

DRAWING NO.

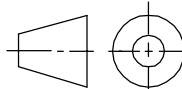


01 ALL PIPES ARE TO BE SUPPLIED WITH EDGE PREPARATION AS PER DRG NO. 3-80-300-19825. FOR EP STYLE & d1 VALUE (WELD END DIAMETER) REFER THE TABLE. INSIDE BEVEL IS REQUIRED, ONLY IF D1 VALUE IS HIGHER THAN INSIDE DIAMETER.

02 FOR SHOP PAINTING/COATING DETAILS, REFER CUSTOMER APPROVED PAINTING SCHEDULE & QUALITY PLAN FOR THE PROJECT.

03 FOR PIPE DIAMETER > 1000mm, SPIDER ARRANGEMENT HAS TO BE PROVIDED AT THE ENDS AFTER EDGE PREPARATION, AS PER DRG. NO. 4-80-999-93078. FOR PIPE DIAMETER < 1000mm, SPIDER ARRANGEMENT IS NOT REQUIRED.

SL NO	PGMA	DU NO	PIPE DESCRIPTION	QTY (M)	SPECIFIC LENGTH(M)	MATERIAL CODE	MATERIAL SPEC	EDGE PREPARATION			TOLERANCE
								DRG NO	STYLE	d1	
01	80-463	010	PIPE OD273.1X6(OVER GROUND)	2915	10 TO 14	159385380000	IS3589-410MPA	3-80-300-19825	D	261	+/- 2M
02	80-463	017	PIPE OD2235X18(OVER GROUND)	8	NA	159385970000	IS3589-410MPA	3-80-300-19825	D	2199	NA
03	80-463	018	PIPE OD2235X18(UNDER GROUND)	28	10 TO 14	159385970000	IS3589-410MPA	3-80-300-19825	D	2199	+ 2M
04	80-463	019	PIPE OD1829X14(UNDER GROUND)	1100	10 TO 14	159386020002	IS3589-410MPA	3-80-300-19825	D	1801	+/- 2M
05	80-463	020	PIPE OD1422X12(UNDER GROUND)	180	10 TO 14	159387080001	IS3589-410MPA	3-80-300-19825	D	1397	+/- 2M
06	80-463	021	PIPE OD914X10(UNDER GROUND)	4100	10 TO 14	159385830000	IS3589-410MPA	3-80-300-19825	D	894	+/- 2M
07	80-463	022	PIPE OD914X10(OVER GROUND)	80	10 TO 14	159385830000	IS3589-410MPA	3-80-300-19825	D	894	+/- 2M
08	80-463	025	PIPE OD711X8(OVER GROUND)	32	10 TO 14	159385340001	IS3589-410MPA	3-80-300-19825	D	697	+/- 2M
09	80-463	095	PIPE OD711X8(OVER GROUND)	77	10 TO 14	159385340001	IS3589-410MPA	3-80-300-19825	D	697	+/- 2M
10	80-463	096	PIPE OD711X8(UNDER GROUND)	475	10 TO 14	159385340001	IS3589-410MPA	3-80-300-19825	D	697	+/- 2M

CUSTOMER NO. : 7384									
NAME OF PROJECT : 3X800MW PATRATU SUPER THERMAL POWER PROJECT									
NAME OF CUSTOMER : M/S NTPC LIMITED									
 BHARAT HEAVY ELECTRICALS LTD., PIPING CENTRE, MADRAS					DRN	NAME RP SINGH	SIGN	DATE 04.05.19	NO OF ITEMS
					CHD	KONDAPANAU		04.05.19	
					APPD	C SARVANAN		04.05.19	
DEPT.	GRADE OF UN TOL DIM		SCALE	WEIGHT (Kg).	NAME OF ORIGINAL ORGANISATION	ITEM No.			
CODE	C/M/F		N.T.S						
TITLE PRODUCTION NOTES FOR LP PIPING SYSTEM				CARD CODE U 01	DRAWING No. 3-80-463-35663		REV 00		

DRAWING NO.

MATERIAL SPECIFICATION :- IS:3589-410MPA
(SPIRAL/LS WELD)

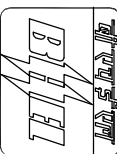
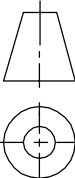
(SPECIFIC LENGTH)

SL. No.	DU NO.	PGMA	PIPE DESCRIPTION	QTY (in Meters)	SPECIFIC LENGTH	MATT. CODE		EDGE PREPARATION AS PER DRG NO. 3-80-300-19825	
						MATT. SPEC.		STYLE	Ø d1
01	009	80-468	PIPE OD 813 x 8 (UNDER GROUND PIPING)	2150 MR	7MR TO 12.5MR	15 938 537 0001		STYLE-D	797
02	010	80-468	PIPE OD 813 x 8 (OVER GROUND PIPING)	80 MR	7MR TO 12.5MR	15 938 537 0001		STYLE-D	797
03	032 033	80-468	PIPE OD 914 x 10 (OVER GROUND PIPING)	38 MR	7MR TO 12.5MR	15 938 583 0000		STYLE-D	894
04	033	80-468	PIPE OD 914 x 10 (UNDER GROUND PIPING)	150 MR	7MR TO 12.5MR	15 938 583 0000		STYLE-D	894
05									
06									

NOTES:-

- 01 ALL PIPES ARE TO BE SUPPLIED WITH EDGE PREPARATION AS PER DRG NO.
3-80-300-19825. FOR EP STYLE & d1 VALUE (WELD END DIAMETER) REFER THE TABLE.
02 TOLERANCE ON TOTAL LENGTH OF PIPE FOR EACH SERIAL NO IS ± 2 METERS .
03 FOR SHOP PAINTING/COATING DETAILS , REFER CUSTOMER APPROVED PAINTING SCHEDULE &
QUALITY PLAN FOR THE PROJECT.
04 FOR PIPE DIAMETER > 1000mm , SPIDER ARRANGEMENT HAS TO BE PROVIDED AT THE
ENDS AFTER EDGE PREPARATION , AS PER DRG. NO. 4-80-999-93078. FOR PIPE
DIAMETER < 1000mm , SPIDER ARRANGEMENT IS NOT REQUIRED.

REV	DATE	ALTERED	I.BISWAS
03	19.03.19	APPROVED	C.SARAVANAN
ZONE	DU NO.32 DELETED AND DU NO.33 QTY REVISED.	ZONE	SPECIFIC LENGTH & NOTE NO. 02 REVISED BASED ON DISCUSSION WITH MPL &MM MAIL DATED 17.01.19.
	ALL REV IS INDICATED AS 03		ALL REV IS INDICATED AS 02
		ZONE	NOTE NO.05 DELETED.
			ALL REV IS INDICATED AS 01

CUSTOMER NO. : 7300																									
NAME OF PROJECT :																									
YADADRI THERMAL POWER PROJECT (5 x 800MW)																									
NAME OF CUSTOMER :																									
TELANGANA STATE POWER GENERATION CORP. LTD.																									
										BHARAT HEAVY ELECTRICALS LTD.,										NO OF ITEMS					
										PIPING CENTRE, MADRAS															
										DEPT.		GRADE OF UN TOL. DIM				SCALE		WEIGHT (Kg).		NAME OF ORIGINAL ORGANISATION					
										CODE		C/M/F				N.T.S									
TITLE				PRODUCTION NOTES FOR CW & ACW PIPING SYSTEM				CARD CODE		DRAWING No.		REV													
								U 01		3-80-468-35326		03													

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FIRST ANGLE PROJECTION (ALL DIMENSIOINS ARE IN MILLIMETRES)

DRAWING NO.
3-80-468-35687

L

(SPECIFIC LENGTH)

SL. No.	DU NO.	PGMA	PIPE DESCRIPTION	QTY (in Meters)	SPECIFIC LENGTH	MATL. CODE	EDGE PREPARATION AS PER DRG NO. 4-80-999-93079	
						MATL. SPEC.	STYLE	Ø d1
01	001	80-468	PIPE OD3240x20 (UNDER GROUND PIPING)	800	10 m TO 14 m	15 938 611 0001 IS 2062 250 GRA	FIG-A	3226
02	002	80-468	PIPE OD813X8 (UNDER GROUND PIPING)	350	10 m TO 14 m	15 938 537 0001 IS3589-410MPA		
03	005	80-468	PIPE OD2336X18 (OVER GROUND PIPING)	60	10 m TO 14 m	15 938 726 000G IS3589-410MPA	FIG-A	2321
04	024	80-468	PIPE OD2032X18 (OVER GROUND PIPING)	17	10 m TO 14 m	15 938 717 000G IS3589-410MPA	FIG-A	2018
05	025	80-468	PIPE OD1422X12 (OVER GROUND PIPING)	20	10 m TO 14 m	15 938 708 0001 IS3589-410MPA	STYLE-D	1398
06	001	80-477	PIPE OD1726X14 (OVER GROUND PIPING)	2000	10 m TO 14 m	15 938 235 0001 IS3589-410MPA	STYLE-D	1698

CUSTOMER NO. : 7372

NAME OF PROJECT :
1x660MW BHUSAWAL TPS UNIT-6

NAME OF CUSTOMER :
MAHARASHTRA STATE POWER GENERATION CO. LTD.

BHARAT HEAVY ELECTRICALS LTD.,
PIPING CENTRE, MADRAS

DRN

CHD

APPD

NAME

PRADEEP

TRINADHA RAO

SESHAGIRI

SIGN

DATE

18.05.19

18.05.19

18.05.19

NO OF ITEMS

DEPT.

GRADE OF UN TOL. DIM

SCALE

WEIGHT (Kg).

NAME OF ORIGINAL ORGANISATION

ITEM No.

CODE

C/M/F

N.T.S

CARD CODE

U 01

DRAWING No.

3-80-468-35687

REV

02

REV 02

DATE 12.06.19

ALTERED TRINADHA RAO
APPROVED SESHAGIRI

REV 01

DATE 03.06.19

ALTERED TRINADHA RAO
APPROVED SESHAGIRI

ZONE

SL.NO. 01& 03 REVISED.

ZONE

SL.NO. 03 TO 06 ADDED.

TITLE

PRODUCTION NOTES FOR
LP PIPING SYSTEM

NOTES: -

- 01 ALL PIPES ARE TO BE SUPPLIED WITH EDGE PREPARATION AS PER DRG NO. 4-80-999-93079. FOR EP STYLE & WELD END DIA (Ød1), REFER THE TABLE. INSIDE BEVEL IS REQUIRED, ONLY IF D1 VALUE IS HIGHER THAN INSIDE DIAMETER.
- 02 TOLARANCE ON TOTAL LENGTH OF PIPE FOR EACH SERIAL NO IS ± 2 METERS .
- 03 FOR SHOP PAINTING/COATING DETAILS , REFER CUSTOMER APPROVED PAINTING SCHEDULE & QUALITY PLAN FOR THE PROJECT.
- 04 FOR PIPE DIAMETER > 1000mm , SPIDER ARRANGEMENT HAS TO BE PROVIDED AT THE ENDS AFTER EDGE PREPARATION , AS PER DRG. NO. 4-80-999-93078. FOR PIPE DIAMETER < 1000mm , SPIDER ARRANGEMENT IS NOT REQUIRED.

DRAWING NO.

MATERIAL SPECIFICATION :- IS:3589-410MPa
(SPIRAL WELD)

(SPECIFIC LENGTH)

- 01 ALL PIPES ARE TO BE SUPPLIED WITH EDGE PREPARATION AS PER DOG NO. 3-80-300-19825. FOR EP STYLE & d1 VALUE (WELD END DIAMETER) REFER THE TABLE. INSIDE BEVEL IS REQUIRED, ONLY IF D1 VALUE IS HIGHER THAN INSIDE DIAMETER.
- 02 TOLERANCE ON TOTAL LENGTH OF PIPE FOR EACH SERIAL NO IS ± 2 METERS .
- 03 FOR SHOP PAINTING/COATING DETAILS , REFER CUSTOMER APPROVED PAINTING SCHEDULE & QUALITY PLAN FOR THE PROJECT.
- 04 FOR PIPE DIAMETER $> 1000\text{mm}$, SPIDER ARRANGEMENT HAS TO BE PROVIDED AT THE ENDS AFTER EDGE PREPARATION .AS PER DOG. NO. 4-80-999-93078. FOR PIPE DIAMETER $< 1000\text{mm}$, SPIDER ARRANGEMENT IS NOT REQUIRED.

DIAMETER < 1000mm , SPIDER ARRANGEMENT IS NOT REQUIRED

NAME OF PROJECT :

PANKI THERMAL POWER PROJECT (1 x 660MW)

NAME OF CUSTOMER :

UTTAR PRADESH RAJYA VIDYUT UTPADAN NIGAM LTD



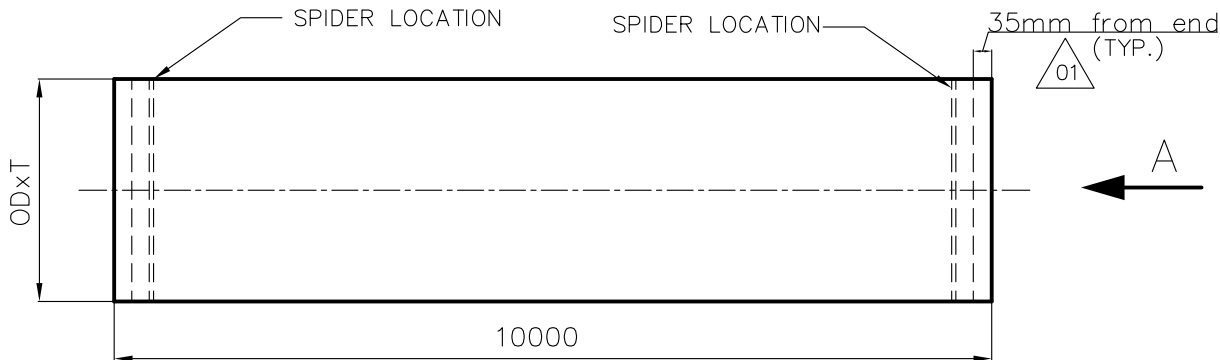
DRN	S. ARUN SHARMA	18.06.19
CHD	P SURESH	18.06.19
APPD	C SARAVANAN	18.06.19

Size A3

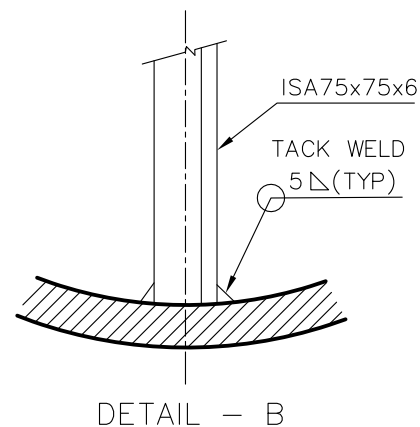
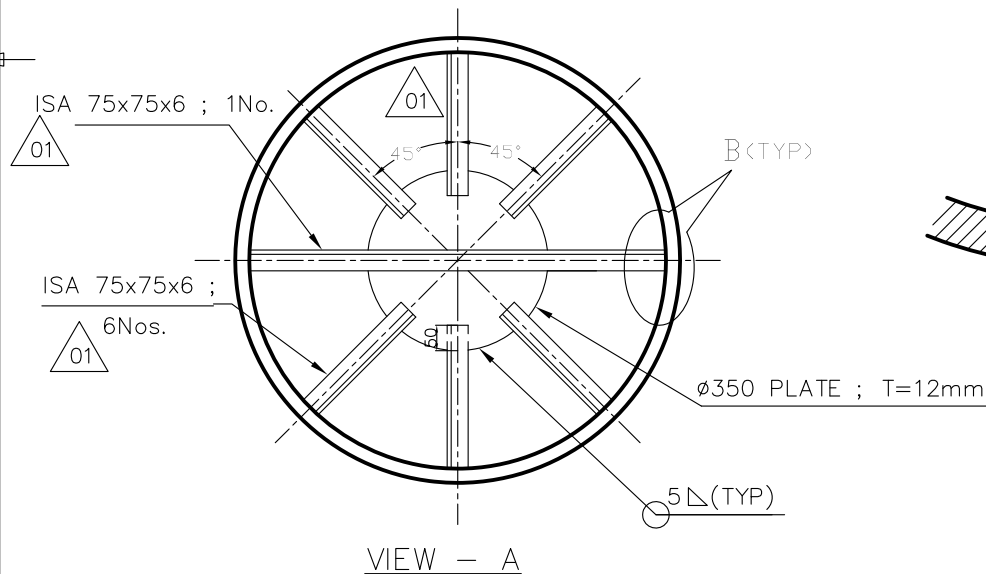
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REV	DATE	ALTERED	P SURESH
01	31.03.18	APPROVED	R SESHAGIRI
SPIDER DETAIL VIEW-A MODIFIED			
REVISIONS MARKED AS 			

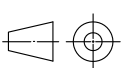
ALL DIMENSIONS ARE IN MILLIMETRES



SPIRAL/LONGITUDINAL WELDED PIPE
(2 LOCATIONS IN A PIPE)



STANDARD

 BHARAT HEAVY ELECTRICALS LIMITED PIPING CENTRE CHENNAI 600 017			DRN	NAME C.KUMAR	SIGN	DATE 11.04.08	NO.OF VAR	
			CHD	C.K.KARAN		11.04.08		
			APPD	C.K.KARAN		11.04.08		
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	
SPIDER ARRANGEMENT FOR FOR PIPE DIA 1000				U 01	4-80-999-93078		01	

DRAWING No. 3-80-300-19825

NOTES: — 01. APPLICABLE FOR P91/P92
03 i) STRAIGHT WITH STRAIGHT/FITTING
03 ii) BEND WITH BEND/FITTING

- 04 02. FOR OD MISMATCH, REFER FIGURE-Xa
04 03. REFER STYLE-DL FOR THICKNESS <14.2mm (FOR ALL OD/ID)
04 04. REFER STYLE-PL
i) WHEN THICKNESS IS ≥ 14.2 mm & <20mm (FOR ALL OD/ID)
ii) WHEN THICKNESS ≥ 20 mm & OD <219.1mm.
04 05. $\alpha = 6^\circ$ FOR WALL THICKNESS ≥ 20 mm AND ≤ 30 mm
06. $\alpha = 10^\circ$ FOR WALL THICKNESS > 30 mm

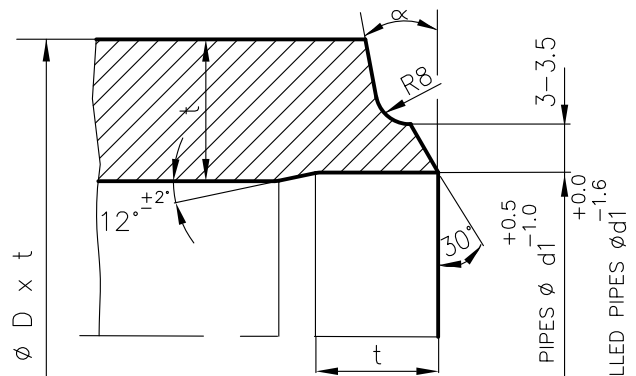


FIGURE - X

- MATCHING EDGE PREPARATION
02 FOR MISMATCH OD APPLICABLE FOR
BENDS/FITTINGS OF P91/P92 MATERIALS 03
NOTES: —
01. OD OF STRAIGHT TO BE PHYSICALLY MEASURED/VERIFIED.
02. t = THK OF CONNECTING PIPE (STRAIGHT)

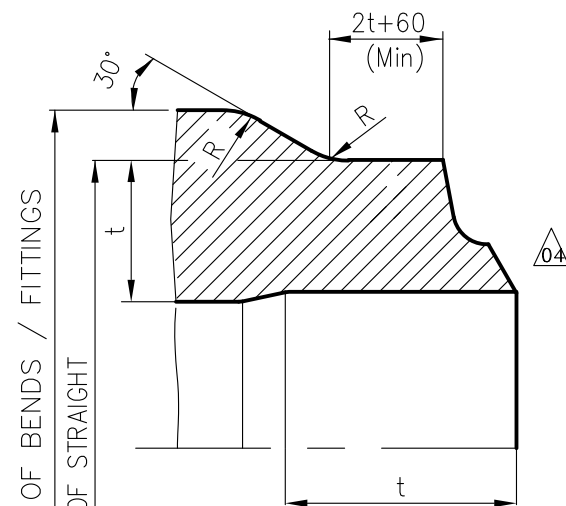
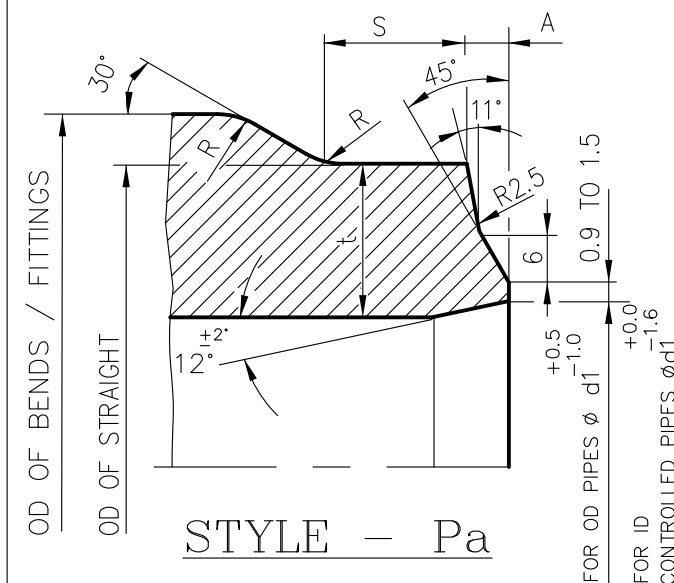


FIGURE - Xa

- 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)
03. t = THK OF CONN. PIPE (STRAIGHT)

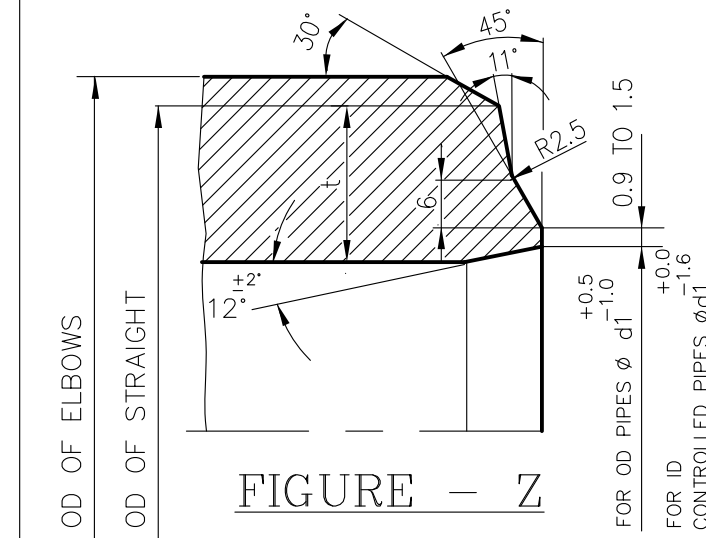


FIGURE - Z

- NOTES: — 01. APPLICABLE FOR P91/P92 ZERO ARM PIPEBEND WELDED WITH P91/P92 STRAIGHT PIPE
02. FOR OD MISMATCH, REFER FIGURE-Xa
03. REFER STYLE-DL FOR THICKNESS <14.2mm (FOR ALL OD/ID)
04 04. REFER STYLE-PL
i) WHEN THICKNESS IS ≥ 14.2 mm AND <20 mm FOR ALL OD/ID.
ii) WHEN THICKNESS ≥ 20 mm AND OD < 219.1 mm.
05. $\alpha = 6^\circ$ FOR WALL THICKNESS ≥ 20 mm AND ≤ 30 mm
06. $\alpha = 10^\circ$ FOR WALL THICKNESS > 30 mm

