TENDER DOCUMENT

For

DESIGN, SUPPLY, TESTING AND COMMISSIONING OF 02 NOS.(750 KVA & 500 KVA) OF DIESEL ENGINE DRIVEN GENRATING SETS WITH ALLIED ELECTRICAL WORKS AT STATE BANK ACADEMY, GURUGRAM.

NIT No: SBA/ADMIN/2026-27/02 dated 23.10.2026

NOTICE INVITING TENDER

State Bank Academy **(SBA)**, Plot No.77, Sector 18, Gurugram - 122015 invites two-bid online tenders through GeM portal **for DESIGN, SUPPLY, TESTING AND COMMISSIONING OF 02 NOS. (750 KVA & 500 KVA) OF DIESEL ENGINE DRIVEN GENRATING SETS WITH ALLIED ELECTRICAL WORKS AT STATE BANK ACADEMY, GURUGRAM.**

. The other details of the tender are as under:

Buyer Added Additional Terms & Conditions (ATC) will prevail over rest of the conditions in case of ambiguity or contradiction.

1.	**Scope of Work & Site Address**	**DESIGN, SUPPLY, TESTING AND COMMISSIONING OF 02 NOS. (750 KVA & 500 KVA) OF DIESEL ENGINE DRIVEN GENRATING SETS WITH ALLIED ELECTRICAL WORKS AT STATE BANK ACADEMY, GURUGRAM** a) as per BOQ as at Annexure-I with dismantling of existing of 3Nos. of 320 KVA DG sets & Electric control panels b) Buy-back of existing of 3Nos. of 320 KVA DG sets & Electric control panels c) 04 Years Comprehensive Annual Maintenance after completion of two years of Guarantee period with effect from date of handing over the completed work.
		Site Address: State Bank Academy, Plot No.77, Sector 18, Gurugram – 122015.
2	**a) Tender invitation**	21 **days**
	b) Tender technical bid opening	**As per GEM**
	c) Technical bid clarification time	As per GEM
	d) Price bid opening	As per GEM
3	a) Earnest Money Deposit (EMD) Estimated Cost (Rs.1,43,54,794/- excluding GST)	**Rs.1,44,000.00 (Rupees One lakh Forty-Four thousand only) to be submitted in the form DEMAND DRAFT or Banker's Cheque in FAVOUR "Asstt. General Manager(Administration), State Bank Academy, Gurugram and payable at Gurugram**. EMD is exempted

		for Micro and Small Enterprises with uploading valid MSME/UDYAM registration certificate. Tender not accompanied by EMD (as applicable) is liable to be rejected.
4	Minimum Turnover (Average annual in last three years (23-24, 24-25, 25-26) and Provisional of 26-27 may also be considered on producing valid CA certificate.	**Rs.43.0 Lakh**
5	Past Performance	**Having experience of completion of similar works (in the name of the applicant only) in any PSU/ Public Sector Bank/Public limited (Listed) Company/Govt) during last 7 years ending 30th September,2026 should be either of the following:** • **One similar completed work costing not less than Rs.1,14,84,000.00 (work Contract Value/certified work value excluding GST)** **Or** • **Two similar completed works costing not less than Rs.71,77,000.00 for each work (work Contract Value/certified work value excluding GST)** **Or** • **three similar completed works costing not less than Rs.57,42,000.00 for each work (work Contract Value/certified work value excluding GST)** Completion Certificates with Work Order copies in the name of the applicant for the above works must be submitted alongwith in the Technical Bid. In case completion certificates are not available, the copies of GST invoices raised in the name of client may be considered at the sole discretion of the Bank.
6	Full-fledged office	**The bidder must have full-fledged office/service center/Branch office in any of location within geographical area of Delhi NCT/Ghaziabad/Gurugram/Faridabad/NOIDA . Copy of electricity bill in the name of firm /GST certificate/ trade license /ESI/PF registration receipt etc. to be uploaded to ascertain that the service center/Office/Branch office in any of location within geographical area of Delhi NCT/Ghaziabad/Gurugram/Faridabad/NOIDA . SBA may visit the said these sites at its own discretion.**
7	Initial Security Deposit (ISD)	2% of the total value of the contract including Earnest Money **(without GST)** to be submitted by the Successful

		Bidder in the form DEMAND DRAFT/Banker's Cheque issued by any branch of State Bank of India in the name of Assistant General Manager (Administration), SBA payable at Gurugram within 7 days from date of receipt of work order.
8	Security Deposit (SD)	**The security money @5% on contract value will be retained and will be refunded on expiry/termination of the contract including Warranty & CAMC period, after adjusting the dues payable by the Successful Bidder to the Bank. No interest shall be paid to the amount retained by the Bank on the Security Deposit. The initial Security Deposit of 2% of the total contract value, inclusive of EMD submitted by the Successful Bidder, shall be adjusted towards the Security Deposit However, the Security Deposit amount may be released on submission of Bank Guarantee/FDR for equivalent amount valid for total warranty & CAMC period of 06 years.** Forfeiting Of Security Deposit: a) The security deposit shall be liable to be forfeited wholly or partly at the sole discretion of the SBA, if the Bidder either fails to execute the Contract or fails to fulfill the contractual obligations or fails to settle in full his dues to the SBA. b) The SBA is empowered to recover from the security deposit for any sum due and for any other sum that may be fixed by the SBA as being the amount or loss or losses or damages suffered by it due to delay in performance and / or non-performance and / or partial performance of any of the conditions of the contract and / or non-performance of guarantee obligations. **c)** Any default in CAMC
9	Time of completion of work	**120 days from the date of award of work**
10	Income Tax and GST	1) Income Tax/GST will be deducted at source as per Govt. Guidelines. 2) Reimbursement of GST on contract will be made only on submission of proper GST invoice as per applicable GST provision. The Bidder should comply with the following. 1.0 Bidder should have GST Registration Number 2.0 Invoice should specifically/separately disclose the

		amount of GST levied at applicable rate as per GST provision 3.0 Bidder should timely file his GST return in accordance with GST provisions to enable the Bank to claim the credit of GST paid to the Bidder.
11	Validity of Offer	90 days from the date of opening the Tenders and are likely to be extended as per the requirement of SBA.
12	Liquidate Damage(LD)	At the rate of 0.5% of the Contract Value per week for the delayed period, subject to a maximum of 5% of the accepted Contract Value.
13	Terms & mode of payment	• 75% payment shall be released on delivery of the DG sets with materials to the site and on verification at the site by the project consultant/SBA. The test certificates in original must be enclosed with the invoices. • 20% payment shall be released on installation and commissioning of the complete works and on production of Warranty certificate and the commissioning report attested by the project consultant/SBA. • 5%(Security Money) balance of the payment will be released **on expiry/termination of the complete contract including the warranty period of 2 years and CAMC period of 4 years, after adjusting the dues payable by the contractor to the Bank. No interest shall be paid to the amount retained by the Bank on the Security Deposit. However, the Security Deposit amount may be released on submission of Bank Guarantee from any Nationalized Bank other than State Bank of India for equivalent amount valid for 06 years(Warranty & CAMC period).** • **Payment shall be made by way of Electronic fund transfer. The Successful Bidder should furnish details of the Bank, A/c no, IFSC code PAN, GST numbers etc. in the Invoice.** • **The CAMC payment will be made on Quarterly basis on expiry of the warranty period of two years as per the terms defined in this tender document. Further, the CAMC payment shall be released on written request and subject to satisfactory services are rendered on completion of each quarter. No advance will be payable.**
14	Place of opening of tender	Tender will be opened through Gem portal at Administrative Block, State Bank Academy**, Gurugram .**
15	Contact person of SBA/ Consultants	Shri Surender Kumar , Chief Manager(Estate), SBA Contact No. 9999468305 M/s V. S. Kukreja & Associates Pvt. Ltd. Contact No.011-46066460

16	**Additional** Performance guarantee:	**Additional Performance Deposit/Guarantee (ASD) shall be applicable if the bid price is more than 10% below the estimated cost put to tender. The amount of such ASD shall be the difference between 90% of estimated cost put to tender and the quoted price. The ASD shall be in addition to the regular Security Deposit of 5% of the contract value as prescribed in the tender. The ASD in the format of DD / Banker's Cheque / Bank Guarantee issued by any scheduled commercial bank (except SBI) in the format prescribed by the Bank, shall be submitted within 15 days from the date of issue of award of work / work order to the Bank. Without submission of the required ASD, the Successful Bidder will not be allowed to start the work and failure of submission of ASD will result in forfeiture of EMD/initial Security Deposit. The ASD will be refunded after satisfactory completion of the work and fulfilment of the applicable contractual obligations, including any stipulated warranty obligations/CAMC obligations and subject to adjustment of recoverable dues by the Bank arises due to default of the Successful Bidder.** **For e.g., if a contractor is quoted 15% below the estimated cost put to tender (i.e. 85% of the estimate), then ASD of 5% of the estimated cost, in addition to 5% security deposit, is required to be deposited by the vendor (90%-85%).**
17.1	**Warranty/Guarantee**	The entire equipment shall be guaranteed to be free from defective workmanship or materials and any defects that may appear within 24 months from the date of issue of virtual completion certificate for the work, which in the opinion of the Bank have arisen from bad workmanship or materials, shall upon intimation by the Bank, be made good by the Successful Bidder at his own cost within the time specified by the Bank. During the said period of 24 months, the Successful Bidder shall make periodical inspection of the working of the D G Sets free of charge at least once a month or earlier, if required, and attend to the lubrication of the various parts and such other service that may be required of him.
17.2	**Comprehensive Annual Maintenance Contract (CAMC)**	The Successful Bidder shall quote their rates only per annum for all-inclusive Comprehensive Maintenance Contract inclusive of custom duty for spares imported, transport, insurance, handling, GST etc. year wise for 4-years CAMC period which will start after expiry of free warranty period of 24 months. These rates shall remain firm for the four years of CAMC after free warranty period

		& these charges will also be considered while evaluating tender as prescribed in the section "evaluation of tenders".
17.3	**Scope of works during CAMC**	i) Routine servicing/ troubleshooting/ setting/ adjustments/ cleaning/ lubrication/ checking of safeties etc. to ensure smooth and trouble-free working of the D G Set/other equipment. ii) Repairs/ replacement to the D G Set/other equipment in the event of any breakdown including replacement of spares/ components and any other component, part or whole of tendered items, which may need replacement/ repairs. iii) Import of spares, if any and stocking them shall be responsibility of the tenderer. Non availability of spares/ components will not be accepted as a reason for waiving of penalty towards delay in rendering prompt service. iv) All manufacturers preventive maintenance schedules/ replacement periodicity of spares /components including checking of safety devices, protections shall be strictly followed as per the manufacturer's periodicity or as required in addition to the scope of maintenance indicated above. v) The scope of maintenance in addition to periodic maintenance will also include attending to /any number of breakdown calls.
18	Documents to be uploaded on GEM Portal	1. Complete tender document signed and stamped. 2. EMD/Exemption as defined in NIT 3. Copies of documents for past performance criteria including copy of Work orders and Completion Certificates of the works executed. In case completion certificates are not available, the copies of GST invoices raised in the name of client 4. Copy of electricity bill in the name of firm /GST certificate/ trade license /ESI/PF registration receipts to ensure having service center/Office/Branch office in any of location within geographical area of **Delhi NCT/Ghaziabad/Gurugram/Faridabad/NOIDA .** **5**. Average Annual turnover certified by CA. 6. Authorisation certificate from the OEM. **7**. List of services centre to be furnished by the principles on their letter head clearly mentioning that they have service center of Engine and DG sets in the address of supply. PLEASE SUBMIT ONLY RELEVANT DOCUMENTS as above or other defined anywhere else in this tender document , non-submission of the above document or others as advised in this tender document, tender will be liable for rejection.

19	**Pre-Bid Meeting**	**On 30.10.2026 at State Bank Academy, Sector-18 Gurugram.**
20	Rights of SBA	**The SBA reserves the right to issue a corrigendum, or to cancel or postpone or modify the tender at any stage without assigning any reason therefor.** SBA is also not bound to accept the lowest bid or any tender received and may reject any or all bids in accordance with the tender conditions and applicable law.
21	After sales services	**List of services center to be furnished by the principles on their letter head clearly mentioning that they have service center of Engine and DG sets in the address of supply. Outsourcing of after sales service by OEM is not permitted and such bids shall not be accepted. OEM whose Principles do not have their own authorized service centers in the nearby area of the installation shall not be allowed to participate in the tender. The vendor shall train the authorized person of SBA in the operations and minor trouble shooting of the DG sets. Service calls should be attended within 2 hours. Also, the details shall be entered in the Bank's log book at the site by the service personnel then and there. During the currency of the contract, all care shall be taken so that the downtime of DG sets is kept minimum. Maximum permissible frequency of failures in a month as under :-** **A) Once for approximately one hour.** **B) Four times for approximately half hour.** **Security money will be forfeited in case of poor performance 0r non-performance. Any of the deliverables not being delivered for more than 2 days in a quarter would mean "poor performance".**
22	Local Regulations, Bye-Laws etc.	**The approval/clearance for installation of DG sets from Central Pollution Control Board/State Pollution Control Board/Local Boards/ State Electricity Board/other licensing Authorities as required will be obtained by the Successful Bidder. The Successful Bidder will be responsible for preparation of all applications, submission of applications, follow-up, inspection and obtaining of requisite documents, permission, approvals, NOC etc. from the competent authorities & submitting the same to the SBA before the commencement of installation, commissioning or operations of the DG sets in the SBA. The Successful Bidder shall also ensure compliance with all applicable environmental, electrical, safety and other statutory requirements relating to DG sets.**

AGM (Administration),
SBA

ANNEXURE-I

UNDERTAKING
(To be submitted along with the technical Bid)

To

The Asstt. General Manager(Administration),
State Bank Academy**, Gurugram**

Dear Sir,

Sub.: - DESIGN, SUPPLY, TESTING AND COMMISSIONING OF 02 NOS.(750 KVA & 500 KVA) OF DIESEL ENGINE DRIVEN GENRATING SETS WITH ALLIED ELECTRICAL WORKS AT STATE BANK ACADEMY, GURUGRAM

I/ We refer to the tender notice issued by you for "**DESIGN, SUPPLY, TESTING AND COMMISSIONING OF 02 NOS.(750 KVA & 500 KVA) OF DIESEL ENGINE DRIVEN GENRATING SETS WITH ALLIED ELECTRICAL WORKS AT STATE BANK ACADEMY, GURUGRAM**
in connection with the above.

1. **I undertake to submit in Hard copy the tender document along with all terms & Conditions, Specifications and subsequent annexure and corrigendum's duly signed and stamped by authorized representative/ signatory on becoming L1. However, we accept all the terms and conditions along with the specifications, Drawings, Layouts etc. defined in the tender documents.**
2. I/ We hereby offer to perform, provide, execute, complete and maintain the works in conformity with the drawings, designs, conditions of contracts & specifications schedule of quantities relating to the works.
3. I/ We have satisfied myself/ ourselves as to the site conditions, examined the drawings and all aspects of the tender conditions, subject to above, I/ We do hereby agree, should this tender be accepted in whole or in part, to:

a. Abide by and fulfill all the terms and provisions of the said conditions annexed hereto
b. Complete the works within **(till the validity of the contract)** as per the work programme enclosed with the tender in two or three shifts if considered necessary by the Employer/ Consultants at no extra cost to the Employer.

4. I/ We have deposited an amount of **Rs.1,44,000.00 (Rupees One lakh Forty-Four thousand only) in the form DEMAND DRAFT/Banker's Cheque in "Asstt. General Manager(Administration),** State Bank Academy**, Gurugram and payable at Gurugram. /Exemption if applicable** respectively which I/ We note that EMD will not bear any interest and is liable for forfeiture.

I. If our offer is withdrawn within the validity period of acceptance of the tender by the Employer.
Or

II. If the contract agreement is not executed **within 15 days** from the date of receipt of the letter of acceptance.
Or

III. If we fail to pay the initial security deposit as stipulated.

4. I/We understand that SBA is not bound to accept the lowest or any tender received.
5. The intending bidders shall be asked to quote their offers in terms of Individual item wise unit rate and amount for that item and the total cost of the project he will be willing to execute the work.
6. **I agree to enter into CAMC contract after the expiry of the warranty period as per the terms defined in this tender document.**
7. We shall maintain all the necessary registers, record as per the existing Labor Laws and also agree to maintain additional registers, record as directed by SBA from time to time. All the workmen working with us in SBA shall be given Identity Cards with photographs and it will be ensured by us that they carry the same without fail.
8. **Additional Security deposit (ASD) as additional performance Guarantee shall be applicable if the bid price is below 10% of the estimated cost put to tender. The amount of such ASD shall be the difference between 90% of estimated cost put to tender and the quoted price. ASD in the format of DD / Banker's Cheque / Bank Guarantee shall be submitted within 15 days of intimation of award of work / work order, without which the contractor will not be allowed to start the work and failure of submission of ASD will result in forfeiture of EMD and cancellation of tender.**

Date: **Vendor's Stamp & Signature**

The names of DIRECTORS of our Firm are:
1. _____
2. _____
3. _____
4. _____

Yours faithfully,

Signature ……..……..…..

Designation ……..……

INSTRUCTIONS TO THE TENDERERS

1.0 **Scope of Work & Site address**

DESIGN, SUPPLY, TESTING AND COMMISSIONING OF 02 NOS. (750 KVA & 500 KVA) OF DIESEL ENGINE DRIVEN GENRATING SET WITH ALLIED ELECTRICAL WORKS AT STATE BANK ACADEMY, GURUGRAM as per BOQ and Tender Document.

SBA having Basement, Ground, 1st and 2ndfloors, is presently provided with 3 Nos. of old DG sets(320x3). SBA desires to replace three of the D.G. sets with two no. of DG sets of capacity 750 KVA & 500 KVA including electrical control panels with buy-back of old DG sets & Electric Panels.

The scope of work shall include the following: -

1) Design, Supply, installation, testing and commissioning of 1 No. 750 KVA and 1 No. 500 KVA silent type DIESEL ENGINE DRIVEN GENRATING SETS.
2) Complete engine, alternator, base frame, anti-vibration arrangement, acoustic/weatherproof enclosure, radiator/cooling system, batteries, charger, fuel system, exhaust system and standard accessories.
3) AMF panels with motorised draw-out ACB/MCCB, electronic protection, metering, annunciation, battery charging, auto start/stop and BMS communication.
4) Main DG synchronising panel for 1 x 750 kVA + 1 x 500 kVA, with future provision for up to two DGs, auto/manual synchronising, auto load sharing and load management.
5) 1250 A and 800 A sandwich bus trunking from DG sets to PLC/synchronising/main LT panel as specified.
6) Exhaust piping, silencers, SS flexible bellows, rock wool insulation, aluminium cladding and steel supports.
7) Copper and GI plate earthing stations and copper/GI earthing strips.
8) Lightning arrester and aviation light with UPS/cable.
9) Control cabling and cable termination.
10) Protection and metering packages including CTs, multifunction meters, reverse power, REF/differential, earth fault and associated relays.
11) Five 9-litre foam fire extinguishers.
12) Dismantling and removal of 3 existing 320 kVA DG sets and 3 existing AMF/ATS panels.
13) Buy-back of existing DG sets and AMF/ATS panels.
14) Comprehensive four-year AMC after the warranty period of 2 years.

Related works to be provided by contractor:

1) Scaffolding necessary for erection, and all minor builder's work for cutting away and making good to walls and masonry work required, including repairs to plaster, whitewash etc. Further, all chase cutting, and openings as required by the D G Set Contractor and shown on his drawings, will be carried out by the D G Set Contractor. Machine RS beams and/or MS channels should be of reputed make for support of D G Set machinery and oil buffers shall be supplied and erected by the D G Set Contractor.
   Please also note the following:
2) Full length i.e. from sill to header fascia sheets of appropriate gauge also should be included on all floors including emergency landings. which will require additional support for extended lengths to be included in tenderer's scope.

3) Main **3 phase Copper power cables** and appropriate size or make duly approved by SBA shall be laid through individual shafts to meet the current PWD requirements. Single phase hoist way lighting cable of appropriate specification of the same make as 3 phase cable be laid with necessary bulkhead fitting with light point/plug and switches. Double copper earthing of appropriate gauge should also be provided. Main switches along with MCB'S /ELCB, RCCB of reputed make only duly approved by SBA etc on both sides should also be supplied and included in your scope.

Site Address :-
State Bank Academy, Plot No.77, Sector 18, Gurugram – 122015.

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 workman like manner :-**

- ✓ Notice Inviting Tender
- ✓ **Instructions to tenderers**
- ✓ **General Conditions of Contract**
- ✓ **Special Conditions of Contract**
- ✓ **Additional Conditions for Electrical Installation**
- ✓ **Technical Specifications**
- ✓ **Drawings**
- ✓ **Priced Bid as per BOQ**

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:

- ➢ Notice Inviting Tender
- ➢ Price Bid
- ➢ Technical Specifications
- ➢ Additional Conditions for Electrical Installation
- ➢ Special Conditions of Contract
- ➢ General Conditions of Contract
- ➢ Instructions to Tenderers

2.3 The tender documents are not transferable.

3.0 Site Visit

The tenderer must obtain himself on his own responsibility and his own expenses for obtaining all information and data which may be required for the purpose of filling this tender document and enter into a contract for the satisfactory performance of the work by conducting a site visit by himself or through his authorized representative on his behalf during working hours on working days from -26.10.2026 to 30.10.2026 . The Tenderer is requested satisfy himself regarding the availability of water, power, transport and communication facilities, the character quality and quantity of the materials, labour, the law & 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 Deposit(EMD)**

Rs.1,44,000.00 (Rupees One lakh Forty-Four thousand only) to be submitted in the form DEMAND DRAFT or Banker's Cheque in FAVOUR "Asstt. General Manager(Administration), State Bank Academy**, Gurugram and payable at Gurugram**. EMD is exempted for Micro and Small Enterprises with uploading valid MSME/UDYAM registration certificate. Tender not accompanied by EMD(as applicable) is liable to be rejected. EMD in any other form other than as specified above will not be accepted. No interest will be paid on the EMD.

4.2 EMD of unsuccessful tenderers will be refunded within 30 days of award of Contract.

4.3 EMD of successful tenderer will be retained as a part of security deposit.

5.0 **Initial Security Deposit (ISD)**

The successful tenderer will have to submit a sum equivalent to 2% of the total value of the contract including Earnest Money **(without GST)** in the form of DEMAND DRAFT/Banker's Cheque issued by any branch of State Bank of India in the name of State Bank Academy, Gurugram payable at Gurugram within 7 days from date of receipt of work order. **The initial Security Deposit of 2% of the total contract value, including EMD submitted by the Successful Bidder, shall be adjusted towards the Security Deposit.**

6.0 Additional Security deposit as additional Performance Guarantee (ASD)

Additional Performance Deposit/Guarantee (ASD) shall be applicable if the bid price is more than 10% below the estimated cost put to tender. The amount of such ASD shall be the difference between 90% of estimated cost put to tender and the quoted price. The ASD shall be in addition to the regular Security Deposit of 5% of the contract value as prescribed in the tender. The ASD in the format of DD / Banker's Cheque / Bank Guarantee issued by any scheduled commercial bank (except SBI) in the format prescribed by the Bank, shall be submitted within 15 days from the date of issue of award of work / work order to the Bank. Without submission of the required ASD, the Successful Bidder will not be allowed to start the work and failure of submission of ASD will result in forfeiture of EMD/initial Security Deposit. The ASD will be refunded after satisfactory completion of the work and fulfilment of the applicable contractual obligations, including any stipulated warranty obligations/CAMC obligations and subject to adjustment of recoverable dues by the Bank arises due to default of the Successful Bidder.

For e.g., if a contractor is quoted 15% below the estimated cost put to tender (i.e. 85% of the estimate), then ASD of 5% of the estimated cost, in addition to 5% security deposit, is required to be deposited by the vendor (90%-85%).

7.0 Signing of Contract Documents

The successful tenderer shall be bound to implement the contract by signing an agreement and conditions of contract as per Bank's standard format within **15 days from** the receipt of intimation of acceptance of his tender by the Bank. However, the written acceptance of the tender by the Bank will constitute a binding agreement between the Bank and successful tenderer whether such formal agreement is subsequently entered into or not.

8.0 **Completion Period**: The time period allowed for completion of the project shall be 120 **days** from the date of commencement of work or **7 days** from the date of issuance of work order, whichever is earlier.

9.0 **Validity of Tender**

Tenders shall remain valid for acceptance for a period of **90 days** from the date of opening price bid and are likely to be extended as per the requirement of SBA. If the tenderer withdraws his/her offer during the validity period or makes modifications in his/her original offer which are not acceptance to the Bank without prejudice to any other right or remedy, SBA will be at liberty to forfeit the EMD.

10.0 **Liquidated Damages**

The liquidated damages shall be 0.5% per week subject to a maximum of 5% of contract value.

11.0 Rates and Prices

11.1 The tenderers shall quote their rates for individual items both in words and figures in case of discrepancy between the rates quoted in words and figures the unit rate quoted in words will prevail. If no rate is quoted for a particular item the Successful Bidder 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.

11.2 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.

11.3 The tenderers should not change the units as 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.

11.4 The tenderer will 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/ SBA.

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

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

11.7 The rate quoted shall be firm and shall include all costs, allowances, taxes, VAT, levies, etc.

12. In case of any dispute arising regarding the job contract including the interpretation or the scope or working thereof, the decision of SBA shall be final and binding on the tenderer. All disputes are subject to local Jurisdictions at Gurugram only.

13.1 Before dispatching of equipment to the site, the equipment may be inspected by SBA's engineers/ officials / consultants at the manufacturer's works and then cleared for

shipment. The Successful Bidder at his own expense offer to the inspector all reasonable facilities as may be necessary for satisfying himself that the equipment is being or have been manufactured according to the specifications laid down in the tender. However, all cost towards inspector's travelling, lodging, boarding if any would be borne by SBA.

13.2 SBA's consultant / officials shall have free and full access at any time during execution of the contract to the Successful Bidder's works or site in case of the execution of work for the aforesaid purpose, and he may require the Successful Bidder to make arrangements for inspection of work or any part thereof or any material at his premises or at any other place specified by SBA's consultant / officials and if the Successful Bidder has been permitted to employ the service of a sub-contractor, reserve to SBA's consultant / officials a similar right.

SBA at its discretion may inspect the DG sets equipment at the manufacturer's works, before dispatch of the same to the site at State Bank Academy, Plot No.77, Sector 18, Gurugram, India. The inspection will cover the following equipment.

1) Machine/motors.
2) Controllers with VF installed.
3) Assembled cabin with panels approved by SBA.
4) Door operating system
5) Signal/indicator devices
6) Any other equipment.

13.3 The above will, however, not in any way absolve the Successful Bidder of his responsibility about proper performance of the system/ components after erection and commissioning at the designated place.

13.4 **The SBA's officials shall have the power**:

a) Before any equipment or part thereof are submitted for inspection to certify that they or any portion thereof are not in accordance with the contract owing to adoption of any unsatisfactory method of manufacture.
b) To reject any equipment or parts submitted as not being in accordance with the specification.
c) To reject the whole of the equipment tendered for inspection, if after inspection of such portion thereof as he may in his discretion think fit, he is satisfied that the same is unsatisfactory; and
d) To mark the rejected equipment or parts with a rejection mark so that it may easily be identified if re-submitted.

13.5 **Consequence of rejection:**

If on the equipment or a part thereof, being rejected by SBA's consultant / officials, the Successful Bidder fails to make satisfactory supplies or rectify the faulty work thus executed within the stipulated period of delivery/completion period, SBA shall be at liberty to:

i) Allow the Successful Bidder to re-submit the equipment or parts in replacement of those rejected, within a time to be specified, the Successful Bidder bearing the cost of freight if any, on such replacement without being entitled to any extra payments on that account; or

ii) Purchase/execute or authorize the purchase/execution of quantity/work of the equipment or parts rejected or others of a similar description (when equipment or parts exactly complying with specifications are not, in the opinion of SBA which shall be final, readily available) to the Successful Bidder at his risk and cost and without affecting the Successful Bidder's liability as regards supply under the contract; or

iii) Cancel the contract and purchase/execute or authorize the purchase/execution of the equipment or others of a similar description (when equipment or parts exactly complying with specifications are not in the opinion of SBA, which shall be final, readily available) at the risk and cost of the Successful Bidder. In the event of action being taken under such clause (ii) above or this clause, the provision of delivery clause applies as far as applicable.

13.6 SBA's decision as to rejection final: - SBA's decision as regards the rejection shall be final and binding on the Successful Bidder.

14.0 SBA will provide open space within the compound of the building. However, the responsibility and safety of the materials stored will be with the Successful Bidder. No accommodation will be provided for any worker by SBA. The partitions / enclosure for lockable storage to be erected by the Successful Bidder at his cost.

GENERAL CONDITIONS OF CONTRACT (GCC)

1.0 Definitions

"Contract" means the documents forming the tender and the acceptance thereof and the formal agreement executed between SBA, and the Successful Bidder, together with the documents referred therein including these conditions, the specifications, designs, drawings and instructions issued from time to time by the SBA/Consultants/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 'SBA' shall mean State Bank Academy, Gurugram, at Plot No.77, Sector 18, Gurugram – 122015, Haryana, acting through State Bank of India a body Corporate constituted under State Bank of India Act 1955, having its Corporate Centre at State Bank Bhavan, Madame Cama Road, Mumbai 400 021 and shall includes its successors and assigns.

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

1.1.3 'The Contractor/Successful Bidder' 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.

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.

1.1.4 'Engineer' shall mean the representative of the SBA/consultant.

1.1.5 'Drawings' shall mean the drawings prepared by the Consultants 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.

1.1.6 '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.

1.1.7 "Week" means seven consecutive days.

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

2.0 Language 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 dimension (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 latter shall be adopted.
iv) In case of difference between rates written in figures and words, the rate in words shall prevail.
v) Between the duplicate/subsequent copies of the tender, the original tender shall be taken as correct.

3.0 Scope of Work

The contractor shall carry out, complete and maintain the said work in every respect strictly in accordance with this contract and with the directions of and to the satisfaction of the Bank to be communicated through the consultant. The consultant at the directions of the Bank from time to time issue further drawings and/or written instructions, details directions and explanations which are hereafter collectively referred to as Consultant's instructions in regard to : the variation or modification of the design, quality or quantity of work or the addition or omission or substitution of any work, any discrepancy in the drawings or between the BOQ and/or drawings and/or specifications, the removal from the site of any material brought thereon by the contractor and the substitution of any other materials thereof, the demolition, removal and/or re-execution of any work executed by him, the dismissal from the work of any person employed/engaged thereupon.

4 (i) Letter of Acceptance

Within the validity period of the tender, the Bank shall issue a letter of acceptance either directly or through the Consultant by registered post or otherwise depositing at the address 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 SBA and the contractor.

4 (ii) Contract Agreement

On receipt of intimation of the acceptance of tender from the SBA/Consultant the successful tenderer shall be bound to implement the contract and within fifteen days thereof he shall sign an agreement in the formant prescribed by the Bank in a non-judicial stamp paper of appropriate value.

5.0 Ownership of drawings

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

6.0 Detailed drawings and instructions

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

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

Copies of Agreement

Two copies of agreement/tender document duly signed by both the parties in a non-judicial stamp paper of Rs 500/- with the drawings shall be handed over to the contractors.

7.0 Liquidated Damages

If the contractor fails to maintain the required progress 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 SBA on account of such breach to pay a liquidated damages at the rate of 0.5% of the contract value per week subject to a maximum of 5% of the contract value till the completion of works in terms of scope of work and other terms & conditions of the tender.

8.0 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 behaviour is found to be unsatisfactory by the SBA/Consultant he shall be removed from the site immediately.

9.0 Permits, Laws and Regulations

Permits and license required for the execution of the work shall be obtained by the contractor at his own expenses.

The contractor shall give notices and comply with the regulations, laws, and ordinances rules, applicable to the contractor. If the contractor observes any discrepancy between the drawings and specifications, he shall promptly notify the SBA 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 SBA any legal actions arising there from.

10.0 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 had been approved by the consultant the contractor shall be responsible for the same and shall at his own expenses rectify such error, if so, required to satisfaction of the SBA.

11.0 Protection of works and property

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

He shall take adequate care and steps for protection of the adjacent properties. The contractor shall take all precautions for safety and protection of his employees on the works and shall comply with all applicable provisions of Government and local bodies' safety laws and building codes to prevent accidents, or injuries to persons or property of 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 contractors and the SBA and the original policy may be lodged with the SBA.

12.0 Inspection of Work

The SBA/ Consultant or their representatives shall at all reasonable time 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 SBA, Consultant and their representatives necessary for inspection and examination and test of the materials and workmanship. No person unless authorized by the SBA/ 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.

