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

NO: BHE/PW/PUR/SAT-CPS/769

PROVIDING CONSTRUCTION POWER SYSTEM ON " BOOT BASIS" (BUILD OWN OPERATE TRANSFER) BASIS, OF 33/11KV & 11/0.433 KV POWER DISTRIBUTION NETWORK, CONSISTING OF TRANSFORMERS , ASSOCIATED EQUIPMENT AND HT /LT CABLING ETC.FOR CONSTRUCTION WORKS OF 2 x 250 MW SATPUDA THERMAL POWER STATION

AT

MADHYA PRADESH STATE ELECTRICITY BOARD

SATPUDA THERMAL POWER STATION, SARNI

DIST: - BETUL (MP)

VOLUME – I

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

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769

NOTICE INVITING TENDER

Bharat Heavy Electricals Limited

Ref: BHE/PW/PUR/SAT-CPS/769 Date: 25/10/2010

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/SAT-CPS/769**	
ii	**Broad Scope of job**	**PROVIDING CONSTRUCTION POWER SYSTEM ON " BOOT BASIS" (BUILD OWN OPERATE TRANSFER) BASIS, OF 33/11KV & 11/0.433 KV POWER DISTRIBUTION NETWORK, CONSISTING OF TRANSFORMERS , ASSOCIATED EQUIPMENT AND HT /LT CABLING ETC.FOR CONSTRUCTION WORKS OF 2 x 250 MW SATPUDA THERMAL POWER STATION AT MADHYA PRADESH STATE ELECTRICITY BOARD, SATPUDA THERMAL POWER STATION, SARNI, DIST: - BETUL (MP)**	
iii	**DETAILS OF TENDER DOCUMENT**		
a	Volume-IA	*Technical Conditions of Contract (TCC) consisting of Scope of work, Technical Specification, Drawings, Procedures, Bill of Quantities, Terms of payment, etc*	*Applicable*
b	Volume-IB	*Special Conditions of Contract (SCC)*	*Applicable*
c	Volume-IC	*General Conditions of Contract (GCC)*	*Applicable*
d	Volume-ID	*Forms and Procedures*	*Applicable*
e	Volume-II	*Price Schedule (Absolute value).*	*Applicable*
iv	**Issue of Tender Documents**	***1. Sale from BHEL PS Regional office at :Nagpur*** ***Start : 25 /10/ 2010*** ***Closes: 12/11/2010 , Time :16.00 Hrs IST*** **2. From BHEL website (www.bhel.com)** Tender documents can however be downloaded	*Applicable*

		from website till due date of submission	
v	**DUE DATE & TIME OF OFFER SUBMISSION**	**Date : 15/11/2010 , Time :15.00Hrs IST** **Place : BHEL PSWR, Nagpur** Tenders being submitted through representative shall be handed over to any of the following BHEL officials after making entry/registration at the reception: RK Ranade/ Manager (Purchase) Pratish Gee Varghese/ Engineer(Purchase) Priyanka Desabaktula/ Engineer(Purchase)	*Applicable*
vi	**OPENING OF TENDER**	***1 hour (IST) 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, tenders shall be opened on next working day at the same time.* *(2) Bidder may depute representative to witness the opening of tender*	*Applicable*
vii	**EMD AMOUNT**	**Rupees 2,00,000/-**	*Applicable*
viii	**COST OF TENDER**	***Rupees 2000/-***	*Applicable*
ix	**LAST DATE FOR SEEKING CLARIFICATION**	*Date: At least 3 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.*	*Not applicable.*
xi	**INTEGRITY PACT & DETAILS OF INDEPENDENT EXTERNAL MONITOR (IEM)**	*Not Applicable*	*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)

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 No Deviation with respect to tender clauses and no additional clauses/ suggestions/ in Techno-commercial bid/ Price bid shall normally 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: (Shall be applicable for Bid Evaluation after 1st Jan 2011)
Bidders capacity for executing the job under tender shall be assessed as per the following:

I. **Assigning Weightages (A) for Similar Jobs Under-Execution**: Weightages shall be worked out and assigned based on the average number of Similar Works under execution including works yet to be commenced by the agency, in the following manner:

i). Number of Similar Jobs
- a) No. of jobs in BHEL, PSER : Say 'J'
- b) No. of jobs in BHEL, PSSR : Say 'K'
- c) No. of jobs in BHEL, PSWR : Say 'L'
- d) No. of jobs in BHEL, PSNR : Say 'M'
- e) No. of jobs with other customers* : Say 'N' (*: Other than BHEL PSER, PSSR, PSWR & PSNR)
- f) Average No. of Jobs is 'P'= (J+K+L+M+N) divided by 5

ii) Weightage "A" assigned to bidders based on Average Number of jobs "P";
- a) If 'P' = 0-1, "A" will be equal to '3'
- b) If 'P' = 2-3, "A" will be equal to '2'
- c) If 'P' = 4-5, "A" will be equal to '1'
- d) If 'P' is Above 5, "A" will be equal to '0'

II. **Weightage "B" for Quarterly Performance Reports of Vendors**: This shall be based on the averages of the net weighted score obtained by the bidder for the jobs under execution (excluding works not commenced) for the quarter previous to the last quarter reckoned from the date of latest due date of submission, in all four Regions i.e BHEL PSER, PSSR, PSWR & PSNR, in the following manner.

i). Ratings by Power Sector Region:
- a) PS ER's Rating 'R**e**r' = $(X_1 + X_2 + .. + X_n)$ divided by n
- b) PS WR's Rating 'R**w**r' = $(X_1 + X_2 + .. + X_n)$ divided by n
- c) PS SR's Rating 'R**s**r' = $(X_1 + X_2 + .. + X_n)$ divided by n
- d) PS NR's Rating 'Rnr' = $(X_1 + X_2 + .. + X_n)$ divided by n
- e) **Over all Power Sector Region Rating 'R_{BHEL}'**= (R**e**r+ R**w**r+ R**s**r+ R**n**r) divided by 4

(where "X_1, X_2, X_3,…X_n" is the net weighted score obtained by the bidder as per the "Evaluation of Contractor Performance (Quarterly)" against the various contracts 'n' under execution in the respective Region).

ii) Weightage "B" assigned to bidders based on Overall Power Sector Rating **(R_{BHEL}):**

a) If **R_{BHEL}** is 80% and above, "B" will be equal to '6'
b) If **R_{BHEL}** is > 70% < 80%, "B" will be equal to '5'
c) If **R_{BHEL}** is > 60% < 70%, "B" will be equal to '4'
d) If **R_{BHEL}** is = < 60%, "B" will be equal to '0'

III. Evaluation of Bidders capacity to execute the job under tender: shall be based on the sum of scores obtained in 'A' and 'B', as below:

a) 6 or above : Considered 'Qualified' for the job under tender
b) Less than 6: Considered 'NOT Qualified' for the job under tender

IV. **Explanatory note**:

a) Similar work means Boiler or Turbine or Civil or Electrical or CI, etc irrespective of rating of Plant
b) Quarter shall be as per the quarter defined in the "Evaluation of Contractor performance (Quarterly)". For contracts where annexed Quarterly Evaluation performance was not part of the contract, 'Quarterly Performance Reports' previous to the last quarter reckoned from the date of latest due date of submission, given by the respective project site against the contract will be the basis for evaluation.

c) Vendors who are not executing any jobs presently in the Region and first timers to the Region, may be considered subject to satisfying all other tender conditions

d) 'Under execution' shall mean works in progress upto Boiler Steam Blowing (for Boiler and Auxilliaries) or Synchronisation (for all other jobs including Civil) shall be considered.

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 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. No additional claim shall be entertained by BHEL in future, on account of non-acquaintance of above.

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 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 (xi) of 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 pre-qualification evaluation/ techno-commercial bids, approval/ acceptance of customer (as applicable), etc. and date of opening of price bids shall be intimated to only such bidders.

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) or specified otherwise in SCC of tender.

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 In case Consortium Bidding is allowed as per Pre Qualifying Requirement, then Prime Bidder and Consortium Partner shall enter into Consortium Agreement. Validity period of Consortium Agreement shall be 6 months after which the same can be re validated.

'Stand alone' bidder cannot become a '**prime bidder' or a 'consortium bidder' in a consortium 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. .

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

for BHARAT HEAVY ELECTRICALS LTD

AGM (PUR)

Enclosure

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

ANNEXURE - 1

PRE QUALIFYING CRITERIA

JOB	**PROVIDING CONSTRUCTION POWER SYSTEM ON " BOOT BASIS" (BUILD OWN OPERATE TRANSFER) BASIS, OF 33/11KV & 11/0.433 KV POWER DISTRIBUTION NETWORK, CONSISTING OF TRANSFORMERS , ASSOCIATED EQUIPMENT AND HT /LT CABLING ETC.FOR CONSTRUCTION WORKS OF 2 x 250 MW SATPUDA THERMAL POWER STATION AT MADHYA PRADESH STATE ELECTRICITY BOARD, SATPUDA THERMAL POWER STATION, SARNI, DIST: - BETUL (MP)**
TENDER NO	**BHE/PW/PUR/SAT-CPS/769**

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
A	Submission of Integrity Pact duly signed	**NOT APPLICABLE**	
B	Assessment of Capacity of Bidder to execute the work as per sl no 9 of NIT	**Shall be applicable for Bid Evaluation after 1st Jan 2011**	
C	**TECHNICAL:** Bidder must fulfill the Qualifying Requirements as under in order to be considered as technically qualified for this Tendering process **C.1)** Bidder must have, in last seven years as on 30/09/2010, executed: **C.1.1)** Supply, Erection and Commissioning of HV Power transmission / distribution of11 KV or higher voltage rating and LT substation of 415 volt rating or higher rating. **OR** **C.1.2)** Erection and Commissioning of Electrical systems consisting of HV transformers of Primary voltage 11 KV or higher, switchgears and cables **OR** **C.1.3)** 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" **OR** **C.2)** Bidder should have been Techno Commercially Qualified for Providing Construction power on 'Build, Own & Operate' or 'Build, Operate & Transfer' or 'Build, Own, Operate & Transfer' basis of 11 KV or higher rated power distribution network		

	by any of the Power Sector Region/Unit/division of BHEL, in the last 3(Three) years as on 30/09/2010 **OR** **C.3)** Bidder should be empanelled with BHEL-PSWR for E-CP-2 or E-CP-3 category **AND** **C.4)** Bidder must possess a valid electrical contractor license as on the date of offer submission		
D 1	**Financial** **TURNOVER** Bidders must have achieved an average annual financial turnover (Audited) of **57 Lakhs** or more over last three Financial Years (FY) i.e 2007-08, 2008-2009, 2009-2010		
2	NETWORTH Net worth of bidder based on Audited Accounts of 2009-10 (should be higher than 50% of paid up capital in case of companies.		
3	PROFIT Bidder must have earned cash profit in any one of the three Financial Years as applicable in the last three years defined in 'D1 above based on latest Audited Accounts.		
E	Approval of Customer Note: Names of bidders who stand qualified after compliance of criteria A to D shall be forwarded to customer for their approval. Price bid of only those bidders shall be opened who are approved by customer.	**NOT APPLICABLE**	
F	Consortium criteria	**NOT APPLICABLE**	
	Explanatory Notes for QR 'A' 1. Bidder to submit Audited Balance Sheet and Profit and Loss Account for the respective years as given above along with all annexures		

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	Details of Contact person for this Tender	Name : Mr/Ms Designation: Telephone No: Mobile No: Fax No:	
4	EMD DETAILS	DD No: Date : Bank : Amount: Please tick (√) whichever applicable:- ONE TIME EMD / ONLY FOR THIS TENDER	
		APPLICABILITY	BIDDER REPLY
5	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
6	Whether Audited profit and Loss Account for the last three years submitted	Applicable	YES/NO
7	Whether Copy of PAN Card submitted	Applicable	YES/NO
8	Whether all pages of the Tender documents including annexures, appendices etc are read understood and signed	Applicable	YES/NO
9	Integrity Pact	Not Applicable	Not Applicable
10	Declaration by Authorised Signatory	Applicable	YES/NO
11	Whether No Deviation Certificate submitted	Applicable	YES/NO
12	Whether Declaration confirming knowledge about Site Conditions submitted	Applicable	YES/NO
13	Whether Declaration for relation in BHEL submitted	Applicable	YES/NO
14	Whether Non Disclosure Certificate submitted	Applicable	YES/NO
15	Whether Bank Account Details for E-Payment submitted	Applicable	YES/NO
16	Capacity Evaluation of Bidder for current Tender	Not Applicable	Not Applicable
17	Tie Ups/Consortium Agreement are submitted as per format	Not Applicable	Not Applicable
18	Whether Power of Attorney for Submission of Tender/Signing Contract Agreement submitted	Applicable	YES/NO
19	Whether Analysis of Unit rates submitted	Applicable	YES/NO

NOTE : STRIKE OFF 'YES' OR 'NO', AS APPLICABLE

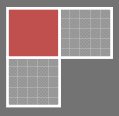
DATE :

AUTHORISED SIGNATORY
(With Name, Designation and Company seal)

769

TECHNICAL CONDITIONS OF CONTRACT (TCC)

BHARAT HEAVY ELECTRICALS LIMITED



Sl No	DESCRIPTION	Chapter	No. OF PAGES
Volume-IA	**Part-I: Contract specific details**		
1	Project Information	Chapter-I	01
2	Scope of Works	Chapter-II	02
3	Facilities in the scope of Contractor/BHEL (Scope Matrix)	Chapter-III	09
4	T&Ps and MMEs to be deployed by Contractor	Chapter-IV	03
5	T&Ps and MMEs to be deployed by BHEL on sharing basis	Chapter-V	01
6	Time Schedule	Chapter-VI	02
7	Terms of Payment	Chapter-VII	02
8	Taxes and other Duties	Chapter-VIII	02
9	Standards Applicable for 33/11/0.433KV construction Power	Chapter-IX	04
10	Annexures	Chapter-X	
A	Drawings		04
B	BOQ		03
Volume-IA	**Part-II : Technical Specifications**		
1	General	Chapter-I	01
2	Detailed Technical Requirements	Chapter-II	13

	Project Information
1.1	**LOCATION AND APPROACH:** 1) Project: Thermal Power Station extention Units # 10 & 11 (250 MW each). 2) Project Location: Satpura, Dist: Betul, Madhya Pradesh, India. 3) Transport facilities: A) Nearest Railway Station: Ghodadongri on Nagpur Itarsi route. Ghodadongri is 71 Kms from Itarsi on the Itarsi – Betul State Highway. B) Road: Sarni/Satpura TPS is connected to Ghodadongri by 20 Km long all-weather district road. C) Nearest Airport: Nagpur / 200 Kms, Bhopal / 200 Kms.
1.2	**CLIMATIC CONDITIONS:** 1) Maximum ambient Temperature: 50^{o} Centigrade 2) Minimum ambient Temperature: 6.5^{o} Centigrade 3) Seismic Zone : Part 3, Zone-III as per IS:1893/84 4) Relative Humidity: 60 % 5) Wind Speed: 10 kmph as per IS 875/87.
1.3	**GEOGRAPHICAL CONDITION:** 1) Plant Elevation above MSL: 439 m

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 BOOT basis (Build, Own, Operate and Transfer). The scope of work includes Engineering, Procurement, Installation, Erection, Commissioning, and Operation & Maintenance. The brief scope of work shall be defined as under.

2.2 SCOPE OF WORK UNDER "BOOT"

2.2.1 MPMKVVCL (Madhya Pradesh Madhya Kshetra Vidyut Vitran Company Limited) shall provide Construction Power Supply at 33 KV voltage from their existing 33 KV line . MPMKVVCL shall provide one spare feeder suitable for 33/11KV, 2000 KVA transformer and it will have protection relay for power transformer and associated control circuit.

Bidder shall ensure suitability of protections available in the 33KV and 11 KV feeder and any further hock up required for Buchholtz relay, OTI / WTI protection bidder shall make necessary cabling arrangement between 2000 KVA transformer and 33 KV line. Bidder shall carry out testing and commissioning of 33 KV Breaker including protection relays & metering circuit of client.

2.2.2 The scope of work covered under this tender specification to carry out detail engineering, procurement of equipment, installation, commissioning, operation and maintenance of construction power distribution net work on BOOT basis. (Built, Own, Operate & Transfer).

The scope work includes engineering, procurement, supply of Materials & Equipments, installation/erection, Civil Construction of foundation for transformers (33/11KV- 1 No & 11/0.433KV-4 Nos including 2 nos supplied by BHEL) and ACDB, Control Room and all other associated civil works, commissioning, operation, maintenance etc. Shall be as per terminal point as given in the enclosed single line diagram (refer Sketch No BHE/PSWR/SAT/ELC.-3) and the arrangements/ systems provided shall be as per requirements of MPMKVVCL.

2.2.3 Contractor shall dismantle and Hand Over the equipments installed like Transformers ,Vaccum Breaker ,AC Distribution Panels etc (except consumables like cables ,33KV conductors ,Pole etc) at the end of contract period at his own cost. Bidder shall also dismantle the civil works done by him for the substations and leave the area level and absolutely clear of any kind of garbage/debris/scrap.

2.2.4 Bidder shall visit site and prepare lay out plan in consultation of BHEL/ MPMKVVCL.

2.2.5 Design/ detail engineering of equipment / devices which includes 33/11KV & 11 /0.433 KV step down power transformers /sizing of HT /LT cables, 415 volt AC Distribution boards, civil foundation for transformers / ACDB and other associated civil work .

2.2.6 It is proposed to install the required equipment in the area of extension project. Bidder shall prepare of lay out drawing of 33/11KV & 11 /0.433 KV transformers and associated equipment as per proposed by bidder to meet the requirement as specified.

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2.2.7 Bidder shall obtain approval from MPMKVVCL / Electrical Inspectorate ,MP Govt for technical data sheet of equipments such as transformer , AC DB and cables and lay out of the of power distribution network which includes 33/11KV & 11 /0.433 KV transformer and further LT distribution.

2.2.8 Providing materials, equipments, devices, protection & metering arrangements etc as per requirement.

2.2.9 Erection & Commissioning, Operation Maintenance of the entire system including providing necessary consumables & spare parts and associated works as per scope of work defined in the Sketch No BHE/PSWR/SAT/ELC.-3

2.2.10 All the Equipments / Items/ Materials provided shall be New & Fresh purchase from approved & the reputed Brand / Make & source.

2.2.11 Obtaining Approval of entire installation and clearance for operation of system from appropriate statutory authority.

2.2.12 At the end of the contract period including extended period if any, bidder shall dismantle the total installation, clear the premises of all debris, scrap etc.

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.
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	

Sl.No	Description PART I	Scope / to be taken care by		*Remarks*
		BHEL	**Bidder**	
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 3 Phase** of Voltage 415/440 V			

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	
3.2.2	**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	

Sl.No	Description PART I	Scope / to be taken care by		*Remarks*
		BHEL	**Bidder**	
c	Duties and deposits including statutory clearances if applicable		Yes	
3.3.0	**WATER SUPPLY**			
3.3.1	**For construction purposes: (to be specified whether chargeable or free)**			FREE
a	Making the water available at single point		Yes	. For construction purpose, water shall be arranged by the contractor from the reservoir which is approximately 1.5km away from site of works.
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	

Sl.No	Description PART I	Scope / to be taken care by		*Remarks*
		BHEL	**Bidder**	
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	
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**	

Sl.No	Description PART I	Scope / to be taken care by		*Remarks*
		BHEL	**Bidder**	
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		
b	Drawings for construction methods	Yes	Yes	In consultation with BHEL/MPMKVVCL
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

Sl.No	Description **PART II** **3.9.0 ERECTION FACILITIES**	Scope / to be taken care by		*Remarks*
		BHEL	**Bidder**	
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**
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	2 NOS.
02	PPM TESTER FOR TRANSFORMER OIL	1 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.
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.

SL. NO.	DESCRIPTION	QUANTITY
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.

Chapter-V : T & Ps and MMEs to be deployed by BHEL on sharing basis

No T&P shall be provided by BHEL

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 PERIOD**
01	Completion of Finalisation of Scheme, Engineering, Design and BOQ for entire 33/11KV ,2000KVA & 11/0.433KV,500KVA Construction Power arrangements / Equipments and preparation of installation Drawings with approval of authorities as per tender specifications etc.	Within Ten days of award of work by Fax L.O.I.
02	Arranging of all required materials including Transformer, Cables, ACDBs and associated items/materials including protections & metering materials	Within 2 months of award of work by Fax L.O.I.
03	Completion of Installation, Erection, Testing, Commissioning and putting / charging of system including arranging the Operation, Maintenance and Up keeping services of entire system	Within 3 months of award of work by Fax L.O.I.
04	Providing the services of Operation, Maintenance and upkeep of the entire construction power distribution system	24 Months from date of successful commissioning and charging of system
05	Withdrawal, dismantling and clearing of site for clear possession by Client	Within 30 days after clearance by BHEL for withdrawal & dismantling of system

6.1.2 In case of non-availability of the system in full or part for reasons attributable to the Contractor, the same shall be dealt as per conditions under Section-4.

6.1.3 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.

6.1.4 BHEL 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 the reasons for delay not in his control as required by BHEL.

6.2 **Contract Period, and Overrun compensation**

The total contract period shall be 28 months from date of Fax LOI.

No overrun charges are applicable for the scope of work covered under this contract.

6.3 EXTENSION OF HIRING PERIOD

BHEL may extend the hiring period for the services to be provided on BOOT basis as specified in this tender specifications depending upon the requirement reviewed from time to time. The extension of hiring period if applicable shall be in two tranches as given below:

- 1st Extension of six months at the end of contract period
- Subsequent (2nd) extension of six months after expiry of contract period + 1st extension.

Payments for the extended hiring periods shall be as defined in Chapter VII

6.7 PRICE VARIATION

The contract price shall remain firm throughout the contract period. For the 1st extension period of six months and the subsequent (i.e 2nd) extension period of six months, price variation as provided in section-12 shall become applicable.

PVC as provided in General Conditions of Contract is applicable.

6.8 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.

6.9 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.

7.1 SCHEDULE OF PAYMENTS

A. ACITIVITY BASED PAYMENT:

S no	ACTIVITY	% Progressive Payment
1	On Receipt of 2.00 MVA, 33/11 KV Transformer – 1 no, 33KV Air/Vaccum Circuit Breaker & associated accessories/ materials of substation.	4.00
2	On Completion of Installation & Commissioning of 2.0 MVA 33/11 KV and Vaccum Circuit Breaker Sub station	1.00
3	On receipt of 33 KV Over head Transmission Line material such as Poles, ACSR Conductor, Insulators etc.	1.00
4	Completion of Installation of 33 KV Over head Transmission Line	1.00
5	On Completion of Testing, Commissioning & Charging of 33 KV Line	1.50
6	Reconditioning of 11/0.433 KV transformers -2 nos	0.50
7	On receipt of 500 KVA, 11/0.433KV Transformer- 2nos ,ACDB- 4 nos & associated accessories/ material of sub stations	1.00
8	On Completion of testing, commissioning and putting the 500 KVA, 11/0.433 KV sub stations in service (Four Nos. bidder's scope-: Transformer - 2nos supplied by BHEL & 2 Nos by Contractor). BHEL supplied transformers shall be reconditioned and tested in authorised Labortary before charging	5.00
9	Monthly Hiring charges for the services to be provided for 2.0 MVA, 33/11 KV Transformer Sub Station & 11 KV Transmission line as per detail scope of work as specified in tender condition. Monthly Hiring charges shall be calculated = 85% of the accepted contract value divided by duration of 24 months.	85.00
	TOTAL	**100.00**

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

For the extended periods, BHEL shall pay monthly charges at the following rates:

1. For 1st Extension period of Six Months: 12% x Accepted monthly hire charges { 12% of 85% of Contract Value divided by 24} .
2. For 2nd Extension period of Six Months: 10% x Accepted monthly hire charges { 10% of 85% of Contract Value divided by 24}.
3. Price Variation Clause is applicable for both the above extended periods and shall be in the Same variation as the variation in Consumer price Index for Industrial Workers applicable for the respective month. The Base for the variation shall be the 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.

8.1.0 TAXES, DUTIES, LEVIES

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

Service Tax and Cess on Service Tax as applicable on output Services are excluded from contractor's scope; therefore contractor's price/rates shall be **exclusive** of Service Tax and Cess on Output Services. In case, it becomes mandatory for the contractor under provisions of relevant act/law to collect the Service Tax & Cess from BHEL and deposit the same with the concerned tax authorities, such applicable amount will be paid by BHEL.

Contractor shall submit to BHEL documentary evidence of Service Tax registration certificate specifying name of services covered under this contract. **Contractor has to mention in their RA Bill service tax registration number and remittance record of such tax immediately after depositing the tax with concerned authorities 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,**

I. **The name, address and the registration number of the contractor,**
II. **The name and address of the party receiving taxable service,**
III. **Description, classification and value of taxable service provided and,**
IV. **The service tax payable thereon.**

All the four conditions shall be fulfilled in the invoice before release of service tax payment.
Contractor shall obtain prior written consent from BHEL before billing the amount towards such taxes.

With introduction of Cenvat Credit Rules 2004, which came into force w.e.f. 10.09.2004, Excise Duty paid on Input Goods including Capital Goods and Service Tax paid on Input Services that are used for providing the output services can be taken credit of against the Service Tax payable on output services. However BHEL may opt for availing the abatement provision in which case cenvat credit may not be available on input duty.

8.1.3 VAT (Sales Tax /WCT)

As regards Value Added Tax (VAT) 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 **exclusive** of the same. Where such taxes are required to be paid by the contractor, this will be reimbursed on production of proof of payment made to the authorities by the Contractor. 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. The contractor has to take all necessary steps to **minimize tax on input goods** by purchasing the materials from any registered dealer of the concerned state only. In case contractor opts for composition, it will be with the prior express consent of BHEL. Deduction of tax at source shall be made as per the provisions of law unless otherwise found exempted. In case tax is deducted at source as per the provisions of law, this is to be construed as an advance tax paid by the contractor and no reimbursement thereof will be made unless specifically agreed to.

8.1.4 Modalities of Tax Incidence on BHEL

Wherever the relevant tax laws permit more than one option or methodology for discharging the liability of tax/levy/duty, BHEL will have the right to adopt the appropriate one considering the amount of tax liability on BHEL/Client as well as procedural simplicity with regard to assessment of the liability. The option chosen by BHEL shall be binding on the Contractor for discharging the obligation of BHEL in respect of the tax liability to the Contractor.

8.1.5 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.

8.1.6 Submission of Periodical Reports

Contractor shall submit periodical reports in respect of following aspects of operation:

1) Consumption of welding electrodes and gases
2) Consumption of construction power
3) Manpower reports
4) Daily and Monthly Progress reports
5) Field calibration reports

BHEL at site will inform formats for these reports.

8.1.7 It is the responsibility of the contractor to arrange gate pass for all his employees, T&P etc. Necessary coordination with customer officials is the responsibility of the contractor. Contractor to follow all the procedures laid down by the customer for making gate passes. Where permitted, by customer/ BHEL,

to work beyond normal working hours, the contractor shall arrange necessary work permit for working beyond normal working hours

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	Sectional Layout Plot Plan	BHE/PSWR/SAT/ELC-1
02	Scheme of available 33KV feeder source	BHE/PSWR/SAT/ELC-2
03	Proposed Single line diagram For 11/0.433KV Construction Power	BHE/PSWR/SAT/ELC-3

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.

