BHARAT HEAVY ELECTRICALS LIMITED

ENQUIRY (INDIGENOUS)

(A Government of India Undertaking)
80, G.N.ROAD, T.NAGAR
Purchase Department - Piping Centre
CHENNAI - 600 017.
TAMILNADU (INDIA)

PHONE :
GRAMS : BHARATELEC
FAX NO :
E-mail :
Web :

OFFICE COPY

Collective No.	Enquiry Date	Due Date for Quotation
4010700040	01.12.2007	14.12.2007

Due Date for

Please quote Enquiry No, Date and due date in all correspondences.
This is only a request for quotation and not an order

RFQ No: 4010700040

Item	Description	Unit	Quantity	Delivery Quantity	Schedule Date
10	159385970001 PIPEDIA2235X18(SPIRAL/LS)IS3589-410MPA *HTP: 26.00* *TDC: TDC:TDG:07/05* *Length: 10000.00*	M	50.000	50.00	31.03.08
20	159386020001 PIPEDIA1829X14(SPI/LS)IS3589-410MPA-OG *HTP: 21.00* *TDC: TDG:07:05* *Length: 10000.00*	M	40.000	40.00	31.03.08
30	1593859700UG PIPE DIA 2235X18 (SPI/LONGI)IS3589-410MP *HTP: 26.00* *TDC: TDG:07:05* *Length: 10000.00*	M	70.000	70.00	31.03.08
40	1593860100UG PIPEDIA3240X20UG(SPIRAL/LS)IS3589-410MPA *HTP: 18.00* *TDC: TDG:07.05* *Length: 10000.00*	M	1180.000	1,180.00	31.03.08

General Note:

Enclosures:

"LD clause has to be confirmed without fail."

PR Links

Material.	PR.No	PR.Item.	Quanity	Acc. Assign	Customer Numbe
159385970001	27454719	00040	50.000	P1/6919	P1/6919
159386020001	27454719	00050	40.000	P1/6919	P1/6919

The offers should reach us before the time of opening of tenders.
The offers will be opened at 14:30 hours on the due date in the presence of the tenderers who may like to be present.
Late tenders are liable to be rejected.

Yours faithfully,
For BHARAT HEAVY ELECTRICALS LIMITED

ENQUIRY NO: 4010700040 **DATE: 01.12.07**

IMPORTANT INFORMATION TO BIDDERS.

1. This Tender is a **TWO PART BID.**
   Part I - Technical cum Commercial.
   Part II - Price.
   Type and quantum of work is detailed in "SCOPE OF WORK"
2. The quoted price shall be " FIRM " till the complete execution of the scope.
3. Last date for submission of offer **14.12.07 - Time - 13.30 Hours.**
4. Technical cum Commercial Bid Opening Date **14.12.07 - Time - 14.30** Hours.
5. Price Bid of only the Technically acceptable offers shall be opened at a later date.
6. The above bid shall be sent in a sealed cover duly indicating

Enquiry No. & date, Tender Opening date and " **CW PIPING - IS 3589 – BELLARY POWER PROJECT"**

To
SDGM / PROCUREMENT
BHEL - Piping Centre
Old No 93, (New No:80) G N Chetty Road
T Nagar / Chennai 600 017 . PHONE : 28158804 / 28158820

(Technical cum Commercial offer and Priced offer shall be put in separate envelopes with the above mentioned details on it.)

SCOPE OF WORK :

BHEL requires the below mentioned quantities of various sizes of Welded Pipes – Pipes either **Spiral or Longitudinal Seam Weld** conforming to IS 3589 FE 410 Pipes with Internal and External Painting and as per TDC-TDG:07:05 and to be delivered to Site as per Technical specification detailed out in Technical and Commercial Part of this Bid. The raw material plate is to be arranged by suppliers themselves.

LIST OF ITEMS.

Enq. Sl.no	Pipe Size	Sp. Length mm	Specification	Hydro Test (Bars)	Qty. Mtr	Destination	Delivery
01	Dia 2235 x18 OG	10000	IS 3589	26	50.0	BELLARY SITE	31.03.08
02	Dia 2235 x18 UG	10000	IS 3589	26	70.0	BELLARY SITE	31.03.08
03	Dia 3240 x 20 UG	10000	IS 3589	18	1180.0	BELLARY SITE	31.03.08
04	Dia 1829 x 14 OG	10000	IS 3589	21	40.0	BELLARY SITE	31.03.08

Total Weight = 2017 MT

PART - I : TECHNICAL CUM COMMERCIAL.

Technical :

1. The bidder shall supply the Welded Pipes, as per IS 3589 Specification and shall also comply with the following BHEL documents.
   a. Acceptance to BHEL TDC ref : TDG : 07 : 05 .
   b. Painting requirements for CW Piping – KPCL Bellary, as per QP No. 6779 : QPC : 01 Rev 01 Dt. 14.02.05 & QP No. 6779:QPC:03 Rev 02 Dt. 14.02.05
   c. Edge Preparation shall be done on each Pipe as per BHEL Drawing No. 4-80-468-58934 Rev 00
   d. Spiders shall be provided as per the enclosed drawings

2. Bidders shall clearly indicate their point to point acceptance to the TDC and other requirements and in case, any deviations taken shall be clearly indicated. Also, Please ensure "Not to repeat deviations taken in earlier tenders which have not been accepted by BHEL". This will enable quicker processing of tender. Any deviations taken after placement of Purchase Order "shall not be considered". The bidder shall clearly mention the manufacturing process that will be adopted. Also the proposed WPS (Welding Procedure Specification) shall be enclosed.
3. The Bidder shall submit their Quality plan to BHEL for approval along with the offer indicating the verification, witness and hold points of PDIL and Customer Inspection with percentage of checks involved in the manufacturing process. The Procedure for the Holiday Detector Testing shall be submitted along with the offer. Holiday Test shall be witnessed by BHEL/BHEL Authorised agency and Customer.
4. The Bidder shall indicate the raw material specification of Plate/Coil to be used for Pipe Fabrication.
5. Vendors to depute suitable representative to discuss and finalise Technical and Commercial points and Quality Plan etc., to speed up the process before opening the price bids
6. Inspection shall be done by BHEL/BHEL Authorised Agency and BHEL's Customer.

