Bharat Sanchar Nigam Limited
(Electrical Wing)

O/o The Executive Engineer (E)
BSNL Electrical Division-III
No.22, Kellys Road,
Chennai - 600010.
Office: 044-26474545 Fax: 044-2647 6292
E-mail: eeedn3@gmail.com

E-TENDER DOCUMENT

PART I--TECHNICAL BID

Nameofwork: -Providing Electrical Infra structure works for proposed Cable Landing Station at RK Mutt Road, Mandaveli, Chennai.(SW: SITC of IBMS,ACS, IP CCTV, AFAS, FSS, ASDS, WLDS and RRS including AMC for 84Months(i/c 24 Months warranty))

NIT No : 36 / EEE/ED-III/CH/2019-20

This tender document contains:

Part-I Technical Bid - 101 pages (One hundred and one pages only).

Part-II Price Bid -14 pages (Fourteen pages only)

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

Mail Id:twhelpdesk399@gmail.com, bsnltwhelpdesk@gmail.com

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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,**ED III, Chennai** on behalf of the CMD,BSNL invites online Item rate bids from eligible bidders in **SINGLE STAGE BIDDING &TWO STAGE OPENING SYSTEM** for the following work:

1	Name of work	Providing Electrical Infra structure works for proposed Cable Landing Station at RK Mutt Road, Mandaveli, Chennai.(SW: SITC of IBMS,ACS, IP CCTV, AFAS, FSS, ASDS, WLDS and RRS including AMC for 84Months(i/c 24 Months warranty))
2	Estimated cost put to tender.	**Rs. 66,18,927/-**
3	Earnest Money	**Rs.1, 32,379/-.**
4	Period of completion	86 months(SITC-2months,AMC-84 months after completion of SITC)
5	Tender Fee(Non-refundable)	Rs. 1000/- + 18% GST
6	Last date & time for online and physical submission of tender	Up to 11:00 Hrs. on 31.07.2019
7	Date and time for opening of Technical bid	11:30 Hrs. on 31.07.2019
8	Date and time for opening of Price bid	To be notified separately
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 31st March 2019, should be at least 30% of the estimated cost put to tender.

AND

2. (a) Original Manufacturer of BMS /Analogue Addressable Fire detection & Fire Suppression system or their authorised dealers/system integrators with specific letter from OEMs

OR

b) Experience of having successfully completed similar works in Central Government /State Government /Central Autonomous Body/Central Public sector Undertaking during last 7 years ending 30th June-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 ''SITC of Analogue Addressable Fire detection &Fire Suppression system /IBMS".

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 deposited e-Tender Processing Fee with M/s ITI Limited, and 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 authorised by the manufacturer, the original authorisation letter is to be scanned and uploaded)
   e. ~~Enlistment certificate issued by BSNL if applicable~~.
   f. ~~Electrical license issued by TN Govt. if applicable~~
   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 if applicable the original authorisation letter by the manufacturer, (the scanned copies of which are uploaded) shall be deposited in the tender box available in the office

of tender opening authority, by all the bidders before 3:00 PM on the tender opening date, failing which the tender shall not be opened.

SINGLE STAGE BIDDING &TWO STAGE OPENING SYSTEM

The tender will be submitted on line in two parts:

Part -1:- TECHNICAL BID

Part -II: PRICE BID

- The technical bid will be opened on line at the first instance and evaluated by the Committee. At the second stage price bids of only the technical & commercially accepted offer will be opened for further evaluation and ranking before awarding the contract. The price bid shall be opened subsequently on a date and time to be notified by BSNL.

- The Physical Tender cost, EMD, technical brochure and technical deviation if any shall be deposited by all the bidders before 11:00 AM on the tender opening date, failing which the tender shall not be opened.

- **The Micro Inventory in Page No. 38-39 of tender document shall be downloaded, filled up, scanned and uploaded along with the Technical bid in the e- Tendering website.**

- The technical bid shall be evaluated by the tender evaluation committee and if necessary clarifications / confirmation, for deviations (if any) shall be taken from the eligible bidders so as to evaluate their bids as per terms and conditions of the tender documents to decide the technically responsive / non responsive bidder.

- **The bidders shall not be at any stage allowed to revise / modify the price bid after the opening of Technical Bid.**

BSNL EW-6
Bharat Sanchar Nigam Limited
Electrical Wing

Electrical Division: **ED III, Chennai.** Sub Division: CANI Project, Chennai

1. Item rate tenders on **SINGLE STAGE BIDDING &TWO STAGE OPENING SYSTEM**are invited on behalf of CMD,BSNL for the work "Providing Electrical Infra structure works for proposed Cable Landing Station at RK Mutt Road, Mandaveli, Chennai.(SW: SITC of IBMS,ACS, IP CCTV, AFAS, FSS, ASDS, WLDS and RRS including AMC for 84Months(i/c 24 Months warranty)) 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.

2. 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.

3. The work is estimated to cost **Rs. 66,18,927/- [EXCLUDING GST]**

4. 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.

5. The time allowed for carrying out the work will be 86 months (SITC-2months, AMC-84 months after completion of SITC)) from the 10 th day after the date of written order to commence the work

6. 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.

7. 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** at free of cost. The BSNL EW-8 document can be seen from the web site **www.chennai.bsnl.co.in** at free of cost.

8. 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.

9. The Tender Fee **Rs. 1000+ 18% GST** 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.

10. The Earnest money deposit (EMD) for **Rs.1, 32,379/-.**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. 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.

11. 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.

12. 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.

13. The last date for online submission of bid is 31.07.2019 up to 11:00 AM and the Technical Bid submitted shall be opened at 11:30 AM on the same day, 31.07.2019. However the price bid will not be opened on the same day. The opening of price bid shall be notified by BSNL after Technical bid is finalized. If a holiday is declared on the tender opening day, the tender will be opened on the next working day.

14. The e-Tender processing fee and tender cost are non-refundable

15. **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. Date of Actual completion of work will be completion of AMC period. **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**.

16. **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.**

17. 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.

18. 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.

19. 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.

20. 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.

21. 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.

22. 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.

23. 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.

24. 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'**.

25. **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.

26. 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.

27. 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. Tender Bidding Methodology: - "Single Stage Bidding and Two stage opening system". In this system Technical Bid (Techno-commercial NIT document) and Price Bid shall be submitted by the bidder at the same time.

6. On opening date, the bidder can login and see the bid opening process. After opening of bids he will receive the competitor bid sheets.
7. Bidder can upload documents in the form of JPG format or / and PDF format.

8. 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)

9. 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.

10. 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.

11. 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.

12. **Tender Evaluation** :

(a) The evaluation and comparison of responsive bids shall be done on the basis of Net 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.

13. 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.
14. 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.

15. **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.

16. 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.

17. 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.

18. 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 is 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 is 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. Actual date of completion
7. 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.

5. 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

Name of Work:- Providing Electrical Infra structure works for proposed Cable Landing Station at RK Mutt Road, Mandaveli, Chennai.(SW: SITC of IBMS,ACS, IP CCTV, AFAS, FSS, ASDS, WLDS and RRS including AMC for 84Months (i/c 24 Months warranty))

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 / SAC code
					%	Rate	%	Rate	%	Rate				
1	2	3	4	5	6	7 = 6 x 5	8	9 = 8 x 5	10	11 = 10x5	12=5+(7+9) or (11)	13 = 3 x 5	14 = 3 x 12	15
	PART A- SITC													
I	**Sub Head-I: IBMS (INTELLIGENT BUILDING MANAGEMENT SYSTEM)**													
1	IBMS Software, Server Machine and Operator Workstation.													
a	**Server Machine to Install IBMS Software:** SITC of Server to accommodate Intelligent Building Management software. The server should be minimum of Intel® Xeon® Processor 3.06 GHz, 512K Cache, 533 MHz FSB or better, Minimum Windows ***2012*** server OS, ***8GB RAM, 1TB HDD,*** video resolution of 1280x1024 pixels or better, ***21" LED monitor*** DVD Writer,1Gbit/sec or greater on-board network card, rack mountable, redundant power supply units complete as required. All OS required as per OEM and other accessories required to complete the system shall be provided. Work station shall be pre loaded with requisite MS Windows Licensed software compatible with the IBMS platform etc. complete as required, ***along with licensed anti-virus for 5 years***	1 No	Each											

UNPRICED SCHEDULE

b	**Workstation Machine**: SITC of Workstation Machine with PC i-7 processor, 500GB HDD, 4 GB RAM, DVD R/W Drive, optical Mouse, 106 keys key board, 8 serial and one parallel ports with 10/100 Mbps Ethernet card & internal modem. The system should be supplied with 21" LED monitor, etc. complete as required, ***along with licensed anti-virus for 5 years***	1 No	Each											
c	**Integrated Building Management System Software:** SITC of ***web based*** GUI IBMS Software to be installed at server with unlimited client viewing license for recording 3years data or more. The IBMS software should have provision for seamless integration of Precision Air-Conditioning Units, DDC Controllers, Electrical Panel, DGs, UPS, Energy Meters, Fire Alarm System (BACNET/IP), Security System alarm etc. The alarms in integrated system should flow to IBMS with point names and give a pop up visual indication into BMS Work-station .The alarms as indicated in IO summary should be available in IBMS system. The license shall be priced for ***1000 points and unlimited client station licenses*** for viewing the IBMS from Lon/Modbus / BACnet Interface.													
	The Software point /Hardwired point integration will include the services as detailed in IO Summary. The firms offering soft integration for hardwired points is also acceptable without extra cost. The IBMS software will be highly scalable and later act as a master to all the smaller stations in future. The uplink will be provided by BSNL.	1 No	Each											

2	**DDC CONTROLLER**:SITC of standalone Intelligent UL Listed, BTL certified onboard TCP/IP freely programmable DDC with latest 32 bit microprocessor technology having built-in Lon/Modbus / BACnet gateway for connecting third party devices, with peer to peer communication, input or output relays, terminal block, real time clock, networking and inbuilt data buffer. The controller shall have a minimum of 32 MB of Non-volatile Flash memory for control applications and 32 MB non-volatile flash memory for storage with Minimum 12 input/ outputs. Each standalone controller should be able to store minimum 45 days data. The controller shall be fixed in the suitable size powder coated MS box with suitable power supply unit. Earthing bolt shall be provided for body earthing also.													
a)	DDC for Monitoring & control as per IO summary													
b)	DDC for Monitoring status of energy meter, UPS & other devices etc. Complete as required													
	Total of a &b comprising of 1 lot	1 lot	Lot											
3	**Field Instruments / Devices**: Supplying and installing of the following Sensors as per the detailed specification. The Sensors shall be of two wire type.													
a)	Temperature cum Humidity Sensor of Resistance Temperature Detection Type of PT 1000 / NI 1000/ NTC 20k ***with built in LCD display for Temperature & RH.*** The accuracy of the temperature sensor shall be $\pm$ 1 ^{O}C over the range. Relative Humidity sensors shall capacitance type with an effective sensing range of 10% to 90%. The accuracy shall be ± 5 % or better.	3Nos	Each											
b)	Hydrogen Sensor (0-100% LEL)	1 No	Each											

4	**INTEGRATOR & SWITCH**: SITC of Integration Module with Lon/BACnet/IP output to integrate third Party Devices working on Modbus RTU, BACnet, over RS 485/IP, Open protocol over RS 485/IP to Building Management Station etc. complete as required. The Points for soft integration is to be considered as per IO summary. (Note : If Integrator is a part of the DDC Controller, the rate need not be quoted for this item, instead same shall be covered in Item 2 of SH:-1)	1 lot	Lot											
5	SITC of standalone 3 KVA, 3phase, on line UPS for all the IBMS systems with a backup of upto 20 minutes i/c providing bypass arrangement etc as required.	1 No	Each											
6	SITC of Layer II managed 24 ports POE switch with RJ45 ports 10/1000 mbps ports and two uplink gigabit ports etc as required.	2Nos	Each											
7	27U Floor Mount Rack with caster wheel, required shelfs, 4 no's of cooling fans, 5/15A power strips and required accessories etc as required.	1 No	Each											
	Sub-Total of SH-I (BMS)													
II	**SH-II: ACS (ACCESS CONTROL SYSTEM)**													

1	**MAIN ACCESS CONTROL PANEL:** SITC of following Microprocessor based Access controllers for connecting the item such as card readers, Magnetic locks etc. with TCP/IP Compatibility with suitable size MS powder coated enclosure, power supply units along with PSU, store 99000 cards for faster processing and 99999 swipe records on-board additional Inputs /Auxiliary outputs and all accessories along with Tamper Protected casing as per the detailed technical specification attached. The Access controllers should be UL listed. The access controller is to be integrated with the analog addressable fire alarm system for operation. The DOTL (Door Open Too Long) Alarm shall be generated by the control panel as per set timing. IP Access controller / Controllers shall be suitable to connect up to 8 readers.	2set	Set											
2	**SMART CARD READERS**: SITC of *iClass* Smart Card readers with stainless steel base plate with base box i/c door interface module (if applicable) etc as required. The read range shall be up to 125 mm for Doors.The reader log data should be transferred to server on real time basis.	4 Nos	Each											
3	**Biometric Finger Print Reader**: SITC of Biometric finger reader having inbuilt smartcard readers with pin pad complete with enclosure, protective cover to avoid scratching and all accessories i/c door interface module (if applicable), for Doors of server/ critical room etc as required as per the detailed technical specification attached . The reader log data should be transferred to server on real time basis.The reader should be capable of both enrolment purpose and access control purpose.	6 Nos	Each											
4	**SMART CARDS**: Supplying of Smart Cards, double side card holder and lanyard including printing on lanyard etc as required.	50 Nos	Each											

5	**EM-LOCK FOR DOORS:** SITC of Electromagnetic Locks of 600 lbs holding force suitable for operating with 12/24V DC power supply i/c providing Green /Red LED indication **with built-in door monitor status** as per the specification													
a)	For single leaf doors	1Nos	Each											
b)	For double leaf doors	2 Nos	Each											
6	SITC of Emergency door release /exit switch inside the room for Doors etc as required.	3 Nos	Each											
7	SITC of master switch for opening all access control doors in case of Emergency.	1 No	Each											
8	Access Management software Including Attendance Software as per the detailed specification attached.	1set	Set											
	Sub total of Sub Head-II (ACS)													
	SH –III: IP CCTV surveillance system													
1	SITC of Indoor/outdoor Fixed Dome IR Camera having Full HD resolution (2304 x 1296) 3MP or better Low light colour cameras with sensitivity of minimum 0.12 lux in color mode & 0.03 lux in B/W mode along with power supply unit. The cameras shall use the 1/3 inch format CMOS/CCD imager and shall have a 3 to 12 mm varifocal lens. Electronic Shutter range of 1/5 - 1/10,000. The cameras shall have digital wide dynamic range (WDR) of upto 60 db. The Cameras shall be POE (IEEE 802.3af class 3). The Cameras shall be **ONVIF and UL** compliant and complete as per detailed specification attached.	6 Nos	Each											

2	Supply, Installation, Testing and Commissioning of 16 channel Network video recorder with 8 SATA interface, not less than 8TB usable storage, H.264 Compression format and Including the hard disk for redundant to Record @ D1 resolution, 15FPS for 60 days etc as per specification attached.	1 No	Each											
3	SITC 32" diagonal, 1920 x 1080 pixels LED monitoring screen with all mounting bracket, connection chord wire, remote control , with suitable ports etc as per the specification attached.	2 Nos	Each											
4	Cat6 IO modules with single shutter faceplate and Back Box etc as required.	6 Nos	Each											
	Sub Total of Sub Head-III (IP CCTV)													
IV	**SH-IV: AFAS (ADDRESSABLE FIRE ALARM SYSTEM)**													
1	**Fire Alarm Control Panel (FACP)**: SITC of Analogue addressable micro Processor - controlled , Standalone , Main Fire Alarm Control Panel 2 loop (1 Loop Card) (with minimum 125 detectors /125 devices capacity per loop card) with LCD display , capable of being networked to the central monitoring System, to monitor and integrate other panels such as Access control System and accessories like detectors, LCP's, hooters, control modules, monitor modules Fault Isolation Modules, response indicators, fire/fault indicators, audio-visual signals, central processing units, complete with LCD display, zone indicating LEDs, having multiple access levels, event history file in non-volatile memory (EEPROM) as per the detailed specification, complete with PSU, Battery backup along with charger for 24 hours in non-alarm condition and 30 minutes in alarm condition etc. as required. The panel shall be UL & FM listed.													

