Report of Green and Energy Audits

Submitted to

BHARAT INSTITUTE OF ENGINEERING AND TECHNOLOGY, HYDERABAD – 501 510, TELANGANA, INDIA

Date of Audit: 24.09.2022
Valid Till : 23.09.2025

Regd. No. 114 / 2017

Submitted by

NATURE SCIENCE FOUNDATION

(A Unique Research and Development Centre for Society Improvement)
[ISO Certified and Ministry of MSME Registered Organization]
No. 2669, LIG-II, Gandhi Managar, Peelamedu
Coimbatore 641 004, Tamil Nadu, India
Phone: 0422 2510006, Mobile: 9566777255, 9566777258
Email: director@nsfonl

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NATURE SCIENCE FOUNDATION

(A Unique Research and Development Centre for Society Improvement)
ISO 9001:2015, 14001:2015, 45001:2018 & 50001:2018 Certified and Ministry of MSME Registered Organization
No. 2669, LIG - II, Ganesh Nagar, Peelamedu, Coimbatore - 641 004, Tamil Nadu, India.
Email : directornsf@gmail.com, director@nsfonline.org.in, Website : www.nsfonline.org.in
Office : 0422 - 2510006, Mobile : 95667 77255, 95667 77258.

Dr. S. RAJALAKSHMI, M.B.A., Ph.D., FNSF.,
Chairman

Mr. P. KANAGARAJ, FNSF.,
Secretary

Certificate of Declaration

The **Office of Nature Science Foundation**, Coimbatore, Tamil Nadu declare that

1. Nature Science Foundation has conducted onsite green audit at ***Bharat institute of Engineering and Technology, Hyderabad – 501 510, Telangana, India*** by deputing certified Lead Auditors and Technical Experts.
2. On the basis of audit observations by the auditors and pertinent data collected from the Auditee, the Technical Report has been prepared and being submitted.
3. Data presented in the Technical Report are verified and to best of our knowledge, the data are authentic and reliable.
4. Nature Science Foundation declares that data generated were not shared with any third parties and the soft copy of the report is available with Nature Science Foundation's Office.
5. Provided the Auditee desired to publish or share the data with other agencies, Nature Science Foundation has no conflict of interest.

Date:
Place:

Authorized Signatory
Nature Science Foundation

Signature of the Director
NSF Audit Processes

CONTENTS

1. GENERAL INTRODUCTION

1.1. Introduction

Green campus is an area of the Organization or the Organization as a whole itself contributing to have an infrastructure or development that is structured/planned to incur less energy, less water, less or no CO_2 emission and less or pollution free environment. Green Audit is a tool to evaluate environment management system which is systematically executed to protect and preserve the environment. Green audit constitutes the environmental friendly practices and education combined to promote sustenance of green environment by adopting user-friendly technology within the campus. It creates awareness on environmental ethics, resolves environmental issuesand offers solutions to various social and economic needs. It strengthens the concept of 'Green Building' and 'Oxygenated Building' which in turn provides a healthy atmosphere to the stakeholders.

1.2. Importance of National Building Code (NBC)

National Building Code (NBC) of India has a set of rules and guidelines that regulates construction of buildings and as well as ecofriendly activities of the campus without harming the environment. In order to achieve the minimum standards of welfare and safety of stakeholders of a campus, the Governing body of Central and State Governments lays down a set of guidelines to offer sustainable environment. In 1970, the National Building Code (NBC) was first published in India and the significant provisions of the Indian Building Code involve: 1. Structural safety of the building, 2. Earthquake-resistant building design, 3. Fire and life safety, 4. Solid waste management, 5. Accessibility for differently-abled and senior citizens, 6. Use of alternative building techniques and 7. Environmentally compatible building construction techniques like the use of solar power, rainwater harvesting, etc.

NBC is not only offer a standard uniform benchmark that constructors and environmentalists must meet, but they also establish safety standards along with ecofriendly atmosphere of a campus for years to come. As extreme weather conditions and fires are growing rapidly in the country, it becomes vital that buildings and structures be built and designed using the current building codes to allow for maximum safety sustainability and resilience to the stakeholders. For instance, new and updated building codes put much emphasis on conservation as energy and the degradable and non-degradable wastes are the most expensive byproduct of older regions. This will not only offer environmental benefits to future generations but will also regulate indoor air pollution and greenhouse gas emissions to protect the health of human beings.

Before the introduction of NBC in the construction industry, building commercial and residential properties used a lot of energy which adversely affected the sustainable environment. Thus, enforcing building codes to create low-energy buildings offers a tangible way for the company to help decrease the greenhouse gas emissions of the nation. While safety is the primary objective, new building codes are making significant contributions toward solving energy issues relating to the use of environmentally compatible construction techniques like planting trees, landscaping, rainwater harvesting and renewable and non-renewable energy sources.

1.3. Environment Friendly Campus

As stated earlier, Organization is liable to provide an eco-friendly atmosphere along with good quality of drinking water facility to all the stakeholders. Manuring the cultivated plants/grown within the campus may applied with organic manure, cow dung, farmyard manure and vermicompost instead of using chemical fertilizers. All non-compostable and single-use disposable plastic items, plastic utensils, plastic straws and stirrers should be avoided. Demonstration / awareness programme on establishing plastic-free environment and utility of organic alternatives for all incoming and current students, staff and faculty should be organized. Reduction of use of papers alternated with e-services, e-circulars, etc., and proper disposal of wastes, recycling and suitable waste management system should be considered to establish environment friendly campus.

The term 'auditing' is to examine the management practices and to evaluate performance of an organization in relation to environmental issues. World along with Associated Chambers of Commerce and Industry of India (ASSOCHAM), Green Building Council (IGBC) and Green Ratings Systems (GBCRS), Green Rating for Integrated Habitat Assessment (GRIHA), Bureau of Energy Efficiency(BEE), Leadership in Energy and Environmental Design (LEED), CII-GreenCo –GreenCo Rating System (CII-GRS), Food Safety Management System & OccupationalSafety & Health (FSMS), Swatch Bharath under India Clean Mission (SBICM) and International Standard Organization (ISO 2021) have formulated a series of standards in the field of environmental auditing. These standards are basically intended to guide organizations and auditors on the general principles common to the execution of environmental audits.

Green Audit (ISO/IEC 17020:2012) comprised green campus, environment, energy, waste management (solid, liquid, municipal sewage, biomedical, plastic and electronic wastes), water, soil, air quality and hygienic audits are playing important role in Academic Institutions, R&D Organizations and Industries towards the accreditation process as well as maintaining a hygienic eco-friendly environment to the stakeholders in their campus. All audits will be conducted as per the Government Law and Environmental and the concept of Swachh Bharath Abhiyan under Clean India Mission.

1.4. About Nature Science Foundation (NSF)

NSF is the ISO QMS (9001:2015), EMS (14001:2015), OHSMS (45001:2018) & EnMS (50001:2018) Certified and registered with Ministry of Micro, Small and Medium Enterprise (MSME), Government of India Organization functioning energetically towards the noble cause of nature conservation and environmental protection. NSF is managed by a Board of Trustees which is a Public Charitable Trust registered under the TN Societies registration Act 1975 (TN Act 27 of 1975) on 29th November, 2017 at Peelamedu, Coimbatore 641 004, Tamil Nadu, India with Certificate of Registration No. 114 / 2017. In addition, NSF has 12AA, 80G and Form 10AC certificates for income tax exemption and implanting various Government schemes. The main motto of the NSF is 'Save the Nature to Save the Future' and 'Go Green to Save the Planet'.

1.5. About the Organization

Bharat Institute of Engineering & Technology (BIET), established in 2001 by Chinta Reddy Madhusudhan Reddy Educational Society (CHMR) under the leadership of Sri Ch. Venugopal Reddy, an eminent educationist with a social conscience and commitment. It has grown in its size and stature over the years, from an initial intake of 240 to 1350 students. BIET is one of the largest Engineering Colleges in Telangana. It offers 10 B.Tech programs, 8 M.Tech programs and 1 MBA program. With consistent and excellent academic performance of students in the University examinations, the Institute has endeared itself to many students and parents. Bharat Institute of Engineering & Technology (BIET) boasts of well experienced and highly qualified faculty, State-of-the-art Infrastructure, regular placements and well equipped laboratories.

Vision

To achieve the autonomous and university status and spread universal education by inculating discipline, character and knowledge into the young minds and mould them into enlightened citizens.

Mission

- To impart adequate fundamental knowledge in all basic sciences and engineering, technical and Inter-personal skills to students.
- To bring out creativity in students that would promote innovation, research and entrepreneurship.
- To Preserve and promote cultural heritage, humanistic and spiritual values promoting peace and harmony in society.

1.6. Audit Team Details

1. Date of Audit	**:**	**24.09.2022**
2. Audit Site	**:**	**Bharat institute of Engineering and Technology, Hyderabad – 501 510, Telangana, India.**
3. Inspection Body	**:**	**Nature Science Foundation** Coimbatore, Tamil Nadu, India.
4. Audit Scope	**:**	**Green, Environment and Energy Audits**
5. Name of the Auditing Chairman	**:**	**Dr. S. Rajalakshmi** ISO QMS, EMS and EnMS Certified Lead Auditor, Founder & Chairman of NSF.
6. Name of the Auditing Team Leader	**:**	**Ms. V. Sri Santhya** ISO QMS, EMS and EnMS Certified Lead Auditor, Assistant Director & Programme Manager, NSF.
7. Name of the Lead Auditor for Green Audit	**:**	**Dr. R. Mary Josephine** ISO EMS and EnMS Certified Lead Auditor.
8. Name of the Lead Auditor for Environment Audit	**:**	**Ar. N. M. Pradeep Kumar** ISO EMS and IGBC Certified Lead Auditor.
9. Name of the Lead Auditor for Energy Audit	**:**	**Er. A. Karthick** Bureau of Energy Efficiency Certified Auditor.

1.6.1. Audit Scope and Criteria

Green audits are conducted in line with National Building Code (NBC) Part 11 Approach to Sustainability as per the NAAC and NABCB advisory. NBC part 11 consists of 11 different types of clauses. In this report the eleven clauses of sustainability are differentiated into Green, Environment, Energy, Waste Management, Soil & Water, Air Quality and Hygiene audits.

S.No.	Name of the Audits	NBC covered clauses
1.	Green Audit	3. Approach to Sustainability (3.2 & 3.9), 6. Siting, Form and Design (6.2.4.), 7. External Development and Landscape (7.1.1.), 12. Constructional Practices (12.4.5. & 12.4.6.)
2.	Environment Audit	3. Approach to Sustainability (3.2, 3.7, 3.10 & 3.11), 4. Applicability of this part (4.1 and 4.2), 5. Implementation of this part (5), 6. Siting, Form and Design (6.2.1.), 7. External Development and Landscape (7.1.2, 7.2, 7.3, 7.4.), 9. Materials (9.1, 9.2, 9.3), 10. Water and Waste Management (10.1.), 12. Construction Practices (12.8. and 12.11.)
3.	Energy Audit	3. Approach to Sustainability (3.2, 3.5, 3.6 & 3.8), 6. Siting, Form and Design (6.2.2, 6.2.3, 6.2.5, 6.2.6, 6.2.7, 6.2.8, 6.2.9 & 6.2.10), 7. External Development and Landscape (7.5.), 8. Envelope Optimization (8.1, 8.2. & 8.3), 11. Building service Optimization (11.1 – 11.16), 12. Constructional Practices (12.3.4, 12.4.4 & 12.9.), 13. Commissioning, Operation, Maintenance and Building Performance Tracking (13.1, 13.2, 13.3, 13.4, 13.5 & 13.6.)
4.	Waste Management Audit	3. Approach to Sustainability (3.3 & 3.4), 10. Water and Waste Management (10.6.1. – 10.6.5.), 12. Construction Practices (12.1, 12.2, 12.3, 12.5, 12.7, 12.10.)
5.	Soil & Water Audit	7. External Development and Landscape (7.3.2), 10. Water and Waste Management (10.2. – 10.5.), 12. Construction Practices (12.4.1. and 12.4.2.)
6.	Air Quality Audit	12. Construction Practices (12.4.3.)
7.	Hygiene Audit	12. Construction Practices (12.3.6 & 12.3.7.)

1.6.2. Audit Checklist Observations

The audit checklist in line with National Building Code (NBC) Part 11 – Approach to Sustainability covers 163 checkpoints. During the onsite visit, respective auditors marks not applicable and write the reason for non-applicability and wherever its applicable, auditors verifies the records / practice / documents and physical observation to confirm the same.

There are two parameters such as meeting the requirements and not meeting the requirements. Marking as meeting the requirements for the specific checkpoint reveals that the physical observation and documents are up to the mark. For some checkpoints OFI – Opportunity for Improvements will be given by the auditors. The physical observations and documents which are not up to the mark will be given as not meeting the requirements. The checkpoints under not meeting the requirements are up to the Management of the Organization to develop further.

1.7. List of Instruments used in the Inspection Process

During the on-site visit the below listed instruments are used by the Lead Auditors and Technical experts to check the specific parameters in the view of maintaining sustainability. All the instruments are calibrated by ISO 17025 accredited labs (JRTS Technical Services, Chennai, Tamil Nadu and Instruments Calibration and Test Centre, Coimbatore, TN). The frequency of calibration is six months once or 20 times after its use.

1.7.1. Oxygen Meter

Oxygen meter is used in the audit process to measure the oxygen level in the organization. The instrument is calibrated after using 20 times. Suitability of the instrument are range between 0 to 30% O_2, resolution of 0.1%, accuracy is ± (1% reading + 0.2% O_2), response time is ≤ 15 seconds, environment pressure range is 0.9 to 1.1 atmosphere, temperature range is 0 °C to 50°C, 32°F to 122°F, temperature resolution is 0.1°C, temperature accuracy is 25°C.

1.7.2. Carbon dioxide meter

Carbon dioxide meter is to measure the carbon level in the organization. The instrument is calibrated after using 20 times. Suitability of the instrument are range between 0 ~ 4000 ppm, resolution of CO_2 Meter is 1 ppm, accuracy is ≤ 1,000 ppm, repeatability is ± 20 ppm, temperature range between 0°C to 50°C, 32°F to 122°F, temperature resolution is 0.1°C, temperature accuracy is at 25°C.

1.7.3. Light (LUX) Meter

Light meter is to calculate the light intensity in the organization. Suitability of the instruments are, 5 ranges. ie., 40.00, 400.0, 4,000, 40,000, 400,000 Lux, operating temperature is 0 to 50°C, Operating humidity is less than 80% RH, Power consumption is DC 8 mA approximately. This Instrument will be calibrated yearly once or during non-functioning.

1.7.4. Sound Level Meter

Sound level meter is to measure the noise level in the organization. This instrument is calibrated yearly once or after using 20 times. Suitability of the instruments are measurement range is 30 – 130 dB, resolution is 0.1 dB, accuracy is (23±5 °C), Frequency of the instrument is 31.5 to 8,000 Hz, Operating temperature is 0 to 50 °C (32 to 122 °F), Operating humidity is less than 80% RH, Power consumption is DC 6 mA approximately.

1.7.5. pH Meter

pH meter is generally used to measure the pH level in water. It is calibrated 6 months once or after 20 times of its use. Suitability of the instrument are range of the pH meter is 0 – 14, accuracy is ± 2%, resolution of the instrument is 0.1 pH, operating temperature is 0 to 50 °C (32 to 122 °F).

1.7.6. TDS Meter

TDS meter is generally used to measure the TDS level in water. Suitability of the meter are range of TDS meter is 0 – 9990 ppm (mg/L), operating temperature is 0 to 80 °C (32 to 176 °F) and accuracy is ± 2 %. This meter is calibrated six months once or 20 times after its use.

1.7.7. GPS Meter

GPS meter is subjected to know the latitude and altitude, location, etc., Suitability of the GPS meter are, dimension is 2.1" x 4.0" x 1.3" (5.4 x 10.3 x 3.3 cm), Display resolution is 128 x 160 pixels an GPS Map features included in Continental Europe. It is calibrated six months once or after 20 times of the usage.

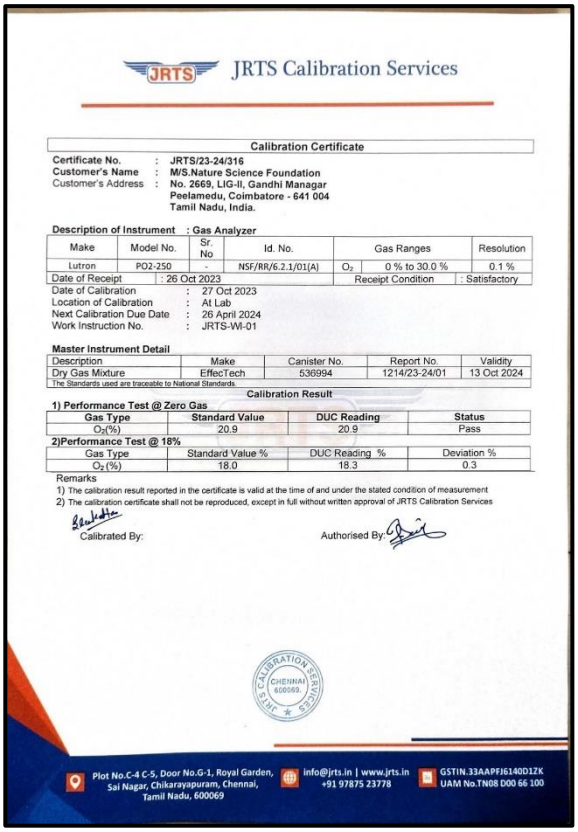
1.7.8. Deluxe Water and Soil Analysis Kit

Deluxe water and soil analysis kit is used to analyze the pH, TDS, salinity, turbidity, alkalinity dissolved oxygen of water.

1.7.9. Digital Clamp (Voltage) Meter

It is used to check the input and output voltage between two points of an electrical circuit of Alternating Current (AC) and Direct Current (DC) by means of the high resistance of the voltage that impede the flow of current.

1.7.10. Calibration Certificates of Instruments used for the conduct of audits



JRTS Calibration Services

Calibration Certificate

Certificate No. : JRTS/23-24/316
Customer's Name : M/S.Nature Science Foundation
Customer's Address : No. 2669, LIG-II, Gandhi Managar, Peelamedu, Coimbatore - 641 004, Tamil Nadu, India.

Description of Instrument : Gas Analyzer

Make	Model No.	Sr. No	Id. No.	Gas Ranges		Resolution
Lutron	PO2-250	-	NSF/RR/6.2.1/01(A)	O_2	0 % to 30.0 %	0.1 %

Date of Receipt : 26 Oct 2023 | Receipt Condition : Satisfactory

Date of Calibration : 27 Oct 2023
Location of Calibration : At Lab
Next Calibration Due Date : 26 April 2024
Work Instruction No. : JRTS-WI-01

Master Instrument Detail

Description	Make	Canister No.	Report No.	Validity
Dry Gas Mixture	EffecTech	536994	1214/23-24/01	13 Oct 2024

The Standards used are traceable to National Standards.

Calibration Result

1) Performance Test @ Zero Gas

Gas Type	Standard Value	DUC Reading	Status
O_2(%)	20.9	20.9	Pass

2)Performance Test @ 18%

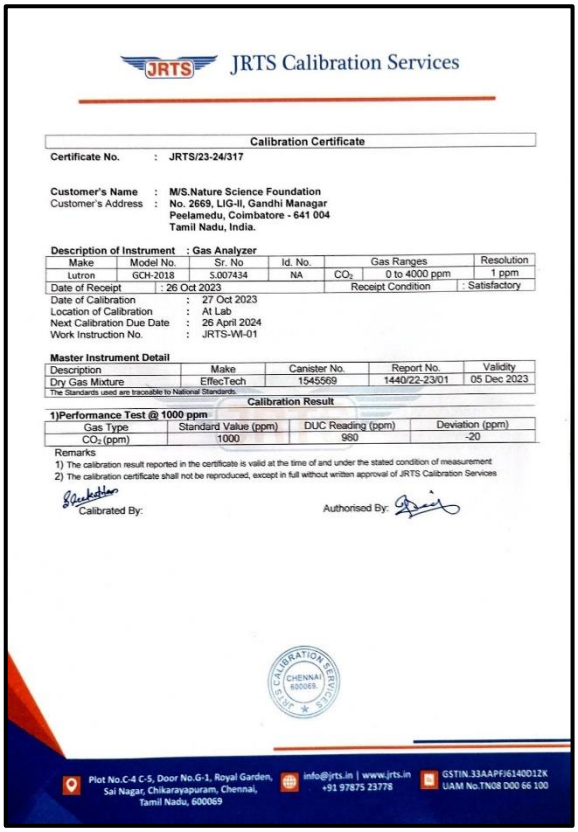
Gas Type	Standard Value %	DUC Reading %	Deviation %
O_2(%)	18.0	18.3	0.3

Remarks
1) The calibration result reported in the certificate is valid at the time of and under the stated condition of measurement
2) The calibration certificate shall not be reproduced, except in full without written approval of JRTS Calibration Services

Calibrated By: Authorised By:

Plot No.C-4 C-5, Door No.G-1, Royal Garden, Sai Nagar, Chikarayapuram, Chennai, Tamil Nadu, 600069 | info@jrts.in | www.jrts.in | +91 97875 23778 | GSTIN.33AAPFJ6140D1ZK UAM No.TN08 D00 66 100

Calibration Certificate of O_2 Meter



JRTS Calibration Services

Calibration Certificate

Certificate No. : JRTS/23-24/317

Customer's Name : M/S.Nature Science Foundation
Customer's Address : No. 2669, LIG-II, Gandhi Managar, Peelamedu, Coimbatore - 641 004, Tamil Nadu, India.

Description of Instrument : Gas Analyzer

Make	Model No.	Sr. No	Id. No.	Gas Ranges		Resolution
Lutron	GCH-2018	5.007434	NA	CO_2	0 to 4000 ppm	1 ppm

Date of Receipt : 26 Oct 2023 | Receipt Condition : Satisfactory

Date of Calibration : 27 Oct 2023
Location of Calibration : At Lab
Next Calibration Due Date : 26 April 2024
Work Instruction No. : JRTS-WI-01

Master Instrument Detail

Description	Make	Canister No.	Report No.	Validity
Dry Gas Mixture	EffecTech	1545569	1440/22-23/01	05 Dec 2023

The Standards used are traceable to National Standards.

Calibration Result

1)Performance Test @ 1000 ppm

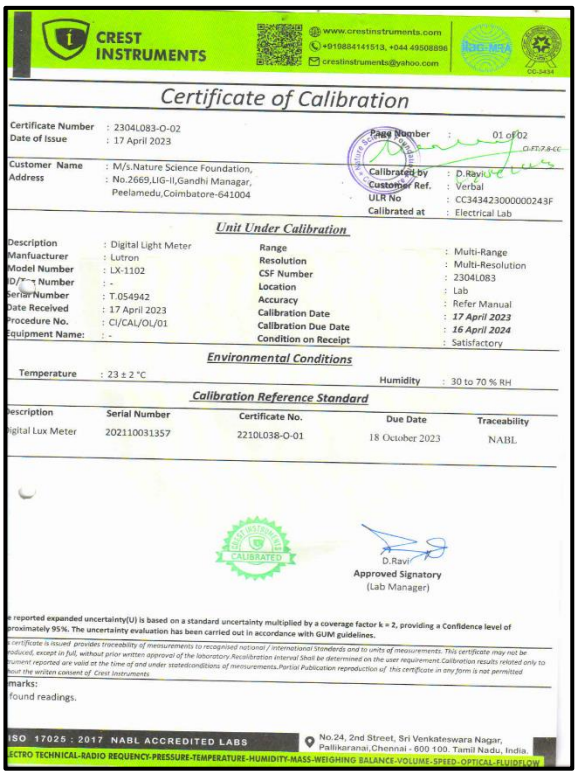
Gas Type	Standard Value (ppm)	DUC Reading (ppm)	Deviation (ppm)
CO_2 (ppm)	1000	980	-20

Remarks
1) The calibration result reported in the certificate is valid at the time of and under the stated condition of measurement
2) The calibration certificate shall not be reproduced, except in full without written approval of JRTS Calibration Services

Calibrated By: Authorised By:

Plot No.C-4 C-5, Door No.G-1, Royal Garden, Sai Nagar, Chikarayapuram, Chennai, Tamil Nadu, 600069 | info@jrts.in | www.jrts.in | +91 97875 23778 | GSTIN.33AAPFJ6140D1ZK UAM No.TN08 D00 66 100

Calibration Certificate of CO_2 Meter



CREST INSTRUMENTS

www.crestinstruments.com | +919884141513, +044 49508896 | crestinstruments@yahoo.com

Certificate of Calibration

Certificate Number : 2304L083-O-02
Date of Issue : 17 April 2023
Page Number : 01 of 02

Customer Name & Address : M/s.Nature Science Foundation, No.2669,LIG-II,Gandhi Managar, Peelamedu,Coimbatore-641004

Calibrated by : D.Ravi
Customer Ref. : Verbal
ULR No : CC343423000000243F
Calibrated at : Electrical Lab

Unit Under Calibration

Description	: Digital Light Meter	Range	: Multi-Range
Manufacturer	: Lutron	Resolution	: Multi-Resolution
Model Number	: LX-1102	CSF Number	: 2304L083
ID/[illegible] Number	: -	Location	: Lab
Serial Number	: T.054942	Accuracy	: Refer Manual
Date Received	: 17 April 2023	Calibration Date	: *17 April 2023*
Procedure No.	: CI/CAL/OL/01	Calibration Due Date	: *16 April 2024*
Equipment Name:	: -	Condition on Receipt	: Satisfactory

Environmental Conditions

Temperature : 23 ± 2 °C Humidity : 30 to 70 % RH

Calibration Reference Standard

Description	Serial Number	Certificate No.	Due Date	Traceability
Digital Lux Meter	202110031357	2210L038-O-01	18 October 2023	NABL

CALIBRATED

D.Ravi
Approved Signatory
(Lab Manager)

e reported expanded uncertainty(U) is based on a standard uncertainty multiplied by a coverage factor k = 2, providing a Confidence level of proximately 95%. The uncertainty evaluation has been carried out in accordance with GUM guidelines.

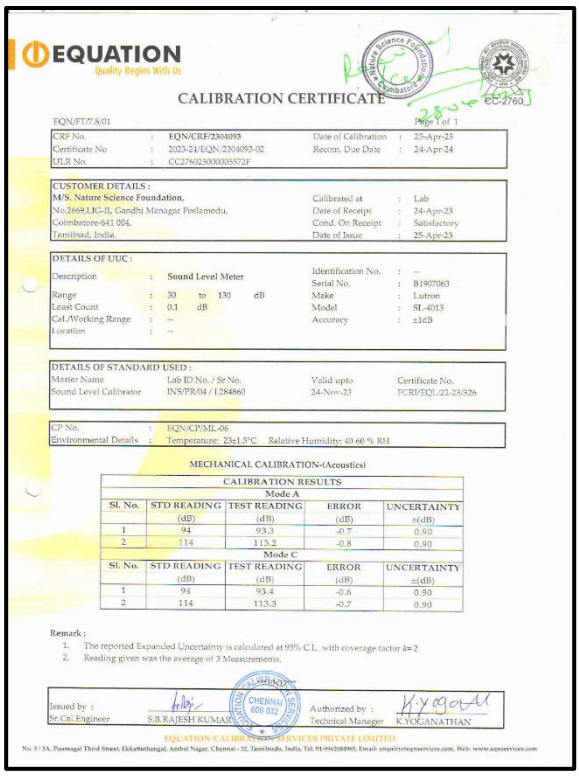
Certificate is issued provides traceability of measurements to recognised national / international Standards and to units of measurements. This certificate may not be produced, except in full, without prior written approval of the laboratory.Recalibration interval Shall be determined on the user requirement.Calibration results related only to sument reported are valid at the time of and under statedconditions of measurements.Partial Publication reproduction of this certificate in any form is not permitted hout the written consent of Crest Instruments

marks:
Found readings.

ISO 17025 : 2017 NABL ACCREDITED LABS | No.24, 2nd Street, Sri Venkateswara Nagar, Pallikaranai,Chennai - 600 100. Tamil Nadu, India.

ECTRO TECHNICAL-RADIO REQUENCY-PRESSURE-TEMPERATURE-HUMIDITY-MASS-WEIGHING BALANCE-VOLUME-SPEED-OPTICAL-FLUIDFLOW

Calibration Certificate of LUX Meter



EQUATION
Quality Begins With Us

CALIBRATION CERTIFICATE

CC-2760

EQN/FT/7.8/01 Page 1 of 1

CRF No.	: EQN/CRF/2304093		Date of Calibration	:	25-Apr-23
Certificate No	: 2023-24/EQN/2304093-02		Recom. Due Date	:	24-Apr-24
ULR No.	: CC276923000005572F				

CUSTOMER DETAILS :
M/S. Nature Science Foundation,
No.2669,LIG-II, Gandhi Managar Peelamedu,
Coimbatore-641 004,
Tamilnad, India.

Calibrated at : Lab
Date of Receipt : 24-Apr-23
Cond. On Receipt : Satisfactory
Date of Issue : 25-Apr-23

DETAILS OF UUC :

Description	: Sound Level Meter		Identification No.	:	--
			Serial No.	:	B1907063
Range	: 30 to 130 dB		Make	:	Lutron
Least Count	: 0.1 dB		Model	:	SL-4013
Cal./Working Range	: --		Accuracy	:	±1dB
Location	: --				

DETAILS OF STANDARD USED :

Master Name	Lab ID No. / Sr No.	Valid upto	Certificate No.
Sound Level Calibrator	INS/FR/04 / L284860	24-Nov-23	FCRI/EQL/22-23/326

CP No. : EQN/CP/ML-06
Environmental Details : Temperature: 23±1.5°C Relative Humidity: 40-60 % RH

MECHANICAL CALIBRATION-(Acoustics)

CALIBRATION RESULTS

Mode A

Sl. No.	STD READING (dB)	TEST READING (dB)	ERROR (dB)	UNCERTAINTY ±(dB)
1	94	93.3	-0.7	0.90
2	114	113.2	-0.8	0.90

Mode C

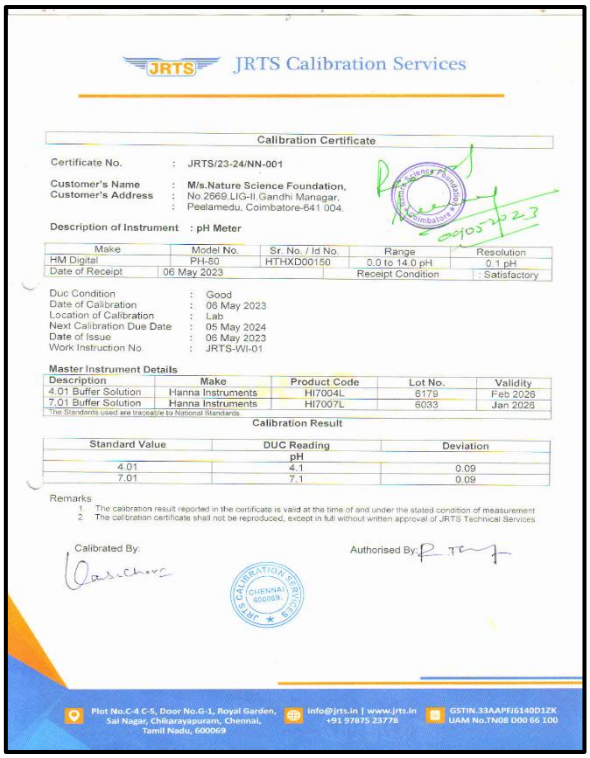
Sl. No.	STD READING (dB)	TEST READING (dB)	ERROR (dB)	UNCERTAINTY ±(dB)
1	94	93.4	-0.6	0.90
2	114	113.3	-0.7	0.90

Remark :
1. The reported Expanded Uncertainty is calculated at 95% C.L. with coverage factor k= 2
2. Reading given was the average of 3 Measurements.

Issued by : Sr.Cal.Engineer S.B.RAJESH KUMAR
Authorized by : Technical Manager K.YOGANATHAN

EQUATION CALIBRATION SERVICES PRIVATE LIMITED

Calibration Certificate of Sound Level Meter



JRTS Calibration Services

Calibration Certificate

Certificate No. : JRTS/23-24/NN-001

Customer's Name : M/s.Nature Science Foundation,
Customer's Address : No.2669,LIG-II,Gandhi Managar,
Peelamedu, Coimbatore-641 004.

Description of Instrument : pH Meter

Make	Model No.	Sr. No. / Id No.	Range	Resolution
HM Digital	PH-80	HTHXD00150	0.0 to 14.0 pH	0.1 pH
Date of Receipt	06 May 2023		Receipt Condition	Satisfactory

Duc Condition : Good
Date of Calibration : 06 May 2023
Location of Calibration : Lab
Next Calibration Due Date : 05 May 2024
Date of Issue : 06 May 2023
Work Instruction No. : JRTS-WI-01

Master Instrument Details

Description	Make	Product Code	Lot No.	Validity
4.01 Buffer Solution	Hanna Instruments	HI7004L	6179	Feb 2026
7.01 Buffer Solution	Hanna Instruments	HI7007L	6033	Jan 2026

The Standards used are traceable to National Standards.

Calibration Result

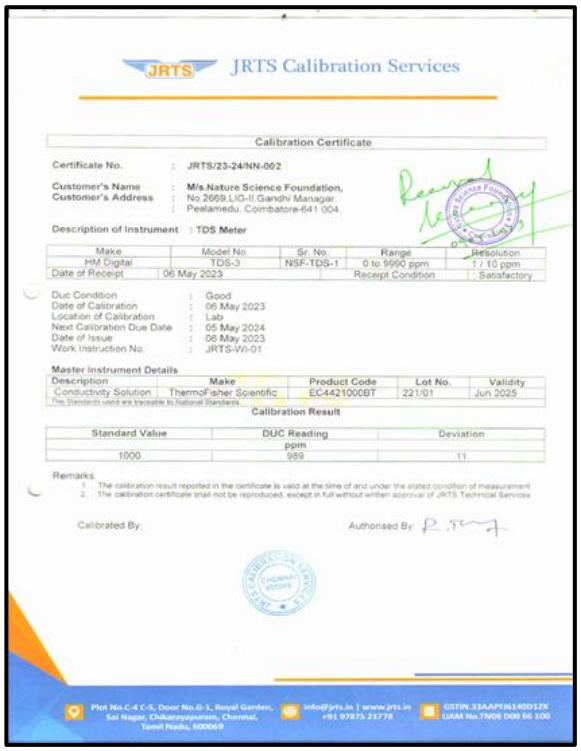
Standard Value	DUC Reading pH	Deviation
4.01	4.1	0.09
7.01	7.1	0.09

Remarks
1. The calibration result reported in the certificate is valid at the time of and under the stated condition of measurement
2. The calibration certificate shall not be reproduced, except in full without written approval of JRTS Technical Services

Calibrated By: Authorised By:

Plot No.C-4 C-5, Door No.G-1, Royal Garden, Sai Nagar, Chikarayapuram, Chennai, Tamil Nadu, 600069 | info@jrts.in | www.jrts.in +91 97875 23778 | GSTIN.33AAPFJ6140D1ZK UAM No.TN08 D00 66 100

Calibration Certificate of pH Meter



JRTS Calibration Services

Calibration Certificate

Certificate No. : JRTS/23-24/NN-002

Customer's Name : M/s.Nature Science Foundation,
Customer's Address : No.2669,LIG-II,Gandhi Managar,
Peelamedu, Coimbatore-641 004.

Description of Instrument : TDS Meter

Make	Model No.	Sr. No.	Range	Resolution
HM Digital	TDS-3	NSF-TDS-1	0 to 9990 ppm	1 / 10 ppm
Date of Receipt	06 May 2023		Receipt Condition	Satisfactory

Duc Condition : Good
Date of Calibration : 06 May 2023
Location of Calibration : Lab
Next Calibration Due Date : 05 May 2024
Date of Issue : 06 May 2023
Work Instruction No. : JRTS-WI-01

Master Instrument Details

Description	Make	Product Code	Lot No.	Validity
Conductivity Solution	ThermoFisher Scientific	EC4421000BT	221/01	Jun 2025

The Standards used are traceable to National Standards.

Calibration Result

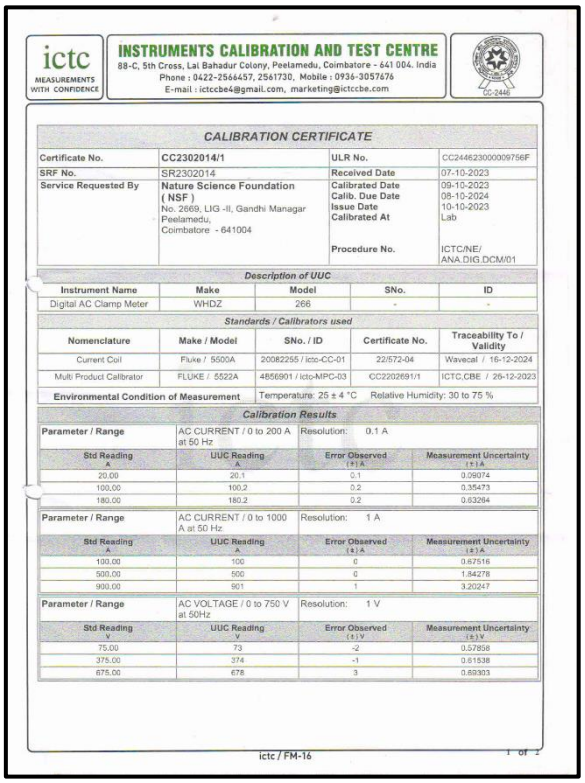
Standard Value	DUC Reading ppm	Deviation
1000	989	11

Remarks
1. The calibration result reported in the certificate is valid at the time of and under the stated condition of measurement
2. The calibration certificate shall not be reproduced, except in full without written approval of JRTS Technical Services

Calibrated By: Authorised By:

Plot No.C-4 C-5, Door No.G-1, Royal Garden, Sai Nagar, Chikarayapuram, Chennai, Tamil Nadu, 600069 | info@jrts.in | www.jrts.in +91 97875 23778 | GSTIN.33AAPFJ6140D1ZK UAM No.TN08 D00 66 100

Calibration Certificate of TDS Meter



ictc MEASUREMENTS WITH CONFIDENCE

INSTRUMENTS CALIBRATION AND TEST CENTRE
88-C, 5th Cross, Lal Bahadur Colony, Peelamedu, Coimbatore - 641 004. India
Phone : 0422-2566457, 2561730, Mobile : 0936-3057676
E-mail : ictccbe4@gmail.com, marketing@ictccbe.com

CC-2446

CALIBRATION CERTIFICATE

Certificate No.	CC2302014/1	ULR No.	CC244623000009756F
SRF No.	SR2302014	Received Date	07-10-2023
Service Requested By	Nature Science Foundation (NSF) No. 2669, LIG -II, Gandhi Managar Peelamedu, Coimbatore - 641004	Calibrated Date Calib. Due Date Issue Date Calibrated At Procedure No.	09-10-2023 08-10-2024 10-10-2023 Lab ICTC/NE/ ANA.DIG.DCM/01

Description of UUC

Instrument Name	Make	Model	SNo.	ID
Digital AC Clamp Meter	WHDZ	266	-	-

Standards / Calibrators used

Nomenclature	Make / Model	SNo. / ID	Certificate No.	Traceability To / Validity
Current Coil	Fluke / 5500A	20082255 / ictc-CC-01	22/572-04	Wavecal / 16-12-2024
Multi Product Calibrator	FLUKE / 5522A	4856901 / ictc-MPC-03	CC2202691/1	ICTC,CBE / 26-12-2023

Environmental Condition of Measurement: Temperature: 25 ± 4 °C Relative Humidity: 30 to 75 %

Calibration Results

Parameter / Range: AC CURRENT / 0 to 200 A at 50 Hz — Resolution: 0.1 A

Std Reading A	UUC Reading A	Error Observed (±) A	Measurement Uncertainty (±) A
20.00	20.1	0.1	0.09074
100.00	100.2	0.2	0.35473
180.00	180.2	0.2	0.63264

Parameter / Range: AC CURRENT / 0 to 1000 A at 50 Hz — Resolution: 1 A

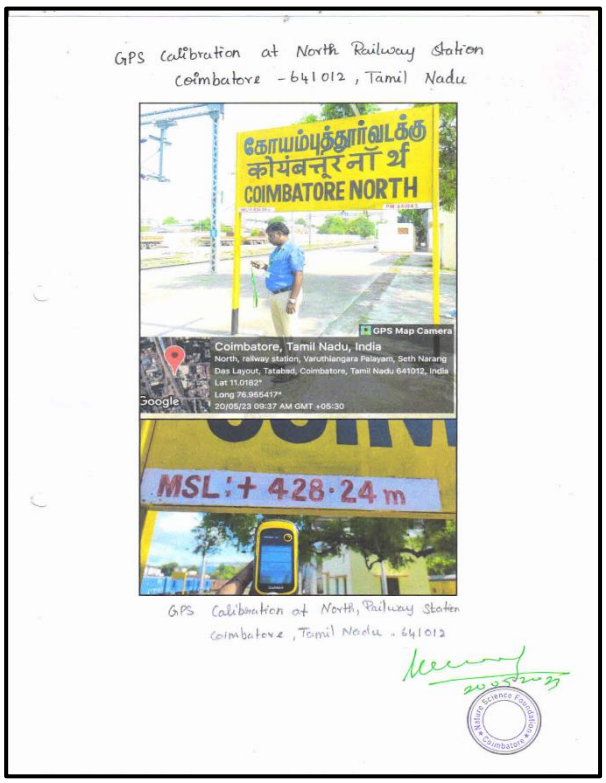
Std Reading A	UUC Reading A	Error Observed (±) A	Measurement Uncertainty (±) A
100.00	100	0	0.67516
500.00	500	0	1.84278
900.00	901	1	3.20247

Parameter / Range: AC VOLTAGE / 0 to 750 V at 50Hz — Resolution: 1 V

Std Reading V	UUC Reading V	Error Observed (±) V	Measurement Uncertainty (±) V
75.00	73	-2	0.57858
375.00	374	-1	0.61538
675.00	678	3	0.69303

ictc / FM-16 1 of 2

Calibration Certificate of Digital Clamp Meter



GPS Calibration at North Railway Station
Coimbatore - 641012, Tamil Nadu

GPS Calibration at North Railway Station
Coimbatore, Tamil Nadu - 641012

In-service check of GPS Meter

1.8. Use of Personal Protective Equipment (PPE)

Personal Protective Equipment (PPE) refers to protective clothing for the eyes, head, ears, hands, respiratory system, body, and feet. It is utilized to protect individuals from the risks of injury while minimizing exposure to chemical, biological, and physical hazards. PPE serves as the final line of defense when engineering and administrative controls are insufficient in reducing risks. Nature Science Foundation safeguards all the auditors by supplying PPE during the conduct of audits. PPE used are safety jackets, ear plugs, googles, face shield, hand gloves, shoes, etc.,

1.8.1. Safety jackets:

PPE includes safety vests and suits that can be used for inspection process which will protect body injuries from extreme temperatures, flames and sparks, toxic chemicals, insect bites and radiation.

1.8.2. Goggles and Face shield:

Goggles and face shield are used in the inspection process while inspecting items which would cause eye damage or loss of vision, spray or toxic liquids especially in chemistry labs, nearing the electric and electronic item.

1.8.3. Helmet:

PPE includes hard hats and headgears which will be required for tasks that can cause any force or object falling to the head. It also helps to resist penetration.

1.8.4. Hand gloves:

PPE includes safety gloves and should be used for tasks that can cause hand and skin burns, absorption of harmful substances, cuts, fractures or amputations**.** Selection of hand gloves is based on the application of use.

1.8.5. Safety Boots:

Foot protection is one of the most commonly used PPE and can differ depending upon the environment. Safety boots are used for tasks that can cause serious foot and leg injuries from falling or rolling objects, hot substances, electrical hazards, and slippery surfaces.

1.8.6. Ear Plug:

Ear plugs are used for tasks that can cause hearing problems and loss of hearing. Hearing protection devices reduces the noise energy reducing reaching and causing damage to the inner ear. This ear plug is mostly used near sound producing devices like power motors, genets, generators, etc.,

Opening and closing meetings with the Head of the Organization, NAAC / IQAC Coordinators and NSF Inspection Team

2. GREEN AUDIT

2.1. Introduction

Green audit ensures the Organization's campus should have greenish with large diversity of trees, herbs, shrubs, climbers and lawns to reduce the environmental pollution and soil erosion; it is also useful in relation to biodiversity conservation, landscape management, irrigation/economic water utilization and maintenance of natural topography besides vegetation. For the benefit of stakeholders, solid waste management, recycling of water, disposal of sewage and waste materials (electronic and biomedical wastes), 'zero' use of plastics, single use plastic items, etc. should be followed consistently in the organization campus. Green Audit procedures includes the definition of green audit, methodology on how to conduct green audit at Educational Institutions and Industrial sectors as per the checklist based on National Building Code (NBC) Part 11 - Approach to sustainability and assessment of risk at 360^{o} view.

2.2. Importance of green audit

The Management of the Organization (Auditee) should be exposed their inherent commitment towards making ecofriendly atmosphere through the green auditing and ready to encourage/follow all types of green activities. A clean and healthy environment will enhance an effective teaching/learning process. They shouldcreate the awareness on the importance of greenish initiatives through environmental education among the student members and research scholars. Green audit is the most effective, ecological approach to manage environmental complications (Rajalakshmi *et al*., 2023). Green audit is a kind of professional care and a simple indigenized system about the environment monitoring in terms of planting more number of trees which is a duty of each and every individual who are the part of economical, financial, social and environmental factors. Green audit is a professional and useful measure for an Organization to determine how and where they are retaining the campus eco-friendly manner. It can also be used to implement the alleviation measures at win-win situation for the stakeholders and the planet. It provides an opportunity to the stakeholders for the development of ownership, personal and social responsibility.

2.3. Green audit observations

- It is observed that the Organization has facilities (ramp walk, lift, wheel chair etc.,) for disabled and different age group people.
- Monitoring plan is available for the periodic checking at proper time interval to maintain sustainability.
- Adequate training and awareness programmes are conducted to the Stakeholders for sustainable development at all stages of building life cycle.
- More than 30% of open space is maintained as soft scapes (vegetation) to lower the energy conservation in the campus.
- Land scape design are planned to maintain the natural capacity of the site.
- Land scape irrigation are performed as per the microclimatic condition like during humid / winter season less watering through irrigation is observed.
- Vegetation / vegetative structures are available around the building to reduce energy consumption and maintain indoor climates.

- Soil health is maintained well without using any chemical fertilizers.
- Ecological design / conserving biodiversity such as Transplantation, climate and design in accordance with bio diversity, reduced pesticides and other activities are not applicable because no new construction is planned and raised.
- Ornamental garden and green roof system are available to maintain sustainability.
- Plant and animal species are monitored by conducting the periodic survey in the Organization.
- Traffic survey is conducted to measure the number and type of vehicles passing on the existing main roads giving access to the campus

2.3.1. Facilities for Human Comforts (NBC checkpoint 3.2. and 3.9.)

As per the National Building Code part 11 (Approach to Sustainability) under elements of sustainability quality of plumbing services and buildings are maintained in line with the standard. Ramp walk and wheel chair facilities are implemented for the benefit of disabled and different age group people. As no blind persons are observed in the campus divyang (blind) reading software, signages are not available. Water management, waste management, operation and maintenance plan are followed to maintain sustainability as per the standard.

Ramp walk, Wheel Chair and Accessible Toilet facilities designed for the comfort of person with disability.

2.3.2. Natural topography, vegetation and monitoring (NBC checkpoint 6.2.4.)

Natural topography means the original geographical features and natural resources of the Site. It is observed that the organization has the natural features like rocks, water resources, slopes, landscape, pathways, etc. Vegetation is the cultivation of a bunch of plants irrespective of the plant *taxa* for the covering of the area or ground topography. The observation at the campus indicated that there are more than 40% natural topography and vegetation. Monitoring plan for maintaining the vegetation and sustainability are evident through separate operation and maintenance team & their records for regular watering as per the micro climatic condition through irrigation.

Natural Topography and Vegetation at the Campus

2.3.3. Landscape design and soil erosion control (NBC Checkpoint 7.1.1. – 7.1.3.)

Landscape design is an important feature for any disasters to control especially with respect to the soil erosion. In general, soil erosion occurs if the design of the land is not altered so as to prevent the slope features by strong vegetation and use of a plant buffer zone as safe for escape of nutrients or fertilizers entering the streams. Observation revealed that the audited site has very good landscape design without disturbing the natural vegetation. Contour ploughing is being done at right angles to the slope wherever possible and ridges and furrows are properly maintained to break the flow of water down to the empty land. These activities are widely adopted to control soil erosion in the campus. Microclimatic conditions are considered, during winter season irrigation and watering to plants are controlled as per the water management plan. External landscapes are designed based on the shading pattern of the building. Green vegetation are available around the building to reduce the energy consumption.

Landscape design of the campus

2.3.4. Establishment of different gardens, vertical landscaping and roof gardens (NBC Checkpoint 7.1.1. – 7.1.3.)

It is observed that Organization has implemented and maintaining terrace gardens to lower the energy consumption. To maintain certain biomass critical for human health and also to reduce the bio-retention through water flow rates different types of gardens like ornamental garden is implemented in the campus.

Ornamental garden observed in the campus

2.3.5. Survey of Flora and Fauna (NBC Checkpoint 12.4.5. and 12.4.6.)

Ensuring the rich biodiversity in the green campus is an important parameter which reflects the real-time ecosystem. In general, plants improve the outdoor air quality with increased oxygen levels and reduced temperature and carbon dioxide. The record on maintenance of the plant biomass and its management are important with respect to green campus initiatives. The existence of such plants and birds in the green campus are recorded for the rich flora and fauna which are being considered as a value addition to the campus.

Bougainvillean glabra

Bambusa vulgaris L

Carica papaya

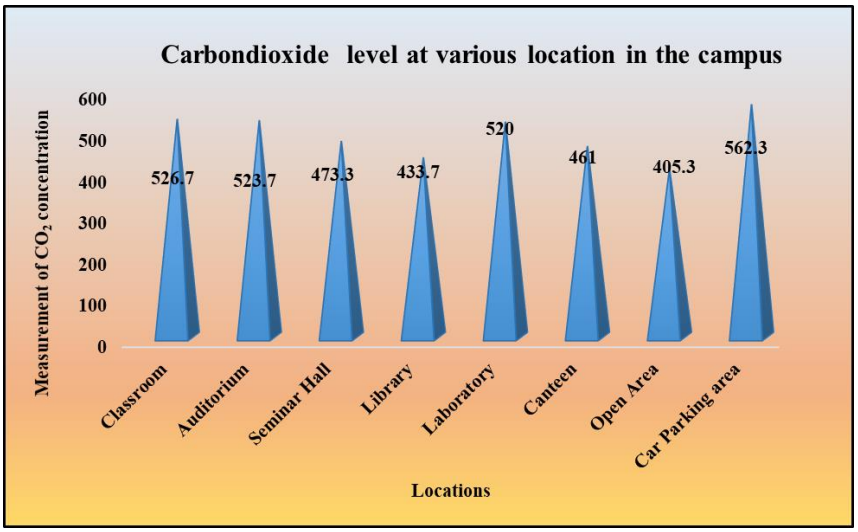
2.4. Measurement of carbon dioxide level in the campus

Climatic conditions of the earth changed now-a-days due to a massive increase in global warming and environmental changes including human population and human activities. In addition, primarily fossil fuel burning and an extensive usage enhances heat-trapping greenhouse gas levels in the atmosphere. Global warming is driven by human-induced emissions of greenhouse gases which resulted in paramount shifts in weather patterns. In general, a portable CO_2 Analyzer is used to measure the level of carbon dioxide in the atmosphere at different places across the campus.

Table 2. Measurement of CO_2 concentration in the Organization

S. No.	Different locations of the Organization's Campus	Carbon dioxide level (ppm)*	Remarks
1.	Classroom	526.7	Within permissible limits
2.	Auditorium	523.7	Within permissible limits
3.	Seminar Hall	473.3	Within permissible limits
4.	Library	433.7	Within permissible limits
5.	Laboratory	520.0	Within permissible limits
6.	Canteen	461.0	Within permissible limits
7.	Open Area	405.3	Within permissible limits
8.	Car Parking area	562.3	Within permissible limits

Figure 1. Measurement of CO_2 concentration in the Organization



Measurement of CO2 level at College Campus

2.5. Atmospheric oxygen level measurements analysis and interpretation

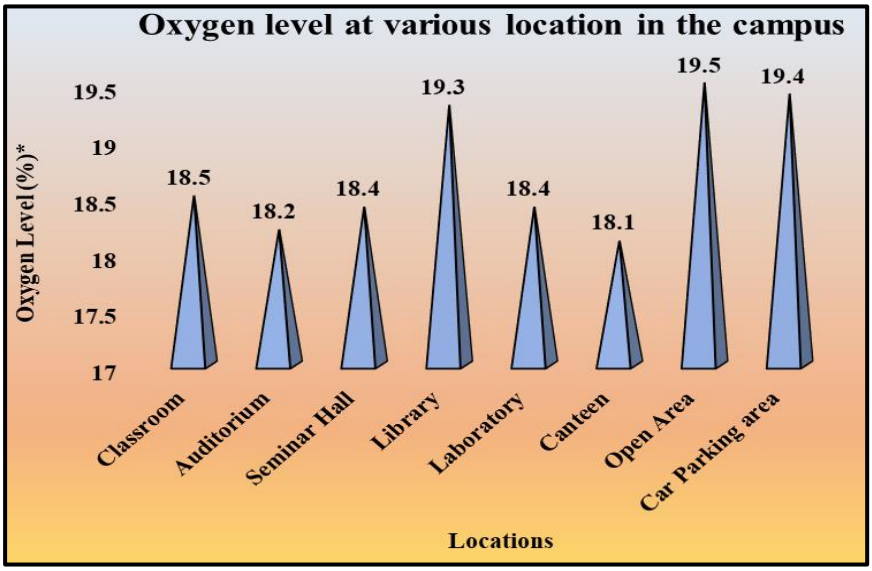
Oxygen level refers to the amount of oxygen available within the atmosphere or water bodies. Oxygen is produced/released as a by-product of photosynthesis, the metabolic activity of all green plants besides certain microbes. Oxygen plays a paramount role in metabolic activities like respiration and the energy-producing chemistry of all living organisms. In order to quantify the oxygen level, Oxygen Meter is used. The atmosphere contains 18-21% oxygen concentration, 75-78.5% nitrogen and 2-3% other gases like carbon dioxide, neon and hydrogen. The amount of oxygen level in the atmosphere is determined by abiotic factors like altitude, latitude and longitude

and biotic factors like plantations in the surroundings. If it excess, it causes oxygen toxicity and oxygen poisoning by creating coughing, breathing trouble and damage the lungs to human beings. The oxygen level of different places at the campus are monitored and presented (Table 3).

Table 3. The oxygen concentration at different places of audited organization

S. No	Location	Oxygen Level (%)*	Remarks
1.	Classroom	18.5	O_2 level is good
2.	Auditorium	18.2	O_2 level is good
3.	Seminar Hall	18.4	O_2 level is good
4.	Library	19.3	O_2 level is good
5.	Laboratory	18.4	O_2 level is good
6.	Canteen	18.1	O_2 level is good
7.	Open Area	19.5	O_2 level is good
8.	Car Parking area	19.4	O_2 level is good
Mean		18.8%	
SEC ±		0.09	
CD at P=0.05%		0.16	

Figure 2. The oxygen concentration in the Organization



Measurement of O_2 level at the College Campus

3. ENERGY AUDIT

3.1. Introduction

An energy audit is a survey in which the study of energy flows for the purpose of conservation is examined at an organization. It refers to a technique or system that seeks to reduce the amount of energy used in the Organization without impacting the output. The audit includes suggestions of alternative means and methods for achieving energy savings to a greater extend. Conventionally, electrical energy is generated by means of fossil fuels, hydraulic and wind energy. The availability of fossil fuels and their depletion rate, insist the need for alternate energy systems and conservation of conventional electricenergy. In general, the primary objective of an energy auditing and management of energy consumption is to offer goods or services at the lowest possible cost and with the least amount of environmental impact.

Energy Conservation Building Code (ECBC) is established in the year 2017, which provides minimum requirements for the energy-efficient design and construction of buildings across India. It also provides two additional sets of incremental requirements for buildings to achieve enhanced levels of energy efficiency that go beyond the minimum requirements. Bureau of Energy Efficiency (BEE) came into force in 2002 towards implementation of energy saving practices in an organization. Energy-efficiency labels are information affixed to manufactured products and usually communicate the product energy performance.

BEE Star Rating Scheme is based on actual performance of the building as well as equipment in terms of specific energy usage termed as 'Energy Performance Indicator' by means of star ratings labelled items used which will be useful for energy savings in a sustainable manner (Mishra and Patel, 2016). Energy audit programme provide aid in maintaining a focus on energy price variations, energy supply availability and efficiency, determining an appropriate energy mix, identifying energy-saving technology, retrofitting for energy-saving equipment and so on (Gnanamangai *et al*., 2021). In general, an energy audit process dealt with the driving energy conservation concepts into reality by giving technically possible solutions within a specified time limit while considering the economic and other organizational issues. It also dealt with the uncover ways to cut operating expenses or reduce energy use per unit of production interms of savings. It serves as a "benchmark" for managing energy in the organization for planning more energy-efficient use across the board.

3.2. Energy audit observations

During onsite audit following departments were verified for physical facility availability.

- Adequate awareness programmes are organized and conducted to the stakeholders for the proper handling and maintenance of the appliances.
- Standard Operating Procedure and user manual are adequately available for the operation and maintenance of utilities like DG, AC, UPS , lifts, etc.,
- Adequate external and vertical shading are provided to conserve energy.
- Natural ventilation through windows and shading is available adequately to reduce the energy consumption.

- It is observed that large foliage trees are planted inside the campus to reduce noise pollution.
- Low emitting lights are fixed as per the LPD mentioned in National Building Code (NBC) Part -11(Approach to Sustainability) for safety and comfort.
- External and internal signage lits are differentiated to conserve energy.
- 'Danger' and 'warning boards' are available near transformer, generator and UPS.
- Over deck and under deck insulation of roofs are available.
- Solar water heater and panel are available to maintain the sustainability.
- Building Integrated Photovoltaic system like power storage system, backup power supplies, wiring and safety disconnects are available.
- Adequate HVAC and day lighting facilities are observed.
- Outside air is introduced through windows for ventilation in the conditioned spaces.
- The metering system are appropriately monitored through maintenance of log books and sub meters.
- Five star rated appliances (lift, AC, Air cooler, Refrigerator, etc.,) are procured to conserve energy.
- All the fluorescent (tube) lights are replaced with LED lights to conserve energy.
- Awareness posters like 'Turn off when not in use', 'Save Energy', etc., are displayed for conserving energy.
- Lifts and moving walk path are adequately available in the campus.
- Operation and maintenance manual are observed in the on-site.
- Instruments and equipment are properly calibrated and maintained.
- Noise level observed in the different location resulted in normal range.
- Adequate training and awareness programmes are conducted to the stakeholders for energy conservation.
- To optimize the energy campus has implemented solar panel, water heater, sensor lights, operation and maintenance, etc.,

3.2.1. Energy Efficient Design and Process (NBC Checkpoint 3.5, 3.6 & 3.8.)

In the campus, it is observed that for lighting, cooling and ventilation renewable sources of energy like solar panel, water heater, etc., are used. Local resources are made available in post occupant stage. Standard Operating Procedures for lifts, UPS, AC are available to conserve energy and to avoid damages.

3.2.2. Lighting facilities (NBC Checkpoint 6.2.2 – 6.2.10, 7.1.1.2 and 7.5)

External shading facilities are made based on the sun path to reduce the energy consumption. Day light integration is implemented in the building by placing adequate number of windows. Electrical lighting facilities during day time increases the energy consumption, it is observed that sufficient day lighting facilities are available through windows which in turn reduce the energy consumption bill of the Organization. Artificial lighting facilities are regularly monitored and maintained. In some areas sensor lights are implemented to save energy. External and internal signage lits are made up of recycled material with maximum light intensity. In the buildings windows head are higher to penetrate day light.

3.2.3. Building Service Optimization (NBC Checkpoint 11)

To save energy in the buildings there should be a proper plan for HVAC system. In the organization it is observed that adequate natural ventilation is implemented and practices. In some places exhaust fans are used for ventilation especially in the canteen and laboratories. To reduce the heat inside the building shading patterns are maintained by planting trees in and around the campus. Solar panels are implemented at the roof top to reduce the heat and to save energy. Air conditioning are provided at specific areas. Energy conservation plays an vital role in maintaining the sustainability. It is observed that the Organization has replaced all the tube light with CFL / LED lamps, has proper metering and submetering facilities, availability of BEE star rated appliances in Air cooler, lift, AC, generator, etc., Solar water heater and panels are implemented to conserve energy. Instruments and meters are properly maintained and calibrated at regular intervals or annual maintenance plan is observed as one of the energy saving opportunity. Adequate energy saving awareness programmes are conducted to the stakeholders. Emissions and leaks are monitored through operation and maintenance manual.

Energy conservation facilities observed in the Campus

3.2.4. Energy consumption and cost profile (NBC Checkpoint 12.3.4.)

The following chart shows the profile of energy consumed and the cost for one year by the auditee (Figures 3 & 4; Table 5).

Figure 3. Electrical energy consumption profile

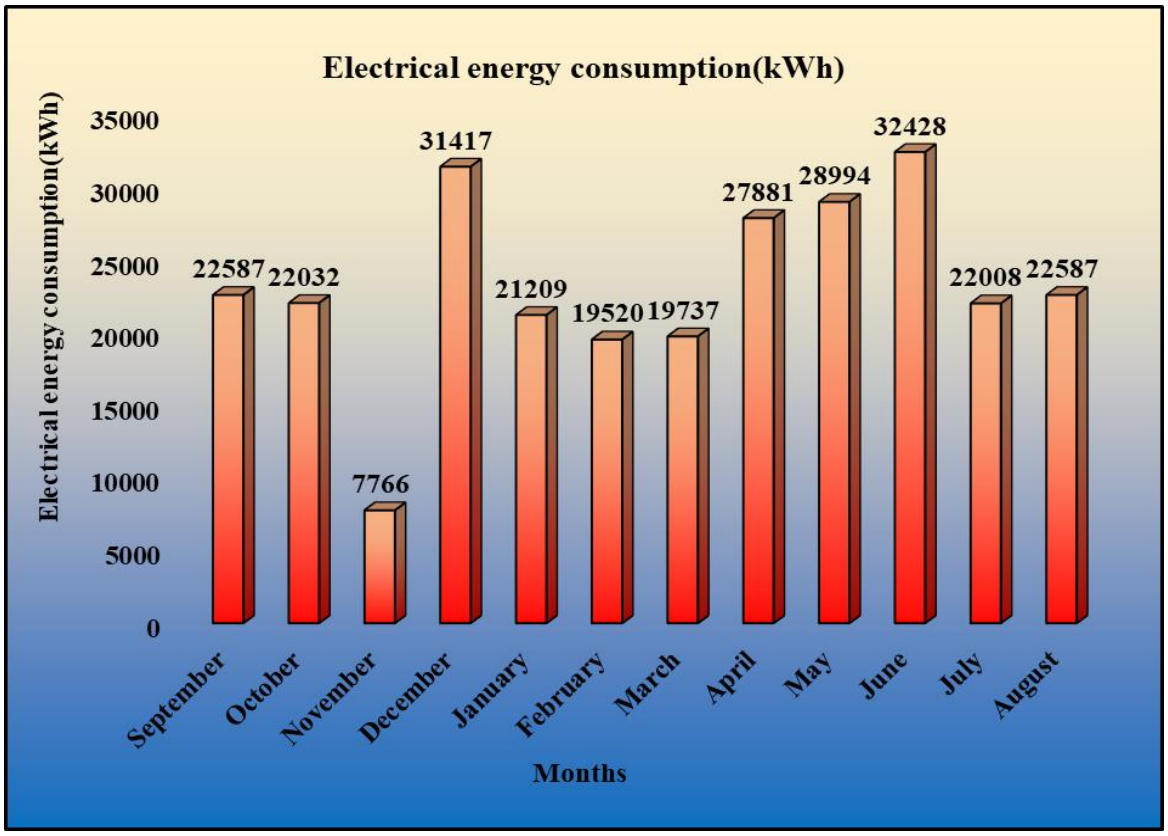


Figure 4. Overall electrical energy consumption and cost profile

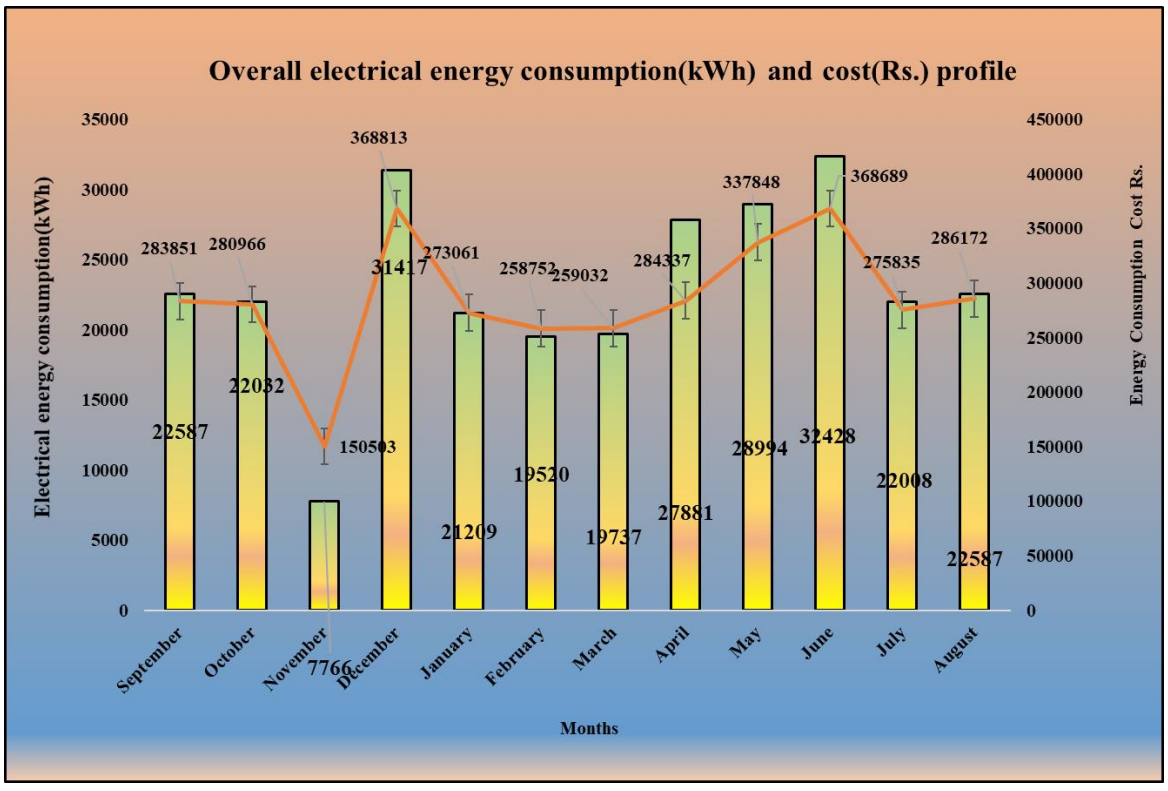


Table 5. Electrical energy consumption and cost profile in the Institution

S. No	Months	Rating / Capacity units in kWh	Cost in Rs.
1.	September	22587	283851
2.	October	22032	280966
3.	November	7766	150503
4.	December	31417	368813
5.	January	21209	273061
6.	February	19520	258752
7.	March	19737	259032
8.	April	27881	284337
9.	May	28994	337848
10.	June	32428	368689
11.	July	22008	275835
12.	August	22587	286172

3.2.5. Power consuming equipment and electrical appliances

Other than electrical energy from grid, energy generated using fossil fuels for the year are presented in the Table 6.

Table 6. Annual Energy Consumption of Fuels in the College

S.No	Month	Diesel consumption (Liters)	Petrol consumption (Liters)	LPG consumption (kg)
1	September	23070	-	-
2	October	22701	-	-
3	November	22001	-	-
4	December	32447	-	-
5	January	21818	-	-
6	February	20913	-	-
7	March	20163	-	-
8	April	28172	-	-
9	May	29206	-	-
10	June	32535	-	-
11	July	32535	-	-
12	August	22157	-	-

3.2.6. Carbon footprint

The carbon footprint per year is calculated (www.carbonfootprint.com) based on electricity usage per year in which CO_2 emission from electricity and the sum of transportation per year in terms of number of the shuttle buses service operated by the Organization and number of cars, motorcycles and trucks entering in the Organization

campus. These factors are multiplied with total number of trips in each day and approximate travel distance of vehicles covered in each day with a coefficient (0.01) to calculate the emission of CO_2 in metric tons per year. Humans contribute to a massive increase of carbon dioxide emissions by burning fossil fuels, deforestation, and other industrial activities.

3.2.7. Calculation of carbon footprint

The carbon footprint analysis can be calculated based on the earlier reports as stated in www.carbonfootprint.com which is the sum of electricity usage per year. According to the data provided by the Management, carbon emission due to electricity consumption and fossil fuels are presented hereunder.

The CO_2 emission from electricity

= (electricity usage per year in kWh/1000) x 0.84, where 0.84 is the coefficient to convert kWh to metric tons
=(278166 kWh/1000) x 0.84
= 233.66 metric tons

According to the above calculations, carbon emission due to electricity usage per year accounts for 380.32 metric tons.

Transportation per year (Shuttle)

= (Number of the shuttle vehicle in the campus (2) x total trips for shuttle bus service each day x approximate travel distance of a vehicle each day inside campus only (20 km) x 365/100) x 0.01
= ((10 x 20 x 1 x 365)/100)) x 0.01
= 7.3metric tons

365 is the number of days per year
0.01 is the coefficient to calculate the emission in metric tons per 100 km for bus

a. Transportation per year (Car)

= (Number of cars entering the campus x 2 x approximate travel distance of a vehicleeach day inside campus only (in kilometers) x 365/100) x 0.02
= (0 x 20 x 1 x 365)/100)) x 0.02
= 0 metric tons

365 is the number of days per year
0.02 is the coefficient to calculate the emission in metric tons per 100 km car

b. Transportation per year (Motorcycles)

= (Number of motorcycles entering the campus x 2 x approximate travel distance of avehicle each day inside campus only (in kilometers) x 365/100) x 0.01
= ((0 x 20 x 1 x 365)/100)) x 0.01
= 0 metric tons

365 is the number of days per year
0.01 is the coefficient to calculate the emission in metric tons per 100 km for motorcycles.

c. Total Carbon emission per year

= total emission from electricity usage + transportation (bus, car, motorcycle)
= (233.66+7.3)
= 240.96 metric tons

3.2.8. Noise level measurements (NBC Checkpoint 12.4.4.)

Noise is all unwanted sound or set of sounds that causes annoyance or can have a health impact and noise level is measured in decibels (dB).

The body can also respond to lower noise levels. Level of noise are expected to be within 55 dB in residential areas, including institutions. Class room noise levels are supposed to be around 50 db. Sound Level Meter / Noise Thermometer are used to measurethe noise level in the surroundings which converts the sound signal to an equivalent electrical signal and the resulting sound pressure level in decibels (dB) referenced to 20 μPa. Noise level prescribed by Central Pollution Control Board was presented in the Table 7.

Table 7. Noise level standard prescribed by Central Pollution Control Board, Government of India

Area Code	Zone	Limits in dB (A) Leq	
		Day Time	Night Time
A	Industrial	75	70
B	Commercial	65	55
C	Residential	55	45
D	Silence	50	40

Source: IS: 12065 - 1987

Table 8. Noise level at various location in the campus

S.No	Locations	Measurements (dB)	Major noise sources	Remarks
1.	Class room	51.87	Students and Staff	No Noise Pollution
2.	Auditorium	42.70	Students	No Noise Pollution
3.	Seminar hall	57.33	Students	No Noise Pollution
4.	Library	42.23	Staff members	No Noise Pollution
5.	Laboratory	64.27	Students	No Noise Pollution
6.	Canteen	33.17	Students and Staff	No Noise Pollution
7.	Open area	46.10	Students and staff	No Noise Pollution
8.	Parking area	51.80	Vehicles	No Noise Pollution
9.	Generator area	54.63	Generator Sound	No Noise Pollution
	Mean	49.34		
	SE	4.49		
	CD	8.00		

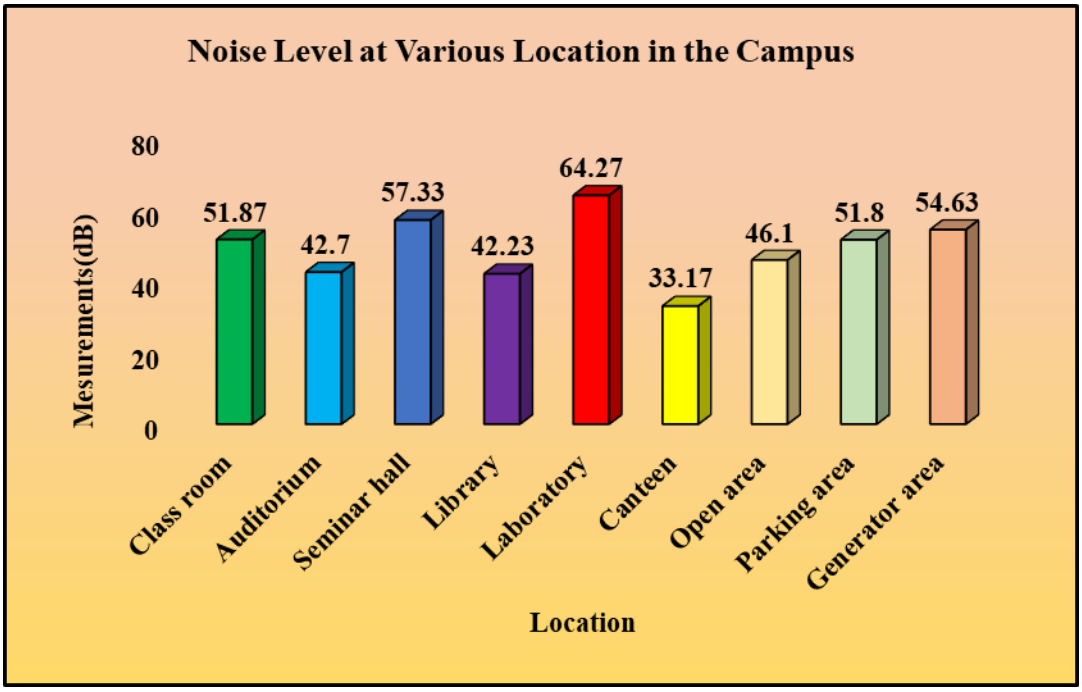


Figure 5. Noise level at various location in the campus

3.2.8.1. Light intensity measurement at the campus

Light intensity or light output is used to measure whether a particular light source provides enough light for an application needed. There is a well-established light level recommendation for a wide range of applications in lighting industry and also for the type of space. Light intensity is measured in terms of lumens per square foot (foot-candles) or lumens per square meter (lux). A light meter (lux meter) is used to measure the amount of light in a space/on a particular work surface. The light meter consists of a sensor that measures the light falling on it and provides the user with a measurable illuminance reading. Light meters are an especially useful tool for measuring light for safety or over-illumination.

Table 9. Light intensity measured at various locations in the College

S.No	Type of Spaces	Illuminances (LUX)
1.	Class room	303.33
2.	Auditorium	392.67
3.	Seminar hall	368.33
4.	Library	450.67
5.	Laboratory	400.67
6.	Canteen	449.33
8.	Open area	681.33
9	Car Parking area	508.67
	SE	0.88
	CD	1.89

Source: IS: 6665-1972

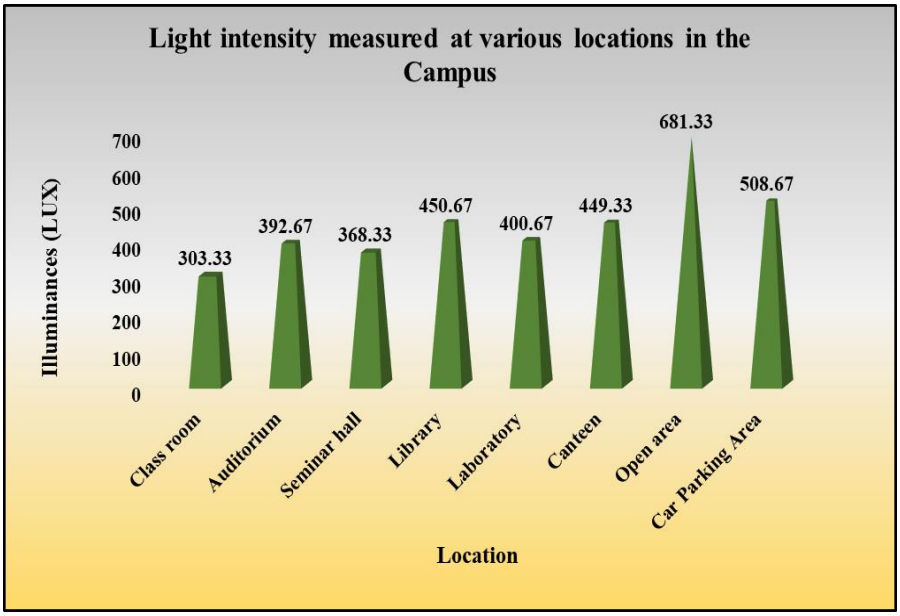


Figure 6. Light intensity Measured at the campus

3.2.8.2. Voltage Measurement at the Campus

Voltage measurement in AC & DC at different places in the campus is measured using the clamp (voltage) meter to reduce the energy consumption.

Table 10. Voltage measured at various locations in the College

S.No	Name of the Place	AC & DC Voltage Measurement [Volt (v)]
1.	Class Room (AC)	227
2.	Auditorium (AC)	400
3.	Seminar Hall (AC)	404
4.	Library (AC)	230
5.	Laboratory (AC)	230
6.	Canteen (AC)	402
7.	Power Room (AC)	415
8.	Generator Room (AC)	415
9.	Battery (DC)	12
10.	Solar Panel (DC)	37.7
SD±		2.29

Source: BEE, 2015, Bureau of Energy Efficiency

4. Conclusion

Considering the fact that the organization is a well-established, there is significant scope for conserving energy, water and make the campus as self-sustained in it. The energy conservation initiatives taken up by the organization are substantial. Water conservation activities are also implemented and practiced. Proper facilities and procedures are followed for waste collection, segregation, disposal, recycle and reuse. Tree Plantation at appropriate locations are maintained to resist the indoor climate and conserve energy as per the National Building Code (Part 11 – Approach to Sustainability).

5. References

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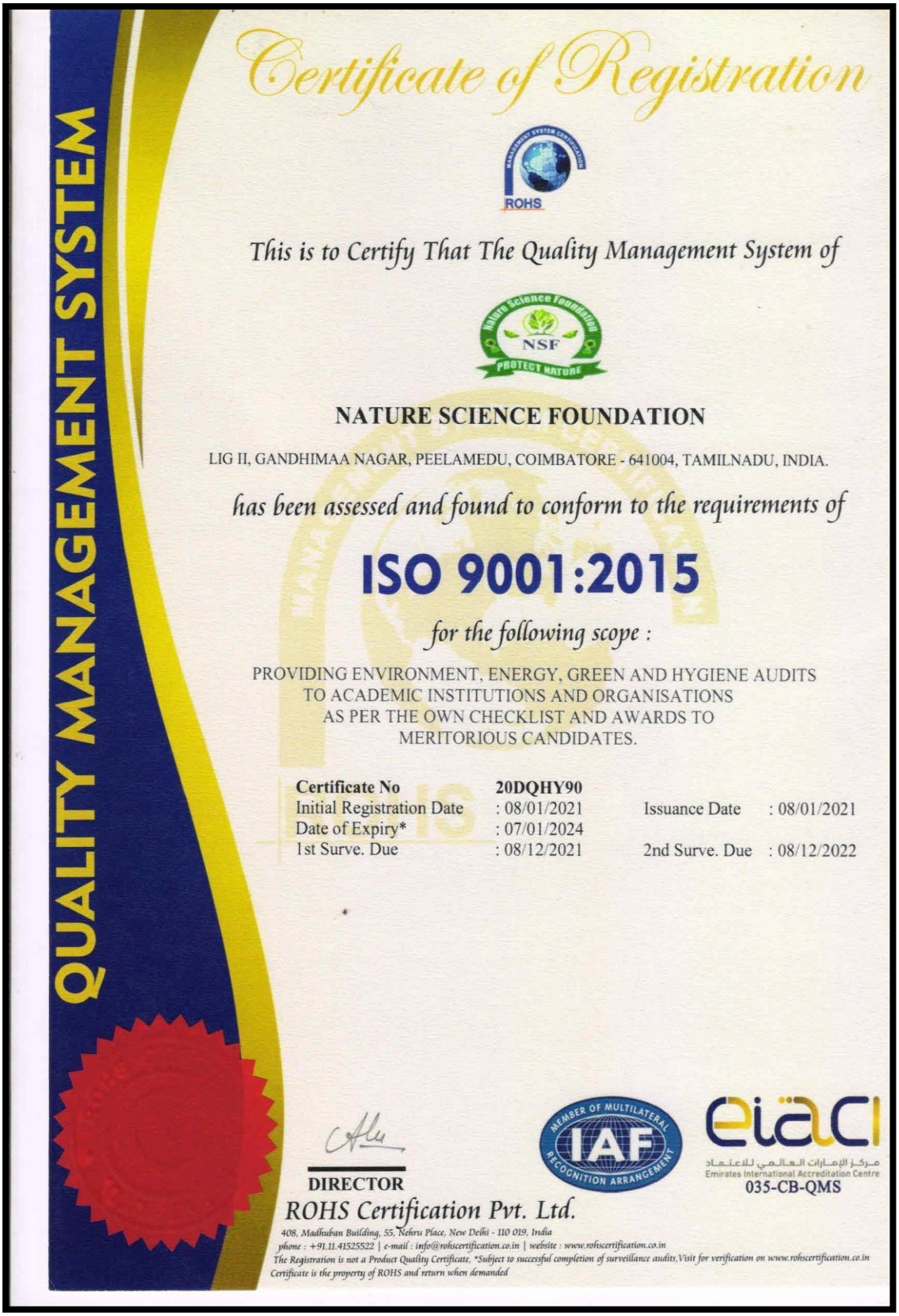
6. Certificates of Nature Science Foundation

1. ISO Certificate (QMS 9001:2015)
2. ISO Certificate (EMS 14001:2015)
3. ISO Certificate (OHSMS 45001:2018)
4. ISO Certificate (EnMS 50001:2018)
5. MSME Certificate



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Certificate No	**20DQHY90**		
Initial Registration Date	: 08/01/2021	Issuance Date	: 08/01/2021
Date of Expiry*	: 07/01/2024		
1st Surve. Due	: 08/12/2021	2nd Surve. Due	: 08/12/2022

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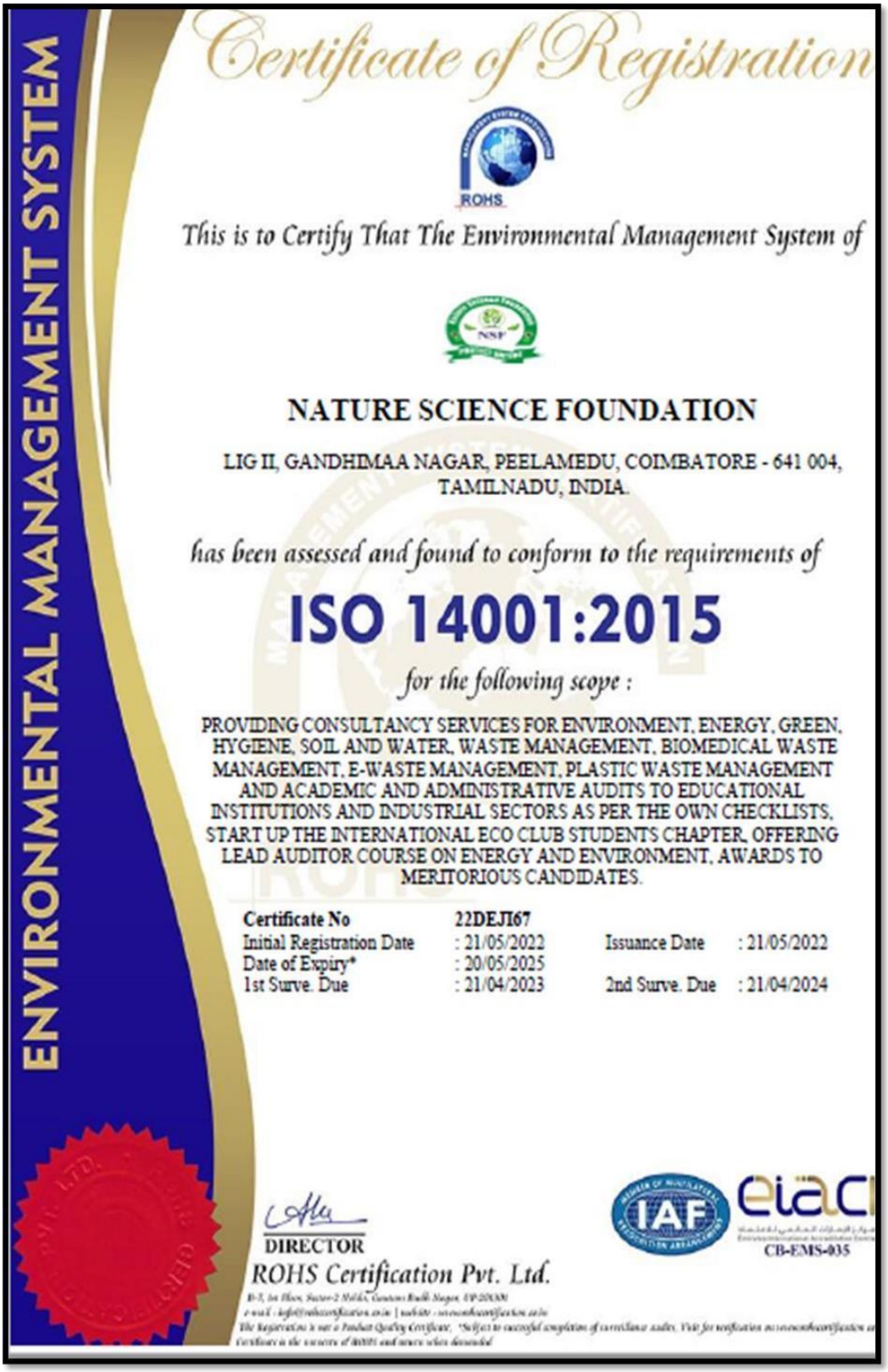

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Certificate No	**22DEJI67**		
Initial Registration Date	: 21/05/2022	Issuance Date	: 21/05/2022
Date of Expiry*	: 20/05/2025		
1st Surve. Due	: 21/04/2023	2nd Surve. Due	: 21/04/2024

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Certificate Number : QCS/EUAS/OHS/002

		1ST Surveillance Audit Within	: 02/07/2023
Issue Date	: 03/08/2022	2nd Surveillance Audit Within	: 02/07/2024
Expiration Date	: 02/08/2023	Re-certification Due Date	: 02/08/2025

Partha Bagchi
(Managing Director)

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Email: info@qcspl.com, Call: +91 8697724963,+91 8902447427. Website: www.qcspl.com

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Date of Certification: 9th August 2022
1st Surveillance Audit Due: 8th August 2023
2nd Surveillance Audit Due: 8th August 2024
Certificate Expiry: 8th August 2025

Certificate Number: 305022080903EN

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सूक्ष्म, लघु एवं मध्यम उद्यम मंत्रालय
Ministry of Micro, Small and Medium Enterprises

MSME
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MICRO, SMALL & MEDIUM ENTERPRISES

UDYAM
REGISTRATION CERTIFICATE

UDYAM REGISTRATION NUMBER	UDYAM-TN-03-0073706
NAME OF ENTERPRISE	M/S NATURE SCIENCE FOUNDATION
TYPE OF ENTERPRISE *	MICRO
MAJOR ACTIVITY	SERVICES
SOCIAL CATEGORY OF ENTREPRENEUR	GENERAL

NAME OF UNIT(S)

S.No.	Name of Unit(s)
1	Green Campus, Energy and Environment Management Audits

OFFICAL ADDRESS OF ENTERPRISE

Flat/Door/Block No.	LIG-II,2669	Name of Premises/ Building	GANDHIMAA NAGAR
Village/Town	Gandhimaanagar S.O	Block	LIG-II
Road/Street/Lane	Peelamedu	City	Coimbatore South
State	TAMIL NADU	District	COIMBATORE , Pin 641004
Mobile	9566777255	Email:	chairmannsf@gmail.com

DATE OF INCORPORATION / REGISTRATION OF ENTERPRISE	28/11/2017
DATE OF COMMENCEMENT OF PRODUCTION/BUSINESS	12/03/2020

NATIONAL INDUSTRY CLASSIFICATION CODE(S)

SNo.	NIC 2 Digit	NIC 4 Digit	NIC 5 Digit	Activity
1	69 - Legal and accounting activities	6920 - Accounting, bookkeeping and auditing activities; tax consultancy	69201 - Accounting, bookkeeping and auditing activities	Services
2	85 - Education	8542 - Cultural education	85420 - Cultural education	Services
3	85 - Education	8549 - Other education n.e.c.	85499 - Other educational services n.e.c.	Services

DATE OF UDYAM REGISTRATION	26/02/2022

* In case of graduation (upward/reverse) of status of an enterprise, the benefit of the Government Schemes will be availed as per the provisions of Notification No. S.O. 2119(E) dated 26.06.2020 issued by the M/o MSME.

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7. Certificates of Lead Auditors

1. Bureau of Energy Efficiency (BEE), LEED AP and GRIHA Certificates of Er. D. Dinesh kumar, Energy and Environment Auditor of NSF.

2. Indian Green Building Council (IGBC AP) Accredited Professional of Dr. B. Mythili Gnanamangai, Vice-Chairman of NSF.

3. Tamil Nadu Fire and Rescue Service Certificate of Er. S. Srinivash, Energy Auditors of NSF.

4. Energy Management System ISO 50001:2018 Certificate of Dr. D. Vinoth Kumar, Joint Director of NSF.

BUREAU OF ENERGY EFFICIENCY

Examination Registration No. : EA-14056 Serial Number. 9176

Certificate Registration No. : 9176

Certificate For Certified Energy Manager

This is to certify that Mr./Mrs./Ms. Dinesh Kumar D Son/Daughter of Mr./Mrs. R M Dhanasekaran who has passed the National Examination for certification of energy manager held in the month of October 2011 is qualified as certified energy manager subject to the provisions of Bureau of Energy Efficiency (Certification Procedures for Energy Managers) Regulations, 2010.

This certificate shall be valid for five years with effect from the date of award of this certificate and shall be renewable subject to attending the prescribed refresher training course once in every five years.

His /Her name has been entered in the Register of certified energy manager at Serial Number 9176 being maintained by the Bureau of Energy Efficiency under the aforesaid regulations.

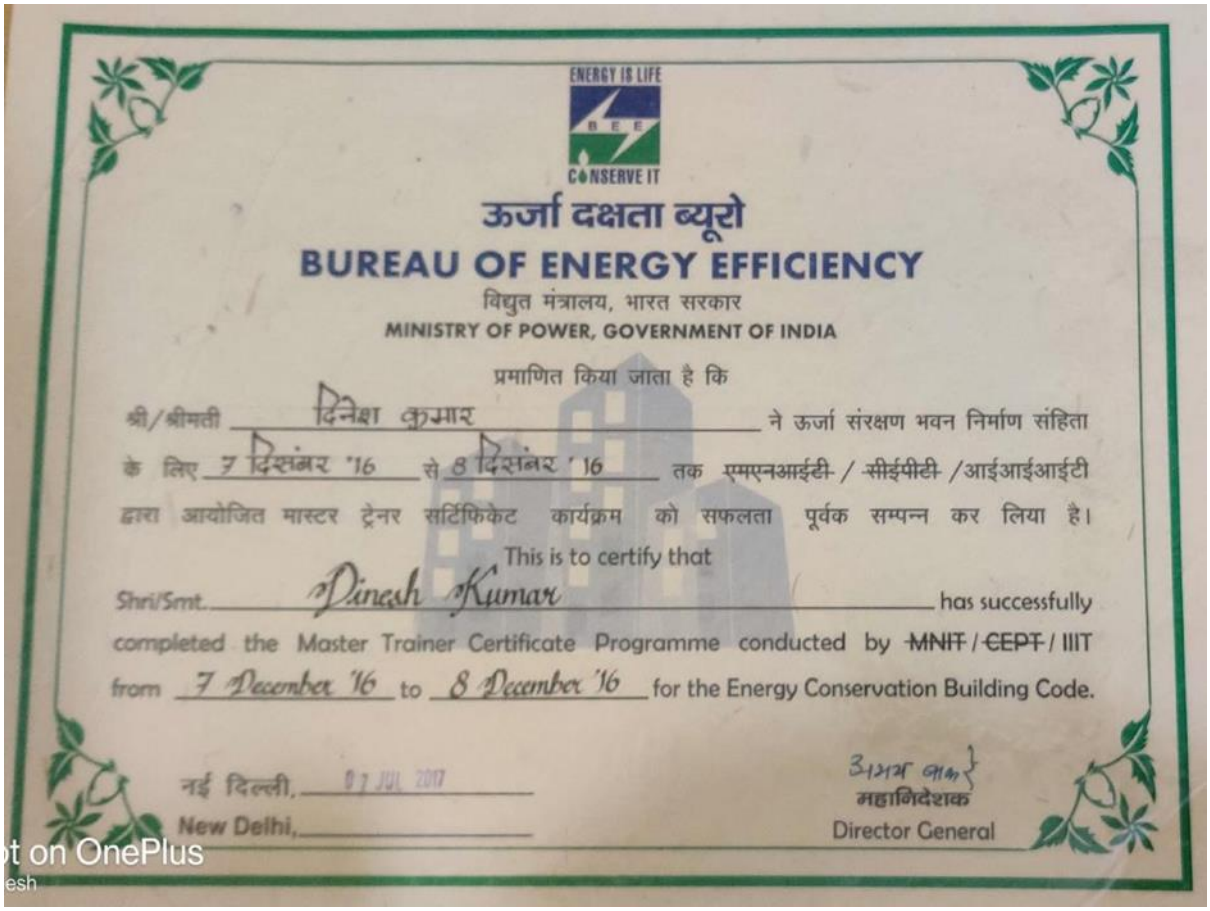
Mr./Mrs./Ms. Dinesh Kumar D is deemed to have qualified for appointment or designation as energy manager under clause (*l*) of Section 14 of the Energy Conservation Act, 2001 (Act No.52 of 2001).

Given under the seal of the Bureau of Energy Efficiency, this 7th day of February, 2013

Digitally Signed: RAKESH KUMAR RAI
Sun Mar 01 10:58:55 IST 2020
Secretary, BEE New Delhi

Secretary
Bureau of Energy Efficiency
New Delhi

Dates of attending the refresher course	Secretary's Signature	Dates of attending the refresher course	Secretary's Signature
22.12.2019			



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CONSERVE IT

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श्री/श्रीमती दिनेश कुमार ने ऊर्जा संरक्षण भवन निर्माण संहिता के लिए 7 दिसंबर '16 से 8 दिसंबर '16 तक ~~एमएनआईटी~~ / ~~सीईपीटी~~ /आईआईआईटी द्वारा आयोजित मास्टर ट्रेनर सर्टिफिकेट कार्यक्रम को सफलता पूर्वक सम्पन्न कर लिया है।

This is to certify that

Shri/Smt. Dinesh Kumar has successfully completed the Master Trainer Certificate Programme conducted by ~~MNIT~~ / ~~CEPT~~ / IIIT from 7 December '16 to 8 December '16 for the Energy Conservation Building Code.

नई दिल्ली, 07 JUL 2017
New Delhi,

महानिदेशक
Director General

GRIHA

GREEN RATING FOR INTEGRATED HABITAT ASSESSMENT

GRIHA CERTIFIED PROFESSIONAL CERTIFICATE

This is to certify that

Dinesh Kumar Dhanasekaran

has qualified as a **GRIHA** Certified Professional For V. 2015

Date of issue: 19th June 2020

Note : This certification is valid only for GRIHA version 2015.

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GRIHA Council

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25 DEC 2022
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Mahesh Ramanujam

MAHESH RAMANUJAM
PRESIDENT & CEO, U.S. GREEN BUILDING COUNCIL
PRESIDENT & CEO, GREEN BUSINESS CERTIFICATION INC.