

**TENDER  
FOR  
SUPPLY, INSTALLATION, TESTING AND  
COMMISSIONING OF 1000A ACB AND 400 SQMM  
ARMOURED CABLE WITH MODIFICATION WORK  
AT  
NSIC EXHIBITION COMPLEX  
OKHLA INDUSTRIAL ESTATE  
NEW DELHI -110020**



**ISO 9001:2008**

**THE NATIONAL SMALL INDUSTRIES  
CORPORATION LTD.**

***(A Government of India Enterprise)*  
Okhla Industrial Estate  
New Delhi-110020**

**Website: <http://www.nsic.co>.THE NATIONAL SMALL  
INDUSTRIES CORPORATION LTD.  
(A GOVERNMENT OF INDIA ENTERPRISES)  
Okhla Industrial Estate New Delhi-110020**

Ref:- SIC/HO/STP/EXB/ST.LIGHT/1 (60)/06-10

Dt: 06-02-2013

M/s. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Sub: SUPPLY, INSTALLATION, TESTING AND COMMISSIONING OF 1000A ACB AND 400 SQMM ARMoured CABLE WITH MODIFICATION WORK AT NSIC EXHIBITION COMPLEX, OKHLA INDUSTRIAL ESTATE, NEW DELHI -110020.**

Sir,

Tender documents in respect of the above mentioned works containing 31 pages as detailed on page 6 (Index) are forwarded herewith. ***Please note that tender is to be issued in the office of the General Manager (S.G.) (Works/Estate) NSIC Ltd., NSIC Bhawan Okhla Industrial Estate New Delhi-110020 upto 18-02-2013, 3.00 P.M.***

The Tender should be signed on each page, dated and witnessed in all places provided for in the documents; all other papers should be initialed.

The tender should be accompanied with Earnest Money Deposit in the form of demand draft as mentioned in Appendix. Tenders without earnest money deposit shall be summarily rejected. The tenders will be opened at 4.00 P.M. on 19-02-2013.

The person, signing the tender on behalf of company/firm or on behalf of another person shall attach with tender a certified copy of proper authority/power of attorney on a non-judicial stamp paper of

requisite value duly executed in his favour by such person, company/firm and must state specifically that he has authority to sign such tenders for and on behalf of such person or company/firm as the case may be, and in all matters pertaining to the contract including arbitration clause.

This letter shall form part of the **“CONTRACT”** and must be signed and returned along with the tender documents.

**Yours faithfully**

**General Manager (S.G.)  
(Works/Estate)**

**Signature of the Contractor with stamp**

**Tender notice for Supply, Installation, Testing and Commissioning of 1000A ACB and 400 Sqmm Al.Armoured Cable with Modification work at NSIC Exhibition Complex, Okhla, New Delhi -110020.**

Tender Notice No-SIC/HO/STP/EXB/ST.LIGHT/1(60)/06-10 Dt: 06-02-2013

Sealed item rate tenders are hereby invited on behalf of NSIC Ltd. from experienced Contractors/dealers/suppliers/manufactures

S. No	Name of the work	Estimated Cost Rs. (Lacs)	EMD (Rs)	Completion Time	Issue of Blank Tender Document	Last Date for submission of Tender
1	Supply,Installation, Testing & Commissioning of 1000A ACB and 400 Sqmm Aluminum Armoured Cable with Modification work at NSIC Exhibition Complex, Okhla Industrial Estate, New Delhi - 110020.	4.28 Lacs	8000/-	45 days	From 06-02-2013 to 18-02-2013	19-02-2013 Up to 3.00 PM

- Blank tender documents (non-transferable) for above work shall be issued from 06-02-2013 to 18-02-2013 on working days from the address given below on payment of required tender fee of Rs. 500/- (Rupees Five Hundred only) (non-refundable) in cash/DD/Bankers Cheque in favour of "NSIC Ltd.", payable at New Delhi. The bidders may also download the tender documents from the website [www.nsic.co.in](http://www.nsic.co.in). However a separate demand draft/bankers cheque of Rs 500/- from any nationalized bank in favour of NSIC Ltd. payable at New Delhi is to be enclosed along-with the tender towards the cost of tender documents.

2. The tenderers should have three years experience of similar nature of work. Photocopies of the completion certificates/award letters should be submitted along with the tender. Completion certificate issued by the reputed organization / MNC shall also be accepted. In case of certificates issued by the private party, copies of TDS should also be enclosed.
3. Similar nature mean that bidder should have executed the work of Supply, installation, testing and Commissioning of LT Panel, MCCB, Cable work etc.
4. While applying for the tender document, the intending tenderers shall furnish proof of experience certificates, works completed/awarded, valid work contract tax /sales tax/ VAT/TIN as applicable.
5. The tender issuing authority reserves the right to issue or refuse to issue the tender document to any party without assigning any reason.
6. Tenders not accompanied by Earnest Money Deposit and tender cost in the prescribed form shall be summarily rejected.
7. NSIC reserves the right to reject all or any tender wholly or partly without assigning any reason whatsoever.

**General Manager (S.G.)  
(Works)**

**THE NATIONAL SMALL INDUSTRIES CORPORATION LTD.  
(A GOVERNMENT OF INDIA ENTERPRISES)  
Okhla Industrial Estate New Delhi -110020**

Ref: - SIC/HO/STP/EXB/ST.LIGHT/1 (60)/06-10

Date: 06-02-2013

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**THE NATIONAL SMALL INDUSTRIES CORPORATION LTD.**  
(A GOVT OF INDIA ENTERPRISE)  
NSIC BHAWAN, OKHLA INDUSTRIAL ESTATE,  
**NEW DELHI - 110020**

**INSTRUCTION TO THE TENDERERS**

The Tender shall be submitted in accordance with these instructions and any tender not conforming to the instructions as under is liable to be rejected.

These instructions shall form part of the tender and contract.

**1.0 GENERAL**

Tenderers are advised to acquaint themselves fully with the description of work, scope of services, time schedule and terms and conditions including all the provisions of the Tender Document before framing up their tender.

**2.0 SITE PARTICULARS**

Tenderers are advised to inspect and examine the site and its surroundings and satisfy themselves before submitting their tenders as to site conditions, means of access to the site.

**3.0 SUBMISSION OF TENDER**

The envelope must be super scribed "***Tender for Supply, Installation, Testing & Commissioning of 1000A ACB and 400 Sqmm Aluminum Armoured Cable with Modification work at NSIC Exhibition Complex, Okhla Industrial Estate, New Delhi - 110020***". The tender should reach the office of General Manager (S.G.) (Works), NSIC-LTD, NSIC Bhawan, Okhla Industrial Estate, Ph-III, New Delhi by 19<sup>th</sup> February 2013 up to 1500 hours. This envelope shall contain the following: -

- a) EMD in the form of Demand Draft drawn on a scheduled/nationalized bank in favour of 'NSIC LTD' payable at New Delhi be accepted.
- b) Details of the minimum two works of similar nature of value of Rs.2.00 Lacs each or one work of Rs 4.00 Lacs in their name, during last five years. Photocopies of the completion certificates/award letters should be submitted along with the tender. Completion certificate issued by the reputed organization / MNC shall also be accepted. In case of certificates issued by the private party, copies of TDS should also be enclosed.
- c) Valid registration with Sales Tax department for Work Contract Tax/VAT/TIN.
- d) Tender cost in requisite form if tender down loaded from the Website.
- e) Tender document with **PRICES and amount duly filled by the party against each item prescribed in the Schedule of quantity of tender document** and no conditions (i.e. deviations / assumptions / stipulations / clarifications / comments / any other request) whatsoever should be given.

The tenders will be opened at NSIC Bhawan on 19<sup>th</sup> February 2013 at 16:00 Hours (4.00 p.m). The Tenderer or their authorized representative (One person only) may be present at the time of opening of the tender.

#### **4.0 ABNORMAL RATES**

If it is noticed that the unit rates quoted by the Tenderer for any items are unusually high or unusually low, it will be sufficient cause for rejection of the tender unless the Corporation is convinced about the reasonableness of the unit rates on scrutiny of the analysis for such unit rate to be furnished by the tenderer on demand.



## **5.0 DEVIATIONS TO TENDER CLAUSES:**

Tenderers are advised to submit the tenderers strictly based on the terms and conditions and specification contained in the Tender Documents and not to stipulate any deviations. Conditional tenders are liable to be rejected.

## **6.0 AWARD OF WORK**

Corporation reserves the right to split the job into two or more parts and to award the work to separate agencies/contractors. Work shall be awarded to the lowest bidder, subject to the work experience and fulfillment of other terms & conditions and specifications.

## **7.0 ACCEPTANCE / REJECTION OF TENDER**

- i) Corporation does not bind itself to accept the lowest tender.
- ii) General Manager (S.G.) (Works) reserves the right to reject any tender/ bid wholly or partly without assigning any reason.
- iii) Corporation also reserves the absolute right to reject any or all the tenders at any time solely based on the past unsatisfactory performance by the bidder(s) the opinion/decision of NSIC regarding the same shall be final and conclusive.

## **9.0 CORRECTIONS**

No corrections or overwriting will be entertained in schedule of rates by using correcting fluid. All correction in the schedule of rate should be initialed.

## **10.0 FIRM RATES**

**The rates quoted by bidder shall remain firm till completion of all works even during the extended period, if any, on any account what so ever. It is provided that the contractor shall not change any of the rates, quoted in the tender till the completion of work.**

- 10.1 The tender shall be completed in all respect and should be signed with date by the Authorized Signatory of Tenderer on

all the pages of tender documents. Also the company stamp shall be placed under the signature of person on each and every page of tender document.

- 10.2 All the columns of the tender shall be duly, properly and exhaustively filled in. The rates and units shall not be overwritten. The rates shall always be both in figures and words.
- 10.3 Nothing extra shall be paid on account of any discrepancy in nomenclature of items. The Tenderer shall seek clarifications if any before submitting the tender.
- 10.4 While submitting the tender, any of the prescribed conditions are not fulfilled or tender is incomplete in any form, the same is liable to be rejected. If any Tenderer stipulates any condition of his own, such conditional tender is liable to be rejected.
- 10.5 Any cutting/over writing etc. in the tender must be signed by the person who is signing the tender.
- 10.6 NSIC LTD has right to verify the particulars furnished by the tenderer independently.
- 10.7 Tenderer shall take into account the cost of labour, loading/unloading & cartage, taxes etc. for giving delivery of material at site i.e. NSIC-HO Complex, Okhla Industrial Estate, Ph-III, New Delhi while quoting the rates. In this regard no claim what so ever shall be entertained.
- 10.8 The material shall be inspected on receipt at destination, i.e. NSIC-Exhibition Complex, Okhla Industrial Estate, Ph-III, New Delhi and tenderer shall be responsible for any damage during the transit of goods.
- 10.9 Complete tender document is available on our website [www.nsic.co.in](http://www.nsic.co.in), Any further corrigendum/addendum to this tender document shall be made available on aforesaid website. It is therefore, requested that the bidders may

regularly visit the website for checking any corrigendum/addendum to this document.

- 11 All the communication with respect to the tender shall be addressed to:

**General Manager (S.G.) (Works),  
NSIC- LTD, NSIC Bhawan,  
Okhla Industrial Estate,  
Phase-III, New Delhi-110020**

- 12 In the event of any dispute the legal matter shall be subjected to the jurisdiction of Delhi Court only.

*We hereby confirm our acceptance to the instructions (S.No-1 to 12) as given above.*

**Tenderer's Name & Signature with seal**

**THE NATIONAL SMALL INDUSTRIES CORPORATION LTD.  
(A GOVT OF INDIA ENTERPRISE)  
NSIC BHAWAN, OKHLA INDUSTRIAL ESTATE,  
NEW DELHI - 110020**

**COMMERCIAL AND GENERAL TERMS & CONDITIONS**

**Name of work: Supply, Installation, Testing & Commissioning of 1000A ACB and 400 Sqmm Al. Armoured Cable with Modification work at NSIC Exhibition Complex, Okhla, New Delhi -110020.**

**1. Scope of Supply:**

- a) The tenders shall be submitted as per the technical specification enclosed in Annexure-B.
- b) Sealed tenders should be submitted in the prescribed form and should be addressed to the **General Manager (S.G.) (Works), NSIC-LTD, NSIC Bhawan, Okhla Industrial Estate, Phase-III, New Delhi**. The envelope should be super- scribed as “Supply, Installation, Testing & Commissioning of 1000A ACB and 400 Sqmm Aluminum Armoured Cable with Modification work at NSIC Exhibition Complex, Okhla Industrial Estate, New Delhi -110020.The authorized person of the Tenderer should sign the tender documents.
- b) The quantity indicated in the Annexure- A is only approximate and liable for upward/downward revision. If additional quantity is required, the qualified Tenderer is bound to supply such quantity at the accepted rates.
- c) Submission of the tender implies that these conditions of Contract have been read by the Tenderer and is aware of the scope of the work and the quality of the material to be supplied. The final acceptance of the tender rests with the General Manager (S.G.) (Works) of NSIC-LTD, who

reserves the right to accept or reject any or all tenders without assigning any reason therefore.

**2. Validity of tender:**

The tender shall be valid for a period of 90 days from the date of opening of tender. If any Tenderer withdraws his tender before the said period or makes any modifications in the terms and the conditions of the tender which are not acceptable to the NSIC, then the NSIC shall, without prejudice to any other rights or remedy, be at liberty to forfeit his EMD.

**3. Price:**

The price shall be firm and shall include all applicable taxes. Any variation in the taxes duties, levies etc. during the period of contract shall be to the Tenderer account. The rates quoted shall be all inclusive on FOR destination. Destination means NSIC-Head Office Complex, Okhla Industrial Estate, Phase-III, New Delhi. The Corporation will not issue Forms C and or D. The tenderer should note this while quoting the rates. The price shall be quoted both in figures and words.

The successful tenderer shall produce PAN Number, TIN Number registration details along with the tender document. Applicable taxes, if any, will be recovered from the bills.

**4. Delivery:**

a) The successful tenderer shall complete supplies strictly within the accepted delivery period. Material ordered by the NSIC shall be delivered FOR destination securely packed as may be necessary.

b) Installation & commissioning of ACB and power cable etc their operation shall also have to be carried out at NSIC-Exhibition Complex, Okhla Industrial Estate, Phase-III, New Delhi with the rates quoted for the items of work.

## 5. Earnest Money Deposit:

- a) An EMD of Rs 8,000/- shall be paid along with the tender either by way of DD/Pay order drawn in favour of the “**National Small Industries Corporation Ltd**” payable at New Delhi.
- b) Non furnishing of EMD at prescribed rate alongwith the tender or by claiming exemption will attract to rejection of the tender.
- c) NSIC shall not be liable for payment of any interest on EMD or any depreciation thereof.
- d) Any request by the bidders to consider their EMD furnished by them to NSIC for any other contract/tender as EMD for this tender cannot be considered. Hence the bidders have to invariably furnish the required EMD for this tender.
- e) The EMD will be returned to the unsuccessful bidders soon after the orders are placed on the successful bidder/s.
- f) In case of successful bidder, the EMD will be converted as part of Security Deposit (SD) for due performance of the contract.
- g) The EMD/SD will be forfeited in the following cases:
  - I. If the bidder fails to accept the order based on his offer and/or fails to agree to enter into contract within the prescribed time.
  - II. If the Tenderer for any reason withdraws the tender after it is accepted or fails to execute the orders within stipulated period, the NSIC shall be at liberty to cancel the order forthwith. The EMD of the tenderers in such a case will be forfeited by the Corporation.
  - III. If the bidder delays supplies beyond a reasonable time resulting in disruption of NSIC works.

## **6 Inspections and Approval:**

All work embracing more than process shall be subject to examination and approval at each stage thereof and the Contractor shall give due notice to the Engineer-in-Charge or his authorized representative when each stage is ready. The Engineer-in-Charge or his representative shall have powers at any time to inspect and examine any part of the Works and the contractor shall give such facilities as may be required for such inspection and examination, at manufacturers works if necessary.

## **7. MATERIALS**

All materials to be provided by the Contractor shall be in conformity with the specifications laid down in the contract and the Contractor shall, if requested by the Engineer-in-Charge, furnish proof to the satisfaction of Engineer-in-Charge in this regard.

## **8. Security Deposit:**

Total security deposit shall be 10 % of the accepted tender cost and shall be deposited/deducted by/from the contractor as following: -

### **a). Initial Security Deposit:**

The earnest money deposited shall be converted into initial security deposit.

### **b). Balance Security Deposit**

Balance security deposit will be recovered in through deduction of bill up to 10% of total accepted tender cost after adjustment of EMD.

9 All compensation or other sums of money payable by the contractor under the terms of this Contract or any other

Contract or any other account whatsoever may be deducted from the security deposit.

Refund **of Security deposit.** Security deposit deducted & refundable to the Contractor shall be refunded to the Contractor on the Engineer-In-Charge certifying in writing that the work has been completed satisfactorily and after defect liability period of 12 months.

No interest shall be payable to the contractor on the Security Deposit furnished/ recovered from the contractor, by the Corporation.

## **10 Deviations/Variations Extent and Pricing**

The Engineer-in-charge shall have power (i) to make alteration, in omissions from, additions to, or substitutions for the original specifications, drawings, designs and instructions that may appear to him to be necessary or advisable during the progress of the work, and (ii) to omit a part of the works in case of non-availability of a portion of the site or for any other reasons and the contractor shall be bound to carry out the works in accordance with any instructions given to him in writing signed by the Engineer-in Charge and such alterations, omissions, additions or substitutions shall form part of the contract as if originally provided therein and any altered, additional or substituted work which the contractor may be directed to do in the manner specified above as part of the works, shall be carried out by the contractor on the same conditions in all respects including price on which he agreed to do the main work except as hereafter provided.

10.1 The time for completion of the works shall, in the event of any deviations resulting in additional cost over the tendered value sum being ordered, be extended if requested by the contractor, as follows:

- i) In the proportion which the additional cost of the altered, additional or substituted work, bears to the original tendered value plus



- ii) 25% of the time calculated in (i) above or such further additional time as may be considered reasonable by the Engineer-in-Charge.

## **10.2 Deviation, Extra Items and Pricing Rates for Extra/ Additional Items**

- i) If the rate for additional, altered or substituted item of work is specified in the Schedule of Quantities, the Contractor shall carry out the additional, altered or substituted item at the same rate.
- ii) If the rate for any altered, additional or substituted item of work is not specified in the schedule of Quantities, the rate for that item shall be derived from the rate for the nearest similar item specified therein.
- iii) If the rate for any altered, additional or substituted item of work cannot be determined in the manner specified in sub-paras (i), and (ii) above, the contractor shall, within 7 days of the date of receipt of the order to carry out the said work, inform the Engineer-in-Charge under advice to the Accepting Authority of the rate which he proposes to claim for such item of work, supported by analysis of the rate claimed, and the Engineer-in-Charge shall, within fifteen days thereafter, after give due consideration to the rate claimed by the Contractor determine the rate on the basis of market rate(s). In the event of the contractor failing to inform the Engineer-in-Charge within the stipulated period of time, the rate which he proposes to claim, the rate for such item shall be determined by the Engineer-in-Charge on the basis of market rate(s) shall be final. Payment of such items shall be made accordingly.

## **11.0 Time and Extension for Delay:**

- 11.1 The time allowed for execution of the works as specified in the Appendix or the extended time in accordance with these

conditions shall be the essence of the Contract. The execution of the works shall commence from the 10<sup>th</sup> day after the date on which the Corporation issues written orders to commence the work or from the date of handing over of the site, which ever is earlier.

11.2 As soon as possible after the Contract is concluded the Engineer-in-Charge and the Contractor shall agree upon a Time and Progress Chart. The Chart shall be prepared in direct relation to the time stated in the Contract documents for completion of items of the works.

11.3 If the work be delayed by

- (a) Force majeure or
- (b) Abnormally bad weather or
- (c) Serious loss or damage by fire, or
- (d) Civil commotion, local combination of workmen strike or lockout, affecting any of the trades employed on the work, or
- (e) Delay on the part of other contractors or tradesmen engaged by Corporation in executing work not forming part of the contract, or
- (f) Any other cause, which, in the absolute discretion of the authority mentioned in Appendix, is beyond the Contractor's control;

11.4 Then upon the happening of any such event causing delay, the Contractor shall immediately give notice thereof in writing to the Engineer-in-Charge but shall nevertheless use constantly his best endeavors to prevent or make good the delay and shall do all that may be reasonably required to the satisfaction of the Engineer-in-Charge to proceed with the Works.

**11.5** The Contractor shall arrange, at his own expense, all tools, plant and equipment hereafter referred to as (T & P) labour, P.O.L. & electricity/water required for execution of the work.

## **12 FORCE MAJEURE**

Any delays in or failure of the performance of either party herein shall not constitute default hereunder or give rise to any claim for damages, if any, to the extent such delays or failure of performance is caused by occurrences such as Act of god or the public enemy; expropriation or confiscation of facilities by Government authorities, or in compliance with any order or request of any Governmental authorities or due acts of war, rebellion or sabotage or fires, floods, explosions, riots or illegal joint strikes of all the workers of all the contractors.

## **13 Labour:**

a.) The Contractor shall employ its labour in sufficient numbers to maintain the required rate of progress and of quality to ensure workmanship of the degree specified in the Contract and to the satisfaction of the Engineer-in-Charge. The Contractor shall not employ in connection with the Works any person who has not completed eighteen years of age.

b.) All the workers or employees deployed by the contractors shall consider the employees of contractor and corporation shall not have any liability what so ever in nature in regard to such workers/employees.

c.) The Contractor shall pay to labour employed by him directly wages not less than fair wages as per Minimum Wages Act. Fair Wage' means wages, which shall include wages for weekly day of rest and other allowances whether for time or piece work, after taking into consideration prevailing market rates for similar employment in the neighborhood but shall not be less than the minimum rates of wages fixed under the payment of Minimum Wages Act.

d.) The Contractor shall in respect of labour employed by him or his sub-contractor comply with or cause to be complied with the Contractor Labour Regulation in regard to all matters provided therein.

e.) The Contractor shall comply with the provisions of the payment of Wages Act, 1936, Minimum Wages Act, 1948, Employers' Liability Act, 1938. Workmen's Compensation Act, 1923, Industrial Disputes Act, 1947, Maternity Benefit Act, 1970 or any modification thereof or any other law relating thereto and rules made there under from time to time.

f.) The Contractor shall indemnify and keep indemnified the Corporation against:

- i) Any claim arising out of third party loss/ damage to life or property caused by/ during execution of the work.
  - a. Any claim arising out of loss/ damage to the workmen engaged by the Contractor during execution of the work.
  - b. Any claim due to non-compliance of applicable PF/ Labour laws, ESI Regulations etc.

#### **14 Liquidated Damages for Delay**

Time is essence of the contract. In case the CONTRACTOR fails to complete the whole work within the stipulated period, and clear the site he shall be liable to pay liquidated damages @ 0.5% (One Half of one percent only) of the value of contract per week and or part thereof of the delay subject to a maximum of 10% (ten percent only) of the value of the contract. The amount of Compensation may be adjusted or set-off against any sum payable to the Contractor under this or any other contract with the Corporation.

## **15 Instruction and Notices:**

- 15.1 Subject as otherwise provided in this contract, all notices to be given on behalf of the Corporation and all other actions to be taken on its behalf may be given or taken by the Engineer-in-Charge or any officer for the time being entrusted with the functions, duties and powers of the Engineer-in-Charge.
- 15.2 All instructions, notices and communications, etc., under the contract shall be given in writing and if sent by registered post to the last known place of abode or business of the Contractor shall be deemed to have been served on the date when in the ordinary course of post these would have been delivered to him.
- 15.3 Foreclosure of Contract in Full or in Part due to Abandonment or Reduction in Scope of Work.

If at any time after acceptance of the tender the Corporation shall decide to abandon or reduce the scope of the works for any reason whatsoever and hence not require the whole or any part of the Works to be carried out the Engineer-in-Charge shall give notice in writing to that effect to the Contractor and Contractor shall have no claim to any payment of compensation or otherwise whatsoever, on account of any profit or advantage which he might have derived from the execution of the works in full but which he did not derive in consequence of the foreclosure of the whole or part of the works.

- 15.4 The Contractor shall be paid at Contract rates full amount for works executed at Site as certified by the Engineer-in-Charge.

## **16 Cancellation of Contract in Full or in Part:**

If the Contractor:

- a. At any time makes defaults in proceeding with the Works with due negligence and continues to do so even after a notice in writing of 7 days from the Engineer-in-Charge; or
- b. Commits default in complying with any of the terms and conditions of Contract and does not remedy it or take effective

- steps to remedy it within 7 days after a notice in writing is given to him in that behalf by the Engineer-in-Charge; or
- c. Fails to complete the works or items of work on or before the date(s) of completion, and does not complete them within the period specified in a notice given in writing in that behalf by the Engineer-in-Charge; or
  - d. Violates any of the terms and conditions stipulated in this agreement
  - e. Being a company, passes a resolution or the Court makes an order for liquidation of its affairs, or a receiver or manager on behalf of the debenture holders is appointed or circumstances shall arise which entitle the Court or debenture holders to appoint a receiver or manager; or

**17. Liability for Damage, Defects or Imperfections and Rectification thereof:**

If the Contractor or his workmen or employees shall injure or destroy any part of the building in which they may be working or any building, road, fence, etc. contiguous to the premises on which the work or any part of it is being executed, or if any damage shall happen to the work while in progress the Contractor shall upon receipt of a notice in writing in that behalf make the same good at his own expense. In case of repairs and maintenance works, splashes and dropping from white washing, painting, etc. shall be removed and surfaces cleaned simultaneously with completion of these items of work in individual rooms, cabins or premises, etc. where the work is done, without waiting for completion of all other items of work in the contract. In case the Contractor fails to comply with the requirements of this condition, the Engineer-in-Charge shall have the right to get the work done by other means at the cost of the Contractor. Before taking such action, however, the Engineer-in-Charge shall give three days notice in writing to the Contractor.

## **18 Urgent Works:**

If any Urgent work (in respect whereof the decision of the Engineer-in-Charge shall be final and binding) becomes necessary and Contractor is unable or unwilling at once to carry it out, the Engineer-in-Charge may by his own or other workpeople carry it out, as he may consider necessary. If the urgent work shall be such as the Contractor is liable under the contract to carry out at his expenses, the expenses incurred on it by the Corporation shall be recoverable from the Contractor and be adjusted or set off against any sum payable to him.

## **19 VALUATIONS AND PAYMENT:**

19.1 The Engineer-in-Charge shall accept as otherwise stated ascertain and determine by measurement the value in accordance with the contract work done in accordance therewith.

19.2 All items having a financial value shall be entered in Measurement Book, etc. prescribed by the Corporation so that a complete record is obtained of all work performed under the contract.

19.3 Payment will be made on actual measurement basis as carried out at the site. The quantities given in the schedule of quantities are only approximate and contractor will have to carry out the work as per the increased/decreased quantity of work as per the directions of Engineer-in-Charge, for which no extra claim over and above the tender rate will be considered. For releasing the payment up-to accepted tender amount the GM-SG (Works) is the approving authority.

19.4 The Contractor shall, without extra charge, provide assistance with every appliance, labour and other things necessary for measurements.

**No escalation will be paid even in extended period, if any.**

19.5 All measurements shall be taken jointly by the Engineer-in-charge or his authorized representative and by the contractor or

his authorized representative from time to time during the progress of the work and such measurements shall be signed and dated by the Engineer-in-charge and the parties. If the Contractor objects to any of the measurements recorded on behalf of the Corporation a note to that effect shall be made in the Measurement Book against the item object to and such note shall be signed and dated by all the parties engaged in taking the measurement. The decision of the Competent Authority on any such dispute or difference or interpretation shall be final and binding on both the parties and shall be beyond the scope of the settlement of disputes of Arbitration in respect of all contract items, substituted items, extra items and deviations.

19.6 All statutory deductions as applicable like TDS, sales tax/VAT shall be made from the due payment of the contractor.

## **20. Methods of Measurement:**

Except where any general or detailed description of the work in Quantities expressly shows to the contrary, Schedule of Quantities shall be deemed to have been prepared and measurements shall be taken in accordance with the procedure set forth in the Schedule of Rates / Specification notwithstanding any provision in the relevant Standard Method of Measurement or any general or local custom.

## **21 Income Tax/WCT/VAT**

21.1 Income tax including surcharge if any, at the prevailing rate shall be deducted from the Contractor's bills as per the provision of Income Tax Act.

21.2 The Contractor shall ascertain from the concerned commercial tax department regarding the applicability of Works Contract Tax / VAT/TIN. Necessary deductions will be made from the contractor's bill as applicable.



**22. Duration & Termination of contract:**

- a) The time of completion of work is 45 days from the date of acceptance of work order.
- b) Service Facility: In order to ensure proper and timely after sales service manufacturer or authorized agency shall have an office in New Delhi with well equipped service centers with technically qualified people across Delhi or shall be able to deploy Service Personnel at short notice and attend the maintenance within 24 hours.

**23. Claims:**

- a) If the materials supplied are found to be of size and shape different than those contracted and of specifications lower than those stipulated in this contract, NSIC shall have right to totally reject the goods and/or to prefer a claim for compensation for the part of goods, which is rejected. The tenderer shall reimburse to NSIC, the actual expenditure on such goods by way of cost, within 15 (fifteen) days of its demand. The tenderer shall be responsible for arranging the rejected goods to be removed at his cost from NSIC premises, if so desired by NSIC.
- b) The tenderer shall also compensate for losses, if any, sustained by Corporation due to defective packing and/or marking of the goods not in accordance with the terms of the Contract.

**24. Breach of Contract:**

- a) In case of failure of the tenderer to perform the contract as per the terms and conditions and to the satisfaction of NSIC. NSIC reserves the right to terminate the contract without assigning any reason. NSIC shall have a right to execute the work through any other agency at the risk and cost of the Tenderer.

b) Following actions on the part of tenderer will constitute breach of contract:

1. Non supply of Electrical items up to stipulated time, the quantity as per specifications ordered by the Corporation
2. Supply & installation of poor quality/sub standard ACB/Power cables and other materials
3. Inordinate delay on supply, installation, testing and commissioning of equipments
4. Failure to replace/provide alternate materials in place of faulty/damaged, seconds or sub standard materials

In case the tenderer commits any of the above acts the Corporation reserves the right to repudiate the contract without assigning any reasons besides taking appropriate action against the tenderer including forfeiture of security deposit.

## **25. Guarantee:**

The tenderer shall be unconditionally guarantee that the Material supplied and work executed shall:-

- a. Be in satisfactory condition and free from all defects including defects arising out of inferior materials faulty and inferior workmanship.
- b. Be of highest quality and fit for the purpose for which they are intended.
- c. The equipments offered shall confirm to the specifications as given in tender/order and shall be guaranteed against defective design, defective quality material supplied, manufacturing defects etc. for a minimum period of 12 months from the date of supply and installation of ACB with cable and provide onsite warranty for the period as confirmed in tender (minimum one year). Onsite warranty of minimum 12 months covers free service and free spare parts excluding cost of consumables.

## **26 Carrying out part work at risk & cost of contractor**

The Engineer-in-charge without prejudice to any other right or remedy against the contractor which have either accrued or accrue thereafter to the Corporation, by a notice in writing to take the part work/ part incomplete work of any item(s) out of his hands and shall have powers to:

- a. Take possession of the site and any materials, constructional plant, implements, Stores etc., thereon; and/or
- b. Carry out the part work/ part incomplete work of any item(s) at the risk and cost of the contractor.

Any excess expenditure incurred or to be incurred by the Corporation in completing the part work/ part incomplete work of any item(s) or the excess loss of damages suffered or may be suffered by the Corporation as aforesaid without prejudice to any other right or remedy available to Corporation in law or as per agreement be recovered from any money due to the contractor on any account, and if such money is insufficient, the contractor shall be called upon in writing and shall be liable to pay the same within 30 days.

If the contractor fails to pay the required sum within the aforesaid period of 30 days, the Engineer-in-charge shall have the right to sell any or all of the contractors' unused materials, constructional plant, implements, temporary building at site etc. and adjust the proceeds of sale thereof towards the dues recoverable from the contractor under the contract and if thereafter there remains any balance outstanding, it shall be recovered in accordance with the provision of the contract.

In the event of above course being adopted by the Engineer-in-charge, the contractor shall have no claim to compensation for any loss sustained by him by reason of his having purchased or procured materials or entered into any engagements or made any advance on any account or with a view to the execution of the work or the performance of the contract.

## 27     **ARBITRATION AND LAWS**

### **Arbitration:**

Except where otherwise provided for in the contract all questions and disputes relating to the meaning of the specifications, designs, drawings and instructions herein before mentioned and as to the quality of workmanship or materials used onto work or as to any other question, claim right matter or thing whatsoever in any way arising out of or relating to the contract, designs drawings, specifications, estimates, instructions, orders and these conditions or otherwise concerning the works, or the execution or failure to execute the same whether arising during the progress of the work or after the completion or abandonment thereof shall be referred to the sole arbitration of the Chairman-cum-Managing Director of the National Small Industries Corporation Ltd. and if the Chairman-cum-Managing Director is unable or unwilling to act, to the sole arbitration of some other person appointed by the Chairman cum Managing Director, National Small Industries Corporation Ltd. willing to act as such arbitrator. There will be no objection if the arbitrator so appointed is an employee of the National Small Industries Corporation Ltd. and that he had to deal with the matters to which the contract relates and that in the course of his duties as such he had expressed views on all or any of the matters in dispute or difference. The arbitrator to whom the matter is originally referred being transferred or vacating his office or being unable to act for any reason as aforesaid at the time of such transfer, vacation of office or inability to act., Chairman and Managing Director, National Small Industries Corporation Ltd. shall appoint another person to act, as arbitrator in accordance with the terms of the Contract. It is also a term of this contract that no person other than a person appointed by C.M.D., National Small Industries Corporation LTD., as aforesaid should act as arbitrator and if for any reason, that is not possible, the matter is not to be referred to arbitration at all.

Subject as aforesaid the provision of the Indian Arbitration and Reconciliation Act, 1996, or any statutory modification or re-enactment thereof and the rules made there under and for the

time being in force shall apply to the arbitration proceeding under this clause.

It is a term of the contract that the party invoking arbitration shall specify the dispute or disputes to be referred to arbitration under this clause together with the amount or amounts claimed in respect of each such dispute.

The arbitrators may from time to time with consent of this party enlarge the time, for making and publishing the award.

The work under the contract shall, if reasonably possible continue during the arbitration proceedings and so payment due to payable to the Contractor shall be withheld on account of such proceedings.

The Arbitrator shall be deemed to have entered on the reference on the date he issued notice to both parties fixing the date of the first hearing. The Arbitrator shall give a separate award in respect of each dispute of difference referred to him.

The venue of arbitration shall be such place as may be fixed by the Arbitrator in sole discretion.

The award of the arbitrator shall be final, conclusive and binding on all parties to this contract.

The cost of arbitration shall be borne by the parties to the dispute, as may be decided by the arbitrator(s).

The Indian Laws shall govern this contract for the time being in force. The courts at New Delhi / Delhi only shall have the jurisdiction

Signature of the Tenderer

## Undertaking from the Tenderer

To

General Manager (S.G.) (Works)  
NSIC Ltd., NSIC Bhawan  
Okhla Industrial Estate,  
New Delhi-110020

I/We have read and examined the following documents relating to Supply, Installation, Testing & Commissioning of 1000A ACB and 400 Sqmm Al. Armoured Cable with Modification work at NSIC Exhibition Complex, Okhla Industrial Estate, New Delhi -110020.

- a). Notice inviting tender.
- b). Instructions to Tenderers
- c). Technical Specifications
- d). General Conditions of Contract including Contractors, Labour Regulations, Model Rules for Labour Welfare and Safety Code appended to these conditions together with the amendments thereto if any.
- e). Special Conditions of contracts if any.
- f). Bill of Quantities

I/We hereby tender for execution of the works referred to in the aforesaid documents upon the terms and conditions contained or referred to therein and in accordance in all respects with the specifications, designs, drawings and other relevant details at the rates contained in Schedule and within the period(s) of completion as stipulated in Appendix.

In consideration of I/We being invited to tender, I/We agree to keep the tender open for acceptance for 90 days from the due date

of submission thereof and not to make any modifications in its terms and conditions which are not acceptable to the Corporation.

A sum of Rs 8,000/- is hereby forwarded as Earnest Money Deposit in the form of Demand Draft/Pay order in favour of NSIC Ltd. payable at New Delhi . If I/We fail to keep the tender open as aforesaid or make any modifications in the terms and conditions of the tender which are not acceptable to the Corporation, I/We agree that the Corporation shall without prejudice to any other right or remedy, be at liberty to forfeit the said earnest money absolutely. Should this tender be accepted, I /We agree to abide by & fulfill all the terms conditions of aforesaid document.

If after the tender is accepted, I/we fail to commence the execution of the work as provided in the conditions. I/We agree that Corporation shall without prejudice to any other right or remedy is at liberty to forfeit the said earnest money absolutely.

**Signature of contractor.....**

**Duly authorized to sign the tender on behalf of the (in block capitals).....**

.....

Dated.....

Witness.....

Address.....

.....

## APPENDIX

- |  |  |
|--|--|
| 1. Competent Authority   | C.M.D. NSIC or his<br>Authorized executives                                    |
| 2. Earnest money/Security deposit  |  |
| a) Estimated cost of the Works   | Rs. 4.28 Lacs  |
| b) Earnest money   | Rs 8,000/- in the form of<br>DD /Pay order in favour<br>of NSIC Ltd.,New Delhi |
| c) Security Deposit  | 10% of the contract value  |
| 3. Deviation limit for items of work   |  |
| Deviation limit beyond which clauses 10.2<br>shall apply for the building / Development work   | 30%  |
| 4. Time allowed for execution of work  |  |
|  | 45 Days  |
| 5. Authority competent to grant extension of time for<br>or his any cause of delay which is beyond<br>Authorized representative Contractor's control |  |
|  | GM-SG (Works/Estate)   |
| 6. Liquidated Damaged  |  |
|  | 0.5% per week subject<br>to a Maximum 10% value of the<br>contract             |
| 7. Approving Authority for releasing the payment<br>up to the accepted tender cost.  |  |
|  | GM-SG (Works/Estate)<br>New Delhi  |
| 8. Defect Liability Period   |  |
|  | 12 months from the date<br>of Completion of work.                              |
| 9. Authority competent to reduce<br>Compensation   |  |
|  | GM-SG (Works) NSIC Ltd.<br>New Delhi   |

(Signature of the Contractor)



## **SPECIAL CONDITIONS**

1. Any facility not mentioned in this scope, but which is vital to erection and commissioning of ACB & Power cables are assumed to be included in the scope of work.
2. Electricity for erection at site will be provided free of cost at NSIC substation. However, cable, T &P etc will have to be managed by the contractor.
3. Contractor has to ensure safety and provide adequate supervision/precautions.
4. During working at site, some restrictions may be imposed by Engineer-in-Charge/Security staff of Corporation or Local Authorities regarding safety and security etc., the contractor shall be bound to follow all such restrictions/instruction & nothing extra shall be payable on this account & no claim for delay on this account shall be entertained.
5. No compensation shall be payable to the contractor for any damage caused by rains lightning, wind, storm, floods Tornado, earth quakes or other natural calamities during the execution of work. He shall make good all such damages at his own cost; and no claim on this account will be entertained.
6. The tender shall be based on Conditions of Contract and tenderers are required to quote their own rates against each item in schedule of quantities, which is enclosed. All rates shall remain firm for the contract period/extended contract period.
7. If the contractor fails to proceed with the work within the stipulated time as specified from the date of issue of letter of intent/letter to proceed with the work, the Corporation shall forfeit the earnest money deposited by him along with the tender.
8. All the works to be carried out in accordance with latest CPWD/BIS Specifications and as per the directions of Engineer-in-charge.

**Packing :**

The supplier shall provide such packing of the goods, as is required to prevent their damages or deterioration during the transit to their final destination as indicated in the contract. The packing shall be sufficient to withstand, without limitation, rough handling during transit.

**DRAWING AND SPECIFICATIONS**

A copy of tender documents and all relevant drawings and specifications viz. Indian standards, latest CPWD specifications etc. shall be made available at site if & when asked for reference.

**COST OF TESTS**

The cost of preparing samples and carrying out tests for quality of material or workmanship will be borne by the contractor except for such exclusions as are specifically mentioned in the specifications laid down in contract. The cost of all test carried out by Laboratories directed by the Engineer-in-Charge will be borne by the contractor.

**ADDITIONAL CONDITIONS**

The work shall be carried out strictly as per the attached technical specifications, relevant IS specifications, Indian Electricity Rules & National Electrical Code.

The contractor has to get approved all the material from the Engineer-in-Charge before its actual use at site of work.

The contractor has to quote his rate after including all the works mentioned in schedule of quantities, scope of work, specification and additional conditions.

All inter-connections in cubical panel shall with suitable size of Copper/Aluminium links/cables as per specification.

All the material shall be ISI marked except those items whose make is specified in the tender.

No T & P shall be issued to the Contractor.

The scope of work includes all minor building works required for execution work such as cutting of wall etc. and making good the same. Nothing extra will be paid to contractor for the same.

The watch and ward of material and installation shall rest on the part of contractor during execution of work and till handing over of the same after completion of work in accordance with schedule of work.

The contractor will take care of the building etc. while handling / installing the equipment to avoid damages to the building. If any damages occur during execution of work, it shall be made good by contractor without any extra cost.

**General Manager (S.G.)  
(Works)**

SIGNATURE OF THE CONTRACTOR

### Schedule of Work

S. No	Description of item	Qty.	Rate (Rs.)	Amount (Rs.)
1	Fabrication, supply, installation, testing & commissioning of CPRI approved dust & vermin proof compartmentalized type floor mounted electrical cubical panel board powder coated made out of 2 mm thick CRCA sheet for frame and covers, 3 mm thick for gland plates including cleaning & finishing complete with 7 tank process for power coating in approved shade, having 1000 amps capacity extensible type TPN Aluminum alloy bus bar of high conductivity, with short circuit withstand capacity of 31 MVA for 1 sec, entire panel shall have a common copper earth bar of size 25mmx5mm at the rear with 2 Nos earth stud, solid sections from main bus bars to ACB with required size of Al. bus bars and control wiring with 1.5 sqmm PVC insulated copper conductor S/C cable, cable alleys, cable gland plates in two half including connections, interconnections, testing, commissioning etc as required along with accessories as given below:-	01 job		
a	One nos 1000 amps, 4-pole Motorized electrically operated draw out with cradle type 3 position Air Circuit Breaker of fault breaking capacity 50 KA (Ics= Icu upto 433V) manually/automatic operated, fitted with interlocked door, automatic safety shutters, mechanical ON/OFF and service/test/isolated position indicators and frame earthing contact, conforming to IS complete with electronic microprocessor release for O/C &			

	E/F and shunt trip under voltage. Make: ABB-EMAX/Siemens 3WL/ L&T-U Power/GE-entligaurd/Scheniders- Masterpact			
b.	3-phase indication LED Lamps with 2 amps back up HRC Fuse, breaker 'ON' Indicating light with 2A HRC Fuse, test terminal block set, fuses, circuits etc, auxiliary contacts for positive interlocking of the breakers as required.			
c.	Digital type Voltmeter (0-500V) with Selector Switch and back up HRC Fuses/MCBs---01 Set Make:AE/Rishabh/L&T			
d.	Digital type Ammeter (0-800A) with Selector Switch and one set of 3 nos CTs of ratio 100/5 amps class-1 accuracy. Make:AE/Rishabh/L&T			
e.	TPN Aluminium bus bars of minimum 1000 amps capacity with heat shrinkable coloured sleeves and including DMC/SMC Bus bars supports at required intervals completer for cross section, size supports & their spacing etc for withstanding fault level of 31 MVA for 1 sec.			
2.	Supply & laying PVC Insulated XLPE Aluminium conductor power cable of 1.1 KV Grade of size 3.5x400 sqmm on surface/in open duct as required.	120 mtr		
<b>Make: Havells, Gloster, Universal or Equivalent</b>				
3	Supply and making end termination with brass compression gland and aluminum lugs and other jointing materials for 3.5x400 sqmm	12 set		

	PVC insulated XLPE aluminium conductor cable of 1.1 KV grade as required.			
4	Necessary modification work on existing LT distribution panel to connect with new ACB panel, providing aluminium bus bars of minimum current carrying capacity of 1000 amps with the existing system insulated with heat shrinkable coloured sleeves and including cutting, bending, making holes, tightening etc as per requirement of site.	01 Job		
5	Supply, replacement, testing and commissioning of backlite front cabinet cover of Siemens make 3-pole, 1000 amps ACB of existing panel as required on site.	01 job		
	Total (Rs.)=			

Total in words -----  
-----

**Signature of bidder with stamp**

## **TECHNICAL SPECIFICATIONS**

### **1. SCOPE:**

The scope of this specification covers manufacture, transport, installation, testing and commissioning of the complete LT Panel consisting of 1000Amps 4-Pole, ACB and laying of power cables and necessary modification works as directed by engineer in charges are including the Civil Foundation Works.

### **CONSTRUCTION.**

#### **LT Panel shall be: -**

- i Of metal enclosed , indoor, floor mounted, free standing construction, extensible type.
- ii. Made up of the requisite vertical sections, which when coupled together shall form continuous dead front switchboards.
- iii. Provide dust and damp protection, the degree of protection being not less than IP 42 to IS: 2147
- iv. Be readily extensible on both sides by the addition of vertical sections after removal of the end covers.

LT Panel shall be constructed only of materials capable of withstanding the mechanical, electrical and thermal stresses, as the effects of humidity, which are likely to be encountered in normal service.

Each vertical section shall comprise

- i. A front framed structure of rolled/ folded sheet steel channel section, of minimum 2mm thickness, rigidly bolted together. This structure shall house the components contributing to the major weight of the equipment, such as circuit breaker cassettes, fuse switch units, main horizontal bus-bars, vertical risers and other front mounted accessories.
- ii. A rear cable chamber housing the cable end connections, and power / control cable terminations. The design shall ensure generous availability of space for ease of installation and maintenance of cabling and adequate safety for working in one vertical section without coming into accidental contact with live parts in a adjacent section.
- iii. A cover plate at the top of the vertical section, provided with a ventilating hood where necessary. Any aperture for ventilation shall be covered with a perforated sheet having less then 1 mm dia. perforations to prevent entry of vermin.
- iv. Front and rear doors fitted with dust excluding neoprene gaskets with fasteners designed to ensure proper compression of the gaskets. When covers are provided in place of doors, generous overlap shall be assured between sheet steel surfaces with closely spaced fasteners to preclude the entry of dust.

Doors and covers shall be of min. 2mm. thick sheet steel. Sheet steel shrouds and partitions shall be of min. 2mm. thickness. All sheet panels shall be smoothly finished, leveled and free from flaws. The corners should be rounded.

The apparatus and circuits in the power control Contrals shall be so arranged as to facilitate their operation and maintenance and at the same time to ensure the necessary degree of safety.

Apparatus forming part of the Main L.T. Panels shall have the following min. clearances.

- i. Between phases - 32 mm.



- ii. Between phases and neutral - 26 mm.
- iii. Between phases and earth - 26 mm.
- iv. Between neutral and earth - 26 mm.

When, for any reason, the above clearances are not available, suitable insulation shall be provided. Clearances shall be maintained during normal service conditions.

All insulating material used in the construction of the equipment shall be of non-hygroscopic material, duly treated to withstand the effects of the high humidity, high temperature tropical ambient service conditions.

All doors/covers providing access to live power equipment/circuits shall be provided with tool operated fasteners to prevent unauthorized access.

Provision shall also be made for permanently earthing on the frames and other metal parts of the switchgear by two independent connections.

### **BUSBARS.**

The busbars shall be air insulated and made of high conductivity, high strength Al. alloy complying with the requirement of IS grade.

The busbars shall be suitable braced with non-hygroscopic SMC supports to provide a through fault withstand capacity of 50 KA RMS symmetrical for one second and a peak short circuit withstand capacity of 105 KA.

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 busbars. Large clearances and minimize possibilities of fault.

The Main L.T. Panel shall be designed that the cables are not directly terminated on the terminals of breaker/switch fuse/fuse switch etc. but on cable termination links. The main busbars shall have continuous current rating throughout the length of L.T. panel. The cross section of neutral busbars shall be same as that of phase busbar for busbars of capacity upto 1000Amp, for higher capacity the neutral busbar shall not be less than half (50%) the cross section of that the phase busbars. The busbar system shall consist of main horizontal busbar and auxiliary vertical busbars run in busbar alloy/chamber in which the circuit could be arranged / connected with front access.

## **MEASURING INSTRUMENTS, METERING & PROTECTION.**

### **GENERAL**

Direct reading electrical instruments shall be in conformity with IS grade. The accuracy of direct reading shall be 1.0 for voltmeter and 1.5 for ammeter. Other type of instruments shall have accuracy of 1.5. The errors due to variations in temperature shall be limited to a min. The meter shall be suitable for continuous operation between -10 degree centigrade to +50 degree centigrade. All meter shall be of flush mounting Digital type. 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 instrument glass.

Suitable selector switches shall be provided for ammeter and voltmeter 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 work.

### **AMMETER.**

Ammeters shall be Digital type. Ammeters shall be instrument transformer operated, & shall be suitable for 5 Amp secondary of instrument transformer. The ammeters shall be capable of carrying

sustained overloads during fault conditions without damage or loss of accuracy.

### **VOLTMETER.**

Voltmeters shall be Digital type. The range for 415 volts, 3 phase voltmeters shall be 0 to 600 volts. Suitable selector switch shall be provided on voltmeter to read voltage between any two lines of the system. The voltmeter shall be provided with protection fuse 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 1 KV. Current transformers shall have rated primary current, rated burden and class of accuracy as required. However, the rated secondary current shall be 5A unless otherwise specified. The acceptable min. class of various applications shall be as given below :

Measuring : Class 0.5 to 1.

Protection : Class 5P10.

Current transformers shall be capable of withstanding without damage, magnetic and thermal stresses due to short circuit fault of 50KA on medium voltage system. Terminals of the current transformers 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.

### **MISCELLANEOUS.**

Indicating lamps shall be of the filament type of low watt consumption, provided with series resistor where necessary, and with translucent lamps covers, bulbs & lenses shall be easily replaced from the front.

Push buttons shall be of the momentary contract, 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 Main M.V. panel to suit the number, type and size of Al. conductor power cables 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.

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 another live circuit.

### **TESTING AND COMMISSIONING.**

Checks and tests shall include the following.

- a. Operation checks of all electrical equipments fitted in distribution panel.
- b. Interlocking function check.
- c. Insulation test: When measured with 500V meggar, the insulation resistance shall not be less than 100 mega ohms.

### **LT CABLES**

## **GENERAL**

L.T. Cables shall be supplied, inspected, laid, tested and commissioned in accordance with drawings, specifications, relevant Indian Standards, CPWD specifications and cable manufacturer's recommendations. The cable shall be delivered at site in original drums with manufacturer's name clearly written on the drums. The recommendations of the cable manufacture with regard jointing and sealing shall be strictly followed.

## **MATERIALS**

The LT Power Cables shall be XLPE insulated PVC sheathed aluminum conductor armored cable conforming to IS:7098 : Part - 1:1988 with up-to-date amendments.

**Make: Havells, Gloster, Universal or Equivalent as approved by the Engineer Incharge.**

## **INSTALLATION OF CABLES**

Cables shall be laid directly in ground, pipes, masonry ducts, on cable tray, surface of wall etc. as indicated in BOQ and/or as per the direction of Engineer-in-charge, and as per CPWD specifications.

## **INSPECTION**

All cables shall be inspected at site and checked for any damage during transit.

## **JOINTS IN CABLES**

The contractor shall take care to see that the cables received at site are apportioned to various locations in such a manner as to ensure maximum utilization and avoiding of cable joints. This apportioning shall be got approved from Engineer-in-charge before the cables are cut to lengths.

## **LAYING CABLES IN GROUND**

Cables shall be laid by skilled experienced workmen using adequate rollers to minimize stretching of the cables. The cable drums shall be placed on jacks before unwinding the cable. With great care it shall be unrolled on over wooden rollers placed in trenches at intervals not exceeding 2 meters. Cables and other accessories shall be laid as per CPWD specification and other relevant IS Codes.

At all changes in direction in horizontal and vertical planes, the cables shall be bent smooth with a radius of bent not less than 12 times the diameter of cables. Minimum 3 metre long loop shall be provided at both end of cable.

Distinguishing marks may be made on the cable ends for identifications of phases. Insulation tapes of appropriate voltage and in red, yellow and blue colours shall be wrapped just below the sockets for phase identifications.

Where the cables are to be laid in ducts (pucca trenches) in side the building, they will have to be laid on MS rack/ on MS cable trays grouted in walls trenches. Cables sizing through floors shall be protected from mechanical damage by a steel channel to a height of one meter above the floor where cable pass through wall they shall be sleeved with PVC /steel conduit.

Where the cables laid in open (in building) along walls or ceiling cable rack (ladder type) or cable tray shall be provided. The size of the cable tray or rack shall depend on the number of cables to pass over that rack. Cable tray/ rack shall be properly supported through wall/ceiling according to the site conditions. All power cables shall be clamped individually & control cables shall be clamped in groups of three or four cables.

## **TESTING OF CABLES**

Prior to installation, buying of cables, following tests shall be carried out. Insulation test between phases, phase & neutral, phase & earth for each length of cable.

- a. Before laying
- b. After laying

c. After jointing

On completion of cable laying work, the following tests shall be conducted in the presence of the Engineer-in-Charge.

- a. Insulation Resistance Test (Sectional and overall)
- b. Continuity Resistance Test
- c. Earth Test

All tests shall be carried out in accordance with relevant Indian Standard code of practice and Indian Electricity Rules. The Contractor shall provide necessary instruments, equipments and labour for conducting the above tests & shall bear all expenses of conducting such tests.

## **PROTECTIVE EARTHING & LIGHTING PROTECTION**

The scope of work shall cover laying copper/GI earth strips and connecting the power panels, DBs and switch boards.

The work shall be done as per the CPWD specification

All apparatus and equipment transmitting or utilizing power shall be earthed.

### **Wiring of Panel:**

All the wiring of CT and PT shall be of standard make and colour code of switch board type consisting of single tinned annealed copper conductor insulated with polyvinyl chloride of size 1.5 mm Square suitable for 440 volts service.

Ferules engraved with some number and letters shall be provided on the terminal ends of all wired for easy identification of circuits for inspection and maintenance.