भारतीय स्टेट बैंक
State Bank of India

State Bank Bhavan, Corporate Centre,
Madame Cama Road, Nariman Point,
Mumbai -400021.

UKA Consulting & Engineers Pvt. Ltd.
FIRE PROTECTION & MEP CONSULTANTS

4/204, Vijay Park, off. G B Road,
Kasarvadavili, Thane, Maharashtra
400615 India

NIT NO	SBI/CC/FIRE/PKY/01
Date	**22.06.2026**

Request For Proposal (RFP)

SUPPLY, INSTALLATION, TESTING & COMMISSIONING (SITC) OF FIRE PROTECTION, FIRE PREVENTION, BUILDING MANAGEMENT SYSTEM (BMS), VENTILATION, PRESSURIZATION AND SMOKE EXTRACTION SYSTEM (REVAMPING AND UPGRADATION PROJECT)

Last date & time of submission of tender: 14.07.2026 up to 15:00 Hrs.

Client:

Deputy General Manager (Premises)
State Bank of India,
9th Floor, Premises Department
Corporate Centre, Nariman Point, Mumbai- 400021

Project Management Consultant

M/s UKA Consulting & Engineers Pvt Ltd

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STATE BANK OF INDIA

State Bank Bhavan, Corporate Centre, MADAME Cama Road, Nariman Point, Mumbai - 400021.

Part – I
(Technical Bid)
STATE BANK OF INDIA

PART – A: TECHNICAL BID

TENDER FOR SUPPLY, INSTALLATION, TESTING AND COMMISSIONING (SITC) OF FIRE PROTECTION SYSTEM, FIRE PREVENTION SYSTEM, BUILDING MANAGEMNET SYSTEM (BMS), VENTILATION, PRESSURIZATION AND SMOKE EXTRACTION SYSTEM AT STATE BANK BHAVAN (SBB), MADAME CAMA ROAD, NARIMAN POINT, MUMBAI.

E-TENDER SUBMITTED BY:

(Name and Address of Bidder)

NAME : _____

ADDRESS : _____

_____

_____

GST NO. : _____

DATE : _____

भारतीय स्टेट बैंक
State Bank of India

State Bank Bhavan, Corporate Centre,
Madame Cama Road, Nariman Point,
Mumbai -400021.

UKA Consulting & Engineers Pvt. Ltd.
FIRE PROTECTION & MEP CONSULTANTS

4/204, Vijay Park, off. G B Road,
Kasarvadavali, Thane, Maharashtra
400615 India

NOTICE INVITING TENDERS (NIT) UNDER TWO BID SYSTEM

State Bank of India Invites E-Tenders from eligible contractors/firms for Supply, Installation, Testing and Commissioning (SITC) of FIRE PROTECTION & PREVENTION SYSTEMS, BUILDING MANAGEMNET SYSTEM (BMS), VENTILATION, PRESSURIZATION AND SMOKE EXTRACTION SYSTEM at State Bank Bhavan (SBB), MADAME Cama Road, Nariman Point, Mumbai. All the documents are to be submitted **online** along with physical hard copies to be submitted at the office address.

***NIT No: - SBI/CC/FIRE/PKY/01 dated* 22.06.2026**

TABLE – 1

1	**Name of the Work**	Supply, Installation, Testing and Commissioning (SITC) of Fire protection, prevention, Building Management System (BMS), Ventilation, Pressurization and Smoke Extraction System at State Bank Bhavan building, Nariman point, Mumbai- 400021.
2	**Estimated cost.**	**Rs. 14,87,00,000/-** (Rupees Fourteen crore eighty seven lakhs only), exclusive of GST.
3	**Earnest Money Deposit (EMD).**	The tenderers are requested to submit the Earnest Money of **Rs. 14,87,000/- only by means of Demand Draft / Pay Order** (Valid for a period of 180 Days from the last date of submission of the tender) from any scheduled Nationalized Bank drawn in favour of SBI and payable in Mumbai. **Exemption of EMD is not allowed in any case. Tenders without EMD shall be rejected.** Please note that scanned copy of the EMD shall be uploaded in the online technical bid as well as the original hard copy shall be submitted to the above address, before the last date of submission of the bid, without which the tender shall be declared **as invalid due to non-receipt of original EMD**.
4	**Date and time of Pre-bid meeting**	**04.07.2026** at **1500** hrs. State Bank of India, Premises department, 9th floor, State Bank Bhavan, Nariman point, Mumbai- 400021. Submit the **questionnaire** (If any), regarding technical bid to be discussed in the pre-bid meeting by **01.07.2026.**
5	**Clarification to be sent**	cfosafety@sbi.co.in
6	**Date from where tender forms are available.**	From 22.06.2026, Tender documents are available at Bank's website https://sbi.bank.in/web/sbi-in-the-news under "SBI procurement News" section.

7	**Last date & time of submission of online bids.**	**14.07.2026** up to 15:00 Hrs.
8	**Address and contact details for submission of tender.**	Deputy General Manager (Premises), State Bank of India, 9th floor, Corporate Centre, State Bank Bhavan, Nariman Point, Mumbai- 400021. Email: dgmpremises@sbi.co.in; Ph: 022 22740950, 22740923, 22742904.
9	**Place, Date & Time of opening of online bids (technical bids)**	State Bank of India, 9th floor, Corporate Centre, State Bank Bhavan, Nariman Point, Mumbai. **Date: 14.07.2026 Time: 15:30 Hrs**
10	**Date and time of opening of financial bids online.**	Technically qualified bidders will be informed about the date and time of the financial bid opening.
11	**Last date, time and mode of submission of Technical Bid document along with Authorization Letter and EMD.**	The signed and stamped copy of technical bid along with following documents in sealed envelope should reach us having submitted their technical bid and confirmation online within 07 days of last submission date. 1) Signed and stamped copies of complete Tender Document. 2) EMD 3) The bidder should have Digital Certificate Signature (DSC) valid for 3 months for participation in e-tender.
12	**Initial Security Deposit (ISD).**	2% of awarded value of work including EMD issued by the scheduled bank or nationalized bank.
13	**Additional Security Deposit (ASD) / (Additional performance Guarantee (APG)**	In case L-1 bidder quotes abnormally low rates (i.e. 10% or more, below estimated project cost), the bank may ask such bidder to deposit additional security deposit (ASD) equivalent to difference of estimated cost vis-à-vis L-1 quoted amount for due fulfillment of contract. Such ASD could be in the form of FDR / Bank's guarantee (Other than SBI) in the Bank's name as per format approved by the Bank shall be submitted within 15 days of the work order without which the submission of ASD will result in forfeiture of EMD and cancellation of tender. On successful completion of work ASD will be returned to the contractor. In case contractor fails to complete the work in time or as per tender specification or leave the job incomplete, the bank will be at liberty to recover the dues from ASD or to forfeit such ASD as the case may be within its sole discretion. No interest shall be paid to the amount retained by the Bank as Security Deposit. The ASD shall be the difference between 90% of the estimated cost and the quoted price.
14	**Retention Money**	10 % of the project cost will be deducted from running bill shall be recovered as Retention Money (RM), till the total RM including EMD and ISD amount already with the bank becomes 5% of the value of the contract.

15	**Completion period**	1. Letter of Acceptance (LoA) will be given to successful contractor (L1) and within 15 days from date of LoA, the contractor shall submit ISD as applicable. 2. **18 months** from the date of work order for execution and completion of work.
16	**Mode of Bidding**	Bidder must submit its Technical and Price bid **in online mode** at https://etender.sbi/ on or before **-14.07.2026, up to 15:00 hours IST.**
17	**Details about Mode of Bidding**	Single-Stage, Two-Part Bidding**:** This method involves submitting bids **in two distinct parts**: **Technical Bid**: This part includes the contractor's technical qualifications, experience, financial capability and other non-financial aspects. This also includes detailed scope of work, general conditions of contract, special conditions of contract, including site establishment, Tools, Plant & Machinery, Manpower deployment and site organization chart. Only agencies who have valid license of class A category issued by Maharashtra Fire Services (MFS) can participate in the bid. **Financial Bid:** This part contains the contractor's pricing proposal for the project on **Item rate basis** based on BOQ and specifications. **Staging:** The process is staged, meaning the evaluation of the technical bid happens first. Only those firms who qualify based on their technical and non-financial aspects will have their financial bids opened and evaluated.
18	**Validity for Offer**	3 (Three) Months from the date of opening of on-line Price-Bid
19	**Commencement of Work**	Within 15 days from the date of receiving a Work Order.
20	**Defects Liability Period**	24 Months (Twenty-four months)
21	**Payment terms**	No advance payment shall be made.
22	**Insurance**	As per Insurance clause of the Tender Document.
23	**Working Schedule for Commercial Buildings**	Working Schedule is from 7 p.m. to 7 a.m. during working days and at any time during the bank holidays. The working plan / schedule must be provided 15 days before the execution to facilitate necessary shifting of the workstations.
24	**Liquidated Damages for Delay**	**@ 0.5%** of the value of work per week of delay subject to a maximum penalty of **5%** of the value of work would be strictly imposed.
25	**Minimum Value of interim bills**	Rs 1.00 crore (Rupees one crore only) No advances on materials at site shall be paid under any circumstances.

26	**Eligible Taxes**	Income Tax & GST IT will be deducted at source as per Govt. Guidelines. Reimbursement of GST will be made only on submission of proper GST invoice as per applicable GST provision. The contractor should comply with the following: 1) Contractor should have GST Registration Number 2) Invoice should specifically/separately disclose the amount of GST levied at applicable rate as per GST provision 3) In case of Correction in the bills after scrutiny, contractor should submit fresh bills for payment 4) Contractor should timely file his GST return in accordance with GST provisions to enable the bank to claim the credit of GST paid to the contractor 5) The GST Number of State Bank of India, Mumbai State – 27AAACS85777K2ZO
27	Integrity Pact	Bidder shall submit the original copy of duly executed Pre-Contract Integrity Pact as mentioned (Form F) and seal it in an envelope and mark the envelope as "Technical Bid-Integrity Pact". The said envelope shall clearly bear the name of the Tender and name and address of the Bidder. The original Pre-Contract Integrity Pact should be submitted within the bid submission date and time for the Tender at the address mentioned in Notice Inviting Tender, failing which Bid will be treated as non-responsive/ invalid. **The scanned copy of the signed pre-contract integrity pact shall be uploaded together with the NIT.** The format for integrity Pact to be executed is enclosed as **Annexure -B.**
28	E Procurement contact details	**Name** / **Mob No** / **Mail id** Nithya Vallavar / 7859800609 / Nithya.v@eptl.in Akhlad Rajput / 7859800624 / akhlad.rajput@eptl.in Nandan Valera / 9081000427 / Nandan.v@eptl.in **Mail to - etender.support@sbi.co.in**
29	**Consultant**	M/s. UKA Consulting and Engineers Pvt. Ltd., Registered Address: 4/204, Vijay Park, off. G B Road, Kasarvadavili, Thane, Maharashtra 400615 India
30	**Contact Person, Phone No and Mail Id for any clarifications.**	AGM & Chief Fire Officer, Mobile No 9995840288 cfosafety@sbi.co.in

31	**External Members for this project**	1. Shri. Satyajit Mohanty, IPS (Retd.), Email – satyajitmohanty88@gmail.com 2. Smt. Rashmi Verma, IAS (Retd.), Email – verma.rashmi@rediffmail.com

- The tender forms and other details **can be obtained from the website** https://sbi.bank.in/web/sbi-in-the-news under SBI procurement news.
- All corrigendum / addendum shall only be available on above websites and shall not be published anywhere else.
- In case the date of opening of tenders is declared as a holiday, the tenders will be opened on the next working day at the same time.
- The bidder, who is the authorized representative and participating on behalf of company/ Dealer/vendor, should have authorization from the bidder along with **valid digital signature certificate (DSC)** for attending this **e-tender opening**. The validity of the DSC should be at least 3 months.
- The signed copies of technical Bid documents, tender fees, authorization Letter, Technical Specification sheet and EMD should be submitted in sealed envelope **only through 'Speed Post'. Other modes of delivery (including hand delivery and private courier) will not be accepted.** Completed applications must reach this office by speed post on or before as mentioned in NIT. Applications received after due date will not be entertained (Postal delay, if any, will not be considered), failing which tender will be summarily rejected.
- The **price bid (Part-2)** is to be submitted **only online**.
- Payments towards above work shall be made by SBI. On certification and recommendation of project Consultant and SBI AGM & Chief Fire Officer/Fire Officer in charge.
- SBI reserves the right to increase or decrease the quantum of services and also reserves the right to reject, cancel or revise or accept any or all the tenders or part of tenders without giving any reasons there to and contractor has to execute the same at the rate quoted and no correspondence shall be entertained in this regard.
- Conditional tenders are liable for rejection.
- The eligibility criteria mentioned is minimum. Hence, merely fulfilling the prescribed minimum eligibility criteria shall not entitle the contractor to claim the award of contract. The selection of technically qualified contractors shall be considered purely merits, performance of the contractor in timely execution of the project with quality, feedback / confidential reports of the firms /applicant received from other employers etc.

- Canvassing in any form including bringing influence from any person/agency/Officials/authorities shall lead to disqualification of contractor.

- **QUALIFYING CRITERIA**

1. **Average Annual financial turnover** during the last 3 years, ending 31st March of the previous financial year, **should be at least 30 % (i.e. Rs 4,46,10,000/-) of the estimated cost**.

2. **Experience of having** successfully completed **similar works during last 10 years,** ending last day of months previous to the one in which applications are invited should be either of the following: -

a. **Three similar completed works** costing not less than the amount equal to **40 % (i.e. Rs 5,94,80,000/-) of the estimated cost**. Or
b. **Two similar completed works** costing not less than the amount equal to **50 % (i.e. Rs 7,43,50,000/-) of the estimated cost**. Or
c. **One similar completed work** costing not less than the amount equal to **80 % (i.e. Rs 11,89,60,000/-) of the estimated cost**.

[Similar works: - means successful completion of supply/installation testing and commissioning (SITC) of fire prevention arrangements, fire Protection arrangements, BMS, ventilation, pressurization and smoke extraction system of a multi-storied building (i.e. Minimum 15 Mtrs & above) project of above specified magnitude for residential or commercial or Institutional building **for** Central Govt department **or** State Govt Dept **or** Semi Govt Dept **or** PSU or Public Sector Banks or financial institutions **or** public limited company or MNCs.

3. Service Support Office:

a) The firm should have **an established office** with adequate technical personnel **in the State of Maharashtra,** i.e. Mumbai, Pune etc. This office should have been operational for a **minimum period of last 03 years in continuation** from the date RFP backwards and the firm must be prepared to **open additional support office** at Mumbai from the perspective of providing 24 hours / 7 days, for post implementation support for the pending period of Defect Liability Period (DLP) and Comprehensive Annual Maintenance Contract (CAMC).

b) The firm should mandatorily have license to comply with the Govt. of Maharashtra Fire Prevention & Life Safety Measures Act 2006 and Maharashtra Fire Prevention & Life Safety Measures Rules 2009. Class A category certification is mandatory for all the 3 categories. However, as the tender published is composite in nature, the firm can have JV for BMS, Pressurization and ventilation systems with reputed organizations having experience in the subject with proven record. The JV partner should produce their credentials along with the bidder credentials. The same will be verified during verification of the main bidder

credentials. The JV should be for a minimum period of 105 months from the date of issue of the tender

c) Those who have applied for renewal of the existing license, in such case they should submit their existing license along with the submission of letter for renewal. The fees paid challan must also be submitted along with the above document.

The criteria for assessment of the contractors/firms placed on the preliminary select list are as under: -

Sl No	Criteria	Assessment
1	Quality Consciousness	The Bank's Fire Officer and the Consultant should inspect their work and satisfy themselves about the quality of works.
2	Quality of finishes	-do as above in point no 1
3	Timely execution	This information could be ascertained from their previous clients/consultants.
4	Integrity as regards working.	-do as above in point no 3
5	Ease in setting extra item Rates.	-do as above in point no 3
6	Litigations if any involve arbitration/court of law.	-do as above in point no 3
7	Financial soundness	To be ascertained from their Bankers as well as their previous clients/architects.
8	Magnitude of works.	The maximum value of worm/nature of work undertaken should be ascertained to judge whether the intended work could be given.
9	List of works executed	Value, name and address of client, period of completion etc.

Deputy General Manager (Premises)

ANNEXURE-A

DECLARATION REGARDING NEAR RELATIVES WORKING IN STATE BANK OF INDIA (SBI)

Name of Bank Staff Related to Applicant	Designation	Office/Branch & Place of Posting	Relation with the Applicant

(Add separate sheet if required)

Notes:
1. Information has to be filled up specifically in this format.
2. Indicate other points, if any, to show your technical competence to indicate any important point in your favour.

Name of Authorized Signatory

Sign & seal of the applicant

Annexure- B

PRE-CONTRACT INTEGRITY PACT

(TO BE STAMPED AS AN AGREEMENT AND SUBMITTED ALONGWITH THE TENDER)

General

This pre-Bid pre-contract Agreement (hereinafter called the Integrity Pact) is made on ……. day of the ……..……. month of 2026, between, on the one hand,
The State Bank of India (a body corporate incorporated under the State Bank of India Act, 1955) having its Corporate Center at State Bank Bhavan, Nariman Point, Mumbai (hereinafter called the "SBI", which expression shall mean and include, unless the context otherwise requires, its successors) of the First Part and M/s represented by Shri ……..……..…… MD & Chief Executive Officer (hereinafter called the "the Contractor" or "the Bidder" which expression shall mean and include, unless the context otherwise requires, its / his successors and permitted assigns) of the Second Part.
WHEREAS the SBI proposes for selection of contractor/firm to execute **Proposed Supply Installation, Testing & Commissioning (SITC) of Fire Protection Systems, Fire Prevention Systems, Building Management System, Ventilation, Pressurization and smoke extraction system (Revamping and Upgradation Project) at State bank Bhavan Building Mumbai** and the contractor is willing to offer/has offered the services and WHEREAS the contractor is a private company/public company/Government undertaking/partnership/registered export agency, constituted in accordance with the relevant law in the matter and the SBI is an Office / Department of State Bank of India performing its functions on behalf of State Bank of India. NOW, THEREFORE,
To avoid all forms of corruption by following a system that is fair, transparent and free from any influence/prejudiced dealings prior to, during and subsequent to the currency of the contract to be entered into with a view to:

- Enabling the SBI to obtain the desired service at a competitive price in conformity with the defined specifications by avoiding the high cost and the distortionary impact of corruption on public procurement; and

- Enabling the Bidder/Contractor to abstain from bribing or indulging in any corrupt practice in order to secure the contract by providing assurance to them that their competitors will also abstain from bribing and other corrupt practices and the SBI will commit to prevent corruption, in any farm, by its officials by following transparent procedures.

The parties hereto hereby agree to enter into this Integrity Pact and agree as follows:

1. **Commitments of the SBI**

1.1. The SBI undertakes that no official of the SBI, connected directly or indirectly with the contract, will demand, take a promise for or accept, directly or through intermediaries, any bribe, consideration, gift, reward, favor or any material or immaterial benefit or any other advantage from the Bidder, either for themselves or for any person, organization or third party related to the contract in exchange for an advantage in the bidding process, Bid evaluation, contracting or implementation process related to the contract.

1.2. The SBI will, during the pre-contract stage, treat all Bidders (contractor) alike, and will provide to all Bidders the same information and will not provide any such information to any particular Bidder which could afford an advantage to that particular Bidder in comparison to other Bidders.

1.3. All the officials of the SBI will report to the appropriate authority any attempted or complete breaches of the above commitments as well as any substantial suspicion of such a breach.

1.4. In case any such preceding misconduct on the part of such official(s) is reported by the Bidder to the SBI with full and verifiable facts and the same is prima facie found to be correct by the SBI, necessary disciplinary proceedings, or any other action as deemed fit, including criminal proceedings may be initiated by the SBI and such a person shall be debarred from further dealings related to the contract process. In such a case while an enquiry is being conducted by the SBI the proceedings under the contract would not be stalled.

2. **Commitments of the Bidder.**

2.1. The Bidder/contractor/firm commits itself to take all measures necessary to prevent corrupt practices, unfair means and illegal activities during any stage of its Bid or during any pre-contract or post-contract stage in order to secure the contract or in furtherance to secure it and in particular commit itself to the following:

2.2. The Bidder/ contractor/firm will not offer, directly or through intermediaries, any bribe, gift, consideration, reward, favor, any material or immaterial benefit or other advantage, commission, fees, brokerage or inducement to any official of the SBI, connected directly or indirectly with the bidding process, or to any person, organization or third party related to the contract in exchange for any advantage in the bidding, evaluation, contracting and implementation of the contract.

2.3. The Bidder/ contractor/firm further undertakes that it has not given, offered or promised to give, directly or indirectly any bribe, gift, consideration, reward, favor, any material or immaterial benefit or other advantage, commission, fees, brokerage or inducement to any official of the SBI or otherwise in procuring the Contract or forbearing to do or having done any act in relation to the obtaining or execution of the contract or any other contract with State Bank of India for showing or forbearing to show favor or disfavor to any person in relation to the contract or any other contract with State Bank of India.

2.4. Wherever applicable, the Bidder shall disclose the name and address of agents and representatives and shall also disclose their foreign principals or associates, if any.

2.5. The Bidder confirms and declares that they have not made any payments to any agents/brokers or any other intermediary, in connection with this Bid/contract.

2.6. The Bidder/ contractor/firm further confirms and declares to the SBI that the Bidder is the original SIs in respect of Equipment / product / service covered in the Bid documents and the Bidder has not engaged any individual or firm or company whether Indian or foreign to

intercede, facilitate or in any way to recommend to the SBI or any of its functionaries, whether officially or unofficially to the award of the contract to the Bidder, nor has any amount been paid, promised or intended to be paid to any such individual, firm or company in respect of any such intercession, facilitation or recommendation.

2.7. The Bidder, at the earliest available opportunity, i.e. either while presenting the Bid or during pre-contract negotiations and in any case before opening the financial Bid and before signing the contract, shall disclose any payments he has made, is committed to or intends to make to officials of the SBI or their family members, agents, brokers or any other intermediaries in connection with the contract and the details of services agreed upon for such payments.

2.8. The Bidder/ contractor/firm will not collude with other parties interested in the contract to impair the transparency, fairness and progress of the bidding process, bid evaluation, contracting and implementation of the contract.

2.9. The Bidder/ contractor/firm will not accept any advantage in exchange for any corrupt practice, unfair means and illegal activities.

2.10. The Bidder/ contractor/firm shall not use improperly, for purposes of competition or personal gain, or pass. on 'to others, any -information provided by the SBI as part of the business relationship, regarding plans, technical proposals and business details, including information contained in any electronic data carrier. The Bidder also undertakes to exercise due and adequate care lest any such information is divulged.

2.11. The Bidder commits to refrain from giving any complaint directly or through any other manner without supporting it with full and verifiable facts.

2.12. The Bidder shall not instigate or cause to instigate any third person to commit any of the action Bidders mentioned above.

2.13. If the Bidder or any employee of the Bidder or any person acting on behalf of the Bidder, either directly or indirectly, is a relative of any of the officers of the SBI, or alternatively, if any relative of an officer of the SBI has financial Interest/stake in the Bidder's firm, the same shall be disclosed by the Bidder at the time of filing of tender. The term 'relative' for this purpose would be as defined in Section 6 of the Companies Act 1956.

2.14. The Bidder shall not lend to or borrow any money from or enter into any monetary dealings or transactions, directly or indirectly, with any employee of the SBI.

3. **Previous Transgression**

3.1. The Bidder declares that no previous transgression occurred in the last three years immediately before signing of this Integrity Pact, with any other company in any country in respect of any corrupt practices envisaged hereunder or with any Public Sector Enterprise / Public Sector Banks in India or any Government Department in India or RBI that could justify Bidder's exclusion from the tender process.

3.2. The Bidder agrees that if it makes incorrect statement on this subject, Bidder can be disqualified from the tender process or the contract, if already awarded, can be terminated for such reason.

4. **Sanctions for Violations**

4.1. Any breach of the aforesaid provisions by the Bidder or any one employed by it or acting on its behalf (whether with or without the knowledge of the Bidder) shall entitle the SBI to take all or any one of the following actions, wherever required:

i. To immediately call off the pre contract negotiations without assigning any reason and without giving any compensation to the contractor. However, the proceedings with the other Bidder would continue, unless the SBI desires to drop the entire process.

ii. To immediately cancel the contract, if already signed, without giving any compensation to the Bidder.

iii. To recover all sums already paid by the SBI, and in case of an Indian Bidder with interest thereon at 2% higher than the prevailing Base Rate of State Bank of India, while in case of a Bidder from a country other than India with interest thereon at 2% higher than the LIBOR. If any outstanding payment is due to the Bidder from the SBI in connection with any other contract for any other stores, such outstanding could also be utilized to recover the aforesaid sum and interest.

iv. To encash the advance bank guarantee and performance bond/warranty bond, if furnished by the Bidder, in order to recover the payments, already made by the SBI, along with interest.

v. To cancel all or any other Contracts with the Bidder. The Bidder shall be liable to pay compensation for any loss or damage to the SBI resulting from such cancellation/rescission and the SBI shall be entitled to deduct the amount so payable from the money(s) due to the Bidder.

vi. To debar the Bidder from participating in future bidding processes of the SBI or any of its Subsidiaries for a minimum period of five years, which may be further extended at the discretion of the SBI. To recover all sums paid, in violation of this Pact, by Bidder to any middleman or agent or broker with a view to securing the contract. Forfeiture of Performance

Bond in case of a decision by the SBI to forfeit the same without assigning any reason for imposing sanction for violation of this Pact.

vii. Intimate to the CVC, IBA, RBI, as the SBI deemed fit the details of such events for appropriate action by such authorities.

4.2. The SBI will be entitled to take all or any of the actions mentioned at para 6.1(i) to (x) of this Pact also on the Commission by the Bidder or any one employed by it or acting on its behalf (whether with or without the knowledge of the Bidder), of an offence as defined in Chapter IX of the Indian Penal code, 1860 or Prevention of Corruption Act, 1988 or any other statute enacted for prevention of corruption.

4.3 The decision of the SBI to the effect that a breach of the provisions of this Pact has been committed by the Bidder shall be final and conclusive on the Bidder. However, the Bidder can approach the Independent Monitor(s) appointed for the purposes of this Pact.

5. **Fall Clause**

The Bidder undertakes that it has not supplied/is not supplying similar service/product/equipment/systems or subsystems at a price lower than that offered in the present Bid in respect of any other Ministry/Department of the Government of India or PSU or any other Bank and if it is found at any stage that similar Equipment/product/systems or sub systems was supplied by the Bidder to any other Ministry/Department of the Government of India or a PSU or a Bank at a lower price, then that very price, with due allowance for elapsed time, will be applicable to the present case and the difference in the cost would be refunded by the Bidder to the SBI, if the contract has already been concluded.

6. **Facilitation of Investigation**

In case of any allegation of violation of any provisions of this Pact or payment of commission, the SBI or its agencies shall be entitled to examine all the documents including the Books of Accounts of the Contractor and the Contractor shall provide necessary information and documents in English and shall extend all possible help for the purpose of such examination.

7. **Law and Place of Jurisdiction**

This Pact is subject to Indian Law. The place of performance and jurisdiction is the Courts at **Mumbai**.

8. **Other Legal Actions**

The actions stipulated in this Integrity Pact are without prejudice to any other legal action that may follow in accordance with the provisions of the extant law in force relating to any civil or criminal proceedings.

9. **Validity**

9.1. The validity of this Integrity Pact shall be from date of its signing and extend up to 5 years or the complete execution of the agreement to the satisfaction of both the SBI and the Contractor, including warranty period, whichever is later. In case the Bidder is unsuccessful, this Integrity Pact shall expire after six months or contract period agreed as per NIT from the date of the signing of the contract, with the successful Bidder by the SBI.

9.2. Should one or several provisions of this Pact turn out to be invalid; the remainder of this Pact shall remain valid. In this case, the parties will strive to come to an agreement to their original intentions.

10. The parties hereby sign this Integrity Pact at_____ on _____

For SBI

Name of the Officer

Designation

Office/Department/Branch

FOR Contractor/Firm

Chief Executive Officer

LETTER OF SUBMISSION FROM CONTRACTOR

To,

Deputy General Manager (Premises)
State Bank of India,
Madame Cama Road,
9th Floors, Nariman Point,
Mumbai – 400 021.

Dear Sir(s),

Sub: TENDER **FOR SUPPLY, INSTALLATION, TESTING & COMMISSIONING (SITC) OF FIRE PROTECTION, PREVENTION AND LIFE SAFETY MEASURES TENDER AT STATE BANK BHAVAN (SBB) NARIMAN POINT MUMBAI.**

Having examined the site of work and drawings, specifications, general and Special Conditions of Contract, Schedule of Quantities relating to the tender for proposed Supply Installation, Testing & Commissioning of FIRE PROTECTION, PREVENTION AND LIFE SAFETY MEASURES TENDER work prepared by your Consultant, M/s. UKA Consulting and Engineers Pvt. Ltd., 4/204, Vijay Park, off. G B Road, Kasarvadavili, Thane, Maharashtra - 400615 India having obtained the tender invited by your consultants.

1. We the undersigned hereby offer to execute complete and maintain the proposed work in strict accordance with the contract documents for the items described in the tender at the item rates quoted by us in the tender.

2. We undertake to complete and deliver the total work within **18 MONTHS** from the date of issue of LOI / work order.

3. We enclose herewith interest free Earnest Money Deposit amounting to **Rs. 14,87,000/- only** by D/D and this sum shall be forfeited in the event of our failing to execute the contract when called upon to do so by accepting our tender.

4. In the event of this tender being accepted, the above-mentioned Earnest Money will be converted into part of the Initial Security Deposit. The amount of the initial security Deposit shall be 2% of the accepted value of the Tender including the Earnest Money Deposit shall be deposited by the "Demand Draft" in the name of State Bank of India Mumbai. within 15 days from the date of award of work.

5. Total security deposit shall be 10% of contract value (Including bid Deposit i.e. EMD). The initial EMD of 1% will be returned on receipt of 5% value as DD in the name of State Bank of India and balance 5% shall be deducted from the running bill of the work, submitted from time to time, at the rate of 10% of the bill i.e. deduction from each running bill account will be 10% till total balance 5% of contract value is reached. The above Security deposit will be converted into performance guarantee on completion of the job. From the date of confirmation of the handing over of the system along with all documents and certificate including the Fire brigade and/or local authorities, and also on the certification and recommendation of the Consultant. The performance guarantee amount will be returned on the completion of the CAMC period, i.e. the completion of the 5th year from the date of handing over after defect liability period of 24 Months. This amount will be returned on the certification and recommendation of the Consultant.

6. We agree not to employ sub-contractors other than those approved by the Consultants. We agree to pay Government all types of Tax (State and Central), and any other taxes if applicable as prevailing from time to time, on such items for with the same are leviable and the rates quoted by us are inclusive of the same. Any taxes duties that are to be paid to the Government will be paid by us without having any charges to the owner.

7. The successful tenderer shall obtain the permission/approval as required by local Authority/Government department etc./Consultant shall prepare only concept drawings, however the responsibility of the submission of shop drawings / Liaoning follow-up and obtaining approval /permission shall be the responsibility of the contractor and no separate money shall be payable for these activities.

   The contractor shall absolve the employer and Consultant from any loss, damage, action etc. Rate quoted by the tendered shall be inclusive of all such expenses.

Name of the person having Power of
Attorney to sign the Contract.

Duplicate copy of Power of Attorney to
to submitted along with the Tender)

Yours faithfully,

Seal and Address of the Contractor

Date:

e-TENDER FOR SUPPLY, INSTALLATION, TESTING & COMMISSIONING (SITC) OF FIRE PROTECTION, PREVENTION AND LIFE SAFETY MEASURES TENDER AT STATE BANK BHAVAN, MUMBAI.

DUTIES / FUNCTIONS OF BIDDER

a. Taking the client's instructions, visiting the sites, preparing detailed designs which shall be in accordance with local governing codes/ standards, regulations, like Maharashtra Fire Prevention and Protection Law 2008/BMC/ Local Bye Laws /Mumbai Fire Brigade requirements etc. (including carrying out necessary revisions till the sketch designs are finally approved by the client), making estimate of cost and preparing reports on the scheme so as to enable the client to take a decision on the sketch designs.

b. Submitting a proper PERTCHART/Bar Chart incorporating all the activities logistics required for the completion of the project well in time i.e. preparation of shop floor and working drawings, detailed drawings etc. The program should also include various stages of services to be provided by the BIDDERs.

c. If Local Authorities like BMC/ Mumbai Fire Brigade visits the site BIDDER is required to provide assistance to Consultant/ Employer

d. Examining necessary structural stability test of soundness on the Ducting shaft well for Wet Riser /Sprinkler Riser and Fire Pump Room foundation and adopting routing in the safest method as possible.

e. Coordinating with all other BIDDERs, BIDDER's own vendors, Consortium Partner, for Supply, Installation, Testing & Commissioning (SITC) Of FIRE PROTECTION, PREVENTION AND LIFE SAFETY MEASURES TENDER, following up on articles of agreement, specifications, bill of quantities, (ii) analysis of rates based on market rates, (iii) time and progress charts etc.

f. Fulfilling all activities as covered in the detailed scope of work.

g. Furnishing three hard copies of the drawings, documents etc. until approval of the documents and thereafter furnishing four copies of the same. Softcopies to be accompanied always along with.

h. Working out theoretical requirement and actual consumption of any material, at every stage on regular basis, procuring the materials on a regular basis and intimation appropriately in the bills.

Signature of the BIDDER with seal
Digital Certificate
Date:
Place:

SECTION I

BUISNESS RULE DOCUMENT

BUSINESS RULE DOCUMENT OF ONLINE E-TENDERING FOR SUPPLY, INSTALLATION, TESTING AND COMMISSIONING (SITC) OF FIRE PROTECTION, PREVENTION AND LIFE SAFETY MEASURES TENDER AT STATE BANK BHAVAN (SBB), MADAME CAMA ROAD, NARIMAN POINT, MUMBAI

(A) Business rules for E-tendering:

Against this Enquiry for the subject item/system with detailed scope of work as per our specification, SBI may resort to "E-TENDERING" i.e. ONLINE on INTERNET.

1. All the bidders are requested to ensure that they have a valid digital signature certificate well in advance to participate in the online event.
2. **For the proposed e-tendering, only technically qualified bidders will be allowed to participate in online bidding.**
3. SBI will engage the services of an E-tendering service provider who will provide all necessary training and assistance before commencement of on-line bidding on Internet.
4. Business rules like event date, closing and opening time etc. also will be communicated through service provider for compliance.
5. Vendors have to send the mail the compliance form in the prescribed format (provided by service provider) before start of E-tendering. Without this the vendor will not be eligible to participate in the event.
6. The Contractors will be required to submit the various documents in sealed Envelope to the office of SBI .at the address mentioned hereinbefore by the stipulated date i.e. (1) Hard Copy of Technical Bid duly signed and stamped on each page (2) Demand Draft of specified amount of EMD. Contractors not submitting any one or more documents shall not be eligible to participate in the on-line price bidding
7. E-tendering will be conducted on scheduled date & time.
8. At the end of E-tendering, the lowest bidder value will be known on the network.
9. The lowest bidder has to send through email the duly signed filled-in prescribed format as provided on case-to-case basis to SBI. through service provider within 24 hours of E-tendering/E-Reverse Auction without fail.
10. **In all respects for the item the E-tendering will be treated as closed only when the bidding process gets closed listed in the tender.**

(B) Terms & conditions of E-tendering:

SBI shall finalize the Tender through e-tendering. SBI has made arrangement with E-tendering shall be conducted by SBI through M/s. E-Procurement Technologies Ltd, Ahmedabad (EPTL). who shall be SBI's authorized service provider for the same. Please go through the guidelines given below and submit your acceptance to the same along with your Commercial Bid: -

1. E-tendering shall be conducted by SBI through M/s. E-Procurement Technologies Ltd, Ahmedabad (EPTL)., on pre-specified date. While the Contractors should be quoting from their own offices/ place of their choice, Internet connectivity and other paraphernalia

requirements shall have to be ensured by Contractors themselves. In the event of failure of their Internet connectivity, (due to any reason whatsoever it may be) it is the bidders' responsibility. In order to ward-off such contingent situation bidders are requested to make all the necessary arrangements/ alternatives such as back–up power supply whatever required so that they are able to circumvent such situation and still be able to participate in the E-tendering successfully. Failure of power at the premises of Contractors during the E-tendering cannot be the cause for not participating in the E-tendering. On account of this the time for the E-tendering cannot be extended and SBI is not responsible for such eventualities.

2. M/s. E-Procurement Technologies Ltd, Ahmedabad (EPTL). shall arrange to train your nominated person(s), without any cost to you. They shall also explain you all the Rules related to the E-tendering. You are required to give your compliance on it before start of bid process.

3. BIDDING CURRENCY AND UNIT OF MEASUREMENT: Bidding will be conducted in Indian currency & Unit of Measurement will be displayed in Online E-tendering.

4. BID PRICE: The Bidder has to quote the rate as per the tender document provided by SBI and their appointed consultants.

5. VALIDITY OF BIDS: The Bid price shall be firm for a period specified in the tender document and shall not be subjected to any change whatsoever.

6. If no bid is received within the specified date & time, SBI, at its discretion, may decide to scrap the whole e-tendering process / proceed with conventional mode of tendering.

7. **Procedure of E-tendering**:

(a) The NIT &Technical bid available on the e-tender's service provider website during the period specified in the NIT.
(b) Online e-tendering is open to the empaneled bidders who receive NIT from the Architect and qualified for participating in the price bidding as provisions mentioned hereinabove through SBI approved Service Provider.
(c) The Price Bid shall be made available online by the Service Provider wherein the contractors will be required to fill-in their Item-wise rates for each item.
(d) The Contractors are advised not to wait till the last minute to submit their online item-wise quote in the price bid to avoid complications related with internet connectivity, network problems, system crash down, power failure, etc.
(e) It is mandatory to all the bidders participating in the price bid to quote their rates for each and every item.
(f) In case, contractor fails to quote their rates for any one or more tender items, their tender shall be treated as ***"Incomplete Tender***" and shall be liable for rejection.

8. LOG IN NAME & PASSWORD: Each Bidder is assigned a Unique Username & Password by M/s. E-Procurement Technologies Ltd, Ahmedabad (EPTL). The Bidders are requested to

change the Password after the receipt of initial Password from M/s auctiontigher.net. All bids made from the Login ID given to the bidder will be deemed to have been made by the bidder.

9. BIDS PLACED BY BIDDER: Bids will be taken as an offer to execute the work as specified. Bids once made cannot be cancelled / withdrawn and the Bidder shall be bound to execute the work as per scope of work mentioned in the tender and at the quoted bid price. In case bidder backs out from their quote or fails to execute the work within the specified or leave the job incomplete, SBI/SBI shall be free to take action against the bidder as deemed fit including forfeiting their EMD/ISD/ASD and to de-panel such contractor from the panel of SBI.

10. At the end of the E-tendering, the decision of SBI regarding award of Contract shall be final and binding to all the Bidders.

11. SBI shall be at liberty to cancel the E-tendering process / tender at any time, before ordering, without assigning any reason.

12. SBI shall not have any liability to bidders for any interruption or delay in access to the site irrespective of the cause.

13. Other terms and conditions shall be as per techno-commercial offers and other correspondences till date.

14. Bidders are required to submit their acceptance to the terms & conditions / modality (Technical bid) given above before participating in the e-tendering.

15. E-TENDERING WINNER: At the end of the E-tendering then, SBI will evaluate all the bids submitted and will decide upon the winner.

16. OTHER TERMS & CONDITIONS:
    - The Bidder shall not involve himself or any of his representatives in Price manipulation of any kind directly or indirectly by communicating with other suppliers / bidders.

    - The Bidder shall not divulge either his Bids or any other exclusive details of SBI to any other party.

    - SBI decision on award of Contract shall be final and binding on all the Bidders.
    - SBI along with M/s. E-Procurement Technologies Ltd, Ahmedabad (EPTL). can decide to extend, reschedule or cancel any E-tendering.

    - M/s. E-Procurement Technologies Ltd, Ahmedabad (EPTL). shall not have any liability to Bidders for any interruption or delay in access to the site irrespective of the cause.

- M/s. E-Procurement Technologies Ltd, Ahmedabad (EPTL).is not responsible for any damage, including damages that result from, but are not limited to negligence. M/s. E-Procurement Technologies Ltd, Ahmedabad (EPTL). will not be held responsible for consequential damages, including but not limited to systems problems, inability to use the system, loss of electronic information etc.

N.B.

- All the Bidders are required to submit the Process Compliance Statement duly signed to M/s. E-Procurement Technologies Ltd, Ahmedabad (EPTL).

- All the bidders are requested to ensure that they have a valid digital signature certificate well in advance to participate in the online event.

PROCESS COMPLIANCE STATEMENT (ANNEXURE C)

(The bidders are required to print this on their company's head and sign, stamp before emailing)

To

CONSENT TO THE PROCESS RELATED TERMS AND CONDITIONS FOR THE ONLINE E-TENDERING BUSINESS RULE DOCUMENT OF ONLINE E-TENDERING "FOR SUPPLY, INSTALLATION, TESTING AND COMMISSIONING (SITC) OF FIRE PROTECTION, PREVENTION AND LIFE SAFETY MEASURES TENDER AT STATE BANK BHAVAN (SBB), MADAME CAMA ROAD, NARIMAN POINT, MUMBAI."

Dear Sir,

This has reference to the Terms & Conditions for the E-tendering mentioned in the Tender document. This letter is to confirm that:

1) The undersigned is authorized representative of the company.
2) We have studied the Commercial Terms and the Business rules governing the E-tendering as mentioned in NIT of SBI as well as this document and confirm our consent to them.
3) We also confirm that we have taken the training on the E-tendering tool and have understood the functionality of the same thoroughly.
4) We confirm that SBI and M/s. E-Procurement Technologies Ltd, Ahmedabad (EPTL). Limited shall not be liable & responsible in any manner whatsoever for my/our failure to access & bid on the E-tendering platform due to loss of internet connectivity, electricity failure, virus attack, problems with the PC, any other unforeseen circumstances etc. before or during the E-tendering and E-reverse auction event.
5) We also confirm that we have a valid digital signature certificate issued by a valid Certifying Authority.

6) We hereby confirm that we will honor the Bids placed by us during the E-tendering process.

With regards,
Date:

Signature with company seal
Name:

Company / Organization:

Designation within Company / Organization:

Address of Company / Organization:

Scan it and send to this Document on ----------

Price Confirmation Letter

(The bidders are required to print this on their Company's letter head and sign, stamp before emailing)

To,
E-Procurement Technologies Ltd. (Auction Tiger)
B-704, Wall Street - II,
Opp. Orient Club,
Nr. Gujarat College, Ahmedabad - 380 006.
Gujarat State, India

TENDER FOR SUPPLY, INSTALLATION, TESTING AND COMMISSIONING (SITC) OF FIRE PROTECTION, PREVENTION AND LIFE SAFETY MEASURES AT STATE BANK BHAVAN (SBB), MADAME CAMA ROAD, NARIMAN POINT, MUMBAI

Online Price Bid Date:

Dear Sir,

We confirm that we have quoted.

Thanking you and looking forward to the valuable order from SBI.

Yours sincerely,

For _____

Name:
Company:
Date:
Seal:
Scan it and send to this Document on samjad@procuretiger.com

Price breaks up

Detailed Price Break up as per tender document

ARTICLES OF AGREEMENT

This AGREEMENT is made at …… on this ……. day of …… between State Bank of India, a body Corporate incorporated under SBI Act 1955, having its Corporate Centre at State Bank Bhavan, MADAME Cama Road, Nariman Point, Mumbai 400 021, represented by authorized officer of SBI. (hereinafter called "the Employer") on the one part and M/s _____ (proprietorship/partnership firm/Company), incorporated under the provisions of the Companies Act and having its registered office at _____ (hereinafter called "the Vendor") represented by Shri …… who is authorized to enter this agreement by its Board of Directors on the other part.

AND WHEREAS the Employer has intention of engaging SBI issuing tenders on its behalf **For Supply, Installation, Testing and Commissioning (SITC) of FIRE PROTECTION, PREVENTION AND LIFE SAFETY MEASURES TENDER at State Bank Bhavan (SBB), Mumbai** under two bid systems

AND WHEREAS the SBI had called for tenders through newspaper advertisement followed by uploading the tender documents in Bank's website for the proposed work as indicated in the scope of work and other documents attached to the tender.
AND WHEREAS the Vendor and others submitted the tenders and the Employer has awarded the contract relating to **For Supply, Installation, Testing and Commissioning (SITC) of FIRE PROTECTION, PREVENTION AND LIFE SAFETY MEASURES TENDER at State Bank Bhavan (SBB), Mumbai** as stated in the scope of work attached to the Tender Document to the Vendor.
AND WHEREAS both the parties to this agreement are desirous of recording the terms and conditions upon which the said services are to be rendered by the Vendor.

NOW IT IS HEREBY AGREED AS FOLLOWS:

1. In consideration of the said Contract Amount to be paid at the times and in the manner set forth in the said Conditions, the Contractor shall upon and subject to the said Conditions execute and complete the work shown upon the said Drawings and described in the said Specifications and the priced Schedule of Quantities.

2. The Employer shall pay to the Contractor the said Contract Amount, or such other sum as shall become payable, at the times and in the manner specified in the said Conditions.

3. The said Conditions and Appendix thereto shall be read and construed as forming part of this Agreement, and the parties hereto shall respectively abide by submit themselves to the said Conditions and perform the Agreements on their part respectively in the said Conditions contained.

4. The Plans, Agreements and Documents mentioned herein shall form the basis of this Contract.
5. This Contract is neither a fixed lump-sum contract nor a piece work contract but a contract to carry out the work as per enclosed schedule of Items and to be paid for according to actual measured quantities at the rates contained in the Schedule of Quantities or as provided in the said Conditions and approved by the SBI.

6. The Contractor shall afford every reasonable facility for the carrying out of all works relating to above Installation in the manner laid down in the said Conditions, and shall make good any damages done to walls, floors, etc. after the completion of his work.

7. The Employer reserves to itself the right of altering the drawings and nature of the work by adding to or omitting any items of work or having portions of the same carried out without prejudice to this Contract.

8. Time shall be considered as the essence of this Contract and the Contractor hereby agrees to commence the work soon after the Site is handed over to him or from 7th day after the date of issue of formal work order as provided for in the said Conditions whichever is later and to complete the entire work within 8 weeks month subject to nevertheless the provisions for extension of time.

9. All payments by the Employer under this Contract will be made by State Bank of India.

10. All disputes arising out of or in any way connected with this Agreement shall be resolved by mutual discussion and if it still remains unresolved the same will be referred to MD for conclusion deemed to have arisen at Mumbai and only the Courts in Mumbai shall have jurisdiction to determine the same.

11. That the several parts of this Contract have been read by the Contractor and fully understood by the Contractor.

IN WITNESS WHEREOF THE EMPLOYER and the Contractor have set their respective hands to these presents and two duplicates hereof the day and year first hereinabove written.

SIGNATURE CLAUSE

SIGNED AND DELIVERED by the

_____
(Employer)

hand of Shri _____

_____ (Signature of Employer)
(Name and Designation)

In the presence of:

Shri / Smt. _____ (Signature of Witness)

Address _____

_____
(Witness)

SIGNED AND DELIVERED by the

_____ by the
(Contractor) (Signature of Contractors)

in the presence of:

Shri / Smt. _____ (Signature of Witness)

Address _____

SECTION – II

INSTRUCTIONS TO THE TENDERERS

1.0 Scope of work

Sealed Tenders are invited **by SBI,** For Supply, Installation, Testing and Commissioning (SITC) of FIRE PROTECTION & PREVENTION SYSTEMS, BMS at State Bank Bhavan (SBB), Mumbai.

1.1 Site and its location

The proposed work is to be carried out at State Bank Bhavan (SBB), Mumbai for Supply, Installation, Testing and Commissioning (SITC) of FIRE PROTECTION SYSTEM at State Bank Bhavan (SBB), Mumbai

2.0 Tender documents

2.1 The work has to be carried out strictly according to the conditions stipulated in the tender consisting of the following documents and the most workmen like manner.

Instructions to Tenderers
General Conditions of Contract
Special Conditions of Contract
Priced Bid

2.2 The above documents shall be taken as complementary and mutually explanatory of one another but in case of ambiguities or discrepancies, shall take precedence in the order given below;

a) Price Bid

b) Technical Specifications

c) Special Conditions of Contract

d) General Conditions of Contract

e) Instructions to Tenderers

2.3 Complete set of tender documents including relative drawings can be downloaded from the website https://sbi.bank.in/web/sbi-in-the-news/procurement-news

2.4 The tender documents are not transferable.

3.0 **Site Visit**

3.1 The tenderer must obtain on his own responsibility and his own expenses all information and data that may be required for the purpose of filling in this tender document and enter into a contract for the satisfactory performance of the work. The tenderer is requested satisfy himself regarding the availability of water, power, transport and communication facilities, the character quality and quantity of the materials, labor, the law-and-order situation, climatic conditions local authorities' requirement, traffic regulations etc.

The tenderer will be fully responsible for considering the financial effect of any or all the factors while submitting his tender.

4.0 **Earnest Money**

4.1 The tenderers are requested to submit the Earnest Money of **Rs. 12,50,000/- Only by means of Demand Draft / Pay Order** (Valid for a period of 180 Days from the last date of submission of the tender) from any scheduled Nationalized Bank drawn **in favor of SBI and payable in Mumbai.**

4.2 EMD in any other form other than as specified above will not be accepted. Tender, not accompanied by the EMD, will be rejected.

4.3 No interest will be paid on the EMD.
4.4 EMD of unsuccessful tenderer will be refunded within 30 days of award of Contract.
4.5 EMD of successful tenderer will be retained as a part of security deposit.
4.6 The EMD made by the Bidder will be forfeited if:
4.6.1 The BIDDER withdraws his Tender before processing the same.
4.6.2 The BIDDER withdraws his Tender after processing but before acceptance of "Letter of appointment" issued by Bank
4.6.3 The BIDDER violates any of the provisions of the terms and conditions of this Tender specification.

5.0 **Initial Security Deposit**

The successful tenderer will have to submit a sum equivalent to 2% of accepted tender value less EMD by means of DD drawn in favor of SBI within a period of 15 days of acceptance of tender.

5.1 Defects Liability Period: 24 months from the date of "Virtual Completion" of the said Work certified by the Bank/ Consultant.

6.0 **Security Deposit**

6.1 Total security deposit shall be 10% of contract value. The initial deposit of 5% of the agreed value of the contract will be deposited by the vender within15 days from the date of award of order/ LOI and the balance 5% shall be deducted from the running bill of the work, submitted from time to time, at the rate of 10% of the bill i.e. deduction from each running bill account will be 10% till the total balance 5% of contract value is reached. This amount will be paid back to the vendor on submission of performance guarantee for a period of 5 years from the date of handing over of the system along with all documents certificates including the Fire brigade and/or local authorities, and also on the certification and recommendation of the Consultant to the owner. No interest shall be paid to the amount retained by the Bank as Security Deposit.

6.2 **Additional Security Deposit (ASD)**

In case L-1 bidder quotes abnormally low rates (i.e. 10% or more, below estimated project cost), the bank may ask such bidder to deposit additional security deposit (ASD) equivalent to difference of estimated cost vis-à-vis L-1 quoted amount for due fulfillment of contract. Such ASD could be in the form of FDR / Bank's guarantee in the Bank's name as per format approved by the Bank. On successful completion of work ASD will be returned to the contractor. In case contractor fails to complete the work in time or as per tender specification or leave the job incomplete, the bank will be at liberty to recover the dues from ASD or to forfeit such ASD as the case may be within its sole discretion.

6.2.1 No interest shall be paid to the amount retained by the Bank as Security Deposit.
6.2.2 The ASD shall be the difference between 90% of the estimated cost and the quoted price.

7.0 Validity of Tender

Tenders shall remain valid and open for acceptance for a period of 3 (Three) months from the date of opening of e-Tendering If the tenderer withdraws his/her offer during the validity period or makes modifications in his/her original offer which are not acceptable to the Bank, without prejudice to any other right or remedy the Bank shall be at liberty to forfeit the EMD.

(i) The successful bidder will enter into a Stamp paper agreement for value as per Mumbai Stamp Act, 1958 read with Indian Stamp Act, 1899 with **SBI** as per the standard format within 15 days on receipt of Letter of Acceptance of tender from Bank. The cost of non-judicial stamp paper as applicable as per the latest Stamp Act for entering into the agreement will be borne by the bidder. (To Note: It is a substantial amount)

(ii) All information called for in the enclosed forms should be furnished against the relevant columns in the forms. If for any reason, information is furnished on separate sheet, this fact should be mentioned against the relevant column. Even if no information is to be provided in a column, a "Nil" or "no such case" or "Not Available" entry should be made in that column. If any particulars/queries are not applicable in case of the bidder, it should be stated as "Not Applicable". The bidders may please note that giving incomplete/unclear information called for in application forms, or making any changes in the prescribed forms, or deliberately suppressing any information, may result in disqualification of the bidder summarily. Applications received thus will not be entertained. Applications made by telex/telegram also will not be entertained.

(iii) Overwriting and using of correcting fluid must be avoided. Corrections, if any, should be made by neatly crossing out and shall be rewritten with initials and date. Pages of the document have to be numbered. Additional sheets, if any added by the bidder, should also be numbered by him. They should be submitted as a package with signed letter of transmittal.

(iv) The bidder may furnish any additional information, which he thinks is necessary to establish his capabilities to successfully complete the envisaged work. He is, however, advised not to furnish superfluous information. No information shall be entertained after submission of Expression of Interest documents unless it is called for by the Employer.

(v) References, information and certificates from the respective clients certifying suitability, technical know-how or capability of the bidder should be signed by an officer not below the rank of Superintending Engineer/Chief Project Manager or equivalent.

(vi) Documents submitted in connection with this tender will be treated as confidential and will not be returned.

7.0 **Signing of contract Documents**

The successful tenderer shall be bound to implement the contract by signing an agreement and conditions of contract attached herewith within 15 days from the receipt of intimation of acceptance of the tender by the Bank. However, the written acceptance of the tenders by the Bank will constitute a binding agreement between the Bank and successful tenderer till such formal agreement is subsequently entered into or not.

8.0 **Completion Period**

Time is essence of the contract. The work should be completed in all respects in accordance with the terms of contract as mentioned in the NIT from the date of award of work.

9.0 **Validity of tender**

Tenders shall remain valid and open for acceptance for a period of 90 days from the date of opening price bid. If the tenderer withdraws his/her offer during the value period or makes modifications in his/her original offer which are not acceptable to Bank without prejudice to any other right or remedy the Bank shall be at liberty forfeit the EMD.

10.0 **Liquidated Damages**

The liquidated damages shall be **0.50%** per week subject to a maximum of 5% of contract value.

11.0 **Rate and prices:**

11.1 **In case of item rate tender**

11.1.1 The tenderers shall quote their rates for individual items both in words and figures. In case of discrepancy between the rate quoted in words and figures, the unit rate quantity in words will prevail. If no rate is quoted for a particular item the contractor shall not be paid for that item when it is executed.
The amount of each item shall be calculated and the requisite total is given. In case of discrepancy between the unit rate and the total amount calculated from multiplication of unit rate and the quantity the unit rate quoted will govern and the amount will be corrected.

11.1.2 The tenderers need not quote their rates for which no quantities have been given. In case the tenderers quote their rates for such items those rates will be ignored and will not be considered during execution.

11.1.3 The tenderers should not change the units specified in the tender. If any unit is changed the tenders would be evaluated as per the original unit and the contractor would be paid accordingly.
The tenderer should not change or modify or delete the description of the item. If any discrepancy is observed he should immediately bring to the knowledge of the Consultant / SBI.

11.1.4 Each page of the BOQ shall be signed by the authorized person and cutting or overwriting shall be duly attested by him.

11.1.5 Each page shall be totaled, and the grand total shall be given.

11.1.6 The rate quoted shall be firm and shall include all costs, allowances, taxes, and levies.

11.1.7 The SBI. reserve their rights to accept any tenders, either in whole or in part or may entrust the work in phases or may drop the part scope of work at any stage of the project within its sole discretion without assigning any reason(s) for doing so and no claim / correspondence shall be entertained in this regard.

11.1.8 In case it is decided by the SBI. to drop one or more buildings from the scope of work at any stage of the project, the contractor shall not be entitled to raise any claim / compensation for such deleted scope of work. Also, the SBI may consider issuing work orders for various buildings in phases but within a reasonable time interval and the contractor shall be bound to execute the same within the stipulated time period and as per rates quoted by them in this tender without any claim for price escalation.

SIGNATURE OF THE CONTRACTOR

WITH SEAL

GENERAL CONDITIONS

1.0 **Definitions**:
"Contract means the documents forming the tender and the acceptance thereof and the formal agreement executed between SBI (client) and the contractor, together with the documents referred there in including these conditions, the specifications, designs, drawings and instructions issued from time to time by the Consultant s/ Bank and all these documents taken together shall be deemed to form one contract and shall be complementary to one another.

1.1 In the contract the following expressions shall, unless the context otherwise requires, have the meaning hereby respectively assigned to them.

1.1.1 Site Engineer' shall mean a Fire Officer/Engineer- Fire appointed by the SBI at site as their representative for day-to-day supervision of work and to give instructions to the contractors.

1.1.2 'The Contractor' shall mean the individual or firm or company whether incorporate not, undertaking the works and shall include legal personal representative of individual or the composing the firm or company and the permitted assignees of individual or firms of company.

1.1.3 The expression 'works or 'work' shall mean the permanent or temporary work description in the "Scope of work" and / or to be executed in accordance with the contract includes materials, apparatus, equipment, temporary supports, fittings and things of kinds to be provided, the obligations of the contractor hereunder and work to be done by the contractor under the contract.

1.1.4. 'Engineer' shall mean the representative of the Consultant.

1.1.5. 'Drawings' shall mean the drawings prepared by the Consultant s/Consultant and issued by the Engineer and referred to in the specifications and any modifications of such drawings as may be issued by the Engineer from time to time 'Contract value shall mean value of the entire work as stipulated in the letter of acceptance of tender subject such additions there to or deductions there from as may be made under the provide herein after contained.

1.1.6. Specifications shall mean the specifications referred to in the tender and modifications thereof as may time to time be furnished or approved by the Consultant.

1.1.7. "Month" means calendar month.

1.1.8 "Week" means seven consecutive days.

1.1.9 Day" means a calendar day beginning and ending at 00 Hrs. and 24 Hrs. respectively.

1.1.10 "**SBI's Engineer"** shall mean The **Fire officer in - charge** of the Project, as nominated by the bank.

1.1.11 The following shall constitute the Joint Project Committee (herein under referred to as JPC) for assessing and reviewing the progress of the work on the project and to issue instructions or directions from time to time for being observed and followed by the Consultant's Site Engineer /PMC and other Consultants / contractors engaged in the execution of the project.

i) SBI Fire Officer/ Engineer-Fire
ii) Concerned partner / proprietor of the Consultant s and their Resident Consultant Member.

CLAUSE

1.0 Total Security Deposit

Total Security deposit comprises of - Earnest Money Deposit, Initial security deposit and Retention Money

a) **Earnest Money Deposit:**

The tenderer shall furnish an EMD of **Rs. 14,87,000/- only (Rupees Fourteen lakh eighty seven thousand only)** in the form of Demand draft or banker's cheque drawn in favour of SBI on any Scheduled Bank. No tender shall be considered unless the EMD is so deposited in the required form. No interest shall be paid on this EMD. The EMD of the unsuccessful tenderer shall be refunded soon after the decision to award the contract is taken without interest. The EMD shall stand absolutely forfeited if the tenderer revokes his tender at any time the period when he is required to keep his tender open acceptance by the SBI or after it is accepted by the SBI the contractor fails to enter into a formal agreement or fails to pay the initial security deposit as stipulated or fails to commence the commence the work within the stipulated time.

b) **Initial Security Deposit (lSD):**

The amount of ISD shall be 2% of accepted value of tender including the EMD in the form of DD/FDR drawn on any scheduled Bank and shall be deposited within 15 days from the date of acceptance of tender.

ADDITIONAL SECURITY DEPOSIT / PERFORMANCE GUARANTEE

In case L-1 bidder quotes abnormally low rates (i.e. 10% or more, below estimated project cost), the bank may ask such bidder to deposit additional security deposit (ASD) equivalent to difference of estimated cost vis-à-vis L-1 quoted amount for due fulfillment of contract as performance guarantee. Such ASD could be in the form of FDR / Bank's guarantee in the Bank's name as per format approved by the Bank. On successful completion of work ASD will be returned to the contractor. In case contractor fails to complete the work in time or as per tender specification or leave the job incomplete, the bank will be at liberty to recover the dues from ASD or to forfeit such ASD as the case may be within its sole discretion.
No interest shall be paid to the amount retained by the Bank as Security Deposit.

c) **Retention Money:**

Besides the SD as deposited by the contractor in the above said manner, the Retention money shall be deducted from the running account bill at the rate of 10% of the gross value of work done by the contractor and claimed in each bill provided the total security deposit i.e. ISD plus EMD plus Retention Money shall both together not exceed 5% of the contract value. The 50% of the total security deposit shall be refunded to the contractor without any interest on issue of Virtual Completion certificate by the Consultant. The balance 50% of the total security deposit shall be refunded to the contractors without interest within fifteen days after the end of defects liability period provided the contractor has satisfactorily attended to all defects, if any, in accordance with the conditions of contract including site clearance.

2.0 **Language:**
The language in which the contract documents shall be drawn shall be in English.

3.0 **Errors, omissions and discrepancies:**
In case of errors, omissions and/ or disagreement between written and scaled dimensions on the drawings or between the drawings and specifications etc., the following order shall apply.

i) Between scaled and written dimensions (or description) on a drawing, the latter shall be adopted.

ii) Between the written or shown description or dimensions in the drawings and the corresponding one in the specification the former shall be taken as correct.

iii) Between written description of the item in the specifications and descriptions in bills of quantities of the same item, the former shall be adopted:

a) In case of difference between rates written in figures and words, the rate in words shall prevail.
b) Between the duplicate / subsequent copies of the tender, the original tender shall be taken as correct.

4.0 **Scope of Work:**

The contractor shall carry out complete and maintain the said work in every respect strictly accordance with this contract and with the directions of and to the satisfaction Bank to be communicated through the Consultant. The Consultant at the directions of the SBI from time-to-time issue further drawings and / or write instructions, details directions and explanations which are here after collectively references to as Consultant instructions in regard to the variation or modification of the design, quality or quantity of any work or the addition or omission or substitution work. Any discrepancy in the drawings or between BOQ and / or drawings and / or specifications. The removal from the site of any material brought thereon by the Contractor and any substitution of any other materials therefore the removal and / or re-executed of any work executed by him. The dismissal from the work of any person engaged thereupon.

5.0 i) **Letter of Acceptance:**

Within the validity period of the tender the SBI shall issue a letter of acceptance directly or through the Consultant by registered post or otherwise depositing at the of the contractor as given in the tender to enter into a Contract for the execution of the work as per the terms of the tender. The letter of acceptance shall constitute a binding contract between the SBI and the contractor.

ii) **Contract Agreement:**

On receipt of intimation of the acceptance of tender from the SBI/ Consultant, the successful tenderer shall be bound to implement the contract and within fifteen days there of shall sign an agreement in a non-judicial stamp paper of appropriate value.