Commercial :

1. The prices quoted by the Bidder shall be on F.O.R. Ex-works basis with Freight extra for transportation of Finished pipes to Bellary Site. Price quoted shall be " FIRM " till the execution of the complete scope with raw material plate in their scope.
2. Payment for freight will be based on per meter. The Bidder shall clearly indicate whether Service Tax for Transportation is included or not in the Freight Rate quoted. Documentary evidence for proof of payment of Service Tax shall be submitted for payment.
3. The bidder shall confirm in this Part of bid that he has given all the breakups as requested in the price bid format as enclosed (Part II - Price) .
   (The bidder shall also enclose in Part I a copy of un priced - Price part format to know whether the bidder have taken care of all the points).
4. The bidder shall clearly indicate the applicable Taxes / Duties / CESS. (See Format).
5. Delivery - 31st March 2008.
6. LD @ 0.5 % per week subject to a maximum of 15% for the undelivered portion shall be levied.
7. Bidder shall give a minimum validity of 60 days for the offer i.e 60 days from the date of opening of Price Bids.
8. Payment terms - 100 % against Acknowledged Lorry way Bill from Site and within 60 days from the date of submission of clear documents, as listed below,
   a. Invoice (Original).
   b. Excise Gate Pass if applicable.
   c. Acknowledged Lorry Way Bill / Delivery Challan.
   d. Original Test certificate and Inspection reports.

   The Bidders shall strictly adhere to the Payment Terms as indicated above.
9. In case of incomplete / inadequate information provided against the requirements of this tender the offer shall be liable for rejection.

10. L1 bidder shall not automatically qualify for getting the order and BHEL has the right to negotiate price and delivery and if warranted BHEL shall also split the order on two or more parties. If split between 2 parties the ratio shall be 60:40. 60% on original L1 bidder and 40% to L2 bidder who has matched with L1 price.

PART - II - PRICE :

In this part of bid, the bidder shall provide the price strictly in the below mentioned format In this addition to the hard copy, the bidder has to submit in soft copy also in excel format. This format for which shall be sent and the same is to be submitted along with the offer (Refer Annexure - Price Format).

a. Base Price shall include Cost of Raw Material plus conversion cost per Mtr of bare pipe including Edge Preparation and providing Spider Arrangement and Testing as per TDC : TDG : 07 : 05.
b. Ordering shall be on FOR - Site basis .
c. Percentage of applicable Taxes, Duties and CESS shall be clearly indicated .
d. Service Tax on transportation if included shall be clearly indicated.
e. A soft copy of the price format with price details are also to be sent along with price bid.
(Preferably in CD).

The Price quoted shall be " FIRM " till complete execution of the scope and bidder shall give **validity** of this price offer for a period of **minimum 60 days** from the date of opening of Price Bids.

LIST OF DOCUMENTS ENCLOSED :

1. TDC : TDG: 07:05.
2. QP No. 6779 : QPC : 01 Rev 01 Dt. 14.02.05 & QP No. 6779:QPC:03 Rev 02 Dt. 14.02.05
3. Edge Preparation Drawing No. No. 4-80-468-58934 Rev 00
4. Spider Arrangement Drawings.

The above documents from part of this tender document and bidder shall ensure that they have received all these along with tender and confirm.

- **Pre Qualified** is the criteria for consideration for other than the BHEL Approved Vendors. After qualifying for registration, the new Vendors, may be considered for future inline with their system and policy. Such Vendors will not be considered in this Enquiry.
- The new Vendors may download Vendor registration forms from BHEL Web Site www.bhel.com and submit all relevant data for formal registration.

Sr. Purchase Officer

PRICE :

In this part of bid, the bidder shall provide the price strictly in the below mentioned format.

b. Under Ground - As per Sl.no. 4 (a) and 6 (a) of Painting Scheme

Sl. No	Pipe Size	Total Qty in Mtrs	Base Price of Pipe Rate/Mtr (Ex-Works) as per TDC: TDG:07:05	Extra inside Coating Rate/Mtr (Coal Tar Primer – 1 x 25 Microns) – Primer Coat	Extra inside Coating Rate/Mtr (Coal Tar Epoxy – 2 x 75 Microns) – Over Coat	Extra Outside Coating Rate/Mtr (Red Oxide Zinc Chromate–Alkyd Base to IS 2074 – 1 x 25 Microns) – Primer	Extra Transportation Cost/Mtr of Finished Pipe to Bellary Site
USE EXCEL FILE -PRICE FORMAT- GIVEN BY US (REFER ENCLOSED PRICE FORMAT) FOR GIVING YOUR OFFER							

b. Over Ground – As per Sl.no. 2 and 6 (a) of Painting Scheme

Sl. No	Pipe Size	Total Qty in Mtrs	Base Price of Pipe Rate/Mtr (Ex-Works) as per TDC: TDG:07:05	Extra inside Coating Rate/Mtr (Coal Tar Primer – 1 x 25 Microns) – Primer Coat	Extra inside Coating Rate/Mtr (Coal Tar Epoxy – 2 x 75 Microns) – Over Coat	Extra Outside Coating Rate/Mtr (Red Oxide Zinc Chromate–Alkyd Base to IS 2074 – 2 x 25 Microns) – Primer	Extra Outside Coating Rate/Mtr (Synthetic Enamel Long Oil Alkyd to IS 2932 Sea Green Shade 217 as per IS 5 – 2 x 25 Microns) – Finish Paint	Extra Transportation Cost/Mtr of Finished Pipe to Bellary Site
USE EXCEL FILE -PRICE FORMAT- GIVEN BY US (REFER ENCLOSED PRICE FORMAT) FOR GIVING YOUR OFFER								

BHARAT HEAVY ELECTRICALS LIMITED PIPING CENTRE CHENNAI – 17 QUALITY ASSURANCE & CONTROL DEPT. QA 03	KPCL BELLARY (1X500MW) CUSTOMER NO. 6779 QUALITY PLAN FOR MANUFACTURING OF CIRCULATING WATER (CW) PIPING AS PER IS 3589	QP NO. 6779: QPC: 01 REV.NO. 01 DATE: 14.02.2005
PREPARED BY: P. RAVISHANKAR	REVIEWED AND APPROVED BY: P. ELANGOVAN	PAGE: 2 OF 2

S.NO	COMPONENT OR OPERATION	CHARACTERISTICS	TYPE OF CHECK	QUANTUM OF CHECK	REF.DOCUMENT/ ACCEPTANCE STANDARD	TYPE OF RECORD	AGENCY			REMARKS
							**	B	C	
1	2	3	4	5	6	7	8 –			9
4	DIMENSION	Length, Dia. Thickness, Straightness and bevel profile, surface defects.	Measurement	100%	Drawing / Tolerance on OD: +/- 6mm, Tolerance on Thk: +1.4mm, -0.8mm Tolerance on Ovality = Diff between major & minor outside diameter shall not exceed 0.5%.	Dimension Record	P	W	V	
5	NDT ON WELDED PIPE	RT on pipe ends (Long Seam Weld) of length 100mm on both the ends of pipe shall be Radiographically tested.	RT	100%	ASME Sec V	RT Report	P	V	W*	
6	Hydro test or Radiography	Soundness	Hydro / RT	100% Hydro or 10% RT	No Leakage ASME Sec V	Report	P	W	CHP	CHP:Customer hold point.
7	PAINTING	Correctness / Elcometer / DFT Thickness	Visual	100%	As per approved KPCL Painting Specification 6779:QPC:03	Painting Record	P	W	W	

FICHTNER CONSULTING ENGINEERS MADRAS

CHIEF Engineer KPCL

BHARAT HEAVY ELECTRICALS LIMITED PIPING CENTRE CHENNAI – 17 QUALITY ASSURANCE & CONTROL DEPT. QA 03	KPCL BELLARY (1X500MW) CUSTOMER NO. 6779 QUALITY PLAN FOR MANUFACTURING OF CIRCULATING WATER (CW) PIPING AS PER IS 3589	QP NO. 6779: QPC: 01 REV.NO. 01 DATE: 14.02.2005
PREPARED BY: P. RAVISHANKAR	REVIEWED AND APPROVED BY: P. ELANGOVAN	PAGE: 1 OF 2

S.NO	COMPONENT OR OPERATION	CHARACTERISTICS	TYPE OF CHECK	QUANTUM OF CHECK	REF.DOCUMENT/ ACCEPTANCE STANDARD	TYPE OF RECORD	AGENCY **	AGENCY B	AGENCY C	REMARKS
1	2	3	4	5	6	7	8	8	8	9
1	RAW MATERIALS	Chemical and Mechanical Properties Thickness Surface defects i.e. pitting and Lamination	Receipt Inspection	100%	Mill Test Certificate IS 2062 Gr.B	Mill TC	P	V	V	Marking plates / coil shall be co-related with MTC. ** Manufacturer B BHEL C Customer W Witness V Verification P Perform
2	IN PROCESS CONTROL	Plate Marking cutting and edge preparation	Visual and Dimensional	100%	Drawings	-	P	-	-	
		Rolling and Fit-up	Measurement of Circularity& Root Gap	100%	Drawings, Root gap 2 to 3mm	-	P	-	-	
3	WELDING QUALIFICATION (SAW)	Procedure Qualification	Review of WPS,PQR	100%	ASME Sec IX	WPS,PQR	P	V	V	* If welder is already qualified then records will be reviewed otherwise, Procedure, Welder will be qualified by BHEL.
		Welder Qualification	Review of Records.	100%	ASME Sec IX	WQ	P	-	V	

QP APPROVED FOR BELLARY UNIT-1.

APPLICABLE FOR BELLARY UNIT-2

FICHTNER CONSULTING ENGINEERS ★ MADRAS ★

Chief Engineer KHCL Tharun Nagar

[illegible] ELECTRICALS LTD.	KPCL - BELLARY 1X500MW CUSTOMER NO: 6779 PAINTING SCHEDULE FOR (CW/ACW/RW/ECW & PLANT WATER ,PLANT AIR PIPING)	QP NO: - 6779:QPC:[illegible] Rev: - 02 Date: 14.02.2005 Page: 1 of 3