	NB: - The alarm from Fire Alarm Panel should flow to IBMS (as per IO Summary) for soft integration and should give a Pop-Up Visual indication at IBMS work station. Cross Zoning shall be considered for NOVEC FSS triggering in respective zones only.	1 No	Each											
2	**Addressable Multi Sensor Detector**: SITC of Addressable analogue MULTISENSOR / MULTICRITERIA type, UL Listed photo cum thermal detectors with solid state design, indicating LED, mounting base, mounting bracket etc. base box, loop in and loop out gland as per requirement and detailed specification attached.													
a)	On Real Ceiling (Base Box is to be Used)	35Nos	Each											
b)	On False Ceiling	20Nos	Each											
3	**Addressable Heat Detector**: SITC of UL Listed Intelligent Analogue addressable ROR Heat detector with junction box etc. as required as per specification attached.	6Nos	Each											
4	**Addressable control modules:** SITC of UL Listed Addressable control module complete with junction box etc. for control options of Hooters & other control options like Access Doors opening, the package Air Conditioners trip, ***Novec suppression*** etc. in case of emergency, as required.	6Nos	Each											
5	Manual Call Point: SITC of UL Listed Manual call points slim type with NO/NC contacts, Pull type/break glass, reset Lock & Key arrangement etc suitable for addressable function as required.	4Nos	Each											
6	Electronic Hooter Cum Strobe: SITC of Hooter having three distinct sounds with addressable relay module and strob light with minimum 85 db from 1Mtr distance etc. as required.	6Nos	Each											

7	Fault Isolator Module: SITC of UL Listed Fault isolation module to electrically isolate different sections of detector loops (for every 20 detectors / devices) as per detailed specifications.etc. as required.	2Nos	Each											
8	Response Indicator: SITC of Response indicator having twin LEDs for mounting on false ceiling / wall at the entries of the cabin for indicating the operation of detectors in the above false ceiling / below false flooring detectors etc. as required.	20Nos	Each											
9	Input Module: SITC of UL Listed Input Module with junction box etc. For monitoring the status of Vesda, WLD, Novec 1230 etc., as required.	10Nos	Each											
10	24VDC PSU : SITC of suitable power supply unit with sufficient battery backup to activating the Hooters in alarm conditions. etc as required.	2Nos	Each											
	Sub-Total of SH-IV (AFAS)													
V	**SH-V: FIRE SUPPRESSION SYSTEM (For Equipment & Battery Rooms)**													
1	Designing and SITC of Vds/UL approved NOVEC 1230, fire suppression system, design for highest degree of protection and minimum extinguishing time for Server Room at uniform extinguishing concentration comprising of following components and related accessories, connections etc. as per specifications and approved makes as required.													
a)	SITC of 120 Ltrs. Capacity NOVEC 1230 seamless cylinder complete with Cylinder Valve, Pressure gauge, safety outlet and port for low pressure switch connection and cylinder strap including Manual actuator, Actuation Hose etc complete as required.	3Nos	Each											

b)	SITC of NOVEC 1230 Agent in the existing cylinders.	320Kg	Kg											
c)	**Centralized Master Cylinder Kit Comprising Below Items:** Low Pr. Supervisory Switch	2Nos	Each											
d)	Electromagnetic Actuator	2Nos	Each											
e)	Pneumatic Actuator	2Nos	Each											
f)	* Flexible Discharge Hose	2Nos	Each											
g)	Warning Sign Board	2Nos	Each											
h)	**Centralized Slave Cylinder Kit Comprising Below Items:** Low Pr. Supervisory Switch	1No	Each											
i)	Pneumatic Actuator	1No	Each											
j)	* Flexible Discharge Hose	1No	Each											
k)	Check Valve	1 No	Each											
l)	Nozzles	8 Nos	Each											
m)	Wall Mount Cylinder Bracket	6 Nos	Each											
n)	Discharge Pressure Switch	2 Nos	Each											
o)	SITC of Gas Release Panel with PSU	2 Nos	Each											
p)	SITC of Manual Release Switch (Green)	2 Nos	Each											

q)	SITC of Manual Abort Switch (Yellow)	2 Nos	Each											
2	SITC of suitable size M. S. Seamless pipes as per ASTM 106 Gr. B, Schedule-40 according to design consideration complete with necessary fittings including cutting, welding and clamping and shall be painted with two coats of primer and two coats of red enameled paint as per fire norms etc. complete as required.	2 lot	Lot											
	Sub-Total of SH-V (FSS)													
VI	**SH-VI: ASDS (ASPIRATION SMOKE DETECTION SYSTEM)**													
1	Supply, installation, Testing & commissioning of Air sampling type Networkable 1 Zone HSSD System, Auxiliary Programmable relays for Alert / Action / Fire on board for FAS system.													
	a) Equipment room &Battery room	2 Nos	Each											
2	Supply, installation, Testing & commissioning of suitable power supply unit with sufficient Battery backup etc as required.	2 Nos	Each											
3	Supply and Installation of Air termination Nozzles with Capillary set and accessories including end caps etc as required.	8 Nos	Each											
4	Aspiration 25mm OD, heavy duty, PVC Sampling Pipes with accessories etc as required.	120mts	Mtr											
5	Electronic Hooter with mounting arrangement etc as required.	2 Nos	Each											
	Sub-Total of SH-VI (ASDS)													

VII	**SH-VII: WLD (WATER LEAK DETECTION SYSTEM)**													
1	SITC of 4 Zones Non-Locating Water leak detection system with Suitable length of leader cable - MODBUS communication -NC/NO for relay or as per solution with LCD keypad etc., as required.	1 Nos	Each											
2	Supply, Installation, Testing and Commissioning of Water Leak Sensing Tape i/c providing adhesive to fix sensing cable etc as required as per technical specifications attached.	50 mts	Mtr											
	Sub-Total of SH-VII (WLDS)													
	-													
VIII	**SH-VIII: RODENT REPELLENT SYSTEM**													
1	Supply, installation, testing and commissioning of Microprocessor based Master Digital Controller Console with auto tuning capability of connecting 12 Satellites per console in individual cable to transducer, LCD display, with on-board controls for generating frequencies from 20Khz to 60 Khz, including all accessories such as stand/rack etc., as required.	3 Nos	Each											
2	Supply, installation, testing and commissioning of Transducer Satellite Stations, capable of Emitting Ultrasonic sound of frequencies 20 Khz and higher including all accessories all complete as per specifications, relevant standards etc., as required.	36 Nos	Each											
3	Supplying & Laying Standard 2 core, flexible **(14/40) SWG multi-stranded CT wires for rodent,** for connectivity between the transducers and the master console suitable for rodent repellant system. **Including supplying & laying necessary FRLS PVC Conduit of 25mm dia, couplers, bends etc complete as required.**	500 mts	Mtr											

	Sub-Total of SH-VIII (RRS)													
	-													
	SH-IX: Cabling													
1	S/L of following type and size of cable etc. complete as required													
a)	S/L of 2-Core, 1 sq. mm copper conductor Shielded FRLS armoured cable Gray Color for Communication etc as required.	750 mts	Mtr											
b)	S/L of 2-Core, 1 sq. mm copper conductor Shielded FRLS unarmoured cable for Communication as required.	750 mts	Mtr											
c)	S/L 4-C x 1.0 Sq mm, copper conductor, Twisted Pair, multi strand, ATC shielded, armoured cable in recess/on surface/ cable tray (Gray Color) etc as required.	750 mts	Mtr											
d)	S/L of 8-Core, 1 sq. mm ,copper conductor, Shielded, FRLS ,unarmoured cable for Communication etc as required.	750 mts	Mtr											
e)	S/L of 2 Core, 1.5 sq. mm, copper conductor, FRLS, armoured cable etc as required.(RED Colour)	750 mts	Mtr											
f)	S/L of 6Core, 1 sq. mm, copper conductor, ATC shielded, unarmoured cable etc as required.	700 mts	Mtr											
g)	S/F 25mm dia PVC FRLS Conduit with all its accessories on surface of wall/in recess etc as required..	1000 mts	Mtr											
h)	S/L Cat6 4Pair UTP Cable etc as required.	1200 mts	Mtr											

i)	Supplying of Cat6 Factory pre-crimped patch chords of length of 1 meter etc as required.	40 Nos	Each											
j)	Supply and Laying of 3 Run x 2.5 sq.mm flexible Wire in existing conduit etc as required.	300 mts	Mtr											
k)	Supply and Laying of 3 Run x 1.5 sq.mm flexible Wire in existing conduit etc as required.	500 mts	Mtr											
l)	Supply and Erection of 5/15Amps, 3 Pin universal Socket with Switch, Back box and Cover Plate etc as required.	40 Nos	Each											
m)	S/F 20mm dia PVC FRLS Conduit with all its accessories on surface of wall/in recess etc as required..	500 mts	Mtr											
	Sub-Total of SH-IX (CABLING)													
	PART B AMC													
1	Comprehensivel Maintenance of above IBMS, Access Control system, CCTV system, Addressable Fire alarm system, Fire Suppression system, Aspiration Smoke Detection system, Water Leakage Detection system, Rodent Repellent system excluding gas, Cables and Conduits as required. (post Warranty Period)													
a	First Year (Under warranty)	12 Months	Month											
b	Second Year (Under warranty)	12 Months	Month											
c	Third year	12 Months	Month											
d	Fourth year	12 Months	Month											
e	Fifth year	12 Months	Month											
f	Sixth year	12 Months	Month											
g	Seventh year	12 Months	Month											
2	Extra rate for deputation of trained operator cum trainer at site in general shift. The operator is required to do all the function on day today basis and train the client's persons to acquaint them all the	1 Month	Month											

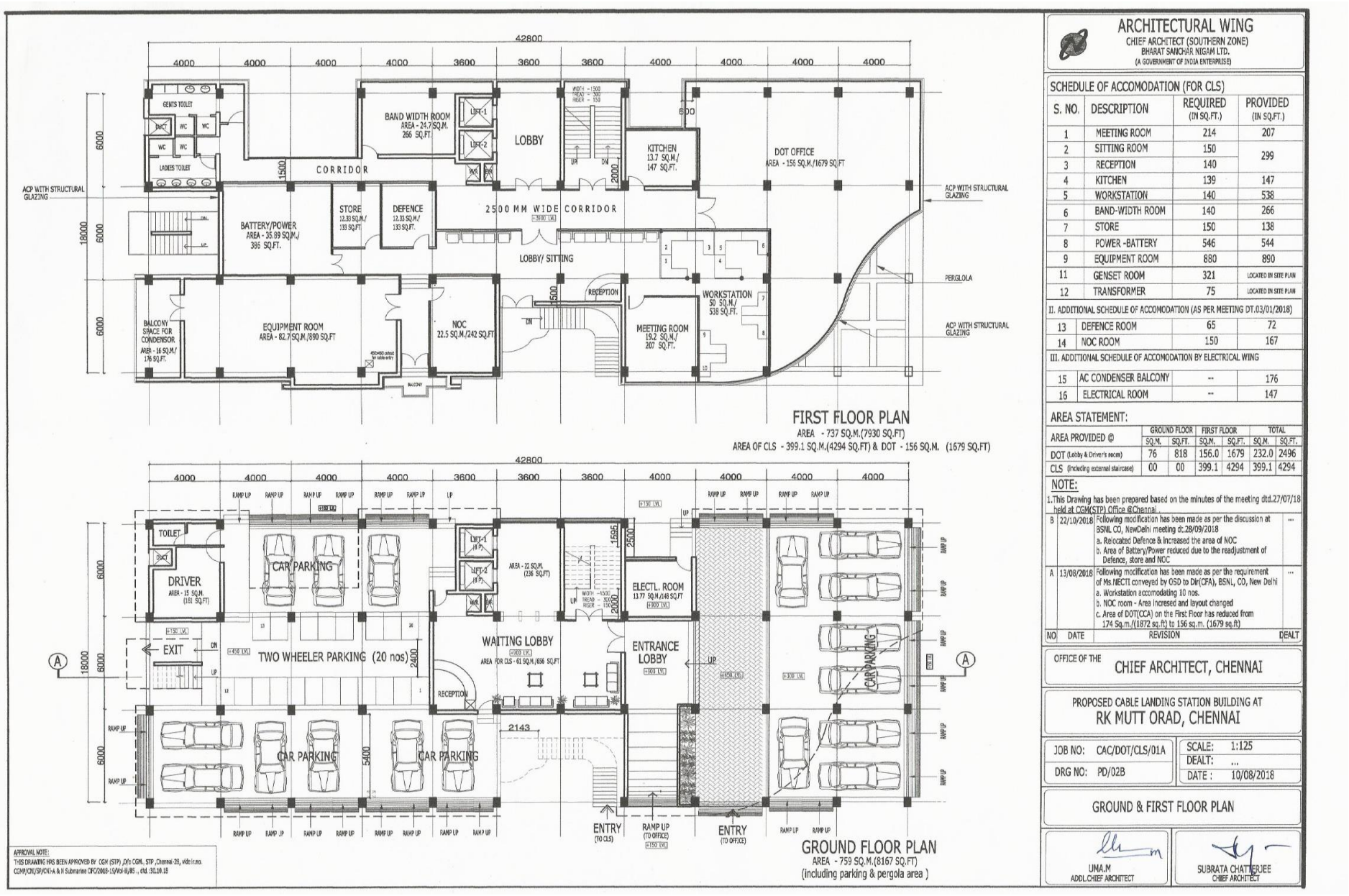
	functions of all sub systems provided under this contract.(note: if required the quantity may be deviated**)**													
	Sub Total of PART B AMC													

Abstract Of Cost

I	Sub-Total of SH-I (BMS)		
II	Sub Total of Sub Head-II (ACS)		
III	Sub Total of Sub Head-III (IP CCTV)		
IV	Sub-Total of SH-IV (AFAS)		
V	Sub-Total of SH-V (FSS)		
VI	Sub-Total of SH-VI (ASDS)		
VII	Sub-Total of SH-VII (WLDS)		
VIII	Sub-Total of SH-VIII (RRS)		
IX	Sub-Total of SH-IX (CABLING)		
X	**Sub Total of PART B AMC**		
	Grand Total amount excluding GST (Net Cost)		
	Grand Total amount including GST		

IMPORTANT NOTES

1	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.
2	Tax Invoice /Bill of supply should be pre-printed with all the details as per the requirement under GST Act.
3	The evaluation and comparison of responsive bids shall be done on the basis of **Net cost to BSNL** on the prices offered inclusive of packing, forwarding, freight and insurance charges etc., **but excluding GST.**
4	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.
5	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.
6	Bidders must mandatorily quote for all GST components (CGST, SGST, IGST) as applicable.
7	Bidders must mandatorily mention correct HSN / SAC codes.


FIRST FLOOR PLAN
AREA - 737 SQ.M.(7930 SQ.FT)
AREA OF CLS - 399.1 SQ.M.(4294 SQ.FT) & DOT - 156 SQ.M. (1679 SQ.FT)
GROUND FLOOR PLAN
AREA - 759 SQ.M.(8167 SQ.FT)
(including parking & pergola area)
ARCHITECTURAL WING
CHIEF ARCHITECT (SOUTHERN ZONE)
BHARAT SANCHAR NIGAM LTD.
(A GOVERNMENT OF INDIA ENTERPRISE)
SCHEDULE OF ACCOMODATION (FOR CLS)
S. NO. | DESCRIPTION | REQUIRED (IN SQ.FT.) | PROVIDED (IN SQ.FT.)
1 MEETING ROOM 214 207
2 SITTING ROOM 150 299
3 RECEPTION 140
4 KITCHEN 139 147
5 WORKSTATION 140 538
6 BAND-WIDTH ROOM 140 266
7 STORE 150 138
8 POWER -BATTERY 546 544
9 EQUIPMENT ROOM 880 890
11 GENSET ROOM 321 LOCATED IN SITE PLAN
12 TRANSFORMER 75 LOCATED IN SITE PLAN
II. ADDITIONAL SCHEDULE OF ACCOMODATION (AS PER MEETING DT.03/01/2018)
13 DEFENCE ROOM 65 72
14 NOC ROOM 150 167
III. ADDITIONAL SCHEDULE OF ACCOMODATION BY ELECTRICAL WING
15 AC CONDENSER BALCONY -- 176
16 ELECTRICAL ROOM -- 147
AREA STATEMENT:
AREA PROVIDED @ | GROUND FLOOR SQ.M. SQ.FT. | FIRST FLOOR SQ.M. SQ.FT. | TOTAL SQ.M. SQ.FT.
DOT (Lobby & Driver's room) 76 818 156.0 1679 232.0 2496
CLS (including external staircase) 00 00 399.1 4294 399.1 4294
NOTE:
1.This Drawing has been prepared based on the minutes of the meeting dtd.27/07/18 held at CGM(STP) Office @Chennai
B 22/10/2018 Following modification has been made as per the discussion at BSNL CO, NewDelhi meeting dt.28/09/2018
a. Relocated Defence & Increased the area of NOC
b. Area of Battery/Power reduced due to the readjustment of Defence, store and NOC
A 13/08/2018 Following modification has been made as per the requirement of Ms.NECTI conveyed by OSD to Dir(CFA), BSNL, CO, New Delhi
a. Workstation accomodating 10 nos.
b. NOC room - Area Incresed and layout changed
c. Area of DOT(CCA) on the First Floor has reduced from 174 Sq.m./(1872 sq.ft) to 156 sq.m. (1679 sq.ft)
NO DATE REVISION DEALT
OFFICE OF THE CHIEF ARCHITECT, CHENNAI
PROPOSED CABLE LANDING STATION BUILDING AT
RK MUTT ORAD, CHENNAI
JOB NO: CAC/DOT/CLS/01A
DRG NO: PD/02B
SCALE: 1:125
DEALT: ...
DATE : 10/08/2018
GROUND & FIRST FLOOR PLAN
UMA.M ADDL.CHIEF ARCHITECT
SUBRATA CHATTERJEE CHIEF ARCHITECT
APPROVAL NOTE:
THIS DRAWING HAS BEEN APPROVED BY CGM (STP) /O/o CGM, STP ,Chennai-28, vide l.no. CGMP/CNI/SP/CNI-A & N Subrarine CFC/2018-19/Vol-II/85 ., dtd.:30.10.18

BSNL - BMS INPUT OUTPUT POINT SUMMARY

Sl. No.	Description	I/O required					Remarks
		AI	AO	DI	DO	Soft point	
I	DIGITAL DIRECT CONTROLLER.						
1.	Temperature Monitoring	3					
2	Relative Humidity Monitoring	3					
3	Gas Release Panel Fire Status			2			GSS Panel Should Have the PFC for Fire to monitor the status on BMS.
4	Gas Release Panel Fault Status			2			GSS Panel Should Have the PFC for Fault to monitor the status on BMS.
5	Pressure Switch Gas Flow Status			2			Pressure Switch Should Have the PFC to monitor the status on BMS.
6	Vesda Fault Status			2			Vesda Panel Should Have the PFC for Fault to monitor the status on BMS.
7	Vesda Action Status			2			Vesda Panel Should Have the PFC for Alert to monitor the status on BMS.
8	Vesda Fire 1 Alert			2			Vesda Panel Should Have the PFC for Fire 1 to monitor the status on BMS.
9	AC ON / OFF Status			3			AC Machine Should Have the PFC for on/off to monitor the status on BMS.
10	AC Trip Status			3			AC Machine Should Have the PFC for Trip to monitor the status on BMS.
11	Intruder Alarm Status			2			Intruder Alarm Panel Should have PFC to monitor the status on BMS.
12	Electrical Breakers On/off Status			5			Electrical Vendor Should Provide PFC

							contact to connect with BMS.
13	Electrical Breakers Trip Status			5			Electrical Vendor Should Provide PFC contact to connect with BMS.
	Soft Link Integration						
II	Energy Meters - 5 Nos					150	Each Energy meter 30 soft point have considered. Energy meter should have Modbus RS 485 connectivity and Electrical vendor shall share the Modbus mapping register detail and they have to set parameter in the meters also they have shown parameter values in the Modscan software.
III	DG-2 Nos. a) Minimum level b) 50% level c) Maximum level	6				60	Each DG 30 soft point have considered. DG should have Modbus RS 485 Connectivity and DG vendor shall share the Modbus mapping register detail and they have to set parameter in the machine also they have shown parameter values in the Modscan software.
IV	UPS – 2 Nos.					60	Each UPS 30 soft point have considered. UPS Machine should have Modbus RS 485 connectivity and UPS vendor shall share the Modbus mapping register detail and they have to set parameter in the machine also they have shown

							parameter values in the Modscan software.
V	7TR PAC-3 Nos.					60	Each AC 20 soft point have considered. Aircondition unit should have Modbus RS 485 Connectivity and AC vendor shall share the Modbus mapping register detail and they have to set parameter in the machine also they have shown parameter values in the Modscan software.
VI	Fire Alarm					400	200 Nos of soft point considered for detector and devices fire and fault status monitoring. Fire alarm panel should have Modbus RS 485 / BACNet TCP connectivity and Fire Alarm vendor shall share the Modbus/BACNet mapping register detail and they have to set parameter in the Panel also they have shown parameter values in the Modscan / BACNet software.
VII	Water Leak Detection-2 Nos					20	Each panel 10 soft point have considered. Water leak panel should have Modbus RS 485 connectivity and vendor shall share the Modbus mapping register detail and they have to set parameter in the machine also they have shown parameter values in the

							Modscan software.
VIII	Fire Aspiration Detection-2 Nos					20	Each panel 10 soft point have considered. Vesda panel should have Modbus RS 485 connectivity and vendor shall share the Modbus mapping register detail and they have to set parameter in the machine also they have shown parameter values in the Modscan software.
IX	Rodent Repellent-3 Nos					30	Each panel 10 soft point have considered. Rodent Panel should have Modbus RS 485 connectivity and Rodent vendor shall share the Modbus mapping register detail and they have to set parameter in the machine also they have shown parameter values in the Modscan software.
	Sub Total	**12**	0	30	0	800	
	Spare points	3	2	4	8	200	
	Total minimum points required.	**15**	**2**	**34**	**8**	**1000**	

Note: The above are tentative points that may increase as per actual functional requirement. Additional parameters in respect of DG, AC & other devices, may also need to be included.

MICRO INVENTORY

[To be downloaded, filled up, scanned & uploaded along with Technical Bid]

Sl. No	Description of Items	Make of item offered by firm	Compliance as per NIT (Yes/No)	Comments on deviation (if any)
	IBMS:			
1a	Server			
1b	Work Station			
1c	IBMS Software (access+BMS)			
2.0	DDC controller			
3.0	Temperature humidity sensor			
4.0	Integrator Switch			
5.0	Layer II 24 port Switch			
	Access control system			
1	Main access control panel			
2	Smart card reader			
3	Biometric finger print reader			
	CCTV surveillance system			
1	Varifocal dome camera			
2	Server machine / Network Video recorder			
3	LED TV			
	Addressable fire alarm system			
1	Main fire alarm panel			
2	Multi sensor detector			

Contractor EE(E)

3	Heat detector			
4	Control module			
5	Monitoring module			
	Fire suppression system			
1	NOVEC 1230			
	WLD system:			
1	WLD panel			
2	Zone module			
3	Sensing Cable			
	Rodent Repellant System			
1	Rodent Panel			
2	Rodent transducers			
	VESDA			
1	VESDA Panel			
2	Capillary tubes/sampling tubes			

SPECIFICATION

1 Scope of Work

The bidder shall Supply, Installation, Testing & Commissioning of Integrated Building Management System(IBMS), Access Control system, IP CCTV System, Fire alarm system & Fire Suppression System, Aspiration Smoke Detection System, Water Leak Detection System and Rodent Repellent System for Cable Landing Station Chennai including cameras, Network video recorder system, Management servers, applications/software, access control system equipment, Fire Alarm panel, Detectors/ Devices, DDC controllers, BMS Field devices, cables, switches, WLDS, ASDS and any other items/accessories required for a fully functional system.

The number of cameras and their placement shall be decided in such a way that most critical areas can be monitored. Biometric cum card reader devices shall be placed at the entry points of Cable landing station. Multi-criteria detectors at cable landing station shall be placed in such a way all the areas to be covered.

The operator can easily analyse the operation of the building's system by viewing the important parameters viz. temperature, humidity, equipment status etc. Information is presented on the screen with full colour diagrams of the equipment so it is easy to understand.

The state-of-the-art Integrated Building Management System would support the open protocol and not limited to any proprietary language. The IBMS shall cover all the major electro-mechanical equipment designed in this building viz:

1. Monitoring of critical Room Parameters like Temperature & RH and PAC units
2. Monitoring of UPS parameters.
3. Monitoring the Fire Alarm System
4. Seamless integration with Access controllers
5. Seamless Integration with IP CCTV system
6. Monitoring and control of parameters of DG set, UPS, Energy Meters etc

Building Management

Integrated Building Management Software platform shall meet building management system needs by providing interfaces to leading open system solutions and devices.

Security Management

Integrated Building Management Software platform shall collect information from security, access control and surveillance devices, ensuring protection of people, assets and intellectual property.

Life Safety Management

Integrated Building Management Software platform must allow monitoring and control of fire alarm systems for fire protection and smoke control.

System Architecture

Integrated Building Management Software platform shall be on a scalable system that can accommodate configurations ranging from a small single-node system to an extended system with multiple nodes.

2 Functional Requirements

2.1 *Integrated Building Management System*

The BMS shall perform the following general functions

- Building Management & Control
- Data Collection & Historian
- Alarm and Event Management
- Access Control Management
- Trending, Reports & MIS Generation
- Maintenance & Complaint Management
- Network Integration

The IBMS contractor shall integrate with different system through RS485 over Modbus / LON/ BAC net protocol and through DDC controller for system of electrical equipments, UPS, DG set, Air-conditioning units and Hardwired Alarm & notifications of Fire Alarm Control Panel, Access Control Panel, IP CCTV System etc.

The system will make a log of the measured parameter and it will raise an alarm if it goes above/below the set point as per required control logic. The system will monitor the critical alarms of the critical services. The system has the User interface that shows the status of the facilities at a glance.

The proposed system shall be based on Distributed Networkable Intelligent system on Ethernet. The network switch shall be provided in enclosure with proper patch panel, media converters and cable managements. Bidder shall select appropriate model and configuration of switch as per demand of application. The BMS system architecture shall be modular, utilizing industry standard open protocols. The system shall allow distribution of system functions such as monitoring and control along with graphical user interface etc. through Ethernet LAN, to allow maximum flexibility and performance. It shall also have a capability of remote monitoring through dial up modem or internet or through WEB Browser.

The architecture shall support various third party systems using standard hardware or software to link various functional nodes into a single integrated system. The system shall be compatible to industrial standard protocols like MODBUS, BACnet, LON works, etc., for any third party system integration they can communicate on these open/universal protocols. In case of non-compatibility, gateways can be utilized. It is deemed that either open protocol software is included or the required gateway and necessary software are included for this purpose.

Total coordination and compatibility between any third party system supplier and IBMS supplier and respective system is extremely important and deemed to have been taken care of and all related cost included for this.

The IBMS operator control station shall allow the user to monitor and control the entire system with various user definable access levels.

System shall be capable of generating alarms, operator transactions and system reports. The system shall have provision for connecting to dedicated serial printer interface or through BMS control station.

2.2 Air conditioning units

The Air conditioning System shall be integrated with the BMS through **BACNET/IP** protocol provided by them**.**
From the BMS PC, the following features shall be provided:

- Display of all the parameters, status of ancillaries.
- Data Acquisition and Logging.
- Alarms and information of all important parameters on the central BMS monitor.

The parameters shall be shared by the AC supplier through BACnet/IP. The bidder shall take the necessary software & hardware interfaces on the AC & BMS side for achieving above integration.

2.3 UPS

The UPS shall be integrated with the BMS through **Modbus protocol over RS485** provided by them.

From the BMS PC, the following features shall be provided:

- Display of all the parameters, status of ancillaries.
- Data Acquisition and Logging.
- Alarms and information of all important parameters on the central BMS monitor.

The parameters shall be shared by the UPS Vendor through ModBus over RS-485 of BACnet/IP, BACnet/Lontalk or any standard industrial open protocol.

The bidder shall take the necessary software & hardware interfaces on the UPS & BMS side for achieving above integration.

2.4 DG Set

The DG Set shall be integrated with the BMS through **Modbus protocol overRS485** provided by them.

From the BMS PC, the following features shall be provided:

- Display of all the parameters, status of ancillaries.
- Data Acquisition and Logging.
- Alarms and information of all important parameters on the central BMS monitor.

The parameters shall be shared by the DG Vendor through ModBus over RS-485 of BACnet/IP, BACnet/Lontalk or any standard industrial open protocol.

The bidder shall take the necessary software & hardware interfaces on the DG set & BMS side for achieving above integration.

2.5 ***Integrated Security System***

2.5.1 *Access Control System*

Control and monitoring for security applies to all entry/exit doors and related areas. Access to buildings, gates, doors is restricted for unauthorized users. Biometric and card access can offer facility managers the flexibility to control these access points.

Fingerprint Identification cum keypad reader shall be installed at entry to Equipment, Bandwidth and battery room & Smart Card reader at other entry/exit. The Biometric Finger print reader shall be used for enrolment purpose also. Each door shall have a door locking mechanism, and a door status indicator. All exit gates shall be openable through push button switches.

In case of fire, the FAS, using addressable outputs shall directly release the door locks controlled by the Access control system.

2.5.2 The system shall provide a mean to control access through nominated doors having electric locking door status monitoring and access control readers. Access rights associated with a presented access card or biometric identifier shall be checked for validity based on card or identifier, access area, access time and any other access management function defined in this specification; as stored in access controllers. Access shall be granted or denied, dependant on the access privilege. Access rights shall be programmed in a variety of ways to allow flexibility as defined elsewhere in this specification.

2.5.3 All system communications must be totally integrated with either existing or new LAN/WAN networks. Bidder must make themselves familiar with the specific requirements for this project.

2.5.4 Connection to Access Controllers shall be achieved using cabling supporting Ethernet and TCP/IP protocols.

2.5.5 All data communication internal to the system between Access Controller and the Server shall be on TCP/IP Network and should be encrypted and an industry-standard encryption algorithm to a minimum of 128 bit AES.

2.5.6 The system shall report all events to the operator(s) as configured and shall produce and maintain a log of all system events and alarms.

2.5.7 The system shall provide a means for an operator to extract information relative to the event log and system configuration and produce this information in the form of printed reports, screen displays etc.

2.5.8 The system shall provide for a Windows based User Interface with Site Plans and interactive icons representing the location and real-time status of Access Control, and Alarm Monitoring equipment.

2.5.9 Comprehensive backup and archiving facilities shall be incorporated as an integral part of the system software.

2.5.10 Access Controllers must support peer to peer communications for input and output communications between Access Controllers.

2.5.11 The Access Controller shall be of **UL listed.**

2.6 *IP CCTV System*

IP CCTV system shall enable centralized online surveillance of various selected areas and to generate a record for post event analysis. The camera shall be a high resolution, visible at low light capability. The recording shall be in real time motion i.e. 15 frames per second at D1 resolution for

each camera. Recording videos shall be kept for 60 days with minimum 8TB usable space after RAID5 has been configured. The camera shall be ONVIF S and G compliant.

One Network Video recorder with required client license shall be used to record & playback the camera videos and have the remote viewing facility on the network. All the live view or recorded videos of cameras shall be displayed through client software on proposed workstation.

As an application, the video surveillance will do the following:

- Providing real-time monitoring of a facility's environment, people and assets.
- Recording in case there is a motion in the room
- Recording events for subsequent investigation, proof of compliance / audit purposes
- Shall facilitate motion search on recorded video

2.7 *Fire Alarm System*

The proposed Fire Alarm System will be one loop intelligent addressable panel. The loop will consists of detectors & devices making it a total capacity of detectors / devices per panel. The fire alarm panel has a large display. The proposed panel is networkable for future expansion if expansion is required. The proposed panel shall be UL listed/FM approved. We have proposed intelligent Multi-criteria detectors on ceiling, on false ceiling wherever applicable & below false flooring. Addressable relay module & monitor modules are proposed in the system for monitoring as well as control requirement respectively. The fire alarm system shall use monitor modules / relay modules / control modules and gas release modules which will operate based on cross-zoning of detectors.

The monitoring of the status of various detectors/devices should be possible at the PC level (Main Operator station)

In the event of fire, FAS using addressable relay outputs should directly trip the PAC units.

The supervisory controllers/gateways shall simultaneously convey the fire alarm data to the operator station terminals.

2.8 *Fire Suppression System*

NOVEC 1230 fire suppression works hand-in-hand with state-of-the-art detection to identify and extinguish a fire hazard, long before substantial fire damage can occur. **NOVEC 1230** does not leave harmful or messy residues that could damage delicate electronic and data processing equipment.

NOVEC1230 reacts quickly at low concentrations to eliminate a fire. In normally occupied areas, people can breathe **NOVEC 1230** at extinguishing concentrations without fear as it is used as a propellant in inhalers for asthmatic patients.

NOVEC 1230 is designed such that a detection system detects the fire and causes the suppression system to actuate and extinguishes or suppresses the fire.

The Fire Suppression System should comply to **Vds/UL Standards.**

2.9 Digital Water Leak Detection (WLD) System

The system shall be based on linear sensing cables, connected to a SIM (Sensor Interface Module) unit, allowing the localization of any abnormal presence of liquid. Each SIM Shall be connected to master panel in the BMS Room. The Master Panel shall be able to manage information of all leaks

relating to the particular sense cables installed. Each SIM shall be connected with maximum 15m of sensing cable length. The water leak system comprises of a digital water leak Master panel, sensor interface module & sensor cable. All alarms shall be extended to premises as required and the system shall have ample provision for this.

This specification shall be the guideline for supplying, installing, testing and commissioning complete water leak detection system as per Approved drawings, specifications and relevant standards all complete, including necessary hardware and software for integration with IBMS.

Testing procedure shall involve physical application of a wet cloth on the cable, to test the relay operation. The Panel should sound the Alarms, and notify the IBMS system with zone name or as applicable for each sensing cable.

2.10 Aspiration Smoke Detection System.

A high performance aspirating smoke detection system shall be supplied, installed and commissioned by the agency in accordance with the requirements detailed in the NFPA – 72, Aspirating Detection Systems including necessary hardware and software for integration with BMS. The panels shall be mounted inside the risk protected area and there shall be a network of air sampling pipe work.

The Aspiration Smoke detection consists of highly sensitive Laser-based Smoke Detectors with aspirators connected to networks of sampling pipes. The alarms are generated once the laser sensor receives smoke at a predetermined obscuration level to activate and alert, Fire 1, Fire 2 and alert signal. The signal is extended to the Fire Alarm monitor Modules / BMS through potential free contacts for further investigation.

Provision for connecting to open protocol using an interface card to BMS system for online monitoring and software level integration

The system shall have provision to connect remote Display unit, shall be able to monitor each detector, and a Program shall be supplied to configure the system. The protected area(s) shall be installed with one zone pipe inlet aspiration smoke detection panel with network of piping to draw air samples through flow program calculated through sampling holes. The system shall achieve highest level of sensitivity varying between 0.005 % per metre obscuration to 20%. The system comprises of a panel with inbuilt power supply with laser chamber and suction fan. The panel shall be connected to network of pipe which is designed and installed in accordance to approved pipe cad flow program with sampling holes at specific locations.

The system shall be designed to provide Primary & Secondary Sampling of the protected area. The system sensitivity shall be normal/ enhanced/ very high.

The system shall be designed to sample air through sampling method wherein the sampling of air is done in the room void/ false ceiling/ false floor of the room under consideration.

The piping here runs along the ceiling with sampling holes at the location of point detectors. The system shall incorporate a high performance laser based particle detection system based on the principal of forward light scatter, a high efficiency aspirator and a sampling pipe system designed to sample air from within the protected area(s).

The system shall incorporate a facility to desensitize detector alarm thresholds by a pre-programmed percentage to accommodate planned occurrences that may cause unwanted alarms. The system shall interface with the main building Fire Alarm system for remote monitoring of multiple alarm levels and faults.

CODES AND STANDARDS

The entire installation shall be installed to comply with one or more of the following codes or

Standards:
- NBC of India, 2016 amended up to date
- IS 2189.
- AS 1670, AS1603 NZ Part 2, 4, 8, ASNZS 3000
- British Fire Protection Systems Association, Code of Practice for Category 1, Aspirating Detection Systems
- British Standards, BS 5839 Part 1 or BS 6266
- NFPA 72 Standards, US.

PRODUCT / MATERIAL SPECIFICATIONS

The Aspiration smoke detection system shall consist of a highly sensitive detector assembly consisting of LASER-based smoke detector, aspirator, and filter. It shall be modular, with each detector optionally monitored by a Display featuring LEDs and a sounder. The system shall be configured by a Program that is either integral to the system, portable or PC based.

The system shall allow programming of:

- Four smoke threshold alarm levels;
- time delays;
- faults including airflow, detector, power, filter and network as well as an indication of the urgency of the fault;
- Seven or more configurable relay outputs for remote indication of alarm and fault conditions.

It shall consist of an air sampling pipe network to transport air to the detection system, supported by calculations from a computer -based design modelling tool.

Equipment may include intelligent remote displays and/or a high level interface with the building fire alarm system, or a dedicated ASD System Management graphics package.

Performance Requirements

The system shall provide very early smoke detection and provide four output levels corresponding to Alert, Action, Fire 1 and Fire 2. These levels shall be programmable and able to be set at sensitivities ranging from 0.005 – 20% obsc/m.

The system shall report any fault on the unit by using configurable fault output relays. The system shall be self-monitoring for filter contamination. The system shall incorporate a flow sensor in each pipe and provide staged airflow faults.

Detector Assembly

The Detector, Filter, Aspirator and Relay Outputs shall be housed in a mounting box and shall be arranged in such a way that air is drawn from the fire risk and a sample passed through the Dual Stage Filter and Detector by the Aspirator.

The Detector shall be LASER-based type and shall have an obscuration sensitivity range of 0.005 – 20% obs/m.The Detector shall have four independent field programmable smoke alarm thresholds across its sensitivity range with adjustable time delays for each threshold between 0-60 seconds. The Detector shall also incorporate facilities to transmit the following faults.

Detector
Air flow
Filter
System
Zone
Network
Power

Urgent and Minor faults: Minor faults shall be considered as servicing or maintenance signals. Urgent faults indicate the unit may not be able to detect smoke. The detector shall have four in-line sample pipe inlets and must contain a flow sensor for each pipe inlet. Both Minor and Urgent flow faults shall; be reported.
The filter must be a two-stage disposable filter cartridge. The first stage shall be capable of filtering particles in excess of 20 microns from the air sample. The second stage shall be ultrafine, removing more than 99% of contaminant particles of 0.3microns or larger, to provide a clean air barrier around the detector's optics to prevent contamination and increase service life.
The aspirator shall be a purpose-designed rotary vane air pump. It shall be capable of allowing for multiple sampling pipe runs up to 200m in total, (4 pipe runs per detector) with a transport time of less than 90 seconds or as appropriate codes dictate.

The Assembly must contain relays for alarm and fault conditions. The relays shall be software programmable to the required functions. The relays must be rated at 2 AMP at 30 VDC. Remote relays shall be offered as an option and either configured to replicate those on the detector or programmed differently.
The Assembly shall be able to be surface mounted to a wall or recessed in the wall cavity (the unit may be inverted in either option). The assembly shall have built-in event and smoke logging. It shall store smoke levels, alarm conditions, operator actions and faults. The date and time of each event shall be recorded.
Each detector (zone) shall be capable of storing up to 18,000 events and does not require the presence of a display in order to do so.

Detection Alarm Levels
The laser based aspirating detection system shall have four (4) independently programmable alarm thresholds. The four alarm levels may be used as follows, or as decided by the Consultant / client:-
Alarm Level 1 (Alert)
Activate a visual and audible alarm in the fire risk area.
Alarm Level 2 (Action)
Activate the electrical/electronic equipment shutdown relay and activate visual and audible alarms in the Security Office or other appropriate location.
Alarm Level 3 (Fire 1)
Activate an alarm condition in the Fire Alarm Control Panel to call the Fire Brigade and activate all warning systems.
Alarm Level 4 (Fire 2)
Activate a suppression system and/or other suitable countermeasures (e.g. evacuation action or shut down of systems).
The alarm level functions as listed are possible scenarios. Consideration should be given to the best utilization of these facilities for each application and the requirements of local codes.

Initial Detection Alarm Settings
Initial settings for the alarm levels shall be determined by the requirements of the fire zone. However, the setting for Fire 1 (Alarm Level 3) shall always appear as 100% on the bar graph scale. Default settings of the unit shall be:
Alarm Level 1 (Alert) 0.08% Obs/m
Alarm Level 2 (Action) 0.14% Obs/m
Alarm Level 3 (Fire 1) 0.2% Obs/m
Alarm Level 4 (Fire 2) 2.0% Obs/m.

1. Technical Specifications

1.1 Integrated Building Management System

The IBMS system shall be easily configurable to suit the user specific requirements. There shall be no restrictions on usage of the controllers to specific requirement. All DDC and access controllers shall thus be seamlessly integrated to the network. Systems that require software drivers to be developed for shall not be accepted.
All configurations shall be permissible while the system is on-line without interruption to monitoring and control on other controllers. Systems that require going off line for programming/configuration shall not be acceptable. Specifically, IBMS nodes must not require "re-starting" to implement database changes.

1.1.1 Integrator Module

1. Equip each router with a Modbus Receiver on one side and a LonTalk/Bacnet transceiver on the other side.

2. The network router shall be designed to route messages from a segment, sub-net, or domain in full duplex communication mode.

3. The integrator shall transport, network, session layers to transparently route messages bound for a node address in another sub-net or domain.

4. Integrator shall be fully programmable and permit a systems integrator to define message traffic, destination, and other network management functions utilizing software tool.

5. The integrator shall be capable of DIN rail or panel mounting and be equipped with status LED lights for Network traffic and power.

1.1.2 BACnet / Modbus / Lonworks Router

1. Equip each router with an Ethernet IP communication on one side and a LonTalk/Bacnet transceiver on the other side.

2. The network router shall be designed to route messages from a segment, sub-net, or domain in full duplex communication mode.

3. On Ethernet IP side, the router shall utilize Ethernet IP protocol transport to route messages.

4. The routers shall transport, network, session layers to transparently route messages bound for a node address in another sub-net or domain.

5. Routers shall be fully programmable and permit a systems integrator to define message traffic, destination, and other network management functions utilizing software tool.

6. The routers shall be capable of DIN rail or panel mounting and be equipped with status LED lights for Network traffic and power.

7. The routers built-in into the IP based Direct Digital Controllers also shall be acceptable.

1.1.3 Direct Digital Controller

A. DDC CONTROLLER

- IP based DDC controllers should be UL Listed 32 bit microprocessor based with real time operation system
- IP DDC controllers should have inbuilt Real Time Clock with an inbuilt battery backup life span of 10 years and should be able to work in total stand alone as well as networked conditions.
- IP DDC controller should support Modbus RTU over RS232/RS485, BACnet IP/Ethernet/MSTP/PTP, All provisions / ports should be inbuilt. This facility shall be used for seamless integration of Third Party Systems with open standard protocols.
- All IP DDC in network should support inbuilt peer – to peer network communication without any need for external programming / System Integrator Unit/ Gateway Controller/ Supervisory Network Controller and redundancy
- All IP DDC controllers should have minimum of 2 GB - SD memory card for internal and external data, program memory and history backup.
- Power failure safety data, set points, schedule and programs should be secured on a DDC onboard memory card.
- The Input Output modules shall have the option of providing with manual over-ride controls for Analog & Digital output commands. All IOs should also have configurable LED indicators inbuilt.
- In addition to the hard points stated above, the same DDC controller shall integrate the Soft points of the particular equipment / group of equipment / third party integration with open standard protocols. (eg. UPS, DG, PAC, VRF and Electrical Meters with DDC for Electrical Panels etc).
- DDCs should be able to communicated at a network of 10/100 Base T.

B. Schedules

1. Each DDC controller shall support a minimum of 100 BACnet Schedule Objects and 100 BACnet Calendar Objects.
2. Each schedule object (Weekly or Exception) shall be capable of performing an optimum start. Optimum start calculation shall be based on outside air temperature, zone air temperature deviation from zones daytime cooling set points, and individual zone adaptive cooling coefficients that are adjusted each day based on performance parameters of the individual zone.

C. Logging Capabilities

1. Each DDC Controller shall log as a minimum 150 user selectable objects types with a minimum of 100 samples per object type with standard memory configuration. Logging shall

be expandable, (user defined) with additional memory in DDC controller. Any object type in the system (real or calculated) may be logged. Sample time interval shall be adjustable at the operator's terminal.

Start of sampling may be by one of the following:

2. Logs maybe viewed both on-site or off-site via remote communication / download programs.
3. DDC controller shall periodically upload trended data to operator's terminal for long term archiving as desired.
4. Archived data stored in database format shall be available for use in third-party spreadsheet or database programs.

D. Alarm Generation

1. Object type change of values and change of states may be identified as alarm conditions. This summary of active alarms (Event State property value not equal to NORMAL) is presented to and displayed at the operator's terminal for system user action.
    a. Alarm may be generated within the system for any object type change of value or state either real or calculated. This includes things such as analog object type value changes, binary object type state changes, and various controller communication failures.

2. Alarm log shall be provided for viewing of alarms. Log may be viewed in-site at the operator's terminal/ controller or off-site remote communications.

i. The Controllers shall have a self-analysis feature and shall transmit any malfunction messages to the Control Station. For any failed chip the diagnostic tests, printout shall include identification of each and every chip on the board with the chip number/location and whether the chip “Passed” or “Failed” the diagnostic test. This is a desired requirement as it would facilitate trouble-shooting and ensure the shortest possible down time of any failed controller. Controllers without such safety feature shall be provided with custom software diagnostic resident in the EEPROM. The bidder shall confirm in writing that all controllers are provided with this diagnostic requirement.

ii. Operating system (O.S.) software for controllers shall be EPROM resident.

iii. Controllers shall have resident in its memory and available to the programs, a relevant library of algorithms, intrinsic control operators, arithmetic, logic and relational operators for implementation of control sequences.

iv. In the event of failure of communication between the controllers and/or Control Station terminal, alarms, reports and logs shall be stored at the controllers and transmitted to the terminal on restoration of communication.

v. In the event of memory loss of a Controller or the expiration of back-up power, on start-up of the unit the necessary data-base shall be downloaded automatically and without operator instruction. Controllers requiring a manual intervention for the re-boot of software are not desired.

vi. Where information is required to be transmitted between controllers for the sharing of data such as outside air temperature, it shall be possible for global points to be allocated such that information may be transmitted either on change of incremental value or at specific time intervals.

vii. Controllers must be able to perform the following energy management functions as a minimum.

a. Time & Event programs
b. Holiday Scheduling
c. Maximum and Distributed power demand
d. Optimum start and stop program
e. Night purge
f. Load reset
g. Zero energy band
h. Duty cycle
i. Enthalpy analysis and control
j. Run Time Totalization
k. Sequencing and Optimization
l. Exception scheduling

Detailed description of software features and operating sequence of all available energy management software shall be submitted with the tender for evaluation by the department.

viii. The DDC Controllers shall have Adaptive Control capability whereby the control software measures response time and adjusts control parameters accordingly to provide optimum control. The software shall allow self-tuning of the variable control loops (all or any of P, P+I, P+I+D) of the Precision AC system so as to provide the most efficient and optimised controls at different load conditions. The energy management programs shall update their parameters based on past experience and current operating conditions.

ix. Alarm Lockout shall be provided to prevent nuisance alarms. On the initial start up of air handler and other mechanical equipment a "timed lockout" period shall be assigned to analog points to allow them to reach a stable condition before activating an alarm comparison logic.

x. Run time shall be accumulated based on the status of a digital input point. It shall be possible to total either ON time or OFF time. Run time counts shall be resident in non-volatile memory.

xi. It shall be possible to accommodate Holiday and other planned exceptions to the normal time programs. Exception schedules shall be operator programmable up to one year in advance.

xii. The Controllers should have on-board Lon/BACnet port for communications. However the communication with BMS server will be IP based.

1.1.4 Central Station Software

The system shall have a flexible software package to allow an operator with minimal knowledge of software programming to construct programmes for plant control and management information. All system software shall be field proven Perpetual Licensed software for IBMS system. Bidder shall not quote for untested and unproven software.

1.1.4.a Technical Specifications:

1) All programming shall be done in clear English language.

2) The system shall hold a complete set of instructions in the software which can be viewed by the operator whilst in the operating mode.

3) The system shall provide run simulation of the programs to allow operator verification before the program is down loaded to the controllers.

4) It shall be possible to assign alarm functions to any programmes created as required.

5) Full arithmetic operators shall be available for use in the programmes as required eg: +, -, /, *, ().

6) Programmes shall permit the use of comparison statements such as: =, >, <, =< etc.

7) Programmes shall permit logical operators to be used such as: NOT, AND, OR, AND MASK.

8) Direct reference to any point shall be available to obtain its current value. Such references shall be using standard language such as, ON, OFF, MANUAL, SETPOINT, EXPIRED TIME, PRIORITY, ALARM.

9) It shall be possible to refer to time and calendar functions directly, so that DATE, TIME, HOUR, MINUTE functions may be used.

10) It shall be possible to set timers so that a timed delay may be introduced before an action is carried out.

The following user programs must be processed by the Control Station

i. Operating functions:
   - Via graphic management schematics with dynamic display of actual status information.

   Manual control of parameters and status variables of the electrical and mechanical plant.

   Manual switch of programs which are not part of progress routines.

ii. Monitoring functions:
   automatic monitoring of connected plant and equipment
   automatic monitoring of the system (idle or operation)

iii. Data Visualization functions:
   Individual processing of operating data for Building Management.
   comfort chart data for temperature / humidity using psychometric charts

iv. In standardised form for:
   trend reports
   consumer statistics
   fault statistics
   maintenance management

v. Display functions:
For the representation and display of operating data and management information in alphanumeric and graphic form.

vi. Management functions:
For optimization of energy consumption.
for rational use of personnel

vii. Access control functions:
Different operating levels for all information and all data by way of code word or user key.

viii. Commissioning functions:
For system specific software of the field stations and the management system
Downloading the system specific software to the DDC units.
Testing of the software in connection with electrical and mechanical plant.
Automatic and periodic storage of all system data.

ix. Test functions:
Automatic and continuously running test functions for system tests (hardware and operating software) and management system configuration (communication) Test tools for individual hardware and software components which can be activated manually. Self test functions for individual system components which can be activated manually.

1.1.4.b Operator Interface

All communications between the operator and the system shall be in clear language, without reference to special code or codes. Generation and editing of software shall be via clear English language menus.

1.1.4.c Password Access

1) None of the features of the Operators Panel shall be accessible without the user first being required to log on by entering a password.

2) The System should support some definable level of operator security to have better security.

3) Alpha numeric passwords of up to 15 characters shall be available and definable by individual operators.

4) It shall be possible to grant or deny access to any terminal and/or functions for individual user. The ability to use this feature itself shall also be definable.

5) It shall also be possible to grant or deny access to individual points or groups of points by function or type.

6) It shall also be possible to define a timeout value for individual user. Automatic log-off of the operator shall occur if no keyboard or mouse activity is detected during this timeout period. It shall also be possible to allocate an infinite timeout.

7) A log of at least previous 100 users shall be available at each control station. A record of the user's name, the time and date of log ON and log OFF shall be available from this file.

8) Password summary shall be available to the operators with the highest level of access. The summary shall display all passwords and their associated parameters.

1.1.4.d Control Station Graphics Capabilities

The work stations shall have Web Based Graphics as the basis of operation. The software shall have following advanced techniques for ease of operation:

1) Colour banding of screen displays shall be provided for display and differentiation of normal and abnormal signals. This shall allow operator instant recognition and response to critical building operation.

2) To provide instantaneous confirmation to system operator of equipment status, graphic screen animation shall be provided. This shall allow full color animated displays of equipment in site layouts, building floor plans, and other system configurations. All graphic displays shall be online programmable via keyboard or mouse selection of graphic library stored symbols and system profiles. Fully implemented graphic displays are to be provided for all systems so identified in the Input/ Output Summary section of this document.

3) Split screens capability shall be provided to allow operator to observe multiple dynamic graphic screens at the same time to enable operator to manage several separate building operation tasks concurrently.

4) To enable operator to "find" his way in and out of the system, a stacked display of windows shall be included to provide orderly reference. Operator option of enlarged full screen display at any penetration level shall also be included.

5) Alarm class differentiation shall define coloration, and storage requirements for different alarms.

6) Graphic driven point identification and selection shall be provided to allow operator to select a point by "clicking on" the graphic symbol representing the point type. Consequently display will appear to enable the operator to select the desired command.

7) The system shall be capable of running programs in both the foreground mode and background mode simultaneously. The system running only foreground "window" while keeping the other programs dormant in the background "window" shall not be acceptable as this slows down the availability of control and essential information to be made available to the operator in the system.

8) Capability of on-line graphics generation shall be a major requirement i.e. the operator shall have the ability to create new graphics on-site from a menu of symbols.

9) Historical system trouble, fault, false alarms shall be stored on line in the hard disk for trouble analysis.

10) It shall be possible to define upto 12 functional categories in the plant schematic each of which shall be removable from the screen individually. This shall allow the operator to delete temporarily any equipment and have a better overview of the other sections of the system.

11) Data Base Manager shall manage all data on an integrated and non-redundant basis. It shall allow addition and deletions to the data base without any detriment to the existing data. Cross linkages shall be provided such that no data required by a software program can be deleted by the operator until that data has been deleted from its respective programs.

12) Dynamic data such as temperature and humidity values, fans and motor status, alarm point condition, etc. shall be embedded in the graphics as the sensing location. Points in alarm condition shall be animated by colour changes and flashing/blinking icon, symbol, or value.

13) Commandable points shall be uniquely identified by colour and/or discrete symbol and shall be directly addressable and commandable from the graphic display. It shall not be necessary for an operator to type in command request or point names. Direct entry of commandable point address or positioning of the cursor to the point shall cause a display of associated command states for digitals, the set point value and valid range for analogs. Cursor positioning shall be via a “mouse”.

14) In order to allow the operators to view graphics in greater detail, zoom /pan display feature shall be provided to return zoomed/panned graphics to their original status. A “return to original” feature shall also be provided. The mouse shall be used to pan in all directions in real time, and to jump, from any section of the plant schematic directly to another section or to another level.

1.1.4.e User Interface

The operator panel on a terminal shall provide the primary interface for operator access to the BAS while also providing a vehicle for the annunciation of alarms and the reporting function. The operator shall have the option of switching between a text based and graphic based user interface at any time. In particular following standard functions shall be provided.

1) It shall be possible to carry out the following commands by use of dedicated function keys on the keyboard and by the mouse :

   a. ON - digital points
   b. OFF - digital points
   c. AUTO - analogue and digital points
   d. SET TO VALUE - analogue points

e. ALARM REVIEW
f. POINT TYPE REVIEW
g. POINT GROUP REVIEW
h. HOURS RUN REVIEW
i. REVIEW CANCEL
j. GRAPHICS ENABLE
k. HELP
l. ALARM ACKNOWLEDGE

2) It shall be possible to add new points, and reconfigure or modify existing points without taking any part of the system off-line. It shall be possible to change designation of operator passwords, access levels, point segregation and auto sign off, designation of backup consoles and printers. It shall also be possible to add/change descriptors for points, segregation groups and access levels, and action messages for alarms and trouble condition, system/point enable/disable, input or output value, and assignment of alarm/warning limits. All additions and modifications shall be on-line programmable via operators keyboard and then down the line loaded to distributed processing units.

3) It shall be possible to address plant, zones, points etc., and using clear language descriptors. Each individual point may also be identified by a unique alpha-numeric mnemonic address entry. Simple key names may be assigned to points to allow direct display. These key names shall be fully operator assignable and depending on how frequently they have to be accessed, they may be as simple as one, two or three characters or as lengthy as 20 characters.

4) The operator shall be able to access any point on any graphic without going through the penetration path. Graphics shall be menu-driven. Direct access to graphics shall be menu selectable wherein the operator may select optionally by entering the name of the graphic system desired or by selecting the desired graphic via cursor positioning.

5) It should be possible to identify some points which are frequently addressed as “frequent access” points. This listing shall be selectable from a screen top menu bar drop down menu item with a user address, descriptor and value/status of each “frequent access” point displayed.

6) A wild card search utility should be provided which shall be operated by a partial data entry. For example, by listing chiller 1, all chiller no. 1 points shall be listed.

7) The information displayed for individual points during a review shall be:

- its unique mnemonic address
- its current state or value (in Engineering units)
- its type of point (analog/digital, input/ output)
- any secondary or tertiary value
- reason for state, if applicable

8) An Electronic message facility shall be provided on the operator station for any operator to enter a message to another operator of the same station or different station, by selecting the receiving operator's ID and entering the message. When the operator with a queued message, signs onto the operator station, a "mail message waiting" prompt shall be issued. Upon displaying a mail message, the display shall prompt the operator with three message options to execute, delete, print, and save. Messages shall also include the senders personal ID and a brief title or subject description.

9) Dynamic data shall be automatically updated on the central station. Manual update shall also be provided via a screen update key.

10) It shall be possible to enter any of the subroutines such as the editor functions, or the Data Manipulation function from the central station without closing down the terminal or the programs currently running.

11) The operator shall be provided with the facility to override the use of portable operator's terminal.

1.1.4.f Help Facility

Software shall be provided to facilitate programming and storage of the system operation manuals in the hard-disk. The operation manual shall be retrieved by On Line Help mode so as to enable the operator to self learn the system operation, command, or function as and when needed.

This `help' facility shall be made available to the operator by use of a dedicated key or a single key click on the mouse. A minimum help shall be available for every menu item and dialogue box.

The facility shall contain both text and graphics to provide information about the selected function directly.

The information provided shall be in simple clear language and shall be capable of being added to or modified by an authorized operator.

1.1.4.g Alarms

Multiple priority levels of alarm shall be made available. Priority levels shall be deemed Critical Alarms and Non- critical (general) Alarms. Normally, critical alarms shall take precedence over non-critical alarms and high priority over low priority.

Each analog point shall have the following limits defined; wherever required

- High priority critical alarm limit
- Low priority critical alarm warning limit
- Low priority warning limit
- Low general alarm limit

When an analog point goes outside the low priority critical alarm limit or Low priority warning limit, a user defined warning message shall be directed to the appropriate alarm printers at the control station.

The Warning limits shall be used to monitor controllability, not comfort conditions. The alarm limits shall be used to monitor comfort conditions. When a set point is changed, the warning limits shall automatically change while the alarm limits shall not change.

When an analog point goes outside any of the limits defined, a user defined alarm message for that level shall be directed to the appropriate alarm printer and to respective operator workstation. Alarm message shall require operator acknowledgement.

When a digital point goes into alarm, a user defined alarm message shall be output to the appropriate alarm printer and to respective control station. Alarm messages shall require operator acknowledgement.

When a point is overridden by operator command from an operator workstation or a local workstation, an alarm message shall be output to the appropriate alarm printer and to respective operator workstation. Alarm messages shall require operator acknowledgement.

When a point returns to normal, the event shall be recorded in control stations as 'Return to Normal'.

The Operator workstations shall be capable of displaying a list of all points in alarm for the building in a single summary. Systems which require the operator to make a separate summary for alarms shall not be acceptable.

1. **Annunciation:** Alarms shall be annunciated at a terminal by an audible tone and icon. Critical alarms shall be defined by a different colour than non-critical alarms.

2. **Printing:** Alarms shall automatically be printed on the defined alarm printer. The printout shall contain the address, state or nature of the alarm, alarm priority, and time and date of occurrence.

   It shall be possible to route alarms to any printer on the system, in case the allotted printer fails.

3. It shall be possible to produce a user definable full text message to accompany the annunciation of any alarm. This shall provide further information about the alarm and any action required to be taken by the operator or indicate that action is automatically programmed in the system. These messages shall be automatically printed on a designated printer. There shall be no practical limit to the length of messages created.

4. **Acknowledgement:** It shall be necessary for all alarms to be acknowledged by an authorized operator. The facility shall exist for an additional message to be appended at the time of acknowledgement to provide further information as to any action taken.

   Acknowledgement of alarms shall be automatically printed and will indicate the time, date, and any message generated by the operator.

Alarm silencing shall be by the authorized operators by pressing the silence key.

5. **Alarm Clear:** When alarms are cleared, then a message shall be produced to indicate the description of the alarm point, its current state, and the time and date.

6. **Disk Records:** With the exception of extended text messages, all the information produced above, alarm annunciation, acknowledgement, and clearing, shall be automatically recorded on the fixed disk for historical purposes.

7. **Alarm Inhibits:** It shall be possible to inhibit the transmission of alarms in the following ways :

   (i) Operational Inhibits - to allow time for stabilization of power after the normal power is restored.

   (ii) Transient Inhibit - to make allowance for fluttering contacts or allow internal responses.

   It shall be possible to select time periods for inhibits (i) and (ii) and may be applied when entering into alarm, out of alarm, or both.

8. **Point lockout:** It shall be possible for the operator to lockout the control for any point, to force it to remain in its current state.

   A summary showing locked out points shall be available. Systems which require the operator to make a separate lockout summary shall not be acceptable.

9. **Alarm Review:** Points in alarm shall be displayed on the operators panel using the alarm review function.

1.1.4.h Logging

1. It shall be possible to log the status or value of system points at regular intervals or on change of state and store this on hard-disk at any of the central station.

2. It shall be possible to archive this information for future reference.

3. In the case of timed interval logs, it shall be possible to specify a time interval (in minutes) and the points which are required to be logged.

4. Storage of logged information shall be able to be carried out in any of three ways, single-shot, roll- over, or split. These are defined as follows :-

   4.1 Single-shot: In this type of file, logging shall be carried out only during a pre-defined period for which the start and finish time and date shall be configurable.

   4.2 Roll-over: This file shall be wrap-around where oldest data shall continuously be overwritten by new incoming data. It shall be possible to configure the number of records to be stored or the duration in hours, days or months before wrap around occurs.

4.3 Split: Data shall be continuously stored in a series of files automatically created. The change-over or creation of subsequent files shall be created by splits at user-defined boundaries. The boundaries shall be able to be defined by duration (hours, days, months) and by time and day of the first split.

5. Logging files shall be terminal based not system based, to provide true multi-terminal capability.

6. Data produced by the logging facility must be able to be used by standard spread-sheet package for the analysis of information and the preparation of management report.

7. In addition to the above, the data may be presented in a simplified customised package. The package should have the following features as minimum :

- Charting of logged data on disk in line graph, bar graph or pie format.
- Presentation of logged data on disk in tabular format.
- Charting of dynamic data (up to 8 points) in real time.
- Presentation of dynamic data in tabular format in real time.
- Selection of Auto/ manual scaling of X (time) axis and Y (variable) axis.
- Tailoring of charts by selection of line width and background colours.
- Optional grid overlays (full and dotted lines).
- Selection of horizontal/ vertical arrangement of windows or a `cascade' presentation.
- Multiple Windows.
- Printing of completed presentations.
- User configurable data selections.
- Optional display of point titles.
- Selection of primary or secondary values for display.

Presentation of both analog and digital values (ON/OFF etc.).

1.1.4.i Report Generation:

Standard reports shall be provided, which shall be operator selectable to appear on the operator station, any selected printer or both. A "terminate report" command shall be available to allow the operator to stop any report in the process of being printed. Standard pre-formatted reports to be provided shall include:

1. Point summary reports may be requested at any penetration level. Point summary reports shall include the current value/status and condition, point descriptors and all relevant information. Point summary reports shall be selectable for all points.

   All reports shall be capable of being scheduled to run at a specific time and/or interval via an operator function supported by necessary data entry templates and interactive prompts.

2. As a minimum, the system shall provide the following summaries:
   - Point summary

- Alarm summary
- Limits summary
- Lockout summary
- Off-line summary
- Override summary
- Utility summary
- Point status (alarm, locked out, off-line, override)
- Point name
- Point status/value (automatically updating)
- Engineering units.

The alarm summary shall list all points in alarm in the selected system. It shall be possible to print on a single summary, all points in alarm in the building. As a minimum, the alarm summary shall include:

- Point name
- Point status/value (when alarm occurred)
- Alarm message
- Date and time of alarm occurrence

The limits summary shall list all the alarm limits, and warning limits.

The lockout summary shall display points in the selected system which has either reporting or triggering locked out.

The off-line summary shall display points in the selected system which has lost communication with the system.

The override summary shall display points in the selected system which have been overridden by operator command.

The utility profile shall display the total consumption, measured peak for the current period and the previous period.

3. Trend reports shall allow the operator to randomly select logical group of points to be recorded at selectable time intervals. It shall be possible to assign up to ten variables to each trend report. The format, headers, footers, and calculations shall be selectable by the operator. The trend report shall be stored to disk and shall be subsequently capable of being displayed, and/or printed by the operator.

4. Dynamic trends shall provide upto eight points and show real time activity of the associated points. This information shall be printed and/or displayed in numeric, bar chart, curve plot, pie chart, etc., as selected by the operator. Graphic plots shall allow a unique color for each point. Sample interval of points selected for dynamic trend shall be user selectable. 3-Dimensional dynamic trending must be provided in the system.

5. Alarm and run time reports shall be automatically issued to assigned printers immediately upon occurrence, and shall consist of the point with engineering unit, the time, and the date, and the alarm message.

DDC Panels:

The panel housing the DDC controllers shall be located inside the conditioned area. Proper care shall be taken to ensure that there is no induction problem between the control and power cables. These panels shall be IP54, 16 gauge & powder coated and supplied by the specialist controls supplier.

1.1.5 Server hardware for IBMS

The Minimum specification for Server shall be as follows:

1. Intel® Xeon® Processor 3.06 GHz or more with 512K Cache
2. 533MHz FSB
3. Motherboard Chipset: OEM Motherboard
4. Chassis Type: Rack type
5. SAS 10K rpm or higher hot swappable Hard Disk in 1TB or more.
6. A Super VGA graphics card having video resolution of 1280x1024 pixels or better.
7. NIC - Two numbers of Gigabit Ethernet ports (10/100/1000 Mbps)
8. Free at least 2 x PCI express I/O slots, multiple USB ports.
9. DVD RW Drive.
10. 21” LED monitor.
11. Multimedia speaker
12. Hot Swappable dual redundant power supply.
13. Inbuilt cooling system.
14. Rack mounts with rapid rail.

1.1.6 Access Controller

The above IBMS & Access control software shall be capable of monitoring, control and reporting facilities of the system shall be powerful enough to enable security managers to manage their site's overall security. The Access Control System (ACS) shall be capable of integrating multiple building functions including access control, alarm management, intrusion detection.
The system shall be modular in nature, and shall permit expansion of both capacity and functionality through the addition of control panels, card readers, and sensors.
The system shall incorporate the necessary hardware, software, and firmware to collect, transmit, and process alarm, tamper and trouble conditions, access requests, and advisories in accordance with the security procedures of the facility. The system shall control the flow of authorized personnel traffic through the secured areas of the facility. The user interface at the host computer (server) and at the OWT (operator workstation terminal computers) shall be a mouse driven graphical user interface (GUI) allowing the user to open and work on multiple windows simultaneously.

a) The Controllers shall be UL certified and conform to UL standards.

b) Up to 8 readers and four doors per controller for flexible configurations

c) Flash memory for easy online software updates

d) The controller should have capacity for 99000 card holders

e) The controller shall have capacity to store 99999 messages

f) Supports two-man rule and escorted access for increased security

g) Configurable audio tones to indicate valid card read, invalid card read, and other types of events.

h) Large alarm buffer protects integrity of alarm data

i) Dynamic memory management allows maximum storage of card holders and transactions

1.1.7 **Biometric Fingerprint Card Reader & Enrolment Biometric Reader**

Reading element	: Optic sensor
Verification Algorithm	: 1:1 or 1: N
False Acceptance Rate (FAR)	: < 0.01%,
False rejection rate (FRR)	: < 0.01%
Users	: 500
Templates	: 2 templates per user (template on card)
Timing	: Card read < 0.5 sec
	Fingerprint capture < 2 sec, typical 1 sec
	Verification of captured finger < 1 sec
Card compatibility	: iCLASS 14443 standard
Output	: Same card data as in the Input in case of validation.
	No data in case of no validation

Access decisions shall be made at each controller.

Access criteria changes shall be downloaded from the controller automatically, according to a pre-programmed schedule.

All card readers shall unlock the controlled door within 0.2 seconds of the completion of the access attempt. The completion of the access attempt is defined as the end of the card shown for card only entry. This time delay shall never be exceeded, regardless of system loading.

Each access attempt shall be converted into a message and transmitted to the site controller and central management system. The following fields shall be transmitted:

- Time or entry or exit
- Point of entry or exit
- Access granted or denied
- Card number
- Cardholder's name

Each card reader shall be capable of automatically switching the current access criteria at a door at different times of the day, based on access control data received from the site

controller.

The following access criteria modes are required:

Free access - door is unlocked, no card entry is required

Secure access - door is locked (secure). A successful card attempt is required for valid entry. Door rescues after access attempt.

Pending access - door is locked (secure). Door switches automatically to unlock (free) upon first successful access attempt during pending mode period, or vice versa (see next clause). Within pending mode, two options shall exist:

The card reader is operating in secure access mode. When the first valid entry occurs, the card reader shall automatically set the access criteria for this reader to free (public) access.

The card reader is operating in free (public) access mode. When the first valid "access attempt" occurs, the card reader shall automatically set the access criteria for this reader to secure (card-required) access.

1.1.7.1 Database management:

The system shall create and maintain a master database of all cardholder records and all system activity for all connected to IBMS points as per IO summary. The System shall support various databases – Microsoft SQL, MySQL and Oracle.

1.1.7.2 Audit trail:

The IBMS shall maintain an audit trail file of operator activity, and provide the ability to generate a report by operator, time and date, and type of activity (audit code). The system shall allow the operator to direct the audit trail report to screen, printer, or file. The audit trail feature shall record the following system events at a minimum:

- Site parameters modified.
- System login or logout.
- System restart.
- Cardholder added, deleted, or changed.
- Event added, deleted, changed, or executed.
- Alarm message added, deleted, or changed.
- Communications initiated or terminated.
- Field device/points added, deleted, or changed.
- Access privileges added, deleted, or changed.
- Input point monitoring:
- Collect and process status information from all monitored points.

1.1.7.3 Alarm annunciation:

Audibly and visually annunciate all alarm, tamper and trouble conditions, and advisories.

Input point supervision:

The system shall electrically supervise all 2-state and 4-state input point circuits as specified or shown on the drawings.

1.1.7.4 Reports:

User definable reports that can be saved and re-run as required without redefining the report fields and format each time the report is run.
The predefined reports shall include the following at a minimum:

- Cardholder Report
- Input Point Report
- Alarm Response Message Report
- Alarm Instruction Text Report
- Output Point Report
- Time Zone Report
- Event Trigger Report
- Event Action Report
- Panel Report
- Field Device Report
- Card Transaction History Report
- Access Reports
- Reader Group Report
- Alarm History Report
- Transaction History Report with the ability to filter by any one or more of the following parameters:
  - Reader name
  - Start date
  - Start time
  - End date
  - End time
  - Transaction type:

Operator Menu Access: The operator password shall control which menu items that the individual operator may access. It shall also be possible to restrict operators such that certain specified menu commands do not appear on the screen, or are greyed-out (disabled) for a given operator. All user passwords are fully encrypted, even while being stored and transmitted across the network.

Alarm Input Point Reporting Delay: The ACS shall allow the operator to apply an input point reporting delay period from 0-60 seconds for each input point terminal. The default setting for each input point reporting delay shall be 0 seconds.

Alarm Input Point Suppression: The ACS shall provide an alarm input point suppression facility such that the operator may define a time zone suppression period for each individual input point. Alarm conditions for suppressed input points shall not be recorded or archived by the system, however, trouble conditions will be recorded.

Alarm graphics (maps): The alarm-graphics portion of the system shall provide dynamic color alarm graphic maps with the following functions: User definable graphic maps to depict input and output point conditions, reader status, and sub-map attachments in the ACS.

The ACS shall support the importing of most bitmap file format graphics produced with any graphic drawing program such as TIF, BMP or JPG file format. Vector file formats are not acceptable.

The ACS map program shall support the importing of most bitmap file format graphics to produce custom icons for all map attachments (input, output, reader, etc.).The ACS software shall be capable of storing a number of graphic maps.

The ACS shall provide a palette that includes six categories of pre-defined alarm map icons:

Input: representing a user-defined alarm input point located anywhere in the system. The input point icon shall flash, change color, and the computer's internal sounder shall beep when an alarm condition exits. It shall be possible to click on the icon to respond to the alarm condition or move directly to the alarm queue window to respond to the alarm. Each alarm-input icon shall have a pop-up box that indicates the point's current state (open, short, alarm/active, secure).

Output: representing a user defined output point located anywhere in the ACS. It shall be possible to click on the icon to set or reset the output point. In addition, it can display the set or reset status of point.

Map layer: representing that lower level maps associated with the top layer map exist in the system. It shall be possible to navigate through the map layers by clicking on the map layer (up and down) icons.

Reader Terminals: reader icons shall have the capability of displaying: held open, forced open, locked, unlocked, unknown, override, up and down. Panels: representing a system panel controlled by the ACS. Panel icons shall have the capability of displaying the up or down status of the panel.

I/O Terminals: I/O terminal icons shall have the capability of displaying the up or down status.

Alarm handling: The alarm handling portion of the system, which consists of the point contacts, and the Alarm monitoring Window shall provide the following functions:

The Alarm Monitoring Window shall be capable of being sorted by any column. It shall also have displayed the total number of alarms in the queue and the number that are pending. The Alarm Monitoring Window shall have the capability to bring up the map to the input, which is highlighted in the window.

User definable alarm message/instructions description: The system shall provide the ability to assign alarm message/instructions to each state of an input point ('Open', 'Short', 'Alarm/Active', and 'Secure.')

Alarm message "pick list": all alarm message names and associated descriptions shall appear in the form of a pick list from which the operator may select an appropriate alarm name and message from all alarm messages defined in the database by the operator.

1.1.7.5 Event processing:

Panel card events: the ACS shall provide the capability for the user to define a panel card event, which may be executed by a cardholder at a reader equipped with a keypad. For each 'card event' the following data may be defined by the User:

- Alphanumeric event name
- Access code to control the triggering of the event (card activated event)
- Event triggers type (card only, card + PIN, card + PIN + code, card + code, void card)
- Event Privilege level (0-7)
- Duration of the event execution (0-1440 minutes)
- Input point group to be suppressed or not
- Output point group to be activated or not
- Door strike operation enabled/disable
- Reset panel alarm relay

Host events:
Triggers: the ACS shall provide the operator with a scrolling list of the following event sequence triggers as a minimum that may be combined with the event sequence logical operators listed below to program a custom sequence of events. The ACS shall be delivered with this entire list functional whether or not these features are implemented by the User upon initial installation.

Actions: the ACS shall be provide a scrolling list of the following event sequence actions as a minimum, and allow the user to attach one or more actions to one or more of the event sequence triggers listed above to program a custom sequence of events.

- Enable anti-passback
- Disable anti-passback
- Unlock door control relay
- Lock door control relay
- Enable timed override of door control relay
- Set time zone for PIN code suppression
- Set time zone for reader
- Set time zone for reader override
- Enable reader override
- Disable reader override
- Enable soft In-X-It
- Disable soft In-X-It
- Enable local timed override
- Disable local timed override
- Lock all doors
- Unlock all doors

- Enable history upload
- Disable history upload
- Include time zone in access decision
- Ignore time zone in access decision
- Set controller relay
- Reset controller relay
- Enable input point group
- Disable input point group
- Set output point group
- Reset output point group
- Display a user defined message in a pop-up window
- Print user defined message on any printer
- System Database backup
- System Panel Download
- Display map
- Event Counters

Time zones: The ACS shall provide the capability for the user to define time zones with the following identification and configuration parameters.

1.1.7.6 Alphanumeric name

Alphanumeric description Allowance for up to eight periods, four active and four inactive, during each day of the week and each of three different holiday types. Any day of the year may be designated as a holiday; each defined as one of three holiday types.

1.1.7.7 Communications:

Pertaining to network-based communications between the Host and the door controllers:

Communications between the server (Host) and the door controller panels can optionally support a redundant network path. Thus the loss of Communications on the primary network path automatically causes Communications to be established via the other path without operator.

Intervention should the controller(s) lose communications with the Host, the controllers shall continue to control access and monitor inputs for all connected points. Local history of all transactions shall be buffered at the sub controller and automatically uploaded to the Host for alarm reporting and long-term historical storage once communications is re-established.

The bidder shall be responsible for the design of a system that will compensate for all signal level losses in the trunk wiring. This shall include any power supplies for the field devices and any signal level converters or repeaters for the proper amplification of electrical signals.

1.1.7.8 Other Features:

User defined cardholder database fields: The system shall support up to an unlimited number of user defined data fields, which may be used to store information for each cardholder. Each field may be of a type: alphanumeric text, numeric, date, toggle (Yes/No). The ACS shall provide standard menu items, which shall allow the operator to define these

cardholder database fields at anytime. The system shall remain on-line while user defined cardholder database fields are added or edited

The System shall support the capturing of high quality finger prints and encoding the finger print into the card during enrolment process that is native of System.

Also the System shall allow operators to capture and store the fingerprint to the System database. The fingerprints shall be captured using a biometric reader and an enrolment reader shall be used for fingerprint encoding.

Event and Transaction History: The ACS shall maintain a record of all alarm, card transaction, and system exceptions, which take place, and provide a means for a user to access this information. It shall be possible to print information in the log in real-time or by a report.

Anti-Passback Control: The ACS shall provide the capability to prevent more than one person from gaining access to a controlled area by recognizing when a cardholder who is granted access is passing back the card to another person to use the same card to gain access. If so programmed, an alarm may be generated if the anti-passback rules are violated by the cardholder. It shall be possible to define on a reader by reader basis, which readers are subject to anti-passback rules.

Duress Processing: The ACS shall permit cardholders to indicate that they are requesting access to an area under some forced or duress situation. An alarm may be generated if a duress condition occurs, and the cardholder will be granted access.

Cardholder Definition: The ACS shall provide the capability for the user to define Cardholders with the following identification and operating parameters.

- Cardholder name (first, middle, last)
- Cardholder address
- Cardholder phone number and extension number
- Validation period using start and void dates
- Department and Company fields from selection list of user defined departments and companies
- Unlimited number of user defined cardholder fields. The ACS shall provide the capability to use these fields in filtering reports.

Badge Definition: The ACS shall provide the capability for the user to define Cardholders with the following Badge identification and operating parameters on a per badge basis.

- Badge number assignment
- Issue level (0-7), only (1) per badge
- Validation period using start and void date and time
- Globally disable badges in all partitions

- Executive privilege enabled or disabled
- Active/Disable badge toggle button
- Trace enabled or disabled
- Override enabled or disabled
- PIN code (4 or 5 digits)
- Badge event privilege level
- Assign eight Access Groups and Time zones per Badge
-

System Status Display: The ACS shall provide a dynamic system status summary display that graphically indicates the following status information, filtered by panel or terminal. All status display information shall be summarized in a single window.

Alarm routing: The ACS shall provide the ability for the user to define which input points or groups of input points are displayed on each ACS Operator Workstation Terminal (OWT) computer. The system shall provide a report showing which input points are routed to each OWT.

Control points: The ACS shall provide the ability to define input points as control points to be used in input/output linking and event processing sequences of operation. Control points shall not enter the alarm queue and shall not require that an operator acknowledge them when they change state. The control point activity will however, be automatically logged to the history file.

Real Time Printer: The ACS shall be capable of printing to a network accessible printer as well as printing from an LPT port. The ACS shall be capable of printing with the following parameters:

Be able to specify printing of the following items, independent from each other:

- Input Point Alarms
- System Exception and Event Messages
- Access Trace
- Access Deny
- Access Grant
- Entry/Exit Central
- Audit Trail.

1.2 *IP CCTV System*

1.2.1 System Description

The system shall include all network video cameras, network switch, server hardware, video management software, cabling, supports, hardware, software and interfaces to provide complete system. The system shall seamlessly integrate with the access control system and security management control system. The system shall be expandable to encompass the entire site.

A network camera combines a camera and computer in one unit, which includes the digitization and compression of the video, as well as a network connector. The video is transported over an IP-based network, via network switches. This represents a true network video system, and is also a fully digital system, where no analog components are used.

A network video system using network cameras adds the following advantages:

- High resolution cameras (megapixel)
- Consistent image quality
- Power over Ethernet
- Full flexibility and scalability

The CCTV system shall comprise minimum of the following equipments (components) along with CAT6 cables, cable containment and associated accessories, hardware to provide a complete and operational CCTV system for alarm assessment and general surveillance purposes. Provide following minimum operational features:

- Network camera,
- Network switch with patch panel and necessary converters (if required)
- Viewing Station

1.2.2 Indoor/outdoor High Definition Resolution IP Network Dome Camera

	Video:	
i.	Video standards	Dual H.264 and MJPEG stream
ii.	Sensor	1/3" 3MP progressive CMOS/CCD image sensor
iii	**Resolutions and frame rates:**	**PAL**
iv	Resolution	2304 X 1296
	Video out	
v	Signal	ONVIF S and G
vi	Connector	RJ-45 10BaseT / 100BaseTX
vii	Video S/N	> 50 dB
viii	**Sensitivity:**	
	Day/Night	Yes
	Color	0.12lux
	Night Sens	0.03lux
ix	Wide Dynamic Range	60dB

x	White balance	Yes
	Electronic shutter	
xi	PAL	1/5 – 1/10000 s
	Optical	
xii	Lens	Varifocal 3 mm (W) – 12 mm (T)
xiii	Iris control	Automatic
	Camera Tampering	
xiv	Camera Sabotage	Alarm should be generated
	Software Control	
xv	Unit configuration	Via web browser or Configuration Manager
xvi	Motion detection	**Yes**
	Alarm	**Yes; 1x Alarm In & 1x Alarm Out**
	Network	
xvii	Protocols (Any of the following)	TCP/IP, UDP, HTTP, HTTPs, SMTP, SNMP, DNS, DHCP, NTP, FTP, RTSP (RTP), IGMP v3, UpnP, CIFS, NFS, IEC802.1x, ONVIF
xviii	Ethernet	10/100 Base-T, auto-sensing, half/full duplex, RJ45
xix	POE	IEEE 802.3af compliant
xx	Operating Temperature	0°C to 50°C
xxi	Operating Humidity	0% to 80% (Non Condensing)
	CERTIFICATES & APPROVAL	
xxii	Safety	UL
xxiii	Ingress protection and Vandal	IP66, IK10

1.2.3.Network Recorder

The Network video Recorder shall be capable to seamlessly integrate to the video analytic software, if and when added to the system.

Sl No	Specification	Minimum requirement
1	Type	Rack-mountable, Dedicated Network Video Recorder with suitable hardware to connect up to 16 IP cameras (i), offered storage is not an externally attached device to NVR, the total recording storage requirement shall be met through internally installed HDD itself. The bidder to submit the storage analysis for required no of cameras for a period of 60 days @15fps on minimum D1

		resolution. All channels must support recording resolution of D1 @15fps. (ii) Additional hardware/ software/ license, if any required by the bidder to meet its offered solution, should be considered accordingly by the bidder in its offer.
2	Storage capacity	Each NVR storage unit should be provided with usable 8 SATA HDD slots with provision of future expansion of HDD Slots using eSATA
3	Operating system	Linux or Embedded or Microsoft
4	Video compression	H.265/ H.264, MJPEG/MPEG
5	Recording support	The offered NVR must be able to support simultaneous recording of 16 IP cameras at D1 resolution at 15 fps
6	Network Protocol Support	HTTP/HTTPS, TCP/IP, RTSP, UDP, NTP, DHCP, IPC Search
7	On-board diagnostics	Web based support for system configuration & Diagnostics
8	Documentation	Installation guide, Operation & Maintenance Manuals, Installation CD/DVD for licensed software
9	Input Voltage	100~240 V AC, 50/60 Hz.
10	Compatibility	The supplied NVR must be compatible in all respects to the cameras being supplied at the locations
11	Operating temperature	10°C ~ 40°C or better
12	Operating Humidity	20% to 80% RH, non-condensing
13	HDD	HDD Hot swap, 8 bays SATA HDD, up to 8TB storage.
14	Product Safety	To comply with CE, FCC, UL
15	Details Required with offer	Bidder to submit the details of complete offered solution (Item make, model/part code, block diagram etc.) as stated above along with the offer.

1.2.4 LED HD MONITOR

The flat panel LED **MONITOR** shall have HD resolution and shall allow for on-screen display for setup and adjustment of tv parameters. The flat panel LED **MONITOR** shall allow for multiple video inputs (front panel switchable), PC-compatible inputs, video and audio inputs and outputs, and built-in automatic input scanning. The flat panel HD **MONITOR** shall meet or exceed the following design and performance specifications.

SL No	Specification	Minimum requirement
1	Resolution	1920 x 1080P
2	Contrast Ratio	5000 : 1
3	Viewing Angle	Horizontal 178°/Vertical 178°
4	Display Colours	16M
5	Source Input	VGA, HDMI, AV, DVI, RGB
6	Power	100 – 240V, 50/60HZ

1.2.5. 27U" FLOOR MOUNT RACK

The Network shall be accommodate to storage server, core switch, network switch, light interface modules, patch panel etc. Shall also be a provision to add more switch and server. Network Rack shall Compliance the following specification

SL No	**Specification**	**Minimum requirement**
1	Size	Min 27U
2	Type	Network
3	Mount	Floor
4	Caster Wheel	4 No's with Lockable
5	Mounting Size	19"
6	Cable Manager	As Required
7	Shelves	Min 4
8	Doors	Front and Rear Lockable Glass Door
9	Power Strip	Min 10 No's of 5/15A
10	Cooling Fan	4 No's on Top

1.3 ***Cables & Conduits***

Cat 6 cables shall be used for connection to the switch from the camera/ access controller / DDC Controller.

The 2 Core 1.0 Sq mm cable connecting the Field devices to DDCs shall be PVC insulated copper, multi strand, Shielded, ATC cables shall be 650V grades.

The 2 Core 1.5 Sq mm cable connecting the Detectors/ Field devices to Fire alarm Panel shall be PVC insulated copper, multi strand, FRLS cables shall be 1100V grades.

The 8 Core 1.0 Sq mm cable connecting the Readers to Access Controller shall be PVC insulated copper, multi strand, Shielded, ATC cables.

The 6 Core 1.0 Sq mm cable connecting the EM Lock/ Push Button Switch to Access Controller and DDCs to Communication Controller/Router/Gateway and for the RS 485 MODBUS Interface shall be PVC insulated copper, multi strand, Shielded, ATC cables.

Cables connected to devices shall be given 'S' loop on both the sides of the devices which shall be properly clamped to the ceiling. Loop shall also be left where cables connect sounders, panels, dampers, etc. Appropriate glands shall be provided where the cable enters the junction box.

All the cables and wires shall be tagged for proper identification. Wires shall be identified by ferrules at junction and cables by colour bands.

1.3.1 Cat 6 Cable

i.	Conductors	23 AWG solid bare copper or better
ii.	Insulation	Polyethylene
iii.	Jacket	Sheath Fire retardant PVC Compound (FRPVC) Flame Rating : 60 deg. C As per UL 1685 CM/CMR
iv.	Pair Separator	Cross-member fluted member
v.	Approvals	UL tested for TIA/EIA-568C.2
vi.	Frequency tested up to	Minimum 600 MHz
vii.	Delay Skew	35ns MAX.
viii.	Impedance	100 Ohms + / - 6 ohms, 1 to 300 MHz.

1.4 ***Fire alarm System***

1.4.1 Fire Alarm Panel

The control panel shall be a microprocessor based fully Analogue Addressable, Analogue Control Unit which shall control all Analogue Addressable Detectors, Manual Call Stations and Switching Systems (for disconnecting PAC and power supply) connected to it, single loop addressable unit, designed and manufactured to the requirements of UL for the control and indicating component and UL for the internal power supply.

A loop shall mean a 2-wire circuit connecting 125 addressable detectors/devices. The loop card shall have built-in circuit isolator to accommodate Class 'A' wiring. The loop cards shall be of modular construction.

It shall be possible to trip from the Fire Alarm Panel through the use of Addressable Output Modules, individual PAC activated by the fire signal of specified detectors.

All wiring shall be done using 2 x 1.5 mm^2 PVC insulated armoured FRLS copper cable.

1. All controls of the system shall be via the control panel only.
2. All site-specific data shall be field programmable and stored in an integral EEPROM.
3. All internal components of the control panel shall be fully monitored.
4. The control panel shall be capable of supporting a multi device, multi zone 2-wire detection loop. Removal of 1 or more detection devices on the loop shall not render the remaining devices on the loop inoperable.
5. All addressable units shall be connected to the Fire alarm control panel through the Loop Cards and shall be addressed through individual numbers. The Fire alarm control panel shall be able to obtain analogue value for all detectors in the circuit through a pulsed digitalized current data. The Fire alarm control panel shall be able to analyses all analogue inputs from all addressable units, and through its own software and ambient level

screening the Fire alarm control panel shall be able to identify fire, possible fire or fault conditions. The unit supervision shall be dynamic and continuous.

6. The Fire alarm control panel shall also give adequate warning signal whenever there is dust accumulation in detectors. It should be possible to change the level of ambient alarm calibration condition by the use of software program.
7. Short / Open circuit fault shall also be reported at the Fire alarm control panel. In such cases, the system through the use of fault isolators shall be able to isolate that segment.The missing Detectors/Devices shall also be reported at the Fire alarm control panel with identification of the location.
8. When an alarm condition is sensed at the Fire alarm control panel from a smoke or heat detector, a delay time/alarm verification period shall be started. If the detector is still in alarm after the delay time expires, an alarm condition is reported. The delay time shall be adjustable from 0 to 990 sec's.
9. The Fire alarm control panel shall have the facility to perform walk test. In the walk test mode, the performance of each device is checked out by initiating the device. As each device is placed into alarm the Fire alarm control panel shall print the condition and automatically reset the device. Audible devices shall be initiated, if required at a pre-programmed time. If a zone is inadvertently left in walk test mode, it shall automatically reset to normal after the idle time is exceeded. During the walk test the zones other than the programmed zones shall perform continuous supervision (normal mode).In case of any alarm initiated by detector/devices the walk test shall get terminated automatically.
10. The Fire alarm control panel shall also be able to carry out continuous self-monitoring when in normal condition.
11. The Fire alarm control panel shall also be able to discriminate between false alarms and fire conditions.
12. The Fire alarm control panel shall carry out priority selection of alarm in case alarm activities in two or more remotely located units simultaneously. In such cases, the manual call stations shall have the highest priority.
13. The Fire alarm control panel shall also be able to actuate switches automatically in case of Fire condition that of PACs and power supply or other systems such as Access control doors.
14. The System shall be fail safe and adequate safe guards should be ensured that in the event of a failure of a part of the System it shall not handicap the complete System.
15. The system status shall be made available via panel mounted LEDs and a backlit 4 line or 168-character alphanumeric liquid crystal display.
16. All user primary controls shall be password protected over 4 access levels in accordance with UL. Essential controls, such as Start / Stop sounders and Cancel fault buzzer, etc. will be clearly marked.
17. Cancel fault and display test functions shall be configurable to be accessed from level 1 or level 2.

18. All system controls and programming will be accessed via PC/Laptop / alphanumeric keypad. The control panel will incorporate form fill menu driven fields for data entry and retrieval.
19. The control panel shall log a minimum of 700 events comprising of 100 event fire log and 200 event fault, disablement and historic logs, giving time, date, device reference and status of indication.
20. Fire, fault and disablement events shall be logged as they occur. Visual and audible conformation shall be given on an array of LEDs, the Liquid Crystal Display and the internal supervisory buzzer.
21. The control panel shall have an integral automatic power supply and maintenance free sealed battery, providing a standby capacity of a minimum (48 Hrs) hours and further 30 minutes under full alarm load conditions. The system shall be capable of full re-charge within 24 hours following full system discharge. The performance of the power supply and batteries shall be monitored and alarm rose, should a fault be detected. The system shall protect the batteries from deep discharge.
22. The Software shall be user friendly. The system shall have the ability to be upgraded so as to incorporate more features at a later date. The system shall be designed such that it shall have the add-on feature.
23. The Fire alarm control panel shall be capable of being networked (future expansion) with other similar Fire alarm control panel's located at different part of the premises through a single RS485 bus.
24. The Fire alarm control panel shall have provision for interfacing with the Public Address System.
25. The panel should have the facility to interface with an automatic two channel programmable speech dialler for verbal reporting of fire. Fire alarm control panel shall be able to call four telephone numbers per channel. The programmable speech dialler shall have two alarm inputs and shall provide listen-in capabilities through the built in microphone. The dialler shall have a built-in keypad for easy operation, programming and voice recording.

1.4.2 ADDRESSABLE DETECTORS

MULTISENSOR DETECTOR

a) All detectors shall be plug-in type, from the maintenance and compatibility point of view.
b) An alarm condition should not affect a detector's good functioning.
c) After resetting the alarm, the detector shall resume normal operations without readjustment of any kind.
d) The detector shall have a Multi-sensor type integrated photoelectric smoke and fixed temperature heat sensing technology.
e) It shall be possible to use a single detector type for both above and below false ceiling applications.
f) The detector shall be capable of detecting fast flaming fires and slow smouldering fires equally well.

g) The detector shall therefore be a multi technology detector or shall be of unique design whereby a single type/model can be used in applications where either ISD/OSD would be normally used.
h) The sensitivity of the detector shall not vary with change in ambient temperature, humidity, pressure or voltage variation, and should not trigger the false alarm due to the above condition.
i) The detector shall be suitably protected against dust accumulation/ ingress of moisture. The detector shall be free from maintenance and functionally tested at periodic intervals. All detectors shall be identical in construction design and characteristic to facilitate easy replacement and interchangeably by suitable programming.
j) Devices shall be compatible with the CIE conforming to the requirements of UL Listed and be UL approved.
k) Secondary response indicators shall be provided for all the Above False Ceiling Detectors.
l) The detector shall have twin LED's/Single LED for 360/180 degree viewing angle. LED on the detector shall blink each time the sensor is scanned by the Fire alarm control panel.
m) Detectors shall fit a common addressable base.

1.4.3 Manual call points (MCP)

a) MCP's shall be addressable and of the Pull type / steady pressure break glass type shall be provided to allow the routine testing of the unit.
b) The device shall be red in colour and suitable for surface or flush mounting.
c) Manual stations shall be interfacable to an addressable input module. The manual station shall have normally open fire alarm and annunciator contacts and these contacts shall close on activation. Contacts shall remain closed until station is manually reset.

1.4.4 SOUNDER

a) Electronic sounders shall be colour red with adjustable sound outputs and at least ~~3~~ sound signals. The sounders should be suitable for operation with a 24V DC supply providing a sound output of at least 92 dBA at 1 meter and 75 dBA min, for a bed head or sounder base type device.
b) The sounder shall be addressable electronic type and shall give discontinuous/ intermittent audible alarm whenever any detector or MCP operates.
c) The sounder shall be powered from Main Fire alarm control panel through separate 2 wire cable.

1.4.5 FIRE ALARM SYSTEM TESTING

1. FACP:

a) The FACP shall be visually checked for input voltage and ampere. All zones one by one shall be de wired to check for fault signal indication in the FACP.

b) The Power Source shall be cut off and checked for stand by Supply from the Batteries. After six hours the FACP Source shall be switched on to check for auto switch over to the Mains mode.
c) Tests shall be conducted for AC fail, charger fail, DC fail, Battery Disconnect or Battery fail. In all such cases the relevant L E D should glow and the piezo sound shall also give sound output.
d) Low battery indication, fault indication should be made available at the panel.

2. MULTI SENSOR DETECTOR

a) The testing shall be carried out for each loop / zone,
b) Initially one detector in a zone and subsequently 2 or more disassociated detectors in each zone shall be tested for Alarm Priority, Alarm Queuing and Call Logging with time lapse between detectors.
c) An identified detector shall be subject to smoke aspiration from burning paper/cigarette puffs, rubber and other materials which give dense smoke held at 0.3 M distance from the detector.
d) The FACP should indicate increased analogue output for that address and after the programmed delay time, a fire alarm signal shall be indicated. This delay shall be utilized for alarm verification.

3. ADDITIONAL TEST:

a) One detector of each type will be disconnected and subjected to slow dust build up by means as desired by the Engineers in charge and again connected in the circuit.
b) Any part of the Loop shall be short circuited. The FACP shall indicate the communication failure of all the devices connected in the short circuited segment.
c) After the short circuit is corrected, the Fault Isolator shall return to its normal status automatically, this being reflected in the FACP.
d) The Loop shall then be in normal operation again. Any part of the Loop shall be de wired and tested as given above for open fault.
e) All other tests as required by the client at the time of handing over shall also to be conducted.

1.5 *Fire Suppression System*

The scope shall include, design, supply, installation, testing and commissioning of Automatic & Gas flooding, fire suppression system for all the critical areas.

Fire suppression shall have following specifications:

1. The suppression system used shall NOVEC 1230 based fire suppression systemwith cross-zoned detector systems for all locations. These detectors should be arranged in a manner that they activate the suppression system zone wise to cater to only the affected area.
2. The critical area shall be divided into number of zones, whenever fire is detected or sensed in any of the zones, annunciation should be available on the Fire
3. There should be a fail-safe alarm system to prevent false discharge or tampering.
4. Alarm Control Panel (FACP), and the suppression system in that particular zone shall be automatically activated.

5. The flooding of the gas is considered in the area above false ceiling, below false ceiling and false floor.
6. The server room shall be protected with the gas based fire protection system.
7. Design calculation for the Suppression system shall be done on Vds / UL listed, FM approved software.
8. Design of the system shall be in accordance with NFPA 2001-2012 edition
9. The scope shall include design, supply, installation, testing and commissioning of piping system & manifold required for the gas based suppression system.
10. The Bidder should prepare & submit the piping Isometric drawing, datasheets of the hardware used in the system before execution.
11. The Bidder shall also submit copy of (CCE) PESO approval letter for the cylinder proposed to be used. These documents shall be submitted along with the supply of cylinders after the award of contract.
12. The Bidder shall also submit calculations to evidence the qty of agent considered for the system.
13. The Bidder should provide, as part of handling over, the as-built drawing, operation manual, training material and maintenance manual.
14. The as-built drawing shall exactly match the Isometric drawing submitted with the flow calculation prior to commencement of work.
15. Scope includes laying of required pipes, Electric Actuator, Pneumatic Actuator, Discharge Nozzles, Manual Actuator, Flexible discharge Hose and other relevant accessories of the system.

SCOPE OF WORK

The scope of work envisaged under this MR covers the Clean Agent system protection for the DCU control room as per the minimum requirements of total flooding fire extinguishing Clean Agent system as per NFPA-2001 and having design concentration as specified at 70˚ F (21 ˚C) for the single largest risk area of control room.

The system design shall be total flooding and Clean Agent requirement shall correspond to the single largest risk area of building.

No deviation from specification will be acceptable.

System supplied and design calculation shall be approved by UL/FM/Vds/LPC .specifications, drawings, codes, standards and good engineering practice etc. complete. The contractor shall be responsible to complete the entire work in all respects and any other work necessary to complete the job whether specifically mentioned or not in the scope of work. In general, scope of work covers the following but not limited to:-

Design, supply of all materials, installation, fabrication, testing and commissioning, puff test, performance guaranteeing of total flooding (main room + below false flooring + above false ceiling) centralized Clean Agent Fire Extinguishing System for Fire Protection of various risks. Clean Agent to be Novec 1230 as per NFPA-2001 for Fire Protection of various risks as listed below:

1. Equipment Room
2. Battery Room

The actual net volume of the risk shall be calculated based on the Architectural & Structural Drawing of the building, higher % /quantity of volume as specified by Clean Agent manufacturer for Clean

Agent system. (However the maximum discharge concentration shall not exceed NOAEL. as per NFPA-2001 2012 edition)
All equipments shall be approved by UL/FM/Vds/LPC and cylinders along with cylinder valve assemblies shall be seamless and PESO/CCE approved.
It shall be noted that Clean Agent system to be provided shall meet the requirements of NFPA-2001 (2012 edition). Hence anything specified as "Mandatory" in NFPA-2001, although not specifically mentioned in this specification, shall form part of this specification.
The system shall be designed based on the single largest risk area of the control room building. The system shall include electrically actuated automatic Clean Agent Fire Extinguishing System complete with filled up Clean Agent cylinders, cylinder rack, manifolds, pressure reducing devices, cylinder valves, directional valves, pipes, discharge nozzles, bracket supports, hangers and such other fittings as necessary for complete installation of the system.
RCC/ brick walls/ cutting of steel plates etc. or removal & re-fixing of false ceiling and floor of risk areas, fixing fasteners and other activities required to install the system.
The system shall also comprise of the different modes of operation, actuation and cancellation facility etc. with necessary local control panel as per specification.
The design requirements and material of construction shall be as per specification. Physical properties of clean Agent shall meet the requirements as per NFPA-2001 (2012 edition)

System shall be designed for No Adverse Effect Level (NOEL)
They shall be installed in rack room, UPS room./ As recommended by NFPA-2001 2012 edition) Automatic release shall be initiated via smoke detection system, located in cross- zone pattern (different loops). The system could be set on manual mode or auto mode. The discharge piping & nozzles shall be designed in order to allow discharge of 95% of minimum design concentration of clean agent gas **as per NFPA 2001 (2012 edition).**

CODES AND STANDARDS
The latest editions of the following codes, specification and regulations has been used for the detailed design and specification of Clean Agent system
NFPA 2001: National Fire Protection Association, (Standard on Clean Agent fire extinguishing system)
ESO/CCE Nagpur (For storage cylinders)
Clean Agent manufacturer's recommendations
NFPA 72

System Operation
The system shall comprise of the following mode of operation and actuation and cancellation facility etc. with necessary control panel:
System operation shall be possible by the following means:
- Automatically due to fire detection in the protected area.
- Operation of manual release push button located adjacent to protected area.
- By operating manual lever provided on electrical/ manual control head on pilot cylinder
- By push button actuation at Clean Agent control panel, in manual mode

The Clean Agent shall be discharged / actuated automatically after an adjustable time delay based on the detection signal received. The delay shall be minimum 30 seconds; however it shall be adjustable from 30 to 120 seconds. In the local control panel of Clean Agent system, there shall be one hooter, which shall operate once the gas is released. During time delay, there shall be a pre-discharge alarm (audio + visual). Hooter shall follow the alarm once the gas is discharged.

Clean Agent Gas & its grouping/distribution

The quantity of Clean Agent gas provided shall be sufficient to protect the single largest risk. The system for every individual risk shall have its own distribution piping, nozzles, alarm, and actuation system, etc. Cylinders shall be permanently connected to the distribution piping through manifold. Since the system is designed for the largest risk and there are several risk areas varying in size in a particular building, the system shall permit the use of required number of cylinders for any individual risk involved so that the **concentration of gas in that risk area does not exceed the NOAEL specified as per NFPA 2001 (2012 edition).**

Gas properties & its discharge characteristics

Physical properties of Clean Agent shall meet the requirements of NFPA-2001. The agent discharge shall be substantially completed within the time frame as per **NFPA 2001 (2012edition)**. The minimum oxygen concentration shall be as per NFPA-2001 to have NOAEL.

System Flow Calculations

System flow calculations shall be performed using A CALCULATION METHOD LISTED OR APPROVED BY THE AUTHORITY HAVING JURISDICTION (i.e. UL/FM/Vds/LPC) . The system design shall be within the manufacturers listed limitations.

CONTRACTOR shall also provide sufficient measure (like properly designed louvers etc.) facilities in the risk areas to dissipate over pressurization due to release of Clean Agent and also provide calculation in support of same for each protected area. Approval certificate of software from the UL/FM/Vds/LPC shall be submitted along with the offer.

Clean Agent Quantity

Minimum design concentration of Clean Agent gas shall be as per NFPA-2001 by volume for Clean Agent fire extinguishing system based on approved / listed flow calculation method.

Clean Agent concentration requirement shall be computed considering the volume of the hazard as specified. The BIDDER, as per NFPA-2001, shall work out the quantity of Clean Agent. However, BIDDER shall quote minimum quantity of agent for the volume as given in the scope. Suitable margins of 20% for leakage etc. shall be kept over & above the calculated quantities.

However in any case the minimum design concentration of Clean Agent gas shall not be less as specified in relevant **NFPA 2001 (2012 edition)** unless otherwise specified by the agent manufacturer for clean agent fire extinguishing system based on approved/listed flow calculation method.

Clean Agent Storage Cylinders

The Clean Agent storage cylinders shall be designed to hold Clean Agent at ambient temperatures. Cylinder shall be of approved type and freshly imported. Minimum design level pressure of storage cylinder shall be as per NFPA-2001.

The capacity of the cylinder shall be standardized for better placement & inter-changeability. The design pressure for cylinder shall be suitable for the maximum pressure developed at 1300 F (550 C).

The cylinders shall be charged to a fill density or super pressurization (super pressurization means the addition of a gas to fire suppression agent cylinder necessary to achieve the pressure required for proper system operation) within the range specified in the manufacturers listed manual.

BIDDER shall select the capacity of cylinder based on the storage space available and for better replacement and inter changeability. The BIDDER shall preferably select the capacity of cylinder keeping in view the filling ratio as per NFPA 2001.

The cylinder shall be **seamless**, brand new (date of manufacturing of cylinders shall not be older than 1 year from the date of bid opening) never retested and month & year of manufacture shall be latest (or as specified in the requisition).

Each cylinder shall have a permanent name plate, specifying the agent, tare and gross weight in addition to the pressurization level, nominal agent volume. Cylinder shall bear the mark of manufacturer, serial number, single test certificate issued by authority having jurisdiction and shall

be duly approved by competent authority of the country of origin (FM/UL/Vds/LPC/EEC) in addition to approval by PESO/CCE Nagpur, (India). Cylinders without approval will not be accepted. A reliable means of indication shall be provided to determine the pressure in refillable cylinders. **PESO/CCE Approval of the cylinders is a must.** Cylinder shall conform to the requirement of NFPA 2001 and shall be compatible with the engineered system being provided along with design analysis.

Each cylinder shall have pressure relief valve to protect the cylinders against excess pressure conditions.

Pressure gauges with isolation valves on manifold shall be provided. Automatic means such as check valve shall be provided to prevent agent loss if the system is operated when any cylinders are removed for maintenance.

Layout of Cylinders:

Clean Agent cylinders shall be arranged in the following manner:

The cylinder storage racks shall be provided for cylinders.

The manifold, containers referred to above shall be securely mounted on the floor and suitably supported in a rack with provision for convenient individual servicing and content weighing according to manufacturer's installation manual. Such servicing or weighing shall be possible without shutting down the system.

A space marked as Clean Agent room on the drawing will be made available to the BIDDER for placing Clean Agent Cylinders and Piping Manifold. BIDDER shall accommodate the storage of Gas Cylinders and Manifold Piping in the space provided and confirm the adequacy of space (along with technical bid).

Piping, Fittings and Discharge Nozzles

I) Piping & Fittings

a) Pipe shall be provided as per the requirements as specified in NFPA-2001.

b) Pipe fittings shall be provided as per NFPA-2001.

c) All CS Studs, Bolts and Nuts shall be Hot Dip Galvanized as per ANSI A153 for corrosion resistance.

d) The Pressure Reduction device shall be easily identifiable.

e) The Clean Agent piping layout shall be such that the pipes of one risk shall not pass through that of another risk.

f) All Valves shall be approved for intended use. The Gaskets, O-Rings and other Valve material shall be compatible to the Clean Agent.

g) The Clean Agent piping and nozzles shall have to planned clearing following facilities coming on its route, in the areas where protection is being envisaged:

The beams and ribs which criss-cross the ceiling. The Clean Agent piping shall be routed considering clearing structural beams / columns or any other facilities coming in the areas where Clean Agent system is being envisaged. All necessary civil works including taking support from Structural steel members, blast resistant RCC walls or breaking brick walls for routing the piping and making them good, shall be in the scope of work of bidder.

h) If required, the exposed piping works shall be camouflaged to match with the interior of the protected room

Discharge Nozzles

Discharge nozzles shall conform to Cl.4.2.5 of NFPA 2001 and shall be of Brass and shall be FM/UL approved. Discharge nozzles used in the system shall be listed for the use intended for discharge characteristics. The selection of nozzle orifice shall be such discharge time required to achieve 95% of the minimum design concentration for flame extinguishment based on 20% safety factor shall not exceed the time specified in NFPA-2001. Each nozzle shall be permanently marked to identify the

manufacturer as well as type and size of the orifice along with tag / part number, orifice code, or other suitable marking as specified by the authority having jurisdiction.

Painting

Painting shall be carried out as per Job Specification for Shop and Field Painting. Painting and colour scheme of pipelines, Clean Agent storage cylinders, supports etc. shall be as per shade No. 536 of IS: 5.

Local Control Panel for Clean Agent System

The local control panel shall be free standing/ floor / wall mounted type and shall be suitable for both auto and manual operation. The panel shall be made out of minimum 16 gauge CRCA sheets. The panel shall be naturally ventilated, totally enclosed, dust and vermin proof, with IP-42 enclosure as a minimum.

The Clean Agent system shall be actuated automatically by the signal received from the fire alarm and detection panel. Fire alarm and detection panel, after detecting the fire in the protected area/ zone, shall provide an actuating signal to Clean Agent control panel, which in turn shall energise the solenoid valve to trigger the dumping operation in the respective protected area / zone. Necessary control / interlock cabling between Fire Alarm and Detection Panel and Clean Agent system panel, using multi-core Cu conductor PVC insulated flame retardant cable, shall be provided.

The control panel shall be located inside the clean agent cylinder room or any other place as decided by owner at the time of detailed engineering.

However, control panel shall be equipped with adequate rating battery charger and VRLA battery with 24 hour back up, for efficient operation of the system during mains power failure.

(i)Control panel shall be provided with all alarms, indicators, caution/sign board and relays/ control switches meeting all the requirements of NFPA-2001 and shall include but not be limited to the following:

Two alarms and one fault indicator lamp for each zone to be protected

Combination of alarm silence and alarm off switch.

Combination of fault silence and trouble lamp switches/ Alarm test switch

Alarm re-set switch.

ii) The system shall have a positive warning device by sounding alarm to alert personnel of the impending discharge and also a positive indication to show that the system has actuated. Two numbers potential free contacts shall be provided for owner’s use, one contact for indication of start of dumping operation and other contact for indication of end of dumping operation.

Alarm indicating failure of supervised devices of equipment shall give prompt and positive indication of any failure and shall be distinctive from alarm indicating operation of hazardous conditions.

iii) All indication lamps shall be LED type.

iv) Warning and instruction signs at entrance to and inside protection areas shall be provided.

v) A Control Box /Clean Agent Release Panel shall be provided for manual control at the exit doors of each risk area, comprising of selector switches for selection of Main/Reserve and Auto/Manual Push buttons for Clean Agent release. Potential free contacts shall be provided from the Clean Agent Control Panel to shut off the fire dampers / louvers and Air Conditioning System.

vi) Supervision of automatic systems shall be provided and shall include electrical supervision of the actuating device and the wiring connecting the actuation device and the detection system.

vii) Operating instructions shall be displayed on a name plate fitted permanently on the Clean Agent skid.

viii) Clean Agent extinguishing system shall incorporate a pre-discharge alarm with a time delay, sufficient to allow personnel evacuation prior to discharge. The delay shall be minimum 30 seconds. However it shall be adjustable from 0 to 180 seconds.

ix) Solenoid valves shall be direct acting type with SS body, Intrinsically Safe, 24V DC with insulation Class- F.
x) Abort switch shall be provided outside each risk area and on the main gas release panel.

Important Inter-locks for Cable Station:

1. In case of Fire Alarm, the access doors will operate in 'Fail-Safe' mode and open all the doors; shut down the AC systems, the specific fire device address will be sent via email by the IBMS system to concerned Engineer.
2. In case of Fire alarm in battery or equipment room, and any two detectors are activated in this zone, it has to activate the Gas Release Panel, the detected alarm will activate the actuator after a time delay of 120s. The gas release panel status will be monitored by IBMS and will send an email in case it is activated.
3. Access based events to be recorded in case of door forced open, Access Denied and door open too long (DOTL).
4. DOTL alarms will be monitored by IBMS and the alarm will be sent via email
5. UPS fluctuation alarms (LOW and HIGH) to be sent via email
6. ASDS alarm detected will shut down AC systems to localize smoke and same ASDS will be sent via email alert.
7. WLD alarms to be sent via email through IBMS indicating specific sensing cable.

NOTE: Internet access will be provided by BSNL for email alerts as per requirement.

1.6 RODENT REPELLENT SYSTEMS

1. GENERAL

1.1. This section covers rodent repellent system with controller, transducers & alarm sounders.
1.2. The manufacturer shall have an IDEM & CFTRI certification.
1.3. Proposed system shall be provided at all locations including room void areas of battery, UPS & MDF rooms.

2. CONTROLLER

2.1. Manufacturer shall have an IDEM & CFTRI certification.
2.2. Controller shall support 12 Transducers & shall come with a pair of stands & brackets. The controller is installed in the control room, service corridors & the transducers in the problematic areas i.e. room voids & below false flooring. Controllers supporting 10 transducers shall be used in smaller areas/zones.
2.3. Controller shall have LCD display with on-board controls for changing the following parameters like wave speed, wave density, frequency testing, transducer testing.
2.4. Controller shall automatically operate at minimum 3 different frequency bands & the time of operation of each band can be set at controller.
2.5. Controller shall provide 5 different values for the wave speed parameter which is an indicator for the number of frequency sweeps per minute. The 5 wave speed values shall be 90, 100, 110, 120 and 130/ frequency sweeps per minute.
2.6. Controller shall have RS/ EIA 485 feature to transfer the controller data to the serial port of IBMS computer up to a kilometer apart.
2.7. Controller shall be password protected.
2.8. Controller shall be equipped with a 3 pin power supply cord of 1.5meters and each controller shall be provided with of 5A electrical plug points.
2.9. Standard 2core, flexible (14/40) SWG multi-stranded CT wires shall be used for connectivity between the transducers and the master console.

3. TRANSDUCERS

3.1. The Transducers shall be circular ceiling mounted low profile units that produce high decibel sound waves at very high frequency not less than 20 Khz.
3.2. These transducers shall cover an area not less than 300 Sq. ft for Room void application, & 150 sq. Ft for ceiling Voids & floor void applications.
3.3. These shall be powered thru main Controller to 10 satellites in parallel.
3.4. Transducers shall have pre-tuned operating frequency band of > 20 KHz and <60 KHz.
3.5. Power output per transducer shall be 800mW.

List of Approved makes

Sr. No.	System	Approved Make
1	Server	DELL / HP / LENOVO/WIPRO/IBM
2	Monitor	HP, Dell, Samsung, LG
3	Integrated Building Management System	Siemens Desigo, Schneider TAC, L&T Atmos, Honeywell/ Sauter Race /Tyco
4	BMS Field Devices	Siemens Desigo, Schneider TAC, Greystone, Honeywell / Sauter Race /Tyco
5	DDC Controller	Honeywell / Schneider /Siemens /L&T Atmos / Sauter Race/Tyco
6	Network Switch	CISCO, HP, Netgear
	Room temperature Humidity sensor	Sauter Race/Tyco / Honeywell
7	Access Control Panel	Honeywell / Schneider /Siemens/ DDS/ Prowatch /Lenel /GE
8	Smart Card Reader	HID iClass
9	Biometric Finger Print Reader	HID/L1 identity/Honeywell
10	EM-LOCK For Door	EBELCO / ALGATEC /INSYIN/Faradays /BEL
11	Indoor Dome Camera	Honeywell / Axis / Bosch
12	Access Control	AXIS / Honeywell / Milestone /Prowatch/Lenel/GE
13	IP Camera	Bosch / Axis / Honeywell
14	Video Network Recorder	Bosch / Axis / Honeywell
15	Floor Mount Rack	MRS / Valrack / Netrack
16	Fire Alarm Control Panel (FACP)	Honeywell / Edwards / Bosch / Schneider/Notifier/GE
17	Addressable MultiSensor Detector	Honeywell / Edwards / Bosch / Schneider/ Notifier/GE
18	Addressable Heat Detector	Honeywell / Edwards / Bosch / Schneider/ Notifier/GE
19	Addressable control modules	Honeywell / Edwards / Bosch / Schneider/ Notifier/GE
20	Addressable monitoring modules	Honeywell / Edwards / Bosch / Schneider/ Notifier/GE
21	Manual Call Point	Honeywell / Edwards / Bosch / Schneider/ Notifier/ GE
22	Electronic Hooter Cum Strobe	Honeywell / Edwards / Bosch / Schneider/ Notifier/GE
23	Fault Isolator Module	Honeywell / Edwards / Bosch / Schneider/ Notifier/GE
24	Response Indicator	Agni / Ravel
25	Portable Fire Extinguisher 4.5-Kg	Minimax / Safex / CeaseFire/Similar Superior

26	Novec 1230 Cylinders	Kidde/Ansul(Tyco)/Rama/EKC
27	Valve assembly	Siemens / Kidde / Ansul(Tyco)/Honeywell
28	Electric Control Head	Siemens / Kidde / Ansul(Tyco) /Honeywell
29	Discharge Nozzle	Siemens / Kidde / Ansul(Tyco) /Honeywell
30	Manual Actuator	Siemens / Kidde / Ansul(Tyco) /Honeywell
31	Flexible Discharge Hose	Siemens / Kidde / Ansul(Tyco) /Honeywell
32	Actuation Hose	Siemens / Kidde / Ansul(Tyco) /Honeywell
33	Manual Release Switch	Ravel/Siemens/Safeway/ Alert
34	Manual Abort Switch	Ravel/Siemens Safeway/ Alert
35	Seamless Pipe	Maharashtra/ Tata/ Jindal/BHEL
36	Digital Water Leak Detection	TTK / ELSA / DSC Sontay
37	Sensor Interface Module	TTK / ELSA / Sontay
38	Sensing Cable	TTK / ELSA / Sontay
39	ASDS Panel	FAAST/Xtralis/Airsense/System Sensor/ Xtralis /Securiton
40	Rodent Repellent System	RSCAT / Maser/ Star/C system
41	Cable	VARSHA / Finolex / Polycab / ISI mark
42	CAT-6 Cable	D-link / Molex / Finolex/Netgear / TP link

ANNUAL MAINTENANCE CONTRACT

Part – I : Scope of Maintenance.

To ensure that the maintenance of Integrated Building management system comprising of Access Control system, Closed Circuit Television, Addressable Fire Alarm System, Fire Suppression System, Aspiration Smoke Detection System, Water Leak Detection System and Rodent Repellent System as included in the schedule of work are to be carried out on comprehensive basis and in healthy working condition.
Perform periodical check/ preventive maintenance as per Part – III.

Part – II : Tasks to be performed within first 30 days.

To familiarize with the whole package installed in the building, their distribution arrangement/ location and working of various equipments/ field devices/ sensors and method of responding to various alarms.
To inspect the complete Integrated Building Management System and all its associated constituents like Access Control system, Closed Circuit Television, Addressable Fire Alarm System, Fire Suppression System, Aspiration Smoke Detection System, Water Leak Detection System and Rodent Repellent System for any shortcoming that may come in the way of proper operation which are to be recorded and brought to the notice of Engineer in charge.
Finalize method of documentation, proforma of log book/ register in consultation with the Engineer in charge.

Part – III : Maintenance schedule to be followed.

General:

Periodical maintenance of entire system shall be done as per manufacturer's recommendation.
Cleaning of equipments of entire system.
Visual check of all equipments for any physical damage, loose connection, improper alignment and take suitable remedial action
The firm has to repair all defective parts or replace with same/ superior make at no extra cost subject to exceptions mentioned in Part-IV hereunder and submit necessary service reports. In case same make is not available, Engineer in-charge shall approve an alternate make.

Integrated Building Management, Access Control & CCTV:

Monthly check and upkeep of Hardware/ Software of Operator workstations, status of all Access readers, Cameras, Monitors/ TVs, field devices, DDC, sensors etc and the communication between associated services
Check of Archives database and making back-up copies of ACS/ CCTV etc whenever required.

Addressable Fire Alarm System:

Check status (monthly) of the AFAS panel and its associated devices like addressable multi sensor detectors, smoke detectors, etc. and set right faults.
Carry out periodical Fire alarm tests including check the functioning of hooters, response indicators, manual call points etc.
Ensure healthiness of batteries of FAP for proper charge, water level and clean the terminals if required.

Fire Suppression System:

Only professionally competent personnel shall be engaged for the maintenance.
Monthly visual check of all system components such as main control/ gas release panel, cylinder pressure, actuating mechanisms, manual release/ abort switches etc. and correct all deficiencies.
Semi-annually (i) examine all nozzles, pipes /joints / supports for corrosion/ looseness/ damage and repair or replace if necessary. (ii) Check the discharge nozzle orifice(s) to see if they are clear with no obstructions. (iii) Perform functional test of all components including nozzles.
Every six months check the quantity of liquid and pressure in the cylinder. The gas shall be replaced or refilled (i) in case there is a loss in net weight of more than 5% or a loss in pressure of more than 10%. (Since pressure varies with temperature this must be taken into account). (ii) Mal functioning of the system.

Aspiration Smoke detection System:

Monthly perform functional smoke test on test mode, check, alarm and fault forwarding.
Monthly inspection of aspiration sampling pipe for block and blow out the nozzles.
Ensure healthiness of power supply and batteries.
Check the functioning of Electronic hooters.

Water leak detection System:

Monthly perform functional test using wet cloth on the sensing tape, check alarm and fault forwarding.
Examine all connections to be secure.

Rodent Repellant System:

Periodically test/ ensure that the main console and transducers are in operation.

Part – IV : Materials

All the materials required for carrying out maintenance shall be arranged by the contractor at his own cost .

SPECIAL CONDITIONS OF THE TENDER

[In case of any difference between any clause of any section of NIT and that of the "special conditions of contract," then the "special conditions of contract" shall prevail]

The firm shall read carefully the following conditions and shall quote accordingly confirming all the points in their offer.

GENERAL CONDITIONS

Please note that the offers, which do not comply with the following, will not be considered and will be totally rejected. These instructions supersede the BSNL / EW6 and EW 8 clauses, or any other clauses/conditions appearing elsewhere in the tender, in case of any Disparity.

1) Tenders with any condition including that of conditional rebates shall be rejected forthwith summarily.

2) Insurance, loading, unloading, transportation etc. should be included on works contract basis. The rates shall be firm and final.

3) The price shall be firm and fixed during the currency of the contract. No cost escalation is permitted. Clause10CC is not applicable.

4) The Extension of time for completion of the works is governed by clause 2 of EW8.

5) No advance payments can be made. The payment is governed by the normal department practice and stipulations like levy of interest if payment is not made in a specified time are not acceptable.

6) The firm should deposit EMD before submission of their offer. The EMD of other works returnable to them cannot be adjusted against this work. The firm's offer shall be liable for rejection without fresh EMD for this particular work.

1. Terms of Payment:

Payment to the Contractors is regulated as below:

For SITC items

a) 80% of the price shall be paid on the receipt of goods at site by the consignee. For claiming this payment the following documents are to be submitted to the paying authority:

i) invoice or equivalent document

ii) Delivery Challan, Consignee receipt etc as applicable

b) 10%payment shall be released after installation, testing and satisfactory commissioning of equipment

c) The balance 10% payment shall be made after final testing and handing over of the equipments.

For AMC

i) Payments shall be made once in three month subjected to submission of maintenance report signed by concerned in charge.

1(i) INCREASE /DECREASE OF TENDERED QUANTITY

a) BSNL will have the right to increase or decrease up to 50% of the quantity of goods and services specified in the schedule of items without any change in the unit price or other terms and conditions at the time of award of contract.

b) In exceptional and unavoidable cases BSNL can increase the quantity of goods and services beyond 50% of the tendered quantity without any change in tendered and accepted unit price and also other terms and conditions as applicable at the time of award of contract.

1(ii) CURTAILMENT OF QUANTITY:-

BSNL reserves the right to enforce curtailment in the assigned quantum of work for any contractor on the grounds of defaults/delay in regard to execution of the individual work assigned.

2. COMPLETION OF WORK:-

At the time of issuing NIT for a particular work, the time allowed for completion of work consistent with magnitude and urgency of work is specified. The time allowed for carrying out the work as entered in the contract is reckoned from the tenth day after the date on which the orders to commence the work are given to the Contractor. To ensure good progress of the work during the execution, the contractor is bound in all cases in which the time allowed for any work exceeds one month (except special jobs) to complete 1/8th of the whole of the work before 1/8th of the time allowed under the contract has elapsed, 3/8th of the work before half of the time has elapsed and 3/4th of the work before 3/4th of such time has elapsed. However, for special jobs, if a time schedule has been submitted by the Contractor and the same has been accepted by the Engineer-in-charge, the contractor shall comply with such time schedule.

The work shall be deemed to have been completed **(For SITC)** after the fulfilment of the following:

Physical completion of installation of Integrated Building management system along with, Access Control system, CCTV system, Addressable Fire Alarm & Fire Suppression system, Aspiration Smoke Detection system, Water leak Detection system and Rodent Repellent System and successful testing by the contractor in the presence of the Engineer-in-Charge or his authorized representative.

b) Successful completion of the Acceptance Testing as per departmental standards in the presence of departmental officers**.**

3) PF PROVISIONS:-

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.

Agency has to observe all the labour rules & regulation in force. Agency shall be fully responsible for any violation observed at any time.

4) EARNEST MONEY DEPOSIT

The firm should deposit EMD in proper form. The EMD of other works refundable to them cannot be adjusted against this work. The firm's offer shall be liable for rejection without EMD for this particular work. Firm has option to deposit earnest money in the form of Bank guarantee in BSNL' s attached format and manner.

5) PROGRAMME FOR EXECUTION

The firm shall supply detailed programme to Engineer in charge for execution of contract within 15 days of award of work. The programme shall contain the details about submission of drawing, supply of materials etc., The tentative dates for installation, testing, commissioning and A/T shall also be submitted.

6) STORES AND SAFETY

All the stores and materials required for the satisfactory completion of the work shall be arranged at work site by the contractor from his own source. Space for storing the same materials may be provided on request from the contractor. However safe custody of the material in the stores at site will be responsibility of the contractor.

7) CO-ORDINATION AT SITE

At the site of work more than one agency may be working. Full cooperation shall be extended to other agencies during the progress of work. Further work shall be carried out in such a way so that it may not cause abnormal noise and hindrance to the officers of the BSNL engaged in erection as well as to normal routine work.

8). COMPLETION DRAWINGS

Following drawings shall be submitted by the contractor after physical completion of the work but before the proposed date of acceptance testing.

- Three sets of Equipment installation drawing giving complete details of the entire equipment.
- Three sets of Schematic drawings giving detailed sequence or operation and notes to explain the operation or the control circuit.
- One set of technical and service manuals.

9. GUARANTEE & DEFECT LIABILITY

(a) The Guarantee shall be valid for a period of **twenty four months** from the date of commissioning of entire system. However the bidder has to maintain the system for a period of 7 years. The contractor shall guarantee that all equipments shall be free from any defect due to the defective materials and bad workmanship and that equipment shall work satisfactory and that the performance and the efficiencies of the equipments shall be not less than guaranteed values. Any parts found defective during the guarantee period shall be replaced without any charge whatsoever. The services of the contractor's personnel, if requisitioned during this period for such work, shall be made available free of any cost to the department.

(b) The contractor shall depute his representative to the site within **24hrs** of notification of defects by the department.

(c) A joint inspection report will be made by the departmental representative and representative of the firm regarding the nature of defects and remedial action required in time schedule for the rectification/remedial action.

(d) In case the contractor fails to depute his representative within **24hrs** of notification of defect(s) or fails to cause remedial action within a reasonable time as decided in the joint inspection, the Department may proceed to do so at the contractors' risk and expenses without prejudice to any other rights.

(e) The following aspects are, however, not covered under the purview of guarantee:-

i) Consequential losses and damages.

10. CHANGES IN SPECIFICATIONS

The BSNL reserves the right to make changes in respect of specifications of work if in its opinion same is found necessary. However such alterations shall be made after mutual discussions and agreement between the BSNL and the contractor. Any price implications in this regard shall be mutually discussed and agreed up on in terms of clause 12 of EW 8 form. The BSNL as matter of principle will not permit modifications by the contractor in design /specifications of any document /material. However the same can be agreed upon by the BSNL under exceptional circumstances where

a) The same is necessitated due to non-availability of material / components of certain specifications / make.

Or

b) Such alterations constitute an improvement in the opinion of BSNL.

Prior approval is necessary before undertaking any alteration/modification in the specifications of the equipment.

11. Packing, Forwarding, Storage at site.

Before dispatch to the site, the equipment /components/materials shall be properly packed so as to afford protection against transit damages and damage against storage in open areas either at transporters premises or at work site. Special care shall be taken in respect of sensitive items. When storage in open areas is inevitable, proper water proof covering shall be provided to protect damages on account of rain water etc. However damaged items should be replaced as per the directions of the Engineer –in-charge.

12 Inspection Of Site & Contract Documents

For the purpose of inspection of site and relevant documents, the contractor is required to contact E.E.(Elect) concerned who shall give reasonable facilities for inspection of the same. The contractor shall inspect and examine the site and its surroundings and shall satisfy himself commencement of work as to the form and nature of the site, the quantities and nature of work, materials necessary for completion of the works, the means of access to the site, the accommodation he may require and in general shall himself obtain all necessary information as to risks, contingencies and other circumstances which may influence or affect his work. No extra charges consequent on any misunderstanding or otherwise shall be allowed.

13) SUFFICIENCY OF TENDER

The contractor shall be deemed to have satisfied himself before entering into the contract as the correctness and sufficiency of his offer for the work and of the rates and prices quoted in the schedule of works and items/quantities or in bills of quantities for the contract period. These rates and prices shall except as otherwise provided, cover all his obligations under the contract and all matters and things necessary for proper completion of works.

No additional conditions shall be stipulated by the tenderer.

14. TESTING OF IBMS SYSTEM AT SITE: -

a) TRIAL RUN

After the installation is complete physically, the System shall be subjected to trial run. The trial run of all the system in the tender is to be conducted in the presence of representative of the BSNL. During this test performance of all the equipments and systems shall be checked as per NIT specifications. A record of this test shall be submitted to the Engineer-in-Charge who shall arrange for Acceptance Testing thereafter.

b) ACCEPTANCE TESTING.

After completion of trial run the System shall be subjected to acceptance testing as per standards of the BSNL. This testing shall be conducted jointly as per departmental standards in the presence of departmental officers. A list of all defects and discrepancies shall be prepared during the test, which shall be rectified by the agency within a period of 15 days.

15. Rejection of Defective items in the completed work 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. 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 and expenses of the contractor, the whole or any portion of the plant which is defective or fails to fulfill the requirements of the contract.
All equipment shall be tested as per tender specifications. Where test results indicate capacity less than specified in the equipment schedule, the contractor shall pay to the Department pro-rata compensation against each item.

16. Set off clause:

Only those payments due to Government against a particular contract agreement shall be deducted from the bills of the same work and not deductible from other works.

17. Inspection at Contractor's Premises

The Department'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.

18. Training of BSNL/DOT Personnel:

The contractor shall arrange to impart the training to the BSNL/DOT personnel on the following aspects prior to provisional takeover:-

Preventive maintenance.
Operation of individual systems
Fault diagnoses and rectification.
Operator training on IBMS software.
Preventive maintenance.

19. PENALTY CLAUSE:

1. Any accident or damage during maintenance will be the responsibility of the agency & BSNL will not entertain any claim, compensation, penalty etc on this account or on account of non observance of law to his work
2. If the agency fails to rectify any fault within reasonable time, the BSNL reserves the right to carry out any work at the risk and cost of the agency. In case the fault is of emergency nature which may affect the normal functioning of services and the firm fails to take immediate necessary action, the work shall be carried out at the risk and cost of the firm without giving any notice. The decision of EE(E) shall be final.
3. The mechanic/ technician should attend the site immediately and minor faults may be cleared then and there.
4. However, in case of certain non-stocked spare parts not available locally or to be imported or for works beyond the control of the contractor, he can give technical justification and ask for extra time for approval of Engineer in charge who will have power to grant such extra time depending upon the correct technical justification and a reasonability of time scheduling for such extension.

In addition to the various penalty provisions mentioned in the elsewhere in the tender document, the following additional conditions shall also be applied.

Sl No	ACTIVITY	RECOVERY ON EACH DEFAULT	ACTION FOR RESTORATION BY CONTRACTOR/DEPTT.
1	BMS / Access control system / CCTV/ Fire suppression / Aspiration smoke detection system / water leak detection / Rodent repellent system faulty	Rs. 1000/- per day beyond 48 hrs.	Engineer-in-Charge shall rectify the defect at the risk and cost of agency without further notice.

20. CURRENCY OF CONTRACT

1. The currency of contract shall be 86 months.(2+84)(supply , installation and commissioning + AMC)
2. The BSNL reserves the right to terminate the contract by giving show cause notice of one-month duration at any time during the currency of the contract.

ACTUAL PERIODICAL MAINTENANCE CARRIED OUT IN THE MONTH OF _____

Name of work: .....

Agreement No……..

S.no	Service	Activity as per quarterly plan	Date on which actual activity carried out	Result of the activity	Remarks

Certified that we have carried out maintenance properly as per schedule of work and as per terms and condition of the agreement and testing/ drills etc. required during the period has been performed.

Signature of Supervisor Signature of Contractor

Counter signed by:

Contractor EE(E)

CERTIFICATE TO BE SUBMITTED ALONG WITH EACH BILL

1. CERTIFIED THAT WE HAVE CARRIED OUT THE PREVENTIVE MTCE. OF ALL THE SERVICES COVERED IN THE ABOVE CONTRACT SATISFACTORILY AND ALL THE SERVICES HAVE BEEN UNDER SATISFACTORY WORKING CONDITION EXCEPT THE FOLLOWING DUE TO THE REASONS MENTIONED AGAINST THE RESPECTIVE ITEM:

Sl.No	ITEM/SERVICES	REASONS FOR NON OPERATION

2. CERTIFIED THAT THE EQUIPMENTS FOR WHICH THE ENERGY EFFICIENCY PARAMETERS HAVE BEEN PRESCRIBED WERE MAINTAINED WITHIN THE PRESCRIBED BENCHMARK.
3. CERTIFIED THAT REQUIRED INVENTORY HAS BEEN REPLENISHED BY US.
4. CERTIFIED THAT EPF FOR THE EMPLOYEES ARE REMITTED.

SIGNATURE OF CONTRACTOR

JTO (E) SDE (E)

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 — **Executive Engineer (E), ED – III,Chennai**

2(vi) Accepting Authority — **CE (E), BSNL CHTD,Chennai**

CLAUSE 5
Time allowed for execution — 86 months(SITC-2months,AMC-84 months after completion of SITC)

Authority to give fair and reasonable extension of time for completion of work: **S(E), BSNL CHTD,Chennai**

Competent Authority for deciding reduced rates: CE (E), BSNL CHTD,Chennai

Clause 25
Competent authority for conciliation: SE (E) not in-charge of the work.

Contractor EE(E)

BSNL EW-8

Bharat Sanchar Nigam Limited

Electrical Wing

Electrical Division**: ED-III, Chennai.** Sub Division:-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 up to 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 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 therefrom 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.

Contractor EE(E)

Signature of Witness (required in the case of bidder's thumb impression is given by the bidder in place of signature) Occupation of Witness :	(Signature of bidder) (Name & Postal address) Seal of Bidder Date:

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: