



BORDER SECURITY FORCE

e – Tender Documents

- N.I.T. No.** : NIT/____/ SE (E)/Ftr-Raj/2025-26
- Name of Work** : Development and bulk services i.e. Electrical works, Boundary wall, P/F main gates for 125 Bn BSF (Now 48 Bn) at 7-A Chhoti New location) Sriganganagar (Raj) (SH: - Providing 11/0.415 KV Sub-Stations, HT & LT Panels/ Cables and shifting of DG sets)
- Estimated Cost** : Rs. **2,20,48,149/-**
- Earnest Money** : **Rs. 4,40,963/-**
- Time allowed** : **180 Days**
- Performance Guarantee** : PG shall be 5% of tendered amount or ECPT (Whichever is higher). Where the tendered amount is less than eighty percent (80%) of the ECPT, the performance guarantee, in addition to the requirement under (a) above, shall be increased by an amount equal to the difference between eighty percent (80%) of the ECPT and the tendered amount.
- Last date & time of tender submission** : **16:00 hrs on / /2026.**
- Date of Opening of technical bid** : **16:30 hrs on / /2026.**
- Date and Time of opening of financial Bids** : **To be communicated later on.**

Certified that this N.I.T. amounting to ₹ **2,20,48,149/-** (Rupees Two crore Twenty lakh Forty eight thousand One hundred forty nine) only contains **01 to 103** pages only, in chronological order.

Assistant Engineer (Elect)
SHQ BSF SGNR,

Executive Engineer (Elect)
Ftr HQ BSF Raj,

Notice inviting tender amounting to Rs. **2,20,48,149/-** (Rupees Two crore Twenty lakh Forty eight thousand One hundred forty nine) is approved.

APPROVED/ NOT APPROVED

Commandant (Elect)
FHQ BSF, New Delhi

I N D E X

S. No.	DESCRIPTION	PAGE NO.
1)	NIT approval (Front page)	01
2)	Index	02
	<u>PART – A</u>	03
3)	Press Notice (Notice Inviting e- tenders)	04
4)	Information and instructions for bidders for e-tendering forming part of bid document and to be uploaded on e-tenders web site.	05-07
5)	Form A and Form E	08-15
6)	CPWD-6 for e-tendering	16-20
7)	Item Rate Tender and Contract of Work (Form CPWD-8)	21-22
8)	Proforma of schedules (A to F)	23-28
9)	Integrity Pact & Agreement	29-30
10)	Proforma for Integrity Agreement	31-35
11)	Form of bank guarantee for earnest money deposit /performance guarantee/security deposit/mobilization advance	36-37
12)	Form of Earnest Money (Bank Guarantee)	38
13)	Form of Performance Security (Guarantee) Bank Guarantee Bond	39-40
14)	List of Equipment's & Tools & Plants required at Site.	41
	<u>PART – B</u>	42
15)	General conditions	43-48
16)	Commercial and additional conditions	49-54
17)	Additional terms & conditions with specifications Conditions	55-86
18)	List of preferred makes	87-89
19)	Under taking	90
20)	ECS/EFT/ Direct Credit/ RTGS/ NFT/ Other payment mechanism as approved by RBI	91
	<u>PART – C</u>	92
21)	Schedule of Quantity	93-103

PART – A

GENERAL INFORMATION

Notice Inviting e –Tender/ Press Notice

The Commandant (Elect)/ Superintendent Engineer, FHQ BSF New Delhi invites, on behalf of President of India, **on line item rate** tenders from approved and eligible electrical contractors of respective department of CPWD and non- CPWD contractors (i.e. State PWD / MES / P & T (BSNL) / Railways etc.) in appropriate class in two bid systems for the following work:-

S. No	NIT No.	Name of work	Estimated cost put to tender	Earnest Money	Period of Completion	Last date & time of online submission of bid, original EMD, copy of receipt or deposition of original EMD and other documents as specified in the Press Notice	Time and date of opening of tender
1.	NIT/ ____/ SE (E)/Ftr-Raj/2025-26	Development and bulk services i.e. Electrical works, Boundary wall, P/F main gates for 125 Bn BSF (Now 48 Bn) at 7-A Chhoti New location) Sriganaganar (Raj) (SH: - Providing 11/0.415 KV Sub-Stations, HT & LT Panels/ Cables and shifting of DG sets)	Rs. 2,20,48,149/-	Rs. 4,40,963/-	180 Days	16: 00 hrs on / 2026.	16:30 hrs on / 2026.

The tender forms and other details can be obtained from the web site www.eprocure.gov.in and www.bsf.gov.in .

Note: - Applicants are advised to keep visiting the above -mentioned web-sites from time to time (till the deadline for bid submission) for any updates in respect of the tender documents, if any. Failure to do so shall not absolve the applicant of his liabilities to submit the applications complete in all respect including updated thereof, if any. An incomplete application may be liable for rejection.

Commandant (Elect)/ SE,
FHQ BSF New Delhi

Information and Instruction for Bidders for e-Tendering forming part of Bid Document and to be uploaded on e-Tenders Web Site

The Commandant (Elect)/ Superintendent Engineer, FHQ BSF New Delhi invites, on behalf of President of India, **on line item rate** tenders from approved and eligible electrical contractors of respective department of CPWD and non- CPWD contractors (i.e. State PWD / MES / P & T (BSNL) / Railways etc.) in appropriate class in two bid systems for the following work mentioned below:-

S. No	NIT No.	Name of work	Estimated cost put to tender	Earnest Money	Period of Completion	Last date & time of online submission of bid, original EMD, copy of receipt or deposition of original EMD and other documents as specified in the Press Notice	Time and date of opening of tender
1.	NIT/____/ SE (E)/Ftr-Raj/2025-26	Development and bulk services i.e. Electrical works, Boundary wall, P/F main gates for 125 Bn BSF (Now 48 Bn) at 7-A Chhoti New location) Sriganaganagar (Raj) (SH: - Providing 11/0.415 KV Sub-Stations, HT & LT Panels/ Cables and shifting of DG sets)	Rs. 2,20,48,149/-	Rs. 4,40,963/-	180 Days	16: 00 hrs on / 2026	16:30 hrs on / 2026.

1. The intending bidder must read the terms and conditions of CPWD-6 carefully. He should only submit his bid if he considers himself eligible and he is in possession of all the documents required.
2. Information and Instructions for bidders posted on website shall form part of bid document.
3. The bid document consisting of plans, specifications, the schedule of quantities of various types of items to be executed and the set of terms and conditions of contract to be complied with and other necessary documents can be seen and downloaded from website www.eprocure.gov.in free of cost.
4. Those contractors not registered on the website (e-tendering portal) are required to get registered beforehand. If needed they can be imparted training on online tendering process as per the details available on the website.
5. The intending bidder must have valid class-III digital signature certificate to submit the bid.
6. On opening date, the contractor can login and see the bid opening process. After opening of bids, he will receive the competitor bid sheets.
7. Contractor can upload documents in the form of JPG and PDF format.
8. Contractor must ensure to quote rate of each item. The column meant for quoting rate in figures appears in pink colour and the moment rate is entered, it turns sky blue. In addition to this, while selecting any of the cells a warning appears that if any cell is left blank the same shall be treated as "0". Therefore, if any cell is left blank and no rate is quoted by the bidder, rate of such item shall be treated as "0" (ZERO).

Insertion:

Correction:

Deletion:

Overwriting:

AE(E).....

EE(E).....

SE(E).....

9. The EMD can be paid in the form of Insurance Surety Bonds, Account Payee Demand Draft, Fixed Deposit Receipt, Banker's Cheque or Bank Guarantee including e- Bank Guarantee from any of the Commercial Banks. The intending bidder has to fill all the details such as Banker's name, Demand Draft/Fixed Deposit Receipt/ Banker's Cheque / Bank Guarantee number, amount and date.
10. It is mandatory to be upload scanned copies duly signed and stamped of all the documents including GST Registration as stipulated in the bid document. If such document is not uploaded the bid will become invalid
11. If any discrepancy is noticed between the documents as uploaded at the time of submission of bid and hard copies as submitted physically by the contractor, the bid shall become invalid.
12. **List of documents to be scanned and uploaded within the period of bid submission:-**
 - a) Enlistment order of the contractor.
 - b) Copy of Electrical License of eligible class of the bidder.
 - c) Earnest Money in the form of Insurance Surety Bonds, Account Payee Demand Draft, Fixed Deposit Receipt, Banker's Cheque or Bank Guarantee including e- Bank Guarantee from any of the Commercial Banks (drawn in favour of **DIG SHQ BSF Sriganganagar**) (To be filled by respective HQ) shall be scanned and uploaded on the e-Tendering website within the period of bid submission.
 - d) Copy of receipt for deposition of original EMD issued from DDO / Engg Officer of any BSF Establishment (i.e. Command HQ / Frontier HQ / Sector HQ / Training Centre/ Bn HQ). **(Form-A)**
 - e) Contact details of the contractor in his letterhead mentioning following details:
 - i) Mailing Address
 - ii) Contact Phone / Mobile No.
 - iii) E-Mail ID.
 - f) **GST registration certificate**, if already obtained by the bidder. If the bidder has not obtained GST registration as applicable, then he shall scan and upload following undertaking along with bid documents.

“If work is awarded to me, I/We shall obtain GST registration certificate, as applicable, within one month from the date of receipt of award letter or before release of any payment by CPWD, whichever is earlier, failing which I/we shall be responsible for any delay in payments which will be due towards me /us on account of the work executed and /or for any action taken by CPWD or GST department in this regard”. **(Form – B)**
 - g) PAN Card.
 - h) EPF & ESIC Registration Certificate

i) **Certificates of Work Experience**

Experience of having successfully completed similar works during the last 7 years
Should have satisfactorily completed the works as mentioned below during the last Seven years ending last day of the month previous to the one in which tenders are invited. For this purpose, cost of work shall mean gross value of the completed work including cost of materials supplied by the Government/ client but excluding those supplied free of cost. This should be certified by an officer not below the rank of Executive Engineer or Equivalent in support of execution of **similar works** in case of registration with CPWD as well as other than CPWD Dept.

The completion certificate should include the name of work, agreement No., estimated cost, tendered / awarded cost, stipulated date of start, completion cost of work and actual date of completion of work etc.

Three similar works each costing not less than that Rs. 97.10 Lakh. (40% of ECPT)

OR
Two similar works each costing not less than that Rs. 1.46 Cr. (60% of ECPT)
OR
One similar work costing not less than that Rs. 1.94 Cr. (80% of ECPT)
AND

Similar work means: - Supplying Installation testing commissioning of 11 KV/.433 KV electrical sub-stations, including Transformers, HT/ LT panels.

Note:-All components of the proposed similar work shall be executed under one agreement.

- j) Average financial turnover. The bidder should have had the average annual financial turnover of 30% of ECPT on electrical works during the immediate last three Financial years . (Scan copy of original in **Form C** to be uploaded).
- k) Networth certificate at least 10% of the estimated cost of last 03 years duly verified by CA (or) bank solvency certificate of last 03 years at least 40% of the estimated cost duly signed by respective Bank Manager in original. (Scan copy of original in **Form C-1& 2** to be uploaded).
- l) Undertaking regarding the bidder should not have been barred/blacklisted by the Central Government/State Government, or any entity controlled by it, from participating in any tender, and the bar subsists as on the Bid Due Date, such bidder would not be eligible to submit the BID. The Bidder should upload affidavit for NON – BLACK LISTING. At the time of uploading of bid, the bidder shall have also to upload Scanned copy of an affidavit on Non-Judicial Stamp paper of Rs.100/- as under: **(Form- D)**
- m) To become eligible for issue of bid, the bidders shall have to furnish an affidavit (Rs.100) as under:- (as per Para 1.2.2 of SOP for CPWD Works Manual 2024) **(Form-E)**
- “I/We undertake and confirm that eligible similar work(s) has/have not been got executed through another contractor on back to back basis. Further, if such a violation comes to the notice of Department, then I/We shall be debarred for tendering in BSF in future forever. Also, if such a violation comes to the notice of Department before date of start of work, the Engineer-in-charge shall be free to forfeit the entire amount of the Earnest Money/Performance Guarantee”.
- n) Scanned copy of NIT duly signed and stamped.
- o) The following certificate is required to be submitted on non-Judicial stamp paper (Rs.100/-) from OEM:- “Confirmation from the manufacturers to BSF that proper after-sales services and spare parts will be provided for minimum period of 05 years from the date of commissioning, for the BOQ item No. 2,3,4,5,6,7 of schedule of quantity

Note: If the above-mentioned documents are not scanned and uploaded within the period of bid submission the bid shall be treated as invalid and cancelled.

Commandant (Elect)/ SE,
FHQ BSF New Delhi

FORMAT FOR DEPOSITING EARNEST MONEY**Receipt of Deposition of Original EMD**

Receipt No.....

Date.....

1.	Name of work	Development and bulk services i.e. Electrical works, Boundary wall, P/F main gates for 125 Bn BSF (Now 48 Bn) at 7-A Chhoti New location) Sriganganagar (Raj) (SH: - Providing 11/0.415 KV Sub-Stations, HT & LT Panels/ Cables and shifting of DG sets)
2.	NIT No	NIT/____/ SE (E)/Ftr-Raj/2025-26
3.	Estimated Cost	Rs. 2,20,48,149/-
4.	Amount of EMD	Rs. 4,40,963/-
5.	Last date of submission of bid	16: 00 hrs on / /2026.

(To be filled by NIT approving authority at the time of issue of NIT and uploaded along with NIT)

To be filled by EMD receiving officer

1.	Name of contractor #	
2.	Form/shape of EMD No & Date #	
3.	Amount EMD Deposit#	
4.	Date of submission of EMD#	

Signature, Name and Designation of EMD receiving officer along with office stamp

Undertaking regarding GST registration

(On letter head of the bidder with the stamp)

To,

Commandant (Elect),

FHQ BSF New Delhi

Name of Work: Development and bulk services i.e. Electrical works, Boundary wall, P/F main gates for 125 Bn BSF (Now 48 Bn) at 7-A Chhoti New location) Sriganganagar (Raj) (SH: - Providing 11/0.415 KV Sub-Stations, HT & LT Panels/ Cables and shifting of DG sets)

NIT/____/ SE (E)/Ftr-Raj/2025-26

Sir,

Having examined the details given in press notice & with documents for the above work.

“If work is awarded to me, I/We shall obtain GST registration certificate, as applicable, within one month from the date of receipt of award letter or before release of any payment by BSF, whichever is earlier, failing which I/we shall be responsible for any delay in payments which will be due towards me /us on account of the work executed and /or for any action taken by BSF or GST department in this regard”.

Seal of the bidder

Date of submission:

Signature(s) of bidder(s):

INFORMATION ON AVERAGE ANNUAL TURNOVER

1.	Name of firm	
2.	Address with telephone No. & E-mail id	
3.	GST NO.	

1.	Financial year	Annual Turnover (in INR)
2.	2022-23	
3.	2023-24	
4.	2024-25	

{To be printed on the letterhead of CA including full postal address, telephone and e-mail address}

Annual turnover data for last 03 years

This is to be certified that the firm has annual turnover in last three years

{This format should be certified by the registered Chattered Account of the bidder with seal, signature and address with UDIN should certify this format}

FORM C-1

FINANCIAL INFORMATION

Name of the firm / Bidder.....:

- I Financial Analysis-** Details to be furnished duly supported by figures in balance sheet / profit & loss account for the last three financial years duly certified and audited by the Chartered Accountants, as submitted by the applicant to the Income Tax Department (Copies to be attached).

(Figures in Lakhs Rs.)

Year	2022-23	2023-24	2024-25
Gross Annual Turnover on Construction works			
Profit/loss (standalone finance statement and consolidated financial statement both)			

*The figure of loss should be prefixed by (-) sign.

- II** Financial arrangements for carryout the proposed work.

Signature of Chartered Accountant with Seal
UDIN No.

Signature (S) Of Bidder (S)

FORM “C2”

**FORM OF CERTIFICATE OF NET WORTH FROM CHARTERED
ACCOUNTANT**

(Not more than Six months old)

“It is to certify that as per audited balance sheet and profit & loss account during the financial year....., the net worth of M/S./Sh
(Name & Registered Address of individual/firm/company), as on
(The relevant date) is Rs.....
after considering all liabilities. It is further certified that the net worth of the company has not eroded by more than 30% in the last three years ending on (the relevant date).”

Unique document identification number (UDIN).....

Signature of Chartered Accountant.....

Name of Chartered Accountant.....

Membership No. of ICAI

Date & Seal

PROFORMA OF AFFIDAVIT FOR NON - BLACK LISTING

I/we undertake and confirm that our firm/partnership firm has not been blacklisted by any state/Central Departments/PSUs/Autonomous bodies during the last 7 years of its operations. Further that, if such information comes to the notice of the department, then I/we shall be debarred for bidding in CPWD in future forever. Also, if such information comes to the notice of department on any day before date of start of work, the Engineer-in charge shall be free to cancel the agreement and to forfeit the entire amount of Earnest Money Deposit/Performance Guarantee (Scanned copy of this notarized affidavit to be uploaded at the time of submission of bid).

NOTE: Affidavit to be furnished on a 'non-Judicial' stamp paper worth Rs. 100/-

**Signature of
Bidder(s) or an authorized
Officer of the firm with stamp**

Signature of Notary with seal

Form – E

(TO BECOME ELIGIBLE FOR ISSUE OF BID, THE BIDDERS SHALL HAVE TO FURNISH AN AFFIDAVIT AS UNDER)

(As per para 1.2.2 of SOP for CPWD works manual 2024)

AFFIDAVIT FOR NON-EXECUTION OF WORKS ON BACK-TO-BACK BASIS

Name of work : Development and bulk services i.e. Electrical works, Boundary wall, P/F main gates for 125 Bn BSF (Now 48 Bn) at 7-A Chhoti New location) Sriganaganagar (Raj) (SH: - Providing 11/0.415 KV Sub-Stations, HT & LT Panels/ Cables and shifting of DG sets)

I/We undertake and confirm that eligible similar work(s) has / have not been got executed through another contractor on back-to-back basis. Further that, if such a violation comes to the notice of Department, then I/we shall be debarred for bidding in CPWD in or if it is found that any information has been concealed, then I / we shall be debarred for tendering in CPWD in future forever. Also, if such a violation comes to the notice of Department before date of start of work, the Engineer-in- Charge shall be free to forfeit the entire amount of Earnest Money Deposit/Performance Guarantee.

NOTE: This Affidavit to be furnished on a ‘non-judicial’ stamp paper worth Rs.100/-

Date:

Place:

**Signature of Bidder (s) or an authorized
Officer of the firm with stamp & seal
Signature of Notary with seal**

**DETAILS OF ELIGIBLE SIMILAR NATURE OF WORKS
COMPLETED DURING THE LAST SEVEN YEARS ENDING LAST
DATE OF THE MONTH PREVIOUS TO THE ONE IN WHICH
TENDERS ARE INVITED**

Sl. No.	Name of work / Project and Location	Owner or sponsoring Organization	Cost of work in crores of rupees	Date of commencement as per contract	Stipulated date of completion	Actual date of completion	Litigation/ arbitration cases pending / in progress with details*	Name and address/ telephone no of officer to whom reference may be made	Whether the work was done on back-to-back basis Yes/ No
1	2	3	4	5	6	7	8	9	10

**Indicate gross Amount Claimed and Amount Awarded by the Arbitrator.*

SIGNATURE (S) OF BIDDER (S)

NOTICE INVITING e-TENDERS

The Commandant (Electrical), FHQ BSF New Delhi invites Online item rate tenders are invited on behalf of President of India from approved and eligible electrical contractors of respective department i.e (CPWD and non- CPWD contractors (i.e. State PWD / MES / P &T (BSNL) / Railways etc.) in appropriate class for the following work:

Name of work:- **Development and bulk services i.e. Electrical works, Boundary wall, P/F main gates for 125 Bn BSF (Now 48 Bn) at 7-A Chhoti New location) Sriganganagar (Raj) (SH: - Providing 11/0.415 KV Sub-Stations, HT & LT Panels/ Cables and shifting of DG sets)**

The enlistment of the contractor should be valid on the last date of submission of bids.

In case the last date of submission of bid is extended, the enlistment of contractor should be valid on the original date of submission of bids.

1. The work is estimated to cost **Rs. 2,20,48,149/-**. This estimate, however, is given merely as a rough guide.

- 1.1 The authority competent to approve NIT for the combined cost and belonging to the major discipline will consolidate NITs for calling the bids. He will also nominate Division which will deal with all matters relating to the invitation of bids. For composite bid, besides indicating the combined estimated cost put to bid, should clearly indicate the estimated cost of each component separately. The eligibility of bidders will correspond to the combined estimated cost of different components put to bid.

1.2 Experience Requirement

Contractor is eligible to submit the bid provided they have definite proof from the appropriate authority, which shall be to the satisfaction of the competent authority, of having satisfactorily completed similar works of magnitude specified below:-

One similar work costing not less than 80% of the estimated cost put to tender.

OR

Two similar works costing not less than 60% of the estimated cost put to tender.

OR

Three similar works costing not less than 40% of the estimated cost put to tender.

The value of executed work shall be brought to current costing level by enhancing the actual value of work at simple rate of 7% per annum; calculated from the date of completion of **last date of submission of bids**.

Similar work shall means “Electrical works as per NIT”.

- 1.3 The bidder should have satisfactory completed similar work(s) during the last 7 years ending previous day of last date of submission of bids. (Scanned copy of performance of each work with schedule of quantity certified by an officer not below the rank of Executive Engineer or equivalent to be uploaded)

2. Agreement shall be drawn with the successful bidder on prescribed Form No. **CPWD 8** or other standard CPWD form as mentioned) which is available as a Govt. of India Publication and also available on website www.eprocure.gov.in Bidders shall quote his rates as per various terms and conditions of the said form which will form part of the agreement.
 3. The time allowed for carrying out the work will be **180 Days** from the date of start as defined in schedule 'F' or from the first date of handing over of the site, whichever is later, in accordance with the phasing, if any, indicated in the bid documents.
 4. The site for the work is available however, it will be made available to the contractor in parts as decided by Border guarding Force considering the security aspects since the work will be carried out at 48 Bn BSF, BSF Campus 7-A Chhoti, Sri Ganaganagar sector, Rajasthan. The work is to be carried out in coordination with the construction of Lateral Road.
 5. The bid document consisting of plans, specifications, the schedule of quantities of various types of items to be executed and the set of terms and conditions of the contract to be complied with and other necessary documents except Standard General Conditions of Contract Form can be seen from website "www.eprocure.gov.in" free of cost.
 6. After submission of the bid the contractor can re-submit revised bid any number of times but before last time and date of submission of tender as notified.
 7. While submitting the revised bid, contractor can revise the rate of one or more items(s) any number of times (he need not re-enter rate of all the items) but before last time and date of submission of bid as notified.
 8. When bids are invited in three stage system and if it is desired to submit revised financial bid then it shall be mandatory to submit revised financial bid. If not submitted, then the bid submitted earlier shall become invalid.
 9. Earnest Money in the form of Insurance Surety Bonds, Account Payee Demand Draft, Fixed Deposit Receipt, Banker's Cheque or Bank Guarantee including e- Bank Guarantee from any of the Commercial Banks **drawn in favour of DIG SHQ BSF SGNR** shall be scanned and uploaded on the e-Tendering website within the period of bid submission. The original EMD should be deposited alongwith prescribed format mentioned in Form-A of NIT to any of BSF DDO / Engg Officer i.e. **Command HQ / Frontier HQ / Sector HQ / Training Centre/ Bn HQ BSF** before last date & time of submission of bid. The EMD receiving authority (**DDO / Engg Officer**) of any BSF establishment i.e. **Command HQ / Frontier HQ / Sector HQ / Training Centre/ Bn HQ BSF** shall examine EMD in original form and issue a receipt of deposition of earnest money deposit to the bidder in a prescribed format (**as per enclosed Form-A**) uploaded by tender inviting authority in the NIT. The authority receiving original EMD also intimates tender inviting authority about deposition of EMD by the agency.
- A part of earnest money is acceptable in the form of bank guarantee also. In such case, minimum 50% of earnest money or Rs. 20 lakh, whichever is less, shall have to be deposited in shape prescribed above, and balance may be deposited in shape of Bank Guarantee including e-Bank Guarantee of any Commercial bank having validity for a period of 90 days for single bid works and 180 days for two bid system or more from the last date of receipt of bids which is to be scanned and uploaded by the intending bidders.

The earnest money given by all the tenderers except the lowest tenderer shall be refunded immediately after the expiry of stipulated bid validity period or immediately after acceptance of the successful bidder, whichever is earlier. However, in case of two/ three bid system, earnest money deposit of bidders unsuccessful during technical bid evaluation etc. should be returned within 30 days of declaration of result of technical bid evaluation.

Copy of Enlistment Order and certificate of work experience and other documents as specified in the notice inviting e- tender shall be scanned and uploaded on the e- Tendering website within the period of bid submission. However, certified copy of all the scanned and uploaded documents as specified in e- tender notice shall have to be submitted by the lowest bidder within a week physically in the office of tender opening authority. Online bid documents submitted by intending bidders shall be opened only of those bidders, who has deposited EMD with any BSF Establishment and other documents scanned and uploaded are found in order.

The bid submitted shall be opened at 16:30 Hrs on / /2026

10. The bid submitted shall become invalid and e-tender processing fee (if applicable) shall not be refunded if:-
 - (i) The bidder is found ineligible
 - (ii) The bidder does not upload scanned copies of all the documents stipulated in the bid document.
 - (iii) If any discrepancy is noticed between the documents as uploaded at the time of submission of bid and hard copies as submitted physically by the lowest bidder in the office of bid opening authority.
 - (iv) If a tenderer quotes nil rates against each item in item rate tender or does not quote any percentage above/below on the total amount of the tender or any section / sub head in percentage rate tender, the tender shall be treated as invalid and will not be considered as lowest tenderer.
11. The contractor whose tender is accepted, will be required to furnish performance guarantee as specified percentage of the tendered amount as specified in Schedule E and within the period specified in Schedule F. This guarantee shall be in the form of Insurance Surety Bonds, Account Payee Demand Draft, Fixed Deposit Receipt or Bank Guarantee from any of the Commercial Banks in accordance with the prescribed form. In case the contractor fails to deposit the said performance guarantee within the period as indicated in Schedule 'F', including the extended period if any, the Earnest Money deposited by the contractor shall be forfeited automatically without any notice to the contractor. The earnest money deposited along with bid shall be returned after receiving the aforesaid performance guarantee. The contractor whose bid is accepted will also be required to furnish either copy of applicable licenses/ registrations or proof of applying for obtaining labour licenses, registration with EPFO, ESIC and BOCW Welfare Board including Provident Fund Code No. If applicable and also ensure the compliance of aforesaid provisions by the subcontractors, if any engaged by the contractor for the said work within the period specified in Schedule F.
12. The description of the work is as follows:-

Development and bulk services i.e. Electrical works, Boundary wall, P/F main gates for 125 Bn BSF (Now 48 Bn) at 7-A Chhoti New location) Sriganganagar (Raj) (SH: - Providing 11/0.415 KV Sub-Stations, HT & LT Panels/ Cables and shifting of DG sets)

Intending Bidders are advised to inspect and examine the site and its surroundings and satisfy themselves before submitting their tenders as to the nature of the ground and sub-soil (so far as is practicable), the form and nature of the site, the means of access to the site, the accommodation they may require and in general shall themselves obtain all necessary information as to risks, contingencies and other circumstances which may influence or affect their bid. A Bidder shall be deemed to have full knowledge of the site whether he inspects it or not and no extra charge consequent on any misunderstanding or otherwise shall be allowed. The Bidder shall be responsible for arranging and maintaining at his own cost all materials, tools & plants, water, electricity access, facilities for workers and all other services required for executing the work unless otherwise specifically provided for in the contract documents. Submission of a Bid by a Bidder implies that he has read this notice and all other contract documents and has made himself aware of the scope and specifications of the work to be done and of conditions and rates at which stores, tools and plant etc. will be issued to him by the Government and local conditions and other factors having a bearing on the execution of the work.

13. The competent authority on behalf of the President of India does not bind itself to accept the lowest or any other tender and reserves to itself the authority to reject any or all the tenders received without the assignment of any reason. All bids in which any of the prescribed condition is not fulfilled or any condition including that of conditional rebate is put forth by the Bidder shall be summarily rejected.
14. Canvassing whether directly or indirectly, in connection with Bidders is strictly prohibited and the bids submitted by the contractors who resort to canvassing will be liable to rejection.
15. The competent authority on behalf of President of India reserves to himself the right of accepting the whole or any part of the bid and the Bidder shall be bound to perform the same at the rate quoted.
16. The contractor shall not be permitted to tender for works in the BSF for award and execution of contracts, in which his near relative is posted a Divisional Accountant or as an officer in any capacity between the grades of Superintending Engineer and Junior Engineer (both inclusive). He shall also intimate the names of persons who are working with him in any capacity or are subsequently employed by him and who are near relatives to any gazetted officer in the BORDER SECURITY FORCE or in the Ministry of Home Affairs. Any breach of this condition by the contractor would render him liable to be from this Department.
17. No Engineer of Gazetted rank or other Gazetted Officer employed in Engineering or Administrative duties in an Engineering Department of the Government of India is allowed to work as a contractor for a period of one year after his retirement from Government service, without the prior permission of the Government of India in writing. This contract is liable to be cancelled if either the contractor or any of his employees is found any time to be such a person who had not obtained the permission of the Government of India as aforesaid before submission of the bid or engagement in the contractor's service.
18. The bids for the work shall remain open for acceptance for a period of 45 (forty five) days from the date of opening of bids in case of single bid system and 75 (seventy five) days from the date of opening of technical bids in case bids are invited in 2 or 3 bid system. Further
 - i) If any tenderer withdraws his tender or makes any modification in the terms & conditions of the tender which is not acceptable to the department within 7 days after last date of submission of bids, then the Government shall without prejudice to any other right or remedy, be at liberty to forfeit 50% of the earnest money absolutely irrespective of letter of acceptance for the work is issued or not.

- ii) If any tenderer withdraws his tender or makes any modification in the terms & conditions of the tender which is not acceptable to the department after expiry of 7 days after last date of submission of bids, then the Government shall without prejudice to any other right or remedy, be at liberty to forfeit 100% of the earnest money absolutely irrespective of letter of acceptance for the work is issued or not.
- iii) In case of forfeiture of earnest money as prescribed in para (i) and (ii) above, the bidders shall not be allowed to participate in the rebidding process of the same work.
- 19. This notice inviting Bid shall form a part of the contract document. The successful Bidder/contractor, on acceptance of his tender by the Accepting Authority shall within 15 days from the stipulated date of start of the work, sign the contract consisting of:-
 - a) The Notice Inviting Bid, all the documents including additional conditions, specifications and drawings, if any, forming part of the bids as uploaded at the time of invitation of bid and the rates quoted online at the time of submission of bid and acceptance thereof together with any correspondence leading thereto.
 - b) Standard C.P.W.D. Form 8 or other Standard C.P.W.D Form as applicable
- 20. The intending bidders are required to update their profile in CPPP or e-procure portal and to upload their bids well in advance of last date of submission of tender. The e- tendering bidders are also advised not to wait to raise any issues till the last date of submission of bid in their own interest.
- 21. Following persons shall only be accepted as accredited/authorized representative(s):
 - (i) Proprietor of an individual firm or one of partner in partnership firm or one of director of firm as the case may be.

Or

 - (ii) Senior person in management or engineer who had served in the firm in continuous past for at least 5 years and for this, Form 16A/TDS issued to person/engineer by the bidder in last 5 financial year shall be produced as basis. If person is not issued Form 16A/TDS then he/she shall not be considered as accredited/authorized representative.

This para shall prevail over any other provision in bid document/GCC.
- 22. Bidder is advised to avail the facility of mobilization advance (if applicable in Schedule A to F under clause 10 B(ii). If any bidder does not want to avail this facility from department, then bidder shall produce the evidence of having invested minimum 8% of the construction contract amount towards mobilization within 1 months of start of work. The evidence shall be of bank statement of firm showing the payment made for mobilization. Non-compliance to this provision may be considered as subletting of work to other person(s)/firm(s) on back-to- back basis in full or part which may attract action under clause 3 of the GCC.

This para shall prevail over any other provision in bid document/GCC.

- 23. The bidder shall be possessed Profit in positive at least in two financial year out of three FY.

Commandant (Elect)
FHQ BSF New Delhi

GOVERNMENT OF INDIA
BORDER SECURITY FORCE

Item Rate Tender & Contract for Works

1. Tender for the work of:
Name of work:- Development and bulk services i.e. Electrical works, Boundary wall, P/F main gates for 125 Bn BSF (Now 48 Bn) at 7-A Chhoti New location) Sriganganagar (Raj) (SH: - Providing 11/0.415 KV Sub-Stations, HT & LT Panels/ Cables and shifting of DG sets)
2. To be uploaded by 16.00 Hrs. on / /2026 to/upload at www.eprocure.gov.in
3. To be opened in presence of tenderers who may be present at 16.30 Hrs. on /..../2026 in the office of Executive Engineer (Elect) Ftr HQ BSF Raj

Commandant (Elect/ SE,
FHQ BSF New Delhi

TENDER

I/We have read and examined the notice inviting tender, schedule, A, B, C, D, E & F Specifications applicable, Drawings & Designs, General Rules and Directions, Conditions of Contract, clauses of contract, Special conditions, Schedule of Rate & other documents and Rules referred to in the conditions of contract and all other contents in the tender document for the work.

I/We hereby tender for the execution of the work specified for the President of India within the time specified in Schedule „F“ viz., schedule of quantities and in accordance in all respect with the specifications, designs, drawing and instructions in writing referred to in Rule-1 of General Rules and Directions and in Clause 11 of the Conditions of contract and with such materials as are provided for, by, and in respect of accordance with, such conditions so far as applicable.

I/We agree to keep the tender open for a period of **75 (seventy five) days from the date of opening of technical bid** in case tenders are invited on 2 /3 bid/ system for specialised work and not to make any modification in its terms and conditions.

I/We have deposited EMD for the prescribed amount in the office of concerned Executive Engineer as per the bid document.

A copy of earnest money deposit receipt of prescribed amount deposited in the form of Insurance Surety Bonds, Account Payee Demand Draft, Fixed Deposit Receipt, Banker's Cheque or Bank Guarantee (as prescribed) issued by a Commercial Bank, is scanned and uploaded (strike out as the case may be). If I/We, fail to furnish the prescribed performance guarantee within prescribed period, I/We agree that the said President of India or his successors, in office shall without prejudice to any other right or remedy, be at liberty to forfeit the said earnest money absolutely. Further, if I/We fail to commence work as specified, I/ We agree that President of India or the successors in office shall without prejudice to any other right or remedy available in law, be at liberty to forfeit the said performance guarantee absolutely. The said Performance Guarantee shall be a guarantee to execute all the works referred to in the tender documents upon the terms and conditions contained or referred to those in excess of that limit at the rates to be determined in accordance with the provision contained in Clause 12.2 and 12.3 of the tender form.

Further, I/We agree that in case of forfeiture of Earnest Money or Performance Guarantee as aforesaid, I/We shall be debarred for participation in the re-tendering process of the work.

I/We undertake and confirm that eligible similar work(s) has/have not been got executed through another contractor on back to back basis. Further that, if such a violation comes to the notice of Department, then I/We shall be debarred for tendering in BSF in future forever. Also, if such a violation comes to the notice of Department before date of start of work, the Engineer-in-Charge shall be free to forfeit the entire amount of Earnest Money Deposit/Performance Guarantee.

I/We hereby declare that I/We shall treat the tender documents drawings and other records connected with the work as secret/confidential documents and shall not communicate information/derived there from to any person other than a person to whom I/We am/are authorized to communicate the same or use the information in any manner prejudicial to the safety & integrity of the State.

Dated.....

Signature of the contractor.....

Witness.....

Postal Address.....

Address.....

Occupation... ..

Email -

(Blank space to be filled by Contractor)

ACCEPTANCE

The above tender (as modified by you as provided in the letters mentioned hereunder) is accepted by me for and on behalf of the President of India for a sum of ₹.....

(Rupees.....).

The letters referred to below shall form part of this contract Agreement: -

a)

For & on behalf of the President of India

Signature.....

Dated.....

Designation.....

PROFORMA OF SCHEDULES („A“ TO „F“)

SCHEDULE „A“

Schedule of Quantities - As per the schedule of work enclosed.

SCHEDULE „B“

Schedule of materials to be issued to the contractor:-

S. No	Description of item	Quantity	Rates in figures & words at which the material will be Charged to the contractor	Place of issue
1	2	3	4	5
..... Nil.....				

SCHEDULE „C“

Tools and plants to be hired to the contractor

S. No	Description	Hire charges per day	Place of issue
1	2	3	4
.....Nil.....			

SCHEDULE „D“

Extra schedule for specific : Attached at page No... (if any)
requirements / document for the work,
if any.

SCHEDULE „E”

- Reference to General Conditions of contract : Reference to CPWD General Conditions of contract: GCC–2023 (Construction Works) with amendments up to last date of submission of bid.
- Name of Work : Development and bulk services i.e. Electrical works, Boundary wall, P/F main gates for 125 Bn BSF (Now 48 Bn) at 7-A Chhoti (New location) Sriganganagar (Raj) (SH :- Providing HT/LT panels, transformers, Street light and service connection)
- Estimated cost of work : Rs. **2,20,48,149/-**
- (i) Earnest Money : Rs. **4,40,963/-** (to be returned after receiving performance guarantee)
- (ii) Performance Guarantee : PG shall be 5% of tendered amount or ECPT (Whichever is higher). Where the tendered amount is less than eighty percent (80%) of the ECPT, the performance guarantee, in addition to the requirement under (a) above, shall be increased by an amount equal to the difference between eighty percent (80%) of the ECPT and the tendered amount.
- (iii) Security Deposit : 2.5% of tendered value. **(SD shall be retained for the entire guarantee period)**

SCHEDULE-„F”

GENERAL RULES & DIRECTIONS :

- Officer inviting tender : Commandant (Elect), FHQ BSF New Delhi.
- Maximum percentage for quantity of items of work to be executed beyond which rates are to be determined in accordance with Clauses 12.2 & 12.3 : As per Clause 12 below

Definitions:-

- (i) Engineer-in-charge : DC (Elect), Ftr HQ BSF Raj
- (ii) Accepting Authority : Commandant (Elect), FHQ BSF New Delhi
- (iii) Percentage on cost of materials and labour to cover all overheads and profits : 15%
- (iv) Standard Schedule of Rates : Delhi Schedule of Rates – 2025 (E &M) & prevailing Market Rates
- (v) Department : BSF

(vi) Standard CPWD Contract Form : GCC-2023 (Construction Works),
CPWD form 8 with amendments up to
last date of submission of bid.

Clause 1

(i) Time allowed for submission of : 10 days
Performance Guarantee Programme
Chart (Time& progress) in days

(ii) Maximum allowable extension with : 07 days
late fee @ 0.1% per day of Performance
Guarantee amount beyond the period
provided in (i) above for extended up 07
days

Clause 2

Authority for fixing compensation : Commandant (Elect), FHQ BSF New Delhi.
under clause 2

Clause 2 A

Whether Clause 2 A shall be applicable : No

Clause 5

Time allowed for Execution of Work : 180 Days

Number of days from the date of issue : 17 days from the date of issue of Award Letter or
of letter of acceptance for reckoning date date of handing over of site whichever is later.
of start.

Authority to decide

- (i) Extension of time : DC (Elect), Ftr HQ BSF Raj
- (ii) Rescheduling of milestones : Comdt (Elect) FHQ BSF New Delhi.
- (iii) Shifting of date of start in case : Comdt (Elect) FHQ BSF New Delhi
of delay in handing over of
site.

Schedule of handing over of site: Site is Available

PERFOMA OF SCHEDULES Clause 5: Schedule of handing over of site

Part	Portion of site	Description	Time period for handing over reckoned from date of issue of letter of intent.
Full Site Available			

Schedule of issue of Design/Drawings: The required drawings of E & M work should be provided by the bidder at before execution of work for approval of Engineer in charge. Agency has to use these drawings for execution of work.

Mile stone(s) as per table given below :

S. NO.	Description Of Milestone (Physical)	Time Allowed In Days (From The Date Of Start)	Amount To Be Withheld In Case Of Non-Achievement Of Milestone.
1	1/8th (of whole work)	1/4th (of whole work)	In the event of not achieving the necessary progress as assessed from the running payments, 1.25% of the tendered value of work will be withheld for failure of each milestone
2	3/8 th (of whole work)	1/2 (of whole work)	
3	3/4th (of whole work)	3/4th (of whole work)	
4.	Full	Full	

Clause 6 : Applicable (CMB)

Clause 7

Gross work to be done together with : 20% of tendered amount.
net payment/adjustment of advances for material collected if any, since the last such payment for being eligible to interim payment

Clause 7 A

Whether clause 7A shall be : Yes, applicable applicable.

Clause 8A

Authority to decide compensation on : Commandant (Electrical), FHQ BSF N/ Delhi
account if contractor fails to submit completion plans

Clause 10 A

List of testing equipment to be : As per the enclosed Annexure-,,A“
provided by the contractor at site Lab.

Clause 10 B(ii)

Whether Clause 10 B(ii) shall be : Not applicable.
applicable

Clause 10 C : Not applicable.

Clause 10 CA : Not applicable.

Clause 10 CC : Not applicable.

E and M Part

Sl No.	Relevant component of Material /Labour for price escalation	Percentage of total value of work (E & M Part)
1	Component of Labour	15%
2	Electrical and Mechanical (E&M) Component of Construction Materials	85%
	Total	100 %

Clause 11

Specifications to be followed for execution of work : CPWD General Specifications for Electrical works- Part-I Internal-2023 & Part-II External- 2023
Part – IV (Sub stations) – 2013
National electrical code 2023 Correction Slips issued up to the last date of receipt of tender and additional conditions and Specifications as attached in the Tender

Clause 12

Authority to decide deviation up to 1.25 time of tendered amount. : DC (Elect) Ftr HQ BSF Raj

Authority to decide deviation beyond 1.25 times upto 1.5 times of tender amount. : Comdt (Elect), FHQ BSF, New Delhi

Clause 12.2 & 12.3

Deviation Limit beyond which Clauses shall apply for building work excluding foundation : 100% (Hundred Percent)

Clause 12.4

(i) Deviation Limit beyond which clauses 12.2 & 12.3 shall apply for foundation work (except items mentioned in earth work subhead in DSR and related items) : 100% (Hundred Percent)

(ii) Deviation Limit for items mentioned in earth work subhead of DSR and related items : 100% (Hundred Percent)

Clause 16

Competent Authority for deciding reduced rates

Sub-standard work must be got rectified and if necessary, may be redone. Acceptance of sub-standard work at reduced rate should be done only under exceptional circumstances. Total value of items of agreement rate for which the Superintending Engineer accepts sub- standard work in a contract shall not exceed 5% of the Contract value. In case, total value of such items exceeds 5%, prior approval of FHQ (Engg Dte), BSF, New Delhi will be necessary.

Clause 18

List of mandatory machinery, tools & plants to be deployed by the contractor at site:

As per list enclosed and as required refer in page no.....

Any other T&P as per requirement of site & as per direction of Engineer-In Charge.

Clause 19C – Engineer-in-charge to decide penalty for each default.

Clause 19D – Engineer-in-charge to decide penalty for each default.

Clause 19G – Engineer-in-charge to decide penalty for each default.

Clause 19K –Engineer-in-charge to decide penalty for each default.

Clause 25

Constitution of Dispute Redressal Committee (DRC) for total claims more than ₹ 25 Lakh:

- 1.Chairman – IG of some other Ftr.
- 2.Member – Concerned DIG
- 3.Member- Any nominated officer by Ftr IG
- 4.Member- Concerned EE (Only to present the case).

Constitution of Dispute Redressal Committee (DRC) for total claims upto ₹25 Lakh:

1. Chairman – DIG of some other Ftr. to be nominated by IG.
2. Member- Executive Engineer, Any other Ftr. to be nominated by IG.
3. Member- Executive Engineer, of some other Ftr. to be nominated by IG
4. Concerned Executive Engineer (Only to present the case).

SDG/ADG of Command HQrs and Ftr IG is competent to appoint DRC in both cases.

Clause 32 : Requirement of Technical Representative(s) and recovery Rate

Cost of work (Rs. In lacs)	Requirement of Technical Staff		Minimum experience (Years)	Designation of Technical staff	Rate at which recovery shall be made from the contractor in the event of not fulfilling
	Qualification	Number			
More than 150 to 500	Graduate Engineer or Diploma Engineer	1/1	2 or 5 respectively	Project Manager cum Planning/ Quality/ Site/ Billing Engineer	Rs.15,000/- per Month per person

Assistant Engineers retired from Government services that are holding Diploma will be treated at par with Graduate Engineers.

Diploma holder with minimum 10 year relevant experience with a reputed construction co. can be treated at par with Graduate Engineers for the purpose of such deployment subject to the condition that such diploma holders should not exceed 50% of requirement of degree engineers

Commandant (Elect)/SE
FHQ BSF New Delhi

INTEGRITY PACT BSF

To

Subject :- NIT No. _____ SE (E)/Ftr-Raj//2025-26 for the work **Development and bulk services i.e. Electrical works, Boundary wall, P/F main gates for 125 Bn BSF (Now 48 Bn) at 7-A Chhoti New location) Sriganganagar (Raj) (SH: - Providing 11/0.415 KV Sub-Stations, HT & LT Panels/ Cables and shifting of DG sets)**

Dear Sir,

It is hereby declared that Border Security Force is committed to follow the principle of transparency, equity and competitiveness in public procurement/e-tendering.

The subject notice inviting tender (NIT) is an invitation to offer made on the condition that the bidder will sign the integrity Agreement, which is an integral part of tender/ bid documents, failing which the tenderer/ bidder will stand disqualified and the bid of the bidder would be summarily rejected.

This declaration shall form part and parcel of the Integrity agreement and signing of the same shall be deemed as acceptance and signing of the Integrity Agreement on behalf of the Border Security Force.

Yours faithfully,

Comdt. (Elect)
FHQ BSF New Delhi

INTEGRITY PACT BSF

To,

The Comdt (Elect),
FHQ BSF New Delhi

Sub :- Submission of tender for the work of “Development and bulk services i.e. Electrical works, Boundary wall, P/F main gates for 125 Bn BSF (Now 48 Bn) at 7-A Chhoti New location) Sriganganagar (Raj) (SH: - Providing 11/0.415 KV Sub-Stations, HT & LT Panels/ Cables and shifting of DG sets).

Dear Sir,

I / We acknowledge that Border Security Force is committed to follow the principles thereof as enumerated in the Integrity Agreement enclosed with the tender/bid document.

I/ We agree that the Notice Inviting Tender (NIT) is an invitation to offer made on the condition that I / We will sign the enclosed integrity agreement, which is an integral part of tender documents, failing which I/ We will stand disqualified from the tendering process. I / We acknowledge that the making of the bid shall be regarded as an unconditional and absolute acceptance of this condition of the NIT.

I / We confirm acceptance and compliance with the Integrity Agreement in letter and spirit and further agree that execution of the said Integrity Agreement shall be separate and distinct from the main contract, which will come into existence when tender/ bid is finally accepted by Border Security Force. I/ We acknowledge and accept the duration of Integrity Agreement, which shall be in the line with Article 1 of the enclosed Integrity Agreement.

I/ We acknowledge that in the event of my/ our failure to sign and accept the Integrity Agreement, while submitting the tender/ bid, Border Security Force shall have unqualified, absolute and unfettered right to disqualify the tenderer/ bidder and reject the tender/ bid in accordance with terms and conditions of the tender/ bid.

Yours faithfully,

Signatures of Contractor with seal and address

(to be signed by the bidder and same signatory competent / authorized to sign relevant contract on behalf of B.S.F.)

To be signed by the bidder and same signatory competent / authorized to sign the relevant contract on behalf of BSF.

INTEGRITY AGREEMENT

This Integrity Agreement is made at on this day of 20.....

BETWEEN

(to be signed by the bidder and same signatory competent / authorized to sign relevant contract on behalf of B.S.F.)

President of India represented through Executive Engineer i.e. Comdt./DC(Elect), ...
.....(Name of BSF Establishment)

BSF, ..., (Hereinafter referred as the
(Address of Division) ,,

Principal/Owner“, which expression shall unless repugnant to the meaning or context hereof include its successors and permitted assigns)

AND

.....
(Name and Address of the Individual/firm/Company)

Through (Hereinafter referred to as the

(Details of duly authorized signatory)

“Bidder/Contractor” and which expression shall unless repugnant to the meaning or context hereof include its successors and permitted assigns)

Preamble

WHEREAS the Principal / Owner has floated the Tender (NIT No.....)
(hereinafter referred to as **“Tender/Bid”**) and intends to award, under laid down organizational procedure, contract

for.....

(Name of work)

hereinafter referred to as the **“Contract”**.

AND WHEREAS the Principal/Owner values full compliance with all relevant laws of the land, rules, regulations, economic use of resources and of fairness/transparency in its relation with its Bidder(s) and Contractor(s).

AND WHEREAS to meet the purpose aforesaid both the parties have agreed to enter into this Integrity Agreement (hereinafter referred to as **“Integrity Pact”** or **“Pact”**), the terms and conditions of which shall also be read as integral part and parcel of the Tender/Bid documents and Contract between the parties.

NOW, THEREFORE, in consideration of mutual covenants contained in this Pact,
the parties hereby agree as follows and this Pact witnesses as under:

Article 1: Commitment of the Principal/Owner

- 1) The Principal/Owner commits itself to take all measures necessary to prevent corruption and to observe the following principles:
 - (a) No employee of the Principal/Owner, personally or through any of his/her family members, will in connection with the Tender, or the execution of the Contract, demand, take a promise for or accept, for self or third person, any material or immaterial benefit which the person is not legally entitled to.
 - (b) The Principal/Owner will, during the Tender process, treat all Bidder(s) with equity and reason. The Principal/Owner will, in particular, before and during the Tender process, provide to all Bidder(s) the same information and will not provide to any Bidder(s) confidential / additional information through which the Bidder(s) could obtain an advantage in relation to the Tender process or the Contract execution.
 - (c) The Principal/Owner shall endeavor to exclude from the Tender process any person, whose conduct in the past has been of biased nature.
- 2) If the Principal/Owner obtains information on the conduct of any of its employees which is a criminal offence under the Indian Penal code (IPC)/Prevention of Corruption Act, 1988 (PC Act) or is in violation of the principles herein mentioned or if there be a substantive suspicion in this regard, the Principal/Owner will inform the Chief Vigilance Officer and in addition can also initiate disciplinary actions as per its internal laid down policies and procedures.

Article 2: Commitment of the Bidder(s)/Contractor(s)

- 1) It is required that each Bidder/Contractor (including their respective officers, employees and agents) adhere to the highest ethical standards, and report to the Government / Department all suspected acts of **fraud or corruption or Coercion or Collusion** of which it has knowledge or becomes aware, during the tendering process and throughout the negotiation or award of a contract.
- 2) The Bidder(s)/Contractor(s) commits himself to take all measures necessary to prevent corruption. He commits himself to observe the following principles during his participation in the Tender process and during the Contract execution:
 - a) The Bidder(s)/Contractor(s) will not, directly or through any other person or firm, offer, promise or give to any of the Principal/Owner's employees involved in the Tender process or execution of the Contract or to any third person any material or other benefit which he/she is not legally entitled to, in order to obtain in exchange any advantage of any kind whatsoever during the Tender process or during the execution of the Contract.
 - b) The Bidder(s)/Contractor(s) will not enter with other Bidder(s) into any undisclosed agreement or understanding, whether formal or informal. This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non-submission of bids or any other actions to restrict competitiveness or to cartelize in the bidding process.

- c) The Bidder(s)/Contractor(s) will not commit any offence under the relevant IPC/PC Act. Further the Bidder(s)/Contract(s) will not use improperly, (for the purpose of competition or personal gain), or pass on to others, any information or documents provided by the Principal/Owner as part of the business relationship, regarding plans, technical proposals and business details, including information contained or transmitted electronically.
- d) The Bidder(s)/Contractor(s) of foreign origin shall disclose the names and addresses of agents/representatives in India, if any. Similarly Bidder(s)/Contractor(s) of Indian Nationality shall disclose names and addresses of foreign agents/representatives, if any. Either the Indian agent on behalf of the foreign principal or the foreign principal directly could bid in a tender but not both. Further, in cases where an agent participate in a tender on behalf of one manufacturer, he shall not be allowed to quote on behalf of another manufacturer along with the first manufacturer in a subsequent/parallel tender for the same Item.
- d) The Bidder(s)/Contractor(s) will, when presenting his bid, disclose (with each tender as per proforma enclosed) any and all payments he has made, is committed to or intends to make to agents, brokers or any other intermediaries in connection with the award of the Contract.
- 3) The Bidder(s)/Contractor(s) will not instigate third persons to commit offences outlined above or be an accessory to such offences.
- 4) The Bidder(s)/Contractor(s) will not, directly or through any other person or firm indulge in fraudulent practice **means a willful misrepresentation or omission of facts or submission of fake/forged documents in order to induce public official to act in reliance thereof, with the purpose of obtaining unjust advantage by or causing damage to justified interest of others and/or to influence the procurement process to the detriment of the Government interests.**
- 5) The Bidder(s)/Contractor(s) will not, directly or through any other person or firm use Coercive Practices (means the act of obtaining something, compelling an action or influencing a decision through intimidation, threat or the use of force directly or indirectly, where potential or actual injury may befall upon a person, his/ her reputation or property to influence their participation in the tendering process).

Article 3: Consequences of Breach

Without prejudice to any rights that may be available to the Principal/Owner under law or the Contract or its established policies and laid down procedures, the Principal/Owner shall have the following rights in case of breach of this Integrity Pact by the Bidder(s)/Contractor(s) and the Bidder/ Contractor accepts and undertakes to respect and uphold the Principal/Owner's absolute right:

- 1) If the Bidder(s)/Contractor(s), either before award or during execution of Contract has committed a transgression through a violation of Article 2 above or in any other form, such as to put his reliability or credibility in question, the Principal/Owner after giving 14 days notice to the contractor shall have powers to disqualify the Bidder(s)/Contractor(s) from the Tender process or terminate/determine the Contract, if already executed or exclude the Bidder/Contractor from future contract award processes. The imposition and duration of the exclusion will be determined by the severity of transgression and determined by the Principal/Owner. **Such exclusion may be forever or for a limited period as decided by the Principal/Owner.**

- 2) **Forfeiture of EMD/Performance Guarantee/Security Deposit:** If the Principal/Owner has disqualified the Bidder(s) from the Tender process prior to the award of the Contract or terminated/determined the Contract or has accrued the right to terminate/determine the Contract according to Article 3(1), the Principal/Owner apart from exercising any legal rights that may have accrued to the Principal/Owner, may in its considered opinion forfeit the entire amount of Earnest Money Deposit, Performance Guarantee and Security Deposit of the Bidder/Contractor.
- 3) **Criminal Liability:** If the Principal/Owner obtains knowledge of conduct of a Bidder or Contractor, or of an employee or a representative or an associate of a Bidder or Contractor which constitutes corruption within the meaning of Indian Penal code (IPC)/Prevention of Corruption Act, or if the Principal/Owner has substantive suspicion in this regard, the Principal/Owner will inform the same to law enforcing agencies for further investigation.

Article 4: Previous Transgression

- 1) The Bidder declares that no previous transgressions occurred in the last 3 years with any other Company in any country confirming to the anticorruption approach or with Central Government or State Government or any other Central/State Public Sector Enterprises in India that could justify his exclusion from the Tender process.
- 2) If the Bidder makes incorrect statement on this subject, he can be disqualified from the Tender process or action can be taken for banning of business dealings/ holiday listing of the Bidder/Contractor as deemed fit by the Principal/ Owner.
- 3) If the Bidder/Contractor can prove that he has resorted / recouped the damage caused by him and has installed a suitable corruption prevention system, the Principal/Owner may, at its own discretion, revoke the exclusion prematurely.

Article 5: Equal Treatment of all Bidders/Contractors/Subcontractors

- 1) The Bidder(s)/Contractor(s) undertake(s) to demand from all subcontractors a commitment in conformity with this Integrity Pact. The Bidder/Contractor shall be responsible for any violation(s) of the principles laid down in this agreement/Pact by any of its Subcontractors/sub-vendors.
- 2) The Principal/Owner will enter into Pacts on identical terms as this one with all Bidders and Contractors.
- 3) The Principal/Owner will disqualify Bidders, who do not submit, the duly signed Pact between the Principal/Owner and the bidder, along with the Tender or violate its provisions at any stage of the Tender process, from the Tender process.

Article 6- Duration of the Pact

This Pact begins when both the parties have legally signed it. It expires for the Contractor/Vendor 180 Days after the completion of work under the contract or till the continuation of defect liability period, whichever is more and for all other bidders, till the Contract has been awarded.

If any claim is made/lodged during the time, the same shall be binding and continue to be valid despite the lapse of this Pacts as specified above, unless it is discharged/determined by the Competent Authority, BSF.

Article 7- Other Provisions

- 1) This Pact is subject to Indian Law, place of performance and jurisdiction is the **Headquarters of the Division** of the Principal/Owner, who has floated the Tender.
- 2) Changes and supplements need to be made in writing. Side agreements have not been made.
- 3) If the Contractor is a partnership or a consortium, this Pact must be signed by all the partners or by one or more partner holding power of attorney signed by all partners and consortium members. In case of a Company, the Pact must be signed by a representative duly authorized by board resolution.
- 4) Should one or several provisions of this Pact turn out to be invalid; the remainder of this Pact remains valid. In this case, the parties will strive to come to an agreement to their original intentions.
- 5) It is agreed term and condition that any dispute or difference arising between the parties with regard to the terms of this Integrity Agreement / Pact, any action taken by the Owner/Principal in accordance with this **Integrity Agreement/ Pact or interpretation thereof shall not be subject to arbitration.**

Article 8- LEGAL AND PRIOR RIGHTS

All rights and remedies of the parties hereto shall be in addition to all the other legal rights and remedies belonging to such parties under the Contract and/or law and the same shall be deemed to be cumulative and not alternative to such legal rights and remedies aforesaid. For the sake of brevity, both the Parties agree that this Integrity Pact will have precedence over the Tender/Contact documents with regard any of the provisions covered under this Integrity Pact.

IN WITNESS WHEREOF the parties have signed and executed this Integrity Pact at the place and date first above mentioned in the presence of following

Witnesses:

.....

(For and on behalf of Principal/Owner)

.....

(For and on behalf of Bidder/Contractor)

WITNESSES:

1.

(signature, name and address)

2.

ON NON-JUDICIAL STAMP PAPER OF MINIMUM RS. 100

(Guarantee offered by Bank to BSF in connection with the execution of contracts) Form of Bank
Guarantee for Earnest Money Deposit/Performance Guarantee/Security Deposit/ Mobilization
Advance

1. Whereas the Comdt/ DC(Elect) (name of BSF Establishment)..... ,
BSF on behalf of the President of India (hereinafter called “The Government”) has invited bids under
.....(NIT number)..... dated..... for
..... (name of work)
..... The Government has further agreed to accept
irrevocable Bank Guarantee for Rs. (Rupees..... only)
valid upto (date)*..... as Earnest Money Deposit from (name and address of
contractor).....(hereinafter called “the contractor”) for compliance of his
obligations in accordance with the terms and conditions of the said NIT

OR**

Whereas the 2IC/DC(Elect) (name of BSF Establishment)..... ,
BSF on behalf of the President of India (hereinafter called “The Government”) has entered into an agreement
bearing number with(name and address of the contractor)
(hereinafter called “the Contractor”) for execution of work
..... (Name of work) The
Government has further agreed to accept an irrevocable Bank Guarantee for Rs.
..... (Rupees only) valid upto (date).....as
Performance Guarantee/Security Deposit/Mobilization Advance from the said Contractor for compliance of
his obligations in accordance with the terms and conditions of the agreement.

2. We, ... (indicate the name of the bank) (herein after referred to as “the
Bank”), hereby undertake to pay to the Government an amount not exceeding Rs.
..... (Rupees..... only) on demand by the Government within 10 days of the
demand.
3. We, ...(indicate the name of the Bank)....., do here by undertake to
pay the amount due and payable under this guarantee without any demur, merely on a demand from the
Government stating that the amount claimed is required to meet the recoveries due or likely to be due from
the said Contractor. 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. (Rupees..... only)
4. We, ... (indicate the name of the Bank)....., further undertake to pay the
Government any money so demanded notwithstanding any dispute or disputes raised by the contractor in
any suit or proceeding pending before any Court or Tribunal, our liability under this Bank Guarantee being
absolute and unequivocal. The payment so made by us under this Bank Guarantee shall be a valid discharge
of our liability for payment there under and the Contractor shall have no claim against us for making such
payment.
5. We, ... (indicate the name of the Bank) , further agree that the
Government shall have the fullest liberty without our consent and without affecting in any manner
our obligation here under to vary any of the terms and conditions of the said agreement or to extend
time of performance by the said Contractor from time to time or to postpone for any time or from

Insertion:

Correction:

Deletion:

Overwriting:

AE(E).....

EE(E).....

SE(E).....

time to time any of the powers exercisable by the Government against the said contractor and to forbear or enforce any of the terms and conditions relating to the said agreement and we shall not be relieved from our liability by reason of any such variation or extension being granted to the said Contractor or for any forbearance, act of omission on the part of the Government or any indulgence by the Government to the said Contractor 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.

6. We, ... (indicate the name of the Bank)....., further agree that the Government at its option shall be entitled to enforce this Guarantee against the Bank as a principal debtor at the first instance without proceeding against the Contractor and notwithstanding any security or other guarantee the Government may have in relation to the Contractor's liabilities.
7. This guarantee will not be discharged due to the change in the constitution of the Bank or the Contractor.
8. We, ... (indicate the name of the Bank), undertake not to revoke this guarantee except with the consent of the Government in writing.
9. This Bank Guarantee shall be valid up to..... unless extended on demand by the Government. Notwithstanding anything mentioned above, our liability against this guarantee is restricted to Rs. (Rupees only) and unless a claim in writing is lodged with us within the date of expiry or extended date of expiry of this guarantee, all our liabilities under this guarantee shall stand discharged.

Date

Witnesses:

a. Signature.....
Name and address

Authorized signatory

Name Designation Staff code no.
Bank seal

a. Signature
Name and address

*Date to be worked out on the basis of validity period of 90 days where only financial bids are invited and 180 days for two/three bid system from the date of submission of tender.

**In paragraph 1, strike out the portion not applicable. Bank Guarantee will be made either for earnest money or for performance guarantee/security deposit/mobilization advance, as the case may be.

FORM OF EARNEST MONEY (BANK GUARANTEE)

WHEREAS, contractor (Name of contractor) (hereinafter called "the contractor") has submitted his tender dated (date) for the construction of (name of work) (hereinafter called "the Tender")

KNOW ALL PEOPLE by these presents that we (name of bank) having our registered office at (hereinafter called "the Bank") are bound unto (Name and division of Executive Engineer) (hereinafter called "the Engineer-in-Charge") in the sum of Rs. (Rs. in words) for which payment well and truly to be made to the said Engineer-in-Charge the Bank binds itself, his successors and assigns by these presents.

SEALED with the Common Seal of the said Bank this day of 20... .

THE CONDITIONS of this obligation are:

- i. If after tender opening the Contractor withdraws, his tender during the period of validity of tender (including extended validity of tender) specified in the Form of Tender;
- ii. If the contractor having been notified of the acceptance of his tender by the Engineer-in-Charge:
 1. fails or refuses to execute the Form of Agreement in accordance with the Instructions to contractor, if required; OR
 2. fails or refuses to furnish the Performance Guarantee, in accordance with the provisions of tender document and Instructions to contractor,

We undertake to pay to the Engineer-in-Charge up to the above amount upon receipt of his first written demand, without the Engineer-in-Charge having to substantiate his demand, provided that in his demand the Engineer-in-Charge will note that the amount claimed by him is due to him owing to the occurrence of one or any of the above conditions, specifying the occurred condition or conditions.

This Guarantee will remain in force up to and including the date* after the deadline for submission of tender as such deadline is stated in the Instructions to contractor or as it may be extended by the Engineer-in-Charge, notice of which extension(s) to the Bank is hereby waived. Any demand in respect of this Guarantee should reach the Bank not later than the above date.

DATE SIGNATURE OF THE BANK

WITNESS SEAL

(SIGNATURE, NAME AND ADDRESS)

*Date to be worked out on the basis of validity period of 6 months from last date of receipt of tender.

FORM OF PERFORMANCE SECURITY (GUARANTEE) BANK GUARANTEE BOND

1. In consideration of the President of India (hereinafter called “the Government”) having agreed under the terms and conditions of agreement No. _____ dated _____ made between _____ and _____ {hereinafter called “the said contractor(s)”} for the work _____

_____ (hereinafter called “the said agreement”) having agreed to production of an irrevocable Bank Guarantee for Rs. _____ (Rupees _____ only) as a security/guarantee from the contractor(s) for compliance of his obligations in accordance with the terms and conditions in the said agreement, We _____

(indicate the name of the Bank)
(hereinafter referred to as “the Bank”) hereby undertake to pay to the Government an amount not exceeding Rs. _____/- (Rupees _____ only) on demand by the Government.

2. We _____ do hereby undertake to
(indicate the name of the Bank)

pay the amounts due and payable under this Guarantee without any demure, merely on a demand from the Government stating that the amount claimed is required to meet the recoveries due or likely to be due from the said contractor (s). 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. _____/-(Rupees _____ only).

3. We, the said bank further undertakes to pay to the Government 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 relating thereto, our liability under this present being absolute and unequivocal.

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

4. We _____ further agree that the guarantee
(indicate the name of the Bank)

herein contained shall remain in full force and effect during the period that would be taken for the performance of the said agreement and that it shall continue to be enforceable till all the dues of the Government under or by virtue of the said agreement have been fully paid and its claims satisfied or discharged or till Engineer-in-Charge, on behalf of the Government, certifies that the terms and conditions of the said agreement have been fully and properly carried out by the said contractor(s) accordingly discharges this guarantee.

5. We _____ further agree with the Government that
(indicate the name of the Bank)

the Government 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 agreement 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 Government against the said contractor(s) and to forbear or enforce any of the terms and conditions relating to the said agreement and we shall not be relieved from our liability by reason of any such variation, or extension being granted to the said contractor(s) or for any forbearance, act of omission on the part of the Government or any indulgence by the Government 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.

6. This guarantee will not be discharged due to the change in the constitution of the Bank or the contractor(s).

7. We _____lastly undertake not to
(indicate the name of bank)
revoke this guarantee except with the previous consent of the Government in writing.

8. This guarantee shall be valid upto _____unless extended on demand by Government. Notwithstanding anything mentioned above, our liability against this Guarantee is restricted to Rs. _____/-(Rupees _____only) and unless a claim in writing is lodged with us within Six Months of the date of expiry or the extended date of expiry of this guarantee, all our liabilities under this guarantee shall stand discharged.

Dated the _____ day of _____ for _____ (indicate the name of the Bank)

List of Equipment's & Tools & Plants required at Site.

Following Equipments & Tools & Plants shall be provided and installed at site by the agency at his own cost. The following list is only indicative and not exhaustive. The Bidder may be required to deploy more T & P as per requirement of work. Nothing extra shall be payable.

S No.	Description Equipment	Numbers
1.	Steel/Aluminum Ladder 1.5 m to 8 m suitable for internal & external work	2 Nos
2.	Chase cutting machines	2 Nos
3.	Electrical wire drawing equipment.	2 set
4.	Torque wrench for nut/bolt/screws	2 Nos
5.	Conduit die set.	2 set
6.	Megger (0-1000V)	2 Nos
7.	Earth Tester	2 Nos
8.	Lux meter	2 Nos
9.	Wire Gauge	2 Nos
10.	Micro meter, screw gauge	2 Nos
11.	Vernier Callipers, Screw gauge (Digital)	2 Nos
12.	Anemometer	1 No
13.	Pipe vice.	1 No
14.	Bench vice.	1 No
15.	Decibel meter	1 No
16.	Tacho Meter	1 No
17.	Hydro Meter	1 No
18.	Ammeter	1 No
19.	Voltmeter 0 – 500	1 No
20.	Psychrometer	1 No
21.	Bench vice	1 No
22.	Conduit bending Machine	1 No
23.	Tong Tester.	1 No
24.	Multimeter.	1 No
25.	Hydraulically operated & hand operated crimping machine & tools for all sizes	1 No
26.	Portable Ordinary drilling machine	2 Nos
27.	Portable Hammer drilling machine	2 Nos
28.	Overhead conduit puller.	1 No
29.	Chain wrench 2", 4", 6"	2 Sets
30.	Spanners kit	1 Set
31.	Digital Micrometer least count 0.01mm	1 No
32.	Screw gauge (Digital)	1 No
33.	Dial Gauge	1 No
34.	Drilling machine	1 No
35.	Hand gloves	2 Sets
36.	First Aid Box with recommended medicines as per IS: 2217-1963 as amended	1 No
37.	Thermometer	1 No
39.	Umbrella	4 Nos

PART B
E & M WORKS

GENERAL TERMS AND CONDITIONS

1. Agency has to execute the SITC of Substation, Transformer, HT/LT Panels, laying of HT/ LT cables & shifting of DG Set related to all the services complete in all respects as per schedule of quantities and as per direction of Engineer-in- charge. All the items have to be executed as per item description, NIT specifications, CPWD specifications and other relevant IS codes as applicable.
2. All the sundry materials required for completion of the items / works shall be deemed to be included in the scope of work. Agency has to make good all the damages done by him during execution of the E&M services. Repair work has to be of the quality so that it can match and blend with the work as original. Nothing extra shall be paid in this regard.
3. Agency has to follow the quality assurance plan of “Quality Assurance Policy & Check List of E & M Services 2016” & “Quality Assurance Manual 2022” as available on CPWD official website. All expenditure to be incurred for testing of samples e.g. packaging, sealing, transportation, loading, unloading etc. including testing charges shall be borne by the agency.
4. Agency has to offer the major equipment’s (sub-station, HT/LT Panels, Transformers, UG cables etc.) under this scope of work for pre dispatch inspection at manufacturer’s workshop/ factories. Department would reserve the right to waive off any such inspection as it finds suitable. However, this does not give right to the agency for not offering the equipment for pre dispatch inspection. Nothing extra shall be paid by the department for these mentioned inspections.
5. Testing of materials shall be done as per Quality Assurance Policy & Check list of E&M Services-2016 amended upto date.
6. Any statutory fees as demanded by local bodies shall be reimbursed to the agency on production of original receipts/vouchers. However, before depositing any fees to local body, agency shall take permission from Engineer-in-charge.
7. The agency must study respective CPWD specifications, get themselves acquainted with site conditions along with provision for internal & external EI, Substation & DG sets, Access Control System, etc. for the sub station building and BSF campus as per local byelaws and additional conditions carefully. The work shall be executed in close co-ordination with the progress of civil work.
8. The work shall be carried out in the following order of preference.
 - (i) Indian Electricity Act 2003 & Indian Electricity Rules 2005 amended rules up to date.
 - (ii) Additional Technical specifications and list of acceptable makes attached

The CPWD general specifications for electrical works to be followed are as: Part – I (Internal) – 2023 , Part II (External) -2023 amended up to date, CPWD general specifications for electrical works Part – IV (Sub stations) – 2013, CPWD general specifications for electrical works Part – VII (DG set) - 2013, National electrical code 2011 amended up to date and Relevant sections of relevant IS codes of latest edition, guidelines of RSEB, ECBC, GRIHA, CEA, National Building Code 2016 Vol-I & II and CPWD special publications, guide lines for substation, ASHRAE Hand book, special conditions particular specification relevant BIS code and if both are not applicable then manufacturer’s specifications etc available on CPWD website.

(Note: The higher specifications/stringent conditions of CPWD specifications or NBC – 2016 shall be followed). Relevant BIS standards as modified up to date.)

9. The executing agency has to submit all the necessary documents in respect of all the sub heads of E & M services. The executing agency shall be entirely responsible and answerable for the works executed in all respects.

10. All the equipments shall be delivered with (i) Manufacturer's test certificate, (ii) Manufacturer's technical catalogues and Installation / Instruction (O&M) manuals.
11. Scaffoldings & any other T & P required for execution, testing and commissioning of work shall be arranged by the agency and is included in the cost of work tendered by the agency.
12. Inspection before Dispatch: All routine tests shall be conducted and duly recorded before dispatch of the equipments from the manufacturer's premises. These test certificates shall be provided along with the supply of equipments. The Engineer In-charge/his representative shall, if he so desires, inspect and witness the pre-delivery tests. For this purpose, the agency shall give 15 days' advance notice and shall arrange for inspection by the department. However, the inspection shall be done at the discretion of the department without any cost implication but ROUTINE TEST & TYPE TEST Certificates shall have to be submitted for equipments. Prior to dispatch, all equipments shall be adequately protected & insured for the whole period of transit, storage and erection against any damages like corrosion, pilferage, incidental damages etc. or due to the effect of vermin, sunlight, rain, heat and humidity.
13. Procedure for approval of materials and commencement of work:

Within the time specified in table of milestone, the agency shall submit following documents for approval:-

- (i) Make & model of all the equipment and items as per list of acceptable makes in the agreement.
- (ii) Catalogues/drawings of the equipment to be provided.

It is the responsibility of the tenderer to get the makes, models approved by the department before placing of order.

14. Owing to the complexity of the building, the electrical works are divided into various sub- heads and shall be executed after proper planning/scheduling of the sub-heads and its individual components in tandem with the construction/building work integrating the services well with the building so as to ensure timely completion, no cost overrun, proper quality, sustainability and compliance.
15. Insurance: The agency shall include storage cum erection insurance including third party insurance right from the storage to commissioning and handing over of various equipment. In insurance, the beneficiary shall be Engineer -In-charge at the cost of the agency. All insurance which the agency is required to enter into under the contract shall be affected any authorized general insurance company and the agency shall produce the policies of insurance. In case of any delay in ITC & handing over, the insurance cover will be suitably extended by the agency at his own cost.
16. Remedy of failure to insure: If the agency fails to effect and keep in force the insurance referred to in the preceding sub-clause the department may affect and keep in force any such insurance and pay such premium as may be necessary for that purpose and from time to time deduct the amount, so paid by the department, from any money due or which may become due to bids or recover the same as debit from the agency's bill.
17. Quality of material and workmanship: All parts of the equipment shall be of such design, size and material so as to function satisfactorily under all rated conditions of operation. All components of the equipments shall have adequate factor of safety. The work of fabrication and assembly shall conform to sound engineering practice and on the basis of "Fail Safe Design". The mechanical parts subject to wear and tear shall be easily replaceable type. The construction of the equipments shall be such as to facilitate easy operation, inspection, maintenance and repairs. All connections and

contacts shall be designed to minimize risk of accidental short circuits caused by animals, birds and vermin etc. All identical items and their component parts should be completely, interchangeable including spare parts.

18. Inspection and testing at site :

- (i) The installation shall be subject to necessary inspection during every stage of erection, by the Engineer In-charge or his authorized representative. The successful bidder shall provide all facilities and assistance for the purpose.
- (ii) The completed installation shall be inspected and tested by the Engineer-in charge in the manner as will be laid down by him, in consultation the agency.
- (iii) All instruments and facilities necessary for the tests shall be provided by the agency.

19. Completeness of work :

- (i) The installations shall be completed in all respects and put in to operation even where certain details have not been mentioned / left out in these specifications.
 - (ii) All E&M services shall be inclusive of installation, testing and commissioning complete as required and declared as completed after completion of trial run of 1 month or handing over of whole work to the client, whichever is later. However, maintenance of these installations during the maintenance period of 180 Days shall be carried out by the agency at his own cost. DLP / Warranty period for all the works / machine / equipment shall commence from date of completion of complete work (project) or handing over of whole work to the client, whichever is later.
 - (iii) The agency has to submit three sets of as-built drawings (A0 size) as well as soft copies in Auto-cad for all the sub-heads of E & M services.
- 20.** The agency shall take all necessary safety precautions during execution of the work by means of caution boards, red flags, barriers, providing safety gear to the workers including all other possible means of safety. The agency shall be responsible for any accident or mishap, whatsoever and department shall not be liable for any claims in such cases.
- 21.** The agency shall obtain necessary permission/give intimation to the concerned local authorities/police/dept. as may be required during the execution of the work.
- 22.** Incidental Charges: All incidental charges of any kind including cartage, storage, wastage and safe custody of material etc. shall be borne by the Agency. Nothing extra shall be payable on this account.
- 23.** Quality Assurance: The Agency shall make available, on request from the Department, for record, copies of challans, cash memos, receipts and other certificates, if any, vouchers towards the quantity and quality of various materials procured and the same shall be kept in record. These shall also provide information on the name of the manufacturer, manufacturer's product identification, manufacturer's instructions, warning, date of manufacturing and test certificates from manufacturers for the product for each consignment delivered at site, shelf life, if any, for the department to ensure that the material have been procured from the approved source and of the approved quality, as directed by the Engineer-in-Charge. Day to day account of receipt of such material shall be maintained at site of work and shall be regulated by the department. Nothing extra shall be payable on this account.

24. Quality Control and Testing of Materials:

- (i) All the material to be used on works shall bear ISI certification mark unless otherwise the make is specified in the item or special conditions appended this tender document. In case ISI mark material or the materials mentioned in the tender documents are not available, as per opinion of Engineer-in-charge, which shall be final and binding, the material to be used shall conform to CPWD specifications applicable in this tender or IS Code. In such cases Engineer-in-charge shall satisfy himself about the quality or such material and give his approval in writing. Only articles classified as first quality by the manufacturers shall be used unless otherwise specified. All material not having ISI mark shall be tested as per relevant ISI specification. The Engineer in charge may relax the condition regarding testing if the quantity of the materials required for the work is small. In all cases of use of ISI marked materials proper proof of procurement of materials from authentic manufacturers shall be provided by the agency to the entire satisfaction of Engineer-in-charge. All materials equivalent to the one specified should be got approved by the Engineer-in-charge before using the said materials in the work.
 - (ii) Sample of materials for testing as per CVC / CPWD guidelines has to be carried out in an accredited laboratory. The Agency at his own expense shall supply all materials, labour for preparing and testing samples as required by the Engineer-in-Charge. The testing shall be carried out in the presence of the representative of the Engineer- in- Charge. The transportation and testing charges shall also be borne by the agency.
25. No foreign exchange shall be made available by the department for importing (purchase) of equipments, plants, machinery, materials of any kind. No delay and no claim of any kind shall be entertained from the Agency on account of variation in the foreign exchange rate and/or any Custom duties / charges or any other levies.
26. **NO WAIVING OF LEGAL RIGHTS AND POWERS :**The Engineer-in-Charge shall not be precluded or stopped from taking any measurements, and framing of estimates or detaining any certificates made either before or after the completion and acceptance of the work and payment, from showing the true amount and character of the works performed and materials Furnished by the Agency and from showing that any such measurements, estimates or certificates untrue or incorrectly made and that Engineer-in-charge shall not be precluded or stopped from recovering from the Agency such damages as it may be sustained by reasons of his failure to comply the terms and conditions of the contract.
27. The tenderers shall take into account the element of wastage(s) those are likely to be there in all elements of the work and quote his price, taking that into account. The tenderers shall study all the items from the point of view of wastage(s), which are likely to take place.
28. Power supply required for construction, testing & commissioning shall have to be arranged by the bidder at his own costs. Water required for testing of equipments is also in the scope of agency.
29. Making core cutting in wall/ ceiling, plastering of the same for all E&M sub-heads shall be included in the scope of work without any extra cost.
30. The work shall be carried out, all in accordance with true intent and meaning of the specifications and the drawings taken together, regardless of whether the same may or may not be particularly shown on the drawings and/ or described in the specifications, provided that the same can be reasonably inferred there from. There may be several incidental works, which are not mentioned in the contract document/specifications but will be necessary to complete the item in all respect. After execution, approvals / NOCs / clearances from local bodies, governing bodies etc. shall be the responsibility of successful bidder without any extra cost.

31. Supervision of Work :

The Agency shall depute Site Engineers & skilled workers as required for the work as per the documents required in technical bids & in Part-A. He shall submit organization chart along with details of Engineers and supervisory staff. It shall be ensured that all decision-making powers shall be available to the representatives of the Agency at site itself to avoid any likely delays on this account. The Agency shall also furnish list of persons for specialized works to be executed for various items of work. The Agency shall identify and deploy key persons having qualifications and experience in the similar and other major works, as per the field of their expertise. If during the course of execution of work, the Engineer-in-Charge is of the opinion that the deployed staff is not sufficient or not well experienced; the Agency shall deploy more staff or better-experienced staff at site to complete the work quality and in stipulated time limit.

32. All the materials to be used for E&M services shall not be more than 6 months older at the time of installation.

33. The agencies executing the electrical work should have valid license for LT/HT as applicable.

34. Power supply and water supply :

Power supply required for construction; testing & commissioning shall have to be arranged by the bidder. Water required for testing of equipment's is also in the scope of agency.

35. Cooperation With Other Agencies:

The successful tenderer shall ensure proper coordination between various associate contractor executing the work of different E&M services in the construction of buildings, if any, and exchange freely all technical information so as to make the execution of this work/contract smooth. No remuneration should be claimed from the department for such technical cooperation. If any unreasonable hindrance is caused to other agencies and any completed portion of the work has to be dismantled and re-done for want of cooperation and coordination by the tenderer during the course of work, such expenditure incurred will be recovered from the successful tenderer if the restoration work to the original condition or specification of the dismantled portion of the work was not undertaken by the tenderer himself.

36. Guarantee:

All equipment shall be guaranteed for a period of 12 months from the date of completion against unsatisfactory performance and/or break down due to defective design, workmanship of material. The equipment or components, or any part thereof, so found defective during guarantee period shall be forthwith repaired or replaced free of cost, to the satisfaction of the Engineer-in-Charge. In case it is felt by the department that undue delay is being caused by the contractor in doing this, the same will be got done by the department at the risk and cost of the contractor. The decision of the Engineer-in-Charge in this regard shall be final. The firm will be required to attend to the breakdowns calls as and when required and also ensure timely periodically checks for installations as per CPWD Specifications and standard trade practice.

37. The tenderer shall warranty among other things, the following:

- Quality, Strength and performance of the materials used.
- Safe mechanical and electrical stress on all parts under all specified conditions of operation.
- Satisfactory operation during the maintenance period.

38. Undertaking from OEM for specialized E&M works :

The agency shall submit an undertaking from the OEM regarding

That OEM will unconditionally support technically throughout the execution of contract as well as for Maintenance/ Comprehensive Maintenance Contract for the useful life of the system, and

The OEM will provide an undertaking to provide all the spares required for healthy functioning of the equipment for at least seven years/ the useful life of the system from the date of completion of the project.

The following certificate is required to be submitted on non-Judicial stamp paper :- “Confirmation from the manufacturers to BSF that proper after-sales services and spare parts will be provided for minimum period of 05 years from the date of commissioning, For the BOQ item No. 2,3,4,5,6 of schedule of quantity.

The firm shall execute any extra/ substitute items during execution of work required by the department.

COMMERCIAL AND ADDITIONAL CONDITIONS

1. The scope of work includes SITC of **11KV /0.415 KV Sub-Stations, HT & LT Panels/ Cables and shifting of DG sets** at 48 Bn BSF, 7-A Chhoti, Sri Ganganagar.
2. The material like Transformers, HT Panel, HT/ LT Cables, MV/ LT Panel and earthings including foundation and shifting of DG set etc. should perform satisfactorily.
3. The cable route shall be decided by the Engineer-In-Charge as per feasibility at site and the decision of Engineer-in-Charge in this regard shall be final and binding on the contractor.
4. Due to restricted length of cables in cable drums, jointing of cables shall be carried out through cable junction boxes only and no other type of jointing will be accepted. However, in the cable of circuits from one panel to another panel jointing shall not be allowed.
5. Double earthing with G.I plate earth electrode with salt and charcoal shall be provided for earthing of Main LT panel and G.I pipe earthing for Feeder Pillars, cable joint boxes and main LT panel boards. Also, there shall be 3 Nos. earthing with G.I pipe earth electrode with salt and charcoal per km (average of complete stretch) of street/ security lights, provided last pole of each circuit must be earthed with G.I pipe earth electrode with salt and charcoal. Double wired looped earth G.I. wires of 6 SWG dia. shall also run along all the UG cables duly tied with cable by means of suitable binding wire. For the cable stretches in HDPE Pipe, these earth wires shall also be drawn along with the UG cables in the HDPE Pipe, duly clamped /tied with the cables at a spacing not more than 1 Mtr.
6. In case of reduction in scope of work no claim on account of reduction in value of work, loss of expected profit, consequential overheads etc shall be entertained.
7. The Contractor shall make his own arrangement for safety, watch and ward of his man and materials. Nothing extra shall be paid by the department on this account.
8. The contractor has to take full precaution & safety measure during execution of work. If any types of miss-happening/human loss occur during execution of work at site, the contractor will be fully responsible for it and liable to bear all losses and has to pay full compensation. The department will not take any responsibility for such type of happening.
9. The normal working time shall be in day time. No claim from contractor for extra payment on account of any change in working hours shall be entertained by the department.
10. This specification covers manufacture, testing as may be necessary before dispatch, delivery at site, all preparatory work, assembly and installation, commissioning putting into operation of equipment of all E&M substation components of the tender and final testing.
11. The Tenderer may, before submission of the tender, must study various CPWD specifications; get themselves acquainted with site and site conditions. The department shall not bear responsibility for the lack of knowledge and also the consequences thereof to the Contractor. The information and data shown in the drawings and mentioned in the tender document have been furnished in good faith and for general information and guidance only. The Engineer-in-

Charge in no case shall be held responsible for the accuracy thereof and / or interpretations or conclusions drawn there from by the Contractor and all consequences shall be borne by the Contractor and no claim, whatsoever, shall be entertained from the Contractor, if the data or information furnished in tender document is different from data / drawing for actual construction issued after the award of work or in-correct otherwise. It is presumed that the Contractor has satisfied himself for all possible contingencies, situations, bottlenecks and acts of coordination, which may be required between different agencies.

12. Before commencing the work, the Contractor shall, without in any way limiting his obligations and liabilities, insure at his own cost and expense against any damage or loss or injury, which may be caused to any person or property. Nothing extra shall be payable on this account.

13. There is space constrain for providing new E&M equipment. The entire process is to be planned in such a way that no interruption shall be caused to existing Institute office working. The work will be carried out with least disturbance during shifting and shut down taken in consultation with the client department as the work is to be executed in a operational office campus.

14. INSPECTION OF SITE

The Contractors should in his own interest visit the site, inspect and examine the site and its surroundings, get familiarize with the site conditions before tendering and satisfy themselves with the nature of site, the means of access to the site, the constraints of space for stacking material / machinery, labour etc., constraints put by local regulations, if any, weather conditions at site, general ground / subsoil conditions etc. or any other circumstances which may affect or influence their tenders. The site is available for work. The contractor shall, immediately on issue of letter of acceptance of tender, make arrangements for starting the work.

15. COMMERCIAL CONDITIONS

Type of Contract: The work to be awarded by this tender shall be treated as indivisible works contract. Income tax, GST, labour cess & other statutory deductions etc. shall be made at source as per the prevalent laws. The deductions of Security Deposit, Income Tax, Labour Cess etc. shall be done as applicable on the gross payments and net payment shall be paid accordingly.

16. RATES

The rates quoted by the tenderer, shall for complete items of works, firm and inclusive of all taxes (including GST, labour cess etc.) duties and levies, all charges for items contingent to the work such as for packing, forwarding, insurance, freight and delivery, installation, testing, commissioning etc. at site including equipment required for temporary power connections, risks, over head charges, general liabilities/obligations and clearance from CEA, local power supply company, local bodies, Fire authorities.

17. All tools /tackles/cranes/hydra required for lifting, lowering and positioning of existing as well as new equipment- substation, HT, LT panels etc is included in the scope of work. Nothing extra shall be payable on this account.

18. The contractor shall obtain an undertaking from the Original Equipment Manufacturer (OEM) regarding:-

- (i) Authorization certificate.
- (ii) Technical Support Commitment:- The OEM shall provide unconditional technical support to the contractor throughout the execution of the project and during the maintenance period for the system's useful life.
- (iii) Availability of the Spares:- The OEM shall ensure the availability of all necessary spare parts for healthy functioning of the equipment for a minimum of seven years from the date of supply of equipment.

19. Unless otherwise provided in the Schedule of Quantities, the rates quoted by the Contractor shall be inclusive of carrying out the works at and / or upto all heights, leads and depths. The contractor shall make all arrangements for the same. Nothing extra shall be payable on this account.

The tenderers shall take into account the element of wastage(s) those are likely to be there in all elements of the work and quote his price, taking that into account. The tenderers shall study all the items from the point of view of wastage(s), which are likely to take place as the work is to be executed in a working Institute office building. Nothing extra shall be payable on this account.

20. Mobilization advance : No Mobilization advance shall be paid for this work

21. Insurance and Storage:

All consignments are to be duly insured up to the destination from warehouse at the cost of the contractor. The insurance covers shall be valid till the equipment is handed over duly installed, tested and commissioned.

22. The contractor shall ensure quality construction in a planned and time bound manner. Any sub-standard material or work beyond set out tolerance limits shall be summarily rejected by the Engineer-in-charge.

The work is to be carried out in workman like manner and generally in accordance with the plans. However the contractor will be bound to carry out the work with minor deviation over the plan supplied if desired by the Engineer-in-Charge of the work.

All ancillary and incidental facilities required for execution of work like labour camp, stores fabrication yard, watch and ward, temporary ramp, temporary structure for plants and machineries, installation and consumption charges of temporary electricity, water etc. required for execution of the work, liaison and pursuing for obtaining various No Objection Certificates/clearances, completion certificates from local bodies etc., protection works, barricading, facilities for all field tests and for taking samples etc. during execution or any other activity which is necessary (for execution of work and as directed by Engineer-in-Charge), shall be deemed to be included in rates quoted by the Contractor, for various items in the schedule of quantities. Nothing extra shall be payable on these accounts. All incidental charges of any kind including cartage, storage, wastage and safe custody of material etc. shall be the sole responsibility of the Contractor & shall be borne by him and no claim whatsoever shall be entertained on this account.

The contractor shall give due notices to Municipality/Corporation, Police and/or other authorities that may be required under the laws/rules under force and obtain all requisite permissions/licenses for temporary obstructions/enclosures and pay all charges which may be leviable on account of his execution of the work under the agreement. Nothing extra shall be payable on this account.

23. The Contractor shall prepare the programme chart for the execution of the work showing clearly all activities from the start of work to the completion, with details of requirements of materials, man power, equipment and machinery deployment, required for the completion of the work within the stipulated period and submit the same to the Engineer-in-Charge, as prescribed, after award of work. The Contractor shall also submit monthly programme and progress reports and update/ re-schedule the same every month. These shall be submitted by the contractor in soft copy also besides forwarding hard copy of the same.

24. The contractor shall coordinate with local bodies/licensing authorities/supply company etc for getting approvals/clearances and shall submit necessary documents required for the same. No extra payment shall be made for the same. However statutory charges for such approvals/clearances shall be reimbursed by the department.

25. COMPLETENESS OF TENDER

All sundry equipment, fittings, unit assemblies, accessories, hardware items, foundation bolts, termination lugs for electrical connections, and all other items which are useful and necessary for efficient assembly and installation of equipment and components of the work shall be deemed to have been included in the tender irrespective of the fact whether such items are specifically mentioned in the tender documents or not.

26. STORAGE AND CUSTODY OF MATERIALS

The agency has to make his own arrangements for storage of materials. The contractor shall be responsible for the safe custody of the electrical installation in the building, including fitting, fixtures and equipment till the installations handed over to the client/department. No storage accommodation shall be provided by the department. He should make his own arrangement for proper watch and ward, safe custody of the site/property/material provided by him and materials issued by the department against pilferage and breakage during the period of execution and thereafter till the work is completed and physically handed over to the client/department at his risk and cost. No claim will be entertained on this account.

27. CARE OF THE BUILDING:

Care shall be taken by the contractor while handling and installing the various equipment and components of the work to avoid damage to the building/existing equipment. He shall be responsible for repairing all damages and restoring the same to their original finish at his cost. He shall also remove at his cost all unwanted and waste materials arising out of the installation from the site of work.

The contractor or his representative, labour should not remove / disturb/ dislocate the existing equipment and its parts from its positions until and unless it is authorized by the Engineer-in-charge. Care shall be taken not to damage the Civil / Electrical installation by improper handling etc. The contractor shall be responsible for any damage on account of negligence of the contractor's staff, the same will have to be made good at contractor's own cost. He shall also remove at his cost all unwanted

and waste materials arising out of the maintenance from the site of work. Nothing extra shall be paid on this account.

28. INTEGRATED PROGRAMME CHART

The Contractor shall prepare and submit to the Engineer-in-charge, an integrated programme chart. The integrated program chart showing clearly all activities from the start of work to completion, with details of manpower, equipment and machinery required for the fulfillment of the program within the stipulated period or earlier and submit the same for approval to the Engineer-in-Charge.

The integrated programme chart submitted by the contractor shall not have any discrepancy with the milestones attached in the contract agreement. The contractor shall execute the work according to the programme submitted to and approved by the Engineer-in-Charge.

The program chart should include the following:

Descriptive note explaining sequence of the various activities. Network (PERT/CPM/BAR CHART)

Program for procurement of materials by the contractor.

Program of procurement of machinery/ equipment having adequate capacity, commensurate with the quantum of work to be done within the stipulated period, by the contractor. The construction agency shall submit shuttering schedule adequate to complete structure work within laid down physical milestone etc. If at any time, it appears to the Engineer-in-Charge that the actual progress of work does not confirm to the approved program referred above, the contractor shall produce a revised program showing the modifications to the approved program to ensure completion of the work. The modified schedule of program shall be approved by the Engineer-in-Charge. Non-submission of such revised program shall attract the recoveries as per relevant clauses of relevant GCC.

The submission for approval by the Engineer-in-Charge of such program or the furnishing of such particulars shall not relieve the contractor of any of the duties or responsibilities under the contract. This is without prejudice to the right of Engineer-in-Charge to take action against the contractor as per terms and conditions of the agreement.

29. INTEGRATED SERVICE DRAWINGS

Before taking up the work, the contractor shall prepare integrated drawings for various civil and electrical works/services showing details of layout plan including sectional elevations and submit the same for the approval of Engineer-in-Charge. Integrated drawings shall be prepared and submitted by the Contractor as per local Byelaws and as per the site conditions to facilitate convenient installation as well as maintenance. Nothing extra shall be payable on this account.

30. APPROVAL OF MATERIALS AND COMMENCEMENT OF WORK

The design layout plans / drawings / other documents pertaining to E & M services shall have to be submitted for approval and got checked within the time period as specified in the table of mile stone. Within 15 days of award of work the contractor shall visit the site and submit following documents for approval.

1. List of makes & Model numbers of all items and/or equipment and accessories offered

for all packages.

2. Catalogues of the equipment to be supplied, detailed technical literature, drawings, specifications, pamphlets and performance data for appraisal and evaluation.
3. Shop floor drawings of each package separately for approval. It is the responsibility of the tenderer to get the makes, models and shop floor drawings approved by the department.
4. All general arrangement drawings.
5. Any other drawing/information not specifically mentioned above but deemed to be necessary for the job by the contractor.
6. All materials equivalent to the one specified should be got approved by the Engineer-in-charge before using the said materials in the work.
7. The Engineer-in-charge shall scrutinize the proposal and approve the makes and models which are acceptable as per the schedule, specifications, conditions of the agreement and inform the agency for procurement.
8. After approval of the equipment/materials by the department the agency shall procure the equipment/materials from the OEM/authorized distributor/dealer as the case may be.
9. Adequate care that only tested and genuine materials of proper quality are used in work shall be ensured by firm. The firm shall also ensure that:
 - (i) Material will be ordered & delivered at site only with the prior approval of the department to ensure timely delivery.
 - (ii) The firm will be required to procure material directly from the manufacturer/authorized dealers to ensure genuineness & quality and as per the approved makes only. Proof in this regard shall be submitted by the contractor if required by the department.

Year of manufacturing of all equipment/fittings/cables shall be current.

The successful tenderer should also furnish well in advance three copies of detailed instructions and manuals of manufactures for all items and/or equipment regarding installation, adjustments operation and maintenance including preventive maintenance and troubleshooting together with all the relevant data sheets, spare parts catalogue and workshop procedure for repairs, assembly and adjustment etc all in triplicate.

31. Painting:

This shall include cost of painting of entire exposed ironwork complete in the installation. All major equipment of works like Power substation -HT panel, transformers, LT panels, cable trays etc shall be factory final finish painted at the works before dispatch to the site. The agency shall be required to do only touching to the damages caused to the painting during transportation, handling & installation at site, if there is no major damage to the painting. However hangers, supports etc. shall be painted with required shade including painting with two coats of anticorrosive primer paint at site.

ADDITIONAL TERMS & CONDITIONS WITH SPECIFICATIONS

HT SUBSTATION EQUIPMENT

1.1 CONFORMITY WITH STATUTORY ACTS, RULES, REGULATIONS, STANDARDS AND SAFETY CODES

Indian Electricity Act and Rules

All electrical works in connection with installation of Electric sub-stations including transformer, HT/ LT panels and laying of HT/ LT cables shall be carried out in accordance with the provisions of Indian Electricity Act, 2003 and the Indian Electricity Rules, 1956 amended upto date. Wherever I.E. rule numbers have been indicated, they are based on I.E. Rules, 1956 amended upto date.

1.2 CPWD Specifications

The Electrical works shall also conform to CPWD General Specifications for Electrical Works Part I (Internal) 2023, Part II (External) 2023 and Part-IV Sub Station – 2013 as amended upto date wherever relevant and applicable.

1.3 Indian Standards

The sub-station equipment and their installation shall conform to relevant Indian standards.

1.4 Other Acts and Rules

The installation shall also comply with the following:-

- (i) Factories Act wherever applicable.
- (ii) Any other Act or Rules in force.

1.5 Safety Codes and Labour Regulations

In respect of all labour employed directly or indirectly on the work, the tenderer, herein after called the contractor, at his own expense will arrange for the safety provision outlined in section 9 of these specifications to comply with the statutory regulations, ISI recommendations and CPWD codes.

In case of default, the department shall be at liberty to make arrangements and provide facilities as aforesaid and recover the cost from the contractor.

The contractor shall provide necessary barriers warning signals and other safety measures to avoid accidents. He shall also indemnify CPWD against claims for compensation arising out of negligence in this respect.

Nothing in these specifications shall be construed to relieve the contractor of his responsibility for the design, manufacture and installation of the equipment with all accessories in accordance with applicable statutory regulations and safety codes in force from the safety angle.

1.6 Works to be done by the contractor

In addition to supply, installation, testing and commissioning of all equipment the following work shall be deemed to be included within the scope of work, to be executed by the contractor.

- (i) All minor building works, such as equipment foundation if required cutting and making good holes, grouting of channels belts as required. Cutting and making good damages etc.
- (ii) The firm shall execute any extra/ substitute items during execution of work required by the department
- (iii) Provision of supports / clamps for equipment, cables etc. wherever required.
- (iv) Small wiring, inter-connection etc. inclusive of all materials and accessories, necessary to comply with the regulations as well as proper and trouble free operation of the equipment.
- (v) Closing of the cable entry points in sub-station against seepage of water, rodents etc.
- (vi) Tools and tackles required for handling and installation.
- (vii) Necessary testing equipment for commissioning.
- (viii) Watch and ward of materials and/or installation and equipment till their completion & handing over to the Client/department.

1.7 Inspection of Site and collection of Data

The contractor shall be deemed to have examined the tender documents, detailed specification, data etc. and to have visited the site or ascertained all relevant details for offering suitable equipment/ installation.

1.8 Final Inspection and Testing

When the installation is complete, the contractor shall arrange for inspection and testing of the installation. Test results obtained shall be recorded. The installation shall not be accepted until it complies with the requirement of these specifications. The Substation installation shall be got inspected by the contractor from local licensee and/or CEA and their clearance taken be for energizing the Substation. All the observations/deficiencies pointed out by the inspecting authorities shall be complied with by the contractor on priority.

1.9 Completion Drawing

In addition to supply, installation, testing and commissioning of all equipment the following work shall be deemed to be included within the scope of work, to be executed by the contractor.

Five sets of completion drawings comprising the following shall be submitted by the contractor while handing over the installation:

- (a) Equipment layout drawing(s) giving complete details of the entire equipment.

- (b) Electrical drawings for the entire electrical equipment showing cable sizes, equipment capacities, switch-gear's ratings, control components, control wiring etc.
- (c) Schematic diagram of the entire sub-station installation.

1.10 Date of Acceptance

The contractor shall operate the substation for a period of fifteen days after it is energized. The substation work shall be reckoned complete after its trouble free operation during the running in period.

1.11 After Sales Services

The contractor shall ensure adequate and prompt after sales services in the form of maintenance personnel and spares as and when required with a view to minimizing the breakdown period. Particular attention shall be given to ensure that all spares are easily available during the normal life of installation.

TECHINCAL SPECIFICATION

CODE & STANDARDS:

- 1.1.0 All equipment and material shall be designed manufactured and tested in accordance with the latest applicable Indian Standard / IEC standard.
- 1.2.0 Equipment and material confirming to any other standard which ensures equal or better quality may be accepted. In such case copies of English version of the standard adopted shall be submitted.
- 1.3.0 The electrical installation shall meet the requirement of Indian Electricity Rules as amended upto date relevant IS code of practice and Indian Electricity Act.
- 1.3.1 The Unitized Sub-station offered shall in general comply with the latest issues including amendments of the following standards but not restricted to it.

All equipment and material shall be designed manufactured and tested in accordance with the latest applicable IEC standards. The 11 KV Package Substation Design must be as per **IEC 61330/ IEC 62271-202. The following materials / components will be approved on production of following Test reports as per IS Code.**

Title	Indian & IEC Standards
High Voltage Low Voltage Prefabricated Substation	IEC:62271-202
11 kV Switchgear cubicles	IS:13118, IS:3427, IEC:60694, IEC:60298
Code of practice for selection, installation and maintenance of Switchgear & and Control gear	IS:10118
Oil type power Transformer	IS - 11171
Power transformer	IS: 2026

Sub Head- : (Substation, Transformer, Panels)

1. The work shall be executed as per CPWD General specifications for Electrical works Part-I, II & IV as amended upto date and relevant IE rules, BIS/IEC/IS codes or statutory norms as prescribed by local authorities e.g. CEA, Power supply Co. etc. and as per directions of Engineer-in-Charge.
2. The sub-station shall conform to IS 14786(2000).
3. Panels shall be:
 - a) Panels shall be manufactured from CPRI approved factory.
 - b) Sectionalized, Compartmentalized.
 - c) Dust and vermin proof construction.
 - d) Cable entry: From Bottom and TOP as per site requirement.
 - e) Provided with gaskets all-round the perimeter of removable covers and doors.
 - f) Bus bars and cable alley shall be shrouded.
 - g) Provided with labels on the front indicating the switchgear designation.
4. Cable alleys shall be provided with suitably hinged doors/cover. It shall be possible to safely carry out maintenance work in any one circuit with the busbar and adjacent circuits live. Adequate number of slotted cable support arms shall be provided for clearing the cables.
5. Metallic partitions shall be provided between adjacent cubicles, between feeder compartments, between busbar chambers and other compartments. Cubicles shall be bolted together to give appearance of a single switchboard.
6. Provision shall be made for shrouding the outgoing terminals for protection against accidental touch. All exposed live parts shall be totally covered by shrouds.
7. Wherever more than one cable has to be terminated on any incoming / outgoing feeder the respective incoming / outgoing terminals has to be designed in such way as to receive the required number of cables.
8. Base Channel / Base frame shall be provided in case of free floor standing panels.
9. The panel board shall be fabricated using suitable mild steel structural sections or pressed and shaped cold rolled sheet steel of thickness not less than 2 mm. Stiffeners shall be provided wherever necessary.
10. All panel edges and door edges shall be reinforced against distortion by rolling, bending or by the addition of welded reinforced members. Cut-outs shall be true in shape and devoid of sharp edges. The complete structure shall be rigid, self-supporting and free from vibration, twists and bends.
11. All sheet steel work shall be phosphate with applicable standards. All metal works shall be chemically treated with 7 tank process for degreasing, derusting, phosphate and applied with two coats of Epoxy powder coating.

12. The panel board shall be painted with epoxy powder coated, approved shade and color (as per IS : 5) on interior and exterior side
13. The panel shall be provided with three phase and neutral busbar. Busbar shall be of uniform cross section throughout their length of the bus bar section.
14. All bus bar and bus-taps shall be insulated with color coded heat shrinkable PVC insulation sleeves
15. Busbar shall be adequately supported and braced to withstand the stresses due to the specified short circuit currents. Busbar supports shall be made of fiber reinforced moulded plastic material, or cast resin.
16. Separate supports shall be provided for each phase of the busbars. If a common support is provided for all three phases, anti-tracking barriers shall be incorporated.
17. Busbar joints shall be complete with high tensile steel bolts and washers and nuts. Busbars shall be thoroughly cleaned at the joint locations and a suitable contact grease shall be applied just before making a joint.
18. Lightning Protection should be as per IEC 62305.

1. 11 KV SWITCHGEAR

The Panel board shall be of indoor type, having the incoming sectionalization and outgoing switch gears as per IS 13118-1991 of VCB, IEC 62271-100 for Breakers and -200 for Panels/IS 3427 of switch board. The degree of enclosure protection shall be IP-4X. Detailed requirements shall be in accordance with the schedule of works at BOQ.

Rating: All panels assembled to form a board shall be suitable for the nominal operation voltage and rupturing capacity as specified. They should be rated as specified with a minimum of 630 Amps. and suitable for operation on 11 KV, 3 phase 50 Hz system. Type test certificate for the breaking capacity of the panel shall be supplied. A circuit breaker for a given duty in service is best selected by considering the individual rated values required by load conditions and fault condition. **The VCB panel shall have a short circuit fault level certified for internal arc of 21KA for 3sec**

Finish: The HV panel Board shall be totally enclosed, metal clad, dust, damp and vermin proof, indoor, floor mounting, free standing type and suitable for tropical climate. SF6 Vacuum Circuit Breaker shall be used for distribution network of HT switchgear. Vacuum Circuit Breaker complete with operating mechanism, self- powered microprocessor-based protection Numerical Relay with associated Current Transformers shall be used for control and protection of transformer. An integral cable earthing switch with full making capacity shall be provided. The arc proof cable covers accessible from front shall be mechanically interlocked to the earthing switch, which in turn shall be interlocked to the switch for safety of operator.

The above Load Break Switch, VCB, Bus bars should be mounted inside a robotically welded sealed for life, stainless steel tank of **2 mm thick sheet metal**. The operating mechanism of the switches and breakers shall be outside the SF6 tank and accessible from front/side. The tank should be filled with SF6 gas at an adequate pressure. The degree of protection for gas tank should be IP67. Moreover, the Stainless-Steel Gas Tank shall confirm to the sealed pressure system as per IEC and

ensure the gas leakage to 0.1 % per year as per IEC.

The VCB is required to control distribution transformer and relay settings and current Transformers shall be selected accordingly.

Ratings: The bus bars shall have continuous rating of 630 Amps. The isolator shall have a continuous rating of 630 Amps. The SF6 VCB breaker shall have a continuous rating of 630 Amps in accordance with relevant IS / IEC standard

Breaking & Making Capacity: The Load Break Cable Switches shall be capable for breaking rated full load current. The same along with its earthing switch shall also be suitable for full making capacity of the system as specified. The complete switchgear shall be suitable for breaking capacity of 21kA symmetrical at 11000 volts three phase.

Busbars Switchgear shall be complete with all connection bus bars etc. ~~Aluminium / Copper~~ bus bars continuous rating shall be 630 Amps. The bus bars should be fully encapsulated by SF6 gas inside the steel tank.

Protection: The SF6 circuit breaker shall be fitted with microprocessor based self-powered relay [IDMT RELAY] inside the front cover to avoid any tampering. The same shall be used in conjunction with suitable CT's and Tripping Coil for fault tripping of the Circuit Breakers. CTs shall be mounted on bushing of breaker. CTs mounted on cable inside cable compartment are not acceptable.

Cable Termination: Each Cable compartment shall be provided with three bushings of adequate sizes to terminate the incoming outgoing 11kV, 3Core upto 120 Sq.mm Al. conductor XLPE insulation Armoured Cable. There shall be enough height from the base of the mounted switchgear so that the cables can be bent and taken vertically up to the bushings. The Cable termination shall be done by Heat shrinkable termination method so that adequate clearances shall be maintained between phases for Termination. Access to all the cables should be possible from the front/side of RMU. Cable Termination boots shall be supplied by the switchgear manufacturer.

Locking Arrangement: Suitable padlocking arrangements shall be provided as stated below:

- a) Circuit Breaker manual operating handle in the "OFF" position.
- b) Each feeder Panel operating handle in 'Closed' 'Open" or 'Earth' position.
- c) Isolator operating handle in 'Closed', 'Open' or 'Earth' position.

	RATINGS:	Extensible radial / ring compact switchgear with SF6 insulated VCB 11kV
Switchgear Data		
a)	Service	INDOOR
b)	Type	Metal enclosed
c)	Number of phases	3
d)	Voltage	11000V
e)	Rated Frequency	50Hz
f)	Rated Current	630 Amp (Isolator)
g)	Short Circuit rating	
i)	Breaking	21 kA rms for breaker
ii)	Short time withstand for 3 Sec.	21 kA rms
iii)	Rated S/C making	52.5 kA peak
h)	Short duration power frequency	28kV
i)	Insulation Level	75kV peak
j)	System Earthing	Solidly earthed

Breaker		For load
a)	Type	Vacuum Circuit Breaker in SF6 tank
b)	Rated voltage	11kV
c)	Breaking current	
	i) Load breaking	21 KA rms
d)	Making current	52.5 KA peak
e)	Rated current	630Amps.
f)	No. of poles	3
g)	Operating mechanism.	Trip free & free handle type with mechanically operate indication & pad locking, Motorized type (EDO)
Isolators		Loop-in & Loop out
a)	Type	Load breaking and fault making in SF6 tank
b)	Rated current	630Amps.
d)	Rated breaking capacity	630Amps.
e)	Fault making capacity	52.5 KA peak
f)	No. of poles	3
g)	Operating mechanism	Operating handle with ON, OFF, Earth positions with arrangement for padlocking in each position.
Busbars:		
a)	Material	Copper
b)	Type	SF6 insulated
c)	Rated Current	630Amps

Switchgear:

Sealed for life, the enclosure shall meet the “sealed pressure system” criteria in accordance with IEC: 298 (a system for which no handling of gas is required throughout service life of approximate 30 years.) There shall be no requirement to ‘top up’ the SF6 gas. In addition, manufacturer shall confirm that maximum leakage rate is lower than 0.1% per year. It shall provide full insulation, making the switchgear insensitive to the environment. Thus assembled, the active parts of the switchgear unit shall be maintenance free.

The switchgear & switchboard shall be designed so that the position of different devices is visible to the operator on the front of the switchboard & operations are visible as well. The switchboard shall be designed so as to prevent access to all live parts during operation without the use of tools.

CIRCUIT BREAKER:

The Unit shall consist of Tee-offspring assisted, three pole SF6 breaker, with integral fault making / dead breaking earth switch. The function shall be naturally interlocked to prevent the main & earth switch from being switched ‘ON’ at the same time & the circuit breaker not allowed to trip in ‘Earth On’ position. The selection of the main/earth switch lever on the panel, which is allowed to move only if the main or earth switches in the off position. The lever shall be able to pad locked in either the main or earth position.

PROTECTION:

Protection Relays: The Circuit breaker shall be fitted with microprocessor based self-powered relay inside the front cover to avoid any tampering.

Testing:

Each type of 11 KV switchgear shall be completely assembled, wired, adjusted, tested at the factory as per the relevant standards IS 9920, IS

2. Transformer

General Construction

2X500 KVA Losses as per IS:1180 Level- 3 rating continuous duty cycle, 11kV/0.415kV, 3 phase, 50Hz, Dyn-11 vector group, step down, Out type, copper wound, ONAN type (Easter Oil) transformers with On load tap changer with manual RTCC and high voltage windings for varying low or high voltage in the range of +5% to -10% in 2.5% steps. Class 'A' of Thermal insulation Suitable for Ambient temperature 45° C. Maximum winding temperature 105° C. The Following Fittings Shall Be provided with all required accessories:- Rating & Terminal Marking Plate, Earthing Terminals , Lifting Lugs For Main Tank & Top Cover, Filter Valve , Drain Cum Sampling Valve, Thermometer Pocket, Dial Type Oil Temperature Indicator, Air Release Plug, Silica Gel Breather, Explosion Vent, Inspection Cover, Arcing Horn, Radiators Mounted on Tank, 4 Nos. bi-directional Rollers, First Filling of Transformer Oil as per IS:335, 2Nos. Buchholz Relay (1 for trans. & 1 for OLTC), Oil Temperature Indicator, Winding Temperature Indicator, Magnetic Oil Level Gauge, Marshalling Box, Epoxy Bushing, PU Paints, Palm, LV Bus Bar, Radiator Valves, Busbar Box on LT side & Cable Box on HT side.

Transformer shall Compliance to IS:1180 & IS:2026 all parts latest as on date whichever is higher complete with all accessories. The transformer shall be delivered along with after complete factory tests and temperature rise test (incl. in cost), with RS485 port for BMS communication.

Note :- Transformer cost with On load tap changer with manual RTCC Panel including Cabling and Battery Backups.

The Transformers shall comply with the following Indian Standards as amended upto date:

- (i) IS:1180 & IS:2026 Level- 3 – ONAN type (Easter Oil) power transformers.
- (ii) IS 10028 (Part II & III)-Installation and Maintenance of Transformers.
- (iii) IS2099 – Bushing
- (iv) IS2705– Current

Transformers General Requirements

The transformer shall be indoor or outdoor type as specified. Unless otherwise specified the transformer in addition shall have thermal and dynamic ability to withstand external short-circuit as per clause 9 of IS 2026 (Part I): 1977 and clause 5 of IS 11171: 1985.

Capacity and Rating

The KVA rating for 2 Nos three phase transformers is 500 KVA Continuous rating specified shall be irrespective of tapping position

Temperature Rise

The reference ambient temperatures assumed for the purpose of this specification are as follows: -

- | | |
|---|----------|
| (a) Maximum ambient air temperature | 50°C. |
| (b) Maximum daily average ambient air temperature | 40°C. |
| (c) Maximum yearly weighted average ambient temperature | 32°C. |
| (d) Minimum yearly weighted average ambient temperature | (-) 5°C. |
| (e) Class of insulation | F |

The temperature rise limit at the above conditions and at the altitude not exceeding 1000 meters shall be as specified.

If the site conditions indicated for a particular job is more severe than the referred ambient temperature mentioned above, the temperature rise above ambient shall be suitably scaled down such that the hot spot temperature shall not exceed the values for the reference conditions 90°C (F/H class insulation).

Voltage Ratio: Unless otherwise specified, the transformer shall be suitable for a voltage ratio of 11KV/433V. Insulating material shall be of proven design. The insulating materials shall be Class “A” for AN & Class “F” for Dry Cast Resin.

Connections: H.V. Delta and L.V Star connected with neutral brought out on the secondary side for connection to earth; Vector group Dyn11 of IS:2026.

Vector Group : In case of step-down transformers, the winding connections shall conform to vector group Dy 11 unless otherwise specified.

Cooling : The transformer cooling shall be oil cooled.

Technical Particulars

(To be submitted at the time of approval of equipment/material)

Name of work: - Development and bulk services i.e. Electrical works, Boundary wall, P/F main gates for 125 Bn BSF (Now 48 Bn) at 7-A Chhoti New location) Sriganganagar (Raj) (SH: - Providing 11/0.415 KV Sub-Stations, HT & LT Panels/ Cables and shifting of DG sets) NIT No.:

Transformers

- 1.1 Make
- 1.2 Type
 - (a) Type of winding
 - (b) Type of enclosure
- 1.3 Output in KVA (continuous rating)
- 1.4 Frequency
- 1.5 Voltage between phases (HV on no-load)
- 1.6 Voltage between phases (L V on no-load)
- 1.7 Impedence at normal voltage ratio at 75 deg. C
- 1.8 Efficiency at unity power factor
 - (a) Full Load
 - (b) $\frac{3}{4}$ load
 - (c) $\frac{1}{2}$ load
- 1.9 Iron losses at normal voltage ratio
- 1.10 Copper losses at normal voltage ratio, at full load
- 1.11 Regulation at unity power factor at 75 deg.
- 1.12 Reactance at normal voltage and ratio
- 1.13 Resistance of HV winding at 75 deg. C
- 1.14 Regulation at 0.8 PF at 75 deg. C
- 1.15 Resistance of MV winding at 75 deg. C
- 1.16 Over Load: The transformers are capable of carrying overload as follows:

Percentage	When starting	After Running
Load	Cold (in hours)	continuously (in hours)
(a) 25%		
(b) 50%		
(c) 100%		
- 1.17 Over all dimensions of the transformer
- 1.18 CPRI / NABL Type test certificate be enclosed for all type tests applicable as per I.S.

Transformer Compartment:		
11KV/433V, 500 KVA ONAN type (Easter Oil), transformer.	2	
Phase & Frequency	-	
Type of winding	-	
Vector Group	-	
Taping Mode	-	
Taping Range	-	
Steps/%	-	
Type of cooling	-	
Insulation	-	
HV/LV Termination	-	
Temperature rise over ambient	-	
No Load Losses (kW)	-	
Load Losses at 75°C (kW)	-	
Impedance Subject to IS tolerance	-	
Standards & Specification	-	
Fitting & Accessories:		
HV /LV Epoxy Insulator	3/4	
Earthing terminals.	2	
Rating and diagram plate	1	
Lifting lugs	4	
HT Compartment:		
11kV, 630A, 21kA for 3 Sec, Indoor Type, Non-Extensible, Motorized Operated, 3 way (3 VCBs), SF6 Insulated, With Self-Powered Microprocessor based Relay Having O/C, S/C, E/F Protection with Metering Module Consisting of CT and PT.	3	
Gland Plate suitable for 11kV Grade Armored Cable	YES	
LT Compartment:		
800A, 4P, 50KA, 433V, EDO ACB, Microprocessor based with LSING Protection and Current metering display.	2	
800A 4P 50kA Frame Size: 1 MDO ACB, Release: UW-MTX1G (LSING - BCD Switches), Type: U-Power Omega	1	
RYB Indication	YES	
Gland Plate suitable for 1.1kV Grade Armored Cable	YES	
Base: Skid	1	
	-	
Transformer compartment ingress protection: IP 34	-	
HT & LT Compartment ingress protection: IP 54	-	
Base frame: 4 mm Thick Bended Structure	-	
Frame: Pure propylene Siemens Grey	-	
Canopy & Doors: Pure propylene powder coated, Siemens Grey	-	
Miscellaneous:		
Panel light / Door limit switch	2/2	1 each for LT & HT compartments
Panel labels	1	YES
Indication lamp for LV side	1	YES
Transformer To HV connection	LS	11 KV XLPE cable
Transformer to LV connections to ACB	LS	1.1 KV XLPE cable

3. L.T. Panel System

a) Nominal voltage: 3 Phase, 433V, 50 Hz

b) Neutral: Solidly earthed at substation.

LT compartment shall be suitable to house following equipment,

- Cable connection from transformer to MV panel 3.5 X 300 Sqmm A2XFY aluminium cables & Above fault current, **EDO** type ACB with LSING protection and current metering display.
- Bus bars should be suitable for termination of 11 Number of 3.5CX240/300Sq.mm A2XFY aluminium cables
-

THE DESIGN SHOULD COMPLY FOR THE FOLLOWING STANDARDS ALL AMENDED UPTO DATE.

IEC-, IEC- 61439-1 & 2	Low voltage Switch gear and Control gear assemblies Part-I and II, type tested and partially type tested assemblies
IEC-60947-1,2004	Low voltage Switch gear and Control gear Part-I general rules
IEC-1180-1,1992	High voltage test techniques for low voltage equipment Part-I definition test and Procedure requirement
IEC-60529,1989	Degree of protection provided by enclosures (IP code)

EQUIPMENT SPECIFICATION

800A Air circuit Breaker (ACB)

These shall be Drawout type with electrically operated (**EDO**) mechanism. The short circuit mechanism and breaking capacity as shall be supported by test certificate. The test certificates should be from CPRI / any Govt. approved recognized test house /laboratory.

All Air Circuit Breakers shall be 3/4 pole with minimum KA 55kA & above breaking capacity (55kA & above at 433V) conforming to IS/IEC-60947-2 (Part-II). Rated current shall be as per capacities specified. The equipment shall be complete with the following: -

- Necessary circuit breaker carriage with 3 position (isolate, test, service) draw-out mechanism.
- Necessary isolating plugs and sockets.
- Necessary mechanism interlock and automatic safe shutters gear with arrangement for pad locking.
- Necessary independent manual spring mechanism with mechanical On / Off indication as
- Necessary bus bars with bolted type neutral links.
- ACB shall be provided with microprocessor-based releases having built in overload, short circuit, Instantaneous, Neutral & earth fault protection. ACB shall have Current metering

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display and capable to providing ON/OFF/Trip Status remotely. Microprocessor release shall be EMI (Electro Magnetic Induction)/ EMC (Electro Magnetic Compatible) certified.

- g. Necessary set of auxiliary switches.
- h. Necessary set of CTs with ratios as specified, ACB with Rogowski coil current sensor CT for Microprocessor release .
- i. Necessary identification, metering requirements as specified i/c. ON/OFF indication lamps, selector switches, fuses, ammeter, voltmeter etc.
- j. In case of 4 pole breaker neutral shall be fully rated – 100% with adjustable settings from 50% to 100% of In. In case of 3 Pole breaker External neutral CT is used to provide the protection to Neutral pole through ACB Microprocessor release and avoid nuisance tripping
- k. ACB terminals shall be suitable/suitably brought-out for direct aluminum termination as per IS /IEC- 60947 Part-II.

The circuit breaker shall be fitted with CT operated thermal overload and short circuit releases devices for suitable current rating.

Overload releases should be settable from 40 % to 100% of the rated current In.

Ambient temperature compensated type and there should not be de-rating of ACB current carrying capacity at 50C. The testing of ACB for the temperature rise shall be carried out by the manufacturer as per the prevailing, IS / IEC or any other international standards.

ACB shall be provided with very sensitive overload and short circuit release. Short circuit release should have settable value as required with an adjustable time having setting range of 40 – 460 m seconds, to have a proper co-ordination with short circuit release of outgoing ACB/MCCBs.

Interconnections between the main bus bars and individual units shall be made using vertical / horizontal aluminium bus bars of adequate rating.

4. HT & LT METERING:

Shall be as per mentioned in schedule of quantities

5. Earthing:

Earthing arrangement shall be provided for earthing each cable, brass cable gland, neutral busbar, chassis and framework of the cubicle with separate earthing terminals at two ends. The main earthing terminals shall be suitably marked. The earthing terminals shall be of adequate size, protected against corrosion, and readily accessible. These shall be identified by means of sign marked in a legible manner on or adjacent to terminals. Neutral bus bar strip shall be connected to Earthing terminal with help of earth strip of suitable capacity & nut-bolt arrangement.

(iii) TYPE/ ROUTINE TEST ON SUBSTATION

TYPE TESTS FOR THE SUBSTATION:

The Package Substations offered must be type tested as per latest **IEC 62271-202** only. The copy of type test summary should be submitted along with the tender.

Routine Tests: All the routine tests shall be made on each complete prefabricated substation as prescribed

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in IS standards at manufacturer's work before dispatch in presence of Engineer-in-charge. In addition to prescribed routine tests, temperature rise test on each transformer shall be done.

- a) Voltage tests on auxiliary circuit.
- b) Functional test.
- c) Verification of complete wiring.

Test Witness: Routine test shall be performed in presence of Dept.'s representative if so desired by the Owner. The Contractor shall give at least fifteen (15) days advance notice of the date when the tests are to be carried out.

TEST CERTIFICATES:

Test reports of all the tests mentioned under type tests clause shall be submitted along with technical details submitted for approval. Certified reports of all the tests carried out at the works shall be furnished in three (3) copies for approval of the Dept./CEA

Enclosure:

- Tests to verify the degree of protection.
- Arcing due to internal fault 20KA as per latest IEC62271-202
- Test to proven closure class-Temperature rise of the transformer inside the enclosure.
- Short circuit test to prove the capability of the earthing circuits to be subjected to the rated peak and the rated short time withstand currents.
- Tests to verify the withstand of the enclosure of the prefabricated substation against mechanical stress.

Tests at Site

In addition to tests at manufacturer's premises, all relevant pre-commissioning checks and tests conforming to IS code of practice No. 10028 shall be done before energization. The following tests are to be particularly done before cable jointing or connecting the busbar trunking.

- 1.** Insulation test between HV to earth and HV to MV with 5000 volts Megger.
- 2.** Insulation test between MV to earth with 500 volts Megger.
- 3.** All test results are to be recorded, and reports should be submitted to the department.

PANELS SPECIFICATIONS

Scope

This Section covers the detailed requirements of medium voltage switch panel for 11KV/ 433V, 3 phase, 50 Hz, 3/4 wire system. The Scope of these specifications covers the design, material selection, manufacture, testing at manufacturer's works, insurance, packing, transportation, loading/unloading, supply at site, installation, testing and commissioning of the low voltage panels/ boards TTA Panel (IEC-61439) covered in the schedule of quantities, for indoor / outdoor installation. These shall be assembled/ fabricated from a factory/fabricator of repute and CPRI approved. All switchgears shall be fully rated at an ambient of 40°C.

Type of Panel

The medium voltage switch board panel shall comprise of any one of the following types of switchgears or combination thereof as specified.

- a) Air Circuit breakers draw out or fixed type.
- b) MCCBs of suitable Ics ratings. MCCBs shall invariably be Current Limiting type.

The Panel shall be indoor type having incoming sectionalization and outgoing switchgears as specified. The design shall be cubical type. The degree of enclosure protection shall be IP42 as per IS 13947 (Part-I) or as specified.

M.V. PANEL

This section covers Supply/erection/testing and commissioning of the panels suitable for 415 Volt, 3 phase, 50Hz 4 wire system.

General Construction

The cubicle panel/switch board shall be floor mounted (on base frame) free standing, totally enclosed and extensible type. The switch board shall be dust & vermin proof and shall be suitable for the climate conditions as specified. The design shall include all provisions for safety of operation and maintenance personnel.

The general construction shall conform to TTA Panel (IEC-61439) for factory assembled switch board.

Note:

- The LV panels shall be modular, extendable and shall have maintenance friendly Construction. The LV panel shall have compartmentalized bolted construction.
- Intrinsic load bearing member shall be used as per design verified assembly and should have minimum thickness of 2 mm. Load bearing members to be supplied by OEM or by approved supplier of OEM.
- The LV Panel shall comply to internal arc as per IEC 61641 for 0.5 seconds necessary test certification required to be produced at time of an inspection.
- The panels shall be tested for mechanical impact IK10.
- The busbars shall be supported of regular intervals using SMC insulators as per the tested design. It should have minimum Comparative Tracking Index (CTI) of 600 V as per IS 2824).
- The busbar support to be supplied by OEM or by approved supplier of OEM.
- Critical component of panels i.e. Gasket, Hinges, Camlock, dropper support shall be supplied by OEM or approved supplier of OEM. Necessary document shall be presented by vendor at time of an

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inspection.

- At the time of Drawing approval, Panel GA drawing and Bill of Material (BOM) shall be submitted with stamp and sign of OEM.
- Prior to final inspection by the department, OEM internal QC inspection report shall be submitted.
- APFC Panel shall be comply as per IEC 61439, IEC 61921 standard. Type test report shall be produced at time of drawing approval.

Cubical Type Panels

Cubical type panels shall be fabricated out of sheet steel not less than 2.0 mm thick. Wherever necessary, such sheet steel members shall be stiffened by angle iron frame work. General construction shall employ the principle of compartmentalization and segregation for each circuit. Unless otherwise approved, incomer and bus section panels or sections shall be separate and independent and shall not be mixed with sections required for feeders. Each section of the rear accessible type panel shall have hinged access doors at the rear. Overall height of the panel shall not exceed 2.4 meters. Operating levers, handle etc. of highest unit shall not be higher than 1.7meters. Multi-tier mounting of feeder is permissible. The general arrangement for multi-tier construction shall be such that the horizontal tiers formed present a pleasing and aesthetic look. The general arrangement shall be approved before fabrication.

Cable compartments of adequate size shall be provided in the Panels/Distribution Boards for easy termination of cables. Cable entries for various feeders shall be either from top or bottom through cable alleys located in between two circuit sections, either in the rear or in the front of the panel. All outgoing and incoming feeder terminals shall be brought out to terminal blocks in the cable compartment. All cable terminations shall be through gland plates. There shall be separate gland plate for each cable entry so that there will not be dislocation of already wired circuits when new feeders are added. Cable entry plates shall therefore be sectionalized. The construction shall include necessary cable supports for clamping the cable in the cable alley or rear cable chamber.

Cubicle panels with more than 1000 Amps bus shall be made of tested structural modular sections.

Bus Bar and Connections

The bus bars shall be of Copper of high conductivity electrolytic quality and of adequate section. Current density for copper shall not exceed 160 amps/sq. cm. The bus bar system may comprise of a system of main horizontal bus bars and ancillary vertical bus bars run in bus bar alleys on either side of which the circuit could be arranged with front access cable entries. In the case of rear access, horizontal bus system shall run suitably either at the top or bottom. All connections to individual circuits from the bus bar shall preferably be solid connections; however flexible connections shall also be permitted as per recommendations of the Panel Manufacturer. All bus bars and connections shall be suitably sleeved/ insulated in approved manner.

Incomer/Termination

Incomer termination shall be suitable for receiving bus trunking/underground cables. Cable terminations shall invariably be through terminal blocks (Polyamide or superior) or brought out solid terminal.

The outgoing terminals and neutral link shall be brought out to a cable alley suitably located and accessible from the panel front. The current transformers for instruments metering shall be mounted on the terminal blocks. No direct connection of incoming or outgoing cables to internal components of the Panels/Distribution board is permitted.

Instruments

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All voltmeters and ammeters shall be flush mounted of size minimum 96mm conforming to class 1.5 of IS 1248 for accuracy. All voltmeters shall be protected with MCB.

Indicating Lamps

On all the incomers of M.V panels, ON/OFF indicating LED lamps shall be provided and shall be suitable for operation on AC supply. Phase indicating LED amps shall be associated with necessary ON/OFF toggle switch.

Small Wiring

All small wiring for Controls, Indication etc. shall be with suitable FRLS/ HFFR (halogen free fire retardant) copper conductor cables. Wiring shall be suitably protected within switchboard. Runs of wires shall be neatly bunched, suitably supported and clamped. Means shall be provided for easy identifications of the wires. Where wires are drawn through steel conduits, the works shall conform to CPWD General Specifications for Electrical Works (Part I- Internal), 2023 and IS 732 as the case may be. Identification ferrules shall be used at both ends of the wires. All control wiring meant for external connections are to be brought out of terminal board.

Earthing: copper / GI strip for LT panel shall be fixed throughout the panel connected to 2 nos. earth bus copper strips connected to incoming earth conductors.

Name plates & Labels: Suitable white engraving on black name plate and indications labels of metallic plates- anodized aluminum for all switchboards and circuits shall be provided. These shall indicate the feeder number and feeder designation. A common label shall also be provided for the panel

Single line circuit diagram showing the arrangements of circuit inside the Panels/DBs shall be pasted on inside of the panel door and covered with transparent laminated plastic sheet.

Sheet Steel Treatment and Painting:

Sheet steel used in the fabrication of switchboards shall undergo a rigorous cleaning and surface treatment, seven tank process comprising of alkaline degreasing, descaling in dilute sulphuric acid and a recognized phosphating process after which a coat of primer paint compactively with the final paint shall be applied over the treated surface. Final paint coat of oven baked powder coating of minimum 50-micron thickness, of sheet approved by Engineer-in-charge shall then be provided.

Interlocks

Suitable mechanical interlock castle key type shall be provided, if specified. For automatic operation, only electrical interlocks shall be provided. Interlocking scheme shall be designed for automatic operation.

OPERATIONAL REQUIREMENTS

The indoor type MV panel shall conform to the following: -

- a) The panel shall comprise of incomers, outgoing feeders and bus coupler as specified. The incomer shall be either a double break/contact repulsion MCCB or an Air Circuit Breaker. The bus coupler shall be either a circuit breaker or a double break / contact repulsion MCCB or switch disconnector fuse unit as specified. The outgoing feeders shall be circuit breakers/MCCBs as specified.

- b) Busbars for phase and neutral shall have a rating as specified or as per General Specifications for Electrical Works- Substation Part-IV 2013.
- c) The entire switch panel shall be cubical type factory assembled switch board.
- d) The incomer panel shall be suitable for receiving bus trunking or MV cable of size specified either from top or from bottom.
- e) All incoming Air Circuit Breaker/ MCCB shall have suitable adjustable tripping current and the time delay settings.
- f) The entire panel shall have a common earth bar of size as specified with two terminals for earth connections.

RATING AND REQUIREMENTS

Air Circuit Breaker

All Air Circuit Breakers shall be 3/4 pole with minimum 50 KA breaking capacity (35 MVA at 433V) or as specified conforming to IS 13947 (Part-II). Rated current shall be as per capacities specified. The equipment shall be complete with the following: -

- (a) Necessary circuit breaker carriage with 3 position (isolate, test, service) draw- out mechanism.
- (b) Necessary isolating plugs and sockets.
- (c) Necessary mechanism interlock and automatic safe shutters gear with arrangement for pad locking.
- (d) Necessary independent manual spring mechanism with mechanical On/Off indication as well as electrical On/Off indication.
- (e) Necessary bus bars with bolted type neutral links.
- (f) ACB shall be provided with microprocessor-based releases having built in over load, short circuit & earth fault protection. Microprocessor release shall be EMI (Electro Magnetic Induction)/ EMC (Electro Magnetic Compatible) certified.
- (g) Necessary set of auxiliary switches.
- (h) Necessary set of CTs with ratios as specified.
- (i) Necessary identification, metering requirements as specified i/c. ON/ OFF indication lamps, selector switches, fuses, ammeter, voltmeter etc.
- (j) In case of 4 pole breaker neutral shall be fully rated with adjustable settings from 50% to 100% of I_n .
- (k) ACB terminals shall be suitable/ suitably brought out for direct aluminium termination as per IS 13947 Part-II.

MCCB

All MCCBs shall be current limiting type with features of load line reversibility and suitable for Horizontal/ Vertical mounting without any derating. Beyond 300 Amps capacity MCCBs shall have positive isolation and preferably double break / contact repulsion & double insulation features.

The MCCBs shall invariably be used with terminal spreaders.

All the MCCB's Shall be suitable for fault breaking capacity as mentioned in the schedule of quantities but in any case, should not be less than 25 kA. Operating mechanism should be double break, Quick make / Quick break & trip free type. All the MCCB's shall be provided with variable Over Current, fixed Short Circuit releases. The variable Earth fault release is optional. The same shall be provided if called for in the schedule of quantity. The MCCB's having rating 250 Amps and the above the releases shall be Microprocessor based only and the MCCBS of lower ratings the releases shall be Thermo magnetic type. All MCCBs up to 630A should be covered in 2 frame sizes. All the MCCBs shall have $I_{cs}=100\%$ of I_{cu} . All the MCCBS shall conform to isolation function as per IEC947-2 Section 7.1.2. All four pole MCCBS above 160 Amps shall have capability of setting Neutral to N or N/2 as mentioned in the BOQ. All accessories of MCCBS shall be snap fitted type. All MCCBS should have flexibility of Line Load reversibility.

The Manufacturer of the MCCBs should provide energy curves and Total discrimination charts with cascading table for the approval of the Consultant/Bank prior to ordering the MCCBs. All the MCCBS should comply to IEC 60947-2 and IS/IEC 60947-2. All the MCCBS should have three clear positions ON/OFF and TRIP. MCCBs shall comply with environmental directives National / International.

The MCCB shall be provided with direct or extended Rotary handle with door interlock facility for all the rating of the MCCBS. All the MCCBS should be suitable for total discrimination. The MCCBs having rating more than 160 Amps shall have communication option which should able to display the status of each breaker and its setting, Control the circuit breakers and display the faults. All MCCB's shall be true double make & double break with current limiting type, enabling full use of current limitation. Operating mechanism shall be of the quick make quick break type, with the speed of operation independent of the operator, and mechanically trip free from the operating handle to revert the contacts from being held closed against short-circuit and overload conditions.

The operating mechanism shall be constructed to operate all poles in a multi-pole breaker simultaneously during opening, closing and tripped conditions.

Protection Function

Electronic trip units shall comply with appendix F of IEC 60947-2 standard (measurement of Rms current values, electromagnetic compatibility, etc.).

All electronic components shall withstand temperatures up to 125°C.

Earth fault protection if required should be an integral part of the release & should be adjustable

The control unit shall have thermal memory to store temp rise data in case of repetitive overloads or earth fault for protecting the cables & loads.

The accessories like shunt trip, closing trip coils should be continuously rated to avoid the burning due to sustained command. Fault differentiation should be available.

The MCCBs should be with Class-2 front facia in order to avoid any live part exposure in case the front cover is opened for the accessory mounting.

All the Molded Case Circuit Breakers should able to monitor load and adjustable Magnetic Threshold above 200 Amps. All the MCCBs should have Trip Unit Interchangeability at site.

The MCCB shall be 3 pole / 4 pole as the need be. In case of 4 pole MCCB, the 4th pole shall be 100% rated.

The MCCB shall be available in fixed / draw-out version as the need be.

It shall be possible to fit accessories on the MCCB such as auxiliary contact, trip indication contact, rotary handle, under volt coil or shunt trip coil, etc. In case of rotary handle, the same shall have built-in door interlock, defeat & padlocking facility. The rotary handle shall be same as that for SDF or MCCB for better aesthetics.

The MCCB shall be manually operated or motor operated as the need be. It shall be possible to convert the MCCB from manually operated to motorized MCCB and vice-versa.

All the MCCB shall be suitable for 690V ac system voltage. The MCCB shall be suitable for impulse withstand of 8 kV.

The MCCB shall have short circuit breaking capacity Icu of 16 or 25 or 36 or 50 kA rms. The MCCB breaking capacity shall have Icu = 100% of Ics for the entire range.

The MCCB shall have no de rating up to 50°C service temperature. In case the MCCB needs de rating, manufacturer shall declare the de rated current carrying capacity at 50°C service temperature.

The MCCB shall be current limiting and shall have line-load interchangeability without any loss of capacity.

The MCCBs above 100A, shall have adjustable and properly calibrated overload and short circuit settings.

Trip Unit

The MCCBs up to 160A shall be with thermo-magnetic trip unit. 160A & above, the trip unit shall be microprocessor based. Static trip unit shall not be acceptable.

The trip unit shall be capable to accept any change in the setting on-line, without need to switch off the MCCB.

The trip unit shall have overload and short circuit protection. It shall be possible to change the trip unit from thermo-magnetic to microprocessor based and vice-versa.

Test at Manufacturers Work

All routine tests shall be carried out at ACB/ MCCB manufacturers works and test certificates produced to the department.

Installation

The installation work shall cover assembly of various sections of the panels lining up, grouting the

units etc. In the case of multiple panel switch boards after connecting up the bus bars etc., all joints shall be insulated with necessary insulation tape or approved insulation compound. A common earth bar as per section 7 of these specifications (Part-IV 2013) shall be run inside at the back of switch panel connecting all the sections for connection to frame earth system. All protection and other small wirings for indication etc. shall be completed before calibration and commissioning checks are commenced. All relays, meters etc. shall be mounted and connected with appropriate wiring.

Drawings/ Data for Panels/ Boards

Before fabrication of the panels/ boards, Contractor shall submit 4 sets of detailed general arrangement drawings, single line diagrams and schematic diagrams for all circuits/ modules for approval. G.A. drawings shall show foundation/ fixing details also.

G.A. drawings shall indicate the list of components with manufacturer's reference scheme/wiring diagram and detailed bill of materials.

Minor changes suggested by the Engineer-in-charge during approvals shall be without any price variation.

Testing and Commissioning

The panels shall be inspected by Engineer-in-charge or his representative at fabricators works prior to dispatch to site to witness the followings.

- a) Physical variation and dimensional check
- b) Verification of bill of material
- c) Functional check
- d) HV test
- e) IR test

Commissioning checks and tests shall include all wiring checks and checking up of connections. Relay adjustment/setting shall be done before commissioning in addition to routine Megger tests. Checks and tests shall include the following:-

- a) Operation checks and lubrication of all moving parts.
- b) Interlock function checks.
- c) Continuity checks of wiring, fuses etc. as required.
- d) Insulation test: When measured with 500V Megger the insulation resistance shall not be less than 100 mega ohms.
- e) Trip tests and protection gear test.

Copies of type test carried out at the switchboard fabricators shop shall be furnished along with the delivery

TECHNICAL PARTICULARS OF CAPACITOR BANK

The Capacitor units shall comply with IS 13340 / IEC 831 for self-healing type and other components such as Contactors, MCCBs, MCBs HRC Fuses etc., shall comply with the latest versions of relevant Indian Standards.

The Capacitor units shall be CPRI/ ERDA tested.

RATINGS:

The rating of the Power Factor Correction equipment shall be 3 phase, 50 Hz, 440 volts: APFC kVAr = (120)

OPERATING LIMITS/ OVERLOADS

Each capacitor shall meet the following requirements:

- a) Maximum permissible over-voltage: Each capacitor shall be capable of operating continuously at 110% of the rated voltage (3 phase, 440V, 50 Hz).
- b) Maximum permissible over current: The permissible increase in current loading due to any or all of the following shall not exceed 30% of the rated current:
 1. Increased voltage
 2. Increased frequency
 3. Non-sinusoidal voltage.
- c) Test voltage: All routine tests shall be conducted at 2.15 Un for each element as well as the assembled capacitor unit.
- d) The capacitors shall be suitable for operating in temperature category:-**25/D** (Category: Max. Temp. 55 °C) as per relevant IS / IEC temperature category.

CAPACITOR CELLS (MANUFACTURE & CONSTRUCTION) :

Individual Capacitors shall be made up of single phase elements internally delta connected to form a 3- phase capacitor Heavy Duty Metallised Polypropylene as a dielectric with electrodes of special material.

The capacitor shall be provided with safety device in the form on INTERNAL FUSE

Capacitors shall be contained in heavy duty metallic enclosure. The capacitors shall be provided with Thermal equalizers & the Heat Dissipation shall be through conduction via metal enclosure.

Dielectric material shall have loss less than 0.5 watts per KVAR. This shall enable longer life and lower capitalization of losses in the long run.

The capacitors shall have current carrying capability of **200x In** and there shall be no need for providing inrush current limiting inductor coil.

The encapsulation medium shall be a thermo-plastic material. Nominal design life of individual capacitor cells shall be 15 years.

The capacitor shall have threaded terminals for wire connection OR cables brought out for direct termination on contactors.

DISCHARGE RESISTORS

Capacitor cells shall be provided with discharge resistors to reduce residual voltage to less than 50 volts within one minute of disconnection

Resistors shall be chosen to ensure a 20 year minimum life. CONTROLS:

All controls shall be mounted on enclosure door for easy inspection and service.

AUTOMATIC POWER FACTOR CONTROLLER/RELAY:

The APFC RELAY shall be microprocessor-based VAR Sensing type and not PF or current sensing type. Controller shall be able to sense the reactive current requirement and switch on the required VAR providing intelligent switching based on actual value of KVAR and Bank Sizes.

The relay shall have LED display The relay shall be easily programmable from front panel itself. It shall have provision of both Auto and manual operation.

A built-in settable time delay function shall be provided and the controller shall have provision to automatically set itself for a time delay of 40 – 60 secs in the event of Power Outage.

C/K ratio shall be automatically settable

The switching sequence shall be so chosen as to minimize the wear and tear of contactors. The equal step of capacitors shall be switched in rotation to achieve this feature.

The relay shall be able to recognize the connection of CT and Voltage and be able to automatically adjust itself to the phase angle difference.

The relay shall be 144 x 144mm dimensions It shall be single phase sensing type.

The target PF setting range shall be 0.8 lead to 0.8 lag. The operating temperature shall be upto 70 deg C.

SWITCHGEAR COMPONENTS:

CAPACITOR DUTY CONTACTORS:

Heavy Duty Contactors shall be used. These shall be suitable for capacitor switching of 25 / 50KVAR capacity. The contactors shall be able to withstand 200 In inrush currents. The contactors shall be provided with damping resistors.

INCOMER MCCB:

Each panel shall be provided with an incomer MCCB of adequate rating and shall be provided with overload and short circuit release. The short circuit breaking capacity of the MCCB shall be 50 KA.

STEP PROTECTION:

Each step of capacitor panel shall be provided with adequately rated Fuses.

4. CABLES WORK

Scope:

This section covers supply, laying and jointing as required and testing and energizing all cable work.

Specification Of Cable

- a) 11 KV grade XLPE insulated PVC sheathed armoured Aluminum/ Copper cable shall be 3 core earthed of sizes as specified. The cable shall conform to IS 7098 / (Part-II) 1985 with the Latest Amendments.
 - b) 1.1 KV grade XLPE insulated PVC sheathed armoured Aluminum/Copper cable shall be 3½/4 core of sizes as specified. The cable shall conform to IS 7098 / (Part-I) 1988 with the Latest Amendments.
 - c) All control wires shall be 650 V grade copper conductor Halogen free fire retardant or FRLS PVC insulated, conforming to IS 694. The minimum size of the control wires shall be 1.5 sq. mm.
- 4.1 XLPE insulated PVC sheathed (with extruded inner and outer sheath) GI armored Aluminum conductor underground cables shall be ISI marked.
- 4.2 The XLPE cables shall be with extruded inner and outer sheath, suitable for installation in air, conduits/pipes, ducts, open concrete trenches, for direct burial in either wet, or dry locations for indicated operating conditions. The length of the cables required shall be measured w.r.t. site conditions and these shall be delivered in section of approved length only, to avoid jointing as far as possible. Cable delivery shall be scheduled in consultation with Department only.
- 4.3 All cables shall be offered for inspection by Department prior to dispatch, Department reserve the right to wave of inspection so required in lieu of proper test certificates.
- 4.4 Only BIS certificated cables shall be bought from manufacturer and confirm to following latest relevant applicable Standards: -

(a)	IS-8130	:-	Conductors for insulated electric cables and flexible cords
(b)	IS-5831	:-	PVC insulation and sheath of electric cables
(c)	IS-1554 (Part-I)	:-	PVC insulation (Heavy duty) Electrical cable
(d)	IS-7098 (Part-I)	:-	Specification for crosslinked polyethylene insulated pvc sheathed cables
(e)	IS-7098 (Part-II)	:-	Specification for crosslinked polyethylene insulated pvc sheathed cables
(f)	IS-17048	:-	Halogen free flame retardant (HFFR) cables
(g)	IS- 3975	:-	Low carbon galvanized steel wires, formed wires and tapes for armouring of cables
(h)	IS-10810	:-	Methods of test for Cables.

- 4.5 The cross-linked polyethylene insulated (XLPE) Cable shall be manufactured and tested strictly in accordance with the above mentioned Indian Standard codes and its latest amendments. The insulation shall fit tightly to the conductor and shall be applied concentrically about the conductor in thickness consistent with the voltage classification. The insulation shall be so applied that it shall be possible to remove it without damaging the conductor.
- 4.6 All conductors shall be of stranded construction complying with the requirement of class II of IS: 8130 with latest amendments. All conductors shall be of high electrical conductivity Aluminum conforming to requirement of IS: 8130 with latest amendments. Before stranding, the conductor shall be circular in cross section, uniform in quality, solid, smooth and free from scale, sharp edges and other defects.
- 4.7 The laid up cores shall be provided with an inner sheath applied by extrusion process. It shall be ensured that it is as circular as possible. The inner sheath material shall be of polyvinyl chloride (PVC) compound conforming to the requirements of type ST 2 compound of IS:5831 with latest amendments. The inner sheath shall be so applied that it fits closely on the laid up cores and shall be possible to remove it without damage to the insulation. The armouring shall be of galvanized steel strips for multi core cables, complying with the requirements of IS: 3975 with latest amendments. The outer sheath shall be of polyvinyl chloride (PVC) compound conforming to the requirements of Type ST 2 of IS: 5831 with latest amendments. The outer sheath shall be applied by extrusion process. The thickness of the outer sheath shall be as per IS: 7098 (Part - I).
- 4.8 Sequential cable marking, after every 1 meter, indicating the name of the purchaser as “**street/ security lights Z, CPWD**”, size of cable, name of the manufacturer etc. shall be provided. Cables shall be supplied in the wooden drums in the specified length. Wooden drums shall be strong, weatherproof and non-returnable. The ends of the cable shall be sealed by means of non – hygroscopic sealing material.
- 4.9 **Testing of Cables**
Cables shall be subjected to routine & acceptance tests in accordance with the relevant BIS standards in addition to physical, ageing and electrical tests at the Manufacturer’s plant in accordance with applicable standards. Each test shall be carried out on randomly selected samples. The sample size for testing shall be as per CPWD Quality Assurance Policy for E&M Services (2016) as amended up to date / relevant BIS Standard or as per direction of the Engineer-In-Charge. All costs of such tests, including replacement of damaged material shall be borne by the Contractor.
- 4.10 **Rejection**
In case the samples of cables fail to pass the tests or comply with the requirement of the specifications, the whole consignment shall be rejected and to be replaced immediately without any additional payment.
- 4.11 **Laying of cable**
- 4.11.1 Cable shall be laid in HDPE pipe, trenches, cable trays and on walls as specified. Installation shall include all supports and clamps as required. The complete work shall be in accordance to CPWD General Specifications for Electrical Works - Part II (External) 2023 amended upto date. As far as possible cables shall not be fixed on walls directly but laid on cable trays.
- 4.11.2 The cables & DWC pipe shall be laid at the depth of 75 cm in ground. Contractors are advised to quote the tender accordingly. As the previous cable are laid at a depth of 50 cm, hence there shall not be allowed use of JCB, Excavator etc for excavation except manual excavation and due care is to be

taken for existing cables. If any already laid cable is damaged during execution of work, then it would be replaced/repaired by agency without any extra cost.

- 4.11.3 DWC pipe & cables laying works the excavated soil is to be used as cushioning. If required, the extra earth (surplus earth) after back filling of excavated trench / pole foundation is to be disposed of beyond the lead of border road. Nothing extra shall be paid on this account. All debris/malba generated while carrying out work shall be removed and shall be cleared by contractor as soon as the work is completed. The work should be carried out, carefully, in a manner that no damage is done to the existing/ongoing fence and road. In case any damage is done, same has to be repaired without any extra cost. In case of excavation for foundation, in trenches or other areas, the bed of excavation shall be to the correct level or slope and shall be consolidated by watering and ramming. During excavation of trench excavated soil should be deposited on land adjacent to road/border track side to avoid road damage. If any road damage occur then it would be repaired by agency without free of cost.
- 4.11.4 The contractor shall unroll the cable drums properly at the time of laying of cables, so that the cables are not damaged. Empty cable drums (wooden) and assorted wooden packing boxes of other accessories etc. shall be the property of contractor after completion of work and such property shall be removed by the contractor within two weeks of the physical completion of works, failing which recovery at the rate of Rs 500/- (Rupees Five Hundred Only) for each cable drum shall be made from the bill of the contractor.
- 4.11.5 Cable shall be buried in ground only after inspection of Engineer-in-Charge or his authorized representative. If any cable is buried without checking of aforesaid person then Engineer-in-Charge or his authorized person may ask to re-lay cable after excavating same trench where cable is laid without any extra cost.
- 4.11.6 Leveling and ramming of earth should be done after laying of cable without any extra cost.
- 4.11.7 Unrolling of cable drum must be done in the presence of Engineer-in-Charge or his authorized person.
- 4.11.8 If any equipments/ infrastructure is damaged during excavation of trench or execution of work then same would be repaired or replaced without any extra cost.
- 4.11.9 Testing of cable as per External-(2023) specifications of CPWD for Electrical works should be done in the presence of Engineer-in-Charge or his authorized representative.

5. Cable Junction Box

- 5.1 Jointing For 11 KV Grade Cable glands
- 5.2 Jointing work shall be carried out only by licensed experienced cable jointer and shall be in accordance to CPWD General Specifications for Electrical Works - Part II (External) 2023 amended upto date.
- 5.3 Jointing of LT cables shall be carried out through cable junction boxes only and no other type of jointing will be accepted. However, in the cable of circuits from MV panel/ essential & non-essential panel to feeder pillar jointing shall not be allowed.
- 5.4 The Cable Junction Box shall be not less than of nominal dimensions of 600 mm (H) x 450 mm (W) x 300 mm (D), and made out of 2 mm thick CRCA sheet, duly powder coated and with locking arrangement.
- 5.5 4 strip Aluminium bus bar arrangement of appropriate size (minimum 30 mm x 5 mm) for cable

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jointing shall be provided in the Cable Junction Box and these Junction Boxes shall be mounted on 40 mm x 40 mm x 6 mm thick GI angle frame with four nos. 750 mm long leg, as per the approved drawings.

- 5.6 The foundation for junction box shall be made of cement concrete 1:2:4 (1 cement: 2 coarse sand (zone-III) derived from natural sources : 4 graded stone aggregate 20 mm nominal size derived from natural sources). The base of the junction box shall be at least 600 mm above the ground level. However, in low lying flood prone area height of the junction box shall be suitably increased for which no extra cost shall be paid to the contractor. Similarly, depth of the foundation below the ground level shall be suitably decided depending on the soil condition. The foundation drawing shall be got approved from Engineer-In-Charge before execution. After installation all the cable junction boxes shall be numbered by the good quality enamel paints as per the direction of Engineer-in-charge.

Cable Identification Tags :

Wherever more than one cable is laid/run side by side, marker tags, inscribed with cable identification details shall be permanently attached to all the cables in the manholes/open ducts etc. These shall also be attached to various cables laid direct in ground at suitable intervals as decided before trenches are filled up.

Earthing For 11 KV Grade Cable glands

All HV cable glands shall be connected to the earth with 2 Nos. 38.6 mm copper or equivalent G.I. conductors.

Selection shall be made as per tables given under Table V of CPWD General Specifications for Electrical Works Part-II (External) - 2023 amended upto date.

TESTING

Testing of the complete cable installation shall be as per clause 2.8.2 and 2.8.3 of CPWD General Specifications for Electrical Works-Part II (External) 2023 amended upto date.

All cables before laying shall be tested with a 500 Volts megger for 1.1 KV grade or with a 2,500/5,000 Volts megger for cables of higher voltages. The cable cores shall be tested for continuity, absence of cross phasing, insulation resistance to earth/sheath/armor and insulation resistance between conductors.

All cables shall be subjected to above mentioned tests during laying, before covering the cables by protective covers and back filling and before the jointing operations.

Power Distribution System Losses

The power cabling shall be adequately sized as to maintain the distribution losses not to exceed 1% of the total power usage. Record of design calculation for the losses shall be maintained.

The cables be designed as per the voltage drop regulations at peak load, and the losses be calculated on the basis of the assessed load during the day, week and year and should not be limited to the peak load.

Cable schedule shall be proposed and get approved by the Engineer-in-charge, before laying.

This schedule will indicate point to point laying, no of runs, voltage drop, No of termination, size of cable any gland selected etc.

6. **Route Marker**

- 6.1 The Cable route markers shall be provided along the runs of cable at the locations approved by the Engineer-in-Charge and generally at an interval not exceeding 100 Mtr from DG set room location (Essential panel) to service corridor/track near boundary wall/road and along cable route adjoining to internal road. Markers shall also be provided to identify change in the direction of the cable route.
- 6.2 The cable route marker shall be with 10cm X 10cmX 5mm thick G.I. Plate with inscription thereon, bolted/welded to 35mm X 35mm X 6mm M.S. Angle iron, 100 cm long, Grouting shall be done upto suitable depth with the cement concrete as decided by the Engineer-in-charge.

7. **Earthing.**

- 1.1 Earthing requirements are laid down in Indian Electricity Rules, 1956, as amended from time to time, and in the Regulations of the Electricity Supply Authority concerned. These shall be complied with.
- 1.2 Every circuit will have its earth continuity conductor to run along with circuit wiring. In case of 3-phase circuit two earth continuity conductors shall be provided.
- 1.3 The type of earth electrode shall be any of the following, as specified.
- (a) Pipe earth electrode.
 - (b) Plate Earth electrode

8. **Electrode Materials and Dimensions**

- i) The materials and minimum sizes of earth electrodes shall be as per CPWD specifications.
- ii) GI pipe electrodes shall be cut tapered at the bottom, and provided with holes of 12 mm dia, drilled not less than 7.5 cm from each other upto 2 m of length from the bottom.
- iii) The length of the buried strip or conductor earth electrode shall be not less than 15 m. This length shall suitably be increased if necessary, on the basis of the information available about soil resistance, so that the required earth resistance is obtained. Prior approval of the Engineer-in-charge shall be taken for any such increase in length.
- iv) All hardware items used for connecting the earthing conductor with the electrode shall be of GI in the case of GI pipe and GI plate earth electrodes, and forged tinned brass in case of copper plate electrodes.

9. Earthing Conductor & Sizes

- 9.1 The earthing conductor (protective conductor from earth electrode up to the main earthing terminal/earth bus, as the case may be) shall be of the same material as the electrode, viz. GI or copper, and in the form of wire or strip as specified.
- 9.2 The size of earthing conductor shall be specified, but this shall not be less than the following (For calculating the size of the earthing conductor in design, Appendix F (F.8.4.)).
- (a) 4 mm dia. (8 SWG) copper wire,
 - (b) 25 mm x 4 mm in the case of GI strip, or
 - (c) 20 mm x 3 mm in the case of copper strip.
- 9.3 Earthing conductor larger than the following sectional areas need not be used, unless otherwise specified.
- (d) 150 sq.mm. in case of GI

10. Location for Earth Electrodes

Normally an earth electrode shall not be located closer than 1.5 m from any building. Care shall be taken to see that the excavation for earth electrode does not affect the foundation of the building; in such cases, electrodes may be located further away from the building, with the prior approval of the Engineer-in-charge. The location of the earth electrode will be such that the soil has a reasonable chance of remaining moist as far as possible. Entrances, pavements and roadways, should be avoided for locating earth electrodes.

10.1 Installation

Electrodes

Various Types of Electrodes

- a) Pipe electrode shall be buried in the ground vertically with its top at not less than 20 cm below the ground level. The installation shall be carried out as shown in Fig. F.17 and F.18.
 - b) In locations where the full length of pipe electrode is not possible to be installed due to meeting a water table, hard soil or rock, the electrode may be of reduced length, provided the required earth resistance result is achieved with or without additional electrodes, or any alternative method of earthing may be adopted, with the prior approval of the Engineer-in-charge. Pipe electrodes may also be installed in horizontal formation in such exceptional cases.
- 10.2 Plate electrode shall be buried in ground with its faces vertical, and its top not less than 3.0 m below the ground level.

When more than one electrode (plate/pipe) is to be installed, a separation of not less than 2 m shall be maintained between two adjacent electrodes.

The strip or conductor electrode shall be buried in trench not less than 0.5 m deep.

- a) If conditions necessitate the use of more than one strip or conductor electrode, they shall be laid as widely distributed as possible, in a single straight trench where feasible, or preferably in a number of trenches radiating from one point.
- b) If the electrode cannot be laid in a straight length, it may be laid in a zigzag manner with a deviation upto 45 degrees from the axis of the strip. It can also be laid in the form of an arc with curvature more than 1 m or a polygon.

11. SAFETY REQUIREMENTS

SCOPE

This section covers the requirements of items to be provided in the sub-station for compliance with statutory regulations, safety and operational needs.

REQUIREMENTS

Safety provisions shall be generally in conformity with appendices (A) and (C) of CPWD General Specifications of Electrical Works (Part I-Internal), 2023. In particular following items shall be provided:

1. Insulation Mats

Insulation mats conforming to IS 15652:2006 shall be provided in front of main switch boards as well as other control equipment as specified.

2. First Aid Charts and First Aid Box

Charts (one in English, one in Hindi, one in Regional language), displaying methods of giving artificial respiration to a recipient of electrical shock shall be prominently provided at appropriate place. Standard first aid boxes containing materials as prescribed by St. John Ambulance brigade or Indian Red Cross should be provided in each sub-station.

3. Danger Plate

Danger Plates shall be provided on HV and MV equipment. MV danger notice plate shall be 200mmx150mm made of mild steel atleast 2mm thick vitreous enameled white on both sides and with the descriptions in signal red colour on front side as required. Notice plates of other suitable materials such as stainless steel, brass or such other permanent nature material shall also be accepted with the description engraved in signal red colour.

4. Fire Extinguishers

Portable CO₂ extinguishers conforming to IS 2878: 1976/ chemical conforming to IS 2171:1976 extinguishers, HCFC Blend A (P-IV) shall be installed in the sub-station at suitable places. Other extinguishers recommended for electric fires may also be used.

5. Fire Buckets

Fire buckets conforming to IS 2546: 1974 shall be installed with the suitable stand for storage of water and sand.

6. Tool Box

A Standard tool box containing necessary tools required for operation and maintenance shall be provided in the sub-station.

7. Caution Board

Necessary number of caution boards such as “Man on Line” ‘Don’t Switch on’ etc. shall be available in the sub-station.

8. Key Board

A keyboard of required size shall be provided at a proper place containing castle keys, and all other keys of sub-station and allied areas.

**Commandant (Elect)/ SE,
FHQ BSF New Delhi**

LIST OF PREFERRED MAKES (Electrical)

Sr. No.	Description	Makes
	Substation Equipment's	
1	Substation (provided from OEM / OEM's Licensed partner)	ABB / Siemens / Schneider Electric
2	HV Circuit Breakers/ LBS	ABB/ Siemens/Schneider Electric
3	Transformers	Hitachi / Expert engineers / Sudhir / L&T/Schneider/CG
4	Air Circuit Breaker	Schneider (Master pact MTZ) / Lauritz Knudsen (L&T) (U-Power Omega) /Siemens(3WJ) /ABB (E-Max2-Ekip-Hi-Touch)/ Legrand (DMX3MP4)
5	MCCB	Schneider (NSX) / Lauritz Knudsen (L&T) (DZ DSine)/ Siemens(3VJ) / ABB(Tmax)/ Legrand (DPX3)
6	SFU with HRC fuses, 415V	Siemens / Schneider Electric / ABB
7	Motorized/manual COS & ATS	ABB/Siemens/Schneider/Socomec/ Legrand / LAURITZ KNUDSEN (L&T)
8	Protection Relays	ABB/Siemens/ Schneider Electric /Lauritz Knudsen (L&T) / LEGRAND
9	Contactor, Timer, starters	Siemens / Schneider Electric / ABB/Legrand/ Lauritz Knudsen (L&T)
10	Bi Metal Relays	Siemens/ABB/Schneider /Legrand
11	Dry type Capacitors, 440V, 50Hz	Siemens/Epcos/ABB/Schneider Lauritz Knudsen (L&T)
12	Detuned Reactors	Lauritz Knudsen (L&T) / Siemens/ Schneider/ ABB / EPCOS
13	APFC Relay	Siemens/Epcos/Neptune /ABB /Schneider /Trinity/Beluk
14	Sandwich type bus trunking, rising mains and Accessories	Legrand / L&T / Schneider /ABB/C&S
15	RCCB/RCBO/ELCB/Industrial Sockets	ABB/Siemens/Schneider Electric /Legrand
16	MCB DBs/MCBs/Loose wire box	Schneider Electric ACTI-9(N)/ Legrand (DX3)/ L&T(Exora)/ ABB (SB200M)/Seimens (Betaguard)
17	LT Distribution panel (TTA)/SYNCH. Panel (TTA)/Feeder pillar (TTA)	SCHNEIDER – (BLOKSET) / SIEMENS – (- SIEPAN)/ ABB – (ARTUK) / L&T (Ti) / Legrand XL3/ EXPERT
18	TTA panel manufacturer	Adlec/ Tricolite/ Advance Panels & Switchgear Pvt. Ltd Haridwar / Marine Electricals /ABAK Electrofab Engineering/Active Engineers, Ahmedabad/ AD Enterprise, Ahmedabad /Omkar Electricals, Ahmedabad/Peaton Electrical, Ahmedabad/ Shiv Shakti Engineers/ R P Controls

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19	Current Transformer	AE/Kappa/Alstom/ L&T/RECO/Siemens
20	Potential Transformer	AE/Kappa/Alstom/BHEL/Siemens/ RECO
21	Digital Meters/ Digital Energy Meters/ Multifunction Meters/Load Managers	Conzerv/Elmeasure/Socomec/ Secure/Neptune /AE/Trinity /Siemens/Schneider/ABB / Lauritz Knudsen (L&T)
22	Voltmeter/ Ammeter/Digital meters	Schneider/Secure/Socomec/ABB/AE /Conzerv/Elmeasure/Trinity/Siemens / Lauritz Knudsen (L&T)
23	Power Quality Meters	Schneider/Eaton Power/PSL/Siemens / Lauritz Knudsen (L&T)
24	PLCs	ABB/Omron/Siemens/AllenBradley/Honeywell/ LAURITZ KNUDSEN (L&T)
25	Relays (Microprocessor/ Electromechanical/ Numerical)	Siemens/ABB /Schneider/ Alstom/ LAURITZ KNUDSEN (L&T)/Siemens
26	Connectors	Connectwell /Siemens/ABB / Phoenix Contacts/Wago & Controls/ Weidmuller/ Elmex/ Essen
27	Indication Lamps	Siemens / GE Power / ABB / Schneider /Tecknic/ LAURITZ KNUDSEN (L&T)
28	Selector Switches	AE / Kaycee/Siemens/Salzer/ LAURITZ KNUDSEN (L&T)
29	Local Push Button Stations	BCH/Teknic/Siemens/ Schneider / Vaishnov/ LAURITZ KNUDSEN (L&T)/ Salzer
30	HRC Fuses & Fuse Settings/ Links with Bakelite moulded base	Siemens / ABB/Schneider/ LAURITZ KNUDSEN (L&T)
31	Batteries Charger	Volstat/Statcon/Uptron/ Mahamai/Powertron
32	Rubber Mats (ISI marked)	Premier/Birla/Jyoti/Sintex/Electro safe
33	Surge protection Devices	OBO Betterman / ABB / Legrand / schneider / siemens
34	LV Power/Control Cables 1.1 KV grade Aluminium/copper conductor & control cables	Polycab/Havells/Finolex/RR Kabel
35	HV Cables	Havells/ Polycab/ Havells/ CCI/ Finolex/ RR Kabel
36	HV Cable Termination/Jointing kit	Raychem/M-Seal/ 3M/REPL/Denson
37	DWC Pipe/ HDPE Pipe	Duraline / Rex / Gemini / Tirupathi / Supreme/Sudhakar
38	Terminals/ Terminal Block	Phoenix Contacts/Wago& Controls / Weidmuller/ Elmex/ Connectwell/ Essen

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40	GI/MS Pipe (ISI marked)	TATA/ Jindal/ Zenith /Prakash Surya
41	Cable Glands	Dowells/ Comet/Braco/Jainsons
42	Cable lugs/Thimbles/ Terminal Ends (heavy duty)	Dowell/ Comet / Braco/Jainsons
43	Cable tray - Electro zinc galvanized /Steel SS-304 Wiremesh trays	Legrand Cablofil /Panduit/Leviton/OBO Betterman
44	Perforated/Ladder Cable Tray	MK/OBO Betterman/AKG/ Indiana/ Slotco/Pilco/Storack/Venus/Profab/ BEC
45	Lighting Arrester/ Surge/ Flash Counter	Indelec/ ABB Furse/ Purcel/ Tercel/ Nimbus
46	Fire Extinguishers	Vintex/Minimax/Safex/ Ceasefire/ Safeguard/Kanex
47	Paints	Asian/Berger/Nerolac /ICI-Dulux
48	Anti vibration mounting	Dunlop/Resistoflex/GERB/Easyflex
49	Structural steel sections/ MS angle/ Channel/ ISMB/ beams, flats, tees, insert plates	Tata/Jindal/JSW/SAIL/RINL/ Zenith

The samples of all material shall be approved by the Engineer-in-charge before put into installation.

The list of preferred makes of all items as above may (or) may not be changed of any (or) all by the engineer-in-charge during approval of samples.

Apart from the list of materials above, shall be obtained prior approval from engineer-in-charge.

Under taking by the contractor

Full name and address of the Tenderer in addition to post Box No., if any, should be quoted in all communications to this office

From :

Name of Work:- **Development and bulk services i.e. Electrical works, Boundary wall, P/F main gates for 125 Bn BSF (Now 48 Bn) at 7-A Chhoti New location) Sriganganagar (Raj) (SH: - Providing 11/0.415 KV Sub-Stations, HT & LT Panels/ Cables and shifting of DG sets)**

Dear Sir,

2. I/We have understood all the instructions to Tenderers in the Tender Enquiry and have thoroughly examined the specification drawing and/or pattern quoted in the schedule hereto and am/are fully aware of the nature of the stores required and my/our offer is to supply stores strictly in accordance with the requirements.

3. I have understood all the tender condition in the Tender Enquiry and will comply with them.

4. All the schedules & appendices have been submitted duly filled in & signed.

5. The complete tender document from page No._____ to Page No._____ of this tender and any other document mentioned in this tender shall be considered for constitution of Contract Agreement.

Yours faithfully.

(SIGNATURE OF TENDERER) DATED _____

ADDRESS

**CUSTOMER'S OPTION TO RECEIVE PAYMENTS THROUGH E –PA YMENT
(ECS/EFT/DIRECT CREDIT/RTGS/NEFT/OTHER PAYMENT MECHANISM AS
APPROVED BY RBI)**

Name of Work:- Development and bulk services i.e. Electrical works, Boundary wall, P/F main gates for 125 Bn BSF (Now 48 Bn) at 7-A Chhoti New location) Sriganganagar (Raj) (SH: - Providing 11/0.415 KV Sub-Stations, HT & LT Panels/ Cables and shifting of DG sets).

Credit Clearing Mechanism

11.1 Customer's name :

11.2 Particulars of Bank Account :

a. Bank Name :

b. Branch name :

c. Address :

d. Telephone numbers :

e. IFS code :

f. digit code number of Bank and Branch:

g. Appearing on MICR cheque issued by Bank

h. Account Type :

(SB Account/Current Account or Cash)

i. Ledger number :

j. Ledger Folio number :

k. Account number as appearing :

On Cheque Book

11.3 Please attach a blank cancelled cheque, or, photocopy of a cheque or front page of your savings bank passbook issued by your bank for verification of the above particulars.

11.4 Date of Effect

"I, hereby, declare that the particulars given above are correct and complete. If the transaction is delayed or not effected at all for reasons of incomplete or incorrect information, I would not hold the user institution responsible. I have read the option invitation letter and agree to discharge the responsibility expected of me as a participant under scheme."

Date (.....)

Signature of Customer

Certified that the particulars furnished above are correct as per our records

Bank's Stamp (.....) cancellation

Date :-

Signature of the Authorized Official from the Bank.

PART-C
SCHEDULE OF QUANTITIES

SCHEDULE OF WORK

Name of Work :- Development and bulk services i.e. Electrical works, Boundary wall, P/F main gates for 125 Bn BSF (Now 48 Bn) at 7-A Chhoti New location) Sriganganagar (Raj) (SH: - Providing 11/0.415 KV Sub-Stations, HT & LT Panels/ Cables and shifting of DG sets)

S No.	Description Of Items	Qty	Unit	Rate	Amount in figure	Amount in words
	HT PANEL & TRANSFORMER					
1	Supplying, installation testing and commissioning of 11 KV HT metering cubicle with following accessories, but without meter as per JdVVNLL specifications. The unit shall be compact type fabricated with 14 SWG MS sheet with supporting angle and channel, hinged door with gland plate, 25x6mm electrolytic copper busbar painted with powder coating and epoxy paint. There shall be an electronic safety lock and a mechanical lock and digital counter for measuring the number of times the cubicle door is opened. There shall be a cover on the top side of the CT/PT, which interlocks with the meter cubicle door alongwith an epoxy terminal block suitable for providing the tri-vector meter, with provision for incoming and outgoing Supplying through cables of 11KV grade 3C x 120 sq.mm Aluminium conductor XLPE cables. The panel shall be duly tested by JdVVNL, and factory inspection certificates to be enclosed. a) 3 Nos. CTs with CT Ratio:50/5 cl.0.2s b) 3 Nos. PT with PT: Ratio: PT-50VA, cl.0.2 c) Interlocking mechanism for cover with meter door d) Suitable space for Trivector meter.	1.00	Set			
2	Supplying, installation, testing & commissioning of indoor type, floor mounted metal clad, 11 KV 630 Amps VCB panel with 3 Nos. VCBs (1 No incoming and 2 Nos outgoing), totally enclosed & fully interlocked, horizontal drawout, horizontal isolation type breaker as per IS 13118, as amended up to date and additional specifications, having capacities as mentioned below, single break, trip free mechanism, motorized charged and auto / manually closing breaker suitable for use on 11KV, 3 Phase, 50 Hz, A.C. supply with short circuit current rating not less than 21 KA for 3 seconds, complete with self-contained, full interlocked, rack in and rack out mechanism, air insulated but encapsulated copper bus bars of 630 Amps capacity, breaker featured with mechanical On/OFF indicator with hand trip device, spring release coil, shunt trip coil and auxiliary switch of 4 NO + 4 NC and equipped with following switch gears and accessories i/c connections suitable for 3 X 95 Sq.mm. XLPE cable (cable entry from bottom), end termination with heat shrinkable jointing material, electronic hooter suitable for 230 volt operation with suitable size cement concrete foundation etc. as required. Panel Enclosure 14/16 Gauge (Indoor) of size 2175 mm(H)x 1800 mm(W)x 1800 mm(D) and factory inspection certificates to be enclosed. Fitting and Accessories : The following fittings shall be provided:- (a) Incoming - 1 No. 11kv, 630Amp. 26.3kA/3sec. EDO VCB make L&T Closing Coil : 24V DC - 1 No, Shunt Trip Coil :24VDC -1 No., Spring Charge Motor : 230V AC - 1 No., Automatic Safety Shutters Operation Counter, 25A Standard Mounting TNC Switch, Aux Contact: 2NO+2NC-1 No, Single element Lockout (Mater Trip) Relay with Hand reset contact and Flag, Contacts: 3NO+2NC, Aux. Supply: 230V AC - 01 No, 3 O/G + EARTH FAULT RELAY WITH TCS - 1 No, 4A Auxiliary Contactor, Coil: 240V AC, Aux. Contact: 2NO+2NC, Type: MX0 22E - 4 No, Current Transformer Dual Ratio, Dual Core Single Phase Type : Resin Cast 11kv Ratio :100/50/5/5a 15va Core-1 : Cl-0.5, 15va Core-2 : Cl-5p10, 15va - 3 No, Potential Transformer, Single Core Dual Ratio Type : Resin Cast Fixed Type Ratio : 11kv/√3/110/√3 Class-1 : 0.5 Burden :100va - 3 No, Ammeter with Inbuilt selector switch, 3Ph, Acc. CL: 0.5, Aux Supply: 80-300V AC, Size: 96X96 - 1 No, Voltmeter with Inbuilt selector switch, 3Ph, Acc. CL: 0.5, Aux Supply: 80-300V AC, Size: 96X96 -1 No, Multifunction Meter	1.00	Set			

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(LED display), 3Ph, Parameters: V, A, F, PF, kW, kVA, kVAR, kWh, kVAh, kVARh, Run hours, On hours, Phase angle, Interrupts, THD, Events (High-Low), Neutral Current, CL: 0.5, Aux Sup: 90-300V AC/DC, Size: 96X96, With: RS485 - 1 No, power pack with 220 Volt AC supply input & 24 Volts DC continuous output suitable for closing/tripping/indication for 3 Nos. HT panels board with 2 Nos.12 Volts each maintenance free batteries of 100 AH each - 1 No, Red Gen Next Pro LED Indicator 22.5 mm, Voltage: 64V AC/DC - 1 No, Yellow Gen Next Pro LED Indicator 22.5 mm, Voltage: 64V AC/DC - 1 No, Blue Gen Next Pro LED Indicator 22.5 mm, Voltage: 64V AC/DC - 1 No, Red Gen Next Pro LED Indicator 22.5 mm, Voltage: 24V AC/DC - 1 No, Green Gen Next Pro LED Indicator 22.5 mm, Voltage: 24V AC/DC - 1 No, Amber Gen Next Pro LED Indicator 22.5 mm, Voltage: 24V AC/DC - 1 No, Blue Gen Next Pro LED Indicator 22.5 mm, Voltage: 24V AC/DC - 1 No, White Gen Next Pro LED Indicator 22.5 mm, Voltage: 24V AC/DC - 1 No, Red Mushroom Head(Push - Turn) Push Button 22.5 mm -1 No, 1NO Contact Block - 3 No, 1NC Contact Block - 1 No, 10A Toggle Switch 230V AC - 1 No, 6A 2P 2Way Local - Remote/ Auto-Manual Switch with Center OFF, 60 Deg. Operation - 1 No, 2.5 Sq.mm Feed Through Terminal (Std. Color),Type: KUT 2.5 - 80, 4 Sq.mm Disconnecting Terminal (Std. Color),Type: KLTD M4 - 20, 8Window Microprocessor Based Alarm Annunciator - 1 No, hooter - 1 No, 32A Neutral Link, Channel Mounting, Color: Black/Grey - 1 No, 6A 1P 10kA, C-Curve MCB - 8 No, 16A 2P 10kA, C-Curve MCB - 2 No, 16A 2P 6kA DC MCB, Voltage: 250V DC, Type: Exora - 1 No, Door Switch With Openable Execution Push Rod - 2 No, Switch And Socket 15A, 5PIN - 1 No, Panel Illumination LED Light (B22)- 1 No, Panel Illumination LED Light (B22D)- 1 No, Thermostat - 1 No, Space Heater - 1 No, HANDLE - 1 No, 12KV, 3.15A P.T. FUSE LINKS - 3 No, 630 Amp main CU BUSBAR

(b) Outgoing - 2 No. 11kV, 630Amp. 26.3kA/3sec. EDO VCB make L&T

Closing Coil : 24V DC - 3 No, Shunt Trip Coil :24VDC -2 No., Spring Charge Motor : 230V AC - 2 No., Automatic Safety Shutters Operation Counter, 25A Standard Mounting TNC Switch, Aux Contact: 2NO+2NC-2 No, Single element Lockout (Mater Trip) Relay with Hand reset contact and Flag, Contacts: 3NO+2NC, Aux. Supply: 230V AC - 02 No, 3 O/G + EARTH FAULT RELAY WITH TCS - 2 No, Three element Auxiliary Relay, self reset contacts with operation indicator, Flush mounting , Contact:12.01.2022, Voltage: 24/30/48/110/220/250V DC - 04 Nos, 4A Auxiliary Contactor, Coil: 240V AC, Aux. Contact: 2NO+2NC, Type: MX0 22E - 8 No, Current Transformer Dual Ratio, Dual Core Single Phase Type : Resin Cast 11kv Ratio :100/50/5/5a 15va Core-1 : Cl-0.5, 15va Core-2 : Cl-5p10, 15va - 6 No, Potential Transformer, Single Core Dual Ratio Type : Resin Cast Fixed Type Ratio : 11kv/√3/110/√3 Class-1 : 0.5 Burden :100va - 6 No, Ammeter with Inbuilt selector switch, 3Ph, Acc. CL: 0.5, Aux Supply: 80-300V AC, Size: 96X96 - 2 No, Voltmeter with Inbuilt selector switch, 3Ph, Acc. CL: 0.5, Aux Supply: 80-300V AC, Size: 96X96 -2 No, Multifunction Meter (LED display), 3Ph, Parameters: V, A, F, PF, kW, kVA, kVAR, kWh, kVAh, kVARh, Run hours, On hours, Phase angle, Interrupts, THD, Events (High-Low), Neutral Current, CL: 0.5, Aux Sup: 90-300V AC/DC, Size: 96X96, With: RS485 make L&T - 2 No, Red Gen Next Pro LED Indicator 22.5 mm, Voltage: 64V AC/DC - 2 No, Yellow Gen Next Pro LED Indicator 22.5 mm, Voltage: 64V AC/DC - 2 No, Blue Gen Next Pro LED Indicator 22.5 mm, Voltage: 64V AC/DC - 2 No, Red Gen Next Pro LED Indicator 22.5 mm, Voltage: 24V AC/DC - 2 No, Green Gen Next Pro LED Indicator 22.5 mm, Voltage: 24V AC/DC - 2 No, Amber Gen Next Pro LED Indicator 22.5 mm, Voltage: 24V AC/DC - 2 No, Blue Gen Next Pro LED Indicator 22.5 mm, Voltage: 24V AC/DC - 2 No, White Gen Next Pro LED Indicator 22.5 mm, Voltage: 24V AC/DC - 2 No, Red Mushroom Head(Push - Turn) Push Button 22.5 mm -2 No, 1NO Contact Block - 6 No, 1NC Contact Block - 2 No, 10A Toggle Switch 230V AC - 2 No, 6A 2P 2Way Local - Remote/ Auto-Manual Switch with Center OFF, 60 Deg. Operation - 2 No, 2.5 Sq.mm Feed Through Terminal

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	(Std. Color),Type: KUT 2.5 - 160, 4 Sq.mm Disconnecting Terminal (Std. Color),Type: KLTD M4 - 40, 8 Window Microprocessor Based Alarm Annunciator - 2 No, hooter - 2 No, 32A Neutral Link, Channel Mounting, Color: Black/Grey - 2 No, 6A 1P 10kA, C-Curve MCB - 16 No, 16A 2P 10kA, C-Curve MCB - 4 No, 16A 2P 6kA DC MCB, Voltage: 250V DC, Type: Exora - 2 No, Door Switch With Openable Execution Push Rod - 4 No, Switch And Socket 15A, 5PIN - 2 No, Panel Illumination LED Light (B22)- 2 No, Panel Illumination LED Light (B22D)- 2 No, Thermostat - 2 No, Space Heater - 1 No,					
3	Supply, installation, testing and commissioning of 500KVA capacity (continuous loading) BEE 5 Star rated (Corresponding Level as per BIS amended upto date of receipt of tender) , 11/0.433 KV step down, 3 Phase, 50 Hz, Dyn 11 vector group, ONAN (Oil Natural Air Natural) copper wound transformer (Electrolytic grade 99.9% pure copper, Core made of first grade Cold Rolled Grain Oriented (CRGO) Core grade MOH or better, suitable for outdoor/indoor applications with Offload Tap Changer/ On Load Tap Changer (OLTC) (below 500 KVA offload and above 500 KVA On Load Tap Changer) on HV side having AVR relay and Remote Tap Changer Control (RTCC) for automatic sensing of incoming voltage, automatic operation of OLTC and facility for remote and manual operation of OLTC HV side in range of +5% to -15% in steps of 2.5%, having cable end boxes on HV side suitable for 3x300 sqmm XLPE cable of 11 KV grade, including bus trunking arrangement on LV side including supplying and laying of copper conductor multicore control cable from transformer to HT breaker/panel for safety tripping, complete with all accessories and safety provisions as per relevant IS Code including first filling of filtered dehydrated oil, i/c supplying and grouting of suitable M.S. Channel with all accessories and transformer shall be confirming to IS : 2026 (Part 1 to Part 5), IS : 1180 and duly ISI Marked and as per CPWD specifications complete in all respects etc as required at site. The maximum flux density in any part of the core and yoke at rated voltage and frequency shall be such that the flux density with + 12.5 percent combined voltage and frequency variation from rated voltage and frequency does not exceed 1.9 Tesla. The permissible temperature-rise shall not exceed 35 dg.C for oil and 40 dg. C up to 200 KVA and 40 dg.C for oil and 45 dg. C for above 200 KVA for winding. Inside of tank shall be painted with varnish or liquid resistant paint. For external surfaces one coat of thermo setting powder paint or one coat of epoxy primer followed by two coats of polyurethane base paint shall be used. IS: 1180 (Part 3) shall be referred to for paint thickness for normal to medium corrosive atmosphere. For highly polluted atmosphere and special application external paint work shall be as per direction of Engineer-in-Charge. Design ambient condition : a) air temperature 50 deg C, b) Relative Humidity 90 % Max, c) Seismic Zone as per location of site, d) Altitude as per location/site. Noise level Shall not exceed limits as per NEMA TR-1 with all accessories running measured as per IEC 551 / NEMA standard. The transformer should have QR code which should contain drawing, test report OEM manual, Geo- Tag of manufacturing location etc. Marking Each transformer shall be provided with rating plate made of anodized aluminum/ stainless steel material securely fixed on the outer body, easily accessible, as per IS: 1180 Part- 3. The entries on the rating plate shall be indelibly marked. Fitting and Accessories : The following fittings shall be provided:- a) Two earthing terminals with the earthing symbol b) Oil level gauge indicating oil level at minimum, 30°C and maximum operating temperature; c) Air release device (for non-sealed type transformers) d) Rating and terminal marking plates; e) Silica gel breather f) Drain-cum-sampling valve (¾" nominal size thread, IS 554) preferably steel with plug for three phase transformers; g) Thermometer pocket with cap; h) Oil filling holes having (1¼" nominal size thread) with cover (for sealed type transformers without conservator); i) Lifting lugs for the complete transformer as well as for core and winding assembly; j) Pressure relief device or explosion vent above 200 kVA; k) One filter valve on the upper side of the tank (for transformers	2.00	Nos.			

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	above 200 kVA); I) Unidirectional flat rollers (for transformers above 200 kVA); m) Inspection hole (for transformers above 200 kVA); n) HV side neutral grounding strip (where one of the HV bushing terminal is connected to earth); o) Buchholz relay for transformers. p) Arcing horns or suitable rating lightning arrestors for HT side – 3 Nos. q) Bird guard; r) Oil temperature indicator and winding temperature indicators for transformers above 200 kVA with suitable tripping mechanism above permissible limit, s) Jacking pads (for transformer above 1 600 kVA); t) Additional Neutral separately brought out on bushing for earthing. u) Magnetic oil level gauge (for transformer above 1600 kVA) with low oil level alarm contact; v) Non return valve (for conducting pressure test); w) Pressure relief device or explosion vent x). Monogram Plate y) Inspection cover z). Detachable type radiators with top and bottom shutoff valve. aa) Oil Conservator with Oil level indicator, minimum level marking and drain plug for all transformers of capacity 50 KVA and above. bb) Necessary hardware, clamps, lugs etc. for termination on HV/MV etc. for all transformers.					
4	Supplying, installation, testing & commissioning of indoor, floor mounted, cubical type LT panel suitable for 415 V, 3 Phase, 4 Wire 50 Hz AC supply system having front surface area not less than 9.46 sq. mtr. & depth not less than 1200 mm fabricated in compartmentalized (preferably) design from CRCA sheet steel of 2 mm thick for frame work enclosure, doors & covers with stiffeners as required i/c suitable size cable alleys, 3 mm thick for gland plates i/c cleaning & finishing complete with 7 tank process for powder coating in approved shade, having 1000 Amp capacity extensible type TPN aluminium bus bars of high conductivity, DMC/SMC bus bar supports, with short circuit with stand capacity of 31 MVA for 1 sec., MS bottom base channel of section not less than 100mm x 50mm x 5mm thick 100mmX 50mmX 5 mm thick, fabrication shall be done in transportable sections, entire panel shall have a common copper earth bar of size 25mm X 5 mm at the rear with 2 Nos. earth stud, connections from main busbar to switch gear with required size of Al. bus bar, suitable size PVC insulated FRLS copper conductor S/C cable for voltage & current respectively, including providing and fixing following switch gears and accessories as per technical specifications etc. complete as required. (MV Panel Enclosure 14 Gauge (Indoor) of size 2175 mm (H) x 4600 mm (W) x 1200 mm (D) At Sub) Fitting and Accessories : The following fittings shall be provided:- (I) Incomings: (a) 02 Nos 800 Amps four pole Frame Size: 1 microprocessor based MDO U-Power Omega type air circuit breaker of fault breaking capacity 50 KA (Ics=Icu upto 433 V) Release: UW-MTX1G (LSING - BCD Switches) manually operated, fitted with interlocked door, automatic safety shutters, mechanical ON/OFF and service/test/isolated position indicators and frame earthing contact, conforming to IS-13947-2 1993 as amended up-to-date complete with following accessories for each ACB: Under Voltage Release with time delay (0-1-3-5 sec), Voltage: 240V AC / 220V DC for U-Power Omega ACB - 2 Nos, 25A Standard Mounting TNC Switch, Aux 9Contact: 2NO+2NC -2 No, 4A Auxiliary Contactor, Coil: 240V AC, Aux. Contact: 2NO+2NC, Type: MX0 22E - 4 Nos, 2NO + 2NC Add-on Auxiliary Contact Block Front Mounting for MX0 Aux. Contactors - 4 No, 800/5A 15VA Acc. Cl: 1 Ring Type Current Transformer - 8 Nos, 4 Sq.mm Disconnecting Terminal (Std. Color),Type: KLTD M4NV - 6 Nos, Multifunction Meter (LED display), 3Ph, Parameters: V, A, F, PF, kW, kVA, Old energy, On hours, site selectable kWh/ kVAh, CL: 1, Aux Sup: 90-300V AC/DC, Size: 96X96, With: RS485 - 2 Nos, Red Gen Next Pro LED Indicator 22.5 mm, Voltage: 240V AC - 4 No, Yellow Gen Next Pro LED Indicator 22.5 mm, Voltage: 240V AC - 2 No, Blue Gen Next Pro LED Indicator 22.5 mm, Voltage: 240V AC - 2 Nos, Green Gen Next Pro LED Indicator 22.5 mm, Voltage: 240V AC - 2 No, Amber Gen Next Pro LED Indicator 22.5 mm, Voltage: 240V AC - 2 No, 32A Neutral Link, Channel Mounting, Color: Black/Grey - 2 No, 2A 1P 10kA, C-Curve MCB - 8 No, (II) BUSCOUPLER : 1 No 800 Amps four pole Frame Size: 1 microprocessor based MDO U-Power Omega type air circuit breaker of	1.00	Job			
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	fault breaking capacity 50 KA (Ics=Icu upto 433 V) Release: UW-MTX1G (LSING - BCD Switches) manually operated, fitted with interlocked door, automatic safely shutters, mechanical ON/OFF and service/test/isolated position indicators and frame earthing contact, conforming to IS-13947-2-1993 as amended upto date complete with following accessories : Under Voltage Release with time delay (0-1-3-5 sec), Voltage: 240V AC / 220V DC for U-Power Omega ACB - 1 No, 25A Standard Mounting TNC Switch, Aux Contact: 2NO+2NC - 1 No, 4A Auxiliary Contactor, Coil: 240V AC, Aux. Contact: 2NO+2NC, Type: MX0 22E - 3 No, 2NO + 2NC Add-on Auxiliary Contact Block Front Mounting for MX0 Aux. Contactors -3 No, Mechanical Interlock using Bowden Cable (3 meters length), Between 2 Incomers & 1 Bus coupler - 1 set, Red Gen Next Pro LED Indicator 22.5 mm, Voltage: 240V AC - 1 No, Green Gen Next Pro LED Indicator 22.5 mm, Voltage: 240V AC - 1 No, Amber Gen Next Pro LED Indicator 22.5 mm, Voltage: 240V AC - 1 No, 32A Neutral Link, Channel Mounting, Color: Black/Grey - 1 No, 2A 1P 10kA, C-Curve MCB - 3 Nos, (III) Outgoings: (a) 02 Nos 630A 4P 50kA MCCB TM Release, Type: DN3-630N, 415V AC, 50Hz with following accessories Extended Rotary Handle for DN3B, DN3 MCCB - 2 Nos, Spreader Terminals - 4 Pole (Set of 8) for DN3-630 MCCB - 2 Nos (b) 03 Nos 250A 4P 36kA MCCB TM Release, Type: DN2-250D, 415V AC, 50Hz with following accessories Extended Rotary Handle for DN3B, DN3 MCCB - 3 Nos, Spreader Terminals - 4 Pole (Set of 8) for DN3-250 MCCB - 3 Nos				
5	Supply, installation, testing and commissioning of cubical type LT Panel suitable for 415V, 3 Phase, 4 wire 50 Hz AC supply system having front surface area not less than 1.68 sq. mtr. and depth not less than 300 mm fabricated in compartmentalized design from CRCA sheet steel of 2 mm thick for frame work and covers, 3 mm thick for gland plates i/c cleaning and finishing complete with 7 tank process for powder coating in approved shade, having 200 amps capacity extensible type TPN alluminium alloy bus bars of high conductivity, DMC/SMC bus bar supports, with short circuit withstand capacity of 31 MVA for 1 sec., bottom base channel of MS section not less than 100mm x 50mm x 5mm thick, fabrication shall be done in transportable sections, entire panel shall have a common copper earth bar of size 25mm x 5mm at the rear with 2 nos. earth stud, solid connection from main bus bar to switch gears with required size of Al. bus bars control wiring with suitable size of PVC insulated copper conductor S/C cable, cable alleys, cable gland plates in two half, naming/ numbering, The LT. Panel shall be as per CPWD specification for elect. Sub-station work 2013 (Part-IV) as amended upto date complete with following switch gears and accessories etc as required. (Essential Panel Enclosure 14 Gauge (Indoor) of size 2175 mm (H) x 2600 mm (W) x 700 mm (D) at SS) Fitting and Accessories : The following fittings shall be provided:- (1) Incomer : 630A 4P 50 kA MCCB Microprocessor Release MTX 2.0, Type: DN3-630N, 415V AC, 50Hz make L&T - 2 Nos, Extended Rotary Handle for DN3B, DN3 MCCB - 2 Nos, Spreader Terminals - 4 Pole (Set of 8) for DN3-630 MCCB - 2 Set, AC1: 700A 4P Power Contactor, Coil: 240V AC, Aux. Contact: 2NO+2NC, Type: MCX 46 - 2 No, 4A Auxiliary Contactor, Coil: 240V AC, Aux. Contact: 2NO+2NC, Type: MX0 22E - 4 Nos, 2NO + 2NC Add-on Auxiliary Contact Block Front Mounting for MX0 Aux. Contactors - 4 No, 630/5A 15VA Acc. Cl: 1 Ring Type Current Transformer - 6 set, 4 Sq.mm Disconnecting Terminal (Std. Color),Type: KLTD M4NV - 6 No, Multifunction Meter (LED display), 3Ph, Parameters: V, A, F, PF, kW, kVA, Old energy, On hours, site selectable kWh/ kVAh, CL: 1, Aux Sup: 90-300V AC/DC, Size: 96X96, With: RS485 make L&T - 2 No, Red Gen Next Pro LED Indicator 22.5 mm, Voltage: 240V AC -Nos, Yellow Gen Next Pro LED Indicator 22.5 mm, Voltage: 240V AC -2 Nos, Blue Gen Next Pro LED Indicator 22.5 mm, Voltage: 240V AC - 2 Nos, 32A Neutral Link, Channel Mounting, Color: Black/Grey - 2 No, 2A 1P 10kA, C-Curve MCB - 6 No, 1000 Amp main BUSBAR with 4 strip - 1 sets, 1000 Amp main BUSBAR with 4 strip (2) CHANGEOVERSWITCH :- 400A 4P On Load Manual Changeover	1.00	Job		
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	Switch - Disconnecter with 2 C/O, Frame-4, Type: CO4-400, Open Execution make L&T - 1 No, Red Gen Next Pro LED Indicator 22.5 mm, Voltage: 240V AC - 2 Nos, 2A 1P 10kA, C-Curve MCB -3 Nos (2) Outgoing: (a) 630A 4P 36kA MCCB TM Release, Type: DN3-630D, 415V AC, 50Hz make L&T- 2 Nos, Extended Rotary Handle for DN3B, DN3 MCCB - 2 Nos, Spreader Terminals - 4 Pole (Set of 8) for DN3-630 MCCB - 2 sets, (b) 400A 4P 36kA MCCB TM Release, Type: DN3B-400D, 415V AC, 50Hz - 2 Nos, Extended Rotary Handle for DN3B, DN3 MCCB - 2 Nos, Spreader Terminals - 4 Pole (Set of 8) for DN3-400 MCCB - 2 sets, (c) 250A 4P 36kA MCCB TM Release, Type: DN2-250D, 415V AC, 50Hz - 2 Nos, Extended Rotary Handle for DN2 MCCB - 2 Nos, Spreader Terminals - 4 Pole (Set of 8) for DN1, DN2-250 MCCB - 2 sets, (d) 125A 4P 36kA MCCB TM Release, Type: DN2-1250D, 415V AC, 50Hz - 2 Nos, Extended Rotary Handle for DN2 MCCB - 2 Nos, Spreader Terminals - 4 Pole (Set of 8) for DN1, DN2-125 MCCB - 2 sets,					
6	Supply, installation, testing and commissioning of cubical type LT Panel suitable for 415V, 3 Phase, 4 wire 50 Hz AC supply system having front surface area not less than 1.68 sq. mtr. and depth not less than 300 mm fabricated in compartmentalized design from CRCA sheet steel of 2 mm thick for frame work and covers, 3 mm thick for gland plates i/c cleaning and finishing complete with 7 tank process for powder coating in approved shade, having 200 amps capacity extensible type TPN alluminium alloy bus bars of high conductivity, DMC/SMC bus bar supports, with short circuit withstand capacity of 31 MVA for 1 sec., bottom base channel of MS section not less than 100mm x 50mm x 5mm thick, fabrication shall be done in transportable sections, entire panel shall have a common copper earth bar of size 25mm x 5mm at the rear with 2 nos. earth stud, solid connection from main bus bar to switch gears with required size of Al. bus bars control wiring with suitable size of PVC insulated copper conductor S/C cable, cable alleys, cable gland plates in two half, naming/ numbering, The LT. Panel shall be as per CPWD specification for elect. Sub-station work 2013 (Part-IV) as amended upto date complete with following switch gears and accessories etc as required. (Non-Essential Panel Enclosure 14 Gauge (Indoor) of size 1275 mm (H) x 1900 mm (W) x 450 mm (D) at SS) Fitting and Accessories : The following fittings shall be provided:- (1) Incomer : 400A 4P 36kA MCCB TM Release, Type: DN3B-400D, 415V AC, 50Hz make L&T - 1 Nos, Extended Rotary Handle for DN3B, DN3 MCCB - 1 Nos, Spreader Terminals - 4 Pole (Set of 8) for DN3-400 MCCB - 1 sets, 400/5A 15VA Acc. Cl: 1 Ring Type Current Transformer - 3 Nos, 4 Sq.mm Disconnecting Terminal (Std. Color),Type: KLTD M4NV - 3 Nos, Multifunction Meter (LED display), 3Ph, Parameters: V, A, F, PF, kW, kVA, Old energy, On hours, site selectable kWh/ kVAh, CL: 1, Aux Sup: 90-300V AC/DC, Size: 96X96, With: RS485 - 1 No, Red Gen Next Pro LED Indicator 22.5 mm, Voltage: 240V AC - 1 Nos, Yellow Gen Next Pro LED Indicator 22.5 mm, Voltage: 240V AC -1 Nos, Blue Gen Next Pro LED Indicator 22.5 mm, Voltage: 240V AC - 1 Nos, 32A Neutral Link, Channel Mounting, Color: Black/Grey - 1 No, 2A 1P 10kA, C-Curve MCB - 3 No, 800 Amp main BUSBAR with 4 strip - 1 sets (2) Outgoing: (a) 400A 4P 36kA MCCB TM Release, Type: DN3B-400D, 415V AC, 50Hz - 1 Nos, Extended Rotary Handle for DN3B, DN3 MCCB - 1 Nos, Spreader Terminals - 4 Pole (Set of 8) for DN3-400 MCCB - 1 sets, (c) 250A 4P 36kA MCCB TM Release, Type: DN2-250D, 415V AC, 50Hz - 1 Nos, Extended Rotary Handle for DN2 MCCB - 1 Nos, Spreader Terminals - 4 Pole (Set of 8) for DN1, DN2-250 MCCB - 1 sets, (d) 125A 4P 36kA MCCB TM Release, Type: DN2-1250D, 415V AC, 50Hz - 1 Nos, Extended Rotary Handle for DN2 MCCB - 1 Nos, Spreader Terminals - 4 Pole (Set of 8) for DN1, DN2-125 MCCB - 1 sets,	1.00	Job			
7	Supplying, installation, testing & commissioning of compartmentalized, floor mounted APFC panel having face area not less than 2.42 sq. mtr. and depth not less than 500 mm (Thyristor Switched) of 120 KVAR (2 x 5 KVAR + 2 x 10 KVAR + 2 x 20 KVAR ,2 x 25 KVAR). The panel shall be suitable for 415 V, 3 phase, 4 wire, 50 Hz, AC supply system of suitable size fabricated from CRCA sheet steel of 2 mm thick for frame work and	2.00	Jobs			
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cover & doors of 1.6 mm thick sheet, 3 mm thick for gland plates i/c cleaning & finishing complete with 7 tank process for powder coating in approved shade, having 400 Amp capacity TPN Aluminium bus bars of high conductivity, DMC/SMC bus bar supports, with short circuit withstand capacity of 31 MVA for 1 Sec., bottom base channel of MS section not less than 100mm x 50mm x 3mm thick. Fabrication shall be done in transportable sections, entire panel shall have a common copper earth bar of size 25mm x 5mm at the rear with 2 Nos. earth stud, solid / flexible connections from main bus bar to switch gears with required size of copper bus bars /conductor. Capacitor shall be three phase MPP Super Heavy Duty type, resin bonded, low loss, terminal less capacitors without oil, housed in aluminium cans. Panel shall also have thyristor circuits with inductor coils to suppress switching inrush current to improve capacitor life. The system shall have 8 step dual display mode real time power factor control with 7% anti harmonic block reactors and dual P.F. control for mains microprocessor based power factor controller, for target PF setting and having LED display, with first mode showing V, I, PF, shortfall KVAR, KW on the screen continuously without scrolling & in second mode the controller should show actual KVAR activated, KVA in every second & actual PF (in 30-40 milliseconds). Dedicated fan should be provided for forceful cooling of the Thyristor (APFC Panel Enclosure 14 Gauge (Indoor) of size 2175 mm (H) x 1600 mm (W) x 1000 mm (D) at SS) AT S/S)

Fitting and Accessories : The following fittings shall be provided:-

(1) INCOMER : 250A 4P 36kA MCCB TM Release, Type: DN2-250D, 415V AC, 50Hz - 1 No, Extended Rotary Handle for DN2 MCCB - 1No, Spreader Terminals - 4 Pole (Set of 8) for DN1, DN2-250 MCCB - 1 No, 250/5A 15VA Acc. Cl: 1 Ring Type Current Transformer - 4 Nos, 4 Sq.mm Disconnecting Terminal (Std. Color),Type: KLTD M4NV - 4 No, Multifunction Meter (LED display), 3Ph, Parameters: V, A, F, PF, kW, kVA, Old energy, On hours, site selectable kWh/ kVAh, CL: 1, Aux Sup: 90-300V AC/DC, Size: 96X96, With: RS485 - 1 No, 8 Steps APFC Relay for Thyristor Switching with 1 CT Input: 1A/5A, Size: 144X144, Voltage: 415V AC, Type: eta SMART T - 1 Set, ON Delay Timer, Time Setting: 0.3sec - 30hrs , Voltage: 240V AC / 24V AC/DC, Contact: 1 C/O - 1Set, 5A 4P 240V AC Enclosed Miniature Plug In Relay with LED Indication, Type: MSP - 10 No, Closed Terminals Socket for MSP - 4 pole - 10 No, 6A 2P 2Way Local - Remote/ Auto-Manual Switch with Center OFF, 60 Deg. Operation - 3 No., Red Gen Next Pro LED Indicator 22.5 mm, Voltage: 240V AC - 1 No, Yellow Gen Next Pro LED Indicator 22.5 mm, Voltage: 240V AC - 1 No, Blue Gen Next Pro LED Indicator 22.5 mm, Voltage: 240V AC - 1 No, 2A 1P 10kA, C-Curve MCB - 3 No, FAN"6 -1 No, FILTER - 1 No, SMPS -1 No, 300 Amp main AL BUSBAR with 4 strip-1sets

(a) **25 KVAR CAP.BANK** 2 set with 63A 3P 10kA, D-Curve MCB - 2 No, 33.1kVAr 3Ph Super Heavy Duty Square Cap ESHDC - Box 525V AC Capacitor- 2 No, 25kVAr Thyristor Switching Module, Voltage: 440V AC 50Hz - 2 no, 25kVAr 3Ph 7% Copper Wound Detuned Reactor, Voltage: 440V AC - 2 no, 6A 1P 2Way Local - Remote/ Auto-Manual Switch with Center OFF, 60 Deg. Operation - 2 no, Red Flush Head Push Button 22.5 mm - 2 No, Green Flush Head Push Button 22.5 mm - 2 No, 1NO Contact Block - 2 No, 1NC Contact Block -2 No, Red Gen Next Pro LED Indicator 22.5 mm, Voltage: 240V AC -2 No, Green Gen Next Pro LED Indicator 22.5 mm, Voltage: 240V AC -2 No, 2A 1P 10kA, C-Curve MCB -2 No
(b) **20 KVAR CAP.BANK** 2 set with 63A 3P 10kA, D-Curve MCB - 2 No, 25 kVAr 3Ph Super Heavy Duty Square Cap ESHDC - Box 525V AC Capacitor- 2 No, 25kVAr Thyristor Switching Module, Voltage: 440V AC 50Hz - 2 no, 20 kVAr 3Ph 7% Copper Wound Detuned Reactor, Voltage: 440V AC - 2 no, 6A 1P 2Way Local - Remote/ Auto-Manual Switch with Center OFF, 60 Deg. Operation - 2 no, Red Flush Head Push Button 22.5 mm - 2 No, Green Flush Head Push Button 22.5 mm - 2 No, 1NO Contact Block - 2 No, 1NC Contact Block -2 No, Red Gen Next Pro LED Indicator 22.5 mm, Voltage: 240V AC -2 No, Green Gen Next Pro LED Indicator

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	22.5 mm, Voltage: 240V AC -2 No, 2A 1P 10kA, C-Curve MCB -2 No (c) 10 KVAR CAP.BANK 2 set with 32A 3P 10kA, D-Curve MCB - 2 No, 12.5kVAr 3Ph Super Heavy Duty Square Cap ESHDC - Box 525V AC Capacitor- 2 No, 10 kVAr Thyristor Switching Module, Voltage: 440V AC 50Hz - 2 no, 10 kVAr 3Ph 7% Copper Wound Detuned Reactor, Voltage: 440V AC - 2 no, 6A 1P 2Way Local - Remote/ Auto-Manual Switch with Center OFF, 60 Deg. Operation - 2 no, Red Flush Head Push Button 22.5 mm - 2 No, Green Flush Head Push Button 22.5 mm - 2 No, 1NO Contact Block - 2 No, 1NC Contact Block -2 No, Red Gen Next Pro LED Indicator 22.5 mm, Voltage: 240V AC -2 No, Green Gen Next Pro LED Indicator 22.5 mm, Voltage: 240V AC -2 No, 2A 1P 10kA, C-Curve MCB -2No (d) 5 KVAR CAP.BANK 2 set with 16A 3P 10kA, D-Curve MCB - 2 No, 6.6 kVAr 3Ph Super Heavy Duty Square Cap ESHDC - Box 525V AC Capacitor- 2 No, 10 kVAr Thyristor Switching Module, Voltage: 440V AC 50Hz - 2 no, 5 kVAr 3Ph 7% Copper Wound Detuned Reactor, Voltage: 440V AC - 2 No, 6A 1P 2Way Local - Remote/ Auto-Manual Switch with Center OFF, 60 Deg. Operation - 2 No, Red Flush Head Push Button 22.5 mm - 2 No, Green Flush Head Push Button 22.5 mm - 2 No, 1NO Contact Block - 2 No, 1NC Contact Block -2 No, Red Gen Next Pro LED Indicator 22.5 mm, Voltage: 240V AC -2 No, Green Gen Next Pro LED Indicator 22.5 mm, Voltage: 240V AC -2 No, 2A 1P 10kA, C-Curve MCB -2 No (e) FIXED TYPE 25 KVAR CAP.BANK with 63A 3P 10kA, D-Curve MCB - 1 No, 33.1 kVAr 3Ph Super Heavy Duty Square Cap ESHDC - Box 525V AC Capacitor - 1 No, 6A 1P 2Way Local - Remote/ Auto-Manual Switch with Center OFF, 60 Deg. Operation - 2 No, Red Gen Next Pro LED Indicator 22.5 mm, Voltage: 240V AC - 2 no, Green Gen Next Pro LED Indicator 22.5 mm, Voltage: 240V AC - 1 no, 2A 1P 10kA, C-Curve MCB -1 No				
8	Supplying and laying of PVC insulated and PVC sheathed / XLPE insulated, galvanised steel formed wire armoured (strip) cable 11 kV(E), 3 x 120 sq. mm. aluminium conductor power cable in ground including excavation, sand cushioning, protective covering and refilling the trench etc as required. 3 x 120 sqmm	50.00	Mtrs.		
9	Supplying and laying of PVC insulated and PVC sheathed / XLPE insulated, galvanised steel formed wire armoured (strip) cable 11 kV(E), 3 x 120 sq. mm. aluminium conductor power cable in the existing RCC/ HUME/ METAL pipe as required.	50.00	Mtrs.		
10	Supplying and laying of PVC insulated and PVC sheathed / XLPE insulated, galvanised steel formed wire armoured (strip) cable 11 kV(E), 3 x 120 sq. mm. aluminium conductor power cable in the existing masonry open duct as required.	50.00	Mtrs.		
11	Supplying and making outdoor cable end termination with heat shrinkable jointing kit complete with all accessories including lugs suitable for following size of 3 core, XLPE aluminium conductor cable of 11 kV grade as required. 120 sq. mm	2.00	Nos.		
12	supplying and making indoor cable end termination with heat shrinkable jointing kit complete with all accessories including lugs suitable for following size of 3 core, XLPE aluminium conductor cable of 11 KV grade as required : 120 sq. mm	8.00	Nos.		
13	Supplying and fixing of light class G.I. pipe of 80 mm dia. (nominal) 3 meters length along the pole for protection of under ground cable as required.	2.00	Nos.		
14	Providing, laying and fixing following dia RCC pipe NP2 class(light duty) in ground complete with RCC collars, jointing with cement mortar 1:2 (1 cement : 2 fine sand) including trenching (75 cm deep) and refilling etc as required. 300 mm dia	30.00	Mtrs.		
15	Supplying and Laying of 3½ X 50 sqmm one number power Cables multi stranded Aluminium conductor, XLPE Insulated, cores laid up PVC tape / Extruded Inner sheath, unarmoured, extruded PVC Type ST2 sheathed, 650/1100V grade as per IS 7098(Part 1) 1988 with upto date amendments in the existing RCC/ HUME/ METAL/HDPE pipe as reqd. Make- Havells/ KEI/Polycab/ Finolex etc.	1770.00	Mtrs.		

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16	Supplying and Laying of 3½ X50 sqmm one number power Cables multi stranded Aluminium conductor, XLPE Insulated, cores laid up PVC tape / Extruded Inner sheath, unarmoured, extruded PVC Type ST2 sheathed, 650/1100V grade as per IS 7098(Part 1) 1988 with upto date amendments in the existing masonry open duct/Loop etc as required. Make-Havells/KEI/Polycab/Finolex etc.	100.00	Mtrs.			
17	Supplying and Laying of 3½ X 120 sqmm one number power Cables multi stranded Aluminium conductor, XLPE Insulated, cores laid up PVC tape / Extruded Inner sheath, unarmoured, extruded PVC Type ST2 sheathed, 650/1100V grade as per IS 7098(Part 1) 1988 with upto date amendments in the existing RCC/ HUME/ METAL/HDPE pipe as reqd. Make- Havells/KEI/Polycab/ Finolex etc.	460.00	Mtrs.			
18	Supplying and Laying of 3½ X 120 sqmm one number power Cables multi stranded Aluminium conductor, XLPE Insulated, cores laid up PVC tape / Extruded Inner sheath, unarmoured, extruded PVC Type ST2 sheathed, 650/1100V grade as per IS 7098(Part 1) 1988 with upto date amendments in the existing masonry open duct/Loop etc as required. Make-Havells/KEI/Polycab/Finolex etc.	40.00	Mtrs.			
19	Supplying and Laying of 3½ X 300 sqmm one number power Cables multi stranded Aluminium conductor, XLPE Insulated, cores laid up PVC tape / Extruded Inner sheath , unarmoured ,extruded PVC Type ST2 sheathed, 650/1100V grade as per IS 7098(Part 1) 1988 with upto date amendments in the existing RCC/ HUME/ METAL/HDPE pipe as reqd. Make- Havells/KEI/Polycab/ Finolex etc.	2880.00	Mtrs.			
20	Supplying and Laying of 3½ X 300 sqmm Sqmm one number power Cables multi stranded Aluminium conductor, XLPE Insulated, cores laid up PVC tape / Extruded Inner sheath , unarmoured,extruded PVC Type ST2 sheathed, 650/1100V grade as per IS 7098(Part 1) 1988 with upto date amendments in the existing masonry open duct/Loop etc as required. Make- Havells/KEI/Polycab/Finolex etc.	45.00	Mtrs.			
21	Supplying and fixing cable route marker with 10 cm X 10 cm X 5 mm thick G.I. plate with inscription there on, bolted /welded to 35 mm X 35 mm X 6 mm angle iron, 60 cm long and fixing the same in ground as required	30.00	Each			
22	Supplying and making end termination with brass compression gland and aluminium lugs for following size of PVC insulated and PVC sheathed / XLPE aluminium conductor cable of 1.1 KV grade as reqd. 3½ X 70 sq. mm (38 mm)	4.00	Nos.			
23	Supplying and making end termination with brass compression gland and aluminium lugs for following size of PVC insulated and PVC sheathed / XLPE aluminium conductor cable of 1.1 KV grade as reqd. 3½ x 95 sq.mm (45 mm)	4.00	Nos.			
24	Supplying and making end termination with brass compression gland and aluminium lugs for following size of PVC insulated and PVC sheathed / XLPE aluminium conductor cable of 1.1 KV grade as reqd. 3½ X 120 sq. mm (45 mm)	8.00	Nos.			
25	Supplying and making end termination with brass compression gland and aluminium lugs for following size of PVC insulated and PVC sheathed / XLPE aluminium conductor cable of 1.1 KV grade as reqd. 3½ X 240 sq. mm (62 mm)	4.00	Nos.			
26	Supplying and making end termination with brass compression gland and aluminium lugs for following size of PVC insulated and PVC sheathed / XLPE aluminium conductor cable of 1.1 KV grade as reqd. 3½ X 300 sq. mm (70mm)	6.00	Nos.			
27	Supplying and laying of following size DWC HDPE pipe ISI marked along with all accessories like socket, bend, couplers etc. conforming to IS 14930, Part II complete with fitting and cutting, jointing etc..direct in ground (75 cm below ground level) including excavation and refilling the trench but excluding sand cushioning and protective covering etc., complete as required 90 mm dia (OD-90 mm & ID-76 mm nominal)	1770.00	Mtrs.			
28	Supplying and laying of following size DWC HDPE pipe ISI marked along with all accessories like socket, bend, couplers etc. conforming to IS	250.00	Mtrs.			

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	14930, Part II complete with fitting and cutting, jointing etc..direct in ground (75 cm below ground level) including excavation and refilling the trench but excluding sand cushioning and protective covering etc., complete as required 120 mm dia (OD-120 mm & ID-103 mm nominal)					
29	Supplying and laying of following size DWC HDPE pipe ISI marked along with all accessories like socket, bend, couplers etc. conforming to IS 14930, Part II complete with fitting and cutting, jointing etc..direct in ground (75 cm below ground level) including excavation and refilling the trench but excluding sand cushioning and protective covering etc., complete as required) 160 mm dia (OD-160 mm & ID-135 mm nominal)	1270.00	Mtrs.			
30	Supplying and laying of following size DWC HDPE pipe ISI marked along with all accessories like socket, bend, couplers etc. conforming to IS 14930, Part II complete with fitting and cutting, jointing etc..in the existing trench, complete as required 90 mm dia (OD-90 mm & ID-76 mm nominal)	100.00	Mtrs.			
31	Supplying and laying of following size DWC HDPE pipe ISI marked along with all accessories like socket, bend, couplers etc. conforming to IS 14930, Part II complete with fitting and cutting, jointing etc..in the existing trench, complete as required 120 mm dia (OD-120 mm & ID-103 mm nominal)	250.00	Mtrs.			
32	Supplying and laying of following size DWC HDPE pipe ISI marked along with all accessories like socket, bend, couplers etc. conforming to IS 14930, Part II complete with fitting and cutting, jointing etc..in the existing trench, complete as required 160 mm dia (OD-160 mm & ID-135 mm nominal)	1310.00	Mtrs.			
33	Earthing with G.I. earth plate 600 mm X 600 mm X 6 mm thick including accessories, and providing masonry enclosure with cover plate having locking arrangement and watering pipe of 2.7 meter long etc. with charcoal/ coke and salt as required	10.00	Nos.			
34	Earthing with Copper earth plate 600 mm X 600 mm X 3 mm thick including accessories, and providing masonry enclosure with cover plate having locking arrangement and watering pipe of 2.7 meter long etc. with charcoal/ coke and salt as required	16.00	Nos.			
35	Providing and fixing 25 mm X 5 mm G.I. strip in 40 mm dia G.I. pipe from earth electrode including connection with G.I. nut, bolt, spring, washer excavation and re-filling etc. as required	50.00	Mtrs.			
36	Providing and fixing 25 mm X 5 mm copper strip in 40 mm dia G.I. pipe from earth electrode including connection with G.I. nut, bolt, spring, washer excavation and re-filling etc. as required	50.00	Mtrs.			
37	Providing and fixing 25 mm X 5 mm G.I. strip on surface or in recess for connections etc. as required.	20.00	Mtrs.			
38	Providing and fixing 25 mm X 5 mm Copper strip on surface or in recess for connections etc. as required.	45.00	Mtrs.			
39	Supplying and Installing ABC Modular Type CE certified Capacity 5 Kg Fire Extinguisher filled with ISI marked IS: 4308 ABC Powder. Complete in all respect, with 5 year warranty etc as required. . Brand LIFEGUARD	4.00	Nos			
40	Supplying an installing of CO2 type Fire Extinguisher ISI marked conforming to IS: 15683. Capacity 4.5 Kg. Complete with delivery hose horn, wheel type release valve, locking arrangement, operation manual and bracket. Operating Temperature:- 30°C to +60°C. ISI approved with 5 year warranty etc as required. Brand LIFEGUARD	4.00	Nos			
41	Providing Insulating rubber Mat of 1.00 mtr width x 2.00 mtr length x 12.0 mm thickness of di-electric strength for working voltage 11 KV (nominal size) duly ISI marked as required.	8.00	Nos			
42	Providing of set of 4 nos 9.5 Litre capacity GI bucket painted in post office red colour with prior coat of red oxide paint and written with white paint 'FIRE' and mounted on MS handle iron frame of appropriate size and capacity i/c filling sand etc. as required.	6.00	Nos			
43	Supply and fixing Framed shock treatment chart/safety instruction chart at least in three languages chart duly mounted on wooden frame with 3 mm thick glass as required.	6.00	Nos			
44	Providing and fixing MV danger notice plates of 200mm x150mm made of Mild Steel at least 2 mm thick and vitreous enameled white on both sides	6.00	Nos			

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	an with inscriptions in signal red color on front side as required.					
45	Earth work in excavation by mechanical means (Hydraulic excavator) / manual means in foundation trenches or drains (not exceeding 1.5 m in width or 10 sqm on plan), including dressing of sides and ramming of bottoms, for all lift, including getting out the excavated soil and disposal of surplus excavated soil as directed, within a lead of 50 m. All kinds of soil.	10.50	Cum			
46	Providing and laying in position cement concrete of specified grade excluding the cost of centering and shuttering - All work up to plinth level : 1:2:4 (1 Cement: 2 coarse sand (zone-III) derived from natural sources: 4 graded stone aggregate 40 mm nominal size derived from natural sources)	7.50	Cum			
47	Providing and laying in position cement concrete of specified grade excluding the cost of centering and shuttering - All work up to plinth level : 1:5:10 (1 cement: 5 fine sand derived from natural sources: 10 graded stone aggregate 40 mm nominal size derived from natural sources)	7.50	Cum			
48	Steel reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete upto plinth level. Cold twisted bars	450.00	Kg			
49	Reinforced cement concrete work in beams, suspended floors, roofs having slope up to 15° landings, balconies, shelves, chajjas, lintels, bands, plain window sills, staircases and spiral stair cases above plinth level up to floor five level, excluding the cost of centering, shuttering, finishing and reinforcement with 1:1.5:3 (1 cement : 1.5 coarse sand(zone-III) derived from natural sources : 3 graded stone aggregate 20 mm nominal size derived from natural sources).	8.50	Cum			
50	Structural steel work riveted, bolted or welded in built up sections, trusses and framed work, including cutting, hoisting, fixing in position and applying a priming coat of approved steel primer all complete.as the direction of engg-in-charges (50 X 50X5) mm size.	212.00	Kg			
51	Shifting of DG set including handling and lifting at newly constructed DG set foundation by crain i/c making of connection as per direction of engineer -in- charge	1.00	Each			

Assistant Engineer (Elect)
SHQ BSF SGNR,

Executive Engineer (Elect)
Ftr HQ BSF Raj,

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COMMANDANT (Elect)
FHQ BSF New Delhi

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Signature Not Verified

Digitally signed by KARTHIKEYAN
Date: 2026.05.01 22:09:42 IST
Location: eProcure-EPROC

