भारतीय रिज़र्व बैंक / Reserve Bank of India
संपदा विभाग / Estate Department
तिरुवनंतपुरम / Thiruvananthapuram

NOTICE INVITING TENDER

Reserve Bank of India invites Tender (Sealed Quotation) for undertaking Conducting Energy Audit of Bank's Office Building at Thiruvananthapuram. This is an open tender. Bidders are advised to check with RBI regarding their eligibility for this tender before participating.

SCHEDULE OF TENDER (SOT)

a. Tender Name	**Conducting Energy Audit of Bank's Office Building at Thiruvananthapuram**
b. Estimated Cost	₹1.77 lakh (Including GST)
c. Date of Notice inviting tender	January 8, 2026, 05:00 PM
d. Validity of the tender for acceptance by the Bank	90 days from the date of opening of the quotation
e. Start date for submission of tenders	January 30, 2026, 11:00 AM
f. Last date to submit tenders	February 9, 2026, 02:00 PM
g. Date of opening of tenders	February 9, 2026, 03:00 PM

Applicants intending to apply will have to satisfy the Bank by furnishing documentary evidence in support of their possessing required eligibility and in the event of their failure to do so, the Bank reserves the right to reject their candidature.

Officer-in-Charge for Kerala and Lakshadweep

भारतीय रिज़र्व बैंक / Reserve Bank of India
संपदा विभाग / Estate Department
तिरुवनंतपुरम / Thiruvananthapuram

NOTICE INVITING TENDER

Reserve Bank of India invites Tender (Sealed Quotation) for undertaking Conducting Energy Audit of Bank's Office Building at Thiruvananthapuram. This is an open tender. Bidders are advised to check with RBI regarding their eligibility for this tender before participating.

SCHEDULE OF TENDER (SOT)

a. Tender Name	**Conducting Energy Audit of Bank's Office Building at Thiruvananthapuram**
b. Estimated Cost	₹1.77 lakh (Including GST)
c. Date of Notice inviting tender	January 8, 2026, 05:00 PM
d. Validity of the tender for acceptance by the Bank	90 days from the date of opening of the quotation
e. Start date for submission of tenders	January 30, 2026, 11:00 AM
f. Last date to submit tenders	February 9, 2026, 02:00 PM
g. Date of opening of tenders	February 9, 2026, 03:00 PM

Applicants intending to apply will have to satisfy the Bank by furnishing documentary evidence in support of their possessing required eligibility and in the event of their failure to do so, the Bank reserves the right to reject their candidature.

Officer-in-Charge for Kerala and Lakshadweep

DISCLAIMER

Reserve Bank of India, Estate Department, Thiruvananthapuram, has prepared this document to give background information on the Project to the interested parties. While Reserve Bank of India has taken due care in the preparation of the information contained herein and believe it to be in order, neither Reserve Bank of India nor any of its authorities or agencies nor any of their respective officers, employees, agents or advisors give any warranty or make any representations, express or implied as to the completeness or accuracy of the information contained in this document or any information which may be provided in association with it.

The information is not intended to be exhaustive. Interested parties are required to make their own inquiries and respondents will be required to confirm they have done so and they do not rely only on the information provided by RBI in submitting the Tender. The information is provided on the basis that it is non-binding on Reserve Bank of India or any of its authorities or agencies or any of their respective officers, employees, agents or advisors.

Reserve Bank of India reserves the right not to proceed with the Project or to change the configuration of the Project, to alter the timetable reflected in this document or to change the process or procedure to be applied. It also reserves the right to decline to discuss the matter further with any party expressing interest. No reimbursement of cost of any type will be paid to persons or entities expressing interest.

Section I
Form of Tender

Place _____
Date _____

To,
The General Manager (Officer-in-Charge)
Estate Department
Reserve Bank of India
Thiruvananthapuram

Madam,

We have carefully examined the specifications, designs and schedule of quantities relating to the Energy Audit specified in the memorandum hereinafter set out and having visited and examined the site of the Energy Audit as specified in the said memorandum and having acquired the requisite information relating thereto as affecting the tender. We hereby offer to conduct the Energy Audit as specified in the said memorandum within the time specified in the said memorandum at the rates mentioned in the attached Schedule of Quantities and in accordance in all respects with specifications, designs and instructions in writing referred to in articles of agreement, general instructions to the tenderers and special conditions, conditions hereinbefore referred to, specifications, data sheet and schedule of quantities and with such equipments as are provided for, by and in all other respects, in accordance with such conditions so far as they may be applicable.

MEMORANDUM

(a)	Description of works	**Conducting Energy Audit of Bank's Office Building at Thiruvananthapuram**
(b)	Estimated cost	**Rs. 1.77 Lakh**
(c)	Terms of payment	As per clause 10 of Commercial Conditions
(d)	Time allowed for completion of work from the date of letter advising acceptance of tender.	**4 weeks**

2. We also agree that our tender will remain valid for acceptance by the Bank for 90 days from the date of opening of the tender and this period of validity can be extended for such period as may be mutually agreed between the Bank and us in writing.

3. Should this Tender be accepted, I/we hereby agree to abide by and fulfill all the Terms and Conditions of the Tender and in default thereof, to forfeit and pay to you or your successors, or assignees or nominees such sums of money as are stipulated in the conditions contained in the tender together with the written acceptance of the Contract.

4. I/We understand that you reserve the right to accept or reject any or all the tender either in full or in part without assigning any reason therefore.

5. The Tender is submitted separate sealed envelope**.**

Dated this ___day of _____2026.

For and on behalf of M/s _____

_____

(Signature with seal)

Name _____

Designation _____

Place _____

Date _____

(Certified true copy of the Power of Attorney of the above signatory should be enclosed).

Witnesses

(1) Signature with _____

name, address and date _____

_____

(2) Signature with _____

name, address and date _____

_____

Section II
Articles of Agreement

ARTICLES OF AGREEMENT made the _____ day of _____ between the Reserve Bank of India, Thiruvananthapuram having its Central Office at Mumbai (hereinafter called "the Employer") of the one part and _____ (hereinafter called "the Auditor") on the other part.

WHEREAS the Employer is desirous of **Conducting Energy Audit of Bank's Office Building at Thiruvananthapuram** and has caused drawings and specifications describing the work to be done AND WHEREAS the said specifications, and the schedule of quantities have been signed by or on behalf of the parties hereto.
AND WHEREAS the Auditor has agreed to execute upon the subject work to the conditions set forth herein and to the conditions set forth in the special conditions and in the schedule of quantities and conditions of Contract as modified and finally accepted by both the parties (all of which are collectively hereinafter referred to as "the said Conditions") the works shown upon the said drawings and/or described in the said Specifications and included in the Schedule of quantities at the respective rates therein set forth, amounting to the sum as therein arrived at or such other sum as shall become payable there under **(hereinafter referred to as "the said Contract Amount").**

NOW IT IS HEREBY AGREED AS FOLLOWS-

2.1 In consideration of the said Contract amount to be paid at the times and in the manner set forth in the said conditions, the Auditor shall, upon and subject to the said conditions, execute and complete the work shown upon the said drawings and described in the said specifications and the schedule of quantities.

2.2 The Employer shall pay the Auditor the said Contract amount or such other sum as shall become payable at the times and in the manner specified in the said conditions.

2.3 The said Conditions and Annexures thereto shall be read and construed as forming part of this agreement and the parties hereto shall respectively abide by, submit themselves to the said conditions and perform the agreements on their part respectively in the said conditions contained.

2.4 The drawings, agreement and documents mentioned herein shall form the basis of this Contract.

2.5 This Contract is deemed to be lump sum Contract as described in the bill of quantities and specifications of the tender documents.

2.6 The Auditor shall afford every reasonable facility for carrying out of all works relating to Energy Audit in the manner laid down in the said conditions, and shall make good any damages done to walls, floors, etc., after the completion of such works.

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

2.8 Time shall be considered as the essence of this Contract and the Auditor hereby agrees to commence the work from the day of issue of works order/letter of acceptance as provided for in the said conditions and to complete the entire work **within 4 weeks** subject nevertheless to the provisions for the extension of time.

2.9 All payments by the Employer under this Contract will be made only at Reserve Bank of India, Thiruvananthapuram.

2.10 All disputes arising out of or in any way connected with this agreement shall be deemed to have arisen in Thiruvananthapuram and only courts in Thiruvananthapuram shall have jurisdiction to determine the same.

2.11 That the several parts of this Contract have been read by the Auditor and fully understood by the Auditor.

If the Auditor is a partnership or an individual	IN WITNESS WHEREOF the Employer and the Auditor have set their respective hands to these presents and two duplicates hereof the day and year first herein above written.
If the Auditor is a company	IN WITNESS WHEREOF the Employer has set its hands to these presents through its duly authorised official and the Auditor has caused its common seal to be affixed hereunto and the said two duplicates hereof to be executed on its behalf, the day and year first hereinabove written.

Signature Clause

SIGNED AND DELIVERED by the Reserve Bank of India,

Thiruvananthapuram by the hand of Signature

……

……

(Name and designation)

in the presence of (Witness)

1. Signature …… 2.Signature……

Address Address

……. …….

……. …….

……. …….

If the part is a partnership firm or any individual should be SIGNED AND DELIVERED by Signature ……

……

(Name and designation)

in the presence of (Witness)

1. Signature ……. 2. Signature……

Address Address

……. …….

……. …….

……. …….

The common seal of ……

Was hereunto affixed pursuant to the resolutions passed by its Board of Directors at the meeting held on …….

in the presence of (Witness)

1. Signature ……. 2. Signature……

Address Address

……. …….

……. …….

If the Contractor signs under its common Seal the signature clause should tally with their sealing clause in the Articles of Associations.

Directors who have signed these presents in taken thereof in the presence of (Witness) 1.

Signature …….	2. Signature……
Address	Address
…….	……
…….	……
…….	……

If the Contractor is signed by the hand of power of attorney, whether a company or individual

SIGNED AND DELIVERED by the Contractor by the hand of

Shri / Smt. …… and duly constituted attorney.

in the presence of (Witness)

1. Signature …….	2. Signature……
Address	Address
…….	……
…….	……
…….	……

Section III
Commercial Conditions

1. Sealed tenders are invited from accredited energy auditors for conducting energy audit in Bank's office buildings at Thiruvananthapuram.

2. **Eligibility:**

The intending tenderer for energy audit should be **qualified accredited energy auditor** by Bureau of Energy Efficiency.

In support of the above, the firms should submit the **letter of accreditation** issued by Bureau of Energy Efficiency.

3. **The tenders for the above work shall be submitted in separate sealed covers for Part 1 (techno-commercial bid) and Part II (price bid) addressed to Smt Sujatha Jaganathan, General Manager (Officer-in-Charge), Reserve Bank of India, Thiruvananthapuram so as to reach her not later than 14:00 hours on February 9, 2026.** The envelopes shall be super-scribed **"Tenders for conducting energy audit for Bank's office building at Thiruvananthapuram".** Tenders will be opened on the same day at 15:00 hours.

4. Tenderers are advised to use only the forms supplied by the Bank and not to use any other forms. Incomplete tenders are liable for rejection. No terms and conditions or any other information/ enclosures shall be included in price bid.

5. The tenders shall be valid for acceptance by the Bank for a period of 90 days from the date of opening of tender and shall be extended by such period as may be mutually agreed to.

6. **Prices:** The price quoted for the work shall be firm till completion of the work and shall include all taxes including service tax as applicable and cost of transportation / accommodation etc. of the equipments and persons deputed.

7. This contract is a fixed lump sum contract in respect of the entire energy auditing and to be paid for according to, at the rates contained in the schedule of rates and as provided in the said conditions.

8. The employer reserve to itself the right of altering the items to be executed by adding to or omitting any items without prejudice to this contract. However, the Auditor shall not be entitled to any payment for the works done exceeding the tender quantities unless specifically approved in writing by the Bank's engineer.

9. **Completion Period:** The time for completion of the entire work is four weeks from the date of award of work. The site survey, data collection/measurements and draft report shall be completed in four weeks and the final report shall be submitted within two weeks thereafter.

10. **Terms of payment**

The following terms of payment shall be applicable for the work:

100% of the quoted amount after completion of energy audit and submission of final report to the Bank.

All payments for the work will be made after statuary deductions.

11. All disputes arising out of or in way connected with this Agreement shall be deemed to have arisen at Thiruvananthapuram and only courts in Thiruvananthapuram shall have the jurisdiction to determine the same.

12. The Reserve Bank of India does not bind itself to accept the lowest or any tender and reserves to itself the right to accept or reject any or all the tenders, either in whole or in part, without assigning any reasons for doing so.

13. On receipt of intimation from the employer of the acceptance of his/ their tender, the successful tenderer shall be bound to sign the formal contract and within fourteen days thereof, the successful tenderer shall sign an agreement in accordance with the draft agreement and the schedule of conditions but the written acceptance by the Reserve Bank of India of a tender will constitute a binding contract between the RBI and the person so tendering, whether such formal Agreement is or is not subsequently executed. The cost of necessary stamp paper for execution of the agreement shall be borne by the successful tenderer.

14. 1f the Auditor being individual or a firm commits any act of insolvency or shall be adjudged an Insolvent or being an incorporated company shall have an order for compulsory winding up made against it or pass an effective resolution for winding up voluntarily or subject to ·supervision of the court and official Assignee or liquidator in such acts of solvency or winding up, as the case may be, shall be unable within seven days after notice of him requiring him to do so, to show to the reasonable satisfaction of the Bank's Engineer that he is able to carry out and fulfill the contract and to give security therefore, if so required by the Bank's Engineer. Or If the Bank's Engineer shall clarify in writing to the employer that the Auditor.

Date _____ Signature of the tenderer
Place _____ Name and Address

List of clients

(For whom similar scope has been completed in the last 5 years.)

Sr. No.	Details	Name of client (1)	Name of client (2)	Name of client (3)
1	Address, fax and telephone numbers			
2	Establishment name, location and address.			
3	Brief details of the work			
4	Date of award of contract			
5	Date of completion of work			
6	Whether the Establishment is with central air-conditioning system			

Section IV
Terms and Conditions

1. Introduction

Reserve Bank of India is desirous of undertaking Energy audit of the Electrical / Electromechanical installations provided in the office building at Thiruvananthapuram. The office building receives power supply at 11 KV from the Electricity supply authorities. In addition, diesel generator sets of suitable capacities have been installed to meet critical applications during power outages.

2. Objective

a. The objective of energy audit is to have Energy Performance Assessment of equipments and utilities in the electrical sub-station, Electric power distribution network, HVAC systems, Electric motors and drives, Fans and blowers, Water pumping systems, UPS systems, Lighting systems, Diesel generator sets etc. including study of energy consumption pattern and management of power demand in the building .

b. Based on the above observations, to identify opportunities for energy saving and to have recommendations for the same along with cost benefit analysis.

3. Terms & conditions

A. Equipments/measuring instruments

i) All the equipments/instruments required for site measurements for carrying out the energy audit will have to be arranged by the firm without any extra payment to the Bank. The firm should have the following minimum equipments/instruments for energy audit:

1. Three-phase Power analyser
2. Ultra sonic flow meter
3. Pressure gauges
4. Thermometers
5. Anemometers
6. Thermography camera
7. Harmonic analyzer

ii) All testing instruments/meters shall be accompanied with valid calibration certificate.

iii) The site measurements should be recorded in the presence of Bank's personnel.

Please note that the Bank will not provide any kind of assistance in the form of men/material and the firm will have to make their own arrangement for all assistance.

B. Work at site

The firm may visit the premises and ascertain site conditions. The work has to be carried out in a working office building without causing inconvenience to the normal working of the Bank. No power shut down will be provided during office hours. Power shut down required for the work will be given on holidays and after office hours at the discretion of the Bank. No extra claims will be admissible later on these grounds.

The firm should deploy only qualified and experienced Engineers/Technician having requisite licenses to carry out such works. Utmost care shall be exercised by the firm in carrying out the work to ensure that no damage is caused to persons and properties. The Bank will not be liable for any injury or damage to persons and any such happening will be entirely the responsibility of the firm

Scope of Work:

A. **Methodology:**

Energy audit activities shall include the following:

1. **Pre Audit:** Meeting with Bank's technical team, Visual inspection of the site & verification of various documents regarding energy consumption and electrical installation.

2. **Audit:** Auditing and performance analysis to determine the condition of electrical installation as detailed below.

3. Submission of **Draft report to** Bank and discuss the report with Bank's representative.

4. Submission of **Final report** to Bank after incorporating the changes as per discussions with the Bank.

B. **Equipment details**

The energy audit of the electrical / electromechanical installation as detailed in annexure-I shall be conducted. The major list of equipments is as under:

1. Electricity Supply and Distribution
2. Air Conditioning System
3. Air Handling Units
4. Split / Package Air Conditioners
5. UPS
6. Lighting
7. Kitchen Equipment's
8. Water Pumps, Fire Pumps
9. Lifts,
10. DG sets

11. Any other existing electrical system not mentioned above

C. <u>The energy audit of the electrical installation shall cover the following activities</u>:

i) Building Energy Bills Analysis

Analysis of energy consumption pattern in the building with respect to peak demand, load pattern, power factor for the last 3 years

ii) **Electricity Supply and Distribution network- Distribution Transformer(s)**

Study and analysis of the utility pattern of transformer(s), checking no load loss of the transformers, measuring all Day Efficiency for each transformer etc.

LT Distribution Panels

1. General inspection of the LT distribution panel(s) for its maintenance and working including checking all the meters mounted on it.

2. Performing thermography for the cable termination wherever required and analysis of the observations

3. Measurement and analysis of demand and power factor, suggestions to reduce the demand and improve the power factor.

4. Study on Metering system and suggestion for improvement.

5. Study on V, I, KW fluctuation and profiling, V & I imbalances in the network.

6. Detailed examination of the existing energy use of the facility with break up.

7. Study and examination of use of electric energy, cost balance with break up.

8. Performance evaluation of installed capacitors to ensure deliverance of desired output, level of losses, management of system power factor and operation of capacitors.

iii) Air Conditioning Systems- Centralized Air Conditioning System

1. Performance evaluation of existing central air conditioning system(s) in all the areas, measurement and analysis of indoor temperatures and suggest to optimize the energy utilization.

Chillers -

1. Measuring all the operating parameters such as water flow (If the actual flow found to be in variation with the designed flow, the same needs to be adjusted to match designed flow before taking observations) inlet & out water temperatures, gas suctions & discharge pressure, Power Consumption etc. after stabilising the parameters.

2. Calculation of operating Input KW per TR (IKW / TR) of Chiller(s) at minimum three different available load conditions for each chiller.

3. Comparison of actual parameters with the design values, and suggestion for corrective actions to be implemented.

Pumps-

1. Measuring all the operating parameter such as water flow, suction & discharge head, power consumption etc.

2. Performance Evaluation of chilled water & Condenser water pumps and compare the same with the design or generally expected efficiency of such pumps.

Cooling Towers -

1. Measurement of various parameters for cooling tower fans, water flow rate, air flow rate, dry bulb temperature (DBT) wet bulb temperature (WBT) sump temperature, relative humidity etc.

2. Evaluation of cooling tower performance (Range, approach, and effectiveness) and comparing it with designed data.

Air Handling Units

1. Measurement of airflow, Relative Humidity(RH), Supply air temperature (Tsa), Return air temperature (Tra), Chilled Water Inlet and outlet temperature i.e. Tin, Tout through cooling coil and energy consumption of Air Handling Units (AHUs).

2. Examination of Air Handling Units for air delivery capacity, capacity utilization, temperature pattern, pressure drop and operational pattern with respect to time to identify potential energy saving measures.

3. Calculation of actual tonnage of AHUs and measurement of operating zone temperatures under each unit. Comparison of actual parameters with the design values.

Package/ precision Air Conditioners / Split or window air conditioners

1. Evaluation of operating Coefficient of Performance (COP) of Precision and package Air Conditioner. Identification and suggestions for performance improvement and energy saving potential.

2. Calculation of actual tonnage and comparison of actual parameters with the design values and corrective actions.

iv) UPS

1. Measurement and analysis UPS loading, redundancy, operating efficiency, load pattern to suggest measures for energy cost reduction, Measurement and analysis of Harmonics as per standards.

v) Lighting

1. Examination of the · performance of existing lighting system in all the areas, measurement of illumination levels, etc.

2. To look possibilities to reduce energy use by incorporating energy efficient lighting system.

3. Study of operating electrical parameters like voltage, current etc. in the lighting circuits.

vi) Diesel generator sets

1. General Inspection of DG set.

2. The DG sets are to be tested for operational performance and parameters including fuel consumption, power generated, Voltage, Ampere, KW, KWh, KVA should be recorded during the audit.

vii) Kitchen equipments

1. Examination of the performance of the existing kitchen equipments, measurement of power consumption etc. to improve efficiency and optimizing power consumption.

2. To look possibilities to reduce energy use by incorporating energy efficient equipments.

viii) Fire Hydrant Pumps and Domestic water Pumps

1. Performance analysis of all major motors (above 10 HP) needs to be studied for possible energy savings opportunities by the application of following items.

a. Possibility of on /off control

b. Interlocking

c. Downsizing motors etc.

D. Insurance: The Contractor shall at his own expense, arrange to effect and maintain (until the virtual completion of the contract) with an approved office, **workmen compensation policy** in the joint name of employer and himself with the employer being first (Principal) and deposit such policy with the employer during the currency of this contract.

E. Energy Audit Report

The report shall contain complete building information, inventory of all equipments. It should include the log sheet data collected/measured at site, analysis of data (Log sheet and actual measured), observations of operational performance of various equipments, findings and recommendations for achieving energy and cost saving.

The recommended energy saving measures shall be categorized as (i) short term, (ii) medium term and (iii) long term measures for energy conservation. The report should also include energy use indices and comparison with industry averages.

The report should provide the estimated cost, estimated savings and simple pay back for each recommended energy saving measures in a chart. A detailed description of each energy conservation measure and supporting calculation with energy use and savings calculations, economic analysis and any assumptions that are made regarding operation or equipment efficiency shall be included. The recommendations for energy efficiency shall include the technical particulars of the equipment, life expectancy and details of manufacturer etc.

Date:

Place: Seal & Signature of Agency

Annexure –I
Systems

Details of Power Supply:

Sanctioned Load (KVA) 825 KVA

	Capacity (KVA)	Voltage ratio	Type of cooling (oil / air)
Transformer No. 1	630 KVA	11KV/433Volt	ONAN
Transformer No. 2	630 KVA	11KV/433volt	ONAN

Details of Major Power Equipments:

Central A C Plant Data	Capacity (TR)	compressor Motor 1 (KW)	compressor Motor 2 (KW)	Chilled Water Flow	Condenser Water Flow (LPM)
Chiller No. 1	233 TR	102	102	2416	4100
Chiller No. 2	233 TR	102	102	2416	4100

Chilled Water Pumps

	Flow (LPM)	Head (M)	Motor (KW)
Chilled Water Pump 1	2416	30	18.5
Chilled Water Pump 2	2416	30	18.5
Chilled Water Pump 3	2416	30	18.5

Condenser Water Pumps

	Flow (LPM)	Head (M)	Motor (KW)
Condenser Water Pump 1	4100	32	30
Condenser Water Pump 2	4100	32	30
Condenser Water Pump 3	4100	32	30

Cooling Towers

	Capacity (TR)	Flow (LPM)	Motor (KW)
Cooling Tower 1	280	4100	5.5
Cooling Tower 2	280	4100	5.5

AHU Nos	Location	Capacity (TR)	Air Flow (CFM)	Motor (HP)	Areacovered (M2)(Approx.)
1	Vaults	40	16000	15	
2	Claims, sec. kiosk	17.5	7000	5	
3	Police Rest Room	25	10000	7.5	
4a	Banking Hall and cash area	25	10000	7.5	
4b		25	10000	7.5	
5a	Banking Department	25	10000	7.5	
5b	Ombudsman	25	10000	7.5	
6	FIDD	40	16000	15	
7	Issue Department	40	16000	15	
8	Library, DIT, Old Estate	25	10000	7.5	
9	Canteen	25	10000	7.5	
10	Estate,CES	40	16000	15	
11a	HRMD	25	10000	7.5	
11b	RD Secretariat	12.5	5000	5	
12	DNBS Department	40	16000	15	
13	DBS	40	16000	15	
14	Officer's lounge	25	10000	7.5	

Lighting

Internal Lighting – Main Office (Floor wise)

Sr.No.	Floor	Type of Fitting	Wattage	Quantity	Area (sq mtr)
Basement					
	Overnight vault	LED	22 watt	4	36
	Coin vault	LED	40 watt	21	260
		LED	22 watt	3	
	FNV Cage1	LED	40 watt	27	300
		LED	22 watt	5	
	FNV cage2	LED	40 watt	18	260
		LED	22 watt	2	
	CNV Cage1	LED	38 watt	20	260
		LED	22 watt	3	
	CNV cage2	LED	38 watt	19	300
		LED	22 watt	3	
	Vault Passage (F)	LED	22 watt	8	136
	Vault Passage (R)	LED	20 watt	8	45
	Vault Passage (B)	LED	20 watt	10	65
	Vault Passage (L)	LED	20 watt	7	45
	Safety Yard	LED	22 watt	19	288
	Passage (AC Plant)	LED	22 watt	4	45
	Central AC Plant	LED	22 watt	12	210
	Changing Area	LED	22 watt	4	34
	Main Staircase	LED	20 watt	4	20 (Each landing)
	Electrical store	LED	22 watt	3	16

	Electrical Scrap room	LED	40 watt	1	16
	Stationary room	LED	22 watt	2	16
	Record Room I	LED	22 watt	2	25
	Record Room II	LED	22 watt	2	30
	Record Room III	LED	22 watt	2	30
	Briquetting (including panel area)	LED	22 watt	6	59
	Shredding	LED	22 watt	6	54
	AHU Basement	LED	22 watt	6	70
Ground Floor					
	Entrance lobby	LED	6 Watt	4	120
		LED	12 watt	2	
		LED	15 watt	10	
		LED	36 watt	7	
	Tel exchange	LED	22 watt	3	16
	Wiremen room	LED	22 watt	2	20
	IPCCTV server	LED	15 watt	11	27
	IPCCTV monitoring	LED	15 watt	16	37
	Toilet (CCTV Staff)	LED	15 watt	2	3
		LED	10 watt	1	
	IPCCTV passage	LED	15 watt	5	20
	AHU claims	LED	22 watt	2	12
	Mini Auditorium	LED	9 watt	3	
		LED	12 watt	29	
		LED	18 watt	3	
		LED	36 watt	8	
	CVPS Inside	LED	12 watt	12	
		LED	20 watt	7	
		LED	36 watt	10	

	Gents Toilet (CVPS)	LED	6 watt	3	6
	Ladies Toilet (CVPS)	LED	6 watt	2	6
	Passage CVPS	LED	12 watt	5	28
	Passage in front of Bullion lift	LED	12 watt	5	40
	Inspector Passage to cash dept.	LED	12 watt	8	37
	Passage IPCCTV to Cash Dept.	LED	12 watt	5	89
	Passage claims vault to staff entrance)	LED	22 watt	5	24
	CVPS vault	LED	22 watt	12	144
	Gents toilet	LED	22 watt	2	5
	Ladies toilet	LED	12 watt	4	5
	Police guard room	LED	22 watt	16	144
	Toilet	LED	22 watt	3	14
	Police rest room	LED	22 watt	15	144
	Toilet (Rest Room) Police	LED	9 watt	1	5
	Toilet (Rest Room) Police	LED	22 watt	2	5
	AHU Guard Room	LED	22 watt	2	13
	Toilet for basement staff	LED	10 watt	2	10
		LED	15 watt	3	
	Toilet passage	LED	15 watt	3	7
	Staircase(internal)	LED	15 watt	6	18 (Each landing)
	Gents Toilet(inspector)	LED	22 watt	2	10
	Ladies Toilet (cash)	LED	9 watt	5	10
	Gents Toilet (cash)	LED	22 watt	3	10
	Inspector Room	LED	22 watt	2	13
	20 KVA UPS Entrance	LED	22 watt	3	24

	UPS room 20 KVA	LED	22 watt	2	10
	Battery room 20 KVA	LED	22 watt	1	10
	Banking Hall	LED	24 watt	80	720
		LED	36 watt	6	
	Banking Record Room	LED	22 watt	4	20
	S O Toilet	LED	12 watt	2	10
	BH Entrance	LED	24 watt	5	23
	Toilet (Public)	LED	12 watt	4	10
	AHU BH	LED	22 watt	3	35
	Staircase to PAD/DAD	LED	22 watt	2	8
First floor					
	DIT	LED	22 watt	15	216
	DIT Server Room	LED	36 watt	8	
	Computer Lab	LED	12 watt	12	162
	Old Estate	LED	6 watt	2	20
		LED	12 watt	5	
		LED	20 watt	36	
	Old Estate	LED	5 watt	3	15
	Changing room 1 Ladies	LED	22 watt	4	25
	Changing room 2 (Outsourced staff ladies)	LED	22 watt	2	8
	RBIOA	TL	36 watt	2	
	Society vault	TL	40 watt	2	8
	Officers association (AIRBOA)	LED	15 watt	2	16
	Library	LED	20 watt	13	130
	Caretaker	LED	12 watt	5	28

	Issue+FIDD	LED	6 watt	15	700
		LED	15 watt	92	
		LED	36 watt	45	
	GM Issue	LED	15 watt	6	20
		LED	36 watt	2	
	DGM issue	LED	15 watt	5	20
		LED	36 watt	1	
	Banking Dept.	LED	15 watt	38	432
		LED	36 watt	22	
	Banking and OBO Passage	LED	15 watt	13	18
			20 watt	2	
		LED	36 watt	2	
	Banking and OBO Gents toilet	LED	6 watt	2	18
		LED	20 watt	2	
		LED	36 watt	2	
	Banking and OBO Ladies toilet	LED	6 watt	2	6
		LED	10 watt	1	
	BO Cabin	LED	15 watt	8	30
			36 watt	2	
	Toilet	LED	15 watt	3	10
			10 watt	1	
	Secretary BO	LED	12 watt	4	15
			36 watt	1	
	BO Section	LED	15 watt	41	20
			36 watt	12	
	BO Conference	LED	15 watt	6	30
			36 watt	3	
	Court yard passage	LED	12 watt	12	225
	Lift lobby	LED	12 watt	8	36

		Fancy Light	60 watt	1	
	Staff toilet	LED	10 watt	2	26
		LED	12 watt	3	
		LED	18 watt	1	
		LED	24 watt	2	
	Officers toilet	LED	10 watt	1	13
		LED	15 watt	3	
		LED	24 watt	1	
	Ladies toilet	LED	15 watt	3	13
		LED	20 watt	1	
		LED	24 watt	1	
	Rear side passage	LED	15 watt	5	32
	Toilet passage	LED	12 watt	2	10
		LED	18 watt	5	
	AHU FIDD	LED	20 watt	2	24
	AHU Issue	LED	20 watt	2	24
Second Floor					
	Estate	LED	6 watt	5	112
		LED	15 watt	7	
		LED	36 watt	10	
	Record room	LED	36 watt	4	10
	Meeting Room	LED	15 watt	4	
		LED	36 watt	1	
	Establishment	LED	6 watt	8	260
		LED	15 watt	31	
		LED	24 watt	1	
		LED	36 watt	14	
	HRMD	LED	15 watt	72	275

		LED	36 watt	28	
	AGM (Personnel)	LED	15 watt	4	13
		LED	24 watt	1	
	Record room	LED	20 watt	2	16
	RD's cabin	LED	6 watt	8	50
		LED	12 watt	14	
		LED	50 watt	1	
		LED	60 watt	1	
	RD's secretariat				20
		LED	9 watt	1	
		LED	30 watt	1	
	Visitors area	LED	6 watt	4	20
		LED	12 watt	4	
		LED	15 watt	5	
		LED	60 watt	1	
	RD's lounge	LED	15 watt	1	12
		LED	20 watt	8	
	RD's Toilet + Storeroom	LED	12watt	5	8
			15watt	2	
			20 watt	1	
	GM (DOS)-1	LED	3 watt	3	20
		LED	15 watt	9	
		LED	36 watt	2	
	DGM (DOS)-1	LED	15 watt	12	16
	GM (DOS)-2	LED	15 Watt	6	20
	DGM (DOS) - 2	LED	15 Watt	9	18

	DOS Conference Hall	LED	15 watt	6	
		LED	36 watt	2	
	DOS section	LED	9 Watt	5	575
		LED	12 Watt	5	
		LED	15 watt	115	
			36 watt	47	
	DGM cabin (DOS-3)	LED	15 Watt	12	20
	DGM cabin (DOS-4)	LED	15 Watt	12	20
	DGM cabin (DOS-5)	LED	15 Watt	12	20
	Switch room	LED	12 watt	3	9
	Record room	LED	15 watt	6	16
			36 watt	2	
	Toilet (1)	LED	6 watt	3	26
			12 watt	4	
			20 watt	2	
	Toilet (2)	LED	15 watt	4	13
			24 watt	1	
	Toilet (L)	LED	20 watt	3	13
	Toilet passage	LED	18 watt 12 watt	5 2	10
	Passage courtyard	LED	15 watt	10	225
	Rear side passage	LED	15 watt	5	32
	Lift lobby	LED	6 watt	6	36
			9 watt	10	
	AHU Estate	LED	20 watt	2	24
	AHU HRMD	LED	20 watt	2	24
	AHU DOS-1	LED	20 watt	4	24
	AHU DOS-2	LED	20 watt	4	24

Third Floor

	Training hall	LED	12 watt	9	72
		LED	20 watt	6	
		LED	36 watt	2	
	VC room	LED	9 watt	22	37
			15 watt	10	
		LED	18 watt	8	
	Executive lounge	LED	11 watt	35	54
		Fancy Light	40 watt	2	
	VIP dining	LED	15 watt	14	40
	Officers lounge	LED	15 watt	2	110
		LED	24 watt	15	
		Fancy Light	40 watt	5	
	Kitchen	LED	22 watt	4	40
	Gov. cabin	LED	9 watt	5	36
		LED	15 watt	9	
		LED	80 watt	2	
	Cabin 1	LED	6 watt	1	20
		LED	12 watt	2	
		LED	40 watt	1	
	Cabin 2	LED	6 watt	1	18
		LED	12 watt	2	
		LED	40 watt	1	
	Cabin 3	LED	9 watt	2	18
		LED	12 watt	2	
		LED	25 watt	2	

	Cabin 4	LED	9 watt	2	18
		LED	12 watt	2	
		LED	25 watt	2	
	Cabin 5	LED	15 watt	2	18
	Executive Lobby	LED	6watt	16	70
			12 watt	10	
		LED	15 watt	3	
			20 watt	4	
		Fancy light	10 watt	5	
	Store room	TL	40 watt	4	50
	Court yard passage	LED	12 watt	24	225
	Board Room	LED	15 watt	35	65
		LED	40 watt	16	
	Passage	LED	9 watt	2	30
		LED	12 watt	18	
		LED	40 watt	1	
	Lift lobby	LED	6 watt	6	36
		LED	15 watt	17	
		LED	20 watt	2	
	AHU officers lounge	TL	22 watt	1	11
	Board Room Toilet Gents	LED	6 watt	6	
		LED	20 watt	1	
	Board Room Toilet Ladies	LED	6 watt	4	
		LED	10 watt	1	
	Toilet Exec. Gents	LED	6 watt	4	10
	Toilet Staff	LED	36 watt 20 watt	2 1	14
	Toilet Exec. Ladies	LED	6 watt	3	10

Internal Lighting – Annex Office (Floor wise)

Sr.No.	Floor	Type of Fitting	Wattage	Quantity	Area
Ground Floor					
	Car parking	LED	12 Watt	12	432
	UPS Room (100 KVA)	LED	20 watt	2	12
	Battery room (100 KVA)	LED	20 watt	2	14
	Gardener	LED	20 watt	1	4
	Fire staff	LED	20 watt	1	6
	RD parking	LED	22 watt	1	22
	VIP parking	LED	22 watt	1	22
First Floor					
	Recreation Club Store	LED	12 watt	2	
	Recreation club	LED	15 watt	16	144
		Fancy Strip		14	
	Recreation Conf Hall	LED	24 watt	6	26
		LED	12 Watt	2	
	Association office	LED	36 watt	2	28
		LED	12 watt	10	
	Union office	LED	36 watt	2	35
		LED	12 watt	9	
	Society	LED	36 watt	4	80
		LED	12 watt	10	
		TL	40 watt	2	
	Ladies Toilet	LED	15 watt	6	20

		LED	10 watt	2	
	Gents Toilet	LED	6 watt	2	20
			10 watt	2	
			15 watt	3	
	BMO	LED	15 watt	4	9
		LED	36 watt	1	
	Dispensary waiting	LED	15 watt	8	12
	Pharmacist	LED	15 watt	4	21
		LED	20Watt	1	
		LED	36 watt	1	
	Toilet	LED	10 Watt	1	1.5
	Gym	LED	22 watt	6	40
	Passage	LED	22 watt	4	220
Second Floor					
	Canteen	LED	6 watt	7	432
		LED	9 watt	5	
		LED	12 watt	34	
		LED	20 watt	31	
		LED	24 watt	4	
	Kitchen	LED	38 watt	10	56
		LED	22 watt	2	
	Canteen passage	LED	12 watt	6	28
		LED	20 watt	1	
	Ambedkar Library	LED	12 watt	3	
		LED	15 watt	4	
	AHU	LED	22 watt	1	16
	OBC association	LED	18 watt	2	16
	Canteen Inside Rooms	LED	12 watt	12	

Third Floor					
	Creche	LED	7 watt	2	
		LED	9 watt	4	
		LED	10 watt	3	
		LED	20 watt	9	50
	Quarters for officers (occupied-1no) SRA 1	LED	20 watt	5	80
	Quarters for officers (occupied-1no) SRA 2	LED	20 watt	5	80
	Quarters for officers (occupied-1no) SRA 3	LED	20 watt	5	80
	Quarters for officers (occupied-1no) SRA 4	LED	20 watt	5	80
	Quarters for officers (occupied-1no) SRA 5	LED	20 watt	5	80
	Quarters for officers (occupied-1no) SRA 6	LED	20 watt	5	80
	Quarters for officers (occupied-1no) SRA 7	LED	20 watt	5	80
	Staircase (both)	LED	12 watt	18	10 (each landing)
	Lift Entrance	LED	12 watt	4	

Internal Lightening –substation/ Two level parking/Information center

Sr.No.	Floor	Type of Fitting	Wattage	Quantity	Area sq mm
Ground Floor					
	Substation	LED	20Watt	7	80

	Drinking water pump	LED	20 watt	2	15
	Fire pump room	LED	20 watt	2	15
	Two wheeler parking	LED	20 watt	5	162
	Generator Room	LED	36 watt	7	72
		LED	20 watt	1	
	CISF	LED	24 watt	4	36
	Sec guard rest room	LED	20 watt	3	18
	Passage	LED	12 watt	1	4
	Staircase	LED	12 watt	4	18
	Toilet Gents	LED	20 watt	4	
First floor					
	Two wheeler parking	LED	20 watt	12	216
	Information Centre	**LED**	**9 W**	**7**	**25**
		LED	**36 W**	**3**	
		CFL	**11 W**	**4**	
	Main Gate	LED	5 watt 9 watt	4 1	6
	Rain Water Pump	LED	20 watt	3	

External Lighting

Sr.No.	Location	Type of Fitting	Wattage	Quantity	Total ground area covered(M2)
1	Street Light	LED	150 W	20	peripheral light
2	Street Light	LED	50W	2	peripheral light

Lifts

Lifts No.	Location	Make	Passenger Capacity	Speed (M/S)	No. of floors served	Whether controller V3F or not
1	MOB	Johnson	8 passengers	1	4(Gr+3)	Yes
2	MOB	Johnson	8passengers	1	4(Gr+3)	Yes
3	MOB	Johnson	8 passengers	1	4(Gr+3)	Yes
4	MOB	Otis	2000 kg	0.6	4	Yes

Standalone A. C. units where central AC is also provided (Area wise)-Main Office

Sr. No.	Location	Type of A.C.	Quantity	Capacity of each A.C.(TR)	Area covered (M2)	Expected per day operation hours
	Basement					
	Briquetting panel	Split AC	1 no	1.5TR	6	8hrs
	Shredding room	Split AC	2 no	2.0TR	54	8hrs
	Record Room	Split AC	3 no	2.0TR		
1	Ground Floor					
	CCTV room (Existing)	Split A.C.	2 Nos.	2.0TR	40	alternate
	Telephone Exchange	Split AC	2 Nos	1.5 TR	16	Alternate
	CVPS	Split AC	3 nos	11TR	180	8hrs
	Mini Auditorium	Split AC	5 Nos	2.0TR	10	8hrs
	20KVA UPS room	Split AC	2	1.5TR	12	alternate
	20 KVA battery room	Split AC	1	1.5TR		8hrs
	Inspector Room	Split AC	1	2.0TR	14	8hrs
	IPCCTV server	Precision	2Nos	3.5TR	25	alternate
	IPCCTV Monitoring	Split AC	2Nos	2.0TR	37	alternate
	Claims	Split AC	2 nos	1.5 TR		
	Claims Switch Room	Split AC	2 nos	1.0TR		
	Main Entrance	Split AC	3 nos	2.0TR		
2	First Floor					
	GM issue	Split A.C	1 no	1.5TR	20	8hrs
	Computer lab	Cassette AC	2nos	2.0TR	60	8hrs

	DGM Issue	Split A.C	1 nos	2.0TR	20	8hrs
	DIT Server	Split A.C	1 nos	1.5TR	42	alternate
	DIT Server	Tower AC	1 nos	3.0TR	42	alternate
	DIT Server	Precision	2	10 TR	42	
	AIRBOA	Split AC	1 nos	1.0TR		
	RBIOA	Split AC	1 nos	1.5TR		
	Issue Switch Room	Split AC	2 nos	1.0TR		
	DGM FIDD	Split AC	1 nos	1.5TR		
	Banking Dept	Tower AC	2 nos	3.0TR		
	BO Conference	Tower AC	1 nos	3.0TR	30	During meeting
	BO DGM	Split AC	1 no	1.5TR	15	8hrs
	BO cabin	Split AC	1 no	2.0TR	30	8hrs
	DGM DCB	Split AC	1 no	1.5TR	20	8hrs
	Banking conference hall	Split AC	2 no	2.0TR	16	8hrs
	DGM Banking	Split AC	1 no	1.5TR	16	8hrs
3	Second Floor					
	GM DOS	Split A.C.	1	1.5TR	20	8 hrs.
	DGM DNBS	Split AC	1	1.5TR	18	8hrs
	GM DBS	Split AC	1	1.5TR	20	8hrs
	DGM DBS	Split A.C.	1	1.5TR	16	8 hrs.
	DBS switch room	Split ac	2	1.0TR	9	alternate
	RD Rest Room (New)	Split A.C	1	2.0 TR	50	8hrs
	PS to RD (New)	Split A.C	1	2.0 TR	20	8hrs
	DGM HRMD	Split A.C	1	2.0TR	20	8hrs
	Auditors Room	Split AC	1	1.5TR	12	8hrs
4	Third Floor					

	Training hall	Split AC	5	2.0 TR	72	During training
	Board Room	Ductable AC	3	8.5TR	68	During meeting
		Ductable AC	1	5.5 Tr		
	Executive Lobby	Split AC Cassette AC	2 2	1.5 TR 1.5 TR	70	During meeting
	Executive Lounge	Cassette AC	1	3.0TR		
	Officer's Lounge	Cassette AC	2	3.0TR		
	VC Room	Split AC	2	1.5TR		
	Executive Lounge inside room	Split Ac	2	1.5TR		

Standalone A. C. units -Annex Building

Sr. No.	Location	Type of A.C.	Quantity	Capacity of each A.C.(TR)	Area covered (M2)	Expected per day operation hours
1	Ground Floor					
	100 KVA UPS room	Split AC	2	1.5TR	12	24x7 (timer) alternate
	100 KVA Battery room	Split	2	1.5TR	14	24x7(timer) alternate
2	First floor					
	Association office	Split AC	1	1.5 TR	28	8 hrs
	Union office	Split AC	1	1.5TR	35	8hsr
	Society	Split A.C	2	1.5TR	80	8hrs
	Recreation office Conf Hall	Split AC Split AC	2 1	1.5TR 1.5 TR	26	During meeting
	BMO	Split AC	1	1.5 TR	9	8hrs
	Pharmacist	Split AC	1	1.5TR	21	8hrs
	Ambedkar Library	Split AC	1	1.5TR	24	8hrs
3	Second Floor					
	OBC association	Split ac	1	1.0 TR	16	8hrs
	Ladies Rest Room	Split AC	1	2.0TR		
	Pharmacy Waiting Area	Split AC	1	1.5TR		
4	Third Floor					
	Creche SRA1	Split AC	4	1.5 TR		
	SRA2	Split AC	1	1.5 TR		
	SRA3	Split AC	1	1.5 TR		
	SRA4	Split AC	1	1.5 TR		

	SRA5	Split AC	1	1.5 TR		
	SRA6	Split AC	1	1.5 TR		
	SRA7	Split AC	1	1.5 TR		
	SRA8	Split AC	1	1.5 TR		

Standalone A. C. units where central AC is not provided (Area wise)

Sr. No.	Location	Type of AC (window / split / package etc.)	Qty	Capacity of each AC (TR)	Area catered (M2)	Expected per day operating hours
1	Inf. center	Split AC	2	1.5TR	25	8 hrs.

DG Sets

	Location	Make	Rating (KVA)
DG SET No. 1	DG Set room	Kirloskar	320 KVA
DG SET No.2	DG Set room	Kirloskar	320 KVA

Special Equipment viz. Shredding & Briquetting Machine, CVPS Machine etc.

Sr. No.	Name of the machine	Make	Power Rating of each machine (KW)	Expected operating hours per day
1	CVPS (3 Nos.)	GND	4 KW	8 hrs.
2	Briquetting Machiine	Kusters	37 KW	8 hrs.
3	Shredding Machine	Kusters	14 KW	8 hrs.

UPS Details

Sr. No.	Location	Make	Capacity (KVA)
1	Annexe Building centralized UPS	Power One	2x100KVA

2	Ground floor	Power One	2x 20 KVA

Annexure-II

Performance Evaluation of Main Equipments-Sample Formats

Central AC Plant

Chiller No. ---

Sr.No.	Chilled Water Inlet Temp. Tintc	Chilled Water Outlet Temp. Tintc	Chilled Water Flow (LPM)	Suction Pressure	Discharge Pressure	Input Power (KW)	IKW/TR	Comments/ Remarks/ Suggestions
1	16.2	11.5	2416			143.6	233TR	
2	16.2	14.1	2416			143.6	233TR	

Capacity of the Chiller (TR) = (Tin -Tout)*Water Flow rate (LPM)*G0/3024

Efficiency of Chiller in KW/TR =Total Power input (in KW)/Total Tonnage

Air Handling Units

Air Handling Unit (AHU) No. 17 nos

	Return / Inlet Air		Supply / outlet Air						
Sr. No.	Dry Bulb Temp. Tdb (OC)	Wet Bulb Temp. Twb (OC)	Dry Bulb Temp. Tdb (OC)	Wet Bulb Temp. Twb (OC)	Air Flow (CFM)	Tons of Refrigeration (TR)	Input KW	IKW/ TR	Remarks/ Comments/ Suggestions

AHU TR = 1.699*Air Flow (CFM)* Density of Air (Kg/M3)*(Hin-Hout)/ (4.18*3024)

Where:

Hin = Enthalpy of inlet Air at AHU (KJIKg) Enthalpy of outlet Air from AHU

Hout = (KJIKg)

Density of Air= 1.18 KgiM3 at standard Temperature and Pressure

Note: Enthalpy is to be read from Psychometric Chart corresponding to DB and WB Temp.

Chilled Water Pumps

Chilled Water Pump No. 3 nos

Sr. No.	Discharge Pressure (Pdisc) Kg/cm2	Suction Pressure (Psuc) Kg/cm2	Chilled Water Flow (LPM)	Developed Hydraulic Power (KW)	Measured Input Power (KW)	Pump efficiency	Remarks / Comments / Suggestions

Developed Hydraulic Power (KW) = Flow (LPM) * (Pdisc-Psuc) Kg/cm2 ***9.81/6000**

Pump Efficiency =_Developed Hydraulic Power (KW)/Input Electric KW

Condenser Water Pump

Condenser Water Pump No. _

Sr. No.	Discharge Pressure (Pdisc) Kg/cm2	Suction Pressure (Psuc) Kg/cm2	Condenser Water Flow (LPM)	Developed Hydraulic Power (KW)	Measured Input Power (KW)	>. *Cl...(.)* E a3 o:::.:l..':(	Remarks/ Comments/ Suggestions

Developed Hydraulic Power (KW)= Flow (LPM)*(Pdisc-Psuc)*9.81/6000

Pump Efficiency =_Developed Hydraulic Power (KW)/Input Electric KW

COOLING TOWER- 2 nos

Sr. No.	Water inlet Temp. (TintC	Water outlet Temp. (TouttC	Water Flow (LPM)	Wet Bulb Temp. Twb *CC)*	Cooling Tower Capacity (TR)	Cooling Tower Efficiency	IKW/ TR	Remarks/ Comments/ Suggestions

Range= Tin-Tout Approach= Tout- Twb

Cooling Tower Efficiency = Range*100/ (Range + Approach)

Cooling Tower Capacity (TR) = (**Tin -Tout)*Water Flow (LPM)*S0/3024**

Internal Lighting (Floor wise)

Sr. No.	Floor	Type of fitting	Calculated Wattage per Fitting	Qty	Total Wattage (KW)	Total carpet area covered (M2)	Light Power Density (W/M2)	Measured Average Light Level (Lux)	Light Efficiency (Lux/LPD)

DG set

1. Run the DG set at available load

2. The initial and final reading of the diesel tank and Energy meter needs to be recorded.

Sr. No.	Rating of DG set (KVA)	Make of DG set	Start Time	Stop Time	Period of Operation (Hrs.)	Diesel Consumed (Ltrs.)	Generated Energy (KWH)	Specific fuel Consumption (KWH/Ltr)	Remark /Observation
1 2	320 KVA 320 KVA	Kirloskar Kirloskar							

UPS

1. Measurement on each UPS needs to be recorded

Sr. No.	Rating of UPS (KVA)	Make of UPS	Input Voltage			Input Current			Total current Harmonic Distortion THDi	Total Voltage Harmonic Distortion THDv	Remarks
			Vrn	Vyn	Vbn	Ir	Iy	Ib			
1 2	100KVA x 2 20KVA x 2	Power one									

LT Panels: LT Panels at Substation including capacitor

Panel Name:

Sr. No.	Input Voltage			Input Current			Input KW	Input KVA	P.F.	Total current Harmonic Distortion THDi	Total Voltage Harmonic Distortion THDv	Remarks
	Vrn	Vyn	Vbn	Ir	Iy	Ib						

Place: _____

Date: _____

Seal and signature of

the auditor

REPORT ON
ENERGY AUDIT OF BANK'S OFFICE BUILDING
at
Thiruvananthapuram

Summary of Recommendations

Remarks

Reserve Bank of India
Estate Department
Thiruvananthapuram

Bill of Quantity

Name of Work: Tender for Conducting Energy Audit of Bank's Office Building at Thiruvananthapuram

Sr No	Description	Qty	Rate excluding service tax (Rs.)	Service tax as applicable (Rs.)	Total Rate = (4)+(5) (Rs.)
(1)	(2)	(3)	(4)	(5)	(6)
1	Rate for conducting Energy Audit and Submitting Energy Audit Reports as per the scope specified in the tender.	L.S.			

Place: Seal and Signature of the contractor

Date: