

Enquiry No 4102000056 dt 21.12.2020
Procurement of BW Fittings (CS & AS)

Dear Sir / Madam,

Sub: Procurement of BW Fittings (CS & AS) as per BHEL Enquiry- 4102000056 dt 21.12.2020.

We are pleased to inform that Indigenous Limited Tender Enquiry has been floated for the **“Procurement of BW Fittings (CS & AS)”** as per BHEL Enquiry No 4102000056 dt 21.12.2020. Prospective suppliers are requested to submit their offer thru BHEL’s E-Procurement portal (<https://eprocurebhel.co.in/nicgep/app>) in Two Parts basis (Part I- Techno-Commercial bid; Part II- Price bid) on or before **14.00 HRS IST** on **07.01.2021**. Part I bid will be opened on **14.30 HRS** on the tender due date.

All corrigenda, addenda, amendments, time extensions, clarifications etc (if any) will be hosted on BHEL’s E-Procurement portal, BHEL’s tender notification (<http://www.bhel.com>). Such corrigenda, addenda, amendments, time extensions, clarifications etc will not be published in newspapers or any other media. Bidders shall regularly visit the above websites to keep themselves updated.

The following are enclosed for information-

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|---|---|
| 1.0 Techno commercial requirements | 6.0 Applicable items list |
| 2.0 Technical Delivery Conditions | 7.0 Annexure A- General Terms & Conditions |
| 3.0 Quality Plan | 8.0 Annexure I- CA certificate format |
| 4.0 Technical Deviation Format | 9.0 Make in India declaration format |
| 5.0 Packing Procedure | 10.0 Edge Preparation and Tolerance Drawings |

Bids on Two Part basis shall be submitted in line with the Terms & Conditions of the NIT. Care shall be given to submit the following documents along with Part I offer without fail-

- Technical deviation sheet (in case of any deviations)
- CA certificate and Make in India declaration in formats attached (in case purchase preference is applicable)

Any clarification on technical specifications can be obtained from BHEL before tender opening. Suppliers are welcome to have pre-bid meeting with BHEL Engineers for better understanding our requirements. Please note that as per BHEL’s Policy, **BHEL cannot allow price impact post Part I opening for the requirement / scope of supply which is a part of specifications of our Enquiry.** Hence, please read specification / documents thoroughly and submit your offer as per specifications of Enquiry. In case of any query / un-clarity on any of the clause / requirement of specification, please get them clarified from BHEL before submission of offer. No deviation & request regarding un-clarity / contradictory conditions / ambiguity of specifications would be entertained after opening of Part I bid. Vendors are required to thoroughly understand the scope of supply and submit their quotation before the Enquiry due date indicated above.

Enquiry No 4102000056 dt 21.12.2020
Procurement of BW Fittings (CS & AS)

In the event of any Technical or Commercial queries, the same may please be addressed to the following concerned before Part I opening-

- Sandeep, Sr. Engineer / Purchase- sandeepj@bhel.in, +91-9445159877, +91-044-28161315
- Shreelekha S Chandar, DM /Purchase -shreelekha@bhel.in, +91-044-28161385

In the event of any queries during submission of the tender thru BHEL's E-Procurement portal, you may pls contact-

- EPS Customer Care- Bhel.Support@abcProcure.com, +91-79-68136809/849/871/823/872

General Note-

- BHEL reserves the right to increase or decrease the tendered quantity and split the tendered quantity. BHEL reserves the right to negotiate or re-float the tender opened if L1 price is not the lowest acceptable price to them inter-alia other reasons.
- One agent cannot represent two or more suppliers or quote on their behalf in a particular tender. If so found at any stage, BHEL Piping Centre is likely to cancel bids of such suppliers. Further, such Indian Agent is likely to be de-listed (Black listed for business from BHEL). Any agent representing the supplier shall upload agency agreement along with the part-I bid of the tender.
- In order to protect the commercial interests of BHEL, it becomes necessary to take action against suppliers / contractors by way of suspension of business dealings, who either fail to perform or are in default without any reasonable cause, cause loss of business / money / reputation, indulge in malpractices, cheating, bribery, fraud or any other misconduct or formation of cartels so as to influence the bidding process or influence the price etc. Suspension of Business Dealings could be in the form of "Hold" or "Banning" a supplier / contractor or a bidder or an applicant for registration as a registered supplier. For this purpose, the abridged version of guidelines hoisted at website http://www.bhel.com/vender_registration/vender.php (Suspension of business dealings with suppliers / contractors) is being followed across all BHEL units. Bidders shall keep themselves aware of these guidelines before submission of their quote.

For BHEL Piping Centre,

Sandeep
SE / Purchase
+91-044-28161315
+91-9445159877

Enq- 4102000056 - Procurement of BW Fittings (CS & AS)
Techno-Commercial Terms

Sl No	BHEL requirement
1	Quotation no
2	Quotation date
3	Currency of quote
4	Applicable GST % shall be indicated
5	<u>Technical requirements-</u> 1) TDG 102 Rev 09 is applicable. 2) Quality Plan QPG46 Rev 01 is applicable . 3) Fabrication, Supply and Inspection shall be as per applicabe TDG, ASME Standards and Quality Plan. 4) Packing procedure shall be as per PC-PKG-01. 5) EP shall be as per DRG 3-80-300-19825/04 if not indicated explicitly in the drawing.
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>Delivery period-</u> 3 months from LOI / PO date. Mandatory to accept. Bids with higher delivery period shall be liable for rejection.
8	<u>Bid Validity-</u> Price Validity shall be sought for a period of 3 months from date of Part-I (Techno-commercial) bid opening OR 60 days from date of Price bid opening.
9	<u>Delivery term-</u> 'FOR' BHEL Trichy / Site (all inc of P&F, F&I, testing, inspection charges etc).
10	<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, LR date will be considered . In case of deviation to BHEL's standard LD terms, loading will be applicable and will be limited to the extent to which it is not agreed to by the bidder.
11	<u>Evaluation & Ordering-</u> 1. Evaluation will be done Item wise. 2. Item wise ordering will be resorted to. 3. Minimum Order Quantity (MOQ) / Minimum Order Value (MOV) condition will not be accepted. Bids of such bidders (if any) insisting for MOQ / MOV will be rejected.
12	<u>Payment term-</u> 1. 100% payment after 60 days after receipt and acceptance of materials (site acknowledgement to be submitted in case of Direct to Site supplies). 2. For MSE bidders, Payment shall be MSME Act. For availing MSE benefits bidder shall submit relevant MSE documents prior to award. No other payment terms will be accepted. If bidders propose for any other payment term other than indicated above, such bids will be rejected.
13	<u>Price Finalization-</u> Prices will be finalized by opening of Price bids (Bid Part-II) thru Sealed Price Bid Opening. BHEL may decide to negotiate with L1 vendor of price bids.(refer Annexure A for details).
14	<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.
15	<u>Make In India 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.
16	<u>MSE Purchase Preferences for the Enquiry-</u> If MSE preference is applicable as per Annexure A to NIT, supporting documents as per NIT shall be submitted. In the event of non-submission of supporting documents, purchase preference will not be extended to bidders.
17	All other terms and conditions other than those indicated above shall be as per Annexure A (General Terms and Conditions enclosed and Techno-commercial MOU (latest) signed with BHEL.
18	<u>General note-</u> Any disparity to terms indicated above, Annexure A and bidders offer, only the agreed terms and conditions above / Annexure A shall stand valid. Bidders terms and conditions which are in conflict will be ignored and will not be taken into consideration.



1.0 SCOPE: -

The fittings shall meet Indian Boiler Regulations (IBR), unless otherwise specified, and the following requirements in addition to the standards specified in the Purchase Order (PO).

2.0 RAW MATERIALS: -

- All fittings 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.
- All pipes used for fittings shall meet the respective specification. The test certificate shall be furnished with Traceability
- For Gr-91 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. Indigenous vendors shall procure the raw material for Alloy Steel other than SA 335 P91 from IBR approved "creep resistance steel makers".
- Raw material Steel for IBR forging items to be inspected at Mill & test certificate countersigned by IBR approved Authority, if the mill is not approved under IBR as well-known steel maker.
- For Gr-91 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. Indigenous vendors shall procure the raw material for Alloy Steel other than SA182 F91 from IBR approved sources.

3.0 MANUFACTURING & TESTING REQUIREMENTS:

3.1 MANUFACTURING PROCESS :

(i) Seamless Fittings:-

A) Tees & Reducers : Upto 80mm thickness : Formed Type.

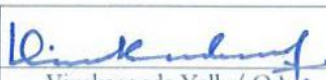
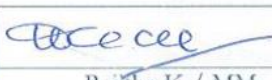
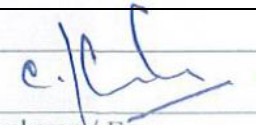
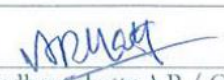
Above 80mm thickness Formed or Forged type.

B) Elbows : Formed type for all thickness

(ii) **Welded Fittings:-** Supplied only if indicated in P.O and shall be of **Two-Half construction**.

3.2 Machined Fittings (Max size permitted 4"- directly from bar) – Reducers, Couplings & End Caps : Fittings machined from Castings are **prohibited**.

Starting material	Heat treatment	CS – Normalised AS – Normalised & Tempered SS & Duplex SS (UNS32205) – Solution Annealed
Rolled or Forged Bars (Killed Steel)	NDE – UT	To be done after Heat treatment. For size above 40mm – to be done as per ASTM A 388 Acceptance to - ASME Sec.VIII Div.2 Cl.3.3.4. Actual measured notch depth to be specified in Test Certificate.
Finished fitting (after machining)	Heat treatment	Not required
	NDE (for all sizes)	- MT (100%) - Procedure - As per ASTM E709. No linear indications are acceptable (Linear Indication : Length $\geq$ 3XWidth) For WP91 Wet MPI shall be done - LPI – SS & Duplex SS (UNS32205): Shall be done as per ASTM E165. No linear indications are acceptable.
	Hardness	Base material Hardness for. WPB, WPC, WP11, WP12, WP22 – 197 HBW max. WP91 - 190-250 HBW – 100% to be checked Duplex SS (UNS32205) – 300BHN max
	Dimension	ASME B16.9 or as per Engineering Drawing indicated in Purchase Order.
	Bend Test (for IBR items)	Specimen: 19mm. Thickness (t) x 25.4mm width - cold bent 180 deg. over thin section without fracture, mandrel radius: CS : $\leq$ 6.35 mm. AS, SS : $\leq$ 1.5 times specimen thick.

 Vivekananda Yellu/ QA Prepared by	 Rajitha K / MM Reviewed by	 C. Karunakaran/ Engg Reviewed by	 Madhavankutty.A.P / Quality Approved by
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3.3 Seamless Formed Fittings – Ells, Tees, Reducers, Dished end (End cover / Cap)

Starting material:	Heat treatment shall be as per starting material specification	CS – Normalised AS – Normalised & Tempered SS & Duplex SS (UNS32205) – Solution Annealed																																
1)Tube & Pipe	NDE – UT	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.																																
2) Forged blank (For End covers)	NDE – UT	For size above 40mm UT shall be done as per - ASTM A 388 In acceptance to - ASME Sec.VIII Div.2 Cl.3.3.4. Actual measured notch depth to be specified in Test Certificate.																																
3) Plate	NDE – UT	For size above 10mm SA 578, Acceptance Level – B. Actual measured notch depth to be specified in Test Certificate.																																
Finished fitting (cold/hot forming)	Heat treatment after forming	Shall be done as per SA234 and follow below table for heat treatment values. <table><tr><th rowspan="2">Material</th><th colspan="2">Heat Treatment Temp,°C</th><th colspan="2">Soaking time, hr/in</th></tr><tr><th>Normalising</th><th>Tempering</th><th>Normalising</th><th>Tempering</th></tr><tr><td>CS- WPB & WPC</td><td>870-900</td><td>-</td><td>1/2</td><td>-</td></tr><tr><td>AS-WP11 & WP12</td><td>920-960</td><td>640-670</td><td>1/2</td><td>1</td></tr><tr><td>AS-WP22</td><td>920-960</td><td>680-710</td><td>1/2</td><td>1</td></tr><tr><td>AS- WP91</td><td>1040-1080</td><td>760-780</td><td>1/2</td><td>1</td></tr></table> Stainless Steel - All grades & Duplex SS (UNS32205): - Solution Annealed: 1050-1100 Deg C Soaking time : ½ hr per inch with minimum 15 minutes Note: Normalising shall be done for a minimum time of 30 min while tempering to be done for a minimum time of 60min for all materials except SS & Duplex SS (UNS32205).				Material	Heat Treatment Temp,°C		Soaking time, hr/in		Normalising	Tempering	Normalising	Tempering	CS- WPB & WPC	870-900	-	1/2	-	AS-WP11 & WP12	920-960	640-670	1/2	1	AS-WP22	920-960	680-710	1/2	1	AS- WP91	1040-1080	760-780	1/2	1
	Material	Heat Treatment Temp,°C		Soaking time, hr/in																														
		Normalising	Tempering	Normalising	Tempering																													
	CS- WPB & WPC	870-900	-	1/2	-																													
	AS-WP11 & WP12	920-960	640-670	1/2	1																													
	AS-WP22	920-960	680-710	1/2	1																													
	AS- WP91	1040-1080	760-780	1/2	1																													
	NDE (for all sizes) – Except for Plate formed Dished end	• MT (100%) - Shall be as per - ASTM E709 No linear indications are acceptable. For WP91 Wet MPI shall be done. • LPI – SS & Duplex SS (UNS32205): Shall be done as per ASTM E165. No linear indications are acceptable.																																
NDE–for Plate formed Dished end	For Plate Formed Dished end – 100% MT as per - ASTM E709 on both inner and outer surfaces of Knuckle radius and weld ends. No linear indications are acceptable. UT shall be as per A578 Level-B. Actual measured notch depth to be specified in Test Certificate.																																	
NDE – UT For OD >= 200mm or W.T >= 6mm	If made from Pipe & Tube – 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. If made from Forging - Shall be as per - ASTM A 388 In acceptance to - ASME Sec.VIII Div.2 Cl.3.3.4. Actual measured notch depth to be specified in Test Certificate.																																	
Hardness	Base material Hardness for WPB, WPC, WP11, WP12, WP22 – 197 HBW max. WP91 - 191-250 HBW – 100% to be checked Duplex SS (UNS32205) – 300HBW max																																	
Dimension	ASME B16.9, As per Engineering drawing indicated in Purchase Order. The ends of reducers shall have a straight portion of Minimum 13mm.																																	
Bend Test (if starting material is forged blank) (for IBR items)	Specimen: 25.4 mm x 19 mm thick - cold bent 180 deg. over thin section without fracture, internal radius of bend: CS :<=6.35 mm. AS, SS: <=1.5 times specimen thick.																																	

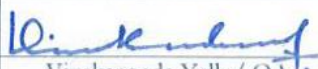
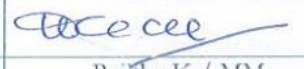
Vivekananda Yellu/ QA	Rajitha K / MM	C. Karunakaran / Engg	Madhavankutty.A.P / Quality
Prepared by	Reviewed by		Approved by



3.4 Forged Fittings –Tees, Reducers, Couplings, Flanges & Dished End (End cover/Cap)

Shall be forged to the shape with a minimum forge reduction ratio of 1:4. Fitting shall not be machined from a forged block.

Starting material: Rolled or Forged Bars, Blooms, Billets (Killed steel)	Heat treatment shall be as per starting material specification	CS – Normalised AS – Normalised & Tempered SS & Duplex SS (UNS32205) – Solution Annealed				
	NDE – UT	To be done for diameter or thickness above 40mm Procedure - As per ASTM A388 In acceptance to - ASME Sec.VIII Div.2 Cl.3.3.4. Actual measured notch depth to be specified in Test Certificate.				
Finished fitting	Heat treatment After forging (cold/hot forging)	Shall be done as per SA234 and follow below table for heat treatment values.				
		Material	Heat Treatment Temp,°C		Soaking time, hr/in	
			Normalizing	Tempering	Normalizing	Tempering
		CS- WPB & WPC	870-900	-	1/2	-
		AS-WP11 & WP12	920-960	640-670	1/2	1
		AS-WP22	920-960	680-710	1/2	1
	AS- WP91	1040-1080	760-780	1/2	1	
	Stainless Steel - All grades & Duplex SS (UNS32205): - Solution Annealed: 1050-1100 Deg C Soaking time : ½ hr per inch with minimum 15 minutes Note: Normalising shall be done for a minimum time of 30 min while tempering to be done for a minimum time of 60min for all materials except SS & Duplex SS (UNS32205).					
	NDE – UT For OD >= 200mm or W.T >= 6mm	UT shall be done as per - ASTM A388 In Acceptance to - ASME Sec.VIII Div.2 Cl.3.3.4. Actual measured notch depth to be specified in Test Certificate.				
	NDE (for all sizes)	MT- (100%) Shall be done as per ASTM E709. No linear indications are acceptable. For WP91 Wet MPI shall be done. LPI – SS & Duplex SS (UNS32205): Shall be done as per ASTM E165. No linear indications are acceptable.				
Hardness	WPB, WPC, WP11, WP12, WP22 – 197 BHN max. WP91 - 191-250 BHN – 100% to be checked Duplex SS (UNS32205) – 300BHN max					
Dimension	ASME B16.9 or ASME B16.5 or as per Engineering drawing indicated in Purchase order.					
Bend Test (for IBR items)	Specimen: 19mm. Thickness (t) x 25.4mm width - cold bent 180 deg. over thin section without fracture, mandrel radius: CS :<=6.35 mm. AS, SS : <=1.5 times specimen thick.					

 Vivekananda Yellu/ QA	 Rajitha K / MM	 C. Karunakaran / Engg	 Madhavankutty.A.P / Quality
Prepared by	Reviewed by		Approved by



3.5 Welded Fittings– Ells, Tees, Reducers (Two-Half construction):

Pipe made from plate and long seam welded shall not be used as a starting material.

Starting material: Plate	NDE – UT	For thickness above 10mm SA 578, Acceptance Level – B.				
Finished fitting	Heat Treatment After forming	Shall be done as per SA234 and follow below table for heat treatment values.				
		Material	Heat Treatment Temp,°C		Soaking time, hr/in	
			Normalizing	Tempering	Normalizing	Tempering
		CS- WPBW & WPCW	870-900	-	1/2	-
		AS–WP11W & WP12W	920-960	640-670	1/2	1
		AS–WP22W	920-960	680-710	1/2	1
		AS- WP91W	1040-1080	760-780	1/2	1
	Stainless Steel - All grades & Duplex SS (UNS32205): - Solution Annealed: 1050-1100 Deg C Soaking time : ½ hr per inch with minimum 15 minutes					
	Post Weld Heat Treatment (PWHT)	PWHT shall be done as indicated below.				
		Material	Heat Treatment Temp,°C		Soaking time	
CS- WPB-W & WPC-W If weld thk>19mm			595-635		2.5min per mm of weld thk; Minimum 30minutes.	
AS–WP11-W&WP12-W		650-680		2.5min per mm of weld thk; Minimum 60minutes.		
AS–WP22-W		690-710				
AS- WP91-W		760-780				
NDE (for all sizes)	• MT (100%)- Procedure - As per ASTM E709. No linear indications are acceptable For WP91 Wet MPI shall be done • LPI – SS & Duplex SS (UNS32205) : Shall be done as per ASTM E165. No linear indications are acceptable.					
NDE – for Weld	• RT (100%)- Acceptance norm shall be UW 51 of ASME Sec VIII DIV-1.					
Hardness	Base material Hardness for WPB, WPC, WP11, WP12, WP22 – 197 BHN max. WP91 - 191-250 BHN – 100% to be checked Duplex SS (UNS32205) – 300BHN max Weld Hardness WP91 - 300 BHN max. – 100% to be checked					
Dimension	ASME B16.9 or as per Engineering drawing indicated in Purchase order.					
Bend Test (for IBR items)	Specimen: 19mm. Thickness (t) x 25.4mm width - cold bent 180 deg. over thin section without fracture, mandrel radius: CS :<=6.35 mm. AS, SS : <=1.5 times specimen thick.					

4.0 GENERAL REQUIREMENTS:

- Carbon < or = 0.25% for WPB (all thickness) and WPC (thickness < or = 20mm)
- Carbon < or = 0.30% for WPC (thickness > 20mm)
- If UT not done on the starting material, the same shall be done by the fitting manufactures before forming / fabrication.**

Vivekananda Yellu/ QA	Rajitha K / MM	C. Karunakaran / Engg	Madhavankutty.A.P / Quality
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- d) **Mechanical Testing** –Test samples shall be tested in the Heat treatment of fitting delivered condition.
1. **Tensile Test**:- One sample of each specification, heat, heat treatment lot and size shall be subjected to Tension Test as per applicable standard.
 2. The following **supplementary tests** shall be carried out for specifications namely SA 234 WPC / WP11 / WP12 / WP22 / WP91 (No supplementary test applicable for SA 234 WPB)
 - i) Product analysis – one / heat / size.
 - ii) Tension test – one / heat / heat treatment lot / size
- e) **Photomicrograph test for WP91**:- Photomicrograph test shall be carried out on one per heat, per size. Acceptance norms - The Material shall be free from any micro fissures. Microstructure shall show tempered martensite and also to be examined for any grain growth. Photomicrograph with 500x (Min) magnification along with Photomicrograph report to be provided. The actual magnification shall be indicated.
- f) In case of welded fittings, WPS, PQR & welder qualification shall be approved by BHEL, prior to start of welding.
- g) Unless otherwise specified in the P.O SA 234 WP 11/12/22 fittings shall be supplied as per class1.
- h) **Stainless Steel (SS) & Duplex SS (UNS32205)** : Finished fittings shall be checked for radioactive contamination and reported. Survey meter shall be used to measure at 5cm near the surface. Acceptance limits: Shall be less than 0.1 milli Rontgen (MR) per hr or 1 micro Sievert per hr.

5.0 POSITIVE MATERIAL IDENTIFICATION (PMI) FOR ALLOY STEEL FITTINGS.

Each alloy steel fitting shall be checked for the correctness of the material during manufacturing and final inspection using X-ray fluorescence principle or spark emission spectrography.

6.0 WORKMANSHIP, FINISH AND REPAIR

All items shall have smooth, workman like finish, and to be free from scale & defects like laps, seams, folds, cracks, etc. Pickled & Passivated as per ASTM A380 for SS items & Duplex SS (UNS32205). Surface defects can be removed by mechanical means and defective areas smoothly dressed up with the adjacent surface. Minimum dimension after repair shall meet drawing / Specification. Repairs by fusion welding are prohibited.

Flatness on curved surfaces of fittings shall be limited to 6% of nominal OD.

Thickness: Outer Diameter & Transition: Variation shall be merged smooth to min 1:4 taper.

7.0 PAINTING, COLOUR CODING & MARKING

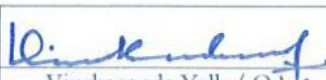
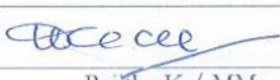
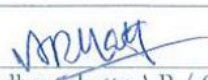
- 7.1 **PAINTING**: All fittings (except stainless steel and galvanized) shall be **painted** on the external surface as given below (unless otherwise specified): -
- a) **Surface preparation**: Blast cleaning
 - b) **Primer coat**: One coat of 60 microns of In-Organic Ethyl Zinc Silicate primer.
 - c) **Finish coat**: Two coats of 20 microns each of Heat Resistance Aluminium paint to IS13183 Gr-1.
 - d) **Total DFT**: 100 microns minimum.
 - e) **Shade**: Aluminium -- for all fittings.

The internal surface shall be protected with rust preventive coating or rust inhibitor.

Stainless steel and Duplex SS (UNS32205) fittings need not be painted.

- 7.2 **COLOUR CODING**: All fittings shall be colour coded circumferentially at all ends as given below:

Material Specification	Colour Code
WPB	Red
WPC	Blue
WP11	Green & White

 Vivekananda Yellu/ QA Prepared by	 Rajitha K / MM Reviewed by	 C. Karunakaran / Engg Reviewed by	 Madhavankutty.A.P / Quality Approved by
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SA 234	WP12	Black & Red
	WP22	Blue & Red
	WP91	Brown & Red
SA 403	WP304	Blue & Yellow
	WP304H	Black, Blue & Yellow
	WP316	Black & Green
	WP316L	Blue, Brown & Yellow
	WP321	Blue & Brown
	WP347	Yellow & Black
SA815 (Duplex Stainless Steel)		Red, White & Green

7.3 MARKING (In English only):

7.3.1 The fittings dispatched to **BHEL Stores** shall be hard punched / etched with Material code, Heat number, material specification, maker's emblem, Inspectors seal, Running Serial number for the P.O. quantity and Statutory authorities seal as applicable.

In addition, the above details along with size shall be paint stencilled on the fittings. If the thickness of the fitting is less than 6 mm, punching is not permitted and the above details shall be paint stencilled. Fittings of size up to 2" (50mm) shall be tied together and the above details shall be punched / engraved in a separate tag and tied to it.

7.3.2 In case of fittings dispatched directly to project site as **DTS**, material code shall be replaced with DU code (14-digit work order du detail) as given by purchase during DTS advice. All other details shall be hard punched & stencilled as indicated in Para 7.3.1.

Sample format for Punching & Stencilling is given below.

Vendor code & Name	:	Makers Emblem Insp. Authority Stamp
Material code / DU details :	:	
Melt No.	:	
Material Specification	:	
Qty.	:	
Serial No	: (Example : 1,2,3,.....& 25)	
Weight.	:	

8.0 PACKING AND END PROTECTION:

Machined ends of the fittings shall be well Protected using end caps and fittings shall be suitably packed in box / crate as per the Packaging procedure PC: PKG: 01 to avoid transit & other damages.

9.0 INSPECTION & CERTIFICATION (In English only): -

9.1 All fittings are to be Inspected at the manufacturer's works by the Inspection agencies / authorities as per IBR and as indicated in the P.O. Inspection certificate in IBR Form III C & Form III-I for Dished Ends shall be submitted along with the Work Test Certificate countersigned by the above authorities and shall include the following (Three ink signed originals required).

1. Test Certificate Number & date.
2. BHEL P.O Number & Amendment Number
3. BHEL P.O. Serial Number
4. BHEL TDC Number
5. Size-wise Quantity
6. Specification, Grade & Year of code.

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7. Heat/Melt Number
8. Starting material details with traceability.
9. Steel making process
10. Ladle Analysis of Raw Material and product analysis of fitting.
- *11. Supplementary Test (Product analysis, Tension test.) results.
12. Tensile Test Report
- *13. Guarantee of HTP shall be given as follows:- "Fittings are capable of withstanding without failure, leakage 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.

9.2 The following reports shall be **furnished separately** along with the IBR Forms & MTC indicated in para 9.1 above.

- i. NDE reports for MT, RT, UT (UT Reports in soft copy + hard copy). Actual measured UT-notch depth to be specified in Test Certificate.
- ii. Positive Material identification (PMI) report for Alloy steel.
- iii. Heat Treatment Chart.
- iv. Hardness Test report.
- v. Photomicrograph test report along with photomicrograph with minimum 500x magnifications.
- vi. Dimensional report (as built drawing with dimensions)
- vii. Thickness Measurement Report for Elbows & Tees as per Doc No : TDG102:001 & TDG102:002

9.3 For CE marking items if indicated in P.O. the TCs with details specified above shall be submitted as per EN-10204 (Latest).

- i. For pressure parts test certificates of type 3.1 or 3.2 is acceptable.
Type 3.1 – Suppliers shall have ISO 9001-2008/2015 (with validity as applicable) certification certified by Notified Body recognized by European Community and test certificate certified by suppliers authorized inspection representative.
Type 3.2 – Components inspected and test certificates certified by both the supplier's authorized inspection representative and Notified Body recognized by European Community.
- ii. For non-pressure parts test certificates of type 2.2 is acceptable.
Type 2.2 – Suppliers test certificates certified by the supplier's authorized inspection representative with test results as required by this TDG.

10.0 AUDIT CHECKS AT BHEL

BHEL reserves the right to carry out audit checks for Chemistry, HT condition, Mechanical test and NDT on fittings.

Supplies found defective during check at BHEL are liable for rejection.

11.0 RECORDS OF REVISION:-

Rev 01 : a) Fully revised for better clarity.

b) Para 2.0 (e) added.

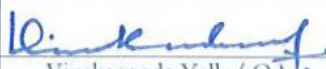
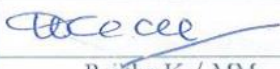
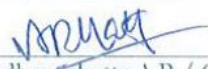
Rev 02 : a) Para 2.0 (c): UT acceptance norms revised from level A to B.

Rev 03 : a) Fully revised for better clarity.

b) Para 4.2, 6.0, 8.0 (11) added.

c) Para 2 (d), 4.1, 5 (d) are revised.

Rev 04 : a) Para 5.0 (g), 7.0 and 8.0 (17) are revised.

 Vivekananda Yellu/ QA Prepared by	 Rajitha K / MM Reviewed by	 C. Karunakaran / Engg Reviewed by	 Madhavankutty.A.P / Quality Approved by
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Rev 05 : a) New material specification SA 815 Duplex Stainless Steel included.

b) Para 4.1, 4.2, 5.0 (d), 7.1 & 7.2 are revised.

c) 5.0 (a), (b), (c), (e), (f), (g), 7.3.1 & 7.3.2 are modified for better clarity.

Rev 06 : a) Para 8.2 added.

b) Para 5.0(d), 5.0(g), 7.1, & 8.1 are revised.

c) Para 1.0 & 7.2 are modified.

Rev 07 : Para 8.2 - vii added.

Rev 08 : a) Title revised for better clarity

b) Para 1.0,2.0(a),5.0(c),8.4,9.1(8) & 9.2(vi) are revised.

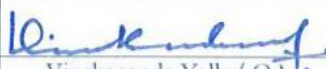
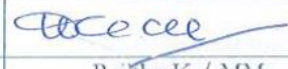
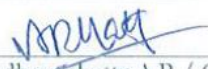
c) From Para 3.0(f),4.2,5.0(d),(f),(g),7.2 forging spec removed

d) Para 2.0(c),(f),3.0(a),7.0 & 10.0 added

e) Para 3.0(e) deleted

f) Document no.TDG102:002 Rev.00 added.

Rev 09 : Fully revised for better clarity

 Vivekananda Yellu/ QA	 Rajitha K / MM	 C. Karunakaran / Engg	 Madhavankutty.A.P / Quality
Prepared by	Reviewed by		Approved by



THICKNESS MEASUREMENT REPORT FOR ELBOW

Doc No: TDG102:001 Rev.00

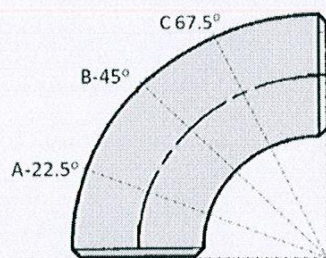
Date: 03.02.2014

PO Number:

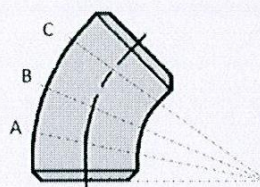
Work order/Du:

Heat no:

Size:



90° Elbow



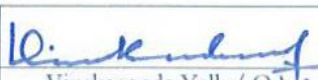
Less than 90°

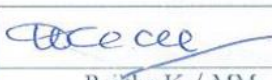
Measurement (Extrados) points

Angle	A	B	C
90	22.50°	45.00°	67.50°
60	15.00°	30.00°	45.00°
45	11.25°	22.50°	33.75°
30	NA	15.00°	NA

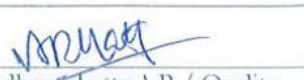
Description of item :
Material Spec :
Material Code :

No	Wall thickness at ends		Wall Thickness at angle			Remarks
	End 1	End 2	A	B	C	
1.						
2.						
3.						
4.						
5.						
6.						
7.						
8.						
9.						
10.						
11.						
12.						
13.						
14.						
15.						


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THICKNESS MEASUREMENT REPORT FOR TEE's

Doc No: TDG102:002 Rev.00

Date: 20.06.2015

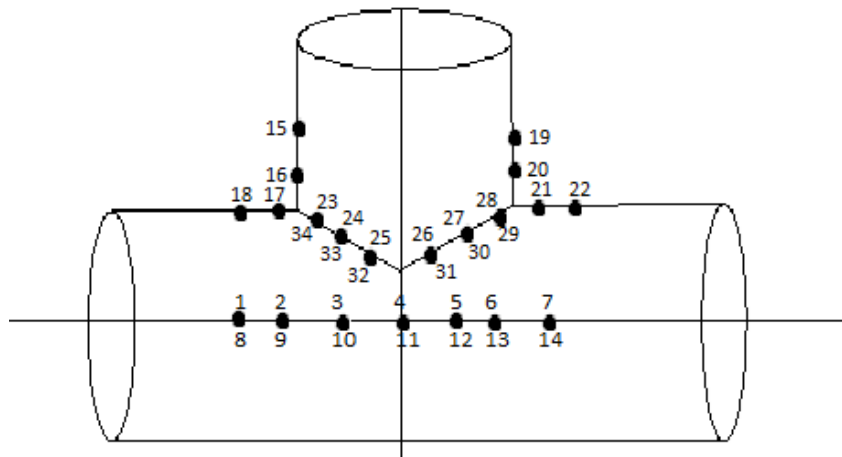
PO Number:

Description of Material:

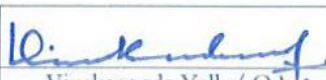
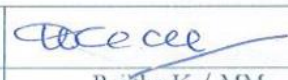
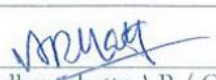
Size:

Material Spec.

Work order/Du:



Location	Thickness (mm)	Location	Thickness (mm)	Location	Thickness (mm)
1		13		24	
2		14		25	
3		15		26	
4		16		27	
5		17		28	
6		18		29	
7		19		30	
8		20		31	
9		21		32	
10		22		33	
11		23		34	
12		24			

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Prepared by	Reviewed by		Approved by



**BHARAT HEAVY
ELECTRICALS LIMITED**
PIPING CENTRE, MADRAS - 17
QUALITY ASSURANCE & CONTROL DEPT.

STANDARD QUALITY ASSURANCE PLAN FOR BUTT WELDED FITTINGS CONFORMING TO ASME SA 234

QP NO : QPG: 46

REV.NO : 01

DATE : 13-10-2015

REF: BHEL TDC No. : TDG:102 (latest revision)

SL . NO.	COMPONENT OR OPERATION	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE STANDARD	TYPE OF RECORD		AGENCY		REMARKS
									D*	M	B	
1	2	3	4	5	6	7	8	9	10	11	12	15
1.0	Raw material sources for P91 shall be as per QCP:19(Latest Revision); Any other source proposed by the vendor shall be subjected to BHEL approval.. The Test Certificate for all material specifications received from RM manufacturer shall meet IBR requirements.											
1.1	Seamless Pipe	Chemical Composition, Mechanical Properties & HT/UT	Major	Verification of MTC & Ladle Analysis Report	100%	As per Required Material (ASME) Specification	MTC	X	P	V/R	Refer Note:1 MTC - Mill Test Certificate	
1.2		Surface defect	Major	Visual	100%	As per Required Material (ASME) Specification	Report	X	P	V		
1.3		Dimensions Outer Dia.,Thk.etc	Major	Measurement	100%	As per Spec	Report	X	P	V		
1.4		Pipe Check (chemical)	Major	PMI	100%	As per Required Material (ASME) Specification	Report	X	P	R/W*	*For 1st off trial at random	
1.5		Hardness Test for P91 material	Major	Measurement	100%	As per Spec	Report	X	P	R/W*		
1.6	Plates	Co-relation & verification of Mill TCs for										
1.7		a) Chemical Composition & b) Mechanical Properties	Major	Verify	100%	BHEL Drawing , Material Spec.	Mill TCs	X	P	V		
1.8		c) Soundness	Major	UT	100%	SA578						
1.9		d) Dimension & Surface finish	Major	Measurement & Visual	100%	BHEL Drawing , Material Spec.						

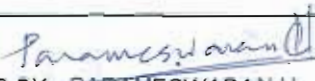
LEGEND: M:- Manufacturer; B:- BHEL/ BHEL Nominated Agency;
D* - Documents required if marked "X"

P - Perform; V - Verification; R-Review; W - Witness; H - Hold.

