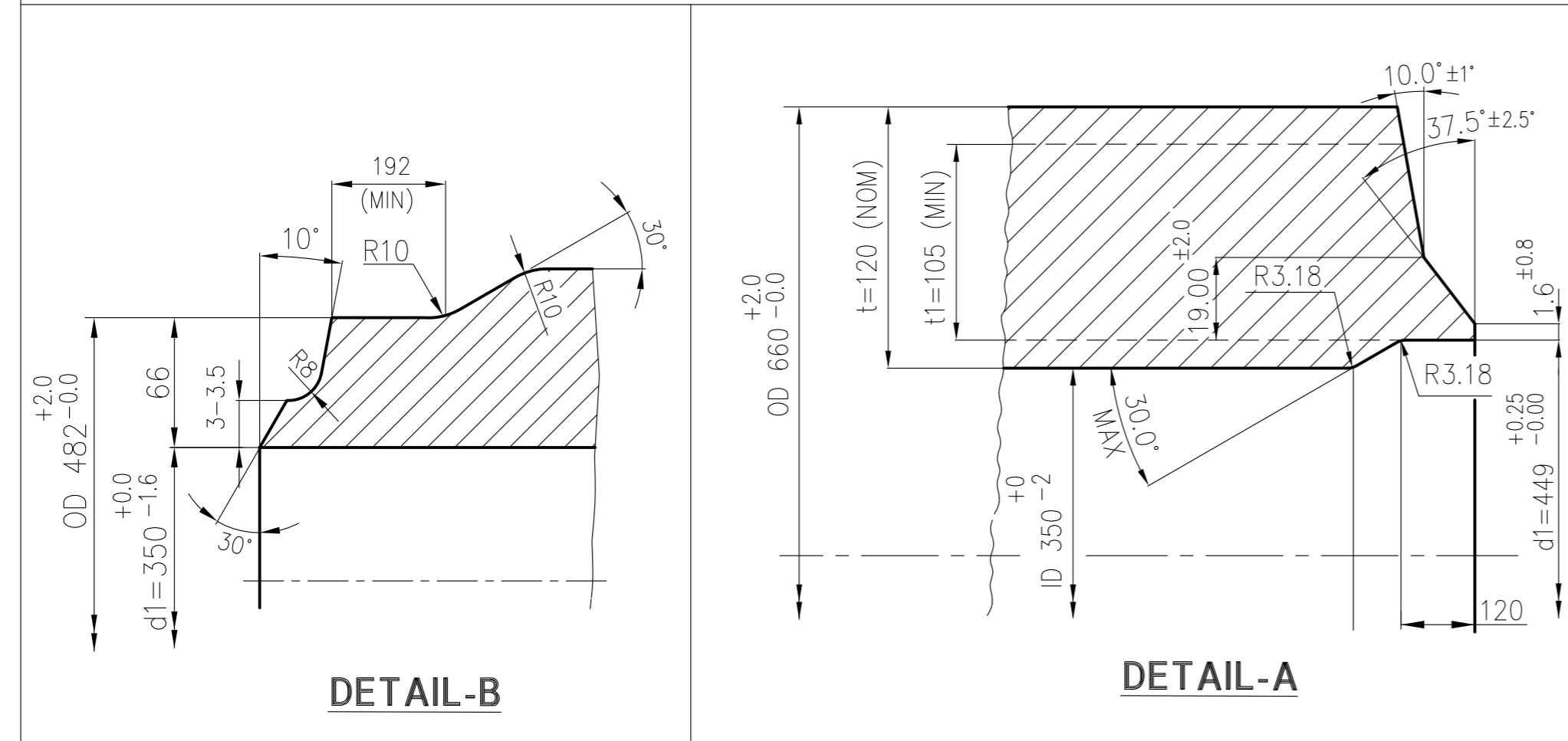
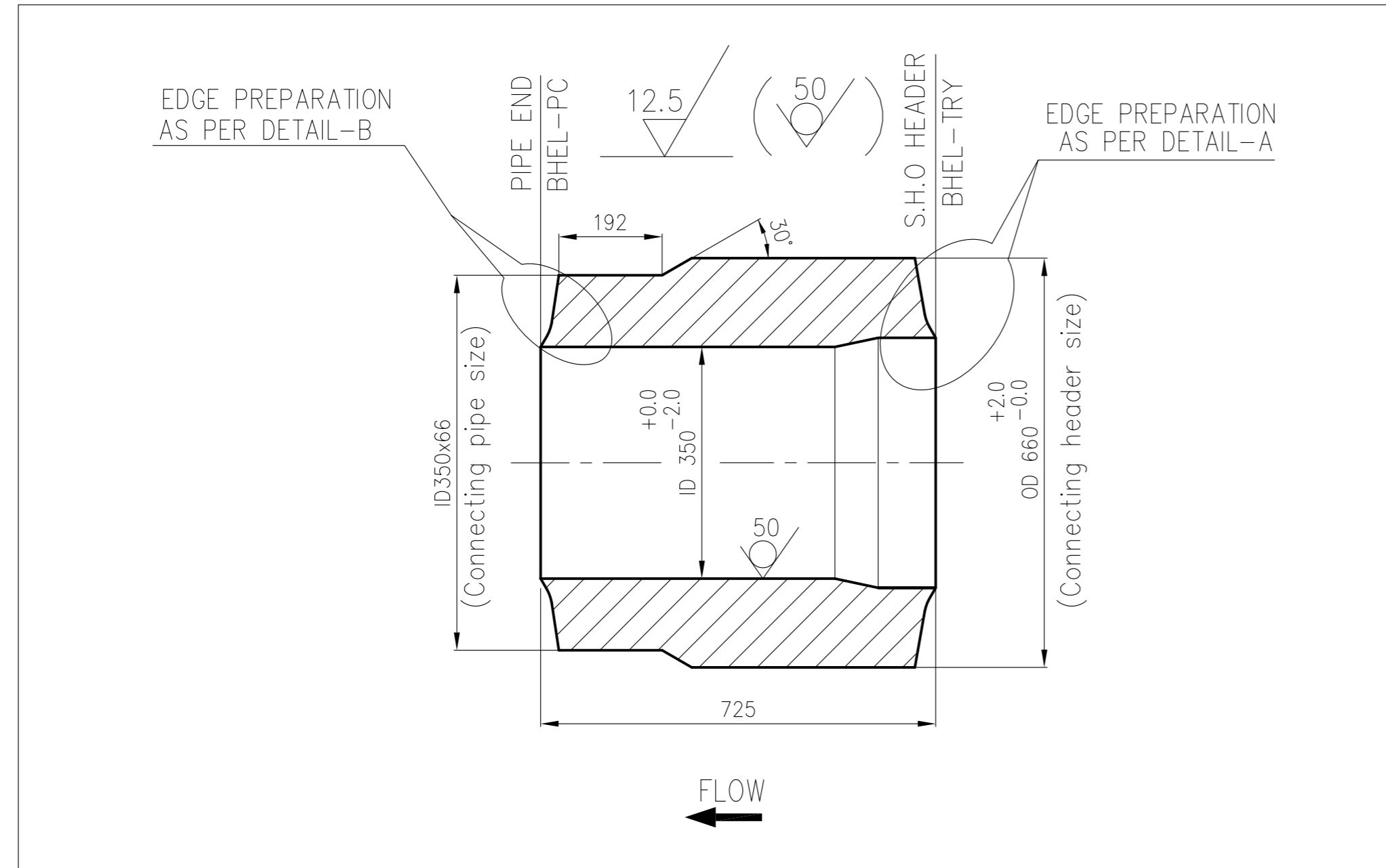


3-80-300-32308
DRAWING No

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NOTES

- DESIGN PRESSURE : 271 Kg/Cm²(g)
- DESIGN TEMPERATURE : 573 °C
- 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)
- THE FINISHED MATERIAL CODE IS '92 117 067 0000'
- FOLLOW TDC No. : TDG-104 (LATEST REVISION)
- WEIGHT INDICATED IS FOR APPROXIMATE FINISHED MATCHING PIECE WEIGHT.

01	FORGING OD660 / ID350 L=725	3-80-300-32308		-	A	980,000
ITEM NO.	DESCRIPTION	DRAWING NO.	ITEM NO.	MATERIAL CODE	A	UNIT WT.
			VAR NO.	MATERIAL SPEC.	C	QTY.

SPACE FOR IBR APPL.



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

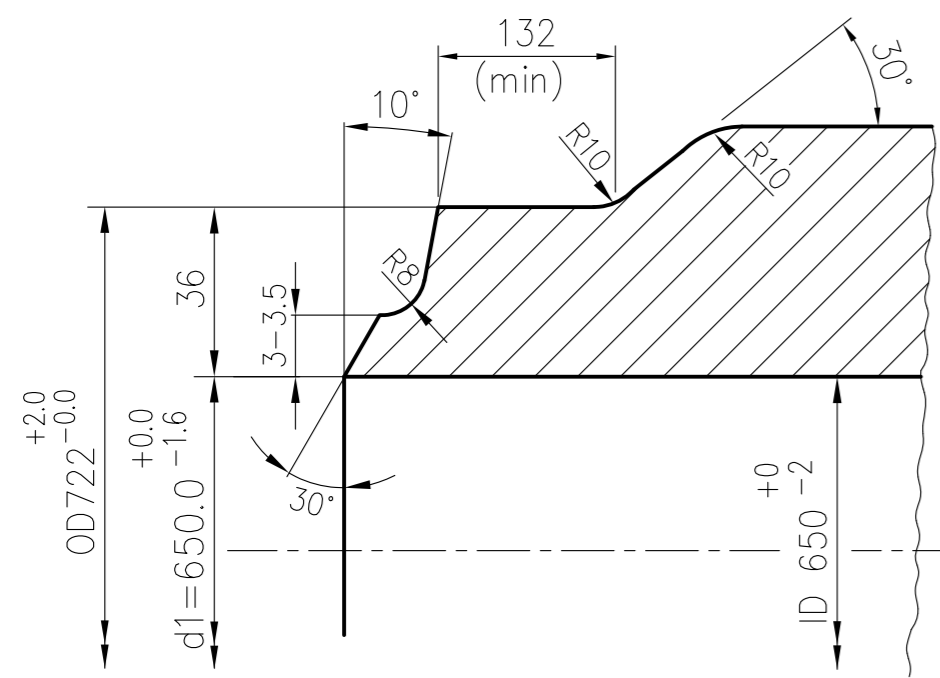
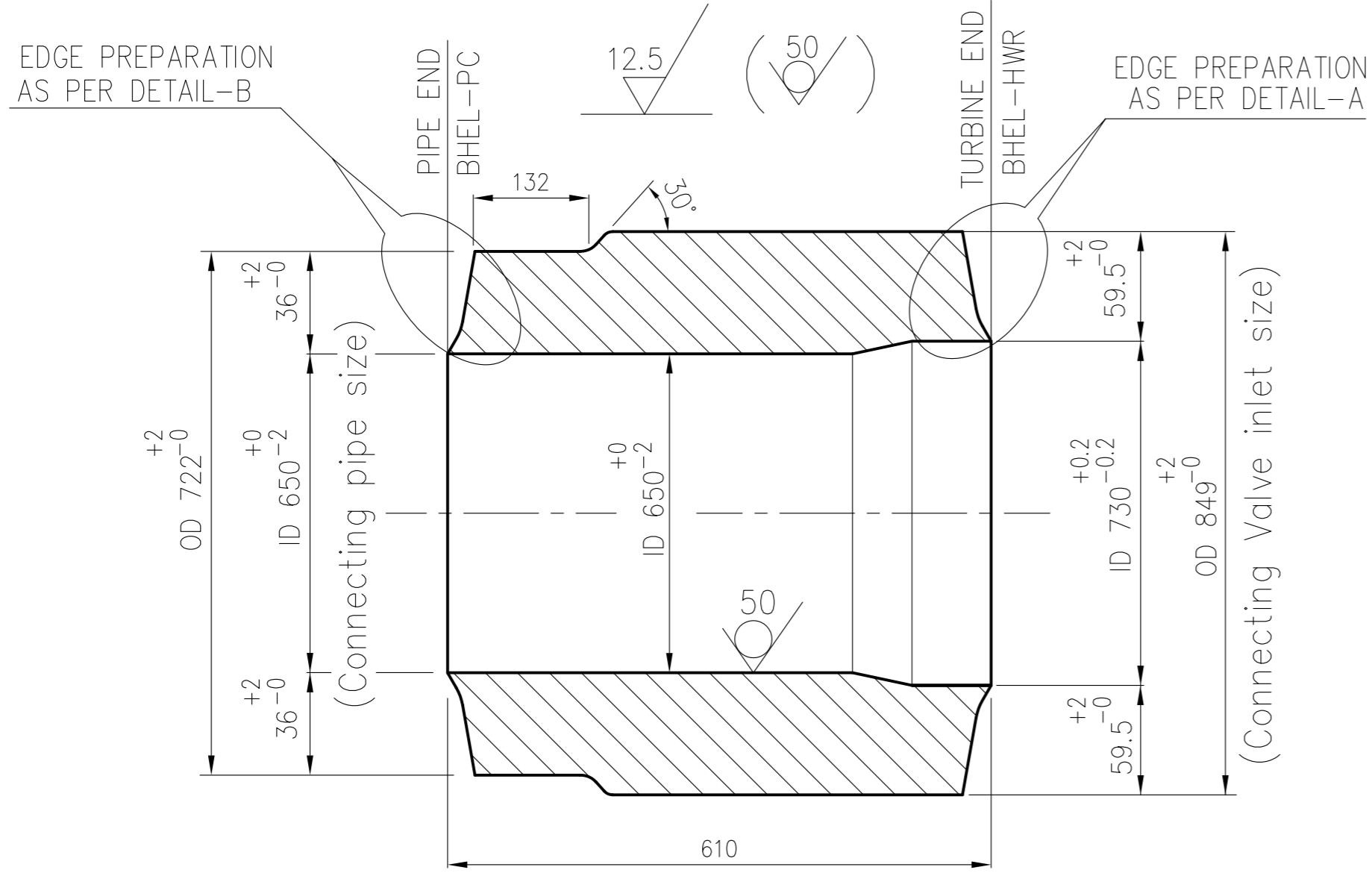
	NAME	SIGN	DATE	NO OF ITEMS
DRN	I.BISWAS	_sd_	20.08.2015	-
CHD	I.BISWAS	_sd_	20.08.2015	-
APPD	S.RAMAMURTHY	_sd_	20.08.2015	-

REV 01	DATE	ALTD APPD
ZONE		

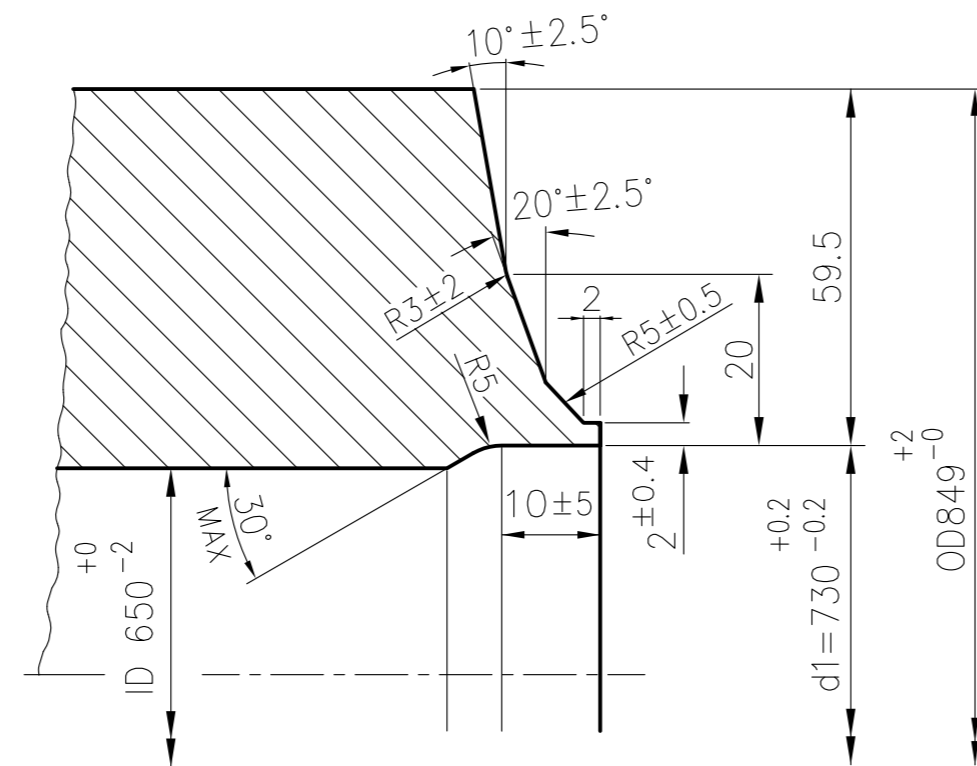
DEPT.	GRADE OF UN TOL. DIM	SCALE	WEIGHT (Kg).	BHEL PO REF.NO:	ITEM No.
CODE	C/M/F	N.T.S.	980.000	-	-
TITLE	MATCHING PIECE (OD660x120/ID350x66)		CARD CODE	DRAWING No.	REV
			U 01	3-80-300-32308	00

3-80-310-32222
DRAWING No

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DETAIL-B



DETAIL-A

NOTES

- DESIGN PRESSURE : 68 Kg/Cm²(g)
- DESIGN TEMPERATURE : 601 °C
- 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)
- THE FINISHED MATERIAL CODE IS '92 117 078 0000'
- FOLLOW TDC No. : TDG-104 (LATEST REVISION)
- WEIGHT INDICATED IS FOR APPROXIMATE FINISHED MATCHING PIECE WEIGHT.