Annexure - I

2/

Sr. No.	Item Description	Qty	Unit
26 B	SETC of 375 KVAR APFCR Panel	2	Nos.
27	SETC of 1.1KV AYFY / YWY Cable		
A	3.5C x 300 sq.mm AYFY Cable	UR	Mtr.
B	4C x 2.5 sq.mm YWY Cable	UR	Mtr.
C	3C x 2.5 sq.mm YWY Cable	UR	Mtr.
D	4C x 1.5 sq.mm YWY Cable	UR	Mtr.
E	3C x 1.5 sq.mm YWY Cable	UR	Mtr.
28	Cable End Termination		
A	3.5C x 300 sq.mm AYFY Cable	UR	Mtr.
B	4C x 2.5 sq.mm YWY Cable	UR	Mtr.
C	3C x 2.5 sq.mm YWY Cable	UR	Mtr.
D	4C x 1.5 sq.mm YWY Cable	UR	Mtr.
E	3C x 1.5 sq.mm YWY Cable	UR	Mtr.
29	Earthing Flats		
A	50 x 6 mm Copper Strip	UR	Mtr.
B	32 x 6 mm Copper Strip	UR	Mtr.
C	25 x 6 mm Copper Strip	UR	Mtr.
D	25 x 3 mm Copper Flat	UR	Mtr.
E	8 SWG Copper Wire	UR	Mtr.
30A	50 x 6 mm G.I. Flat	UR	Mtr.
30B	32 x 6 mm G.I. Strip	UR	Mtr.
30C	25 x 6 mm G.I. Strip	UR	Mtr.
30D	25 x 3 mm G.I. Strip	UR	Mtr.
30E	8 SWG G.I. Wire	UR	Mtr.
31	Excavation & Refilling of Cable Trench		
A	In Soft Soil	UR	Mtr.
B	In hard Soil	UR	Mtr.
C	In Hard Rock	UR	Mtr.
32 A	Supply of River Sand	UR	Mtr.
32 B	Supply of Bricks	UR	Mtr.
33	Safty Items		
A	3 Nos. Fire Bucket / Stand	UR	Nos.
B	Caution Boards 11KV /433V	UR	Nos.
C	33/11KV Rubbe mat - 12mm	UR	Mtr.
D	1.1KV Rubbe mat 6 mm	UR	Mtr.
E	33 KV Rubber Gloves	UR	Set.
F	11 KV Rubber Gloves	UR	Set.
G	First Aid Box	UR	Nos.
H	Shock Treatment Chart	UR	Nos.
I	4.5 Kg Fire Extigusher	UR	Nos.
34	Laisoning Work with Electrical Authorities	1	Lot

Annexure-I

3/

33 KV D.P/T.P. STRUCTURTE ON 13 Mtr RAILS/H-Beam

Sl. No.	Particulars	Unit	Qnty.
1	2	3	4
1	52Kg/Mt. Rail Pole, 13 m long	Nos.	4
2	D.C.cross- arm of 100 X 50 mm. channel 5' centre)	No.	2
3	33 KV Strain set with hard ware	Set	12
4	33 KV Pin Insulator with G.I.Pins	No	6
5	Horizontal and cross bracing 5' centre with set of four back clamps	Set	2
6	Stay set 20 mm. complete with back clamp, stay wire 7/4.0 m m. (10 kc.stay	Set	12
7	Concreting(1:3:6) @ 0.5 cmt. per stay and @0.3 cmt. per stay	Cmt. (1:3:6)	6.8
8	Bird guard stool	No.	6
9	Earthing Set (Coil earth as per Drg. No. G/007).	No	2
10	Red oxide paint	Ltr.	1.18
11	Aluminium paint	Ltr.	1.85
12	Anti climbing devices	No.	4
13	Danger Boards	No.	2
14	M.S.Nuts and Bolts	Kg.	14

Annexure- I

1 Km of 33 KV line on 13 mtr H-Beam

Sl.No.	Particulars	Unit	Qty.
1	2	3	4
1	H-Beams 152 X 152 mm., 37.1 Kg./Mtr.13	Nos.	6
2	33 KV 'V' cross-arms with back clamps	Nos.	6
3	33 KV Top clamps	Nos.	6
4	Earthing Set (Coil earth as per Drg.No.G/D07)	Nos.	6
5	33 KV Pin Insulator with G.I.Pins	Nos.	18
6	Dog AAAC Conductor (100Sq.mm.Al.Eq.) with 3	Kms.	0·93
7	Painting Sleeves suitable for 100Sq.mm.Al. Eq.	Nos.	6
8	Stay set 20 mm. complete with back	Sets	3
9	Concreting(1:3:6) @ 0.8 cmt. per pole and @0.3 cmt. per stay	Cmt.	5.70
10	Red oxide paint	Ltrs.	1.065
11	Aluminium paint	Ltrs.	1.065
12	climbing devices	Nos.	6
13	Danger Boards	Nos.	6
14	Binding wire and tape	Kgs.	1.5
15	M.S. Nuts and Bolts	Kgs.	9
16	Carpet guarding with G.I. wire -- 2x6SWG + 1x8	Kms.	0·31

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.

2.0 TECHNICAL FEATURES OF THE CONSTRUCTION POWER DISTRIBUTION NETWORK

2.1 BHEL intends to avail of the services of complete power distribution network on Hire basis which includes comprising of 33 KV XLPE Cabling from main 33KV line to 33KV Vaccum Circuit Breaker & 33/11KV step-down transformer of rating 2000 KVA, 33/11KV.

2.2 From 11KV of step-down Transformer of 2000KVA, cabling connection shall be made to Breaker panel and from Breaker panel it will be connected to 11/0.433KV, 500KVA step down transformer and then to 415 Volt ACDB with metering & protection arrangements. The LT connection between the Construction Power Transformer, Incomer Feeders, and AC Distribution Boards shall be Cables / Bus-bars connections as per recommendations of BHEL/client/ consultant of client.

HT & LT Cabling work shall include the laying the under ground cable, routing of cable through as per actual site cable routing layout requirement. Vendor shall arrange all required arrangements / materials and works for under ground cabling, routing as scope of work for offering the systems on Hire basis.

2.3 Bidder shall provide complete 33/11 KV ,Dyn11, 2000 KVA, ONAN cooled step down transformer substation along with associated LT distribution boards with their respective civil foundations, Control Room, Metering & Protection equipments / systems, earthing and HT/LT power cabling with supporting arrangements etc. on monthly hire charges basis including operation and maintenance. All the equipments and components required for entire systems, installation, erection, commissioning and operation & maintenance shall be in bidder's scope.

2.4 Bidder shall source the required equipments and accessories of reputed make and the equipments/components shall conform to BIS specification. Bidder shall ensure technical requirement of 33/11KV, 2000KVA & 11/0.433KV power transformer 500KVA-2 nos 33KV Vaccum Circuit Breaker, 11KV Breaker panel for 11KV system,Capacitor Panel for Power Factor improvement and 415 Volt AC Distribution Boards as per detail given in the tender specification vide clause no. 2.7 Bidder shall also ensure trouble-free operation and specified availability of equipment/system for use at site, failing which LD/Penalty as stipulated elsewhere in this Tender Specification shall be levied.
2 nos of 11/0.433KV 500KVA transformer shall be supplied by BHEL and they will be reconditioned by the contractor.

2.5 The contract period, duration of Hiring period, price variation, extension of hiring period etc shall be as indicated in Chapter-VI. Terms of payment shall be as indicated in Chapter-VII.

2.6 The installation shall be conforming to the statutory requirement and as per as applicable Indian Standard Specifications. The services shall also include Operation & Maintenance of the equipments / arrangements provided by bidder with all consumables, spares and upkeep and break down maintenance of the Substations.

2.4 OTHER TECHNICAL REQUIREMENT FOR HIRING OF 33/11KV & 11/0.433KV- 2NOS TRANSFORMER SUB STATION, DISTRIBUTION BOARDS & ASSOCIATED EQUIPMENTS

2.4.1 All the Civil works including providing the required materials for civil works, as required for substations and associated equipments given on lease shall be arrangement/made by the contractor under this scope of work.

2.4.2 The substation area shall be fenced as per Indian electricity rules & regulation and shall have provision of lockable door. Fencing shall be of chain link wire mesh on mild steel angle iron posts to a height of not less than 2500 mm. The 33/11 KV & 11/0.433 sub-stations area shall be graded and sloped to prevent any water stagnation of rainwater. Surface shall be covered with ballast of 15 to 20 mm size.

2.4.3 Earthing of all the sub-station equipments shall be carried out as per is: 3043. Earthing system shall consist of number of earth electrodes of 40 mm dia. galvanised steel pipe, buried in earth pit.

2.4.4 Transformer sub-station shall have minimum two-earth electrodes/ pit for natural earthing, two electrodes for body earthing and two electrodes for lighting arrestor earthing.

2.4.5 All non-current carrying metal parts shall be connected to earth system at two points, each of 100 % rating. Metallic supports, fencing, etc. shall be connected to earth system.

2.4.6 Bidder shall submit the substation layout drg and install the substation in accordance with IE Rule and other statutory requirements. It is the responsibility of contractor to get the installation certified by appropriate statutory authority. All the expenses towards the statutory approval shall be borne by bidder.

2.4.7 Bidder shall have to visit site as pre requirements, discuss with client & client's consultant and BHEL site In-charge and finalise the scheme, arrangements & layout for Construction Power at site.

2.4.8 Bidder 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.

2.4.9 Bidder shall have to provide adequate fire protection arrangements such as Fire extinguishers & Sand Buckets as per relevant standard specification and Industrial/factory Safety rules & regulations and requirement of customer.

2.4.10 In case of non-availability of construction power equipment for use due to breakdown/failure attributable to the contractor, he shall restore it within the shortest possible time. BHEL will allow a maximum of 24 hours time 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.

2.4.11 In case the breakdown/non-availability duration extends beyond 24 hours in a calendar month, recoveries shall be made at the rate of 1½ times the pro-rata hourly rate. Pro-rata hourly rate will be calculated as under.

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

2.4.12 However recoveries shall not be made in case reason is not attributable to contractor for non availability of power in the event of power failure from source.

2.4.13 During the contract period including the extended period if any, the ownership of entire system shall lie with the bidder.(Except 2 Nos.of Transformer of BHEL)

2.4.14 Contractor shall dismantle and take back the equipment at the end of contract period at his own cost. Bidder shall also dismantle the civil works done by him for the substations and leave the area level and absolutely clear of any kind of garbage/debris/scrap.

2.4.15 Bidder shall arrange entry permits as per prevailing sale tax law in the state of Madhya Pradesh and tax liability shall be borne by the Bidder.

2.4.16 Bidder shall arrange at insurance cover at his own cost for his materials, substation installation, manpower deputed for operation & maintenance.

2.4.17 The monthly hiring charges shall be inclusive of the detail scope of work as above, entry tax, service tax and all other applicable taxes.

2.4.18 The contractor shall operate and maintain the substations round the clock 24 Hours in two/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 & Construction Supply. Electrician should have valid license for handling 33 KV & 11KV HT installation. In addition to shift operation, the contractor shall deploy a supervisor for over all co-ordination purpose.

2.4.19 2Nos.of Transformer of 11/0.433KV.500KVA shall be supplied BHEL .Bidder shall carry out Refurbishment & maintain till the completion of work.

2.4.20 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 on day to day basis.

2.4.21 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.

2.4.22 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.

2.4.23 Contractor shall intimate BHEL engineer immediately on notice any thing adverse and critical in the system, which requires immediate attention.

2.4.24 All work, including preventive and breakdown maintenance period, in the system shall be taken up only after obtaining necessary permit/ clearance from BHEL engineer.

2.4.25 Bidder shall procure and arrange the inspection themselves for other items from BIS approved source / make.

2.4.26 If Bidder is failed to provide the services as per tender specification, BHEL will take suitable action at contractor's risk and cost.

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

2.4.28 Erection of the total system shall be done in stages.4 nos.of 11/0.433KV Transformer & other accessories shall be erected & commissioned depending on the Electrical Supply connection approval from MPMKVVCL .Erection & commissioned shall be done for entire system with the temporary supply from site.The connection with MPMKVVCL shall be made after duly approval by statutory authorities.

2.4.29 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.

2.4.30 **TIME SCHEDULE**

Bidder shall plan his activities such that the installation & commissioning of 33/11KV 2000KVA & 11/0.433 KV,500KVA Transformer substation, and associated equipments shall be completed as per schedule given in Chapter-VI

2.4.31 **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.

2.5 TECHNICAL REQUIREMENT OF 33/11KV, 2000KVA & 11/0.433 KV ,500KVA-2 Nos DISTRIBUTION NET WORK & TRANSFORMER SUB-STATION

2.5.1 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.

23.5.2 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.

2.5.3 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.

2.5.4 Bidder shall design and carry out preparation of layout, sub-station drawing etc. taking into account the statutory requirements and clearances etc as per latest Indian Electricity Acts and Rules including amendments thereof.

2.5.5 All incidental civil works e.g. grouting of poles/stays/ posts, foundations, civil foundation work, Canopy/covering, including necessary earthwork like excavation and backfilling, provision of all requisite materials like cement, sand & grit, reinforcement steel, T&P, shuttering etc. are in scope of contractor.

2.5.6 Contractor shall obtain approval from appropriate statutory authority for the installations, at all stages including the renewal etc as per requirement. Contractor shall bear all the statutory fees/levies/ charges in connection with the approval of installations.

2.5.7 The work covered under this specification is of high voltage 33/11 KV & 11/0.433 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.

2.5.8 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 along with manpower. 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.

2.5.9 The work shall be executed under the usual conditions affecting major power plant construction and in conjunction with numerous other operations at site including the space constraints. 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.

2.5.10 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.

2.5.11 Contractor shall be holding valid (at least up to Due Date of Tender Submission) 'A' class license as electrical contractor, copy of which should be furnished along with the offer. If the license is of state other than Madhya Pradesh, then he will have to obtain electrical license/permission from appropriate authority as may be applicable after award of the work.

2.5.12 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.

2.5.13 Bidder 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.

2.5.14 In case of non-availability of any substation due to breakdown/failure attributable to the contractor, it shall be restored by him within the shortest possible time.

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

2.5.16 Bidder shall arrange entry permits as per prevailing sale tax law in the state of Madhya Pradesh and tax liability shall be borne by the Bidder.

2.5.17 Bidder shall arrange at insurance cover at own cost for his material, substation installation, manpower deputed for operation & maintenance including the third party liabilities.

2.5.18 The contractor shall operate and maintain the substations round the clock 24 hours in three-shift operation as per the instruction of BHEL Engineer In-charge. Contractor shall deploy one electricians and one helpers (total 6 nos) in each shift for uninterrupted operation. Electrician should have valid license for handling 33KV & 11KV HT installation. In addition to shift operation, the contractor shall deploy a supervisor- 1 no for over all co-ordination purpose.

