T E N D E R S P E C I F I C A T I O N

NO: BHE/PW/PUR/WNT2-CPS/1380

PROVIDING CONSTRUCTION POWER SYSTEM ON " BOO BASIS" (BUILD OWN OPERATE) BASIS, 11/0.415 KV POWER DISTRIBUTION NETWORK, CONSISTING OF TRANSFORMERS , ASSOCIATED EQUIPMENT AND HT /LT CABLING ETC.FOR CONSTRUCTION WORKS OF 1 x 800 MW THERMAL POWER STATION

AT

1X 800 MW WANAKBORI TPS

GUJRAT

VOLUME – I-Technical Specifications

CONSISTING OF:

- **Volume-IA : Technical Conditions of Contract-,**
- **Volume-IB : Special conditions of Contract,**
- **Volume-IC : General conditions of Contract**
- **Volume-ID : Forms & Procedures**

Bharat Heavy Electricals Limited
(*A Government of India Undertaking*)
Power Sector - Western Region
345-Kingsway, Nagpur-440001

Volume No	Description	Hosted in website bhel.com as files titled
NIL	Tender Specification Issue Details	(Part of **Vol-IA-1380**)
NIL	Notice Inviting Tender	(Part of **Vol-IA-1380**)
I-A	Technical Conditions of Contract	Vol-I-A-1380
I-B	Special Conditions of Contract	Vol-I-BCD-1380
I-C	General Conditions of Contract	(Part of Vol-I-BCD-1380)
I-D	Forms & Procedures	(Part of Vol-I-BCD-1380)
II	Price Bid Specification	Volume-II-1380

T E N D E R S P E C I F I C A T I O N

NO: BHE/PW/PUR/WNT2-CPS/1380

PROVIDING CONSTRUCTION POWER SYSTEM ON " BOO BASIS" (BUILD OWN OPERATE) BASIS, 11/0.415 KV POWER DISTRIBUTION NETWORK, CONSISTING OF TRANSFORMERS , ASSOCIATED EQUIPMENT AND HT /LT CABLING ETC.FOR CONSTRUCTION WORKS OF 1 x 800 MW THERMAL POWER STATION

AT

1X 800 MW WANAKBORI TPS

GUJRAT

EARNEST MONEY DEPOSIT: Refer Notice Inviting Tender

LAST DATE FOR TENDER SUBMISSION: Refer Notice Inviting Tender

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

AGM (Purchase)
Place: Nagpur
Date:

1380

NOTICE INVITING TENDER

Bharat Heavy Electricals Limited

Registered Office : BHEL House, Siri Fort, New Delhi – 110 049, India
Website : www.bhel.com

Ref: BHE/PW/PUR/WNT2-CPS/1380 Date: 22/12/2014

NOTICE INVITING TENDER (NIT)

NOTE: BIDDER MAY DOWNLOAD FROM WEB SITES OR PURCHASE TENDERS FROM THIS OFFICE ALSO

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To

Dear Sir/Madam

Sub : NOTICE INVITING TENDER

Sealed offers in two part bid system are invited from reputed & experienced bidders (meeting PRE QUALIFICATION CRITERIA as mentioned in Annexure-I) 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

SL NO	ISSUE	DESCRIPTION	
i	**TENDER NUMBER**	BHE/PW/PUR/WNT2-CPS/1380	
ii	**Broad Scope of job**	PROVIDING CONSTRUCTION POWER SYSTEM ON " BOO BASIS" (BUILD OWN OPERATE) BASIS, 11/0.415 KV POWER DISTRIBUTION NETWORK, CONSISTING OF TRANSFORMERS , ASSOCIATED EQUIPMENT AND HT /LT CABLING ETC.FOR CONSTRUCTION WORKS OF 1 x 800 MW THERMAL POWER STATION AT 1X 800 MW WANAKBORI TPS GUJRAT	
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*	
e	Volume-II	*Price Schedule (Absolute value).*	*Applicable*
iv	**Issue of Tender Documents**	***1. Sale from BHEL PS Regional office at :*** ***Start : 23/12/2014 ,*** ***Closes: 06/01/2015 , Time : 16.00 Hrs*** **2. From BHEL website (www.bhel.com)** Tender documents will be available for downloading from website till due date of submission	*Applicable*
v	**DUE DATE & TIME OF OFFER SUBMISSION**	***Date : 07/01/2015, Time 15.00 Hrs*** ***Place : BHEL PS Regional office at :Nagpur***	*Applicable*

		Tenders being submitted through representative shall be submitted at dispatch section of PSWR HQ Office after making entry/registration at the reception. For any assistance on the matter kindly contact following officials: • Pratish Gee Varghese / Sr Engineer (Purchase • Shivkesh Meena / Engineer (Purchase)	
vi	**OPENING OF TENDER**	***1 hours after the latest due date and time of Offer submission*** *Notes:* *(1) In case the due date of opening of tender becomes a non-working day, then the due date & time of offer submission and opening of tenders get extended to the next working day.* *(2) Bidder may depute representative to witness the opening of tender*	*Applicable*
vii	**EMD AMOUNT**	*Rs 2,00,000/- (Rupees Two Lakhs Only)*	*Applicable*
viii	**COST OF TENDER**	*Rs 2000/-. (Rupees Two Thousand OnlY)*	*Applicable*
ix	**LAST DATE FOR SEEKING CLARIFICATION**	*Five days before the due date of offer submission. Along with soft version also, addressing to undersigned & to others as per contact address given below*	*Applicable*
x	**SCHEDULE OF Pre Bid Discussion (PBD)**	*Date :*	*Not applicable.*
xi	**INTEGRITY PACT & DETAILS OF INDEPENDENT EXTERNAL MONITOR (IEM)**		*Not Applicable*
xii	**Latest updates**	Latest updates on the important dates, Amendments, Correspondences, Corrigenda, Clarifications, Changes, Errata, Modifications, Revisions, etc to Tender Specifications will be hosted in BHEL webpage (**www.bhel.com** -->Tender Notifications →View Corrigendums) **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 & stamped on each page, 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 Unless specifically stated otherwise, bidder shall remit cost of tender and courier charges if applicable, in the form of Demand Draft drawn in favour of Bharat Heavy Electricals Ltd, payable at Power Sector Regional HQ at Nagpur issuing the Tender, along with techno-commercial offer. Bidder may also choose to deposit the Tender document cost by cash at the Cash Office as stated above against sl no iv of 1, on any working day; and in such case copy of Cash receipt is to be enclosed with the Techno Commercial offer. Sale of tender Documents shall not take place on National Holidays, holidays declared by Central or State Governments and BHEL PS HQ at Nagpur, Sundays and second/ last Saturdays

4.0 Unless specifically stated otherwise, bidder shall deposit EMD through Demand Draft/Pay Order in favour of Bharat Heavy Electricals Ltd, payable at Nagpur. For other details and for 'One Time EMD' please refer General Conditions of Contract.

5.0 **Procedure for Submission of Tenders**: 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/COST of TENDER)' 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)**

Sl no	Description	Remarks
	Part-I A	
	ENVELOPE – I superscribed as : PART-I (TECHNO COMMERCIAL BID) TENDER NO : NAME OF WORK : PROJECT: DUE DATE OF SUBMISSION: **CONTAINING THE FOLLOWING**:-	
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. **Note:** 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.	

	PART-I B	

	ENVELOPE – II superscribed as: PART-I (EMD/COST of TENDER) TENDER NO : NAME OF WORK : PROJECT: DUE DATE OF SUBMISSION: **CONTAINING THE FOLLOWING**:-	
i.	1. Earnest Money Deposit (EMD) in the form as indicated in this Tender **OR** Documentary evidence for 'One Time EMD' with the Power Sector Region of BHEL floating the Tender 2. Cost of Tender (Demand Draft or copy of Cash Receipt as the case may be)	

	PART-II	
	PRICE BID consisting of the following shall be enclosed	
	ENVELOPE-III superscribed as: PART-II (PRICE BID) TENDER NO : NAME OF WORK : PROJECT: DUE DATE OF SUBMISSION: **CONTAINING THE FOLLOWING**	
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)	

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

SPECIAL NOTE : All documents/ annexures submitted with the offer shall be properly annexed and placed in respective places of the offer as per enclosure list mentioned in the covering letter. BHEL shall not be responsible for any missing 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:

Bidders capacity for executing the job under tender shall be assessed 'LOAD' wise and 'PERFORMANCE' wise 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 'Load' is the sum of the unit wise identified packages (refer Table-1) for contracts with BHEL Regions. The cut off month for reckoning 'Load' shall be the month, two (2) months preceding the month corresponding to the 'latest date of bid submission', in the following manner:

(Note: For example if latest bid submission is in Aug 2011, then the 'load' shall be calculated upto and inclusive of June 2011)

i). Total number of Packages

Total number of Packages in hand = P

Where

- 'P' is the sum of all unit wise identified packages under execution with BHEL Regions as of the cut off month defined above, including packages yet to be commenced, excepting packages which are on HOLD due to reasons not attributable to Bidder..

II. **PERFORMANCE**: Here 'Monthly Performance' of the bidder for all the packages (**under execution**/ executed during the 'Period of Assessment' in all the 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 the cut off month. The cut off month for reckoning 'Period of Assessment' shall be the month two (2) months preceding the month corresponding to the 'latest date of bid submission', in the following manner:

(Note: For example if 'latest date of bid submission' is in Aug 2011, then the 'performance' shall be assessed for a 6 month period upto and inclusive of June 2011, 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) $P_1, P_2, P_3, P_4, P_5, \ldots P_N$ etc be the packages (**under execution**/ executed during the 'Period of Assessment' in all Regions) **SIMILAR** to the packages covered under the tendered scope, excepting packages not commenced. Total number of similar packages for all Regions = $\mathbf{P_T}$ (ie $P_T = P_1 + P_2 + P_3 + P_4 + .. P_N$)

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

c) Sum 'S_1 ' of 'Monthly Performance Evaluation' Scores ($S_{1\text{-}1}$, $S_{1\text{-}2}$, $S_{1\text{-}3}$, $S_{1\text{-}4}$, $S_{1\text{-}5}$,…. $S_{1\text{-}N}$) for similar package P_1, for the 'period of assessment' 'T_1' (i.e $S_1 = S_{1\text{-}1} + S_{1\text{-}2} + S_{1\text{-}3} + S_{1\text{-}4} + S_{1\text{-}5} + \ldots S_{1\text{-}N}$). 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 '$\mathbf{P_T}$' for all Regions (i.e 'S_T'= S_1+ S_2+ S_3+ S_4+ S_5+…. S_N.)

d) **Overall Performance Rating 'R_{BEHL}' for the similar Package/Packages** (**under execution**/ executed during the 'Period of Assessment') in all the Power Sector Regions of BHEL)**:**

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

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

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 = $\mathbf{P_T}$ ie Sum (Σ) of columns (iii) to (ix)
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 Package (as in row 1)	T_1	T_2	T_3	T_4	T_5	…	T_N	Sum (Σ) of columns (iii) to (ix) = $\mathbf{T_T}$
3	Monthly performance scores for the corresponding period (as in Row 2)	$S_{1\text{-}1}$, $S_{1\text{-}2}$, $S_{1\text{-}3}$, $S_{1\text{-}4}$, … $S_{1\text{-}T1}$	$S_{2\text{-}1}$, $S_{2\text{-}2}$, $S_{2\text{-}3}$, $S_{2\text{-}4}$, … $S_{2\text{-}T2}$	$S_{3\text{-}1}$, $S_{3\text{-}2}$, $S_{3\text{-}3}$, $S_{3\text{-}4}$, … $S_{3\text{-}T3}$	$S_{4\text{-}1}$, $S_{4\text{-}2}$, $S_{4\text{-}3}$, $S_{4\text{-}4}$, … $S_{4\text{-}T4}$	$S_{5\text{-}1}$, $S_{5\text{-}2}$, $S_{5\text{-}3}$, $S_{5\text{-}4}$, … $S_{5\text{-}T5}$	.. … … … …	$S_{N\text{-}1}$, $S_{N\text{-}2}$, $S_{N\text{-}3}$, $S_{N\text{-}4}$, … $S_{N\text{-}TN}$	---------
4	Sum of Monthly Performance scores of the corresponding Package for the corresponding period (as in row-3)	S_1	S_2	S_3	S_4	S_5	…	S_N	Sum (Σ) of columns (iii) to (ix) = $\mathbf{S_T}$

ii) Calculation of Overall 'Performance Rating' (**R_{BHEL}**) in case '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:

a) 'Period of Assessment.
b) 12 months preceding the cut-off month
c) 24 months preceding the cut-off month
d) 36 months preceding 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.:

Sl no	Overall Performance Rating (R_{BHEL})	Corresponding value of 'L'
1	=60	NA
2	> 60 and ≤ 65	0.4
3	> 65 and ≤ 70	0.35
4	> 70 and ≤ 75	0.25
5	> 75 and < 80	0.2
6	≥ 80	NA

III. 'Assessment of Capacity of Bidder':

'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_{Max}= (R_{BHEL}- 60) divided by corresponding value of 'L'
i.e. (R_{BHEL}- 60)/L

Note:

i. In case the value of P_{Max} results in a fraction, the value of P_{Max} is to be rounded off to next whole number
ii. For R_{BHEL} = 60 , P_{Max} = '1'
iii. For R_{BHEL} ≥ 80, there will be no upper limit on P_{Max}

The Bidder shall be considered 'Qualified' as per 'Assessment of Capacity of Bidder' for the subject Tender if $P \leq P_{Max}$
(where P is calculated as per clause 9.I)

IV. **Explanatory note**:

a) Similar package means Boiler or ESP or Piping or Turbine or Civil or Structure or Electrical or CI, 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, CI, 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 (ie Boiler, ESP and Power Cycle Piping) and finally the Bidder's capacity to execute the tendered scope is assessed in line with III above
b) Identified Packages (Unit wise)

Table-1

	Civil	Electrical & CI	Mechanical
	i). Enabling works ii). Pile and Pile Caps iii). Civil Works including foundations iv). Structural Steel Fabrication & Erection v). Chimney vi). Cooling Tower vii). Others (Civil)	i). Electrical ii). CI iii). Others (Elec & CI)	i). Boiler & Aux (All types including CW Piping if applicable) ii). Power Cycle Piping/Critical Piping iii). LP Piping iv). ESP v). Steam Turbine Generator set & Aux vi). Gas Turbine Generator set & Aux vii). Hydro Turbine Generator set & Aux viii). Turbo Blower (including Steam Turbine) ix). Material Handling x). Material Management xi). Material Handling & Material Management xii). Others (Mechanical)

c) Bidders who have not been evaluated for at least six package months in the last 36 months in the online BHEL system for contractor performance evaluation in BHEL PS Regions, wef July'2010 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 execution of work for a period of not less than 09 months, from the commencement of work of first package

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 'Capacity Evaluation of Bidders'.

d) In the unlikely event of all bidders shortlisted against Technical and Financial Qualification criteria not meeting the criteria on 'Assessment of Capacity of Bidders' detailed above, OR leads to a single tender response on applying the criteria of 'Assessment of Capacity of Bidders' or due to non-approval by Customer, then BHEL at its discretion reserves the right to consider the further processing of the Tender based on the **Overall Performance Rating** '$\mathbf{R_{BHEL}}$**'** only, starting from the upper band.

e) 'Under execution' shall mean works in progress as per the following:

i. up to Boiler Steam Blowing in case of Steam Generator and Auxiliaries

ii. upto Synchronisation in case of all other works excepting sl no (i) and (iii)

iii. Upto execution of at least 90% of anticipated contract value in case of Civil & Structures (unit wise), Enabling works and upto 90% of material unloading (in tonnage) as per the original contract in case of MM Package.

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

f) Performance evaluation in CL 9 above 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, 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.

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.**

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 authorised representative to 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 BHEL reserves the right to decide the successful bidder on the basis of Reverse Auction process. In such case all qualified bidders will be intimated regarding procedure/ modality for Reverse Auction process prior to Reverse Auction and price will be decided as per the rules for Reverse Auction. .

However, if reverse auction process is unsuccessful as defined in the RA rules/procedures, or for whatsoever reason, then the sealed 'PRICE BIDs' will be opened for deciding the successful bidder. BHEL's decision in this regard will be final and binding on bidder.

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 Consortium Bidding (or Technical Tie up) shall be allowed only if specified in Pre Qualifying Requirement (PQR) criteria, and in such a case the following shall be complied with:

23.1 Prime Bidder and Consortium Partner or partners are required to enter into a consortium agreement with a validity period of six months initially. In case the consortium is awarded the contract, then the Consortium Agreement between the Prime Bidder and Consortium Partner or partners shall be extended till contractual completion period including extension periods if any applicable.

23.2 'Stand alone' bidder cannot become a '**Prime Bidder' or a 'Consortium bidder' or 'Technical Tie up bidder' in a consortium (or Technical Tie up) bidding**. Prime bidder shall neither be a consortium partner to other prime bidder nor take any other consortium partners. However, consortium partner may enter into consortium agreement with other prime bidders. In case of non compliance, consortium bids of such Prime bidders will be rejected.

23.3 Number of partners for a consortium Bidding (or Technical Tie up) shall be as specified in the PQR

23.4 Prime Bidder shall be as specified in the Pre Qualification Requirement, else the bidder who has the major share of work

23.5 In order to be qualified for the tender, Prime Bidder and Consortium partner or partners shall satisfy (i) the Technical 'Pre Qualifying Requirements' specified for the respective package, (ii) "Assessment of Capacity of Bidder' as specified in clause 9.0

23.6 Prime Bidder shall comply with additional 'Technical' criteria of PQR as defined in 'Explanatory Notes for the PQR'

23.7 Prime Bidder shall comply with all other Pre Qualifying criteria for the Tender unless otherwise specified

23.8 In case customer approval is required, then Prime Bidder and Consortium Partner or partners shall have to be individually approved by Customer for being considered for the tender.

23.9 Prime Bidder shall be responsible for the overall execution of the contract

23.10 In case of award of job, Performance shall be evaluated for Prime Bidder and Consortium Partner or partners for their respective scope of work(s) as per prescribed formats

23.11 In case the Consortium partner or partners back out, their SDs shall be encashed by BHEL. In such a case, other consortium partner or partners meeting the PQR have to be engaged by the Prime Bidder, and if not, the respective work will be withdrawn and executed on risk and cost basis of the Prime Bidder. The new consortium partner or partners shall submit fresh SDs as applicable.

23.12 In case the prime Bidder withdraws, the whole contract shall be considered cancelled and short closed.

23.13 After execution of work, the work experience shall be assigned to the Prime Bidder and the consortium partner or partners for their respective scope of work. After successful execution of two similar works with the same consortium partner or partners under direct orders of BHEL, the Prime Bidder shall be eligible for becoming a 'stand alone' bidder for similar works, subject to certification from BHEL about the active involvement of the Prime Bidder for satisfactory execution of the works.

23.14 The consortium partner shall submit SD equivalent to 2% of the total contract value in addition to the SD to be submitted by the prime Bidder for the total contract value. In case there are two consortium partners, then each 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.

23.15 In case of a Technical Tie up, all the clauses applicable for the Consortium partner shall be applicable for the Technical Tie up partner also

24.0 The bidder shall submit 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 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/rules in respect of suspension of business dealings', 'Vendor evaluation format', 'Quality, Safety & HSE guidelines', etc may undergo change from time to time and the latest one shall be followed

for BHARAT HEAVY ELECTRICALS LTD

AGM Pur

Enclosure

01. Annexure-1: Pre Qualifying criteria.
02. Annexure-2: Check List.
03. Annexure-3: Important Information.
05 Other Tender documents as per this NIT.

ANNEXURE - 1

PRE QUALIFYING CRITERIA

JOB	PROVIDING CONSTRUCTION POWER SYSTEM ON " BOO BASIS" (BUILD OWN OPERATE) BASIS, 11/0.415 KV POWER DISTRIBUTION NETWORK, CONSISTING OF TRANSFORMERS , ASSOCIATED EQUIPMENT AND HT /LT CABLING ETC.FOR CONSTRUCTION WORKS OF 1 x 800 MW THERMAL POWER STATION AT 1X 800 MW WANAKBORI TPS GUJRAT
Tender NO	BHE/PW/PUR/WNT2-CPS/1380

SL NO	PRE QUALIFICATION CRITERIA	Bidders claim in respect of fulfilling the PQR Criteria	
		Name and Description of qualifying criteria	Page no of supporting document. **Bidder must fill up this column as per applicability**
A	Submission of Integrity Pact duly signed (if applicable) (Note: To be submitted by Prime Bidder & Consortium/Technical Tie up partner jointly in case Consortium bidding is permitted, otherwise by the sole bidder)	**Not APPLICABLE**	
B	**Technical** Bidder must have achieved the following in the last seven (7) years as on latest date of bid submission as bellow : **B.1:** **B.1.1):** (Supply, Erection & Commissioning) / (Erection and Commissioning) of Electrical systems / Switchyard / Power Transmission System / Power Distribution System / LT Substation consisting of HV (High Voltage) transformers of Primary voltage 11 KV or higher, switchgears and cables. **OR** **B.1.2):** Providing Construction Power supply system of 11KV or higher rated power distribution network consisting of Transformers, Associated equipments, HT/LT cabling etc. on 'Build, Own, Operate' basis or 'Lease basis" **AND**	**APPLICABLE**	

	B.2: Bidder must have executed the similar works (i.e. any of the scope defined in B.1.1 or B.1.2 above) in the last seven (7) years as on latest date of bid submission as bellow: B.2.1) One similar work of value not less than **Rs. 224 Lakhs** against single work order. ***OR*** B.2.2) Two similar works each of value not less than **Rs. 140 Lakhs** against maximum two work orders. ***OR*** B.2.3) Three similar works each of value not less than **Rs. 112 Lakhs** against maximum three work orders. Note: Bidder must meet B.1 **AND** B.2		
C-1	**Financial** **TURNOVER** Bidders must have achieved an average annual financial turnover (audited) of Rs 84 Lakhs or more over last three Financial Years (FY) i.e. 2011-2012, 2012-2013, 2013-14	**APPLICABLE**	
C-2	**NETWORTH** (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.	**APPLICABLE**	
C-3	**PROFIT** Bidder must have earned cash profit in any one of the three Financial Years as applicable in the last three Financial Years defined in 'C-1 above based on latest Audited Accounts.	**APPLICABLE**	
D	Assessment of Capacity of Bidder to execute the work as per sl no 9 of NIT (if applicable)	**APPLICABLE**	By BHEL
E	Approval of Customer (if applicable) **Note:** 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	**Not APPLICABLE**	BY BHEL

	forwarded to customer for their approval.		
F	Price Bid Opening **Note:** Price Bids of only those bidders shall be opened who stand qualified after compliance of criteria A to E		BY BHEL
F	Technical Tie up criteria (if applicable)	Not applicable	

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

1. Bidder to submit Audited Balance Sheet and Profit and Loss Account for the respective years as indicated against C-1 above along with all annexures
2. 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 i.e total divided by three.
3. C-2:-NETWORTH : Shall be calculated based on the latest Audited Accounts as furnished for C-1 above. Net worth = Paid up share capital + Reserves. (Net worth is required to be evaluated in case of companies)
4. C-3:- PROFIT : shall be NET profit (PAT + Non cash expenditure viz depreciation) earned during any one of the three financial years as in C-1 above
5. Time period for achievement of the 'Technical' criteria of PQR (as in 'B' above) will be the last 7 years ending on the 'latest date' of Bid submission
6. 'EXECUTED' means the Vendor should have achieved the criteria specified in the Technical criteria of PQR (as in 'B' above) even if the Contract has not been completed or closed
7. Unless otherwise specified, for the purpose of 'Technical' criteria of PQR (as in 'B' above), the word 'EXECUTED' means:

    1. Term 'Commissioning' indicated in PQR refers to 'assistance to commissioning' / 'commissioning'
    2. "CHARGING" in respect of power Transformers, Bus ducts, HT/LT switchgears, Cables, HV (High Voltage) Power transmission / distribution, LT Substation
    3. For PQR B.1.2, system should have been in operation for atleast one year.
8. In case the experience/PO/WO certificate enclosed by bidders do not have separate break up prices for the E&C portion of Electrical and CI Works, (i.e. the certificates enclosed are for composite order for supply and erection of Electrical & CI and other works if any), then value of Erection and Commissioning for the Electrical & CI portion shall be considered as 15% of the supply & erection of Electrical & CI, unless otherwise specifically indicated in the PQR.
9. The value of work (Experience submitted against PQR B) shall be updated as per the PVC indices for "All India Avg. Consumer Price Index for Industrial Workers" with base month as date of execution (completion of contract/work) and indexed upto two months prior to bid opening month.
10. Evaluation of PQR D 'Assessment of Capacity of Bidders' shall be considering all packages of Electrical as per Table 1 of Explanatory note of Sl.No.9 of NIT as 'similar package'.

BIDDER SHALL SUBMIT ABOVE PRE-QUALIFICATION CRITERIA FORMAT, DULY FILLED-IN, SPECIFYING RESPECTIVE ANNEXURE NUMBER AGAINST EACH CRITERIA AND FURNISH RELEVANT DOCUMENT IN THE RESPECTIVE ANNEXURES IN THEIR OFFER.

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: Please tick (√) whichever applicable:- ONE TIME EMD / ONLY FOR THIS TENDER		
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 **PRE QUALIFICATION CRITERIA** (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/~~Not Applicable~~	YES/NO
8	Copy of PAN Card		Applicable/~~Not Applicable~~	YES/NO
9	Whether all pages of the Tender documents including annexures, appendices etc are read understood and signed		Applicable/~~Not Applicable~~	YES/NO
10	Integrity Pact		Applicable/~~Not Applicable~~	YES/NO
11	Declaration by Authorised Signatory		Applicable/~~Not Applicable~~	YES/NO
12	No Deviation Certificate		Applicable/~~Not Applicable~~	YES/NO
13	Declaration confirming knowledge about Site Conditions		Applicable/~~Not Applicable~~	YES/NO

14	Declaration for relation in BHEL	Applicable/~~Not Applicable~~	YES/NO
15	Non Disclosure Certificate	Applicable/~~Not Applicable~~	YES/NO
16	Bank Account Details for E-Payment	Applicable/~~Not Applicable~~	YES/NO
17	Capacity Evaluation of Bidder for current Tender	Applicable/~~Not Applicable~~	YES/NO
18	Tie Ups/Consortium Agreement are submitted as per format	~~Applicable~~/Not Applicable	YES/NO
19	Power of Attorney for Submission of Tender/Signing Contract Agreement	Applicable/~~Not Applicable~~	YES/NO
20	Analysis of Unit rates	Applicable/~~Not Applicable~~	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

IMPORTANT INFORMATION

1. **The offers of the bidders who are on the banned list as also the offer of the bidders, who engage the services of the banned firms, shall be rejected. The list of banned firms is available on BHEL web site (www.bhel.com ---> Tender Notification -→ List of Banned Firms)**

2. **All Statutory Requirements as applicable for this project shall be complied with.**

3. **Please take note of following Revised Tender Clauses:**

   i. Notice Inviting Tender: Sl No 9

   ii. General conditions of Contract: Clause No 1.15.13 (New), Clause No 2.8.3, 2.8.4 and 2.8.5

4. Following Notes are added to Form F- 15 of Volume I D 'Forms & procedures'

   i. It is only indicative and shall be as per the online format issued by BHEL time to time.
   ii. No request will be entertained after specified date of the current month w.r.t the changes requested in the scores of immediate previous month.

5. **PRICE VARIATION CLAUSE**

   Price Variation Compensation Clause no. 2.17 of Vol I C GCC shall not be Applicable:

6. **OVER RUN COMPENSATION**

   Over Run Compensation Clause no. 2.12 of Vol I C GCC shall not be Applicable

7. **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 is given in Annexure V of NIT:

   7.1. Against this enquiry for the subject item/ system with detailed scope of supply as per enquiry specifications, BHEL may resort to "REVERSE AUCTION PROCEDURE" i.e., ON LINE BIDDING (THROUGH A SERVICE PROVIDER). The philosophy followed for reverse auction shall be English Reverse (No ties).

7.2. BHEL reserves the right to go for Reverse Auction (RA) instead of opening the sealed envelope price bid, submitted by the bidder. This will be decided after techno-commercial evaluation. All bidders to give their acceptance for participation in RA. Non-acceptance to participate in RA may result in non-consideration of their bids. In case BHEL decides to go for Reverse Auction, only those bidders who have given their acceptance to participate in RA will be allowed to participate in the Reverse Auction. Those bidders who have given their acceptance to participate in Reverse Auction will have to necessarily submit „online sealed bid" in the Reverse Auction. Non-submission of „online sealed bid" by the bidder will be considered as tampering of the tender process and will invite action by BHEL as per extant guidelines in vogue.

7.3. For the proposed reverse auction, technically and commercially acceptable bidders only shall be eligible to participate.

7.4. Those bidders who have given their acceptance for Reverse Auction (quoted against this tender enquiry) will have to necessarily submit 'online sealed bid' in the Reverse Auction. Non-submission of 'online sealed bid' by the bidder for any of the eligible items for which techno-commercially qualified, will be considered as tampering of the tender process and will invite action by BHEL as per extant guidelines in vogue.

7.5. BHEL will engage the services of a service provider who will provide all necessary training and assistance before commencement of on line bidding on internet.

7.6. In case of reverse auction, BHEL will inform the bidders the details of Service Provider to enable them to contact & get trained.

7.7. Business rules like event date, time, bid decrement, extension etc. also will be communicated through service provider for compliance.

7.8. Bidders have to fax the Compliance form (annexure IV) before start of Reverse auction. Without this, the bidder will not be eligible to participate in the event.

7.9. In line with the NIT terms, BHEL will provide the calculation sheet (e.g., EXCEL sheet) which will help to arrive at "Total Cost to BHEL" like Packing & forwarding charges, Taxes and Duties, Freight charges, Insurance, Service Tax for Services and loading factors (for noncompliance to BHEL standard Commercial terms & conditions) for each of the bidder to enable them to fill-in the price and keep it ready for keying in during the Auction.

7.10. Reverse auction will be conducted on scheduled date & time.

7.11. At the end of Reverse Auction event, the lowest bidder value will be known on auction portal.

7.12. The lowest bidder has to fax/e-mail the duly signed and filled-in prescribed format for price breakup including that of line items, if required, (Annexure VII) as provided on case-to-case basis to Service provider within two working days of Auction without fail.

7.13. In case BHEL decides not to go for Reverse Auction procedure for this tender enquiry, the Price bids and price impacts, if any, already submitted and available with BHEL shall be opened as per BHEL"s standard practice.

7.14. Bidders shall be required to read the "Terms and Conditions" section of the auctions site of Service provider, using the Login IDs and passwords given to them by the service provider before reverse auction event. Bidders should acquaint

themselves of the “Business Rules of Reverse Auction", which will be communicated before the Reverse Auction.

7.15. If the Bidder or any of his representatives are found to be involved in Price manipulation/ cartel formation of any kind, directly or indirectly by communicating with other bidders, action as per extant BHEL guidelines, shall be initiated by BHEL and the results of the RA scrapped/ aborted.

7.16. The Bidder shall not divulge either his Bids or any other exclusive details of BHEL to any other party.

7.17. In case BHEL decides to go for reverse auction, the H1 bidder (whose quote is highest in online sealed bid) may not be allowed to participate in further RA process.

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TECHNICAL CONDITIONS OF CONTRACT (TCC)

BHARAT HEAVY ELECTRICALS LIMITED

TECHNICAL CONDITIONS OF CONTRACT (TCC)
CONTENT

Sl No	DESCRIPTION	Chapter	No. OF PAGES
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	Project Information
1.1	**<u>LOCATION AND APPROACH:</u>** **Location :** Wanakbori, District-Kheda, Gujarat **Nearest Railway Station :**Sevaliya (8KM) – Anand-Godhra main line **Nearest Airport :** Vadodara (85 KM from site), Ahmedabad (100 KM from site) **Nearest Sea Port :**Kandla **Access By Road :** 10KM from Dakor-Godhra NH No. 8, 02 KM from Balasinor-Sevaliya SH No. 59 **Major Towns/Cities:** 13 KM from Balasinor and 10KM from sevaliya. **Land:** Within existing Thermal Power Station. North-East side of the existing plot. **Source Of Coal:** Indian coal sourced from captive mines Machha in Talchar,Orissa. **Source Of Water:** River Mahi, flowing by side of existing Wanakbori Power Station.
1.2	**CLIMATIC CONDITIONS:** 1) Maximum ambient Temperature: 40.8 degree Centigrate 2) Minimum ambient Temperature: 10.8 degree Centigrade 3) Seismic Zone : Part 3, Zone-III as per IS:1893/84 4) Relative Humidity: 81.5 % 5) Wind Speed: 39m/sec

The bidder is advised to visit and examine the site of WORKS and its surroundings and obtain for himself on his own responsibility all information that may be necessary for preparing the bid and entering into the contract. All costs for and associated with site visits shall be borne by the bidder.

2.1 SCOPE OF WORK

The intent of this specification is to provide the services of **"Construction Power Package"** on Built, Own and Operate basis (BOO). The scope of work includes Design/Detailed Engineering, Procurement, Supply, Receipt, and Storage at Site, associated civil works, Erection, Testing & Commissioning, and Operation & Maintenance. The brief scope of work shall be defined as under.

2.2 SCOPE OF WORK UNDER "BOO"

2.2.1. **Bidder must obtain/possess valid Electrical license in the state of Gujarat.**

2.2.2 Contractor shall carry out route survey for locating the sub-stations, 11 KV transmission line, poles, LT outdoors power distribution kiosks, earthing location and road crossing etc(Including all accessories)

2.2.3 Contractor shall design and carry out preparation of layout, sub-station drawing etc. taking into account the statutory requirements, Insurance coverage of equipment's/ T&P etc (during E&C, BOO period) and clearances etc as per latest Indian Electricity Acts and Rules including amendments thereof.

Contractor shall prepare proposed detailed drawings, substation layout drawings and BOQ of all items with engineering specifications and submit the same along with Technical Bid. However, the work shall be done as per the final layout decided at site which may at variance with proposed drawings as above. This shall be done without any additional financial implication on BHEL.

2.2.4 Contractor shall provide Materials, Equipments, and Devices etc as per finally approved documents. These should be of reputed make and the equipment/components shall conform to BIS specification.

2.2.5 The scope of work also includes receipt of material at site supplied by the contractor himself, handling at stores and site, transport to site, storage & preservation, covered herein.

2.2.6 Contractor shall perform Erection, Testing & Commissioning Including Obtaining Approval of entire installation from appropriate statutory authority. Contractor shall bear all the statutory fees/levies/ charges and all other expenses in connection with the approval of installations.

2.2.7 Construction of Entire System shall also include cutting/ trimming of branches of trees or clearing of any other obstruction that may come in the way of over head line, however this must be done with the approval of GSECL / BHEL.

2.2.8 Contractor shall provide the services of Operation & Maintenance of entire system to ensure reliable availability of the system and shall attend to the break downs and replace the defective components promptly. Failing which BHEL will get the same done at the risk and cost of the contractor.

2.2.9 At the end of the contract period including extended period if any, contractor shall dismantle the total installation, clear the premises of all debris, scrap etc. and take back all the equipment's for that period no ORC shall be applicable.
The scope of work envisage supply, installation and O&M of 5 Nos. 500KVA (including one stand by 500 KVA transformer) & 2 Nos. 250KVA 11/0.433 KV Substation at different Location to meet the requirement of the project on BOO basis.

2.3 SYSTEM REQUIREMENT

BHEL intends to avail of the services of Complete Construction Power System on Built, Own and Operate (BOO) basis. Suggested Lay-out & Single Line Diagram is attached for information only.

One supply point at pole of 11 KV existing Transmission line will be provided by GSECL, beyond this point further distribution of power shall be done through a combination of overhead 11 kV line and Multi –run underground cables at Tap-off KV transformer substation. The Tap-off Point should be provided with 4-pole structure on 11 KV overhead line side and 2- pole structure on underground cable side OR arrangement suggested by bidder and approved by engineer incharge. These should be provided with Triple Pole gang operated AB switch, DO Fuse, and Lightening Arrestors on incoming side. Along with HT Incoming VCB & No. of Transformers along with their Tentative Locations is mentioned in layout drawing.

Tentative Power Requirement for various Packages for BHEL's use as per above Location is furnished in Appendix-V.

2.3.1 The contractor shall operate and maintain the substations in three-shift operation as per the instruction of BHEL Engineer In-charge. Contractor shall deploy adequate electricians and helpers in each shift for uninterrupted operation. Electricians (both for Installation as well as during operation) should have valid license for handling 11 kV HT installation. In addition to shift operation, the contractor shall deploy a supervisor for over all co-ordination purpose.

2.3.2 Sectional isolations in 11KV are to be provided at different locations by using Triple-Pole Gang-Operated AB Switch with earthing switch. Lightening Arrestors are to be provided in the HT side of 11/0.433 KV transformers. The location of sectional isolation is to be decided considering the maintenance aspects.

2.3.3 Supply, erection and commissioning of HT breaker and LT distribution panel for specified substation shall be covered in the scope of the bidder.

2.4 OTHER TECHNICAL REQUIREMENT

2.4.1 All Civil works as required for Installation of this complete system and other incidental civil works e.g. grouting of poles/stays/ posts, foundations, including necessary

earthwork like excavation, backfilling and formwork, provision of all requisite materials like cement, sand & grit, reinforcement steel, T&P, shuttering etc. are in scope of contractor.

2.4. 2 The substation area shall be fenced as per Indian electricity rules & regulation and shall have provision of lockable door.

2.4. 3 Earthing of all the sub-station equipments and overhead line shall be carried out as per IS: 3043.

2.4. 4 Contractor shall maintain adequate inventory of spares and consumables at site for regular, preventive and break down maintenance and day-to-day upkeep of the substations.

2.4. 5 In case of non-availability power supply due to breakdowns/failures attributable to the contractor, he shall restore it within the shortest possible time. BHEL will allow a maximum outage of 24 hours in one calendar month per substation for preventive cum breakdown maintenance. Preventive maintenance shall be scheduled with prior consent of BHEL site in charge. No recoveries will be made from the agreed monthly hire charges for such purpose up to the duration of 24 hours per month per substation.

2.4. 6 In case the breakdown/non-availability of power duration extends beyond 24 hours in a calendar month per substation, recoveries shall be made at the rate of 2 times the pro-rata hourly rate for each Sub- station. Pro-rata hourly rate will be calculated as under.

PRO-RATA HOURLY RATE = AGREED MONTHLY HIRE CHARGES PER SUBSTATION DIVIDED BY 720

- Bidder should ensure that the preventive maintenance schedule is to be submitted and get approved by BHEL.

2.4.7 All work, including in preventive and breakdown maintenance period, in the system shall be taken up only after obtaining necessary permit/ clearance from BHEL engineer. Preventive maintenance as per schedule may get changed.

2.4.8 In the event of breakdown/non-availability of any strategically important substation, BHEL may choose to revive the said substation by cannibalising the relevant equipment/component from another working substation of lesser importance. Contractor shall carry out such cannibalisation including dismantling, local transportation, loading, unloading, erection, testing, commissioning and normalization/restoration after repair of the defective equipments/substation without any extra cost to BHEL.

2.4.9 Any replacement of the equipment caused due to failure shall not be attributable to any additional cost to BHEL.

2.4.10 Failure and supply at source from customer terminal point shall not be counted while working out the total outage attributable to the contractor for levying the penalty

.

2.4.11 During the contract period including the extended period if any, the ownership of substations shall lie with the contractor.

2.4.12 Contractor shall arrange entry permits as per laws in the state of (Gujarat) and all taxes.

2.4.13 At all stages of this contract, Contractor shall arrange all insurance cover at his own cost for his material, all installation, manpower for this work. Also refer GCC

2.4.14 During this period, various reports have to be generated and records maintained as per the requirements of BHEL. The engineer will specify the formats for these at site.

2.4.15 Various parameters of the system e.g. recording of loads on individual substations, transformers oil temperature and oil level in transformers, healthiness of the system etc. shall be done on day to day basis and proper log should be maintained substation wise. All the logs shut down & running logs should be submitted with the monthly billing.

2.4.16 BHEL, Customer, Sub–contractors of customer and BHEL will draw power from LT distribution boards at various locations. Contractor shall co-ordinate and assists them in terminating the cables, issue of permit for work and other work related to drawl of construction power by these agencies. **All the LT distribution Outgoing feeder should have energy meter is essential and covered in the bidder's scope.**

2.4.17 Contractor shall intimate BHEL engineer immediately on notice anything adverse and critical in his system, which requires immediate attention and take corrective action as required/directed at his own cost & risk.

2.4.18 In case during the course of contract period & extended period, cable routing can be changed based on site requirement. In such eventuality of cable rerouting Rs. 54 /- per mtr will be paid towards the completion of work of cable laying.

2.4.19 In case additional cable length is added to the existing cable & side joint is done, on such occasion per joint Rs.2160/- will be paid.

2.4.20 Loops in Cable: - Approximately 3 meter of surplus cable shall be left at each end of cable and on each side of underground joint. Surplus cable may be left in form of loop.

2.4.21 If Contractor fails to provide the services as per tender specification, BHEL will take suitable action at contractor's risk and cost.

2.4.22 The terminal points as decided by BHEL shall be final and binding on the contractor.

2.4.23 LT distribution to sub vendors should be displayed in Each Substation by making single line diagram on display board.

2.4.24 Adequate fire extinguishers as per the safety norms for oil type transfers and electrical panels / equipment's should be kept in the premises of all substations.

2.5.0 APPLICABLE STANDARDS FOR INSTALLATION:

The installation shall be done conforming to Indian Electricity Rule/Act with all the safety provision. Experienced persons shall be deployed for installation, commissioning and maintenance purpose. Contractor shall deploy only licensed electrician for the installation and commissioning WORK.

2.5.1 The work covered under this specification is of high voltage 11 kV system, requiring the best quality of workmanship, engineering and construction management. The contractor shall execute the entire work according to most modern and proven techniques and codes. The omission of specific reference to any method and/or equipment or materials necessary for the proper and efficient services in connection with this work shall not relieve the contractor of the responsibility of providing such services, facilities etc.

2.5.2 The contractor should ensure timely completion of work. Parallel and simultaneous working in multiple fronts will be required to meet the schedule. The contractor must deploy adequate quantity of tools, & testing instruments. He must also have on his rolls adequate trained, qualified and experienced engineers, supervisory staff and skilled personnel. Contractor shall deploy the manpower as instructed to match the work requirement.

2.5.3 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 co-operate with the personnel of other agencies, co-ordinate his work with others and proceed in a manner that shall not delay or hinder the progress of work as a whole.

2.5.4 All the work shall be carried out as per the instructions of BHEL engineer. BHEL engineer's decision regarding the correctness of the work and method of working shall be final and binding on the contractor.

2.5.5 Contractor shall be holding valid ‘A’ class license as electrical contractor, copy of which should be furnished along with the offer. If the license is of state other than Gujarat, then he will have to obtain electrical license/permission from appropriate authority as may be applicable.

2.5.6 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 cost. In rainy season water all the required T&P shall be the part of this contract no additional cost shall be paid extra to maintain the system.

2.5.7 Miscellaneous items and works not specifically described herein but required for this work shall be provided as per relevant IS and REC Specifications & Construction Standards.

2.6.0 BRIEF TECHNICAL DETAILS POWER DISTRIBUTION TRANSFORMER, SUB STATION & 415 VOLT AC DISTRIBUTION BORAD.

2.6.1 DISTRIBUTION TRANSFORMER

The distribution transformer shall be oil immersed, natural air cooled, 3 phase, 50 HZ, outdoor type, conforming to IS 2026. Rating 500 KVA, 11/0.433 KV, Vector group, Dyn11, Neutral solidly earth. Make should be Volt amp/kirloskar/equivalent.

The transformer shall be capable of being loaded in accordance with IS 6600 up to 150%. There shall be no limitation imposed by bushing, tap changer etc. The transformer shall be capable of being operated without danger on any tapping at rated KVA with voltage variation of +10% corresponding the voltage of the tapping. The transformer and all accessories shall be capable of withstanding for two seconds any external short circuit at bushing terminals without any damage. The maximum flux density in any part of the core and yoke at nominal voltage and frequency shall be such that the flux density on any tap position with 10% voltage variation from voltage corresponding to the tap shall not exceed 1.9 wb/m2.

Cores shall be constructed from high grade, cold rolled, non-aging grain oriented silicon steel lamination. The insulation structure for the core to bolt and core to clamp plate shall be capable of withstanding shocks during transport, installation, and service.

Winding shall be of fully insulated electrolytic grade copper winding and connection shall be adequate braced to withstand shocks during transportation and short circuit condition.

The tank shall be conventional type, fabricated from commercial grade low carbon steel. All bolted joints shall be fitted with oil tight gaskets. It shall be designed to with stand mechanical shocks and short circuit forces. All accessories such as pressure relief valve, air vent plugs, filling & drain valve, lifting lugs, thermometer pockets, conservator tank, air breather, radiators etc to be provided.
The transformer shall be provided with 3-phase hand operated off circuit tap change switch. The mechanism shall be complete with tap position indicator, direction of operation, warning plate & mechanical stop to prevent over cranking. Suitable pad lock arrangement shall be provided in any working position.

Transformer HT bushing shall be solid porcelain type confirming to IS 2099 & 8603. It should be suitable for ACSR conductor.

Suitable cable box shall be provided on LV side. In addition to neutral terminal, an addition provision shall be provided on the tank for earthing of LV winding neutral.

General Technical Particulars are as under.

1.	Rated Out put	500 kVA, 3 Ph, 50 Hz
2.	Voltage Ratio	11/0.433 kV
3.	Type	Two Winding
4.	Temp. Rise Winding	55 Deg C
5.	Temp. Rise Top Oil	50 DegC
6.	Impedance at 75 Deg C& permissible tolerance	As per IS 2026
7.	Fault level of system	As per IS 2026
8.	Vector group	Dyn11
9.	Winding Connection/ Nominal System Voltage(KV)	As per IS 2026
10	One minute power frequency withstand voltage (KV) rms	As per IS 2026
11	Lighting impulse withstand voltage	As per IS 2026

	(KV) peak	
12	Insulation Neutral	As per IS 2026
13	Tap Changer	Off circuit tap change switch on HV winding with range of +/- 5% in steps of 2.5 %
14	Phase Bushing Rated voltage (kV) Rated Current (Amp) Minimum Creepage distance (mm) Basic impulse level (kV)peak	As per IS 2026 As per IS 2026
15	Neutral Bushing Rated Voltage (kV) Rated Current (Amps)	As per IS 2026
16	Termination	

2.6.2 **LT DISTRIBUTION OUTDOOR KIOSK**

Distribution boards shall be suitable for 415 volts, 3-phase, 4-wire 50 Hz system. The board shall be designed for continuous operation at maximum ambient temperature of 50 deg. C and maximum relative humidity of 100 %.

Distribution boards shall be free standing out door type, totally enclosed. Dust and vermin proof , CRCA sheet construction . Frame shall be fabricated out of 2 mm thick sheet steel and thickness of sheet steel enclosure shall not be less than 1.6 mm. Gland plate shall be removable type made of 3 mm thick sheet.

Distribution board shall be single front, fully compartmentalized, having uniform height of not more than 2100 mm. Operating handles shall not more than 1800 mm height. Board shall be provided with outer enclosure so that access to individual compartment, bus bar and cable alley shall be available only after the out door is opened.

It shall be provided with pad lock arrangement with hinged door, slopped canopy to prevent ingress of rain water, base frame mounting, Caution notice, earth bolts, lifting hooks, energy meter, phase indication lamps, voltmeter & ammeter with selector switch etc.

All the cable entry shall be bottom only. All the doors and cut out shall be gasket with neoprene/ synthetic rubber to give minimum protection of IP 55 . Cable termination shall be suitable for terminating specified number of armoured aluminium cables as per the number of outgoing feeder asked for.

The board shall be provided with live, neutral earth bus bars. Individual out going feeders shall be tapped from vertical section bus bars. Vertical cables alley shall be provided covering entire height. Earth bus shall be of 50 x 8 mm GI strip/ welded framework of the panel at bottom through the length.

A minimum clearance in air of 25 mm shall be provided between phases and between phase and earth for horizontal & vertical run of bus bars, bus link connection to ACB & MCCBs. Bus bar shall be bare and supported with insulators of high strength molded compound or equivalent. The bus bar and supports shall be designed for short circuit capacity of minimum 20 kA rms for 1 sec. Maximum temperature rise while carrying rated current shall not exceeded 40 deg. C above ambient of 50 deg. C.

Internal wiring shall be carried out with 1.1 KV grade PVC insulated flexible connection, stud type power terminal shall be provided.

The board shall be coated with two coats of primer after proper degreasing, picking, rinsing, phosphate and acid treatment. Two coats of synthetic enamel finish paint of shade 631 as per IS 5 shall be applied on panel exterior. Panel interior shall be painted with glossy white.

FEEDERS PARTICULARS AS PER SLD.

DESCRIPTION	TECHNICAL DETAILS
Incomer Make – L&T or GE Power or Controls & Switchgears or Siemens	630 Amps, 415 volts, TPN, VACCUM Circuit Breaker, AC 3 pole with over current release, 3 Nos built in CTs, Earth fault release
Outgoing MCCB Make – L&T or GE Power or C&S or Siemens	400 Amps, TPN, Moulded Case Circuit Breakers. Built-in over-current & short-circuit protection
	200 Amps, TPN, Moulded Case Circuit Breakers.
	100 Amps, TPN, Moulded Case Circuit Breakers.
Metering	Ammeter & voltmeter 96x96 mm flush mounted, CTR, Selector switch Energy meter 3-phase, four- wire at power measurement at incoming power. Phase indication lamp

**** One No. spare Feeder of each rating should be in the LT Panel.**

2.6.3 VACCUM CIRCUIT BREAKER SHOULD BE L&T OR GE MAKE.

HT VCB shall be installed in the incoming HT Supply along with all transformers at every substation. Specification should be as per the IS electricity code.

2.6.4 11 kV GRADE HT XLPE SINGLE /MULTI CORE CABLE

11KV (UE) grade power cable with stranded Aluminium Conductor, conductor screen, XLPE Insulation, insulation screen, Colour coded for phase identification extruded ST-2 PVC inner sheath, GI wire / strip armoured, FRLS outer sheath of ST-2 PVC–FRLS, conforming IS:7098 Part –II (latest**)**

2.6.5 LT POWER CABLE 1.1 KV GRADE

Power cable with stranded aluminium conductor, PVC insulated, colour coded for phase identification, extruded PVC inner sheath, GI wire / strip armoured, FRLS outer sheath of PVC FRLS conforming to IS 1554(latest)

2.6.6 **Inspection and Acceptance of Components/Equipment:**

Contractor shall provide all the components as per finally approved documents. BHEL will carry out suitable stage inspection and final inspection before the materials are installed / put to use.

Sl.No	Description **PART I**	Scope / to be taken care by		*Remarks*
		BHEL	**Bidder**	
3.1	**ESTABLISHMENT**			
3.1.1	**FOR CONSTRUCTION PURPOSE**:			
a	Open space for office (as per availability)	Yes		Only small open space as per availability & at available location will be provided by customer free of charge. **As such there is limitation / shortage of open space inside the project premise and looking to this aspect contractor will plan his small portable type (Porta Cabin) office cum T&P storage arrangement at site. A**fter the completion of work, contractor shall dismantle his structures/ installations and handover the vacant land to customer/BHEL.

Sl.No	Description PART I	Scope / to be taken care by		*Remarks*
		BHEL	**Bidder**	
b	Open space for storage (as per availability)	Yes		Only small open space as per availability & at available location will be provided by customer free of charge.
c	Construction of bidder's office, canteen and storage building including supply of materials and other services		Yes	
d	Bidder's all office equipments, office / store / canteen consumables		Yes	
e	Canteen facilities for the bidder's staff, supervisors and engineers etc		Yes	
f	Fire fighting equipments like buckets, extinguishers etc		Yes	
g	Fencing of storage area, office, canteen etc of the bidder		Yes	
3.1.2	**FOR LIVING PURPOSES OF THE BIDDER**			
a	Open space for labour colony (as per availability)	**YES**		Electricity, Water etc for Labour colony is also in the scope of Contractor
b	Labour Colony with internal roads, sanitation, complying with statutory requirements		**YES**	
3.2.0	**ELECTRICITY**			
3.2.1	**Electricity For construction purposes at 11 KV Source**			

Sl.No	Description PART I	Scope / to be taken care by		*Remarks*
		BHEL	**Bidder**	
a	Single point source	**YES**		FREE .However Bidders shall have to arrange DG set for erection / installation / construction works of Construction Power arrangements / equipments under these tender specifications. BHEL is not responsible for any loss or damage to the contractor's equipment as a result of variations in voltage or frequency or interruptions in power supply.
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**			

Sl.No	Description PART I	Scope / to be taken care by		*Remarks*
		BHEL	**Bidder**	
a	Single point source		Yes	Bidders shall have to arrange DG set for erection / installation / construction works of Construction Power arrangements / equipments under these tender specifications. BHEL is not responsible for any loss or damage to the contractor's equipment as a result of variations in voltage or frequency or interruptions in power supply.
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**		Yes	Bidder to make his own arrangement
a	Single point source		Yes	
b	Further distribution including all materials, Energy Meter, Protection devices and its service		Yes	
c	Duties and deposits including statutory clearances if applicable		Yes	
3.3.0	**WATER SUPPLY**			

Sl.No	Description PART I	Scope / to be taken care by		*Remarks*
		BHEL	**Bidder**	
3.3.1	**For construction purposes: (to be specified whether chargeable or free)**			CHARGEABLE @ Rs 11 per Kilo liter.
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	
3.3.2	**Water supply for bidder's office, stores, canteen etc**			Bidder to make his own arrangement
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	**Water supply for Living Purpose**		**yes**	Bidder to make his own arrangement
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	
3.4.0	**LIGHTING**			
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	

Sl.No	Description PART I	Scope / to be taken care by		*Remarks*
		BHEL	**Bidder**	
3.5.0	**COMMUNICATION FACILITIES FOR SITE OPERATIONS OF THE BIDDER**			
a	Telephone, fax, internet, intranet, e-mail etc		Yes	
3.6.0	**COMPRESSED AIR wherever required for the work**		Yes	
3.7.0	**Demobilization of all the above facilities**		**YES**	
3.8.0	**TRANSPORTATION**			
a	For site personnel of the bidder		Yes	
B	For bidder's equipments and consumables (T&P, Consumables etc)		Yes	

Sl.No	Description **PART II** **3.9.0 ERECTION FACILITIES**	Scope / to be taken care by		*Remarks*
		BHEL	**Bidder**	
3.9.1	Engineering works for construction:			
a	Providing the erection/constructions drawings for all the equipments covered under this scope	**YES**		**INDICATIVE DRAWING ONLY.**
b	Drawings for construction methods		Yes	In consultation with BHEL/GSECL
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	
d	Shipping lists etc for reference and planning the activities			**NA**
e	Preparation of site erection schedules and other input requirements		Yes	In consultation with BHEL
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 Sl No. e		Yes	In consultation with BHEL
h	Daily erection / work plan based on Sl 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 works are 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	
k	Laying of racks for gantry crane if provided by BHEL or brought by the contractor/bidder himself			**NA**

Sl.No	Description **PART II** **3.9.0 ERECTION FACILITIES**	Scope / to be taken care by		*Remarks*
		BHEL	**Bidder**	
L	Arranging the materials required for preassembly		Yes	

Tentative List of Major T&P & MMD to be deployed by the Contractor

A. T&P FOR ELECTRICAL WORKS

SL. NO.	DESCRIPTION	QUANTITY
01	TRANSFORMER OIL PURIFICATION PLANT WITH VACUUM PUMP FOR EVACUATION TRANSFORMER ALONGWITH ACCESSORIES & HOSES. A) CAPACITY 750/1000 LTR. PER HOUR	3 NOS.
02	PPM TESTER FOR TRANSFORMER OIL	2 No.
03	METERS FOR TIME MEASUREMENT OF BREAKER OPENING & CLOSING TIME	1 No.
04	3 PHASE VARIAC 15 Amps	2 NO.
05	SINGLE PHASE VARIAC 28 AMPS	2 NO.
06	HV TEST KIT AC, 0 –50 KV &DC, 0- 100 KV PREFERSBLY WITH DRY TYPE TRANSFORMER	1 NO. EACH
07	TRANSFORMER OIL BDV TEST KIT 0-100 KV WITH 2.5MM AIR GAP.	1 NO.
08	PORTABLE AIR COMPRESSOR WITH DRIER AND REGULATOR MAKE "TOSHNIWAL"/"KHOSLA" RATED FOR 7/10 KG/CM2	2 NO.
09	SOLDERING IRON "SOLDRON" MAKE 25 WATT	3 NOS.
10	MULTIMETRES	
11	DIGITAL "MOTWANE" MAKE 3.1/2 DIGIT OR HIL MAKE ANALOG MOTWANE MAKE DIGITAL 4.1/2 DIGIT Accuracy +/- 1% (HIL/MOTWANE/ Fluke make)	4 NOS. 4 NOS. 2NOS.
12	STANDARD MILLI AMPS/MILLIVOLTS SOURCE MAKE RANGE 0 TO 60 mA AND 0 TO 100 mV	2 NO.
13	INSULATION TESTER MOTORISED OPERATED / ELECTRONIC WITH SELECTIVE RANGE 0F 1000 / 2500/ 5000 VOLT. Range 0.5 Mega ohms to 10000 Mega ohms	1 No.
14	INSULATION TESTER MAINS OPERATED/ ELECTRONIC 500 volt & 1000 Volts Range 0.5 Mega ohms to 1000 Mega ohms	3 NO.

SL. NO.	DESCRIPTION	QUANTITY
15	VARIABLE DC POWER SUPPLY 0 TO 250 V DC, 10 A MAKE "APLAB" OR RQUIVALENT(VARIABLE SOURCE)	2NO
16	PHASE SEQUENCE INDICATOR	1 NO.
17	DIGITAL TONGUE TESTER A/C 5/10, 25/60/300 AMP RANGE AC KEW SNAP MAKE	1 NO. EACH
18	DIGITAL TONGUE TESTER D/C 30/60/300 AMS	1 NO.
19	DIGITAL TONGUE TESTER 0-1 / 5 AMPS AC	1 NO.
20	STOP WATCH	1 NO.
21	CONTAINER FOR TRANSFORMER OIL SAMPLING	10 NOS.
22	MICRO OHM METER/DUCTER (mV volt Drop Test Kit) 0-200 A DC , 0-2000 Micro ohms with suitable calibrated cable leas for current injection & mv drop	1 NO.
23	CAPACITANCE METER HAVING RANGE 20 pf –100MFD +/- 1%	1 NO.
24	DECADE RESISTANCE BOX	2 NOS.
25	TELETALK 2 WIRE SYSTEM	6 SETS
26	TORQUE WRENCH (12-60Nm, 50-225 Nm)	1 NO EACH
27	WATTMETER AC/DC 0-125-250V, 0-5-10A	1 NO
28	TACHOMETER (NON CONTACT TYPE)	1 NO
29	CAPACITANCE & TAN DELTA TEST KIT 12 KV	1 SET
30	OIL SPECIFIC GRAVITY AND PPM MEASURING INSTRUMENT	1 NO
31	RHEOSTAT	3 NOS
32	POLARITY TEST KIT	1 NO
33	NON – CONTACT TYPE DIGITAL THERMOMETER	1 NO
34	RELAY TESTING KIT	1 NO
35	TWO WAY INTERCOM SET WITH 50 to 100 MTRS CABLES FOR CHECKING THE CABLES CONTINUTITY	2 Sets
36	PROTECTIVE EARTH ROD SUITABLE FOR 220 / 400 KV SYSTEM HAVING LEAKAGE CURRENT METER, 70 SQMM CABLE & CLAMPS ANY REPUTED MAKE	2 Nos.
37	OTHER PROTECTIVE DEVICES	AS REQUIRED

B. T&Ps FOR MECHANICAL WORKS

SN	DESCRIPTION	QUANTITY
	II. HANDLING EQUIPMENT	
1	TURN BUCKLES	AS PER REQMT
2	D'SHACKLES	AS PER REQMT
3	STEEL WIRE ROPES	AS PER REQMT
4	MANILA ROPES	AS PER REQMT
5	CRANES / TRUCKS	AS PER REQMT
6	CABLE ROLLERS	AS REQD.
7	SHEARING MACHINE	AS REQD.
8	DYNAMOMETERS	AS REQD.
9	HYDRAULIC CRIMPING TOOL FOR CONDUCTOR / SHIELD WIRE	AS REQD.
10	TORQUE WRENCH OF DIFFERENT RANGES	AS REQD.

NOTE:

THE LIST OF INSTRUMENTS / EQUIPMENTS TO BE BROUGHT BY THE CONTRACTOR AS SHOWN ABOVE IS ONLY INDICATIVE. ANY OTHER INSTRUMENTS / EQUIPMENTS 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 ENGINEERS FROM THE REPUTED AGENCIES DECIDED BY BHEL AND TEST CERTIFICATE TO BE FURNISHED.

No T&P shall be provided by BHEL

6.0 TIME SCHEDULE, QUANTITY VARIATION, PRICE VARIATION ETC.

6.0 TIME SCHEDULE, QUANTITY VARIATION, PRICE VARIATION ETC.

6.1 TIME SCHEDULE

The contractor shall mobiles his resources so that the entire work shall be completed to meet the following schedule.

SN	Description of Activity	**Completion by**
01	Completion of engineering and BOQ, finalisation of 11 kV line route survey, location of sub-stations etc.	Within 2 Weeks from award of work by Fax L.O.I.
02	Procurement, Supply, Installation, Testing & Commissioning & Clearance for charging the system with approval of statutory authority.	12 Weeks from the date of Fax LOI.
03	Providing the services of Operation, Maintenance & Up keep of Entire System	43 Months

6.2 Contractor to note that delay in achieving the schedule shall attract Liquidated Damages in accordance with the relevant provisions of General Conditions of Supply / Installation Contract.

6.3 BHEL at its discretion may grant extension of time schedule in case the reasons are beyond the control of the contractor. Contractor shall provide every documentary evidence to prove to the satisfaction of BHEL that the reasons for delay are not in his control.

6.4 **Contract Period, Grace Period and Overrun Compensation**

Total Contract Period shall be of 46 Months from the date of Fax LOI.

No overrun charges & grace period will be applicable for the scope of work covered under this contract.

6.5 Review and Monitoring

The detailed plan and progress of supply and installation of the system shall be made by the contractor and approved by BHEL. This shall be reviewed regularly and contractor shall take necessary action based up on the review and as per instruction of BHEL.

6.6 Definition of Work Completion:

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

A. ACITIVITY BASED PAYMENT:

7.1 PAYMENT TERMS AND CONDITION

SN	ACTIVITY	% Break up Payment
01	For 1st 500 KVA Substation - On Completion of Installation, Testing & Commissioning and on clearance of statutory authority for charging the system.	4.75 %
02	For subsequent substations @ 4% of contract value each for 500 KVA Substation and @ 2 % of contract value each for 250 KVA Substation - on completion of Installation, Testing & Commissioning and on clearance of statutory authority for charging the system(4 No's 500 KVA Substation with one standby transformer + 2 No's 250 KVA Substation)	20.00%
03	Monthly charges for the services to be provided on BOO Basis for 500KV transformer @ 0.3% of contract value for each substation { i.e. % Break up payment(64.5 %) / 500 KVA No. of Substations(5) / No. of hiring months(43) } Payment will be made pro-rata basis from the date of commissioning of respective substation treating the above fraction as monthly service charges.	64.5%
04	Monthly charges for the services to be provided on BOO Basis for 250KV transformer @ 0.125% of contract value for each substation { i.e. % Break up payment(10.75 %) / 250 KVA No. of Substations(2) / No. of hiring months(43) } Payment will be made pro-rata basis from the date of commissioning of respective substation treating the above fraction as monthly	10.75%

SN	ACTIVITY	% Break up Payment
	service charges.	
10	**TOTAL**	**100%**

B. MONTHLY HIRING CHARGES for PROVIDING SERVICES DURING THE EXTENDED HIRING PERIOD (IF ANY) APPLICABLE.

BHEL may extend the contract period for services to be provided on BOO Basis as specified in the tender specification depending up on the requirement and it shall be reviewed at appropriate time. For extended period BHEL shall pay Monthly charges for the services as indicated above in clause 12.2.1 at the following rate:

1.1ST extension of 3 months at existing terms and condition and with same monthly service rate (@ 0.3% of contract value for 500 KVA substations and @ .125% of contract value for 250 KVA substations)

2. 2nd Extension of six month on existing terms and condition with half the monthly rate (@ 0.15% of contract value for 500 KVA substation and @ .0625% of contract value for 250 KVA substation).During the 2nd extension the rate will be variable in the same way as variation in Consumer Price index for Industrial workers for respective months of extension when compared to CPI-IW applicable for the last month of contract Period.

C. PRO RATA PAYMENT

In case hiring services are provided for part of calendar month, during the normal contract period and the extended periods, pro- rata payment of monthly hiring charges for the utilised numbers of days shall be made by BHEL.

Pro-rata rate shall be calculated as under:

- Pro-rata daily rate = accepted monthly hire charges divided by 30

7.2 Mode of Payment and measurement of work completed

Refer General Conditions of Contract

7.3 Extra Charges For Modification And Rectification:

There shall not any extra charges on any account.

TAXES, DUTIES, LEVIES

8.0 TAXES, DUTIES, LEVIES (Consolidated Rev 03 dated 09/04/2013)

8.1. For All types of works excepting works covered under sl no 8.2

8.1.1

The contractor shall pay all (save the specific exclusions as enumerated in this contract) taxes, fees, license charges, deposits, duties, tools, royalty, commissions or other charges which may be levied on the input goods & services consumed and output goods & services delivered in course of his operations in executing the contract. In case BHEL is forced to pay any of such taxes, BHEL shall have the right to recover the same from his bills or otherwise as deemed fit.

However, provisions regarding Service Tax and Value Added Tax (VAT) on output services and goods shall be as per following clauses.

8.1.2 Service Tax &Cess on Service Tax

Contractor's price/rates shall be exclusive of Service Tax and Cess on Services. In case, it becomes mandatory for the contractor under provisions of relevant act/law to collect the Service Tax &Cess from BHEL and pay the same to the concerned tax authorities, such applicable amount will be paid by BHEL at the prevailing Service Tax Rate (presently 12.36 %) on the admitted bill value.

Contractor shall submit to BHEL documentary evidence of Service Tax registration certificate specifying name of services covered under this contract. Contractor shall submit serially numbered Service Tax and Cess Invoice, signed by him or a person authorized by him in respect of taxable service provided, and shall contain the following, namely,

1. **The name, address and the registration number of the contractor,**
2. **The name and address of the party receiving taxable service,**
3. **Description, classification and value of taxable service provided and,**
4. **The service tax payable thereon.**

All the Four conditions shall be fulfilled in the invoice before release of service tax payment.

Wherever, more than one route/option are available for discharge of service tax liability under a particular service, (e.g. "works contract Service"), contractor shall obtain prior written consent from BHEL site before billing the amount towards Service Tax.

8.1.3 VAT (Sales Tax /WCT)

As regards Value Added Tax (VAT)/CST on transfer of property in goods involved in Works Contract (previously known as Works Contract Tax) applicable as per local laws, the price quoted by the contractor shall be inclusive of the same and in no case input or output VAT/CST will be reimbursed extra.

In any case the Contractor shall register himself with the respective Sales Tax authorities of the state and submit proof of such registration to BHEL along with the first RA bill. Contractor will submit all the details of

VAT/CST paid for the contract in the prescribed format of the respective state VAT laws. Also, the contractor will issue the tax Invoices to BHEL as per the Tax laws of respective state on monthly basis. Contractor shall also be required to furnish to BHEL necessary proof of VAT remittance on monthly basis.

Deduction of tax at source shall be made as per the provisions of law and is to be construed as an advance tax paid by the contractor and no reimbursement thereof will be made.

Further, if BHEL, at the instance of customer or otherwise adopts the specific route for discharging output VAT liability itself, benefit of the reduction in liability of the contractor will be passed on to BHEL.

In case, BHEL is forced to pay any VAT liability on behalf of contractor, the same will be recovered from contractor's bill or otherwise as deemed fit

~~**8.2 'Enabling Works'**~~

~~The contractor shall pay all (save the specific exclusions as enumerated in this contract) taxes, fees, license charges, deposits, duties, tools, royalty, commissions or other charges which may be levied on the input goods & services consumed and output goods & services delivered in course of his operations in executing the contract. In case BHEL is forced to pay any of such taxes, BHEL shall have the right to recover the same from his bills or otherwise as deemed fit.~~**~~(i.e. rates quoted by bidder shall be inclusive of Service Tax, VAT/WCT and all other taxes and duties)~~**

~~However, Since the proposed work is in the nature of 'Works Contract service' as per Service tax law, Hence, For non-corporate contractors being Individual, HUF, Proprietary Firm, Partnership Firm or Association of Persons (AOP), BHEL shall recover the applicable Service Tax under reverse charge mechanism from the contractor and remit the same with the Government as per the provisions of Law. Necessary advice/confirmation of remittance shall be issued to the contractor. The contractor shall not be eligible for any refund/reimbursement of such service tax from BHEL. It shall be the responsibility of the contractor to submit proper invoice giving all the requisite details as per Service Tax Law for the determination of the service tax liability of BHEL under reverse charge mechanism. BHEL reserves the right to determine such liability based on the invoice submitted by the contractor or otherwise independently and remittance of the same with the Government.~~

8.3 New Taxes/Levies

In case the Government imposes any new levy/tax on the output service/ goods/work after award of the contract, the same shall be reimbursed by BHEL at actual.

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

No reimbursement/recovery on account of increase/reduction in the rate of taxes, levies, duties etc. on input goods/services/work shall be made. Such impact shall be taken care of by the Price Variation/Adjustment Clause (PVC) if any. In case PVC is not applicable for the contract, Bidder has to make his own assessment of the impact of future variation if any, in rates of taxes/duties/ levies etc. in his price bid.

Sl.No	IS No. and Amendment	IEC PUB	Description
01	585/1962 Amd 1,2,3	38/1967	AC transmission line
02	1818/1972 Amd.1 to 6	129/1961	Ac current Isolators & earth switch
03	2607/1967	129/1986	AB isolator upto 1000 volts
04	2099/1986 Amd. 1to 4	137/1962	HV porcelain bushing
05	3347/1965 & 67		-------Do------- for transformer
06	4257/1967		-------Do-------clamping arrangement for transformer bushing
07	2516/1985		Ac Circuit breaker < 1000 volts
08	398/1976	209	ACSR conductor
09	2121/1962 Part 1 to 5		Fittings for ACSR conductor & over head line accessories
10	3835/1966		Aluminiumised steel core wire for AL conductor
11	2147/1972	144/1963	LT SWGR enclosure
12	4237/1967		LT SWGR <1000 volts
13	3427/1069		SWGR >1000 volts
14	6262/1971		Di-eclectric for Ins.oil
15	6209/1971		Distribution pillar <1000 volts
16	3043/1966		Earthling
17	5792/1970		HT fuses
18	4770/1968		Rubber gloves
19	335/1983		Ins. Oil for transformer & SWGR
20	731/1971		Porcelain Insulators for O/H lines.>1000 volts
21	1445/1977		Porcelain Insulators for O/H lines.<1000 volts
22	2486/1963 part 1 to 4		Insulator fitting for O/H lines >1000 volts
23	2544/1963		Porcelain post insulators 3.3 KV and above.
24	3188/1980		Disc Insulator/string insulators for O/H line

25	5613/1970 Part 1 to 4		Installation & maintenance of O/H lines
26	5216/1982 Part 1 & 2		Safety procedure in electrical works
27	375/1963		SWGR
28	3072/1965		SWGR Installation & Maintenance
29	4067/1967		Normal duty AB switch up to 1000 volts
30	1886/1967		Installation & Maintenance of Transformers
31	2026/1962 Part 1 to 4		Power transformers
32	3639/1966		Fitting & accessories of power transformer.
33	3043		Earthing.

SN	Description	Drawing No
01	Layout Plot Plan	1
02	Proposed Single line diagram For 11KV Construction Power	2

NOTE: -The above listed drawings are suggestive for tendering purpose and not to be considered as final. Actual layout and arrangements shall depend on job requirement

DRAWINGS ARE ATTACHED IN THE LAST PAGES.

GENERAL REQUIREMENTS – COMMON TO ALL WORK

1.1
The intent of specification is to provide 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.

1.2
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.

1.3
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 of the project as a whole.

1.4
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 and successful & timely completion of the work to meet the overall project schedule. The Contractor must deploy adequate quantity of tools & plants, modern / latest construction aids etc. He must also deploy adequate trained, qualified and experienced supervisory staff and skilled personnel.

1.5
Contractor shall erect and commission all the equipments 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 / sequence adopted in erection of similar sets elsewhere.

1.6
All necessary certificates and licenses, permits & clearances required to carry out this work from the respective statutory/ local authorities are to be arranged by the Contractor at his cost in time to ensure smooth progress of work.

2. OPERATION AND MAINTENANCE OF CONSTRUCTION POWER DISTRIBUTION SYSTEM

Contractor shall operate and maintain the installations regularly. Contractor shall attend the break down and replace the defective items, equipments, components including cables etc. promptly. Failing which BHEL will get the same done at the risk and cost of the contractor.

Contractor shall take special care for selection, laying/installation of cables to provide satisfactory & un-interrupted Construction Power supply. For any failure of Cables, contractor shall promptly replace / rectify the faulty / defective cables.

Operation, Maintenance and Upkeep of the entire system including requisite manpower, T&Ps, consumables, spares from the day of installation & commissioning of system till completion of contract period including extended period shall form part of scope of work.

The hiring period of complete system in integrated operational condition shall commence from date of successful commissioning & charging of system for regular operation. The decision of BHEL Engineer In-charge at site to accept the date of successful commissioning shall be final and binding on Contractor.

3 DEMOBILIZATION OF INSTALLATION

Bidder shall dismantle entire installation and remove all materials, scrap and debris from the project premises. The land shall be levelled and consolidated as a part of the work while handing over back to BHEL/Client. Bidder shall take back all the material at his cost.

BHEL will serve one month's advance notice for withdrawal of the construction power distribution system.

4 TECHNICAL REQUIREMENT

a The information herein is not intended to list the complete technical requirement. It is only for general information. However, contractors have to visit the site, discuss with client & consultant of client and BHEL site in-charge, and make their own study / assessment of work & requirement prior to submission of offer. Omissions from mention of any/all equipment, material, services etc; herein shall

not relieve the contractor from providing all such equipment, materials, services etc within the quoted rates.

b Bidder shall make necessary arrangement for receipt, handling at stores and work site, transport to work site, erection, fabrication, civil work, testing and commission of entire system.

c **CABLE LAYING DIRECT IN GROUND**

The method shall be adopted where the cable route is through open country, along road / lanes etc, and where no frequent excavations are encountered and re-excavation is possible without affecting the other work.

Width of Trenches: -The minimum width of trench for laying single cable shall be 35 cms. Where more than one cable are to be laid in the same trench in horizontal formation, width of trench shall be increased such that the inter axial spacing between the cables, for 415 volts shall be 20 cms, and for 11 & 33 KV shall be 35 cms; to be maintained.

Depth of Trenches: - Where cables are laid in single formation, the total depth of trench shall not be less than 75 cms for cable up to 1.1 KV grade and shall not less than 120 cms for cable above 1.1 KV grade. When ever more than one tires formation of cable is unavoidable and vertical formation is adopted, the depth of trench shall be increased by 30 cms for each additional tire to be formed.

Excavation of Trenches: - The trenches shall be excavated in reasonably straight lines. Wherever there is change in direction, the minimum safe bending radius for all type of PVC cables shall be 12 times the overall diameter of the cable. A larger radius shall be adopted at joints and termination; it shall not be less than 15 times of its overall diameter.

Adequate precaution shall be taken while excavation of trenches to avoid damages to existing cables, pipes or such installation in the proposed route during excavation. Where-ever bricks, tiles or protective covers or bare cables are encountered, further excavation shall not be carried out without the approval of Engineer –In-Charge.

Where there is any danger of trench collapsing /endangering adjacent structures, the side should be well shored up with timbering and or sheeting as excavation process. This should be followed back filling wherever necessary.

The bottom of the trench shall be level and free from stone, brickbats etc. The trench shall be provided with a layer of clean and dry sand cushion of not less than 8 cms in depth.

D **Laying of cables in Trenches:-**

Continuity and insulation measurement test shall be performed for cable core before and after laying in the trenches, if any abnormality is observed, the same shall be brought in notice of Engineer- in -Charge. End of the cables shall be sealed with suitable moisture seal tape in case of PVC cables and XLPE cables shall be sealed with end seal caps.

Cable laid in trenches in single tier formation shall have covering of clean dry sand of not less than 17 cms above the base cushion of sand before the protective cover is laid.

In case of vertical multi tier formation after the first cable has been laid, a sand cushion of 30 cms shall be provided over the initial bed before the second tier is laid. If additional tiers are formed, each of the subsequent tires also shall have sand cushion of 30 cms as stated above. The top most cable shall have final sand covering not less than 17 cms before protective cover is laid.

Protective Covering: - Unless otherwise specified, the cable be protected by B class/ second class brick of not less than 20cmsx 10 cms x 10cns (nominal size) as per CPWD building specification or protective cover placed on the top of the sand and both sides of cable (bricks shall be laid breadth wise foe cable top protection / height wise for cable side protection) for full length of cables to the satisfaction of EIC.Where more than one cable is laid in the same trench. This protective covering shall cover all the cables and projects at least 5 cms. over the sides of the end cables. A layer of bricks shall be laid in between two cables when more than one cable are laid in same trench.

Back filling: -The trenches shall be than back filled with excavated earth free from stones or other sharp edged debris and shall be rammed and watered, if necessary, in successive layer not exceeding 30 cms, unless otherwise specified. A crown of earth not less than 50 cms in the centre and tapering towards the sides of the trench shall be left to allow for subsidence. The crown of earth however should not exceed 10 cms so as not to be hazard to vehicular traffic. The temporary reinstatements of road ways should be inspected at regular intervals, particularly during wet weather and any settlement should be made good by further filling as may be required.

Where road berms or lawns have been cut or kerbed stones are displaced, the same shall be repaired and made good except/ turning / asphalting.

Route Marker: -Route marker shall be provided along straight runs of cables and at change in direction locations as approved by EIC and in general at intervals not exceeding 100 meter in straight run.

Route marker shall be made out of 100 mm x 100 mm x 5 mm GI/Aluminium plate bolted or welded on 35 x35 x6 mm MS angle iron of 600 mm long. Such route marker shall be mounted and grouted parallel to and o.5 meter away from the side of trench.

The word "Cable" and voltage grading, size of cable shall be inscribed on the marker.

Three Core XLPE Cable: - Three core cables for three-phase circuit shall normally laid on close trefoil formation and shall be bounded at interval of 1 meter. The relative position of the three cables shall be changed at each joint, complete transposition being effected in every three consecutive cable lengths. The joints shall be marked in an approved manner to indicate the circuit and phases. The arrangement for laying a number of parallel cables shall be detailed of IS 1255-1967.

Cable laying in pipe: In location such as road crossing, entry to building, on poles, in paved area etc. cable shall be laid in pipe.

Stone ware pipe, GI /CI or spun reinforcement pipe shall be used for such purpose. The size of the pipe shall be not less than 10 cms dia for single core cable and not less than 15 cms for more than one cable. In a pipe. This pipe shall be laid directly in the ground without any special bed except for SW pipes which shall be laid over 10 cms thick cement concrete 1:5:10 bed. No sand cushion or tiles shall be used in such situation, unless otherwise specified. The top surface of pipe shall be at minimum depth of 1 meter from ground level when laid under road, pavements etc.

Loops in Cable: - Approximately 3 meter of surplus cable shall be left at each end of cable and on each side of under ground joint. Surplus cable may be left in form of loop.

5 CODES & STANDARDS

All the equipment and system installation shall be confirming to relevant Indian standards, Indian electricity Rules/Acts etc. Suggestive List of such standards is furnished in Appendix-III.

6 TESTING AND COMMISSIONING

Prior to commissioning and energizing of system, following tests shall be carried out:

1) Insulation Resistance measurement.
2) High Voltage test on HT cables.
3) Earth Resistance Test
4) Mechanical Checks of Overhead lines and all associated components.
5) Any other check/test necessary to ensure desired quality of installation as per Codes and FQP and safe operation of the system.

7 Miscellaneous items and works

Miscellaneous items and works not specifically described herein but required for completion of system and substations shall be provided as per relevant IS and REC Specifications & Construction Standards and shall constitute part of scope of contract.

8 VACCUM AIR CIRCUIT BREAKER at 11 KV side

Circuit breakers shall be air break, three pole, horizontal, non-draw out type suitable for manual operation. Manual operating mechanism shall be spring charging stored energy type.

It shall have spring charging handle and push button for closing the breaker mechanically after the spring has been fully charged. . However closing by spring charging handle, after the spring is fully charged, shall also be acceptable. It shall be interlocked such that it shall not close unless the spring is fully charged. The closing action of the circuit breaker shall charge the spring, thus making it ready for tripping. Push button shall be provided on front of the panel to trip the breaker manually.

The circuit breaker shall be provided with short circuit release, over current & earth fault release. The tripping characteristic of breaker to provide satisfactory discrimination.

Rating	630 Amps
Short Circuit Making Current	50 Ka/desired

Short time breaking capacity at rated voltage	20 kA/desired
Short time with stand rating	20 kA/desired rms for 1 sec.

MOULDED CASE CIRCUIT BREAKERS.

It shall be 3 pole, quick make, and quick break type with short circuit & over current release, manual closing / opening, automatic tripping under fault condition. Magnetic & thermal release shall be adjustable one.
Short time breaking capacity 20 kA at 0.25 PF at rated voltage.

Short time with stand rating 20 kA rms for 1 sec.

9 11 kV GRADE HT XLPE SINGLE /MULTI CORE CABLE

11 KV (UE) grade power cable with stranded Aluminium Conductor, conductor screen, XLPE Insulation, insulation screen, Colour coded for phase identification extruded ST-2 PVC inner sheath, GI wire / strip armoured, FRLS outer sheath of ST-2 PVC–FRLS, conforming IS: 7098 Part –II (latest**)**

10 LT POWER CABLE 1.1 KV GRADE

Power cable with stranded aluminium conductor (AYFY), PVC insulated, colour coded for phase identification, extruded PVC inner sheath, Copper armoured (YWY), FRLS outer sheath of PVC FRLS conforming to IS 1554(latest)

a Capacitor panel for Power Factor improvement
375 KVAR APFCR Panel shall be used for power factor improvement

b The make of supplies of various components /Parts /assemblies/Components shall be of reputed or renowned company and like transformer 33/11 KV Capacitor panel having switchgears of C&S/L&T or equivalent and Capacitor of Heavy Duty MPP of Epcos/Siemens make, APFCR relay of Trinity make

c

Contractor shall make own arrangement, for receipt, store, verification, safe custody, watch & ward and transportation of material from store to site, for the equipment is his scope.
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 cost.

d **Inspection and Acceptance of Components/Equipment:**

Contractor shall provide all the components as per specifications indicated herein. BHEL will carry out suitable stage inspection and final inspection before accepting the materials.

APPENDIX-V

TENTATIVE POWER REQUIREMENT FOR VARIOUS PACKAGES AT 1 x800 MW WANAKBORI GUJARAT

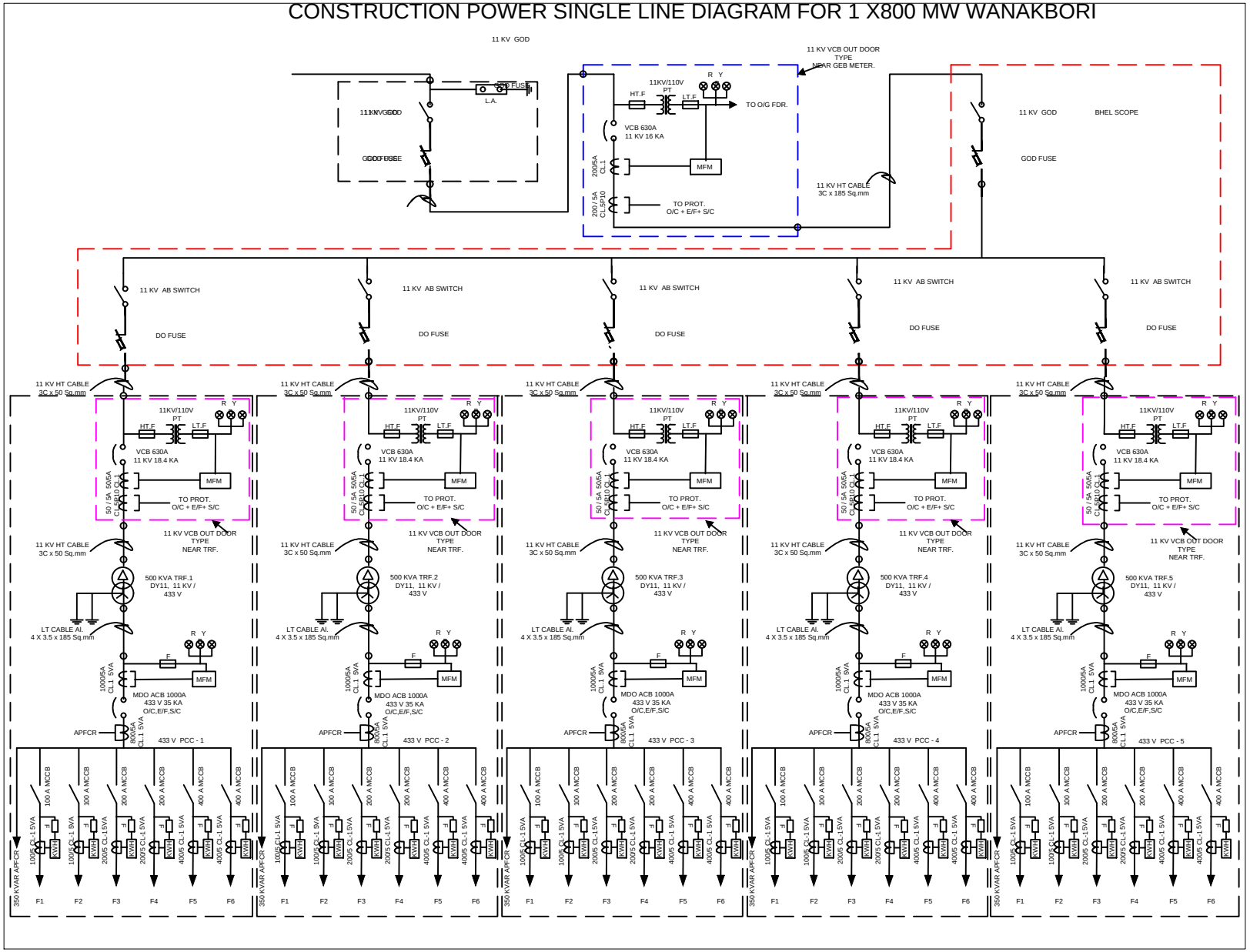
❖ Civil & Batching plant	- 400 Amps
❖ Structure Fabrication	- 1000 Amps
❖ BOP Civil	- 200 Amps
❖ Turnkey packages	- 100 Amps
❖ CW PIPE	-100 Amps
❖ Steam turbine	- 200 Amps
❖ Piping package	- 500 Amps
❖ Boiler, Bunker ,ESP & Chimney	-1500 Amps
❖ Misc including Electrical, C&I & BOP Vendors etc.	– 500 Amps
TOTAL REQUIREMENT	**4500 Amps**
❖ Expected average peak load ❖ (60 %)	2700 Amps

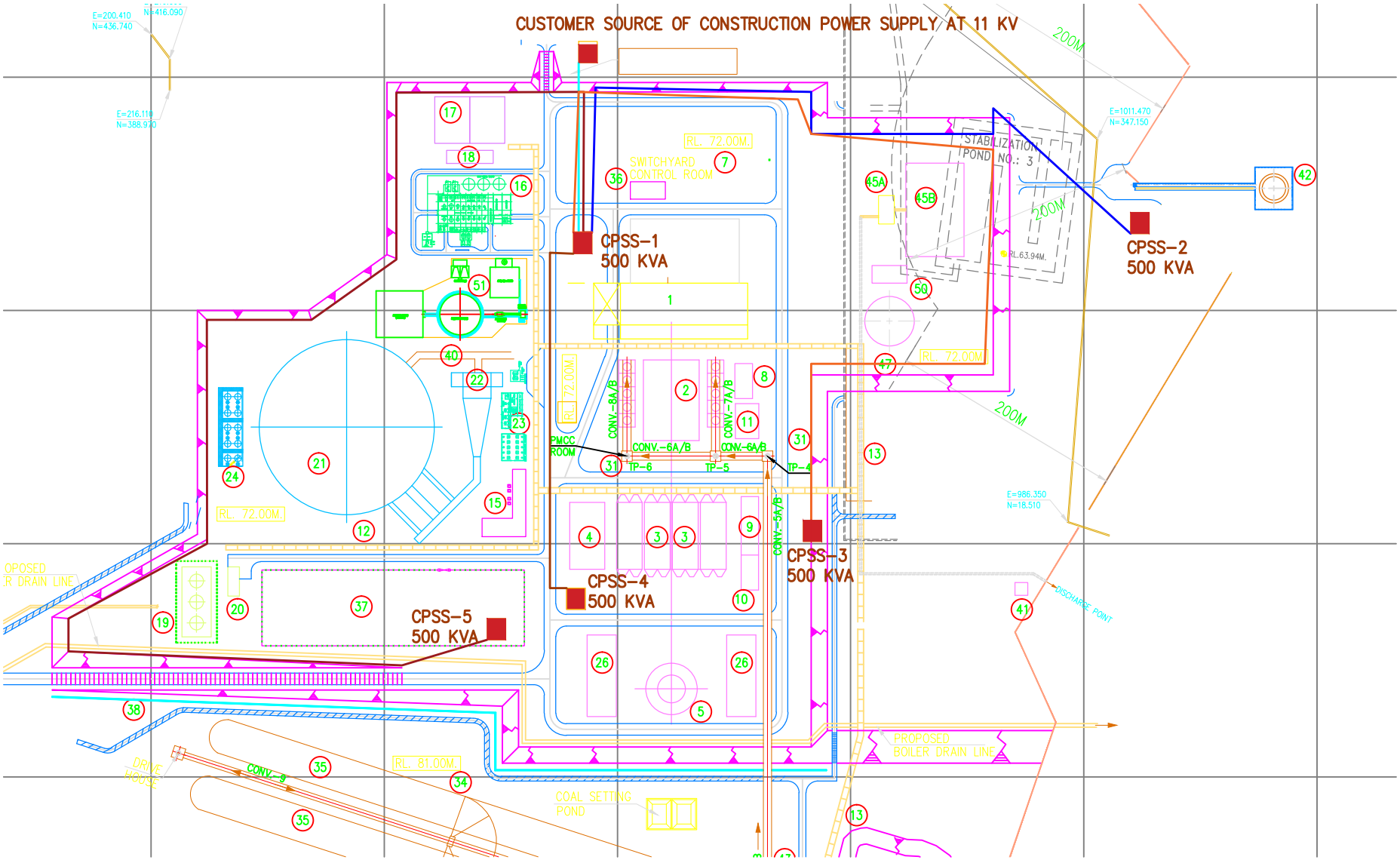
A) One 500 KVA Transformer Max Current – 869 A - LV Side.

Total Requirement of Transformer for Plant Area as per the Requirement (4500/800) = 5 Nos. of Transformers + 1 Nos. Standby.

For Store Yard and Labor Colony Two Nos. of (250 KVA rating) transformers are required.

CONSTRUCTION POWER SINGLE LINE DIAGRAM FOR 1 X800 MW WANAKBORI




CUSTOMER SOURCE OF CONSTRUCTION POWER SUPPLY AT 11 KV
CPSS-1
500 KVA
CPSS-2
500 KVA
CPSS-3
500 KVA
CPSS-4
500 KVA
CPSS-5
500 KVA
SWITCHYARD
CONTROL ROOM
PMCC
ROOM
CONV.-6A/B
CONV.-7A/B
CONV.-8A/B
CONV.-5A/B
TP-6
TP-5
TP-4
RL. 72.00M.
RL. 81.00M.
RL.63.94M.
STABILIZATION
POND NO.: 3
200M
E=200.410
N=436.740
N=416.090
E=216.110
N=388.930
E=1011.470
N=347.150
E=986.350
N=18.510
DISCHARGE POINT
PROPOSED
BOILER DRAIN LINE
COAL SETTING
POND
DRIVE
HOUSE