

Item Details for tender													
Sl. No.	Material	Descri	Design/Operating Pressure	TDC	Applicable QP	SPECIFICATION	FITTING TYPES	TDCTPPC	FITTING D1 VALUE	DRAWING No	Unit Wt (Kgs)	Qty (Nos)	Total Weight (Kgs)
1	925182790099	WELD NECK FLANGE NB15 SA105	<70 bar	TDG 41:02	7480:QPX:01 Rev No 01	SA105	WN FLANGE	TDG 41:02	STY-D /15.76	3-80-435-36927	0.648	80	51.84
2	925182800099	WELD NECK FLANGE NB25 SA105	<70 bar	TDG 41:02	7480:QPX:01 Rev No 01	SA105	WN FLANGE	TDG 41:02	STY-D /26.64	3-80-435-36927	1.140	40	45.6
3	925182850099	WELD NECK FLANGE NB25 SA105	<70 bar	TDG 41:02	7480:QPX:01 Rev No 01	SA105	WN FLANGE	TDG 41:02	STY-D /27.2	4-80-435-84516	3.000	50	150
4	925181930099	WELD NECK FLANGE NB40 SA105	<70 bar	TDG 41:02	7480:QPX:01 Rev No 01	SA105	WN FLANGE	TDG 41:02	FIG-4/40.94	3-80-673-36922	1.840	90	165.6
5	925181940099	WELD NECK FLANGE NB50 SA105	<70 bar	TDG 41:02	7480:QPX:01 Rev No 01	SA105	WN FLANGE	TDG 41:02	FIG-4/52.48	3-80-673-36922	2.500	25	62.5
6	925181950099	WELD NECK FLANGE NB150 SA105	<70 bar	TDG 41:02	7480:QPX:01 Rev No 01	SA105	WN FLANGE	TDG 41:02	FIG-4/154	3-80-673-36922	7.700	5	38.5
7	925182840099	WELD NECK FLANGE NB200 SA105	<70 bar	TDG 41:02	7480:QPX:01 Rev No 01	SA105	WN FLANGE	TDG 41:02	STY-D /206.4	3-80-435-36928	11.000	40	440
												330	954.04

GEM TENDER Enquiry - Procurement of WN flanges for Yadadri Project- TIP
Techno-Commercial Terms

S No	BHEL requirement	Bidder response
1	Quotation no	
2	Quotation date	
3	Currency of quote	
4	Applicable GST % shall be indicated	
5	<u>Technical requirements-</u> 1) TDG - 41 Rev 02 and QP No. 7480:QPX:01 Rev No 01 is applicable. All fittings shall be manufactured and supplied as per applicable TDG, approved QP and applicable standard (B16.9). 2) Packing procedure shall be as per PC-PKG-01. 3) EP shall be as per item Drawings provided.	
6	<u>Technical deviations (if any)-</u> Bidders may note that except for the deviations listed in the 'Enquiry Deviation Format', the bid shall be deemed to comply with all the requirement in the bidding documents and the bidders shall be required to comply with all terms, conditions and specifications of the bidding documents irrespective of any mention to the contrary, anywhere else in the bid. Deviations taken by vendors (if any) are subject to BHEL approval. If deviation format is not submitted by bidder, it will be construed that the bidder complies to all the technical requirements of BHEL without any deviation.	
7	<u>Bid validity-</u> 90 days from the date of Part I bid opening or 60 days from date of Reverse Auction whichever is later	
8	<u>Delivery period-</u> 90 days from GEM Contract date.	
9	<u>Delivery term-</u> 'FOR' WARD 85 STORES PPPU-THIRUMAYAM - WITH RUST PREVENTIVE OIL (all inc of P&F, F&I, testing, inspection charges etc)	
10	<u>Inspection-</u> Inspection shall be as per ASME, BHEL TDG and approved Quality Plan.	
11	<u>Liquidated Damage clause-</u> 0.5% of the price for each week of delay upto a maximum of 10% of the price of delayed / undelivered portion. For the purpose of LD calculation, Invoice date / Lorry Way bill date / E-Way Bill date whichever is later will be taken for LD calculation.	
12	<u>Evaluation & Ordering-</u> 1. Evaluation of bids and ranking of bidders shall be done based on total value package wise. Bidder shall quote for all items of a package mandatorily. 2. Ordering will be done for all the items of the package/ (s). (based on the item price break-up provided by L1 bidder of package). 3. Minimum Order Quantity (MOQ) / Minimum Order Value (MOV) condition will not be accepted. Bids of such bidders (if	
13	<u>Payment term-</u> a. 100% payment within 90 days of issue of CRAC for Non-M S M E bidders b. 100% payment within 60 days of issue of CRAC for Medium category bidders subject to submission of relevant documents. c. For MSE bidders Payment shall be as per MSE Clause subject to submission of relevant documents (100% payment within 45 days of issue of CRAC).	
14	<u>Price Finalization by Reverse Auction-</u> BHEL shall be resorting to Reverse Auction (RA) for price finalization. RA shall be conducted in GEM portal as per GEM logics.	
15	<u>Cancellation / termination of contract, default / breach of contract and risk purchase-</u> As per BHEL's Standard Cost and Risk clause indicated in Annexure A enclosed. By submitting the bid, vendor explicitly accepts to BHEL's requirement. Bids deviating from BHEL's standard condition will be rejected.	
16	<u>Purchase Preferences for the Enquiry-</u> If Make in India preference is applicable as per Annexure A to NIT, declaration format as per NIT shall be submitted. In the event of non-submission of declaration, purchase preference will not be extended to bidders.	

**GEM TENDER Enquiry - Procurement of WN flanges for Yadadri Project- TIP
Techno-Commercial Terms**

S No	BHEL requirement	Bidder response
17	<p><u>Purchase Preferences for the Enquiry-</u></p> <p>If MSE preference is applicable as per Annexure A to NIT, supporting documents as per NIT shall be submitted.</p> <p>In the event of non-submission of supporting documents, purchase preference will not be extended to bidders.</p>	
18	All other terms and conditions other than those indicated above shall be as per Annexure A- General Terms and Conditions enclosed	
19	<p>General note-</p> <p>Any disparity to terms indicated above, Annexure A and bidders offer, only the agreed terms and conditions above / Annexure shall stand valid. Bidders terms and conditions which are in conflict will be ignored and will not be taken into consideration by BHEL.</p>	

BHARAT HEAVY ELECTRICALS LIMITED
PIPING CENTRE, PURCHASE
BHEL / CHENNAI – 600 017

THIRD PARTY NON-DISCLOSURE AGREEMENT

I, _____, on behalf of the _____ (Name of Company), acknowledge that the information received or generated, directly or indirectly, while working with BHEL, Piping Centre, Chennai on contract is confidential and that the nature of the business of the BHEL, Piping Centre, Chennai is such that the following conditions are reasonable, and therefore:

I warrant and agree as follows:

I, or any other personnel employed or engaged by our company, agree not to disclose, directly or indirectly, any information related to the BHEL, Piping Centre, Chennai Without restricting the generality of the foregoing, it is agreed that we will not disclose such information consisting but not necessarily limited to:

- Technical information: Methods, drawings, processes, formulae, compositions, systems, techniques, inventions, computer programs/data/configuration and research projects.
- Business information: Customer lists, project schedules, pricing data, estimates, financial or marketing data.

On conclusion of contract, I, or any other personnel employed or engaged by our company shall return to BHEL, Piping Centre, Chennai all documents and property of BHEL, Piping Centre, Chennai, including: drawings, blueprints, reports, manuals, computer programs/data/configuration, and all other materials and all copies thereof relating in any way to BHEL, Piping Centre, Chennai's business, or in any way obtained by me during the course of contract. I further agree that I, or any others employed or engaged by our company shall not retain copies, notes or abstracts of the foregoing.

This obligation of confidence shall continue after the conclusion of the contract also.

I acknowledge that the aforesaid restrictions are necessary and fundamental to the business of the BHEL, Piping Centre, Chennai and are reasonable given the nature of the business carried on by the BHEL, Piping Centre, Chennai I agree that this agreement shall be governed by and construed in accordance with the laws of country.

I enter into this agreement totally voluntarily, with full knowledge of its meaning, and without duress.

Dated at _____, this ____ day of _____, 20__.

Name

Company

Signature

Declaration to be issued on Company letter head

In line with Government Public Procurement Order (Preference to Make in India) Order (PPP-MII Order), 2017 vide No. P-45021/2/2017-PP (BE-II) dated 04.06.2020, issued by DPIIT, Ministry of Commerce and Industry, we hereby certify that we, (Supplier name) are

- a) 'Class-I local supplier' meeting requirement of local content equal to or more than 50%,
- b) 'Class-II local supplier' meeting requirement of local content more than 20% but less than 50%,
- c) 'Non local supplier' meeting requirement of local content equal to or less than 20%,

(Strike off whichever is not applicable)

As defined under above referred Order for the following Enquiry Item SI Nos of BHEL Enquiry No dt

- Enquiry Item No./ (s) -

Details of location at which local value addition will be made is as follows:

.....
.....

By issuing this declaration, we understand and are in acceptance to the following-

- False declarations will be in breach of the Code of Integrity under Rule 175(1)(i)(h) of the General Financial Rules for which a bidder or its successors can be debarred for up to two years as per Rule 151 (iii) of the General Financial Rules along with such other actions as may be permissible under law.
- In case of debarment by any procuring entity for violation of the provisions of the Public Procurement (Preference to Make in India), Order 2017 we shall not be eligible for preference for procurement by any other procuring entity for the duration of the debarment. The debarment for such other procuring entities shall take effect prospectively from the date on which it comes to the notice of other procurement entities, the debarment takes effect prospectively from the date of uploading on the website(s) of The Department of Expenditure, GOI in such a manner that ongoing procurements are not disrupted.
- We undertake the onus of responsibility of submission of appropriately certified documents. We understand that BHEL is not at liability to verify the contents and will not be responsible for the declaration made by us. However, in case BHEL has any reason to doubt the authenticity of the local content, BHEL reserves the right to obtain the complete back up calculations before award of contract and we are liable to submit the same if requested by BHEL. We also understand that our bid is liable for rejection in case we fail to submit the details as requested by BHEL.