2.5.19 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 on day to day basis.

2.5.20 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.

2.5.21 Contractor shall intimate BHEL engineer immediately on notice any thing adverse and critical in the system, which requires immediate attention.

2.5.22 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.

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

2.5.24 On completion of the works, the contractor shall clear away and remove from the site all his equipments, surplus materials, rubble/debris and temporary works of every kind and leave the whole of the site and works clean to the satisfaction of BHEL.

2.6 GENERAL GUIDE LINES FOR EXECUTION OF WORK

2.6.1 33 KV & 11KV HT & 415 VOLTS LT CABLING REQUIREMENT

The cable installation including necessary joints shall be carried out in accordance with the specification IS 1255-1967

Cable route shall be decided prior to cable laying work is under taken. While shortest possible route should be referred, cable runs shall generally follow fixed development such as road, foot paths etc; with proper off set so that future maintenance, identification etc. are rendered easy.

While selecting cable route, corrosive soils, surrounding sewage effluent etc. shall be avoided, where this not feasible, special precaution as decided by Engineer-In-Charge, particularly for HV cable, shall be taken.

Power and communication cable shall be as far as possible cross at right angles. Where power cables are laid in proximity to communication cables to horizontal and vertical clearance shall not normally less than 60 cm.

During the preliminary stages of cable laying, consideration should be given to proper location of the joint position so that when cable is laid the joints are made in most suitable places. As far as possible water logged location, carriageways, pavements, proximity to telephone cables, gas to water mains, inaccessible places, ducts, pipe racks etc, shall be avoided for joint position.

2.6.2 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.

2.6.3 **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.

2.6.4 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.

2.6.5 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.

2.6.6 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.

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

2.7.1 DISTRIBUTION TRANSFORMER

The distribution transformer shall be oil immersed, natural air cooled, 3 phases, 50 HZ, out door type, conforming to IS 2026. Rating 2000 KVA, 33/11 KV & 4 nos. of 11KV/415V.500KVA, Vector group, Dyn11, Neutral solidly earth. The transformer will have 2 neutrals (One for solid earthing and the other one for 415 V Distribution Board 3 phase, 4 wires.

The transformer shall be capable of being loaded in accordance with IS 6600 upto 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 HV / 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	2000 KVA, 3ph, 33/11KV, ONAN cooled
2.	Voltage Ratio	33/11KV
3.	Type	TWO winding (Electrolytic grade copper)
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 (KV) peak	As per IS 2026
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	HT & LT Termination	Suitable Cable Box to be provided on HT /LT side. Suitable size cable type XLEP may be selected as per to meet the load / system fault level.
17	Variations to be considered	Voltage-+/-10% Frequency-+/-5% Combined variations-10%
18	Short Circuit level to be considered	40KA for 3 seconds
19	Protections to be incorporated	1. Composite Numerical transformer protection relay including Over current, Earth fault and Under Voltage, Winding temperature, Oil temperature and Buch holtz protection.

2.7.2 **LT DISTRIBUTION OUTDOOR KIOSK (Suitable Covered shed is required)**

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 compartmentalised, 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 gasketed 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 out going 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 moulded 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, phosphating 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

DESCRIPTION	QUANTITY	TECHNICAL DETAILS
Incomer Make – L&T or GE Power or Controls & Switchgears or Siemens	1No.	1600 Amps, 415 volts, TPN, Air Circuit Breaker, AC 3 pole with over current release, 3 Nos built in CTs, Earth fault release
Outgoing MCCB	2 No.	400 Amps, TPN, Moulded Case Circuit Breakers. Built-in over-current & short-circuit protection

Make – L&T or GE Power or C&S or Siemens	3 Nos.	200 Amps, TPN, Moulded Case Circuit Breakers.
	2 No.	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

2.7.2.1 VACCUM AIR CIRCUIT BREAKER at 33 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	1600 Amps
Short Circuit Making Current	50 kA
Short time breaking capacity at rated voltage	20 kA
Short time with stand rating	20 kA 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.

2.7.3 33 kV GRADE HT XLPE SINGLE /MULTI CORE CABLE

33 KV (E) 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**)**

2.7.4 11 KV Breaker panel with one incoming and four outgoing panel shall be provided to take 11KV supply to 4 nos of 11/0.433KV, 500KVA transformers.

2.7.5 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**)**

2.7.6 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)

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

2.7.8 33/11KV and 11/0.433 KV transformers shall be of Voltamp or equivalent make ,LTPCC and Distribution panel shall be supplied by CPRI approved fabricator

2.7.9 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

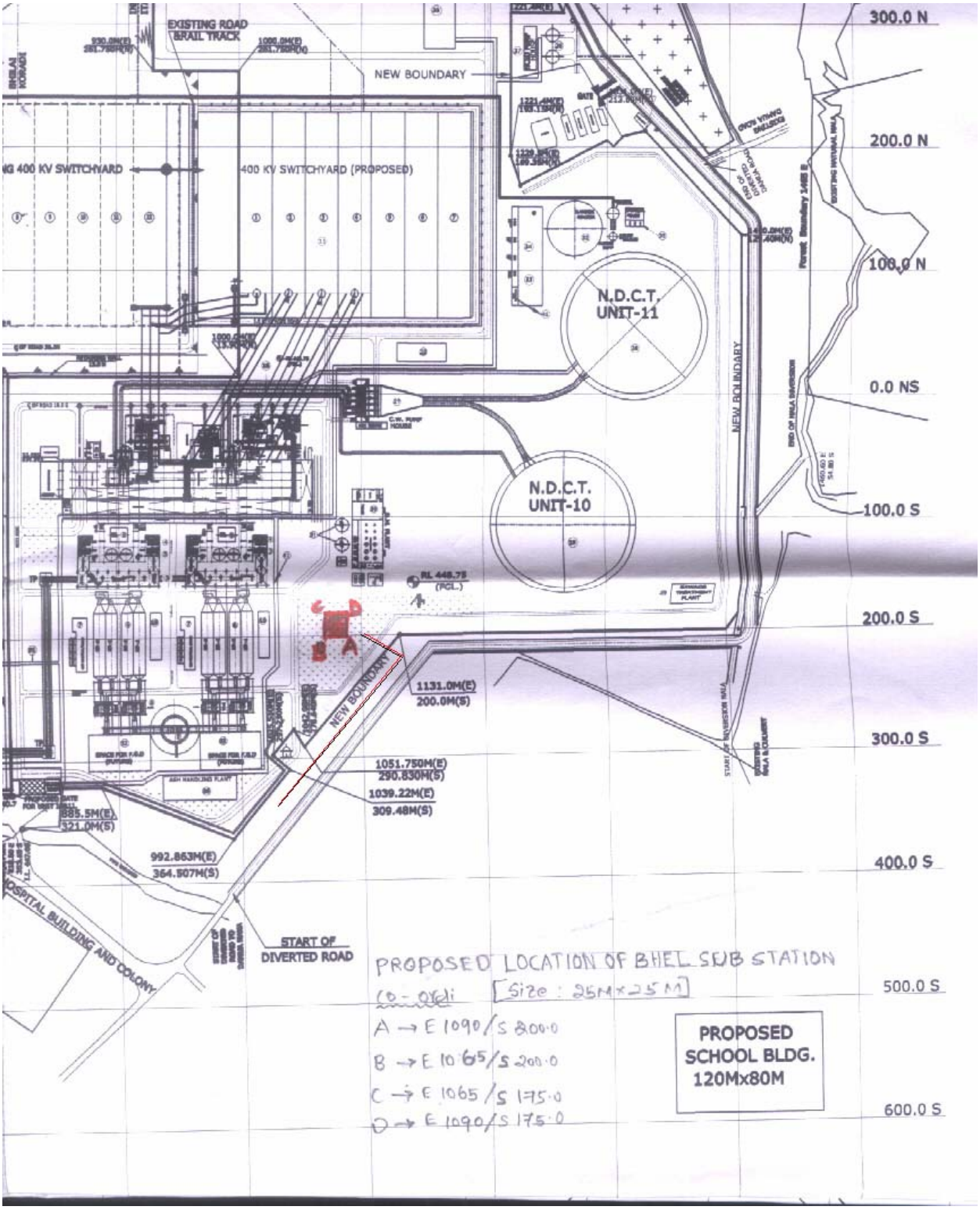
2.8

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.

2.9 **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.

SKETCH NO
:BHE/PSWR/SAT/ELC-1

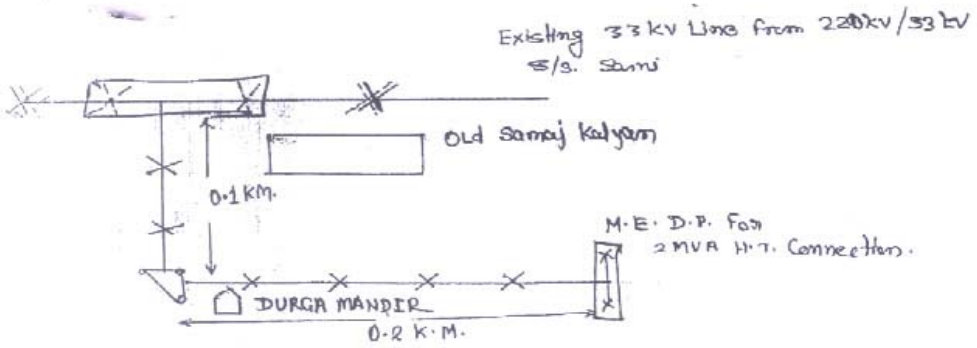


SECTIONAL LAYOUT PLOT PLAN FOR CONSTRUCTION POWER AT MPPGCL SATPUDA TPS EXTN 10 & 11

SKETCH NO :
BHE/PSWR/SAT/ELC-3

M.P.M.K. V.V. Co. Ltd. Sarni S/Dn.

MAP OF BHEL NEW H.T. Connection 2MVA at BTG area STPS Sarni



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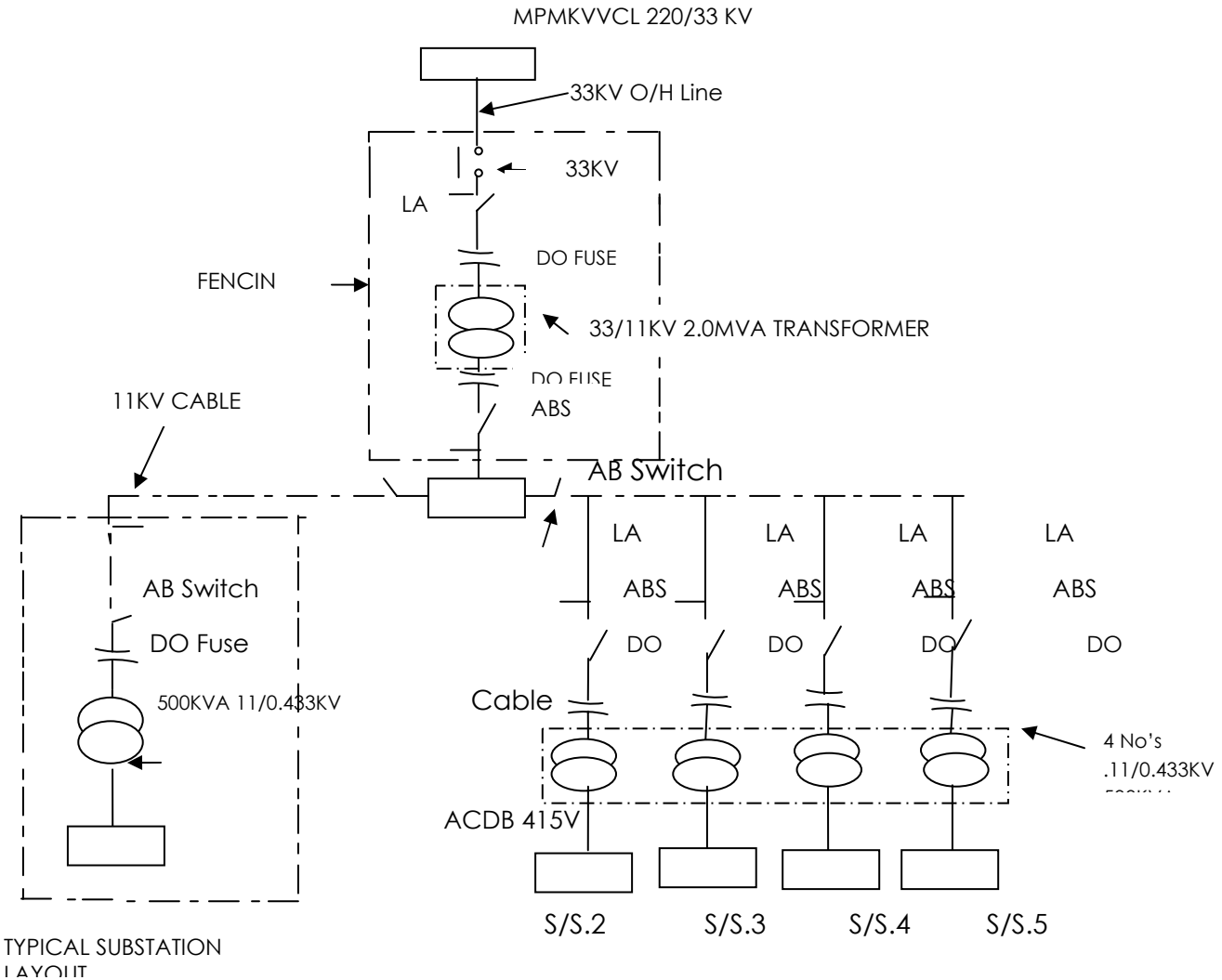
A.E.(C&M)
Sarni

Dy. General Manager
M.P.M.K. V.V. Co. Ltd. Betul (M.)

SCHEME OF AVAILABLE 33KV FEEDER SOURCE AT MPPGCL SATPUDA TPS EXTN 2X250MW

SKETCH NO. BHE/PSWR/SAT/ELC-3



PROPOSED SINGLE LINE DIAGRAM FOR 33/11 KV CONSTRUCTION POWER DISTRIBUTION SYSTEM & 11/0.433 KV SUBSTATIONS FOR 2X250 MW.