6.0 **Ownership of drawings:**

All drawings, specifications and copies thereof furnished by the SBI through its Consultants are the properties of the SBI They are not to be used on other work.

7.0 **Detailed drawings and instructions:**

The SBI through its Consultant s / Consultants shall furnish with reasonable proper additional instructions by means of drawings or otherwise necessary for the execution of the work. All such drawings and instructions shall be consistent with contract documents, true developments thereof and reasonably inferable there.

The work shall be executed in conformity therewith and the contractor prepare a detailed program schedule indicating therein the date of start and completion of various activities on receipt of the work order and submit the same to the SBI through the Consultant

8.0 **Copies of agreement:**

Two copies of agreement duly signed by both the parties with the drawings shall be handed over to the contractors.

9.0 **Liquidated damages:**

If the contractor fails to maintain the required progress in terms of clause 6. 0 of GOC or to complete the work and clear the site including vacating their office on or before the contracted or extended date or completion, without justification in support of the cause of delay, he may be called upon without prejudice to any other right of remedy available under the law to the SBI on account of such breach to pay a liquidated damage at the rate of 0.50% of the contract value which subject to a maximum of 5% of the contract value.

10.0 **Materials, Appliances and Employees:**

Unless or otherwise specified the contractor shall provide and pay for all materials, labour, water, power, tools, equipment, transportation and any other facilities that are required for the satisfactory execution and completion of the work. Unless or otherwise specified all materials shall be new and both workmanship and materials shall be best quality. The contractor shall at all times enforce strict discipline and good order among his employees and shall not employ on the work any unfit person or anyone not skilled in the work assigned to him. Workman whose work or behavior is found to be unsatisfactory by the SBI /Consultant he shall be removed from the site immediately.

11.0 **Permits, Laws and Regulations:**

Permits and licenses required for the execution of the work shall be obtained by the contractor at his own expense. The contractor shall give notices and comply with the regulations, laws, and ordinances rules applicable to the contract. If the contractor observes any discrepancy between the drawings and specifications, he shall promptly notify the SBI in writing under intimation of the Consultant. If the contractor performs any act, which is against the law, rules and regulations, he shall meet all the costs arising there from and shall indemnify the SBI any legal actions arising there from.

12.0 **Setting out Work:**

The contractor shall set out the work and shall be responsible for the true and perfect setting out of the same and for the correctness of the positions, levels, dimensions, and alignment of all parts thereof and get it approved by the Consultant before proceeding with the work. If at any time, any error in this respect shall appear during the progress of the works, irrespective of the fact that the layout has

been approved by the Consultant, the contractor shall be responsible for the same ad shall his own expenses rectify such error, if so, required to satisfaction of the SBI

13.0 **Protection of works and property:**

The contractor shall continuously maintain adequate protection. of all his work from damage and shall protect the SBI's properties from injury or loss arising in connection with contract. He shall make good any such damage, injury, loss, except due to causes beyond his control and due to his fault or negligence.

He shall take adequate care and steps for protection of the adjacent properties. The contractor shall take all precautions for safety and protections of his employees on the works and shall comply with all applicable provisions of Govt. and local bodies' safety laws and building codes to prevent accidents, or injuries to persons or property on about or adjacent to his place of work. The contractor shall take insurance covers as per clause 24.0 at his own cost. The policy may be taken in joint names of the contractor and the SBI and the original policy may be lodged with the SBI

13.1 Dismantling of false ceilings

The bidders should note that the false ceiling can be cut according to their requirements at places wherever necessary. Dismantling & reinstallation of the false ceiling must be carried out by the vendor without causing any disturbance to the staff seating below.

14.0 **Inspection of work:**

The SBI and Consultant or their representatives shall at all reasonable times have free access to the work site and / or to the workshop, factories, or other places where materials are lying or from where they are obtained and the contractor shall give every facility to the SBI/Consultant and their representatives necessary for inspection and examination and test of the materials and workmanship. No person unless authorized by the SBI/ Consultant except the representative of public authorities shall be allowed on the work at any time. The proposed work either during its construction stage or its completion can also be inspected by the Chief Technical Examiner's Organization, a wing of Central Vigilance commission.

15.0 **Assignment and subletting:**

The whole of work included in the contract shall be executed the contractor and he shall not directly entrust and engage or indirectly transfer, assign or underlet the contract or any part or share there of or interest therein without the written consent of the SBI through the Consultant and no undertaking shall relieve the contractor from the responsibility of the contractor from active & superintendence of the work during its progress.

16.0 **Quality of materials, workmanship & Test:**

All materials and workmanship shall be best of the respective kinds described in the contract and in accordance with consultant instructions and shall be subject from time to time to such tests as the Consultant may direct at the place of manufacture or fabrication or on the site or an approved testing laboratory. The contractor shall provide such assistance, instruments, machinery, labor, and materials as are normally required for examining measuring sampling and testing any material or part of work before incorporation in the work for testing as may be selected and required by the Consultant.

ii) **Samples:**

All samples of adequate numbers, size, shades & pattern as per specifications shall be supplied by the contractor without any extra charges. If certain items proposed to be used are of such nature that samples cannot be presented or prepared at the site detailed literature / test certificate of the same shall be provided to the satisfaction of the Consultant. Before submitting the sample / literature the contractor shall satisfy himself that the material / equipment for which he is submitting the sample / literature meet with the requirement of tender specification. Only when the samples are approved in writing by the Consultant the contractor shall proceed with the procurement and installation of the particular material / equipment. The approved samples shall be signed by the Consultant for identification and shall be kept on record at site office until the completion of the work for inspection / comparison at any time. The Consultant shall take reasonable time to approve the sample. Any delay that might occur in approving the samples for reasons of its not meeting the specifications or other discrepancies inadequacy in furnishing samples of best qualities from various manufacturers and such other aspects causing delays in the approval of the materials / equipment etc. shall be on the account of the contractor.

iii) **Cost of tests:**

The cost of making any test shall be borne by the contractor if such test is intended by or provided for in the specification or BOQ.

iv) **Costs of tests not provided for:**

If any test is ordered by the Consultant which is either

a) If so intended by or provided for or (in the cases above mentioned) is not so particularized, or though so intended or provided for but ordered by the Consultant to be carried out by an independent person at any place other than the site or the place of manufacture or fabrication of the materials tested or any Government / approved laboratory, then the cost of such test shall be borne by the contractor.

17.0 **Obtaining information related to execution of work:**

No claim by the contractor for additional payment shall be entertained which is consequent upon failure on his part to obtain correct information as to any matter affecting the execution of the work nor any misunderstanding or the obtaining incorrect information or the failure to obtain correct information relieve him from any risks or from the entire responsibility for the fulfillment of contract.

18.0 **Contractor's superintendence:**

The contractor shall give necessary personal superintendence during the execution of the works and as long, thereafter, as the Consultant may consider necessary until the expiry of the defect's liability period, stated here to.

19.0 **Quantities:**

i) The bill of quantities (BOQ) unless or otherwise stated shall be deemed to have been prepared in accordance with the Indian Standard Method of Measurements and quantities. The quoted rate remains valid for variation of quantity against individual item to any extent. The entire amount paid under Clause 19, 20 hereof as well as amounts of prime cost and provision sums, if any, shall be excluded.

20.0 **Works to be measured:**

The Consultant may from time-to-time intimate to the contractor that he requires the work to be measured and the contractor shall forthwith attend or send a representative to assist the Consultant in taking such measurements and calculation and to furnish all particulars or to give all assistance required by any of them. Such measurements shall be taken in accordance with the Mode of Measurements in detail in the specifications. The representative of the Consultant shall take measurements with the contractor's representative, and the measurements shall be entered in the measurement book. The contractor or his authorized representative shall sign all the pages of the measurement book in which the measurements have been recorded in token of his acceptance. All the corrections shall be duly attested by both representatives. No over writings shall be made in the Measurement Book (M.B.) Should the contractor not attend or neglect or omit to depute his representative to take measurements, the measurements recorded by the representative of the Consultant shall be final. All authorized extra work, omissions and all variations made shall be included such measurement.

21.0 **Variations:**

No alteration, omission or variation ordered in writing by the Consultant vitiates the contract. In case the SBI / Consultant thinks proper at any during the progress of works to make any alteration in, or additions to or omission from the works or any. alteration in the kind or quality of the materials to be used therein, the Consultant shall give notice thereof in writing to the contractor shall confirm in writing within seven days of giving such oral instructions the contract shall alter to, add to, or omit from as the case may be in accordance with such but the contractor shall not do any work extra to or make any alterations or additions to or omissions from the works or any deviation from any of the provisions of the contract, stipulations, specifications or contract drawings without previous consent in writing of the Consultant and the value of such extras, alterations, additions or omissions shall in all cases be determined by the Consultant and the same shall be added to or deducted from the contract value, as the case may be.

22.0 **Valuation of Variations:**

No claim for an extra shall be allowed unless it shall have been executed under the authority of the Consultant with the concurrence of the SBI as herein mentioned. Any such extra is herein referred to as authorized extra and shall be made in accordance with the following provisions.

a) (i) The net rates or prices in the contract shall determine the valuation of the extra work where such extra work is of similar character and executed under similar conditions as the work priced herein.

(ii) Rates for all items, wherever possible should be derived out of the rates given in the priced BOQ.

b) The net prices of the original tender shall determine the value of the items omitted, provided if omissions do not vary the conditions under which any remaining items of
Works are carried out, otherwise the prices for the same shall be valued under sub-Clause 'c' hereunder.

c) Where the extra works are not of similar character and/or executed under similar conditions as aforesaid or where the omissions vary the conditions under which any remaining items or works are carried out, then the contractor shall within 7 days of the receipt of the letter of acceptance inform the Consultant of the rate which he intends to charge for such items of work, duly supported by analysis

of the rate or rates claimed and the Consultant shall fix such rate or prices as in the circumstances in his opinion are reasonable and proper, based on the market rate.

d) Where extra work cannot be properly measured or valued the contractor shall be allowed day work prices at the net rates stated in the tender, of the BOQ or, if not, so stated then in accordance with the local day work rates and wages for the district; provided that in either case, vouchers specifying the daily time (and if required by the Consultant) the workman's name and materials employed be delivered for verifications to the Consultant at or before the end of the week following that in which the work has been executed.

e) It is further clarified that for all such authorized extra items where rates cannot be derived from the tender, the Contractor shall submit rates duly supported by rate analysis worked on the 'market rate basis for material, labor hire / running charges of equipment and wastages etc. plus 15% towards establishment charges, contractor's overheads and profit. Such items shall not be eligible for escalation.

23.0 **Final measurement:**

The measurement and valuation in respect of the contract shall be completed within two months of the virtual completion of the work.

24.0 **Virtual Completion Certificate (VCC):**

On successful completion of entire works covered by the contract to the full satisfaction of the SBI, the contractor shall ensure that the following works have been completed with the satisfaction of the SBI:

a) Clear the site of all scaffolding, wiring, pipes, surplus materials, contractor's labour equipment and machinery.

b) Demolish, dismantle and remove the contractor's site office, temporary works, structure including labour sheds/camps and constructions and other items and things whatsoever brought upon or erected at the site or any land allotted to the contractor by the SBI not incorporated in the permanent works.

c) Remove all rubbish, debris etc. from the site and the land allotted to the contractor the SBI and shall clear, level and dress, compact the site as required by the SBI

d) Shall put the SBI in undisputed custody and possession of the site and all land allot by the SBI

e) Shall hand over the work in a peaceful manner to the SBI

f) All defects / imperfections have been attended and rectified as pointed out by the Consultant s to the full satisfaction of SBI

Upon satisfactory fulfillment by the contractor as stated above, the contractor is entitled to apply to the Consultant is satisfied of the completion of work. Relative to which the completion certificate has been sought, the Consultant shall, within fourteen (14) days of the receipt of the application for completion certificate, issue a VCC in respect of the work for which the VCC has applied.

This issuance of a VCC shall not be without prejudice to the SBI's rights and contractor liabilities under the contract including the contractor's liability for defects liability nor shall the issuance of

VCC in respect of the works or work at any site be construction as a waiver of any right or claim of the SBI against the contractor in respect of or work at the site and in respect of which the VCC has been issued.

25.0 **Work by other agencies:**

The SBI / Consultant reserves the rights to use premises and any portion of the site for execution of any work not included in the scope of this contract which it may desire to have carried out by other persons simultaneously and the contractor shall not only allow but also extend reasonable facilities for the execution of such work. The contractor, however, shall not be required to provide any plant or material for the execution of such work except by special arrangement with the SBI. Such work shall be carried out in such manner as not to impede the progress of the works included in the contract.

26.0 **Insurance of works:**

26.1 Without limiting his obligations and responsibilities under the contract the contractor shall insure in the joint names of the SBI and the contractor against all loss of damages from whatever cause arising other than the excepted risks, for which he is responsible under the terms of contract and in such a manner that the SBI and contractor are covered for the period stipulated vide clause of GCC and are also covered during the period of maintenance for loss or damage arising from a cause, occurring prior to the commencement of the period of maintenance and for any loss or damage occasioned by the contractor in the course of any operations carried out by him for the purpose of complying with his obligations under clause.

a) The Works for the time being executed to the estimated current Contract value thereof, or such additional sum as may be specified together with the materials for incorporation in the works at their replacement value.

b) The constructional plant and other things brought on to the site by the contractor to the replacement value of such constructional plant and other things.

c) Such insurance shall be affected with an insurer and in terms approved by the SBI which approval shall not be unreasonably withheld, and the contractor shall whenever require, produce to the Consultant the policy if insurance and the receipts for payment of the current premiums.

26.2 **Damage to persons and property:**

The contractor shall, except if and so far as the contract provides otherwise indemnify the SBI against all losses and claims in respect of injuries or damages to any person or material or physical damage to any property whatsoever which may arise out of or in consequence of the execution and maintenance of the works and against all claims proceedings, damages, costs, charges and expenses whatsoever in respect of or in relation thereto except any compensation of damages for or with respect to:

a) The permanent use or occupation of land by or any part thereof.

b) The right of SBI to execute the works or any part thereof on, over, under, in or through any lands.

c) Injuries or damage to persons or properties which are unavoidable result of the execution or maintenance of the works in accordance with the contract

d) Injuries or damage to persons or property resulting from any act or neglect of the SBI their agents, employees or other contractors not being employed by the contractor or for or in respect of any claims, proceedings, damages, costs, charges and expenses in respect thereof or in relation thereto or where the injury or damage was contributed to by the contractor, his servants or agents such part of the compensation as may be just and equitable having regard to the extent of the responsibility of the SBI, their employees, or agents or other employees, or agents or other contractors for the damage or injury.

26.3 **Contractor to indemnify SBI:**

The contractor shall indemnify the SBI against all claims, proceedings, damages, costs, charges and expenses in respect of the matters referred to in the provision.

26.4 **Contractor's superintendence:**

The contractor shall fully indemnify and keep indemnified the SBI against any action, claim, or proceeding relating to infringement or use of any patent or design or any alleged patent or design rights and shall pay any royalties which may be payable in respect of any article or part thereof included in the contract. In the event of any claim made under or action brought against SBI in respect of such matters as aforesaid the contractor shall be immediately notified thereof and the contractor shall be at liberty, at his own expenses to settle any dispute or to conduct any litigation that may arise there from, provided that the contractor shall not be liable to indemnify the SBI if the infringement of the patent or design or any alleged patent or design right is the direct result of an order passed by the Consultant in this behalf.

26.5 **Third Party Insurance:**

26.5.1 Before commencing the execution of the work the contractor but without limiting his obligations and responsibilities under clause 24.0 of GCC shall insure against his liability for any material or physical damage, loss, or injury which may occur to any property including that of SBI, or to any person, including any employee of the SBI, by or arising out of the execution of the works or in the carrying out of the contract, otherwise than due to the matters referred to in the provision to clause 24.0 thereof.

26.5.2 **Minimum amount of Third-Party Insurance:**

Such insurance shall be affected with an insurer and in terms approved by the SBI which approval shall not be reasonably withheld and for at least the amount stated below. The contractor shall, whenever required, produce to the Consultant the policy or policies of insurance cover and receipts for payment of the current premiums.

26.6 The minimum insurance cover for physical property, injury, and death is Rs 5 Lakh per occurrence with the number of occurrences limited to four. After each occurrence contractor will pay additional premium necessary to make insurance valid for four occurrences always.

26.7 **Accident or Injury to workman:**

26.7.1 The SBI shall not be liable for or in respect of any damages or compensation payable at law in respect or in consequence of any accident or injury to any workmen or other person in the employment of the

contractor or any sub-contractor, save and except an accident or injury resulting from any act or default of the SBI or their agents, or employees. The contractor shall indemnify and keep indemnified SBI against all such damages and compensation, save and except as aforesaid, and against all claims, proceedings, costs, charges and expenses whatsoever in respect thereof or in relation thereto.

26.7.2 **Insurance against accidents etc. to workmen:**

The contractor shall insure against such liability with an insurer approved by the SBI during the whole of the time that any persons are employed by him on the works and shall, when required, produce to the Consultant such policy of insurance and receipt for payment of the current premium. Provided always that, in respect of any persons employed by any sub-contractor the contractor's obligation to insured as aforesaid under this sub-clause shall be satisfied if the sub-contractor shall have insured against the liability in respect of such persons in such manner that SBI is indemnified under the policy but the contractor shall require such sub-contractor to produce to the Consultant when such policy of insurance and the receipt for the payment of the current premium.

26.7.3 **Remedy on contractor's failure to insure:**

If the contractor fails to effect and keep in force the insurance referred to above or any other insurance which he may be required to effect under the terms of contract, then and in any such case the SBI may effect and keep in force any such insurance and pay such premium or premiums as may be necessary for that purpose and from time to time deduct the amount so paid by the SBI as aforesaid from any amount due or which may become due to the contractor, or recover the same as debt from the contractor.

26.7.4 Without prejudice to the others' rights of the SBI against contractors. In respect of such default, the employer shall be entitled to deduct from any sums payable to the contractor the amount of any damage's costs, charges, and other expenses paid by the SBI and which are payable by the contractors under this clause. The contractor shall upon settlement by the Insurer of any claim made against the insurer pursuant to a policy taken under this clause, proceed with due diligence to rebuild or repair the works destroyed or damaged. In this event all the monies received from the Insurer in respect of such damage shall be paid to the contractor and the Contractor shall not be entitled to any further payment in respect of the expenditure incurred for rebuilding or repairing of the materials or goods destroyed or damaged

27.0 **Commencement of Works:**

The date of commencement of the work will be reckoned as the date, fifteen days from the date of award of letter by the SBI

28.0 **Time for completion**

Time is essence of the contract and shall be strictly observed by the contractor. The entire work shall be completed within a period of (18 months) from the date of commencement. If required in the contract or as directed by the Consultant. The contractor shall complete certain portions of work before completion of the entire work. However, the completion date shall be reckoned as the date by which the whole work is completed as per the terms of the contract. The contractor is to submit a program chart depicting the plan of implementation based on supply and erection. It is also required to full fill the program chart with proper material supply and inventory management. All the trash

material accumulated should be carted away on a monthly basis. The proper necessary permissions from the departments concerned should be taken in advance and in writing before carting the material.

29.0 **Extension of time:**

If, in the opinion of the Consultant, the work be delayed for reasons beyond the control of the contractor, the Consultant may submit a recommendation to SBI to grant a fair and reasonable extension of time for completion of work as per the terms of contract. If the contractor needs an extension of time for the completion of work or if the completion of work is likely to be delayed for any reasons beyond the due date of completion as stipulated in the contract, the contractor shall apply to the SBI through the Consultant ' Consultant in writing at least 30 Days before the expiry of the scheduled time and while applying for extension of time he shall furnish the reason in detail and his justification if an', for the delays. The Consultant shall submit their recommendations to the SBI in the prescribed format for granting extension of time. While granting extension of time the contractor shall be informed of the period extended time which will qualify for levy of liquidated damages. For the balance period in excess of original stipulated period and duly sanctioned extension of time by the provision of liquidated damages as stated under clause 10.0 shall become applicable. Further the contract shall remain in force even for the period beyond the due date of completion irrespective of whether the extension is granted or not.

30.0 **Rate of progress:**

Whole of the materials, plant and labor to be provided by the contractor and the mode, manner and speed of execution and maintenance of the works are to be of a kind and conducted in a manner to the satisfaction of the Consultant should the rate of progress of the work or any part thereof be at any time be in the opinion the. Consultant too Slow to ensure the completion of the whole of the work the prescribed time or extended time for completion the Consultant shall thereupon take such steps as considered necessary by the Consultant to expedite progress so as to complete the works by the prescribed time or extended time. Such communications from the Consultant neither shall relieve the contractor from fulfilling obligations under the contract nor will he be entitled to raise any claims arising out of such directions.

31.0 **Work during nights and holidays:**

Subject to any provision to the contrary contained in the contract no permanent work shall save as herein provided be carried on during the night (7 PM to 6 AM) and on holidays without the permission in writing of the Consultant, save when the work is unavoidable or absolutely necessary for the saving of life or property or for the safety of the work in which case the contractor shall immediately advise the Consultant. However, the provisions of the clause shall not be applicable in the case of any work which becomes essential to carry by rotary or double shifts in order to achieve the progress and quality of the part of the work being technically required / continued with the prior approval of the Consultant at no extra cost to the SBI

All work at night after obtaining approval from competent authorities shall be carried out without unreasonable noise and disturbance.

32.0 **No compensation or restrictions of work:**

If at any time after acceptance of the tender SBI shall decide to abandon or reduce the scope of work for any reason whatsoever and hence not required, the whole or any part of the work to be carried out. The Consultant shall give notice in writing that effect to the contractor and the contractor shall act accordingly in the matter. The contractor shall have no claim to any payment of compensation or otherwise whatsoever on account of any profit or advantage which he might have derived from the execution of the Work fully but which he did not derive in consequence of the foreclosure of the whole or part of the work.

Provided that the contractor shall be paid the charges on the cartage only of materials actually and bona-fide brought to the site of the work by the contractor and rendered surplus as a result of the abandonment, curtailment of the work or any portion thereof and then taken back by the contractor, provided however that the Consultant shall have in such cases the option of taking over all or any such materials at their purchase price or a local current rate whichever is less.

"In case of such stores having been issued from SBI stores and returned by the contractor to stores, credit shall be given to him at the rates not exceeding those at which were originally issued to the contractor after taking into consideration and deduction for claims on account of any deterioration or damage while in the custody of the contractor and in this respect the decision of Consultant shall be final.

33.0 **Suspension of work:**

i) The contractor shall, on receipt of the order in writing of the Consultant (whose decision shall be final and binding on the contractor) suspend the progress of works or any part thereof for such time and in such manner as Consultant may consider necessary so as not to cause any damage or injury to the work already done or endanger the safety thereof for any of following reasons:

a) On account of any default on the part of the contractor, or

b) For proper execution of the works or part thereof for reasons other than the default the contractor, or
c) for safety of the work or part thereof.

The contractor shall, during such suspension, properly protect and secure the work to the extent necessary and carry out the instructions given on that behalf by the Consultant.

i) If the suspension is ordered for reasons (b) and (c) in sub-para (i) above:
The contractor shall be entitled to an extension of time equal to the period of every such suspension. No compensation whatsoever shall be paid on this account.

34.0 **Action when the whole security deposit is forfeited:**

In any case in which under any clause or clauses of this contract, the Contractor shall have rendered himself liable to pay compensation amounting to the whole of his security deposit the Consultant shall have the power to adopt any of the following course as they may deem best suited to the interest of the SBI:

a) To rescind the contract (of which rescission notice in writing to the contractor by - Consultant shall be conclusive evidence) and in which case the security, deposit of the contractor shall be forfeited and be absolutely at the disposal of SBI

b) To employ labour paid by the SBI and to supply materials to carry out the work, or part of the work, debiting the contractor with the cost of the labor and materials cost of such labour and materials as worked out by the Consultant shall final and conclusive against the contractor) and crediting him with the value of the work done, in all respects in the same manner and at the same manner and at the same rates as if it had been carried out by the contractor under the terms of this contract certificate of Consultant as to the value of work done shall be final conclusive against the contractor.

c) To measure up the work of the contractor, and to take such part thereof as shall unexecuted, out of his hands, and to give it to another contractor to complete in which case any expenses which may be incurred in excess of the sum which would have been paid to the original contractor, if the whole work had been executed by him (The amount of which excess the certificates in writing of the Consultant s / Consultant shall final and conclusive) shall be borne by original contractor and may be deducted f any money due to him by SBI under the contract or otherwise, or from his security deposit or the proceeds of sale thereof, or sufficient part thereof.

In the event of any of above courses being adopted by the SBI the contractor shall have no claim to compensation for any loss sustained by him by reasons of his having purchased or procured any material or entered into any engagements or make any advances on account of, or with a view to the execution of the work or the performance of the contract and in case the contract shall be rescind under the provision aforesaid, the contractor shall not be entitled to recover or to be paid any sum or any work thereto for actually performed under this contract, unless, and until the Consultant will have certified in writing the performance of such work and the value payable in respect thereof, and he shall only be entitled to be paid the value so certified.

35.0 **Owner's right to terminate the contract:**

If the contractor being an individual or a firm commit any 'Act of insolvency' or shall be adjusted an insolvent or being an incorporated company shall have an order for compulsory winding up voluntarily or subject to the supervision of Govt. and of the Official Assignee of the liquidator in such acts of insolvency or winding up shall be unable within seven days after notice to him to do so, to show to the reasonable satisfaction of the Consultant that he is able to carry out and fulfill the contract, and to dye security therefore if so required by the Consultant or if the contractor (whether an individual firm or incorporated Company) shall suffer execution to be issued or shall suffer any payment under this contract to be attached by or on behalf of any of the creditors of the contractor.

Or shall assign or sublet this contract without the consent in writing of the SBI through the Consultant or shall charge or encumber this contract or any payment due to which may become due to the contractor there under:

a) has abandoned the contract; or

b) has failed to commence the works, or has without any lawful excuse under these conditions suspended the progress of the works for 14 days after receiving from the SBI through the Consultant written notice to proceed, or

c) has failed to proceed with the works with such diligence and failed to make such due progress as would enable the works to be completed within the time agreed upon, or
has failed to remove the materials from the site or to pull down and replace work within seven days after written notice from the SBI through the Consultant that the said materials were condemned and rejected by the Consultant under these conditions; or has neglected or failed persistently to observe and perform all or any of the acts matters or things by this contract to be observed and performed by

the contactor for seven days after written notice shall have been given to the contractor to observe or perform the same or has to the detriment of good workmanship or in defiance of the SBI or Consultant 's / Consultant's instructions to the contrary subject any part of the contract. Then and in any of said cases the SBI and or the Consultant, may not withstanding any previous waiver, after giving seven days' notice in writing to the contractor, determine the contract, but without thereby affecting the powers of the SBI or the Consultant or the obligation and liabilities of the contractor the whole of which shall continue in force as fully as if the contract had not been determined and as if the works subsequently had been executed by or on behalf of the contractor. And, further the SBI through the Consultant their agents or employees may enter upon and take possession of the work and all plants, took scaffoldings, materials, sheds, machineries lying upon the premises or on the adjoining lands or roads use the same by means of their own employees or workmen in carrying on and completing the work or by engaging any other contractors or persons to the work and the contractor shall not in any was interrupt or do any act, matter or thing to prevent or hinder such other contractor or other persons employed for complement and finishing or using the materials and plant for the works.

When the works shall be completed or as soon thereafter as convenient the SBI or Consultant shall give a notice in writing to the contractor to remove his surplus materials and plants and should the contractor fail to do so within 14 days after receive thereof by him the SBI sell the same by publication, and after due publication, and shall, adjust the amount realized by such auction. The contractor shall have no right to question any of the act of the SBI incidental to the sale of the materials etc.

36.0 **Certificate of payment:**

The contractor shall be entitled under the certificates to be issued by the Consultant to the contractor within 10 working days from the date of certificate to payment from SBI from time to time. The SBI shall recover the statutory recovering other dues including the retention amount from the certificate of payment.

Provided always that the issue of any certificate by the Consultant during progress of works or completion shall not have effect as certificate of satisfaction relieve the contractor from his liability under clause.

The Consultant shall have power to withhold the certificate if the work or in part thereof is not carried out to their satisfaction.

The Consultant may by any certificate make any corrections required previous certificate.

The SBI shall modify the certificate of payment as issued by the Consultant from time to time while making the payment

The contractor shall submit interim bills only after taking actual measurements and properly recorded in the Measurement Book (M. B.)

The Contractor shall not submit interim bills when the approximate value of work done by him is less than **Rs. 1.25 Crore.**

The final bill may be submitted by contractor within a period of one month from the date of virtual completion and Consultant shall issue the certificate of payment within a period of two months. The SBI shall pay the amount within a period of three months from the date of issue of certificate provided there is no dispute in respect of rates and quantities.

The contractor shall submit the interim bills in the prescribed format with all details.

37.0 **A. Settlement of Disputes and Arbitration:**

Except where otherwise provided in the contract all questions and disputes to the meaning of the specifications, design, drawings and instructions herein before mentioned and as to the quality of workmanship or materials used on the work or as to any other question , claim, right, matter or thing whatsoever in any way arising out of or relating to the contract, designs, drawings specifications, estimates, instructions orders or these conditions or otherwise concerning the work or the execution or failure to execute the same whether arising during the progress of the work or after the cancellation, termination, completion or abandonment thereof shall be dealt with as mentioned hereinafter:

i) If the contractor considers that he is entitled to any extra payment or compensation in respect of the works over and above the amounts admitted as payable by the Consultant or in case the contractor wants to dispute the validity of any deductions or recoveries made or proposed to be made from the contract or raise any dispute, the contractor shall forthwith give notice in writing of his claim, or dispute to Dy. General Manager (Premises), SBI, 9th floor, Corporate Centre, State Bank Bhavan, Nariman Point, Mumbai and endorse a copy of the same to the Consultant , within 30 days from the date of disallowance thereof or the date of deduction or recovery. The said notice shall give full particulars of the claim, grounds on which it is based and detailed calculations of the amount claimed and the contractor shall not be entitled to raise any claim nor shall the SBI be in any way liable in respect of any claim by the contractor unless notice of such claim shall have been given by the contractor to Dy. General Manager (Premises), Corporate Centre, State Bank Bhavan, Nariman Point, Mumbai in the manner and within the time as aforesaid. The Contractor shall be deemed to have waived and extinguished all his rights in respect of any claim not notified to Dy. General Manager (Premises), State Bank Bhavan, Mumbai in writing in the manner and within the time aforesaid.

B. Settlement of Disputes and Arbitration:

Dy. General Manager (Premises), SBI, 9th floor, Corporate Centre, State Bank Bhavan, Nariman Point, Mumbai shall give his decision in writing on the claims notified by the receipt of the contractor within 30 days of the receipt of the decision of Dy. General Manager (Premises) SBI, 9th floor, Corporate Centre, State Bank Bhavan, Nariman Point, Mumbai Submit his claims to the conciliating authority namely Dy. General Manager (Premises) for conciliation along with all details and copies of correspondence exchanged between him and the SBI.
If the conciliation proceedings are terminated without settlement of the disputes, the contractor shall, within a period of 30 days of termination thereof shall give a notice to the concerned Dy. General Manager (Premises) of the SBI for appointment of an arbitrator to adjudicate the notified claims falling which the claims of the contractor shall be deemed to have been considered absolutely barred and waived.

ii) Except where the decision has become final, binding and conclusive in terms of the contract, all disputes or differences arising out of the notified claims of the contractor as aforesaid and all claims of the SBI shall be referred for adjudication through arbitration by the Sole Arbitrator appointed by the Dy. General Manager (Premises). It will also be no objection to any such appointment that the Arbitrator appointed and that he had to deal with the matters to which the Contract relates in the course of his duties as SBI, Officer. If the arbitrator so appointed is unable or unwilling to act or resigns his appointment or vacates his office due to any reason whatsoever another sole arbitrator shall be appointed in the manner aforesaid by the said Dy. General Manager (Premises) of the SBI

Such person shall be entitled to proceed with the reference from the stage at which it was let by his predecessor.

It is a term of this contract that the party invoking arbitration shall give a list of disputes with amounts claimed in respect of each dispute along with the notice for appointment of arbitrator.

It is also a term of this contract that no person other than a person appointed by such Dy. General Manager (Premises) as aforesaid should act as arbitrator.

The conciliation and arbitration shall be conducted in accordance with the provisions of the Arbitration & Conciliation Act 1996 or any or any accordance modification or reenactment thereof and the rules made there under.

It is also the term of the contract that if any fees are payable to the Arbitrator these shall be paid equally by both the parties. However, no fees will be payable to the arbitrator if he is a SBI Officer.

It is also a term of the contract that the Arbitrator shall be deemed to have entered on the reference on the date he issues notice to both the parties calling them to submit their statement of claims and counter statement of claims. The venue of the arbitration shall be such place as may be fixed by the arbitrator in his sole discretion. The fees, if any of the arbitrators shall, if required to be paid before the award is made and published, be paid half and half by each of the parties. The Cost of the reference and of the award (including the fees, if any of the arbitrator) shall be in the discretion of the arbitrator who may direct to any by whom and din what manner, such costs or any part thereof, shall be paid and fix or settle the amount of costs to be so paid.

38.0 **Water Supply:**

The contractor shall make his own arrangements for water required for the work and nothing extra will be paid for the same. This will be subject to the following condition.

i) That the water used by the contractor shall be fit for construction purposes to the satisfaction of the Consultants.

ii) The contractor shall make alternative arrangements for the supply of water if the arrangement made by the contractor for procurement of water in the opinion of the Consultant is unsatisfactory.

38.1 The contractor shall construct temporary well / tube well in SBI land for taking water for construction purposes only after obtaining permission in writing from the SBI. The contractor has to make his own arrangements for drawing and distributing the water at his own cost. He has to make necessary arrangements. To avoid any accidents or damages caused due to construction and subsequent maintenance of the wells. He has to obtain necessary approvals from local authorities, if required, at his own cost. He shall restore the ground to its original condition after wells are dismantled on completion of work or hand over the well to the SBI without any compensation as directed by the Consultant.

39.0 **Power Supply:**

The contractor shall make his own arrangements for power and supply / distribution system for driving plant or machinery for the work and for lighting purposes.

40.0 **Treasure Trove etc.:**

Any treasure trove, coin or object antique which may be found on the site shall be the property of SBI and shall be handed over to the bank immediately.

41.0 **Method of Measurement:**

Unless otherwise mentioned in the schedule of quantities or in mode of measurement, the measurement will be on the net quantities or work produced in accordance with up-to-date rules laid down by the Bureau of Indian Standards. In the event any dispute / disagreement the decision of the Consultant shall be final and binding on the corrector.

42.0 **Maintenance of Registers:**

The contractor shall maintain the following registers as per the enclosed perform at site of work and should produce the same for inspection of SBI/Consultant, Engineers or representative authorized by the bank or the consultant, whenever desired by them. The contractor shall also maintain the records / registers as required by the local authorities / Govt. from time to time.

a. Register for secured advance
b. Register for hindrance to work
c. Register for running account bill
d. Register for labor
e. Register for Mustering for all those who are concerned with the project, whenever they visit the site.
f. Register for Labour, Engineers, Technicians etc, those who are working at site on daily basis. This should be displayed by the contractor on a daily basis. The details should be sent to the bank and consultant on a daily basis.
g. The contractor should provide daily working plan for a period of 15 days and the same should be published to all the concerned persons connected with the project work

43.0 **Force Majeure:**

43.1 Neither contractor nor SBI shall be considered in default in performance of the obligations if such performance is prevented or delayed by events such as but not war, hostilities revolution, riots, civil commotion, strikes, lockout, conflagrations, epidemics, accidents, fire, storms, floods, droughts, earthquakes or ordinances or any act of or for any other cause beyond the reasonable control of the party affected or prevents or delayed. However, a notice is required to be given within 30 days from the happening of the event with complete details, to the other party to the contract, if it is not possible to serve a notice, within the shortest possible period without delay.

43.2 As soon as the cause of force majeure has been removed the party whose ability to perform its obligations has been affected, shall notify the other of such cessation and the actual delay incurred in such affected activity adducing necessary evidence in support thereof.

43.3 From the date of occurrence of a case of force majeure obligations of the party affected shall be suspended during the continuance of any inability so caused. With the cause itself and inability resulting there from having been removed, the agreed time completion of the respective obligations under this agreement shall stand extended a period equal to the period of delay occasioned by such events.

43.4 Should one or both parties be prevented from fulfilling the contractual obligations by state of force majeure lasting to a period of 6 months or wore the two parties, shall each other to decide regarding the future execution of this agreement.

44.0 **Local laws, Acts Regulations:**

The contractor shall strictly adhere to all prevailing labor laws inclusive at contract labour (regulation and abolition act of 1970) and other safety regulations. The contractors should comply with the provision of all labor legislation including the latest requirements of the Acts, laws, any other regulations that are applicable to the execution of the project.

i) Minimum wages Act 1948 (Amended)
ii) Payment of wages Act 1936 (Amended)
iii) Workmen's compensation Act 1923 (Amended)
iv) Contract labor regulation and abolition act 1970 and central rules 1971 (Amended)
v) Apprentice act 1961 (amended)
vi) Industrial employment (standing order) Act 1946 (Amended)
vii) Personal injuries (Compensation insurance) act 1 963 and any other modifications
viii) Employees' provident fund and miscellaneous provisions Act 1952 and amendment thereof
ix) Shop and establishment act
x) Any other act or enactment relating thereto and rules framed there under from time to time.
xi) Prevailing Indian Electricity rules & act.

45.0 **Accidents:**

The contractor shall immediately on occurrence of any accident at or about the site or in connection with the execution of the work report such accident to the Consultant. The contractor shall also make such report immediately to the competent authority whenever such report is required to be lodged by the law and take appropriate action thereof.

GENERAL CONDITIONS OF CONTRACT

Definition:

"Contract" means the documents forming the tender and the acceptance thereof and the formal agreement executed between SBI and the contractor, together with the documents referred therein including these conditions, the specifications, designs, drawings and instructions issued from time to time by the Consultant s/Consultant/ SBI and all these, documents taken together shall be deemed to form one contract and shall be, complementary to one another.

1.0 INTERPRETATIONS GCC 01

1.1 In the contract the following expressions shall, unless the context otherwise requires, have the meaning hereby respectively assigned to them.

1.1.1 **'SBI'** shall mean State Bank of India a body Corporate incorporated under SBI Act 1955, having its Corporate Centre at State Bank Bhavan, MADAME Cama Road, Nariman Point Mumbai 400 021.

1.1.2 **Consultants** shall mean **M/s. UKA Consulting and Engineers Pvt Ltd, having their office at Office NO:1 & 2, Malanadu Educational & Welfare Association, Near Shastri Nagar Naka, Thane (West) - 400604. (Maharashtra-India)** appointed by the employer for the said works.

1.1.3 **'Site Engineer'** shall mean an Engineer appointed by the Bank as their representative to give instructions to the contractors.

1.1.4 **'The Contractor'** shall mean the individual or firm or company whether incorporated or not, undertaking the works and shall include legal personal representative of such individual or the composing the firm or company and the permitted assignees of such individual or firms of company.

1.1.5 **"Contract document"** shall include the notice inviting tenders, the Articles of Agreements the General Conditions of Contract, and the special conditions of contract. The Appendices, the Schedule of Quantities Specifications for material Work sheet and mode of measurement and drawings pertaining to the works. All sections of the Contract document are to read together.

1.1.6 The expression '**works**' or 'work' shall mean the permanent or temporary work described in the 'Scope of Work" and/or to be executed in accordance with the contract and includes materials, apparatus, equipment, temporary supports, fittings and things of all kinds to be provided, the obligations of the contractor hereunder and work to be done by the contractor under the contract.

1.1.7 **'Engineer'** shall mean the representative of the SBI/Consultant.

1.1.8 **'Drawings'** shall mean the drawings prepared by the Consultant s/Consultant and issued by the Engineer and referred to in the specifications and any modifications of such drawings as may be issued by the Engineer from time to time 'Contract value shall mean the value of the entire work as stipulated in the letter of acceptance of tender subject to such additions thereto or deductions there from as may be made under the provision herein after contained.

1.1.9 **"Notice"** in writing "or written notice shall mean a notice in writing, typed or printed characters, sent (unless delivered personally or otherwise) proved to have been received by registered post to the last known private or business address or registered office of the addressee and shall be deemed to have received when in the ordinary course of post, it would have been delivered.

1.1.10 **"Act of Insolvency"** shall mean any Act of Insolvency as defined by the Presidency Towns-Insolvency Act, or the Provincial Insolvency Act or any Act.

1.1.11 **"Virtual" Completion"** shall mean that the works are in the opinion of the Consultants complete or fit for occupation.

1.1.12 Words importing persons include firms and Corporations, words importing the singular also include the plural vice versa where the context required.

1.1.13 **'Specifications'** shall mean the specifications referred to in the tender and any modifications thereof as may time to time be furnished or approved by the Consultant "Month" means calendar month.

1.1.14 **"Week"** means seven consecutive days.

1.1.15 **"Day"** means a calendar day beginning and ending at 00 Hrs. and 24 hrs. respectively.

2.0 SCOPE OF CONTRACT GCC 02

The contractor shall carry out and complete the works in every respect in accordance with this Contract and with the directions of, and to the satisfaction of the Consultants/ Employer. The Consultants may in his discretion with the consent of the employer and from time-to-time issue further drawings and / or written instruction's details, direction and explanations which are hereafter collectively referred to as "Consultants Instructions" as regard to.

a. The variations or modification of the design, quality or quantity of works or the addition, or omission or substitution of any work.

b. Any discrepancy in or divergence between the Drawings or between the Schedule of Quantities and/ or Drawings and or Specifications.

c. The removal from the site of any material brought thereon by the Contractor and the substitutions of any other material thereof.

d. The removal and/ or re-execution of any works executed by the Contractor.

e. The postponement of any work to be executed under the provisions of this Contract.

f. The dismissal from the works of any person employed there upon.

g. The opening up for inspection of any work covered up.

h. The amending and making good of any defects.

i. Co-ordination of work with other agencies.

The contractor shall forthwith comply with and duly execute any work comprised in such Consultant's Instruction provided always that verbal instructions, directions and explanations given to the Contractor or his representatives upon the works by the Consultants shall, if involving a variation, be confirmed in writing to the Contractors within seven days, and if not dissented from in writing within a further seven days by the Consultant such shall be deemed to be Consultant's Instructions within the scope of the contract.

If compliance with the Consultant's instructions involves, variation, such variation shall be dealt with under CLAUSE NO.20.

Where extra work cannot properly be measured and valued, the Contractor shall be allowed day work prices, provided that a written authority for day work is obtained by the Contractor before the execution of the extra work and provided that in any case vouchers specifying the time daily spent time upon the work countersigned by the Employer's Representative and the materials employed, shall be delivered for verification to the Consultant not later than the end of the week, following that in which the work has been executed.

3.0 DRAWINGS AND SPECIFICATIONS **GCC -03**

The works shall be carried out to the entire satisfaction of the Employer, and the Consultants in accordance with the, signed drawings and specifications and such further drawings and details as may be instruction, direction and explanations as may from time to time & be given by the Consultant, whose decision is to the sufficient and quality of the work and materials shall be final and binding upon all parties. If the work shown on any such further drawings or work that may be necessary to comply with such instructions, direction or explanations, be in the opinion of the Contractor extra to that comprised in or reasonably to be inferred from the Contract, he shall before proceeding with such work, give notice in writing to this effect to the Consultant and in the event of the Consultant agreeing to the same in writing the Contractor shall be entitled to an allowance in respect of such extra work as an authorized extra.

If the Consultant and the Contractor fail to agree as to whether or not there is in extra than if the Consultant decides that the Contractor shall carry out the said works, the Contractor shall do so, and the question whether or not there is extras and if so the amount thereof, shall failing agreement, be settled by reference to arbitration whose decision shall be final and binding but such reference shall in no way delay the fulfillment of this contract.

No drawing shall be taken as in itself an order for variation unless in addition to the Consultant's signature, it bears express words stating that it is intended to be such an order or bears remark "VALID FOR EXECUTION". No claim for payment for extra work shall be allowed unless the said work shall have been executed under the provision of CLAUSE NO.8 (Authorities, Notices, Patent Rights and Royalties), or by the authorities, directions in writing of the Consultant as herein mentioned.

One complete set of the signed Drawings Specification and Schedule of Quantities shall be furnished by the Consultants to the Contractors. The Consultant shall furnish within 7 days of receipt of request by the Contractor one copy of additional drawings for the execution of any work. Such copies shall be kept on the works site and the Consultant, or his representatives shall at all reasonable times have access to the same. All drawings and specifications shall be returned to the Consultant by the Contractor before the issue of the Final Certificate. These drawings in original shall remain with the Employer and the duplicate copy will be with the Consultant.

Any additional prints of drawings, if any required by the Contractor may be supplied by the Consultant but on the payment of charges: (only black and white prints will be provided.)

AO Size – Rs. 300 - 350/- each, A1 – Rs.250/-, A2 – Rs.200/-, A3- Rs.125/-, A4 – Rs.75/-

4.0 SCHEDULE OF QUANTITIES **GCC-04**

The Schedule of Quantities, unless otherwise stated shall be deemed to have been prepared in accordance with the standard procedure of the Consultant and shall be considered to be **approximate** and no liability shall attach to the Consultant for any error that say be discovered therein.

5.0 SUFFICENCY OF SCHEDULE OF QUANTITIES **GCC-05**

The Contractor shall be deemed to have satisfied himself before tendering as to the correctness and sufficiency of his tender for the works and of the prices stated in the Schedule of Quantities and / or

the Schedule of Rates and Prices, which rates and prices shall cover all his obligations under the Contract, and all matters and things necessary for the proper completion of the works.

6.0 ERRORS IN SCHEDULE OF QUANTITIES **GCC-06**

Should any error appear in the Schedule of Quantities, other than in the Contractor's prices and calculations, it shall be rectified, and such rectification shall not vitiate the Contract but shall constitute a variation of the Contract and shall be dealt with as an authorized extra or deviation.

7.0 CONTRACTOR TO PROVIDE EVERYTHING NECESSARY **GCC-07**

The Contractor shall provide everything necessary for the proper execution of the works according to the true intent and meaning of the Drawings, Specifications and Schedule of Quantities taken together whether the same may or may not be particularly shown or described therein, provided that the same can be inferred there from and if the Contractor finds any discrepancy in the Drawings or between the Drawings, Specification and Schedule of Quantities, he shall immediately refer the same in writing to the Consultants, who shall decide, which shall be followed, and his decision shall be final and binding on all parties.

The Contractor shall provide ground for himself and fresh water for carrying out of the works at his own cost. The Employer shall not charge the Contractor for its own unrented ground but shall on no account be responsible for the expenses incurred by the Contractor for hired ground. If water from any source other than Municipal main is to be used for execution of work, the same shall be tested at the Contractor's cost and a report submitted to the Consultant for their approval, before such water is used for the works. Water and electricity can be arranged by the employer at one point. **The amount would be recovered from the contractors towards the Water and Electricity charges equivalent to ½% (Half Percent) of the actual work carried out.**

The Contractor shall provide and maintain all measuring instruments including steel tape, at all times for properly carrying out the work and for the use of the Consultant/ Employer, including skilled attendants as required.

The Contractor shall supply, fix and maintain at his cost during the execution of any works, all the necessary centering, scaffolding, staging, timbering, strutting, shoring, pumping, fencing, hoarding, watch & ward and lighting by night as well as by day required not only for the proper execution and protection of the public and safety of any adjacent roads, streets, cellars, vaults pavements, walls, houses, buildings and all other erections, matter or things. The Contractor shall take down and remove any or all such centering, scaffolding, staging, planking, strutting, shoring etc. as occasion shall require or when ordered to do so, and shall fully reinstate and make good all matters and things described during the execution of the works, to the satisfaction of the Contractor.

8.0 AUTHORITIES, NOTICES, PATENTS, RIGHTS & ROYALTIES **GCC-08**

The Contractor shall conform to the provisions of the statutes relating to the works, and to the Regulations and bye-laws of any local Authority and of any Water, Lighting of another Companies or Authorities with whose systems the structure is proposed to be connected, and shall before making any variation from the drawings or specifications that may be necessitated by so conforming, give to the Consultant written notice, specifying the variations proposed to be made and the reason for making it, and apply for instruction thereon. In case the Contractor shall not within ten days receive such instructions, he shall proceed with the work conforming to the provisions, Regulations or Bye Laws in question.

The Contractor shall bring to the attention of the Consultant all notices required by the said Acts Regulations or Bye Laws to be given to any Authority by the Employer or the Consultant and pay to such Authority or to any public officer, all fees that may be properly chargeable in respect of the works, and lodge the receipts with the Consultant.

The Contractor shall indemnify the Employer against all claims in respect of patent rights, design, trademarks of name or other protected rights in respect of any constructional plant, machine work or material used for in connection with the works or temporary works and from against all claims, demands, proceedings, damages, costs, charges and expenses whatsoever in respect thereof or in relation thereof. The Contractor shall defend all actions arising from such claims unless he informed the Consultant, before any such infringement and receives permissions to proceed, and shall himself pay all royalties, license fees, damages, costs and charges of all and every sort that may be legally incurred in, respect thereof.

9.0 MATERIALS AND WORKMANSHIP TO CONFORM TO DESCRIPTION: GCC-09

All materials and workmanship shall, so far as procurable, be of the respective kinds specified in the Schedule of quantities and for specifications and in accordance with the Consultant instructions and the Contractor shall upon the request of the Consultant furnish to them all invoices, accounts, receipts and other vouchers to prove that the materials comply therewith. The Contractor shall at his own cost arrange for and/or carry out any test of any materials with the Consultant say require. The Contractor shall submit the samples of various materials through consultant for, the approval of the employer. If the Contractor contends that any of the materials, goods or workmanship specified as aforesaid, is unobtainable, he shall submit to the clients his grounds for his contention, and thereupon the Consultant shall decide whether the same is unobtainable in fact. If the Consultant shall decide that any of the materials, goods or workmanship is in fact unobtainable, they shall issue in order in writing as what is to be substituted thereof and such order should be deemed to be an order for variation; such order shall however be got approved by the client before issue.

10.0 SETTING OUT GCC-10

The Contractor shall at his own expense, set out the works accurately in accordance with the plans and to the complete satisfaction of the Consultant. The Contractor shall be solely responsible for the true and perfect setting out of the works, and for the correctness of the position, levels, dimensions and alignment of all parts thereof. If at any time, any error shall appear during the progress or on completion of any part of the work, the Contractor shall at his own cost rectify such error if called upon, to the satisfaction of the Consultant. The work shall from time to time be inspected by the Consultant and/or his representatives but such inspections shall not exonerate the Contractor in any way from his obligations to remedy any defects, which may be found to exist at any stage of the work or subsequently after the same is completed.

11.0 OPENING OF WORKS GCC-11

Contractor shall be liable to reinstate all work that may subsequently be, at any time, damaged on account of any defect in or insufficiency in his work. The Contractor shall at request of the Consultant within such time as the Consultant shall name, open up for inspection any other work and should the Contractor refuse or neglect to comply with such requests, the Employer through the Consultant, may employ other workmen to open up the same.

If the said work has been covered up in contravention of the Consultant's instructions, or if on being opened up, it is found not in accordance with the drawings and Specifications, or the instructions of the Consultants, the expenses of opening and covering it up again, whether done by Contractor or such other, workmen shall be borne by and recoverable from the Contractor or may be deducted from any money due or which may become due to the Contractor. If the work has not been covered up in Contravention of such instructions, and is found in accordance with the said drawings and specifications or instructions, then the expenses aforesaid shall be borne by the Employer and be

added to the contractors sum provided always that in the case of concealed work, or another work so opened up and requiring immediate attention, the Consultants shall within seven days after receipt of writing notice from the Contractor that the work has been opened, made or cause the inspection thereof to be made and at the expiration of such times if such inspection thereof to be made, and at the expiration of such time, if such inspection shall not have been made, the Contractor may cover the same, shall not be required to open it up again, except at the expense of the Employer.

12.0 CONTRACTOR'S SUPERINTENDENCE & REPRESENTATIVE ON WORKS: GCC-12

The Contractor shall give all necessary personal superintendence during the execution of the works and as long thereafter as the Consultant and consider it necessary until the expiration of the "Defects Liability Period" stated in CLAUSE NO.23. The contractor shall meet the Consultant or his representative whenever required if requested by consultant.

The Contractor shall maintain and be represented on site, at all times while the work is in progress, by a responsible and efficient Engineer in charge, approved by the Consultant and who must thoroughly understand all the trades entailed and be constantly in Attendance, while the same are at work. Any directions, explanations, instructions or notices given by the Consultant to such Engineer shall be deemed to be given to the Contractor and shall be binding as such on the Contractor. The Engineer shall be thoroughly conversant with the English Language and should be able to read, write and-speak English.

13.0 REMOVAL OF ALL OFFENSIVE MATTERS GCC-13

All debris shall be disposed of as per the rules and regulations of Local Authorities concerned beyond the property limits and the site shall be kept free of safety / fire hazards.

14.0 DISMISSAL OF WORKMEN GCC-14

The Contractor shall on the request of the Consultant/Employer immediately dismiss from the works any person Employed thereon, who may, in the opinion of the Consultant/Employer, be unsuitable or incompetent or who may misconduct himself and such person shall not again be employed or allowed on the works without the permission of the Consultant.

15.0 ACCESS TO WORKS GCC-15

The Consultant/Employer and any person authorized by them shall at all reasonable times have free access to the works, and to the Factories or other places where materials are being prepared or fabricated for the Contract and also to any place where the materials are lying or from which they are being obtained. The Contractor shall give every facility to the Consultant and the Employer and their representative for inspection and examination and test of the Consultant and workmanship. No person unless authorized Consultants or the Employer, except the Representative, authorized shall be allowed on the works at any time. If any works is to be done at place other than the site of the works Contractor shall obtain the written permission of the doing so.

16.0 ROLE OF THE CONSULTANT GCC-16

Consultant duties are to be watch and supervise the works and to test any materials to be used or workmanship employed in connection with the works, quality control, project scheduling and monitoring and co-ordination with all other agencies and Civil Contractor, recording of measurement clarifications of bills, preparing extra deviation items, excess/saving statement preparing minutes of meeting etc. They shall have no authority either to relieve the Contractor of any of his duties or obligations under the Contract, or, except those expressly provided hereunder, to order any work involving delay or any extra payment of the Employer or any variation of or in the works.

The Contractor shall afford the Consultant every facility and assistance for examining the works and materials and checking and measuring time and materials. The Consultant shall have no power to revoke alter, enlarge or relax any requirements of this Contract, or to sanction any day-work,

additions, alterations, deviations or emissions unless such in authority may be specially conferred by a written order of the Employer.

The Consultant shall act in consultation with the Structural Consultant in regard to the quality of all Structural aspects of the work and in consultation with the Consultant will finalize the selection of materials involved. The Consultant shall jointly record the measurements with Contractor's representative for all items of works and on completion hand over the records to the Employer.

The Consultant shall have the power to give notice to the Contractor or his Engineer in charge about the non-approval of any work or materials and such works shall be suspended or the use of such materials should be discontinued until the decision of the Consultant/Employer is obtained, the work, will from time to time visited by the Consultant/Employer but such examination shall not in any way exonerate the Contractor from the obligation to remedy any defects, which may be found to exist at any stage of the work or after the same is completed. Subject to the limitations of this Clause, the Contractor shall take instructions only from the Consultant as the case may be.

The Consultant shall have such other powers and discharge other functions as are specifically provided in this contract including such incidental or consequential powers or duties, subject always to such specific instructions or directions of the Employer, which shall be duly notified to the Contractor.

17.0 ASSIGNMENT OR SUB-LETTING **GCC-17**

The work included in the Contract shall be executed by the Contractor and the Contractor shall not directly or indirectly transfer, assign or underlet the Contract or any part share thereof or interest herein, nor shall he take a new partner, without the written consent of the Consultant/Employer and not undertaking shall relieve Contractor from the full and entire responsibility of the Contract or from active superintendence of the works during their progress.

18.0 VARIATIONS NOT TO VITIATE CONTRACT **GCC-18**

The Contractor shall when directed in writing by the Consultant, omit from or vary any works shown upon the drawings or described in the specifications or included in the priced Schedule of Quantities, but the Contractor shall not make any alterations on the provisions of the Contract without such authorization or direction in writing from the Consultant.

No claim for an extra shall be allowed unless it shall have been executed by the authority of the Consultant as herein mentioned. Any such extra is hereinafter referred to as an authorized extra. No variations, i.e. additions, omissions or substitutions shall vitiate the Contract.

The rate of items not included in the bill of quantities shall be settled by the Consultant in accordance with the provisions of CLAUSE NO.21 hereof.

19.0 MEASUREMENT OF WORKS **GCC-19**

The Consultant may from time to time intimate the Contractor that he requires the works to be measured and the Contractor shall forthwith attend or send a qualified Engineer to assist the Consultant's or their representative in taking such measurements and calculations and to furnish all particulars or give all assistance required by them.

Should the Contractor not attend or neglect or omit to send such agent, then the measurements taken by the Consultant or approved by him shall be taken to be the correct measurements. The works shall be measured according to the mode of measurements stated in the Annexed general specifications. The measurement shall wherever not be mentioned in the tender be taken in accordance with the Handbook of Method of Measurement of building work (SP-27-1987) / (IS: 1200) published by Bureau Indian Standards1988 and its latest revision if any.

The Contractor or his Agent may at the time of measurement take such notes and measurements as he may require.

All authorized extra works, omissions and all variation made without the Consultant's knowledge, if subsequently sanctioned by him, in writing, shall be included in such measurements. Accordance with

the Drawings and Specifications or instructions and the Contractor shall forthwith carryout such order at his own cost. In case of default on the part of the Contractor to carry out such order the Employer shall have power to employ and pay other persons to carry out the same and all expenses consequent thereon or incidental thereto shall be borne by the Contractor and shall be recoverable from him on behalf of the Employer or may or may be deducted by the Consultant from any money due or say become due to the Contractor.

In lieu of the correcting works, which are not done in & accordance with the contract, the Consultant/Employer may allow such work to remain and, in that case, may make allowance for the difference in value together with such further allowance in consultation with the employer.

20.0 PRICES FOR EXTRA ETC. - ASCERTAINMENT OF **GCC 20**

Should it be found after the completion of the works from measurements taken in accordance with the previous paragraph that any of the quantities or amounts of work thus ascertained are less or more than the specified for the works in the period schedule of quantities and/or that any variation is made, from the tendered schedule of item by operating additional item called "extra item" or "substitute item" in substitution of some tendered items, the rate and the valuation thereof, unless previously or otherwise agreed upon shall be made in accordance with the following rules:-

a. The net rates or prices in the original tender shall determine the valuation of the extra work where extra work is of a similar character and executed under similar conditions as the work priced therein.
b. The net rates or prices in the original tender shall determine the value of the item omitted, provided if omissions vary the conditions under which any remaining, items of works are carried out, the prices for the same shall be valued under (c) hereof.
c. Where the extra works are not of similar character and/or not executed under similar condition as aforesaid or where the omissions vary, the conditions under which any remaining items of works are carried out or if the amount of any omission or additions relative to the amount of the whole of the Contract works or to be any part thereof shall be such that in the opinion of the Consultant, the net rate or price contained in the priced Schedule of Quantities or tender or for any item of the works involves loss or expenses beyond that reasonably contemplated by the Contractor or is by reason of such omission or addition rendered unreasonable or inapplicable, the Consultant shall fix such other rate or prices as in the circumstances he shall think reasonable and proper, on the basis of actual cost of work involved plus 15% (Fifteen Percent) towards contractor's overhead and profits, which shall be final and binding on the contractor. **No escalation shall be entertained on the extra or deviated items**.
d. The measurement and valuation in respect of the Final Contract as executed shall be completed within the "period of final measurement" or within 3 (THREE) months of the completion of the Contracted works as defined under CLAUSE NO.24 (Certificate of Virtual Completion)
e. The Contractor shall submit the claims for deviated items on pink sheets & extra items on yellow sheets.

21.0 UNFIXED MATERIALS **GCC 21**

When any materials intended for the works shall have been placed at the site by the Contractor, such materials shall not be removed there from (except for the purpose if being used an the works) without the written authority of the Consultant and when the Contractor shall have received payment in respect of any Certificate in which the Consultant shall have stated that he has taken into account the value of such unfixed materials on the works, such materials shall become the property of the Employer and the contractor shall be liable for any loss or damage to any such materials.

22.0 REMOVAL OF IMPROPER WORK AND MATERIALS **GCC 22**

The Consultant shall during the progress of the works, have power to order in writing from time to time the removal from the works, within such reasonable time as may be specified in the order of any

material which, in the opinion of the Consultant are not in accordance with the specification or the instruction of the Consultant and the substitution of proper materials and the removal and proper execution of any such work, which has been executed with materials or workmanship, not in accordance with the Drawings and Specifications or instructions and the Contractor shall forthwith carryout such order at his own cost. In case of default on the part of the Contractor to carry out such order the Employer shall have power to employ and pay other persons to carry out the same and all expenses consequent thereon or incidental thereto shall be borne by the Contractor and shall be recoverable from him on behalf of the Employer or may or may be deducted by the Consultant from any money due or say become due to the Contractor.
In lieu of the correcting works, which are not done in & accordance with the contract, the Consultant/Employer may allow such work to remain and, in that case, may make allowance for the difference in value together with such further allowance in consultation with the employer.

23.0 DEFECTS AFTER COMPLETION **GCC-23**

Any defects, or other faults which may appear within the **"Defects Liability Period" of 24 months** after the Virtual Completion of work, Responsibility for making good of the fault lays with the contractor at their cost. The defects becoming apparent during this period will rest entirely with the Contractor & the Contractor shall upon the direction and writing of the Consultant, and within such reasonable time as shall be specified therein, be rectified and made good by the Contractor, at his cost, unless, the Consultant shall decide that he ought to be paid for such rectification and making good and in case of default the Employer may employ and pay other persons to rectify and make good such defects or other faults and all damages, loss and expenses consequent thereon or incidental thereto shall be made good and borne by the Contractor and such damage, loss and expenses shall be recoverable from him by the Employer or say be deducted by the Employer upon the Consultant's Certificate in writing from any moneys due or that may become due to the Contractor or the Employer may in lieu of such rectification and making good by the Contractor deduct from any money due to the Contractor as sum, to be determined by the Consultant, equivalent to the cost of rectifying such works & in the event the amount retained under CLAUSE NO. 34 (Certificate and Payments) being insufficient, recover the balance from the Contractor.

24.0 CERTIFICATE OF VIRTUAL COMPLETION OF WORKS **GCC-24**

The Contractor shall inform in writing to the Consultant in the prescribed PERFORMA 'D' as and when the works are completed in all respects to enable the Consultant to inform the Employer to take possession of the completed works. The defects liability period shall commence from the date of issue of such letter by the Contractor & accepted by the Consultant to be called Virtual Completion Certificate. This will be effective on receipt of SITC and fire brigade approval to be arranged by the contractor with prior intimation to the Consultant and State Bank of India. The final NOC should be obtained by the contractor on behalf of the bank and the same should be handed over to the Dy. General Manager (Premises) with a covering letter duly signed by the contractor in the original format. The contractor also should submit As Built drawing complete with stage wise inspection report and hand written sketches/ Drawings to substantiate and support the final As-Build drawing.

25.0 OTHER PERSONS ENGAGED BY THE EMPLOYER **GCC-25**

The Employer reserves the right to use the premises and any portion of the site for the execution of any work not included in this contract which he may desire to have carried out by other persons, and the Contractor is to allow all reasonable facilities for the execution of such work, but is not required to provide any plant or material for the execution of such work, except by special arrangement with the Employer. Such work shall be carried out in such a manner as not to impede the progress of the works included in the Contract, and the Contractor shall not be responsible for any damage or delay which may happen to or be occasioned by such work.

26.0 CONTRACTOR'S LIABILITY AND INSURANCE **GCC-26**

a. From commencement to completion of works, the Contractor shall take full responsibility for the care of the work and for taking precautions to prevent loss or damage to the works and to minimize the loss or damage to the maximum extent possible shall be liable for any damage or loss that may arise to the works or any part thereof from any cause whatsoever, inherent defects and failures due etc. poor workmanship and causes such as lighting, explosion, earthquake, storm, hurricane, floods, inundation, riots (excluding civil war rebellion, revolution and insurrection) but further including the failure to the design and shall at his own cost repair and make good the same so that at all times the work shall be in good order and condition and in conformity in every respect with the requirements of the Contract. The Contractor shall take the Comprehensive contractor's all Risk Insurance policy for the full value provided under this contract increased by 25% of the contract value.

Explanation:
For the purpose of this condition, the expression "from the commencement to completion of work" shall mean the time commencing **from the date of commencement and ending with the date of virtual completion of work.**

b. Without limiting the obligations and responsibilities under this condition, the Contractor shall insure to keep insured the works from commencement to completion, as aforesaid, for their full value provided under this contract increased by 25% of the Contract value against the risk of loss or damage from any cause whatsoever including the causes enumerated in the CLAUSE NO.26(a) above. In the event of there being in variation in the nature and extent of the work, the Contractor shall from time to time increase or decreases the value of the insurance correspondingly. All the premiums shall be borne and paid by the Contractor. The said insurance shall also provide for the removal of debris of the lost or damaged works.
The said insurance shall be in **the Joint name of the Employer and the Contractor**, the Employers name being mentioned first in policy and the Contractor should deposit with the Employer the said policy or Policies before commencing the work at site. All money payable by the insurers under such policy or Policies shall be recovered by the Employer and shall be paid to the Contractor in installments for the purpose of rebuilding or replacement or repair the work and/or goods destroyed or damaged as the case may be.

c. If the Contractor has a blanket insurance policy for all the works and the policy covers all the items to be insured under the condition, the said policy shall be assigned by the Contractor in favor of the Employer, provided however that if any amount is payable under the policy by the insurers in respect of works other than the work under the Contract, the same may be recovered by the Contractors directly from the insurers.

d. The Contractor shall indemnify and keep indemnified the Employer against all losses and claims, damages or compensation under the provision of the Payments of Wages Act 1938, Minimum Wages Act 1949, Employer's Liability Act 1938, Workman's Compensation Act 1923, the Maternity Benefit Act 1961, the Mumbai Shops and Establishment Act 1947, Industrial Dispute Act 1947 and Contractor Labour (Regulation and Abolition) Act 1970 and Employees State Insurance Act or any modification thereof or any other law relating thereto and rules made there under from time to time or as consequences of any accident or injury to any workman or other person in or about the work whether in the employment of the employer or contractor or not, and also against cost, charges and expenses of any unit, action or proceedings whatsoever of such accident or injury or combination of any such claim.

e. Before commencing the work, the Contractor shall without limiting his obligations and responsibilities under this condition, insure against any loss of life or injury to any personnel in the employment of Contractor/ Sub-Contractor/ nominated subcontractor. For this purpose, an insurance shall be taken by the Contractor/ Sub- Contractor, such insurance shall be taken to include both employees/workmen covered by the Workman's Compensation Act 1923, as well

those employers/workmen not covered by the Act. Separate insurance policies may be taken for employees/workmen covered by Workman's Compensation Act. 1923, and employees' workmen not covered by the said Act. The entire premium shall be paid by the Contractor
Policy/ Policies taken under this clause for the 'personnel in employment with the Contractor/ Sub-Contractor/nominated Sub-Contractors the Employee and Contractor shall recover directly from the Insurance Company and ensure that payment of the same is made to the affected parties. The policy in original shall be deposited with the Employer.

f. The Contractor shall at all times indemnify and keep indemnified the Employer against all losses and claims for injuries or damage to any person or any property whatsoever which may arise out of or in consequence of the construction and during the defect's liability period and against all claims, demands, proceedings, damages, costs, charges and expenses whatsoever in respect of the relation thereto. Before commencing the execution of the works, the Contractor shall without in any way limiting his obligations and liabilities under this condition, insure at his cost and expense against any damage or loss, or injury which may be caused to any person or property including the Employee or servants of the Employer and the Consultants and their property by or in the Course of the execution of the works. Such insurance to be known as Third-Party Insurance shall be in a sum equivalent to two percent of the estimated value of the work, subject to the minimum sum of Rupees Five Lakhs. The Insurance Policy to be so obtained by the Contractor shall be deposited by the Contractor with the Employer within seven days of its issue by the insurers.
g. The Contractor shall provide the Employer with documentary evidence from time to time that he has taken all the insurance policies mentioned foregoing paragraphs and that he has paid the necessary premium for keeping the policies valid till the expiry of the defects liability period
h. The Contractor shall ensure that similar insurance policies are taken out by his sub- Contractors or nominated Contractors, if any, and shall be responsible for any claim or loss resulting from their failure to obtain adequate Insurance protection in connection thereof. While taking the insurance policies, Contractor should indicate clearly to the insurance companies that policies issued should cover their sub-contractors and nominated subcontractors also.
i. If the Contractor and/or his sub- Contractor or nominated Contractor, if any, shall fail to effect and keep in force the Insurance referred to above or any other insurance which he/they say be required to effect under the terms of the Contract, then in any such case the Employer may without being bound to effect and keep in force any such insurance policy and pay such premium or premium as may be necessary for that purpose from time to time and deduct the amount so paid by the Employer from any moneys due or which may become due to the Contractor recover the same as a debt due from the Contractor.
j. All insurance to be affected by the Contractor and/or his sub-contractors or nominated sub-Contractors if any, shall be taken only with the insurance company to be approved by the Employer.
k. Without prejudice to any of his obligations and responsibilities under this condition, the Contractor shall within 30 days from the date of work order and thereafter at the end of each quarter submit a report to the Employer in Performa 'C' annexed hereto indicating the detailed information on the insurance policies as prescribed in the said Performa together with relevant document.
l. No work shall be commenced by the Contractor unless and until he has obtained the insurance or Insurances required to be obtained by his under or by the foregoing clauses and no work shall be carried out or continued by the Contractor unless and until – each insurance is current and valid at that time. All the receipts in original, along with two photocopies thereof, for the payment of premium shall be furnished by the Contractor to the Consultant/ Employer. The original receipts will be returned to the Contractor after verification. The Employer reserves the right for payment on works done subject to fulfillment of these conditions.
m. In the event of any claim for insurance becoming due on account of any eventuality covered by the respective insurance policy/policies, the Contractor shall reinstate the installation, replace the

materials or equipment's or pay compensation to be affected personnel/employee under this Contract or any other Contract

n. If the Contractor shall not perform and observe any of the duties and obligations devolving upon him hereunder and such omission or breach by the Contractor shall involve the Employer in any liability tortuous or otherwise and/ or loss or damage, the Employer shall be entitled to recover the amount of restitution from any moneys due to the Contractor from the Employer under this Contract or any other Contract.

o. The Consultant will ensure the validity of the Insurance policies (taken by the Contractors) on behalf of the Employer.

27.0 TO DEFINE TERMS AND EXPLAIN PLANS **GCC-27**

The various parts of the Contract are intended to be complementary to one another, but should any discrepancy appear, or any misunderstanding arise as to the import of anything contained therein the explanations of the Consultant shall be final and binding. The correction of any errors or omissions of the Drawings and Specifications may be made good by the Consultant/ Consultants, when such correction is necessary to bring out clearly the intention, which is indicated by a reasonable interpretation of the drawings and specification as whole.

28.0 DATE OF COMPLETION **GCC-28**

On receiving the Work Order, the Contractor shall thereupon and forthwith begin the works within 10 days and shall proceed regularly with and complete the same in accordance with the program of execution to the entire satisfaction of the Consultant/employer within **18 MONTHS** from the date of issue of work order subject nevertheless, to the provisions for extension of time hereinafter contained. The Contractor shall not have any lieu or charges on the site, building and/or any other plant, equipment, machinery etc. lying on the site in respect of any of his claim arising under the contract or otherwise.

29.0 DELAY AND EXTENSION OF TIME **GCC-29**

If in the opinion of the Consultant, the works be delayed (a) by force majeure or (b) by reason of any exceptionally inclement weather or (c) by reason of proceeding taken or threatened by the dispute with adjoining or neighboring owners or public authorities arising otherwise than through the Contractor's own default or (d) by the works or delays of other.

Contractors or tradesmen engaged or nominated by the Employer or the Consultant and not referred to in the Schedule of Quantities and/ or Specifications or (e) by reason of the Consultant's instruction as per CLAUSE NO. (9) below or (f) by reason of civil commotion local commotion of workmen or strike of lock-out affecting any of the building trades or (9) in consequences of the Contractor not having in due time necessary instructions from the Consultant for which he shall have specifically applied in writing, ahead of time giving the Consultant reasonable time to prepare such instructions, the Employer/ Consultant shall make a fair and reasonable extension of time for completion of the Contracted works. In case of such strike or lock-out, the Contractor shall, as soon as may be, give written notice thereof to the Consultant, but the Contractor shall nevertheless constantly use his endeavors to prevent delay and shall do all that may reasonably be required to the satisfaction of the Consultant to proceed with the work.

The Contractor shall take all practicable steps to avoid or reduce any delay in the execution and completion of the works arising out of

(a) Force Majeure
(b) Exceptionally inclement weather
(c) Loss or damage by fire and earthquake
(d) Civil commotion lock out, strike etc.
(e) Consultants/Employer's instructions, as the case may be….

30.0 DAMAGES FOR NON-COMPLETION **GCC-30**

If the Contractor fails to complete the works by the date named in CLAUSE NO. 28 (Date of Completion) or within any extended time under CLAUSE NO. 29 (Extension of time) and if the Consultant shall certify in writing on or before the date of issue of the Certificate for the last payment which the Contractor may become entitled hereunder that the works could reasonably have been completed by the date or within the said extended time, then the Contractor shall pay or allow the Employer the sum to be worked out at ½% of the contract value per week or part of the week thereof subject to maximum 5% of contract value to be recovered as liquidated damages and not by way of penalty for the delays beyond the said date of extended that as the case say be, drying which the works shall remain unfinished and such damages may be deducted from any moneys dues or which say become due to the Contractor. The deduction of such sum shall not, however, absolve the Contractor of his responsibility and obligations to complete the work in its entirety.

31.0 FAILURE BY CONTRACTOR TO COMPLY WITH CONSULTANTS INSTRUCTIONS **GCC-31**

If the Contractor after receipt of written notice from the Consultant requiring compliance, with such further drawings and/or instructions to remove, fails within seven days to comply with the same, **the Consultant may employ other persons to execute any such work whatsoever as may be necessary to give effect thereto and all costs incurred in connection therewith shall** be recoverable from the Contractor by the Employer on a certificate by the Consultant as a debt, to be deducted by him from any moneys due to and/or to become due to the Contractor

32.0 CONSULTANTS DELAY IN PROGRESS **GCC-32**

The Consultant may delay the progress of the works in case of rains or otherwise, without vitiating the Contract and grant such extension of time with the approval of the Employer for the completion of the Contract as he may think proper and sufficient in consequences of such delay and the Contractor shall not make any claim for compensation or damage in relation thereto.

33.0 SUSPENSION OF WORKS **GCC-33**

If the Contractor except on account of any legal restraint upon the Employer preventing the continuance of the works, on account of any of the causes mentioned in CLAUSE NO. 29 (Extension of time) in the case of a certificate being withheld or not paid when due, shall suspend the works, or in the opinion of the Consultant shall neglect or fail to proceed with due diligence in the performance of his part of the Contract or if he shall more than once make default in the respects mentioned in CLAUSE NO. 22 (Removal of improper work and materials) the Employer through the Consultant shall have power to give notice in writing to the Contractor requiring that the work be proceeded with a reasonable manner and with reasonable dispatch. Such notice shall not be unreasonably given and must signify that it purports to be a notice under the provisions of this clause and must specify the act or defaults on the part of the Contractor upon which it is based. After such notice shall have been given, the Contractor shall not be at liberty to remove from the site of works, or from any ground contiguous thereto, any plant or materials belonging to him, which shall have been placed thereon for the purpose of works and the Employer shall retain and hold a lien upon such plant and materials until the works shall have been completed. If the Contractor fails for 7 (seven) days after such notice has been given to proceed with the works as therein prescribed, the Employer say enter upon and take possession of the works and of all such plant and materials thereon intended to be used or the work, and the Employer shall retain and hold a lien upon all such plant and materials until the works shall have been completed under powers hereinafter conferred upon him. If the Employer shall exercise the above power, he may engage any other person to complete the works and exclude the Contractor, his agents and servants, from entry upon or access to the same, except that the Contractor or any

person appointed in writing may have access at all reasonable times during the progress of the works to inspect, survey and measure the works.

Such written appointment or a copy thereof shall be delivered to the Consultant before the person so appointed comes on to the works and the Employer shall take such steps as in the opinion of the Consultant, may be reasonably necessary for completion the works, without undue delay or expenses, using for that purpose the plant and materials above mentioned in so far as they are suitable and adaptable to such use.

Upon the completion of the work, the Consultant shall certify the amount of the expenses properly incurred, consequent on and incidental to the default of the Contractor as aforesaid and in completing the works by other persons. Should the amount so certified as the expenses poverty incurred be less than the amount which would have been due to the Contractor upon the completion of the works by him, the difference shall be paid to the Contractor by the Employer should be amount of the former exceed the latter, the difference shall be paid by the Contractor of the Employer.

The Employer shall not be liable to make any further payment or compensation to the Contractor for or on account of the proper use of the plant for the completion of the works under the provision herein before mentioned other than such payment as included in the contract. After the works shall have been so completed by persons other than the Contractor under provision herein before contained, the Consultant shall give notice to the Contractor to remove his plant and all surplus materials as may not have been used in the completion of the works from the site. If such plant and materials are not removed within a period of 14 days, after the notice shall have been given, the Employer may cause to remove and sell the same, holding the proceeds, loss the cost of the removal and sale to the credit of the Contractor. The Employer shall not be responsible for any loss sustained by the Contractor the event of from the sale of the plant in the Contractor not removing if after notice.

34.0 CERTIFICATE & PAYMENTS GCC-34

The Contractor shall be entitled under the certificate to be issued by the Consultant to the Contractor, ADHOC PAYMENT – 60% within 7 working days from the date of each certificate to the payment from the Employer from time to time by installments when in the opinion of the Consultants work to be the value of Rs**. 1.25 Crore** (or more at the reasonable discretion of the Consultant). The retention at the rate of **10%** (Ten percent) of the value of the work so executed shall be deducted from running bills. The maximum amount of Retention Money shall be balance of the total Security deposit of **10%** (Ten Percent) of contract value. This amount will not carry any interest. This balance payment will be made after due scrutiny within 14 working days from the date of certificate of the Consultant. Total security deposit shall be 10% of contract value (Including the security deposit by DD submitted at the time of confirmation of the order.). The initial EMD of 1% will be returned on receipt of 5% value as DD in the name of State Bank of India and balance 5% shall be deducted from the running bill of the work, submitted from time to time, at the rate of 10% of the bill i.e. deduction from each running bill account will be 10% till total balance 5% of contract value is reached. The above Security deposit will be converted into performance guarantee on completion of the job. From the date of confirmation of the handing over of the system along with all documents and certificate including the Fire brigade and/or local authorities, and also on the certification and recommendation of the Consultant. The performance guarantee amount will be returned on the completion of the CAMC period, i.e. the completion of the 5th year from the date of handing over. This amount will be returned on the certification and recommendation of the Consultant.

Provided always that the issue of any certificate by the Consultant during the progress of the works or at or after their completion shall not have effect as a certificate of satisfaction or relieve the Contractor from his liability under CLAUSE NO. 23 and within the extent and period provided by the Statute of Limitations, provided always that the interim certificate and the final certificate issued by the Consultant shall be accompanied by the Consultant's Certificate to the effect that the work has been carried out as per the drawings and specifications approved by them. The Consultant shall have

power to withhold any certificate, if the works or any parts thereof are not carried out to this satisfaction.

The Consultant may by any certificate make any correction required in previous certificates/s, which shall have been issued by him.

The Contractor shall submit interim bills only after taking actual measurement jointly recorded with Consultant in Measurements Book and showing the register to Employer's Representatives.

This is not only to regulate the correctness of the quantity but also to facilitate expeditious clearing of the bills. The bills shall be submitted in the following Performa. The employer shall carry out test checking of measurements as when required.

The final bill shall be submitted by the Contractor within one month of Virtual Completion Certificate received from the Contractor duly endorsed by the Consultant, and such bill shall be settled and certified for payment by the Consultant within three months of the submission of the bill.

Payments upon the Consultant's Certificate shall be made within a period of seven working days named in the appendix as 'Period of Honoring of Interim Certificates' after such Certificates have been delivered to the Employer. Payment upon the Consultant's Final Certificate shall be made within a period of three months from the date of its receipt by the Employer.

The Contractor shall submit the Performa 'A' and 'B' serially numbered with dates for all extra/deviated items of works. The approved rates & quantities in the bills shall be in 'Pink Sheets for deviated items & Yellow' sheets for extra items.

Contractor shall, without fail submit along with his R.A. Bills/Final Bills the test certificates to the Consultant for the equipment's that he is brought in conformity with latest relevant I.S. Codes. Such test certificates and result shall be presented to and certified for acceptance by the Consultants before submission along with R.A. Bills / Final Bills.

R.A. Bills/Final Bills received without the test certificate/results approved by consultant shall be returned to the Contractor.

35.0 NOTICES **GCC-35**

Notices of the Employer, to the Consultant or the Contractor may be served personally or by being left at or sent by registered post to last known place of the business of the party to whom the same is given or in the case of the Contractor by being left on the works. In the case of Company or Corporation, notices shall be served at or sent by registered post to the registered office of the Company or Corporation. Any notice sent by registered post shall be deemed to be served at the time when, in the ordinary course of post, it would be delivered.

36.0 TERMINATION OF CONTRACT BY THE EMPLOYER **GCC-36**

If the Contractor being an individual or a firm, commit any Act of Insolvency of shall be adjudged an insolvent or being in an incorporated company shall have an order for compulsory winding up or applies for voluntary winding up or subject to the supervision of the Court and of the Official Assignee or the Liquidator in such acts of insolvency or winding up shall be unable within seven days' notice to his requiring him to do so, to show to the reasonable satisfaction of the Consultant that he is able to carry out and fulfill the contract and to give security, therefore if so required by the Consultant.

OR if the Contractor (whether an individual, firm or incorporated company) shall suffer execution to be issued or shall suffer any payment under this contract to be attached by or on behalf of any of the creditors of the Contractor.

OR shall assign or sub-let the contract without the consent in writing of the Consultant first obtained,

OR shall charge or encumber this contract or any payments due or which might become due to the Contractor there under,

OR if the Consultant shall certify in writing to the Employer that the Contractor:

i. has abandoned the contract, or

ii. has failed to commence the works, or has without any lawful excuse under these conditions suspended the progress of the works for seven days after receiving from the Consultant, written notice to proceed or

iii. has failed to proceed with the works with such due diligence and failed to make such due progress as would enable the works to be completed within the time agreed upon, or

iv. has failed to remove materials from the site or to pull down and replace work for seven days after receiving from the Consultant written notice that the said materials of work were condemned and rejected by the Consultant under these conditions, or

v. has neglected or failed persistently to observe and perform all or any of these acts, matters or things by this contract to be observed and performed by the Contractor for seven days, after written notice shall have been given to the Contractor requiring the Contractor to observe or perform the same, or

vi. Has to be detriment of good workmanship or in defiance of the Consultant's instructions to the contrary sub-let any part of the contract.

Then and in any of the said cases the Employer may, notwithstanding any previous waiver, after giving seven days' notice in writing to the Contractor, determine the contract but without thereby affecting the powers of the Consultant or the obligations and liabilities of the Contractor, the whole of which shall continue in force as fully as if the contract has not been so determined and as if the works subsequently executed has been executed by or on behalf of the Contractor. And further the Employer may enter upon and take possession of the work and plant, tools, scaffolding, sheds, machinery, steam and other power utensils and materials lying upon the premises or the adjoining lands or roads and use the same as his own property or may employ the same by means of his own servants and workmen in carrying on and completing the works or by employing any other Contractors or other persons to complete the works, and the Contractor shall not in any way interrupt or do any Act, matter or thing to prevent or hinder such other Contractor or other person or persons employed for completing and finishing or using the materials and plant for the works. When the works shall be completed or as soon thereafter as convenient, the Consultant shall give a notice in writing to the Contractor to remove his surplus materials and plant, and should the Contractor fail to do so within a period of 14 days after receipt thereof by him, the Employer shall sell the same by public auction and give credit to the Contractor for the amount realized on deducting there from, the costs of removal and sales. The Consultant shall (if anything) shall be due or payable to or by the Employer for the values of the said plant and material so taken possession of by the Employer and the expense or loss which the Employer shall have been put to in procuring the works to be completed and the amount if any, owing to the Contractor and the amount which shall be so certified shall thereupon be paid by the Employer, to the Contractor or by the Contractor to the Employer, as the case may be and the certificate of the Consultant shall be final and conclusive between the parties. On termination of the contract, the Contractor shall forthwith remove himself and his workmen from the works site.

37.0 PHOTOGRAPHS OF WORKS CARRIED OUT **GCC-37**

The Contractor shall every month supply at his own cost a reasonable number of Post Card size-colored photographs of the works carried out from time to time as per the instructions of the Consultant. In the event of any dispute or termination of contract either by the Employer or the Contractor as provided for in the aforesaid CLAUSE NOS. 37 & 30, the Contractor shall arrange to obtain photographs of the works completed up to the date of such termination of contract.

38.0 MATTER TO BE FINALLY DETERMINED BY THE CONSULTANTANTS: GCC-38

Consultants decision, opinion, direction, certificates (except for payments) with respect to all or any of the matter under CLAUSE NOS. 2, 7, 9, 17, 22, 29a, b,c,d and the schedule of rates as contained in Annexure hereof and as to the exercise by him under clause It of the right to have any works opened up, (which matters are here in referred to as the excepted matters) shall be final and conclusive and binding on the parties hereto and shall be without appeals litigation in court or Arbitration etc.

39.0 FORECLOSURE OF CONTRACT IN FULL OR IN PART **GCC-39**

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

The Contractor shall be paid at the contract rates, full amount for works executed at site, and in addition, reasonable amount as certified by the Consultant for the value, of such material which material shall thereupon become the property of the Employer.

40.0 INSPECTION OF SITE AND SUFFICIENCY OF TENDERS **GCC-40**

a. The Contractor shall inspect and examine the site and its surroundings and shall satisfy himself before submitting his tender as to the nature of the premises, the form and nature of the site, the quantities and nature of work and materials necessary for the completion of the works and the means of access of site, the accommodation he may require outside the project site and in general shall himself obtain all necessary information as to risks, contingencies and other circumstances which may influence or affect his tender.

b. The Contractor shall be deemed to have satisfied himself before tendering as to the correctness and sufficiency of his tender for the works and of the rates and prices quoted in the Schedule of work/items/quantities or in Bills of Quantities, which rates and prices shall, except as otherwise provided, cover all his obligations under the contract and all matters and things necessary for proper completion and maintenance of the works.

c. No extra charges consequent on any misunderstanding or otherwise shall be allowed.

INSPECTION OF WORKS

The proposed work can be inspected by the CTE's Organization – a wing of Central Vigilance Commission and / or Chief Vigilance Officer of the Bank / Employer. The Contractor shall assist, co-ordinate to provide everything necessary for the purpose and comply with their instructions / findings in the matter. Their decision in the matter shall be final and binding to the contractor.

41.0 NOTICES TO LOCAL BODIES **GCC-41**

The Contractor shall comply with and give all notices required under any law, rule, regulations, or Bye Laws of parliament, State Legislature or local authority relating to works. The Contractor shall before commence the execution of work issue a certificate to the Employer or Consultant that he has obtained all the permission and given all the notices as are required to be obtained or given under law.

42.0 TOTAL SECURITY DEPOSIT **GCC-42**

Total Security Deposit shall comprise:

a. EARNEST MONEY DEPOSIT

The tenderer shall furnish Earnest Money Deposit amounting **Rs. 12,50,000/- only (Rupees Twelve lakh fifty thousand only)** in the form of Bank Draft drawn in favor of Employer and attach draft at the time of submission of tender as the Earnest Money. No tenders shall be considered unless the Earnest Money is deposited. No interest shall be paid out this Earnest Money Deposit. The Earnest Money of an unsuccessful tenderer will be refunded, without any interest, soon after the decision to award the work is taken. The Earnest Money Deposit shall stand absolutely forfeited if the tenderer revokes his tender at any time during the period when he is required to keep his tender open for acceptance by the Employer, or if, after the tender is accepted, the Contractor fails to enter into a formal agreement / or if fails to pay the security deposit as stipulated/or if he fails to commence the work within stipulated time limit.

b. INITIAL SECURITY DEPOSIT

The amount of Initial Security Deposit shall be **5%** (Five Percent) of the accepted value of the tender in the form of a DD. The Earnest Money Deposit will be returned on receipt of the security deposit.

c. RETENTION MONEY

The initial EMD of 1% will be returned on receipt of 5% value as DD in the name of State Bank of India and balance 5% shall be deducted from the running bill of the work, submitted from time to time, at the rate of 10% of the bill i.e. deduction from each running bill account will be 10% till total balance 5% of contract value is reached. The above Security deposit will be converted into performance guarantee on completion of the job. From the date of confirmation of the handing over of the system along with all documents and certificate including the Fire brigade and/or local authorities, and also on the certification and recommendation of the Consultant. The performance guarantee amount will be returned on the completion of the CAMC period, i.e. the completion of the 5th year from the date of handing over. This amount will be returned on the certification and recommendation of the Consultant.

43.0 TECHNICAL AUDIT CLAUSE **GCC-43**

The work is liable to be technically audited by the Chief Technical Examiner of the Central Vigilance Commission Government of India / Chief Vigilance Officer of the Bank / Employer from time to time. Any defects, improvements or testing etc pointed out by the Chief Technical Examiner / Chief Vigilance Officer of the Bank / Employer should be carried out by the Contractor as his own cost and any deduction suggested by the CTE / CVO will be affected from the contractor's bill.

The Employer shall have the right to cause a technical examination and audit of works and the final bills of the Contractor including all supporting vouchers, abstract, etc to be made at the time of payment of the final bill. If as a result of this examination or otherwise any sum is found to have been overpaid in respect of any work done by the Contractor under the contract the Contractor shall be liable to return the amount of over payment and it will be lawful for the Employer to recover the same from any sum or due to him and in any other manner legally permissible and if it is found, that the Contractor was paid less then what was due to his under the contract in respect of any work, executed by him under the contract the amount of such under payment shall be duly paid by the Employer.

Any sum of money due and payable to the Contractor (including Security deposit returnable to him) under this contract may be appropriated by the Employer and set off against any claim of the Employer for the payment of a sum of money arising out of or under any other contract made by the Contractor with the Employer.

44.0 PROCEDURE FOR BILLING

GCC-44

a. Contractor shall submit THREE COPIES of his bill on white paper for tender items.

b. As regards Contractor's claims for extra/deviated items. The onus of getting Consultant's/Owner's approval for the admissibility of such items lies on the Contractor.

c. After the admissibility is confirmed by client in writing, the Contractor will submit his rate analysis and details of claims on Consultant pink or yellow papers to be made available by the Consultant.

d. The Contractor will include extra/deviated items in his interim bills only after Employer's approval of rates on the basis of Consultant recommendations.

45.0 DELETION OF ITEMS FROM BILLS OF QUANTITIES **GCC-45**

The Employer reserves the right to delete any item from the bill of quantities drawn up. The Contractor will not have any claim on his account whatsoever.

46.0 REINSTATEMENT ITEMS **GCC-46**

In case of items like making good new work plaster of Paris false ceiling after the alteration and matching the finish with the existing one, the work will have to be done perfectly. In this case, Consultants' decision will be final regarding the acceptability of finish. If the reinstatement is not accepted by the Consultant, the same will have to be done again to Consultant's and Bank's satisfaction at no extra cost.

47.0 NON-AVAILABILITY OF ANY MATERIAL **GCC-47**

If for some reasons, the materials mentioned in the Approved Brand of Manufacturer's or the Bill of Quantities are not available, the same shall be brought to the notice of the Employer/ Consultant in writing by the Contractor. No alternative material shall be used without Employer's and Consultant written approval.

48.0 APPENDIX TO CONDITIONS OF CONTRACT **GCC-48**

Clause No.	Particulars	Details
42(a)	Earnest Money Deposit	**Rs. 12,50,000 only (Rupees Twelve lakh fifty thousand only)**
23	Defects Liability Period	24 Months from the date of Virtual Completion Certificate issued by the Consultant
28	Date of Commencement	On awarding the work, within 10 days from the date of issue of letter of intent, or the date of handover of site, whichever is earlier.
28	Date of Completion	18 MONTHS from the date of issue of LOI / Work order.
30	Liquidated Damages	½% of the contract value per week or part of the week thereof subject to maximum 10% of contract value
34	Period of Final Measurement	90 working days from the date of handing over.
34	Value of work for the issue of Interim Certificates	Rs. 1.25 Crore/- (Rupees One crore twenty five lakhs Only)
42(c)	Retention Percentage	The initial EMD of 1% will be returned on receipt of 5% value as DD in the name of State Bank of India and balance 5% shall be deducted from the running bill of the work, submitted from time to time, at the rate of 10% of the bill i.e. deduction from each running bill account will be 10% till total balance 5% of contract value is reached. The above Security deposit will be converted into performance guarantee on completion of the job. From the date of confirmation of the handing over of the system along with all documents and certificate including the Fire brigade and/or local authorities, and also on the certification and recommendation of the Consultant. The performance guarantee amount will be returned on the completion of the CAMC period, i.e. the completion of the 5th year from the date of handing over. This amount will be returned on the certification and recommendation of the Consultant.
34	Period of honoring Interim Certificate.	15 working days
34	Period of honoring Final Certificate	90 working days.

Witness_____ Signature of Contractor

_____

49.0 CONTRACTOR'S LIABILITY & INSURANCE: - SUMMARY GCC-49

Sr. No.	Nature & Scope Insurance of Work	Value of Insurance	Validity Period of Insurance	Name of Insurer	Insurance Policy No.
1	Loss or Damage to works or any part thereof & all materials at site from any cause whatsoever.				
2	Damage, loss or injury to any property of the Employer or Consultant to any person Including the Employer or Consultant or his Agents and Servants.				
3	Claims under the Workman's Compensation Act, 19IL3, the Minimum Wages Act 1949 & the Contract Labour. (Regulation & Abolition) Act 1970.				

Signature of Contractor

Address

_____

_____

_____

Witness:_____

50. **PROFORMA "A"** **GCC-50**

Name of work:

Interim Bill No.:

As Per Current Bill		As Per Previous Bill		For Current Bill		Remarks
No.	**Amount (Rs.)**	**No.**	**Amount (Rs.)**	**No.**	**Amount (Rs.)**	

1. Deviated Items : _____
2. Extra Items : _____
3. Deleted Items : _____

Net Excess / Savings : _____

Tender Items (As Executed) : _____

Actual Total (As Executed) : _____

Tender Amount : _____

_____

_____

51. **CERTIFICATE** **GCC 51**

The measurement on the basis of which the above entries for the Running Bill No. _____

Were made have been taken jointly on _____and are

Recorded at pages _____to_____ of measurement book No. _____

_____	_____	_____
Signature & Date of Contractor	Signature & Date of Consultant's Representative (Seal)	Signature & Date of Site

The work recorded in the above-mentioned measurement has been done at the site satisfactorily as **per tender drawing**, condition and specifications.

Consultant Site Engineer / Bank's AGM & Chief Fire Officer

52. PROFORMA OF CERTIFICATE OF PAYMENT BY CONSULTANTS GCC 52

Certificate No. Interim/ Dated

Client: - Project No. Building

Work/Interior Work

Particulars: -

Contractor Contract/Letter No. Dated

Contract's Bill No. Dated

This is to certify the amount given below (*) is due to your Contractors for the work done by then and/or against materials delivered at site and/or advance towards contract on the above referred project.

Advance against contract	Rs.
LESS - Advance adjusted to date	Rs.
Balance Advance	Rs.
Advance against material delivery at site	Rs.
Amount of work done to-date	Rs.
Total	Rs.
LESS - Retention on work done	Rs.
LESS - Previously certified upto	Rs.
PRESENT CERTIFICATE (*)	Rs.

Rupees

The cost of cement or any other material supplied by you or payments made by you directly, if any and not covered herein above, should be adjusted before making the payment of the certified amount (*)

Necessary Deduction U/S 194C of the Income Tax 1961 & sales tax may be made before paying the above certified amount.

By a copy of this letter, we are intimating the contractors to call on you for the necessary payments.

Remarks, if any
(P.T.O) The details of Insurance Policy are given in the next page.

Signature of Consultants

Enclosure: - Bill

Client's Copy

53. **DETAILS OF INSURANCE POLICIES** **GCC 53**

Types of Policies	Name of Insurance	Amount (Rupees)	Policy No.	Validity

CAR Policy
Including 3rd Party
Liability
Workmen's Compensation

Remarks: -

01. This is only an 'on-account' payment and is not to be interpreted either as approval of work, material brought of affixed at site or for that matter approval of any sort.

02. The quantum of work done and material delivery at site have been certified by_____.

03. Should you wish to audit such work, kindly contact the undersigned & oblige.

Consultants

54. **MEMORANDUM FOR PAYMENT** **GCC 54**

R. BILL NO. _____

01. Total amount due since previous bill (D) (A+B) Rs.
_____

02. P.V.A. on account of escalation in price of steel,
Cement & other material and labour as detailed
In separate statements enclosed
Rs. _____

03. **DEDUCTION**:-

a) Secured advance paid in the previous bill
Rs. _____

b) Retention money on value of works as per accepted tenders: up to date amount
Rs. _____

LESS - Already recovered (-)
Rs. _____

BALANCE TO BE RECOVERED Rs. _____
Rs. _____

c) Mobilization advance, if any
c1) Outstanding amount
(Principal + Interest) as on date Rs. _____

c2) To be recovered in this Bill Rs. _____

d) Any other departmental
Material cost to be recovered
As per contract, if any Rs. _____

e) Any other departmental
Service charges to be recovered
If any, as per contract (water,
Power etc.) Enclose statement Rs. _____

Total deduction as per contractor Rs. _____ (-)
Rs. _____

Net amount payable as per contract (E-F)
Rs. _____(G)

IN WORDS (Rupees

_____)

The bill amounting to _____ (both figures and words) has been scrutinized by me after due test check of the measurement of works as required and is recommended for payment.

_____
Dated Signature of Bank's Fire Officer

In Charge of the Project

STATUTORY DEDUCATIONS: -

01. Total amount due (E) Rs._____

02. LESS-Income Tax Payable Rs._____

NET PAYABLE

Rs._____

The figure given in the Memorandum for Payment Rs ---------- and the bill passed for payment _____ (words and figures).

Date:- _____

_____Signature of AGM & Chief Fire Officer.

For A & B refer Annexure 29.

55. **PROFORMA 'B'** **GCC 55**

Name of Work: -

Interim Bill No: -

Tender Provision Remark	Actual Amount Rs.	Excess (+) Rs.	Saving (-) Rs.

01. Deviated Items
(Pink Sheets) +

02. Extra Items
(Yellow sheets) +

03. Deleted Items -

Net Excess Saving +

04. Tender Items
(As executed)

Actual cost: -
(As executed)
LESS Tender cost -
Net Excess Saving

56. **PROFORMA `C'** **GCC 56**

CONTRACTORS LIAIBILITY AND INSURANCE SUMMARY

Name & Number of Insurance Policy with Description	Value of Insurance	Validity Period	Loss or damage in work (covered under policy) or any part thereof and all materials at site from any Cause whatsoever
1	2	3	4
a			
b			
c			
Damage, loss or injury to Any property of the Employer Or Consultant or his agents & Servants		Claims under the workman Remark Compensation Act. 19L`3, the Minimum Wages Act 1949 & Contract Labor (Regulation Abolition) Act 1970	REMARK
5		6	7

NB: - Details of further policies if any taken and the loss or damage if any under that policy may please be indicated separately 4t appropriate places.

Signature of Contractor

Address: -

Witness_____

_____

57. **PROFORMA 'D'** **GCC-57**

CERTIFICATE FOR VIRTUAL COMPLETION

Draft for letter to be written by the Contractor to the Consultant in connection with the Virtual completion certificate as per CLAUSE NO.24 on Page No.25 of the Contract.

Having executed the work in terms of the Contract, we hereby certify and affirm that we have virtually completed the contracted works.

We hereby certify that the works has been executed wholly to our satisfaction and with the materials and workmanship in accordance with the contract between us. We do certify further that we have executed the work in accordance with the applicable laws and without any transgression of such laws.

58. **CERTIFICATE FOR INSURANCE POLICIES** **GCC-58**

This is to certify that the work for which this bill is presented was executed only after obtaining the necessary insurance policies in accordance with obligation under this contract and during the execution of such work, the insurance policy was current and valid as detailed below: -

---

Workmen's Insurance

Particulars	Contractors Plant, Machinery & Material Insurance	Third Party Insurance	Covered by Workmen is Compensation Act	Not Covered by workmen's Compensation Act
1	2	3	4	5
Name of Insurance Company				
Policy No				
Value in Rs.				
Date of Expiry				

SPECIAL CONDITIONS OF CONTRACT

1. INSPECTION OF DRAWING **SPCC-01**

Before filing in the tender, the tenderer will have to check up all Drawings and Schedules of quantities and will have to get an immediate clarification from the Consultant on any point that he feels is vague or uncertain. No claim for damages or compensation will be entertained on this account.

2. EXECUTION OF WORK **SPCC-02**

The whole of the work as described in the Contract (including the schedule of quantities the specifications and all drawing pertaining hereto) and as advised by the Consultant from time to time is to be carried out and completed in all its parts to the entire satisfaction of the Employer/ Consultant. Any minor details of work which are obviously and fairly attended, or which may not have been definitely referred to in this contract, but which are usual in sound construction practice and essential to the work, are to be included in that contract. Rates quoted in the Schedules shall be inclusive of all freights, taxes, duties such as Vat, Octroi, Sales Tax, Work Contract Tax, Excise Duty, Royalties etc., as well as transportation to as to execute the contract as per the rules and regulations of Local Bodies. State Government and the Government of India and to the full intent of tender document.
Following shall be deemed to be provided for in the quoted rates.

a. Labour, maintenance, flying, carrying, cleaning, making good, hauling, wastage etc.

b. Plant, double scaffolding framework, English ladders, ropes, nails, spikes, tools, material and workmanlike-protection from weather, shuttering, temporary supports, plant for and the maintenance of the same.

c. Covering for the walling and other works during inclement weather or strikes or whenever directed as necessary.

d. All temporary canvas, lights, tarpaulin, barricades, water sheets etc.

e. All stairs and steps thresholds and any other requisite protection of the works.

f. All such temporary weather-proof sheds at such places and in a manner approved by the Consultant for the storage and protection of materials against the effects of Sun or Rain.

g. All such temporary fences guards' approaches and roads say be necessary for execution of the contract works and for safeguarding the public.

h. The necessary scaffolding, labour and removal of the same after the completion of the work. The Consultant will be sole judge in deciding as to the suitability of the tools and plant that say be brought at the works by the Contractors for the proper execution of the work.

The rates quoted by the tenderer in the schedule of probable quantities will be deemed to be for the finished work inclusive of the list of providing the above items

3. SCHEDULE OF QUANTITIES – NO CLAIM BECAUSE ACTUAL QUANTITIES DIFFER FROM PRELIMINARY STATEMENT **SPCC-03**

A schedule of probable quantities in respect of work and specifications accompany these conditions. The schedule of probable quantities is liable to alterations by omission, deductions or additions at the discretion of the Consultant / Employer.

The quantities of the various kind of work to be done and materials to be furnished under this Contract which have been estimated and are set forth in the proposal of the Agreement or the list or Contract prices, are the best available but may not be accurate in any of all particulars and are only, for the purpose of comparing on a uniform basis the bids offered for the work under this Contract. The Contractor agrees that neither the Employer nor the Consultant nor any of the employees or agents hereof shall be held responsible if any of the said estimated quantities shall be found to be not even approximately correct in the execution of the work and that he will not at any time dispute or complain of such statement nor assert that there was any misunderstanding in regard to the characters, size and type of work to be done or the kind or amount of the materials to be furnished or work to be done. Further, the Contractor shall make no claim for anticipated profits, for loss of profits or for damages because no work is ordered under certain items or because of a difference between the quantities of the various kinds of work to be done or materials actually delivered and the estimated quantities set forth by the Employer or the Consultant

4. ACCESS FOR INSPECTION

SPCC-04

The Contractor is to provide at all times during the progress of the works and the maintenance period proper means of access, ladders, gang ways etc., and the necessary attendants to move and adapt the same as directed for the inspection or measurement of the works by the Consultant/Employer or their representatives.

5. DIMENSION **SPCC-05**

Figured dimensions are in all cases to be followed and no case should they be scaled? Large scale details kike precedence over small scale drawings. In case of discrepancy, the Contractor is to ask for an explanation before proceeding with the work.

6. PROGRAMME OF WORK **SPCC-06**

The Bidder shall, along with his bid, submit completion of work, either in the form of CPM Net Work or in the form of a bar chart, showing how he proposes to complete the works. This programmed shall be prepared in sufficient detail and shall – indicate, among other things, the following details on month-to-month basis (for each month) or week to week.

a. Quantum of work under each major item of work that should be carried out.

b. Amount of resources that would be deployed e.g. skilled/unskilled labor Carpenter's equipment etc.

c. Schedule of delivery of materials to site.

d. Approximate value of work contemplated to be completed each month/week.

e. Schedule and manner in which detail is or material (to be issued by the – Employer) are required from the Consultant/Employer.

f. Time period allowed for other agencies work.

g. Various milestones to be achieved.
This program, suitably amended after discussions with the Consultant/Employer, shall become binding on the, Contractor. However, during the execution of project, should it become necessary in the opinion of the Consultant/Employer to reschedule some of the activities the Contractor shall do so at no extra cost and/or without any other claim.
Acceptance of bidder's tender does not necessarily, imply acceptance of the schedule submitted and the Consultant/Employer reserves to himself the right to modify/amend this schedule to suit the overall project schedule and the Contractor shall adhere to these revisions/modifications at no extra cost to the Employer.
Open space for storage could be provided by the Employer. The Contractor has to make arrangements for enclosing open space for providing safety Arrangements

7. WORK ON HOLIDAY/WEEK DAYS SPCC-07

Major work is required to be carried out after office hours and holidays without disturbing the departments/occupants in the building / floor and during office hours on working days may be permitted provided care is taken by the Contractor for not causing any disturbance to the working staff.

8. ACTION WHERE THERE IS NO SPECIFICATION SPCC-08

In the case of any class of work over which there is no specification mentioned, the same shall be carried out in accordance with the Indian Standard Specifications subject to the approval of the Consultant and clients.

9. REPORTING OF ACCIDENT TO LABOUR SPCC-09

Contractor shall be responsible for the safety of persons employed by him on the works and shall report accidents to any of them, however and wherever occurring on the works, to the Consultant/Employer. The Contractor shall make every arrangement to render all possible service to such workman. This shall be without prejudice to the responsibility of the Contractor to under the Insurance Clause of the General Condition.

10. CLEARING THE SITE OF WORKS SPCC-10

The Contractor shall clear the site of works as per the instructions of the Consultant. The site of works shall be cleared of all men, materials, sheds, etc., belonging to the Contractor. The site shall be delivered in a clean and neat condition as required by the Consultant within a period of one week after the job is completed. In case of failure by the Contractor, the Employer under advice to the Consultant will have the right to get the site cleared at the risk and cost of the Contractor to the satisfaction of the Consultant.

11. OCCUPATION OF PARTIALLY COMPLETED BUILDING BY THE EMPLOYER SPCC-11

The Employer shall be entitled to and at liberty to occupy even the partially completed premises or any portion thereof by themselves or through their agents and servants if they so desire in which even. Necessary extension of time & on this account for completing the work shall however, be granted to the Contractor, but he shall have no claim for any compensation whatsoever due to the delay involved in completing the work.

12. PREPARATION OF BUILDING FOR OCCUPATION AND USE ON COMPLETION SPCC-12

On completion of the work, the Contractor shall inform the Consultant in writing that he has finished the work and it is ready for the Consultants inspection. The Contractor/Employer shall clean all windows and doors including the cleaning and oiling, if necessary, of all hardware, inside and outside, all floors, staircase and every part of the building. He will leave the entire building neat and clean and ready for occupation and to the satisfaction of the Consultant

13. WAGES OF LABOUR EMPLOYED BY THE CONTRACTOR SPCC-13

The Contractor shall pay all labour employed by him at rates fixed by him at the commencement of the Contract as per the Labour Laws. Wages as applicable for the construction work as per norms stipulated by the Bombay Metro Corporation/ Labour Laws / Local Bodies etc. shall be followed by the Contractor.

No variation of such statutory laws & rules shall be permissible. This will also include the minimum & maximum allowable wages for various categories of labour to be employed by the Contractor.

All wages shall be paid in full and without any deductions whatsoever at the approved rates and for the full time actually worked during the wage period. The Engineer or other offices of the Employer maybe authorized in that behalf and shall have power to exercise supervision over the labour employed by the Contractor and or such purpose any of these officers may inspect the wage books, muster books and other labour records of the Contractor. In the event of the report of the inspecting officer showing that the proper rates of wages are not being paid, or that in any manner whatsoever the dealings between the Contractor and his labour are not satisfied, the Engineer shall pass such order upon the report as he considers desirable, and those orders shall be final and binding upon the contractor. The Contractor shall indemnify & keep indemnified the Consultant against any claim arising from failure of the Contractor to comply with such labour laws.

14. EXTRA ITEMS / DEVIATIONS SPCC-14

The Contractor shall not commence work in respect of any extra items/deviations without obtaining the approval of the Consultant/Employer in writing. The Contractor shall immediately submit the rate analysis for such items, with necessary details to support the rate quoted. The rate shall then be settled by the Consultant and necessary certificate based on this shall be given to the Employer while incorporating the item in the Interim Bills.

Claim for extra/ deviated items shall be submitted in the yellow/pink Performa respectively (as per specimen copies of Performa included in the tender document), which indicate authority/ order for such items.

15. INSURANCE POLICIES SPCC-15

The Contractor shall not commence any work at site, until all the Insurance Policies, as required in terms of the General Conditions of Contract, have been submitted to the Employer. Renewal of the same if required due to extension of time of the completion or similar reasons is also the responsibility of the Contractor.

Notwithstanding anything to the contrary mentioned in the contract, Contractors have to submit all Insurance policies in original to the Client directly to sake the Client satisfy themselves regarding adequacy of the value of Insurance, validity etc. as per contractual clauses and furnish a copy to the Consultant. The Contractor shall arrange for renewals on their own. Any omission to do so or delay in non-receipt of such information will be no excuse for failure to renew them or keep thee in force without a break.

16. INDEBTEDNESS AND LIENS **SPCC-16**

The Contractor agrees to furnish the Employer from time to time during the progress of the work as requested, verified statements showing the Contractors total outstanding indebtedness in connection with the work covered by the contract. Before final payment is made, the Employer may require the Contractor to furnish the Employer with satisfactory proof that there are no outstanding debts or liens in connection with the contract. If during the progress of the work, the Contractor shall allow any indebtedness to accrue to sub-contractors or others and shall fail to pay or discharge same within five (5) days after demand then the Employer may withhold any money due to the Contractor until such debt is paid or apply the same towards the discharge thereof.

17. INDEPENDENT CONTRACTOR **SPCC-17**

The Contractor agrees to perform this contract as an independent Contractor and not as a sub-contractor, agent or employee of the Employer.

18. WORK PERFORMED AT CONTRACTORS RISK **SPCC-18**

The Contractor shall take all precautions necessary and shall be responsible for the safety of the work and shall maintain all lights, guards, signs, temporary passages or other protection necessary for the purpose. All work shall be done at the contractor's risk and if any loss or damage shall result from fire or from other cause, the Contractor shall promptly repair or replace such loss or damage free from all expenses to the Employer. The Contractor shall be responsible for any loss or damage to materials, tools or other articles used or held for use in connection with the work. The work shall be carried on and completed without damage to any work or property of the Employer or of others and without interference with the operation of existing machinery or equipment, if any.

During the contract period, the Contractor shall appoint at the site a Senior Engineer to the satisfaction of the Consultant and shall continue in such appointment for three months after the grant of the "Virtual Completion Certificate" to him. The Consultant shall be entitled to approve or disapprove without assigning reasons for the appointment of such Engineer proposed by the Contractor. This condition shall be reckoned as being the essence of the contract and its breach shall make the contract revocable at the option of the Employer.

The Engineer so appointed shall coordinate the execution of work by Contractors of other trades in general and shall perform the following function in particular:

a. The Senior Engineer, in-charge of co-ordination shall be responsible for providing all the necessary support, required to be given by the **FURNITURE/CIVIL** Contractor by virtue of the contract, to the various services Contractors for the purpose of commissioning the testing of their respective services.
b. The Senior Engineer shall have adequate knowledge about the various services involved in the job to appreciate the importance of various interface activities to be performed by the main **FURNITURE/CIVIL** Contractor in the desired sequence so as to hold up the work of the services Contractors as regards commissioning and testing of their respective services.
c. The Senior Engineer should have preferably past experience of shouldering similar responsibilities to appreciate the importance of this final critical phase of the project where utmost co-ordination is required for cutting down the delays in successful commissioning of the entire facility.

19. CONSTRUCTION DRAWINGS **SPCC-19**

The successful tenderer shall state on receiving the letter of intent, what drawings are yet to be issued by the Consultant for execution purposes and what further details are required by him from the Consultants. Silence on the part of the successful tenderer in this regard will be construed to mean that he has all the information that he needs for ordering out materials and for contractual purposes.

Unless specifically asked for in writing, delays later claimed by the successful tenderer on account of drawings will not be construed as reasons for delay the execution of work.

Apart from clarifications sought during the periodic visits to site by the Consultants representatives, the successful tenderer shall obtain all clarifications and the Consultants drawings from there offices in Mumbai.

Extra / variation not registered within 3 weeks on receipt of drawings will not be entertained.

20. COMPLETION DRAWINGS / ACCEPTANCE OF INSTALLATION SPCC-20

The Contractor shall furnish 3 sets of drawings 'as erected' and approved by different statutory authorities in accepting the work in its entirety and completion.
The Contractor shall submit the written acceptance of the installation by the different statutory authorities in respect of the different components of the installation and commission the system in the presence of the Consultant and Employer's representative before asking for the Virtual Completion Certificate.

21. KEEPING THE AREAS AND ACCESS ROAD CLEAN SPCC-21

The Contractor shall be required to maintain the site all the building areas in a neat and clean condition at all times to the satisfaction of the Consultant.
The Contractor shall also be required to maintain all access roads to the sit and within the site and keep, them free from all obstructions, material dropping etc. to the satisfaction of consultant and local authorities.

22. TYPOGRAPHICAL OR CLERICAL ERRORS SPCC-22

The Consultant's clarifications regarding partially omitted particulars or typographical or clerical errors shall be final and binding on the Contractor.

23. INFORMATION TO BE SUPPLIED BY THE CONTRACTORS SPCC-23

The Contractor shall furnish the Employer the following:

a. Detailed Industrial statistics regarding the labour, employed by his etc.
b. The Power of Attorney, name and signature of his authorized representative who will be in charge for the execution of the work.

c. A list of technically qualified persons employed by his for the execution of the work.

d. The total quantity and quality of materials used the work.

24. TESTING OF WORKS, MATERIALS & PREPARATION OF SAMPLES SPCC-24

The Contractor shall arrange to test materials and / or portions of the works as instructed by the Consultant/ Employer, wherever required/ possible as per Bureau of Indian Standards (BIS) at his own cost in order to prove their soundness and efficiency. If after any such test, the work or portions of the works are found to be detective or unsound the Contractor shall pull down and re-erect the same at his own cost.
Samples of various materials shall be submitted by the Contractor for approval prior to ordering out the same, wherever necessary the Contractor shall at his own cost, prepare samples to indicate the workmanship.

25. COVERING UP OF WORKS **SPCC-25**

The Contractor shall cover up and protect the works from the weather and from wear and tear as directed by Consultant /Employer and shall suspend all wet operations during weather, which in the opinion of consultant, will be detrimental to the works.

26. DISPLAY OF NOTICES **SPCC-26**

The Contractor shall give all notices and pay all fees charges royalties, which may be levied/ leviable to any authority and shall comply with all Acts and Regulations for the successful completion of the Contract Works.

27. MUNICIPAL REGULATION **SPCC-27**

The whole of the work including sanitation is to comply with the requirements and Bye Laws of the concerned Municipal Corporation, local bodies & Chief Fire Officer and / or any other regulatory authorities as the case may be.

28. MEASUREMENT TO BE RECORDED BEFORE WORK IS COVERED UP **SPCC-28**

The Contractor shall take joint measurement with the Consultant's representative before covering up or otherwise placing beyond the reach of measurement any item of work. Should the Contractor neglect to do so, the same shall be uncovered at the Contractors expenses or in default thereof, no payment or allowance shall be made for such work or the materials with which the same was executed.

29. WORK AT NIGHT **SPCC-29**

If the Contractor is required to work at night in order to complete the work within the 'Time Schedule', the Contractor shall provide and maintain at his own cost sufficient lights to enable the work to proceed satisfactorily without danger. Approaches to the site also shall be sufficiently lighted by the Contractor. No extra payment will be made for night. Prior intimation of approval should also be taken from the Consultant.

30. ISSUE OF EXTRA CONSTRUCTION DRAWING **SPCC-30**

Consultants will supply two sets of drawings to the Clients for construction. Extra prints of drawings for construction will be issued on chargeable basis by Consultant as detailed hereunder:

A0-Size	Rs.350/- each to Rs.300/- each depending on size of drawing
A1-Size	Rs.250/- each
A2-Size	Rs.200/- each
A3-Size	Rs.125/- each
A4-Size	Rs.75/- each

The Contractor shall ensure that all the bills furnished from the Consultant's Office in this regard are hachured, failing which the certificate for payment of Contractor's next Interim Bill will be withhold. The drawings are to be used for the project concerned.

31. DISPLAY OF NOTICES **SPCC-31**

Except where otherwise provided in the contract all questions and disputes relating to the meaning of the specifications, design, drawings and instructions herein before mentioned and as to the quality of workmanship of materials used on the work or as to any other question, claim, right, matter or thing whatsoever in any way arising out of or relating to the contract, designs, drawings, specifications,

estimates, instructions, orders or these conditions or otherwise concerning the work or the execution or failure to execute the same, whether arising during the progress of the work or after the cancellation, termination, completion or abandonment thereof shall be dealt with as mentioned hereinafter :

If the contractor considers that he is entitled to any extra payment or compensation in respect of the works over and above the amounts admitted as payable by the Consultant or in case the contractor wants to dispute the validity of any deductions or recoveries made or proposed to be made from the contract or raise any dispute, the Contractor shall forthwith give notice in writing of his claim, or dispute to the DGM - Premises, State Bank of India and endorse a copy of the same to the Consultant, within 30 days from the date of disallowance thereof or the date of deduction or recovery. The said notice shall give full particulars of the claim, grounds on which it is based and detailed calculations of the amount claimed and the contractor shall not be entitled to raise any claim nor shall the Bank be in any way liable in respect of any claim by the contractor unless notice of such claim shall have been given by the contractor to the DGM - Premises, State Bank of India in the manner and within the time as aforesaid. The contractor shall be deemed to have waived and extinguished all his rights in respect of any claim not notified to the DGM - Premises, State Bank of India, CO Department, Mezzanine floor, Corporate Centre in writing in the manner and within the time aforesaid.

DGM - Premises, State Bank of India shall give his decision in writing on the claims notified by the contractor. The contractor may within 30 days of the receipt of the decision of the DGM - Premises, State Bank of India submit his claims to the conciliating authority namely the Dy. General Manager (Premises) State Bank of India, Corporate Centre for conciliation along with all details and copies of correspondence exchanged between him and the DGM - Premises.

If the conciliation proceedings are terminated without settlement of the disputes, the contractor shall, within a period of 30 days of termination thereof shall give a notice to the DGM - Premises of the Bank for appointment of an arbitrator to adjudicate the notified claims failing which the claims of the contractor shall be deemed to have been considered absolutely barred and waived.

Except where the decision has become final, binding and conclusive in terms of the contract, all disputes or differences arising out of the notified claims of the contractor as aforesaid and all claims of the Bank shall be referred for adjudication through arbitration by the Sole Arbitrator appointed by the DGM - Premises. It will also be no objection to any such appointment that the Arbitrator so appointed is a Bank Officer and that he had to deal with the matters to which the Contract relates in the course of his duties as Bank Officer. If the arbitrator so appointed is unable or unwilling to act or resigns his appointment or vacates his office due to any reason whatsoever another sole arbitrator from Bank shall be appointed in the manner aforesaid by the said DGM - Premises. Such person shall be entitled to proceed with the reference from the stage at which it was left by his predecessor.

It is a term of this contract that the party invoking arbitration shall give a list of disputes with amounts claimed in respect of each dispute along with the notice for appointment of arbitrator.

It is also a term of this contract that no person other than a person appointed by such DGM - Premises aforesaid - should act as arbitrator.

The conciliation and arbitration shall be conducted in accordance with the provisions of the Arbitration & Conciliation Act 1996 or any statutory modification or re-enactment thereof and the rules made there under.

It is also a term of the contract that if any fees are payable to the arbitrator these shall be paid equally by both the parties. However, no fees will be payable to the arbitrator if he is a Bank Officer.

It is also a term of the contract that the arbitrator shall be deemed to have entered on the reference on the date he issues notice to both the parties calling them to submit their statement of claims and counter statement of claims. The venue of the arbitration shall be such place as may be fixed by the arbitrator in his sole discretion. The fees if any, of the arbitrator shall, if required to be paid before the award is made and published, be paid half and half by each of the parties. The cost of the reference and of the award (including the fees, if any of the arbitrator) shall be in the discretion of the arbitrator

who may direct to any by whom and in what manner, such costs or any part thereof shall be paid and fix or settle the amount of costs to be so paid.

32. WORK TO BE CONTINUED DURING THE PENDENCY OF THE ARBITRATION **SPCC-32**

The Contractor shall continue with the construction work with due diligence and speed so as to complete the same within the period agreed upon, notwithstanding any dispute or different or question as referred to arbitration. The works shall not be delayed on account of any such reference made to the Arbitrators.

33. LIEN ON SUMS PAYABLE TO THE CONTRACTORS **SPCC-33**

Any sum of money due and payable to the Contractor including any deposits returnable to them under this contract may be withheld or retained by the Employer, against any claims of the Employer.

34. APPROVAL OF MOCK-PLUMBING AND SAMPLES **SPCC-34**

It will be the Contractors responsibility to obtain written approval of mock-ups and samples from the Consultant and Employer. If this is not done, such items where these materials are used will be rejected by the Consultant / Employer

35. APPROVAL OF FINAL FINISH WORK **SPCC-35**

In case of items for painting and sheet metal work finish, sand cement plaster on chilled water line, MEP services, the final finishing is to be got approved to the satisfaction of Employer's/ Consultant. This will have to be done by the Contractor at no extra cost.

36. NON-AVAILABILITY OF SPECIFIED MATERIALS/ ITEMS **SPCC-36**

In case of materials/items, which are not available, the Contractor shall have to submit a letter from manufacturer to that effect. After proper verification, alternative material may be selected by the Employer / Consultant. In the case there will not be any increase of the quoted rates. However, if accepted alternative is cheaper the cost benefit is to be passed on to the Employer.

37. ADDRESS FOR SERVICE **SPCC-37**

All letters and notices under or pursuant to these presents shall be hand delivered against acknowledgement or sent by Registered Post with acknowledgement due at the respective addresses mentioned below. Any change in the addresses shall be duly intimated by the party concerned to all others.

01. Dy General Manager (Premises)
State Bank of India
9th Floor, State Bank Bhavan,
Corporate Centre, MADAME Cama Road,
Nariman Point, Mumbai – 400 021.

02. Address of Consultant
M/s. UKA Consulting and Engineers Pvt. Ltd.,
Office 1&2, Malanad Educational & Welfare Association,
Near Shastri Nagar Naka,
Thane (West) - 400 604.

03. Address of the Contractors.

_____

_____

_____

SIGNATURE OF THE TENDERER

PREAMBLE TO SPECIAL CONDITIONS OF CONTRACT

GENERAL:

The tender must obtain for himself on his responsibility in at his own expense all the information which may be necessary for the purpose of filling this tender and for entering into are contract for the execution of the same and must examine himself / themselves with all local condition and all the bye-laws and rules and regulation various authorities and matter pertaining thereto.
This is intended to be a performance-based contract whereto the Contracture will be liable to execute the work on the basis of the plane and design offered by him or the plans and design hereby given and accepted by him. The Contractor will have to guarantee for the due and proper performance of the work agreed to be so erected and installed by him. The Contractor shall be paid his bills from time to time "on account" basis and the payment so made shall be adjust against the money becoming due and payable to him at the agreed rate at the conclusion of the contract if the work erected and installed under the contract is found to be giving the due and proper performance.

1. The prices shall be firm for the duration of contract plus all authorized extensions of time plus three months period after completion of work. all rates will be including turnover tax, sales tax, works contract tax, VAT, import duties (as client does not get any duty exemption on imported items if any) and all prevailing taxes duties as required and as of today etc. Vendors are to advised to give all price break up material and labour only in Indian Rupees as the contract will ne INR Contract only as there is no duty exemption to the client. But for imported items, vendors are requested to give a list and attach the Foreign Currency quote with duties, insurance, clearing and handing charges separately as supporting documents backup. ***No separate payment shall be made towards Breaking of brick/block works to go ahead with the works as required (breaking to be done with prior written permission from SBI) for making Core-cuts in the RCC structure separate payments shall be made as per the agreed rates in the bill of materials. Making and breaking of RCC structures are not included in the contract work and the same may be required to be done only upon taking the necessary clearance from Structural Consultants of SBI and SBI as required.***
2. The Contractor is to furnish the basic of various materials likely to be used in the MEP services work listed out in the bill of quantities or any other additional items or extra items required as and when necessary, so as to serve as guidelines for working out the rates analysis for extra / taxes, duties etc.
3. The Contractor is to quote for all sections of the bills of quantities. However, the Contractor will have to quote for all items including those where only rate is asked for particular section. If all such items of & section are not quoted, the tender shall be treated as incomplete and is likely to be rejected.
4. Clients/ Consultants reserves the right to ask the Contractor to prepare 'Mock-up' of any item for their approval before proceeding with the work and extra money shall be paid for this.

