BHARAT HEAVY ELECTRICALS LIMITED
TRANSMISSION BUSINESS GROUP
SUBCONTRACTS MANAGEMENT
PLOT NO. 25, SECTOR 16A, NOIDA,
DISTT. – GAUTAM BUDDH NAGAR (U.P.) - 201301

TENDER DOCUMENTS

FOR

DETAILED ROUTE SURVEY & CHECK SURVEY AND GEOTECHNICAL INVESTIGATION ALONG WITH DESIGN AND ENGINEERING WORKS FOR 11KV RAHUGHAT DISTRIBUTION LINE AT 220KV AIS S/S RAHUGHAT HYDRO ELECTRIC PROJECT (2X220 MW) IN NEPAL.

CUSTOMER

Raghuganga Hydropower Limited, Nepal

TENDER SPEC. NO.: TBSM/RAHUGHAT/SURVEY/TENDER/23-24

DATE: 08.02.2024

TRANSMISSION BUSINESS GROUP

SUBCONTRACTS MANAGEMENT

INDEX

BHARAT HEAVY ELECTRICALS LIMITED

TRANSMISSION BUSINESS GROUP

SECTOR-16A, NOIDA -201301

e-mail: dipak.mandal@bhel.in;

NOTICE INVITING TENDER

REF.: TBSM/RAHUGHAT/SURVEY/TENDER/23-24 **DATE: 08.02.2024**

SUB: Tender for "Detailed Route Survey & Check Survey and Geotechnical Investigation along with design and Engineering works for 11kV Rahughat distribution line at 220kV AIS S/S Rahughat Hydro Electric Project (2X220 MW) in Nepal".

Dear Sirs,

1. **Sealed tenders are invited for the following:**

NAME OF WORK	TIME OF COMPLETION	EARNEST MONEY DEPOSIT	TENDER SUBMISSION DATE AND TIME	TENDER OPENING DATE & TIME
Detailed Route Survey & Check Survey and Geotechnical Investigation along with design and Engineering works for 11kV Rahughat distribution line at 220kV AIS S/S Rahughat Hydro Electric Project (2X220 MW) in Nepal	Two (02) Months from the date of LOI except check survey#	Nil	20.02.2024 14.30 hrs.	20.02.2024 15.30 hrs. (Technical bid only)

The check survey shall be done along with civil construction agency after finalizing coordination with of civil construction agency by BHEL and intimation by site in-charge. Check survey should be completed within one month.

2. Bidder has to submit offer directly through E-PROCURMENT MODE. Bidder may visit **https://eprocurebhel.co.in**

Procedure for Submission of Tenders through e-tendering: The tender is also floated online through our E-Procurement Site https://eprocurebhel.co.in . The bidder may respond by submitting their offer online in our e-Procurement platform at https://eprocurebhel.co.in

Offers are invited in two-parts only.

Documents Comprising the e-Tender

The tender shall be submitted online as mentioned below:

a) Technical Bid (Un priced Tender)

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

i) Technical Bid (without indicating any prices).

b) Price Bid:

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

c) Uploading of the price bid in prequalification bid or technical bid may RESULT IN REJECTION of the tender.

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

3. **Bidders may please note that no other mode of bid submission shall be considered for evaluation apart from Clause no. 02 mentioned above.**

4. The prospective bidders who have downloaded the tender documents from our website are requested to send their acknowledgement and willingness to participate in the tender to the undersigned, through email.

5. Offers should be strictly in accordance with the Tender Specifications and General Instructions to Tenderer enclosed herewith.

6. "BHEL shall be resorting to Reverse Auction (RA) (Guidelines as available on www.bhel.com) for this tender. RA shall be conducted among all the techno-commercially qualified bidders.

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

7. The contractor shall give his explicit confirmation without any deviations to the HSE (Health, Safety and Environment) requirements as per enclosed specification No. TBSM/HSE/NIT-01, Rev-01, Date 22.10.2021. Contactors are also required to furnish details as per Annexure (HSE) to NIT along with their offer. Offers received without compliance & data about HSE requirements are liable to be rejected.

8. All documents submitted with the offer shall be signed and stamped in each page by authorized representative of the bidder.

9. Clarifications, if any, can be obtained from the undersigned but such requests should be submitted well before the due date for submission of tenders. Due date for submission and opening of tenders will not be extended on such grounds.

10. Drawings & FQP enclosed with the NIT (if provided) are for tender purpose only. Drawings & FQP may get change during execution stage and work to be carried as per latest RFC drawings & Field Quality Plan (FQP).

11. Construction/ RFC drawing/ Fronts shall be furnished progressively as per project requirement and no claim towards idling charges/ project overheads etc. borne by the contractor on account of non-availability of drawings/ fronts shall be entertained.

12. **Completion period of the work has been envisaged under best possible conditions. Any changes/ deviation during execution shall be dealt as per relevant clauses mentioned in Terms & Conditions of contract.**

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

14. The Bidders are advised to visit Site to have better understanding of job.

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

12.1. Commitment by BHEL:

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

12.2. Commitment by Bidder/ Supplier/ Contractor:

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

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

12.2.3. The bidder/ supplier/ contractor will perform/ execute the contract as per the contract terms & conditions and will not default without any reasonable cause, which causes loss of business/ money/ reputation, to BHEL.
If any bidder/ supplier/ contractor during pre-tendering/ tendering/ post tendering/ award/ execution/ post-execution stage indulges in mal-practices, cheating, bribery, fraud or and other misconduct or formation of cartel so as to influence the bidding process or influence the price or acts or omits in any manner which tantamount to an offence punishable under any provision of the Indian Penal Code, 1860 or any other law in force in India, then, action may be taken against such bidder/ supplier/ contractor as per extant guidelines of the company available on www. bhel.com and/or under applicable legal provisions".

16. Also, offer of the bidders who are suspended (under hold/ delist) for business dealings by BHEL, TBG shall not be considered. Please note that lifting/ restoration of suspension (Ban/Hold/ De-list) of business dealing is not automatic after expiry of specified suspension period. Hence,

vendor shall be considered as suspended for business till suspension is lifted by BHEL in writing on specific request of the vendor as per extant guidelines.

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

18. Offers will be scrutinized based on the qualifying requirements and only those who are technically and financially capable to execute the Job and who fulfil the Pre-Qualifying Requirements (PQR) are eligible to quote against the above NIT. However, final acceptance of the bidder/ offer shall be subject to acceptance of our customer.

19. **The evaluation currency for this tender shall be NPR.**

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

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

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

21. Technical Bid will be opened in the office of undersigned. The price bids will be opened subsequently, after Technical Bids of all the bidders have been evaluated and freezed. Bidders should quote their most competitive rates as there will not be any price negotiation. However, if felt necessary by BHEL, price negotiation will be held with lowest bidder (L-1) only. **IT WOULD BE PREFERRED THAT YOUR OFFER IS WITHOUT ANY DEVIATION w.r.t. TENDER SPECIFICATIONS.** Offers with deviations are likely to be rejected.

22. In case any adverse information is received concerning performance, capability or conduct of the bidder after issue of tender enquiry, BHEL reserves the right to reject the offer at any stage as deemed fit.

23. Any materials (if required) for civil works have to be procured from Customer approved sources only. It will be the bidder's responsibility to get the approval of materials and vendors for materials.

24. The purchase preference for central P.S.U.s shall be given as per the prevailing Government policy.

25. In case an offer is not being submitted by the prospective bidders against this tender, they may send their "regret" letter to this office, for information.

26. Details of qualifying work(s) executed by the bidder will be forwarded to the principal employer for verification of the work with respect to completion, commencement & completion date and value of the work executed. Performance feedback of the bidder will also be sought from the principal employer.

27. The bidder representative may be called for discussion with the committee. His originals may be verified by the committee. In addition to above their organisation chart and detail list of manpower, tools & plants and technically capability will be discussed and ascertained by the committee.

28. **Conflict of Interest among bidders/Agents:** -

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

a) *they have controlling partner (s) in common;* ***or***
b) *they receive or have received any direct or indirect subsidy/ financial stake from any of them;* ***or***
c) *they have the same legal representative/agent for purposes of this bid;* ***or***
d) *they have relationship with each other, directly or through common third parties, that puts them in a position to have access to information about or influence on the bid of another Bidder;* ***or***
e) *Bidder participates in more than one bid in this bidding process. Participation by a Bidder in more than one Bid will result in the disqualification of all bids in which the parties are involved. However, this does not limit the inclusion of the components/ sub-assembly/ Assemblies from one bidding manufacturer in more than one bid;* ***or***
f) *In cases of agents quoting in offshore procurements, on behalf of their principal manufacturers, one agent cannot represent two manufacturers or quote on their behalf in a particular tender enquiry. One manufacturer can also authorise only one agent/dealer. There can be only one bid from the following:*
    1. *The principal manufacturer directly or through one Indian agent on his behalf; and*
    2. *Indian/foreign agent on behalf of only one principal;*

    or
g) *A Bidder or any of its affiliates participated as a consultant in the preparation of the design or technical specifications of the contract that is the subject of the Bid;* ***or***
h) *In case of it holding company having more than one independently manufacturing units, or more than one unit having common business ownership/management, only one unit should quote. Similar restrictions would apply to closely related sister companies. Bidders must proactively declare such sister/ common business/ management units in same/ similar line of business.* "

Thanking you,

Yours faithfully,
For and on behalf of BHEL,

(Dipak Kumar Mandal)
AGM /TBSM

TO BE FILLED BY TENDERER OVER THEIR LETTERHEAD

REF.: TBSM/RAHUGHAT/SURVEY/TENDER/23-24 **DATE: 08.02.2024**

SUB: TENDER FOR "Detailed Route Survey & Check Survey and Geotechnical Investigation along with design and Engineering works for 11kV Rahughat distribution line at 220kV AIS S/S Rahughat Hydro Electric Project (2X220 MW) in Nepal".

It is certified that General Instructions and Information for tenderer have been read/ complied/ agreed to and each page of tender offer has been initialled and stamped.

Also It is being declares that we (……Bidder Name ……..) will not enter into any illegal or undisclosed agreement or understanding, whether formal or informal with other Bidder(s). This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non-submission of bids or any other actions to restrict competiveness or to introduce cartelization in the bidding process.

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

(Signature of Tenderer)

Name and Designation of Authorised person (s)
Signing the tender on behalf of the tenderer

Authorization of representative who will participate in the Online Reverse Auction Process:

1	NAME & DESIGNATION OF OFFICIAL	
2	POSTAL ADDRESS (COMPLETE)	
3	TELEPHONE NOS. (LAND LINE & MOBILE BOTH)	
4	FAX NO.	
5	E-MAIL ADDRESS	
6	NAME OF PLACE / STATE / COUNTRY, WHEREFROM S/HE WILL PARTICIPATE IN THE REVERSE AUCTION	

BHARAT HEAVY ELECTRICALS LIMITED

TRANSMISSION BUSINESS GROUP, NOIDA

PRE-QUALIFYING REQUIREMENTS

Tender Ref. No.: TBSM/RAHUGHAT/SURVEY/TENDER/23-24 DATE: 08.02.2024

Subject: Pre-Qualifying Requirements

Sl. No.	Criteria	Description
a.	Turn Over	Vendors should have a minimum average annual turnover of NPR 21,79,200/- for last three fin. Years 2020-21, 2021-22 & 2022-23 and should submit audited balance sheet and Profit & Loss Account Sheet of these years. In case audited financial statements have not been submitted for all the three years as indicated above, then the applicable audited statements submitted by the bidders against the requisite three years, will be averaged for three years i.e. total divided by three. The audited financial statements must be signed by the owner and the auditor. Auditors seal, Name, Membership No., Firm Registration No. & firm name (if applicable), UDIN and the capacity in which he is signing (Proprietor/Partner), must be mentioned on the Profit & Loss A/c and Balance Sheet. If Financial Statements are not required to be audited statutorily, then instead of audited financial statements, financial statements are required to be certified by Chartered Accountant.
b.	Profit	Vendor should have earned profit in at least one year during last three financial years as mentioned in A above.
c.	Similar Work	Vendor should have successfully executed similar job (ref note below) during last seven years ending 31.12.2023 and should be either of the following: a. Three similar jobs executed costing not less than NPR. 29,05,600/- each. OR b. Two similar jobs executed costing not less than NPR. 36,32,000/- each. OR c. One similar job executed costing not less than NPR. 58,11,200/-. **Note:** Bidder should have successfully completed Survey, Design & Engineering Work for 11 kV or Higher Distribution/ Transmission Line.

Notes (General points):

1. The word 'executed' means the bidder should have achieved the criteria specified in the PQR even if the total contract has not been completed or closed.
2. The bidder shall submit the Contract Agreement/ Work Order/LOI/Any Proof of completion of work issued by Customer/Contractor in support of experience along with technical bid.
3. In order to technically qualify, bidder should meet all the criteria i.e. A, B & C mentioned above.
4. If the qualifying work is executed in the last seven years period, as specified above, even if it has been started earlier, the same will also be considered meeting the qualifying requirements.
5. Consortium/ JV bidding is not allowed
6. Bidder shall quote prices in NPR only for all the items of BOQ.
7. Any cost of exchange variation in currency will be borne by bidder.
8. BHEL reserves the right to:

    a) Accept or reject any bid received at its discretion without assigning any reasons whatsoever.

    b) Postpone the above-mentioned date, split and distribute the work among more than one bidder without assigning any reason whatsoever.

    c) May ask for further qualification during techno commercial scrutiny of bids received.

    d) May ask for further proofs including TDS certificates/ Final bill/Form 26AS/ payment detail for the said job for cross- verification.

9. BHEL shall not be liable for any expenses incurred by bidder in preparation of bid irrespective of whether it is accepted or not.

10. Quotations received from bidders who do not fulfil the PQR shall be summarily rejected without any further evaluation and information to bidders.

11. Canvassing i.e. soliciting favour, seeking advantage etc. in any form is strictly prohibited and any bidder found to have engaged in canvassing shall be liable to have his bid rejected summarily.

12. If the bidder deliberately gives any wrong information in his tender to create in circumstances for the acceptance to his bid, BHEL reserves the right to reject such application.

13. Bidder's selection is subject to approval of BHEL's customer for this work.

14. All corrigenda, addenda, amendments and clarifications to this Tender will be hosted in web page, www.bhel.com & https://eprocurebhel.co.in and not in the newspaper. Bidders shall keep themselves updated with all such amendments.

PROJECT INFORMATION

1.0 CUSTOMER:

Raghuganga Hydropower Limited, Nepal

2.0 PROJECT LOCATION AND DETAILS:

DETAILED ROUTE SURVEY & CHECK SURVEY AND GEOTECHNICAL INVESTIGATION ALONG WITH DESIGN AND ENGINEERING WORKS FOR 11KV RAHUGHAT DISTRIBUTION LINE AT 220KV AIS S/S RAHUGHAT HYDRO ELECTRIC PROJECT (2X220 MW) IN NEPAL.

3.0 CONTACT PERSON: FOR CONTRACTUAL ISSUES

DIPAK KUMAR MANDAL
AGM (TBSM)
SUBCONTRACTS MANAGEMENT,
TRANSMISSION BUSINESS GROUP,
Plot No. 25, Sector-16A, Noida,
Distt. Gautambudh Nagar, UP-201301

PHONE: 0120-674-8134/ 99111 63182
E-mail: dipak.mandal@bhel.in

CONTACT PERSON: FOR ENGINEERING ISSUES

Nishant Singh
Manager (TBEM)
TRANSMISSION BUSINESS GROUP,
Plot No. 25, Sector-16A, Noida,
Distt. Gautambudh Nagar, UP-201301

PHONE: 0120-674- 8515/ 9911164040
E-mail: nishant.singh@bhel.in

CONTACT PERSON: FOR CONTRACT EXECUTION ISSUES

Lakshman Sarkar
GM (TBES, TBWS & Overseas Projects)
BHARAT HEAVY ELECTRICALS LIMITED,
TRANSMISSION BUSINESS GROUP,
Plot no.: - 25A, Sector-16 A, Noida,
Distt. Gautam Buddh Nagar, UP-201301

PHONE: 0120-674-8620 / 96500 26888
E-mail: lakshman@bhel.in

HSE CONDITIONS

at a GLANCE (for bidders)

Health Safety and Environment Management

Transmission Business Group, Noida

DOCUMENT CONTROL			
Document number:	TBG/HSE/NIT-01		
Issue number:	00	Issue date:	08.01.2020
Revision number:	01	Revision date :	22.10.2021

	Prepared by	Checked by	Approved and Issued for use by
Name	Sanjeev Sharma	Arvind Kumar Pandey	Anindya Chakraborty
Designation	Addl. Engineer	Engineer	Adl. General Manager
Signature	-sd-	-sd-	-sd-
Date	22.10.2021	22.10.2021	22.10.2021

Doc. copy issue no. :	Doc. copy issue date :

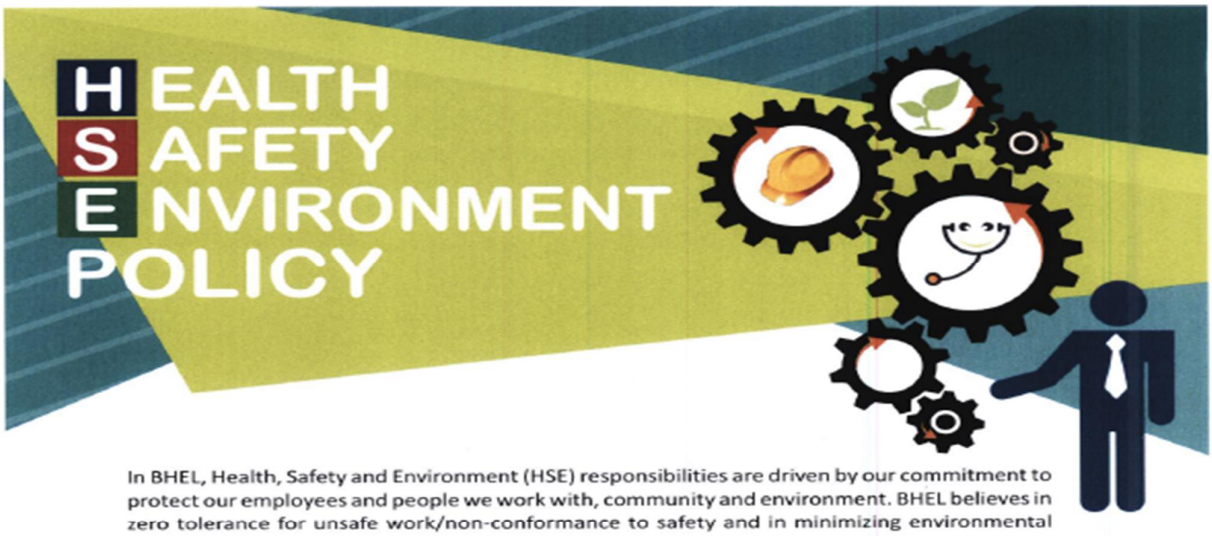
	Name	Designation	Signature
Issued to :			
Issued by :			

BHARAT HEAVY ELECTRICALS LIMITED

TRANSMISSION BUSINESS GROUP

BHEL TBG through its long experience and policy, has developed a culture to consider wellbeing of the society, protection of environment and occupational health and safety of its workers first. TBG has also a culture of transparency in all its business activities. In line to this culture, this NIT annexure is prepared as a peeping window in to the TBG HSE requirements which need to be 100% complied by the successful bidders while executing the contract. Interested bidders should go through these HSE conditions:

1. BHEL HSE Policy



In BHEL, Health, Safety and Environment (HSE) responsibilities are driven by our commitment to protect our employees and people we work with, community and environment. BHEL believes in zero tolerance for unsafe work/non-conformance to safety and in minimizing environmental footprint associated with all its business activities. We commit to continually improve our HSE performance by:

- Developing safety and sustainability culture through active leadership and by ensuring availability of required resources.
- Ensuring compliance with applicable legislation, regulations and BHEL systems.
- Taking up activities for conservation of resources and adopting sound waste management by following Reduce/Recycle/Reuse approach.
- Continually identifying, assessing and managing environmental impacts and Occupational Health & Safety risks of all activities, products and services adopting approach based on elimination/ substitution/reduction/control.
- Incorporating appropriate Occupational Health, Safety and Environment criteria into business decisions, design of products & systems and for selection of plants, technologies and services.
- Imparting appropriate structured training to all persons at workplace and promoting awareness amongst customers, contractors and suppliers on HSE issues.
- Reviewing periodically this policy and HSE Management Systems to ensure its relevance, appropriateness and effectiveness.
- Communicating this policy within BHEL and making it available to interested parties.

Atul Sobti
Chairman & Managing Director

June 5, 2018

Creating BHEL of tomorrow

2. Legal Compliances:

a. Statutory Provisions: All the sub-contractors are to comply with client specific rules and procedures, the National legislations and codes, in particular the following or their revised versions:

Srl. No	Acts/Rules Name	Srl. No	Acts/Rules Name
1	The Factories Act 1948, Amendment Act 1947	11	Contractor labour Act, 1970 (Regulation and abolition)
2	The Environment Act 1986	12	Provident fund Act, 1952
3	Workmen's Compensation Act, 1923	13	Payment of gratuity Act, 1972
4	Building and Other Construction Workers (Regulation of employment and condition of service) Act, 1996	14	Indian Explosives Act and the explosives Rules 2008
5	Buildings and Other Construction Workers Welfare Act, 1996	15	The Gas Cylinder Rules, 2016, Static and Mobile Pressure Vessels (Unfired) Rules 2016
6	Payment of wages Act, 2017 Equal remuneration Act,	16	The Indian Electricity Act 2003 and Indian Electricity Rules 2005
7	Minimum wages Act.1948	17	The Atomic Energy Act, 2015
8	Employers liability Act, 1938	18	The atomic energy (Radiation Protection) Rules. 2004
9	Industrial dispute Act, 1947	19	National Fire Protection Association (NFPA),
10	maternity benefit amendment act 2017	20	National Building Code of India 2016 etc.

b. Indian Standard (IS) Codes related to HSE

All the sub-contractors are to comply with client specific rules and procedures, the National legislations and codes in particular the following or their revised versions:

Srl	IS Code	Applies on
1	IS: 4081 -1986	Safety code for Blasting and Related Drilling operations
2	IS: 3764 -1992	Safety code for excavation work
3	IS: 5121 -1969	Safety code for pilling and other deep foundations

4	IS: 2750 -1964	Specification for steel scaffoldings
5	IS: 3696 (Part-I)-1987	Safety code for scaffolds and Ladders: Part- I Scaffolds
6	IS: 3696 (Part-II) -1991	Safety code for scaffolds and Ladders: Part –II Ladders
7	IS: 4082 -1977	Recommendations on stacking and storage of construction materials at site (First revision)
8	IS: 4130-1976	Safety code for demolition of building (First revision)
9	IS: 4912-1978	Safety requirements for floor and wall openings, railings and toe boards (First revision)
10	IS: 5916- 1970	Safety code for constructions involving use of hot bituminous materials
11	IS: 7205 -1974	Safety code for erection of structural steel work
12	IS: 7969 -1975	Safety code for handling and storage of building materials
13	IS: 8989 -1978	Safety code for erection of concrete framed structures
14	IS: 7293 -1974	Safety code for working with construction machinery
15	IS: 2212 -1991	Pipe lines –Identification –Colour code
16	IS: 5216 -1982	Recommendations on safety procedures &practices in Electrical works (Part -I &II)
17	IS: 875 -1964	Code of practice for structural safety of buildings and loading standards
18	IS: 10386 -1983	General aspects Part-1 -1983, Part-2 -1982, Part-6 -1983, Part-10 -1983- Amenities, Protective clothing and equipment, construction, storage, handling, detection and Safety measures for gases, chemicals and flammable liquids
19	IS: 10500-2012	Drinking water (Specification)
20	IS: 10291 -1982	Code of dress in civil engineering works
21	IS: 2925-1984	Safety helmets
22	IS: 1179-1967	Welding helmets
23	IS: 7524 -1979 (Part-I)	Safety goggles
24	IS: 9167 -1979	Ear muff /Ear plugs
25	IS: 6994 -1973 (Part-I)	Canvas hand gloves, Cotton hand gloves, Chrome leather gloves
26	IS: 4770 -1991	Rubber hand gloves tested for 15,000 volts
27	IS: 3521 -1999	Full body safety harness
28	IS: 11057 -1984	Specification for Industrial safety nets
29	IS: 13415 -1992	Protective Barriers in & around buildings (Code of safety)

30	IS: 13416 -1992	Preventive measures against Hazards at work places-Recommendations part-I Falling materials hazards Prevention part-I
31	IS: 13416 -1992	Preventive measures against Hazards at work places-Recommendations part-II Fall Prevention
32	IS: 15298 -2011 (Part 1&2)	Personal Protective Equipment -Safety shoes
33	IS: 12254 -1993	Poly vinyl chloride (PVC) industrial boots
34	IS: 5557:2004	Industrial and Protective Rubber knee and Ankle boots
35	IS: 2878 -2004	Co2 Type fire extinguisher
36	IS: 2171 -1999	Dry chemical powder fire extinguisher
37	IS: 13849 – 1993	Fire extinguisher for ABC fires
38	IS: 10204-2001	Mechanical Foam type extinguisher (Foam used shall conform to IS: 4989 -1974 and Co2 cartridge shall conform to IS: 4947 -1985)
39	IS: 3786 -1983	Methods for computation of Frequency rate and Severity rates for Industrial injuries and classification of Industrial accidents (First revision)

c. The Sub-contractors need to

- Attend HSE familiarization program at TBG-HQ with his site management team. This will be a half day long awareness session on HSE requirements and compliances which the agency is supposed to fulfil during contract execution at site. The session shall be taken by TBG HSE department on intimation by TBSM. **(Rev-01)**
- Request for issuance of Form-V in their name from customer on behalf of BHEL
- Get the Labour license registration from concerned Labour office.
- Get the BOCW Registration done along with the labour license.
- Get their labourers registered under BOCW for benefits provided by the office.
- Maintain Seven registers of labours as per BOCW requirement.
- Ensure payment of wages to labours not less than the current minimum wages applicable in the premises.
- Ensure PF deduction of labourers and submission of proof to BHEL office (Wage sheet, ECR & Challan copies) duly signed.
- Submit Labour Payment Certificate by 10th of Every month.
- File timely returns, get renewals done and submit a copy to BHEL office.

- Get Workmen's Compensation policy before the start of work, covering all the labourers and staff,
  - Policy should clearly mention the project name and location,
  - should be as per labour class and wage.
  - Should cover all the height workers with clear mention of Max. height.
  - Policy should be submitted to BHEL office and renewal before expiry.
- Issue employment card to every worker.

3. Labour Welfare and Medical Facilities

a. Labour Welfare

1. Declaration of normal working hours and weekly off day, Payment day & intervals
2. Paid rest days & holidays.
3. Payment of overtime @ twice the normal wage rate.
4. No labour shall be allowed overtime >12 hrs/week, limited to 48 hrs/month.
5. Rest and lunch area.
6. Separate Male/Female Toilets and Lavatories, clearly marked in local Language and provided with signage.
7. Cold and clean drinking water facility suitable to strength and near workplace
8. Creche for children of female workers as per BOCW requirements
9. Arranging labour accommodation in hygienic environment with the facilities of Water (Drinking, Sanitation), washing and bathing area, toilets in sufficient nos., clean and safe camps and surrounding, access road, well illuminated camp and roads, mode of contact, transport facility, first aid centre, 24x7 Security etc.
10. Cooking and eating place to be maintained in hygienic condition
11. General awareness of health and hygiene.

b. Medical facilities and Health centres

- Availability of first aid box at every work location and agency office, with contents as per BOCW requirement.
- Emergency vehicle (four wheeler) at work place
- Availability of stretchers in emergency vehicle and in office.
- Trained first aider
- Medical check-up for all the supervisors and workers including cooks, at the time of induction and annually thereafter.
- Tetanus Vaccination for all in every six months.
- Identification and tie-up with nearby reputed hospital(s) and display of their contact number in Emergency contact list.

4. House Keeping & Storage

Housekeeping is a continuous process and is the part of work. Agencies shall maintain safe and presentable housekeeping all the time in their respective areas, common work locations and passage areas. Roads, passages, staircases, entrance/exit gates shall always be maintained obstruction free. No material shall be left or stacked at the roof edges. Agency shall make arrangements to remove scraps on regular basis and dispose them at a space provided by customer, clearly fenced and marked by the sub-contractor as **"SCRAP YARD"**. Suitable arrangement like dedicated housekeeping team and tractor/hydra should be identified for this work.

Construction materials like shuttering materials, staging materials, cables, re-bars, cements bags, earthing flats and rods, FF pipes, surplus soil etc should be stored/stacked properly such that it should neither pose threat to safety of man nor should obstruct the free movement of man and machineries.

Every sub-contractor should have separate and well maintained storage area for his own materials, T&Ps, PPEs and BHEL issued materials. Consumables like diesel, cotton, grease, oil, paint, admixtures and other fire potential materials should be stored separately with suitable firefighting facility.

Fire capacity of store area to be assessed and accordingly fire extinguishers shall be planned suiting the class and capacity of fire. Sand heaps may also be stacked in open store yards suitably to use in case of fires.

