

1.0 SCOPE

- 1.1 This Technical Delivery Conditions specify the requirements in addition to IS:3589 for electrically welded (EFW / SAW) steel pipes.
- 1.2 The pipes are intended for water services (under Non-IBR piping system only).
- 1.3 The pipes shall conform to the size, grade and quantity as specified in the purchase order.

2.0 MATERIAL

- 2.1 The plates / coils used for pipe shall meet the requirements as per IS: 3589 Grade Fe 410 MPa including mechanical test requirements.

3.0 DIMENSIONAL TOLERANCES

- 3.1 The tolerances limits are:

OD:- Upto NB 1600 mm: ± 4 mm; Above NB 1600 mm: ± 6 mm

Thickness:- Upto 14mm : $+1.3$ mm / -0.8 mm; Above 14 mm : $+1.4$ mm / -0.8 mm.

Length:- for OD upto 1300 mm : $+10$ mm/ -0 mm;

for OD above 1300 mm : ± 50 mm

Ovality (Difference between major and minor inside diameter) : 0.5% maximum

- 3.2 Other tolerances shall be as per IS: 3589

4.0 MANUFACTURING

- 4.1 The pipe shall be of longitudinally welded or spirally welded as indicated in the P.O.
- 4.2 The ends shall be edge prepared as indicated in the purchase order.
- 4.3 Circumferential seams shall be 1500 mm apart from each other and from ends.
- 4.4 All pipes shall be clearly finished and free from surface, sub surface defects such as pits, cracks, weld spatters & laminations etc..

5.0 NDE

- 5.1 The spiral welds/butt welds of length 100 mm from both the ends of the pipe shall be radiographically tested.

6.0 HYDROSTATIC PRESSURE TEST

- 6.1 Each pipe shall be subjected to a hydraulic test pressure as per IS: 3589 .
(i.e., using the formula $P = 2ST / D$)

7.0 INSPECTION

- 7.1 All pipes shall be inspected by the vendor prior to BHEL / Customers' Inspection. BHEL or BHEL authorized inspector / Customer will select the pipes at random and carryout the inspection. The necessary Material Despatch Clearance Certificate is to be obtained by the vendor prior to the despatch of material.

Approved by

P.Elangovan, QA

K.Ganeshan, MM

C. Karunakaran, Engg

B. Prakash Rao, Q & MS

8.0 PAINTING AND PACKING

- 8.1 Unless otherwise specified in the Purchase Order, all the pipes shall be coated with resin type translucent dry type rust preventive on the outside; pipes of diameter above NB 450 mm, shall be coated inside also.
- 8.2 Spiders are to be provided on both ends of the pipes as per the drawing - if indicated in the enquiry / Purchase Order.

9.0 MARKING

- 9.1 All pipes shall be paint stencilled, hard punched with the following details.

Paint Stencil

- Specification
- Heat number
- Pipe number
- Manufacturer's identification
- Material Code
- Size

Hard punch

- Specification
- Heat number
- Pipe number
- Manufacturer's identification

- 9.2 In addition to the above, for the pipes directly despatched to project site, the following details (furnished in the P.O. or separately) shall be paint stencilled & hard punched on both ends of the pipes

- Work order No
- DU No
- Project name
- Quantity
- Weight

10.0 CERTIFICATES

- 10.1 Three original test certificates typed in English shall be submitted along with the inspection report.

- 10.2 The test certificate shall furnish the following details.

- a. Purchase Order references.
- b. Test Certificate number.
- c. Specification, grade, size, quantity
- d. Heat number of plate (or pipe number with traceability to heat number)
- e. Chemical composition and mechanical properties
- f. Hydrostatic pressure test report
- g. RT Report.

P.Elangovan, QA
K.Ganeshan, MM

Approved by

C. Karunakaran, Engg
B. Prakash Rao, Q & MS

Bhilai 2 x 250MW Units 1 & 2

18/04/2006

Sl. No.	PGMA / Description	Surface Preparation & Profile	First Coat		Second Coat		Total DFT minimum
			Paint	No.of Coats	Paint	No. of coats	
1	a) Internal Surface – CW pipe (for pipe dia above 1000mm)	Blast Cleaning SSPC –SP-10 SA 2 ½ (Note 1)	Coal tar Epoxy (Note 2, 3)	One (100--200 microns)	Coal tar Epoxy (Note 2, 3)	One (200--400 microns)	400--500 microns.
	b) Internal Surface – Holiday testing of Epoxy coating	Holiday testing by low voltage (75 V) wet sponge Holiday detector.					
2	No painting shall be applied on galvanized piping, stainless steel piping.						
3	External Surface - CW Pipe-Encased in concrete.(For pipe dia- 1000 mm and above)	SSPC-SP3 / Power Tool Cleaning	Coal tar primer	one (30 microns)	-----	-----	30 microns.
4	External Surface (over ground piping) CW, ACW, ECW, plant water& AH Wash.water..(For all diameters)	SSPC-SP3 / Power Tool Cleaning	Red Oxide - Zinc Phosphate (Alkyd base to IS 12744)	Two (30 microns per coat)	Synthetic enamel Long oil Alkyd to IS 2932 (Smoke Grey Shade No.692 of IS:5	Three (30 microns per coat)	150 microns
5	External Surface of CW --Buried Piping (For pipe dia- 1000 mm and above) (Temporary Protection for transportation from works to site. Further protection shall be done by erection group as per field painting schedule).	Wire brush cleaning	Red Oxide Zinc Phosphate (Alkyd base to IS 12744)	One (30 microns)	-----	-----	30 microns.

Note2:- Approved paint manufacturers and their brand of Coal tar Epoxy paint are:

(a) Ameron .. Amercoat 78HB ; (b) Carboline .. Bitumastic 300M ; © Hempel.. Hempadur 15130 ; (d) ICI/Devoe.. Devtar 247 ;
(e) International .. Intertuf 708 ; (f) KCC Corrosion .. KCC AEP-20 ; (g) Sherwin-Williams .. TarGuard ;
(h) Sigma .. Sigma C-200a Coal Tar 3307 ; (i) U.S.Coatings ..MasticGrip 200 .

Note 3:- Paint application by airless spray as per paint data sheet requirements

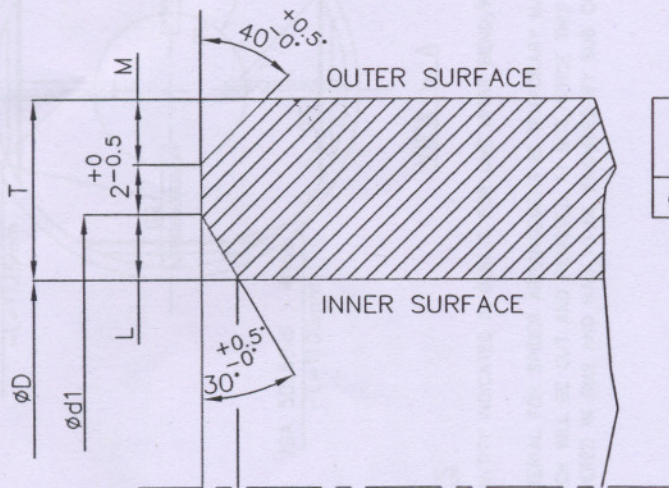
Note 4:- Vendors to incorporate these requirements and also include witness or verification points by BHEL / BHEL nominated inspection agency at appropriate stages in their QP. **The Vendor shall submit the Quality Plan, Painting Procedures along with the offer for BHEL Approval.**

m. P. [Signature] 18/4/06.

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.

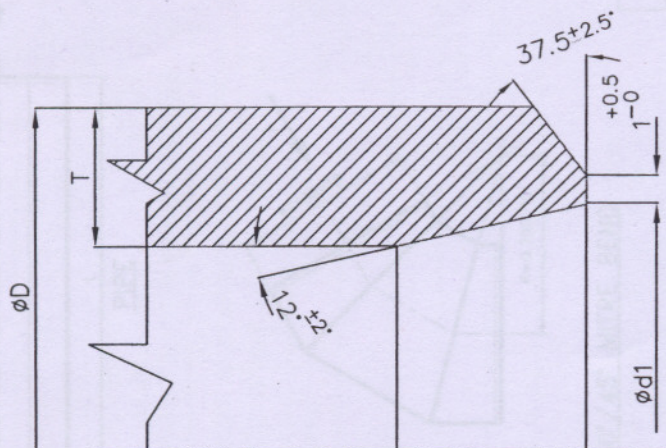
REV	DATE	ALTERED
		APPROVED

ALL DIMENSIONS ARE IN MILLIMETRES



PIPE SIZE OD X T	ød1	øD	T	L	M
ø 2435 x 18	2423	2399	18	11	5

FIG-A



PIPE SIZE ø D X T	ø d1
ø 1829 x 14	1801.0
ø 1626 x 14	1598.0

S.V.R. Kalaiselvan
S.V.R. Kalaiselvan
Deputy Manager / Engineering
BHEL / Piping Centre, Chennai 600 017

STYLE-D

BHILAI ELECTRIC SUPPLY CO. PVT. LTD.
EXPANSION OF BHILAI POWER PROJECT, 2x250 MW - UNIT 1&2



BHARAT HEAVY ELECTRICALS LIMITED
PIPING CENTRE
CHENNAI 600 017

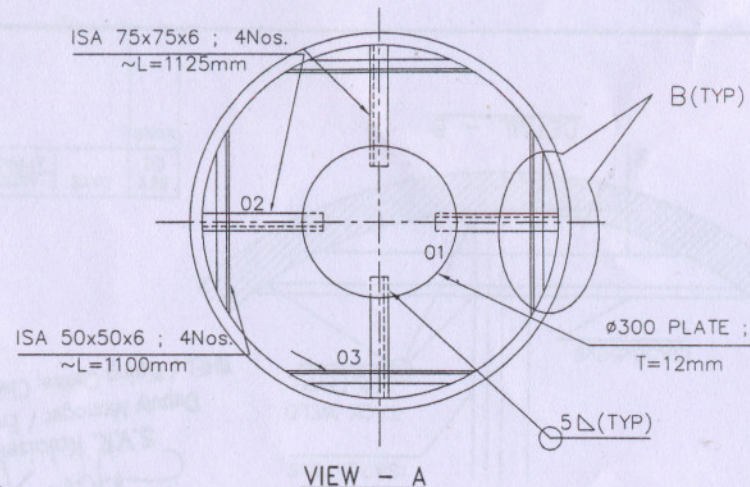
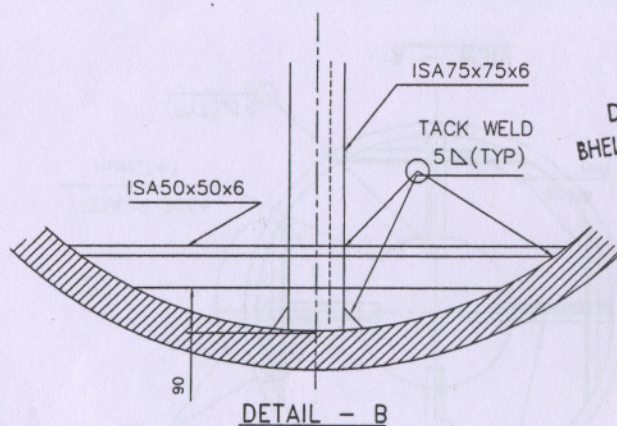
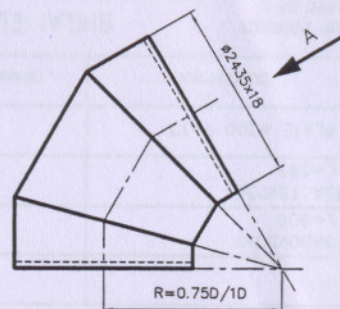
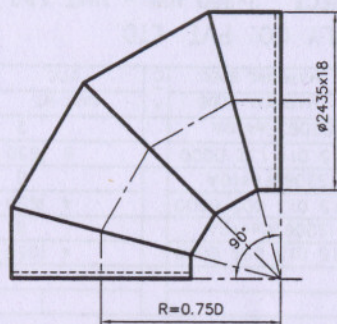
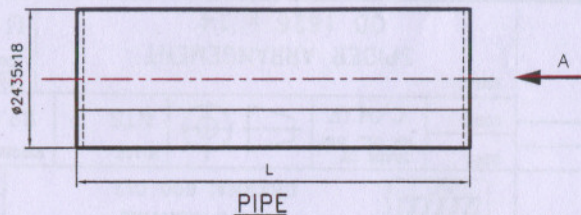
DRN	NAME	SIGN	DATE	NO. OF VAR
CHD	NS.RAJASEKAR		11.5.06	
APPD	SVR.KALAISELVAN			
	AP.MADHAVANKUTTY			

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	
EDGE PREPARATION DETAIL FOR CW PIPING	U 01			4-80-468-62194	00	

Size A4

3-80-468-23454

DRAWING No



NOTES

- QUANTITY INDICATED IN BOM IS FOR ONE MITRE BEND/PIPE.
- MATERIAL FOR SPIDER ARRANGEMENT IS TEMPORARY MATERIAL WHICH WILL BE CUT AND REMOVED AT SITE.HENCE THIS MATERIAL IS NOT COVERED IN GMS AND HAS TO BE PROVIDED BY SUB CONTRACTOR.

VAR NO.	ITEM NO.	DESCRIPTION	DRAWING NO.	ITEM NO.	MATERIAL CODE	UNIT WT.
	03	ISA50x50x6 L=1100		15 013 056 0000	4	950
				IS2062Fe410A		8
	02	ISA 75x75x6 L=1125		15 013 005 0000	7	650
				IS2062Fe410A		8
	01	PLATE 300 T=12		15 011 132 0000	6	655
				IS2062Fe410A		2
				VAR NO.	MATERIAL SPEC.	QTY.

TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT BHILAI ELECTRIC SUPPLY CO. PVT. LTD.
EXPANSION OF BHILAI POWER PROJECT, 2x250 MW - UNIT 1&2



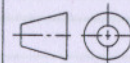
BHARAT HEAVY ELECTRICALS LTD.,
PIPING CENTRE,
CHENNAI 600 017

DRN	NAME	SIGN	DATE	NO OF ITEMS
CHD	T.N.ELANGOVAN		26.11.04	
APPD	R.CHANDRASEKHAR		26.11.04	

REV	DATE	ALTERED
01		APPROVED

ZONE

DEPT.	GRADE OF UN TOL DIM
	C/M/F



SCALE

WEIGHT (Kg)

114.11

REF TO ASSY / OLD DRG

ITEM No.

TITLE

SPIDER ARRANGEMENT
OD 2435x18

CARD CODE

U 01

DRAWING No.

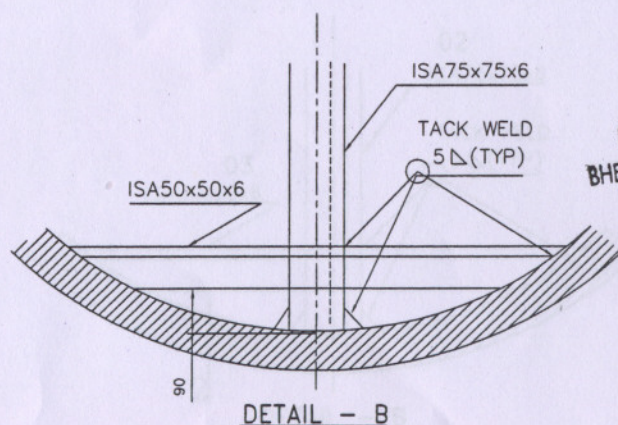
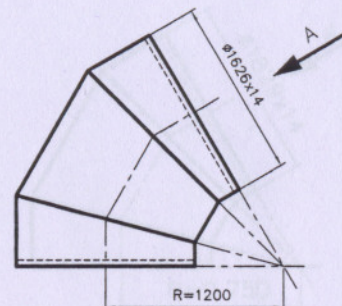
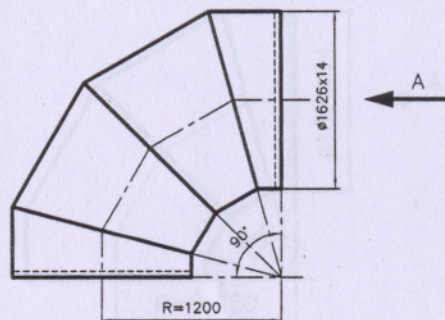
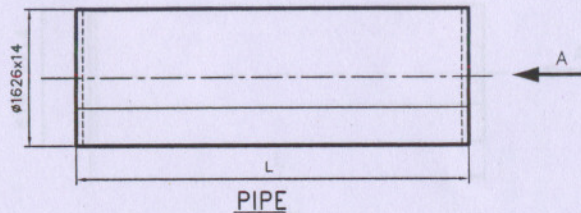
3-80-468-23454

REV

00

3-80-468-23455

DRAWING No

ISA 75x75x6 ; 4Nos.
~L=682mmISA 50x50x6 ; 4Nos.
~L=900mm

B(TYP)

φ300 PLATE ;
T=12mm

5Δ(TYP)

VIEW - A

NOTES

1. QUANTITY INDICATED IN BOM IS FOR ONE MITRE BEND/PIPE.
2. MATERIAL FOR SPIDER ARRANGEMENT IS TEMPORARY MATERIAL WHICH WILL BE CUT AND REMOVED AT SITE.HENCE THIS MATERIAL IS NOT COVERED IN GMS AND HAS TO BE PROVIDED BY SUB CONTRACTOR.

	03	ISA50x50x6 L=900			15 013 056 0000		4	050
					IS2062Fe410A			8
	02	ISA 75x75x6 L=682			15 013 005 0000		4	650
					IS2062Fe410A			8
	01	PLATE Ø300 T=12			15 011 132 0000		6	650
					IS2062Fe410A			2
VAR NO.	ITEM NO.	DESCRIPTION	DRAWING NO.	ITEM NO.	MATERIAL CODE	A	UNIT WT.	
				VAR NO.	MATERIAL SPEC.	C	QTY.	


S.V.R. Kalaiselvan
Deputy Manager / Engineering
BHEL / Piping Centre, Chennai 600 017

TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT BHILAI ELECTRIC SUPPLY CO. PVT. LTD.
EXPANSION OF BHILAI POWER PROJECT, 2x250 MW - UNIT 1&2

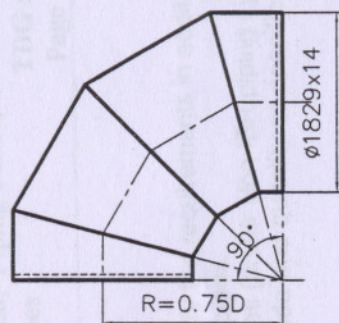


BHARAT HEAVY ELECTRICALS LTD.,
PIPING CENTRE,
CHENNAI 600 017

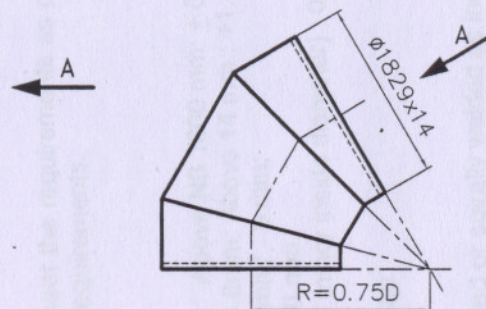
DRN	NAME	SIGN	DATE	NO OF ITEMS
CHD	SVR KALAISELVAN		12.5.06	
APPD	AP.MADHAVANKUTTY			

REV 01	DATE	ALTERED APPROVED	DEPT.	GRADE OF UN TOL DIM		SCALE	WEIGHT (Kg).	REF TO ASSY / OLD DRG	ITEM No.
ZONE			CODE	C/M/F		NTS	82.900		
			TITLE	SPIDER ARRANGEMENT OD 1626 x 14			CARD CODE	DRAWING No.	REV
							U 01	3-80-468-23455	00

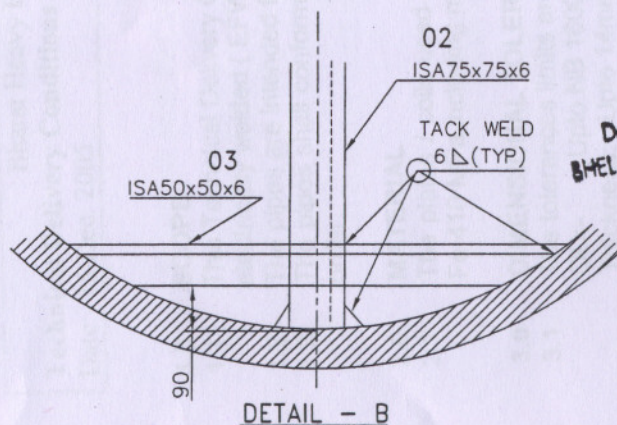
DRAFTING NO.



90Deg MITRE BEND

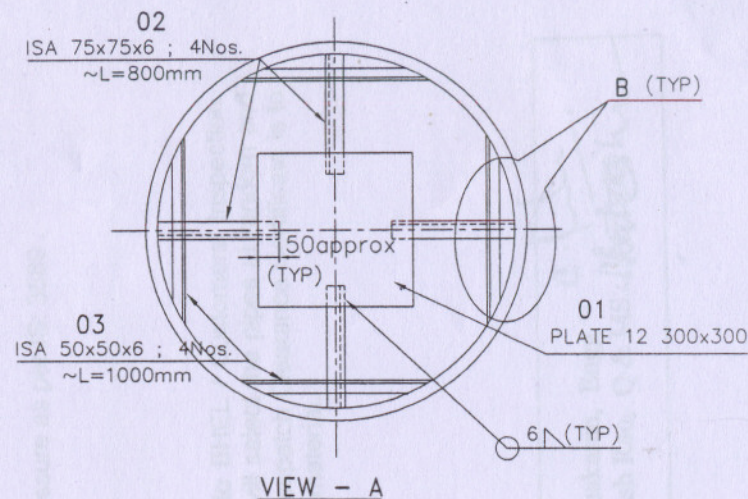


60Deg/45Deg MITRE BEND



DETAIL - B

K. Selva
S.V.R. Kalaiselvan
Deputy Manager / Engineering
BHEL / Piping Centre, Chennai 600 017




NOTES


1. QUANTITY INDICATED IN BOM IS FOR ONE MITRE BEND/PIPE.
2. MATERIAL FOR SPIDER ARRANGEMENT IS TEMPORARY MATERIAL ONLY, WHICH WILL BE CUT AND REMOVED LATER. HENCE THIS MATERIAL IS NOT COVERED IN GMS AND HAS TO BE PROVIDED BY SUB CONTRACTOR.

[illegible]

TYPE OF PRODUCT
OR NAME OF
CUSTOMER/PROJECT

BHILAI ELECTRIC SUPPLY CO. PVT. LTD.
EXPANSION OF BHILAI POWER PROJECT, 2x250 MW - UNIT 1&2

	BHARAT HEAVY ELECTRICALS LTD.,		NAME	SIGN	DATE	NO OF ITEMS
	PIPING CENTRE,		DRN NS.RAJASEKARAN		11.5.06	
	CHENNAI 600 017		CHD SVR.KALAISELVAN			
			APPDAP.MADHAVANKUTTY			

REV 01	DATE	ALTERED APPROVED	DEPT.	GRADE OF UN TOL DIM C/M/F		SCALE N.T.S.	WEIGHT (Kg.) 96.480	REF TO ASSY / OLD DRG	ITEM No.
ZONE			CODE	TITLE SPIDER ARRANGEMENT OD1829x14			CARD CODE U 01	DRAWING No. 3-80-468-23456	REV 00