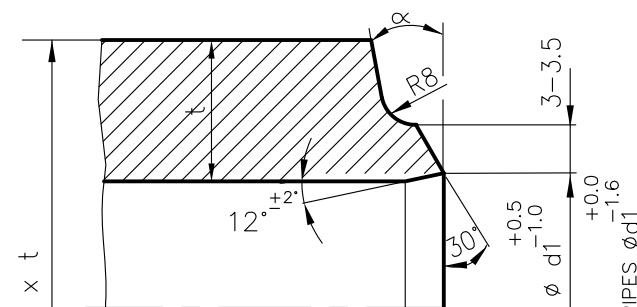


FIGURE - Xb

(BEND END) 03

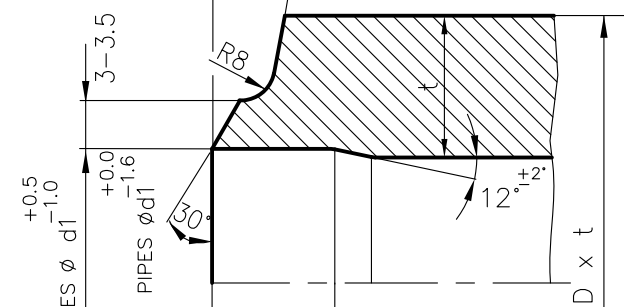
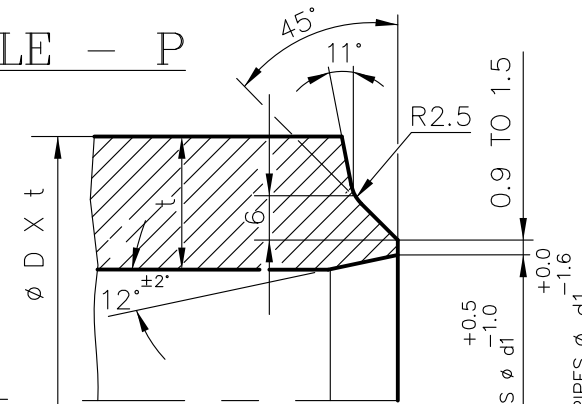


FIGURE - Xc

(STRAIGHT END) 03

STYLE - P

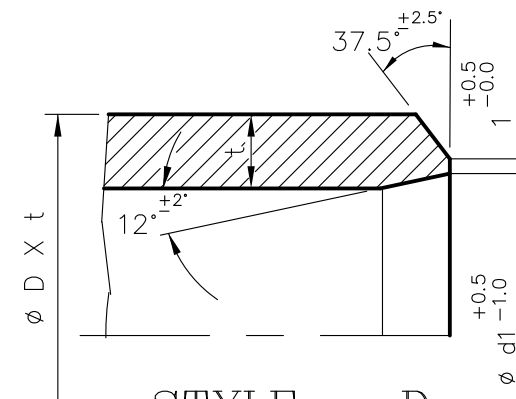


NOTES: —

- 04 01. USE WHEN $t \geq 14.2$ mm AND < 70mm.
04 02. FOR $t \geq 70.0$ mm REF. STYLE-Pm
03. FOR OD MISMATCHING REF. STYLE-Pa

NOTES: —

01. USE WHEN $t < 14.2$ mm.



STYLE - D

TYPE OF PRODUCT
OR NAME OF
CUSTOMER/PROJECT

01

STANDARD

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. 02

NOTES FOR WELDING:

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

REV 04	DATE 07.12.16	ALTERED: P SURESH APPROVED: R SESHAGIRI
ZONE	SHEET 2 OF 2 IS ADDED. NOTES ADDED, MODIFIED AND DELETED IN FIGURE-X, Xa, Xb, Xc AND STYLE-P	
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	

BHARAT HEAVY ELECTRICALS LTD.,
PIPING CENTRE, MADRAS

DEPT.

GRADE OF
UN TOL. DIM

CODE

C/M/F

TITLE

EDGE PREPARATION
DETAILS

DRN

NAME
K.B.RAGUNATH

CHD

M.C.SEKARAN

APPD

A.VELAYUTHAM

WEIGHT (Kg).

NAME OF ORIGINAL
ORGANISATIONCARD
CODE

DRAWING No.

U 01

3-80-300-19825

SHEET 1 OF 2

NO OF
ITEMSITEM
No.

REV

04

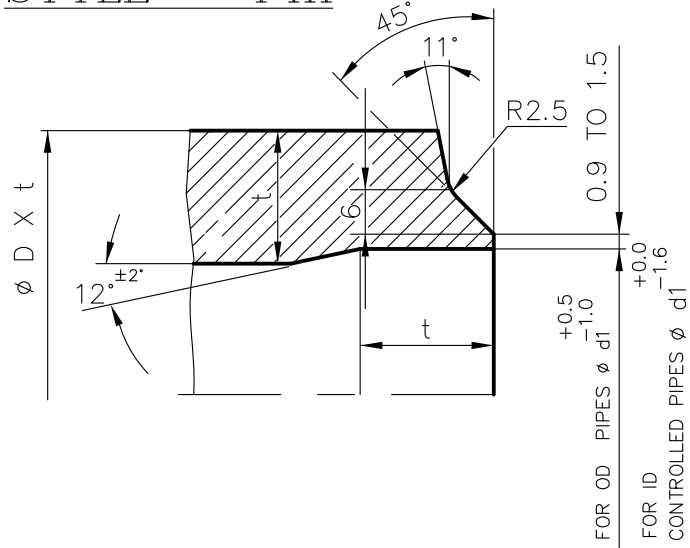
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3-80-300-19825

DRAWING No.

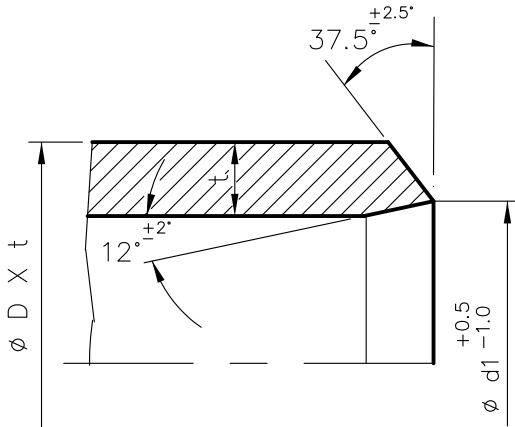
STYLE - P_m



NOTES: -

01. USE FOR SA106GRC PIPES WHEN $t \geq 70.0$ mm.
02. FOR OD MISMATCHING REF. FIGURE-P_a
03. FOR FITTINGS USE STYLE-P.

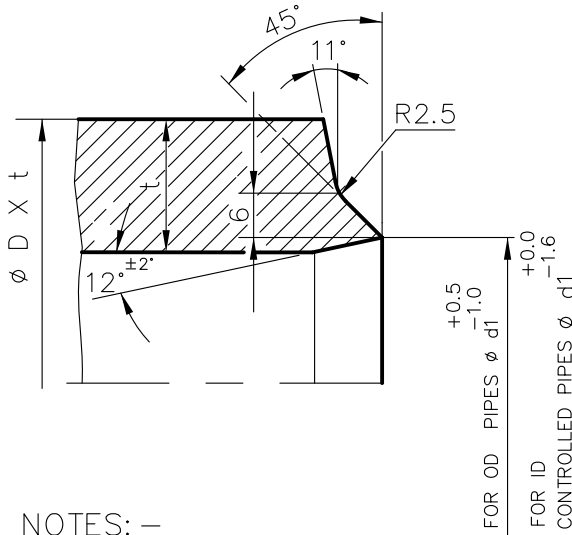
STYLE - D_L



NOTES: -

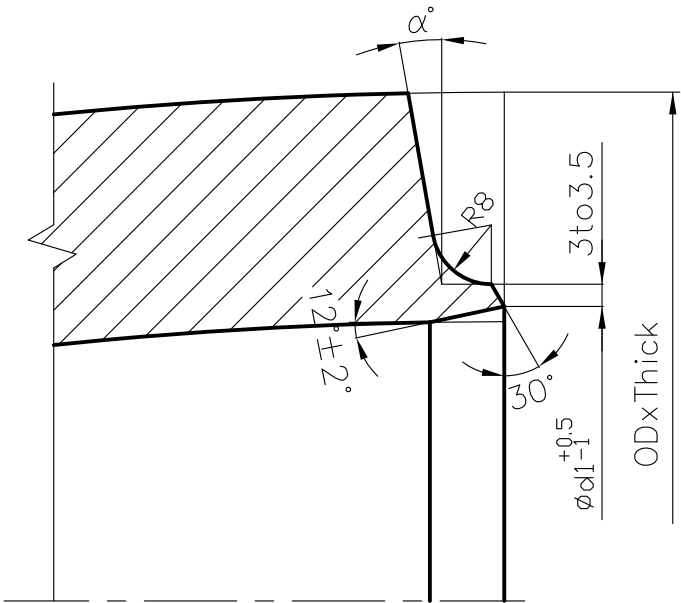
01. USE FOR P91 / P92 PIPES AND FITTINGS WHEN $t < 14.2$ mm (ALL OD/ID).

STYLE - P_L



NOTES: -

01. USE FOR P91 / P92 PIPES AND FITTINGS
i) WHEN THICKNESS IS ≥ 14.2 mm AND < 20 mm FOR ALL OD/ID.
ii) WHEN THICKNESS ≥ 20 mm AND OD < 219.1 mm.
02. FOR OD MISMATCHING REF. FIGURE-P_a



01. USE FOR P91 / P92 FITTINGS
02. REFER STYLE-D_L FOR THICKNESS < 14.2 mm FOR ALL OD/ID.
03. REFER STYLE-P_L
i) WHEN THICKNESS IS ≥ 14.2 mm AND < 20 mm FOR ALL OD/ID.
ii) WHEN THICKNESS ≥ 20 mm AND OD < 219.1 mm.
04. $\alpha = 6^\circ$ FOR WALL THICKNESS ≥ 20 mm AND ≤ 30 mm
05. $\alpha = 10^\circ$ FOR WALL THICKNESS > 30 mm.
06. FIGURE-Xf IS APPLICABLE FOR ALL BUTT WELDED FITTINGS NOT COVERED IN NOTES 02 & 03

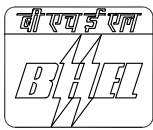
FIGURE-Xf

NOTE :

01. FOR GENERAL NOTES AND NOTES FOR WELDING REFER SHEET 1 OF 2.

TYPE OF PRODUCT
OR NAME OF
CUSTOMER/PROJECT

STANDARD

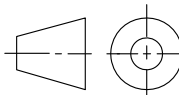


BHARAT HEAVY ELECTRICALS LTD.,
PIPING CENTRE, MADRAS

DRN	NAME	SIGN	DATE	NO OF ITEMS
CHD	P SURESH		07.12.16	
APPD	R SESHAGIRI		07.12.16	
	C KARUNAKARAN		07.12.16	

DEPT.

GRADE OF
UN TOL. DIM



SCALE

WEIGHT (Kg).

NAME OF ORIGINAL
ORGANISATION

ITEM
No.

CODE

C/M/F

SCALE

WEIGHT (Kg).

NAME OF ORIGINAL
ORGANISATION

ITEM
No.

TITLE

EDGE PREPARATION
DETAILS

CARD
CODE

U 01

DRAWING No.

3-80-300-19825

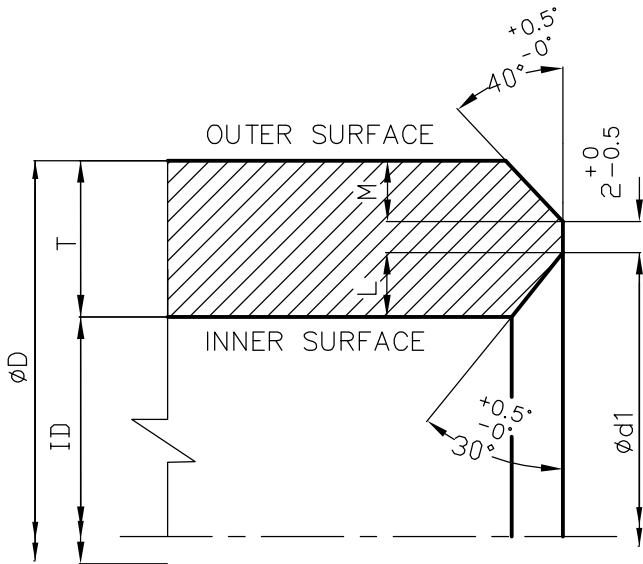
SHEET 2 OF 2

REV

04

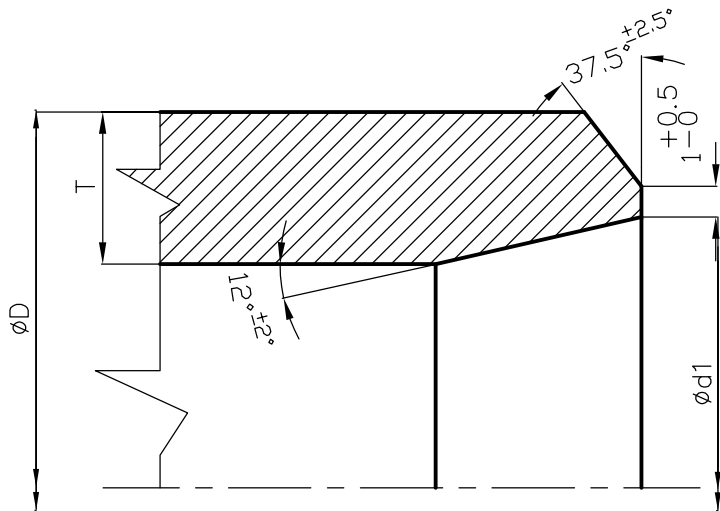
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REV	DATE	ALTERED	
		APPROVED	
		ALL DIMENSIONS ARE IN MILLIMETRES	



PIPE SIZE	M	L	ID	ød1
øD X T	5	T-7	D-2T	D-14

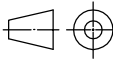
FIG-A E.P.DETAIL FOR PIPES OF THICKNESS
ABOVE 14mm



PIPE SIZE	ød1
øD X T	D-2T

STYLE-D E.P.DETAIL FOR PIPES OF THICKNESS
14mm AND BELOW

STANDARD

		BHARAT HEAVY ELECTRICALS LIMITED PIPING CENTRE CHENNAI 600 017			DRN	NAME C.KUMAR	SIGN	DATE 11.04.08	NO.OF VAR
					CHD	C.K.KARAN		11.04.08	
					APPD	C.K.KARAN		11.04.08	
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 EDGE PREPARATION DETAIL FOR PIPE DIA >1000					CARD CODE U 01	DRAWING NO. 4-80-999-93079			REV 00