Description/PGMA	Surface Prepa-ration & Surface Profile	Primer coat		Intermediate coat		Finish coat			
		Paint	No.of coats	Paint	No.of coats	Paint	No.of coats	Shade	Total DFT Microns (min)
[illegible] Encased in [illegible] 1000 mm and	SSPC-SP3/ Power Tool Cleaning	Red Oxide Zinc chromate (Alkyd base to IS 2074)	1 (25 microns)	--	--	--	--	--	25
[illegible] over ground. [illegible] 1000 mm and	SSPC-SP3/ Power Tool Cleaning	Red Oxide Zinc chromate (Alkyd base to IS 2074)	2 (25 microns per coat)	--	--	Synthetic enamel Long oil Alkyd to IS 2932	2 (25 microns per coat)	Sea Green shade 217 As per IS 5	[illegible]

[illegible] SHANKAR

[illegible] NGOVAN

QP APPROVED FOR BELLARY UNIT-1,

APPLICABLE FOR BELLARY UNIT-2

Chief Engineer (Thermal Projects)

[illegible] ELECTRICALS LTD..			KPCL - BELLARY 1X500MW CUSTOMER NO: 6779 PAINTING SCHEDULE FOR (CW/ACW/ RW/ECW & PLANT WATER ,PLANT AIR PIPING)						QP NO: - 6779:QPC:01 Rev: - 02 Date: 14.02.2005 Page: 2 of 3	
SL NO	Description	Surface Prepa-ration & Surface Profile	Primer coat		Intermediate coat		Finish coat			
			Paint	No.of coats	Paint	No. of coats	Paint	No.of coats	Shade	Total DFT Microns (min)
	[illegible] Surface (over ground piping) ACW, ECW & Raw water for [illegible]	SSPC-SP3/ Power Tool Cleaning	Red Oxide Zinc chromate (Alkyd base to IS 2074)	2 (25 microns per coat)	--	--	Synthetic enamel Long oil Alkyd to IS 2932	2 (25 microns per coat)	Sea Green shade 217 As per IS 5	100
	[illegible] Surface [illegible] Temporary Protection [illegible] from [illegible]	Wire brush cleaning	Red Oxide Zinc chromate (Alkyd base to IS 2074)	1 (25 microns)	--	--	--	--	--	

[illegible] pipe, Service air, and Instrument air piping – shall be galvanised as per – IS-4736.

[illegible] BY : P.R.VISHANKAR

[illegible] : [illegible] ANGOVAN

Chief Engineer KPCL Thermal Designs

KARNATAKA POWER CORPORATION LIMITED

A. Drawing Approved As submitted
B. Drawing Approved with Comments, Proceed with Fabrication Considering Comments.
C. Drawing Not approved. Correct the Original Drawing Duly Incorporating our Comments and Resubmit for Approval.
D. Correct the Original Drawing Duly Incorporating our Comments and Submit for Records.
E. Our Comments are Marked up on this Drawing.
F. See Attached Memo TDDS/STG/APP-1/1917
G. Refer Covering Letter No..... Dt. 24.1.97
H. Drawing Not Approved. Information furnished on the Drawing is Noted.
I. Print Not Enclosed.

Approval/Comments Conveyed herein neither relieves Contractor of his Contractual obligations and ... Responsibilities for Correctness of Dimensio... Materials of Construction, Weights, Quantities, Design, Details Assembly for System/performance Requirements and Conformity of Supplies w... Indian Statutory Laws as may be applicable ... does it limit the Purchaser's Rights under the Contra...

Date : 24/1/97 Chief Engineer (Thermal Designs)

BHEL - HEAVY ELECTRICALS LTD., PIPING CENTRE CHENNAI-600 017	KPCL - BELLARY 1X500MW CUSTOMER NO: 6779 PAINTING SCHEDULE FOR (CW/ACW, RW, ECW & PLANT WATER ,PLANT AIR PIPING)	QP NO: - 6779:QPC:035 Rev: - 02 Date: 14.02.2005 Page: 3 of 3

SL NO	PGMA / Description	Surface Preparation & Surface Profile	Primer coat		Intermediate coat		Finish coat			
			Paint	No.of coats	Paint	No. of coats	Paint	No. of coats	Shade	Total DFT Microns (min)
(i)	External Surface – CW pipe (for [illegible] 1000mm and above) (ii) Hydro test witness by BHEL [illegible]	Blast Cleaning SSPC – SP-10 SA 2 1/2	Coal tar Primer	1 (25 microns)	--	--	Coal tar epoxy	2 (75 microns per coat)	—	175

Application of Coal tar primer, coal tar epoxy shall be done as per manufacturers data sheet / recommendation [illegible] the thickness indicated above.

[illegible] SHANKAR

[illegible] GOVAN

Chief Engineer KPCL Thermal Projects

KARNATAKA POWER CORPORATION LIMITED

A. Drawing Approved As submitted

B. Drawing Approved with Comments. Proceed with Fabrication incorporating the Comments.

C. Drawing Not Approved. Correct the Original Drawing Duly Incorporating our Comments and Resubmit for Approval.

D. Correct the Original Drawing Duly Incorporating our Comments and Submit for Records.

E. Comments noted up on this Drawing.

F. See Attached Sheets

G. Refer Covering Letter No. ..... Dt. .....

H. Drawing not approved. Information furnished on this Drawing is Noted.

I. Print Not Enclosed.

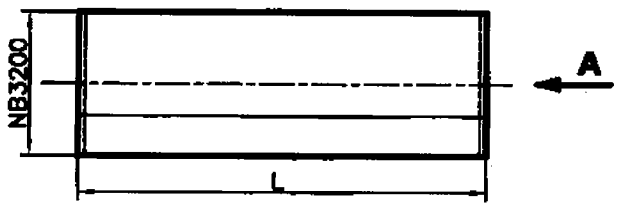
Approval/Comments, Corrections if any on the Drawings or Data submitted by the Contractor do not relieve the Contractor of his responsibilities for Correctness of Dimensions, Materials of Construction, Weights, Quantities, Design Details Assembly for System/parts and Requirements and Conformity of Supplies with Indian Statutory Laws as may be applicable. Nor does it limit the Purchaser's Rights under the Contract.

Date : .....

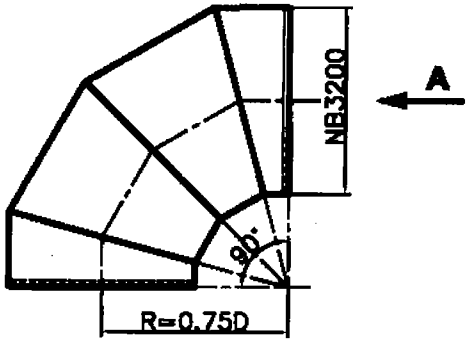
Chief Engineer (Thermal Design)

FIRST ANGLE PROJECTION(ALL DIMENSIONS IN MILLIMETRES)

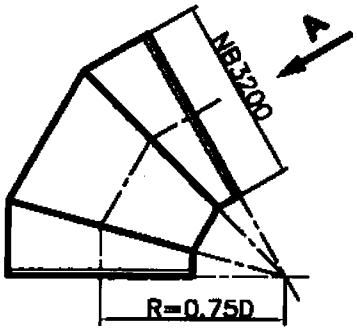
3-80-468-22160



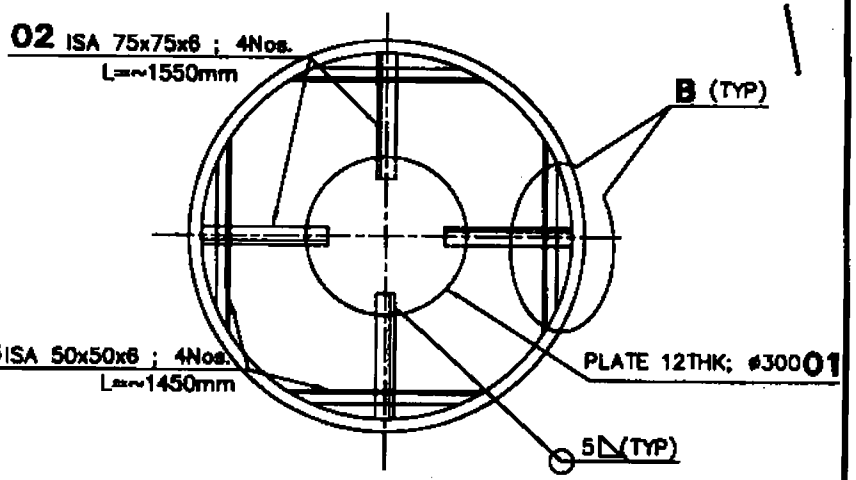
PIPE



ODEG MITRE BEND



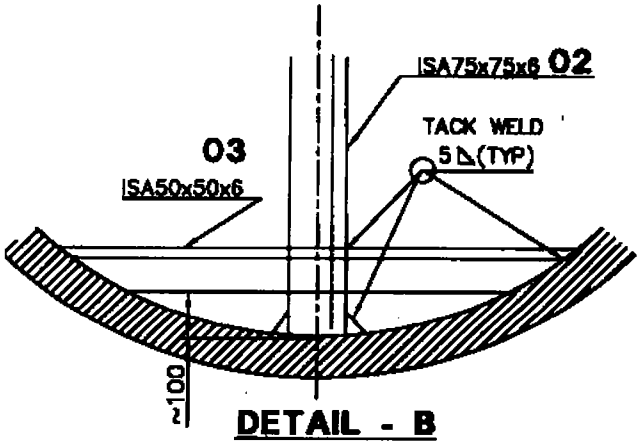
65DEG/45DEG MITRE BEND



VIEW - A

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.



DETAIL - B

VAR NO.	ITEM NO.	DESCRIPTION	DRAWING NO.	MATERIAL CODE	A/C	UNIT WT.
	03	ISA 50x50x6 L=1450		150130560000		6 525
				IS2062Fe410A		8
	02	ISA 75x75x6 L=1550		150130050000		10 540
				IS2062Fe410A		8
	01	PLATE 12THK; ø300		15011132000		6 659
				IS2062Fe410A		2

TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT

BHARAT HEAVY ELECTRICALS LTD.
PIPING CENTRE,
CHENNAI 600 017

	NAME	SIGN	DATE
DRN	A.VICTOR		05.05.05
CHD	R.RAMKUMAR		05.05.05
APPD	S.JAYAKUMAR		05.05.05

REV	DATE	ALTERED / APPROVED
01		

DEPT. CODE | GRADE OF TOL. DIM C/M/F | SCALE N.T.S. | WEIGHT (Kg) 149.838 | ITEM No.

TITLE: SPIDER ARRANGEMENT FOR PIPE NB3200

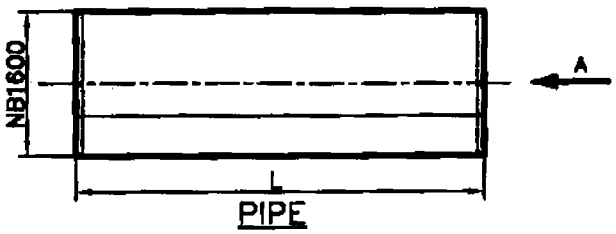
CARD CODE: U 01

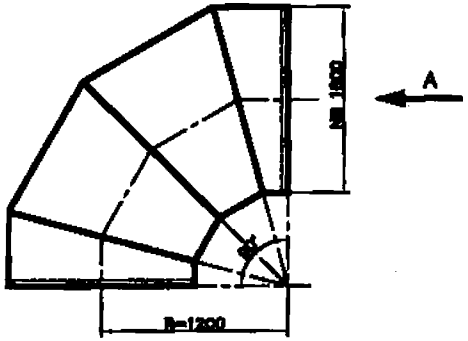
DRAWING No. 3-80-468-22160

REV 00

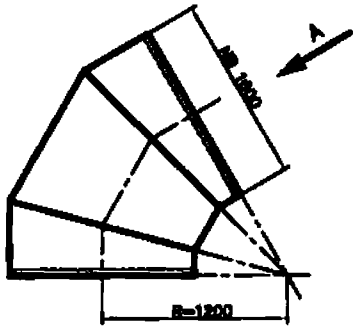
FIRST ANGLE PROJECTION(ALL DIMENSIONS IN MILLIMETERS)

3-80-468-22208

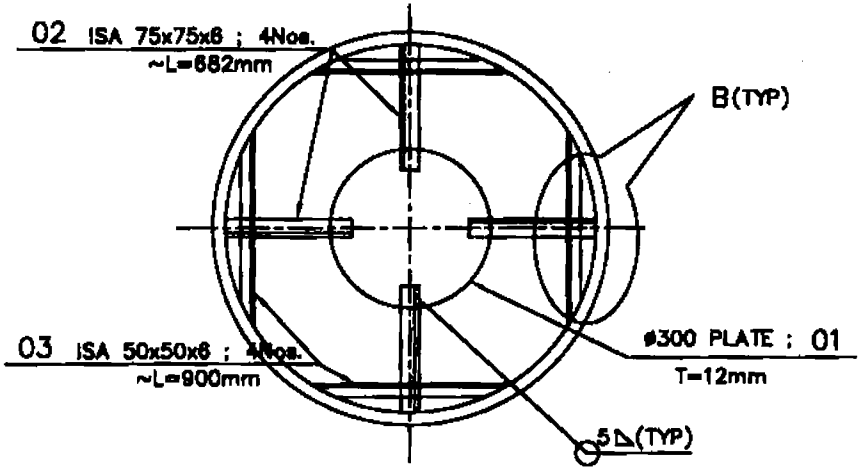




90° MITRE BEND



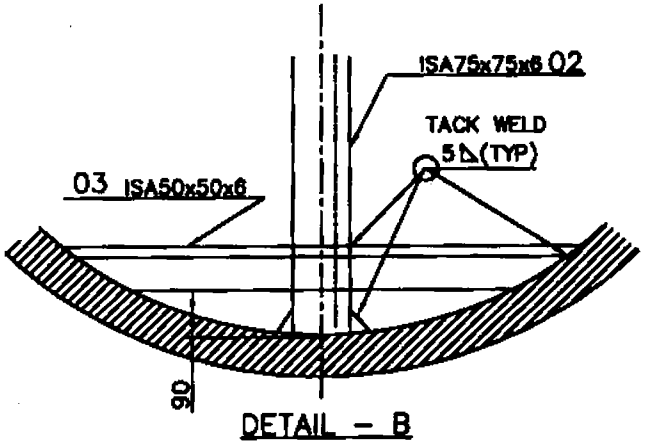
60°/45° MITRE BEND



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.



DETAIL – B

VAR NO.	ITEM NO.	DESCRIPTION	DRAWING NO.	MATERIAL CODE / MATERIAL SPEC.	UNIT WT. / QTY.
	03	ISA50x50x6 L=900	3-80-468-22208	15013056000 IS2062Fe410A	4 050 / 8
	02	ISA 75x75x6 L=682	3-80-468-22208	15013005000 IS2062Fe410A	4 650 / 8
	01	PLATE ø300 T=12	3-80-468-22208	15011132000 IS2062Fe410A	8 650 / 2

TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT

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

	NAME	SIGN	DATE
DRN	J.SYED		20/06/05
CHD	R.RAMKUMAR		28.04.05
APPD	S.JAYAKUMAR		28.04.05

REV	DATE	ALTERED / APPROVED
01		

DEPT. C/M/P | SCALE | WEIGHT (Kg) 82.900

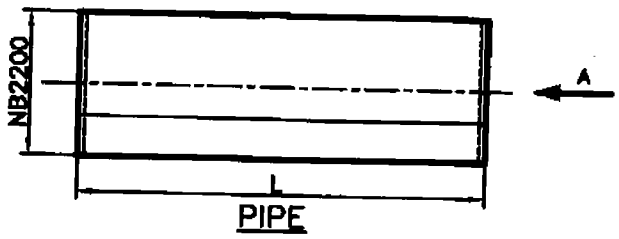
TITLE: SPIDER ARRANGEMENT NB 1600

CARD CODE: U 01

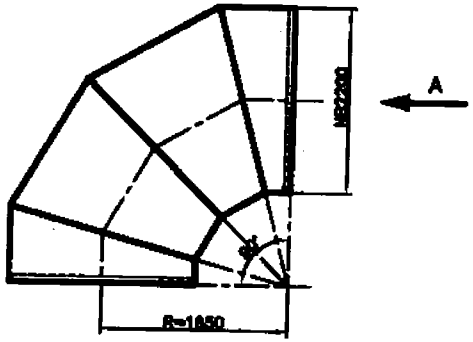
DRAWING No. 3-80-468-22208

FIRST ANGLE PROJECTION(ALL DIMENSIONS IN MILLIMETERS)

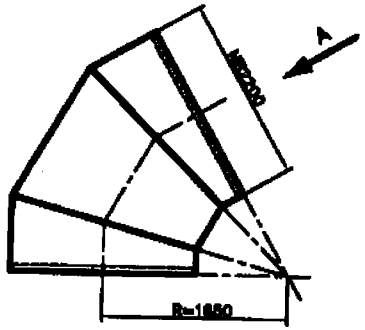
3-80-468-22168



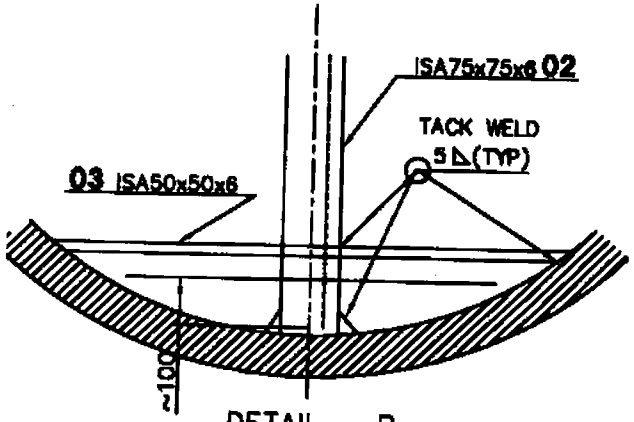
PIPE



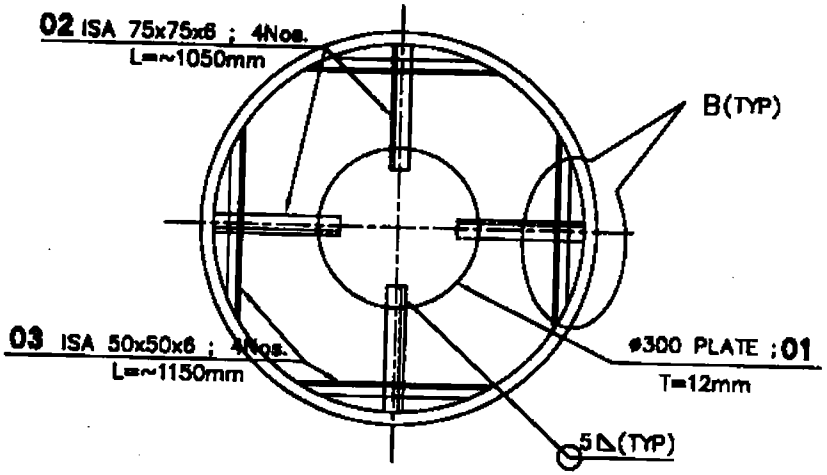
90° MITRE BEND



60°/45° MITRE BEND



DETAIL – B



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.

VAR NO.	ITEM NO.	DESCRIPTION	DRAWING NO.	MATERIAL CODE	A/C	UNIT WT.
	03	ISA50x50x6 L=1150		150130560000 IS2062Fe410A		5 175
	02	ISA 75x75x6 L=1050		150130050000 IS2062Fe410A		8 7 140
	01	PLATE ø300 T=12		150111320000 IS2062Fe410A		8 6 660
				MATERIAL SPEC.		QTY. 2

TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT

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

	NAME	SIGN	DATE
DSN	A.VICTOR		07.06.06
CHD	R.RAMKUMAR		07.06.06
APPD	S.JAYAKUMAR		07.06.06

REV	DATE	ALTERED / APPROVED
01		

DEPT. | GRADE OF UN TOL. DIM: C/M/F | SCALE | WEIGHT (Kg): 111.640

TITLE: SPIDER ARRANGEMENT NB2200

CARD CODE: H 01

DRAWING No.: 3-80-468-22168

ALTERED
APPROVED

ALL DIMENSIONS ARE IN MILLIMETRES

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

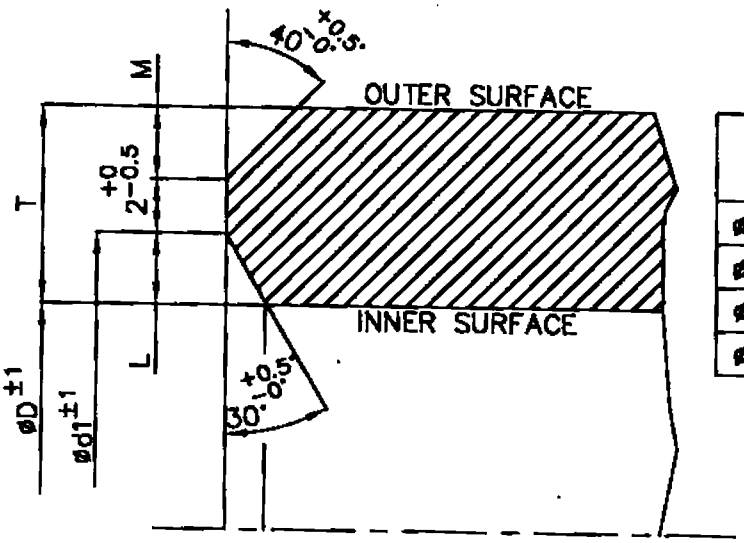


FIG-A

PIPE SIZE OD X T	ød1	øD	T	L	M
ø 3240 X 20	3226.0	3200	20	13	5
ø 3220 X 20	3206.0	3180	20	13	5
ø 2235 X 20	2221.0	2195	20	13	5
ø 2235 X 18	2221.0	2199	18	11	5

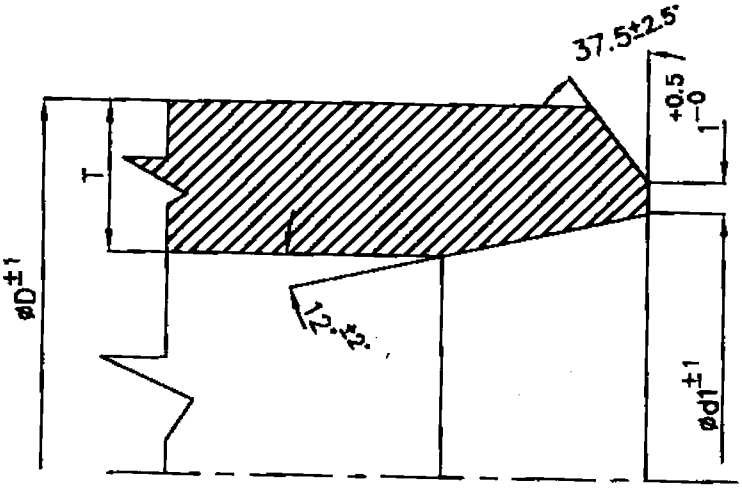


FIG-B

PIPE SIZE øD X T	ød1
ø 1829 X 14	1801.0
ø 1626 X 14	1598.0

BHARAT HEAVY ELECTRICALS LIMITED
PIPING CENTRE
CHENNAI 600 017

	NAME	SIGN	DATE	NO.OF VAR
DRN	S.BALAJI		21.10.04	
CHD	R.RAMKUMAR		21.10.04	
APPD	S.JAYAKUMAR		21.10.04	

DEPT / CODE	GRADE OF UNTOL.DIM	SCALE	WEIGHT (KG).	REF. TO ASSY./OLD DRG.	ITEM NO.	NO. OF ITEMS
	C / M / F	N.T.S				

TITLE

EDGE PREPARATION DETAIL

CARD CODE	DRAWING NO.	REV
U 01	4-80-468-58934	00

DATE	ALTERED
	APPROVED

ALL DIMENSIONS ARE IN MILLIMETRES

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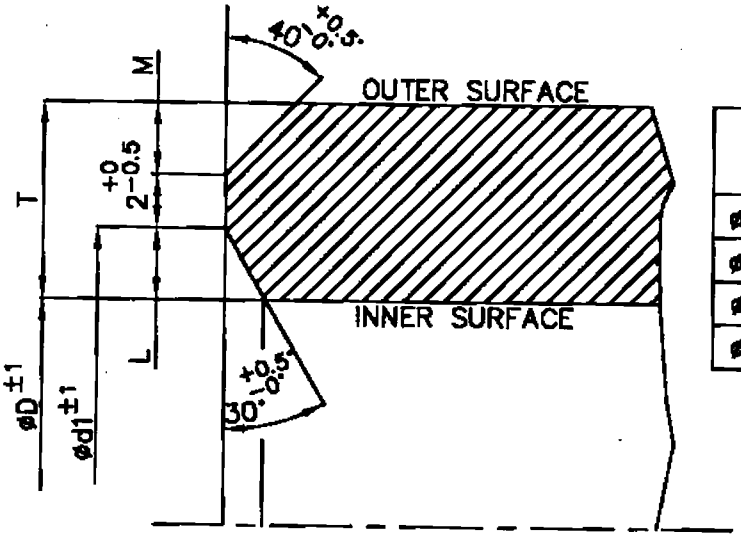
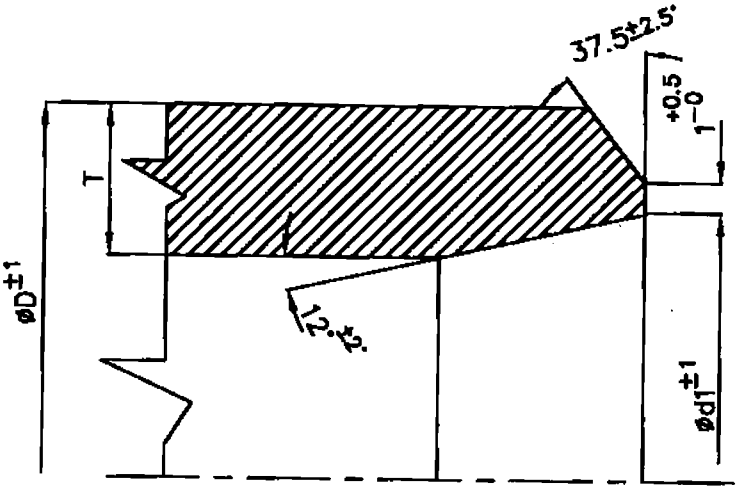


PIPE SIZE OD X T	Ød1	ØD	T	L	M
Ø 3240 X 20	3226.0	3200	20	13	5
Ø 3220 X 20	3206.0	3180	20	13	5
Ø 2235 X 20	2221.0	2195	20	13	5
Ø 2235 X 18	2221.0	2199	18	11	5

FIG-A



PIPE SIZE ØD X T	Ød1
Ø 1829 X 14	1801.0
Ø 1626 X 14	1598.0

FIG-B

BHARAT HEAVY ELECTRICALS LIMITED PIPING CENTRE CHENNAI 600 017		NAME	SIGN	DATE	NO.OF VAR
	DRN	S.BALAJI		21.10.04	
	CHD	R.RAMKUMAR		21.10.04	
	APPD	S.JAYAKUMAR		21.10.04	

DEPT / CODE	GRADE OF UNTOL.DIM	SCALE	WEIGHT (KG).	REF. TO ASSY./OLD DRG.	ITEM NO.	NO. OF ITEMS
	C / M / F	N.T.S				

TITLE	CARD CODE	DRAWING NO.	REV
EDGE PREPARATION DETAIL		4 90 468 58024	00