The State Trading Corporation of India Ltd.

(A Public Sector Undertaking)

Under the Ministry of Commerce and Industry (Govt. of India.)

Tender /Bid document for

Two-part bidding process for open e-bidding process from competent Bidder/contractors/firms, for the woks of Supply, Installation, Testing, Commissioning of fire sprinkler, Fire detection & Alarm system etc. after dismantling the existing system at Jawahar Vyapar Bhawan,1-Tolstoy Marg, Connaught Place, Delhi.

It is to be noted that bidder shall not disclose any Confidential Information to any third party without STC's prior written consent. All Confidential Information is and shall remain the property of the STC which has supplied it to the Bidder and Bidder shall not use, or permit to be used, any Confidential Information of STC other than in connection with the purpose contemplated by this Tender/EOI/Bid Document. Confidential information shall not be limited to the Tender Documents or any Invitation to offer but covers communications between STC and Bidder/s pertaining to the period starting from bidding process and up to selection of the successful bidder or the period as decided by STC at its sole discretion.

Contact person for any clarification

Rajesh (Manager-Elect.) /R K Avasthi (DGM-Electrical)
The State Trading Corporation of India Ltd.
1-Tolstoy Marg, Jawahar Vyapar Bhawan,
Connaught Place, New Delhi-01
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Bid Reference : - STC/CO/BLD-E/01124/2019/Dated 31/10/19

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The State Trading Corporation of India Ltd.

(A Public Sector Undertaking)

NOTICE INVITING BID

Bid Ref: -STC/CO/BLD-E/01124/2019/Dated 31/10/19

1. Bids are invited in two part bidding process online (e-bidding process) via open bid process from competent Bidder/contractors, for the woks of Supply, Installation, Testing , Commissioning of fire sprinkler , Fire detection & Alarm system etc. after dismantling the existing system at Jawahar Vyapar Bhawan,1-Tolstoy Marg, Connaught Place, Delhi.The bids have to be submitted on-line only.

Sr. No.	Particular	Details
1	Bid issue and filling site	www.eprocure.gov.in/eprocure/app
2.	Bid document fee	Rs. 5000.00 (including GST)
3.	Bid floating date	31/10/19
4.	Last Date of issue of bid document (online)	21/11/19
5.	Last Date and time of submission of scanned bid documents with all necessary documents on the e bid portal	22/11/19, 11:00 AM
6.	Date and time of opening of bid (Technical Bid-Part-1)	22/11/19, 11:30 AM
7	Venue of opening	www.eprocure.gov.in/eprocure/app
8	Date and time of opening of Price Bid of bid (Part-II)	Shall be intimated later to the successful bidders in technical bid.
9.	Amount of earnest money to be deposited (EMD)	Rs 11,00,000=00
10.	Submission of EMD and non-refundable bidding fee.	The EMD & tender fee (if applicable) have to be deposited online prior to closing time of bid, as per below. The details of the same have to uploaded with tender

		document. 1. Name of Bank:- IndusInd Bank, Barakhamba Road, New Delhi-110001 2. Name of beneficiary:- The State Trading Corporation of India Ltd., New Delhi-110001 3. Account No.:-200000550077 4. IFSC:- INDB0000005

Note :-

1. Any Deviation from bid conditions shall result into technical disqualification.

2. If any of the dates mentioned above happens to be a Holiday in STC, the next working day shall be considered as mentioned date.

Instruction for filling the e-bid

1 Bids are invited via open bid process for the woks of Supply, Installation, Testing, Commissioning of fire sprinkler, Fire detection & Alarm system etc. after dismantling the existing system at Jawahar Vyapar Bhawan,1-Tolstoy Marg, Connaught Place , Delhi. The bids have to be uploaded on line.

2. Bids have to be uploaded on line only via www.eprocure.gov.in/eprocure/app (the e-procurement portal of NIC (eprocure.gov.in/eprocure/app). No bids shall be accepted in hard copy or any other form.

3. For submission of e bids, bidders are required to get them registered with NIC's central Public Procurement (CPP) portal (http//eprocure.gov.in/eprocure) using class-II/Class –III digital signature certificate. All the details mentioned during registration / enrolment process should be correct and true. Bidders have to abide by all the terms and conditions mentioned during registration process.

4. The details of financial instrument (Tender fee, EMD) need to be uploaded during the e-bid submission and it should tally with the amount received as required, otherwise, the bid may be rejected.

5. The bidders are required to upload soft copies of all relevant documents.

6. Bidders are advised in their own interest to upload the on line bids well before the bid document submission end date and time (as per server system clock of CPP). STC shall not be responsible for any delay or the difficulties encountered during submission of bids at the eleventh hour due to any technical or other problems.

7. For any queries relating to the process of online bid submission or queries relating to Procurement Portal (eprocure.gov.in), the bidders may contact CPP Portal Helpdesk on Tel No's.: 1800-3070-2232, 91-7878007972, 91-7878007973, 91-7574889871 and 91-7574889874.

8. Bidders may regularly visit STC website for any information / clarification / addendum / corrigendum etc. related to this bid, processing of bids received, award of job, pre bid meet decisions etc. STC shall not be liable to send any individual information or publish a public notice for any further information regarding this bid in newspapers.

9. Portal for Online Submission www.eprocure.gov.in/eprocure/app

10. Scanned copy of all the documents as required for bid submission have to be uploaded online only. Physical submission of any documents is not be required for bid submission.

11. A bidder may modify, substitute or withdraw its e-bid after submission before the last date and time of bid submission. No bids shall be modified, substituted or withdrawn by the bidder on or after the last date and time of bid submission. For modification of e-bids, bidder has to detach its old proposal from e-biding portal and upload/resubmit digitally signed modified bid.

12. STC may ask the bidders to submit any or all the documents in original as part of their online bid anytime during the bid process.

13. If there is a discrepancy between words and figures, the amount in words shall prevail. However, where the amount expressed in words does not represent arithmetically correct total, the amount in figures shall prevail.

14. It shall be the bidder's responsibility to ensure that adequate documentary proof is provided in the bid for each of the technical evaluation criteria. Bidder has to satisfy STC for ensuring sufficiency of documents necessary for tender evaluation at his cost if so desired by STC.

15. The bid document available on e- procurement portal shall be taken as final. In exceptional circumstances, STC reserves the right to ask for more /New document as "Clarification/supporting" only for proper technical evaluation of the bids or for verification of the uploaded documents, without compromising on transparency and equality of the bidding process. Decision of Engineer in charge will be final and binding in this regard.

Definitions

1. “Application” shall mean the request submitted by interested parties for obtaining the bid document against the tender notice inviting bid.

2. ‘Bid document or the tender document shall mean the documents (including notice inviting tender-NIT) issued by STC in respect to the bidding to the prospective bidder andthe corresponding document submitted by the bidder under his application /“Bid”.

3. Security/Earnest Money/EMD” shall mean the amount to be deposited by the Bidder with the Bid.

4. “Bid Validity” shall mean the period for which the Bids shall remain valid.

5. “Bidder” shall mean the party participating in the Bidding process pursuant to and in accordance with the terms of this document.

6. “Contract” shall mean the agreement to be signed between the successful bidder and the nominee of the competent authority on behalf of STC.

7. “Contract Price” shall mean the financial bid of the successful bidder as accepted by the STC.

8. “Date of commencement of work” shall mean the date of start as communicated byLetter of work order.

9. “Defects Liability Period/Maintenance Period” means the period after completion of the contract during which the STC or its authorized representative/Engineer-in-charge will notify to the Contractor any defect noticed in the work and the contractor is liable for, replacing or repair the same as provided under the Terms of the Contract/ Document. Proof of dispatch of letter notifying the defect/intimating the representative of Contractor at site on the last date of Defect Liability period will make the contractor liable for rectifying all such defects.

10. “Tender Evaluation Committee” shall mean the committee constituted by STC for the evaluation of the bids.

11. “Letter of Award/Notification of Award” shall mean the letter issued by the STC to the successful bidder inviting him to sign the agreement.

12. ‘STC’ shall mean The State Trading Corporation of India Limited having its registered office at Jawahar Vyapar Bhawan,1-Tolstoy Marg Connaught Place,Delhi.

14 “The Contractor” shall mean the sole proprietor, or firm or company, undertaking the works and shall include the legal representative or such successors, heirs,

administrators or official pen assignees of such sole proprietor, partnership or company, as the case may be

15. Engineer-in-charge shall mean the officer designated by STC who shall supervise and who shall be in charge of the work, and issue necessary instructions at the site, on behalf of STC.

16. "Performance Bank Guarantee" shall mean the security amount to be paid by the successful bidder as per relevant clause mentioned in the bid document. provided by the contractor for performance of the contract during execution of the work.

17. "Work" means Supply, Installation, Testing, Commissioning of fire sprinkler, Fire detection & Alarm system etc. after dismantling the existing system at Jawahar Vyapar Bhawan,1-Tolstoy Marg, Connaught Place, Delhi.

18. "Site: shall mean the place where the works under the Contract are to be carried out and the details of which are provided in this document.

19. "Successful Bidder" shall mean the bidder who has been declared technically qualified and whose bid has been accepted by competent authority of STC. The successful bidder has to sign the agreement.

20. "Scheduled Banks" mean Scheduled Commercial Banks of Govt. of India.

21 Order placing authority means: - The officer who is issuing or Placing detailed work order to the contractor.

22. GST:-Any tax imposed under the Goods and service Tax.

23. Bill of quantities (B.O.Q.) : - Shall mean the Part of the bid document, wherein Price of the work has to be quoted by the bidder online , to be treated same as Price bid or Financial Bid

24. SITC- Supply, installation, Testing and Commissioning

25. Owner/Client :- Shall mean " The state Trading Corporation of India Limited,

Tender Evaluation Criteria (TEC).

Name of Work: -Supply, Installation, Testing, Commissioning of fire sprinkler , Fire detection & Alarm system etc. after dismantling the existing system at Jawahar Vyapar Bhawan,1-Tolstoy Marg, Connaught Place , Delhi.

Only those Bidders will qualify in techno commercial Evaluation/ Technical Evaluation (Part-1), who possess the following minimum pre-qualifying requirements. The prospective bidders have to upload self-attested documents in PDF format in support of their qualification.

1. Experience of having successfully completed similar works during last 7 years ending last date of the month previous to the one in which bids are invited should be either of the following

Three similar completed works costing not less than the amount equal to Rs. 220 Lakhs

"Or"

Two similar completed works costing not less than the amount equal to Rs. 275 Lakhs

"Or "

One similar completed works costing not less than the amount equal to Rs 440 Lakhs.

The value of firefighting works will have to be separated out from the complex work order having different nature of items/works.

Similar works means "having experience of the following Fire fighting related works (1.(a)&1(b) below, both) in any Public Sector Undertaking (PSU/ Government./ Semi Government./ State Public sector undertaking / Government Autonomous bodies

1. Fire fighting works: -
   (a) Fire Sprinkler System & Fire Detection & Alarm system consisting of MS piping for fire fighting works, Smoke management system dedicated fire fighting pumps, hydrant system, cabling and allied works,
   (b) Fire department should have issued No Objection Certificate (N.O.C.)/Fire safety certificate for the works executed submitted as experience certificate above.

2. The bidder must have working experience (a) on Electrical panels (breakers/Transformers/switchgear) on 11 KV voltage level (b) installation of Earthing /Lightening arrestor.

Work experience of Electrical (of any value) and Fire fighting works (minimum value asked as above) may be from different work order(s)

The bidder may be asked for detailed contract document/work order(s) for the verification of the above during tender evaluation process.

3. A certificate of satisfactory completion by the order placing authority or higher authority shall only be considered against the works submitted for experience purpose at Sr. No. 1(a),1(b),2

4. The bidder should be financially capable for execution of the work as per NIT specifications.

For this purpose, Average annual turnover during last three financial years (FY 2018-19, 2017-18, 2016-17), should be at least Rs 165 Lakhs. For the verification purpose, financial statement i:e Profit & Loss account (P & L) sheet and Balance sheets for above Years must be uploaded . These financial statements must be properly authenticated by Chartered accountant.

5. Bidder must upload the following with the technical bid.

(a) Copy of GST Registration

(b) Copy of PF registration

(c) Copy of PAN card

(d) Certificate of Non-Blacklisting /debarring from PSU/Govt. / MNC as per bid document (Proforma-3)

(e) ESI Registration

(f) Electrical License from statutory authority

(g) Proof of depositing EMD, Tender fee online (before the closing time of the bid) or Registration with MSME/NSIC for availing preferential purchase policy 2012. (For availing exemption from EMD and bid fee).

(h) In case the signatory is other than the contractor Certified true copy of the Power of attorney should be uploaded as a token of authorized signatory. In case of a company, board resolution must be uploaded for the same.

(i) Bidder must upload Performa – 1,2,3 of tender document, signed and stamped and scanned as a token of Un-conditional acceptance of complete Bid Conditions

Note:-

1. The technical evaluation of the bids shall be done on the basis of above criteria. Further the bidder should also follow other terms of the tender documents.

2 .STC reserve the right to verify the certificate(s) submitted by the contractor directly from the issuing authority/authorities/clients or any other Bidder/contractor/party as deemed fit. Bidder should be in a position to produce the original certificate, if required. The bidder will be liable for verification of the documents, if fails, STC reserve the right the reject the bid at any stage.

3. The contractor will have to submit complete details as per KYC format (Know Your Customer) after award of work, without fail. The same is not required at the time of bidding

4. The contractor will submit Labour Licence at the start of the work for the site as per the law

PROFORMA – I

Letter for submission of bid

(To be up loaded online after filling, signed, stamped and scanned)

From: ----------

To

The Deputy General Manager (Elect.)

General Administration Division-Building Cell

The STC of India Ltd.

Jawahar Vyapar Bhawan

1,Tolstoy Marg, New delhi-110001.

Sir,

1. I/We have examined the conditions as incorporated in the Bid documents for the Execution of work and having visited and examined the site of said work, I/we the undersigned, offer to execute the said works in conformity with the conditions of bid.

2. Should this bid be accepted I/We undertake to commence the work within seven (7) days of issue of the Letter of award for the said work and further undertake to perform whole of the work comprised in the contract for a period of 12 months within the period specified under bid documents/contract. If I do not commence the work at site within 07 days from the date of award of work, STC may take punitive action against me as deemed fit including debarring/ Holidaying / Blacklisting, for 2 years and/or Forfeiture of EMD.

3. I/We agree to abide by this bid for a period of 60 days from the date of opening of Bid or such extended period as may be mutually agreed as prescribed in Instruction to Bidders and shall remain binding upon us.

4. I/We agree to inform you that whenever there is a change in my permanent, correspondence address for communication including electronic mail, I/we will inform STC immediately. I/We also agree that communication through electronic mail as mentioned in my bidding KYC form will be as good as by registered/ speed post

5. I/We agree that unless and until an agreement is prepared and executed, this bid and conditions of the tender document together with STC’s written acceptance thereof shall constitute a binding contract between us.

6. I/We understand that STC is not bound to accept the lowest bid and that STC reserve the right to accept or reject any bid, and/or to annul the bidding process and reject all bids, at any time prior to award of work, without thereby incurring any liability from the affected bidder or bidders nor shall STC have any obligations to inform the affected bidders of the grounds for STC's action.

7. Name of the One representative of the Bidder/contractor at site

(a)----------Sign ……..

(b)---------- Sign ……..

Yours Faithfully,

Signature of the Bidder (who will sign the agreement with STC)

Permanent address ----------

…….

Local address :----------

……

Email address …….

Note : The contractor is to fill up the blanks in above form before signing & submitting the bid.

This application is made with full understanding that bids submitted by bidders will be subject to verification of all information furnished for bid evaluation during the bidding process.

Signature of Authorized representative of the bidder.

PROFORMA – 2

Letter for Un-Conditional acceptance of Bid Document

(To be up loaded online after filling, signed, stamped and scanned)

The Deputy General Manager (Elect.)
General Administration Division
The State Trading Corporation of India Ltd.
Jawahar Vyapar Bhawan,
Tolstoy Marg,
New Delhi-110001.

Subject: Unconditional acceptance of Bid Conditions

Dear Sir,

1. I/We have read and examined and understood all the conditions in the bid documents for the subject work and we hereby unconditionally accept the bid conditions entirely for the said work.
2. I/we undertake to execute the above items strictly in accordance with the requirements and particulars /Specifications stipulated in the bid documents.
3. I/we hereby further undertake that during the said period: -
   (a) I/we shall not vary/alter or revoke my /our bid during the validity period of Bid after bid submission.
   (b) I/we have quoted for the complete scope of the said work
4. I/we undertake to abide by the terms and conditions as stipulated in STC bid documents and as amended thereafter before award of work.
5. I/We have not enclosed any condition/deviation to conditions of Bid documents in the envelope containing Price Bid.
6. I/we agree that in an event of conditional bid, the bid is liable to be rejected without assigning any reason whatsoever and the Earnest Money deposit is liable to be forfeited.
7. This undertaking is in consideration of STC to open my bid and considering and evaluating the same for the purpose of award of work in terms of provision of bid documents.

Name ----------

Designation----------

PROFORMA – 3

(To be up loaded online after filling, signed, stamped and scanned)

Past Contractual performance/declaration by the bidder

This is to certify that We, M/s. _____ in submission of this offer confirm that

1. We have not made any misleading or false representation in the forms, statements and attachments in proof of the bid evaluation criteria.
2. We do not have records of poor performance such as abandoning the work, not properly completing the contract, fail to comply statutory compliances related to any contract, debarring/holidaying due to inordinate delays in completion, litigation history with STC or financial failures etc.
3. Our business has never been banned/ Blacklisted/debarred/holidaying by any Central/State Govt. department/Public Sector Undertakings or Enterprises of Central /State Govt during last 3 years proceeding from the last date of bid submission.
4. We have submitted all the supporting documents and furnished the relevant details as per the prescribed format.
5. The information and documents submitted with the bid by us are correct and we are fully responsible for the correctness of the information and documents submitted by us.
6. We have not submitted any fraudulent document/information either in present or past bids due to which, STC can invokes its right to disqualify us/me or take any action as deemed fit such as forfeiture of EMD/ debarring of business for 2 years.
7. There has been no judgement/award by tribunals/orders if any against us/me pertaining to cheque bounce/dishonour/damage or commercial disputes.

Signature of Authorized representative of the bid

Bidder’s stamp

AGREEMENT

(To be executed on the stamp paper as per Delhi Stamp act)

This agreement is made on the _____ day of _____, Two thousand ……

Between

The State Trading Corporation of India Ltd., the Company incorporated under Companies Act, 1956, having its registered office at Jawahar Vyapar Bhawan, Tolstoy Marg, New Delhi – 110001 (hereinafter referred to as the **"STC",** which expression shall unless it be repugnant to the context be deemed to mean and include its successors and assigns)

on the one part

and

M/s _____ a company registered under the companies act 1956/2013 or a partnership registered under the Indian Partnership Act 1932 or Sole proprietorship registered under the licence no./certificate no. _____(hereinafter referred to as the **"Contractor",** which expression shall unless be repugnant to the context be deemed to mean and include its successors and assigns) where asthe STC having its registered office at Jawahar Vyapar Bhawan, Tolstoy Marg, New Delhi – 110001 on the other partwherever mentioned as per terms of the bid document and annexure(s) including general conditions and where STC desires certain works to be executed by the contractor viz. "

_____

" in considerations of *the amount of Rs.* _____ *(Rupees* _____ in words) and subject to such terms and conditions as set out in the bid documents (Bid No. _____ dated _____) which shall form part of the contract.

And where in consideration of the payments to be made by the STC as per terms of the bid document and annexure(s) including general conditions, the contractor hereby agrees with the STC in furtherance of the bid document and annexure(s) including general conditions, to perform the work of Supply, Installation, Testing, Commissioning of fire sprinkler , Fire detection & Alarm system etc. after dismantling the existing system at Jawahar Vyapar Bhawan,1-Tolstoy Marg, Connaught Place, Delhi, in conformity with the provisions of this agreement.

And where the STC per terms of the bid document and annexure(s) including general conditions, agrees to pay the contractor in consideration of the performance of the work

of Supply, Installation, Testing , Commissioning of fire sprinkler , Fire detection & Alarm system etc. after dismantling the existing system at Jawahar Vyapar Bhawan,1-Tolstoy Marg, Connaught Place , Delhi. Such amounts as may become payable under the provisions of the agreement at the times and in manner prescribed by the agreement.

NOW IT IS HEREBY AGREED BY AND BETWEEN THE PARTIES HERETO AS FOLLOWS

That the terms and conditions in the bid documents(Annexure-A) and award letter (Annexure-B) No. _____ dated _____ shall form integral part of the agreement and all the terms and conditions of Bid Documents/ Award letter shall be deemed to be the terms and conditions of this agreement.

For the sake of brevity the same are not reproduced herein and are placed as annexure-A and Annexure – B of this agreement and shall be binding on both the parties.

This agreement shall be binding upon and inure to the benefits of the parties and their respective successors and permitted assigns.

ACCEPTED AND AGREED as of the first date above written by the following authorized party / representatives.

.Signature of the Contractor	Signature of the representative of STC
Name:	Name
Designation	Designation

In the presence of

Signature	Signature
Name:	Name:
Designation	Designation

General Conditions of Contract

Section "A"

INSTRUCTION TO BIDDERS:-

DEFINITION: - The term 'Corporation or STC or STC of India Ltd. wherever appearing in this specification would mean The State Trading Corporation of India Limited and shall include the nominated person authorized to place an order under prescribed specification.

1.0 PREPARTION OF BID:-

1.01 Before submission of the bid, the Bidders are requested to have themselves fully conversant with the Tender Evaluation Criteria "specification, nature of work, the site conditions and general conditions of contract etc., so that, no ambiguity arises at a later date in this respect. They may visit the site for seeing the actual working conditions and the nature of work.

1.02.Only such persons/firms/company need to submit bids which meets the Tender evaluation criteria as laid down in the bid documents and which can submit satisfactory evidence in that regard.

1.03 The Corporation reserves the right to revise, amend or cancel the bid documents prior to the date notified for closing to the bids & also the right to postpone the date for presentation and opening of bid without assigning any reason.

1.04 The terminated/debarred/ Black listed bidders from any Govt./Semi Govt./ PSUs/. are not allowed to participate in the bid (as per Performa 3).

1.05 If the Bidder deliberately furnishes wrong information in his bid, the bid would be liable to be rejected out rightly at any stage and the security deposit and/or EMD shall be forfeited and/or may be debarred for business for 2 years.

1.06 Bid document are not transferable. JV (Joint Ventures) firms/companies are not allowed to participate in the bid. Not more than one bid for the work shall be submitted by one contractor.

1.07 The Corporation shall not be liable for expenses incurred by the Bidder in the preparation of the bid whether the bid is accepted or not.

1.08. Bids containing any alterations/cuttings/marks of eraser etc even if accompanied by signature shall be liable to be rejected on such grounds.

1.09 Successful L-1 (First Lowest) bidder shall be decided on the basis of price quoted in the price bids section.

1.10 Bids submitted by courier/post / manual submission shall be rejected. Only electronic submission (online) is accepted.

1.11 Part Bid submissions shall be rejected. .

1.12 The bid is to be furnished in two parts i.e. PART-I (Techno-commercial bid) & PART-II (Price Bid); All the bid document digitally signed accompanied by documents in support of tender evaluation criteria / bid enquiry , scanned copy of financial instrument (for EMD and bid fee) should be uploaded to the http://eprocure.gov.in/eprocure/app . Price bid section (Part II) has also to be filled on e-mode only in separate folder (online). No other document has to be attached with Price bid. .

1.13 The Part-I i.e. Techno-commercial Bid (also called Technical Bid) will be opened on the scheduled date and time online.

1.14 The bidder who's Part-I (Techno- Commercial bid) bids have been found acceptable, shall be intimated via e-procurement portal for opening of price bid opening.

1.15 Intimation regarding date, time of opening of price bid shall be intimated online to the technically qualified bidders. .

1.16 STC reserves the right to accept or reject any bid, and/or to annul the bidding process and reject all bids, at any time prior to award the work without thereby incurring any liability from the affected bidder or bidders nor shall STC have any obligations to inform the affected bidder or bidders of the grounds for STC's action.

1.17 STC reserves the right to nominate or replace the Engineering in charge during the currency of contract period or during the bid process.

1.18 The Contractor shall fill in the rates tendered in figures as well as words. The amount of each item should be worked out and the requisite total given. The bidders who do not fulfil these requirements, their tender is liable to be summarily rejected.

1.19 No alteration is to be made by the bidder in Notice inviting tender, instructions to the Contractors, in the contract form, in the conditions of contract, in the drawings, in specifications or in quantities, and if any such alterations are made or any special conditions are attached, the tender is liable to be rejected.

2.0 Earnest Money Cost of bid document:-

2.01 Before submitting the bid, the Bidder will have to deposit EMD, Tender document fee, online prior to closing time of bid, as per below details. The details of the same have to uploaded with tender document.

1. Name of Bank :- IndusInd Bank, Barakhamba Road, New Delhi-110001
2. Name of beneficiary: - The State Trading Corporation of India Ltd., New Delhi-110001.
3. Account No. :-200000550077
4. IFSC:- INDB0000005

2.02 Any bid not accompanied with EMD or cost of bid document is liable to be rejected. unless they are exempted under any notification / rule. Those bidders exempted for depositing EMD/ tender fee have to upload scanned copy of relevant certification of the same.

2.03 In case of unsuccessful bidders the earnest money will be refundable on application after award of work to the successful bidder. Bid document fee is non-refundable.

2.04 Request for adjustment/appropriation of earnest money/deposits if any already lying with the Corporation in connection with some other bid/orders/works shall not be entertained.

2.05 No interest shall be payable on earnest money deposits.

2.06 Exemption from Deposition of EMD, Cost of bid :-

(a) Participation in the bid process without cost of bid document and/EMD shall be permitted only for those Bidder/contractors who are exempted /notified via any statutory/ Govt. body. Those bidders should deposit the concerned notice /document/Certificate showing exemption, along with the bid submission. Purchase and Price Preferential policy 2012, as declared by the Central Govt. regarding MSEs (Micro and small Enterprises) /MSMEs / NSIC shall be followed for exempting bidders for EMD, Tender fee.

(b) It is also to be noted that STC reserve the right to intimate respective Govt. body for suitable penal action against those MSME/NSIC/MSE registered bidder(s), who have availed exemption from deposition of EMD /Bid document fee under policy as above, if found guilty of breach of such tender terms which calls forfeiture of EMD/PBG/Security deposit of the bidder/Contractor in addition to necessary action including Blacklisting, debarring from business etc from STC.

2.07 The bidder shall treat the details of specification and other bid documents as private and confidential and they shall not be reproduced anywhere without the written authorization of the Corporation

3.0 RECEIPT OF BIDS:-

The bids should be filled on line as detailed above. No other form of bid/document submission shall be accepted.

4.0 DEVIATIONS:-

Bids containing deviations from the specifications and general condition of Notice for invitation/contract shall be liable to be rejected.

5.0 VALIDITY OF BID:-

The bid shall remain valid for 60 days which will reckon from the date of opening of technical bid. Bids once opened cannot be withdrawn by the bidder at any stage..Bidders mentioning a shorter validity period than specified are liable to be rejected. In case validity period is not stated it will be presumed that the bid is valid for 60 days without obtaining any confirmation from the bidder.

6.0 CANVASSING: - No Bidder shall canvas any official/Officer with respect to his or other bid. Contravention of the condition will result in rejection of the bid.

7.0:- INSPECTION OF SITE

Any site information given in this document is for guidance only. The Bidder is advised to visit and examine the Site of works and its surroundings at his/their cost at his/their own responsibility. Bidder is advised to obtain relevant information that may be considered necessary for preparing /participating in the Bid enquiry and entering into a Contract with STC, including availability of electricity, water and drainage or any other parameter which may be an integral part for the successful completion of the work. The contractor is free to raise any clarification /doubts regarding scope of work/ scope of supply etc prior to last date of seeking clarification “as per tender terms”. STC shall not be liable for any costs for such activities performed by bidder

8.0 ENTRIES

All the entries in the tender documents must be in English. Any tender in whom there is over writing or marks of erasure is liable to be rejected. Tender containing any alterations/cuttings/marks of erasers etc. even if accompanied by signatures shall be liable to be rejected on such grounds. Price Bid to be filled up in figure and words for rate and amount of each item.

9.0 Price Bid /Bill of quantities(B.O.Q.) /Financial Bid

Before quoting in the Price bid section, it will be assumed that that the contractor has understood all the terms and condition of the contract and site conditions without any ambiguity. The contractor will be solely responsible for the quoted rates. The decision of L-1(First Lowest Bidder) will be the criteria for the award of the work after price bid opening. However, flowing should be taken in to consideration before quoting the Price bid.

1. GST Goods and service tax will be paid extra as per terms
2. No other format of price submission shall be accepted.
3.The bidder is required to quote for the complete work, though STC reserve the right to award the work in full of in part.
4. Bidder quoting for only one part of the tender shall not be considered.
5. The offer shall be valid for 60 days from the date of tender opening.
6. Leaving an unfilled entry in the price bid against any term shall mean as Zero cost and the bid shall be evaluated accordingly. It is assumed that the contractor has already taken the cost of this item in any other item, without any changes in the scope of work.
7. Cost of dismantled material shall be treated as “Sale of scrap” by STC. Tax liability shall be borne by the contractor accordingly.

GENERAL CONDITIONS OF CONTRACT

SECTION – B

The bidder shall be deemed to have carefully examined & made himself fully conversant with the general conditions, specifications, schedules, scope of work and site conditions etc. before submitting the bid. If he has any doubt as to the meaning of any portion of the general and special conditions of bid specifications or about any point regarding site conditions, he may seek necessary clarification before submitting his offer/bid from the State Trading Corporation of India Limited.

1.0 ACCEPTANCE OF BID: -

STC is not bound to accept the lowest bid or any other bid and may accept or reject any bid, and/or annul the bidding process and reject all bids, at any time prior to award of work, without thereby incurring any liability from the affected bidders nor shall STC have any obligation to inform the affected bidder/ bidder of the grounds for STC's action.

2.0 CONTRACT DOCUMENT

The order placed under specifications given under the Bid document shall be governed by terms and conditions as incorporated in thebid document specifications and as given in the 'Work order' and it's Annexure (s). The terms and conditions specified under contract agreement if differ from the terms as indicated in the work order and its Annexure(s), the later shall prevail. For the due fulfilment of the performance of the award of the work, the contractor shall execute an agreement in duplicate in the prescribed format (attached in the bid document) on non-judicial stamp paper worth Rs. 100/- (Purchased on the name of "The State Trading Corporation of India Limited" by the contractor). Such agreement shall be executed & signed by the Contractor/authorized representative of the contractor on each page thereof. The original copy is to be executed on the non-judicial stamp paper. The remaining copy may be executed on simple paper. Such complete agreement along with the bid document shall be required to be submitted to the STC within a period of 15 days from the dispatch date on the detailed work order from STC. No payment to the contractor shall be released by STC without execution of the agreement. One copy of the accepted agreement duly signed by STC representative officer shall be given to the contactor for his reference.

The documents to be submitted along with the agreement shall include the followings: -

(i) Detailed work order and its annexure(s).

(iii) Tender document and Notice inviting tender

All the charges in respect of execution of the agreement shall be borne by the contractor.

3.0 CORRESPONDENCE: -

All correspondence pertaining to the work order in respect of any clarification required on the terms and conditions, contract, scope of work etc, should be addressed to the Deputy General Manager-Electrical, STC of India Ltd. New Delhi.

4.0 CHANGE OF NAME OF BIDDER / CONTRACTOR: -

4.01 At any stage after biding, the order placing authority shall deal with bidder / contractor only in the name and at the address under which he has submitted the bid. All the liabilities / responsibilities for due execution of the contract shall be that of the contractor. Under no circumstances he shall be relieved of any obligations under the contract. STC may however, at its discretion deal with the agent / representatives / sister concern and such dealing shall not relieve the contractor from his responsibilities / obligations / liabilities to the STC of India Ltd. under the contract. Any change/ alteration of name / constitution / organization of the contractor shall be duly notified to the order placing authority. Order placing authority reserves the right to terminate the contract in case of such notification. In the event of such termination, the STC of India Ltd. may get the portion of work or whole piece of work, not executed by the contractor or done in violation of the contract; get it executed from elsewhere at the risk and cost of the contractor. In such condition, security deposit of the contractor will be forfeited.

5.0 SUB-Contracting: -

No sub-contracting by the contractor shall be accepted. Any sub-contracting shall be treated as a breach of contract and conditions of this agreement, and the security deposit, if any, shall be forfeited.

6.0 INTERPRETAION OF CONTRACT: -

The contract shall in all respect be deemed to be and shall be construed and interpreted in accordance with the laws on India.

7.0 ACCEPTANCE OF THE ORDER: -

The bidder whose tender is accepted will acknowledge the consent of the order within a week's time from the date of receipt of such a written order, intimate to the Engineer-in-charge of his acknowledgement. Bidder's failure to furnish such acceptance within the stipulated time shall give right to the Engineer-in-charge to revoke the acceptance of tender without any further notice to bidder.

8.0 SECURITY DEPOSIT: -

8.01 The successful bidder shall have to deposit a security amount @ 5% of the contract value for one-year contract period which should be deposited online as detailed in the document, in account of The State Trading Corporation of India Ltd., New Delhi within 15(Fifteen) days after award of work. Amount of Ernest Money Deposited (EMD) shall not be adjusted in this Security deposit amount and will be returned on request of the bidder. In case of non-deposition of security deposit as mentioned, STC reserve the right to cancel the bid and EMD deposited will be forfeited, further such contractor will be debarred for business for 2 yrs. STC reserve the right to recover the cost of publication of advertisement from such debarred bidders from any other deposits of the bidder. Further in case of those bidders who have availed EMD, Tender fee exemption under MSME preferential purchase policy 2012,STC reserve the right to pursue suitable statutory body for taking necessary action including Blacklisting , debarring from business etc against such defaulters bidder as deemed fit.,

8.2 Unless otherwise specifically required to be retained / forfeited by STC of India Ltd. in part or full, the security deposit shall be refundable on the request of the contractor after one year of completion of the entire contract to the satisfaction of the STC of India Ltd. and on submission of annual return of EPF, ESI, Other statutory dues, and annual contribution slips of individual workers engaged during the term of contract. STC reserve the right to get cross check the validity of deposit of statutory dues with respective statutory body(s) at contractor's cost.

8.3 If the contractor fails and neglects to observe or perform any of the obligation/ conditions under the contract it will be lawful for the STC of India Ltd. to forfeit either in whole or in part, at its absolute discretion, the security deposit and/or other deposits or securities, furnished by the contractor.

8.4 No interest shall be payable on such deposit.

8.5 Adjustments: -

All compensation or other sum of money payable to the Contractor under the terms of the contract may be deducted from or adjusted against his security deposit Or against any sum which may be due or become due to the Contractor by STC on any account whatsoever.

9.0 FORCE MAJEURE CONDITIONS: -

For the purpose of this Contract, "Force Majeure" means an event which is beyond the reasonable control of STC or the Contractor, is not reasonably foreseeable, is unavoidable and is not brought about by or at the instance of the party claiming to be affected by such events and which caused the non-performance or delay in performance, and which makes a party's performance of its obligations hereunder impossible or so impractical as reasonably to be considered impossible in the circumstances and includes, but is not limited to, war, riots, civil disorder, earthquake, fire, explosion, storm, flood or other extreme adverse weather conditions, strikes, lockouts or other industrial action (except where such strikes, lockouts or other industrial action are within the power of the party invoking Force Majeure to prevent), confiscation or any other action by Government agencies.

The party which is unable to fulfil its obligations under the present contract must within 24 hours from the day of occurrence of any of the causes mentioned in this clause shall inform the other party of the existence of the circumstances referred to above, which are responsible for causing delays in performance of the contract.

The party affected by an event of Force Majeure shall continue to perform its obligations under the Contract as far as is reasonably practical, and shall take all reasonable measures to minimise the consequences of any event of Force Majeure.

The failure of either party to fulfil any of its obligations under this contract shall not be considered to be a breach of, or default under, the Contract insofar as such inability arises from an event of Force Majeure, provided that the party affected by such an event has taken all reasonable precautions, due care and reasonable alternative measures, all with the objectives of carrying out the terms and conditions of the Contract.

Notwithstanding the above in case of Strike /Labour dispute that prolongs beyond a period of 48 hours, the Contractor is required to inform STC about the same, on

account of which STC reserves the right to get the work done from any other agency at the risk and cost of the Contractor.

10.0 LIABILITY OF THE CONTRACTOR: -

The contractor is required to carry out the works as per direction of Engineer in charge and contractual terms, conditions. The Engineer-in-charge or his representative will check the work claimed in the bill raised before any recommendation for releasing payment to the Contractor. STC reserve the right to deduct any amount suitable as deemed fit for uncompleted works.

11.0 WAGES: -

Contractor shall ensure and will be solely responsible for payment of wages and other dues latest by 7th of the following month to the personnel deployed by him as per statutory provisions and shall fully comply with the rules laid under payment of wages act and enforced from time to time, irrespective of the payment released from STC. The contractor shall keep and up to date account of deployment of labour and payment of their wages etc, which will be produced for inspection to the Engineer-in-charge/representative as and when desired by him.

The Contractor will pay Overtime to the workers as per prevailing rules and no extra payment shall be made to the contractor on this account.

The STC of India Ltd. shall not be responsible in any manner for any Act or Omission of the workers engaged by the contactor and the contractor shall indemnify STC in this regard. No claim in this regard shall be entertained by STC of India Ltd. In case the contractor fails to make payment of wages within the prescribed period or makes short payment, then the STC will make payment of wages in full or the unpaid balance due, as the case may be, to the contract labour employed by the contractor and recover the amount so paid from the contractor either by deduction from any amount payable to the contractor under contract or as a debt payable by the contractor.

12.0 COMPLIANCE OF LABOUR LAWS

The contractor shall abide by the Contract Labour, (Regulation and Abolition) Act, 1970, and Contract Labour (Abolition and Regulation) Central Rules 1971. The Contractor shall comply with the provisions of Payment of Wages Act, 1936, Minimum Wages Act, 1948, Employees Liability Act, 1938, Workmen's Compensation

Act, 1923. Industrial Disputes Act and other applicable regulations and other Labour laws applicable to Contract Labour as mentioned below:

1. Industrial Disputes Act;
2. Industrial Establishment (Standing Orders) Act,
3. Trade Unions Act;
4. The Factory Act;
5. Employees Provident Fund & Miscellaneous Provision Act
6. Employees State Insurance Act;
7. Workmen's Compensation Act'
8. Payment of Gratuity Act;
9. Minimum Wages Act;
10. Payment of Wages Act;
11. Equal Remuneration Act,
12. Payment of Bonus Act,
13. National/Weekly Holidays Act,
14. Inter-state Migrant Workmen (Regulation of Employment and of service conditions) Act.

15. The contractor whose tender is accepted and who employs or employed 20 or more workers on any day of the preceding 12 months in various contracts, that he may have in other departments/establishments of STC shall obtain a valid License under the Contract Labour (R&A) Act 1970 and the Contract Labour (Regulation and Abolition) (Central) Rules 1971 before the commencement of the work and continue to have a valid license until the completion of the work.

Any failure to fulfill this requirement shall attract the penal provisions of the Act, which includes imprisonment for a term which may extent to three months or with fine or both.

16. No Labour below the age of 18 shall be employed on the work.

17. The contractor shall pay to the Labour employed by him wages not less than the minimum wages in accordance with the notification for minimum wages issued by Govt. of NCT of Delhi (Labour Department) or Central Govt., whichever is higher from time to time.

13.0 PROVIDENT FUND (PF): -

The contractor shall have to submit a certificate every month to the Engineer In charge that he has an establishment covered under the Employees Provident Funds and Miscellaneous Provisions Act 1952, and is having a separate code number with the provident fund commissioner and also that the provident fund contribution in respect of all the employees employed by him, under the contract, along with employer's share of contribution etc, has been deposited with the Provident Fund Authorities and shall also submit certified photo copies of the Bank Challan of deposits with all relevant details.

In absence of above the contractor shall deposit employee's as well as employer's contribution / other charges in the respect of all employees engaged by him for the said work with STC of India Ltd. along with the details of the employees, their wages and the amount of contribution as per PF rules every month. In case of failure, STC of India Ltd. shall be entitled to withhold 25% from the amount of his bills till the regularization of such discrepancies notwithstanding the above, the contractor has to comply with provisions 36-B of the EPF scheme 1952.

The Contractor will give annual contribution slips of individual workers engaged during the term of contract as issued by PF department.

Contractor will be responsible to make deduction towards the contribution of provident fund (PF) from salary account of contract labour engaged by him who may be covered under provident fund Act in accordance with the provisions of EPF scheme 1952.

Contractor shall arrange to open PF accounts in the name of the labour engaged by him immediately from first month after deployment of persons at his own cost.

14.0 EMPLOYESS STATE INSURANCE (ESI): -

It is sole responsibility of the contractor to get his workmen insured under Employees State Insurance Act(ESIC) 1948 & 1950 /workmen compensation Act & Rules, while at work, as required by relevant rules and regulations of workmen compensation and shall pay compensation, as per Act and provision / rules made there under.

(i) Wages should be disbursed by the contractor as per the terms of the Bid documents in light with Contract Labour Act/Rules and STC shall not be under any responsibility for the same;

(ii) Contractor is liable to pay all statutory benefits such as provident fund contributions, leave, salary, medical benefits, and observe statutory working hours for its employees and maintain records thereof;

(iii) Contractor is responsible for proper maintenance of registers, records and accounts for compliance with statutory provisions/obligations; (iv) It is for the contractor to manage its employees for the performance of the work in terms of the standard prescribed herein without any deviation

(iv) Contractor is liable to defend/indemnify the principal employer from any liability or penalty which may be imposed by authorities for any violation by the contractor of such laws, regulations applicable to him and also against all claims, suits or proceedings.

(v) No contractor, to whom this Act applies, shall undertake or execute any work through contract labour except under and in accordance with a license issued in that behalf by the licensing officer/authority

(vi) Contractor shall keep a copy of the license shall display prominently at the premises where the contract work is being carried on

(vii)Contractor must also ensure that number of workmen employed as contract labour in the establishment shall not, on any day, exceed the maximum number specified in the license.

(viii) Every contractor shall send half yearly return in Form XXIV in duplicate to the Office of the Labour Commissioner, so as to reach the licensing officer concerned not later than 30 days from the close of the half year.

(ix) It shall be the duty of the contractor to ensure the disbursement of wages in the presence of the authorised representative of the STC

(x) Contractor is also required to maintain a number of important records. This includes Muster Roll, Register of Wages, Register of Deductions, Register of Overtime, Register of Fines, Register of Advances, Wages Slips, etc.

15.0 Issue Of Gate Passes, Uniform, Shoes to Workers Engaged by Contractor, Representative of the contractor: -

The contractor will declare a competent person as his representative from the date of commencement of the work until the work is completed. This representative will coordinate with STC for day today works and will primarily carry out the works under his supervision. Such representative will have to be authorized to act on behalf of the

contractor. Contractor will be bound by the decisions of the representative during execution of the work without any responsibility on STC

. After award of the contract the successful contractor will furnish the list of his representative and/or Supervisor, labour to be engaged by him indicating their particulars with passport size photo graph to the Engineer-in-charge for arranging gate passes which should be required to be produced for security check every time before entry into the Jawahar Vyapar Bhawan The said gate passes should always displayed by the labour during working hours in the Jawahar Vyapar Bhawan.

Contractor shall submit ID proof of each employee duly issued by him and attested by STC.

Contractor shall also get ID verification through local police authorities and submit the same within one-month period from the date of commencement of work order if required for security purpose by STC of India Ltd. time to time.

Contractor should ensure that the engaged man power should wear the uniform while on duty, issued by the contractor (at no cost to STC) during the currency of the contract with the badge of his contractor. No manpower would be allowed on duty without uniform.

The contractor would also disburse a pair of safety shoe at the start of the contract within one month for the engaged labour at no cost to STC.No manpower would be allowed on duty without safety shoes.

16.0 TIMING FOR CARRYING OUT WORK

The normal working hours in Jawahar Vyapar Bhawan (JVB) shall be generally from 9.00 AM to 6.00 PM or as prescribed by the Engineer In-charge, in general shift. However, the work may also be required to be done in one or more shifts/ round the clock/night hours as per requirement to meet the dead line of time, or as per direction of Engineer in charge.

Contractor will have to ensure that normal functioning of the offices in the building should not get disturbed due to his ongoing work. Accordingly works during night hours may also be allowed/ instructed by the STC, as decided by the Engineer in charge, without any extra cost to STC.

It may be noted that one of our owner of the building operated 7 days a week and till 8 PM, to which contractor will have to co-operate with the system without any extra cost to STC.

17.0. REMOVAL OF PERSON

The Engineer-in-charge may require the contractor to remove from the site of the work any person or persons under the contractor's employment who have been found to be incompetent or has done any act of misconduct and the contractor shall forthwith comply with such requirement/instructions

18.0 Change In Contractor Address and Change of Authorized Representative During the Execution Period

Any notice under the Contract shall be deemed to have been served to the successful bidder if served upon his authorized officer or sent by registered letter at his known address. Contractor will be bounded to intimate STC about the change in his corresponding address immediately. Also, the Contractor is advised to not to change his authorized representative during the contract period, without prior consent of the STC or unless not intended by STC. If the need to change the authorized representative arises due to site condition during the execution of the works, Contractor will have to submit the reasons prior to taking such action. The Contractor shall have to provide mobile phone with incoming & outgoing facility to their Supervisor during execution of work. The complete details having name of Supervisors with Mobile number is to be given to Engineer In charge before start of work.

In case the contractor does not provide supervisor to meet the requirement of contract at work site a deduction as a penalty at the rate of Rs. 1000/- per day shall be made for the period in which contractor becomes defaulter to the maximum limit of 2% of the contract value

19.0 TOOLS& TACKLES, EQUIPMENT -

All required general tools, tackles, equipment for carrying out the works shall be arranged by the contractor at his own cost. Any damage to the STC of India Ltd shall be recovered from the contractor.

20.0 CONSUMABLES: -

All the consumable shall be arranged by the contractor at his own cost and consumables such as rope, spanners, pliers, hacksaw blades, soap cakes, waste cloth, gunny bags, cotton waste, screw driver, torch, tester hand gloves, battery cells insulation tape, cotton tap, multi-meter, testing lamp and cell, Sanitary & Plumbing & Plumbing, carpentry tools etc., necessary for maintenance purpose shall be kept in ready stock by contractor.

21.0 CONTRACTOR'SRESPONSIBILITY: -

21.01 Supervision and control of the work / job will be contractor's responsibility.

21.02 Contractor shall be solely responsible to obtain and abide by all necessary licenses / permissions from the concerned authorities as required under the various Labour laws, legislations including Labour license from the competent authority under the Contract Labour (Regulation and Abolition) Act, 1971.

Supervision, control and regulation of condition of the workmen engaged by the contractor shall be his responsibility and STC of India Ltd. will have no direct connection with the workers of the contractor.

The Contractor shall ensure checking of all relevant records to, Labour Inspector, PF Inspector or any other statuary authority as desired by concerned Officer and submit the report of the same to Engineer In charge at No cost to STC.

Contractor will adhere to labour laws of state/central Govt. and other statutory laws/rules.

The Contractor shall remove all Tools and Tackles (T&T) and material from Site after completion of work and same shall be deposited in Contractor store etc. The scrap material shall be the property of the contractor. The work area under the contract of the Contractor shall remain always clean at any time during the contract period. The contractor will arrange necessaryTools and Tackles T&T and labour for cleaning of work area and equipment etc. as per direction of Engineer In charge.

22.0 Non-compliance of contractual terms

On failure of the contractor in complying with any of the directions in the bid document/ Award of work/Contract, the STC of India Ltd. may at its discretion either cancel the contract or impose such penalty as per tender terms or as deemed fit if not described in tender document specifically, which may be recovered from the security deposit or other amount payable to the contractor against this contract or any other payment due to him and/ or may take legal recourse for such recovery. The decision of the Joint General Manager/General Manager (GAD) shall be final and binding on the contractor.

The Contractor will also take proper care for other equipment /offices nearby to the working place and will also ensure no damage is caused to them. The Contractor will also ensure proper fencing/ to cover the openings/dug-out and to put Sign Board [For Dangerous/ Work in Progress] at the place, to avoid any incident before leaving the work under pending

23.0 CONTRACTOR'S RESPONISBILITY TOWARDS THEFT: -

The contractor will be responsible in case he/they or their workmen are found committing theft. An FIR will be lodged with Police against the delinquent(s) & concerned contractor & penalty of Rs. 5000/- (Rs. Five Thousand Only) will be imposed/ recovered in each case as token penalty beside the recovery. However, for such incident, contractor will be black listed and no work shall be awarded to him for a further period of three years & all the existing contracts will be liable to be cancelled provided in such cases it is always open for the STC to forfeit the security deposit of the contractor and also any other dues towards the contractor and also the lien over any equipment/movable property and other valuable belongings of the contractor or delinquent employee. The release of the same, if any shall depend upon the investigation of the police authority, such release however shall be subject to other dues of the contractor as well as the normal wear and tear and depreciation rules.

24.0 MEDICAL CHECKS UP &CARE: -

The contractor shall be fully responsible for providing safety equipment, First Aid and emergency medical treatment to his employees. The contractor shall make necessary arrangement for this purpose.

The contractor shall submit health check-up report in form No.19 of workers employed by him at least once in twelve months' period.

Free and Comprehensive medical treatment to be provided by the Contractor to all workmen found to be suffering from an occupational disease, ailment until cured or until death. Services of the workmen not to be terminated during illness and to be treated as if on duty.

Compensation to be paid by the contractor to workmen suffering from any occupational disease, ailment or accident in accordance with the provisions of workmen's Compensation Act 1923 or ESI scheme as effective during the contract.

25.0 SAFETY DEVICES,SAFETY CODE, LABOUR CAMPS SANITARY ARRANGEMENTS

The contractor shall follow the Safety Code and Model Rules for the Protection of health and sanitary arrangement for workers as prescribed by the CPWD as regard to safety code and first aid facilities. Contractor shall be fully responsible for safety of his workers and in case of any accident/mishap the entire responsibility shall be on the contractor.

Deterrent penal and legal action shall be taken in the event of any failure on the part of the contractor to discharge the safety obligations as determined by the STC.

The contractor shall provide all the required safety appliances to the workers / staff as may be warranted for safety of the workers during the course of the work. Safety devices like Safety belt, Safety Helmet, Safety Shoes, Ear protector, welding glass, welding gloves, Asbestos gloves etc. shall be provided for use by workers during work.

The contractor shall provide personal protective equipment conforming to the IS mentioned below -

(a) Safety helmets conforming to IS-2925: 1984

(b) Safety Belts conforming to IS-3521: 1983

(c) Eye and face protection devices conforming to IS-8520:1977and IS-8940:1978

(d)Hand and body protection devices conforming to

(1) IS-2573: 1975

(2) IS-6994: 1973

(3) IS-8807: 1978 (4) IS-8519: 1977

26.0 LIABILITY FOR DAMAGES: -

26.01 If due to contractor's negligence and / or non-observance of safety and other precautions, any accident / injury occurs to any other person / public, the contractor shall have to pay necessary compensation & other expenses

26.02 If due to contractor's negligence and/ or non-observance of safety precautions, damage is caused to the property of STC of India Ltd., the same will be recovered from the running bill of the contractor or from his security deposit.

27.0 WITH HOLDING PAYMENT: -

The STC of India Ltd may withheld the whole or part of any payment for work claimed by the contractor, which in the opinion of the Engineer In charge necessary to protect STC from loss on account of: -

A. Defective work not remedied or Conditions/warranties not met.

B. Claims filed against the contractor related to the works in JVB.

C. Failure of the contractor to make due payment for the labour employed by him.

D. Damage to another contractors/ STC of India Ltd property or its tenants, Co-owners

E. Insufficient / Unsatisfactory progress.

F. Any adverse observation of any statutory body regarding work performance/payment to the contractor Or non-compliance of any labour laws applicable to contractor.

When grounds for withholding of payment are removed, to the satisfaction of Engineer in charge the payment of the amount due to the contactor shall be arranged by the STC of India Ltd.

28.0 REGARDING PERSONNEL OF CONTRACTOR: -

28.01 The Engineer in charge shall be at liberty to object about the working of the Supervisor or any person employed by the Contractor for execution of work on account of misconduct / incompetence /negligence by way of Notice in writing addressed to the Contractor.

On receipt of such Notice from Engineer in charge, the Contractor shall remove the person so objected and shall provide a suitable replacement within 24 hours of such Notice at its own Cost and expense".

28.02 Contractor/ his representative / supervisor shall abide by all general rules and regulations in force on the site and to any special conditions imposed by the local administration. The general discipline of the Jawahar Vyapar Bhawan shall be maintained.

29.0 CO-ORDINATION

The contractor shall co-ordinate and co-operate with all other agencies appointed by the STC so that the work shall proceed smoothly with least possible delay and to the satisfaction of the STC. Work shall be carried out in such a manner that the work of other agencies operating at the site is not hampered due to any action of the contractor. Proper co-ordination with other agencies will be contractor's responsibility. In case of any dispute, the decision of STC shall be final and binding on the contractor.

30.00 ENGINEER IN CHARGE: -

Deputy General Manager –Elect. /GAD, STC of India Ltd. New Delhi who is the Engineer in charge of this contract. He will supervise the works and will issue instructions at site from time to time and his authorized representative Manager/s

31.00 TAX DEDUCTIONS: -

The tax deduction at applicable rate will be made from the running bills of the contractor by, STC(I) Ltd. New Delhi.

32.00 DISPUTES: -

*(a)*In case of any dispute, the matter shall be referred to the Director (Personnel), STC of India Ltd, New Delhi and the decision given by him shall be final on both the Parties.

*(b)*ARBITRATION

All disputes or differences whatsoever arising between STC and the contractor out of or relating to construction, meaning and operation or effect of this agreement or the breach thereof if not settled through conciliation, shall be referred to arbitration as per rules of Indian Council of Arbitration, New Delhi and the award made in pursuance thereof shall be final and binding and final on both the parties. The venue of arbitration will be New Delhi (India) Only.

33.0 LIEN IN RESPECT OF CLAIM IN OTHER CONTRACTS

Any sum of money due and payable to the contractor (including the security deposit refundable to him) under the contract may be withheld or retained by way of lien by the STC in respect of payment of a sum of money arising out of or under the same or any other contract made by the contractor with the STC.

It is an agreed term of the contract that the sum of money so withheld or retained under this clause by the STC will be kept withheld or retained as such by the STC or till its claim arising out of the same contract or any other contract is either mutually settled or determined by the arbitration clause , as the case may be and that the contractor shall have no claim for interest or damages whatsoever on this account or any other ground in respect of any sum of money withheld or retained under this clause and duly notified as such to the contractor.

34.0 OTHERS: -

(a) Domestic LPG Gas cylinder shall not be allowed in the Jawahar Vyapar Bhawan for any cutting and welding works.

(b) WATER & POWER FOR INSTALLATION

STC shall provide power & water at one point for the proper execution of the work free of cost under normal circumstances. In case STC is not in a position to supply the water and/or power, the Contractor will make his own arrangement so that the work does not suffer. However, no claim of the contractor whatsoever shall be entertained by STC on this account.

(c)Disposal shall be done as per hazardous waste management rule under the mandates of applicable law. In case the site is not cleared immediately and final

disposal of waste is not done within one-week period then a penalty of Rs. 1000/- per day may be imposed.

The contractor shall have to remove all waste/scrap/debris melba and other unwanted material from site of work before handing over the installation to the STC. The work shall not be treated as complete in all respects unless these requirements are fulfilled by Contractor. In the event of contractor failing to do so, the STC shall have right to get the site cleared at Contractor's cost.

35.0 CONTRACT VALUE: -

The amount mentioned is subject to completion of entire work as per Schedule and is payable to the contractor on normal course but the quantities are tentative/indicative only. The work may increase or decrease as per actual requirement during the contract period. The payment shall be made for actual work done satisfactorily. STC of India Ltd. does not guarantee for payment of entire Work Order amount.

36.0 TERMINATION

(a) Penal termination of contract by STC : -

Notwithstanding anything elsewhere provided herein and in addition to any other right or remedy of STC under the contract or otherwise, including right of STC for compensation for delay, the Engineer-in-charge may, without prejudice to his right against contractor in respect of any delay, bad workmanship or otherwise or to any claims for damage in respect of any breach of the contract and without prejudice to any rights or remedies under any of the provisions of this contract or otherwise and whether the date for completion has or has not elapsed may by intimation in writing, absolutely determine the contract.

Default or failure by the contractor in any of the under mentioned cases, including but not limited to the following shall be the basis of taking action under this clause of the contract:

1) Failure to provide at the job site, sufficient labour, material, equipment, machinery, and/or facilities required for the proper and/or due execution of the work or any part thereof;

2) Failure to execute the works or any of them in accordance with the contract

3) Disobedience of any order or instruction of the Site Engineer and/or Engineer-in-charge.

4) Negligence in carrying out the work or carrying out of work found to be unsatisfactory by the Engineer-in-charge.

5) Abandonment of the works or any part thereof;

6) Failure to execute the contract according to the terms of the Contract.

7) If the contractor is incapable of carrying out the work;

8) If the contractor misconducts in any manner;

9) If there is any change in the constitution of the contractor or in the circumstances or organization of the contractor, which is detrimental to the interests of STC.

10) Dissolution of the contractor or winding up (whether voluntary or compulsory) of the contractor (if a company) or appointment of a receiver or Manager or any other professional under the applicable lawsany of the contractor's assets and/or insolvency of the contractor

11) Delay in execution of work, which in opinion of Engineer-in-charge shall delay the completion of work beyond the stipulated date of completion;

12) Distress, execution, or other legal process being levied on or upon any of the contractor's goods and/or assets;

13) Death of Contactor/s

14) If the contractor or any person employed by him shall make or offer for any purpose connected with the contract any gift, gratuitous act royalty, commission, gratification or other inducement (whether money or in any other form) to any employee or agent to STC.

15) If the contractor remove, assign or attempt to assign his interest or any part thereof in the contract.

16) In case of violation of terms and conditions of the tender, violation of any statutory regulations, local laws etc. STC shall reserve the right to terminate the contract.

17) If the Bidder deliberately gives wrong information in his tender,. In such cases in addition to termination of contract the deposited dues with STC shall be forfeited by the Corporation

The decision of the Deputy General Manager (Elect./GAD), STC as to whether any of the events/contingencies mentioned in aforesaid clauses entitling STC to terminate the contract has occurred shall be final and binding upon the contractor. However, before termination of the contract, a notice with a time period of reply of 7 days will be served to the contractor informing the termination action. The reason for the termination stated in the notice of

termination shall be final and binding upon the contractor and shall be non-arbitral. The jobs left however by the contractor shall be got done at his risk and cost through the other agencies and the contract shall be determined accordingly.

(b) Voluntary termination of contract by STC: - In unforeseen circumstances or in the event of Force Majeure including but not restricted to Any Natural Calamity, Closure, or Structural Changes of the STC. STC reserves the right to terminate the contract with a notice period of 30 days without any claim against the executed work or for the undelivered material at site, Recovery or damages of any nature or any other dues including any interest thereupon, and without any risk and liability on each other.

Such Decision of STC will be final and binding upon the Contractor and without any recourse in any manner to STC.

The date of termination of contract will be deemed as the final day of the period of contract.

37.0 Recovery against the contractor :-If due to any default by the contractor, recovery arises against the contractor, the contractor shall be required to deposit the amount of recoveries finalized within a period of 30 days of receipt of intimation failing which the dues shall be recovered from the securities and financial hold of the contractor including any amount owed to contractor available with the STC of India Ltd. In case, where the amount of recoveries against the contractor exceeds its financial hold, securities and payable /due of the contract including its financial hold with STC, the STC of India Ltd. will be at liberty to effect such recoveries out of the such securities and payables due of the contractor including its other financial hold and future receivables towards pending payments of the contractor available with other PSUs or through legal course of action

38.0The Indemnity Clause

1. The contractor will indemnify STC of all legal/other obligations of the professional / employees deployed for STC work.

2. STC also shall stand absolved of any liability on account of fraud or breach of trust

3. STC shall also be indemnified from any act or from any factual concealment causing thereby damage or any legal proceedings against STC by any third party or contractor's deployed employees.

4. The contractor shall also undertake to keep STC harmless and indemnified from any loss or costs resultant from any decree/award/orders /directions /penalties obtained/enforced against the STC or implicating STC as a liable body/ entity / person for such enforcement or making such decree/award/direction/orders/penalties effective. Also, the STC shall be indemnified from any consequential act taken by STC in order to protect its interest or in order to defend any suit or legal action for itself or for on behalf of contractor, to the extent of cost/legal expenses/interest imposed upon.

5. The contractor shall indemnify and compensate STC, if the STC as principal employer under the contract Labour (Regulation & Abolition) Act, 1970 becomes liable to assume any liability towards the work force engaged by the contractor. In that event, the provisions relating to recovery as provided in the relevant clauses of the said Act shall be applicable into.

The Contractor shall at all times indemnify and keep STC indemnified against any claims in respect of any damages or compensation payable in consequences of any accident or injury sustained or suffered by its employees/workmen or agents or by any other third Party resulting from or by any action, omission or operation conducted by or on behalf of the Contractor.

The Contractor shall at all times indemnify and keep indemnified STC against any and all claims by Employees, Workman, agent(s), employed engaged or otherwise working for the Contractor, in respect of wages, salaries, remuneration, compensation or the like.

*All claims regarding indemnity shall survive the termination or expiry of the Contract and shall be recoverable from Security Deposit in addition to any other means.*The quantum of indemnification shall be finalised by STC and be binding upon the contractor

39.0 Jurisdiction of Courts

The agreement will be governed by the laws of India and within the framework of applicable legislation and enactment made from time to time. All the legal disputes between STC and the contractor shall be governed by the courts/tribunals/forums situated in Delhi and shall have the exclusive jurisdiction, to entertain such disputes.

40. Successor and Assigns

This agreement shall be binding upon and inure to the benefits of the parties and their respective successors and permitted assigns.

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FINANCIAL & OTHER TERMS

1.0 CONTRACT

1.1 This is an item rate contract. The decision of L1 (First Lowest) in this tender shall be taken on the basis of the Net cost (Net cost=Total Cost of SITC of equipment/work –cost of dismantled material) quoted.

1.2 Contractor shall strictly conform to the specifications, schedule of rates, general and special terms and conditions if any, and any other matter contained in the tender documents issued by the STC.

1.3 The value of estimated cost, Earnest Money and Performance Guarantee, Security Deposit are as follows:

A) Earnest Money : Rs 11,00,000=00

B) Performance Bank Guarantee (PBG) : 5 % of awarded value (Excluding GST) as per STC format

C) Security Deposit (S.D.) : 5% of the awarded value, (Excluding GST)

2.0 SECURITY DEPOSIT (S.D.)

2.01 The successful bidder will have to deposit a security amount @ 5% of the contract value through online mode as detailed in the documents, within 15 days from the letter of award or work order issued from STC. Amount of EMD already deposited shall not be adjusted in this Security deposit amount. EMD will be refunded on request.

2.02 Unless otherwise specifically required to be retained / forfeited by STC in part or full, the security deposit shall be refundable on the request of the contractor after satisfactorily completion of the free warranty period (Defect liability period) of 12 months to the satisfaction of the STC.

2.03 If the contractor fails and neglects to observe or perform any of this obligation the contract it will be lawful for the STC to forfeit either in whole or in part, at its absolute discretion, the security deposit furnished by the contractor.

2.04 No interest shall be payable on such deposit.

3.0 PERFORMANCE BANK GUARANTEE (PBG)

The bidder shall submit an irrevocable performance guarantee amount which will be 5 % of awarded value in addition to security deposit against the proper performance

of the contract. The performance guarantee amount will have to be deposited within 15 days of issue of detailed award letter in the form of Bank Guarantee. **The performance bank guarantee amount will be valid up to the practical completion or handing over date of project to STC plus 60 days beyond, whichever is later**.

The bidder shall guarantee among other things, the following however If the contractor fails in fulfilling the following obligation of the work in view of the Engineering in charge, STC reserve the right to forfeit the PBG.

(a) Quality, Strength and performance of the material used.

(b) Safe electrical and mechanical stress on all parts used under all specified condition of operation.

(c) Satisfactory performance during the work execution period

(d) Completion of work assigned/awarded in respect of quantity and/or quality to the satisfaction of Engineering in charge. Contractor will have to ensure the quality and/or quantity of work as per tender terms or as to the satisfaction of STC.

(e) STC reserve the right to terminate the contract in the absence of PBG during the currency of the contract, as per the terms. STC shall have the right to forfeit security deposit in such circumstances and the contractor will be banned for business for 2 years.

(f) Decision of Engineer in charge will be final and binding to the contractor in this regard.

4.0 WORK OPEN TO INSPECTION

All work under or in course of execution or being executed in pursuance of the contract shall at all times be open to inspection and supervision of the Engineer-in-charge and his authorized subordinates, and the contractor shall at all times during the usual working hours, and at all other times at which reasonable notice of the intention of the Engineer-in-charge or his subordinate to visit the works shall have been given to the contractor, either himself be present to receive order and instructions, or have a responsible agent duly accredited in writing, present for that purpose. Order given to the contractor's agent shall be considered to have the same force as if the same had been given to the contractor himself.

5) REJECTION OF DEFECTIVE MATERIAL

5.1 If on test, any portion of the work, or their accessories are found to be defective or not fulfilling the intent or the meaning of the specifications, the same shall

be replaced with a new one OR be repaired or rectified either during or after the completion of the work but before the expiry of defect liability period to the entire satisfaction of STC, at no cost to STC.

5.2 In case the contractor fail to remove the defects, within 7 days, STC reserves the right to take necessary remedial measures through other Firm/companyand all expenses thus incurred would be recovered from the contractor.

6) APPROVAL OF MATERIALS

All materials articles and workmanship shall be subject to the approval of the Engineer-in-charge.

7) DEPLOYMENT OF TECHNICAL & OTHER STAFF

(a)The contractor shall deploy the qualified personnel such as project Engineer having experience in related work for the execution of the work .In case, the contractor fails to deploy proper technical staff as aforesaid, he shall be liable to pay to STC of India at the rate of Rs.5000/- per week (Five thousand) for Project Engineer. The contractor shall deploy at his own cost all labor and all consumable material tools and plants, appliances, implements, ladders, tackle, scaffolding etc. requisite for the proper execution of the work and whether included in the specifications or other documents forming part of the contract or referred to in the conditions or not, or which may be necessary for the purpose of entirely satisfying the engineer-in-charge.

(b) **Engagement of Fire Consultant/Expert** : -Contractor will have to engage /deploy a consultant at his own, who will have proven past track record of providing Fire Consultancy any time, during the last 5 years in any Govt. organization and having in depth knowledge of CPWD specification., National Building Code 2016, Delhi Building By Laws, For Fire Protections System In High Rise Building, Relevant Indian Standards etc. Such credentials of the consultant must be verifiable and acceptable to the In charge.

The consultant will supervise the ongoing work at site, time to time and will plan, suggest, give his opinion, prepare documents for statutory authority and will also assure that the work is being carried out as to the satisfaction of Delhi Fire service rules, necessary for issuance of fire safety certificate.

The consultant will be deemed to be an employee of the contractor for all risk and liabilities.

The contractor is bound to replace the consultant by any other suitable consultant/Expert due to poor consultancy services / adverse intent towards STC /performance of the consultant, without any claim by the contractor towards STC.

Consultant will have to certify that the work has been/has taken place as per requirement of National Building Code 2016/DFS, during the currency /completion of the work.

Non deployment of consultant during the contract period will be deemed as non compliance of contract terms and STC will be free to impose penalty as deemed fit by the Engineer In charge including debarring from business for 2 years/forfeiture of PBG.

The work is to be carried out as per the specifications in the tender and relevant standards. The material should be got approved before start of work.

Agency will be responsible to test & commission the entire installation .The work shall be executed without any loss/damage to the STC's properties.

8) CERTIFICATION OF COMPLETION

The work shall not be considered as completed until the Engineer-in-charge has certified in writing that the works have been practically completed and has been taken over by STC .The defect liability period of 12 months shall commence from the date of taking over of system by STC. Partial completion will not be issued.

9). TIME EXTENSION FOR CONTRACT

If in the opinion of the Engineer-in-charge the works is delayed by:

(a) Force majeure

(b) Reasons of civil commotion, location combination of workers on strike or lock-out affecting any of the building trades;

(c) In consequence of the contractor for not having received in due time necessary instructions from the Engineer-in-charge for which he shall have specifically applied in writing.

(d) If STC fails in making the front available to the contractor for execution of the work, due to site conditions. Contractor will intimate Engineer in charge whenever such situation occurs. The same will be examined by STC rationally as per conditions of site and immediate efforts would be taken up to make available the working front. However, Decision of Engineer in charge will be final and binding to the contractor in concluding the opinion regarding availability or non-availability of front / space to work.

(e)If Engineering in charge considers that pending work is utmost urgent and cannot be put off.

Request for rescheduling of date of completion and extension of time, to be eligible for consideration, shall be made by the contractor in writing immediately after the happenings of the event causing delay. The contractor may also, if practicable, indicate in such a request the period for which extension is desired.

The Contractor shall immediately give notice thereof in writing to the Engineer-in-charge but shall nevertheless use constantly his best endeavors to prevent the delay and shall do all that may be reasonably required to the satisfaction of the Engineer-in-charge to proceed with the works

In such case, the Engineer-in-charge may give a fair and reasonable extension of time and reschedule the completion date. Such extension shall be communicated to the contractor by the Engineer-in-charge in writing within 15 days of receipt of such a request.

Time extension shall be sole prerogative of STC and no claim of contractor shall be entertained if time extension is not granted.

STC reserve the right for the compensation for delay if the reasons of the delay are owed to the contractor, resulting in to the poor/slow progress of the execution of the works as per the tender terms.

For waiving of penalty for the delayed execution, contractor must submit the detailed reasoning of the delay. Engineer in charge will rationally analyse the reasons of the delay submitted by the contractor as per site /actual conditions and will decide accordingly for levying or waiving off the penalty for delay. The decision of Engineer in charge for levying/waiving off compensation for delay will be final and binding in this regard.

Extending the time period of the contract will be sole prerogative of STC

The rates, terms and conditions will remain same during the extension period.

10). RATE FOR LIQUIDATED DAMAGES (L.D.) FOR DELAY

If the contractor fails to maintain the required progress as mentioned in tender terms or to complete the work and clear the site on or before the contract or extended date of completion (without imposition of any compensation/penalty) , the contractor shall, without prejudice to any other right or remedy available under the law to the STC on account of such breach, pay as ½ % (half percent) per week, up to maximum @ 10 % of the delayed part of work (I e work completed after, initial contract period OR

extension period allowed by STC without compensation for delay) as compensation or penalty. The contractor will have to take permission from STC for working at site irrespective of the imposition of delay penalty or waiver of the same.

The contract will be governed by the initial NIT/Contractual terms and condition till such time the contractor is working at site.

11). PAYMENT

(a) No advance payments shall be made to the contractor. Payment shall be released on pro rata basis after supply, installation testing, commissioning of the any equipment/item as per B.O.Q. Final payment shall be made only on the basis of detailed measurements on actual basis considering completion of the project. Payment to the contractor shall be made through NEFT mode only for which Bank charge necessary shall be borne by the contractor.

(b) Minimum limit of raised bill will be 12-15% of total work order, however this limit may be varied to maintain continuity of work/availability of funds/Project requirement/ instructions issued from the Govt./Statutory body.

(c) Payment will be made on the actual works carried out and work progress at site will not be interlinked with release of payment from STC.

(d) Final payment shall be released as per recommendation of Engineer in charge and deductions of statuary dues and as per the status of works carried out, as per terms of the contract.

(e) STC will apply to DFS (Delhi Fire Services) for issuing Fire safety certificate after completion of the proposed works. The contractor will coordinate for all necessary documentation and processing for the same. Upon inspection by DFS authorities, adverse observation regarding completed works , from DFS, will be deemed as defect at the end of the contractor and final 5% payment will be released only after such defects / observations are attended as per the requirement of site as to the satisfaction of STC so as to nullify the observation of DFS. This 5% amount will be in addition to the security deposit and Performance Bank guarantee.

12). MEASUREMENTS

Joint Measurements by the contractor and STC representative shall be done in metric system and running account bills as per schedule of rates and will be submitted to the Engineer in charge for the work done. For any dispute regarding measurements, decision of Engineer in charge will be final and binding.

13). RATES

13.01 The rates shall include the cost of materials, labor, installation, testing, commissioning, loading, unloading, shifting, supervision, tools & tackles, transport, statuary levies and duties, contingencies, breakage, wastage, sundries, scaffolding etc. and maintenance during defect liability period for one year for complete installations of equipment as per tender terms, in Jawahar Vyapar Bhawan, 1-Tolstoy Marg, Delhi Whether specifically mentioned or not. Goods and service tax (GST) shall be paid extra as per rules.The contractor will have to get themselves registered under GST ,Labour department (for engaging labourers at site) before start of work and will submit the documentary proof of monthly deposit of GST. The contractor will pass on input credit tax to STC under GST act.

13.02 If the rates of any item(s) is/are left lank by the bidder, the same shall be treated as zero and it will be presumed the bidder has already accounted the rates in other items against the blank items and the contractor shall have to carry out the that item work within stipulated cost

13.03 VARIATION / INTRODUCTION OF TAXES & DUTIES

If any new tax or new statue levy is introduced after the tender closing date which may affect the rates of the contractor, STC will reimburse the same on submission of documentary evidence of deposition to the statuary body.

14). Contract Period

The contract period will be one year from the date of award of the work which may be extended as per site condition on mutual consent basis without violating any terms and condition of tender document.

15). SUBMISSION OF BILL & MODE OF PAYMENT: -

15.01 A bill shall be submitted by the contractor BI monthly on or before the date fixed by the Engineer-in-charge for all the works executed in the previous months, and the Engineer-in-charge shall take or cause to be taken the requisite measurement for the purpose of having the same verified and the claim as far as admissible to be adjusted.

The same will be verified by engineering section of STC of India Ltd for releasing the payment through electronic mode. The Bank fee for this RTGS /NEFT facility shall be borne by the contractor. The Contractor shall have to submit the following self-attested documents along with the bill.

1. Self-attested copy of bank Challan of PF, ESI Deduction and deposited in the bank/ statutory body of one month before.

2.Monthly statement/ return of PF, ESI contributions with name of workers & PF Account numbers etc. and PF, ESI undertaking in duplicate of one month before

4. Self attested copy of labour license if applicable at site.

5. Self-attested copy of insurance/ESI deposition cover note.

6. Undertaking in respect of depositing GST (Goods and service Tax) regularly by Contractor as per norms.

7. Measurement sheet as per B.O.Q.

--STC reserve the right to get the records cross checked from the originals documents as per need of STC.

-100% payment after making necessary deduction (towards security deposit, Income tax & other if any) shall be made by ,STC against satisfactory performance of work done on the recommendation of the Engineer in charge. Under no circumstances, the contractor shall withheld/ delay the wages payment of workers for want of release of payment /reimbursement from STC.

16). DEVIATION/VARIATION EXTENT/EXTRA ITEMS/SUBSTITUTED ITEMS/LUMPSUM COST AND PRICING:

16.01 **Lump sum cost :**Contractor has to ensure successful complete installation of the equipment described in the tender document whether specifically mentioned in full details or not . STC will not be responsible for any inadvertence error or omission in description of the B.O.Q. items.

To cater any such requirement of works at site which would be necessary during execution period, for completion of the works mentioned in B.O.Q, Bidder has to quote accordingly in the price bid for the same in Lump sum cost column after taking in the consideration of all such extra works/items.

Bidder has to evaluate the site condition before bidding and should include all ancillary civil and other works/extra items that may arise in connection with successful completion of the work but which are not specifically mentioned in the B.O.Q. Such works have also to be taking in to consideration while quoting in this column. The work should be completed in all respect without any enhancement of total value of the contract.

It is emphasized here that merely quoting in the LUMP SUM column does not confer any right to the contractor for releasing the payment from STC. The contractor will

have to submit the individual rate reasonability of every item items executed under Lump sum head at the time of billing. The rates of individual items accorded by STC will be final and binding to the contractor for the items executed under Lump sum head.

Quoting zero in the lump sum item head will be deemed as nothing will be required as extra items during execution of the contract for the completion of the works. The contractor will be bounded to complete the installation of B.O.Q items within the price quoted, without any extra cost to STC, for any extra items if needed during execution. In such case it will be presumed that contractor has already taken in to account the cost of all the extra items that would be required during execution for completion of the works, in the price quoted.

The decision of Engineer in charge will be final and binding for any doubts/ambiguity.

16.02**DEVIATION IN QUANTITY:** STC reserve the right to order the contractor to supply and install some equipment/items mentioned in awarded work order if needed so for the completion of the Project considering site conditions on the same rates, terms and conditions. However it is clarified.

(a) There will be no enhancement in the total project value.

(b) Contractor should ensure installation of quantities as per B.O.Q. Variations in quantities will be allowed only in **exceptional** conditions, with the approval of Engineer in charge, however such variation should not result in the enhancement of the contract value.

(c) The payment will be made on the actual quantities executed at site.

(d) STC reserve the right to alter the scope of work at any stage of contract without prejudice to the rights of the contractor.

It is to also added here that STC reserve the right to alter the quantities considering site requirement at his own during currency of the contract if the value of the total works remains within the total accepted cost of the project.

16.03 **Alteration/ substitutions/ omissions/ additions in scheme**: The Engineer-in-charge shall have power (i) to make alteration in, omissions from, additions to, or substitutions for the original specifications, drawings, designs and instructions that may appear to him to be necessary or advisable during the progress of the work, and (ii) to omit a part of the works in case of non-availability of a portion of the site or for any other reasons provided the same are recorded in writing and proper approval is obtained thereof and the contractor shall be bound to carry out the works in

accordance with any instructions given to him in writing signed by the Engineer-in-charge and such alterations, omissions, additions or substitutions shall form part of the contract as if originally provided therein and any altered, additional or substituted work which the contractor may be directed to do in the manner specified above as part of the works, shall be carried out by the contractor on the same terms and condition in all respects on which he agreed to do the main work.

17). DRAWINGS, MAINTENANCE MANUALS ETC.

On the award of work, the contractor shall immediately proceed with the preparation of General Arrangement drawings, single line diagrams, schematic for the project, detailing the equipment that are to be installed and the ancillary works that are to be carried out. Four sets of all such working drawings shall be submitted to the Engineer in charge, for his approval to ensure that the works will be carried out in accordance with the specifications and drawings, including such changes as may have been mutually agreed upon. All the drawings shall be received by the STC for his approval, within 20 days of the award of work. The approval of the drawings by the STC representative shall in no way relieve the contractor form his obligations to provide a complete and satisfactory execution of the work, as per intent and purposes as laid down in the specifications .Any omissions and/or errors shall be made good or rectified whether or not the drawings are approved prior to the completion of the work the contractor shall furnish to STC, Four sets of a comprehensive manual, describing all components, furnishing list of installation for the operation and maintenance of the (SITC) of complete system.

Successful contractor after receipt of order must furnish detailed bar chart showing various activities with respect to time and he must organize co-ordination meeting at site to review the progress of his work.

18). AS BUILT DRAWINGS

On completion of the work in all respects, the contractor shall supply 4 sets in hard copies and soft copies/Compact Disc /Pen drive with CAD/CAM / relevant Engineering tool of as built drawings indicating the completed work with detailed specifications used for various equipment as to the satisfaction and verification of the Engineer in charge. The contractor will have to prepare the various drawing/Plans as will be needed and necessary for obtaining Fire safety certificate From Delhi Fire services, at his own cost even if those parts/components were not included in his scope of work. Necessary input data for preparing such drawings will be collected by

the contractor at his own measurement at no cost to STC. STC will provide only architectural drawing given by NDMC at the time of construction of JVB. Contractor is advised to go through the available drawings in STC before deducing any conclusion so as to avoid confusion at later stage. Contractor will be responsible for any discrepancy in this regard. Final bill will not be paid for non-submission of the same.

19). TEST & INSPECTION

a. Before the dispatch of the material to STC, the contractor shall inform STC that the material is ready for inspection. STC will inform the contractor within 5 working days about the inspecting offer(s). The contractor shall arrange the inspection at the venue as indicated. After the detailed checking/ testing in appropriate laboratory of the material and consequent approval of the testing Engineer as per the standard test procedures laid down in the IS / relevant standards thereafter as per instructions of STC Engineer. The inspecting officer shall inspect the material as per the technical specification of the tender document. Partial inspection of one type of the material will not be entertained. STC reserve the right to get the material inspected through any independent/accredited third party Laboratory as decided by the Engineer in charge, at the cost of the contractor. Once the material is inspected and cleared for dispatch by inspecting engineer, the contractor shall arrange to deliver the same material at site in intact condition at his own cost. The poor quality of material shall be rejected. However such tests at any laboratory during any stage of contract period does not absolve the responsibility of the contractor for proper functioning of the material during execution and afterwards also.

b. All the cost including travelling, lodging, boarding of inspecting engineer will be borne by the supplier/contractor. The entire test either on the field or outside concerning the execution of the work and supply of materials by the contractor shall be carried out by the contractor at his own cost.

c. The work is subject to inspection at all times by the STC and or its authorized representative. The contractor shall carry out all instructions given during inspection and shall ensure that the work is being carried out according to the technical specifications of this tender. The technical documents will be furnished to him during the performance of the work and the relevant codes of practice.

d. The contractor shall provide for purpose of inspection access all tools and gazettes required for inspection.

e. All results of inspection and tests will be recorded in the inspection reports. Performa of which will be approved by the STC. These reports shall form part of the completion documents.
f. Any work not conforming to the execution of drawings, specifications or codes shall be rejected forthwith and the contractor shall carry out the rectification at his own cost.
g. Certificate of inspection – the Contractor shall obtain and deliver to the STC, all the certificates of inspection and approval by the local statutory authorities concerned (if required), at site before putting the system into operation. The inspection fee shall be paid by the contractor. License fee will be paid by STC.
h. STC reserve the right to waive off such inspections and may accept the test reports also if available from genuine laboratory / established labs for the tests which are not feasible to carry out.

20). GUARANTEE/CONDITION

The contractor shall guarantee that all the equipment, materials and components supplied, fabricated, designed and installed by him shall be free from defects due to faulty design, material or workmanship. The period of the guarantee shall be (12) twelve months from the date of handing over the complete work. During this period any or all components /equipment pertaining found to be defective shall be replaced with a new one, at no extra cost. The contractor shall provide the necessary personnel and tools for fulfilling the above guarantee.

If the above is not carried out within a reasonable time, then STC may arrange to do the same at the contractor's risk and cost, without prejudice to any other rights.

21). PAINTING

All equipment/ancillary items, supports, clamps, saddles etc. will be painted in approved manner as per CPWD specifications, using colors scheme as approved by the STC.

22). SAFE CUSTODY AND STORAGE

Safe custody of all machinery and equipment supplied by the contractor shall be his own responsibility till the final taking over by STC at his own cost. The contractor should, therefore, employ sufficient staff for watch and ward at his own expenses. STC may, however, allow the contractor to use the temporary space/ storage free of cost, of his equipment if such spaces are ready and available.

23). INTERPRETATION

In interpretation of specifications, the following orders of decreasing importance shall be followed:

1. Schedule/Bill of quantities
2. Technical specifications
3. Schedule of Fiscal aspects
4. Special conditions of contracts
5. General conditions of contract

Matters are covered by the specifications given in this contract, as a whole shall be covered by relevant and latest Indian Standard codes/CPWD DSR (Delhi Schedule of rates) code, NBC (National Building Code -2016) in case of any disputes. If such codes on a particular subject have not been framed or crossed with the specifications of this tender, the decision of the STC shall be final and binding.

24). SCAFFOLDINGS

The contractor shall allow the usage of the scaffoldings etc. for the inspections and also to the other agencies employed by the STC for execution of other works in a proper manner. No charge shall be made by the contractor to other agencies for the same.

25). DEFECT LIABILITY PERIOD

The contractor shall guarantee the installation for a period of 12 months against defective materials and workmanship from the date of taking over by the STC and shall rectify or replace the defective material or workmanship without any extra cost to the STC as provided under the terms of the contract /Tender document without any delay. If the contractor fails to attend the defects within the period as asked by STC, then the STC has right to get it done at the risk and cost of contractor without giving any further notice. Effective date of completion of work shall be considered after handing over of the entire installation of STC even if, the equipment are installed and put into use in phases, accordingly the defect liability period shall start only from the date of completion and taking over of the entire installation by STC.

Comprehensive Maintenance during Defects Liability Period

A) COMPLAINTS

The contractor shall receive calls for any and all problems experienced in the operation of the system installed under this contract, attend to these within 4-5

hours of receiving the complaints and shall take steps to immediately correct any deficiencies that may exist.

B) REPAIRS/REPLACEMENT

In case any defect is observed pertaining any equipment /component, the same shall necessarily be required to be replaced with a new one whereas in cases of any other defect, immediate service, repairs and maintenance shall be carried out within the defect liability period. The period for replacement of defective part is 5 days else STC may take the works through any other agency at the risk and cost of the contractor.

The replacement parts and labor shall be supplied promptly free of charge to STC.

C) Un-Attending Defects

If the contractor does not repair the defect as indicated in clause B within the stipulated time asked by the Engineer in charge, STC shall be free to get the repairs done at the risk and cost of the Contractor, through the dues pending with STC or any other means possible.

SCHEDULE OF FISCAL ASPECT

1.	Earnest money (E.M.D.) to be deposited	Rs. 11,00,000=00
2)	Time of completion	12 months from the date of issue of Letter of award (Work order)
3)	Date of commencement	Permission to work at site after deposition of PBG, S.D. and execution of agreement
4)	Compensation for delay (Liquidated damages)	1/2% per week for the delayed work, subject to max. of 10% of contract value
5)	Security Deposit	5 % of the value of work awarded within 15 days from letter of award
6)	Performance Bank Guarantee	5% value of awarded value within 15 days from date of letter of award
7)	Release of Security deposit	After satisfactory expiry of Defect Liability Period of 12 months
8)	Defect Liability Period	12 months from the date of completion and taken over over.
9)	Terms of payment	The payment shall be made on pro rata on running bill.

SCOPE OF WORK, SCOPE OF SUPPLY ,TECHNICAL SPECIFICATION, METHODOLOGY FOR EXECUTION

1. Introduction to Site: -

The site of the work will be the Corporate office of The state Trading Corporation of India Limited (STC -A Public Sector Undertaking under the administrative control of Ministry of Commerce and Industry) which is also known as 'Jawahar Vyapar Bhawan (JVB) ' situated at Janpath-Tolstoy Marg Crossing, Connaught Place, New Delhi – 110 001. JVB is a 23 storied building with two basements and is fully occupied by STC and Co-owners viz a viz CCIC (Central Cottage Industries Corporation) & HHEC (Handicraft and Handloom export Corporation) along with very prestigious Govt. /PSU banks tenants like 'Fifteenth Finance Commission', Security printing and Minting Corporation (I) Ltd.(SPMCIL), Corporate Branches of The state Bank of India, NOIDA SEZ , IBEF (India Brand Equity Forum), Department of Factories and Alkaloids, etc. The building witnesses frequent VVIP visits/Dignitaries.

2. It is advised that the contractor should verify all figures, facts, site conditions, taxes, tender terms and conditions / interpretation thereof or any other factor (e.g. statuary requirement, civic body compliances etc.) that may impact the performance during /after the work execution period, at their end at own cost ,before bidding for the work. STC shall not be responsible for any manner whatsoever, later on this account.

3. Various Electromechanical installations viz-a- viz 1675 TR HVAC Plants, 2 x 1010 and 2 x 500 KVA DG Sets, Sump pumps, Transformers Water supply System , 11kV/400 V NDMC substation, Fire protection system comprising Fire Hydrant system, Fire Sprinkler system, Fire Alarm and annunciation system, Fire Deluge system, Mulsifier system, First Aid Fire extinguishers , Public address system etc serve the building for its day today functions. .

4. The bid under consideration is for the woks of Supply, Installation, Testing , Commissioning of fire sprinkler , Fire detection & Alarm system etc. after dismantling the existing system at Jawahar Vyapar Bhawan for obtaining necessary/statutory Fire safety certificate from Delhi Fire Services (DFS).The details of work requirement is as per Bill of quantities & Tender terms .

5. It is also clarified that after completion of the works the contractor will assist STC in obtaining fire safety certificate and will arrange/construct "as built" drawings/plans/documents/3 D drawings of the building and/or its floors necessary to be submitted along with the application from STC for obtaining fire safety certificate. Contractor has to ensure that the equipment/items installed under this contract should be in proper functionality as per building norms/bye-laws, during the inspection of the Delhi Fire Services Authority's meant/intended for issuances of fire safety certificate. STC is having "architectural lay out plans" only of the Jawahar Vyapar Bhawan issued from NDMC which may be seen by the bidder before bidding so as to confirm the requirement of drawings/3D drawings/plans as to satisfy the requirement of Delhi Fire Services for issuance of fire safety certificate. Preparing the complete documents required for the application of FSC will be responsibility of the contractor without any extra cost to STC.

6. The installation will be offered for inspection to local body (Chief Fire Officer), The contractor will extend all help including test facilities to the representative of Chief Fire Officer. In case contractor fails to make desired facilities available during inspection, the department reserves the right to provide the same at the risk & cost of the contractor. The observation of Chief Fire Officer which are a part of agreement shall be promptly attended by the contractor. The installation will be accepted by the department only after receiving clearance from Chief Fire Officer.

7. It is the responsibility of the contractor to coordinate with the DFS for getting the Fire safety certificate, for which no extra payment, on any account, will be made by STC. Contractor will have to assist STC in preparing the necessary documents for the same. Non-cooperation from the contractor in getting issued FSC (Fire safety certificate) will be taken as serious default and STC reserve the right to not to issue completion certificate for such noncompliance at the end of the contractor. Decision of STC will be final and binding to the contractor in this regard. The intermediate duration /Time, taken by DFS after submission of application for inspection of the system till the inspection is carried out by DFS will not be counted in the contract period (12 months).

8. In case fire safety certificate is not obtained by STC due to any discrepancy/negative remarks by DFS about the works executed, work completion certificate will not be issued to the contractor, however, if the fire safety certificate

is not obtained by STC due to any other reason owed to STC (i;e not due to contractor's scope of work) , issuance of the completion certificate of the work will be decided by the other terms & conditions of the contract if deemed fit by Engineer in charge at his rational prerogative.

9. A) In case of any negative observations/remarks by Delhi Fire Services (DFS) during the inspection regarding the works carried out by the contractor, the contractor will have to attend/repair/amend the executed works as to the satisfaction of DFS within the contract value.

B) In case the negative observations/remarks by Delhi Fire Services (DFS) during the inspection falls out of the scope of work executed by the contractor, such observation/remarks will be attended by STC at its end without any liability on contractor. Time taken for carrying out the those works which are out of scope of the present tender will also not be considered in the contract period if STC decides to ask the contractor to take up such works.

C) Since getting issuance of fire safety certificate lies within the contractor's scope, the bidder should be well familiar about Delhi Fire Service requirements, formalities, compliances and rules, norms of National Building Code 2016 so that any ambiguity could be avoided at later stage, Any works carried out in contravention to the requirement of NBC Code 2016 will be deemed as null and void even if those are prescribed by STC in the tender document and accordingly no payment shall be released for such works.

10. Extent of Work:-The work shall comprise of entire labour including supervision and all materials necessary to make a complete installation to the entire satisfaction of the Engineer-in-Charge. The term complete installation shall mean; not only major items of equipment covered by these specifications, but also incidental sundry components necessary for complete execution and satisfactory performance of the installation, with all labour charges, whether or not these have been mentioned in detail in the tender documents.

The contractor will have to work in the following main area along with other ancillary works needed for the completion.

The contractor will dismantle the existing system and install the new system. The main components are as below.

1. Fire Fighting Protection system:-

(a) Sprinkler system

(b) Fully addressable fire detection and alarm system

(c) Public address or announcement compatible with fully addressable Fire detection and alarm system

(d) Smoke management system including lift lobby and Lift well pressurization, staircase pressurization, basements smoke exhaust system.

(e) Fire Proof doors, signage.

(f) Primary fire extinguishers

2. Electrical works:

a) Installation of electrical distribution boards on various floors
b) Electrical earthing work
c) Fire protection in electrical panels (11 KV), 11 KV/415volt 3 phase transformers, 415 volt panels by fire extinguishing Gas flooding system.
d) Installation of lightning arrester along with necessary chemical earthing.

3.Re-installation of false ceiling wherever needed.

The contractor is expected to have through knowledge/experience and expertise in fire protection codes in high rise buildings as well as works on electrical panels/system up to 11 KV, civil works necessary for the completion of the work as per tender document.

11. Dismantled material:- the contractor will be responsible for taking all safety measures and precautions during the dismantling of the existing system. Contractor will take all prerequisite steps /works before initiation of dismantling of the system without any cost to STC. The safety practices as per CPWD specifications will be followed. Cost of man power and material for dismantling the existing system will be borne by the contractor.

12. The dismantled material will be the property of the contractor and will be treated as " Sell" from STC. Tax liability of the dismantled material will be borne by the Contractor. The dismantled material will be accumulated in the building at one place as directed by the Engineer in charge. Contractor will ensure cleanliness at site during the works

13. The dismantled material will be allowed to exit from Jawahar Vyapar Bhawan (Site) only after the permission from Engineer in charge /issuance of Gate pass from STC. Contractor will be responsible for arranging permission from Delhi Police/ NDMC/statutory authority for disposal of dismantled material. The contractor will also be solely responsible for compliance of statutory requirement for the disposal of dismantled material.

14. The site (JVB) is fully operational and occupied building, the functionality of various occupants should not get disturbed due to the working of the contractor at site. Contractor will have to coordinate closely with the floor occupant and engineering in-charge before taking the any front at site. STC will not allow the contractor to take up any piece of work in arbitrary manner so as to ensure minimal disturbances/distraction to the occupants. Noncompliance of instructions of engineering in-charge in this regard will be viewed seriously and the works will not be permitted. Any financial implication to the contractor on this account will be borne by the contractor only. The following schedule in seriatim will be followed by the contractor. Any changes/addition/Deletion in the schedule will be allowed only after prior permission of engineering in-charge. The renovated system should comply the National Building Code (NBC) 2016 Part IV – India.

Proposed Schedule

Sr. No.	Step of the work	Time period needed	Remarks /Total Cumulative period
1.	Award of work Deposition of Security Deposit (S.D.), PBG and signing of Contract Agreement .	2 weeks	2 weeks
2.	Dismantling and accumulation at ground floor at designated place, of existing system components of all sub-systems present in JVB including basement	4 weeks	6 weeks

	machinery, except the systems installed inside floors		
3.	Complete Supply Erection, testing of all components described in work order, (pipes, flanges, valves, cables, Motors, Pumps, electrical panels, switches etc.) and other components in shafts, basements ,except on JVB floors	10 weeks	16 weeks
Till this stage of work, floors will not be disturbed. Testing of all installed components will have to be completed.			
4	Complete Supply, Erection, Testing of all components described in work order, (pipes, flanges, valves, cables, electrical panels, switches etc.) and other components on following JVB floors after dismantling and accumulating at ground floor	8 weeks	24 weeks
(a)	(a)4th Floor –Main and Annex (b) 6th Floor –Main and Annex (c) 7th,8th Floor Annex (d) 20th Floor (e) 23rd Floor	8 weeks	24 weeks
(b)	(a) 5th Main and Annex (b) 19th,21st , 22nd (c) 17th , 18th, 10th	10 weeks	34 weeks

(c)	(a)7^{th} ,8^{th} ,9^{th} Floor –Main (b) 11^{th}, $12^{th,}$ 14^{th}, 15^{th}Floor - Main	6 weeks	40 weeks
(d)	(a) Ground Floor (b) CCIC area (Up to 3^{rd} Floor) (c) 1^{st} 2^{nd} Floor annexes.	8 weeks	48 weeks
(e)	Any other remaining/ miscellaneous work, Final completion of works testing, final measurement, DFS inspection, handing over taking over of system of complete system .	4 weeks	52 weeks

The scheduled above is indicative only and STC reserve the right to alter the Same with the consent of the contractor, depending upon the site condition/Progress of the work. Contractor may be asked to take up the works in parallel fronts for earlier completion /convenience of site.

15. The contractor will comply the following while executing the works conformity to Statutory Acts, Rules, Regulations, Standards & Safety Codes.

1. Indian Electricity Act and Rules :

All electrical works in connection with installation of FAS and AFAS shall be carried out in accordance with the provision of Indian Electricity Act, 2003 and the Indian. Electricity Rules 1956 both amended up to date.

2. CPWD Specification :

The electrical installation work shall conform to CPWD General Specifications for electrical works Part I (Internal) 2013 and Part-II (External) 1994, both amended up to date.

3. Indian Standards:

The system/components shall conform to relevant Indian Standards and National Building Code 2016 amended up to date.

4. International Standard:

Conformity to International Standards is required only in the case of imported fire detectors. The standards applicable shall be indicated by the bidder in their offer.

5. Fire regulations:

The installation shall be carried out in conformity with the local Fire Regulations & Rules there under wherever they are in force and the provisions in local bye-laws, if any.

6. Safety Codes and Labour Regulations:

In respect of all labour employed directly or indirectly on the work, the successful bidder (herein after called the contractor) at his own expense will arrange for the safety provisions to comply with the statutory regulations, B.I.S. recommendations and CPWD Codes. In case of default, the department shall be at a liberty to make arrangements and provide facilities as aforesaid and recover the cost from the contractor.

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

16. .Nothing in these specifications shall be construed to relieve the contractor of his responsibility for the design, supply and installation of the equipment with all accessories in accordance with applicable Statutory Regulations and Safety Codes in force from the safety angle.

17. The works under this contract envisage installation of various Electrical, Mechanical and Fire Fighting equipment. The technical specifications of common components/items (like electrical parts)in these various systems have not been mentioned repeatedly in each section for brevity. Reference for technical specification for common component will be taken from other section of the work wherever required.

TECHICAL SPECIFICATIONS

FIRE FIGHTING INSTALLATION

1. GENERAL

1. The work shall be executed and measured as per metric dimensions given in the Bill of Quantities, drawings etc.

2. The Contractor shall acquaint himself fully with the partial provisions for supports that maybe available in the structure and utilize them to the extent possible. In any case the Contractor shall provide all the supports regardless of provisions that they have been already made. Nothing extra shall be payable for situations where insert plates (for supports) are not available or are not useful.

3. Shop coats of paint that may be damaged during shipment or erection shall be cleaned off with mineral spirits, wire brushed and spot primed over the affected areas, then coated with paint to match the finish over the adjoining shop painted surface.

4. APPLICABLE CODES AND STANDARDS: All equipment, supply, erection, testing and commissioning shall comply with the requirements of Indian Standards and code of practice given below as amended up to the date of submission of Tender. All equipment and material being supplied shall meet the requirements of BIS and other relevant standard and codes amended as up to date.

S. No.	***I.S. No.***	***Title***
1	IS-8757	Glossary of terms associated with Fire safety
2	IS-884	Specification for first-aid hose reel for fire fighting
3	IS-901	Specification for couplings, double male and double female instantaneous pattern for fire fighting
4	IS-902	Specification for suction hose couplings for fire fighting purposes
5	IS-903	Specification for fire hose delivery couplings, branch pipe, nozzles and nozzle spanner
6	IS-904	Specification for two-way and three- way suction collecting heads for firefighting purposes
7	IS-907	Specification for suction strainers, cylindrical type for fire fighting purpose
8	IS-908	Specification for fire hydrant, stand post type

9	IS-909	Specification for under ground fire hydrant
10	IS-636	Non percolating flexible fire fighting delivery hose
11	IS-7637	Glossary of terms for fire fighting equipment
12	IS-937	Specification for washers for water fittings for fire fighting purposes.
13	IS-1641	Code of practice for fire safety of buildings (general): General principles for fire grading and classification
14	IS-1642	Code of practice for fire safety of buildings (general) : Details of construction
15	IS-1643	Code of practice for fire safety of buildings (general) : Exposure hazard
16	IS-1644	Code of practice for fire safety of buildings(general}:Exit requirements and personal hazard
17	IS-1646	Code of practice for fire safety of buildings (general) : Electrical installations.
18	IS-2871	Specification for branch pipe, universal for fire fighting purposes.
19	IS-2930	Functional requirements for hose laying tender for fire brigade use.
20	IS-5290	Specification for landing valves
21	IS-8090	Specification for couplings, branch pipe, nozzle, used in hose reel tubing for fire fighting.
22	IS-8442	Specification for stand post type water monitor for fire fighting
23	IS-9972	Specification for automatic sprinkler heads
24	IS-11101	Specification for extended branch pipe for fire brigade use
25	IS-12349	Fire protection-Safety sign.
26	IS-12407	Graphic symbols for fire protection plan
27	IS-9668.	Code of practice for provision and maintenance of water supplies and fire fighting
28	IS-3844.	Code of practice for installation and maintenance of internal fire hydrants and hose reel on premises.
29	IS-12585.	Specification for thermoplastic house (Textile Reinforced) for Water Genset purpose.
30	IS-10221.	Code of practice for coating and wrapping of under ground mild steel pipe lines.
31	IS-15105.	Design and installation of fixed automatic sprinkler fire Extinguisher system-Code of Practice.
32	IS-325	Three phase induction motors.
33	IS-1822	Motor starter for voltage not exceeding 1000 volts.
34	IS-3624	Burden tube pressure and vacuum gauges.
35	IS-1554	PVC insulated (heavy duty) electric cabl
36	IS:1536	Centrifugally Cast Iron Pipe
37	IS:1537	Vertically Cast Iron Pipe
38	IS:1538	Cast Iron Pipe Fitting

39	IS:780	Sluice valve for water works purposes (50 to 300 mm.size)
40	IS:13095	Butterfly valves.

2. Fire Pumps to be provided

a) One electric motor operated pump for Sprinkler System of capacity 2850 lpm at 140 mtr head.

b) Diesel engine driven pump as common stand by pump of capacity – 2850 lpm at 140 mtr head.

c) Electric motor operated Jockey pump for pressurisation of capacity – 180 lpm at 140 mtr head,

3.Operation Philosophy of Pumping System

The complete system will remain pressurized up to the sprinkler valves / Landing Valves / Sprinkler head by the jockey pump. The jockey pump is independent for the system and will operate automatically to compensate leakage in the systems round the clock.

Fire Protection system to be provided with three fire pumps(one for hydrant system, one for sprinkler system & one common standby) which will come into operation automatically in the event of fire, but will be stopped manually.

In the event of fire outbreak, the jockey pump of respective system will come into operation automatically on opening of sprinkler / landing valve or actuation of sprinklers. The main pumps come into operation when the system pressure requirement will fall down below the preset limit of pressure switch dedicated for main motor driven pumps. The Diesel Engine Driven Pump will come into operation when the pressure will drop below the preset pressure point of pressure switch dedicated for diesel engine pump. Interlock shall be provided between Jockey and Main pumps.

PRESET PRESSURE FOR SEQUENTIAL OPERATION OF PUMPS:

1) Jockey Pumps - Start @ 10.0kg/cm^2 Stop @ 11kg/cm^2

2) Main Motor Driven Sprinkler Pump - Start @ 8.0kg/cm^2
Stop @ manually

3) Diesel Engine Driven Pumps - Start @ 4.0kg/cm^{2}Stop @ manually

4.1 Control Philosophy

1) Jockey pump can be started and stopped manually through push button when mode selector switch is in manual mode.

2) Fire Pumps can be started and stopped manually through push buttons when mode selector switch is in manual mode.

3) Jockey Pump will start and stop automatically through pressure switches provided on header.

4) Fire Pumps for sprinkler system will start automatically through pressure switch provided on delivery header, but has to be stopped manually only.

5) Standby Fire Pump will start automatically through pressure Switch provided on delivery header when main fire pump fail to start, but has to be stopped manually only.

4.2 DETAILS OF CONTROL CUM ANNUNCIATION REQUIREMENT OF MCC PANEL.

Operational Requirement of Pumping system

1) The Jockey pump can be started and stopped manually through push buttons when mode selector switch is in manual mode.

2) The Jockey pump can be started and stopped automatically through pressure switch when the mode selector switch is in auto mode.

3) Fire Pump for sprinkler will start automatically through pressure switch but stopping would be manual only.

4) Standby Fire pumps will start automatically through pressure switch but stopping would be manual only. However it will come into operation only when either of the main pumps failed to come into operation.

4.3 CONTROL FEATURES ENVISAGED

In addition to above, the following additional feature have been envisaged which are necessary for improvement of system performance.

a) When sprinkler fails to start in spite of receiving impulse from pressure switch, standby pump shall start automatically through pressure switch.

b) As it is not necessary to run Jockey pump, when the main or stand by fire pump have come into operation, the operational logic have been provided with interlock so that Jockey pump can be automatically stopped.

c) Standby pump will start automatically in the event of failure of main fire pumps through timers provided in the panel.

4.4 INDICATION FEATURES ENVISAGED

In order to provide summarized information of the system to the operator of the fire water pump house, following indication lamps are provided:

PUMP NOT IN DEMAND This identifies that the situation is healthy. (One for each)

PUMP IN DEMAND This identifies that fire situation has arisen and pump should start. (One for each)

PUMP RUNNING This would ensure that the pump is taking care of the situation.(One for each)

An audible hooter/speaker is provided common to all pumps which would sound the moment impulse has come from any pressure switch warranting the respective pump to start. However, the moment "PUMP RUNNING" indication lamp glow, the hooter/speaker will cut out automatically.

In any case only one indication lamp will glow at any time i.e. under healthy condition of the system only 'NOT IN DEMAND' indication lamp will glow. This will automatically cut off on receipt of impulse from the respective pressure switch and 'IN DEMAND' indication lamp glow which will further cut off automatically when pump starts and RUNNING indication lamp glows. This will further cut off automatically if the prime mover fails to start and 'FAILS TO START' indication lamp glows.

4.5 **ANNUNCIATION FEATURE ENVISAGED**

As the diesel engine control panel will have inbuilt indication lamps identifying the status of engine and battery along the audible hooters, this panel has been provided with other fault alarm also, as detailed below in the form of indication lamps.

VISUAL ALARM

1) SPRINKLER PUMP FAILS TO START
2) STANDBY PUMP FAILS TO START
3) JOCKEY PUMP FAILS TO START
4) HIGH HEADER PRESSURE
5) LOW HEADER PRESSURE
6) SYSTEM DEMAND

AUDIABLE ALARM

One hooter/speaker shall be provided to alert the operator in the event of any of the above conditions and one hooter/speaker shall be provided (different tone), in the event of fire condition i.e. SYSTEM DEMAND.

5. QUALITY ASSURANCE AND QUALITYCONTROL:

a) The work shall conform to high standard of design and workmanship, shall be structurally sound and aesthetically pleasing. Quality standards

prescribed shall form the backbone for the quality assurance and quality control system.

b) At the site, the Contractor shall arrange the materials and their stacking/ storage in appropriate manner to ensure the quality. Contractor shall provide equipment and manpower to test continuously the quality of material, assemblies etc. as directed by the Client's Representative. The test shall be conducted continuously and the result of tests maintained. In addition the Contractor shall keep appropriate tools and equipment for checking alignments, levels, slopes and evenness of surface.

c) All testing of the material will be done by the contractor at his own cost before the despatch of the material, in the presence of the STC's representative if so desired by Engineer in charge.

FIRE PUMPS

1. SCOPE:

This section covers the general requirements of water pumps for sprinkler fire pump, jockey pump and engine Driven standby Sprinkler Pump.

2. TYPE:

The pumps shall be centrifugal type direct driven with a 3 phase, 415 V ±10%, 50 Hz, A.C. motor. The standby fire pump shall be driven by diesel engine. The pumps may be either of horizontal split casing (HSC) type with operating speed not exceeding 1500 rpm, or solid casing with operating speed not exceeding 3000 rpm as specified in the tender documents (B.O.Q.).

3. RATING

The main fire pump and terrace pump shall be suitable for continuous operation in the system. The jockey pump shall be suitable for intermittent

operation to build up pressure in the system on account of leakage. The head and discharge requirements shall be as specified in the tender documents.

Pump shall be capable of discharging not less than 150 percent of the rated discharge at a head of not less than 65 percent with the rated head. The shut off head shall not exceed 120 percent of the rated head.

4. MATERIAL ANDCONSTRUCTION

i. The centrifugal pumps shall conform to IS1520.

ii. The pump casing shall be of heavy section close grained cast iron and designed to withstand 1.5 times the working pressure. The casing shall be provided with shaft seal arrangement as well as flanges for suction and delivery pipe connections asrequired.

iii. The impeller shall be of bronze or gunmetal. This snail be shrouded type with machined collars. Wear rings, where fitted to the impeller, shall be of the same material as the impeller. The impeller surface shall be smooth finished for minimum frictional loss. The impeller shall be secured to the shaft by a key.

iv. The shaft shall be of stainless steel and shall be accurately machined. The shaft shall be balanced to avoid vibrations at any speed within the operating range of the pump.

v. The shaft sleeve 'shall be of bronze or gun metal.

vi. The bearings shall be ball or roller type suitable for the duty involved. These shall be grease lubricated and shall be provided with grease nipples/cups. The bearings shall be effectively sealed against leakage of lubricant or entry of dust or water.

vii. The shaft seal shall be mechanical type, so as to allow minimum leakage. A drip well shall be provided beneath the seal.

viii. The pumps shall be directly coupled to the motor/diesel engine shaft through a flexible coupling protected by a coupling guard.

ix. The pump and motor/diesel engine shall be mounted on a common base plate fabricated from mild steel section. The base plate shall have rigid, flat and true surfaces to receive the pump and motor/diesel engine mounting feet. The pump will be perfectly aligned with the motor/engine so as to avoid any vibration during operation.

5. ACCESSORIES

Each pump shall be provided with the following accessories: -

a) Butterfly/sluice valves on suction and discharge (If positive suction is not provided butterfly valve at suction is not to be provided).

b) Reducers, as may be required to match the sizes of the connected pipe work.
c) Non-return valve at the discharge.
d) Pressure gauge at discharge side between pump and the non-return valve.

6. ACCESSORIES

i. The pump and motor/engine assembly shall be mounted and arranged for ease of maintenance and to prevent transmission of vibration and noise to the building structure or to the pipe work.

ii. The pump and motor/engine assembly shall be installed on suitable RCC foundation. The length and width of the foundation shall be such that 100 mm. space is left all around the base frame. The height of foundation shall be so decided that the total weight of foundation block is 1.5 times the operating weight of the pump assembly. The foundation shall be isolated from the floor by vibration isolating pads. Angle iron frame of size 35 mm x 35 mm x 3 mm shall be provided on the top edges of the foundation.

iii. More than one pump and motor assembly shall not be installed on a single base or cement concrete block.

iv. The suction/discharge pipe shall be independently supported and their weight shall not be transferred to the pump. It should be possible to disconnect any pump for repairs without disturbing the connecting pipe line.

v. A minimum clearance of 1 m. around the main pumps shall be provided. For jockey pump-clearance of 75 cm. shall be adequate.

vi. Sufficient space is to be left in front for the radiator of diesel engine for free discharge of hot air. Arrangement for discharging hot air to out side the pump house shall be provided so that hot air does not stagnate in the pump house.

DIESEL ENGINE DRIVEN FIRE PUMP

1. GENERAL

The diesel engine shall be suitable for automatic operation complete with necessary automatic starting gear, battery system and shall be complete with all accessories. Both engine and pump shall be assembled on a common bed place, fabricated from mild steel channel.

2. DRIVE

The pump shall be only direct driven by means of a flexible coupling. Coupling guard shall be provided. The speed shall be 1500 RPM.

3. DIESELENGINE

Environment conditions- The engine shall be suitable to operate under the conditions of environment at site.

Engine Rating- The engine shall be multi cylinder/vertical 4 stroke cycle, water cooled, developing suitable HP at the operating speed specified to drive the fire pump. Heat exchanger water cooled diesel engine of required BHP as per manufacturer at 1500 RPM for the above pump complete with standard accessories & suitable cooling system as described in specifications. Continuous capacity available for the load shall be exclusive of the power requirement of auxiliaries of the diesel engine, and after correction for altitude, ambient temperature and humidity for specified environment conditions. Pump shall be capable of furnishing not less than 150% of rated capacity at a head not less than 65% of the rated head. The shut off head shall not exceed 120% of rated head.

Horizontal split casing multistage centrifugal fire pump capable of delivering 2850 LPM against a maximum head of 140 M while running at 1500 RPM complete with proper connection to suction and delivery line, and including bypass arrangement for testing of pumps. Mechanical seal shall be included for stuffing box. Pump shall have a name plate indicating suction, delivery, head, discharge, stages, RPM and direction of rotation.

The engine shall be suitable for cold starting for which suitable heaters shall be provided in lubricating oil.

The engine shall develop full load within 15 seconds from the receipt of signal to start. The diesel engine shall conform to BS 64911S1601/IS 10002, amended up to date.

a) ***Engine Accessories***- The engine shall be complete with following accessories.

i. Fly wheel dynamically balanced.

ii. Direct coupling for pump and coupling guard.

iii. Radiator with hoses, fan, water pump, drive arrangement and guard.

iv. Air cleaner dry type.

v. Fuel service tank with necessary pipe work.

vi. Pump for lubricating oil and Lub.oil filter.

vii. Elect. starting battery 12 V/24 V with 2 Nos. batteries.

viii. Exhaust silencer with necessary pipe work.

ix. Governor.

x. Instrument panel housing all the gauges, including Tachometer, hour meter and starting switch with key (for manual starting).

xi. Necessary safety controls.

xii. Winterization arrangement.

xiii. Hand operated semi rotary pump for filling the service tank.

b) ***Cooling System*** **-** The engine shall be radiator water cooled. The radiator assembly shall be mounted on the engine. The radiator fan shall be driven by the engine as its auxiliary with multiple fan belts. When half the belts are broken, the remaining belts shall be capable of driving the fan. Cooling water shall be circulated by means of an auxiliary pump of suitable capacity driven by the engine in a closed circuit.

c) ***Fuel System-*** The fuel, system shall be gravity fed from the fuel tank to the engine driven fuel pump. The engine fuel tank shall be mounted either adjacent to the engine or suitably wall mounted on brackets. The fuel filter shall be suitably located to permit easy servicing. All fuel tubing to the engine shall be with M.S.'C' class pipe with flexible hose connections where required. Plastic tubing shall not be permitted. The fuel tank shall be of welded steel construction (3mm. thick) and of capacity sufficient to allow the engine to run on full load for at least 8 hours. The tank shall be complete with necessary floor mounted supports, level indicator (protected against mechanical injury) inlet, outlet, overflow connections and drain plug and piping to the engine fuel tank. The outlet should be so located as to avoid entry of any sediment into the fuel line to the engine.

d) ***Lubricating Oil System-*** Forced feed Lub. Oil system shall be employed for positive lubrication. Necessary Lub.oil filters shall be provided, located suitably for convenient servicing

e) ***Starting System-*** The starting system shall comprise necessary batteries

12 Volts / 24 Volts, starter motor of adequate capacity and axle type gear to match with the toothed ring on the fly wheel. Suitable protection to protect starting motor from excessively long cranking runs shall be suitably integrated with engine protection system.

The capacity of the battery shall be suitable for meeting the needs of the starting system.

The battery capacity shall be adequate for 10 consecutive starts without recharging with cold engine under full compression. Three attempt starting facility shall be provided. If the engine fails to start after third attempt, the engine shall be locked out and suitable audio-visual alarm shall be given to indicate engine failure.

The scope shall cover all cabling, terminals, initial charging etc.

f) ***Exhaust*** **System-**The exhaust system shall be complete with residential silencer suitable for outdoor installation and silencer piping shall be extended up to 1 m, outside pump house duly insulated with 50 mm. thick glass wool and 1.0 mm. thick aluminium sheet cladding.

g) ***Engine Shutdown mechanism -*** This shall be manually operated and shall return automatically to the starting position after use.

h) ***Governing System –*** The engine shall be provided with an adjustable governor to control the engine speed within 5% of its rated speed under all conditions of load up to full load. The governor shall be set to maintain rated pump speed at maximum pump load.

i) ***Engine instrumentation*** - Engine instrumentation shall include the following:-

(i) Lub.oil pressure gauge.

(ii) Lub.oll temperature gauge.

(iii) Water temperature gauge.

(iv) Tachometer.

(v) Hydrometer.

The instrumentation panel shall be suitably mounted on the engine.

j) ***Engine protection devices -*** Following engine protection and automatic shut down facilities shall be provided:

(i) Low tub. Oil pressure.

(ii) High cooling water temperature.

(iii) High lub. Oil temperature.

(iv) Over speed shutdown.

k) ***Pipe work-*** All pipe lines with fittings and accessories required shall be provided for fuel oil, lub.oil and exhaust systems.

l) ***Anti vibration mounting-*** Suitable vibration mounting duly approved by engineer in-charge shall be employed for mounting the unit so as to minimize transmission of vibration to the structure.

m) ***Battery Charger-*** Necessary float and boost charger shall be incorporated in the control section of power and control panel, to keep the battery under trim condition. Voltmeter to indicate the state of charge of the batteries shall be provided.

n) The engine installation shall be approved by the representative of engine manufacturer (who shall carry out after sales service under AMC).

SPRINKLER SYSTEM (INTERNAL ONLY)

1. PIPEWORK

The contractor shall be responsible for selection of sizes as per detailed engineering to be done by him as per relevant IS code and requirement of NBC-2016. Design to be done by the contractor shall incorporate the following: -

a) Butterfly/sluice valves shall be provided at suction and delivery sides of pumps (If positive suction is not provided valve at suction is not to be provided).

b) Fire service connection/inlet.

c) Test valve.

d) Drain connections.

e) For testing the system healthiness and automatic operation on daily basis, one test pipe with butterfly/sluice valve shall be provided in common discharge header. For avoiding wastage of water, this pipe shall discharge water in the tank. Non return valve shall be provided at the delivery of each pump and fire service inlet. This shall be of swing type.

f) Air release valves with ball valve shall be provided in the piping system for venting trapped air with a size of 25 mm for pipes up to 100 mm and 40 mm for larger pipes.

g) Piping drawings showing the sizes of pipe, valves, layout and other details

shall be prepared and shall be got approved from the Engineer-in- Charge before the execution of the work.

2. PIPE MATERIALS

Pipes shall be of the following materials.

a. Mild steel heavy class (C-class) conforming to IS:1239 for sizes up to 150 mm.
b. Welded black steel pipe, class 2, conforming to IS: 3589, for sizes greater than 150 mm. These pipes shall be factory rolled and fabricated from minimum 6mm thick M.S. Sheet for pipes up to 350 mm dia and from minimum 7mm thick M.S. sheet for pipes of 400 mm dia and above.
c. Cast iron double flanged class-A conforming to IS: 1536 or IS: 1537(to be provided only in underground application).
d. GI Pipe medium class (B-class) conforming to IS:1239 (For Drain)
e. Cadmium plated steel nuts/bolts/washers shall be used.

3. PIPEJOINTS

i. Jointing of pipes shall be provided in the M.S. pipe work as per existing network and requirement of size as per IS to the satisfaction of Engineering in charge.. Flanged joints shall be provided for connections to valves, pumps, air vessels etc. and also on straight lengths at suitable points to facilitate erection and subsequent maintenance.

ii. Mild steel flanges shall be in accordance with IS: 6392 i.e. "Plate Flanges for Welding" and flange thickness shall be as under. Gasket thickness shall not be less than 3mm.

All hardware items such as Nuts, Bolts, and Washers shall be of appropriate size. Washers shall be used on both sides of the bolt.

4. VALVES

Sluice valve conforming to IS: 780 or butterfly valve conforming to IS: 13095 shall be provided. All valves shall be suitable to with-stand the pressure in the system and rating shall be PN. 1.6. All valves shall be right handed (i.e. handle or key shall be rotated clock wise to close the valve), the direction of opening and closing shall be marked and an open/shunt indicator fitted.

(i) The material of valves shall be as under:
Body – Cast iron
Disc - Cast Bronze or Stainless
Steel Seat - Either integral or Nitrile
rubber O-ring- Nitrile/ Silicon

(ii) Non return valves shall be swing check type in horizontal run and lift check type in vertical run of pipes.

(iii) Air release valves shall be of gun metal body.

5. STRAINERS

Stainless steel strainers shall have minimum 1 mm thick screen with 3 mm perforations. Strainers shall be provided with flanges.

6. ORIFICE PLATE

Orifice plate shall be made of 6 mm. thick stainless steel and shall have an identification tag projecting beyond any flange between which it is clamped. The orifice shall be plain central hole without burs and diameter not less than one-half of the internal diameter of the pipe to which it is fitted.

7. INSTRUMENTS

i. Pressure gauge of appropriate range and 150 mm. dia size shall be provided.

ii. The pressure gauge shall be duly calibrated before installation and shall be complete with shut off valve.

8. **AIRVESSEL:-** Air vessel shall be provided on top of each riser and shall be fabricated out of 8 mm.thickM.S.Sheet.Theendsshallbedished.Thisshallbeof250mm.dia,1.2m.highandinstalledverticallyonsuitablelegs.ThelegsshallbeprovidedwithM.S. Plate of size 75 mm x 75 mm x 5 mm at the bottom so that the legs do not puncture the roof. The legs shall be grouted in CC foundation. Flange connection shall be provided for connection with wet riser pipe. Air release valve and pressure gauge with shut off valve shall be provided. The air vessel shall be tested at 25 kg/cm2 pressure before installation.

9. INSTALLATION

i. The installation work shall be carried out in accordance with the detailed drawings prepared by the contractor and approved by the Engineer-in-charge.

ii. In pipe above ground level, expansion loops or joints shall be provided to take care of expansion or contraction of pipes due to temperature changes.

iii. Tee-off connections shall be through equal or reducing tees, otherwise ferrules welded to the main pipe shall be used. Drilling and tapping of the walls of the main pipe shall not be resorted to.

iv. Open ends of piping shall be blocked as soon as the pipe is installed to avoid entrance of foreign matter.

v. Piping installation shall be, supported on or suspended from structure adequately. The contractor shall provide, clamps, hangers etc. in accordance with specifications. Proper lines and levels shall be maintained while installing exposed pipes.

vi. Pipe supports in pump house shall be floor mounted and of mild steel/G. I. Spacing of pipe supports shall not be more than that specified below:-

Nominal Pipe Size (mm)	Spacing

(m.)	
20 and 25	2.00
32 to 125	2.50
150 and above	3.00

Extra supports shall be provided at the bends and at heavy fittings like valves to avoid undue stress on the pipes.

vii. Anti vibration pads, springs or liners of resilient and non-deteriorating material shall be provided at each support, so as to prevent transmission of vibration through the supports.

viii. Pipe sleeves of diameter larger than the pipe by least 50 mm shall be provided wherever pipes pass through walls and the annular spaces shall be filled with felt and finished with retaining rings.

ix. (a) Vertical risers shall be parallel to walls and column lines and shall be straight and in plumb. Risers passing from floor to floor shall be supported at each floor by clamps as per specifications.

(b) The space in the floor cut outs around the pipe work shall be closed using cement concrete (1 :2:4 mix) or steel sheet, from the fire safety considerations, taking care to see that a small annular space is left around the pipes to prevent transmission of vibration to the structure.

(c) Riser shall have suitable supports at the lowest point.

x. Pipe over ground shall be painted in red colour as per specifications. Suitable identification shall be provided to indicate the run of underground pipe wherever the route of underground pipe cannot be ascertained from the location of isolating valves.

10. PRESSURETESTING

1. All piping shall be tested to hydrostatic test pressure of at least one and a half times the maximum operating pressure, but not less than 10 kg./sq.cm for a period not less than 24 hours. All leaks and defects in joints revealed during the testing shall be rectified to the satisfaction of the Engineer-in-Charge.

2. Piping repaired subsequent to the above pressure test shall be re-tested in the same manner.

3. System may be tested in sections and such sections shall be securely capped.

4. Pressure gauges may be capped off during pressure testing of the installation.

11. PIPESUPPORTS·

For installing pipes vertically or horizontally inside the building standard pipe supports of reputed make shall be used. Following supports shall be used.

i. Split pipe support clamps with rubber lining for vertical, horizontal and roof hanging.

ii. Clevis Hangers for horizontal supports to adjust varying heights.

iii. Sprinkler Hangers for horizontal supports for pipes from 15 mm dia to 150 mm dia.
iv. Piping installation shall be carried out with vibration elimination fittings wherever required.

Fasteners and fully threaded rods shall be used for installing the pipe supports. The sizes of pipe supports and installation shall be in accordance with manufacturers' recommendations. For pipes of size 100 mm and above, with the prior approval of Engineer-in Charge, 'U' clamp with dash fastener may be used for supporting horizontal pipe from ceiling.

12. MEASUREMENT

Measurements of plumbing work shall be on following basis:-

1. Piping shall be measured along the centre line of installed pipes including all pipe fittings and accessories but excluding valves and other items for which quantities are specifically indicated in the schedule of work. No separate payment shall be made for fittings and accessories.
2. The rates for piping work shall include all wastage allowances, flanges, hangers, excavation, refilling, testing, nuts and check nuts, vibration isolators, suspension where specified or required, and any other item required to complete the piping installation. None of these items will be separately measured and paid.

FIRE FIGHTING ACCESSORIES

1. FIRE SERVICE INLET AND FIRE SERVICECONNECTION

a) These are provided for connection of fire service hose pipes for either directly pressurizing the system with their pumps or filling water in the tank from a distance. In the first case non return valve with butterfly valve shall be provided for holding water pressure. Fire service inlet shall be provided with sprinkler ring mains. These are fixed to 150 mm dia pipe
b) These shall be as per IS:904.
c) Material of Construction: Copper Alloy/ Aluminium Alloy

2. VALVES

a. Gate valves:

Gate valve shall be provided as required or as shown in the applicable shop drawings conforming to the following specifications:

Seat - The Resilient lining mounded black nitrile rubber Nylon coated. Disc - SG iron to IS:1865 SG 400/12 and BS : 2789 Gr 420/12

Gate valves shall conform to IS:780/1969, Flanges to IS:1536 or as required. Valves shall have non-rising spindles unless otherwise specified and shall be suitable for 21 Kg/Sq.cm test pressure.

Sluice valves of sizes 80mm and above shall be cast iron double flanged solid wedge, outside screw, non rising stem, yoke type bonnet and two piece gland construction. The valves shall have renewable screwed body seat rings. Flanges shall have raised faces and serrated face finish and shall conform to IS:780- 1984.

b. Check valves:

Check valves shall be provided as required or as shown on the drawings and conform to the following specifications:

Size	***Connection***	***Ends***
12mm to 65mm	Gunmetal	Screwed Female
75mm to Over	Gunmetal/C.I.	Flanged

Swing check valves shall normally be used in all water services. Lift type valves may be used in horizontal runs. Air release and clean out plugs shall be provided whenever required Valves shall be suitable for 21 Kg/Sq.cm test pressure.

c. Butter fly Valves:

All the isolation valve 50cm and above on the equipment and water lines, where specified or shown on drawings shall be wafer type butterfly valves. They shall be designed to fit without gaskets, the water tight seal being obtained by EPDM seat projection at the faces compressed between the flanges. The valves shall be supplied inclusive of M.S. pipe flanges and high tensile steel bolts of dimensions recommended by suppliers of valves. The valves shall comply with following specifications:

a)	Test Pressure	Body 24 Bar, Seat 16 Bar
b)	Valve Component	Material of Construction
	Body	Cast Iron, Gr. FG 260, IS:210
	Disc	Nylon or Epoxy powder coated high duty iron, Gr, FG 260
	Stem	Stainless Steel or carbon steel - IS:1570, Part- II.
	Seat	EPDM
	Hand Lever	Cast Iron
	(Mechanical Memory Stop) Bearings	PTFE or Nylon covered S.S. bush bearings at stem and pivot.

	Primary Seal	Reinforced PTEE slide bearings
	Temperature	80 Degree C (max.)

d. Pressure Gauges:

Pressure gauge shall be not less than 100mm dia dial and of appropriate range and be complete with shut off gauge valve etc. duly calibrated before installation.

Pressure gauge shall be provided at the following locations and as indicated on the drawings and Bill of Quantities. Care shall be taken to protect pressure gauges during pressure testing.

e. Drain Valve:

Provide 50mm dia, MS pipe to IS:1239 (heavy class) with 50mm gunmetal full way valve for draining any water in the system in low pockets same to be extended to the nearest drain point as directed by Client's Representative.

f. Air Valves:

Provide 25mm dia, screwed inlet spring type single acting brass air valve on all high points in the system or as shown on drawings on top of air cushion tanks.

3. Installation:

Valve shall be install in a manner that allows future removal and service of the valve. Packing and gasket shall not contain asbestos.

The valve shall be of the same size as the pipe to which they are installed.

Valve above 150mm diameter shall be self locking warm gear type water proof and lubricated. Provide chain operators w/chain cleats on all valves more than2.4 meter above floor.

4. Flow Meter:

Provide "Venturi Type" flow meter on each pump test. The flow element shall be as venturi tube, fiberglass reinforced polyester plastic body with stainless steel connections. The flow indicator shall be well type mercury manometer suitable for closed valve pressure of the pump.

Provide over scale fluid check valve, three way manifold; vent plugs, shut off valves, and all other necessary trimmings.

Allow for at least five (5) diameters of strong pipe upstream and downstream of the venturi tube flanges.

The flow meter indicator shall be positioned in a suitable location to enable easy reading and in any case shall not be installed more than 1.8 meter above finished

floor level.

5. Painting:

All pipes in exposed locations shall be painted with one coat of red oxide primer and two or more coats of synthetic enamel paint of approved shade after the Hydrostatic test pressure of the internal hydrant piping network.

1. SCOPE:

Work under this section shall consist of furnishing all labour, materials, equipment and appliances necessary and required to completely install the sprinkler system as required by the drawings and specified hereinafter or given in this Bill of Quantities.

a) Sprinkler mains, branch and connection from external piping complete with valves, alarm, hangers, appurtenances and painting.

b) Sprinkler heads with spare sprinklers.

c) Connections to risers, pumps and appliances.

d) Flow switches, installation valve

e) Vertical drainpipes.

2. GENERALREQUIREMENTS:

All materials shall be of the best quality conforming to the specifications and subject to the approval of the STC's Representative.

Pipes and fittings shall be fixed truly vertical, horizontal or in slopes as required in a neat workmanlike manner.

Pipes shall be fixed in a manner as to provide easy accessibility for repair and maintenance and shall not cause obstruction in shafts, passages etc.

Pipes shall be securely fixed to walls and ceilings by suitable clamps at intervals specified. Only approved type of anchor fasteners shall be used for RCC ceilings and walls.

Valves and other appurtenances shall be so located that they are easily accessible for operations, repairs and maintenance.

3. SUPERVISORY SWITCH:

Provide a supervisory switch attached to each supervised valve. The supervisory switch shall monitor the valve position and signal valve tempering. The switch shall consist of a single pole, double throw switch with a roller type switch actuator and a spring loaded plunger. The switch shall be U. L. listed and F. M. approved.

4. Sprinkler Heads

Sprinkler heads shall be of Quartzoid bulb type with standard bulb, valve

assembly, yoke and the deflector. The sprinkler shall be of approved make and type.

Pendent pattern: These sprinklers shall be designed to produce a hemispherical type of discharge below the plane of the deflector with little or no water being discharged upwards to wet the ceiling.

Upright pattern: These sprinklers shall be designed to produce a hemispherical type of discharge below the plane of the deflector with water being discharged upwards to wet the ceiling.

Construction bulb: Bulb shall be made of corrosion free material strong enough to withstand any water pressure likely to occur in the system. The bulb shall shatter when the temperature of the surrounding air reaches a predetermined level.

Valve assembly: Water passage of the sprinkler shall be closed by a valve assembly of flexible construction. The valve assembly shall be held in position by the Quartzoid bulb. The assembly shall be stable and shall withstand pressure surges or external vibration with displacement.

Yoke: The yoke shall be made of high quality gunmetal. The arms of yoke shall be so designed as to avoid interference with discharge of water from the deflector.

Deflector: The deflector shall be suitable for either upright or pendent erection. The deflector shall be designed to give an even distribution of water over the area protected by each sprinkler.

K-Factor: The following K - Factor shall be adopted for classification of sprinklers according to nominal temperature ratings: -

Sl.No.	Sprinkler Type	K Factor	Size of the bulb
1	Standard Spray Pendent Sprinkler	80	5mm
2	Standard Spray upright Sprinkler	80	5mm
3	Standard Spray side wall Sprinkler	80	5mm

Size of sprinkler orifices: The sizes of sprinklers shall be selected for low hazard as 15mm nominal bore

Temperature ratings: For normal conditions and climates, temperature rating of 68^0C shall be used. However, the temperature rating shall be as close as possible to, but not less than 30^0C above the highest anticipated temperature conditions.

Sprinkler heads shall be provided at regular spacing as per NBC-2016 and relevant IS code so as to satisfy the criteria of DFS (Delhi Fire services) criteria. The spacing shall however be in conformity with the drawings and properly coordinated with electrical fixtures, ventilation ducts and grills and other services along the ceiling. Sprinkler head shall be of brass quartz bulb type with a temperature rating of 68 Deg. C. Sprinkler heads shall be of as per

B.O.Q..

Alternatively sprinklers may be of side wall type with fusible link for operation.

Sprinkler heads shall be approved by the Underwriters Laboratories (U.L.) or Fire Officers Committee (FOC), Tarrif Advisory Committee (TAC). The finish shall be as specified in Bill of Quantities.

Contractor shall install cabinet fabricated from 16 gauge MS sheet with lockable glass shutters. Shelves for keeping spare sprinklers and spanner at locations approved by the Client's Representative and given in the Bill of Quantities.

5.INSTALLATION CONTROLVALVE:

Installation control valve for sprinkler system shall consist of a vertical alarm valve complete with 50mm dia drain and 15mm test valve with a provision to install water operated turbine alarm. A cast iron sluice valves shall be provided on upstream of alarm valve. The size of alarm valve and sluice valve shall be as indicated in BOQ.

One water operated turbine alarm motor with gong to be provided for each sprinkler installation control valve on the sprinkler main. The alarm shall operate and sound a gong on the drop of pressure and flow of water in the mains. Turbine alarm shall be approved by the Client's Representative and installed at approved locations. The alarm shall be provided with suitable test cock. Both alarm valve and turbine alarm must have TAC/FOC/UL/FM approval/listing.

Installation control valve shall be measured by numbers and shall include upstream
C.I. sluice valve, alarm valve, alarm motor and gong, drain valve, test valve, drain piping (50mm dia G.I. upto 5 M) and all fittings including 2 Nos. pressure gauges required to complete the work.

If required by Client's Representative, at least 10% of all the welded joints shall be radio-graphically tested by the Contractor and half the joints radio-graphed shall be field joints. It will be Contractors responsibility to arrange radiography and other NDT test also.

Contractor shall give the water flow test of pumps as required by the Client's Representative.

COMMISSIONING

SCOPE:

Work under this section shall consist of pre-commissioning, commissioning, testing and providing guarantees for all equipment, appliances and accessories supplied and installed by the Contractor under this contract.

GENERALREQUIREMENTS:

Work under this section shall be executed without any additional cost. The rates quoted in this tender shall be inclusive of the works given in this section.

Contractor shall provide all tools, equipment, metering and testing devices required for the purpose.

On award of work, Contractor shall submit a detailed proposal giving methods of testing and gauging the performance of the equipment to be supplied and installed under this contract. Contractor shall get the thread test between the Fire Department Hose and service connections.

PRE-COMMISSIONING:

On completion of the installation of all pumps, piping, valves, pipe connections, electrical wiring, motor control panels and water level controlling devices the Contractor shall proceed as follows:

Testing of M.C.C.:

Tests to be carried out for motor control centres shall be:

a. Insulation resistance test with 500 volt megger, before and after high voltage test, on all power and control wiring.

b. High voltage test at 3000 Volts A. C. for one minute on all power and control wiring.

c. Low voltage continuity test (6 volts) on power wiring of each feeder, between bus bars and outgoing terminals with switches and contactors in closed position.

d. Low voltage continuity test (6 volts) on all control wiring.

e. Operation test for all feeders with only control supply made “ON” to ensure correctness of control wiring, operation of the various equipment used, such as push buttons, protective devices, indicating lamps and relays, etc. All contactors shall be checked for the earth bus provided in the M.C.C.

f. Operation of all instruments and meters provided on the M.C.C.

FIRE PROTECTIONSYSTEM:

a. Check all valves and close if any valve is open. Check that all suction and delivery connections are properly made.

b. Test run and check rotation of each motor and correct the same if required.

PIPEWORK:

a. Check all clamps, supports and hangers provided for the pipes.

b. Fill up pipes with water and apply hydrostatic pressure to the system as given in the relevant section of the specifications if any leakage is found. Rectify the same and retest the pipes.

COMMISSIONING AND TESTING:

i) Start the sprinkler pump and develop the right pressure in the sprinkler pipes.

ii) Open the test valve to check the automatic starting of the pump. If necessary make adjustments in the setting of the pressure switch. The sprinkler fire alarm should also operate when the test valve is open.

iii) After satisfactory operation of the pump the Contractor shall set up mock fire and test the system

HANDINGOVER:

a. All commissioning and testing shall be done by the Contractor to the complete satisfaction of the STC's Representative, and the job handed over to the client.

b. Contractor shall also hand over to the client all maintenance and operation manuals and all items as per the terms of the contract.

c. Contractor shall arrange the inspection from Local Fire Authority to inspect the systems installed by him. Contractor shall arrange to get the system completion and satisfactory working certificate from the local Fire Authority after the inspections conducted by the Local Fire Authority.

Fire detection and Alarm system

1. These general specification cover the details of equipment to be supplied, inspected as may be necessary before dispatch, delivery at site, installation, testing, commissioning and handing over in working condition of Fire Alarm System and Automatic Fire Alarm System (called FAS and AFAS).

2. Definition of terms:

The definitions of terms used in these general specifications are given in Appendix-II (Terminology).

3.System Engineering:

1.General

FAS/ AFAS installation comprises of trigger devices, automatic as well as manual indicating panels, sounders, power supply equipments including stand by battery unit, system wiring and mimic diagrams.

2.Scope of work:

The scope of FAS / AFAS installation work shall generally comprise the supply, installation, testing and commissioning of the following. The scope shall also include the engineering design of the system, using the equipment offered.

(i) Trigger devices viz. automatic fire detector of the required types and/or manual call boxes.

(ii) Sounders of low intensity and high intensity types.

(iii) Control and indicating panels including repeater panels.

(iv) Standby battery and charging unit.

(v) Mimic diagram (s)

(vi) P.A. System.

(vi) System wiring.

3. Component performance:

All components of FAS /AFAS shall be new and suitable for the environment of installation at site. These shall be satisfactory in operation at voltage deviated by ±10% from the nominal value.

4. Works to be done by the Contractor:

In addition to supply, installation, testing and commissioning of all the equipments and materials as per the schedule of work, the following works shall be deemed to be included within the scope of work to be executed by the contractor, whether or not indicated in the schedule of work.

(i) Extension of the conduit ends up to the FAS / AFAS Equipments and loop earthling as required.

(ii) All minor building work such as cutting and making good the damages.

(iii) Necessary testing equipments.

(iv) Watch and ward of the equipments, materials and installation, till their handing over to the department duly installed and commissioned.

(v) Approval from the concerned fire authorities as may be required as per the local Fire Regulations and byelaws.

5. Inspection of site and collection of data:

The materials shall be dispatched to site of work by the contractor after getting duly inspected by Engineer-in-Charge or his authorized representative.

6. Drawings and manual to be furnished by the Contractor:

(a) The contractor shall submit in duplicate the following drawings within a fortnight of the award of work for approval by the department:

(i) Layout of detectors, manual call boxes and all other accessories.

(ii) Wiring diagram including connection topology for the complete system.

(iii) Circuit diagram of individual panels, P.A. system and detectors.

(iv) Constructional details of the various control and indicating panels and

mimic diagram(s).

(b) Before commencement of the installation:

The above drawings, with observations of the Department duly incorporated, shall be submitted to the Engineer-in-Charge in triplicate along with any special instructions, with regard to handling, storage and installation.

(c) Documents to be furnished on completion of installation:

Three sets of the following documents shall be furnished to the department by the contractor on completion of work:-

(i) Completion drawings

(ii) Manufacturer's technical catalogues of all equipments and accessories.

(iii) Operation and maintenance manual of all major equipments, detailing all adjustments, operation and maintenance procedures.

7. Completion drawings:

Four sets of following laminated drawings shall be submitted by the contractor while handing over the installations to the Department. Out of this one of the sets shall be laminated on a hard base for display in the fire control room. In addition one soft copy shall also be furnished.

(a) Installation drawings giving complete details of all the components/ items such as detectors, call boxes etc.

(b) Line diagram and layout of all electrical control panels and work station.

(c) Control wiring drawings with all control components and sequence of operation to explain the operation of control circuits.

MANUAL CALL POINTS

This section covers the requirements of manual call points (MCP) used in addressable intelligent fire alarm systems.

Constructional requirements of:-

i. It is used to trigger a fire alarm manually, and should be suitable for connection to the system loop technology. The alarm is raised by breaking the glass with the alarm carrying on until a replacement glass panel is fitted or alarm to be made silent from control panel. Suitable arrangement like scratching by a diamond bit shall be incorporated in the frangible element.

ii. A micro switch within the units is held “off” by the edge of the glass when glass is broken the switch is released and a signal is transmitted to control panel where the alarm is raised. The glass is preferably plastic coated to eliminate the damage of splinters causing injury.

iii. For testing without breaking the glass a test key, should be available so as to lower or remove the glass to release the micro switch. Full functional test is achieved accordingly.

iv. Facility for reset/adjustment of manual call point alarm triggering.

v. The unit shall be made out of polycarbonate ABS blend with flame retardant & self extinguishing properties or cast aluminum or ASA plastic or as per manufacturer design and applicable standards.

vi. It shall preferably contain an integrated short circuit isolator which should ensure that a fault is localized and that the loop continues to function fully in the event of a wire break or a short circuit.

vii. The call box shall have suitable provision to knock out of termination of a 20mm conduit. This shall also have suitable provision for being fixed on surface or semi recessed in wall.

viii. The word 'FIRE' shall appear embossed in red color on the front.

ix. Acknowledgement LED displays –red for triggered alarm indication (flashing) and / or maintenance evacuation.

x. Protective category shall be IP54 for indoors & IP65 for outdoors applications.

Intelligent Addressable Fire Detectors

1. Scope

The section covers the requirement of automatic intelligent addressable fire detectors.

2. Type of Detectors

The required types of detectors along with their technical specification are mentioned in B.O.Q.

The technical specification will be followed as per CPWD, DSR 2018 mentioning the details of the technical specification therein.

3. General Features common to all Detectors:

i) Built-in-response Indicator:

Each detector shall incorporate indicator "LED" at the detector which shall blink on actuation of the detector to locate the detector which is operated while on fire. The detector shall not be affected by the failure of the response indicator lamp.

ii) The detector shall have preferably 360^0 visible view of the alarm LED or twin LEDs blink whenever detector is addressed.

iii) The detector shall have preferably with integrated built in short circuit isolator or as per manufacturer design so that in case of any short circuit in the detector, the detector can be isolated so that loop should be able to retain the full functionality or in case built in short circuit isolator not available/ provided by the manufacturer a fault isolator unit shall be provided after every 20 detectors/ devices in a loop. But in later case isolator unit shall ensure that the loop is functional except the faulty detector.

iv.) The detector shall be with IP 54 protection category with base.

v) The detector shall be with built in microprocessor capable of making alarm on control panel based on the information stored in detector.

vi) The detector shall confirm to international standard i.e. NFPA/EN or equivalent.

vii) The detector shall provide electronic address setting by means of configuration software.

viii) The detector shall be plug-in-type and shall have common base to facilitate exchange for cleaning & maintenance. The base of the detector shall be interchangeable with other smoke detectors.

ix) The detector shall be supplied fully tested and each detector should bear the SI. No. and seal of the approving laboratory/body.

x) The detectors, device including response indicator and control panel shall be of same make.

xi) Reversed polarity or faulty zone wiring shall not damage the detector.

xii) The detector shall be suitable for column/ceiling mounting.

xiii) The detector should have static voltage over load protection.

xiv) The detector shall be individually identifiable from the control unit by geographical location in the system.

xv) The detector shall connect to the local control unit via a fully supervised two wire circuit.

xvi) The detector shall be inserted into or remove from the base by a simple push twist mechanism with an appropriate tool.

4. Addressable Beam Detector (Infra-red light detector)

(i) The Beam Detectors shall be long range, projected beam type smoke detectors which consist of a separate transmitter and receiver and evaluating unit integrated into a compact housing.

(ii) The transmitter shall emit an invisible pulsed infra red beam to receiver when beam is obscured beyond selected threshold (20%, 30%,.....70% obscuration) by smoke, the receiver shall signal an alarm. If the beam is completely blocked, receiver shall signal a trouble.

(iii) It shall provide selectable sensitivity and alarm response time for flexibility of installations.

(iv) It shall have a range coverage from 9 mtrs. to 100 mtrs. with up to 16-17 mtrs. spacing between adjacent detectors on smooth, flat ceilings.

(v) It shall have automatic environment compensation.

5. Addressable Heat Detector:

Type of Heat Detectors as given in Central Public Works Department General Specifications For Electrical Works 2018,Part-VI Fire Detection And Alarm System 2018 (Section-3 Part A-3.3, 3.51, 3.5.2, 3.5.3 & 3.5.4). The bidder has to comply the CPWD specifications in this regard. The heat detectors will comply the following also.

(i) The detector and transmission electronics in the detector head for easy exchange in the event of malfunction. Therefore no electronics are permitted in base.

(ii) It has maximum triggering temperature programmable from 58^0 C to 81^0 C.

(iii) It has high level of immunity to electromagnetic influences.

(iv) The alarm signal when limit temperature is reached is given in Para (ii) above.

(v) Automatic addressing during initial set up or exchange of the detector, without making adjustment of detector.

(vi) Adjustment of the maximum temperature value in combination with or without the temperature differential value.

(vii) Theft protection to protect against unauthorized removal of the detector from base can be available.

6. Addressable optical- Thermal (Multi Criteria Detector):

i) The intelligent multi criteria detector shall have photo electric and thermal technologies in a signal sensing device.
ii) The device shall include to combine the signal of the thermal sensor with the signal of the photoelectric signal in an effort to react in the event of a fire condition.
iii) It shall have an ability to distinguish between a fire condition and a fire alarm condition by examining the characteristics of the thermal and smoke sensing chambers and comparing them to database of actual fire and deceptive phenomena.

7. Intelligent Duct Smoke Detectors

i) The smoke detectors housing shall accommodate either an intelligent ionization detector or an intelligent photo electric detector of that provides continuous analog monitoring and alarm verification from the panel through a control module in the loop system.

ii) When sufficient smoke is sensed in the return air coming to AHU (Detector unit has to be installed in return air path) an alarm signal is initiated at FACP to close the fire damper and prevent the rapid distribution of toxic smoke and fire gases throughout the areas served by duct system.

8. Detector Base:

i) The detectors of all types shall fit into a common type of standard base.

ii) Once a base has been installed, it shall be possible to insert, remove and exchange different types of detectors by a simple push & twist movement.

iii) The standard base shall be equipped with screw less wiring terminals suitable for securing wire size upto 1.5sqmm and with built in strain limits to prevent permanent terminals deformation and weakening of contact pressure.

iv) It shall have a sealing plate, prevent dirt, dust condensation or water from the conduit reaching the wire terminals of the detector contact points.

v) All standard base shall be supplied with a removable dust cover to protect the contact area during installation and construction phase of the building. It must allow the inspection and verification of the zone wiring before insertion of any detectors.

vi) The standard base shall have a built in mechanism, which allows mechanical locking of any installed detector head, thus preventing unauthorized removal or temperin while maintaining.

vii) Reversed polarity or faulty zone wiring shall not damage the detector.

9. Intelligent Addressable Monitor Module

i) The module shall be suitable to monitor the polling of up to minimum four potential free contacts by using a single or multiple housing and designed for surface or flush mounting.

ii) The operating mode can be selected and is assigned separately for each input the addressing of the module and the setting of parameters should be carried out using PC software, via the fire alarm control panel.

iii) The module should contain an integrated short circuit isolator which ensures that the fault is localized and the loop continues to function fully in the event of a wire break or a short circuit.

iv) The module should be minimum IP 40 protection category when housed in a case or as per manufacturer design.

v) The module should be with soft addressing to be set with a PC via fire alarm panel at the time of programming.

vi) The module should have integrated buzzer force signalling maintenance alarms.

vii) An LED shall be provided that shall flash under normal condition indicate that module is operational.

10. Intelligent Addressable Relay / Control Module

i) Relay module may contain upto four relays each with a potential free changeover contact.

ii) Each relay contact should be FAIL/ SAFE programmable, means it should be possible to program each contact to operate in three conditions viz. No Fire Condition, Fire Condition and Loop Power Failure Condition.

iii) Both the addressing of the module and setting of parameters to be carried out using PC software via the fire alarm control panel.

iv) The module contains a short circuit isolator, which ensures that the fault is localized and that the loop continues to function fully in the event of a wire break or a shot circuit.

v) The module should be minimum with IP 40 protection category when housed in a case or as per manufacture design.

vi) It should have integrated buzzer for signalling maintenance alarms.

vii) Its housing have is designed for surface or flush mounting.

11. Isolator Module:

i) The module shall limit the number of module of detectors that may be rendered inoperative by a short circuit on the loop segment.

ii) At least one isolator module shall be provided for each floor or protected zone of the building.

iii) If a wire short circuit occurs, the isolator module shall automatically open circuit (disconnect) the loop. When the short circuit condition is corrected, the module shall automatically reconnect the isolated section.

iv) The module shall not require any address setting and its operation shall be automatic. It shall not be necessary to replace or reset an isolator module after its normal operation.

v) It shall give information on the control panel in the form of audio- visual alarm enunciations along with list of detectors which have become non-functional.

Addressable Fire Alarm Control Panel

This section covers the requirements of main fire alarm, control panel, repeater panel, graphical management system, response indicator etc. used in addressable fire alarm system.

1. Functional Requirement General

i. In the event of fire alarm but not in a fault condition, the exact location shall be shown on the Main Fire Alarm Panel (MFAP).
ii. Local sounder should sound automatically.
iii. Complete information shall be printed with time and date of occurrence.
iv. Air handling units on the effected zones shall be automatically switched OFF and respective fire dampers shall also be closed.
v. Pressurization fans of staircase shall automatically be switched ON.
vi. The audio portion integrated to the system shall direct the proper signal (tone or voice) to the appropriate speaker circuits.
vii. Pre-recorded alarm messages shall be played on the Public Address System.
viii. The panel shall have the facility to process the input signals and control the output functions either directly or through interface modules as per the requirements.
ix. The panels shall have necessary interface units for addressable detectors alarm output modules for external actuations through fail safe programmable relays.
x. The processor shall interact with the other modules through a common bus.
xi. The system shall store all basic information and job specific data in memory.
xii. Different password shall protect any change to system operations.
xiii. The design of the panel hardware and software shall incorporate the capability to accept additional input from fire protection system such as sprinkler and water flow switch, operation of fire dampers, pressurization fans etc.
xiv. The panel shall have an extra loop card to serve as standby in case of burn out or malfunctioning of any operating loop cards.
xv. The panel shall be totally enclosed, dust and vermin proof.

2. Type of control and indicating panels:

Following are the types of control and indication panels in Addressable Fire Alarm Control Panel:

i) Intelligent Addressable Main Fire Alarm Control and Indicating Panel.

ii) Graphical Fire Alarm Management System.

iii) Intelligent Repeater Panel.

iv) Intelligent Response Indicator

v) Talk Back System/Fire Fighter Telephone Systems.

3. Addressable Fire Alarm Control Panel (FACP)

1. The addressable Fire Alarm Control Panel (FACP) shall function as a network panel & also as a fully stand alone panel. FACP shall have its own microprocessor, software and memory. In the event of failure of panel or communication breakdown between the networked panels the FACP shall automatically operate on stand-alone mode without sacrificing any functions (The networking should be peer to peer). Information of all panel in the network should be available on all individual panels.
2. The panel should be modular microprocessor based in nature and should be expandable from single loop up to 10 loops.
3. FACP shall supervise detection circuits and shall generate an alarm in case of abnormal conditions.
4. FACP shall provide general purpose inputs for monitoring such functions as low battery on AC power failure. FACPs shall provide tamper protection and commendable outputs, which can operate relays or logic level devices.
5. Smoke detectors shall be powered using the FACP based smoke detection circuits FACPs shall provide control for resetting smoke detectors, fault isolation and sensor loop operations. It shall be possible to mix different fire devices within same FACP to optimize field wiring.
6. It shall be possible for the panel to have a loop length with different modules offering 1.5km length of devices from the panel.
7. FACP shall provide monitoring and control of one floor or area or for multiple floors or areas. FACP shall meet the following requirements to assure the integrity and reliability of the system:

4. The FACP shall have the following

1. The FACP should have integrated power distribution module and fixed cabling done internally to guarantee a clear and tidy cable feed

2. The panel should have an LCD display with minimum 300 characters and keypad. The Display should enable a flexible design of the operating menu with variable keys and message windows fixed keys should be used for standard operating steps e.g. for fire alarm securities supervisory trouble and other events. The current status of the system should be displayed by LED's interfaces (RS232) enable the connection to a PC.
3. The panel should have a 230V AC power supply unit in plug in design with rack and panel connector and 24VDC /6Amp. single output power supply. The module should be protected against over voltage and reverse polarity. The output voltage is monitored and regulated externally.
4. LCD display at the FACP shall be provided to indicate point of alarm or trouble. In Such systems means for manually scanning the points in trouble shall be provided and a trouble and alarm LED shall be used to indicate that there are points in alarm / trouble. The alarm /trouble LED shall only get switched off when all alarm/ trouble are cleared from the loop.
5. It shall be possible to command test, reset and alarm silence from the FACP.

5. FACP switches shall allow authorized personnel to accomplish the following, independent of the central console.

a) Acknowledge a general alarm condition.

b) Silence the local audible alarm.

c) It shall be possible to silence the alarm indicating devices (hooters).

d) Reset all zones (logical Point Group) / points, after all initiating devices have returned to normal.

e) Perform a complete operational test of the memory with a visual indication.

f) Test all panel LED's for proper operation without causing a change in the condition of any zone (Logical Point Group).

6. Walk test –The system shall provide both a basic and advanced walk test for testing the entire fire alarm system including testing of all devices, detectors module etc. in the complete system.
7. Software zones/loops shall be circuited and protected by fault isolators such that in the event of a zone/loop short–circuit, smoke and thermal sensors shall be located and shall report alarm and fault isolator unit after every 20 detector or devices in a loop isolates the part.
8. Monitoring modules shall be provided to monitor and address contact-type input devices. The monitor module shall be housed in the FACP supervised by FACP.
9. The FACP shall have drift compensation facility to compensate for environment. When a detector accumulates dust in the chamber and reaches an unacceptable level but still below the allowed limit, the control panel shall indicate a maintenance alert warning. When the detector accumulates dust in the chamber above the allowed limit, the control panel shall indicate a maintenance urgent warning.
10. The FACP should be NFPA/EN listed approved to provide the sensitivity measurement and documentation required.
11. FACP shall be backed up with its built in UPS power or can be powered separately.
12. The display on FACP shall provide indication for AC power, system alarm, system trouble/security alarm, display trouble and signal silence to this would mean that in the event of change of any detector/zone sequence alterations, the operator can initiate these by use of the LCD & alpha –numeric keys on the FACP panel to reconfigure the above parameters.
13. Power supply unit of FACP shall have following characters:

    (a) The main power supply shall be 230V AC ±10% 50Hz ± 3% and shall in turn provide all necessary power of FACP.

    (b) It shall provide a separate battery control module with charger. The battery should last for 24 hours minimum in normal operation upon power failure & 30 minutes in alarm condition.

    (c) For ease of service, all wiring terminal blocks shall be plug-in type.

(d) The fire alarm panels shall have a possibility of being interlinked by direct connectivity or an optical cable link between the various locations and should further have connectivity to the main control center.

14. Each loop shall have minimum 99 detectors/devices.

15. There shall be minimum 20% spare capacity in the looping system for future expansions. The firm has to intimate the maximum number of devices/ detectors can be connected in one loop based on the manufacturer design . Some devices need external supply and some devices supported by loop power.

16. The length of loop shall not exceed more than 3000 meter for wire size 1.5sq mm. as per manufacturer recommendations.

17. Each loop should not be divided into more than 8 fire zones.

Graphical Fire alarm management system

1. The fire alarm management system shall be a multiuser graphical management system to centrally monitor and operate the fire alarm system by a computer having a graphical software.
2. All the messages and status of the connected detectors & devices with main control panel shall be displayed on the PC monitor to operate via keyboard and mouse. All devices & detectors should be visible on building plans superimposed in fire alarm system.
3. The modular expansion of the system should be possible by adding software modules.
4. Power graphics with a dynamic zoom function should be available.
5. The system shall have password system with individual password and access privileges shall also be available.
6. The system should be capable monitoring status of detector. The status of each detector be monitored by the fire alarm system.
7. The operator should be able to adjust the sensitivity of any detector.
8. The operator should be able to define the entire database for the fire system.
9. The operator should be able to acknowledge alarm or trouble messages by the fire alarm system.

Intelligent Repeater Panel

(i) The repeater panel shall be active repeater panel with all the controls and monitoring as on the main fire alarm panel.

(ii) The panel shall be functioning as a controller.

(iii) The panel shall allow remote command in the system reset, trouble and alarm silence and manual alarm.

(iv) A keyed switch shall enable or disable the keys.

(v) The panel shall be compatible with the analog fire detection and alarm main control panel.

(vi) It shall be programmable to display information for the entire system i.e. all panels in the network.

(vii)It shall have minimum 80 characters LCD display (display system status). The back lit display repeats the status, trouble and alarm messages displayed at the fire detection and alarm panel in English text.

(viii) The system text displays shall include: Alarm missing point trouble; system test, service, local system test, extra custom test by polling circuit and address.

(ix) It shall have an internal trouble buzzer .

(x) It shall be possible to connect up to 4 repeater panels with each fire detection & alarm panel.

(xi) It shall annunciate alarm and trouble conditions.

(xi) The repeater panels will be installed at the entrance of the building so that in case of emergency the security personnel can rush straight to the trouble point.

Installation requirement of repeater panel:

1. Response indicator:
    a) The response indicator shall be used to locate a fire alarm if the detector's LED cannot be seen (i.e. it is hidden by false floors, false ceilings etc.). When a detector is set off, as well as the alarm message being sent, unit response indicator is also activated and flashes red.

b) The response indicator shall loop powered and separate power supply shall not be required.

c) Remote response indicator shall be installed outside the areas normally kept closed to identify the detect or response even if the room is locked. These indicators shall be able to indicate the status of the corresponding detectors in these areas.

Installation of Response Indicator:-

(i) Response indicator shall be installed on wall such that its top is at door level and by the side of the entrance to the respective premises.

(ii) Response indicators for detectors installed over a false ceiling in a corridor shall be installed directly under the false ceiling.

(iii) No panel or management system shall be located inside any room the building or in a room of severe environment conditions.

(iv)The panel shall be positioned in “Fire Alarm Control Room” in a building or any other conspicuously sited location so as to be visible without effort on entering a building and as per the drawing approval by STC.

(v)The panel shall be either wall mounted or floor mounted.

(a) Response indicators for detectors under a false floor shall be installed at a height of 1 mtr. above false floor level. Additionally, a marking of an arrow pointing downwards shall be made by the side of the response indicator.

(b) The installation shall be such that visual indications from the response indicators are conspicuous and the affected area is spotted without difficulty.

Talk Back System/Fire Fighters Telephone Systems:-

(i) Fire Fighters Telephone System Panel:-

Fire Fighters Telephone System Panel shall be microprocessor based with its own microcontroller, memory, communication modules, intelligent initiating and indicating

devices and suitable SMPS. The panel shall be suitable for required number talk back unit connections. The fire fighters telephone system will have integral talk back system to provide a 2 way voice communication between the fire fighters telephone. The talk back system shall include fire fighter master control console with a backlit LCD display for status display and a fire fighters telephone handset, standby battery for 24 hours in operation and half an hour alarm condition. The Fire Fighter Telephone System shall also include the following:

A red colored master telephone handset with flexible coiled self winding five feet cord placed within the fire fighters telephone system panel housing:-

The Fire Fighters Telephone Systems Panel shall include:-

- Indicating High power LEDs

- Input power supply : 230 volts AC 50Hz single phase supply 17-28V DC through rectifier, sealed maintenance free battery including trickle/Booster battery charger. Fire fighters telephone system panel housing shall be Dust and vermin proof cold rolled steel sheet 16 gauge powder coated with see through glass front Fire fighters Telephone system shall be able to withstand 10^0 to 490^0C and upto 93 % RH non condensing type.

Fire fighter Telephone system shall be able to be integrated with building and control system and Public Address System.

(ii) Talk back Units/Fire Fighters Telephone:-

Red Colored fire fighters telephone of rugged ABS plastic construction with 1500 mm coiled cord, a hook switch and the telephone jack placed in a surface mounted cabinet of 18 gauge CRC sheet steel construction with a hinged lockable door and a break glass full front panel labeled. Fire Fighters Telephone including painting with two coats of red synthetic enamel paint over one coat of primer.

ADDRESSABLE INTELLIGENT SOUNDERS AND SILENCING SWITCHES

1. SCOPE

This section covers the requirements of sounders and silencing switches used in fire alarm systems:

2. Type of Sounders:

(i) Panel Sounders (ii) Addressable Loop Fire Alarm Sounders.

3. Functional requirements:

Panel Sounder shall be provided in specified fire alarm panel, repeater panel if any so as to draw attention of the caretaking personnel in a building to a fault in the FAS wiring and a fire condition in the protected premises.

Fire alarm sounder of low intensity type shall be installed to signal to the occupants of the building to evacuate in the event of a fire.

Fire alarm sounders cum strobe of high intensity types shall be installed to draw the attention of the fire fighting personnel towards the main location of fire in the premises where a fire has erupted. The strobe should have a light intensity of 15cd. To100cd.

Fire alarm sounders shall not be used for any purpose other than for fire operations.

Silencing facility shall be provided only for panel sounders and not for fire alarm sounders.

It shall be designed Suitable for ceiling mounted or wall mounted.

Operation of sounders and silencing

1. Panel sounders shall be actuated automatically from the control panel.
2. Panel sounders shall be actuated automatically as soon as fire alarm signal is initiated from any trigger device connected to them. These shall also be sounded when there is a fault alarm signal within their areas of control.
3. A silencing switch shall be provided in the panel. Operation of this switch shall mute the audio output from the panel sounder in this panel and in its repeater panel, if any. Silencing switch shall also be provided in repeater panel which when actuated shall mute the audio output in the panel only.

4. Fire alarm sounders in a zone affected by a fire shall be actuated automatically as soon as fire alarm signal is initiated from any trigger device in that zone. All other fire alarm sounders shall be actuated only automatically from the fire alarm panel.

Sounders

Installation Requirements:

1. Low intensity fire alarm sounders may be installed on surface of ceilings, suspended from ceiling or recessed in flush with the ceiling, depending on the construction of the sounder and ceiling height.
2. These shall be installed at a height not lower than 2.4 mtrs. except when recessed in a false ceiling of lower height. In such cases the sounders shall be recessed at false ceiling level.
3. When installed flush with a false ceiling these shall match the ceiling surface. Necessary provisions such as wooden boxing or frame work to accommodate the sounders shall be made in the ceiling in advance.
4. (d) High intensity sounders shall be mounted or substantial supports. Provisions for terminating the electrical wiring cables shall be such as not to permit entry of rain water through the wiring conduits or cable runs.

The frequency of sound from sounders shall lie in the 500-1000 Hz band. The sound level shall be at least 65dB (A) or 5dB (a) above or any other noise likely persists for a period longer than 30 second at any part of the building sounders with a level greater than 120 dB (A) shall not be provided.

The sound shall be continuous although the frequencies and amplitude may vary and of the same characteristics from the fire alarm sounders in a building. Coded fire alarm signaling from sounders shall not be provided which may cause hearing damage.

'Fault alarm' and 'Fire alarm' in a panel sounder shall be distinctly different.

The sounder shall be with IP 54 protection category.

It shall conform to EN/NFPA/Indian standards.

The volume of sounders can be adjusted from the fire detectors control panel. Minimum three volume setting from fire alarm control panel shall be available.

The strobe cum hooter are two wire devices that offer tone choices of either continuous horn or temporal tone when constant voltage from fire alarm control panel is applied. Each tone has minimum three volume levels that can be selected for installation.

The strobe cum hooter installed at entrance of building should have three tones programmable from the fire detector control panel so that at least one of these tones can be selected to comply with at least 110dB (A) frequency range of 440Hz to 2850 Hz. The Volume should be adjustable from control panel.

The strobe should have a light intensity from 15 cd to 110 cd.

MIMIC PANEL

This Section covers the requirements of mimic panel to be provided as part of a Fire Alarm Systems for remote display.

1. A clear indication of the locations of all the ZONES shall be provided in mimic panel.
2. It shall be provided at a remote location wheresoever's required.
3. A topographical representation of the premises shall be provided in the mimic diagram for the purpose.
4. The construction shall either in a metal frame work or plastic housing or as per manufacturer design suitable for wall mounting.
5. The panel shall have alarm LED's display in red, yellow or a combination.
6. One set of LED's represent one Zone.
7. The mimic panel (Remote Display) shows the display of malfunctions and/ or alarm for detector or detector zone.
8. It shall have Built-in-isolator to maintain complete functions of all elements in loop if wires are broken or if there is a short circuit.
9. It shall monitor data communication between control panel/panels.

Locations: In Guard room/ Security rooms of the campus /Main Gates / Entrance Gates.

POWER SUPPLY EQUIPMENT AND WIRING

This section covers the requirements of power supply equipment for the addressable Fire Alarm System (AFAS) and the wiring for the system.

1. Main Supply

   Power supply at 230 + 10% V, 50Hz, AC single phase shall be provided by the department, terminating directly into the incoming switches of the C&I panel. Earth wire shall also be provided with the power supply. Rectification of the input AC supply into DC and further stabilization of the voltage as may be necessary shall form part of the FAS equipment.

2. Stand by battery supply
   1. Standby battery shall be provided with Fire Alarm Control Panel.
   2. Battery supply shall be arranged to automatically feed the FAS in the event of variation of input A.C. voltage beyond preset values on high and low sides.
   3. The battery shall be sealed completely maintenance free. The battery shall be conforming to relevant Indian/International Standard. The normal voltage shall be suitable for the AFAS. The Capacity of the battery shall be suitable to feed the fire alarm panel and other addressable loop elements for a period of 24 hours upon a normal power failure and after which sufficient battery shall remain to provide full load operation for at least 30 minutes in line with IS 2189.
   4. Installation:
      Battery shall be located in the main fire alarm panel.
3. Battery Charger
   1. The power supply in the fire alarm panel shall be in-built automatic battery charger suitable to charge the batteries as per the requirements of relevant standard.
   2. The charger shall be complete with necessary voltmeter, ammeter, indicating lamps, fuses etc.
   3. It shall have protection from overloads and short circuits on both AC & DC sides.
   4. It shall have protection to prevent discharge through the charger.
4. Wiring for FAS/AFAS

   1. Circuit Design:

   (i) The loop element (Smoke Detectors Heat Detectors, Manual Call Points, Monitor Modules Control Modules, Loop Sounders) wiring in AFAS shall be closed circuit loop type (Class A type), so that if the communication fails from one side, it

is restored automatically from the other side. The wiring shall be independent of the detector zoning. The Zones shall be software based.

(ii) The design of the system wiring shall match the control and indicating equipment in the system.

2. Wiring Materials:

(i) The wiring shall be PVC insulated 2 core 1.5 Sq mm FRLS shielded copper Conductor stranded cables in red/black color and generally confirming to IS-694-2010 and meet the signal cabling requirements.

(ii) The strand of cables shall not be cut to accommodate & connect to the terminals. The terminals shall have sufficient cross sectional area to take all the strands.

3. Installation requirements:

(i) The electrical work connected with a FAS shall be carried out in conformity with CPWD general specification for electrical works Part-I (Internal) 2013, and part-II (external) 1994, both amended up to date.

(ii) In no case the FAS equipment or connections be mounted in or on boxes, cover plates or blanks carrying the accessories or connections of any other service.

(iii) FAS wiring shall be exclusive to the FAS and be physically separated from wiring for any other service in the building.

(iv) Wiring for different circuit voltages in a FAS shall be in separate conduits.

(v) To minimize possible disruption due to fire or other causes, fire alarm circuits should be separated as much as possible from each other. Where practicable, the different fire alarm circuit shall be run through different routes.

(vi) The metal body of all control and indicating panels shall be loop earthed using 2.5 sqmm copper wire and bonded to the earthling system in the building

SMOKE MANAGEMENT SYSTEM

1. The contractor will have to ensure the installation of smoke exhaust system as per the requirement of National Building code 2016, irrespective of the fact whether specifically mentioned in the tender document or not.
2. The technical specifications of the various components have been elaborated in the tender documents.
3. Works should be carried out as required in B.O.Q. as per relevant IS and CPWD/DSR (Delhi Scheduled of rates) standards
4. The details of the equipment for Supplying installation, testing and commissioning is well described in Bill of quantities which is self-explanatory
5. Contractor should ensure the proper size of the motor/ fan for the compliance as per NBC-2016.
6. Contractor is advised to visit the site before quoting so as to avoid any confusion at later stage.
7. Smoke management is divided in to 3 segments. The contractor has to supply and install all the segments as detailed below. The works will have to take up as to satisfy the NBC-2016 standards whether specifically mentioned or not.
   (a) Lift lobby pressurization system
   (b) Lift well pressurization system
   (c) Stair pressurization system
   (d) Basements (1,2) smoke exhaust and fresh air intake system
8. The contractor should ensure proper designing of the system so as to ensure pressurization as required as per NBC code. The size of duct, louvers, inlet, outlet, support system , path, location air inlet system outlet system, filters, dampers, various accessories etc. will be designed by the Contractor to satisfy the requirement of NBC-2016/ DFS rules and the same in details should be get approved by the Engineer In-charge before start of the work..
9. The civil works as required will also be taken up by the contractor without any extra cost beyond the tender terms. Contractor will have to ensure that building should not be adversely affected by undertaking civil works.
10 .Technical requirement of the works needed is elaborated in the Bill of quantities section.

11. LIST OF BUREAU OF INDIAN STANDARDS CODES

Following relevant IS codes shall apply read in concurrence with their latest amendments.

IS 3768 : 1996 and amended therafter

IS 655 (2006): Specification for Air Ducts

IS:226-1975 Specification for structural steel

IS:277-1992 Specification for galvanised sheet (plain and corrugated)

IS:325-1978 Specification for three phase induction motors

IS:554 – 1975 Dimensions for pipe threads where pressure tight joints are required on thethreads.

IS:655-1963 Specification for metal duct

IS 659-1964 (1991) Safety code for air-conditioning (resived)

IS:778-1984 Specification for copper alloy and gate , globe & check valves for waterworks

IS:780-1984 Specification for sluice valves for water works (50 to 300 mm size)

IS:800-1984 Code of practice for general construction in steel

IS:808-1964 Specification for rolled steel beam channel and angle section

IS:816-1969 Code of practice for metal arc welding for general purpose in mild steel

IS:823-1964 Code of procedure for manual metal arc welding of mild steel

IS:1239-1979 (Part 1) MS tubes,tubulars and other wrought steel fittings

1990

IS:1239-(Part 2) –1992 MS tubes tubulars and other wrought steel fittings

IS:1536 - 1976 Flanges configuration

IS:1554-(Part 1) –1976 Specs for PVC insulated (heavy duty electrical cables)

IS:2253-1974 Designation for types of construction and mounting arrangement of rotating

electric machine.

IS:2312-1967 Specs for propeller type AC ventilating fans

IS:2379 - 1963 Colour code for the identification of pipelines

IS : 3103-1975 Code of practice for Industrial Ventilation

IS 4064 - (Part -II) 1978 Specific requirements for the direct switching of individual motors.

IS: 4736 - 1968 Hot-dip zinc coatings on steel tubes

IS: 4894-1987 Test Code for Centrifugal Fan.
IS : 7240-1981 Application & Finishing of thermal insulation material
IS:8544 (Part-I to IV)
1979 Starters
IS:9224 (Part II) - 1979 HRC cartridge fuse links upto 650 volts.
IS:3069-1965 Glossary of terms, symbols and unit relating to thermal insulation material
IS:3346-1980 Method for the determination of thermal conductivity thermal I insulationmateral (two slab, guarded hot plate method)
IS:3588-1966 Specification for electric axial flow fans
IS:3589-1981 and 1991 Seamless or electrically welded steel pipes for water, gas and sewage (168.3to 2032 mm outside dia)
IS:3724-1966 Specs for cartridge type heating elements (non embedded type)
IS:4158-1967 Specs for solid embedded type electric heating elements
IIS:4671-1984 Specs for expanded polystyrene for thermal insulation purpose
IS:4691-1984 Degree of protection provided by enclosure for rotating electrical machine
IS:4722-1968 Specs for rotating electrical machine
IS:4729-1968 Measurement and evaluation of vibration of rotating electrical machine.
IS:4831-1968: Recommendation on units and symbols for Refrigeration
IS:4894-1987 Specs for centrifugal fans
IS:5111 -1993 Testing of Refrigerating compressors.
IS:5512:(Part 1) –1984 Specs for swing check type (non return) for water works purposes.
IS:6272-1971: Specs of industrial cooling fans
IS: 6392-1971 Specs for steel pipe flanges
IS:6168-1976 Code of practice for treatment of water for industrial cooling system
IS:7616-1975 Method of testing panel type air filters for air conditioning and ventilation purposes
IS;8623 1977 Specs of factory built switch / control section.
IS:8623(Part3) 1993: Specs for low voltage switchgear and control gear assemblies

IS: 8789- 1978 Values of performance characteristics for three phase induction motor

IS:9137-1978 Code for acceptable tests for centrifugal, mixed flow and axial pumps classC

IS:9338-1964 Specs for Cl screw down stop valves on stop and check valves for waterworks purpose

IS-13947 (Part-1)1993 Specs for low voltage switchgear and control gear.

12. In case of any revision in above BIS code the REVISED one shall only be applicable.

Fire Proof Doors

1. The Contractor will dismantle the doors installed at Staircase, lift lobby door without damage to the nearby structure of JVB.
2. The contractor will do Supplying, installation, testing & Commissioning of new doors in the place of old doors of the Building as per the requirement of NBC-2016 including all minor, major works and will provide make good doors . The technical specs are as below.
3. Payment to the contractor will be made on the basis of area of door (per sq meter) with the other terms of the contract .
4. The contractor is advised to visit the site before bidding so as avoid any ambiguity at latter stage.
5. Technical specs of fire doors

   -2 Hrs. (120 minutes) Fire Rated G.I- Steel Door with Powder Coating As Per IS-3614 & BS-476 Part 20 & 22.

   -2 Hrs GI -Steel Fire Rated Door Single/Double shutter door of Pure Polyester (UV Resistant Grade) 120 Micron Grade Powder coated,

   -120 minutes Fire Rated (for Stability & Integrity) ,Galvanized (Zinc Coated) Steel Door and frame confirming to IS & BS Norms.

   -The Door shall be Provided with all Accessories like Ball Bearing, Vision Glass, Panic Bar / Key , Door Closer , Tower Bolt ,

   -The Door Shutter 46 mm shall be made of 20 Gauge thick GI-steel pressed formed to provide fully flush double skin door shell with lock seam joints at style edges or as per manufactures specifications.

   -The internal construction of the door shutter's to be ADHESIVE with Core Bonded Honey -Com Craft with PU Cyanoacrylate and Acrylic Thermosetting Adhesives insulation material to be provided for structural rigidity e.i as per norms. Stability , Integrity, and Insulation for 2 Hrs. Fire Rating. phenolic resin impregnated specially designed honey comb craft paper with suitable internal reinforcement.

-The door frame made from 18 Gauge GI steel pressed to Single Rebate 100 X 57 mm profile for better structural strength. Frames are to be fixed with fasteners. The gap between the frame & shutter should not exceed 3mm on all side except at the bottom where the gap can go upto a maximum of 10 mm.

-The frame to be provided with 3 mm thick base plate and duly reinforced; pre-machined for receiving hardware &Hings arrangement & The entire assembly to be prefinished -factory finished heat ovened, powder coated, & made as per approved architectural drawings.

-The shutter shall be provided with Panic Bar, Vision Panel with Clear fire rated glass with matching beading all around etc. complete as per approved architectural drawing. ----Approx. Size of Single Door 2.1 Mtr x 1.4 Mtr.

6. Contractor will also supply, install and commission new doors in the Fire shaft on all floors in place of existing broken doors. The specs will be as below.

   The new door will be Standard shaft door as to meet shaft sizespace, made of not less than 18 swg MS CRCA sheet having louvers (as required by STC) with glass (minimum 5 mm thick), and hinges including necessary locking arrangement with Chest handle as required, painting (Powder coated with proper treatment process), including painting (RED Powder coated) with "FIRE SHAFT " legend.

Electrical Works:-

1. The Contractor will follow the technical specifications as mentioned in CPWD specifications and/or relevant IS (Indian Standards) irrespective of the fact whether mentioned in the tender document or not.
2. Contractor will have to adopt all safety precautions while carrying out electrical works as per Indian Electricity Rules/Codes.
3. Contractor will be solely responsible for any unpleasant accident/eventuality during the execution of the works
4. Major works under electrical category are as below, besides supply and installation of various electrical panels, pumps, motors, fans, etc.
    a) Electrical distribution system: Contractor will supply install the electrical distribution MCBs, MCCBs, switches, etc in the designated electrical DB rooms in Jawahar Vyapar Bhawan and proper earthing of existing electrical network, as per technical specifications and BOQ.
    b) Lightening arrester and Earthing: Contractor will have to install lightening arrester and chemical Earthing as per technical specifications and BOQ.
    c) Gas flooding system for firefighting: The contractor will have to install Gas flooding fire extinguisher system in 11 KV breakers, panels, 415 volt panels, switch gear, 11 KV/415 volt transformers etc.
    d) The building is housed with 11 KV substation meant to meet the electrical supply to the building as well as to the various top most VVIP locations. Hence, contractor should have prior experience of working on 11 KV systems for frequent operation of the breakers ensuring no black-out of the supply to the VVIP areas. The contractor will be solely responsible for coordination with NDMC authorities for permission/consent for the installation of Gas flood system in the 11 KV sub-station.

Specifications

1. Codes and standards

    The equipment covered by this specification shall unless otherwise stated be designed, constructed and tested in accordance with the requirements of the Indian Electricity Act and Rules and latest revision of the following standards.

    IS 159: Bus bars & bus bars connections IS 11448 :AC Electricity Meters.

    IS 1248 : Direct acting electrical indicating instruments.

IS 2419 : Dimensions of panel mounted electrical indicating and recording instruments.

IS 2705 : Current Transformers.

IS 3231 : Electrical relays for power system protection.

IS 3842 : Application guide for electrical relays for AC System.

IS 8623 : Factory built assemblies of switchgear and control gear for voltages up to and including 1000 V AC and 1200 V DC.

IS 8588 : Code of practice for thermostatic bimetals Part I general requirements and method of tests.

2. Design requirement

2.1 The switchboards shall be designed for 400/440 V, 3 phase 4 wire, 50 Hz supply.

2.2 Switchboards shall be suitable for direct–on–line starting of all motors.

2.3 Control power supply of the Switchboards shall be 415 Volts, single phase, 50 Hz AC supply tapped for the respective module itself.

2.4 The switchboards manufacturers shall apply all derating factors necessary to all components of the switchboards to comply with the conditions detailed in this specification.

3. Constructional features

3.1 The switchboard shall: -

a) Be of the totally metal enclosed, indoor, floor mounted, free standing cubicle fixed type fuse switch units with compartmentalized design.

b) Be made up of the requisite vertical sections, which when coupled together shall form continuous dead front switchboards.

c) Provide dust and damp protection, the degree of protection being not less than IP 54 to IS 2147.

d) Be readily extensible on both sides by addition of vertical sections after removal of the end covers.

e) Have access to the feeders, bus bars, cable termination, cable alley etc. from front only.

3.2 Each vertical section shall comprise

a) A front framed structure rolled/folded sheet steel channel section, of minimum 3 mm thickness, rigidly bolted together. This structure shall house the

components contributing to the major weight of the equipment, such as circuit breaker cassettes, MCCB, MCB, MPCB main horizontal bus bars, vertical risers and other front mounted accessories.

b) The structure shall be mounted on a rigid base frame of folded sheet steel of minimum 3mm thickness and at least 75mm height. The design shall ensure that the weight of the components is adequately supported without deformation or loss of alignment during transit or during operation.

c) Each compartment shall be provided with a hinged door interlocked with switch/breaker housed inside the compartments so that door cannot be opened unless the switch breaker is in 'OFF' position.

d) The design shall ensure generous availability of space for ease of installation and maintenance of cabling and adequate safety for working in one vertical section without coming into accidental contact with live parts in and adjacent section.

e) A cover plate at the top of the vertical section, provided with a ventilation hood where necessary. Any aperture for ventilation shall be covered with a perforated sheet having less than 1 mm diameter perforations to prevent entry of vermin.

f) Front and rear doors shall be fitted with dust tight neoprene gaskets with easy operating type fasteners designed to ensure proper compression of the gaskets. When covers are provided in place of doors, generous overlap shall be assured between sheet steel surfaces with closely spaced fasteners to preclude the entry of dust. The doors shall have concealed hinges. Removable screwed covers shall be provided on the rear of the cubicles.

g) The height of the panel should not be more than 2200 mm. The working height shall be limited to a maximum height of 1800 mm. The total depth of the panel should be adequate to cater for proper cabling space.

h) Covers and partitions shall be of minimum 16 Gauge sheet steel, whereas doors shall be minimum 14 gauge sheet steel. All sheet steel work forming the exterior of switchboards shall be smoothly finished, leveled and free from flaws.

i) All switches, push buttons etc. shall be operable from the front and shall be flush/semi flush mounted.

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

k) Apparatus forming part of the switchboards shall have the minimum clearances, as per relevant IS clearances shall be maintained during normal service conditions.

l) Creepage distances shall comply with those specified in relevant standards.

m) All insulating material shall be of DMC/FRP/SMC to withstand the effects of high humidity, high temperature, tropical ambient service conditions, etc.

n) Foundation bolts and nuts for each panel shall be supplied along with the respective switchboard

o) The lifting eyes for each shipping section and danger notice plates shall be provided for each switchboard.

p) Functional units such as circuit breakers and fuse switches shall be arranged in multi–tier formation.

q) Metallic/insulated barriers shall be provided within vertical sections and between adjacent sections to ensure prevention of accidental contact with main bus bars and vertical risers during operation, inspection or maintenance of functional units and front mounted accessories.

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

s) Provision shall be made for permanently earthing the frames and other metal parts of the switchgear by the independent connections.

3.3 Metal treatment and finish

a) All steel work used in the construction of the switchboards should have undergone a rigorous metal treatment process.

b) All surfaces to be painted including interior and exterior of panels, and other metal parts shall be chemically treated to remove all rust, scale, grease and other adhering foreign matters using seven tank processes. All parts shall be coated with two coats of highly corrosion resistant primer followed by two coats of synthetic enamel paint (post office red) of approved colour and approved manufacturer. Matt finish of the painting is required.

c) The complete treatment, painting, drying with compressed air and storing operations shall be done in dry and dust free atmosphere.

3.4 Switchboards should finished paint chip off or crinkle during transit/ handling/ installation, the contractor shall arrange for repainting the equipment at site at his own cost.

3.5 Bus bars

a) The bus bars shall be air insulated and made of high conductivity, high strength aluminum alloy complying with the requirements of grade E91E of IS.5082 and suitable for 415 Volts, 4 wire 50 Hz system.

b) The bus bars and connections shall be suitably supported / braced with no hygroscopic DMC/FRP/SMC supports.

c) High tensile bolts and spring washers shall be provided at all bus bar joints.

d) The bus bars shall be liberally sized and shall have uniform cross section throughout, and shall be capable of carrying the rated current at 415 V continuously. The bus bars shall be designed to withstand a temperature rise of 450 C above the ambient. A current density of 1.3 Amps/Sq.mm shall not be exceeded for aluminum bus bars.

e) All bus connections, joints and taps shall be short and as straight as possible, and applied with contact grease in the mating surface.

f) Bus bars shall be provided with insulating cover to prevent accidental contacts. The neutral bus bars shall have a continuous rating of at least 50% of the phase bus bars.

g) Bus bars shall be encased in colour coded heat shrunk PVC sleeves (snug fit type). An earth bus of size not less than 50 x 6 mm shall run through the length of switch boards at top or bottom as required.

3.6 MCCB : Molded case circuit breaker

a) The Molded Case Circuit Breaker shall be incorporated in the switchboard wherever specified and shall be of the current limiting type. MCCB shall conform to IS 2516, IS 13947–1/ IEC 947–1 (part I & II / section 1) 1977 for general rules. It should be suitable for Horizontal and Vertical mounting and line load reversibility. MCCB shall be suitable either for Single Phase AC 230V Or Three Phase 415V. The MCCB shall be available in four pole versions for neutral isolation. It shall have tropicalization as standard feature.

b) The MCCB cover and case shall be made of high strength heat–resistant and flame–retardant thermosetting insulating material. The operating handle shall be quick make, quick break, and trip–free type. The operating handle shall have suitable ‘ON', ‘OFF', ‘TRIPPED' indicators and in order to ensure suitability for isolation complying with IS: 13947–2/IEC947–2, the operating mechanism shall be designed such that the toggle or the handle can only be in ‘OFF' position if the main contacts are actually separated.

c) Accessories: MCCB shall be designed to have following accessories and it shall be fittable at site.

- Under voltage trip
- Shunt trip
- Alarm switch
- Auxiliary switch
- Remote operation using motor mechanism with facility of using the same in auto/manual mode.

d) Interlocking: MCCB shall be provided with following interlocking devices for interlocking the door of a switchboard.

- Handle interlock to prevent unnecessary manipulations of the breaker.
- Door interlock to prevent door being opened when breaker is in ON position.
- The interlocking device to open the door even if the breaker is in ON position.
- In addition to the above, any other features indicated in the Schedule of Quantities shall also be provided.

e) Breaking capacity: Short time with standing capacities different ratings of MCCB’s shall be as follows:

Sl.No	Ratings	Breaking capacity [Amps] [KA]
01.	Up to 200	20
02.	250 to 400	35
03.	630 to 800	50

3.7 Indicating lamps

Filament type indicating lamps shall be provided wherever called for in the control schematic diagrams. The lamps assembly shall be complete with series resistor, bulbs, holders and lenses.

3.8 Fuses

All control and power fuses shall be link type HRC fuses and they shall be provided with visible indication to show that they have operated.

3.9 Contactors

a) Contactor shall comply with IS 13947–1 for general rules and IS 13947 – 4.1for Standards pertaining to Contactor and Motor Starter.

b) The Contactors shall be capable of withstanding breaking and making capacities per following:

	AC3 category	AC4 category
Making Current	10 x Rated Current	12 x Rated Current
Breaking Current	08 x Rated Current	10 x Rated Current

Contactor shall be capable of withstanding an impulse voltage of 8KV and have an insulation voltage of 1000V.

c) Contactor shall be suitable for aluminum termination with a maximum permissible temperature rise of 65^0C at the terminals with an ambient temperature of 50^0C.ype.The coils shall have three terminals and the insulation should be of class H

d) The auxiliary contact block shall have a switching capacity of 220V, 2A.

e) Contactor shall have one auxiliary in built and it should be possible to have additional NO / NC contacts in steps of two.

3.10 Miniature Circuit Breakers [MCB]:

a) MCB shall be in 1,2,3,4, pole versions. MCB casing shall be made of self–extinguishing, tropicalised material.

b) MCB shall comply with IS 8828–1996/IEC 898–1995. It shall be suitable for use in frequency range 40Hz to 60Hz and shall accommodate AC / DC supply according to requirements. It shall have a trip–free mechanism and toggle shall give a positive contact indication. It shall be suitable for mounting on 35mm DIN rail/surface mounting. It may be installed horizontally, vertically on the ceiling in any place without any change in electrical performance.

c) Line supply may be connected to either top or bottom terminals i.e. there should be no line–load restriction. Degree of protection when the MCB is flush mounted shall be IP40. MCB shall be supplied with clamping terminals fully open. Contact closing shall be independent of the speed of operator. The breaking capacity of the MCB shall be 9KA / 10KA. The MCB shall be capable of being used as Incomer Circuit Breaker and shall be suitable for use as isolator. In case of multiple MCBs in a single location (DB), it should be possible to remove any MCB without having to disturb other MCB in the vicinity.

3.11 Current transformers (CT)

a) Current transformers shall comply with the requirements of IS 2705. They shall have ratios, outputs and accuracies as specified/required.

b) Current transformers wherever required and called for in the single line diagram and/or required shall be furnished.

c) The CTs shall be bar primary in epoxy–encapsulated type, rated for 415 V. The CTs shall be designed to withstand the thermal and mechanical stresses resulting from the maximum short circuit current.

d) The vendor shall ensure that the VA outputs of the CTs are adequate for the relays, meters and loads connecting them.

e) The CTs shall be provided with Class A/Class B insulation and proper polarity markings in a suitable manner.

3.12 Potential transformer (PT)

a) All the Potential Transformers shall comply with the requirements of IS 3156 latest edition. All PT's shall be resin cast type and shall have Voltage ratios, output and accuracy class as specified in Data Sheet.

b) All PT's shall be single phase, dry type suitable for mounting inside the panel / cubicles. Clamps / brackets / supports required for the mounting shall be supplied along with PT.

c) Polarities and Terminal markings shall be clearly marked in all PT's.

d) Name plate indicating, voltage ratio, burden, accuracy class, type, sl.no, make and model etc., shall be provided.

e) A common earth terminal for Earthing of core, bolts, clamps (non current carrying metal parts) etc., shall be provided.

3.13 Instruments & meters

All instruments and meters shall be enclosed in dust proof, moisture resistant, black finished cases and shall be suitable for tropical use. They shall be calibrated to read directly the primary quantities. They shall be accurately adjusted and calibrated at works and shall have means of calibration, check and adjustment at site.

3.14 Indicating instruments

a) Indicating instruments shall be flush mounted with anti–parallel white circular scales with black pointer and with black numbers and lettering. Knife edge pointers shall be preferred. Unless otherwise specified, the size of all instruments shall be 95mm x 95mm type.

b) The dials shall be free from warping, fading and discolouring. Spring controlled instruments shall be provided with front of board zero adjuster, capable of being safely handled while the instrument is in service. Instrument covers shall also have red marks on the dial corresponding to rated values of the associated primary equipment. Synchronizing instruments shall also meet the requirements of this clause.

c) The indicating instruments shall conform to IS1248 and shall have an accuracy class of 1.

d) The Ammeter and Wattmeter current coils shall withstand 200% of rated current continuously and 10 times the rated current for 0.5 seconds without loss of accuracy. Voltmeter and Wattmeter potential coils shall withstand 120% of rated voltage continuously and twice the rated voltage for 0.5 sec. without loss of accuracy.

3.15 Voltmeter

a) Voltmeter shall be suitable for operating directly on LT supply voltage 415V, 50Hz or with a PT as per the requirements.

b) All the Voltmeters used for rated operating Voltage of 415 / 110V as required at 50Hz AC. With a scale as required at site.

c) All Voltmeters are 95 x 95mm, suitable for mounting on the panel.

d) Type, Sl.No, Accuracy class and borders of the Voltmeter shall be indicated on the dial.

3.16 Ammeter

a) All the Ammeters shall be CT operated (5A) with a dial marked for line currents.

b) Type, Sl.No, Accuracy class, Operating Current, Burden etc., shall be indicated on the dial.

c) All Ammeters shall be of panel mounting type and shall be provided with zero setting screws.

3.17 Energy Meters

a) Watt hour and VAR hour meters shall be of the three–phase two element type suitable for measurement of unbalanced loads in three phase four wire circuits. They shall be of draw out type and suitable for flush mounting with back connecting terminals. The meter shall have glass covers removable from the front of the panel, without dismantling the meter from the panel. All permanent magnets shall of the non–ageing type. The meter shall be fitted with a separate test block for testing of the reverse direction. They shall be provided with a separate test block for testing of the meters without disturbing the CT and PT secondary connections. They shall have cyclometer type of register. At least two sealing studs for sealing purposes shall be provided.

b) They Energy Meter shall be connected to the secondary of potential transformers and current transformers rated for 110/v3 and 5 Amp respectively. These meters shall conform to IS: 13010 and have an accuracy of class 1.0 or better for KWH meter and 3.0 or better for KVARH meters. Meters shall be compensated for temperature errors and factory calibrated to directly read the primary quantities without the use of additional multiplying factor. Multiplying factor, if unavoidable shall be a multiple of 10. Number of digits provided shall be adequate to cover at least 1000hrs. of operations.

c) The current coil of the meters shall have a continuous overload capacity of 200% for both accuracy and thermal limits. Also the current coils shall withstand at least 10 times the rated current for 0.5 seconds without loss of accuracy.

3.18 Digital Load Monitor

a) Digital Load Monitor shall be capable of displaying the following parameters:

b) Line and Phase Voltages, Current, Active and Reactive Power, Power Factor, Frequency, Active and Reactive Energies, Maximum Demand etc.

c) The Digital Monitor shall have four quadrant capabilities to measure both power and energy. It shall serve as data logger for all Electrical Parameter as and

when scanned, displayed and stored. Built in memory shall have a storage capacity to store all Data up to a period of 30 days a more.

d) The Digital Monitor shall have RS 232/RS 485 Port for PC interface for remote data acquisition, telemetering capability, analysis and graph plotting.

e) It shall be capable of operating on Low Voltage networks with a input voltage 110V to 600V and on a CT either 1A or 5A.

f) Shall be mechanically robust, LED display, suitable for mounting an Electrical panels, capable of operating on 3Ph, 4Wire, balanced / unbalanced load, continuously on environmental condition such as temperature 0 to + 500C, Relative humidity 100%

3.19 Push buttons

Push buttons shall be of momentary contact type with rear terminal connection. These shall be suitably shrouded to prevent inadvertent operation. Integral inscription plates engraved with their functions shall be provided. All push buttons shall have two Normally Closed and two Normally Open contacts comprising rivets of pure silver. The contacts shall be able to make and carry 5 A and break up one amp inductive load at 250V DC.

4. Cable terminations

4.1 Cable entries and terminals shall be provided in the switchboard to suit the number, type and size of the aluminum conductor power cables and copper conductor control cable specified in the detailed specifications.

4.2 Provision shall be made for top or bottom entry of cables as required. Generous size of cabling chambers shall be provided, with the position of cable gland and terminals such that cables can be easily and safely terminated. Removable undrilled plates shall be furnished for fitting the cable glands.

4.3 Sufficient space shall be provided to avoid sharp bending and for easy connection.

4.4 Multi way terminal blocks complete with screws, nuts, washers and marking strips shall be furnished for terminating the internal wiring and outgoing cables.

4.5 Power and control terminals shall be washer head screw type or stud type complete with crimping type connectors. Screw type terminals with screws directly impinging of conductors are not acceptable.

4.6 Each control terminal shall be capable for connection of 2 Nos. 2.5 mm standard copper wires at each ends.

4.7 Not more than two wires shall be connected to any terminal. If necessary, the number of terminals shall bind together to provide wiring points.

4.8 Terminal block for current transformer secondary lead wires shall be provided with shorting and earthing facility.

4.9 Barriers or shrouds shall be provided to permit safe working at the terminals of one circuit without accidentally touching that of another live circuit.

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

5. Control wiring

5.1 The wiring shall be completed in all respects so as to ensure proper functioning of control, protection and interlocking scheme.

5.2 All wiring shall be completed up to terminal blocks on the side of each unit module.

5.3 All control wiring shall be carried out with 1100/660 V grade single core PVC cable conforming to IS 694/IS 8130 having stranded copper conductors switchboard wires of minimum 2.5 Sq mm.

5.4 Wiring shall be neatly bunched, adequately supported and properly routed to allow for easy access and maintenance. Wires shall not be spliced or tapped between terminal point.

5.5 Wires shall be identified by numbered ferrules at each end. The ferrules shall be of the ring and of no deteriorating material. They shall be firmly located on each wire so as to prevent free movement, and shall be interlocking type.

5.6 All control circuit fuses shall be mounted in front of the panel and shall be easily accessible.

5.7 All spare contacts of relays and switches shall be wired upto the terminal blocks.

5.8 Each of the DC Circuit shall be provided with two fuses one in the positive and the other in the negative for 2 wire DC ungrounded system of specified voltage.

6. Ground bus

6.1 An aluminum ground bus rated to carry maximum fault current shall be furnished along the entire length of each switchboard. Each stationary unit shall

be connected directly to this ground bus by two separate and distinct connections in accordance with Indian Electricity Rules.

6.2 Grounding terminals on the ground bus shall be provided. Connectors shall be provided at either end of each PMCC for connection to station ground mat.

7. Terminal blocks

7.1 Terminal blocks shall be 660 Volts grade of stud type. Insulating barriers shall be provided between adjacent terminals.

7.2 Suitable provision shall be made to terminate control/power connections in the respective module.

7.3 Terminal blocks shall have a minimum current rating of 10 Amps and shall be shrouded. Provisions shall be made for label inscriptions. The wire terminations to the blocks shall be of screw type suitable for crimp type socket.

8. Relays

8.1 All Relays shall conform to the requirement of IS: 3231/IS: 8686 or other applicable approved standards Relays shall be suitable for flush and Semi–flush mounting on front at with connections from the rear.

8.2 All Protective Relays shall be of draw out or plug in type/Modular cases with proper built in test facilities. Test blocks and switches shall be located immediately below each relay for testing. The auxiliary relays shall be self reset type.

8.3 All AC Relays shall be suitable for operation at 50Hz. AC Voltage operated relays shall be suitable for (110 / √3) Volts PT secondary and Current operated relays for 5Amp. CT. secondary as specified in this specification. Voltage operated relays shall have adequate thermal capacity for continuous operation.

8.4 Auxiliary Relays and Timers shall have pairs of contacts as required to complete the scheme. Contacts shall be silver faced with spring action.

8.5 All Protective Relays, Auxiliary Relays and Timers except the lockout relays and interlocking relays specified shall be provided with self reset type contacts. All, Trip and Timers shall be provided with externally hand reset positive action provided with inscription subject to STC's approval. Timers shall be of the electromagnetic or solid state type.

8.6 Wherever solid state relays are used the following requirement shall be met with: All Relays shall be designed for operating under or ambient temperature

550C and 100% relative humidity. Electronic type timers shall be as far as possible avoided.

8.7 All accessories required for correct operation of each relay shall be supported by the contractor without any extra cost.

8.8 The solid–state relays shall be stable and suitably protected against transient / induced over voltages. The bidder shall state clearly in his list special requirements, if any, for DC input arrangement or cabling considered necessary for satisfactory operation of solid state relays quoted by him.

9. Name plate

The panel as well as feeders compartments shall be provided with nameplate of anodized aluminum, with white engraving of black background. They shall be properly secured with self–tapping screws at the top of the cubicles. The panel/feeder descriptions shall be as indicated in the drawings/employers. The size of the nameplates shall be

proportionate to the respective equipments. Also individual panel number and danger plate shall be furnished at back of panel.

10. Drawings and manuals

The following drawings shall be supplied for each switchboard:

- General arrangement drawing for each type of board showing constructional features and space required in the front of withdrawal of breaker, power and control cable entry points, location of various devices, terminal blocks, etc. GA drawings shall be submitted along with offer.
- Foundation plan and anchor hold details including dead load and impact load.
- Drawing and data sheet for each component.
- Electrical wiring diagram.
- Terminal block arrangement drawing for out going feeders.
- Operation, maintenance and installation manuals, (one set to Employer).
- Technical catalogues/leaflets of CTs, meters, lamps, etc. shall be submitted along with offer.
- The approval of the drawing does not absolve the contractor from his obligation of ensuring proper and correctness of functioning/operation of the system.

11. Tests

11.1 Routine and Type Test:

a) Type test certificates and results as per relevant Standards (specifications) for all the equipment offered under the scope of this specification shall be furnished.

b) All routine tests on all major components shall be made as per relevant specification.

c) Inspection of Switch boards including inspection of wiring and electrical operational tests wherever necessary.

11.2 Dielectric Tests:

a) Insulation of the main circuit that is the insulation resistance of each pole is the earth and that between the poles shall be measured.

b) Insulation resistance to earth of all secondary wiring should be tested with1000 V megger.

c) Insulation test shall be carried out both before and after high voltage test.

d) Each switchboard will be completely assembled, wired, adjusted and tested for operation under stipulated conditions to ensure correctness of wiring and proper functioning of all equipments.

e) All current carrying parts and wiring shall be subjected to a high potential test.

11.3 High voltage test

a) A high voltage test with 2.5 K.V. for one minute shall be applied between the pole and earth. Test shall be carried out on each pole in turn with the remaining poles earthed. All units racked in position and the switches closed. Originals test certificate shall be submitted along with panel.

b) Employer's reserves the right to get the routine tests witnessed by his representatives, if so desired by the Employer's. The contractor shall give at least 14 days advance notice for the above to the Employer's.

12. Packing and transportation

The switchboards shall be sent to site by road transport packed in wooden crates. The packing should be of high quality to avoid any damage to the equipments during transit. They shall be wrapped with polythene sheets before being placed in crates to prevent damage to the finish.

13. Batteries and charger

13.1 Battery shall be 12 volt, Gel–Cell type. Battery shall have sufficient capacity to power the fire alarm system for not less than twenty four hours plus 30 minutes of alarm upon a normal AC power failure.

13.2 The batteries are to be completely maintenance free. No liquids are required. Fluid level checks refilling, spills and leakage shall not be required.

13.3 External Battery Charger:

13.4 Shall be built in to FACP & completely automatic, with constant potential charger maintaining the battery fully charged under all service conditions. Charger shall operate from a 120/240–volt 50/60 hertz source.

13.5 Shall be rated for fully charging a completely discharged battery within 48 hours while simultaneously supplying any loads connected to the battery.

13.6 Shall have protection to prevent discharge through the charger.

13.7 Shall have protection for overloads and short circuits on both AC and DC sides.

Earthing :

Contractor will provide proper earthing to the existing Electrical network of the building as well as to the new machines as per CPWD specification and relevant IS with their latest amendments. The codes to be used for carrying out the work as well as for testing ,will be IS 3043 : 1987 and the amendments thereto.

14. The work of earthing is well described in B.O.Q.

- As far as possible, all earth connections shall be visible for inspection.
- No cut-out, link or switch other than a linked switch arranged to operate simultaneously on the
- Earthed or earthed neutral conductor and the live conductors shall be inserted on any supply System.
- This however does not include the case of a switch for use in controlling a generator or a transformer or a link for test purposes.
- Plate electrodes shall be of the size at least 60 c m X 60 cm, Plates are generally of cut iron not less than 12 mm thick and preferably ribbed. The earth connection should be joined to the plate at not less than two separate points. Plate electrodes, when made of GI or steel, shall be not less than 63 mm in thickness.

- Plate electrodes of Cu shall be not less than 3.15 mm in thickness.
- Plate electrodes shall be buried ouch that ii. Top edge is at a depth not less than 15m from the surface of the ground. However, the depth at which plates are set should be such as to ensure that the surrounding soil is always damp.
- Pipes may be *of* cast iron of not less than 100mm diameter, 2.5 to 3 m long and 13 mm thick. Such pipes cannot be driven satisfactorily and may, therefore, be more expensive to install than plates for the same effective Area.
- Water pipes shall not be use as consumer earth electrodes.
- Under fault conditions, the earth electrode is raised to a potential with respect to the general mass of the earth that can be calculated from the prospective fault current and the earth resistance of the electrode. The results in the existence of voltage. In the soil around the electrode, that may be injurious to telephone and pilot cables, whose cores are substantially at earth potential, owing to the voltage to which the sheaths of such cables are raised.
- The voltage gradient at the surface of the ground may also constitute a danger to life, especially where cattle are concerned. The former risk arises mainly in connection with large elect rode systems as at power stations and substation.
- Earth electrodes, other than the used for the earthing of the fence itself, should not be installed
- In proximity to a metal fence to avoid the possibility of the fence becoming live and thus. Dangerous at points remote from the substation.
- The materials used for making connections have to be compatible with the earth rod and the copper earthing conductor so that galvanic corrosion is minimized. In all cases, the connections have to be mechanically strong.
- The cross-sectional area of every protective conductor which does not form part of the supply cable or cable enclosure shall be in any case, not less than

  a) **2.5 mm2,** if mechanical protection is provided and

b) **4 mm2,** if mechanical protection ii not provided.

- Joints of protective conductors shall be accessible for inspection and testing except m compound-filled or encapsulated joints.
- No switching device. hall is inserted in the protective conductor, but joints which can be disconnected for test purposes by use of a tool may be provided.
- An auxiliary earth electrode shall be provided electrically' independent of all other earthed metal, for example, constructional metalwork, pipers, or metal-sheathed cables. This requirement i. considered to be fulfilled if the auxiliary earth electrode is installed at a specified distance from all other earthed metal (value of distance under consideration).
- The earthing conductor leading to the auxiliary earth electrode shall be isolated to avoid contact with the protective conductor or any of the parts connected thereto or extraneous conductive parts which are, or may be, in contact with them.
- General public supply unless there has been consultation with the electricity authority concerned.
- It should be emphasized that an installation together with its source of energy may not consist entirely of one particular type of system. In such cases, each part of that installation may be required to be treated separately without detriment to other parts of the same installation.
- GI/Copper Plate Size: 500mmX500mmX10mm.
- Wood coal powder and salt are in same quantity.
- Size of GI Strip: 300mmX10mm
- Size of GI Pipe: 2.5" Diameter.
- Minimum 1Ω Resistance should be available at a distance of 15mt.
- IR value of Earth resistance is less than 10Ω.
- Distance between two earthing pit is 2 X Length of earthing electrode.
- If ground resistance is less than plate earthing (if hard rock) than Pipe earthing shall be used.
- Resistance between two earthing pit is negligible.
- Earthing of lighting protection should not mix with power system earthing.

- Lighting protection earhing should be 10 time stronger than normal earthing (use copper bus strip instead of wire)
- Jointing of earthing strip shall be overlap of min 50mm and for earthing wire overlapping shall be min 40mm

Plate / Pipe Earthing:

Plate Earthing Electrode

- for copper shall be 600X600X3.1mm and
- For Hot dip GI shall be 600X600X6.3mm.

Pipe Earthing Electrode.

- Earthing electrode shall consist of a GI pipe (class B of approved make), not less than 40 mm dia. and 3 meters long. CL pipe electrode shall be cut tapered at the bottom and provided with holes of 12 mm dia. drilled at 75 mm interval up to 2.5 meters length from bottom. The electrode shall be buried vertically in the ground as far as practicable below permanent moisture level, but in any case not less than 3 meters below ground level. The electrode shall be in one piece and no joints shall be allowed in the electrode.

Size of Excavation:

- Size of 1 meter diameter and 3 meter length shall be excavated after depth of 3 meter the size of excavation shall be 900X300X900mm depth.
- Plate / Pipe Electrode shall be in vertical position.
- GI/PVC pipe for Watering shall be used of 40mm Diameter, length of 3 meter (contain hole of 12mm Diameter in Zigzag manner starting from 15cm away from bottom to 2 meter height).
- At bottom 150mm layer of Salt and charcoal power shall be installed than Plate shall be installed.
- Alternate layer of 150mm of Salt and charcoal power shall be used up to 2.5 meter.
- Min 120kg of charcoal power and 120kg of salt shall be used for each earthing pit.

- The plate \ pipe electrode, as far as practicable, shall be buried below permanent moisture level but in no case not less than 2.5 M below finished ground level.

LIGHTING ARRESTOR

1. The contractor will have to visit the site before quoting to understand the site conditions.
2. The site (Jahavar Vyapar Bhawan) is an iconic building having a height of 102 metres approximately , comprising 3 blocks of 10, 17 and 23 storyed section.
3. Very Sensitive security /telecommunication equipment are installed on the terrace of the building.
4. Building needs total and reliable protection from random lightening surges
5. Technical specification of the Lightening arrestor along with attached chemical earthing is well mentioned in the B.O.Q. (Bill of quantity) section which is self-explanatory and does not need more elaborations here.
6. The contractor will have to design, provide and install Lightening arrestor and chemical earthing as mentioned.
7. The work will have to be carried out as per IS 2309 (1989): Code of practice for the protection of buildings and allied structures against lightning [ETD 20: Electrical Installation] and CPWD specifications with amendments thereafter.
8. Location of earthing will be decided by Engineer in charge as per site conditions.
9. Nothing extra will be paid to the contractor on this account.

Gas Flooding system for 11 kv, LT Panels

The contractor will supply install test and commission Gas flooding system, Primary portable fire extinguishers in the Electrical panels situated in Basements and other as per B.O.Q. terms

Gas flooding System;

1. All the new installation shall be provided in existing electrical panels of Sub Station, Panels of Jawahar Vyapar Bhawan as per the direction of engineer in-charge so that the overall fire protection may be provided to these equipment.

2. ContractorshallfollowtheNFPA2001/Relevant IS Standard while executing the Fire extinguisher Gas flooding system.
3. Contractor shall integrate the system with Fire alarm and detection system after providing necessary cable and monitor module of compatible make.
4. Cable used for system integration with detection and alarm system shall be of specification:

Heat resistance cable2Cx1.5sqmm cable, color Red,Non-armored, BS8434-1.2003 BSEN50200.2006

PH120BS7629-1.1997(H) BS6387.1994CWZ300/500V-2

5. All the necessary clamps, hooks etc required for holding of tube, cylinder or MCU etc shall be provided by contractor.
6. The contractor shall made all the necessary arrangement and machinery for drilling, welding, brazing required nothing shall be paid extra.
7. Electrical wiring connection including cables, wire, connectors and installation accessories shall be in scope of contractor.
8. Electrical cables or wiring installed outside the electrical panels shall be protected by metallic flexible conduit.
9. Contractor shall carry out the wiring/cable etc. As required with proper dressing and saddle as direction of engineer in-charge.
10. ContractorshallfollowtherelevantIErules/actsetc.duringexecutionofwork.
11. PropersafetyshallberesponsibilityofthecontractorduringworkonHVandLVelectricalsystem.
12. If gas releases due to any defect mal-operation, the cost shall be borne by contractor during the completion period and DLP.
13. The contractor shall submit the scheduled planning for execution of work at least two days in advance to the engineer in-charge.
14. All the work shall be executed non-revenue hours (night) for that nothing shall be paid extra.
15. Contractor shall clean & dispose there leased scrap/material etc. as per Statue policy in this regard.
16. Contractor shall bring all tools &tackles required to carry out the work, no T&P etc. shall be provided by STC

17. Contractor shall provide onsite training for operation and maintenance of above system.
18. Any other minor work required for completion of job shall be in scope of contractor, nothing shall be paid extra.
19. Contractor will ensure compliance of norms, Statuary requirement for Environment, Health& safety.
20. The contractor will supply either of the following as per B.O.Q. For gas flooding system Clean agent with ozone zero depletion characteristics Like FS49C2 (NAFS 227,MH 227,FM-200),NOVEC 1230 , Pentafluroethene (NAFS125,ECARO-25)

False ceiling

1. Ceiling of Various floors of the site (Jawahar Vyapar Bhawan) are covered by false ceiling .
2. Various tenants' offices are operational on these floors including top notch Govt. offices, Banks etc.
3. Contractor will have to plan the work in advance before taking up and will be allowed to work on floors only after proper approval of engineer in charge.
4. Engineer in charge may ask the contractor to take up the work in odd hours or during night hours as per the requirement of site without any extra cost to STC.
5. Contractor will ensure that the functionality of the offices on various floor is not adversely affected due to ongoing work.
6. Contractor will take safety measures, precautionary steps to so as to ensure smooth functionality of the various offices of Jawahar Vyapar Bhawan.
7. Contractor will have to install the fire protection network viz a viz , sprinkler system network , fire detection and alarm system etc as mentioned in tender document ,on various floors of JVB which are covered by ceiling with/without false ceiling .
8. To mitigate the disturbances on the functionality of the various floors of the building, contractor will take prior permission from the Engineer in charge for any work on the floors.
9. Contractor will not be allowed to dismantle to damage the complete existing false celling of the floors.
10. To mitigate the damage to the false ceiling, contractor will have to make minimal passage in the false ceiling so that installation of various components of fire fighting system be installed as per the direction of Engineer in charge.
11. The working space on the floors will be made available on " as is where basis " so as to ensure non disturbance to the occupant of the floor. Accordingly contractor will have to keep his man and machinery alert for taking up the works in the

available space for complete it as to the satisfaction of Delhi Fire services, NBC-2016.

12. As mentioned above, the work may be taken up sequentially on a floor and testing of the work may be done sequentially accordingly.
13. The contractor will dismantle the minimal quantum of false ceiling which is necessary for the successful installation of the fire fighting equipment.
14. The contractor will repair the broken false ceiling in good aesthetic matching with the existing false ceiling after cleaning the site. Decision of Engineer in charge will be final and binding in this regard. Payment will be made as per tender terms.
15. Technical specification the work is described in the B.O.Q. section of the tender document which is self-explanatory.

Fire Control Room

1. The contractor will install the Electrical panels designated for control room as advised by Engineer in charge. One room at ground floor has been designated for the purpose. STC reserves the right to change it without any claim of the contractor.
2. The contractor is advised to measure all the control cables, route, and location of the control room before quoting the bid so as to avoid any ambiguity at later stage.
3. The control room should be properly illuminated.
4. The laying and dressing of the Electrical cables, control cables should be as per relevant IS.
5. The control room will be furnished by half glazed door as per the B.O.Q.
6. The air conditioner mentioned in the B.O.Q. will have to be installed in control room with all fittings and fixtures by the contractor.

Drawings

1. As already mentioned in the tender document that the contractor will have to submit detailed engineering drawings before start of the work and will have to take prior permission and approval of the Engineer in charge for the works to be taken.
2. Contractor will be required to submit all documents/drawings of the equipment, manufacturer’s catalogue, warranty/guarantee papers to the Engineer in- charge.
3. Contractor will make all the drawings as required by the DFS including those systems of firefighting already installed in Jawahar Vyapar Bhawan without any extra cost to STC.

4. Contractor will also make and submit as built drawings, 3 D drawings, etc. as to the satisfaction of Engineer uncharged without any extra cost to STC
5. Contractor will ensure accuracy of the drawings. Contractor will have to re-submit the drawings after correction if found incorrect or not representing the facts as required, by DFS, without any extra cost to STC.
6. Contractor is liable to make even those drawings which are not available with STC but required by DFS.
7. All the drawings submitted to STC must be minimum in 04 (Four) sets and soft copies also.
8. The contractor will have to arrange the signage boards, directional boards, equipment details, flow details at all places of JVB ,even to those items which have not been installed by the contractor, as per provisions of NBC- 2016 or as to the satisfaction of Engineer in charge, without any extra cost to STC.
9. Documents to be furnished on completion of installation:

   Four sets of the following documents shall be furnished to the department by the contractor on completion of work:-

   (a) Completion drawings
   (b) Manufacturer's technical catalogues of all equipment and accessories.

   (c) Operation and maintenance manual of all major equipment, detailing all adjustments, operation and maintenance procedures.

10. **Completion drawings:**
    Four sets of following laminated drawings shall be submitted by the contractor while handing over the installations to the Department. Out of this one of the sets shall be laminated on a hard base for display in the fire control room. In addition one soft copy shall also be furnished.

    (a) Installation drawings giving complete details of all the components/items such as detectors, call boxes etc.etc

    (b) Line diagram and layout of all electrical control panels and work station.

    (c) Control wiring drawings with all control components and sequence of operation to explain the operation of control circuits.

Primary Fire extinguishers

The Contractor will supply CO2 type and Dry powder type primary fire extinguishers to STC as per B.O.Q. terms

1. The existing Primary fire extinguishers installed in JVB have over lived its life
2. Since there are no CO2 and Dry powder type extinguishers at present in STC, Equal number of existing empty vessel of used/rejected primary extinguishers of nearest size will be taken back by the contractor against the buy back.
3. The contractor will supply and install the new extinguishers as per provisions made in Indian Standard IS 15683: 2018
4. The primary fire extinguishers will be installed at the locations as decided by the Engineer in charge
5. Operating instruction shall be provided and mounted in a brushed stainless steel frame with a clear plastic cover on their location. The instructions shall include the following:
   (a) Procedure to follow when fire is detected.
   (b) How to reset and test the entire system after trouble or fire is detected.
   (c) Scaled sketch of the building showing location, type and the zone to which all detectors and manual pull stations are connected.
6. The location, type and capacities of all fire extinguishers will be indicated in the Drawings. The appliances shall be installed in readily accessible locations with the appliances brackets fixed to wall by suitable anchor fasteners.
7. All mounting brackets shall be of approved type suitable for the location where they installed. The performance of all extinguishers shall be to the approval of the applicable local authorities.

Standards and codes to be followed

Extinguishing media- (Clause 5.1 of IS 15683)

a) Carbon dioxide – IS 15222

b) Clean agent –certificate of manufacturer/supplier

c) Powder – IS 4308

d) Foam concentrate – IS 4989

2. Propellants – Clause 5.2 of IS 15683

3. Gas cartridge - IS 4947

4. Construction requirement :

a) High pressure cylinder – Clause 9.1 of IS 15683

i) for Steel body - IS 7285 (Part 1 and 2)

ii) for Aluminium body - IS 15660

b) Low pressure cylinder – Clause 9.2 of IS 15683

i)Welded low carbon steel cylinders – Clause 9.2.5 of IS 15683

ii) Stainless steel cylinders – Clause 9.2.6 of IS 15683

iii) Aluminium Cylinder – Clause 9.2.7 of IS 15683

iv) Composite cylinder – Clause 9.2.8 of IS 15683

c) Carrying handle – Clause 9.3 of IS 15683

d) Mounting – Clause 9.4 of IS 15683

e) Caps, valves and closures – Clause 9.5 of IS 15683

f) Safety devices – Clause 9.6 of IS 15683

g) Plastic components – Clause 9.7 of IS 15683

h) Hose assemblies – Clause 9.8 of IS 15683

i) Safety locking devices – Clause 9.10 of IS 15683

j) Pressure gauges and indicators for low pressure extinguishers – Clause 9.11 ofIS 15683

k) Dip tubes and filters for water based extinguishers – Clause 9.12 of IS 15683

l) Horn for Carbon dioxide extinguishers - Clause 9.13 of IS 15683

m) Extinguish ants - Clause 9.14 of IS 15683

PM/ IS 15683/

n) NFPA-2001 where Indian Standards are not available

SIGNAGES

a) Contractor will have to Supply & fix of ultra/ slim LED exit Lights confirming to IS : 9583-1981 of size 350 mm X 280 mm suitable for operation of 50 Hz , 230 V AC supply with 2 Hours backup self-contained dischargeable battery (Ni. Cd. Abs Plastic Body surface/ edge light double sided with special application LED signs with LED enclosure made out of 1 mm thick CRCA sheet powder coated with fixing arrangement on wall/ceiling complete etc as required. The same have to be fixed in the basement areas of the building or as per requirement of NBC-2016. Location of the same may be varied as per decision of the Engineer in charge.

b) Contractor will have to provide and fix self-illuminated / auto glow "EXIT" signs printed on photo luminescent sheet containing self-illuminated base chemical, of appropriate size not less than 400 x 150 mm, suspended from ceiling or fixed to the walls with accessories as required and as directed at site.

c) Contractor will also be required action chart (size shall be 600mm x 1000mm) in case of fire / emergency, Staircase location indication etc. The location / quantity shall be on each landing of every staircase on each floor. Signs shall be made out of 3mm thick PVC foam board with PVC non –reflective self–adhesive vinyl foam board OR equivalent material with Mirror fasteners for fixing complete.

d) STC reserve the right to change the locations indicated for fixing the sign boards without any extra cost.

APPROVED MANUFACTURERS

-The contractor shall use materials in the works subject to inspection, prior to dispatch, by STC's authorized representative of any materials.

-The list of approved manufacturer **is for indicative purpose only** and will not be treated as nomination of purchase by "Name".

-All materials not otherwise specified shall be in accordance with the latest Indian Standard Specification (IS), where such exists, with prior approval of STC.

-The contractor shall be bound to offer sample of materials, which are claimed to be conforming to IS Specifications, for testing at an approved Test Laboratory.

-The firm shall arrange the testing of the material in any approved lab in present of STC representative, however STC reserve the right to waive off such tests but the contractor will have to submit the test certificates in that condition.

-All the expanses for testing the material including to and for Travel, lodging, lab fee etc. shall be borne by contractor.

-Contractor shall purchase all materials from the makers or their authorized stockiest only. Necessary documentary evidences must be produced to STC for their authorized representative on demand.

- Material supplied must be in compliant to B.O.Q of the works and/or technical specification as per terms, ir-respective their manufacturer's name.

Recommended Makes for Mechanical Works:

Fire Pumps	**:** Kirloskar/ Mather & Platt / KSB
M.S. Pipes	**:** Jindal Hisar/ Tata
Pipe Fittings	**: VS/**Zoloto/True Forge/Unik
Butt Welded	:Fabricated
Butterfly Valves	**:**Audco/Zoloto / Advance
Non – Return Valves	**:** Audco/Advance/Zoloto
Gate Valves	**:** Leader / Zoloto /
Ball Vales	**:** Leader / Zoloto /
Strainers	**:** Audco / Zoloto
C.I. Gate Valves	**:**Kartar / Hydint / Koley/Audco/Kirloskar
Pressure Switch	**:**Indfos / Switzer / Switzer/Danfoss

Pressure Gauge	**:**H. Guru / Fiebig / Pricol / Reputed
Wrapping Coating	**:**IWL / Rustech
Branch Pipe	**:** Minimax / Newage / Safex
Fire Extinguishers	**:** Fireshield / Minimax / Safex / Guards
Sprinklers	**:**Tyco / HD / Newage
Enamel painting	:Asian/ GoodlasNerolac/ Berger
Mechanical Seal	:Duramettalic/sealol/ Kirloskar
Weld Rod	:Advani/ Esab/Ador
Fasteners	:Hilti / Fischer
Sluice/NRV	:Kirloskar/ HD/ New age/ Sant
Hydrants & 4Ways	: Minimax / Newage / Safex

Four way Fire Brigade inlet and shut off valves

Recommended Makes for Electrical Works

1	Battery	**:** Exide / Standard / Amaron
2	Motor Control Centre	**:** Venus /Schenider /ABB/ Reputed
3	Control / Power Cables	**:** Polycab / Schneider / Finolex
4	MCCB	**:** Schneider / ABB / Siemens / L&T
5	Control MCB	**:**ABB / Schneider / Siemens / Legrand
6	Volt Meter Select Switch	**:** Salzer / L & T / Kaycee
7	Voltmeter (Ac / Dc)	**:** Meco / AE
8	Ammeter (Ac / Dc)	**:** Meco / Ae
9	Power Contactors	**:** ABB / Siemens / Schneider
10	Indicating Laps (Led Type)	**:** Siemens / Teknic/ Schneider
11	. Push Buttons	**:** Teknic / Siemens/ L & T/Schneider
12	Auto / Manual Selector	**:** Salzer / Kaycee
13	Timers	**:** EAPL / Ae
14	Terminal Blocks	**:** Elmex / Wago
15	Current Transformers	**:** Kalpa / Voltamps / Kappa
16	Over Load Relay	**:** Siemens/ABB/Siemens
17	Siren / Hooter	**:**Equi/ Bosch
18	End Terminations	**:** Dowewls / Multi
19	End Terminations	**:** Dowewls / Multi
20	Cable Tray	**:** Storack / Patny/Reputed

Fire Detection & Emergency Lighting

	Fire Alarm Panel	:	Notifier / Edwards / Honeywell
2	MCP	:	Notifier / Edwards / Honeywell
3	Detectors	:	Notifier / Edwards / Honeywell
4	Addressable Devices	:	Notifier / Edwards / Honeywell
5	Hooters / Strobes	:	Notifier / Edwards / Honeywell
6	Emergency Lighting	:	Technoware / Prolite / Equivalant
7	Battery	:	Hitachi / Drysil / Exide / Amaron
8	Cable	:	Polycab / Finolex / Havells
9	PVC Conduits	:	Polycab/AKG
10	P.A. Speakers	:	Notifire/ Edwards / Bosch / Honeywell

PERFORMANCE BANK GUARANTEE FORMAT

(To be executed by any Nationalized Bank in India having their Branch in the State of End-user Department on stamp paper of Rs.100/-)

Name & Address of the Buyers (End-user Department)

_____

1. Whereas a Tender No. _____ dated _____ and Contract No. _____ Dated - _____(hereinafter called the Contract entered into between the STC of India Ltd., New Delhi which expression shall unless repugnant to the context or meaning thereof include its successors, representatives & assigns , for and on behalf of _____ (hereinafter called the Buyers/End user Department)

and

M/s. _____(Name and Complete Address) (hereinafter called the Sellers) which expression shall, unless repugnant to the context or meaning, thereof include its successors, representatives & assigns

We _____ (the Bank) at the request of the Seller hereby agrees unconditionally and irrevocably to guarantee and to pay to the Buyers immediately on first demand, the amount of Rupees_____(@ 5% of contract value) without any protest or demur or reference to the Sellers even if the Sellers fail to perform all or any of their obligations under the said contract.

The decision of the Buyer/End user _____or The STC of India Ltd., New Delhi duly communicated in writing to the bank that the sellers have failed to perform all or any of the obligations under the contract shall not be questioned and be final and conclusive. The said amount of Rupee _____ will accordingly forthwith be paid without any conditions or requirement of our proof whatsoever failing which interest @ 15% p.a. on monthly rest basis shall be payable by the Bank to Buyer until the realization of the amount so guaranteed as above and without prejudice to the rights and remedies available to the Buyer.

2. It is fully understood that this guarantee is effective for a period up to _____ (completion period + 60 days) and that we _____ Bank undertake not to revoke this guarantee during its currency (up to claim period) without the consent in writing of the Buyers. We also understands the tenure of completion period as referred under this guarantee.

3. We _____ Bank, further agree that the buyer shall have the fullest liberty, without affecting in any manner or obligations hereunder to vary/extend any of the terms and conditions of the said contract or/extend time of performance by the Sellers from time to time or to postpone for any time or from time to time any of the powers exercisable by the Buyers against the said sellers and/or forebear to enforce any of the terms & conditions relating to the said contract and we, _____ Bank shall not be released from its liabilities under this guarantee by reasons of any such exercise, variations or extension being granted to the said sellers or for any forbearance and/or commission on the part of the buyers, or any indulgence by the Buyers, to the said Sellers or by any other manner or thing whatsoever which under the law relating to the sureties would, but for this provision

have the effect of so releasing us from our liability under this performance guarantee.

4. We further agree that the validity period of this Performance Bank Guarantee will be extended by us upon receipt of any such request in writing from the Buyer and any charges on account thereof shall be to the account of seller

4. We _____ Bank further agree that the guarantee herein contained shall not be affected / discharged by any change in the constitution of the said Sellers/Buyers/Bank.

5.The Guarantee will be governed by Indian Laws and will be subject to the jurisdiction of competent courts in the State of Buyer / End – user in India alone.

6. No claim shall be admissible against the Buyer in respect of interest on Performance Guarantee regardless of the time of release.

7. The Bank further agrees that decision of the Buyer as to the invocation of this Guarantee /or as to the amount payable by the bank to the Buyer shall be final, conclusive & binding on the Bank.

8. This Guarantee will remain in force up to _____(completion period + 60 days) and any demand in respect thereof should reach Bank not later than 10 (Ten) working days (claim period) from the expiry of above validity date.

9. Notwithstanding anything entered hereto Banks liability under this Performance Bank Guarantee shall not exceed _____(in words).

Bank is liable to pay the guaranteed amount if Buyer same upon in written claim/demand on of before the expiry date.

FOR _____ BANK ACCEPTED
Witness:-

Know Your Customer (KYC) Policy

The information sought in KYC format are not required during the bidding process

a. STC, before awarding any work order/contract or entering into any agreement/contract//MOU, etc. with any potential party, **shall mandatorily obtain certain information**/documents about the party as mentioned in the KYC Form annexed to this policy.

b. The details required in the KYC Form are minimum basic requirement and STC may ask for additional details/documents from the party keeping in view the specific nature of the transaction, if necessary.

c. STC shall not deal with a party, who refuses to share the requisite details in KYC Form. For such parties, STC reserve the right to cancel the award of work and/or holidaying/blacklist/debar from future tenders for a period of 3 years.

d. STC may cross verify the KYC details furnished by the party through available means and the party will have no objection to the same nor will it hold STC responsible for the same in any manner whatsoever.

e. Providing KYC details shall not confer any right upon the party to seek orders/contracts from STC and the same shall solely be on commercial consideration and as per applicable rules/guidelines/procedures, etc. of the Company as well as GOI or any other authority.

f. The KYC details of all existing and new parties shall be updated at least once every year.

g. This policy shall not apply to dealings with Govt. departments/entities/CPSEs.

h. Bidders are requested to go through the required information that will be sought before the award of the contract. **The information sought in KYC format are not required during the bidding process.**

i. Interested bidders may seek KYC format available online on STC's website or may ask directly from the officers inviting the bids so as to nullify any confusion at later stage.

Information/documents to be uploaded, online by the bidder

Name of the Contract / Work: - Supply, Installation, Testing , Commissioning of fire sprinkler , Fire detection & Alarm system etc. after dismantling the existing system at Jawahar Vyapar Bhawan,1-Tolstoy Marg, Connaught Place , Delhi.

Sr. No.	Particulars	Details to be provided , filled Performa(wherever necessary) and upload documentary evidence signed , stamped and scanned online
1.	Name of the Firm	
2.	Correspondence address to the firm	
3.	Official email, Phone no . of the firm	
4.	Name(s) of the Proprietor/Partners/Owner/Director along with their permanent address	
5.	Details of Bank account for Financial transactions (a) Bank account No. (b) Name of Bank, address of Branch (c) IFSC code	
6.	Aadhar Card No.(s)of Proprietor/Directors /Partners	

7.	Details of **Similar** Past work experience submitted for tender evaluation purpose(Copy of work orders/agreement)	
8.	Annual turnover of last threes 03 (FY) years (Rs.)	
	2018-19	
	2017-18	
	2016-17	
9	Average Annual turnover of last threes 03 FY as above years (Rs.)	
10.	GST No.	
11.	P.F No.	
12.	PAN No.	
13.	E.S.I. Registration No.	
14.	Electrical License No. , & name of issuing authority with validity period.	
15.	Details of the issuing authority of Satisfactory performance certificates for the mentioned works	
16	Non- Black-listing certificate, Affidavits enclosed	
17.	Registration No. for MSME/NSIC for availing the benefit of preferential purchase policy-2012	

18.	Details of tender document fee (Rs. 5000.00 (including Taxes)	
19.	Details of EMD (Rs. 11.0 Lakhs)	
20	Letter for submission of bid PROFORMA – I(Filled , stamped , signed and scanned ,)	
21.	Proforma-2 of bid document, Filled , stamped , signed and scanned ,as a token of acceptance without any deviation.	
22	PROFORMA – 3 Past Contractual performance/declaration by the bidder-(Filled , stamped , signed and scanned)	
23.	PROFORMA-4--Summary of Past Work Experience-(Filled , stamped , signed and scanned)	
24.	In case the signatory is other than the contractor, Certified true copy of the Power of attorney should be uploaded as a token of authorized signatory. In case of a company, board resolution must be uploaded for the same (Uploaded -Yes/No)	

-The bidder has to upload the scanned and digitally signed copies of all relevant documents as mentioned above.

Price bid (Bill of quantities) has to be quoted and put in separate envelope online . Technical bid and Price bid have to be put up in separate folders online only.

PROFORMA-4

Summary of Past Work Experience

Sr. No.	Name of Work Order awarding organisation	PSU/ GOVT./ Semi Govt./ State PSU/ Govt. Autonomous body	Value of the total work	Value of the desired Fire fighting work in the awarded work order , carried out (as per requirement of Tender evaluation criteria)	Duration (from.. to….)	Satisfactory completion certificate attached (Y/N)
1.						
2.						
3.						

Name and Signature of Contractor with seal

Note: - Separate relevant sheets may be attached for furnishing the past work details

Price Bid /Financial Bid/Bill of quantities(B.O.Q.)

Price bid for the works of for the woks of Supply, Installation, Testing , Commissioning of fire sprinkler , Fire detection & Alarm system etc. after dismantling the existing system at Jawahar Vyapar Bhawan,1-Tolstoy Marg, Connaught Place , Delhi.

Price bid has to be quoted online only. Bidder is advised to conversant for the requirement of work at site and tender terms before quoting any rates.

PROCEDURE FOR FILLING OF PRICE BID ONLINE

1. BOQ (PRICE BID) UPLOADED BY STC TO BE USED ONLY FOR SUBMISSION OF PRICE.

2. THIS BOQ TEMPLATE MUST NOT BE MODIFIED/ REPLACED BY THE BIDDER AND THE SAME SHOULD BE UPLOADED AFTER FILLING THE RELEVENT COLUMNS, ELSE THE BIDDER IS LIABLE TO BE REJECTED FOR THIS TENDER. BIDDERS ARE ALLOWED TO ENTER THE BIDDER NAME AND ITEM/UNIT RATE (GST WILL BE EXTRA) ONLY.

3. AT THE TIME OF UPLAODING OF BOQ BY BIDDER, THE FILE NAME FOR UPLOADING THE BOQ (PRICE BID) SHOULD REMAIN THE SAME AS IT WAS DOWNLOADED FROM THE CPP PORTAL.

Note: The price comparison shall be done on the basis of price quoted above

1. Bidders required to furnish the unit price,GST shall be extra. The contractor will have to provide input credit of GST if arises.
2. No other format of price submission shall be accepted.
3. The bidder is required to quote for the complete work, though STC reserve the right to award the work in full of in part.
4. Bidder/contractor has to quote the final rates only, all including discount/ rebate etc. Any separate discount/ rebate quoted shall not be considered.
5. The offer shall be valid for 60 days from the date of bid opening.
6. Leaving an unfilled entry in the price bid against any term shall mean as Zero cost and the bid shall be evaluated accordingly.
7. KYC information has to be provided by the contractor before the execution of the agreement.
8. Putting price bid along with technical bid will lead to rejection of the bid summarily.

BOQ			
Sl. No.	**Item Description**	Quantity	**Units**
1	**Providing, laying, testing & commissioning of 'C' class heavy duty MS pipe conforming to IS 3589/IS 1239 including Welding, fittings like elbows, tees, flanges, tapers, nuts bolts, gaskets etc. and fixing the pipe on the wall/ceiling with suitable clamp/support frame and painting with two or more coats of synthetic enamel paint of required shade complete as required :**		
1.01	25 mm dia	4710	Nos
1.02	32 mm dia	2176	Nos
1.03	40 mm dia	430	Nos
1.04	50 mm dia	320	Nos
1.05	65 mm dia	233	Nos
1.06	80 mm dia	204	Nos
1.07	100 mm dia	261	Nos
1.08	150 mm dia	1525	Nos
1.09	200 mm dia	12	Nos
1.1	250 mm dia	3	Nos
1.11	300 mm dia	3	Nos
2	**Providing, fixing, testing & commissioning of 15mm dia quartzoid bulb type sprinklers of rating 68 degree centigrade with required accessories :**		
2.01	Pendent Sprinkler	2988	Nos
2.02	Upright Sprinkler	350	Nos
2.03	Horizontal side wall sprinkler	175	Nos
2.04	Concealed sprinkler	650	Nos
3	Supply, Fixing, testing & commissioning of Extended Throw Side Wall Nozzles/Sprinklers	100	Nos

4	Providing, installation, testing & commissioning of water curtain nozzle 15mm dia nickel chrome plated brass, BSPT, K-factor as per design consideration complete as required.	140	Nos
5	**Providing & fixing flow switch in following sizes M.S. pipe including connection etc as required:**		
5.01	100mm dia	9	Nos
5.02	150mm dia	44	Nos
6	**Providing, fixing, testing & commissioning of installation control valve of cast iron body, brass/bronze working parts comprising of water motor alarm, bronze seat clapper, clapper arm and hydraulically driven mechanical gong bell to sound continuous alarm when the wet riser/sprinkler system activates, pressure gauges, emergency releases, strainer, pressure switch, cock valve complete with drain valve and bypass, test control box, ball valves, MS pipe of required size, flanges, orifice plate, gasket etc of following sizes as required -**		
6.01	150mm dia	6	Nos
6.02	100mm dia	1	Nos
6.03	80mm dia	1	Nos
7	Providing and fixing ball valve (brass) of approved quality, High or low pressure, with plastic floats complete :		
7.01	25 mm dia.	6	Nos
7.02	*Providing and fixing C.I. sluice valves (with cap) complete with bolts, nuts, rubber insertions etc. (the tail Piece if Required shall be paid separately)- (For Risers and Terrace)*		
7.021	*150 mm diameter Class II*	***42***	*Each*
7.022	*200 mm diameter Class II*	***8***	*Each*
7.023	*250 mm diameter Class II*	***1***	*set*
7.024	*300 mm diameter Class II*	***2***	*set*
8	Supplying, fixing, testing and commissioning of butterfly valve of PN 1.6 rating with bronze/gunmetal seat duly ISI marked complete with nuts, bolts, washers, gaskets conforming to IS 13095 of following sizes as required :		
8.01	65 mm dia	8	Nos

8.02	80 mm dia	11	Nos
8.03	100 mm dia	6	Nos
8.04	150 mm dia	16	Nos
8.05	200 mm dia	2	Nos
9	**Supplying and fixing of fire brigade connection of cast iron body with gun metal male instantaneous inlet couplings complete with cap and chain as reqd. for suitable dia MS pipe connection conforming to IS 904 as required :**		
9.01	4 way - 150 mm dia M.S. Pipe	2	Nos
10	Supplying and fixing air vessel made of 250 mm dia, 8 mm thick MS sheet, 1200 mm in height with air release valve on top and flanged connection to riser, drain arrangement with 25 mm dia gun metal wheel valve with required accessories, pressure gauge and paintingwith synthetic enamel paint of approved shade as required.	3	Nos
11	**Supplying, installation, testing & commissioning of deluge valve (to be used for water curtains) UL listed with wet pilot basic trim assembly for DVA with test and alarm, drip and drain valve with water motor gong complete as required.**		
11.01	150 mm dia	2	Nos
12	Providing, installation, testing & commissioning of adjustable rosette plate for 15mm dia in white finish UL Listed or FM approved complete as required.	2238	Nos
13	*Supplying, installation, testing & commissioning of sprinkler flexible pipe (UL Listed) of stainless steel complete with 15 NPT on reducer thread with maximum working pressure of 175 PSI test pressure of 875 PSI (Burst) with branch line (Inlet) 25mm NPT male thread to sprinkler head (Outlet) 15mm NPT female thread with reducer, nipple, 2 side brackets, center bracket, stockbar of following sizes complete as required.*		
13.01	700 mm	1056	Nos
13.02	1000 mm	912	Nos
13.03	1200 mm	120	Nos
13.04	1500 mm	150	Nos
13.05	Structural steel work in single section, fixed with or without connecting plate,including cutting, hoisting, fixing in position and applying a priming coat of approved steel primer all complete. (For Various Sections and	1000	kgs

	Supports made out of Structural Steel as per Site Requirements)		
14	Supplying, installing, testing and commissioning of Fire authority approved Electrical driven fire pump suitable for automatic/ manual operation consisting of the following: Horizontal/vertical multistage centrifugal fire pump capable of delivering 2850 LPM against a maximum head of 140 M while running at 1450 RPM complete with proper connection to suction and delivery line, and including bypass arrangement for testing of pumps. mechanical seal shall be included for stuffing box. Pump shall have a name plate indicating suction, delivery, head, discharge, stages, RPM and direction of rotation. Pump shall be capable of furnishing not less than 150% of rated capacity at a head not less than 65 % of rated head. The shut off head shall not exceed 120% of rated head. Squirrel cage, induction motor, TEFC type suitable for 415 + 6%V, 3 phase, 50 Hz, AC supply, of suitable HP rating for the above pump with asynchronous speed of 1450 RPM conforming to IP 55 protection & class 'F' insulation. The motor shall conform to IS 325 1978(up to date) with flexible coupling and coupling guard. Common base plate for mounting pump and motor fabricated of mild steel channel as per manufacturer's recommendation with heavy duty Anti Vibration pads as per requirement. Suitable reinforced cement concrete pump foundation as per manufacturer's design including foundation bolts, washers as required. Flexible Coupling and coupling guard for direct coupling of pump and motor. Technical Parameter For Sprinkler Pump Discharge : 2850 LPM Pumping Head Outlet - 140 m (Head) Motor kw - as per manufacturer recommendation Material of construction Casing - CI Impeller - Bronze (Br) RPM - 1450-1500 RPM Rate should included interconnection cables, foundation and foundation bolts.	1.000	Nos

15	Diesel Engine Driven Fire Pump (Location - Plant Room) : Supplying, installing, testing & commissioning of fire authority approved Diesel Engine driven fire pump suitable for automatic/manual operations consisting of the following : Horizontal split casing multistage centrifugal fire pump capable of delivering 2850 LPM against a maximum head of 140 M while running at 1500 RPM complete with proper connection to suction and delivery line, and including bypass arrangement for testing of pumps. mechanical seal shall be included for stuffing box. Pump shall have a name plate indicating suction, delivery, head, discharge, stages, RPM and direction of rotation. Pump shall be capable of furnishing not less than 150% of rated capacity at a head not less than 65% of the rated head. The shut off head shall not exceed 120% of rated head. Heat exchanger water cooled diesel engine of required BHP as per manufacturer at 1500 RPM for the above pump complete with standard accessories & suitable cooling system as described in specifications. Common base plate for mounting pump & engine of required strength manufactured out of M.S. channels as per manufacture's recommendation with heavy duty Anti Vibration pads as per requirement. Flexible Coupling & coupling guard for direct coupling of engine & pump. Suitable reinforced cement concrete pump foundations as per manufacturer design including foundation bolts, washer as required. 1 No. 3 hours capacity day oil storage tank welded steel construction conforming to IS : 2522 fabricated from 3 mm thick M.S. plates. Tank shall be provided with inlet, outlet, overflow, air vent, drain connections, filling connection & magnetic level indicator showing the level of fuel in the tank. Tank shall be mounted on a suitable steel structure (Painted with 2 coats of red oxide paint). Tank shall be provided with epoxy coat from inside & two or more coats of synthetic enamel paint outside over two coats of red oxide primer. Diesel storage tank shall be double skin. 24 volts 180 AH lead acid battery (12 volts - 2 Nos) with boost/Trickle charger for starting the engine automatically complete as required. Technical Parameter For Diesel Engine driven pump: Discharge : 2850 LPM Pumping Head/Pressure: Outlet - 140 m/14 kg/cm2 Material of construction Casing - CI Impeller - Bronze Rate should include inter connecting cables, foundation & foundation bolts.	1.000	Nos

16	"Electrical Motor Driven Jockey Pump Location - Plant Room :" Supplying, installing, testing & commissioning of fire authority approved electrically driven Jockey pump suitable for automatic/manual operation consisting of the following: Horizontal/vertical mounted jockey pump having cast iron/SS body, Bronze/S.S. impeller, stainless shaft with mechanical seal capable of delivering 180 LPM against total head as mentioned below while running at 2900 RPM complete. The system shall be complete with necessary pressure gauge with gun metal shut off cock on delivery side including bypass arrangement for testing of working of the pumping set as required. The pump should meet the recommended requirement and must be approved by the local fire authority. Squirrel cage induction motor suitable for 415 + 6%V, 3 phase, 50 Hz, AC supply of suitable HP rating for the above pump with asynchronous speed of 2900 RPM T.E.F.C type connected to pump with flexible coupling and coupling guard . Common base plate for mounting pump and motor fabricated of mild steel channel as per manufacturer's recommendation with heavy duty as per requirement. Suitable reinforced cement concrete pump foundations as per manufacturer's design including foundation bolts, washers as required. Drain pipe with valve (25 mm dia) Rate shall include inter connecting cables, foundation & foundation bolts. Technical Parameter For Jockey Pump : Jockey Pump :- Flow rate : 180 LPM (10.8 m3/hr) Pumping head/Pressure : 140 m/14 kg/cm2 Motor KW : 5.5 KW (Approx.) or As per manufacturer recommendation	1.000	Nos
17	Fabrication, supply, Installation testing & commissioning of Electrical control panel of cubical construction, floor mounted type, fabricated out of 2mm thick CRCA sheet, compartmentalised with hinged lockable doors, dust and vermin proof, powder coated of approved shade after 7 tank treatment process, cable alley, inter- connection with suitable size copper conductor cable/solid copper strip, having switchgears and accessories, mountings and internal wiring, earth terminals, numbering etc. complete in all respect, suitable for main fire pump, pressurisation pump & diesel pump set complete as per CPWD specification with following in coming and Outgoings, suitable for operation on 415V, 3 phase, 50Hz Ac Supply with enclosure protection class IP 42 as required : "INCOMING 800A, 50kA 4 Pole MCCB, Ics=100% Icu rating Digital Voltmeter 0-500V with selector switch Digital Ammeter (0-250 A) with selector swtich & CTs etc.LED type RYB phase indicating lamps, ON, OFF, trip indicating lamps	1.000	Nos

	Set of Copper Bus Bar 800A" "OUTGOING (Note : All outgoing feeders for pumps should have digital Ammeter with selector switches, and LED type ON, OFF, trip indicating lamps) Main Fire Pump 630 A, 50kA TPN MCCB, Ics=100% Icu, with fully automatic Star/Delta starter suitable for 150 HP pump with overload protection, current sensing type single phase preventor complete with all accessories and internal wiring required for automatic operation, selector switch for local/remote, auto/manual/OFF operation." "Jockey Pump 100 A, 50kA TPN MCCB, Ics=100% Icu, with suitable HP fully automatic Star/Delta starter with overload Set protection, current sensing type single phase preventer complete with all accessories and internal wiring required for automatic operation, selector switch for local/remote, auto/manual/OFF operation." "DIESEL ENGINE CONTROL Control for diesel engine comprising - Automatic/Manual selector switch & 3 attempts starting device, timers and relays as required, push buttons, start/stop in manual mode Indicating lamp for high/ Low Lub. Oil pressure, High Water Temp and Engine on indication Battery charger suitable for 12V/24 V DC with boost and trickle selector switch, 0-30 V DC volt meter, and 0- 20 A DC Ammeter All standard relays and accessories for automatic operation of diesel engine " "System Controller Designing, Supply, commissioning of system controller to control operation of main electric fire pump, diesel pump, Pressurization pump, Terrace pump in sequence as per specification consisting of relays, timers. Sensors, annunciation window for fault indication, complete as per specification"		
18	Providing, fixing, testing and commissioning of precharged air vessel (size 450 mm dia & 2000mm height) fabricated from 8 mm thick shell & dished end 10 mm thick M.S. Plate for pressurization of hydrant/ sprinkler system complete with adequate pressure switches (as per design / requirement) with valve to operate as per operating sequences including 25 mm dia drain valve, air release valve with ball cock on top, 25 mm dia inlet with isolating valve duly painted from inside and outside complete as required.	1.000	Nos
19	**Providing, laying, testing & commissioning of 'C' class heavy duty MS pipe conforming to IS 3589/IS 1239 including Welding, fittings like elbows, tees, flanges, tapers, nuts bolts, gaskets etc. and fixing the pipe on the wall/ceiling with suitable clamp/support frame and painting with two or more coats of synthetic enamel paint of**		

	required shade complete as required :		
19.01	25 mm dia	5	Nos
19.02	80 mm dia	5	Nos
19.03	100 mm dia	5	Nos
19.04	150 mm dia	20	Nos
19.05	200 mm dia	24	Nos
19.06	250 mm dia	12	Nos
19.07	300 mm dia	12	Nos
20	**Providing, installation, testing and commissioning of stainless steel Y-strainer fabricated out of 1.6 mm thick stainless steel, Grade 304, sheet with 3 mm dia holes with stainless steel flange.**		
20.01	200 mm dia	1	Nos
20.02	250 mm dia	1	Nos
20.03	*300 mm dia*	1	Nos
21	**Supplying, fixing, testing and commissioning of butterfly valve of PN 1.6 rating with bronze/gunmetal seat duly ISI marked complete with nuts, bolts, washers, gaskets conforming to IS 13095 of following sizes as required :**		
21.01	100 mm dia	2	Nos
21.02	150 mm dia	4	Nos
21.03	200 mm dia	4	Nos
21.04	250 mm dia	2	Nos
21.05	300 mm dia	2	Nos
22	**Providing, installation, testing and commissioning of non-return valve of following sizes confirming to IS: 5312 complete with rubber gasket, GI bolts, nuts, washers etc.as required :.**		
22.01	100 mm dia	1	Nos
22.02	150 mm dia	2	Nos

22.03	200 mm dia	1	Nos
22.04	250 mm dia	1	
22.05	300 mm dia	1	
23	**PRESSURE GAUGE :**		
23.01	Providing & fixing dial type (100 dia as per pipe size) pressure gauge with isolation ball valve suitable for operating pressure of 10 Kg/cm2 cost shall be of inclusive of Providing any short pieces, nipples, elbows etc as required. having calibration of 0-15 Kg/cm2.	19	Nos
24	**Providing, fixing, testing & commissioning of resilient rubber lined single arch vibration eliminators suitable for raw water up to 45°C temperature, working pressure 10 Kg/cm2 and test pressure 15 Kg/cm2 (for Suction and delivery of Fire Fighting Pump).**		
24.01	200 mm dia	2	Nos
24.02	100 mm dia	1	Nos
24.03	*250 mm dia*	1	
24.04	*150 mm dia*	1	
24.05	*80 mm dia*	1	
25	**Providing, fixing, testing & commissioning of water flow meter complete with bypass arrangement and all accessories for flow indication, monitoring & testing of fire pumps.**		
25.01	100 mm dia (For working pressure 10.00 Kg/cm2)	1	Nos
26	Providing, fixing, testing & commissioning of M.S. class 'C' diesel pump exhaust pipe including all fittings like bends, tee, clamps/structural steel support of suitable dia for the engine. The pipe shall be provided with 12 mm thick Supercera Ceramic Fibre rope.		
26.01	100 mm dia	12	Nos
26.02	150 mm dia	66	Nos
27	**Supplying & laying of following 1100 volt grade PVC insulated sheathed XLPE aluminium conductor armoured cables as per specification in cable trays, ducts, clamped includes anchor fastners to wall with suitable clamps, saddles fixing bolts including connecting testing and commissioning.(For Main Hydrant/Sprinkler Pumps)**		

27.01	3.5 Core 400 Sqmm Aluminium conductor cable	104	Nos
27.02	3 core 185 sqmm Aluminium conductor cable	21	Nos
27.03	3 core 25 sqmm Aluminium conductor cable	12	Nos
28	**Cable end termination of the following PVC insulated sheathed PVC/XLPE aluminium conductor armoured cables of 1100 volt grade including supplying and fixing of crimping aluminium/Cu lugs, double compression glands with earthing facility at both ends of cables etc. complete as required for following dia cables**		
28.01	3.5 Core 400 Sqmm Aluminium conductor cable	12	Nos
28.02	3 core 185 sqmm Aluminium conductor cable	6	Nos
28.03	3 core 25 sqmm Aluminium conductor cable	4	Nos
29	**Supply and fixing of perforated type GI cable trays of the following sizes as per specifications**		
29.01	150 mm x 40 x 40 x 2 mm thick	24	Nos
29.02	300 mm x 40 x 40 x 2 mm thick	46	Nos
30	**SITC of Fire Doors With all Accessories & Panic Bars** "Supply Installation Testing & Comm of 2 Hrs. (120 minutes) Fire Rated G.I- Steel Door with Powder Coating As Per IS-3614 & BS-476 Part 20 & 22. 2 Hrs GI -Steel Fire Rated Door Single/Double shutter door of Pure Polyester (UV Resistant Grade) 120 Micron Grade Powder coated, 120 minutes Fire Rated (for Stability & Integrity) ,Galvanized (Zinc Coated) Steel Door and frame confirming to IS & BS Norms. The Door shall be Provided with all Accessories like Ball Bearing , Vision Galss , Panic Bar / Key , Door Closer , Tower Bolt , The Door Shutter 46 mm shall be made of 20 Gauge thick GI-steel pressed formed to provide fully flush double skin door shell with lock seam joints at style edges or as per manufactures specifications. The internal construction of the door shutter's to be ADHESIVE with Core Bonded Honey -Com Craft with PU Cyanoacrylate and Acrylic Thermosetting Adhesives insulation material to be provided for structural rigidity i.e. as per norms. Stability , Integrity, and Insulation for 2 Hrs. Fire Rating. phenolic resin impregnated specially designed honey comb craft paper with suitable internal reinforcement. The door frame made from 18 Gauge GI steel pressed to Single Rebate 100 X 57 mm profile for better structural strength. Frames are to be fixed with fasteners. The gap between the frame & shutter should not exceed 3mm on all side except at the bottom where the gap can go upto a maximum of 10 mm. The frame to be provided with 3 mm thick base plate and duly reinforced; pre-machined for receiving hardware & Hings arrangement & The entire assembly to be prefinished -factory finished heat ovened, powder coated, & made as		

	per approved architectural drawings. The shutter shall be provided with Panic Bar, Vision Panel with Clear fire rated glass with matching beading all around etc. complete as per approved architectural drawing. Approx Size of Single Door 2.1 Mtr x 1.4 Mtr. (Rates shall be Inclusive of Lifting, Minor Civil Works to fix the Door as required and making it good."		
30.01	Single Leaf Fire Doors	196	Sqm
30.02	Double Leaf Fire Doors	82	Sqm
31	**Providing and Fixing of Standard shaft door to be installed in the shaft size, made of not less than 18 swg MS CRCA sheet having louvers (as required), glass (5 mm thick), and hinges including necessary locking arrangement with Chest handle as required, painting (Powder coated with proper treatment process),including painting (RED Powder coated) with "FIRE SHAFT " legend.**		
31.01	Single Leaf Doors (Approx Size - 900 x 1800) FHC Doors	48	Sqm
31.02	Single Leaf Doors (Approx Size - 900 x 1800) Electrical Shafts	52	Sqm
32	**FIRE ALARM & PA SYSTEM** Supplying, installation, testing and commissioning of micro processor based intelligent addressable main fire alarm panel, central processing unit with the following loop modules and capable of supporting not less than 240 devices (including detectors) and minimum 120 detectors per loop and loop length up to 2 km, network communication card, minimum 320 character graphics/ LCD display with touch screen or other keypad and minimum 4000 events history log in the non volatile memory (EPROM), power supply unit (230 ± 5% V, 50 hz), 48 hrs back-up with 24 volt sealed maintenance free batteries with automatic charger. The panel shall have facility to connect printer to printout log and facility to have seamless integration with analog/digital voice evacuation system (which is part of the schedule of work under SH: PA System) and shall be complete with all accessories . The panel shall be compatible for IBMS system with open protocol BACnet/ Modbus over IP complete as per specifications.		
32.01	Ten Loop Panel.	3	Nos
32.02	Two Loop Panel.	1	Nos
32.03	Supplying, installation, testing & commissioning of central graphical fire alarm management system to centrally monitor and operate the fire alarm system complete as required	6	Nos
32.04	Supplying, installation, testing & commissioning of repeater panel with 320 characters/ Touch screen LCD display with inbuilt reset, acknowledge and silence switches complete as required.	3	Nos

32.05	Supplying, installation, testing & commissioning of intelligent analog addressable photo thermal detector complete with mounting base complete as required.	1012	Nos
32.06	Supplying, installation, testing & commissioning of intelligent addressable thermal detector with rate of rise cum fixed temperature thermistor complete with base as required.	88	Nos
32.07	Supplying, installation, testing & commissioning of intelligent addressable duct detector including suitable Photo detector complete with base as required.	24	Nos
32.08	Supplying, installation, testing & commissioning of fire fighter telephone handset complete as required.	2	Nos
32.09	Supplying, installation, testing & commissioning of addressable phone control module complete as required.	2	Nos
32.1	Supplying, installation, testing & commissioning of response indicator on surface/recessed MS Box having two LED, metallic cover complete with all connections etc as required.	380	Nos
32.11	Supplying, installation, testing & commissioning of addressable fire control module complete as required	82	Nos
32.12	Supplying, installation, testing & commissioning of addressable manual call point complete as required.	114	Nos
32.13	Supplying, installation, testing & commissioning of addressable horn cum strobe complete as required.	114	Nos
32.14	Supplying, installation, testing & commissioning of 6 zone, voice alarm controller with USB, MP3 player (including 6 zone button paging station) with seamless integration facility with main fire alarm panel for voice evacuation complete as required.	1	Nos
33	Supplying, installation, testing & commissioning of 1.5/3/6W ceiling speaker complete as required.	187	Nos
34	Supplying, installation, testing & commissioning of 1.5/3/6W metal box ceiling/wall speakers complete as required.	52	Nos
35	Supplying, installation, testing & commissioning of digital audio amplifier 75 Watt, 25V rms operating at 240 Volt AC Supply complete as required.	2	Nos
36	Supplying, installation, testing & commissioning of exit point directional sound speaker with voice and integral audio amplifier with selectable sound pulse patterns complete as required.	52	Nos
37	Supplying, installation, testing & commissioning of Voice command keypad 6 zone, with microphone assembly complete as required.	1	Nos

38	Supplying & laying of 2x1.5 sqmm fire survival armoured cable, 600/1000V rated with annealed copper conductor having glass mica fire barrier tape covered by an extruded layer of Cross Linkable Ethylene Propylene Rubber (EPR) insulation and LSZH inner bedding, steel wire armouring & LSZH outer sheath complete as required.	3000	Nos
39	Supplying & laying of 2x1.5 sqmm fire alarm armoured cable, 600/1000V rated with annealed copper conductor having XLPE insulation, steel wire armouring & FRLS outer sheath complete as required.	2800	Nos
40	**Supplying and drawing of cable Fire Retardant PVC insulated copper conductor cable in the existing surface / recessed steel conduit of following pairs, cores and size including connections and interconnections etc. as required.**		
40.01	speaker cable Two pair, 2-core, 1.5 sqmm	1500	Nos
41	**Supply installation, testing and commissioning of Tube Axial fan confirming to IS-3588 (revised) complete with tube casing in MS/GI standard construction epoxy painted, impeller with adjustable blade angles, bird screen ,gravity louvers, fire retardant double fold moisture and fire proof with flame retardant fabric confirming to IS-206 (revised) fire retardant flexible connection, necessary nut bolts and directly coupled TEFC Sq.cage induction motor (F-class insulation & B-class Temp. rise) suitable for 415V±10%, 50 Hz. 3 phase electric supply complete with required hardware etc.**		
41.01	Basement Exhaust Ventilation Fan Air Qty. = 21000 CFM Static Pressure = 25 mm Wg Proposed Motor = 7.5 KW	8.000	Nos
41.02	Basement Fresh Air Ventilation Fan Air Qty. = 21000 CFM Static Pressure = 20 mm Wg Proposed Motor = 7.5 KW	8.000	Nos
41.03	Lift Well Pressurisation (Terrace) 10th Floor Air Qty. = 13500 CFM Static Pressure = 20mm Wg Proposed Motor = 5.5 KW	2.000	Nos
41.04	Lift Well Pressurisation (Terrace) 17th Floor Air Qty. = 18000 CFM Static Pressure = 20mm Wg Proposed Motor = 7.5 KW	4.000	Nos

41.05	Lift Well Pressurisation (Terrace) 24 Foor Air Qty. = 21000 CFM Static Pressure = 20mm Wg Proposed Motor = 7.5 KW	4.000	Nos
41.06	Lift Lobby Pressurisation (Terrace), 10th Floor Air Qty. = 34000 CFM Static Pressure = 20mm Wg Proposed Motor = 15.0 KW	1.000	Nos
41.07	Lift Lobby Pressurisation (Terrace), 17th Floor Air Qty. = 42000 CFM Static Pressure = 20mm Wg Proposed Motor = 18.5KW	1.000	Nos
41.08	Lift Lobby Pressurisation (Terrace), 24th Floor Air Qty. = 48000 CFM Static Pressure = 20mm Wg Proposed Motor = 18.5KW	1.000	Nos
41.09	Stair Case Pressurisation (Terrace), 10th Floor Air Qty. = 21000 CFM Static Pressure = 20mm Wg Proposed Motor = 7.5 KW	1.000	Nos
41.1	Stair Case Pressurisation (Terrace), 17th Floor Air Qty. = 27000 CFM Static Pressure = 20mm Wg Proposed Motor = 15 KW	1.000	Nos
41.11	Stair Case Pressurisation (Terrace), 24th Floor Air Qty. = 32000 CFM Static Pressure = 20mm Wg Proposed Motor = 15 KW	1.000	Nos
42	**Supply and installation of Induced Air Axial Jet fans, balanced to vibration grade of G2.5 as per AMCA 204. Fan shall be complete with GSS casing (220 GSM), Aluminium impeller, Motor Class H, special rated motor certified for 250 Deg C for 2 Hrs - 415/3P/50Hz. Inlet & outlet attenuators each of 2 dia length, inlet & outlet protection net. Deflectors should not be used. Complete assembly shall be certified for 250 Deg C for 2 Hrs. fire rating as per BS EN 12101-3 & the copy of the Fire-test report has to be submitted for the approval.The Locationing of the jet fans has to be done in such a way that the Air velocity at any point on the plane of 1m from the ground level should not be less than 0.25m/s during the normal mode.**		
42.01	Upper basement - 6000 / 12000 CMH	4	Nos

42.02	Lower basement - 6000 / 12000 CMH	4	Nos
43	**Supply, installation, balancing and commissioning of factory fabricated GSS sheet metal rectangular/round ducting complete with neoprene rubber gaskets, elbows, splitter dampers, vanes, hangers, supports etc. as per approved drawings and specifications of following sheet thickness complete as required.**		
43.01	Thickness 0.63 mm sheet	127	Nos
43.02	Thickness 0.80 mm sheet	2413	Nos
43.03	Thickness 1.00 mm sheet	750	Nos
43.04	Thickness 1.25 mm sheet	2250	Nos
44	Supplying & fixing of powder coated extruded aluminium Supply Air Grills with aluminium volume control dampers as per specifications.	25.000	Nos
45	Supplying & fixing of powder coated extruded aluminium Return Air Grills with louvers but without volume control dampers complete as required.	27.000	Nos
46	Supply, Fixing and Commissioning of M.S. collar dampers with suitable key operate lever with necessary fittings & support.	23.000	Nos
47	Supply, Installation, Testing and Commissioning of Mild Steel louvers with bird screen for fresh air intake.	12.000	Nos
48	Supply, Installation, Testing and Commissioning of Mild Steel louvers with bird screen for exhaust air.	12.000	Nos
49	Supply and fabrication of angle iron frame, mountings for installation/mounting of fans. The mounting frame work to be fabricated / made out of M.S. channel, angle iron, MS flat, including providing all necessary hardware for completing the installation work, painting with two coats of red oxide primer and pre approved paint.	1200.000	Nos

50	**Electrical Sub Panel - Upper Basement (For Centrifugal Fans - Exhaust Air Fan (Normal & In case Fire operation)** Supply, installation, testing & commissioning of Cubical type sectionalised floor standing switch board of 31 MVA fault capacity at 415 V complete with 4 strip, 4000 A capacity Aluminium Bus - Bar Electrolytic grade, cable alley, switchgears of following capacity & as per specifications. For 7.5 KW Motor duly Synchronized with Fire Fighting Panel for Automatic Starting and Option for Manual Operation i) INCOMER 01 No. - 400 A FP MCCB with (0 - 250 A) ammeter, with 3 CT & selector switch, (0-500 V) Voltmeter with selector switch, phase indication light with protection fuse. with protection fuse, on / off / trip indicating light with protection fuse. OUTGOINGS For 24 x 7.5 KW Fan Motor 24 No. - 32 A TP MCB with Conforming to BIS Star Delta starter, overload relay, start/stop push buttons, ammeter (0-40A) on / off / trip indication lights with protection fuse, single phase preventer. Controls & interlocking accessories as Complete with Connection / interconnection required for above switchgears.	1.000	Nos
51	**Electrical Sub Panel - Terrace Level Fans** 01 No. - 32 A TP MCB with Conforming to BIS DOL starter, overload relay, start/stop push buttons, ammeter (0-40A) with three CT, on / off / trip indication lights with protection fuse, single phase preventer. MCCB shall be of 25 KA . For up to 7.5 KW Motor duly Synchronized with Fire Fighting Panel for Automatic Starting and Manual Operation Controls & interlocking accessories as Complete with Connection / interconnection required for above switchgears.	11.000	Nos
52	**Electrical Sub Panel - Terrace Level Fans** 01 No. - 63 A TP MCB with Conforming to BIS DOL starter, overload relay, start/stop push buttons, ammeter (0-100A) with three CT, on / off / trip indication lights with protection fuse, single phase preventer. MCCB shall be of 25 KA . For upto 18.5 KW Motor duly Synchronized with Fire Fighting Panel for Automatic Starting and Manual Operation. Controls & interlocking accessories as Complete with Connection / interconnection required for above switchgears.	5.000	Nos
53	**POWER & CONTROL CABLING** Supply, laying, testing and commissioning of power and control cabling, as per Standard specification including end termination as required. Power / Control Cabling (PVC insulated and PVC sheathed, armoured, Cooper Conductor of 1.1 KV grade on existing cable trays).		
53.01	4C x 6 Sq mm	1800	Nos

53.02	4C x 10 Sq mm	550	Nos
53.03	2C x 1.5 Sq mm	1200	Nos
53.04	3C x 2.5 Sq mm	1200	Nos
54	Providing & fixing of weather-Proof Isolator 40A with ELCB for each Outdoor unit.	11.000	Nos
55	Providing & fixing of weather-Proof Isolator 63A with ELCB for each Outdoor unit.	5.000	Nos
56	Dismantling aluminium/ Gypsum partitions, doors, windows, fixed glazing and false ceiling including disposal of unserviceable material and stacking of serviceable material with in 50 meters lead as directed by Engineer-in-charge.	2200.000	Nos
57	**Providing and fixing false ceiling at all heights with integral densified calcium silicate reinforced with fibre and natural filler false ceiling tiles of Size 595x595mm of approved texture, design and patterns having NRC (Noise Reduction coefficient) of 0.50 (minimum) as per IS 8225:1987, Light reflectance of 85% (minimum). Non combustible as per BS:476 (part-4), fire performance as per BS:476 (part 6 &7), humidity resistance of 100%, thermal conductivity < 0.043 W/m K as per ASTM 518:1991,in true horizontal level suspended on inter- locking metal T-Grid of hot dipped galvanised iron section of 0.33mm thick (galvanized @ 120 grams per sqm including both sides) comprising of main-T runners of size 24x38 mm of length 3000 mm, cross - T of size 24x32 mm of length 1200 mm and secondary intermediate cross-T ofsize24x32mmoflength600mmtoform grid module of size 600 x 600 mm, suspended from ceiling using galvanised mild steel items (galvanizing @ 80 grams per sqm) i.e. 50 mm long, 8 mm outer diameter M-6 dash fasteners, 6 mm dia fully threaded hanger rod upto 1000 mm length and L-shape level adjuster of size 85x25x25x2 mm. Galvanised iron perimeter wall angle of size 24x24x0.40 mm of length 3000 mm to be fixed on periphery wall / partition with the help of plastic rawl plugs at 450 mm center to center and 40 mm long dry wall S.S screws. The work shall be carried out as per specifications, drawing and as per directions of the Engineer-in-Charge.**		
57.01	12.5 mm thick tapered edge gypsum plain board conforming to IS: 2095-(Part I) : 2011 (Board with BIS certification marks)	2200	Nos
58	**Brick work with common burnt clay modular bricks of class designation 7.5 in foundation and plinth in:**		
58.01	Cement mortar 1:4 (1 cement : 4 coarse sand)	15.000	Nos

59	**Providing and laying in position cement concrete of specified grade excluding the cost of centering and shuttering - All work up to plinth level :**		
59.01	1:1 / 2:3 (1 Cement: 1½ coarse sand (zone-III) : 3 graded stone aggregate 20 mm nominal size)	5.000	Nos
59.02	1:2:4 (1 cement : 2 coarse sand (zone-III) : 4 graded stone aggregate 20 mm nominal size)	5.000	Nos
60	Supplying & fixing of ultra/ slim LED exit Lights confirming to IS : 9583-1981 of size 350 mm X 280 mm suitable for operation of 50 Hz , 230 V AC supply with 2 Hours backup self contained dischargable battery (Ni. Cd. Abs Plastic Body surface/ edge light double sided with special application LED signs with LED enclosure made out of 1 mm thick CRCA sheet powder coated with fixing arrangement on wall/cieling complete etc as required.	25.000	Nos
61	Providing and fixing of self illuminated / auto glow "EXIT" signs printed on photoluminescent sheet containing self illuminated base chemical, of appropriate size not less than 400 x 150 mm, suspended from ceiling or fixed to the walls with accessories as required and as directed at site.	252.000	Nos
62	**SITC of ISI marked portable type fire extinguishers of following type complete as per specification and fixed / install as per site condition :**		
62.01	CO2 type 4.5 kg capacity as per IS Code	30.000	Nos
62.02	Water CO2 type of 9 liters capacity as per IS Code	10.000	Nos
62.03	Dry Chemical Powder type of 6 Kg capacity as per IS Code	10.000	Nos
63	**For riser main supply**		
63.01	Supplying and fixing following way, single pole and neutral,sheet steel, MCB distribution board, 240 V, on surface/ recess, complete with tinned copper bus bar, neutral bus bar, earthbar, din bar, interconnections, powder painted including earthing etc. as required. (But without MCB/RCCB/Isolator) **12 way , Double door**	87.000	Nos
63.02	Supplying and fixing 5 A to 32 A rating, 240/415 V, 10 kA, "C" curve, miniature circuit breaker suitable for inductive load of following poles in the existing MCB DB complete with connections, testing and commissioning etc. as required. **Single pole**	1044.000	Nos

63.03	Supplying and fixing following rating, double pole, 240 V, isolator/TPN in the existing MCB DB complete with connections, testing and commissioning etc. as required. **63 A**	87.000	Nos
63.04	Supply of 4 pole MCCB, 125A, 36KA	58.000	Nos
64	**For riser emergency supply**		
64.01	Supplying and fixing following way, horizontal type three pole and neutral, sheet steel, MCB distribution board, 415 V, on surface/ recess, complete with tinned copper bus bar, neutral bus bar, earth bar, din bar, interconnections, powder painted including earthing etc. as required. (But without MCB/RCCB/Isolator) **4 way (4 + 12), Double door**	29.000	Nos
64.02	Supplying and fixing 5 A to 32 A rating, 240/415 V, 10 kA, "C" curve, miniature circuit breaker suitable for inductive load of following poles in the existing MCB DB complete with connections, testing and commissioning etc. as required. **Single pole**	348.000	Nos
64.03	Supplying and fixing following rating, four pole, 415 V, isolator in the existing MCB DB complete with connections, testing and commissioning etc. as required. **40A**	29.000	Nos
64.04	Supply and installation of 4 pole MCCB,100A,30KA	58.000	Nos
65	**EXTRA--For all electrical risers in first basement** Providing and fixing following rating and breaking capacity and pole MCCB with thermomagnetic release and terminal spreaders in existing cubicle panel board including drilling holes in cubicle panel, making connections, etc. as required.		
65.01	400 A,50KA,FPMCCB	3.000	Nos
65.02	630 A,50KA,FPMCCB	4.000	Nos
66	**Lift light distribution Panel- lift secondary room** **Supplying and fixing following way, horizontal type three pole and neutral, sheet steel, MCB distribution board, 415 V, on surface/ recess, complete with tinned copper bus bar, neutral bus bar, earth bar, din bar, interconnections, powder painted including earthing etc. as required. (But without MCB/RCCB/Isolator)**		
66.01	4 way (4 + 12), Double door	3.000	Nos
66.02	Single pole	36.000	Nos

67	**Providing and fixing following rating and breaking capacity and pole MCCB with thermomagnetic release and terminal spreaders in existing cubicle panel board including drilling holes in cubicle panel, making connections, etc. as required.**		
67.01	400 A,50KA,FPMCCB	6.000	Nos
67.02	250 A,36KA,FPMCCB	3.000	Nos
67.03	100 A,30KA,FPMCCB	13.000	Nos
68	**For lift operation MCCBs**		
68.01	Supply and installation of 4 pole MCCB,100A,30KA with enclosure.	8.000	Nos
69	**For lift controlling during operation/repair** Supplying and fixing following way, horizontal type three pole and neutral, sheet steel, MCB distribution board, 415 V, on surface/ recess, complete with tinned copper bus bar, neutral bus bar, earth bar, din bar, interconnections, powder painted including earthing etc. as required. (But without MCB/RCCB/Isolator)		
69.01	4 way (4 + 12), Double door	3.000	Nos
69.02	100 A,30KA,FPMCCB	8.000	Nos
70	**EARTHING**		
70.01	Earthing with copper earth plate 600 mm X 600 mm X 3 mm thickincluding accessories, and providing masonry enclosure with cover plate having locking arrangement and watering pipe of 2.7 metre long etc. with charcoal/ coke and salt as required.	25.000	Nos
70.02	Earthing with G.I. earth plate 600 mm X 600 mm X 6 mm thick including accessories, and providing masonry enclosure with cover plate having locking arrangement and watering pipe of 2.7 metre long etc. with charcoal/ coke and salt as required.	32.000	Nos
70.03	Supplying and laying 25 mm X 5 mm copper strip at 0.50 metre below ground as strip earth electrode, including connection/terminating with nut, bolt, spring, washer etc. as required. (Jointing shall be done by overlapping and with 2 sets of brass nut bolt & spring washer spaced at 50mm)	1620.000	Nos
70.04	Supplying and laying 6 SWG G.I. wire at 0.50 metre below ground level for conductor earth electrode, including connection/ termination with GI thimble etc. as required.	2108.000	Nos
70.05	Supplying and laying 25 mm X 5 mm GI strip at 0.50 metre below ground as strip earth electrode, including connection/terminating with GI nut, bolt, spring, washer etc. as required. (Jointing shall be done by	4388.000	Nos

	overlapping and with 2 sets of GI nut bolt & spring washer spaced at 50mm)		
71	**LIGHTING ARRESTOR**		
71.01	**ESE LIGHTNING AIR TERMINAL** Supply and installation of Early Streamer Emission (ESE) type Lightning Protection complete with the Stormaster Lightning Air Terminal - Configured as a Spheroid which is comprised of separate electrically isolated 4 panels (stainless steel) surrounding an earthed central finial. The Insulation material used to electrically isolate the panels (stainless steel) is comprised of a base polymer which provides high Ozone & UV resistance with a di-electric strength of 24-38 KV/mm. The Stormaster ESE terminal is tested & certified as per NFC 17-102 with the "Switching Impulse Voltage" of -700 KV and "Direct Voltage" of -70 KV. The Stormaster ESE terminal is tested & certified by CPRI (Central Power Research Institute), Govt of India for the Impulse current of 45 KA (8/20 micro sec) with 5 positive & 5 negative impulse. (Protection radius = 79 mtrs @ Level 1 / equivalent	4.000	Nos
71.02	Mast Supply and installation of G.I. mast of 5 mtrs height for mounting the terminal & adaptor with the ESE Air Terminal along with supporting guy wires, etc.	4.000	Nos
71.03	**Lightning Strike Recorder** Supply and installation of Lightning Strike Recorder - 7 digits mechanical display to record the lightning current in an IP 67 enclosure with the minimum sensitivity of 1500A & maximum capacity of 220 KA (8/20 micro second waveform). The recorder shall be of non-resettable type with the electro-mechanical display. No LCD screen is used as it may depend upon the battery life to energize the LCD. The lightning strike recorder is duly tested & certified in line with the ese lightning arrester in an international laboratory for an impulse current (8/20 micro sec) of more than 480 KA as per IEC 60-1:1989 standard. The lightning strike recorder is tested & certified by CPRI (Central Power Research Institute), Govt of India for the Impulse current of 45 KA (8/20 micro sec) with 5 positive & 5 negative impulse.	4.000	Nos
72	**Chemical Earthing**		

72.01	Supply and fixing of advance chemical gel earthing system of (G.I.) of 3 mtrs long 80 mm dia of outer shell (MS) with the 50mm dia of inner shell (MS) of 80-100 microns galvanized filled with highly conducting metallic compounds with the permanent sealings at both the ends with the lead terminal of 50x10 mm size at the top. The length of the electrode is 3000 mm excluding the lead terminal and the length of the lead terminal at the top is 100 mm. To ensure the moisture content and electrical conductivity, 50 Kgs of (mixture of Sulphate, Silica, Alumina, Iron Oxide, Titanium Oxide, Calcium Oxide, Potassium Oxide, Chloride, Magnesium Oxide, Sodium Oxide, Zinc Oxide, etc) Resistance Lowering Grounding Minerals. The loss on ignition by mass of the chemical compound is less than 20%. The resistivity of the grounding minerals is less than 0.2 ohm-mtr with the pH value of 7. The CHEMRODE is duly tested & certified by CPRI (Central Research Institute), Govt of India for a minimum short circuit current of 30 KA rms. The chemical compound is tested and certified by an International accredited, BIS (Bureau of Indian Standards) accredited, ISO 9001 & ISO 14001 certified laboratory. The earthing system manufacturer is an ISO 9001:2008 & ISO 14001:2004 certified organization.	8.000	Nos
72.02	Polyplastic Earth Pit Chamber with Cover Supply and fixing of heavy duty weather proof environment friendly polyplastic earth pit chamber with cover of auto-locking facility with the following dimensions - 254 mm dia (top), 330 mm dia (bottom) and 260 mm height. 4 knock-out openings are provided for the easy interconnection of earth strips between the earth pits to form a grid. Supply of 300x300mm C.I. earth pit cover.	8.000	Nos
72.03	Down Conductor Supply of down conductor of 70 sq.mm single core insulated flexible copper cable with necessary accessories, etc	450.000	Nos
72.04	Test Link Joint Supply of weather proof thermoplastic insulated, shock proof, dust & rust proof enclosure of suitable dimension.	4.000	Nos
72.05	Installation,Fixing of Lightning arrester, mast on the roof top (Item No: 1-6). Fixing of Lightning strike recorder, Test Link joint, Digging and refilling of earth pits (2 separate earth pits) with rod and chemical compound. (Item No:4)	4.000	Nos
72.06	SITC of Aviation obstruction light fixtures with yellow painted die-cast aluminium alloy housing, red coloured polycarbonate dome, including supply of 2 Nos neon light 75 VA Incandescent lamps with all necessary accessories, as required to be mounted at the top with suitable controlling switch. (Item No:4)	6.000	Nos

73	**Cable/wires for emergency/main circuits**		
73.01	Supply of 35 sq. mm ISI marked, FRLS PVC insulated, single core copper conductor cable	1276.000	Nos
73.02	Supply of 16 sq. mm ISI marked, FRLS PVC insulated, single core copper conductor cable	1015.000	Nos
73.03	Proving and fixing of One No. 2 TR 5 STAR window AC with stabilizer along with providing and Fixing of an anodized Aluminium door (size 3 ft x 7 ft approx.) partly half-glazed, half panelled along with the frame including door closure , handle, locking arrangement , hinges etc in the Fire control room at Ground floor.	2.000	Nos
74	**GAS SUPPRESSION SYSTEM** Supply, fixing, testing and commissioning of automatic Linear pneumatic Tube Detection based on clean agent (as per technical spec.) System for Electrical Panels (Linear Pnuematic Heat Detection Tube Panel Protection System), consisting of the Mentioned components-		
74.01	2 LB capacity based on clean agent (as per technical spec.) , DLP Assembly with automatic valve, push in connector for tube, clean agent gas , mounting bracket, End of Line adopter and low pressure switch for monitoring system activation.	18.000	Nos
74.02	4 LB capacity based on clean agent (as per technical spec.) , DLP Assembly with automatic valve, push in connector for tube, clean agent , mounting bracket, End of Line adopter and low pressure switch for monitoring system activation.	1.000	Nos
74.03	Linear pneumatic heat Detection Tube with all necessary fittings & supports.	600.000	Nos
74.04	Master Control Unit with Audio Visual Alarm With Wiring to Make Complete System Operational. The Control Panel Should have Provision for integration with Fire Alarm	6.000	Nos
75	Any other cost to be incurred for ancillary/ extra / civil/ miscellaneous works necessary to the complete the works mentioned above (lumpsum cost as per tender document)	1.000	Nos
76	Total cost of the above		
77	Cost of dismantled (scrap) material - will be treated as sell from STC, tax liability will be borne by the bidder (to be subtracted from grand total)	1.000	Nos
78	Net cost (Rs.) -will be basis of the selecting the L1., GST will be extra		