5. Vendor are to note that this contract shall cover all the works indicated in the specifications, bill of materials and drawings with co-ordination within this works and also with vendors of other services as required for the project to successfully complete the SITC of the works as said. The Consultant as well for final verification and if any other compatibility to be looked into can be further initiated.
6. The vendor is to note that it's the vendors sole responsibility to ensure that all the necessary components are covered in the individual item specified in the bill of materials to make the product complete and good for SITC and handover and no extra are acceptable if any inter components are not covered
7. For all the items involved in the bills of materials random samples shall be picked up and the vendor to send the same for testing in a Govt. Approved testing labs for its quality and for the tender specification compliance and no separate payment shall be made for this.

The rates shall also include the following works and cost thereof:

1. All works connected with removal, disconnection and stacking of removed Pipes, conduits, fittings, wiring related to his tender items and accessories shall be carefully handled and handed over to the representative of the client in good condition without any further damages due to bad handling. Vendors may give buyback offer as suitable. It is to be noted that dismantled material is never to be used for this project in any of the works.

2. The work shall confirm the general descriptions given for each item and the requirement of Byelaw if the Municipal Corporation of Greater Mumbai within whose jurisdiction the work is required to be done.

3. Necessary precautions to allow the exiting services on the unaffected areas of the building shall be maintained while these works is being carried out, and there should not be interruption of the existing services to the remaining toilet areas.

4. All the items of work shall be carried out through a licensed Fire Fighting agency or through the respective Expert team of Engineers only and with a high standard of workmanship and elegance of plumbing shall be obtained. The work shall be done strictly required by the engineer in charge to the specifications in the trade.

5. The contractor shall use approved brand of materials only and consistent with the Consumer Protection act shall use material, which are backed by longer year of guarantee from the manufacture. If so, required such guarantee, from the manufacturer be padded on the Owner while handing over installations.

6. The brick for brick masonry work shall be well burnt (not over burnt) and the best available locally from approved manufactures wherever required as specified in the bill of materials and specification as mentioned.

7. In case of schedule of quantities, the preamble to drawings or specifications are not fully describing the item of work, the work shall be executed accordingly to relevant ISI specifications / National building code/ sound engineering practices in conformity with the Rule and Byelaw of the Tariff advisory committee.
8. The Drawing specification and schedule of quantities forming parts of the contract are explanatory and complementary to one another representing together the installation to be carried out. If neither the specification nor schedule of quantities includes any provision specifically, and if such provision is normally expected to be provided as far as the best professional practice to complete the work, the

contractor shall provide the same without any additional extra cost. In case of any discrepancy between the bill of quantities and drawings/ specifications, the decision and clarification given by the Consultant shall take precedence.

9. Work at any height above ground level and any of the floors above ground level is deemed to have been covered.
10. Making chases or holes through concrete and machinery with prior permission of the employee's representative and reinstating the surface to its original condition or redoing the same to match the surrounding shall from part of the responsibilities and deemed to have been taken in Consideration while filing holes, cut through concrete a suitable additive like 'Groutex" shall be added in concrete to avoid Shrinkage.

11. The cost labor, material, tools, plants, equipment's, tackles, double scaffolding and other sundries, curing etc. for workman like completion of the work shall be include in unit rates.

12. Regarding use of approved brand or manufacture wherever specified in the contract the order of preference for selection of material of approved brand or manufacture stall rest with the Consultants and employer depending on the availability in the market. All material procured on the basis such approval shall be of first quality free from latent/ patent manufacturing or inherent operational defects.

13. As the workmen are expected to work in-restricted areas & shifts, adequate Protective insurance and safety appliance shall be given to them to avoid accidents.

SAFETY CODE:

01. First aid appliances, including adequate supply of sterilized dressing and cotton wool shall be kept in a readily accessible place.

02. An injured person shall be taken to a public hospital without loss of time, in case where the injury necessitates hospitalization.

03. Suitable and strong scaffolds should be provided for workmen for all works that cannot safely be done from the ground.

04. No portable single ladder shall be over 8 meters in length. The width between the side rails shall not be less than 30 cm (clear) and the distance between two adjacent rungs shall not be more than 30 cm. When a ladder is used an extra mazdoor shall be engaged for holding ladder.

05. The excavated material shall not be placed within 1.5 meters of the edge of the trench or half of the depth of trench whichever is more. All trenches and excavations shall be provided with necessary fencing and lighting.

06. Every opening in the floor of a building or in a working platform be provided with suitable means to prevent the fall of persons or materials by providing suitable fencing or railing whose minimum height shall be on meter.

07. No floor, roof or other part of the structure shall be so overloaded with debris or materials as to render it unsafe.

08. Workers employed on mixing and handling material such as asphalt, cement mortar or concrete and lime mortar shall be provided with protective footwear and rubber hand gloves.

09. Those engaged in welding works shall be provided with welder's protective eye-shields and gloves.

10. No paint containing lead or lead products shall be used except in the form of paste or readymade paint.

11. Suitable face masks should be supplied for use by the workers when the paint is applied in the form of spray or surface having lead paint dry rubbed and scrapped.

12. Gloves shall be supplied by the Contractor to the painters and adequate facilities shall be provided to enable the working painters to wash during the periods of cessation of work.

13. Hoisting machines and tackle used in the works, including their attachments, anchorage and supports shall be in perfect condition.

The ropes used in hoisting or lowering material or as a means of suspension shall be of durable quality and adequate strength and free form defects.

Accidents

On occurrence of any incident at site in connection with the execution of the work, the contractor shall also report immediately to the competent authority whenever such report is required to be lodged by the law and take appropriate actions thereof.

TECHNICAL SPECIFICATIONS
Section: 01
PROJECT INFORMATION

1.0 PROJECT INFORMATION

1.0	Client		:	**M/s. STATE BANK OF INDIA**			
2.0	Building location		:	**STATE BANK BHAVAN, CORPORATE CENTRE** **MADAME CAMA ROAD, NARIMAN POINT** **MUMBAI – 400 021** **MAHARASHTRA, INDIA**			
3.0	Project		:	**Refurbishment of FIRE PREVENTION AND PROTECTION SYSTEMS.**			
4.0	Site data	Ambient data	:		**(^{0}F)**	**(^{0}C)**	**RH (%)**
				Summer	98.6	37	14
				Winter	44.6	7	60
		Other data	:	Altitude		0 m (Above MSL)	
				Latitude		18 ^{O} 97 ‘50 “ N	
				Longitude		72 ^{O} 82 ‘58 “ E	
5.0	Access to Site	By Road	:	Within Mumbai city			
		Railway Station	:	CST Station- C Rly, Church Gate, W Rly.			
		Nearest Airport	:	Mumbai Airport, CSMT, Mumbai			

The renowned Bank - M/s. State Bank of India have their prestigious head office located at MADAME Cama Road, Nariman Point at Mumbai.

This area is also home to several key Governmental and Public Sector organizations including Mantralaya. The SBI building consists of 19 occupational floors 2 Service floors, along with two basements for car parking, utility and administrative services.

The original Consultants of the building are M/s Pheroz khodianwala and Associates and the Main Contractor were M/s Shapoorji Pallonji and Company (Pvt.) Ltd. The building was constructed in **the year 1971**.
The building admirably had fire protection systems planned and installed as per the standards applicable at that time. Further renovations and changes to the interior have been carried out for the civil part. Presently

due to the ageing of the systems, changes in the building configuration and use, obsolescence of some systems, etc., M/s. SBI has embarked on the refurbishment of the Fire Protection Systems. The fire protection system is now being refurbished and modified, as per the latest regulation so as to meet the latest standards. Hence the revamping of the system.

Section: 02
CODES AND STANDARDS

1.0 CODES AND STANDARDS:

The refurbished fire protection system will comply to the following Codes and Standards. Additional standards as required will be adopted.

Sr. No.	Standard No.	Description
1.	NBC	Part 4 – Fire & Life Safety
2	IS 778	Copper alloy gate, globe, and check valves for water works purposes
3	IS 1239 (PART 1)	Steel Tubes, Tubular and Other Wrought Steel Fittings - Specification Part 1 Steel Tubes (BI-LINGUAL)
4	IS 1239 (PART 2)	Mild steel tubes, tubular and other wrought steel fittings, Part 2 Mild steel Sockets, tubular and other wrought steel pipe fittings
5	IS 1520 & DIN 24255	Horizontal Centrifugal Pumps for clear, cold, raw and fresh Waters
6	IS: 1643	Code Of Practice for Fire Safety Buildings
7	IS 3589	Steel Pipes for Water and Sewage (168.3 to 2 540 mm Outside Diameter)
8	IS: 9137	Code for acceptance test for Centrifugal & Axial Pumps
9	IS: 10221	Wrapping And Coating of Mild Steel Pipes
10	IS: 15105 - 2021	Code of Practice for Design and Installation of Fixed Automatic Sprinkler Fire Extinguishing Systems.
11	NFPA – 13	Standard for Installation of Sprinkler Systems (For specific criterion not covered in the Indian standards)
12	NFPA – 72	Fire Alarm Code
13.	BS EN 12094-1	Fixed firefighting systems. Components for gas extinguishing systems. Requirements and test methods for electrical automatic control and delay devices
14	BS EN ISO 10297	Transportable gas cylinders. Cylinder valves. Specification and type testing
15	EN 10204	Standards for pressure switches

Sr. No.	Standard No.	Description
16	NFPA 2000	Clean agent fire protection system
17	IS 15683	Portable fire extinguishers – performance and construction

Section: 3

FIRE WATER PUMP HOUSE, FIRE HYDRANT, SPRINKLER SYSTEM & PIPING FOR FIRE PROTECTION SYSTEM

Section: 3.1

PARTICULARS OF PRESENT SYSTEMS PROVIDED

1.0 PARTICULARS OF PRESENT SYSTEMS PROVIDED

The water-based fire protection system forms the backbone of the active fire protection system installed in the premises.

M/s. SBI have installed the hydrant system pump sets to cater to all the areas of the project. In addition, **M/s SBI** have sprinkler system for the basements installed. However, the M/s Siemens Ltd. supplied few pump sets, which are in packed condition in site in year 2009.

1.1 HYDRANT AND SPRINKLER SYSTEMS

The details of the pump set existing are as follows:

EXISTING HYDRANT SYSTEM PUMPSETS

Sr. No.	PUMP NAME	PUMP TYPE	CAPACITY	
			M^3/h	MWC
1	Diesel Driven Pump	Multistage, Multi outlet -Split Casing	90.84	152/100
2	Motor Driven Pump (Hydrant High Level)	Multistage, Single outlet -Split Casing	141.94	152
3	Motor Driven Pump (Hydrant Low Level)	End Suction	141.94	91
4	Jockey pump	End Suction	10.80	131
5	Motor Driven Pump (Sprinkler System)	End Suction	141.94	70

The hydrant system is presently operational. Since the head and flow is not as required norms, the same has to be upgraded/modified. Hence it is decided by the management that all existing fire pumps moderately in working conditions should be replaced with upgraded specifications to meet out the latest building norms by new fire pumps as indicated below.

SPRINKLER SYSTEM PUMPSETS IN PACKED CONDITION

The sprinkler system for the lower basement and upper basement is partially provided with water tapped from an existing pump set. However, there are additional pump sets in packed condition as follows:

Sr. No.	PUMP NAME	PUMP TYPE	CAPACITY	TOTAL HEAD
			M^3/h	MWC
1	Diesel Driven Pump	Multistage, Multi outlet -Split Casing	137	135
2	Motor Driven Pump (High Level)	Multistage, Multi outlet -Split Casing	137	135
3	Motor Driven Pump (Low Level)	Multistage, Multi outlet -Split Casing	137	135
4	Jockey pump	Multistage, Single outlet -Split Casing	10.80	131

Section: 3.2

THE REFURBISHMENT OF FIRE WATER PUMP HOUSE, FIRE HYDRANT, SPRINKLER SYSTEM & PIPING FOR FIRE PROTECTION SYSTEM.

1.0 REFURBISHMENT OF THE FIRE WATER PUMPHOUSE

a. The existing hydrant pump sets are occupying the required space for operating them properly. Sprinkler system for the upper and lower basements is catered from existing pump sets. Further the firewater tank is also present only in the same area.
b. However, the sprinkler pump sets are not installed and the pump sets in packed condition are also not fulfilling the system requirements. Hence alternative pump sets as below are proposed:
c. On studying the present system and along with the new pumps in packed condition it is recommended to have to revamp the entire pump house with brand new approved pumps of proper head, and flow capacity.

Sr No	Pump Name	Quantity	Pump Type	Stage	Capacity	Total Head
					M^3/h	MWC
1	Diesel Driven Pump stand by for hydrant and sprinkler system	2	Multistage, Multioutlet -Split Casing	Low stage	171.00	100
				High stage	171.00	140
2	Motor Driven Pump for hydrant and sprinkler system	2	Multistage, Multioutlet -Split Casing	Low stage	171.00	100
				High stage	171.00	140
3	Jockey pump set for hydrant and sprinkler system	2	Multistage, Multioutlet - Inline	Low stage	15.00	110
				High stage	15.00	150
4	Booster pump set in terrace level	3	End suction	Single stage	30.00	35

The broad requirements of the pump sets are indicated herein. Additional details are also indicated in the BOM.

2.0 FIRE PUMP

a. The type of pump sets to be provided shall be as indicated above after. The bidder may review the same and if have any doubts the same should be clarified before quoting.

b. Pump casing shall be of close-grained cast steel with bronze-impeller. The shaft sleeve shall be close-grained cast steel with bronze impeller. The shaft sleeve shall be S.S 304 and the trim should be brass or bronze.

c. The motor and diesel engine driven pumps shall be capable of delivering 150% of the rated capacity at not less than 65% of the rated head and the no-delivery head shall be not more than 125% of the rated delivery head. The pump casing shall withstand 1.5 times the no-delivery pressure or 2 times of the duty pressure whichever is higher.

d. The electric driven motor shall be squirrel cage induction conforming to IS 325-1996 and rated for continuous duty (S1). Motor shall have not less than class F insulation and minimum enclosure of IP 54.

f. The power rating for the drives shall be based on the largest of the following.

- Rated pump discharge at rated head.
- 150% of rated discharge @ not less than 65% of rated head.
- Maximum power absorbed by the pump in its operating range i.e. no delivery to free discharge.

g. The diesel engine shall be naturally aspirated (non-turbocharged) and electrically started. The engine shall have a speed governor to regulate the rated rpm within 5% of its rated speed. The engine shall be complete with starting batteries main and standby, full-wave selenium rectifier charger, isolator, leads, mounting frame etc.

h. Engine exhaust pipe shall have a residential duty silencer and insulated with 100 thick 48 Kg/m3 fiberglass finished with 0.5mm thick aluminum cladding. The exhaust shall be left outside the building as directed. The size of the exhaust also to be worked out by contractor as the fire pump house is in the lower basement while the exhaust will be evacuated above the ground floor. (To confirm that the exhaust is not creating any pollution hazard. This is to be confirmed by the contractor before introducing the exhaust pipe.)

i. Necessary fuel tank to cater to six hours of fuel requirement for the diesel engine driven fire pump and one hour of fuel requirement for the makeup diesel engine driven pump set to be provided. The day tank shall be complete with mounting frame, valve inlet connection with float, overflow gauge glass and drain high/ low level controls (not flat type). Engine Starting system shall be complete with a storage battery cranking motor, fuel solenoid valves battery leads etc.

3.0 SYSTEM OPERATION AND CONTROL PANELS

a. The starting and stopping procedure for the fire, booster, makeup water pump sets are indicated in the BOM.

b. The motor driven pump sets shall be provided with star-delta starters. All other pump sets, i.e. Booster pumps and any other pumps, shall be provided with DOL starters. The starters shall be complete with ON-OFF push buttons, timers and auxiliary contacts and shall be fully automatic. There shall be an indicating lamp with each of the pumps and voltmeter and ammeter and always with selector switch. Fire pump starting shall be annunciated through an electric siren.

c. All cabling shall be FRLS PVC / XLPE with Copper conductor multistranded, armored cables of approved makes. The Cabling will be routed through cable trays or steel conduits. All electrical items shall be earthed in accordance with IS 3043-1966.

d. The removal and reinstallation of pump sets etc. shall be planned suitably to execute safely and not to keep the existing building unprotected.

4.0 ADDITION OF NEW PUMPS AND PUMPING STATION

The Pump house now being constructed is for the sprinkler system. It is going to be an addition to the existing fire water network the scheme is already prepared, and the drawings are available. The vendor has to check the site, to ascertain the feasibility of the system synchronization with existing system. Also refer the drawing provided.

Further the new pumps are being erected in the basement near the existing pumps and the new area, where the proposed system is erected, should have a dedicated enclosure. Hence civil structural work is to be implemented for which the civil drawings are already attached herewith. In the same drawing the construction details for the foundation of the pumps are also provided. The above civil / structural work is also to be carried out by the vendor.

5.0 REFURBISHMENT OF THE HYDRANT SYSTEM

5.1 THE HYDRANT SYSTEM IS ALREADY PROVIDED FOR THE PROJECT. THE CURRENT SCOPE OF WORK COVERS ALL THE POINTS OF REFURBISHMENT AND SCOPE OF WORK INDICATED ABOVE.

The performance and condition of the following items shall be reviewed and supply, installation testing and commissioning of the fire hydrant system covering the following:

1. Evaluating the existing fire headers thoroughly and ensuring that the low and high stage piping are properly connected and operational. Wherein necessary, additional pressure gauges, isolation valves to be installed.
2. Open and inspect each of the hose cabinets, swivel the hose reels out, extract the hose fully, check for damage, short length, missing couplings, nozzles, damage to drums, missing branch pipes, damaged braiding etc. Clean the cabinet thoroughly with vacuum cleaner and clean the hoses, hose pipes etc. thoroughly with soap and water. Ensure that necessary safety caution boards are installed during the period. Grease and service all the hydrants, hose reels etc.
3. Make a list floor wise, wing wise, basement wise of the equipment and their condition and compile the defect list.
4. Verify the functioning of the Fire bridge breaching, Siamese connections and connections to pumps and appliances.
5. Verify the provision of the orifice plates as required as per calculations and if necessary, replace / provide the same newly.
6. Do the radiography testing of 10% of the existing welding joints to review the condition of the existing pipes.
7. Obtain formal approval and procure / fabricate **replacement sample** including the hose box door etc. for example. Installation and get the same certified by the Bank's Fire Officer/Consultant.
8. Supply and install balance quantities. Identify and take back defective items after due reconciliation with client.

9. Interconnect the headers to the booster pumps suitably with air release etc. complete in all respects.

10. Prepare proper As-Built drawings for the system prior to rectification and the same should be checked and verified by the Consultant after rectification. The detailed As Built drawing to be prepared and confirmed by the authorities.

11. Test and complete the total installation of the system by the approving authorities. The following representative should be informed and witnessed the test.

    1. The authorized representative engineer of SBI.
    2. The authorized representative of Consultant UKACEPL

5.2 SYSTEM PARTICULARS

The particulars of the existing systems are indicated. Same to be reviewed as per the modifications carried out in the building over the period of time and necessary additions / alterations carried out.

The planning of the earthing system dismantling will be carried out only after submitting the execution program in detail and the same should be approved by the Consultant and SBI.

1. FIRE HYDRANTS & HOSE REELS

Hydrants are provided internally and externally as shown in the drawings. Internal hydrant is provided at each landing of escape staircase and additionally depending on the floor area as shown on drawings. Landings Valve has 63mm dia outlets and 100 mm inlet conforming to IS 5290-1998. Landing valves are fixed within the cabinet at the staircases.
The contractor to review the conditions of each hydrant, hose reel etc. and service / replace them after prior approval. The hydrant valves are to be provided with pressure reducing system so as to achieve pressure of 5.5 Kg/Cm^2 minimum and 7 Kg/Cm^2 maximum.

2. Internal Hydrants

Each landing valve shall have a hose reel cabinet of approximately 1800 x 900 x 450mm housing as installed at site.

i. Landing valve with 63mm dia capped outlets.

ii. First-aid hose reel with 30m long 20mm dia high pressure Dunlop hose & 20mm dia gate valve.

iii. Two Nos. 7.5 m long 63mm dia Rubber Reinforced Lined (RRL) hose canvas-controlled percolation hose with instantaneous S.S couplings on either side.

iv. One S.S instantaneous coupling branch pipe with 20 mm nozzle.

The first aid hose provided conforms to IS 884-1969 and is wound on a heavy-duty circular hose reel with a cast iron bracket. The hose is permanently connected on one end to the standpipe through a 20 mm G.M gate valve with necessary hose adapter and a gunmetal nozzle at the other end. The reel shall swing out by 270°.

The hose cabinet provided is fabricated from 2 mm stainless steel sheet duly rust inhibited through a process of degreasing and phosphate. Any replacement cabinet made shall fully resemble the current cabinets installed at site.
The hydrant valves are to be provided with pressure reducing system so as to achieve pressure of 3.5 Kg/Cm^2 minimum and 5 Kg/Cm^2 maximum.

3. External Hydrant

1. External hydrants are of stand post type over-ground unless shown otherwise. Hydrants shall be located at least 2 m away from and within 15m from the building wall.

2. Each hydrant shall be provided with hose cabinet containing 2 x 15m 63 dia RRL type A hoses with couplings. The cabinet shall be 900 x 600 x 400 mm size the hose box should be FRP type and should be capable to hold hose 2 no's and branch pipe etc.., The cabinet shall receive two coats of red oxide primer inside and outside, before 2 coats of final painting of approved shade. The cabinet shall be wall-mounted or free standing with its own steel legs depending on the site conditions and as shown on drawings.

4. Fire Brigade Connection

1. The fire brigade breech connection shall consist of 4 couplings along with built in check valve, which is connected to the hydrant and sprinkler main header line. Twin-headed 63mm dia gun metal outlets with built-in check valve and drain plugs connected to a 150 mm dia connection to the water reservoir or to the hydrant main. The fire brigade collecting head shall conform to IS 904-1983.

5. Piping

1. All piping shall be as specified under bill of materials "BOM" and the schedule of work for piping.

5.3 TESTING AND COMMISSIONING

1. All hydrant piping shall be tested for a hydrostatic test pressure of 1.5 times the working pressure of the particular section (low pressure section or high-pressure section as applicable for a period of 24 hours at the end of which there shall be no loss in pressure.

2. The performance of the pump sets at the manufacturers' works will be carried out. All costs for the tests shall be borne by the Contractor. Further, at site, through the flow meter, the pump set discharge shall be tested and the performance of the pump sets shall be verified. The performance of the booster pump sets, jockey pump set, and make up water pump set shall be tested by running the pump set continuously for a period of two hours by connecting to a hydrant or as suitably decided at site.

3. All the operating tests shall be carried out in the presence of authorized authority specified by the bank and the Consultant. Fire Brigade or Insurance Co. Pressures obtained at each landing valve shall be tested and recorded, the pressure-reducing system should be calibrated by the manufacturer or to be replaced.

5.4 MAKES OF MATERIALS

1. All materials and equipment used shall be UL Listed / FM approved / BIS approved and ISI stamped. Any discrepancy / additional makes required fully conforming to the tender specifications shall be brought to notice during the tender stage itself. Any deviation after award of the contract will not be allowed.

5.5 MODE OF MEASUREMENTS

1. The mode of measurement shall be as indicated in the specification. Any discrepancy / clarification required shall be brought to notice during the tender stage itself. Any deviation after award of contract will not be entertained.

5.6 REFURBISHMENT OF THE SPRINKLER SYSTEM

5.6.1 THE SPRINKLER SYSTEM IS PROVIDED PARTIALLY FOR THE PROJECT. THE PARTICULARS OF THE DEVICES / SYSTEMS PRESENTLY INSTALLED AND TO BE PROVIDED ARE AS FOLLOWS:

a. Fire water pump sets – Presently a standby pump set provides water but new pump sets to be installed as part of this contract and the delivery line migrated to the new pump sets.

b. Sprinkler system for the lower basement and upper basement – Partially provided. To be provided at balance places.

c. Sprinkler system branches at Ground Floor and top Floors – Partially provided and terminated at the isolation valve and flow switch. Same to be reviewed and connected to the risers.

d. Risers and alarm valves – provided. Low level and high-level headers to be tapped from the new fire pump sets to be provided. Low level and high-level alarm valve with isolation valves below and above the alarm valves to be provided and routed to both the shafts and connected to the sprinkler's cross mains in the individual floors.

e. Connection to the booster pump sets at the terrace – Same to be provided with connection to low level and high-level headers.

f. Integration of the flow switches to the fire alarm system by means of modulation: The system should be hooked to the fire alarm control panel (FACP).

g. Sprinklers of sidewall type with flexible drops shall be provided for electrical shaft

The performance and condition of the following items shall be reviewed and supply, installation testing and commissioning of the sprinkler system and water curtain system shall cover the following:

1. Evaluating the existing sprinkler system thoroughly and ensuring that all areas of the building are appropriately protected. This will include pneumatic testing of the branches as well.

2. Evaluating the cross-mains at each floor and ensuring that necessary isolation valves, flow switches, test and drain connections are provided.

3. Verifying the valve ratings etc. presently provided presently and if found to be below specification for the application, to be informed to the bank and the Consultant.

4. Evaluating the shaft for suitable locations and plan the provision of the low and high stage piping including supports.

5. Verifying the location of the brick and concrete walls, supports etc. and for brick walls using chemical anchor fasteners.

6. Pressure checks all existing sprinkler cross mains pneumatically, individually prior to total system pressurization. Any existing flexible hoses if damaged to be replaced. It is to be informed to the concerned officials of the bank and the Consultant before the testing and the part that is being removed should be certified by the bank and Consultant representatives.

7. Provision of grooved fittings for the risers in the shafts.

8. Verify the position and damage to existing sprinklers including paint spatters and replace the sprinklers with same type.

9. Prepare proper As-Built drawings for the system prior to rectification and after rectification.

10. Replace the alarm valves, isolation valves etc., to be replaced after ensuring necessary safety precautions are carried out. Ensure that necessary safety caution boards are installed during the period.

11. Make a list floor-wise, wing-wise, area – wise, basement wise of the equipment and their condition and compile the defect list. Before starting the work and get it authorized by the concerned authorities.

12. Inform the client of the core-cuttings required to be carried out and carry out the same without damaging other equipment etc.

13. Calibrate the PRV operation perfectly.

14. Obtain formal approval and procure / fabricate replacement samples including the flexible hoses etc. for example. Installation, get the same certified by the Bank's Fire Officer/Consultant.

15. Supply and install the balance quantities. Identify and take back defective items after due reconciliation with bank and the Consultant.

16. Interconnect the headers to the booster pumps suitably with air release etc. complete in all respects.

17. Test and complete the total installation of the system at every stage.

18. The scope of work shall cover supply, installation, testing and commissioning of the sprinkler system covering the following:

    - Sprinkler pump, electric and diesel driven
    - Jockey pump
    - Installation valves with motor gong bell

- Sprinklers
- Sprinkler piping
- Branches flow switches connected to the building fire alarm system etc. complete in all respects

5.6.2 SYSTEM PARTICULARS

The particulars of the existing systems are indicated. Same to be reviewed as per the modifications carried out in the building over the period of time and necessary additions / alterations carried out.

1. INSTALLATION ALARM VALVES

Installation alarm valves, UL Listed / FM approved along with the water motor gong, retard chamber two numbers in series, trims, upstream and downstream pressure gauges, test and drain connection etc. complete.

The discharge from the test connection outlet shall be left to the nearest sump or drain as shown on drawings or as directed.

2. FLOW SWITCHES

Flow switches shall be of paddle type UL Listed / FM approved. They shall be SPDT snap acting contacts rate 10 A @ 220 V. The paddle shall be made of either brass or phosphor bronze terminated in a screwed terminal connector. The entire unit shall be encased in cold drawn steel IP 55 enclosure and the maximum operating pressure of the parts in contact with the liquid shall be consisted with the system pressure.

3. SPRINKLER

Sprinkler shall be thermo-sensitive glass-bulb actuated type and be standard product from an established company of repute and standing and approved by appropriated authority for firefighting duty. UL Listed / FM approved.

All sprinklers shall be brass casting polished chrome or white (polyester) as approved and rated for 12.0 Kg/sq.cm. Sprinklers shall be pendant, upright or side wall type as specified types as required.
Where necessary for sprinklers mounted on false ceiling or on side wall shall be provided with an adjustable escutcheon finished same as sprinkler head. Further to match with the décor, some sprinklers may have to be of concealed type.

Temperature classifications of sprinklers in each space shall be shown on the drawings or as required, generally 68 deg C.

4. PIPING

All piping shall be as specified under “Piping for Fire Fighting” and the schedule of work for piping.

5. TESTING

Entire sprinkler piping shall be tested before and after rectification with the sprinkler in position to a hydrostatic test pressure of 1.5 times the working pressure and maintained for a period of 24 hours at the end of which there shall be no loss in pressure.

Test valve in each sprinkler installation shall be opened (with temporary drain connection) and the following observations recorded:

1) Start-up of jockey pump
2) Start-up of sprinkler pump
3) Operation of water motor gong
4) Operation of flow switch in the appropriate branch
5) Operation of tamper switches for shut off valves

All the operating test shall be carried out in the presence of banks and Consultant Engineer-in-charge, respective local authority, fire brigade or Insurance company.

6. MAKE OF MATERIALS

All materials and equipment's used shall be approved products as per UL / FM / BIS as specifically indicated. The list of makes of materials are indicated in the BOM and shall be adhered to. Any change / addition in the same is required to be solicited during the tender stage itself. Variations after order placement are entirely in the discretion of the client and Consultant with valid reasons provided by the contractor.

7. MODE OF MEASUREMENT

a) All the pumps with base frame, anti-vibration pad and flexible couplings both inlet and outlet of the pump including concrete foundation shall be measured per unit.

b) Flow switches and tamper switches shall be measured per unit and excludes Wiring to the fire Alarm Panel which shall form part of Fire Alarm Wiring.

c) Sprinkler shall be identified as pendent, sidewall, or concealed and paid for per unit.

d) For Piping refer section on Piping for Firefighting.

e) Installation valve complete with test valve, orifice plate etc. shall be regarded as one unit.

f) All power; Control Cabling shall be measured in running meter length and paid at unit rates.

g) Pipes are measured linear length basis.

5.7 REFURBISHMENT OF THE PIPING FOR FIRE PROTECTION SYSTEM

5.7.1 PIPING FOR FIRE PROTECTION SYSTEM

1.0 Scope: The scope of work covers, supply, installation, testing and commissioning of the entire piping system for the firefighting installation i.e. Fire Hydrant and sprinkler system.

2.0 Standards

2.1 The standards indicated separately as part of the tender document shall be applicable:

All standards should be the latest.

3.0 Hydrant Mains

3.1 External Piping

3.1.1 All external piping to be GI ERW Pipes confirming IS 1239 or IS 3589. and protected against corrosion by two coats of hot bitumen and two wraps of fiber glass tissue over the entire length including fitting & valves.

3.1.2 Valve selection shall be as follows:

- Valves of nominal dia up to and including 40 mm dia – Globe valve and ball valve
- Valves of nominal dia 50 mm and above –OS&Y valve for above ground piping application.
- Butterfly valves shall be adopted preferably for places with space restriction like inside the building. Otherwise, OS&Y valves are only recommended.
- Bronze Globe Valve shall be of screwed type with female ends, inside screw, rising stem, hand wheel operated, rated for minimum working pressure of 16 kg(f)/sq.cm and 24 kg(f)/sq.cm, to Indian Standards
- Isolation valve of OS&Y type suitable for working pressure of working pressure of 16 kg(f)/sq.cm and 24 kg(f)/sq.cm minimum with matching flanges, chain and lock complete.
- Isolation valve of Butterfly valve type to be of Wafer type design, suitable for working pressure of working pressure of 16 kg(f)/sq.cm and 24 kg(f)/sq.cm.
- Valves of sizes 150 mm nominal dia and below to be provided with throttling lever and valves for sizes above 150 mm nominal dia to be of gear operated type. Matching Drilling flanges to ANSI B 16.5 class 150 / 300 respectively.
- The butterfly valves and OS&Y valves shall be provided with a lock and chain with common keys. Tamper switch which shall be UL Listed / FM approved and acceptable to the valve manufacturer shall be quoted as optional.
- The valve shall be angled and installed suitably at site to enable easy operation.

3.1.5 Underground mains shall be laid not less than 750mm below the ground level and shall be at least 2m away from the building face and supported on concrete pedestals at every 3.5m and held on with galvanized iron clamps. Concrete trust anchors shall be provided at all bends and tees as shown on drawing and as directed. All excavation for pipe laying shall be carried out with sufficient width for making proper joints. Back filling shall be done only after the piping is hydro-statically pressure tested. Piping shall be constantly kept clean till tested.

3.1.6 All valve pits shall be housed in brick masonry chambers over 150mm cement concrete (1:3:6) foundation. The brick wall of the chamber shall be plastered inside and outside with 20 mm cement sand plaster 1:4 with a floating coat of neat cement. Chamber shall be 650 x 650 mm clear for depths up to 900 mm & 1000 x 1000 mm for depths beyond. Each chamber shall have a cast iron surface box approved by the local fire brigade.

3.1.7 Piping laid above ground shall be supported on cement concert (1:3:6) pedestal raising the bottom of the pipe at least 150 mm over the ground level and held to the pedestals with galvanized clamps. Pedestal shall be made at 3.0m center to center and as shown drawing.

Cements concrete 1:3:6 thrust anchors shall be provide at all tee-off points and change of direction as shown on drawing and as required. Pipes laid on walls and ceiling shall have galvanized steel brackets.

3.2 Internal Piping

3.2.1 All internal pipes shall be, unless specified, heavy quality Electric Resistance Welding (ERW) GI pipes to IS 1239 part -1 and fittings will be grooved DI type, Flanges shall be provided to mate with valves and other equipment and shall conform to IS 6392 / IS 13159 – PART -1 Reaffirmed 1999.

3.2.2 Pipe support shall be as follows.

SUPPORT SIZING:-				
PIPE SIZE	PARTICULARS ALLOWED AS PER NFPA		PARTICULARS ADOPTED	
NB	SPACING, Mtr.	THREAD ROD DIA, MM.	SPACING, Mtr.	THREAD ROD DIA, MM.
25	3.66	9.525	2	10
32	3.66	9.525	2.7	10
40	4.57	9.525	2.7	10
50	4.57	9.525	3	10
65	4.57	9.525	3	10
80	4.57	9.525	3	12
100	4.57	9.525	3	12
125	4.57	12.7	3	16
150	4.57	12.7	3	16

NOTE: In addition to the above if the system warrants additional support due to peculiar situation the same should be provided by the contractor as suggested without any financial implication or cost.

4.0 Testing & commissioning

4.1 All piping after installation shall be tested for a hydrostatic test pressure of 1.5 times of the rated pressure of the low / high pressure pumping system as applicable for the particular piping for a period not less than 2 hours and no leakage or drop in pressure shall be observed.

5.0 Makes of Materials

5.1 The makes of materials as indicated in the BOM to be abided. **Any changes required to be indicated in the tender stage itself, otherwise the same is liable not to be accepted by client.**

6.0 Mode of measurement

6.1 All external piping shall be measured along the center line of the pipe and paid per unit length and shall include:

i. All pipes & fittings
ii. Bituminous coating

6.2 All internal piping shall be measured similarly but shall include for the pipe Supports and clamps instead of excavation.

6.3 All valves, air valves, drain valves together with flanges or tail pieces shall be measured per unit.

6.4 All excavation and concrete support and thrust block shall be measured as per drawing and paid for per cum

5.8 COMPREHENSIVE ANNUAL MAITENANCE CONTRACT(CAMC):

INDEX

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COMPREHENSIVE ANNUAL MAINTANANCE CONTRACT

The maintenance should be carried out as per manufacturers maintenance manual recommendation. The same should be done based on the written document issued by the manufacturer, this document should be submitted to the SBI Bank and to the consultant before starting the work. The contractor must submit form A & B as applicable every six months to the Mumbai Fire Brigade, i.e. January & July months of every year as per the Maharashtra Fire Prevention & Life Safety Measures Act 2006 & Maharashtra Fire Prevention & Life Safety Measures Rules 2009 and also submit the same to the bank.

It is also required to Employ experienced engineers having through knowledge of the systems revamped and upgraded should be capable of maintaining the systems as required from time to time. The personal should be employed 24/7-365 days without fail. The person will be under the contractor's payroll and strictly follow all government norms.

The bank no way will have any direct responsibility to the personals employed for the discharge of the contractual obligation of the contractor.

1. Payment of CAMC

   i) Prorata basis
   ii) Every quarter (At the end of the quarter)
   CAMC payment will start after defect liability period (DLP) (After 2 years)
   iii) Since CAMC is comprehensive, no additional payment for replacement of parts and allied equipment/ components/ machine etc., will be made. CAMC should be quoted for a period of 5 years from the date of completion of DLP.

2. Scheduled work to be carried out for each system

   i) Periodicity of visit (system wise)
   ii) Work to be carried out (brief description)
   iii) Items which are not supplied by contractor, but only installation done by contractor should also be maintained. It should be included in CAMC. This means that the final system maintenance will be the sole responsibility of the vendor irrespective of the product supply.

3. Down Time Period of system

   i) Down Time Period should not be more than 24 hours.
   Start time: Call reported by telephone/ Fax/ Mail
   End time: System in operational condition, critical system i.e. Fire Alarm, Gas based system, Wet Riser, Sprinkler etc. and machines like pumps.
   1. Fire Hydrants, sprinkler and all other supporting Pumps not more than twelve hours.
   2. Fire hydrants pipes and accessories not more than eight hours.
   3. Fire Sprinklers not more than four hours with respect to sprinkler heads and eight working hours for all other accessories.

4. Penalty clause:
   i) If the services are not satisfactory, penalty of ____% of the CAMC will be imposed or deducted from contract amount.
   ii) If contractor unable to repair or maintain the system as per maintenance manual, penalty ___% will be imposed.
   iii) If down time of the system is more than stipulated period
   iv) If fails to repair or maintain then Bank at risk and cost of contractor will get it repaired, by engaging other contractor. The cost involved will be deducted plus penalty.

5. CAMC Agreement: Separate CAMC Agreement will be executed as per Bank's standard CAMC format on completion and handing over date.

THE MAINTANANCE MANUAL IS MADE AS PER THE NFPA 25 STANDARD. THE FOLLOWING SYSTEMS ARE INCLUDED TO THE DESCRIPTIONS.

I. Form for Testing and Maintenance of Fire Pumps
II. Form for Testing and Maintenance of Water Storage Tanks
III. Form for Testing and Maintenance of Fire Sprinkler Systems
IV. Form for Testing and Maintenance of Fire Escape Hydrant Systems
V. Form for Testing and Maintenance of External Hydrant System

I. Form for Testing and Maintenance of Fire Pumps

Information on this form covers the minimum requirements of **NFPA 25-1998** for centrifugal fire pumps. Separate forms are available to inspect, test and maintain the rest of the fire protection system of which the fire pump is a part. More frequent inspection, testing and maintenance may be necessary depending on the conditions of the occupancy and water supply.

Owner: **State Bank of India**
Owner's address: **State Bank Bhavan, Corporate Centre, MADAME Cama Road, Nariman Point, Mumbai - 400021.**
Date of inspection:
(All responses refer to the **current inspection performed on this date**.)
This inspection is: (check one) ❑ Weekly ❑ Monthly ❑ Quarterly ❑ Semiannual ❑ Annual

Note: All questions are to be answered yes, no, or not applicable. All "No" answers are to be explained in the comment portion of this form.

Part I – Owner's Section

A. Is the fire pump in service? ❑ Yes ❑ No
B. Has the fire pump remained in service since the last inspection? ❑ Yes ❑ No
C. Was the system (of which the fire pump is a part) free from actuation of devices or alarms since the last inspection? ❑ Yes ❑ No

Note to owner: Periodic tests of transfer switches and emergency generators are to be performed by a qualified electrical contractor in accordance with NFPA 110.

Owner or representative (print name) Signature and date

A. TESTS

1. Weekly test items

A. Electric motor-driven pumps

1. Pump started automatically? ❑ Yes ❑ No
   Record starting pressure. _____ psi.
2. Pump run for at least 10 minutes? ❑ Yes ❑ No
   Record suction ____ and discharge ____ pressure while running.
3. Pump packing gland showing slight discharge? Adjust if necessary. ❑ Yes ❑ No
4. Free from unusual noises or vibrations? ❑ Yes ❑ No
5. Packing boxes, bearings and pump casing free from overheating? ❑ Yes ❑ No
6. Record time for motor to accelerate to full speed. _____ ❑ Yes ❑ No
7. For reduced voltage or reduced current starting, record time controller is on first step. _____ ❑ Yes ❑ No
8. For automatic stop controllers, record time pump runs after starting. _____
9. All times and pressures in Part A acceptable? ❑ Yes ❑ No

B. Diesel engine-driven pumps

1. Pump started automatically? ❑ Yes ❑ No
   Record starting pressure. _____ psi.
2. Pump run for at least 30 minutes? ❑ Yes ❑ No
   Record suction ____ and discharge ____ pressure while running.
3. Pump packing gland showing slight discharge? Adjust if necessary. ❑ Yes ❑ No
4. Free from unusual noises or vibrations? ❑ Yes ❑ No
5. Packing boxes, bearings and pump casing free from overheating? ❑ Yes ❑ No
6. Record time for engine to crank. _____
7. Record time for engine to reach running speed. _____
8. Engine oil pressure gauge, speed indicator, water and oil temperature indicators all reading normal? ❑ Yes ❑ No
9. Cooling water flowing from heat exchanger? ❑ Yes ❑ No
10. All times and pressures in Part B acceptable? ❑ Yes ❑ No

2. <u>Annual tests</u>

Annual pump test was run using the following method: (check one)

- **Method A.**
  Discharge of flow through hose streams Flow readings taken at each hose stream.

- **Method B**.
  Discharge through bypass flow meter to drain or suction reservoir. Flow readings taken by flow meter.

- **Method C.**
  Discharge through bypass flow meter directly returned to pump suction. Flow readings taken by flow meter.
  Note: At least once every three years method A or B must be used.

<u>Pump Test Result</u>

Suction pressure	No flow	Rated flow	Peak flow
Discharge pressure			
Flow	N/A		
Electrical flow and current	N/A		
Pump speed			

Are the values in the above table acceptable? ❑ Yes ❑ No
No alarm indicators or other visible abnormalities observed during
No -flow test? ❑ Yes ❑ No

D. Automatic transfer switch test

1. Power failure simulated during peak flow? ❑ Yes ❑ No
   Connection made to alternate power source? ❑ Yes ❑ No

2. After termination of simulated power failure did motor reconnect to the normal power source? ❑ Yes ❑ No

E. All alarm conditions simulated? ❑ Yes ❑ No

All alarms operated? ❑ Yes ❑ No

B. Maintenance

A maintenance schedule must be established in accordance with the manufacturer's instructions. In the absence of such a schedule, the following must be used:

1. Weekly maintenance items for diesel engine systems:

A. Fuel tank level, tank float switch, and solenoid valve operation acceptable? ❑ Yes ❑ No

B. Diesel fuel system free of water? ❑ Yes ❑ No

C. Flexible hose and connectors in fuel and coolant systems acceptable? ❑ Yes ❑ No

D. Oil level and lube oil heater acceptable? ❑ Yes ❑ No

E. Coolant level acceptable? ❑ Yes ❑ No

F. Water pump for coolant system operating? ❑ Yes ❑ No

G. Jacket water heater for coolant system acceptable? ❑ Yes ❑ No

H. Exhaust system free of leakage? ❑ Yes ❑ No

I. Drain condensate trap on exhaust system operational? ❑ Yes ❑ No

J. Electrolyte level in batteries acceptable? ❑ Yes ❑ No

K. Connections to electrical system acceptable? ❑ Yes ❑ No

2. Monthly maintenance items

A. Isolation switch and circuit breaker exercised? ❑ Yes ❑ No

B. Battery case clean, dry and free of corrosion? ❑ Yes ❑ No

Batteries specific gravity or state of charge passed test? ❑ Yes ❑ No

C. Charger and charge rate passed visual inspection? ❑ Yes ❑ No

D. Battery charge being equalized? ❑ Yes ❑ No

E. Circuit breakers appear clean? ❑ Yes ❑ No

3. Quarterly maintenance items

A. Cleaned strainer, filter or dirt leg in diesel fuel system? ❑ Yes ❑ No

B. Cleaned or replaced crank case breather in lubrication system? ❑ Yes ❑ No

C. Cleaned water strainer in coolant system? ❑ Yes ❑ No

D. Insulation acceptable and fire hazards eliminated from exhaust system? ❑ Yes ❑ No

E. Battery terminals clean and tight? ❑ Yes ❑ No

F. Electrical system free of wire chafing? ❑ Yes ❑ No

4. Semiannual maintenance items

A. Manual starting means on electrical systems operated? ❑ Yes ❑ No

Flexible exhaust section acceptable? ❑ Yes ❑ No

Alarms operated on electrical portions of diesel engine systems? ❑ Yes ❑ No

B. Boxes, panels and cabinets on electrical systems cleaned? ❑ Yes ❑ No

5. Annual maintenance items

A.	Changed pump bearing lubrication?	❑ Yes ❑ No
B.	Shaft end plays acceptable?	❑ Yes ❑ No
C.	Pump coupling alignment acceptable?	❑ Yes ❑ No
D.	Transmission coupling, right angle gear drive and mechanical moving parts lubricated?	❑ Yes ❑ No
E.	Circuit breakers passed trip test?	❑ Yes ❑ No
F.	Emergency manual starting means operated without power?	❑ Yes ❑ No
G.	Electrical connections secure?	❑ Yes ❑ No
H.	Pressure switch settings calibrated?	❑ Yes ❑ No
I.	Motor bearings greased?	❑ Yes ❑ No
J.	Fuel tank free of water and foreign material?	❑ Yes ❑ No
K.	Tank vents and overflows pipes free of obstructions?	❑ Yes ❑ No
	Fuel piping acceptable?	❑ Yes ❑ No
L.	Oil and filters changed in diesel systems?	❑ Yes ❑ No
M.	Heater exchanger cleaned out?	❑ Yes ❑ No
N.	Duct work & louvers (combustion air) acceptable?	❑ Yes ❑ No
O.	Exhaust system free of back pressure?	❑ Yes ❑ No
P.	Exhaust system hangers and supports acceptable?	❑ Yes ❑ No
Q.	Control and power wirings tight?	❑ Yes ❑ No

Part II – Comments (Any "No" answers, test failures or other problems found with the fire pump must be explained here.)

_____

_____

_____

_____

_____

_____

Part III – Inspector's Information

Inspector:

Company:

Company's address:

I state that the information on this form is correct at the time and place of my inspection, and that all equipment tested at this time was left in operational condition upon completion of this inspection except as noted in Part II above.

Signature of Inspector: Date:

II. Form for Testing and Maintenance of Water Storage Tanks

Information on this form covers the minimum requirements of **NFPA 25-1998** for water storage tanks. Separate forms are available to inspect, test and maintain the rest of the fire protection system of which the water tank is a part. More frequent inspection, testing, and maintenance may be necessary depending on the conditions of the occupancy and water supply.

Owner: **State Bank of India**

Owner's address: **State Bank Bhavan, Corporate Centre, MADAME Cama Road, Nariman Point, Mumbai - 400021.**

Date of inspection:

(All responses refer to the current inspection performed on this date.)

This inspection is: (check one) ❑ Weekly ❑ Monthly ❑ Quarterly ❑ Semiannual ❑ Annual

Note: All questions are to be answered yes, no, or not applicable. All "No" answers are to be explained in the comment portion of this form.

Part I – Owner's Section

A. Is the water storage tank in service? ❑ Yes ❑ No

B. Has the tank remained in service since the last inspection? ❑ Yes ❑ No

C. Was the system (of which the tank is a part) free from actuation of devices or alarms since the last inspection? ❑ Yes ❑ No

Owner or representative (print name) Signature and date

A. Testing

1. Quarterly test

Valve supervisory devices indicate movement? ❑ Yes ❑ No

2. Semiannual tests

a. High water level alarm passed test? ❑ Yes ❑ No

b. Low water level alarm passed test? ❑ Yes ❑ No

3. Every fifth-year tests

a. Level indicators accurate and free to move? ❑ Yes ❑ No

b. Pressure gauges within 3% of the scale compared to a calibrated gauge? If no, calibrate or replace. ❑ Yes ❑ No

B. Maintenance

1. Semiannual maintenance

Sediment drained or flushed from the tank? ❑ Yes ❑ No

2. Annual maintenance

a. Cathodic protection maintained in accordance with manufacturer's instructions? ❑ Yes ❑ No

b. All tank drains fully opened then closed? ❑ Yes ❑ No

c. Tank vents cleaned? ❑ Yes ❑ No

Part II – Comments (Any "No" answers, test failures or other problems found with the fire pump must be explained here.)

_____

_____

Part III – Inspector's Information

Inspector:

Company:

Company's address:

I state that the information on this form is correct at the time and place of my inspection, and that all equipment tested at this time was left in operational condition upon completion of this inspection except as noted in Part II above.

Signature of Inspector: Date:

III. Form for Testing and Maintenance of Fire Sprinkler Systems

Information on this form covers the minimum requirements of **NFPA 25-1998** for fire sprinkler systems connected to distribution systems without supplemental tanks or fire pumps. Separate forms are available to inspect, test and maintain fire pumps and water tanks. Additional forms are also available for standpipe and hose systems, private fire service mains, water spray fixed systems and foam-water sprinkler systems. More frequent inspection, testing and maintenance may be necessary depending on the conditions of the occupancy and the water supply.

Owner: **State Bank Of India**
Owner's address: **State Bank Bhavan, Corporate Centre, MADAME Cama Road, Nariman Point, Mumbai - 400021.**
Date of inspection:
(All responses refer to the current inspection performed on this date.)
This inspection is: (check one) ❑ Weekly ❑ Monthly ❑ Quarterly ❑ Semiannual ❑ Annual

Note: All questions are to be answered yes, no, or not applicable. All "No" answers are to be explained in the comment portion of this form.

Part I – Owner's Section

A. Is the building occupied?	❑ Yes ❑ No
B. Has the occupancy classification and hazard of contents remained the same since the last inspection?	❑ Yes ❑ No
C. Are all fire protection systems in service?	❑ Yes ❑ No
D. Has the system remained in service without modification since the last inspection?	❑ Yes ❑ No
E. Was the system free of actuations of devices or alarms since the last inspection?	❑ Yes ❑ No

Owner or representative (print name) Signature and date

A. Testing

The following tests are to be performed at the noted intervals. Report any failures on Part III of this form.

Part I: Initial test
The existing sprinkler pipeline in each floor should be subjected to pneumatic pressure test before subjecting the same to hydraulic pressure test. The test should be carried out on every floor basis. The pipe network on each floor will be subjected to pneumatic pressure test by plugging all openings and the compressor will be connected to one side of the pipe network. The pressure will be introduced to the line on stage basis. (i.e., 0.5 bar pressure to be introduced and allow the pressure to be remain for at least 15 minutes and if the pressure is s steady introduce 1 bar pressure for further 15 minutes. If the pressure is steady add 2 bar pressure to the system. This pressure (3.5 bar) should be allowed to remain at least 2 hours. If the pressure is steady, it shows that there is no leakage in the system. If the pressure shows at downward trend, then one has to find out the leakage point by using soup bubbles. Once the pressure is steady then subject the line for 7 bar pneumatic pressure and confirm there is no leakage in the pipeline by keeping the pressure for 2 hours).
Once the system is passed the pneumatic system the pipe network should be subjected to hydraulic pressure test of 14 bar and confirm that there is no leakage in the pipeline.

1. **Quarterly tests**
   A. Sprinkler system main drain test:
   1. Record static pressure ____ psi and residual pressure ____ psi.
      Was flow observed? ❑ Yes ❑ No
   2. Are results comparable to previous test? ❑ Yes ❑ No
   B. Water flow alarm devices passed tests? ❑ Yes ❑ No

1. Inspectors test connection opened? ❑ Yes ❑ No
2. By-pass connection opened? ❑ Yes ❑ No
3. Alarms actuated and flow observed? ❑ Yes ❑ No

C. Control valves (except OS&Y and gear-operated indicating butterfly valves) opened until spring or torsion is felt in the rod, then closed back one-quarter turn? ❑ Yes ❑ No

D. Quick opening devices passed test? ❑ Yes ❑ No

E. Valve supervisory switches indicate movement? ❑ Yes ❑ No

2. Annual tests

A. sample now and every 10 years. ❑ Yes ❑ No
If "no" has a sample been tested within 10 years? ❑ Yes ❑ No
If “no” test sample now and every 10 years.

B. All control valves operated through full range and returned to normal position? ❑ Yes ❑ No

(Test all systems together which will operate simultaneously.)

1. Water discharge from all nozzles unimpeded? ❑ Yes ❑ No
2. Pressure reading at hydraulically most remote nozzle _____ psi.
3. Residual pressure reading at valve _____ psi. Was flow observed? ❑ Yes ❑ No
4. Are above readings comparable to design values? ❑ Yes ❑ No
5. Manual activation devices passed test? ❑ Yes ❑ No

C. <u>Maintenance</u>

1. Regular maintenance items

A. If sprinklers have been replaced, were they proper replacements? ❑ Yes ❑ No

B. Air leaks in dry pipe system resulting in air pressure loss more than 10 psi/week repaired? ❑ Yes ❑ No

C. If any of the following were discovered, was an obstruction investigation conducted and the system flushed? ❑ Yes ❑ No

Explain reason(s) and obstruction investigation findings in Part III

1. Obstructive material discharged during water flow tests. ❑ Yes ❑ No
2. Foreign materials found in dry pipe valves, check valves or pumps. ❑ Yes ❑ No
3. Heavy discoloration of water during drain test or plugging of inspectors test connection. ❑ Yes ❑ No
4. Plugging of sprinklers found during activation or alteration. ❑ Yes ❑ No
5. Plugging found in piping dismantled during alterations. ❑ Yes ❑ No
6. Failure to flush yard piping or surrounding public mains following new installation or repairs. ❑ Yes ❑ No
7. Record of broken mains in the vicinity. ❑ Yes ❑ No
8. Abnormally frequent false-tripping of dry pipe valves. ❑ Yes ❑ No
9. System is returned to service after an extended period out of service (greater than one year). ❑ Yes ❑ No
10. There is reason to believe the system contains sodium silicate or its derivatives. ❑ Yes ❑ No

2. Annual Maintenance Items

A. Operating stem of all OS&Y valves lubricated, completely closed, and reopened? ❑ Yes ❑ No

Part II – Comments
((Any "No" answers, test failures or other problems found with the sprinkler system must be explained here.)

_____

_____

_____

Part III Inspector's Information

Inspector:

Company:

Company's address:

I state that the information on this form is correct at the time and place of my inspection, and that all equipment tested at this time was left in operational condition upon completion of this inspection except as noted in Part II above.

Signature of Inspector: Date:

IV. Form for Testing and Maintenance of Standpipe and Hose Systems

Information on this form covers the minimum requirements of **NFPA 25-1998** for standpipe and hose systems. Where the standpipe system includes a fire pump or water tank, an additional form must be completed for inspection, testing and maintenance of the pump or tank. Forms are also available for fire sprinkler systems, private fire service mains, water spray fixed systems and foam-water sprinkler systems. More frequent inspection, testing and maintenance may be necessary depending on the conditions of the occupancy and the water supply.

Owner: **State Bank of India**
Owner's address: **State Bank Bhavan, Corporate Centre, MADAME Cama Road, Nariman Point, Mumbai - 400021.**
Date of inspection:
(All responses refer to the current inspection performed on this date.)

This inspection is: (check one) ❑ Weekly ❑ Monthly ❑ Quarterly ❑ Semiannual ❑ Annual
Note: All questions are to be answered yes, no, or not applicable. All "No" answers are to be explained in the comment portion of this form.

Part I – Owner's Section

A. Is the building occupied? ❑ Yes ❑ No
B. Has the occupancy classification and hazard of contents remained the same since the last inspection? ❑ Yes ❑ No
C. Are all fire protection systems in service? ❑ Yes ❑ No
D. Has the system remained in service without modification since the last inspection? ❑ Yes ❑ No
E. As the system free of actuations of devices or alarms since the last inspection? ❑ Yes ❑ No

Owner or representative (print name) Signature and date

A. Testing

The following tests are to be performed at the noted intervals. Report any failures on Part III of this form.

1. Quarterly tests

A. Main drain test
1. Record static pressure ____ psi and residual pressure ____ psi.
2. Was flow observed? ❑ Yes ❑ No
3. Are results comparable to pressures from last test? ❑ Yes ❑ No

B. Water flow alarm devices passed test? ❑ Yes ❑ No
1. Inspectors test connection opened? ❑ Yes ❑ No
2. Bypass connection opened? ❑ Yes ❑ No
3. Alarms actuated? ❑ Yes ❑ No
4. Was flow observed? ❑ Yes ❑ No

C. Control valves (except OS&Y and gear-operated indicating butterfly valves) opened until spring or torsion is felt in the rod, then closed back one-quarter turn? ❑ Yes ❑ No
D. Priming water level (dry pipe) passed test? ❑ Yes ❑ No
E. Low air pressure signal (dry pipe) passed test? ❑ Yes ❑ No
F. Quick opening device passed test? ❑ Yes ❑ No
G. Valve supervisory devices indicate movement? ❑ Yes ❑ No

2. Annual tests

A. All control valves operated through full range and returned to normal position? ❑ Yes ❑ No
B. Backflow devices passed backflow test? ❑ Yes ❑ No
C. Backflow devices passed full flow test? ❑ Yes ❑ No

3. Third year tests

A. Dry pipe valve full flow trip test:
1. Record initial air pressure ____ psi and water pressure ____ psi.
2. Record tripping air pressure ____ psi and tripping time ____ sec.
3. Was water delivered to inspector's test connection? ❑ Yes ❑ No
4. Above results comparable to previous tests? ❑ Yes ❑ No

B. Is hose less than five years old? ❑ Yes ❑ No
If "no," has hose been tested within three years? ❑ Yes ❑ No

If "no," test hose now and every three years.

4. Fifth year tests

A. Gauges tested against calibrated one or replaced? ❑ Yes ❑ No

B. Standpipe systems tested at required flows:

1. Record static pressure ____ psi and residual pressure ____ psi.
2. Record total flow ____ gpm.
3. Above flows and pressures acceptable? ❑ Yes ❑ No

C. Wet pipe systems passed hydrostatic test? ❑ Yes ❑ No

D. All hose connection and hose rack assembly pressure regulating and pressure control valves passed full flow test? ❑ Yes ❑ No

C. <u>Maintenance</u>

1. Regular maintenance items

A. Items found missing or in disrepair during inspection or testing repaired or replaced? ❑ Yes ❑ No

B. If any of the following were discovered, was an obstruction investigation conducted and the system flushed? ❑ Yes ❑ No

Explain reason(s) and obstruction investigation findings in Part III.

1. Obstructive material discharged during water flow test.
2. Foreign materials found in dry pipe valves, check valves or pumps.
3. Heavy discoloration of water during drain test or plugging of inspector's test connection.
4. Plugging found in piping dismantled during alterations.
5. Failure to flush yard piping or surrounding public mains following new installation or repairs.
6. Record of broken mains in the vicinity.
7. Abnormally frequent false tripping of dry pipe valves.
8. System is returned to service after an extended period out of service (greater than one year).
9. There is reason to believe the system contains sodium silicate or its derivatives.

2. Annual maintenance items

A. Operating stem of all OS&Y valves lubricated, completely closed, and reopened? ❑ Yes ❑ No

B. Hose reracked or rerolled so folds do not occur in same position? ❑ Yes ❑ No

C. Interior of dry pipe valves cleaned? ❑ Yes ❑ No

D. Low points drained in dry systems prior to onset of freezing weather? ❑ Yes ❑ No

<u>Part II – Comments</u>

<u>((Any "No" answers, test failures or other problems found with the standpipe and hose system must be explained here.)</u>

_____

_____

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_____

Inspector's Information

Inspector:

Company:

Company's address:

I state that the information on this form is correct at the time and place of my inspection, and that all equipment tested at this time was left in operational condition upon completion of this inspection except as noted in Part II above.

Signature of Inspector: Date:

V. Form for Testing and Maintenance of External Hydrant System

Information on this form covers the minimum requirements of **NFPA 25-1998** for private fire service mains. Separate forms are available to inspect, test and maintain other portions of the fire protection system of which the private fire service main is a part. More frequent testing and maintenance may be necessary depending on conditions of the occupancy and water supply.

Owner: **State Bank of India**
Owner's address: **State Bank Bhavan, Corporate Centre, MADAME Cama Road, Nariman Point, Mumbai - 400021.**
Date of inspection:
(All responses refer to the current inspection performed on this date.)
This inspection is: (check one) ❑ Weekly ❑ Monthly ❑ Quarterly ❑ Semiannual ❑ Annual

Note: All questions are to be answered yes, no, or not applicable. All "No" answers are to be explained in the comment portion of this form.

Part I – Owner's Section

A. Is the Hydrant System in service? ❑ Yes ❑ No
B. Has it remained in service since the last inspection? ❑ Yes ❑ No
C. Were the systems supplied by the fire main free from actuation of devices or alarms since the last inspection? ❑ Yes ❑ No
Owner or representative (print name) Signature and date

B. Testing

1. Quarterly test

A. Control valves (except OS&Y and gear-operated indicating butterfly valves) opened until spring or torsion is felt in rod, then closed back one-quarter turn? ❑ Yes ❑ No
B. Valve supervisory devices indicate movement? ❑ Yes ❑ No

2. Annual tests

C. Hydrants flowed until clear (at least one minute)? ❑ Yes ❑ No
F. All control valves operated through full range and returned to

normal position? ❑ Yes ❑ No

G. Backflow devices passed backflow test? ❑ Yes ❑ No

H. Backflow devices passed full flow test? ❑ Yes ❑ No

3. Fifth year test – Exposed and underground piping passed flow test at expected flows? ❑ Yes ❑ No

C. Maintenance

1. Annual maintenance items

A. Mainline strainers cleaned? ❑ Yes ❑ No

B. Hose/hydrant houses and equipment in usable condition? ❑ Yes ❑ No

C. Hydrant caps, stems, plugs, and threads lubricated? ❑ Yes ❑ No

D. Hydrants free of ice, snow and damage? ❑ Yes ❑ No

E. Monitor nozzles are lubricated? ❑ Yes ❑ No

Part II – Comments

_____

_____

_____

_____

_____

Inspector's Information

Inspector:

Company:

Company's address:

I state that the information on this form is correct at the time and place of my inspection, and that all equipment tested at this time was left in operational condition upon completion of this inspection except as noted in Part II above.

Signature of Inspector: Date:

BILL OF QUANTITIES

1. SCHEDULE FOR QUANTITY FOR FIRE FIGHTING PUMP HOUSE			
Sr No.	**Item**	**Qty.**	**Unit**
(A)	**(B)**	**(C)**	**(D)**
	The scope includes design, manufacture, assembly, testing, installation of new systems, revamping of old systems, completing the erection, testing and commissioning of the system and obtaining approval for the system from client, statutory authorities and insurance agency of client.		
	The scope includes comprehensive maintainance of the system in full working condition for a period of two year from date of commissioning of the system in writing.		
	The particulars mentioned herein in this section are also applicable to other sections and systems as well. Any point specifically divergent shall be brought to notice during the tender stage itself. Any extra item brought to site shall be taken back by the contractor without any cost implications after due verification by the concerned department.		
	The fire water pumphouse shall be designed to Indian Standards. International guidelines like of NFPA shall be adopted where necessary. This includes the product standards as well. In all cases, the contractor is responsible for the successful performance of the system and obtaining approval from statutory authorities and client.		
	The project is on Unit Rate Basis only. Any excess materials brought to site shall be taken back by the successful contractor without any cost implication to the client after due technical and commercial clearances from client.		
	Any power supply or water connection or structural support etc. taken in existing structures shall be done with prior concurrence of the client/Consultant.		
	The project requirement is for Horizontal centrifugal pump sets only.		

	The main pump sets including the pump, motor, baseplate, coupler, coupler guard, controllers, pump sets can be to Indian Standard. The power distribution board with electrical accessories, diesel engine control panel, power and control cables, cable trays, glands, lugs, could be to Indian Standards. The piping, isolation valves, non return valves, strainers to be Indian Standards. The PRV, Pressure gauges, pressure switches, flow meter to be UL Listed / FM approved.		
	The churn pressure of the pump set shall not exceed 25% more than the high lift pressure indicated.		
	The pump sets shall be supplied complete with drives, common base plate, coupling, coupling guard, power & control cables, foundation bolts, earthing etc. complete.		
	The water suction to be considered partially positive and negative with the maximum water level above suction nozzle of pump set at one meter above adn minimum water level below suction nozzle of pump set at (-) 2 m.		
	The pump set shall be factory supplied complete with the drives etc. In case the pump set is sourced from the manufacturer's authorised dealers, then inspection certificate and clearance from the manufacturer is required. The pump set performance will be witness tested at manufacturer's works. However, guarantee of performance rests on the Contractor.		
	The motor and diesel engine driven pump set should be suitable for parallel operation with each other.		
	The power rating for the motor and diesel engine driven pump set shall be higher of the requirement at duty point or at 150% of discharge at not less than 65% of the head. In addition the derating for the auxiliary loads, ambient conditions and site elevation to be considered.		
	The rpm of the pump set not to exceed 2900.		
	The pump shall have gland packing and drain piping shall be connected suitably from the gland drain to the nearest pumphouse drain point.		
	The motor shall be NEMA 4, IP 55 rated minimum and necessary additional Cable termination box with glands, to be provided by the Contractor. NEMA 4 is for indoor or outdoor use to provide a degree of protection to personnel against to access to hazardous parts.		

	IE2 motor is an energy-efficient electric motor classified under the IEC (International Electrotechnical Commission) standards as "High Efficiency," You have to provide the motor which confirms to both the above two categories.		
	The motor shall be of Energy Efficient Type to enable client to qualify for Green Building Certification in future		
	The motor for the main pumps shall be suitable for Star-Delta Starting and the motors for the jockey and booster pump sets shall be suitable for DOL starting.		
	The color of the pump sets complete shall be "FIRE RED" as per IS-5.		
1.0	Design, Manufacture, Assembly, Supply, installation, testing & commissioning of **Diesel Driven Pump for sprinkler system and hydrant system** Multi stage, Muiti outlet (MSMO) -Split Casing type, capable of delivering in low stage 171 cum/hr., in low stage 100 mwc, in high stage 140 mwc. Complete with dual earthing.	2	No.
	The fuel tank capacity to be suitable for 6 hours pumping of the pump set along with stand & gauge glass, Fuel piping with valves etc..,		
	The pump shall coupled to suitable HP of Diesel engine of recirculating water cooled type and complete set shall be mounted on common base frame.		
	The rpm of the pump set not to exceed 2000.		
	The Diesel Engine shall be complete with a battery charger panel complete with boost and trickle charging facility, auto-manual selector switch, two sets of maintenance free Lead Acid Batteries, (Batteries to be of sufficient Ampere Hour to be adequate for 10 consecutive starts without recharging with a cold engine under compression) & battery leads with stand. Cost to include the fill of diesel and all consumables until handing over.		
	An additional canopy consisting of 2 mm thick CRCA sheet steel extending 300 mm on the sides and front with appropriate cutout to route the cables shall be provided to prevent inadvertent excess water entry into the controller if it was to be open and ceiling sprinklers were to operate at that time.		
	The fuel tank shall be in or more tanks with each tank limited maximum 950 litres to fulfil the number of hours of continuous operation as per standards, but not less than six hours.		
	The diesel tank level gauge shall be of magnetic type and not of glass tube type.		

	The diesel engine exhaust to be suitably taken out from the lower basement upto the terrace floor and also properly insulated. The size of the pipe should not cause undue back pressure on the diesel engine.		
	All pump testing facilities in accordance with standards to be provided.		
2.0	Design, Manufacture, Assembly, Supply, installation, testing & commissioning of **Electric motor driven fire water pump for Sprinkler system and Hydrant system** of Multi stage, Multi outlet-Split Casing type, capable of delivering in low stage 171 cum/hr., 100 mwc, in high stage 171 cum/hr., 140 mwc. complete with the TEFC motor with minimum IP55 degree of protection, common base plate, coupling, coupling guard, foundation bolts, earthing etc. complete.	2	Nos.
3.0	Design, Manufacture, Assembly, Supply, installation, testing & commissioning of **Electric motor driven fire water Jockey pump for sprinkler system and hydrant system** of Multi stage, Muiti outlet type, capable of delivering in low stage 15 cum/hr., 110 mwc, in high stage 15 cum/hr., 150 mwc. complete with the TEFC motor with minimum IP55 degree of protection, common base plate, coupling, coupling guard, foundation bolts, earthing etc. complete.	2	Nos.
4.0	Design, Manufacture, Assembly, Supply, installation, testing & commissioning of **Electric motor driven fire water booster pump set** of end suction / inline type single outlet type capable of delivering 30 cum/hr., 20 mwc complete with the TEFC motor with minimum IP55 degree of protection, common base plate, coupling, coupling guard, foundation bolts, earthing etc. complete.	3	Nos.
5.0	Design, Manufacture, Assembly, Supply, installation, testing & commissioning of **diesel engine control panel** as per spec. of local fire authority & as per requirement for the operation of the pumps along with the battery charger, Suitable power cabling & Control cabling from the engine to control panel and earthing (as per BIS 3043) with inter locking alarm and indicating lamps etc. complete.	0	No.
	24 V battery with cable , 300 lit single walled tank , 10 lit oil , 30 lit coolant	1	No.
6.0	Design, Manufacture, Assembly, Supply, installation, testing & commissioning of **electric power distribution cum control panel** as per BIS & as per requirement for the operation of the pumps along with the Suitable power cabling & Control cabling from the pumps to control panel and earthing with inter locking alarm and indicating lamps etc for electric pump & jockey pump complete.	2	No.

	Provide the necessary Power and Controls for motor driven pump sets, diesel engine driven pump set, jockey pump sets, booster pump sets, pressure switches and other controls as required for running of the system as per fire norms		
	The jockey pump sets shall have facility for automatic starting and stopping as well as manual starting and stopping.		
	The main motor driven pump set, the diesel engine driven pump set shall have facility for automatic starting and manual starting but only manual stopping.		
	The booster pump sets shall have facility for automatic and manual starting but automatic stopping.		
	The water tanks of the fire water pump and the booster pump shall be annunicated for water level and low water level shall be annunciated in the PDB as well as in the fire alarm panel.		
	Two pressure switches will be provided for the jockey pump set for individual setting for start and stop. One pressure switch shall be provided for the other pump sets for starting.		
	Inter locking alarm and indicating lamps etc. for electric pump & jockey pump complete to be provided and included by the Contractor in this scope.		
	The panel shall be suitable for floor mounting type with cable entry from the top.		
	The panel shall be complete with all accessories to provide power and control to the Main Motor Driven Pump set, Diesel Engine driven pump set and jockey pump set as well the power and control to the booster pump sets. In addition, key lockable pushbuttons to be provided as required by the authority having jurisdiction, the electrical inspectorate and also for the remote stopping and starting of the booster pump sets.		
	The panel shall be minimum rated for IP 55 and a 2 mm thick CRCA sheet steel canopy shall be provided over the panel, extending at least 300 mm on all sides in order to avoid any inadvertent entry of water into the panel.		
	Provide the necessary dual Earthing System for the entire system and terminate in the Earthing Station provided by Client.		
	The type of panel should be front afront access only.		
	The panel manufacturer to be CPRI approved.		

	Power & control Cable, earthing, cable trays, etc. complete inside the pump house. The cables shall be of FRLS PVC / XLPE type with copper / Aluminium multi-stranded conductor and armoured type. Cables to the motors shall be minimum 3 1/2 core type. The cable trays shall be of GI prefab / hot dipped galvanised type along with cover plates, couplers, coupling guards, brackets, inside and outside bends, tees, etc. complete. The earthing shall consist of minimum 50 mm x 6 mm thick GI strips connecting independently to both sides of each electrical item like motor, PDB, etc. and led to the client's earthing station which shall be considered 150 m away from the fire water pumphouse.		
	The Electrical Panel shall be powder coated (7 tank process) and suitable for 430 Volts, 50 cycles, 4 wire supply. (Necessary automatic change over switch between multiple power sources will be provided by the client and terminated in this panel.). The panel color shall be Fire Red.		
	The panel shall have separate compartments for bus bar and cable alleys. the following components and accessories shall be mounted within each control panel.		
	Provision of suitably rated MCCBs complete including 0-500 volts 96 x 96 mm square digital electronic voltmeter with selector switches.		
	Digital electronic ammeter of minimum size 96 x 96 mm with working range as required with selector switch.		
	Phase indication lamps through 430 / 110 V PT, primary & secondary of PTs shall be protected by 2 amps SP MCB for all motors individually.		
	Aluminium bus bar sleeves type, suitably rated for three phase & neutral phase bus bar shall have maximum current density of 1 amps per sq.cm. and the neutral bus bar of not less than 50% capacity		
	Outgoing TPN MCCB for main pump suitable for Star Delta starting, Jockey pump sets, booster pump sets suitable for DOL starting, spare 15 A MCB etc. The compartment shall contain CT operated digital electronic ammeter of suitable range with selector switch and indicating lamps with MCBs for ON/OFF TRIP status of motor.		

	All terminals shall be properly shrouded including the bolted terminals so that inadvertent contact with the terminals can be avoided.		
	Necessary rubber mats, wooden board etc. shall be provided as per the electrical statutory requirements.		
	Remote indication of pump starting, pump fails to start, etc. shall be annunciated by client in their fire alarm / BMS system. For this, necessary potential free relay contacts to be available and pump set bidder to indicate such features available in his tender document.		
	Instrumentation		
7.0	Supplying, installing, testing and commissioning of pressure gauges, glycerine filled with SS siphon tube, globe valve and cock 150mm dial, range - 0 to 20 kg/cm2 complete with all fittings.	14	Nos.
	Of make, size and MOC as listed part of the FM approved Alarm Valve, Deluge Valve, pump sets etc. is preferred. Alternatively makes are otherwise indicated.		
8.0	Supplying, installing, testing and commissioning of pressure switches suitable for with the maximum pressure rating at least twice the normal working pressure rating of the pipeline with tubing, isolation stop cock etc. complete.	8	Nos.
9.0	**Suction & Delivery Piping**		
	Supplying, installing, testing and commissioning of piping GI pipe as per IS 3589 6.3mm thick Gr. Fe 330 / IS 1239 Class C, heavy grade complete with grooved fittings, supports, painting, etc. complete.		
	All fitting connections shall be grooved fittings.		
	Grooved fittings shall be of DI rolled grooved type which shall be UL Listed / FM approved including the grooved components of Tees, Bends, reducers, Flow Switch Connections, Alarm Valve Connection, etc. complete. Sprinkler connections shall be of grooved, forged, threaded connection as required.		
	All companion flanges and dummy flanges to be of M.S Butt-welded of MOC Carbon Steel as per ASTM A 105N, class 150 / 300 respectively with dimensions as per ANSI B 16.5. Companion flanges to be of Slip on, Flat face type.		
	All gaskets shall be EPDM construction dimensioned to ANSI B16.5.		

	All bolts and nuts to be to ASTM A 193 Gr. B7 and ASTM A 194 Gr. 2H respectively		
	Coating and wrapping shall consist of 4 mm of single wound of tape or 2 wounds of 2 mm thickness of tape as per IS:10221 complete with primer, surface preparation etc.		
	All anchor fasteners to be of GI finish of Sleeve bullet (Flush type) / Stud type. Chemical anchor fasteners as required for brick work to be supplied and installed. Anchor fasteners dimension to consider the loading, surface finish depth etc. Setting tool from the anchor fastener manufacturer, drill bit of the proper size, etc. should be used at site.		
	Surface protection shall be ensured by cleaning the surface of pipes thoroughly of rust, scales, dust etc. Then two Coats of red oxide zinc chromate primer of not less than 70 DFT total with 2 coat of synthetic enamel paint of fire red colour with not less than 50 DFT total to be applied.		
	Underground pipes shall be buried with top of pipe minimum 1 m below the finished ground level.		
	For all the systems the headers and drain pipes have to be accommodated within the ducts for which suitable planning and materials to be done by the Contractor		
	Where necessary, the pipes shall be laid below the flooring with necessary protection.		
10.0	**ABOVE GROUND PIPING PASSING ALONGWITH THE WALL**		
a	300mm NB	30	RMT
b	250mm NB	0	RMT
c	200mm NB	24	RMT
d	150mm NB	50	RMT
e	100mm NB	0	RMT
f	80mm NB	20	RMT
g	65mm NB	30	RMT
h	50mm NB	0	RMT
i	40mm NB	0	RMT
j	32mm NB	0	RMT
k	25mm NB	24	RMT
11.0	**UNDERGROUND PIPING WITH COATING AND WRAPPING / WALL PENETRATION.**		
a	200mm NB	0	RMT
b	150mm NB	0	RMT

c	65mm NB	0	RMT
12.0	**DIESEL ENGINE EXHAUST WITH SUITABLE INSULATION CLADDING ETC. SIZE SUITABLE FOR EXTENDED LENGTHS OF EXHAUST. THE DIAMETER INDICATED HEREIN IS ONLY INDICATIVE AND TO BE CONFIRMED WITH THE DIESEL ENGINE MANUFACTURER. THE EXCAUST TO BE TAKEN THROUGH SHAFT UPTO THE TERRACE AND SHOULD BE EXTENDED FOR ONE AND HALF MTR. ABOVE THE TERRACE LEVEL.**		
a	200mm NB	100	RMT
13.0	**VALVES AND MECHANICAL EQUIPMENT PARTICULARS (SPEC APPLICABLE FOR ALL WATER BASED FIRE PROTECTION SYSTEM UTILISING ONLY PLAIN WATER AND FOAM SOLUTION LINE)**		
	Valve selection shall be as follows: - Valves of nominal dia up to and including 50 mm dia – Globe valve and ball valve - Valves of nominal dia 65 mm and above – Butterfly valve and OS&Y valve for above ground piping application. - Valves of nominal dia 65 mm and above - Gate valve with indicator post for underground piping application.		
	Butterfly valves shall be adopted preferably for places with space restriction like inside the building. Otherwise, OS&Y valves are preferable.		
	The valve shall be angled and installed suitably at site to enable easy operation.		
	Bronze Globe Valve shall be of screwed type with female ends, inside screw, rising stem, handwheel operated, rated for minimum working pressure of 16 kg(f)/sq.cm and 24 kg(f)/sq.cm, to Indian Standards		
	Isolation valve of OS&Y type suitable for working pressure of working pressure of 16 kg(f)/sq.cm and 24 kg(f)/sq.cm minimum with matching flanges, chain and lock complete.		

	Isolation valve of Butterfly valve type to be of Wafer type design, suitable for working pressure of working pressure of 16 kg(f)/sq.cm and 24 kg(f)/sq.cm. Valves of sizes 150 mm nominal dia and below to be provided with throttling lever and valves for sizes above 150 mm nominal dia to be of gear operated type. Matching Drilling flanges to ANSI B 16.5 class 150 / 300 respectively. The valves to be UL Listed / FM approved where suitable Indian valves are not available.		
	The butterfly valves and OS&Y valves shall be provided with a lock and chain with common keys. Tamper switch which shall be UL Listed / FM approved and acceptable to the valve manufacturer shall be quoted as optional.		
	Any variation in the specification to be brought in the tender stage itself.		
13.1	Providing and Fixing of C.I. / D.I. double flanged OS&Y Sluice Valve with matching flanges , PN 16 rising spindle with matching Drilling as per ASA 150 lbs flanges.		
a	300mm NB	0	Nos.
b	250mm NB	0	Nos.
c	200mm NB	4	Nos.
d	150mm NB	8	Nos.
e	100mm NB	0	Nos.
f	80mm NB	2	Nos.
g	65mm NB	4	Nos.
13.2	Providing and Fixing of D.I. double flanged OS&Y Sluice Valve with matching flanges , PN 24 rising spindle with matching Drilling as per ASA 300 lbs flanges.		
a	150mm NB	5	Nos.
b	80mm NB	2	Nos.
13.3	Design, Manufacture, Assembly, Supply, installation, testing & commissioning of D.I. non return valves PN 24 rating with matching flanges as per IS specifications. Drilling as per ASA 150 lbs / 300 lbs flanges.		
a	150mm NB	5	Nos.
b	80mm NB	2	Nos.
c	50mm NB	0	Nos.

13.4	Design, Manufacture, Assembly, Supply, installation, testing & commissioning of D.I. non return valves PN 24 rating with matching flanges as per IS specifications. Drilling as per ASA 150 lbs / 300 lbs flanges.		
a	150mm NB		Nos.
b	50mm NB		Nos.
13.5	Design, Manufacture, Assembly, Supply, installation, testing & commissioning of D.I. pressure relief valves PN 24 / 300 psi rating with matching flanges as per IS specifications. Drilling as per ASA 300 lbs flanges.		
a	150mm NB	2	Nos.
b	80mm NB	0	Nos.
c	65mm NB	0	Nos.
13.6	Design, Manufacture, Assembly, Supply, installation, testing & commissioning of ball type Foot valve with strainer as per specification suitable for the pump set manufacturer.		
a	300mm NB	2	Nos.
b	100mm NB	2	Nos.
13.7	Providing and Fixing of Strainers on the delivery line shall be of "Y" type / basket type suitable for the specification below.		
	The material of construction shall be as per ASTM A 351 Gr. CF8M with SS316 screens of maximum 5 mm perforations. Flanges to be to ANSI B 16.5 Class 300. The strainer shall be hydrotested to a pressure of 30 kg(f)/sq.cm.		
a	250mm NB	1	Nos.
b	200mm NB	2	Nos.
c	100mm NB	1	Nos.
13.8	Providing and Fixing of Brass chrome plated Ball Valve, suitable for seat working pressure of minimum 24 bars, threaded, quarter turn, lever operated.		
a	50 NB		Nos.
b	40 NB		Nos.
	25 NB	10	

14.0	Providing and Fixing of Capacitance type level / float operated level transmitter / switch complete with level indicator / ultrasonic level transmitter respectively suitable for water upto maximum temperature of 50 deg C complete with rod type / rope type / float probe suitable for tank depth upto 3 m for annunciation of levels of makeup water tank, fire water tank and booster tank complete with mounting flanges, stilling basin, cabling, etc. and connected to the power distribution board.	3	sets
15.0	Providing and laying of Cables - FRLS, PVC / XLPE outer sheath, armoured, multi strand, copper / aluminium conductor cables complete with glands, ferrule etc. complete.	1	LOT
a	1C X 4 sq.mm copper armoured Cable	25	Mtr.
b	2C X 1.5 sq.mm copper armoured Cable	360	Mtr.
c	2C X 2.5 sq.mm copper armoured Cable	25	Mtr.
d	3C X 2.5 sq.mm copper armoured Cable	576	Mtr.
e	3C X 240 sq.mm Al. armoured Cable	145	Mtr.
f	4C X 2.5 sq.mm copper armoured Cable	36	Mtr.
g	4C X 6 sq.mm copper armoured Cable	480	Mtr.
16.0	Providing and Fixing of Interconnection to the existing priming tank of all the pump sets complete	1	lot
17.0	Providing and Fixing of Cable tray of suitable width in GI MOC Complete with top cover, structural supports, coupler plate, anchor fastener, hat clamp, etc complete.	500	mtr
18.0	Providing and Fixing of Structural supports.	500	kg
19.0	Providing and Fixing of Structural steel for the purpose of rectifying the access to shafts etc.	6000	kg

2. SCHEDULE OF QUANTITY FOR HYDRANT SYSTEM			
Sr No.	**Item**	**Qty.**	**Unit**
(A)	**(B)**	**(C)**	**(D)**
	Supply, Installation, Testing and Commissioning (SITC) of the following:		
1.0	GI ERW pipe as per IS 1239 heavy gauge upto 150 mm dia and as per IS 3589 6.3mm thick FE330 grade above 150 mm dia complete with grooved fittings, supports, fire resistant silicon epoxy coating etc. complete as per drawing.		
a	150 mm	500.0	R.M
b	100 mm	60.0	R.M
c	80 mm	60.0	R.M
2.0	GI ERW as per IS 1239 heavy gauge upto 150 mm dia and as per IS 3589 6.3mm thick FE330 grade above 150 mm dia complete with grooved fittings, supports, coating and wrapping etc. complete / wall penetration.		
a	150 mm	12.0	R.M
b	100 mm	48.0	R.M
c	80 mm	60.0	R.M
3.0	D.I. OS&Y Sluice Valve, grooved type. The pressure rating should be PN 16 rising spindle. For Riser.		
a	150 mm	4.0	Nos.
4.0	D.I. OS&Y Sluice Valve, grooved type. The pressure rating should be PN 24 rising spindle. For Riser.		
a	150 mm	2.0	Nos.
5.0	External & Internal Hydrants		
	63mm Dia. Oblique type double headed GM Hydrant valve with female type instantaneous coupling including rubber gasket, nuts, bolts, washers etc. with matching flanges as per IS 5290 complete. along with pressure relief arrangement.		
a	Yard Hydrant at the Mushroom openings	8.0	Nos.
b	Internal Hydrant for the basement	20.0	Nos.

	63mm Dia. Oblique type single headed GM Hydrant valve with female type instantaneous coupling including rubber gasket, nuts, bolts,washers etc. with matching flanges as per IS 5290 complete. along with pressure relief arrangement.		
a	Fire Escape Hydrant (Internal)	30.0	Nos.
6.0	FRP hose boxes suitable for storing 2 Nos. hoses and 1 No. GM branch pipe, hose boxes shall be made of fibre & duly painted with two coats of Fire red colour from outside & white from inside with locking arrangement & front glass		
a	Yard Hydrant	8.0	Nos.
b	Internal Hydrant	20.0	Nos.
c	Fire Escape Hydrant (Internal)	50.0	Nos.
7.0	63mm Dia. RRL type fire hoses 15 m long as per IS 636 Type A with female and male SS coupling.		
a	Yard Hydrant	16.0	
b	Internal Hydrant	40.0	
c	Fire Escape Hydrant (Internal)	100.0	Nos.
8.0	Hose reel drum units with 20mm dia hoses 30m long and 19 mm shut off nozzle complete with fixing brackets etc. complete.	50.0	Nos.
9.0	GM Short pattern Branch pipe With nozzle.	78.0	Nos.
10.0	Air Release Valve 25 NB.	4.0	Nos.
11.0	Structural steel for supports standard as per IS 808.	1000.0	Kg.
12.0	Blind Flange of MS		
a	150 NB	4.0	Nos.

3. SCHEDULE OF QUANTITY FOR SPRINKLER SYSTEM

Sr No.	Item	Qty.	Unit
(A)	**(B)**	**(C)**	**(D)**
	Supply, Installation, Testing and Commissioning (SITC) of the following:		
1	GI ERW pipe as per IS 1239 heavy gauge upto 150 mm dia and as per IS 3589 6.3mm thick FE330 grade above 150 mm dia complete with grooved fittings, supports, fire resistant silicon epoxy coating etc. complete as per drawing.		

a	200 NB	0	Mtrs.
b	150 NB	350	Mtrs.
c	100 NB	1,554	Mtrs.
d	80 NB	1,110	Mtrs.
e	65 NB	1,200	Mtrs.
f	50 NB	1,500	Mtrs.
g	40 NB	1,200	Mtrs.
h	32 NB	6,500	Mtrs.
i	25 NB	5,000	Mtrs.
2	D.I. OS&Y Sluice Valve, grooved type. The pressure rating should be PN 16 rising spindle.		
a	150mm NB	0	Nos.
3	D.I. OS&Y Sluice Valve, grooved type. The pressure rating should be PN 24 rising spindle. For Riser.		
a	150mm NB	6	Nos.
4	D.I. double flanged butterfly Valve, with matching flanges , PN 16 with matching Drilling as per ASA 150 lbs flanges complete.		
a	100 NB	200	Nos.
6	Wet type Sprinkler Installation Alarm Control Valve 14 bar and 10 bar rating with matching grooved flanges, complete with test and drain vaves, water motor gong , Bypass arrangement, pressure gauges etc. complete.		
a	150 NB	4	Nos.
7	Upright Sprinklers K=80, TEMP=68deg C Chrome finish, Standard Response, UL Listed / FM approved.	3,150	Nos.
8	Pendent Sprinklers K=80, TEMP=68deg C Chrome finish, Standard Response. UL Listed / FM approved.	3,000	Nos.
9	Pendent Sprinklers K=80, TEMP=68deg C Chrome finish, Standard Response. UL Listed / FM approved. **For Auditorium.**	50	Nos.
10	Extended Coverage Horizontal Sidewall Sprinkler TEMP=68deg Chrome finish, Standard Response. UL Listed / FM approved.	100	Nos.
11	Rosette Plate from the original sprinkler manufacturer, chrome finished, UL Listed / FM approved.	2,500	Nos.

12	Flow Switch.	200	Nos.
13	Flexidrop SS, 1.5m long, braided type, FM approved.	2,500	Nos.
14	System Test Connection for sprinkler piping with sight glass and 25 mm dia ball valve complete.		
a	Ball Vale - 25 Nb	500	Nos.
b	Sight Glass - 25 Nb	300	Nos.
15	System Flush Connection for sprinkler piping with coupling & ball valve 50NB as applicable.		
a	Ball Vale - 50 Nb	500	Nos.
b	Sight Glass - 50 Nb	300	Nos.
16	Supplying, installing, testing and commissioning of pressure gauges, glycerine filled with SS siphon tube, globe valve and cock 150mm dial, range - 0 to 24 kg/cm2 complete.	200	Nos.
17	Structural steel for supports	4,000	Kgs.

4. TESTING OF EXISTING SYSTEM INTEGRATE TO THE NEW SYSTEM FOR MAKING FUNCTIONAL BENEFITS

Sr No.	Item	QTY.	Unit
(A)	(B)	(C)	(D)
	Cost of material and labour charges for following items:		
1	Providing P.O. Red colour Paint, and rectification of supports, providing pipe identification etc. complete in pump room.	1	Lot
2	Fire Brigade Breeching connection complete with NRV etc.in hydrant system to be replaced with latest BIS standard.	1	Nos.
3	Radiography testing of 10% of existing hydrant and sprinkler pipe joints in hydrant system/and sprinkler joints.	1	Lot
4	Core cutting on the walls / roof for proper installation of pipes. The core cutting shall have minimum 25 mm annular gap on all sides. The pipe sizes are indicated below in sprinkler system		
a	200mm NB	20	Nos.
b	150mm NB	30	Nos.
c	100mm NB	20	Nos.
d	80mm NB	10	Nos.

e	65mm NB	10	Nos.
f	50mm NB	10	Nos.
5	Painting, rectification of supports, providing pipe identification etc. complete in sprinkler system	1	Lot
6	Pneumatic testing of all existing sprinkler branch lines of all floors at 4 bars pressure for not less than 3 hours to confirm no loss of pressure. Bringing to site the air compressor, installation of tap off valves etc. included in scope (sprinkler system)	22	per floor
7	Setting right the system complete including existing system complete in all aspects in fire alarm system, Only Labour Charges	22	per floor

5. SCHEDULE OF QUANTITY FOR PROPOSED PUMP HOUSE CONSTRUCTION

Sr No.	**Item**	**QTY.**	**Unit**
(A)	(B)	(C)	(D)
1	Providing and laying in situ water proof cement concrete m-25 of trap/ granite/ quartzite/ gneiss metal for r.c.c.work in beam, column, foundation like raft, grillages, strip foundation and footings of r.c.c columns and steel stanchions including bailing out water plywood/steel formwork, compaction , curing and roughening the surface if special finish is to be provided finishing. Uneven and honeycombed surface with c.m. 1:3 of sufficient minimum thickness to give smooth and even surface etc. Complete (excluding reinforcement and structural steel including cover block). The cement mortar 1:3 plaster is considered honeycombed for rendering uneven and surface only. Newly laid concrete shall be covered by gunny bag, plastic, tarpaulin etc. (wooden centering will not be allowed)	10	CUM
	BRICK LAYER		
	Note:		
	1) ordinary clay bricks of any brand conforming to IS 1077 shall be used. Crushing strength shall not be less than 35 kg/sq.cm. and its water absorption shall not be more than 25% for bricks used in panel walls and 20% for load bearing walls. Tolerances in dimensions of bricks shall be allowed only in conformity with I.S. 1077.		
	2) All 230 mm brick masonry shall be plumb from out side and done with scaffolding.		

	3) For wall surfaces of brick partitions (rates of which includes cost of plaster on both sides), if dado or skirting is provided at such places, deduction for cost of corresponding plaster item will be made.		
2	Brick masonry, first sort in cement mortar 1:5 in partition walls 110mm thick including M25 R.C.C. stiffner 10 cm X 11 cm with 2 No. M.S./HYSD(tor) bars 10 mm dia. and 6 mm dia M.S. binders at 15cm c/c plastered on all exposed surfaces with cement sand plaster 20 mm thick (1:4), finished with neat cement or neeru and with 3 coats of white or colour wash, complete as directed and specified. Partition walls between rooms shall have one horizontal stiffener at about 1.5 m height. In dwarf Partition walls of kitchens, W.C.s bath-rooms and galleries instead of stiffener at 1.5 m height, one horizontal stiffener shall be provided at top and one vertical stiffener on outer edge of the wall shall be provided as directed. Steel shall not be paid separately AND without plaster but with cement pointing (1:2) on both sides and without 3 coats of white or colour wash complete, including finishing smooth exposed surfaces of R.C.C. stiffeners if provided.	56	SQ.M
3	Providing **internal plain** faced plaster 20 mm thick internal faces for using kharsalia/kasaba or similar type of sand, in all positions including base coat of 15mm thick in c.m. 1:4 using waterproofing compound at 1kg per cement bag curing the same for not less than 3 days and keeping the surface of the base coat rough to receive the sand faced treatment 6 to 8mm thick in c.m. 1:4 finishing the surface by taking out grains, making grooves and curing for fourteen days scaffolding etc complete	56	SQ.M
4	Providing **sand faced plaster for** external portion in cement mortar using kharsalia/kasaba or similar type of sand, in all positions including base coat of 15mm thick in c.m. 1:4 using waterproofing compound at 1kg per cement bag curing the same for not less than 3 days and keeping the surace of the base coat rough to receive the sand faced treatment 6 to 8mm thick in c.m. 1:4 finishing the surface by taking out grains, making grooves and curing for fourteen days scaffolding etc complete	56	SQ.M
Note : Rates of all the items in painter are inclusive of staging or scaffolding wherever necessary for any height.			
5	Providing and applying 3 coats of waterproof cement paint of approved manufacture and of approved colour to the new plastered surfaces including scaffolding if necessary, cleaning and preparing the surface watering for two days complete.(sample and brand is to be got approved from ex. Engineer before use)	111	SqM

6	Providing and fixing in position **tmt bar reinforcement of** various diameters for r.c.c. pile caps, footing, foundations, slab, beams & columns, canopies, staircase, newels,chajjas, lintels, pardies, coping, fins, arches etc. As per detailed design & drawings and schedules including cutting, bending, hooking the bars, binding with wires or tack welding and supporting as required complete.	1	M.T.
7	Scaping old surface, The surface must be thoroughly cleaned and prepared. Remove all loose particles, dirt, dust, laitance, and mould release agents, curing compounds, oils, grease, floor hardeners and any waterproofing materials for best results. Remove laitance, dirt and dust by mechanical scarification such as wire brushing, scrapping, scabling or grit blasting. Clean the dust by pressurized air or by washing with water. Oil and grease should be removed by degreasing with solvents like turpentine or thinners. V isible signs of mould growth should be removed & treated with a fungicidal solution. New concrete must be cured completely.	20	SqM
8	Providing and fixing MS Rolling Shutter in position manually operated with all accessories including Transportation etc complete	15	Sq.m

6. SCHEDULE FOR QUANTITY FOR BUY BACK				
Sr No	**Item**	**Qty.**	**Unit**	**MODEL**
(A)	**(B)**	**(C)**	**(D)**	**(E)**
	The bidder is provided with the brief particulars of existing materials at site. The successful bidder as part of his execution plan is expected to identify, inform the client, obtain the dismantling and commercial clearances, dismantle, pack, cleanup the area, etc. complete in all respects.			
	Any statutory, pollution control certificate etc. if required to be handed over to the client to be furnished by the successful bidder			
	Disposal of materials shall be done at suitable distance / location as authorised by client / statutory / governmental authorities			
1	**Diesel Driven Pump.**			
	Diesel Driven Pump common for hydrant and sprinkler system, Multi stage, Multi outlet-Split Casing type, capable of delivering 137 cum/hr., 135 mwc, 169 Hp, 1500 Rpm Make - Mather+Plate Pump Ltd.	1	No.	Engine: 4YDC MK3 Sr No: 14320460504
2	**Motor Driven Pump**			

	Electric motor driven fire water pump, Multi stage, Multi outlet-Split Casing type, capable of delivering 137 cum/hr., 135 mwc, 125 Hp, 1470 Rpm Make - Mather+Plate Pump Ltd.	2	No.	8/20/303/10/2 ,3 Model:C250H
3	**Jockey Pump**			
	Electric motor driven fire water Jockey pump, Multi stage, Multi outlet-Split Casing type, capable of delivering 10.8 cum/hr., 131 mwc, 11 Hp, 2920 Rpm Make - Mather+Plate Pump Ltd.	1	No.	8/20/306/10/2 Model:ACH 12A
4	Existing pump to be dismantled and taken out. Dismantling should be done after synchronizing the new pumps to be brought to the site and after proper planning.			
4.1	Diesel Driven Pump existing online pump to be dismantled and taken out. Dismantling should be done after synchronizing the new pumps to be brought to the site and after proper planning.			
	Diesel Driven Pump stand by hydrant pump. Multistage, Multi outlet -Split Casing 90.84 cum/hr.	1		
4.2	**Motor Driven Pump**			
	Motor Driven Pump (Hydrant High Level),Multistage, Single outlet -Split Casing,141.94 cum/hr	1		
	Motor Driven Pump (Hydrant Low Level) End Suction,141.94 cum/hr.	1		
	Motor Driven Pump (Sprinkler System) End Suction,141.94 cum/hr.	1		
4.3	**Jockey Pump**			
	Electric motor driven fire water Jockey pump, End Suction, capable of delivering 10.8 cum/hr..	1		

Section: 04

CLEAN AGENT EXTINGUISHING SYSTEM

Section: 4.1

PARTICULARS OF PRESENT SYSTEMS PROVIDED

4.1 CLEAN AGENT FIRE PROTECTION SYSTEM

The details of the existing clean agent fire protection are as follows:

Clean Agent fire protection system consisting of FM200 42 bar systems have been provided for the Server Rooms.

The same consists of cylinders, piping, nozzle and actuator.

The same are in different stages of completion.

Further, the site has cylinders – partially and fully filled of FM200, Halon 1301 cylinders as well.

The successful contractor shall secure and remove the cylinders and systems.

4.2 AIR SAMPLING SYSTEM

Air sampling system has been provided for the server rooms as an additional method of detection system.
The same consists of tubes connected to their respective air sampling system panels.
The systems are in different stages of completion.

Section: 4.2

THE REFURBISHMENT OF CLEAN AGENT EXTINGUISHING SYSTEM

1.0 Scope

The Scope of works included design, manufacture, Supply, erection, Testing and Commissioning of the inert gas fire suppression system with constant flow technology and using IG55 as extinguishing agent. The work described in this specification includes all engineering, labor, materials, equipment, commissioning and services required to install and test the clean agent fire suppression and control system.

2.0 Applicable codes and standards

The bidder shall supply, Install, Test and put in operation Inert Gas Fire Suppression system. The Fire suppression system shall include and not limited to Gas release control panel, Peso approved Seamless Cylinder, Valve, with Solenoid, Pneumatic actuator, discharge hose flexible connector, check valve, and all other accessories. All components including the seamless cylinder shall be UL Listed and FM approved along with System.
The System design should be based on the specifications contained herein. The bidder shall confirm compliance with the specification along with their bid.
The System shall be filled & supplied by UL listed OEM manufacturer & having PESO approved filling station along with the UL & FM approval for filling station, The bidder should submit the document with their bid.
The design, installation, operation, testing and maintenance of the Inert gas System must be in accordance with, but not necessarily limited to, the recommendations of applicable requirements set forth in the latest editions of the following standards:
NFPA 70 National Electric Code latest
NFPA 72 National Fire Alarm Code latest
NFPA 2001 Standard on Clean Agent Fire Suppression Systems code latest
National Building Code of India Part 4 Fire and Life Safety code latest
IS 15493: 2004 Gaseous Fire Extinguishing system – General Requirements
Petroleum Explosive Safety organization (PESO)
15506 : 2004 Gaseous fire extinguishing systems — IG 55 extinguishing systems
15525 : 2004 Gaseous fire extinguishing systems — IG 100 extinguishing systems
The standards and requirements listed, as well as all other applicable codes and standards, must be used as “minimum” safety precaution standards.

3.0 Requirements

The suppression system installation shall be made in accordance with the drawings, specifications and applicable standards. Should a conflict occur between the drawing and specifications, the specifications prevail. The fire suppression system shall be designed to ensure both operational continuity and protection of sensitive equipment. The preferred suppression technologies clean agent extinguishers should be available throughout protected areas. These systems shall be effective in suppressing fires without leaving any residue, making them safe for electronic and electrical installations. All critical areas as listed here, must be covered

comprehensively by the fire suppression system The suppression agents should be ozone-friendly and compliant with international environmental norms. The recharge process must be easy, with minimal downtime, and the equipment should be easy to test periodically. An early warning fire detection and suppression system shall be integrated with the fire alarm and Building Management System (BMS) for real-time monitoring and response. The system shall be engineered to offer reliable and quick suppression to minimize damage and downtime.

A. Quality assurance

1. Manufacturer

a. The valves, cylinders, regulators, gasket, pressure gauge, release devices, reset tool for release device, adapters, pilot hoses, discharge hoses, bleed valve, check valve, manifolds and manifold components, nozzles, and other components of the UL LISTED INERT GAS system shall be supplied by OEM or one of its direct representatives.
b. The name of the brand or the OEM logo shall appear on all major components (valves, regulators, pneumatic actuators).
c. All devices, components and equipment shall be approved by OEM
d. All devices, components and equipment shall be new, standard products of the manufacturer's latest design and suitable to perform the functions intended.
e. OEM should have UL & FM approved Filling station in India & shall submit the documentary proof against it along with bid.

2. Installer

a. The Bidder contractor shall be trained by the supplier to design, install, test and maintain fire suppression systems and be in possession of the corresponding training certificate.
b. The Bidder contractor shall be an experienced firm regularly engaged in the installation of inert gas, or similar, fixed installation systems in strict accordance with all applicable codes and standards.
c. The contractor shall specifically prepare plans according to the common standards and easily reproducible. These plans will show the quantity, location, and marking of all system components. Included shall be a description and routing of all tubing. Care should be taken to locate all agent storage containers as close to the protected area as possible.
d. The Bidder contractor shall show proof of emergency service available 24 hours a day, 7 days a week.
e. The Bidder contractor shall be an authorized stocking distributor of the IG 55 system equipment so that immediate replacement parts are available from inventory.
f. The Bidder contractor shall provide the project specific authorization letter mentioning the project details from the OEM

3. Submittals

a. The Bidder contractor shall submit the drawings, calculations and system component data sheets described below for approval to the local fire prevention agency, owner's insurance underwriter, and all other authorities having jurisdiction before starting installation. Submit approved plans to the architect/engineer for record.
   1- Working plans indicating detailed layout of the system, locating each component (e.g. agent storage containers, nozzles, pipe runs, including pipe sizes and lengths, electrical control

panel(s) and associated devices) with an appropriate scale (typically 1:100, 1:50, 1:25). Control diagrams, wiring diagrams, written sequence of operation or cause and affect matrix along with battery calculations shall be included. Refer to NFPA 2001.

2- Separate layouts, or drawings, shall be provided for the mechanical and electrical work in the protected enclosure as well as on any floor and ceiling voids.
3- Product data for each piece of equipment used in the system.
4- Complete hydraulic flow calculations derived from the approved software and verified by Underwriters Laboratories (UL) shall be provided. Analysis shall include calculations to verify system terminal pressures, nozzle flow rates, orifice code number, piping pressure losses, component flow data, and pipe sizes considering actual and equivalent lengths of pipe and elevation changes. Total agent discharge time must be shown and detailed by hazard. Designers using this software shall be trained and certified by OEM

System requirements

I. System description and operation

A. The fire protection system is a total Flooding UL LISTED INERT Gas fire suppression system with constant flow technology and using IG55 as extinguishing agent. The System is a fixed installation where equipment is designed and installed to provide fire suppression capability for hazards described.

The system shall provide a minimum agent design concentration as 38.5 % in all areas and/or protected spaces at the minimum anticipated temperature, according to the applicable codes and standards.
The system should be designed to discharge 95% of the design concentration within 120 seconds.
System design should consider oxygen concentration, which must be above NOAEL or LOAEL at the minimum operating temperature.
If the protected volume has a floor and /or Ceiling void spaces shall be included in the protected volume. Employing a minimum design concentration not below the main room compartments

The system shall be complete in all ways. It shall include all mechanical, and electrical installation, all detection and control equipment, agent storage cylinders, IG55 extinguishing agent, discharge nozzles, pipe and fittings, manual release and abort stations, audible and visual alarm devices, auxiliary devices and controls, shutdowns, alarm interface, caution/advisory signs, functional checkout and testing, training and all other operations necessary for a functional, UL Listed UL LISTED INERT Gas suppression system for use with IG55.
The centralized system of a station should be designed to protect the rooms from any of the risk (volume wise) in a particular room of a building.
The separate room is required for the installation of clean agent cylinders to cater the risk of the building; the system shall be designed for the largest risk area volume.
The quantity of Clean Agent gas provided shall be sufficient to protect the single largest risk in each building with 100% standby filled up cylinders. The system should have its own storage, distribution piping, nozzles, alarm, and actuation system etc. for each risk area.
Both primary and standby supply shall be permanently connected to the distribution piping through manifold and arranged for easy and auto changeover.
As the system is designed for the largest risk and there are several risks varying in size in particular building, the system shall permit use of required no. of cylinders for any individual risk involved so

that the concentration of gas in that risk does not exceed the design concentration specified in the table below.
Properties of Inert Gas Agents Used as Fire Extinguishing Agent

Name	Formula	NOAE L (%)	LOAE L (%)	Agent Container Charging pressure at 70 deg F (21degC)	Agent Container Charging pressure at 130 deg F (55 deg C)	Design Concentration
IG- 100	N2 –100%	43	52	3236/4061 psig	3773/4754 psig	(*) Design Concentration for the type of clean agent selected shall be in accordance NFPA 2001 Latest Standard
IG-55	N2 –50% Ar -50%	43	52	2962/4443 psig	3300/4950 psig	

(*) Or higher %/quantity of volume as specified by clean agent manufacturer for clean agent system.

IG 55, and 100 are called Inert Gas as per NFPA latest edition.
The agent discharge shall be substantially completed in a nominal 120 seconds for IG 55, and 100. The measured discharge time is the time when the measuring device starts to record reduction of oxygen until the design oxygen reduction level is achieved.
The min. Oxygen concentration shall be maintained after release of clean agent (IG) as per NFPA-2001.

II. Sequence of operation

Automatic operation of each protected area shall be as follows:

A. Actuation of detectors
B. After completion of the time-delay sequence, the UL LISTED INERT Gas fire suppression system shall be discharged, and the following shall occur:

- Shutdown of all power to high-voltage equipment
- Provide a system release indication at the system control panel (initiated from the system pressure switch).
- Illuminate a visual indicator(s) outside the hazard area in which the discharge occurred.
- Energize a "SYSTEM RELEASED" audible device. (Optional)

III. Auxiliary components

A. Depending on local rules, double action manual releasing stations shall be provided at each exit of the protected area and shall, when activated, immediately release the IG55 extinguishing agent and cause all audible/visual alarms to activate. In addition, the activation of the manual releasing stations shall cause immediate shutdown of air and power circuits.
B. Depending on local rules, abort stations shall be provided at each exit of the protected area and shall, when operated, interrupt the discharge of INERGEN agent and emergency power-off functions.
Note: Manual Releasing Station activation shall override any abort station.

Material and equipment

I. General requirements

A. The UL LISTED INERT Gas fire suppression system materials and equipment shall be standard products of the supplier's latest design and suitable to perform the functions intended. When one or more pieces of equipment must perform the same function(s), they shall be duplicates produced by one manufacturer.
B. All devices and equipment shall be listed with UL.

II. Clean agent storage

The extinguishing agent is stored in UL LISTED INERT GAS Agent Storage Cylinder Assemblies. Cylinders are pressurized to an operating pressure of 300 bar at 15°C. The cylinder for vertical installation only is a red-coated steel construction. Each cylinder shall be delivered with a protection cap.

1. Each system shall have its own battery of IG55 cylinders.
2. Systems shall be designed in accordance with the manufacturer's guidelines & shall be PESO approved.
3. Each supply shall be located out of the protected area, on the allotted space.
4. The UL LISTED INERT Gas fire suppression system shall be suitable for applications where the cylinder ambient storage temperature is between -17.8°C to 54.4°C (0°F to 130°F).
5. The 300 bar UL LISTED INERT Gas fire suppression system is available in three capacities. Details are provided in the table below.

Technical data		
Water volume	80 litres	140 litres
External diameter	267 ± 1 mm	360 ± 1 mm
Height	1760± 10 mm	1745 ± 1 mm
Working pressure	300 bar	300 bar
Test pressure	450 bar	450 bar
Material	CrMo-steel	CrMo-steel

Protection cap thread	W80 x 1/11“	W80 x 1/11“

6. The cylinders shall be constructed, tested, and marked in accordance with IS / Peso regulations.
7. A complete traceability system shall be set up and the following documents shall be accessible for all cylinder batch series:
   - Certificate of conformity of manufacture according to Directive.
   - Material test report including results of the material tests, impact tests, bend tests and bursting tests.
   - Hydraulic test report duly sign
   - PESO approval certificate

III. Valve

A. Each Valve shall be approved separately apart from Cylinder.
B. Each cylinder is equipped with a discharge valve.
C. The valve has a forged brass body and a working pressure of 300 bar.
D. Each discharge and filling port of the valve shall be fitted with hexagonal safety nuts for safety purposes during transportation and intended to prevent uncontrolled discharge of a cylinder in the event of accidental system activation. An additional steel protection cap shall be installed to protect the valve.
E. The valve shall have a monitoring port to install a removable pressure gauge to monitor the cylinder pressure (refer to section 3 – V.), or to install a pressure switch. The valve shall have a burst disc with a bursting pressure of 450 bar for protection against overpressure.
F. The valve shall have external connection for release device (refer to section 3 – VI.).
G. The valve is equipped with a discharge port to connect the discharge hose and a port for pilot hose to connect the valve from one cylinder to another.
H. All valves shall be tested against leakage prior to be validated for sales. The Leak rate at 20 bar to 200 bar is 10^{-4} mbar l/s.
I. All valves shall be “π” marked in accordance with Directive EN 2010/35/EU: Transportable Pressure Equipment Directive (TPED) – 2010, and Construction Products Directive 89/106 ECC – CPR as manufactured by OEM
J. All Valve shall be approved PESO certificate with Serial number & also UL listed as manufacturer by OEM

IV. Pressure regulator

A. All valves shall be equipped with a pressure regulator to reduce the discharge pressure to 40-60 bar dynamic pressure.
B. The pressure regulator is made of brass.
C. The pressure regulator has an inlet connection to connect to the valve and an outlet connection to the discharge hose.
D. The pressure regulator has a nominal inlet pressure of 300 bar, and a maximum inlet pressure of 360 bar.

E. All pressure regulators shall be UL listed as manufactured by OEM

V. Pressure gauge

A. Each cylinder/valve assembly shall be equipped with a 300-bar pressure gauge to measure the pressure in the cylinder.
B. The pressure gauge shall have an integrated pressure switch to supervise the loss of pressure in the cylinder.
C. The scale of the pressure gauge must go from 0 bar to 420 bar (0 PSI to 6100 PSI) and shows 5 different pressure zones:
   - From 0 to 260 bar (0 to 3771 PSI): "Recharge" zone
   - From 260 to 295 bar (3771 to 4273 PSI): Red zone
   - From 295 to 341 bar (4273 to 4948 PSI): Green zone
   - From 341 to 350 bar (4948 to 5076 PSI): Red zone
   - Over 350 bar (5076 PSI): "Overcharged" zone
D. All pressure gauges shall be compatible with IG55 extinguishing agent.
E. All pressure gauges shall be UL listed as supplied by OEM

VI. Release devices

A. Release devices are installed on top of each valve.
B. All release devices shall be in conformity with the Construction Products Directive 89/106 ECC – CPR, and VdS and LPCB approved for manual/pneumatic and pneumatic release device as manufactured by OEM
C. Manual/Pneumatic release device:
   a. The manual/pneumatic release device is made of brass and stainless steel.
   b. The manual/pneumatic release device has a working pressure of 300 bar and maximum working pressure of 360 bar.
   c. The actuation force is <150 Newton, and the actuation pressure is min. 21 bar for 300 bar systems.
   d. In the closed position, the release device shall be secured with a safety pin.
D. Pneumatic release device:
   a. The pneumatic release device is made of brass and stainless steel.
   b. The manual/pneumatic release device is made of brass and stainless steel.
   c. The pneumatic release device has a working pressure of 300 bar and maximum working pressure of 360 bar.
   d. The actuation pressure is min. 21 bar for 300 bar systems.
E. Electromagnetic release device:
   a. The electromagnetic release device is made of brass and stainless steel. An additional plastic protection cap is provided.
   a. The electromagnetic release device is operated by an electrical signal (a constant DC voltage of 24V)
   b. The electromagnetic release device shall have a protection class of IP65.

VII. Pilot hose

A. Pilot hoses connect release devices together.
B. Pilot hoses are made of galvanized steel for the connection, oil resistant synthetic rubber for inner layer, high tensile steel wire braided for inserts, and oil resistant and weatherproof synthetic rubber for outer layer.
C. Pilot hoses are available in three different lengths: 400 mm, 500mm, or 700mm.
D. Pilot hoses have a nominal diameter DN6.
E. Pilot hoses have a working pressure of 400 bar and a burst pressure of 1600 bar.
F. All pilot hoses shall be UL listed and VdS approved as manufactured by OEM

VIII. Bleed valve

A. Bleed valve is installed at the end of the pilot line at the last pneumatic release device.
B. Bleed valve is made of brass.
C. Bleed valve has a nominal diameter DN1,5.
D. Bleed valve has a working pressure of 360 bar at 20°C (68 °F) and a closing pressure of 0,7 – 1,5 bar.
E. Bleed valves shall be UL listed and VdS approved as manufactured by OEM

IX. Discharge hoses

A. Discharge hoses are installed to connect the cylinder/valve assemblies to the manifold inlet.
B. Discharge hoses are 400mm long.
C. Discharge hoses are available with two different nominal diameters: DN12 or DN16.
D. Discharge hoses DN16:
    a. Discharge hoses DN16 are made of galvanized steel for the connection, oil resistant synthetic rubber for inner layer, high tensile steel wire braided for inserts, oil resistant and weatherproof synthetic rubber for outer layer.
    b. Discharge hoses DN16 have a working pressure of max. 350 bar, and a burst pressure of 1400 bar.
    c. Discharge hoses DN16 have a bending radius of 180mm.
E. All discharge hoses shall be UL listed and VdS approved as manufactured by OEM

X. Check valve

A. Check valves are installed at the manifold inlet.
B. Check valves have a brass housing, a stainless-steel ball, and a thermoplastic sealing.
C. Check valves have a 300-bar working pressure at 20°C.
D. Check valves shall open at a pressure > 0,1 bar.
E. Check valves shall have a leak rate at 20 bar inferiors to 20 bubbles per minute.
F. All check valves shall be UL listed and VdS approved as manufactured by OEM

XI. Manifolds

A. Manifolds are used to connect several cylinders to the discharge line.

B. Manifolds can only be used with valves with pressure regulator devices.
C. Manifolds are made of galvanized steel through hot dip arrangements.
D. Manifolds have a working pressure of 100 bar, and a test pressure of 150 bar.
E. Manifold can be used to connect from 2 to 20 cylinders together.
F. All manifolds shall be UL tested as supplied by OEM.

XII. Nozzles

A. Discharge nozzles shall be sized to provide flow rates in accordance with system design flow calculations.
B. The discharge nozzles used to control the flow of IG55 extinguishing agent and distribute the agent into the hazard area are made of brass.
C. Nozzles have a 60-bar working pressure at 20°C and a 360° discharge pattern.
D. A nozzle inlet orifice plate shall be included. The orifice size shall be determined by a computerized UL listed flow calculation program.
E. Nozzles shall be permanently marked with the manufacturer's part number. The nozzles shall be threaded directly to the discharge piping without the use of special adapters.
F. Nozzles shall be supplied in quantities sufficient to properly cover the area(s) being protected in accordance with NFPA 2001 and the design requirements.
G. Nozzles shall be of corrosion resistant construction and shall be designed specifically for Inert gas application.
H. Nozzles shall be UL listed, and VdS approved.
I. Each Nozzle sound output shall be below 100 dB at one (1) meter distance.

XIII. Other components

A. Pressure gauge for manifold

a. When using directional valves, pressure gauges shall be used to monitor the discharge pressure in the manifold.
b. The scale of the pressure gauge must go from 0 bar to 400 bar (0 PSI to 5801 PSI).

B. Pressure relief for manifold

a. Pressure relief devices shall be installed to prevent overpressure during discharge.
b. Pressure relief devices have a pre-set pressure of 66 bar at 20°C (957 PSI at 68°F).

C. Pressure and flow detector switch

a. Pressure and flow detector switch shall be connected to the manifold and to a power supply to energize or de-energize electrically operated equipment.
b. Pressure and flow detector switch have an opening pressure of 2 bar.
c. Pressure and flow detector switch have a power source of 400 VAC / 3 A or 24 VDC / 10 A.

D. Monitoring switch

a. A monitoring switch shall be installed on valve actuated by an electromagnetic release device, in order to send a signal when the release device is no longer engaged to valve.
b. The monitoring switch is mandatory according to NFPA 2001, Edition 15.

E. PIPE & FITTINGS

All Piping shall be ASTM A -106 Grade B, schedule 40 Seamless pipes and all fittings shall be ASTM A-105.

System arrangement

I. UL LISTED INERT GAS system

A. The UL LISTED INERT Gas fire suppression system shall be of the engineered, permanently piped, fixed nozzle type with all pertinent components provided by OEM
B. All agent storage cylinders shall be centrally located as vertical, free-standing cylinders with wall and/or floor mounted retaining brackets. A common manifold shall be employed for cylinders.
C. On multiple cylinder arrangements (discharging into a common hazard), one cylinder shall be designated as the master cylinder and employ both the restorable electric and pneumatic manual actuators. All remaining cylinders shall be pneumatically/back-pressure operated from the IG55 agent discharge of the pilot cylinder into the manifold.
D. One master cylinder opens no more than 39 slave cylinders. Additional master cylinder must be used every 39 slave cylinders.
E. Manifolded cylinders shall employ a flexible discharge hose to facilitate installation and system maintenance. Each cylinder on a manifold shall also include an agent check valve installed to the manifold inlet.

II. Flow calculation

Computerized verification of flow calculations shall be submitted for each UL LISTED INERT Gas fire suppression system and include the following data as a minimum:

A. Design Quantity
B. Minimum storage quantity
C. Container pressure
D. IG55-mass in one container
E. Number of containers
F. Actual storage quantity
G. Discharge time
H. Pipe system working pressure
I. Container working pressure
J. Total network volume
K. Nozzle data

➔ VdS Calculation results

III. Agent

A. The agent shall be IG55 extinguishing agent, composed of minimum 50% nitrogen, 50% argon.
B. The agent shall be suitable for use in normally occupied spaces. Agent shall be listed as "Acceptable" on the EPA's SNAP list.
C. In case of the leakage or accidental discharge of the agent, it should be possible to refill the cylinders from UL listed filling station and having valid PESO approved OEM filling station in India.

IV. Caution signs

A. Warning signs shall be attached to all entrance doors of the gas storage room. The warning sign in national language and in English must contain the following information: "DANGER! GAS STORAGE AREA! FIRE PROTECTION SYSTEM UL LISTED INERT GASAUTHORISED PERSONNEL ONLY!".
B. Warning signs shall be attached to all entrance doors of the protected enclosures. The warning sign in national language and in English must contain the following information: "THIS ROOM IS PROTECTED BY A FIRE PROTECTION SYSTEM! LEAVE THE ROOM IMMEDIATELY WHEN ALARM SOUNDS!".

Documentation and testing

I. System inspection and checkout

After the system installation has been completed, the entire system shall be checked out, inspected and functionally tested by qualified, trained personnel, in accordance with the manufacturer's recommended procedures and NFPA standards.

A. All containers and distribution piping shall be checked for proper mounting and installation.
B. All electrical wiring shall be tested for proper connection, continuity and resistance to earth.
C. The complete system shall be functionally tested, in the presence of the owner or his representative, and all functions, including system and equipment interlocks, must be operational at least five (5) days prior to the final acceptance tests/during the acceptance test.
D. The installer must submit to the end user all technical documents giving sufficient information to estimate the hazards and the effectiveness of the inert gas extinguishing system as follows:

- Name of the owner
- Location of the risk
- Drawings of the protected enclosures (minimum scale 1:100).
- Protected risk

- Type, arrangement, surface coverage, performance characteristics and possibly direction of the nozzles
- Pressure drop data for valves and fittings
- Calculation of the required inert gas storage quantity
- Hydraulic calculations including appropriate isometric drawings and length of pipes and pipe diameter (internal diameter; alternatively nominal width and wall thickness; as the case may be, the wall thickness may also be part of the system approval; for individual projects these specifications will then be required only in the event of a deviation)
- Location and size of the storage room including filling pressure, ambient temperature
- Inspection and maintenance instructions, and
- Possible endangerment of the neighborhood or danger from the neighborhood

The drawings shall show actual installation details including all equipment locations (e.g. control panel(s), agent container(s), detectors, alarms, manuals and aborts, etc.) as well as piping and conduit routing details. Show all room or facilities modifications, including door and/or damper installations completed.

II. Training requirements

All qualified personnel who may be expected to inspect, test, maintain or operate the UL LISTED INERT GAS System must be trained and kept adequately trained in the functions they are expected to perform.

III. Operation and Maintenance

Prior to final acceptance, the installing contractor shall provide complete operation and maintenance instruction manuals, four (4) copies for each system, to the owner. All aspects of system operation and maintenance shall be detailed, including piping isometrics, wiring diagrams of all circuits, a written description of the system design, sequence of operation and drawing(s) illustrating control logic and equipment used in the system. Checklists and procedures for emergency situations, troubleshooting techniques, maintenance operations and procedures shall be included in the manual.

IV. Installation

Installation procedures shall be performed in accordance with "The Design, Installation, Operation and Maintenance Manual for UL LISTED INERT GAS Systems", by fire protection personnel – qualified and trained by OEM in accordance with existing regulations, rules and guidelines including requirements of the Governmental and/or Local authority and other regulatory authorities.

V. System inspection

A. During the one-year warranty period, the installing contractor shall provide two inspections of each system installed under this contract. The first inspection shall be at the 6-month interval, and the second inspection at the 12-month interval. Inspections shall be conducted in accordance with the manufacturer's guidelines and the recommendations of ISO 14520 or NFPA 2001.

B. Documents certifying satisfactory system(s) inspection shall be submitted to the owner upon completion of each inspection.

VI. Comprehensive Annual Maintenance Contract:

The maintenance should be carried out as per manufacturers maintenance manual recommendation. The same should be done based on the written document issued by the manufacturer, this document should be submitted to the owner and also to the consultant before starting the work. The contractor is also to submit the concerned forms (form a & b as applicable) to the fire authorities from time to time and should obtain their approvals from time to time**.** It is also required to Employ experienced engineers having through knowledge of the systems revamped and upgraded should be capable of maintaining the systems as required from time to time. The personal should be employed 24/7-365 days without fail. The person will be under the contractor's payroll and strictly follow all government norms.
The bank no way will have any direct responsibility to the personals employed for the discharge of the contractual obligation of the contractor.

1. Payment of CAMC
   i) Prorate basis
   ii) Every quarter (At the end of the quarter)
   iii) CAMC payment will start after defect liability period (After 2 years)
   iv) Since CAMC is comprehensive, no additional payment for replacement of parts and allied equipment's/ components/ machine etc., will be made.

2. Scheduled work to be carried out for each system
   i) Periodicity of visit (system wise)
   ii) Work to be carried out (brief description)
   iii) Items which are not supplied by contractors, but only installation done by contractor should also be maintained. It should be included in CAMC. This means that the final system maintenance will be the sole responsibility of the vendor irrespective of the product supply.

3. Down Time Period of System
   i) Down Time Period should not be more than 24-48 hours.

Start time: Call reported by telephone/ Fax/ Mail
End time: System in operational condition, critical system i

4. **Penalty clause**:
   i) If the services are not satisfactory, penalty of 1% per week which shall be limited to maximum 5 % of the CAMC value will be imposed or deducted from contract amount.

ii) If contractor unable to repair or maintain the system as per maintenance manual, penalty of 1% per week which shall be limited to maximum 5 % of work will be imposed.
iii) If down time of the system is more than stipulated period
iv) If fails to repair or maintain then Bank at risk and cost of contractor will get it repaired, by engaging other contractor. The cost involved will be deducted plus penalty.

5. CAMC Agreement: Separate CAMC Agreement will be executed as per Bank's standard CAMC format.

VII. Warranty

The UL LISTED INERT Gas fire suppression system shall be warranted for parts and workmanship for not less than a period of Two (2) year from the date of installation. The contractor shall specify the maintenance to be performed during the warranty period to maintain warranty conditions. Five years CAMC also be included.

BILL OF QUANTITIES

1. SCHEDULE OF QUANTITY FOR CLEAN AGENT SYSTEM			
Sr No.	**Item**	**Qty.**	**Unit**
(A)	**(B)**	**(C)**	**(D)**
	Areas catering to Clean Agent System:		
	Old Server & Electrical Room, 13th Floor		
	UPS Room & battery Room, Basement		
	Battery & UPS Room, 20th Floor		
	Other Requirement		
	13th Floor		
1	140L Cylinder / Valve Assembly + Protec. Cap / IG / Cyl. PESO / 300 Bar / FILLED IG 55 / UL / FM	10	Nos
CYLINDER MOUNTING BRACKETS			
2	Wall mounting rail / Single row / 3 Cylinders L = 940 mm	1	Nos
3	Wall mounting rail / Single row / 4 Cylinders L = 1240 mm	2	Nos
4	Outer bracket / galvanized painted steel / double row / 2 cylinders / 140L / L = 810 mm	1	Nos
5	Outer bracket / galvanized painted steel / double row / 3 cylinders / 140L / L = 1210 mm	2	Nos
6	Bolts and Nuts Kit / Double row for steel brackets / L = 860 mm	3	Nos
7	End cover for mounting rail or bracket	6	Nos
PRESSURE REGULATOR FOR 200/300 BAR INERT GAS			
8	Pressure Regulator / inlet fem. W21,8 / outlet mal. W21,8 / out 60 Bar / UL	10	Nos
VALVE ACTUATORS			
9	Pneumatic release device - B0480 / B0481 / B0482 / single piston - actuation 21 bar / VdS / LPCB / UL / FM	8	Nos
10	Manual-pneumatic release device - B0480 / B0481 / B0482 / single piston - actuation 21 bar / VdS / LPCB / UL / FM	2	Nos
11	Elec-mag R. Device / 24 VDC / Diode / mini design / VdS / LPCB	2	Nos
12	Monitoring switch for electro-magnetic actuator / mounts on valve B0480 / cable included / UL / FM	2	Nos
13	Reset Tool for Elec-mag Actuator / M42 x 1,5 / protection cap included	1	Nos

14	Bleed Valve for Pneumatic actuator / G 1/8" / VdS tested / UL / FM	2	Nos
PRESSURE GAUGES M10 × 1 - WITH PRESSURE SWITCH			
15	Pressure Gauge - IG / P. switch NO 270 Bar / M10x1 / Radial / Scale 0-400 Bar / PG Connection / CE / VdS	10	Nos
PILOT HOSES			
16	Pilot hose 700 mm / M12 x 1,5 / Internal Diam. Ø1/8" - DN6 / VdS / UL-FM (IG)	2	Nos
17	Pilot hose 500 mm / M12 x 1,5 / Internal Diam. Ø1/8" - DN6 / VdS / UL-FM (IG)	7	Nos
18	Adapter for pilot hoses / M12 x 1,5 / G 1/8" / with O-ring	18	Nos
DISCHARGE HOSES			
19	Discharge Hose - W 21,8 x 1 / 14"DIN - G 3 / 4" / L= 400 / DN16 / 350 bar / VdS / UL-FM (IG)	10	Nos
DISCHARGE LINE MANIFOLDS - 100 BAR WORKING PRESSURE			
20	Manifold for 10 x 140L Cylinders / 2 row / 2020 mm / Inlet Rc 1" / Outlet R2"	1	Nos
21	Manifold connector / 2"	1	Nos
22	Manifold End Cap / 2"	1	Nos
MANIFOLD MOUNTING BRACKETS			
23	Bracket for Manifold / Double row / for 140 L cyl. / L = 600 mm	2	Nos
24	Clamp for Manifold / Dia. 2"	2	Nos
25	End cover for mounting rail or bracket	2	Nos
DISCHARGE LINE SAFETY ACCESSORIES			
26	Check valve - for IG / CO2 / Clean agent valves B0480-B0439 / DN 12 / WP 360 bar / Inlet G 3/4" / Outlet R 1"/ VdS / UL / FM	10	Nos
27	Pressure gauge for manifold / G1/2 - 14 / scale 0-400 Bar	1	Nos
28	Pressure relief device for manifold / 66 Bar / G 1/2" / Standard	1	Nos
29	Pressure and flow detector / switch 2 Bar / BSPP G 1/2"/ UL-FM (IG)	5	Nos
DISCHARGE NOZZLES - INERT GAS & CO2 - PRE-ASSEMBLED - 360°			
30	Nozzle - IG / CO2 / BSP R 1/2" / 360° / Rx orifice Ø xx mm / VdS (IG - CO2) / UL-FM (IG)	9	Nos
31	Nozzle - IG / CO2 / BSP R 3/4" / 360° / Rx orifice Ø xx mm / VdS (IG - CO2) / UL-FM (IG)	8	Nos

32	Nozzle - IG / CO2 / BSP R 1" / 360° / Rx orifice Ø xx mm / VdS (CO2) / UL	9	Nos
DIRECTIONAL VALVE - PNEUMATIC ACTUATOR			
33	Directional Valve G1" - DN25 / BKH / Pneumatic actuator / Carbon Steel / VdS / UL-FM (IG)	3	Nos
34	Directional Valve G2" 1/2 - DN65 / BKH / Pneumatic actuator / Carbon Steel / VdS / UL-FM (IG)	1	Nos
CONTROL PANEL - DIRECTIONAL VALVE - UL / FM			
35	Control-Panel for directional valve / 5 zones / UL-FM (IG)	1	Nos
DANGER AND WARNING SIGNS			
36	Warning emergency label / FIX / EN	4	Nos
37	Warning label / FIX / EN	4	Nos
38	LABEL Gas storage area / FIX / INEREX system / EN	1	Nos
PIPE, FITTING & OTHERS			
39	PIPE & FITTINGS	1	Nos
40	Gravity Pressure Vent (size to be define as per flow calculation)	4	Nos
INSTALLATION			
41	SYSTEM ENGNIREEING INSTALLATION , COMMSSIONING & HANDINGOVER	1	Nos
	Basement		
140L - CYLINDERS/VALVE ASSEMBLY FOR 300 BAR INERT GAS			
1	140L Cylinder / Valve Assembly + Protec. Cap / IG / Cyl. PESO / 300 Bar / FILLED IG 55 / UL / FM	11	Nos
CYLINDER MOUNTING BRACKETS			
2	Wall mounting rail / Single row / 3 Cylinders L = 940 mm	1	Nos
3	Wall mounting rail / Single row / 4 Cylinders L = 1240 mm	2	Nos
4	Outer bracket / galvanized painted steel / double row / 2 cylinders / 140L / L = 810 mm	1	Nos
5	Outer bracket / galvanized painted steel / double row / 3 cylinders / 140L / L = 1210 mm	2	Nos
6	Bolts and Nuts Kit / Double row for steel brackets / L = 860 mm	3	Nos
7	End cover for mounting rail or bracket	6	Nos
PRESSURE REGULATOR FOR 200/300 BAR INERT GAS			

8	Pressure Regulator / inlet fem. W21,8 / outlet mal. W21,8 / out 60 Bar / UL	11	Nos
VALVE ACTUATORS			
9	Pneumatic release device - B0480 / B0481 / B0482 / single piston - actuation 21 bar / VdS / LPCB / UL / FM	10	Nos
10	Manual-pneumatic release device - B0480 / B0481 / B0482 / single piston - actuation 21 bar / VdS / LPCB / UL / FM	1	Nos
11	Elec-mag R. Device / 24 VDC / Diode / mini design / VdS / LPCB	1	Nos
12	Monitoring switch for electro-magnetic actuator / mounts on valve B0480 / cable included / UL / FM	1	Nos
13	Reset Tool for Elec-mag Actuator / M42 x 1,5 / protection cap included	1	Nos
PRESSURE GAUGES M10 × 1 - WITH PRESSURE SWITCH			
14	Pressure Gauge - IG / P. switch NO 270 Bar / M10x1 / Radial / Scale 0-400 Bar / PG Connection / CE / VdS	11	Nos
PILOT HOSES			
15	Pilot hose 700 mm / M12 x 1,5 / Internal Diam. Ø1/8" - DN6 / VdS / UL-FM (IG)	1	Nos
16	Pilot hose 500 mm / M12 x 1,5 / Internal Diam. Ø1/8" - DN6 / VdS / UL-FM (IG)	10	Nos
17	Adapter for pilot hoses / M12 x 1,5 / G 1/8" / with O-ring	22	Nos
DISCHARGE HOSES			
18	Discharge Hose - W 21,8 x 1 / 14"DIN - G 3 / 4" / L= 400 / DN16 / 350 bar / VdS / UL-FM (IG)	11	Nos
DISCHARGE LINE MANIFOLDS - 100 BAR WORKING PRESSURE			
19	Manifold for 6 x 140L Cylinders / 2 row / 1200 mm / Inlet Rc 1" / Outlet R2"	1	Nos
20	Manifold for 4 x 140L Cylinders / 2 row / 790 mm / Inlet Rc 1" / Outlet R2"	1	Nos
21	Manifold connector / 2"	2	Nos
22	Manifold End Cap / 2"	2	Nos
MANIFOLD MOUNTING BRACKETS			
23	Bracket for Manifold / Double row / for 140 L cyl. / L = 600 mm	4	Nos
24	Clamp for Manifold / Dia. 2"	4	Nos

25	End cover for mounting rail or bracket	4	Nos
DISCHARGE LINE SAFETY ACCESSORIES			
26	Check valve - for IG / CO2 / Clean agent valves B0480-B0439 / DN 12 / WP 360 bar / Inlet G 3/4" / Outlet R 1"/ VdS / UL / FM	11	Nos
27	Pressure gauge for manifold / G1/2 - 14 / scale 0-400 Bar	1	Nos
28	Pressure and flow detector / switch 2 Bar / BSPP G 1/2"/ UL-FM (IG)	1	Nos
DISCHARGE NOZZLES - INERT GAS & CO2 - PRE-ASSEMBLED - 360°			
29	Nozzle - IG / CO2 / BSP R 1/2" / 360° / Rx orifice Ø xx mm / VdS (IG - CO2) / UL-FM (IG)	3	Nos
30	Nozzle - IG / CO2 / BSP R 3/4" / 360° / Rx orifice Ø xx mm / VdS (IG - CO2) / UL-FM (IG)	3	Nos
31	Nozzle - IG / CO2 / BSP R 1" / 360° / Rx orifice Ø xx mm / VdS (CO2) / UL	2	Nos
DANGER AND WARNING SIGNS			
32	Warning emergency label / FIX / EN	1	Nos
33	Warning label / FIX / EN	1	Nos
34	LABEL Gas storage area / FIX / INEREX system / EN	1	Nos
PIPE, FITTING & OTHERS			
35	PIPE & FITTINGS	1	Nos
36	Gravity Pressure Vent (size to be define as per flow calculation)	1	Nos
INSTALLATION			
37	SYSTEM ENGNIREEING INSTALLATION, COMMSSIONING & HANDINGOVER	1	Nos
	20th floor		
140L - CYLINDERS/VALVE ASSEMBLY FOR 300 BAR INERT GAS			
1	140L Cylinder / Valve Assembly + Protec. Cap / IG / Cyl. PESO / 300 Bar / FILLED IG 55 / UL / FM	2	Nos
CYLINDER MOUNTING BRACKETS			
2	Wall mounting rail / Single row / 4 Cylinders L = 1240 mm	1	Nos
3	Outer bracket / galvanized painted steel / double row / 2 cylinders / 140L / L = 810 mm	2	Nos
5	Bolts and Nuts Kit / Double row for steel brackets / L = 860 mm	2	Nos
6	End cover for mounting rail or bracket	2	Nos

PRESSURE REGULATOR FOR 200/300 BAR INERT GAS			
7	Pressure Regulator / inlet fem. W21,8 / outlet mal. W21,8 / out 60 Bar / UL	2	Nos
VALVE ACTUATORS			
8	Pneumatic release device - B0480 / B0481 / B0482 / single piston - actuation 21 bar / VdS / LPCB / UL / FM	1	Nos
9	Manual-pneumatic release device - B0480 / B0481 / B0482 / single piston - actuation 21 bar / VdS / LPCB / UL / FM	1	Nos
10	Elec-mag R. Device / 24 VDC / Diode / mini design / VdS / LPCB	1	Nos
11	Monitoring switch for electro-magnetic actuator / mounts on valve B0480 / cable included / UL / FM	1	Nos
12	Reset Tool for Elec-mag Actuator / M42 x 1,5 / protection cap included	1	Nos
13	Bleed Valve for Pneumatic actuator / G 1/8" / VdS tested / UL / FM	1	Nos
PRESSURE GAUGES M10 × 1 - WITH PRESSURE SWITCH			
15	Pressure Gauge - IG / P. switch NO 270 Bar / M10x1 / Radial / Scale 0-400 Bar / PG Connection / CE / VdS	2	Nos
PILOT HOSES			
16	Pilot hose 700 mm / M12 x 1,5 / Internal Diam. Ø1/8" - DN6 / VdS / UL-FM (IG)	2	Nos
17	Adapter for pilot hoses / M12 x 1,5 / G 1/8" / with O-ring	4	Nos
DISCHARGE HOSES			
18	Discharge Hose - W 21,8 x 1 / 14"DIN - G 3 / 4" / L= 400 / DN16 / 350 bar / VdS / UL-FM (IG)	2	Nos
DISCHARGE LINE MANIFOLDS - 100 BAR WORKING PRESSURE			
19	Manifold for 4 x 140L Cylinders / 2 row / 790 mm / Inlet Rc 1" / Outlet R2"	1	Nos
20	Manifold connector / 2"	1	Nos
21	Manifold End Cap / 2"	1	Nos
MANIFOLD MOUNTING BRACKETS			
22	Bracket for Manifold / Double row / for 140 L cyl. / L = 600 mm	2	Nos
23	Clamp for Manifold / Dia. 2"	2	Nos
24	End cover for mounting rail or bracket	2	Nos

DISCHARGE LINE SAFETY ACCESSORIES			
25	Check valve - for IG / CO2 / Clean agent valves B0480-B0439 / DN 12 / WP 360 bar / Inlet G 3/4" / Outlet R 1"/ VdS / UL / FM	2	Nos
26	Pressure gauge for manifold / G1/2 - 14 / scale 0-400 Bar	1	Nos
27	Pressure and flow detector / switch 2 Bar / BSPP G 1/2"/ UL-FM (IG)	1	Nos
DISCHARGE NOZZLES - INERT GAS & CO2 - PRE-ASSEMBLED - 360°			
28	Nozzle - IG / CO2 / BSP R 1/2" / 360° / Rx orifice Ø xx mm / VdS (IG - CO2) / UL-FM (IG)	2	Nos
29	Nozzle - IG / CO2 / BSP R 3/4" / 360° / Rx orifice Ø xx mm / VdS (IG - CO2) / UL-FM (IG)	2	Nos
DANGER AND WARNING SIGNS			
30	Warning emergency label / FIX / EN	1	Nos
31	Warning label / FIX / EN	1	Nos
32	LABEL Gas storage area / FIX / INEREX system / EN	1	Nos
PIPE, FITTING & OTHERS			
33	PIPE & FITTINGS	1	Nos
34	Gravity Pressure Vent (size to be define as per flow calculation)	1	Nos
INSTALLATION			
35	SYSTEM ENGNIREEING INSTALLATION, COMMSSIONING & HANDINGOVER	1	Job
	Other Requirement		
36	Nitrogen Puff Test	3	Nos
37	Room Integrity Test	6	Nos
38	Dum Test for the Room (Smallest room)	1	Nos

2. SCHEDULE OF QUANTITY FOR GAS RELEASE PANEL			
Sr No.	Item	QTY.	Unit
(A)	**(B)**	**(C)**	**(D)**
1	Supply, installation, testing & commissioning of 32-bit dual core microprocessor based 100% Hot Redundant Intelligent Addressable Fire Alarm Control panel with **6 loop** with inbuilt Bluetooth and battery back up to 60 hours, expandable up to min. 12 loops w/o changing the cabinet. The FACP should Have Capacity of Peer-to-Peer Networking of Panels, the control panel, batteries, battery charger etc., shall be VdS approved and as per EN-54 standard. The panel should be modular, decentralized, with 100% hot redundancy in CPU/master control unit, 100% hot redundancy in loop cards, relay, and interface card by means of duplicated electronics means hardware redundancy with full functionality. The panel shall consist with minimum 240-character LCD display. Panel should be able to record at least 65000 events history. Each loop should be capable to have at least 250 elements / devices out of which min. 200 nos. shall be detectors. The Panel Shall have on board TCP/IP Lan port to facilitate remote operation of the panel include Modbus / Bacnet gateway for BMS integration. The Panel must have 1 zone extinguishing indicating LEDs inbuilt (Up to 10 LEDs) inbuilt. The system should be VdS approved It is possible to Commissioning the System through LAN Network.	Nos	1
2	Supply, Installation, Testing & Commissioning of VDS approved having and 100% hot standby Redundant control circuit, **GAS release indication panel** consist of 8 GAS release zones indication LED, also has Key Switch for Auto Manual mode selection. It should consist of 12 LED indication Per zone and 9 LED indication for whole system. Panel enclosure should be in Red RAL 3000.	Nos	3
3	Supply, Installation, Testing & Commissioning of Intelligent Addressable type **multisensor detector with base**, and Microprocessor inbuilt, for use as heat (Fixed + Rate of Rise or individual) or smoke or combined both with automatic electronic addressing, microprocessor type and must have integrated short circuit isolator (in case short circuit isolator is not inbuilt, the price of this item shall be inclusive of an independent short-circuit isolator along with each detector). The detector shall have IP 44 protection category & ambient temperature -20ºC to + 60ºC, the base shall have no electronics only dry contact terminals. The quoted item shall completely comply to the technical specification. Shall be VdS approved according to EN 54-5, 54-7, 54-17, 54-29	Nos	RO

4	Supply, Installation, Testing & Commissioning of **Manual Release** with Inbuilt fault isolator, in accordance with EN 54-11 (type B). The Release should be triggered by breaking the glass panel and pressing the button. The Release must contain a built-in red LED & should have IP 52 protection and operating temperature should be -20° to +50°C. The Release must be approved by VDS	Nos	18
5	Supply, Installation, Testing & Commissioning of **Manual Abort** with Inbuilt fault isolator, in accordance with EN 54-11 (type B). The Abort should be triggered by breaking the glass panel and pressing the button. The Abort must contain a built-in red LED & should have IP 52 protection and operating temperature should be -20° to +50°C. The Abort must be approved by VDS	Nos	18
6	Supply, Installation, Testing & Commissioning Addressable **Loop Powered multi tone sounder** with integrated short circuit isolator (in case short circuit isolator is not inbuilt, the price of this item shall be inclusive of an independent short-circuit isolator along with each loop powered sounder) & having operating temperature -10ºC to + 55ºC shall be VdS approved	Nos	18
7	Supply, Installation, Testing & Commissioning of Addressable **loop powered flashing light** for visual notification of a fire alarm in interior areas, should have inbuilt fault isolator. The operating Temperature should be -10° to +55°C. The module must be VDS approved.	Nos	18
8	Supply, Installation, Testing & Commissioning of VdS approved **Analogue Addressable Input module** with IP66 casing containing 4 inputs for monitored querying of potential free contacts with in-built short circuit isolator (in case short circuit isolator is not inbuilt, the price of this item shall be inclusive of an independent short-circuit isolator along with each monitor module), it must be VdS approved and as per EN-54 standard. The ambient temperature range shall be -20ºC to +60ºC.The quoted item shall completely comply to the technical specification.	Nos	15

9	Supply, Installation, Testing & Commissioning of VdS approved **Analogue Addressable Output module** with IP66 casing containing 4 Relay Output with in-built short circuit isolator (in case short circuit isolator is not inbuilt, the price of this item shall be inclusive of an independent short-circuit isolator along with each monitor module), it must be VdS approved and as per EN-54 standard. The ambient temperature range shall be -20ºC to +60ºC.The quoted item shall completely comply to the technical specification.	Nos	30
10	Auto/Manual Switch	Nos	18
11	Supply and laying of 2C x 1 Sq.mm twisted multistranded FRLS shielded Armored cable for FAS System	Mts	4000
12	Glow Signages electronic “gas discharge do not enter”	Nos	6
13	Glow Signages electronic “gas discharge please evacuate”	Nos	6

3. SCHEDULE OF QUANTITY FOR FIRE TRACE SYSTEM			
Sr No.	**Item**	**QTY.**	**Unit**
(A)	**(B)**	**(C)**	**(D)**
	Fire Trace System integrated with the fire alarm system etc. complete.		
	It is to be understood that the integration of systems for full and seamless performance to be ensured by the successful bidder. For this purpose, some models, some makes could be interchanged with the fire alarm system etc. as well.		
	Complete fire trace system shall be CE/ UL / FM marked.		
	The system shall Conform to the following codes		
	BS EN 12094-1, Fixed firefighting systems. Components for gas extinguishing systems. Requirements and test methods for electrical automatic control and delay devices		
	BS EN ISO 10297; Transportable gas cylinders. Cylinder valves. Specification and type testing		
	(Any additional / alternative international code adhered to, to be mentioned)		
	The fire suppression gas adopted shall be FE36 / NOVEC 1230 / NAF S 120 suitable for such application.		

	The fire suppression gas adopted shall be a low-pressure agent with working pressure of around 13.5 kg/sq.cm. Exact pressure to be confirmed in the bid. The gas could be super-pressurized with nitrogen if required.		
	The system shall be suitable for working temperature of 0 deg C to at least 54 deg C		
	The flooding factor in kg / cum of protected area to be suitable for electrical fires and confirmed by the OEM in accordance with the standards		
	A detailed calculation for the various areas along with the fill densities, quantity of cylinders, length of the tubing etc. to be furnished.		
	The following shall be the cylinder particulars:		
	The cylinders sheet steel shall be of SS-316 MOC		
	Internally epoxy powder coating		
	Externally epoxy polyester powder coating		
	Fully confirms to EN and other international standards		
	Manufacturing certificates for hydrostatic, temperature cycling, dropping, vibration etc. to be furnished after carrying out the same.		
	Gas authorization certificate to be received from the original gas supplier.		
	All cylinders of any capacity shall be filled to the maximum fill densities.		
	The cylinder filling will be witnessed by client.		
	The valves shall show open / close settings and valve closures as well as low gas pressure shall be annunciated through pressure switches with POTENTIAL FREE NC / NO contacts.		
	The MOC and approval certificate from the manufacturer of the fire trace tube to be furnished with the material being supplied.		
	A separate fire alarm panel is not required, and the system should be able to give full annunciations in the client's addressable fire alarm panel.		
a	**Areas catering to Fire Trace System**		
	INTERCOM EXCHANGE ROOM (2ND FLOOR)		
	NETWORK ROOM (2nd FLOOR)		
	MULTI CONFERENCE UNIT ROOM (2ND FLOOR)		
	SERVER ROOM (9th FLOOR)		
	ELECTRICAL ROOM (9th FLOOR)		
	SERVER ROOM (12th FLOOR)		
	ELECTRICAL ROOM (12th FLOOR)		
	SERVER ROOM (16th FLOOR)		
	ELECTRICAL ROOM (16th FLOOR)		

	ELECTRICAL SUBSTATION (UPPER BASEMENT)		
b	Suitable capacity cylinder, complete with discharge Assembly with automatic valve, gas fully filled with N2 super pressurization as required, mounting bracket, End of Line adopter, low pressure switch, fixing stand, etc		
1	2 kg cylinder	38	No.
2	Fire Trace tubing complete with connectors, end plugs, mounting cleats etc.	600	m

4. TESTING OF EXISTING SYSTEM INTEGRATE TO THE NEW SYSTEM FOR MAKING FUNCTIONAL BENEFITS			
Sr No.	**Item**	**QTY.**	**Unit**
(A)	**(B)**	**(C)**	**(D)**
	Passive fire protection system for coating of the cables emanating from the electrical switchgear panels, transformers, etc. complete including all the above-mentioned points in sl. No. 1, cleaning up the cables, informing the client to seal gland plate, compression glands etc. complete, providing cable coating for a minimum length of 1 m starting close to the panel. The coating thickness shall ensure a minimum fire rating of two hours. The coating shall not cause fungus growth or get washed off with water, get eaten by termites etc. The coating shall be UL listed / FM approved in all respects**.**		
	The coating shall also be applied over cable joints.		
	The coating shall be applied one meter length for every 7 m or part thereof of vertical shafts and once every 14 m of horizontal runs.		
	The coating shall be applied for one meter of both sides of through penetration fire stops		
	On cable trays etc. it shall be ensured that the bottom of the cables etc. are also fully coated and no portion is left exposed.		
1	The measurement for the cable coating will be done on sq.m basis. For all bunch of cables or individual cables coated, a measurement shall be taken by drawing a steel wire tight over the bunch of cables to verify the perimeter of the cable. This shall be multiplied by one-meter length of the cable coating to determine the total coating area. The measurement sheet shall clearly indicate the panel designation, room / shaft / floor designation etc. in Passive Fire Protection System	100	sq.m

5. SCHEDULE FOR QUANTITY FOR BUY BACK			
Sr No.	**Item**	**Qty.**	**Unit**
(A)	**(B)**	**(C)**	**(D)**
	The bidder is provided the brief particulars of existing materials on site. The successful bidder as part of his execution plan is expected to identify, inform the client, obtain the dismantling and commercial clearances, dismantle, pack, cleanup the area, etc. complete in all respects.		
	Any statutory, pollution control certificate etc. if required to be handed over to the client to be furnished by the successful bidder		
	Disposal of materials shall be done at suitable distance / location as authorized by client / statutory / governmental authorities		
1	Clean Agent Cylinders of 42 and 25 bar systems in as-is where-is uninstalled condition. The approximate quantity of the cylinders with capacity is as under:		
a	FM200, 42 bars, app. 68 l capacity:	10	lot

Section: 05

FIRE DETECTION AND ALARM SYSTEM

Section: 5.1

PARTICULARS OF PRESENT SYSTEMS PROVIDED

1. FIRE DETECTION AND ALARM SYSTEM

The details of the existing fire detection and alarm system are as follows:

Fire alarm panels of Edwards System Technology (EST-3) and Ravel are installed in the project.
The EST panel are installed by Siemens and Rajyog.
Rajyog has supplied 2 loop systems for 13th floor further expanded up to four loop by Triangle Security Systems and additional 183 devices from 11th and 17th floor are integrated with this panel.
The particulars of the systems installed by them are as follows:

Siemens Installation:

a. Siemens has installed standalone EST3 system for 14 loops by using single 3-CAB21 cabinet with integrated Evacuation as well as 2 Way Fire Fighter Telephone systems.
b. A separate PA system has been provided and hence the Evacuation feature available in the panel has not used.
c. 3-FTCU used for 2 Way Fire Fighter Telephone.
d. Approximate 1500 devices including Detectors, MCP and Modules are installed in 14 loops.
e. Approximate 74 nos. Telephone Jacks are installed in the building

Rajyog Fire Installation:

a. Rajyog Fire has installed standalone 2 loops Edwards Fire system for approximate 170 devices.

Triangle Security Systems Installation:

b. System supplied by Rajyog has further expanded upto four loops by Triangle Security systems and additional 183 devices from 11th and 17th floor addition work is in progress.

The fire detection and alarm system is operational but with some operational and installation faults.

Section: 5.2

REFURBISHMENT OF THE FIRE DETECTION AND ALARM SYSTEM

1. Scope of work

1.1 The particulars of the fire alarm panel and system existing are indicated. The refurbishment work are as follows:

1. Evaluating the existing fire alarm system thoroughly and ensuring that all areas of the building are appropriately protected. Preparing proper schematics and individual layouts accordingly.
2. Evaluating the detection loops at each floor and ensure that necessary isolators, detectors, manual call points, hooters, flow switches, strobes, monitor modules, control modules, etc. are provided.
3. Cleaning up all detectors etc. once while starting the work and another time during commissioning and handing over so that pre-alarm could be minimized.
4. Verifying proper location for power supplies, UPS etc. for the air sampling system etc.
5. Providing the relay modules for the proper closing of the ventilation dampers.
6. Providing a proper cable way box and routing and dressing the cables to the cable way box and there-from leading the same to the fire alarm panel.
7. Evaluating the shaft and rerouting the detection cable with only control cables to avoid EM interference.
8. Planning of loop installation for the future as well.
9. Verify the position (on roof, below beam etc. which are unsuitable for detection) and damage to existing detectors and good the installation proper.
10. Handing over to client all the detector caps, MCP keys, dongle, backup data etc. properly.
11. Prepare proper As-Built drawings for the system prior to rectification and after rectification.
12. Inform the client of the core-cuttings required to be carried out and carry out the same without damaging other equipment etc.
13. Reprogram all the fire alarm systems properly.
14. Test and complete the total installation of the system which will include:

    i) Fire Alarm Control Panel (FACP).
    ii) Addressable Alarm initiating devices.
    iii) Circuit interface modules, as required.
    iv) Audio-visual annunciation devices (AVAD).
    v) Repeater Panels (RP).

vi) All wiring
a) From alarm initiating devices.
b) From circuit interface modules t various AVAD's.
c) All AHU tripping through Modules.
vii) Integrating Gas Based Suppression System, Air sampling, etc.
viii) PA system as Background Music & Fire Evacuation System.

2. Submittals

2.1 At the tender, all details comprising the following shall be submitted:

i) Vendors experience with the fire alarm system makes proposed.
ii) System configuration & capability vis-a-vis the specification.
iii) Makes of catalogues of various signal initiating devices, AVAD's etc.
iv) Compliance or deviation from the specifications. (If no deviation are received, then it is considered that the bidder is in total agreement with the requirements and specifications)

2.2 After award of the contract and before placement of orders on sub vendors the following particulars shall be furnished and got approved.

i) Individual datasheet of each component.
ii) Detailed schematic and floor layout drawings which shall be suitable for loading in the graphics display.
iii) Wiring diagrams.
iv) Installation and integration planning for the various areas.

3. Fire Alarm Panel:

Fully redundant fire alarm control panel with operating Display integrated, data-serial log printer, including module rack with master control unit in fully redundant dual core microprocessor technology and SMD technology. Incl. power supply unit, charging unit and DC converter.
The fire alarm control panel complies with EN 54-2 and EN 54-4, VDE 0833, DIN 14675 and EN 12094-1 and is approved for use as a fire alarm control panel for the control of more than one extinguishing zone according to VdS 2496 as well as for the control of high-pressure gas and low-pressure extinguishing systems and water extinguishing systems.
The following functions are available as the basic configuration of the fire alarm control panel:

- Independent duplicated redundant computer system. The microprocessor structure, system structures, components and electronic components are redundant. In the event of a fault, the system switches over automatically to the second system which runs in parallel.
- Detectors can be interlinked across different loops and sub-control units

- Inbuilt Display as per section 2.1.2
- Intermediate alarm storage
- Redundant Loop Cards, Network Card and other Interfacing cards.
- PC-supported programming via integrated computer interface
- System configuration can be saved using flexible flash memory technology.
- Watchdog logical processing for automatic system monitoring.
- Software-controlled free assignment and connection of detectors to the activation criteria
- One man testing for all detector zones.
- Programmable outputs through free assignment of inputs and outputs
- Evaluation of detector states (contamination)
- Visual and acoustic signal device for alarms and faults
- Alarm counter, Alarm delay mode.
- Intervention mode/intervention function
- Real-time clock
- Self-acting cyclical test routine with fully automatic and detailed fault messages
- EMC protective measures in accordance with standard EN 50082-2 (Emissions for Industrial Environments)
- Inbuilt TCP/IP Ports for MODBUS over TCP/IP output for SCADA interface. The External Converters are not allowed.
- Optional Inbuilt Printer

In addition, the system is also pre-equipped for:

- Redundant Data serial interfaces for connection to fire alarm control systems, for networking several fire alarm control panels and for connecting external log printers.
- Built-in emergency power supply battery for a 24-hour bridging time.
- Serial interfaces for the connection of fire alarm operation control systems and for external log printers
- Decentralized operation – the fire alarm control panel can be networked over redundant RS-485 or FO Port or on existing LAN Network.
- Automatic e-mail delivery to any number of recipients
- Operation via mobile devices (smartphones, tablets) over the internet

Messages with push notifications to mobile devices

4. Field Devices

4.1 Addressable Multisensor Detector with Base

The multiple sensor intelligent addressable detector is a combined smoke and heat detector and should use to detect a fire in buildings. The detector should provide early detection of smouldering and open fires by detecting and evaluating both fire characteristics smoke and heat. The inbuilt algorithm of detector should automatically adjust to the ambient conditions.
The Detector should have following features:

- Integrated short circuit isolator and IP 44 protection.

- Automatic Addressing
- Should be able to programme as only smoke, only Heat or Multisensor Detector
- Should be able to evaluate False alarm.
- Inbuilt memory for Fire Alarm condition algorithm
- Automatic contamination compensation
- Alarm filter with fire characteristics pattern matching.
- Temperature-assisted detection algorithm for automatic adjustment to the ambient conditions
- It should support Class A1, A2, B with Indices R and S for Temperature Detection as per EN 54-5
- It should be VDS approved as per EN 54-5, EN 54-7 and EN 54-29. The Detector without EN 54-29 approval is not allowed.

4.2 Manual Call Point – Single Action

The Manual Call Point should be in a red plastic case, conforming to EN 54-11 (Type A) for manually triggering a fire alarm, suitable for use indoors. The alarm is triggered by smashing the glass panel, with the alarm remaining in alarm state until reset. The built-in LED indicates its triggered state. The detector can be installed on the same loop circuit as automatic detectors with integrated short circuit isolator in built. VdS approved.

4.3 Input / Output Module

The input/output module should contain potential-free bistable relay outputs for switching of loads of up to 2 A. If loop voltage is lost, a fail-safe-position can be individually programmed for each output. In addition, the module contains monitored primary inputs for the query of potential-free contacts.
Every input can be configured with/without circuit monitoring, and moreover the element type input or detector zone can be assigned for each input.
Module should have following features:

- bi-stable relay outputs
- primary inputs
- Fail-safe position of the relay outputs at loss of the supply voltage
- Integrated short circuit isolator.
- VDS approved as per EN 54

4.4 Loop Powered Platform Sounder

Addressable signal devices for acoustic notification of a fire alarm in interior areas for direct connection to the loop. The siren should be available in red, have four different tones and the volume can be set via software.
It should have following features:

- Loop Powered
- Up to 90 db Output
- Integrated short circuit isolator
- VDS Approved as per EN 54-3

4.5 Loop Powered Flasher

Addressable flashlight for optical signaling of a fire alarm in indoor areas, loop powered . The flashlight is available in red with the dome in red or orange. The flash rate can be set via software. It should have following features:

- Loop Powered
- Integrated short circuit isolator.
- VDS Approved as per EN 54

4.6 Beam Detector

Stand-alone line-type smoke detector consisting of a combined transmitter/receiver unit and reflector. The monitoring length can be configured between 5 and 120 meters. It should be possible to install in places that could be exposed to sunlight. No special tools or prior knowledge is required for its installation.

It should have a n integrated automatic alignment motor keeps the infrared beam in the optimal position, even if the building moves, e.g. through to seasonal changes. The optics are fully enclosed in an IP-rated casing with a flat surface for easy cleaning without affecting alignment.

The user interface at the front of the detector should allow realignment and programming without having to dismount the detector and a special auto-alignment feature not only saves time during installation, the quality of alignment is also guaranteed by the automation protocol.

The Detector should be VDS approved as per EN 54.

5.0 Installation

5.1 The installation shall be carried out in accordance with the specifications and drawings and complying with NFPA 72, IS 2189 any local codes and proprietary manufacturer's instructions. Where the provisions are conflicting, areas of such conflict shall be identified and clearly brought out the Deviations from Tender together with the financial implications if any.

5.2 All wiring shall be carried out with 660V grade PVC insulated FRLS cables in galvanized steel conduit or as specified in the BOM. Cable less than 1.0 sq. mm shall not be used other than for flat cables between cable way box to panel. All junction boxes and conduit accessories shall be galvanized steel with suitable terminals.

5.3 The conduit installation shall be carried out generally in accordance with the site conditions. All conduits shall be concealed above false ceiling or run or surface wherever permitted and shall be of steel black enameled or galvanized as specified. Conduit drops and junction boxes shall be concealed in partitions by chasing the walls which shall be refilled and finalized.

5.4 Smoke detectors shall be installed last after the system is programmed and the installation is tested.

6.0 Testing

6.1 The system shall be tested and commissioned by a qualified specialist technician to establish system performance in all its aspects and all such tests shall be witnessed and test readings attested by the Engineer in charge.

6.2 All wiring shall be checked for proper connections and tested for

i) Continuity
ii) Ground faults
iii) Short circuits
iv) Insulation resistance by 1000V megger.

All wiring shall be tested segment by segment and readings and findings recorded. No wiring installation offering a resistance of less than 1.0 mega ohm shall be energized.

6.3 Test all circuits and device for verification trouble/ fault signals in the FACP and performance compliance.

i) Initiating device circuits
    i) Open circuit
    ii) Short circuit
    iii) Ground fault

ii) Signal line circuit
iii) Notification application circuits
iv) Verify signal for Tamper and flow switches, air sampling systems, gas release systems etc.
v) Verify audibility and tone of all Audio visual notification devices.
vi) Check supervision of all circuits and operations of all detectors during a walk test.

6.4 Simulate all alarm conditions in the system and verify and confirm proper processing and recording of the signals as per design.

6.5 All test results shall be verified and authenticated by the Engineer-in-charge and shall be included as part of the Instruction Manual.

6.6 Provide training to client's designated personnel at least two times.

7.0 Mode of measurement.

- Individual items like the detectors, modules etc. as identified in the BOM will be paid on unit rate basis. Their cost will include the back boxes, terminals within the back boxes, etc. complete.
- Cables, conduits etc. will be measured point to point. Their cost will include necessary clamps, ferrules, bends, tees etc. complete.
- Any item not mentioned in the BOM which the bidder will like to be considered as a separate item for measurement shall be indicated and accepted by client during the tender stage itself.

8.0 REMOVAL OF EXISTING AND UNUSED CABLES FROM VARIOUS FLOORS REACHING TO THE CONTROL ROOM.

The Existing control room at mezzanine floor has got various cables coming from various floors most of them are obsolete and is not in use. Some of them are main data, audio video cables connected to the existing control room equipment. The vendor has to remove the unwanted cables in a systematic co-ordinate way. These cables are to be removed from the site after completion of the work by the vendor. The storage of the cables has to be done systematically and the removed cables should not be allowed to lay haphazardly. The entire premises should be neat and clean and no obstruction should be there during the working hours. Please note that the cables which are live is connected to BMS and also drawn along with the unwanted cables. This point is to make you aware that there are live cables hence while removing the cables the vendor should ensure that the live cables are not disturbed and removed. Dismantling of cables should be started from the control room and should be neatly tugged to proper places. Under no circumstances removal of cables should create any problem for the control room. The vendor should visit the site before quoting so that they are aware about the work involved.

After removing the un-wanted cables the live cables should be laid in cables trays. And the new cables which are being laid as per the new design is also to be laid through cable trays only.

9.0 Intelligent Addressable GAS Release Panel:

SCOPE OF WORK

1.1 The scope of work covers supply, installation, commissioning and testing of Conventional Gas Release System meeting the intents of this specification. The work shall cover:

I. Addressable Fire Alarm with Gas release Control Panel.
II. Cross Zoning with Addressable devices.
III. Pre Gas release Notification.
IV. Abort Operation Facility.
V. Manual gas release.
VI. Gas release notification.
VII. All wiring from alarm initiating devices.

VIII. Integrating Gas Based Suppression System, Venda, Water Leak, ACS etc.
IX. PA system as Background Music & Fire Evacuation System.

GENERAL SPECIFICATIONS:

Addressable microprocessor based 100% Hot Redundant Intelligent Addressable panel with inbuilt 40-line dot-matrix printer, LED Indication Panel for 4 GAS Release Zones **multi loop** expandable up to minimum 12 loops without changing the cabinet with battery back up to 60 hours in standby mode and minimum 45 mins in alarm mode. The battery should be sealed maintenance free conforming to relevant Indian/International Standard. The panel should be modular, decentralized, with 100% hot redundancy in CPU control unit and 100% hot redundancy in loop cards/hot pluggable loop cards, 100% hot redundancy in relay and interface card by means of duplicated electronics means hardware redundancy with full functionality. The panel shall consist of a minimum of 240-character LCD Panel and should be able to record at least minimum 65000 or more events history. The Panel shall have Modbus output provision for BMS/Third party system interface without any hardware requirement. Fire Alarm Control Panel (FACP) shall be EN approved and as per equivalent IS. The Fire Alarm Panel should be VDS approved.

Built-in LED indicator panel for 4 extinguishing zones

- Twelve LEDs per extinguishing zone and nine LEDs as system aggregate indication (see figure below)
- Auto/Manual Key switch
- Labelling the LEDs by using push-in strips

Addressable Loop Powered multi tone Hooter

Addressable Loop Powered multi tone Hooter / sounder with integrated short circuit isolator (in case short circuit isolator is not inbuilt, the price of this item shall be inclusive of an independent short-circuit isolator along with each loop powered sounder) with minimum range of IP21c or better range of protection for indoor use & having operating temperature -10°C to + 50°C. The item shall confirm to EN / equivalent IS. The Hooter should be VDS approved.

Addressable Loop Powered Flasher

Addressable Loop Powered flashing light for optical signaling of a fire alarm in indoor areas, suitable for direct connection to the loop. The flashlight shall be in red colour, with the flash rate being set by means of software and using DIP switches. The flashlight shall have the integrated short circuit isolator and shall be capable to handle the ambient temperature of -10°C to + 50°C. The item shall confirm to EN / equivalent IS. The Flasher should be VDS approved.

3.4 COMPREHENSIVE ANNUAL MAITENANCE CONTRACT:

THE MAINTANCE SHOULD BE CARRIED OUT AS PER MANUFACTURERS MAINTANANCE MANUAL RECOMMENDATION. THE SAME SHOULD BE DONE BASED ON THE WRITTEN DOCUMENT ISSUED BY THE MANUFACTURER THIS DOCUMENT SHOULD BE SUBMITTED TO THE OWNER AND ALSO TO THE CONSULTANT BEFORE STARTING THE WORK. THE CONTRACTOR IS ALSO TO SUBMIT THE CONCERNED FORMS (FORM A & B AS APPLICABLE) TO THE FIRE AUTHORITIES FROM TIME TO TIME AND SHOULD OBTAIN THEIR APPROVALS FROM TIME TO TIME.

6. Payment of CAMC
    i) Prorata basis
    ii) Every quarter (At the end of the quarter)
    iii) CAMC payment will start after defect liability period (After 1 year)
    iv) Since CAMC is comprehensive, no additional payment for replacement of parts and allied equipments/ components/ machine etc., will be made.

7. Scheduled work to be carried out for each system
    i) Periodicity of visit (system wise)
    ii) Work to be carried (brief description)
    iii) Items which are not supplied by contractor, but only installation done by contractor should also be maintained. It should be included in CAMC. This means that the final system maintenance will be the sole responsibility of the vendor irrespective of the product supply.

8. Down Time Period of system
    i) Down Time Period should not be more than 24-48 hours.

Start time: Call reported by telephone/ Fax/ Mail
End time: System in operational condition, critical system i.e. Fire Alarm.

1. Fire Alarm System: Not more than two hours.
2. Fire Alarm Panel Not more than Eight hours.
3. BMS and all other systems should not more than eight hours.

9. Penalty clause:
    i) If the services are not satisfactory, penalty of ____% of the CAMC will be imposed or deducted from contract amount.
    ii) If contractor unable to repair or maintain the system as per maintenance manual, penalty ___% will be imposed.
    iii) If down time of the system is more than stipulated period
    iv) If fails to repair or maintain then Bank at risk and cost of contractor will get it repaired, by engaging other contractor. The cost involved will be deducted plus penalty.

10. CAMC Agreement: Separate CAMC Agreement will be executed as per Bank's standard CAMC format

(To be vetted from Law Department and should be in Tender format)

THE MAINTANANCE MANUAL IS MADE AS PER THE NFPA 25 STANDARD. THE FOLLOWING SYSTEMS ARE INCLUDED TO THE DESCRIPTIONS.

I. Form for Testing and Maintenance of Fire Alarm System

I. Form for Testing and Maintenance of Fire Alarm System

Owner: **State Bank Of India**
Owner's address: **State Bank Bhavan, Corporate Centre, MADAME Cama Road, Nariman Point, Mumbai - 400021.**
Date of inspection:
(All responses refer to the current inspection performed on this date.)
This inspection is: (check one)❑ Weekly ❑ Monthly ❑ Quarterly ❑ Semiannual ❑ Annual
TYPE TRANSMISSION:)❑ McCulloh ❑ Multiplex ❑ Digital ❑ Reverse Priority ❑RF ❑Other (Specify)_____

Panel Manufacturer:
Model No.:
Circuit Styles:
Number of Circuits:
Software Rev.:
Last Date System Had Any Service Performed:
Last Date that Any Software or Configuration Was Revised:

ALARM-INITIATING DEVICES AND CIRCUIT INFORMATION

Quantity	**Circuit Style**
Manual Stations	
Ion Detectors	
Photo Detectors	
Heat Detectors	
Waterflow Switches	
Supervisory Switches	

Other (Specify):_____

ALARM NOTIFICATION APPLIANCES AND CIRCUIT INFORMATION

Quantity	**Circuit Style**
Horns	
Strobes	
Speakers	
Other (Specify):_____	

SUPERVISORY SIGNAL-INITIATING DEVICES AND CIRCUIT INFORMATION

Quantity	**Circuit Style**
Site Water Level	
Fire Pump Power	
Fire Pump Running	
Fire Pump Auto Position	
Fire Pump or Pump Controller Trouble	
Fire Pump Running	
Generator In Auto Position	
Generator or Controller Trouble	
Switch Transfer	
Generator Engine Running	
Other:_____	

SIGNALING LINE CIRCUITS

Quantity and style (See NFPA 72, Table 3-6) of signaling line circuits connected to system:
Quantity_____ Style(s) _____

SYSTEM POWER SUPPLIES

a. Primary (Main): Nominal Voltage _____, Amps_____
Over current Protection: Type_____ , Amps_____
Location (Panel Number): _____
Disconnecting Means Location: _____
b. Secondary (Standby):
_____ Storage Battery: Amp-Hr. Rating_____
Calculated capacity to operate system, in hours: _____24
_____60_____

TYPE BATTERY
Sealed Maintenance Free

c. Emergency or standby system used as a backup to primary power supply, instead of using a secondary power supply:
_____Emergency system described in NFPA 70, Article 700
_____Legally required standby described in NFPA 70, Article 701
_____Optional standby system described in NFPA 70, Article 702, which also meets the performance requirements of Article 700 or 701.

PRIOR TO ANY TESTING

NOTIFICATIONS ARE MADE	**Yes**	**No**	**Who Time**
Monitoring Entity	❑	❑	
Building Occupants	❑	❑	
Building Management	❑	❑	
Other (Specify)	❑	❑	
AHJ (Notified) of Any Impairments	❑	❑	

SYSTEM TESTS AND INSPECTIONS

TYPE	**Visual**	**Functional**	**Comments**
Control Panel	❑	❑	
Interface Eq.	❑	❑	
Lamps/LEDS	❑	❑	
Fuses	❑	❑	
Primary Power Supply	❑	❑	
Trouble Signals	❑	❑	
Disconnect Switches	❑	❑	
Ground-Fault Monitoring	❑	❑	

SECONDARY POWER

TYPE	**Visual**	**Functional**	**Comments**
Battery Condition	❑	❑	
Load Voltage	❑	❑	

Discharge Test	❑	❑
Charger Test	❑	❑
Specific Gravity	❑	❑
TRANSIENT SUPPRESSORS	❑	
REMOTE ANNUNCIATORS	❑	❑
NOTIFICATION APPLIANCES		
Audible	❑	❑
Visual	❑	❑
Speakers	❑	❑
Voice Clarity	❑	

INITIATING AND SUPERVISORY DEVICE TESTS AND INSPECTIONS

Loc. & S/N	Device Type	Visual Check	Functional Test	Factory Setting	Meas. Setting	Pass	Fail
		❑	❑			❑	❑
		❑	❑			❑	❑
		❑	❑			❑	❑
		❑	❑			❑	❑
		❑	❑			❑	❑
		❑	❑			❑	❑

Comments:_____

_____

_____

_____

_

EMERGENCY COMMUNICATIONS EQUIPMENT

	Visual	Functional	Comments
Phone Set	❑	❑	_____
Phone Jacks	❑	❑	_____
Amplifier(s)	❑	❑	_____
Call-in Signal	❑	❑	_____
System Performance	❑	❑	_____

Device Visual	Simulated Operation

INTERFACE EQUIPMENT

(Specify) _____	❑	❑	❑
(Specify) _____	❑	❑	❑
(Specify) _____	❑	❑	❑

SPECIAL HAZARD SYSTEMS

(Specify) _____	❑	❑	❑
(Specify) _____	❑	❑	❑
(Specify) _____	❑	❑	❑

Special Procedures: _____

_____

_____

Comments: _____

_____

_____

ON/OFF PREMISES MONITORING	Yes	No	Time	Comments
Alarm Signal	❑	❑	_____	_____
Alarm Restoral	❑	❑	_____	_____
Trouble Signal	❑	❑	_____	_____
Supervisory Signal	❑	❑	_____	_____
Supervisory Restoral	❑	❑	_____	_____

NOTIFICATIONS THAT TESTING IS COMPLETE

Yes	No	Who	Time
Building Management	❑	❑	_____ _____
Monitoring Agency	❑	❑	_____ _____
Building Occupants	❑	❑	_____ _____
Other (Specify)	❑	❑	_____ _____

The following did not operate correctly:

_____

_____

_____

System restored to normal operation: Date: _____Time:_____

THIS TESTING WAS PERFORMED IN ACCORDANCE WITH APPLICABLE NFPA STANDARDS.

Name of Inspector: _____Date:_____
Time:_____
Signature: _____
Name of Owner or Representative: _____
Date: Time: _____
Signature: _____

BILL OF QUANTITIES (BOQ)

1. SCHEDULE OF QUANTITY FOR FIRE ALARM SYSTEM			
Sr No	**Item**	**QTY.**	**Unit**
	Supply, Installation, Testing and Commissioning (SITC) of the following:		
	FAS PANEL		
1	Supply, Installation, Testing & Commissioning of 32-bit dual core microprocessor based 100% Hot Redundant Intelligent Addressable Fire Alarm Control panel with 14 loop with inbuilt Bluetooth, expandable upto 16 loops w/o changing the cabinet. The FACP should Have Capacity of Peer to Peer Networking of Panels, The control panel shall be Vds approved and as per EN-54 standard. The panel should be modular, decentralized, with 100% hot redundancy in cpu/master control unit, 100% hot redundancy in loop cards, relay and interface card by means of duplicated electronics means hardware redundancy with full functionality. The panel shall consisting with minimum 800 character LCD display with 10 configurable soft buttons and 10 configurable LED's. Panel should be able to record atleast minimum 65000 events history or more. Each loop should be capable to have at least 250 elements / devices out of which min. 200 nos. shall be detectors. The Panel Shall have on board TCP/IP Lan port to facilitate remote operation of the panel.The system should be Vds approved It is possible to Commissioning the System through LAN Network.	1	Set
	INTELLIGENT ADDRESSABLE DETECTORS		
2	Signal initiating devices complete with back box, detector base, detector etc. Complete as specified and as required taking into account the following. I) for Car park, Pantry, Kitchen, and high temp zones, heat detectors to be used. ii) for general office combination of photo electric and heat type detector to be used.		
a	Supply, Installation, Testing & Commissioning of Intelligent Addressable type multisensor detector with base, with Microprocessor inbuilt, for use as heat (Fixed + Rate of Rise or individual) or smoke or combined both with automatic electronic addressing, microprocessor type and must have integrated short circuit isolator (in case short circuit isolator is not inbuilt, the	2,000	No.

	price of this item shall be inclusive of an independent short-circuit isolator along with each detector). The detector shall have IP 44 protection category & ambient temperature -20ºC to + 60ºC, the base shall have no electronics only dry contact terminals. The quoted item shall completely comply to the technical specification. Shall be VdS approved according to EN 54-5, 54-7, 54-17, 54-29		
B	Supply, Installation, Testing & Commissioning of Intelligent Addressable type multisensor detector with base, with Microprocessor inbuilt, for use as heat (Fixed + Rate of Rise or individual) or smoke or combined both with automatic electronic addressing, microprocessor type and must have integrated short circuit isolator (in case short circuit isolator is not inbuilt, the price of this item shall be inclusive of an independent short-circuit isolator along with each detector). The detector shall have IP 44 protection category & ambient temperature -20ºC to + 60ºC, the base shall have no electronics only dry contact terminals. The quoted item shall completely comply to the technical specification. Shall be VdS approved according to EN 54-5, 54-7, 54-17, 54-29. **For Auditorium.**	30	No.
c	Supply, Installation, Testing & Commissioning of Intelligent Addressable type heat detector with base, with Microprocessor inbuilt, for use as heat (Fixed + Rate of Rise or individual) or smoke or combined both with automatic electronic addressing, microprocessor type and must have integrated short circuit isolator (in case short circuit isolator is not inbuilt, the price of this item shall be inclusive of an independent short-circuit isolator along with each detector). The detector shall have IP 44 protection category & ambient temperature -20ºC to + 60ºC, the base shall have no electronics only dry contact terminals. The quoted item shall completely comply to the technical specification. Shall be VdS approved according to EN 54-5, 54-7, 54-17, 54-29	200	No.
c	Supply, Installation, Testing & Commissioning of Addressable type multicriteria detector with an automatic detection of con-tamination. With the CUBUS levelling, a temperature-and CO gas-assisted smoke-evaluation, the smoke part is continually	30	No.

	adapted to the environ-mental conditions. contains an alarm filter to reduce deceptive alarms, and continuous monitoring of all integrated sensors, which allow a multi-standard-use on three parallel channels (smoke, heat, CO) ac-cording to EN 54-5, 54-7, 54 - 26, 54-29 and 54-30. shall be VdS approved		
3	**ANALOG ADDRESSABLE MODULES**		
a	Supply, Installation , Testing & Commissioning of VdS approved Analogue Addressable Input Module (for fire exit door panic bar alarm, fire pump monitoring) with IP66 casing containing 1 inputs for monitored quering of potential free contacts with in-built short circuit isolator (in case short circuit isolator is not inbuilt, the price of this item shall be inclusive of an independent short-circuit isolator along with each monitor module), it must be VdS approved and as per EN-54 standard. The ambient temperature range shall be -20ºC to +60ºC.The quoted item shall completely comply to the technical specification.	150	Each
b	Supply, Installation, Testing & Commissioning of Addressable loop powered flashing light for visual notification of a fire alarm in interior areas, should have inbuilt fault isolator. The operating Temperature should be -10ºC to + 55ºC, Luminous intensity: approx. 1 cd, IP 21 and shall be VdS approved	100	Each
d	Supply, Installation, Testing & Commissioning Addressable Loop Powered multi tone platform sounder with integrated short circuit isolator (in case short circuit isolator is not inbuilt, the price of this item shall be inclusive of an independent short-circuit isolator along with each loop powered sounder) & having operating temperature -10ºC to + 55ºC shall be VdS approved	200	Each
	(Note: If these modules form part of the detector base, separate rates need not be quoted.**)**		

e	Supply, Installation, Testing & Commissioning of Single Action Manual Call Point. The Manual Call Point should be in a red plastic case, conforming to EN 54-11 (Type A) for manually triggering a fire alarm, suitable for use indoors. The alarm is triggered by smashing the glass panel, with the alarm remaining in alarm state until reset. The built-in LED indicates its triggered state. The detector can be installed on the same loop circuit as automatic detectors with integrated short circuit isolator in built. VdS approved	200	Each
f	Fire Man Jack with Control Module.	20	Each
g	Fireman Telephone Handset portable type.	6	No.
h	Portable Handset Storage box with transferarent cover and lock and key arrangement.	2	No.
j	24 zone Fireman telephone controller	1	No.
4	**BEAM DETECTORS**		
a	Supply, Installation, Testing & Commissioning of Linear Smoke detector with module consists of a transmitter receiver and reflector which are mounted opposite each other at a distance of between 5 and 120 m.The module must be VDS approved.	4	Each
5	**CONDUIT, CABLE AND TRUNKING**		
a	Wiring for signal initiating devices, control, monitor & fault isolator 2 Cx1 Sq.mm multi-stranded copper conductor, PVC insulated, twisted and shielded, armored, outer sheath FRLS PVC / XLPE color Red color complete with glands, ferrules, pull wires, junction boxes, terminal strips etc. complete in all respects.	12,000	Rm.
b	Trunking		
	Hot Dip GI raceway for signal cabling complete with: a) Openable Raceway as per the details and as specified and shown on drawings.		

	b) All bends, T joints junction boxes etc. as specified and shown complete.		
c	100mm X 50mm Single Compartment Raceways.	10	Rm.
d	200mm X 50mm Single Compartment Raceways	5	Rm.
e	Cable Trays		
	Hot Dip Galvanized perforated cable trays with necessary frame, cover, hat clamp etc. complete		
f	200mm wide horizontal / vertical tier.	100	Rm.
6	**EXTRAS**		
a	24 Volt 10 Amp, SMPS Grade Power supply with 12 V / 44 Ah Batteries 2 Nos and Integration terminal with FAS System along with Industrial grade cabinet with lock and key arrangement.	2	Set
b	Response Indicator.	100	No.
c	Wall mounted Signage Board to display the location of Telephone Jack with 3Hours battery backup as per standards.	74	No.
d	Supply of Floor Distribution box with Required floor loo, Power, Audio riser cable connector terminal with fusible link and lock and key arrangement.	25	Nos
7	**GRAPHIC CONTROL STATION**		
	The Graphic **Central Control Stations** consisting of the following		

a	GUI workstation with following features: a. Core i7 latest Generation b. 16GM RAM c. 500GB Hardisk, 4 USB 2.0 Ports d. Dual head graphics card 512 MB of RAM (resolution at least 2,560 x 1,024) e. 10/100MBPS Network Adapter with TCP/IP Port, Mouse and Keyboard f. 2 LCD Monitor at least 19" connected via VGA/ HDMI cable with 2,560 x 1,024 resolution g. Windows 11 latest installed and activated. h. Sound card and Speaker	1	No.
b	42" color monitor flat screen LCD display as per specifications.	1	No.
c	Laser jet printers will be selected as per configuration of the system.	1	No.
d	Modular type GUI fire alarm management system to monitor & control the entire fire alarm panel network from a central location with necessary license. All messages & states of attached fire alarm control panels are displayed using a clear graphical user interface. All connected system & their cabling shall be constantly monitored. Software shall have minimum following features: Can be operated from one or more operator's desks Clear 2 monitor user interface with automatic changeover if a fault occurs Graphics can be imported from all current graphics and CAD programs Hierarchical password system with individual privilege and password allocation Detector information acquisition for automatic positioning and assigning of levels (auto-configuration) Tested and approved in accordance with OENORM F 3003/ VdS/EN54.		
e	GUI for up to 4500 Elements	1	Set
f	1.5 KVA offline UPS to deliver 60 minutes back up.	1	Set
8	MOTORISED DAMPER		

a	Motorised Fire damper of 1200 mm * 450 mm with actuator, UL listed / FM approved suited for a fire rating of minimum 2 hours which shall automatically close on being tripped by the relay contact from the fire alarm panel / manual release lever. Make - Reputed.	6	Set
b	Motorised Damper Actuator UL Listed / FM Approved. Make - Reputed.	10	Nos

2. SCHEDULE FOR QUANTITY FOR BUY BACK				
Sr No.	**Item**	**Qty.**	**Unit**	**MODEL**
(A)	**(B)**	**(C)**	**(D)**	**(E)**
1	**Detector, MCP, Hooter, Fire Alram Panel, etc. EST-3 Make.**			
a	Detector (Approximately)	1200	Nos.	EST Make.
b	MCP (approximately)	32	Nos.	EST Make.
c	Hooter with Flasher (approximately)	69	Nos.	EST Make.
d	Module (approximately)	75	Nos.	EST Make.
e	Fire Alarm Control Panel	1	Nos.	EST- 3 Make.
f	Repeater Panel	2	Nos.	EST Make.

Section: 06

FORCED AIR VENTILATION SYSTEM FOR LIFT LOBBIES, STAIRCASES AND BASEMENTS

Section: 6.1

PARTICULARS OF PRESENT SYSTEMS PROVIDED

1.0 PARTICULARS OF PRESENT SYSTEMS PROVIDED

1.1 FORCED AIR VENTILATION SYSTEM FOR THE BASEMENTS, STAIRCASES AND LIFT CORRIDORS

In case of a fire, the personnel within the building shall be able to evacuate smoothly and safely from the premises while at the same time allowing the fire personnel to approach the fire.

For this, the original design has considered for the provision of the blower fans for the various areas as follows:

Staircase Pressurization

- Pressurization system is provided for staircases of tower north side and south side. Staircase coverage up to 21 floors
- North side Pressurization system is through the shaft. Fan model ADH 630 R Nicotra with 9.3 kW motor. Approx GI Duct size of each tapping on staircase - 250 x 150 with Supply grille of approx. 400 x 400 size. In addition, there is additional grille 250 x 150.
- South side Pressurization system is discharged in shaft. Fan model ADH 630 R Nicotra with 9.3 kW motor. From plumbing shaft small duct of approx. 300 x 200 is taken through pantry and taken into staircase

Lift well and corridor Pressurization system

- North side - lift well - 19th floor to 10th floor and lift corridor --served by Fan Model ADH 710 Nicotra, 11 kW motor
- South side - lift well - 12th floor to ground floor and lift corridor --served by Fan Model CP 71 ,18.5 kW motor

Basement ventilation system

- All fans of basement ventilation system for lower basement and upper basement are located in upper basement
- There are 8 no's fan rooms
- Fan room -1 for STP - Smoke exhaust fan - for Lower basement
- Fan room -2 for upper basement - NO FANS ARE INSTALLED. SAME REQUIRES INSTALLATION.

- Fan room -3 for AC Plant and substation - Smoke exhaust fan - for Lower basement. Fan model CP 630 15 Kw Motor
- Fan room -4 for upper basement - 20 HP Blower Acco make. Capacity not mentioned
- Fan room -5 for upper basement - 20 HP Blower Acco make. Capacity not mentioned
- Fan room -6 for lower basement - NO FANS ARE INSTALLED. SAME REQUIRES INSTALLATION.
- Fan room -7 for upper basement - 20 HP Blower Acco make. Capacity not mentioned
- Fan room -8 for lower basement - 20 HP Blower Acco make. Capacity not mentioned
- Room 8 has 2 no's fresh air fan for feeding in basement

Some of these systems are functional. However, there is a need to improve the performance of the system to provide full life safety.

Section: 6.2

RENOVATION OF THE FORCED AIR VENTILATION SYSTEM FOR LIFT LOBBIES, STAIRCASES AND BASEMENTS

1.0 SCOPE OF WORK AND AREAS OF PROTECTION

The particulars of the existing ventilation system are indicated in the earlier pages of this specification. The following are the planning:

- Design of ventilation system for basements as per NBC standards for proper ventilation of car parks scavenging CO (Carbon monoxide) from basement and smoke exhaust under fire conditions. In this system ductless fans are used to create draft, fresh air is supplied through ramps area because of draft. Ductless fans shall be located strategically to force air outside through new proposed vane axial smoke spill fan located at point of discharge to atmosphere.

  The system shall enable reduction of power to operate under the Normal – Ventilation Mode.

  This is proposed with VFD and demand control ventilation to conserve energy. Saving of power in NORMAL Ventilation mode. Installation of CO sensors for operation of fans under demand control ventilation.
  Under smoke mode – All fans will be operational

  Lower basement will have similar proposal. Fresh air fan- existing shall be retained.

System description:

The building is having 2basements with parking lot. The proposed quantities of Jet vent fans are 8+ 4Nos. Jet fans are to be located at various locations will move and should induce the surrounding air forward to a distance of 20- 40meters without forming dead stagnated zones, as is the case in conventional system.

The exhaust air fans shall be designed such that they are capable of extracting air at a rate of 6 AC/hr for normal day-to-day ventilation.