Seal and Signature of authorized signatory

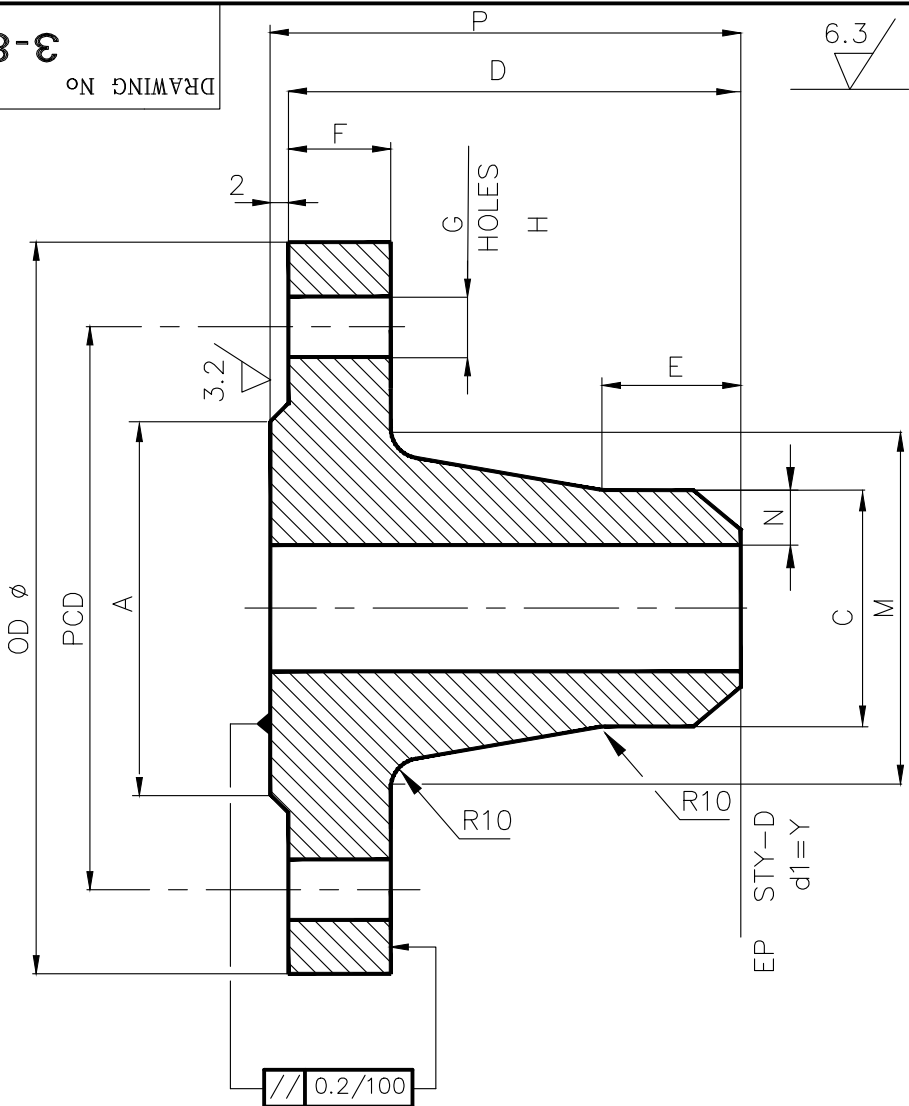
Special Note-

In cases of procurement for a value in excess of Rs. 10 crores, the local supplier shall be required to provide a certificate from the statutory auditor or cost auditor of the company (in the case of companies) or from a practicing cost accountant or practicing chartered accountant (in respect of suppliers other than companies) giving the percentage of local content.

CAUTION THE INFORMATION ON THIS DOCUMENT IS THE PROPERTY OF BHARAT HEAVY ELECTRICALS LIMITED. IT MUST NOT BE USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTEREST OF THE COMPANY

3-80-435-36927

DRAWING No



VAR NO.	OD ø	PCD	A	C	D	E	F	G	H	M	EP STY- "D"	d1 Y	N	P
01.	95	65	45	21.3	33	6	14	14	4	32	D	15.76	2.77	35
02.	115	85	68	33.4	36	6	16	14	4	45	D	26.64	3.3	38

ALL DIMENSIONS ARE IN MILLIMETRES

NOTES: –

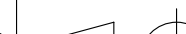
01. DESIGN PRESSURE : 47 bar (g)
02. DESIGN TEMPERATURE : 80° C
03. FOLLOW APPLICABLE QP & TDG
04. ALL OTHER DIMENSIONS SHALL BE AS PER ASME B16.5
05. FOR EDGE PREPARATION REFER DRG No. 3–80–300–19825

02	WELD NECK FLANGE NB25	3–80–435–36927		92 518 280 0000	C	1.14
				SA105		1
01	WELD NECK FLANGE NB15	3–80–435–36927		92 518 279 0000	C	0.648
				SA105		1
VAR NO.	DESCRIPTION	DRAWING NO.	NO. VAR NO.	MATERIAL CODE		UNIT WT.
				MATERIAL SPEC.	C	QTY.



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

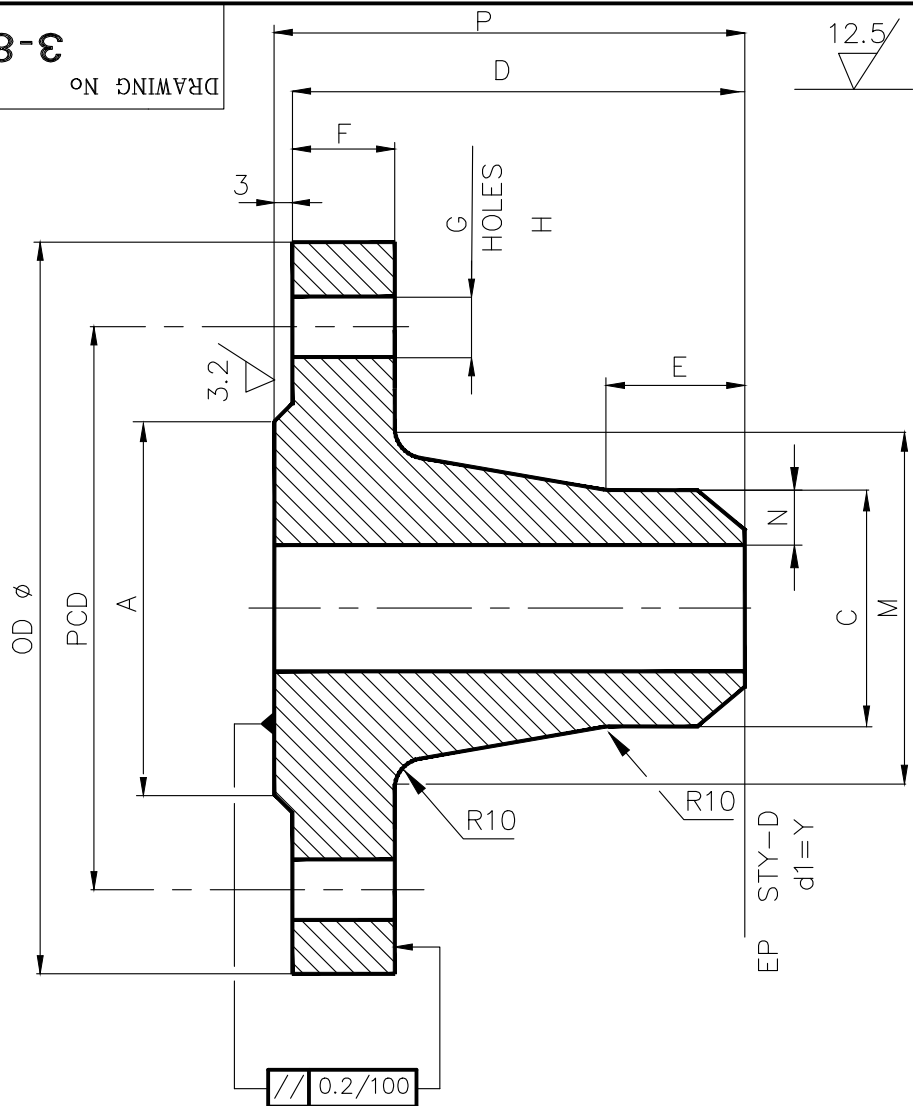
DRN	NAME ARUN	SIGN	DATE 07.02.22	NO OF ITEMS
CHD	P SURESH		07.02.22	
APPD	C SARAVANAN		07.02.22	

DEPT.	GRADE OF UN TOL. DIM		SCALE	WEIGHT (Kg).	REF TO ASSY / OLD DRG	ITEM No.
CODE	C/M/F					
TITLE WELD NECK FLANGE				CARD CODE U 01	DRAWING No. 3-80-435-36927	REV 00

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3-80-435-36928

DRAWING No



VAR NO.	OD ø	PCD	A	C	D	E	F	G	H	M	EP STY-"D"	D1 Y	N	P
01.	155.6	114.3	73	48.3	61	10	25.5	22	4	59	D	40.94	3.68	64
02.	170	125	88	48.3	61	8	25	22	4	70	D	40.94	5.08	64
03.	195	145	102	60.3	72	10	27	26	4	90	D	52.48	5.54	75
04.	343	298.5	268	219.1	59	16	26	22	8	235	D	206.4	6.35	62

ALL DIMENSIONS ARE IN MILLIMETRES

NOTES: –

01. DESIGN PRESSURE : 47 bar (g)
02. DESIGN TEMPERATURE : 80° C
03. FOLLOW APPLICABLE QP & TDG
04. ALL OTHER DIMENSIONS SHALL BE AS PER ASME B16.5
05. FOR EDGE PREPARATION REFER DRG No. 3–80–300–19825

04	WELD NECK FLANGE NB200	3–80–435–36928		92 518 284 0000 SA105	C	11.0 1
03	WELD NECK FLANGE NB50	3–80–435–36928		92 518 283 0000 SA105	C	6.25 1
02	WELD NECK FLANGE NB40	3–80–435–36928		92 518 282 0000 SA105	C	4.3 1
01	WELD NECK FLANGE NB40	3–80–435–36928		92 518 281 0000 SA105	C	4.3 1
VAR NO.	DESCRIPTION	DRAWING NO.	NO. VAR NO.	MATERIAL CODE MATERIAL SPEC.	C	UNIT WT. QTY.



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

DEPT.	GRADE OF UN TOL. DIM	SCALE	WEIGHT (Kg).	REF TO ASSY / OLD DRG	ITEM No.
CODE	C / M / F				
TITLE	WELD NECK FLANGE		CARD CODE	DRAWING No.	REV
			U 01	3-80-435-36928	00

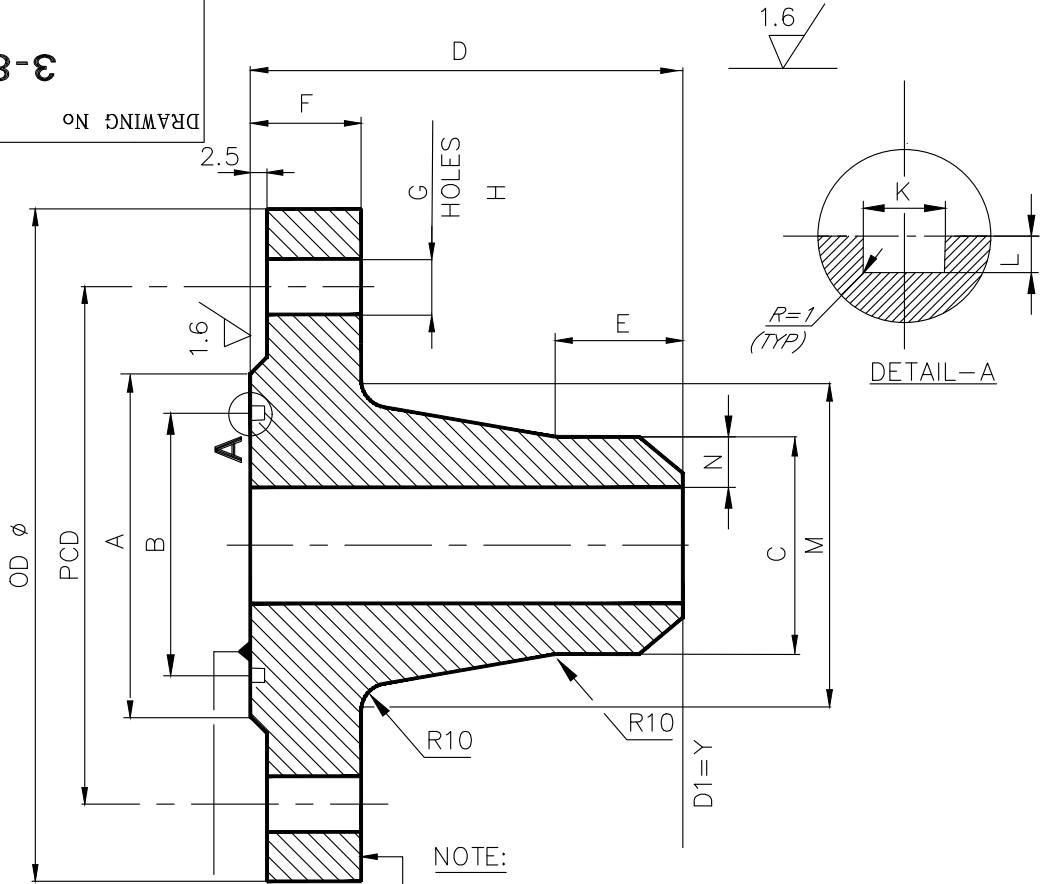
FIRST ANGLE PROJECTION(ALL DIMENSIONS IN MILLIMETRES)

ALL DIMENSIONS ARE IN MILLIMETRES

CAUTION THE INFORMATION ON THIS DOCUMENT IS THE PROPERTY OF BHARAT HEAVY ELECTRICALS LIMITED. IT MUST NOT BE USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTEREST OF THE COMPANY

3-80-673-36922

DRAWING No



NOTE:

1. ALL OTHER DIMENSIONS SHALL BE AS PER ASME B16.5
2. FOR EDGE PREPARATION REFER ASME B16.25 FIG.4

// 0.2/100

VAR NO.	OD ϕ	PCD	A	B	C	D	E	F	G	H	M	EP B16.25	D1 Y	K	L	N
01.	150	110	88	54.6	48.3	42	7	16	17.5	4	64	FIG-4	40.94	5	2.5	3.7
02.	165	125	102	64.6	60.3	45	8	18	17.5	4	75	FIG-4	52.48	5	2.5	4
03.	285	240	212	171.6	168.3	55	12	22	22	8	184	FIG-4	154	5	2.5	4.5

03	WELD NECK FLANGE NB150	3-80-673-36922		92 518 195 0000	C	7.700
				SA105		1
02	WELD NECK FLANGE NB50	3-80-673-36922		92 518 194 0000	C	2.500
				SA105		1
01	WELD NECK FLANGE NB40	3-80-673-36922		92 518 193 0000	C	1.840
				SA105		1
VAR NO.	DESCRIPTION	DRAWING NO.	NO. VAR NO.	MATERIAL CODE		UNIT WT.
				MATERIAL SPEC.	C	QTY.

REV 04	DATE	ALTERED:	REV 03	DATE	ALTERED:
		APPROVED:			APPROVED:
ZONE			ZONE		
REV 05	DATE	ALTERED:	REV 02	DATE	ALTERED:
		APPROVED:			APPROVED:
ZONE			ZONE		



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

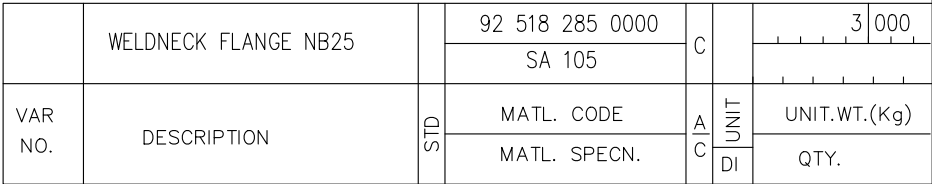
DRN	NAME ARUN	SIGN	DATE 28.01.22	NO OF ITEMS
CHD	P SURESH		28.01.22	
APPD	C SARAVANAN		28.01.22	



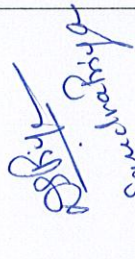
DEPT.	GRADE OF UN TOL DIM	SCALE	WEIGHT (Kg).	REF TO ASSY / OLD DRG	ITEM No.
CODE	C/M/F				
TITLE	CARD CODE	DRAWING No.	REV		
WELD NECK FLANGE	U 01	3-80-673-36922	00		


V:A4

ALL DIMENSIONS ARE IN MILLIMETRES



1. DESIGN PRESSURE : 47 bar (g)
2. DESIGN TEMPERATURE : 80°C
3. FOLLOW APPLICABLE QP.

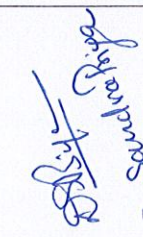
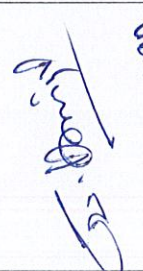
Size A4


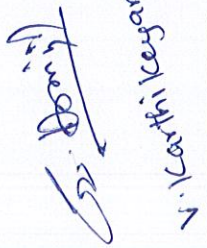
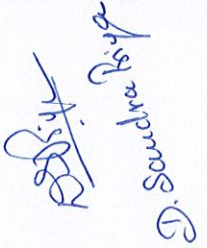
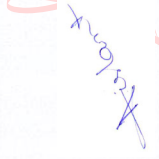
MANUFACTURER'S NAME & ADDRESS:				MANUFACTURING QUALITY PLAN				PROJECT: TSGENCO YADRADRI STPP PACKAGE: 5x800MW MAIN SUPPLIER: BHEL HEEL, HARIDWAR CUST NO: 7480,7481,7482,7483 & 7484			
 BHEL PIPING CENTRE, CHENNAI / BHEL PPPU, THIRUMAYAM / BHEL HPBP TRICHY				QP NO: 7480:QPX:01 REV NO: 01 DATE: 27.01.2022							
				ITEM : TURBINE INTEGRAL PIPING							
REF SPEC: ST34001											
SL. NO	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORDS	AGENCY	REMARKS	
					M B/N				M B		
1	2	3	4	5	6	7	8	9	10	11	
1.0 MATERIAL :											
1.1	Seamless Steel Pipes (SA106 Gr. B/C, SA335 P11/P22/ P91 & SA312 TP321.etc)	a) Chemical Composition b) Mech. Properties c) Flattening or bending test (as applicable as per ASME) d) Hydraulic test (For pipes with operating pressure < 70 bar) e) UT (For pipes with operating pressure > / = 70 bar and temp > / = 400 deg.C) f) Hardness test for P91 g) Surface finish h) Dimension	Critical	TC Verification & Co-relation	100%	Applicable Material Specification, ST34001 / ASTM E213 (with 5% notch, Min 0.3mm, max 1.5mm)		Mill TC	P V		
1.2	Rolled & welded pipes (SA691/ 672.etc)	a) Chemical Composition b) Mech. Properties c) Hydraulic test & RT. d) UT (on plates used for making pipes)	Critical	TC Verification & Co-relation	100%	Applicable Material Specification, ST34001 / ASME Sec VIII Div.1 UW51.		Mill TC	P V		
FOR MANUFACTURER USE : SIGNATURE <div style="display: flex; justify-content: space-between;"> <div>  PREPARED BY V. Karthikeyan </div> <div>  CHECKED & APPROVED BY D. Suresh Babu </div> </div>				M: Manufacturer B: BHEL/BHEL authorised inspection agency. * Records, identified with "√" in Records column shall be essentially included by contractor in QA documentation. Indicate P: Perform, W: Witness, V: Verification. All 'W' indicated in column 'N' shall be CHP of customer. TC: Test Certificate, NDT: Non Destructive testing, RT: Radiographic Testing, UT: Ultrasonic Testing, MPT: Magnetic Particle Testing, LPT: Liquid Penetrant Testing				DOC. NO. REV... CAT...			
				FOR CUSTOMER USE: LEGEND				REVIEWED BY APPROVED BY APPROVAL SEAL			


MANUFACTURER'S NAME & ADDRESS:		MANUFACTURING QUALITY PLAN					PROJECT: TSGENCO YADRADRI STPP PACKAGE: 5x800MW MAIN SUPPLIER: BHEL HEEL, HARIDWAR CUST NO: 7480,7481,7482,7483 & 7484				
 BHEL PIPING CENTRE, CHENNAI / BHEL PPPU, THIRUMAYAM / BHEL HPBP TRICHY		ITEM : TURBINE INTEGRAL PIPING			QP NO: 7480:QPX:01		AGENCY		REMARKS		
		REF SPEC: ST34001			REV NO: 01		M B				
					DATE: 27.01.2022		FORMAT OF RECORDS				
SL. NO	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	9	D*	10	11
1	2	3	4	5	M B/N	6	7	8			

		e) Dimension and Surface finish									
1.3	Pipe fittings - Elbows, Tees, Caps Reducers, stubs etc. (SA105, SA234 WPB, WPC, WP11, WP12, WP22 /WP91, SA182 F22/F321.etc)	a) Chemical Composition b) Mech. Properties c) UT (For Mother pipes) d) Surface NDE (MT/PT) e) Weld quality (in case of welded fittings if any) f) Dimension and Surface finish	Critical	TC Verification & Co-relation	100% 10% 100%	Applicable Material Specification, ST34001 / ASME Sec VIII Div.1 UW51.	Mill TC	✓	P	V	Weld fittings are allowed as per cl 5 of ASTM A 234 100% RT on all fittings for use above 70 bar design condition.
1.4	Plates (as per drawing)	a) Chemical Composition b) Mech. Properties c) UT d) Surface NDE (MT/PT)	Major	TC Verification & Co-relation	100%	Applicable Material Specification, ST34001 / ASTM 435	Mill TC	✓	P	V	UT shall be done for thick above 25mm

 PREPARED BY		 CHECKED & APPROVED BY		M: Manufacturer B: BHEL/BHEL authorised inspection agency. * Records, identified with "✓" in Records column shall be essentially included by contractor in QA documentation. Indicate P: Perform, W: Witness, V: Verification. All 'W' indicated in column 'N' shall be CHP of customer. TC: Test Certificate, NDT: Non Destructive testing, RT: Radiographic Testing, UT: Ultrasonic Testing, MPT: Magnetic Particle Testing, LPT: Liquid Penetrant Testing	DOC. NO. REV... CAT... Digitally signed by Nishant Kumar Date: 2022.02.01 11:46:31 +05'30'	APPROVED BY APPROVAL SEAL
FOR MANUFACTURER USE : SIGNATURE		FOR CUSTOMER USE:				

MANUFACTURER'S NAME & ADDRESS:				MANUFACTURING QUALITY PLAN					PROJECT: TSGENCO YADRADRI STPP PACKAGE: 5x800MW MAIN SUPPLIER: BHEL HEEL, HARIDWAR CUST NO: 7480,7481,7482,7483 & 7484				
BHEL PIPING CENTRE, CHENNAI / BHEL PPPU, THIRUMAYAM / BHEL HPBP TRICHY				ITEM : TURBINE INTEGRAL PIPING		QP NO: 7480:QPX:01 REV NO: 01		REF SPEC: ST34001		DATE: 27.01.2022			
SL. NO	COMPONENT & OPERATIONS	CHARACTERISTICS	3	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORDS	AGENCY	REMARKS		
1	2			4	5	6	7	8	9	10	11		
1.5	Flanges, Rods, Rounds & flanges (SA105, SA182 F11, F22 & F321)	a) Chemical Composition b) Mech. Properties c) UT d) Surface NDE (MT/PT)		Major	TC Verification & Co-relation	100%	Applicable Material Specification, ST34001 / ASTM A388 & ASME Section VIII Div.2 Cl.3.3.4		Mill TC	P	V		
1.6	Fasteners (IS1367, IS1364, SA193, SA194)	a) Chemical Composition b) Mech. Properties c) Dimension d) Hardness		Major	TC Verification & Co-relation	100%	Applicable Material Specification		Mill TC	P	V		
2.0 INPROCESS													
2.1	Marking, Cutting & Edge Preparation	Identification Check		Major	Visual	100%	As per approved Drawing		-	P	V	Refer Note 2	
2.2	NDE	Surface defects on edge preparation		Minor	LPT	100%	ST34001		Report	P	V		
2.3	Bending	a) Dimensions, Ovality, Wrinkles, Bend Angle b) Thinning by Ultrasonic D-meter c) Surface defects (On bend portion only)		Major	Measurement	100%	As per approved Drawing / ST34001		Report	P	W		
				Major	Measurement	100%			Report	P	W		
				Critical	MT	100%			Report	P	V		
  PREPARED BY				M: Manufacturer B: BHEL/BHEL authorised inspection agency. * Records, identified with "✓" in Records column shall be essentially included by contractor in QA documentation. Indicate P: Perform, W: Witness, V: Verification. All 'W' indicated in column 'N' shall be CHP of customer. TC: Test Certificate, NDT: Non Destructive testing, RT: Radiographic Testing, UT: Ultrasonic Testing, MPT: Magnetic Particle Testing, LPT: Liquid Penetrant Testing				DOC. NO. REV...		CAT...		Digitally signed by Nishant Kumar Date: 2022.02.01 11:46:50 +05'30'	
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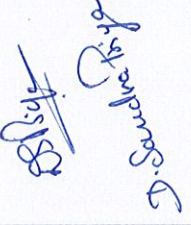
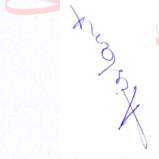
MANUFACTURER'S NAME & ADDRESS:				MANUFACTURING QUALITY PLAN					PROJECT: TSGENCO YADRADRI STPP PACKAGE: 5x800MW MAIN SUPPLIER: BHEL HEEL, HARIDWAR CUST NO: 7480,7481,7482,7483 & 7484			
BHEL PIPING CENTRE, CHENNAI / BHEL PPPU, THIRUMAYAM / BHEL HPBP TRICHY				ITEM : TURBINE INTEGRAL PIPING REF SPEC: ST34001				QP NO: 7480:QPX:01 REV NO: 01 DATE: 27.01.2022				
SL. NO	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK M B/N	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORDS	AGENCY	REMARKS		
1	2	3	4	5	6	7	8	9	D*	10	11	
2.4	Welding Qualification	a) Procedure b) Personnel	Major	Verify	100%	ASME Sec. IX		WPS, WPQ	✓	P	V	
2.5	Welding	a) Fit-up b) Pre-heating c) Root run	Major Major Major	Visual Temp Visual & LPT	100% 100% 100%	HW0620599 Relevant WPS ST34001		- - -	- - -	P P P	- - V	
2.6	PWHT	Time/Temp control	Major	Review of Chart	100%	ANSI B 31.1		Report	✓	P	V	
2.7	NDE after PWHT	a) Weld profile & Dimension b) Surface defects for fillet welds c) Hardness Survey on Weld & HAZ for AS d) Internal Defects (for butt welds only)	Major Critical Major Critical	Measurement & Visual MPT/LPT Hardness RT/UT	10% 100% As per Table AA & BB of ST34001 ST34001	HW0620099 ST34001 As per Table AA & BB of ST34001 ST34001		- Report Report Report	- ✓ ✓ ✓	P P P P	- V # @	
3.0 FINAL INSPECTION												
3.1	Complete Fabricated Piping	Visual examination	Major	Visual	100%	HW0620099		Report	✓	P	W	
3.2		PMI check for alloy steel	Major	Visual	100%	Applicable Material Specification		Report	✓	P	W	
				M: Manufacturer B: BHEL/BHEL authorised inspection agency. * Records, identified with "✓" in Records column shall be essentially included by contractor in QA documentation. Indicate P: Perform, W: Witness, V: Verification. All 'W' indicated in column 'N' shall be CHP of customer. TC: Test Certificate, NDT: Non Destructive testing, RT: Radiographic Testing, UT: Ultrasonic Testing, MPT: Magnetic Particle Testing, LPT: Liquid Penetrant Testing				DOC. NO. REV...		CAT... Digitally signed by Nishant Kumar Date: 2022.02.01 11:47:07 +05'30'		
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MANUFACTURER'S NAME & ADDRESS:			MANUFACTURING QUALITY PLAN					PROJECT: TSGENCO YADRADRI STPP PACKAGE: 5x800MW MAIN SUPPLIER: BHEL HEEP, HARIDWAR CUST NO: 7480,7481,7482,7483 & 7484				
	BHEL PIPING CENTRE, CHENNAI / BHEL PPPU, THIRUMAYAM / BHEL HPBP TRICHY		ITEM : TURBINE INTEGRAL PIPING	QP NO: 7480:QPX:01 REV NO: 01		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORDS	AGENCY		REMARKS	
				M	B							
	REF SPEC: ST34001			9 D* 10								
SL. NO	COMPONENT & OPERATIONS	CHARACTRISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK M B/N	7	8	9	10	11		
1	2	3	4	5	6							

3.3	Dimensions	Major	Measurement	100%	As per Drawing	Report	✓	P	W	
3.4	Marking	Major	Visual	100%	ST34001/As per Drawing	-		P	W	
3.5	Cleaning of Piping	Major	Visual	100%	BHEL Standards	-		P	W	
3.6	Preservation & Painting	Major	Visual	100%	Preservation & Painting as per customer approved Painting scheme	Report	✓	P	W	
3.7	End protection & packing	Major	Visual	100%	ST34001	-		P	W	
3.8	Documentation	Major	Compilation of records	100%	QP No:7480:QPX:01 & IBR	Data Folder	✓	P	P	IBR forms will be sent to site (if applicable)


NOTES:


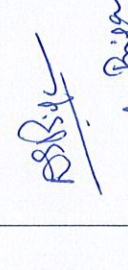
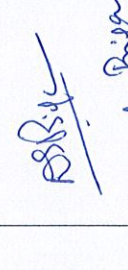

- Edge preparation shall be done by machining only.
- For small bore piping, where the individual stamping & stenciling may not be possible metal tags or plastic tags may be used for identification.
- Each item either individually or jointly will be segregated system wise for dispatch.
 - Small items like small reducers, elbows, tees, stubs, flanges etc. and other machines components duly preserved shall be packed in wooden boxes.
- Inside protection by VPI tablets/powder shall be ensured before end capping.


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MANUFACTURER'S NAME & ADDRESS:		MANUFACTURING QUALITY PLAN						PROJECT: TSGENCO YADRADRI STPP PACKAGE: 5x800MW MAIN SUPPLIER: BHEL HEEL, HARIDWAR CUST NO: 7480,7481,7482,7483 & 7484			
 BHEL PIPING CENTRE, CHENNAI / BHEL PPPU, THIRUMAYAM / BHEL HBPB TRICHY		ITEM : TURBINE INTEGRAL PIPING		QP NO: 7480:QPX:01		REV NO: 01		REF SPEC: ST34001		DATE: 27.01.2022	
		CLASS		TYPE OF CHECK		QUANTUM OF CHECK		REFERENCE DOCUMENT		ACCEPTANCE NORMS	
		CHARACTERISTICS		CHECK		M B/N		DOCUMENT		NORMS	
SL. NO	COMPONENT & OPERATIONS	3	4	5	6	7	8	9	D*	10	11
1											

- Check testing shall be carried out in case no co-relation is observed.
- Colour coding shall be done on the end of each pipe as per BHEL specification no.ST34001. Color coding to be done by way of color band/strip all along the length of loose and spare pipes.
- The material of construction shall be as per approved drawing /data sheet/pipe schedule.
- In case of IBR piping IBR code regulation shall be ensured and IBR certificates in original shall be given to Customer

MANUFACTURER'S NAME & ADDRESS:		MANUFACTURING QUALITY PLAN						PROJECT: TSGENCO YADRADRI STPP PACKAGE: 5x800MW MAIN SUPPLIER: BHEL HEEL, HARIDWAR CUST NO: 7480,7481,7482,7483 & 7484			
 BHEL PIPING CENTRE, CHENNAI / BHEL PPPU, THIRUMAYAM / BHEL HBPB TRICHY		ITEM : TURBINE INTEGRAL PIPING		QP NO: 7480:QPX:01		REV NO: 01		REF SPEC: ST34001		DATE: 27.01.2022	
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SL. NO	COMPONENT & OPERATIONS	3	4	5	6	7	8	9	D*	10	11
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  PREPARED BY		  CHECKED & APPROVED BY		M: Manufacturer B: BHEL/BHEL authorised inspection agency. * Records, identified with “√” in Records column shall be essentially included by contractor in QA documentation. Indicate P: Perform, W: Witness, V: Verification. All ‘W’ indicated in column ‘N’ shall be CHP of customer. TC: Test Certificate, NDT : Non Destructive testing, RT: Radiographic Testing, UT : Ultrasonic Testing, MPT : Magnetic Particle Testing, LPT : Liquid Penetrant Testing		DOC. NO. REV...		CAT... Digitally signed by Nishant Kumar Date: 2022.02.01 11:49:15 +05'30'			
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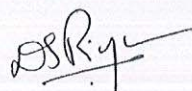

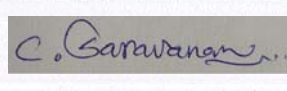

	Bharat Heavy Electricals Limited, Piping Centre, Chennai	
TDG : 41	Technical Delivery Conditions for Seamless Butt Weld Fittings & Forgings including Weldolets Conforming to ASME SA234, SA403, SA105, SA182.	Date : 13.01.2022
Rev. 02	Project : Turbine Integral Piping.	Page : 1 of 5

1.0 **SCOPE:-**

The fittings / forgings / flanges / weldolets shall meet the following requirements in addition to the requirements of the standards specified in the Purchase Order (PO) / approved drawings.

2.0 **RAW MATERIALS:-**

- a) The mother Pipe shall be Hydraulically Tested to the pressure mentioned in BHEL Drawing (for fittings with working/operating pressure less than or equal to 70 bar).
- b) UT 100% to be performed on all mother pipes, bar stocks and forgings for fittings for **design temperature greater than 400 deg C and / or design pressure greater than 70 bar.**
- c) UT shall be done as per - ASTM E 213 with longitudinal notch of 5% wall thickness with max. 1.5mm and min. 0.3mm. Actual measured notch depth to be specified in Test Certificate.
- d) The raw forgings shall be ultrasonically tested as per SA388 and acceptance criteria as per Cl.3.3.4 of ASME Sec VIII Div. 2.
- e) **Test certificate to be produced for Chemical & Mechanical properties (Tension, Flattening/Bend test as applicable).**
- f) All raw materials used for SS fittings & forgings shall be checked by supplier to ensure freedom from radioactivity.
- g) Plates to be used for flanges > 25 mm shall be checked for laminations by UT as per ASTM 435.
- h) All Fittings & Forgings shall be of seamless construction unless otherwise specified in the purchase order. Pipes used for manufacturing of seamless fittings shall be seamless pipes or forgings only.
- i) For forgings : to ensure uniformity of structure and strength with reduction ratio in area 4:1 min from ingot to final forging, close to final size and shape. Flow lines to be parallel to the axis of openings. Forged items order to this TDC shall be forged to the nearest shape before machining to final dimensions as per respective drawing.

			
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Prepared by	Reviewed by		Approved by



**Bharat Heavy Electricals Limited,
Piping Centre, Chennai**

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- j) **For Gr-91/92 Pipes:** Shall be procured from the Mills listed in document ref.QCP:19 (latest revision). For pipe sources not listed in QCP:19, credentials shall be submitted by the vendor along with offer for BHEL review and approval.
- k) **For Gr-91/92 Forgings:** The raw material shall be procured from the Mills listed in document ref.QCP:18(latest revision). For raw material sources not listed in QCP:18, credentials shall be submitted by the vendor along with offer for BHEL review and approval.


3.0 PROCESS:-

Process of manufacture, Heat Treatment, Hardness shall conform to applicable standards.

4.0 FINISHED FITTINGS & FORGINGS:-

- (A) **Chemical Composition / Product Analysis** for one lot/size/heat to be furnished.
Carbon $\leq 0.25\%$ for WPB / SA105 (all thickness) and WPC (thickness $\leq 20\text{mm}$)
Carbon $\leq 0.30\%$ for WPC (thickness $> 20\text{mm}$)
SA182 F92: Si: 0.10-0.50, Ni: 0.30 max, Cu: 0.25 max
- (B) **NDE Test** : All Ferrous fittings & forgings shall be tested by MPI as per ASTM E-709 and SS fittings & forgings shall be LPI tested as per ASTM E 165. For WP91 / 92, F91 / 92 fittings, Wet MPI shall be done.
- (C) ONE Fitting / Forging of each size and specification per heat treatment lot shall be subjected to **Tension Test** as per applicable standard.
- (D) **Tensile properties** shall be as per Material Specification.
- (E) Wall Thickness of fittings & forgings shall be measured with Ultrasonic thickness gauge meter & minimum wall thickness shall be ensured.
- (F) All fittings & forgings shall have smooth, workmanlike finish. Repair by welding is NOT permitted.

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(G) Dimensions shall be as per ASME B 16.9, B16.28. Butt Weld edges shall be As given in Purchase order.

(H) Hardness test to be carried out on 10% of fittings & forgings at random and Reports shall be furnished.

(I) Hardness shall be as per material spec in ASME standard
Hardness shall be tested 100% for all Gr91 and 92 fittings & forgings.

(J) All SS fittings & forgings shall be supplied in pickled & passivated condition as per ASTM A380 only.

(K) Unless otherwise specified in the PO WP11, WP22 and F11, F22 fittings shall be supplied as Cl 3; and WP12, F12 shall be of Cl 2 only.

(L) Grain Size for SS forgings shall be as per the standard referred.

(M) PMI for Alloy Steel Fittings & forgings – Each Alloy steel fitting / forging shall be checked for the correctness of the material during manufacturing and final inspection using X-ray fluorescence principle or spark emission spectography.

5.0 **MARKING, PAINTING, COLOUR CODING, PACKING & END PROTECTION:-**

MARKING:-

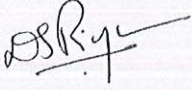
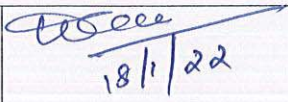
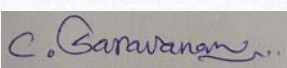
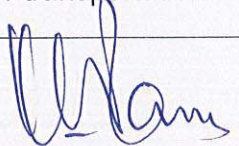
All fittings & forgings shall be PUNCHED with specification, Grade, Heat No, maker's emblem and Inspection Authorities seal.


Fittings & forgings of size above 76mm shall in addition be stenciled with above details.

PAINTING:

a) If delivered directly to Site – Painting shall be as per approved Painting scheme for the project. Annexure A

b) If delivered to BHEL Stores - Rust Preventive coating for transportation.

	 18/1/22		
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- c) The internal surface shall be protected with rust preventive coating or rust inhibitor.
- d) Stainless steel and Galvanized fittings / forgings need not be painted.

COLOUR CODING:-

SA234 WPB/ WPC/SA105	Red
WP11/SA182 F11	Yellow
WP22/SA182 F22	Green
WP91/SA182 F91	Blue
WP92/SA182 F92	Purple
SA 403 TP 321	Pink

PACKING & END PROTECTION:-

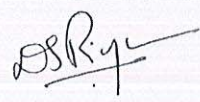
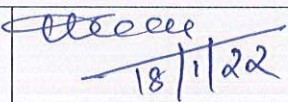
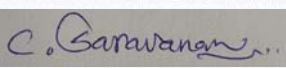

All fittings & forgings shall be suitably packed in box/crate to avoid transit/other damages.

Ends of fittings / forgings shall be well protected using end caps.

6.0 INSPECTION & CERTIFICATION:-

All fittings / forgings are to be Inspected at the manufacturer's works by the Inspection agencies/authorities as indicated in the P.O. Inspection certificate shall be submitted along with the Work Test Certificate countersigned by any of the above authorities and shall include the following.

01. Test Certificate Number & date
02. BHEL P.O. Number & Amendment Number.
03. BHEL P.O. Serial Number.
04. BHEL TDC Number.
05. Size-wise Quantity.
06. Specification, Grade & year of code.
07. Heat/Melt Number.

			
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- 08 Steel making/Forming Process.
- 09 Laddle or Product Analysis of Raw Material.
- #10 Heat Treatment chart.
- #11. NDE report. (VISUAL, MPI / LPI)
- #12. Tensile Test Report.
- #13. Hardness Test Report.
- #14 Dimensional conformance.
- # 15. Starting material details.
- 16. Guarantee of HTP shall be given as follows:- "Fittings / Forgings are capable of withstanding without failure, breakage or impairment of their serviceability a hydrostatic test pressure equal to that prescribed for the specified matching pipe of equivalent material".

#Details furnished in the Tests certificate in lieu of chart/report is acceptable.

7.0 Details not covered in this TDG, shall be complied with as per the applicable ASME standards.


8.0 RECORDS OF REVISIONS

Rev 00 – Prepared for Turbine Integral piping

Rev 01 – C.2d, 4k added, 6.09 - Laddle & Product analysis changed as Laddle or Product analysis, 11. NDR report for UT deleted.

Rev 02 – Inclusion of Grade 91 and 92 and general revision to comply to BHEL HEEP Specification ST 34001 Rev 08.

	 18/1/22		
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Bharat Heavy Electricals Ltd., Piping Centre, Chennai – 600 017		
Packaging Instructions for Piping Components	Doc. No PC: PKG:01	
	Rev No: 00 Date : 28 /05/ 2014	No of Sheets : 24


PACKAGING INSTRUCTIONS FOR PIPING COMPONENTS

PC: PKG: 01

Revision summary


Rev No	Revision Details	Issued on
00	Fresh issue	28-05-2014

Prepared by	Reviewed & Approved by
	
S.ARUN KUMAR	K.VEDAPRASAD

Bharat Heavy Electricals Ltd., Piping Centre, Chennai – 600 017		
Packaging Instructions for Piping Components	Doc. No PC: PKG:01	
	Rev No: 00 Date : 28 /05/ 2014	No of Sheets : 24

Contents

1. Scope
2. Packaging
3. Criteria for Selection of Packaging
4. Types of packaging
5. Sling protections
6. Marking and Labelling
7. Packing list
8. General Instructions for packaging
9. Reference drawings
10. Cautionary symbols
11. Packing reference table
12. Check list

Bharat Heavy Electricals Ltd., Piping Centre, Chennai – 600 017		
Packaging Instructions for Piping Components	Doc. No PC: PKG:01	
	Rev No: 00 Date : 28 /05/ 2014	No of Sheets : 24

1. SCOPE

This procedure elicits the general requirements to be complied with for packaging of piping components. The packaging is intended to preserve and protect the contents.

The handling, storage, cleaning, packaging, and preservation of items shall be controlled to prevent damage or loss and to minimize deterioration.

2. PACKAGING

This procedure contains requirements for packaging of items for protection against corrosion, contamination, physical damage, or any effect that would lower the quality or cause the components to deteriorate during the time they are shipped and stored at sites.

Items shall be inspected for cleanliness immediately before packaging. Dirt, oil, residue, metal chips or other forms of contamination shall be removed.


Adequate protection shall be provided against mechanical damage and atmospheric corrosion in transit and, for equipment suitable for outside storage, for prolonged storage at the site prior to installation.

Water proof barrier material – high density polythene shall be used as a resistant to grease and water; it shall protect items from airborne and windblown soils.

Desiccants like silica gel to be used inside pipe components. Silica gel shall conform to IS 3401. The gel is to be packed in sachets placed at different positions inside the components for absorbing moisture. The quantity of silica gel shall be adequate for storage period of one year.

Components to be placed in such a way that metal to metal contact is avoided.

For mechanical components, (1) all openings shall be covered or plugged with substantial (1/2 inch minimum thick) one piece plywood or metal closures, securely fastened and suitable for prolonged exposure prior to final installation; (2) all tapped openings in equipment shall be plugged with plastic plugs to protect internal threads; and (3) all welding end connections shall be provided with adequate weld bevel protectors to protect from corrosion and physical damage.

Bharat Heavy Electricals Ltd., Piping Centre, Chennai – 600 017		
Packaging Instructions for Piping Components	Doc. No PC: PKG:01	
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Austenitic stainless steel and nickel-based alloy materials shall be handled in such a manner that they are not in direct contact with carbon steel materials or with materials containing halogen, sulphur, zinc and lead.

Each components/item of stainless steel materials should be wrapped with high density polythene.

All equipment shall be packed, securely anchored (skid mounted when required) and weather protected for the shipment method adopted.

Temporary bracing or supports, marked and tagged for removal after equipment installation, shall be provided to prevent damage during shipment and shall be painted bright, fluorescent yellow.

3. Criteria for Selection of Packaging:

Packages are to be made according to categories listed in Table-6 (see page – 24), depending on the type of materials and size.

4. TYPES OF PACKAGING:

4.1 CRATES

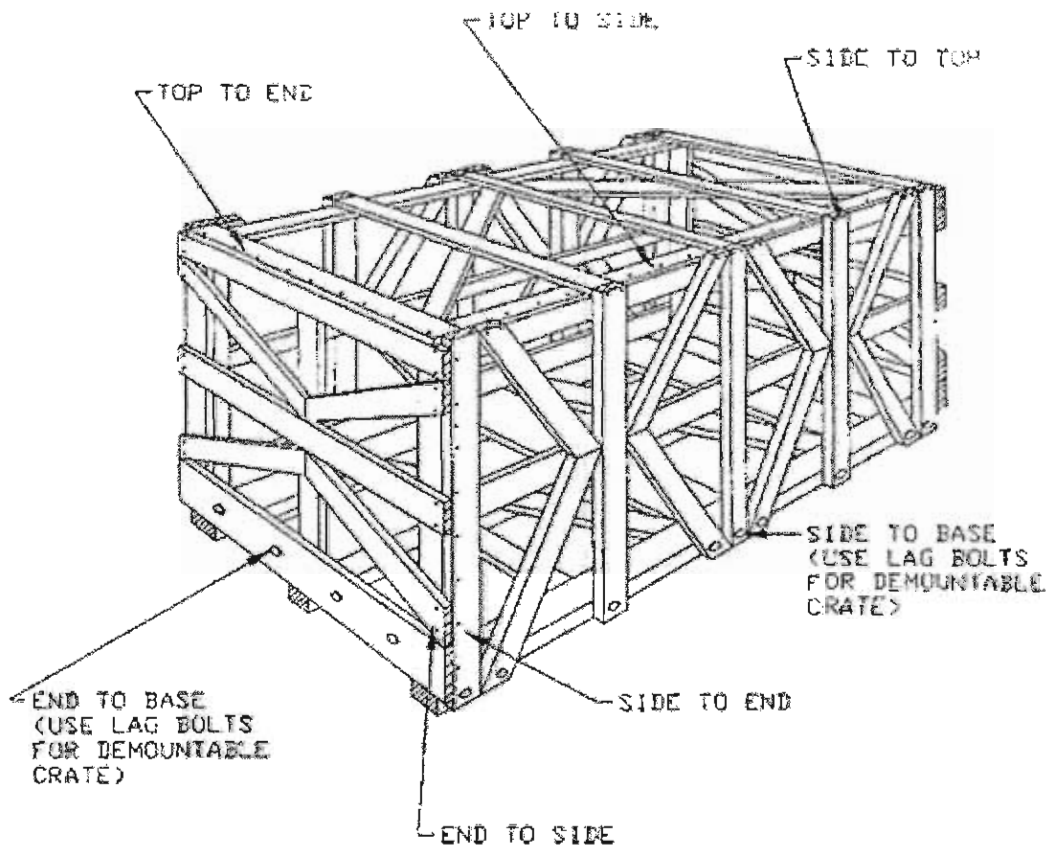
- These are to be made of seasoned wood and are intended for packaging heavy materials Viz., straight pipes and pipes with attachments.
- The crates are to be lined with hi-density polythene, to prevent entry of moisture.
- The dimensions of the crates are to be restricted to 20 x5x5 feet.
- Pipes up to OD 350mm are to be crated.
- Pipes are to be stacked inside the crate so that the weight of the pipe does not rest on branch stubs or carrier plates.
- Contents of the crate should not come in contact with each other or with the crating, and should be adequately cushioned to preserve the painting.
- The gross weight of the crate should not exceed 2 Tons.
- For further instructions refer ASTM D6039 Standard Specification for Open and Covered wood Crates.

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WOODEN CRATE



Max Net Load (KGS)	Length (mm)	Width (mm)	Height (mm)
2000	6096	1524	1524

All the dimensions shown in the above table are maximum inside dimensions.

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4.3 SADDLES

- Saddles are defined as profiled supports made of wood, and are used to cradle and support Tanks, pipe bends and pressure vessels.
- Ensure that the end chamfering of the bends are duly protected for the transit.
- Tanks are to be completely drained and dried.
- Adequate amount of the specified desiccant is to be placed inside the tank/ vessel.
- Ensure that all openings are covered and /or plugged.

4.4 CASES

- Other components such as fittings and Mitres are to be packed inside wooden cases.
- The insides of the cases are to be lined with hi-density polythene.
- Air vents to be provided in the cases for ventilation.
- Components to be placed in such a way that metal to metal contact is avoided.
- Small components like Fasteners, gaskets are to be packed in high density polythene covers and placed inside the wooden cases.
- Holes to be provided in the case floor to act as drains.

4.5 BUNDLES

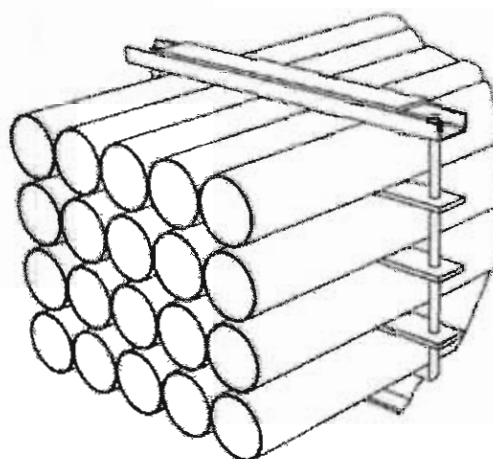
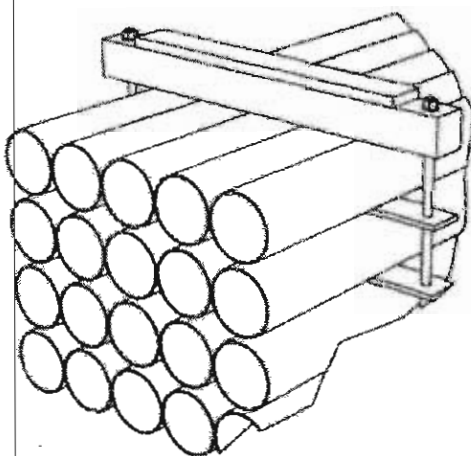
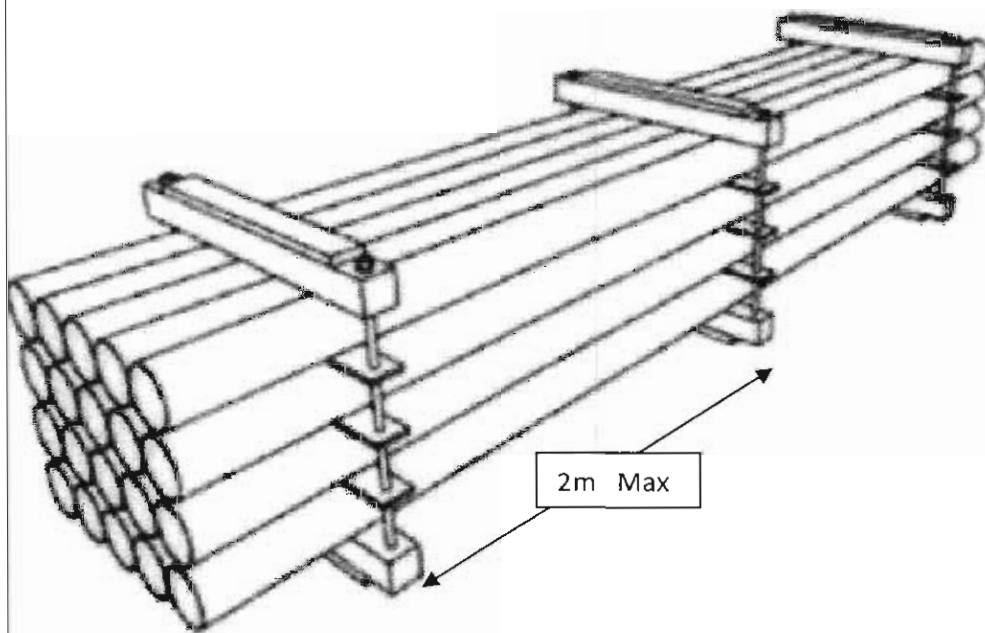
- Bundles are transportable units where a large number of straight pipes of the same diameter and even lengths are arranged securely and are fit to be lifted by cranes and also stacked.
- Pipe ends should be covered fully with plastic end caps.
- Pipes can be bundled only when they can bear the stack compression load without additional support.
- Clamps made of wood or steel clamps with wooden inserts are to be used.
- Clamps must be locked firmly so that the pipes cannot slide out of bundle.
- Bundle must be held together by at least three sets of clamps as indicated in the diagram.


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5. SLING PROTECTIONS

The lifting points of the case or crate or bundle must be equipped with sling protections suitable to the respective package gross weight.


6. MARKING AND LABELLING

Components and their containers shall be identified by marking. Shipping marks shall be on all sides of package. The shipping marks shall be at least 3 inches high where space permits. Markings are to be in black paint or ink depending on shade of the package surface.

Cautionary symbols to be stencilled in red waterproof paint or ink.

7. PACKING LIST

One complete packing list inside a watertight envelope must be affixed outside of each package and be covered by sheet metal. One more copy of the packing slip wrapped in polyethylene bag is to be kept inside the box at the pertinent place.

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8. General Instructions for packaging

- The quantity of Slides / Runners is selected depending upon the weight and over-all dimension of the Load, to be carried. Table-1 and 2 details out the number of Slides, length and cross sections of the Slides to be provided with their carrying capacity.
- The construction of bottom frame is as shown in the Figure-2.
- The construction of the top frame is, as shown in the figure -3.
- Thickness of the boards, used for sheathing for the top, sides and end panels, shall be 25 mm.
- The top of the Box consist of Beam supported on top traverse bar and sheathing, as shown in the figure- 3.
- The dimension of items 1, 2 f figure -3 shall be as table -3.
- Diagonal braces shall be used in packing cases with height, exceeding 600 mm as shown in the figure- 4.
- The angle between the lower (or) upper horizontal supports and diagonal braces, shall be in the range of 20° to 60° and if possible, this angle preferably be kept at 45°.
- If the height of the box exceeds more than 1400 mm the diagonal braces, shall cross each other and when this dimension exceeds 1800mm additional horizontal supports shall be provided as shown in figure-5 and figure- 6.
- Size of upper and lower horizontal supports and vertical supports, shall be as per Table 4 refer figure 7, 8, 9 & 10 for the arrangement.
- The cross section of end traverses bar (item -1) and thickness of bottom boards (item-2), shall be used as per table -5.
- All boxes measuring more than 600 mm height shall be constructed by assembling end, side and top shook's on a bottom, forming a complete enclosed Box (refer figure-11).
- Angle iron cleats shall be used for strengthening the joints, as indicated in figure -12.
- Boxes will be strengthened by steel bands to withstand transit damages.

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9. Reference drawings

1. SLIDE
2. LONGITUDINAL UNDER
SLIDE BOARD.
3. BOTTOM BOARD
4. CARRIER TRAVERSE BAR
5. INTERMEDIATE VERTICAL SUPPO
6. HORIZONTAL BRACING
7. DRAINAGE HOLES
8. BATTEN
9. SLING PLATE
10. NUT BOLT WASHER
11. END TRAVERSE BAR
12. WATER PROOF LINING OF
BITUMANISED PAPER
13. VERTICAL SUPPORTS
14. END SHEETING BOARD
15. SIDE SHEATING BOARD
16. TOP SHEATING BOARD
17. LONGITUDINAL SUPPORT
18. TOP HORIZONTAL BEAM
19. TOP SHEATING BOARD
20. TOP CORNER STRIPS
(FOR STRENGTHENING)
21. OUT SIDE DOCUMENTS
CONTAINER.

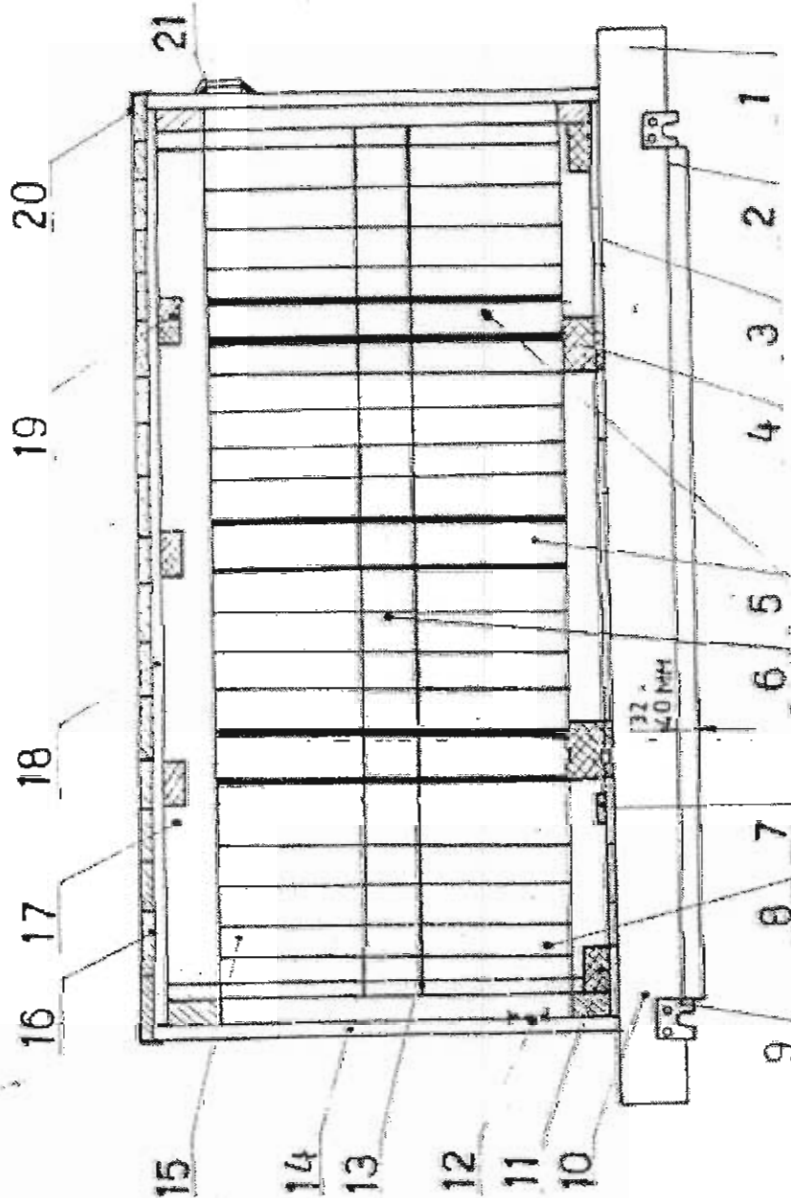


Fig. 1

NOMENCLATURE OF PARTS OF PACKING

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BOTTOM FRAME ARRANGEMENTS FOR TYPES
633, 654, 966, 1296, 1122, 1144, 1399, 1577

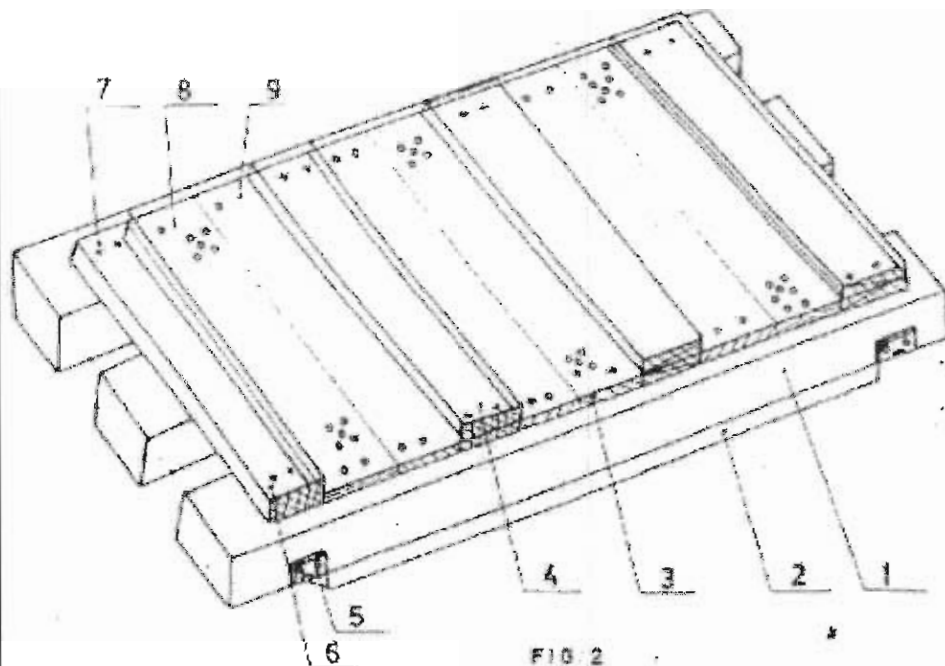


FIG. 2

- 1. SLIDE
- 2. UNDER SLIDE BOARD
- 3. BOTTOM BOARD
- 4. CARRIER TRAVERSE BAR
- 5. SLING PLATE
- 6. TRAVERSE BAR
- 7. BOLT, NUT & WASHER
- 8. DRAINAGE HOLES
- 9. NAILS

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TOP FRAME ARRANGEMENT FOR TYPES
633, 654, 966, 1296, 1122, 1144, 1399 & 1577

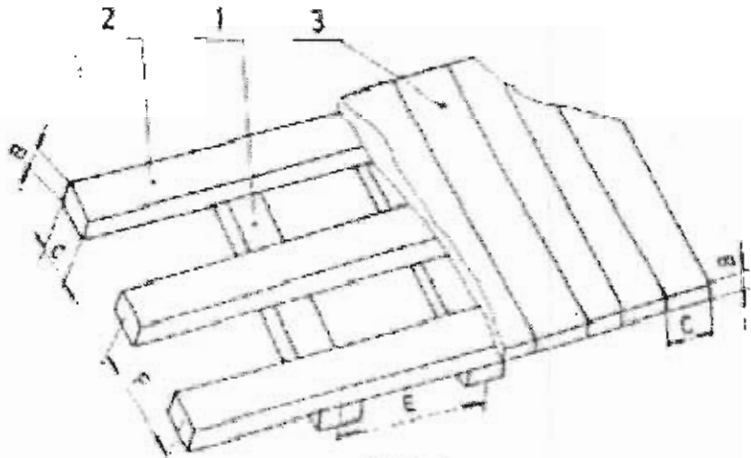


FIG-3

- 1 - Traverse Bars
- 2 - Horizontal Scans
- 3 - Top Board

PROVISION OF DIAGONAL BRACING ARRANGEMENT



FIG-4

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ARRANGEMENT OF DIAGONAL BRACING &
HORIZONTAL SUPPORT

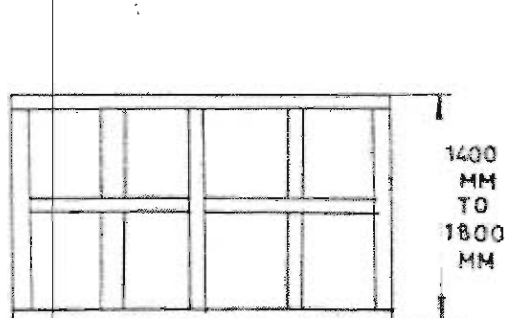


FIG. 5

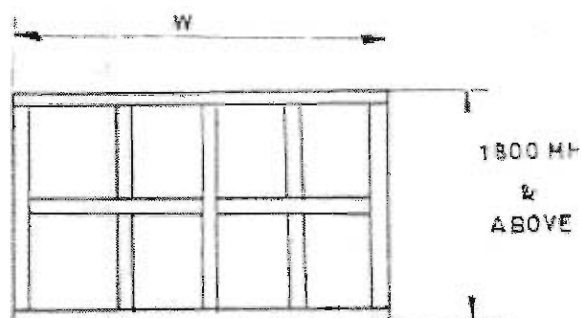


FIG. 6

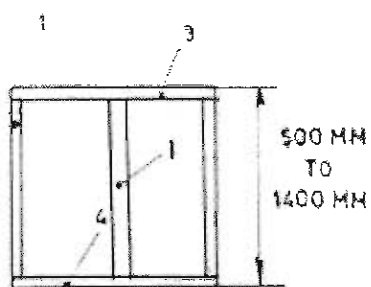


FIG. 7

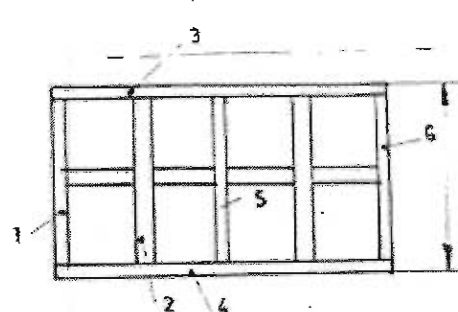


FIG. 8

1. VERTICAL SUPPORT


1, 2, 5, 6 - VERTICAL SUPPORT

3. UPPER HORIZONTAL SUPPORT

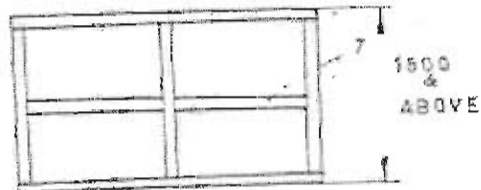
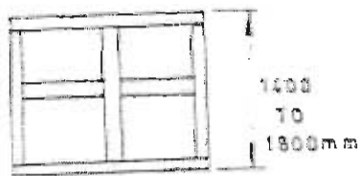
3 - UPPER HORIZONTAL SUPPORT

4. LOWER HORIZONTAL SUPPORT


4 - LOWER HORIZONTAL SUPPORT

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ARRANGEMENT OF DIAGONAL BRACING AND HORIZONTAL SUPPORT



7-MIDDLE HORIZONTAL SUPPORT

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ARRANGEMENT OF PACKING CASE

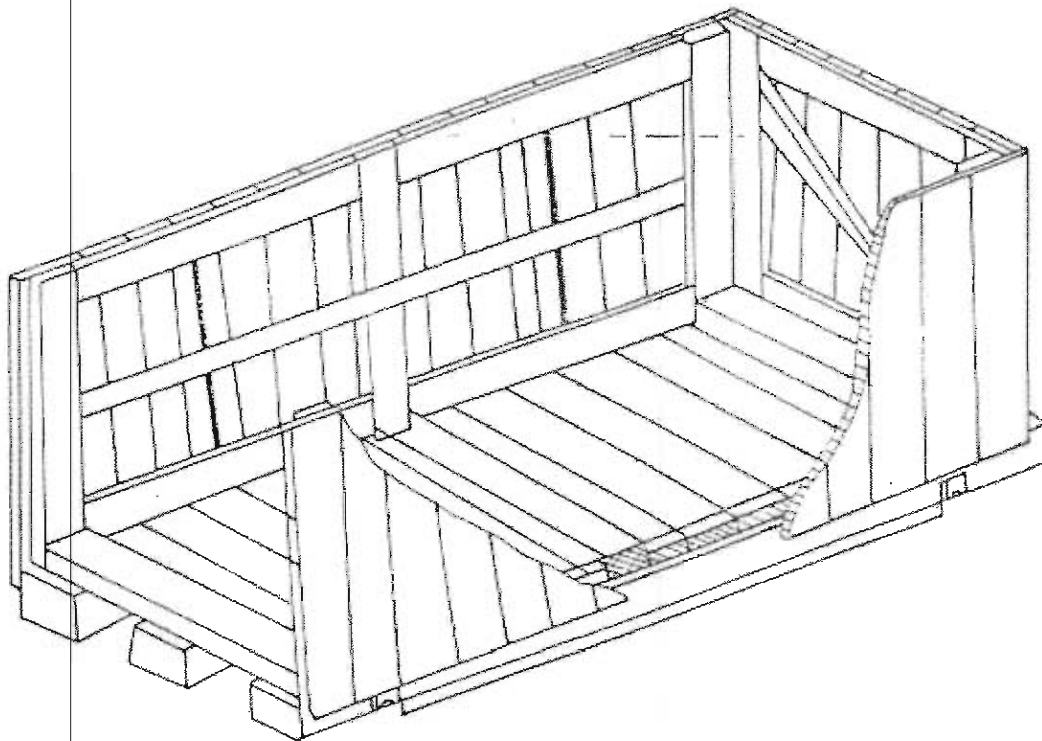


FIG : 11

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ARRANGEMENT OF ANGLE IRON CLEATS

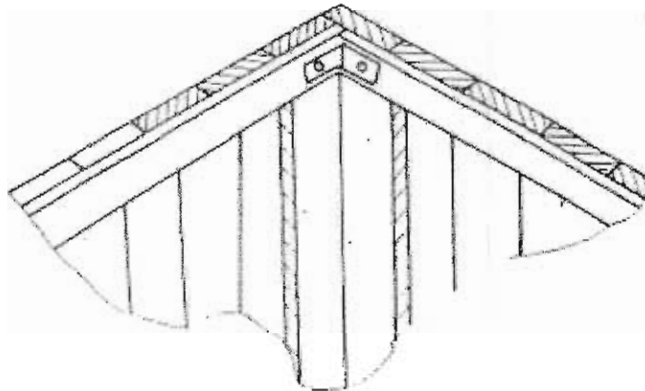


FIG:12

ARRANGEMENT OF C-CLAMPS AROUND CASES

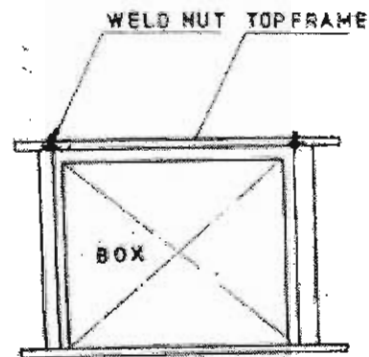
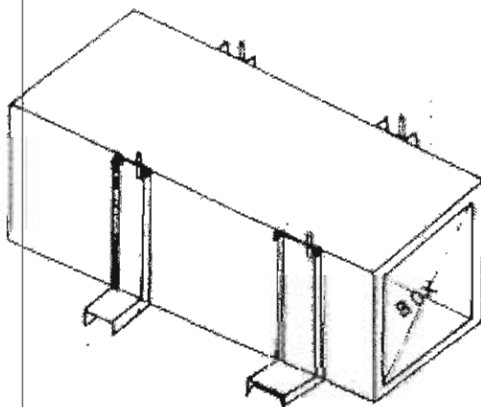


FIG:13

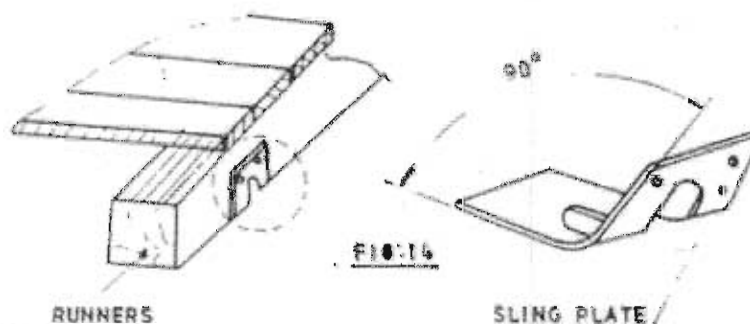
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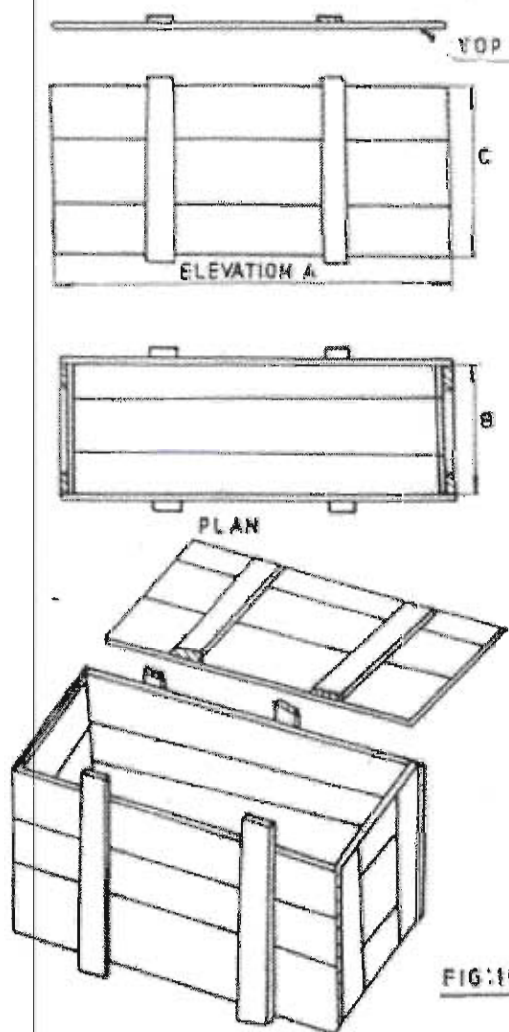
**ARRANGEMENT OF SLING - PLATE ON
CASES**



RUNNERS

SLING PLATE

ARRANGEMENT OF SMALL CASES




TYPE 654, 633

DMS TYP	A	B	C
654	600	500	400
633	600	300	300

IN MM ONLY

1. BOTTOM BOARD
 2. CROSS TRAVERS BOARD
- A. UNIFORMLY DISTRIBUTED
B. CONCENTRATED LOAD

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The sizes of boxes given below are indicative. Actual sizes may vary according to size and positioning of component inside.

ANNEXURE – A
WOODEN BOXES

TYPE	L X B X H (MM)	CARRYING CAPACITY IN KGS
633	600x300x300	200
654	600x500x400	500
966	900x600x600	1000
1296	1200x900x600	2000
1122	100x200x200	300
1144	110x400x400	300
1399	1300x900x900	2500
1577	1500 X 700 X 700	1500

TABLE - 1

No. of slides	Length of slides	Weight in (kgs)	Types of loading
2	600 - 1800 mm	0 - 1000	Two slides for central loading near the ends or uniformly distributes load.
3	1801 - 2500 mm	1001 - 5000	Three slides with load concentrates near the end or uniformly distributed load.


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TABLE - 2

LOAD	Length of slides						
	600	800	1000	1200	1300	1500	2000
	CROSS SECTION						
	B x C		c				
			b				
500	30 x 100	30 x 100	30 x 100	30 x 100	30 x 100	30 x 100	30 x 100
800	30 x 100	30 x 100	100 x 100	100 x 100	100 x 100	100 x 100	100 x 100
1000	30 x 100	100 x 100	100 x 100	100 x 100	100 x 100	100 x 100	100 x 100
1500	100 x 100	100 x 100	100 x 100	100 x 100	100 x 100	100 x 100	100 x 100
2000	100 x 100	100 x 100	100 x 100	100 x 100	100 x 100	100 x 100	100 x 100
2500	100 x 100	100 x 100	100 x 100	100 x 100	100 x 100	120 x 150	120 x 150
3000	100 x 100	120 x 150	120 x 150	120 x 150	120 x 150		

TABLE – 3

Distance between top horizontal scans dim 'f'	Distance between the axis of the traverse bar dimension 'E' in fig -3				
	500	600	700	800	900
	Size b x c				
700 – 1000 mm	30 x 100	30 x 100	30 x 100	30 x 100	30 x 100


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TABLE-4

End and side panels	Width of the panels	Distance Between Longitudinal Support DIM 'D'						
		600	800	1000	1200	1400	1600	1800
		Cross section (b x c) Item 1 to 7						
Fig - 7	600 to 1200	30 x 100	30 x 100	30 x 100	30 x 130	30 x 130	30 x 130	30 x 130
Fig - 8	1201 to 1600	30 x 130	30 x 130	30 x 130	30 x 130	30 x 130	30 x 130	30 x 130
Fig - 9	1601 to 2000	30 x 130	30 x 130	30 x 130	30 x 130	30 x 130	30 x 130	30 x 130
Fig - 10	2001 to 3000	30 x 130	30 x 130	30 x 130	30 x 130	30 x 130	30 x 130	40 x 150
	3001 to 4000	30 x 130	30 x 130	40 x 150	40 x 150	40 x 150	40 x 150	40 x 150


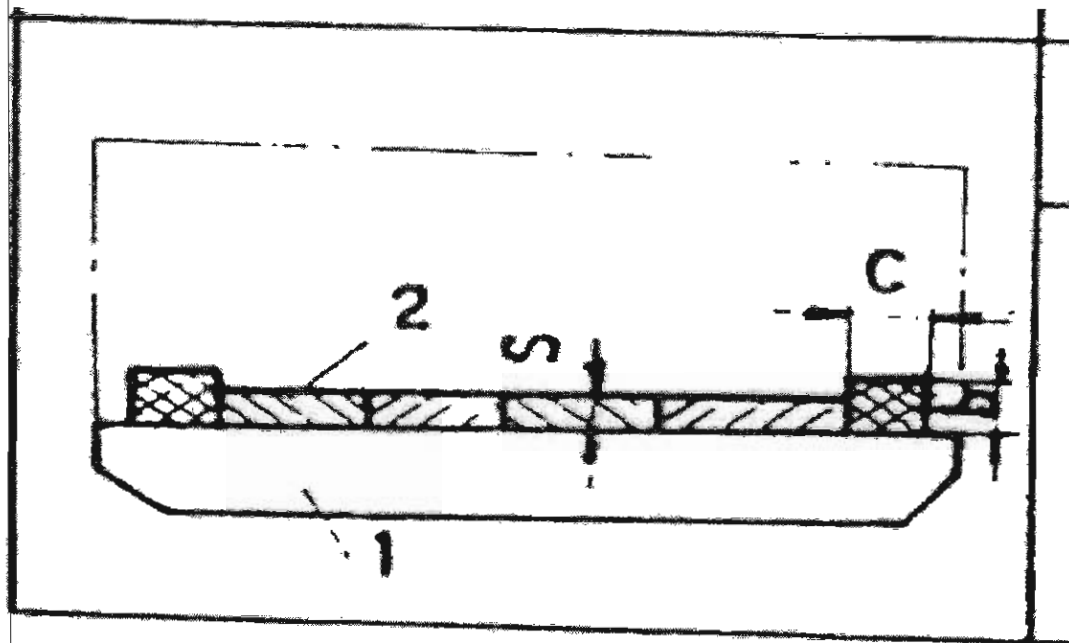

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TABLE-5

BOTTOM TRAVERSE:



Cross section of end traverse bar item 1 fig. X and thickness of bottom board (item – 2)			
Load in kg	Width of the box	Cross section	S
Up to 3000	Above 1000 mm	100 x 100	25

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10. Cautionary symbols



FRAGILE, HANDLE WITH CARE



PROTECT FROM HEAT AND RADIOACTIVE SOURCES



USE NO HOOKS

NOTE: The design of heavy goods packages cannot always resist top lifting by grabhooks.



KEEP DRY

NOTE: Not all cases have waterproof internal liners; plywood used in the construction may not have a waterproof gluing.



THIS WAY UP

NOTE: Certain designs of small cases make it difficult to distinguish top from bottom.



CENTRE OF GRAVITY

NOTE: This should be stencilled as a minimum on the two longest case sides (this information will normally be supplied by the manufacturer of the item(s) packed).



KEEP AWAY FROM HEAT

... kg max.



STACKING LIMITATION

NOTE: The maximum load in kilograms should be marked above the arrow.



International 'slings here' symbol



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11. Packing Reference Table

TABLE-6

No	Packing Method ->	Wooden Crates	Bundles	Saddle supports	HD Polythene Sheet Wrapping	Wooden boxes (Cases)	Spider	Remarks
	Description							
1	Straight Pipes	✓	✓					Crates for random length
2	Pipes with attachments	✓						
3	Pipes with Fittings	✓						
4	Tanks			✓				
5	Mitre bends			✓		✓		Saddle or cases to be used
6	Fasteners					✓		
7	Hanger components					✓		
8	Clamps					✓		
9	Fittings >nb200/ Flanges					✓		Fittings <200 shall be packed in boxes
10	Plates(Cut to size)					✓		
11	SS Pipes		✓		✓			Wrap SS pipes before bundling
12	SS fittings / Flanges	✓				✓		Fittings <200 shall be packed in boxes
15	SS Fasteners					✓		
16	CW piping(>900mm)						✓	To maintain circularity of pipes
17	CW fittings(>900mm)						✓	
18	CW fittings(<900mm)							
19	Structurals(<200mm)		✓					

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12. CHECK LIST

S No	VENDOR TO PROVIDE DETAILS	
1	On despatch of components/items , vendor has to provide the following information for each package of despatched items: <ol style="list-style-type: none"> 1. Contents of package (Packing list) 2. Corrosion Prevention: Rust-preventive coating /protective painting/Silica gel/ other corrosion inhibitors (please mention) 3. Lifting Instructions: Crane using slings/Fork lift/any other means (please mention) 4. Dimensions (LxBxH) mm: 5. Gross Weight (Kgs): 6. Net Weight (kgs): 	
S No	VENDOR TO CONFIRM	
1	Where ever items are despatched as a bundle, they should be clamped together with bolted timber block clamps or bolted steel section clamps with timber block inserts. Adequate number of clamps should be provided along the length of the bundle with sufficient projection of the clamps beyond the width and height of the bundle.	
2	Only such materials which can withstand corrosion and environmental conditions are allowed to be packed in wooden crates or bundles.	
3	In case of wooden packing, planks of 20-25 mm thick and 100-150mm wide needs to be suitably placed at close intervals for giving rigidity to packing appropriately.	
4	Wood used for packing should be seasoned & shall be free of termites.	
5	Damages, if any, resulting due to improper/inadequate packing will be to vendors account. It will be the responsibility of the vendor to identify suitable and adequate packing for his supplies to protect it from damage and/or deterioration during storage, stacking, transport and handling.	
6	All packing should be suitable for loading/unloading by cranes/forklifts & suitable for transport by road. Suitable marking should be made on the packing indicating the lifting positions.	