13.0 Assignment and subletting

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

14.0 Quality of Materials, Workmanship & Test

(i) All materials and workmanship shall be best of the respective kinds described in the contract and in accordance with Consultant/SBA's 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, labour and materials

(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 samples/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 delay on the approval of the materials / equipment etc. shall be to the account of the contractor.

(iii) Cost of tests

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

(iv) **Cost of test not provided for**

If any test is ordered by the Consultant which is either:

If so intended by or provided for or (in the cases above mentioned) is not so particularized or through so intended or provided for but ordered by the Consultant which is either 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.

15.0 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 fulfilment of contract.

16.0 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 hereto.

17.0 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

The rate quoted shall remain valid for variation of quantity against individual item to any extent subject to maximum variation of the contract value by 25%. The entire amount paid under Clause 19 hereof as well as amounts of prime cost and provisional sums, if any, shall be excluded.

ii) Variation exceeding 25%: The items of work executed in relation to variation exceeding 25% shall be paid on the basis of provisions of clause 20(e) hereof.

18.0 Works to be measured

The Consultant may from time to time intimate to the contractor that he required the work to be measured, and the contractor shall forthwith attend or send a qualified 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 detailed in the specifications. The representative of the Consultant shall take joint 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. Should the contractor not attend or neglect or omit to depute his representative to take measurements then the measurements recorded by the representative of the consultant shall be final. All authorized extra work, omissions and all variations made shall be included in such measurements.

19.0 Variations:

No alteration, omission or variation ordered in writing by the Consultant shall vitiate the contract.

In case the SBA/ Consultant thinks proper at any time 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 or shall confirm in writing within seven days of giving such oral instructions the contractor shall alter to, add to, or omit from as the case may be in accordance with such notice but the contractor shall not do any work extra to or make any alteration 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.

20.0 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 SBA as herein mentioned. Any such extra is herein referred to as authorized extra and shall be made in accordance with the following provisions.

a) 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. 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, labour, 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.

21.0 Final Measurement

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

22.0 Virtual Completion Certificate (VCC)

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

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, structures 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 SBA and not incorporated in the permanent works.
c) Remove all rubbish, debris etc. from the site and the land allotted to the contractor by the SBA and shall clear, level and dress, compact the site as required by the SBA.
d) Shall put the SBA in undisputed custody and possession of the site and all land allotted by the SBA.
e) Shall hand over the work in a peaceful manner to the SBA.
f) All defects/imperfections have been attended and rectified as pointed out by the SBA to the full satisfaction of SBA.

Upon the satisfactory fulfilment by the contractor as stated above, the contractor shall be entitled to apply to the Consultant for the certificate. If the Consultant is satisfied of the completion of the work, relative to which the completion certificate has been sought, the Consultant shall within fourteen (14) days of the receipt of the application for virtual completion certificate, issue a VCC in respect of the work for which the VCC has been applied.
This issuance of a VCC shall be without prejudice to the SBA's rights and contractor's liabilities under the contract including the contractor's liability for defects liability period nor shall the issuance of VCC in respect of the works or work at any site be construed as a waiver of any right or claim of the SBA against the contractor in respect of works or work at the site and in respect of which the VCC has been issued.

23.0 Work by other agencies

The SBA/ 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 SBA. Such work shall be carried out in such manners not to impede the progress of the works included in the contract.

24.0 Insurance of Works

24.1 Without limiting the Contractor's obligations and responsibilities under the contract the contractor shall insure under CAR Policy (Contractor All Risk Policy) for 110 % of the contract amount as well as Third Party Insurance for Minimum value of Rs. 5 lakhs until the " Completion of the Project or handing over whichever is later +03 months, in the joint names of the SBA and the contractor against all loss or damages from whatever cause arising, for which the Contractor is liable under the terms of contract and in such a manner that the SBA and contractor are adequately covered for the period stipulated in clause 28 of GCC or the period which may be extended by the SBA as per its discretion 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. For the purpose of calculating the quantum of amount required for insurance, the following aspects may be taken into consideration:

a) The works for the time being executed, to an amount not less than the estimated current Contract value thereof, including such additional sums 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 effected with an insurer and in terms approved by the SBA which approval shall not be unreasonably withheld and the contractor shall whenever required produce to the Consultant the policy of insurance and the receipts for payment of the current premiums. The Contractor shall maintain such insurance throughout the applicable period and promptly notify the SBA of any cancellation, non-renewal or lapse in coverage.
d) The Contractor shall, at its own cost, obtain and maintain all insurance coverage required under applicable laws in respect of its workmen and personnel engaged in the works, including coverage against death, injury and accident and other health consequences that may occur and shall remain responsible for compliance with all applicable statutory obligations in this regard.

24.2 Damage to persons and property

The contractor shall, at all times indemnify the SBA 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.

24.3 Contractor to indemnify SBA

The Contractor shall indemnify, defend and hold harmless SBA and its officers, and employees from and against all third-party claims, liabilities, losses, damages, costs and expenses to the extent arising out of or resulting from the Contractor's performance, non-performance, breach or maintenance of the Contract, including any act, omission, negligence or misconduct of the Contractor or any of its employees, personnel or agents, or any failure by the Contractor or its employees or personnel to comply with applicable statutory obligations. The Contractor remains fully responsible for the act and omissions of its employees and personnel.

24.4 Contractor's superintendence

The contractor shall fully indemnify and keep indemnified the SBA 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 SBA 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. **Third Party Insurance**

24.5 Before commencing the execution of the work, the contractor but without limiting his obligations and responsibilities as per tender shall insure against his liability for any material or physical damage, loss, or injury which may occur to any property including that of SBA, or to any person, including any employee of the SBA, 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.

24.6 Minimum Amount of Third-Party Insurance

Such insurance shall be affected with an insurer and in terms approved by the SBA 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.

24.7 The minimum insurance cover for physical property, injury, and death is Rs.5.00 lacs 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.

24.8 Accident or Injury to Workmen

24.9 The SBA 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 SBA or their agents, or employees. The contractor shall indemnify and keep indemnified SBA 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.

24.10 Insurance against accidents etc to workmen

The contractor shall insure against such liability with an insurer approved by the SBA during the whole of the time any person 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 subcontractor the contractor's obligation to insure 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 SBA is indemnified under the policy but the contractor shall require such sub-contractor to produce to the Consultant when required such policy of insurance and the receipt for the payment of the current premium.

24.11 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 SBA 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 SBA as aforesaid and also deduct 15% of contract value from any amount due or which may become due to the contractor, or recover the same as debt from the contractor.

24.12 Without prejudice to the other rights of the SBA against contractors, in respect of such default, the Bank shall be entitled to deduct from any sums payable to the contractor the amount of any damages costs, charges, and other expenses paid by the SBA 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.

25.0 Commencement of Works

The date of commencement of the work will be reckoned as the recorded date of handing over site by the SBA or 15 days from the date of issue of Letter of Acceptance of Bank, whichever is later.

26.0 Time for completion

Time is the essence of the contract and shall be strictly observed by the contractor. The entire work shall be completed within a **period of 120 days** 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.

27.0 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 the SBA 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 SBA through the 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 reasons in detail and his justification if any, for the delays. The consultant shall submit their recommendations to the SBA in the prescribed format for granting extension of time. While granting extension of time the contractor shall be informed 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 SBA the provision of liquidated damages as stated under clause 7 of GCC shall become applicable. Further contract shall remain in force even for the period beyond the due date of completion irrespective whether the extension is granted or not.

28.0 Rate of progress

Whole of the materials, plant and labour 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 of the Consultant too slow to ensure the completion of the whole of the work by 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 woks by the prescribed time or extended time. Such communications from the Consultant neither shall relieve the contractor from fulfilling obligations under the contract nor he shall be entitled to raise any claims arising out of such directions.

29.0 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 or on holidays without the permission in writing of the SBA/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 provision 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 works being technically required and continued with the prior approval of the consultant at no extra cost to the SBA.

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

30.0 No compensation for restrictions of work

If at any time after acceptance of the tender SBA shall decide to abandon or reduce the scope of work for any reason whatsoever and hence not require the whole or any part of the work to be carried out, the Consultant shall give notice in writing to 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 SBA 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.

31.0 Suspension of work

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 cause any damage or injury to the work already done or endanger the safety thereof for any of following reasons.

a) On account 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 of the contractor, or
c) For safety of the works or part thereof.

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

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.

32.0 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 SBA.

a) To rescind the contract (of which rescission notice in writing to the contractor by the 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 SBA.
b) To employ labour paid by the SBA and to supply materials to carry out the work, or any part of the work, debiting the contractor with the cost of the labour and materials (the cost of such labour and materials as worked out by the Consultant shall be 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 the certificate of Consultant as to the value of work done shall be final and conclusive against the contractor.
c) To measure up the work of the contractor, and to take such part thereof as shall be 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 (of the amount of which excess the certificates in writing of the Consultant shall be final and conclusive) shall be borne by original contractor and may be deducted from any money due to him by SBA 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 SBA 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 rescinded 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.

33.0 SBA's Right to Terminate the Contract: If the Contractor commits a material breach of the terms and conditions of the Contract and fails to remedy the breach within seven (07) days of receipt of written notice from the SBA, the SBA reserves its right to terminate the contract without prejudice to its other rights and remedies.

A. In the following events the SBA has right to terminate the Contract without giving any notice to the Contractor:

(i) If the Contractor is found to have engaged in fraud, collusion, submission of forged documents, material misrepresentation or suppression of material facts in connection with the tender or performance of the Contract.

(ii) If the Contractor violates any applicable law, statutory requirement, licence condition or lawful direction of a competent authority in a manner that materially affects the performance of the Contract or exposes the SBA to legal or regulatory risk.

(iii) If the contractor being an individual or a firm commit any 'Act of Insolvency' or shall be adjudged an insolvent or being an incorporated company shall have an order for compulsory winding up voluntarily or subject to the supervision of Government and of the Official Assignee of the liquidator.

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 SBA through the Consultant or shall charge or encumber this contract or any payment due to which may become due to the contractor there under.

33.1 Additional grounds of termination:

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 SBA 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 SBA 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 contractor 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 SBA's or Consultant's instructions to the contrary subject any part of the contract. Then and in any of said cases the SBA and or the Consultant, 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 SBA 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 so determined and as if the works subsequently had been executed by or on behalf of the contractor. And, further the SBA through the Consultant, their agents or employees may enter upon and take possession of the work and all plants, tools, 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 complete 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 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 SBA or the 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 receipt thereof by him the SBA sell the same by public auction 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 SBA incidental to the sale of the materials etc.

34.0 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 the payment from SBA from time to time. The SBA shall recover the statutory recoveries and other dues including the retention amount from the certificate of payment.

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

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

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

The SBA 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 payment will be made as per the terms defined in the NIT.

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 SBA 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.

35.0 Settlement of Disputes and Arbitration

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 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 :

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 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 **Asstt. General Manager(Administration),** State Bank Academy**, Gurugram** and endorse a copy of the same to the , 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 **Asstt. General Manager(Administration),** State Bank Academy**, Gurugram** 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 **Asstt. General Manager(Administration),** State Bank Academy**, Gurugram** in writing in the manner and within the time aforesaid. The **Asstt. General Manager(Administration),** State Bank Academy**, Gurugram** shall give his decision in writing on the claims notified by the contractor. In the event the dispute between the parties remains unresolved, the same shall be resolved in accordance with the provisions of the Arbitration and Conciliation Act 1996 (the "Act") amended from time to time.
The Parties agree with respect to such arbitration that:

a. If the Parties fail to appoint a single arbitrator acceptable to both the parties, there shall be three (3) arbitrators. One (1) arbitrator shall be appointed by each Party and the third shall be appointed by the other two (2) arbitrators and shall serve as the presiding arbitrator of the arbitral tribunal. The fees

of arbitration proceedings shall be shared equally between the parties as per the provisions of the Act.

b. Subject to the provisions of the Act, the arbitration award shall be binding on the Parties and enforceable in accordance with its terms. The arbitrators shall bound thereby and to act accordingly.
c. The Arbitration proceedings shall be conducted in English Language and the seat and venue of the Arbitration shall be at Gurugram.

36.0 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 purpose at his own cost. The cost of running and maintenance of the plants are to be included in his tender prices. He shall pay all fees and charges required for the power supply and include the same in his tendered rates and hold the owner free from all such costs. He has to obtain necessary approval from the appropriate authorities, if required.

37.0 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 conditions:

i) That the water used by the Contractor shall be fit for construction purpose to the satisfaction of the Consultant.
ii) The Contractor shall make alternative arrangements for the supply of water if the arrangements made by the Contractor for procurement of water in the opinion of the Consultant is unsatisfactory.

37.1 The Contractor shall construct temporary well/tube well in SBA land for taking water for construction purposes only after obtaining permission in writing from the SBA. 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 the 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 SBA without any compensation as directed by the Consultant.

38.0 Treasure Trove etc.

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

39.0 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 SBA/Consultant shall be final and binding on the contractor.

40.0 Maintenance of Registers

The contractor shall maintain the following registers as per the enclosed format at site of work and should produce the same for inspection of SBA/Consultant whenever desired by them. The contractor shall also maintain the records/registers as required by the local authorities/Government from time to time.

i) Register for secured advance
ii) Register for hindrance to work
iii) Register for running account bill
iv) Register for labour

41.0 PRICE VARIATION ADJUSTMENT (PVA) FOR ALL MATERIALS (INCLUDING CEMENT & STEEL) & LABOUR: Not Applicable

42.0 Force Majeure

Neither contractor not SBA shall be considered in default in performance of their obligations if such performance is prevented or delayed by events such as war, hostilities revolution, riots, civil commotion, strikes, lockout, conflagrations, epidemics, accidents, fire, storms, floods, droughts, earthquakes or ordinances or any act of god or for any other cause beyond the reasonable control of the party affected or prevented 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.

42.1 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.

42.2 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 of completion of the respective obligations under this agreement shall stand extended by a period equal to the period of delay occasioned by such events.

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

43.0 Local Laws, Acts, Regulations

The contractor shall strictly adhere to all prevailing labour laws and other safety regulations. The contractor shall comply with the provision of all labour legislation including the latest requirements of all the Acts, laws, any other regulations that are applicable to the execution of the project.

(i) Code on Wages, 2019.

(ii) Code on Social Security, 2019.

(iii) Occupational Safety, Health and Working Conditions Code, 2020.

(iv) Industrial Relations Code, 2020.

(v) Apprentice Act 1961 (Amended)

(vi) Personal Injuries (Compensation Insurance) Act 1963 and any other modifications

(vii) Employees' Provident Fund and Miscellaneous Provisions Act 1952 and amendment thereof

(viii) Shop and Establishment Act

(ix) Any other Act or enactment relating thereto and rules framed there under from time to time.

44.0 SAFETY :

GENERAL SAFETY

1. First-aid appliances, including adequate supply of sterilized dressings and cotton wool, shall be maintained in a readily accessible place.

2. The injured person shall be taken to a public hospital without loss of time, in cases where the injury necessitates hospitalization.

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

4. No portable single ladder shall be over 8 meters in length, the width between the side rails not 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 labour shall be engaged for holding the ladder.

5. The excavated material 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. All trenches and excavations shall be provided with necessary protection of minimum height of one meter.

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

7. No floor, roof or other part of the structure shall be so over-loaded with debris or materials as to render it unsafe.

8. 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.

9. 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. Hoisting machines and tackles used in the work, including their attachments, anchorage and supports shall be in perfect condition.

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

FIRE SAFETY

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 buckets of water, sand and a fire cloth of suitable size 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 provided 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 D G Set lobby 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.

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 report immediately to the competent authority whenever such report is required to be lodged by the law and take appropriate actions thereof.

46.0 MAINTENANCE OF RECORDS

A.	**Registers at the site office**
1	Measurement Books.
2	Drawings register
3	Materials at site register.
4	Hindrance Register.
5	File and register for extra / variation items.
6	Materials test Register and File. 6
7	Site Order Book (in triplicate).
8	Labour Reports and progress Reports Register.
9	Site Visit & Instructions Register.
10	Certified true copies of the contracts.

Technical specifications

1. Codes and Standards:

- The equipment furnish under this specification shall conform to the latest Indian and BS Amendment up to date standard, except where modified or supplemented by this specification:
- The installation work shall conform to Indian Electricity act and Indian Electricity Rules as amended up to the date of installation.
- The fuel oil installation shall meet all statutory requirements of Govt. of India as amended up to the date of installation. Any approval required from statutory authorities shall be obtained by the Contractor. Nothing in this specification shall be construed to relieve the contractor of these responsibilities.
- Equipment conforming to any other National/ International Standard which ensures equal or better quality may be accepted. In such case the contractor shall furnish copies of the standards in English and shall clearly bring out the salient features of comparison with corresponding listed standards. The same shall be got approved before start of works
- The equipment furnished under this specification have to operate in a tropical climate and shall be given tropical and fungicidal treatment as per relevant specification.
- The design construction, manufacture, inspection, testing and performance shall comply with all the currently applicable statues, safety codes, relevant Bureau of Indian Standards (BIS) British Standards (BS), International Electro Technical Commission (IEC) Publication, CPWD DG set specifications, CPCB IV+ or better norms norms, NEMA, VDE and DEMA Standards.

2. Some of the applicable Standards are listed below:-

a. IS 1601 : Performance and testing of 1C engines for General Purpose.

b. BS-649 : Performance and testing of diesel engines for General Purpose.

c. IS-4722 : Rotating electrical machines.

d. IS-4889 : Method of determination of efficiency of Rotating Electrical machinery.

e. IS-6491 : Degree of protection provided by enclosures for Rotating Electrical machinery.

f. IS-4729 : Measurement and evaluation of vibration of Rotating Electrical machines.

g. AIEE-606(1959) : Recommended specification for speed Governing of internal Combustion engine Generator units

h. IS-2705 : Current transformers.

i. IS-1248 : Electrical indicating instruments.

j. ISO-8528 : Reciprocating IC engine driven AC Gensets

k. IS-10000 : Method of tests for I.C engines

l. CPWD specifications for DG sets amended up to date

m. CPCB/ NGT norms amended up to date

3. Period of Operation/ Duty Cycle:

- The sets are intended to supply power only during an emergency for all services and may be idle for long periods except for periodic routine tests. When there is a total failure of main power supply, the sets shall be required to operate continuously at full load for a period which at times may exceed even 24 hours.
  Engine:

Type:

- The diesel engine shall be of stationary type four stroke (prime duty), electric start, Turbo-charged, radiator cooled Rating:
- Prime power BHP rating of the engine shall be such that the DG set deliver the specified net rated electrical output while supplying power/ driving all electrical and mechanical auxiliaries connected to alternator terminals and engine shaft at site conditions at an ambient temperature of 50 deg C by considering the de-rating etc. (if any). The contractor shall submit, for approval, the de-ration calculations if the engine is not designed for 50 deg C. ambient temperature along with OEM de-ration charts etc to arrive at diesel engine rating at site condition.
- The engine shall be capable for delivering specified Prime Power rating at variable loads for PF of 0.8 lag with 10% overload available in excess of specified output for one hour in every 12 hours. The average load factor of the engine over period of 24 hours shall be 0.85 (85%) for prime power output.

Emission:

- The engine shall comply with the emission norms of CPCB/ NGT for diesel engine generators with upto date amendments and necessary certification/ approvals towards emission limits issued by CPCB authorized agencies shall be submitted to EIC before supply of DG sets.

Frequency Variation:

- The Engine speed shall be so maintained that frequency variation at constant load including NO LOAD condition shall remain within a band of 1% of rated frequency.
  Lubrications:
  - The engine shall have a closed cycle forced & splash lubricating system with positive oil pressure and a crank chamber for collection/ storage of the lubricating oil during circulation. Lubricating oil shall be circulated in the engine by an engine driven pump.
  - It shall be so designed that when the engine starts after long shut down lubrication failure does not occur. Necessary priming pump of suitable capacity for the lubricating oil circuit, if required and as per recommendation of manufacturer shall be installed, to keep bearings primed. This pump shall be normally automatically operative with timer and interlocking on AC(mains)/ DC supply available with the sets.

Fuel System:

The engine shall be capable of satisfactory running on all types of diesel fuel oil normally available locally as per Fuel IS: 1460 HSD with up to date amendments for DG Sets.

A fuel service tank with each D.G. Set shall be provided on a suitably fabricated steel platform. The tank shall be complete with level indicator (as per OEM design and recommendation) marked in liters, filling inlet with removable screen, an outlet, a drain plug, an air vent and necessary piping. The fuel tank shall be painted with oil resistant paint. All pipe joints should be brazed/ welded. Necessary provision shall also be made in the fuel service tank for installation of automatic/ electronic level sensors, connection for inlet, with NRV, outlet and overflow along with ball valves of suitable size as per design for connection of automatic fuel filling system.

Air Intake System:

The diesel engine shall be provided with special dry type air filters having low resistance to air passage, high dust retaining efficiency and provision for easy cleaning. Filters shall be suitable for achieving satisfactory engine operation and ensuring the engine life under tropical humid conditions, with Sulphur dioxide fumes, abrasive dust and coal particles of 5 to 100 microns present in the atmosphere. The minimum efficiency of filters shall be 90% down to 5 micron size.

Cooling:

The diesel engine should be radiator Cooled. The cooling system should include temperature gauge with high temperature alarm/ trip, corrosion resistor etc.

Engine Governor:

The governor shall be Electronic Fuel control type to maintain the speed rate or regulation and shall be class A1 as per latest BS in order to take care of heavy motor starting. It shall have necessary characteristics to maintain the speed substantially constant even with sudden variation in load. However, a tripping shall be provided if speed exceeds maximum permissible limit. The governor shall be suitable for operation without external power supply.

Turbo charger:

- It shall be of a robust construction, suitable of being driven by engine exhaust having a common shaft for the turbine and blower. It shall draw air from filter of adequate capacity to suit the requirements of the engine.

Silent Operation:

- The engine shall be designed to achieve maximum silent operation.
- Efficient residential grade silencer shall be provided as per engine manufacturer's design. Noise level of the DG set shall be as per the latest CPCB Norms

Piping Work:

All pipe lines and fittings and accessories requirement inside the room/ enclosure and outside for exhaust piping shall be provided by the contractor. This shall include necessary flexible pieces in the exhaust, fuel, lubricating oil and water lines as are necessary in view of the vibration isolation requirement in the installation. Piping of adequate size shall be used for lubricating oil of the material as per manufacturer

standard. However, only M.S. pipes for the exhaust shall be used. For fuel lines within the acoustic enclosure, PVC braided pipe as per manufacturer recommendations can be used. However, for fuel lines outside the acoustics enclosure only MS pipe be used.

The pipe work shall be inclusive of all fittings and accessories required such as bends, reducers, elbows, flanges, flexible connections, necessary hardware etc. The installation shall cover clamps, supports, hangers etc. as are necessary for completing the work. However, the work shall be sectionalized with flanged connections as are necessary for easy isolation for purposes for maintenance of unit as approved by SBA.

Starter Battery:

- The battery shall conform to the requirement of latest IS. Starting battery system shall consist of heavy duty high performance batteries to give 24V and capacity as per OEM design subject to minimum 360 AH capacity to enable crank & start the engine even in cold/ winter morning conditions. Type/ voltage/ minimum 360 AH capacity of batteries on 20 hour rated discharge period shall be indicated in the technical submittal.
- Battery capacity shall be suitable for meeting the needs of starting system (as three attempt starting), as well as the requirements of control panel, indications and auxiliaries such as priming pump as applicable etc. without recharging. The battery set shall be capable of performing at-least three normal cranking without recharging.

- The battery shall be provided with good quality MS battery stand painted with acid proof black paint with min 3 mm thick insulation mat below the battery.
- Batteries shall not be with PVC molded sealed container and individual cells shall be available for individual monitoring during its life span. Each cell shall be provided with electrolyte filling cap with level floats for easy monitoring of electrolytic level.

- The battery shall be provided with 2 Nos. Copper cables of minimum 70 Sq.mm size of appropriate length, heavy duty rubber/ PVC insulated with brazed tinned copper/ brass lugs for connection of batteries to cranking system - with suitable length of inter battery connecting cable. The lugs shall be clearly stamped (+) or (-) and positive cable shall be red sleeved & negative cable shall be black sleeved for easy identification.

- The battery Set shall be supplied fully filled and first charged ready to use. The system shall be capable of starting the DG set within 10 sec., even in winter condition with an ambient temperature down to 0°C. Battery set shall be supplied along with spring type hydrometer, thermometer with specific gravity correction scale and cell testing volt meter etc.

- Float rate charging and quick rate charging system shall be provided at the generator panel with appropriate bridge charger system. LC network, rate selector switch and generously rated charging transformer and rectifier bridge, so that the cranking battery system can be kept fully charged at all times from Main DISCOM supply network with quick charging rate limited to 0.8 times rated discharge current with provision in control transformer and rectifier present to enable boost charging the battery at 2 times rated discharge current in case of emergencies. The mode selector switch boost charge position shall be provided.

- Digital DC ammeters to clearly indicate float charging current and quick/ boost charging current shall be provided.

- Battery charging subsystem shall be designed for continuous operation at cubicle ambient of 55 deg C corresponding to 50 deg C ambient outside and should be designed to operate at 1.5 times of rated maximum current corresponding to boost charge current which can reach in practice as high as 2.5 times or 3 times rated discharge current.

Any charger dynamo and dynamo charging current network present on the set shall be made inoperative so that both for AMF and manual application the cranking battery system is kept charged from the charger at the panels at all times during at shut down and running periods of the set.

4. Engine Fitments:

- The engine shall be provided with but not limited to following essential basic fitments:

i) Crankcase breather - Dry type element (Breather outlet shall be fitted with a Filter cap capable of preventing entry of dust).
ii) Air Cleaner - Dry type.
iii) Corrosion resistor - To control acidity and impurities from Coolant.
iv) Filters - Lube oil & fuel oil, paper element type.
v) Coolant Pump - Gear Driven.
vi) Fuel Pumps - Priming &Transfer
vii) Governor - Electronic ClassA1.
viii)Turbo Charger - Exhaust gas driven in case of turbo Charged Engines.
ix) Vibration dampers - One Set

- Exhaust/ Intake manifolds
- Oil Sump (crank case) with dipstick
- Engine Supports
- Residential type silencer in exhaust system
- Self-starter 24V
- Safety controls & instruments
- Flexible coupling with guard
- Lubricating Oil Cooler
- Lubrication oil filters with replaceable elements
- Fuel injection: Engine should have suitable fuel injection system in order to achieve low fuel consumption
- Fuel control solenoid
- Fuel pump with engine speed adjustment
- Engine Control Panel: fitted and having digital display for following:
  i. Start/ stop key switch.
  ii. Lube oil pressure indication
  iii. Water temp. indication
  iv. RPM indication
  v. Engine Hours indications
  vi. Battery charging indication
  vii. Low lub. Oil trip indication

viii. High water temp. indication
ix. Over speed indication

- Acoustic Enclosure as per OEM design and CPCB IV or latest norms.
- All moving parts of the engine shall be mechanically guarded in such a manner that a human finger cannot touch any moving part.
- Daily fuel service tank of minimum capacity as per manufactures recommendation, fabricated from 3 mm M.S. sheet with inlet, outlet connections air vent tap, drain plug and level indicator (gauge) M.S. fuel piping from tank to engine with valves, unions, reducers, flexible hose connection and floor mounting pedestals, twin fuel filters and fuel injectors. The location of the tank shall depend on standard manufacturers design.

5. Any other item not included/ specified but is a standard design of the manufacturer

- DG Set shall be provided with integrated Microprocessor based Power command/ Engine Alternator controller along with each DG Set. The controller shall provide voltage, engine protection, alternator protection, operator interface and isochronous governing. The controller Cummins PCC 3.3 or equivalent shall be suitable for Synchronization of DG Sets. The controller and PLC provided in Main LT Panel shall be compatible and shall ensure Synchronizing of DG Set, Load sharing on DG Sets, Load management, Auto start/ Auto Stop of DG Set, Automatic operation and Changeover of breakers of Grid supply & DG Sets including interlocking and DG Set protection. All hardware & Software required for achieving synchronizing load sharing & Load Management shall be deemed to be included in the quoted rate of DG Set and LT Panel.

(a) <u>Mountings and Foundations:</u>

- The engine and direct coupled alternator shall be rigidly secured to a common rigid base frame fabricated from MS section.
- The DG set shall be placed on the RCC foundation with approved make anti-vibration mountings. A lifting hook with overhead gantry of required capacity shall be provided above the finalized location of the each DG set to facilitate installation and subsequent maintenance of the DG Sets.
- The design of foundation with anti-vibration mountings shall be as recommended by the DG manufacturers and shall be such that vibrations shall not be transmitted to the structure.

(b) <u>Exhaust System:</u>

- Exhaust Piping: All M.S. Pipes for exhaust lines shall be conforming to relevant IS. The exhaust piping duly insulated including flexible connections up to exhaust silencer including exhaust silencer(s) shall be inclusive with DG set item whereas the exhaust piping beyond exhaust silencer(s) shall be measured and paid as per design item. The work include necessary cladding of exhaust pipe work using 50 mm thick Loosely bound resin (LBR) mattress/ mineral wool/ Rockwool of density not less than 120 kg/m3 covered with aluminium cladding (0.6 mm thick) for the complete portion starting from Engine exhaust manifold. The exhaust pipe work includes necessary supports, stacking structure, foundation etc. to avoid any load & stress on turbo charger/ exhaust piping. The necessary exhaust sampling pit with removable cap shall be provided in the exhaust line.

The height of the exhaust pipe shall be as per latest CPCB Norms and shall be calculated as per the formula

H = h+0.2 SQRT KVA

Where H- Height of Exhaust

i. h- Height of the building
ii. KVA- Rating of the DG set

- The exhaust pipe shall be supported on independent stack structure for which, the design and Drawing shall be got vetted from IIT for the wind speed upto 300 KMPH.
- Exhaust system should create minimum back pressure.
  - Number of bends should be kept minimum and smooth bends should be used to minimize backpressure.
  - Pipe sleeve of larger 6dia. should be used while passing the pipe through concrete wall & gap should be filled with felt lining. The cost of pipe sleevs shall be deemed to be included in quoted rates.

- Exhaust piping inside the Acoustic Enclosure/ Gen set room should be lagged with asbestos rope along with aluminum sheet cladding/ insulated as per clause to avoid heat input to the room/ acoustic enclosure.

- Class C/ Heavy grade MS pipes and long bend/ elbows should be used.

- The exhaust outlet should be in the direction of prevailing winds and should not allow exhaust gases to enter air inlet/ windows etc.

- When tail end is horizontal, 45 Degree downward cut should be given at the end of the pipe to avoid rain water entry into exhaust piping.

- When tail end is vertical, there should be rain trap to avoid rain water entry. If rain cap is used, the distance between exhaust pipe and rain cap should be higher than diameter of pipe. Horizontal run of exhaust piping should slope downwards away from engine to the condensate trap. Silencer should be installed with drain plug at bottom.

- Optimum Silencer Location: Location of the silencer shall be in accordance with OEM standards.

- Care should be taken to ensure that no carbon particles emitted due to exhaust leakage enters and deposits on alternator windings and on open connections.

- Support to Exhaust Piping: Exhaust piping should be supported in such manner that load of exhaust piping is not exerted to turbo charger. All the pipe supports excluding the stack structure are deemed to be included in the quoted rates

(c) Alternator:

Scope: This section covers technical requirement of the alternator.

6. Synchronous Alternator

Self/ PMG excited, screen protected self-regulated, brush less alternator, Horizontal foot mounted in Double or single bearing construction suitable for the following:

Rated PF	:	0.8(lag)
Rated voltage	:	415volts
Rated frequency	:	50Hz
Number of Phases	:	3
Enclosure	:	SPDP
Degree of protection	:	IP-23
Ventilation	:	Self ventilated air cooled
Ambient Temperature	:	40° C without de-rating
Insulation Class	:	F / H as per OEM design
Temperature Rise insulation class	:	Within class F/H limits at rated load as per
Voltage Regulation	:	+/-1%
Voltage variation	:	+/-5%
Overload deration/ capacity	:	10% for one hour in every 12 hours of continuous use
Frequency Variation	:	As defined by the Engine governor (+/- 1%)
Excitation	:	Self or separately excited (upto 750 KVA self Excited, beyond 750 KVA separately excited with PMG)
Type of AVR	:	Electronic
Type of Bearing and	:	Anti-friction bearings with Grease Lubrication Arrangements

Standard : IS 4722 & IEC:34 as amended up to date.

7. Alternator should be able to deliver output rating at actual site conditions.

The alternator shall be fitted with suitable Number Resistance Temperature Detector (RTD) & Bearing Temperature Detector (BTD) along with space heaters. The terminal of space heaters will be wired to terminal box and the temperature scanner shall be provided in control panel for scaling the winding and bearing temperature.

Excitation

The alternator shall be brushless type and shall be self/ separately excited, self-regulated having static excitation facility. The exciter unit be mounted on the alternator assembly. The rectifier shall be suitable for operation at high ambient temperature at site.

Automatic Voltage Regulators (AVR)

In order to maintain output terminal voltage constant within the regulation limits i.e.+/- 1%, Automatic voltage regulator unit shall be provided as per standard practice of manufacturer.

Fault tripping

- In the event of any fault e.g. over voltage/ high bearing temperature/ high winding temperature or an external fault, the AVR shall remove the excitation voltage to the alternator. An emergency trip shall also be provided.

Standards

- The alternator shall be in accordance with the following standards as are applicable. IS 4722/ BS 2613: 1970. The performance of rotating electrical machine.IS 4889/ BS 269 rules for method of declaring efficiency of electrical machine.

Performance

- Voltage dip shall not exceed 20% of the rated voltage for any step load or transient load as per ISO 8528 (Part-1). The winding shall not develop hot spots exceeding safe limits due to imbalance of 20% between any two phases from no load to full load.
- The generator shall preferably be capable of withstanding a current equal to 1.5 times the rated current for a period of not more than 15 seconds as required vide clause 14.1.1 of IS 4722:1992.

8. THE PERFORMANCE CHARACTERISTICS OF THE ALTERNATOR SHALL BE AS BELOW:

Efficiency at full load 0.8 P.F.	Not less than 93.5%
Total distortion factor	Less than 3%
(i) 10% overload	One hour in every 12 hrs of continuous use.
(ii) 50% overload	15 seconds.

Terminal Boxes

Terminal boxes shall be suitable for Bus Trunking. The terminal box shall be suitable to withstand the mechanical and thermal stresses developed due to any short circuit at the terminals.

- **Earth Terminals**

02 Numbers earth terminals on opposite side with vibration proof of connections, non-ferrous hardware etc. with galvanized plate and passivated washer of minimum size 12 mm dia. holes shall be provided.

- **Space Heaters**

i) Alternators shall be provided with suitable space heaters to maintain the winding temperature automatically such that it does not absorb moisture during long idle periods. The heater terminals shall be brought to a separate terminal box suitable for 230V AC supply and a permanent caution notice shall be displayed.

ii) The necessary cabling and switchgear required for the space heater from main LT panel shall be included in the quoted cost of DG set.

- **<u>Engine Safeguards:</u>**

Safeguards shall be provided and arranged when necessary to stop the engine automatically by the following:

- ✓ Energizing a solenoid coupled to the stop lever on the fuel injection pump rack.
- ✓ De-energizing the "fuel on "solenoid
- ✓ Energizing the "fuel - cut off "solenoid

i) The operation of the safeguard shall at the same time give individual warning of the failure by illuminating an appropriate local visual indicator and remote alarm at generator panel.
ii) The contactors, relays and other devices necessary for signal and control, for above purposes shall be provided at Generator panel.
iii) At the DG set enclosure at easily accessible place an "EMERGENCY STOP" mushroom head stay put type Push Button shall be provided to stop the DG set in emergency mode.
iv) The safeguard to "STOP THE SET" shall stop the set irrespective of mode selection of the set viz. Auto, Manual or test for following cases, with simultaneous isolation of alternator circuit.

- ✓ Emergency stop P.B's operation
- ✓ Over speed.
- ✓ Low lube oil pressure
- ✓ Earth fault
- ✓ Over current
- ✓ High temperature

9. INSPECTION OF TESTING:

a. Factory Inspection

i. The DG set shall be subjected to a Factory Acceptance Test at factory/ manufacturer premises in presence of representative of the SBA and a Site Acceptance Test at site after the installation. Necessary HSD fuel/ POL/ staff for the Factory Acceptance Test shall be arranged by the contractor at his own cost.

ii. For testing, following procedure will be followed: All major items/ equipment i.e. engine & alternator in assembled condition, associated electrical control panels etc. shall be offered for inspection and testing at factory/ manufacturers works. The successful tenderer shall give a notice of minimum two weeks for carrying out such tests. The SBA or his authorized representative shall witness such inspection & testing at mutually agreed date. The cost of the representative's visit to the factory will be borne by the SBA. However, if a second visit to the factory becomes necessary due to the failure to offer any item for inspection during the first factory inspection the cost of such inspection shall be borne by the contractor.

iii. SBA also reserves the right to inspect the fabrication job at factory, and the successful tenderer has to make arrangements for the same.

b. Factory Acceptance Test

- DG set will be tested on load of unity power factor for the rated KW rating. During testing, each of the D.G. sets covered under scope of work, shall be operated for a period of 12 hours on the rated KW at DG set's KW rating including one hour on 10% overload after continuous run of the 12 Hours. During testing all controls/ operations safeties will be checked and proper record will be maintained. Any defect/ abnormality noticed during testing shall be rectified. The testing will be declared successful only when no abnormality/ failure is noticed during the testing. The DG set will be cleared for dispatch to site only when the testing is declared successful by SBA authorized representative. The copy of the manufacture Type Test report for the Engine and the Alternator shall be submitted during the Testing at manufacture work.

c. <u>Site Acceptance Test</u>

- DG set will be tested on available load in fully assembled acoustic enclosure after installation at site. During testing, each of the D.G. sets covered under scope of work, shall be operated for a period of 6 hours on the available load at DG set's KW rating. During testing all controls/ operations safeties will be checked and proper record will be maintained. Any defect/ abnormality noticed during testing shall be rectified. Necessary fuel/ POL/ Staff/ Load for the site acceptance test shall be arranged by the contractor at his own cost, however the cost of fuel shall be reimbursed on production of documents/ invoices.

d. <u>Trial Run/ Running-in-Period</u>

- After successful testing of the DG Set and installation at site, a trial run will be carried out for 120 Hours or 15 Days whichever is earlier. The DG Set will be

operated and a log of all relevant parameters will be maintained during this period. The arrangement of staff for trial run/ running in period will be made by the successful tenderer. However, diesel shall be provided by SBA. The contractor will be free to carry out necessary adjustments. The DG Set will be said to have successfully completed the trial run, if no break-down or abnormal/ unsatisfactory operation of any component of the entire installation included in the scope of work of the contract, occurs during this period. After this the DG Set will be made available for beneficial use. After the DG Set has operated without any major break-down/ trouble, it shall be taken over by the department/ SBA subject to guarantee clause of the contract. This date of taking over of the DG Set, after trouble free operation during the trial run/ running-in period, shall be the date of acceptance/ taking over.

Note: During site Acceptance Test and trail runs/running in period test proper coordination with local service agency of the engine manufacturer shall be done and their presence during the test shall be ensured by the contractor.

e. <u>Safety measures</u>

All equipment shall incorporate suitable safety provisions to ensure safety of the operating personnel as per manufacturers' standard practice.

f. Statutory Clearance(s)

Approval/ clearance of the complete installation shall be obtained by the contractor from CPCB/ State Pollution Control Boards/ Local Bodies/ Central Electricity Authority (CEA)/ other licensing authorities where required. However, application shall be made by Department and any statutory fee, as applicable, shall be paid by SBA directly to the govt. authorities concerned.

10. SPECIFICATIONS FOR ACOUSTIC ENCLOSURE:

a. The acoustic enclosure shall be designed and manufactured confirming to relevant standards suitable for outdoor installation exposed to weather conditions, and to limit over all noise level to 75 dB (A) at a distance of 1mtr. from the enclosure as per CPCB IV norms under free field conditions.
b. The construction should be such that it prevents entry of rainwater splashing into the enclosure and allows free & quick flow of rainwater to the ground in the event of heavy rain. The detailed construction shall conform to the details as under:
c. The enclosure shall be fabricated out of CRCA sheet of thickness not less than1.6 mm on the outside cover with inside cover having not less than 0.6 mm thick perforated powder coated CRCA sheet.
d. The hinged doors shall be made from not less than 16 SWG (1.6 mm) thick CRCA sheet and will be made airtight with neoprene rubber gasket and heavy-duty locks.
e. All sheet metal parts should be processed through 7-tank process.
f. The enclosure should be powder coated.
g. The batteries should be accommodated in the enclosure in battery rack.
h. The canopy should be provided with high enclosure temperature safety device.

i. The acoustic lining should be made up of high-quality insulation material i.e. rock wool/ glass/ mineral wool/ PU foam of appropriate thickness & density for sound absorption as per standard design of manufacturers to reduce the sound level as per CPCB norms. The insulation material shall be covered with fine glass fiber cloth and shall be supported by perforated M. S. Sheet duly powder coated/ GI sheet/ aluminum sheet.

j. Temperature rise inside the enclosure should not be more than 5 degree C for maximum ambient above 40 degree C and it should be below 10 degree C for ambient below 40degree C.

k. The enclosure should be designed to meet the total air requirement for the D.G. Set at full load at site conditions as recommended by the engine manufacturer.

l. The enclosure shall be provided with suitable size & number of hinged type doors along the length of the enclosure one each side for easy access inside the acoustic enclosure for inspection, operation and maintenance purpose. Sufficient space will be provided inside the enclosure on all sides of the DG set for inspection, easy maintenance & repairs.

m. The canopy should be as compact as possible with good aesthetic look.

n. The complete enclosure shall be of modular construction.

o. The forced ventilation shall be as per manufacturer's design using either engine radiator fan or additional blower fan(s). If the acoustic enclosure is to be provided with forced ventilation, then suitable size of axial flow fan (with motor and auto-start arrangement) and suitable size axial flow exhaust fan to take the hot air from the enclosure complete with necessary motors and auto start arrangement should be provided. The forced ventilation arrangement should be provided with auto stop arrangement to stop after 5 minutes of the stopping of DG sets.

p. Acoustic enclosures are supplied with built in Anti Vibration Mountings (AVMs). As such Genset can be installed directly on the leveled surface.

q. The acoustic enclosure should be suitable for connection through bus-trunking. Such arrangements on acoustic enclosure should be waterproof & dust-proof conforming to IP-65 protection.

r. Exhaust piping outlet should not be turned towards window/ ventilator of home or occupied building. Provision of rain cap should be ensured.

s. The acoustic enclosure placement should be such that there is no restriction in front of air inlet and outlet from canopy.

t. Genset/ Engine control panel should be visible from outside the enclosure.

u. Routine/ periodical check on engine/ alternator (filter replacement and tappet setting etc.) should be possible without dismantling acoustic enclosure.

v. For major repairs/ overhaul, it may be required to dismantle the acoustic enclosure.

w. Sufficient space should be available around the Genset for inspection and service.

x. The inside of enclosure should be provided with at least Four number LED tube light luminaries controlled by a switch for adequate lighting during servicing etc. of the DG Set. The power supply to these luminaries should be from the load side of the AMF Panel so that it can remain energized under all conditions, necessary cabling, switchgear etc shall be included in quoted rates of DG set.

11. DG SYNCHRONISING PANEL

SCOPE

This section covers synchronization of DG sets as required and comprises of running of DG set in parallel i.e. their synchronization on common bus bar, auto load sharing and auto load management.

GENERAL DESCRIPTION

DG Sets: 2 Nos. (750 kVA and 500kVA) as per design capacity.

PLC system shall be designed to provide following salient features for the DG sets.

- Mains supply Failure sensing system.
- Electrical parameter monitoring i.e., V, I, P, F, Kw, KVAR, KVA, Max, Demand, Frequency, Load Status etc.
- Auto synchronization (Dead bus/ Live Bus Synchronization for transfer the full power within 15 seconds)
- Auto Load sharing
- Load Management System.
- Protection
- Manual Operation

Note: Synchronizing Panel Shall Be A Separate Panel As Per Design.

Mains Supply Sensing System

The system shall come in operation after sensing of Main Supply Failure. The initiation of DG operation shall be done in AUTO/ MANUAL mode from Man-Machine-Interface to automatically control the start & stop of engines, depending on the predefined load & DG selection in the PLC. When Mains Supply is not available than all DGs shall start, build up voltage, synchronize in such a way that power supply is available within 15 second at main LT Panel.

Auto Synchronization

The system of synchronization shall be available in Auto mode. The PLC system shall monitor & control DG parameters like voltage, frequency & phase angle difference for synchronization and when the parameters of main bus & DG come in defined range, PLC system shall connect the output of DG to main bus. In normal circumstances the auto synchronization shall work, however due to any reason auto synchronization fails, within specified time, the PLC shall generate an audio-visual alarm.

Auto Load Sharing And Load Management

Sensing both active & reactive power shall perform auto load sharing. The percentage loading of a particular DG shall be fed by MMI. This feature is important when synchronization shall be done between all DG's of different/ same ratings.

Load Management System

I. The system should come in operation after sensing of grid failure and automatically
II. control the start and stop of engines depending upon the predefined load setting in the PLC.
III. Operation of DG sets shall be monitored and controlled by PLC/ Synchronization Panel. In case of mains failure, the logic panel shall control auto change over from mains to DG sets supply and interlock of ACBs, auto synchronization and auto load management functions along with annunciation for alternator control and protection.

IV. The logic panel shall be provided with a total manual override facility. There shall be smooth transfer of DG set operation from PLC to manual system & vice versa without any interruption/ tripping. The logic panel shall be complete with all Auxiliary Relays, Timers, Contactors, Programmable logic controller, control wiring, interconnections etc. with 2.5 sq.mm. PVC insulated, 1.1 KV grade copper conductor wires.

V. The DG sets shall be auto synchronized through dead bus/ live bus synchronization in order to supply the full power within 15 seconds at main LT panel. In case engine does not start in the first cranking, two more auto commands must appear on MMI.

VI. In the event the engines are under loaded then command must be given to stop required number of excess DG sets after running idle for short duration. Provision to select no. of DG sets to be started and synchronized at no load to cope up with sudden load without tripping the DG's should also be inbuilt into the system.

VII. The PLC used in operation of synchronization either through dead bus/ live bus shall have the facility of modification if required for transfer of full power within 15 seconds as per site requirement.

Protection

- **Engine**
    a. Over speed fault
    b. Low lube oil pressure
    c. Water temperature High
    d. Emergency Stop
- **Electrical**

    a. Under voltage
    b. Over Voltage
    c. Under frequency
    d. Over frequency
    e. Over Current
    f. Reverse Power
    g. Reverse KVAR
    h. Synchronization Check
    i. Earth Fault by External relay

System Features

- The system shall be designed run in AUTO as well as in MANUAL mode. In auto mode the system shall run automatically with predefined sequence and in manual mode all the operation shall be done as per the sequence defined by operator.
- System shall be capable to operate in manual mode in the case of failure of synchronization panel.
- PLC logic which will be used in operation of synchronization shall have the capacity of modification for operation as per site requirement.
- It shall be possible to predefine sequence from PLC and sequence shall be changed by Programmable PLC.

- DG's shall be started & stopped automatically as per the load requirement on the main bus.
- Selection of DG's for DG start stop automatically on sudden load requirement.
- Automatic synchronization of DG sets in Auto mode
- Active & reactive Load sharing of each DG set
- Automatic starting of All DG's.
- Monitoring of electrical parameter of each DG, voltage, frequency, reactive load, active load, and energy produced, voltage error (%), frequency error and phase angle error etc.

- Status & control of outgoing breakers
- Back up protection electrical/ mechanical by time delayed tripping of DG sets.
- Protection for Reverse power; reverse KVAR, under voltage, over voltage, under frequency, over frequency, over current, low lube of oil pressure, high cooling water pump, over speed etc.
- "B" checks alarm after each DG complete recommended time/ Running hours for proper maintenance.
- Tripping of non-critical loads in the plant in case of under frequency of bus both in isolation as well as synchronized mode.
- Control of all auxiliary drive of DG sets shall start stop automatically with proper interlocks as per safety considerations.
- PLC system shall have provision to test the DG in Test mode without closing the breaker to do the routine electrical / mechanical testing of DG sets without interruption of power generation.

DG Auxiliary

PLC shall also monitor & control DG auxiliary start/ stop activity and PLC shall issue a visual/ audio alarm in case of abnormality for operation attention.

Visual Indicators on the Panel

Window type annunciation shall be provided to give the following visual indications for each DG Set:-

- Main supply ON
- Load on Mains
- DG set ON
- Load on DG set
- DG set Tripped
- Alternator Earth fault Trip
- Alternator Under voltage trip
- Alternator Over voltage trip
- Alternator Over current trip
- DG set over speed
- Low Engine lube oil pressure trip
- Engine lube oil temperature high trip
- Coolant water temperature high trip
- Failure to start the Engine after pre-set time
- Master trip relay operated

- DC supply failure

Other Technical Requirements

a. The general arrangement shall be got approved before manufacturing.
b. Each compartment shall have a hinged door.
c. All doors shall have neoprene gaskets. Adequate protection shall be provided so that ingress of dust and moisture encountered in indoor installation shall not in any amount be sufficient to interfere with the satisfactory operation of enclosed equipment.
d. All switches, indicating instruments etc., shall be flush mounted.
e. All the switchgear and components shall be brand new, genuine and free from manufacturing, transit defects.
f. All the items and their quantity shall be as per design and technical specification.
g. Extension of auxiliary power supply and control accessories if any required is included in the scope of work.

Contactors, Relays, Auxiliary Relays, Timers

The suitable range and required numbers of control contactors, relays, Auxiliary relays and timers, three impulse units etc. shall be provided in the AMF panel so as to achieve the AMF panel function as described in circuitry logic, tripping and indication functions mentioned above and safe operation of DG set as per the requirement.

Metering

All indicating meters should be as per design and technical specification shall be provided in the Panel.

- Manual operation of the DG Sets
  The AMF panel, though catering to the auto-start and other functions described above, shall facilitate, whenever necessary, manual start, stop switch on ACB's for loading of DG Auto and test run of the DG sets.

Tripping circuit

The DG set and associated switchgear shall be tripped under the following conditions.

i. Incomplete start after a pre-set time/ attempts
ii. Engine over speed
iii. Engine coolant water high temperature
iv. Engine low lubricating oil pressure
v. Engine lubricating oil temperature high

vi. Alternator voltage low/ high or single phasing etc.
vii. Over current/ short circuit trip to protect Alternator.
viii. Failure of DC control supply

In addition to the above, the contractor shall include any other additional features which shall be required for effective function or to enhance the safety of DG set.

Sequence of Operation

The following sequence of operation shall be achieved through PLC based logic panel in addition to hardware interlocks as well as software interlocks:

I. Selection of any generator as a lead generator to achieve the uniform running hours of all generators.
II. Three attempts to start the engine of lead generator. In case the engine fails to start or does not achieve the requisite speed within the predetermined time, PLC system declares engine of generator faulty. In this event PLC automatically selects next generator as the lead generator.
III. The PLC system automatically selects starting sequence of other generators on the basis of the lead generator being selected by the operator.
IV. Before issuing close command to lead generator air circuit breaker, PLC checks that ACB of any other generator is not in close position. Then PLC system gives close command to lead generator ACB. The PLC system tries two times with interval of 5 secs. to close the ACB. Simultaneously, it also gives starting command to next generator engine in queue depending upon load.
V. The speed, excitation, frequency and voltage of incoming generator is controlled identically as per the lead generator starting sequence described above, except closing of ACB.
VI. When the lead generator KW crosses more than the 85% of rated capacity of DG set, the PLC system performs synchronization sequence for paralleling of generator prior to switching on of the ACB of 2nd generator. When the KW of 2nd generator crosses 80% of rated capacity of DG set then the PLC system performs synchronization sequence for paralleling of next generator prior to switching on the ACB of 3rd generator and similar sequence to be followed for other DG sets.
VII. The last incoming generator ACB is tripped when PLC system senses that the total load on the system is less than the specified load and stops the engine after 3 minutes of idle running.
VIII. DG sets will start and stop automatically depending on the pre-defined load setting in the PLC & also all DG sets will operate in load sharing mode.
IX. The system shall have the facility of re-programming or modification in the above sequence at site, if required.

List Of Approved Makes Of Materials

S. No.	Description		Makes
1.	DG sets		Kirloskar/Cummins/Greaves/Mahindra/Ashok Leyland/Eicher/Tata
2.	Alternator		Stamford/Kirloskar/Kirloskar Electric/Crompton Greaves
3.	Air Circuit Breaker (ACB)		1. Lauritz & Knudsen 2. ABB 3. Siemens 4. Legrand 5. Schneider
4.	Moulded Case Circuit Breaker (MCCB)		1. Lauritz & Knudsen 2. ABB 3. Siemens 4. Legrand 5. Schneider
5.	MCB's/ Isolator's/ Distribution Board's		1. Lauritz & Knudsen 2. ABB 3. Siemens 4. Legrand 5. Schneider
6.	Power/ Aux. Contactor		1. Lauritz & Knudsen 2. ABB 3. Siemens 4. Legrand
7.	Current Transformer (Epoxy Cast Resin)		1. Automatic 2. Pragati 3. Precise 4. Procom

			5. Trinity
8.	Indicating Lamps LED type and Push Button		1. Lauritz & Knuen 2. Vaishno Electricals 3. Siemens
9.	Electronic Digital Meters (A/ V/ PF/ Hz/ KW/ KWH) with LED Display		1. Ducatti 2. Elmeasure 3. Procom 4. Trinity
10.	Meter		1. Conzerv 2. Meco 3. Nippon 4. RISHAB 5. Elmeasure 6. Trinity
11.	Selector Switch, Toggle switch		1. Salzer (Larsen & Toubro) 2. Kaycee
12.	Copper Conductor PVC Insulated Wires / Telephone Wires and Co-axial Wires		1. RR Kabel 2. Rallison 3. KEI 4. Paramount
13.	Cable Trays (Factory Fabricated) / Raceways		1. Slotco 2. Legrand 3. MEM (Maheshwari Electricals) 4. OBO Betterman 5. AKG
14.	M.S. / PVC/GI Conduit (ISI marked) and accessories		1. AKG

			2. RMCON
15.	L.T. Panels		1. KEPL 2. Amptech 3. Spectrum Automation 4. Asiatic Electrical 5. Powertech 6. Schneider
16.	Air Insulated Rising Mains/ Bus Ducts		1. KEPL 2. Amptech 3. Spectrum Automation 4. Asiatic Electrical 5. Powertech
17.	Lugs		1. Dowell's 2. Comet
18.	Bus Ducts / Rising mains/ Compact Sandwich type		1. Legrand 2. IDUCT 3. Lauritz & Knudsen 4. Tacobar 5. DLC
19.	Cable Glands		1. Comet 2. Cosmos 3. Dowell
20.	XLPE Aluminium Conductor Armoured cables upto 1100Suppression V Grade		1.Rallison 2. RR Kabel 3. Havells 4. Paramount 5. Svarn

21.	Lightening Protection		1. Tercel 2. LPI 3. Indelec
22.	Communication Cable / Signal Cable		1. Lapp Cable 2. Fusion Polymer 3. Beldon 4. Svarn
23.	Earthing		1. Messon Electrical 2. Elancrete
24.	Fire Survival Cable		1.Rallison 2. Havells 3. Ravin 4. Avatron 5. Agilion 6. No Burn
25.	Controller		1. Delta 2. Barco 3. Avatron

NOTES: The Contractor shall get the samples of all the items covered/ not covered in this list, approved from the Consultant / owner before commencing the supply.

1. General: These specifications are intended to cover the complete installation of the D G Set with all materials in accordance with the drawings and specifications and with all other requirements unchanged.

1.1 Applicable codes

Compliance with Regulatory Agencies: Comply with most stringent applicable provisions of following Codes, laws, and/or Authorities, including most recent amendments in effect.

Codes for D G Sets IS-14655 Parts 1, 2, 3, 4 and 5 including all relevant parts, codes of practice and national variations as appropriate.

IS-14671 (1999) Edition or statutory modification thereof amended up to date.

IS-2147 (1962) Edition or statutory modification thereof amended up to date.

IS-2332 (1972) Edition or statutory modification thereof amended up to date.

IS-15330 (2003) Edition or statutory modification thereof amended up to date.

Comply to the requirements of all other Codes, Ordinances and Laws applicable within the governing jurisdiction and latest Indian Standards, as applicable. The Electrical wiring shall strictly comply to IS: 732 and the entire installation shall be in accordance with the Indian Electricity Act 2001 and Indian Electricity Rules 1956 or latest amendments thereof. The Contractor shall arrange to obtain the sanction of the D G Set authorities for commissioning of the D G Set and hand-over for operation.

SALIENT FEATURES OF DG SET

1. **DG Set Capacity:** 1 No. 750 kVA + 1 No. 500 kVA DG Set.
2. **System Voltage:** 415 V, 3-Phase, 4-Wire, 50 Hz.
3. **Power Factor:** 0.8 Lagging.
4. **Engine:** 4-Stroke, Turbocharged, Water-Cooled Diesel Engine.
5. **Speed:** 1500 RPM.
6. **Alternator:** Brushless, Synchronous Alternator with electronic AVR.
7. **Emission Compliance:** CPCB IV+ / latest applicable statutory requirements.
8. **Acoustic Enclosure:** Weatherproof, sound-attenuated enclosure suitable for outdoor installation.
9. **Starting System:** Electric starting system with suitable DC battery and automatic battery charger.
10. **Control System:** Microprocessor-based DG controller with necessary metering, monitoring and protection.
11. **AMF System:** Automatic Mains Failure panel for automatic starting/stopping and changeover operation.
12. **Synchronisation:** Automatic synchronisation and load-sharing arrangement for the DG sets.
13. **BMS Communication:** RS-485 / MODBUS communication with provision for BMS integration.
14. **Protection:** Overload, short circuit, earth fault, over/under voltage, over/under frequency and other standard DG protections.

15. **Fuel System:** Suitable diesel fuel system with service/day tank and all necessary accessories.
16. **Cooling System:** Closed-loop radiator-based water cooling system.
17. **Exhaust System:** MS exhaust piping with SS flexible bellows, supports and thermal insulation with aluminium cladding.
18. **Earthing:** Complete DG earthing arrangement including equipment and neutral earthing as specified.
19. **Bus Trunking:** 1250 A and 800 A sandwich-type bus trunking as specified in the BOQ.
20. **Lightning Protection:** Lightning arrester with GI strip connection to earth pit.
21. **Safety:** Suitable fire extinguishers, warning/safety signage and necessary safety accessories.
22. **Dismantling:** Dismantling and removal of existing **3 Nos. 320 kVA DG Sets** and existing AMF/ATS panels as specified.
23. **Testing & Commissioning:** Complete inspection, testing, commissioning and performance demonstration of the DG system.
24. **Warranty:** Minimum **2 years** comprehensive warranty from the date of commissioning.
25. **Comprehensive AMC: 5 years** comprehensive AMC after completion of the warranty period.
26. **OEM Authorisation:** Bidder shall submit valid OEM authorisation and technical credentials.
27. **Complete Package:** The contractor shall be responsible for complete design, engineering, supply, installation, testing and commissioning of the DG system with all associated works and accessories required for a complete and operational installation.

7. **TESTING: -**

The DG Set shall be tested individually by the vendor at their site. In case vendor do not have the in-house testing facilities / expertise, then the same shall be carried out by any authorized agency at vendor's site or at the supply point. In either case satisfactory test report shall be submitted along with the bill. The quoted price of the DG Sets shall be inclusive of testing charges. No payments shall be released unless the satisfactorily test certificates are produced. All the tests given in the specifications shall be carried out and brought out in the test certificates.

8. The bank reserves its right to witness all of the testing arranged at vendors work place or at site after installation at the cost of the DG Sets vendor who will be required to arrange for all requisite variacs, meters, load or any other equipment's required for onsite testing etc. and test shall be carried out by vendor or other institutions mentioned above in the presence of the Electrical Engineer or as directed by the Bank and test certificates obtained as aforesaid.

9. **LOCAL REGULATIONS, BYE-LAWS, IER, ETC.:**

The approval / clearance for installation of DG Set from Central Pollution Control Board/ State Pollution Control Board / Local Bodies/ State Electricity Board/ other Licensing Authorities as required will be obtained by the supplier/ contractor. The diesel generator installation is generally governed by the following regulations:

a) Indian Electricity Rules 1910

b) Local Regulations

c) Pollution control rules (State /Union Govt. Rules)

d) Electricity board (State / Union Govt. Rules)

The supplier shall be responsible for preparation of all applications, submission of applications, follow-up, inspection and obtaining & delivering to the State Bank of India, NOC from various authorities concerned. The payment of demand notices of the various statutory bodies shall be made by the State Bank of India. The original payment receipt shall be logged with State Bank of India. State Bank of India, will only affix signatures and furnish fees to be paid for local authorities' inspection, etc. It must be clearly understood that the installation will not be taken over by State Bank of India even after commissioning unless all clearance/ approval from concerned authorities are furnished.

10. **SHOP DRAWINGS:**

The supplier shall prepare and submit to the Bank's Engineer for his approval, detailed shop drawings depicting the general arrangement of DG Sets, its accessories, fuel tank, fuel oil piping, pumps, control panel, exhaust piping, chimney / Scrubber unit, Acoustic container, etc. Within 7 days of award of work. The supplier shall also furnish the detailed foundations drawing for DG Sets.

11. **COMPLETION DRAWINGS:**

- On successful completion of the installation and before issuance of certificate of virtual completion, the supplier shall prepare and submit to the Bank "As built" completion drawings of the entire installation. The completion drawings shall include: - a) Layout of DG Set & accessories. b) Exhaust piping arrangement / De-carbonization unit. c) Fuel oil tank & piping. d) Electrical schematic, control schematic, cable layout, panel GA drawings, etc. e) Acoustic container.
- One set of pamphlets and operations and instructions manual shall be submitted to the branch and our office. Duly laminated instruction for smooth running of the DG Set in the form of DO's and DONT's shall be attached to the front of the Control Panel, else a suitable amount shall be deducted from the vendor's bill as per the decision of the bank.

ANNEXURE-4.9 Bank Guarantee In Lieu Of Security Deposit

Place: ……

Date:……..……..**.**

(On non-judicial stamp paper of Rs. -------/-)

BANK GUARANTEE IN LIEU OF SECURITY DEPOSIT

B.G.No._____ Value Rs._____

State Bank of India,

(Address)

Sub: Bank Guarantee of Rs……towards Security Deposit for the work offer State Bank of India.

(Name of Branch/Office)

Dear Sir,

WHEREAS (Name and address of contractor/ vendor) (hereinafter called the Contractor) have entered into contract for (Name of Work) with State Bank of India a body Corporate constituted under State Bank of India Act 1955, having its Corporate Centre at State Bank Bhavan, Madame Cama Road, Mumbai 400 021 and having its State Bank Academy, Gurugram, at Plot No.77, Sector 18, Gurugram – 122015, Haryana, acting through (hereinafter referred to as "SBA") which includes its successors and assigns, as mentioned in the letter of SBA's Consultants (Name & address of consultants) vide their letter No……. dated ……and the correspondence and tender relating thereto which is hereinafter referred to as "the said contract" the Contractor has now agreed to produce a Bank Guarantee amounting to 5% of the contract value less earnest money deposit of Rs……. (Rupees only), to State Bank of India for performing their part of the contract obligations.

AND WHEREAS in terms of said contract, the contractor is required to furnish to State Bank of India a Guarantee of a Scheduled Bank for a value of Rs……. to be valid upto (date).

AND WHEREAS (Name of Bank and its branch) having their office at (address) the Guarantor, at the request of the contractor hereby furnishes a PBG in favour of State Bank of India and Guarantees in the manner hereinafter appearing.

In consideration of the premise, we (name of Bank and its branch) having our office at

(address)here after called the "Guarantor" (which expression shall include its successors and assigns) here by expressly, irrevocably &unreservedly undertake and guarantee under that if the Contractor fails to execute the work according to his obligations under the said contract, then not withstanding any dispute between State Bank of India and the contractor the Guarantor shall, on demand without demur and without reference to the contractor pay to State Bank of India immediately any sum claimed by State Bank of India under the said contract up to a maximum amount of Rs._____ (Rupees only).
In case the amount demanded by State Bank of India is not paid within 48 hours of receipt of demand, the Guarantor agrees to pay the aforesaid amount of Rs. _____/- (Rupees _____only).

(i) Such payment shall be notwithstanding any right the contractor may have directly against State Bank of India, or any disputes raised by the Contractor with State Bank of India or any suits or proceedings pending in any competent court or before any arbitrator. State Bank of India's written demand shall be conclusive evidence to the Guarantor that such payment is payable under the terms of the Contract and shall be binding in all respect on the guarantor.
(ii) The Guarantor shall not be discharged or released from the undertaking and Guarantee, by any arrangement, variations made between SBA and the Contractor and or indulgence shown to the contractor by SBA, with or without the consent and knowledge of the guarantor or by alterations in the obligations of the contractor by any forbearance, whether as to payment, time performance or otherwise.
(iii) This guarantee shall remain valid until or as may be caused to be extended by the contractor or until discharged by SBA in writing whichever is earlier.
(iv) This guarantee shall be a continuing guarantee and shall not be revocable during its currency except with the previous written consent of SBA.
(v) This guarantee shall not be affected by any change in the constitution of the contractor, by absorption with any other body or corporation or dissolution or otherwise and this guarantee will be available to or enforceable against such body or corporation.
(vi) In order to give effect to this guarantee SBA will be entitled to act as if the Guarantor were the Principal debtor and the Guarantor hereby waives all and any of its rights or surety ship.
(vii) This guarantee shall continue to be in force notwithstanding the discharge of the contractor by operation of law and shall cease only on payment of the full amount by the Guarantor to SBA of the amount hereby secured.
(viii) This guarantee shall be in addition to and not in substitution for any other guarantee or security for the contractor given or to be given to SBA in respect of the said contract.

(ix) Any notice by way of request and demand or otherwise here under may be sent by post or any other mode or communication to the guarantor addressed as aforesaid and if sent by post it shall be deemed to have been given at the time when it would be delivered in due course of post and in providing such notice when given by post it shall be sufficient to prove that the envelope containing the notice was posted and a certificate signed by an officer of SBA that the envelope was so posted shall be conclusive.

(x) These presents shall be governed by and constructed in accordance with Indian Law.

Notwithstanding anything contained hereinbefore the liability of the guarantor under this guarantee is restricted to a sum of Rs._____.

This guarantee will remain valid upto _____unless a demand or claim under this guarantee is made in writing on or before _____ the guarantor shall be discharged from all liability under the guarantee thereafter.

Dated the ……..…….…….. For (Name of Bank)

(Signature/s with designation/s of signatory/ies)

(Name and Stamp of Bank)

ANNEXURE-4.13: Form Vi-B: Format Of Notice Of Commencement/Completion Of Contract Work

1. Name and Principal Employer & address.

2. No. and Date of certificate of registration

3. I / We hereby intimate that the contract work _____ (Name of work) given to _____ (Name and address of the contractor) having Licence No._____ dated _____ has commenced/has been completed with effect from _____(date)/ on_____(date).

Signature of the Principal Employer

The Inspector,

_____

_____

_____

ANNEXURE-4.17: Format Of Measurement Book 1st Page:

STATE BANK OF INDIA

…….office,

Measurement Book No.

(Pages 1 to……)

This book is issued to Shri……..……..……..……..……..……

Signature of A.G.M. (Premises& Estate) / D.G.M. (Premises)

Certified that this book contains…….…….. pages

Signature of the official (to whom the book is issued)

MEASUREMENT BOOK PAGES NOS. 1 TO……

Item No.	Description	Measurement No.LB D/H	Quantity	Remarks

Site Engineer/Contractor

Checking/Test checking Engineer Date of checking/Test checking

NOTE:

Checking and test checking pertains to items wherever initialed.

ANNEXURE-4.18: FORMAT FOR RUNNING BILL

I. Running A/C Bill

(i) Name of Contractor / Agency:
(ii) Name of work:
(iii) Sr, No. of this Bill:
(iv) No. and date of previous bill:
(v) Reference to Agreement No.:
(vi) Date of written order to commence:
(vii) Date of completion as per agreement:

Sr. No.	**Item Description**	**Estimated Quantity**	**Unit**	**Rate (Rs.)**	**Tendered Amount (Rs.)**
	1.	**2.**	**3.**	**4.**	**5.**

Up to previous R/A Bill		**Up to date (Gross)**		**Present Bill (7-6)**		**Remark**
Qty.	**Amount (Rs.)**	**Qty.**	**Amount (Rs.)**	**Qty.**	**Amount (Rs.)**	

6.	7.	8.	9.

Note :

(i) If part rate is allowed for any item, it should be _____ indicated with reasons for allowing such a rate 'Net value since'

(ii) If adhoc payment is made, it should be mentioned previous bill specifically.

II. ACCOUNT OF SECURED ADVANCE, IF ADMISSIBLE ON MATERIALS HELD AT SITE BY THE CONTRACTOR

No.	Item	Quantity	Unit	Amount	Remarks
1.	2.	3.	4.	5.	6.

Total value of materials at site.
Secured Advance @ _____ % of above value B

CERTIFIED (i) that the materials mentioned above have actually been brought by the contractor to the site of the work and no advance on any quantity of any of this item is outstanding on their security (ii) that the materials are of imperishable nature and are all required by the contractor for use in the work in connection with the items for which rates of finished work have been agreed upon.

Dated signature of Site Engineer

preparing the bill

Designation _____

Dated signature of Bank's

Consultant

(Name of the Consultant)

_____

Dated signature of Contractor

CERTIFICATE

The measurements 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 and Signature and date of Signature and date of

Date of contractor Consultant's representative the Site Engineer

(seal)

The work recorded in the above mentioned measurements has been done at the site satisfactorily as per tender drawings, conditions and specifications.

Consultant / Site Engineer / Bank's Engineer

Annexure-4.20: Format Of Certificate Of Payment By Consultant

<table>
<tr><td>Certificate No. Interim /</td><td colspan="3">Dated</td></tr>
<tr><td rowspan="2">Client:</td><td>Project No.</td><td colspan="2">Building work / Interior work</td></tr>
<tr><td colspan="3">Particulars:</td></tr>
<tr><td>Contractor:</td><td colspan="2">Contract / Letter No.</td><td>Dated:</td></tr>
<tr><td></td><td colspan="2">Contractor’s Bill No.</td><td>Dated:</td></tr>
</table>

This is to certify that the amount given below (*) is due to your Contractors for the work done by them and/or against materials delivered at site and/or for advance towards contract on the above referred project. Advance against contract Rs_____ Less: Advance adjusted to-date Rs._____ Balance Advance Rs._____ Advance against material delivered 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/S194C of the income Tax 1961 and 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 payment.
Remarks if any: The details of Insurance policy are given in the next page.
Signature of Consultant Enclosures: Bill

ANNEXURE-4.24: Format For Application By Contractor For Extension Of Time

1.	Name of the Contractor	
2.	Name of the work as given in the Agreement	
3.	Agreement WO	
4.	Tender amount	
5.	Date of commencement of work	

6.	Period allowed for completion as per agreement				
7.	Date of completion as per agreement				
8.	Period for which extension of time has been given				
			Date	Month	Year
	a)	1st extension vide Bank's Letter No.			
	b)	2nd extension vide Bank's Letter No.			
	c)	3rd extension vide Bank's Letter No.			
9.	Reasons for which extensions have been previously given (copies of the previous applications should be attached)				
10.	Period for which extension is applied for and the reasons thereof including hindrances, time for extra work assigned, if any etc.				

Signature of Contractor

Recommendations of Consultant

Signature of Consultant.

ANNEXURE-4.25: Format Of Hindrance Register

Name of Work	:	Date of state of work	:
Name of Contractor	:	Period of completion	:
Agreement No.	:	Date of completion	:

Sr. No.	Nature of Hindrance	Date of occurrence of hindrance	Date of which hindrance was removed	Period of hindrance	Signature Site Engineer/ Project Engineer	Remarks
1	2	3	4	5	6	7

ANNEXURE-4.31: Details Of Insurance Policies

Type of policies	**Name of Insurance**	**Amount Rs.**	**Policy No.**	**Validity**
CAR policy including 3rd party liability				
Workmen's Compensation				

Remarks:

1. This is only an 'on-account' payment and is not to be interpreted either as approval of work, materials brought or affixed at site or for that matter approval of any sort.
2. The quantum of work done and materials delivered at site have been certified by.....
3. should you wish to audit such work, kindly contact the undersigned and oblige.

Consultants_____

BILL OF QUANTITY

Preamble: To Be Read Along With Drawings.

1. Rates to be quoted both in figures and words.
2. All pages to be signed and stamped by the tenderer.
3. The rate of the items shall be applicable for any floor level/ any number of floors, or any quantity.
4. The specification of the items shall be as per latest indian standard codes unless otherwise specified.
5. All materials shall be as per approved list and should be of Ist quality unless otherwise specified.
6. The rates are inclusive of all duties and taxes (except GST) of all government, municipal or any other statutory body applicable from time to time.
7. Rates shall be for items complete in all respects as per drawing, instructions and approval of the consultant/ bank's engineer.
8. The quantities are approximate and tentative which may vary during course of execution. the rates quoted against particular item shall not be changed with variation in quantities.
9. Making of any cutout / opening for electrical / air – conditioning wiring / fitting in any of the item of false ceiling, partitions, paneling masonry work etc. and finishing edges jambs / cills / soffits of the opening shall not be paid extra.
10. The tenderer shall visit the site and shall satisfy himself as to conditions under which the work is to be performed. he shall also check, ascertain the locations of any existing structures or equipment or any other situation which may affect the work. no extra claim as a consequence of ignorance or on ground of insufficient description will be allowed at a later date.
11. The quoted price for items shall include all accessories, consumables etc. as required to make the item complete in all respects, compatible with other related / associated items and fully functional.
12. Contractor shall be fully responsible for any error, difficulty in execution / damages incurred owing to discrepancy in drawings which has been overlooked by him and has not been brought to the notice of the consultant.
13. There are number of items given in the tender where in basic rates including all taxes expected has been mentioned in the tender. these items shall be purchased by the contractor from the market only after the approval of quality and rates by the consultant.
14. All hidden surfaces of board / ply / wood work to be painted with anti-bacterial paint from nav air international for 881 (viper) (white colour as per manufacturer's specifications on wood / board).
15. Contractor shall appoint technically qualified full-time site supervisor to monitoring the day to day progress of work at site on their own cost.

PART II (Price Bid)

S. No.	Description of Item	Unit	Qty	Rate Rs.)	Amount (Rs.)
	DG Sets (750 / 500 kVA) Design, Supplying, Installation, Testing & Commissioning of Rate 'Silent Type Diesel Generating set as per CPCB IV + or better norms along with having Prime Power Rating of 750/500 KVA as below, 415 volts at 1500 RPM, 0.8 lagging power factor at 415 V suitable for 50 Hz, 3 phase system & for 0.85 Load Factor, including testing at factory and site with fuel, load for test and other necessary arrangements Complete as per CPWD specifications, should have QR code which should contain drawing, test report OEM manual, Geo- Tag of manufacturing location, rating plate as per relevant IS Code etc. and consisting of the followings: Diesel Engine Turbocharged Diesel engine 4 stroke water cooled, multi cylinder, dynamically balanced fly wheel, electric start of suitable BHP at 1500 RPM suitable for above output of alternator at 40 0C, 50% RH & at 1000 Meter MSL , capable of taking 10% over loading for one hour after 12 hours of continuous operation. The engine will be with Electronic governor, Dry type Air filter with service indicator, first filling of engine fuel (after commissioning) lubricating Oil, Coolant and other consumables complete with all the required accessories, the Electronic governor shall be as per ISO 8528.The engine shall comply to the latest CPCB norms (CPCB IV + or better) and Conforming to BS 5514, BS 649, IS 10000, IS 10002, IS 13018 and as per CPWD specifications. Engine mounted Instrument Panel fitted with and having digital display for following: Start-Stop switch with push button Water temperature indication Lubrication Oil pressure indication Battery charging indication RPM indication Over speed indication Low lubrication Oil trip indication Engine Running Hours indication Fuel Level Alternator				

	Synchronous alternator rated of appropriate KVA, 415 volts at 1500 RPM, 3 phase 50 Hz, AC supply with 0.8 lagging power factor at 40 0C, 50% RH & at 1000 Meter MSL. The alternator shall be having Screen Protected Drip Proof (SPDP) enclosure IP23, brushless, continuous duty, dynamically balanced rotor, capable of taking 10% over loading for one hour after 12 hours of continuous operation, self cooled,self-excited and self-regulated through AVR conforming to IS13364(Part 2)/IS: 4722/BS 2613 suitable for tropical conditions and with class- H insulation. Base Frame & Foundation Both the engine and alternator shall be mounted on suitable base frame made of MS channel with necessary reinforcement which shall be installed on suitable cement concrete foundation and vibration isolation arrangement as per recommendations of manufacturer. Fuel Tank: Daily service fuel tank of suitable liters capacity as per CPWD Specifications, fabricated out of 3 mm thick M.S. sheet complete with all standard accessories and fuel piping between fuel tank and diesel engine with MS class 'C' pipes of suitable dia. Complete with valves, level indications & accessories as required as per specifications. Exhaust System Dry exhaust manifold with hospital type exhaust silencer and catalytic convertor. Starting System 12V/24V DC starting system comprising of starter motors: voltage regulator and arrangement for initial excitation complete with suitable numbers of batteries (180 AH capacity lead acid SMF type) as required as per specifications. The battery shall be housed inside the acoustic enclosure of DG Set. Acoustic and weather proof				

	enclosure with arrangement for fresh air intake for cooling of the engine & alternator, extraction, discharging hot air in to the atmosphere and the temperature rise inside the enclosure, noise level outside enclosure. The acoustic enclosure should be suitable for cable connection/connection through bus-trunking. Such arrangements on acoustic enclosure should be water proof & dust-proof conforming to IP-65 protection. The enclosure shall be as per CPCB IV + or better norms etc. and as per CPWD specifications. AMF Panel: Free standing floor mounted IP 42 automatic mains failure control panel including auto by-pass, suitable for KVA as below for silent type DG set complete with relays, timers, set of CTs for metering & protection and energy analyser to indicate currents, phase and line voltages, frequency, power factor, KWH, Kilo Volt Ampere Reactive Hour (KVARH), KVA (Phase & Total), KW & provision for overload, short circuit, restricted earth fault, under frequency, power (aluminum) and control (copper) cabling of suitable size upto 15 meter between AMF panel, LT Panel and DG Set including connection interconnection etc. as required, all complete and inter locking and communication/ Ethernet /RS485/SNMP port open protocol for BMS integration including suitable software, the panel shall be of DG Set OEM make etc. as per approved by Engineering in charge and including the following: Suitable numbers and appropriate capacity 4 pole motorized electrically operated draw out with cradle type 3 position ACB/ MCCB with electronic release for O/C & E/F and shunt trip. Auto/Manual/Test/Off selector switch Protection for under and over voltage phase reversal (2 nos Over voltage relay, 2 Nos. reverse power relay and 2 Nos. under voltage relay). 3 Sets of current transformers 15 P 10 accuracy for protection and 15 VA class-I for metering Energy analyser unit to indicate current, Voltage(LN & L_L), kW, kVA (Phase & Total), Frequency, KWH, PF. . LED Indicating lamps for load on mains and load on set Fuse/ MCB for instruments Battery charger, complete with transformer/ rectifier, D.C. voltmeter and ammeter, selector switch for trickle, off and boost and current adjustment. Main supply failure monitor				

	Restoration timer Control unit with three impulse automatic engine start/stop and failure to start lockout. Impulse counter with locking and reset facility. ON/OFF/Control circuit switch with indicator Audio/Video annunciation for (i) High water temperature (ii) Low lubricating oil pressure (iii) Engine over speed (iv) Engine fails to start (v) Full load/maximum load warning Protection for over/under Frequency, Loss of AC sensing, Over Current, Unbalancing load with suitable number of relays and accessories Maintenance notification based on Engine Run Hour & due date. Load Management through PLC to achieve auto opening and closing of incomer breakers, bus coupler switching of essential panel, interlocking providing signal to AMF Panel for load status and AMF shall give command to DG Set to auto start / auto stop depending upon load status and requirement etc. and necessary hardware and software required to perform the operation shall be provided by the contractor including all control wiring.				
	SUB HEAD -I DG SETS				
1.a	500KVA	**Each**	**1**		
1.b	750KVA	**Each**	**1**		

2	Supplying & Fixing of following dia. M.S. Pipe as per relevant IS specifications including LRV rock wool insulation having 48 kg per m^3 density, 75 mm thick, chicken wire mesh and cladding with 24 gauge aluminum sheet, for exhaust of smoke of D.G. Sets including fixing the M.S. cladded pipes on the existing structure etc. complete as required.				
2.a	250 mm dia. × 4.85 mm nominal thick – Meter	**Meter**	**40**		
2.b	150 mm dia. × 4.85 mm nominal thick – Meter	**Meter**	**20**		
3	Providing and fixing in place required Heavy duty expansion bellows of SS material with GI nuts, GI bolts, GI washers etc. complete as required.				
3.a	250 mm dia. – Set	**Each**	**2**		
3.b	150 mm dia. – Set	**Each**	**4**		
4	Providing and fixing of MS Steel required for supporting the exhaust pipe – Kg	**Kg**	**1500**		
5	INSULATION OF RESIDENTIAL SILENCER - (LRV rock wool insulation having 100 kg per m3 density insulation)				
5.a	Supply, testing and commissioning of 75mm thick LRV Rock Wool insulation (of 100 kg per cubic meter density) around the silencer pipes including cladding with aluminium sheet of 0.60mm thick and covering from outside complete as required suitable for DG exhaust pipe temperature upto 500°C.	**Nos**	**4**		

5.b	Supply and installation of 150mm MS support structure for exhaust fume pipes from DG Sets (Exhaust pipe to be measured and paid for separately) along horizontal and vertical runs upto the height (as per CPCB norms) including cutting, welding etc and applying two coats of red oxide and two coats of synthetic enamelled paint of colour and shade as directed by client/consultant. The design of the support structure shall be done by the contractor and shall be as per CPCB norms approved, also to get the approval from the consultant before execution etc. as required.	**No.**	**1**		
6	Supply and installation of SS Flexible Bellows, 250 mm NB, complete with counter flanges, heat resistant gaskets, nuts-bolts-washers etc., complete as required.	**No.**	**1**		
7	Supply and installation of Lightening Arrestors Non-Seamer Type with GI Strip upto Earth Pit	**No.**	**1**		
8	Supply and installation of Aviation light with UPS and Cable upto light	**No.**	**1**		
9	Supply, laying testing and commissioning of 12C X 2.5 Sqmm. (Copper) control cable with following sizes of copper conductor armoured cable of 1.1 KV grade on existing cable tray / surface including saddle, clamps etc. complete as required.	**Mtr.**	**40**		
10	Supplying and making end termination 12C X 2.5 Sqmm. (Copper) with brass compression glands and copper lugs for following size of control cable of 1.1 KV grade complete as required.	**Nos.**	**4**		

11	Supplying, Installation, Testing & Commissioning of Pre-fabricated Sandwiched type insulated bus trunking with GI housing of minimum 1.6 mm thick of following capacities, as per IS 8623 / 1993 Part I&II suitable for 415Volt 3 Phase 4 wire (with 50 % Neutral) 50Hz AC supply system of aluminium bus bars complete with flange end, elbow, expansion joints, fire barriers, copper flexible end connections at both ends Earthing with 2 runs of copper earth of size 50mm x 6mm strips etc. i/c necessary supports etc. as per specifications attached as required. (suitable for 50kA fault level)(IP 54 rating)				
11. a	1250 Amps (from DG Sets to PLC Panel and PLC Panel to Main LT Panel)	**Mtr.**	**20**		
11. b	800 Amps (from DG Sets to PLC Panel and PLC Panel to Main LT Panel)	**Mtr.**	**15**		
12	Earthing with copper earth plate 600 mm X 600 mm X 3 mm thick including accessories, and providing masonry enclosure with cover plate having locking arrangement and watering pipe of 2.7 meter long etc. with charcoal/ coke and salt as required.	**Set**	**4**		
13	Earthing with G.I. earth plate 600 mm X 600 mm X 6 mm thick including accessories, and providing masonry enclosure with cover plate having locking arrangement and watering pipe of 2.7 meter long etc. with charcoal/ coke and salt as required.	**Set**	**2**		
14	Supplying, straightening, shaping, laying under ground / laying on a cable tray / laying in cement concrete trench the following sizes of copper/hot dipped galvanized iron conductor. The work is inclusive of providing clamping with the trays / on the sides of the trenches, making joints wherever required and providing the hardware and the terminating the hardware and the termination to the equipment / earthing station / etc.				

14.a	Providing and fixing earth bus of 50 mm x 10 mm C.U. strip on surface for connections as Required.	**Metre**	**30**		
14.b	Providing and fixing of 50 mm x 5 mm C.U strip on surface or in recess for connections as Required.	**Metre**	**30**		
14.c	Providing and fixing of 25 mm x 5 mm G.I. strip on surface or in recess for connections as Required.	**Metre**	**50**		
15	**Breaker** Supply, Installing, Testing and Commissioning of 800A FP EDO ACB, 50KA with microprocessor based releases for O/C, S/C along with time delay for all protections, communication module (MODBUS) , 1no. ON/OFF/TRIP indications. 1 Set of three phase R,Y,B indicating lamps along with 2A SP MCB backup protection and Digital flush type class-1.0 accuracy multifunction meter showing V, A, PF, KVAR , KWH etc. along with current transformers of 800/5A ratio, 15 VA Class 1.0 metering including the following: 1 No. Digital Voltmeter with selector switch. 2 1 No. digital multi function meter to display F, PF, kW, kVA, kVAR, kWh, kVAh, kVARh, THD, Phase angles, Power demand parameters. 3 3 No. phase indicating lamps to show the incoming power with control 2A HRC fuse/back up MCBs. 4 3 Nos. indicating lamps for ACB on/ off/ trip position. 5 1 No. reverse power relay with matching cast resin CTs. 6 1 no. 3 phase voltage monitoring relay cum phase sequence meter 7 1 No. Low- set standby earth fault relay connected to neutral CT of transformer 8 1 No. Restricted earth fault relay (REF) /differential protection relay connected to neutral CT & mains CT of transformer with facility of primary trip with necessary ancillary relays like master trip element etc. 9 Necessary Current transformers of suitable burden and for metering and protections as above.	**Set**	**1**		

16	Supply, Installing, Testing and Commissioning of 1250A FP EDO ACB, 50KA with microprocessor based releases for O/C, S/C along with time delay for all protections, communication module(MODBUS) , 1no. ON/OFF/TRIP indications. 1 Set of three phase R,Y,B indicating lamps along with 2A SP MCB backup protection.and Digital flush type class-1.0 accuracy multifunction meter showing V, A, PF, KVAR , KWH etc. along with current transformers of 800/5A ratio, 15 VA Class 1.0 metering in existing panel. 1 No. Digital Voltmeter with selector switch. 2 1 No. digital multi function meter to display F, PF, kW, kVA, kVAR, kWh, kVAh, kVARh, THD, Phase angles, Power demand parameters. 3 3 No. phase indicating lamps to show the incoming power with control 2A HRC fuse/back up MCBs. 4 3 Nos. indicating lamps for ACB on/ off/ trip position. 5 1 No. reverse power relay with matching cast resin CTs. 6 1 no. 3 phase voltage monitoring relay cum phase sequence meter 7 1 No. Low- set standby earth fault relay connected to neutral CT of transformer 8 1 No. Restricted earth fault relay (REF) /differential protection relay connected to neutral CT & mains CT of transformer with facility of primary trip with necessary ancillary relays like master trip element etc. 9 Necessary Current transformers of suitable burden and for metering and protections as above				
17	Supply and fixing of Foam fire extinguishers, portable 9 litre capacity hanged from ceiling complete as required.	**No.**	**5**		
18	**DG SYNCHRONISING PANELS (1 X 750 + 1 X 500KVA)**				

	i. Main DG Synchronizing Panel suitable for DG for paralleling in future, AMF feature, Auto Synchronization, Auto Load Sharing, Load Management (Distance between DG and DG Sync. Panel will be approx. 25-30 Mtr). All DG's shall synchronize with each other successfully. complete DG synch. panel shall have two years warranty. ii. Supply of Main DG synchronization panel. This will be floor mounted, free standing, dust proof, vermin proof, front operated, electrical panel fabricated, painted and manufactured exactly as per specifications laid in this document and will be complete with the main and auxiliary bus bars, interconnection, cable glands, earth terminals, earth bus and will be powdered coated finish with 70micron thickness. The ACB panel shall use all draw out 3 position withdrawn type breakers suitable for 415 V AC, 3 phase, 50 Hz, 4 wire supply system and will have fault level of 50 KA. The panel will be made as per detailed specifications and drawings forming part of this document (Under no case temperature of DG Panel shall be more than 85^0 C at any point of the panel, otherwise necessary exhaust fan shall be have to provided). iii. Bus bar calculations considering temperature derating, enclosure derating, sleeving derating must be done and submitted for checking. The bus bar size shall not be less than the ampere sizes mentioned after derating factor of 0.75. The DG panel will comprise of the following : iv. The system shall be deemed complete, only when integrated system testing with fully functional BMS monitoring and controls are demonstrated and certified by BMS consultant. v. Two numbers incomer having (1X1250A FP ACB + 1X800A FP EDO ACB with neutral contactor) feeders and each incomer ACB feeder shall have the following equipments. Neutral contactor size will be same for all DGs of 750 KVA and 500KVA equal to 750 KVA vi. The panel shall have auto / manual synchronizing. vii. 1No microprocessor based three element adjustable over current with time delay & adjustable short circuit with time delay, adjustable earth fault release with time delay along with communicable releases with RS 485 port and display module. This will give all electrical data to BMS alongwith ON/OFF/TRIP status to BMS, all necessary provisions shall be made. viii. 3Nos. indicating lamps to show the incoming power along with MCB. (2Sets) ix. 1.No digital ammeter, ammeter selector switch, digital voltmeter, Voltmeter selector switch.				

	x. 2. no. digital combined multifunction meter with relevant CT's of class 1.0 accuracy with RS 485 port and BMS communication on MODBUS. xi. 1. no. D.C battery charger thyristor based constant current type, volt meter and D.C voltmeter & ammeter shall be analogue type. xii. 1 No. PLC for bus coupler closing, auto load management, voltage sensing, incomer breaker ON/OFF feedback, main LT panel incomer breakers ON/OFF feedback of coil cooler fan and canopy blower etc. Each DG controller will carryout basic function like AMF start, auto synchronizing, load sharing. xiii. 1 No. REF relay with separate CTs, 1 no. reverse power relay, 1no. field failure relay, 1 no. under voltage, 1 no. over voltage, 1no. under frequency & over frequency relay, 1 no. standby earth fault relay in neutral circuit with separate CT. All these relays will remain common both in auto and manual mode. If above relays are inbuilt in DG controller then these relays shall not be repeated but standby earth fault relay and REF relay shall be totally separate alongwith cast resin CTs. xiv. Annunciation for LLOP, HWT, over speed & oil temp (annunciator shall reset itself) U/V, O/V, U/F, O/F, O/C, E/F, field failure relay, RPR, stand bye earth fault , REF relay and RTD and BTD annunciation. All engine annunciation will come from DG controller located near engine. xv. Engine should trip on LLOP, HWT, oil temp, O/V, O/F and breaker should trip on other faults. xvi. Initially U/V & U/F will be bye passed till oil pressure is picked up. xvii. Indicating lights for ACB ON/OFF, ACB trip, D.G. on mains, D.G. fails to start. xviii. Generator start /stop facility through push button from panel. 1 No. lub oil priming pump starter with cyclic timer (If inbuilt with engine). xix. Whenever D.G. stop through PB, load shall be disconnected first. xx. PLC shall be suitable for two DGs and suitable terminals will be left out for PLC terminals and input and output commands along with power supply and small inbuilt UPS in DG sync panel. PLC shall have sufficient I/O's to close/open LT panel incomer breakers, operate LT panel bus coupler, LT panel DG incomer feeders , open DG incomer breaker, give command to start all canopy blowers and coil cooler fans. LT panel incomer breakers and bus coupler breaker operation shall be controlled through DG PLC in auto mode. PLC shall be suitable for paralleling of two nos DG (present and future) alongwith necessary hardware. PLC system will be complete for 2 nos DGs				

	only cards inside I/Os for future DGs will be installed later. xxi. All hardware suitable for manual synchronizing along with auto check synchronizing etc. xxii. One no. bus coupler feeder with 4P EDO 1250 amps ACB with microprocessor based non communicable LSI releases. The breaker shall have local ON/OFF/TRIP indication and ON/OFF/TRIP contacts shall be wired upto terminal strip for BMS monitoring. **Outgoing feeders** xxiii. One number 1250 amps TPN MDO ACB with inbuilt microprocessor based releases and 1no. ON/OFF/TRIP indication. xxiv. One number 800 amps TPN MDO ACB with inbuilt microprocessor based releases and 1no. ON/OFF/TRIP indication. **Bus Bar-I &II** xxv. 1 set of Aluminium bus bars for 3 phase rated for 1600 amps after taking all derating (minimum derating will be 75%) and neutral rated for 1700 amps (Earthing size of bus bar will be as per fault level of system). xxvi. 1 Lot of control wiring				

19.	**Dismantling** Dismantling of existing 320 kVA Diesel Generator (DG) Set complete with engine, alternator, common base frame, acoustic enclosure, radiator, anti-vibration mounts, day fuel tank, exhaust piping, flexible bellow, silencer, control panel, battery charger, starting batteries, power and control cable terminations, earthing connections, and all associated electrical and mechanical accessories. The work shall include isolation of electrical supply and fuel system, disconnection of all electrical, mechanical and fuel connections, dismantling, loading, shifting, unloading and stacking of dismantled serviceable materials at the location designated by the Engineer-in-Charge within the premises. The item shall also include all labour, cranes/lifting equipment, tools & tackles, consumables, scaffolding, transportation within the site, safety measures, removal of debris, cleaning of the work area, and all incidental works required for complete dismantling. Serviceable dismantled materials shall remain the property of the Employer and shall be handed over to the Engineer-in-Charge. Nothing extra shall be paid on any account. Loading, shifting, unloading and stacking of dismantled serviceable materials at the designated location within the project premises. Disposal of unserviceable materials and debris outside the premises, including transportation and all statutory charges. Cleaning of work area and making good the site after dismantling. The work shall include the cost of all hardware, T&P, machinery like Hydra etc.	**Each**	**3**		

20.	Dismantling & Removal of existing Automatic Mains Failure (AMF)/Automatic Transfer Switch (ATS) Panel complete with all associated components, including isolation of incoming and outgoing power supply, disconnection of all power and control cables, cable glands, lugs, busbar connections, earthing connections, indication lamps, meters, relays, control wiring, cable terminations and all accessories. The item shall include dismantling from the existing foundation/support structure, loading, transportation within the project premises, unloading and stacking at the location designated by the Engineer-in-Charge. The work shall also include all labour, tools & tackles, lifting equipment, consumables, safety precautions, making safe all disconnected cables, blanking/open termination protection, removal of mounting hardware, cleaning of the work area and handing over all serviceable materials to the Employer. The work shall be carried out without damage to adjoining installations and complete in all respects as directed by the Engineer-in-Charge.	**Each**	**3**		
	Sub Total				
	Buy Back				
21.	Less Buy Back of existing 320 kVA Diesel Generator (DG) Set complete with engine, alternator, common base frame, acoustic enclosure, radiator, anti-vibration mounts, day fuel tank, exhaust piping, flexible bellow, silencer, control panel, battery charger, starting batteries, power and control cable terminations, earthing connections, and all associated electrical and mechanical accessories. The work shall include isolation of electrical supply and fuel system, disconnection of all electrical, mechanical and fuel connections, dismantling, loading, shifting, unloading and stacking of dismantled serviceable materials at the location designated by the Engineer-in-Charge within the premises. The item shall also include all labour, cranes/lifting equipment, tools & tackles, consumables, scaffolding, transportation within the site, safety measures, removal of debris, cleaning of the work area, and all incidental works required for complete dismantling. Serviceable dismantled materials shall remain the property of the Employer and shall be handed over to the Engineer-in-Charge. Nothing extra shall be paid on any account.	**Each**	**3**		

22.	Less Buy Back of existing Automatic Mains Failure (AMF)/Automatic Transfer Switch (ATS) Panel complete with all associated components, including isolation of incoming and outgoing power supply, disconnection of all power and control cables, cable glands, lugs, busbar connections, earthing connections, indication lamps, meters, relays, control wiring, cable terminations and all accessories. The item shall include dismantling from the existing foundation/support structure, loading, transportation within the project premises, unloading and stacking at the location designated by the Engineer-in-Charge. The work shall also include all labour, tools & tackles, lifting equipment, consumables, safety precautions, making safe all disconnected cables, blanking/open termination protection, removal of mounting hardware, cleaning of the work area and handing over all serviceable materials to the Employer. The work shall be carried out without damage to adjoining installations and complete in all respects as directed by the Engineer-in-Charge.	**Each**	**3**		
	Less Total (Buy Back Amount)				
	Grand Total Amount after Buy Back excluding GST				
23.	Comprehensive AMC of 1 No. 750 KVA and 1 No. 500 KVA silent type Diesel Generating Sets, including diesel engines, alternators, base frames, acoustic/weatherproof enclosures, radiators/cooling system, starting batteries, battery chargers, fuel systems, daily service tanks, exhaust systems, silencers including AMF panel, synchronization panel, Breakers all engine-mounted instruments, controls and accessories. Includes preventive maintenance, breakdown maintenance, labour, consumables, testing and servicing as required. (AMC will commence after Two years of Gurantee Period). Gurantee will start after handing over the project.				
	During the First Year after the Gurantee Period	**year**	**1**		
	During the Second Year after the Gurantee Period	**year**	**1**		
	During the Third Year after the Gurantee Period	**year**	**1**		
	During the Fourth Year after the Gurantee Period	**year**	**1**		

GST Extra as applicable.

Signature ---------- **Company Seal ----------**