01	FORGING OD849 / ID650 L=610	3-80-310-32222		-	A	890,000
ITEM NO.	DESCRIPTION	DRAWING NO.	ITEM NO.	MATERIAL CODE	A	UNIT WT.
			VAR NO.	MATERIAL SPEC.	C	QTY.

SPACE FOR IBR APPL.



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

	NAME	SIGN	DATE	NO OF ITEMS
DRN	I.BISWAS	Sd/-	05.06.2015	-
CHD	I.BISWAS	Sd/-	05.06.2015	-
APPD	S.RAMAMURTHY	Sd/-	05.06.2015	-

REV 01	DATE	ALTD APPD
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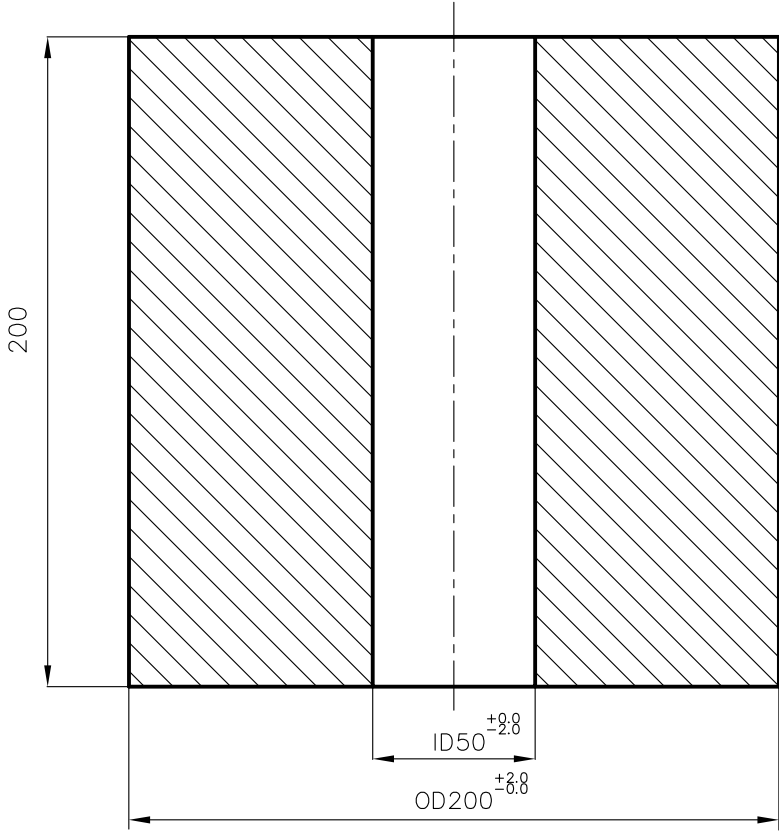
DEPT.	GRADE OF UN TOL. DIM	SCALE	WEIGHT (Kg).	BHEL PO REF.NO:	ITEM No.
CODE	C/M/F	N.T.S.	890.000	-	-

TITLE	CARD CODE	DRAWING No.	REV
MATCHING PIECE (OD849x59.5/ID650x36)	U 01	3-80-310-32222	00


ALL DIMENSIONS ARE IN MILLIMETRES

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REV	DATE	ALTERED
01		APPROVED



	HOLLOW FORGING OD200 / ID50	92 084 110 0000	A	93	00
		SA 182 F91			
VAR NO.	DESCRIPTION	MATL. CODE	A	UNIT.WT.(Kg)	
		MATL. SPECN.	C	QTY.	

	BHARAT HEAVY ELECTRICALS LIMITED PIPING CENTRE CHENNAI 600 017		DRN	PAVANKUMAR	SIGN	DATE	NO. OF VAR
			CHD	PAVANKUMAR		01.06.12	
			APPD	C KARUNAKARAN		01.06.12	
DEPT	GRADE OF UNTOL. DIM	SCALE	WEIGHT (KG).	BHEL PO REF.NO:		ITEM NO.	NO. OF ITEMS
CODE	C / M / F	N.T.S	93.000				
TITLE			CARD CODE	DRAWING NO.		REV	
HOLLOW FORGING OD200 / ID50			U 01	4-80-300-75314		00	

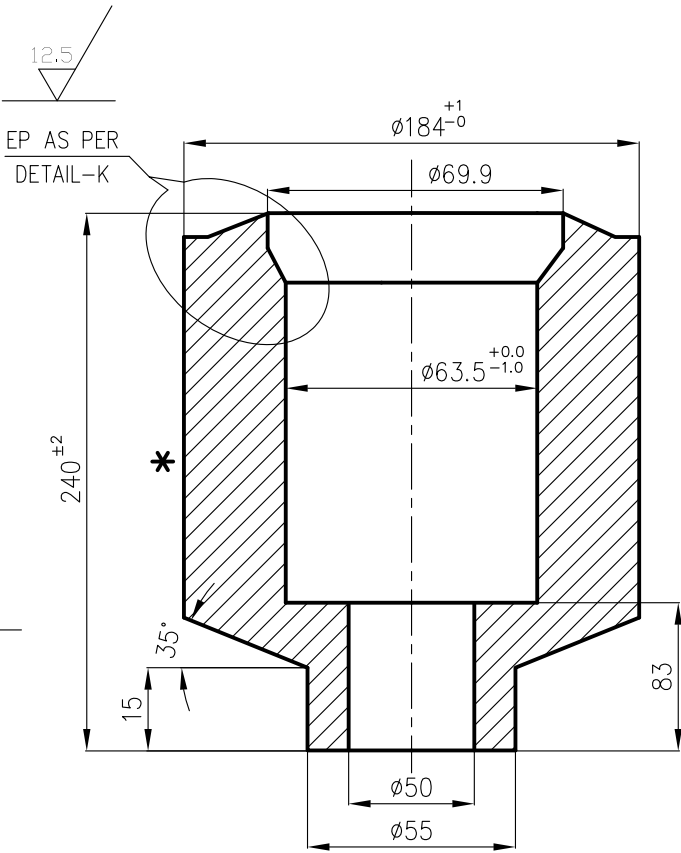
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REV 01	DATE	ALTERED
		APPROVED

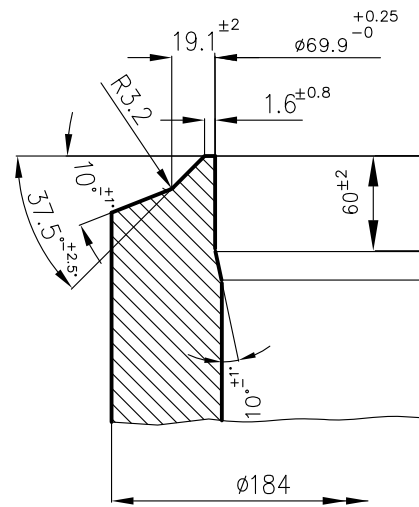
ALL DIMENSIONS ARE IN MILLIMETRES

NOTES:

- 01 DESIGN PRESSURE : 272.4 kg/sq.cm(g)
- 02 DESIGN TEMPERATURE : 573 °C
- 03 HARD PUNCH "F91" AT PLACE MARKED WITH *
- 04 ALTERNATE/SUITABLE SIZE OF SA182 F91 FORGING CAN ALSO BE USED.
- 05 FOLLOW TDC: TDG:104, REV.04
- 06 THIS STUB IS REQUIRED FOR MS SYSTEM OF OTSC BOILERS



DETAIL-K



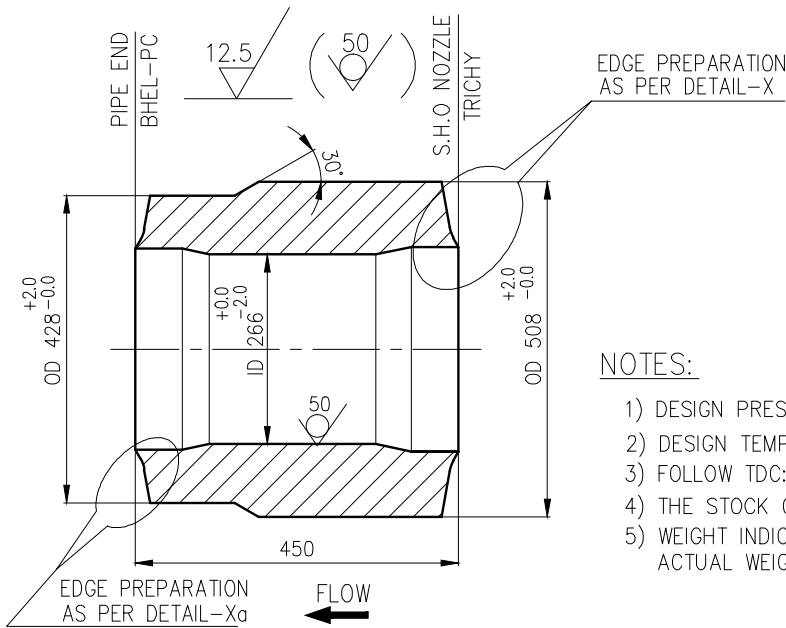
	FORGED STUB L=240 OD184/ID50	92 516 778 0000	A	42 000
		SA182F91		
VAR NO.	DESCRIPTION	MATL. CODE	A	UNIT
		MATL. SPECN.	C	DI
				UNIT.WT.(Kg)
				QTY.

	BHARAT HEAVY ELECTRICALS LIMITED		DRN	NAME	SIGN	DATE	NO.OF VAR
	PIPING CENTRE		CHD	C.DEEPAK		14.05.14	
	CHENNAI 600 017		APPD	M.MANO		14.05.14	
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	42.000				
TITLE			CARD CODE	DRAWING NO.			REV
SAFETY VALVE STUB OD 184 SA182F91			U 01	4-80-300-77989			00

ALL DIMENSIONS ARE IN MILLIMETRES

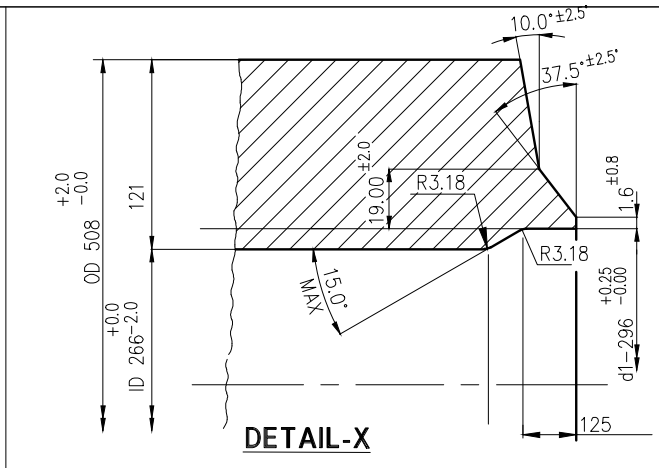
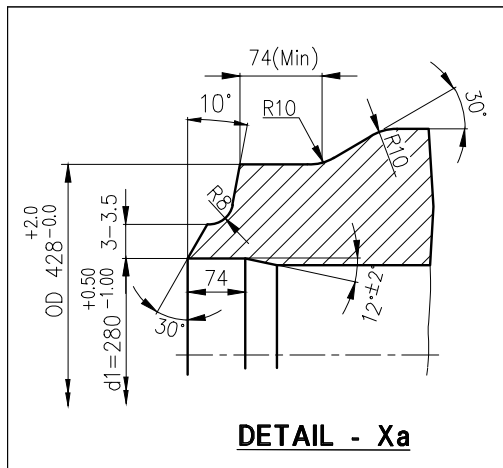
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IN ANY WAY DETRIMENTAL TO THE INTEREST OF BHEL

REV 01	DATE	ALTERED : CHD & APPD :	REV 02	DATE	ALTERED : CHD & APPD :	REV 03	DATE	ALTERED : CHD & APPD :
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NOTES:

- 1) DESIGN PRESSURE : 286.0 Kg/sq.cm(g)
- 2) DESIGN TEMPERATURE : 601 °C
- 3) FOLLOW TDC:104 LATEST REVISION
- 4) THE STOCK CODE FOR THE MATCHING PIECE:921170290000
- 5) WEIGHT INDICATED IN THE DRG IS INDICATIVE ONLY, ACTUAL WEIGHT SHALL BE FURNISHED BY FITTING SUPPLIER



VARIANT NUMBER	DESCRIPTION	STD	MATCHING PIECE OD508x121/ID280x74 L=450	92 117 029 0000	A	UNIT	376	000
				SA 182 F91				
			MATERIAL CODE				UNIT WEIGHT(KG)	
			MATERIAL SPECN				QUANTITY	

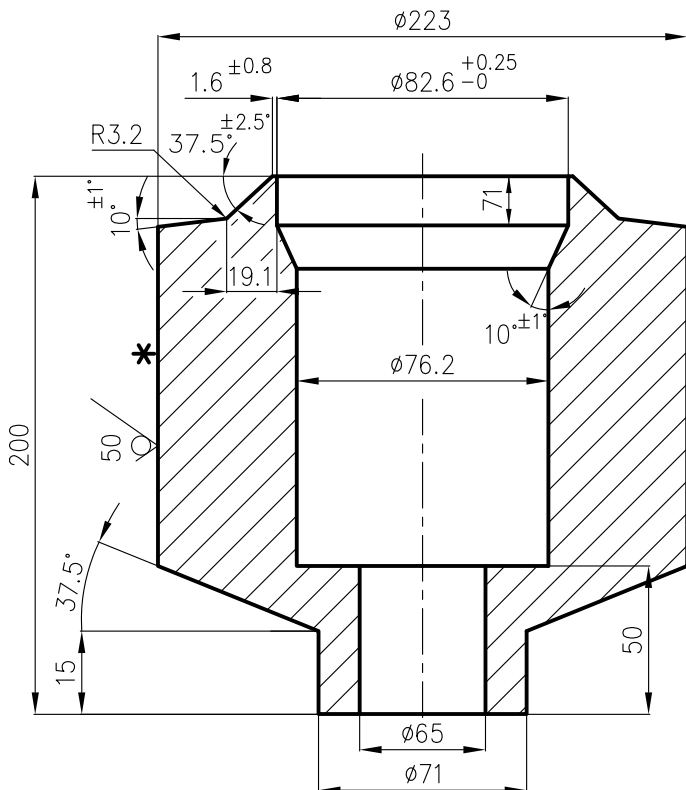
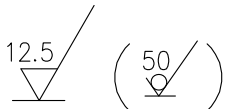
	BHARAT HEAVY ELECTRICALS LIMITED PIPING CENTRE CHENNAI 600 017			DRN	NAME M.R.KRISHNA	SIGNATURE Sd.....	DATE 30.04.15
				CHD	I.D.B.RAJU	Sd.....	30.04.15
				APPD	S.RAMAMURTHY	Sd.....	30.04.15
DEPT	ALL DIMENSIONS ARE IN MM	PROJECTION	SCALE N.T.S	WEIGHT (Kg) 376.0	REF TO ASSY / OLD DWG		
TITLE MATCHING PIECE OD508x121/ID280x74					DRAWING NO : 4-80-300-79032		REV 00

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REV	DATE	ALTERED :
01		APPROVED :

NOTES:

- 01 DESIGN PRESSURE : 270.3kg/sq.cm(g)
- 02 DESIGN TEMPERATURE : 573°C
- 03 HARD PUNCH "F91" AT PLACE MARKED WITH *
- 04 FOLLOW TDC: TDG:104 (LATEST REVISION).
- 05 THIS STUB IS REQUIRED FOR MS SYSTEM OF OTSC BOILERS.



			92-516-108-0000	A		39 000
			SA182F91			
VAR NO.	DESCRIPTION	STD	MATL. CODE	A	UNIT	UNIT.WT.(Kg)
			MATL. SPECN.	C	DI	QTY.

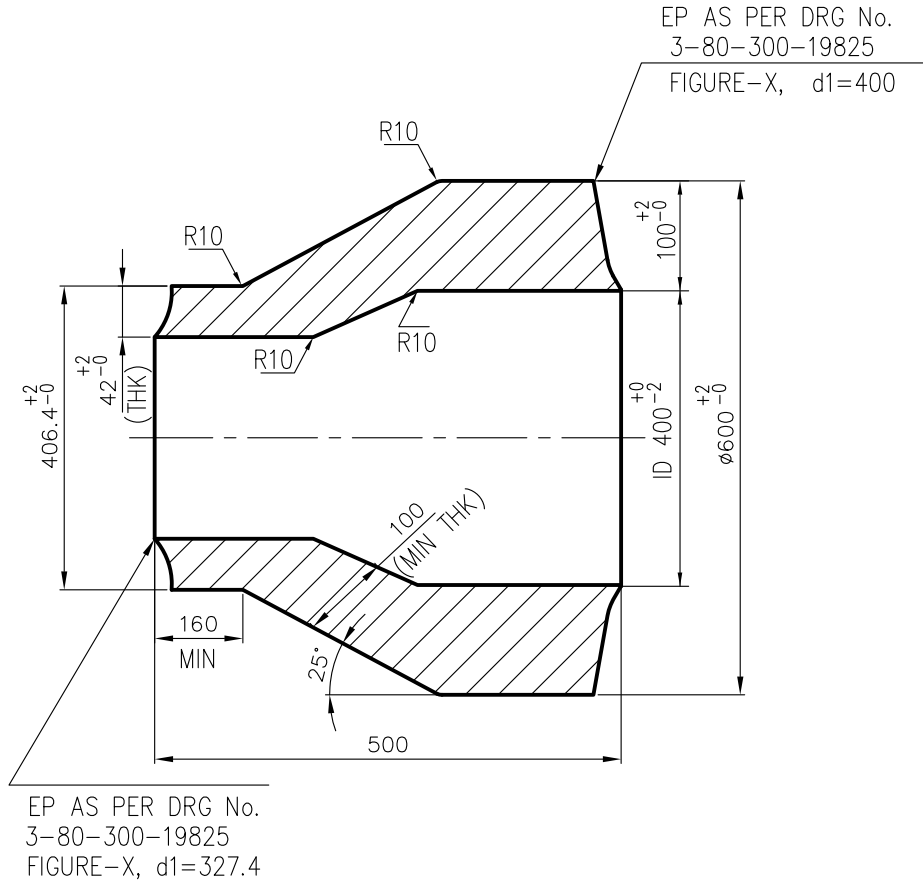
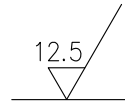
	BHARAT HEAVY ELECTRICALS LIMITED PIPING CENTRE CHENNAI 600 017		DRN	I.BISWAS	SIGN	Sd/-	DATE	11.05.15	NO.OF VAR
			CHD	I.BISWAS			DATE	11.05.15	
			APPD	S.RAMAMURTHY			DATE	11.05.15	
DEPT	GRADE OF UNTOL.DIM	SCALE	WEIGHT (KG).	REF. TO ASSY./OLD DRG.			ITEM NO.	NO. OF ITEMS	
CODE	C / M / F	N.T.S	39.000						
TITLE				CARD CODE	DRAWING NO.				REV
SAFETY VALVE STUB OD223 L200, d1=82.6 - SA182F91				U 01	4-80-300-79239				00

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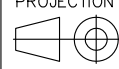
REV 01	DATE	ALTERED :
		CHD & APPD :

NOTES:

- 1) DESIGN PRESSURE : 200 Kg/sq.cm(g)
- 2) DESIGN TEMPERATURE : 545°C
- 3) FOLLOW APPLICABLE QCP



VARIANT NUMBER	MATCHING PIECE ID400MAX X 100 THK MIN OD406.4X42	STD	XX XXX XXX XXXX	A	308	600
			SA 182 F91			
DESCRIPTION			MATERIAL CODE	A/C/P	UNIT	UNIT WEIGHT(KG)
			MATERIAL SPECN			QUANTITY

	BHARAT HEAVY ELECTRICALS LIMITED PIPING CENTRE CHENNAI 600 017		DRN	NAME EZHIL KUMAR	SIGNATURE	DATE 01.12.14
			CHD	KONDAPANAU DU		01.12.14
			APPD	R.SESHAGIRI		01.12.14
DEPT BM	ALL DIMENSIONS ARE IN MM	PROJECTION 	SCALE N.T.S	WEIGHT (Kg) 308.600	REF TO ASSY / OLD DWG	
CODE 121	TITLE MATCHING PIECE ID400MAX X 100 THK MIN/OD406.4x42THK			DRAWING NO : 4-80-301-78754		REV 00

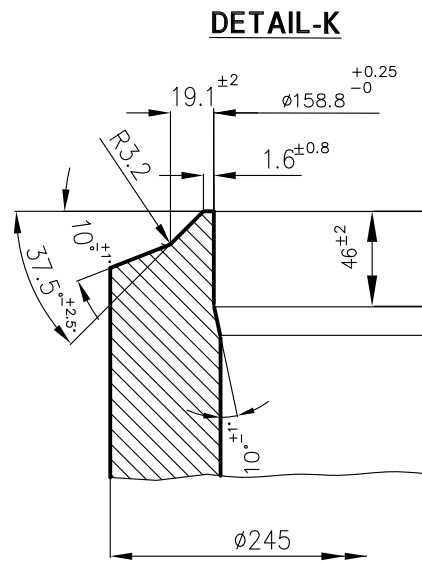
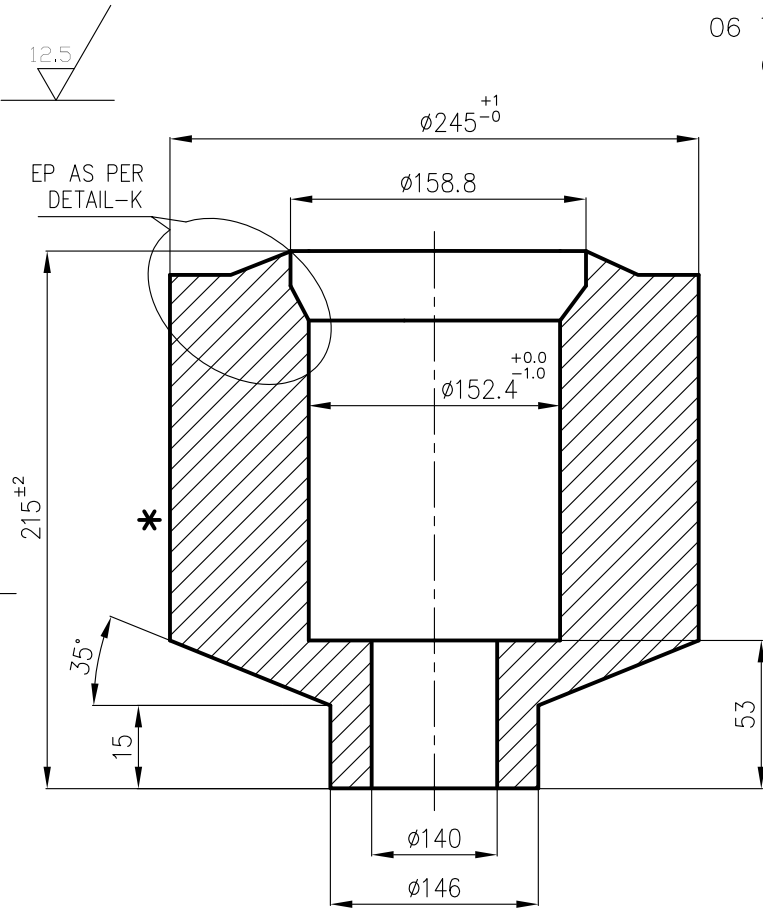
CAUTION: The information on this document is the property of BHARAT HEAVY ELECTRICALS LTD. It must not be used directly or indirectly in any way detrimental to the interest of the company.

REV	DATE	ALTERED
01		APPROVED

ALL DIMENSIONS ARE IN MILLIMETRES

NOTES:

- 01 DESIGN PRESSURE : 68kg/sq.cm(g)
- 02 DESIGN TEMPERATURE : 601°C
- 03 HARD PUNCH "F91" AT PLACE MARKED WITH *
- 04 ALTERNATE/SUITABLE SIZE OF SA182 F91 FORGING CAN ALSO BE USED.
- 05 FOLLOW TDC: TDG:104, REV.04
- 06 THIS STUB IS REQUIRED FOR HRH SYSTEM OF OTSC BOILERS



	SV STUB L=215 OD245	92 516 777 0000		38	000
		SA182F91	A		
VAR NO.	DESCRIPTION	MATL. CODE	A	UNIT	UNIT.WT.(Kg)
		MATL. SPECN.	C	DI	QTY.

		BHARAT HEAVY ELECTRICALS LIMITED PIPING CENTRE CHENNAI 600 017		DRN	NAME	SIGN	DATE	NO.OF VAR
				CHD	M.MANO		14.05.14	
				APPD	CKN		14.05.14	
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	38.000					
TITLE				CARD CODE	DRAWING NO.			REV
SAFETY VALVE STUB OD 245 SA182F91				U 01	4-80-310-77988			00

ALL DIMENSIONS ARE IN MILLIMETRES

REV 01	DATE	ALTD:
		APPD:

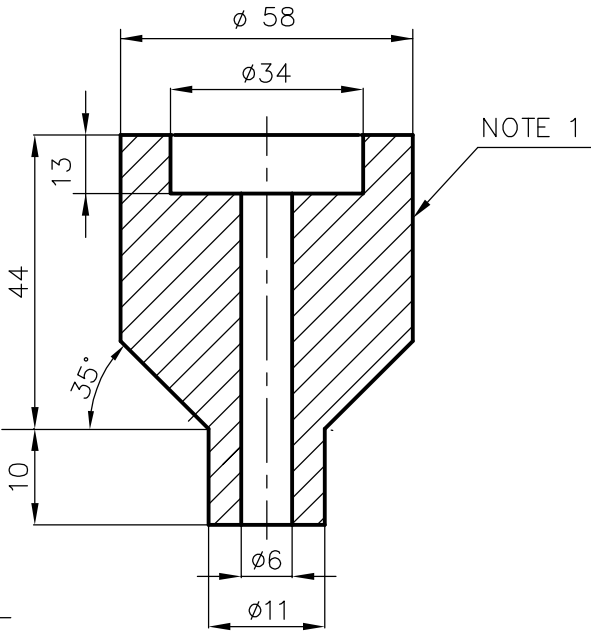
CAUTION: The information on this document is the property of BHARAT HEAVY ELECTRICALS LTD. It must not be used directly or indirectly in any way detrimental to the interest of the company.



DESIGN PRESSURE: 272 kg/sq.cm(g) DESIGN TEMPERATURE: 568°C
 DESIGN PRESSURE: 69 kg/sq.cm(g) DESIGN TEMPERATURE: 596°C

NOTES:

- 01 HARD PUNCH "SA182F91(A) CL9000-25", AT PLACE MARKED WITH *
- 02 FINISHED COMPONENT CODE IS 925167140000
- 03 ALTERNATE/SUITABLE SIZE OF SA182 F91 FORGING CAN ALSO BE USED.
- 04 FOLLOW TDC: TDG:104, REV.03
- 05 THIS STUB IS REQUIRED FOR HRH & MS SYSTEM OF 660/800 MW UNITS.
- 06 THE CRITICAL DIMENSIONS ARE IN LINE WITH ASME B16.11 (HALF COUPLING)/CL 9000.
- 07 RAW MATERIAL CODE IS 15 339 405 0000



STANDARD

	ROD ϕ 80 ; L=54				0 810
		SA 182 F91	A		
NO.	DESCRIPTION	MATL. CODE	A	UNIT	UNIT.WT.(Kg)
		MATL. SPECN.	C	DI	QTY.

BHARAT HEAVY ELECTRICALS LIMITED PIPING CENTRE CHENNAI 600 017		NAME		SIGN	DATE	NO. OF VAR	
		DRN	LALIT		16.12.10		
		CHD	SVR.KALAISELVAN		16.12.10		
		APPD	AP.MADHAVANKUTTY		16.12.10		
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	0.810			
TITLE			CARD CODE	DRAWING NO.		REV	
SOCKET WELDED STUB NB 25-CL 9000 SA182F91			U 01	4-80-999-93306		00	

Size A4

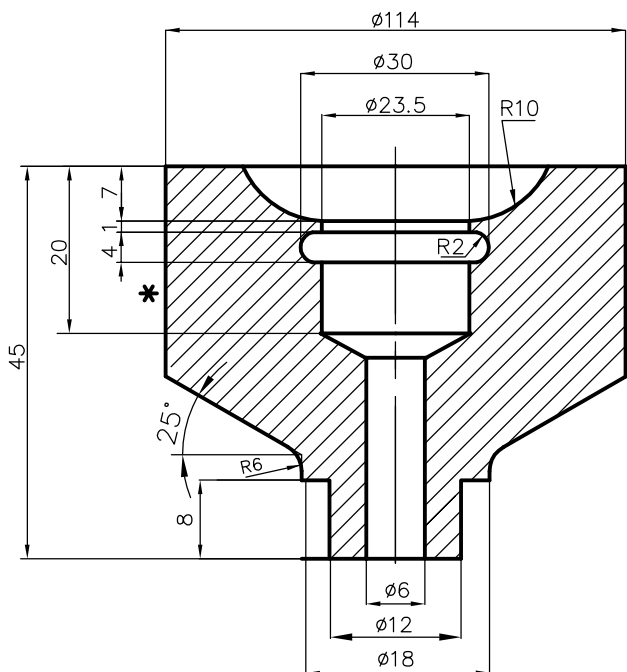
ALL DIMENSIONS ARE IN MILLIMETRES

12.5/

REV	DATE	ALTERED:
01		APPROVED:

NOTES:

- 01 DESIGN PRESSURE : 272 kg/sq.cm(g)
- 02 DESIGN TEMPERATURE : 568 °C
- 03 HARD PUNCH "F91" AT PLACE MARKED WITH *
- 04 FINISHED COMPONENT CODE IS 925167200000
- 05 ALTERNATE/SUITABLE SIZE OF SA182 F91 FORGING CAN ALSO BE USED.
- 06 FOLLOW TDC: TDG:104, REV.03
- 07 THIS STUB IS REQUIRED FOR MS SYSTEM OF 660 MW UNITS.
- 08 RAW MATERIAL CODE IS 15 339 407 0000



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STANDARD

	ROUND ϕ 130 L=45		A	1	470
		SA 182 F91			
VAR NO.	DESCRIPTION	MATL. CODE	A	UNIT	UNIT.WT.(Kg)
		MATL. SPECN.	C	DI	QTY.

	BHARAT HEAVY ELECTRICALS LIMITED PIPING CENTRE CHENNAI 600 017		DRN	LALIT	SIGN	DATE	NO.OF VAR
			CHD	SVR.KALAISELVAN		11.12.10	
			APPD	AP.MADHAVANKUTTY		11.12.10	
DEPT	GRADE OF UNTO L. DIM	SCALE	WEIGHT (KG).	REF. TO ASSY./OLD DRG.		ITEM NO.	NO. OF ITEMS
CODE	C / M / F	N.T.S	1.470	4-80-999-93150			
TITLE			CARD CODE	DRAWING NO.		REV	
TEMPERATURE STUB OD114 L45 HWR SA182F91			U 01	4-80-999-93312		00	

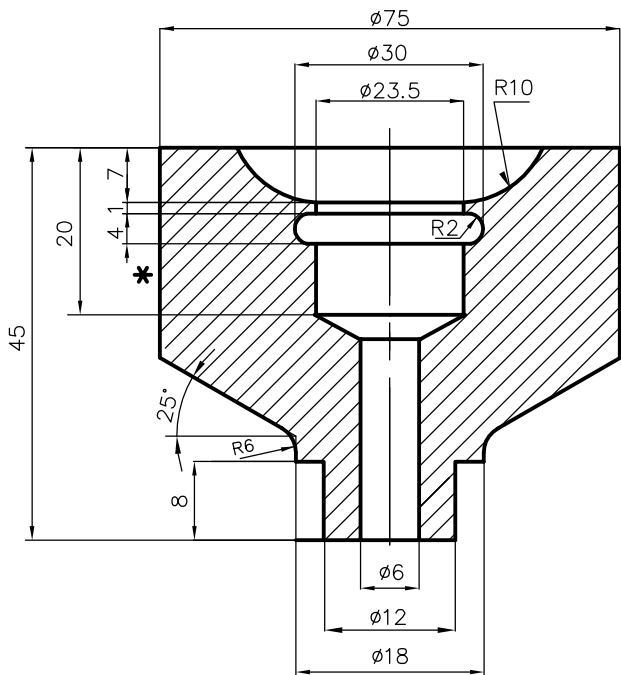
ALL DIMENSIONS ARE IN MILLIMETRES

12.5/

REV	DATE	ALTERED
		APPROVED

NOTES:

- 01 DESIGN PRESSURE : 70 kg/sq.cm(g)
- 02 DESIGN TEMPERATURE : 596 °C
- 03 HARD PUNCH "F91" AT PLACE MARKED WITH *
- 04 FINISHED COMPONENT CODE IS 925167210000
- 05 ALTERNATE/SUITABLE SIZE OF SA182 F91 FORGING CAN ALSO BE USED.
- 06 FOLLOW TDC: TDG:104, REV.03
- 07 THIS STUB IS REQUIRED FOR HRH SYSTEM OF 660 MW UNITS.
- 08 RAW MATERIAL CODE IS 15 339 405 0000



STANDARD

	ROUND $\phi 80$ L=45		A		0 820
		SA 182 F91			
VAR NO.	DESCRIPTION	MATL. CODE	A	UNIT	UNIT.WT.(Kg)
		MATL. SPECN.	C	DI	QTY.



BHARAT HEAVY ELECTRICALS LIMITED
 PIPING CENTRE
 CHENNAI 600 017

DRN	NAME	SIGN	DATE	NO. OF VAR
CHD	LALIT		11.12.10	
APPD	SVR.KALAISELVAN		11.12.10	
	AP.MADHAVANKUTTY		11.12.10	

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	0.820			

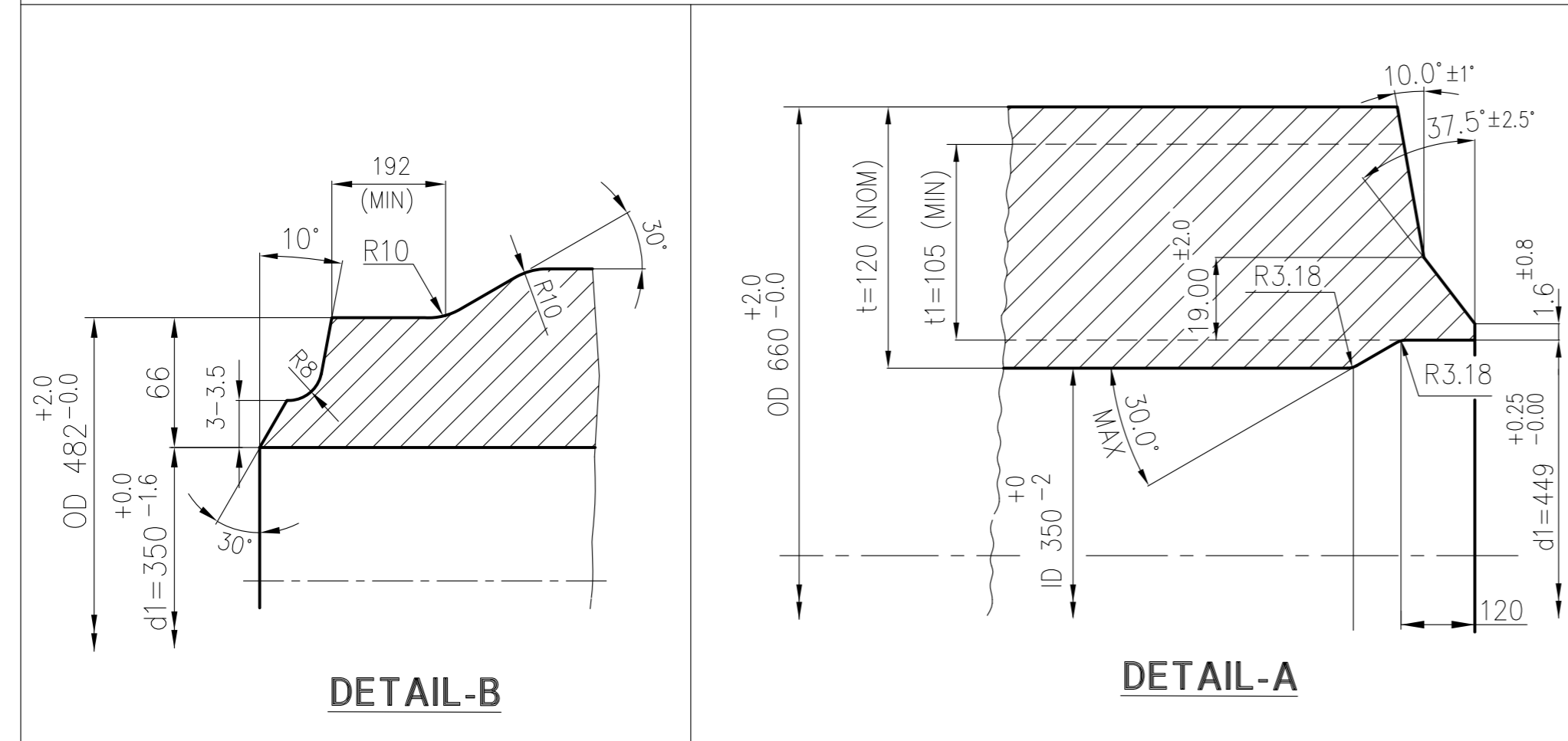
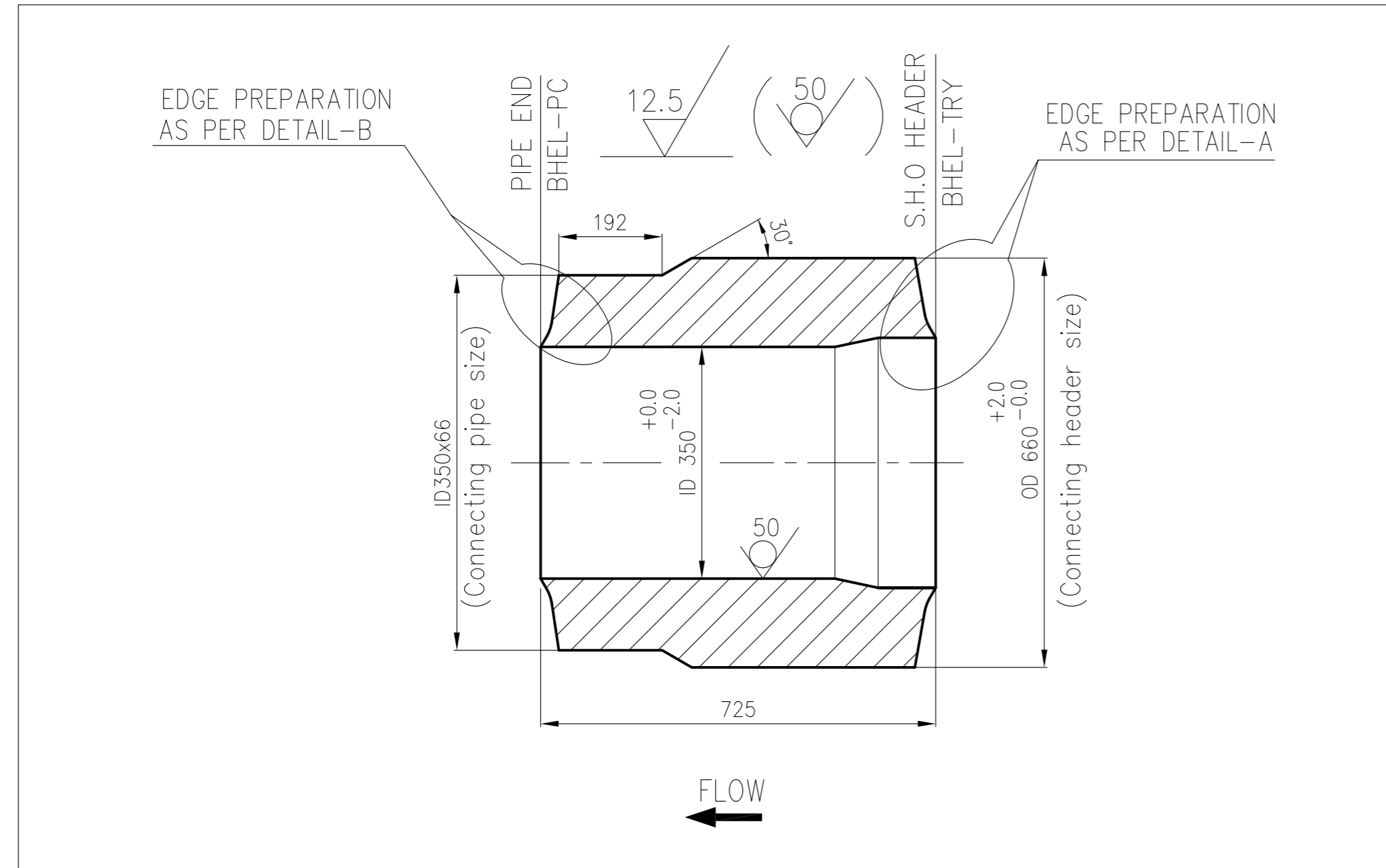
TITLE	CARD CODE	DRAWING NO.	REV
TEMPERATURE STUB OD75 L=45 HWR SA182F91	U 01	4-80-999-93313	00

Size A4

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3-80-300-32308 DRAWING No

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NOTES

- DESIGN PRESSURE : 271 Kg/Cm²(g)
- DESIGN TEMPERATURE : 573 °C
- 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)
- THE FINISHED MATERIAL CODE IS '92 117 067 0000'
- FOLLOW TDC No. : TDG-104 (LATEST REVISION)
- WEIGHT INDICATED IS FOR APPROXIMATE FINISHED MATCHING PIECE WEIGHT.

01	FORGING OD660 / ID350 L=725	3-80-300-32308		-	A	980,000
ITEM NO.	DESCRIPTION	DRAWING NO.	ITEM NO.	MATERIAL CODE	A	UNIT WT.
			VAR NO.	MATERIAL SPEC.	C	QTY.

SPACE FOR IBR APPL.



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

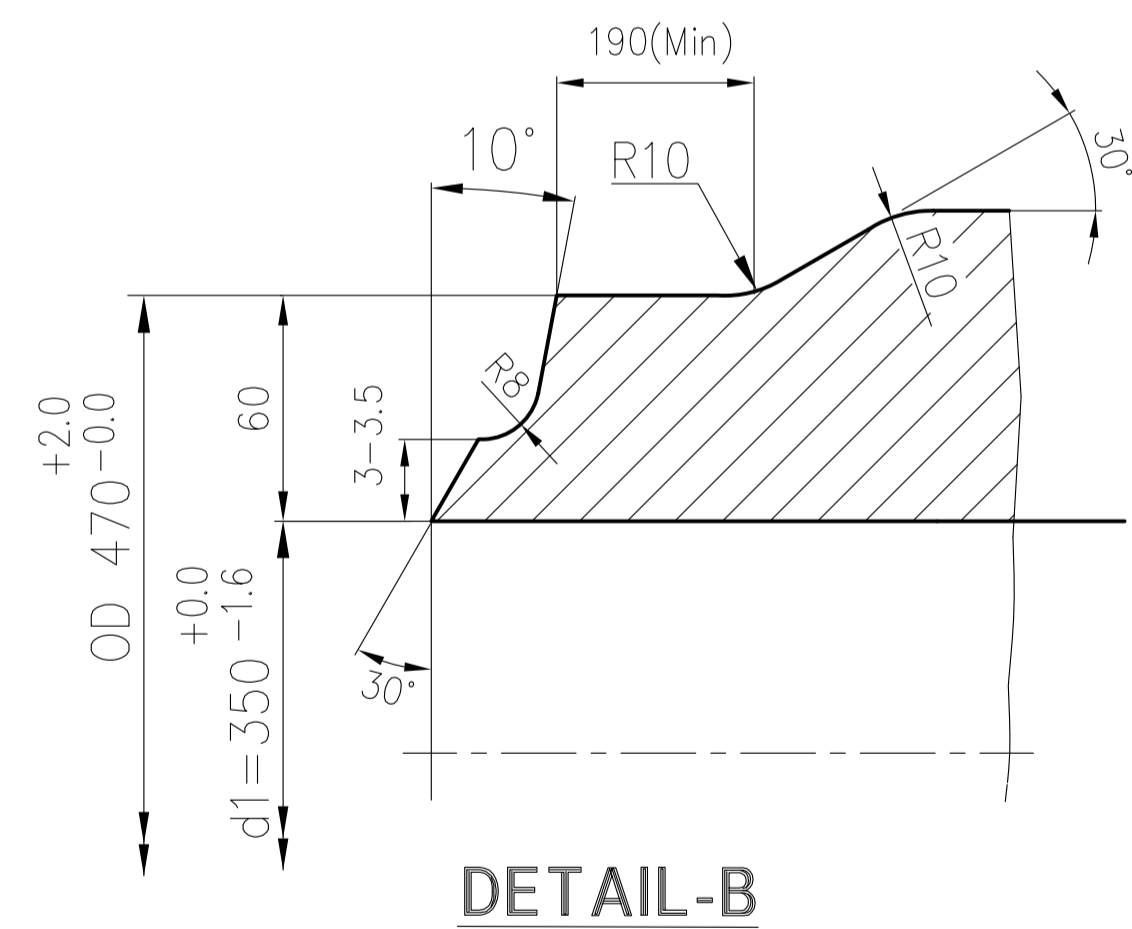
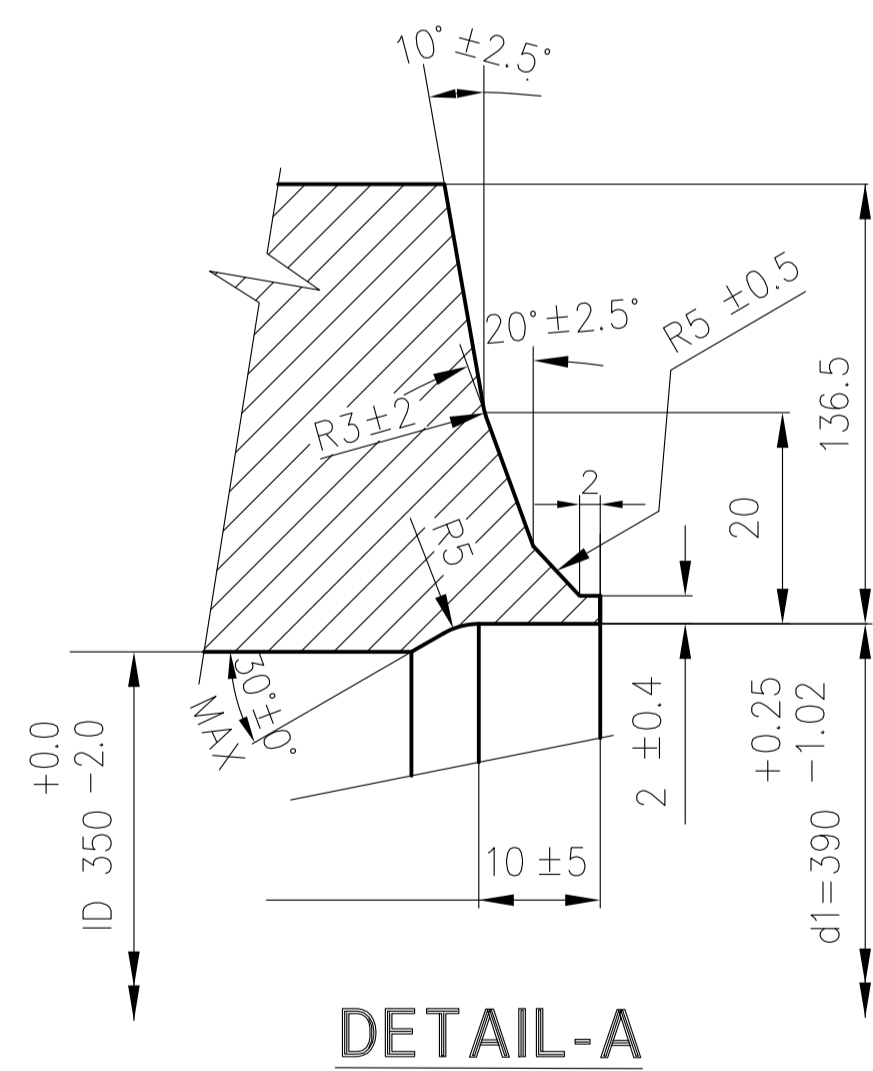
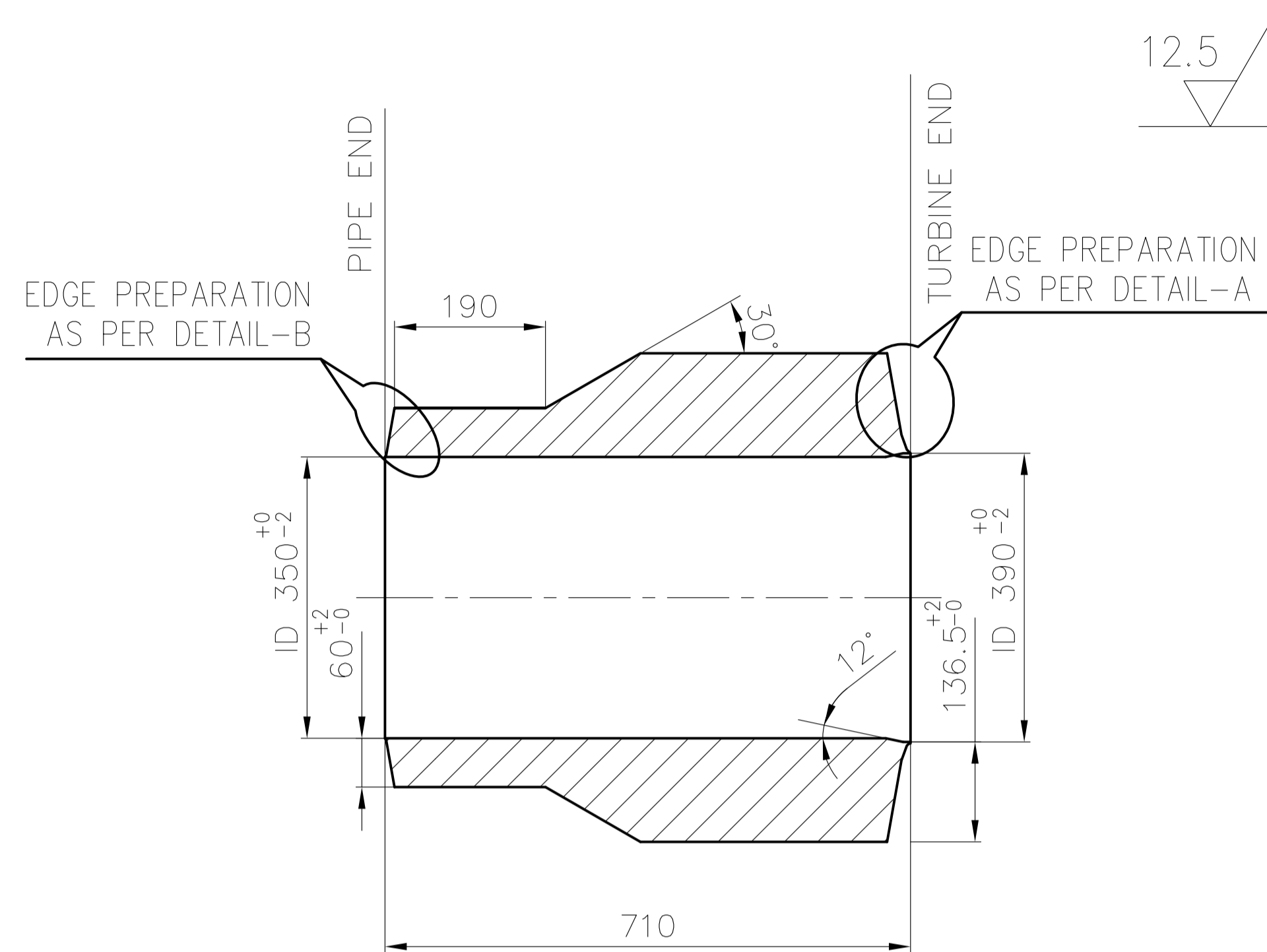
	NAME	SIGN	DATE	NO OF ITEMS
DRN	I.BISWAS	_sd_	20.08.2015	-
CHD	I.BISWAS	_sd_	20.08.2015	-
APPD	S.RAMAMURTHY	_sd_	20.08.2015	-

REV 01	DATE	ALTD APPD
ZONE		

DEPT.	GRADE OF UN TOL. DIM	SCALE	WEIGHT (Kg).	BHEL PO REF.NO:	ITEM No.
CODE	C/M/F	N.T.S.	980.000	-	-
TITLE	MATCHING PIECE (OD660x120/ID350x66)		CARD CODE	DRAWING No.	REV
			U 01	3-80-300-32308	00

DRAWING No 3-80-301-31143

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NOTES

- DESIGN PRESSURE : 275 Kg/Cm²(g)
- DESIGN TEMPERATURE : 568 °C
- 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)
- FOLLOW TDC No. : TDG-104 (LATEST REVISION)

01	FORGING OD663 / ID350 L=710	3-80-301-31143		-	A	1012,000
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

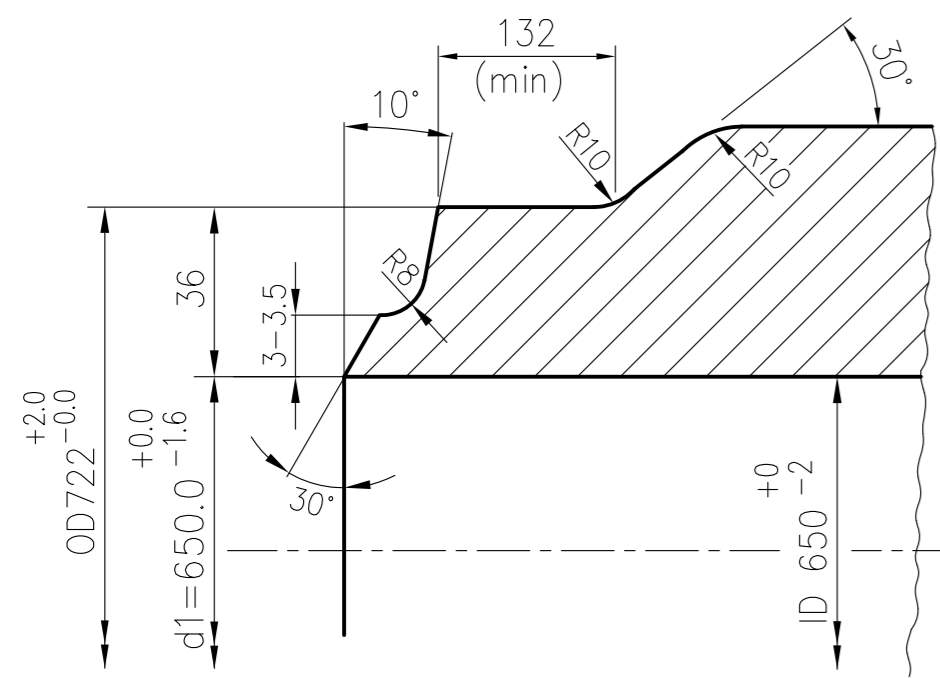
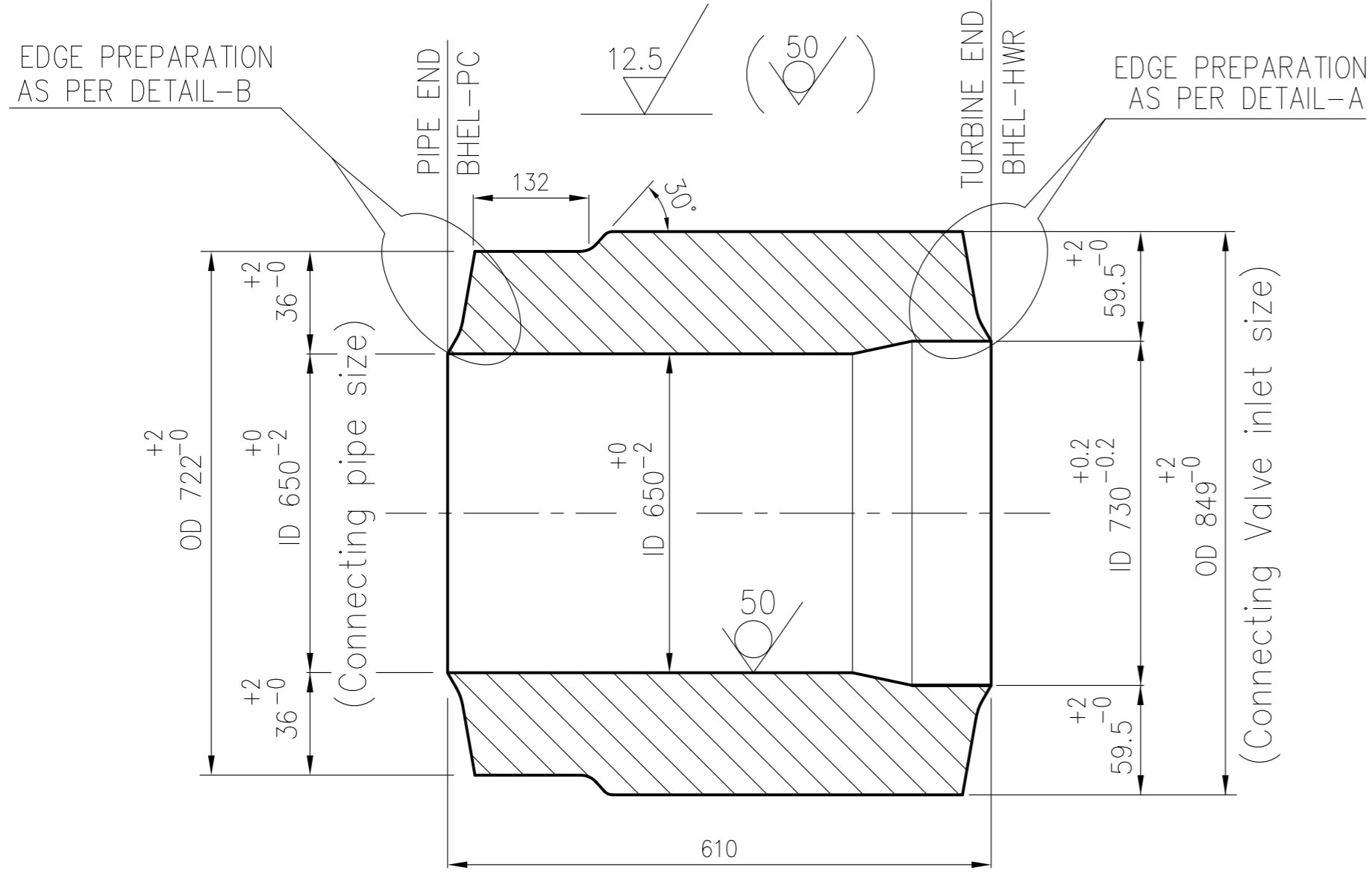
DRN	NAME	SIGN	DATE	NO OF ITEMS
CHD	KONDAPA		03.12.13	-
APPD	R.SESHAGIRI		03.12.13	-

REV 01	DATE	ALTD APPD
ZONE		

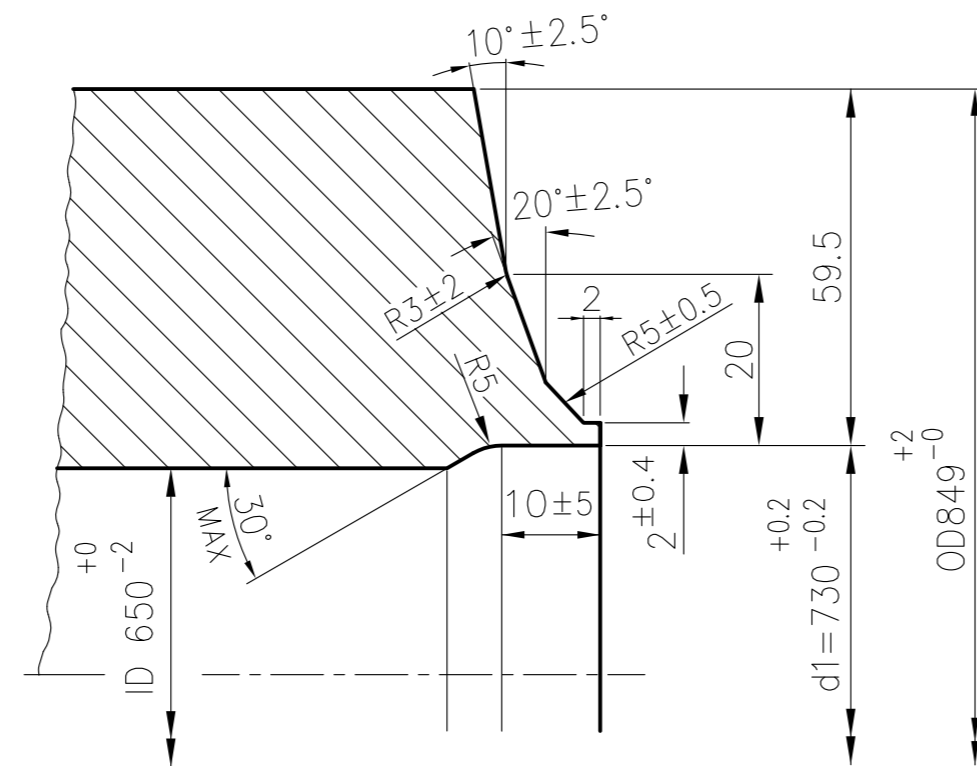
DEPT.	GRADE OF UN TOL. DIM	SCALE	WEIGHT (Kg)	BHEL PO REF.NO:	ITEM No.
CODE	C/M/F	N.T.S.	1012.00	-	-
TITLE	MATCHING PIECE (OD663X136.5/ID350X60)		CARD CODE U 01	DRAWING No. 3-80-301-31143	REV 00

3-80-310-32222
DRAWING No

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DETAIL-B



DETAIL-A

NOTES

- DESIGN PRESSURE : 68 Kg/Cm²(g)
- DESIGN TEMPERATURE : 601 °C
- 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)
- THE FINISHED MATERIAL CODE IS '92 117 078 0000'
- FOLLOW TDC No. : TDG-104 (LATEST REVISION)
- WEIGHT INDICATED IS FOR APPROXIMATE FINISHED MATCHING PIECE WEIGHT.

01	FORGING OD849 / ID650 L=610	3-80-310-32222		-	A	890,000
ITEM NO.	DESCRIPTION	DRAWING NO.	ITEM NO.	MATERIAL CODE	A	UNIT WT.
			VAR NO.	MATERIAL SPEC.	C	QTY.

SPACE FOR IBR APPL.



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

NAME	SIGN	DATE	NO OF ITEMS
DRN I.BISWAS	Sd/-	05.06.2015	-
CHD I.BISWAS	Sd/-	05.06.2015	-
APPD S.RAMAMURTHY	Sd/-	05.06.2015	-

REV 01	DATE	ALTD APPD
--------	------	-----------

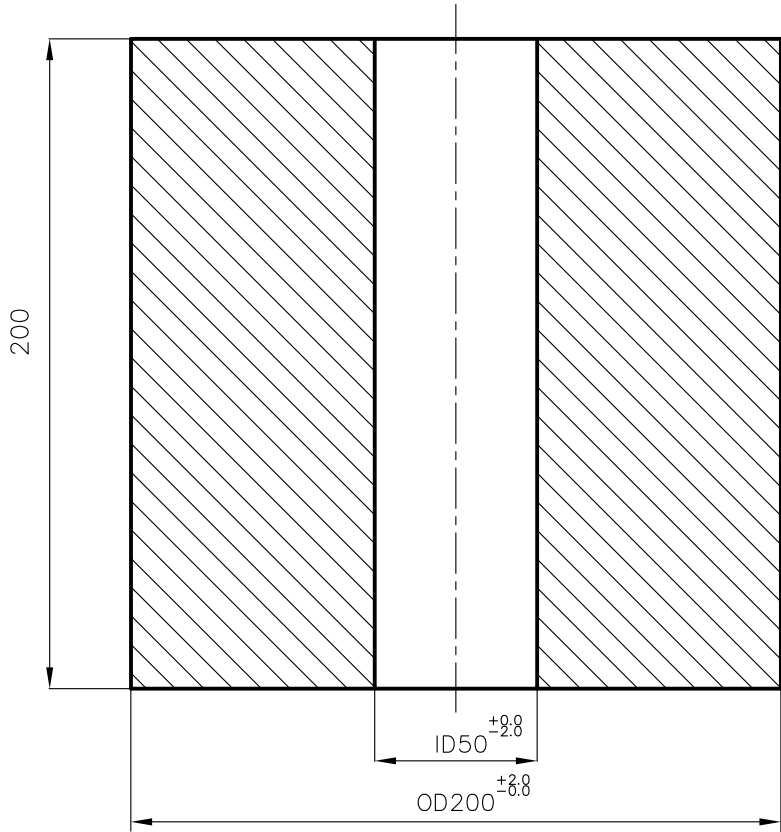
DEPT.	GRADE OF UN TOL. DIM	SCALE	WEIGHT (Kg).	BHEL PO REF.NO:	ITEM No.
CODE	C/M/F	N.T.S.	890.000	-	-

TITLE	CARD CODE	DRAWING No.	REV
MATCHING PIECE (OD849x59.5/ID650x36)	U 01	3-80-310-32222	00

ALL DIMENSIONS ARE IN MILLIMETRES

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REV	DATE	ALTERED
01		APPROVED



	HOLLOW FORGING OD200 / ID50	92 084 110 0000	A	93	00
		SA 182 F91			
VAR NO.	DESCRIPTION	MATL. CODE	A	UNIT.WT.(Kg)	
		MATL. SPECN.	C	QTY.	

	BHARAT HEAVY ELECTRICALS LIMITED PIPING CENTRE CHENNAI 600 017		DRN	NAME	SIGN	DATE	NO. OF VAR	
			CHD	PAVANKUMAR		01.06.12		
			APPD	C KARUNAKARAN		01.06.12		
DEPT	GRADE OF UNTOL. DIM		SCALE	WEIGHT (KG).	BHEL PO REF.NO:		ITEM NO.	NO. OF ITEMS
CODE	C / M / F		N.T.S	93.000				
TITLE			CARD CODE	DRAWING NO.			REV	
HOLLOW FORGING OD200 / ID50			U 01	4-80-300-75314			00	

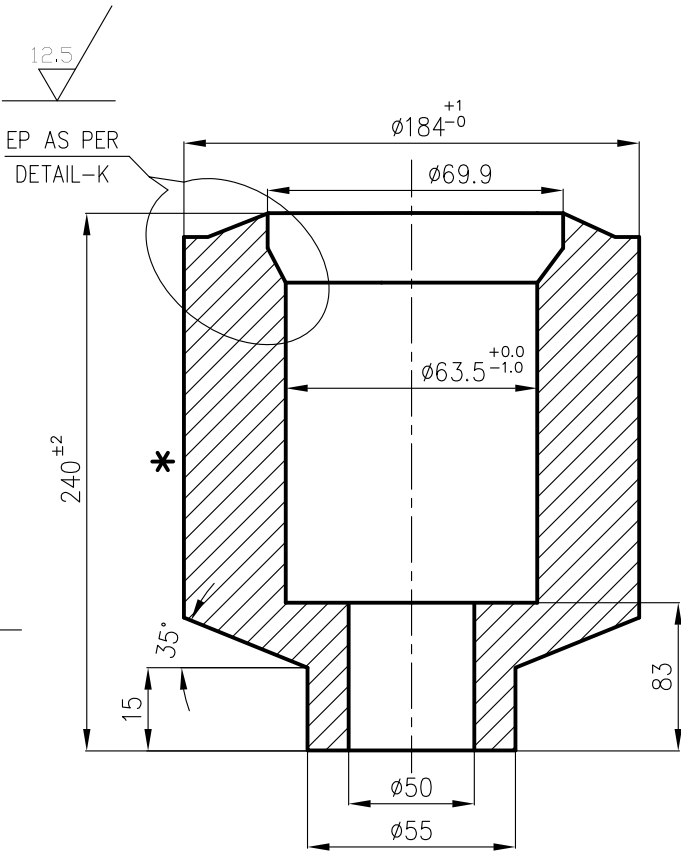
CAUTION: The information on this document is the property of BHARAT HEAVY ELECTRICALS LTD. It must not be used directly or indirectly in any way detrimental to the interest of the company.

REV	DATE	ALTERED
01		APPROVED

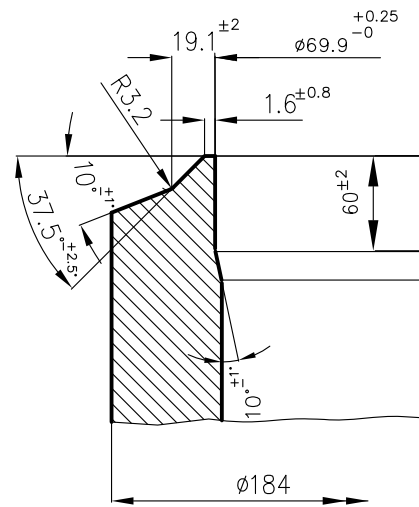
ALL DIMENSIONS ARE IN MILLIMETRES

NOTES:

- 01 DESIGN PRESSURE : 272.4 kg/sq.cm(g)
- 02 DESIGN TEMPERATURE : 573 °C
- 03 HARD PUNCH "F91" AT PLACE MARKED WITH *
- 04 ALTERNATE/SUITABLE SIZE OF SA182 F91 FORGING CAN ALSO BE USED.
- 05 FOLLOW TDC: TDG:104, REV.04
- 06 THIS STUB IS REQUIRED FOR MS SYSTEM OF OTSC BOILERS



DETAIL-K



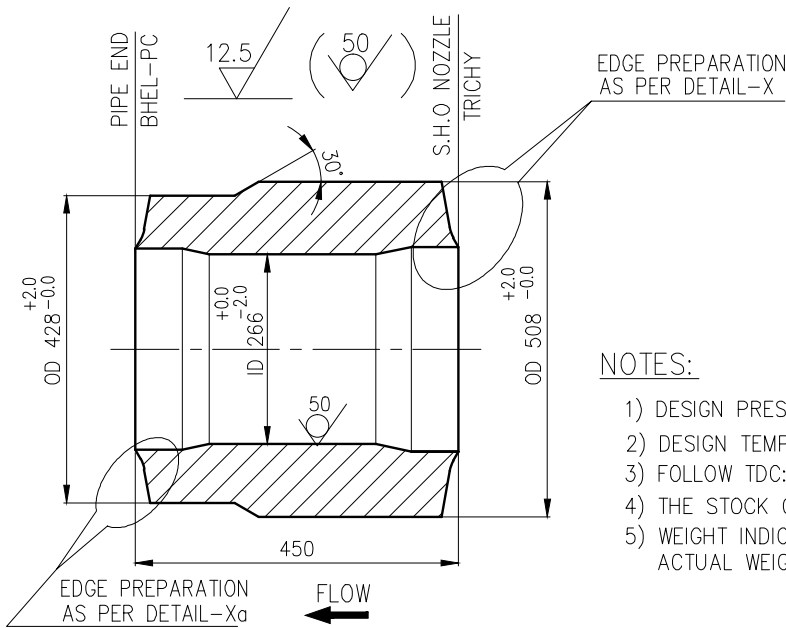
	FORGED STUB L=240 OD184/ID50	92 516 778 0000	A	42 000
		SA182F91		
VAR NO.	DESCRIPTION	MATL. CODE	A	UNIT
		MATL. SPECN.	C	DI
				UNIT.WT.(Kg)
				QTY.

	BHARAT HEAVY ELECTRICALS LIMITED		DRN	NAME	SIGN	DATE	NO.OF VAR
	PIPING CENTRE		CHD	C.DEEPAK		14.05.14	
	CHENNAI 600 017		APPD	M.MANO		14.05.14	
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	42.000				
TITLE			CARD CODE	DRAWING NO.			REV
SAFETY VALVE STUB OD 184 SA182F91			U 01	4-80-300-77989			00

ALL DIMENSIONS ARE IN MILLIMETRES

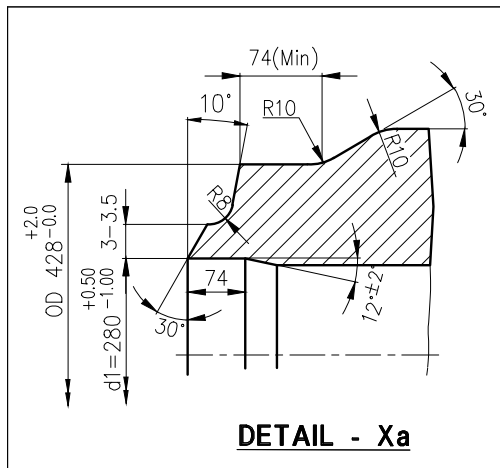
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REV 01	DATE	ALTERED : CHD & APPD :	REV 02	DATE	ALTERED : CHD & APPD :	REV 03	DATE	ALTERED : CHD & APPD :
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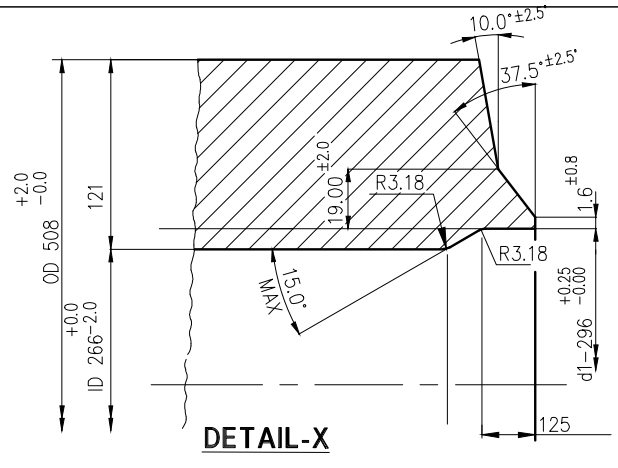


NOTES:

- 1) DESIGN PRESSURE : 286.0 Kg/sq.cm(g)
- 2) DESIGN TEMPERATURE : 601 °C
- 3) FOLLOW TDC:104 LATEST REVISION
- 4) THE STOCK CODE FOR THE MATCHING PIECE:921170290000
- 5) WEIGHT INDICATED IN THE DRG IS INDICATIVE ONLY, ACTUAL WEIGHT SHALL BE FURNISHED BY FITTING SUPPLIER



DETAIL - Xa



DETAIL - X

VARIANT NUMBER	DESCRIPTION	STD	MATCHING PIECE OD508x121/ID280x74 L=450	92 117 029 0000	A	UNIT	376	000
				SA 182 F91				
			MATERIAL CODE		A/C/P		UNIT WEIGHT(KG)	
			MATERIAL SPECN				QUANTITY	

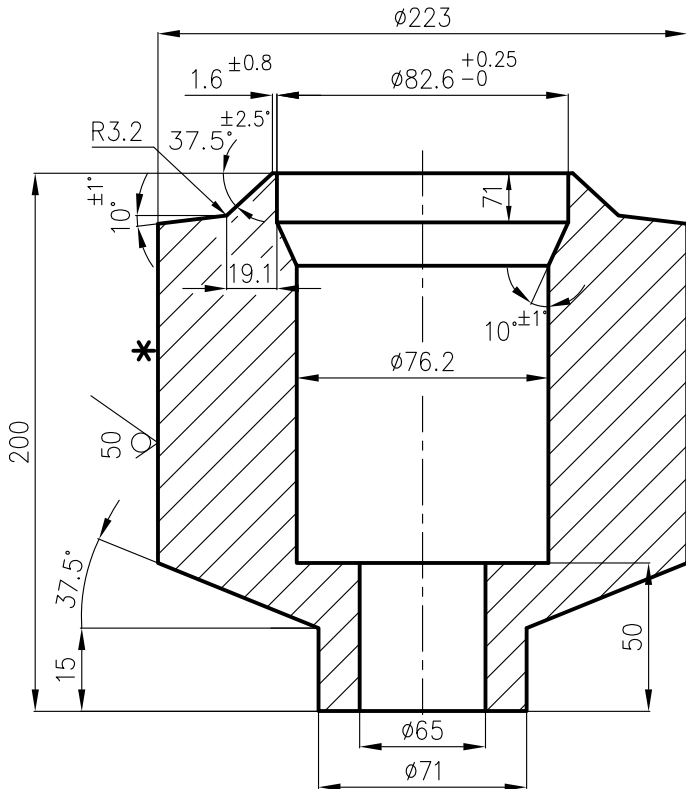
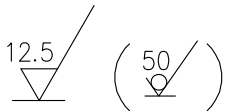
	BHARAT HEAVY ELECTRICALS LIMITED PIPING CENTRE CHENNAI 600 017			DRN	NAME M.R.KRISHNA	SIGNATURE Sd.....	DATE 30.04.15
				CHD	I.D.B.RAJU	Sd.....	30.04.15
				APPD	S.RAMAMURTHY	Sd.....	30.04.15
DEPT	ALL DIMENSIONS ARE IN MM	PROJECTION	SCALE N.T.S	WEIGHT (Kg) 376.0	REF TO ASSY / OLD DWG		
TITLE MATCHING PIECE OD508x121/ID280x74					DRAWING NO : 4-80-300-79032		REV 00

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REV	DATE	ALTERED :
01		APPROVED :

NOTES:

- 01 DESIGN PRESSURE : 270.3kg/sq.cm(g)
- 02 DESIGN TEMPERATURE : 573°C
- 03 HARD PUNCH "F91" AT PLACE MARKED WITH *
- 04 FOLLOW TDC: TDG:104 (LATEST REVISION).
- 05 THIS STUB IS REQUIRED FOR MS SYSTEM OF OTSC BOILERS.



			92-516-108-0000			39 000
			SA182F91	A		
VAR NO.	DESCRIPTION	STD	MATL. CODE	A	UNIT	UNIT.WT.(Kg)
			MATL. SPECN.	C	DI	QTY.

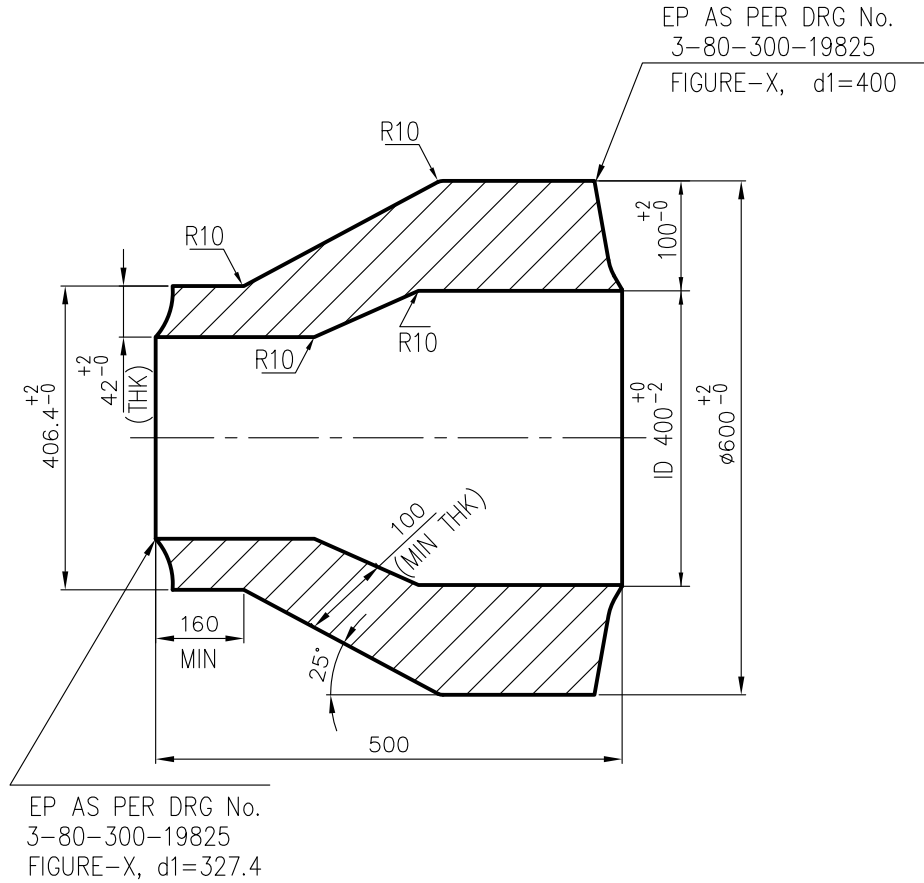
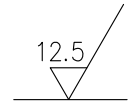
	BHARAT HEAVY ELECTRICALS LIMITED PIPING CENTRE CHENNAI 600 017		DRN	I.BISWAS	SIGN	Sd/-	DATE	11.05.15	NO.OF VAR
			CHD	I.BISWAS			DATE	11.05.15	
			APPD	S.RAMAMURTHY			DATE	11.05.15	
DEPT	GRADE OF UNTOL.DIM	SCALE	WEIGHT (KG).	REF. TO ASSY./OLD DRG.			ITEM NO.	NO. OF ITEMS	
CODE	C / M / F	N.T.S	39.000						
TITLE				CARD CODE	DRAWING NO.				REV
SAFETY VALVE STUB OD223 L200, d1=82.6 - SA182F91				U 01	4-80-300-79239				00

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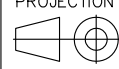
REV 01	DATE	ALTERED :
		CHD & APPD :

NOTES:

- 1) DESIGN PRESSURE : 200 Kg/sq.cm(g)
- 2) DESIGN TEMPERATURE : 545°C
- 3) FOLLOW APPLICABLE QCP



VARIANT NUMBER	MATCHING PIECE ID400MAX X 100 THK MIN OD406.4X42	STD	XX XXX XXX XXXX	A	308	600
			SA 182 F91			
	DESCRIPTION		MATERIAL CODE	A/C/P	UNIT	UNIT WEIGHT(KG)
			MATERIAL SPECN			QUANTITY

	BHARAT HEAVY ELECTRICALS LIMITED PIPING CENTRE CHENNAI 600 017		DRN	NAME EZHIL KUMAR	SIGNATURE	DATE 01.12.14
			CHD	KONDAPANAI DU		01.12.14
			APPD	R.SESHAGIRI		01.12.14
DEPT BM	ALL DIMENSIONS ARE IN MM	PROJECTION 	SCALE N.T.S	WEIGHT (Kg) 308.600	REF TO ASSY / OLD DWG	
CODE 121	TITLE MATCHING PIECE ID400MAX X 100 THK MIN/OD406.4x42THK			DRAWING NO : 4-80-301-78754		REV 00

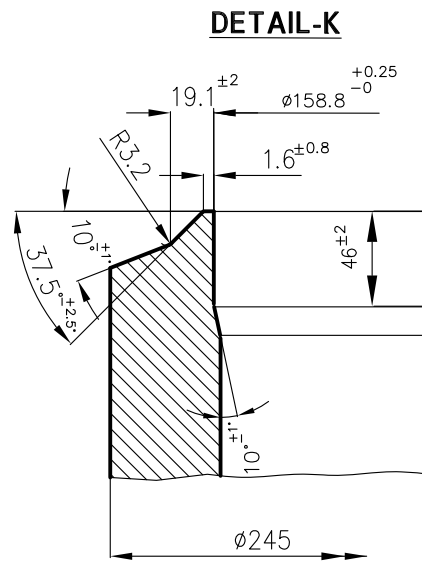
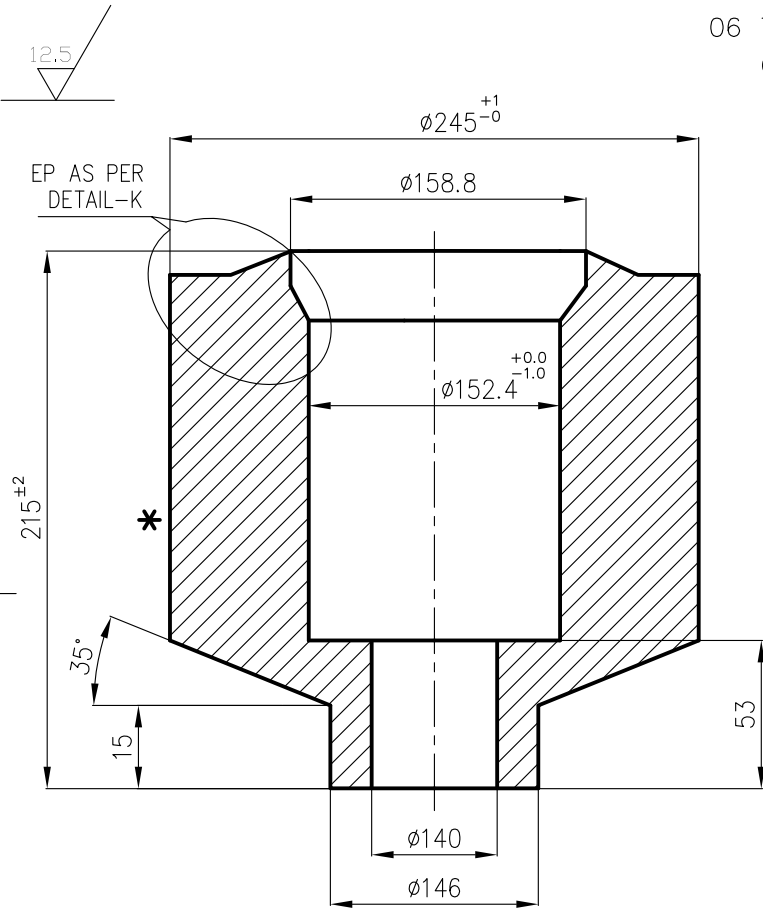
CAUTION: The information on this document is the property of BHARAT HEAVY ELECTRICALS LTD. It must not be used directly or indirectly in any way detrimental to the interest of the company.

REV	DATE	ALTERED
01		APPROVED

ALL DIMENSIONS ARE IN MILLIMETRES

NOTES:

- 01 DESIGN PRESSURE : 68kg/sq.cm(g)
- 02 DESIGN TEMPERATURE : 601°C
- 03 HARD PUNCH "F91" AT PLACE MARKED WITH *
- 04 ALTERNATE/SUITABLE SIZE OF SA182 F91 FORGING CAN ALSO BE USED.
- 05 FOLLOW TDC: TDG:104, REV.04
- 06 THIS STUB IS REQUIRED FOR HRH SYSTEM OF OTSC BOILERS



	SV STUB L=215 OD245	92 516 777 0000		38	000
		SA182F91	A		
VAR NO.	DESCRIPTION	MATL. CODE	A	UNIT	UNIT.WT.(Kg)
		MATL. SPECN.	C	DI	QTY.

		BHARAT HEAVY ELECTRICALS LIMITED PIPING CENTRE CHENNAI 600 017		DRN	NAME	SIGN	DATE	NO.OF VAR
				CHD	M.MANO		14.05.14	
				APPD	CKN		14.05.14	
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	38.000				
TITLE				CARD CODE	DRAWING NO.			REV
SAFETY VALVE STUB OD 245 SA182F91				U 01	4-80-310-77988			00

ALL DIMENSIONS ARE IN MILLIMETRES

REV 01	DATE	ALTD:
		APPD:

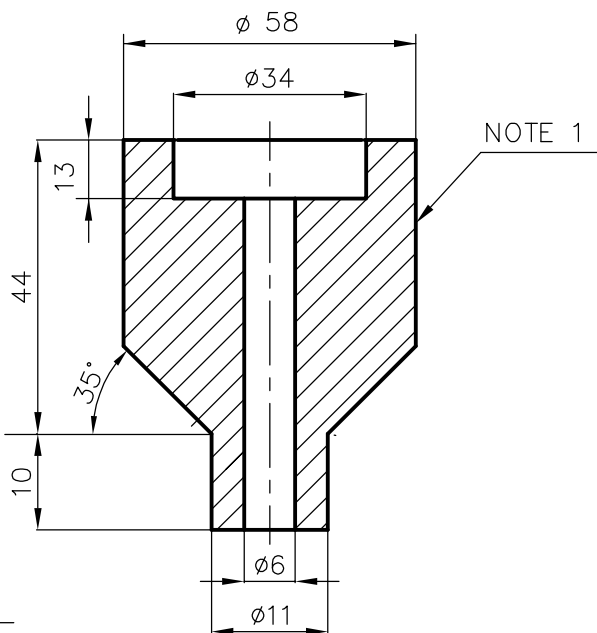
CAUTION: The information on this document is the property of BHARAT HEAVY ELECTRICALS LTD. It must not be used directly or indirectly in any way detrimental to the interest of the company.



DESIGN PRESSURE: 272 kg/sq.cm(g) DESIGN TEMPERATURE: 568°C
 DESIGN PRESSURE: 69 kg/sq.cm(g) DESIGN TEMPERATURE: 596°C

NOTES:

- 01 HARD PUNCH "SA182F91(A) CL9000-25", AT PLACE MARKED WITH *
- 02 FINISHED COMPONENT CODE IS 925167140000
- 03 ALTERNATE/SUITABLE SIZE OF SA182 F91 FORGING CAN ALSO BE USED.
- 04 FOLLOW TDC: TDG:104, REV.03
- 05 THIS STUB IS REQUIRED FOR HRH & MS SYSTEM OF 660/800 MW UNITS.
- 06 THE CRITICAL DIMENSIONS ARE IN LINE WITH ASME B16.11 (HALF COUPLING)/CL 9000.
- 07 RAW MATERIAL CODE IS 15 339 405 0000



STANDARD

	ROD ϕ 80 ; L=54				0 810
		SA 182 F91	A		
NO.	DESCRIPTION	MATL. CODE	A	UNIT	UNIT.WT.(Kg)
		MATL. SPECN.	C	DI	QTY.

BHARAT HEAVY ELECTRICALS LIMITED PIPING CENTRE CHENNAI 600 017		NAME		SIGN	DATE	NO. OF VAR	
		DRN	LALIT		16.12.10		
		CHD	SVR.KALAISELVAN		16.12.10		
		APPD	AP.MADHAVANKUTTY		16.12.10		
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	0.810			
TITLE			CARD CODE	DRAWING NO.		REV	
SOCKET WELDED STUB NB 25-CL 9000 SA182F91			U 01	4-80-999-93306		00	

Size A4

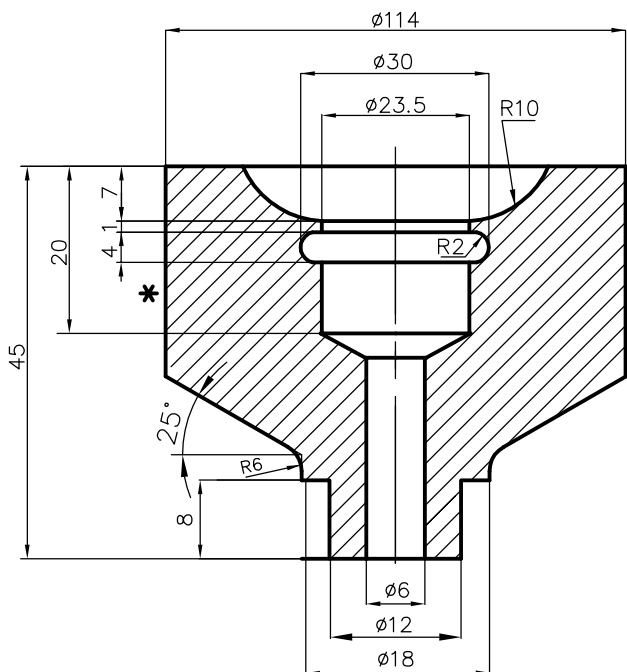
ALL DIMENSIONS ARE IN MILLIMETRES

12.5/

REV	DATE	ALTERED:
01		APPROVED:

NOTES:

- 01 DESIGN PRESSURE : 272 kg/sq.cm(g)
- 02 DESIGN TEMPERATURE : 568 °C
- 03 HARD PUNCH "F91" AT PLACE MARKED WITH *
- 04 FINISHED COMPONENT CODE IS 925167200000
- 05 ALTERNATE/SUITABLE SIZE OF SA182 F91 FORGING CAN ALSO BE USED.
- 06 FOLLOW TDC: TDG:104, REV.03
- 07 THIS STUB IS REQUIRED FOR MS SYSTEM OF 660 MW UNITS.
- 08 RAW MATERIAL CODE IS 15 339 407 0000



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STANDARD

	ROUND ϕ 130 L=45		A	1	470
		SA 182 F91			
VAR NO.	DESCRIPTION	MATL. CODE	A	UNIT	UNIT.WT.(Kg)
		MATL. SPECN.	C	DI	QTY.

		BHARAT HEAVY ELECTRICALS LIMITED PIPING CENTRE CHENNAI 600 017		DRN	LALIT	SIGN	DATE	NO.OF VAR
				CHD	SVR.KALAISELVAN		11.12.10	
				APPD	AP.MADHAVANKUTTY		11.12.10	
DEPT	GRADE OF UNTOLO. DIM	SCALE	WEIGHT (KG).	REF. TO ASSY./OLD DRG.		ITEM NO.	NO. OF ITEMS	
CODE	C / M / F	N.T.S	1.470	4-80-999-93150				
TITLE				CARD CODE	DRAWING NO.		REV	
TEMPERATURE STUB OD114 L45 HWR SA182F91				U 01	4-80-999-93312		00	

3-80-300-19825

DRAWING No.

NOTES: -

- 01. APPLICABLE FOR P91/P92**
i) STRAIGHT WITH STRAIGHT/FITTING
ii) BEND WITH BEND/FITTING
 02. FOR OD MISMATCHING REF. FIGURE-Xa.
 03. $\alpha = 6^\circ$ FOR WALL THICKNESS ≤ 30 mm
 04. $\alpha = 10^\circ$ FOR WALL THICKNESS > 30 mm

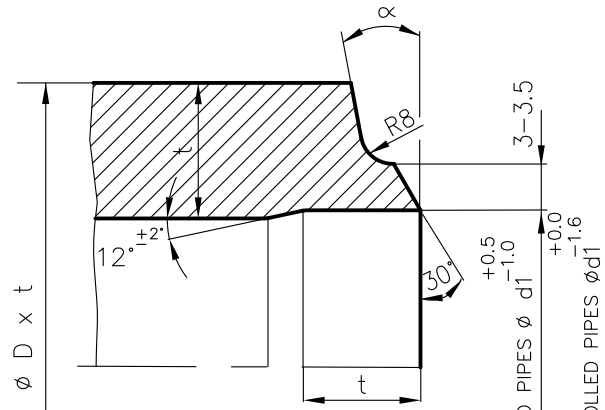


FIGURE - X

MATCHING EDGE PREPARATION FOR MISMATCH OD APPLICABLE FOR BENDS/FITTINGS OF P91/P92 MATERIALS

NOTES: -

01. OD OF STRAIGHT TO BE PHYSICALLY MEASURED/VERIFIED.
 02. $\alpha = 6^\circ$ FOR WALL THICKNESS ≤ 30 mm
 03. $\alpha = 10^\circ$ FOR WALL THICKNESS > 30 mm
 04. $t =$ THK OF CONNECTING PIPE (STRAIGHT)

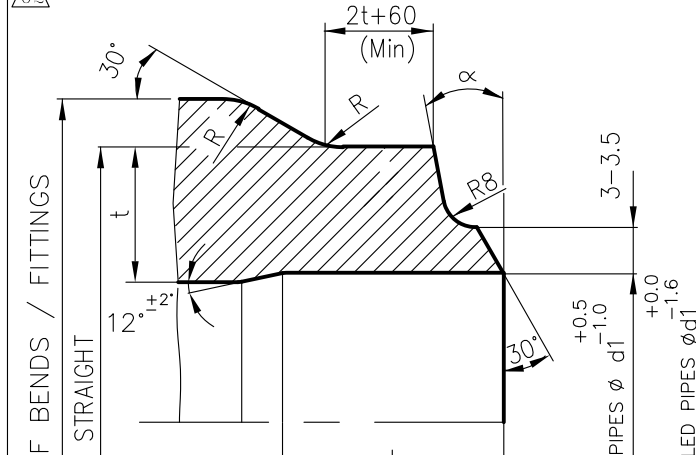
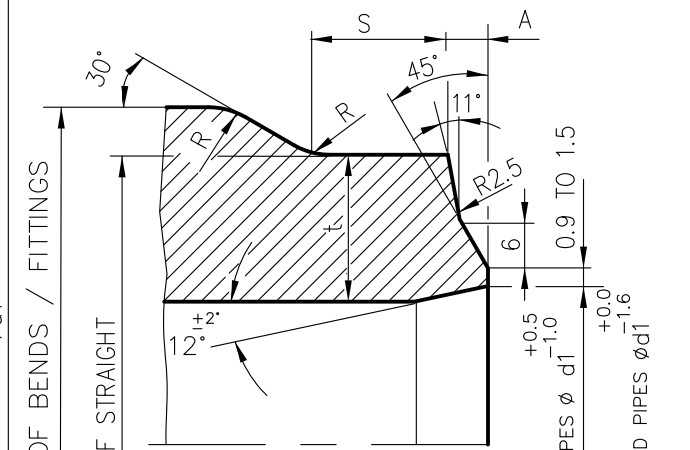


FIGURE - Xa

MATCHING EDGE PREPARATION FOR MISMATCH OD DIAMETRICALLY GREATER THAN 8 mm (ie OD1 - OD2 > 8mm) APPLICABLE FOR BENDS/FITTINGS OTHER THAN P91/P92 MATERIALS

NOTES: -

01. OD OF STRAIGHT TO BE PHYSICALLY MEASURED/VERIFIED.
 02. WHEN $t < 65$, $S+A = 65$ Min. & $t > 65$, $S=65$ Min. WHERE $t =$ THK OF CONN. PIPE (STRAIGHT).



STYLE - Pa

MATCHING EDGE PREPARATION FOR MISMATCH OD DIAMETRICALLY GREATER THAN 8 mm (ie OD1 - OD2 > 8mm) APPLICABLE FOR ELBOWS OTHER THAN P91/P92 MATERIALS

NOTES: -

01. OD = OUTSIDE DIA OF CONN. PIPE (STRAIGHT) TO BE PHYSICALLY MEASURED/VERIFIED.
 02. $t =$ THK OF CONN. PIPE (STRAIGHT)

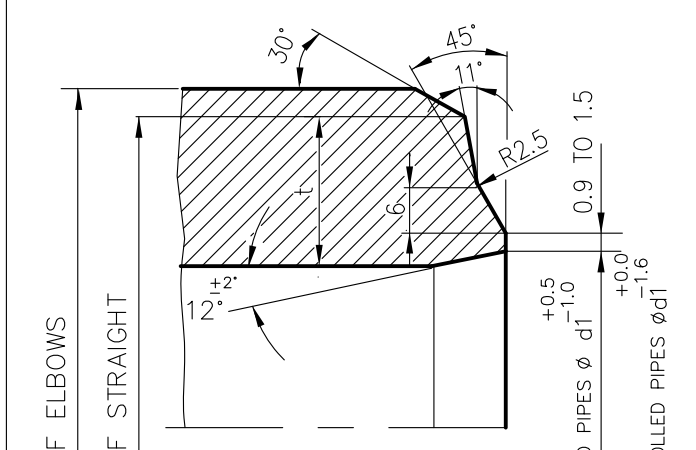


FIGURE - Z

NOTES: -

- 01. APPLICABLE FOR P91 PIPE BEND WELDED WITH P91 STRAIGHT PIPE FOR THICKNESS ≤ 30 mm AND OD ≥ 558 mm.**
 02. $\alpha = 6^\circ$ FOR WALL THICKNESS ≤ 30 mm
 03. FOR OD MISMATCH, REFER THE OD MACHINING ONLY SHOWN IN FIGURE-Xa
 04. FIGURE-Xb AND FIGURE-Xc ARE NOT APPLICABLE FOR P92 MATERIALS.

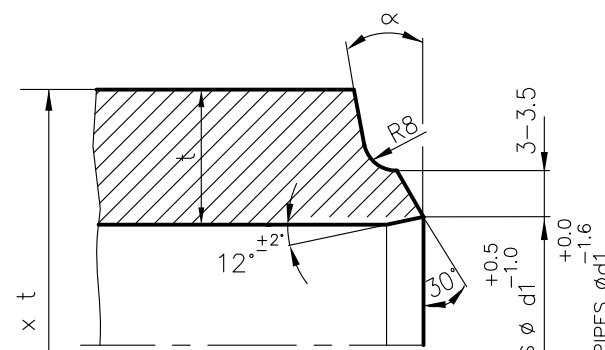


FIGURE - Xb
(BEND END)

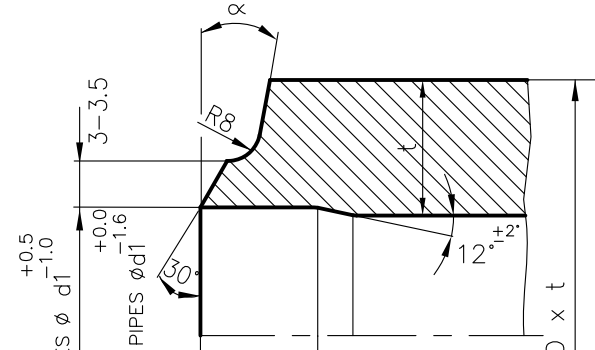
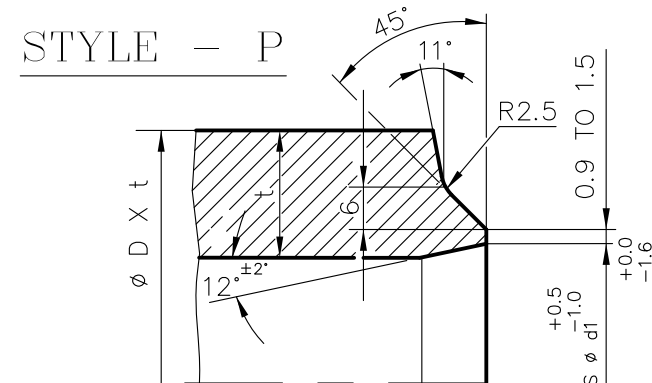


FIGURE - Xc
(STRAIGHT END)

STYLE - P

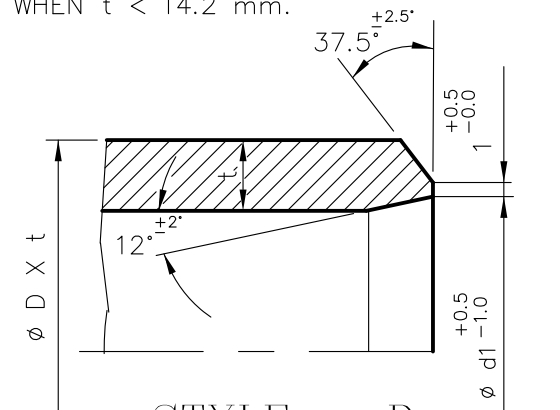


NOTES: -

01. USE WHEN $t \geq 14.2$ mm.
 02. FOR OD MISMATCHING REF. FIGURE-PA

NOTES: -

01. USE WHEN $t < 14.2$ mm.



STYLE - D

TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT

STANDARD

	BHARAT HEAVY ELECTRICALS LTD.		DRN	NAME	SIGN	DATE	NO OF ITEMS
	PIPING CENTRE, MADRAS		CHD	K.B.RAGUNATH		11.10.01	
			APPD	M.C.SEKARAN		11.10.01	
				APPD	A.VELAYUTHAM	11.10.01	

DEPT.	GRADE OF UN TOL DIM	SCALE	WEIGHT (Kg)	NAME OF ORIGINAL ORGANISATION	ITEM No.
CODE	C/M/F				

TITLE	CARD CODE	DRAWING No.	REV
EDGE PREPARATION DETAILS	U 01	3-80-300-19825	03

GENERAL NOTES :

01. THE MINIMUM THICKNESS AT WELD END SHALL NOT BE LESS THAN
 a) 0.875 TIMES t NOM. FOR OD PIPES.
 b) t MIN. FOR ID CONTROLLED PIPES.
 02. t NOM & t MIN SHALL BE AS PER SPECIFIED PIPE SIZE.
 03. SHARP CORNERS SHALL BE ROUNDED OFF WHEREEVER 'R' IS INDICATED.

NOTES FOR WELDING:

01. WELD REINFORCEMENT TO BE FLUSH GROUND AND MERGED WITH PARENT METAL WITHOUT ANY UNEVENNESS.

REV 03	DATE 10.04.13	ALTERED: M.R.K	APPROVED: C.K.N
ZONE	FIG.Xb AND FIG.Xc ADDED. IN FIG.X. NOTE 01 MODIFIED. IN FIG.Xa, STY-PA, FIG.Z. P92 MATERIAL ADDED		
REV 02	DATE 10.01.13	ALTERED: M.R.K	APPROVED: C.K.N
ZONE	IN FIG.Xa, NOTE 04 ADDED. GENERAL NOTES 03 ADDED. IN FIG.Xa, 8MM OD MISMATCH IS REMOVED		
REV 01	DATE 11.05.04	ALTERED: R.SENDHIL	APPROVED: A.VELAYUTHAM
ZONE	PROJECT NAME REMOVED AND STANDARD INCORPORATED IN TITLE BLOCK		