

## **TENDER SPECIFICATIONS**

**E- TENDER SPECIFICATION NUMBER: BHE/PW/PUR/NTPRT-CABLING U2/2909**

**FOR**

**Cabling Package of Unit#2 at 3 X 800 MWPVUNL PROJECT PATRATU, DISTRICT-  
RAMGARH STATE- JHARKHAND**

### **VOLUME I - TECHNICAL BID**

**THIS TENDER SPECIFICATION CONSISTS OF:**

<b>Notice Inviting Tender</b>	
<b>Volume-IA</b>	<b>Technical Conditions of Contract</b>
<b>Volume-IB</b>	<b>Special conditions of Contract</b>
<b>Volume-IC</b>	<b>General conditions of Contract</b>
<b>Volume-ID</b>	<b>Forms &amp; Procedures</b>
<b>Volume-IE</b>	<b>Additional Annexures</b>
<b>Volume II</b>	<b>Price Bid</b>

**Bharat Heavy Electricals Limited**



*(A Government of India Undertaking)*

Power Sector – Western Region

345-Kingsway, Nagpur-440001

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Volume No	Description	Hosted in website bhel.com (Briefly) and detailed in BHEL e-Procurement Portal as files titled
NIL	Tender Specification Issue Details	(Part of <b><u>Vol-IA-2909</u></b> )
NIL	Notice Inviting Tender	(Part of <b><u>Vol-IA-2909</u></b> )
I-A	Technical Conditions of Contract	Vol-I-A-2909
I-B	Special Conditions of Contract	Vol-I-BCD-2909
I-C	General Conditions of Contract	(Part of Vol-I-BCD-2909)
I-D	Forms & Procedures	(Part of Vol-I-BCD-2909)
I-E	Technical Specification & Drawing	Vol-IE-2909
II	Price Bid Specification as specified in E-Procurement Portal	Volume-II-2909

**E-TENDER SPECIFICATIONS**

**E- TENDER SPECIFICATION NUMBER: BHE/PW/PUR/NTPRT-CABLING U2/2909**

**FOR**

**Cabling Package of Unit#2 at 3 X 800 MWPVUNL PROJECT PATRATU, DISTRICT-RAMGARH  
STATE- JHARKHAND**

EARNEST MONEY DEPOSIT: Refer Notice Inviting Tender

LAST DATE FOR                      Refer Notice Inviting Tender  
TENDER SUBMISSION

THESE TENDER SPECIFICATION DOCUMENTS CONTAINING VOLUME-I AND VOLUME- II ARE ISSUED TO:

M/s. ....  
.....

PLEASE NOTE:  
THESE TENDER SPECS DOCUMENTS ARE NOT TRANSFERABLE.

For Bharat Heavy Electricals Limited

**GM (Purchase)**  
Place: Nagpur  
Dae:

**BHEL PSWR**  
**Notice Inviting Tender**  
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Date:30/01/2024

**NOTICE INVITING TENDER (NIT)**

**NOTE: BIDDER MAY DOWNLOAD FROM WEB SITES**

To,

Dear Sir/Madam,

**Sub : NOTICE INVITING E-TENDER**

Sealed offers in two part bid system (National competitive bidding (NCB) ~~or International Co07/11mpetitive Bidding (ICB~~ are invited from reputed & experienced bidders (meeting PRE QUALIFICATION CRITERIA as mentioned in Annexure-1) through E-Procurement Portal <https://eprocurebhel.co.in> only, for the subject job by the undersigned on the behalf of BHARAT HEAVY ELECTRICALS LIMITED as per the tender document. Following points relevant to the tender may please be noted and complied with.

**1.0 Salient Features of NIT**

S No.	ISSUE	DESCRIPTION	
i	TENDER NUMBER	BHE/PW/PUR/NTPRT-CABLING U2/2909	
ii	Broad Scope of job	Cabling Package of Unit#2 at 3 X 800 MWPVUNL PROJECT PATRATU, DISTRICT-RAMGARH STATE- JHARKHAND	
iii	DETAILS OF TENDER DOCUMENT		
A	Volume-IA	Technical Conditions of Contract (TCC) consisting of Scope of work, Technical Specification, Drawings, Procedures, Bill of Quantities, Terms of payment, etc.	Applicable
B	Volume-IB	Special Conditions of Contract (SCC)	Applicable
C	Volume-IC	General Conditions of Contract (GCC)	Applicable
D	Volume-ID	Forms and Procedures	Applicable
E	Volume-IE	Drawing and Plot Plan	Applicable
	Volume-II	Price Schedule (Absolute value).	Applicable
iv	Issue of Tender Documents	Tender documents will be available for downloading from BHEL website (www.bhel.com) or e-procurement portal ( <a href="https://eprocurebhel.co.in">https://eprocurebhel.co.in</a> ) as per schedule below: <b>Start: 30/01/2024, Time :18:00 Hrs</b> <b>Closes: 20/02/2024, Time: 13:00 Hrs</b> Brief information of the tenders shall also be available at central public procurement portal. ( <a href="https://eprocure.gov.in/epublish/app">https://eprocure.gov.in/epublish/app</a> )	Applicable
v	DUE DATE & TIME OF OFFER	<b>Date: 20/02/2024, Time :13:00 Hrs</b>	Applicable

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S No.	ISSUE	DESCRIPTION	
	<b>SUBMISSION</b>	<p>The bidder should submit their offer online only in e-Procurement portal at <a href="https://eprocurebhel.co.in">https://eprocurebhel.co.in</a></p> <p><b><u>Bidders are requested to upload their offer well in advance in order to avoid last minute congestion at this website.</u></b></p> <p>Hard copy bid or bids through E-mail / fax shall not be accepted.</p>	
vi	<b>OPENING OF TENDER (Techno-Commercial Bid)</b>	<p><b>Date:20/02/2024, Time: 17:00 Hrs</b></p> <p>Notes:</p> <p>(1) In case the due date of opening of tender becomes a non-working day, then the due date &amp; time of offer submission and opening of tenders get extended to the next working day.</p> <p>(2) Bidder may depute representative to witness the opening of tender. For e-Tender, Bidder may witness the opening of tender through e-Procurement portal only.</p>	Applicable
vii	<b>EMD AMOUNT</b>	<p><b>5,00,000/- (Rupees Five Lakhs Only)</b></p> <p><b>Important Note: Bidders kindly to take note that EMD (Earnest Money Deposit) shall be furnished by MSE bidders as well, as per the amount and procedure indicated in the NIT/GCC</b></p>	Applicable
viii	<b>COST OF TENDER</b>	NIL	Not Applicable
ix	<b>LAST DATE FOR SEEKING CLARIFICATION</b>	<p><b>One day before due date of offer submission.</b></p> <p>Along with soft version also, addressing to undersigned &amp; to others as per contact address given below:</p> <p>1) Name: Viveka Nand Jha/ <b>Tapish Kumar</b> Designation: Manager Deptt: Purchase Address: Floor no. 5 &amp; 6, Shree Mohini Complex, 345 Kingsway, Nagpur-440001 Mobile-9429198214/ <b>9010903666</b> Email: <a href="mailto:vivekjha@bhel.in">vivekjha@bhel.in</a>/ <a href="mailto:tapishkhandelwal@bhel.in">tapishkhandelwal@bhel.in</a></p> <p>2) Mr. Kamlesh Kumar Designation: DGM Deptt: Purchase Address: Floor no. 5 &amp; 6, Shree Mohini Complex, 345 Kingsway, Nagpur-440001 Email: <a href="mailto:kamleshbhel@bhel.in">kamleshbhel@bhel.in</a> Mob: 9425554615</p> <p>3) Name: R. M. Malhotra Designation: GM</p>	Applicable

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S No.	ISSUE	DESCRIPTION	
		Deptt: Purchase Address: Floor no. 5 & 6, Shree Mohini Complex, 345 Kingsway, Nagpur-440001 Email : <a href="mailto:rmalhotra@bhel.in">rmalhotra@bhel.in</a>	
x	<b>SCHEDULE OF Pre Bid Discussion (PBD)</b>	---	<b>Not Applicable</b>
xi	<b>INTEGRITY PACT &amp; DETAILS OF INDEPENDENT EXTERNAL MONITOR (IEM)</b>	1) Shri Otem Dai, IAS (Retd.) 2) Shri Bishwamitra Pandey, IRAS (Retd.) 3) Shri Mukesh Mittal, IRS (Retd.)	<b>Applicable</b>
xii	<b>Latest updates</b>	Latest updates on the important dates, Amendments, Correspondences, Corrigenda, Clarifications, Changes, Errata, Modifications, Revisions, etc to Tender Specifications will be hosted in BHEL webpage ( <a href="http://www.bhel.com">www.bhel.com</a> -->Tender Notifications →View Corrigendum), Central Public Procurement portal ( <a href="https://eprocure.gov.in/epublish/app">https://eprocure.gov.in/epublish/app</a> ) & on e-tender portal <a href="https://eprocurebhel.co.in">https://eprocurebhel.co.in</a> and not in the newspapers. Bidders to keep themselves updated with all such information.	

2.0 The offer shall be submitted as per the instructions of tender document and as detailed in this NIT. Bidders to note specifically that all pages of tender document, including these NIT pages of this particular tender together with subsequent correspondences shall be submitted by them, duly signed digitally using Class III DSC & uploaded in E-Procurement Portal, as part of offer. **Rates/Price including discounts/rebates, if any, mentioned anywhere/in any form in the techno-commercial offer other than the Price Bid, shall not be entertained.**

3.0 Not Used

4.0 Unless specifically stated otherwise, bidder shall deposit EMD as per clause 1.9 of General Conditions of Contract.

For Electronic Fund Transfer the details are as below:-

NAME OF THE BENEFICIARY	BHARAT HEAVY ELECTRICALS LTD
ADDRESS OF THE COMPANY	5th Floor, SHREE MOHINI COMPLEX 345, KINGSWAY,NAGPUR
NAME OF BANK	STATE BANK OF INDIA
NAME OF BANK BRANCH AND BRANCH CODE	SBI,NAGPUR MAIN BRANCH ,CODE-00432
CITY	NAGPUR
ACCOUNT NUMBER	40227423158
ACCOUNT TYPE	MC-C C Clean (C&I)
IFSC CODE OF THE BENEFICIARY BANK BRANCH	SBIN0000432
MICR CODE OF THE BANK BRANCH	440002002

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(Note -: In case of E-Tenders, proof of remittance of EMD should be uploaded in the E-Procurement Portal and originals, as applicable, shall be sent to the officer inviting tender within a reasonable time, failing which the offer is liable to be rejected.

(Note -: In case of E-Tenders, proof of remittance of EMD should be uploaded in the E-Procurement Portal and originals, as applicable, shall be sent to the officer inviting tender within a reasonable time, failing which the offer is liable to be rejected.

**5.0 Procedure for Submission of Tenders:**

This is an E-tender floated online through our E-Procurement Site (<https://eprocurebhel.co.in>). The bidder should respond by submitting their offer online only in our e-Procurement platform at (<https://eprocurebhel.co.in>). Offers are invited in two-parts only.

**Documents Comprising the e-Tender**

The tender shall be submitted online ONLY EXCEPT EMD (in physical form) as mentioned below:

**a. Technical Tender (UN priced Tender)**

All Technical details (e.g. Eligibility Criteria requested (as mentioned below)) should be attached in e-tendering module, failing which the tender stands invalid & may be REJECTED. Bidders shall furnish the following information along with technical tender (preferably in pdf format):

- i. Earnest Money Deposit (EMD) furnished in accordance with NIT Clause 4.0. ~~Alternatively, documentary evidence for claiming exemption as per clause 29 of NIT.~~
- ii. Technical Bid (without indicating any prices).

**b. Price Bid:**

- i. Prices are to be quoted in the attached Price Bid format online on e-tender portal.
- ii. The price should be quoted for the accounting unit indicated in the e-tender document.

**Note:**

- It is the responsibility of tenderer to go through the Tender document to ensure furnishing all required documents in addition to above, if any. Any deviation would result in REJECTION of tender and would not be considered at a later stage at any cost by BHEL.
- A person signing (manually or digitally) the tender form or any documents forming part of the contract on behalf of another shall be deemed to warrantee that he has authority to bind such other persons and if, on enquiry, it appears that the persons so signing had no authority to do so, the purchaser may, without prejudice to other civil and criminal remedies, cancel the contract and hold the signatory liable for all cost and damages.
- A tender, which does not fulfil any of the above requirements and/or gives evasive information/reply against any such requirement, shall be liable to be ignored and rejected.

**DO NOT'S**

Bidders are requested NOT to submit the hard copy of the Bid. In case offer is sent through hard copy/fax/telex/cable/electronically in place of e-tender, the same shall not be considered. **Also, uploading of the price bid in prequalification bid or technical bid may RESULT IN REJECTION of the tender.**

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**Digital Signing of e-Tender**

Tenders shall be uploaded with all relevant PDF/zip format. The relevant tender documents should be uploaded by an authorized person having Class 3- SHA2- 2048 BIT- SIGNING & ENCRYPTION digital signature certificate (DSC).

**The Requirement:**

1. A PC with Internet connectivity &
2. DSC (Digital Signature Certificate) (**Class 3- SHA2- 2048 BIT- SIGNING & ENCRYPTION**)

BHEL has finalized the e-procurement service Provider:-

**NIC PORTAL (<https://eprocurebhel.co.in>)**

**For E-PROCUREMENT ASSISTANCE & TRAINING, NIC PORTAL HELPDESK CONTACTS AS PER FOLLOWING:**

**For any technical related queries, please call at 24 x 7 Help Desk Number**

**0120-4001 002**

**0120-4200 462**

**0120-4001 005**

**0120-6277 787**

**1. Peter Raj, NIC, Ph: 9942069052**

**Email Support: [support-eproc@nic.in](mailto:support-eproc@nic.in)**

**Other details/update yourself from : <https://eprocurebhel.co.in>**

The process of utilizing e-procurement necessitates usage of **DSC (Digital Signature Certificate) (Class 3- SHA2- 2048 BIT- SIGNING & ENCRYPTION)** and you are requested to procure the same immediately, if not presently available with you. Please note that only with DSC, you will be able to login the e-procurement secured site and take part in the tendering process.

The contact details of the DSC certifying authority:-

please refer <http://www.mca.gov.in/> → MCA SERVICES → DSC SERVICES

Vendors are requested to go through seller manual available on <https://eprocurebhel.co.in>.

**Procedure for Submission of Tenders (To be used in case of Paper bid only):** The Tenderers must submit their Tenders to Officer inviting Tender, as detailed below:

- ~~PART-I consisting of 'PART-I A (Techno Commercial Bid)' & 'PART-I B (EMD)' in two separate sealed and superscribed envelopes (ENVELOPE-I & ENVELOPE-II)~~
- ~~PART-II (Price Bid) in sealed and superscribed envelope (ENVELOPE-III)~~

~~One set of tender documents shall be retained by the bidder for their reference~~

**6.0 The contents for ENVELOPES and the superscription for each sealed cover/Envelope are as given below. (All pages to be signed and stamped) (To be used in case of Paper bid only):**

Sl. no.	Description	Remarks
	<b>Part-I A</b>	
	<del>ENVELOPE – I superscribed as:</del> <del>PART-I (TECHNO COMMERCIAL BID)</del>	



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	<b>TENDER NO :-</b> <b>NAME OF WORK :-</b> <b>PROJECT :-</b> <b>DUE DATE OF SUBMISSION:-</b>  <b>CONTAINING THE FOLLOWING:-</b>	
i. —	Covering letter/Offer forwarding letter of Tenderer.	
ii. —	Duly filled in 'No Deviation Certificate' as per prescribed format to be placed after document under sl no (i) above.  <b>Note:</b> a. In case of any deviation, the same should be submitted separately for technical & commercial parts, indicating respective clauses of tender against which deviation is taken by bidder. The list of such deviation shall be placed after document under sl no (i) above. It shall be specifically noted that deviation recorded elsewhere shall not be entertained. b. BHEL reserves the right to accept/reject the deviations without assigning any reasons, and BHEL decision is final and binding. i). In case of acceptance of the deviations, appropriate loading shall be done by BHEL ii). In case of unacceptable deviations, BHEL reserves the right to reject the tender	
iii. —	Supporting documents/ annexure/ schedules/ drawing etc. as required in line with Pre-Qualification criteria.  It shall be specifically noted that all documents as per above shall be indexed properly and credential certificates issued by clients shall distinctly bear the name of organization, contact ph. no, FAX no, etc.	
iv. —	All Amendments/Correspondences/Corrigenda/Clarifications/Changes/Errata etc. pertinent to this NIT.	
v. —	Integrity Pact Agreement (Duly signed by the authorized signatory)	If applicable
vi. —	Duly filled in annexures, formats etc. as required under this Tender Specification/NIT	
vii. —	Notice inviting Tender (NIT)	
viii. —	Volume I A : Technical Conditions of Contract (TCC) consisting of Scope of work, Technical Specification, Drawings, Procedures, Bill of Quantities, Terms of payment, etc.	
ix. —	Volume I B : Special Conditions of Contract (SCC)	
x. —	Volume I C : General Conditions of Contract (GCC)	
xi. —	Volume I D : Forms & Procedures	
xii. —	Volume II (UNPRICED – without disclosing rates/price, but mentioning only 'QUOTED' or 'UNQUOTED' against each item	
xiii. —	Any other details preferred by bidder with proper indexing.	

	<b>PART-I B</b>	
	<b><u>ENVELOPE – II superscribed as:</u></b> <b>PART I (EMD)</b> <b>TENDER NO :-</b>	

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	<b>NAME OF WORK:-</b> <b>PROJECT:-</b> <b>DUE DATE OF SUBMISSION:-</b>  <b>CONTAINING THE FOLLOWING:-</b>	
	Earnest Money Deposit (EMD) in the form as indicated in this Tender	

	<b>PART-II</b>	
	<b>PRICE BID</b> consisting of the following shall be enclosed	
	<b><u>ENVELOPE-III</u></b> superscribed as: PART-II (PRICE BID) TENDER NO:- NAME OF WORK:- PROJECT:- DUE DATE OF SUBMISSION:-  <b>CONTAINING THE FOLLOWING</b>	
i	Covering letter/Offer forwarding letter of Tenderer enclosed in Part-I	
ii	Volume II – PRICE BID ( Duly Filled in Schedule of Rates – rate/price to be entered in words as well as figures)	

	<b>OUTER COVER</b>	
	<b><u>ENVELOPE-IV</u></b> (MAIN ENVELOPE / OUTER ENVELOPE) superscribed as: TECHNO-COMMERCIAL BID, PRICE BID & EMD TENDER NO:- NAME OF WORK:- PROJECT:- DUE DATE OF SUBMISSION:-  <b>CONTAINING THE FOLLOWING:</b>	
i	⊖ Envelopes I ⊖ Envelopes II ⊖ Envelopes III	

- **SPECIAL NOTE: All documents/ annexures to be submitted should be uploaded in respective places in the E-Tender portal as per the list mentioned given in this NIT. BHEL shall not be responsible for any in-complete documents.**

- 7.0 Deviation with respect to tender clauses and additional clauses/suggestions in Techno-commercial bid / Price bid shall NOT be considered by BHEL. Bidders are requested to positively comply with the same.
- 8.0 BHEL reserves the right to accept or reject any or all Offers without assigning any reasons thereof. BHEL also reserves the right to cancel the Tender wholly or partly without assigning any reason thereof. Also BHEL shall not entertain any correspondence from bidders in this matter (except for the refund of EMD).
- 9.0 **Assessment of Capacity of Bidders:**

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**Bidder's capacity for executing the job under tender shall be assessed based on its 'LOAD and PERFORMANCE' and 'AVERAGE ANNUAL TURNOVER', as per the following:**

- I. **LOAD:** Load takes into consideration ALL the contracts of the Bidder under execution with BHEL Regions, irrespective of whether they are similar to the tendered scope or not. The cut off month for reckoning 'Load' shall be the 3<sup>rd</sup> Month preceding the month corresponding to the 'latest date of bid submission', in the following manner -

**(Note:** For example, if latest bid submission is in Jan 2017, then the 'load' shall be calculated up to and inclusive of Oct 2016)

Total number of Packages in hand = Load (P)

Where 'P' is the sum of all unit wise identified packages (refer table-1) under execution with BHEL Regions as on the cut off month defined above, including packages yet to be commenced, excepting packages which are on Long Hold.

- II. **PERFORMANCE:** Here 'Monthly Performance' of the bidder for all the packages (under execution/ executed during the 'Period of Assessment' in all Power Sector Regions of BHEL) SIMILAR to the packages covered under the tendered scope, excepting packages not commenced shall be taken into consideration. The 'Period of Assessment' shall be 6 months preceding and including the cut off month. The cut off month for reckoning 'Period of Assessment' shall be the 3<sup>rd</sup> Month preceding the month corresponding to 'latest date of bid submission', in the following manner:

**(Note:** For example, if 'latest date of bid submission' is in Jan 2017, then the 'performance' shall be assessed for a 6 months' period up to and inclusive of Oct 2016 (i.e. from May 2016 to Oct 2016), for all the unit wise identified packages (refer Table I))

- i). Calculation of Overall 'Performance Rating' for 'Similar Package/Packages' for the tendered scope under execution at Power Sector Regions for the 'Period of Assessment':

This shall be obtained by summing up the 'Monthly Performance Evaluation' scores obtained by the bidder in all Regions for all the similar Package/packages', divided by the total number of Package months for which evaluation should have been done, as per procedure below:

- a)  $P_1, P_2, P_3, P_4, P_5, \dots, P_N$  etc. be the packages (under execution/ executed during the 'Period of Assessment' in all Regions of BHEL) SIMILAR to the packages covered under the tendered scope, excepting packages not commenced. Total number of similar packages for all Regions =  $P_T$  (i.e.  $P_T = P_1 + P_2 + P_3 + P_4 + \dots + P_N$ )
- b) Number of Months ' $T_1$ ' for which 'Monthly Performance Evaluation' as per relevant formats, should have been done in the 'Period of Assessment' for the corresponding similar package  $P_1$ . Similarly  $T_2$  for package  $P_2, T_3$  for package  $P_3$ , etc. for the tendered

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scope. Now calculate cumulative total months ' $T_T$ ' for total similar Packages ' $P_T$ ' for all Regions (i.e.  $T_T = T_1 + T_2 + T_3 + T_4 + \dots T_N$ )

- c) Sum ' $S_1$ ' of 'Monthly Performance Evaluation' Scores ( $S_{1-1}, S_{1-2}, S_{1-3}, S_{1-4}, S_{1-5} \dots S_{1-T_1}$ ) for similar package  $P_1$ , for the 'period of assessment' ' $T_1$ ' (i.e.  $S_1 = S_{1-1} + S_{1-2} + S_{1-3} + S_{1-4} + S_{1-5} + \dots S_{1-T_1}$ ). Similarly,  $S_2$  for package  $P_2$  for period  $T_2$ ,  $S_3$  for package  $P_3$  for period  $T_3$  etc. for the tendered scope for all Regions. Now calculate cumulative sum ' $S_T$ ' of 'Monthly Performance Evaluation' Scores for total similar Packages ' $P_T$ ' for all Regions (i.e. ' $S_T = S_1 + S_2 + S_3 + S_4 + S_5 + \dots S_N$ ')
- d) **Overall Performance Rating ' $R_{BHEL}$ ' for the Similar Package/Packages** (under execution/ executed during the 'Period of Assessment') in all the Power Sector Regions of BHEL

$$= \frac{\text{Aggregate of Performance scores for all similar packages in all the Regions}}{\text{Aggregate of months for each of the similar packages for which performance should have been evaluated in all the Regions}}$$

$$= \frac{S_T}{T_T}$$

- e) Bidders to note that the risk of non-evaluation or non-availability of the 'Monthly Performance Evaluation' reports as per relevant formats is to be borne by the Bidder.

- f) Table showing methodology for calculating 'a', 'b' and 'c' above

Sl. No.	Item Description	Details for all Regions							Total
(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	(viii)	(ix)	(x)
1	Similar Packages for all Regions → (under execution/ executed during period of assessment)	$P_1$	$P_2$	$P_3$	$P_4$	$P_5$	...	$P_N$	Total No. of similar packages for all Regions = $P_T$ i.e. Sum ( $\Sigma$ ) of columns (iii) to (ix)

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Sl. No.	Item Description	Details for all Regions							Total
(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	(viii)	(ix)	(x)
2	Number of Months for which 'Monthly Performance Evaluation' as per relevant formats should have been done in the 'period of assessment' for corresponding Similar Packages ( as in row 1)	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	...	T <sub>N</sub>	Sum ( $\Sigma$ ) of columns (iii) to (ix)  = T <sub>T</sub>
3	Monthly performance scores for the corresponding period (as in Row 2)	S <sub>1-1</sub> , S <sub>1-2</sub> , S <sub>1-3</sub> , S <sub>1-4</sub> , ... S <sub>1-T1</sub>	S <sub>2-1</sub> , S <sub>2-2</sub> , S <sub>2-3</sub> , S <sub>2-4</sub> , ... S <sub>2-T2</sub>	S <sub>3-1</sub> , S <sub>3-2</sub> , S <sub>3-3</sub> , S <sub>3-4</sub> , ... S <sub>3-T3</sub>	S <sub>4-1</sub> , S <sub>4-2</sub> , S <sub>4-3</sub> , S <sub>4-4</sub> , ... S <sub>4-T4</sub>	S <sub>5-1</sub> , S <sub>5-2</sub> , S <sub>5-3</sub> , S <sub>5-4</sub> , ... S <sub>5-T5</sub>	.. .. .. .. .. .. ..	S <sub>N-1</sub> , S <sub>N-2</sub> , S <sub>N-3</sub> , S <sub>N-4</sub> , ... S <sub>N-TN</sub>	-----
4	Sum of Monthly Performance scores of the corresponding Package for the corresponding period (as in row-3)	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	S <sub>4</sub>	S <sub>5</sub>	...	S <sub>N</sub>	Sum ( $\Sigma$ ) of columns (iii) to (ix) = S <sub>T</sub>

- ii). Calculation of Overall 'Performance Rating' ( $R_{BHEL}$ ) in case at least 6 evaluation scores for 'similar Package/Packages' for the tendered scope ARE NOT AVAILABLE, during the 'Period of Assessment':

This shall be obtained by summing up the 'Monthly Performance Evaluation' scores obtained by the bidder in all Regions for ALL the packages, divided by the total number of Package months for which evaluation should have been done. ' $R_{BHEL}$ ' shall be calculated subject to availability of 'performance scores' for at least 6 'package months' in the order of precedence below:

- 'Period of Assessment' i.e. 6 months preceding and including the cut-off month
- 12 months preceding and including the cut-off month
- 24 months preceding and including the cut-off month

In case,  $R_{BHEL}$  cannot be calculated as above, then Bidder shall be treated as 'NEW VENDOR'. Further eligibility and qualification of this bidder shall be as per definition of 'NEW VENDOR' described in 'Explanatory Notes'.

- iii). Factor "L" assigned based on Overall Performance Rating ( $R_{BHEL}$ ) at Power Sector Regions:

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Sl. no.	Overall Performance Rating (R <sub>BHEL</sub> )	Corresponding Value of 'L'
1	=60	NA
2	> 60 and ≤ 65	0.5
3	> 65 and ≤ 70	0.45
4	> 70 and ≤ 75	0.4
5	> 75 and ≤ 80	0.375
6	> 80 and < 90	0.35
7	≥90	0.33

- iv). **Performance Systems:** The performance rating as mentioned in II (i) and (ii) above, shall be calculated as per Online Systems i.e. Contractor Performance Evaluation System (CPES) and Safety Performance Evaluation System (HSEPES). The scores assigned in HSEPES shall be scaled down to 10 and assigned in CPES against the category “HSE” (mentioned in Form F-15).

**III. i) ‘Assessment of Capacity based on ‘LOAD and PERFORMANCE’:**

- a) ‘Assessment of Capacity of Bidder’ is based on the Maximum number of packages for which a vendor is eligible, considering the performance scores of similar packages, as below:

Max number of packages  $P_{\text{Max}} = (R_{\text{BHEL}} - 60) \text{ divided by corresponding value of 'L', i.e. } (R_{\text{BHEL}} - 60)/L$

**Note:**

- i). In case the value of  $P_{\text{Max}}$  results in a fraction, the value of  $P_{\text{Max}}$  is to be rounded off to next whole number
- ii). For  $R_{\text{BHEL}} = 60$ ,  $P_{\text{Max}} = '1'$

The Bidder shall be considered ‘Qualified’ on ‘Performance basis’ as per ‘Assessment of Capacity of Bidder’ for the subject Tender if  $P \leq P_{\text{Max}}$   
(Where P is calculated as per clause ‘I’ above)

- b) In addition to above, in case contractor fails to score 5 or more than 5 (five) marks in the scaled down scores of HSEPES for “3 or more than 3 months in a period of 6 months preceding and including the cut-off month in any single package”, the contractor shall be considered disqualified for ongoing tender(s) of BHEL. Qualification of bidder for further tendering process shall be subject to qualifying this condition in addition to qualifying requirements mentioned in PQR. Bidders who did not qualify this condition shall not be considered under the provisions of clause 9 IV (iv) of NIT.

**ii) Assessment of Capacity based on ‘AVERAGE ANNUAL TURNOVER’:**

If the ‘value of contracts in hand’ across all PS Regions by a contractor is less than the product of “annual average turnover of the Contractor and multiplying factor”, then such bidder shall be considered qualified on ‘Annual Average Turnover basis’. The ‘value of contracts in hand’

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will be computed by summing up “50% of the annualized awarded value of each contract” unless performance evaluation is not closed in the online CPES.

Based on the performance rating of the Contractor, the above mentioned multiplying factor shall be as below:

Sl. no.	Overall Performance Rating (R <sub>BHEL</sub> )	(Multiplying factor to Average Annual Turnover)
1	≥ 60 and ≤ 70	1
2	> 70 and ≤ 80	2
3	> 80	3

**‘Assessment of Capacity of Bidder’:**

The bidder will be considered qualified for the tender if it qualifies on ‘Load and Performance basis’ as well as on ‘Average Annual Turnover basis’.

However, ‘New Vendor’/ ‘Consortium Partner’ shall be considered qualified based on only ‘Load and Performance’ (they will be regarded pre-qualified on ‘Average Annual Turnover’ criteria).

**IV. Explanatory note:**

i). Similar package means Boiler or ESP or Piping or Turbine or Civil or Structure or Electrical or C&I etc. at the individual level irrespective of rating of Plant and irrespective of whether the subject tender is a single package or as part of combined/composite packages. Normally Boiler, ESP, Piping, Turbine, Electrical, C&I, Civil, Structure etc. is considered individual level of package. For example, in case the tendered scope is a Boiler Vertical Package comprising of Boiler, ESP and Power Cycle Piping (i.e. the ‘identified packages as per Table-1 below), the ‘PERFORMANCE’ part against sl.no. II above, needs to be evaluated considering all the identified packages (i.e. Boiler, ESP and Power Cycle Piping) and finally the Bidder’s capacity to execute the tendered scope is assessed in line with III above.

ii). Identified Packages (Unit wise)

**Table-1**

Civil	Electrical and C&I	Mechanical
i). Enabling works	i). Electrical	i). Boiler & Aux (All types including CW Piping if applicable)
ii). Pile and Pile Caps	ii). C&I	ii). Power Cycle Piping/Critical Piping
iii). Civil Works including foundations	iii). Others (Elect. and C&I)	iii). ESP
iv). Structural Steel Fabrication & Erection	iv). Electrical Enabling Works	iv). LP Piping
		v). Steam Turbine Generator set

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v). Chimney vi). Cooling Tower vii). Others (Civil)		& Aux vi). Gas Turbine Generator set & Aux vii). Hydro Turbine Generator set & Aux viii). Turbo Blower (including Steam Turbine) ix). Material Management x). FGD xi). ACC xii). Others (Mechanical)
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- iii). Bidders who have not been evaluated for at least six package months in the last 24 months preceding and including the Cut-off month in the online BHEL system for contractor performance evaluation in BHEL PS Regions, shall be considered “NEW VENDOR”.

A ‘NEW VENDOR’ shall be considered qualified subject to satisfying all other tender conditions.

A ‘NEW VENDOR’ if awarded a job (of package/packages identified under this clause) shall be tagged as “FIRST TIMER” on the date of first LOI from BHEL.

The “FIRST TIMER” tag shall remain till completion of all the contracts against which vendor has been tagged as First Timer or availability of 6 evaluation scores within last 24 months preceding and including the Cut-off month in the online BHEL system for contractor performance evaluation in BHEL PS Regions.

A Bidder shall not be eligible for the next job as long as the Bidder is tagged as “FIRST TIMER” excepting for the Tenders which have been opened on or before the date of the bidder being tagged as ‘FIRST TIMER’.

After removal of ‘FIRST TIMER’ tag, the Bidder shall be considered ‘QUALIFIED’ for the future tenders subject to satisfying all other tender conditions including ‘Assessment of Capacity of Bidders’.

- iv). Consequent upon applying the criteria of ‘Assessment of Capacity of Bidders’ detailed above on all the bidders qualified against Technical and Financial Qualification criteria, if the number of qualified bidders reduces to less than four, then for further processing of the Tender, BHEL at its discretion reserves the right to also consider the bidders who are “not



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qualified” as per criteria of ‘Assessment of Capacity of Bidders’ and for this, procedure described in following three options shall be followed:

- a) All the bidders having Overall Performance Rating ( $R_{BHEL}$ )  $\geq 60$  shall be considered qualified against criteria of ‘Assessment of Capacity of Bidders’.
- b) If even after using option “a”, the number of qualified bidders remains less than four, then in addition to bidders considered as per option “a”, “First timer” bidders having average of available performance scores  $\geq 60$  upto and including the Cut Off month shall also be considered qualified against criteria of ‘Assessment of Capacity of Bidders’.
- c) If even after using option “a” and “b”, the number of qualified bidders remains less than four, then in addition to bidders considered as per option “a” and “b”, “First timer” bidders for whom no performance score is available in the system upto and including the Cut Off month, shall also be considered qualified against criteria of ‘Assessment of Capacity of Bidders’.

**Note:-** In case, the number of bidders qualified against Technical and Financial Qualification criteria itself is less than four, then all bidders (a)- having Overall Performance Rating ( $R_{BHEL}$ )  $\geq 60$ , (b)- “First timer” bidders having average of available performance scores  $\geq 60$  upto and including the Cut Off month, (c)- “First timer” bidders for whom no performance score is available in the system upto and including the Cut Off month, shall be considered qualified against criteria of ‘Assessment of Capacity of Bidders’ for further processing of tender.

v). ‘Under execution’ shall mean works in progress as per the following:

- a. Up to execution of 90% of anticipated Contract Value in case of Civil, MM, Structural and Turbo Blower Packages
- b. Up to Steam Blowing in case of Boiler/ESP/Piping Packages
- c. Up to Synchronization in all Balance Packages

Note: BHEL at its discretion can extend (or reduce in exceptional cases in line with Contract conditions) the period defined against (a), (b) and (c) above, depending upon the balance scope of work to be completed.

- vi). Contractor shall provide the latest contact details i.e. mail-ID and Correspondence Address to SCT Department, so that same can be entered in the Contractor Performance Evaluation System, and in case of any change/discrepancy same shall be informed immediately. Login Details for viewing scores in Contractor Performance Evaluation System shall be provided to the Contractor by SCT Department.
- vii). Performance Evaluation for Activity Month shall be completed in Evaluation Month (i.e. month next to Activity Month) or in rare cases in Post Evaluation Month (i.e. month next to Evaluation Month) after approval from Competent Authority. In case scores are not acceptable, Contractor can submit Review Request to GM Site/ GM Project latest by 27<sup>th</sup> of Evaluation Month or 5 days after approval of score, whichever is later. However, acceptance/rejection of ‘Review Request’ solely depends on the discretion of GM Site/GM Pro-

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ject. After acceptance of Review Request, evaluation score shall be reviewed at site and the score after completion of review process shall be acceptable and binding on the contractor.

viii). Project on Hold due to reasons not attributable to bidder -

- a. **Short hold:** Evaluation shall not be applicable for this period, however, Loading will be considered.
- b. **Long hold:** Short hold for continuous six months and beyond or hold on account of Force Majeure shall be considered as Long Hold. Evaluation as well as Loading shall not be considered for this period.

ix). Performance evaluation as specified above in this clause is applicable to Prime bidder and Consortium partner (or Technical tie up partner) for their respective scope of work

- 10.0 Since the job shall be executed at site, bidders must visit site/ work area and study the job content, facilities available, availability of materials, prevailing site conditions including law & order situation, applicable wage structure, wage rules, etc. before quoting for this tender. They may also consult this office before submitting their offers, for any clarifications regarding scope of work, facilities available at sites or on terms and conditions.
- 11.0 For any clarification on the tender document, the bidder may seek the same in writing or through e-mail and/or through e-procurement portal <https://eprocurebhel.co.in>, as per specified format, within the scheduled date for seeking clarification, from the office of the undersigned. BHEL shall not be responsible for receipt of queries after due date of seeking clarification due to postal delay or any other delays. Any clarification / query received after last date for seeking clarification may not be normally entertained by BHEL and no time extension will be given.
- 12.0 BHEL may decide holding of pre-bid discussion [PBD] with all intending bidders as per date indicated in the NIT. The bidder shall ensure participation for the same at the appointed time, date and place as may be decided by BHEL. Bidders shall plan their visit accordingly. The outcome of pre-bid discussion (PBD) shall also form part of tender.
- 13.0 In the event of any conflict between requirement of any clause of this specification/ documents/drawings/data sheets etc. or requirements of different codes/standards specified, the same to be brought to the knowledge of BHEL in writing for clarification before due date of seeking clarification (whichever is applicable), otherwise, interpretation by BHEL shall prevail. Any typing error/missing pages/ other clerical errors in the tender documents, noticed must be pointed out before pre-bid meeting/submission of offer, else BHEL's interpretation shall prevail.
- 14.0 Unless specifically mentioned otherwise, bidder's quoted price shall deemed to be in compliance with tender including PBD.

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- 15.0 Bidders shall submit Integrity Pact Agreement (Duly signed by authorized signatory who signs in the offer), **if applicable**, along with techno-commercial bid. This pact shall be considered as a preliminary qualification for further participation. **The names and other details of Independent External Monitor (IEM) for the subject tender is as given at point (1) above.**

**“Integrity Pact (IP)”**

- (a) IP is a tool to ensure that activities and transactions between the Company and its Bidders/ Contractors are handled in a fair, transparent and corruption free manner. Following Independent External Monitors (IEMs) on the present panel have been appointed by BHEL with the approval of CVC to oversee implementation of IP in BHEL.

Sl. No.	IEM	Email
1.	Shri Otem Dai, IAS (Retd.)	<a href="mailto:iem1@bhel.in">iem1@bhel.in</a>
2.	Shri Bishwamitra Pandey, IRAS (Retd.)	<a href="mailto:Iem2@bhel.in">Iem2@bhel.in</a>
3.	Shri Mukesh Mittal, IRS (Retd.)	<a href="mailto:Iem3@bhel.in">Iem3@bhel.in</a>

- (b) The IP as enclosed with the tender is to be submitted (duly signed by authorized signatory) along with techno-commercial bid (Part-I, in case of two/ three part bid). Only those bidders who have entered into such an IP with BHEL would be competent to participate in the bidding. In other words, entering into this Pact would be a preliminary qualification.

- (c) Please refer Section-8 of IP for Role and Responsibilities of IEMs. In case of any complaint arising out of the tendering process, the matter may be referred to any of the above IEM(s). All correspondence with the IEMs shall be done through email only.

**Note:**

*No routine correspondence shall be addressed to the IEM (phone/ post/ email) regarding the clarifications, time extensions or any other administrative queries, etc. on the tender issued. All such clarification/ issues shall be addressed directly to the tender issuing (procurement) department's officials whose contact details are provided below:*

**Details of contact person(s):**

Name:	R M Malhotra/ GM (Purchase)	Tapish Kumar/Manager (Purchase)
Dept:	Purchase Department	
Address:	Floor No. 5 & 6, Shreemohini Complex, 345 Kingsway, Nagpur-440001	
Email:	<a href="mailto:rmalhotra@bhel.in">rmalhotra@bhel.in</a>	<a href="mailto:tapishkhandelwal@bhel.in">tapishkhandelwal@bhel.in</a>
Phone:	9010903666	

- 16.0 The Bidder has to satisfy the Pre-Qualifying Requirements stipulated for this Tender in order to be qualified. The Price Bids of only those bidders will be opened who will be qualified for the subject job on the basis of satisfying the Pre-Qualification Criteria specified in this NIT as per Annexure-I (as applicable), past performance etc. and date of opening of price bids shall be intimated to only such bidders. BHEL reserves the right not to consider offers of parties under HOLD.

- 17.0 In case BHEL decides on a 'Public Opening', the date & time of opening of the sealed PRICE BID shall be intimated to the qualified bidders and in such a case, bidder may depute one authorized representative to

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witness the price bid opening. BHEL reserves the right to open 'in-camera' the 'PRICE BID' of any or all Unsuccessful/Disqualified bidders under intimation to the respective bidders.

- 18.0 Validity of the offer shall be for **six months** from the latest due date of offer submission (including extension, if any) unless specified otherwise.
- 19.0 **Reverse Auction:** "BHEL shall be resorting to Reverse Auction (RA) (Guidelines as available on [www.bhel.com](http://www.bhel.com)) (<https://www.bhel.com/guidelines-reverse-auction-2021>) for this tender. RA shall be conducted among the techno-commercially qualified bidders.

Price bids of all techno-commercially qualified bidders shall be opened and same shall be considered for RA. In case any bidder(s) do(es) not participate in online Reverse Auction, their sealed envelope price bid along with applicable loading, if any, shall be considered for ranking."

**Note:-**

1. No benefits to MSE bidders w.r.t Reverse Auction Guidelines as available on [www.bhel.com](http://www.bhel.com) against works contract.
  2. In case of enquiry through e-procurement the sealed electronic price bid (e-bid) is to be treated as sealed envelope price bid.
- 20.0 On submission of offer, further consideration will be subject to compliance to tender & qualifying requirement and customer's acceptance, as applicable.
- 21.0 In case the bidder is an "Indian Agent of Foreign Principals", 'Agency agreement has to be submitted along with Bid, detailing the role of the agent along with the terms of payment for agency commission in INR, along with supporting documents.
- 22.0 The bidders shall not enter into any undisclosed M.O.U. or any understanding amongst themselves with respect to tender.
- 23.0 Void.
- 24.0 The bidder shall submit/upload documents in support of possession of 'Qualifying Requirements' duly self-certified and stamped by the authorized signatory, indexed and properly linked in the format for PQR. In case BHEL requires any other documents/proofs, these shall be submitted immediately.
- 25.0 The bidder may have to produce original document for verification if so decided by BHEL.
- 26.0 The consultant / firm (and any of its affiliates) shall not be eligible to participate in tender(s) for the related works or services for the same project, if they were engaged for the consultancy services.
- 27.0 Guidelines/rules in respect of Suspension of Business dealings, Vendor evaluation format, Quality, Safety & HSE guidelines, Experience Certificate, etc. may undergo change from time to time and the latest one shall be followed. The abridged version of extant 'Guidelines for suspension of business dealings with suppliers/ contractors' is available on [www.bhel.com](http://www.bhel.com) on "supplier registration page".
- 28.0 The offers of the bidders who are on the banned/ hold list and also the offer of the bidders, who engage the services of the banned/ hold firms, shall be rejected. The list of **banned/ hold firms** is available on BHEL web site [www.bhel.com](http://www.bhel.com).

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**28.1 Integrity commitment, performance of the contract and punitive action thereof:**

**28.1.1 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.

**28.1.2 Commitment by Bidder/ Supplier/ Contractor:**

- (i) 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.
- (ii) 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.
- (iii) 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 prices 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 extent guidelines of the company available on [www.bhel.com](http://www.bhel.com) and / or under applicable legal provisions.

**29.0 Micro and Small Enterprises (MSE)**

Any Bidder falling under MSE category, shall furnish the following details & submit documentary evidence/ Govt. Certificate etc. in support of the same along with their techno-commercial offer.

Type under MSE	SC/ST owned	Women owned	Others (excluding SC/ ST & Women Owned)
— Micro			
— Small			

**Note:** – If the bidder does not furnish the above, offer shall be processed construing that the bidder is not falling under MSE category.

- a) MSE suppliers can avail the intended benefits in respect of the procurements related to the Goods and Services only (Definition of Goods and Services as enumerated by Govt. of India vide Office Memorandum F. No. 21(8)/2011 MA dtd. 09/11/2016 office of AS & DC, MSME) only if they submit along with the offer, attested copies of either Udyam Registration Certificate or EM-II certificate having deemed validity (five years from the date of issue of acknowledgement in EM-II) or valid NSIC certificate or Udyog Aadhar Memorandum (UAM) & Acknowledgement or EM-II Certificate along with attested copy of a CA certificate (format enclosed as Annexure – 3) where deemed validity of EM-II certificate of five years has expired applicable for the relevant financial year (latest audited). Date to be reckoned for determining the deemed validity will be the last date of Technical Bid submission. Non submission of such documents will lead to consideration of their bids at par with other bidders. No

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~~benefits shall be applicable for this enquiry if the above required documents are not submitted before price bid opening. If the tender is to be submitted through e-procurement portal, then the above required documents are to be uploaded on the portal. Documents should be notarized or attested by a Gazetted officer. Documents submitted by the bidder may be verified by BHEL for rendering the applicable benefits.~~

30.0 The Bidder along with its associate/ collaborators/ sub-contractors/ sub-vendors/ consultants/ service providers shall strictly adhere to BHEL Fraud Prevention Policy displayed on BHEL website <http://www.bhel.com> and shall immediately bring to the notice of BHEL Management about any fraud or suspected fraud as soon as it comes to their notice.

**31.0 PREFERENCE TO MAKE IN INDIA:**

For this procurement, the local content to categorize a supplier as a Class I local supplier/ Class II local Supplier/Non-Local Supplier and purchase preferences to Class I local supplier, is as defined I 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 opening of Part-II bids against this NIT.

**31.1 Compliance to Restrictions under Rule 144 (xi) of GFR 2017**

- I. Any bidder from a country which shares a land border with India will be eligible to bid in this tender only if the bidder is registered with the Competent Authority. The Competent Authority for the purpose of this Clause shall be the Registration Committee constituted by the Department for Promotion of Industry and Internal Trade (DPIIT).
- II. "Bidder" (including the term 'tenderer', 'consultant' or 'service provider' in certain contexts) means any person or firm or company, including any member of a consortium or joint venture (that is an association of several persons, or firms or companies), every artificial juridical person not falling in any of the descriptions of bidders stated hereinbefore, including any agency branch or office controlled by such person, participating in a procurement process.
- III. "Bidder from a country which shares a land border with India" for the purpose of this Clause means: -
  - a. An entity incorporated established or registered in such a country; or
  - b. A subsidiary of an entity incorporated established or registered in such a country; or
  - c. An entity substantially controlled through entities incorporated, established or registered in such a country; or
  - d. An entity whose beneficial owner is situated in such a country; or
  - e. An Indian (or other) agent of such an entity; or
  - f. A natural person who is a citizen of such a country; or
  - g. A consortium or joint venture where any member of the consortium or joint venture falls under any of the above.
- IV. The beneficial owner for the purpose of (III) above will be as under:
  1. In case of a company or Limited Liability Partnership, the beneficial owner is the natural person(s), who, whether acting alone or together or through one or more juridical person, has a controlling ownership interest or who exercises control through other means.

Explanation

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- .....
- a. "Controlling ownership interest" means ownership of or entitlement to more than twenty-five per cent of shares or capital or profits of the company.
  - b. "Control" shall include the right to appoint majority of the directors or to control the management or policy decisions including by virtue of their shareholding or management rights or shareholders agreements or voting agreements.
- 2. In case of a partnership firm, the beneficial owner is the natural person(s) who, whether acting alone or together, or through one or more juridical person, has ownership of entitlement to more than fifteen percent of capital or profits of the partnership.
  - 3. In case of an unincorporated association or body of individuals, the beneficial owner is the natural person(s), who, whether acting alone or together, or through one or more juridical person has ownership of or entitlement to more than fifteen percent of the property or capital or profits of the such association or body of individuals.
  - 4. Where no natural person is identified under (1) or (2) or (3) above, the beneficial owner is the relevant natural person who holds the position of senior managing official;
  - 5. In case of a trust, the identification of beneficial owner(s) shall include identification of the author of the trust, the trustee, the beneficiaries with fifteen percent or more interest in the trust and any other natural person exercising ultimate effective control over the trust through a chain of control or ownership.
- V. An Agent is a person employed to do any act for another, or to represent another in dealings with third person.
- VI. The successful bidder shall not be allowed to sub-contract works to any contractor from a country which shares a land border with India unless such contractor is registered with the Competent Authority.
- Note:**
- (i) The bidder shall provide undertaking for their compliance to this Clause, in the Format provided in **Annexure-11**.
  - (ii) Registration of the bidder with Competent Authority should be valid at the time of submission as well as acceptance of the bids.

32.0 Bid should be free from correction, overwriting, using corrective fluid, etc. Any interlineation, cutting, erasure or overwriting shall be valid only if they are attested under full signature(s) of person(s) signing the bid else bid shall be liable for rejection.  
All overwriting/cutting, etc., will be numbered by bid opening officials and announced during bid opening.

33.0 In the course of evaluation, if more than one bidder happens to occupy L-1 status, effective L-1 will be decided by soliciting discounts from the respective L-1 bidders.

In case more than one bidder happens to occupy the L-1 status even after soliciting discounts, the L-1 bidder shall be decided by a toss/ draw of lots, in the presence of the respective L-1 bidder(s) or their representative(s).

Ranking will be done accordingly. BHEL's decision in such situations shall be final and binding.

34.0 The Bidder declares that they will not enter into any illegal or undisclosed agreement or understanding, whether formal or informal with other Bidder(s). This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non-submission of bids or any other actions to restrict competitiveness or to introduce cartelization in the bidding process.

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.....  
In case, the Bidder is found having indulged in above activities, suitable action shall be taken by BHEL as per extant policies/ guidelines.

**35.0 Order of Precedence:**

In the event of any ambiguity or conflict between the Tender Documents, the order of precedence shall be in the order below:

- a. Amendments/Clarifications/Corrigenda/Errata etc. issued in respect of the tender documents by BHEL
- b. Notice Inviting Tender (NIT)
- c. Price Bid
- d. Technical Conditions of Contract (TCC)—Volume-1A
- e. Special Conditions of Contract (SCC) —Volume-1B
- f. General Conditions of Contract (GCC) —Volume-1C
- g. Forms and Procedures —Volume-1D

It may please be noted that guidelines/ circulars/ amendments/ govt. directives issued from time to time shall also be applicable.

For BHARAT HEAVY ELECTRICALS LTD

(General Manager - Purchase)

**Enclosure:**

- 1.0 Annexure-1: Pre Qualifying Requirements.
- 2.0 Annexure-2: Check List.
- ~~3.0 Annexure-3: Certificate by Chartered Accountant~~
- 4.0 Annexure-4: Reverse Auction Process Compliance Form
- 5.0 Annexure-5: Authorization of representative who will participate in the online Reverse Auction Process
- 6.0 Annexure-6: RA Price Confirmation and Breakup
- 7.0 Annexure-7: Integrity Pact
- 8.0 Annexure-8: Undertaking as per PQR C4 of Annexure-1 i.e. PQR
- 9.0 Annexure-9: Declaration reg. Related Firms & their areas of Activities
- 10.0 Annexure-10: Declaration regarding minimum local content
- 11.0 Annexure-11: Declaration regarding compliance to restrictions under rule 144 (xi) of GFR 2017
- 12.0 Annexure 12: Important information.



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**ANNEXURE - 1**

**PRE QUALIFYING CRITERIA**

<b>E-Tender Spec No: BHE/PW/PUR/NTPRT-CABLING U2/2909</b>	
<b>JOB</b>	<b>Cabling Package of Unit#2 at 3 X 800 MWPVUNL PROJECT PATRATU, DISTRICT-RAMGARH STATE- JHARKHAND</b>

S No	PRE QUALIFICATION CRITERIA	Bidders claim in respect of fulfilling the PQR Criteria	
		Applicability	
<b>A</b>	<b>Submission of Integrity Pact duly signed (if applicable)</b>  (Note: To be submitted by Prime Bidder & Consortium /Technical Tie up partner jointly in case Consortium bidding is permitted, otherwise by the sole bidder)	<b>APPLICABLE</b>	
<b>B</b>	<b><u>B) Technical PQR</u></b> Bidder shall essentially meet all the Qualifying Requirements (i.e. B.1 & B.2) as under:  B.1: Bidder should have Executed “ <b>Electrical or C&amp;I or Electrical and C&amp;I works</b> ” for any one of the following in the last seven years from latest date of bid submission:  B.1.1) Executed One work of value not less than <b>Rs 440.00 Lakhs</b> against single work order. <div style="text-align: center;">OR</div> B.1.2) Executed Two works each of value not less than <b>Rs 275.00 Lakhs</b> against maximum two work orders. <div style="text-align: center;">OR</div> B.1.3) Executed Three works each of value not less than <b>Rs 220.00 Lakhs</b> against maximum three work orders. <div style="text-align: center;">AND</div> B.2: B.2.1: Bidder should have Executed Electrical Works consisting of following: a) HT Cabling/LT Cabling	<b>APPLICABLE</b>	
<b>C-1</b>	<b><u>Financial TURNOVER</u></b> Bidders must have achieved an average annual financial turnover (audited) of <b>Rs. 165.00 Lakhs</b> or more over last three Financial Years (FY) i.e. <b>2020-21, 2021-22 &amp; 2022-23.</b>	<b>APPLICABLE</b>	

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<b>C-2</b>	<b><u>NETWORTH</u></b> (only in case of Companies) Net worth of the Bidder based on the latest Audited Accounts as furnished for 'C-1' above should be positive.	<b>APPLICABLE</b>	
<b>C-3</b>	<b><u>PROFIT</u></b> Bidder must have earned profit in any one of the three Financial Years as applicable in the last three Financial Years as furnished for 'C-1' above.	<b>APPLICABLE</b>	
<b>C-4</b>	Bidder must not be under Bankruptcy Code Proceedings (IBC) by NCLT or under Liquidation / BIFR, which will render him ineligible for participation in this tender, and shall submit undertaking to this effect.	<b>APPLICABLE</b>	
<b>D</b>	<b>Assessment of Capacity of Bidder to execute the work as per sl no 9 of NIT (if applicable)</b> Applicable, The "Assessment of Capacity of Bidders" for this Tender shall be carried out by considering the identified packages i.e. <b>"ELECTRICALS"</b> .	<b>APPLICABLE</b>	<b>BY BHEL</b>
<b>E</b>	<b>Approval of Customer (if applicable)</b> <b>Note:</b> Names of bidders (including consortium/Technical Tie up partners in case consortium bidding is permitted) who stand qualified after compliance of criteria A to D shall be forwarded to customer for their approval	<b>NOT APPLICABLE</b>	<b>BY BHEL</b>
<b>F</b>	Price Bid Opening <b>Note:</b> Price Bids of only those bidders shall be opened who stand qualified after compliance of criteria A to E		<b>BY BHEL</b>
<b>G</b>	Consortium tie-ups	<b>NOT APPLICABLE</b>	

**Explanatory Notes for the PQR (unless otherwise specified in the PQR):**

**Explanatory Notes for PQR B.1 (Technical)**

- For the criteria (B.1), actual executed value shall be considered.
- Value of work is to be updated with indices for "All India Avg. Consumer Price index for industrial workers" and "Monthly Whole Sale Price Index for All Commodities" with base month as per last month of work execution and indexed up to three (3) months prior to the month of latest due date of bid submission as per following formula-

$$P = R + 0.425 \times R \times \frac{(X_N - X_0)}{X_0} + 0.425 \times R \times \frac{(Y_N - Y_0)}{Y_0}$$

Where

P = Updated value of work

R = Value of executed work

X<sub>N</sub> = All India Avg. Consumer Price index for industrial workers for three months prior to the month of latest due date of bid submission (e.g. If latest bid submission date is 02-Mar-17, then bid submission month shall be reckoned as March'17 and index for Dec'2016

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shall be considered).

$X_0$  = All India Avg. Consumer Price index for industrial workers for last month of work execution

$Y_N$  = Monthly Whole Sale Price Index for All Commodities for three months prior to the month of latest due date of bid submission (e.g. If latest bid submission date is 02-Mar-17, then bid submission month shall be reckoned as March'17 and index for Dec'2016 shall be considered).

$Y_0$  = Monthly Whole Sale Price Index for All Commodities for last month of work execution

- The evaluation currency for this tender shall be INR.

**Explanatory Notes for Technical Criteria (B2):**

1. VOID
2. Unless otherwise specified, for the purpose of "B2 Technical Criteria", the word 'EXECUTED' means achievement of milestones as defined below -
  - a. "ACHIEVEMENT OF PHYSICAL QUANTITIES" as per PQRs.
  - b. "READINESS FOR COAL FILLING" of at least one Bunker, in respect of Mill Bunker Structure.
  - c. "CHARGING" in respect of Power Transformers/ Bus Ducts/ "HT/LT Switchgears" / "HT/LT Cabling".
  - d. For C&I works: "SYNCHRONISATION" in case of power project / "WORK EXECUTION of the value as defined in PQR" in case of industry.
  - e. "BOILER LIGHT UP" in respect of Boiler / CFBC / ESP.
  - f. "CHARGING OF ATLEAST ONE PASS" in respect of ESP(R&M)
  - g. "GAS IN" in respect of HRSG.
  - h. "STEAM BLOWING" in respect of Power Cycle Piping.
  - i. "HYDRAULIC TEST"/ ANY OTHER EQUIVALENT TEST LIKE "100% RT/UT OF WELDED JOINTS" of the system in respect of Pressure parts/ LP Piping/CW Piping.
  - j. "FULL LOAD OPERATION OF THE UNIT" in respect of Insulation work.
  - k. "SYNCHRONISATION" in respect of STG / GTG.
  - l. "SPINNING" in respect of HTG.
  - m. "GAS IN" in respect of FGD
3. Boiler means HRSG or WHRB or any other types of Steam Generator.
4. Power Cycle piping means Main Steam, Hot Reheat, Cold Reheat, HP Bypass.
5. For the purpose of evaluation of the PQR, one MW shall be considered equivalent to 3.5 TPH where ever rating of HRSG/BOILER is mentioned in MW. Similarly, where ever rating of Gas Turbine is mentioned in terms of Frame size, ISO rating of the same in terms of MW shall be considered for evaluation.

**Explanatory Notes for PQR -C (Financial):**

**C-1:**

- i. Bidder to submit Audited Balance Sheet and Profit and Loss Account for the respective years as indicated against C-1 above.
- ii. Evaluation of Turnover criteria shall be calculated from the Audited Balance Sheet and Prof-

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- it & Loss Account for the three Financial Years (FY).
- iii. In case audited Financial statements have not been submitted for all the three years as indicated against C-1 above, then the applicable audited statements submitted by the bidders against the requisite three years, will be averaged for three years.
  - iv. If financial statements are not required to be audited statutorily, then instead of audited financial statements, financial statements are required to be certified by Chartered Accountant.

**C-2:** Net Worth (Only in case of companies) of the bidder should be positive.

**Note:** Net worth shall be calculated based on the latest Audited Accounts as furnished for 'C-1' above.

Net worth = Paid up share capital + Reserves

**C-3:** Bidder must have earned profit in any one of the three financial years as applicable in the last three financial years as furnished for 'C-1' above.

**Note:** PROFIT shall be PBT earned during any one year of last three financial years as in 'C-1' above.

**C-4:** Bidder must not be under Bankruptcy Code Proceedings (IBC) by NCLT or under Liquidation / BIFR, which will render him ineligible for participation in this tender, and shall submit undertaking to this effect.

**Common Explanatory Notes:**

1. For evaluation of PQR, in case Bidder alone does not meet the pre-qualifying technical criteria B1 above, bidder may utilize the experience of its Parent/ Subsidiary Company along with its own experience, subject to following:
  - a. The parent company shall have a controlling stake of  $\geq 50\%$  in the subsidiary company (as per Format-1).
  - b. The Parent Company/ Subsidiary Company of which experience is being utilized for bidding shall submit Security Deposit(SD) equivalent to 1% of the total contract value
  - c. The parent/ subsidiary company and bidder shall provide an undertaking that they are jointly or severally responsible for successful performance of the contract (as per Format-2).
  - d. In case Bidder is submitting bid as a Consortium Partner, option of utilizing experience of parent/subsidiary Company can be availed by Prime Bidder only.
  - e. Parent Company/ Subsidiary Company of which experience is being used for bidding, cannot participate as a 'Standalone Bidder' or as a 'Consortium bidder'.
2. Completion date for achievement of the technical criteria specified in the 'B' above should be in the last 7 years ending on the 'latest date of Bid Submission' of Tender irrespective of date of the start of work. Completion date shall be reckoned from the "Financial Year quarter of bid submission". (for e.g. -Work completed on 01.01.2014 shall be considered even if latest date of bid submission is 20.03.2021).
3. "Executed" means the bidder should have achieved the technical criteria specified in the Common QR even if the Contract has not been completed or closed.
4. In case the Experience/PO/WO certificate enclosed by bidders do not have separate break

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up of prices for the E&C portion for Electrical and C&I works (i.e. the certificates enclosed are for composite order for supply and erection of Electrical and C&I and other works if any), then value of Erection & Commissioning for the Electrical and C&I portion shall be considered as 15% of the price for supply & erection of Electrical and C&I.

**5. Following shall be complied with in case of consortium:**

- a. The Prime Bidder and Consortium Partner(s) are required to enter in to a consortium agreement and certify to BHEL regarding existence and validity of their consortium agreement in line with validity period mentioned in NIT.
- b. Prime Bidder and Consortium partners shall be approved by Customer for being considered for the tender (applicable if customer approval is required).
- c. Number of partners including prime Bidder shall be NOT more than 3 (three).
- d. Prime Bidder alone shall necessarily comply with "B1Technical Criteria" except for mechanical package where B1 criteria is not applicable.
- e. Prime Bidder and Consortium Partner shall together comply with the 'Pre-Qualification Requirements' specified for the respective category of technical requirement as per "B2 technical criteria".
- f. Prime Bidder shall comply with all other Pre Qualifying criteria for the Tender unless otherwise specified.
- g. All other conditions shall be read in conjunction with clause no 23.0 of NIT.
- h. Prime Bidder shall be the Bidder who has a major share of work.
- i. Prime Bidder shall be responsible for the overall execution of the Contract.
- j. Performance shall be evaluated for Prime Bidder and the Consortium partner for their respective scope of work.
- k. In case the Consortium partner backs out, another consortium partner meeting the QRs, has to be engaged by Prime Bidder and if not, the respective work will be withdrawn and executed on risk and cost basis of the prime bidder.
- l. In case Prime Bidder withdraws or insolvency / liquidation / winding up proceedings have been initiated / admitted against the Prime Bidder, BHEL reserves the right to cancel, terminate or short close the contract or take any other action to safeguard BHEL's interest in the Project / Contract. This action will be without prejudice to any other action that BHEL can take under Law and the Contract to safeguard interests of BHEL
- m. After successful execution of one work with a consortium partner under direct orders of BHEL, the Prime Bidder shall be eligible for becoming a 'standalone' bidder for works similar to that for which consortium partner was engaged, for subsequent tenders.
- n. The Consortium partner shall submit SD equivalent to 1% of the total contract value in addition to the SD to be submitted by the Prime Bidder for the total contract value.

**BIDDER SHALL SUBMIT ABOVE PRE-QUALIFICATION CRITERIA FORMAT, DULY FILLED-IN, SPECIFYING RESPECTIVE ANNEXURE NUMBER AGAINST EACH CRITERIA AND FURNISH RELEVANT DOCUMENT**

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.....  
INCLUSIVE OF WORK ORDER AND WORK COMPLETION CERTIFICATE ETC IN THE RESPECTIVE  
ANNEXURES IN THEIR OFFER.

Credentials submitted by the bidder against “PRE QUALIFYING CRITERIAS” shall be verified for its authenticity. In case, any credential (s) is/are found unauthentic, offer of the bidder is liable to the rejection. BHEL reserves the right to initiate any further action as per extant guidelines for Suspension of Business Dealings.

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Format-1

**Certificate for relationship between Parent Company / Subsidiary Company and the bidder**

To,

.....

.....

Dear Sir,

**Sub:** Bid for NIT No .....dated..... for "....." (name of the tender).

We hereby certify that M/s..... is Parent Company/ Subsidiary Company of M/s.....(the bidder) and details of equity holding of the Parent Company in Subsidiary Company as on .....(not earlier than seven days prior to the Bid Submission Date) are given as below:

Name of Parent Company	Name of Subsidiary Company	Percentage of Equity Holding of Parent Company in Subsidiary Company

**(Insert Name and Signature of Statutory Auditor or practicing Company Secretary of the Bidder)**

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Format-2

**Undertaking from the Parent Company/ Subsidiary Company of the bidder  
(On the Letter Head of Parent Company/ Subsidiary Company, as applicable)**

From,  
Name:  
Full Address:

Telephone No.:  
E-mail address:  
Fax/No.:

To,

Dear Sir,

We refer to the NIT No ..... dated..... for "....." (name of the Tender).

"We have carefully read and examined in detail the NIT/Tender Terms and Conditions, including in particular, Clause .... of the NIT/Tender, regarding submission of an Undertaking, as per the prescribed Format 1 of the NIT/ Tender.

We confirm that M/s.....(the Bidder) has been authorized by us to use our Technical capability for meeting the Technical Criteria as specified in Clause.....of the PQR of the NIT/Tender referred above.

We agree to submit the Security Deposit equivalent to 1% of the total contract value in addition to Security Deposit to be submitted by Bidder as per Clause.....of the NIT/Tender for fulfillment of all obligations in terms of provisions of the contract, in the event of .....(the Bidder) being selected as the Successful Bidder.

We confirm that we along with M/s.....(the bidder), are jointly or severally responsible for successful performance of the contract.

We confirm that our company shall not participate in the above tender as a 'Standalone Bidder' or as a 'Consortium bidder' and also shall not authorize any other bidder to use our Technical capability for the above tender.

All the terms used herein but not defined, shall have the meaning as ascribed to the said terms under the referred NIT/Tender.

**Signature of Managing Director/Authorized signatory of Parent/ Subsidiary Company** \_\_\_\_\_



**ANNEXURE - 2**

**CHECK LIST**

**NOTE: - Tenderers are required to fill in the following details and no column should be left blank**

1	Name and Address of the Tenderer		
2	Details about type of the Firm/Company		
3.a	Details of Contact person for this Tender	Name : Mr/Ms Designation: Telephone No: Mobile No: Email ID: Fax No:	
3.b	Details of alternate Contact person for this Tender	Name : Mr/Ms Designation: Telephone No: Mobile No: Email ID: Fax No:	
4	EMD DETAILS	DD No:                      Date : Bank :                      Amount: <u>Please tick ( √ ) whichever applicable:-</u> <b>ONE TIME EMD / ONLY FOR THIS TENDER</b>	
5	Validity of Offer	TO BE VALID FOR SIX MONTHS FROM DUE DATE	
		APPLICABILITY (BY BHEL)	ENCLOSED BY BIDDER
6	Whether the format for compliance with <b>PRE QUALIFICATION CRITERIA</b> (ANNEXURE-I) is understood and filled with proper supporting documents referenced in the specified format	Applicable	YES / NO
7	Audited profit and Loss Account for the last three years	Applicable/ <del>Not Applicable</del>	YES/NO
8	Copy of GST & PAN Card	Applicable/ <del>Not Applicable</del>	YES/NO
9	Whether all pages of the Tender documents including annexures, appendices etc. are read understood and signed	Applicable/ <del>Not Applicable</del>	YES/NO
10	Integrity Pact	Applicable/ <del>Not Applicable</del>	YES/NO
11	OFFER FORWARDING LETTER / TENDER SUBMISSION LETTER	Applicable/ <del>Not Applicable</del>	YES/NO
12	Declaration by Authorized Signatory	Applicable/ <del>Not Applicable</del>	YES/NO
13	No Deviation Certificate	Applicable/ <del>Not Applicable</del>	YES/NO
14	Declaration confirming knowledge about Site Conditions	Applicable/ <del>Not Applicable</del>	YES/NO

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15	Declaration for relation in BHEL	Applicable/ <del>Not Applicable</del>	YES/NO
16	Non-Disclosure Certificate	Applicable/ <del>Not Applicable</del>	YES/NO
17	Bank Account Details for E-Payment	Applicable/ <del>Not Applicable</del>	YES/NO
18	Capacity Evaluation of Bidder for current Tender	Applicable/ <del>Not Applicable</del>	YES/NO
19	Tie Ups/Consortium Agreement are submitted as per format	Applicable/ <del>Not Applicable</del>	YES/ NO
20	Power of Attorney for Submission of Tender/Signing Contract Agreement <del>Power of Attorney of Consortium Partner.</del>	Applicable/ <del>Not Applicable</del>	YES/NO
21	Analysis of Unit rates	Applicable/ <del>Not Applicable</del>	YES/NO
22	Annexure-5: Authorization of representative who will participate in the online Reverse Auction Process	Applicable/ <del>Not Applicable</del>	YES/NO
23	Annexure-6: RA Price Confirmation and Breakup	Applicable/ <del>Not Applicable</del>	YES/NO
24	Annexure-8: Undertaking as per PQR C4 of Annexure-1 i.e. PQR	Applicable/ <del>Not Applicable</del>	YES/NO
25	Annexure-9: Declaration reg. Related Firms & their areas of Activities (x) Other Tender documents as per this NIT.	Applicable/ <del>Not Applicable</del>	YES/NO
26	Annexure-10 Declaration regarding minimum local content	Applicable/ <del>Not Applicable</del>	YES/NO
27	Annexure-11: Declaration regarding compliance to restrictions under rule 144 (xi) of GFR 2017	Applicable/ <del>Not Applicable</del>	YES/NO

**NOTE: STRIKE OFF 'YES' OR 'NO', AS APPLICABLE. TENDER NOT ACCOMPANIED BY THE PRESCRIBED ABOVE APPLICABLE DOCUMENTS ARE LIABLE TO BE SUMMARILY REJECTED.**

**DATE :**

**AUTHORISED SIGNATORY  
(With Name, Designation and Company seal)**

**ANNEXURE-3**

**Certificate by Chartered Accountant on letter head**

(applicable upto 31<sup>st</sup> March'2021 in line with MSME notification no. S.O. 2119 (E), dated 26<sup>th</sup> June'2020)

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)/ Udyam Registration Certificate No.  
..... dtd: ....., Category: (Micro/Small/Medium)

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
3. ~~For Enterprises (having EM-II Certificate/ valid NSIC Certificate or Udyog Aadhar Memorandum):~~ Investment in plant and machinery or equipment is Rs..... Lacs and turnover is Rs. .... Lacs (as notified in MSME notification no. S.O. 2119 (E) dated 26.06.2020)
4. ~~For Enterprises (having EM-II Certificate/ valid NSIC Certificate or Udyog Aadhar Memorandum):~~ Investment in plant and machinery or equipment is Rs..... Lacs and turnover is Rs. .... Lacs (as notified in MSME notification no. S.O. 2119 (E) dated 26.06.2020)

**(Strike off whichever is not applicable)**

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

~~Or~~

~~The enterprise has been graduated upward from its original category (micro/small/medium) (strike off which is not applicable), the enterprise shall maintain its prevailing status till expiry of one year from the close of year of registration, as notified vide S.O. No. 2119 (E) dated 26.06.2020 published in the gazette notification dated 26.06.2020 by Ministry of MSME.~~

~~Or~~

~~The enterprise has been reverse-graduated from its original category (micro/small/medium) (strike off which is not applicable), the enterprise will continue in its present category till the closure of the financial year and it will be given the benefit of the changed status only with effect from 1<sup>st</sup> April of the financial year following the year in which such change took place, as notified vide S.O. No. 2119 (E) dated 26.06.2020 published in the gazette notification dated 26.06.2020 by Ministry of MSME.~~

~~Date:~~

~~(Signature)~~

~~Name:~~

~~Membership Number:~~

Seal of the Chartered Accountant

Reverse Auction Process Compliance Form

**(The bidders are required to print this on their company's letterhead and sign, stamp before RA)**

To

- M/s. {Service provider}
- Postal address}

**Sub: Agreement to the Process related Terms and Conditions**

Dear Sir,

This has reference to the Terms & Conditions for the Reverse Auction mentioned in the RFQ document for {Items} against BHEL enquiry/ RFQ no. { BHE/PW/PUR/NTPRT-CABLING U2/2909 } dt. {.....}

This letter is to confirm that:

- 1) The undersigned is authorized official/ representative of the company to participate in RA and to sign the related documents.
- 2) We have studied the Reverse Auction guidelines (as available on www.bhel.com), and the Business rules governing the Reverse Auction as mentioned in your letter and confirm our agreement to them.
- 3) We also confirm that we have taken the training on the auction tool and have understood the functionality of the same thoroughly.
- 4) We also confirm that, in case we become L1 bidder, we will FAX/ email the price confirmation & break up of our quoted price as per Annexure - 6 within **two** working days (of BHEL) after completion of RA event, besides sending the same by registered post/ courier both to M/s. BHEL and M/s. {Service provider.}

We, hereby confirm that we will honor the Bids placed by us during the auction process.

With regards

Signature with company seal

Name:

Company / Organization:

Designation within Company / Organization:

Address of Company / Organization:

Sign this document and FAX/ email it to M/s {Service provider} at {.....} prior to start of the Event

**ANNEXURE-5**

**Authorization of representative who will participate in the on line Reverse Auction Process:**

1	NAME OF THE BIDDER	
2	NAME & DESIGNATION OF OFFICIAL	
3	POSTAL ADDRESS (COMPLETE)	
4	TELEPHONE NOS. (LAND LINE & MOBILE BOTH)	
5	E-MAIL ADDRESS	
6	NAME OF PLACE/ STATE/ COUNTRY, WHEREFROM S/HE WILL PARTICIPATE IN THE REVERSE AUCTION	

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**ANNEXURE-6**

**Reverse Auction price confirmation and breakup**

***(To be submitted by L1 bidder after completion of Reverse Auction)***

To

- M/s. Service provider
- Postal address

CC: M/s BHEL  
BHEL-PSWR, 345, KINGSWAY, NAGPUR-440001

**Sub: Final price quoted during Reverse Auction and price breakup**

Dear Sir,

We confirm that we have quoted.

**Rs.{\_\_in value & in words\_\_} for item(s) covered under tender enquiry No. { BHE/PW/PUR/NTPRT-CABLING U2/2909} dt.{...}**

Total price of the items covered under above cited enquiries is inclusive of {Packing & forwarding, GST, E.D., C.S.T., freight and insurance charges up to {.....}  
District,{.....} State and Type Test Charges etc., (exclusive of service tax), other as per NIT}

as our final landed prices as quoted during the Reverse Auction conducted today {date} which will be valid for a period of {\_\_ in nos. & in words \_\_} days.

The price break-up is as given below.

Total

=====

**- Rs. in value & in words**

=====

Yours sincerely,

For \_\_\_\_\_

**Name:**  
**Company:**  
**Date:**  
**Seal:**

**INTEGRITY PACT**

**Between**

Bharat Heavy Electricals Ltd. (BHEL), a company registered under the Companies Act 1956 and having its registered office at "BHEL House", Siri Fort, New Delhi -110049 (India) hereinafter referred to as "The Principal", which expression unless repugnant to the context or meaning hereof shall include its successors or assigns of the ONE PART

**and**

\_\_\_\_\_, (description of the party along with address), hereinafter referred to as "The Bidder/ Contractor" which expression unless repugnant to the context or meaning hereof shall include its successors or assigns of the OTHER PART

**Preamble**

The Principal intends to award, under laid-down organizational procedures, contract/s for **E-Tender Spec No: BHE/PW/PUR/NTPRT-CABLING U2/2909 (Job Description: Cabling Package of Unit#2 At 3 X 800 MWPVUNL PROJECT PATRATU, DISTRICT-RAMGARH STATE-JHARKHAND,.)**

(hereinafter referred to as "Contract"). The Principal values full compliance with all relevant laws

of the land, rules and regulations, and the principles of economic use of resources, and of fairness and transparency in its relations with its Bidder(s)/ Contractor(s).

In order to achieve these goals, the Principal will appoint panel of Independent External Monitor(s) (IEMs), who will monitor the tender process and the execution of the contract for compliance with the principles mentioned above.

**Section 1-Commitments of the Principal**

- 1.1 The Principal commits itself to take all measures necessary to prevent corruption and to observe the following principles:
  - 1.1.1 No employee of the Principal, personally or through family members, will in connection with the tender for, or the execution of a contract, demand, take a promise for or accept, for self or third person, any material or immaterial benefit which the person is not legally entitled to.
  - 1.1.2 The Principal will, during the tender process treat all Bidder(s) with equity and reason. The Principal will in particular, before and during the tender process, provide to all Bidder(s) the same information and will not provide to any Bidder(s) confidential/ additional information through which the Bidder(s) could obtain an advantage in relation to the tender process or the contract execution.
  - 1.1.3 The Principal will exclude from the process all known prejudiced persons.
- 1.2 If the Principal obtains information on the conduct of any of its employees which is a penal offence under the Indian Penal Code 1860 and Prevention of Corruption Act 1988 or any other statutory penal enactment, or if there be a substantive suspicion in this regard, the Principal will inform its Vigilance Office and in addition can initiate disciplinary actions.

**Section 2 -Commitments of the Bidder(s)/ Contractor(s)**

2.1 The Bidder(s)/ Contractor(s) commit himself to take all measures necessary to prevent corruption. The Bidder(s)/ Contractor(s) commits himself to observe the following principles during participation in the tender process and during the contract execution.

2.1.1 The Bidder(s)/ Contractor(s) will not, directly or through any other person or firm, offer, promise or  
give to the Principal or to any of the Principal's employees involved in the tender process or the  
execution of the contract or to any third person any material, immaterial or any other benefit which  
he/ she is not legally entitled to, in order to obtain in exchange any advantage of any kind whatsoever  
during the tender process or during the execution of the contract.

2.1.2 The Bidder(s)/ Contractor(s) will not enter with other Bidder(s) into any illegal or undisclosed agreement or understanding, whether formal or informal. This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non-submission of bids or any other actions to restrict competitiveness or to introduce cartelization in the bidding process.

2.1.3 The Bidder(s)/ Contractor(s) will not commit any penal offence under the relevant Indian Penal Code (IPC) and Prevention of Corruption Act; further the Bidder(s)/ Contractor(s) will not use improperly, for purposes of competition or personal gain, or pass on to others, any information or document provided by the Principal as part of the business relationship, regarding plans, technical proposals and business details, including information contained or transmitted electronically.

2.1.4 Foreign Bidder(s)/ Contractor(s) shall disclose the name and address of agents and representatives in India and Indian Bidder(s)/ Contractor(s) to disclose their foreign principals or associates. The Bidder(s)/ Contractor(s) 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.

2.2 The Bidder(s)/ Contractor(s) will not instigate third persons to commit offences outlined above or be an accessory to such offences.

2.3 The Bidder(s)/ Contractor(s) shall not approach the Courts while representing the matters to IEMs and shall await their decision in the matter.

**Section 3 -Disqualification from tender process and exclusion from future contracts**

If the Bidder(s)/ Contractor(s), before award or during execution has committed a transgression through a violation of Section 2 above, or acts in any other manner such as to put his reliability or credibility in question, the Principal is entitled to disqualify the Bidder(s)/ Contractor(s) from the tender process , terminate the contract,



if already awarded, exclude from future business dealings and/ or take action as per the separate "Guidelines on Banning of Business dealings with Suppliers/ Contractors", framed by the Principal.

#### **Section 4 -Compensation for Damages**

- 4.1 If the Principal has disqualified the Bidder (s) from the tender process before award / order acceptance according to Section 3, the Principal is entitled to demand and recover the damages equivalent to Earnest Money Deposit/ Bid Security.
- 4.2 If the Principal is entitled to terminate the Contract according to Section 3, or terminates the Contract in application of Section 3 above , the Bidder(s)/ Contractor (s) transgression through a violation of Section 2 above shall be construed breach of contract and the Principal shall be entitled to demand and recover from the Contractor an amount equal to 5% of the contract value or the amount equivalent to Security Deposit/ Performance Bank Guarantee , whichever is higher, as damages, in addition to and without prejudice to its right to demand and recover compensation for any other loss or damages specified elsewhere in the contract.

#### **Section 5 -Previous Transgression**

- 5.1 The Bidder declares that no previous transgressions occurred in the last 3 (three) years with any other company in any country conforming to the anti-corruption approach or with any other Public Sector Enterprise in India that could justify his exclusion from the tender process.
- 5.2 If the Bidder makes incorrect statement on this subject, he can be disqualified from the tender process or the contract, if already awarded, can be terminated for such reason or action can be taken as per the separate "Guidelines on Banning of Business dealings with Suppliers/ Contractors", framed by the Principal.

#### **Section 6 -Equal treatment of all Bidder (s)/ Contractor (s) / Sub-contractor (s)**

- 6.1 The Principal will enter into Integrity Pacts with identical conditions as this Integrity Pact with all Bidders and Contractors.
- 6.2 In case of Sub-contracting, the Principal Contractor shall take the responsibility of the adoption of Integrity Pact by the Sub-contractor(s) and ensure that all Sub-contractors also sign the Integrity Pact.
- 6.3 The Principal will disqualify from the tender process all Bidders who do not sign this Integrity Pact or violate its provisions.

#### **Section 7 -Criminal Charges against violating Bidders/ Contractors /Subcontractors**

If the Principal obtains knowledge of conduct of a Bidder, Contractor or Subcontractor, or of an employee or a representative or an associate of a Bidder, Contractor or Subcontractor which constitutes corruption, or if the Principal has substantive suspicion in this regard, the Principal will inform the Vigilance Office.

**Section 8 -Independent External Monitor(s)**

- 8.1 The Principal appoints competent and credible panel of Independent External Monitor (s) (IEMs) for this Integrity Pact. The task of the IEMs is to review independently and objectively, whether and to what extent the parties comply with the obligations under this Integrity Pact.
- 8.2 The IEMs are not subject to instructions by the representatives of the parties and performs his functions neutrally and independently. He reports to the CMD, BHEL.
- 8.3 The IEMs shall be provided access to all documents/ records pertaining to the Contract, for which a complaint or issue is raised before them as and when warranted. However, the documents/records/information having National Security implications and those documents which have been classified as Secret/Top Secret are not to be disclosed.
- 8.4 The Principal will provide to the IEMs sufficient information about all meetings among the parties related to the Contract provided such meetings could have an impact on the contractual relations between the Principal and the Contractor. The parties offer to the IEMs the option to participate in such meetings.
- 8.5 The advisory role of IEMs is envisaged as that of a friend, philosopher and guide. The advice of IEMs would not be legally binding and it is restricted to resolving issues raised by a Bidder regarding any aspect of the tender which allegedly restricts competition or bias towards some Bidders. At the same time, it must be understood that IEMs are not consultants to the Management. Their role is independent in nature and the advice once tendered would not be subject to review at the request of the organization.
- 8.6 For ensuring the desired transparency and objectivity in dealing with the complaints arising out of any tendering process or during execution of Contract, the matter should be examined by the full panel of IEMs jointly, who would look into the records, conduct an investigation, and submit their joint recommendations to the Management.
- 8.7 The IEMs would examine all complaints received by them and give their recommendations/ views to the CMD, BHEL at the earliest. They may also send their report directly to the CVO, in case of suspicion of serious irregularities requiring legal/ administrative action. Only in case of very serious issue having a specific, verifiable Vigilance angle, the matter should be reported directly to the Commission. IEMs will tender their advice on the complaints within 30 days.
- 8.8 The CMD, BHEL shall decide the compensation to be paid to the IEMs and its terms and conditions.
- 8.9 IEMs should examine the process integrity; they are not expected to concern themselves with fixing of responsibility of officers. Complaints alleging mala fide on the part of any officer of the Principal should be looked into by the CVO of the Principal.
- 8.10 If the IEMs have reported to the CMD, BHEL, a substantiated suspicion of an offence under relevant Indian Penal Code / Prevention of Corruption Act, and the CMD, BHEL has not, within reasonable time, taken visible action to proceed against such offence or reported it to the Vigilance Office, the IEMs may also transmit this information di-

rectly to the Central Vigilance Commissioner, Government of India.

- 8.11 After award of work, the IEMs shall look into any issue relating to execution of Contract, if specifically raised before them. As an illustrative example, if a Contractor who has been awarded the Contract, during the execution of Contract, raises issue of delayed payment etc. before the IEMs, the same shall be examined by the panel of IEMs. Issues like warranty/ guarantee etc. shall be outside the purview of IEMs.
- 8.12 However, the IEMs may suggest systemic improvements to the management of the Principal, if considered necessary, to bring about transparency, equity and fairness in the system of procurement.
- 8.13 The word 'Monitor' would include both singular and plural.

### **Section 9 -Pact Duration**

- 9.1 This Integrity Pact shall be operative from the date this Integrity Pact is signed by both the parties till the final completion of contract for successful Bidder, and for all other Bidders 6 months after the Contract has been awarded. Any violation of the same would entail disqualification of the bidders and exclusion from future business dealings.
- 9.2 If any claim is made/ lodged during currency of this Integrity Pact, the same shall be binding and continue to be valid despite the lapse of this Pact as specified above, unless it is discharged/ determined by the CMD, BHEL.

### **Section 10 -Other Provisions**

- 10.1 This Integrity Pact is subject to Indian Laws and exclusive jurisdiction shall be of the competent Courts as indicated in the Tender or Contract, as the case may be.
- 10.2 Changes and supplements as well as termination notices need to be made in writing.
- 10.3 If the Bidder(s)/ Contractor(s) is a partnership or a consortium or a joint venture, this Integrity Pact shall be signed by all partners of the partnership or joint venture or all consortium members.
- 10.4 Should one or several provisions of this Integrity Pact turn out to be invalid, the remainder of this Integrity Pact remains valid. In this case, the parties will strive to come to an agreement to their original intentions.
- 10.5 Only those bidders / contractors who have entered into this Integrity Pact with the Principal would be competent to participate in the bidding. In other words, entering into this Integrity Pact would be a preliminary qualification.
- 10.6 In the event of any dispute between the Principal and Bidder(s)/ Contractor(s) relating to the Contract, in case, both the parties are agreeable, they may try to settle dispute through Mediation before the panel of IEMs in a time bound manner. In case, the dispute remains unresolved even after mediation by the panel of IEMs, either party may take further action as the terms & conditions of the Contract. The fees/expenses

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on dispute resolution through mediation shall be shared by both the parties. Further, the mediation proceedings shall be confidential in nature and the parties shall keep confidential all matters relating to the mediation proceedings including any settlement agreement arrived at between the parties as outcome of mediation. Any views expressed, suggestions, admissions or proposals etc. made by either party in the course of mediation shall not be relied upon or introduced as evidence in any further arbitral or judicial proceedings, whether or not such proceedings relate to the dispute that is the subject of mediation proceedings. Neither of the parties shall present IEMs as witness in any Alternative Dispute Resolution or judicial proceedings in respect of the dispute that was subject of mediation.

-----

For & On behalf of the Principal

(Office Seal)

Place-----

Date-----

Witness:\_\_\_\_\_

(Name & Address) \_\_\_\_\_

\_\_\_\_\_

-----

For & On behalf of the Bidder/ Contractor

(Office Seal)

Witness:\_\_\_\_\_

(Name & Address) \_\_\_\_\_

\_\_\_\_\_

.....

**ANNEXURE - 8**

**UNDERTAKING**

(To be typed and submitted in the Letter Head of the Company/Firm of Bidder)

**To,**

GM-PURCHASE, BHEL-PSWR,  
Floor No. 5&6, Shri Mohini Complex  
345, KINGSWAY, NAGPUR-440001

Dear Sir/Madam,

**Sub: DECLARATION REGARDING INSOLVENCY/ LIQUIDATION/ BANKRUPTCY PROCEEDINGS**

**Ref:** NIT/Tender Specification No: BHE/PW/PUR/NTPRT-CABLING U2/2909

I/We, \_\_\_\_\_ declare that, I/We  
am/are not under insolvency resolution process or liquidation or Bankruptcy Code Proceedings  
(IBC) as on date, by NCLT or any adjudicating authority/authorities, which will render us ineligible  
for participation in this tender.

**Sign. of the AUTHORISED SIGNATORY  
(With Name, Designation and Company seal)**

Place:  
Date:

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**Annexure-9**

**DECLARATION**

Date: \_\_\_\_\_

To

GM-PURCHASE, BHEL-PSWR,  
Floor No. 5&6, Shri Mohini Complex  
345, KINGSWAY, NAGPUR-440001

**Sub: Details of related firms and their area of activities**

Dear Sir/ Madam,

Please find below details of firms owned by our family members that are doing business/  
registered for same item with BHEL, \_\_\_\_\_ (NA, if not applicable).

1	Material Category/ Work Description	
	Name of Firm	
	Address of Firm	
	Nature of Business	
	Name of Family Member	
	Relationship	
2	Material Category/ Work Description	
	Name of Firm	
	Address of Firm	
	Nature of Business	
	Name of Family Member	
	Relationship	
.....		

***Note: I certify that the above information is true and I agree for penal action from BHEL in case any of the above information furnished is found to be false.***

Regards,  
( \_\_\_\_\_ )

From: M/s \_\_\_\_\_  
Supplier Code: \_\_\_\_\_  
Address: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

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**Annexure-10**

**DECLARATION REGARDING MINIMUM LOCAL CONTENT IN LINE WITH  
REVISED PUBLIC PROCUREMENT (PREFERENCE TO MAKE IN INDIA), ORDER 2017 DATED  
04<sup>TH</sup> JUNE, 2020 AND SUBSEQUENT ORDER(S)**

*(To be typed and submitted in the Letter Head of the Entity/Firm providing certificate as applicable)*

To,

GM-PURCHASE, BHEL-PSWR,  
Floor No. 5&6, Shri Mohini Complex  
345, KINGSWAY, NAGPUR-440001

Dear Sir,

**Sub:** Declaration reg. minimum local content in line with Public Procurement (Preference to Make in India), Order 2017-Revision, dated 04<sup>th</sup> June, 2020 and subsequent order(s).

**Ref :** 1) NIT/Tender Specification No: BHE/PW/PUR/NTPRT-CABLING U2/2909,  
2) All other pertinent issues till date

We hereby certify that the items/works/services offered by..... *(specify the name of the organization here)* has a local content of \_\_\_\_\_ % and this meets the local content requirement for 'Class-I local supplier' / 'Class II local supplier' \*\* as defined in Public Procurement (Preference to Make in India), Order 2017-Revision dated 04.06.2020 issued by DPIIT and subsequent order(s).

The details of the location(s) at which the local value addition is made are as follows:

- |          |          |
|----------|----------|
| 1. _____ | 2. _____ |
| 3. _____ | 4. _____ |

...

Thanking you,  
Yours faithfully,

**(Signature, Date & Seal of  
Authorized Signatory of the Bidder)**

**\*\* - Strike out whichever is not applicable.**

**Note:**

1. Bidders to note that above format Duly filled & signed by authorized signatory, shall be submitted along with the techno-commercial offer.
2. In case the bidder's quoted value is in excess of Rs. 10 crores, the authorized signatory for this declaration shall necessarily be the statutory auditor or cost auditor of the company (in the case of companies) or a practising cost accountant or practicing chartered accountant (in respect of suppliers other than companies).

In the event of false declaration, actions as per the above order and as per BHEL Guidelines shall be initiated against the bidder.)

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**Annexure-11**

**DECLARATION REGARDING COMPLIANCE TO RESTRICTIONS UNDER RULE 144 (xi) OF GFR 2017**

*(To be typed and submitted in the Letter Head of the Entity/Firm providing certificate as applicable)*

To,

GM-PURCHASE, BHEL-PSWR,  
Floor No. 5&6, Shri Mohini Complex  
345, KINGSWAY, NAGPUR-440001

Dear Sir,

**Sub:** Declaration regarding compliance to Restrictions under Rule 144 (xi) of GFR 2017

**Ref :** 1) NIT/Tender Specification No: BHE/PW/PUR/NTPRT-CABLING U2/2909,  
2) All other pertinent issues till date

I have read the clause regarding restrictions on procurement from a bidder of a country which shares a land border with India and on sub-contracting to contractors from such countries. I certify that \_\_\_\_\_ *(specify the name of the organization here),*

(a) is not from such a country / ☐

(b) has been registered with the Competent Authority *(attach valid registration by the Competent Authority, i.e., the Registration Committee constituted by the Dept. for Promotion of Industry and Internal Trade (DPIIT));* ☐

and will not sub-contract any work to a contractor from such countries unless such contractor is registered with the Competent Authority. *(attach relevant valid registration, if applicable)*

I hereby certify that we fulfil all requirements in this regard and is eligible to be considered.

Thanking you,  
Yours faithfully,

**(Signature, Date & Seal of  
Authorized Signatory of the Bidder)**

**Note:** Bidders to note that in case above certification given by a bidder, whose bid is accepted, is found to be false, then this would be a ground for immediate termination and for taking further action in accordance with law and as per BHEL guidelines.



**Annexure-12: IMPORTANT INFORMATION**

**E -Tender** for this work is invited by BHEL PSWR NAGPUR and offer shall be submitted through BHEL e-procurement portal only. All correspondences regarding this tender shall be through E-procurement portal.

**Postal Address:**

GM /Purchase BHEL PSWR,  
SRIMOHINI COMPLEX, Floor No. 5 & 6, 345 KINGSWAY, NAGPUR 440001, INDIA

Following are the concerned BHEL officials to whom bidders can contact in case of any difficulty:

Manager Purchase, Email: [tapishkhandelwal@bhel.in](mailto:tapishkhandelwal@bhel.in) Ph: +91-9010903666

Manager Purchase, Email: [vivekjha@bhel.in](mailto:vivekjha@bhel.in); Ph+91-9429198214

DGM/Purchase, email: [kamleshbhel@bhel.in](mailto:kamleshbhel@bhel.in),

GM Purchase, Email: [rmalhotra@bhel.in](mailto:rmalhotra@bhel.in).

1. **Refer the abridged version of extant 'Guidelines for suspension of business dealings with suppliers/ contractors' which is available at [www.bhel.com](http://www.bhel.com) on "supplier registration page" at the following link: [https://www.bhel.com/sites/default/files/suspension\\_guidelines\\_abridged.pdf](https://www.bhel.com/sites/default/files/suspension_guidelines_abridged.pdf)**
2. **All Statutory Requirements as applicable for this project shall be complied with.**
3. **Following clause shall form part of the HSE documents issued under Chapter IX of Volume IB 'Special Conditions of Contract'**

"In case of any financial deduction made by Customer for lapses of safety other than what is provided elsewhere in the contract, the same shall be charged on back-to-back basis on the defaulting contractor without prejudice to any other right spelt anywhere in the tender /contract"

4. **BHEL Fraud Prevention Policy: "The Bidder along with its associate/ collaborators/ sub-contractors/ sub-vendors/ consultants/ service providers shall strictly adhere to BHEL Fraud Prevention Policy displayed on BHEL website <http://www.bhel.com> and shall immediately bring to the notice of BHEL Management about any fraud or suspected fraud as soon as it comes to their notice."**
5. **"Pradhan Mantri Kaushal Vikas Yojna:** The contractor shall, at all stages of work deploy skilled/semi-skilled tradesmen who are qualified and possess certificate in particular trade from CPWD Training Institute/Industrial Training Institute/ National Institute of Construction Management and Research (NICMAR), National Academy of Construction, CIDC or any similar reputed and recognized Institute managed/ certified by State/ Central Government. The number of such qualified tradesmen shall not be less than 20% of total skilled/semi-skilled workers required in each trade at any stage of work. The contractor shall submit number of man days required in respect of each trade, its scheduling and the list of qualified tradesmen along with requisite certificate from recognized Institute to Engineer-in-Charge for approval. Notwithstanding such approval, if the tradesmen are found to have inadequate skill to execute the work of respective trade, the contractor shall substitute such tradesmen within two days of written notice from Engineer-in-Charge. Failure on the part of contractor to obtain approval of Engineer-in-Charge or failure to deploy qualified tradesmen will attract a compensation to be paid by contractor at the rate of Rs.100 per such tradesman per day. Decision of Engineer-in-Charge as to whether particular tradesman possesses requisite skill and amount of compensation in case of default shall be final and binding".

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6. Bidder to strictly follow all the necessary guidelines issued by Customer, District Magistrate, State Government and Central government to control Pandemic/Epidemic outbreak. The related towards quarantine Centre/Medical expenses etc., if any, shall be in the bidder's scope.
7. **The clause 2.7.9.1 below is added under the heading "Rights of BHEL" of General Conditions of Contract Volume-IC GCC:**

**2.7.9.1 Provision of Penalty in case of slippage of Intermediate Milestones:**

- i) **Two major Intermediate Milestones are mentioned as M1 & M2 in Chapter VI: Time Schedule of Vol IA Technical Conditions of Contract.**
- ii) In case of slippage of these identified Intermediate Milestones, Delay Analysis shall be carried out on achievement of each of these two Intermediate Milestones in reference to Form 14.
- iii) In case delay in achieving M1 Milestone is solely attributable to the contractor, 0.5% per week of Executable Contract Value\*, limited to maximum 2% of Executable Contract Value, will be withheld.
- iv) In case delay in achieving M2 Milestone is solely attributable to the contractor, 0.5% per week of Executable Contract Value\*, limited to maximum 3% of Executable Contract Value, will be withheld.
- v) Amount already withheld, if any against slippage of M1 milestone, shall be released only if there is no delay attributable to contractor in achievement of M2 Milestone.
- vi) Amount required to be withheld on account of slippage of identified intermediate milestone(s) shall be withheld out of respective milestone payment and balance amount (if any) shall be withheld @10% of RA Bill amount from subsequent RA bills.
- vii) Final deduction towards LD (if applicable as per clause 2.7.9 above), on account of delay attributable to contractor shall be based on final delay analysis on completion / closure of contract. Withheld amount, if any due to slippage of identified intermediate milestone(s) shall be adjusted against LD or released as the case may be.
- viii) In case of termination of contract due to any reason attributable to contractor before completion of work, the amount already withheld against slippage of intermediate milestones shall not be released and be converted into recovery.

\* **Executable Contract Value** - Value of work for which inputs/ fronts were made available to contractor and were scheduled for execution till the date of achievement of that milestone.

**8. Conflict of Interest among Bidders/ Agents:**

"A bidder shall not have conflict of interest with other bidders. Such conflict of interest can lead to anti-competitive practices to the detriment of Procuring Entity's interests. ***The bidder found to have a conflict of interest shall be disqualified.*** A bidder may be considered to have a conflict of interest with one or more parties in this bidding process, if:

- a) they have controlling partner (s) in common; **or**
- b) they receive or have received any direct or indirect subsidy/ financial stake from any of them; **or**
- c) they have the same legal representative/agent for purposes of this bid; **or**
- d) they have relationship with each other, directly or through common third parties, that puts them in a position to have access to information about or influence on the bid of another Bidder; **or**
- e) Bidder participates in more than one bid in this bidding process. Participation by a Bidder in more than one Bid will result in the disqualification of all bids in which the parties are

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involved. However, this does not limit the inclusion of the components/ sub-assembly/ Assemblies from one bidding manufacturer in more than one bid; or

f) In cases of agents quoting in offshore procurements, on behalf of their principal manufacturers, one agent cannot represent two manufacturers or quote on their behalf in a particular tender enquiry. One manufacturer can also authorize only one agent/dealer. There can be only one bid from the following:

1. The principal manufacturer directly or through one Indian agent on his behalf; **and**
2. Indian/foreign agent on behalf of only one principal;

**or**

g) A Bidder or any of its affiliates participated as a consultant in the preparation of the design or technical specifications of the contract that is the subject of the Bid; **or**

h) In case of a holding company having more than one independently manufacturing units, or more than one unit having common business ownership/management, only one unit should quote. Similar restrictions would apply to closely related sister companies. Bidders must proactively declare such sister/ common business/ management units in same/ similar line of business."

**9. Acceptance of Bank Guarantee (BG)**

**Revision in Acceptance of Bank Guarantee (BG) Clause no. 1.10.3 (iii) of Vol I C GCC:**

**Clause No. 1.10.3 (iii) of Vol IC GCC is revised as below: -**

"Bank Guarantee issued by:

- a. Any of the BHEL consortium bank listed below:

State Bank of India  
ABN Amro Bank N.V.  
Bank of Baroda  
Canara Bank  
Citi Bank N.A.  
Corporation Bank  
Deutsche Bank  
HDFC Bank Ltd.  
The Hongkong and Shanghai Banking Corporation Ltd  
ICICI Bank Ltd.  
IDBI Ltd.  
Punjab National Bank  
Standard Chartered Bank  
State Bank of Travancore  
State Bank of Hyderabad  
Syndicate Bank

- b. Any public sector Bank (other than consortium banks) with a clause in the text of Bank Guarantee that **"It is enforceable at Nagpur, Maharashtra"**.
- c. Any private sector banks, with a clause in the text of Bank Guarantee that **"It is enforceable by being presented at any branch of the bank"**.

**Note: "Bank Guarantees issued by Co-operative Banks are not acceptable".**

**10. Broad Terms & Conditions of Reverse Auction:**

*In continuation to Clause 19.0 of NIT (Notice Inviting Tender) following are the broad terms and conditions of Reverse Auction:*

*"BHEL shall be resorting to Reverse Auction (RA) (Guidelines as available on [www.bhel.com](http://www.bhel.com)) (<https://www.bhel.com/guidelines-reverse-auction-2021>) for this tender. RA shall be conducted among the techno-commercially qualified bidders.*

*Price bids of all techno-commercially qualified bidders shall be opened and same shall be considered for RA. In case any bidder(s) do(es) not participate in online Reverse Auction, their sealed envelope price bid along with applicable loading, if any, shall be considered for ranking."*

**Note:-**

- 1. No benefits to MSE bidders w.r.t Reverse Auction Guidelines as available on [www.bhel.com](http://www.bhel.com) against works contract.*
- 2. In case of enquiry through e-procurement the sealed electronic price bid (e-bid) is to be treated as sealed envelope price bid.*
- 3. Reverse Auction will be conducted if two or more bidders are techno-commercially qualified. In case of two or three qualified bidders, there shall be no elimination of H1 bidder (whose quote is highest in sealed envelope price bid). **In case of four qualified bidders, the H1 bidder shall be eliminated whereas in case of five qualified bidders, H1 & H2 bidders shall be eliminated. However, in case of six or more qualified bidders are available, RA would be conducted amongst first 50% of the bidders arranged in the order of prices from lowest to highest.** Number of bidders eligible for participating in RA would be rounded off to next higher integer value if number of qualified bidders is odd (e.g. if 7 bids are qualified, then RA will be conducted amongst lowest four bidders). However, there will be no elimination of qualified bidders who are MSE or qualifying under PPP-MII, Order 2017, *provided their bids are within their respective margin of purchase preference {presently 15% for MSEs and 20% for PPP-MII, or as amended from time to time}.**

*In case of multiple H1 bidders, all H1 bidders (except MSEs and bidders qualifying under PPP-MII, Order 2017, **who are within the margin of purchase preference**) shall be removed provided minimum two bidders remain in fray, else no H1 removal*

- 11. PRICE VARIATION COMPENSATION (Clause No. 2.17 of Vol C GCC):** Applicable. However Clause no. 2.17.6 is being revised as below

Existing	Revised As
Base date shall be calendar month of the 'last date of submission of Tender'	Base date shall be calendar month of the 'date of start of work at Site'

- 12. Commencement Period for "Performance Guarantee for Workmanship" as per clause no 2.24 of Vol-IC GCC:** This period shall commence after the completion of Contract as certified by Engineer-in-Charge

- 13. Bidder to take note of the following clauses which have been revised:**

- **General Conditions of Contract: Clause No. 1.9, 1.10, 2.7, 2.11, 2.13, 2.15.5, 2.19, 2.22, 2.24 & 2.27**

**BHEL PSWR  
Notice Inviting Tender**

**E-Tender Spec No: BHE/PW/PUR/NTPRT-CABLING U2/2909**

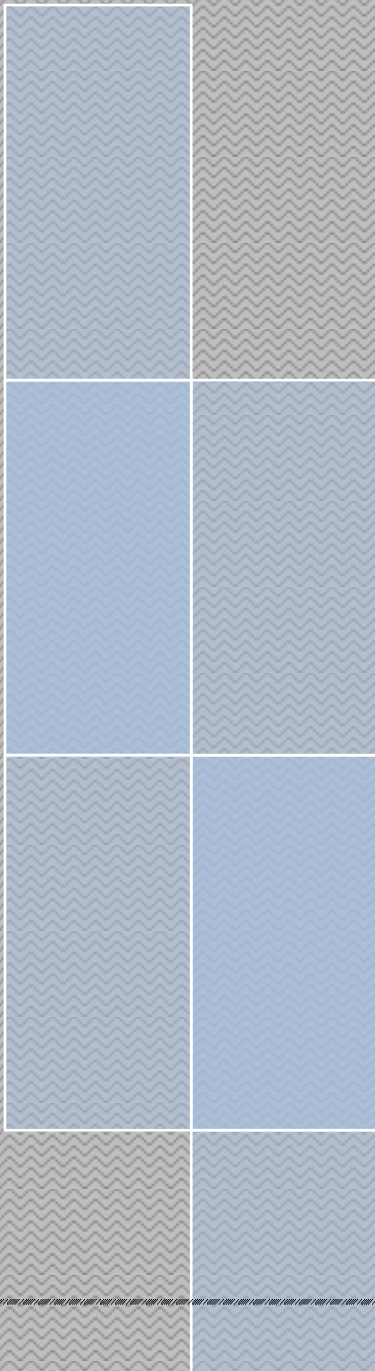
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○ **Special Conditions of Contract: Clause no: 2.5, 4.2.1.7, 4.2.2.5, 5.14 , 6.1.11, & 10.3, 10.4**

**14. Bidders kindly to take note that EMD (Earnest Money Deposit) shall be furnished by MSE bidders as well, as per the amount and procedure indicated in the NIT/GCC**

2909

# TECHNICAL CONDI- TIONS OF CON- TRACT (TCC)



# TECHNICAL CONDITIONS OF CONTRACT (TCC)

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# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## Chapter - I: PROJECT INFORMATION

### 1. PROJECT INFORMATION

Project Information details are as follows:

1	Project Name	3x800 MW Patratu Vidut Utpadan Nigam Ltd. (PVUNL) Patratu STPP	
2	Plant Site Location	Near Patratu town in Ramgarh district of Jharkhand	
3	Location Co-ordinate	Main Plant & Township:	
3.1	Corner name	Latitude	Longitude
3.2	Top Corner	23°39'00" N	85°17'51.5"E
3.3	Bottom Corner	23°38'12.5"N	85°17'27"E
3.4	Left Corner	23°38'22.5"N	85° 17'10.6"E
3.5	Right Corner	23°38'40"N	85°17'57"E
4	Nearest Town/ City	Patratu -03km, Ramgarh-30km, Ranchi - 37km	
5	Nearest Railway Station	Patratu-4km	
6	Nearest Airport	Ranchi-45km	
7	Nearest Seaport	Kolkata-424km	
8	Nearest Road Access	Ranchi Patratu Ramgarh Road	
9	Site Elevation	377m above MSL	
10	Ambient Temperature		
10.1	Mean of Daily Maximum Temperature	40°C (During May)	
10.2	Mean of Daily Minimum Temperature	10.7°C (During December)	
10.3	Wet Bulb Temperature	27°C (Maximum)	
11	Annual Rainfall	311mm average annually	
12	Wind Speed	0 to 39 km/ hr	
13	Wind Direction	East North East to West South West	
14	Seismic Zone	Zone III as per IS:1893	

The vicinity map of the project is shown below



# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## Chapter - I: PROJECT INFORMATION



The Bidder shall visit site and get acquainted himself with the conditions prevailing at site before submission of the bid. The information given here in under are for general guidance and shall not be contractually binding on BHEL/ Owner. All relevant site data/ information as may be necessary shall have to be obtained/ collected by the Bidder.

# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## Chapter - II: SCOPE OF WORK

### 2. SCOPE OF WORK

The work under these specifications broadly covers the complete work of handling at storage yard/ stores, transportation to work site, calibration, pre-assembly, erection, testing, pre-commissioning, and handing over of Main Plant Cabling System of Unit#2 and BOP of 3x800MW PVUNL Patratu Thermal Power Plant including ACC, Boiler, Turbine, Pipe Rack, Transformer Yard, CHP, AHP, FGD, ESP and other related areas for unit-2 readiness which are not specifically mentioned in this TCC. The main components of this package are:

- a) Cable Tray & Accessories.
- b) Power Cables (HT & LT).
- c) Control Cables.
- d) HT Straight through joints and Termination Kits.
- e) Junction boxes and Push buttons.
- f) Structural Steel
- g) Above Ground Earthing and Lightning Protection systems.
- h) Other related works to complete the job as per drawings/instruction of site engineer.

#### 2.1 CABLE TRAYS/ CABLE DUCTS AND ACCESSORIES

- 2.1.1 Cables shall run in cable trays mounted horizontally or vertically on cable tray support system which in turn shall be supported from floor, ceiling, overhead structures, trestles, pipe racks, trenches or other building structures.
- 2.1.2 This scope of works includes Base plate for single/double channel, Flat Plate,
- 2.1.3 Horizontally running cable trays shall be clamped by bolting to cantilever arms and vertically running cable trays shall be bolted to main support channel by suitable bracket/ clamps on both top and bottom side rails at an interval of 2000mm in general. For vertical cable risers/ shafts cable trays shall be supported at an interval of 1000mm in general. Fixing of cable trays to cantilever arms or main support channel by welding shall not be accepted. Cable tray installation shall generally be carried out as per the approved guidelines/ drawings.
- 2.1.4 The cantilever arms shall be positioned on the main support channel with a minimum vertical spacing of 300mm unless otherwise indicated.
- 2.1.5 Spacing between cable trays shall normally be kept 300mm for cable laying convenience and effective heat dissipation. Where direct heat radiation exists, heat isolating barriers shall be adopted.
- 2.1.6 The contractor shall fix the brackets/ clamps/ insert plates using anchor fasteners. Minimum size of anchor fasteners shall be M8x50 and material shall be stainless steel grade 316 or better. Anchor fastener shall be fixed as recommended by manufacturer and as approved by site engineer. For brick wall suitable anchor fasteners shall be used as per the recommendations of manufacturer.
- 2.1.7 All cable way sections shall have identification, designations as per cable way layout drawings and painted/ stenciled at each end of cable way and where there is a branch connection to another cable way. Minimum height of letter shall be not less than 75mm. For long lengths of trays, the identification shall be painted at every 10meter and at each end of cable tray & branch connection floor/ wall opening. Risers shall additionally be painted/ stenciled with identification

# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## Chapter - II: SCOPE OF WORK

numbers at every floor.

- 2.1.8 In certain cases, it may be necessary to site fabricate portions of trays, supports and other non-standard bends where the normal prefabricated trays, supports and accessories may not be suitable. Fabricated sections of trays, supports and accessories to make the installation complete at site shall be neat in appearance and shall match with the prefabricated sections in the dimensions. They shall be applied with one coat of red lead primer, one coat of oil primer followed by two finishing coats of aluminium paint.
- 2.1.9 Various types of sheet metal, galvanized cable tray, i.e., Perforated, ladder type, seal metal duct, solid bottom tray, shall be provided in standard lengths along with accessories like hardware, bends, reducers, coupler plate, tray covers, trefoil clamps and tray clamps etc.
- 2.1.10 Installation of cable tray/ cable duct shall include cutting, laying, jointing, supporting, drilling holes in the support, providing tees/ reducers/ bends/ clamps as per tray route layout, Fabrication of bends/ tees/ reducers from straight length, fixing of tray covers, welding of tray on support, cleaning and application of paint (refer clause no. 2.29 for details) on weld joints. Installation of tray/ duct covers, wherever provided, will be done as a part of tray erection and no extra rates will be payable.
- 2.1.11 Rate for Fabrication of bends are as per BOQ.
- 2.1.12 Fabrication of tee/ reducers from straight length of tray is within the scope of work and rate quoted shall be inclusive in unit rate (in running meter).
- 2.1.13 Cable trays/ ducts have to be routed underground in cable trench, over head on structure, valves, floors etc. for various applications such as cable laying, copper tubes, conduits, thermocouple, temperature gauge capillary etc.
- 2.1.14 As per the BOQ Main Cable tray and support shall be installed in Cable cellar, Boiler floors, All floors in B-C, C-D, and Mill, ID-Fan, PA-Fan, ID-Fan, ESP, Soot Blower area, BOP and other associated systems. Looping Trays shall be laid from JB to Field which is also under the scope of the contract.
- 2.1.15 Cable trays where ever is required by the other BHEL vendor (from BHEL Equipment to BHEL Equipment) are included in this contract as sizes mentioned in BOQ. Cable tray routing shall be done by the agency as per the drawing provided by PEM or Concerned BOP agency.
- 2.1.16 Installation of cable racks and supports structure shall be carried out in all the required areas. Steel embedment shall be provided in the cable trenches, ceiling slabs and concrete blocks for installing the cable racks and support structures:
- 2.1.17 Ladder perforated type cable trays shall be used in cable trenches and vertical risers.
- 2.1.18 Perforated cable trays shall be used in higher elevations in Boiler and TG area.
- 2.1.19 Cable racks in the trenches and control room are to be shared with other contractors installing cables in different areas wherever required. Contractor shall cooperate with the other contractors in sharing the cable trays and proper dressing and clamping the cables.
- 2.1.20 Cable trays in boiler & ESP area shall be supported from the boiler and ESP structures. The same shall be coordinated with Boiler/ ESP contractor.
- 2.1.21 Cable trays in these areas shall be in vertical formation to avoid dust accumulation. No cable trenches shall be provided in Boiler/ ESP area.
- 2.1.22 Cable tray philosophy shall be as per enclosed cable erection philosophy.



# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## Chapter - II: SCOPE OF WORK

### **2.2 METAL CHANNEL FLEXIBLE BOLTABLE CABLE SUPPORT SYSTEM (ESP/ BOILER/ BOP Area/ As per the drawing provided by BHEL-PEM for main route to AHP/ CHP etc.)**

- 2.2.1 Flexible GI cable support system, consisting of single/ double channels, base plates, Fabrication of irregular bend and cantilever arms are as per BOQ. Wherever necessary, the base plate beam clamps will be supplied for bolting. Otherwise, the base plates are to be welded to the racks or beams if necessary, at 90°.
- 2.2.2 Wherever supplied, GI cable trays shall be of bolted construction only with fixing screws and coupler plates.
- 2.2.3 Angle fittings, flat plate fittings, clamps for single & double channels, TC1, Beam Clamp, PF1, PF2, fasteners etc. will be supplied for fixing trays and cantilever arms and for this no separate erection charges will be paid. Quoted Rate Rates shall be accommodated in support channel and cantilever arm erection.
- 2.2.4 Metal channel bolt able GI cable support shall be supplied. Each cable rack assembly comprises of sub components such as single or double channel, base plate for single/ double channel, angle fitting, clamps, cantilever arm, anchor fastener, associated hardware (spring loaded nuts, bolts and washers) etc.
- 2.2.5 Channel shall be supplied in standard length of six meter. Contractor shall cut the channel and assembly the rack as per site requirement. Cantilever arm is to be fixed on channel support with spring loaded nuts/ bolts as per installation drawing.
- 2.2.6 Base plate/ angle fitting shall be continuously welded all around to steel members/ plate insert if provided. Brackets/ clamps shall be welded to steel surface with channel as applicable in position to ensure alignment of clamps/ channels. Weld thickness shall be 6 mm minimum. In case steel surface is not available for welding, anchor bolts is to be used for fixing the base/ angle fitting.
- 2.2.7 Main support for longitudinal cable tray run in the cable vaults shall be fixed at both ends at top as well at bottom as out lined above.
- 2.2.8 Galvanization damaged due to welding/ cutting shall be re-painted with cold galvanizing paint (refer Clause no. 2.29 for details).
- 2.2.9 Unit rate for "Single/ Double Channel" shall include cutting channel in required lengths, fixing of angle fittings/ base plate/ clamps/ brackets/ fasteners/ cantilever arms/ welding etc. as required as per type of installation.
- 2.2.10 The Nuts & bolts should be galvanized type.
- 2.2.11 If fabricated bend is readily available at site and still contractor does fabrication then fabrication rate of bending shall not be applicable and it will be treated as free of cost .

### **2.3 CABLE LAYING (POWER/ CONTROL/ INSTRUMENTATION SHIELDED/ UNSHIELDED CABLES/ PLUG-IN CABLES/ COAXIAL/ UTP/ STP/ DATA HIGHWAY, ARMoured/ UN- ARMoured, SINGLE-CORE/ MULTI-CORE, PVC/ HR PVC/ FRLS/ TEFLON/ PTFE/ XLPE INSULATION, OPTICAL FIBER)**

- 2.3.1 Cable installation shall be carried out as per IS:1255 and other applicable

# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## Chapter - II: SCOPE OF WORK

standards.

- 2.3.2 For Cable unloading, pulling etc. following guidelines shall be followed in general:
- 2.3.2.1 Cable drums shall be unloaded, handled and stored in an approved manner on hard and well drained surface so that they may not sink. In no case shall be drum be stored flat i.e. with flange horizontal. Rolling of drums shall be avoided as far as possible. For short distances, the drums may be rolled provided they are rolled slowly and in proper direction as marked on the drum. In absence of any indication, the drums may be rolled in the same direction as it was rolled during taking up the cables. For unreeling the cable, the drum shall be mounted on suitable jacks or on cable wheels and shall be rolled slowly so that cable comes out over the drum and not from below. All possible care shall be taken during unreeling and laying to avoid damage due to twist, kink or sharp bends. Cable ends shall be provided with sealed plastic caps to prevent damage and ingress of moisture.
- 2.3.3 While laying cable, ground rollers shall be used at every 2-meter interval to avoid cable touching ground. The cables shall be pushed over the rollers by a gang of people positioned in between the rollers. Cables shall not be pulled from the end without having intermediate pushing arrangements. Pulling tension shall not exceed the values recommended by cable manufacturer. Selection of cable drums for each run shall be so planned so as to avoid using straight through joints. Care should be taken while laying the cables so as to avoid damage to cables. If any particular cable is damaged, the same shall be repaired or changed to the satisfaction of Engineer in Charge.
- 2.3.4 Cables shall be laid on cable trays strictly in line with cable schedule. Where specific cable layouts are not shown on drawings, Contractor shall route these as directed by the Engineer in Charge
- 2.3.5 Power and control cables shall be laid on separate tiers in line with the approved guidelines/ drawings. The laying of different voltage grade cables shall be on different tiers according to the voltage grade of the cables. In horizontal tray stacks, H.T. cables shall be laid on top most tier and cables of subsequent lower voltage grades on lower tiers of trays. Single core cable in trefoil formation shall be laid with a distance of four times the diameter of cable between trefoil center lines and clamped at every two meter. All multicore cables shall be laid in touching formation. Power and control cables shall be secured fixed to trays/ support with cable clamps/ ties with self-locking arrangement. For horizontal trays arrangements, multicore power cables and control cables shall be secured at every five-meter interval. For vertical tray arrangement, individual multicore power cables and control cables shall be secured at every one meter. After completion of cable laying work in the particular vertical tray, all the control cables shall be bound to trays/ supports by cable clamps/ ties with self-locking arrangement at every five-meter interval and at every bend. Fiber Optical cable shall be laid in trenches/ trays or as decided by BHEL.
- 2.3.6 Bending radii for cables shall be as per manufacturer's recommendations and IS:1255.
- 2.3.7 Where cables cross roads/ rail tracks, the cables shall be laid in hume pipe/ HDPE pipe.
- 2.3.8 No joints shall be allowed in trip circuits, protection circuits and CT/ PT circuits. Also joints in critical equipment in main plant area shall not be permitted. Vendor shall identify and accordingly procure the cable drum length.
- 2.3.9 In each cable run some extra length shall be kept at suitable point to enable one

# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## Chapter - II: SCOPE OF WORK

LT/ two HT straight through joints to be made, should the cable develop fault at a later stage. Control cable termination inside equipment enclosure shall have sufficient lengths so that shifting of termination in terminal blocks can be done without requiring any splicing.

- 2.3.10 Wherever few cables are branching out from main trunk route troughs shall be used.
- 2.3.11 Where there is a considerable risk of steam, hot oil or mechanical damage cable routes shall be protected by barriers or enclosures.
- 2.3.12 The installation work shall be carried out in a neat workman like manner & areas of work shall be cleaned of all scraps, water, etc. after the completion of work in each area every day. Contractor shall replace RCC/ Steel trench covers after the Installation work in that particular area is completed or when further work is not likely to be taken up for some time.
- 2.3.13 Separation: At least 300mm clearance shall be provided between:
- 2.3.14.1 HT power & LT power cables,
- 2.3.14.2 LT power & LT control/ instrumentation cables.
- 2.3.14 Segregation
- 2.3.15.1 Segregation means physical isolation to prevent fire jumping.
- 2.3.15.2 All cables associated with the unit shall be segregated from cables of other units.
- 2.3.15.3 Interplant cables of station auxiliaries and unit critical drives shall be segregated in such a way that not more than half of the drives are lost in case of single incident of fire. Power and control cables for AC drives and corresponding emergency AC or DC drives shall be laid in segregated routes. Cable routes for one set of auxiliaries of same unit shall be segregated from the other set.
- 2.3.15.4 In switchyard, control cables of each bay shall be laid on separate racks/ trays.
- 2.3.15 Cable tags shall be provided on all cables at each end (just before entering the equipment enclosure), on both sides of a wall or floor crossing, on each duct/ conduit entry, and at every 20 meters in cable tray/ trench runs. Cable tags shall also be provided inside the switchgear, motor control centers, control and relay panels etc. where a number of cables enter together through a gland plate. Cable tag shall be of rectangular shape for power cables and control cables. Cable tag shall be of 2 mm thick aluminum with number punched on it and securely attached to the cable by not less than two turns of 20 SWG GI wire conforming to IS:280. Alternatively, the Contractor may also provide cable tags made of nylon, cable marking ties with cable number heat stamped on the cable tags. The cable tag requirements mentioned above shall prevail over Tag requirements mentioned elsewhere in this document for HT power, LT power & control cables.
- 2.3.16 While crossing the floors, un-armoured cables shall be protected in conduits up to a height of 500 mm from floor level if not laid in tray.
- 2.3.17 The termination and connection of cables shall be done strictly in accordance with cable termination kit manufacturer" instructions, drawings and/ or as directed by Engineer in Charge.
- 2.3.18 Cable jointer shall be qualified to carryout satisfactory cable jointing/ termination. Contractor shall furnish for review documentary evidence/ experience reports of the jointers to be deployed at site.
- 2.3.19 Work shall include all clamps, fittings etc. and clamping, fitting, fixing, plumbing, soldering, drilling, cutting, taping, preparation of cable end, crimping of lug, putting insulated sleeves over control cable lugs, heat shrinking (where applicable), connecting to cable terminal, shorting and grounding as required to

# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## Chapter - II: SCOPE OF WORK

complete the job to the satisfaction of the Engineer in Charge. Apart from termination and straight through joints of HT cables, everything is included in cable laying.

- 2.3.20 The equipment will be generally provided with undrilled gland plates for cables/ conduit entry. The Contractor shall be responsible for punching of gland plates, painting and touching up. Holes shall not be made by gas cutting. The holes shall be true in shape. All cable entry points shall be sealed and made vermin and dust proof. Unused openings shall be effectively sealed by 2mm thick aluminium sheets.
- 2.3.21 Control cable cores entering control panel/ switchgear/ MCC/ miscellaneous panels shall be neatly bunched, clamped and tied with self-locking type nylon cable ties with de interlocking facility to keep them in position.
- 2.3.22 All the cores of the control cable to be terminated shall have identification by providing ferrules at either end of the core, each ferrule shall be indelible, printed single tube ferrule and shall include the complete wire number and TB number as per the drawings. The ferrule shall fit tightly on the core. Spare cores shall have similar ferrules with suffix sp1, sp2, ---etc. along with cable numbers and coiled up after end sealing.
- 2.3.23 All cable terminations shall be appropriately tightened to ensure secure and reliable connections.
- 2.3.24 Cable laying includes cutting to the required length, laying in overhead cable racks/ underground cable trenches/ pipes/ flexible conduits, dressing/ clamping in tray, drilling of holes in gland plates in panels and junction box, glanding, splicing, dressing of spliced wire inside the panel and JBs, providing printed ferrules (ferrule printing machines to be provided by contractor for printing necessary cross ferruling details)/ providing PVC numerical/ alphabetical/ printed ferrules (contractor to arrange adequate numbers of his own ferrule printing machine), termination by using crimp type copper tinned/ aluminium lugs, insulated/ un-insulated, termination (crimp, soldering, etc.), plug-in connections with insert type crimping, continuity checking, providing identification PVC/ aluminium cable tags (at both the ends and at appropriate intervals (approximately 30meter) throughout the route length and also at each bend), continuity checking, insulation resistance checking, high voltage test on HT cables. Laying of Optical fiber cables on cable trays/ cable trench shall necessarily be done using flexible conduit.
- 2.3.25 The erection contractor shall supply consumables like aluminum tags, lugs and ferrules.
- 2.3.26 Buried cable routes shall have marker projecting 150mm above ground and shall be spaced at an interval of 30m along the route and at every bend.
- 2.3.27 No single core cable shall pass through a GI conduit/ pipe or duct singly except DC single core cables. AC single core cables shall pass through GI conduit/ pipe in trefoil formation only, or through PVC pipes confirming to IS: 4985.
- 2.3.28 Entry to the panels and JBs may be at top, sides or bottom. All cables are required to be properly supported and clamped near to the JB/ panel.
- 2.3.29 LT Power cables of cross-sectional area less than 95 sq. mm. and all control and Instrumentation cables shall be clamped in bunches by means of cable nylon ties.
- 2.3.30 Wherever cable glanding is not possible, either due to the gland plate size limitations or more number of cable entries, prefab plug-in cables, etc., for such cases cables may have to be lifted inside the panel by either making cut-out in gland plate and providing rubber profile for sharp edge protection or



# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## Chapter - II: SCOPE OF WORK

- alternatively, providing 4" or 6" PVC pipe coupling gland and these pipe coupling gland shall be supplied by contractor within the quoted rate of cable laying.
- 2.3.31 Copper tinned lugs of various types (pin, ring, fork, snap-on) up to 4 sq. mm conforming to IS: 694 for cables, PVC cable ties, PVC ferrules, PVC button and tapes, cable identification tag of PVC/ metal as per site requirement, clamping and dressing material such as suitable cable ties/ clamps etc. with hardware, PVC sleeves etc. shall be supplied by the contractor within the quoted rates for cable laying. However, trefoil clamps with hardware for single core power cable shall be supplied by BHEL. No separate payment for erection of this trefoil clamp will be entertained and is included in the cable laying. The quality of material shall be got approved from BHEL Engineer prior to their use on job.
- 2.3.32 Trefoil clamps for single core cables to be supplied shall be pressure die cast aluminum or fiber glass or nylon and shall include necessary fixing accessories like G.I. nuts, bolts, washers, etc. Trefoil clamps shall have adequate mechanical strength to withstand the forces generated by the peak value of maximum system short circuit current.
- 2.3.33 All care should be taken to avoid abrasion, tension, twisting, kinking, and stretching of cables during installation. Rollers are to be used during pulling of cable for long length.
- 2.3.34 Cable shielding – all signal cables are supplied with bare shielded copper wire/ with braided wire shield. Generally, shield wire is kept isolated at instrument/ field device end and continuity is maintained through JB's and grounded at panel end only. While terminating the shield wire either in either panel or JB's, PVC sleeves are to be used to avoid two-point earthing.
- 2.3.35 Spare holes in the panels/ Instruments/ Actuators/ Motors/ JB's etc. shall be sealed by suitable method by contractor. (The cost of work and Materials such as aluminium sheet or Adhesive tape/ Plugs etc. shall be within the quoted rates for laying of cables).
- 2.3.36 Insulation test of the various circuits shall be done.
- 2.3.37 Wherever cables run through ducts, conduits, valves, etc., they shall be sealed using fire/ weather proof compound. In addition to this, cable entry in panels, MCCs, instruments, electrical actuators etc., are also required to be sealed. The required material for doing so shall be included by contractor in the cabling scope.
- 2.3.38 When cables pass through floors, walls etc., it shall be passed through a pipe for mechanical protection and the pipe ends sealed suitably.
- 2.3.39 All the cables will be properly laid in cable trays, dressed and clamped with aluminum flats. The cable will be terminated at both ends with suitable lugs and printed ferrules and will be glanded properly. Suitable equipment and consumables for ferrule printing has to be arranged by the contractor at his own cost. For cable identification, the contractor shall provide at his cost aluminium tags at regular intervals (20 m) through each run of cable.
- 2.3.40 Cable lugs/ ferrules for power cables shall be tinned copper solderless crimping type suitable for aluminium compacted conductor cables. Cable lugs and ferrules for control cables shall be tinned copper type. The cable lugs for control cables shall be provided with insulating sleeve and shall suit the type of terminals provided on the equipment. Cable lugs and ferrule shall conform to DIN standards.
- 2.3.41 All electrical connections shall be tested for polarity and proper connections.
- 2.3.42 The checking of operation of individual equipment and instruments to which the cabling/ wiring connected shall also be done by the contractor.



# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## Chapter - II: SCOPE OF WORK

- 2.3.43 Where power and control cables are to be laid in the same route, suitable barriers to segregate them physically shall be employed.
- 2.3.44 Space equal to the diameter of cable shall be provided between power cables of six over 50 mm in diameter.
- 2.3.45 Care shall be taken to avoid short bending and kinking of conductor damaging insulation and stressing the cable beyond pulling force recommended by the manufacturer. Cable shall be protected at all times from mechanical damage.
- 2.3.46 The minimum radius of formed bend of an insulated cable shall be 12d for un-armoured cables and 15d for armoured cables where 'd' is the overall diameter of the cables or as per the datasheet, whichever is higher.
- 2.3.47 No cable shall be laid in ducts or trenches where other services such as oil pipes, steam or water pipes are laid.
- 2.3.48 Where cabling passes through brickwork or concrete work, the contractor shall provide suitable local protection against mechanical damage wherever necessary.
- 2.3.49 The layout of all cables shall be arranged to give adequate clearance from other services and cables shall be routed to avoid hot zones. No extra cost shall be considered for rework.
- 2.3.50 Jointing of cables shall be avoided as far as practicable. However, jointing if at all necessary, shall be done by crimping type cable joints after getting approval of BHEL Engineer.
- 2.3.51 The cable schedules indicating cable sizes, tentative cables routing information will be furnished by BHEL at site to the contractor. Required steel inserts on cable trenches, ceilings of the platforms in TG hall for erecting the cables will be provided by BHEL. The contractor shall design number of cable/ racks to accommodate the cables on racks/ trays properly.
- 2.3.52 Many of the cable trays and cables have to be laid in cable trenches. For this purpose, the cover of the trenches has to be opened for working in site and whenever the cables are to be laid in existing cable tray, all safety precautions have to be observed. After completing the work, the trenches have to be cleaned and covers put back into position. Contractor shall also carry out de-watering from the trenches if required and arrange pumps etc., at his cost.
- 2.3.53 Cables to be laid for exhaust fan and its starter box shall be laid on the wall/ beam/ ceiling for that spacer, cleat and clamp material shall be supplied by the bidder. Cable laying rate shall be inclusive of hardware items.
- 2.3.54 Looping wire at terminal block of panels and electrical actuator as shown in the inter-connection diagrams or as required is to be done by contractor at no extra cost. Re termination of control cable in panel or equipment side due to any reason will not be paid extra. Agency shall provide the electrician during commissioning of equipment after cable termination work if necessary.
- 2.3.55 Sharp bends of cable trays shall be avoided in all type of cable trays.
- 2.3.56 Contractor shall carefully plan the cutting schedule of each cable drum in consultation with BHEL site engineer such that wastage is minimized. Recovery will be made in case the wastages are exceeding the wastage allowances fixed in this contract.
- 2.3.57 Testing and electrical measurement of cable installations shall conform to the requirement of IS: 1255.
- 2.3.58 The rate of laying for LT power, control and signal cable is inclusive of glanding, trefoil clamps and termination at both ends. Glands & Lugs above 4 sq. mm shall be supplied by BHEL & lugs up to 4 sq. mm shall be in vendor's scope. **The LT**

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**Power Cable straight through Jointing Kit (if required) shall be in vendor's scope of supply.** The rate for erection for all these items will be part of laying rates. No separate rate is applicable on this account.

2.3.59 The unit rates for the HT cable termination and unit rates for laying of HT cables are exclusive of each other. Glands & termination kits for HT cables (3.3kV and above) shall be supplied by BHEL/ BHEL's Customer.

2.3.60 Apart from above, Cable Erection Philosophy (Doc no. PE-DC-424-507-E004) should be strictly followed.

### 2.4 JUNCTION BOXES AND PUSH BUTTONS

2.4.1 Different types of junction boxes are to be erected by the contractor as per attached BOQ. The junction boxes are to be located at the locations jointly decided at site during erection. The junction boxes are to be erected on the frames fabricated at site. The installation of Junction Boxes/ Push Buttons (JB/ PB) should be checked for correctness and their functions.

2.4.2 Junction boxes shall be mounted at a height of 1200mm above floor level or as specified in the drawings and shall be adequately supported/ mounted on masonry wall by means of anchor fasteners/ expandable bolts or shall be mounted on an angle, plate or other structural supports fixed to floor, wall, ceiling or equipment foundations.

### 2.5 STRUCTURAL STEEL FABRICATION AND INSTALLATION (INSTRUMENT/ JUNCTION BOX FRAME/ CABLE TRAY & MISC STRUCTURES FABRICATION)

2.5.1 Structural steel material like MS angles, channels, beams, flats, plates etc. shall be supplied in running meter and the same shall be used for misc. fabrication if required. and the same shall be used for fabrication of panel base frame, cable tray supports, canopies for instruments/ panels/ drives/ JB's/ Push Buttons etc., Instrument/ Junction box frames, Impulse Pipe/ Instrument Air Pipe supports and instruments etc.

2.5.2 This shall include cutting into size, conduiting of end connections, if required, welding, grinding of excess weld deposits, drilling of holes for mounting of device/ instrument, installation at location, leveling, alignment, providing bracings, painting etc. No gas cut holes will be permitted. Contractor to follow the BHEL supplied welding schedule and welding procedures.

2.5.3 All the fabricated supports/ frames for instruments, trays, pipes, electrical equipment, etc., shall be painted after sand blasting and surface preparation as per painting specifications (refer clause no. 2.29 for details). Paints and other associated items are in the scope of the contractor.

2.5.4 In case, structural cable trays, bends, tees, reducers etc., are required to be fabricated from structural steel and installed, unit rate applicable for fabrication and installation of structural steel shall be applicable in such instances.

2.5.5 Frame installation at site may involve mounting either on concrete floor by grouting/ using anchor fasteners or on steel structure by welding etc. All consumables including anchor fasteners shall be arranged by the contractor.

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Where required, as part of work, concrete floors may have to be chipped out to reinforcement depth for anchoring the frames. Wherever grouting is required, contractor shall arrange all the required material including cement/ grout mix, shuttering etc., necessary labour and meet all other requirements as part of work. All consumables including anchor fasteners shall be arranged by the contractor.

2.5.6 In certain packages, galvanized members of junction box frames and instrument racks shall be supplied in cut to sizes and frame assemblies are required to be done as per drawing by bolting/ welding. The installation rate as quoted shall include the assembling of the frames.

2.5.7 Gas cutting of tray/ impulse pipe support and holes in frame is not permitted. Only hacksaw cutting/ drilled hole shall be permitted.

### 2.6 ABOVE GROUND EARTHING

2.6.1 All equipment shall be earthed by two separate and distinct connections. Earthing terminals will be available in all equipment supplied by BHEL. Earthing terminals will be available in all the equipment supplied by BHEL. Above ground earthing shall be carried out as the approved drawing & Philosophy furnished by BHEL Engineer.

2.6.2 The contractor shall carry out above ground earthing for all Electrical equipment, which may be erected by him, or some other agency. Different type of earthing materials shall be supplied and the contractor shall lay and connect the earthing materials as per site requirement and as detailed in drawings. Unit rate for earthing material shall be paid on running meter basis.

2.6.3 Parts of all electrical equipment and machinery not intended to be live shall have two separate and distinct earth connections each to conform to the stipulation of the Indian Electricity Rules and apparatus rated 240V and below may have single earth connections.

2.6.4 The earthing conductors shall be of mild steel/ GI strip/ wires. All connections from equipment to main earthing conductors shall be made as illustrated in earthing drawing/ as per instruction of BHEL Engineer. Suitable "CU" Lugs are to be supplied for earthing with GI wire by the agency wherever is required.

2.6.5 A continuous earthing conductor shall be installed in all cables trays and securely clamped to each tray section by suitable connectors to form a continuous earthing system. When two or more trays supporting power cables run on parallel a continuous earthing conductors shall be provided on one tray only with tap-offs to the control cable trays. All valve and damper motor and rapping motors will be earthed to this conductor.

2.6.6 All joints in the earthing system shall be welded type. Earthing connections to all equipment including motors shall be bolted type.

2.6.7 Earthing connections shall be free from tinning scale paint, enamel, grease, rust or dirt at the time of making joint.

2.6.8 Metallic sheaths, screens/ shields and armour of all multicore cables shall be bonded and earthed.

2.6.9 Earthing conductors along their run-on columns, beams, walls etc. shall be supported by suitable cleats at intervals of 750/ 1000 mm.

2.6.10 Welded joints on GI earthing conductors shall be painted (Refer clause no. 2.29 for details.)

2.6.11 For different floors in a building, localized internal earthing ring shall be formed

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- and connected to the ground earthing through vertical risers. The earthing mat shall be common to both power and lighting installations.
- 2.6.12 The runway conductors at different building elevation shall be inter connected between the main risers along the column/ wall and shall also be connected to the nearest riser/ structure columns and the distance between earthing point shall not exceed 30 meters.
- 2.6.13 Generally, risers are provided near the structure/ equipment foundation, in case risers are not visible and buried below the foundation level, contractor shall carry out necessary earth excavation for connecting the above ground earthing strips. Wherever welding is involved necessary protective coating shall be applied on weld joints.
- 2.6.14 If the equipment is not available at the time of earthing conductor laying tap connections from the main earthing conductor shall be brought out up to slab equipment foundation level with at least 200mm spare length left for further connections to equipment earthing terminals.
- 2.6.15 Entire system shall be earthed in accordance with the provisions of the relevant IEC recommendations/ IS code of practice IS 3043-1947 and Indian Electricity Rules, so that the values of the step and contact potentials in case of faults are kept within safe permissible limits.
- 2.6.16 If any outer shops and buildings as well as the electrical sub-stations and electrical rooms are also in contractor's scope, a ring main earthing system will be provided. Ring main earthing systems shall again be interconnected as a network to power plant main earthing mat. Internal earthing ring in the electrical equipment room shall be provided by the contractor irrespective of whether equipment of the area is in their scope or not.
- 2.6.17 A minimum of two spare earth rings will be provided in each floor of the building for earthing future building. All tray tiers of each section shall be connected to the runway conductor at an interval of about 10 meters.
- 2.6.18 Each RCC steel column of the building will be interconnected to the floor-earthing grid in basement/ ground floor.
- 2.6.19 For protective earthing separate conductor shall be used for flow of earth fault current.
- 2.6.20 Contractor shall carry out minor civil i.e., chipping of floor (where earth strip is to be laid on floor), removal of topsoil for laying earth strip in switchyard area etc.
- 2.6.21 Refer notes mentioned in Drawing no. PE-DG-434-509-E004.

## 2.7 BELOW GROUND EARTHING

- 2.7.1 **Treated Earth Pits:** As per PEM Specification Preparation of Treated earth pit includes supply of all items (except the electrode rod/ pipe 3-meter-long with funnel) including charcoal; salt, civil chamber with cover (as indicated in the drawing) is in the scope of the contractor. The contractor shall also connect this pit to the earth grid (by other agency) at nominal distances of 5 to 10 meters by 40 mm rods, which are also in the scope of the contractor.
- 2.7.2 **Earth electrode:** As per PEM specification, Earth electrode shall be made of 40mm diameter MS rod/ Pipe tapering of one end of electrode rod and buried as indicated in the drawing. Civil works are also to be carried out by the contractor.

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The contractor shall also connect this pit to the earth grid (by other agency) at nominal distances of 5 to 10 meters by 40 mm rods, which are also in the scope of the contractor.

### 2.8 LIGHTNING PROTECTION SYSTEM

- 2.8.1 Lightning Protection system consists of Air Terminal, Base Plate, Disconnection Link with JB and Fastener.
- 2.8.2 Requirement clamp, support etc. shall be the part of the installation of system, no extra payment shall be entertained.
- 2.8.3 Though concrete Block shall be a part of civil, if it is not supplied than same shall be casted at site on cost plus basis as per the approved drawing.
- 2.8.4 Building wise drawing shall be furnished for execution of Lightning Protection system.
- 2.8.5 Any changes shall be done as per instruction of Engineer in consultation with BHEL-PEM.
- 2.8.6 The Disconnecting Link shall be made at the height of 1500 mm above ground level.
- 2.8.7 The Down conductor shall be laid on the wall/ structure column and fixed at the interval of 750mm as indicated in the drawing.
- 2.8.8 Apart from above, Typical Lightning Protection Details (Dwg no. PE-DG-434-509-E006) should be strictly followed.

- 2.9 Vendor to execute the job in ACC area also (height job) . Vendor is requested to visit the site and ACC area before quoting the rates.

### 2.10 BRIEF DESCRIPTION OF THE FGD SYSTEM

- 2.10.1 The FGD system shall be based on Wet Limestone Forced Oxidation process. Each unit shall be provided with an independent absorber.
- 2.10.2 Gas from terminal point on ID fan discharge duct shall be taken directly to the absorber through Booster Fans. In the absorber, SO<sub>2</sub> in flue gas shall be removed by a spray of recirculating slurry, pumped by slurry recirculation pumps.
- 2.10.3 Compressed oxidation air shall be blown through the slurry in the oxidation tank, to oxidize the Calcium sulphite to gypsum.
- 2.10.4 Clean gas from the absorber shall be taken to the Wet Chimney through three stage mist eliminators.
- 2.10.5 Limestone to the absorbers of the units shall be supplied by a wet limestone grinding system, common for the units. Limestone shall be fed to the Limestone day silos which in turn will feed the Limestone to wet ball mill through a gravi-



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metric feeder.

- 2.10.6 The gypsum from the absorber(s) shall be pumped by dedicated gypsum bleed pumps to a common Gypsum Dewatering system consisting of two streams (2x100%) of primary and secondary hydrocyclone and vacuum belt filters for gypsum dewatering. The water removed from the absorber shall be recycled to the absorbers. The waste water from the system shall be collected and neutralized using lime and neutralized effluent shall be pumped at required pressure to waste water terminal point.

### 2.11 GENERAL GUIDELINES FOR ERECTION AND COMMISSIONING

- 2.11.1 **Contractor shall abide by the safety/ security rules and regulations as per the requirement of PVUNL and BHEL. Contractor shall obtain information about all safety and security norms of PVUNL well in advance. BHEL will not admit any claims whatsoever on account of Contractor's non-familiarization of site safety and security regulations.**

- 2.11.2 The intent of specification is to procure services according to the most modern and proven techniques and codes. The omission of specific reference to any method, equipment or material necessary for proper and efficient execution of this work shall not relieve the contractor of the responsibility of providing such facilities to complete the work without any extra compensation.

- 2.11.3 The work covered under this specification is of highly sophisticated nature, requiring the best quality workmanship, supervision, engineering and construction management. The contractor should ensure proper planning, successful & timely completion of the work to meet the overall project schedule. The contractor must deploy adequate quantity of tools & plants, measuring instruments, calibrating equipment, modern/ latest construction aids etc. He must also deploy adequate trained, qualified and experienced engineers, supervisory staff and skilled personnel. The manpower deployment identified by contractor should match requirement of sophistication involved with the items mentioned in the BOQ.

- 2.11.4 The work under this scope being quite sophisticated and also quite extensive, for proper planning, monitoring, reporting, etc. of ongoing works, the contractor shall establish his own computer (1no.) and printer (1no.) at his site office, along with suitable operator(s), consumables, etc. Non-establishment of above equipment will attract penalty @Rs 10,000/ - (Rs Ten thousand only) per month. These computers/ printers & accessories shall remain contractor's property/ ownership for all legal/ technical purposes. The contractor will be allowed to take out the same after completion of the site works as per instruction of BHEL Engineer.

- 2.11.5 BHEL uses its own software SDD/IPMS/SOMS etc for total project execution and billing. The contractor shall also provide adequate and suitable manpower for updating/ entries into SDD/IPMS/SOMS in BHEL computers at site.

- 2.11.6 The work to be carried out under the scope of this specification covers the complete work of loading, handling, transporting, unloading, preassembly, erection, calibration, testing, air flushing, pre commissioning tests, commissioning of systems, trial run of various auxiliaries, achieving various activities till handing over of the unit to BHEL's customer, providing maintenance team to cater to

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- guarantee responsibilities and maintenance thereafter.
- 2.11.7 The work shall be executed under the usual conditions affecting major power plant construction and in conjunction with numerous other operations at site. The contractor and his personnel shall cooperate with personnel of BHEL, BHEL's customer, customer's consultants and other contractors, coordinating his work with others and proceed in a manner that shall not delay or hinder the progress of work or the project as a whole.
- 2.11.8 Contractor shall erect, align and commission all the equipment and auxiliaries as per the sequence & methodology prescribed by BHEL depending upon the technical requirements. Availability of materials and fronts will decide this. BHEL Engineer's decision regarding correctness of the work and method of working shall be final and binding on the contractor. No claims for extra payment from the contractor will be entertained on the ground of deviation from the methods/ sequences adopted in erection of similar sets elsewhere.
- 2.11.9 The services, tests and support to be provided by the agency for the work mentioned in the various sections of this tender are indicative and not exhaustive, but not limited to these for the completion of the work in all respects.
- 2.11.10 Plant materials should not be used for any temporary supports/ scaffolding/ preparing pre-assembly bed etc.
- 2.11.11 The contractor shall have total responsibility for all equipment and materials in his custody at contractor's stores, or any loose, semi-assembled, assembled or erected by him at site. He shall effectively protect the finished works from action of weather and from damages or defacement and shall also cover the finished parts immediately on completion of work as per BHEL Engineer's instructions. The machined surfaces/ finished surfaces should be greased and covered.
- 2.11.12 At all stages of work, equipment/ materials in the custody of contractor, including those erected, will have to be preserved as per the instructions of BHEL.
- 2.11.13 The contractor shall make all fixtures, temporary supports, steel structures required for jigs & fixtures, anchors for load and guide pulleys required for the work (including those specifically included in BHEL scope). However, necessary steel will be provided from the scrap/ surplus materials available at site.
- 2.11.14 The work shall conform to dimensions and tolerances specified in various drawings that will be provided during the erection. If any portion of the work is found to be defective in workmanship or not conforming to drawings or other specifications, the contractor shall dismantle and re-do the work duly replacing the defective materials at his own cost, failing which the work will be done departmentally or by engaging other agencies and recoveries will be effected from contractor's bills towards expenditure incurred including 30% departmental charges.
- 2.11.15 The terminal points decided by BHEL shall be final and binding on the contractor for deciding the scope of work and effecting payment for the work done.
- 2.11.16 During the course of erection, testing and commissioning of Electrical work, certain rework/ modification/ rectification/ repairs/ fabrication etc., will be necessary on account of feedback from various thermal power stations or units already commissioned and/ or units under erection and commissioning and also on account of design discrepancies and manufacturing defects and site operation/ maintenance requirements. This will also include modifications/ re-works suggested by BHEL/ customer/ other inspection group. Contractor shall carryout such rework/ modification/ rectification/ fabrication repairs etc. promptly and

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- expeditiously. Claims of contractor, if any, for such works will be dealt as per clauses 2.15 of GCC.
- 2.11.17 In case any rework/ repair/ rectification/ modification/ fabrication etc. is required because of contractor's faulty workmanship which are noticed during the commissioning of, at any stages, the same shall be rectified by the contractor at his cost. If during the commissioning any improvement/ repair/ rework/ rectification/ fabrication/ modification due to design improvement is required, the same shall be carried out by the contractor promptly and expeditiously. Claim if any, for such work from the contractor shall be governed by clause no. 2.15 of GCC.
- 2.11.18 Daily log sheets indicating the details of work carried out, man-hours, consumables used etc., shall be maintained by the contractor and counter-signed by BHEL Engineer every day.
- 2.11.19 Contractor shall prepare Marked-Up drawings incorporating modifications and deviations from original drawings or prepare fresh sketch for actual installation/ connection details if need be, that can be converted to "As-built" drawings.
- 2.11.20 All transport equipment, handling equipment, tools, tackles, fixtures, equipment, materials, manpower, supervisors/ engineers, consumables, electrodes including oxygen, acetylene argon etc. gases, primers, paints etc.; except otherwise specified as BHEL scope of free issue; required for this scope of work shall be provided by the contractor. All expenditure including taxes and incidentals in this connection will have to be borne by him unless otherwise specified in the relevant clause. The contractor's quoted rates should be inclusive of all such contingencies. Electrodes shall be baked/ dried in the electrode drying oven (range 375–425°C) to the temperature and period specified by BHEL Engineer before their use. Necessary drying oven/ portable oven shall be provided by the contractor at his cost.
- 2.11.21 Equipment/ instruments required to be erected for this work, though not limited to but are generally as per rate schedule. For any items or class of work not specified herein but required for total completion of work, the same shall be carried out as per BHEL requirement. However, the payment of these items/ class of work shall be regulated as per the General Condition of the contract.
- 2.11.22 Overhauling, cleaning, revisioning, servicing of equipment/ instruments, valves etc. during erection and commissioning stages will be arranged by the contractor. However, gaskets/ packing for replacement will be provided by BHEL free of cost. All equipment shall be preserved and protected before and after erection as per the advice of BHEL Engineer.
- 2.11.23 The glands & lugs shall be supplied either loose or fitted with the equipment. Contractor shall take care of this aspect at the time of receipt of the equipment from BHEL stores. Contractor shall account for the quantities received with the equipment and shall hand over the same to cabling agency under intimation to BHEL Engineer. Contractor shall extend all necessary help & co-ordinate with the cabling agency during the course of work.
- 2.11.24 The contractor shall collect all scrap materials periodically from various levels of powerhouse, working area of the power station, auxiliary and piping around power station and collect the same at one place earmarked for the same. Loads of scraps are to be shifted to a place earmarked by BHEL. Failure to collect the scrap is likely to lead to accidents and as such, BHEL reserves the right to collect and remove the scrap at contractor's risk and cost, if there is any failure on the part of contractor in this respect. **1% value of each RA bill will be earmarked against**



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**compliance of the above, to be released only on satisfactory collection and deposit of scrap as stated above. In case of failure of contractor to comply with this requirement, BHEL will make suitable arrangement at contractor's risk and cost. In such case, any expenditure over and above the withheld 1% amount will also be recovered suitably from the RA bills of vendor.**

- 2.11.25 All works such as cleaning, leveling, aligning, trial assembly, dismantling of certain equipment/ components for checking and cleaning, surface preparation, fabrication of sheets, tubes and pipes as per general engineering practice and as per BHEL Engineer's instructions at site, cutting, gouging, weld depositing, grinding, straightening, chamfering, filing of cut outs/ openings for mounting of console inserts, modules, indicators, recorders, chipping, drilling of holes, reaming, scrapping, cable laying, dressing, lapping, fitting up etc. as may be applicable in such erection works are treated as incidentals to erection work and are necessary to complete the work satisfactorily shall be carried out by the contractor as part of the work within the quoted rates.
- 2.11.26 All equipment shall be handled very carefully to prevent any damage or loss. No bare wire ropes, slings etc. shall be used for unloading and/ or handling of the equipment without the specific written permission of the BHEL Engineer. The equipment from the storage yard shall be moved to the actual site of erection/ location at the appropriate time as per the direction of BHEL Engineer so as to avoid damage/ loss of such equipment at site.
- 2.11.27 Contractor shall provide necessary resources for completion of such work within the stipulated time schedule. Value of such work shall be included while computing the total value of work finally executed for all contractual purposes, particularly for contract variation purpose.
- 2.11.28 The contractor should take all reasonable care to protect equipment and materials under his custody either in his stores or at site. Copper tubing, brass fittings, brass valves etc. forming an integral part of equipment or system are liable to greater damages/ pilferages/ theft/ losses. It will be responsibility of contractor to arrange for adequate security round the clock for protection from such damages/ pilferages/ theft/ losses.
- 2.11.29 Housekeeping in the erection and preassembly area is as important as well-planned and orderly work. The access to site for inspection approaches by BHEL and customer engineers and loading of the material shall be made available by the contractor at all times. The shifting and re-shifting of erection materials, tools and plants and clearance of restrictions, filling of ditches, undulation near preassembly, boiler area and switch yard area is the responsibility of the contractor. Contractor should visit the site and acquaint himself with all restrictions and difficulties that he may encounter during erection/ commissioning stages.
- 2.11.30 The contractor shall ensure that all the packing materials and protection devices used for the various equipment during transit and storage are removed before the equipment are erected in position.
- 2.11.31 All pipes and tubes, equipment, instruments issued to contractor and kept at site for erection shall be covered with plastic caps/ steel caps or shall be closed with suitable plugs by the contractor.
- 2.11.32 Contractor shall calibrate, erect, commission all the equipment, cabinets/ panels and cabling etc. as per sequence prescribed by BHEL at site. The sequence of erection/ commissioning methodology will be decided by the BHEL Engineers

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depending upon the availability of materials/ work fronts etc. No claims for extra payment from the contractor will be entertained on the grounds of deviation from the methods of erection/ commissioning adopted in erection/ commissioning of similar jobs or for any reasons whatsoever.

- 2.11.33 Descriptions of certain packages appearing in the rate schedule are available in this section and also in Appendix-I (Chapter-XI), to give general idea to bidder about the type of equipment to be erected, calibrated, tested and commissioned.
- 2.11.34 BHEL reserves right to recover from the contractor any loss, which arises out of undue delay/ discrepancy/ shortage/ damage, or any other causes due to contractor's lapse during any stage of work. Any loss to BHEL due to contractor's lapse shall have to be made good by the contractor.
- 2.11.35 The contractor shall take delivery of the components, equipment's, chemicals, lubricants etc. from the BHEL stores/ storage area after getting the approval of BHEL engineer on standard indent forms of BHEL. Complete and detailed account of the materials and equipment's after usage shall be submitted to the BHEL and reconciled periodically.
- 2.11.36 The contractor shall take delivery of equipment, materials from the storage yard/ stores/ sheds of BHEL/ customer. He shall also make arrangements for verification of equipment, transportation up to site of work, safe custody, watch and ward of equipment after it has been handed over to him till these are fully erected, tested and commissioned and taken over by the customer. The contractor should note that the transport of equipment's to erection site, assembly yards etc. should be done by the prescribed route without disturbing the other works and contractors and in the most professional manner. Special equipment's such as measuring and control equipment's, panels, electronic items, SF6 breakers, switches, cables, conduits etc. shall be stored when taken over by the contractor in appropriate manner as per BHEL's instructions.
- 2.11.37 Contractor shall plan and transport equipment's, components from storage to erection site and erect them in such a manner and sequence that material accumulation at site does not lead to congestion at site of work. Materials shall be stacked neatly, preserved and stored in the contractor's shed and at work areas in an orderly manner. In case it is necessary to shift and re-stack the materials kept at work areas/ site to enable other agencies to carry out their work or for any other reason, contractor shall do it most expeditiously. No claim for extra payment for such work will be entertained.
- 2.11.38 **The weight & dimension as mentioned against the individual items in Price Bid Part –II Rate Schedules or elsewhere in the tender specification are indicative and approximate and there may be variation in dimension & weight in actual supply of equipment. No rate variation shall be considered on this account. The scope of work & description of system/ equipment as given in the various clause of this tender specification and rate schedule are only for understanding the system requirements; contractor shall note this point and assess the volume of work prior to submit the offer.**
- 2.11.39 For any class of work for which no specifications have been laid down in these specifications, work shall be executed as per the instructions of BHEL.

## 2.12 STATUTORY LICENCES AND OTHER RELATED REQUIREMENTS

The contractor will have the following valid certificates:

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- 2.12.1 The contractor should have the applicable Contractor Electrical License for Applicable Voltage System to work in Jharkhand State.
- 2.12.2 Contractor should have obtained valid Electrical Contractor-ship License to carry out the Erection, Testing & Commissioning work on High/ Low Voltage electrical equipment from the appropriate statutory authority of concerned state or Central Electricity Authority, as the case may be. All fees and expenses in this regard shall be to the contractor's account.
- 2.12.3 Supervisory Competency Certificate of Applicable Voltage for equipment erection, testing & commissioning classes as defined in this tender specification, issued by applicable appropriate State or Central Statutory Authority. During the execution of work minimum two persons should be posted at site who have valid Supervisory Competency Certificate.
- 2.12.4 Contractor shall arrange inspection of concerned Statutory Authority for the installation, testing & commissioning of High/ Low voltage equipment covered under this tender specification and obtain their approval in appropriate format prior to charging of the equipment.
- 2.12.5 Contractor shall be responsible for all necessary liasioning work with Statutory Authority towards the certification of installation/ works. BHEL/ BHEL's Customer shall provide technical assistance, drawings & documents for submission to Statutory Authority. Contractor shall provide all logistical services in this regard.
- 2.12.6 All necessary certificates and licenses, permits & clearances required to carry out this work from the respective statutory authorities are to be arranged by the contractor expeditiously at his cost in time to ensure smooth progress of work.
- 2.12.7 If the contractor does not have these licenses and statutory requirements, then the contractor has to arrange them to work in the concerned state (Jharkhand) where the project is being executed within 6 weeks of mobilization at site for carrying out the works covered under this contract.

### 2.13 COLLECTION OF MATERIALS

- 2.13.1 The contractor shall take delivery of equipment, materials from the storage yard/ stores/ sheds of BHEL/ customer. He shall also make arrangements for verification of equipment, safe custody, watch and ward of equipment after it has been handed over to him till these are fully erected, tested and commissioned and taken over by the customer. The contractor should note that the transport of equipment to erection site, assembly yards etc. should be done by the prescribed route in the most professional manner without disturbing other ongoing works of various contractors. Special equipment such as laboratory equipment, measuring and control equipment, electronic items, SF6 Breakers, gauges, panels, console inserts, switches, transmitters, controllers, cables, conduits etc. shall be stored when taken over by the contractor in appropriate manner as per BHEL's instructions. The contractor should also note that while taking delivery of materials from BHEL stores (open/ closed), it may be necessary to handle other items which could be blocking the exit route of the materials. This aspect shall be taken care of in the quoted rates and no extra payment shall be done in this regard. It shall be the contractor's responsibility to arrange necessary cranes/ tractors, trailer, trucks, slings, labor, etc., for transport of equipment.
- 2.13.2 Note: - Damaged cable drums or any damaged items also to be shifted within the

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- quoted rates. No extra compensation for difficulty in shifting due to damaged drums shall be made in this regard.
- 2.13.3 The distance between storage area and erection site is approx. 3-4km. However, this location may change at the discretion of the BHEL's customer. Contractor shall plan and transport equipment, components from storage to erection site and erect them in such a manner and sequence that material accumulation at site does not lead to congestion at site of work. Materials shall be stacked neatly, preserved and stored in the Contractor's shed and at work areas in an orderly manner. In case it is necessary to shift and re-stack the materials kept at work areas/ site to enable other agencies to carry out their work or for any other reason, same shall be done by Contractor most expeditiously as incidental to work.
- 2.13.4 The panels shall be transported from stores to the place of installation in vertical position. Care shall be taken such that the switches, lamps, instruments etc. mounted on the panel do not get damaged during transit.
- 2.13.5 Contractor shall plan and transport equipment/ components from storage yard/ sheds to erection site and erect them in such a manner and in a sequence that material accumulation at site should not lead to congestion. Materials shall be stacked neatly, preserved and stored in the contractor's shed and work areas in an orderly manner. It may be specifically noted that the space available may be limited and accumulation of material may lead to the necessity of shifting and restacking the materials to enable other agencies to carry on with their work or to comply with customer's requirements. If required, the contractor shall arrange shifting of surplus material expeditiously (no claim for extra payment for such work will be entertained) failing which the same will be arranged by BHEL and all charges together with departmental charges will be recovered from his bills.
- 2.13.6 The contractor shall take delivery of the components, equipment, chemicals, lubricants etc. from the storage area/ sheds of BHEL/ customer after getting the approval of BHEL/ customer on standard indent forms to be specified by BHEL/ customer. Complete and detailed account of the materials and equipment after usage shall be submitted to the BHEL and reconciled periodically.
- 2.13.7 The contractor shall handover all the damaged, unused materials, package materials, containers, special transporting frames, gunny bags, parts/ materials remaining extra over the normal requirement with proper identification tags in a packed condition to BHEL stores. In case of any misuse or use over actual design requirements, BHEL reserves the right to recover the cost of parts/ materials used in excess or misused. Decision of BHEL Engineer in this regard will be final and binding on the contractor.
- 2.13.8 Equipment/ instruments etc., under the scope of erection and commissioning are generally dispatched from BHEL's Manufacturing Units/ vendor's works to erection site well before the start of erection. Sometimes, such dispatched materials may get stuck up with transporters/ railways. The contractor shall provide support/ manpower for necessary chase up for removal of such bottlenecks in transportation. Also, for smaller items, it could be necessary to depute his person to personally carry certain items from works to site. Requirement of such activities; which will be decided by BHEL Engineer; and chase up activities, if required, shall be performed under authorization by BHEL. The above services shall be provided within the quoted rates.
- 2.13.9 The contractor shall make suitable security arrangements including employment

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of security personnel and ensure protection of all materials/ equipment in their custody and installed equipment's from theft/ fire/ pilferage and any other damages and losses.

### **2.14 GUIDELINES FOR HANDLING AND STORAGE**

- 2.14.1 After unloading at site, the package of the equipment shall be inspected for external damage. In case the package is damaged, package number and details of damage should be noted. The details of damage should be reported to concerned site Engineer.
- 2.14.2 Cases should be opened/ unpacked using correct nail pullers. While opening the planks, care should be taken to see that equipment inside is not damaged. Cases should not be unpacked in areas where they are exposed to rain, water/ liquid splashing, dust or other harmful materials like chlorine gas, sulphur dioxide etc.
- 2.14.3 After opening the case, all supports provided for transport are to be removed with due care.
- 2.14.4 Immediately after unloading at site, the electronic equipment should be kept in a covered area. Handling and lifting of package should be done without jerks or impacts. Packing case should not be dropped or slid along the floor under any circumstances. Suitable forklift should be used to move the case to its final position. All above points are to be strictly followed as electronic equipment may get damaged due to vibration and shock.
- 2.14.5 Hinged frames should not be opened when equipment is not secured to floor as this is likely to cause it to topple over. The hinged frame can be opened only if the equipment is still fixed on to bottom wooden pallet.
- 2.14.6 The equipment should preferably be stored in its original package and should not be unpacked until it is absolutely necessary for its installation or advised by BHEL Engineer. The equipment should be best protected in its cases. It should be arranged away from walls.
- 2.14.7 The wooden pallet provided for packing itself can be retained on raised platform to protect equipment from ground damp, sinking into and to circulate air under the stored equipment. This will also help in lifting the package with fork-lifter.
- 2.14.8 Periodic inspection of silica gel placed inside the equipment is necessary. It has to be replaced or regenerated when de-colorization takes place.
- 2.14.9 Due care should be taken to ensure that the equipment is not exposed to fumes, gases etc., which can affect electrical contacts of relays and terminal boards.
- 2.14.10 The storage room and the equipment should be checked at regular interval to ensure protection from termites, mould growth, condensation of water etc., which can damage the equipment.
- 2.14.11 All the equipment, materials and goods kept in the store room should be identified and registered in a book. Inspection report should be recorded. Any discrepancy observed should be communicated to site Engineer.
- 2.14.12 The packing material shall be retained if the cubicle is to be repacked after inspection.
- 2.14.13 All subassemblies should be kept in a separate place where they are easily accessible.
- 2.14.14 Subassemblies should have a protective cover in case they are stored without wooden packing/ case to prevent accumulation of dust. Silica gel packets should also be kept along with it.



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- 2.14.15 Subassemblies should not be stacked one above the other.
- 2.14.16 The loose items supplied for the main equipment falls into various categories like tools, cables, prefabricated cables, console inserts, recorders, VDU/ CRT, other display units, printers, sensors and transducers, cable glands, cable ducts, frames, racks, etc. These are to be categorized and stored separately.
- 2.14.17 All the electronic modules shall be handled by qualified personnel only.
- 2.14.18 Electronic modules should only be touched when it is absolutely essential to do so.
- 2.14.19 Before touching any electronic module, the operator should discharge the static electricity by earthing himself or better still, ensure constant discharge by wearing an earthed wrist strap.
- 2.14.20 The operator should not wear clothing made entirely from synthetic fibres, but a mixture containing at least 65% cotton.
- 2.14.21 The PCB should always be held by front panel or by module frame and electronic components/ connectors should never be touched.
- 2.14.22 The electronic modules should not be placed close to television sets or CRT units.
- 2.14.23 Soldering irons and any other tools used must be grounded.
- 2.14.24 All modules using CMOS components are packed in antistatic bags when transported loose to avoid ESD failures. The antistatic bags must always be used to transport modules at site from one place to the other.

### 2.15 MEASUREMENTS, WASTAGE & CUTTING ALLOWANCE

- 2.15.1 The contractor shall not waste any materials issued to him. In case it is observed at any stage that the wastage/ excess utilization of materials is not within the permissible limits, recovery for the excess quantity used or wasted will be effected with departmental charges from the contractor. Decision of BHEL on this will be final and binding on the contractor.
- 2.15.2 For all payment purposes, measurement shall be made on the basis of the execution of drawings/ physical measurements. Physical measurements shall be made by the contractor in the presence of the BHEL Engineer.
- 2.15.3 The measurement for cable, impulse pipes/ tubes, GI pipe, conduits, flexible conduits, trays etc., shall be made on the basis of length actually laid.
- 2.15.4 All the surplus, scrap and serviceable materials, out of the quantity issued to the contractor shall be returned to BHEL in good condition and as directed by the BHEL Engineer.
- 2.15.5 All materials returned to stores should carry aluminium tag indicating the size and type. Power cables more than 15 meters' length and C&I cables more than 5 meters' length is termed as serviceable material and shall be returned size wise and category wise to the owner's stores/ yard. Cable of serviceable length being returned to the stores in drums shall have their free ends sealed and the balance lengths on the drum(s) shall be noted and certified by the Engineer-in-charge. This shall be applicable only for the purpose of accounting the cables issued for installation.
- 2.15.6 While carrying out material reconciliation with contractor, all the above points will be taken into account. All serviceable material returned by the contractor shall be deducted from the quantities issued for the respective sizes and categories and the balance quantity will be taken as the net quantity issued to the contractor. Material reconciliation shall be done and allowable scrap quantity calculated as per wastage allowance percentage specified above. Any scrap/ wastage generated by the con-

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tractor in excess of the allowable percentage shall be charged at the rates decided by the Engineer whose decision shall be final and binding on the contractor.

2.15.7 The entire surplus, damaged, unused materials, packaging materials/ containers, special transporting frames, gunny bags, etc., shall be returned to BHEL stores by the contractor.

2.15.8 The contractor shall handover all parts/ materials remaining extra over the normal requirement with proper identification tags in a packed condition to BHEL stores. In case of any misuse or use over actual design requirements, BHEL reserves the right to recover the cost of parts/ materials used in excess or misused. Decision of BHEL engineer in this regard will be final and binding on the contractor.

2.15.9 The contractor shall ensure that all the packing materials and protection devices used for the various equipment's during transit and storage are removed before this equipment are erected in position.

2.15.10 For all site-fabricated steel items such as supports, racks, frame, canopy etc. physical measurement shall be made and then converted to tonnage. For steel material supplied to the contractor, all scrap shall be returned to BHEL stores with due accounting.

2.15.11 Every month the contractor shall submit an account for all the materials issued to him by BHEL in the standard Performa prescribed for this purpose by the site-in-charge.

2.15.12 The erection contractor shall make every effort to minimize wastage during erection work. Cutting and wastage allowance shall be computed on length, weight of material actually used, measured and accepted. In any case, the wastage shall not exceed the following limits:

S. No.	Item	%age Wastage of Erected Qty
a)	Each iron/ steel fabricated section	2
b)	Each size of power cables	1
c)	Each size of control	2
d)	GI pipes	1

2.15.13 If the actual wastage is more than the specified figure, then equivalent price of the excess portion will be deducted from the contractor's bill.

2.15.14 The cable take-off from drums shall be planned strategically such that jointing in the run of cables and wastage are avoided. For this purpose, the exact route length between various equipment/ panels as per the cable schedule shall be measured and the route length recorded before laying of the cables. Depending upon the route length and the type of cable required for various destinations, the cable drums shall be suitably selected for cable laying. Any jointing shall have to be approved by BHEL Engineer. All the cut pieces/ bits of cables, which are not used, shall be returned to the purchaser for accounting towards wastage. The cables damaged by the contractor shall have to be replaced by the contractor at his own cost.

2.15.15 **NOTE:**

a) Salvageable scrap shall mean lengths of pipes, multi-cables, other cables etc., that can be used one time or other at a later date and normally they are recovered from the cut-pieces of pipes, multicore cables, cables etc.

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- b) Non - Salvageable scrap means the lengths of tubes, pipes, multicore cables, cables etc., and they are from cut-pieces of tubes, pipes, multicore cables, cables etc., that cannot be used at all one time or other.
- c) As per the contract material like cable tray and accessories, cables, tray supports shall be supplied by BHEL and customer. Reconciliation shall be done and duly submitted every month with joint signature to BHEL and Customer.

### 2.16 FINAL PAINTING

2.16.1 The contractor shall provide the Primer (ROZC as per IS:2074) for the scope of painting work indicated in Section-4 as well as for protection of site weld joints and gas cut locations. Contractor shall also arrange to provide the required thinner and other consumables, T&P etc. required for application of ROZC Primer. All paints and thinners shall be sourced only from BHEL approved manufacturers. Some of them are as listed under:

- M/s Asian Paints
- M/s Berger paints
- M/s Jenson & Nicholson
- M/s Shalimar Paints
- M/s Akzo Nobel
- M/s Kansai Nerolac Paints

2.16.2 In order to have consistency in painting system, it is preferable that all the supplies are sourced from one single manufacturer.

2.16.3 The contractor shall provide all the primer, paint, and other consumables like brush, cleaning agents etc. All T&Ps, manpower, supervision is in contractor's scope. Painting shall be carried out as per colour scheme approved by BHEL/BHEL's customer.

2.16.4 Touch up paintings on damaged areas: Surface preparation by manual tools, wire brush/ emery paper etc. Minimum 6" peripheral area, adjoining to damaged area to be covered. If metal surface is exposed; it is to be painted with Zinc rich epoxy (70 micron) or suitable primer with existing paint scheme. If primer is intact, intermediate & top coat to be done with specified DFT in scheme.

2.16.5 All the fabricated frames, instrument racks, Junction box frame, trays/ impulse pipes, supports, panel base frame, etc., wherever applicable shall be first painted with two coats of primer paint (red chromate zinc primer) and then two coats of epoxy-based paint of approved shade (decided by BHEL Engineer) after thoroughly cleaning the surface of dust, rust, scale, grease, oil, etc., by wire brushing, scrapping or any other suitable method like sand blasting/ shot blasting. The quoted rates should be inclusive of all these including supply of paints and consumables.

2.16.6 All metal parts of the equipment including supports, structures, etc., as applicable shall be painted after thoroughly cleaning the surface from dust, rust, greases, oils, scales, etc., by wire brush, scrapping, sand blasting/ shot blasting (as applicable) as specified in relevant erection documents. The above parts shall then be painted with specified two coats of specified paint over the shop primer/ paint. Also, where the shop primer/ paint has peeled off, the affected area shall be cleaned thoroughly by the specified method and then primer coat applied. Similarly, certain components may be supplied without any primer/ paint coat from shop.



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The surface of such items shall be cleaned as per specifications, coated with suitable primer and then coated with final paint coats. The dry film thickness after final coat should be as per specification. The color, shade etc. shall be as per specification. Painting schedule will be furnished at site.

- 2.16.7 Other equipment like JB's, Panels, transmitter racks, Local gauge boards etc., shall be painted with two coats of synthetic enamel paint. The quoted rates should be inclusive of application of two final coats of synthetic enamel paint. All the consumables such as wire brush, other cleaning materials, painting implements, etc., is to be arranged by the contractor at his own cost. All equipment painting will be done by spray painting. The quoted rates should be inclusive of all these including
- 2.16.8 All the weld joints of GI cable trays and GI structural members shall be applied with red oxide and aluminium paint and then coated with bitumen.
- 2.16.9 All damaged surfaces of galvanized or un-galvanized faces of steel structures etc. shall be brushed up and painted with red primer paint followed by two coats of aluminium paint/ enamel paint to the satisfaction of Engineer. The contractor has to arrange all the materials for painting at his cost.
- 2.16.10 Welded joints on GI earthing conductors shall be coated with one coat of bituminous paint in case of buried earth grid or earth flats to be laid in cable trench. For site welded GI strips/ wires which are exposed these are required to be painted with one coat of cold galvanizing zinc paint. Contractor to arrange the required paints and other items at his cost.
- 2.16.11 In case of GI Structure, the cold galvanizing paint to be applied as touch up where ever needed. This is to be done as per instruction of BHEL Engineer.
- 2.16.12 The primer shall be compatible with the final coat paint schedule.
- 2.16.13 Full (spray) painting of transformers, bus ducts with two coats of paint as per specification.
- 2.16.14 Colour Banding, Legend and Identification Marking, Direction marking etc. shall be in scope of the contractor.
- 2.16.15 Touch-up painting of switchgear panel, 415V LT MCC, Control Panels or any other equipment/ devices wherever necessary. Treatment as per IS: 6005. Two coats of lead oxide primer followed by powder painting with final paint shade of RAL 9002.
- 2.16.16 The primer shall be compatible with the final coat paint schedule.
- 2.16.17 Supply of paint, primers, other consumables etc. for above and any other scope in these specifications shall be in Contractor's scope.
- 2.16.18 Irrespective to scopes of painting & supply of paint mentioned elsewhere it is to be noted that supply of paint, primers, other consumables etc. for all primer/ painting works to be done by the contractor, shall be in Contractor's scope. No dispute shall be entertained on the above matter.
- 2.16.19 **STRUCTURAL**  
Structural components may be supplied without any primer/ paint coat from shop. The surface of such items shall be cleaned as per specifications and then coated with two coats of Primer.
- 2.16.20 **PANELS, JUNCTION BOXES**  
Panels and Junction Boxes shall be Touch-up painted as and where original shop

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paint is peeled off. Necessary surface cleaning and preparation shall be done by the contractor as per relevant painting codes followed by two coats of Primer and two coats of Finish Paint.

### **2.17 WELDING, NON-DESTRUCTIVE TESTING ETC.**

- 2.17.1 Installation of equipment involves good quality welding, NDE checks etc.
- 2.17.2 Welder deployed for aluminium welding shall have experienced and approved by BHEL and BHEL's Customer after due qualification process/ testing.
- 2.17.3 Welding of all structural steel & aluminium shall be done only by the qualified and approved welders.
- 2.17.4 All the welders shall be tested and approved by BHEL Engineer/ BHEL's Customer before they are actually engaged on work even though they may possess IBR/ other certificates. BHEL reserves the right to reject any welder without assigning any reason.
- 2.17.5 The welded surface shall be cleaned of slag and painted with primer paint to prevent corrosion. For this paint will be supplied by the contractor.
- 2.17.6 Welding electrodes have to be stored in enclosures having temperature and humidity control arrangement. This enclosure shall meet BHEL specifications.
- 2.17.7 Certain types of coated welding electrodes, prior to their use, call for baking for specified period and will have to be held at specified temperature for specified period. Also, during execution, the coated welding electrodes have to be carried in portable ovens.

### **2.18 INTEGRATED ELECTRICAL TESTING/ COMMISSIONING**

- 2.18.1 The brief scope of work under is defined as below, but not limited to the following. Drawing & documents shall be provided by BHEL at the time of testing. BHEL decision in this regard shall be final and binding on the contractor.
- 2.18.2 The contractor shall prepare all erection/ commissioning log sheets and protocols/ test certificates as per field quality plan, and is signed by the concerned BHEL/ BHEL's Customer engineer and submit the same to BHEL engineer as per his instruction.
- 2.18.3 Contractor shall maintain the charged and commissioned equipment till the same is taken over by customer.

### **2.19 CALIBRATION, TESTING & COMMISSIONING**

Calibration, testing & commissioning activity as specified in this technical specification and rate schedule against various equipment, devices, systems etc. are broadly classified below. However, there may be some overlapping between the activities (erection, calibration and testing, commissioning.) The classification of activity is only a guideline for understanding the total volume of work in each activity. The contractor shall have no claim for performing or providing manpower for such overlapping work, which is also within the scope of the work.

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### 2.19.1 CALIBRATION

- a) Verification after drawing of material of various types, range of the field devices with respect to instrument schedule, data sheet or system document.
- b) Codification of instruments as per system tag numbers
- c) Calibration/ adjustment of instrument as per system requirement/ set values.
- d) Providing head correction in case of pressure measurement as per calculated values or actual measured value for the instrument, which are used for interlock protections/ monitoring. This is generally applicable for turbine/ generator, lube oil systems, lube oil system of fans etc.
- e) Verification of installation of instruments for range, type, tag number as per physical location of process point as per process, instrumentation diagram.
- f) Checking and ensuring the proper function of instrument.
- g) All the recorders shall be made functional with proper chart movement and ink marking.
- h) Preparation of computerized calibration certificates in the formats specified by BHEL Engineers and getting those signed by the customer is in the scope of the contractor.

### 2.19.2 ERECTION

- a) Withdrawal of material from store, verification, inspection as per shipping list, drawings and documents.
- b) Preservation, up keeping, safe custody of the erected equipment till handing over to the customer.
- c) Verification of installation as per drawing and document for the correctness of cabling, JBs, impulse pipe, various field device, panels, instruments etc.
- d) Continuity check and IR value check of cables.
- e) Verification of correction of cable termination with respect to instrument, electrical hook-up diagram, panel interconnection diagram, JB schedule.
- f) Checking earthing of the equipment and cable shield wire continuity.
- g) Energizing the functional group control panels and field devices.
- h) Flushing of impulse pipe before making the instruments process connections through.
- i) Any leakages, damages to impulse pipe, field device connections, air connections etc. Shall be fully attended by contractor.
- j) All cable glands/ piping/ tubing to be fixed as per installation requirement before commissioning.

### 2.19.3 TESTING, COMMISSIONING & TRIAL OPERATION

- a) Checking/ verification of binary/ analogue input and output signal from field and panel and up to recording/ indicating instrument/ HMI monitors.
- b) Checking the operating electrical/ pneumatic drive through functional group panel, remote control desk, HMI, CRT operation and repeatability and smooth operation to be checked.
- c) Checking the interlock, protection and alarm for various processes by simulation of field devices/ process changes.
- d) Functional check of sub-loop control, sub group control and auto loop and fine tuning.
- e) Adjustment of limit switches/ feedback position transmitter checking the actuator

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for correct Limit switch operation for correct position indication and repeatability shall be ensured.

- f) Motor IR value measurement, bearing/ winding RTD checking, drying out of motor after erection of equipment by mechanical agency, providing assistance for trial run of motor which includes monitoring temperature rise winding/ bearing during trial run.
- g) Contractor shall prepare calibration/ testing report/ protocols.
- h) During trial run of various systems, if the performance of any instrument is found erratic, un-satisfactory and requires re-adjustment, re-calibration etc., and the defect shall be attended by contractor.
- i) Observing and checking the performance of the various devices on load/ process variation. Any deficiencies/ defect noticed during the variable load conditions, the same should be attended properly.
- j) Observe the proper functioning of sub-group/ sub-loop control.
- k) Check the operation of various controls in manual/ auto mode for smooth functioning.
- l) Clearing of all bad/ invalid signals noticed during commissioning.
- m) Providing necessary assistance for **Trial Operation** of the unit is in scope of this specification. Smooth operation and availability of all instrument/ controls of the systems installed under the scope herein, shall be ensured by the contractor. Contractor shall provide adequate number of skilled manpower and T&P for this purpose. Interruption in Trial Operation for reasons attributable to the Contractor shall result in re-start of the Trial Operation all over again; consequential extension in Time Schedule/ Contract Period shall be to the contractor's account.
- n) If any small wiring correction or minor modification in control panel wiring is noticed during the commissioning, it shall be carried out as a part of commissioning activity.
- o) **The trial run of the complete facility as an integral unit shall be conducted for around 720 continuous hours. During the period of trial run of around 720 hours, the unit shall operate continuously at full rated load for a period of not less than 72 hours.**

### 2.19.4 POST-COMMISSIONING

- a) Contractor shall rectify the defect observed/ informed by customer during the trial run.
- b) Contractor shall submit the as- built drawing as per guidelines and instruction of BHEL Engineer.
- c) After trial run/ handing over of the equipment, if due to unforeseen reasons, certain works crop up; the contractor shall provide all the assistance.

## 2.20 TROUBLESHOOTING DURING PLANT OPERATION

During pre-commissioning/ commissioning stages when the plant will be under various stages of operation, it will be necessary to have continuous (day and night) presence of suitable manpower along with required tools to attend to any defects etc. that may arise during such operation. The contractor will be required to put such personnel in shifts in the designated areas. The bidder must also take this aspect into consideration.

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### 2.21 TESTING, PRE-COMMISSIONING, AND POST COMMISSIONING

- 2.21.1 The work is also inclusive of various commissioning activities of BHEL scope. The various activities, tests, trial runs may have to be repeated till satisfactory results are obtained and also to satisfy the requirements of customer/ consultant/ statutory authorities like boiler inspector, electrical inspector etc.
- 2.21.2 The contractor shall perform various activities during pre-commissioning, integrated testing, post-commissioning stages of equipment covered under this tender specification. It is responsibility of contractor to arranged tools & plants, test equipment, experienced engineers and technicians. Contractor shall earmark separate manpower for respective commissioning areas and they shall not be disturbed/ diverted for other work. The contractor's commissioning group shall work as per the instruction of BHEL Engineer and they shall coordinate day-to-day activity with other agency and BHEL/ Customer. The testing activity may have to be repeated till satisfactory results are obtained and also to satisfy the requirement of Customer/ statutory Authority.
- 2.21.3 The contractor shall simultaneously start testing & commissioning activities for equipment to match the mile stone activities of the project.
- 2.21.4 In case any malfunctioning and/ or defects are found during tests, trial runs such as loose components, undue noise or vibration, strain on connected equipment etc., the contractor shall immediately attend to these defects/ malfunctions and take necessary corrective measures. If any readjustment and realignment is necessary, the same shall be done as per BHEL Engineer's instructions.
- 2.21.5 The pre-commissioning activities will start prior to light up of boiler and various trials, commissioning operations shall continue till the unit is handed over to customer. Simultaneous commissioning activities will be in progress in various areas, checking of equipment erected, making ready for trial runs, alkali flushing, chemical cleaning, mass flushing etc. All these works need specialized gangs including electrician/ instrument mechanics in each area. Contractor shall earmark separate manpower for various commissioning activities. This manpower shall not be disturbed or diverted. The mobilization of these commissioning gangs shall be such that planned activities are taken up in time and also completed as per schedule and the work undertaken round the clock if required. It is the responsibility of contractor to discuss on day to day/ weekly/ monthly basis the requirement of manpower, consumables, tools and tackles with BHEL Engineer and arrange for the same. If at any time the requisite manpower, consumables, T&P are not arranged then BHEL shall make alternate arrangements and necessary recoveries with overhead cost will be made from the bills of the contractor.
- 2.21.6 During pre-commissioning, commissioning, post commissioning and trial operation stages of various systems, certain category of manpower with T&P and consumables will have to be provided to BHEL Commissioning Engineers exclusively at their disposal. It shall be the responsibility of the contractor to provide engineers, electricians, technicians, helpers, fitters etc. along with necessary consumables, hand tools, calibration equipment etc., for the various commissioning activities in progress. During peak months there could be requirements of separate commissioning gangs simultaneously in even up to 12 to 15 areas. Contractor has to augment the manpower as and when required as per work demand and necessity at site. The quoted rates shall include this.



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- 2.21.7 The mobilization of these commissioning groups shall be such that planned activities are taken up in time and also completed as per schedule and work undertaken round the clock if required. It is responsibility of contractor to discuss on day to day/ weekly/ monthly basis the requirement of manpower, consumables, tools & tackles/ testing equipment with BHEL Engineers and arrange for the same. If at any time the requisite manpower, consumables, testing equipment etc. are not arranged then BHEL shall make alternative arrangements and necessary recoveries with overhead cost will be made from the running bills.
- 2.21.8 Contractor shall cut open works if needed as per BHEL Engineer's instructions during commissioning for inspection, checking and make good the works after inspection is over without any extra payment.
- 2.21.9 It shall be specifically noted that contractor manpower may have to be engaged round the clock simultaneously at different areas and hence considerable number of personnel and their overtime payment may be involved. This aspect must be considered by the contractor while quoting their rate. No additional compensation by for the same shall be payable, irrespective of number of persons engaged or number of working hours per day.
- 2.21.10 It is the responsibility of contractor to provide for necessary labor, tools and tackles and consumables till the completion of work under these specifications even in case erection, testing and commissioning of this work is delayed due to reasons not attributable to the contractor.
- 2.21.11 For electrical works, 415V and above, the contractor has to bring qualified electricians.
- 2.21.12 It shall be specifically noted that the contractor may have to work round the clock and in shifts during the pre-commissioning and commissioning period along with or without BHEL Engineers and hence considerable overtime payment is involved. The contractor's quoted rates shall be inclusive of all these factors.
- 2.21.13 During the commissioning activities and carrying out various tests, if any of temporarily work such mounting of test equipment/ cabling etc. are required; the contractor shall carry out such work without any extra cost. The same shall be removed after completion of the activity.
- 2.21.14 During this period, though BHEL/ client's staff will also be associated in the work, the contractor's responsibility will be to arrange for complete requirement of men and required T&Ps, consumables, scaffolding and approaches etc., till such time the commissioned unit is taken over for trial operations.
- 2.21.15 The contractor shall carry out any other tests as desired by BHEL Engineer on erected equipment covered under the scope of this contract during testing, pre-commissioning and commissioning, to demonstrate the completion of any part or whole of work performed by the contractor.
- 2.21.16 The pre-commissioning activities will start in phased manner to meet the various milestones and shall continue till equipment are commissioned fully with all connected equipment/ devices or handed over to customer for regular operation. In this duration other erection activities such as cabling etc., shall be carried out by other agencies even though equipment are partially commissioned/ charged. In order to co-ordinate the work such as issue of safety permit, normalization and compliance of other requirement, contractor shall keep team of experienced engineer, supervisor, technician and helper in each shift as decided by BHEL Engineer. The team shall take instruction from BHEL Engineer for day-to-day work and shall not be diverted for other work. No extra payment shall be made for their services.

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## Chapter - II: SCOPE OF WORK

- 2.21.17 Certain systems may be supplied with portable programming units, which are to be connected at various locations during pre-commissioning to handing over. Necessary cabling interconnecting the programming units and other connected panels has to be carried out by the contractor and are to be dismantled after work. For the purpose of testing, monitoring, commissioning, etc., these programming units will have to be repeatedly connected and disconnected at various locations. These will be considered as part of commissioning activities and no separate payment will be entertained for the above

## 2.22 GENERAL

Accepted unit rates for each SWGR/ panel shall remain firm regardless of any change in width, height, type, weight or other parameter (except length), as furnished in tender. For variation in length, adjustment to accepted rate of SWGR/ panel shall be based on following modality. Decision of BHEL shall be final & binding on bidder.

For variation in length within +/- 15% of SWGR/ panel, accepted unit rates shall remain firm.

For variation in length of SWGR/ panel beyond +/- 15% of specified length, wherever indicated in the tender, rate of unit length of variation shall be arrived by dividing the item rate by length as indicated in tender and rate/ price adjustment for payment during execution for length excess/ shortage over & above the +/- 15 % variation of indicated length shall be done accordingly on the following basis.

Based on above, if actual length exceeds variation limit, accepted unit rates will undergo change for the portion beyond 1.15/ 0.85 times of indicated length, additional payment/ recovery will be effected by BHEL in the following manner.

Length of SWGR/ panel as indicated in tender = A.

Accepted unit rate for SWGR/ panel = Rs B.

Rate per unit length (L) to be considered for the purpose of additional payment/ recovery for variation in length =  $\text{Rs B/A} = \text{Rs C}$ .

Actual length of the SWGR/ panel = D.

Additional payment/ recovery in unit rate for variation of length beyond length  $(1.15A/0.85A) = (D-1.15A) / (0.85A-D) \times C$ .

Applicability of new size of cable tray, cable, etc for a project of such magnitude may be inevitable. To derive rates of such new items of installation of cable tray, laying of cable, cable termination, etc, which are not covered in BOQ of Volume-III, following guidelines shall be applicable for this tender. Decision of BHEL shall be final & binding on bidder.

For new size cable tray, width of cable tray will be taken into reference and rate of installation of cable tray of nearest width will be pro-rated to derive the rate for installation of new cable tray.

To derive the rate for laying of new size cable, OD of cable will be taken into reference and rate of laying of cable of nearest lower OD will be pro-rated to derive the rate for laying of for new cable.

Rate for termination of new size cable and other items will be derived based on mutually agreed modality and on approval of BHEL.

# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## Chapter - III: FACILITIES IN THE SCOPE OF CONTRACTOR/BHEL (SCOPE MATRIX)

### 3. FACILITIES IN THE SCOPE OF CONTRACTOR/ BHEL (SCOPE MATRIX)

S. No.	Description	Scope/ to be taken care by		Remarks
		BHEL	Bidder	
<b>3.1</b>	<b>PART I ESTABLISHMENT</b>			
<b>3.1.1</b>	<b>FOR CONSTRUCTION PURPOSE:</b>			
a	Open space for office (as per availability)	Yes		Location will be finalized after joint survey with owner
b	Open space for storage (as per availability)	Yes		Location will be finalized after joint survey with owner
c	Construction of bidder's office, canteen and storage building including supply of materials and other services		Yes	
d	Bidder's all office equipment, office/ store/ canteen consumables		Yes	
e	Canteen facilities for the bidder's staff, supervisors and engineers etc.		Yes	
f	Firefighting equipment like buckets, extinguishers etc.		Yes	
g	Fencing of storage area, office, canteen etc. of the bidder		Yes	
<b>3.1.2</b>	<b>FOR LIVING PURPOSES OF THE BIDDER</b>			
a	Open space for labour colony (as per availability)		Yes	Agency has to make his own arrangement at his own cost.
b	Labour Colony with internal roads, sanitation, complying with statutory requirements		Yes	
<b>3.2</b>	<b>ELECTRICITY</b>			



# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## Chapter - III: FACILITIES IN THE SCOPE OF CONTRACTOR/BHEL (SCOPE MATRIX)

S. No.	Description <b>PART I</b>	Scope/ to be taken care by		Remarks
		BHEL	Bidder	
3.2.1	Electricity for construction purposes only of Voltage 415/ 440V, 3phase, 50Hz	Yes		Chargeable based on the prevalent rates of DISCOM. Any penalty due to non-maintenance of power factor by the customer shall be passed on to the contractor.
a	Single point source	Yes		At a distance of 1000m from site (Distance is only tentative, it may vary up-to an extent depending on site condition)
b	Further distribution including all materials, Energy Meter, Protection devices and its service		Yes	
c	Duties and deposits including statutory clearances if applicable		Yes	
3.2.2	Electricity for the office, stores, canteen etc. of the bidder			
a	Single point source	Yes		At a distance of 1000m from site (Distance is only estimated, it may vary up-to an extent depending on site condition).
b	Further distribution including all materials, Energy Meter, Protection devices and its service		Yes	
c	Duties and deposits including statutory clearances if applicable		Yes	
3.2.3	Electricity for living accommodation of the bidder's staff, engineers, supervisors etc.		<b>Yes</b>	Agency has to make his own arrangement at his own cost.
a	Single point source		Yes	

# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## Chapter - III: FACILITIES IN THE SCOPE OF CONTRACTOR/BHEL (SCOPE MATRIX)

S. No.	Description	Scope/ to be taken care by		Remarks
		BHEL	Bidder	
	<b>PART I</b>			
b	Further distribution including all materials, Energy Meter, Protection devices and its service		Yes	
c	Duties and deposits including statutory clearances if applicable		Yes	
<b>3.3</b>	<b>WATER SUPPLY</b>			
3.3.1	For construction purposes: <b>(Single point source provided by BHEL on chargeable basis)</b>	<b>Yes</b>		
a	Making the water available from single point		<b>Yes</b>	Agency has to make his own arrangement at his own cost.
b	Further distribution as per the requirement of work including supply of materials and execution		Yes	
3.3.2	Water supply for bidder's office, stores, canteen etc.			
a	Making the water available at single point		Yes	
b	Further distribution as per the requirement of work including supply of materials and execution		Yes	
3.3.3	<u>Water supply for Living Purpose</u>			
a	Making the water available at single point		Yes	
b	Further distribution as per the requirement of work including supply of materials and execution		Yes	
<b>3.4</b>	<b>LIGHTING</b>			
a	For construction work (supply of all the necessary materials) 1. At office/ storage area 2. At the preassembly area 3. At the construction site/ area		Yes	
b	For construction work (execution of the lighting work/ arrangements) 1. At office/ storage area 2. At the preassembly area 3. At the construction site/ area		Yes	
c	Providing the necessary consumables like bulbs, switches, etc. during the course of project work		Yes	
d	Lighting for the living purposes of the bidder at the colony/ quarters		Yes	
<b>3.5</b>	<b>COMMUNICATION FACILITIES FOR SITE OPERATIONS OF THE BIDDER</b>			

## TECHNICAL CONDITIONS OF CONTRACT (TCC)

### Chapter - III: FACILITIES IN THE SCOPE OF CONTRACTOR/BHEL (SCOPE MATRIX)

S. No.	Description <b>PART I</b>	Scope/ to be taken care by		Remarks
		BHEL	Bidder	
a	Telephone, fax, internet, intranet, e-mail etc.		Yes	
<b>3.6</b>	<b>COMPRESSED AIR</b> wherever required for the work.		<b>YES</b>	
a	Supply of Compressor and all other equipments required for compressor & compressed air system including pipes, valves, storage systems etc		Yes	
b	Installation of above system and operation & maintenance of the same		Yes	
c	Supply of the all the consumables for the above system during the contract period		Yes	
<b>3.7</b>	<b>Demobilization of all the above facilities</b>		<b>Yes</b>	
<b>3.8</b>	<b>TRANSPORTATION</b>			
a	For site personnel of the bidder		Yes	
b	For bidder's equipment and consumables (T&P, Consumables etc.)		Yes	

S. No.	Description <b>Part - II</b>	Scope/ to be taken care by		Remarks
		BHEL	Bidder	
<b>3.9.1</b>	<b>Engineering works for construction:</b>	Yes		NOT APPLICABLE
a	Providing the erection/ constructions drawings for all the equipment covered under this scope	Yes		
b	Drawings for construction methods	Yes	Yes	In consultation with BHEL
c	As-built drawings – where ever deviations observed and executed and also based on the decisions taken at site- example – routing of small bore pipes		Yes	Changes are to be marked in drawing & handover to BHEL on completion of work.
d	Shipping lists etc. for reference and planning the activities	Yes		NOT APPLICABLE
e	Preparation of site erection schedules and other input requirements		Yes	In consultation with BHEL

# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## Chapter - III: FACILITIES IN THE SCOPE OF CONTRACTOR/BHEL (SCOPE MATRIX)

S. No.	Description	Scope/ to be taken care by		Remarks
	Part - II			
	3.9.0 ERECTION FACILITIES	BHEL	Bidder	
f	Review of performance and revision of site erection schedules in order to achieve the end dates and other commitments	Yes	Yes	In consultation with BHEL
g	Weekly erection schedules based on S. No. e		Yes	In consultation with BHEL
h	Daily erection/ work plan based on S. No. g		Yes	In consultation with BHEL
i	Periodic visit of the senior official of the bidder to site to review the progress so that work is completed as per schedule. It is suggested this review by the senior official of the bidder should be done once in every two months.		Yes	
j	Preparation of preassembly bay		Yes	NOT APPLICABLE
k	Laying of racks for gantry crane if provided by BHEL or brought by the contractor/ bidder himself		Yes	NOT APPLICABLE
l	Arranging the materials required for preassembly		Yes	NOT APPLICABLE
m	COIVD-19 Preventive Measure		Yes	

### 3.10 ELECTRICITY

- 3.10.1 The construction power (415V) will be provided at a single point for construction purpose only on chargeable basis. Further distribution is to be arranged by the bidder at his cost. Construction power shall be provided from the nearest Substation/ tapping point at a distance of approx. 1000m from site. The distance is only estimated; it may vary up to an extent depending on site condition.
- 3.10.2 Any duty, deposit involved in getting the Electricity shall be borne by the bidder. As regards to contractor's office shed also, all such expenditure shall be borne by the contractor.
- 3.10.3 Provision of distribution of electrical power from the given single central common point to the required places with proper distribution boards, approved cables and cable laying including supply of all materials like cables, switch boards, pipes etc., observing the safety rules laid down by electrical authority of the State/ BHEL/ their customer with appropriate statutory requirements shall be the responsibility of the tenderer/ contractor.
- 3.10.4 BHEL is not responsible for any loss or damage to the contractor's equipment as a result of variations in voltage/ frequency or interruptions in power supply.
- 3.10.5 Necessary "Capacitor Banks" to improve the Power factor as directed by PVUNL shall be provided by the contractor at his cost. Penalty if any levied by customer on this account will be recovered from contractor's bills.

## TECHNICAL CONDITIONS OF CONTRACT (TCC)

### Chapter - III: FACILITIES IN THE SCOPE OF CONTRACTOR/BHEL (SCOPE MATRIX)

- 3.10.6 The required energy meter for measuring power consumption shall be arranged by the contractor and taken care by the contractor.
- 3.10.7 Contractor has to make his own arrangements for his electricity requirement for his labour colony at his cost.
- 3.10.8 As there are bound to be interruptions in regular power supply, power cut/ load shedding in any construction sites, contractor should make his own arrangement for alternative source of power supply through deployment of adequate number of DG sets at their cost during the power breakdown/ failure to get urgent and important work to go on without interruptions. No separate payment shall be made for this contingency.

#### 3.11 CONSTRUCTION WATER

- 3.11.1 Water (Raw water) required for construction purposes will be provided at one single point within the plant area on chargeable basis. The further distribution is to be arranged by the bidder at his cost. Construction water shall be provided at a distance of 1000m from site. Distance is only estimated, it may vary up to an extent depending on site condition.
- 3.11.2 The required water meter for measuring the consumption shall be provided and installed by the contractor. The required pumps & accessories, pipes for drawing water from the points and further distribution will be arranged by the contractor at their cost. BHEL is not responsible for any loss or damage to the contractor's equipment due to any reason. Any dispute regarding water consumption and distribution, the BHEL engineer decision will be final and binding.
- 3.11.3 The water charges may vary from time to time as per PVUNL prevailing charges, any dispute regarding consumption, the BHEL engineer decision will be final. In case of non-availability of water, the contractor shall make his own arrangements of water suitable for construction to have uninterrupted work. No separate payment shall be made for any contingency arrangement made by contractor, due to delay/ failure for providing water supply. Contractor has to make his own arrangements for his water requirement for his labour colony at his cost.
- 3.11.4 In case of non-availability of water, the contractor shall make his own arrangements of water suitable for construction purpose to have uninterrupted work. No separate payment shall be made for any contingency arrangement made by contractor, due to delay/ failure for providing water supply. Contractor has to make his own arrangements for his water requirement for his labour colony at his cost.

#### 3.12 DRINKING WATER

Bidder shall provide drinking water at the work spot at their cost.

#### 3.13 LIGHTING FACILITY

Adequate lighting facilities such as flood lamps, hand lamps and area lighting shall be arranged by the contractor at the site of construction, pre assembly yard and contractor's material storage area etc. at his cost.

#### 3.14 OTHER FACILITIES

## TECHNICAL CONDITIONS OF CONTRACT (TCC)

### Chapter - III: FACILITIES IN THE SCOPE OF CONTRACTOR/BHEL (SCOPE MATRIX)

- 3.14.1 Adequate water less urinals shall be arranged by the contractor within quoted rates, at site of construction at different level and different areas like boiler structure, with proper disposal arrangement.
- 3.14.2 Vendors have to comply requirements of HSE & Statutory requirement in line with BHEL HSE plan, PVUNL Safety requirement, Jharkhand/ Central statutory requirement.
- 3.14.3 Vendors have to arrange labour rest sheds, drinking water facility, toilets, canteen facility as per local labour act/ BOCW act. Maintaining hygiene and disposal of debris, scraps, canteen items and area cleaning is included in vendor's scope.
- 3.14.4 Agency has to arrange trained scaffolding experts with accreditation from statutory agencies with proper experience and they will issue fitness certificates for safe use. Such kind of qualified scaffolding experts will vary as per job requirement. At the same time, training has to be given by these experts at regular intervals for their own workers for increasing no. of experts.
- 3.14.5 Agencies HSE officers should have sufficient experience as per rule 209 of BOCW act central rule 1998. Agencies HSE officers will be part of BHEL HSE Team and they will be responsible for giving training on HSE issues in addition to normal field works and other normal site requirements.
- 3.14.6 Preparation of method statement, HIRA, Job Safety analysis, permit to work, Lifting plans, and all supporting documents as required for starting & continuation of work/ job is in vendor's scope.
- 3.14.7 Hydras are not allowed for materials transport, only pick and carry cranes shall be deployed by the agency.
- 3.14.8 First aid centre will be maintained by BHEL and cost will be proportionately recovered from vendors.
- 3.14.9 Vendor has to arrange land within his quoted rate for making labour colony. Vendors labour colony has to be maintained with proper hygiene, drinking water, bathroom water, lighting arrangement, sewerage system. These facilities are to be regularly maintained including drains, surrounding, upkeep of labour colony. BHEL/ PVUNL & local statutory authorities will visit labour colony from time to time and all healthy conditions are to be maintained by vendor.
- 3.14.10 Scaffolding pipes, clamps, safety nets, floor grills for working platforms are to be made of good quality with proper certifications as per IS Codes.
- 3.15 DEWATERING:**  
Contractor shall ensure at all times that the work area & approach/ access roads are free from accumulation of water, so that the materials are safe and the erection/ progress schedule are not affected. No separate claim in this regard shall be admitted by BHEL.
- 3.16 LAND FOR SITE OFFICE**
- 3.16.1 To establish a temporary site office, fabrication yard and storage area at the job site, open space will be provided free of charges. Contractor has to make his own arrangements for labour colony.
- 3.16.2 BHEL shall not provide to the contractor any residential accommodation to any of his staff and the contractor has to make his own arrangements.

## TECHNICAL CONDITIONS OF CONTRACT (TCC)

### Chapter - III: FACILITIES IN THE SCOPE OF CONTRACTOR/BHEL (SCOPE MATRIX)

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- 3.16.3 Contractor has to furnish along with their offer, the details of requirements of area of space for his temporary site office, stores / storage shed.
- 3.16.4 Location and area requirement for office / storage sheds / fabrication yard shall be discussed and mutually agreed to.

#### **3.17 SITE ORGANISATION**

- 3.17.1 The contractor shall provide adequate staffing in the following areas in addition to the staffing requirements of execution as instructed/ informed by BHEL:
- a) Overall planning, monitoring & control.
  - b) Quality control and quality assurance.
  - c) Materials management.
  - d) Safety, fire & security.
  - e) Industrial relations and fulfilment of labour laws and other statutory obligations.
- 3.17.2 The contractor shall maintain a site organization of adequate strength in respect of manpower, construction machinery and other implements at all times for smooth execution of the contract. This organization shall be reinforced from time to time, as required to make up for slippage from the schedule without any commercial implication to BHEL. The site organization shall be headed by a competent construction manager having sufficient authority to take decisions at site.
- 3.17.3 The contractor should also submit to BHEL for approval a list of construction equipment, erection tools, tackle etc. prior to commencement of site activities. These tools & tackles shall not be removed from site without written permission of BHEL.



# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## Chapter - IV: T&Ps AND MMEs TO BE DEPLOYED BY THE CONTRACTOR

### 4. T&Ps and MMEs TO BE DEPLOYED BY CONTRACTOR

**List of major testing & measuring equipment/ tools and tackles to be arranged/ brought by contractor (depending on the requirement- as certified by BHEL Engineer).**

S. No.	Description	UoM	Qty
1	Digital Tong Tester 0-1/ 5 A AC	Nos.	1
2	Digital Tong tester AC 5/ 10 and 25/ 60/ 300 A of reputed make	Nos. Each	2
3	Digital Tong tester DC 30/ 60/ 300 A	Nos.	2
4	Ferrule printing machine	Nos.	4
5	Fire proof tarpaulin		As per rmt
6	HV Test Kit AC: 0 –20 kV & DC: 0- 25 kV Preferably with dry type transformer	Nos. Each	As per rmt
7	Industrial type vacuum cleaner	Nos.	2
8	Insulation Tester Hand Operated 250V/ 500V/ 1000V rated mains/ battery operated	Nos.	2
9	Insulation Tester Mains Operated 2500/ 5000V	Nos.	1
10	Insulation Tester Motorised Operated/ Electronic with selective range of 500/ 1000/ 2500/ 5000 V. Range 0.5 MΩ to 10000 MΩ	Nos.	1
11	Multimeters		
	A) Digital, 3 1/ 2 digit Motwane/ HIL/ Fluke	Nos.	16
	B) Analog: Motwane make	Nos.	10
	C) Digital, 4 1/ 2 digit Motwane/ HIL/ Fluke	Nos.	10
12	Soldering iron “Soldron” make 25 W	Nos.	11
13	Stop Watch	Nos.	2
14	Teletalk 2 wire system/ Group Mobile	Sets	28
15	Two way intercom set with 50 to 100 m cable for checking the cables continuity	Sets	4
16	Earth Resistance Tester	Nos.	1



# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## Chapter - IV: T&Ps AND MMEs TO BE DEPLOYED BY THE CONTRACTOR

S. No.	Description	UoM	Qty
<b>HANDLING EQUIPMENTS</b>			
1	Chain pulley block/ turfer		As per rqmt
2	Cranes, trucks, hydra , trailers etc. for transportation and erection of equipment		As per rqmt
3	D-shackles		As per rqmt
4	Manila ropes		As per rqmt
5	Nylon Slings		As per rqmt
6	Steel wire ropes		As per rqmt
7	Turn buckles		As per rqmt
<b>MAJOR T&amp;Ps</b>			
8	24V AC Transformer & Hand lamps	Nos.	10
9	Cable Rollers		As per rqmt
10	Chain Pulley Blocks 5/ 10 T	Nos. Each	1
11	Copper tube bender and cutter sizes 6mm, 8mm, 1/ 2", 1/ 4"	Nos. Each	2
12	Crimping tool up to all sizes of Cables under scope of work	Nos. Each	4
13	Die sets for threading up to 2" pipe.	Sets	3
14	Distribution boards with power cable complete as required		As per rqmt
15	Drilling machines 1/ 4", 1/ 2", 3/ 4" & 1"	Nos. Each	4
16	Dynamometers		As per rqmt
17	Electrician tool kit	Nos.	15
18	Electrode drying ovens		As per rqmt
19	Fire extinguishers (Type: as required)	Nos.	5
20	Fire proof tarpaulin		As per rqmt
21	Flood light fittings	Nos.	30
22	Grinding machine	Nos.	15
23	Hydraulic Crimping Tool for conductor/ shield wire		As per rqmt
24	Hydraulic Jacks 250T/ 100T Capacity		As per rqmt
25	Measuring instruments like Micrometres and Callipers	Sets Each	3
26	Mechanical tool kit for fitters	Nos.	15
27	TIG/ MIG Welding Machine with accessories air cool type	Sets	4
28	Painting brush		As per rqmt
29	Personal computer and accessories, Printer	Sets	1
30	Pipe bending machine – 2" size	Nos.	3
31	Safety belts and Safety helmets		As per rqmt
32	Shearing Machine		As per rqmt
33	Spirit level	Nos.	5
34	Tap sets for both BSP and MPT threads up to 1" each	Sets Each	4

## TECHNICAL CONDITIONS OF CONTRACT (TCC)

### Chapter - IV: T&Ps AND MMEs TO BE DEPLOYED BY THE CONTRACTOR

35	Torque Wrench Set (Till 225Nm)	Nos. Each	2
36	Tuffer Capacity 15T	Nos.	4
37	Welding Generators	Nos.	12
38	Dewatering Pump with accessories	No	Atleast 01
39	Welding Transformers	Nos.	12
40	Man-lifter wth 40 feet min	As per Requirement	
41	Motorized Sky climber	As per Requirement	
42	Safety PPE Kits	As per Requirement	
43	Dewatering pump	As per Requirement	
44	Platform ladder	As per Requirement	
45	Scaffolding material	As per Requirement	

**The following materials/ consumables are to be arranged by the contractor as part of the contractual scope.**

S. No.	Description
1	Welding electrodes for welding AS/ CS/ SS pipe and other welding from BHEL approved vendors only
2	Filler wire for argon welding
3	Argon, oxygen and acetylene gas
4	Provision for temporary scaffoldings.
5	GI "U" clamps with nuts and washers for impulse and GI pipe clamping.
6	Round aluminium tags (30mm dia. x 3mm thick)
7	Teflon tape and insulation tape.
8	Hold tight/ bitumen tape for GI pipe coupling.
9	Required paints and primer from BHEL approved vendors only.
10	Solder wire (60/ 40)
11	Protocol/ calibration report sheets as per BHEL format.
12	Panel/ JB sealing compound material (for cable entry from bottom/ top of panel).
13	PVC cable tie, aluminium strip and hardware for clamping of cables, copper tube, and temperature gauge capillary.
14	Copper lugs up to 4 sq. mm, PVC sleeve of different size, PVC button & tape
15	Ferrules (PVC) and suitable for ferrule printing.

#### NOTE:

## TECHNICAL CONDITIONS OF CONTRACT (TCC)

### Chapter - IV: T&Ps AND MMEs TO BE DEPLOYED BY THE CONTRACTOR

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- a) Instruments shown above are for the regular works only. However, separate sets of tools and instruments are to be arranged and provided to commissioning gang. If contractor fails to arrange the testing instruments as listed above, BHEL site will arrange the instruments at the cost of contractor.
- b) The list of instruments/ equipment to be brought by the contractor as shown above is only indicative. Any other instruments/ equipment are required for the execution of the work is to be necessarily arranged by the contractor. The testing/ calibration instruments which are used to be duly calibrated in the interval prescribed by BHEL engineer from the BHEL approved agencies. And test certificate to be furnished.
- c) The testing/ calibration instruments which are used to be duly calibrated in the interval prescribed by BHEL Engineers from the reputed agencies decided by BHEL and test certificate to be furnished. Contractor to submit calibration report from recognized agency prior to deployment of same at site and periodical calibration of the same to be arranged by contractor as per procedure of BHEL.
- d) This above list is only indicative and neither exhaustive nor limiting. Contractor shall deploy all necessary T&P to meet the schedules & as prescribed by BHEL engineer and required for completion of work.
- e) Other than the aforesaid, one computer, printer and other necessary peripherals will have to be maintained by the contractor in his site office as mentioned in Scope of Work.

# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## Chapter - V: T&Ps AND MMEs TO BE DEPLOYED BY BHEL ON SHARING BASIS

### 5 LIST OF T&P TO BE PROVIDED BY BHEL FREE OF HIRE CHARGES ON SHARING BASIS:

S. No.	DESCRIPTION & CAPACITY OF T&P	QTY	PURPOSE
01	EOT crane in TG Hall (265/ 25 MT) without Operator.	2Nos.	For handling and erection within TG hall on sharing basis as available and subject to their accessibility and approachability.

- Above T&P will be provided on sharing basis only. Contractor has to plan his activities well in advance and inform BHEL Engineer in charge/ Construction Manager the date of actual use. The decision of BHEL Engineer in-charge/ CM on this will be final and binding.

# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## Chapter - VI: TIME SCHEDULE

### 6. TIME SCHEDULE & MOBILIZATION

#### 6.1 INITIAL MOBILIZATION

After receipt of fax/ Email LOI, Contractor shall discuss with Project Manager/ Construction Manager regarding initial mobilization. Contractor shall reach site, make his site establishment and be ready to commence the erection work within two weeks from the date of issue of Letter of Intent or as per the directions of Construction Manager/ Project Manager of BHEL. Such resources shall be progressively augmented to match the schedule of milestones and commissioning.

#### 6.2 COMMENCEMENT OF CONTRACT PERIOD AND TENTATIVE SCHEDULE

Based on the availability of civil foundations from BHEL and materials from manufacturing units, contractor may have to advance the start of erection after getting clearance from Construction Manager, or the start of erection may get delayed due to site condition.

The contractor has to subsequently augment his resources in such a manner that following major milestones of erection & commission are achieved on specified schedules:

S. No.	MAJOR MILESTONE	Unit-2
1	START OF ACTIVITIES	Mar-2024
2	BOILER LIGHT UP & ALKALI BOIL OUT	Aug-2024
3	SYNCHRONIZATION	Dec-2024
4	COAL FIRING & FULL LOAD	Dec-2024
5	COMPLETION OF FACILITIES	Mar-2025

**NOTE:** Above time schedule is tentative and in order to meet above schedule in general, and any other intermediate targets set, to meet customer/ project schedule, contractor shall arrange & augment all necessary resources from time to time as per the instructions of BHEL.

#### 6.3 CONTRACT PERIOD

- 6.3.1 The total contract period for completion of entire work will be **13 (Thirteen) months** from the date of start of Erection of the first major equipment. Erection, Testing, Calibration and Commissioning of permanent equipment required for completion of system shall be completed within the time schedule given above.
- 6.3.2 The contract shall commence from the date of deployment of contractor's T&P, proper site setup and erection of first equipment. All the above three conditions are to be fulfilled (certified by BHEL Engineer) for deciding the date of commencement of the contract.
- 6.3.3 The contractor shall complete all the work in the scope of this contract within the contract period.

# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## Chapter - VI: TIME SCHEDULE

- 6.3.4 Subject to availability of materials and other inputs, it is the responsibility of the contractor to carry out work to achieve the monthly progress and keep up the schedules.
- 6.3.5 Contractor shall draw the monthly erection program along with BHEL Engineer indicating the work to be achieved and event to be completed. Once the program is drawn, he shall adhere to the same. Contractor shall plan and erect the materials as it is received at site. The monthly planned percentage shall take into consideration the material available at site before the start of the month and also any material received during the month. Contractor shall mobilize his resources required to achieve the monthly programs.
- 6.3.6 Contractor shall specifically note that there is likely to be some delay in supplies of materials/ release of work fronts/ other reasons. Contractor shall have to work round the clock on such critical activities as a part of catch up program to meet the project requirement to the extent possible and shall also provide required resources as part of scope of work.
- 6.3.7 In order to meet above schedule in general, and any other intermediate targets set, to meet customer/ project schedule, contractor shall arrange & augment all necessary resources from time to time as per the instructions of BHEL.
- 6.3.8 In case the activities in the schedule are to be advanced, the related structural activities in the scope of the contractor are to be advanced to meet the project requirement. No extra payment whatsoever shall be paid on this account.
- 6.3.9 The contractor shall submit area-wise L3 schedule within 7 days in consultation with BHEL. The detailed L3 schedule shall be approved by BHEL and same shall be implemented. Bidder shall submit L3 schedule in MS Projects to meet the agreed project schedule covering various mile stone activities and their split up details such as mobilization, procurement of materials, fabrication & erection activities. This schedule shall also clearly indicate the interface facilities/ inputs applicable in each package.

### 6.4 DEFINITION OF WORK COMPLETION

The contractor's scope of work under these specifications will be deemed to have been completed in all respect, only when all the activities are completed satisfactorily and so certified by BHEL site in charge. The decision of BHEL in this regard shall be final and binding on the contractor.

### 6.5 MATERIAL RE-CONCILIATION & SHORT CLOSURE OF CONTRACT

The BOQ is for one unit and common areas. The contractor shall do unit-wise material re-conciliation periodically. In extreme case if need arises, BHEL may short close the contract unit-wise.

### 6.6 PERFORMANCE GUARANTEE FOR WORKMANSHIP (Clause no 2.24 of GCC)

Guarantee Period for entire contract shall commence from the "Work Completion Date" certified by BHEL Engineer.

# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## Chapter - VI: TIME SCHEDULE

### 6.7 SCHEDULE COMPRESSION

BHEL, owing to its commitment to their customer, may ask contractor to compress the total completion schedule by up to 15%. This will result in advancement of various milestones. For achieving the same, contractor shall plan his activities and mobilize additional resources accordingly to the satisfaction of BHEL engineer within the quoted rates.

### 6.8 PROVISION OF PENALTY IN CASE OF SLIPPAGE OF INTERMEDIATE MILESTONES

In case of slippage of Two Major Intermediate Milestones, mentioned as M1 & M2 hereunder, Delay Analysis shall be carried out on achievement of each of these two Intermediate Milestones in reference to F-14.

Milestones	Activities	To be completed by
M1	BOILER LIGHT UP & ALKALI BOIL OUT	Aug-2024
M2	SYNCHRONIZATION	Dec-2024

#### Note 1:

Refer Clause No. 7 of IMPORTANT INFORMATION of the NIT regarding modalities against provision of penalty in case of slippage of Intermediate Milestones.

# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## Chapter - VII: TERMS OF PAYMENT

### 7. TERMS OF PAYMENT

The progressive payment for erection, testing and commissioning on accepted price of contract value for Cabling Package rates will be released as per the break up given hereinafter:

<b>TERMS OF PAYMENT FOR CABLING WORKS</b>		
<b>S. No.</b>	<b>Activity/ Work Description</b>	<b>%age of Unit Rate</b>
<b>E</b>	<b>PRO RATA PAYMENTS (85%)</b>	
<b>1.0</b>	<b>Cable tray and accessories</b>	
1.1	Fabrication and fixing/ welding/ bolting in position	60%
1.2	Earthing of cable trays	10%
1.3	Tagging of cable trays (including touch up painting & cable tray numbering on sides)	8%
1.4	Covering of trays where ever envisaged	7%
	<b>Total =</b>	<b>85%</b>
<b>2.0</b>	<b>Cable laying including Earth wires</b>	
2.1	Laying of cables/ wires	45%
2.2	Glanding, Termination and tagging of cables (Except HT Termination)	15%
2.3	Dressing and clamping of cables	15%
2.4	Testing and charging of cables	10%
	<b>Total =</b>	<b>85%</b>
<b>3.0</b>	<b>Junction box/ Push button station (local)</b>	
3.1	Erection including fixing of terminal blocks where ever applicable	75%
3.2	Name plate fixing where ever applicable, Labelling (both inside and outside) and Commissioning of connected equipment	10%
	<b>Total =</b>	<b>85%</b>
<b>4.0</b>	<b>Miscellaneous Structural steel including frames for Panels/ Racks/ Instruments, supports for cable tray/ pipes/ tubes, Canopies etc.</b>	
4.1	Fabrication/ Pre assembly	45%
4.2	Erection, Alignment, welding/ bolting and if applicable chipping/ grouting/ painting	40%
	<b>Total =</b>	<b>85%</b>
<b>5.0</b>	<b>DG sets/ Switch Gears/ MCC/ PCC/ Distribution Boards/ Marshalling Box/ Starter Units/ Dry Transformers/ Electrical Hoists/ Panels/ Cubicles/ Desks/ UPS/ Batteries/ Chargers/ VFD/ LA assy/ NGT/ NGR/ SP/ Miscellaneous Equipment/ etc.</b>	
5.1	Placement, Alignment and coupling/ interconnection where ever applicable, erection of associated accessories etc.	50%
5.2	Pre-commissioning checks and tests	10%
5.3	Charging, Loop testing and commissioning	15%
5.4	System commissioning	10%
	<b>Total =</b>	<b>85%</b>
<b>6.0</b>	<b>Earthing/ Lightning protection strips, Earthing pits</b>	
6.1	Fabrication, erection, alignment, welding/ bolting of earthing/ lightning protection strips; earth pits completion	60%



# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## Chapter - VII: TERMS OF PAYMENT

6.2	Testing/ commissioning	25%
	<b>Total =</b>	<b>85%</b>
<b>7.0</b>	<b>LT/ HT Bus Ducts</b>	
7.1	Pre assembly of Bus Ducts and accessories, erection, alignment, bolting/ welding etc. complete with supporting structure	50%
7.2	Pre commissioning checks	20%
7.3	Testing, Charging and Painting (as applicable)	15%
	<b>Total =</b>	<b>85%</b>
<b>8.0</b>	<b>Oil Filled Transformers (Generator, Station, UAT, Station Service etc.)</b>	
8.1	Placement on foundation and alignment	25%
8.2	Erection of associated auxiliaries/ assemblies, oil filling, etc.	25%
8.3	Dry out including oil filtration	15%
8.4	Pre-commissioning checks	10%
8.5	Testing, Charging and Painting (as applicable)	10%
	<b>Total =</b>	<b>85%</b>
<b>9.0</b>	<b>Testing/ Commissioning of Equipment (like motors, actuators, ESP transformer, misc. equipment, etc.) erected by other agencies</b>	
9.1	Local testing	40%
9.2	Remote testing, Loop testing, and commissioning	40%
9.3	System commissioning	5%
	<b>Total =</b>	<b>85%</b>
<b>10.0</b>	<b>Other Items</b>	
10.1	Rubber mats/ Display Boards/ Miscellaneous items/ etc. : on installation	85%
10.2	Specialized Commissioning Services - on pro rata basis.	85%
10.3	Civil Works – Pro-rata on completion of actual work.	85%
10.4	Termination, HT Termination, Straight through jointing etc. : on pro rata basis	85%

<b>II</b>	<b>STAGE/ MILESTONE PAYMENTS (15%)</b>	
1	Boiler Light-Up	1%
2	ABO	0%
3	Steam Blowing	1%
4	Safety Valve Floating	0%
5	Oil Flushing (TG)	0%
6	Barring Gear (TG)	0%
7	Rolling and Synchronisation (STG)	2%
8	Full Load	2%
9	Trial Operation of Unit	3%
10	Painting	1%
11	Area cleaning, temporary structures cutting/ removal and return of scrap	1%
12	Punch List points/ pending points liquidation	1%
13	Submission of 'As Built Drawings'	1%

# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## Chapter - VII: TERMS OF PAYMENT

14	Material Reconciliation	1%
15	Completion of Contractual Obligation	1%
	<b>Total for Stage/ Milestone Payments (15%)</b>	<b>15%</b>

The unit rates quoted by the bidder shall be firm for a variation of quantities limited to  $\pm 30\%$  of total order value corresponding to BOQ of Main equipment supply as above till finalization of engineering details & BOQ.

# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## Chapter - VIII: TAXES AND DUTIES

### 8.0 TAXES, DUTIES, LEVIES (Rev 14 dated 09/10/2020)

1. All taxes excluding GST, GST Cess & BOCW Cess **but including, Royalties, fees, license, deposits, commission, any State or Central Levy and other charges whatsoever, if any, shall be borne by you and shall not be payable extra.**
2. Any increase of the taxes excluding GST, GST Cess & BOCW Cess, at any stage during execution including extension of the contract shall have to be borne by the contractor. Quoted/ accepted rates/ price shall be inclusive of all such requirements. Please note that since GST on output will be paid by BHEL separately as enumerated below, your quoted rates/ price should be after considering the Input Credit under GST law at your end.
3. **GST :**  
The successful bidder shall furnish proof of GST registration .GST along with Cess (as applicable) legally leviable & payable by the successful bidder as per GST Law, shall be paid by BHEL. Hence Bidder shall not include GST along with Cess (as applicable) in their quoted price.
4. GST charged in the Tax Invoice/Debit note by the contractor shall be released separately to the contractor only after contractor files the outward supply details in GSTR-1 on GSTN portal and input tax credit of such invoice is matched with corresponding details of outward supply of the contractor and has paid the GST at the time of filing the monthly return
5. E-invoicing under GST has been implemented with effect from 1st October 2020 for all the taxable persons having turnover more than the threshold limit in any preceding financial year from 2017-18 onwards. Therefore, for all the taxable persons falling under the purview of E-invoice, it is mandatory to mention a valid unique Invoice Reference No. (IRN) and QR code as generated from E-Invoicing portal of the Government for the purpose of issuing a valid Tax Invoice. Only an E-invoice issued in the manner prescribed under rule 48(4) of CGST Rules shall be treated as valid invoice for reimbursement of GST amount.  
If the successful Bidder is not falling under the purview of E-Invoicing then he has to submit a declaration in that respect along with relevant financial statements.
6. Bidder shall note that the GST Tax Invoice complying with GST Invoice Rules (Section 31 of GST Act & Rules referred there under) wherein the 'Bill To' details will be as below:  
BHEL GSTN – As per **Annexure -1**  
NAME -- Bharat Heavy Electricals Limited  
ADDRESS -- Site address
7. Bidder to immediately intimate on the day of removal of Goods (in case of any supply of goods) to BHEL along with all relevant details and a scanned copy of Tax Invoice to below email ids to enable BHEL to meet its GST related compliances :-  
Email id ---- to be intimated later on.

# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## Chapter - VIII: TAXES AND DUTIES

In case of delay in submission of the abovementioned documents on the date of dispatch, BHEL may incur penalty /interest for not adhering to Invoicing Rules under GST Law. The same will be liable to be recovered from the successful bidder, if such delay is not attributable to BHEL.

8. In case of raising any Supplementary Tax Invoice (Debit / Credit Note) Bidder shall issue the same containing all the details as referred to in Section 34 read with Rule 53.
9. Bidder shall note that in case GST credit is delayed/ denied to BHEL due to delayed / non receipt of goods and /or tax invoice or expiry of the timeline prescribed in GST Law for availing such ITC, or any other reasons not attributable to BHEL, GST amount shall be recoverable from the vendor along with interest levied / leviable on BHEL, as the case may be.
10. Bidder shall upload the Invoices raised on BHEL in GSTR-1 within the prescribed time as given in the GST Act. Bidder shall note that in case of delay in declaring such invoice in your return and GST credit availed by BHEL is denied or reversed subsequently as per GST Law , GST amount paid by BHEL towards such ITC reversal as per GST law shall be recoverable from the bidder along with interest levied / leviable on BHEL.
11. Way Bill: Successful Bidder to arrange for way bill / e-waybill for any transfer of goods for the execution of the contract.

The Bidder has to make their own arrangement at their cost for completing the formalities, if required, with Issuing Authorities, for bringing materials, plants & machinery at site for execution of the works under this contract, Road Permit/ Way Bill, if required, shall be arranged by the contractor and BHEL will not supply any Road Permit/ Way Bill for this purpose.

12. **New taxes and duties:-**Any New taxes & duties, if imposed subsequent to due date of offer submission as per NIT & TCN, by statutory authority during contract period including extension, if the same is not attributable to you, shall be reimbursed by BHEL on production of relevant supporting document to the satisfaction of BHEL. However, you shall obtain prior approval from BHEL before depositing new taxes and duties.

Benefits and/or abolition of all existing taxes must be passed on to BHEL against new Taxes, if any, proposed to be introduced at a later date.

In case any new tax/levy/duty etc. becomes applicable after the date of bidder's offer but before opening of the price bid, the bidder must convey its impact on his price duly substantiated by documentary evidence in support of the same before opening of the price bids. Claim for any such impact after opening the price bid will not be considered by BHEL for reimbursement of tax or reassessment of offer.

13. For transportation work, bidder shall declare in his quotation whether he is registered under GST, if yes, whether he intends to claim GST on forward charge basis. In absence of this declaration, BHEL will proceed further with the assumption that

# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## Chapter - VIII: TAXES AND DUTIES

bidder intends not to claim GST on forward charge basis. However, in case of GST registered transporter, the amount to the extent of goods and service tax will be retained till BHEL avails the credit of GST. Further, transporter shall issue tax invoice which inter alia includes gross weight of the consignment, name of the consigner and the consignee, registration number of vehicle in which the goods are transported, details of goods transported, details of place of origin and destination, GSTIN of the person liable for paying tax whether as consigner, consignee or goods transport agency, and also containing other information as mentioned under rule 46.

14. **TDS under Income Tax shall be deducted at prevailing rates on gross invoice value from the running bills unless exemption certificate from the appropriate authority/ authorities is furnished.**
15. **TDS under GST shall be deducted at prevailing rates on applicable value from the running bills.**
16. **TCS under Income Tax 1961 has been implemented with effect from 1<sup>st</sup> October 2020 for every seller having turnover more than threshold limit during financial year immediately preceding financial year in which the sale of goods is carried out, who receives any amount as consideration for sale of any goods of the value or aggregate of such value exceeding threshold limit other than export of goods or who is already covered under other provision of section 206C, collect from the buyer, TCS as per applicable rates of the sale consideration exceeding threshold limit subject to following conditions**
  - i. Buyer shall be as per clause (a) of section 206C- (1H)
  - ii. Seller shall be as per clause (b) of section 206C- (1H)
  - iii. No TCS is to be collected, if the seller is liable to collect TCS under other provision of section 206C or the buyer is liable to deduct TDS under any provision of the Act and has deducted such amount.

**If Successful Bidder is falling under the purview of TCS then he has to submit a declaration in that respect along with relevant financial statements before the start of work or if bidder is falling under preview of TCS during the work in progress then bidder is compulsorily required to submit relevant financial statement in the beginning of the respective FY.**

**For TCS claim, vendor has to submit relevant documents required as per Income Tax Act.**

17. Refer Annexure – 2 for BOCW Act & Cess Act.

### **ANNEXURE-1**

#### **State wise GSTIN no.s of BHEL**

<b>Sl. No</b>	<b>Projects under state</b>	<b>GSTIN</b>
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# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## Chapter - VIII: TAXES AND DUTIES

1	Andhra Pradesh	37AAACB4146P7Z8
2	Bihar	10AAACB4146P1ZU
3	Chhattisgarh	22AAACB4146P1ZP
4	Gujarat	24AAACB4146P1ZL
5	Jharkhand	20AAACB4146P5ZP
6	Madhya Pradesh	23AAACB4146P1ZN
7	Maharashtra	27AAACB4146P1ZF
8	Orissa	21AAACB4146P1ZR
9	Telangana	36AAACB4146P1ZG

### ANNEXURE-2

#### BOCW Act & Cess Act

Bidder may please note that the sub-contractor/bidder of BHEL engaging building or construction worker in connection with building or other construction work, are required to follow the procedures enumerated below:

1. It shall be the sole responsibility of the contractor as employer to ensure compliance of all the statutory obligations under the Building and other Construction Workers' (Regulation of Employment and Conditions of Service) Act, 1996 and the Building and other Construction Workers' Welfare Cess Act, 1996 and the rules made thereunder.
2. It shall be sole responsibility of the contractor engaging Building Workers in connection with the building or other construction works in the capacity of employer to apply and obtain registration certificate specifying the scope of work under the relevant provisions of the Building and Other Construction Workers' (Regulation of Employment and Conditions of Service) Act, 1996 from the appropriate Authorities.
3. It shall be responsibility of the contractor to furnish a copy of such Registration Certificate within a period of one month from the date of commencement of Work.
4. It is responsibility of the contractor to register under the Building and other Construction Workers' Welfare Cess Act, 1996 and deposit the required Cess for the purposes of the Building and other Construction Workers' (Regulation of Employment and Conditions of Service) Act, 1996 at such rate as the Central Government may , by notification in the Official Gazette, from time to time specify. However, before registering and deposit of Cess under the Building and other Construction Workers' Welfare Cess Act, 1996, the contractor will seek written prior approval from the Construction Manager.
5. It shall be sole responsibility of the contractor as employer to get registered every Building Worker, who is between the age of 18 to 60 years of age and who has been engaged in any building or other construction work for not less than ninety days



# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## Chapter - VIII: TAXES AND DUTIES

during the preceding twelve months as Beneficiary under the Building and other Construction Workers' (Regulation of Employment and Conditions of Service) Act, 1996.

6. It shall be sole responsibility of the contractor as employer to maintain all the registers, records, notices and submit returns under the Building and other Construction Workers' (Regulation of Employment and Conditions of Service) Act, 1996 and the Building and other Construction Workers' Welfare Cess Act, 1996 and the rules made thereunder.
7. It shall be sole responsibility of the contractor as employer to provide notice of poisoning or occupation notifiable diseases, to report of accident and dangerous occurrences to the concerned authorities under the Building and other Construction Workers' (Regulation of Employment and Conditions of Service) Act, 1996 and the rules made thereunder and to make payment of all statutory payments & compensation under the Employees' Compensation Act, 1923.
8. It shall be the responsibility of the sub-contractor as employer to make payment/deposit of applicable cess amount on the extent of work involving building or construction workers engaged by the sub-contractor within a period of one month from the receipt of payment. It shall also be responsibility of the Contractor to furnish BHEL on monthly basis, Receipts/ Challans towards Deposit of the Cess under the Building and other Construction Workers' Welfare Cess Act, 1996 and the rules made thereunder along with following statistics :
  - (i) Number of Building Workers employed during preceding one month.
  - (ii) Number of Building workers registered as Beneficiary during preceding one month.
  - (iii) Disbursement of Wages made to the Building Workers for preceding wage month.
  - (iv) Remittance of Contribution of Beneficiaries made during the preceding month
9. BHEL shall reimburse the contractor the Cess amount deposited for the purposes of the Building and other Construction Workers' (Regulation of Employment and Conditions of Service) Act, 1996 under the Building and other Construction Workers' Welfare Cess Act, 1996 and the rules made thereunder. However, BHEL shall not reimburse the Fee paid towards the registration of establishment, fees paid towards registration of Beneficiaries and Contribution of Beneficiaries remitted.
10. It shall be responsibility of the Building Worker engaged by the Contractor and registered as a beneficiary under the Building and other Construction Workers' (Regulation of Employment and Conditions of Service) Act, 1996 to contribute to the Fund at such rate per mensem as may be specified by the State government by notification in the Official Gazette. Where such beneficiary authorizes the contractor being his employer to deduct his contribution from his monthly wages and to remit the same, the contractor shall remit such contribution to the Building and other construction Workers' Welfare Board in such manner as may be directed by the Board , within the fifteen days from such deduction.

# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## Chapter - VIII: TAXES AND DUTIES

11. Bidders may please note that though the quoted price is exclusive of BOCW (which will be reimbursed by BHEL as per sub-clause 9 above) , however, If at any point of time during the contract period, non-compliance of the provisions of the Building and other Construction Workers' (Regulation of Employment and Conditions of Service) Act, 1996 and the Building and other Construction Workers' Welfare Cess Act, 1996 and the rules made thereunder is observed, BHEL reserves the right to deduct the applicable cess (1%) on the contract value and penalty ( if any, imposed by Cess Authorities) from the payables on account of non-compliance.
12. The contractor shall declare to undertake any liability or claim arising out of employment of building workers and shall indemnify BHEL from all consequences / liabilities / penalties in case of non-compliance of the provisions of the Building and other Construction Workers' (Regulation of Employment and Conditions of Service) Act, 1996 and the Building and other Construction Workers' Welfare Cess Act, 1996 and the rules made thereunder.



# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## Chapter - IX: SPECIFIC INCLUSIONS

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### 9. SPECIFIC INCLUSIONS

#### 9.1 Specific Inclusions for Cabling works:

##### 9.1.1 Consumables/ items to be provided by BHEL free of charge

- a) Metallic Cable glands.
- b) Steel for fabrication.
- c) Lugs beyond 4 sq. mm size.
- d) HT Termination Kits.
- e) Trefoil Clamps with hardware except mentioned in BOQ which is to be supplied by subcontractor.

##### 9.1.2 Consumables/ items to be arranged by Bidder at his/ her own cost.

- a) Lugs up to 4 sq. mm size.
- b) Paint, primer and consumables.
- c) LT cable straight through jointing Kits.
- d) Cable ferruling printing machine along with ferrule rolls.
- e) Identification tags PVC/ Metals with tying/ fixing material, sleeve and clamps with hardware. PVC ties, Ferrule, Buttons and tap for cables at both end & field instruments.
- f) Cable Markers.
- g) Trefoil Clamps with hardware as mentioned in BOQ

# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## Chapter - X: SPECIFIC EXCLUSIONS

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### 10. SPECIFIC EXCLUSIONS

#### 10.1 EXCLUSIONS

N.A.

**NOTE: The aforesaid exclusions should not be construed as exhaustive. They are meant for general guideline. BHEL reserves the right to include or exclude any item which is required for completing the job as per rates indicated in rate schedule. Contractor should carry out all such jobs as per the instructions of BHEL Engineer..**

# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## Chapter - XI: Technical Details

### 11. TECHNICAL DETAILS OF CABLING WORKS

Details (wherever required) of items listed in the rate schedule

#### **SPECIAL NOTE:**

- All the items in general are to be erected and commissioned by the contractor, unless specifically mentioned otherwise.
- In such cases where systems are described with component quantities lump sum rates are to be quoted. No separate payment will be made for the component items of those systems, although these systems may have certain items for which separate unit rates are also available.
- The dimensions and weights mentioned are only approximate. No extra claims will be entertained due to change in dimensions/ weight.
- Work includes instrumentation work in main plant area as well as all the off-site/ BOP areas.

#### **11.1 ASSEMBLY OF JUCTION BOXES AND PUSH BUTTON MOUNTING FRAMES:**

Galvanized members will be supplied. These are to be assembled as per drawings. Some frames are suitable for one side JB mounting and others are suitable for JB mounting on both sides. Rate quoted should include assembly and installation.

#### **11.2 GENERAL INFORMATION**

##### **11.3.1 CONTACT PRESSURE**

Following torque are normally recommended for various bolts.

<b>BOLT SIZE</b>	<b>RECOMMENDED TORQUE</b>	<b>TORQUE SPANNER CAPTY.</b>
M10	0.85 to 1.30 Nm (20-30 ft-lb)	0.85 to 1.3 Nm
M12	1.30 to 1.70 Nm (30-40 ft-lb)	0.85 to 4.3 Nm
M16	1.70 to 2.10 Nm (40-50 ft-lb)	0.85 to 4.3 Nm
M20	2.10 to 2.50 Nm (50-60 ft-lb)	0.85 to 4.3 Nm

Alternatively tightening the nut till Belleville washer becomes flats. Then unscrew the nut by 1/ 8<sup>th</sup> turn. Exact method and extent of tightening shall be done as per instructions of BHEL site engineer/ as per equipment supplier's recommendation.

Note: - Considering the layout of the bus ducts as mentioned above for interconnection between the transformer and Generator it is not possible to

# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## Chapter - XI: Technical Details

the segregate the quantity of structural support materials for individual area, hence the total quantity is mentioned.

Flexible joints, seal off bushings, rubber bellows, CT and their wiring, conduits/ GI pipes breather tapping etc., are accessories and form a part of the system.

### 11.3.2 Recommendation for Welded Joints (For Enclosure, Box Conductor, Make Up Pieces, Shunt and Flexible Joint etc.)

TYPE OF WELDING	MIG/ TIG WELDING
Filler Wire	1.6 mm dia. (NG 21 with 5% silicon)
Angle	10 to 15 degree foreheads.
Cleaning	Degrease and scratch brush.
Current Setting	Depend on thickness.

### 11.3 ADDITIONAL TECHNICAL DOCUMENTS ATTACHED AS ANNEXURES

S. No.	Document Title	Document No.
1	Typical details of cable trays and accessories.	PE-DG-434-507-E005
2	Cable Tray Support system – Details & Drawings for Channels, Arms, Brackets and other Hardware.	PE-DG-434-507-E006
3	Typical Above Ground Earthing Details.	PE-DG-434-509-E004
4	Typical Lightning Protection Details.	PE-DG-424-509-E006
5	Cable Erection Philosophy.	PE-DC-424-507-E004
6	Cable Management System	--

# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## Chapter - XII: BILL OF QUANTITY & Weightages/ Factor

S. No	DESCRIPTION	UOM	TOTAL QTY	Factor Components
<b>E1A</b>	<b>CABLE TRAYS AND ACCESSORIES</b>			
E1A.03	Ladder type Cable Tray 150mm	Meter	10714.00	0.01395147889195 3
E1A.04	Ladder type Cable Tray 300mm	Meter	10449.00	0.01753760355422 5
E1A.05	Ladder type Cable Tray 600mm	Meter	30129.00	0.05576336728458 1
E1A.06	Perforated type Cable Tray 50mm	Meter	1890.00	0.00226138862640 3
E1A.07	Perforated type Cable Tray 100mm	Meter	1854.00	0.00203135964119 9
E1A.08	Perforated type Cable Tray 150mm	Meter	5071.00	0.00732353357906 8
E1A.09	Perforated type Cable Tray 300mm	Meter	5497.00	0.01062791148289 5
E1A.10	Perforated type Cable Tray 600mm	Meter	8621.00	0.02361487742119 9
<b>E1B</b>	<b>CABLE TRAY SUPPORT AND ACCESSORIES</b>			
E1B.01	Single Channel (in standard length of 6meter per piece)	Meter	11450.00	0.02443025998903 3
E1B.02	Double Channel (in standard length of 6meter per piece)	Meter	11173.00	0.02595980723808 4
<b>E1C</b>	<b>CANTILEVER ARM (EACH COMPLETE WITH, 2 NOS.-M12 HEX. BOLT &amp; WASHER, 2 NOS.-M12 SPRING NUTS, 2 NOS.-M6 PAN HEAD SCREWS &amp; WASHER, 2 NOS.-M6 SPRING NUTS)</b>			
E1C.01	For 750mm trays	No	1000.00	0.00155311193335 7
E1C.02	For 600mm trays	No	28763.00	0.04101154240034 1
E1C.03	For 300mm trays	No	10596.00	0.00985487268346 9
E1C.04	For 150mm trays	No	8191.00	0.01063169553981 9
E1C.05	For 100mm trays	No	100.00	0.00003759497139 8
<b>E1D</b>	<b>CLAMPS &amp; FITTINGS (COMPLETE WITH REQUIRED HARDWARE I.E. SPRING NUTS / WASHERS, TRESTLE BRACKET, ETC. AS REQUIRED FOR COMPLETE INSTALLATION)</b>			
E1D.01	Base plate for single channel.	No	6258.00	0.00379888258583 4

# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## Chapter - XII: BILL OF QUANTITY & Weightages/ Factor

S. No	DESCRIPTION	UOM	TOTAL QTY	Factor Components
E1D.02	Base plate for double channel.	No	3493.00	0.002339625943719
<b>E1E</b>	<b>FABRICATION OF IRREGULAR BEND TO BE DONE FROM THE EXISTING CABLE TRAY AS PER SITE REQUIREMENT (cable tray material will be issued by BHEL free of cost) (CONSUMABLES etc. TO BE PROVIDED BY VENDOR) (Applicable for BEND TYPE 'E', 'F' &amp; G )</b>			
E1E.1	IRREGULAR BEND FOR LADDER 600 MM TRAYS	No	100.00	0.000733765055135
E1E.2	IRREGULAR BEND FOR LADDER 450 MM TRAYS	No	0.00	
E1E.3	IRREGULAR BEND FOR LADDER 300 MM TRAYS	No	100.00	0.000440262603453
E1E.4	IRREGULAR BEND FOR LADDER 150 MM TRAYS	No	0.00	
<b>E2A</b>	<b>LT XLPE/ PVC ARMOURED/ UN-ARMOURED ALUMINIUM/ COPPER CONDUCTOR POWER/ FRLS CABLE</b>			
E2A.01	1Cx35sqmm Al Cable	Meter	16200.00	0.005414420308845
E2A.02	1Cx70sqmm Cable	Meter	500.00	0.000223377854672
E2A.03	1Cx120sqmm Al Cable	Meter	9000.00	0.003989175498412
E2A.04	1Cx300sqmm Al Cable	Meter	18900.00	0.009509375408997
E2A.05	1Cx630sqmm Al Cable	Meter	21540.00	0.013270975100610
E2A.06	2Cx10sqmm Al Cable	Meter	7400.00	0.00166137449166

# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## Chapter - XII: BILL OF QUANTITY & Weightages/ Factor

S. No	DESCRIPTION	UOM	TOTAL QTY	Factor Components
				0
E2A.07	2Cx16sqmm Al Cable	Meter	10800.00	0.002603558646321
E2A.08	2Cx25sqmm Al Cable	Meter	400.00	0.000090844576812
E2A.09	2Cx35sqmm Al Cable	Meter	16920.00	0.004635388476202
E2A.10	2Cx70sqmm Al Cable	Meter	5760.00	0.001632856067217
E2A.11	2Cx95sqmm Al Cable	Meter	16200.00	0.005908149222302
E2A.12	2Cx120sqmm Al Cable	Meter	31000.00	0.013677024361550
E2A.13	3Cx10sqmm Al Cable	Meter	25920.00	0.006603139181371
E2A.14	3Cx16sqmm Al Cable	Meter	11000.00	0.002673395396488
E2A.15	3Cx25sqmm Al Cable	Meter	32160.00	0.011075785938914
E2A.16	3Cx35sqmm Al Cable	Meter	500.00	0.000164504901907
E2A.17	3Cx50sqmm Al Cable	Meter	19640.00	0.008146399979110
E2A.19	3Cx120/150/185 sqmm Al Cable	Meter	8740.00	0.006266152634739
E2A.20	3Cx240sqmm Al Cable	Meter	33750.00	0.025572091668572
E2A.21	3.5Cx25sqmm Al Cable	Meter	28480.00	0.012362519766967
E2A.22	3.5Cx50sqmm Al Cable	Meter	29800.00	0.014380799103521
E2A.23	3.5Cx95sqmm Al Cable	Meter	16920.00	0.008604196309607
E2A.24	4Cx10sqmm Al Cable	Meter	8640.00	0.002325826816439
E2A.25	2Cx1.5sqmm Cu Control Cable	Meter	86040.00	0.018534915092311
E2A.26	2Cx2.5sqmm Cu Power Cable	Meter	96700.00	0.019702540585397
E2A.27	3Cx1.5sqmm Cu Control Cable	Meter	135240.00	0.027686636556471
E2A.28	3Cx2.5sqmm Cu Power Cable	Meter	148620.00	0.031749614065890
E2A.29	4Cx1.5sqmm Cu Screened Cable for ESP	Meter	27000.00	0.005881729622840
E2A.30	4Cx2.5sqmm Cu Screened Cable for ESP		400.00	0.000095596570075
E2A.31	5Cx1.5sqmm Cu Control Cable	Meter	4680.00	0.001007508449633



# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## Chapter - XII: BILL OF QUANTITY & Weightages/ Factor

S. No	DESCRIPTION	UOM	TOTAL QTY	Factor Components
E2A.32	5Cx2.5sqmm Cu Control Cable	Meter	28700.00	0.006226409342690
E2A.33	7Cx1.5sqmm Cu Control Cable	Meter	10440.00	0.002682375798798
E2A.34	12Cx1.5/2.5 sqmm Cu Control Cable	Meter	31360.00	0.008046630196162
E2A.35	14Cx1.5sqmm Cu Control Cable	Meter	37000.00	0.009835056332684
<b>E2B</b>	<b>HT ALUMINIUM CONDUCTOR, ARMOURED/ UNARMOURED XLPE POWER CABLE</b>			
E2B.01	11/11kV, 1Cx240sqmm Power Cable	Meter	12401.00	0.008644545523509
E2B.02	11/11kV, 1Cx400sqmm Power Cable	Meter	27200.00	0.034709952729773
E2B.03	11/11kV, 1Cx630sqmm Power Cable	Meter	20000.00	0.024771279805729
E2B.04	11/11kV, 3Cx185sqmm Power Cable	Meter	20100.00	0.036082617676880
E2B.05	3.3/3.3kV, 1Cx150sqmm Power Cable	Meter	2400.00	0.002514289505576
E2B.06	3.3/3.3kV, 3Cx150sqmm Power Cable	Meter	16200.00	0.022183094371074
<b>E2C</b>	<b>CABLE TERMINATION KITS &amp; JOINING KITS</b>			
<b>E2C.1</b>	<b>HT END TERMINATION JOINTING KITS, XLPE INSULATED, UN-ARMOURED/ ARMOURED, ALUMINIUM CABLE WITH LUGS</b>			
E2C.1.01	11/11kV, 1Cx240sqmm Power Cable	No	65.00	0.004328280165131
E2C.1.02	11/11kV, 1Cx400sqmm Power Cable	No	144.00	0.009580850221366
E2C.1.03	11/11kV, 3Cx185sqmm Power Cable	No	4.00	0.000317391171770
E2C.1.04	3.3/3.3kV, 1Cx150sqmm Power Cable	No	14.00	0.000831824268999
E2C.1.05	3.3/3.3kV, 1Cx240sqmm Power Cable	No	4.00	0.000256239353968
E2C.1.06	3.3/3.3kV, 3Cx150sqmm Power Cable	No	4.00	0.000317391171770
E2C.1.07	3.3/3.3kV, 3Cx185sqmm Power Cable	No	10.00	0.000771795114117
<b>E2C.2</b>	<b>HT STRAIGHT THROUGH JOINTING KITS, XLPE INSULATED, UN-ARMOURED/ ARMOURED, ALUMINIUM CABLE WITH LUGS</b>			
E2C.2.01	11/11kV, 1Cx240sqmm Power Cable	No	72.00	0.004794402644453

# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## Chapter - XII: BILL OF QUANTITY & Weightages/ Factor

S. No	DESCRIPTION	UOM	TOTAL QTY	Factor Components
E2C.2.02	11/11kV, 1Cx630sqmm Power Cable	No	43.00	0.00252715720928 6
E2C.2.03	11/11kV, 1Cx400sqmm Power Cable	No	32.00	0.00190131261485 5
E2C.2.04	11/11kV, 3Cx185sqmm Power Cable	No	25.00	0.00148540048035 6
E2C.2.05	3.3/3.3kV, 1Cx240sqmm Power Cable		4.00	0.00027047260420 2
E2C.2.06	3.3/3.3kV, 3Cx185sqmm Power Cable	No	4.00	0.00028308774842 4
E2C.2.07	3.3/3.3kV, 3Cx150sqmm Power Cable	No	4.00	0.00026613057732 4
<b>E3</b>	<b>JUNCTION BOXES AND PUSH BUT-TON</b>			
E3.01	Start Stop Push Button Station (Local push button station Type A/ B/ C/ D)	No	722.00	0.00734988397159 1
E3.02	Local Motor Starter	No	195.00	0.00202812141004 7
<b>E4</b>	<b>STRUCTURAL STEEL</b>			
E4.01	Structural Steel fabrication & Installation (MS angle, Channel, Plate etc)/ Cable tray structural steel fabrication & installation.	MT	213.00	0.06520591909958 0
<b>E6</b>	<b>ABOVE GROUND EARTHING &amp; LIGHTNING PROTECTION MATERI-ALS</b>			
E6.01	8 SWG GI wire	Meter	62940.00	0.00539014230471 8
E6.02	65x8mm GI flat	Meter	23558.00	0.03582928524837 3
E6.03	50x6mm GI flat	Meter	5477.00	0.00677045306469 0
E6.05	25x6mm GI flat	Meter	21966.00	0.02267827692987 6
E6.06	25x3mm GI flat	Meter	8698.00	0.00897191809408 9
E6.07	40mm dia MS Rod	Meter	1000.00	0.00078212654395 8
E6.08	Ground Electrode with 40mm Dia rod (One end Sharpened) 3000mm long located along the periphery of Earthing Grid (Without Treated Pit Other than Earth Test Pit)	No	75.00	0.00257947392425 2
E6.09	GS Rod 20mm dia Vertical Air Termination	No	263.00	0.00321359916724 9
E6.10	Test Links with 150x150x3mm GS flat	No	263.00	0.00092787064410 9

## TECHNICAL CONDITIONS OF CONTRACT (TCC)

### Chapter - XII: BILL OF QUANTITY & Weightages/ Factor

S. No	DESCRIPTION	UOM	TOTAL QTY	Factor Components
E6.11	Flexible braided Copper conductor of 600mm with tinned Cu, clamp connected by U-bolt for fence gate earthing.	No	22.00	0.000038189392370
E6.12	50NB gal MS pipe(PERF) (for neutral earthing along with salt, sand, charcol & chamber with cover)	No	101.00	0.017464699789639
E10.1	<b>TREFOIL CLAMPS (COMPLETE WITH FIXING HARDWARES) 11/11kV,3.3/3.3kV GRADE ALUMINIUM CONDUCTOR, XLPE INSULATED, ARMOURED/ UN-ARMOURED CABLES AS PER CABLE OD.</b>			
E10.1.1	Trefoil Clamp	No	52704.00	0.117789238278217

### Instructions to the bidders

- Bidders shall quote Total Lump-sum Price for the entire scope of work in Rupees in VOL II PRICE BID at BHEL E-procurement Portal.** Any other entry elsewhere in the offer of the bidder shall be treated as Null and Void. The total value including value of St No. A shall be automatically calculated on E-portal
- This **Quoted** Lump-sum Price shall be distributed based on the BHEL fixed percentage weightages w.r.t the total Total Lump-sum Price quoted by the bidder for the subject tender.
- BHEL has pre-fixed the Weightage/Factor as detailed above in this chapter for deriving the Item Rates. By multiplying BHEL pre-fixed the Weightages / Factor and the total prices derived in sl no. 2 above; item rate of individual items shall be derived. Item Rate/Item Rate thus arrived shall be rounded off to two decimal places.
- Item Rates derived in Sl. no. 4 shall be divided by quantity of respective items to derive Unite Rates. Unit Rates thus derived shall be rounded off to two decimal places
- Grand Total amount for the work shall be derived by BHEL by summing up respective total amounts.**
- Bidders to note that this is an item rate contract. Payment shall be made for the actual quantities of work executed at the unit rate arrived at as per Sl No.4 above.**
- For the convenience of bidders, BHEL has issued an excel sheet with all the requisite formulae as described above. **However the referred excel sheet shall not form part of contract document. Further, this sheet should not be uploaded at the e-Portal.**