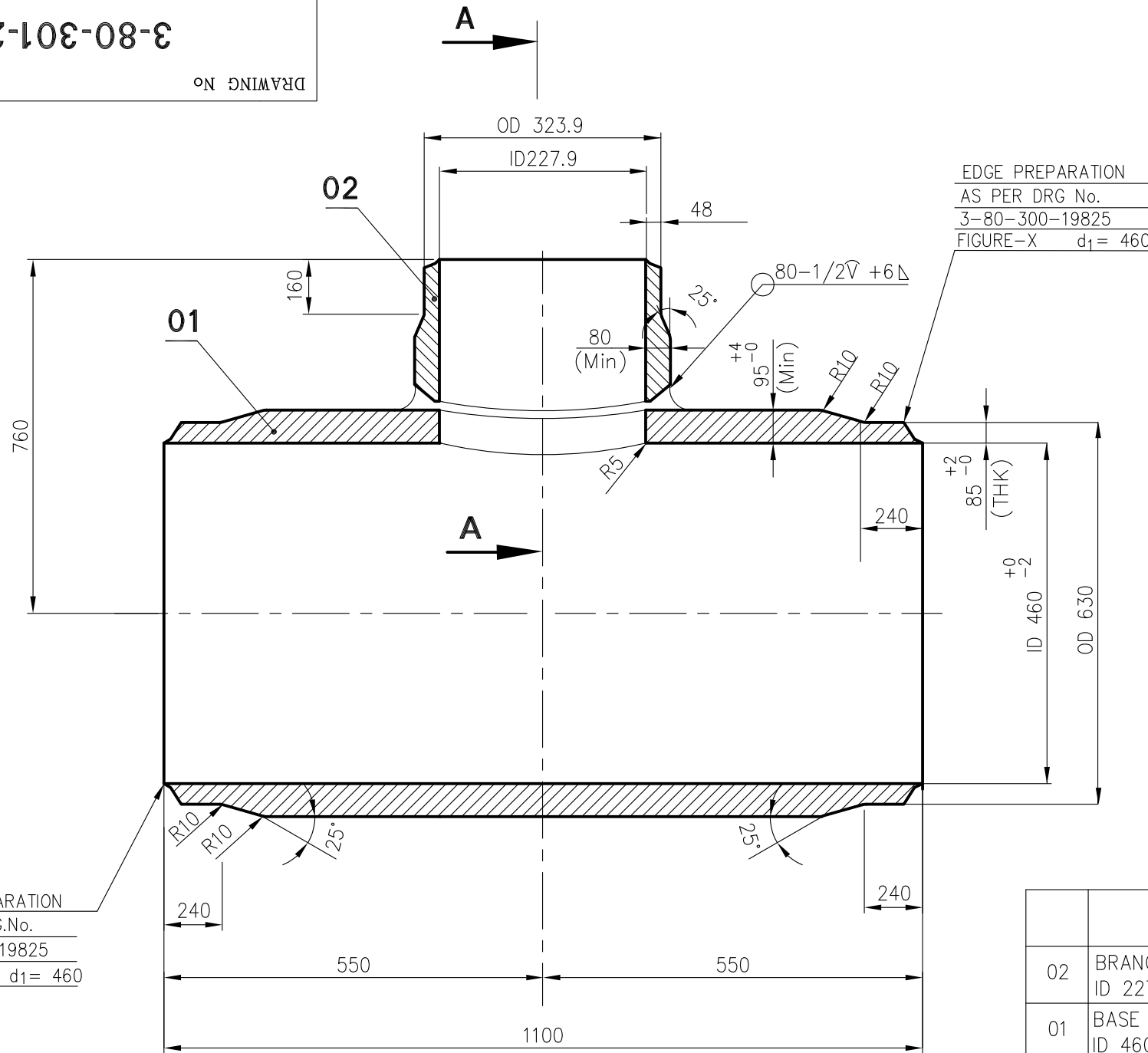
REV	DATE	ALTD	REV	DATE	ALTD
02		APPD	01	14.08.2012	APPD S.PANDA -SD.-
ZONE			ZONE		DESIGN PRESSURE ALTERED REVISION INDICATED AS $\triangle 01$

DEPT.	GRADE OF UN TOL DIM	SCALE	WEIGHT (Kg).	BHEL PO REF.NO:	ITEM No.
	C/M/F	N.T.S.	2921.000		
TITLE <b>FABRICATED UNEQUAL TEE (ID460x85/ID350x60) (SA182F91)</b>			CARD CODE U 01	DRAWING No. <b>3-80-301-27185</b>	REV <b>01</b>

3-80-301-27186

DRAWING No

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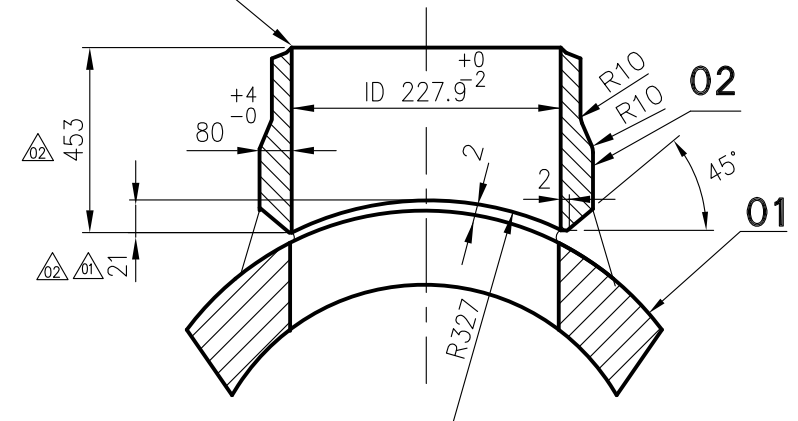


**NOTES :-**

- DESIGN PRESSURE : 272 Kg/Sq.Cm (g)
- DESIGN TEMPERATURE : 573° C
- FOLLOW TDG : 108 LATEST
- ELECTRODES TO BE USED ARE,
  - a) GTAW : ER90S-B9 (A)
  - b) SMAW : E9015-B9 (A)
 ELECTRODES GIVEN ABOVE ARE INDICATIVE. VENDOR TO GIVE WPS FOR BHEL's APPROVAL.
- PIPE SA335P91(A) CAN ALSO BE USED IN PLACE OF SA182F91(A).
- THE STOCK CODE FOR FINISHED UEQ. TEE: 925058800000.

12.5

EDGE PREPARATION  
AS PER DRG No.  
3-80-300-19825  
FIGURE-X d<sub>1</sub> = 231.3



**SECTION-AA**

EDGE PREPARATION  
AS PER DRG.No.  
3-80-300-19825  
FIGURE-X d<sub>1</sub> = 460

ITEM NO.	DESCRIPTION	DRAWING NO.	ITEM NO.	MATERIAL CODE	A	UNIT WT.
VAR NO.	MATERIAL SPEC.	C	QTY.			
02	BRANCH NOZZLE L=459 ID 227.9 x Thk 80 Min	3-80-301-27186		SA 182 F91	A	278,684 1
01	BASE PIPE L = 1100 ID 460 x Thk 95 Min	3-80-301-27186		SA 182 F91	A	1429,580 1

TYPE OF PRODUCT  
OR NAME OF  
CUSTOMER/PROJECT



BHARAT HEAVY ELECTRICALS LTD.,  
PIPING CENTRE,  
CHENNAI 600 017

NAME	SIGN	DATE	NO OF ITEMS
DRN LALIT	-SD-	07.05.10	
CHD C.SARAVANAN	-SD-	07.05.10	
APPD C.SARAVANAN	-SD-	07.05.10	

REV	DATE	ALTD : K.BOOPALAN -SD.-	REV	DATE	ALTD : LALIT -SD.-	REV	DATE	ALTD : LALIT -SD.-
03	14.08.2012	APPD : S.PANDA -SD.-	02	04.03.11	APPD : C.SARAVANAN-SD.-	01	21.02.11	APPD : C.SARAVANAN-SD.-

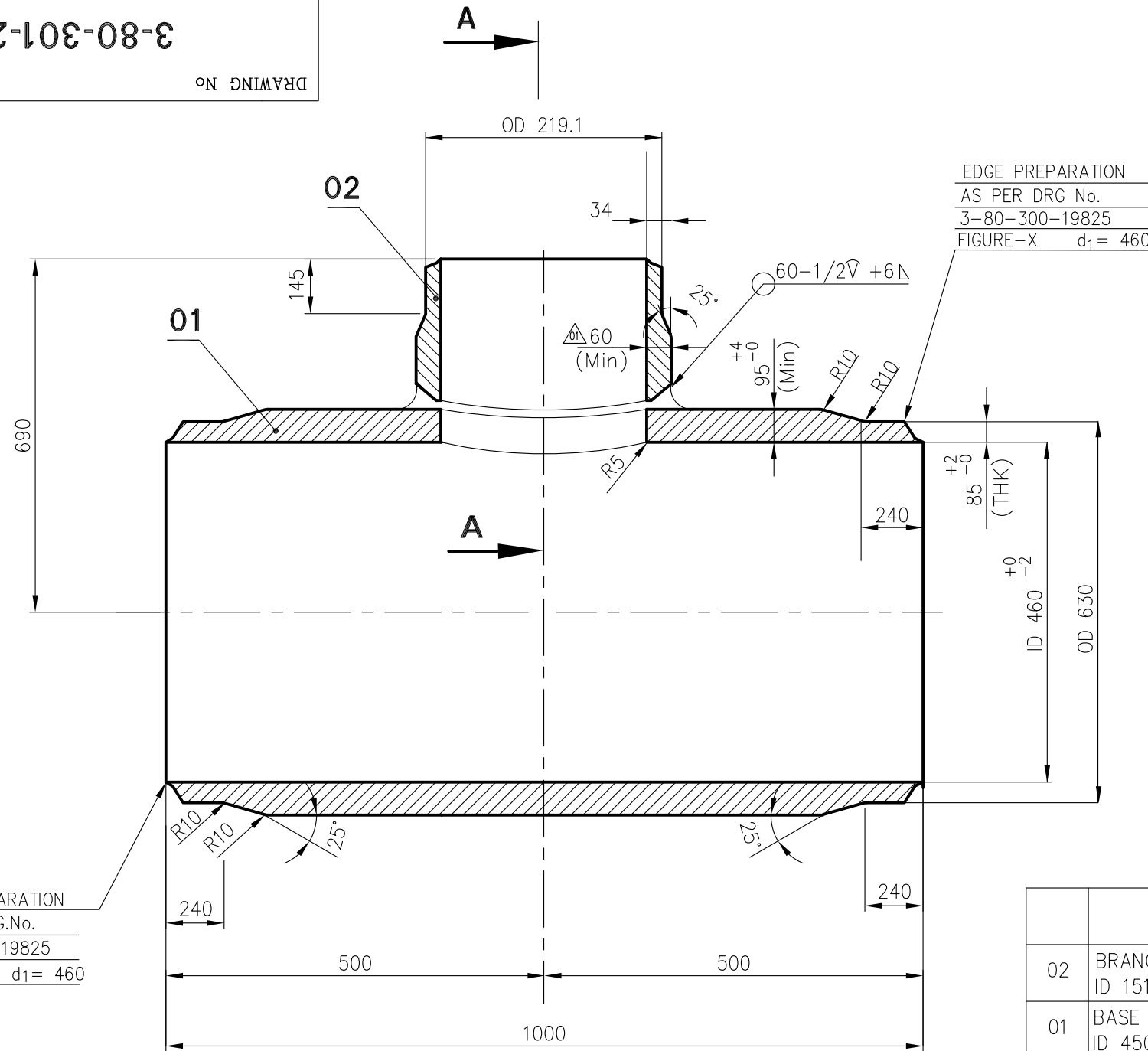
ZONE	DESIGN PRESSURE ALTERED REVISION INDICATED AS $\Delta_{03}$	ZONE	DIMENSION REVISED IN SECTION-AA REVISION INDICATED AS $\Delta_{02}$	ZONE	REVISION MARKED AS $\Delta_{01}$
------	----------------------------------------------------------------	------	------------------------------------------------------------------------	------	----------------------------------

DEPT.	GRADE OF UN TOL DIM	SCALE	WEIGHT (Kg).	BHEL PO REF.NO:	ITEM No.
	C/M/F	N.T.S.	1709.000		
TITLE <b>FABRICATED UNEQUAL TEE (ID460x85/OD323.9x48) (SA182F91)</b>				CARD CODE U 01	REV 03
				DRAWING No. <b>3-80-301-27186</b>	

3-80-301-27192

DRAWING No

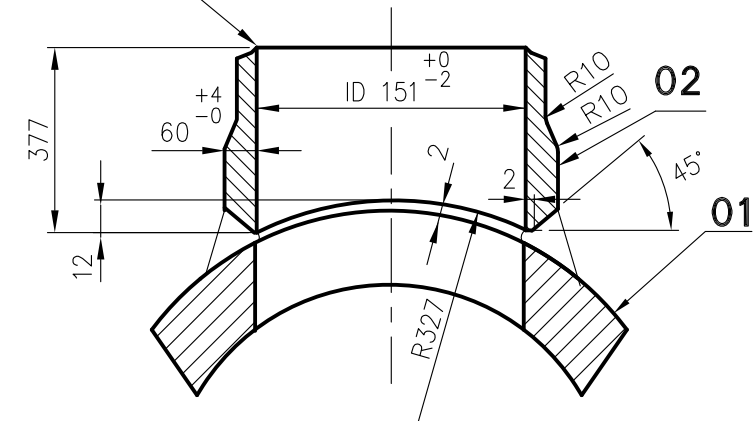
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**NOTES :-**

- DESIGN PRESSURE : 272 Kg/Sq.Cm (g)
- DESIGN TEMPERATURE : 573° C
- FOLLOW TDG : 108 LATEST
- ELECTRODES TO BE USED ARE,  
a) GTAW : ER90S-B9 (A)  
b) SMAW : E9015-B9 (A)  
ELECTRODES GIVEN ABOVE ARE INDICATIVE. VENDOR TO GIVE WPS FOR BHEL's APPROVAL.
- PIPE SA335P91(A) CAN ALSO BE USED IN PLACE OF SA182F91(A).
- THE STOCK CODE FOR FINISHED UEQ. TEE: 925058820000

12.5



**SECTION-AA**

EDGE PREPARATION  
AS PER DRG.No.  
3-80-300-19825  
FIGURE-X d<sub>1</sub> = 460

ITEM NO.	DESCRIPTION	DRAWING NO.	ITEM NO. VAR NO.	MATERIAL CODE MATERIAL SPEC.	A C	UNIT WT. QTY.
02	BRANCH NOZZLE L=377 ID 151 x Thk 60 Min	3-80-301-27192		SA 182 F91	A	117,700 1
01	BASE PIPE L = 1000 ID 450 x Thk 95 Min	3-80-301-27192		SA 182 F91	A	1299,610 1

TYPE OF PRODUCT  
OR NAME OF  
CUSTOMER/PROJECT



BHARAT HEAVY ELECTRICALS LTD.,  
PIPING CENTRE,  
CHENNAI 600 017

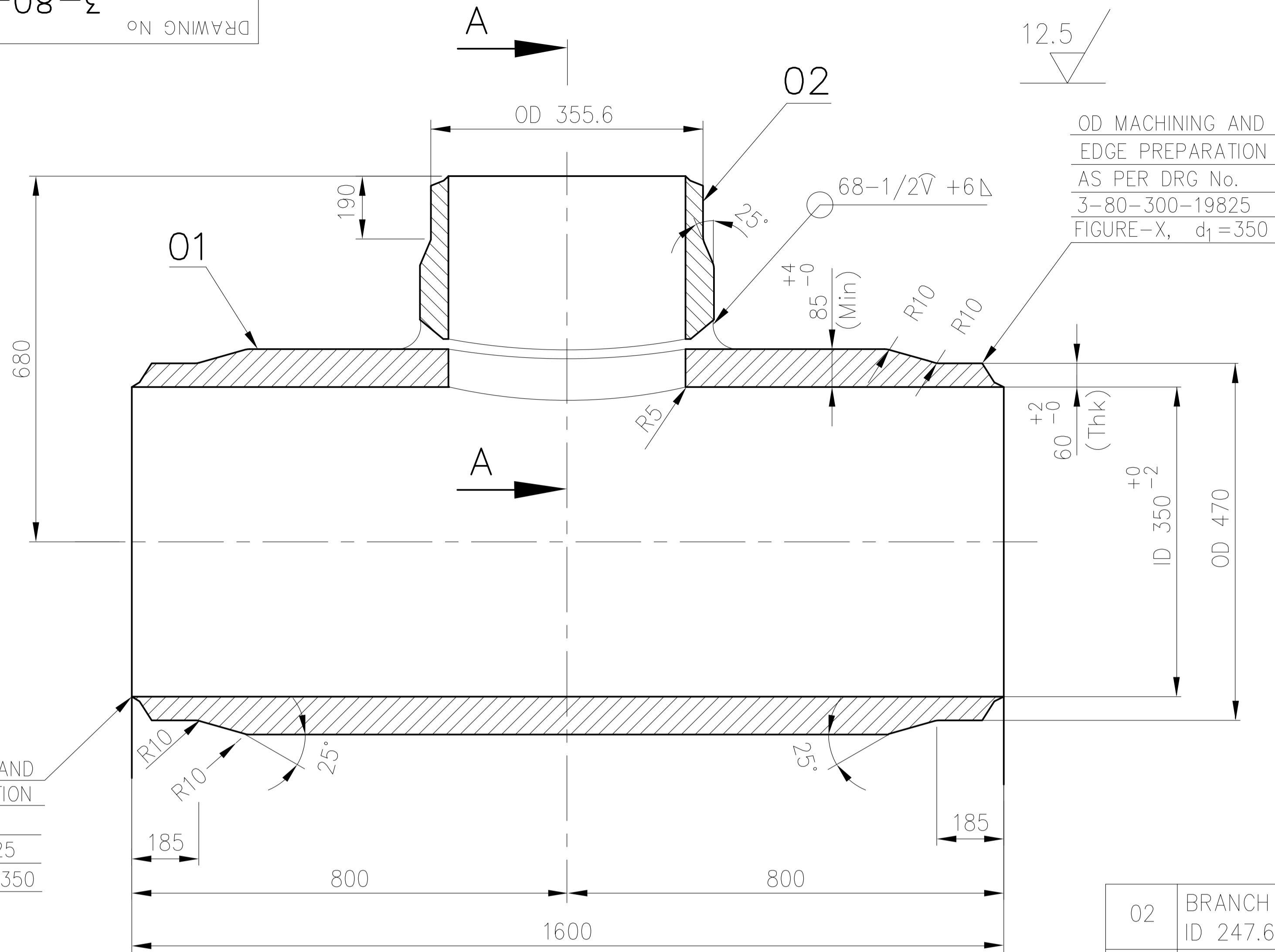
NAME	SIGN.	DATE	NO OF ITEMS
DRN LALIT	-SD.-	07.05.10	
CHD C.SARAVANAN	-SD.-	07.05.10	
APPD C.SARAVANAN	-SD.-	07.05.10	

REV	DATE	ALTD	BY	REV	DATE	ALTD	BY
02	14.08.2012		K.BOOPALAN -SD.- APPD S.PANDA -SD.-	01	04.03.11		LALIT -SD.- APPD C.SARAVANAN-SD.-
ZONE	DESIGN PRESSURE ALTERED REVISION INDICATED AS $\triangle$ <sub>02</sub>			ZONE	DIMENSION REVISED AS MARKED. REVISION INDICATED AS $\triangle$		

DEPT.	GRADE OF UN TOL DIM	SCALE	WEIGHT (Kg).	BHEL PO REF.NO:	ITEM No.
	C/M/F	N.T.S.	1418.000		
TITLE <b>FABRICATED UNEQUAL TEE</b> <b>(ID460x85/OD219.1x34)</b> <b>(SA182F91)</b>				CARD CODE	REV
				U 01	02
				DRAWING No.	
				<b>3-80-301-27192</b>	

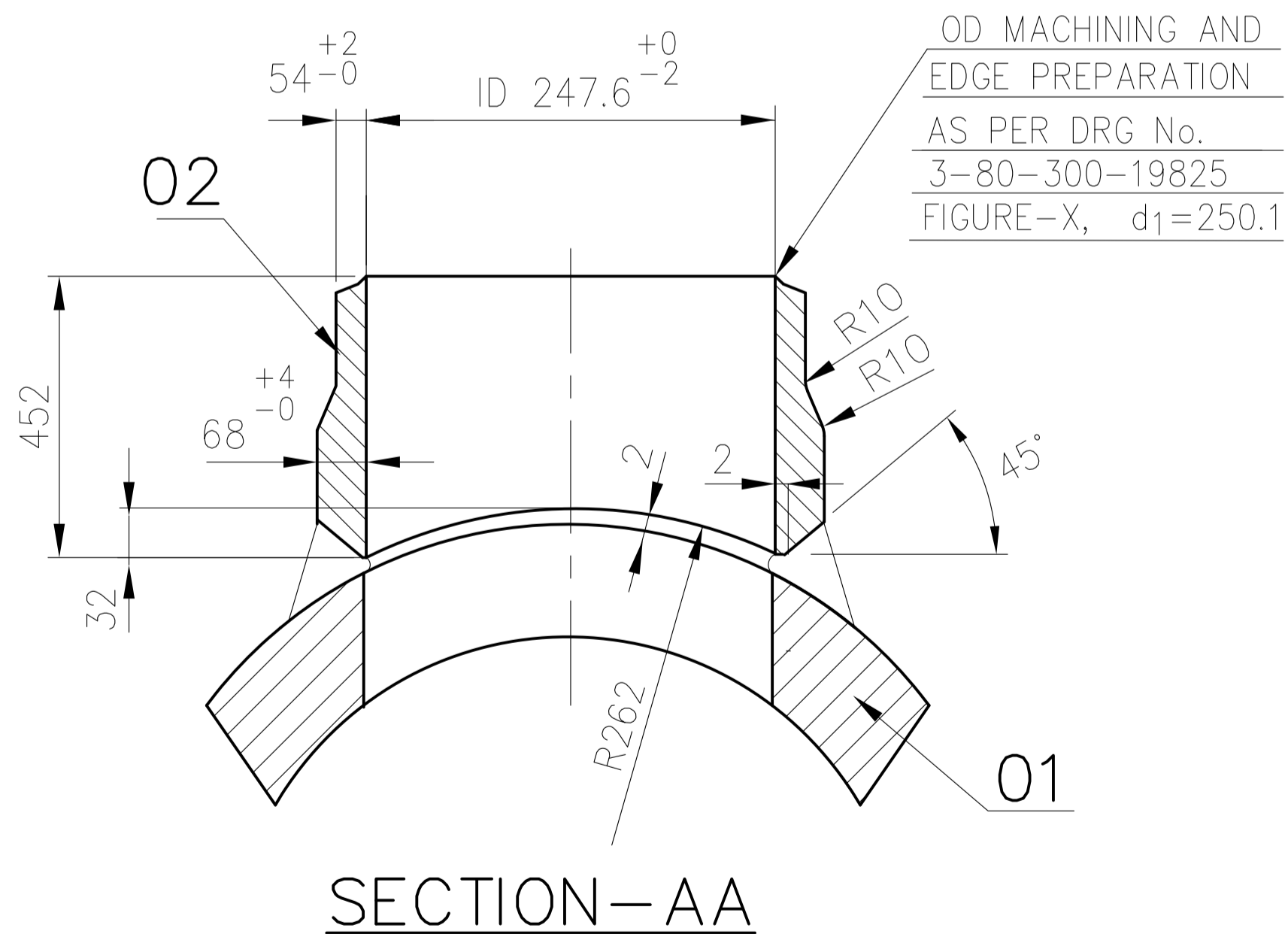
DRAWING No. 3-80-301-31142

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OD MACHINING AND  
EDGE PREPARATION  
AS PER DRG.No.  
3-80-300-19825  
FIGURE-X, d1=350

OD MACHINING AND  
EDGE PREPARATION  
AS PER DRG No.  
3-80-300-19825  
FIGURE-X, d1=350



OD MACHINING AND  
EDGE PREPARATION  
AS PER DRG No.  
3-80-300-19825  
FIGURE-X, d1=250.1

NOTES

- DESIGN PRESSURE : 275 Kg/Cm<sup>2</sup>(g)
- DESIGN TEMPERATURE : 568 °C
- FOLLOW TDC No. : TDG-108 (LATEST REVISION)
- ELECTRODES TO BE USED ARE,  
a) GTAW : ER90S-B9 (A)  
b) SMAW : E9015-B9 (A)  
ELECTRODES GIVEN ABOVE ARE INDICATIVE. VENDOR TO GIVE WPS FOR BHEL'S APPROVAL.
- PIPE 'SA 335 P91'(A) CAN ALSO BE USED IN PLACE OF 'SA 182 F91'(A)
- THE FINISHED MATERIAL SPECIFICATION IS 'SA 182 F91'(A)

02	BRANCH FORGING L=450 ID 247.6 x Thk 68 Min	3-80-301-31142		-	A	200,000
				SA 182 F91		1
01	BASE FORGING L=1600 ID 350 x Thk 85 Min	3-80-301-31142		-	A	1320,000
				SA 182 F91		1
ITEM NO.	DESCRIPTION	DRAWING NO.	ITEM NO. VAR NO.	MATERIAL CODE MATERIAL SPEC.	A C	UNIT WT. QTY.

SPACE FOR IBR APPL.



BHARAT HEAVY ELECTRICALS LTD.,  
PIPING CENTRE,  
CHENNAI 600 017

	NAME	SIGN	DATE	NO OF ITEMS
DRN	KONDAPA		07.12.2013	
CHD	KONDAPA		07.12.2013	-
APPD	R.SESHAGIRI		07.12.2013	

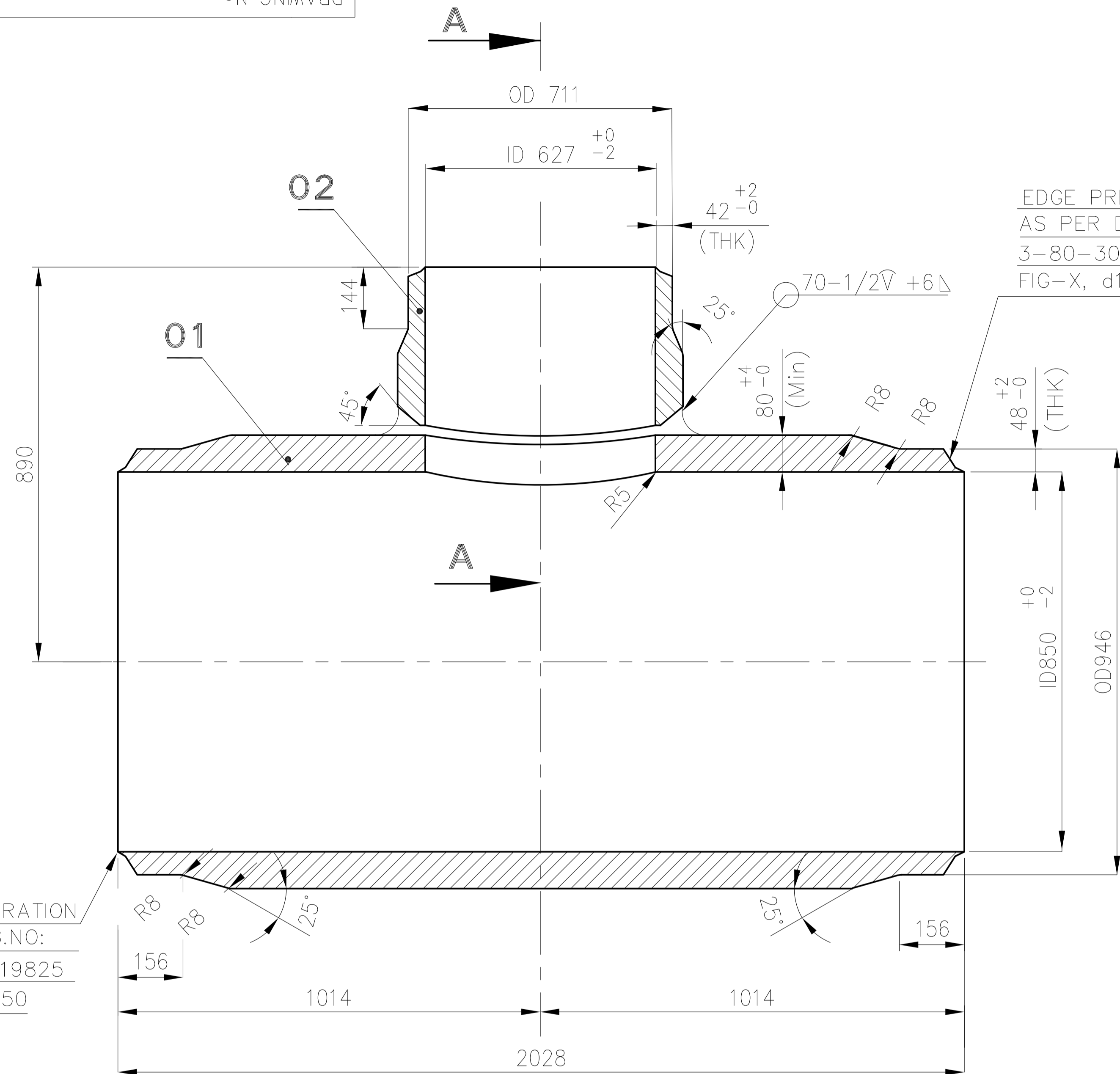
REV 01	DATE	ALTD
ZONE		APPD

DEPT.	GRADE OF UN TOL. DIM	SCALE	WEIGHT (Kg).	BHEL PO REF.NO:	ITEM No.
CODE	C/M/F	N.T.S.	1520.00	-	-
TITLE	FABRICATED UNEQUAL TEE (ID350X60/OD355.6x54)		CARD CODE	DRAWING No.	REV
			U 01	3-80-301-31142	00

3-80-310-30689

DRAWING No

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EDGE PREPARATION  
AS PER DRG.NO:  
3-80-300-19825  
FIG-X, d1=850

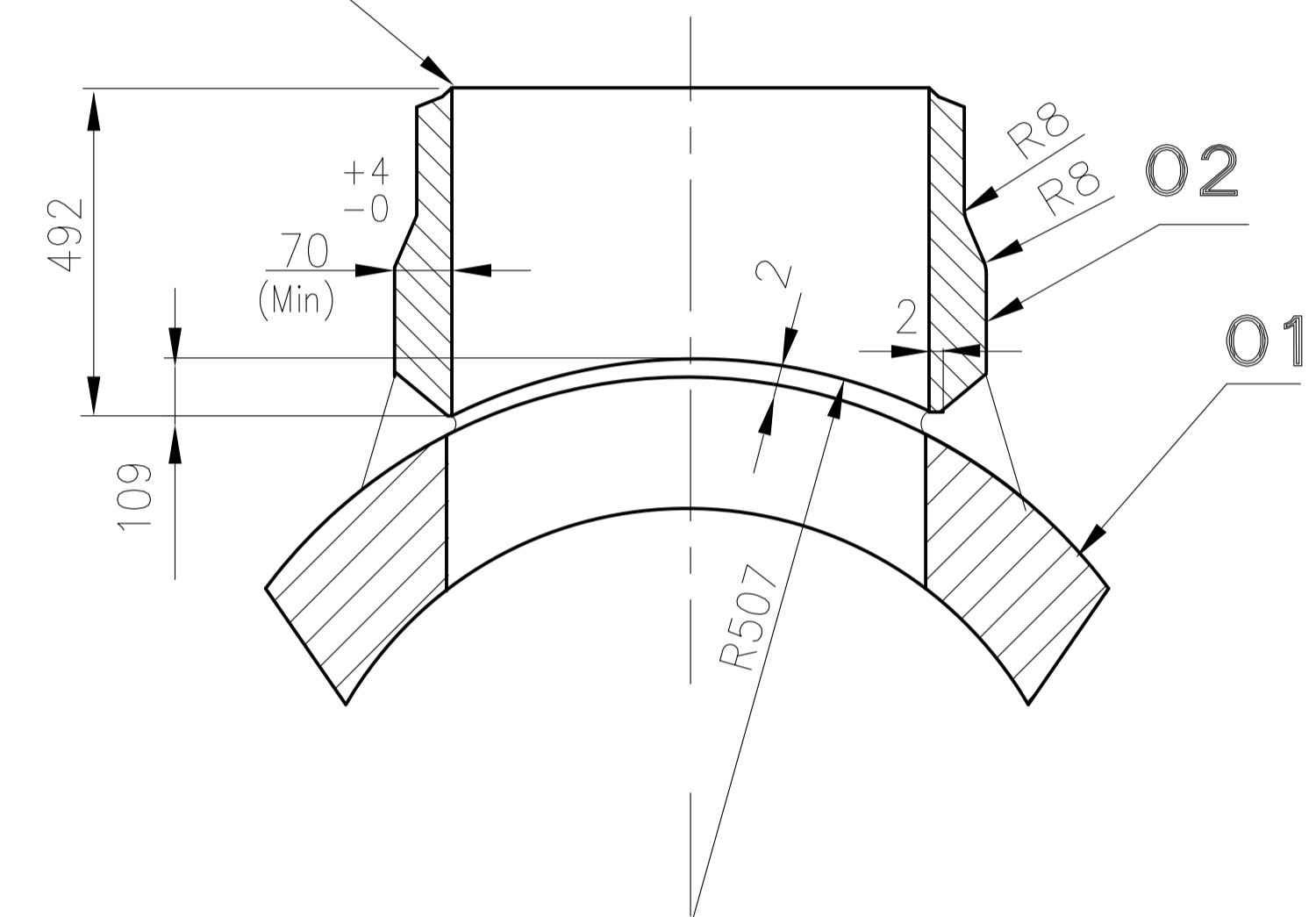
EDGE PREPARATION  
AS PER DRG.NO:  
3-80-300-19825  
FIG-X, d1 =850

EDGE PREPARATION  
AS PER DRG.NO:  
3-80-300-19825  
FIG-X, d1=630.4

**NOTES :-**

- DESIGN PRESSURE : 70 Kg/Sq.Cm (g)
- DESIGN TEMPERATURE : 601° C
- FOLLOW TDG : 108
- ELECTRODES TO BE USED ARE,  
a) GTAW : ER90S-B9 (A)  
b) SMAW : E9015-B9 (A)  
ELECTRODES GIVEN ABOVE ARE INDICATIVE. VENDOR TO GIVE WPS FOR BHEL'S APPROVAL.
- PIPE SA335P91(A) CAN ALSO BE USED IN PLACE OF SA182F91(A).
- THE STOCK CODE FOR THE FINISHED UEQ. TEE:92 505 611 0000

12.5



**SECTION-AA**

02	BRANCH NOZZLE L=492 ID 627 x Thk 70 Min	3-80-310-30689		SA 182 F91	A	---	---
01	BASE PIPE L = 2028 ID 850 x Thk 80 Min	3-80-310-30689		SA 182 F91	A	---	---
ITEM NO.	DESCRIPTION	DRAWING NO.	ITEM NO. VAR NO.	MATERIAL CODE MATERIAL SPEC.	A C	UNIT WT.	QTY.

TYPE OF PRODUCT  
OR NAME OF  
CUSTOMER/PROJECT



BHARAT HEAVY ELECTRICALS LTD.,  
PIPING CENTRE,  
CHENNAI 600 017

DRN	NAME KONDAPA	SIGN	DATE 07.06.13	NO OF ITEMS
CHD	KONDAPA		07.06.13	
APPD	R.SESHAGIRI		07.06.13	

REV 02	DATE	ALTD :	REV 01	DATE	ALTD :
ZONE		APPD :	ZONE		APPD :

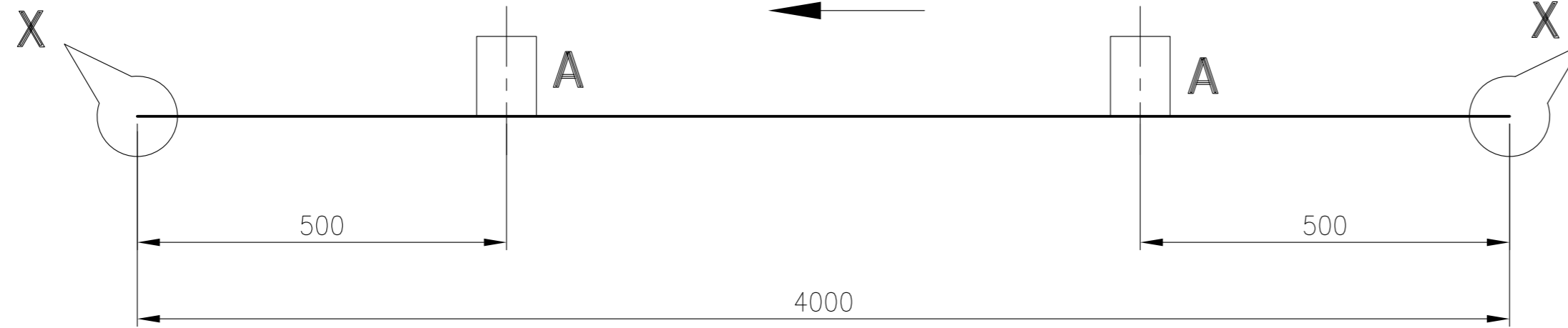
DEPT.	GRADE OF UN TOL. DIM	SCALE	WEIGHT (Kg).	BHEL PO REF.NO:	ITEM No.
CODE	C/M/F	N.T.S.	3700		
TITLE	FABRICATED UNEQUAL TEE (ID850X48/OD711x42) SA182F91			CARD CODE	REV
				U 01	00

DRAWING No. **3-80-310-30689**

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3-80-320-31182

DRAWING No



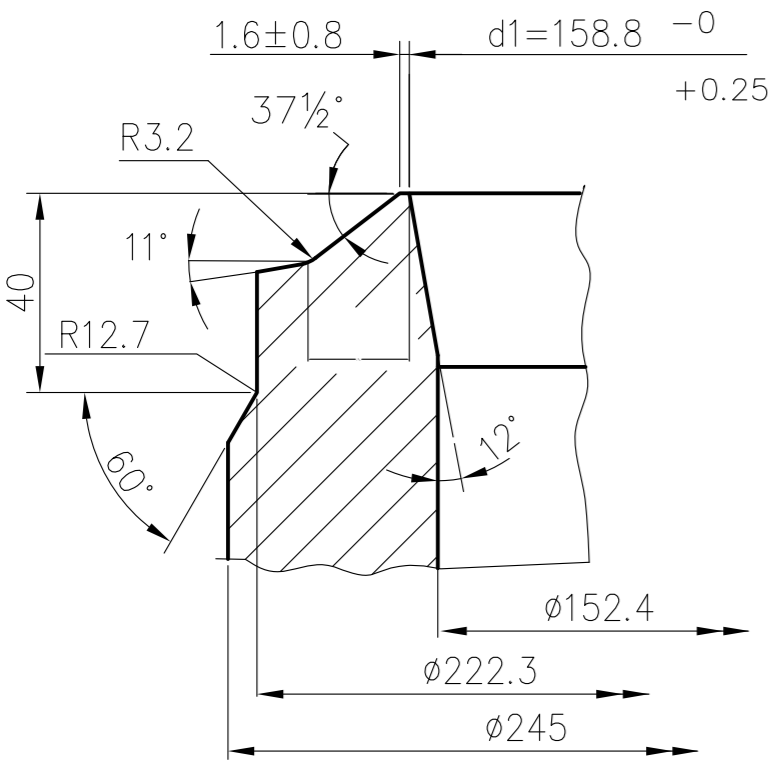
**NOTES :-**

- DESIGN PRESSURE : 75 Kg/Sq.Cm (g)
- DESIGN TEMPERATURE : 380° C
- FOLLOW TDG : 109
- ELECTRODES TO BE USED ARE,

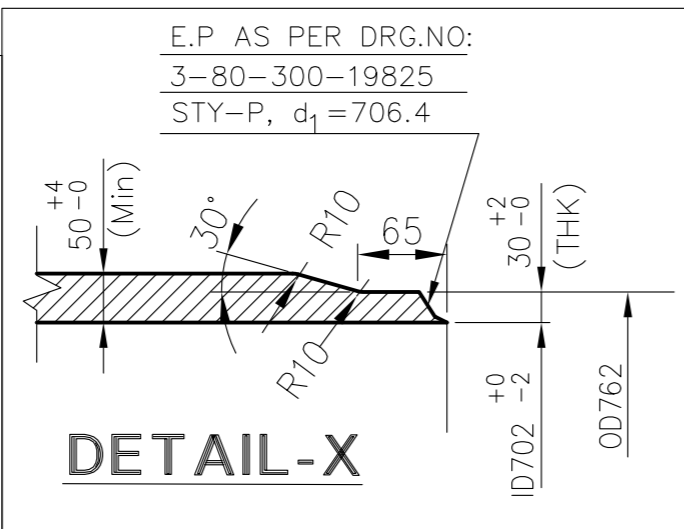
12.5/

MATERIAL SPECN. (A)	ELECTRODE DATA(A)	
MATERIAL SPECN. (A)	ROOT RUN	FURTHER RUN
SA106GRC/SA105	ER70SA1	E7018A1
SA106GRC/SA105		

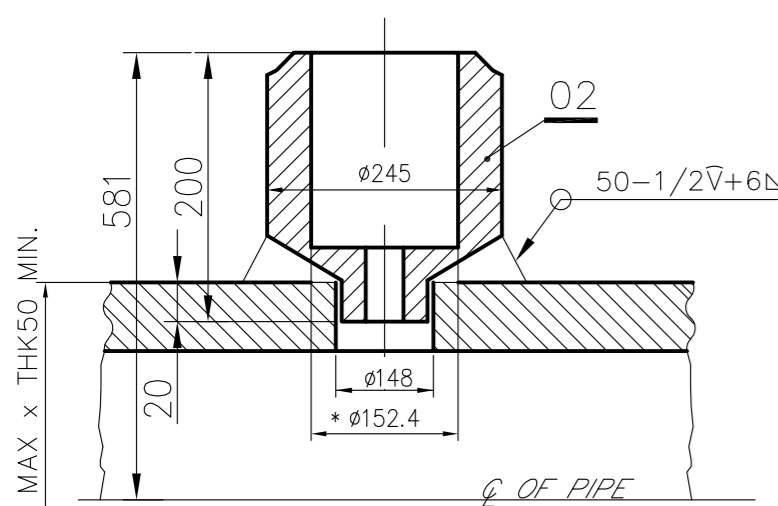
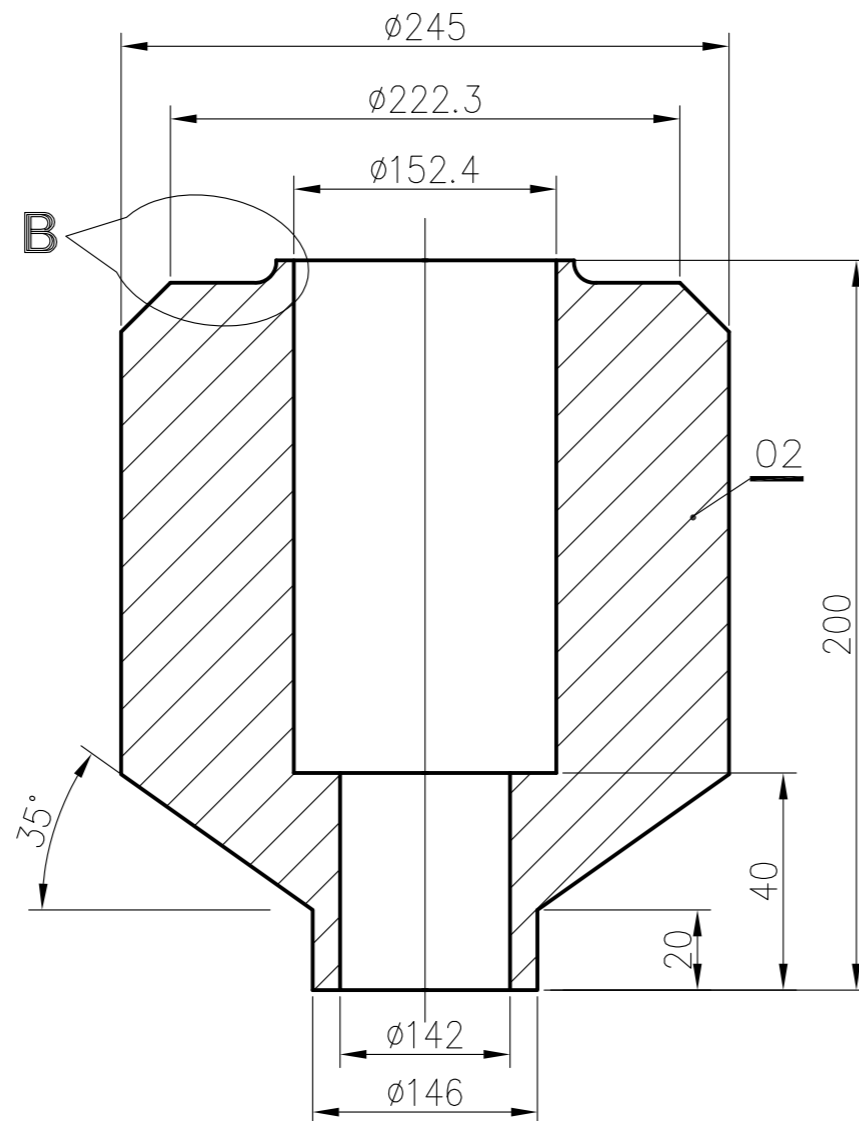
- VENDOR TO GIVE WPS,PQR FOR BHEL'S APPROVAL.
- FABRICATION, INSPECTION, TESTING AS PER IBR 1950
  - PIPE SA106GrC(A) CAN ALSO BE USED IN PLACE OF SA105(A).
  - THE FINISHED MATERIAL CODE :92 516 770 0000



**DETAIL-B**



**DETAIL-X**



**DETAIL-A**

\* AFTER WELDING THE STUB, BORE THROUGH 152.4

ITEM NO.	DESCRIPTION	DRAWING NO.	ITEM NO. / VAR NO.	MATERIAL CODE / MATERIAL SPEC.	A / C	UNIT WT. / QTY.
02	FORGED STUB OD250/ID140 L=200	3-80-320-31182		XX XXX XXX XXXX SA 105	A	36,530 / 2
01	FORGING ID702xThK 50Min L=4000	3-80-320-31182		XX XXX XXX XXXX SA 105	A	3645,000 / 1



BHARAT HEAVY ELECTRICALS LTD.,  
PIPING CENTRE,  
CHENNAI 600 017

DRN	NAME	SIGN	DATE	NO OF ITEMS
CHD	SASIDHARAN		27.12.13	
APPD	KONDAPA NAIDU		27.12.13	
	K.V.RAMANI		27.12.13	

REV	DATE	ALTD	REV	DATE	ALTD
02		APPD	01		APPD
ZONE			ZONE		

DEPT.	GRADE OF UN TOL. DIM	SCALE	WEIGHT (Kg).	BHEL PO REF.NO:	ITEM No.
CODE	C/M/F	N.T.S.	~3720		
TITLE	PIPE WITH SAFETY VALVE STUBS ID702X50 SA105		CARD CODE	DRAWING No.	REV
			U 01	3-80-320-31182	00

FIRST ANGLE PROJECTION(ALL DIMENSIONS IN MILLIMETRES)

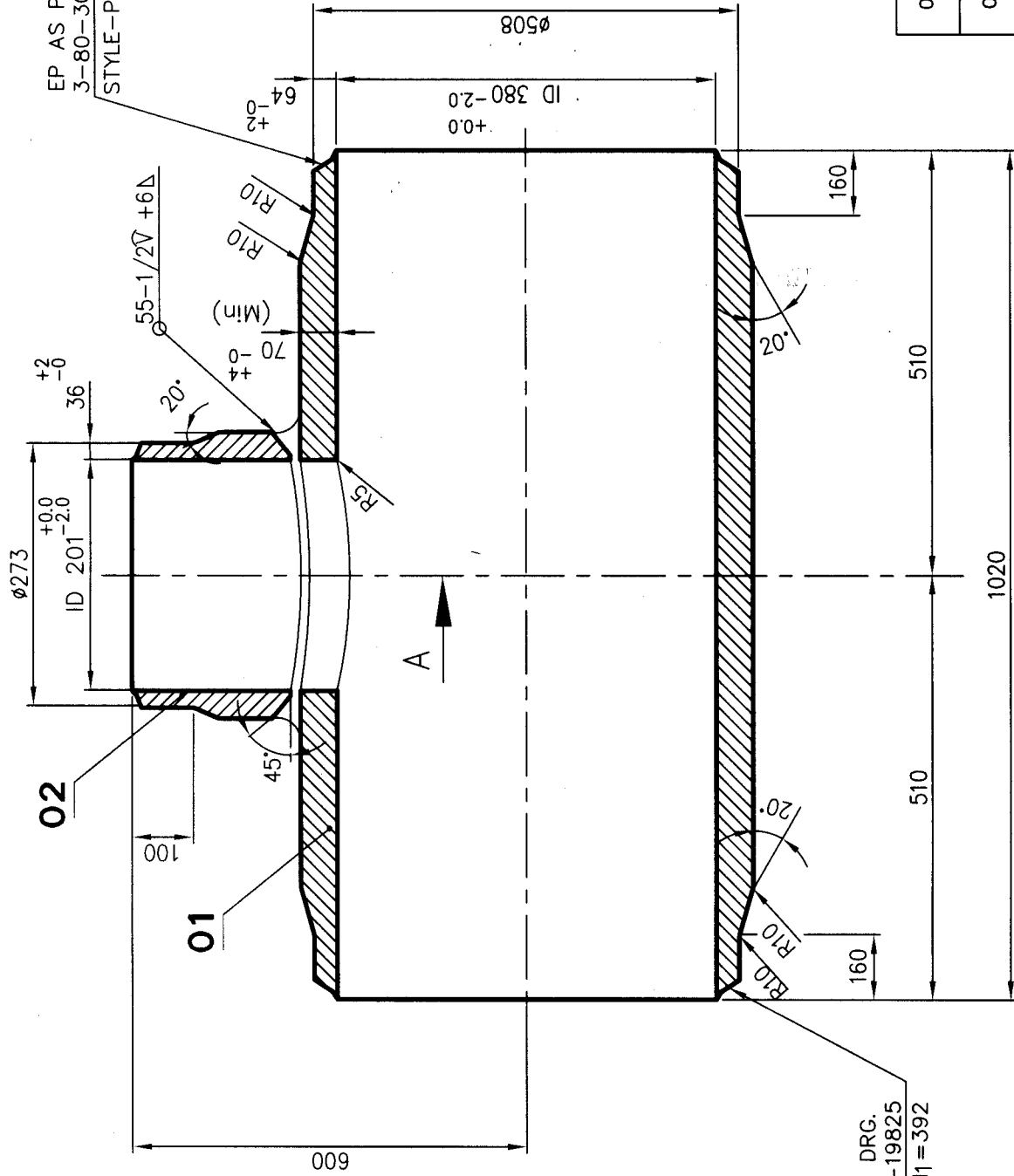
0076-666-08-3

DRAWING No

12.5

**NOTES :-**

- DESIGN PRESSURE : 320.0 Kg/Sq.Cm (g)
- DESIGN TEMPERATURE : 260° C
- FOLLOW TDG : 108
- PIPE SA106GRC(A) CAN ALSO BE USED IN PLACE OF SA105(A).



EP AS PER DRG.  
3-80-300-19825  
STYLE-P, d1=392

EP AS PER DRG.  
3-80-300-19825  
STYLE-P, d1=208

EP AS PER DRG.  
3-80-300-19825  
STYLE-P, d1=392

VIEW-A

**STANDARD**

02	BRANCH NOZZLE L=358 ID 201 x Thk 55.0 Min	3-80-999-97700	A	131900
01	BASE PIPE L = 1020 ID 380 x Thk 70.0 Min	3-80-999-97700	A	8071862
ITEM NO.	DESCRIPTION	DRAWING NO.	MATERIAL CODE	UNIT WT.
			A	C
			MATERIAL SPEC.	QTY.

TYPE OF PRODUCT  
OR NAME OF  
CUSTOMER/PROJECT



BHARAT HEAVY ELECTRICALS LTD.,  
PIPING CENTRE,  
CHENNAI 600 017

DEPT.	GRADE OF UN TOL DIM C/M/F	SCALE N.T.S.	WEIGHT (Kg) 939.762	REF TO MSE DRG. No. 3-80-423-23669/00	DATE 07.02.08	SIGN	NO OF ITEMS
CODE					07.02.08	UBAITHULLAH	1
					07.02.08	R. ANANTH	8071862
					07.02.08	S. JAYAKUMAR	1
REV	DATE	ALTERED	APPROVED	ZONE			
TITLE				CARD CODE	DRAWING No.	REV	
FABRICATED UNEQUAL TEE (OD 508.0x64.0/OD 273.0x36.0)				U 01	3-80-999-97700	00	

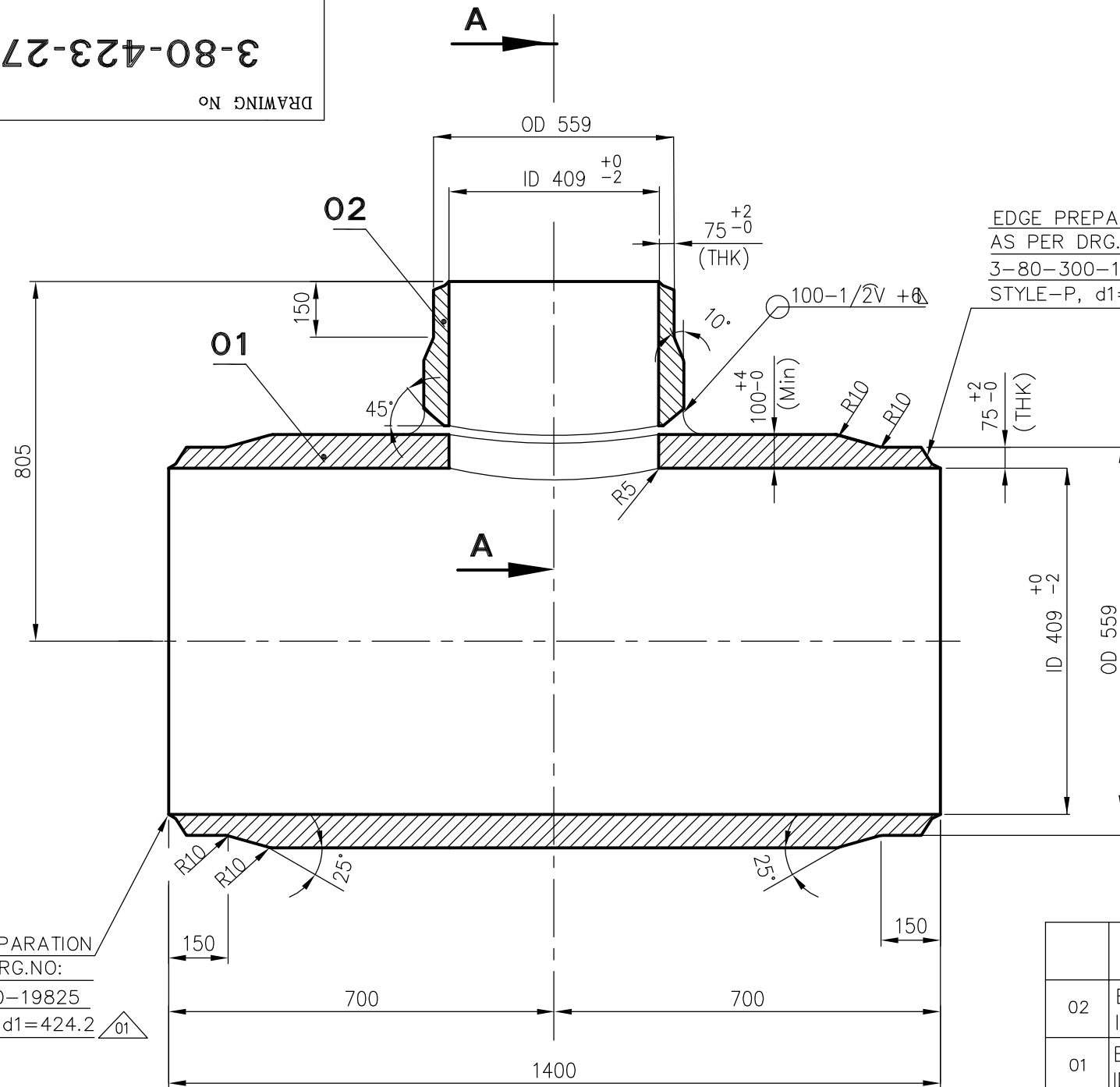
SIZE A3

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3-80-423-27273

DRAWING No



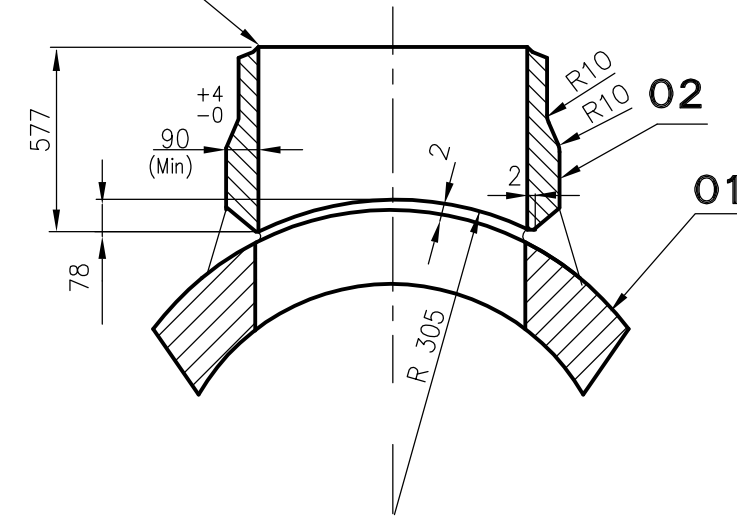
**NOTES :-**

1. DESIGN PRESSURE : 350 Kg/Sq.Cm (g)
2. DESIGN TEMPERATURE : 300° C
3. FOLLOW TDG : 108 LATEST
4. PIPE SA106GRC(A) CAN ALSO BE USED IN PLACE OF SA105(A)
5. THE STOCK CODE FOR THE FINISHED EQ. TEE:925058710000

12.5

EDGE PREPARATION  
AS PER DRG.NO:  
3-80-300-19825  
STYLE-P, d1=424.2

EDGE PREPARATION  
AS PER DRG.NO:  
3-80-300-19825  
STYLE-P, d1=424.2



**SECTION-AA**

EDGE PREPARATION  
AS PER DRG.NO:  
3-80-300-19825  
STYLE-P, d1=424.2

02	BRANCH NOZZLE L=577 ID 409 X Thk 100 Min	3-80-423-27273		SA 105	A	715,141 1
01	BASE PIPE L = 1400 ID 409 X Thk 100 Min	3-80-423-27273		SA 105	A	1756,487 1
ITEM NO.	DESCRIPTION	DRAWING NO.	ITEM NO. VAR NO.	MATERIAL CODE MATERIAL SPEC.	A C	UNIT WT. QTY.

TYPE OF PRODUCT  
OR NAME OF  
CUSTOMER/PROJECT



BHARAT HEAVY ELECTRICALS LTD.,  
PIPING CENTRE,  
CHENNAI 600 017

DRN	NAME	SIGN	DATE	NO OF ITEMS
CHD	T.RAJASEKAR	-SD.-	10.05.10	
APPD	LALIT	-SD.-	10.05.10	
	C.SARAVANAN	-SD.-	10.05.10	

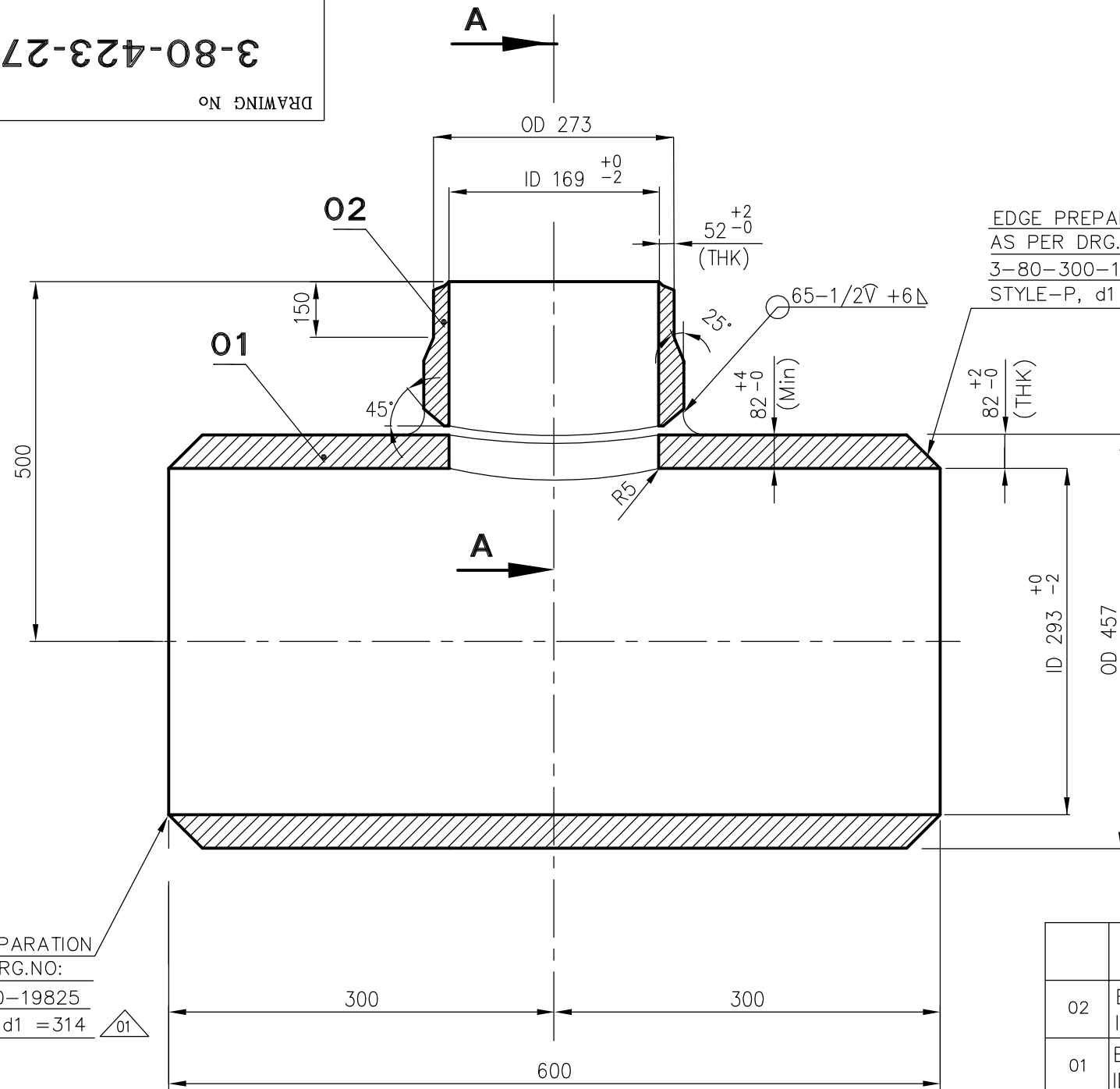
REV	DATE	ALTD: LALIT -SD.-
01	19.02.11	APPD: CS -SD.-
ZONE	d1 VALUES REVISED	
	REVISION MARKED AS 01	

DEPT.	GRADE OF UN TOL DIM	SCALE	WEIGHT (Kg).	BHEL PO REF.NO:	ITEM No.
CODE	C/M/F	N.T.S.	2472		
TITLE	FABRICATED EQUAL TEE (OD559X75) SA 105		CARD CODE	DRAWING No.	REV
			U 01	3-80-423-27273	01

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3-80-423-27269

DRAWING No



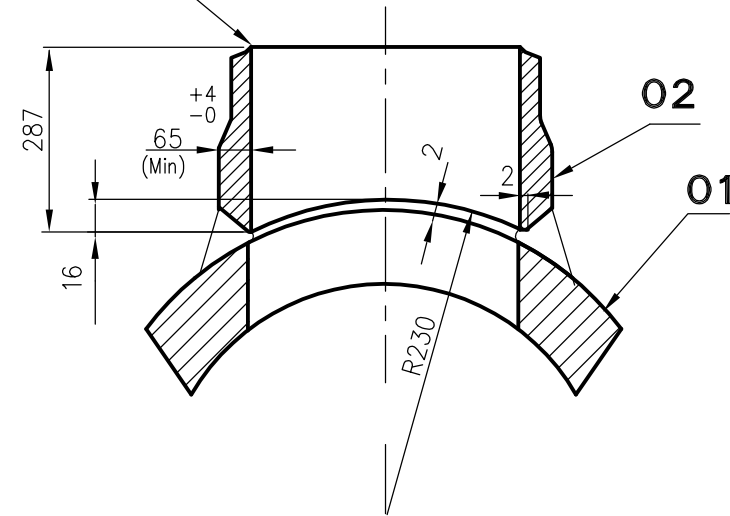
**NOTES :-**

- DESIGN PRESSURE : 480 Kg/Sq.Cm (g)
- DESIGN TEMPERATURE : 200° C
- FOLLOW TDG : 108 LATEST
- PIPE SA106GRC(A) CAN ALSO BE USED IN PLACE OF SA105(A)
- THE STOCK CODE FOR THE FINISHED UEQ. TEE:925058670000

12.5

EDGE PREPARATION  
AS PER DRG.NO:  
3-80-300-19825  
STYLE-P, d1 =314

EDGE PREPARATION  
AS PER DRG.NO:  
3-80-300-19825  
STYLE-P, d1 =184.4



**SECTION-AA**

EDGE PREPARATION  
AS PER DRG.NO:  
3-80-300-19825  
STYLE-P, d1 =314

ITEM NO.	DESCRIPTION	DRAWING NO.	ITEM NO. / VAR NO.	MATERIAL CODE / MATERIAL SPEC.	A / C	UNIT WT. / QTY.
02	BRANCH NOZZLE L=287 ID 169 x Thk 65 Min	3-80-423-27269		SA 105	A	95,644 1
01	BASE PIPE L = 600 ID 293 x Thk 82 Min	3-80-423-27269		SA 105	A	454,774 1

TYPE OF PRODUCT  
OR NAME OF  
CUSTOMER/PROJECT



BHARAT HEAVY ELECTRICALS LTD.,  
PIPING CENTRE,  
CHENNAI 600 017

DRN	NAME	SIGN	DATE	NO OF ITEMS
	T.RAJASEKAR	-SD.-	10.05.10	
CHD	LALIT	-SD.-	10.05.10	
APPD	C.SARAVANAN	-SD.-	10.05.10	

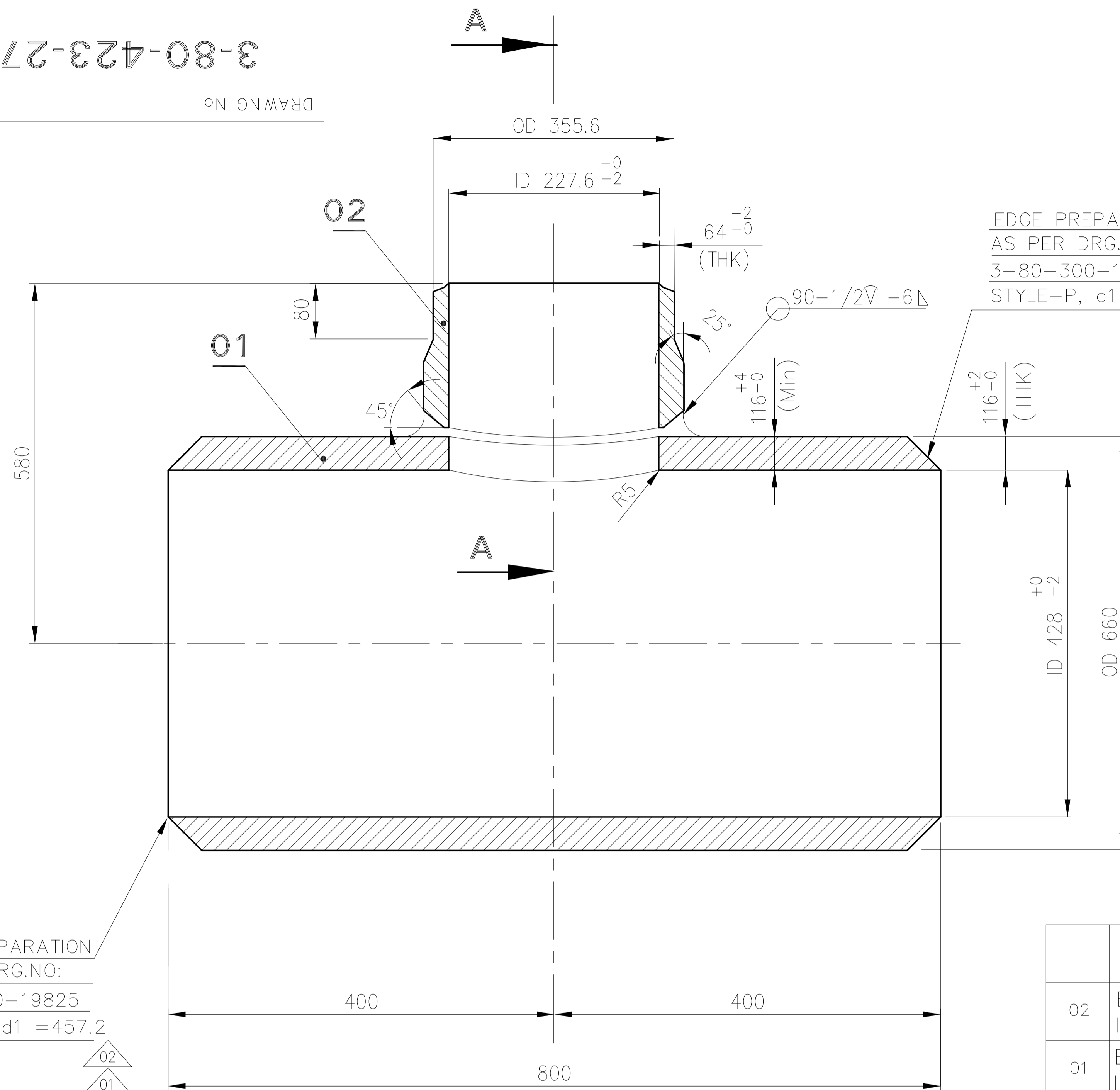
REV	DATE	DESCRIPTION
01	19.02.11	ALTD: LALIT -SD.- APPD: CS -SD.-
ZONE	d1 VALUE REVISED	
REVISION MARKED AS 01		

DEPT.	GRADE OF UN TOL DIM	SCALE	WEIGHT (Kg).	BHEL PO REF.NO:	ITEM No.
	C/M/F	N.T.S.	551		
TITLE				CARD CODE	REV
FABRICATED UNEQUAL TEE (OD457x82/OD273x52) SA105				U 01	01
DRAWING No.				3-80-423-27269	

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3-80-423-27272

DRAWING No

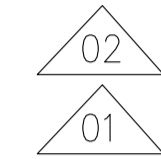


**NOTES :-**

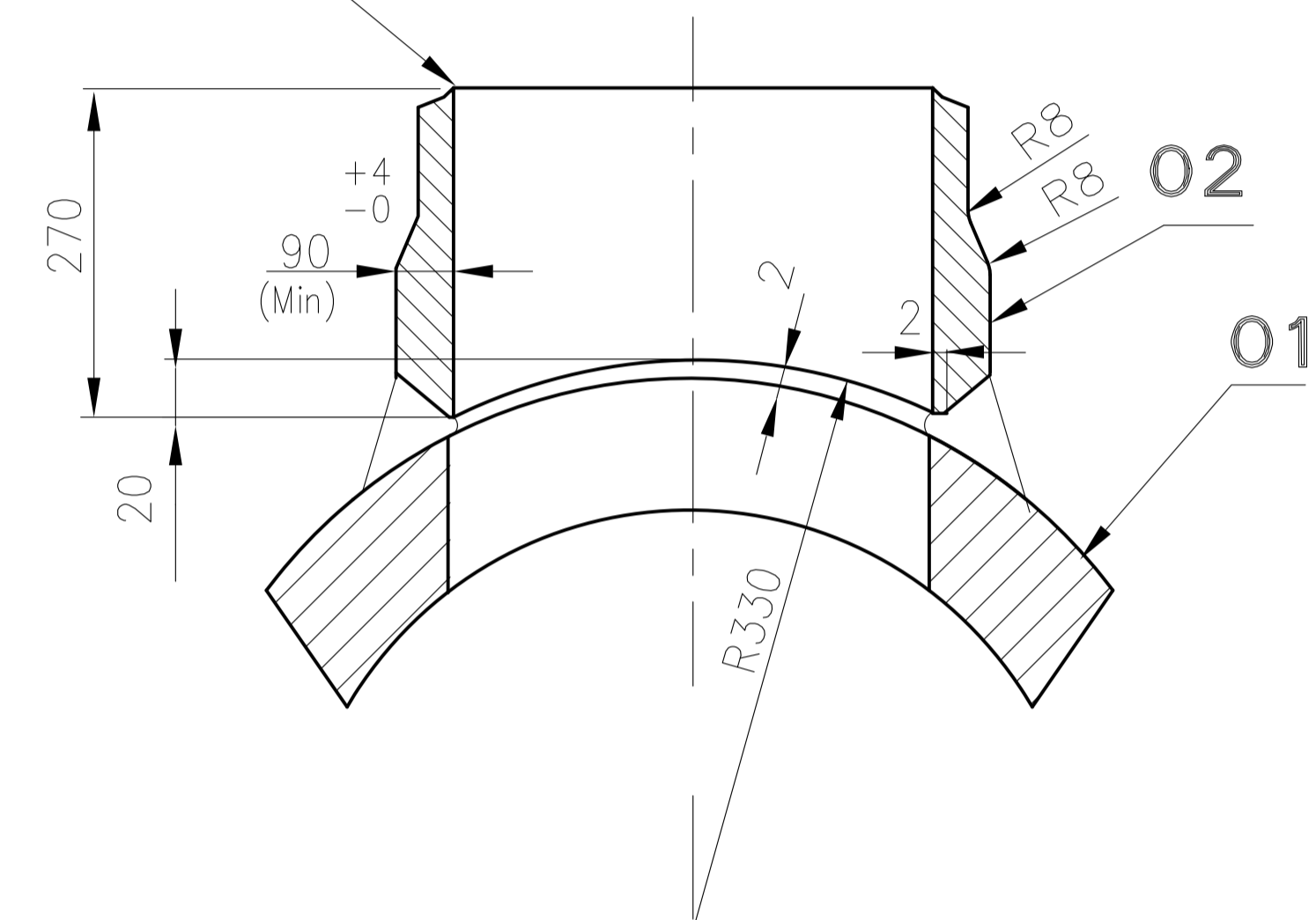
- DESIGN PRESSURE : 480 Kg/Sq.Cm (g)
- DESIGN TEMPERATURE : 200° C
- FOLLOW TDG : 108 LATEST
- PIPE SA106GRC(A) CAN ALSO BE USED IN PLACE OF SA105(A)
- THE STOCK CODE FOR THE FINISHED UEQ. TEE:925058700000

12.5

EDGE PREPARATION  
AS PER DRG.NO:  
3-80-300-19825  
STYLE-P, d1 =457.2



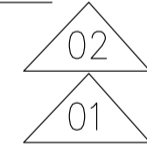
EDGE PREPARATION  
AS PER DRG.NO:  
3-80-300-19825  
STYLE-P, d1 =231.6



**SECTION-AA**

**STANDARD**

EDGE PREPARATION  
AS PER DRG.NO:  
3-80-300-19825  
STYLE-P, d1 =457.2



ITEM NO.	DESCRIPTION	DRAWING NO.	ITEM NO. / VAR NO.	MATERIAL CODE / MATERIAL SPEC.	A / C	UNIT WT. / QTY.
02	BRANCH NOZZLE L=270 ID 227.6 x Thk 90 Min	3-80-423-27272		SA 105	A	190,233 1
01	BASE PIPE L = 800 ID 428 x Thk 116 Min	3-80-423-27272		SA 105	A	1244,360 1

TYPE OF PRODUCT  
OR NAME OF  
CUSTOMER/PROJECT



BHARAT HEAVY ELECTRICALS LTD.,  
PIPING CENTRE,  
CHENNAI 600 017

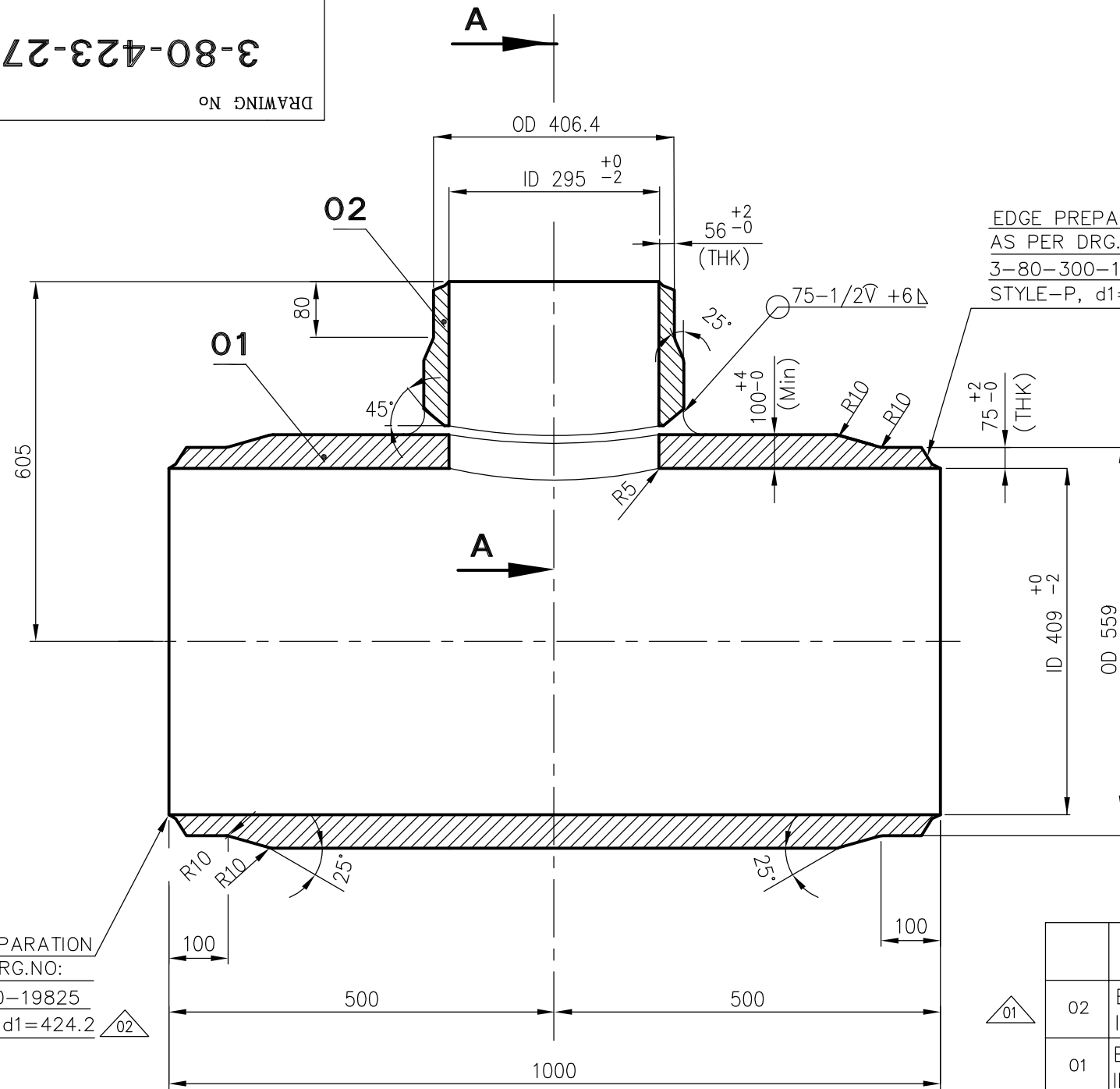
DRN	NAME	SIGN	DATE	NO OF ITEMS
T.RAJASEKAR	T.RAJASEKAR	-SD.-	10.05.10	
LALIT	LALIT	-SD.-	10.05.10	
C.SARAVANAN	C.SARAVANAN	-SD.-	10.05.10	

REV	DATE	ALTD: M.MANO	REV	DATE	ALTD: LALIT -SD.-
02	26.09.13	APPD: R.SESHAGIRI	01	10.11.10	APPD: CS -SD.-
ZONE	d1 VALUE OF BASE PIPE REVISED.		ZONE	d1 VALUE OF BASE PIPE REVISED.	
	REVISION MARKED AS 02			REVISION MARKED AS 01	

DEPT.	GRADE OF UN TOL. DIM	SCALE	WEIGHT (Kg).	BHEL PO REF.NO:	ITEM No.
	C/M/F	N.T.S.	1435		
TITLE	FABRICATED UNEQUAL TEE (OD660x116/OD355.6x64) SA105			CARD CODE	REV
				U 01	02
				DRAWING No.	
				3-80-423-27272	

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DRAWING No 3-80-423-27274



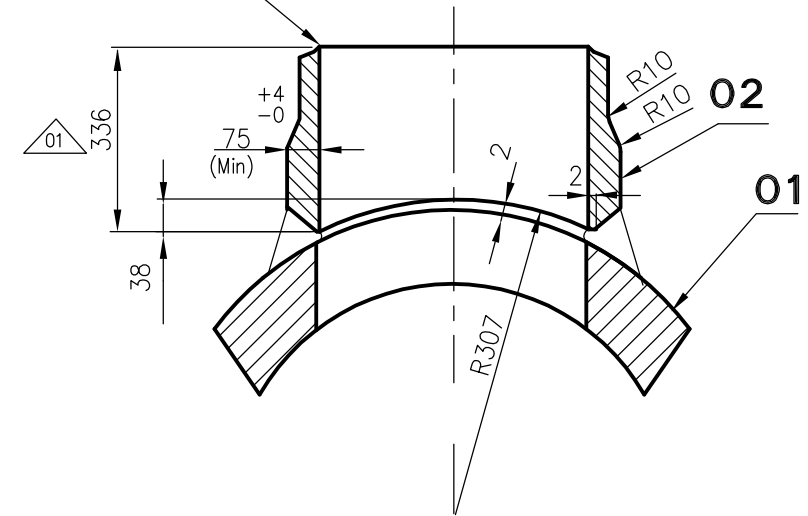
**NOTES :-**

1. DESIGN PRESSURE : 350 Kg/Sq.Cm (g)
2. DESIGN TEMPERATURE : 300° C
3. FOLLOW TDG : 108 LATEST
4. PIPE SA106GRC(A) CAN ALSO BE USED IN PLACE OF SA105(A)
5. THE STOCK CODE FOR THE FINISHED UEQ. TEE:925058720000

12.5  
▽

EDGE PREPARATION  
AS PER DRG.NO:  
3-80-300-19825  
STYLE-P, d1=424.2

EDGE PREPARATION  
AS PER DRG.NO:  
3-80-300-19825  
STYLE-P, d1=306.2



**SECTION-AA**

EDGE PREPARATION  
AS PER DRG.NO:  
3-80-300-19825  
STYLE-P, d1=424.2

01

02	BRANCH NOZZLE L=336 ID 295 X Thk 75 Min	3-80-423-27274		SA 105	A	229,824 1
01	BASE PIPE L = 1000 ID 409 X Thk 100 Min	3-80-423-27274		SA 105	A	1254,630 1
ITEM NO.	DESCRIPTION	DRAWING NO.	ITEM NO. VAR NO.	MATERIAL CODE MATERIAL SPEC.	A C	UNIT WT. QTY.

TYPE OF PRODUCT  
OR NAME OF  
CUSTOMER/PROJECT



BHARAT HEAVY ELECTRICALS LTD.,  
PIPING CENTRE,  
CHENNAI 600 017

DRN	NAME	SIGN	DATE	NO OF ITEMS
CHD	T.RAJASEKAR	-SD.-	10.05.10	
APPD	LALIT	-SD.-	10.05.10	
	C.SARAVANAN	-SD.-	10.05.10	

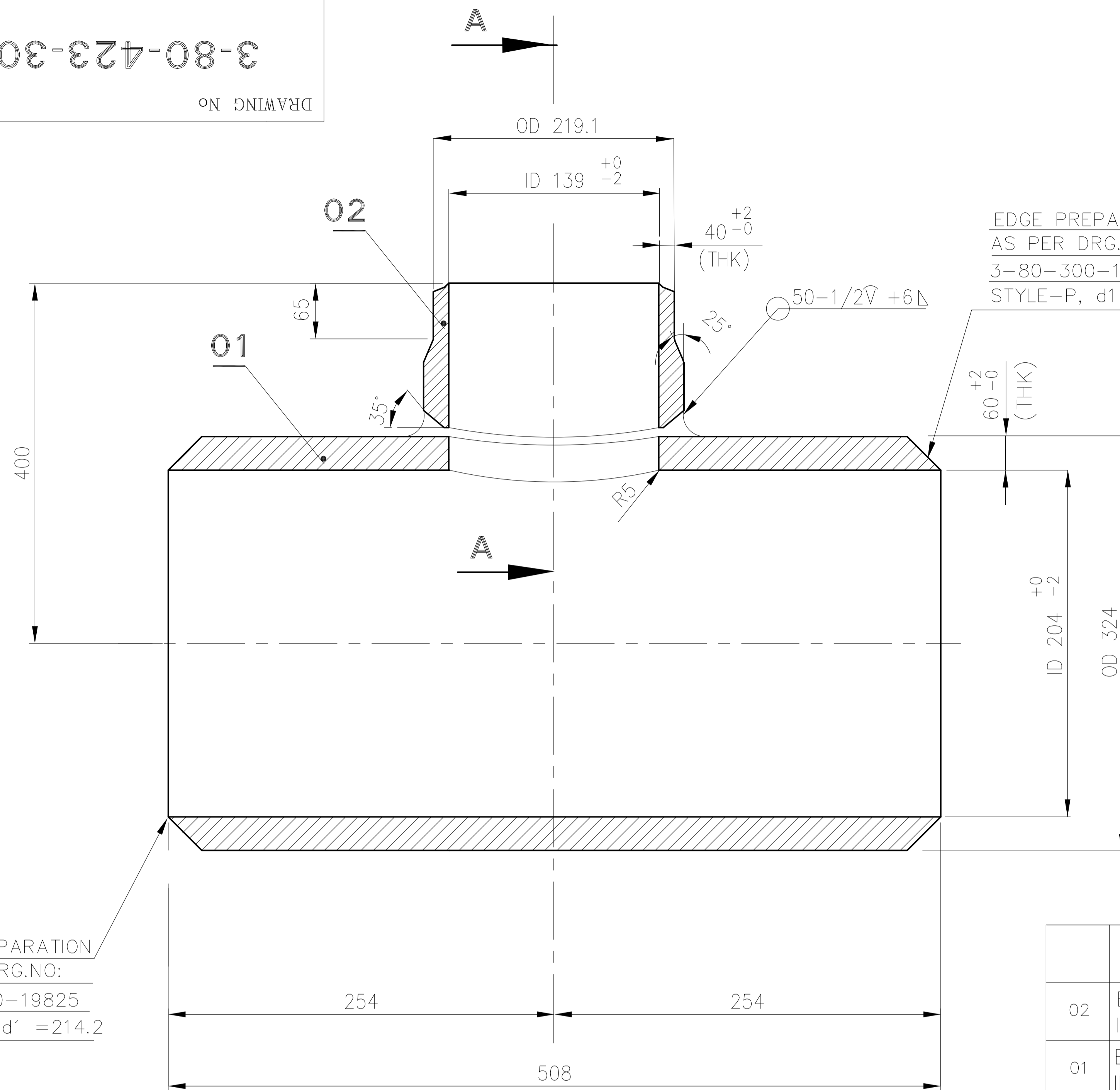
REV 02	DATE 19.02.11	ALTD: LALIT -SD.- APPD: CS -SD.-	REV 01	DATE 10.11.10	ALTD: LALIT -SD.- APPD: CS -SD.-
ZONE	d1 VALUE REVISED		ZONE	LENGTH OF BRANCH NOZZLE CORRECTED.	
	REVISION MARKED AS 02			REVISION MARKED AS 01	

DEPT.	GRADE OF UN TOL DIM	SCALE	WEIGHT (Kg).	BHEL PO REF.NO:	ITEM No.
CODE	C/M/F	N.T.S.	1485		
TITLE	FABRICATED UNEQUAL TEE (OD559x75/OD406.4X56) SA 105		CARD CODE	DRAWING No.	REV
			U 01	3-80-423-27274	02

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3-80-423-30241

DRAWING No



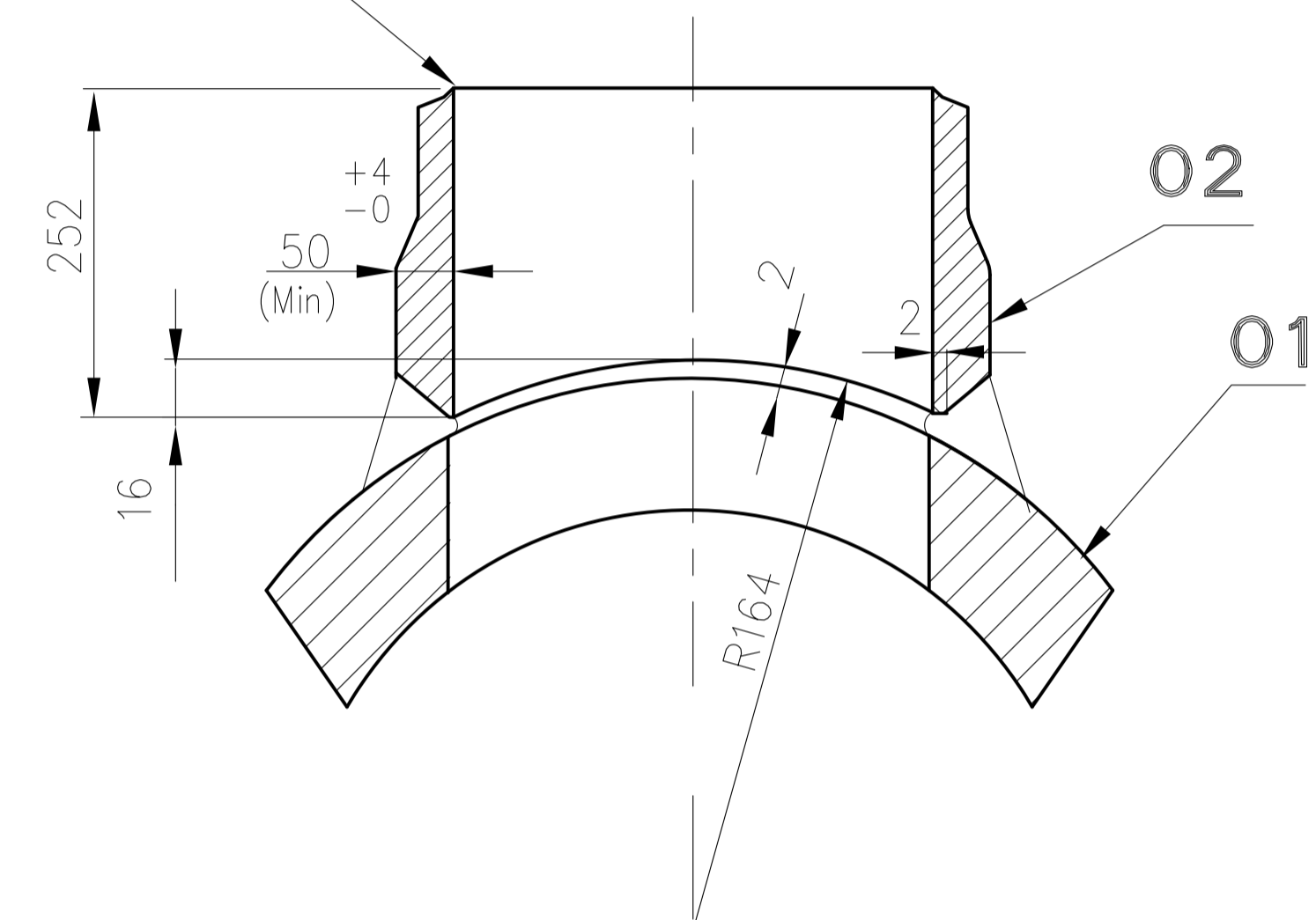
**NOTES :-**

1. DESIGN PRESSURE : 470 Kg/Sq.Cm (g)
2. DESIGN TEMPERATURE : 200° C
3. FOLLOW TDG : 108 LATEST
4. PIPE SA106GRC(A) CAN ALSO BE USED IN PLACE OF SA105(A)

12.5

EDGE PREPARATION  
AS PER DRG.NO:  
3-80-300-19825  
STYLE-P, d1 =214.2

EDGE PREPARATION  
AS PER DRG.NO:  
3-80-300-19825  
STYLE-P, d1 =143.6



**SECTION-AA**

EDGE PREPARATION  
AS PER DRG.NO:  
3-80-300-19825  
STYLE-P, d1 =214.2

ITEM NO.	DESCRIPTION	DRAWING NO.	ITEM NO. / VAR NO.	MATERIAL CODE / MATERIAL SPEC.	A / C	UNIT WT. / QTY.
02	BRANCH NOZZLE L=252 ID 139 x Thk 50 Min	3-80-423-30241		SA 105	A	59,000 1
01	BASE PIPE L = 508 ID 204 x Thk 60 Min	3-80-423-30241		SA 105	A	198,000 1

TYPE OF PRODUCT  
OR NAME OF  
CUSTOMER/PROJECT



BHARAT HEAVY ELECTRICALS LTD.,  
PIPING CENTRE,  
CHENNAI 600 017

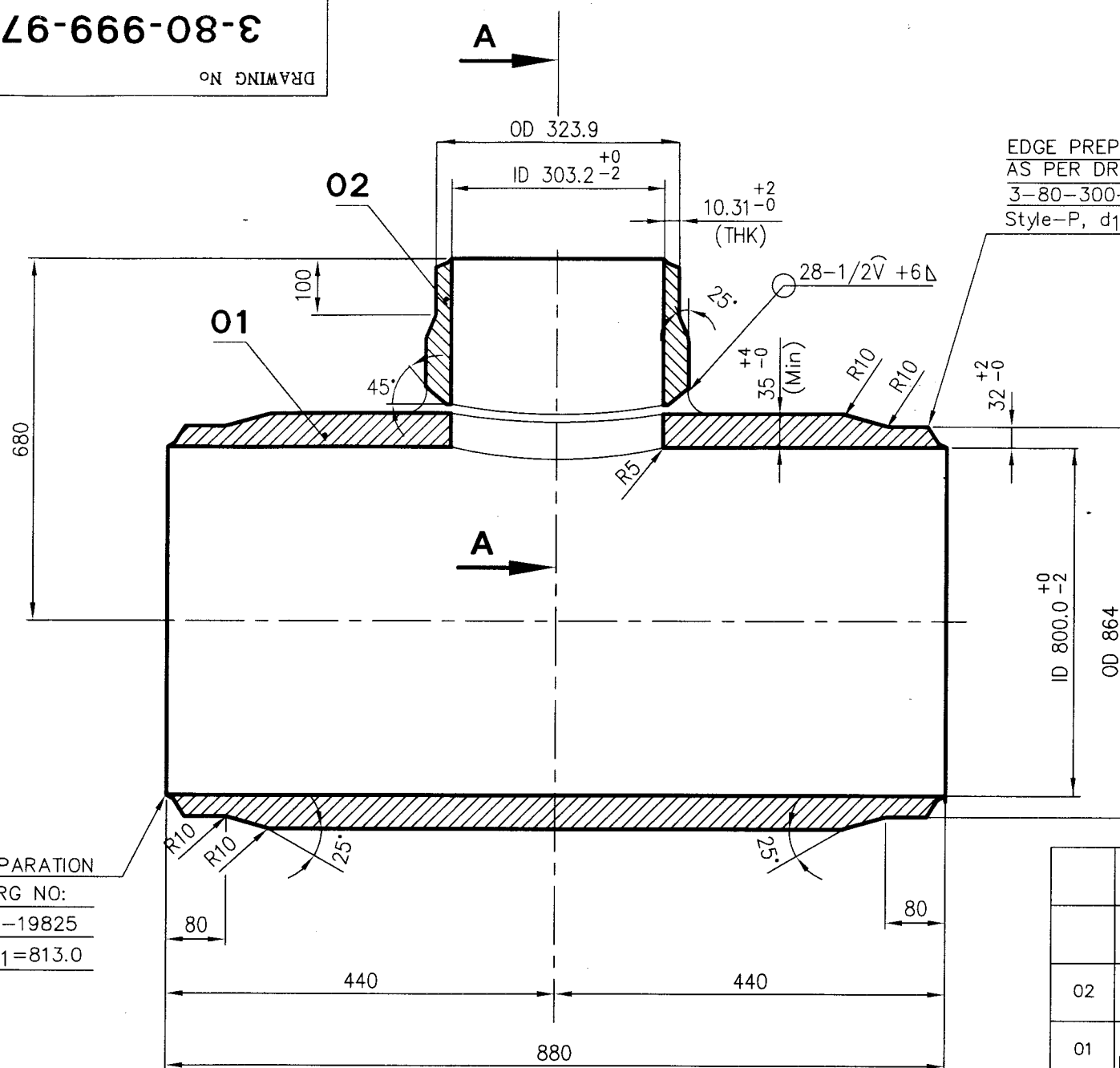
DRN	NAME	SIGN	DATE	NO OF ITEMS
CHD	M.MANO	-SD.-	23.12.12	
APPD	R.SESHAGIRI	-SD.-	23.12.12	

REV	DATE	ALTD:
01		APPD:
ZONE		

DEPT.	GRADE OF UN TOL DIM	SCALE	WEIGHT (Kg).	BHEL PO REF.NO:	ITEM No.
	C/M/F	N.T.S.	257.000		
TITLE	CARD CODE	DRAWING No.	REV		
FABRICATED UNEQUAL TEE (OD323.9x58/OD219.1x40) SA105	U 01	3-80-423-30241	00		

88976-666-08-E

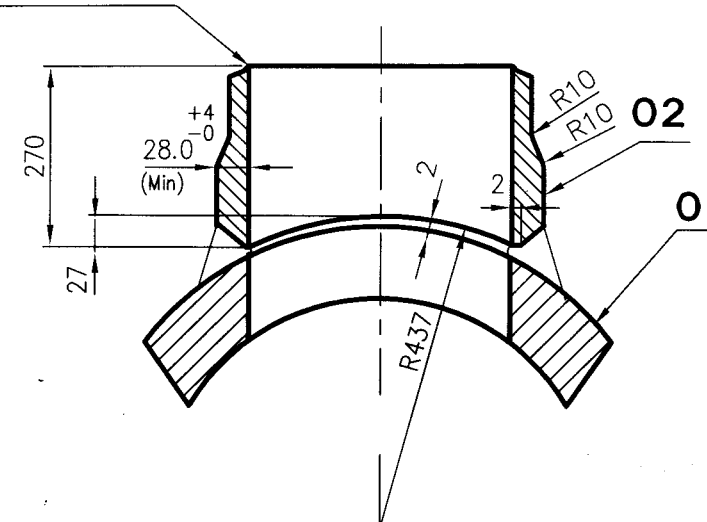
DRAWING No



EDGE PREPARATION  
AS PER DRG NO:  
3-80-300-19825  
Style-P, d1=813.0

EDGE PREPARATION  
AS PER DRG NO:  
3-80-300-19825  
Style-P, d1=813.0

EDGE PREPARATION  
AS PER DRG NO:  
3-80-300-19825  
Style-D, d1=303.2



SECTION-AA

STANDARD

ITEM NO.	DESCRIPTION	DRAWING NO.	ITEM NO. / VAR NO.	MATERIAL CODE / MATERIAL SPEC.	A / C	UNIT WT. / QTY.
02	BRANCH NOZZLE L=270 ID 303.2 x Thk 28.0 Min	3-80-999-97688		SA 105	A	44,000 1
01	BASE PIPE L = 880 ID 800.0 x Thk 35.0 Min	3-80-999-97688		SA 105	A	604,000 1

TYPE OF PRODUCT  
OR NAME OF  
CUSTOMER/PROJECT



BHARAT HEAVY ELECTRICALS LTD.,  
PIPING CENTRE,  
CHENNAI 600 017

DRN	NAME	SIGN	DATE	NO OF ITEMS
	UBAITHULLAH	<i>Ubait</i>	07.02.08	
CHD	R.ANANTH	<i>Ran</i>	07.02.08	
APPD	S.JAYAKUMAR	<i>SJK</i>	07.02.08	

REV	DATE	ALTD:
01	01.08.02	APPD:
ZONE		

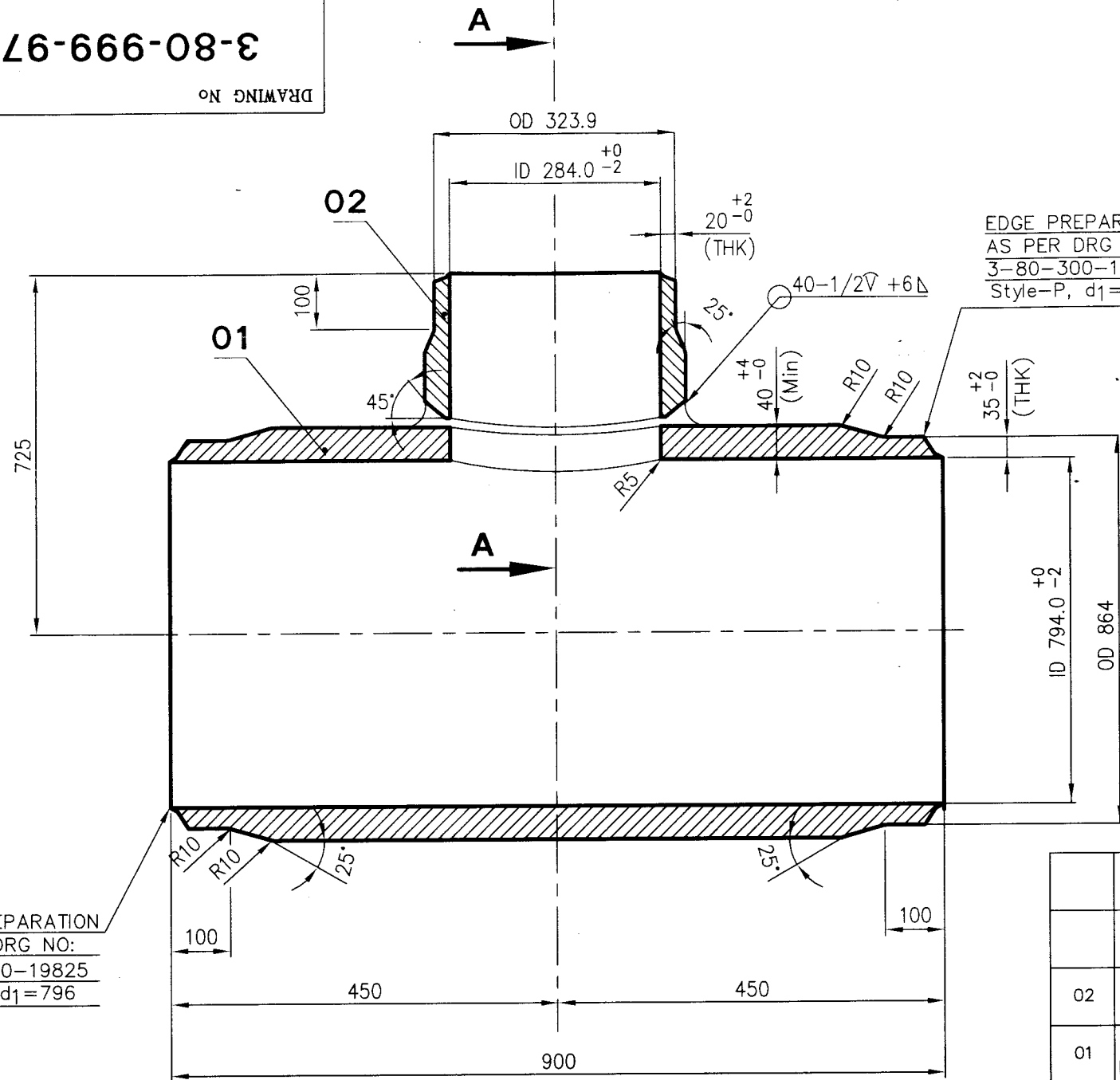
DEPT.	GRADE OF UN TOL DIM	SCALE	WEIGHT (Kg)	BHEL PO REF.NO:	ITEM No.
	C/M/F	N.T.S.	648.000	3-80-320-21355/01	
TITLE	FABRICATED UNEQUAL TEE (OD864.0x27.00/OD323.9x10.31)		CARD CODE	DRAWING No.	REV
			U 01	3-80-999-97688	00

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069/6-666-08-3

DRAWING No

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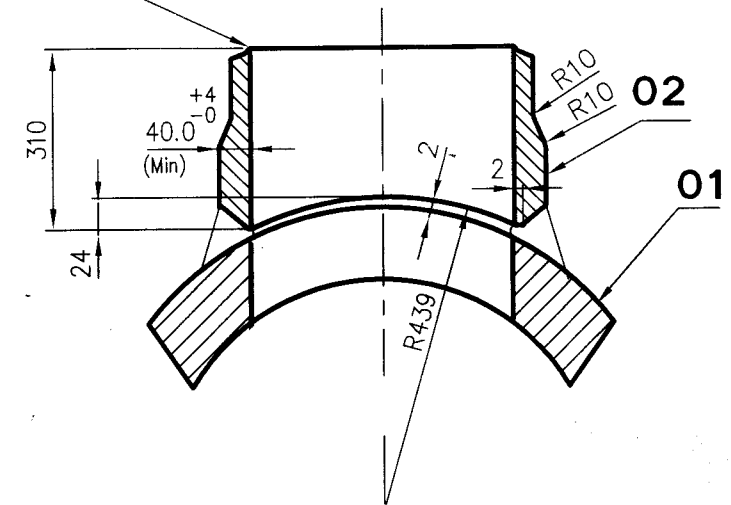
**NOTES :-**

- DESIGN PRESSURE : 54.0 Kg/Sq.Cm (g)
- DESIGN TEMPERATURE : 500° C
- FOLLOW TDG : 108
- PIPE SA335P22(A) CAN ALSO BE USED IN PLACE OF SA182F22CL3(A).

12.5

EDGE PREPARATION  
AS PER DRG NO:  
3-80-300-19825  
Style-P, d1=796

EDGE PREPARATION  
AS PER DRG NO:  
3-80-300-19825  
Style-P, d1=284.0



**SECTION-AA**

**STANDARD**

EDGE PREPARATION  
AS PER DRG NO:  
3-80-300-19825  
Style-P, d1=796

ITEM NO.	DESCRIPTION	DRAWING NO.	ITEM NO. VAR NO.	MATERIAL CODE	MATERIAL SPEC.	A/C	UNIT WT. QTY.
02	BRANCH NOZZLE L=310 ID 284.0 x Thk 40.0 Min	3-80-999-97690		SA 182 F22 CL3		A	79,000 1
01	BASE PIPE L = 900 ID 794.0 x Thk 40.0 Min	3-80-999-97690		SA 182 F22 CL3		A	698,000 1

TYPE OF PRODUCT  
OR NAME OF  
CUSTOMER/PROJECT



BHARAT HEAVY ELECTRICALS LTD.,  
PIPING CENTRE,  
CHENNAI 600 017

DRN	NAME	SIGN	DATE	NO OF ITEMS
	UBAITHULLAH	<i>Ubaithullah</i>	07.02.08	
CHD	R.ANANTH	<i>R.Ananth</i>	07.02.08	
APPD	S.JAYAKUMAR	<i>S.Jayakumar</i>	07.02.08	

REV	DATE	ALTD:
01		APPD:
ZONE		

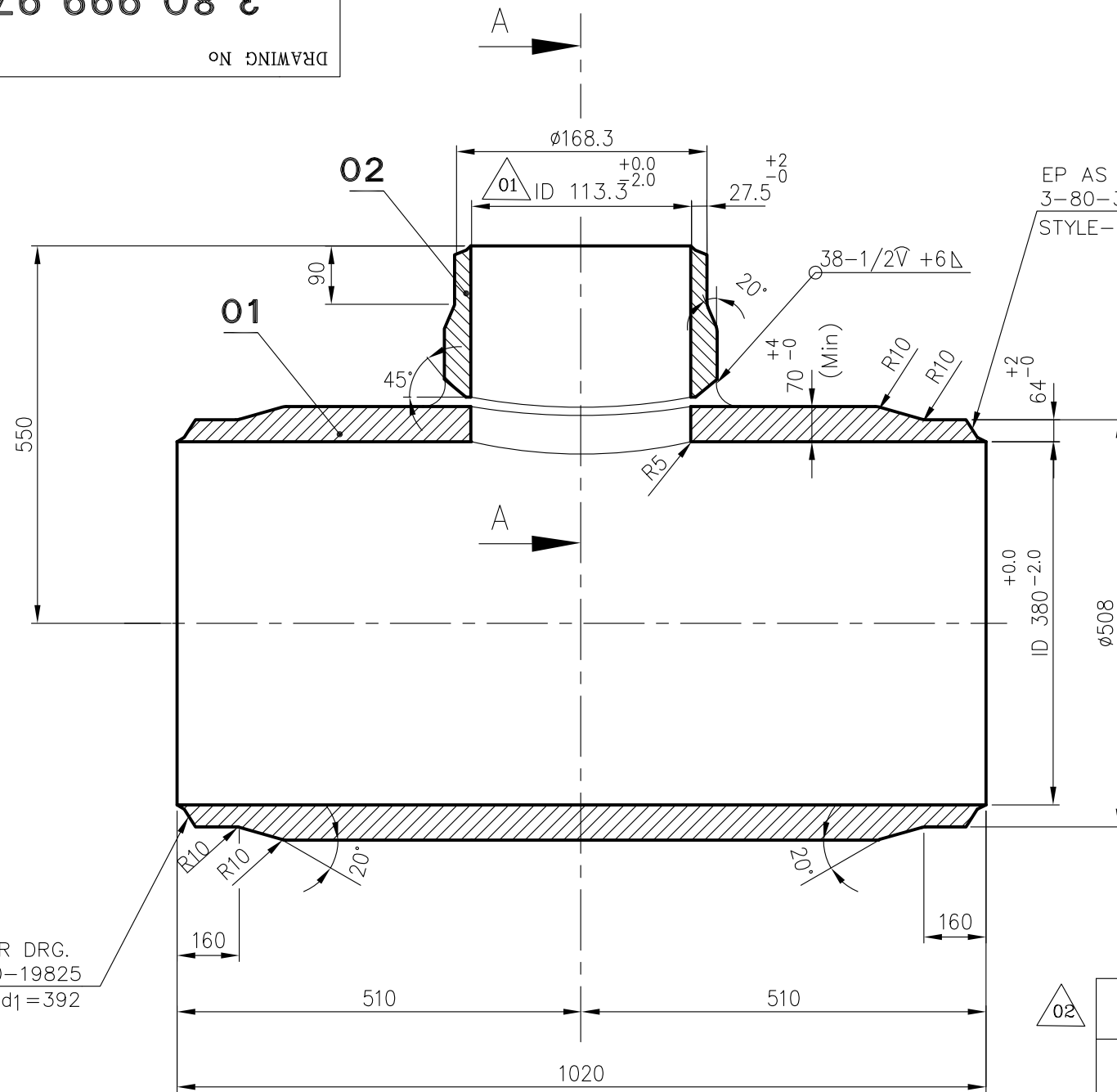
DEPT.	GRADE OF UN TOL DIM	SCALE	WEIGHT (Kg)	BHEL PO REF.NO:	ITEM No.
	C/M/F	N.T.S.	777.000	3-80-320-21357/01	
TITLE			CARD CODE	DRAWING No.	REV
FABRICATED UNEQUAL TEE (OD864.0x35.0/OD323.9x20.0)			U 01	3-80-999-97690	00



80776-666-08-C

DRAWING No

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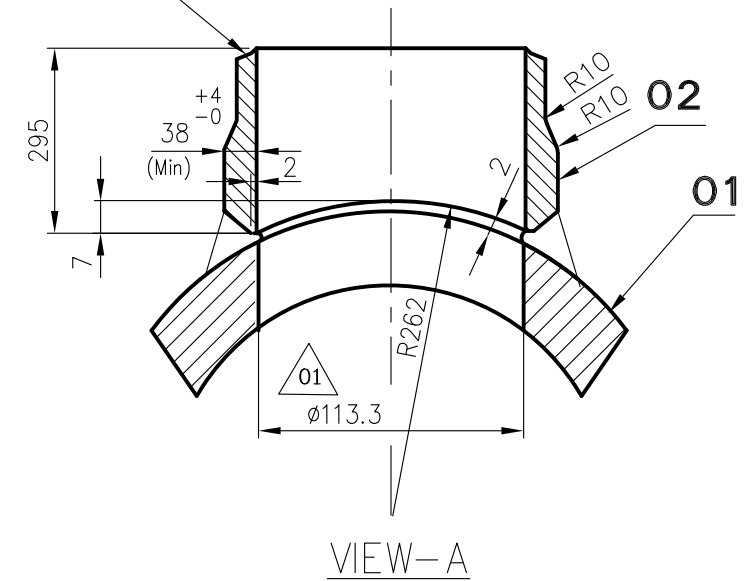


**NOTES :-**

- DESIGN PRESSURE : 320.0 Kg/Sq.Cm (g)
- DESIGN TEMPERATURE : 260° C
- FOLLOW TDG : 108
- PIPE SA106GRC(A) CAN ALSO BE USED IN PLACE OF SA105(A).

12.5

EP AS PER DRG. 3-80-300-19825 STYLE-P, d1=121.5



EP AS PER DRG. 3-80-300-19825 STYLE-P, d1=392

**STANDARD**

02	BRANCH NOZZLE L=295 ID 113.3 x Thk 38.0 Min	3-80-999-97708		SA 105	A	45.1000 1
01	BASE PIPE L = 1020 ID 380 x Thk 70.0 Min	3-80-999-97708		SA 105	A	807.862 1
ITEM NO.	DESCRIPTION	DRAWING NO.	ITEM NO.	MATERIAL CODE	A	UNIT WT.
			VAR NO.	MATERIAL SPEC.	C	QTY.

REV	DATE	ALTERED MRK
02	31.1.13	APPROVED CKN
ZONE	BOM REVISED AND MARKED AS 02	
REV	DATE	ALTERED P.JUDEANTONE
01	29.03.11	APPROVED A.P.M.K
ZONE	DIMENSION REVISED AND MARKED AS 01	

TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT



BHARAT HEAVY ELECTRICALS LTD.,  
PIPING CENTRE,  
CHENNAI 600 017

DRN	NAME	SIGN	DATE	NO OF ITEMS
CHD	UBAITHULLAH		07.02.08	
APPD	R.ANANTH		07.02.08	
	S.JAYAKUMAR		07.02.08	

DEPT.	GRADE OF UN TOL DIM	SCALE	WEIGHT (Kg).	REF TO MSE DRG. No.	ITEM No.
CODE	C/M/F	N.T.S.	852.862	3-80-425-24562/00	
TITLE	FABRICATED UNEQUAL TEE (OD 508.0x64.0/OD 168.3x27.5)		CARD CODE	DRAWING No.	REV
			U 01	3-80-999-97708	02

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3-80-999-97712

DRAWING No

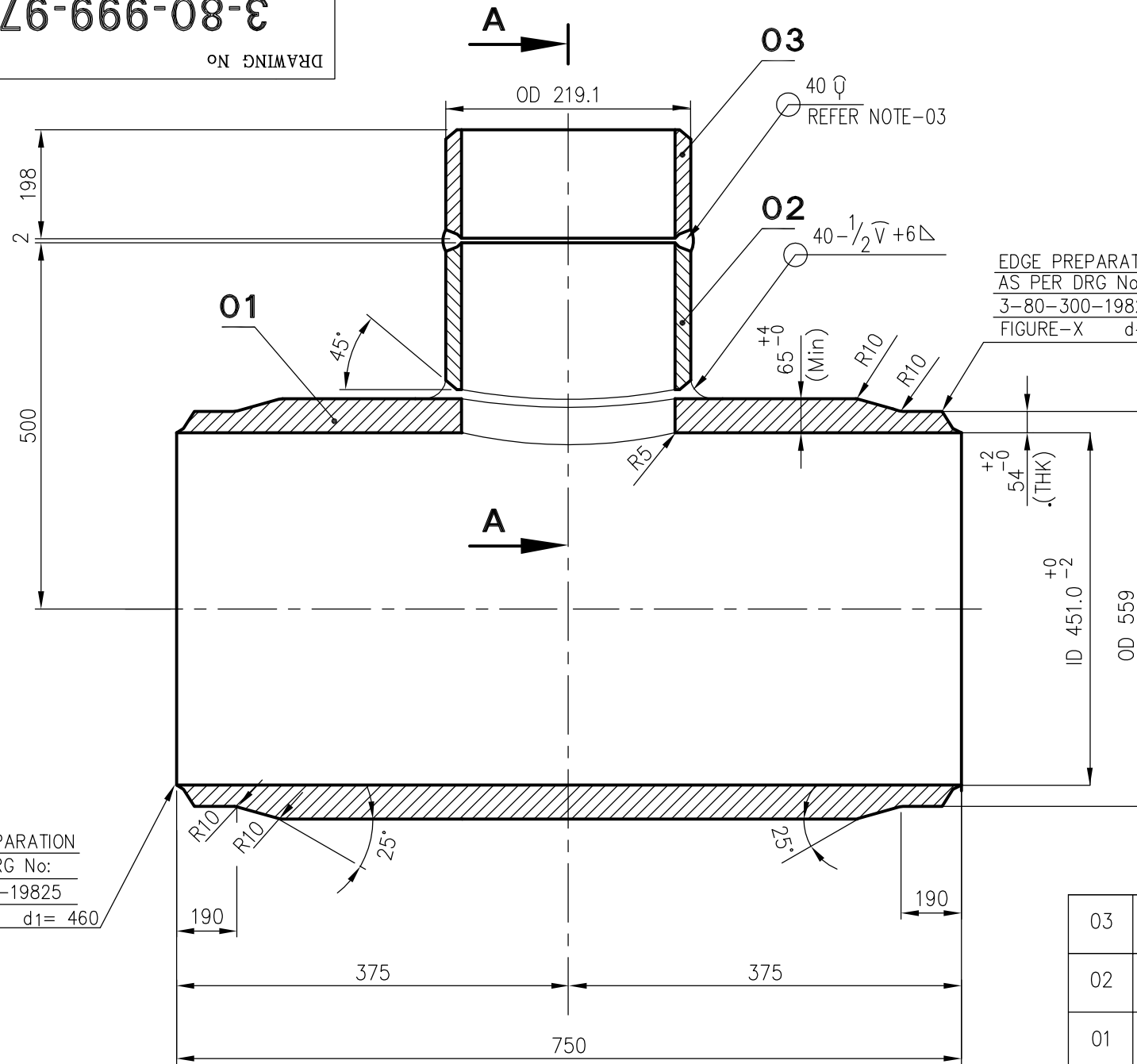
- NOTES :-**
- DESIGN PRESSURE : 200 Kg/Sq.Cm (g)  $\triangle 01$
  - DESIGN TEMPERATURE : 545° C  $\triangle 01$
  - FOLLOW TDG : 108
  - ELECTRODES TO BE USED ARE,

F91 TO F91 WELD	F91 TO P22 WELD
a) GTAW : ER90S-B9 (A)	a) GTAW : ER90S-G (A)
b) SMAW : E9015-B9 (A)	b) SMAW : E9018-B3 (A)

ELECTRODES GIVEN ABOVE ARE INDICATIVE. VENDOR TO GIVE WPS FOR BHEL'S APPROVAL.

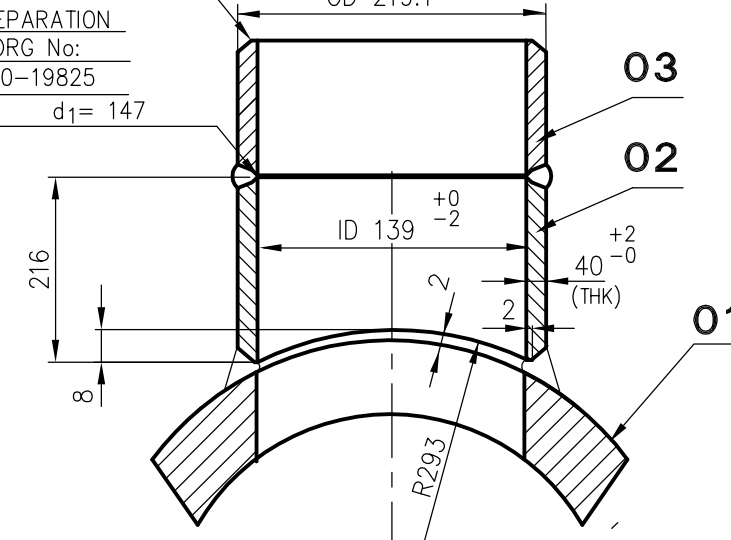
- PIPE SA335P91(A) CAN ALSO BE USED IN PLACE OF SA182F91(A).
- THE FINISHED MATERIAL SPECIFICATION WILL BE SA182F91(A)

UNDER MATERIAL CODE : **925057840000**  
OD 219.1



EDGE PREPARATION  
AS PER DRG No:  
3-80-300-19825  
FIGURE-X d1= 460

EDGE PREPARATION  
AS PER DRG No:  
3-80-300-19825  
FIGURE-X d1= 147



**SECTION-AA**

**STANDARD**

EDGE PREPARATION  
AS PER DRG No:  
3-80-300-19825  
FIGURE-X d1= 460

03	BRANCH PIPE L = 198 OD 219 x 40	3-80-999-97712		SA 335 P22	A	35,000 1
02	BRANCH NOZZLE L = 216 ID 139.0 x Thk 40.0 Min	3-80-999-97712		SA 182 F91	A	41,000 1
01	BASE PIPE L = 750 ID 451.0 x Thk 65.0 Min	3-80-999-97712		SA 182 F91	A	636,870 1
ITEM NO.	DESCRIPTION	DRAWING NO.	ITEM NO.	MATERIAL CODE	A	UNIT WT.
			VAR NO.	MATERIAL SPEC.	C	QTY.

TYPE OF PRODUCT  
OR NAME OF  
CUSTOMER/PROJECT



BHARAT HEAVY ELECTRICALS LTD.,  
PIPING CENTRE,  
CHENNAI 600 017

	NAME	SIGN	DATE	NO OF ITEMS
DRN	UBAITHULLAH		07.02.08	
CHD	R.ANANTH		07.02.08	
APPD	S.JAYAKUMAR		07.02.08	

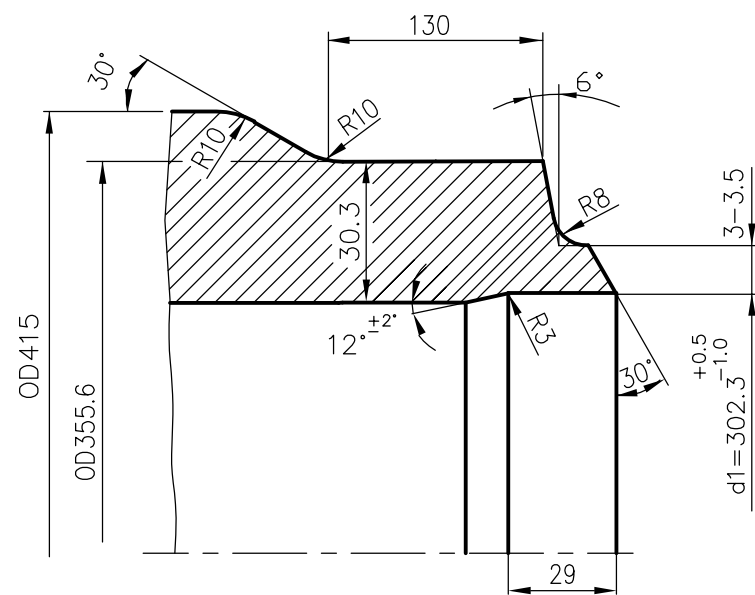
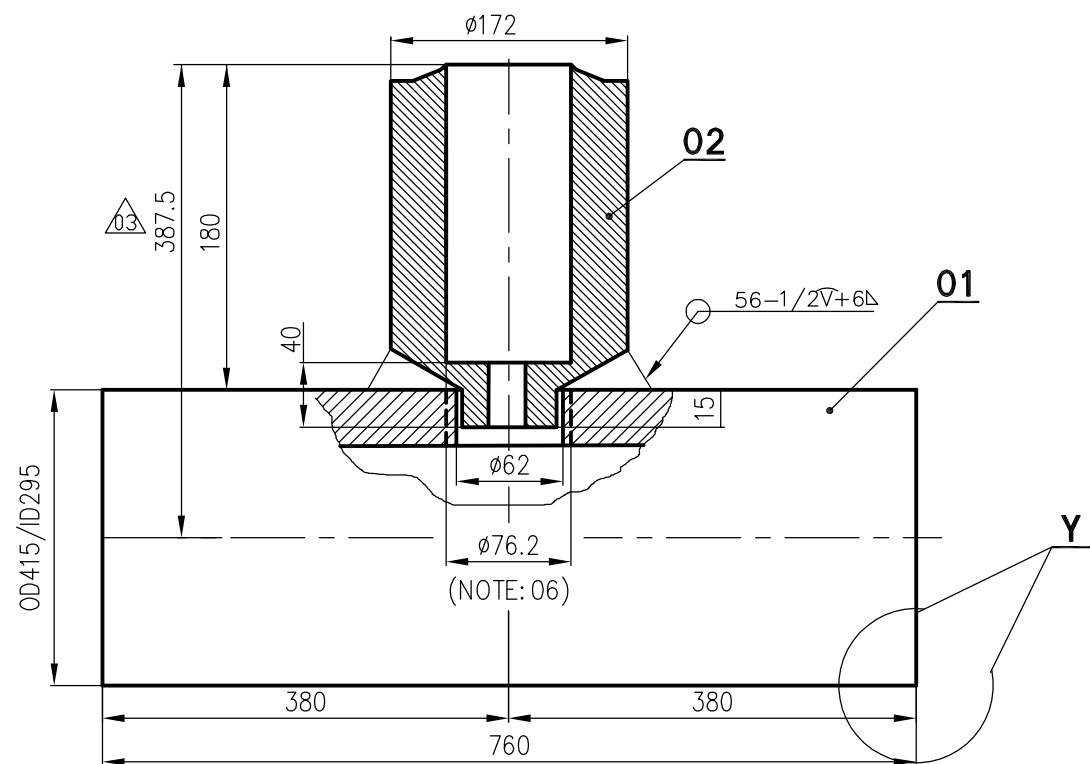
REV 01	DATE 25-02-11	ALTD APPD	JUDE ANTONE A.P.M.KUTTY
ZONE	DESIGN PRESSURE & DESIGN TEMPERATURE IS REVISED. NOTE-06 ADDED		
ALL REVISIONS INDICATED AS $\triangle 01$			

DEPT.	GRADE OF UN TOL DIM	SCALE	WEIGHT (Kg).	BHEL PO REF.NO:	ITEM No.
CODE	C/M/F	N.T.S.	712.870	3-80-301-24986/00	
TITLE			CARD CODE	DRAWING No.	REV
FABRICATED UNEQUAL TEE WITH MATCHING PIECE (OD559.0x54.0/OD219.1x40.0)			U 01	<b>3-80-999-97712</b>	<b>01</b>

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19776-666-08-3

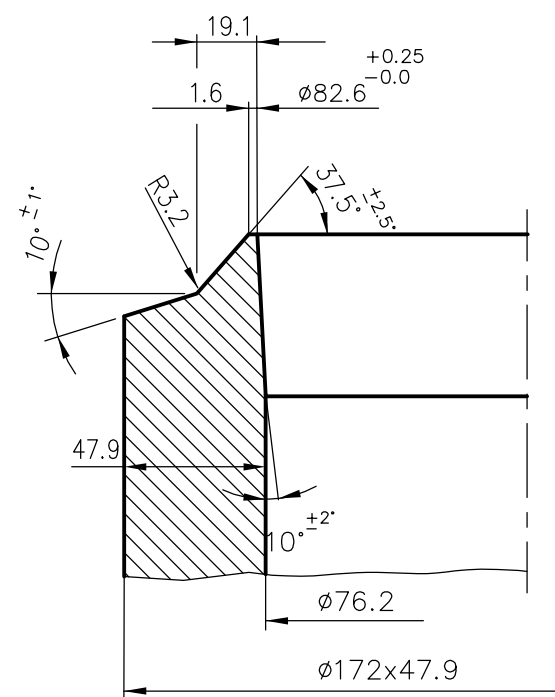
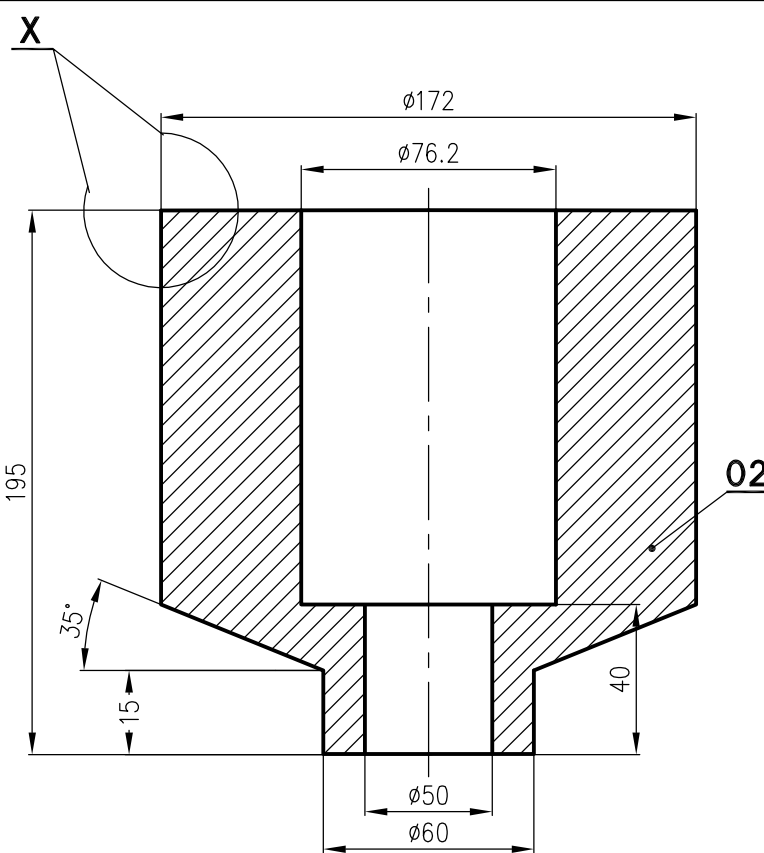
DRAWING No



DETAIL-Y

NOTES:

- DESIGN PRESSURE : 150 Kg/Sq.Cm (g)
- DESIGN TEMPERATURE : 540° C
- FOLLOW TDG : 109
- ELECTRODES TO BE USED ARE,
  - a) GTAW : ER90S-B9 (A)
  - b) SMAW : E9015-B9 (A)
 VENDOR TO GIVE WPS , PQR FOR BHEL'S APPROVAL.
- PIPE SA335P91(A) CAN ALSO BE USED IN PLACE OF SA182F91(A).
- AFTER WELDING THE STUB, BORE THROUGH TO  $\phi 76.2$
- FABRICATION, INSPECTION, TESTING AS PER IBR 1950.
- THE STOCK CODE FOR THE FINISHED COMPONENTS IS "925166940000"



DETAIL-X

STANDARD

ITEM NO.	DESCRIPTION	DRAWING NO.	ITEM NO. / VAR NO.	MATERIAL CODE / MATERIAL SPEC.	A / C	UNIT WT. / QTY.
02	STUB OD172/ ID50 L=195	3-80-999-97761		SA 182 F91	A	20,000 / 1
01	FORGING OD415/ID295 L=760	3-80-999-97761		SA 182 F91	A	399,000 / 1

TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT

BHARAT HEAVY ELECTRICALS LTD., PIPING CENTRE, CHENNAI 600 017	DRN	NAME	SIGN	DATE	NO OF ITEMS
	CHD	S.Rajju		01.02.10	
	APPD	S.R.Murthy		01.02.10	
				01.02.10	

DEPT. CODE	GRADE OF UN TOL DIM	SCALE	WEIGHT (Kg)	REF TO ASSY / OLD DRG	ITEM No.
	C/M/F		419.000		

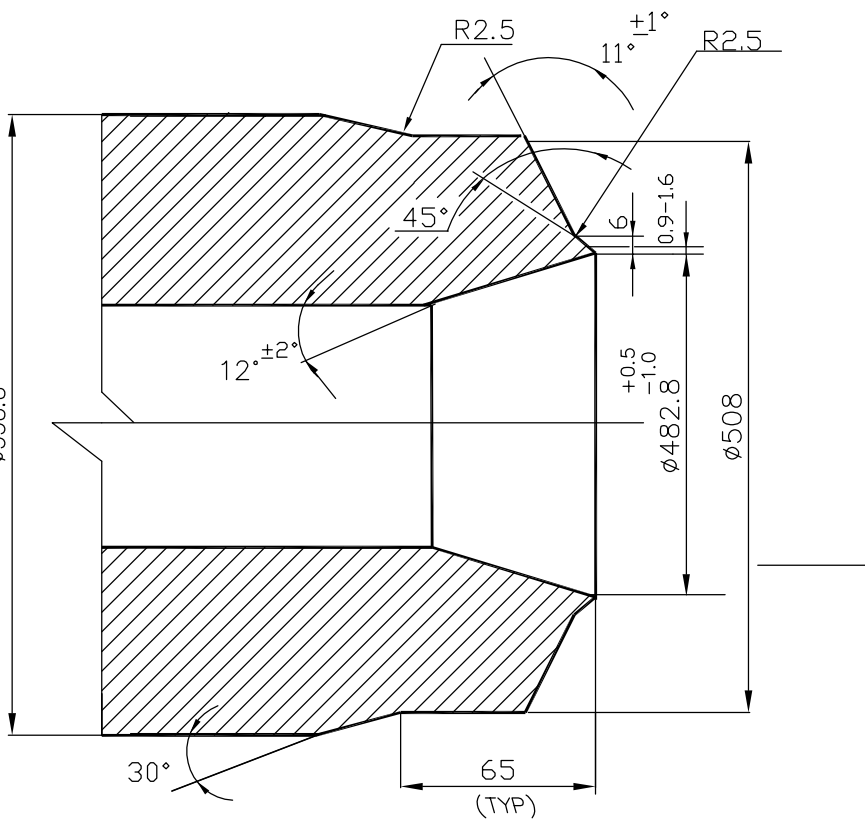
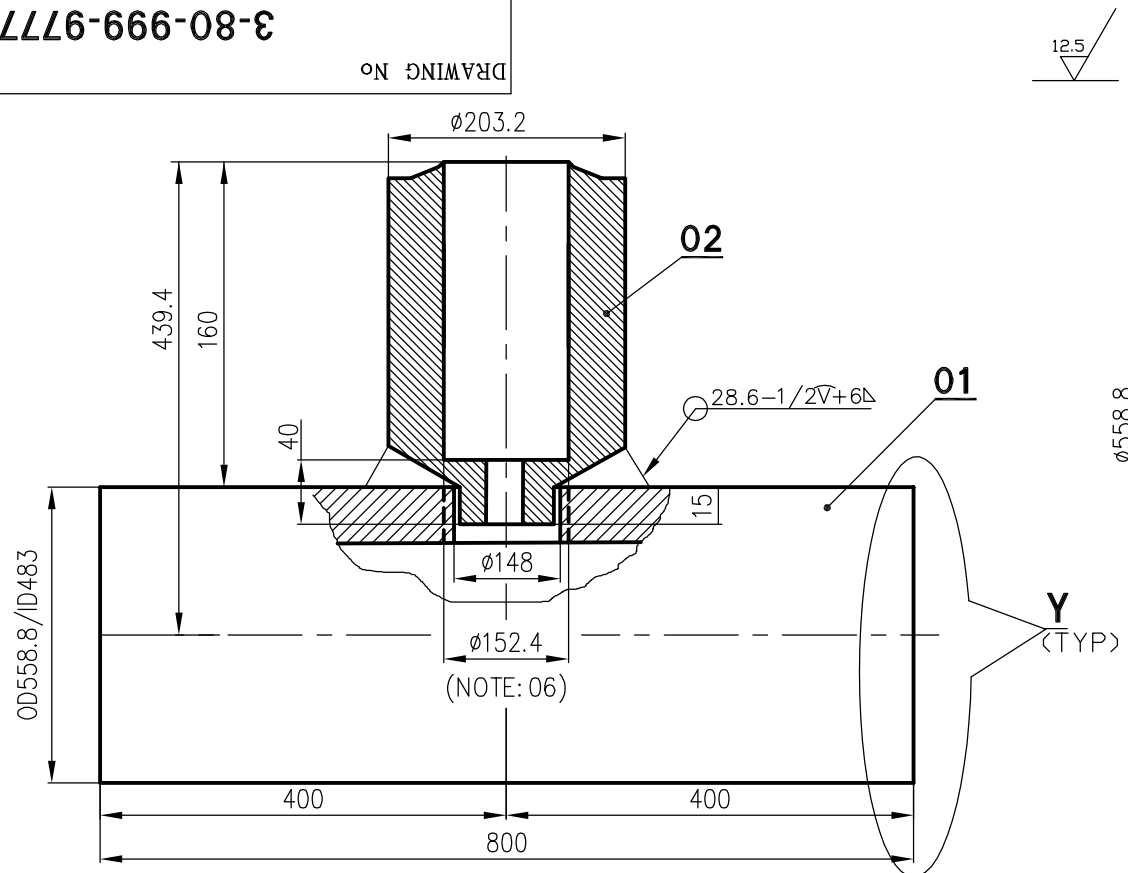
TITLE	CARD CODE	DRAWING No.	REV
<b>PIPE WITH STUB (MS-SV) F91 ( NB350 )</b>	U 01	<b>3-80-999-97761</b>	<b>03</b>

REV	DATE	ALTERED S.RAJU	REV	DATE	ALTERED S.RAJU	REV	DATE	ALTERED S.RAJU
03	27.09.10	APPROVED S.R.MURTHY	02	05.03.10	APPROVED S.R.MURTHY	01	24.02.10	APPROVED S.R.MURTHY
ZONE	BRANCH LENGTH MARKED	ALTD AS	ZONE	TITLE REVISED	TDG NO. REVISED	ZONE	TITLE REVISED	

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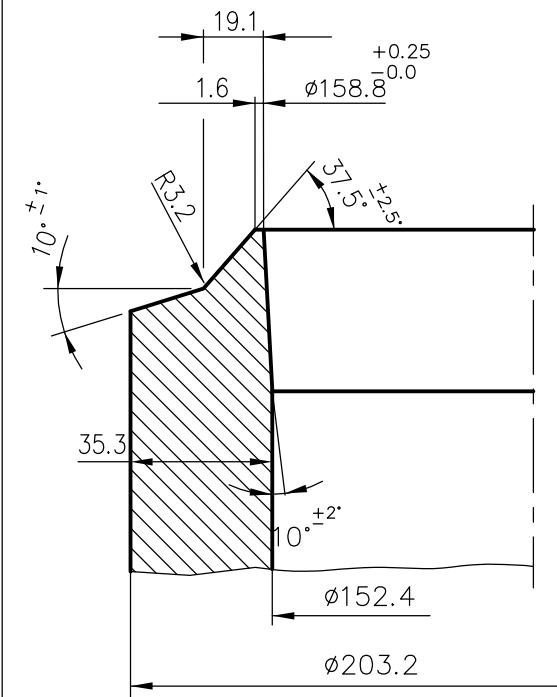
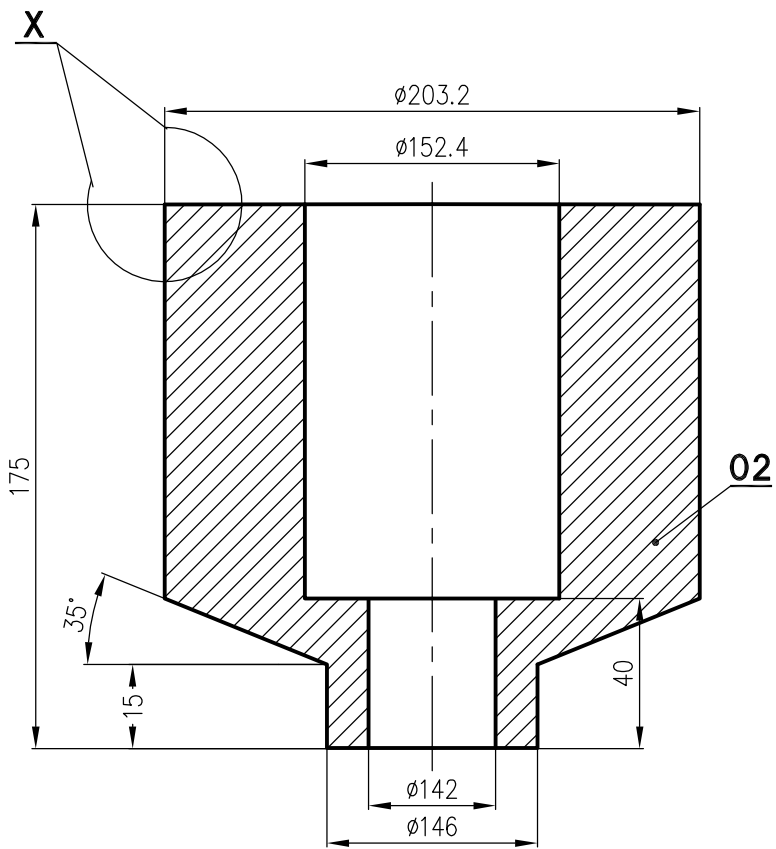
3-80-999-9777

DRAWING No



NOTES:

1. DESIGN PRESSURE : 45 Kg/Sq.Cm (g)
2. DESIGN TEMPERATURE : 360 C
3. FOLLOW TDG : 109
4. ELECTRODES TO BE USED ARE,
  - a) GTAW : ER 70S-A1 (A)
  - b) SMAW : E7018-A1 (A)
 VENDOR TO GIVE WPS, PQR FOR BHEL'S APPROVAL
5. PIPE SA106GRC (A) CAN ALSO BE USED IN PLACE OF SA105(A).
6. AFTER WELDING THE STUB, BORE THROUGH TO  $\phi 152.4$
7. FABRICATION, INSPECTION, TESTING AS PER IBR 1950.
8. THE STOCK CODE FOR THE FINISHED COMPONENT IS "925166980000"



DETAIL-X

STANDARD

DETAIL-Y

ITEM NO.	DESCRIPTION	DRAWING NO.	ITEM NO.	MATERIAL CODE	A	UNIT WT.
VAR NO.				MATERIAL SPEC.	C	QTY.
02	STUB OD203.2 L=175	3-80-999-97777		SA 105	A	17,900
01	FORGING OD558.8/ID483 L=1000	3-80-999-97777		SA 105	A	389,400

TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT

BHARAT HEAVY ELECTRICALS LTD., PIPING CENTRE, CHENNAI 600 017	DRN	NAME	SIGN	DATE	NO OF ITEMS
	CHD	S.Rajju		25.02.10	
	APPD	S.R.Murthy		25.02.10	
				25.02.10	

DEPT.	GRADE OF UN TOL DIM	SCALE	WEIGHT (Kg).	REF TO ASSY / OLD DRG	ITEM No.
CODE	C/M/F		407.300		
TITLE	CARD CODE		DRAWING No.	REV	
PIPE WITH STUB (CRH-SV) SA105 ( NB500 )	U 01	3-80-999-97777	01		

REV 01	DATE 05.03.10	ALTERED S.R.MURTHY
		APPROVED C.V. NATHAN
ZONE	TDG No. AND ELECTRODE DETAIL INDICATED TITLE REVISED	

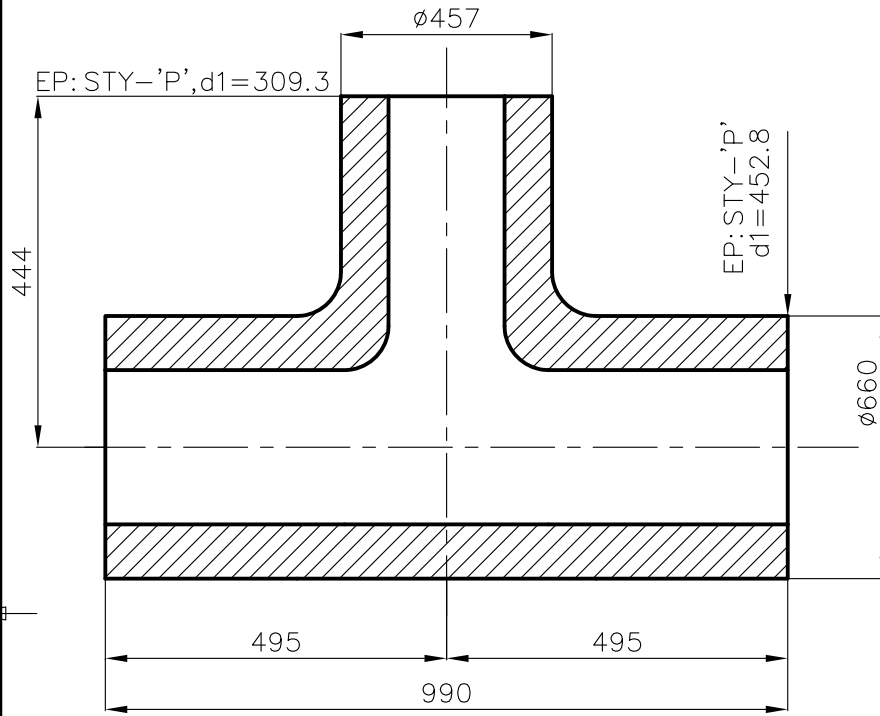
ALL DIMENSIONS ARE IN MILLIMETRES

REV	DATE	ALTERED
01		APPROVED

ALL DIMENSIONS ARE IN MM

12.5


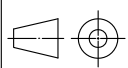
CAUTION: The information on this document is the property of BHARAT HEAVY ELECTRICALS LTD. It must not be used directly or indirectly in any way detrimental to the interest of the company.



NOTES

1. FITTING SHALL CONFIRM TO ASME B16.9.
2. ALL DIMENSIONS SHOWN ARE FINISHED DIMENSIONS.
3. ROUND OFF ALL SHARP CORNERS.
4. EDGE PREPERATION SHALL BE DONE AS PER DRG. NO. 3-80-300-19825.

VARIANT NO.	ASME B16.9 BW UNEQUAL TEE ø660X116/ø457X82	STD	92 505 217 0000	A	UNIT	3013 000
			SA105			1
DESCRIPTION			MATL. CODE	A	UNIT	UNIT.WT.(Kg)
			MATL. SPECN.			C

	BHARAT HEAVY ELECTRICALS LIMITED			NAME	SIGN	DATE	NO. OF VAR
	PIPING CENTRE			DRN	MANOJ	07.09.12	
	CHENNAI 600 017			CHD	K.BOOPALAN	07.09.12	
				APPD	S.PANDA	07.09.12	
DEPT	GRADE OF UNTOL. DIM		SCALE	WEIGHT (KG).	REF. TO ASSY./OLD DRG.	ITEM NO.	NO. OF ITEMS
CODE	C / M / F		N.T.S				
TITLE				CARD CODE	DRAWING NO.		REV
ASME B16.9 BW UNEQUAL TEE ø660X116/ø457X82				U 01	4-80-423-75899		00

Size A4