Axial fans should be provided in the basements for exhaust through small duct piece and discharged at ground floor level through cutout.

The fresh air is ample available from the ramp and there is no need for providing separate Fresh air intake fans for UPPER BASEMENT.

For Lower basement – Additional fresh air fans are used as ramp area is not adequate. NEW Fresh air fans for lower basement to be used.

DESIGN PARAMETERS AS PER NBC FOR BASEMENT VENTILATION SYSTEM FOR BUILDING

1	Area sq m	Upper basement- 2264 sqm (effective car park area) Lower basement- 1332 sqm (effective car park area)
2	Height	3.4 mtr.
3	Air change per hour	15—Normal ventilation mode 30- Smoke evacuation mode
4	Total air quantity cfm	Upper basement Normal mode-69000 cfm smoke mode-138000 cfm Existing blowers- 20 HP X 3 with approx rating (33000 cfm x 3 totalling 99000 cfm). We could use Fan in room no 5 & 7 totalling 66000 cfm under smoke exhaust condition. Normal mode we propose to add 36000 cfm x 2 nos fans with VFD – Axial smoke fill fans. Lower basement Normal mode-40000 cfm Smoke mode-80000 cfm We will use Fan room 8 fan as it is on Smoke Mode- 33000 cfm. Two additional fans 23500 cfm x 2 nos Axial fans are added to complete requirement 30 ACPH.
5	Jet vent impulse fans: 4 no's ductless fans each in both basements, this replaces ducting in basement. These are ceiling suspended fans to direct air to fan rooms, two speed motor to operate normal mode and higher speed on smoke mode.	
6	Control panel- PLC Based proposed. Normal mode – Operation based on CO sensor with measuring range 0-300 ppm. Normal mode axial fan shall be operated on VFD for saving power. It is demanding control ventilation capable of operating under 6 / 8 / 10/15 ACPH. During smoke condition second fan comes into operation through signal from Fire alarm panel.	
7	CONSIDERATION FOR DESIGN We have considered only CAR park area and height for ventilation system. Fans are split for normal operation and smoke operation- 15 ACPH + 15 ACPH. Smoke condition operation at 30 ACPH Parking exhaust –NORMAL mode is operation with VFD to conserve energy and it is demanding control ventilation to reduce operating expense.	

	All fans are ceiling suspended. Saving of space for fan room is obtained. All fans are capable of withstanding 250 deg C for 2 hours with Class H Insulation and Motor to EFF2 energy efficiency standards.

System requirements salient features of duct less fans:

Jet vent fans is proposed to ventilate underground car parking lots. The Jet vent fans, which are positioned in strategic locations, will without any dead stagnated zones, as is often the case in conventional ducted ventilation systems.

Accessories such as inlet flexible connection, back-draft damper, outlet cone, pressure relief damper, etc. are to be included in the scope of the jet fan. It is not showed as BOQ items. As standard design of jet fans these accessories are not included. (If the bidder is required to be provided these item as additional accessories you may add the same as included in the BOQ separately.)

All surrounded air is set into a vortex motion while being simultaneously pushed forward to a distance of 20-40 meters and provide a continuous air flow in the car park. The ducting is no longer needed to transport the air but instead, Jet vent fans form a virtual ducting system thru the air.

Principle of Induction Jet vent System expected:

- Jet Vent Fan shall induce the air stream to the exhaust outlet.
- System shall move air of surrounded / shadowy area to the main air stream without any dead stagnated zones.
- System shall equally disperse fresh air throughout area, dilutes the congested & contaminated air by stirring it with fresh air and induces air stream to the outlet both by induction effect due to pressure difference and whirl effect.

Principle of Ductless induction ventilation system expected:

- No ducts should be required.
- The Car Park and areas should be neat and attractive. As there is no interference with column, pipe and beams while installing. Permission of Low layer design by use of Ductless System.
- Improved air quality with no stagnated zone: The air quality in underground Car Park is improved, as compared to conventional ducted systems.
- Advantage of fine external appearance.
- Efficient dilution of pollutant air CO by much induced air flow.
- Optimum Safety is provided in case of Fire in the car park, Rapid smoke extraction, smoke cooling, limited smoke spread i.e. better smoke control.
- As the installation is in a marine environment with high humidity and saline atmosphere, marine-grade coating is best suited, whereas jet fans is in standard GSS construction.

- Easy to Retrofit: Jets fans are ideal solutions for renovation. Jet fans are more flexible in positioning.
- Energy Saving: Energy saving in Exhaust air fans due to reduced system resistance.
- Reduced Installation and running cost.

STAIRCASE PRESSURISATION SYSTEM:

Design of the system to pressurize staircase as per NBC Part-4 standards under EMERGENCY OPERATION-Single stage system with building height above 15 m to maintain pressure 50 Pa.

Difference in pressure difference between staircase and lobby should not be more 5 Pa.
Under fire condition the following steps to be followed

1. All recirculation to be stopped.
2. All air supply other than ESCAPE route to be stopped.
3. Extract system to be running so that smoke is not spread.
4. Pressurization system to be connected to main fire alarm system.
5. Staircase Pressurization to be actuated through fire alarm panel.

System designed to operate in following mode

1. Mode 1 – Detection mode - To raise pressure differential in protection space (Staircase) by 50 Pa when all others doors are CLOSED.
2. Mode 2- Escape mode –To maintain pressure differential 10 Pa when fire floor door-OPEN, one more door-OPEN.
   The supply air demand is maximum within Mode-2 hence calculation done for Mode 2.

   Air quantity based on above works out to 39000 CFM with 20% safety. Hence 39000 CFM axial fan selected while existing is 12000 cfm.

   Existing ducts shall remain as it is. Balance air flow will be blown directly in staircase from top.

   Ducting space for taking additional 39000 cfm is not available in existing shafts. It is not advisable to get air from plumbing shaft.

   Conclusion: 2 nos 39,000 cfm x 20 mm SP Vane Axial fan with 6 pole motor to be procured. In addition, control system to be provided along with differential pressure sensor and signal fan to ramp up speed. FANS are to be provided with VFD.

Lift Corridor/Lobby Pressurization system:

Considering Mode 1 – Fire floor-lift lobby door and lifts open, all other doors closed with 50Pa as per enclosed calculation.
Air quantity - 52000 cfm for 19th to 10th floor and 68000 cfm for 12th to 10th floor.

Other areas such as AC plant room, substation, STP areas are in working condition. Can be retained without change. Air changes under smoke condition will be checked.

Note: For Fresh air Class F motor is suitable whereas for exhaust application (Class H) in fire mode it is needed 250 Deg for 2 hrs. fire rating.

3.1.1 Testing

After installation, all systems shall be demonstrated for their full and satisfactory operation. All arrangements for the same to be carried out by the contractor.

All the operating test shall be carried out in the presence of Engineer-in-charge, respective local authority, fire brigade or Insurance company.

3.1.2 Make Of Materials

All materials and equipment's used shall be approved products as per UL / FM / BIS as specifically indicated. The list of makes of materials are indicated in the BOM and shall be adhered to. Any change / addition in the same required to be solicited during the tender stage itself. Variations after order placement are entirely in the discretion of the client and consultant with valid reasons provided by the contractor.

3.1.3 Mode of Measurement

The payment will be made based on the units mentioned against each item in the bill of materials.

3.2 COMPREHENSIVE ANNUAL MAITENANCE CONTRACT:

The maintenance should be carried out as per manufacturers maintenance manual recommendation. The same should be done based on the written document issued by the manufacturer this document should be submitted to the owner and also to the consultant before starting work. The contractor is also to submit the forms concerned (form a & b as applicable) to the fire authorities from time to time and should obtain their approvals from time to time. It is also required to Employ experienced engineers having through knowledge of the systems revamped and upgraded should be capable of maintaining the systems as required from time to time. The personal should be employed 24/7-365 days without fail. The person will be under the contractor's payroll and strictly follow all government norms.
The bank no way will have any direct responsibility to the personals employed for the discharge of the contractual obligation of the contractor.

1. Payment of CAMC
   i) Prorate basis
   ii) Every quarter (At the end of the quarter)
   iii) CAMC payment will start after defect liability period (After 1 year)
   iv) Since CAMC is comprehensive, no additional payment for replacement of parts and allied equipment's/ components/ machine etc., will be made.

2. Scheduled work to be carried out for each system
   i) Periodicity of visit (system wise)
   ii) Work to be carried (brief description)
   iii) Items which are not supplied by contractors, but only installation done by contractor should also be maintained. It should be included in CAMC. This means that the final system maintenance will be the sole responsibility of the vendor irrespective of the product supply.

3. Down Time Period of system
   i) Down Time Period should not be more than 24-48 hours.
   Start time: Call reported by telephone/ Fax/ Mail

End time: System in operational condition, critical system.

4. Ventilation system should be in action within sixteen hours.

4. Penalty clause:
   i) If the services are not satisfactory, penalty of ____% of the CAMC will be imposed or deducted from contract amount.
   ii) If contractor unable to repair or maintain the system as per maintenance manual, penalty ___% will be imposed.
   iii) If down time of the system is more than stipulated period
   iv) If fails to repair or maintain then Bank at risk and cost of contractor will get it repaired, by engaging another contractor. The cost involved will be deducted plus penalty.

5. CAMC Agreement: Separate CAMC Agreement will be executed as per Bank's standard CAMC format
   (To be vetted from Law Department and should be in Tender format)

II. <u>Testing and Maintenance of Pressurization Systems.</u>

THE PRESSURISATION SYSTEM SHOULD BE MAINTAINED AS PER THE APPLICABLE MAINTANANCE MANUAL OF THE CONCERNED AUTHORITIES.

Contractor to quote separately for 5 years comprehensive CAMC which includes all necessary material supply and Labour covering following

1. Replacement / rectification of fan impeller / motor etc., if damaged / not working.
2. Rectification / replacement of any components of PLC panel, sensors if not found in working condition.
3. Rectification / replacement of actuators of fire damper if not found in working condition.
4. Checking / correcting any leakages in the duct.
5. Periodically checking of all interlocking systems covering tripping of all HVAC units except staircase / lift well Pressurization system and smoke venting system on receipt of fire signal from fire alarm system.

Contractor to submit schedule of routine maintenance of entire system. Schedule to include monthly and quarterly schedule as is required, depending on the moving part.

BILL OF QUANTITIES (BOQ)

1. SCHEDULE OF QUANTITY FOR BASEMENT VENTILATION SYSTEM			
Sr No.	**Item**	**Qty.**	**Unit**
(A)	**(B)**	**(C)**	**(D)**
1	**SECTION I : Lower Basement**		
1	Supply, Installation, Testing & Commissioning (SITC) of smoke spill vane axial fans with integrated aerodynamic straightening vanes. Fan, casing, motor, shall be suitable for smoke exhaust application & thermally rated for 250ºC for 2 hours as per BS EN 12101-3. Fan shall be AMCA certified for Air and Sound performance in accordance with AMCA 210 and AMCA 300. Base fan performance shall be at standard conditions (density 1.2 Kg/Cu.mt.) The fans and motors complete assembly dynamically trim-balanced to ISO1940 and AMCA 204/3 - G2.5 quality grade. Motors shall be High Temperature resistance smoke venting type suitable for 415+10% volts, 50 cycles, 3 phase AC supply with IP 55 protection, static pressure shall be as indicated. Each fan shall be with TEFC squirrel cage induction motors, all fan shall be with integral long casing covering entire motor. Suitable spring isolators to provide along with the fans. Spring mount Isolator to have Efficiency of above 90%. All fans to have IE2 motors.		
a	CFM: 11750 CFM @ 25 mm wg	1	Nos
	Mode: - Normal + Fire (Exhaust Air Fan)		
	RPM: -Below 1000		
	Noise Level @ 3 MTR: - Below 70 dB @ 3m		
b	CFM: 11750 CFM @ 25 mm wg	1	Nos
	Mode: - Fire (Exhaust Air Fan)		
	RPM: - Below 1500		
	Noise Level @ 3 MTR: - Below 79 dB @ 3m		
c	CFM: 11750 CFM @ 25 mm wg	1	Nos
	Mode: - (Fresh Air Fan)		
	RPM: - Below 1000		
	Noise Level @ 3 MTR: - Below 70 dB @ 3m		
2	**JET FAN FOR AIR MOVEMENT**		
a	Supply of Centrifugal backward curved Jet fans with bottom suction. Fan shall be AMCA/BS certified for Air & Sound performance. Fan shall be complete with GSS casing with two mounting brackets (220 GSM), Aluminum impeller, Class H high temperature rated smoke spill		

	motor certified for 250 Deg C for 2 hrs. - 415/3P/50Hz. Complete assembly shall be certified for 250 Deg C for 2 Hrs. fire rating as per BS EN 12101-3:2002 F200, F300 & F400, certified by a third party. The Location Ing 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.		
	These fans shall operate at low speed during Normal mode & at high speed during fire mode.	4	Nos
	Quantity of jet fans to be confirmed by CFD Analysis.		
	Normal Mode: Flow Rate - 3650 CMH (4241 CMH)		
	Fire Mode: Flow Rate - 7250 CMH (7312 CMH)		
3	**SECTION II: Upper Basement**		
3	Supply, Installation, Testing & Commissioning (SITC) of smoke spill vane axial fans with integrated aerodynamic straightening vanes. Fan, casing, motor, shall be suitable for smoke exhaust application & thermally rated for 250ºC for 2 hours as per BS EN 12101-3. Fan shall be AMCA certified for Air and Sound performance in accordance with AMCA 210 and AMCA 300. Base fan performance shall be at standard conditions (density 1.2 Kg/Cu.mt.) The fans and motors complete assembly dynamically trim-balanced to ISO1940 and AMCA 204/3 - G2.5 quality grade. Motors shall be High Temperature resistance smoke venting type suitable for 415+10% volts, 50 cycles, 3 phase AC supply with IP 55 protection, static pressure shall be as indicated. Each fan shall be with TEFC squirrel cage induction motors, all fan shall be with integral long casing covering entire motor. Suitable spring isolators to provide along with the fans. Spring mount Isolator to have Efficiency of above 90%. All fans to have IE2 motors.		
a	CFM: 25500 CFM @ 20 mm wg	1	Nos
	Mode: - Normal + Fire (Exhaust Air Fan)		
	RPM: -Below 1000		
	Noise Level @ 3 MTR: - Below 76 dB @ 3m		
b	CFM: 25500 CFM @ 20 mm wg	1	Nos
	Mode: - Fire (Exhaust Air Fan)		
	RPM: - Below 1500		
	Noise Level @ 3 MTR: - Below 81 dB @ 3m		
c	CFM: 25500 CFM @ 40 mmWG	1	Nos
	Mode: - (Fresh Air Fan)		
	RPM: - Below 1000		
	Noise Level @ 3 MTR:- Below 76 dB @ 3m		

4	**JET FAN FOR AIR MOVEMENT**		
a	Supply of Centrifugal backward curved Jet fans with bottom suction. Fan shall be AMCA/BS certified for Air & Sound performance. Fan shall be complete with GSS casing with two mounting brackets (220 GSM), Aluminum impeller, Class H high temperature rated smoke spill motor certified for 250 Deg C for 2 hrs. - 415/3P/50Hz. Complete assembly shall be certified for 250 Deg C for 2 Hrs. fire rating as per BS EN 12101-3:2002 F200, F300 & F400, certified by a third party. 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.	8	Nos
	These fans shall operate at low speed during Normal mode & at high speed during fire mode.		
	Quantity of jet fans to be confirmed by CFD Analysis.		
	Normal Mode: Flow Rate - 3650 CMH (4241 CMH)		
	Fire Mode: Flow Rate - 7250 CMH (7312 CMH)		
5	Supply, Installation, Testing & Commissioning (SITC) of MCC Panel within built Digital Display PLC (programmable logic controller) fabricated out of 1.6 / 2 mm thick CRCA Sheet with powder coated painting with IP-54 Degree of protection. MPCB Feeders for fans, Normal mode operation fans with VFD and Bypass Starters for all fans for automatic operation of jet fans with incoming MCCB, voltmeter, ammeter, voltmeter and ammeter selector switch, CTs, indication lamps. Panel compatible with RS485. Panel to be integrated with fire alarm panel. Separate Panels for Lower & Upper Basements. Feeders as per specified basements.	2	No
a	Panel For Lower Basement	1	No
b	Panel for Upper Basement	1	No
c	Integrated panel for both Basements to be connected at control room	1	No
	Outgoing feeders - 2 nos for vent fans with VFD		
	Outgoing feeders - 2 nos for vent fans with VFD		
	Outgoing feeders - 2 nos for Fresh fans		
	Outgoing feeders - 12 nos + 4 SPARE three phase MCB for jet fans with power contactor, overload relay		
	PLC section complete with control transformer, push button, analogue to relay convertor / auto manual switch		
6	Supply, Installation, Testing & Commissioning (SITC) of power and control cabling (with necessary double compression glands) of 1.1 kV grade copper conductor armored XLPE Insulated, PVC sheathed of following sizes. All cables FRLS		
a	Copper armored cable-FRLS - 11,750CFM fan	400	mtr
b	Copper armored cable-FRLS - 11,750CFM fan	400	mtr
c	Copper armored cable-FRLS - 25,500CFM fan	400	mtr
d	Copper armored cable-FRLS - 25,500CFM fan	400	mtr

e	Copper armored cable-FRLS - Fresh air fan	100	mtr
f	Copper armored cable-FRLS - Jet fans	1,800	mtr
g	CO Sensor Cabling	600	mtr
h	Control Cabling	200	mtr
i	Cabling from Fire Panel to MCC logic control panel	100	mtr
7	Remote ON-OFF (lockable) push button station in rain & weather proof enclosure	6	No
8	Supply, Installation, Testing & Commissioning (SITC) of Carbon monoxide sensor with 4-20 mA / 0-10 V output with measuring range of 0-300 ppm with covering range of 7500 sqft. Power supply 15-30 V AC / DC. Sensor shall be suitable for Modbus. Should include all required accessories.	12	Nos
9	Supply, Installation, Testing & Commissioning (SITC) of GSS ducting of 120 GSM as per SMACNA standards		
a	22 G	200	sqm
10	GSS Volume control damper - Manual of 16 G	10	sqm
11	Supply, Installation, Testing & Commissioning (SITC) of following mentioned earthing conductors with GI clips on walls & ceiling. (Common for all ventilation systems)		
a	25 x 3 mm. GI strip	0	Mtr
b	8 SWG Cu wire	0	Mtr
c	14 SWG GI wire	3,400	Mtr
12	Supplying MS Structure for Tube Axial fan and Floor Mounted Free standing Electrical MCC Panel	200	Kg

2. SCHEDULE OF QUANTITY FOR STAIRCASE PRESSURIZATION SYSTEM

Sr No.	Item	Qty.	Unit
(A)	(B)	(C)	(D)
1	The scope includes Supply, Installation, Testing & Commissioning (SITC) of new systems, removal of old systems, completing the erection, testing and commissioning of the system and obtaining approval for the system from client, statutory authorities and insurance agency of client.		
	The scope includes comprehensive warranty of the system in full working condition for a period of one year from date of commissioning.		

	The particulars mentioned herein in this section are also applicable to other sections and systems as well. Any point specifically divergent shall be brought to notice during the tender stage itself.		
	PARTICULARS OF STAIRCASE PRESSURIZATION SYSTEM		
	The project requirement is for Vane Axial Fans		
	The fan to be supplied with all necessary accessories as mentioned in boq item		
	The motor shall be suitable for variable speed application		
	The motor shall be NEMA 4, IP 55 rated / 6 Pole / 415 V / 3 Ph. NEMA 4 is for indoor or outdoor use to provide a degree of protection to personnel against to access to hazardous parts. IE2 motor is an energy-efficient electric motor classified under the IEC (International Electrotechnical Commission) standards as "High Efficiency," You have to provide the motor which **confirms to both the above two categories.**		
	The motor shall be of Energy Efficient Type -EFF2 Standards		
	The motor for the fans shall be suitable for DOL starting.		
2	Supply, Installation, Testing & Commissioning (SITC) of Vane axial flow With TEFC motor. Casing shall be hot dipped galvanizing and impeller aluminum with all accessories -mounting feet, inlet flexible connection, inlet screen, back draft damper, outlet cone. Motor to be 6 Pole, energy efficient to IE2 Standards. Pressure relief damper if needed as per site condition.		
a	40000 CFM / 30 mm SP.	2	Nos
3	Supply, Installation, Testing & Commissioning (SITC) of power and control cabling (with necessary double compression glands) of 1.1 kV grade copper conductor armored XLPE Insulated, PVC sheathed of following sizes		
a	Copper armored cable -FRLS - Tube Axial fans	80	mtr
b	Control Cabling	300	mtr
4	Supply, Installation, Testing & Commissioning (SITC) GSS ducting of 120 GSM as per IS 655		
a	22 G	100	sqm
b	GSS Duct dampers - Manual operated of 16 G. Make - Cosmos / Air products	6	sqm
5	Supply, Installation, Testing & Commissioning (SITC) of Aluminum Grill with heavy duty damper	20	sqm

6	Supply, Installation, Testing & Commissioning (SITC) of DP sensor with 4-20 mA / 0-10 V output with measuring range of 0-100 Pascal. Includes all required accessories	2	Nos
7	Design, manufacture, supply, installation, testing and commissioning of the following cubicle type, dead front, sheet steel, wall mounted IP -55 control panels including anchoring into the wall, wiring, incoming, earthing & terminating into MCCB in each panel shall be provided by the electrical contractor. All outgoing shall be provided with Stop / Manual /Auto selector switch to facilitate operation through BAS. All starters shall be provided with potential free Contact for Connections to Building Automation System. The panel shall include the following components and accessories. Panel shall have provision to interlock with fire alarm panel for integration in case of alarm. (Compatible with fire detection system) Panel compatible with RS485. Panel shall include VFD for all fans. Make - VFD make - Danfoss / Honeywell / ABB / Fuji Electric. Panel to be integrated with fire alarm panel	1	Nos
	Note: Consider without VFD panel (VFD not required)		
8	Remote ON-OFF (lockable) push button station in rain & weather proof enclosure	2	Nos
9	Supplying MS Structure for Tube Axial fan and Floor Mounted Free standing Electrical MCC Panel	200	Kg

3. SCHEDULE OF QUANTITY FOR LIFT LOBBY PRESSURIZATION SYSTEM

Sr No.	Item	Qty.	Unit
(A)	(B)	(C)	(D)
1	The scope includes Supply, Installation, Testing & Commissioning (SITC) of new systems, removal of old systems, completing the erection, testing and commissioning of the system and obtaining approval for the system from client, statutory authorities and insurance agency of client.		
	The scope includes comprehensive warranty of the system in full working condition for a period of one year from date of commissioning.		
	The particulars mentioned herein in this section are also applicable to other sections and systems as well. Any point specifically divergent shall be brought to notice during the tender stage itself.		
	The project requirement is for Vane Axial Fans		

	The fan to be supplied with all necessary accessories as mentioned in boq item		
	The motor shall be suitable for variable speed application		
	The motor shall be NEMA 4, IP 55 rated / 6 Pole / 415 V / 3 Ph. NEMA 4 is for indoor or outdoor use to provide a degree of protection to personnel against to access to hazardous parts. IE2 motor is an energy-efficient electric motor classified under the IEC (International Electrotechnical Commission) standards as "High Efficiency," You have to provide the motor **which confirms both the above two categories.**		
	The motor shall be of Energy Efficient Type -EFF2 Standards		
	The motor for the fans shall be suitable for DOL starting.		
2	Supply, Installation, Testing & Commissioning (SITC) of Vane axial flow With TEFC motor. Casing shall be hot dipped galvanizing and impeller aluminum with all accessories -mounting feet, inlet flexible connection, inlet screen, back draft damper, outlet cone. Motor to be 6 Pole, energy efficient to EFF2 Standards and suitable for VFD Application		
a	56000 CFM / 25 MM SP	1	Nos
b	67000 CFM / 25 mm SP	1	Nos
3	Supply, Installation, Testing & Commissioning (SITC) of power and control cabling (with necessary double compression glands) of 1.1 kV grade copper conductor armored XLPE Insulated, PVC sheathed of following sizes. All cables FRLS		
a	Copper armored cable-FRLS - 56000 CFM	80	mtr
a	Copper armored cable-FRLS - 67000 CFM	80	mtr
b	Control Cabling	300	mtr
4	Supply, Installation, Testing & Commissioning (SITC) of DP sensor with 4-20 mA / 0-10 V output with measuring range of 0-100 Pascal. Includes all required accessories Make - Honeywell / Siemens / Greystone	2	Nos
5	Supply, Installation, Testing & Commissioning (SITC) GSS ducting of 120 GSM as per SMACNA standards		
a	22 G	260	sqm
b	20 G	200	sqm

6	GSS Duct dampers - Manual operated of 16 G. Make - Cosmos / Air products	8	sqm
7	Supply , Installation, Testing & Commissioning (SITC) of Aluminum Grill with heavy duty damper	25	sqm
8	Design, manufacture, supply, Installation, Testing & Commissioning (SITC) of the following cubicle type, dead front, sheet steel, wall mounted IP -55 control panels including anchoring into the wall, wiring, incoming, earthing & terminating into MCCB in each panel shall be provided by the electrical contractor. All outgoing shall be provided with Stop / Manual /Auto selector switch to facilitate operation through BAS. All starters shall be provided with potential free Contact for Connections to Building Automation System. The panel shall include the following components and accessories. Panel shall have provision to interlock with fire alarm panel for integration in case of alarm. (Compatible with fire detection system) Panel compatible with RS485. Panels shall include VFD for all fans. Make - VFD make - Danfoss / Honeywell / ABB / Fuji Electric.	1	No
	(Panel for both Fans)		
9	Remote ON-OFF (lockable) push button station in rain & weatherproof enclosure	2	Nos
10	Supplying MS Structure for Tube Axial fan and Floor Mounted Free standing Electrical MCC Panel	200	Kg

4. DISMANTLE OF EXISTING SYSTEM (TO BE CARTED AWAY IMMEDIATELY)

Sr No.	Item	QTY.	Unit
(A)	**(B)**	**(C)**	**(D)**
1	Dismantling existing ducts in Staircase Pressurization System	100	sq m
2	Dismantling and removal of existing fan and shifting to store- 12000 cfm capacity (9.3 kW) in Staircase Pressurization System	2	No

5. TESTING OF EXISTING SYSTEM INTEGRATE TO THE NEW SYSTEM FOR MAKING FUNCTIONAL BENEFITS			
Sr No.	**Item**	**QTY.**	**Unit**
(A)	**(B)**	**(C)**	**(D)**
	Cost of material and labour charges for following items:		
1	Computational Fluid Dynamics (CFD) Analysis for AIR Flow and CO Simulation for both basements, Staircase and Lift Lobby.	1	Lot
2	Computational Fluid Dynamics (CFD) Analysis for smoke density and visibility and temperature during fire condition for both Staircases and Lift Lobby.	1	Lot

Section: 07

PASSIVE FIRE PROTECTION SYSTEM FOR FLOOR CLOSING

1. Supply and application of through-penetration fire stop systems for sealing of mechanical openings (HVAC & Fire Fighting) in walls and floors. Cleaning up the area around the opening, the clearance at each side is between 50 mm to 100 mm maximum, in accordance with the thickness of the sealant. The input material for fire stop, accessories being used, should ensure a minimum fire rating of two hours. Installing the proper thickness and density of the infill material should confirm to the relevant NFPA, ASTM, FM standards. The minimum density of the Rock Wool should be 64 kg / Cu.mtr. The same should be introduced in layers as required. The infill materials should be UL listed / FM approved. It is necessary to have the sealant identification template on wall. The individual input product should have the UL test certificate, and the same should be submitted at the time of Data submission. Produce the certificate of testing in accordance with UL 1479, ASTM E 814, for Sealant & Mineral wool Density should be 64 Kg /cu.mtr.
2. Supply and application of through-penetration fire stop systems for sealing of plumbing pipes (non-metallic pipes) in walls and floor. Cleaning up the area around the opening, the clearance at each side is between 50 mm to 100 mm maximum, in accordance with the thickness of the sealant. The input material for fire stop, accessories (Collars/ Wrap Strip) being used, should ensure a minimum fire rating of two hours. Please note that the collars may be used for pipes having ID 100 mm and above where the collar must be UL and FM Approved. Details and data sheet must be provided before purchasing of the material. Installing the proper thickness and density of the infill material should confirm to the relevant NFPA, ASTM, FM standards. The minimum density of the Rock Wool should be 64 kg / Cu.mtr. The same should be introduced in layers as required. The infill materials should be UL listed / FM approved. It is necessary to have the sealant identification template on wall. The individual input product should have the UL test certificate, and the same should be submitted at the time of Data submission. Produce the certificate of testing in accordance with UL 1479, ASTM E 814, for Sealant & Mineral wool Density should be 64 Kg /cu.mtr.
3. Supply and application of through-penetration fire stop systems for sealing of electrical openings (cables and cable trays) in walls and floor. The sealant shall be UL listed / FM approved in all respects. UL test certificate to be submitted for the above is mandatory
4. Comprehensive Annual Maintenance Contract:

The maintenance should be carried out as per manufacturers maintenance manual recommendation. The same should be done based on the written document issued by the manufacturer, this document should be submitted to the owner and also to the consultant before starting the work. The contractor is also to submit the concerned forms (form a & b as applicable) to the fire authorities from time to time and should obtain their approvals from time to time**.**

- Payment of CAMC
    - Prorate basis
    - Every quarter (At the end of the quarter)
    - CAMC payment will start after defect liability period (After 2 year)
    - Since CAMC is comprehensive, no additional payment for replacement of parts and allied equipment's/ components/ machine etc., will be made.

- Scheduled work to be carried out for each system
  - Periodicity of visit (system wise)
  - Work to be carried out (brief description)
  - Items which are not supplied by contractors, but only installation done by contractor should also be maintained. It should be included in CAMC. This means that the final system maintenance will be the sole responsibility of the vendor irrespective of the product supply.

- Down Time Period of system
  - Down Time Period should not be more than 24-48 hours.

- Start time: Call reported by telephone/ Fax/ Mail
- End time: System in operational condition, critical system i

- Penalty clause:
  - If the services are not satisfactory, penalty of ____% of the CAMC will be imposed or deducted from contract amount.
  - If contractor unable to repair or maintain the system as per maintenance manual, penalty ___% will be imposed.
  - If down time of the system is more than stipulated period
  - If fails to repair or maintain then Bank at risk and cost of contractor will get it repaired, by engaging other contractor. The cost involved will be deducted plus penalty.

- CAMC Agreement: Separate CAMC Agreement will be executed as per Bank's standard CAMC format.

BILL OF QUANTITIES (BOQ)

1. SCHEDULE FOR QUANTITY FOR PASSIVE FIRE PROTECTION SYSTEM

Sr No.	Item	Qty.	Unit
(A)	(B)	(C)	(D)
	Passive fire protection complete with assessing of the systems to be provided for each area, discussing with client on the methodology planned, providing provisions for future provisions, cleaning up the cables, openings, cable trays etc., making proper the cavities perfect for installation of the passive fire protection systems, covering up the panel tops etc. so that passive fire protection material will not drip into such equipment etc, furnishing detailed calculation sheets to estimate the quantity of the items to be utilized for various applications, installing proper mobile and fixed scaffolding so as to safely and properly access the areas, installation of warning signs of working near electrical equipment, at heights etc., demonstration to client first hand of the methodology of the system installation for various applications, training the client so that they would be able to carry out any rectification works in future, installation of signages about the passive fire protection system so that utility service providers are aware of the same, demonstration at site including the physical measurement of the materials installed, ensuring that the system provided will provide a minimum fire rating of 2 hours, furnishing of the material test certificates, etc. to prove compliance to the UL, FM, other International Standards to which the system has been certified, clean up the area after completion of work, providing to client suitable quantity of passive fire protection system as spares so that they can carry out rectification works in future, furnishing of manuals etc. complete in all respects.		
	All necessary safety equipment including safety shoes, gloves, safety mats etc. to be utilized while executing the passive fire protection system.		
	Wherein the successful bidder notices opening in gypsum boards, walls etc. otherwise which could reduce the fire rating of the hazard area, then the successful bidder shall inform the client to close such holes / openings completely.		
	The successful bidder prior to starting of the work shall advise the client to identify the cables ducts etc. and tag them suitably on both sides so that opening of such openings again for the purpose of identification will not be necessary.		
	Passive fire protection is restricted to the areas where clean agent fire protection system is provided presently. Further areas will be decided by customer during detailed engineering.		

1	Passive fire protection system for sealing of ventilation ducts complete including all the above mentioned points in sl. No. 1, cleaning up the area around the ventilation ducts, providing pcc / rcc patchup work to reduce excess cavities presently at site, so that the clearance at each side is between 25 mm to 50 mm in accordance with the thickness of the sealant and accessories required to ensure a minimum fire rating of two hours, installing the proper thickness and layers of infill materials which shall be UL listed / FM approved, providing the flame sealant, providing the sealant identification template on wall etc. complete.	25	sq.m
	The passive fire protection system for ventilation ducts shall be primarily provided for ducts which pass into rooms protected with clean agent total flooding system, fire trace system and such ducts for areas where sprinkler system are not provided presently, for ducts passing through electrical shafts and such ducts mutually discussed and agreed upon with client.		
	For ducts passing through walls etc., for the purpose of measurement, each wall opening will be considered as a single unit and the contractor shall install the passive fire protection system on both sides complete.		
	Wherein the ducts are insulated, the additional infill and passive fire protection system shall be provided for the current insulation.		
	The unit of measurement shall be based on the perimeter / circumference of the metallic ducts installed at site.		
2	Passive fire protection system for sealing of metallic piping complete including all the above mentioned points in sl. No. 1, cleaning up the area around the pipes, providing pcc / rcc patchup work to reduce excess cavities presently at site, so that the clearance at each side is between 25 mm to 50 mm in accordance with the thickness of the sealant and accessories required to ensure a minimum fire rating of two hours, installing the proper thickness and layers of infill materials which shall be UL listed / FM approved, providing the flame sealant, providing the sealant identification template on wall etc. complete.	25	sq.m
	The passive fire protection system for metallic piping shall be primarily provided for pipes which pass into rooms protected with clean agent total flooding system, fire trace system and such pipes for areas where sprinkler system are not provided presently and such pipes mutually discussed and agreed upon with client.		
	For pipes passing through walls etc., for the purpose of measurement, each wall opening will be considered as a single unit and the contractor shall install the passive fire protection system on both sides complete.		
	Wherein the pipes are insulated, the additional infill and passive fire protection system shall be provided for the current insulation.		

	The unit of measurement shall be based on the perimeter / circumference of the metallic pipes installed at site.		
3	Passive fire protection system for sealing of non-metallic piping complete including all the above mentioned points in sl. No. 1, cleaning up the area around the pipes, providing pcc / rcc patchup work to reduce excess cavities presently at site, so that the clearance at each side is between 25 mm to 50 mm in accordance with the thickness of the sealant and accessories required to ensure a minimum fire rating of two hours, installing the proper thickness and layers of infill materials which shall be UL listed / FM approved, providing the flame sealant, providing the sealant identification template on wall etc. complete.	25	sq.m
	The passive fire protection system for non-metallic piping shall be primarily provided for pipes which pass into rooms protected with clean agent total flooding system, fire trace system and such pipes for areas where sprinkler system are not provided presently and such pipes mutually discussed and agreed upon with client.		
	For pipes passing through walls etc., for the purpose of measurement, each wall opening will be considered as a single unit and the contractor shall install the passive fire protection system on both sides complete.		
	Wherein the pipes are insulated, the additional infill and passive fire protection system shall be provided for the current insulation.		
	The unit of measurement shall be based on the perimeter / circumference of the non-metallic pipes installed at site.		
4	Passive fire protection system consisting of through penetration fire stops of cables passing through the walls, floors, for coating of the cables emanating from the electrical switchgear panels, transformers, etc. complete including all the above mentioned points in sl. No. 1, cleaning up the cables, cable trays, informing the client to seal gland plate, compression glands etc. complete, covering the extra cavities of the holes with PCC / RCC, keeping only 25 mm to 50 mm gap consistent with the requirements of the UL / FM certification for the through penetration fire stops, providing the cable coating of necessary length to provide minimum 2 hour fire rating, provision of necessary hi-tress panels etc. to keep the infill and coating secure etc. complete.	25	sq.m
	The through penetration fire stops shall be primarily provided for cables which pass into rooms protected with clean agent total flooding system, fire trace system and such pipes for areas where sprinkler system are not provided presently and such areas mutually discussed and agreed upon with client.		

	The measurement for the through penetration fire stop will be done on sq.m basis of cable width and maximum height of the cables installed in the same. The measurement sheet shall clearly indicate the room / shaft / floor designation etc. through which the through-penetration fire stop passes.		

Section: 08

FIRE DOOR

IS 3614: 2021Fire Doors and Door sets — Specification
SPECIFICATION FOR THE FIRE RATED DOOR Providing and fixing of Hollow metal fire rated doors as per IS 3614 part-1 & part-2 for stability and integrity.

Construction:
The Construction shall be of the type of fire door and frame assembly that has been investigated and successfully fire tested in accordance with the standard. The assembly shall be identified by label(s) and/or an approved identification marking of the certification agency accepted by the competent authority. The door label shall indicate the applicable fire test rating for the door construction furnished, as per the standards.

Fire Door Frames:
Fire door frames are not affected by the fire resistance ratings that apply to doors. There is no fire rating for a basic fire door frame unless the labelling on the frame specifically states that the frame is rated for fire rating as a complete assembly including door leaf and hardware.
The minimum steel sheet thickness recommended for frames shall be 1.2 mm (18 gauge) for a frame depth of 150 mm. Door frames shall have grooved profile with provision for smoke seal in either single rebate or double rebate, with or without architrave, all tested as an assembly. All types of frames either as an assembly or, otherwise shall conform to the requirement of this standard. Frame design and construction shall be as per the tested specimen both for single and double rebate profile. Fire rated EPDM (ethylene propylene diene monomers) or suitable fire rated gaskets are required for doors to control the spread of smoke. A bottom seal may not be required for smoke and draft control assemblies. Recommended fire door shall have doors tested at CBRI or Building Fire Research Centre (BFRC), Mysore, Accredited by NABL & Recognized by BIS. The doors must have minimum fire rating of 2hrs with vision panel.
Test certificates should be available for vision Lites /panels as part of the fire door assembly. Independent glass test certificates will not be accepted. Manufacturer test certificate shall cover doors both single and double leaf and all doors supplied should be within the tested specimen, deviation in specification and sheet thickness other than what is mentioned in the test certificates are not allowed. Proper label confirming the type of door and the hourly rating is mandatory. Door frame shall be double rebate profile of size 143 x 57 mm made out of 1.60mm (16gauge) minimum thick galvanized steel sheet. Frames shall be Mite red and field assembled with self-tabs. All provision should be mortised, drilled and tapped for receiving appropriate hardware. Rubber door silencers should be provided on the striking jamb. Frames should be provided with back plate bracket and anchor fasteners for installation on a finished plastered masonry wall opening. Once frame installed should be grouted with cement & sand slurry necessary for fire doors on the clear masonry opening.
Door leaf shall be 46mm thick fully flush double skin door with vision lite. Door leaf shall be manufactured from 1.2mm (18guage) minimum thick galvanized steel sheet or as per the test certificate of the specimen full size door. The internal construction of the door shall be provided with rigid reinforcement in addition to the core. All double leaf fire door assembly shall be provided with and tested with astragals to ensure compatibility with actual fire performance. The internal construction of the door should be rigid reinforcement pads for receiving appropriate hardware. The infill material shall be as per the specimen tested and the same should be mentioned in the test certificate or report with proper sectional drawing showing the internal fills. All doors shall be factory prepped for receiving appropriate hardware and provided with necessary reinforcement for hinges, locks, and door closers. The edges should be interlocked with a bending radius of 1.4mm or as is specified in the specimen. For pair of doors astragals has to be provided on the meeting stile

for both active and inactive leaf. Vision lite wherever applicable should be provided as per manufacturers recommendation with a beading and screws from inside. The glass should be 6mm clear borosilicate fire rated glass of relevant rating of the door. Vision panel of 6mm thick borosilicate Fire Rated clear glass of size 200mm (W) x 300mm (H), Self-adhesive side roll (Ceramic Tape).
All fire doors are required to have smoke seal and intumescent seal as standard component of the door assembly. (There are different types of smoke seals available, and the most appropriate type shall be chosen.)

The technical detail for all fittings like Panic Bar, Door Closer, Door accessories etc. also should be fitted to the doors as required. All the accessories are to be tested individually and rated for fire resistivity individually and also during the specimen testing. Dormakaba UK Ltd products may be used for accessories.

The following documents are to be submitted while submitting the technical bid.

- Accessories and any other fittings for door should have certificate confirming its fire rating assigned and door assembly system also should have final fire rating certification.
- The door including the frame and accessories should have fire rating assigned by the Indian test house i.e. CBRI, Roorkee. Further the certificate and the test report also should be provided along with technical submission.

Comprehensive Annual Maintenance Contract:

The maintenance should be carried out as per manufacturers maintenance manual recommendation. The same should be done based on the written document issued by the manufacturer, this document should be submitted to the owner and also to the consultant before starting the work. The contractor is also to submit the concerned forms (form a & b as applicable) to the fire authorities from time to time and should obtain their approvals from time to time**.** It is also required to Employ experienced engineers having through knowledge of the systems revamped and upgraded should be capable of maintaining the systems as required from time to time. The personal should be employed 24/7-365 days without fail. The person will be under the contractor's payroll and strictly follow all government norms.

The bank no way will have any direct responsibility to the personals employed for the discharge of the contractual obligation of the contractor.

- Payment of CAMC
  - Prorate basis
  - Every quarter (At the end of the quarter)
  - CAMC payment will start after defect liability period (After 2 year)
  - Since CAMC is comprehensive, no additional payment for replacement of parts and allied equipment's/ components/ machine etc., will be made.

- Scheduled work to be carried out for each system
  - Periodicity of visit (system wise)
  - Work to be carried out (brief description)
  - Items which are not supplied by contractors, but only installation done by contractor should also be maintained. It should be included in CAMC. This means that the final system maintenance will be the sole responsibility of the vendor irrespective of the product supply.

- Down Time Period of system
  - Down Time Period should not be more than 24-48 hours.

- Start time: Call reported by telephone/ Fax/ Mail
- End time: System in operational condition, critical system i

- Penalty clause:
  - If the services are not satisfactory, penalty of ____% of the CAMC will be imposed or deducted from contract amount.
  - If contractor unable to repair or maintain the system as per maintenance manual, penalty ___% will be imposed.
  - If down time of the system is more than stipulated period
  - If fails to repair or maintain then Bank at risk and cost of contractor will get it repaired, by engaging other contractor. The cost involved will be deducted plus penalty.

- CAMC Agreement: Separate CAMC Agreement will be executed as per Bank's standard CAMC format.

BILL OF QUANTITIES (BOQ)

1. SCHEDULE FOR QUANTITY FOR FIRE DOOR			
Sr No	**Description**	**Qty**	**Unit**
1	Supply of Single leaf Powder coated Fire Rated door according to Specification. The infill material is Rockwool with reinforcement at top & bottom. The door frame is made out of 1.6 mm thk PCGI sheet pressed to Double rebate(150x50). The shutter (1.2 mm thk) is to be fixed with frame with 4 Nos SS ball bearing for each door.		
A	965x2113	45	**No**
B	1207x2132	1	**No**
C	1192x2195	1	**No**
D	1130x2150	1	**No**
E	1065x2237	1	**No**
	HARDWARE INCLUDED		
a	HINGES	4	NA
b	D-HANDLE	1	NA
c	DOOR CLOSER	1	NA
d	D-HANDLE 250 MM HT ONE SIDE	1	NA
e	TEAK WOOD PLY PUSH PLATE 300 MM HT	1	NA
f	VIEW PANEL 200x300 MM HT SINGLE GLAZED FIRE RATED TOUGHENED GLASS	1	NA
g	DROP SEAL	1	NA
2	Supply of Double leaf Powder coated Fire Rated door according to Specification. The infill material is Rockwool with reinforcement at top & bottom. The door frame is made out of 1.6 mm thk PCGI sheet pressed to Double rebate(150x50). The shutter (1.2 mm thk) is to be fixed with frame with 4 Nos SS ball bearing for each door		
A	1834x2132	2	**No**
B	1820x2115	1	**No**
C	1450x2064	1	**No**
D	1739x2053	1	**No**
E	2045x1842	1	**No**
F	2159x2493	1	**No**
G	1856x2113	1	**No**
H	1831x2195	2	**No**
I	2180x1832	1	**No**

J	1820x2032	3	**No**
	HARDWARE INCLUDED		
a	HINGES	8	NA
b	D-HANDLE	2	NA
c	DOOR CLOSER	2	NA
d	D-HANDLE 250 MM HT ONE SIDE	2	NA
e	TEAK WOOD PLY PUSH PLATE 300 MM HT	2	NA
f	VIEW PANEL 200x300 MM HT SINGLE GLAZED FIRE RATED TOUGHENED GLASS	2	NA
g	DROP SEAL	1	NA
3	INSTALLATION OF SINGLE LEAF FIRE DOOR	49	**No**
4	INSTALLATION OF DOUBLE LEAF FIRE DOOR	14	**No**
	KINDLY NOTE: Unloading, Lifting and shifting to site in client's scope. Local nuisances, if any, will be taken care of by client. Installation includes erection of doors, the cement filling required to strengthen doors will be in Client's scope. A-form can be provided by the firefighting contractor.		

2. SCHEDULE FOR QUANTITY FOR BUY BACK			
Sr No.	**Item**	**Qty.**	**Unit**
(A)	**(B)**	**(C)**	**(D)**
1	**Existing doors at staircase landings of all floors, Basements etc…**	50	Nos

Section: 09

BUILDING MANAGEMNET SYSTEM (BMS)

TECHNICAL SPECIFICATIONS

GENERAL - SCOPE OF WORK

The general character and the Scope of work to be carried out under this contract is illustrated in Drawings, Specifications, IO Summary and Schedule of Quantities.

The Contractor shall carry out and complete the said work under this contract in every respect in conformity with the contract documents and with the direction of and to the satisfaction of the Engineer. The Contractor shall furnish all labor, materials and devices and specified otherwise, transportation and incidental necessary for Supply, Installation, Testing, Commissioning, final testing, putting into operation and handing over of the complete Building management system (BMS) system as described in the Specifications and as shown in the drawings. This also includes any material, devices, appliances and incidental work not specifically mentioned herein or noted on the Drawings / Documents as being furnished or installed, but which are necessary and customary to be performed under this contract.

The BMS Sub-Contractor carrying out the SITC shall make the system operational for its intended use, by addition of components specific to its make/model even if not specifically mentioned in the tender at no additional Cost.

Building Management System (BMS) shall be based on Cloud, open, interoperable and integrated architecture.
The IBMS system proposed to be installed shall be a peer-to-peer networked, stand-alone, distributed control system with the capability to integrate various technologies and communication protocols such as BACnet/ MSTP, BACnet/IP, RS485, HTTP, MQTT as per well accepted international standards such as the ANSI/ASHRAE Standards in one open, interoperable system for automation of diverse utilities and services such as HVAC, Fire Fighting, Plumbing and electrical systems & ELV system etc.
The integrated BMS platform shall employ state of the art design with facilities such as – Single Log-on URL, Building Portfolio Landing Page, Nine-dot Menu for Module Navigation and indication of operation area, Data Card drag and drop features, Portfolio Menu for Navigation to the Additional Features & Modules, unified workflow for all disciplines, English-language support, intuitive operation, secure, relatively fast in operations and efficient operation and a seamless integration of 3rd party systems.
Besides, adherence is required to industry standards and certifications such as CE and compliance.
The IBMS system offered shall be completely modular in structure and freely expandable at any stage with 3 level architecture.
i) Management Level (Software)
ii) Automation Level (Controller)
iii) Field Level (Expansion/Slave)
Management level and operation shall include cloud server, processing, encryptions, security and cloud software with visualization, data analysis/reporting, Alarm pop-ups, Notification, animations and exchange of data. At the management level, it shall be possible for communication to flow in all directions, across networks and via direct connections.
Automation level is the level at which the redundant (secondary) processing takes place based on the built-in logic written on the Direct Digital Controller (DDC). All DDC controllers shall have Wi-Fi and IP based dual mode of communication, where in taking the benefit of LAN communication protocol & communication backbone. The processes are carried out at the DDC controllers for stand-alone control of all operations.

Automation Level data exchange needs to happen through peer-to-Peer Communication for master slave communication only and data exchange shall happen to server through Wi-Fi or LAN Enabled internet (HTTP) via MQTT brokers.

Field Level shall comprise of Individual expansion/slave controllers for addition of control & monitoring, based on application specific logic written on the master controllers.
The Contractor shall supply the complete Cloud software package consisting of all types modules with cloud server systems, any normal PCs/workstation for operating the systems, cloud based database server suites, and cloud-based anti-virus for cloud servers, IBMS application software modules, Energy Management Software Module and GUIs. The entire software package consisting of the above shall be from established OEMs and shall be original licensed products. Where no user or point capacity licenses shall be required at all.
A hierarchical topology is required to assure reasonable system response times and to be able to manage the flow and sharing of data without unduly burdening the internal Intranet/data communication network.
Maximum acceptable response time from any alarm occurrence (at the point of origin) to the point of annunciation shall not exceed 2-5 seconds for network connected user interfaces.

IBMS CLIENT
The IBMS shall support cloud-based clients, web browser URL for PC and tablet devices. The IBMS shall support N number of concurrent operator workstation connections on a single server with provided IDs & Passwords. There should not be any limitations for user license, application license, point limitations etc. Client URL can be loaded on unlimited number of PC's allowing a limitless number of users to access these connections on simultaneous basis. The IBMS shall have Web-based user interface providing operators or facility engineers easy access and puts the user in control of every situation at any point in time and from anywhere in the world without any SNMP enablement but as Native cloud system.

The IBMS client shall support at a minimum, the following functions:

User log-on identification and password shall be required. If an unauthorized user attempts access, an ID or Password error pop-up shall be displayed.

Graphical screens developed for the GUI shall be the same screens used for the Web browser client. Any animated graphical objects supported by the GUI shall be supported by the Web browser interface.

HTML programming shall not be required to display system graphics or text data on a Web page.

Cloud Storage of the graphical screens shall be in the IBMS cloud server, without requiring any graphics to be stored on the client workstation PC machine. Systems that require graphics storage on local server or client are not acceptable.

Real-time values displayed on a Web page shall update automatically without requiring a manual "refresh" of the Web page with recent update time stamp.

Users shall have administrator-defined access privileges. Depending on the access privileges assigned, the user shall be able to perform the following:

Modify common application objects, such as schedules, calendars, and set points in a graphical manner.

Schedule times will be adjusted using a graphical interface.

Using a graphical calendar shall set holidays.

Commands to start and stop binary objects shall be done by pop-up of override button on data card by the selected object and selecting the appropriate command from the pop-up menu. No entry of text shall be required.

View logs and charts.

View and acknowledge alarms.

There should not be any limitations of no. of points connected, trends, history etc.

The system shall provide the capability to specify a user's (as determined by the log-on user identification) home page. Provide the ability to limit a specific user to adjust their defined home page. From the home page, links to other views, or pages in the system shall be possible, if allowed by the system administrator.

Graphic screens on the Web Browser client shall support hypertext links to other locations on the Internet or on Intranet sites, by specifying the Uniform Resource Locator (URL) for the desired link.

CODES AND STANDARDS:
All the following codes & standards shall follow and conform to the latest editions, amended to date.

CE Certified

SYSTEM DESCRIPTION

The IBMS shall comprise of a Wi-Fi & BLE Enabled, interoperable, stand-alone IP digital controllers communicating on MQTT communication protocol.

The IBMS shall, in addition to HVAC system, communicate with third party systems such as energy metering systems, electrical systems, energy management systems, plumbing system, access control systems, fire-life safety systems etc.

Microcontroller/Microprocessor based Direct Digital Controller (DDC) shall interface with MEP systems as given in but not limited to IO summary and carry out followings functions:

a. Individual input/output point scanning, processing and control.
b. Centralized operation of the services (remote control).
c. Dynamic graphic details of building services.
d. Energy Management through optimization of all connected electrical and mechanical plants.
e. Alarm Detection and early recognition of faults.
f. Time, event and holiday scheduling as well as temporary scheduling.
g. Prevention of unauthorized or unwanted access.
h. Communication interface and control.
i. Suggestive preventive maintenance for all equipment as well as own error Diagnosis.
j. Building maintenance & report generation.
k. Optimum support of personnel.
l. Data Visualization Tool

These Wi-Fi and BLE controllers shall be capable of functioning in a stand-alone mode i.e. in case of loss of communication with the Cloud Server, these shall function independently. These shall have microcontroller/ microprocessors built-in as standard. The local access to these shall be through configuration app on any portable operator terminal (Normal PC/Laptop). The controller shall be capable of executing advanced control

algorithms like Proportional + Integral + Derivative control, Conditioned Based On/Off Command, Schedules, etc. These shall also execute logic function based on time and/or event.

Each stand-alone intelligent Wi-Fi & BLE Enabled IP DDC controller shall have a microcontroller/microprocessor, on board Ethernet connectivity supporting BACnet/ IP or Modbus/IP protocol and Modbus/RTU over RS485.
The operator station should use a simple web browser in conjunction with the IBMS without any need of server/client architecture and no special software should be needed to be loaded on the computer nor any specific server class PCs are required. The computer shall be sized without any hesitation to cover the graphic display memory and planning information. The display shall be in the form of dynamic color graphics and text format with menu driven pop-up windows and help facility.
Since having Cloud based Software & Sever Packed, the following software packages shall not be required to be loaded into the system as minimum standard: -
Databases and database management systems
Anti-Virus package
Complete IBMS software suite
Energy management software

All DDC controllers shall have µC and with minimum 12-bit A/D resolution on the analogue inputs and shall be connected via IEEE standards-based Wi-Fi or LAN on MQTT protocol. Communication between controllers shall be such that, controllers can communicate between themselves without having to first communicate with the Supervisory Controllers. The communication between the different subnets shall be through the router (integration) units rather than through the supervisory or server at control stations. No proprietary LAN or WAN shall be allowed. The BMS platform has to have seamless integrations with API platform.

MONITORING STATION SOFTWARE AND HARDWARE

Integrated Building Management Software

A Cloud based central IBMS server, located at Native Cloud server without the need of physical server, shall be provided. The server shall support all routers and BACnet broadcast management devices connected to the customer's network whether local or remote.

Local connections shall be via an Ethernet LAN. Remote connections can be via broadband connection.

It shall be possible to provide access the MQTT Broker of all controller via a single connection to the IBMS cloud server through building Internet (HTTP). In this configuration, each MQTT Controller can be accessed from the Cloud based Graphical User Interface (GUI) or from a standard Web browser data point by connecting to the cloud-based URL of IBMS server.

It shall have SVGZ Graphics, 3D Style, AutoCAD PDF Import, Multi-Layer Native Editor and Symbol Libraries.

It shall have a user interface with English-language facility and online customization for switching from customization mode to operational mode.

It shall have a powerful report engine for Report Scheduling, Customizable Reports including Bar, Scattered, Line Charts type trend plots, export to other formats such as PDF and Excel.

It shall support flexible client options such as a web based (URL) client interface without any windows based installed application.

It should support automatic discovery of devices on the MQTT network via Internet router (HTTP).

Cloud based Software should support all open protocols such as BACnet, Modbus & Lontalk and any addition or deletion of soft integration should not effect on the software configuration or require any additional software drivers or licenses.

It should provide facility to import symbols and graphics, forward alarms to a predefined email address or SMS account and an automatic alarm escalation in case of no feedback in a defined time frame without the need of Auto-Dialer physical Modem connectivity and shall be enabled to do so via cloud-based software instead.

The IBMS server shall provide the following functions, at a minimum:

1. Native Global Data Access: The server shall provide complete access to distributed data defined anywhere in the world without using any SNMP or additional license enablement.

2. Distributed Control: The IBMS cloud server shall provide the ability to execute global control strategies based on control and data objects in any MQTT device in the network, local or remote.

3. The IBMS system shall include a IST clock service for its all systems and provide time synchronization for all devices with Cloud software & sever.

4. The Cloud based IBMS server shall provide scheduling for all MQTT devices and their underlying field control devices. It should have the Management Scheduling functionality for 3rd party devices' scheduling.

5. The Cloud based IBMS server shall provide demand limiting that operate across all BBMD/B-AAC devices. The Cloud based IBMS server must be capable of multiple demand programs for sites with multiple meters and or multiple sources of energy. Each demand program shall be capable of supporting separate demand shed lists for effective demand control if extensively and exclusively required.

6. Each device supported by the cloud server shall have the ability to archive its log data for 2-5 days in times of internet failure and shall be retrieved by Cloud server automatically by first in first out basis. Archiving options shall be user-friendly and automatic without any configuration needs.

7. The Cloud Based IBMS server shall provide central alarm management for all devices supported by the cloud server. Alarm management shall include:

Routing of alarms to display, printer, email and mobile SMS
View and acknowledge of alarms
Query alarm logs based on user-defined parameters
Module wise alarm separation
Alarm with Alarm Description of Connected Equipment & Sensor

8. The Cloud Based IBMS server shall provide central management of log data for all devices supported by the Cloud server. Log data shall include process logs, runtime and event counter logs, audit logs and error logs. Log data management shall include:

Viewing and printing log data
Exporting log data to other software applications via API Integration
Query log data based on user-defined parameters
Cloud based Server Shall be Requirements:
The IBMS Cloud server shall meet the following requirements:
Supply, Installation and Testing & Commissioning of Cloud Deployed Server with on demand auto scaling capabilities using orchestration tool, 99.95 % uptime-downtime by using distributed architecture and highest level of inbuilt SSL securities and 256-bit encryptions which shall be certified by DigiCert, compatible with all type of OS. Shall have machine learning & AI capabilities for Optimization & Energy Savings. Single sign-on for multi-site database access through Cloud Based server working independently without any intervention of Local PC based server. Shall have cloud-based computing, processing and upgrades shall be on the go without any license upgrade or software changes and without any downtime on server, shall be having cloud data optimization, state of art logic engine, easy to upgrade & change without additional license purchase, highly secured end to end encrypted data trans receiver process with cloud with highest SSL certification. Advanced & future IOT enabled device interface capable. Having all type of anti-virus and also shall be able to share API integration for the high-level integration.

System Programming

The Graphical User Interface software (GUI) shall provide the ability to perform system customization and graphic display engineering as part of a complete software package. Access to the GUI shall be through password access as assigned by the system administrator and shall be attended by with the help of configuration tool.

The Cloud based library of control, application, and graphic objects shall be with OEM to enable the creation of all applications and user interface screens. Applications shall be created by selecting the desired control objects from the library, arranging them back-end platforms and linking them together using a cloud based built in data point connection tool. Completed applications may be stored in the cloud library for future use. Graphical User Interface screens shall be created in the same fashion on cloud via Back-end. Data for the user displays is obtained by graphically linking the user display objects to the application objects to provide "real-time" data updates. Any real-time data value or object property may be connected to display its current value on a user display. Systems required any separate PC based software tools or processes to create applications and user interface display and to upload & download data base or create offline database acceptable/allowed through Configuration tool on site for data base creation.

C. Programming Methods

Provide the capability to use objects from the cloud libraries by back-end developers. Objects shall be linked by a graphical linking scheme by assigning a link from one object to another. Object links will support one-to-one, many-to-one, or one-to-many relationships. Linked objects shall maintain their connections to other objects regardless of where they are positioned on the page and shall show link identification for links to objects on other pages for easy identification. Configuration of each object will be done through the object's property sheet using fill-in the blank fields, list boxes, and selection buttons. Use of custom programming, scripting language, or an Open procedural language for configuration will not be accepted.

It shall be programmable through Cloud based back-end programming and shall allow creating control strategies, schedules and helps user to commission and monitor the controller parameters.

The system shall support object mirror within a customer's cloud database though an API integration only and any mirroring shall not be allowed through any MQTT brokers. An application, once configured, can be reuse for easy re-use and duplication with minimum required project level changes. All links, other than to the hardware, shall be maintained during duplication.

Device Network Management

A. URL Based Native Cloud Graphical User Interface software (GUI) shall provide a complete set of integrated network management tools for working with MQTT protocol-based network.
B. Cloud Network management shall include the following services: device identification, device installation, device configuration, device diagnostics, device maintenance and network variable binding.
C. Cloud based back-end configuration shall also provide diagnostics to identify devices on the network, to reset devices, and to view health and status counters within devices on separate checksum backend dashboard.
D. The network management database shall be resident in the Cloud based software/server and local data of each controller for 2-5 days in case of Wi-Fi failure, ensuring that anyone with proper authorization has access to the cloud managed database at all times. Systems employing network management databases that are not cloud native, at all times, and within the control system shall not be accepted.

System Features:

Help Facility

The help facility shall be made available to the operator by use of a dedicated key or a single key click on the mouse. A minimum help shall be available for every menu item and dialogue box.
The facility shall contain both text and graphics to provide information about the selected function directly.
The information provided shall be in simple clear language and shall be capable of being added to or modified by an authorized operator.

Alarms

Multiple priority levels of alarm shall be made available. Priority levels shall be deemed Critical Alarms and Non critical (general) Alarms. Normally, critical alarms shall take precedence over non-critical alarm and high priority over low priority.
Each analog point shall have the following limits defined; wherever required

High threshold alarm limit
Low threshold alarm limit

When an analog point goes outside the low threshold alarm limit, a user defined warning message shall be directed to the appropriate log for future printers at the control station.
The warning limits shall be used to monitor controllability, not comfort conditions. The alarm limits shall be used to monitor comfort conditions. Alarm message shall require operator acknowledgement.
When a digital point goes into alarm, a user defined alarm message shall be output to the appropriate log for future printing and to respective control station. Alarm messages shall require operator acknowledgement.
When a point returns to normal, the event shall be recorded in control stations as 'Return to Normal'.
The Operator workstations shall be capable of displaying a list of all points in alarm for the building in a separate summary. Systems which require the operator to make a single summary for alarm shall not be acceptable.

Annunciation: Alarm shall be annunciated at a terminal icon. Critical alarm shall be defined by a different color than non-critical alarms.

It shall be possible to produce a user definable full text message to accompany the annunciation of any alarm. This shall provide further information about the alarm and any action required to be taken by the operator or indicate that action is automatically programmed in the system.

Acknowledgement: It shall be necessary for all alarms to be acknowledged by an authorized operator. Alarm silencing shall be by the authorized operators by pressing the silence key.

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

5 Point lockout: It shall be possible for the operator to lockout the control for any point, to force it to remain in its current state. A summary showing locked out points shall be available. Systems which require the operator to make a separate lockout summary shall not be acceptable.

6. Alarm History/Summary/Alarm Review: Points in alarm shall be displayed on the operator's panel using the alarm review function.

Data Logging

A. It shall be possible to log the status or value of system points at regular intervals or on change of state and store this on Cloud Server Repository at any of the designated server. Facilities such as historical and dynamic trends, times-shift comparison, workstation trends, sub-system trend, design for each trend curve type, i.e., color, font etc. shall be supported.

B. It shall be possible to archive this information for future reference on cloud server.

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

D. Storage of logged information shall be able to be carried out in the following way:

Logging shall be carried out only during a pre-defined period for which the start and finish time and date shall be configurable.

E. Logging files shall be module/terminal based not system based, to provide true multi-terminal/Module capability.

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

G. In addition to the above, it shall be possible to present the data in a simplified customized format, allowing the following minimum features:

Charting of logged data on cloud GUI in line graph, bar graph or pie format.
Presentation of logged data on Cloud Server in tabular format.
Line graphs of dynamic data (up to 8 points) in real time.
Presentation of dynamic data in tabular format in real time.
Selection of Auto/ manual scaling of X(time) axis and Y(variable) axis.
Tailoring of charts by selection of line width and background colors.
Optional grid overlays (full and dotted lines).
Selection of horizontal/ vertical arrangement of windows or a `cascade' presentation.
Multiple Windows.
Printing of completed presentations.
User configurable data selections.
Optional display of point titles.
Selection of primary or secondary values for display.
Presentation of both analog and digital values (ON/OFF etc.).
Report Generation
Standard reports shall be provided, which shall be operator selectable to appear on the Dashboard, any selected printer or both.

Standard pre-formatted reports to be provided shall include:

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

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

B. As a minimum, the system shall provide the following summaries:
Point summary
Alarm summary
Limits summary
Point status (alarm, locked out, off-line, override)
Point name
Point status/value (automatically updating)
Engineering units.

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

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

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

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

D. Dynamic trends shall provide up to eight points and show real time activity of the associated points. It shall be possible for the operator to print and/or display in numeric, line chart etc., this information as per selection. Graphic plots shall allow a unique color for each point. Sample interval of points selected for dynamic trend shall be user selectable. 3-Dimensional dynamic trending must be provided in the system.

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

Data Storage

A history file capability shall be provided to allow automatic storage of certain records plus allow the operator to selectively direct critical real time system data and activity to a mass storage device for later recall and analysis.

All alarm activity shall automatically be routed to history files. Alarms shall include warning and alarm threshold violations with no-response, trouble, run time exceeded.
B. Operator shall be able to select those analog and digital inputs and outputs to be stored and the interval at which samples are taken.

C. It shall be possible to access software packages and office productivity suites such as MS-Office / MS-Excel or similar, so that the operator may format display or printouts in the form of spread sheets, bar charts or curve plots with the help of Back-end programmer or through configuration app.

D. History files shall be the source data for stored trend reports to be used for records and system analysis. Operator shall be able to select specific points to be trended, the time period of the trend, the sample interval, and time at which the report is printed. Trend output format shall be as specified for trend logs (shaded, un-shaded etc.).

Utilities

The operator Dashboard shall be provided with variety of widely used URL based system utilities.
System should be capable of supporting third party software packages like spreadsheet, word processing, Adobe Acrobat reader etc.

Time Scheduling

A. There shall be real time clock facility to help in time scheduling. The scheduling feature shall not be dependent on a central database cloud server or a controller.

B. The following commands shall be able to be time scheduled to be issued at a later day and time from the operator workstation or portable workstation:

Start and stop a point
Adjust analog value
Change set-point

C. The following typical commands shall be able to be time scheduled to be executed at a later day and time from the operator workstation:
Change alarm limits or warning
Demand limit target setting
Reset tracking period for energy statistics
Trend point enable/ disable for a point
Totalization enable/ disable for a point
Reset totalization value

D. The following typical summaries shall be able to time scheduled to be printed or stored in a cloud server file at a later day and time from the operator workstation:

Standard point summary
Alarm summary
Off-line summary
Override summary
Disabled summary
Utility summary
Alarm limits summary

E. Commands shall be able to be issued repeatedly on specified days of the week at specified times.

F. A system wide calendar shall be set up to define each day as:

Regular day
Special day
Holiday

The system wide calendar shall be stored in multiple locations so that the failure of any one device does not cause the system to fail.
The calendar shall automatically accommodate the leap year and the turn of the century.
The calendar shall allow the days to be scheduled one year in advance from the current system date.
G. Separate schedules shall be stored for:
Regular days
Special days
Holidays

H. The system shall accept one-time schedules to accommodate overtime usage.
One-time schedules shall be automatically deleted from the system after execution.
The system shall allow one-time schedules to be programmed up to one year in advance.
After recovery from a power failure, the system shall determine any time scheduled commands which should have been issued during the period that the power was off. These commands shall automatically be issued.
Point History

A. For every analog point in the system, a 24-hour record of the value sampled on regular interval shall be maintained. The operator shall choose whether samples older than 24 hours shall be discarded or archived.
The most recent 2-4 hours of analog point history shall be able to be displayed at the Cloud Dashboard.
B. Point history samples with time/date shall also be taken under the following conditions:

Point in alarm
Point overridden/released by operator
Point on-line/off-line

A report shall be available showing all points for which point history is being archived.

The system shall provide point history graphs for analog/digital points.
Point Trend

A. The trend feature shall be able to record any of the following parameters for any point:
Point value
Point alarm status
Operator override flag
On-line/Off-line flag

B. The operator shall be able to select points and define any interval on which samples may be taken.
C. For long term storage of samples, trend data shall automatically be updated.
D. A report shall be available listing all points being trended. The report shall display:
Trend status
Point name
Parameter being trended
Display units
Sample interval
Number of samples taken.

E. A trend for a point shall be able to be started either by operator command or according to a time scheduled command. A trend for a point will end as a result of an operator command, time scheduled command or when the required number of samples have been collected.
F. Trend samples shall be displayed in either tabular or graphical format. A minimum of eight trended points shall be able to be displayed concurrently on a graph or report.
G. The trend graph display shall automatically scale the value and time axis to display all samples. From the trend graph, the operator shall be able to select and read the instantaneous value of any previous sample.
H. The trend point graphing capability shall be a built-in feature of the system and shall not require operator set- up. Systems, which require trend point data to be exported to third party software, shall not be acceptable.
Totalization

A. For every digital point, the system shall be able to calculate:
Cumulative on-time
Cumulative off-time

For every point, analog and digital, the system shall be able to calculate:
Cumulative time in alarm
Cumulative time overridden by operator
Cumulative time off-line

Time totalization shall have a resolution of one minute or less.

Time totalization shall be displayed in hours.

Database Manager
Cloud-based software & Server shall include a data base manager to allow the data to be managed on an integral and non-redundant basis. It shall be able to make additions and deletions to database, without affecting the existing data.

PROGRAMMABLE CONTROLLER

Wi-Fi & BLE Enabled Direct Digital Controller (DDC) - Hardware

Wi-Fi and BLE Enable DDC controller shall be IP based type and shall have on board RJ 45 Ethernet Port to directly connect with network switch.

Controllers shall be capable of fully “stand- alone” operation, i.e., in the event of loss of Wi-Fi and hence the internet connection and so the MQTT broker with other DDCs (Slaves) over Modbus/RTU protocol, they shall be able to function on their own.

The DDC shall communicate with peers over Modbus RTU and cloud server over MQTT protocol on Ethernet with Internet or Wi-Fi with Internet

The controllers shall consist of microcontroller/microprocessor and it shall have minimum 16MB internal RAM for data storage and additional SD card provision for higher data storage enablement.

The memory available to the controller board as working space for storage of the firmware only and no operating systems on board shall be accepted and data files shall be decided based on number of points being connected by them.

It shall have built in MQTT router eliminating the need for additional MQTT routers or Gateways for the system.

The controllers shall be CE certified.

It shall have adequate nonvolatile / Flash Memory with capacity to store all I/O data of that particular DDC for minimum 2-7 Days.

Controllers shall have Proportional control, Proportional plus Integral (PI) Control, Proportional plus Integral plus Derivative (PID) Control, Two Position Control and Time Proportioning Control and algorithms etc., all in its memory and all available for use by the user, i.e. all the control modes shall be firmware selectable at any time and in any combination of master slave. The analog output of Proportional Control, PI Control, and PID Control shall continuously be updated and output by the program shall be provided. Between cycles the analog output shall retain its last value or default value as decided for the project. Enhanced integral action in lieu of Derivative function shall not be acceptable.

The controllers shall have a resident real time clock for providing time of day, day of week, date, month and year. These shall be capable of being synchronized with cloud server & software.

Back-up power shall support the clock. Upon power restoration all clocks shall be automatically synchronized.

The controller shall have A/D converters, memory and capacity to accommodate input/output (I/O) hardware points (with expansion board or module) as per I/O requirement. However, DDCs with a lower capacity of I/Os may be adequate for locations with relatively less input/output points. ELV Sub-Contractor shall submit DDC I/O points' configuration, i.e., no. of I/Os in each DDC for approval. DDCs with adequate number of I/O points shall be supplied after considering a spare capacity of 10% for each I/O type in every controller.

If the controllers provided by the contractor have the configurable plug in expansion module with RS485 port, then the following minimum specifications shall have to be met:

In addition to the basic outstation a minimum of one slot shall be provided for the insertion of plug-in expansion module.

ii) The module shall provide for analog or digital, input or output, hardwired connections to the installed plant.

iii) The quantity and combination of these cards shall be determined by the requirements of the plant in that location with the concurrence of the Engineer.
Controller shall be sized to have 10% spare capacity left out (digital/ analog input/output) to give flexibility for future expansion.

Controllers shall have 12-bit A/D resolution and be capable of handling DC voltage (using 500-ohm resistor for I to V conversion) resistance or open and closed contacts inputs in any mix, if required.

Analog (Universal) inputs/outputs of the following minimum types shall be supported:

i) 0-1 volts.
ii) 0-10 volts.

iii) 0-5 volts,
iv) 2-10 volts.
v) 4-20mA
vi) RTD (Ohms)

Digital input / output types to be supported shall be, but not limited to the following:
i) Normally open contacts.
ii) Normally closed contacts.

Modulating outputs shall be true proportional outputs and not floating control type.
Controller packaging shall be such that complete installation and check out of field wiring can be done prior to the installation of electronic boards.

All board terminations shall be made via plug-in connectors to facilitate trouble-shooting, repair and replacement. Soldering of connections shall not be permitted.

Controllers shall be equipped with diagnostic LED indicators with indication for Power On, Bus Error and Wi-Fi or Internet Error. All LED's shall be visible without opening the casing.

It shall be possible for the controllers to accept regulated uninterrupted power supply to maintain full operation of the controller functions (control, logging, monitoring and communications) in the event of a localized mains failure.

Controllers requiring fan cooling are not acceptable.

The controllers shall be housed in vandal proof ABS enclosures to protect them from tampering by any unauthorized personnel. All controllers used in plant room spaces and external application shall be housed in minimum IP55 rating enclosures.

It shall be possible to add new controllers to the system without taking any part of the system off-line.

Direct Digital Controller - Capabilities

Controller shall have a self-analysis feature and shall transmit heat beat messages to the IBMS cloud server to facilitate trouble-shooting and ensure the shortest possible down time of any failed controller.

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

In the event of failure of communication between the controllers and/or IBMS cloud server terminal, data shall be stored at the controllers and transmitted to the cloud server terminal on restoration of communication (Wi-Fi/LAN-Internet).

During new release of firmware, the necessary data-base shall be downloaded automatically over the air update and without operator instruction. Controllers requiring a manual intervention for the re-boot of software are not desired.

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

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

Time & Event programs
Holiday Scheduling
Start and stop program
Load reset
Duty cycle
Run Time Totalization
Sequencing and Optimization
Exception scheduling

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

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

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

Mode of Measurement - "Each".

The ELV Sub-Contractor shall quote as per I/O Summary provided for each DDCs such as for analog and digital I/Os as per the I/O Summary for various equipment's such as HVAC system (AHUs, Chillers, Ventilation), Electrical and Plumbing System that are be integrated with IBMS. Each DDC shall be supplied with required no. of IOs and communication protocols ports as applicable for the DDC at that location. Cabling distances for serial interface protocol shall not exceed 900 mtrs from DDC up to the last device being connected; in which case an additional DDC(s) shall be provided to connect remaining devices. ELV Sub-Contractor shall submit shop drawings/layouts and schematics indicating DDC locations, connectivity etc. for approval.

PORTABLE OPERATOR TERMINAL (POT) (Normal Laptop/PC) for Configuration App

POT shall be provided to allow operator readout of system variables, override control and adjustment of control parameters. The POT shall be portable and plug directly into individual controller for power and data.

The minimum functionality of POT shall include:

Set points to a fixed value or state.
Display diagnostic results.
Display sequentially all point summary and sequentially alarm summary.
Display digital point state, analog point value.
Display/change time and date.
Display/change analog limits.
Display/change time schedule.
Display/change run time counts and run time limits.
Display/change time and/or event initiation.
Display/change minimum ON/OFF and maximum OFF times.

The POT shall be complete with command keys, data entry keys, cursor control keys and a 24-character liquid crystal alphanumeric display. Access shall be via self-prompting menu selection with arrow key control of next menu/previous menu and step forward/backward within a given menu.

Connection of a POT to a controller shall not interrupt or interfere with normal network operation in any way, prevent alarms from being transmitted, or interfere with operator work station commands and system modifications.

Connection of POT at any controller shall provide display access to all controllers on that bus. In case the controller has a fixed LCD display and entry keyboard, then the display access shall be available on each screen.

It shall be possible for the POT to be connected to any controller on the bus to view and control any point on any other controller on the bus under password protected menus. POTs in which only a predefined number & set of points are available shall not be accepted.

A failure of any DDC on the bus, Interface unit or Central PC station or any other device of the system shall not affect the operation of the POT.

Systems in which the POT is connected to only a single interface master port and hard wired to other controllers are not acceptable.

Use of a POT at DDC shall allow the user to display software information and via password control, modify DDC software.

All displays on the POT shall be in English language text and data points shall have customized descriptions as per application requirement.
It should be possible to override the commands given through POT by the Operator Control Station.

DATA COMMUNICATION

The communication shall be via a dedicated Wi-Fi/LAN Ethernet enabled Internet communication on MQTT over Ethernet standards. No other MQTT networking standard shall be acceptable. Controller microcontroller/microprocessor failures shall not cause loss of communication of the remainder of any other device in network.
Each controller shall have equal rights for data transfer and shall report in its predetermined time slot. There shall be no separate device designated as the communications master.
The communication network shall be such that:

Every controller must be capable of communicating with all other controllers via MQTT through Cloud server which are not connected via Master Slave Communication.

Each controller is to be provided with a communication watchdog to assure that an individual controller does not permanently occupy the bus.

Error recovery and communication initialization routines are to be resident in each network connected device.

The communication protocol shall incorporate CRC (Cyclic Redundancy Check) to detect transmission errors. Parity bit error checking shall not be acceptable.

Single or multiple stand-alone controller failures shall not cause loss of communication between active control panels connected on the communication network (Wi-Fi or LAN).

The communication network shall include provision for automatically reconfiguring itself to allow all operational equipment to perform as efficiently as possible in the event of single or multiple failures.

FIELD DEVICES

General Requirements

All controls shall be capable of operating in ambient conditions varying between 0-50°C and 95%R.H. non-condensing.

Ancillary Items

When items of equipment are installed in the situations listed below, the ELV Sub-contractor shall include the following ancillary items:

Weather Protection

All devices required to be weather-proof shall be with required IP rating or shall be mounted in IP rated enclosures as required.

(ii) Pipe work Immersion

Corrosion resisting pockets of a length suitable for the complete active length of the device, screwed ½" (13 mm) or ¾" (20 mm) NPT suitable for the temperature, pressure and medium.

(iii) Duct Mounting (Metal or Builders Work)

Mounting flanges, clamping bushes, couplings, locknuts, gaskets, brackets, sealing glands and any special fittings as necessitated by the device shall be provided.

Additional features:

(i) Concealed Adjustment: All two position switching devices shall have concealed adjustment unless detailed otherwise in the Schedule of Quantities.

Operating Voltage: All two position switching devices shall operate on 230VAC and all accessible live parts shall be shrouded. An earth terminal shall be provided.

TEMPERATURE SENSOR – PIPE IMMERSION TYPE (WATER)

Parameter	Technical Specification
Type	Temperature sensors for space, pipes and ducts, shall be 2-wire, Resistance Temperature Detector (RTD) PT 1000 type.
Sensor	Immersion type with sensor element accuracy of ± 0.004K Ohm.
Range	- 20 °C (-4 °F) to +70 °C (+158 °F), with minimum temperature indication accuracy of ±0.5 °C(33 °F)
Construction	Immersion type temperature sensors shall be provided with separate stainless steel Thermo well. These shall be manufactured from bar stock with hydrostatic pressure rating of at least 10 kg/cm2.

	The connection to the pipe shall be screwed ¾ inch NPT (M). An aluminum sleeve shall be provided to ensure proper heat transfer from the well to the sensor. Terminations shall be provided on the head. Flying leads shall not be acceptable. The sensor housing shall plug into the base so that the same can be easily removed without disturbing the wiring connections. Duct temperature sensors shall be with rigid stem and of averaging type.
Output	RTD, NTC, PTC Resistive output
Mounting Application	Duct Mounting, Room Mounting, Immersion In-line
Accuracy	± 0.004K Ohm for sensor element. ±0.33 °F for temperature indication (output)
Other Requirements	The sensors shall not be mounted near any heat source such as windows, direct sunlight and proximity to heat generating devices or electrical appliances.
Mode of Measurement	In "Each"

RELATIVE HUMIDITY SENSOR – DUCT & OUTSIDE AMBIENT

Parameter	Technical Specification
Type	Electronic, Relative Humidity 2 Wire with in-built temperature compensation.
Sensing Element	RH : Solid state thin-film capacitance polymer type
Range	RH : 0-100%RH
Accuracy	RH : ±2 %RH
Service	Duct & Ambient
Operating Conditions	0 - 90% RH non- condensing
Output	Two Wire ,4-20 mA DC from 750 ohms load or 0-10 VDC corresponding to 0- 100% RH
Power Supply	24 V AC , 50 Hz or 24 V DC
Accessories	Sun-shield in case of outdoor
Housing	The sensor housing shall plug into the base so that the same can be easily removed without disturbing the wiring connections. Outdoor air temperature sensor shall be provided with a sun shield and shall have a weatherproof rating of minimum IP 65.
Mode of Measurement	In "Each"

TEMPERATURE SENSOR – OUTSIDE AMBIENT

Parameter	Technical Specification
Type	Temperature sensors for space, pipes and ducts, shall be 2-wire, Resistance Temperature Detector (RTD) PT 1000 type/ NTC.
Sensor	Immersion type with sensor element accuracy of ± 0.004K Ohm.
Range	- 20 °C (-4 °F) to +70 °C (+158 °F), with minimum temperature indication accuracy of ±0.5 °C(33 °F)
Construction	Immersion type temperature sensors shall be provided with separate stainless steel thermo well. These shall be manufactured from bar stock with hydrostatic pressure rating of at least 10 kg/cm2. The connection to the pipe shall be screwed ¾ inch NPT (M). An aluminum sleeve shall be provided to ensure proper heat transfer from the well to the sensor. Terminations shall be provided on the head. Flying leads shall not be acceptable. The sensor housing shall plug into the base so that the same can be easily removed without disturbing the wiring connections. Duct temperature sensors shall be with rigid stem and of averaging type.
Output	Resistive output
Mounting Application	Outside temperature measurement
Accuracy	± 0.004K Ohm for sensor element. ±0.33 °F for temperature indication (output)
Requirements for Outside Installation	Outside air temperature sensor shall be impact resistant and shall be provided with a sun shield and shall have a weatherproof rating of minimum IP 65.
Mode of Measurement	In “Each”

AIR PRESSURE SENSOR

Parameter	Technical Specification
Type	Electronic Pressure Sensor or 3 Wire
Sensor	Piezo-Resistive / Solid state capacitance
Range	0 to 1000 pascals
Output	Two Wire, 0-10VDC corresponding to 0- 1000 Pascals
Mounting	Duct Mounted
Voltage operation	24 V AC, 50 Hz or 24 V DC
Accuracy	1% of span

Ambient Temp. & RH conditions	Temp. 10 to 55 Deg C and up to 95% RH non- condensing,
Housing	ABS plastic Box / polycarbonate IP 55 for Indoor application and IP65 for outdoor application
Mode of Measurement	In "Each"

ENCLOSURE FOR CONTROLLER

All the controllers shall be housed in lockable vandal proof boxes which shall either be floor mounted or wall mounted. These shall be free standing, totally enclosed, dust and vermin proof and suitable for tropical climatic conditions.
The panel shall be metal enclosed with ABS Plastic Mold Panel with gaskets between all adjacent units and beneath all covers to render the joints dust proof. All doors and covers shall be hinged and latched and shall be folded and braced as necessary to provide rigid support. Joints of any kind in sheet metal shall be seam pressed/hot pressed.
All panels and covers shall be properly fitted and secured with the frame and holes in the panels correctly positioned. Fixing screws shall enter holes tapped into an adequate thickness of metal or provided with nuts. Self-threading screws shall not be used in the construction of control panels. Knockout holes of approved size and number shall be provided in the panels in conformity with the location of incoming and outgoing conduits/cables. Clamps shall be provided to support the weight of the cables. The dimension of the boxes shall depend on the requirement with the color decided in consultation with the Engineer.
Note: All panel enclosures used in plant room spaces and external to building shall be suitable for outdoor application (IP 55 protection) and shall be ISI listed.

CABLES

All Cables shall follow the general IS Cable Standard IS 1554.
Signal Cabling
The signal cable shall be of the following specifications:

Sl. No.	Parameter	Specification
a	Wire	Annealed Tinned Copper
b	Size	1.0 sq. mm dia, 7 strands
c	No. of Cores	2, 8, 12, 24 (as per BOQ)
d	Copper Standard	IS Class 2: 8130/84
e	Shape of Conductor	Stranded Circular
f	Shielding	Overall braided foil Aluminum polyester shield
g	Insulation	PVC
h	Jacket	Chrome PVC – Black color
i	Nominal DCR	17.6 ohm/km (conductor) 57.0 ohm/km (shield)
j	Nominal OD	6.5 mm

k	Nominal Capacitance	130 pF/m between conductors at 1 kHz 180 pF/m between one conductor and other conductor connected to shield
l	Core Color	Black and Red

Communication Cable
The communication cable shall be of the following specifications:

Sl. No.	Parameter	Specification
a	Wire	Annealed Tinned Copper
b	Size	Minimum 24 AWG stranded
c	No. of Cores	2 × 1.5 sq. mm
d	Copper Standard	IS Class 2 : 8130/84
e	Shape of Conductor	Stranded Circular
f	Insulation	PVC
g	Shielding	Overall braided foil Aluminum polyester shield
h	Jacket	Chrome PVC – Black color
i	Nominal DCR	78.7 ohm/km (conductor) 55.8 ohm/km (shield)
j	Nominal OD	6.5 mm
k	Nominal Capacitance	131 pF/m between conductors at 1 kHz 243 pF/m between one conductor and other conductor connected to shield
l	Core Color	Black & Red, Black & White

OPERATOR INSTRUCTION & TRAINING

During system commissioning contractor shall have to provide "On-site Operator Instruction" to the Employer's operating personnel. Operator instruction shall be provide during normal working hours and shall be performed by a competent representative who is familiar with the system hardware, software and accessories.

The contractor shall provide instruction to the Employer's designated personnel on the operation of the BMS and describe its intended use with respect to the specified program functions. Operator orientation of the systems shall include, but not be limited to; the overall operation program, equipment functions (both individually and as part of the total integrated system), commands, systems generation, advisories, and appropriate operator intervention required in responding to the System's operation.
The training shall be arranged with minimum two sessions as follows:
Initial Training:
Minimum one day session (8 hours) after system is started up and at least one week before first acceptance test. Manual shall have been submitted at least before two weeks prior to operating personnel so that they can start to familiarize themselves with the system before "On-site Operator Instruction" session begins.

Follow-Up Training:

After Initial training minimum Two days session (16 hours) shall be required to deal with more advanced topics and answer questions.
This session shall be arranged approximately two weeks after initial training and before formal Acceptance.
LIST OF DOCUMENTS TO BE SUBMITTED BY CONTRACTOR

Drawings and Technical documents to be submitted by bidders/contractors at various stages shall be provided for including in the tender such as-
At The Time of Tender Submission:
OEM's technical datasheets in PDF
Quality Assurance Plan (QAP)
After the Award of contract:
Shop drawings - layouts, schematics and SLDs as a part of their technical proposal
As-built drawings - layouts, schematics and SLDs.
Progress schedules
OEM's site certifications
System wised each Items Make and Model approval sheet with Technical Datasheets

After Completion of work:
Testing and Inspection reports- OEM's site certifications, BMS system testing report
Manufacture's operating and maintenance manuals as well as guarantee/warrantee papers, commissioning and handing over reports for whatever equipment/Materials installed.
A detailed list of inventories of BMS system shall be compiled and submitted to the Engineer for his approval as per approved format.

MODE OF MEASUREMENT

Representatives from the CONTRACTOR and Engineer shall conduct a joint inspection of the Equipment's. All the discrepancies observed, either incomplete work or defective work shall be clearly indicated in the joint inspection report. The mode of measurements given below is for the purpose of measurement and payment and the scope of works shall be as specified elsewhere in the specification.
The following measurement code shall apply to this contract:
Cables, Cable Tray & Raceway
Cable & cable tray shall be measured in running length (meters) for each size of cable & cable tray.
The length of cable tray including accessories and fittings shall be measured along the center line of it.
No separate measurement of flanges, bends, elbows, reducer, expanders, tees, cross supports, hangers etc. shall be made. All such fittings / accessories shall be treated as normal cable tray.
Cable & cable tray shall be measured along the center line of installed.
The rates for cable & cable tray work shall include all wastage allowances, supports, hangers, nuts and check nuts, vibration isolators, suspension where specified or required and any other item as required to complete the installation. None of these items will be separately measured nor paid for
Comprehensive Annual Maintenance Contract:

The maintenance should be carried out as per manufacturers maintenance manual recommendation. The same should be done based on the written document issued by the manufacturer, this document should be submitted to the owner and also to the consultant before starting the work. The contractor is also to submit the concerned forms (form a & b as applicable) to the fire authorities from time to time and should obtain their approvals from time to time**.** It is also required to Employ experienced engineers having through knowledge of the systems revamped and upgraded should be capable of maintaining the systems as required from time to time. The personnel should be employed 24/7-365 days without fail. The person will be under the contractor's payroll and strictly follow all government norms.

The bank no way will have any direct responsibility to the personals employed for the discharge of the contractual obligation of the contractor.

- Payment of CAMC
  - Prorata basis
  - Every quarter (At the end of the quarter)
  - CAMC payment will start after defect liability period (After 2 year)
  - Since CAMC is comprehensive, no additional payment for replacement of parts and allied equipment's/ components/ machine etc., will be made.

- Scheduled work to be carried out for each system
  - Periodicity of visit (system wise)
  - Work to be carried out (brief description)
  - Items which are not supplied by contractors, but only installation done by contractors should also be maintained. It should be included in CAMC. This means that the final system maintenance will be the sole responsibility of the vendor irrespective of the product supply.

- Down Time Period of system
  - Down Time Period should not be more than 24-48 hours.

- Start time: Call reported by telephone/ Fax/ Mail
- End time: System in operational condition, critical system i

- Penalty clause:
  - If the services are not satisfactory, penalty of ____% of the CAMC will be imposed or deducted from contract amount.
  - If contractor unable to repair or maintain the system as per maintenance manual, penalty ___% will be imposed.
  - If down time of the system is more than stipulated period
  - If fails to repair or maintain then Bank at risk and cost of contractor will get it repaired, by engaging other contractor. The cost involved will be deducted plus penalty.

11. CAMC Agreement: Separate CAMC Agreement will be executed as per Bank's standard CAMC format.

IOT SPECIFICATION AND DETAILS.

1. **Summary**

life-safety and fire systems will leverage a secure gateway to **IoT Cloud Platform**, ensuring that critical fire alerts are instantly transmitted to external firefighting teams via mobile and web channels.

2. **IoT-Based Firefighting Alert System: Rapid Response Operations**

While standard operations remain on-premise, fire safety requires immediate external communication. The prospective vendor should bridge the fire detection system to the IoT cloud strictly for emergency alerting.

- **Secure IoT Gateway:** A dedicated, unidirectional IoT gateway connects the on-premise fire alarm control panel (FACP) to the cloud. This ensures alerts can go out, but external threats cannot penetrate the local BMS network.
- **Real-Time Cloud Processing:** When a smoke detector, heat sensor, or manual pull station is activated, the signal is instantly routed via secure protocols to cloud infrastructure.
- **Instant Multi-Channel Alerts:** The cloud platform automatically dispatches high-priority alerts (via SMS, email, push notifications, and automated voice calls) directly to the designated firefighting teams, emergency responders, and critical SBI stakeholders.
- **Geo-Location and Zone Mapping:** The IoT alert includes specific metadata detailing the exact floor, zone, and sensor triggered, allowing the firefighting team to formulate an attack plan before arriving on-site.
- The system is designed for Buildings, warehouses and facilities requiring real-time monitoring of pump room.
- Integration with fire hydrant, alarm and suppression system for comprehensive monitoring and protection
- Continuous monitoring and control of pump room equipment and protection against operational failures

• Hybrid System Workflow: How It Works Together

The synergy between the local and cloud systems ensures neither security nor safety is compromised. Below is the operational workflow during a fire event.

Stage	System Component	Action / Execution
1. Detection	Local Fire Sensors	A localized sensor (smoke/heat) detects anomalies and triggers the physical fire alarm system.
2. On-Premise Response	STR Controllers (Edge)	The local BMS executes emergency logic: shutting down HVAC dampers to prevent smoke spread, grounding elevators, and unlocking access doors.

Stage	System Component	Action / Execution
3. Cloud Transmission	Secure IoT Gateway	Simultaneously, the event data are pushed to the cloud platform using **MQTT, HTTPS, and TLS protocols.**
4. External Alerting	IoT Platform	The cloud processes the event and blasts critical notifications and specific zone data to the external firefighting team's mobile devices.

3. **Key Benefits / Features**

- **Bank-Grade Security:** By keeping day-to-day BMS monitoring fully on-premises, SBI's sensitive facility data is protected from external cyber threats.
- **Accelerated Emergency Response:** Bypassing local communication bottlenecks, the IoT integration ensures first responders receive actionable data in seconds.
- **Compliance & Reliability:** Meets rigorous standards for both data privacy (localized data) and life safety (redundant cloud alerting).
- 3-phase power failure
- Hydrant system or Sprinkler system pressure
- Fire alarm health condition
- All Pumps
  - ➢ On/off
  - ➢ Auto/Manual
  - ➢ Trip condition
  - ➢ Running hours of the pump
- Automated report generation
- Remote access, report generation and monitoring via Web and Mobile application
- Battery voltage
- Diesel tank level
- Water reservoir storage level
- Test-line butterfly/gate valve condition – open/close
- Delivery-line butterfly /gate valve condition – open/close.

IO SUMMARY - IOT

Sr.No	Equipment	Qty.	Point Details	AI	AO	DI	DO	SI	Remark/ Provision required	Water Level Switch
1	Water Tank	2	Tank high/Low Status			2			Water Level Switch	2
2	Pumps	6	Trip Status			6			PFC Contact required	
			On /off Status			6			PFC Contact required	
			Auto/manual Status			6			PFC Contact required	
			Start/Stop Command				6		PFC Contact required	
3	Overhead water tank	2	Tank high/Low Status			2			Water Level Switch	2
4	Overhead Pump	2	Trip Status			2			PFC Contact required	
			On /off Status			2			PFC Contact required	
			Auto/manual Status			2			PFC Contact required	
			Start/Stop Command				2		PFC Contact required	
5	Sprinkler flow switch	42	Sprinkler flow switch Status			42			PFC Provision from Sprinkler flow switch	
6	Fire Alarm System	1	FAS Soft integration					1500	Bacnet-IP/Modbus RS-485 Output required from FAS Panel	
7	Lift	2	Lift Soft integration					30	Bacnet-IP/Modbus RS-485 Output required from Lift Panel	
			Total	**0**	**0**	**70**	**8**	**1530**		**4**

IO SUMMARY – ONPREMISES

Sr.No	Equipment	Qty.	Point Details	AI	AO	DI	DO	SI	Remark/ Provision required	Water Level Switch
1	Water Tank	2	Tank high/Low Status			2			Water Level Switch	2
2	Pumps	6	Trip Status			6			PFC Contact required	
			On /off Status			6			PFC Contact required	
			Auto/manual Status			6			PFC Contact required	
			Start/Stop Command				6		PFC Contact required	
3	Overhead water tank	2	Tank high/Low Status			2			Water Level Switch	2
4	Overhead Pump	2	Trip Status			2			PFC Contact required	
			On /off Status			2			PFC Contact required	
			Auto/manual Status			2			PFC Contact required	
			Start/Stop Command				2		PFC Contact required	
5	Sprinkler flow switch	42	Sprinkler flow switch Status			42			PFC Provision from Sprinkler flow switch	
6	Fire Alarm System	1	FAS Soft integration					1500	Bacnet-IP/Modbus RS-485 Output required from FAS Panel	
7	Lift	10	Lift Soft integration					150	Bacnet-IP/Modbus RS-485 Output required from Lift Panel	
8	PA System	1	PA Soft Integration					500	Bacnet-IP/Modbus RS-485 Output required from PA System	

9	Access Control	1	ACS Soft Integration					500	Bacnet-IP/Modbus RS-485 Output required from ACS system	
10	Ventilation Fans	12	Trip Status			12			PFC Contact required	
			On /off Status			12			PFC Contact required	
			Auto/manual Status			12			PFC Contact required	
			Start/Stop Command				12		PFC Contact required	
11	Pressurizatio n Fans	4	Trip Status			4			PFC Contact required	
			On /off Status			4			PFC Contact required	
			Auto/manual Status			4			PFC Contact required	
12	Fire Doors	42	Fire Door Status			42			PFC Contact required	
13	GSS Panel	1	GSS Soft Integration					15	Bacnet-IP/Modbus RS-485 Output required from FAS Panel	
				0	**0**	**160**	**20**	**2665**		**4**

BILL OF QUANTITIES (BOQ)

	BUILDING MANGEMENT SYSTEM - IOT		
A)	**Design, Supply, Installation, Testing , Commissioning & handing over of Building Automation System as follows:**		
1.0	**Cloud Sever form BMS software**	Set	1
2.0	**BMS System Software** : Supply, Installation, Testing & Commissioning Cloud Deployed Front end platform with end to end encryption of data points. The package includes licenses, software and platform with in and having SaaS based operations. Future rront end user upgradation, software patches & security updates shall be on the go without any server disruption. Multiple Sites on single dashboard without any latency and simultaneously. Role base (R-Back) Access Control for dashboard users. Over the air On the Go licenses & database updates instantly using agile development methodology, Platfrom shall comprises of Building Portfolio.	Job	1
3.0	**Third Party Integration:** Supply, Installation, Testing & Commissioning of CE Certified, Wi-Fi-BLE Enabled IOT Device with MQTT Operation Protocol, SSL/TLS Security with End to End data point encryptions, OCP-OVP-UVP-ESD Protections, 20VA Consumption, 24V AC/DC Supply, Compact Size 215mmx1125mmx62.5mm, Light Weight 300g, Wall & Panel mount two in one plate housing.	Lot	1
3.01	Fire Alarm System on Modbus RTU or BACnet I/p		
3.02	Lifts on Modbus RS485		
4.0	Supply, Installation, Testing & Commissioning of CE Certified, Wi-Fi-BLE Enabled IOT Device with MQTT Operation Protocol, SSL/TLS Security with End to End data point encryptions, OCP-OVP-UVP-ESD Protections, 20VA Consumption, 24V AC/DC Supply, Compact Size 215mmx1125mmx62.5mm, Light Weight 300g, Wall & Panel mount two in one plate housing.		
4.01	Water Tanks		
4.02	Pumps		
5.0	L2/L3 network switches of suitable specifications to create the desired LAN for IP based DDCs. The specifications and number of the switches shall be calculated based on the design and DDC configuration. All the required accessories like racks,3 meter long optic fiber patch cord complete as required shall be included in this line item	Lot	1
	Note: It may be noted that all hard point integration through DDC controllers & Soft integration through integrators will be terminated (minimum two ports) at the IT network switch in each building(Net working switch to be provided by IT vendor) which will be further configured and communicate with BMS system server through LAN. BMS vendor will coordinate with IT vendor for the above provision.		
B)	**Field Devices - MEP Works**		
	Supply, installation, testing, commissioning of necessary Input sensor transmitters/transducers comprising the following:		
1.0	Bi-Level Switches (Hi/Low)	No.	4
C)	**Conduiting , Wiring and Cabling**		
1.0	**Supply, installation, testing and commissioning of following cables:**		
1.1	2 Core 1.0 Sqmm, unarmoured ATC conductor multistranded, twisted shielded cable for signals	RM	500

1.2	4 Core 1.0 Sqmm, unarmoured ATC conductor multistranded, twisted shielded cable for signals	RM	0
1.3	3 Core 1.5 Sqmm, unarmoured ATC conductor multistranded, twisted shielded cable for Powering DDC, Actuators.	RM	250
1.4	CAT 6 UTP Steel tape armoured networking cable with required accessories like patch panel, Factory crimp patchcords.	RM	305
1.5	2 Core 1.5 Sqmm, unarmoured ATC conductor multistranded, twisted shielded cable for integration of 3rd Party Devices	RM	250
1.6	Supplying and laying of following sizes of Heavy Duty FRLS PVC conduit on surface/recess including cutting/filling chases along with conduit accessories etc. complete as required.		
a)	25 mm dia	RM	1000
b)	20mm dia	RM	0
1.7	25 mm Flexible FRLS PVC Conduit	RM	250
1.8	1.6 mm thick GI raceway of the following sizes complete with angle iron supports/hanging arrangement etc. and raceway supports shall at every 1 meter.		
1.8.1	GI Raceway 300mm wide x 40mm high	RM	0
1.8.2	GI Raceway 150mm wide x 40mm high	RM	50
1.8.3	GI Raceway 100mm wide x 40mm high	RM	50

	BUILDING MANGEMENT SYSTEM – ON PREMISES		
A)	**Design, Supply, Installation, Testing , Commissioning & handing over of Building Automation System as follows:**		
1.0	**BMS Computer System:** Pentium i7 Core with 3.4GHz minimum CPU speed, optical Mouse, 106 keys keyboard, 1Gbps Ethernet card/port ,minimum 4 no.USB connection & internal modem, Enhanced Graphics card 4GB. - Tower server grade i7 Processor (Latest Generation) - 16 GB RAM, 4 TB hard disc - 32” flat screen, 3840 x 2160 resolution (4K). - Windows 11 professional and shall have MS-Office including antivirus installed (Latest version). -1no. A4 size Coloured Laser Printer.	Set	1
2.0	**BMS System Software** : Supply, Installation, Testing & Commissioning Cloud Deployed Front end platform with end to end encryption of data points. The package includes licenses, software and platform with in and having SaaS based operations. Future front end user upgradation, software patches & security updates shall be on the go without any server disruption. Multiple Sites on single dashboard without any latency and simultaneously. Role base (R-Back) Access Control for dashboard users. Over the air On the Go licenses & database updates instantly using agile development methodology, Platform shall comprises of Building Portfolio.	Job	1

3.0	**Third Party Integration:** Supply, Installation, Testing & Commissioning of CE Certified, Wi-Fi-BLE Enabled IOT Device with MQTT Operation Protocol, SSL/TLS Security with End to End data point encryptions, OCP-OVP-UVP-ESD Protections, 20VA Consumption, 24V AC/DC Supply, Compact Size 215mmx1125mmx62.5mm, Light Weight 300g, Wall & Panel mount two in one plate housing.	Lot	1
3.01	Fire Alarm System on Modbus RTU or BACnet I/p		
3.02	Lifts on Modbus RS485		
3.03	PAS System		
3.04	ACS System		
4.0	Supply, Installation, Testing & Commissioning of CE Certified, Wi-Fi-BLE Enabled IOT Device with MQTT Operation Protocol, SSL/TLS Security with End to End data point encryptions, OCP-OVP-UVP-ESD Protections, 20VA Consumption, 24V AC/DC Supply, Compact Size 215mmx1125mmx62.5mm, Light Weight 300g, Wall & Panel mount two in one plate housing.		
4.01	Water Tanks		
4.02	Pumps		
4.03	Fans		
4.04	Fire doors		
5.0	L2/L3 network switches of suitable specifications to create the desired LAN for IP based DDCs. The specifications and number of the switches shall be calculated based on the design and DDC configuration. All the required accessories like racks,3 meter long optic fiber patch cord complete as required shall be included in this line item	Lot	1
	Note: It may be noted that all hard point integration through DDC controllers & Soft integration through integrators will be terminated (minimum two ports) at the IT network switch in each building (Net working switch to be provided by IT vendor) which will be further configured and communicate with BMS system server through LAN. BMS vendor will coordinate with IT vendor for the above provision.		
B)	**Field Devices - MEP Works**		
	Supply, installation, testing, commissioning of necessary Input sensor transmitters/transducers comprising the following:		
1.0	Bi-Level Switches (Hi/Low)	No.	4
C)	**Conduiting , Wiring and Cabling**		
	-		
1.0	**Supply, installation, testing and commissioning of following cables:**		
1.1	2 Core 1.0 Sqmm, unarmoured ATC conductor multistranded, twisted shielded cable for signals	RM	2500
1.2	4 Core 1.0 Sqmm, unarmoured ATC conductor multistranded, twisted shielded cable for signals	RM	0
1.3	3 Core 1.5 Sqmm, unarmoured ATC conductor multistranded, twisted shielded cable for Powering DDC, Actuators.	RM	500
1.4	CAT 6 UTP Steel tape armoured networking cable with required accessories like patch panel, Factory crimp patchcords.	RM	1250
1.5	2 Core 1.5 Sqmm, unarmoured ATC conductor multistranded, twisted shielded cable for integration of 3rd Party Devices	RM	1500
1.6	Supplying and laying of following sizes of Heavy Duty FRLS PVC conduit on surface/recess including cutting/filling chases along with conduit accessories etc. complete as required.		

a)	25 mm dia	RM	5000
b)	20mm dia	RM	750
1.7	25 mm Flexible FRLS PVC Conduit	RM	500
1.8	1.6 mm thick GI raceway of the following sizes complete with angle iron supports/hanging arrangement etc. and raceway supports shall at every 1 meter.		
1.8.1	GI Raceway 300mm wide x 40mm high	RM	0
1.8.2	GI Raceway 150mm wide x 40mm high	RM	100
1.8.3	GI Raceway 100mm wide x 40mm high	RM	100

Section: 10

CIVIL WORKS

SR. NO.	ITEM DESCRIPTION	UNIT	QTY.	RATE (Rs.)	AMOUNT (Rs.)
1	**FALSE CEILING**				
1.1	**Gypsum Board False Ceiling**				
	Providing and fixing false ceiling at all height including providing and fixing of frame work made of special sections, power pressed from M.S. sheets and galvanized with zinc coating of 120 gms/sqm (both side inclusive) as per IS : 277 and consisting of angle cleats of size 25 mm wide x 1.6 mm thick with flanges of 27 mm and 37mm, at 1200 mm centre to centre, one flange fixed to the ceiling with dash fastener 12.5 mm dia x 50mm long with 6mm dia bolts, other flange of cleat fixed to the angle hangers of 25x10x0.50 mm of required length with nuts & bolts of required size and other end of angle hanger fixed with intermediate G.I. channels 45x15x0.9 mm running at the spacing of 1200 mm centre to centre, to which the ceiling section 0.5 mm thick bottom wedge of 80 mm with tapered flanges of 26 mm each having lips of 10.5 mm, at 450 mm centre to centre, shall be fixed in a direction perpendicular to G.I. intermediate channel with connecting clips made out of 2.64 mm dia x 230 mm long G.I. wire at every junction, including fixing perimeter channels 0.5 mm thick 27 mm high having flanges of 20 mm and 30 mm long, the perimeter of ceiling fixed to wall/partition with the help of rawl plugs at 450 mm centre, with 25mm long dry wall screws @ 230 mm interval,				
	including fixing of gypsum board to ceiling section and perimeter channel with the help of dry wall screws of size 3.5 x 25mm at 230 mm c/c, including jointing and finishing to a flush finish of tapered and square edges of the board with recommended jointing compound, jointing tapes, finishing with jointing compound in 3 layers covering upto 150 mm on both sides of joint and two coats of primer suitable for board, all as per manufacturer's specification and also including the cost of making openings for light fittings, grills, diffusers, cutouts made with frame of perimeter channels suitably fixed, all complete as per drawings, specification and direction of the EIC/Architect but including the cost of painting with pop and punning. 10mm aluminum Shadow profiles to be provided on periphery for all areas having gypsum false ceiling as per approved sample, shade				

	and make. Making of grooves in gypsum ceiling shall be included as per architect's instructions and approval. Rate shall be inclusive of vertical gypsum band of height 330mm and cove. Make: Knauf, Gyproc, Saint Gobain, USG				
1.1.1	12.5 mm thick tapered edge gypsum plain board conforming to IS: 2095- (Part I)	SQM	18500		
1.2	**Mineral Fibre Board False Ceiling**				
	Providing and fixing mineral fibre false ceiling tiles at all heights of size 595X595 mm of approved texture, design and pattern. The tiles should have humidity resistance (RH) of 99%, Light Reflectance ≥ 85%, Thermal Conductivity k= 0.052-0.057 w/m K, Fire performance as per (BS 476 pt - 6 & 7) in true horizontal level suspended on interlocking T-Grid of hot dipped all round galvanized iron section of 0.33mm thick (galvanised @120 gsm) comprising of main T runners of 15x32 mm of length 3000mm, cross T of size 15x32 mm of length 600mm to form grid module of size 600x600mm suspended from ceiling usinf galvanised mild steel item (galvanised @80gsm) 50mm long 8mm outer diameter M-6 dash fasteners, 6mm diameter fully threaded hanger rod up to 1000mm length and L-shape level adjuster of size 85x25x2mm, spaced at 1200mm center to center along with 'T'. The system should rest on periphery walls/partitions with the help of GI perimeter wall angle of size 24x24x3000 mm made of 0.40mm thick sheet, to be fixed to the wall with the help of plastic rawl plug at 450mm centre to center & 40mm long drywall S.S. screws. The exposed bottom portion of all T-sections used in false ceiling support system shall be pre-painted with polyester baked paint, for all heights including the cost of making openings for light fittings, grills, diffusers, cutouts and required finishing suitably fixed, all complete The work shall be carried out as per specifications, drawings and as per directions of the engineer-in-charge. MAKE: Armstrong, Knauf, USG, Saint Gobain	SQM	2000		
	TOTAL (FALSE CEILING)				

Section: 11

APPROVED MAKE LIST

MAKE LIST			
SR.NO	ITEM		APPROVED MAKE
1	Disel Driven Pump	1. Pump and accessories	Kirloskar/Armstrong/Grundfos.
2		2. Disel engine	Greaves/KOEL/KFE
3		3. Exhaust and exhaust piping - medium grade pipe	Jindal/Tata/Lloyd
4		4. Silencer	Manufacturer Standard of engine make
5		5. Disel storage tank	Manufacturer Standard of engine make
6		6. Battery charging unit and Battery	Manufacturer Standard of engine make
7		7. Panel Board	Crompton/KOEL/Leyland
8		8. Any other items not mentioned above, but required should be manufacturer approved only.	
9	Motor driven pumps	1. Pump and accessories	Kirloskar/Armstrong/Grundfos.
10		2. Motor the latest energy efficient and should agree with star delta starter.	Karad Projects/ABB/Kirloskar electric
11	Jockey pump	1. Pump and accessories	Kirloskar/Armstrong/Grundfos.
12		2. Motor the latest energy efficient and should agree with star delta starter.	Karad Projects/ABB/Kirloskar electric
13	Booster pump	1. Pump and accessories	Kirloskar/Armstrong/Grundfos.
14		2. Motor the latest energy efficient and should agree with star delta starter.	Karad Projects/ABB/Kirloskar electric
15	Diesel engine and Motor control panel	All instruments/ equipment's etc.	L&T, Legrand, Schneider electric
16		Panel fabricator	Yash Enterprises / Vijay Engg. Machinery & Co. / Elecmec Controls.
17	Pressure Gauge	150mm dial, range - 0 to 20 kg/cm2 complete with all fittings	Fiebig / GIC / H. Guru
18	Pressure Switch	Complete with all fittings	Switzer / Danfoss/ Indfoss
19	Pipe Below 150 NB	GI ERW, IS 1239 Part-1, Heavy Grade, Class C	Jindal/Tata/Lloyd

20	Pipe 200NB and above	GI ERW, IS 3589 - 2001, Table-5, Clause 11.1, Wall thickness 6.3 and 7.1 as applicable	Jindal/Tata/Lloyd
21	Pipe fittings	Cold Grooved, FM/UL approved	Merit Fire/ Jainsons/Victaulic/ LEDE (Logix Pipe Fittings)
22	Sluice Valve	PN 24, D.I OS&Y Valve grooved ends	Newage Mumbai/Armour/Merit Fire/ LEDE (Logix Pipe Fittings)
23	Non-Return Valve	PN 24, Ball type Valve grooved ends	Normax/Jyoti Enterprise / Aira Euro Automation/ LEDE (Logix Pipe Fittings)
24	Foot Valve	Ball type foot valve with strainer grooved ends	Concorde Valves /Normex Valves/ LEDE (Logix Pipe Fittings)
25	Pressure Relief Valve (PRV)	D.I. pressure relief valves PN 24 / 300 psi rating with grooved ends	Singer / Rapidrop/Merit Fire/ LEDE (Logix Pipe Fittings)
26	Stainer	T - Bucket / Y type strainer with grooved ends	Singer / Rapidrop/Merit Fire/ LEDE (Logix Pipe Fittings)
27	Ball valve	Threaded Type	Zoloto/Lehry/Newage - Mumbai
28	Level transmitter switch	Float operated	Electronet Equipment's Pvt. Ltd. / SBEM Pvt. Ltd. / Switzer.
29	Cables	All cables low and high voltage	Polycab / Finolex/ Kenter.
30	Cable Tray GI	Perforated and ladder type as required	Elcon Cable Trays Pvt. Ltd., Pune / SS Industries, Pune / Premier Galvanizers, Thane.
31	Structural steel support - MS	Suitable thickness to be selected for the support being given	Bhushan Steel/ Tata/ Jindal/ SAIL
32	Hydrant	Hydrant valve IS 5290 - 2025	Armour Fire/ Newage-Mumbai/ Shah Bhogilal
33		Hose Coupling male - female type, IS 903:1993 (Fourth Revision)	
34		Branch pipe with nozzle, IS 2871: 2012	
35		RRL Hose pipe, IS 636:2018	
36		FRP Hose Box	
37		Hose reel drum, IS 884:2025	
38	Sprinkler	Sprinkler Nozzle, IS 9972:2023	Armour Fire/ Newage-Mumbai/ Shah Bhogilal
39		Rossette plate	
40		Flexible Drop Braided	
41		Alarm Valve complete with accessories as per IS 15105-2021	
42		Butterfly Valve	
43		Flow switch	System Sensor / Potter/Merit Fire
44		Sight Glass	Local Reputed make approved

45	Pipe support and fittings	Complete with anchor fastener, threaded rods, clamps, nut bolts etc..	Fixotec/Hilti/Hi-Tech
46	Fire Detection and alarm system	Fire alarm control panel along with all other accessories	Schrack/Autronica/Esser
47	Fire Resistant Door	2 Hr. Rating, CBRI or Building Fire Research Centre (BFRC)	Win Doors/Bajaj Fire Doors/ Vijay Fire Doors
48	Passive Fire protection	Floor and wall fire stop arrangement, Minimum 2 Hr. Rating	STI FIRE STOP / UNIFRAX / BUCKMAN.
49	BMS	Complete with all software and hardware	Build Track, Enlite, Siemens, Beckhoff, Tridium, Netix – ai.
50	Ventilation System	Fans, boxing and mounting arrangements etc..	Kruger/System air/Aerovient - Elta fans).
51	Gas Suppression System	Gas and cylinder complete with all accessories	Rotarex / Ceoduex / Tyco / UTC
52	False Ceiling	Gypsum Board	Knauf, Gyproc, Saint Gobain, USG
		Mineral Fibre Board	Armstrong, Knauf, USG, Saint Gobain

Section: 12
PRICE BID FORMAT

PRICE BID			
PART-A			
Sr.No.	**System**	**Section**	**Total Amount (in Rs.)* without GST**
1	FIRE WATER PUMP HOUSE, FIRE HYDRANT, SPRINKLER SYSTEM & PIPING FOR FIRE PROTECTION SYSTEM	Section -3	
2	CLEAN AGENT EXTINGUISHING SYSTEM	Section -4	
3	FIRE DETECTION AND ALARM SYSTEM	Section -5	
4	FORCED AIR VENTILATION SYSTEM FOR THE LIFT LOBBIES, STAIRCASES AND BASEMENTS	Section -6	
5	PASSIVE FIRE PROTECTION SYSTEM FOR FLOOR CLOSING	Section -7	
6	FIRE DOOR	Section -8	
7	BUILDING MANAGEMENT SYSTEM (BMS)	Section -9	
8	CIVIL WORKS	Section -10	
	TOTAL OF PART- A (WITHOUT GST)		
* Total amount means the total of input items minus the buyback value.			

PART-B				
Comprehensive Annual Maintenance Contract (CAMC) for 5 years after Defects Liability Period (DLP) of 2 years (24 Months)				
Sr.No.	**DESCRIPTION**	**DURATION**	**Percentage % of Total rate quoted in (PART A)**	**Total Amount (in Rs.) without GST**
1	CAMC FIRE PROTECTION & PREVENTION SYSTEM	1st Year		
2	CAMC FIRE PROTECTION & PREVENTION SYSTEM	2nd Year		
3	CAMC FIRE PROTECTION & PREVENTION SYSTEM	3rd Year		
4	CAMC FIRE PROTECTION & PREVENTION SYSTEM	4th Year		
5	CAMC FIRE PROTECTION & PREVENTION SYSTEM	5th Year		
	TOTAL OF PART B (WITHOUT GST)			Rs.
	GRAND TOTAL (PART A + B) WITHOUT GST			Rs.

LETTER OF DECLARATION

To,
Dy. General Manager (Premises)
State Bank Bhavan,
MADAME Cama Road, Nariman Point
Mumbi – 400021
Maharashtra

Dear Sir,

SUPPLY, INSTALLATION, TESTING AND COMMISSIONG (SITC) OF FIRE PROTECTION SYSTEM AT STATE BANK BHAVAN (SBB), MADAME CAMA ROAD, NARIMAN POINT, MUMBAI.

Having examined the terms & conditions, drawings, specifications, design relating to the works specified in the memorandum hereinafter set out and having visited and examined the site of the works specified in the said memorandum and having acquired the requisite information relating thereto and affecting the quotation, I/We hereby offer to execute the works specified in the said memorandum within the time specified in the said memorandum on the item rate basis mentioned in the attached schedule / BOQ and in accordance in all respect with the specifications, design, drawings and instructions in writing referred to in conditions of Tender, the articles of agreement, conditions of contract and with such conditions so far as they may be applicable.

MEMORANDUM

(a)	Description of work	**Supply, Installation, Testing and Commissiong (SITC) of FIRE PREVENTION AND PROTECTION SYSTEMS at State Bank Bhavan (SBB), Mumbai.**
(b)	Earnest Money	**Rs. 12,50,000/- only (Rupees Twelve lakh Fifty Thousand Only), by** means of Demand Draft / Pay Order from any scheduled Commercial/Nationalized Bank drawn in favour of "SBI and payable in "Mumbai". Valid for 90 days from the date of tender file.
(c)	Time allowed for completion of work from the date of issue of work order.	**18 MONTHS** from the date of commencement as per tender.

Should this tender be accepted, I/we hereby agree to abide by and fulfill the terms and provisions of the said conditions of Contract annexed hereto so far as they may be applicable or in default thereof to forfeit and pay to SBIIM, the amount mentioned in the said conditions.
I/we have deposited Demand Draft / Pay order for a sum of **Rs. --------(Rupees ……Only)** as Earnest money deposit with the SBI Should I/we do fail to execute the contract when called upon to do so, I/we hereby agree that this sum shall be forfeited by me/us to SBI without further notice to me / us.

We understand that as per terms of this tender, the SBI may consider accepting our tender in part or whole or may entrust the work in phases. We, therefore, undertake that we shall not raise any claim / compensation in the eventuality of Bank deciding to drop any of the building / buildings from the scope of work of this tender at any stage during the contract period. Further, we also undertake to execute the work entrusted to us in phases on our approved rates and within the stipulated time limit without any extra claim for price escalation

We, hereby, also undertake that, we will not raise any claim for any escalation in the prices of any of the material during the currency of contract/execution/completion period.

Yours faithfully,

Signature of contractor
With Seal

SAFETY CODE

SAFETY MEASURES AT SITE:

1. All personnel at site should be provided with Helmets and Safety Boots with some Identification Mark. Visitors also should be provided with Helmets. It should be ensured that these are used properly.
2. First Aid Box should be kept at site with all requisite materials.
3. No one should be allowed to inspect / work at a height without Safety Belt.
4. Suitable scaffolds should be provided for workmen for all Works that cannot safely be done from the ground, or from solid construction except such short period Work as can be done safely from ladders. When a ladder is used an extra Mazdoor shall be engaged for holding the ladder and if the ladder is used for carrying materials as well as suitable footholds and handholds shall be provided on the ladder and the ladder shall be given an inclination not steeper than ¼ to 1 (¼ horizontal and 1 vertical).
5. Scaffolding or staging more than 3.5 meters above the ground or floors, swung or suspended from an overhead support or erected with stationary support shall have a guard rail properly attached, bolted, braced and otherwise secured at least 1 Meter high above the floor or platform of such scaffolding or staging and extending along the entire length of the outside and ends thereof with only such openings as may be necessary for the delivery of materials. Such scaffolding or staging shall be so fastened as to prevent it from swaying from the building or structure.
6. Working platforms, Gangways, and Stairways should be so constructed that they do not sag unduly or unequally, and if the height of the platform or the Gangway or the Stairway is more than 3-5 Meters above ground level or floor level they should be closely boarded, should have adequate width and should be suitably fenced, as described.
7. Every opening in the floor of a building or in a working platform be provided with suitable means to prevent the fall of persons or materials by providing suitable fencing or railing whose minimum height shall be 1 Meter.
8. Safe means of access shall be provided to all working platforms and other working places. Every ladder shall be securely fixed. No portable single ladder shall be over 9 Meters in length while the width between side rails in rung ladder shall in no case be less than 30cms for ladder up to and including Meters in length. For longer ladders this width should be increased by at least 6mm for each additional 30 cms. Uniform step spacing shall not exceed 30 cms.
9. Adequate precautions shall be taken to prevent danger from electrical equipment. For electrical online works gloves, rubber mats, and rubber shoes shall be used.
10. All trenches 1.2 Meters or more in depth shall at all times be supplied with at least one ladder for each 30 Meters length or fraction thereof. Ladder shall be extended from bottom of the trench to at least 1 Meter above the surface of the ground. The sides of the trenches, which are 1.5 Meters or more in depth shall be stepped back to give suitable slope, or securely held by timber bracing, so as to avoid the danger of sides collapsing. The excavated materials shall not be placed within 1.5 Meters of the edge of the trench or half of the depth of the trench whichever is more cuttings shall be done from top to bottom. Under no circumstances undermining or under cutting shall be done.
11. Before any demolition work commenced and also during the process of the work: -
    a) All roads and open areas adjacent to the Work Site shall either be closed or suitably protected.
    b) No electrical cable or apparatus which is liable to be a source of danger over a cable or apparatus used by the operator shall remain electrically charged.
    c) All practical steps shall be taken to prevent danger to persons employed from risk or fire or explosion or flooding. No floor, roof or other part of the building shall be so over-loaded with debris or materials as to render it unsafe.
    d) All necessary personal safety equipment, as considered adequate by the Site Engineer should be kept available for the use of the persons employed on the Site and maintained in a condition suitable for immediate use; and the Contractor should take adequate steps to ensure proper use of equipment by those concerned.

e) Workers employed on mixing Asphaltic materials, cement and lime mortars shall be provided with protective footwear and protective goggles.

f) Those engaged in whitewashing and mixing or stacking of cement bags or any materials which is injurious to the eyes shall be provided with protective goggles.

g) Those engaged in welding works shall be provided with Welder's protective eye-shields.

h) Stone breakers shall be provided with protective goggles and protective clothing and seated at sufficiently safe intervals.

i) When workers are employed in sewers and manholes, which are in use, the Contractor shall ensure that the manhole covers are opened and are ventilated at least for an hour before the workers are allowed to get into the manholes and the manholes so opened shall be cordoned off with suitable railing and provided with warning signals and boards to prevent accident to the Public.

12. Use of hoisting machines and tackle including their attachments, anchorage and support shall conform to the following standard or conditions: -

a) These shall be of good mechanical construction, sound material and adequate strength and free from patent defect and shall be kept in good repairs and in good working order.

b) Every rope used in hoisting or lowering materials or as a means of suspension shall be of durable quality and adequate strength, and free from patent defects.

c) Every crane driver or hoisting appliance operator shall be properly qualified and no person under the age of 21 years should be in charge of any hoisting machine including any scaffold, winch or give signals to the operator.

d) In case of every hoisting machine and of every chain ring hook, shackle swivel and pulley block used in hoisting or lowering or as means of suspension the safe working load shall be ascertained by adequate means.

e) Every hoisting machine and all gear referred to above shall be plainly marked with the safe working load. In case of hoisting machine having a variable safe working load, each safe working load of the conditions under which it is applicable shall be clearly indicated. No part of any machine or of any gear referred to above in this paragraph shall be loaded beyond the safe working load except for the purpose of testing.

f) Motor, Gearing, Transmission, Electric wiring and other dangerous parts of hoisting appliances should be provided with efficient safeguards, hoisting appliances should be provided with such means as will reduce to the minimum the risk of accidental descent of the load, adequate precautions should be taken to reduce to the minimum the risk of any part of a suspended load becoming accidentally displaced.

g) When workers are employed on electrical installation, which are already energized, insulating mats, wearing apparel such as gloves, rubber footwear etc.

Address:
Signature of Tenderer: _____
Date:

FIRE SAFETY - INSTRUCTIONS

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i	Cutting / drilling machine and other electrically operated equipment used at site shall be plugged into correctly rated electrical outlets.
ii	Only ISI marked 3 pin plug and other appliances, and equipment shall be used.
iii	Electrical power cables/wires used shall not have any joints and shall be properly rated
iv	All electrical appliances i.e. welding, drilling, cutting machine etc. shall be safely and securely earthed to prevent leakage current while in operation
v	Before commencing the welding work, fire section shall be informed and required precautions should be taken.
vi	Two nos of water CO2 fire extinguishers and 2 nos of CO2 fire extinguishers of 4.5 Kg capacity shall be kept in an easily accessible area on the site
vii	Fire extinguishers recommended by fire officers shall be kept on the site.
viii	Used paint drums shall be stored in specified store only after closing them properly.
ix	Personal protective equipment such as safety shoes, hand gloves, welder's mask, ear plug etc. depending upon the requirement of the work shall be provided by the contractor to the workmen to prevent occupational health hazards.
x	The safety belt shall be feet by the contractor and used by the workmen while working from height for more than 10' from Ground level.
xi	None of the passages near lift lobby, fire exits and staircases shall be used for stacking / dumping any kind of materials/waste.
xii	Any debris/ waste generated from the work shall be collected on daily basis, removed from site and stored at the designated place in proper manner
xiii	Battery operated emergency light/torches shall be provided by the contractor to the workmen while working beyond office hours.

Place:
Date:

SIGNATURE AND SEAL
OF THE CONTRACTOR