5. Site Safety

a. Induction and others safety trainings

Every sub-contractor shall make arrangement to provide induction training as per BHEL and/or customer requirement on a pre-approved and fixed module to all its new inductees irrespective of class or grade of appointment/hire. He shall also arrange the required facilities for induction training such as board, marker, dummy, posters/banners with all the mandatory PPEs.
Sub-contractor shall also arrange for periodic trainings on fire-fighting, first aid, CPR, importance and use of PPEs, electrical safety, hot work safety, Height work safety, confined space, deep excavations and barricading, concreting work safety etc.

b. Appointment of Safety Officer/Supervisor

Every sub-contractor shall appoint at least one full time qualified safety officer having qualification and experience as specified in Schedule-VIII of BOCW Act-1996. He shall not be assigned any duty/work other than assisting in upliftment of safety practices. He shall perform his duties in accordance with the requirements of Schedule-VIII of BOCW-1996. He shall ensure daily TBT, induction training, health check-up and other such compliances as per HSEP-14 on regular basis. In case of non-appointment, agency shall be penalized as per provisions in clause no. 7.0 of HSEP-14 (HSE Plan for Site Operations (subcontractors)) **(Rev-01)**

c. Safety organisation, Safety committees and meetings

Safety officer shall report directly to the head of the projects of the sub-contractor management. There shall be some appointed or nominated safety stewards from each sub-group like shuttering, bar-bending, concreting, brick work, material handling, structure erection, cable laying, pipe work, maintenance, batching plant, housekeeping etc.

A safety committee shall be formed including members from different agencies, BHEL and customer covering at-least 50% participation from workers. Safety committee shall meet on weekly basis or as may be decided by customer, outcomes shall be complied as committed.

d. Personal Protective Equipments.

Unless mentioned otherwise, there will be three mandatory PPEs- Safety shoes, Safety Helmet and Reflective jackets conforming to relevant IS codes as mentioned above.
Every person entering in the project premises shall use above mandatory PPEs.
There will be other PPEs too based on the work requirement like:
Twin lanyard full body harness, fall arresters and life lines for height workers,
Face shield for welders and grinders, Induction helmets and Electrical resistant shoes with FRP/PVC toe for electricians and commissioning engineers, Gum boots for concrete workers and manual excavators, Goggle for gas cutters and grinders, Aprons for welders, shoulder pads for material handlers, Hand gloves – Leather for binders/welders/grinders, certified Rubber gloves

for electricians, PVC for concrete/cement handlers, cotton-housekeeping team/brick coolies/erectors, cable laying men and other material handlers. Dust mask for cement handlers.

e. Material Handling

BHEL as a policy discourages continuous manual handling. Material handling contributes a major portion in the project and hence proper means (mechanical/ electrical powered) should be deployed appropriately for this work. Cranes/Faranas/hydras should not be used for material transportation for long distances(>100m), if such movement is un-avoidable, it must be accompanied by a trained signal man. Long materials should be guided by tagline. Roads for material movement should be free from obstructions. Lifting appliances must be in good condition and must have test/inspection certificates.
Lifting tackles like- D-shackles, chains, ropes, slings, belts shall be periodically inspected and shall have valid test certificate and/or third party inspection certificates.
Painted/galvanized structures/materials to be lifted by adequate capacity nylon belts only.
If a machine undergoes a major maintenance, fresh TPI shall be required before use. Hydraulic/pneumatic machines shall be free from leakages. Daily checklist to be filled and witnessed by the concerned supervisor before start of the work.

f. Vehicle/Machinery Documents and other safety requirements

- Crawler mounted boom cranes/Tyre mounted telescopic cranes/tower cranes
  1. Valid third party inspection certificate.
  2. Valid Insurance policy
  3. Registration Certificate (if applicable)
  4. Valid Pollution under control (PUC) (if applicable)
  5. Fitness certificate from RTO (if applicable)
  6. Operator's valid license, experience and/or competence certificate.
  7. Swing horn
  8. Reverse horn
  9. Boom aviation light
  10. Approved Load chart (inside cabin)
  11. Fire extinguisher (inside cabin)
  12. First aid kit (inside cabin)
  13. Boom angle indicator
  14. Hook Latch
  15. Reflector strips on around cabin and on boom

- Loader backhoe (JCB), crawler excavators (Poclain), Hydra,
  1. Valid third party inspection certificate.
  2. Valid Insurance policy
  3. Registration Certificate (if applicable)
  4. Valid Pollution under control (PUC) (if applicable)

5. Fitness certificate from RTO (if applicable)
6. Operator's valid commercial license, experience and/or competence certificate.
7. Reverse horn
8. Approved Load chart (inside cabin) (Hydra)
9. Fire extinguisher (inside cabin)
10. First aid kit (inside cabin)
11. Hook Latch (Hydra)
12. Reflector strips on around cabin and on boom

- Tipper, Transit mixtures (TM), Self-loading concrete mixture (Ajax Fiori), Tractors
    1. Valid third party inspection certificate.
    2. Valid Insurance policy
    3. Registration Certificate
    4. Valid Pollution under control (PUC)
    5. Fitness certificate from RTO
    6. Operator's valid commercial Heavy license, experience and/or competence certificate.
    7. Reverse horn
    8. Fire extinguisher (inside cabin)
    9. First aid kit (inside cabin)
    10. Reflector strips on around cabin and on body

Note: 1. Tractors may be allowed with Light Commercial/non-commercial license on customer's consent.

- Cars, Taxis, scooters, motor cycles and other public carriers
    - Valid 2/4 wheeler license (as applicable- commercial/non-commercial)
    - Registration Challan
    - Valid Insurance
    - Pollution under control

g. Man-lifts (Cherry pickers), Scissors Lifts

1. Trained operator with experience/competence certificate and license
2. Valid third party inspection certificate.
3. Valid Insurance policy
4. Registration Certificate (if applicable)
5. Valid Pollution under control (PUC) (if applicable)
6. Swing horn
7. Reverse horn
8. Boom aviation light
9. Fire extinguisher (inside cabin)
10. First aid kit (inside cabin)
11. Reflector strips on around cabin and on boom

Note:

1. No one shall ride man-lift bucket without safety belt, safety shoes, helmet and reflective jacket.
2. Not more than 3 persons at a time will board in bucket of man-lift (without any heavy materials) including operator.
3. Operator will not leave the machine while persons are elevated and working.
4. No one other than the authorised operator will operate the man lifts/Scissors lifts.

h. Excavation

Prior permission/clearance from customer is a must for excavations in areas where underground service services such as gas/water/oil/chemical/electrical lines may be routed. Due precautions shall be taken during excavation in such area. Excavations near water bodies (ponds/canals etc.) shall be done with sand/soil bags ready to plug water from accidental damaged/burst of edges. All the excavations shall be done by either step cutting (min. 600mm step at every 1.5m depth) or slope cutting at 1:2(X:Y axis) (or greater depending upon the soil condition). Where step cutting/slope cutting is not possible due to space constraints, shoring/shuttering or sheet piling to be used to check collapse of soil.

Excavated soil shall be stacked away from edge of the pit, at-least 1.5 meters or half of the depth whichever is higher. Height of the stack shall not exceed 2m in height.

Ramps shall be provided for access of the workers in large pits and ladder of metal/good built for small pits. Ladders shall be of sufficient length protruding at least 1m above the ground level.

Pumps of adequate capacity shall be available for pumping out of water. No lone worker shall be allowed to work in any excavation. Overloaded vehicle shall not be allowed near excavated pits.

i. Bar bending and Binding

Bar bending machine shall be installed under shed/roof. It shall be properly earthed and maintained for operation. Housekeeping of the area shall be team's responsibility on daily basis. All be bar benders shall be given hand gloves (leather/cotton) in addition to mandatory PPEs. Scrap shall be segregated and moved to scrap yard on regular basis. Bar bending station shall be located away from Main plying roads/passages. The station shall be well illuminated, shall have a maintained first aid kit and potable water. Station shall be located in such a way that the movement of the material be minimised.

j. Concreting

No electric vibrators shall be allowed to use. All the concrete workers shall be issued gum boots, safety helmets, reflective jackets and PVC hand gloves. Free fall of concrete from chute shall not exceed 1m in height. Heavy machineries/ vehicles shall be kept at least 2m away from the edge. Emergency vehicle shall be available near concreting work. Late night works shall be avoided, if it is unavoidable, a prior permission from BHEL/Customer is mandatory.

k. Welding, Gas Cutting & other hot works

Welding: Only experienced welders should be deployed for welding jobs. Welders shall be provided with apron, hand gloves, arm pads, leg pads, face shield and safety shoes. Welding leads shall be joint less and insulated. Power input point shall be fully covered at machine.

Gas cutting: If LPG is being used, domestic cylinder is strictly prohibited inside the project premises, (not allowed for site kitchen too). Hose pipes shall be in good condition without cracks, cuts, punctures or joints. Ends should be clamped with worm clamps. Dial gauges shall be of good quality and duly calibrated. Flash back arresters is a must for both oxygen/acetylene or LPG/Oxygen combination. Cylinders shall be stored, transported and used in vertical position only. When not in use, they shall be capped. Empty and filled cylinders to be stored separately with distinct marking.
Cylinders shall neither be rolled on the ground nor thrown during loading/unloading.

Grinding: Grinder shall be given clear glass face shield, apron, safety shoes, ear muffs and hand gloves. Grinder machines shall have wheel guard. Plug tops to be used for power connection preferably three wire type. Only trained persons shall be allowed to use grinders, abrasive cutters. Electrical connection shall be free from cuts, joints etc.

l. Erection & Height Work

Only trained filters and experienced helpers shall be engaged in erection work. Step bolts of lattice towers shall be checked for full tightness with spring washers before use. Height pass shall be issued to the identified group of erectors who have passed medical test and have working experience at height. Name of such workers shall be displayed at appropriate place. These workers only shall be allowed to work at height. Height work shall not be permitted in high wind/bad weather condition, during raining or in night/dark.

m. Electrical Safety

BHEL usually provided single point power source and sub-contractors draw power from there. Otherwise agencies make their own arrangement for construction power like DG sets etc. Sub-contractors shall submit their load requirement (amperage & phase) to BHEL before start of work. Accordingly, they shall make arrangements to draw power and distribution arrangements too in a safe way. MCCBs and HRC fuses to be put in circuit for short circuit and overload protections and RCCBs of 30mA sensitivity to be put at each distribution panel for human safety. Earthing pits shall be installed at each distribution point and maintained below three Ohm resistivity which shall be inspected randomly. The distribution points shall be clean, free from vegetation and water logging, easily accessible and covered/protected from three sides and top for rain. Earthing of DBs shall be done by 25x3mm GI flats connected from proper earth pits. Insulation mat, PVC Sheet/Wooden plank to be placed before DBs as platform. DB Sheds shall be legibly marked with name of agency, contact no of electrician and SLD of that DB. Only industrial plugs and sockets shall be allowed. Three wire (Phase, neutral and earth) system shall be used for tools, lights and machineries and two wire power draw shall be strictly prohibited. PTW and LOTO system shall be maintained to work on LT system. Name and contact no of authorised electricians who will be responsible of electrical power facility maintenance shall be submitted to BHEL by Agencies. Unauthorised sharing of power from one agency to other is strictly prohibited. Electricians shall use standard PPEs and insulated tools only. Standard and tested/certified discharge rods to be used in the areas where there is a possibility

of residual current or induction charge. The induction rod to be connected to the earth first and removed in the last. Induction helmets only to be used in the charged area. Electricians to be provided with electrical resistant safety shoes having FRP/PVC toe.

n. Dust Gases and fumes

Sub-contractor shall make arrangements to avoid accumulation of dust fumes and gases. Cement handlers inside store or at batching plant and gravel spreader shall be given effective nose masks and jaggery (at least 200g per person per day). DG sets and other machineries like cranes excavators etc. shall have valid and effective PUC certificate and shall have maintained engine with silencer. No IC engine operated machine shall be used in confined and covered area like hall, sheds, store etc. where accumulation due to lack of ventilation can increase to harmful levels. Dedicated arrangements (tanker or tractor with sprinkler) shall be made by the sub-contractors (individual or jointly) to continuously subside the dusts arising out of the movement of the vehicles roads/passages. Welding activities near roof accumulates harmful gases. Welders in such positions shall be provided with effective masks conforming to IS standards.

o. Vehicular Traffic

Speed limits defined within the premises shall strictly be followed by the drivers/commuters of construction as well as other vehicles.
Every construction machinery, man-lift shall display the name, contact no and passport size photograph of the authorised operator (There can be one or more authorised operators).
No one other than operator and co-operator shall sit inside the cabin of any construction machine while it is working.
Construction machineries (tractor, trucks, tippers, JCBs, hydra, Fassi cranes etc. shall never be used as mode of public transport. Machineries like Ajax Fiori and hydra shall not be driven in back direction except for small distances. No overloaded vehicle shall be permitted entry in the project premises.
Over speeding shall be reported and driver/operator shall be barred from entry or shall be penalised.
Drunken drivers shall be barred from entry in the project.
Carrying harmful weapons like knives (>6”), guns etc. shall permanently disqualify the person from entry in project premises.

p. Barricading and floor openings

Every pit deeper than 4 feet (1.2m) shall be barricaded immediately after excavation and will remain barricaded till backfilling.

Pits/trenches drains near roads, passages whether temporary or permanent shall be hard barricaded and well illuminated. Roof edges and openings shall be strictly hard barricaded and illuminated. Height works like masonry works, structure erection, erection by cranes, Lattice tower/beam erection areas shall be barricaded to restrict entry. Areas under charging/commissioning shall be barricaded and caution boards shall be displayed on newly charged areas.

q. Scaffold & Ladder

No bamboo/wooden scaffold shall be allowed to be used. Only tubular steel scaffolds with couplers conforming to the relevant IS codes shall be allowed with base plates. Standard steel or wooden planks to be used as platforms and no packing materials shall be used. All the platforms shall be built with provisions of **top rail at 1m height, mid rail at 0.5m height and toe boards of min 6" height** at floor level. Minimum width of platform shall be 900mm and if wheel barrow is to be used then 1200mm. Means of access to be provided in the form of ladders, ramps or staircase. Multilevel work platforms or those platforms having passage underneath shall be provided with safety net, screen or canopy at each level for protection from falling objects. Platforms shall be free from concrete, debris or other materials. Platforms shall not extend out of the putlogs and shall be secured and fastened. Decking shall be made non-skidding.
Scaffolds under erection shall be tagged **"RED"**, under repair/maintenance/inspection shall be tagged **"YELLOW"** and ready for use shall be tagged **"GREEN"**

Only metal ladders in the construction site and FRP ladders in charged areas shall be allowed. Ladders made from packing materials shall not be used. Ladders shall be securely fixed at bottom, top and long ladders at middle points too at an interval not more than 2400mm and must have a landing at every 6m. Inclination angle should be approximately 1:4 (X:Y) or 75deg. Ladder must extend at least 1m above the platform/access area. Gap between two rungs shall not exceed 300mm. Portable ladder should not be more than 4m in length. Minimum width of the ladder shall not be less than 300mm.

Use of Mobile aluminium scaffold is preferably advisable for erection of transformers/reactors.

r. Illumination

The sub-contractor shall ensure that the areas such as work stations, buildings, batching plants, passages/roads, stores, rest areas, power sources, staircases etc. are illuminated sufficiently to make safe work conditions at site and shall not be less than the relevant IS standards. Excavations/ below ground level structures near passages/roads shall also be sufficiently illuminated.

s. Safety banners/posters, caution boards

Sub-contractors shall display boards and banners in sufficient quantity having safety signs, slogans, important messages, pictures, cautions at prominent locations to promote safety and spread awareness for important precautions such as "Deep Excavation Ahead", Speed Limit", "Charged Area", "Do not operate", "Hard hat area", "No smoking Zone" etc. Boards containing messages of Emergency contacts, First aid facility, rates of minimum wages, working hours, rest day etc. should be displayed at specific areas.

t. Waste management and disposal

Sub-contractor shall make suitable and effective arrangement to remove waste material from site on regular basis and store them in an identified and safe location. Disposal of wastes shall also be done as per manufacturer's instructions or as per the guidelines laid by legal authorities. Re-bars, Cement bags, packing material (wooden/metal/plastic/paper), paint, oil, grease, cables (armour, sheathing, insulation), civil debris, metal chips, GI sheet scraps, batteries etc. are the common waste materials. Sub-contractor

shall arrange disposal of the hazardous wastes/materials in conformance to the legal and contractual requirements only.

u. Inspection of PPEs, T&Ps, Machineries and lifting appliances

All the PPEs, T&P and lifting appliances purchased newly by sub-contractors shall have test certificates which shall be submitted to BHEL office periodically or on demand. There shall be at least monthly joint inspection schedule for inspection of healthiness of all the PPEs, T&Ps and lifting appliances. All the lifting appliances shall be tested and examined by a competent person before taking into use for the first time or after it has undergone any alterations or repairs liable to affect its strength or stability

and also once at least in every twelve months. To confirm quality of the PPEs as per the relevant IS codes, BHEL may ask sub-contractors to get any or all types of PPEs tested through NABL approved lab as per relevant IS codes. At any stage, the 100% cost of such tests shall be in the scope of respective sub-contractors.

v. Cable Laying

Sub-contractor shall ensure cable trenches free from water, mud, debris, snakes, Scorpios, lizards before start of the work in trenches. Cable drum rollers shall be used to pull cables out of drums to avoid twisting of cables. Hand gloves, Safety shoes/gum boots, reflective jackets, safety helmets shall be provided to the workers. Cable laying area shall be well illuminated.

w. Fire Protection

Every sub-contractor has to maintain their working area, store and office area free from bushes. Stacking of flammable materials like wood, paper, plastic, paint, oil, grease, fuel, cotton, gases etc. at isolated place disconnected from other storage and office areas. Adequate arrangements of firefighting means like suitable extinguishers, fire/water buckets, water tanks, sand dunes etc. shall be made by the agency depending upon the fire capacity assessed or as per MSDS. Fire drills and trainings on how to operate fire extinguishers and how to react in case of fire breakouts shall be the part of regular training program. Guards and store persons must be a regular participant of such training programs. A list of trained firefighting persons and periodicity of such training programs shall be submitted to BHEL by every agency and same to be adhered. Sufficient number of fire extinguishers with suitable class shall be placed at such locations where there can be fire hazard like stores, pantry, office, DG set, electrical distribution panels etc.

x. Fencing of exposed rotating parts

Exposed rotating parts poses great threat to the person in vicinity. Such parts need to be fenced/covered. Guards are mandatory of grinders, abrasive cutters. Flywheels of the engines of heavy machines, Diesel engines, DG sets need to be covered. Electric winch machines, pulleys, chains, shafts, exhaust fans at reachable height, table fans, need to be caged/fenced. Such fencing/guard shall not be removed while machinery is in operation.

y. Emergency preparedness response plan and periodic mock drills.

Sub-contractor shall comply JSA (Job Safety Analysis) and arrange to mitigate the effects of identified possible hazards. He shall also define following in response to emergency preparedness:
An emergency assembly point and put a board of the same with information to all in induction training.
Have facility of ambulance or tie-up with nearest hospital for service in minimum possible time (Max-30min) if there is not ambulance inside the premises.
Ensure availability of emergency vehicle with driver all the time at site during work.
Conduct mock-drills on possible risks like electrocution, fall from height, fire, heat stroke etc., record responses and take photographs to submit in BHEL office. Stretchers availability in emergency vehicle or at work place should be well accessible. Provide fire extinguishers of right type at right place in right quantity with information to all. Display emergency contact nos. to various risk locations and at office, service building or at major work locations. Provide first aid training by doctors for and display names of such trained first aiders and fire fighters. Rescue kit with trained staff or man lift or both to rescue a man hanging by safety belt at height. Provide running water tap near chemical storage and handling points. Agencies shall follow emergency response plan prepared by BHEL in each area of work, store and office.

z. Safety reports & Reporting of accidents

BHEL will provide ''formats and checklists'' for the purpose of records/documents pertaining to the compliance of aforesaid clauses. Agencies shall be responsible for strict adherence and compliance for timely generation and fill-up of the checklists and reports. These shall be submitted on weekly and monthly basis as specified in the formats.

Agency shall also promote such an environment that the near misses, incidents and accidents are reported by every person, whosoever witnesses them. These shall help in analysing the trend and taking measures in reducing/stopping the accidents/incidents. Initial reporting can be in any form-by call, SMS, WhatsApp, e-mail, letter etc.
Major and fatal accidents or high potential incidents shall be investigated for route cause and outcomes shall be immediately implemented to check recurrences.

6. General conditions and penalty clauses

Following are the general conditions:

PPEs shall not only bear the ISI mark but also be conforming to the required standards, 100% compliance of the PPEs is mandatory.
Over speeding of vehicles shall attract penalty/notice and recurrence will attract debarring from entry into project premises.
Hiding of facts like incidents, accidents, fake/forged reports/certificates shall also attract penalty/ notice or both. Only approved third party agencies shall be allowed to inspect the machines, T&Ps. Reports shall directly be sent to BHEL/customers by the third parties.
Insurance and TPIs to be renewed before expiry. Machines, T&Ps shall not be allowed to work if renewal delayed. Continuity of WC policy to be maintained religiously by the respective agencies.

Agency shall submit the status report of his labour license, BOCW registration, WC Policy, insurance & TPI validity on monthly basis with list of machineries and T&Ps

Sub-contractors shall also maintain a buffer stock of all the PPEs in at least 20% excess to the present strength of the work force.

If construction power is not drawn as per the guidelines laid in clause no. 5(m), given above, BHEL may take-up this work at the risk and cost of the agency and/or may withhold a sum of min. Rs. 50,000/- (Rs. Fifty Thousand) or more as the site in-charge deems fit till the system is aligned as per aforesaid requirement.

Agencies shall be responsible for the compliance of the above requirements. Failure in one or more clauses/area shall attract a notice or monitory penalty or a combination of above.

Monitory penalty will be

- Rs. 1000/- per person/incident per day for non-conformity in above areas.
- A Major/severe accident shall attract a penalty of Rs. 2,00,000/- per head
- Fatality or permanent disability with total loss of earning capacity, if any, will attract a penalty of Rs. 5,00,000/- (Rs. Five Lakh).
- Further fatality/permanent disability shall attract double the last penalty imposed on the agency.
- Above penalties are exclusive of medical expenses of the victim or compensation to the family through insurance policy (WC Policy or group insurance).
- **Penalties imposed by customer shall be fully transferable to the sub-contractor. In the event of above cases, penalties shall be imposed whichever will be higher.**
- Evaluation of agency's performance on HSE compliance shall be done as per BHEL guide lines/system.

Revision History

Revision Date	Revision No.	Old Text	New Text	Reason	Revised by (with sign)
03.05.2019	00	N/A	Full Document	New Release	
12.10.2021	01	Nil	Attend HSE familiarization program at TBG-HQ with his site management team. This will be a half day long awareness session on HSE requirements and compliances which the agency is supposed to fulfil during contract execution at site. The session shall be taken by TBG HSE department on intimation by TBSM. (at page no. 5)	For better understanding of HSE requirements to agency. (HSE Review meeting dated 23.08.2021)	
12.10.2021	01	Edition	Inclusion of penalty provisions in case of non-deployment of safety person(page-8)	Introduction of HSEP-14	

-:End of Document:-

BHARAT HEAVY ELECTRICALS LIMITED
TRANSMISSION BUSINESS GROUP
(Subcontract Management)
PLOT NO.- 25, SECTOR-16A, NOIDA-201301

Tender Spec. no.: TBSM/RAHUGHAT/SURVEY/TENDER/23-24 Date: 08.02.2024

TERMS & CONDITIONS OF CONTRACT

The following terms and conditions shall form a part of the tender document.

1.0 GENERAL INSTRUCTION

1.1 **All pages of the tender documents shall be duly signed, stamped and submitted along with the offer in token of complete acceptance thereof.** The information furnished shall be complete by itself. The tenderer is required to furnish all the details and other documents as required in the following pages.

1.2. Tenderers are advised to study all the tender documents carefully. Any submission of tender by the tenderer shall be deemed to have been done after careful study and examination of the tender documents and with the full understanding of the implications thereof. Should the tenderers have any doubt about the meaning of any portion of the Tender Specification or find discrepancies or omissions in the drawings or the tender documents issued are incomplete or shall require clarification on any of the technical aspect, the scope of work etc., tenderer shall at once, contact the authority inviting the tender well in time (so as not to affect last date of submission) for clarification before the submission of the tender. Tenderer's request for clarifications shall be with reference to Sections and Clause numbers given in the tender documents. The specifications and terms and conditions shall be deemed to have been accepted by the tenderer in his offer. Non-compliance with any of the requirements and instructions of the tender enquiry may result in the rejection of the tender.

2.0 PROCEDURE FOR SUBMISSION OF SEALED TENDERS

2.1 Bidders may please refer Cl no. 02 to Cl no. 03 of the Notice inviting tender.

2.2 The tenders received after the specified time of their submission shall be treated as 'Late Tenders' and shall not be considered under any circumstances.

2.3 Tenders shall be opened by the officers concerned of BHEL at the time, date and venue as specified in the tender enquiry. Tenderer or their authorized representative may witness the bid opening.

2.4 The tenderer shall closely pursue all the clauses, specifications and drawings indicated in the Tender Documents before quoting. Should the tenderer have any doubt about the meaning of any portion of the Tender Specifications or find discrepancies/omission in the drawings or the tender documents issued are incomplete or shall require clarification on any of the technical aspect, scope of work etc. he shall at once contact the authority inviting the tender for clarification before the submission of the tender.

2.5 Before submission of offer, the tenderers are advised to inspect the work & the environments and be well acquainted with the actual working and other prevalent conditions, facilities available, sourcing of material and labour, means of transport and access to site, accommodation, etc. No claim will be entertained later on the grounds of lack of knowledge on any of these conditions/ resources.

2.6 Tenderer must fill up all the schedules and furnish all the required information as per the instructions given in various sections of the tender specification. Each and every page of the

Tender Specification must be SIGNED AND SUBMITTED ALONG WITH THE OFFER by the Tenderer in token of complete acceptance thereof the information furnished shall be complete by itself.

2.7 The tenderer shall quote the rates in English Language and international numerals. Total price offered should be entered in figures as well as in words. For the purpose of the tender, the metric system of units shall be used.

2.8 T**he tenderer shall quote a percentage above/ below/At Par the rates shown in the "Percentage BOQ/Price Schedule/Price bid" of subject tender.**

2.9 **The quoted percentage will apply to all the individual items of "Annexure-I i.e Bill of Quantity Cum Price Schedule" uniformly.**

2.10 All entries in the tender shall either be typed or be written legibly in ink. Erasing and overwriting are not permitted and may render such tender liable for rejection. All cancellations and insertions shall be duly attested by the tenderer.

2.11 The tenderer must provide the registered e-mail of their registered office along with the addresses and authorized phone/mobile nos.

3.0 ADJUSTMENT PRICE DISCREPANCY (IES): - Not Applicable being e procurement.

4.0 EVALUATION OF TECHNICAL BIDS

4.1 Technical Bids submitted by the tenderer will be opened first and evaluated for fulfilling the Pre-Qualification criteria and other conditions in NIT/Tender documents, based on documentary evidences submitted along with the offer.

4.2 In case the same qualifying experience is claimed by more than one bidder due to subletting of work by main contractor to subcontractor (s) then following conditions shall be applicable.

a) For labour + consumable contract without material and T&P:
Benefit of work experience shall be given to the subcontractor who has actually executed job and not to the contractor offloaded down the line.

b) For contract with complete scope i.e. with materials, T&P, labour and consumable:

i) Benefit of work experience shall be given to the subcontractor who has actually executed job and not to the contractor offloaded down the line.

ii) If the contractor offloads the labour and/or T&P portion only, Benefit of work experience shall be given to the main contractor and not to the subcontractor who has executed only as labour supply contractor

The bidders qualification shall be subject to submission of documentary proof. BHEL reserves the right to ask for further proofs including submission of TDS certificates/ for the said job.

4.3 In case the qualifying experience is claimed by private organizations based on Work Order and completion certificates from another private organization, BHEL reserves the right to ask for further proofs including submission of TDS certificates/ form 26AS /bills for the said job.

4.4 Credentials of all the bidders participating in open tender will be scrutinized thoroughly

by the nominated committee w.r.t. the pre-qualifying requirement for the tender.

4.5 Details of qualifying work(s) executed by the bidder will be forwarded to the principle employer for verification of the work with respect to completion, commencement & completion date, scope and value of the work executed. Performance feedback of the bidder will also be sought from the principle employer.

4.6 BHEL may conduct onsite verification of at least one of the qualifying work to verify completion of the work and evaluate capability and performance of the bidder.

4.7 The bidder representative may be called for the discussion with the committee. His originals may be verified by the committee. In addition to above their organization chart and detailed list of manpower, tools & plants and technical capability may be discussed and ascertained by the committee.

5.0 **EVALUATION OF PRICE BIDS**

5.1 Price Bids of unqualified bidders shall not be opened.

5.2 The offers will be evaluated on the basis of total price basis (refer "BILL OF QUANTITY AND PRICE SCHEDULE) as shown in the price bid.

5.3 Reasons for rejection of the bid shall be intimated in due course after issue of LOI/LOA to successful bidder and receipt of unconditional acceptance of LOI /LOA from the successful bidder

5.4 In case of electronic Reverse Auction, the unqualified bidders shall not be allowed to participate in reverse auction.

6.0 DOCUMENTS TO BE ENCLOSED:

Full information shall be given by the tenderer in respect of the following.

6.1 Tenders shall be signed by persons duly authorized/empowered to do so. An attested copy of the Power of Attorney to be submitted in all cases except where the sole proprietor is the signatory to the tender documents

6.2 *PERMANENT ACCOUNT NUMBER:*

Certified copies of Permanent Account Numbers as allotted by Income Tax Department for the Company / Firm / Individual Partners, etc. shall be furnished along with tender.

6.3 AUDITED *BALANCE SHEET AND INCOME TAX RETURN*:

Copy of Audited Balance sheets and income tax return for last Five financial years (financial years as specified in PQR)

6.4 *SOLVENCY CERTIFICATE:*

If asked in NIT, bidder should submit solvency certificate (not older than 12 months from date of tender notification) issued by any scheduled bank.

6.5 *DOCUMENT RELATED TO INCORPORATION OF BUSINESS ENTITY:*

6.5.1 *IN CASE OF INDIVIDUALTENDERER:*

His/her full name, address and place & nature of business.

6.5.2 *IN CASE OF PARTNERSHIP FIRMS:*

The names of all the partners with address. A copy of the partnership deed/instrument of partnership duly certified by the Notary shall be enclosed.

6.5.3 *IN CASE OF COMPANIES:*

Date & place of registration including date of commencement certificate in case of Public Companies and the nature of business carried on by the company. Certified copies of Memorandum and Articles of Association are also to be furnished.

6.6 Offer forwarding letter over the letterhead

6.7 *Declaration sheets (As per Prescribed format) over the letter head*

6.8 *No Deviation certificates (As per Prescribed format) over the letterhead*

6.9 GST Registration certificate

All the data required to be enclosed with the tender need to be furnished neatly typed, signed & stamped in the given formats only (in the form of separate sheets) failing which the tender may be considered as incomplete and is liable for rejection. Documentary proof wherever necessary also need to be enclosed.

7.0 REJECTION OF TENDER & OTHER CONDITIONS:

7.1 The decision of acceptance of tender will rest with BHEL which does not bind itself to accept the lowest tender or any tender and reserves to itself full rights for the following without assigning any reasons whatsoever:

(a) To reject any or all of the tenders.

(b) To split up the work amongst two or more Tenderer as per NIT

(c) To award the work in part as per NIT

(d) In either of the contingencies stated in (b) and (c) above to modify the time for completion suitably.

7.2 Conditional tenders, unsolicited tenders, containing abnormally low/ unworkable rates & amounts, tenders which are incomplete or not in the form specified or defective or have been materially altered or not in accordance with the tender conditions, specifications etc. are liable to be rejected.

7.3 Tenders are liable to be rejected in case of unsatisfactory performance of the tenderer with BHEL, or tenderer under suspension (hold / banning / delisted) by any unit / region / division of BHEL or tenderers who do not comply with the latest guidelines of Ministry / Commissions of Govt. of India. BHEL reserves the right to reject a bidder in case it is observed that they are overloaded and may not be in a position to execute this job as per the required schedule in line with 'NIT'. The decision of BHEL will be final in this regard.

7.4 In case of any adverse information is received concerning performance, capability or conduct of the tenderer after issue of tender enquiry or opening of tender or award of work, BHEL reserves the right to reject the offer at any stage as deemed fit.

7.5 Offers with inadequate Tools & Plants, Manpower Deployment Plan, and Method Statement are liable for rejection.

7.6 If a tenderer who is a proprietor expires after the submission of his tender or after the acceptance of his tender, BHEL may at its discretion, cancel such tender. If a partner of a firm expires after the submission of the tender or after the acceptance of the tender, BHEL may cancel such tender at its discretion unless the firm retains its character.

7.7 BHEL will not be bound by any Power of Attorney granted by the tenderer or by changes in the composition of the firm made subsequent to the execution of the contract. BHEL may, however, recognize such Power of Attorney and changes after obtaining proper legal advice, the cost of which will be chargeable to the contractor concerned.

7.8 If the tenderer deliberately gives wrong information in his tender, BHEL reserves the right to reject such tender at any stage or to cancel the contract, if awarded, and forfeit the Earnest Money/Security Deposit/any other moneys due.

7.9 Canvassing in any form in connection with the tender is strictly prohibited and the tenders submitted by the tenderer who resorts to canvassing are liable to be rejected.

7.10 In case the Proprietor, Partner or Director of the Company / Firm submitting the Tender, has any relative or relation employed in BHEL, the authority inviting tender shall be informed to the fact as per specified format along with the offer, failing this, BHEL may, at its sole discretion reject the tender or cancel the contract and forfeit the Earnest Money/ Security Deposit.

7.11 The successful tenderer should not sub-contract the part or complete work detailed in the tender specifications without written permission of BHEL's Site In charge/ Sector Head. For this the contractor shall submit request application to site in charge supported by credentials (financial and technical) and resource mobilization schedule of such sub-contractor. Such request is to be considered in consultation with end user/ultimate customer (if applicable) and subject to satisfactory credentials, fund flow arrangement between them, HSE and other contractual and statutory obligations. The tenderer is solely responsible to BHEL for the work awarded to him.

7.12 The Tender submitted by a tenderer shall become the property of BHEL who shall be under no obligation to return the same to the bidder. However unopened price bids and late tenders shall be returned to the bidders.

7.13 unsolicited discount received after the due date and time of Bid Submission shall not be considered for evaluation. However, if the party who has submitted the unsolicited discount/rebate becomes the L-I party, then the awarded price i.e contract value shall be worked out after considering the discount so offered.

7.14 BHEL shall not be liable for any expenses incurred by the bidder in the preparation of the tender irrespective of whether the tender is accepted or not.

8.0 NO DEVIATIONS ARE ACCEPTABLE: -

Offers with deviations are likely to be rejected. However, if the bidder insists on any technical or commercial deviations from the specifications and / or tender conditions, **the price implication, if any, of withdrawing the deviations must be submitted along with the price bid in a separate sealed envelope** super-scribed "**PRICE IMPLICATION FOR WITHDRAWAL OF DEVIATIONS**". No price implication for withdrawal of deviation shall be accepted at a later date, after opening of technical bid.

9.0 Consortium**/** JV bidding is not allowed under this NIT.

10.0 EARNEST MONEY DEPOSIT

Not applicable for this tender.

11.0 SECURITY DEPOSIT

Security Deposit means the security provided by the Contractor towards fulfilment of any obligations in terms of the provision of the contract.

Upon acceptance of Tender, the successful Tenderer should deposit the required amount of Security Deposit for satisfactory completion of work. **The total amount of Security Deposit will be 5% of the Contract Value.** EMD of the successful tenderer shall be converted and adjusted towards the required amount of Security Deposit.

11.1 **Mode of Security deposit:**

The security Deposit should be furnished before start of the work by the contractor.

"Bidders agrees to submit performance security required for execution of the contract within the time period mentioned. In case of delay in submission of Performance security, enhanced performance security which would include interest (Repo rate + 4%) for the delayed period, shall be submitted by the bidder.

Further, if performance security is not submitted till such time the first bill becomes due, the amount of performance security due shall be recovered as per terms defined in NIT / Contract, from the bills along with due interest".

The balance amount to make up the required Security Deposit of 5% of the contract Value may be furnished in any of the following forms:

i) Cash (as permissible under the extant Income Tax Act)

ii) Local cheques of scheduled banks (subject to realization) / Pay Order / Demand Draft / Electronic Fund Transfer, in favour of BHEL.

iii) Bank Guarantee from Scheduled Banks / Public Financial Institutions as defined in the Companies Act. The Bank Guarantee format for Security Deposit shall be in the prescribed formats enclosed with general conditions of contract.

iv) Fixed Deposit Receipt issued by Scheduled Banks / Public Financial Institutions as defined in the Companies Act. The FDR should be in the name of the contractor, A/C BHEL and duly discharged on the back.

v) Securities available from Indian Post Offices such as National Savings Certificates, Kisan Vikas Patras etc. (Certificates should be held in the name of Contractor furnishing the security and duly endorsed/hypothecated/pledged, as applicable, in favour of BHEL and duly discharged on the back).

vi) Insurance Surety Bonds

(NOTE: BHEL will not be liable or responsible in any manner for the collection of interest or renewal of the documents or in any other matter connected therewith)

11.2 Submission of Security Deposit:

i) At least 50 % of the required Security Deposit, shall be submitted before start of work. Balance of the Security Deposit can be submitted by way of deduction of 10% of the gross amount progressively from each running bills of the contractor till the total amount of the required Security Deposit is collected.

ii) In case of delay in submission of performance security, enhanced performance security which would include interest (Repo rate + 4%) for the delayed period, shall be submitted by the bidder.

iii) If the value of work done at any time exceeds the contract value, the amount of Security Deposit shall be correspondingly enhanced and the additional Security Deposit shall be immediately deposited by the Contractor or it shall be recovered from payment/s due to the Contractor.

iv) The recoveries made from running bills (cash deduction towards balance SD amount) can be released against submission of equivalent Bank Guarantee in acceptable form, but only once, before completion of work, at the discretion of BHEL.

11.3 The BG shall be submitted only through the Banker. Along with the BG, the Bank shall also furnish a letter of confirmation

11.4 The validity of the Bank Guarantee furnished towards Security Deposit shall be up to three months more than the period of completion of work as stipulated in the LOI and the same will be kept valid by proper renewal till the completion of the work.

11.5 BHEL reserves the right of forfeiture of Security Deposit in addition to other claims and penalties in the event of the contractor's failure to fulfil any of the contractual obligations or in the event of termination of contract as per terms and conditions of the contract. BHEL reserves the right to set off the Security Deposit, against any claims of any other contracts with BHEL.

11.6 Conditions for acceptance of bank guarantees

Contractors are advice to obtain Bank Guarantee preferably from any of the following BHEL consortium banks

Sl. No.	**Name of Bank**	Sl. No.	**Name of Bank**
1	State Bank of India	11	Punjab National Bank
2	Canara Bank	12	Union Bank of India
3	IDBI Bank Limited	13	Yes Bank Limited
4	ICICI Bank Limited	14	RBL Bank Ltd.
5	HDFC Bank Limited	15	Standard Chartered Bank
6	Axis Bank	16	Indian Overseas Bank
7	IndusInd Bank Limited	17	Kotak Mahindra Bank Limited
8	Bank of Baroda	18	Federal Bank Limited
9	Exim Bank	19	Hongkong and Shanghai Banking Corporation Ltd
10	Indian Bank		

Bank Guarantees from Banks outside BHEL's consortium shall be as below:

The Bank Guarantees of all Public sector banks can be accepted (in addition to consortium banks)

The Bank Guarantees of Co-operative banks shall not be accepted.

Bank Guarantees of other than consortium bank and public sector bank can be accepted subject to an overall exposure limit (at New Delhi) of Rs. 10 crores for banks with networth of more than Rs. 500 crores as on last balance sheet date and Rs 5 crores for banks with net worth between Rs. 350 to Rs 500 crores (A certificate and copy of latest Balance Sheet to be given by the Bank at the time of submission of Bank Guarantees).

In case of private sector banks a clause to be incorporated in the text of Bank Guarantee that it can be enforceable by being presented at any branch of the bank.

In case of foreign vendors the bank guarantees issued by foreign banks may be confirmed by our consortium bank in India.

In case of Bank Guarantees given by Non-Consortium banks (Private sector or Public sector), the Bank Guarantees are to be enforceable in New Delhi or the town/ city in which the sector office is located.

11.7 RETURN OF SECURITY DEPOSIT:

If the contractor duly performs and completes the work in all respects to the entire satisfaction of BHEL and presents an absolute "No demand certificate", returns properties belonging to BHEL, taken, borrowed or hired by him for carrying out the said works, and

furnishes performance bond BG in the prescribed proforma, Security Deposit will be released to the contractor after deducting all costs, expenses and other amounts that are to be paid to BHEL under this contract or other contracts entered into with the contractor.

It may be noted that in no case the Security Deposit shall be refunded/released prior to passing of final bill.

11.8 Bank Account Details for submission of EMD/ Security Deposit through electronic fund transfer mode.

NAME OF THE COMPANY	**BHARAT HEAVY ELECTRICALS LTD**
ADDRESS OF THE COMPANY	**TRANSMISSION BUSINESS GROUP, PLOT NO. -25, SECTOR-16A, NOIDA DISTT.- GAUTAMBUDH NAGAR – 201301 (U.P.)**
NAME OF BANK	**STATE BANK OF INDIA**
NAME OF BANK BRANCH	**CAG-II NEW DELHI (17313)**
CITY	**NEW DELHI**
ACCOUNT NUMBER	**00000030206227732**
ACCOUNT TYPE	**CASH CREDIT**
IFSC CODE	**SBIN0017313**

12.0 PAYMENT TERMS:

Sr. No.	Condition	Payment
1.	After conducting survey work, report preparation, Submission and approval of reports/design documents/ drawings. (i) Approved with comments (ii) Approved	 i) 80% ii) 10%
2.	After completion of activities under scope of works including check survey and BOM, approval of all Drawings/Document without comment, submission of all drawings/documents.	Balance 10%

13.0 QUANTITY AND PRICE VARIATION

The quantities indicated in "Bill of Quantity" attached with the tender are indicative only and individual quantity may vary up to any extent. However, agreed unit rates shall remain firm up to a variation of ± 30% of the total value of the rate contract irrespective of variations in the quantity of individual items.

14.0 TAXES & DUTIES: -

14.1 Price quoted should be inclusive of all applicable Taxes/charges but Excluding Value Added Tax (VAT) in Nepal. The Contractor shall be responsible to pay all other taxes, fees, royalty, commission etc. that may be levied on the contractor in executing the contract as per prevalent laws at Nepal and compliance to all local regulations. In case BHEL is forced to pay any of such taxes, it shall be recovered from Contactor's bills or otherwise as deemed fit.

14.2 Value Added Tax (VAT) in Nepal shall be payable extra as per followings: -

I) The Contractor is required to get registered with Tax Authorities of Nepal and shall submit to BHEL documentary evidence for such registration.

II) The Contractor has to submit VAT compliance invoice as per prevalent VAT laws in Nepal. Any denial of input credit to BHEL or arising of any tax liability on BHEL due to non-compliance of VAT Laws of Nepal by the contractor in any manner, will be recovered along with liability on account of interest and penalty (if any) from the payments due to the contractor.

III) The Contractor may be required to submit documentary evidence for deposit of VAT@13% with tax authorities as per prevalent laws in Nepal.

IV) The Contractor shall be solely responsible for discharging his VAT liability as per prevalent VAT laws in Nepal and BHEL will not entertain any claim of VAT/Interest/penalty or any other liability on account of failure of contractor in complying the provisions of VAT laws in Nepal or discharging the VAT liability in a manner laid down thereunder.

V) The Contractor shall obtain prior written consent of BHEL before billing the amount towards such taxes. Where prevalent VAT laws in Nepal permit more than one option or methodology for discharging the liability of tax/levy/duty; the contractor shall approach BHEL before choosing any option to discharge his tax liability. BHEL shall have the right to direct the contractor to adopt the appropriate option 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.

14.3 TDS / Withholding Tax or any other deduction as applicable as per prevalent Laws in Nepal shall be deducted. 1.5% Tax Deducted at Source (TDS) of the subcontractor's price will be deducted from the subcontractor's payments made by BHEL and the same will be deposited in his PAN name with the Tax Authorities in Nepal. The subcontractor can claim tax credit subsequently while filing his annual Income Tax return.

14.4 For plant and equipment manufactured inside Nepal, all taxes and duties as applicable for destination site/state on all items of supply from Contractor are included in the Contract price.

14.5 Octroi /Custom (Bhansar) /entry tax/ as applicable for destination site on all items of supply including bought-out finished items, which shall be dispatched directly from the sub-vendor's works (within or outside Nepal) to the Project site is included in the Contract price.

14.6 In case of local supplies, all Customs duties/Bhansar and Levies, Excise Duties, Sales Tax payable on raw materials, components, sub-assemblies and any other items used for their consumption or dispatched directly to the BHEL / Customer from their sub-Contractor (i.e. sale-in-transit) is included in the Contract price and any such taxes, duties, levies additionally payable will be to Contractor's account and no separate claim on this behalf will be entertained by the BHEL.

14.7 If any plant and equipment required to complete the facilities, is manufactured outside Nepal, the Contractor shall be entirely responsible for all taxes, stamp duties, license fees, and other such levies imposed outside the Nepal.

14.8 In such case, Customs duties/ Bhansar on the equipment and materials covered in the Contract to be imported into Nepal against BHEL / Customer's Import License and which will become the property of the BHEL / Customer under the Contract, shall be to the contractor's account and shall be paid directly by the Contractor to Government of Nepal or concerned authorities.

14.9 Except as otherwise specifically provided in the Contract, the Contractor shall bear and pay all taxes, duties, levies and charges assessed on the Contractor, its Sub-Contractors or their employees by all municipal, state or national government authorities in connection with the plant and equipment supplied in and outside of the country where the Site is located.

14.10 If any tax exemptions, reductions, allowances or privileges may be available to the Contractor in the country where the Site is located, BHEL / Customer shall use its best endeavors to enable the Contractor to benefit from any such tax savings to the maximum allowable extent. However, in the event of failure on part of the contractor same shall not be compensated on this account by BHEL.

14.11 For payment/reimbursement of Value Added Tax or any other tax included in the contract price, in respect of dispatches made directly from Contractor's Works, invoices raised by the Contractor shall be accepted as documentary evidence.

14.12 Any upward variation in VAT in Nepal shall be considered for reimbursement provided supply of goods or /and services are made within schedule date stipulated in the contract or approved extended schedule for the reason solely attributable to BHEL. However downward variation shall be subject to adjustment as per actual VAT applicability in Nepal.

In case the Government of Nepal imposes any new levy/tax on the output service/goods after price bid opening, the same shall be reimbursed by BHEL at actual. The reimbursement under this clause is restricted to the direct transaction between BHEL and its contactor only and within the contractual delivery period only.

In case any new tax/levy/duty etc. becomes applicable after the date of Bidder's offer but before opening of the price Bid, the Bidder/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.

These variations / adjustments would be applicable to direct transactions between BHEL and

the Contractor as well as on finished bought-out items (Sale-in-transit) supplied directly by the sub-vendor to BHEL but shall not be applicable on procurement of raw materials, intermediary components etc. by the sub-vendor and Contractor. Such adjustment in tax liability will only be with respect to the values and rates quoted by the bidder in relevant Schedules.

14.13 The Contractor shall be solely responsible for the taxes that may be levied on the Contractor's persons or on earnings of any of his employees and shall hold BHEL indemnified and harmless against any claims that may be made against BHEL / Customer. BHEL does not take any responsibility whatsoever regarding taxes under the Income Tax Act of Nepal, for the Contractor or his personnel. If it is obligatory under the provisions of the Income Tax Act of Nepal, deduction of Income Tax at source shall be made by the BHEL.

14.14 The admissibility of VAT, taxes and duties referred in this chapter or elsewhere in the contract is limited to direct transactions between BHEL & its Contractor. BHEL is not responsible for any liability that may arise due to any transaction beyond the direct transaction between BHEL & its contractor.

14.15 The contractor should submit its invoices in such a manner enabling BHEL for availing of Input Tax Credit of all the taxes whether included or excluded in the contract price, wherever applicable. Any denial of input credit to BHEL or arising of any tax liability on BHEL due to non-compliance of any Applicable Tax Laws in Nepal by the contractor in any manner, will be recovered along with liability on account of interest and penalty (if any) from the contractor.

The above information is indicative and is subject to change, as per amendments and rules in Nepal issued from time to time. The subcontractor is requested to verify the applicability of the above regulations and shall not hold BHEL liable for any loss (actual / notional) on account of the above information, whether to the subcontractor or otherwise.

14.5 Duties and Taxes on Goods

Any element of royalty, duty or tax in the price of any goods including fuel oil, lubricating oil, cement, timber, steel and iron goods locally procured by the Contractor shall be included in the Contract Price, and no reimbursement or payment in respect shall be made to the Contractor. The Contractor shall familiarize himself with all the rules and regulation of Nepal with regard to customs, duties, taxes, clearing of goods and equipment, immigration and the like, and it will be necessary for him to follow the required procedures regardless of the assistance as may be provided by the Employer whenever possible.

14.6 Import License

Import License fees or any other charges shall be at the cost of the Contractor.

The Contractor shall pay all such charges as local or any customs authorities en-route may impose and all such costs, which shall be deemed included in the Contract Price.

14.7 **New Taxes & duties (Introduced after tender opening date):**

If any new tax or duty is levied by the Authority and becomes directly applicable on items specified in the Bill of Quantities, full reimbursement shall be made subject to submission of documentation as per statute.

14.8 Rates of Wages and Conditions of Labour

The Contractor shall pay rates of wages and observe conditions of labour not less favourable than established by district office where the work is carried out. In the absence of any rates of wages or conditions of labour so established, the Contractor shall pay rates of wages and observe conditions of labour which are not less favourable than the general circumstances in the trade or industry in which the Contractor is engaged are similar.

The Contractor shall inform the Contractor's Personnel about their liability to pay personal income taxes in respect of such of their salaries, wages, allowances, and any benefits as are subject to taxes under the Laws of Nepal, and the Contractor shall perform such duties in regard to such deductions thereof as may be imposed on him by such Laws.

15.0 COMPLETION SCHEDULE:

The work under this scope of work must be completed within **2 months** after placement of order except check survey.

The check survey shall be done along with civil construction agency after finalizing coordination with of civil construction agency by BHEL and intimation by site in-charge. Check survey should be completed within **one month** after intimation by BHEL.

16.0 LIQUIDATED DAMAGE/PENALTY:

In case the contractor fails to complete the project within the time specified in the tender specification or any extension thereof subject to force majeure condition, the contractor shall be liable to pay by way of LD/Penalty a sum equal to the half percent of the contract price, per calendar week or part thereof by which the commissioning of the project is delayed, subject to ceiling of 10 % of the contract price. Once the maximum limit of delay is reached (i.e. 20 week of delay) BHEL may consider termination of the contract and forfeit the Security deposit without prejudice to the other remedies under the contract.

Amended/ revised contract value (excluding ORC, Extra Works, Supplementary /Additional Items and PVC) shall be considered for calculating LD/ penalty.

17.0 VALIDITY OF OFFER

The offer shall be kept open for acceptance for a minimum period of FOUR months from the date of opening of tenders. In case BHEL calls for negotiations, such negotiations shall not amount to cancellation or withdrawal of the original offer which shall be binding on the tenderer.

18.0 DELAY AND EXTENSION OF TIME:

If, in the opinion of the Engineer, the work is delayed

(i) by reason of civil commotion, local combination of workmen, strike or lockout, affecting any of the trades employed on the work, or

(ii) by reason of abnormally bad weather, or

(iii) by reason of serious loss or damage by fire, or

(iv) by delay on the part of the agency or tradesman engaged by the BHEL in executing work not forming part of the contract, or

(v) By reason of any other cause which in the absolute discretion of the Engineer is beyond the contractor's control, then in any such case, the Engineer (or higher authority) may make fair and reasonable extension in the completion dates of the individual items of work of the contract as whole. Such extension which will be communicated to the contractor by the Engineer in writing shall be final and binding on the contractor.

(vi) In case of delay in completion of work BHEL reserve the right to grant time extension under the following options depending upon the performance of the vendor:

18.1 Time extension without levy of LD in case it is found that delay is not attributable to the vendor.

18.2 Time extension with deduction of applicable LD in line with Liquidity Damage clause if the delay is solely attributable to the vendor.

18.3 In case facts of delay is not settled, BHEL reserve the right to grant provisional time extension for delay in completion of total work or part thereof and running/ interim payments to the vendor will be released without deduction of LD subject to submission of additional Bank guarantee equivalent to maximum LD amount valid till completion of work under their scope and grant of final time extension.

BHEL reserves to itself the following rights without entitling the Vendor for any compensation

19.0 RIGHTS OF BHEL

BHEL **reserves** the following rights in respect of this contract during the original contract period or its extensions if any, as per the provisions of the contract, without entitling the contractor for any compensation

19.1 To get the work done through another agency, in the event of poor progress, or the vendor's inability to progress the work for completion as stipulated in the

Contract, poor quality of work, persistent disregards of instructions of BHEL, assignment, transfer, subletting of the contracted work without written permission of BHEL, non-fulfilment of any contractual obligations etc. and to claim/recover compensation for such losses from the vendor from Security Deposit/other dues.

19.2 To withdraw any portion of work and/or to restrict/alter quantum of work as indicated in the contract during the progress of construction and get it done through other agency to suit BHEL's commitment to its customer or in case BHEL decides to advance the date of completion period due to other emergent reasons/BHEL's obligations to its customer.

19.3 To terminate the contract after due notice and forfeit Security Deposit and recover the loss sustained in getting the balance work done through other agencies in addition to liquidated damages/penalty in the events of

a) Vendor's continued poor progress.
b) Withdrawal from or abandonment of the work before completion of the work.
c) Corrupt or illegal act of the Vendor.
d) Insolvency of the Vendor.
e) Persistent disregard of the instructions of BHEL.
f) Assignment, transfer, subletting of the contract work without BHEL's written permission.
g) Non-fulfilment of any contractual obligations.

19.4 To recover any moneys due from the Vendor, from any moneys due to the vendor under this or any other contract or from the Security Deposit.

19.5 To claim compensation for losses sustained in case of termination of Contract and to levy Liquidated Damage/Penalty for delay in completion of work.

19.6 To terminate the Contract or to restrict the quantum of work and pay only for the portion or work done in case BHEL's contract with its customer is terminated/ altered/ deferred/ disputed/ frustrated for any reasons.

19.7 To effect recoveries from any amounts due to the vendor under this or any other contract or in any other form the moneys which BHEL is forced to pay to anybody due to vendor's failure to fulfil any of his obligations.

19.8 To restrict or increase the quantity and nature of work to suit project requirements, since the tender specification is based on preliminary documents and quantities furnished therein are indicative and approximate and the rates quoted shall not be subject to revision.

19.9 While every endeavour will be made by BHEL to this end, BHEL cannot guarantee uninterrupted work due to conditions beyond its control. The vendor will not be entitled to any compensation/extra payment on this account. No idle charges will be payable by BHEL in any case.

19.10 In the event of any dispute of technical nature, the decision of BHEL shall be final and binding on the Vendor.

19.11 In case of fault of the contractor, BHEL reserves the right without entitling the contractor for any compensation, To terminate the contract or withdraw portion of work and get it done through other agency after due notice of a period of 14 days' by BHEL in any of the following cases:

i. Contractor's poor progress of the work vis-à-vis execution timeline as stipulated in the Contract, backlog attributable to contractor including unexecuted portion of work does not appear to be executable within balance available period considering its performance of execution.

ii. Withdrawal from or abandonment of the work by contractor before completion of the work as per contract.

iii. Non-completion of work by the Contractor within scheduled completion period as per Contract or as extended from time to time, for the reasons attributable to the contractor.

iv. Termination of Contract on account of any other reason (s) attributable to Contractor.

v. Assignment, transfer, subletting of Contract without BHEL's written permission.

vi. Non-compliance to any contractual condition or any other default attributable to Contractor.

19.12 Following sequence shall be applicable for recoveries from contractor after informing the contractor of the total proposed recovery:

i. Dues available in the form of Bills payable to contractor, SD, BGs against the same contract.

ii. Demand notice for deposit of balance recovery amount to be sent to contractor, if funds are insufficient to effect complete recovery against dues indicated in (a) above.

iii. If contractor fails to deposit the balance amount within the period as prescribed in demand notice, following action shall be taken for balance recovery:

iv. Dues payable to contractor against other contracts in the same Region/unit shall be considered for recovery.

v. If recovery cannot be made out of dues payable to the contractor as above, balance amount to be recovered, shall be informed to other Regions/Units for making recovery from the Unpaid Bills/Running Bills/SD/BGs/Final Bills of contractor.

vi. In-case recoveries are not possible with any of the above available options, Legal action shall be initiated for recovery against contractor.

20.0 BREACH OF CONTRACT, REMEDIES AND TERMINATION:

In case of breach of contract, amount equivalent to 10% of contract value shall be recovered by BHEL due to breach of contract by the subcontractor.

This amount shall be recovered from security instruments like performance bank guarantee available with BHEL against the said contract

In case the value of the security instruments available is less than 10% of the contract value, the balance amount shall be recovered from other financial remedies (i.e. available bills of the contractor, retention amount, etc. with BHEL).

Further, levy of liquidated damages, debarment, termination, de-scoping, short-closure, etc., shall be applied as per provisions of the contract.

21.0 LAW GOVERNING THE CONTRACT AND COURT JURISDICTION:

The Contract shall be governed by the Law for the time being enforced in the Republic of India. The Civil Court at Delhi having ordinary Original Civil Jurisdiction shall alone have exclusive jurisdiction in regard to all claims in respect of this contract.

22.0 FORCE MAJEURE:

The following shall amount to force majeure conditions:

22.21 Acts of God, Act of any Government, war, sabotage, riots, civil commotion, Police action, revolution, flood, fire cyclone, earthquake, epidemic and other similar causes over which the vendor has no control.

22.22 If the vendor suffers delay in the due execution of the contract, due to delays caused by force majeure conditions, as defined above, the agreed time of completion of the work covered by this contract may be extended by a reasonable period of time in consultation and after agreement of BHEL's clients/owner, provided that on the occurrence of any such contingency, the Vendor immediately reports to BHEL in writing the causes of delay. The Vendor shall not be eligible for any compensation on this account.

23.0 Model Conciliation Clause for Conducting Conciliation Proceedings Under The BHEL Conciliation Scheme, 2018

The Parties the if at any time (whether before, during or after the arbitral or judicial proceedings), any Disputes (which terms shall means and include any dispute, difference, question or disagreement arising in connection with construction, meaning, operation, effect, interpretation or breach of the agreement, contract or the

Memorandum of Understanding (delete whichever is inapplicable), which the parties unable to settle mutually), arise inter-se the Parties, the same may, be refereed by either party to conciliation to be conducted through Independent Experts Committee to be appointed by competent authority of BHEL from the BHEL Panel of Conciliators.

Notes:

1. No serving or a retired employee of BHEL/Administrative Ministry of BHEL shall be included in the BHEL Panel of Conciliators.
2. Any other person(s) can be appointed as Conciliator(s) who is/are mutually agreeable to both the parties from outside the BHEL Panel of Conciliators.

The proceedings of Conciliation shall broadly be governed by Part-III of the Arbitration and Conciliation Act 1996 or any statutory modification thereof and as provided in Annexure-A.

The Annexure-A together with its appendices will be treated as if the same is part and parcel hereof and shall be as effectual as if set out herein in these GCC."

24.0 ARBITRATION

(i) Except as provide elsewhere in this Contract, in case amicable settlement is not reached between the Parties, in respect of any dispute or difference; arising out of the formation, breach, termination, validity or execution of the contract; or, the respective rights and liabilities of the Parties; or, in relation to interpretation of any provision of the contract; or, in relation to interpretation of any provision of the Contract; or, in any manner touching upon the contract, then, either Party may, by a notice in writing to the other Party refer such dispute or difference to the sole arbitration of an arbitrator appointed by Head of the BHEL Unit/Region/Division issuing the Contract.

The Arbitrator shall pass a reasoned award and the award of the Arbitrator shall be final and binding upon the Parties.

Subject as aforesaid, the provisions of Arbitration and Conciliation Act 1996 (India) or statutory modifications or re-enactments thereof and the rules made thereunder and for the time being in force shall apply to the arbitration proceedings under this clause.

The seat of arbitration shall be New Delhi.

The cost of arbitration shall be borne as per the award of the Arbitrator.

Subject to the arbitration in terms of clause L above, the court at New Delhi shall have exclusive jurisdiction over nay matter arising out of or in connection with this Contract.

Notwithstanding the existence or any dispute or differences and/or reference for the arbitration, the Contractor shall proceed with and continue without hindrance the performance of its obligations under this contract with due diligence and expedition in a professional manner except where the contract has been terminated by either Party in terms of this contract.

(ii) In the event of dispute or difference relating to the interpretation and application of the provisions of commercial contract(s) between Central Public Sector Enterprises

(CPSEs)/ Port Trusts inter se and also between CPSEs and Government Departments/Organizations (excluding disputes concerning Railways, Income Tax, Customs & Excise Departments), such dispute or difference shall be taken up by either party for resolution through AMRCD as mentioned in DPE OM No.4(1)/2013-DPE9GM)/FTS-1835 dated 22.05.2018.

25.0 PERFORMANCE MONITORING:

The Contractors performance shall be continuously monitored during execution of work at site.

In case of contractor's performance is found not satisfactory during the execution of work at site, BHEL may take alternate remedial measures and may not consider the contractor for further tenders, if the contractor performance is not improved in spite of opportunities given by BHEL.

Tender Spec. no.: TBSM/RAHUGHAT/SURVEY/TENDER/23-24 Date: 08.02.2024

PROFORMA OF BANK GUARANTEE (in lieu of SECURITY DEPOSIT)

In consideration of Bharat Heavy Electricals Limited (hereinafter referred to as the 'Employer' which expression shall unless repugnant to the context or meaning thereof, include its successors and permitted assigns) incorporated under the Companies Act, 1956 and having its registered office at BHEL House, Siri Fort, New Delhi-110049 through its Unit at BHEL, Transmission Business Group, Noida (name of the Unit) having agreed to exempt _____(Name of the Vendor / Contractor / Supplier) with its registered office at_____[1] (hereinafter called the said "Contractor" which term includes supplier), from demand under the terms and conditions of the Contract reference No._____ dated _____ [2] valued at Rs…….[3](Rupees ……) (hereinafter called the said Contract), of Security Deposit for the due fulfilment by the said Contractor of the terms and conditions contained in the said Contract, on production of a Bank Guarantee for Rs……[4] (Rupees…….only),

We _____(indicate the name and address of the Bank) having its Head Office at _____(address of the head Office) (hereinafter referred to as the Bank), at the request of _____ [Contractor(s)], being the Guarantor under this Guarantee, do hereby irrevocably and unconditionally undertake to forthwith and immediately pay to the Employer, an amount not exceeding Rs._____without any demur, immediately on demand from the Employer and without any reservation, protest, and recourse and without the Employer needing to prove or demonstrate reasons for its such demand

Any such demand made on the bank, shall be conclusive as regards the amount due and payable by the Bank under this guarantee. However, our liability under this guarantee shall be restricted to an amount not exceeding Rs._____.

We undertake to pay to the Employer any money so demanded notwithstanding any dispute or disputes raised by the Contractor(s) in any suit or proceeding pending before any Court or Tribunal or Arbitrator or any other authority, our liability under this present being absolute and unequivocal.

The payment so made by us under this guarantee shall be a valid discharge of our liability for payment hereunder and the Contractor(s) shall have no claim against us for making such payment.

We, further agree that the guarantee herein contained shall remain in full force and effect during the period that would be taken for the performance of the said Contract and that it shall continue to be enforceable till all the dues of the Employer under or by virtue of the said Contract have been fully paid and its claims satisfied & the Employer certifies that the terms and conditions of the said Contract have been fully and properly carried out by the said contractor(s) or acceptance of the final bill or discharge of this guarantee by the Employer, whichever is earlier. This guarantee shall initially remain in force up to and including_____[5] and shall be extended from time to time for such period as may be desired by the Employer. Unless a demand or claim under this guarantee is made on us in writing on or before the _____[6], (3 months more than the present date of validity of Bank Guarantee) we shall be discharged from all the liability under this guarantee thereafter.

We, _____ (indicate the name of the Bank) further agree with the Employer that the Employer shall have the fullest liberty without our consent and without affecting in any manner our obligations hereunder to vary any of the terms and conditions of the said Contract or to extend time of performance by the said contractor(s) from time to time or to postpone for any time or from time to time any of the powers exercisable by the Employer against the said contractor(s) and to forbear or enforce any of the terms and conditions relating to the said Contract and we shall not be relieved from our liability by any reason of any such variation or extension being granted to the said contractor(s) or for any forbearance, act or omission on the part of the Employer or any indulgence by the Employer to the said contractor(s) or by any such matter or thing whatsoever which under the law relating to sureties would but for this provision have effect of so relieving us.

The Bank also agrees that the Employer at its option shall be entitled to enforce this Guarantee against the Bank as a principal debtor, in the first instance without proceeding against the Contractor and notwithstanding any security or other guarantee that the Employer may have in relation to the Contractor's liabilities.

This Guarantee shall not be determined or affected by liquidation or winding up, dissolution or change of constitution or insolvency of the Contractor but shall in all respects and for all purposes be binding and operative until payment of all money payable to the Employer in terms thereof. This guarantee will not be discharged due to the change in the constitution of the Bank or the Contractor(s).

We,……. BANK lastly undertake not to revoke this guarantee during its currency except with the previous consent of the Employer in writing.

Notwithstanding anything to the contrary contained hereinabove:

a) The liability of the Bank under this Guarantee shall not exceed…… [4]
b) This Guarantee shall be valid up to ……[5]
c) Unless the Bank is served a written claim or demand on or before _____[6] all rights under this guarantee shall be forfeited and the Bank shall be relieved and discharged from all liabilities under this guarantee irrespective of whether or not the original bank guarantee is returned to the Bank.

We, _____ Bank, have power to issue this Guarantee under law and the undersigned as a duly authorized person has full powers to sign this Guarantee on behalf of the Bank.

Date _____ Day of _____
for___(indicate the name of the Bank)__
(Signature of Authorised signatory)

[1] ADDRESS OF THE VENDOR /CONTRACTOR / SUPPLIER .

[2] DETAILS ABOUTTHE NOTICE OF AWARD/CONTRACTREFERENCE

[3] CONTRACT VALUE

[4] BG AMOUNTIN FIGURES AND WORDS

[5] VALIDITY DATE (At least 3 months more than completion period)

[6] DATE OF EXPIRY OF CLAIM PERIOD (At least 3 months more than the present date of validity of BG)

Tender Spec. no.: TBSM/RAHUGHAT/SURVEY/TENDER/23-24 Date: 08.02.2024

Notes:

1 The expiry of claim period shall be at least 3 months more than the validity date. It may be ensured that the same is in line with the agreement/ contract entered with the Vendor.

2 The BG should be on Non-Judicial Stamp paper/e-stamp paper of appropriate value as per Stamp Act prevailing in the State(s) where the BG is submitted or is to be acted upon or the rate prevailing in the State where the BG was executed, whichever is higher. The Stamp Paper/e-stamp paper shall be purchased in the name of Vendor/Contractor/Supplier /Bank issuing the guarantee.

3 In Case of Bank Guarantees submitted by Foreign Vendors:

a. From Nationalized/Public Sector / Private Sector/ Foreign Banks (BG issued by Branches in India) can be accepted subject to the condition that the Bank Guarantee should be enforceable in the town/city or at nearest branch where the Unit is located i.e. Demand can be presented at the Branch located in the town/city or at nearest branch where the Unit is located.

b. From Foreign Banks (wherein Foreign Vendors intend to provide BG from local branch of the Vendor country's Bank)

b.1 In such cases, in the Tender Enquiry/ Contract itself, it may be clearly specified that Bank Guarantee issued by **any of the Consortium Banks only** will be accepted by BHEL. As such, Foreign Vendor needs to make necessary arrangements for issuance of Counter- Guarantee by Foreign Bank in favour of the Indian Bank's (BHEL's Consortium Bank) branch in India. It is advisable that all charges for issuance of Bank Guarantee/ counter- Guarantee should be borne by the Foreign Vendor. The tender stipulation should clearly specify these requirements.

b.2 In case, Foreign Vendors intend to provide BG from Overseas Branch of our Consortium Bank (e.g. if a BG is to be issued by SBI Frankfurt), the same is acceptable. However, the procedure at sl.no. b.1 will required to be followed.

ANNEXURE TO MODEL CONCILIATION CLAUSE FOR CONDUCT OF CONCILIATION UNDER THE BHEL CONCILIATION SCHEME, 2018

BRIEF PROCEDURE FOR CONDUCT OF CONCILIATION PROCEEDINGS

1. The proceedings of Conciliation shall broadly be governed by Part-III of the Arbitration and Conciliation Act 1996 or any statutory modification thereof and as provided herein:

2. The party desirous of resorting to Conciliation shall send an invitation/notice in writing to the other party to conciliate specifying all points of Disputes with details of the amount claimed. The party concerned shall not raise any new issue thereafter. Parties shall also not claim any interest on claims/counter-claims from the date of notice invoking Conciliation till the conclusion of the Conciliation proceedings.

3. The party receiving the invitation/notice for Conciliation shall within 30 days of receipt of the notice of Conciliation intimate its consent for Conciliation along with its counter-claims, if any.

4. The Conciliation in a matter involving claim or counter-claim (whichever is higher) up to Rs 5 crores shall be carried out by sole Conciliator nominated by BHEL while in a matter involving claim or counter-claim (whichever is higher) of more than Rs 5 crores Conciliation shall be carried out by 3 Conciliators nominated by BHEL.

5. The Parties shall be represented by only their duly authorized in-house executives/officers and neither Party shall be represented by a Lawyer.

6. The first meeting of the IEC shall be convened by the IEC by sending appropriate communication/notice to both the parties as soon as possible but not later than 30 days from the date of his/their appointment. The hearings in the Conciliation proceeding shall ordinarily be concluded within two (2) months and, in exceptional cases where parties have expressed willingness to settle the matter or there exists possibility of settlement in the matter, the proceedings may be extended by the IEC by a maximum of further 2 months with the consent of the Parties subject to cogent reasons being recorded in writing.

7. The IEC shall thereafter formulate recommendations for settlement of the Disputes supported by reasons at the earliest but in any case within

15 days from the date of conclusion of the last hearing. The recommendations so formulated along with the reasons shall be furnished by the IEC to both the Parties at the earliest but in any case within 1 month from the date of conclusion of the last hearing.

8. Response/modifications/suggestions of the Parties on the recommendations of the IEC are to be submitted to the IEC within time limit stipulated by the IEC but not more than 15 days from the date of receipt of the recommendations from the IEC.

9. In the event, upon consideration, further review of the recommendations is considered necessary, whether by BHEL or by the other Party, then, the matter can be remitted back to the IEC with request to reconsider the same in light of the issues projected by either/both the Parties and to submit its recommendations thereon within the following 15 days from the date of remitting of the case by either of the Parties.

10. Upon the recommendations by the Parties, with or without modifications, as considered necessary, the IEC shall be called upon to draw up the Draft Settlement Agreement in terms of the recommendations.

11. When a consensus can be arrived at between the parties only in regard to any one or some of the issues referred for Conciliation the draft Settlement Agreement shall be accordingly formulated in regard to the said Issue(s), and the said Settlement Agreement, if signed, by the parties, shall be valid only for the said issues. As regards the balance issues not settled, the parties may seek to resolve them further as per terms and conditions provided in the contract.

12. In case no settlement can be reached between the parties, the IEC shall by a written declaration, pronounce that the Conciliation between the parties has failed and is accordingly terminated.

13. Unless the Conciliation proceedings are terminated in terms of para 22 (b), (c) & (d) herein below, the IEC shall forward his/its recommendations as to possible terms of settlement within one (1) month from the date of last hearing. The date of first hearing of Conciliation shall be the starting date for calculating the period of 2 months.

14. In case of 3 members IEC, 2 members of IEC present will constitute a valid quorum for IEC and meeting can take place to proceed in the matter after seeking consent from the member who is not available. If necessary, videoconferencing may be arranged for facilitating participation of the members. However, the IEC recommendations will be signed by all members. Where there is more than one (1) Conciliator, as a general rule they shall act jointly. In the event of differences between the Members of IEC, the decision/recommendations of the majority of the Members of IEC shall prevail and be construed as the recommendation of the IEC.

15. The Draft Settlement Agreement prepared by the IEC in terms of the consensus arrived at during the Conciliation proceedings between the Parties shall be given by the IEC to both the parties for putting up for approval of their respective Competent Authority.

16. Before submitting the draft settlement agreement to BHEL's Competent Authority viz. the Board Level Committee on Alternative Dispute Resolution (BLCADR) for approval, concurrence of the other party's Competent Authority to the draft settlement agreement shall be obtained by the other party and informed to BHEL within 15 days of receipt of the final draft settlement agreement by it. Upon approval by the Competent Authority, the Settlement Agreement would thereafter be signed by the authorized representatives of both the Parties and authenticated by the members of the IEC.

17. In case the Draft Settlement Agreement is rejected by the Competent Authority of BHEL or the other Party, the Conciliation proceedings would stand terminated.

18. A Settlement Agreement shall contain a statement to the effect that each of the person(s) signing thereto (i) is fully authorized by the respective Party(ies) he/she represents, (ii) has fully understood the contents of the same and (iii) is signing on the same out of complete freewill and consent, without any pressure, undue influence.

19. The Settlement Agreement shall thereafter have the same legal status and effect as an arbitration award on agreed terms on the substance of the dispute rendered by an arbitral tribunal passed under section 30 of the Arbitration and Conciliation Act, 1996.

20. Acceptance of the Draft Settlement Agreement/recommendations of the Conciliator and/or signing of the Settlement Agreement by BHEL shall

however, be subject to withdrawal/closure of any arbitral and/or judicial proceedings initiated by the concerned Party in regard to such settled issues.

21. Unless otherwise provided for in the agreement, contract or the Memorandum of Understanding, as the case may be, in the event of likelihood of prolonged absence of the Conciliator or any member of IEC, for any reason/incapacity, the Competent Authority/Head of Unit/Division/Region/Business Group of BHEL may substitute the Conciliator or such member at any stage of the proceedings. Upon appointment of the substitute Conciliator(s), such reconstituted IEC may, with the consent of the Parties, proceed with further Conciliation into the matter either de-novo or from the stage already reached by the previous IEC before the substitution.

22. The proceedings of Conciliation under this Scheme may be terminated as follows:
    a. On the date of signing of the Settlement agreement by the Parties; or,
    b. By a written declaration of the IEC, after consultation with the parties, to the effect that further efforts at conciliation are no longer justified, on the date of the declaration; or,
    c. By a written declaration of the Parties addressed to the IEC to the effect that the Conciliation proceedings are terminated, on the date of the declaration; or,
    d. By a written declaration of a Party to the other Party and the IEC, if appointed, to the effect that the Conciliation proceedings are terminated, on the date of the declaration.
    e. On rejection of the Draft Settlement Agreement by the Competent Authority of BHEL or the other Party.

23. The Conciliator(s) shall be entitled to following fees and facilities:

Sl No	**Particulars**	**Amount**
1	Sitting fees	Each Member shall be paid a Lump Sum fee of Rs 75,000/- for the whole case payable in terms of paragraph No. 27 herein below.
2	Towards drafting of settlement agreement	In cases involving claim and/or counter-claim of up to Rs 5crores. Rs 50,000/- (Sole Conciliator)

Sl No	Particulars	Amount
		In cases involving claim and/or counter-claim of exceeding Rs 5 crores but less than Rs 10 crores. Rs 75,000 (per Conciliator) In cases involving claim and/or counter-claim of more than Rs 10 crores. Rs 1,00,000/- (per Conciliator) Note: The aforesaid fees for the drafting of the Settlement Agreement shall be paid on Signing of the Settlement Agreement after approval of the Competent Authority or Rejection of the proposed Settlement Agreement by the Competent Authority of BHEL.
3	Secretarial expenses	Rs 10,000/- (one time) for the whole case for Conciliation by a Sole Member IEC. Where Conciliation is by multi member Conciliators –Rs 30,000/- (one time)- to be paid to the IEC
4	Travel and transportation and stay at outstation i) Retired Senior Officials of other Public Sector Undertakings (pay scale wise equivalent to or more than E-8 level of BHEL)	As per entitlement of the equivalent officer (pay scale wise) in BHEL.
	Others	As per the extant entitlement of whole time Functional Directors in BHEL.

Sl No	Particulars	Amount
		Ordinarily, the IEC Member(s) would be entitled to travel by air Economy Class.
5	Venue for meeting	Unless otherwise agreed in the agreement, contract or the Memorandum of Understanding, as the case may be, the venue/seat of proceedings shall be the location of the concerned Unit / Division / Region / Business Group of BHEL. Without prejudice to the seat/venue of the Conciliation being at the location of concerned BHEL Unit / Division / Region / Business Group, the IEC after consulting the Parties may decide to hold the proceedings at any other place/venue to facilitate the proceedings. Unless, Parties agree to conduct Conciliation at BHEL premises, the venue is to be arranged by either Party alternately.

24. The parties will bear their own costs including cost of presenting their cases/evidence/witness(es)/expert(s)on their behalf. The parties agree to rely upon documentary evidence in support of their claims and not to bring any oral evidence in IEC proceedings.

25. If any witness(es) or expert(s) is/are, with the consent of the parties, called upon to appear at the instance of the IEC in connection with the matter, then, the costs towards such witness(es)/expert(s) shall be determined by the IEC with the consent of the Parties and the cost so determined shall be borne equally by the Parties.

26. The other expenditures/costs in connection with the Conciliation proceedings as well as the IEC's fees and expenses shall be shared by the Parties equally.

27. Out of the lump sum fees of Rs 75,000/- for Sitting Fees, 50% shall be payable after the first meeting of the IEC and the remaining 50% of the Sitting Fees shall be payable only after termination of the conciliation proceedings in terms of para 22 hereinabove.

28. The travelling, transportation and stay at outstation shall be arranged by concerned Unit as per entitlements as per Serial No. 3 of the Table at para 23 above, and in case such arrangements are not made by the BHEL Unit, the same shall be reimbursed to the IEC on actuals limited to their entitlement as per Serial No. 4 of the Table at Para 23 above against supporting documents. The IEC Member(s) shall submit necessary invoice for claiming the fees/reimbursements.

29. The Parties shall keep confidential all matters relating to the conciliation proceedings. Confidentiality shall extend also to the settlement agreement, except where its disclosure is necessary for purposes of its implementation and enforcement or as required by or under a law or as per directions of a Court/Governmental authority/ regulatory body, as the case may be.

30. The Parties shall not rely upon or introduce as evidence in any further arbitral or judicial proceedings, whether or not such proceedings relate to the Disputes that is the subject of the Conciliation proceedings:
    a. Views expressed or suggestions made by the other party in respect of a possible settlement of the Disputes;
    b. admissions made by the other party in the course of the Conciliator proceedings;
    c. proposals made by the Conciliator;
    d. The fact that the other Party had indicated his willingness to accept a proposal for settlement made by the Conciliator.

31. The Parties shall not present the Conciliator(s) as witness in any Alternative Dispute Resolution or Judicial proceedings in respect of a Disputes that is/was the subject of that particular Conciliation proceeding.

32. None of the Conciliators shall act as an arbitrator or as a representative or counsel of a Party in any arbitral or judicial proceeding in respect of a Disputes that is/was the subject of that particular Conciliation proceeding.

33. The Parties shall not initiate, during the Conciliation proceedings, any arbitral or judicial proceedings in respect of a Disputes that is the subject matter of the Conciliation proceedings except that a Party may initiate arbitral or judicial proceedings where, in his opinion, such proceedings are necessary for preserving his rights including for preventing expiry of period of limitation. Unless terminated as per the provisions of this Scheme, the Conciliation proceedings shall continue

notwithstanding the commencement of the arbitral or judicial proceedings and the arbitral or judicial proceedings shall be primarily for the purpose of preserving rights including preventing expiry of period of limitation.

34. The official language of Conciliation proceedings under this Scheme shall be English unless the Parties agree to some other language.

Format 2 to BHEL Conciliation Scheme, 2018

FORMAT FOR SEEKING CONSENT FOR REFERRING THE DISPUTES TO CONCILIATION THROUGH IEC

To,

M/s. (Stakeholder's name)

Sub: Resolution of the Disputes through conciliation by Independent Expert Committee (IEC).

Ref: Contract No/MoU/Agreement/LOI/LOA& date _____.

Sir,

With reference to above referred Contract/MoU/Agreement/LOI/LOA, you have raised certain Disputes/claims. Vide your letter dated____ you have requested BHEL to refer the Disputes/claims to IEC for Conciliation.

We are enclosing herewith Format (3) for giving consent and the terms and conditions of BHEL Conciliation Scheme, 2018 governing conciliation through IEC. You are requested to give your unconditional consent to the said terms and conditions of the Scheme by returning the same duly sealed and signed on each page. On receipt of your consent, matter will be put to the Competent Authority for consideration and decision.

Please note that BHEL has also certain claims against you (if applicable). BHEL reserves its right to agree or not to agree conciliation of the said disputes through BHEL and this letter is being issued without prejudice to BHEL's rights and contentions available under the contract and law.

Yours faithfully,

Representative of BHEL

Format 3 to BHEL Conciliation Scheme, 2018

FORMAT FOR GIVING CONSENT BY CONTRACTOR/VENDOR/CUSTOMER/COLLABORATOR/CONSORTIUM PARTNERSFOR REFERRING THE DISPUTES TO CONCILIATION THROUGH IEC

To,

BHEL

.....

Sub: Resolution of Disputes through Conciliation by Independent Expert Committee (IEC).

Ref: Contract/MoU/Agreement/LOI/LOA No & date____

With reference to above referred contract, our following bills/invoices/claims submitted to BHEL are still unpaid giving rise to Disputes:

SL. no.	Claim Description	Bill submitted to BHEL (no. and date)	Amount of the bill/claim	Amount received from BHEL	Outstanding Amount

Accordingly we request you to kindly refer the Disputes in respect of above claims to IEC for Conciliation.

We hereby agree and give our unconditional consent to the terms and conditions of BHEL Conciliation Scheme, 2018 governing conciliation through IEC. We have signed the same on each page and enclosed it for your consideration.

Yours faithfully,

(Signature with stamp)

Authorized Representative of Contractor
Name, with designation
Date

Format 5 to BHEL Conciliation Scheme, 2018

STATEMENT OF CLAIMS/COUNTER CLAIMS TO BE SUBMITTED TO THE IEC BY BOTH THE PARTIES

1. Chronology of the Disputes

2. Brief of the Contract/MoU/Agreement/LOI/LOA

3. Brief history of the Disputes:

4. Issues:

5. Details of Clam(s)/Counter Claim(s):

Sl. No.	**Description of claim(s)/Counter Claim**	**Amount (in INR)Or currency applicable in the contract**	**Relevant contract clause**

6. Basis/Ground of claim(s)/counter claim(s) (along with relevant clause of contract)

Note– *The Statement of Claims/Counter Claims may ideally be restricted to maximum limit of 20 pages. Relevant documents may be compiled and submitted along with the statement of Claims/Counter Claims. The statement of Claims/Counter Claims is to be submitted to all IEC members and to the other party by post as well as by email.*

BILL OF QUANTITITES CUM PRICE SCHEDULE (ANNEXURE-I)

Project : 220 kV AIS S/S AT RAHUGHAT HYDRO ELECTRIC PROJECT (2X20MW)

Name of Work: Detailed Route Survey & Check Survey and Geotechnical Investigation along with design and Engineering works for 11kV Rahughat distribution line at 220kV AIS S/S Rahughat Hydro Electric Project (2X220 MW) in Nepal

Tender Spec. No.: TBSM/RAHUGHAT/SURVEY/TENDER/23-24 DATE: 08.02.2024

Sr. No.	Description of Item	Quantity	UOM	Unit Rate	Amount
	PART-A SOIL INVESTIGATION WORK				
1	**Survey**				
1.1	**Detailed Survey**: Carrying out detailed survey including modification in preliminary route alignment, site clearance/ jungle clearing/tree cutting to make approach for survey work, adjustment in section details to achieve better average span, profiling, collecting actual field data along the selected route (marking of salient land features like crossing of rivers, nalla, road, railway lines, other transmission / distribution line, nearby habitations, forest land, hills, proximity to airport, nearby buildings/structures etc.), Pole spotting & providing Pole schedule, sag template, tree enumeration, etc. & submission of detailed survey report alongwith route profile drawing, all complete as per technical specification & directions of Engineer-in-charge including its approval from BHEL/Customer s Engineer/Customer.	km	12.5	102400.00	1,280,000
1.2	**Check survey**: Carrying out check-survey for route alignment to locate and peg mark pole positions conforming to approved profile, pole schedule and technical specifications. Changes, if required in pole schedule after detailed survey, shall be carried out and thereafter submit revised pole schedule for approval. The pole schedule shall show co-ordinates of all poles, type of poles, span length, type of foundation for each pole and the deviation. (Check survey to be done jointly in presence of civil work agency)	km	12.5	23040.00	288,000
2	**Geo-Technical Investigation & Soil Resistivity Measurements**				
2.1	Conducting detailed soil investigation at various Pole locations and at other locations as per instruction of BHEL/Customer including mobilization of necessary equipment, providing necessary engineering supervision and technical personnel, carrying out field investigation and tests, laboratory tests, analysis and interpretation of data and results and working out tentative quantity of foundation work, preparations for the type of foundations and the safe bearing capacity for different sizes of foundations, different foundation strata for the various locations along the distribution lines all complete, submission of report as per project specific specification & directions of BHEL including its approval from BHEL/Customer s Engineer/Customer Boreholes (upto 7M depth or refusal)	per nos.	2	179200.00	358,400
2.2	Performing soil resistivity along the route for each Pole location and working out tentative quantity of earthing material all complete as per project specific specification & directions of BHEL including its approval from BHEL/Customer s Engineer/Customer	per location	2	57600.00	115,200
3	**Design/Drawing of Transmission Line Pole (Tubular) Structures including Extensions**				
3.1	Preparation & submission of design documents structural drawings for Pole Structure (11 kV) including bill of materials of all members including their approval from BHEL/Customer s Engineer/Customer all complete as per project specific specification & directions of BHEL.	Per Type	4	307200.00	1,228,800
4	**Design/Drawing of Transmission Line Pole Foundations**				
4.1	Preparation & submission of design documents & drawing for Pole structure (11 kV) foundation based on approved loads on foundations & Bearing Capacity of 10T/sqm. all complete as per project specific specification & directions of BHEL including their approval from BHEL/Customer s Engineer/Customer.	Per Type	4	307200.00	1,228,800
4.2	Preparation & submission of design documents & drawing for Pole structure (11 kV) based on approved loads on foundations & soil data all complete as per project specific specification & directions of BHEL including their approval from BHEL/Customer s Engineer/Customer.	Per Type(For Each Soil Type)	4	307200.00	1,228,800
5	**Design and engineering - All Other Documents**				
5.1	Other documents: Preparation and submission including its approval from BHEL/Customer s Engineer/Customer of the following : (a)Bill of Material for distribution line material including conductor, conductor accessories, earthwire, ADSS Optical Fiber Cable, earth wire/OPGW accessories, ADSS Optical Fiber Cable accessories, stringing hardware, pin insulators, disc insulators etc (b) Erection Key Diagram of each line, (c) Stringing chart of all spans for conductor, earth wire, ADSS cable etc., including damper placement chart as applicable. (d) Earthing details of Poles (e) Design basis report of distribution line (f) Any other drawing/documents required for successful completion of the work.	Lot	1	1024000.00	1,024,000
6	**Visit to Site/BHEL's Office/ Customer's Engineer office/Customer's office/Supplier's Works - For Approval/Review Meetings**				
6.1	Lump sum allowance per day including boarding, lodging, local conveyance, etc., all inclusive. (BHEL shall pay to & fro Ist AC fare from Bidder's headquarters to nearest railway station to Site/BHEL's Office/Customer's Engineer office/Customer's Office/Supplier's Works for each visit separately).	per day	10	51200.00	512,000
	TOTAL AMOUNT(PART A + PART B) (NPR excluding VAT)				**7264000**

Validate Print Help

Percentage BoQ

Tender Inviting Authority: BHEL, TBG- SubContracting Department, Sector 16A Noida, UP

Name of Work: TENDER FOR "Detailed Route Survey & Check Survey and Geotechnical Investigation along with design and Engineering works for 11kV Rahughat distribution line at 220kV AIS S/S Rahughat Hydro Electric Project (2X220 MW) in Nepal"

Contract No:TBSM/RAHUGHAT/SURVEY/TENDER/23-24 DATE 08.02.2024

Name of the Bidder/ Bidding Firm / Company :					
PRICE SCHEDULE **(This BOQ template must not be modified/replaced by the bidder and the same should be uploaded after filling the relevent columns, else the bidder is liable to be rejected for this tender. Bidders are allowed to enter the Bidder Name and Values only)**					
NUMBER #	**TEXT #**	**NUMBER #**	**TEXT #**	**NUMBER**	**NUMBER #**
Sl. No.	**Item Description**	**Quantity**	**Units**	**Estimated Rate in NPR**	**TOTAL AMOUNT Without Taxes in NPR**
1	**2**	**4**	**5**	**6**	**53**
1	Total amount as per rates in BOQ (as per Annexure-I) for "Detailed Route Survey & Check Survey and Geotechnical Investigation along with design and Engineering works for 11kV Rahughat distribution line at 220kV AIS S/S Rahughat Hydro Electric Project (2X220 MW) in Nepal."- Excluding GST	1.000	Nos	7264000.00	**7264000.00**
Total in Figures					**7264000.00**
Quoted Rate in Figures			**Select**		**0.000**

SECTION-1

Scope, Bill of Quantity, Specific Technical Requirements

1.1 Scope

The scope of work under this specification is Detailed survey, ERT Testing, route profiling, design and engineering of distribution line for routing of 11kV distribution lines emanating from RGHEP power house at 2x20MW RAHUGHAT HYDRO ELECTRIC PROJECT, Nepal to headworks with tap-off at Valve chamber being executed by BHEL & Customer's Civil Contractor for Raghuganga Hydropower Limited.

Conducting distribution line route survey, tower spotting/optimization of tower location, soil resistivity measurements and geotechnical investigation, required for construction of 11kV distribution line project is also in the scope of contractor.

The detailed scope of work shall be as per following:

1.1.1 Detailed survey including modification in preliminary route alignment, adjustment in section details to achieve better average span, profiling, collecting actual field data along the selected route (enumeration of salient land features like crossing of rivers, nalla, road, railway lines, other transmission / distribution line, nearby habitations, forest land, hills, proximity to airport, nearby buildings/structures etc.), Galvanized steel tubular poles spotting & providing Pole schedule (showing nos and type of Poles)with detailed land schedule (Plot No/Khata No, etc) for each Pole location, estimation of Pole quantities with height & type information and special Pole requirement, sag template, marking on required map and topographical map, tree enumeration, etc. & submission of detailed survey report.

1.1.2 Conducting detailed soil investigation at various Pole locations and at other locations as necessary including mobilization of necessary equipment, providing necessary engineering supervision and technical personnel, carrying out field investigation and tests, laboratory tests, analysis and interpretation of data and results, collecting data regarding change of course of rivers from local sources, velocity, scour, etc., giving flood details of the area (past history), preparations for the type of foundations and the safe bearing capacity for different sizes of foundations, different founding strata for the various locations along the distribution lines.

Bidder to note that the steel poles shall be designed as to have the depth of, atleast, one sixth of total length of the steel pole. Steel base plate and support anchors shall be designed against the allowable bearing capacity of earth that is assumed to be of 10 t/sq.m. However soil investigation may be required to be carried out at various locations, the bidder to quote as per tentative quantity requirement as per Annexure-I.

1.1.3 Performing soil resistivity measurements as per customer requirement.

1.1.4 Preparation of Bill of quantity in format attached in Annexure-I.

1.1.5 Design calculations, drawings & documents, as specified, are required to be furnished after successful award of order.

1.1.6 Visit to Site/BHEL's Office/ Customer's Engineer office/Customer's office/Supplier's Works as required for completion of work.

1.1.7 The Distribution Line Surveyor shall depute his engineer(s) to Site or BHEL's/Customer's Engineer office for any clarification etc. as required by BHEL/Customer's Engineer/Customer.

1.1.8 The Distribution Line Surveyor shall also depute his engineer(s) to site for check surveys also. Carrying out check-survey for route alignment to locate and peg mark pole positions conforming to approved profile, pole schedule and technical specifications. Changes, if required in pole schedule after detailed survey, shall be carried out and thereafter submit revised pole schedule for approval. The pole schedule shall show co-ordinates of all poles, type of poles, span length, type of foundation for each pole and the deviation. (Check survey to be done jointly in presence of civil work agency)

1.1.9 Preparation & submission of design documents of poles and their foundations, fabrication drawings, bill of material of all members, hardware etc. The detailed design & drawing work shall include, but not limited to:

- Verification of all data, criteria and information contained in the contract documents.

- Generation of all data, criteria and information required for the completion of work including liaison and interface with BHEL/Customer/Customer's Engineer.

- Analysis and design on standard software like STAAD pro etc. and /or in house generated Excel or other programs by qualified and experience personnel. All calculations shall be prepared in a neat, sequential, comprehensive form and properly checked to ensure their correctness and completeness.

- Design and Drawings of foundation for Poles for different soil types including Dry, Wet, Partially Submerged, Fully Submerged, etc including Foundation loading data.

- Preparation of construction drawings with sufficient detailing so that no difficulty is faced by site engineers during execution.

1.1.10 Getting all the works mentioned above approved by BHEL/Customer's Engineer/Customer.

1.1.11 Preparation and submission including its approval from BHEL/Customer of the following drawing/documents:

(a) Bill of Material for distribution line material including conductor, conductor accessories, earthwire, ADSS Optical Fiber Cable, earth wire/OPGW accessories, ADSS Optical Fiber Cable accessories, stringing hardware, pin insulators, disc insulators etc

(b) Erection Key Diagram

(c) Stringing chart of all spans for conductor, earth wire, ADSS cable etc., including damper placement chart as applicable.

(d) Earthing details of Poles

(e) Design basis report of distribution line

(f) Distribution Line geotechnical investigation report including resistivity report.

(g) Distribution Line detailed route survey & check survey, pole spotting & distribution line profile.

(h) Any other drawing/documents required for successful completion of the work.

The works is required for the following project:

Name of the customer/Consultant (Engineer): **RGHPL, NEPAL/WAPCOS LTD.**

Name of the project: **220 kV AIS S/S AT RAHUGHAT HYDRO ELECTRIC PROJECT (2X20MW)**

Site: **RAHUGHAT, NEPAL**

***Note: The terms used in this specification namely, "Employer" refers to RGHPL/WAPCOS, "RGHPL/WAPCOS/PURCHASER" refers to BHEL/RGHPL/WAPCOS, "Contractor/SUPPLIER" refers to Bidder, "GTR" refers to "section-3", "Engineer" refers to WAPCOS.**

In case of any conflict among the various sections of this specification, the order of precedence shall be section 1, section 2 & the section 3.

1.2 Bill of Quantities

As per Annexure - I. The Distribution Line Consultant is required to quote his most competitive rate for these items

1.3 Specific Technical Requirements

1.3.1 The specific technical requirements shall be as per project specific input provided by BHEL from time to time after award of work.

1.3.2 The Distribution Line Surveyor shall interact closely with BHEL engineering group for any input/clarification and finalize details across the table. There may be certain cases when on account of revision or change of inputs certain design/drawing may be required to be redone. ***No claim on account of this shall be entertained.*** Only suitable time extension shall be granted on account of above.

1.3.3 The bidder / representatives of bidder may be required to make several visits to site / BHEL office / customer's engineer office/customer's office depending upon the project requirements. ***No extra claim on account of these visits shall be entertained.***

1.4 Documentation

1.4.1 All design documents including computer outputs shall be neatly typed, produced on A4 size paper and shall have a 'Cover Sheet' (To be provided later).

1.4.2 All drawings shall be prepared in AutoCAD as per standard sizes (viz. A0, A1, A2, A3 & A4) and shall have a 'Title Block' (To be provided later).

1.4.3 The number of copies of design documents & drawings required to be submitted shall be as follows:

At each stage of Submission/Revision. (Soft Copy)

i) Reports/Design Documents (incl excel & Staad file (if applicable))	01 set.
ii) Drawings (incl AutoCAD & pdf file)	01 set.

1.5 Completion Schedule

The work under this scope of work must be completed within 2 months after placement of order except check survey.

The check survey shall be done along with civil construction agency after finalizing coordination with of civil construction agency by BHEL and intimation by site in-charge. Check survey should be completed within one month.

1.6 Payment Schedule

Condition	Payment
After conducting survey work, report preparation, submission and approval of reports/design documents/ drawings **(i) Approved with comments** **(ii) Approved**	 **i) 80%** **ii) 10%**
After completion of activities under scope of works including check survey and BOM, approval of all Drawings/Document without comment, submission of all drawings/documents.	**Balance 10%**

SECTION-2
EQUIPMENT SPECIFICATION

N.A.

SECTION-3

Enclosures to The Specification

Refer document

A. CUSTOMER'S TECHNICAL SPECIFICATION

B. Bill of Quantity - Annexure I

C. 11kV Distribution Line- Preliminary Route Survey Drawing - Annexure II

D. General Technical Requirement: TB-409-316-000 Rev 00

All tests which made to verify the contract specifications and to prove warranty shall be done.

A discharge test at rated 10 hour current is to be repeated until 10 hour discharge is attained or exceeded and unit cell voltages or equalized. A constant current load bank shall be provided by the contractor/manufacture to conduct this testing.

8.6 STEEL POLES AND ACCESSORIES

8.6.1 General

Suitable numbers of galvanized steel pole with insulator set, guy wire, necessary hardware/fittings and accessories shall be supplied and installed for the 11kV distribution line from terminal pole in switchyard of Rahughat power house to the headworks area with tap-off to valve chamber. This line gets its power supply through XLPE cables connected on other end to 11 kV local supply cubicle (LSC) in auxiliary bay. Further, another 11 kV terminal pole shall also be installed in the switchyard. 11 kV feeder (XLPE cables) from LSC shall be connected to this 11 kV pole, which shall facilitate further connection to 11 kV line to camp (under construction by the Employer and which shall run adjacent to the switchyard of the project). However, supply and stringing of ADSS fiber optic cable on these 11 kV poles (for transmission of telemetry/data/communication, control, protection signals etc. to and fro camp/valve chamber/headworks and powerhouse control room/LDC), splicing boxes, terminal equipment and accessories shall also be under the scope of the Contractor as covered in Chapter 7: Control, Automation and Protection and Communication system Chapter 12 respectively.

8.6.2 Steel poles

Galvanized steel tubular poles shall be supplied with the following accessories:

Cross arms and arm ties with bolt holes for fixing the insulator sets.

Adequate welded frame fittings with nuts on the tubular poles/masts for fixing step bolts up to a height of 1.2 meter below the cross arm.

All necessary terminations of overhead conductors (on 11 kV bushings of distribution transformer) as well as lightning arresters, an AC load break switches on pole mounted structures at headworks and valve chamber shall be provided.

Base plates at bottom of steel poles.

Support anchors.

Other requisite accessories/terminations/hardware etc.

8.6.3 Construction

The steel poles shall be galvanized steel tubes consisting of sections, to be jointed mechanically at the Site. Cross arms shall be made of galvanized steel channel or equivalent and each cross arm shall be fixed to the poles by means of through bolts and arm ties.

The base plate of the steel poles shall be provided with a water drain hole. The steel poles shall be provided with support anchors.

8.6.4 Materials

The steel pole sections and fittings shall be manufactured from standard steel as per BS or IEC or IS or equivalent international standards.

8.6.5 Details of Design

The steel poles shall be designed in accordance with the requirements as per BS or IEC or IS or equivalent national/ international standards.

The steel poles shall be so designed that no failure or permanent distortion shall occur when tested with applied loads equivalent to 2.0 times the maximum simultaneous loads.

The steel poles to be supplied by the Contractor shall be designed in consideration of the conditions mentioned above.

The basic span shall be maintained within the following limits:

a) For 11 kV Pole – 60m to 75m

8.6.6 Pole Foundation

The steel poles shall be designed as to have the depth of, at least, one sixth of total length of the steel pole.

Steel base plate and support anchors shall be designed against the allowable bearing capacity of earth that is assumed to be of 10 t/sq.mm.

8.6.7 Insulators and Fittings

The insulator units shall be of standard 254mm porcelain disc with ball and socket arrangement having creepage path not less than 25 mm/kV and spacing of 146mm between discs. The insulator unit shall comply with provision of IEC. The dimension and characteristics of the tension insulator unit and the fittings shall be 191mm porcelain disc type with ball and socket having spacing of 146mm between discs. The string insulator units shall comply with the provisions of IEC 60120, IEC 60305 and IEC 60372.The insulator pin shall be furnished with a spring washer, stainless steel split lock and nut assembled on the insulator pin.

8.6.8 Conductors and Fittings

Conductors and ADSS optical fiber cables with messenger wire will be supplied by the Contractor (under the scope of this chapter as well as Chapter 7 and 12) and the size of conductor and accessories) shall be assumed as follows :

Conductor :

Size	: 64.52mm, dog
Aluminum strands	: 6
Steel strands	: 1
Calculated breaking load	: 3,330 kg
Calculated resistance	: 0.2722 ohm/km at 20°C

Bolted type dead end clamps as well as other suitable type of necessary fittings, Accessories, Step Bolts etc. as per standards/established practices shall be supplied.

Step bolts shall be of 16mm in diameter and 16 cm in effective length and fixed with double nuts to the frame.

8.6.9 Guy Wire Assemblies

General

Guy wire assemblies shall be fixed to the upper portion of the poles and anchored to the ground.

The angle of guy wires against the poles shall be within 30-45 degrees.

Each guy wire assembly shall include a pole band, a guy insulator, a turnbuckle, and a screw or plate type anchor rod, with thimbles, etc where needed.

The guy wires shall be connected to other components by means of preformed grips. Wire clips shall not be used for connection.

Stay pole or flying-stay shall be provided as per the requirement and/or as per Engineer's instruction.

Selection of screw type or plate type anchors depending on soil conditions is the Tenderer's option.

Mechanical Characteristics

The guy wire assemblies shall be designed so as to support the loads due to the maximum conductor tensions with the minimum factor of safety of 2.0.

Guy Wires

Guy wires shall be the galvanized steel stranded wires of the following constructions.

Minimum diameter of individual wire : SWG 7/8 (for 11kV line)
Minimum number of wires in strand : 7

The followings are the minimum clearances between live conductors and other objects, which correspond to the maximum conductor sag conditions:

Item	Description	clearances (m)
1.	Normal ground for pedestrians only	5.5
2.	Residential areas	6.0

3.	Roads and streets	6.0
6.	Power lines (above or below)	2.7

For other objects not listed above the requirements for minimum clearances shall comply also with NEA practice and National Electrical and Safety Code (NESC). Requirements of other standards/Code/established practice shall be subject to the approval of the Engineer.

Crossing of houses, huts and other objects with thatched soft roofing is not allowed.

8.7 TESTS ON DISTRIBUTION LINE MATERIALS

8.7.1 Tests on ACSR Conductor

A) General

1) The Bidder shall clearly indicate the details of the testing facilities available at his works. For the tests, which the Bidder intends to conduct at outside recognised laboratories, the details of testing facilities available in these laboratories shall be indicated in the bid. Type, Acceptance, Routine tests and Tests during manufacture shall be carried-out on the conductor.

2) Type Tests shall mean those tests, which are to be carried out to prove the process of manufacture and general conformity of the material to this specification. These tests shall be carried out on samples prior to commencement of commercial production against the order. The Bidder shall indicate his schedule for carrying out these tests.

3) Tests during Manufacture shall mean those tests which are to be carried out during the process of manufacture and inspection by the supplier to ensure the desired quality of the end product to be supplied by him.

4) Acceptance Tests shall mean those tests which are to be carried out on samples taken from each lot offered for pre-dispatch inspection, for the purposes of acceptance of that lot.

5) Routine Tests shall mean those tests, which are to be carried out on each strand/spool/length of the conductor to check requirements which are likely to vary during production.

6) The norms and procedure of sampling for these tests will be as per the Quality Assurance Programme to be mutually agreed to by the Supplier and the Emloyer/Engineer.

7) The standards and norms to which these tests will be carried out are as per IS:398 (Part-2). When a particular test is a specific requirement of this specification, the norms and procedure of the test shall be as specified in IS-398 (Part-2).

8) For all Type and Acceptance tests, the acceptance values shall be the values guaranteed by the Bidder in the guaranteed technical particulars of his proposal or the acceptance values specified in this specification, whichever is more stringent for that particular test.

B) Type Tests

Type test certificates of recognized test house for same size of conductor carried out earlier shall be acceptable if agreed to between the purchaser & the supplier. The following constitute the type tests.

a) Surface condition
b) Ultimate breaking load on stranding conductor :-

Circles perpendicular to the axis of the conductor shall be marked at two places on a sample of conductor of minimum 5 m length suitably compressed with dead end clamps at either end. The load shall be increased at a steady rate upto 50% breaking load and held for one minute. The circles drawn shall not be distorted due to relative movement of strands. Thereafter the load shall be increased at steady rate to 100% of the breaking load and held for one minute. The conductor sample shall not fail during this period. The applied load shall then be increased until the failing load is reached and the value recorded.

c) Stress strain Test
d) Measurement of diameter of individual aluminium & steel wires
e) Measurement of lay ratio
f) Breaking load of individual wires
g) Ductility test :-

The test procedures shall be as per clause No. 13.4.1 and 14.6.2 of IS:398 (Part-2) – 1996. In torsion test, the number of complete twists before fracture shall not be less than 18 on a length equal to 100 times the standard diameter of the strand before stranding and should not be less than 16 after stranding.

h) Wrapping test
i) D.C. Resistance test :-

On a conductor sample of minimum 5 m length two contact-clamps shall be fixed with a pre-determined bolt torque. The resistance shall be measured by a Kelvin Double Bridge by placing the clamps initially zero meter and subsequently one meter apart. The test shall be repeated at least five times and the average value recorded. The value obtained shall be corrected to the value at 20°C as per clause No. 13.6 of IS:398-(Part-2)-1996. The resistance corrected at 20° C shall conform to the requirements of this specification.

j) Galvanising test

C Routine Tests

a) Check to ensure that the joints are as per specifications.
b) Check that there are no cuts, fins etc. on the strands.
c) Check that drums are as per IS:1778-1980
d) All acceptance tests as mentioned

D Acceptance Test

a) Measurement of diameter of individual aluminium & steel wires.
b) Measurement of lay ratio
c) Breaking load of individual wires
d) Ductibity test
e) Wrapping test
f) Resistance test
g) Galvanising test
h) Visual & dimensional check of drum
i) Check for conductor surface, declared length & weight, sketches etc. Out of each lot offered, at least two drums shall be rewound in the presence of the inspector. The inspector shall visually check for.

   i) Scratches, joints etc. and that the conductor generally conform to the requirements of this specifications.
   ii) Detailed length and weight of the conductor drum.

E) Chemical Analysis of Zinc

Samples taken from the zinc ingots shall be chemically/spectrographically analyzed. The same shall be in conformity to the requirements stated in the specification.

F) Chemical Analysis of Aluminium and Steel

Samples taken from the Aluminium ingots/coils/strands shall be chemically/spectrographically analysed. The same shall be in conformity to the requirements stated in this specification.

8.7.2 Tests on Tubular Poles

The finished poles shall be supplied as well as tested as per IS:2713-1980 for the following:

a) Tensile test and chemical analysis for sulphur and phosphorous;

b) Deflection test;

c) Permanent set test; and

d) Drop test

The selection of poles for sample test shall be as per IS:2713-1980.

The retest on poles shall be performed as per IS:2713 and on structural as per, relevant Indian Standard Specification.

8.7.3 Tests on Insulators

1) The insulator discs and complete insulator strings shall be tested in accordance with IS:731-1971.

Insulator string hardware and locking devices for ball and socket coupling of insulator discs shall be subject to the tests as per IS:2486 (Part-1 and Part-4). The slip strength test for suspension clamps (where armour rods are used) will be conducted with armour rods installed on the conductor.

2) Tests

The following tests shall be conducted on a suitable number of individual discs, components, materials and complete strings. These tests shall be conducted as per procedure laid down in the relevant Indian Standards or IEC.

I) Type Tests

The type test certificates of the following tests shall be supplied along with the Bid by the manufacturer as per IS:731-1971 or as listed below :

a) Visual examination
b) Verification of dimensions
c) Visible discharge test
d) Impulse voltage withstand test
e) Wet power frequency voltage withstand test
f) Temperature cycle test
g) 24 hours mechanical strength test
h) Galvanising test
i) Metallurgical test
j) Eccentricity test for disc insulators

II) Acceptance Test

For Disc Insulator

a) Verification of dimensions
b) Temperature cycle test
c) Galvanising test
d) Puncture test
e) Electro-mechanical failing load test
f) Test on locking device for ball and socket coupling
g) Visual discharge test
h) Porosity test

III) Acceptance Tests on the Complete Insulator String with Hardware fittings :

a) Power frequency voltage withstand and flashover test with arcing horns.
   i) Dry
   ii) Wet
b) Voltage distribution test
c) Mechanical strength test
d) Vibration test
e) Thermal mechanical performance test and mechanical performance strength test
f) Impulse voltage withstand test
g) Visual examination
h) Verification of dimensions
i) Visible discharge test
j) Wet Power Frequency Voltage withstand test

k) Galvanising test

IV) Routine Test for disc insulators

a) Visual inspection
b) Mechanical routine tests
c) Electrical routine tests

V) Tests during Manufacture

On all components as applicable :

a) Chemical analysis of zinc used for galvanising.
b) Chemical analysis, mechanical and metallographic tests and magnetic particle inspection for malleable castings.
c) Chemical analysis, hardness tests and magnetic particle inspection for forging,
d) Hydraulic test on insulator shells.

3) In case of failure of the complete string or any item thereof in any of the tests, the manufacturer shall get the test repeated at his cost.

4) For type tests which involve the tests on the complete insulator string with hardware fittings, the manufacturer of hardware fittings shall supply the necessary number of sets of hardware fittings at the place of test free of cost.

5) Bidders shall indicate the laboratories in which they propose to conduct various tests. They shall ensure that the tests can be completed in these laboratories within the time schedule guaranteed by them in the appropriate schedule.

6) The entire cost of testing for various tests specified herein shall be treated as included in the quoted unit price.

8.7.4 Tests on Hardware Fittings

The helically formed fittings for strain insulators shall be subjected to tests as per IS: 2048-1987 or equivalent. The other hardware fittings shall be tested as per IS:2486 (Part-I).

Fittings for Strain Insulators with Conventional Dead-end Clamps

I. Fittings for strain insulators with conventional dead-end clamps for use with tongue & clevis or ball & socket type insulators shall consist of the following components:

a) Cross arms strap conforming to IS:2486 (Pt.II)-1989 or equivalent.

II. Dead-end clamp made of aluminium alloy to suit 'DOG' ACSR conductors. The ultimate strength of the clamp shall not be less than 3000 Kg.

III. Tests

The fittings shall be subjected to type, routine and acceptance tests in accordance with the stipulations of IS:2486 (Pt.I) or equivalent.

2. String Insulator Fittings

I. The hardware fittings shall be suitable for ball and socket type insulator. Each hardware fitting shall be supplied complete in all respects.

II. The common snail type strain clamp shall be suitable for specified ACSR conductor.

III. The tension hardware with 3 or 4 bolts strain hardware shall have a minimum failing load, not less than 95% of strength of respective conductor.

IV. The bolted type strain clamps shall be :

A) Dog 3 bolted type

V. Suspension hardware fittings shall be :

a) Envelop type clamp and hardware for Dog conductor

VI. The envelop type suspension hardware suitable for Dog conductor shall have minimum failing load of 30 KN.

VII. The suspension clamp shall have slip strength not exceeding 20% of conductor rated strength. The conductor shall not slip at loads less than 12.5% of rated strength of conductor.

VIII. Designation

Ball and Socket Designation

The dimensions of the ball and socket shall be 16 mm designation wherever 70 kN disc insulator are used. The design should be in accordance with the standard dimensions stated in IS:2486-(Part-II)/IEC: 120. The dimensions shall be checked by the appropriate gauge after galvanising only.

IX. Security Clips and Split Pins

Security clips for use with ball and socket coupling shall be R-shaped, hump type which provides positive locking of the coupling as per IS:2486-(Pan-III)/ IEC : 372. The legs of the security clips shall be spread after assembly in the works to prevent complete withdrawal from the socket. The locking device should be resilient, corrosion resistant and of suitable mechanical strength. There shall be no risk of the locking device being displaced accidentally or being rotated when in position. Under no circumstances shall the split pins shall be used with bolts & nuts.

X. Suspension Assembly

a) The suspension clamp shall be designed to have maximum mobility in any direction and minimum moment of inertia so as to have minimum stress on the conductor in the case of oscillation of the same.

b) The suspension assembly shall be designed, manufactured and finished to give it a suitable shape, so as to avoid any possibility of hammering between suspension assembly and conductor due to vibration. The suspension assembly shall be smooth without any cuts, grooves, abrasions, projections, ridges or excrescence which might damage the conductor.

c) The suspension assembly/clamp shall be designed so that it shall minimize the static & dynamic stress developed in the conductor under various loading conditions as well as during wind induced conductor vibrations. It shall also withstand power arcs.

XI. Envelope Type Suspension Clamp

The seat of the envelope type suspension clamp shall be smoothly rounded & suitably curved at the ends. The lip edges shall have rounded head. There shall be

at least two V-bolts for tightening of clamp body and keeper pieces together. Hexagonal bolts and nuts with split-pins shall be used for attachment of the clamp.

XII. Fasteners: Bolts, Nuts and Washers

a) All bolts and nuts shall conform to IS:6639. All bolts and nuts shall be galvanised as per IS-1367 - (Part 13)/IS-2629. All bolts and nuts shall have hexagonal heads, the heads being forged out of solid truly concentric, and square with the shank, which must be perfectly straight.

b) Bolts upto M 16 and having length upto 10 times the diameter of the bolt should be manufactured by cold forging and thread rolling process to obtain good and reliable mechanical properties and effective dimensional control. The shear strength of bolt for 5.6 grade should be 310 MPa minimum as per IS-.12427. Bolts should be provided with washer face in accordance with IS: 1363 Part-I to ensure proper bearing.

c) Nuts should be double chamfered as per the requirement of IS: 1363 Part-III 1984. It should be ensured by the manufacturer that nuts should not be over tapped beyond 0.4 mm oversize on effective diameter for size upto M 16.

d) Fully threaded bolts shall not be used. The length of the bolt shall be such that the threaded portion shall not extend into the place of contact of the component parts.

e) All bolts shall be threaded to take the full depth of the nuts and threaded enough to permit the firm gripping of the component parts but no further. It shall be ensured that the threaded portion of the bolt protrudes not less than 3 mm and not more than 8 mm when fully tightened. All nuts shall fit and tight to the point where shank of the bolt connects to the head.

f) Flat washers and spring washers shall be provided wherever necessary and shall be of positive lock type. Spring wasilers shall be electro-galvanised. The thickness of washers shall conform to IS:2016.

g) The Bidder shall furnish bolt schedules giving thickness of components connected the nut and the washer and the length of shank and the threaded portion of bolts and size of holes and any other special details of this nature.

h) To obviate bending stress in bolt, it shall not connect aggregate thickness more than three time its diameter.

i) Bolts at the joints shall be so staggered that nuts may be tightened with spanners without fouling.

j) To ensure effective in-process Quality control it is essential that the manufacturer should have all the testing facilities for tests like weight of zinc coating, shear strength, other testing facilities etc, inhouse. The manufacturer should also have proper Quality Assurance system which should be in line with the requirement of this specification and IS- 14000 services Quality System standard.

k) Fastners of grade higher than 8.8 are not to be used.

XIII. Tests

Type Tests

(a) Visual examination
(b) Verification of dimensions
(c) Slip strength test
(d) Heating cycle test
(e) Mechanical strength test
(f) Electrical Resistance test

Acceptance Tests

(a) Visual examination
(b) Verification of dimensions
(c) Galvanising/Electroplating test
(d) Mechanical strength test of each component
(e) Mechanical strength test of welded joint
(f) Chemical analysis, hardness tests, grain size, inclusion rating & magnetic particle inspection for forgings/castings
(g) Clamp slip strength Vs Torque test for suspension clamp

Routine Tests

(a) Visual examination
(b) Proof Load Test

8.7.5 Tests on Isolators

8.7.5.1 Type Tests

The type tests should be carried out in accordance with IS:9921. However, for guidance of the tenderer, different type tests are mentioned below :

a) Temperature rise test (for contacts & terminals)
b) Measurement of Resistance of Main Circuit
c) Short Circuit current carrying capability for 1 second. The short time current rating for 1 second should be 18 kA.
d) Dielectric test
e) Mainly active load breaking capacity test
f) Transformer off-load breaking capacity test
g) Line charging breaking capacity test
h) Cable charging breaking capacity test
i) Operation & mechanical endurance test

Type test certificates shall be submitted if these are already carried out by the manufacturers on the similar A.B. Switches for acceptance.

8.7.5.2 Acceptance tests for complete Isolators

The following shall be acceptance tests for complete Isolators :

a) Temperature rise test as per IS:9921.
b) Measurement of resistance of the Main Circuit.
c) Power frequency voltage (Dry) test on Main circuit.
d) Verification of dimensions.
e) Mechanical test on post insulators as per IS:2544.
f) Galvanizing test as per IS:2544.

The post insulator shall be inspected at the works of the original manufacturer of post insulators. The A.B. Switch shall be supplied duly assembled.

8.7.5.3 Routine Tests

Every switch manufactured will be subjected to routine test as per IS mentioned below :

i) Power frequency voltage test (Dry) on isolators which are completely assembled at Manufacturer's works.
ii) Measurement of resistance of the main circuit.
iii) Tests to prove satisfactory operation.

11kV DISTRIBUTION LINE at RAHUGHAT (Annexure I)

BILL OF QUANTITY

Project : 220 kV AIS S/S AT RAHUGHAT HYDRO ELECTRIC PROJECT (2X20MW) **31/10/2023**

Customer' Engineer WAPCOS Ltd.

Customer RGHPL, NEPAL

S. No.	Item / Work description	Unit	Quantity	Remarks
1	**Survey**			
1.1	**Detailed Survey**: Carrying out detailed survey including modification in preliminary route alignment, site clearance/ jungle clearing/tree cutting to make approach for survey work, adjustment in section details to achieve better average span, profiling, collecting actual field data along the selected route (marking of salient land features like crossing of rivers, nalla, road, railway lines, other transmission / distribution line, nearby habitations, forest land, hills, proximity to airport, nearby buildings/structures etc.), Pole spotting & providing Pole schedule, sag template, tree enumeration, etc. & submission of detailed survey report alongwith route profile drawing, all complete as per technical specification & directions of Engineer-in-charge including its approval from BHEL/Customer's Engineer/Customer.	km	12.5	
1.2	**Check survey**: Carrying out check-survey for route alignment to locate and peg mark pole positions conforming to approved profile, pole schedule and technical specifications. Changes, if required in pole schedule after detailed survey, shall be carried out and thereafter submit revised pole schedule for approval. The pole schedule shall show co-ordinates of all poles, type of poles, span length, type of foundation for each pole and the deviation. (Check survey to be done jointly in presence of civil work agency)	km	12.5	
2	**Geo-Technical Investigation & Soil Resistively Meassurements**			
2.1	Conducting detailed soil investigation at various Pole locations and at other locations as per instruction of BHEL/Customer including mobilization of necessary equipment, providing necessary engineering supervision and technical personnel, carrying out field investigation and tests, laboratory tests, analysis and interpretation of data and results and working out tentative quantity of foundation work, preparations for the type of foundations and the safe bearing capacity for different sizes of foundations, different foundation strata for the various locations along the distribution lines all complete, submission of report as per project specific specification & directions of BHEL including its approval from BHEL/Customer's Engineer/Customer Boreholes (upto 7M depth or refusal)	per nos.	2	
2.2	Performing soil resistivity along the route for each Pole location and working out tentative quantity of earthing material all complete as per project specific specification & directions of BHEL including its approval from BHEL/Customer's Engineer/Customer	per location	2	
3	**Design/Drawing of Transmission Line Pole (Tubular) Structures including Extensions**			
3.1	Preparation & submission of design documents structural drawings for Pole Structure (11 kV) including bill of materials of all members including their approval from BHEL/Customer's Engineer/Customer all complete as per project specific specification & directions of BHEL.	Per Type	4	Tentatively considering 4 types of Poles
4	**Design/Drawing of Transmission Line Tower Foundations**			
4.1	Preparation & submission of design documents & drawing for Pole structure (11 kV) foundation based on approved loads on foundations & Bearing Capacity of 10T/sqm. all complete as per project specific specification & directions of BHEL including their approval from BHEL/Customer's Engineer/Customer.	Per Type	4	Tentatively considering 4 types of Poles
4.2	Preparation & submission of design documents & drawing for Pole structure (11 kV) based on approved loads on foundations & soil data all complete as per project specific specification & directions of BHEL including their approval from BHEL/Customer's Engineer/Customer.	Per Type(For Each Soil Type)	4	Tentatively considering 2 types of Poles & 2 Type of Soil
5	**Design and engineering - All Other Documents**			
5.1	Other documents: Preparation and submission including its approval from BHEL/Customer's Engineer/Customer of the following : (a)Bill of Material for distribution line material including conductor, conductor accessories, earthwire, ADSS Optical Fiber Cable, earth wire/OPGW accessories, ADSS Optical Fiber Cable accessories, stringing hardware, pin insulators, disc insulators etc (b) Erection Key Diagram of each line, (c) Stringing chart of all spans for conductor, earth wire, ADSS cable etc., including damper placement chart as applicable. (d) Earthing details of Poles (e) Design basis report of distribution line (f) Any other drawing/documents required for successful completion of the work.	Lot	1	
6	**Visit to Site/BHEL's Office/ Customer's Engineer office/Customer's office/Supplier's Works - For Approval/Review Meetings**			
6.1	Lump sum allowance per day including boarding, lodging, local conveyance, etc., all inclusive. (BHEL shall pay to & fro Ist AC fare from Bidder's headquarters to nearest railway station to Site/BHEL's Office/Customer's Engineer office/Customer's Office/Supplier's Works for each visit separately).	per day	10	

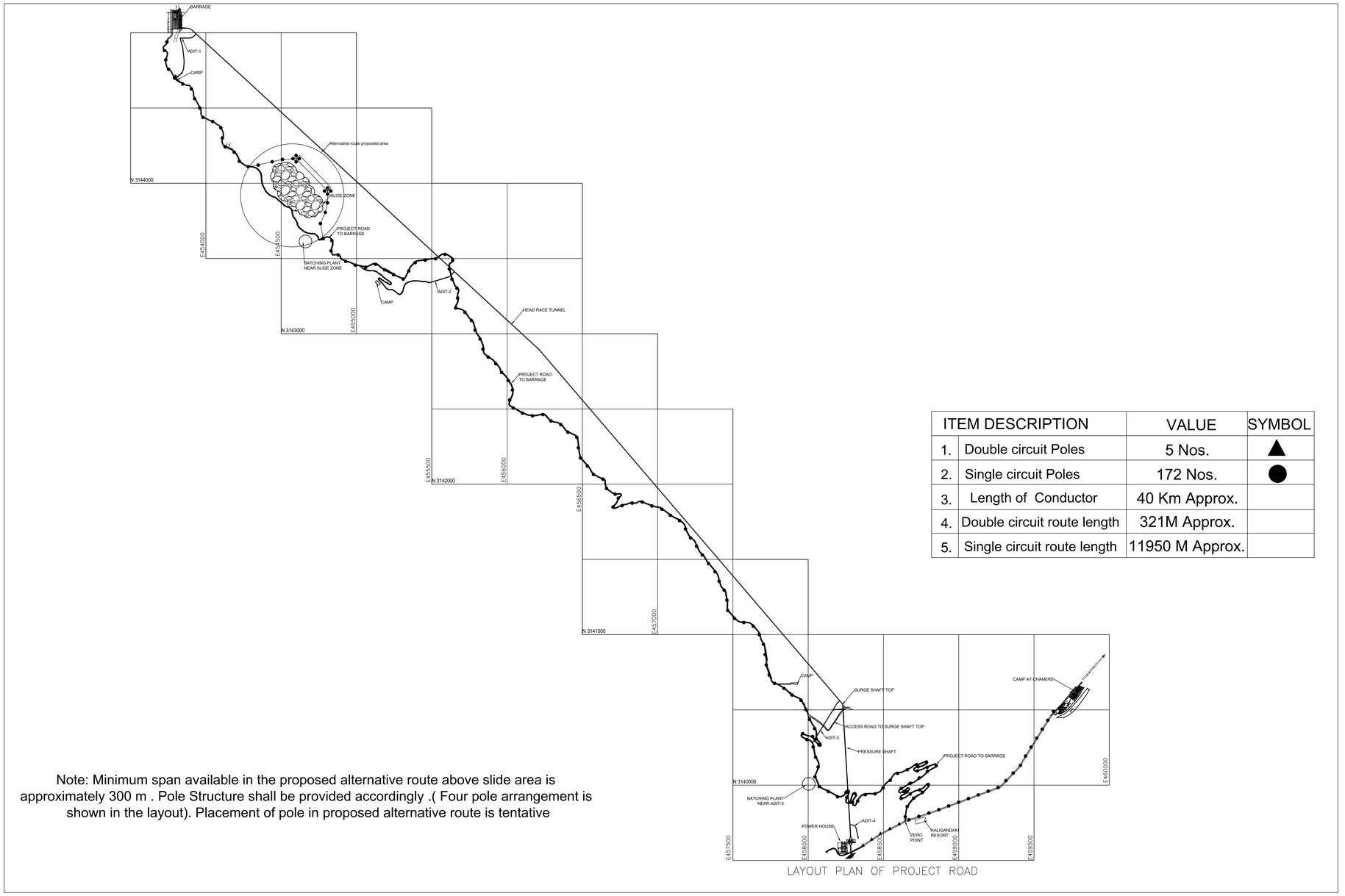
Notes

1. Any material/services required for successful completion of the project but not covered in the BOQ shall be deemed to be included in the scope of contractor without any cost implications to BHEL. The bidder is advised to visit site before submission of bid.
2. The quantities mentioned in the BOQ are tentative and may undergo a change to any extent for individual items.
3. The scope of bidder is for complete design of 11kv distribution system. Any re-design, modifications, extensions required in pole structure/foundation/route during pole testing or site execution is deemed to be included in above design work.
4. Cumulative length of distribution line route is considered approx. 12.5 km as per annexure II. The final measurement for survey shall be of line route length irrespective of number of circuits.

DRAWING No. TB-0-410-316-002A

ANNEXURE II

PRELIMINARY ROUTE SURVEY DRAWING



LAYOUT PLAN OF PROJECT ROAD

ITEM DESCRIPTION		VALUE	SYMBOL
1.	Double circuit Poles	5 Nos.	▲
2.	Single circuit Poles	172 Nos.	●
3.	Length of Conductor	40 Km Approx.	
4.	Double circuit route length	321M Approx.	
5.	Single circuit route length	11950 M Approx.	

Note: Minimum span available in the proposed alternative route above slide area is approximately 300 m . Pole Structure shall be provided accordingly .(Four pole arrangement is shown in the layout). Placement of pole in proposed alternative route is tentative

COMPUTER DRG. PATH NAME :

NOA NO.	WAP/HYDRO/BHEL-RAGHUGHAT/NP/2019/266 DATED 04.12.19
ADDITIONAL INFORMATION W.O.No.	
STATUS OF DRAWING	
DISTRIBUTION OF PRINTS	

ग्राहक/परियोजना का नाम RAGHUGANGA POWER LIMITED
NAME OF CUSTOMER/PROJECT RAGHUGHAT HYDRO ELECTRIC PROJECT (2X20MW)

भारत हेवी इलेक्ट्रिकल्स लिमिटेड
ट्रांसमिशन परियोजना विभाग
BHARAT HEAVY ELECTRICALS LTD.
TRANSMISSION PROJECTS DIVISION

	नाम /NAME	हस्ता./SIGN.	दि./DATE
बनाया DRAWN	SY		22-02-23
जांचा CHECKED	NS		22-02-23
स्वीकृत APPROVED	SKS		22-02-23

विभाग DEPT. | कोड CODE | अनुपात / SCALE | कार्ड कोड CARD CODE

CONSULTANT
WAPCOS LIMITED

शीर्षक/TITLE
11kV Distribution Line- Preliminary Route Survey Drawing

ड्राईंग क्र./DRAWING NO.
CUST. DRG. NO. TB-0-410-316-002A
BHEL DRG NO.

पुनः/REV. 00

पृष्ठ क्र./SHEET No. 01 | अगला पृष्ठ /NEXT SHEET --

REV.	DATE	ALTERED / CHECKED / APPROVED	ZONE
A			
B			
C			
D			
E			
F			
G			
H			

INVENTORY No. | SIGN. & DATE | REF. DRG. No.

12 10 | 9 | 8 | 7 | 6 | 5

BHARAT HEAVY ELECTRICALS LIMITED
TRANSMISSION BUSINESS HVDC & SYSTEMS

DOCUMENT No.	TB-409-316-000	Rev. No.	00		Prepared	Checked	Approved
TYPE OF DOC.	TECHNICAL SPECIFICATION			SIGN			
TITLE	GENERAL TECHNICAL REQUIREMENTS-SECTION 3			NAME	NS	NK	SKS
				DATE	05.07.23	05.07.23	05.07.23
				GROUP	TBEM	W.O. No	

CUSTOMER/ ENGINEER	Raghuganga Hydropower Limited, NEPAL/WAPCOS LTD.
PROJECT	**220 kV AIS S/S AT RAHUGHAT HYDRO ELECTRIC PROJECT (2X20MW)**
NOA NO.	**WAP/HYDRO/BHEL-RAGHUGHAT/NP/2019/266 DATED 04.12.19**
Station	**RAHUGHAT, NEPAL**

Rev No.	Date	Altered	Checked	Approved	REVISION DETAILS

Distribution	To	HVDC	TBMM	TBQM	Supplier
	Copies	1	1	1	4

GENERAL TECHNICAL REQUIREMENTS-SECTION 3

Site Information

S.No.	Particular	Details
a)	Customer	Raghuganga Hydropower Limited, Nepal
b)	Engineer	WAPCOS Ltd.
c)	Project Title	220 kV AIS S/S AT RAHUGHAT HYDRO ELECTRIC PROJECT (2X20MW)
d)	Location	Rahughat Hydroelectric Project (RGHEP) is located between the Latitudes 28°22'21" to 28°25'45"N and the Longitudes 83˚31'13" to 83˚34'35"E in Myagdi District, Western Development Region, Nepal
e)	Transport Facilities	The project is 1060 Km from nearest Indian Port Kolkata and 360 Km from Raxaul (India)/ Birgunj (Nepal) via Narayanghat, Pokhara and Beni. The nearest railhead (broad-gauge) is Raxaul and nearest International Airport is Kathmandu which is about 300Km from the project site. The nearest airport to the project site is Pokhara. Access from Kolkata to the site is available by road or by combination of railway and road. The shortest access from the border to the site will be from Bhairahawa. The last rail connected point in India for this border point is Nautanawa. The road from Nautanwa to Pokhara, via Bhairahawa and Butwal is nearly 214 km long. Another possible access from India would be via Raxaul where there is a railway station with broad gauge line. The road from Raxaul to Pokhara passes via Birgunj, Hetauda and Narayanghat - Mugling, which is about 272 km long. The main access to the project site will be along the Pokhara – Baglung and Baglung –Jomsom highway. The Baglung – Jomsom highway passes or runs through Beni and Galeshwor.
SITE CONDITIONS		
a)	Max. ambient air temp.	40°C
b)	Min. ambient air temp.	0°C
c)	Max. design ambient temp.	40°C
d)	Design reference temp.	40°C
e)	Relative Humidity	Max. 70% - The equipment shall operate satisfactorily without deterioration in 90% humidity
f)	Special corrosion conditions	No
g)	Altitude above sea level	Less than 1000 meter above mean sea level (MSL)
h)	Seismic Zone	The design horizontal seismic coefficient for the project area is 0.2 for the design of all structures except Circuit Breaker.
WIND DATA		
	Wind velocity	47m/sec
Main Electrical Parameters:		
	Fault Levels:	245kV: 40kA for 1 sec
	Creepage Distance	25mm/kV for All Equipment

GENERAL TECHNICAL REQUIREMENTS-SECTION 3

INDEX

GENERAL TECHNICAL REQUIREMENTS-SECTION 3

1.0 FOREWORD

The provisions under this section are intended to supplement requirements for the materials, equipments and services covered under other sections of tender documents and are not exclusive.

The purpose of this section of the specification is to apprise the Bidder with the general requirements applicable as per requirements in section 1 and section 2 of technical specification.

The present directions are to be read in conjunction with the Particular Technical Specifications/General Technical Specifications/General Specifications/Technical Data Sheets/Tender Drawings and the Conditions of the Contract.

The Supplier shall note that the standards mentioned herein are not mutually exclusive or complete in themselves, but are intended to complement each other, with minimum repetition, to define the requirements of the Specification. In the event of a conflict between requirements of any two clauses of the Specification/ documents or requirements of different codes/ standards specified, the more stringent requirement as per the interpretation of the owner/engineer shall apply, unless confirmed otherwise by the owner/engineer in writing based on a written request from the Supplier.

In case of conflicting requirements between this document (General Technical Requirement Section 3) and equipment specification (Section 1 & Section 2), equipment specification shall prevail.

When specific requirements stipulated in the Specification exceed or change those required by the applicable standards, the stipulations of the Specification shall take precedence.

Unless specifically agreed to by the Purchaser prior to Award of Contract, the Work shall be in accordance with the standards indicated and the requirements of the Specification. The Supplier shall be held responsible for any deviation.

In case of conflict between the various standards, the decision of owner/engineer shall be binding & final.

2.0 GENERAL REQUIREMENT

The following words and expressions shall have the meanings hereby assigned to them throughout this document

"Employer/Owner" means Raghuganga Hydropower Limited, Nepal

“**Engineer**” means WAPCOS Limited, India

“Purchaser” means Bharat Heavy Electricals Limited

"Supplier/Manufacturer/Bidder" means the person or persons, firm or company assigned to execute the works as defined by the scope of supply, described here.

"Specification" refers to this document.

Any cost involved in vendor assessment/approval must be borne by the vendor himself.

2.1 The Supplier/Manufacturer shall furnish catalogues, engineering data, technical information, design documents, drawings etc., fully in conformity with the technical specification during detailed engineering.

2.2 It is recognised that the Bidder may have standardised on the use of certain components, materials, processes or procedures different from those specified herein. Alternate proposals offering similar equipment based on the manufacturer's standard practice will also be considered provided such proposals meet the specified designs, standard and performance requirements and are acceptable to Employer/Engineer.

2.3 Wherever a material or article is specified or defined by the name of a particular brand, Manufacturer or Vendor, the specific name mentioned shall be understood as establishing type, function and quality and not as limiting competition.

2.4 Equipment furnished shall be complete in every respect with all mountings, fittings, fixtures and standard accessories normally provided with such equipment and/or needed for erection, completion and safe operation of the equipment as required by applicable codes though they may not have been specifically detailed in the Technical Specifications unless included in the list of exclusions. Materials and components which are minor in nature and incidental to the requirement but not specifically stated in the specification, which are necessary for commissioning and satisfactory operation of the switchyard/ substation unless specifically excluded shall be deemed to be included in the scope of the specification and shall be supplied without any extra cost. All similar standard components/parts of similar standard equipment provided, shall be inter-changeable with one another.

2.5 The purpose of this section of the specification is to apprise the Bidder with the general technical requirements applicable to the works called for in enquiry which are covered under Lot 2-Electro Mechanical Works for the project.

2.6 The present directions are to be read in conjunction with Section 1 & Section 2 of the technical specification.

3.0 STANDARDS AND CODES

3.1 General

The Works shall comply with the relevant standards/codes/practices adopted in Nepal. Provided there is no conflict with these documents/practices, and unless otherwise stated, all parts of the Works shall comply with the relevant international standards and design codes. Unless otherwise specified, the standards and recommendations under which the equipment is to be designed, manufactured, transported or delivered, installed or constructed, tested and commissioned shall be the following:

EN/DIN = Euronorrn/Deutsches Institut fill- Normung
IEC = International Electro-technical Commission
ISO = International Standards Organization
VDI = Verein Deutscher Ingeniure
VDE = Verein Deutscher Elektrotechniker
NEMA = National Electrical Manufacturers Association
FEM = Federation Europeene de Manutention
USAS = United States of America Standards Institute
BSS = British Standard Specifications
IS = Indian Standard
JIS = Japanese Industrial Standard

It shall be understood that the latest revision or edition, including possible amendments in effect at the time of receipt of tenders shall apply.

No deviation from the standards shall be made subsequent to execution of the Contract without the written approval of the Engineer.

The Bidder shall clearly state in his bid documents as to which standards will be applicable in each and every case where alternatives have been left open in the specification. In case of no indication the most stringent standard requirements shall apply.

3.2 Standards and Codes Named in the Specification

Although the Works shall generally comply with international standards, any instruction in these Specifications that a particular aspect of the Works shall comply with a named code or standard shall take precedence and that particular aspect of the Works shall comply with the named code or standard.

3.3 Hierarchy of Standards

In the event of any conflict in standards, the hierarchy of standards shall be as follows, with the standards occurring first in the list taking precedence over any standards later in the list:

(i) Statutory regulations of Nepal
(ii) Standards named in the Technical Specifications
(iii) International Standards
(iv) Other Standards approved by the Employer/Engineer.

Where equipment is specified to a particular standard, the Bidder may supply equipment of an equivalent standard, if approved by the Engineer.

Immediately after the Contract Agreement is executed the Bidder shall supply an indexed list of all standards, codes and associated standards referred to, to which the Works will be performed. The standards in the English language shall be made available to the Employer/Engineer.

Bidder shall provide to site during the period of the site works the applicable Standards and Codes of Practice concerning the site works in general, and the field tests of materials and equipment in

particular. Two sets of these documents shall be provided by the Bidder to the Employer/Engineer.

3.4 Substitution of Standards and Design Codes

The Bidder may offer Works which comply with international standards, or internationally recognised national codes or standards, which differ from those specified. The Bidder, however, may offer Works which comply with the different standards or codes only if, when requested by the Engineer, he is able to demonstrate to the Engineer's satisfaction that the Works offered are equal or superior to that which would have resulted had the specified code or standard been used. This substitution of codes or standards than those specified will only be acceptable if the manufacturing organisation in question has extensive experience with the alternative code or standard offered.

Bidder offering Works or part of those Works to standards and codes, which differ from those specified shall declare the fact to the Engineer and the Bidder shall also supply to the Employer and Engineer, at his own cost, two copies in English of these relevant code or standard, which he proposes to substitute for that specified.

4.0 SERVICES TO BE PERFORMED BY THE EQUIPMENT BEING FURNISHED

4.1 The equipment furnished under this specification shall perform all its functions and operate satisfactorily without showing undue strain, restrike etc under over voltage conditions.

4.2 All equipments shall also perform satisfactorily under various other electrical, electromechanical and meteorological conditions of the site of installation.

4.3 All equipment shall be able to withstand all external and internal mechanical, thermal and electromechanical forces due to various factors like wind load, temperature variation, ice & snow, (wherever applicable) short circuit etc for the equipment.

4.4 The bidder shall design terminal connectors of the equipment taking into account various forces that are required to withstand.

4.5 The equipment shall also comply to the following:

a) To facilitate erection of equipment, all items to be assembled at site shall be “match marked”.

b) All piping, if any between equipment control cabinet/operating mechanism to marshalling box of the equipment, shall bear proper identification to facilitate the connection at site.

4.6 System Parameter

220kV System

SL No	Description of parameters	220kV System
1.	System operating voltage	220kV

2.	Maximum operating voltage of the system (rms)	245kV
3.	Rated frequency	50HZ
4.	No. of phase	3
5.	Rated Insulation levels	
i)	Full wave impulse withstand voltage (1.2/50 microsec.)	1050kVp
ii)	Switching impulse withstand voltage (250/2500 micro sec.) dry and wet	-
iii)	One minute power frequency dry withstand voltage (rms)	-
iv)	One minute power frequency dry and wet withstand voltage (rms)	460kV
6.	Corona extinction voltage	-
7.	Max. radio interference voltage for frequency between 0.5 MHz and 2 MHz	1000 µV at 156 kV rms
8.	Minimum creepage distance - for Equipment other than Insulator string	6125mm
	Minimum creepage distance - for Insulator String	As per requirement
9	Min. clearances	
i.	Phase to phase	**2100mm**
ii.	Phase to earth	**2100mm**
iii.	Sectional clearances	5000 mm
10.	Rated short circuit current for 1 sec. duration	40kA
11.	System neutral earthing	Effectively earthed

Notes:

1. The above parameters are applicable for installations up to an altitude of 1000m above mean sea level. For altitude exceeding 1000m, necessary altitude correction factor shall be applicable as per relevant IEC.

2. The insulation and RIV levels of the equipments shall be as per values given in the Technical Specification of respective equipment.

5.0 ENGINEERING DATA AND DRAWINGS

5.1 The Bidder shall supply the storage as well as Erection and Commissioning manuals for various equipment/systems under their scope of supply. The storage manuals should be received at site at least 15 days before arrival of each and every major equipment/system at site. The Operation and Maintenance Manuals shall be supplied well in advance before the Taking-Over Certificate is issued by the Engineer.

5.2 Drawings

5.2.1 Before manufacturing of the equipment and start of site construction works, the dimensioned drawings and diagrams, showing all details of the equipment and materials to be used as well as all arrangements related to the other works shall be submitted to the Engineer for approval and to the Employer simultaneously. In any case, these drawings shall be submitted well in advance to permit modifications to be made, if deemed to be necessary and /or as instructed by the Engineer without delaying the commencement of the works.
The drawings which are requested to be modified as necessary by the Engineer shall be resubmitted for approval. Submission of Design Calculations shall be accompanied with the copies of standards and references adopted. Claims of extension of time will not be permitted on account of the late submission of drawings to the Engineer or for delays caused by drawings being returned not approved and for re-submission by the Engineer. Drawings submitted for reference shall be submitted in the same manner as for the approved drawings. Should any modification is required the Engineer may instruct the Bidder to do so and the drawings so modified shall be resubmitted for approval.

It shall be understood however that approval of the drawing by the Engineer will not exonerate the Bidder from any of his liabilities under the Contract.

All drawings submitted for approval or sent to the Employer and/or the Engineer for any other reason shall be sent by registered mail with quickest possible mean. An electronic copy of the drawings shall also be delivered by e-mail.

A period of at least three weeks should be allowed for such approval and another one week for return mail.

After all items of the work have been manufactured and erected, electronic copy of drawings and calculation sheets as well as As-built Drawings (hard and soft copy) shall be submitted to the Employer and the Engineer.

As-built Drawings should be prepared and submitted promptly and as soon as one items of work involving some sub-system or system is erected and tested. Submission of such drawings should not wait till the complete plant is tested and commissioned.

5.3 Inspection and Test procedure

The Bidder shall submit to the Employer/Engineer for approval, during or immediately following the submission of drawings, inspection and test procedure to be performed during manufacture, erection and tests on completion. The Bidder shall also be required to submit photocopy of relevant codes of standards for testing.

Procedure shall define sequence of inspection and test, equipment preparation, operation procedures to be followed and, detailed procedure for conducting the inspection and tests, and moreover shall contain design values, technical particulars or any other standard data for testing which will be treated as the criteria for evaluation of each inspection or test. Procedure shall be separately prepared for the inspection and tests to be performed at the shop and at the Site, and submitted for approval.

5.4 Instruction Manuals

The Bidder shall submit to the Employer/Engineer for approval the instruction manuals concerning the correct manner of erection for the work as early as possible but well before despatch of the Equipment and those for the operation and maintenance not later than six months before Taking over of the Works, with special references to any recently developed features. Instruction manuals shall describe in detail erection procedure and use of all erection equipment and measurement devices. Procedure for assembling, adjusting, operating and dismantling of each component system and machine shall be described and illustrated.

Maintenance of each component shall be described in detail including the recommended frequency of inspections and lubrication. The instruction manuals shall include easily readable diagrammatic drawings of the equipment to facilitate understanding the descriptive information. The Bidder shall, in preparing the instruction manuals, take into account the lack of experience and familiarity of the operating personnel with this type of equipment. The instruction manuals shall include a complete list of all drawings prepared for this Contract, spare parts list, and a parts list for each component of item of equipment. The parts list shall include manufacturer's code and serial numbers and ordering instructions and shall be detailed as far as possible for only the equipment supplied.

5.5 Submission of Technical Documents

5.5.1 Numbers to be submitted

All technical documents to be submitted by the Bidder under the Contract, shall be submitted in the following number of copies:

Document		Distribution	
		Engineer	Employer
1	***General Technical Documents:***		
1.1	- Draft version for Approval	3 H + 1 E	3 H + 1 E
1.2	- Final version after Approval including correction	3 H + 1 E	3 H + 1 E
2	***As-built Drawings:***		
2.1	- Draft version for Approval	3 H + 1 E	3 H + 1 E
2.2	- Final version after Approval including corrections	2 H + 2 E	4 H + 2 E
3	***Operation and Maintenance Manuals:***		

	Document	Distribution	
		Engineer	Employer
3.1	- Preliminary version 112 days prior to commencement of Commissioning	3 H + 2 E	3 H + 1 E
3.2	- Final Draft version for Approval	3 H + 1 E	3 H + 1 E
3.3	- Final version after Approval including corrections	2 H + 2 E	4 H + 2 E
4	***Commissioning Manuals:***		
4.1	-Tentative version for Approval	3 H + 2 E	3 H + 1 E
4.2	- Final version after Approval including corrections	2 H + 2 E	4 H + 2 E

Key: H = hardcopy (paper or other as appropriate);
E= electronic copy, with fully open accessibility, editing and user capability, stored on CD or DVD or other approved electronic medium.

5.6 As-Built Drawings

The Bidder shall submit as-built drawings of the completed works to the Engineer/Employer immediately after commissioning but well before the expiration of Defect Liability Period. The numbers of copies shall be as described in Sub-Clause 5.5. The as-built drawings shall clearly show the details and dimensions of the permanent equipment/systems for which construction/manufacturing has been actually made, based on the changes of design from time to time as ordered by the Engineer or proposed by the Bidder and approved by the Employer/Engineer.

NOTE :

(1) The bidder may please note that all resubmissions must incorporate all comments given in the earlier submission by the Employer/Engineer or adequate justification for not incorporating the same must be submitted failing which the submission of documents is likely to be returned.

(2) All drawings should be submitted in softcopy/hardcopy form, however substation design drawings like SLD, GA, all layouts etc. shall also be submitted in AutoCAD Version. SLD, GA & layout drawings shall be submitted for the entire substation in case of substation extension also.

(3) If after the commissioning and initial operation of the substation, the instruction manuals require any modifications/additions/changes, the same shall be incorporated and the updated final instruction manuals shall be submitted by the Bidder to the Employer.

(4) The Bidder shall furnish to the Employer/Engineer catalogues of spare parts.

(5) All As-built drawings/documents shall be certified by site indicating the changes before final submission.

6.0 MATERIAL/ WORKMANSHIP

6.1 General Requirement

6.1.1 Where the specification does not contain references to workmanship, equipment, materials and components of the covered equipment, it is essential that the same must be new, of highest grade of the best quality of their kind, conforming to best engineering practice and suitable for the purpose for which they are intended.

All materials incorporated in the equipment supplied shall be new and of first-class commercial quality, free from defects and imperfections, and shall be of the classifications and grades designated.

Materials for various components including the standard are presented in Annexure 1.

All material, components, supplies and articles not manufactured by the Bidder shall be products of recognized and/or reputed manufacturers.

Samples of the materials contemplated for incorporation in the Works, together with performance capacity data and other significant information pertaining to the material shall be furnished to the Employer/Engineer for approval. Materials installed or used without such approval shall be at the risk of subsequent rejection.

Material tests shall be conducted at the manufacturer's premises or at other places agreeable to the Employer/Engineer, in accordance with the requirements of the DIN standards or other appropriate and agreed standards. The results of these tests shall be in such a form as to provide a means of determining compliance with the applicable specifications for the material tested.

Where the Bidder desires to use stock material not manufactured specifically for the Works, satisfactory evidence that such material conforms to the requirements stated in the Contract shall be furnished to the Employer/Engineer, in which case tests on these materials may be waived. In such a case it will be essential that the purchase, testing, marking and stocking of such material had been supervised by an established quality control system. Relevant documents in this regard would need to be submitted. The cost of performing all of the material tests and the supply of samples shall be fully borne by the Bidder.

6.1.2 In case where the equipment, materials or components are indicated in the specification as “similar” to any special standard, the Employer/Engineer shall decide upon the question of similarity. When required by the specification or when required by the Employer/Engineer the Bidder shall submit, for approval, all the information concerning the materials or components to be used in manufacture. Machinery, equipment, materials and components supplied, installed or used without such approval shall run the risk of subsequent rejection, it is to be understood that the cost as well as the time delay associated with the rejection shall be borne by the Bidder.

6.1.3 The design of the Works shall be such that installation, future expansions, replacements and general maintenance may be undertaken with a minimum of time and expenses. Each component shall be designed to be consistent with its duty and suitable factors of safety, subject to mutual agreements. All joints and fastenings shall be devised, constructed and documented so that the

component parts shall be accurately positioned and restrained to fulfil their required function. In general, screw threads shall be standard metric threads. The use of other thread forms will only be permitted when prior approval has been obtained from the Employer.

6.1.4 Whenever possible, all similar part of the Works shall be made to gauge and shall also be made interchangeable with similar parts. All spare parts shall also be interchangeable and shall be made of the same materials and workmanship as the corresponding parts of the Equipment supplied under the Specification. Where feasible, common component units shall be employed in different pieces of equipment in order to minimize spare parts stocking requirements. All equipment of the same type and rating shall be physically and electrically interchangeable.

6.1.5 All works shall be performed and completed in a thorough manner following the best modern practices in the manufacture of high-grade equipment. All works shall be performed by craftsmen skilled in their various trades.

Machining of renewable parts shall be accurate and to specific dimensions, so that replacements made as per drawing may readily be installed. Like parts and spare parts shall be interchangeable.

Drilled holes for bolts shall be accurately located and drilled to templates.

All work shall be performed so as to secure proper matching of adjoining unfinished surfaces. Where there is a large discrepancy between adjoining surfaces, these shall be chipped and ground smooth or machined to ensure proper alignment. Unfinished surfaces shall be true to these lines and dimensions shown on the drawings, and shall be ground so as to be free from projections and rough spots. Depressions and cavities not affecting the strength or usefulness of the parts may be filled in a manner approved by the Employer/Engineer.

The surface finish of all parts and components shall be in conformity with the respective strength, fit and service requirements. Surfaces to be machine finished shall be indicated on the shop drawings by corresponding symbols.

All electronic equipment shall be manufactured under the supervision of an established quality control system.

All materials and components used must have undergone thorough type testing and detailed verification tests in the Bidder's/manufacturer's laboratories on random samples to prove compliance with specified data which must be sufficiently stringent to guarantee trouble free service. For any material or component used, at least two approved suppliers must exist, whose products have been type tested. Under no circumstances materials or components shall be bought from suppliers not approved by the Engineer, except stock material for which requisite data/kept reports etc. as designed by the Engineer shall require to be submitted for approval.

All materials and components must pass requisite testing after receipt of materials. Such testing shall be made on each individual piece for active components.

For materials and passive components random sample testing according to an internationally accepted principle/practice shall be performed. Such testing shall be carried out by automatic testing circuits to a high degree.

A clear marking system must exist within the manufacturer's Quality Control System to identify good and faulty components and materials.

During manufacture of printed circuit boards or other sub-assemblies best use shall be made of automatic testing circuits at various stages of manufacture. Sufficient number of manufacturer's inspectors shall be present.

During final testing besides verification of pertinent data and characteristics, tolerances must be verified so that inter-changeability will be always assured between identical parts.

All-important sub-assemblies or complete apparatus shall be subject to a 100 hours burn-in phase (temperature plus voltage stress). Essential characteristics and tolerances shall be checked before and after this phase.

Detailed data sheets or type testing certificates must be made available of all sub-assemblies or complete apparatus.

6.1.6 Compatible makes and grades of oil shall be provided for applicable equipment under scope of supply.

Points requiring grease lubrication shall be provided with a sufficient number and easily accessible greasing nipples or boxes.

Lubrication oils and greases used throughout the works shall be of a make and grade readily and commercially available in Nepal.

The first filling of lubricating and insulation oil and grease (including flushing oil for all equipment supplied) plus an excess of ten (10) percent of the overall net quantity required shall be included in the supply. Extra oil, wherever asked as spare, shall also be supplied. The Bidder shall inform the Employer about the quantities of oil, grease and other lubricants to be kept in stock for three (3) years operation.

6.2 Provisions For Exposure to Hot and Humid climate

Outdoor equipment supplied under the specification shall be suitable for service and storage under tropical conditions of high temperature, high humidity, heavy rainfall and environment favourable to the growth of fungi and mildew. The indoor equipments located in non-air conditioned areas shall also be of same type.

6.2.1 Space Heaters

6.2.1.1 The heaters shall be suitable for continuous operation at 230V as supply voltage. On-off switch and fuse shall be provided.

6.2.1.2 One or more adequately rated thermostatically connected heaters shall be supplied to prevent condensation in any compartment. The heaters shall be installed in the compartment and electrical connections shall be made sufficiently away from below the heaters to minimize deterioration of supply wire insulation. The heaters shall be suitable to maintain the compartment temperature to prevent condensation.

6.2.2 FUNGI STATIC VARNISH

Besides the space heaters, special moisture and fungus resistant varnish shall be applied on parts which may be subjected or predisposed to the formation of fungi due to the presence or deposit of nutrient substances. The varnish shall not be applied to any surface of part where the treatment will interfere with the operation or performance of the equipment. Such surfaces or parts shall be protected against the application of the varnish.

6.2.3 Ventilation opening

Wherever ventilation is provided, the compartments shall have ventilation openings with fine wire mesh of brass to prevent the entry of insects and to reduce to a minimum the entry of dirt and dust.

6.2.4 Degree of Protection

The enclosures of the Control Cabinets, Junction boxes and Marshalling Boxes, panels etc. to be installed shall comply with following degree of protection as detailed here under:
a) Installed out door: IP- 55
b) Installed indoor in air conditioned area: IP-31
c) Installed in covered area: IP-52
d) Installed indoor in non-air conditioned area where possibility of entry of water is limited: IP-41.
e) For LT Switchgear (AC & DC distribution Boards): IP-52

The degree of protection shall be in accordance with IEC-60947 (Part-I)/ IEC-60529/Other International Standards. Type test report for IP-55 or higher degree of protection test, shall be submitted for approval.

6.3 NAMEPLATES, LABELS, VISUAL DISPLAY UNITS

6.3.1 All equipment and each major and auxiliary item of equipment shall have a permanently affixed nameplate, showing in a legible and durable manner the name and place of the manufacturer, model and serial number, year of manufacture, main characteristics of the component or item and other significant information in compliance with applicable standards.

Labels shall be provided for equipment and devices mounted on control boards, cabinets, desks and other places as required for proper identification, as well as for operational, functional and safety reasons. The labelling, size of label-plates and their location shall be subject to approval by the Employer/Engineer. A sample label-plate (with indication of material used) with lettering shall be submitted for this purpose.

Where necessary, cautionary and warning plates and signs, shall be provided. Nameplates and warning plates shall be in English and in Nepali Language. Labels and VDU (Visual Display Unit) texts shall be in English.

All data, name plates, duty labels and instruction plates on cubicles with equipment shall be

in English.

6.4 FIRST FILL OF CONSUMABLES, OIL AND LUBRICANTS

All the first fill of consumables such as oils, lubricants, filling compounds, touch up paints, soldering/brazing material for all copper piping of circuit breakers and essential chemicals etc. which will be required to put the equipment covered under the scope of the specifications, into operation, shall be furnished by the Bidder unless specifically excluded under the exclusions in these specifications and documents.

6.5 BOLTS, STUDS, NUTS, SCREWS ETC.

All bolts, studs, nuts, and screws shall have standard threads and be of high-quality steel.

All bolts, studs, nuts and screws (including their washers) shall be protected against corrosion or made of stainless steel if so specified in Particular Technical Specifications and especially if the screw shall be hexagonal in shape and machine faced.

Nuts, bolts and screws, which might become loose during operation, shall be locked in fastened position by means which shall be approved by the Engineer.

Additionally, bolts, thread ends and the like shall be protected against condensation water or adverse climatic conditions by protective non-metallic caps with locking edge and sealing lip.

7.0 DESIGN IMPROVEMENTS / COORDINATION

7.1 The Bidder shall not make any changes to the equipment or to the material to be incorporated in the Plant from those specified or implied in the technical specification without the written approval of the Employer/Engineer. Any changes to be made due to unavoidable reason shall improve the performance of the plant or at least shall be of the same standard with same performance. Any changes or alterations shall in no way be detrimental to the interest of the Employer and shall not result in any increase to the Contract Price.

7.2 Deleted.

7.3 The Bidder shall be responsible for the selection and design of appropriate equipments to provide the best co-ordinated performance of the entire system. The basic design requirements are detailed out in this Specification. The design of various components, sub-assemblies and assemblies shall be so done that it facilitates easy field assembly and maintenance.

7.4 The Bidder has to coordinate designs and terminations with the agencies (if any) who are Engineer/Bidder for the Employer.

7.5 The Bidder will be called upon to attend design co-ordination meetings with the Engineer, other Bidder's and the Consultants of the Employer (if any) during the period of Contract. The Bidder shall attend such meetings at his own cost at mutually agreed venue as and when required and fully cooperate with such persons and agencies involved during those discussions.

8.0 QUALITY ASSURANCE PROGRAMME

8.1 The Bidder shall provide a complete description of the Quality Assurance system that he proposes to implement. The system shall include a quality assurance plan, quality assurance procedures and quality control procedures, in accordance with technical specification. An inspection and test plan for Electro-Mechanical equipment shall be provided. The plan and procedures shall cover the work of all subcontractors and sub vendors.

The Bidder and all of his suppliers or Sub-contractors shall have a fully established and efficient quality control system certified under IS09001. Should the Engineer, during his inspections or otherwise, determine that this system is not sufficiently effective, based on:

- formal errors in contradiction to the established procedures
- and/or manufacturing deficiencies and/or non-acceptable test results and missing tests
- The Engineer may, at his entire discretion and at full expense of the Bidder, impose such additional tests and inspections, as deemed necessary, to assure the quality of manufacturing and performance as stipulated by the terms of the Contract.

9.0 TYPE TEST

9.1 Type tests of major equipment/material/system as indicated under various chapters of the specifications shall be submitted with the bid, as applicable. For other major components, apparatus, equipment or devices, the Bidder shall submit complete type tests reports upon request by the Employer/Engineer. These test reports shall show that such tests have been successfully performed on same type and rating of apparatus, equipment or devices, appropriately witnessed by an independent institution.

If the Engineer shall find the tests incomplete or inconsistent with the provisions of the Contract, the Engineer shall be entitled to ask the Bidder, at the Bidder's expense, to carry out any of the type tests required in order to prove compliance with the requirements of the Contract.

In particular it must be proven by type tests that all dielectric, thermal and dynamic short circuit stresses as specified in the Contract will be met, that the permitted temperature rises will not be exceeded and that the required life times can be achieved.

The test results obtained on equivalent equipment shall be a confirmation of computer calculations if the Bidder wants to use calculations for proving of the guaranteed parameters of the equipment to be supplied.

10.0 TESTS AT MANUFACTURER'S WORKS

Before any material, equipment, aggregate, apparatus, systems etc. are packed or dispatched from the Bidder's or his Sub-contractor's works, all tests, inspections, checks, examinations, etc. required by the pertinent and internationally accepted standards, rules or codes shall be carried out, as far as practicable and agreed, in their premises.

All equipment, materials, aggregates, apparatus, systems and other parts or components of the works to be tested, inspected, checked, examined, etc. at the Bidder's or his Subcontractor's works shall be properly accessible for testing and inspection work. There shall be no interference or disturbance from other shop activities when conducting the tests and inspections.

It is to be understood that all equipment, materials, aggregates, apparatus, systems and other parts or components shall be adequately protected against weather whilst being tested, inspected, checked and examined.

Parts and components shall be assembled to the fairest possible and agreed extent, and dimensional checks shall be performed on all major assemblies, sub-assemblies, parts and components especially when close tolerances and fits are being involved (tolerance of shafts, clearance between stationary and moving parts, connecting dimensions for the assembly with other elements and supplies, combined functioning of electrical equipment/systems, etc.).

If dimensional checks show discrepancies in measurements, which may affect the fit transition clearances, assembly or dismantling of the respective part or component, immediate proper and workmanlike corrections or modification are a must.

Such corrections or modifications shall, however, in no way lead to reduction of reliability of operation or inter-changeability, and shall be performed only after the agreement of the Engineer has been obtained. If the correction or modification cannot be carried out in accordance with the terms mentioned above, the part or component concerned might be subject to rejection.

Doubtful, used, weak and faulty materials or products will also become automatically subject to rejection. Shop testing shall cover also the hydrostatic pressure testing of equipment, which can be finish-assembled in the Bidder's or his Sub-contractor's premises.

Standard equipment like circuit breakers and other apparatus shall be fully tested at the maker's works. If two or more identical items of such equipment are supplied, a complete performance test is to be carried out on the first unit only. Such performance test shall comprise the verification of rated and/or guaranteed data, like discharges against pressures, output, efficiency and other performance data requested in the specification. The corresponding test diagrams/procedures shall be provided. Subsequent units need to be tested only if test results obtained from the first unit prove doubtful or unsatisfactory.

Evidence and diagrams of previous "type-tests" undertaken on identical design of equipment like transformers, breakers and other apparatus may be acceptable instead of further complete performance tests, but the Engineer's approval must be sought in each case. A test at the rated performance point will, however, in any event be required.

Cubicles, cabinets and control boards shall, prior to their inspection and testing, be completely and definitely 'assembled, equipped and wired internally in the Bidder's or his Sub-contractor's shops.

Shop testing shall include functional tests on (as the case may be) partial or complete assemblies, as much as possible, as practicable and agreed. Such tests shall be performed under, as far as possible, operation-like conditions.

When requested by the Engineer the functional tests shall be repeated or extended until proof has been obtained that the functioning of the assemblies will comply with the requirements of the specifications.

11.0 PACKAGING & PROTECTION

11.1 General Requirement

11.1.1 The whole of the equipment/materials shall be packed or bundled properly so that no damage shall be sustained during transportation to the Site and by rough handling.

The contents of packing cases shall be securely bolted or fastened in position with struts or cross battens.

Wood-wool shall not be allowed for packing purposes.

Waterproof papers and felt linings shall overlap at seams and the seams secured together in an adequate manner, but the enclosure shall be provided with screened openings to obtain ventilation, wherever necessary.

All cases, packages, bundles, etc., shall bear at least the identification mark relating to the appropriate shipping documents, the contents and total weight.

Such shipping marks on the outside of casings or on the metal tags attached to bundles shall be protected by varnish etc.

Fragile or perishable materials shall be marked with the appropriate symbol, i.e. FRAGILE, HANDLE WITH CARE, COOL STORAGE and REEFER STORAGE and USE NO HOOKS.

When required due to length or unbalanced weight, containers or pieces shall have centre of balance indicated by painted stripe extending upward on each side with wording "CENTRE OF BALANCE".

Each case, package or bundle shall contain a packing list in a waterproof envelope and copies in triplicate shall be forwarded to the Employer/Engineer prior to dispatch. All items of material shall be clearly marked for easy identification against the packing list.

Dismantling shall be done into convenient sections, so that the weights and sizes are suitable for transport to Site and handling on the Site under the special conditions of the Project.

The Employer/Engineer reserves the right to inspect and approve the packing before the items are dispatched but the Bidder shall be entirely responsible for ensuring that the packing is suitable for transit and such inspection will not exonerate the Bidder from any loss or damage due to faulty packing.

11.1.2 All the equipments shall be suitably protected, coated, covered or boxed and crated to prevent damage or deterioration during transit, handling and storage at Site till the time of erection. On request of the Employer/Engineer, the Bidder shall also submit packing details/associated drawing for any equipment/material under his scope of supply, to facilitate the Employer to repack any equipment/material at a later date, in case the need arises. While packing all the materials, the limitation from the point of view of availability of Railway wagon sizes in India should be taken into account. The Bidder shall be responsible for any loss or damage during transportation, handling and storage due to improper packing. Any demurrage, wharfage and

other such charges claimed by the transporters, railways etc. shall be to the account of the Bidder. Employer takes no responsibility of the availability of the wagons.

11.1.3 All coated surfaces shall be protected against abrasion, impact, discolouration and any other damages. All exposed threaded portions shall be suitably protected with either a metallic or a non-metallic protecting device. All ends of all valves and pipings and conduit equipment connections shall be properly sealed with suitable devices to protect them from damage.

11.2 Marking

11.2.1 Shipping mark shall consist of the following information in sequence and in frame commensurate with the size of container:

(a) Consignee: The Managing Director
Raghuganga Hydropower Limited
Myagdi, Nepal
(b) Supplier's Identity
(c) Port of destination:
(d) Contract No:
(e) Package number:
(f) Item Code:
(g) Net and gross weight,
(h) Dimensions (cubic measurement):
(i) Markings for up right lifting:

12.0 FINISHING OF METAL SURFACES

The latest edition of the following codes, standards and specifications shall apply:

- SIS 055900 Swedish Corrosion Institute
- SSPC Steel Structures Painting Council
- DIN55928 DeutschesInstitut fill Normung
- BS 4232 British Standard
- ASTM Al23 American Society for Testing and Materials
- ASTM A153 American Society for Testing and Materials

12.1 All metal surfaces shall be subjected to treatment for anti-corrosion protection. All ferrous surfaces for external use unless otherwise stated elsewhere in the specification or specifically agreed, shall be hot-dip galvanized after fabrication. All steel conductors including those used for earthing/grounding (above ground level) shall also be galvanized.

12.2 GALVANISING

12.2.1 All materials shall be hot-dip galvanized after fabrication and cleaning. Re-tapping of nuts after galvanizing shall be is not required.

Galvanizing for structural mild steel products shall meet the requirements of ASTM A123.
All holes in structure shall be free of excess material after galvanizing.

Galvanizing for bolts, nuts, washers, lock nuts, step bolts and similar hardware shall meet requirements of ASTM A153. Excess galvanised material on bolts, nuts, washers, locknuts, step bolts and similar hardware shall be removed by appropriate means acceptable to Engineer.

Finished materials shall be dipped into the solution of dichromate after galvanizing for white rust protection during sea transportation.

Uniformity of Coating:

The uniformity of coating test shall be made in accordance with ASTM A239. The minimum repetition times for one-minute dip in uniformity test shall be as follows:

Steep shapes and plates	6
Bolts, nuts and similar hardware	4

Galvanizing Coating Weight

Description	Coating Weight (g/sq.m) Thickness		Uniformity test time (1 min. 1 time)
	Average Value	Minimum Value	
Shaped steel over 6mm	more than 700	more than 610	more than 6
Steel plates under 6mm	more than 610	more than 550	more than 6
Bolts. nuts & washers etc.	more than 470	more than 400	more than 4

Straightening after Galvanizing

All plates and shapes which have been warped by the galvanizing process shall be straightened by being re-rolled or pressed. The materials shall not be hammered or otherwise straightened in a manner that will injure the protective coating. If, in the opinion of Employer/Engineer, the material has been hard fully bent or warped in the process of galvanizing or fabrication, such defects shall be cause for rejection.

Repair of Galvanizing

Materials on which galvanizing has been damaged shall be acid stripped and re-galvanized, unless, in the opinion of Employer/Engineer, the damage is local and can be repaired by zinc spraying or by applying a coating of galvanizing repair compound. Where re-galvanizing is required, any member, which becomes damaged after having been dipped twice, shall be rejected.

12.2.2 Galvanised material must be transported properly to ensure that galvanised surfaces are not damaged during transit. Application of touch-up zinc rich paint at site shall be allowed with approval of Engineer Incharge.

12.3 PAINTING

12.3.1 The colours of painted external surfaces of equipment and structures shall be in accordance with the RAL, Colour Code. Coating shall be especially resistant to mechanical knocks, pressure

variations, temperature changes and vibrations, etc. For internal surfaces the Bidder shall avoid using contaminating fluids coming in contact with them.

12.3.2 All surfaces to be painted shall be thoroughly cleaned of all dirt, dust, grease, cement scale or oil before the application of paint. Oil and grease shall be removed with solvents not harmful to the surface. If required by the paint system, the surface shall be finally cleaned with water. Surfaces shall be dry unless dampening is required for a particular finish material. Any surface contaminated during paint application shall be re-cleaned thoroughly before painting is being continued.

12.3.3 Surface Preparation

All surfaces to be painted shall be thoroughly cleaned by suitable means before application of paint. After cleaning the surfaces will be rinsed so that no residue will remain. Primed surfaces contaminated with oil or grease shall be de-greased in a manner not affecting the quality of the primer. 2-component coatings older than six (6) months must be roughened prior to application of the next coat.

12.3.4 Finishing Coats

Whenever specific colouring is required or where priming is not sufficient protection against corrosion a finishing coat shall be applied. If not otherwise specified, finishing coats shall only be applied to primed surfaces. The primed surface shall be prepared as specified above in Sub-Clause12.3.3 Surface Preparation. Selection of finishing coats with regard to quality and quantity shall be governed by the ambient conditions and its effect on the painted surface.

The Engineer will select the type and shade of colouring in accordance with the RAL colour code. For this purpose the Bidder shall submit colour cards or colour samples. On request of the Engineer colour samples shall be applied to the surface to be painted. Colour selection and/or painting procedure limitations, will be duly considered by the Engineer as long as such limitations have been declared in the offer (Deviation Schedule) and accepted by the Employer/Engineer.

12.3.5 Painting Specification

The various items and equipment shall be protected against corrosion as specified in the following:
Wetted surfaces

All steel surfaces in contact with water etc. shall be protected as follows:
Surface preparation: B Sa 2 1/2 (SIS)
Prime coat: 1 x 2-component epoxy zinc rich primer
Dry film thickness 50 microns.
Finish coat: 2 x 2-component tar-epoxy, colour
black/brown/black
Dry film thickness 2 x 150 microns 300 microns
Total dry film thickness = 350 microns.

External surfaces

i. Not exposed to sunlight:

Surface preparation: B Sa 2 1/2 (SIS)

All such surfaces of breakers, etc. shall receive within two (2) hours after sand-blasting and mechanical cleaning of the respective surfaces up to the sound and base metal, one first layer of priming paint (minimum dry film thickness: 40 micrometers) followed by two (2) priming layers having a minimum dry film thickness of 30 micrometers each. All these layers shall be of red lead on chlorinated rubber/synthetic resin basis (minimum total dry film thickness: 100 micrometers). Final coating shall be with 2 finishing coats (minimum dry film thickness: 30 micrometers each) on chlorinated rubber/synthetic resin basis.

ii. All steel surfaces exposed to sunlight shall be protected as follows:

Surface preparation: B Sa 2 1/2 (SIS)

Prime coat: 2 x 2-component epoxy zinc rich primer
Dry film thickness 2 x 50 ie. 100 microns
Finish coat: 2 x 2-component epoxy m.i.o. paint.
Dry film thickness 2 x 50 ie. 100 microns
Total dry film thickness = 200 microns.

Oil tanks
Inside surfaces:
Surface preparation: B Sa 2 1/2 (SIS)
Finish coat: 2 x 2-component epoxy high build paint.
Dry film thickness 2 x 220 = 440 microns.

External surfaces:
As specified in above sections.

Indoor Cubicles and cabinets
After careful cleaning and degreasing all cubicles and cabinets shall be given an automatic "electrophorese" paint coating inside and outside as follows:
Steel sheets prepared with a Zn-Decordal coat shall receive 2 coats of 2-component Acryresin-varnish, each coat min. 30 microns.

13.0 LANGUAGE

English shall be understood to mean English as normally spoken and written in the United Kingdom. In all technical correspondence between the Bidder and the Employer/Engineer/BHEL and whenever anything is required under the terms of the Contract to be written, marked, or printed, the English language shall be used except where otherwise provided in the Specifications.

Warning and safety notices, plant labels and rating plates and all permanent or temporary notices around the plant shall be in English and in Nepali language, or as agreed with the Employer and Engineer.

Instruction Manuals and the training programmes shall be in English.

The visual display unit outputs given by the computer - driven data acquisition system shall be in English only.

14.0 TOOLS

14.1 Deleted

14.2 SPECIAL TOOLS AND TACKLES

The bidder shall supply all special tools and tackles required for Operation and maintenance of equipment. The special tools and tackles shall only cover items which are specifically required for the equipment offered and are proprietary in nature. The list of special tools and tackles, if any, shall be finalized during detail engineering and the same shall be supplied without any additional cost implication to the Employer. The maintenance equipment and special tools shall be supplied in lockable cabinet(s) fitted internally so that the tools may be safely stored in an orderly manner.

14.3 Deleted

15.0 AUXILIARY SUPPLY

15.1 The Electrical Power for Permanent Equipment

- 11kV, 50 Hz, three-phase system, solidly-earthed neutral, 11kV line from powerhouse to head works/valve chamber with inter connection of this line to the under construction 11kV line to camp (by tapping existing line running adjacent to switchyard)
- 400/230 V, 50 Hz, three-phase system with earthed neutral for feeding three-phase and single-phase loads for lighting, indication, motor control and similar small power circuits for power circuits.
- 400/230 V, 50 Hz, permanent supply, three phase/single phase, earthed (UPS).
- 110 V, DC system, isolated from earth, for the supply of auxiliary and main control circuits, DC motors, DC/AC inverters permanent supply etc.
- 48 V DC system, (by providing 110/48 V DC to DC converter), isolated from earth, for the supply of electronic equipment, tele-control, tele-communications, clock systems, etc.

15.2 Supply Tolerances

Parameters	400/230 V	UPS	110V DC	48V DC
Supply voltage Limits	±10%	±2%	+10/-15%	+10/-15%
Frequency Limits Steady	± 5%	± 1%		

16.0 SUPPORT STRUCTURE

16.1 The equipment support structures shall be suitable for equipment connections at the first level i.e 5.9 meter from plinth level for 220kV substations. All equipment support structures shall be supplied alongwith brackets, angles, stools etc. for attaching the operating mechanism, control cabinets & marshalling box (wherever applicable) etc.

16.2 The minimum vertical distance from the bottom of the lowest porcelain part of the bushing, porcelain enclosures or supporting insulators to the bottom of the equipment base, where it rests on the foundation pad shall be 2.55 metres.

17.0 CLAMPS AND CONNECTORS INCLUDING TERMINAL CONNECTORS

17.1 All power clamps and connectors shall conform to IS: 5561 or other equivalent international standard and shall be made of materials listed below:

S.No.	Description	Materials
a)	For connecting ACSR conductors/AAC conductors/ Aluminium tube	Aluminum alloy casting, conforming to designation A6 of IS:617 and all test shall conform to IS:617
b)	For connecting equipment terminals mad of copper with ACSR conductors/AAC conductors/ Aluminium tube	Bimetallic connectors made from aluminum alloy casting, conforming to designation A6 of IS:617 with 2mm thick bimetallic liner/strip and all test shall conform to IS:617
c)	For connecting G.I	Galvanised mild steel shield wire
d)	Bolts, nuts & plain washers	Electro-galvanised for sizes below M12, for others hot dip galvanised.
e)	Spring washers	Electro-galvanised mild steel suitable for atleast service condition-3 as per IS:1573

17.2 Necessary clamps and connectors shall be supplied for all equipment and connections. If corona rings are required to meet these requirements they shall be considered as part of that equipment and included in the scope of work.

17.3 Where copper to aluminum connections are required, bi-metallic clamps shall be used, which shall be properly designed to ensure that any deterioration of the connection is kept to a minimum and restricted to parts which are not current carrying or subjected to stress.

17.4 Low voltage connectors, grounding connectors and accessories for grounding all equipment as specified in each particular case, are also included in the scope of Work.

17.5 No current carrying part of any clamp shall be less than 10 mm thick. All ferrous parts shall be hot dip galvanised. Copper alloy liner/strip of minimum 2 mm thickness shall be cast integral with aluminum body or 2 mm thick bi-metallic liner/strips shall be provided for Bi-metallic clamps.

17.6 All casting shall be free from blow holes, surface blisters, cracks and cavities. All sharp edges and corners shall be blurred and rounded off.

17.7 Flexible connectors, braids or laminated straps made for the terminal clamps for bus posts shall be suitable for both expansion or through (fixed/sliding) type connection of IPS AL tube as required. In both the cases the clamp height (top of the mounting pad to centre line of the tube) should be same.

17.8 Current carrying parts (500A and above) of the clamp/connector shall be provided with minimum four numbers of bolts preferably for 132kV & above.

17.9 All current carrying parts shall be designed and manufactured to have minimum contact resistance.

17.10 Power Clamps and connectors shall be designed to control corona as per requirement.

17.11 Deleted

18.0 CONSTRUCTIONAL REQUIREMENTS FOR CUBICLES/PANEL BOARDS/CABINETS

Switchboards, control, relay and metering panel boards shall be of robust, industrial type design and manufacture, formed of a steel frame and covered with smooth steel plate. The steel plate shall be sufficiently thick and properly stiffened to prevent distortion. If required, flush mounted hinged steel doors with latches shall be provided. Doors shall be of lockable type by means of approved key-locks. The key-locks shall be of a key system identical throughout the power plant and switchyard/substation, as approved by the Engineer.

All cubicles shall be fully enclosed and protected according to the protection class given in the equipment specification. The lowest degree of protection shall be IP 40.

The frames of the cubicles shall be designed to permit firm anchoring on the floor or on the cable ducts or trenches. The frames shall permit easy erection, and allowance shall be made for extension of the cubicles in each direction with additional similar ones.

All cubicles and panel boards shall be properly designed for being inaccessible to rats, lizards or other small reptile or animals to avoid accidents/disturbances, mal-operation/faults.

The Bidder's supply shall include all necessary mounting brackets, framing, foundation bolts and related embedded metal works to permit proper installation of the cubicles.

The bottom parts of the cubicles must be closed with metal bottom plates and cable entrances must be fitted with glands.

19.0 TROPICALIZATION

In choosing materials and their finishes, due regard shall be given to the humid tropical conditions under which the power plant/switchyard will work. The Bidder shall submit, upon the Engineer's request, details of his practices which have proven satisfactory and which he recommends for application on the parts of the work which may be affected by the tropical conditions. The materials and finishes used shall be approved by the Employer/Engineer.

20.0 WIRING, TERMINAL BLOCKS AND MARKING

20.1 All wiring shall be stranded conductor, XLPE/PVC or equivalent insulated, suitable for operation at voltages below 1000 V in compliance with the provisions of the applicable IEC recommendations. An exception to minimum cross section requirements is the wiring and multi-core cabling of electronic equipment, where solid wires of smaller cross sections and modern means of connection like wire-wrap may be used.

For wiring within boards, the "bunch" pattern shall be adopted. For a small number of connections, wiring may be grouped using flexible plastic ties or equivalent, for a large number of connections a system using support strips or U-shaped troughs (with covers) shall be used. The latter arrangement shall apply in particular for cable distribution racks. All apparatus inside cubicles shall be clearly marked and identified.

For wiring of electronic equipment between racks and to terminals the front side pin and socket connection with flexible multi-core cables shall be the preferred method. The multicore cables shall be connected at the other end to terminal blocks in the cubicles.

All wiring leaving the cubicle shall be connected to terminal blocks, and shall be clearly marked with their respective destination points for easy testing and repair. These shall be of the moulded type and provided with barriers to separate power from control cables. Special precautions shall be observed for electronic equipment to avoid damage to the printed circuit boards during testing or maintenance and to avoid interference. It shall be possible to exchange a single terminal block for a new one without dismantling a whole row. Where appropriate terminal blocks shall be equipped with facilities for testing, such as short circuiting, separating, plugging-in etc. Terminal blocks shall be located at least 300 mm above the bottom of the cubicle and shall be easily accessible. They shall be clearly marked, the designations being those entered in the respective wiring diagrams.

Terminal blocks using screws acting directly on the wire (conductor) as well as spring type terminal blocks are not acceptable. To avoid squeezing of the wire the screw pressure shall be applied by a pressure plate having smooth edges.

21.0 LAMPS & SOCKETS

21.1 Lamps & Sockets
Shall be as per approved drawings.

21.2 Hand Lamp:
Shall be as per approved drawings.

21.3 Switches and Fuses:

21.3.1 Each panel shall be provided with necessary arrangements for receiving, distributing, isolating and fusing of DC and AC supplies for various control, signalling, lighting and space heater circuits. The incoming and sub-circuits shall be separately provided with miniature circuit breaker / switch fuse units. Selection of the main and Sub-circuit fuse ratings shall be such as to ensure selective clearance of sub-circuit faults. Potential circuits for relaying and metering shall be protected by HRC fuses.

21.3.2 All fuses shall be of HRC cartridge type conforming to relevant standard mounted on plug-in type fuse bases. Miniature circuit breakers with thermal protection and alarm contacts will also be accepted. All accessible live connection to fuse bases shall be adequately shrouded. Fuses shall have operation indicators for indicating blown fuse condition. Fuse carrier base shall have imprints of the fuse rating and voltage.

22.0 Bushings, Hollow Column Insulators, Support Insulators – (For Porcelain Type Only):

22.1 Deleted

22.2 Support insulators, bushings and hollow column insulators shall be manufactured from high quality porcelain, as applicable. Porcelain used shall be homogeneous, free from laminations, cavities and other flaws or imperfections that might affect the mechanical or dielectric quality and shall be thoroughly vitrified tough and impervious to moisture.

22.3 Glazing of the porcelain shall be uniform brown in colour, free from blisters, burrs and similar other defects.

22.4 Support insulators/bushings/hollow column insulators shall be designed to have ample insulation, mechanical strength and rigidity for the conditions under which they will be used.

22.5 When operating at normal rated voltage there shall be no electric discharge between the conductors and bushing which would cause corrosion or injury to conductors, insulators or supports by the formation of substances produced by chemical action. No radio interference shall be caused by the insulators/bushings when operating at the normal rated voltage.

22.6 Bushing porcelain shall be robust and capable of withstanding the internal pressures likely to occur in service. The design and location of clamps and the shape and the strength of the porcelain flange securing the bushing to the tank shall be such that there is no risk of fracture. All portions of the assembled porcelain enclosures and supports other than gaskets, which may in any way be exposed to the atmosphere shall be composed of completely non hygroscopic material such as metal or glazed porcelain.

22.7 All iron parts shall be hot dip galvanised and all joints shall be air tight. Surface of joints shall be trued up porcelain parts by grinding and metal parts by machining. Insulator/bushing design shall be such as to ensure a uniform compressive pressure on the joints.

22.8 Tests

In bushing, hollow column insulators and support insulators shall conform to type tests and shall be subjected to routine tests in accordance to relevant standard.

22.9 **Deleted**

23.0 MOTORS

For all electric power drives, three-phase, squirrel-cage type induction motors complying fully with IEC recommendations shall be used. All motors shall be of the totally enclosed, externally cooled (fan cooled) type IP44. Winding insulation shall be Class F throughout.

Starting shall be direct-on-line with starting currents not exceeding 6 times the rated current. However, for motors being large in relation to the feeding transformer, suitable automatic change-over starters shall be provided.

All motors shall be so designed that start-up can be affected successfully at 85% of the rated voltage of the motor. The motors shall be designed to operate continuously without overheating at 400 V ±10%.

Special attention shall be paid when designing the electric motors on account of the temporary frequency rises, which may arise in the motor feeding voltage during full load shedding of the turbines. The motors shall, therefore, be tested for over speeds of not less than 40% of their rated speed.

When connecting differing materials, material transition plates will, in general, be inserted. All connecting materials will be corrosion-proof and suitable for the conditions prevailing at the installation point.

Unless otherwise stipulated in Particular Technical Specification of all materials subject to penstock pressure shall have impact strength (Charpy V-notch) of not less than 35 J/crn^2 (at 0°C) whereby this figure shall be the minimum of each of 3 specimens. For steel plates this figure shall be understood for the transverse direction.

Materials for various components including the standard are presented below in the table.

Component	Material	Standard
Runners	G-X5 Cr Ni 13-4	(DIN No. 1.4313)
Labyrinth and wearing rings	G-X 22 Cr Ni 17	(DIN No, 1.4059)
Shafts	Ck 35	(DIN No. 1.1181)
Cast iron (depending on application)	GG-15 GG-20 GG-25 GG-30 GG-35	(DIN No. 0.6015) (DIN No. 0.6020) (DIN No. 0.6025) (DIN No. 0.6030) (DIN No. 0.6035)
Modular cast iron (depending on application)	GGG-40 GGG-50 GGG-60 GGG-70	(DIN No. 0.7040) (DIN No. 0.7050) (DIN No. 0.7060) (DIN No, 0.7070)
Malleable iron castings	GTW-35} GTW-40	as per DIN standard 1692
Carbon steel castings	GS-45.3 GS-52 GS-20 Mn 5	(DIN No. 1.0446) (DIN No. 1.0551) (DIN No. 1.1133)
Forged carbon steel flanges for up to 20 bars above 20 bars	 R St 37-2 R St 42-2	 (DIN No. 1.0114) (DIN No. 1.0134)
Cast steel flanges	GS 45	(DIN No, 1.0443)
Bolt material	5.6 8.8	As per DIN standard 67
Nut material	4.8 for 5.6 bolts 6.8 for 8.8 bolts	
Stainless steel bolts & nuts bolts nuts	 X20 Cr 13 X10 Cr 13	 (DIN No. 1.4021) (DIN No. 1.4006)
Steel plates (depending on application)	St 360-3 St 430-2 TT St E 26 TT St E 32	(DIN No. 1.0116 (DIN No. 1.0044) (Material No.1.046) (Material No.1.085)
(Note: Steel plates shall have the following characteristics: non ageing, notch-tough, killed, free from segregation and good weld-ability)		

Component	Material	Standard
Steel pipes	welded St 33-1 seamless St 35	(DIN No. 1.0033) (DIN No. 1.0308)
Seamless stainless pipes	X.5 Cr Ni 189 X20 Cr 13 X10 Cr Ni Ti 189	(DIN No. 1.4301) (DIN No. L4021) (DIN No. 1.4541)
Tin bronze	SnBz 6 SnBz 8 G-Cu Sn 10 G-Cu Sn 12	(DIN No. 2.1020) (DIN No. 2.1030) (DIN No. 2.1050.01) (DIN No. 2.1052.01)
Aluminium alloy bronze	G-Fe Al Bz F 50 G-Ni Al Bz F 60	(DIN No. 2.0940.01) (DIN No. 2.0975.01)
Gun metal	G-Cu *Sn 5* Zn Pb G-Cu Sn 10 Zn	(DIN No. 2.1096.01) (DIN No. 2. 1086.01)
Brass pipes	So Ms 58 AI 1	(DIN No. 2.0560)
Babbit Material (for bearings)	LgPbSn 10 LgPb*Sb*12 LgSn 80 LgSn 90	as per DIN standard 1703 (DIN No. 2.3770) (DIN No. 2.3775)

In particular for the mechanical parts of these equipment, the above material specifications shall be used wherever applicable.

All material, components, supplies and articles not manufactured by the Contractor shall be products of recognized and/or reputed manufacturers.

Samples of the materials contemplated for incorporation in the Works, together with performance capacity data and other significant information pertaining to the material shall be furnished to the Employer/Engineer for approval. Materials installed or used without such approval shall be at the risk of subsequent rejection.

Material tests shall be conducted at the manufacturer's premises or at other places agreeable to the Employer/Engineer, in accordance with the requirements of the DIN standards or other appropriate and agreed standards. The results of these tests shall be in such a form as to provide a means of determining compliance with the applicable specifications for the material tested.

Where the Contractor desires to use stock material not manufactured specifically for the Works, satisfactory evidence that such material conforms to the requirements stated in the Contract shall be furnished to the Employer/Engineer, in which case tests on these materials may be waived. In such a case it will be essential that the purchase, testing, marking and stocking of such material had been supervised by an established quality control system. Relevant documents in this regard would need to be submitted.

The cost of performing all of the material tests and the supply of samples shall be fully borne by the Contractor.

4.2.1.5 Cubicles (Marshalling Box) for Switchyard bays

4(four) cubicles, one for each bay for integrated connection of circuit breaker cubicles, instrument transformer cubicle and any interlocks. This cubicle is also intended to facilitate internal wiring for control circuits, measurements and signalling including terminal strips for external connections.

4.3 TECHNICAL REQUIREMENT

4.3.1 Information

The following Technical Specifications cover high-voltage switchgear equipment intended for outdoor installation, including related steel structures and non slip finish steel cable trench cover. One circuit of 220 kV double circuit transmission line from dana to Kushma (under the scope of separate Kaligandaki Transmission Corridor Project of NEA) shall be LILOed at take-off gantry in the switchyard. Layout of all equipment and foundation loads shall be as per requirement of the Contractor. However, all the foundation and other civil works including development or switchyard shall be under the scope of Lot 1 Contractor.

4.3.1.1 Applicable IEC Standards

60038	IEC standard voltages
60044	Instrument Transformers
60050	International Electro-technical Vocabulary
60060	High-voltage test techniques
60071	Insulation coordination
60099	Surge arresters
60104	Aluminium-magnesium-silicon alloy wire for overhead line conductors
60168	Tests on indoor and outdoor post insulators of ceramic material or glass for systems with nominal voltages greater than 1000 V
60265	High-voltage switches
60273	Characteristics of indoor and outdoor post insulators for systems with nominal voltages greater than 1000 V
60305	Characteristics of string insulator units of the cap and pin type
60358	Coupling capacitors and capacitive dividers
60383	Insulators for overhead lines with a nominal voltage above 1000 V
60427	Synthetic testing of high-voltage alternating current circuit-breakers
60437	Radio interference test on high-voltage insulators
60466	A.C. insulation-enclosed switchgear and control gear for rated voltages above 1 kV and up to and including 38 kV
60470	High-voltage alternating current contactors and contactor-based motor-starters

60471	Dimensions of clevis and tongue couplings of string insulator units
60507	Artificial pollution tests on high-voltage insulators to be used on a.c. systems
60575	Thermal-mechanical performance test and mechanical performance test on string insulator units
60694	Common specifications for high-voltage switchgear and controlgear standards
60720	Characteristics of line post insulators
60815	Guide for the selection of insulators in respect of polluted conditions
60865	Short-circuit currents - Calculation of effects
60889	Hard-drawn aluminium wire for overhead line conductors
60932	Additional requirements for enclosed switchgear and controlgear from 1 kV to 72.5 kV to be used in severe climatic conditions
61089	Round wire concentric lay overhead electrical stranded conductors
61109	Insulators for overhead lines-Composite suspension and tension insulators for AC systems with a normal voltage greater than 1000V-Definitions, test methods and acceptance criteria
61166	High-voltage alternating current circuit breakers - Guide for seismic qualification of high-voltage alternating current circuit-breakers
61633	High-voltage alternating current circuit breakers - Guide for short-circuit and switching test procedures for metal-enclosed and dead tank circuit breakers
61634	High-voltage switchgear and controlgear - Use and handling of sulphur hexafluoride (SF6) in high-voltage switchgear and controlgear
61958	High-voltage prefabricated switchgear and controlgear assemblies - Voltage presence indicating systems
62063	High-voltage switchgear and controlgear - The use of electronic and associated technologies in auxiliary equipment of switchgear and controlgear
62155	Hollow pressurized and unpressurized ceramic and glass insulators for use in electrical equipment with rated voltages greater than 1000 V
62271	High-voltage Switchgear and Controlgear

4.3.2 Switchyard Arrangement

4.3.2.1 Insulation clearances

Unless otherwise agreed between the Employer and the Contractor, the insulation clearances shall be as per applicable standard mentioned above.

bushings, clamps and connections, earth wires, operating devices, fixing materials, apparatus supports, galvanised steel structures for 220 kV lines in switchyard.

The "bid" shall include all associated equipment and accessories to complete the specified scope of works in existing site situations. Such costs (if any) shall be included in the relevant items in the Price Schedules.

The Contractor shall perform requisite power system studies to select short circuit ratings of bus bars/switchgears, impulse voltage ratings of switchgears etc. Requisite studies for appropriate location/characteristics for the surge arresters at various locations (near transformers, outgoing line bays etc.) in switchyard shall also be done by the bidder.

Design calculations for the outdoor tubular bus-bars, equipment support structures, take-off structures etc shall be provided after accounting for all the loadings including seismic and short circuit forces as per relevant standards.

The contractor shall submit detailed layout & sectional drawing of switchyard showing locations of transformers & firewalls, equipment/rigid busbars with bus post insulators/support structures, cable trenches, transformer soak pits, waste oil-water sump, power house approach road with embedded rails extending into service bay and to location of transformers, take-off gantry, fencing, gates etc.

4.2 EQUIPMENT SPECIFICATION

4.2.1 Switchyard Equipment

4.2.1.1 General

The configuration of the switchyard shall make it possible looping loop out arrangement in a single bus-bar arrangement within the confined place adjacent to the power house. The supply shall include steel structure necessary for equipment support as well as take off and internal gantry arrangement.

a) General arrangement has been shown in the Single Line Diagram of main circuit drawing No. RG-EL-015

b) Frequency: All switchgear and control shall be designed for a frequency of 50 Hz.
Insulation Level: The switchgear shall withstand the following voltages:

(1)	Full wave impulse- 1.2/50 micro-seconds	1050 kVp
(2)	Power frequency Dry for one minute	460 kV
(3)	Power frequency Wet for 1 minute	460 kV
(4)	Corona extinction voltage	156 kV

c) Insulating oil:
Insulation oil required for the oil filled electrical equipment to be furnished and installed under this section shall be of non-sludge and medium viscosity type. The

Contractor shall state the characteristics and standard of the insulation oil in his Tender. The proposed oil shall be available in Nepal.

d) Indicating lights:
Red indicating lights shall be used for "ON" position and green lights for "OFF" position. White indicating lights shall be use to indicate that a change in switch position

has been ordered and shall light up with red or green light indicating the switch position before the change. On completion of the change only red or green light will stay lit.

e) Name plates and escutcheon Plates:
All escutcheon plates shall be written in the English language.

f) Electric Supply

Electric supply for controls, drives and lights shall be as follows:

400-230 volt, A.C. three-phase, four wire system, from the station auxiliary supply covered under Chapter-8.

110 volt, D.C. from storage battery covered under Chapter-8.

g) Porcelain Insulator and Fittings:

The colour of porcelain insulators to be mounted inside cubicle or enclosure and for outdoor switchgear equipment shall be brown and the glazed surface shall be free from bulges, hairline cracks and other defects.

All fittings shall be of malleable iron hot dip galvanized or of copper alloy.

h) Electrical and Mechanical Design:

Switchgear equipment including rigid bus bars shall be designed electrically to avoid local corona formation and discharge likely to cause radio interference, and shall be designed mechanically to endure short circuit current without thermal and mechanical failure for two (2) seconds. All cubicles and enclosures shall be of vermin proof, dust gap proof and, where required of weatherproof.

i) Tests

The tests to be carried out before shipment at the Contractor's works are stated in the relevant Clauses herein. The tests at Site shall be carried out in accordance with Clause 33.9 of the General Technical Specification.

4.2.1.2 Busbars

a. 220 kV

The supply shall include one three-phase 220 kV tubular bus-bar assembly for min. 2000 A nominal current and 40/50 kA (as applicable) short circuit current, for the following connecting/circuits etc as per arrangement shown in switchyard layout drawing:

2 (two) incoming circuits from generator transformers,

2 (two) outgoing circuits for LILO of one circuit of 220 kV D/C Dana-Kushma line (under separate 220 kV Transmission Corridor Project),

3 (three) single phase voltage transformers connected to three phases of the bus with measuring and protection winding.

Ratio: $\frac{220}{\sqrt{3}} / \frac{0.11}{\sqrt{3}} / 0.11 kV$

4.2.1.3 Outgoing Circuits

Each of the two 220 kV circuits of Dana-Kushma LILO line shall have the following equipment:

- 3 single phase 220 kV circuit breakers (three separate poles equipped with single pole control mechanism) with the following ratings:

  Rated voltage 245 kV
  Rated current 1600 A
  Breaking capacity 40/50 kA

- 2(two) three-phase disconnecting switches and 1 (one) three phase earth switch
  Rated voltage 245 kV
  Rated current 1600 A
  Breaking capacity 40/50 kA
  Rated dynamic S.C
  Current withstand 100kAp

- 3 (three) single phase current transformers with measuring cores and protection cores (ratio, accuracy class as per SLD).

- 3 (three) single phase capacitor voltage transformers, three-phase connected.

  Ratio: $\frac{220}{\sqrt{3}} / \frac{0.11}{\sqrt{3}} / \frac{0.11}{\sqrt{3}} / 0.11 kV$

  Measuring winding Class 0.2
  Protection winding Class 0.2 & 3P

- 3 (three) lightning arresters with surge counters

4.2.1.4 Incoming Circuits

a) Each of the two incoming circuits from generator transformers shall have the following equipment:

- 1 (one) three phase circuit breaker
- 1 (one) three-phase disconnecting switch and 1 (one) three phase earth switch

} Ratings as per SLD

- 3 (three) single phase current transformers with measuring core and protection cores (ratio, accuracy class as per SLD).

FORMAT OF NO DEVIATION CERTIFICATE
(To be submitted in the bidder's letter head)

REF: ……. **Dated**…….

BHARAT HEAVY ELECTRICALS LIMITED,
TRANSMISSION BUSINESS GROUP,
Plot No- 25, Sector- 16A, Noida,
Distt. Gautambudh Nagar, UP-201301

SUBJECT: Tender for "Detailed Route Survey & Check Survey and Geotechnical Investigation along with design and Engineering works for 11kV Rahughat distribution line at 220kV AIS S/S Rahughat Hydro Electric Project (2X220 MW) in Nepal".

TENDER NO.: - TBSM/RAHUGHAT/SURVEY/TENDER/23-24 **Date: - 08.02.2024**

Dear Sir,

With reference to above, this is to confirm that as per tender conditions, we have visited subject site before submission of our offer and noted the job content & site conditions etc.

We also confirm that we have not changed / modified the tender documents as appeared in the website and in case of observance at any stage, it shall be treated as null and void. We hereby confirm that we have not taken any deviation from tender clauses together with other references as enumerated in the above referred NIT and we hereby convey our unqualified acceptance to all terms and conditions as stipulated in the tender and NIT. In the event of observance of any deviation in any part of our offer at a later date whether implicit or explicit, the deviations shall stand null & void.

We confirm to have submitted offer strictly in accordance with tender instructions.

Thanking you,

Yours faithfully,

(Signature, date & seal of authorized representative of the bidder)

DECLARATION FOR RELATION IN BHEL

(To be typed and submitted in the Letter Head of the Company/Firm of Bidder failing which the offer of Bidder is liable to be summarily rejected)

Ref: **Date……..**

To,
AGM/TBSM
BHARAT HEAVY ELECTRICALS LIMITED,
TRANSMISSION BUSINESS GROUP,
PLOT NO.-25, SECTOR-16A,
NOIDA – 201301 (U.P.)

Dear Sir,

Sub: Declaration for relation in BHEL

Ref: 1) NIT/Tender Specification No.: **TBSM/RAHUGHAT/SURVEY/TENDER/23-24,**
Date: - 08.02.2024

I/We hereby submit the following information pertaining to relation/relatives of Proprietor/ Partner(s)/Director(s) employed in BHEL

Tick (√) any one as applicable:

1. The Proprietor, Partner(s), Director(s) of our Company/Firm DO NOT have any relation or relatives employed in BHEL

OR

2. The Proprietor, Partner(s), or Director(s) of our Company / Firm HAVE relation / relatives employed in BHEL and their particulars are as below:

a)

b)

Signature of the Authorized Signatory

Note:

1) Attach separate sheet, if necessary.
2) If BHEL Management comes to know at a later date that the information furnished by the Bidder is false, BHEL reserves the right to take suitable against the Bidder/ Contractor.

FORMATS FOR EPAYMENTS

To,

Sr.DGM (Finance)
Transmission Business Group
BHEL, TBG Finance,
Plot no. - 25, Sector - 16A
Noida - 201301; U.P.

Subject: E-Payments vide RTGS/NEFT

I/We request and authorise you to effect Epayment vide any of the above two modes to my/our bank account as per the details given below:

Vendor Name	:
Title/Name of Account in the bank	:
Account Type(Saving /current)	:
Bank Account Number	☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐
Name & address of Bank	
Bank /Branch contact person's name	:
Bank /Branch Tele Numbers with STD code	:
Bank Branch MICR code	☐☐☐☐☐☐☐☐☐
	(please enclose a copy of a cheque. This cheque should not be a payable at par cheque)
Bank Branch RTGS IFSC code	☐☐☐☐☐☐☐☐☐☐☐
Bank Branch NEFT IFSC code	☐☐☐☐☐☐☐☐☐☐☐
	(you can obtain this from branch where you have your account)
Your Email address	: **(not more than 20 character)**
Name of the Authorised Signatory	: (Please mention here name of person from your organization signing this letter.)
Contact Person's name	: (please mention here the name of a person in your company/organization)

I/We confirm that information provided above is correct & any consequences due to any mistake in above will be borne by us.

Thanking you

For
(Autorised Signatory)

We confirm that we are enabled for receiving RTGS/NEFT credits and we further confirm that the account number of (Please mention here name of the account holder), the signature of the authorised signatory and the MICR and IFSC Codes of our branch mentioned above are correct.

Bank's Verification
(Manager's/Officers signature under
bank Stamp)

Note:- Please attach cancelled original Cheque leaf.