

MAHARASHTRA STATE POWER GENERATION CO. LTD

1X800 MW BHUSAWAL TPS

VOLUME – II

**TECHNICAL SPECIFICATION
FOR
TREFOIL CLAMPS**

SPECIFICATION NO: PE-TS-415-507-E015

REVISION: 0



**BHARAT HEAVY ELECTRICALS LIMITED
POWER SECTOR
PROJECT ENGINEERING MANAGEMENT
NOIDA, UP (INDIA) – 201301**



TECHNICAL SPECIFICATION FOR TREFOIL CLAMP

SPECIFICATION NO. PE-TS-415-507-E015

VOLUME II

SECTION

REVISION 00

DATE: 28.07.2021

SHEET 1 OF 1

CONTENTS

Sl. No.	DESCRIPTION	NO. OF SHEETS
1.0	SECTION- I	
	COMPLIANCE CERTIFICATE	01
	SPECIFIC TECHNICAL REQUIREMENTS	02
	DATA SHEET – A	01
2.0	SECTION- II	
	STANDARD TECHNICAL REQUIREMENTS	02
	STANDARD DRAWING	01
	STANDARD QUALITY PLAN	02

Total nos. of sheets including cover & separator sheets = 12 sheets



TECHNICAL SPECIFICATION FOR
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SPECIFICATION NO. PE-TS-415-507-E015

VOLUME II

SECTION I

REVISION 00

DATE:

SHEET 1 OF 1

COMPLIANCE CERTIFICATE

The bidder shall confirm compliance to the following by signing/ stamping this compliance certificate and furnishing same with the offer.

1. The scope of supply, technical details, construction features, design parameters etc. shall be as per technical specification & there are no exclusion/ deviation with regard to same.
2. There are no deviation with respect to specification other than those furnished in the 'schedule of deviations'
3. Only those technical submittals which are specifically asked for in NIT to be submitted at tender stage shall be considered as part of offer. Any other submission, even if made, shall not be considered as part of offer.
4. Any comments/ clarifications on technical/ inspection requirements furnished as part of bidder's covering letter shall not be considered by BHEL, and bidder's offer shall be construed to be in conformance with the specification.
5. Any changes made by the bidder in the price schedule with respect to the description/ quantities from those given in 'BOQ-Cum-Price schedule' shall not be considered (i.e., technical description and Quantities as per specification shall prevail).

BIDDER'S STAMP & SIGNATURE



TECHNICAL SPECIFICATION FOR
TREFOIL CLAMP

SPECIFICATION NO. PE-TS-415-507-E015

VOLUME II

SECTION I

REVISION 00

DATE:

SECTION – I

SPECIFIC TECHNICAL REQUIREMENTS



TECHNICAL SPECIFICATION FOR TREFOIL CLAMP

SPECIFICATION NO. PE-TS-415-507-E015

VOLUME II

SECTION I

REVISION 00

DATE:

SHEET 1 OF 2

1.0 SCOPE OF ENQUIRY

- 1.1 Design, manufacture, inspection and testing at manufacturer's works, proper packing and delivery to site of Trefoil Clamp conforming to this specification.
- 1.2 It is not the intent to specify herein all the details of design & manufacture of material. However, the material shall conform in all respects to high standard of design, engineering and workmanship and shall be capable of performing in continuous commercial operation at site conditions.
- 1.3 Technical details of trefoil clamps are indicated in Data sheet-A & section-II.
- 1.4 The stipulation of Data Sheet-A shall prevail in case of any conflict between the stipulations of Data Sheet-A & Section-II.

3.0 BILL OF QUANTITIES

Quantity requirements shall be as per BOQ cum Price Schedule.

