



INVITATION TO E-TENDER
WORKS DIRECTORATE, CENTRAL RESERVE POLICE FORCE

Level – 3, Block-7, Sec -1, East Block, R. K. Puram,
 New Delhi-110066, Tel/Fax: 011-26108447

E-Mail id – digwks@crpf.gov.in

Tele / Fax No. :011-26108447

No. B.V(101RAF)/24-25-/EPC/WksDte-C/Cell(NIT-21/E&M works)

Dated,

March,2025

To,

.....

Dear Sir,

On behalf of the President of India, I invite you to **online bid under two bid system** for the following work at **101 BN RAF SHANTIPURAM, PRAYAGRAJ (U.P):-**

| Sl. No. | Details of proposal |
|---------|--------------------------------------------------------------------------------------------------------------------------|
| 1. | POST DEVELOPMENT WORKS SH: ELECTRICAL WORK INCLUDING TRANSFORMER FOR NEW FAMILY QUARTERS AT 101 BN RAF, PRAYAGRAJ |

02. Details **of works** are mentioned in **Schedule- “A”** and **“B.O.Q. of Tender”**.

03. If you are in a position to quote for carrying out the proposed works in accordance with the requirements stated in the attached schedule to tender, all documents attached herewith should be properly filled in, signed and submitted through e-procurement site <http://eprocure.gov.in/eprocure/app>. You are further required to furnish along with the aforesaid tender all the information called for, attached list of questionnaire should also be answered and submitted along with documents through e-procurement site <http://eprocure.gov.in/eprocure/cpp>, failing which your tender will liable to be rejected and will not be considered.

04. This tender is not transferable.

Thanking you.

Yours faithfully

Sd/-
 DIG (Engineer), Works Dte.
 For and on behalf of the President of India

SCHEDULE TO TENDER (OPEN TENDER)
CENTRAL RESERVE POLICE FORCE
(Government of India, Ministry of Home Affairs)
Works Directorate, CRPF

No. B.V(101RAF)/24-25-/S-10/WksDte-C/Cell(NIT-21/E&M works)

Dated,

March' 2025

TENDER SET IS NOT TRANSFERABLE

| | | |
|-----------------------------------------------|---|--------------------------|
| Tender Enquiry No. | : | As per CPP Portal |
| Date of Publishing of Tender | : | |
| Time and date of submission/receipt of tender | : | |
| Time and date for opening of tender | : | |

01. The intending tenderers must read the terms and condition carefully and submit their tender if they consider themselves eligible and are in possession of all the required documents, through online tender (e-procurement web site in CPP Portal) before due date & time. Tenderers are also advised to go through the Earnest Money, Payment terms and other clauses, terms and conditions of this Tender Enquiry carefully before filling the Tender Application.

| Tender No | Name of work with its description and location | Category of service required / Quantity / Work Timing / Periodicity / Period | Estimated cost put to tender | Earnest Money Deposit @2 % | Procedure for deposit of Earnest Money Deposit (EMD) | Critical date |
|---------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------|------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|
| B.V(101RAF)/24-25-/S-10/WksDte-C/Cell(NIT-21/E&M works) | POST DEVELOPMENT WORKS SH: ELECTRICAL WORK INCLUDING TRANSFORMER FOR NEW FAMILY QUARTERS AT 101 BN RAF, PRAYAGRAJ | As per attached Appendix- 'B' of "Schedule to tender" | Rs. 97,98,794/- | Rs. 1,95,976/- | Rs. 1,95,976/- | As per CPP Portal |
| | | | | [Note: - EMD Should be valid for 90 days from the bid submission end date of tender. If there after validity of the E.M.D require extension, the firm will be responsible to extend the same suitably till the validity of the bid] | Original Earnest Money Deposit (EMD) shall be deposited in office of the Works Dte, level-3, East Block-7, Sec -1, , RK Puram, New Delhi before the due date of submission of bid. | |

02. Tenders will be opened online on the given date & time at CRPF Works Dte, Level-3, East Block – 07, RK Puram, Sector- 1, New Delhi.

03. Tenderers are requested to submit their bid/tender documents online through e-procurement in CPP Portal. EMD, Tender Acceptance Letter (On firm's letter head), Integrity Pact (On firm's letter head) documents shall be submitted in original either by hand or by registered/speed post to CRPF Works Dte, Level-3, East Block – 07, RK Puram, Sector- 1, New Delhi.

04. All Tender documents attached with this invitation to tender including the specifications are sacrosanct for considering any offer as complete offer. It is therefore important that Tender Acceptance Letter which is a written undertaking that all the terms and conditions of the tender are understood and accepted should be signed and submitted along with all documents as required through e-Procurement site <http://eprocare.gov.in/eprocare/app>.

05. All bidders required to submit earnest money as mentioned above along with their offer. EMD should be paid by the bidder mandatorily. If the bidder fails to submit EMD then his tender will be rejected summarily.

06. All bidders are required to submit their offer in **two bid system**.

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

08. Details required to be furnished by all bidders in the bid (Composite i.e. Technical & Price or financial Bid together) are as under. The bid should contain the following: -

i) Documents to be submitted online in scanned copy on CPPP:-

| | |
|-----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. | Tender acceptance letter (In firm's letter head) |
| 2. | Earnest Money deposit (As per schedule to tender failing which offers will be summarily rejected). |
| 3. | Copy of GST registration certificate . |
| 4. | Copy of PAN Card |
| 5. | Copy of registration of the firm/contractor of CPWD, MES, BRO, RAILWAY and UP State Work Department for electrical work or All Documents required for Enlistment as specified in the latest CPWD Enlistment Rules. |
| 6. | Copy of certificate of registration for EPFO and certificate of registration for ESIC (Declaration, if not applicable) failing which offers will be summarily rejected). |
| 7. | Satisfactorily completed as a prime contractor at least one similar work of 80% value or two works of atleast 60% value or 3 works of atleast 40% value. (for non – enlisted contractors) Bidder has to submit on-line scanned copy of Work order along with Work Completion certificate of similar nature work equal to required value during last seven years issued by not below the rank of Executive Engineer. (Similar work means electrical works including SITC of transformer not less than 11kV and Capacity 630 KVA and other allied works) |
| 8. | Partnership Agreement of the firm if the firm is a partnership firm. (If no papers submitted with the bid it will be assumed that the firm is a Single/Sole Proprietary and will be fully responsible if found false at later stage) |
| 9. | Check list as per Appendix- 'B' after compliance. |
| 10. | Information in prescribed format (as per Appendix- "F") regarding any litigation, arbitration, black listing, debaring etc. resulting from contracts executed by the bidder in the last five years or currently under execution as provided. If involved any litigation, arbitration, black listing, debaring etc., please provide details for the same. |
| 11. | Bidder has to submit on-line scanned copy of an affidavit duly signed stating that the near relations defined as first blood relations, and their spouses is/are not working in CRPF. If working, give details for the same. (a relation shall mean wife, husband, parents, grandparents, children, grandchildren, brothers, sisters, uncles, aunts, cousins and their corresponding in-laws) Note:- Affidavit should not be old more than 06 months from bid submission end date. |
| 12. | Bidder has to submit on-line scanned copy of an affidavit duly signed stating that no retired personnel in his employment is working who retired within last two years from CRPF. If employed, give details for the same. Note:- Affidavit should not be old more than 06 months from bid submission end date. |
| 13. | Non-enlisted bidders are required to submit (i) Either Banker's Certificate of Rs. 41.6 Lakh (Proforma as Appendix-E) OR Net worth Certificate of Rs. 13 Lakh (proforma as Appendix-D) AND (ii) Average Annual Turnover Certificate of Rs. 41.6 Lakh (Proforma as Appendix-C) on works during the last three financial years from a Chartered Accountant. Note:- Documents should not be old more than 06 months from bid submission end date. |
| 14. | Valid Electrical License issued by State/Central Govt. Deptt. |

ii) Documents to be submitted in original manually or by registered/speed post to CRPF Works Dte, Level-3, East Block – 07, RK Puram, Sector- 1, New Delhi.

| | |
|----|-------------------------------------------------|
| 1. | Tender acceptance letter (On firms letter head) |
| 2. | Earnest Money deposit |
| 3. | Integrity Pact (On firms letter head) |

09. Following should be noted and kept in mind while submission of rate in price bid format of C.P.P Portal-
- Price should only be quoted as per price bid format / B.O.Q along with tender documents at e-procurement site <http://eprocure.gov.in/eprocure/app>.
 - The price bid in B.O.Q format / template should not be modified and replaced by the bidder and the same should be uploaded after filling the relevant columns, else the bidder is liable to be rejected for the tender. Bidders are allowed to enter the Bidder Name and Values only.

10. Bidder should deposit earnest money with required validity along with their Tender. Earnest Money should be in form of **Account payee Demand Draft, Fixed Deposit Receipt, Banker's Cheque** from any of the commercial banks in an acceptable form in favour of "**Commandant 101 RAF Bn, CRPF, Prayagraj**" [Payable At-SBI, SHANTIPURAM, PRAYAGRAJ BranchCodeNo.014577].

11. The tender documents are consisting of specification, schedule of quantities of works to be provided and terms and conditions of this contract to be complied with other necessary documents.

SIGNATURE OF THE TENDERER

Sd/-
DIG (Engineer), Works Dte
For and on behalf of the President of India

TENDER ACCEPTANCE LETTER
(To be given on Firm’s/Company’s Letter Head)

Date:

To,

Subject:-**Acceptance of Terms & Conditions of Tender.**

Tender Reference No:- _____

Name of Tender / Work: - _____

Dear Sir,

1. I/We have downloaded/obtained the tender document(s) for the above mentioned ‘Tender/Work’ from the web site(s) namely..... as per your advertisement, given in the above mentioned website(s).
2. I / We hereby certify that I / we have read the entire terms and conditions of the tender documents from Page No. _____ to _____ (including all documents like annexure(s), schedule(s), etc.) which form part of the contract agreement and I / we shall abide hereby by the terms / conditions / clauses contained therein.
3. The corrigendum(s) issued from time to time by your department/ organizations too have also been taken into consideration, while submitting this acceptance letter.
4. I / We hereby unconditionally accept the tender conditions of above mentioned tender document(s) / corrigendum(s) in its totality/entirety.
5. In case any provisions of this tender are found violated , then your department/ organization shall without prejudice to any other right or remedy be at liberty to reject this tender/bid including the forfeiture of the full said earnest money deposit absolutely.

Yours Faithfully,

(Signature of the Bidder, with Official Seal)
SIGNATURE OF TENDERER

Check list for tenderer**(Tenderers should check following requirements for compliance before submission of the tender documents)**

| Sl. No. | Requirements to be checked by the tenderer before submission of the tender | Compliance (To be indicated With “YES” after Compliance of the requirements) |
|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| 1. | Whether Tenderers has submitted required Earnest Money Deposit with their bid as specified? (As per schedule to tender failing which offers will be summarily rejected). | |
| 2. | Whether rates have been quoted only as per price bid format / B.O.Q along with tender documents? | |
| 3. | Whether rates have been quoted inclusive of all taxes including GST (ESI and EPF contributions on the part of employer in respect of this contract shall be paid by the contractor. The EPF & ESIC contributions on the part of the employer paid by the contractor shall be reimbursed by the department to the contractor on actual basis with site of work at 101 BN RAF SHANTIPURAM, PRAYAGRAJ (U.P.) only on producing original receipt of EPF & ESIC paid by the contractor to Govt. organization. (It may also be noted that the quoted rates are inclusive of all taxes.) | |
| 4. | Whether copy of GST & PAN Card submitted? | |
| 5. | Whether copy of registration of the firm/contractor with CPWD, MES, BRO, RAILWAY & UP State work deptt. submitted? | |
| 6. | Whether copy of registration of certificate registration for EPFO and certificate of registration for ESIC submitted? (Declaration, if not applicable) (Failing to submit the certificates offers will be summarily rejected). | |
| 7. | Whether agree to the Tolerance Clause of the Tender Enquiry? | |
| 8. | Satisfactorily completed as a prime contractor at least one similar work of 80% value or two works of atleast 60% value or 3 works of atleast 40% value. (for non – enlisted contractors) Bidder has to submit on-line scanned copy of Work order along with Work Completion certificate of similar nature work equal to required value during last seven years issued by not below the rank of Executive Engineer. (Similar work means electrical works including SITC of transformer not less than 11kV and Capacity 630 KVA and other allied works) | |
| 9. | Non-enlisted bidders are required to submit (i) Either Banker’s Certificate of Rs. 41.6 lakh (Proforma as Appendix-E) OR Net worth Certificate of 13 lakh (proforma as Appendix-D) and (ii) Average Annual Turnover Certificate of Rs. 41.6 lakh (Proforma as Appendix-C) on works during the last three financial years from a Chartered Accountant. Note:- Documents should not be old more than 06 months from bid submission end date. | |
| 10. | Tenderers should mention that Business dealing with their firms has not been banned by any Govt. / private agencies. | |
| 11. | Tenderers should mention their address for communication with Telephone/Fax Number and e-mail address. | |
| 12. | Whether all the Points under heading “Terms & Conditions”, “Additional Conditions” and instructions are fully abided by the contractor or not? | |
| 13. | Whether all the requisite documents as asked in tender Schedule of inviting tender notice have been submitted by the tenderer? | |
| 14. | Whether the firm has enclosed valid documents if the firm is a partnership proprietary in nature? (If no papers submitted with the bid it will be assumed that the firm is Single/Sole Proprietary) | |
| 15. | Whether any other relevant documents which the firms wish to submit as a part of offer? | |
| 16. | Tender acceptance letter (In firm’s letter head) | |
| 17. | Integrity Pact (on firm’s letter head) | |
| 18. | Valid Electrical License issued by State/Central Govt. Deptt. | |

SIGNATURE OF THE TENDERER

FORM OF CERTIFICATE OF ANNUAL TURNOVER ON WORKS FROM CHARTERED ACCOUNTANT

Certified that following is the annual turnover on works of the individual/firm/company as per returns filed with Income Tax Department for the past 3(three) financial years.

Name and registered address of individual / firm /company :.....

| S. No. | Financial Year | Annual Turnover on Works in Rs. lakhs |
|--------|----------------|---------------------------------------|
| | | |
| | | |
| | | |

Unique Document Identification Number (UDIN).....

(Signature of Chartered Accountant)

(Name of Chartered Accountant)

Membership No. of ICAI

Date and seal

FORM OF CERTIFICATE OF NET WORTH FROM CHARTERED ACCOUNTANT

It is to certify that as per the audited balance sheet and profit & loss account during the financial year, the networth of Shri/Smt/M/s..... (Name & Registered Address of individual/firm/company), is Rs..... after considering all liabilities. It is further certified that the networth of the individual/firm/company has not eroded by more than 50% during the last three years ending on 31st March

Unique Document Identification Number (UDIN).....

(Signature of Chartered Accountant)

(Name of Chartered Accountant)

Membership No. of ICAI

Date and seal

Appendix-“E”**FORM OF BANKER'S CERTIFICATE FROM A COMMERCIAL BANK**

This is to certify that to the best of our knowledge and information Shri/Smt/M/s..... having registered address, a customer of our bank, is/are respectable and can be treated as reliable for any engagement upto a limit of Rs..... (Rupees).

This certificate is issued without any guarantee or responsibility on the Bank or any of the officers. This certificate is issued on the request of Shri/Smt/M/S..... For obtaining Works tender in CRPF in..... (Name of Works).

(Signature)
For the Bank

Note:

- 1. Banker's certificates should be on the letter head of the bank, addressed to enlisting authority.**
- 2. In case of partnership firm, the certificate shall include names of all partners as recorded with the bank.**

UNDERTAKING

It is stated that my firm is not involved in any kind of litigation or arbitration from contracts executed by firm and also not blacklisted or debarred by any department of central/state Government & PSU in last five years from bid submission end date.

Place :-

Date :-

Signature bidder (with seal)

NOTICE INVITING TENDER

The **DIG (Engineer)**, Works Dte. invites online item rate bids for & on behalf of the President of India from approved and qualified firm/contractor with CPWD, MES, BRO, RAILWAY & UP State for **ELECTRICAL WORK FOR NEW FAMILY QTRS AT 101 BN RAF SHANTIPURAM, PRAYAGRAJ (U.P)**

1. The enlistment of the contractors should be valid on the last date of submission of bids. In case the last date of submission of tender is extended, the enlistment of contractor should be valid on the original date of submission of bids.
- 1.1 The estimated cost put to the work is **Rs. 97,98,794/- (Rupees Ninety Seven Lakh Ninety Eight Thousand Seven Hundred Ninety Four) only** including all taxes.
2. Agreement shall be drawn with the successful bidders on prescribed form of CPWD (or other Standard Form as mentioned) which is available as a Govt. of India Publication and also available on website www.cpwd.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 work has to be completed by within **180 days** from the date of placing of Work Order 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. Site of work is within the **RESTRICTED AREA.**
4. The site for the work is available.
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 CPP Portal (<http://eprocure.gov.in/eprocure/app>).
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 bid as notified.
7. While submitting the revised bid, contractor can revise the rate of one or more item(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. Bidder should deposit earnest money with required validity along with their Tender. Earnest Money should be in form of **Account payee Demand Draft, Fixed Deposit Receipt, Banker's Cheque** from any of the commercial banks in an acceptable form in favour of **“The Commandant 101 RAF Bn, CRPF, Prayagraj”**[Payable At-SBI, SHANTIPURAM, PRAYAGRAJ BranchCodeNo.014577].

The Earnest Money shall be scanned and uploaded to the e-Tendering website within the period of bid submission. The physical EMD of the scanned copy of EMD uploaded shall be deposited in original at **Works Dte, Sec -1, East Block, Block – 7, RK Puram, New Delhi – 110066** failing which the tender shall be rejected.

Interested contractor who wish to participate in the bid has to make following payments in the form of Demand Draft / Pay order or Banker's Cheque of any Scheduled Bank to the e-Tendering website within the period of bid submission:
(i) Copy of Enlistment Order and other documents as specified in the press notice shall be scanned and uploaded to the e-Tendering website within the period of bid submission. Original Demand Draft of Earnest Money Deposit (EMD) shall be deposited in the office of the **Works Dte, Sec -1, East Block, Block – 7, RK Puram, New Delhi – 110066** before the due date of submission receipt of tender bids

(ii) The bid/tender submitted shall be opened as per timing specified on CPP Portal.
9. The bid/tender submitted shall become invalid and cost of bid shall not be refunded if:-
 - I. The bidders are found ineligible.
 - II. The bidders does not upload all the documents (including Labour Licence, GST registration, EPFO & ESIC registration, PAN card and copy of registration/enlistment) as stipulated in the bid document including the undertaking about deposition of physical EMD of the scanned copy of EMD uploaded.

- III. Any discrepancy is noticed between the documents as uploaded at the time of submission of bid and hard copies as submitted physically in the office of tender opening authority.
10. The contractor whose tender is accepted will be required to deposit **PERFORMANCE SECURITY** for an amount of **Five percent (5%) of the value of the contract within a period of 07 (SEVEN) days after the Tender is accepted by the Competent Engineering Authority. Performance Security may be furnished in the form of an Fixed Deposit Receipt from a commercial bank in an acceptable form.** Performance Security should remain **valid for a period of 180 (06 months) days** beyond the date of completion of all contractual obligation of the supplier including warranty obligations if any. In case the contractor fails to deposit the performance security within the stipulated period including extended period, if any, the Earnest Money deposited by the contractor shall be forfeited automatically without any notice to the contractor. 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 and registration with EPFO & ESIC within the period specified in Schedule-“F”. Failing to submit the above certificates / documents, offers will be summarily rejected.
 11. The reimbursement of EPF & ESI contributions paid by the contractor on the part of employer is to be made on submission of documentary proof of payment provided the same is in order.
 12. Intending Bidders may inspect and examine the site and its surroundings and satisfy themselves before submitting their bids 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 and no extra charge consequent on any misunderstanding or otherwise shall be allowed. The bidders shall be responsible for arranging and maintaining at his own cost all materials, tools & plants, 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 bidders 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 Engineering Authority on behalf of the President of India does not bind itself to accept the lowest or any other bid and reserves to itself the authority to reject any or all the bids 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 bidders 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 for 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 bidders shall be bound to perform the same at the rate quoted.
 16. 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 before submission of the bid or engagement in the contractor's service.
 17. The bid for the works shall remain open for acceptance for a period of Ninety (90)days from the end date of submission of bids, if any bidders withdraws his bid before the said period or issue of letter of acceptance, whichever is earlier, or makes any modifications in the terms and conditions of the bid which are not acceptable to the department, then the Government shall, without prejudice to any other right or remedy, be at liberty to forfeit 100% of the said earnest money as aforesaid. Further the bidders shall not be allowed to participate in the re-bidding process of the work.
 18. This notice inviting Bid shall form a part of the contract document. The successful bidders/contractor, on acceptance of his bid 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 bid 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 7/8 or other Standard C.P.W.D. Form as applicable.

Sd/-

DIG (Engineer), Works Dte

For and on behalf of the President of India

**GOVERNMENT OF INDIA
CENTRAL RESERVE POLICE FORCE**

STATE: Uttar Pradesh

Work Site : 101 Bn RAF, Shantipuram, Prayagraj

ITEM RATE TENDER & CONTRACT FOR WORKS

Tender for the work of– ELECTRICAL WORK I/C TRANSFORMER FOR NEW FAMILY QTRS AT 101 BN RAF SHANTIPURAM, PRAYAGRAJ (U.P)

- (i) To be submitted online through website <http://eprocure.gov.in/eprocure/app>
- (ii) To be opened in online at **Works Dte, Sec -1, East Block, Block – 7, RK Puram, New Delhi – 110066**

T E N D E R

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 and 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 respects with the Specifications, Designs, Drawings 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 respects in accordance with, such conditions so far as applicable.

We agree to keep the tender open for Ninety (90) days from the date of opening of tender and not to make any modifications in its terms and conditions.

A sum of **Rs. 1,95,976/- (Rupees One Lakh Ninety Five Thousand Nine Hundred Seventy Six) only** is hereby forwarded in Bank Draft/ FDR of a Scheduled Bank/ Demand Draft of a scheduled bank as earnest money. 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 CRPF 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 :
Witness:
Address:
Occupation:

Signature of Contractor
Postal Address

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 Rs. (Rupees)

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

- (a)
- (b)
- (c)

Dated: -

DIG (Engineer), Works Dte.
For and on behalf of the President of India

SCHEDULES (A TO F)**SCHEDULE - "A"**

Name of work :- ELECTRICAL WORK I/C TRANSFORMER FOR NEW FAMILY QTRS AT 101 BN RAF SHANTIPURAM, PRAYAGRAJ (U.P)

Schedule of quantities:- As per BOQ :-

SCHEDULE - "B" :-

Schedule of materials to be issued to the contractor.

| S.No. | Description of item. | Quantity. | Rate in figures & words at which the material will issue be charged to the contractor | Place of |
|-------|----------------------|-----------|---------------------------------------------------------------------------------------|----------|
| (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 |
|-------|--------------|----------------------|----------------|
|-------|--------------|----------------------|----------------|

----- NIL -----

NOTE :-ALL THE TOOLS, PLANTS AND MACHINERY REQUIRED FOR CARRYING OUT THE SUBJECT WORK SHOULD BE OWNED/REGISTERED/LEASED EITHER IN THE NAME OF THE SOLE PROPRIETOR OF THE FIRM OR THE NAME OF FIRM AND THE CONTRACTOR SHALL ALSO MEET THE MINIMUM REQUIREMENT OF TOOLS, PLANTS AND MACHINERY SUCH AS VIBRATORY ROLLERS, PNEUMATIC WHEELED ROLLER, FULLY AUTOMATIC CONCRETE BATCHING PLANT, CONCRETE PAVER FINISHER ,CONTINUES TYPE HOT MIX PLANT, PAVER FINISHER (HYDRAULICALLY CONTROLLED SENSORS OPERATED ELECTRICALLY FOR THE PAVE FINISHER (HYDRAULICALLY CONTROLLED), BULL DOZERS, ROAD ROLLERS, DRILLING MACHINES, CONCRETE MOBILE WEIGH BATCHERS, TRANSIT MIXERS ONE BAG CAPACITY CONCRETE MIXER(DIESEL), VIBRATORS (NEEDLE AND PLATE TYPE), TRUCKS/ TIPPERS, TOTAL STATIONS, CONCRETE CUBE TESTING MACHINE(HYDRAULICALLY OPERATED), FULLY AUTOMATIC CONCRETE BATCHING PLANT AND ANY OTHER TOOLS, PLANTS AND MACHINERY REQUIRED FOR THE WORK AS PER GOOD ENGINEERING PRACTICE/RELEVANT IS-CODES WHICHEVER APPLICABLE.

SCHEDULE - "D" :-

Extra schedule for specific requirements/ documents for the work, if any - NIL

SCHEDULE- "E" :-

Reference to General Conditions of Contract:-

General Conditions of Contract for CPWD Works 2023 with upto-date amendments.

1.1 Name of Work:

(1) POST DEVELOPMENT WORKS SH: ELECTRICAL WORK INCLUDING TRANSFORMER FOR NEW FAMILY QUARTERS AT 101 BN RAF, PRAYAGRAJ

1.2 Estimated Cost of work: -

Rs. 97,98,794/-

1.3 Earnest Money: -

Rs. 1,95,976/- (The EMD will be returned post receipt of Performance Guarantee)

| | | |
|----------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|
| 1.4 | Performance Guarantee | 5% of tendered value (It shall be valid up to the stipulated date of completion Plus 180 days beyond that) |
| 1.5 | Security Deposit | 2.5 % |
| SCHEDULE- "F" :- | | |
| General Rules & Directions:- | | |
| | Officer Inviting Tender: - | DIG (Engineer) |
| | 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 | See below |
| Definitions :- | | |
| 2(v) | Engineer-In-Charge | AC Engr. or Designated by DIG(Engr.) |
| 2(viii) | Accepting Authority | DIG (Engineer) |
| 2(x) | Percentage on cost of Materials and labour to Cover all overheads and Profits | 15% |
| 2(xi) | Standard Schedule of Rates | DSR |
| 2(xii) | Department | CRPF |
| 9(ii) | Standard CPWD contract Form CPWD form 8 & General Conditions of Contract for CPWD Works-2023 with upto-date correction slips. | |
| Clause-1 :- | | |
| (i) | Time allowed for submission of Performance guarantee Programme Chart (Time & Progress) and from the date of issue of letter of acceptance. | 07 days |
| (ii) | Maximum allowable extension Beyond the period as provided in (i) above | 10 days by DIG (Engineer) Dte. |
| Clause-1A :- Recovery of Security Deposit of GCC :- | | Applicable |
| Clause-2 :- Authority for fixing compensation under clause 2. | | DIG (Engineer) |
| Clause-2A:- Whether Clause 2A shall be applicable | | No |
| Clause- 3 :- Applicable | | |
| Clause 3A:- Applicable | | |
| Clause 4 :- Applicable | | |
| Clause-5:- Applicable | | |
| | Time allowed for execution of work | 180 days |
| Authority to decide | | |
| i) | Extension of time | DIG (Engineer) |
| ii) | Rescheduling of mile stones | DIG (Engineer) |
| iii) | Shifting of date of start in case of delay in handing over of site | DIG (Engineer) |
| Clause-6 :- Computerized Measurement Book | | No |
| Clause-7A :- Whether Clause 7A shall be applicable | | Applicable |

| | | |
|---------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|
| Clause 8 :- | Completion Certificate and Completion Plans | Applicable |
| Clause-8A :- | Completion Plans to be Submitted by the Contractor | Applicable. |
| Clause-9 :- | Payment of Final Bill | Applicable. |
| Clause 9A :- | Payment of Contractor's Bills to Banks | Applicable. |
| Clause-10A:- | Materials to be provided by the Contractor | Applicable |
| Clause-10-B | | |
| (i) | Secured Advance on Materials | No |
| (ii) | Whether Mobilization advance will be paid | No |
| Clause-10C:- | | |
| | Payment on Account of Increase in Prices/ Wages due to Statutory Order(s) | Not applicable. |
| Clause-10 CA:- | | |
| | Payment due to variation in prices of materials after receipt of tender | Not applicable. |
| Clause-10-CC:- | | |
| | Payment due to Increase / Decrease in Prices/ Wages (excluding materials covered under clause 10 CA) after Receipt of Tender for Works | Not applicable |
| Clause 10 D :-Dismantled Material Govt. Property | | |
| | The contractor shall treat all materials obtained during dismantling of a structure, excavation of the site for a work, etc. as Government's property and such materials shall be disposed off to the best advantage of Government according to the instructions in writing issued by the Engineer-in-Charge. | |
| Clause-11:- | Work to be Executed in Accordance with Specifications, Drawings, Orders etc. | |
| | The contractor shall execute the whole and every part of the work in the most substantial and workmanlike manner both as regards materials and otherwise in every respect in strict accordance with the specifications. The contractor shall also conform exactly, fully and faithfully to the design, drawings and instructions in writing in respect of the work signed by the Engineer-in-Charge and the contractor shall be furnished free of charge one copy of the contract documents together with specifications, designs, drawings and instructions as are not included in the standard specifications of Central Public Works Department specified in Schedule 'F' or in any Bureau of Indian Standard or any other, published standard or code or, Schedule of Rates or any other printed publication referred to elsewhere in the contract. The contractor shall comply with the provisions of the contract and with the care and diligence execute and maintain the works and provide all labour and materials, tools and plants including for measurements and supervision of all works, structural plans and other things of temporary or permanent nature required for such execution and maintenance in so far as the necessity for providing these, is specified or is reasonably inferred from the contract. The Contractor shall take full responsibility for adequacy, suitability and safety of all the works and methods of construction. | |
| Clause-12:- | | |
| Authority to decide deviation | | DIG (Engineer) |
| Clause -14: - Carrying out part work at risk & cost of contractor(Authority to decide) | | DIG (Engineer) |
| Clause-16:- | Competent Authority for deciding reduced rates. | DIG (Engineer) |
| Clause17: | <u>Contractor Liable for Damages, defects during defect liability period</u> | |

If the contractor or his working people or servants shall break, deface, injure or destroy any part of building in which they may be working, or any building, road, road kerb, fence, enclosure, water pipe, cables, drains, electric or telephone post or wires, trees, grass or grassland, or cultivated ground contiguous to the premises on which the work or any part is being executed, or if any damage shall happen to the work while in progress, from any cause whatever or if any defect, shrinkage or other faults appear in the work within twelve months (six months in the case of work costing Rs. Ten lacs and below except road work) after a certificate final or otherwise of its completion shall have been given by the Engineer in- Charge as aforesaid arising out of defect or improper materials or workmanship the contractor shall upon receipt of a notice in writing on that behalf make the same good at his own expense or in default the Engineer-in-Charge cause the same to be made good by other workmen and deduct the expense from any sums that may be due or at any time thereafter may become due to the contractor, or from his security deposit or the proceeds of sale thereof or of a sufficient portion thereof. The security deposit of the contractor shall not be refunded before the expiry of twelve months after the issue of the certificate final or

otherwise, of completion of work. Provided that in the case of road work, if in the opinion of the Engineer-in-Charge, half of the security deposit is sufficient, to meet all liabilities of the contractor under this contract, half of the security deposit will be refundable after six months and the remaining half after twelve months of the issue of the said certificate of completion.

In case of Maintenance and Operation works of E&M services, the security deposit deducted from contractors shall be refunded within Two months from the date of final payment or within Two months from the date of completion of the maintenance contract whichever is earlier.

Clause-18:- Tools & Plants etc.

The contractor shall provide at his own cost all materials machinery, tools & plants as specified in schedule F. In addition to this, appliances, implements, other plants, ladders, cordage, tackle, scaffolding and temporary works required for the proper execution of the work, whether original, altered or substituted and whether included in the specifications or other documents forming part of the contract or referred to in these conditions or not, or in-Charge as to any matter as to which under these conditions he is entitled to be satisfied, or which he is entitled to require together with carriage therefore to and from the work. The contractor shall also supply without charge the requisite number of persons with the means and materials, examination at any time and from time to time of the work or materials. Failing his so doing, the same may be provided by the Engineer-in-Charge at the expense of the contractor and the expenses may be deducted, from any money due to the contractor, under this contract or otherwise and/or from his security deposit or the proceeds of sale thereof, or of a sufficient portions thereof.

Clause-19 :- Labour Laws to be complied by the contractor Applicable.

Clause-19A :- No labour below the age of Eighteen years shall be employed on the work. Applicable.

Clause-19C :- Applicable.

Clause -19D :- Applicable.

Clause -19K :- Employment of skilled/semi skilled workers

The contractor shall, at all stages of work, deploy skilled/semi skilled tradesmen who are qualified and possess certificate in particular trade from CPWD Training Institute/Industrial Training Institute/ National Institute of construction Management and Research (NICMAR)/ National Academy of Construction, CIDC or any similar reputed and recognized Institute managed/ certified by State/Central Government. The number of such qualified tradesmen. The contractor shall submit number of man days required in respect of each trade, its scheduling and the list of qualified tradesmen along with requisite certificate from recognized Institute to Engineer in charge for approval. Notwithstanding such approval, if the tradesmen are found to have inadequate skill to execute the work of respective trade, the contractor shall substitute such tradesmen within two days of written notice from Engineer in- Charge. Failure on the part of contractor to obtain approval of Engineer-in-Charge or failure to deploy qualified tradesmen will attract a compensation to be paid by contractor at the rate specified in schedule 'F' per such tradesman per day. Decision of Engineer in Charge as to whether particular tradesman possesses requisite skill and amount of compensation in case of default shall be final and binding. Provided always, that the provisions of this clause, shall not be applicable for works with estimated cost put to tender being less than Rs. 5 crores. For work costing more than Rs. 10 Crores, and uptoRs. 50 Crores, the contractor shall arrange on site training as per National Skill Development Corporation (NSDC) norms for at least 20% of the unskilled workers engaged in the project in co-ordination with the CPWD Regional Training Institute& National Skill Development Corporation (NSDC) for certification at the level of skilled/semi skilled tradesmen. For works costing more than Rs. 50 Crores, the contractor shall arrange on site training as per National Skill Development Corporation (NSDC) norms for at least 30% of the unskilled worker engaged in the project in co-ordination with the CPWD Regional Training Institute & National Skill Development Corporation (NSDC) for certification at the level of skilled/semi skilled tradesmen. The cost of such training as stated above shall be born by the Government. The necessary space and workers shall be provided by the contractor and no claim what so ever shall be entertained.

Clause-19L :- Contribution of EPF & ESI Applicable.

Clause-20 :- Minimum wages act to be complied with. Applicable.

Clause 21 :- Work not to be sublet. Action in case of in solvency

The contract shall not be assigned or sublet without the written approval of the Engineer-in Charge. And if the contractor shall assign or sublet his contract, or attempt to do so, or become insolvent or commence any insolvency proceedings or make any composition with his creditors or attempt to do so, or if any bribe, gratuity, gift, loan, perquisite, reward or advantage pecuniary or otherwise, shall either directly or indirectly, be given, promised or offered by the contractor, or any of his servants or agent to any public officer or person in the employ of Government in any way relating to his office or employment, or if any such officer or person shall become in any way directly or indirectly interested in the contract, the Engineer-in-Charge on behalf of the President of India shall have power to

adopt the course specified in Clause 3 hereof in the interest of Government and in the event of such course being adopted, the consequences specified in the said Clause 3 shall ensue.

Clause 25 Settlement of Dispute by Conciliation and Arbitration

| | | | |
|-------|---------------------------------|----|----------------------|
| (i) | Conciliator | -- | IG (Works) |
| (ii) | Arbitrator Appointing Authority | -- | IG (Works) |
| (iii) | Place of Arbitration | -- | PRAYAGRAJ /NEW DELHI |

Clause 28 Action where no Specifications are specified

In the case of any class of work for which there is no such specifications as referred to in Clause 11, such work shall be carried out in accordance with the Bureau of Indian Standards Specifications. In case there are no such specifications in Bureau of Indian Standards, the work shall be carried out as per manufacturers' specifications, if not available then as per state/ District Specifications. In case there are no such specifications as required above, the work shall be carried out in all respects in accordance with the instructions and requirements of the Engineer-in-Charge.

Clause 30 Water for Works

The contractor(s) shall make his/their own arrangements for water required for the work and nothing extra will be paid for the same. This will be subject to the following conditions.

(i) That the water used by the contractor(s) shall be fit for construction purposes to the satisfaction of the Engineer-in-Charge.

(ii) The Engineer-in-Charge shall make alternative arrangements for supply of water at the risk and cost of contractor(s) if the arrangements made by the contractor(s) for procurement of water are in the opinion of the Engineer-in-Charge, unsatisfactory.

(iii) **WATER CHARGES:-** If water is used from CRPF campus then 1% amount of tendered cost shall be levied from contractor.

(iv) **ELECTRICITY CHARGES:-** If electricity is provided by CPRF campus then charges shall be applied on contractor.

Clause 31 Hire of Plant & Machinery

The contractor shall arrange at his own expense all tools, plant, machinery and equipment (hereinafter referred to as T&P) required for execution of the work.

Clause 32,33,34& 35

Applicable

Clause-32 Requirement of technical representative(s) and recovery rate

| Sl. No. | Minimum qualification of technical representative | Minimum Experience | Designation of Technical Staff | Nos. | Rate at which recovery shall be made from the contractor in the event of not fulfilling provision of Clause 32 | |
|---------|---------------------------------------------------|-------------------------------------------------------------------|-------------------------------------------|-----------------------|----------------------------------------------------------------------------------------------------------------|-----------------------------------|
| | | | | | Figure | Words |
| 2. | Graduate or Diploma Engineer | 2 or 5 years (respectively) experience of similar nature of works | Project planning/Quality/Billing Engineer | 01 of major component | <u>Rs. 15,000/- per month</u> | Rupees Fifteen Thousand per month |

Assistant Engineers retired from Govt. Services who are holding Diploma will be treated at par with Graduate Engineers.

Clause 37 :- No engineer of gazetted rank or other gazetted officer employed in engineering or administrative duties in an engineering department of the Government of India shall work as a contractor or employee of a contractor for a period of one year after his retirement from government service without the previous permission of Government of India in writing. This contract is liable to be cancelled if either the contractor or any of his employees is found at any time to be such a person who had not obtained the permission of Government of India as aforesaid, before submission of the tender or engagement in the contractor's service, as the case may be.

Sd/-

DIG (Engineer), Works Dte.
For and on behalf of the President of India

INTEGRITY PACT

To,

DIG (Engineer),
Works Branch, CRPF, Dte.
New Delhi.

Sub: Submission of Tender for the work of.....

Dear Sir, I/We acknowledge that CRPF 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 CRPF. I/We acknowledge and accept the duration of the 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, CRPF 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

(Duly authorized signatory of the Bidder)

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

INTEGRITY AGREEMENT

This Integrity Agreement is made at..... on thisday of 20.....

BETWEEN

President of India represented through The Commandant 101 Bn RAF, Shantipuram, Prayagraj..

.....
(Name of Zone)

CRPF,, (Hereinafter referred as the
(Address of Office)

‘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:

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 (signature, name and address)

Place:

Dated :

Instructions for online Bid submission

Instructions to the Bidders to submit the bids online through the Central Public Procurement Portal for e-Procurement at <https://eprocure.gov.in/eprocure/app>

- 1) Possession of valid Digital Signature Certificate (DSC) and enrolment/ registration of the contractors/bidders on the e-procurement /e-tender portal is a prerequisite for e-tendering.
- 2) Bidder should do the enrolment in the e-Procurement site using the “Click to Enrol” option available on the home page. Portal enrolment is generally free of charge. During enrolment/registration, the bidders should provide the correct/true information including valid eMail ID. All the correspondence shall be made directly with the contractors/bidders through eMail ID provided.
- 3) Bidder need to login to the site thro“ their user ID / password chosen during enrolment / registration.
- 4) Then the Digital Signature Certificate (Class II or Class III Certificates with signing key usage) issued by SIFY/TCS/n-Code/ e-Mudra or any Certifying Authority recognized by CCA India on e-Token/Smart Card, should be registered.
- 5) The DSC that is registered only should be used by the bidder and should ensure safety of the same.
- 6) Contractor/Bidder may go through the tenders published on the site and download the required tender documents/ schedules for the tenders he/she is interested.
- 7) After downloading / getting the tender document/schedules, the Bidder should go through them carefully and then submit the documents as asked, otherwise bid will be rejected.
- 8) If there are any clarifications, this may be obtained online thro“ the tender site, or thro“ the contact details. Bidder should take into account the corrigendum published before submitting the bids online.
- 9) Bidder then logs in to the site through the secured log in by giving the user id/password chosen during enrolment/registration and then by giving the password of the e-Token/Smart Card to access DSC.
- 10) Bidder selects the tender which he/she is interested in by using the search option & then moves it to the „my tenders“ folder.
- 11) From my tender folder, he selects the tender to view all the details indicated.
- 12) It is construed that the bidder has read all the terms and conditions before submitting their offer. Bidder should go through the tender schedules carefully and upload the documents as asked; otherwise, the bid will be rejected.
- 13) Bidder, in advance, should get ready the bid documents to be submitted as indicated in the tender document/ schedule and generally, they can be in PDF/xls/rar/zip formats. If there is more than one document, they can be clubbed together and can be provided in the requested format. Each document to be uploaded through online for the tenders should be less than 2 MB. If any document is more than 2MB, it can be reduced through zip/rar and the same can be uploaded, if permitted. Bidders Bid documents may be scanned with 100 dpi with 12 black and white option. However of the file size is less than 1 MB the transaction uploading time will be very fast.
- 14) If there are any clarifications, this may be obtained through the site, or during the pre-bid meeting if any. Bidder should take into account the corrigendum published from time to time before submitting the online bids.
- 15) The Bidders can update well in advance, the documents such as certificates, annual report details etc., under My Space option and these can be selected as per tender requirements and then send along with bid documents during bid submission. This will facilitate the bid submission process faster by reducing upload time of bids.
- 16) Bidder should submit the EMD as specified in the tender. The original should be Posted / couriered/given in person to the Tender Inviting Authority, within the bid submission due date & time for the tender. Scanned copy of the instrument should be uploaded as part of the offer.
- 17) While submitting the bids online, the bidder reads the terms & conditions and accepts the same to proceed further to submit the bid packets.

- 18) The bidder has to select the payment option as offline to pay the EMD as applicable and enter details of the instruments.
- 19) The details of the DD/any other accepted instrument, physically sent, should tally with the details available in the scanned copy and the data entered during bid submission time. Otherwise submitted bid will not be acceptable.
- 20) The bidder has to digitally sign and upload the required bid documents one by one as indicated. Bidders to note that the very act of using DSC for downloading the bids and uploading their offers shall be deemed to be a confirmation that they have read all sections and pages of the bid document including General conditions of contract without any exception and have understood the entire document and are clear about the requirements of the tender requirements.
- 21) The bidder has to upload the relevant files required as indicated in the cover content. In case of any irrelevant files, the bid will be rejected.
- 22) Tenderers should submit price bid in format available Annexure in **CPP Portal** <http://eprocure.gov.in/eprocure/app> and don't change the name of downloaded Annexure. Only fill the area which is available to fill and validate by the given button in Annexure, save the file and upload the file on portal.
- 23) The bidders are requested to submit the bids through online e-tendering system to the Tender Inviting Authority (TIA) well before the bid submission end date & time (as per Server System Clock). The TIA will not be held responsible for any sort of delay or the difficulties faced during the submission of bids online by the bidders at the eleventh hour.
- 24) After the bid submission (i.e after Clicking "Freeze Bid Submission" in the portal), the acknowledgement number, given by the system should be printed by the bidder and kept as a record of evidence for online submission of bid for the particular tender and will also act as an entry pass to participate in the bid opening date.
- 25) The time settings fixed in the server side & displayed at the top of the tender site, will be valid for all actions of requesting, bid submission, bid opening etc., in the e-tender system. The bidders should follow this time during bid submission.
- 26) All the data being entered by the bidders would be encrypted using PKI encryption techniques to ensure the secrecy of the data. The data entered will not viewable by unauthorized persons during bid submission & not be viewable by any one until the time of bid opening.
- 27) Any bid document that is uploaded to the server is subjected to symmetric encryption using a system generated symmetric key. Further this key is subjected to asymmetric encryption using buyers/bid openers' public keys. Overall, the uploaded tender documents become readable only after the tender opening by the authorized bid openers.

ADDITIONAL TERMS AND CONDITIONS

- (i) **PAYMENT:-** (a) Works are required to be executed on credit basis only and payment will be released after submission of RA bill by the contractor and scrutiny by the department.
- (b) Payment in advance or immediately cannot be made.
- (c) The Payment action will be processed on production of the following documents:
 - (i) Bill in Triplicate.
 - (ii) A Copy of award of work.
 - (iii) A copy of Certificate issued by The Commandant 101 Bn RAF, Shantipuram, Prayagraj, CRPF in consultation with Engineer-in-charge that contracted work for the period for which payment has been claimed, has carried out by the contractor satisfactory.
- (d) GST/TDS/GST-TDS/ Labour Cess and other taxes will be deducted from the Bill of Contractor by RPAO as per norms. EPF & ESIC shall be reimbursed by RPAO only on submission of proof of payment by contractor to concerned authorities.
- (e) Contractor may claim RA Bills at interval of 30 days for the work done as measured and entered in measurement book. RA bill should be checked by Insp/SI (Civil) & Engineer-in-charge and countersigned by Estate Officer before release of payment. Security Deposit of 2.5% shall be retained from the Work Done in the RA Bill which will be paid after completion of Defect Liability Period.

(ii) **MEASUREMENT:** Entire work done at Site shall be recorded in measurement book duly signed by Contractor & Insp/SI (Civil) & AC(Engr). Measurements in measurement book shall be recorded jointly by contractor/authorized representative of contractor and Insp/SI Civil and 50% MB checked & signed by AC(Engr) before processing bill to Estate Officer for counter sign.

(iii) **COMPLETION CERTIFICATE:** Upon Completion of Work, Contractor shall intimate Estate Officer in writing of completion of work. If Estate Office is completely satisfied with the work, he shall issue Completion Certificate duly signed by Engineer-in-Charge (AC Engr) within 20 days of intimation of contractor. If Minor Defects Persists, Provisional Completion Certificate can be issued subject to rectification of defects brought out by Estate Officer. A suitable time frame for rectification of such defects shall also be intimated by Estate Officer in writing beyond which DIG Engineer Dte. Shall be empowered to rectify the defects through other agency at risk and cost of the contractor. This period shall not be less than 30 days and should not exceed 180 days in any case from the date of intimation of defects. Such defects list shall be made part of Provisional Completion certificate by Estate Officer.

(iv) **DISPUTE IN CONTRACT:** - In case of any ambiguity in the provisions of the Contract Agreement, Decision of Accepting Officer shall be Final & Binding on the Contractor. **GCC works-2023 (construction/maintenance) with upto date correction slips will prevail and applicable.**

(v) All materials required to be used on works shall be got approved from the Engineer-in-charge in advance. In case of doubt on any material, Engineer-in-charge has right to get the material tested from any Govt. approved labs/NABL and the charges for the same shall be borne by the contractor, upto the overall amount of Rs. 02 lakh in entire work. Beyond Rs. 02 lakh, the cost of such test shall be borne by the contractor if sample fails in the test & by CRPF if sample passes the test.

(vi) The quoted rate should be inclusive of all taxes, levies, works contract taxes, duties etc.

(vii) All items to be used in this work should be branded and ISI certified. In this case CPWD approved list of material for similar work may be followed. If any make is not specified, decision of **Engineer-in-charge** shall be final and binding.

(viii) Payment to contractor shall be released only after submission of purchase voucher of all new items.

(ix) **TERMINATION OF CONTRACT :-**

In case of violation/breach of any agreed terms and conditions of contract and persistently failure/negligence to observe and perform all or any of the acts, deeds, matters or things to be observed and performed by the Contractor. Tender Accepting Authority may cancel/Terminate this contract and the performance security deposit will be forfeited.

(x) **CONFLICT OF INTEREST**

The bids of any tenderer may be rejected if a conflict of interest between the bidder and CRPF is detected at any stage. Tender Accepting Authority reserves the right to accept or reject the tender without assigning any reason whatsoever.

(xi) Conditional tender is not acceptable and will be summarily rejected.

(xii) **DEFECT LIABILITY PERIOD:** - Defect liability period is 02 years, which will be reckoned from the date of final and complete handing/taking over of building/infrastructure. If any defects occurs/noticed during this period, then a notice in this regard will be issued to the contractor and it is the responsibility of contractor to rectify/repair the defects at his own cost. The work must be got started by the contractor within 15 days after receipt of the 1st notice. If the contractor is unable or unwilling to repair the defects, the competent authorities reserves full rights to forfeit the security deposit and may blacklisted/debarred the firm and rectify the defects at risk and cost of the contractor. Any amount on this account due to the department shall be recovered from the Contractor.

(xiii) Payment for execution of electrical works will be done only after inspection by the BOO/electrical engineer of State Electrical Department/any Govt. electrical engineer(serving) detailed by Estate Officer/Engineer-in-charge. A completion certificate is required to be submitted by the BOO/electrical engineer of State Electrical Department/any Govt. electrical engineer(serving). Any charges if occurs that will be borne by the contractor. No payment in this regard will be done by the CRPF.

(xvi) **All credit obtained during dismantling shall be deposited with CRPF.**

LIST OF MAKES

MATERIALS :Unless specific makes/manufacturers are specified in the tender documents all the materials to be procured by the contractor for incorporation in the work under this contract (with the exception of local materials like bricks, stone aggregate, stones, sand etc) shall be with ISI certifications mark.

SAMPLES OF MATERIALS: The contractor shall produce samples of all materials and shall obtain approval in writing from Engineer-in-charge before he places bulk order for the materials for incorporation in the work. The contractor shall not procure materials unless the samples are first got approved from the Engineer-in-charge .

LIST OF APPROVED MANUFACTURERS AND MAKES

| S.No | NAME OF PRODUCT | MAKES/BRANDS/MANUFACTURERS |
|------|--------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|
| 1 | LED LIGHT FITTING & LUMINARIES FOR ROAD AND STREET LIGHTING (OUT DOOR) | WIPRO, C&S ELECTRIC, PHILIPS, CROMPTON, BAJAJ, OSRAM |
| 2 | LED LAMPS | WIPRO, PHILIPS, CROMPTON, BAJAJ, OSRAM |
| 3 | SMART STREET LIGHTS AND CONTROL SYSTEM | ORIENT ELECTRIC LTD, OPULUS, HAVELLS |
| 4 | STREET LIGHT FITTING & ACCESSORIES -HPSC (70/ 150/ 250/ 400) HPMV (80/ 125/ 250/ 400) | PHILLIPS, C&S ELECTRIC, SURYA, WIPRO |
| 5 | SOLAR STREET LIGHT FITTINGS | JILCO, PHILLIPS, OSRAM |
| 6 | STREET LIGHT TIMERS | SINETRAC, INDO ASIAN, HAVELLS |
| 7 | GI PIPES / MS PIPES | JINDAL, TATA, OSWAL |
| 8 | DI PIPES | JINDAL, TATA, , OSWAL |
| 9 | CI PIPES & FITTINGS | JINDAL, TATA METALIKS, TATA KUBOTA |
| 10 | INTERLOCKING TILES/ PAVER BLOCKS | ISI MARKED GLOSSY FINISH |
| 11 | CEMENT BASED PAINTS | SNOWCEM, ASIAN, BERGER, DULUX |
| 12 | DECORATIVE PAINT (EXT & INT) | SNOWCEM, ASIAN, BERGER, DULUX |
| 13 | CHAIN LINK FENCING / BARBED WIRE / PUNCHED TAPE CONCERTINA COIL / RAZOR BLADE TAPE FENCING | A-1 FENCE, ARMOSTRONG WIRES, MAIMOM ROGER |
| 14 | GALVALUME SHEET | TATA BLUE SCOPE /JSW/BHUSHAN/VARDHMAN |
| 15 | NON SKID/VITRIFIED/GLAZED TILES | 1ST QUALITY OF JOHNSON TILES/ NITCO/ CERA/ KAJARIA. |
| 16 | SHEET GLASS | MODIGUARD FLOAT / SAINT GOBAIN/ ATUL |
| 17 | CHROMIUM PLATED BATHROOM FITTINGS OF CP, CAST COPPER ALLOY FANCY TYPE BIB TAP, STOP VALVES AND PILLAR TAP, SANITARY FITTINGS, SHOWER PNAEL | JAQUAR /KOHLER/ROCA/GROHE |
| 18 | PVC OVERHEAD TANK | SINTEX / SUPREME / ASTRAL.(THREE LAYERED ISI MARKED) |
| 19 | CAT COPPER BIB COCK / STOP VALVE | LEADER /ZOLOTO / JAQUAR |
| 20 | GUN METAL GATE VALVE | KIRLOSKAR / L&T / LEADER |

| | | |
|-----|------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|
| 21 | VITREOUS CHINA WC / WHB / URINAL / SOAP DISH / URINAL PARTITION WALL / LABORATORY SINK | PARRYWARE /CERA/ JAQUAR |
| 22 | NON ASBESTOSFIBRE CEMENT BOARD AS PER IS 14862& FALSE CEILING | ARMSTRONG / SAINT GOBAIN (GYPROC) / EVEREST /INDIA GYPSUM/ |
| 23 | DRY / OIL BOUND/ ACRYLIC DISTEMPER | ASIAN PAINTS (TRACTOR UNO) / BERGER (JADOO)/ DULUX WEATHERSHIELD (SIGNATUREOR POWER FLEX) OF ICI. |
| 24 | ACRYLIC EMULSION / WEATHER PROOF PAINT | ASIAN PAINTS (ROYAL) / BERGER (LUXOL SILK SPLENDER)/ ICI (DULUX VELVET TOUCH) |
| 26 | PLASTIC EMULSION PAINT | ACROCEM / DUROCEM / SUPER SNOWCEM / BERGER / ASIAN PAINT (GUTUCAM) |
| 27 | SYNTHETIC ENAMEL PAINTS | BERGER (LUXOL) / ASIAN (APCOLITE) / ICI (SUPERGLOSS) |
| 28 | MIRROR | ATUL / MODI / SAINGOBAIN / PRAYAG |
| 29 | HOUSE WIRING CABLE (1100 VOLTS)/CABLE FOR SERVICE CONNECTION/CABLE FOR PANEL BARD WIRING | HAVELLS/ RR KABEL/ FINOLEX/RPG |
| 30 | PIANO SWITCHES/SOCKETS ETC. | ISI MARKED PRODUCTS OF LEGRAND/SCHNEIDER/PHILLIPS/ANCHOR (MODULAR TYPE) |
| 31 | PVC CASING CAPPING / CONDUIT | FINOLEX / MODI / PRESTO PLAST / PLAZA / KALINGA/RICHA |
| 32 | WIRING ACCESSORIES AND FITTINGS | ANCHOR/ HAVELLS/ LEGRAND/ KINJAL (ISI MARKED)/RICHA |
| 33 | MCBS, DBS, ISOLATOR | LEGRAND /SIEMENS/ SCHNIEDER/ ABB. |
| 34 | MCCB | ABB/ LEGRAND/ SCHNEIDER/ SIEMENS |
| 35 | LT UG /SERVICE CABLE | HAVELLS/FINOLEX/KEC |
| 36 | EXHAUST FAN/CEILING FAN | CROMPTON GREAVES/KHAITAN/BAJAJ/HAVELLS/ORIENT |
| 37 | HEATER WATER STORAGE TYPE ELECTRIC GEYSER | CROMPTON GREAVES /BAJAJ/HAVELLS |
| 38. | FALSE CEILING | ARMSTRONG/ EVEREST/GYPROC |
| 39. | ADMIXTURE FOR CONCRETE | SIKA, PIDILITE, ASIAN, FOSROC |
| 40. | EPOXY PAINT | NEROLAC OR EQUIVALENT |
| 41. | CERAMIC TILES/ VITRIFIED TILES | JONSON/KAJARIA/SOMANY |
| 42. | CHEQURED TILES | NITCO, GEM, MODERN, HINDUSTAN, JONSON, ORIENT, KAJARIA. |
| 43. | WATER PROOFING COMPOUND | CICO, BY STRUCTURAL WATER PROOFING CO. FOSROC BY FOSROC LTD., IMPERMO BY SNOCEM INDIA, CHESEAL BY OVERSEAS WATER PROOFING COMPOUND, PIDILITE |

| | | |
|-----|--------------------------|---------------------------------------------------|
| 44. | PAVING TILES/PAVER BLOCK | NITCO PREFAB, ULTRA KK, TERRAFIRMA, UNISTONE. |
| 45. | CC KERB STONE | NITCO PREFAB, K.K. MANHOLE, TERRAFIRMA, UNISTONE. |
| 46. | WHITE CEMENT | BIRLA WHITE, J.K. WHITE OR EQUIVALENT |
| 47. | STRUCTURAL STEEL | SAIL, TATA, RINL, ISCO, SRMB |
| 48. | MILD STEEL TUBES | TATA, SAIL, ISCO, SRMB |
| 49. | WELDING ELECTRODES | ESAB, ADVANI-ORLIKON, WELD ALLOY |
| 50. | CPVC PIPES& FITTINGS | SFMC/FINOLEX/SUPREME/ASTRAL |
| 51. | PVC FLUSHING CISTERN | PARRYWARE/CERA/HINDWARE |
| 52. | APP MEMBRANE | ASIAN PAINTS/FOSROC/SIKA/STP |
| 53. | TRANSFORMER | ABB, SCHNEIDER, SIEMENS |
| 54. | DG SET | KIRLOSKAR, CUMMINS, SUDHIR |
| 55. | ELECTRICAL POLES | BANSAL, JINDAL, TATA |
| 56. | SWITCH GEARS | SCHNEIDER ELECTRIC, SIEMENS, ABB, OREECO ELECTRIC |
| 57. | LT PANELS | SERVOKON, NEPTUNE, |

PARTICULAR SPECIFICATIONS

GENERAL

Work under this contract shall be carried out in accordance with Specifications, drawings, General Specifications and other provisions contained in CPWD Manuals and Specifications General Rules, specifications, special conditions and all preambles in the CPWD Schedule shall be deemed to be applicable to the work under this contract, unless specifically stated otherwise in these documents and in case of any conflicting provisions in CPWD schedule and in these tender documents, the provisions in these documents shall take precedence over the aforesaid provisions in the CPWD Schedule. The term "as specified" wherever appears in the tender documents and drawings, relates to relevant particular specifications and in its absence, general specifications. Where specifications for any item of work are not given in CPWD Schedule or in these particular specifications, specifications as given in relevant Indian Standard Code of Practice shall be followed. Unit rate quoted by the tenderer shall be deemed to include for any minor details/items of work and/or constructions which are obviously and fairly intended and which may not have been included in these documents but which are essential for the execution and entire completion of work. Decision of the Accepting Officer as to whether any minor detail of work and/or construction is obviously and fairly intended to be included in the contract or not, shall be final, conclusive and binding.

SAMPLES OF MATERIALS: -

(a) Specific requirements regarding dimensions, strength, weight and finishes, as per IS, CPWD Specification and the particular specifications given hereinafter vis-à-vis actual properties check, tests carried out, reference to test certificates and markings, etc based on which samples of each materials are approved as Conforming to relevant specification shall be recorded in the sample approval register.

(b) The contractor shall produce samples of all materials and shall obtain approval in writing from Engineer-in-charge before he places bulk order for the materials for incorporation in the work. The contractor shall not procure materials unless the samples are first got approved from the Engineer-in-charge.

(c) Samples of approved materials shall be kept in custody of Engineer-in-Charge till completion of work.

RECORD OF MATERIALS

(a) The quantity of all the proprietary materials (including materials and quantity of which cannot be checked after incorporation in the works) shall be recorded in measurement books and signed by the Contractor, the Engineer-in-Charge and Insp/SI (Civil) as a check to ensure that the required quantity has been brought at site for incorporation in the work.

- (b) Materials brought to site shall be stored as directed by the Engineer-in-Charge and shall be suitably marked for identification.
- (c) The contractor shall procure all the materials (where specific makes/manufacturer's specified) directly from their manufacturers or from their authorised dealers only. The contractor shall ensure that the materials are brought to site in original sealed containers/packing bearing manufacturers marking except in the case of the requirement of material(s) being less than smallest packing.
- (d) The contractor shall produce to Engr-in-charge original printed and machine numbered purchase vouchers/invoices including manufacturer's test certificate (where applicable) for all the materials mentioned. Copies of orders placed on the manufacturer/authorised dealers shall also be provided by the contractor to Engr-in-Charge along with above documents. Whenever procured and brought to site of work for incorporation in the work, a Xerox copy of such vouchers/invoices shall be stamped (office stamp) and defaced in ink by the Engineer-in-Charge & Insp/SI (Civil) stating verified for materials purchased and brought to the site of work for incorporation in the subject work and signed with date before allowing payment for these materials through RA Bills.

STANDARD OF WORKMANSHIP

To determine the acceptable standard of workmanship and fittings, wiring etc, the Engr-in-charge shall order the contractor to execute certain typical portion of work (different trades) and services sufficiently in advance of other work. These shall be executed and completed under the close supervision of the **Engineer-in-charge and Insp/SI(Civil)**.

On approval by the **Engineer-in-charge** of such items, these items shall signed and/or suitably identified by the **Engineer-in-charge** and labelled as guiding samples. The record of such inspection and passing of each stage of these samples shall be recorded by **Engineer-in-charge** under his dated signatures. Work on such sample shall be progressed well ahead (minimum two stages ahead). Approved finishes/workmanship shall be followed in the work as a whole.

Grades and Quality

Steel supplied by the contractor shall conform to the following grades and quality.
Structural steel

- (i) Structural steel wherever mentioned shall be conforming to Fe 550 Gde conforming to IS-2062.
(ii) General purpose steel wherever mentioned shall be conforming E-165(Fe-290) conforming to IS-2062.

Testing and Test Certificate

- (a) The contractor shall produce manufacturers test certificate in original along with the test sheet giving the result of each mechanical test as applicable and the chemical composition of the steel supplied as specified in relevant IS Codes, duly signed by the manufacturer of their authorized dealers with each consignment.
- (b) The original test certificate shall be kept on record in the office of Engineer-in-Charge(AC Engr).
- (c) Independent testing of structural steel by the Engineer-in-Charge shall be mandatory in case of procurement from secondary producers and testing charges shall be borne by the Contractor irrespective of the outcome of test results.
- (d) In both the cases at sub para (c) and (d) above, the contractor at his cost shall provide all facilities required for the testing and cost consumed in tests shall be borne by the contractor.
- (e) If the test results as per manufacturer's test certificate or of independent testing of random samples are not as per criteria laid down in the relevant BIS provisions, the entire consignment which is represented by the samples shall be rejected. Such rejected materials shall be removed and replaced by the contractor at his own cost forthwith.
- (f) Cost of transportation of samples to the approved laboratory/test house and all testing charges shall be borne by the contractor.

Storage: - Steel supplied by the contractor shall be stored in accordance with the requirement of IS. Each grade and quality of steel shall be stored separately and have identification tags indicating the source, quality and grade.

Preservation and maintenance of steel :- The steel brought by the contractor shall be preserved to ensure that no rusting takes place till it is incorporated in the works.

Schedule of Supply :- The contractor shall procure the steel sections, timely as required in accordance with CPM Chart, agreed between Engr-in-charge and contractor. The contractor will forego his right to demand extension of time if the supply of steel got delayed due to his failure in placing order in time to the manufacturer/supplier.

Payment :- Payment shall be allowed after production of test certificate and original paid/purchase vouchers by the contractor.

Measurement

(a) The entire quantity of steel brought to site shall be recorded in measurement book as “NOT TO BE ABSTRACTED” indicating the reference to manufacturers, source of supply voucher number and test certificate before incorporation in the work and shall be signed both by the Engineer-in-Charge and the contractor. Proper documentation/record shall be maintained as per the instructions on the subject.

Normal waste and off cuts shall be stacked neatly which shall be the property of the Contractor. Contractor shall be allowed to remove such cut pieces after inspection and certifications by the Engineer-in-Charge.

Advance on account of payment made towards these cut pieces shall be recovered from advance on account of payment immediately falling due and before removal of such cut pieces from site.

Bending and fixing of bars for concrete reinforcement including mild steel wire for binding shall be carried out all as specified in CPWD. Binding wire for reinforcement shall be mild steel wire (annealed) of size not less than 0.9mm.

Steel supply/Acceptance form :- For each consignment of steel supply/acceptance form will be filled in and jointly signed by the department Rep.(Engineer-in-Charge/SI civil/Insp Civil) and contractor and accepted/rejected by Engineer-in-Charge before incorporation in the works.

Steel Reinforcement :- Reinforcement shall be fabricated, placed in position all as specified in CPWD specifications.

Guard Bars/Grills:

MS Guard bars/grills wherever applicable and as indicated shall be provided to wooden/steel windows/ventilators as per details shown on drawings/schedule. Steel Guard bars/ steel grills shall be painted with 2 coats of synthetic enamel paint over a coat of primer as specified here-in-after.

Hold Fast/Lugs: Flat iron hold fast/lugs shall be provided by welding as and where shown on drawings except those, to be provided to wooden chowkats, which shall be fixed with screws as per details shown on drawings. Hold fasts/lugs shall be embedded in PCC(1:3:6) bed blocks of size 220mmx220mmx75mm in one brick thick walls and 100mmx220mmx75mm in half brick thick walls..

GENERAL NOTES FOR APPLYING PUTTY, DISTEMPER, ANTIFUNGAL AND ENAMEL PAINTING

These works shall be executed using modern technics and tools to maintain the required quality work. Following smart painting tools shall be used in site.

- (a) Hand held sander / long handle sander shall be used for plaster / putty work.
- (b) Multipurpose mixer shall be used for mixing putty to get a uniform mix.
- (c) Auto roller and Airless spray shall be used for painting.
- (d) Jet washer to be used for cleaning dirt and fungus etc from external walls.

Chain Link Fencing:-Mild steel galvanized chain link fencing with mesh of size 50mm x50mm nominal dia of wire 3.10mm fixed to fencing posts sing suitable bolts and nuts.

FORM WORK- As per CPWD Specifications.

GENERAL

(a) The work under these specifications consists of furnishing all labour , equipments and materials required for form work including all supporting structure for all works of cast in situ concrete as required by drawing and specification of contract.

(b) The contractor shall submit Form and Centering layout to SI/Insp Civil for checking and final approval by Engineer-in-charge and Estate officer. The complete final approval of the plan will be obtained by the contractor before such work is started on ground. The procedure of erection and removal of forms will be decided at this stage itself. These approvals shall not relive the contractor of any responsibility for correct and complete performance of all works included in the contract. The design and engineering of the formwork as well as its construction shall be the responsibility of the contractor.

ELECTRIFICATION

General-The scope of work consists of providing internal electric wiring to the buildings and connected other works as described in BOQ and as specified/Shown on drawings.

The general layout of wiring points and fittings are as directed by the Engineer in charge.

All electrical fittings and wiring must run clear of door, windows and openings No diagonal run shall be allowed. These must always be parallel or perpendicular to the ground.

The specification and general rules/conditions laid down in the CPWD Schedule(E&M) and CPWD Specifications will be generally applicable to the whole work unless otherwise specified hereinafter.

The work shall be carried out in strict compliance with the latest edition of Indian Electricity Act the Indian Electricity Rules and IEE Regulations and the latest edition of IS732. It shall be of high standard and approved construction used in a modern electrical work both as regards design and workmanship. Complete work shall be suitable in every respect of type of voltage specified and shall be to the satisfaction of Engineer-in-Charge.

WORKMANSHIP

The work under internal electrification work shall be carried out only by licensed wireman under the supervision of shall produce (for inspection) license of electrician/wireman if ordered by the Engineer-in-Charge.

Passing of cables through walls floors etc shall be protected.

SAMPLES

Before starting the work, the contractor shall produce samples of all materials including accessories and got approved by the Engineer-in-Charge. Samples that are approved will be retained by Engineer-in-Charge until the work is completed and accepted. The contractor will not be allowed to commence the work before the samples are produced and approved. The contractor shall ensure that the materials used in the work are identical with approved samples and are uniform through out. All materials shall be accordance with latest edition of the IS/BS specification and shall be of the best indigenous make approved by the Engineer-in-charge.

MATERIALS : All materials shall be accordance with latest edition of the relevant IS/BS specification and shall be of indigenous make approved by Engineer-in-Charge.

CABLES: Cables shall be single core PVC insulated and PVC sheathed/unsheathed (all as described in BOQ). All cables shall be 1100 volts grade for point wiring and shall be of such size as to be capable to

carrying the maximum current which will normally flow through them without the respective rating being exceeded as laid down in IEE Regulations.

Cables shall be delivered a site in makers wrappers etc, with the seal intact and shall not be installed unless approved by Engineer-in-charge. If cables of size as specified in BOQ as per relevant IS are not available, cables of equivalent size with identical current carrying capacity and with multi-stands shall be got approved from accepting office before incorporation works without extra cost to Govt.

MS PRESSED STEEL TERMINAL BOXES

Mild steel pressed terminal boxes shall be made out of 2 thick MS sheet of suitable size. The boxes shall be embedded in the walls with cement mortar (1:2) clear depth of the box shall be not less than 60mm and this shall be increased suitability to accommodate mounting of fan regulators. The box shall be painted with one coat of red oxide primer.

LAMINATED SHEET

Laminated sheet shall be 3mm thick fixed in MS pressed steel terminal boxes by cadmium plated iron screws

CIRCUITS

Separate circuits shall be provided for lighting and power wiring.
Lighting sub circuits shall not be loaded with more than 8 light points.

CONDUIT AND CONDUIT ACCESSORIES: All conduits, conduit fittings and accessories shall be rigid PVC conduit and fittings conforming to IS-9537 Part III of 1983 of (Medium grade).

CEILING ROSES: Ceiling roses shall be ISI marked.

SOCKET OUTLETS: These shall be ISI marked.

MINIATURE CIRCUIT BREAKERS AND DISTRIBUTION BOARDS

MCB shall be of approved make and shall be obtained from any one of the manufacturers listed above.

The unused portion of DBs are to be blocked by the blank piece.

FAN REGULATOR: Fixing of fan regulator and hanging ceiling. All ceiling fans and regulators shall be earthed effectively by means of 2mm bare GI iron conductors. Cost of this earthing to fans and regulators shall be deemed to be included in the rate for point wiring for fans.

EARTHING: Earthing shall be carried out as specified in BOQ. Earthing shall be with earth plate electrode as mentioned in BOQ buried directly in ground (earth pit) not less than 2.25m deep below ground level connected to galvanized earth top edge of the plate not less than 1.5m below ground level connected to earth strip as mentioned in BOQ by means of bolt nut and washers of galvanized iron or steel, and protected by GI pipe light grade of suitable size. Excavation and earth work shall be in soft/loose soil. All surplus soil to be removed to a distance not exceeding 50m. Cement concrete for PCC chamber, cover slab, reinforcement etc shall be as per BOQ. The unit rate of relevant item of BOQ including the cost of earth work, PCC Chamber, RCC cover, testing etc complete.

LED LIGHT FITTING: These shall be all as specified in BOQ and shall be obtained from any of the manufacturer listed here in after and shall be fixed to walls/roofs etc with proper size of clamps/screws and connecting cables etc complete.

PAINTING: Unless otherwise specified all exposed surface of steel works like terminal boxes LT panel board MS clamps etc shall be painted with 2 coats of synthetic enamel paint over a coat of red-oxide primer. Metallic suspenders of tube light fittings shall be black painted.

SYSTEM OF WIRING: Wiring shall be carried out with PVC insulated cable and shall run as far as possible on walls, ceilings so as to be easily accessible and capable of being inspected. Power wiring shall be kept apart at minimum distance of 2 run unless they are enclosed in earthed metal conduit suitably marked to indicate the risk of dangerous shock due to voltage in the conductor.

CONCEALED WIRING: Provide concealed wiring all as described in BOQ. PVC conduit shall be rigid PVC conforming to relevant IS. The make of PVC conduit as mentioned above. PVC conduit shall be adequate size to draw required for cables.

TESTING

On completion of the work, the entire electrical installation including energy meter shall be tested by the contractor for the necessary following tests in the presence of and to the satisfaction of Engineer-in-Charge :-

- (a) Continuity
- (b) Insulation resistance
- (c) Any other test prescribed by the Engineer-in-Charge

All testing equipment/apparatus, material, labour etc required for above tests shall be provided by the contractor at his own expenses through his sources, works for which test results do not conform to standard will be redone by the contractor at his own expenses.

RECORD DRAWINGS: On completion of work, wiring diagram showing the internal electrification (including high frequency supply) and layout of the buildings shall be prepared by the contractor at his own expenses through his sources and submitted to Engineer-in-Charge in triplicate.

SUB MAIN WIRING

CABLES:- Cables shall be single core PVC insulated and PVC sheathed/unsheathed(all as described in BOQ' with multistranded copper conductor conforming to specifications. All cables shall be 1100 volts grade for point wiring and shall be of such size as to be capable to carrying the maximum current which will normally flow through them without the respective rating being exceeded as laid down in IEE Regulations. Cables shall be delivered at site in makers wrappers etc, with the seal intact and shall not be installed unless approved by the Engineer-in-charge.

CONDUIT WIRING: Provide PVC conduit wiring all as described in BOQ. PVC conduit shall be rigid medium grade PVC conforming to relevant IS. The make of PVC conduit shall be as specified inhere-in-after . PVC conduit shall be of adequate size to draw required No of cables.

System of wiring: Wiring shall be carried out with PVC insulated cable and shall run as far as possible on walls, ceiling so as to be easily accessible and capable of being inspected. Power wiring shall be kept apart at minimum distance of 2mm unless they are enclosed in earthed metal conduit suitably marked to indicate the risk of dangerous shock due to voltage in conductor.

DISMANTLING/ DEMOLITION/ TAKING DOWN: The work of dismantling/ demolition/ taking down shall be done carefully and in a workman like manner. Any damage done by contractor or his workmen to existing sanitary fittings/ water supply fittings/ electrical fittings etc in the building while working shall be made good by him at his own expense. All the materials retrieved from demolition/ dismantling/ taking down shall become the Government property except those listed in Credit Schedule. The rates inserted by the CPWD or quoted by the contractor (whichever is more) shall be deemed to include removal or disposal of all waste materials from site of work and site shall be left clean and tidy to the entire satisfaction of Engineer-in-Charge.

SITE CLEARANCE

The contractor shall from time to time, clear away all debris and excess materials accumulated at the site. After the fixtures, etc have been fixed, contractor shall clean-up the same and remove all paints, strains and

other foreign matter or discoloration leaving the same in a ready to use condition. On completion of all works, contractor shall demolish all stores, remove all surplus materials and leave the site in a broom clean condition.

SETUP OF FIELD SAMPLE TEST LABORATORY:- Contractor will setup a laboratory at site for testing of sample i.e. cube testing, Sand test, gravel testing, cement testing, sieve analysis, CBR test, Compressive strength machine, Los angles abrasion, Slump test, Silt test of sand etc.

TRANSFORMER: -

General Specification

The transformer shall conform to the IS: 1180 Level I with latest amendments in all respects like insulation levels, temperature rise, impedance voltage and losses in general shall meet as specified in various annexures attached herewith. Temperature rise shall not exceed 55° over ambient in the winding & 50° C in oil as per IS 355. The transformer shall be designed for continuous operation and to operate satisfactorily in parallel with similar units.

The exterior surfaces of the transformer shall be given a primary coat of zinc chromate-red oxide anti corrosive paint and two finishing coats of durable weather/oil resisting enamel paint of shade no.632 conforming to IS: 5. However powder coating after seven tank process treatment for all the metal surfaces is preferred.

Core

1. Transformer core shall be made with low loss, non-ageing, high permeability prime grade, CRGO silicon steel only with M4 Grade or better, perfectly insulated and clamped to minimize noise and vibrations. The maximum flux density in any part of the cores and yoke at normal voltage and frequency shall not be more than 1.5 Tesla.
2. Each lamination shall be insulated such that it will not deteriorate due to mechanical pressure and the action of hot transformer oil. The laminations shall be free of all burrs and sharp projections. Each sheet shall have an insulating coating resistant to the action of hot oil.
3. The insulation structure for the core to bolts and core to clamp plates, shall be such as to withstand 2000 V DC voltage for one minute.
4. All steel sections used for supporting the core shall be thoroughly shot or sand blasted, after cutting, drilling and welding.
5. The finally assembled core with all the clamping structures shall be free from deformation and shall not vibrate during operation.
6. The core clamping structure shall be designed to minimize eddy current loss. The framework and clamping arrangements shall be securely earthed and rigidly clamped to ensure adequate mechanical strength.
7. Oil ducts shall be provided, where necessary, to ensure adequate cooling inside the core. The welding structure and major insulation shall not obstruct the free flow of oil through such ducts.
8. The design of magnetic circuit shall be such as to avoid static discharges, development of short circuit paths within itself or to the earth clamping structure and production of flux component at right angle to the plane of the lamination, which may cause local heating. The supporting framework of the cores shall be so designed as to avoid the presence of pockets, which would prevent complete emptying of the tank through the drain valve or cause trapping of air during filling.
9. The construction is to be of boltless core type. The core shall be provided with lugs suitable for lifting the complete core and coil assembly. The core and coil assembly shall be so fixed in the tank that shifting will not occur during transport or short circuits.
10. Documents like invoice copy of the core purchased by the vendor from the above manufacturers or from their accredited marketing organizations, Mill's test certificate and other relevant documents to substantiate

the above points pertaining to the transformer core are to be furnished to the CLIP members during inspection of the transformer.

Winding

1. Coils shall be made of continuous smooth high grade 99.9% pure electrolytic copper conductor, shaped and braced to provide for expansion and contraction due to temperature changes.
2. Materials used in the insulation and assembly of the windings shall be insoluble, noncatalytic and chemically inactive in the hot transformer oil and shall not soften or otherwise be affected under the operating conditions.
3. The insulation of winding shall be designed to withstand voltage stress arising from surge. The HV & LV winding should be able withstand thermal and mechanical stress in the event of short circuit.
4. The completed core and coil assembly shall be dried in vacuum at not more than 0.5mm of mercury absolute pressure and shall be immediately impregnated with oil after the drying process to ensure the elimination of air and moisture within the insulation.

Transformer Oil

1. Insulating oil for first filling shall be supplied with the transformers at no extra cost along with oil test certificates. Adequate extra oil required for top up during commissioning shall also be arranged by the vendor.
2. Transformer oil shall be as per IS-335:1993. It shall be ‘PCB free and polycyclic Aromatic Hydrocarbons free mineral oil’.
3. Material Safety Data Sheets (MSDS) and other relevant documents pertaining to the transformer oil shall be furnished to the CLIP members during inspection.

OCTC

1. The transformer shall be provided with Off Circuit Tap Changer (OCTC) on HV side, immersed in oil, which is also suitably insulated.
2. The OCTC shall have 7 distinct tap positions including ‘0’ position with voltage variations from +5% to (-)10% in steps of 2.5% for variation of HV with clear markings of the tap position embossed on the tap changer switch.
3. The OCTC shall have locking provisions so as to avoid inadvertent operation.
4. OCTC arrangement shall be either by means of links or by an externally operated switch with mechanical locking device and a position indicator. Arrangement for pad locking shall be provided.

Transformer Tank

1. The Transformer tank and cover shall be fabricated from high grade low carbon plate steel of tested quality. The tank and the cover shall be of welded construction.
2. Since the transformer is meant for outdoor duty, necessary care shall be taken for surface treatment and painting as per any of the following methods: a. The exterior surfaces shall be grit blasted and shall be finished with powder coating of enamel light grey paint of shade no: 631, IS: 5. If the process requires necessary primer shall also be applied prior to painting. The final finish shall be durable and weather / oil resistant. b. The exterior surfaces shall be thoroughly cleaned and have a priming coat of zinc chromate applied. The second coat shall be of an oil and weather-resistant nature, preferably of distinct colour from the prime and finish coats. The final coat shall be of a glossy, oil and weather resisting non-fading paint of specified shade. (Enamel Light Grey of Shade No 631,IS:5)
3. The interior of the tank shall be cleaned by shot blasting and painting with two coats of heat resistant and oil insoluble paint.

4. Steel bolts and nuts exposed to the atmosphere shall be galvanised. The tank cover shall be suitably sloped so that it does not retain rain water. The material used for gaskets shall be cork neoprene or approved equivalent. All bolts / nuts / washers exposed to the atmosphere shall be as follows: a. Size 12mm or below : Stainless Steel b. Above 12mm: Steel with suitable finish like electro galvanised with passivation or hot dip galvanized.

5. Gaskets wherever used shall conform to Type III as per IS 1149/ Type C as per IS 4253 (Part 2).

6. Plain transformer tank shall be capable of withstanding a pressure of 80kPa and a vacuum of 500mm of mercury as per IS 1180(Level I):2014.

Conservator Tank

1. The Conservator tank shall have adequate capacity between highest and lowest visible levels to meet the requirement of expansion of the total cold oil volume in the transformer and cooling equipment.

2. The conservator tank shall be bolted into position so that it can be removed for cleaning purposes.

3. Magnetic Oil level gauge shall be mounted on the conservator tank with low level electrically insulated alarm contact.

4. The silica gel breather shall be so positioned that it can be seen clearly by an operator standing on the ground.

Marshalling Box

1. Sheet steel, weather, vermin and dust proof marshalling box of 2mm thick fitted with required glands, locks, glass door, terminal Board, heater with switch, illumination lamp with switch, water-tight hinged and padlocked door of a suitable construction shall be provided with each transformer to accommodate temperature indicators, terminal blocks etc. The box shall have slopping roof and the interior and exterior painting shall be in accordance with the specification.

2. Marshalling box shall have the following minimum accessories Top oil temperature indicator – 150 mm with alarm and trip contact: 1 No. Winding temperature indicator with alarm & trip contacts ... 1 No. Terminal block ... 1 No. Sight glass, door and locking arrangements ... 1 Set (The oil temperature indicator with alarm and Winding temperature indicator with alarm should be made available inside the substation room)

3. Interconnecting cables between the marshalling box and remote panels shall be in the scope of the vender.

4. The marshalling box shall be tank mounted, outdoor, weather-proof, sheet-steel (2 mm thick) enclosed, with hinged door having padlocking facility and painted with the same colour as the transformer (Enamel Light Grey of Shade No 631,IS:5).

5. All doors, covers and plates shall be fitted with neoprene gaskets. The door shall have glazed cut out to monitor the gauge readings from the outside.

6. Top surface of the box shall be sloped and the bottom shall be at least 600 mm from floor level and provided with gland plate and cable glands as required.

7. Wiring inside the marshalling box shall be with stranded, copper conductors of sizes not smaller than 1.5 sq.mm for control circuits and not less than 2.5 sq.mm for power circuits.

List of fittings and accessories

The list of fittings and accessories are to be fitted in Transformers are mentioned below,

1. Lifting Lugs: Necessary lifting lugs shall be provided to lift the transformer without disturbing the connection.

2. Swivel type rollers: 4 Nos, bi-directional rollers shall be fitted on a cross channel at the bottom of the transformer so as to facilitate the movement of the transformer in both the directions.
3. Oil-level indicator with minimum marking.
4. Air release valve: An air release valve shall be provided on the top of the tank cover to facilitate the release of the entrapped air while filling of oil.
5. Breather: Sufficient capacity of indicating dehydrating silica gel breather shall be provided.
6. Drain cum oil filter valve: At the bottom of the transformer, drain cum oil filter valve with plug shall be provided.
7. Radiator cut off valves for all radiators.
8. Earthing terminals: Two separate earthing terminals shall be provided on both sides of the tank for earthing.
9. Diagram and rating plate: The transformer shall be fitted with a diagram and rating plate indicating the details of the transformer connection diagram, vector group etc.
10. Terminal marking plate.
11. Stem type dial thermometer of range 0 – 150 deg.c .
12. Explosion Vent: The transformer shall be fitted with an explosion vent of suitable size.
13. The transformer shall be provided with first filling of oil. The transformer oil shall conform to IS 335/1983 with the latest amendment.
14. Top Filter Valve with plug.
15. Buchholz relay with two sets of contacts for alarm and trip condition. The relay operation shall be suitable for 24V DC.
16. Magnetic oil level gauge
17. Jacking lugs
18. over excitation relay
19. Inspection cover

Step down Transformers shall be :-

- (a) Three phase distribution transformers shall be IS-2026 marked. Specifications for three phase distribution transformers oil immersed naturally cooled type the onload voltage ratio shall be 11000/433 volts.
- (b) The transformer oil shall be fresh IS-335 marked and tested upto 40 KV dielectric strength at 2.5 mm air gap between testing electrodes.
- (c) (i) The transformers shall be copper /aluminium wound as specified in BOQ/Sch 'A', 3 phase oil immersed, naturally cooled core type and shall be insulated with high class materials with high dielectric strength and slow aging characteristic and shall be able to withstand impulse voltage corresponding to the voltage laid down in IS.
- (ii) The transformers shall be capable of withstanding the thermal and mechanical effects of short circuits at the terminal for period of at least 5 seconds without any injury. The maximum anticipated material 3 phase short circuits level at 11 KV and 415 volts are 750 MVA/500MVA and 31/28 MVA as per IS respectively.
- (iii) The dehydrating breather shall be fixed to each conservator vessel at normal height, connected through pipe to conservator tank and shall be completed with first fill of dehydrating agent.
- (iv) Each transformer shall be provided with an explosion vent fitted with diaphragm of standard material and shall be connected directly to main tank top and designed for the rapid release of any excessive pressure in the tank due to internal fault that may be generated in the transformer or in the cooling equipment

(v) An equalizer connector between conservator tank (top) and vent should be provided. To prevent any dirt or insect entry inside, the free end of the pipe shall be fitted with a wire net, The vent should point outside.

(vi) The dial type thermometer fitted on the transformer shall be 100mm dia, vapour pressure type, with a range of 0-120 degree centigrade with one indicator, to indicate instant temperature. In addition it shall be provided with a maximum temperature indicating pointer and resting device.

(vii) The transformer shall be provided with OFF LOAD tap changing arrangement on HV side for constant KVA output so as to later the secondary voltage of transformer up to as mentioned in Sch `A`. It should be suitable for exterior change & shall be lockable type.

(viii) The transformer shall be provided with the following unless otherwise specified

(a) Low voltage side cable box with disconnecting chamber suitable for four connectors or provision of sufficient number of cable glands depending on size.

(b) Conservator with drain plug and filling pipe with cover.

(c) LV neutral bushing brought outside for direct earthing.

(d) Tapping switch handle with indicator and locking arrangement.

(e) Rating and diagram plate.

(f) Plain oil level gauge (indicator) on the conservator tank with normal maximum and minimum oil level marking.

(g) Silica gel breather.

(h) Expulsion vent with diaphragm.

(j) Lifting lugs

(k) Jacking lugs/pads

(l) Drain valve and plug.

(m) Cooling Radiators

(n) Air release plug.

(o) Cover lifters

(p) Bi-directional rollers flat treat and channel skids.

(q) Two earthing terminals for main transformers

(r) Inspection cover.

(s) Dial thermometer.

(t) First fill of transformer oil.

(ix) All materials and each part of the equipment shall be subject to routine tests in accordance with the appropriate IS, works tests shall include :-

(a) Routine tests in accordance with relevant IS.

(b) Measurement of zero phase sequence impedance.

(x) Site test shall include :-

(a) Insulation resistance test.

(b) Oil sample test (di-electric strength)

(c) Test to prove correct operation of tap change switches and rating test.

(d) Capacity test by connecting to artificial (water) load.

(xi) Make of the transformer shall be as per Appx `B` to the particular specifications.

13.2 Transformer shall be inspected on arrival by the Engineer-in-charge

13.3 Pre-dispatch inspection of transformer shall be carried out by Rep of Accepting Officer. The contractor shall at his own expense provide all facilities for testing including equipment.

13.4 The contractor shall produce to Engineer-in-charge original purchase voucher/invoice from manufacturer along with test certificate of transformer as per IS test procedure.

13.5 Guarantee :- (a) The Contractor is required to submit guarantee against the manufacturing defect as offered by the manufacturer for the Transformer beyond the defect liability period also if any from the date of completion.

(b) The responsibility of the contractor does not absolve by submitting the above guarantee against the manufacturing defect. Any defect so caused within the above guarantee period whatsoever the contractor is liable to rectify the same at his own arrangement and the unit rate quoted by him is deemed to have included the above provision.

Test Certificate: - (a) Test certificate from manufacturer as tested in their workshop as laid down in relevant IS shall be submitted in respect of electrical equipment such as conductors, insulators, CTS/PTS, transformers, metal clad switchgears, batteries, HT & LT panels, power & control cables, luminaries, structural steel etc to the Engineer-in-Charge in duplicate.

(b) Manufacturer's test certificates shall be furnished by the tenderer in respect of equipment as demanded by the department. If deemed necessary, initial test may be conducted at the manufacturers work site in presence of the Engineer-in-Charge representative. All tests shall be carried out in accordance with relevant Indian Standards (or British Standards where Indian Standards do not exist.).

MANUFACTURER'S LITERATURE: - The tenderer shall submit the following literature in English before installation of transformer at site:

- (a) Complete literature/catalogue giving technical information of components/parts of equipment offered by him.: 2 Sets.
- (b) Complete literature on maintenance and operation and installation of Transformer.: 6 Sets.
- (c) Spare parts catalogue.
- (d) Maintenance chart of the installation duly framed with glass: 1 Set.
- (e) Circuit diagram for panel board : 2 Set

TEST CERTIFICATE:-

(a) Test certificate from manufacturer as tested in their workshop as laid down in relevant IS shall be submitted in respect of electrical equipment such as conductors, insulators, CTS/PTS, transformers, metal clad switchgears, batteries, HT & LT panels, power & control cables, luminaries, structural steel etc to the Engineer-in-Charge in duplicate.

TESTING EQUIPMENT: All tests shall be carried out by the contractor using his own instruments without any extra payment. All tests shall be recorded and signed by the contractor and Engineer-in-Charge

INSTALLATION AND TESTING OF DG SET:-

- (a) DG Set shall be of make mentioned here-in-after and shall be purchased from the approved manufacturer or their authorised dealer comprising all the accessories and equipment as described in Sch `A'/BOQ.
- (b) The contractor shall submit manufacturer's test certificate for all equipment as per relevant IS/BIS besides following tests which shall be carried out as specified here-in-after. The test shall be carried out in presence of testing officer (Rep of Accepting Officer) alongwith authorised rep of manufacturer and contractor. The contractor shall make all necessary amendment for testing of load test i.e. Amp meter, Voltmeter, fuel, mobile oil, grease etc without extra cost of Govt.
- (c) FULL LOAD TEST/WATER LOAD TEST

On full and final installation of the Generating set, the sets shall be put to water load testing. The water load testing of Gen set will be carried out as per IS-10000-1980 (Part-IV) and technical instructions & literature of manufacturer to check for proper out put, for a period of not less than 12 hours continuously as detailed below in presence of board of officers detailed by Accepting Officer. :-

(d) PARTICULAR SPECIFICATIONS

- (i) at 25% load - 01 hour
- (ii) at 50% load - 01 hour.
- (iii) at 75% load - 01 hour
- (iv) at 100% load - 08 hours
- (v) at 110% load - 01 hour.

The tests shall be recorded and signed by the officer deputed by the Accepting Officer & Contractor's representative. A copy of test report duly signed by the testing officer, contractor and manufacturer's authorised representative shall be submitted to Engineer-in-Charge/Tender Accepting Authority.

- (e) Necessary load shall be arranged by the contractor. All necessary apparatus, instruments, labour and other arrangement including Mobil, diesel oil and grease whichever required for the testing shall also be provided by the contractor at no extra cost.
- (f) PVC SHEATHED ARMOURED CABLE AND LAYING OF CABLES

(i) Cable shall be insulated, heavy duty, armoured cables conforming to IS1554 (Part-I) for working voltage upto and including 1100 volts one length without joints.

(ii) All cables boxes and jointing of cables shall be done as per latest CPWD Specifications.

(iii) Width and depth of trenches shall be as specified in BOQ or as directed by Engineer-in-Charge.

(i) The final protection of the cables shall be provided by laying protective cable cover. These protective cables cover shall be of burnt bricks. The bricks shall be laid flat across the cover. The laying of the protective cable cover shall be provided all as shown on drawing.

(g) SPECIAL EARTHING FOR GENERATING SET

(i) The contractor shall obtain Engineer-in-Charge approval for layout of earthing before commencement of work and it shall be executed in presence of a Engineer-in-Charge representatives

(ii) The earth plates shall have galvanized steel earth plate size 600x600x6 mm and shall be placed vertically and shall be surrounded with charcoal dust to the packed thickness of 300mm around the plate, i.e below, above and outward on all sides. The galvanized steel GI strip 32x6 mm riveted/soldered with earth plate shall run upto bottom of the plate. The metallic bodies of Generating set and all other metal works shall be electrically connected at two points to earth by means of GI steel strip and as direct by Engineer-in-Charge.

(iii) The charcoal dust and returning filling shall be done in layers not exceeding 150 mm and shall be properly watered and rammed. Surplus soil shall be disposed off and site left clean and tidy on completion.

(iv) The earth resistance shall be as near as possible zero ohms but should not exceed in any case more than 5 ohm.

(h) PARTICULAR SPECIFICATIONS

The ultimate depth of earth electrode would depend on the nature of soil and contractor is required to take it to a depth where sufficient moisture exists and natural conditions are suitable for the resistance as specified above. However the depth of the electrode shall not less than 4.5 meters below ground level.

(i) TEST CERTIFICATE

Manufacturer's test certificate shall be furnished by the contractor to the Engineer-in-charge in respect of the following items before installation: -

- (a) All items of panel board.
- (b) LT Cables.
- (a) Cable box.
- (b) DG Set & Alternator.
- (e) MCB's

(j) TECHNICAL LITERATURE.

The tenderer is required to submit two sets of detailed specifications/technical literatures and illustrated pamphlets to all the equipments (DG Set Alternator Control Panel) to Engineer-in-charge before its procurement.

(k) ELECTRICAL TEST

The following test to be carried out by the contractor to entire satisfaction of the Engineer-in-Charge before the work is finally handed over by the contractor and completion certificate issued :-

- (a) Insulation resistance tests - Sectional and overall.
- (b) Continuously resistance test - Sectional & overall conductors and sheathing.
- (c) Earth test.

(l) CANOPY FOR DG SET

Acoustic Enclosure: Acoustic Enclosure shall be weather proof powder coated and fabricated out of 16 SWG CR MS sheet. The silent canopy shall be of nut type construction. Critical processes of punching shall be done on CNC machine to maintain dimensional accuracy of holes within 0.1 mm. Powder coating to be done after surface treatment like degreasing pickling, phosphating and passivation on sheet metal. Canopy panel and doors shall be given inside lining of FIRE-RETARDANT foam and acoustic material. Four hinged lockable doors with single key shall be provided to canopy, one door shall have glass window for control panel. There should be access to fill fuel from outside.

(m) BASE FRAME: Base frame shall be fabricated with ISMC channel of suitable of size. The base frame will be primer coated and painted. The base frame shall be rugged in construction and design for mounting engine and alternator close coupled, with cross member mounted on AVM. The base frame shall have provision for mounting of acoustic enclosure and control panel on it. The base frame shall have provision of lifting hook for convenient lifting of complete set, i.e. alongwith canopy, Engine and alternator.

(n) COLOUR SCHEME: The base plate and top be powder coated with OXFORD BLUE/PEPSI BLUE, the canopy be powder coated with IVORY colour.

(o) PERFORMANCE PARAMETERS: The average sound level, when measured green field condition (ISO 3744 OR 8528 PT 10) at 1-meter distance from all four sides shall be less than 75 BA average or as per CPCB norms. The average stabilized hot air temperature rise within the canopy shall be maintained within 10oC over and above ambient temperature.

1 GENERAL

1.1 The work shall be generally carried out in accordance with tender/bid specifications and the following specifications / rules with up to date amendments.

- a) CPWD General Specifications for Electrical Work Part I Internal – 2023, as amended up to date.
- b) CPWD General Specifications for Electrical Work Part II External-2023, as amended up-to-date.
- c) CPWD General Specifications for Electrical Works Part VII- DG set-2013, as amended up-to-date.
- d) Commercial and Additional conditions for this work.
- f) The Indian Electricity Act, 2003, as amended up to date.
- g) Indian Electricity Rules 1956 amended up to date.

1.2 Order of Preference:

Should there be any difference or discrepancy between the description of items as given in the Schedule of Quantities, technical specifications for individual items of work (including additional and commercial conditions) and IS Codes etc., the following order of preference shall be followed:

- a) Description of Schedule of quantities.
- b) Commercial and Additional conditions for this work.
- c) Drawings.
- d) CPWD General Specifications of that particular work.
- e) Relevant IS or any other International code in case IS code is not available. Commercial and Additional conditions of that particular work are to be read in conjunction with above and in case of variations, specifications given in these additional conditions shall apply. However, nothing extra shall be paid on account of these additional specifications and conditions, as the same are to be read along with schedule of quantities for the work.

1.3 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 components of the tender.

1.4 The tenderer should in his own interest visit the site and get familiarize with the site conditions before tendering.

RATES:-

The rates quoted by the tenderer, shall be firm and inclusive of all taxes (including GST, labour cess etc.,) and all charges for packing forwarding, insurance, freight and delivery, installation, testing, commissioning etc. at site including temporary construction of storage, risks, overhead charges, general liabilities/obligations.

WARRANTY:-

The contractor has to carry out maintenance of all E&M installations as per CPWD General Specifications/ manufacturer's standards for a period of 24 months . Nothing extra shall be paid on this account.

In case of Specialized E&M original Works and other original E&M Works, wherever required, the tenderer should submit the following documents along with the performance guarantee after the acceptance of tender, an undertaking from the OEM

- a) Authorization certificate.

- b) The OEM is unconditionally supporting the lowest tenderer technically throughout the execution of contract as well as for Maintenance/Comprehensive Maintenance Contract for the useful life of the system.
- c) OEM provides all the spares required for healthy functioning of the equipment for at least seven years from the date of supply of equipment.

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.

STORAGE AND CUSTODY OF MATERIALS:-

The agency has to make his own arrangements. No storage accommodation shall be provided by the department. Watch and ward of the stores and their safe custody shall be the responsibility of the contractor till the final taking over of the installation by the department/client.

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. 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.

COMPLETION PERIOD:-

The completion period indicated in the tender documents is for the entire work of planning, designing, approval of drawings etc., arrangement of materials & equipment, delivery at site including transportation, installation, testing, commissioning and handing over of the entire system to the satisfaction of the Engineer-in-charge.

GUARANTEE:-

All equipment shall be guaranteed for a period of 24 months (except LED fittings which shall be guaranteed for minimum 5 years), from the date of taking over the installation by the department, against unsatisfactory performance and/or break down due to defective design, workmanship or material. The equipment or components, or any part thereof, so found defective during guarantee period shall be 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 & binding on the contractor.

The tender shall guarantee among other things, the following:

- a. Quality, strength and performance of the materials used as per manufacturers standards.
- b. Safe mechanical and electrical stress on all parts under all specified conditions of operation. Satisfactory operation during the maintenance period.

ACCEPTABLE MAKES OF VARIOUS EQUIPMENTS:-

The acceptable makes of various equipment/components/accessories have been indicated in "Acceptable Makes" appended with the tender documents. The tenderer shall work out the cost of the offer on this basis. Alternate makes are not acceptable.

DATA MANUAL AND DRAWINGS TO BE FURNISHED BY THE TENDERER:-

The successful tenderer would be required to submit the following drawings after award of work for approval as per mile stones of tender.

- a) General arrangement drawing, including detailed shop drawings of all E&M components, conduit size and cable route layout, Panel Drawing and layout plan and other drawings of all E&M components shall be prepared in AUTOCAD or equivalent software (**cost will be borne by the contractor**) and submitted by the agency well in advance to get the approval from the Engineer-in-charge.
- b) The successful tenderer should furnish well in advance of start of work, three copies of detailed instructions and manufacturer's manuals of all equipment regarding installation, operation and maintenance, preventive maintenance & trouble shooting with all the relevant data sheets, spare parts catalogue, etc.

EXTENT OF WORK:-

The work shall comprise of entire labour including supervision, all materials necessary to make a complete installation, tests and adjustments and commissioning, as may be required by the department. The term complete installation shall not only mean major items of the plant and equipment covered by specifications but all incidental sundry components

necessary for complete execution and satisfactory performance of installation with all layout charts whether or not been mentioned in details in the tender document in connection with this contract as this is a turnkey job.

The cables and all other items shall be brought to site only after taking correct measurements as per actual requirement of work. Excess quantities shall not be accepted and paid. i.e., Quantity of item brought to site and used in work as per actual requirement shall only be measured and paid irrespective of quantities of BOQ / work schedule. The item brought at site and paid, if not used in the project have to be taken back by the contractor and deductions in the payment shall be adjusted in subsequent bills. The decision of the Engineer-in-charge in this regard shall be final & binding on the contractor.

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

- a) Minor building works necessary for installation of equipment, foundation, making of opening in walls or in floors and restoring them to their original condition finish and necessary grouting etc. as required.
- b) All necessary supports may be arranged.
- c) Testing of PTs/CTs for metering & protection purpose & relay calibration & setting.
- d) Getting inspection done & obtaining approval from Central/State Electrical Authority and local fire authority for energizing the installation. Necessary fees for inspection shall be borne by the tenderer.
- e) All E&M equipment/materials shall be tested from the 3rd party laborites as per the guidelines of Quality Assurance Policy & Check List of E & M Services. The laborites shall be preferably of Government Labs/ Government autonomous bodies or as approved by the competent authority. Necessary fees for inspection shall be borne by the tenderer.

INDEMNITY:-

The successful tenderer shall at all times indemnify the department. Consequent on this works contract, the successful tenderer shall be liable, in accordance with the Indian Law and Regulations for any accident occurring due to any cause and the contractor shall be responsible for any accident or damage incurred or claims arising there during the period of erection, construction and putting into operation the equipment and ancillary equipment under the supervision of the successful tenderer to the extent the latter is responsible. The successful tenderer shall also provide all insurance including third party insurance as may be necessary to cover the risk. No extra payment would be made to the successful tenderer on account of the above.

ERECTION TOOLS:-

No tools and tackles either for unloading or for shifting the equipment for erection purposes would be made available by the department. The successful tenderer shall make his own arrangement for all these facilities

The work will be carried out with least disturbance during shifting & shut down taken in consultation with the client department.

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.

VERIFICATION OF CORRECTNESS OF EQUIPMENT AT DESTINATION:-

The contractor shall have to produce all the relevant records to certify that the genuine equipment from the manufacturers has been supplied and erected to the satisfaction of the Engineer-in-charge.

PAINTING:-

This shall include cost of painting of the entire installation. The major equipment like HT panel, transformers, L T panel, bus duct, cable trays, HVAC equipment, etc. shall be factory final finish painted. 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. of bus trunking & cable tray etc. shall be painted with required shade including painting with two coats of anticorrosive primer paint at site.

TRAINING:-

The scope of works includes the on job technical training of two persons of Department at site as decided by Engineer – in - charge. Nothing extra shall be payable on this account.

MAINTENANCE:-

Sufficient trained and experienced staff shall be made available to meet any exigency of work during the guarantee period of two year from the handing over of the installation.

APPROVAL OF DRAWINGS, MAKES AND MODELS OF EQUIPMENT/MATERIALS FOR ALL E&M COMPONENTS:-

- a) The agency shall submit drawings and details such as makes and models of the equipment/materials offered by him along with specifications for all E&M components to the Engineer-in-charge of the work, before ordering the equipment/materials for approval of the department.
- b) 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.
- c) 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.

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. As and when the order is placed for the fittings/ fixtures, cables, switchgears, poles, other main items etc., its copy shall be endorsed to the Engineer-in-charge of work.
- iii. The contractor will submit makes & brands of electrical fittings wires & cables, conduits and switchgears, rising mains, poles, outdoor fittings etc. of preferred make list as per tender documents for approval of Engineer-In-Charge, whose decision will be final in the matter.
- iv. The firm will be required to procure material directly from the manufacturer/ authorized dealers to ensure genuineness & quality and per the approved makes only. Proof in this regard shall be submitted by the contractor if required by the department.
- v. Inspection at factory or at go down, as required, shall be arranged by the firm for a mutually agreed date.
- vi. Delivery of material shall be taken up only with the consent of department, after clearance of the material.
- vii. Department shall reserve the right to waive off inspection in lieu of suitable test certificate, at its discretion.
- viii. All the materials to be supplied by the contractor shall be procured & brought to site as per requirement at site of work in consultation with department so that these materials are not damaged & their manufacturer's warrantee.

STANDARDS

The transformer and its accessories specified herein shall conform to the relevant Indian standards with latest amendments.

IS: 1180 Level-2 Outdoor Type Oil Immersed Distribution Transformers upto and including 1000kVA, 11kV Transformer.

IS: 3024 Grain oriented electrical steel sheets and strips

IS:5 Colour for ready mixed paints

IS:191 Specification for Copper

IS:335 New insulating oil for transformers, switch gears

IS:1271 Classification of insulating materials for electrical machinery and apparatus in relation to their stability in services

IS:1180 Distribution Transformer

IS:2071 Method of high voltage testing

IS:2099 High voltage porcelain bushings

IS:2147 Degree of protection

IS:2705 Current Transformers

IS:3202 Code of practice for climate proofing of electrical equipment

IS:3347 Dimensions for porcelain Distribution Transformer Bushings

IS:3637 Gas operated relays

IS:3639 Fittings and accessories for Distribution Transformers

IS:5561 Electric Power Connectors

IS:6600 Guide for loading of oil immersed Distribution Transformers

IS:10028 Code of practice for selection, installation and maintenance of transformers, Part I, II and III

SAFETY CODES & STATUTORY REGULATIONS:-

a. Nothing in this specification shall be construed to relieve the successful tenderer of his responsibility for the design, manufacture and installation of the equipment with all accessories in accordance with currently applicable statutory regulations and safety codes.

b. Successful tenderer shall arrange for compliance with statutory provisions of safety regulations and departmental requirements of safety codes in respect of labour employed on the work by the tenderer. Failure to provide such safety requirement would make the tenderer liable for penalty of Rs.1000/- for each default. In addition, the department will

be at liberty to make arrangement for the safety requirements at the cost of tenderer and recover the cost thereof from him.

FITTINGS

The following accessories and fittings shall be provided with the transformer

LIFTING LUGS: The arrangement of lifting the active part of the transformer along with the cover of the tank by means of lifting lugs without disturbing the connections. Also complete transformer lifting lugs shall be provided.

ROLLERS: The transformer to be provided with 4 Nos. rollers fitted on cross channels to facilitate the movement of transformer.

OIL CONSERVATOR: The transformer to be provided with a conservator with welded end plates. It is to be bolted to the cover and can be dismantled for purposes of transport. It has to be provided with oil gauge with marking for minimum level and an oil filling hole with a cap which can be used for filtering of oil. For draining purposes a plug is to provide. A connection pipe between the conservator and tank is to be provided, which projects inside the conservator.

AIR RELEASE VALVE: An air release valve shall be provided on top of the tank cover to facilitate of the entrapped air while filling of oil.

BREATHER: The transformer shall be provided with an indicating dehydrating silica gel breather of sufficient capacity.

DRAIN VALVE WITH PLUG: The transformer to be provided with drain valve with plug at the bottom of the tank.

DIAGRM WITH RATING PLATE: One diagram and rating plate indicating the details of transformer connection diagram vector group tap changing diagram etc.

THERMOMETER: Dial type thermometer (150mm dia) with maximum set pointer 75 degree C electrical contacts for electrical contacts for electrical alarm at high temp.

EXPLOSION VENT: Explosion vent or pressure relief device shall be provided of sufficient size of rapid release of any pressure that may be generated within the tank and which might result in damage in the equipment. The device shall operate at a static pressure less than the hydraulic test pressure for transformer tank.

FILTER VALVE: Filter valve on the top of the tank.

BUCHOLTZ: Oil actuated relay equipment shall confirm to IS 3637-1966(amended up to date) and shall be double float type having contacts which close following oil surge or under incipient fault condition. Bucholtz relay shall have contacts for alarm /trip.

WINDING TEMPERATURE INDICATOR:

Winding temperature indicator with electrical contact for alarm/trip

OIL TEMPERATURE INDICATOR: Oil temp. Indicator with alarm & trip contacts.

MARSHALLING BOX: the transformer shall be provided with suitable size marshalling box to terminate the control cables of thermometer and bucholtz relay.

CONTROL CABLING: all control cables required from Marshalling box to H.T panel board for Trip/alarm of winding temp. Indicator, oil temp indicator, bucholtz relay etc. shall be provided and deemed to be included in the rate of transformer equipments.

TRANSFORMER OIL: First filling of oil.

EARTHING: Two separate earthing terminals are to be provided at the sides of the tank on both the sides for earthing.

SOAK PIT

Soak pit for oil filled transformer shall be made as per IS 10028 (Part II) 1981 with up to dated amendments. Sump shall be formed in the transformer room and shall be connected to soak pit outside the transformer room with a pipe. All the civil works required for the soak pit shall be done by the contractor and the cost shall be deemed to be included in quoted rates of the transformer item.

INSTRUMENTATION MANUAL

The successful bidder shall submit three copies of manual of complete instructions for the installations, operations, maintenance and repair, circuit diagrams, foundations and trenching details shall be provided with the transformer.

SHOP DRAWINGS

The selected supplier shall prepare and furnish shop drawings for the approval by the Project-in-Charge / Project Director / Consultant before commencing fabrications/ manufacture of the equipment. Shop drawing shall be based on the requirement laid down in the specifications. The manufacture of the equipment shall be commencing only after the shop drawings have been approved in writing by the Project-in-Charge / Project Director / Consultant. Transformer shall be manufactured conforming to specification of Local supply authority.

INSPECTION

The transformer shall be inspected on arrival as per the inspection manual of the supplier

Shall be examined of any sign of damage and special attention shall be given to the following parts.

Oil tank and cooling tubes Bushes cracks or broken Oil sight glass.

INSTALLATION

The transformer shall be installed as per transformer manual of the transformer supplier and conforming to Indian standards.

The transformer is to be erected on suitable size M.S channels embedded in the cement concrete flooring including providing & fixing the channel. The transformer supplied shall be lifted by all lifting lugs for the purpose of avoiding imbalance in transit.

The transformer wheels shall be locked by suitable locking arrangement to avoid accidental movement of the transformer.

The transformer cable end boxes shall be sealed to prevent absorption of moisture.

The transformer natural earthing and body earthing shall conform to Indian Standard.

FACTORY TEST

The transformer shall be subjected to test as laid down in IS 2026 (Part I) 1977 at factory/manufacturing unit prior to dispatch of the transformer to the site.

All original test certificates shall be furnished.

TESTING AT SITE

Prior to commissioning of the transformer the following tests shall be performed

Insulation resistance of the winding between phases and earth of Primary and Secondary side.

Winding resistance of all the winding on all tap positions shall be taken.

The supplier gives sufficient advance information about the test schedule to enable the owner to appoint his representative.

MAIN LT PANEL /OUTDOOR TYPE FEEDER PILLAR

General

Sub Distribution Board shall be metal clad totally enclosed, rigid, floor mounting, air insulated, cubicle type for use on 415 volts, 3 phase, 50 cycle system. Equipment shall be designed for operation in high ambient temperature and high humidity tropical atmospheric conditions. All outdoor type panel shall be IP – 55.

Standards

The equipment shall be designed to conform to the requirements of:

IS 8623 – Factory Built Assemblies of switchgear and control gear.

IS 4237 – General requirements for switchgear and control gear for voltages not exceeding 1000 volts.

IS 2147 – Degrees of protection provided by enclosures for low voltage switchgear and control gear.

IS 375 – Marking and arrangement of bus bars.

Individual equipment housed in the sub distribution boards shall conform to the following IS specifications:

- | | | | |
|----|------------------------------------|---|-----------------------------|
| a) | Moulded Case Circuit Breakers | - | IS: 13947-2/IEC 947-2 |
| b) | Miniature Circuit Breaker | - | IEC - 60898 |
| c) | Contractors | - | IEC – 947-4-1, IS 13947-4-1 |
| d) | Current Transformers | - | IS: 2705 |
| e) | Indicating Instruments (Analogue) | - | IS: 1248, |
| f) | Indicating Instruments (Digital) | - | IS: 13875 |
| g) | Integrating Instruments (Analogue) | - | IS: 722, IS: 13779-1999 |
| h) | Integrating Instruments (Digital) | - | IS: 13779- 1999, IS: 14697 |
| i) | HRC fuse links | - | IS: 13703 / IEC 269 |

Submittals

Shop Drawings And Technical Data

The tenderer shall furnish relevant technical data of switchgears and associated equipment along with the offer.

The Contractor shall furnish relevant descriptive and illustrative literature on switchgears and associated equipment and the following for approval before manufacture of the panel.

- a) Complete assembly drawings of the panel showing plan, elevation and typical section views and locations of cable boxes, bus bar chamber, metering compartment and terminal blocks for external wiring connections.
- b) Typical and recommended schematic diagrams and control wiring.

- c) Foundation plan showing location of foundation channels, anchor bolts and anchors, floor plans and openings for cables etc.
- d) All drawings and data shall be in English.

Constructions

Sub Distribution boards shall be metal enclosed, indoor, floor mounted free standing and/or wall mounted type made up of the required vertical section, which when coupled together shall form continuous dead front. Sub distribution boards shall be dust and damp protected, the degree of protection being no less than IP: 54 to IS:2147. Sub distribution boards shall be fabricated with a framed structure with rolled/folded sheet steel channel section of Sheet steel shroud and partitions shall be of minimum 2mm thickness, doors and covers shall also be of 2mm thickness. All panel doors shall be pad lockable type. All sheet steel work forming the exterior of sub distribution boards shall be smoothly finished, levelled and free from flaws. The corners to be rounded. Front and rear doors to be fitted with dust proof including neoprene gasket with fasteners designed to ensure proper compression of the gaskets. When covers are provided in place of doors, generous overlap shall be ensured between sheet steel surfaces with closely spaced fasteners to preclude the entry of dust.

Following minimum clearance to be maintained after taking into account connecting bolts, clamps etc.

| | | | |
|------|----------------------------|---|------|
| i) | Between Phases | - | 32mm |
| ii) | Between Phases and neutral | - | 26mm |
| iii) | Between Phases and earth | - | 26mm |
| iv) | Between Neutral & earth | - | 26mm |

All insulating, materials used in the construction of the equipment shall be of non-hygroscopic materials, duly treated to withstand the effect of high humidity, high temperatures, tropical ambient service conditions. SMC (Sheet Moulded Compound) supports & shrouds shall be used.

Functional units such as moulded case circuit breakers shall be arranged in multi-tier formation. The design of the sub distribution boards shall be such that each MCCB unit shall be fully compartmentalized.

Insulated barriers shall be provided with vertical section and between adjacent section to ensure prevention of accidental contact with main bus bars and vertical risers during operation, inspection or maintenance of functional units. All doors/covers providing access to live power equipment/circuits shall be provided with tool operated fastness to prevent unauthorized access. Sub distribution boards shall be so constructed that the cable alley shall be sufficient enough to accommodate all the outgoing and incoming cables.

For each cable alley, there shall be separate cable gland plate of detachable type at the bottom and/or top of the panel as required. Gland plate shall be 3 mm thick.

A base frame made out of 75mm x 40mm x 5.0mm M.S. Channel to be provided.

Metal Treatment and Finish

All metal work used in the construction of the sub distribution boards should have under gone a rigorous metal treatment process as follows:

- a) Effective cleaning by hot non alkaline degreasing solution followed by cold water rinsing to remove traces of alkaline solution
- b) Picking in dilute sulphuric acid to remove oxide scales & rust formation, if any, followed by cold water rinsing to remove traces of acidic solution.

- c) A recognized phosphating process to facilitate durable coating of the paint on the metal surfaces and also to prevent the spread of rusting in the event of the paint film being mechanically damaged. This again, shall be followed by hot water rinsing to remove traces of phosphate solution.
- d) Passivating in de-oxalite solution to retain and augment the effects of phosphating.
- e) Drying with compressed air in a dust free atmosphere.
- f) A finishing coat of powder coating of Siemens grey colour and thickness of powder coating shall not be less than 50 micron.

Bus Bars

The bus bars shall be air insulated and made of high conductivity, high strength Aluminium complying with the requirement of grade E-91E.

The bus bars shall be suitably braced with non-hygroscopic SMC supports to provide a through fault withstand capacity shall be as per actual calculation.

The neutral as well as the earth bar should be capable of withstanding the above level. Ridges shall be provided on the SMC supports to prevent tracking between adjacent bus bars. Large clearances and creep age distance shall be provided on the bus bar system to minimize the possibility of fault. The main phase bus bars shall have continued current rating throughout the length of the panel. The cross section of neutral bus bars shall be same as that of the phase bus bar for bus bars of capacity up to 250 Amp; for higher capacities, the neutral bus bar shall not be less than half (50%) the cross section of that of the phase bus bars. Connections from the main bus bars to functional circuits shall be so arranged and supported to withstand without any damage or deformation the thermal and dynamic stresses due to short circuit currents. Bus bars shall be colour coded with PVC heat shrinkable sleeves.

The sub distribution boards shall be designed that the cables are not directly terminated on the terminals of MCCB etc. but are terminated on cable termination links. Capacity of aluminium bus bars shall be considered as 1.0 Amp per sq. mm of cross section area of the bus bars.

AIR CIRCUIT BREAKER TYPE AND CONSTRUCTION

The ACB shall conform to the requirements of IS 13947-2 and shall be type tested & certified for compliance to standards from CPRI. The circuit breaker shall be suitable for 415 V + 10%, 50 Hz supply system. Air Circuit Breakers shall be with moulded housing / sheet metal housing flush front, draw out type and shall be provided with a trip free manual operating mechanism or as indicated in drawings and bill of quantities with mechanical "ON" dular construction, draw out, manually or electrically operated version as specified. The circuit breakers shall be for continuous rating and service short Circuit Breaking capacity (Ics) shall be as specified on the single line diagram and should be equal to the Ultimate breaking capacity (Icu) and short circuit withstand values (Icw) for 1 sec.

$I_{cu} = I_{cs} = I_{cw}$ = shall be based on actual calculation.

Circuit breakers shall be designed to 'close' and 'trip' without opening the circuit breaker compartment door. The operating handle and the mechanical trip push button shall be at the front of the breakers panel. Inspection of main contacts should be possible without using any tools. The ACB shall be provided with a door interlock. i.e. door should not be open when circuit breaker is closed and breaker should not be closed when door is open.

All current carrying parts shall be silver plated and suitable arcing contacts with proper arc chutes shall be provided to protect the main contacts. The ACB shall have double insulation (Class-II) with moving and fixed contacts totally enclosed for enhanced safety and in accessibility to live parts. All electrical closing breaker shall be with electrical motor wound stored energy spring closing mechanism with mechanical indicator to provide ON/OFF status of the ACB.

The auxiliary contacts blocks shall be so located as to be accessible from the front. The auxiliary contacts in the trip circuits shall close before the main contacts have closed. All other contacts shall close simultaneously with the main contacts. The auxiliary contacts in the trip circuits shall open after the main contacts open. It should be possible to change settings on load.

Minimum 4 NO and 4 NC auxiliary contacts shall be provided on each breaker. Break time of ACB shall not be more than 70 milli second in case of short circuit.

Rated insulation voltage shall be 1000 volts AC.

CRADLE

The cradle shall be so designed and constructed as to permit smooth withdrawal and insertion of the breaker into it. The movements shall be free from jerks, easy to operate and shall be on steel balls/rollers and not on flat surfaces.

There shall be 4 distinct and separate position of the circuit breaker on the cradle.

Racking Interlock in Connected/Test/Disconnected Position.

Service Position : Main Isolating contacts and control contacts of the breaker are engaged.

Test Position : Main Isolating contacts are isolated but control contacts are still engaged.

Isolated Position : Both main isolating and control contacts are isolated.

There shall be provision for locking the breaker in any or all of the first three positions mechanically.

The following safety features shall be incorporated:

- a. Withdrawal or engagement of Circuit breaker shall not be possible unless it is in open condition.
- b. Operation of Circuit breaker shall not be possible unless it is fully in service, test or drawn out position.
- c. All modules shall be provided with safety shutters operated automatically by movement of the carriage to cover exposed live parts when the module is withdrawn.
- d. All Switchgear module front covers shall have provision for locking.
- e. Switchgear operating handles shall be provided with arrangement for locking in 'OFF' position.

PROTECTION

All breaker (ACB's) should be equipped with static release to offer accurate and versatile protection with complete flexibility and shall offer complete over current protection to the electrical system in the following four zones:

- Long time protection.
- Short time protection with intentional delay.
- Instantaneous protection.
- Ground fault protection.

SAFETY FEATURES

- (i) The safety shutter shall prevent inadvertent contact with isolating contacts when breaker is withdrawn from the Cradle.
- (ii) It shall not be possible to interchange two circuit breakers of two different thermal ratings. For Draw-out breakers, an arrangement shall be provided to prevent rating mismatch between breaker and cradle.
- (iii) There shall be provision of positive earth connection between fixed and moving portion of the ACB either thru connector plug or sliding solid earth mechanism. Farthing bolts shall be provided on the cradle or body of fixed ACB.
- (iv) The incoming panel accommodating ACB shall be provided with indicating lamps for ON-OFF positions, digital voltmeter and ammeter of size not less than 96 mm x 96 mm, selector switches, MCB for protection circuit and measuring instrument circuits
- (v) It shall be possible to bolt the draw out frame not only in connected position but also in TEST and DISCONNECTED position to prevent dislocation due to vibration and shocks.
- (vi) Draw out breakers should not close unless in distinct Service/Test/Isolated positions.
- (vii) The insulation material used shall conform to Glow wire test as per IEC60695.
- (viii) The ACB shall provide in built electrical and mechanical anti-pumping.

TESTING

Testing of each circuit breaker shall be carried out at the works as per relevant IS Code of Practice and the original test certificate shall be furnished in triplicate. The tests shall incorporate at least the following.

- i. Impulse withstand test.
- ii. Power frequency withstand test.
- iii. Short circuit test.
- iv. Temperature - rise test under rated conditions.

MOULDED CASE CIRCUIT BREAKER

GENERAL

Moulded Case Circuit Breakers shall be incorporated in sub distribution boards wherever specified. MCCB's shall conform to IS 13947-2 and / or IEC 947-2 in all respects. MCCB's shall be suitable either for single phase AC 230 volts or three phase 415 volts.

FRAME SIZES

The MCCB's shall have the following frame sizes subject to meeting the fault level specified elsewhere.

- i) Up to 100A rating 100Amp frame.
- ii) Above 100A to 200A 200Amp frame.
- iii) Above 200A to 250A 250Amp frame.
- iv) Above 250A to 400A 400Amp frame.
- v) Above 400A to 630A 630Amp frame.

CONSTRUCTIONS

The MCCB cover and case shall be made of high strength heat treatment and flame retardant thermo-setting insulating material. Operating handle shall be of rotary type quick make/quick break, trip-free type. The operating handle for simultaneous operation and tripping of all the three phases.

Suitable fire extinguishing device shall be provided for each contact. Tripping unit shall be of thermo magnetic type up to 250 A for adjustable overload & short circuit protection and shall be microprocessor type above 250 A for adjustable overload, short circuit & earth fault protection. MCCB shall be line load reversible type. Device shall have IDMT characteristics for sustained overload, and short circuits. MCCB shall be current limiting type.

Contacts trips shall be made of suitable are resistant, silver alloy for long electrical life. Terminals shall be of liberal design with adequate clearance.

RUPTURING CAPACITY

The Moulded Case Circuit Breaker service breaking capacity (Ics) shall be based on actual calculation.

TESTING

Test certificate of the MCCB as per relevant Indian Standards (IS) shall be furnished. Pre-commissioning tests on the sub distribution boards incorporating the MCCB shall be done as per standard.

Measuring Instruments for Metering

GENERAL

Direct reading electrical instruments shall be in conforming to IS 1248. The accuracy of direct reading shall be 1.0 for voltmeter and 1.5 for ammeters. Other type of instruments direct reading shall be 1.0 for voltmeter and 1.5 for ammeters. Other type of instruments shall have accuracy of 1.5. The errors due to variations in temperature shall be limited to a minimum. The meter shall be of flush mounting type of 96mm square pattern. The meter shall be enclosed in a dust tight housing. The housing shall be of steel or phenolic mould. The design and manufacture of the meters shall ensure the prevention of fogging of instruments glass. Instruments meters shall be sealed in such a way that access to the measuring element and to the accessories with in the case shall not be possible without removal of the seal. The meters shall be provided with white dials and black scale markings.

The pointer shall be black in colour and shall have zero position adjustment device which could be operated from outside. The direction of deflection shall be from left to right.

Suitable selector switches shall be provided for all ammeters and voltmeters intended to be used on three phase supply. The specifications herein-after laid down shall also cover all the meters, instrument and protective devices required for the electrical works. The ratings, type and quantity of meters, instruments and protective devices shall be as per the bill of quantities.

DIGITAL AMMETERS

Digital Ammeters shall be confirmed to IS: 13875. It shall be digital type 7 segment LED display. Ammeter shall be suitable for accuracy class 1.0 and burden 0.2 VA approx. The ammeters shall be capable of carrying sustained overloads during fault conditions without damage or loss of accuracy. The meter shall be suitable for working in ambient temp 0 degree to 50 degree and 95% humidity condition.

DIGITAL VOLTMETERS

Digital Voltmeters shall be confirmed to IS: 13875. It shall be digital type 7 segment LED display. Voltmeter shall be suitable for accuracy class 1.0 and burden 0.2 VA approx. The range for 3 phase voltmeters shall be 0 to 500 volts. The meter shall be suitable for working in ambient temp 0 degree to 50 degree and 95% humidity condition. The voltmeter shall be provided with protection MCB of suitable capacity.

CURRENT TRANSFORMERS

Current transformers shall be in conformity with IS: 2705 (Part I, II & III) in all respects. All current transformers used for medium voltage applications shall be rated for 1KV Current transformers shall have rated primary current, rated burden and class of accuracy as required. However, the rated secondary current

shall be 15A unless otherwise specified. The acceptable minimum class of various applications shall be as given below.

| | |
|------------|---------------|
| Measuring | : Class 1.0 |
| Protection | : Class 5 P10 |

Current transformers shall be capable of withstanding without damage, magnetic and thermal stresses due to short circuit fault on medium voltage system. Terminals of the current transformer shall be marked permanently for easy identification of poles. Separate CT shall be provided for measuring instruments and protection relays. Each C.T. shall be provided with rating plate.

Current transformers shall be mounted such that they are easily accessible for inspection, maintenance and replacement. The wiring for CT's shall be copper conductor, PVC insulated wires with proper termination lugs and wiring shall be bunched with cable straps and fixed to the panel structure in a neat manner.

Control switches

Control switches shall be of the heavy duty rotary type with escutcheon plates clearly marked to show the operating position. They shall be semi-flush mounting with only the front plate and operating handle projecting.

Indicating lamps shall be of the LED type, and with translucent lamps covers. Bulbs & lenses shall be easily replaced from the front.

Push buttons shall be on the momentary contact, push to actuate type fitted with self reset contacts & provided with integral escutcheon plates marked with its functions.

Cable Terminations

Cable entries and terminals shall be provided in the sub distribution boards to suit the number, type and size of aluminium conductor power cable and copper conductor control cable specified.

Provision shall be made for top or bottom entry of cables as required. Generous size of cabling chambers shall be provided, with the position of cable gland and terminals such that cables can be easily and safely terminated. Cable glands shall be brass compression type, barriers or shrouds shall be provided to permit safe working at the terminals of one circuit without accidentally touching that of another live circuit.

Cable risers shall be adequately supported to withstand the effects of rated short circuit currents without damage and without causing secondary faults.

Control Wiring

All control wirings shall be carried out with 1100V grade single core ZHFR cable conforming to IS 694/IS 8130 having stranded copper conductors of minimum 1.5 sq. mm for potential circuits and 2.5 sq. mm for current transformer circuits. Wiring shall be neatly bunched, adequately supported and properly routed to allow for easy access and maintenance. Wiring shall be identified by numbering ferrules at each end. All control fuses shall be mounted in front of the panel and shall be easily accessible.

Terminal Block

Terminal blocks shall be 500 Volts grade of the stud type. Insulating barriers shall be provided between adjacent terminals. Terminals block shall have a minimum current rating of 10 Amps and shall be shrouded. Provisions shall be made for label inscriptions.

Labels

Labels shall be of anodized aluminium, with white engraving on black background. They shall be properly secured with fasteners.

Testing at Manufacturing Work

All routine tests specified in IS:8623-1977 shall be carried out and test certificates submitted to the Engineer – in –Charge.

Testing and Commissioning

Commissioning checks and tests shall be included all wiring checks and checking up of connections. Primary/secondary injection tests for the relays adjustment/setting shall be done before commissioning in addition to routine meggar test. Checks and tests shall include the following:-

- a) Operation checks and lubrication of all moving parts.
- b) Interlocking function check
- c) Insulation test: When measured with 500 V meggar, the insulation resistance shall not be less than 100 mega ohms.
- d) Trip tests & protection gear test.

Automatic transfer switch

General requirements

The following covers the Automatic Transfer Switch Equipment (ATSE) and its By-Pass equipment.

The ATSE shall be composed of

- two separate Load Break Switches,
- a mechanism to operate and mechanically interlock the switches,
- an actuator made of a motorized unit or a double solenoid mechanism (both momentarily energized)
- a 3 phases monitoring device and control module (MDCM) for monitoring supply circuits and for transferring the load circuit from one supply to another.

The ATSE shall be fully integrated in one device. No additional wiring other than the power connection shall be allowed to facilitate the proper functioning of the ATSE with the MDCM.

All the elements of the transfer switch equipment and control module shall be of the same manufacturer.

The ATSE shall be of the PC type.

The ATSE shall have 3 stable positions: Normal, Isolated and Emergency.

The ATSE shall be of a Disconnecter type with fully visualized breaking.

The ATSE shall be able to do On Load Manual switching.

The ATSE must be proposed in 3 and 4 poles versions.

Design requirements

The transfer switch unit shall be electrically operated and mechanically held.

It shall be no power consumption while in a stable position other than the one required for the control unit.

The electrical actuator shall be a motorized unit or a double solenoid mechanism, which is momentarily energized.

The switches shall be inherently mechanically interlocked to ensure at any moment only one out of the three stable positions.

The system shall incorporate a position indicator for the 3 stable positions.

To prevent source overlapping the transfer is operated through distinct isolated positions. The sensing and logic shall be built-in microprocessor for maximum reliability and with option of serial communications feature. To facilitate flexibility of installation there shall be provision of Line/ Load reversibility.

The switching contact shall be silver plated and maintenance free in various environments. It shall be of self cleaning capability to optimize the quality of the contact during operation
The Neutral pole of ATS shall be fully rated (100% rating as that of all 4 poles).
The 4 poles shall switch simultaneously.

Standards & Codes

The ATSE shall conform to the requirements of the IEC Standard 60947-6-1 for the source transfer function and 60947-3 for Disconnection and manual on load switching.

The MDCM shall comply with the following standards:-

Emission General standard

- EN 55022 Conductor Emission
- EN 55022 Radiated Emission Immunity General standard
- EN 61000-4-2 Electrostatic Discharge (ESD)
- EN 61000-4-3 Radiated electromagnetic field
- EN 61000-4-4 Electrical fast transient (EFT)
- EN 61000-4-5 Surges
- EN 61000-4-6 Conducted radio frequency field
- EN 61000-4-8 Power frequency magnetic field
- EN 61000-4-11 Voltage dips, short interruptions and variations
- EN 61000-4-13 Harmonics and inter harmonics
- IEC 61010-1 Electromagnetic compatibility

Safety requirements & features

The ATS shall be of Disconnect or type as per IEC 947-3

It shall not be possible to mix the two supplies (Normal supply and Emergency supply) in case of any failure of the equipment. This characteristic must be guaranteed by a proper design of the mechanism.

Opening and Closing operations of the contacts must be independent from the driving mechanism. The speed of the contacts shall be independent of the speed of motor or manual operation to ensure the safety of the operator.

In case of contacts welding, the ATSE must remain in its actual position, in Manual or Automatic operation, according to IEC 60947-3. Neither the manual nor the automatic operation can lead to a failure of the mechanism or of the interlocking. The mechanical indicator shall show the actual position in contact welded situation.

The ATSE shall have a Manual and Automatic mode: the swap between both modes shall be possible only with a key or selector on the front face. Manual operation shall be prohibited in automatic and Automatic operation shall be inhibited in Manual mode.

The ATSE shall have a built-in provision for padlocking in the Isolation position for the safety of the operators. A provision for a padlocking in Normal or Emergency positions shall also be provided.

Automatic commands shall be inhibited when the product is padlocked

The padlocking shall be possible only in Manual position.

The ATSE shall be able to accommodate up to three padlocks at the same time. A handle for manual operation shall be provided for emergency transfer purposes. The handle shall be located on the ATSE itself to ensure a safe and quick operation during power outages. The handle shall be easily removable for automatic operation.

Manual transfer shall be possible on load, without any upstream disconnection, with respect to the safety of the operator. This feature is essential in case of emergency and panic.

It shall be possible to block the re-transfer process via programming. When selected, retransferring to the Main source must be validated locally or remotely via keypad or external contact.

The replacement of the motor operated actuator shall be possible under live condition with respect to the operator safety (isolation distances, easy access to the fixing elements).

Operations

The ATSE shall be supplied by any present source. It shall allow the ATSE to be controlled in the 3 positions with only one source present.

The ATSE shall have high short time current withstand capability (Icw 1 second in accordance to IEC 60947-3).

Manual retransfer function can be inhibited and must be possible either locally or from remote.

The ATSE shall have the possibility to be electrically controlled in any of the 3 positions by mean of dry contacts. It overrides the automatic sequence. Once back in Auto mode, the ATSE shall come back to the proper position.

Automatic operation via the MDCM

The monitoring device and control module (MDCM) must be integrated within the ATSE.

Electrical Control of the product position must be possible and controlled locally or remotely. Any automatic command must be inhibited during control operation (takeover).

Parameters sensing & setting

The MDCM shall include 3 phases sensing for monitoring of voltage and frequency to detect the presence and loss of the power supply for activation of the automatic transfer. The settings are as following:

| PARAMETER | SOURCES | THRESHOLD | HYSTERISIS |
|-----------------|----------------------------|--------------|-----------------|
| Under voltage | Mains and Backup, 3 phases | 80 to 98% | 81 to 99% |
| Over voltage | Mains and Backup, 3 phases | 102 to 120% | 101 to 119% |
| Under frequency | Mains and Backup | 80 to 99% | 80.5 to 99.5% |
| Over frequency | Mains and Backup | 101 to 120 % | 100.5 to 119.5% |

Voltage settings shall be field adjustable in 1% increments either locally with the display and keypad, or remotely through serial communication. Frequency settings shall be adjustable in 0.1% increments either locally with the display and keypad, or remotely through serial communication. All settings shall be adjustable directly from the front face, opening of the MDCM is strictly forbidden for obvious reasons of safety and possible damages. The MDCM shall have a phase sequence detection to ensure the proper voltage vectors sequence on both power supplies. The MDCM shall have programming for selection of network type 4NBL/41NBL/42NBL/3NBL/2NBL/2BL/1BL and capability to monitor the minimum and maximum voltages and frequencies threshold and hysteresis. The MDCM shall allow the setting of

the sources priority. The MDCM shall be equipped with the activation of manual re-transfer mode. The MDCM must be equipped with a permutation counter to enable to record the life span of the ATSE represented by the number of transfer operations. Resetting of this counter shall be conditioned by 4 digits numerical password with 2 levels of security. Interface with the MDCM The MDCM must be easily configurable via a HMI dialogue interface complete with a 2 levels security 4 digits numerical Password for programming access right. The MDCM shall be equipped with local visualization of three phase currents, powers (P, Q, S), frequency and power factor through 3 current transformers measurement from the 2 sources. Source status shall be clearly visible on the front of the unit for both normal & emergency, stated in a clear schematics diagram. The controller shall provide digital readout of voltage on all 3 phases, frequency and phase rotation. Inputs/outputs, communication.

The MDCM shall be able to provide up to four Inputs (Programmable NO or NC) and four Outputs (NO Type) for interfacing with control system. The inputs and outputs functions shall be versatile (no unique function), the assignment being done by the HMI or the communication. The MDCM can be equipped with an option to enable communication via RS485 module MODBUS protocol with transmission speed up to 38400 bps. The link shall be capable of reading the voltages, timers and inputs values, setting all parameters values and inputs/outputs functions.

Timers settings

An adjustable timer of 0 to 60 seconds shall be provided to detect the priority network failure, to override any transient outages of the normal supply. (Main Failure Timer, MFT). A timer of 0 to 60 seconds shall be provided to validate the stability of emergency network before transfer, once the Generator Set supply is available. (Delay To Transfer, DTT). While transferring to emergency, a possibility to stay in position 0 shall be provided from 0 to 20 seconds (O Main Failure timer, OMF). An adjustable timer of 0 to 30 minutes shall be provided to detect priority network return to normal, to override any false availability of the normal supply. (Main Return Timer, MRT). While transferring back to primary source, a possibility to stay in position 0 shall be provided from 0 to 20 seconds (O Main Return timer, OMR). An adjustable timer of 0 to 30 minutes shall be provided to allow the generator cooling down after load retransfer from standby source to Mains source (Cool Down Timer, CDT). The controller shall provide the ability to prevent retransfer to Mains from happening, except if the user validates manually the retransfer. (Manual Re-Transfer).

Maintenance & testing

The MDCM shall provide the possibility to run a test ON load and OFF load. It shall be possible to actuate these sequences from the front face HMI or via the Modbus link. Maintenance of the electrical parts (Controller or Motorization unit) shall be possible without disconnection of the power conductors. It shall be possible to change any actuator unit based on a motor technology in less than 10 minutes without disconnection of the power conductors. During this operation, it shall still be possible to operate manually the switch with the MDCM and motorization removed.

Both Local and Remote control of test sequences shall be possible on the Switch.

Inspection at factory

The inspection / testing of all the ATS / STS shall be done at manufacturer works before dispatch by Project-in-Charge / Project Director / Consultant.

Factory testing and certification

The complete ATSE shall be factory tested to ensure proper operation of the individual components together and correct overall sequence of operations. The test must also ensure that the operating transfer time, voltage, frequency and time delay settings are in compliance with the specification requirements. The manufacturer shall be certified ISO 9001: 2003 International Quality Standard and the manufacturer shall have third party certification verifying its quality assurance in design / development, production, installation and servicing in accordance with ISO 9001.

Training

The manufacturer / supplier shall ensure the training for Operating staff in the local national language, by means of fully configured Training kits to impart hands-on training to simulate various parameters and for trouble shooting exercise.

POWER FACTOR CORRECTION SYSTEM

1 SCOPE

Design, assembly / fabrication, installation, testing and commissioning of 3 phase, 440 V, 50 Hz TP&N APFC system (Auto + manual option) with MDXL type capacitors, microprocessor based controller and detuned filter. The unit shall improve the monthly average power factor and mitigate harmonic distortion on the LV bus.

2 ENCLOSURE

The panel shall be indoor type, free standing, and floor mounting with IP42 degree of protection. It shall be completely made of CRCA sheet steel. The enclosure shall have sturdy support structure with angle supports as necessary and shall be finished with powder coating in the approved colour shade/s to match the colour of the other panels. The thickness of powder coating should be minimum 60-80 microns.

Suitable provisions shall be made in the panel for proper heat dissipation. Air aspiration louvers for heat dissipation shall be provided as a necessary.

The front portion shall house the switchgear and the rear portion shall house capacitors and series reactors. The enclosure is to be suitably sized to accommodate all the components, providing necessary air clearance between live and non-live parts, providing necessary working clearance.

3 APFC RELAY / CONTROLLER

Microprocessor based APFC relay (Intelligent VAR controller) shall sense the PF in the system and automatically switch ON / OFF the capacitor unit or stage to achieve the preset target PF. The controller shall have the following features:

- Digital settings of parameters like PF, Switching time delay, Step limit etc.
- Indication of PF, preset parameters.
- Indication and elimination of defect capacitor steps.
- No-volt release.
- Protective shut down in case of harmonic overload.
- Indication for Failure to achieve the target PF, Harmonic overloading, Step failure etc.

4 CAPACITORS

- The capacitor shall comply with the following standards (and their latest amendments) : IS 13340-1993, IS 13341-1992, IEC 60831-1+2
- General specifications: 3 phase, delta connected, 50 Hz.
- Voltage: Must be designed to withstand system over voltage, increased voltage due to series reactor and harmonics.

- Capacitor type: Super heavy duty with double side metallized capacitor tissue paper. Oil impregnated and self-healing type with bi-axially oriented polypropylene film shall be fitted with pressure sensitive disconnect or in each individual capacitor cell.
- Over voltage +10% (12h / 24h), + 15% (30m / 24h), + 20% (5m), +30% (1m) as per Clause 6.1 of IS 13340-1993.
- Over current : 2.5 x In
- Peak Inrush current withstand : 350 x In
- Total watt-losses including discharge resistors: < 0.45 W / k V Ar.
- Temperature category: -25 deg.C to 70 deg.C.
- Capacitor shall be self-heating type and oil impregnated for longer life. The impregnate shall be non-PCB, biodegradable type, must be properly treated and de-gasified, so as not to have any degeneration properties and shall be non-oxidizing.
- The design shall be modular for simple mechanical assembly, no extra accessories/ metal parts to be required. Unit must be free standing with an IP 41 protection level.

4.1 Capacitor Construction

Capacitor Unit

Each step in the APFC panel shall comprise of single unit or group of units connected in parallel to form a bank. Each capacitor unit / module shall be provided with Pressure Sensitive Disconnect or for safe disconnection. Each capacitor unit shall comprise of number of single-phase elements connected Delta configuration. All capacitor unit shall be provided with discharge resistors, which shall discharge the capacitors to less than 50 V within 1 minutes.

Capacitor Elements

Each element shall be wound from continuous reels of high quality polypropylene film combined with dual side metalized paper in the dielectric structure to form a cylindrical winding. Elements shall be vacuum dried, impregnated under high vacuum with non PCB oil.

5 SERIES REACTOR

Application

LV Harmonic Filters shall be used with harmonic filter duty power capacitors to mitigate harmonics, improve power factor and avoid electrical resonance in LV electrical networks

Construction, Testing & Protection

The low voltage filter reactor shall be series type having a three phase, iron core construction suitable for indoor use (IP 00). The reactor shall be air cooled and the layout shall be in accordance with IEC 60076.

The complete unit shall be impregnated under vacuum and over-pressure in impregnation resin and shall be suitable for temperature Class H (T60/H) operation.

The reactor shall be tested using a separate source voltage test of 3.0kV (coil to core) for 1 minute as per IEC 60076/3.

The permitted tolerance of inductance shall be + 3% of rated inductance value.

Reactor tuning factor shall be 7% and the current rating of the reactor shall include the effects of harmonics and other possible over-currents.

The limit of linearity of inductance of the filter reactor shall be as follows $1.2 \bullet \sum I_n$ with $L = 0.95$
LN

The reactor shall be fitted with a temperature sensitive micro-switch in the centre coil (normally open) for connection to trip circuits in case of high operating temperatures.

6 SWITCHGEAR & PROTECTION

Incomer switchgear shall be TP&N breaker appropriate rating. Suitable contactor for each step shall be used and must be capable of capacitor switching duty at each step for short circuit protection.

Bus bars shall be suitably colour coded and must be mounted on appropriate insulator supports.

Power cables used shall have superior mechanical, electrical and thermal properties, and shall have the capability to continuously operate at very high temperatures up to 125 deg.C.

Internal wiring between main bus-bars, breaker, contactor and capacitors shall be made with 1100 V grade, PVC insulated, copper conductor cable of appropriate size, by using suitable copper crimping terminal ends etc.

Suitable bus links for input supply cable termination shall be provided.

7 CONTROL CIRCUIT & GENERAL PROTECTION

The control circuit shall be duly protected by using suitable rating MCB.

An emergency stop push button shall be provided to trip the entire system (22.5 mm dia, mushroom type, press to stop and turn to reset).

Wiring of the control circuit shall be done by using 1.5 sq.mm, 1100 V grade, PVC insulated, multi-stranded copper control wire.

Inspection terminal strip, number ferruling, labeling etc. shall be provided.

440 V caution board on the panel shall be provided.

INTERNAL ELECTRIFICATION WORK.

Distribution Boards

General

a) Distribution Board shall be double door type with extended loose wire box & M.S. Junction Box at the top and suitable for flush installation. All distribution boards shall be of three phases (415 Volts) or single phase (240 Volts) type with incoming isolator or MCB and/or RCCB as in Bill of Quantities. Distribution boards shall contain plug in type miniature circuit breaker mounted on bus bars. Miniature circuit breakers shall be quick make & quick break type with trip free mechanism. MCB shall have thermal & magnetic short circuit protection. MCB shall conform with IS 8828-1978 & IS 8828 - 1996. Bus bars shall be of electrolytic copper. Neutral bus bars shall be provided with the same number of terminals as there are single ways on the board, in addition to the terminals for incoming mains. An earth bar of similar size as the neutral bar shall also be provided. Separate neutral & earth bus bar link to be provided for each phase. Phase barrier shall be fitted and all live parts shall be screened from the front. Ample clearance shall be provided between all live metal and the earth case and adequate space for all incoming and outgoing cables. All distribution board enclosures shall have an etched zinc base stove painted followed by synthetic stove enamel, colour light gray. A circuit identification card in clear plastic cover shall be provided for each distribution board. IK (Mechanical Stress) rating of distribution board enclosure shall not be less than IK -07/ 08 / 09.

b) Distribution Board with single phase outgoings requirement shall be Horizontal type. Distribution Board with three phase outgoings requirement shall be Vertical/ Horizontal type. Distribution Board installed in indoor dry locations shall conform to IP-42. Distribution Board installed in outdoor & wet locations shall conform to IP- 65.

c) Miniature Circuit Breakers for lighting circuits shall be of "B" series whereas the circuits feeding discharge lamps (HPMV or HPSV) halogen lamps, all power outlet points, equipment/ machinery shall be of "C/D" series (Motor circuit) types. All miniature circuit breakers shall be of not less than 10KA rated rupturing capacity. All miniature circuit breaker terminals shall have safety shutter.

d) Distribution board shall be provided with isolator or MCB and/or earth leakage circuit breaker. Earth leakage circuit breaker shall be current operated type and of 30mA sensitivity unless otherwise stated. RCCB shall be mounted within distribution board box for single phase distribution board while in three phase distribution board RCCB shall be either mounted within distribution board box or in a separate MS box below distribution board. Width and depth of RCCB box shall be same as that of distribution board box and of same finish. Height of RCCB box shall be sufficient to accommodate RCCB & termination of incoming & outgoing wires. Distribution board box, isolator, MCB'S used shall be of one/same manufacturer. Standard size manufactured by approved manufacturer shall be used. In case size required is not standard size of manufacturer, in that case next standard size distribution board box shall be used with incoming & outgoing MCB. Additional cutout/space for outgoing MCB shall be plugged with blank plates. No extra cost shall be paid for using bigger/higher size distribution board box and blank plates.

Conduit and Wiring System

M.S. Conduit

All conduit pipes shall be of approved gauge (not less than 16 SWG for conduits of sizes up to 32mm diameter and not less than 14 SWG for conduit of size above 32mm diameter) solid drawn or reamed by welding finished with stove enameled surface. All conduit accessories shall be of threaded type and under no circumstances pin grip type accessories shall be used. The maximum number of PVC insulated 650/1100 volts grade copper conductor cable that can be drawn in conduit of various sizes shall be as per IS code. No steel conduit less than 20mm in diameter shall be used unless otherwise stated.

Conduit Joints

Conduit pipes shall be joined by means of threaded couplers, and threaded accessories only. In long distance straight run of conduits, inspection type couplers at reasonable intervals shall be provided or running threads with couplers and jam nuts shall be provided. In the later case the bare threaded portion shall be treated with anti-corrosive preservative. Threads on conduit pipes in all cases shall be between 13mm to 19mm long sufficient to accommodate pipes to full threaded portion of couplers or accessories. Cut ends of conduit pipe shall have no sharp edges nor any burrs left to avoid damage to the insulation of conductor while pulling them through such pipes.

Wherever conduit passes a building expansion joint, galvanized flexible metallic conduit shall be provided for connecting rigid M.S. Conduit in either slab.

Protection against Condensation

The layout of conduit should be such that any condensation or sweating inside the conduit is drained out. Suitable precaution should also be taken to prevent entry of insects inside the conduit.

Protection of Conduit against Rust

The outer surface of conduit including all bends, unions, tees, junction boxes etc forming part of conduit system shall be adequately protected against rust when such system is exposed to weather by being painted with two coats of oxide paint applied before they are fixed. In all cases, no bare threaded portion of conduit pipe shall be allowed. Unless such bare thread portion of conduit is treated with anticorrosive preservative or covered with approved plastic compound.

Painting of Conduit and Accessories

After installation, all accessible surface of conduit pipes, fittings, switch and regulator boxes etc. shall be painted with two coats of approved enameled paint or aluminium paint as required to match the finish of surrounding wall, trusses etc.

Fixing of conduits

Surface Conduit

Conduit pipes shall be fixed by heavy gauge saddles, secured to suitable wood plugs or other approved plugs with screws in an approved manner at an interval of not more than one meter but on either side of the couplers or bends or similar fittings, saddles shall be fixed at a distance of 30cm from the centre of such fittings. The saddles should not be less than 24 gauges for conduits up to 25mm dia and not less than 20 gauge for larger diameter conduits. The corresponding widths shall be 19mm & 25mm. Where conduit pipes are to be laid along the trusses, steel joint etc. the same shall be secured by means of special clamps made of MS. Whereas it is not possible to drill holes in the trusses members suitable clamps with bolts and nuts shall be used. All fixing arrangement like saddles, special purpose clamps, nuts, bolts etc. shall deemed to be included in quoted rates of conduit.

For 25mm diameter conduit width of clip shall be 19mm and of 20 SWG. For conduit of 32mm and above, width of clip shall be 25mm and of 18 SWG.

Where conduit pipes are to be laid above false ceiling, either conduit pipes shall be clamp to false ceiling frame work or suspended with suitable supports from the soffit of slab. For conduit pipe run along with wall, the conduit pipe shall be clamped to wall above false ceiling in uniform pattern with special clamps if required to be approved by the Project-in-Charge / Project Director / Project Director at site.

Recess / Concealed Conduit

The chase in the wall shall be neatly made and of ample dimensions to permit the conduit to be fixed in the manner desired. In the case of building under construction, conduit shall be buried in the wall before plastering and shall be finished neatly after erection of conduit. In case of exposed brick/rubble masonry work, special care shall be taken to fix the conduit and accessories in position along with the building work. Entire work of chasing the wall, fixing the conduit in chases, and during the conduit in mortar before plastering shall form part of point wiring work. (For chase cutting-chase cutting machine shall be used and no manual cutting shall be allowed).

The conduit pipe shall be fixed by means of staples or by means of saddles not more than 60cm apart or by any other approved means of fixing. Fixing of standard bends and elbows shall be avoided as far as practicable and all curves maintained by bending the conduit pipe itself with the long radius which shall permit easy drawing in of conductors. All threaded joint of conduit pipe shall treat with some approved preservative compound to secure protection against rust. Suitable inspection boxes to the barest minimum requirements shall be provided to permit periodical inspection and to facilitate replacement of wires, if necessary. These shall be mounted flush with the wall. Suitable ventilating holes shall be provided in the inspection box covers. Wherever the length of conduit run is more than 10 metres, then circular junction box shall be provided to facilitate pulling of wires. The chicken wire mesh shall be provided by civil agency.

Outlet Boxes

Switch/outlet boxes shall be made of metal on all sides except on the front. Boxes shall be G.I. Up to 10cmx20cm size Box shall have wall thickness of 18 SWG and above 10cmx20cm shall have 16 SWG. The metallic boxes shall be painted with anticorrosive paint before erection. Clear depth of the box shall not be less than 50mm all fitting shall be fitted in flush pattern. Switch/outlet boxes shall be suitable to house modular type light and power accessories. Earthing stud to be provided for connection of earthing wire in side of box at near any corner.

Fan Box

Fan Box shall be made out of 14-gauge M.S. sheet in hexagonal shape. The dia of box shall be 150 mm and depth of box shall be 80 mm. A M.S. covers plate size 160 mm x 160mm x 16 gauges to be provided in the back of fan box. 12 mm dia M.S.Rod to be provided for fan hanging arrangement in the box. A 28 mm dia knockout To be made in all six hexagonal vertical part for conduit entry in the box. The box shall be painted with 2 coat of primer. A 180 mm dia, 2 mm thick hylem sheet Cover to be provided. (The sample to be approved before procurement / execution by Project-in-Charge / Project Director / Consultant.

Light & power accessories

General

All light & power accessories shall be of modular range of plate switch type and shall be of one manufacturer (brand) and type.

Light Switches Modular Type

All switches for control of light shall be of 6/10 Amp unless otherwise stated. All switches shall be modular range of plate switch type. The switches shall be rocker mechanism type with silver contact. All switches shall be of white finish or as sample approved by Project-in-Charge / Project Director / Consultant.

6/16 Amp Switch Socket Outlet Modular Type

Switch socket outlet shall be of 3 pin 6Amp outlet shall have safety shutters. The switch shall be of rocker mechanism type with silver contact. Socket outlet shall be shutter type and of modular range of plate type and having white finish or as approved by Project-in-Charge / Project Director / Consultant.

Wiring

All FRLS insulated copper conductor multi-stranded wires shall conform to relevant IS codes. Cable co

All internal wiring shall be carried out with FRLS insulated wires of 1100 volts grade. The circuit wiring for points shall be carried out in looping in system and no joint shall be allowed in the length of the conductors. Circuit wiring shall be laid in separate conduit originating from distribution board to switch board for light/fan. A light/fan switch board may have more than one circuit but shall have to be of same phase. Looping circuit wiring shall be drawn in same conduit as for point wiring. Each circuit shall have a separate neutral wire. Neutral looping shall be carried out from point to point or in light/fan switch boards. A separate earth wire shall be provided along with circuit wiring for each circuit. For point wiring red or yellow or blue colour wire shall be used for phase and black colour wire for neutral. Circuit wiring shall be carried out with red, yellow or blue colour FRLS insulated wire for RYB phase wire respectively and black colour FRLS insulated wire for the neutral wires. FRLS insulated green colour wire shall be used as earth continuity conductor and shall be drawn along with other wires. No wire shall be drawn into any conduit until all work of any nature, that may cause injury to wire is completed. Care shall be taken in pulling the wires so that no damage occurs to the insulation of the wire.

Before the wires are drawn into the conduit, the conduits shall be thoroughly cleaned of moisture, dust and dirt. Drawing & jointing of copper conductor wires & cables shall be as per CPWD specifications.

All the wire & cables shall be copper up to 16 sq.mm and above 16 sq.mm shall be aluminum except UPS cables. For UPS Incoming & outgoing, only copper cable/ wire shall be used.

| Nominal Cross-sectional Area of conductor in Sq. mm | 20mm | | 25mm | | 32mm | | 38mm | | 51mm | | 64mm | |
|-----------------------------------------------------|------|---|------|---|------|----|------|---|------|---|------|---|
| | S | B | S | B | S | B | S | B | S | B | S | B |
| 1.50 | 5 | 4 | 10 | 8 | 18 | 12 | - | - | - | - | - | - |
| 2.50 | 5 | 3 | 8 | 6 | 12 | 10 | - | - | - | - | - | - |
| 4 | 3 | 2 | 6 | 5 | 10 | 8 | - | - | - | - | - | - |
| 6 | 2 | - | 5 | 4 | 8 | 7 | - | - | - | - | - | - |
| 10 | 2 | - | 4 | 3 | 6 | 5 | 8 | 6 | - | - | - | - |
| 16 | - | - | 2 | 2 | 3 | 3 | 6 | 5 | 10 | 7 | 12 | 8 |
| 25 | - | - | - | - | 3 | 2 | 5 | 3 | 8 | 6 | 9 | 7 |
| 35 | - | - | - | - | - | - | 3 | 2 | 6 | 5 | 8 | 6 |

| | | | | | | | | | | | | |
|----|---|---|---|---|---|---|---|---|---|---|---|---|
| 50 | - | - | - | - | - | - | - | - | 5 | 3 | 6 | 5 |
| 70 | - | - | - | - | - | - | - | - | 4 | 3 | 5 | 4 |
| | | | | | | | | | | | | |

Joints

All joints shall be made at main switches, distribution board socket and switch boxes only. No joint shall be made in conduits & junction boxes. Conductors shall be continuous from outlet to outlet.

Sub Mains

Sub-main wiring shall be carried out with FRLS Insulated Copper multi-stranded wires/cables.

Sub-main cable where called for shall be of the rated capacity and approved make. Every sub-main shall be drawn into an independent adequate size conduit. Adequate size draw boxes shall be provided at convenient locations to facilitate easy drawings of the sub-main cables. Cost of junction box/drawn box is deemed to be included in the rates of sub-main wiring. An independent FRLS insulated copper earth wire of proper rating shall be provided for every sub-main. Single phase sub-main shall have single earth wire whereas three phase sub-main shall be provided with two earth wire.

Where sub-mains cables are connected to the switchgear, sufficient extra lengths of sub-main and mains cable shall be provided to facilitate easy connections and maintenance. For termination of cables crimping type cable socket/ lugs shall be provided. Same colour code as for circuit wiring shall be followed.

Load Balancing

Balancing of circuits in three phase installation shall be planned before the commencement of wiring and shall be strictly adhered to.

Mode of measurement

The following measurement code shall apply to the contract.

Power cables

All power cables/control cables shall be measured on linear basis in meters.

Note:-

1. Apart from the above makes, makes approved by Tender Accepting Authority, satisfying the technical specifications of the item(s) mentioned in the tender document are also acceptable. Also, preference will be given to Public Procurement (Preference to Make in India) order compliant products.
2. The department reserves the right to add or delete any material/make/brand in the list of approved material/make/brand subject to the recovery of financial implications.
3. The makes shall be approved by the competent authority of CRPF and /or client department before procuring the material.
4. The department reserves to right to get the materials tested in a recognized laboratory/test house for its conformity to the tender specifications. Cost of test shall be borne by the bidder.
5. Bidder shall have qualified engineering team for erection, testing and commissioning. Alternatively, bidder should undertake to hire engineer and technicians from OEM to complete installation & commissioning work. Cost of such an arrangement shall be borne entirely by the bidder.

Sd/-
DIG (Engineer), Works Dte
For and on behalf of the President of India

Schedule- "A"

| Sl. No. | | Qty | Unit |
|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-------|
| 1 | <p>Supply, installation, testing and commissioning of 630 KVA step down transformer out door type complete with standard fittings and accessories, HT 11 KV 3 Phase, LT 433 Volt, 3 Phase 4 wire with off load tap changer on primary side to carry secondary voltage tapping range + 7.5% with tappings at every steps 2.5 % all as per IS 1180 Part-I (2014 , With Latest Amendment No 1, 2, 3 & 4 of Energy Efficiency Level -2) Level-2, for Transformer manufacturing of capacity 630 KVA, copper wound, oil cooling with fins vector group : DYn 11, including initial oil filling (oil confirming to IS 335 and ISI Mark) complete all as specified including the following accessories :-</p> <p>(a) Three Nos porcelain bushing HT 11 KV with brass bushing rods, nuts, bolts & washers etc inside cable end box.</p> <p>(b) One cable box LV side consisting of 4 Nos porcelain with brass bushing rods complete with nut's and washers suitable for runs of 3.5 core LT UG cable with suitable arrangement to fix 400 Sqmm XLPE Single core cable, 2 runs per phase.</p> <p>(c) Oil conservator with filler type drain valve and oil level gauge.</p> <p>(d) Dehydrating breather with first fill of dehydrating agent.</p> <p>(e) Explosion vents.</p> <p>(f) Thermometer pocket on tank cover.</p> <p>(g) One No 100mm dia, dial type thermometer vapour pressure type having range 0 to 120 degree centigrade.</p> <p>(h) Rating plate and terminal marking plate.</p> <p>(j) Earthing arrangement. (k) Oil level gauge. (l) Oil drain filter valve.</p> <p>(m) Oil drain valve. (n) Lifting hook and danger Notice plate.</p> <p>(o) Oil conservator with filling hole and cap. (p) Air relief valve plug.</p> <p>(q) WTI and OTI. (r) Bucchoz Relay (s) Four plate solid cast steel detachable rollers.</p> <p>(t) Earth bushing for neutral outside the cable box for providing independent earthing for neutral.</p> <p>(u) Necessary channel on foundation for fixing the transformer with joint and stopper.</p> <p>(v) Transformer drawing shall be got approved from Engineer-in-charge before placing of order.</p> <p>Note :- The transformer should be energy efficiency level-2 and energy conservation (Energy conservation Binary Corps) for which necessary test certificate to be produced by contractor from manufacturer of the transformer.</p> | 01 | Set |
| 2 | SITC of high voltage switchgear for indoor installation 11 KV 3 Phase 50 Hz as supply, 350 MVA breaking capacity, metal clad draw out type, vacuum circuit, over current, earth fault protection, master relay and auxiliary relay for transformer protection, PT, CTR operated ammeter, voltmeter indicating lamp etc as per IS; 13118 amended up to date etc as required. (1 No incoming and 3 nos outgoing) | 01 | Set |
| 3 | SITC of cubical type sectionalized LT panel, metal cist of CRCA sheet steel, powder coat painted suitable for 415 volt 3 phase, 50 Hz AC supply with incomer draw type ABC, ACB Bus coupler outgoing SFU/MCCB/ACB, insulated Bus bar system, interconnection, suitable cable alley, arrangement for cable terminations, earthing, Ammeters, Voltmeter, Phase indicating lamps etc, suitable for 50 KA breaking capacity. | 01 | Set |
| 4 | Supplying and laying standard Compact Aluminium Conductor, Conductor Screened with Extruded Semi Conduction compound, XLPE insulated , insulation screened with Extruded Semi-conduction compound in combination with copper tape (0.3 KA for one set, Cores laid UP, inner sheath of PVC tape, Galvanised steel flat strip armoured and over all PVC sheathed cable conforming to IS; 7098/II/85 with latest amendments | | |
| 4.1 | 3x120 sq.mm | 350 | Meter |
| 5 | Supply and laying of aluminum conductor, armoured, XLPE insulated , PVC inner sheathed power cable 1.1 KV Grade conforming to IS ; 1554 | | |
| 5.1 | 3.5 x 300 Sq.mm | 450 | Meter |
| 5.2 | 3.5 x 70 Sq.mm | 200 | Meter |
| 5.3 | 4 x 16 Sq.mm | 1200 | Meter |
| 6 | Earthing with copper earth plate 600 mm x 600 mm x 3 mm thick including accessories and providing masonar enclosure with cover plate having locking arrangement and watering pipe with charcoal or coke and salt etc as required. | 08 | Each |
| 7 | Providing & fixing 25 mm x 5 mm copper strip on surface or in recess for connections etc. as required. | 50 | Meter |
| 8 | Providing and fixing 25mm x 5 mm copper strip in 40 mm dia G.I pipe from earth electrode including connection with brass nut, bolt spring washer excavation an re-filling etc, as required. | 35 | Meter |
| 9 | SITC(Supply , installation, testing and commissioning) of Silent/containerized diesel engine driven generating set complete to give an output of 62.5 KVA AC 415 Volts, 50 Cycles per second, 3 phase 4 wire supply with power factor 0.8, 1500 RPM diesel engine and alternator mounted on common base plate, anti vibration rubber mounting pad (AVM Pads "B" series) complete in all respect with and including accessories and components as specified below including sound proof integral acoustic enclosure for 62.5 KVA Gen Sets ECO friendly and as per Ministry of Environment, forests notification 17 May 2002 complete including, emergency stop button, illumination inside canopy, Temperature sensor for high temp safety, exhaust fan etc complete as per IS 4722, AMF type with relay panel for | 01 | Job |

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| | <p>automatic starting on mains failure.</p> <p>(a) Diesel Driven Engine (Prime mover):- Multi cylinder, vertical/horizontal, 4 stroke cycle, suitable for 62.5 KVA alternator, water cooled conforming to BSS- 649 rated for continuous running diesel engine suitable to FF matching BHP at 1500 RPM as per latest ISS/BSS, capable of taking 10% over load for any one hour in any 06 hour running, complete with and canopy thickness minimum 3.00 mm including following accessories:-</p> <p>(i) Fuel filter (ii) Governor (Electronic) (iii) Complete battery set with lead & lugs as recommended by manufacturer. (iv) Lubricant oil cooler (v) Lubricant oil pump. (vi) Lubricant oil filter (vii) Digital oil pressure gauge (c) Manufacturer maintenance & operation manual of Gen Set - 02 Set. (d) AMF Panel :- AMF control panel 24 volt DC system complete with internal wiring, voltmeter, Ammeter, frequency meter, power-factor, required switch of cutout, MCB, MCCB, Contractor, Circuit breaker, battery charger and levelling floor type totally enclosed made of steel metal suitable for the above Generator Set incorporating the following:- (i) Voltmeter digital type 0-500 Volts with selector switch - 01 Set (ii) Ammeter digital type upto 800 Amps with CT's and selector switch - 01 Set (iii) Under/ over voltage relay - 01 No (iv) Digital electronic timer - 01 No (v) Frequency meter digital type - 01 No (vi) Indicating lamp LED based with toggle switches - 01 Set of three (vii) KWH meter three phase digital type - 01 No (viii) PF meter three phase digital type - 01 No (ix) Safety alarm against high water temperature and low oil pressure. (x) Bypass arrangement with rotary type switch AC-4 Pole, 160 Amps rating to isolate AMF panel at the time of low voltage and from maintenance point of view. (xi) Auto change over complete with suitable size power contactor of size upto 160 Amps with tripping relay complete. (xii) Engine starting relay. (xiii) Frequency stabilizer auto mechanism to maintain the supply. (xiv) Battery charger suitable to charge the battery of 12 V/24 Volt DC with buck/ boost system - 01 No (e) Supply & install of Acoustic Enclosure suitable for 62.5 KVA DG set as under (i) Fabricated out of CRCA sheet of minimum thickness 3.15mm. Polyester based powder coated internally and externally with lockable type door handle. All nuts and handles shall be zinc coated. (ii) The doors are gasketed with EPDM gaskets. (iii) Sound proofing with high quality rock wool/ mineral wool conforming to IS 8183 of 50mm thickness and density at 96 Kg/M3 covered with fiber glass cloth and perforated powder coated sheet specially designed attenuators (Sound controller) at air entry and exit of the container noise level shall be not exceed 75 Db at 1 meter distance as per CPCB/Government of India Norms. iv) Adequate ventilation to meet air requirement for combustion and heat removal with proven of a blower. v) Emergency stop push button outside the container. vi) Proven of light inside the canopy i.e. providing LED light fitting 1 x10 Watt with wiring and control switch. (f) MOUNTING ARRANGEMENT- Prime mover and alternator shall be mounted on skid mounting type base frame fabricated from ISMC channel or in sheet metal providing common bed for engine and alternator directly coupled together the base frame has provision for grouting on foundation bolt as well as fixing on vibration mounts provision is made in base frame for tilting arrangement of DG set as recommended by manufacturer. The base frame shall have provision of lifting hook for convenient lifting of complete set ie along the canopy engine and alternator. (g) cost of constr of PCC plinth of DG Set as per manufacture design and recommendation deemed to be included in this item.</p> | | |
| 10 | SITC of submersible pump set for drinking water having high grade bronze impeller dynamically balanced stainless-steel shaft with non-return valve of suitable HP (not less than 33 HP) submersible motor with non aging water proof insulation to run on 3 phase 415 volts, 50 HZ supply capable of delivering 50000 LPH against the head of 48 mtrs to 92 mtrs etc compete as required. | 01 | Each |
| 11 | Supply and laying of 100 mm dia column pipe, suitable size submersible cable, wire rope & valves etc .as required. | 01 | Job |
| 12 | Supply and erection of 7 Mtr. Galvanised octagonal pole with base plate 220 x 220 x 12 mm, top 70 mm and bottom 130 mm made up of 3 mm thick sheet suitable for max. wind speed minimum 160km/hr. including foundation bolts and G.I pipe B Class for incoming and outgoing cables and making foundation with cement concrete 1:2:4 of size 550 mm x 550 mm x 1500 mm, GI base plate, GI anchor plate etc. as required. The pole shall be supplied with a junction/looping box complete with 10 amps, 10 KA DP MCB 4 Nos. Screw less DIN mounting connector suitable for 16/25 sq.mm terminations complete with DIN bar, Shorting links, end locks etc. as required and 3x2.5 Sq.mm PVC insulated and PVC sheathed multistrand copper conductor power cable form junction box to the | 30 | Each |

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| | luminaire complete including terminations with copper lugs etc. as required. Octagonal pole should have of approximate 500 mm length at the elevation of 500 mm form the base plate. | | |
| 13 | Supply and fixing of following sizes of hot dipped galvanised bracket made out of minimum 3 mm thick sheet suitable for octagonal pole including fixing etc. as required. | | |
| 13.1 | Single arm bracket of 1.0 mtr. Long | 30 | Each |
| 13.2 | S&F LED security light fitting, 100 watts, 230 volts, 50Hz Ac supply, with high power, unique peanut lens for uniform light distribution and high efficiency long life LEDs with built-in electronic driver, unique peanut lens to ensure uniform distribution completely housed including suitable down rod and fixed on walls complete all as specified and as directed. | 30 | Each |

Note: - Lowest Contractor (L-1) will be decided on overall lowest rates basis. (All items to be used in this work should be branded and ISI certified or as per approved list of material may be followed. If any make is not specified, decision of Engineer-in-charge shall be final.) **All Local Body Approvals required for the execution and completion of said work including electrical connection, Testing/Commissioning of electrical equipments from State Electrical Inspector/Authority, if applicable and other applicable permissions shall be responsibility of the Contractor and all the charges towards the permissions shall be borne by the contractor. Nothing extra shall be paid by the department in this regard. (ii) All products shall be ISI marked and approved by Estate Officer & Engr-in-charge. (iii) Work shall be executed as per CPWD Specifications.**

DIG (Engineer), Works Dte
For and on behalf of the President of India