PREPARED & REVIEWED BY: VIVEKANANDA YELLU

APPROVED BY: PARAMESWARAN.H

PAGE : 1 of 5

 BHARAT HEAVY ELECTRICALS LIMITED PIPING CENTRE, MADRAS - 17 QUALITY ASSURANCE & CONTROL DEPT.		STANDARD QUALITY ASSURANCE PLAN FOR BUTT WELDED FITTINGS CONFORMING TO ASME SA 234							QP NO : QPG: 46 REV.NO : 01 DATE : 13-10-2015						
REF: BHEL TDC No. : TDG:102 (latest revision)															
SL. NO.	COMPONENT OR OPERATION	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE STANDARD	TYPE OF RECORD		AGENCY			REMARKS		
									D*	M	B				
1	2	3	4	5	6	7	8	9	10	11	12	15			
2.0	IN PROCESS INSPECTION														
2.1	Fitting Forming Procedure	procedure qualification	Major	Review	100%	ASME SA 234 & BHEL TDG:102 Refer Note : 5	Appd. Procedure	X	P	V	Forming Procedure shall be approved by BHEL.				
2.2	MT Procedure	Procedure Review	Major	Review	100%	ASME SA 234 & BHEL TDG:102	Appd. Procedure	X	P	V	MT - Magnetic Particle Test				
2.3	UT Procedure	Procedure Review	Major	Review	100%	ASME SA 234 & BHEL TDG:102	Appd. Procedure	X	P	V	UT - Ultrasonic Test				
2.4	RT Procedure	Procedure Review	Major	Review	100%	ASME SA 234 & BHEL TDG:102	Appd. Procedure	X	P	V	RT - Radiography Test				
2.5	Forming of pipe fittings	Process parameters	Major	Temperature, Measurement & Visual	100%	ASME SA 234 & Appd.Procedure	Internal report	X	P	---					
2.6	Heat Treatment	Rate of Heating, Rate of Cooling & Soaking time	Critical	Temp & Time graph	100%	ASME SA 234 & BHEL TDG:102 Refer Note : 2	HT Chart	X	P	V/ W*	W* : For 1st off trial at random				
2.7	Test Piece Marking (TPM)	Selection of Test coupons	Major	Measurement & Marking	One Sample / Heat / Size / HT Batch	As per ASTM A370	Internal report	X	P	V/ W*					
3.0	TESTS														
3.1	Finished product	YS, UTS, % Elongation (Mandatory)	Major	Tensile Strength,	One Sample / Heat / Size / HT Batch	ASME SA 234 & BHEL TDG:102	Test Report	X	P	V					
3.2		Hardness	Major	Hardness test	100% / 10%	ASME SA 234 & BHEL TDG:102	Test Report	X	P	W	100% for WP91 ; 10% for others				
LEGEND: M:- Manufacturer; B:- BHEL/ BHEL Nominated Agency; P - Perform; V - Verification; R-Review; W - Witness; H - Hold. D* - Documents required if marked "X"															
PREPARED & REVIEWED BY: VIVEKANANDA YELLU 										APPROVED BY: PARAMESWARAN.H 				PAGE : 2 of 5	



**BHARAT HEAVY
ELECTRICALS LIMITED**
PIPING CENTRE, MADRAS - 17
QUALITY ASSURANCE & CONTROL DEPT.

STANDARD QUALITY ASSURANCE PLAN FOR BUTT WELDED FITTINGS CONFORMING TO ASME SA 234

QP NO : QPG: 46

REV.NO : 01

DATE : 13-10-2015

REF: BHEL TDC No. : TDG:102 (latest revision)

SL. NO.	COMPONENT OR OPERATION	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE STANDARD	TYPE OF RECORD		AGENCY		REMARKS
									D*	M	B	
1	2	3	4	5	6	7	8	9	10	11	12	15
3.3		Volumetric Defect	Major	NDE - UT	100% / 10%	ASTM E213 - longitudinal notch of 5% - For Pipe Fittings		Test Report	X	P	W	100% for WP91 ; 10% for others
3.4		Sub-surface Defect	Critical	NDE - MT	100% / 10%	ASTM E709	ASME B31.1 Cl. 136.4.3	Test Report	X	P	W	100% for WP91 ; 10% for others
3.5		Volumetric Defect - Welded Fittings	Major	NDE - RT	100%	ASME SEC-V & ASME SecVIII Div-1, UW-51		Test Report	X	P	W	
3.6		Microstructure (Applicable for WP 91 Fittings)	Major	Metallographic test	One Sample / Heat / Size/ HT Batch	No micro fissures. Microstructure shall show tempered martensite. Grain growth if any has to be examined further.		Test Report (Magnification at 500x) Refer Note :9	X	P	W	Actual magnification shall be indicated in the photomicrograph. Photomicrographs shall be provided as records for review & acceptance and future in-service reference.
3.7	Supplementary tests as per TDC on Finished Product	Product Analysis	Major	Chemical Composition	One Sample / Heat / Size	ASME SA 234 & BHEL TDG:102		Test Report	X	P	V/ W*	
		YS, UTS, % Elongation	Major	Tensile Strength,	One Sample / Heat / Size/ HT Batch	ASME SA 234 & BHEL TDG:102		Test Report	X	P	V/ W*	
3.8	PMI for AS fittings	Chemical	Major	PMI	100%	ASME SA 234 & BHEL TDG:102		Test Report	X	P	W	

LEGEND: M:- Manufacturer; B:- BHEL/ BHEL Nominated Agency;
D* - Documents required if marked "X"

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**BHARAT HEAVY
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STANDARD QUALITY ASSURANCE PLAN FOR BUTT WELDED FITTINGS CONFORMING TO ASME SA 234

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REF: BHEL TDC No. : TDG:102 (latest revision)

SL . NO.	COMPONENT OR OPERATION	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE STANDARD	TYPE OF RECORD		AGENCY			REMARKS
										D*	M	B	
1	2	3	4	5	6	7	8	9	10	11	12	15	
3.9	Burst Test	Performance & Design Proof	Critical	Hydro Test	One / Type (on similar Fitting ^s)	ASME B 16.9 & ASME SA 234 Refer Note : 3		Test Report	X	P	R /W#	\$ - As allowed in relevant standard # - WITNESS -If size is not qualified as per Burst Test Report available.	
4.0	FINAL INSPECTION												
4.1		Surface check, Bend angle, Radius, End-to-end dimn, Ovality, Thickness, Wrinkles, d1 at ends, Edge preparation & other dimensions as per Drg.	Major	Visual & Measurement	100%	ASME B16.9, BHEL Drg.. & P.O.		Report	X	P	W	Refer Note : 12	
4.2		IBR Certification	Major	all tests as per IBR	100%	IBR		FORM-IIIC	X	P	IBR		
4.3		Marking / Color coding	Critical	Visual	100%	BHEL TDG:102 & P.O.		Report	X	P	V	Refer Note : 17	
4.4		Surface Protection, Preservation & Packing	Critical	Visual	100%	BHEL TDG:102 & P.O.		Report	X	P	V	Refer Note : 13 & 16	
5.0	Inspection clearance	Documentation	Critical	Verification	100%	All reports as required in this QAP		Report	X	P	H		
NOTES :-													

NOTES :-

- 1.0 (a) If the raw materials are received directly from RM Manufacturer's works, the material shall be accepted based on (i) correlation of Heat number on material with TC and (ii) verification of TCs.
(b) If the materials are received through Dealers place, check test (Chemical and Mechanical tests on one sample per Heat/ size) shall be done in addition to the above for accepting the material

LEGEND: M:- Manufacturer; B:- BHEL/ BHEL Nominated Agency; P - Perform; V - Verification; R-Review; W - Witness; H - Hold.
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**BHARAT HEAVY
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PIPING CENTRE, MADRAS - 17
QUALITY ASSURANCE & CONTROL DEPT.

STANDARD QUALITY ASSURANCE PLAN FOR BUTT WELDED FITTINGS CONFORMING TO ASME SA 234

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SL. NO.	COMPONENT OR OPERATION	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE STANDARD	TYPE OF RECORD		AGENCY			REMARKS
									D*	M	B		
1	2	3	4	5	6	7	8	9	10	11	12	15	
2.0	POST FORMING HEAT TREATMENT :-												
	For P91 materials : Normalise at 1040 - 1060 deg.C & Temper at 750-770 deg.C; Soaking shall be 2Hrs minimum for thickness upto 50mm and 4Hrs minimum for thickness 51-100mm												
	Normalising and Tempering shall be carried out within 72 hours after completion of forming. The items shall be kept dry and stress free. The temperature shall be brought down to room temperature after hot forming before normalizing and also after normalizing before tempering. Normalising and tempering of Gr91 shall be done encompassing the entire component.												
	SA234 WPB : As per Specn; SA105 & SA234WPC : Normalised; SA234 WP11/WP12/WP22 : Normalised & Tempered.												
3.0	BURST TEST (Type test) : Burst test procedure shall be submitted by the vendor to BHEL for approval. Burst test will be witnessed by BHEL.												
	After successful completion of the burst test regular production may be permitted.												
4.0	Seal transfer on pieces to be cut shall be done by BHEL inspector & IBR for Gr-91 materials and IBR for other than Gr-91 materials.												
5.0	Welded Fittings shall be made from Two - Halves.												
6.0	Chemical & Mechanical tests shall be performed at in-house or NABL approved laboratories.												
7.0	Welding consumables shall be approved by BHEL.												
8.0	All NDE procedures shall be submitted to BHEL for review. NDE procedures shall have Level-III certified personnel approval incase of in-house. Incase of non-availability of inhouse facility NDE shall be performed by NABL approved laboratories.												
9.0	Items shall be visually checked. No hard scales shall be present on inside & outside surfaces.												
10.0	Gas cutting & Plasma cutting are prohibited for Gr91 material.												
11.0	3 replicas in one fitting. 1 replica for the size Nb 80 & below. Actual magnification shall be indicated in the photomicrograph. Photomicrographs shall be provided as records for review & acceptance and future in-service reference.												
12.0	Minimum thickness measured at any location on the finished fitting shall be not less than 0.875 of the specified nominal thickness.												
13.0	All fittings shall be Painted as below when not specified in the P.O./Drawing:- Three coats of 20 microns each of total DFT 60 microns minimum of Heat Resistance Aluminium Paint to IS 13183 Gr II, after surface preparation by Blast cleaning (SSPC-SP10).												
14.0	All items shall be inspected and cleared by BHEL / BHEL authorised Inspection agency & IBR authorities.												
15.0	Necessary IBR Requirements shall be fulfilled and IBR documents to be submitted.												
16.0	Machined ends shall be well protected using end caps and suitably packed to avoid transit & other damages. Tack welding is prohibited on P91 material.												
17.0	Marking :- a) Items dispatched to Stores : The finished components shall be punched & paint stencilled with Material code, Heat number, material specification, maker's emblem, Inspectors seal and Statutory authorities seal (as applicable) b) DTS (Direct to Project Site) Items :- DTS shall be hard punched and paint stencilled with DU code (14 digit work order du detail) as given by purchase in addition to marking done as per 15 (a). Colour coding : Red for WPB ; Blue for WPC ; Blue & Red for WP22; Brown & Red for WP91.												
18.0	If the thickness of the fitting is less than 6 mm, punching is not permitted and the above details shall be paint stencilled. Fittings of size up to 2" (50mm) shall be tied together and the above details shall be punched / engraved in a separate tag and tied to it.												

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**PURCHASE / MM / BOI
ENQUIRY DEVIATION**

429-024

PAGE

**SCHEDULE OF DEVIATION TO
BOI ENQUIRY NO:**

4102000056

DATE

21.12.2020

DESCRIPTION

FITTINGS - CS , AS

SPECIFICATION

TDG 102 REV 09 & 7328:002

Drawing No

ENCLOSED WITH TENDER

QUALITY PLAN

QPG 46 REV 01 & 7328QPC22

PACKING PROCEDURE

PC-PKG-01 REV 00

DOCUMENT REFERENCE

BHEL CALLED FOR

FIRM'S ALTERNATIVE OFFER

CERTIFIED THAT OTHER THAN THE ABOVE DEVIATIONS, WE ARE ACCEPTING ALL THE OTHER SPECIFICATIONS AND REQUIREMENTS IN FULL TO YOUR ENQUIRY.

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FIRM SEAL

NOTE 1. Deviations should be taken only in the extreme case.

2. If necessary, use additional sheets with page control number.

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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

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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.

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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

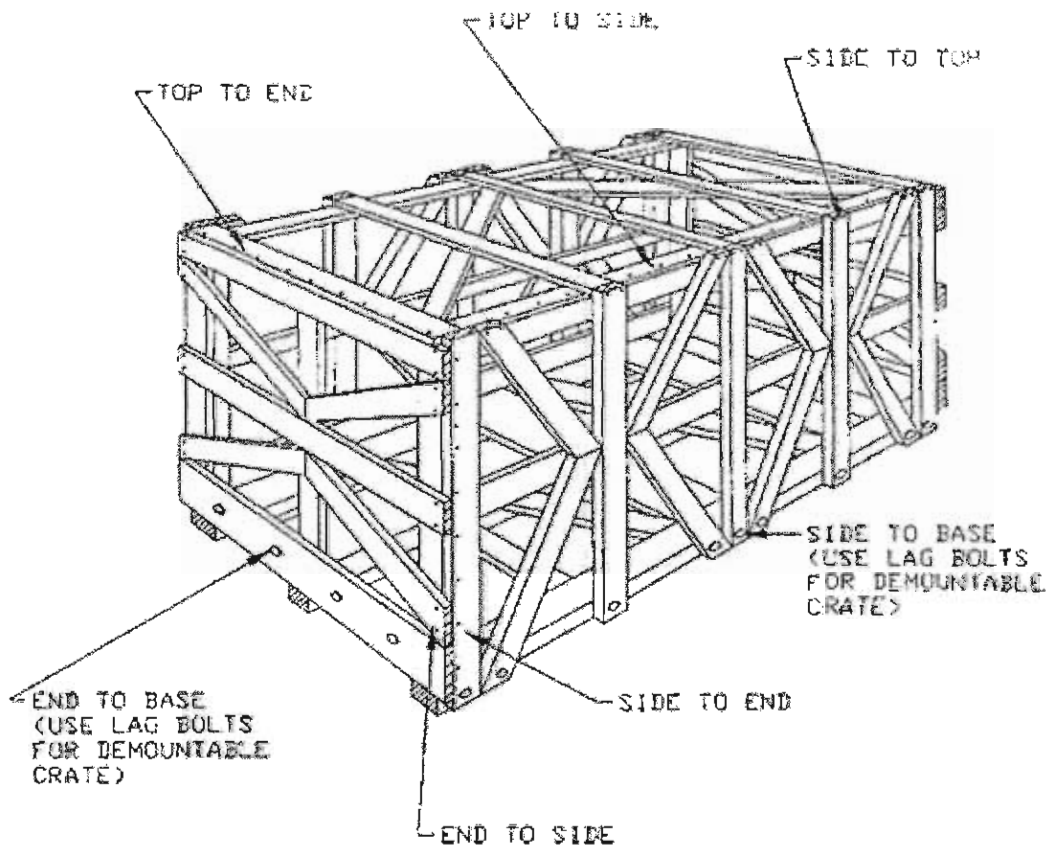
- These are to be made of seasoned wood and are intended for packaging heavy materials Viz., straight pipes and pipes with attachments.
- The crates are to be lined with hi-density polythene, to prevent entry of moisture.
- The dimensions of the crates are to be restricted to 20 x5x5 feet.
- Pipes up 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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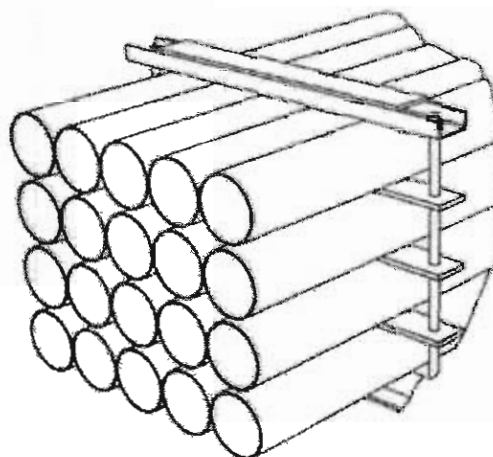
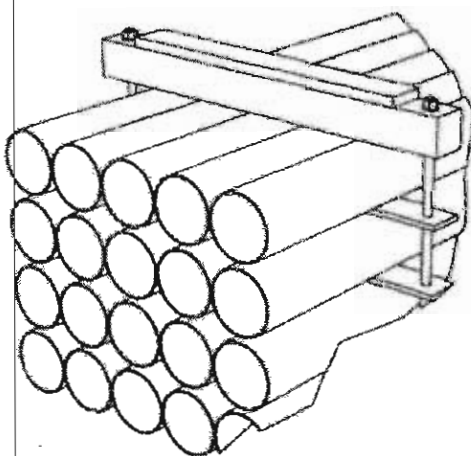
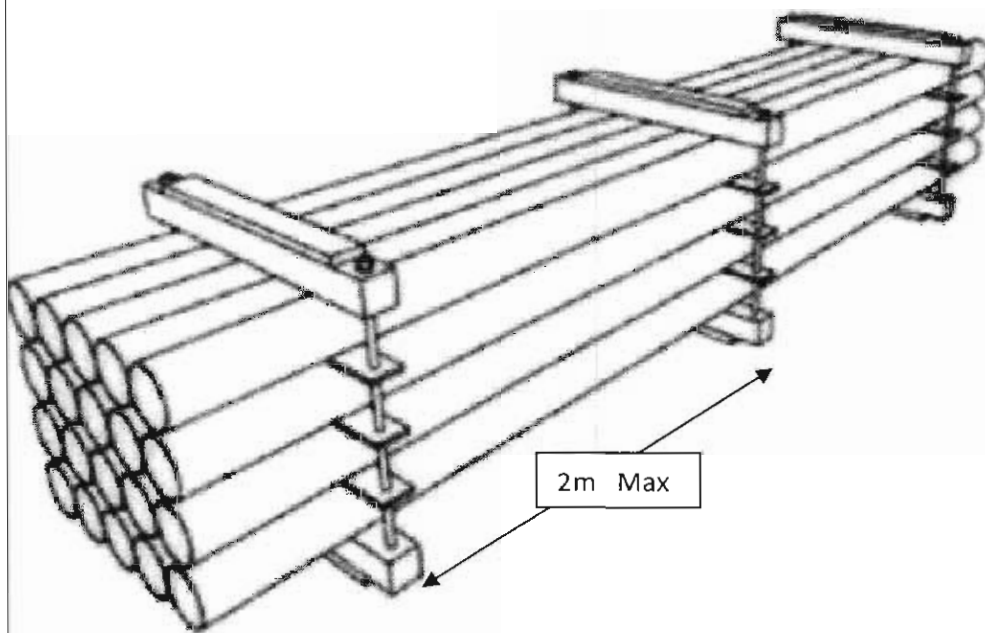
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5. SLING PROTECTIONS

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.

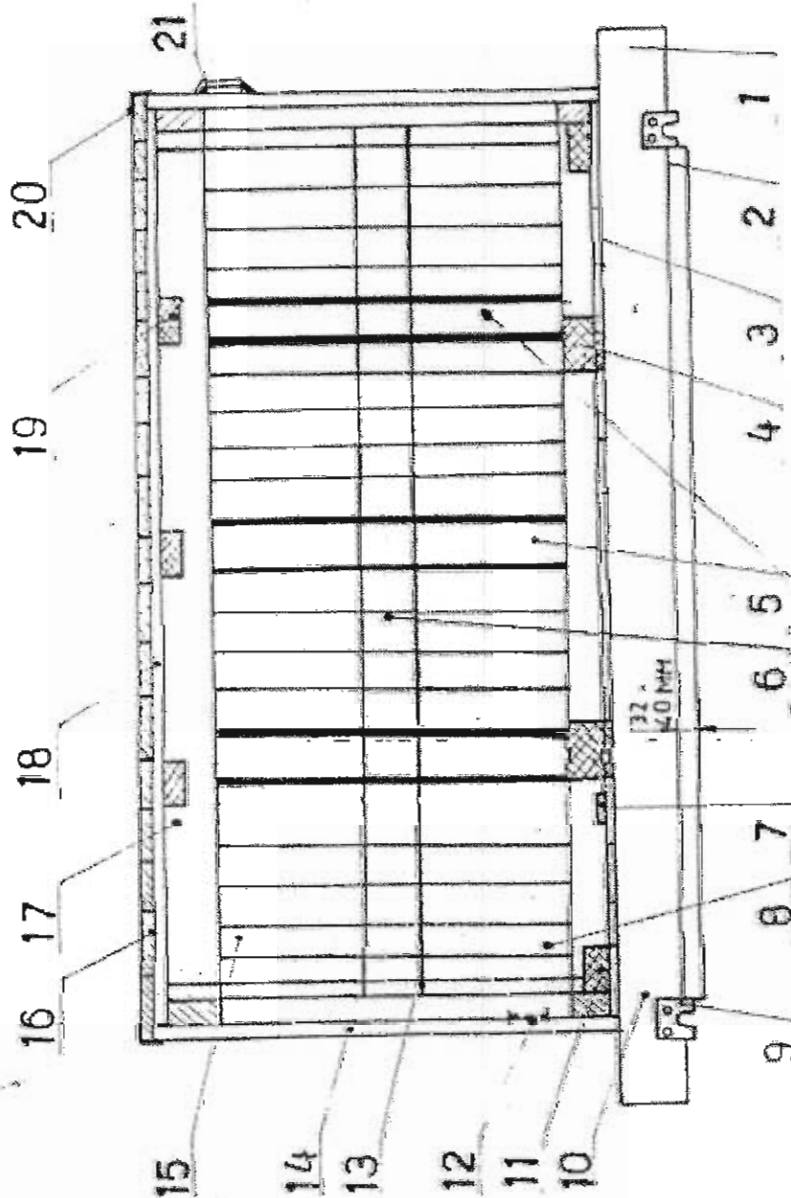


Fig. 1

NOMENCLATURE OF PARTS OF PACKING

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

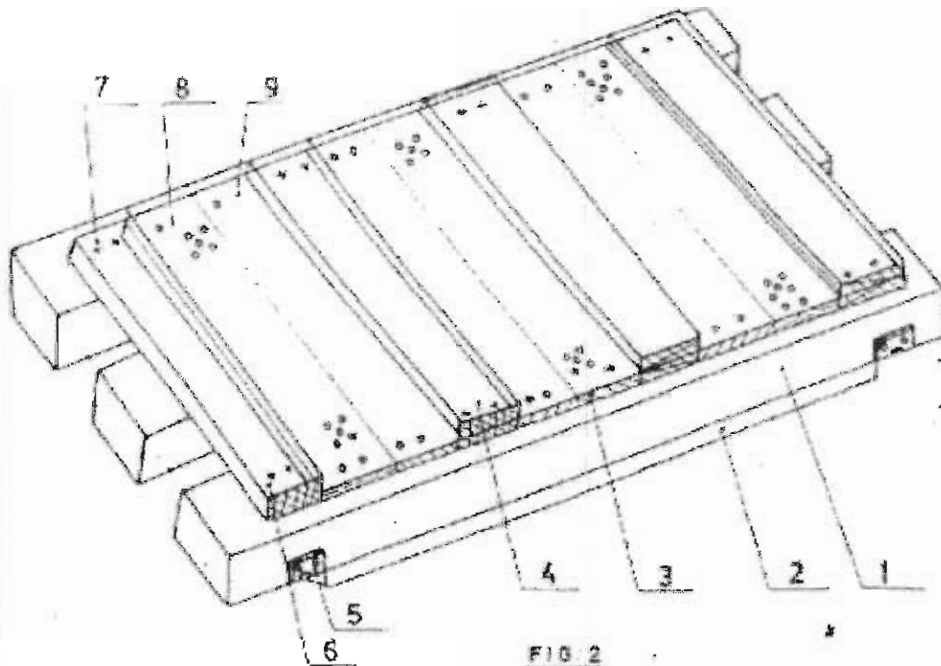


FIG. 2

- 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

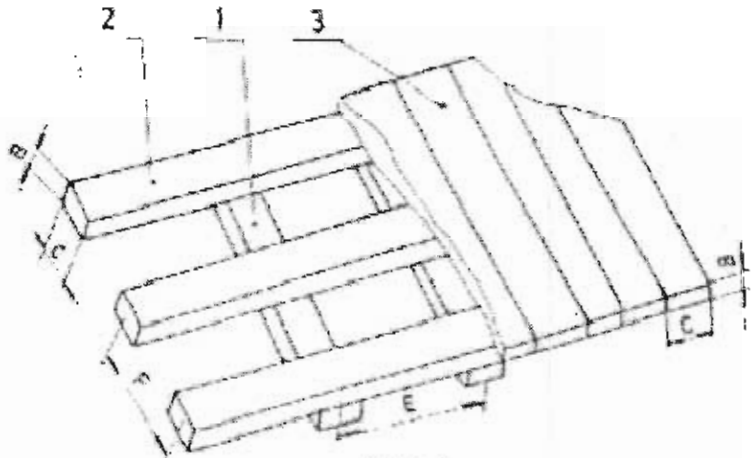


FIG-3

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

PROVISION OF DIAGONAL BRACING ARRANGEMENT

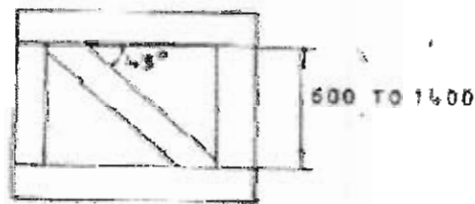


FIG-4

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ARRANGEMENT OF DIAGONAL BRACING &
HORIZONTAL SUPPORT

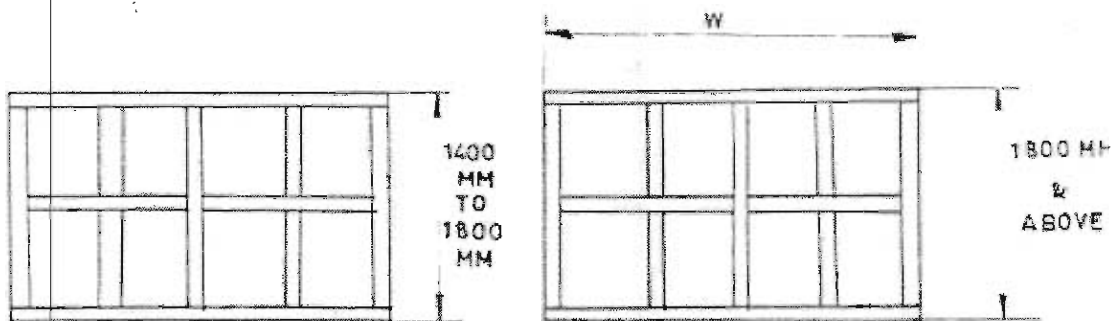


FIG. 5

FIG. 6

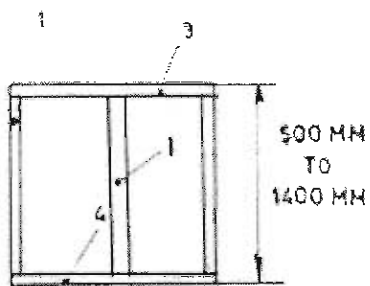


FIG. 7

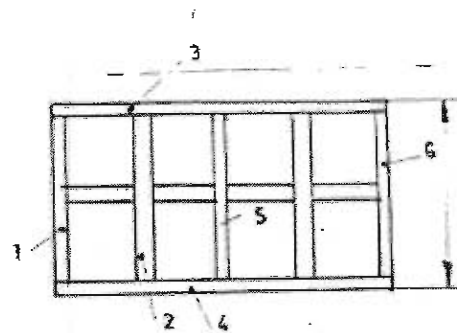


FIG. 8

1. VERTICAL SUPPORT

1, 2, 5, 6 - VERTICAL SUPPORT

3. UPPER HORIZONTAL SUPPORT

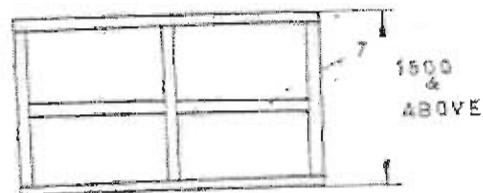
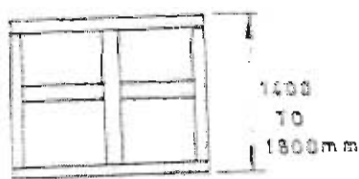
3 - UPPER HORIZONTAL SUPPORT

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

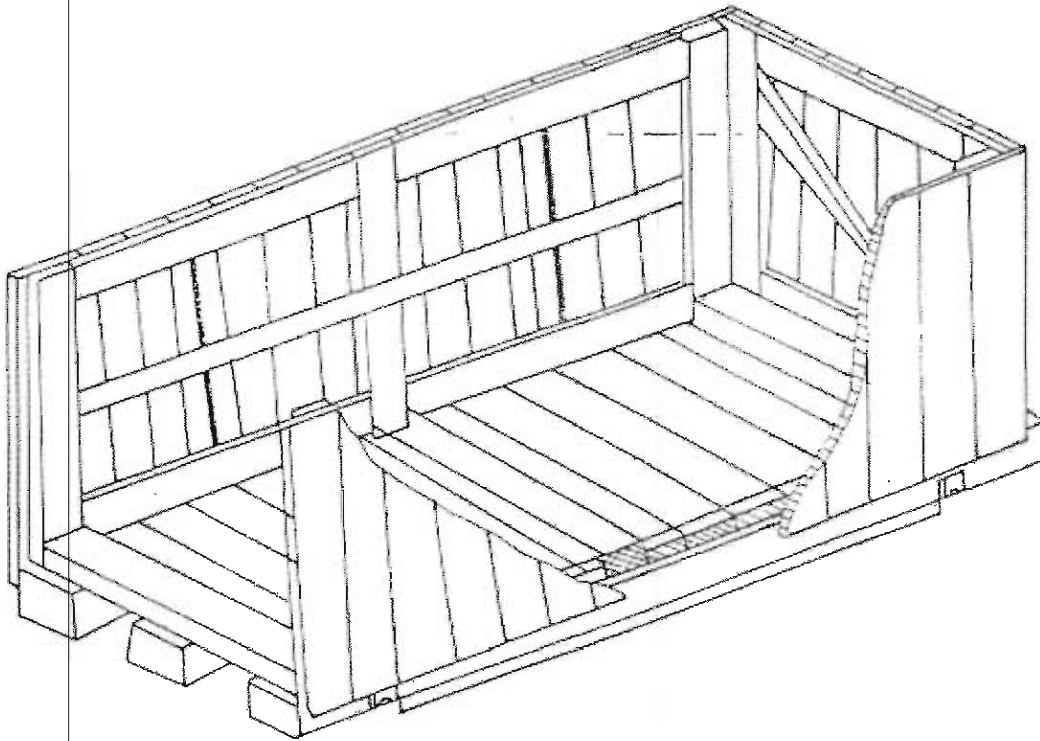


FIG : 11

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ARRANGEMENT OF ANGLE IRON CLEATS

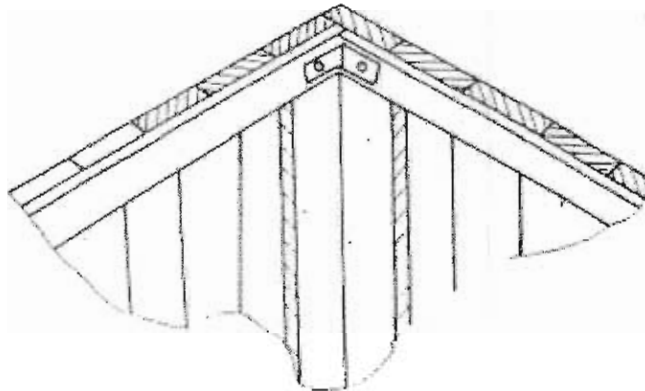


FIG:12

ARRANGEMENT OF C-CLAMPS AROUND CASES

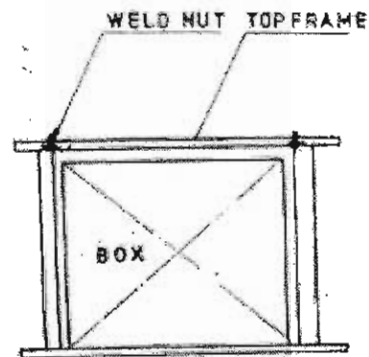
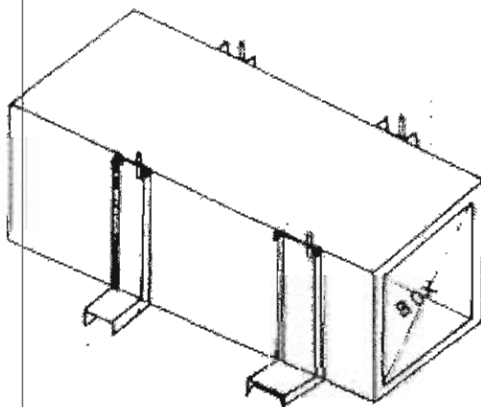


FIG:13

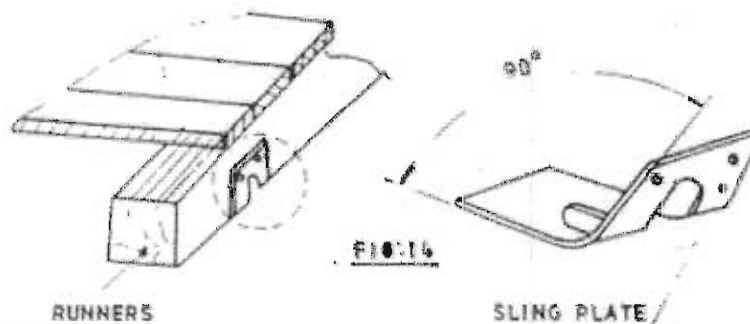
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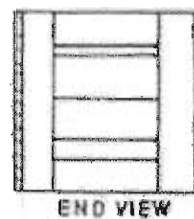
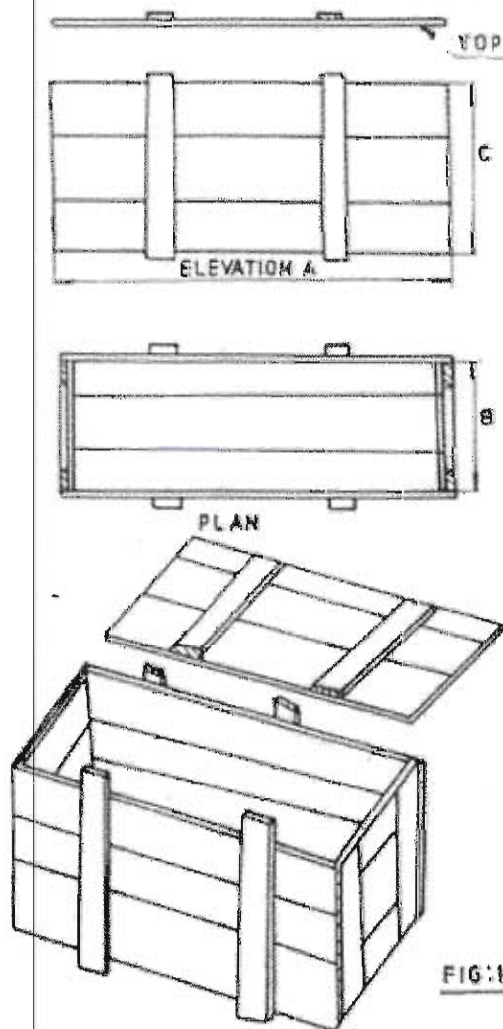
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**ARRANGEMENT OF SLING - PLATE ON
CASES**



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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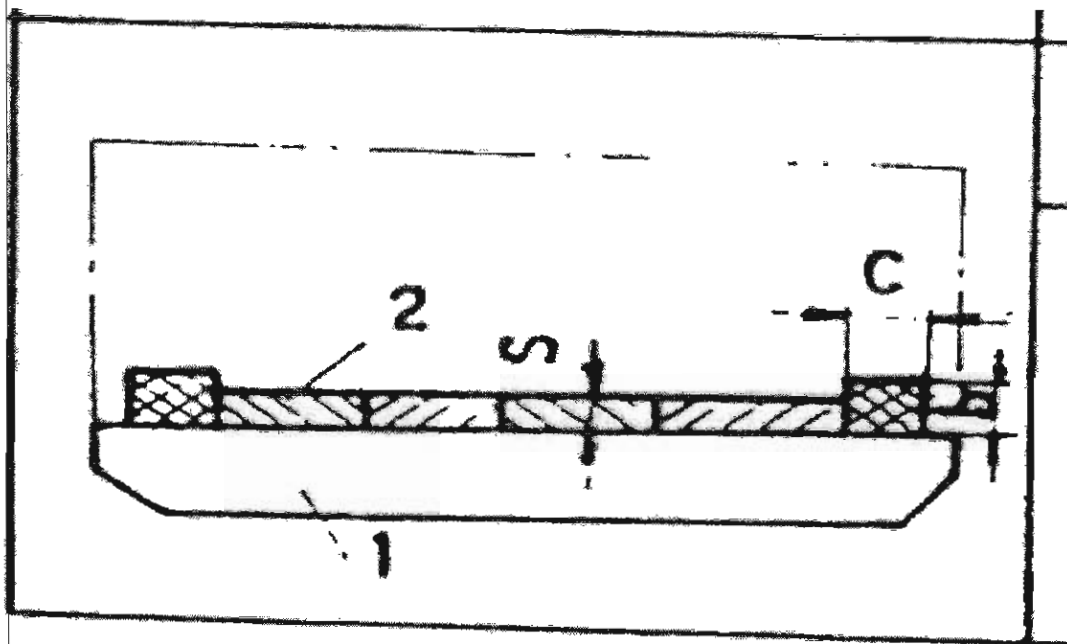
TABLE-4

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: 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.	

Enq SI No	Material Code	Project	Description	Material Specification	FITTING TYPE	Method of construction	Applicable drawing no	EP D1 Value	Applicable TDG & Quality Plan	Net qty (Nos)	Quoted / Regretted
1	925248230100	SCCL SINGRENI	LR 90DEG ELL 60.3 X 3.91SA234WP22CL1	SA234WP22	ELBOW	Seamless	As per ASME B16.9	53.2	TDG:102 Rev 09, QPG 46 Rev01	2	
2	925043460000	SCCL SINGRENI	BW LR 90DEG ELBOW OD26.7X2.87 SA234WP11	SA234WP11	ELBOW	Seamless	As per ASME B16.9	D21.4	TDG:102 Rev 09, QPG 46 Rev01	10	
3	925043470000	SCCL SINGRENI	BW LR 90DEG ELBOW OD33.4X4.55 SA234WP11	SA234WP11	ELBOW	Seamless	As per ASME B16.9	D25.2	TDG:102 Rev 09, QPG 46 Rev01	20	
4	925043480000	SCCL SINGRENI	BW LR 90DEG ELBOW OD48.3X5.08 SA234WP11	SA234WP11	ELBOW	Seamless	As per ASME B16.9	D39.2	TDG:102 Rev 09, QPG 46 Rev01	10	
5	925043500000	SCCL SINGRENI	BW LR 90DEG ELBOW OD73X7.01 SA234WP22CL1	SA234WP22CL1	ELBOW	Seamless	As per ASME B16.9	D59	TDG:102 Rev 09, QPG 46 Rev01	10	
6	925043510000	SCCL SINGRENI	BW LR 90DEG ELBOW OD73X7.01 SA234WP11	SA234WP11	ELBOW	Seamless	As per ASME B16.9	D59	TDG:102 Rev 09, QPG 46 Rev01	10	
7	925244810000	SCCL SINGRENI	LR 90DEG ELL 114.3X13.49SA234WP22CL1	SA234WP22	ELBOW	Seamless	As per ASME B16.9	D89.6	TDG:102 Rev 09, QPG 46 Rev01	10	
8	925278450000	SCCL SINGRENI	BW RED 33.4X4.55/26.7X2.87 SA234WP22	SA234WP22CL1	Reducer	Seamless	As per ASME B16.9	D 25.2 / D 21	TDG:102 Rev 09, QPG 46 Rev01	10	
9	921173720000	SCCL SINGRENI	BW RED OD48.3X5.08/OD33.4X4.55 SA234WP11	SA234WP11	Reducer	Seamless	As per ASME B16.9	D39.2/D25.2	TDG:102 Rev 09, QPG 46 Rev01	10	
10	921173730000	SCCL SINGRENI	BW RED OD60.3X3.91/OD33.4X4.55 SA234WP22	SA234WP22	Reducer	Seamless	As per ASME B16.9	D52.5/D24.5	TDG:102 Rev 09, QPG 46 Rev01	10	
11	925059080000	SCCL SINGRENI	BW EQT OD26.7X7.82 SA234WP22CL1	SA234WP22CL1	Tee	Seamless	As per ASME B16.9	D/ 12.7	TDG:102 Rev 09, QPG 46 Rev01	10	
12	925258280000	SCCL SINGRENI	EQT 26.7 X 2.87SA234WP11CL1	SA234WP11	Tee	Seamless	As per ASME B16.9	D21.4	TDG:102 Rev 09, QPG 46 Rev01	10	
13	921052060000	SCCL SINGRENI	BW EQT OD33.4X4.55 SA234WP11	SA234WP11	Tee	Seamless	As per ASME B16.9	D25.2	TDG:102 Rev 09, QPG 46 Rev01	10	
14	925258290000	SCCL SINGRENI	EQT 33.4 X 3.38SA234WP11CL1	SA234WP11	Tee	Seamless	As per ASME B16.9	D27.2	TDG:102 Rev 09, QPG 46 Rev01	10	
15	921052070000	SCCL SINGRENI	BW EQT OD48.3X5.08 SA234WP11	SA234WP11	Tee	Seamless	As per ASME B16.9	D39.2	TDG:102 Rev 09, QPG 46 Rev01	10	
16	925258350000	SCCL SINGRENI	EQT 48.3 X 10.15SA234WP22CL1	SA234WP22	Tee	Seamless	As per ASME B16.9	D30.3	TDG:102 Rev 09, QPG 46 Rev01	10	
17	925258360000	SCCL SINGRENI	BW EQT OD60.3X3.91 SA234WP22CL1	SA234WP22	Tee	Seamless	As per ASME B16.9	D53.2	TDG:102 Rev 09, QPG 46 Rev01	10	
18	921054900000	SCCL SINGRENI	BW EQT OD73X14.02 SA234WP22CL1	SA234WP22CL1	Tee	Seamless	As per ASME B16.9	D47.7	TDG:102 Rev 09, QPG 46 Rev01	10	
19	925242450000	SCCL SINGRENI	BW LR 90DEG ELL 33.4 X 4.55 SA234WPB	SA234WPB	ELBOW	Seamless	As per ASME B16.9	D25.2	TDG:102 Rev 09, QPG 46 Rev01	10	
20	925278100000	SCCL SINGRENI	BW RED 48.3X3.68/33.4X3.38 SA234WPB	SA234WPB	Reducer	Seamless	As per ASME B16.9	D41.6/27.2	TDG:102 Rev 09, QPG 46 Rev01	10	
21	925258040000	SCCL SINGRENI	BW EQT OD33.4X3.38 SA234WPB	SA234WPB	Tee	Seamless	As per ASME B16.9	D27.2	TDG:102 Rev 09, QPG 46 Rev01	8.00	

Note-

1. Evaluation and ordering will be done itemwise.
2. Unit rate to be quoted 'FOR' BHEL Trichy / Site basis (all inc of P&F, F&I, inspection charges etc)

Annexure A – General Terms & Conditions

1. PURCHASE PREFERENCE FOR MAKE IN INDIA

"For this procurement, the local content to categorize a supplier as a Class I local supplier/ Class II local Supplier/ Nonlocal Supplier and purchase preference to Class I local supplier, is as defined in Public Procurement (Preference to Make in India), Order 2017 dated 04.06.2020 issued by DPIIT. In case of subsequent orders issued by the nodal ministry, changing the definition of local content for the items of the NIT, the same shall be applicable even if issued after issue of this NIT, but before finalization of contract / PO / WO against this NIT". In the event of any Nodal Ministry prescribing higher or lower percentage of purchase preference and / or local content in respect of this procurement, same shall be applicable.

'Local content' means the amount of value added in India which shall, unless otherwise prescribed by the Nodal Ministry, be the total value of the Item procured (excluding net domestic indirect taxes) minus the value of imported. Content in the item (including all customs duties) as a proportion of the total value, in percent.

'Class-I local supplier' means a supplier or service provider, whose goods, services or works offered for procurement, has local content equal to or more than 50%, as defined under this Order.

'Class-II local supplier' means a supplier or service provider, whose goods, services or works offered for procurement, has local content more than 20% but less than 50%, as defined under this Order.

'Non-Local supplier' means a supplier or service provider, whose goods, services or works offered for procurement, has local content less than or equal to 20%, as defined under this Order. ***Bids of Non-Local supplier shall be liable for rejection as the enquiry is not a global tender.***

In case item is divisible, following procedure will be followed-

- Among all qualified bids, the lowest bid will be termed as L1. If L1 is 'Class-I local supplier', the contract for full quantity will be awarded to L 1.
- If L1 bid is not a 'Class-I local supplier', 50% of the order quantity' shall be awarded to L1. Thereafter, the lowest bidder among the 'Class-I local supplier' will be invited to match the L1 price for the remaining 50% quantity subject to local supplier's quoted price falling within the margin purchase preference, and contract for that quantity shall be awarded to 'Class-I local supplier' subject to matching the L 1 price. In case such lowest eligible 'Class-I local supplier' fails to match the L1 price or accepts less than the offered quantity, the next higher 'Class-I local supplier' within the margin of purchase preference shall be invited to match the L1 price for remaining quantity and so on, and contract shall be awarded accordingly. In case some Quantity is still left uncovered on Class-I local suppliers, then such balance quantity may also be ordered on the L 1 bidder.

In case item is not divisible, following procedure will be followed-

- Among all qualified bids, the lowest bid will be termed as L1. If L1 is from a 'Class-I local supplier', the contract will be awarded to L1.
- If L1 is not from a local supplier, the lowest bidder among the 'Class-I local supplier', will be invited to match the L1 price subject to 'Class-I local supplier's' quoted price falling within the margin of purchase preference, and the contract shall be awarded to such 'Class-I local supplier' subject to matching the L1 price.
- In case such lowest eligible 'Class-I local supplier' fails to match the L1 price, the 'Class-I local supplier' with the next higher bid within the margin of purchase preference shall be invited to match the L1 price and so on and contract shall be awarded accordingly. In case none of the 'Class-I local supplier' within the margin of purchase preference matches the L1 price, then the contract may be awarded to the L1 bidder.
- Any item wherein the net quantity is less than 2 (i.e. if qty is 1 No.) will be considered as not divisible for the purpose of operating purchase preference.

"Class-II local supplier" will not get purchase Preference in any procurement.

Annexure A – General Terms & Conditions

Document certifying local content and penal action in case of wrong declaration by suppliers.

- The 'Class-I local supplier' / 'Class-II local supplier' at the time of tender, bidding or solicitation shall be required to provide self-certification on their letter head certified by the authorized signatory of the bidder that the item offered meets the minimum local content and shall give details of the location(s) at which the local value addition is made.
- 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.
- 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.
- A supplier who has been debarred by any procuring entity for violation of this order 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.
- The onus of submission of appropriately certified documents lies with the bidder and BHEL shall not have any liability to verify the contents and will not be responsible for the same. 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 failing which the bid shall be rejected.

2. PRICE FINALIZATION

Prices will be finalized by opening of Price bids (Bid Part-II) thru Sealed Price Bid Opening. BHEL may decide to negotiate with L1 vendor of price bids.

3. PURCHASE PREFERENCE FOR MSE SUPPLIERS.

- Purchase preference for local MSE's quoting in the tender will be 25%.
- Within the 25% reservation for local MSE's, 3% reservation will be applicable for women owned MSE's and 6.25% reservation will be applicable for MSE's owned by SC / ST.
- Payment for MSE Indigenous vendors will be as per MSMED Act, 2006

Document to be submitted as proof of MSE.

MSE suppliers can avail the intended benefits only if they submit along with the offer, attested / notarized copies (by a Gazetted officer) of anyone of the following documents along with Copy of CA certificate (in BHEL's standard format) applicable for the relevant financial year (latest audited)-

- Valid EM II certificate having deemed validity (5 years from the date of issue of acknowledgement in EM II).
- Valid NSIC certificate.
- Copy of UAM certificate

OR UDHYAM CERTIFICATE WILL ALSO BE ACCEPTED IN PLACE OF ABOVE.

Date to be reckoned for determining the deemed validity will be the date of bid opening (Part 1 in case of Two part bid). Non submission of such documents will lead to consideration of their bid at par with other bidders. No benefit shall be applicable for the Enquiry if any deficiency in the above required documents are not submitted before price bid opening. However, credentials of all MSE suppliers will be verified before considering the intended benefits for MSE suppliers at the time of tender evaluation.

In case item is not divisible, following procedure will be followed-

Annexure A – General Terms & Conditions

- Among all qualified bids, the lowest bid will be termed as L1. If L1 is from a MSE supplier, the contract will be awarded to L1.
- If L1 is not from a MSE supplier, the lowest bidder among the MSE suppliers, will be invited to match the L1 price subject to MSE supplier's quoted price falling within the margin of purchase preference, and the contract shall be awarded to such MSE supplier subject to matching the L1 price.
- In case such lowest eligible MSE supplier fails to match the L1 price, the MSE supplier with the next higher bid within the margin of MSE preference shall be invited to match the L1 price and so on and contract shall be awarded accordingly. In case none of the MSE suppliers within the margin of purchase preference matches the L1 price, then the contract may be awarded to the L1 bidder.
- Any item wherein the net quantity is less than 2 (i.e. if qty is 1 No.) will be considered as not divisible for the purpose of operating purchase preference.

Note: - In case of L1 vendor is having any one of MSE OR Make in India preference, but vendor is falling in MSE/MII price range with both MSE and Make in India preference then quantity will be counteroffered to the vendor who is giving both the preferences.

4. BHEL STANDARD GUARANTEE CLAUSE

The materials are to be guaranteed for satisfactory performance for a period of 24 months from the date of dispatch or 18 months from the date of commissioning / putting into use whichever is earlier and if any defect is noticed during the above period, the same shall be rectified / replaced free of cost on FOR destination basis within a reasonable time, maximum limited to the agreed delivery period. To this effect a guarantee certificate should be sent along with the dispatch documents in the event of an order.

5. The offers of the bidders who are under suspension as also the offers of the bidders, who engage the services of the banned firms, shall be rejected. The list of banned firms is available on BHEL web site www.bhel.com.

6. Integrity commitment, performance of the contract and punitive action thereof:

1.1. Commitment by BHEL:

BHEL commits to take all measures necessary to prevent corruption in connection with the tender process and execution of the contract. BHEL will during the tender process treat all Bidder(s) in a transparent and fair manner, and with equity.

1.2. Commitment by Bidder / Supplier / Contractor:

1.2.1. The bidder / supplier / contractor commit to take all measures to prevent corruption and will not directly or indirectly influence any decision or benefit which he is not legally entitled to nor will act or omit in any manner which tantamount to an offence punishable under any provision of the Indian Penal Code, 1860 or any other law in force in India.

1.2.2. The bidder / supplier / contractor will, when presenting his bid, disclose any and all payments he has made, and is committed to or intends to make to agents, brokers or any other intermediaries in connection with the award of the contract and shall adhere to relevant guidelines issued from time to time by Govt. of India / BHEL.

1.2.3. The bidder / supplier / contractor will perform / execute the contract as per the contract terms & conditions and will not default without any reasonable cause, which causes loss of business / money / reputation, to BHEL.

If any bidder / supplier / contractor during pre-tendering / tendering / post tendering / award / execution / post-execution stage indulges in mal-practices, cheating, bribery, fraud or and other misconduct or formation of cartel so as to influence the bidding process or influence the price or acts or omits in any manner which tantamount to an offence punishable under any provision of the Indian Penal Code, 1860 or any other law in force in India, then, action may be taken against such bidder / supplier / contractor as per extant guidelines of the company available on www.bhel.com and / or under applicable legal provisions.

Annexure A – General Terms & Conditions

7. CANCELLATION / TERMINATION OF CONTRACT, DEFAULT / BREACH OF CONTRACT AND RISK PURCHASE

In case of abnormal delays (beyond the maximum late delivery period as per Penalty clause) in supplies / defective supplies or non-fulfilment of any other terms and conditions given in Purchase Order as enumerated subsequently in this clause, Purchaser shall be entitled to cancel the Order / Contract either in whole or portion thereof without compensation to Seller / Contractor and if the Purchaser so desires, may procure upon such terms and in such manner as deemed appropriate, stores not so delivered or others of similar description where stores exactly complying with particulars are not, in the opinion of the Purchaser, which shall be final, readily procurable, at the risk and cost of the Seller / Contractor and the Seller / Contractor shall be liable to the Purchaser for any excess costs provided that the Seller / Contractor shall continue the performance of the Order / Contract to the extent not cancelled under the provisions of this clause. The Seller / Contractor shall on no account be entitled to any gain on such repurchases. If bidder does not agree to the above Risk Purchase Clause, BHEL reserves the right to reject the offer.

Risk & Cost Clause, in line with Conditions of Contract may be invoked in any of the following cases:

- a. Contractor / supplier's poor progress of the work vis-à-vis execution timeline as stipulated in the Contract, backlog attributable to contractor/ supplier including unexecuted portion of work / supply does not appear to be executable within balance available period (#) considering its performance of execution.
- b. Withdrawal from or abandonment of the work by contractor before completion of the work as per contract.
- c. Non completion of work / Non-supply by the Contractor / supplier within scheduled completion / delivery period as per Contract or as extended from time to time, for the reasons attributable to the contractor / supplier.
- d. Termination of Contract on account of any other reason (s) attributable to Contractor / Supplier.
- e. Assignment, transfer, subletting of Contract without BHEL's written permission resulting in termination of Contract or part thereof by BHEL.
- f. Non-compliance to any contractual condition or any other default attributable to Contractor / Supplier.

Risk and Cost amount against Balance Work

Risk & Cost Amount= $[(A-B) + (A \times H/100)]$

Where,

A= Value of Balance scope of Work / Supply (*) as per rates of new contract

B= Value of Balance scope of Work / Supply (*) as per rates of old contract being paid to the contractor / supplier at the time of termination of contract i.e. inclusive of PVC & ORC, if any.

H= Overhead Factor to be taken as 5

In case (A-B) is less than 0 (zero), value of (A-B) shall be taken as 0 (zero).

***(Balance scope of work / supply)**

Difference of Contract Quantities and Executed Quantities as on the date of issue of Letter for 'Termination of Contract', shall be taken as balance scope of Work / Supply for calculating risk & cost amount.

Contract quantities are the quantities as per original contract. If, Contract has been amended, quantities as per amended Contract shall be considered as Contract Quantities.

Items for which total quantities to be executed have exceeded the Contract Quantities based on drawings issued to contractor from time to time till issue of Termination letter, then for these items total Quantities as per issued drawings would be deemed to be contract quantities.

Substitute / extra items whose rates have already been approved would form part of contract quantities for this purpose. Substitute / extra items which have been executed but rates have not been approved, would also form part of contract quantities for this purpose and rates of such items shall be determined in line with contractual provisions.

However, increase in quantities on account of additional scope in new tender shall not be considered for this purpose.

Annexure A – General Terms & Conditions

Note: In case portion of work is being withdrawn, contract quantities pertaining to portion of work withdrawn shall be considered as 'Balance scope of work / supply' for calculating Risk & Cost amount.

LD against delay in executed work / supply in case of Termination of Contract in case of Risk and Cost Option

LD against delay in executed work / supply shall be calculated in line with LD clause of the contract for the delay attributable to contractor / supplier. For limiting maximum LD value, contract value shall be taken as Executed Value of work / supply.

Method for calculation of "LD against delay in executed work / supply" is given below.

- a. Let the time period from scheduled date of start of work till termination of contract excluding the period of Hold (if any) not attributable to contractor / supplier= T1
- b. Let the value of executed work / supply till the time of termination of contract= X
- c. Let the Total Executable Value of work / supply for which inputs / fronts were made available to contractor / supplier and were planned for execution till termination of contract= Y
- d. Delay in executed work / supply attributable to contractor/supplier i.e. $T2 = (1 - X/Y) * T1$
- e. LD shall be calculated in line with LD clause of the Contract for the delay attributable to contractor / supplier taking "X" as Contract Value and "T2" as delay attributable to contractor / supplier.

Note: In case portion of work / supply is withdrawn, no LD shall be applicable for portion of work / supply withdrawn.

Recovery from Supplier

Recoveries from contractor / supplier on whom risk & cost has been invoked shall be made from the following:

- a. Dues available in the form of Bills payable to contractor / supplier, SD, BG's against the same contract.
- b. Dues payable to contractor / supplier against other contracts in the same Region / Unit / Division of BHEL.
- c. Dues payable to contractor / supplier against other contracts in the different Region / Unit / division of BHEL.
- d. Legal Options for recovery of dues payable by the supplier / contractor.

8. SUSPENSION OF BUSINESS DEALING

In order to protect the commercial interests of BHEL, it becomes necessary to take action against suppliers / contractors by way of suspension of business dealings, who either fail to perform or are in default without any reasonable cause, cause loss of business / money / reputation, indulge in malpractices, cheating, bribery, fraud or any other misconduct or formation of cartels so as to influence the bidding process or influence the price etc. Suspension of Business Dealings could be in the form of "Hold" or "Banning" a supplier / contractor or a bidder or an applicant for registration as a registered supplier. For this purpose, the abridged version of guidelines hoisted at website http://www.bhel.com/vender_registration/vender.php (Suspension of business dealings with suppliers / contractors) is being followed across all BHEL units. Vendors shall keep themselves aware of these guidelines before submission of their bid.

9. FRAUD PREVENTION POLICY

The Bidder along with their associates / collaborators / sub-contractors / sub-vendors / consultants / service providers shall strictly adhere to BHEL fraud prevention policy displayed on BHEL website at www.bhel.com/pdf/BHEL_Fraud_Prevention_Policy.pdf and shall immediately bring to the notice of BHEL management about any fraud or suspected fraud as soon as it comes to their notice.

10.FORWARDING OF TEST CERTIFICATES & INSPECTION REPORTS

Test certificates (TC) along with Inspection Reports (IR) as called for in the TDC (Three ink signed originals) / approved Quality Plan shall be sent to Dy.Manager / Purchase (Fittings), BHEL Piping Centre immediately after the shipment / dispatch of items. Forthcoming section may please be refereed for detailed list of documents to be submitted to respective agencies in BHEL.

Annexure A – General Terms & Conditions

TC & IR shall be furnished for each batch of shipment / dispatch. If entire PO quantity is manufactured in one lot but dispatched in phased manner, original “documents” should be submitted with the first consignment. For subsequent consignments, attested Xerox copy of IBR along with copies of TC and IR indicating invoice detail against which original TC and IR was handed over to BHEL shall be submitted. Soft copies of the all the test certificates shall also be submitted through email.

Year of code for the technical standards shall be latest and the specific year shall be indicated in the MTC's as well as applicable documents.

11. PAYMENT DOCUMENTS

Payment shall be made against submission of the following documents-

- a. Original GST compliant invoice and 2 copies of the same.
- b. Original site acknowledged Lorry Receipt (Goods Receipt (GR) date for in case of BHEL Trichy stores).
- c. Original inspection report and all original documents as called for in TDC / approved QP.

If one original certificate / LR is applicable for more than one invoice quantity / invoice, Xerox copy is acceptable with original correlation details on the Xerox copy with attestation by suppliers Quality in charge.

GST compliance-

- a. Response to Tenders for Indigenous supplier will be entertained only if the vendor has a valid GST registration No (GSTIN) which should be clearly mentioned in the offer. If the dealer is exempted from GST registration, a declaration with due supporting documents need to be furnished for considering the offer. Dealers under composition scheme should declare that he is a composition dealer supported by the screen shot taken from GST portal. The dealer has to submit necessary documents if there is any change in status under GST.
- b. Supplier shall mention their GSTIN in all their invoices (incl. credit Notes, Debit Notes) and invoices shall be in the format as specified/prescribed under GST laws. Invoices shall necessarily contain Invoice number (in case of multiple numbering system is being followed for billing like SAP invoice no, commercial invoice no etc., then the Invoice No. which is linked/uploaded in GSTN network shall be clearly indicated), Billed to party (with GSTIN) & Shipped to party details, item description as per PO, Quantity, Rate, Value, applicable taxes with nomenclature (like IGST, SGST, CGST & UTGST) separately, HSN/ SAC Code, Place of Supply etc.
- c. All invoices shall bear the HSN Code for each item separately (Harmonized System of Nomenclature)/ SAC code (Services Accounting Code).
- d. Invoices will be processed only upon completion of statutory requirement and further subject to following:
 - Vendor declaring such invoice in Form GST ANX-1
 - Receipt of Goods or Services and Tax invoice by BHEL
- e. As the continuous uploading of tax invoices in GSTN portal (in GST ANX-1) is available for all (i.e. both Small & Large) tax payers under proposed new GST Return System, all invoices raised on BHEL may be uploaded immediately in GST portal on dispatch of material /rendering of services. The supplier shall ensure availability of Invoice in GST portal before submission of invoice to BHEL. Invoices will be admitted by BHEL only if the invoices are available in GSTN portal (in BHEL's GST ANX-2).
- f. In case of discrepancy in the data uploaded by the supplier in the GSTN portal or in case of any shortages or rejection in the supply, then BHEL will not be able to avail the tax credit and will notify the supplier of the same. Supplier has to rectify the data discrepancy in the GSTN portal or issue credit note or debit note (details also to be uploaded in GSTN portal) for the shortages or rejections in the supplies or additional claims, within the calendar month informed by BHEL.

Annexure A – General Terms & Conditions

- g. In cases where invoice details have been uploaded by the vendor but failed to remit the GST amount to GST Department (Form PMT-08 or Form GST RET-01 to be submitted) within stipulated time, then GST paid on the invoices pertaining to the month for which GST return not filed by the vendor will be recovered from the vendor along with the applicable interest (currently 24% p.a) and all subsequent bills of the vendor will not be processed till filing of the GST return by the vendor
- h. In case GST credit is denied to BHEL due to non-receipt or delayed receipt of goods and/ or tax invoice or expiry of timeline prescribed in GST law for availing such ITC, or any other reasons not attributable to BHEL, GST amount claimed in the invoice shall be disallowed to the vendor.
- i. Where any GST liability arising on BHEL under Reverse Charge (RCM), the vendor has to submit the invoices to BHEL well within the timeline prescribed in GST Law, to enable BHEL to discharge the GST liability. If there is a delay in submission of invoice by the vendor resulting in delayed payment of GST by BHEL along with Interest, then such Interest payable or paid shall be recovered from the vendor.
- j. Under GST regime, BHEL has to discharge GST liability on LD recovered from suppliers/contracts. Hence applicable GST shall also be recoverable from suppliers/contractors on LD amount. For this Tax Invoice will be issued by BHEL indicating the respective supply invoice number.
- k. GST TDS will be deducted as per Section 51 of CGST Act 2017 and in line with Notification 50/2018 – Central Tax dated 13.09.2018. GST TDS certificate which will be generated in GST portal subsequent to vendor accepting the TDS deduction in the GST portal, will be issued to the vendor.

Certificate by Chartered Accountant on letter head

This is to Certify that M/S
(hereinafter referred to as 'company') having its registered office at
is registered under MSMED Act 2006, (Entrepreneur
Memorandum No (Part-II) dtd:.....,
Category: (Micro/Small)). (Copy enclosed).

Further verified from the Books of Accounts that the investment of the company as per the latest audited financial year as per MSMED Act 2006 is as follows:

1. **For Manufacturing Enterprises:** Investment in plant and machinery (i.e. original cost excluding land and building and the items specified by the Ministry of Small Scale Industries vide its notification No.S.O.1722(E) dated October 5, 2006 :
Rs.....Lacs
2. **For Service Enterprises:** Investment in equipment (original cost excluding land and building and furniture, fittings and other items not directly related to the service rendered or as may be notified under the MSMED Act, 2006:
Rs.....Lacs

(Strike off whichever is not applicable)

The above investment of Rs.....Lacs is within permissible limit of Rs.....Lacs forMicro / Small (Strike off which is not applicable) Category under MSMED Act 2006.

Or

The company has been graduated from its original category (Micro/ Small) (Strike off which is not applicable) and the date of graduation of such enterprise from its original category is (dd/mm/yyyy) which is within the period of 3 years from the date of graduation of such enterprise from its original category as notified vide S.O. No. 3322(E) dated 01.11.2013 published in the gazette notification dated 04.11.2013 by Ministry of MSME.

Date:

(Signature)

Name -

Membership number -

Seal of Chartered Accountant

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%,

(Strike off whichever is not applicable)

As defined under above referred Order for the following Enquiry Item SI Nos of BHEL Enquiry No 4102000054 dt 06.11.2020.

- 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.

DRAWING No. 3-80-300-19825

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

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

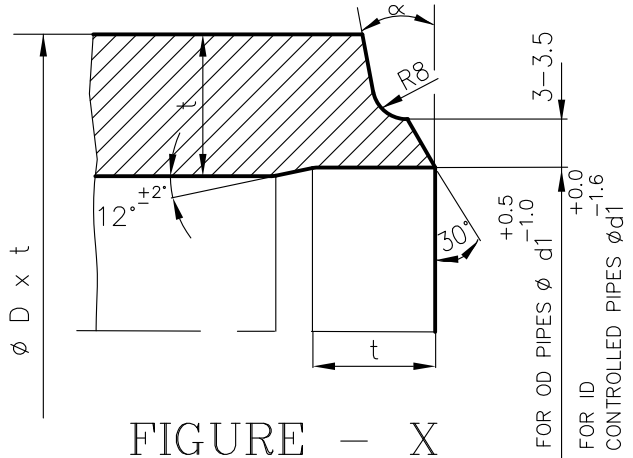


FIGURE - X

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

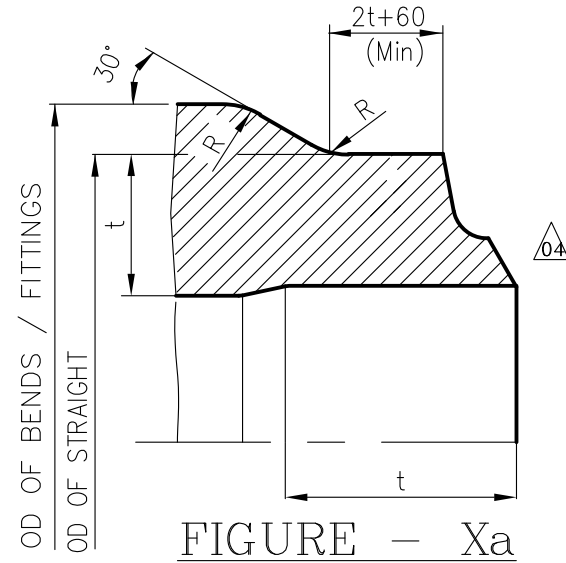
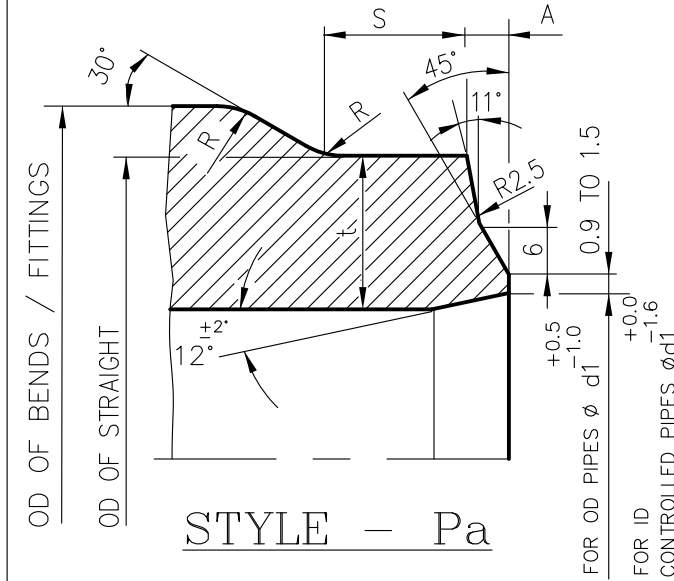


FIGURE - Xa

- MATCHING EDGE PREPARATION FOR MISMATCH OD
DIAMETRICALLY GREATER THAN 8 mm
(ie OD1 - OD2 > 8mm) APPLICABLE FOR
BENDS/FITTINGS OTHER THAN P91/P92 MATERIALS
NOTES: -
01. OD OF STRAIGHT TO BE PHYSICALLY MEASURED/VERIFIED.
02. WHEN $t < 65$, $S+A = 65$ Min. & $t > 65$, $S=65$ Min.
WHERE t=THK OF CONN.PE(STRIGHT).



STYLE - Pa

- MATCHING EDGE PREPARATION FOR MISMATCH OD
DIAMETRICALLY GREATER THAN 8 mm
(ie OD1 - OD2 > 8mm) APPLICABLE FOR
ELBOWS OTHER THAN P91/P92 MATERIALS
NOTES: -
01. OD = OUTSIDE DIA OF CONN. PIPE (STRAIGHT)
TO BE PHYSICALLY MEASURED/VERIFIED.
02. t = THK OF CONN.PE(STRIGHT)
03. t = THK OF CONN.PE(STRIGHT)

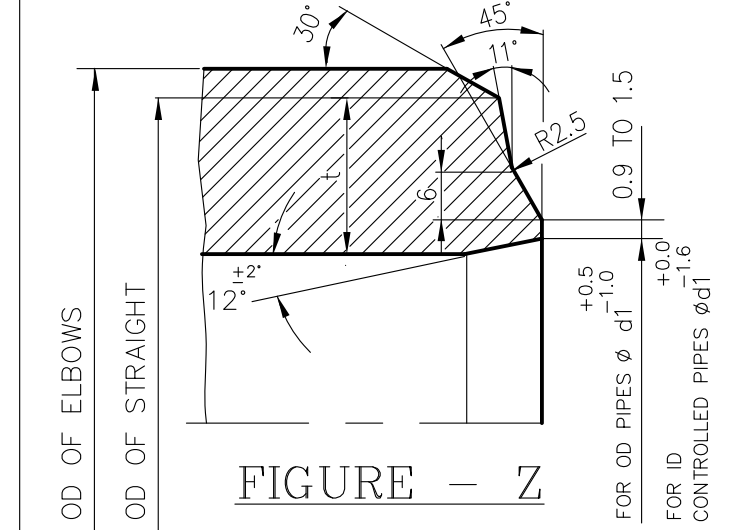
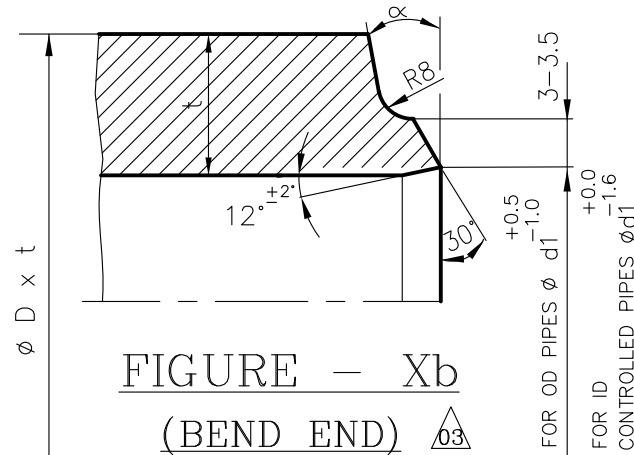
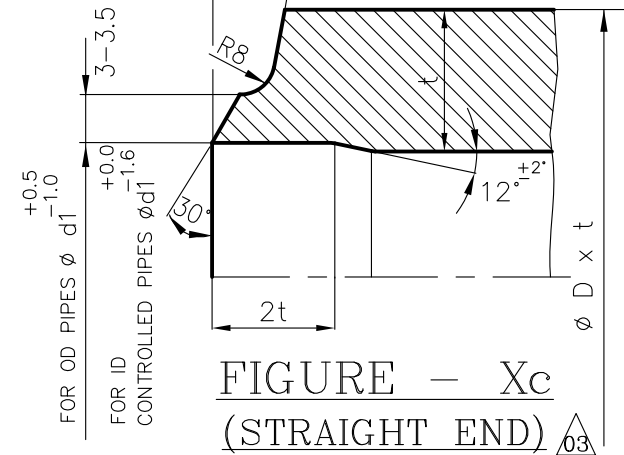
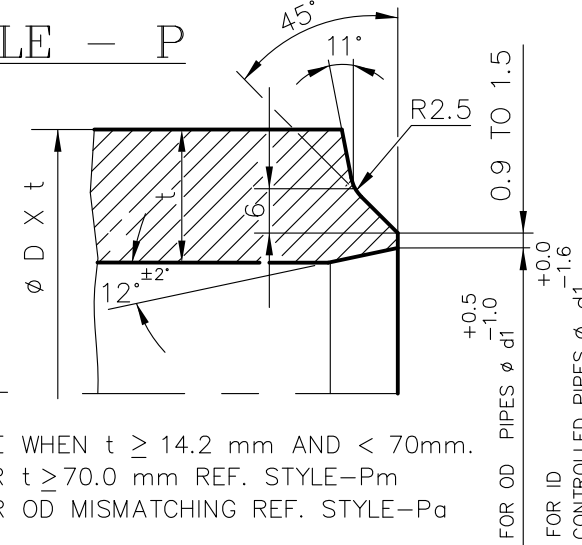


FIGURE - Z

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

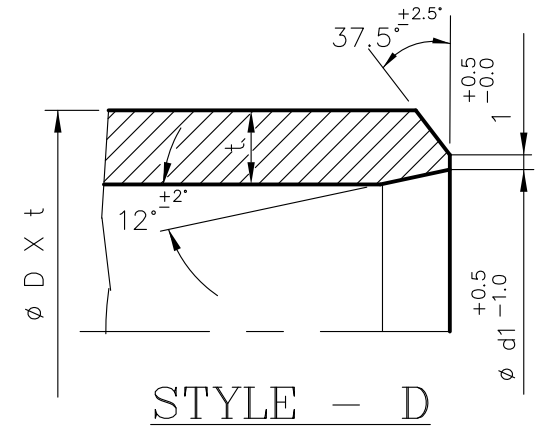
FIGURE - Xb
(BEND END)FIGURE - Xc
(STRAIGHT END)

STYLE - P



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

- NOTES: -
01. USE WHEN $t < 14.2$ mm.



STYLE - D

TYPE OF PRODUCT
OR NAME OF
CUSTOMER/PROJECT

STANDARD

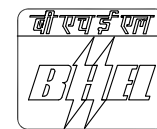
GENERAL NOTES :

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

NOTES FOR WELDING:

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

REV 04	DATE 07.12.16	ALTERED: P SURESH APPROVED: R SESHAGIRI
ZONE	SHEET 2 OF 2 IS ADDED. NOTES ADDED, MODIFIED AND DELETED IN FIGURE-X, Xa, Xb, Xc AND STYLE-P	
REV 03	DATE 10.04.13	ALTERED: M.R.K APPROVED: C.K.N
ZONE	FIG Xb AND FIG Xc ADDED. IN FIG.X, NOTE 01 MODIFIED. IN FIG.Xa, STY-Pa, FIG.Z, P92 MATERIAL ADDED	
REV 02	DATE 10.01.13	ALTERED: M.R.K APPROVED: C.K.N
ZONE	IN FIG.Xa, NOTE 04 ADDED. GENERAL NOTES 03 ADDED. IN FIG.Xa, 8MM OD MISMATCH IS REMOVED	
REV 01	DATE 11.05.04	ALTERED: R.SENDHIL APPROVED: A.VELAYUTHAM
ZONE	PROJECT NAME REMOVED AND STANDARD INCORPORATED IN TITLE BLOCK	

BHARAT HEAVY ELECTRICALS LTD.,
PIPING CENTRE, MADRAS

DEPT.

GRADE OF
UN TOL. DIM

CODE

C/M/F

TITLE

EDGE PREPARATION
DETAILS

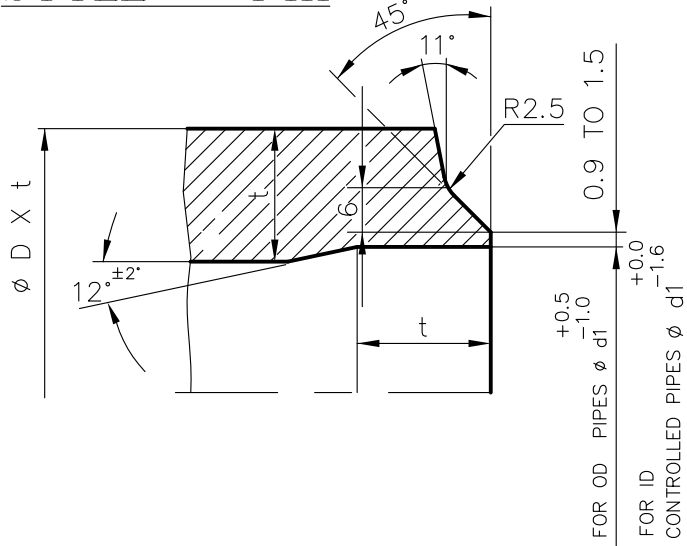
DRN	NAME K.B.RAGUNATH	SIGN	DATE 11.10.01	NO OF ITEMS
CHD	M.C.SEKARAN		11.10.01	
APPD	A.VELAYUTHAM		11.10.01	
DEPT.	GRADE OF UN TOL. DIM	SCALE	WEIGHT (Kg).	NAME OF ORIGINAL ORGANISATION
CODE	C/M/F			
TITLE	EDGE PREPARATION DETAILS	CARD CODE U 01	DRAWING No. 3-80-300-19825	REV 04
			SHEET 1 OF 2	

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

3-80-300-19825

DRAWING No.

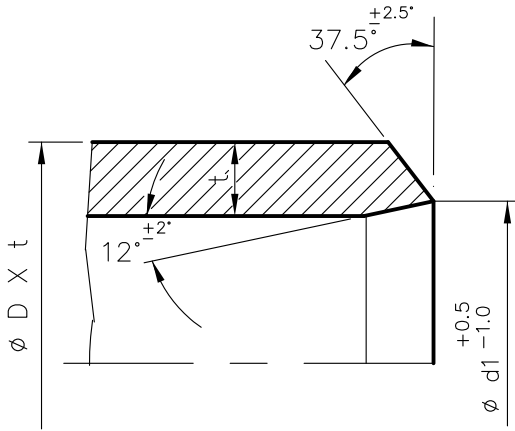
STYLE - P_m



NOTES: -

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

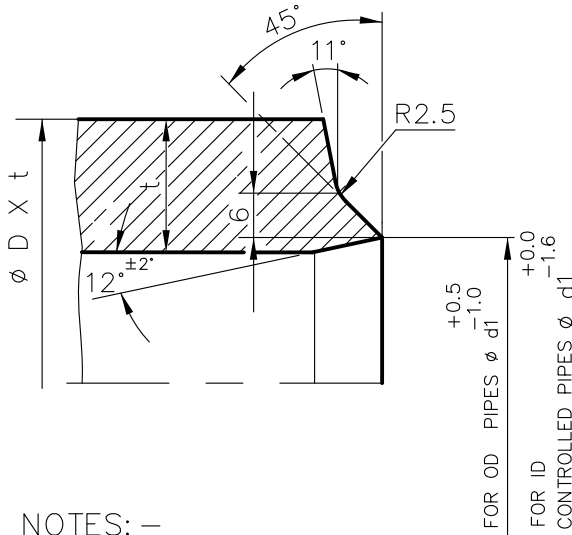
STYLE - D_L



NOTES: -

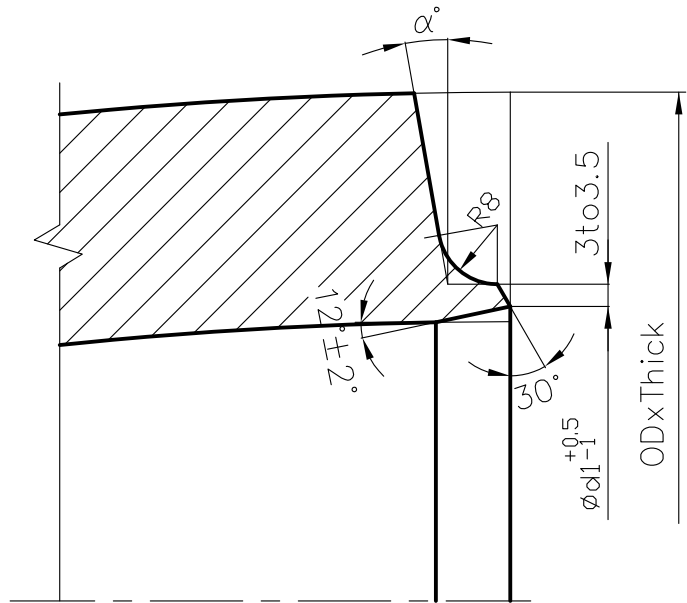
01. USE FOR P91 / P92 PIPES AND FITTINGS
WHEN $t < 14.2$ mm (ALL OD/ID).

STYLE - P_L



NOTES: -

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



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

FIGURE-X_f

NOTE :

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

TYPE OF PRODUCT
OR NAME OF
CUSTOMER/PROJECT

STANDARD



BHARAT HEAVY ELECTRICALS LTD.,
PIPING CENTRE, MADRAS

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

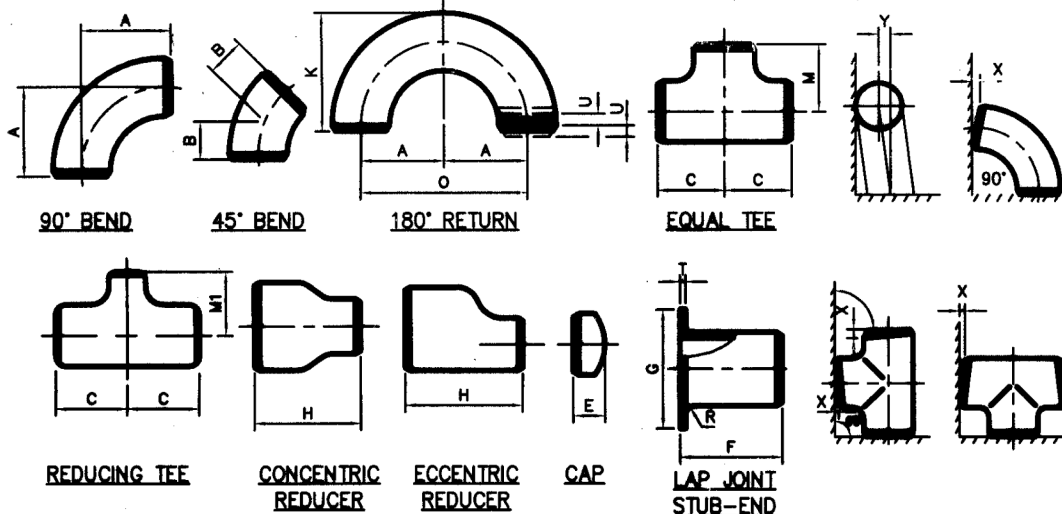
DEPT.	GRADE OF UN TOL. DIM	SCALE	WEIGHT (Kg).	NAME OF ORIGINAL ORGANISATION	ITEM No.
CODE	C/M/F				

TITLE	CARD CODE	DRAWING No.	REV
EDGE PREPARATION DETAILS	U 01	3-80-300-19825 SHEET 2 OF 2	04

REV	DATE	ALTERED
01	05.02.05	APPROVED <i>[Signature]</i> APMK

TITLE BLOCK AND DRAWING ALTERED

(REFERENCE : IS 8001, REG.NO 361(A) INCLUDED IN AMENDMENT)



ALL FITTINGS				90° & 45° ELBOWS AND TEES	REDUCER	180° RETURNS			CAPS	LAP-JOINT		STUB END	
DN.	O.D AT BEVEL	I.D AT END	WALL THICKNESS	CENTER TO END A,B,C,M,M1	OVERALL LENGTH H	CENTER TO CENTER O	BACK TO FACE K	ALIGNMENT OF END U	OVERALL LENGTH E	END TO END F	RADIUS R	DIA OF LAP G	THICKNESS OF LAP
15 TO 65	+1.6 -0.8	±0.8	NOT LESS THAN 87 1/2% OF NOMINAL THICKNESS	±1.6	±1.6	±6.4	±6.4	±0.8	±3.2	±1.6	+ 0 -0.8	+ 0 -0.8	+1.6 - 0
80 TO 90	±1.6	±1.6		±1.6	±1.6	±6.4	±6.4	±0.8	±3.2	±1.6	+ 0 -0.8	+ 0 -0.8	+1.6 - 0
100	±1.6	±1.6		±1.6	±1.6	±6.4	±6.4	±0.8	±3.2	±1.6	+ 0 -0.8	+ 0 -0.8	+1.6 - 0
125 TO 200	+2.4 -1.6	±1.6		±1.6	±1.6	±6.4	±6.4	±0.8	±6.4	±1.6	+ 0 -0.8	+ 0 -0.8	+1.6 - 0
250 TO 400	+4.0 -3.2	±3.2		±2.4	±2.4	±9.5	±6.4	±1.6	±6.4	±2.4	+ 0 -1.6	+ 0 -1.6	+1.6 - 0
500 & ABOVE	+6.4 -4.8	±4.8		±2.4	±2.4	±9.5	±6.4	±1.6	±6.4	±2.4	+ 0 -1.6	+ 0 -1.6	+1.6 - 0

OFF-SQUARE TOLERANCES		
NOMINAL SIZE OF FITTING	OFF SQUARE TOLERANCE, X	OFF SQUARE TOLERANCE, Y
UP TO AND INCLUDING 100	0.8	1.6
125 TO 150	1.2	2.4
200 TO 550	1.6	3.2
600 & ABOVE	3.2	6.4

NOTES : 1. ALL DIMENSIONS ARE IN MILLIMETRES

STANDARD

BHARAT HEAVY ELECTRICALS LIMITED PIPING CENTRE CHENNAI 600 017		DRN	NAME	SIGN	DATE	NO. OF VAR
		CHD	ENG. ENTERPRISES	Sd	15.10.1986	
		APPD	R. ANANTH	Sd	15.10.1986	
DEPT	GRADE OF UNTOLED 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
TOLERANCES ON FITTINGS			U 01	4-80-301-26192		01



BHEL PIPING CENTRE, CHENNAI

TECHNO-COMMERCIAL MEMORANDUM OF UNDERSTANDING FOR SUPPLY OF FITTINGS

BETWEEN

M/s. BHEL PIPING CENTRE, CHENNAI

&

M/s.

**DOC NO- BHEL: PC: MOU: FITTINGS
REVISION NO- 00
PRODUCT- FITTINGS**

RECORD OF REVISION

REV No	DATE OF REVISION	RECORD OF REVISION
00	07.01.2020	ORIGINAL ISSUE

VENDOR'S SIGNATURE WITH SEAL

BHEL PIPING CENTRE

GENERAL:

- This Techno-Commercial MoU is signed between M/s BHEL Piping Centre, Chennai and M/s (Vendor) to finalize the Technical and Commercial terms (except price, delivery period and LD term) for the supply of Fittings. All terms and conditions agreed through this MoU shall stand valid for all tenders and Purchase Orders floated for the supply of Fittings.
- List of applicable products for which MoU is being entered to is indicated below-

SL No	MATERIAL GROUP	PRODUCT DESCRIPTION
1	FIF91	FORGING- SA182F91
2	FIF91NIB	NON IBR F91 FORGINGS
3	FIF92	FORGING- SA182F92
4	FIT91	FITTINGS- WP91
5	FIT92	FITTINGS- WP92
6	FITAS	FITTINGS- ALLOY STEEL
7	FITCS	FITTINGS- CARBON STEEL
8	FITDSS	FITTINGS - DUPLEX SS
9	FITFG	FORGINGS- CS & AS (EXCEPT F91)

SL No	MATERIAL GROUP	PRODUCT DESCRIPTION
10	FITFLG	FLANGES- CS, SS & AS (EXCEPT F91)
11	FITSS	FITTINGS- STAINLESS STEEL
12	FITSW	FITTINGS- SOCKET WELD
13	FITW9	FABRICATED FITTINGS- F91
14	FITWA	FABRICATED FITTINGS- AS
15	FITWC	FABRICATED FITTINGS- CS
16	FOR9	FORGED Y PIECE- F91
17	FOR9C	FORGED Y PIECE- CARBON STEEL
18	FOR9T92	F92 Y PIECE AND TEES

- This MoU will be applicable for all Single, Limited and Open Tender Enquiries floated by BHEL Piping Centre, Chennai.
- The MoU will stand valid till **31.03.2021**.
- The MoU validity may be extended even after the initial period if required by M/s BHEL with the consent of the supplier. However, if any change is required within the validity of the MOU, the MoU will be amended with mutual consent.
- By signing this MoU, the following terms and conditions are agreed by BHEL and the supplier in toto.

MoU TERMS:

SI No	MoU Terms
1	Type of Bid: Enquiry can be either 'Single part bid type' or 'Two part bid type'. The bid type to which an Enquiry will be resorted to will be indicated in the tender itself and vendors have to submit their bids suitably. Generally E-Tenders thru BHEL's Procurement portal will be resorted to. In case tender is addressed in conventional manner, the same will be indicated in the NIT. Suppliers will have to submit the quote accordingly.
1.1	Single Part Bid: In case of Single part bid, only "One bid" has to be submitted. Bid must consist of the following- - Supplier has to confirm for supply as per agreed MoU terms in the format which will be sent along with the Enquiry. Bids deviating from the MoU terms will be liable for rejection. - Price has to be submitted in the format which will be sent along with the Enquiry.

1.2	<u>Two Part Bid:</u> In case of Two part bid, two bids (Part I & Part II) have to be submitted: <u>Part I-</u> a) Supplier has to confirm to supply as per terms of MoU in the format forwarded with Enquiry. b) Unpriced bid shall be submitted to know the items for which the supplier has quoted. c) Applicable tax and duty shall be indicated explicitly. d) Technical deviations if any shall be indicated in a separate sheet. Any deviations indicated elsewhere will not be evaluated by BHEL. <u>Part II-</u> Price bid has to be submitted in the template available in E-Procurement portal. In case of conventional bid submission, price bid has to be sent along with the Enquiry in a separate cover.
2	<u>General Requirements (applicable for all suppliers):</u> a) Suppliers shall not alter the description, size detail and Techno-Commercial / Price bid formats of the tender. Alteration of any of the details as indicated above shall be treated as “Tampering” of the bid and will invite action as per existing guidelines in vogue. b) All fittings shall be painted, marked and packed as per respective TDC requirement. Latest TDC revision shall be referred in this regard. c) Suppliers shall quote only for the sizes that are within their manufacturing range approved by BHEL Piping Centre and fittings shall be manufactured only at the works / mills approved by BHEL Piping Centre. d) Packing shall be as per Packing Procedure PC:PKG:01 (Latest revision as per Annexure A). e) Melt number should be punched on the material without fail. All dimensions indicated in the documents should be hard punched on the material as per Purchase Order (in 'mm' and not in 'inch'). f) Serial number shall be "per size for PO quantity" and shall be continuous numeric only. Identified serial number shall be written on Manufacturing Test Certificate (MTC) only for future reference and correlation. Same shall not be written on IBR forms. All the individual test reports like dimensional report etc shall be indicated with serial number for correlation. For example, PO quantity is 100 nos in which 50 nos were offered and cleared by inspection, then MTC & all relevant test reports shall be indicated with 1 to 50 as serial numbers. For remaining PO quantity serial number shall start from 51 to 100. Serial number shall be hard punched on the external surface. g) Any cost implication arising due to non-compliance to TDC conditions will be debited from supplier's account after due intimation of the same.
3	<u>Technical Requirements:</u> Product wise technical requirement is indicated below. Even though the full list of technical requirements is indicated below, the applicable products are as indicated in Page 2 of the MoU.

3.1	<u>Butt Welded (BW) Fittings conforming to SA234 (WPB, WPC, WP11, WP22, WP91, WP92) & SA 815-32205</u> <i><u>Materials Groups- FITCS, FITAS, FITSS, FIT91, FIT92, FITDSS</u></i> <i><u>Technical Delivery Condition (TDC)- TDG 102</u></i> (LATEST REVISION AS PER ANNEXURE A). a) BHEL TDC No TDG 102 (LATEST REVISION AS PER ANNEXURE A) has been agreed in toto and shall be followed for manufacturing and supply of BW Fittings. Fittings shall be supplied as per BHEL drawings (if any) sent along with Enquiry. Any clarification with regard to drawings shall be obtained during tender stage itself. Manufacturing drawings need not be submitted for BHEL approval until otherwise explicitly indicated in the Enquiry / PO / drawings. b) Raw material sources conforming to SA234 WP91 shall be as per QCP 18 (Latest revision as per Annexure A) or QCP 19 (Latest revision as per Annexure A) (Seamless Pipes- P91 / P92) as applicable. c) Quality Plan QPG 46 (Latest revision as per Annexure A) shall be followed for inspection. d) Edge Preparation (EP) shall be done as per BHEL drawing no 3-80-300-19825 (Latest revision as per Annexure A) as applicable if not explicitly indicated in the item drawing in Enquiry. D1 value shall be as mentioned against each item in the Enquiry / PO. e) Tolerance shall be maintained as per BHEL drawing no 4-80-301-26192 (Latest revision as per Annexure A). f) Bid shall be submitted for Seamless / Welded construction as applicable as indicated against each item in the Enquiry. g) Seamless construction is acceptable in place of Welded construction. However Welded construction is not acceptable in place of Seamless construction. h) All the reducers are concentric, unless otherwise specified as eccentric. All the elbows are LR, unless otherwise specified as SR.
3.2	i) For SS and duplex SS items, IBR inspection is not applicable. <u>Socket Welded (SW) Fittings conforming to SA105 & SA182 (F11, F12, F22, SS304, SS403)</u> <i><u>Materials Groups- FITSW</u></i> <i><u>Technical Delivery Condition (TDC)- TDG 103</u></i> (LATEST REVISION AS PER ANNEXURE A) a) BHEL TDC No TDG 103 (LATEST REVISION AS PER ANNEXURE A) has been agreed in toto and shall be followed for manufacturing and supply of SW Fittings. Fittings shall be supplied as per BHEL drawings (if any) sent along with Enquiry. Any clarification with regard to drawings shall be obtained during tender stage itself. Manufacturing drawings need not be submitted for BHEL approval until otherwise explicitly indicated in the Enquiry / PO / drawings. b) Vendor to follow QPG 87 (LATEST REVISION AS PER ANNEXURE A). c) For SS items, IBR inspection is not applicable.

VENDOR'S SIGNATURE WITH SEAL **BHEL PIPING CENTRE**

6	<u>Offer & Price Validity:</u> Offer shall be valid for 3 months from the date of Techno-Commercial bid opening or 60 days from Reverse Auction / E-Price Bid opening whichever is later. Quoted rates shall be FIRM till completion of supplies until otherwise specified in the Enquiry / PO.
7	<u>Taxes & Duties:</u> Applicable tax and duty in percentage shall be indicated explicitly in the offer.
8	<u>Delivery Terms:</u> a) 'FOR' BHEL Trichy stores / any project site in India as per BHEL's dispatch instruction. b) Wherever Direct to Site (DTS) advice is given, materials shall be dispatched directly to respective project sites. The remaining items shall be dispatched to BHEL Trichy stores after obtaining dispatch clearance from BHEL.
9	<u>Tender Process:</u> Tender shall be processed by opening E-Price bids submitted thru E-Procurement portal or thru Reverse Auction. The mode of tender process will be informed by BHEL after evaluation of Techno-Commercial bids. BHEL reserves the right to go for Reverse Auction (RA) instead of opening the sealed envelope price bid submitted by the bidder and the same will be decided after Techno-Commercial evaluation of the bids. Reverse Auction guidelines shall be as per Annexure I to the MoU. Any revision to the same shall be communicated along with the tender. In case both indigenous and import suppliers are participating in the tender, price comparison will be made by considering Exchange Rate as on the date of Part I opening date (State Bank of India's TT selling rate will be considered). In such case, ranking will be done based on "Net Cash Outflow to BHEL" on "FOR BHEL Trichy stores" basis. In case only indigenous suppliers have quoted for the tender, ranking will be based on "Net Cash Outflow to BHEL" on FOR BHEL Trichy stores / any project site in India basis. Any loading based on deviations taken by vendors will be considered for arriving at Net Cash Outflow to BHEL. Ordering will be done only on item level L1 vendor and "NOT" as a total package. Hence Minimum Order Quantity (MOQ) / Minimum Order Value (MOV) condition will not be accepted. However, in case of emergency requirements, package ordering may also be resorted to. In such cases, the basis of evaluation will be explicitly indicated in the NIT.
10	<u>Delivery:</u> Delivery is tender specific and shall be indicated in the respective tenders.
11	<u>Inspection:</u> Inspection shall be by IBR (if applicable), NTPC (if applicable) or any other customer as specified in the respective contract requirement and BHEL / BHEL authorized TPI.

12	<u>Inspection Charges:</u> Inspection charges of BHEL / BHEL authorized TPI or customer is to BHEL a/c. However any other testing charges and IBR inspection (if applicable) should be included in the quoted rates.
13	<u>Forwarding of Test Certificates & Inspection Reports:</u> 1 set of ink signed originals of Test certificates (TC) along with Inspection Reports (IR) as called for in the TDC / approved Quality Plan shall be sent to Dy.Manager / Purchase (Fittings), BHEL Piping Centre immediately after the shipment / dispatch of items. TC & IR shall be furnished for each batch of shipment / dispatch. If entire PO quantity is manufactured in one lot but dispatched in phased manner, original "IBR Form" should be submitted with the first consignment. For subsequent consignments, attested Xerox copy of IBR along with copies of TC and IR indicating invoice detail against which original TC and IR was handed over to BHEL shall be submitted. Soft copies of all the test certificates shall also be submitted through email. Year of code for the technical standards shall be latest and the specific year shall be indicated in the MTC's as well as applicable IBR Forms.
14	<u>Payment Term:</u> 100% payment after 60 days after receipt and acceptance of materials (site acknowledgement to be submitted in case of Direct to Site supplies). However, PAYMENT FOR MSE VENDORS SHALL BE AS PER MSMED ACT 2006. No advance payment shall be made by BHEL. <u>PAYMENT DOCUMENTS</u> Payment shall be made against presentation of the following documents to BHEL. However a copy of Invoice and LR shall be sent to Purchase department immediately after physical dispatch. - Original GST compliant invoice and 1 xerox copy of the same. - Original site acknowledged Lorry Receipt (Goods Receipt (GR) date in case of BHEL Trichy stores) and 1 xerox copy of the same. - Original inspection report, works test certificate, IBR forms, raw material test certificate, Heat Treatment (HT) chart, NDT reports (PT/ MPI / UT / RT as applicable wrt TDG / approved QP). - Dimensional report, thickness measurement report (for Elbows, Tees) and any other reports as called for in TDC / approved QP. - If one original certificate / LR is applicable for more than one invoice quantity / invoice, Xerox copy is acceptable with original correlation details on the Xerox copy with attestation by supplier's Quality-in-charge. Dispatches shall be on "Door delivery CC attached" basis only. Road Permit (if any) will be provided by BHEL during dispatch clearance.
15	<u>GST compliance:</u> A declaration to the effect that all invoice particulars are / were uploaded in the GSTN network / portal & all tax liability as per GST rules and regulations have been and will be discharged, shall be mentioned in the invoice. If not mentioned in the invoice, a separate declaration shall be submitted as per

the requirement of BHEL.

b) Response to tenders for indigenous supplier will be entertained only if the vendor has a valid GST registration number (GSTIN) which should be clearly mentioned in the offer. If the dealer is exempted from GST registration, a declaration with due supporting documents need to be furnished for considering the offer. Dealers under composition scheme should declare that he is a composition dealer supported by the screen shot taken from GST portal. The dealer has to submit necessary documents if there is any change in status under GST.

c) Supplier shall mention their GSTIN in all their invoices (incl. credit notes, debit notes) and invoices shall be in the format as specified/prescribed under GST laws. Invoices shall necessarily contain invoice number (in case of multiple numbering system is being followed for billing like SAP invoice no, commercial invoice no etc., then the invoice no. which is linked/uploaded in GSTN network shall be clearly indicated), billed to party (with GSTIN) & shipped to party details, item description as per PO, quantity, rate, value, applicable taxes with nomenclature (like IGST, SGST, CGST & UTGST) separately, HSN/ SAC code, place of supply etc.

d) All invoices shall bear the HSN code for each item separately (harmonized system of nomenclature)/ SAC code (services accounting code).

e) Invoices will be processed only upon completion of statutory requirement and further subject to following:

a. vendor declaring such invoice in form GST anx-1

b. receipt of goods or services and tax invoice by BHEL

f) As the continuous uploading of tax invoices in GSTN portal (in gst anx-1) is available for all (i.e. both small & large) tax payers under proposed new GST return system, all invoices raised on BHEL may be uploaded immediately in GST portal on despatch of material /rendering of services. The supplier shall ensure availability of invoice in GST portal before submission of invoice to BHEL. Invoices will be admitted by BHEL only if the invoices are available in GSTN portal (in BHEL's GST anx-2).

g) In case of discrepancy in the data uploaded by the supplier in the GSTN portal or in case of any shortages or rejection in the supply, then BHEL will not be able to avail the tax credit and will notify the supplier of the same. Supplier has to rectify the data discrepancy in the GSTN portal or issue credit note or debit note (details also to be uploaded in GSTN portal) for the shortages or rejections in the supplies or additional claims, within the calendar month informed by BHEL.

h) In cases where invoice details have been uploaded by the vendor but failed to remit the GST amount to GST department (form pmt-08 or form GST ret-01 to be submitted) within stipulated time, then GST paid on the invoices pertaining to the month for which GST return not filed by the vendor will be recovered from the vendor along with the applicable Interest (currently 24% p.a) and all subsequent bills of the vendor will not be processed till filing of the GST return by the vendor

i) In case GST credit is denied to BHEL due to non-receipt or delayed receipt of goods and/ or tax invoice or expiry of timeline prescribed in GST law for availing such ITC, or any other reasons not attributable to BHEL, GST amount claimed in the invoice shall be disallowed to the vendor.

j) Where any GST liability arising on BHEL under reverse charge (RCM), the vendor has to submit the invoices to BHEL well within the timeline prescribed in GST law, to enable BHEL to discharge the GST liability. If there is a delay in submission of invoice by the vendor resulting in delayed payment of GST by BHEL along with interest, then such interest payable or paid shall be recovered from the vendor.

k) Under GST regime, BHEL has to discharge GST liability on LD recovered from suppliers/contracts. Hence applicable GST shall also be recoverable from suppliers/contractors on LD amount. For this tax invoice will be issued by BHEL indicating the respective supply invoice number.

l) GST TDS will be deducted as per section 51 of CGST act 2017 and in line with notification 50/2018 – central tax dated 13.09.2018. GST TDS certificate which will be generated in GST portal subsequent to vendor accepting the TDS deduction in the GST portal, will be issued to the vendor.

m) For any such delay in availing of tax credit for reasons attributable to supplier (as mentioned

	above), interest (calculated @ SBI base rate + 6%) along with penalty (if any) will be deducted / recovered for the delayed period i.e. from the month of receipt till the month tax credit is availed, from the running bills. in case GST credit is denied to BHEL due to any reason not attributable to BHEL, GST amount along with interest levied or leviable on BHEL will be recovered from payment due to vendor.
16	<u>BHEL Standard Guarantee Clause:</u> The materials are to be guaranteed for satisfactory performance for a period of 24 months from the date of dispatch or 18 months from the date of commissioning / putting into use whichever is earlier and if any defect is noticed during the above period, the same shall be rectified / replaced free of cost on FOR destination basis within a reasonable time, maximum limited to the agreed delivery period. To this effect a guarantee certificate should be sent along with the dispatch documents in the event of an order.
17	<u>LD Clause:</u> If the supplier fails to deliver the items within the delivery date as applicable for the PO, the purchaser shall deduct Liquidated Damages, a sum equivalent to 0.5% of the price for each week of delay up to a maximum of 10% of the price of delayed / undelivered portion. For the purpose of LD calculation, LR date will be reckoned as the delivery date.
18	<u>CANCELLATION / TERMINATION OF CONTRACT, DEFAULT / BREACH OF CONTRACT AND RISK PURCHASE</u> In case of abnormal delays (beyond the maximum late delivery period as per Penalty clause) in supplies / defective supplies or non-fulfilment of any other terms and conditions given in Purchase Order as enumerated subsequently in this clause, Purchaser shall be entitled to cancel the Order / Contract either in whole or portion thereof without compensation to Seller / Contractor and if the Purchaser so desires, may procure upon such terms and in such manner as deemed appropriate, stores not so delivered or others of similar description where stores exactly complying with particulars are not, in the opinion of the Purchaser, which shall be final, readily procurable, at the risk and cost of the Seller / Contractor and the Seller / Contractor shall be liable to the Purchaser for any excess costs provided that the Seller / Contractor shall continue the performance of the Order / Contract to the extent not cancelled under the provisions of this clause. The Seller / Contractor shall on no account be entitled to any gain on such repurchases. If bidder does not agree to the above Risk Purchase Clause, BHEL reserves the right to reject the offer. Risk & Cost Clause, in line with Conditions of Contract may be invoked in any of the following cases: - Contractor / supplier's poor progress of the work vis-à-vis execution timeline as stipulated in the Contract, backlog attributable to contractor/ supplier including unexecuted portion of work / supply does not appear to be executable within balance available period (#) considering its performance of execution. - Withdrawal from or abandonment of the work by contractor before completion of the work as per contract. - Non completion of work / Non-supply by the Contractor / supplier within scheduled completion / delivery period as per Contract or as extended from time to time, for the reasons attributable to the contractor / supplier. - Termination of Contract on account of any other reason (s) attributable to Contractor / Supplier. - Assignment, transfer, subletting of Contract without BHEL's written permission resulting in termination of Contract or part thereof by BHEL. - Non-compliance to any contractual condition or any other default attributable to Contractor / Supplier. Risk and Cost amount against Balance Work $\text{Risk \& Cost Amount} = [(A-B) + (A \times H/100)]$ Where,

A= Value of Balance scope of Work / Supply (*) as per rates of new contract B= Value of Balance scope of Work / Supply (*) as per rates of old contract being paid to the contractor / supplier at the time of termination of contract i.e. inclusive of PVC & ORC, if any. H= Overhead Factor to be taken as 5 In case (A-B) is less than 0 (zero), value of (A-B) shall be taken as 0 (zero). *(Balance scope of work / supply) Difference of Contract Quantities and Executed Quantities as on the date of issue of Letter for 'Termination of Contract', shall be taken as balance scope of Work / Supply for calculating risk & cost amount. Contract quantities are the quantities as per original contract. If, Contract has been amended, quantities as per amended Contract shall be considered as Contract Quantities. Items for which total quantities to be executed have exceeded the Contract Quantities based on drawings issued to contractor from time to time till issue of Termination letter, then for these items total Quantities as per issued drawings would be deemed to be contract quantities. Substitute / extra items whose rates have already been approved would form part of contract quantities for this purpose. Substitute / extra items which have been executed but rates have not been approved, would also form part of contract quantities for this purpose and rates of such items shall be determined in line with contractual provisions. However, increase in quantities on account of additional scope in new tender shall not be considered for this purpose. Note: In case portion of work is being withdrawn, contract quantities pertaining to portion of work withdrawn shall be considered as 'Balance scope of work / supply' for calculating Risk & Cost amount. LD against delay in executed work / supply in case of Termination of Contract in case of Risk and Cost Option LD against delay in executed work / supply shall be calculated in line with LD clause of the contract for the delay attributable to contractor / supplier. For limiting maximum LD value, contract value shall be taken as Executed Value of work / supply. Method for calculation of "LD against delay in executed work / supply" is given below. - Let the time period from scheduled date of start of work till termination of contract excluding the period of Hold (if any) not attributable to contractor / supplier= T1 - Let the value of executed work / supply till the time of termination of contract= X - Let the Total Executable Value of work / supply for which inputs / fronts were made available to contractor / supplier and were planned for execution till termination of contract= Y - Delay in executed work / supply attributable to contractor/supplier i.e. T2= (1- X/Y) * T1 - LD shall be calculated in line with LD clause of the Contract for the delay attributable to contractor / supplier taking "X" as Contract Value and "T2" as delay attributable to contractor / supplier. Note: In case portion of work / supply is withdrawn, no LD shall be applicable for portion of work / supply withdrawn. Recovery from Supplier Recoveries from contractor / supplier on whom risk & cost has been invoked shall be made from the following:

	a. Dues available in the form of Bills payable to contractor / supplier, SD, BG's against the same contract. b. Dues payable to contractor / supplier against other contracts in the same Region / Unit / Division of BHEL. c. Dues payable to contractor / supplier against other contracts in the different Region / Unit / division of BHEL. d. Legal Options for recovery of dues payable by the supplier / contractor.
19	<u>MSE Preference:</u> a) In case the supplier belongs to MSE's (Micro Small Enterprises), registration copy in this respect shall be submitted along with the offer. MSE suppliers can avail the intended benefits only if they submit along with the offer, attested copies of either EM II certificate having deemed validity (5 years from the date of issue of acknowledgement in EM II) or valid NSIC certificate or EM II certificate along with attested copy of a CA certificate (where deemed validity of EM II certificate of 5 years has expired) applicable for the relevant FY (latest audited). b) Further if MSE's are owned by the Scheduled Caste or the Scheduled Tribe entrepreneurs, the same may be intimated. c) Small Enterprises that has graduated to a higher category are also eligible for intended benefits for 3 years from the date of such graduation. Certificates to this effect shall be submitted along with the offer for availing MSE preference. d) In case the item is divisible, and where L1 is not MSE vendor, participating MSE's quoting price within price band of L1 + 15% shall also be allowed to supply a portion of requirement by bringing down their price to L1 price in a situation where L1 price is from someone other than a MSE and such MSE shall be allowed to supply up to 25% of quantity (item level). In case of more than one such MSE, the supply shall be shared proportionately within this 25%. In case L1 is MSE vendor, entire order will be done on the L1 vendor. e) Out of the 25% reserved for MSE vendors, 3% reservation will be applicable for women owned MSE's and 6.25% reservation will be applicable for MSE's owned by SC / ST. (supporting documentary proof to be submitted along with the tender). f) If MSE vendor/s do not match the counter offered price, the quantity will be ordered on L1 vendor. In case item is not divisible, the following procedure will be followed: • If L1 is from a MSE vendor, the contract for full quantity will be awarded to L1. • If L1 is not MSE supplier, the lowest bidder among MSE vendors will be invited to match the L1 price subject to MSE supplier's quoted price falling within the margin of purchase preference and the contract shall be awarded to such MSE supplier subject to matching the L1 price. • In case such lowest eligible MSE supplier fails to match the L1 price, the local supplier with the next higher bid within the margin of purchase preference shall be invited to match the L1 price and so on and contract shall be awarded accordingly. In case none of the MSE suppliers within the margin of purchase preference matches the L1 price, then the contract will be awarded to the L1 bidder.
20	<u>PURCHASE PREFERENCE FOR MAKE IN INDIA</u> Public Procurement (Preference to Make in India), Order 2017 dated 15.06.2017, 28.05.2018 & 29.05.2019 and subsequent Orders issued by the respective Nodal Ministry shall be applicable. In the event of any Nodal Ministry prescribing higher or lower percentage of purchase preference and / or local content in respect of the products mentioned, same shall be applicable. In case item is divisible, following procedure will be followed- • Among all qualified bids, the lowest bid will be termed as L1. If L1 is from a local supplier, the

	contract for full quantity will be awarded to L1. - If L1 bid is not from a local supplier, 50% of the order quantity shall be awarded to L1. Thereafter, the lowest bidder among the local suppliers, will be invited to match the L1 price for the remaining 50% quantity subject to the local supplier's quoted price falling within the margin of purchase preference, and contract for that quantity shall be awarded to such local supplier subject to matching the L1 price. In case such lowest eligible local supplier fails to match the L1 price or accepts less than the offered quantity, the next higher local supplier within the margin of purchase preference shall be invited to match the L1 price for remaining quantity and so on, and contract shall be awarded accordingly. In case some quantity is still left uncovered on local suppliers, then such balance quantity may also be ordered on the L1 bidder. In case item is not divisible, , the following procedure will be followed: - Among all qualified bids, the lowest bid will be termed as L1. If L1 is from a local supplier, the contract for full quantity will be awarded to L1. - If L1 is not from a local supplier, the lowest bidder among the local suppliers will be invited to match the L1 price subject to local supplier's quoted price falling within the margin of purchase preference and the contract shall be awarded to such local supplier subject to matching the L1 price. - In case such lowest eligible local supplier fails to match the L1 price, the local supplier with the next higher bid within the margin of purchase preference shall be invited to match the L1 price and so on and contract shall be awarded accordingly. In case none of the local suppliers within the margin of purchase preference matches the L1 price, then the contract will be awarded to the L1 bidder.
21	<u>Suspension of Business Dealing:</u> In order to protect the commercial interests of BHEL, it becomes necessary to take action against suppliers / contractors by way of suspension of business dealings, who either fail to perform or are in default without any reasonable cause, cause loss of business / money / reputation, indulge in malpractices, cheating, bribery, fraud or any other misconduct or formation of cartels so as to influence the bidding process or influence the price etc. Suspension of Business Dealings could be in the form of "Hold" or "Banning" a supplier / contractor or a bidder or an applicant for registration as a registered supplier. For this purpose, the abridged version of guidelines hoisted at website http://www.bhel.com/vender_registration/vender.php (Suspension of business dealings with suppliers / contractors) is being followed across all BHEL units. Vendors shall keep themselves aware of these guidelines before submission of their bid.
22	<u>FRAUD PREVENTION POLICY</u> The Bidder along with their associates / collaborators / sub-contractors / sub-vendors / consultants / service providers shall strictly adhere to BHEL fraud prevention policy displayed on BHEL website at "www.bhel.com/pdf/BHEL Fraud Prevention Policy.pdf" and shall immediately bring to the notice of BHEL management about any fraud or suspected fraud as soon as it comes to their notice.
23	<u>Note:</u> - MSE vendors to submit <u>original</u> CA certificate as per BHEL prescribed format based on latest FY audited financial data latest by July of the subsequent FY. In case of new vendors, the same to be submitted along with the signed copy of the MoU. - Revisions indicated are as on date of issue. Any revision any of the documents indicated in the MoU shall be communicated along with the Enquiry and PO. - Evaluation and ordering will be done on item level and not on package basis unless otherwise indicated in the Enquiry. - PO copy with all details will be forwarded to successful supplier/s and acknowledgement for receipt of PO shall be sent within 5 days from the date of receipt.

	• During the Contract period, any of our sister units of BHEL Piping Centre will be entitled to place order for this item on the same terms and conditions with the consent of the supplier. • BHEL reserves the right to cancel the tender without assigning any reasons what so ever. • Deviation taken after placement of order will not be accepted (Technical, delivery & payment term). • Lowest prices received against BHEL tenders do not mean order will be placed on that Supplier. BHEL reserves the right to consider or not to consider the same. • BHEL reserves the right to negotiate or re-float the tender opened if L1 price or other details are not acceptable to them. • BHEL reserves the right to order on more than one vendor at the lowest acceptable price to BHEL. • Suppliers are requested to make themselves aware of "BHEL Fraud Prevention Policy" and "Suspension of Business Dealings with Suppliers / Contractors) available at www.bhel.com. • "Annexure I on RA guidelines" and "Annexure A on latest revision of documents" forms an integral part and shall be read along with the MoU. • "Checklist of documents for invoice payment processing" and "flow chart for material dispatch activities" are also sent for easier reference and understanding. The same are to be followed. • Signing of this MoU doesn't guarantee either the Enquiry or the order from BHEL. • Any condition(s) if specifically indicated in the Enquiry or PO will override the MoU conditions.
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ANNEXURE A

S.No	DOCUMENT DESCRIPTION	DOCUMENT NUMBER	LATEST REVISION
1	EP DRAWING	3-80-300-19825	REV 04
2	TOLERANCES	4-80-301-26192	REV 01
3	LIST OF RAW MATERIAL SOURCES FOR SA182 F91	QCP 18	REV 03
4	RM SOURCING LIST (SEAMLESS PIPES)	QCP 19	REV 03
5	TDC FOR BW FITTINGS	TDG 102	REV 09
6	TDC FOR SOCKET WELDED FITTINGS	TDG 103	REV 02
7	TDC FOR FORGINGS	TDG 104	REV 10
8	TDC FOR FABRICATED TEE AND Y PIECE	TDG 108	REV 07
9	TDC FOR PIPE WITH ATTACHMENTS	TDG 109	REV 00
10	PACKING PROCEDURE	PC:PKG:01	REV 00
11	QP FOR BW FITTINGS	QPG 46	REV 01
12	QP FOR FORGINGS	QPG 87	REV 01

Annexure I – Reverse Auction Guidelines

BHEL reserves the right to go for reverse auction (RA) (guidelines as available on www.bhel.com) instead of opening the sealed envelope price bid submitted by the bidder. This will be decided after Techno-Commercial evaluation. Bidders to give their acceptance with the offer for participation in RA. Non-acceptance to participate in RA may result in non-consideration of their bids, in case BHEL decides to go For RA.

Those bidders who have given their acceptance to participate in Reverse Auction will have to necessarily submit 'Process Compliance Form' (to the designated service provider) as well as 'Online Sealed Bid' in the Reverse auction. Non-submission of 'Process Compliance Form' or 'Online Sealed Bid' by the agreed bidder(s) will be considered as tampering of the tender process and will invite action by BHEL as per extant Guidelines for suspension of Business Dealings with Suppliers / Contractors (as available on www.bhel.com).

The bidders have to necessarily submit Online Sealed Bid less than or equal to their envelope sealed price bid already submitted to BHEL along with the offer. The envelope sealed price bid of successful L1 bidder in RA, if conducted, shall also be opened after RA and the order will be placed on lower of the two bids (RA closing price & envelope sealed price) thus obtained. The bidder having submitted this offer specifically agrees to this condition and undertakes to execute the contract on thus awarded rates.

If it is found that L1 bidder has quoted higher in online sealed bid in comparison to envelope sealed bid for any item(s), **the bidder will be issued a warning letter to this effect**. However, **if the same bidder again defaults** on this count in any subsequent tender in the unit, **it will be considered as fraud and will invite action by BHEL as per extant Guidelines for Suspension of Business Dealings** with Suppliers / Contractors (as available on www.bhel.com).