4.0 DRAWINGS & DOCUMENTS TO BE SUBMITTED

- 4.1 Following documents shall be submitted for specific project requirement after placement of order for BHEL & customer's approval: -

Sl. No.	Drawings / Document Description	Document Number	Document Type
1	Technical Datasheet of Cable Trefoil Clamp	PE-V0-415-507-E001	Primary
2	GA drawing of Cable Trefoil Clamp	PE-V0-415-507-E002	Primary
3	Quality Plan for Cable Trefoil Clamp	PE-V0-415-507-E901	Primary
3	Type test report/ certificate	PE-V0-415-507-E003	Primary

- 4.2 Drawings/ documents shall be submitted through Document Management System (DMS).



TECHNICAL SPECIFICATION FOR TREFOIL CLAMP

SPECIFICATION NO. PE-TS-415-507-E015

VOLUME II

SECTION I

REVISION 00

DATE:

SHEET 2 OF 2

DATA SHEET - A

S.NO.	Technical Parameters		
1	Voltage grade	11kV	1.1kV
1.1	Application	Indoor & Outdoor	
1.2	Material	NYLON-6	
1.3	Hardware's	Hot Dip Galvanised / Zinc Passivated / Cadmium Plated	
2.	Type and Design	Generally conforming to Drg. No. PE-DG-999-507-E015	
3.	Sizes	To suit the ODs of cables (including tolerances in ODs) as per BOQ cum price schedule.	
4.	Short Circuit Current Value	125 kA (peak)	



TECHNICAL SPECIFICATION FOR
TREFOIL CLAMP

SPECIFICATION NO. PE-RC-999-507-E015

VOLUME II

SECTION II

REVISION 00

DATE: 03.12.2019

SECTION-II

STANDARD TECHNICAL REQUIREMENTS



TECHNICAL SPECIFICATION FOR TREFOIL CLAMP

SPECIFICATION NO. PE-RC-999-507-E015

VOLUME II

SECTION II

REVISION 0

DATE: 03.12.2019

Sheet 1 of 2

1.0 CODES AND STANDARDS

- 1.1 The material shall comply with all currently applicable safety codes and statutory regulations of India as well as of the locality where the material is to be installed.
- 1.2 The design, material, construction, manufacture, inspection and testing of Trefoil clamp shall conform to the latest revision of relevant standards and codes of practices.

2.0 TECHNICAL REQUIREMENTS

- 2.1 Technical particulars of Trefoil Clamp are specified in Datasheet-A.
- 2.2 The trefoil clamps shall be designed & manufactured in accordance with the best engineering practices and shall be suitable for intended purpose.
- 2.3 The Nylon – 6 trefoil clamps shall meet the following requirements
- a) High mechanical strength
 - b) Resistance to chemicals
 - c) Non hygroscopic
 - d) Fire retardant
- 2.4 Bolts, nuts & washers used shall be hot dip galvanised / zinc passivated / cadmium plated.

3.0 QUALITY ASSURANCE, TESTING & INSPECTION

- 3.1 Bidder shall confirm compliance with the BHEL's Standard Quality Plan (PE-QP-999-507-E009) as attached with the specification without any deviations. At contract stage, the successful bidder shall submit the Quality Plan for BHEL/ ultimate customer's approval. In case bidder has reference Quality Plan agreed with ultimate customer, same can be submitted for specific project after award of contract for BHEL/ ultimate customer's approval. There shall be no commercial implication to BHEL on account of minor changes during QP approval.
- 3.2 All materials shall be procured, manufactured, inspected and tested by vendor/ sub-vendor as per approved Quality Plan.
- 3.3 The supplier shall perform all tests necessary to ensure that the material and workmanship conform to the relevant standards and comply with the requirements of the specification. Charges for all these tests for all the equipments & components shall be deemed to be included in the bid price.
- 3.4 The bidder shall furnish the reports of all the type tests carried out, which shall conform to the latest revision of relevant standards. These reports should be for the tests conducted either in government approved third party laboratory or witnessed by client (such as major utilities/ industries) on identical/ similar items to those ordered under this contract.



TECHNICAL SPECIFICATION FOR TREFOIL CLAMP

SPECIFICATION NO. PE-RC-999-507-E015

VOLUME II

SECTION II

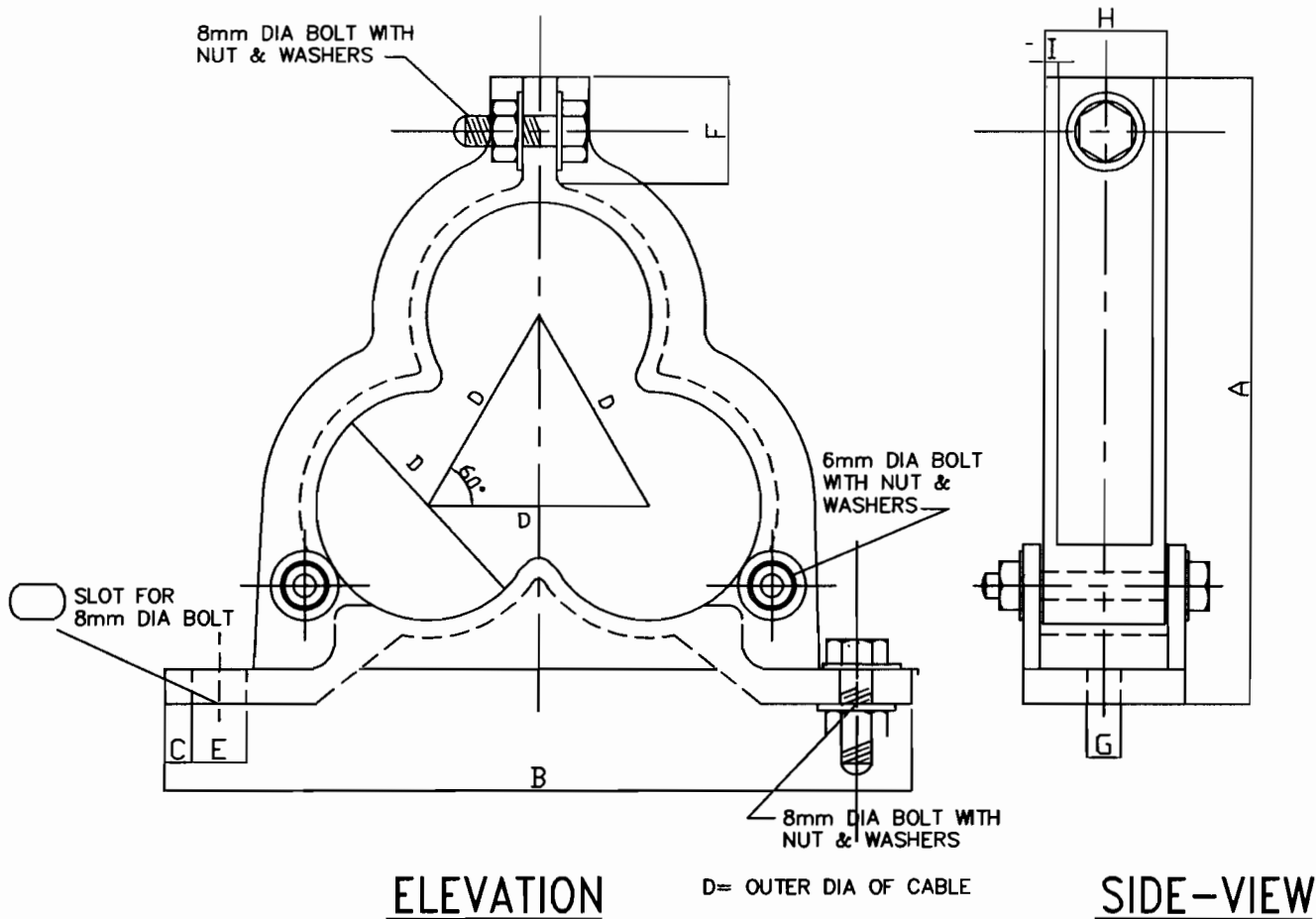
REVISION 0

DATE: 03.12.2019

Sheet 2 of 2

4.0 PACKING

Trefoil Clamp shall be packed in strong plastic bags/ strong card board container/ gunny bags to protect it against damage during transit, storage for prolonged periods and handling. It shall have proper marking over the box for easy identification.



A	B	C	D	E	F	G	H	I	CABLE SIZE

NOTES:-

1. TREFOIL CLAMPS SHALL BE OF MOULDED TYPE OF NYLON MATERIAL (NYLON-6) TYPE.
2. ALL SHARP EDGES, CORNERS AND ENDS SHALL BE ROUNDED SMOOTH.
3. ALL BOLTS, NUTS & WASHERS SHALL BE HOT DIP GALVANISED/ZINC PASSIVATED/CADMIUM PLATED.
4. MOULDING/ CASTING TOLERANCE OF TREFOIL CLAMPS SHALL BE LIMITED TO $\pm 5\%$.
5. ALL DIMENSIONS ARE IN MM.
6. ALL BOLTS WITH NUTS AND WASHERS REQUIRED FOR ASSEMBLING TREFOIL CLAMP & FOR FIXING OVER CABLE TRAY SHALL BE IN VENDOR'S SCOPE & SHALL BE SUPPLIED ALONG WITH TREFOIL CLAMP.

REVISIONS

NAME DATE

DRG. DESCRIPTION


TYPICAL DETAIL OF CABLE TREFOIL CLAMP

DRG. NO.





PE-DG-999-507-E015




BHARAT HEAVY ELECTRICALS LTD.
PROJECT ENGINEERING MANAGEMENT
NOIDA

	MANUFACTURER/ SUPPLIER NAME & ADDRESS		BIDDER/ SUPPLIER NAME & ADDRESS			STANDARD QUALITY PLAN			SPEC. NO. :		DATE:	
	CUSTOMER :						CUSTOMER :		QP NO.: PE-QP-999-507-E009, REV. 01		DATE: 31.07.2020	
	PROJECT:						PROJECT:		PO NO.:		DATE:	
	ITEM: TREFOIL CLAMPS				SYSTEM: CABLING		ITEM: TREFOIL CLAMPS		SECTION: II		SHEET 1 OF 2	

SL NO.	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD		AGENCY			REMARKS
1	2	3	4	5	M	6	7	8	9	*	**			
						C/ N				D	M	C	N	
1.0 RAW MATERIAL														
1.1	NYLONE-6	1. TENSILE STRENGTH	MA	PHYSICAL TEST	LOT WISE		MANUFACTURERS STANDARD	MANUFACTURERS STANDARD/SUPPLIER TEST CERTIFICATE	TEST CERTIFICATE	✓	P/ V	V	V	
		2.MELTING POINT	MA	PHYSICAL TEST	LOT WISE		MANUFACTURERS STANDARD	MANUFACTURERS STANDARD	TEST CERTIFICATE	✓	P	V	V	
2.0 FINISHED ITEMS														
2.1	TREFOIL CLAMPS	1. FINISH	MA	VISUAL	IS 2500 (PART 1) LEVEL S4		BHEL APPROVED DRG.	BHEL APPROVED DRG.	INSP.REP ORT	✓	P	W	W	
		2. DIMENSION	MA	MEASUREMNT	IS 2500 (PART 1) LEVEL S4		BHEL APPROVED DRG.	BHEL APPROVED DRG.	INSP.REP ORT	✓	P	W	W	
		3.TEMPERATURE CYCLE TEST	MA	PHYSICAL TEST	3 NOS. OF EACH SIZE		REFER NOTE - 1	REFER NOTE - 1	INSP.REP ORT	✓	P	W	W	
		4.LOAD BEARING TEST	MA	PHYSICAL TEST	3 NOS. OF EACH SIZE		REFER NOTE - 2	REFER NOTE - 2	INSP.REP ORT	✓	P	W	W	
		5.PACKING	MA	VISUAL	100%		BHEL APPROVED DRG.	BHEL APPROVED DRG.	INSP.REP ORT	✓	P	W	-	Refer note-3

BHEL				
ENGINEERING		QUALITY		
Prepared by:	Sign & Date	Checked by:	Sign & Date	Name
MANISH SH		KUMAR MEENA		KUNAL GANDHI
Reviewed by:	Sign & Date	Reviewed by:	Sign & Date	Name
MANISH SH		MANISH SHUKLA		R.K. JAISWAL
FOR CUSTOMER REVIEW & APPROVAL				
Doc No:		Sign & Date		
Reviewed by:		Name		
Approved by:		Seal		

	MANUFACTURER/ SUPPLIER NAME & ADDRESS		BIDDER/ ADDRESS		STANDARD QUALITY PLAN		SPEC. NO :	DATE:
	CUSTOMER :				QP NO.: PE-QP-999-507-E009, REV. 01		DATE: 31.07.2020	
	PROJECT:				PO NO.:		DATE:	
	ITEM: TREFOIL CLAMPS		SYSTEM: CABLING		SECTION: II		SHEET 2 OF 2	

NOTES:

1. The clamps, in unassembled condition, shall be subjected to temperature cycle test as follows:

The clamps shall be put into boiling water at a temp. of 90 to 100 degree centigrade for 15 minutes. After this, they shall be taken out and put immediately in cold water at room temp where they will be allowed to cool for 15 minutes. The entire test will comprise of 5 transfers, ie; cold to hot, hot to cold, cold to hot, hot to cold and cold to hot. After the test, the clamps should show no signs of deformity or breakage.

2. After temperature cycle test, the same materials have to go undergo this test.

Samples have to be fixed and should apply loads of 25kg, 45kg and 75kg for cable OD up to 40mm, 40 to 60mm and above 60mm respectively on each side one by one for 1 minute. And then apply 10kg, 15kg and 20kg loads respectively as mentioned above in the centre for 1 minute. There should not be any breakage / deformity in the samples after the above process.

3. Photographs of Trefoil clamp after packing to be sent to BHEL purchase group for review before issuing of MDCC.

4. Project specific Quality plan to be developed based on customer requirement.

5. BHEL reserves the right for conducting repeat test if required.

6. For export job, BHEL specification for seaworthy packing for export job to be followed.

7. Packing shall be suitable for storage at site in tropical climatic conditions.

8. Latest revision /year of issue of all the standards (IS/ASME/IEC etc.) indicated in the QP shall be referred.

LEGENDS:

*RECORDS, IDENTIFIED WITH "TICK"(✓) SHALL BE ESSENTIALLY INCLUDED BY SUPPLIER IN QA DOCUMENTATION, **D:** DOCUMENTATION

** M: SUPPLIER/ MANUFACTURER/ SUB-SUPPLIER, C: MAIN SUPPLIER/ BHEL/ THIRD PARTY INSPECTION AGENCY, N: CUSTOMER,

P: PERFORM, W: WITNESS, V: VERIFICATION, AS APPROPRIATE

MA: MAJOR, MI: MINOR, CR: CRITICAL

BHEL			
ENGINEERING		QUALITY	
Sign & Date	Name	Sign & Date	Name
Prepared by: MA NISH	M. MEENA	Checked by: M. MEENA	KUNAL GANDHI
Reviewed by: MA NISH	MANISH SHUKLA	Reviewed by: MA NISH	R.K. JAISWAL
<small>Digitally signed by MA NISH, DN: cn=MA NISH, o=BHEL, ou=QA, email=ma.nish@bhel.co.in, c=IN</small>		<small>Digitally signed by RITESH K. KUMAR JAISWAL, DN: cn=RITESH K. KUMAR JAISWAL, o=BHEL, ou=QA, email=ritesh.k.jaiswal@bhel.co.in, c=IN</small>	
Date: 2020.08.06 16:44:03		Date: 2020.08.06 16:44:03	
+05'30'		+05'30'	

FOR CUSTOMER REVIEW & APPROVAL			
Doc No:			
Reviewed by:	Sign & Date	Name	Seal
Approved by:			

	PRE-QUALIFICATION REQUIREMENTS FOR TREFOIL CLAMPS	PE-PQ-999-507-E005
		REVISION NO. 03 DATE 03/06/2021
		Page 1 of 2

ITEMS: Trefoil Clamps

Vendor may be considered for evaluation for one or more of the following type of trefoil clamps:

Type 1 – Nylon – 6 material

Type 2 – Aluminium alloy

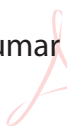


Type 3 – FRP

SCOPE: Supply: YES; Erection & Commissioning: NO;

1	Manufactured & supplied applicable type of trefoil clamps for single core cable of minimum overall dia. of 50 mm.
2	Availability of type test certificates (for short circuit at 125kA peak or above) for the applicable type of trefoil clamps.
3	Vendor should have in-house manufacturing & testing facility for applicable type of trefoil clamps.
4	Manufacturing capacity of 10000 nos. per month for the applicable type of trefoil clamps.
5	Manufactured & supplied at least 20000 nos. trefoil clamps of applicable type in one or more orders.
6	Minimum two (2) nos. purchase orders for trefoil clamps of applicable type shall be submitted which should not be more than five (5) years old from the date of application for registration or date of techno-commercial bid opening (as applicable) for establishing continuity in business.

Notes (General points of PQR):

1. Offers of the JV companies/ Joint Bidders/ bidders having collaboration/ licensing agreement/ MOU/ Indian subsidiaries shall be evaluated as follows:
 - a. If bidder happens to be an Indian subsidiaries of foreign OEM, then the credentials of the foreign OEM can also be considered for meeting PQR.
 - b. If bidder happens to be the Joint Venture Company, then the credentials of any of JV partners can be also considered for meeting PQR.
 - c. If bidder happens to bid jointly with their partner, then credentials of both the partners will be considered for meeting PQR as per distribution of the work. In all such cases, lead bidder as specified in bid documents shall be responsible for overall execution of the contract and all guarantee/ warranty.

<p align="center">PREPARED BY</p> <p align="center">  Sujit Kumar Sethy <small>Digitally signed by Sujit Kumar Sethy DN: cn=Sujit Kumar Sethy, o=BHEL, ou=PEM, email=sujitkumarsethy@bhel.in, c=IN Date: 2021.06.03 12:46:55 +05'30'</small> SUJIT KUMAR SETHY, DY. MANAGER </p>	<p align="center">REVIEWED BY</p> <p align="center">  okumar <small>Digitally signed by okumar DN: cn=okumar, o=bhel, ou=bhel, email=okumar@bhel.in, c=IN Date: 2021.06.03 15:38:18 +05'30'</small> OMKAR KUMAR, DGM </p>	<p align="center">APPROVED BY</p> <p align="center">  Debasisa Rath <small>Digitally signed by Debasisa Rath DN: cn=Debasisa Rath, o=BHEL, ou=BHEL, email=debameena@gmail.com, c=IN Date: 2021.06.06 21:13:58 +05'30'</small> DEBASISA RATH, AGM (DH) </p>
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	PRE-QUALIFICATION REQUIREMENTS FOR TREFOIL CLAMPS	PE-PQ-999-507-E005
		REVISION NO. 03 DATE 03/06/2021
		Page 2 of 2

- d. If bidder happens to be the having valid collaboration agreement/ MOU/ licensing agreement with some other company, then the credentials of collaborator/ MOU partner/ licensing company can also be considered for meeting PQR.

Note: If bidder(s) qualifies on the basis of credentials of his principal/ JV partner/ Collaborator/ joint bidder etc., then the principal/ JV partner/ Collaborator/ MOU partner/ joint bidder shall be responsible for overall design vetting and warranty/ guarantee of the package. The scope matrix clearly defining their respective roles including design vetting, manufacturing of critical component, E&C etc. etc. and warranty/ guarantee shall be submitted along with the offer.

- Bidder to note that the arrangement of bidding (joint bid partners/ collaborator/ MOU partner/ licensing company etc.) once offered to BHEL as a part of bidding documents cannot be changed till the execution of the project.
- Consideration of offer shall be subject to customer's approval of bidders, if applicable
- Bidder to submit all supporting documents in English. If documents submitted by bidder are in language other than English, a self- attested English translated document should also be submitted.
- Any other project specific requirement shall be as per Annexure-I and bidder shall submit relevant supporting documents. Bidder to meet criteria as stated above and as per Annexure-I.
- Notwithstanding anything stated above, BHEL reserves the right to assess the capabilities and capacity of the bidder to perform the contract, should the circumstances warrant such assessment in the overall interest of BHEL.
- After satisfactory fulfilment of the above criteria/ requirement, offer shall be considered for further evaluation as per NIT and all the other terms of tender.

<p>PREPARED BY</p> <p>Sujit Kumar Sethy</p> <p><small>Digitally signed by Sujit Kumar Sethy DN: cn=Sujit Kumar Sethy, o=BHEL, ou=PEM, email=sujitkumarsethy@bhel.in, c=IN Date: 2021.06.03 12:47:21 +05'30'</small></p> <p>SUJIT KUMAR SETHY, DY. MANAGER</p>	<p>REVIEWED BY</p> <p>okumar</p> <p><small>Digitally signed by okumar DN: cn=okumar, o=bhel, ou=bhel, email=okumar@bhel.in, c=IN Date: 2021.06.03 15:40:42 +05'30'</small></p> <p>OMKAR KUMAR, DGM</p>	<p>APPROVED BY</p> <p>Debasis a Rath</p> <p><small>Digitally signed by Debasis Rath DN: cn=Debasis Rath, o=BHEL, ou=bhel, email=debasisa@gmail.com, c=IN Date: 2021.06.06 21:14:38 +05'30'</small></p> <p>DEBASISA RATH, AGM (DH)</p>
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**BHEL PEM ELECTRICAL
PRE-QUALIFYING REQUIREMENTS FOR TREFOIL CLAMPS
ANNEXURE – I
PROJECT SPECIFIC CRITERIA AGAINST ENQUIRY
PROJECT: 1X660 MW BHUSAWAL TPS UNIT 6**

-NIL-

Devendra Singh
[Dy. Manager]

Kavita Gupta
[Manager]

Omkar Kumar
[Section Head]

Debasisa Rath
[DH-Electrical]

Letter head of Company (<Rs. 10 Cr value)

Ref.....

Date.....

To,

Bharat Heavy Electricals Limited

PEM, PPEI Building, Plot No 25,

Sector -16A, Noida (U.P)-201301

Subject: - Certification regarding local content

Reference: Bid No.- ..

Name of Package: .TREFOIL CLAMP

Dear Sir,

We hereby certify that items offered by us of(package name).....for.....(Project Name/Rate contract)..... meets the requirement of minimum local content in line with Cl. No. and the Public Procurement (Preference to Make in India), Order 2017 dated-15.06.2017, 28.05.2018 & 29.05.2019.

We further confirms that details of location at which the local value addition is made will be our registered works at(address of the works)

Yours very truly

..... (authorized signatory of company)

..... (firm name)

authorized signatory
of company

An undertaking regarding Model Clauses (To be provided alongwith bid)

Reference:

RA/Bid no:

Item: TREFOIL CLAMP

Project: 1 X 660 MW BHUSAWAL TPP

TO WHOM SO IT MAY CONCERN

This is with reference to Ministry of Finance circular dated 23.07.20 reg. restriction under rule 144 (xi) of GFR.

“I have read the clause regarding restrictions on procurement from a bidder of a country which shares a land border with India. I hereby certify that M/sis not from such a country and is eligible to be considered against Bid/RA no:”

Sign & Signature

Date:

Place: