



**BHARAT SANCHAR NIGAM LIMITED**

(A Govt of India Enterprise)  
(Electrical Wing)

**O/o The Executive Engineer (E)**

**BSNL Electrical Division-III**

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**E-TENDER DOCUMENT**

(SHORT NOTICE TENDER)

**Name of work: Providing Electrical infrastructure works for the proposed Cable Landing Station (CLS) building at R K Mutt Road, Mandaveli, Chennai (SW: Associated works for Precision Package AC units)**

**NIT No : 48 / EEE/ED-III/CH/2019-20**

This tender document contains 47 ( **Forty Seven** pages only.)

For E Tender Helpdesk Pls Contact M/s ITI LTD : Ph:91-80-40482000 &

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**INFORMATION AND INSTRUCTIONS FOR BIDDERS FOR E-TENDERING FORMING PART OF  
NIT AND TO BE POSTED ON WEBSITE**

The Executive Engineer (Elect), BSNL, **Electrical Division-III, Chennai** on behalf of the CMD, Bharat Sanchar Nigam Limited, invites online Item rate bids from eligible bidders in Single bid system for the following work:

1	Name of work	Providing Electrical infrastructure works for the proposed Cable Landing Station (CLS) building at R K Mutt Road, Mandaveli, Chennai (SW: Associated works for Precision Package AC units)
2	Estimated cost put to tender	<b>Rs. 4,67,063/- (Excluding GST)</b>
3	Earnest Money	<b>Rs.9341/-</b>
4	Period of completion	One month
5	Last date & time for online submission of tender	Up to 15:00 Hrs. on 09/09/2019
6	Last date & time for submission of original Tender cost and EMD	Up to 15:00 Hrs. on 09/09/2019
7	Date and time for opening of tender	15:30 Hrs. on 09/09/2019
8	Tender cost (Non refundable)	Rs.500/- (+) GST 18%
9	E-tender Processing fee (Non-refundable)	0.05% of estimate cost subject to the minimum of Rs.500/- and Maximum of Rs. 5000/- plus GST as applicable.

### **ELIGIBILITY CRITERIA**

The bidders satisfying the following conditions:

1. Average annual turnover during the last 3 years, ending 31<sup>st</sup> March 2019, should be at least 30% of the estimated cost put to tender.

AND

Experience of having successfully completed similar works in Central Government /State Government /Central Autonomous Body/Central Public sector Undertaking during last 7 years ending 31<sup>th</sup> August-2019 should be either of the following :-

➤ Three similar successfully completed works costing not less than the amount equal to 40% of the estimated cost put to tender.

OR

➤ Two similar successfully completed works costing not less than the amount equal to 60% of the estimated cost put to tender.

OR

➤ One similar successfully completed work costing not less than the amount equal to 80% of the estimated cost put to tender.

NOTE: Similar work Means "Associated works for Precision Package AC units"

### **IMPORTANT NOTE:**

1. The self-attested copies of the following documents shall be scanned and uploaded to the e-tendering website within the period of tender submission. Online bid documents submitted by intending bidders shall be opened only of those bidders, who have scanned and uploaded the following documents (and whose uploaded documents are found to be in order), otherwise the bid will not be opened and shall lead to disqualification.
  - a. Tender Fee in the prescribed format
  - b. EMD in the prescribed format
  - c. Certificate of Financial Turnover from Chartered Accountant
  - d. Documents fulfilling Eligibility criteria (Please note that in case the bidder is authorized by the manufacturer, the original authorization letter is to be scanned and uploaded)
  - e. ~~Enlistment certificate issued by BSNL (for BSNL enlisted contractors)~~
  - f. Valid Electrical license
  - g. GST Registration Number details.
  - h. PAN Card
  - i. EPF and ESI Registration certificate (if applicable)
  - j. Undertaking to abide by EW-6 and EW-8 (Form 'A')
  - k. Undertaking regarding EPF and ESI provisions (Form 'B')
  - l. Certificate of work experience issued by client department (Form 'C') if applicable
  - m. Undertaking regarding No Near relative working certificate (Form 'D')

**Not uploading the above documents, (even if the documents are submitted physically) shall lead to disqualification.**

2. The Physical Tender Fee, EMD and the original authorization letter by the manufacturer (if applicable), which were scanned and uploaded, **shall be deposited in the tender box available in the office of tender opening authority**, by all the bidders before 03:00 PM on the tender opening date, **failing which the tender shall not be opened.**

**BSNL EW-6**  
Bharat Sanchar Nigam Limited  
Electrical Wing

Electrical Division: **ED-III, Chennai**

Sub Division: **CANI Project, Chennai**

Item rate tenders on single bid system are invited on behalf of CMD, BSNL for the work "Providing Electrical infrastructure works for the proposed Cable Landing Station (CLS) building at R K Mutt Road, Mandaveli, Chennai (SW: Associated works for Precision Package AC units)" from the eligible bidders as per NIT notification. The enlistment of the bidders should be valid on the opening date of tender. In case the date of opening of tender is extended, the enlistment of bidder should be valid on the original date of opening of tender.

1. Intending bidder is eligible to submit the bid provided that he has definite proof from the appropriate authority, which shall be to the satisfaction of the competent authority as per the eligibility conditions mentioned in the NIT notification page.
2. The work is estimated to cost **Rs.4,67,063/- (Excluding GST)**
3. Agreement shall be drawn with the successful bidder on prescribed form as amended up to the date of opening of tender. Bidder shall quote his rates as per various terms and conditions of the said form which will form part of the agreement.
4. The time allowed for carrying out the work will be **One Month** from the 10<sup>th</sup> day after the date of written order to commence the work.
5. The site for the work is available / or the site for the works shall be made available in parts. The successful bidder shall execute the work in coordination with other agencies working in the campus.
6. The bid documents 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 can be seen and downloaded from website [www.tenderwizard.com/BSNL](http://www.tenderwizard.com/BSNL) at free of cost. The BSNL EW-8 document can be seen from the web site [www.chennai.bsnl.co.in](http://www.chennai.bsnl.co.in) at free of cost.
7. After submission of the bid, the bidder can re-submit revised bid any number of times but before last time and date of submission of tender as notified. While submitting the revised bid, bidder 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 tender as notified.
8. The Tender Fee as applicable in the form of Demand Draft issued by the Nationalized / Scheduled bank authorized by the Reserve Bank of India, drawn in favour of **ACCOUNTS OFFICER(Cash), BSNL, STP, CHENNAI-28** payable at **CHENNAI** shall be scanned & uploaded in the e-tendering website within the period of tender submission. The validity of the tender cost in the form of DD shall be **60 days** from the date of opening.
9. The Earnest money deposit (EMD) in the form of Demand Draft / FDR / BG (BG is only for Air Conditioning, Diesel Engine Alternator, Lifts, and Sub Station works wherever the amount of EMD is more than Rs.20,000)/ CDR of a nationalized / scheduled bank authorized by the Reserve Bank of India, drawn in favour of **ACCOUNTS OFFICER(Cash), BSNL, STP, CHENNAI-28** payable at **CHENNAI** shall be scanned & uploaded in the e-tendering website within the period of tender submission. The validity of the EMD in the form of DD shall be **60 days** from the date of opening.

Contacting

NIT  
Executive Engineer

If the EMD is in the form of CDR/FDR/BG, the validity shall be **180 days** from the date of opening. In case of L1 bidder, the validity of CDR/FDR/BG is to be extended up to the observation period as that of the Performance guarantee / Security deposit. Exemption from payment of Tender Fee, Earnest Money and Security Deposit by any other unit/ department shall not hold good for BSNL.

10. Interested bidder who wishes to participate in the bid shall pay the e-tender processing fee to M/s. ITI Limited through their e-gateway by credit/debit card/ internet banking/ RTGS/NEFT facility.
11. All the documents as specified in the tender document shall be scanned and uploaded to the e-Tendering website within the period of bid submission.
12. The last date for online submission of bid is 09/09/2019 up to 03:00 PM and the bid submitted shall be opened at 03:30 PM on the same day. If a holiday is declared on the tender opening day, the tender will be opened on the next working day.
13. The e-Tender processing fee and tender cost are non-refundable
14. **Performance Guarantee:** The bidder is required to furnish Performance guarantee for an amount equal to 5% of the contract value in the form of bank guarantee/CDR/FDR/DD (of a Nationalized/ Scheduled Bank in a standard format) within two weeks from the date of issue of acceptance letter. This period can be further extended by the Engineer-in-charge up to a maximum period of two weeks on written request of Bidder. The validity period of the performance security in the form of performance bank guarantee shall be: Three Months from the date of actual completion of work, for AMC works; and One year from the date of actual completion of work for all other works. **In case the bidder fails to deposit the said performance guarantee within the stipulated period, including the extended period if any, the Earnest Money deposited by the bidder shall be forfeited automatically without any notice to the bidder and the bidder will not be allowed to participate in the re tendering for the same work.**
15. **Security Deposit:** In addition to Performance guarantee stated above, a sum @ 10% of the gross amount of the bill shall be deducted from each running bill of the contractor till the sum be deducted with the sum already deposited as earnest money, will amount to security deposit of 5% of the contract value of the work. **The security deposit shall be released after an observation period as follows: Three Months from the date of actual completion of work, for AMC works; and One year from the date of actual completion of work for all other works.**
16. In case any discrepancy is noticed in the documents as uploaded at the time of submission of the bid online, then the bid submitted shall become invalid and the BSNL shall, without prejudice to any other right or remedy, be at liberty to forfeit 50% of the said earnest money as aforesaid. Further, the bidder shall not be allowed to participate in the retendering process of the work.
17. Intending bidders are advised to inspect and examine the site and its surroundings and satisfy themselves before submitting their tenders, 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 tender. A bidder shall be deemed to have full knowledge of the site whether he inspects it or not and no extra charge consequent on any misunderstanding or otherwise shall be allowed. The bidder shall be responsible for arranging and maintaining at his own cost all materials, tools & plants, water, electricity access, facilities for workers and all other services required for executing the work unless otherwise specifically provided for in the contract documents. Submission of a tender by a bidder implies that he has read this notice and all other contract documents and has made himself aware of the scope and specifications of the work to be

done and of conditions and rates at which stores, tools and plant, etc. will be issued to him by the BSNL and local conditions and other factors having a bearing on the execution of the work.

18. The competent authority on behalf of the CMD does not bind himself to accept the lowest or any other tender and reserves to himself the authority to reject any or all the tenders received without the assignment of any reason. All tenders in which any of the prescribed condition is not fulfilled or any condition including that of conditional rebate is put forth by the bidder shall be summarily rejected. The competent authority on behalf of CMD reserves to himself the right of accepting the whole or any part of the tender and the bidder shall be bound to perform the same at the rate quoted.
19. Canvassing whether directly or indirectly, in connection with tenders is strictly prohibited and the tenders submitted by the bidders who resort to canvassing will be liable to rejection.
20. Agreement shall be drawn with the successful bidder on prescribed form. Bidder shall quote his rates as per various terms and conditions of the said form, which will form part of the agreement.
21. The bidder should give a certificate as per the following that none of his/her relative is employed in BSNL units as per **Form 'D'**. In case of proprietorship firm, certificate will be given by the proprietor and for partnership firm certificate will be given by all the Directors of the company.
  - a. Near relatives of all BSNL employees either directly recruited or on deputation are prohibited from participation in tenders and execution of works in the different units of BSNL. The near relatives for this purpose are defined as:
    - i. Members of a Hindu Undivided family.
    - ii. They are husband and wife.
    - iii. The one is related to the other in the manner as father, mother, son(s) & son's wife(daughter-in-law), Daughter(s) & daughter's husband(son-in-law), brother(s) & brother's wife, sister(s) & sister's husband(brother -in-law).
  - b. The company or firm or any other person is not permitted to tender for works in BSNL unit in which his near relative(s) is(are) posted. The unit is defined as SSA/Circle/Chief Engineer/Chief Archt./Corporate office for non-executive employees and all SSA in a circle including circle office/Chief Eng./Chief Archt./Corporate office for executive employees (including those called as Gazetted officers at present). The bidder should give a certificate that none of his/her such near relative is working in the units as defined above where he is going to apply for tender/work, for proprietorship, partnership firms and limited company certificate shall be given by the authorized signatory of the firm. Any breach of these conditions by the company or firm or any other person, the tender/work will be cancelled and earnest money/performance guarantee will be forfeited at any stage whenever it is so noticed. BSNL will not pay any damages to the company or firm or the concerned person. The company or firm or the person will also be debarred for further participation in the concerned unit.
  - c. No employee in BSNL/ Govt. of India is allowed to work as a contractor for a period of two years of his retirement from service without the prior permission. The contract is liable to be cancelled if either the bidder or any of his employees is found at any time to be such a person who had not obtained the permission as aforesaid before submission of tender and engagement in the bidders service.
22. The tender for the work shall remain open for acceptance for a period of **Ninety (90)** days from the date of opening of tenders. If any bidder withdraws his tender before the said period or issue of letter of acceptance, whichever is earlier, or makes any modifications in the terms and conditions of the tender which are not acceptable to the BSNL, then the BSNL shall, without prejudice to any other right or remedy, be at liberty to forfeit 50% of the said earnest money as

aforesaid. Further the tenderer shall not be allowed to participate in the retendering process of the work.

23. The agency has to comply with the provisions of EPF and miscellaneous provisions Act-1952 and employees provident fund scheme-1952 as amended up to date in respect of labours/employees engaged by them for this work. Any consequence arising due to non-complying of provisions as specified above shall be the sole responsibility of the firm only. The agency shall give an undertaking to this effect as per **Form 'B'**.
24. **Extension of Validity of tender:** In case, where the letter of award of work cannot be placed within the validity period of the tender, the BSNL can request the bidder to extend the validity of their respective tenders and the Earnest Money deposit by a reasonable period. In such cases, extension of validity of Earnest Money deposit by 30 days beyond the extended validity date of tender should also be asked for. While BSNL can make the request for extension, the tenderer is free to either extend the validity or refuse the request to extend the validity.
25. Rates quoted by the contractor shall be firm and shall be valid for the currency of contract. No cost escalation shall be permitted during the currency of contract.
26. This notice inviting tender shall form a part of the contract document. The successful bidder, on acceptance of his tender by the Accepting Authority shall within 15 days from the stipulated date of start of the work, sign the contract consisting of:-
  - a. The Notice Inviting Tender, all the documents including additional conditions, specifications and drawings, if any, forming part of the tender as uploaded at the time of invitation of tender, subsequent amendments issued and the rates quoted online at the time of submission of bid and acceptance thereof together with any correspondence leading thereto.
  - b. Standard BSNL EW-8 form



### **General Instructions to the Bidders**

1. The intending bidder must read the terms and conditions of BSNL-EW 6 carefully. He should only submit his bid, if he considers himself eligible and he is in possession of all the documents required.
2. Information and instructions for bidders posted on website shall form part of bid document.
3. Applicants are advised to keep visiting the above mentioned website from time to time (till the deadline for bid submission) for any updates in respect of the tender documents, if any. Failure to do so shall not absolve the applicant of his liabilities to submit the applications complete in all respect including updates thereof, if any. An incomplete application may be liable for rejection.
4. Those bidders not registered on the website mentioned above, are required to get registered themselves beforehand. The intending bidder must have valid class-III digital signature to submit the bid.
5. On opening date, the bidder can login and see the bid opening process. After opening of bids he will receive the competitor bid sheets.
6. Bidder can upload documents in the form of JPG format or / and PDF format.
7. Bidder must ensure to quote rate of each item. The column meant for quoting rate in figures appears in yellow colour. In addition to this, while selecting any of the cells a warning appears that if any cell is left blank the same shall be treated as "0". Therefore, if any cell is left blank and no rate is quoted by the bidder, rate of such item shall be treated as "0" (ZERO)
8. Even though any bidder may satisfy the above requirements, he would be liable to disqualification if he has:
  - a. Made misleading or false representation or deliberately suppressed the information in the forms, statements and enclosures required in the eligibility criteria document.
  - b. Record of poor performance such as abandoning work, not properly completing the contract, or financial failures / weaknesses etc.
9. If any information furnished by the bidder is found incorrect at a later stage, he shall be liable to be debarred from tendering/taking up of works in BSNL. The BSNL reserves the right to verify the particulars furnished by the applicant independently.
10. GST and any other tax applicable in respect of this contract shall be borne by the bidder himself. The bidder shall quote his rates considering all such taxes. The TDS as per the Govt. regulations will be recovered from the contractor.
11. **Tender Evaluation :**
  - (a) The evaluation and comparison of responsive bids shall be done on the basis of Nett cost to BSNL on the prices offered inclusive of packing, forwarding, freight and insurance charges etc., but excluding GST. The bid with lowest net cost as elaborated above will be the L1 bidder.
  - (b) Vendors should furnish the correct GST Rate in the price schedule. If the Input Tax Credit is found to be not admissible at any stage subsequently owing to wrong furnishing of GST Rate, then the vendors will be liable to refund such non-admissible amount, if already paid, along with penalty if charged by the concerned authority.

12. However, pursuant to the constitution (Forty-sixth amendment) act, 1982, if any further tax or levy is imposed by statute, after the last date of receipt of tenders, and the contractors there upon necessarily and properly pays such taxes/ levies, the contractor shall be reimbursed the amount so paid, provided such payment, if any, is not in the opinion of Superintending engineer (whose decision shall be final and binding) be attributable to delay in execution of work within the control of contractor.
13. The Contractor shall, within a period of 30 days of imposition of any further tax or levy in pursuant to the constitution of (Forty sixth amendment) act 1982 give a written notice thereof to the Engineer-in-charge that the same is given pursuant to this condition, together with all necessary information relating thereto.

**14. Bye laws Indemnity against liabilities:**

- a. The bidder shall comply with all bylaws and regulations of the local and statutory authorities having jurisdiction over the works and shall be responsible for payment of all fees and other charges and giving and receiving all necessary notices and keep the Engineer –in-charge informed about the notices issued and received.
- b. The bidder shall indemnify the department against all claims in respect of patent rights design, trademark or name of other protected rights in respect of any plant, machine, work or materials used for or in connection with the works or temporary works and from and against all claims demands, proceedings, costs, charges and expenses whatsoever in respect of or in relation thereto.
- c. The bidder shall defend all actions arising from such claims and shall himself pay all royalties, License fees, damages, costs and charges of all and every sort that may be legally incurred in respect hereof shall be borne by the bidder.
- d. All liabilities / penal recoveries on matters arising out of tax /levies such as incorrect deductions, discrepancies in the filing of returns, revised assessments by the concerned authorities etc., shall be borne by the bidder.

**15. Termination of contract on death of contractor :**

Without prejudice of any of the rights or remedies under this contract, if the contractor dies, the Engineer in charge on behalf of the BSNL shall have the option of terminating the contract without compensation to the contractor.

**16. Indulging of contractor in criminal /antisocial activities and cases under investigation/charge sheeted by CBI or any other government agencies etc. :**

If the CBI/Independent External Monitor (IEM) /Income tax/ Sales Tax /GST/ Central Excise/Custom Departments recommend such a course - Action will be taken as per the directions of CBI or concerned department.

17. As a general notion, the terms and conditions/instructions contained in various pages of this document are addressed assuming the bidder as 'Male'. However, the same shall remain and assumed to be addressed in case of 'Female' bidder also, except for the gender centric words, which shall be 'female' centric at appropriate places.

**FORM 'A'**

**Undertaking to abide by EW 6 & EW 8**

"I.....Son/Daughter of .....  
.....Resident of ..... hereby  
give an undertaking that I have read the complete bid document and I am aware of all the clauses  
and sub clauses of BSNL EW 6 & 8 forms and I confirm that I will abide by all the terms and conditions  
available in BSNL EW 6 & 8 forms.

(Seal of the firm)

(Signature of Bidder)

**FORM 'B'**

**Undertaking regarding EPF provisions**

"I..... Son/daughter of .....  
.....Resident of ..... hereby give an  
undertaking that

\* I/We have employed only ----- persons in our establishment and hence the EPF and Miscellaneous provisions Act, 1952 are not applicable to my / our establishment.

\* I/ We have registered as per the EPF and Miscellaneous provisions Act, 1952 and our registration no.\*\* is ----- . We undertake to keep it valid during the currency of contract.

In case at any stage, it is found that the information given by me is false / incorrect, BSNL shall have the absolute right to take any action as deemed fit/without any prior intimation to me".

\* Strike out whichever is not applicable

\*\*Attach a self-attested photo copy of the above said EPF registration certificate.

(Seal of the firm)

(Signature of Bidder)

**Undertaking regarding ESI provisions**

"I..... Son of .....  
.....Resident of ..... hereby give an  
undertaking that

\* I/We have employed only ----- persons in our establishment and hence the ESI and Miscellaneous provisions Act, 1948 are not applicable to my / our establishment.

\* I/ We have registered as per the ESI and Miscellaneous provisions Act, 1948 and our registration no. \*\* is ----- . We undertake to keep it valid during the currency of contract.

In case at any stage, it is found that the information given by me is false / incorrect, BSNL shall have the absolute right to take any action as deemed fit/without any prior intimation to me".

\* Strike out whichever is not applicable

\*\*Attach a self-attested photo copy of the above said ESI registration certificate.

(Seal of the firm)

(Signature of Bidder)

**FORM 'C'****Performance report of works**

1. Name of Agency
2. Name of work
3. Agreement no.
4. Final Value of Work Done
5. Date of start of work
- 6.
7. Actual date of completion
8. Performance: Satisfactory / Not Satisfactory

Dated:

Executive Engineer or Equivalent

**FORM 'D'****No Near relative working certificate**

I..... Son /daughter of Shri/ Smt.....Resident of..... hereby certify that none of my relative(s) as defined in the tender document is/are employed in BSNL unit as per details given in tender document. In case at any stage, it is found that the information given by me is false/incorrect, BSNL shall have the absolute right to take any action as deemed fit/without any prior intimation to me.

(Seal of the firm)

(Signature of Bidder)

**Annexure I**  
**MODEL FORM OF BANK GUARANTEE FOR EMD**  
**(For submitting EMD for Air Conditioning, Diesel Engine Alternator, Lifts, and Sub Station Works wherever the amount of EMD is more than Rs.20,000/-)**

Whereas \_\_\_\_\_ (hereinafter called "the bidder(s)") has submitted its Tender dated \_\_\_\_\_ for the work \_\_\_\_\_  
\_\_\_\_\_ KNOW ALL MEN  
by these presents that WE \_\_\_\_\_ OF  
\_\_\_\_\_ having our registered office at \_\_\_\_\_  
(hereinafter called "the Bank") are bound unto \_\_\_\_\_ (hereinafter called "the BSNL") in the sum of \_\_\_\_\_ for which payment will and truly to be made of the said BSNL, the Bank binds itself, its successors and assigns by these presents.

THE CONDITIONS of the obligation are:

1. If the Bidder(s) withdraws its Tender during the period of Tender validity specified on the Tender Form: or
2. If the Bidder(s) having been notified of the acceptance of its Tender by the BSNL during the period of Tender validity.
  - (a) Fails or refuses to execute the Contract.
  - (b) Fails or refuses to furnish security Deposit in accordance with the conditions of Tender document.

We undertake to pay to the BSNL up to the above amount upon receipt of its first written demand, without the BSNL having to substantiate its demand, provided that in its demand, the BSNL will note that the amount claimed by it is due to it owing to the occurrence of one or both of the two conditions, specifying the occurred condition or conditions.

This guarantee will remain in force as specified in the Tender Document up to and including Thirty (30) days after the period of the Tender validity and any demand in respect thereof should reach the Bank not later than the specified date/dates.

**Signature of the Bank**

**Signature of the Witness**  
**Name of Witness**

**Address of Witness:**

## **ANNEXURE II**

### **PERFORMANCE SECURITY GUARANTEE BOND**

In consideration of the CMD, BSNL (hereinafter called 'BSNL') having agreed to exempt \_\_\_\_\_ (hereinafter called 'the said bidder(s)') from the demand under the terms and conditions of an agreement/Advance Purchase Order No \_\_\_\_\_ dated \_\_\_\_\_ made between \_\_\_\_\_ and \_\_\_\_\_ for the supply of \_\_\_\_\_ (hereinafter called "the said agreement"), of security deposit for the due fulfilment by the said bidder (s) of the terms and conditions contained in the said Agreement, on production of the bank guarantee for \_\_\_\_\_ we, (name of the bank) \_\_\_\_\_ ( hereinafter refer to as "the bank") at the request of \_\_\_\_\_ (bidder(s)) do hereby undertake to pay to the BSNL an amount not exceeding \_\_\_\_\_ against any loss or damage caused to or suffered or would be caused to or suffered by BSNL by reason of any breach by the said Bidder(s) of any of the terms or conditions contained in the said Agreement.

2. We (name of the bank) \_\_\_\_\_ do hereby undertake to pay the amounts due and payable under this guarantee without any demur, merely on a demand from the BSNL by reason of breach by the said bidder(s)' of any of the terms or conditions contained in the said Agreement or by reason of the bidders(s)' failure to perform the said Agreement. Any such demand made on the bank shall be conclusive as regards the amount due and payable by the Bank under this guarantee where the decision of BSNL in these counts shall be final and binding on the bank. However, our liability under this guarantee shall be restricted to an amount not exceeding \_\_\_\_\_.

3. We undertake to pay to the BSNL any money so demanded notwithstanding any dispute or disputes raised by the bidder(s)/supplier(s) in any suit or proceeding pending before any court or tribunal relating thereto our liability under this present being absolute and unequivocal. The payment so made by us under this bond shall be valid discharge of our liability for payment there under and the bidder(s)/supplier(s) shall have no claim against us for making such payment.

4. We(name of the bank)\_\_\_\_\_ further agree that the guarantee herein contained shall remain in full force and effect during the period that would be taken for the performance of the said agreement and that it shall continue to be enforceable till all the dues of the BSNL under or by virtue of the said Agreement have been fully paid and its claims satisfied or discharged or till \_\_\_\_\_ (office/BSNL) BSNL certifies that the terms and conditions of the said Agreement have been fully or properly carried out by the said bidder(s) and accordingly discharges this guarantee. Unless a demand or claim under this guarantee is made on us in writing on or before the expiry of TWO/TWO AND HALF/THREE YEARS (as specified in P.O) from the date hereof, we shall be discharged from all liabilities under this guarantee thereafter.

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

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

7. We (name of the bank) \_\_\_\_\_ lastly undertake not to revoke this guarantee during its currency except with the previous consent of the BSNL in writing.

Dated the \_\_\_\_\_ day of \_\_\_\_\_

for \_\_\_\_\_ (indicate the name of bank)





## SCHEDULE OF QUANTITIES

Providing Electrical infrastructure works for the proposed Cable Landing Station (CLS) building at R K Mutt Road,Mandaveli,Chennai (SW: Associated works for Precision Package AC units)

Sl. No	Description of Item	Qty	unit	Rate per unit excluding GST	CGST		SGST		IGST		Rate per unit including GST	Total Amount excluding GST (Net cost)	Total Amount i/c GST	HSN Code
					%	Rate	%	Rate	%	Rate				
1	Providing and fixing GI sheet ducting/plenum of the following sheet thickness and suitable sizes as required along with necessary supports and suitable frame work for installation of the filters in the plenum complete with canvas connection GI sheet etc. complete as per detailed specifications as reqd.													
a	1.00mm(20Gauge)	20sq.m												
b	0.80 mm(22 Guage)	10sq.m												
c	0.63 mm (24 gauge)	10sq.m												
2	Providing and fixing fire dampers in the supply air duct as per specifications as required.	3sq.m												
3	Providing and fixing powder coated supply air grills made of extruded Aluminium construction with having a free area not less than 60% with volume control dampers in the supply air system as per detailed specification. etc as													

[illegible]

10	Providing MS frame work/extension to existing frame work/supports/ hangers/cable tray/ piping tray/roofing frame work etc fabricated with the following members i/c cutting, welding, drilling holes, threading the rods, required machine shop work, painting etc as required.													
a	75 mm x 40 mm x 6mm ISMC channel	50mts												
b	35mm x 35mm x 5mm MS angle	50mts												
c	32mm x 5 mm MS flat	50mts												
d	25 X 25 X 3 mm MS Angle	75mts												
e	25 x 3 mm MS Flat	75mts												
f	Providing and fixing of 5 mm thick Chequered plate in the existing MS frame work etc as reqd.	3sq.mtrs												
11	P/F information display board made of 3mm thick ALUCOBOND sheet silver coated with necessary lamination and digital printing of necessary details of PAC plant, estimate No, date of commissioning i/c making the content, coordination, transportation, suitable frame work for fixing it on the surface of the wall complete as reqd. (Note: Instructions and information will be given by Engineer-in-Charge). (Size: 4' x 3')	1job												
12	P/f the following items for sensing faults/conditions on suitable frame work/MS box l/c providing necessary hose connections, making connections, testing etc. as required.													
	a)Thermostat for sensing switch room temperature.	1No												

	b)Humidistat for sensing switch room humidity.	1No																	
	c)Heavy duty limit switch for fire damper with rubber rails etc.	3Nos																	
13	SITC of floor mounted cubicle type AC distribution panel , suitable for 415Volts,50 Hz, a.c supply, fabricated with 16 SWG CRCA sheet and of uniform height and depth,bottom base channel of MS section not less than 75mm x 40mm x 5mm & the panel shall be made totally dust and vermin proof by providing neoprene rubber gasket between adjacent units and beneath all covers, i/c powder coating with approved colour, providing necessary cable alley and knockout holes, interconnection with suitable size of Aluminium busbars for incoming and outgoing, providing metering arrangement, providing control wiring with 1.5 sq.mm FRLS copper wire, the entire panel shall have a common copper earth busbar of size 25mm x 3mm at the rear and comprise of the following switchgears:.																		
	a) 250 Amps , 36 kA MCCB, 4 Pole , (RR: 100-125) [DN2-250 of L&T or SS) - 3 Nos (2Nos as incomer and one number as buscoupler)																		
	b) 63A TPN SDFU with 32A HRC fuses for package AC units. Each SDFU shall be provided with digital ammeter and ON /OFF LED type indication lamps.- 4 Sets																		
	c) 63A TPN SDFU with 63A HRC fuses.with ON /OFF LED type indication lamps.- 4 Sets																		
	d) Multifunction meter for 2 sources of supply- 2Nos																		
	e) CT (200:5) - 6 Nos , class 1 accuracy																		
	f) 4 strip 200A Aluminium Bus Bar of suitable size with heat shrinkable coloured sleeve																		
	g)RYB LED type indication lamp with suitable protection-																		

UNPRICED SCHEDULE

	2sets														
	h)Mechanical Interlocking between incomer switches and buscoupler ( 3 locks with 2Keys)	1job													
	Note: The panel drawing shall be got approved by the Engineer in charge before fabrication.														
14	Supplying and Laying 6mm thick rubber mat in front of control panel etc as required.	2sq.mtrs													
	<div> TOTAL AMOUNT EXCLUDING GST </div> <div> TOTAL AMOUNT INCLUDING GST </div>														

TOTAL AMOUNT EXCLUDING GST IN WORDS

CONTRACTOR

EXECUTIVE ENGINEER (E),ED-III/CHENNAI

<b>Important Note:</b>
The firm shall be responsible to ensure that GST shown in the above columns is correct & Input Tax Credit for the amount shown above is admissible as per GST Act as amended up to date.
Tax Invoice /Bill of supply should be pre-printed with all the details as per the requirement under GST Act.
The evaluation and comparison of responsive bids shall be done on the basis <b>of Net cost to BSNL</b> on the prices offered inclusive of packing, forwarding, freight and insurance charges etc., <b>but excluding GST</b> .
The rates for all items of work shall, unless clearly specified otherwise, include cost of all labour, materials and other inputs involved in the execution of the terms as specified in the scope of work.
No advance payments can be made. Stipulations like levy of interest if payment is not made in a specified time are also not acceptable and the payment is governed by the normal BSNL practice.
Bidder must mandatorily quote for all GST components ( CGST,SGST,IGST ) as applicable.
Bidder must mandatorily mention correct HSN/SAC codes.

**Contractor**

**Executive Engineer(E)**

## **SECTION-I**

### **SALIENT FEATURES COMMON FOR ALL SYSTEMS AND ADDITIONAL FEATURES REQUIRES FOR ELECTRONIC EXCHANGES**

#### **General:**

Salient features common for all AC systems for electronic exchange:-

1. Ducting arrangement shall take into account any change or maintenance of air switches , heater bank, booster fan etc., so that it does not require the total shutdown of the plant itself. Some scheme of AC shall be available at all time.
2. The air stream coming from the Package plant shall pass through volume control damper, fire damper fine filter booster fan(s) (if warranted by system design).
3. Air distribution in switch rooms:-

#### **For bottom feed exchanges:-**

The air conditioning system is based on blowing conditioned dust free air upwards through the rack in order to dissipate the heat and Maintain the equipment at suitable temperature. The air blown under the raised floor by the AC equipment should provide draft which Distributed to each individual rack via damper recessed into the raised floor. The switch room shall also have supply air outlet around its circumference to maintain a suitable ambient condition. However in OMC room the AC shall be provide by means of supply air outlet behind the racks. The return hot air shall be extracted through the return air inlet recessed into the false ceiling by the air conditioning equipment .

#### **For top feed Exchanges:-**

The air distribution in all exchanges or technical room i/c electronic exchanges other than E-10B shall be through conventional method. However for any specific case where some new method is to be followed based on the design of equipment supply air separate instruction/ details Shall be furnished along with the work order.

#### **Electrical Power Supply:-**

The entire equipment shall be suitable for operation on 415 +- 5% V, 3 phase, 50 Hz earthed neutral AC supply received either from the departmental sub station or from standby Engine Alternator set. The main incoming for the electrical panel shall have two incoming, one for normal AC supply and other for Emergency supply.



## SECTION-II

### SHEET METAL DUCTING, SUPPLY AIR OUTLETS RETURN AIR AND FRESH AIR INTAKES

#### 1.0 Scope:

This section sets out the general requirements for sheet metal ducting, Supply air outlets and return air/fresh air intakes, their materials of construction, methods of insulation and finishing requirements.

#### 2.0 Design:

Air velocity in sheet metal ducts has a greater role to play in initial cost of the plant and its operation cost. Therefore the air velocity shall be selected from the following ranges for an overall economy.

Application	Main (M/Mt)	Supply air Ducts Branch (M/Mt)	Return Air Passage (M/Mt)
Technical Rooms	350 – 500	250 - 300	280 – 400
Non - Technical	300 – 350	200 - 250	250 – 300

#### 3.0 Ducting:

3.1 All ducts shall be fabricated from class-IV Galvanised steel sheets conforming to IS277, Flanges, mating duct sections and Stiffening angles shall be of rolled steel angles, all nuts, bolts and washers shall be of zone plated steel and all rivets shall be galvanized or made of magnesium aluminium alloy. Self tapping screws shall not be used.

3.2 Duct construction shall generally conform to IS 655 "Specification for metal air Ducts". Thickness of sheets for rectangular duct work shall however be as follows.

Longest Side (mm)	Minimum G.S.S (mm) Sheet thickness Gauge
750 and below	0.63
751 to 1500	0.80
1501 to 2250	1.00
2251 and above	1.25

The thickness of all the four sides shall be determined by the thickness required for the longest side of the duct from the above table

3.3 The duct shall be stiffened by cross breaking or boarding at 300 mm centers for ducts upto 600 mm longest side and at 150 mm centers for ducts above 600 mm longest side. Insulated ducts need not be cross broken.

3.4 Stiffening angles shall be fixed to the sides of the duct by rivets.

3.5 Flanged joints shall be used at intervals not exceeding 2500 mm using angle iron of size as per I.S.S 655. Flanges shall be welded at corners first and then riveted to the duct. Bracing shall be provided as per I.S.S. 655.

3.6 All flanged joints shall have at least 8 mm thick felt lining between the flanges.

3.7 Suitable supply and volume control dampers shall be provided in the branch ducts for balancing the air quantities. Suitable links, levers and quadrants shall be provided for proper operation, control and setting of the dampers.

Every damper shall have indicating device clearly showing the damper position at all time.

3.8 For measurement purposes openings in ducts such as for branch ducts, grills etc., shall not be deducted, however no measurements shall be recorded for volume control dampers, guide vanes, louvers etc.,

3.9 Fire dampers specified in the tender schedule shall be provided.  
The construction of fire damper shall conform to the relevant codal requirement of local bye-laws or fire regulations, if any. Fire damper casing may be either with 3015 mm thick M.S. sheet without reinforcement or 18 G (1.25mm) thick M.S.sheet without reinforcements.

3.10. All joints shall be made of air tight and all interior surfaces be smooth, bends shall be made with radius not less than one half, the width of the duct or with properly designed interior curved vanes.

3.11 A removable panel for access to the heaters shall be provided in the duct. Any holes in the duct for electrical wiring shall be provided with suitable bushes to avoid leakage.

3.12 All ducts shall be supported on angle iron supports 35mm X 35mm X 5 mm in case of ceiling suspended ducts distance between support shall not be more than 2.45 mtrs. In case of straight run an additional support shall be provided wherever necessary such as bends etc., necessary hangers and brace etc., shall be provided by the contractor where ducts cannot be suspended from ceiling wall brackets or other suitable arrangements approved by the engineer-in-charge shall be adopted. A minimum of 6 mm neoprene or other vibration isolation packing shall be provided between the duct and angle from support at critical points.

3.13 Where metal ducts or sleeves terminate in wood work, brick or masonry openings tight joints shall be made by means of closely fitted heavy flanged collar.

3.14 Duct connections to the air handling units shall be made by inserting a double canvass sleeve 100 mm long. The sleeve shall be securely bonded and bolted to the duct and the unit casing.

- 3.15 Doors shall be provided in ducts and air plenums for access to pipe, dampers, heaters etc.,

#### 4.0 DUCT INSULATION:

The entire ducting shall be insulated with following thickness of resin bonded fiberglass or resin bonded mineral wool (as specified in the Tender schedules) with thermal conductivity not more than 0.03 K. Cal/Hr. M at 10 ° C mean temperature and density not less than 24 Kgs/M3 in case of fibre glass and 48 Kgs/m3 in case of mineral wool.

Length of Ducts	Thickness	Insulation length/Surface
Supply Ducts		
i) Upto 18 Metres	Nil	
ii) 18 to 45 Metres	25 mm	Half duct length from tail end
iii) 45 to 60 Metres	25 mm	Full Duct length
iv) Above 60 Metres	50 mm	Full duct length
Return Air boxing/false ceiling		
I) In conditioned space	Nil	
II) In Non condition Space	50 mm	Full length
AC Shaft/Weather maker wall		
I) Isolating non conditioned Space*	50 mm	Full Surface
II) Isolating conditioned space	Nil	
*Or approved alternative as per direction of Engineer-in charges		

4.1 The length of the duct shall be measured from the center of the weather maker room to the last outlet of end branch for deciding about the insulation.

4.2 The duct surface where the insulation is to be applied shall be thoroughly cleaned with wire brush and rendered free from all dust and grease. The specified thickness of insulation then shall be struck to the duct with hot bitumen of suitable grade or any other compound recommended by the insulation manufacturers. The insulation shall be covered with polythene cover to seal all the joints. 19mm X 0.63 mm wire netting, butting all joints laced down with G.I wire shall then be applied round the insulated duct. The surface finish shall be provided as specified in the following paras.

- 4.3 Insulation on supply duct in technical rooms shall be finished with 0.63 mm thick (24 Gauge) G.I sheet where as in other areas it may be finished with sand cement plaster.

- 4.4 Supply air ducts running in technical rooms without return air boxing or false ceiling shall be provided with required thickness of insulation covered with G.I.sheet.
- 4.5 Insulation provided for return air boxing, false ceiling, return air masonry shaft and wall insulation in weather maker room shall have vapour barriers on both sides of the insulation.
- 4.6 Vapour barrier shall be of not more than 26 guage polythen sheet.
- 4.7 Size of the frame work for R.A boxing shall be restricted to 1200 mm X 600 mm ( ` 4 X2` ) to prevent sagging.
- 5.0 Supply Air outlets and return air intakes:
- 5.1 All air outlets and intakes shall be of sheet steel connection/stainless steel/aluminium connection as the case may be in accordance with schedule of works.
- 5.2 Square or rectangular side outlets/intake shall have a flange frame with outside edge returned or curved 5 to 7 mm and fitted with a suitable flexible gasket. Supply air register shall have adjustable front louvers parallel to the longer dimension to give upto 221/2 vertical deflection and adjustable back louvers parallel to the short or dimension to achieve a horizontal bend air pattern to atleast 45° C . Return air grills shall have only front louvers. The outer framework of the grills shall be made of not less than 1.25 mm (18 gauge) steel sheet. The louvers shall be of not less than 0.63 mm (24 Gauge) steel sheet. The louvers may be spaced 18 mm or as advised by the Engineer-in-charge.
- 5.3 Square and rectangular ceiling outlets and intake shall have a flange flush with the ceiling into which it is fitted or be anti smudge type. The outlets shall comprise outer shell with duct collar and removable diffusing assembly. The outer shell shall not be less than 1.25 mm (18 gauge) steel and diffusing not less than 0.63 mm (24 gauge) steel.
- 5.4 Circular ceiling outlets and intakes shall have anti smudge outer cones as required. Anti smudge cones shall have the outer cones profile designed to reduce dirt deposit on the ceiling adjacent to the air outlet. The metal sheets used for construction shall not be less than 1.25 mm (18 gauge) steel.
- 5.5 All supply air outlets shall be so located or protected as to avoid any risk of condensate drops falling on the equipment, particularly at the time of starting of the plant.
- 5.6 Teak wood frame work shall be used for fixing the grills it shall be rigid in construction and present a neat appearance.
- 5.7 Free area of the grills and diffusers must not be less than the specified percentage of the face area given in the schedule of work.
- 5.8 All supply air outlets shall be fitted with a volume control device which shall be located immediately behind the outlet and shall be fully adjustable from within the occupied space, without removing any access panel.

- 5.9 Volume control devices for circular outlet shall be opposed blade radial dampers or butterfly dampers in conjunction with equalizing grid. Opposed blade dampers shall be used for square and rectangular ceiling and wall outlets.

## **SECTION-III**

### **ELECTRICAL WORK**

#### **1. Scope**

This section sets out the basic requirements for switch boards, electrical power wiring to individual meters and other equipments, control circuit wiring and earthing stations and loop earthing.

#### **2. GENERAL**

2.1 Unless otherwise specified particularly, the entire equipment shall be suitable for operation on 415 Volts/240 Volts, 50 Hz, earthed neutral, three/single phase alternating current system.

2.2 All compounds, accessories, raw materials and finished parts used in manufacture and assembly of switch boards, power and control circuit wiring and earthing system shall comply with the relevant Indian Standards amended upto date. Where Indian Standards do not exist British standards shall apply.

2.3 The entire work shall comply with Indian Electricity Rules and CPWD general specifications for electrical work. Particular care shall be taken to ensure compliance to I.E.Rules 41,45,51 and 61.

#### **3.0 SWITCH BOARD**

3.1 The switch board shall be floor mounted, free standing, totally enclosed, Compartmentalized cubical type, rigid construction with not less than 1.6 mm thick (16 Gauge) M.S.Sheet or as specified in tender schedule. Wherever necessary, steel member shall be stiffened with angle iron frame work. All bolts, washers, nuts and screws shall be adequately galvanized. The design shall include all provisions for safety of operating and maintenance personnel.

3.2 All materials used in the switch board shall be of the highest standard and from the reputed makes available.

3.3 Busbars shall be of high conductivity aluminium with adequate cross sectional areas so as to allow a current density not exceeding 130 Amps/Sq.cm. The cross section of neutral busbar shall be not less than half the cross section of the phase bus bar. Bus bars shall be adequately supported on insulators to withstand the maximum short circuit stresses likely to be encountered. The insulating material shall not be non-carbonizing type shall be impervious to moisture.

3.4 Clearance for air insulated bus bars and bus bar connections shall be not less than 32 mm for phase to phase and 26 mm for phase to earth.

3.5 For tap off connections PVC insulated wires may be used for solid conductors/strip suitably insulated with PVC sleeve/type shall be used. Marking of the busbars and connections etc., shall be in accordance with I.S.375.

3.6 The incoming supply feeder in case of all switch boards controlling current requirements of 400 amps or more and all outgoing feeder controlling current requirements of 600 amps and more, shall be provided with air circuit breakers.

3.7 The air circuit breakers shall be of draw out type conforming to the I.S.2516 with a rupturing capacity of 31 MVA at 415 Volts. The circuit breaker shall be complete with overload, earth fault and no volt coil. The panel which houses air circuit breaker shall be provided with indicating lamps for ON and OFF positions of the circuit breakers and voltmeter and ammeter of approximately 100mm X 100mm size with selector switches and control fuses for potential circuits and current transformers. An agreement shall also be provided for termination of cables on to this circuit breaker panel.

3.8 The incoming supply feeder in case of all switch boards controlling current requirements between 200 amps and 400 amps and all outgoing feeders controlling current requirements between 200 amps and 800 amps shall be provided with load break type, pole and neutral molded case circuit breakers with overload protection. These circuit breakers shall conform to relevant Indian or British Standards.

3.9 All incoming and outgoing feeders controlling current less than 200 amps shall be provided with heavy duty, load break type, triple pole and switch fuse units with HRC fuses. These switch fuse units and HRC cartridge fuses shall conform to IS 4047 and IS 2208 respectively.

3.10 In the case of cubicle type switch boards, cable chambers of adequate dimension shall be Provided for entry of cables from different circuits. Connections from the individual components shall be extended to the cable chamber so as to facilitate connecting up outgoing circuit to terminations from different components. The arrangement shall be so provided that it would not be necessary to shut down any healthy circuit in the event of a maintenance work becoming necessary on a defective component/circuit. Such cable chambers shall be of adequate dimensions to permit cables to be suitably clamped with adequate clearances. The physical layout of cable chambers shall be decided mutually.

3.11 Flush mounting type voltmeter and ammeter with current transformers and selectors switch shall be provided for the main incoming feeder. Ammeter shall be provided in booster fans also.

3.12 Voltmeters and ammeters shall conform to IS 1248 "Direct Acting Electrical Indicating Instruments" with higher than 1.5 clause index.

3.13 Provision shall be made for earthing of the switch board frame by two independent earthing plugs.

3.14 Adequate lifting facilities shall be provided for each shipping section to facility handling and transport.

3.15 Sub main switch boards with necessary switch gear, control gear, contactors, bus bars etc., shall be provided for each air handling unit.

#### 4.0 **POWER WIRING**

4.1 All three phase motors and other power circuits shall be connected to the main switchboard 2/3 ½ /4 Core PVC insulated PVC sheathed and steel wire/ tape armoured, 1100 Volts grade aluminum cables conforming to IS 1554. The size selection of three cables shall be made taking into account the maximum rated current of the equipment, ambient temperature and the applicable derating factors.

4.2 The power wiring shall be arranged in such a manner that voltage drop between the bus bars and the motors shall not exceed 2% at 40 °C ambient temperature.

4.3 Power cables shall be laid in racks or trays suspended with hangers as required. No trenches shall be made in floors for this purpose. Where two or more cables are laid together, the cables shall be properly derated.

4.4 When cables pass through pipes, wooden bushes shall be provided at both the ends. When cables are required to pass through floors or walls, pipe inserts shall be provided and openings sealed in approved manner.

4.5 The power cables shall terminate at either end in squeezed glands with cable sockets. The cable conductors crimped into the cable sockets.

## **5.0 CONTROL WIRING**

5.1 Control circuit wiring shall be carried out with 250 volts grade, PVC insulated armoured multi core copper conductor cables.

5.2 Control cables shall be of adequate cross section to restrict the voltage drop.

5.3 Runs of control wires within the switch board shall be neatly bunched and suitably supported/clamped. Means shall be provided for easy identification of the control wires.

5.4 The control wiring shall correspond to the circuit/sequence of operations and interlocks as required for satisfactory performance of the plant.

## **6.0 EARTHING**

6.1 In the case of installation with current requirements not exceeding 400 amps, two numbers G.I plate earth electrodes may be used, while for installations with current requirements for 400 amps and more, two numbers copper plate earth electrodes shall be provided. The dimensions and other details of the earth electrodes and method of earthing shall be in conformity with CPWD general specifications for electrical works (part-I Internal), (by Department)

6.2 As an exception to the above specification under corrosive soil conditions and where the soil is rocky special type of earth electrodes as agreed mutually between the contractor and the Engineer-in-Charge may be provided.

6.3 From the earth electrode, earth lead to G.I strip in the case of G.I plate electrodes and copper strip in the case of copper plate electrodes shall be extended upto grounding terminals/earth bus of the switch board. The earth lead shall be of adequate cross section in accordance with the CPWD general specifications (Part-I Internal), the minimum section being 25mm X 4mm G.I or 25mm X 3mm copper strip, portions of the earth lead laid underground, shall be protected against possible mechanical injury being drawn through G.I pipes.

6.4 In accordance with the rule 61 of I.E.Rules, metallic frames of all medium voltage equipment/supporting frames, shall in all cases be connected to two separate and distinct earths. The size of such earth wires shall be not less than half the cross section of the largest conductor used in the equipment subject to a minimum of 4mm G.I. wire.

6.5 Earth electrode shall have an ohmic resistance not more than 5 ohms. In rocky soils the resistance may be upto 8 ohms.

## **7.0 TESTING**

Before commissioning, the installation shall be subjected to the following tests.

1. An insulation resistance test with a 500 Volts meggar.
2. Earth electrode resistance test and
3. cables continuity test.

All results of such tests shall be furnished to the Engineers-in-Charge.

## **8.0 PAINTING**

Entire steel work shall undergo a process of degreasing, pickling in acid, cold rising, phosphatising, passivating, spraying with a corrosive resistance primer and then finished with two coats resistant primer and then finally finished with two coats of approved color and quality synthetic enamel paint.



## **SECTION-IV**

### **MASONRY AND MINOR CIVIL WORKS**

#### **Scope:-**

This section sets out the general requirements for masonry foundations and supports for various equipments of air conditioning plants such as packaged AC units, air cooled condenser & minor civil works etc.,

#### **1. Masonry Foundation and supports**

The masonry foundations and supports for various equipments shall be provided as per manufacturers recommendations. The foundations shall be substantial size, capable of absorbing vibrations and of non combustible nature. The depth of the foundations shall be decided in consultation with the Engineer-in-Charge.

2. The design of the masonry foundations shall be got approved from the Engineer-in-Charge.

3. Supports for all pipe work, electrical cable trays, air ducts etc., shall be strong and rigid.

4. The civil works shall be executed in accordance with the CPWD specifications for civil works.

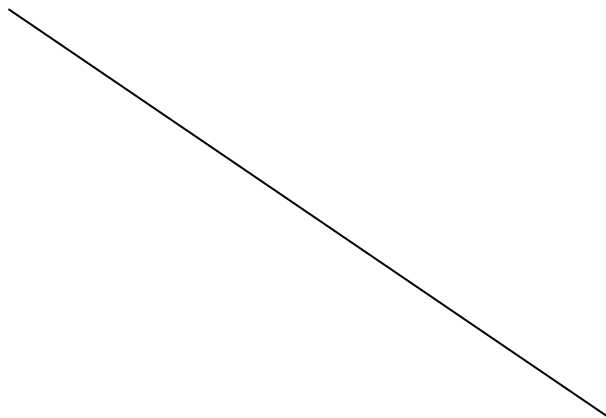
5. The vibration isolation pads shall be provided for mounting of various equipments in order to limit the transmission of noise and vibrations.

#### **Minor Civil Works:-**

Minor civil works, shall include supporting arrangement for pipe work, ducts and making/widening the openings in the walls/floors/ceilings, not involving structural modifications for carrying air ducts, plumbing pipes, electric cable trenches etc. After installing the items, the openings shall be finished smoothly.

#### **Painting:-**

The entire civil works including supports shall be painted with approved colour and quality of paint as directed by engineer-in-Charge.



## **SPECIFICATIONS FOR PACKAGE PLANT DUCTING**

1.1 THE FIRM SHALL CONSULT the SDE(E) and under his guidance prepare and submits a working drawing in triplicate within 15 days of award of work This drawing shall indicate all the dimensions, quantities, specifications of material used in the particular site .

1.2 DEVIATIONS IN QUANTITIES AND SPECIFICATIONS SHOULD BE INTIMATED TO ASSISTANT ENGINEER(E)/EXECUTIVE ENGINEER(E) IN WRITING IMMEDIATELY.

1.3 MATERIALS AND STORAGE AT SITE:- All materials used for the work should be got approved before use. Rejected materials should be removed from site immediately. Original TESTCERTIFICATE and Guarantee Cards and operation manual to be submitted to SDE(E). Lockable space for storing materials at site will be provided by Department. However safe custody will be the firm's responsibility.

1.4 ELECTRICITY & WATER:- Electricity and water for Erection, Commissioning and Testing shall be provided by Department free of cost. However Department does not guarantee the conformity of supply and no compensation whatsoever shall be allowed on this account.

1.5 RATES, TAXES, DUTIES, CESS, LEVIES, etc., applicable in the State of Tamilnadu shall be included in the rate quoted.

1.6 ACCEPTANCE TESTING:- Entire AC system shall be tested for abnormal noise, vibration,electric shock, water leakage and air leakages and rectification if any required should be attended immediately. The whole plant is TO BE TESTED FOR A TWO STAGE ACCEPTANCE TESTING as per Departmental standards in the presence of Engineer in-charges of the work and T& D Circle. INITIAL TESTING will be conducted immediately after trial run of the total plant. FINAL PERFORMANCE CUM SEASON TESTING will be done any time during the period of 1stApril to 30th Sept. TECHNICAL PERSONNEL WITH TESTING INSTRUMENTS SHOULD BE MADE AVAILABLE BY THE FIRM DURING THESE TESTS.

1.7 DATE OF COMPLETION AND PROVISIONAL TAKE OVER will be the date of successful completion of initial Acceptance Testing and the plant will be put to beneficial use by the Department from that date. THREE SETS OF COMPLETION PLAN WITH COPIES OF OPERATING INSTRUCTIONS BEFORE TAKE OVER.

1.8 MAINTENANCE AND GUARANTEE: Twelve Month Free Maintenance from the date of completion of successful initial Acceptance Testing. Which shall consist periodical inspection, fine tuning and changing of faulty components.

### **DESIGN**

B.1 THE AIR STREAM coming from the package plant shall pass through volume control damper,heaters, fire damper, fine filters to branch ducts and supply air outlets.

B.2 THE ROUTE OF THE DUCTING, RA boxing, piping, cables, air outlets/earthings etc., should not obstruct the Telecom Equipments. The Supply Air/Return Air outlets should not cause condensate water leakage on the equipments. These outlets should not fixed near doors, to avoid leakage. Ducts above AC/DC ELECTRICAL BUSBARS SHOULD BE AVOIDED. Wherever possible the fresh air inlet shall be from corridors.

B.3 THE DUCTING ARRANGEMENT shall take into account any change like provision of additional package units, branch ducts and also easy maintenance of air filters, heater bank, without any major and prolonged shunt down.

B.4 THE SIZE OF DUCTS, type of insulation, method of construction and some approved makes of materials as contained in this document and the execution of work shall conform to this.

B.5 ALL NUTS, bolts, screws, washers etc., used shall be of non-rusting type.

C1. THE MAXIMUM velocity permitted is given below.

	VELOCITY IN Mtrs/Min		RETURN AIR DUCT
	SUPPLY AIR DUCT		
	MAIN DUCT	BRANCHES	
TECHNICAL ROOM	350-500	250-300	280-400
NON-TECH. ROOMS	300-350	200-250	250-300

C.2 THICKNESS for sheet for rectangular duct shall be as below

Length of longest side in mm	Sheet thickness
750mm and below	0.63mm
751mm - 1500mm	0.8mm
1501mm - 2250mm	1.00mm
2251mm and above	1.25mm

C.3 THE DUCTS shall be made with Class IV Galvanised Sheets as per IS:277.

C.4 THE CONSTRUCTION shall be as per IS:655

C.5 FLANGES OF ROLLED STEEL angles, welded at corners first and revetted to the duct and bracing to be provided. The intervals of flanges should not exceed 2500mm. The size of angle iron is 35 mm x 35 mm x 3 mm.

C.6 STIFFENER shall be Rolled Steel Angles of size 35 mm x 35mmx3 mm.

C.7 THE SPACING OF STIFFENERS by cross breaking or beading 300mm center to center up to ducts of 600mm length side 150mm center to center above 600mm length side.

C.8 INSULATED DUCTS need not be cross-broken.

C.9 BENDS SHALL BE made with radius not less than one and half of the width of the duct, with properly designed curved vanes.

C.10 ALL JOINTS shall be made air tight and interior surface smooth Thickness of felt lining between the flanged joints of duct shall be not less than 6mm.

C.11 NUTS, Bolts, Washers shall be Zinc plated steel.

C.12 RIVETS shall be galvanised or Magnesium aluminium alloy.

C.13 SUPPORT FOR DUCT:

Size of angle iron supports = 35mm x 35mm x 5mm

Distance between Supports = Not more than 2.45m for straight runs.

Additional Supports to be provided wherever required, such as in bends.

C.14. WALL CROSSING: Closely fitted heavy flanged collars to be provided to tight fit the ducts.

C.15. DUCT CONNECTION at PAC Unit end, Double canvas sleeve of 100mm long should be securely bonded and bolted to the duct and PAC unit. The sleeve should have an opening with a ZIP for temperature measurements.

C.16. OPENING IN DUCTS for branch ducts, grills, inspection joints etc., should not be deducted for measurements. Volume Control dampers, guidance Vanes, louvers etc., not to be measured unless specified.

C.17 INSPECTION DOORS and access in ducts: Ducts and plenum should have access for dampers, heaters, safety thermostat, airflow switch, electrical cables etc. A removable panel as Heater inspection access shall be provided in the duct.

C.18. PROVISION FOR MOUNTING HEATERS:- 2 Sets of angle iron frames with 35mm x 35mm x 3mm with mounting holes shall be provided in the plenum for mounting the heaters. Fire proof lining with sheet asbestos mill board of 6mm thickness shall be fixed inside the duct for a distance of 300 mm on each side of the heaters.

C.19. SIGN WRITING:

- (i) All dampers in the plenum and main duct should be sign written. The indicating devices of the damper should be suitably painted for easy identification of damper position.
- (ii) "FIRE" "THIS UNIT CONTAINS ELECTRIC HEATING ELEMENTS" should be written in FIRE RED ALUMINIUM PAINT as the duct near heaters.
- (iii) "INSPECTION DOOR" to be written in the Heater Inspection Door.

D.1 SUPPLY AND RETURN AIR OUTLETS: Construction shall be as below:

	SUPPLY AIR			RETURN AIR	
	RECTANGULAR			RECTANGULAR	
	Wall side mounting	Ceiling Mounting	CIRCULAR	Wall side mounting	Ceiling Mounting
MATERIAL	Sheet Steel	Sheet Steel	Sheet Steel	Sheet Steel	Sheet Steel
Finish	Spray painted	Spray painted	Spray painted	Spray painted	Spray painted
Outer Frame	1.25mm thick flanged type with outer edge curved and fitted with gasket.1.25mm thick	1.25mm thick flanged type with outer edge curved and fitted with gasket.1.25m m thick	1.25mm thick flanged type with outer edge curved and fitted with gasket.1.25m m thick	1.25mm thick flanged type with outer edge curved and fitted with gasket.1.25 mm thick	1.25mm thick flanged type with outer edge curved and fitted with gasket.1.25m m thick
Louvers	0.63mm Thick	0.63mm thick removable with diffusing assembly	0.63mm thick removable with diffusing assembly Equalizing grid	0.63mm Thick	0.63mm thick
Spacing	18mm	18mm	18mm	18mm	18mm
Free area	60%	60%	60%	70%	70%
Volume Control Damper	Fully adjustable without removing access panel and opposed blade type				

D.2. WALL/SIDE MOUNTING GRILLS are to be fixed on teak wood frame.

D.3. VOLUME CONTROL DAMPERS: Suitably supply and volume control dampers shall be provided in the branch ducts for balancing the air quantities. Suitable links, levers and quadrants shall be provided for proper operation, control and setting of dampers. Every damper shall have indicating device clearly showing damper position at all times.

D.4. FIRE DAMPERS: Fire dampers specified in the tender schedule and as shown in the enclosed drawings shall be provided. The construction of fire damper shall conform to the relevant code of local by-laws or fire regulations, if any. In the absence of any such loss the fire damper design and material shall conform to the details and material specifications shown in the figures 1 & 2. Fire damper casing may be either with 3.15mm thick M.S. sheet without reinforcement or 18 G (1.25mm) thick M.S. sheet with M.S. angle iron reinforcement.

E.1 DUCT INSULATION:- Type of Insulation required can be selected from the table below:

Length of Duct	Insulation length/surface	Material
a)SUPPLY DUCTS		
Upto 18m (from centre of PAC room to the last out let of end branch	Insulation not required.	Resin bonded Fibre glass (density not less than 24 Kg/M – Thermal conductivity not more than 0.03 K Cal/M/Hr MC at 10i C Mean Temperature.) covered with 25mm/50mm (as per Col.2). Vapour Barrier: More than 250 guage polythene sheet.
18M to 45M	25mm thick– half of the duct from tail end to be insulated.	
45M to 60M	25mm thick Full duct to be insulated	
Above 60m 50mm thick	50mm thick Full duct to be insulated	Wire Mesh: 19mm x 0.63mm wire netting
Supply ducts running in technical rooms without R/A Boxing or false ceiling	To be fully insulated with 25mm thick	Covering = 0.63mm thick GI sheet
INSULATION OF PLENUM MAY BE CONSIDERED IN COASTAL AREAS IN CONSULTATION WITH THE EXECUTIVE ENGINEER(E)		
RETURN AIR BOXING		
Conditioned Space	Insulation not required	Min. Size Support= 35mm35mmx5mm. Min. size grid = 1200mm x 60mm
In Non-conditioned space	50mm thick	
AC SHAFT/PACKAGE AC ROOM WALL		
Isolating non-conditioned space	50mm thick full surface	1. size of angle = 25mmx25mmx3mm 2.Size of grid = 1200mm x 600mm 3.Vapour barrier = More than 250 gauge polythene sheet 4. AC sheet = 4mm thick
Isolating conditioned space	Insulation Not required	

## E.2 METHOD OF INSULATION:-

THE DUCT SURFACE where the insulation is to be applied shall be thoroughly cleaned with wire brush and rendered free from all dust and grease. The specified thickness of insulation shall then be stuck to the duct with hot bitumen of suitable grade or any other compound recommended by the insulation manufacturers. The insulation shall be covered with polythene to seal all the joints. 19mm x 0.63mm wire netting, butting all joints laced down with G.I. wire shall then be applied round the insulated ducts. The surface finish shall be provided as specified in the following paras.

INSULATION ON SUPPLY ducts in technical rooms shall be finished with 0.63mm thick (24 guage) G.I. sheet where as in other areas it may be finished with sand cement plaster.

THE OUTER SURFACE of R.A. Boxing/False ceiling/wall insulation shall be cleaned and applied with primer and oil bound distemper.

## **SPECIFICATION FOR NITRILE RUBBER SHEET**

Nitrile Rubber sheet shall have a good general resistance to oil along with good mechanical properties especially tensile strength, flexing, compression set & impermeability to gases. It shall have moderate aging properties & good adhesion to metal. Its operating temperature range shall be -30°C to +120°C. It shall have good resistance to inorganic chemical products & satisfactory resistance to general hydrocarbons.

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## **SPECIAL CONDITIONS OF CONTRACT**

### **1.0I.S.Standards:**

The equipment offered and Installed shall confirm to relevant IS standards/IE rules amended up to date.

### **2.0 Drawings to be submitted for Approval:**

The contractor shall get the following drawings approved before the start of the work.

3. Ducting drawing showing sizes, damper locations (including fire damper), inlet and outlet, grills, diffusers with their sizes for all the floors.

4. Electrical wiring diagrams for all electrical equipments including controls showing cable sizes and equipment capacities.

### **3.0 Co-ordination**

Whenever air conditioning work is being carried out by more than one agency, it should be the aim of different agencies that on their account, the work of other agency/agencies is not delayed. Full co-operation shall be extended to other agencies during the progress of work and at the time of testing.

### **4.0 Completion drawing**

The firm shall supply three sets of drawing documents after physical completion of the work but before the proposed date of initial acceptance testing.

a) Ducting drawing showing sizes, damper locations (including fire damper), inlet and outlet, grills, diffusers with their sizes for all the floors.

b) Electrical wiring diagrams for all electrical equipments including controls showing cable sizes and equipment capacities.

c) Schematic control drawing giving detailed sequence of operation and notes to explain the operation of control circuit.

### **5.0 Completion of work:**

The work shall be deemed to have completed after the fulfillment of the following:-

- Physical completion of the installation of AC system including balancing the air and water circuits (wherever applicable) and successful trial run of AC system by the contractor for a period of 7 days subject to a minimum of 120 hours of running during that period in presence of representative of Engineer in charge.
- Successful completion of initial acceptance testing as per the BSNL standards in presence of representative of Engineer-in charge and T & D circle.

### **6.0 Inspection at Contractor's Premises**

The BSNL's authorized representative shall have full powers to inspect drawings of any portion of the work or examine the materials and workmanship of the plant at the contractor's works or at any other place from where material of equipment is obtained. Acceptance of any materials or equipment shall in no way, relieve the contractor of his responsibility for meeting the requirement of the specifications but shall have to be replaced free of cost by the contractor in case the equipment of work is found defective or of inferior quality.

### **7.0 Testing**

The firm shall carry out following tests at site and submit record to Engineer-in-charge

- (i) BSNL reserves the right to depute representative for inspection of material/equipment and witness the test at contractors/suppliers works and the firm shall be required to perform routine/type tests for unit of each type/model of package unit in the presence of BSNL's representative. At least one week's notice

shall be given by the contractor to the BSNL for fixing up inspection and factory tests.

- (ii) For Micor-Vee filters and motors etc only routine test certificate from manufactures shall be furnished.
- (iii) The contractor shall operate, test and adjust all air conditioning system units fans, motors, all air handling appliances provided in connection with this installation and shall make all necessary adjustments of all regulating damper for the purpose equalization of the flow of air to each and every outlet and inlet.
- (iv) A carefully recorded detailed record of the results of these adjustments shall be furnished by the contractor for approval of the Engineer-in-Charge.
- (v) Following tests at site shall be conducted after completion of the plant.

**(a) TRIAL RUN**

After installation is completed physically and in adjustments as listed above are carried out, the plant shall be subjected to trial run. The trial run is to be conducted for a period of **Seven days** subject a minimum running of **120 hrs.** in the presence of representatives of the Department. During this test performance of all equipments & control system shall be checked. Inside conditions shall also be recorded in this trial run. A record of this test shall be submitted to the Engineer-in-Charge who shall arrange Initial Acceptance Testing thereafter.

**(b) INITIAL ACCEPTANCE TEST**

After completion of trial run the plant shall be subjected to Initial Acceptance Testing as per standards of the Department. This testing shall be conducted jointly by the representative of the Engineer-in-Charge, T&D Circle and user. A list of all defects and discrepancies shall be prepared during the test.

**(c) FINAL PERFORMANCE CUM SEASONAL TESTS**

This test shall be conducted jointly by the representative of the Engineer-in-Charge, T&D Circle and user as per standards of the Department. The test shall be conducted between **1<sup>st</sup> April to 30<sup>th</sup> September.**

**(d)** The BSNL shall have right to operate all equipments, whether or not such Equipment have been accepted as complete and satisfactory. Repairs and alterations shall be made at such times as directed by the Engineer-in-Charge.

**(e)** In special circumstances the department may have to use the plant to air-condition some areas even before the completion of whole work. The firm shall cooperate fully under such circumstances.

- (vi) Wherever relaxations are required, these should be obtained from the Chief Engineer (Electrical) well before the final performance cum seasonal test.
- (vii) All testing equipments, the operating personnel required for testing shall be supplied by the contractor.

**8.0 Rejection of Defective Plant**

**(a)** If the completed plant or any portion thereof, before it is taken over, be found defective or fails to fulfill the intent of the specifications, the contractor shall, on receipt of a written notice from the Engineer-in-Charge, forthwith make good the defective plant.



**(b)** Should the contractor fail to rectify the defects and or make good the defective plant within a stipulated time mentioned in the written notice or replace the plant at no extra cost, Department may make good, reject and or replace at the risk of the plant which is defective or fails to fulfill the requirements of the contract.

## **9.0 Maintenance**

The contractor shall provide free maintenance for a period of **12 months** after the installation is provisionally taken over by the department and to any defects that may arise in operation of the plant during the period.

## **10.0 Training of BSNL Personnel**

The contractor shall arrange to impart training to the BSNL personnels on the following aspects prior to provisional take over of the plant:-

3. Operation of plant.
4. Gas charging and pumping down of the system.
5. Adjustments of settings for microprocessor controls & protective devices.
6. Preventive maintenance.

**11.0** The price shall be firm and validity of tenders shall be **90days** from the date of opening of tender.

**12.0** The tender rates accepted by the Department / BSNL shall be valid for operation for a period of **6 months** from the date of issue of acceptance letter. The currency of the contract shall also be extendable by mutual consent for a further period of **6 months**

**13.0** The Department / BSNL also reserves the right to enforce curtailment in the quantities of work, if the contractor defaults in regard to works contract execution.

**14.0** Test certificates excise duty, gate pass and purchase bill for units shall be produced by the firms.

**15.0** The firm shall furnish all the technical catalogues and performance test certificates of the equipments offered.

**16.0** The firm should early indicate the Quantum of Excise Duty Component in Rupees and in percentage.

# LIST OF APPROVED MAKES-BSNL ELECTRICAL WING

S. No.	Item	Makes
1	Engine	Ashok Leyland /Cummins/ Cater pillar /KOEL/ Mahindra & Mahindra (up to 200 KVA) /Escor KVA)/ Eicher (up to 35 KVA)
2	Alternator(Brushless)	Crompton Greaves (AL. series) / KEC / Leroy Stamford/Jyoti Ltd
3	Battery (Lead Acid / Mntc. Free)	Amara Raja / AMCO / Farukawa / Hitachi / Exide/ Prestolite / Standard
4	HV Switchgear (Vacuum Circuit Breaker/SF6 )	BieccoLawrie / Crompton / Kirloskar / MEI / J
5	Transformer (Oil filled / Dry type) a)	ABB / Schneider Electric /Andrew Yule / Bharat Bijlee / Crompton / EMCO /Kirloskar /
	b) Up to 400 KVA	In addition to above makes, Uttam/ Patson /I Transformer and Switchgear
6	Air Circuit Breaker	L&T/ Schneider Electric / Siemens
7	MCCB(Ics=Icu)	L&T/ Schneider Electric / Siemens
8	SDF units	L&T/ Schneider Electric / Siemens/HPL/Havel
9	Power Contactors	L&T/ Schneider Electric / Siemens/ Lakshmi(l
10	Change Over Switch	HPL / Havells / H-H Elcon
11	Intelligent APFC Relay	L&T/EPCOS(Siemens)/ Schneider Electric / Neptune Ducati/Syntron/ABB
12	Bus Bar Trunking/ Sandwiched Bus Duct	Moeller/L&T/Schneider Electric/ABB/ Legrand
13	Power Capacitors (MPP/APP)	L&T/EPCOS(Siemens)/ABB/Crompton/ Schneider Electric / Neptune Ducati
14	Digital/ KWHr meter	Schneider Electric/ AE/ Digitron / IMP/Meco / /Universal/HPL/L&T/ABB/Yokins
15	Cold shrink HT/LT Cable Joint	Denson / 3M(M-Seal )/ Raychem
16	Rubber Matting	ISI mark
17	MCB/ Isolator /ELCB/RCCB/ Distribution Board	Crompton / Havells / Indokopp / MDS Legrand / L&T / Schneider Electric/ Siemens / Standard/ABB/HPL
18	MS/ PVC Conduit	ISI mark
19	Cable Tray	MEM/Bharti/Ratan/Slotco/Profab
20	HT/LT Cables	ISI mark
21	PVC insulated copper conductor wire	ISI mark
22	Centrifugal Pump	Amrut / BE / Beacon / Batliboi /Crompton / J KSB / Mather &platt / WASP/Grundfos
23	Submersible Pump	Crompton/Amrut / BE / Calama / Kirloskar / I
24	Motors	ABB/ Bharat Bijlee / Crompton Greaves / Schneider Electric / HBB / KEC / Siemens/Jyo
25	Fresh Air Fans	GE / Khaitan/Almonard/Crompton
26	Starter	ABB / BCH / Schneider Electric / L&T / Sieme
27	Single Phase Preventer	L&T / Minilec / Siemens / Zerotrip
28	GI/MS Pipe	ATC / ATL / BST / GSI / ITC / ITS / IIA / JST / Jindal /TTA / Tata/Zenith

29	Foot Valve	ISI mark
30	Gate Valve	Advance/Audco/Johnson Controls / Zoloto /Annapurna / Fountain /Kirloskar / Leader / Sant / Trishul
31	Compressors	Carrier/Emerson copeland/York/Danfoss (for chillers only)
32	Resin Bonded Glass Wool	Fibre Glass / Pilkington / UP Twiga
33	Expanded Polystyrene	BASF(India) Ltd.
34	Gauge	Feibig / H.Guru / Pricol
35	Controls	FLICA / Honeywell / Indfoss / Penn- Danfoss / Ranco / Ranutrol / Sporland
36	Fine Filters	Anfiltra Effluent / ARW / Athlete/ Airtake / Dyna / Kirsloskar/ Puromatic/ Purafill/ Purolator / Tenacity
37	GI Sheet	HSU Jindal / National / Nippon Denro / Sail / Tata
38	Heat Detector	Appollo / Chemtron/ Edward / Fenwal/ Hochiki / Nitton /System Sensor/ Wormald/Honeywell Essar/Notifier
39	Ionization Detector	Appollo / Cerebrus / Edward/ /Fenwal / Hochiki / Nitton / System Sensor /Wormald
40	Photo Electric Smoke Detector	Appollo / Cerebrus / Edward / Fenwal/ Hochiki / Nitton / Wormald /System Sensor
41	Fire Panel (Microprocessor based)	Agni Instruments / Agni Devices/ Aruna Agencies / Carmel Sensor / Ravel Elect. / Honeywell Essar / Notifier / Navin Systems
42	Sprinkler/ Hose Reel & Hose Pipe	ISI mark
43	Fire Extinguisher	ISI mark
44	Lift	OTIS, Kone, Mitsubishi , Schindler, Johnson, Thyssenkrupp Elevator(India)

**NOTE:**

1. The accessories such as CT/PT/measuring instrument/relays provided by approved make in respect of Transformer/HT Panel/DG /AC Package Units as supplied by approved manufacturer along with the equipments are also acceptable in addition.
2. Any other makes which are approved by BSNL CO up to the last date of sale of tender can also be used in this contract.

## LIST OF INDIAN STANDARDS

- I.S.277 Galvanized steel sheets.
- I.S.325 Three Phase Induction Motors
- I.S.655 Metal Air Ducts
- I.S.732 Code of Practice for Electrical Wiring and fittings for Buildings.
- I.S.778 Gun Metal Gate, Globe and Check Valves for general purposes.
- I.S.900 Code of Practice for Installation and Maintenance of Induction Motors.
- I.S.996 Single Phase small AC and Universal Motors.
- I.S.1239 Mild Steel Tubes, G.I. Pipes, Tubular and other wrought steel fittings.
- I.S.1248 Direct Acting Electrical Indicating Instruments.
- I.S.1520 Horizontal Centrifugal Pumps for clear, cold and fresh water.
- I.S.1554 PVC Insulated (heavy duty) Electrical Cables  
(Part-I) for working voltages upto and including 110 volts.
- I.S.2372 Timber for cooling towers.
- I.S.2516 AC Circuit Breakers.
- I.S.2592 Recommendation for Methods of Measurements of Fluid flow by  
means of Orifice Plates and Nozzles.
- I.S.1822 Motor Starters of Voltage not exceeding 1000 volts.
- I.S.2208 HRC Cartridge Fuse – Links upto 650 volts.
- I.S.3589 Electrically welded steel pipes for water, gas and sewage.
- I.S.3624 Bourden Tube Pressure and Vacuum Gauges.
  
- I.S.4047 Heavy Duty air break switches and composite units of air break  
switches and fuses for voltage not exceeding 1000 volts.
- I.S.6392 Steel Pipe Flanges.
- I.S.7403 Code of Practice for Selection of Standard Worm and Helical Gear  
Boxes.
- I.S.8148 Specification for packaged air conditioning.  
CPWD General Specifications for Heating, Ventilation & Air conditioning (HVAC)-2004

### IMPORTANT NOTE

All references to I.S.I. appearing in this specification may be read as Bureau of Indian Standards, Latest amended versions.

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## LIST OF SAFETY STANDARDS

- I.S.618 Code of Practice for safety and health requirements in Electrical and  
Gas Welding and Cutting Operations.
- I.S.659 Safety code for Air Conditioning.
- I.S.660 Safety code for Mechanical Refrigeration.
- I.S.3016 Code of Practice for Fire precautions in welding and cutting operations.
- I.S.3210 Code for Safety procedures and practices in Electrical works.
- I.S.3696 Safety for Scaffolds and Ladders.

### **PROFORMA OF SCHEDULES**

(Operative Schedules to be supplied separately to each intending tenderer)

#### **SCHEDULE 'A'**

Schedule of quantities : Attached

#### **SCHEDULE 'B'**

Schedule of materials to be issued to the bidder: **Nil**

#### **SCHEDULE 'C'**

Tools and plants to be hired to the bidder: Nil

#### **SCHEDULE 'D'**

Extra schedule for specific requirements/documents for the work, if any: Nil

#### **SCHEDULE 'E'**

Schedule of components of Materials, Labour etc. for escalation: Nil

#### **SCHEDULE 'F'**

Reference to General Conditions of contract :

Name of work:	As per NIT notification page
Estimated cost of work:	
Earnest money:	
Security Deposit and performance Guarantee	

General Rules & Directions: Officer inviting tender:

Executive Engineer (E)  
**Electrical Division-III**  
**Chennai**

Definitions:

2(v) Engineer-in-Charge  
ED-III,

Executive Engineer (E),  
  
Chennai

2(vi) Accepting Authority  
Chennai

SE (E), Electrical Circle -II,

2(x) Percentage on cost of materials  
and labour to cover all  
over heads and profits

10% (TEN)

#### **CLAUSE 5**

Time allowed for execution

One **Month**

Authority to give fair and reasonable  
extension of time for completion of work:  
Chennai

SE (E ), EC-II,

Competent Authority for deciding reduced rates:  
Chennai

SE (E ), EC-II,

Clause 25

Contact

Competent authority for conciliation:  
work.

SE (E) not in-charge of the

**BSNL EW-8**  
**Bharat Sanchar Nigam Limited**  
**Electrical Wing**

Electrical Division: III, Chennai

Sub Division:ESD,CANI Project,**Chennai**

1. I/we have read and examined the notice inviting tender, schedule, specifications applicable, Drawings & Designs, General Rules and Directions, Conditions of Contract, clauses of contract, special conditions, Schedule of Rates and other documents and Rules referred to in the conditions of contract and all other contents in the tender document for the work.
2. I/We hereby tender for the execution of the work specified for BSNL within the time specified, schedule of quantities and in accordance in all respects with the specifications, designs, drawings and instructions and other documents and Rules referred to in the conditions of contract and all other contents in the tender document for the work.
3. I/We agree to keep the tender open for ninety (90) days from the due date of submission thereof and not to make any modifications in its terms and conditions.
4. If I/We, fail to commence the work specified, I/We agree that the said BSNL shall without prejudice to any other right or remedy, be at liberty to forfeit the said earnest money absolutely and the same may at the option of the competent authority on behalf of BSNL be recovered without prejudice to any other right or remedy available in law out of the deposit in so far as the same may extend in terms of the said bond and in the event of deficiency out of any other money due to me/us under this contract or otherwise.
5. Should this tender be accepted, I/We agree to execute all the works referred to in the tender documents upon the terms and conditions contained or referred to therein and to carry out such deviations as may be ordered upto maximum of percentage mentioned in clause 12.3 of the tender form and those in excess of that limit at rates to be determined in accordance with provisions contained in clause 12.2.
6. I/we agree to furnish to BSNL, Deposit at Call receipt/FDR/ Bank guarantee of a Nationalized/ Scheduled Bank for an amount equal to 5% of the of the contract value in a standard format within two weeks from the date of issue of award letter. I/We agree to keep the performance bank guarantee valid as per the BSNL terms and conditions.
7. 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 to whom I/We

am/are authorized to communicate the same or use the information in any manner prejudicial to the safety or interest of BSNL.

<p>Signature of Witness (required in the case of bidder's thumb impression is given by the bidder in place of signature) Occupation of Witness :</p>	<p>(Signature of bidder ) (Name &amp; Postal address)</p> <p>Seal of Bidder</p> <p>Date:</p>
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### **Acceptance of Tender**

The above tender (as modified by you as provided in the letters mentioned hereunder) is accepted by me for and on behalf of BSNL for a sum of Rs. \_\_\_\_\_Rupees\_\_\_\_\_ )

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

- a)
- b)

For & on behalf of BSNL

Dated

Signature :  
Designation :