Report of Green, Environment, Energy, Waste Management, Soil &Water, Air Quality and Hygiene Audits

Submitted to

BHIWAPUR MAHAVIDYALAYA
BHIWAPUR, NAGPUR - 441 201,
MAHARASHTRA, INDIA

Date of Audit: 12.09.2024
Date of Issue: 20.09.2024

Regd. No. 114 / 2017

IB 121

Submitted by

NATURE SCIENCE FOUNDATION
[A Unique Research and Development Centre for Society Improvement]
ISO 9001:2015, 14001:2015, 50001:2018 Certified Organization and
ISO/IEC 17020:2012 Accredited Type 'A' Inspection Body [Reg. No. IB 121] by
NABCB, QCI, Ministry of Commerce and Industry, Government of India
No. 2669, LIG-II, Gandhi Managar, Peelamedu
Coimbatore 641 004, Tamil Nadu, India.
Phone: 0422 4917999, Mobile: 9566777255, 9566777258
Email: director@nsfonline.org.in, Website : www.nsfonline.org.in

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No. 2669, LIG-II, Gandhi Managar, Peelamedu, Coimbatore - 641 004, Tamil Nadu, India.
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Regd. No. 114/2017

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 ***Bhiwapur Mahavidyalaya, Bhiwapur, Nagpur-441 201, Maharashtra, 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.
6. We at Nature Science Foundation express our deep sense of gratitude to the Management for given an opportunity to conduct green audit at their premises in compliance with NAAC criteria in line with ISO/IEC 17020:2012 standards and NABCB guidelines and for whole hearted support extended at the time of onsite audit. Our sincere thanks to NAAC, IQAC Coordinators and Head of the Departments of the Organization for their intangible assistance and cooperation extended to the audit team at the time of physical facility verification.

Date: 12.09.2024
Place: Coimbatore

SALAYARAJ RAJALAKSHMI
Digitally signed by SALAYARAJ RAJALAKSHMI
Date: 2024.09.20 14:51:53 +05'30'

Authorized Signatory
Nature Science Foundation

Signature of the Director
NSF Audit Processes

National Accreditation Board for Certification Bodies

Accreditation Certificate

NABCB

hereby confirms that

Nature Science Foundation

No. 2669, LIG-II,Gandhi Managar,
Peelamedu, Coimbatore – 641004,
Tamil Nadu, India

complies with

NABCB Accreditation Criteria for Inspection Bodies
(ISO/IEC 17020:2012)
as Type 'A' Inspection Body

to carry out

Inspection
as per accompanying

Schedule I : Scope of Accreditation
Schedule II : Office(s) under Accreditation

Accreditation Certificate No.:		**IB 121**
Date of Initial Accreditation	:	January 10,2024
Validity of Accreditation	:	January 09, 2027

January 10, 2024
Issue Date

(RajeshMaheshwari)
Chief Executive Officer

(Please refer **http://nabcb.qci.org.in** for validity of the certificate or contact NABCB for any related queries)

National Accreditation Board for Certification Bodies

Schedule I

(Scope of Accreditation)

Nature Science Foundation

Type 'A' Inspection Body

IAF Scope / Field of Inspection and Specific Item(s)	Stage and Range of Inspection(s)	Inspection Requirement(s) Standards / Regulations / Methods / Procedures	
		Number identification with year of publication	Title
IAF Scope 28 Buildings and Associated Infrastructure Green Audit	Green audit of educational institutions as per NBC2016 Part 11	NBC 2016 (Part-11) 14-29/2022 dated 26.05.2022	National Building Code Part 11: Approach to Sustainability NAAC Advisory Client Requirements in the form of QAP mentioning required specification and scope mentioned in this scope. However, the applicable National & International Codes and Standards shall be among those which are either referred in the scope statement or shall be equivalent to the standards described above for the relevant scope category

January 10, 2024
Issue Date

(Rajesh Maheshwari)
Chief Executive Officer

(The schedule must be accompanied by the Accreditation Certificate No. **IB 121** valid upto January 09, 2027)

National Accreditation Board for Certification Bodies

Schedule II

(Office(s) under Accreditation)

Nature Science Foundation

Location	Address	Key activities performed
Coimbatore Tamil Nadu (Main Office)	No. 2669, LIG-II, Gandhi Managar, Peelamedu, Coimbatore – 641004, Tamil Nadu, India	Top Management functions, Quality Management System functions, administration & accounts, other key activities. Inspection contract review, Inspection planning & execution, Inspection personnel authorization & assignment, Issue of inspection reports / certificates.

January 10, 2024
Issue Date

(Rajesh Maheshwari)
Chief Executive Officer

(The schedule must be accompanied by the Accreditation Certificate No. **IB 121** valid upto 09 January 2027)

NSF/PR/7.4.2./01

NATURE SCIENCE FOUNDATION

Regd. No. 114/2017

[A Unique Research and Development Centre for Society Improvement]
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National Accreditation Board for Certification Bodies (NABCB),
Quality Council of India,
An Autonomous body under Ministry of Commerce & Industry, India.
[www.nsfonline.org.in]

Inspection Certificate

This is to certify that Bhiwapur Mahavidyalaya, Bhiwapur, Nagpur - 441 201, Maharashtra, India has implemented ecofriendly sustainability practices in line with National Building Code of India, Part 11 (Approach to Sustainability) which covers the following areas,

1. Green Audit
2. Environment Audit
3. Energy Audit
4. Waste Management Audit
5. Soil and Water Audit
6. Air Quality Audit
7. Hygiene Audit

ilac-MRA

NABCB
IB 121

Certificate No.: 26
Date of Inspection: 12.09.2024
Date of Issue: 20.09.2024

SALAYARAJ RAJALAKSHMI

Dr. S. Rajalakshmi
Chairman

Dr. D. Vinoth Kumar
Director

No. 2669, LIG-II, Gandhi Managar, Peelamedu, Coimbatore - 641 004, Tamil Nadu, India.
Phone: 0422 4917999; Mobile: 95667 77255; 95667 77258
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Note: Organization management is responsible for the validated not meeting the requirements during the Inspection Process.

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) and ISO/IEC 17020:2012 Accredited Type 'A' Inspection Body [Reg. No. IB 121] by NABCB, QCI, Ministry of Commerce and Industry, Government of India. 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

Bhiwpur Mahavidyalaya College

Bhiwapur Mahavidyalaya stands as a synonym today for quality education as envisioned by its Founder, Heavenly Bhausaheb Govindrao Mulak in the mufassil area of Bhiwapur tehsil, Nagpur District. As on today, the Institution has blossomed into a full -grown tree catering to professional and conventional schooling to the rural masses. At a time, when there were no educational institutions in the vicinity, a visionary Late Bahusaheb Govindraoji Mulak pioneered the noble cause of providing edification to the rural folks and under the tutelage of a Charitable Trust named Backward Class Youth Relief Committee in 1974, which initiated a beginning of new epoch in Higher Education in Vidarbha region of Maharashtra State. The stride of the Trust began by establishing Colleges all over with an Engineering College named KDK College of Engineering in 1981. The beacon of light of education dispersed throughout Vidarbha with seventeen institutions imparting learning in almost all the branches of Higher Education.

Bhiwapur Mahavidyalaya is located in Bhiwapur, a rural place with 137 small villages and is very close to the tribal dominated belt of forest area. Located in the serene natural environment with lush green forests and agriculture as the basic occupation, Bhiwapur a small flourishing town is 72 K.M. away from Nagpur. Bhiwapur Mahavidyalaya affiliated to Nagpur University, now Rashtrasant Tukadoji Maharaj Nagpur University was established in 1990 with Arts faculty with the sole objective of imparting education in the field of Higher Studies to enable the rural youth to learn locally and flourish globally despite the tribulations and dearth of abundance.

The journey of elevating the youth continued with the initiation of Commerce Faculty in 2002, B.Sc. in 2012 and B. Voc. in 2019. The stride and vision of the Founder strengthened in its conceptualization with the introduction of Post Graduate courses in Economics, Political Science and Sociology in 2004. Over the years, the noble vision manifested and carved a niche for itself and earned the recognition for the Institution as one of the premier co-educational Institutions in Nagpur region imparting quality education with the strong support of highly competent and skilled teaching and non-teaching staff.

Keeping up with pace of the dynamic changes in the field of education, the Institution has kept itself abreast with ICT enabled classrooms, independent Departments; E.T.N.L software supported English Language Lab, state-of-the-art Computer Lab, fully automated Central Administrative Office and Central Library with spacious reading room and UGC Network Resource Centre. Today, the Institution is transforming its envisioned objectives into a reality through quality knowledge dissemination.

Over the years, the Institution has taken strides to fulfill its vision, mission and quality initiatives. It is proud moment in the history of the Institute to apprise all its stakeholders of the elevation and up gradation of its infrastructural facilities like multi-purpose Auditorium, Conference Hall, Common rooms for girls and boys, canteen, Gymnasium, playgrounds. The Institutions avowals the presence of International Level

Swimming Pool and Indoor Stadium to strengthen the learners of the rural areas to compete unabashedly with zest in the world outside Bhiwapur. Gender equity and sensitization are an integral part of the institution's policy of empowering women's education. The Women's Hostel Building enables the girl students to accomplish their dreams of getting quality education. The Institution surpasses in rendering requisite facilities for the students to grow and live a dignified life

1.6. Audit Team Details

1. **Date of Audit**	:	**12.09.2024**
2. **Audit Site**	:	**Bhiwapur Mahavidyalaya,** Bhiwapur, Nagpur-441 201, Tamil Nadu, India
3. **Inspection Body**	:	**Nature Science Foundation** Coimbatore, Tamil Nadu, India.
4. **Audit Scope**	:	**Green, Environment, Energy, Waste Management, Soil & Water, Air Quality and Hygiene Audits as per ISO/IEC 17020:2012**
5. **Name of the Auditing Chairman**	:	**Dr. S. Rajalakshmi** ISO QMS, EMS and EnMS Certified Lead Auditor ISO 17020:2012 (Green Audit), Founder & Chairman of NSF.
6. **Name of the Auditing Team Leader**	:	**Dr. D. Vinoth Kumar** ISO QMS, EMS and EnMS Certified Lead Auditor & ISO 17020:2012 (Green Audit) Director & Technical Manager, NSF.
7. **Name of the Lead Auditor for Green Audit +Air Quality Audit + Soil & Water Audit**	:	**Dr. R. Mary Josephine** ISO EMS and IGBC Certified Lead Auditor
8. **Name of the Lead Auditor for Environment Audit + Hygiene Audit + Waste Management Audit**	:	**Ar. N. M. Pradeep Kumar** ISO EMS and IGBC Certified Lead Auditor.
9. **Name of the Lead Auditor for Energy Audit**	:	**Er. A. Karthik** Bureau of Energy Efficiency Certified Auditor.
10. **List of Auditees**	:	**1.Dr. Jobi George,** Principal **2.Dr. Vinita S Virgandham,** IQAC Coordinator, **3.Prof. Sunil K Shinde** **4.Dr. Mangesh V Kadu** **5.Dr. Motiraj Chavhan** **6.Prof. Madhukar Nandanwar** **7.Associate Prof. Rahil Quarishi** **8.Associate Prof. Anita V Mahawadiwar** **9.Associate Prof. Rajesh Bahurupi** **10.Dr. Aditya Sarwe, (Director, Physical Education)** **11.Asst. Prof. Someshwar Wasekar** **12.Dr. Rajasree O.P. (Librarian)** **13.Dr. Yogesh K More**

14.Asst. Prof . Amit S Thakare
15.Dr. Ashwini M Kadu
16.Dr. Ravikant D Mishra

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.

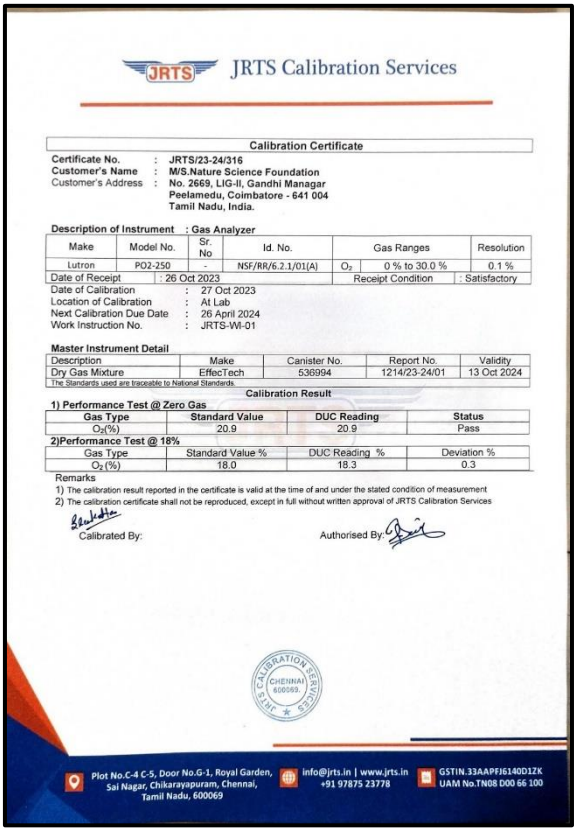
1.7.8. Deluxe Water and Soil Analysis Kit

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%

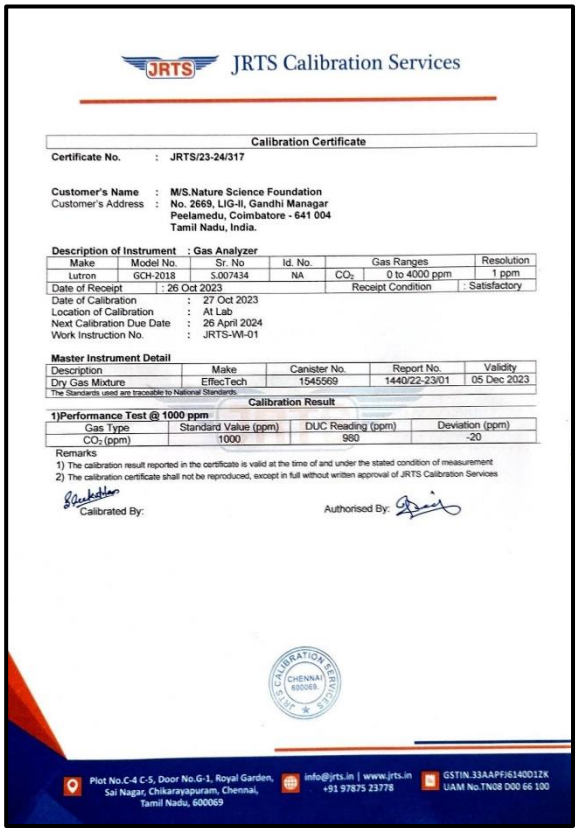
Gas Type	Standard Value %	DUC Reading %	Deviation %
O_2 (%)	18.0	18.3	0.3

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	S.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

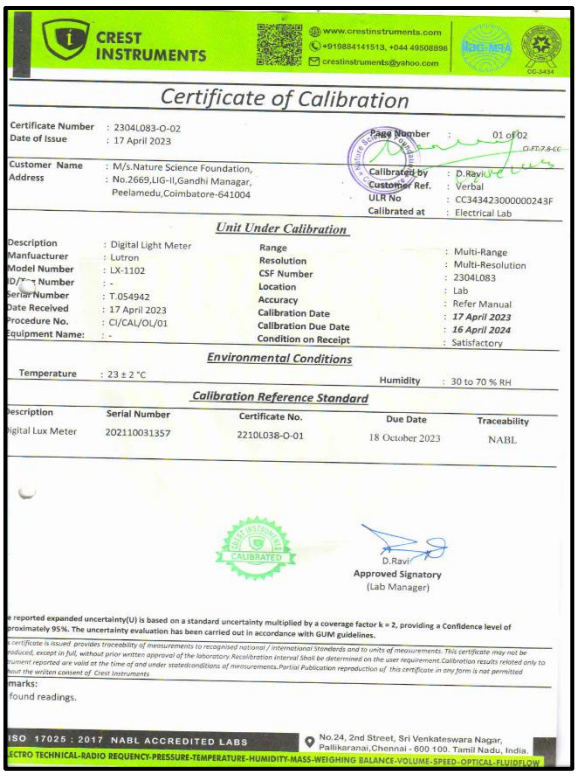
Gas Type	Standard Value (ppm)	DUC Reading (ppm)	Deviation (ppm)
CO_2 (ppm)	1000	980	-20

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
Manfuacturer	: 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

D.Ravi
Approved Signatory
(Lab Manager)

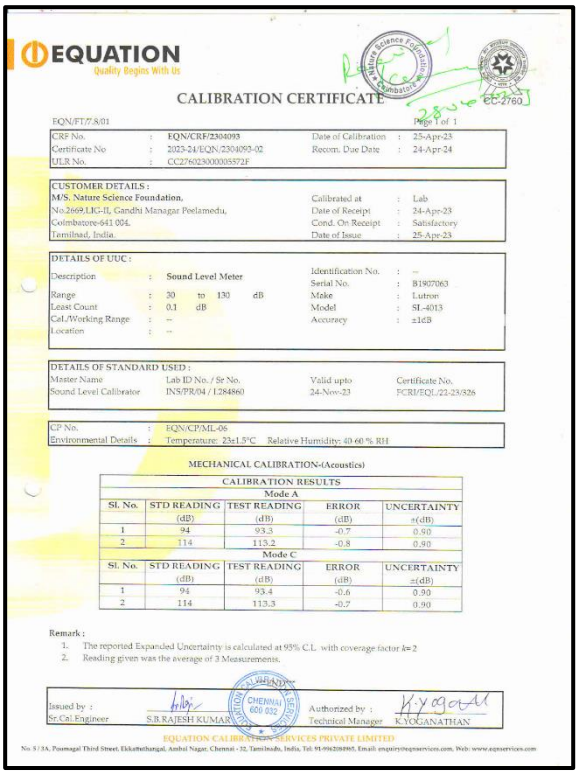
e reported expanded uncertainty(U) is based on a standard uncertainty multiplied by a coverage factor k = 2, providing a Confidence level of proximately 95%. The uncertainty evaluation has been carried out in accordance with GUM guidelines.

s 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

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.	: CC276023000035721F				

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/PR/04 / 1284860	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

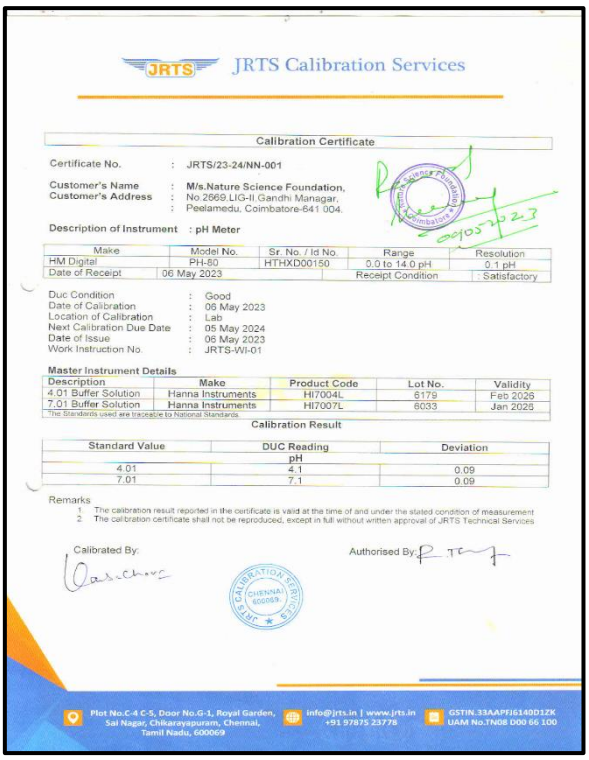
Sl. No.	STD READING (dB)	TEST READING (dB)	ERROR (dB)	UNCERTAINTY ±(dB)
1	94	93.4	-0.6	0.90
2	114	113.3	-0.7	0.90

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
No. 5 / 3A, Poonagal Third Street, Ekkattuthangal, Ambal Nagar, Chennai - 32, Tamilnadu, India, Tel: 91-9962269895, Email: enquiry@eqservices.com, Web: www.eqservices.com

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

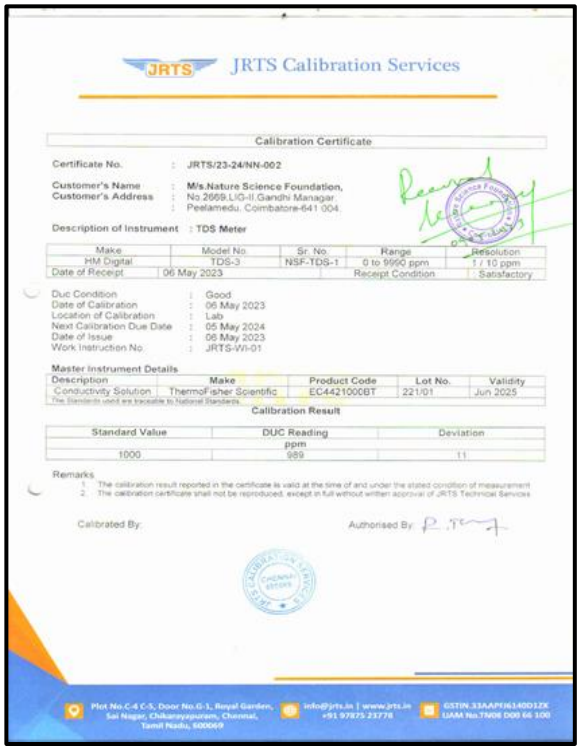
Standard Value	DUC Reading	Deviation
	pH	
4.01	4.1	0.09
7.01	7.1	0.09

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

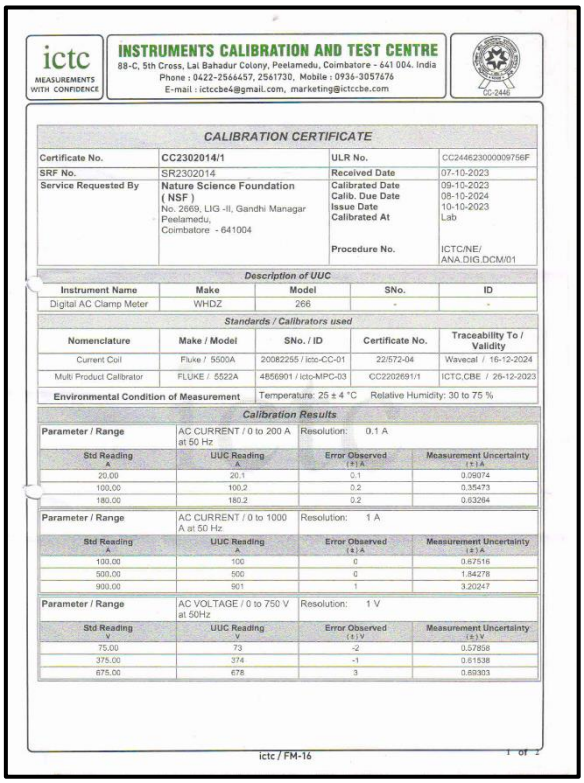
Standard Value	DUC Reading	Deviation
	ppm	
1000	989	11

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

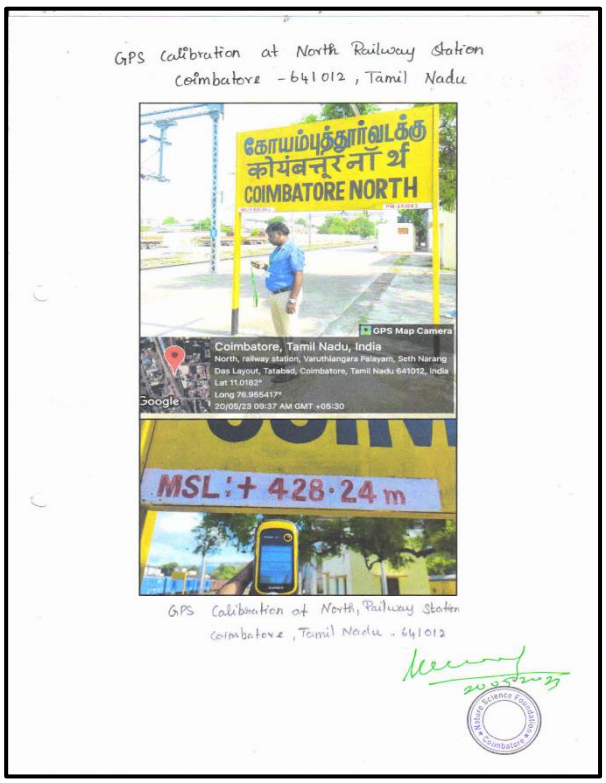
Nomenclature	Make / Model	SNo. / ID	Certificate No.	Traceability To / Validity
Current Coil	Fluke / 5500A	20082255 / ictc-CC-01	22/572-04	Wavecal / 16-12-2024
Multi Product Calibrator	FLUKE / 5522A	4856901 / ictc-MPC-03	CC2202691/1	ICTC,CBE / 26-12-2023
Environmental Condition of Measurement	Temperature: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

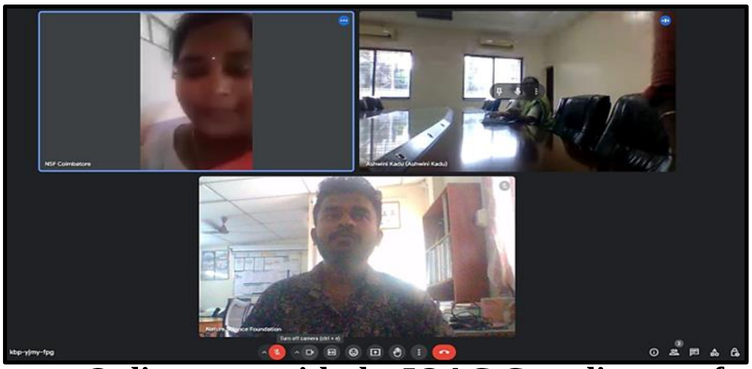
PPE includes safety gloves and should be used for tasks that can cause hand and skin burns, absorption of harmful substances, cuts, fractures or amputations**.** Selection of hand gloves is based on the application of use.

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.

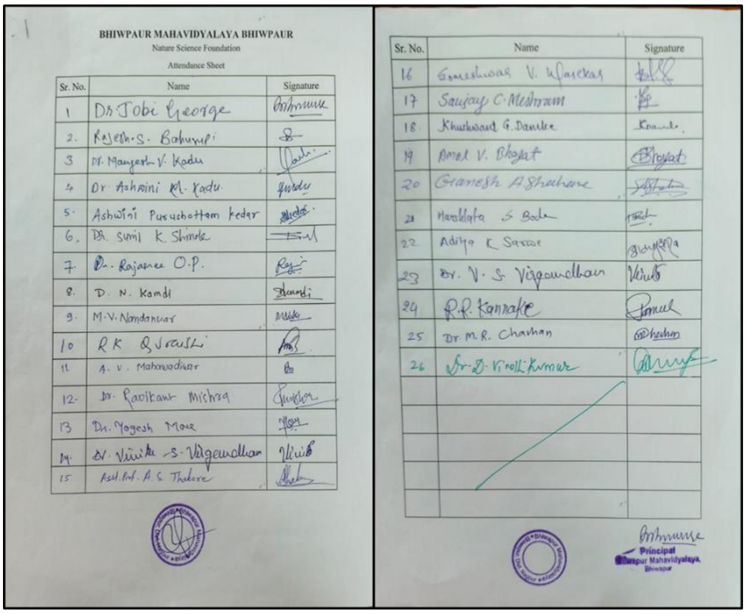
1.8.6. Ear Plug:

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.,



Online meet with the IQAC Coordinator of Bhiwapur Mahavidyalaya to explain the importance and document preparation for Green audit in line with National Building Code Part 11 (Approach to Sustainability)

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



BHIWPAUR MAHAVIDYALAYA BHIWPAUR
Nature Science Foundation
Attendance Sheet

Sr. No.	Name	Signature
1	Dr. Jobi George	
2.	Rajesh. S. Bahurupi	
3	Dr. Mangesh V. Kadu	
4	Dr. Ashwini M. Kadu	
5.	Ashwini Purushottam Kedar	
6.	Dr. Sunil K. Shinde	
7.	Dr. Rajasree O.P.	
8.	D. N. Kamdi	
9.	M.V. Nandanwar	
10	R K Qureshi	
11.	A. V. Mahawadiwar	
12.	Dr. Ravikant Mishra	
13	Dr. Yogesh More	
14.	Dr. Vinika S. Vigawadhan	
15	Asst. Prof. A. S. Thakre	
16	Gomeshwar V. Ufaskar	
17	Sanjay C. Meshram	
18	Khushwant G. Damke	
19	Amol V. Bhagat	
20	Ganesh A. Shahare	
21	Hemlata S. Bode	
22	Aditya K. Sarve	
23	Dr. V. S. Vigawadhan	
24	R.R. Kannake	
25	Dr. M.R. Chavhan	
26	Dr. D. Vinod Kumar	

Principal
Bhiwapur Mahavidyalaya, Bhiwapur

Opening and closing meeting attendance sheet

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, wheel chair) 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 and less watering through irrigation is observed.
- Vegetation 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 applicable because new construction is planned and raised.
- Ornamental garden are available in the campus 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.

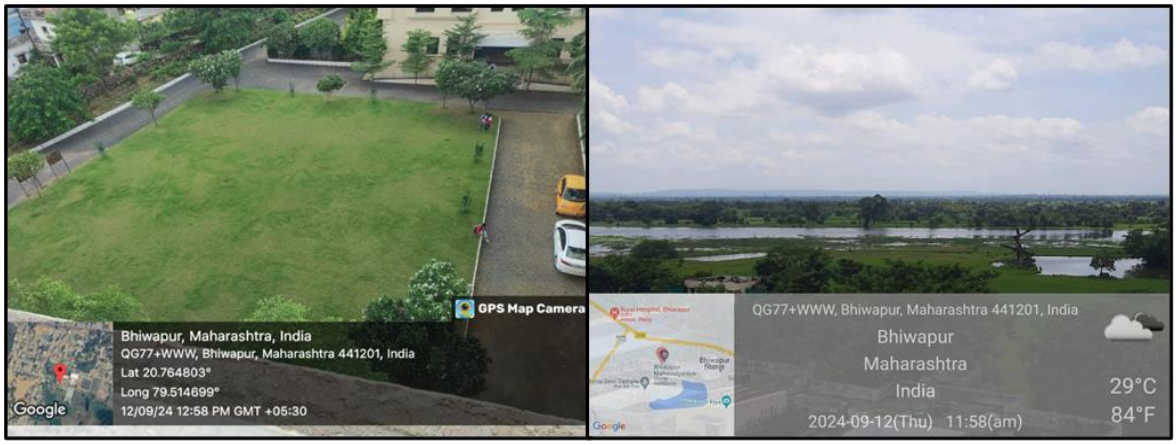
2.3.1. Facilities for Human Comforts (NBC checkpoint 3.2. and 3.9.)

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 facility& Wheel chair facilities observed 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.

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.

3. ENVIRONMENT AUDIT

3.1. Introduction

Environmental (Eco) audit is quantitative and qualitative data to track air, soil and water and to gain actionable insights to improve the operational performance in the atmosphere. It provides a 360˚ view of a surrounding campus and makes it easy for Owners / Managers / Environmentalists to collaborate, measure, control and reduce environmental negative impacts. Finally, it leads to enhance the quality of life of all living organisms. Eco audit initiatives are the need of the hour across the world due to changing environmental conditions and global warming besides ever-increasing human population and anthropogenic activities (NCP, 2016). Eco audit aims to make a sustainable and friendly environment for the stakeholders. In this context, to conserve eco-friendly atmosphere of an organization, well-developed environmental objectives and targets should be undertaken to reduce the harmful effects to a greater extent (Gnanamangai *et al*., 2021).

The audit process can remarkably minimize the environmental pollution in the campus which in turn reduces the impact of global warming scenario. As per the Rules and Regulations laid by Government, the environmental legislations should be followed by all the Institutions and Organizations and make sure that their activities should not degrade the environment. The environmental audit involves systematic documentation of periodic objective review by a regulated entity on available facilities, their operations and practices related to resolve the environmental requirements. In general, environmental audit is planned to achieve an optimum resource utilization and improved process performance in the audit sites. Venkataraman (2009) stated that it is a 'Common Sense Approach' to identify the problems and solve those problems pertaining to curb eco-friendly atmosphere. Environmental audit enables an overall and complete overview at the audit sites to facilitate our understanding of flow of materials and to focus the priority areas where waste reduction is achieved thereby cost saving is made possible.

Purpose of the audit is to determine performance of the environmental management systems and equipmentrelated to environmental safety. Audit reports can provide key information to the management in relation to risk areas, progress towards strategic objectives and targets. Audit work can be undertaken voluntary for the benefit/advantage of the company and it can be executed with the help of environmental auditing authorities. As mentioned earlier, it helps in the proper natural resource utilization and on the whole, it improves the quality of environment.

An environmental auditor will study an organization's performance towards the environmental sustainability in a systematic manner where environmental management systems and equipment are performing with the aims of a) facilitating management control of environmental practices, b) assessing compliance with company policies, c) facilitating professional competence, d) sustenance activities without harming the environment and e) practicing the environmental conservation.

3.2. Organization Details

Table 1. Campus details

S.No.	Details / Descriptions	Quantity
1.	Total strength of Students	744
2.	Total strength of Employees	52
3.	Total number of Buses in the campus	01
4.	Number of Cars entering in the campus	10
5.	Number of Motorcycles entering in the campus	50
6.	Number of other vehicles (Lorry, Ambulance, Jeep, Trucks, Cranes, Poclain, and etc. entering in the campus)	Nil
7.	Number of E-Vehicles	01
8.	Number of RO Water Plants	01
9.	Number of Borewells	02
10.	Number of Open wells	01
11.	Number of Water reservoirs	02
12.	Number of Wastewater treatment facility	Nil
13.	Number of Rain harvesting system	06
14.	Number of Composting pits and Vermicompost units	08

3.3. Environment audit observations

- The construction is proposed based on the applicable climatic zone and geological conditions.
- Human comforts are implemented and observed like ramp walk, fire safety, etc.,
- To reduce the demand of water, rain water harvesting system is implemented.
- Training and awareness programmes records are available to maintain sustainability.
- Fire extinguishers are available in the building to consider the safety of all the Stakeholders and maintained properly.
- It is observed that the tree plantation awareness programmes are conducted.
- Parking is provided under the tree shade to reduce the Heat Island effect (Temperature).
- Rain water harvesting unit is maintained well.
- Use of potable and non-potable waters are identified and differentiated to conserve water.
- Public transport facilities are available in the campus to control air pollution.
- E-vehicle are available in the campus.
- The pedestrian pathways are maintained with adequate shading facilities by planting more number of trees.
- No offsite and subsidized parking are encouraged in the campus.
- Different color dustbins to be maintained in the Campus.
- Biogas Plant are available in the campus.
- Disaster management plan and emergency preparedness are not available as the safety of the stakeholders.

3.3.1. Integrated Water Management System (NBC Checkpoint 3.7. and 7.2.1.)

Water is one of the major source of living. Per captia water consumption in the building is calculated as per the water management plan (litres / person/ day). To reduce the demand of water consumption rain water harvesting unit is implemented and practiced. Proper monitoring plan is made evident to reduce the water consumption in the leakage areas.

3.3.2. Corporate Governance (NBC Checkpoint 3.10.)

Training and awareness programmes are conducted to the stake holders to maintain sustainability. Some of the programmes conducted by the Organization are green initiatives and Sustainable development.

Awareness programme organized by the Organization

3.3.3. Safety measures and green building conservation code (NBC Checkpoint 3.11.)

Environmental safety measures are very important in the buildings as far as students, staff members and other stakeholders are concerned and it requires vigilance and awareness. Management should extend by issuing guidance and the best safety tools. The organization has have a police force, escort services, call boxes, first aid box, fire extinguishers, fire alarms, security systems and staffs towards the safety measures. Organization has very good safety measures as per the green building conservation code such as fire extinguisher and fire bell and alarms in all the place. In addition, in all the place, ‘Exit’, ‘Entry’ and other sign boards kept across the place to give safety to the stakeholder. It is observed that Fire Extinguisher are maintained properly which is evident through AMC. Regular mock drill and awareness programmes are conducted at regular intervals considering the safety of stake holders

Safety measures observed inside the campus

3.3.4. Applicability and Implementation (NBC checkpoint 4 and 5)

Guidelines of Architect, Designer and Civil contractor for the existing building plan was in under Process to implement.

3.3.5. Parking facilities to reduce Heat Island Effect (NBC checkpoint 7.4.1.)

Heat island effect denotes the temperature level. It is observed that the vehicles are parked under the Tree shade to reduce the heat island effect for the benefit of stakeholders and to maintain sustainability. To reduce the heat island effect parking areas are made up of high albedo materials with light coloured paints observed in the organization.

Vehicles parked under the tree shades to reduce the carbon emission

3.3.6. Public transport, low emitting vehicles and control of car smokes (NBC Checkpoint 7.4.1. – 7.4.7)

The audited Organization is provided E- Vehicles to maintain eco-friendly environment in the campus and to reduce carbon dioxide emissions. Apart from the e-vehicles, students are encouraged to use bicycles. The tree species are planted abundantly to provide shade to the pedestrian.

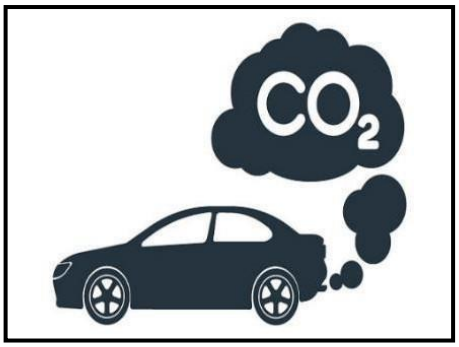
Bicycles was observed in the college campus

3.3.7. Pedestrian path facility at the campus (NBC Checkpoint 7.4.3.)

The concept of pedestrian path is to give safe space to walk freely by the pedestrian. It is very important in the green campus in terms of freely walk pedestrians or people going on foot without any obstacles. The pedestrian path is otherwise called as zebra crossing by the combination of black and white stripes remained to characterize the zebra. In addition, pedestrian path is created in the green campus along with road side which meant for walking only using special cement bricks and stones. The pedestrian path aims to end circulation not only cars, buses, vans, trucks and other vehicles but also giving safe space to the pedestrians, where cross and pass through blocks and also forcing vehicles to comply with it. The audited organization is having very good facility in creating pedestrian path for stakeholders with all the facilities such as accessible public toilets, barrier free environment, dustbins, stone benches, etc. Use of bicycles are encouraged in the Campus to control carbon emission and air pollution.

3.3.8. Carbon footprint

Carbon footprint means measuring/recording the greenhouse gases (GHG) emissions of an organization within its defined boundary. Observations on carbon dioxide and oxygen levels monitored in different parts of the campus are presented under Air Quality Audit section while observation on carbon footprint due to electricity usage per year at the Organization along with other fossil fuel utility are presented under Energy Audit portion of this Technical Report.



3.3.9. Selection of Building Material (NBC checkpoint 9.1. – 9.3.)

Building materials are selected as per the Guidelines to Architect, Designer and Civil contractors. Low carbon emitting cements, bricks, etc., are used for the construction and recycled glass materials are used for windows. Construction material are not stored in the campus. Existing building service life plan is not available as per the National Building Code.

3.3.10. Waste and Water management activities (NBC Checkpoint 10.1.)

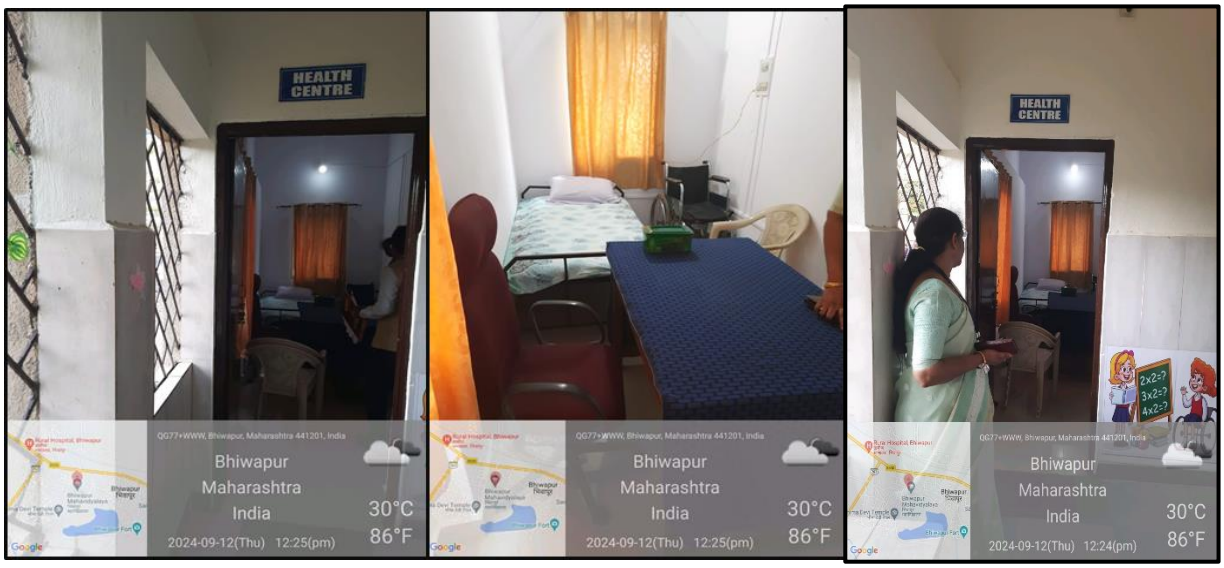
Management of water and waste are the two important parameters which plays a vital role to maintain sustainability. Rainwater harvesting is implemented and maintained properly for water conservation, this water is used for irrigation and domestic purpose. It is observed that colored dustbins are used in the Organization to segregate the waste at the source of generation.

Waste management activities in the Campus

3.3.11. Post Occupancy maintenance

Post occupancy maintenance is the activities performed after the completion of construction work and handed over to the owner for further maintenance. The following activities are observed during the onsite visit as post occupancy maintenance

- Vegetation and plants are maintained properly with regular watering through irrigation facilities.
- Soil is maintained well without adding any chemical fertilizers and pesticides.
- Rainwater harvesting is available to meet the demand of water consumption.
- To reduce the energy consumption HVAC system are maintained properly.
- Considering the safety of the stakeholders fire extinguisher, health care room facilities are available.



Post Occupancy Maintenance in the Campus

4. ENERGY AUDIT

4.1. 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.

4.2. 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.
- 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 generator and UPS.
- 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.
- Three star rated appliances (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 in the campus.
- All the artificial lighting system are monitored and controlled through partial availability of sensors.
- Lifts and moving walk path are adequately available in the campus.
- Operation and maintenance manual are observed in the on-site.
- No emissions and leaks are observed
- 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, operation and maintenance, etc.,
- Standard Operating Procedure for electrical instruments are not available in the campus.

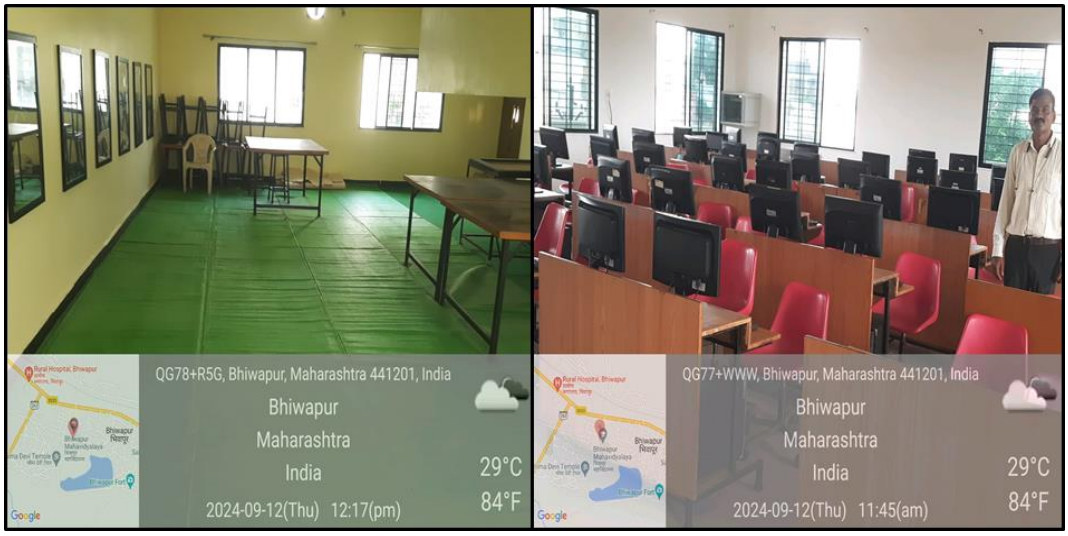
4.2.1. Energy Efficient Design and Process (NBC Checkpoint 3.5, 3.6 & 3.8.)

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 as per the operation and maintenance plan. Standard Operating Procedures for UPS, AC are available to conserve energy and to avoid damages.

Solar panel observed in the campus

4.2.2. 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.



Natural Lighting facilities observed during day time

4.2.3. 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

4.2.4. 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 1 & 2; Table 2).

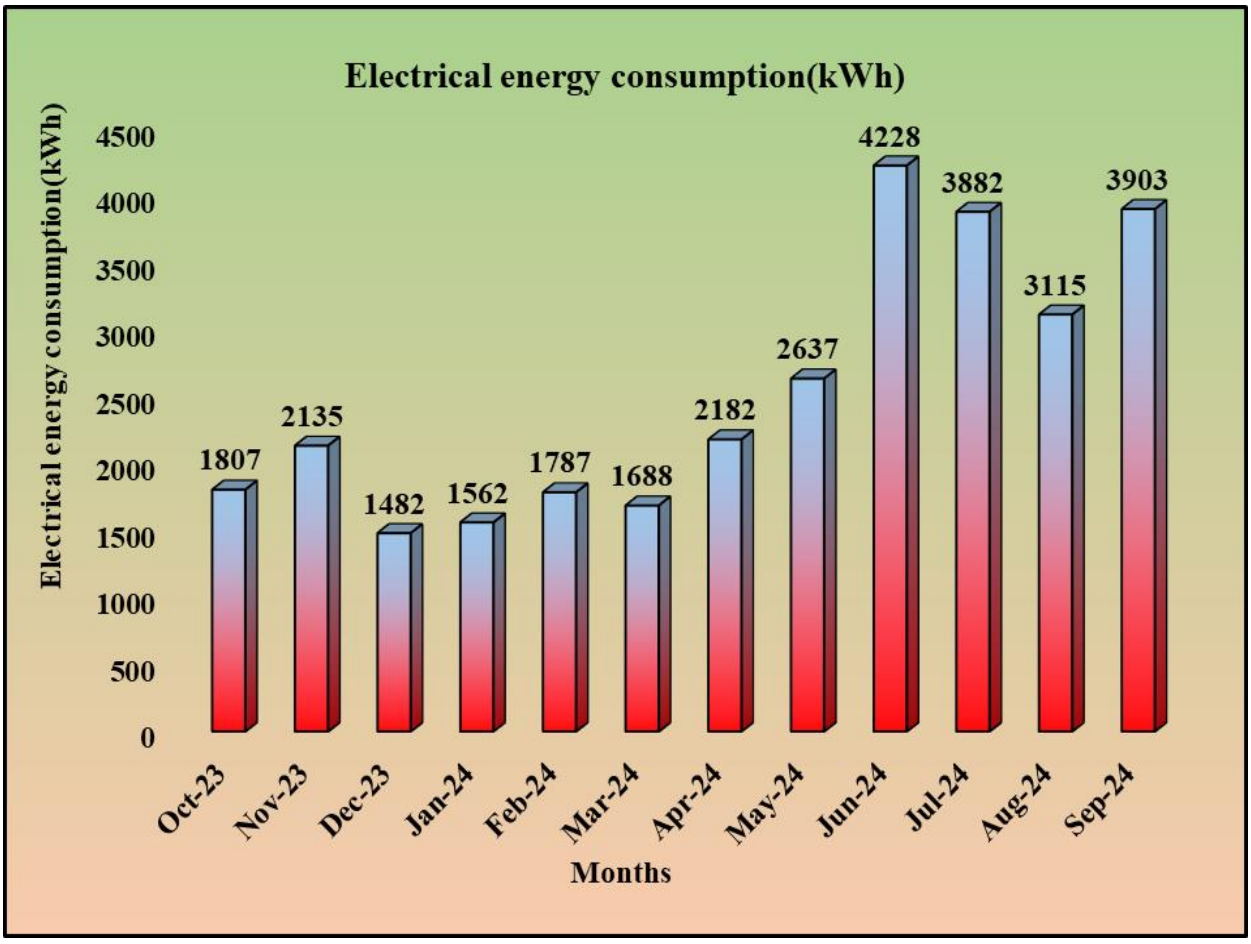


Figure 1. Electrical energy consumption profile

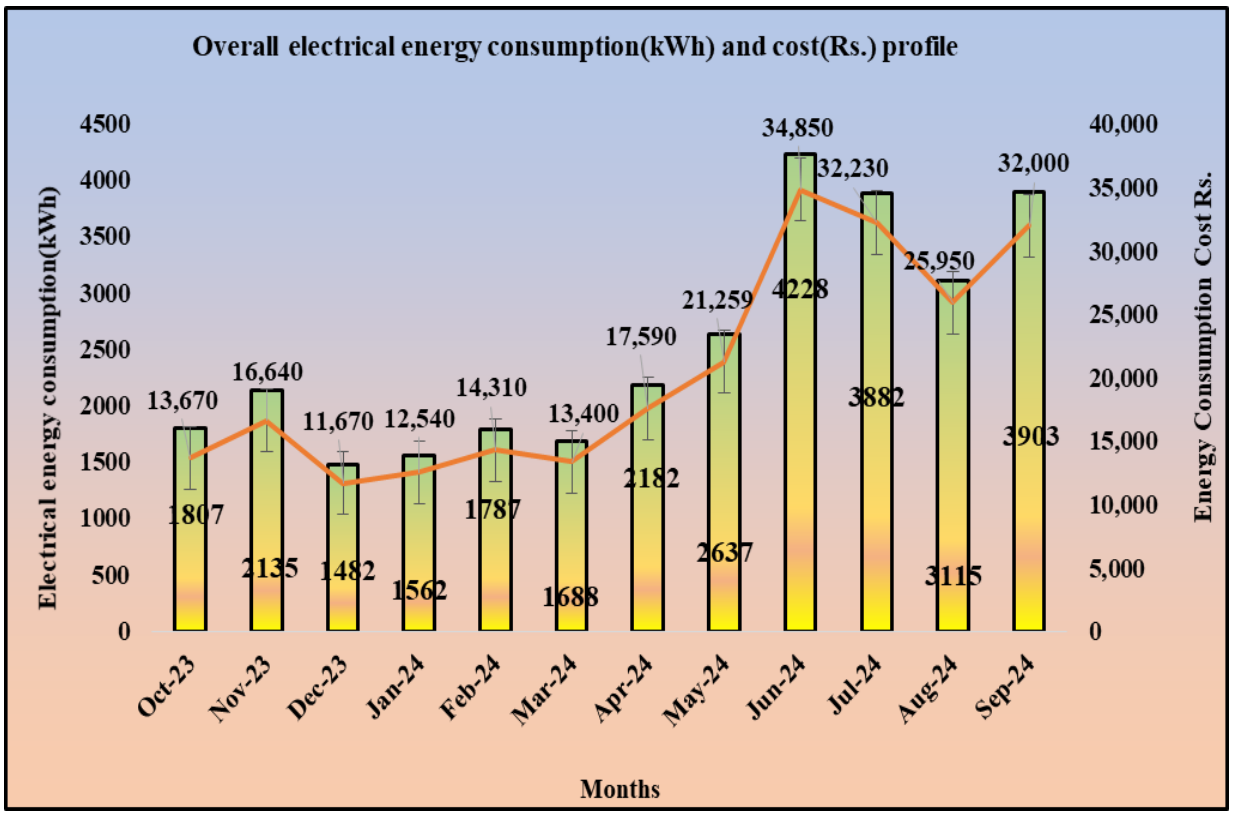


Figure 2. Overall electrical energy consumption and cost profile

Table 2. Electrical energy consumption and cost profile in the Institution

S. No	Months	Rating / Capacity units in kWh	Cost in Rs.
1.	January 2024	1562	12,540
2.	February 2024	1787	14,310
3.	March 2024	1688	13,400
4.	April 2024	2182	17,590
5.	May 2024	2637	21,259
6.	June 2024	4228	34,850
7.	July 2024	3882	32,230
8.	August 2024	3115	25,950
9.	September 2024	3903	32,000
10	October 2023	1807	13,670
11.	November 2023	2135	16,640
12.	December 2023	1482	11,670

4.2.5. 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 3.

Table 3. Annual Energy Consumption of Fuels in the College

S. No	Month	Diesel consumption (Liters)	Petrol consumption (Liters)	LPG consumption (kg)
1	January 2024	18	Nil	Nil
2	February 2024	12	Nil	Nil
3	March 2024	20	Nil	Nil
4	April 2024	27	Nil	Nil
5	May 2023	19	Nil	Nil
6	June 2023	20	Nil	Nil
7	July 2023	23	Nil	Nil
8	August 2023	50	Nil	Nil
9	September 2023	30	Nil	Nil
10	October 2023	20	Nil	Nil
11	November 2023	15	Nil	Nil
12	December 2023	21	Nil	Nil

4.2.6. 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.

4.2.7. 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

= (30408 kWh/1000) x 0.84

= 25.54 metric tons

According to the above calculations, carbon emission due to electricity usage per year accounts for 25.54 metric tons.

Transportation per year (Shuttle)

= (Number of the shuttle vehicle in the campus x (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

= ((1 x 20 x 1 x 365)/100)) x 0.01
= 0.73 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 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
= ((10 x 20 x 1 x 365)/100)) x 0.02
= 14.6 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
= ((50 x 20 x 1 x 365)/100)) x 0.01
= 36.5 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)
= (25.54 + 0.73 + 14.6 + 36.5)
= 77.37 metric tons

4.2.8. 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 tobe within 55 dB in residential areas, including institutions. Class room noise levels aresupposed to be around 50 db. Sound Level Meter / Noise Thermometer are used to measure the 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 4.

Table 4. Noise level standard prescribed by Central Pollution Control Board, Government of India

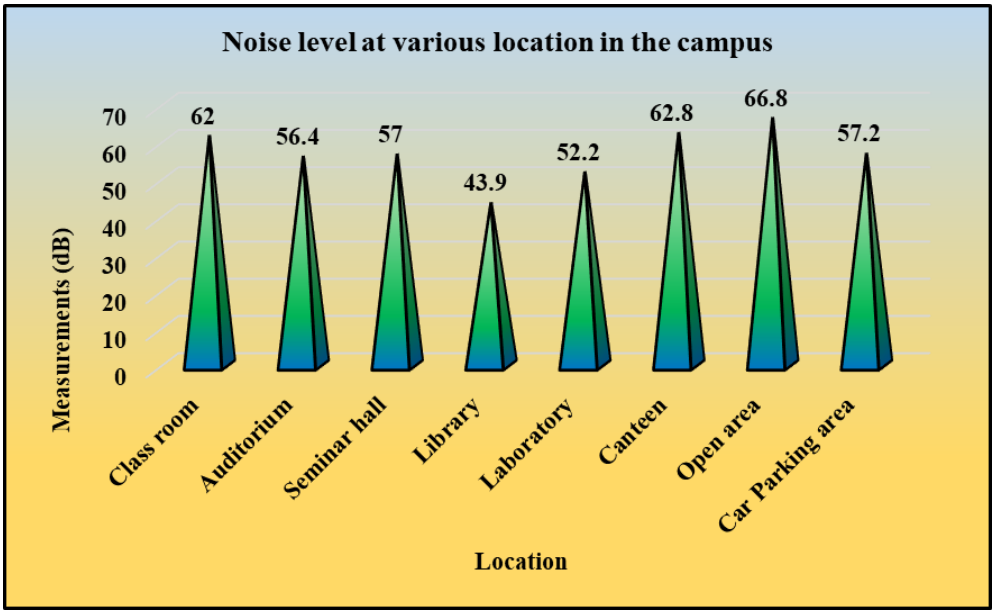
Area Code	Zone	Limits in dB (A) Leq	
		Day Time	Night Time
A	Industrial	75	70
B	Commercial	65	55
C	Residential	55	45
D	Silence	50	40

Source: IS : 12065 - 1987

Table 5. Noise level at various location in the campus

S. No	Locations	Measurements (dB)	Major noise sources	Remarks
1.	Class room	62.0	Students and Staff	No Noise Pollution
2.	Auditorium	56.4	Students	No Noise Pollution
3.	Seminar hall	57.0	Students	No Noise Pollution
4.	Library	43.9	Staff members	No Noise Pollution
5.	Laboratory	52.2	Students	No Noise Pollution
6.	Canteen	62.8	Students and Staff	No Noise Pollution
7.	Open area	66.8	Students and staff	No Noise Pollution
8.	Car Parking area	57.2	Vehicles	No Noise Pollution
	Mean	44.21%		
	SE	2.09		
	CD	2.61		

Figure 3. Noise level at various location in the campus



Noise level measured in various locations at the College Campus

4.2.8.1. 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 6. Light intensity measured at various locations in the College

S. No	Type of Spaces	Illuminances (LUX)
1.	Class room	365.7
2.	Auditorium	468.7
3.	Seminar hall	418.7
4.	Library	394.3
5.	Laboratory	419.3
6.	Canteen	467.3
7.	Open area	571.3
8.	Car Parking area	542.3
	Mean	457.48
	SE	10.03
	CD	17.87

Source: IS: 6665-1972

Light intensity analysis in the Campus

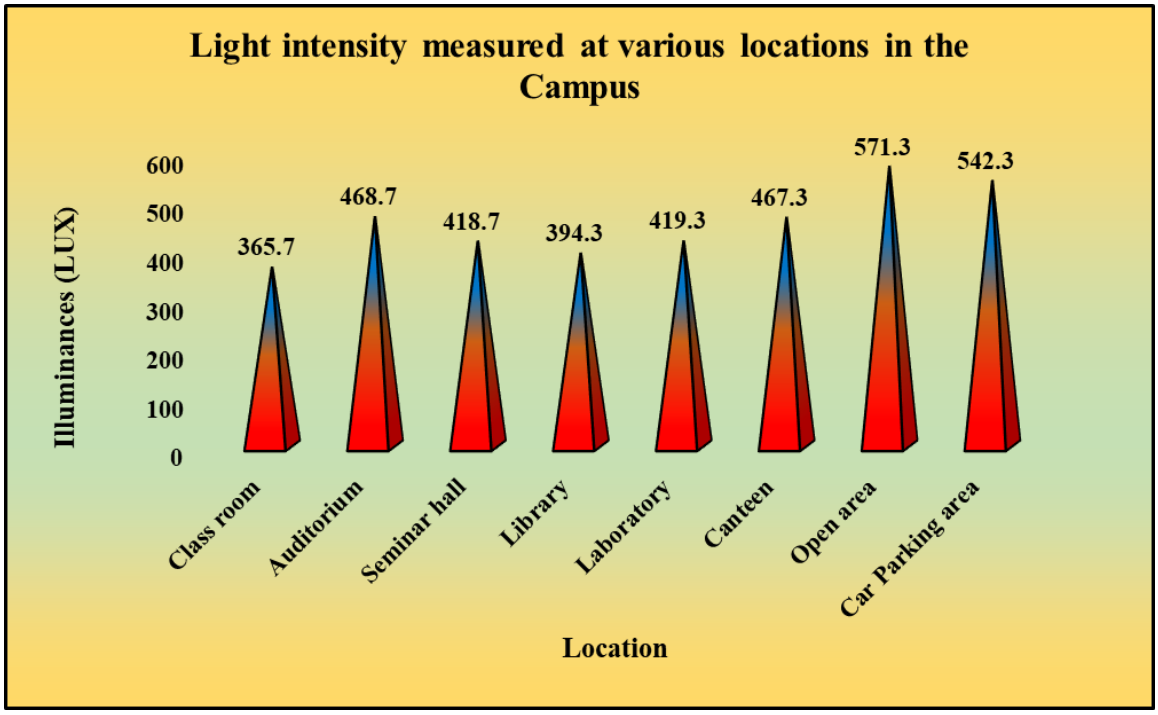


Figure 4. Light intensity Measured at the campus

4.2.8.2. 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 7. Voltage measured at various locations in the College

S.No	Name of the Place	AC & DC Voltage Measurement [Volt (v)]
1.	Class Room (AC)	236.7
2.	Auditorium (AC)	231.0
3.	Seminar Hall (AC)	236.0
4.	Library (AC)	234.0
5.	Laboratory (AC)	235.7
6.	Canteen (AC)	246.3
7.	Power Room (AC)	241.0
8.	Generator Area (AC)	237.3
9.	Battery (DC)	246.3
SD±		2.30

Source: BEE, 2015, Bureau of Energy Efficiency

Voltage intensity measured at the College

4.2.9. Operation and Maintenance (NBC Checkpoint 13)

During commissioning and handover, operation and maintenance plan was in under process to implement.

5. WASTE MANAGEMENT AUDIT

5.1. Introduction

Waste management is a global environmental task but has always been neglected by the public. Improper waste management will create environmental issues *viz*., soil, water- and air-pollution which lead to health problems. Main reason for polluted environment is unawareness of consumers and improper or poor legitimate initiatives. Ever increasing population rate and the improved life style of the people results in generation of amplified amount of solid wastes, irrespective of urban and rural areas. Solid waste is defined as the unwanted substance which is generated by the society that does not have any economic value from the point of view of the user. Waste management is defined as the discipline associated with control of generation, storage, collection, transport/transfer, processing and disposal of solid waste materials in aesthetic way.

There is a daunting need of effective waste management in India as 62 million tons of municipal solid waste and 38 billion liters of sewage is generated annually only from urban areas. The solid waste increases at the rate of 1.0 - 1.3% annually and the maximum amount of municipal waste is left untreated (Rajalakshmi *et al*., 2023). Primary reason for unclean surroundings in the nation is unawareness of individuals, in general, deprived institutional initiatives. While educating the environmental health and security, it has to be initiate from grass root level, primarily, educational institutions are the right forum to start with. Prior to teaching the students on waste management practices and prepare them to adopt strategic plan of waste management to material management, educational institutions should establish the physical facilities and follow the fundamental guidelines. The physical facilities established in the higher educational institutions and their utility through onsite auditing and to assess the implemented waste management practices with particular reference to recycling and generation of value added products.

5.2. Observations of the Waste Management Audit

- Recycling and reuse of waste materials are implemented and practiced through vermicomposting available in the campus.
- Solid wastes are segregated at the source of generation by implementing the use of different coloured dustbins.
- Solid waste are minimized in the campus by controlling the usage, recycling practices.
- Different coloured dustbins for the collection of waste at various locations are not observed in the campus.
- Incinerator facilities are available for the disposal of napkins.
- No usage of radioactive elements observed in the campus.
- Chemical wastes like acids, solvents and salts are dissolved properly before the disposal.
- Electrical and electronic wastes are collected and segregated properly.
- Records are available for e-waste disposal by the authorized agency.
- MoU signed with the authorized waste disposal agency as an effective practice of waste management.

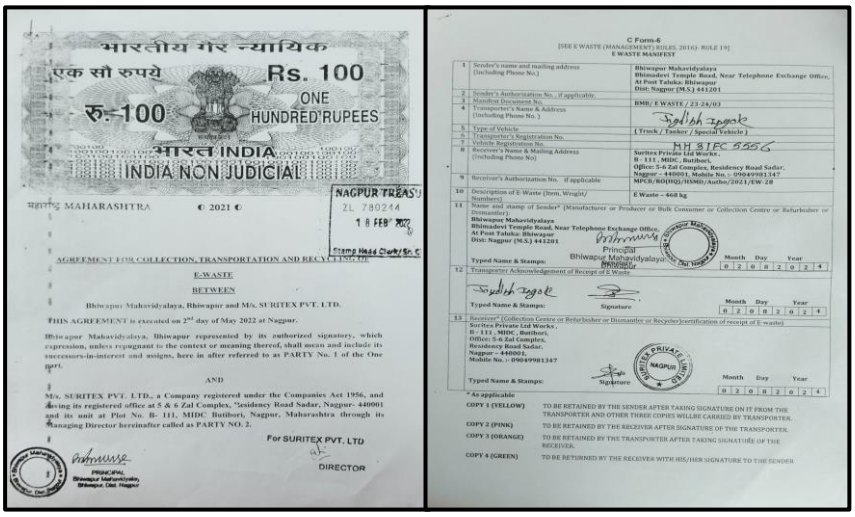
- Observed the allotment of separate team to perform environmental impact assessment and environmental management plan.
- Training needs are identified and workforce training is carried out in regular basis.
- Top soils are preserved and reused in the same site are observed.
- Some of the construction waste are reused for constructing cement roads inside the campus.

5.2.1. Technology Options (NBC Checkpoint 3.3 and 3.4.)

As per the guidelines to Architect and Civil contractors for existing buildings, traditional materials are used in the construction, environment friendly and cost-effective technologies are made available in the campus as per the building code.

5.2.2. Waste Management Practices (NBC Checkpoint 10.6, 10.7 and 12)

Waste Management has a common mandate that the 'Producer Owns the Responsibility'. The solid wastes are collected from different places of campus and segregated based on biodegradable and non-degradable materials subsequently subjected for recycling and degradation processes like composting. Details of the waste management practices in the Organization are 1) bio-degradable waste handling, 2) Biogas plant and 3) disposal of e-waste. Waste management is performed based on the waste management plan, separate committee is formed and monitored accordingly.


भारतीय गैर न्यायिक
एक सौ रुपये
Rs. 100
ONE HUNDRED RUPEES
रु.-100
भारत INDIA
INDIA NON JUDICIAL
NAGPUR TREAS'
AGREEMENT FOR COLLECTION, TRANSPORTATION AND RECYCLING OF E-WASTE
BETWEEN
Bhiwapur Mahavidyalaya, Bhiwapur and M/s. SURITEX PVT. LTD.
THIS AGREEMENT is executed on 2nd day of May 2022 at Nagpur.
For SURITEX PVT. LTD
DIRECTOR
C Form-6
[SEE E WASTE (MANAGEMENT) RULES, 2016)- RULE 19]
E WASTE MANIFEST
Bhiwapur Mahavidyalaya
Bhimadevi Temple Road, Near Telephone Exchange Office,
At Post Taluka: Bhiwapur
Dist: Nagpur (M.S.) 441201
BMR/ E WASTE / 23-24/03
(Truck / Tanker / Special Vehicle)
MH 31 FC 9556
Suritex Private Ltd Works ,
B - 111 , MIDC , Butibori,
Office: 5-6 Zal Complex, Residency Road Sadar,
Nagpur - 440001, Mobile No. :- 09049981347
MPCB/BO(HQ)/HSMR/Authe/2021/EW-28
E Waste – 468 kg
Typed Name & Stamps:
Signature
Month Day Year
0 2 0 5 2 0 2 4
Principal
Bhiwapur Mahavidyalaya
Bhiwapur
Dist. Nagpur
COPY 1 (YELLOW) TO BE RETAINED BY THE SENDER AFTER TAKING SIGNATURE ON IT FROM THE TRANSPORTER AND OTHER THREE COPIES WILLBE CARRIED BY TRANSPORTER.
COPY 2 (PINK) TO BE RETAINED BY THE RECEIVER AFTER SIGNATURE OF THE TRANSPORTER.
COPY 3 (ORANGE) TO BE RETAINED BY THE TRANSPORTER AFTER TAKING SIGNATURE OF THE RECEIVER.
COPY 4 (GREEN) TO BE RETURNED BY THE RECEIVER WITH HIS/HER SIGNATURE TO THE SENDER

E-waste management documents were checked and observed in the campus

i) Solid waste management practices at the campus

The term, solid waste control refers to the method of accumulating and treating solid wastes by following ecofriendly methods. It is also a solution for recycling objects that do not belong to garbage. In the solid waste management, the wastes are accumulated from different parts and are disposed based on degradability materials like paper and non- degradability materials like glasses, plastics and metals. Organization has a very good solid waste recycling unit which operates a few vehicles to collect wastes using compostable bags across the campus. Both degradable and non-degradable items are being collected from canteens, stationary shops and hostels and disposed through the Corporation facility.

ii) Bio-degradable and non-degradable waste materials management practice

For segregation of waste (Organic, recyclable, non-recyclable and e-waste) at source and collecting the same 'Waste Bins' are placed at designated locations in the Campus *viz*. Students Hostels and Staff rooms, Students Service Centre, Sports Complex and Guest rooms. A Contractor is engaged for the collection and further process of waste generated within the campus where biodegradable wastes subjected to preparation of organic compost.

iii) Use of biofertilizers, organic and green manures

Natural or eco-friendly methods should be used to grow plants vigorously in the campus which could reduce the environmental pollution. The plant waste such as fallen leaves, stems, fruits, nuts, seeds and other plant parts are used to make green manures. Minimal use of chemical fertilizers as part of integrated nutrient management system is acceptable but 'zero use' of chemical fertilizers is highly appreciable. Biofertilizers, farm yard manure and dried cow dung manure are extensively used in the audited organization to cultivate plants ensured to keep the campus organic. These practices are very well appreciated because air, water and soil pollution due to use of agrochemicals is eradicated which in turn to improve the soil health significantly.

Biofertilizer process observed inside the campus

iv) Disposal of E-Waste

According to E-Waste Management Rules, 2016 (Ministry of Environment, Forest and Climate Change, Government of India), electronic waste or e-waste includes old and non-functional electrical and electronic appliances. The e-waste materials were collected from the Organization are being segregated and then given to authorized agencies for handling e-waste. Due to this e-waste activity disposal, the e-waste pollution is significantly reduced in the Campus. Organization has produced lesser quantity of e-waste and the same has been disposed through the Corporation facilities.

E-waste collection process observed inside the campus

v) Construction and Demolition waste management

The Ministry of Environment, Forest and Climate Change, Government of India has notified the Construction and Demolition Waste Management Rules, 2016 exclusively to manage waste (building materials, debris and rubble) from construction activities like new construction, re-modelling, repair and demolition. One of the best waste management practices is rebuilding of construction waste into pillars, pathway road and etc. The construction waste inside the campus is found to be very low.

vi) Hazardous and biomedical wastes management

The Organization have taken pioneering efforts to dispose the hazardous as well as biomedical wastes properly that are generated from various Department laboratories. Acids, solvents, salts, reagents and cancer-causing substances (carcinogens) will cause cancer to the stakeholders those who doing research and/or experiments. Most of these kinds of wastes are disposed of safely without affecting the environment, soil health and water quality as per the directions of World Hazardous Waste Programme. Napkins are incinerated onsite while agricultural wastes are recycled within the campus. Hazardous chemical and biomedical wastes are not abundantly used in the campus. Bio medical wastes are segregated at the source of generation using different coloured dustbin and acid neutralization chamber is available to collect the concentrated chemicals in the separate pipeline.

vii) Recycling of wastewaters

The main feature of the treated water should not be harmful to the biodiversity, resources and the environment especially in soil ecosystem. If an industry or Organization has the wastewater treatment plan, proper records on the analysis of water input and output parameters including the running time of the wastewater treatment plant; its operation cost, its maintenance and the reuse records of the treated water should be well accounted.

6. SOIL AND WATER AUDIT

6.1. Introduction

Soil and water are inequitable natural resources of India at global level. Soil are naturally occurring loose covering on the earth's surface. Weathering altered the rock particles of soil into mixtures of mineral and organic constituents. Soil is rich in microorganisms such as bacteria, fungi, actinomycetes, algae, protozoa and nematodes. The microorganism of the soil helps in enzymatic degradation of organic matter, energy storage and conversion of nutrients in available form in their biomass. Water the other natural resource constituting with 97% of salt water and 3% of fresh water. The use of water is inevitable in our daily needs. Water is used in agriculture, industrial, household, recreational and environmental activities. The natural source of fresh water are surface water and ground water.

Soil and water are natural resources of the organization that has to be structured, planned and developed from the point of entry to end users the stakeholders in such a way with contamination free soil and water, sustainable use of land and water and suitable measures for their conservation. Soil and water audit is a tool to improve the quality of the land and water to provide a healthy environment for the stakeholder directly and indirectly of the campus. It creates awareness on environmental ethics, resolves environmental issues and offers solutions to various social and economic needs. It strengthens the concept of 'Jal Jeevan Mission' and 'Sustainable Land Management' among stakeholders of India for the protection of natural ecosystems for future prospects.

Soil and water audit helps the educational institutions/ industries to maintain eco-friendly environment, assures personal hygiene to various stakeholders and supports the nation; on the whole for the noble cause of environmental protection and nature conservation which in turn enhances the quality of life of all living beings. Most of the soil in India are well drained, deep, fairly loamy, slightly acidic to alkaline and lime-free soils and they are ideal for variety of plant cultivation. The Indian soils are mainly derived from gneissic rock containing large amount of mica with good behaviour of water holding capacity with abundance of micro and macro elements. Some of the soils are characterized by clay loam type, classified as latosols with good organic matter contents along with sufficient amount of nitrogen, potassium and phosphorous contents all tea soils are distinctly acidic, rich in nitrogen content.

6.2. Soil and Water audit observations

1. The campus has well established rainwater harvesting models to recharge the bore wells by collecting rainwaters from the building roofs, open areas and playgrounds including unexplored areas which are channelized properly.
2. The physic-chemical properties of soils revealed that the soil health is good towards the construction of building and the cultivation of various native and wild type plant species.
3. The water quality parameters revealed that the quality of water is good in terms of domestic and irrigation purposes.
4. It is observed that the Organization is created massive facilities for wastewater

treatment to purify the wastewaters to manage the wastewaters effectively.

5. A well-established rainwater harvesting system to recharge water ground status by collecting rainwaters from the campus coinciding with the contour of the terrain and natural drains.
6. Solar water heater available to serve hot water for domestic purpose.
7. Low flow fittings, low cisterns and bath faucet are available to conserve water.

6.2.1. Geology, topography and soil condition (NBC Checkpoint 12.4.1)

Bhiwapur is a town and a tehsil in umred subdivision of Nagpur district in Nagpur revenue Division in the Berar region in the state of Maharashtra. Nagpur district is one of the nine districts of Vidarbha Region of Maharashtra State. It is situated on the eastern part of the State abutting Chindwada district of Madhya Pradesh in north. It is bounded by Wardha and Amravati districts in the west, Bhandara district in the east and Chandrapur district in the south. Nagpur district lies between 20.35 to 21.44 North Latitude and 78.15 to 79.40 East Longitude., in the plain to which it gives its name at the southern base of the Satpuda Hills. It has an area of 9,892 Sq. km. Most part of the district is covered by black cotton soil. The western and southern part of the district has clayey soil, while eastern part has clay-loam & sandy clay.

6.2.2. Assessment of Physico-chemical property of Soil samples

Soil physic-chemical properties influence the behaviour of soil and hence, knowledge of soil property is important. Soil testing is the only way to understand the soil health and to determine the available nutrient status in soil. The fertility of the soil depends on the concentration of N, P, K, organic and inorganic materials, conductivity. The results on soil samples analysis revealed that the pH, Electrical conductivity, total organic carbon, total nitrogen, available phosphorous and exchangeable potassium were found to be within the range and suitable for building constructions and cultivating the plants corresponding to the soil health. The soil samples were analysed with the help of ISO 17020 Accredited lab and correlated with the standard values referred from 'Soil Testing Methods in India' published by the Ministry of Agriculture, January 2011 Edition, Government of India.

Soil Sample Test Result:

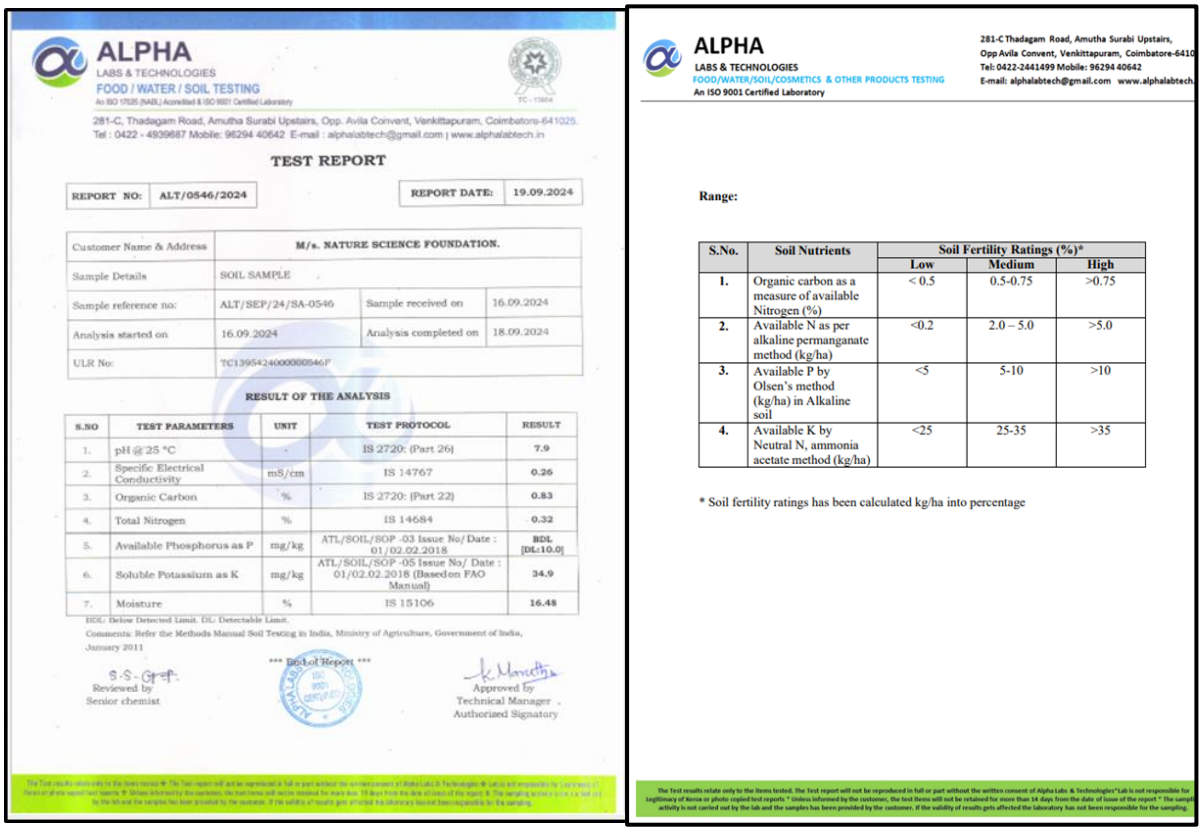
S. No	Test Parameters	Value	Unit	Test Protocols	Comments
1.	pH @ 25 ^{o}C	7.9	-	IS 2720: (Part 26)	Sufficient
2.	Specific Electrical Conductivity	0.26	ms / cm	IS 14767	Sufficient
3.	Organic Carbon	0.83	%	IS 2720: (PART 22)	High
4.	Total Nitrogen	0.32	%	IS 14684	Sufficient
5.	Available Phosphorus as P	BDL(DL: 10.0)	mg / kg	ATL/SOIL/SOP – 03 Issue No / Date: 01/ 02.02.2018	Sufficient
6.	Soluble Potassium as K	34.9	mg / kg	ATL/SOIL/SOP – 05 Issue No / Date: 01/ 02.02.2018 (Based on	Sufficient

				FAO Manual)	
7.	Moisture	16.48	%	IS 15106	Sufficient

Range:

S.No.	Soil Nutrients	Soil Fertility Ratings (%) *		
		Low	Medium	High
1.	Organic carbon as a measure of available Nitrogen (%)	< 0.5	0.5-0.75	>0.75
2.	Available N as per alkaline permanganate method (kg/ha)	<0.2	2.0 – 5.0	>5.0
3.	Available P by Olsen's method (kg/ha) in Alkaline soil	<5	5-10	>10
4.	Available K by Neutral N, ammonia acetate method (kg/ha)	<25	25-35	>35

Standards referred from 'Soil Testing Methods in India' published by the Ministry of Agriculture, Government of India and Methods of Analysis of Soils, Plants, Waters and Fertilizers by Fertilizer Development and Consultation Organization.



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TEST REPORT

REPORT NO:	ALT/0546/2024	REPORT DATE:	19.09.2024

Customer Name & Address	M/s. NATURE SCIENCE FOUNDATION.		
Sample Details	SOIL SAMPLE		
Sample reference no:	ALT/SEP/24/SA-0546	Sample received on	16.09.2024
Analysis started on	16.09.2024	Analysis completed on	18.09.2024
ULR No:	TC139542400000546F		

RESULT OF THE ANALYSIS

S.NO	TEST PARAMETERS	UNIT	TEST PROTOCOL	RESULT
1.	pH @ 25 °C	-	IS 2720: (Part 26)	7.9
2.	Specific Electrical Conductivity	mS/cm	IS 14767	0.26
3.	Organic Carbon	%	IS 2720: (Part 22)	0.83
4.	Total Nitrogen	%	IS 14684	0.32
5.	Available Phosphorus as P	mg/kg	ATL/SOIL/SOP -03 Issue No/ Date : 01/02.02.2018	BDL [DL:10.0]
6.	Soluble Potassium as K	mg/kg	ATL/SOIL/SOP -05 Issue No/ Date : 01/02.02.2018 (Based on FAO Manual)	34.9
7.	Moisture	%	IS 15106	16.48

BDL: Below Detected Limit. DL: Detectable Limit.
Comments: Refer the Methods Manual Soil Testing in India, Ministry of Agriculture, Government of India, January 2011

*** End of Report ***

Reviewed by
Senior chemist

Approved by
Technical Manager
Authorized Signatory

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Range:

S.No.	Soil Nutrients	Soil Fertility Ratings (%)*		
		Low	Medium	High
1.	Organic carbon as a measure of available Nitrogen (%)	< 0.5	0.5-0.75	>0.75
2.	Available N as per alkaline permanganate method (kg/ha)	<0.2	2.0 – 5.0	>5.0
3.	Available P by Olsen's method (kg/ha) in Alkaline soil	<5	5-10	>10
4.	Available K by Neutral N, ammonia acetate method (kg/ha)	<25	25-35	>35

* Soil fertility ratings has been calculated kg/ha into percentage

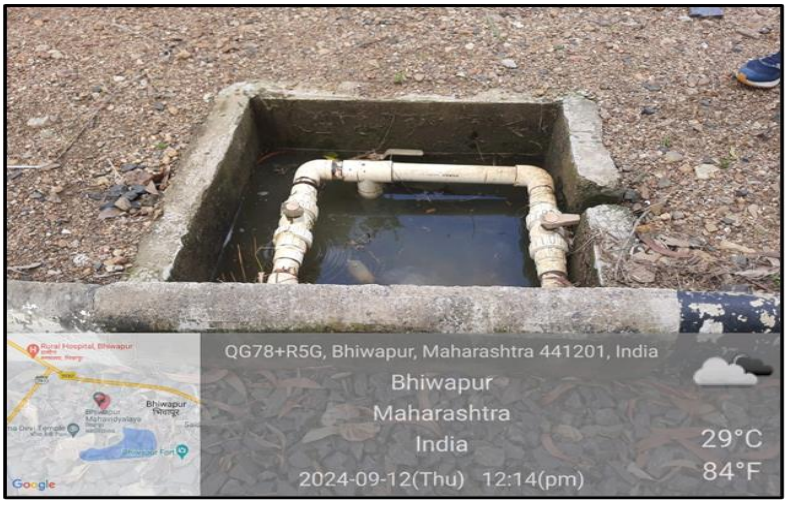
The Test results relate only to the items tested. The Test report will not be reproduced in full or part without the written consent of Alpha Labs & Technologies*Lab is not responsible for legitimacy of Xerox or photo copied test reports * Unless informed by the customer, the test items will not be retained for more than 14 days from the date of issue of the report * The sampling activity is not carried out by the lab and the samples has been provided by the customer. If the validity of results gets affected the laboratory has not been responsible for the sampling.

Soil Sample Test Report obtained from ISO 17025 certified lab

Soil Sample Collection in the Campus

6.3. Water management activities (NBC Checkpoint 7.3, 10.2 – 10.5 and 12.4.2.)

In order to conserve water resources, it is essential that any environmentally responsible institution should examine its water use practices. Water auditing is conducted for the appraisal of facilities of raw water intake and determining the facilities for water treatment and reuse. Auditor concerned investigates the relevant method that can be adopted and implemented to balance the demand and supply of water. The Organization is taking enough attempt to manage wastewater that are coming out from various Department laboratories, hostels and canteens as per the water management plan. Solar water heaters are available for the domestic use of water. Chemicals like bromine and chlorine are avoided to maintain the water quality and to maintain hygienic environment to the stakeholders. Low flow fitting are implemented in the recently constructed building to conserve water.



Water management activities observed in the campus

6.3.1. Operational water supply systems

Maintaining the green campus, water conservation mechanisms should be applied efficiently in the campus. Well planned water irrigation systems like sprinkler and drip should be implemented in the entire green area of the campus for an effective water management system. This can be implemented only when the plantations are well planned. Vegetative area of the audited organization has taken sufficient efforts to maintain the plants greenish and frequency of watering to the plants.

RO Water Units were observed in the Campus

6.3.2. Rainwater harvesting system and percolation pond

Rainwater harvesting system is a traditional old practice not only in drought prone areas and also in areas having seasonal rainfall. Indian traditional rainwater harvesting systems are constructed based on three modes either direct pumped, indirect pumped or by both modes. In addition, lakes, ponds, water channels and any other water reservoir methods are considered as the rainwater harvesting system. During the audit it has been observed that the organization has not have developed and maintained rain water harvesting system.

Rainwater harvesting system observed in the campus

6.3.3. Water quality

After air, water is the second most critical element for life to exist. As a result, the scientific literature has numerous descriptions of water quality. It is the physical, chemical and biological characteristics of water, is the most frequently used definition of water quality. Water quality is a measurement of the state of water in relation to the needs of one or more biotic species and/or to any human need or purpose.

- One of the most crucial aspects of water quality is pH. It is described as the hydrogen ion concentration's negative logarithm. It is an arbitrary number that expresses how acidic or basic a solution is. Actually, water's pH is a gauge of

how acidic or basic it is. Both basic and acidic water have more hydrogen (H+) and hydroxyl (OH) ions than usual.

- Total dissolved solids is referred to as TDS. It calculates the overall concentration of soluble salts and minerals in water. One mg/L of dissolved minerals, for instance, means that the water pitcher contains one mg/L of TDS.
- The salinity of a body of water, commonly known as saline water (also see soil salinity), is the degree to which salt is present. It is often measured in grams per litre (g/L).,Water that is cloudy is referred to as turbid. It gauges how well light can travel through water. It is brought on by particulate matter suspended in water, including clay, silt, organic matter, plankton and other particles.
- One of the most crucial indicators of the water quality in streams, rivers and lakes is dissolved oxygen (DO) which is regarded as one of the factors. It is an important indicator of water pollution. The water quality improves as the dissolved oxygen concentration does.

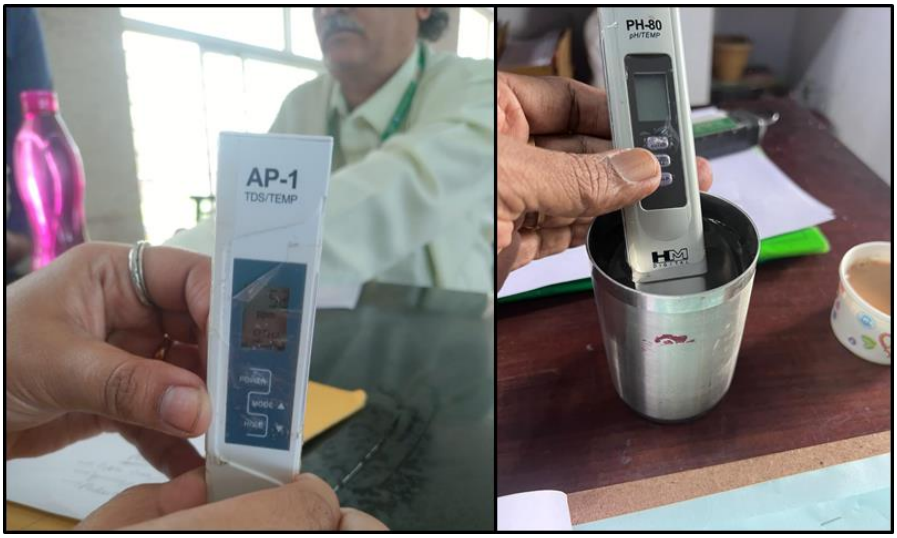
6.3.4. Standards for physico-chemical properties of water

The water samples collected from various sources, i.e., RO water, tap water, bore well water, wastewater and treated water samples were subjected to analyze for its physico-chemical parameters. The results showed that all the parameters were found to be appreciable and no harmful effect was recorded (Table 8). These parameters were observed to be within the limit of Indian Standards of drinking water quality. The observed pH values were found to be 6.5 - 8.5 ranges. Similarly, observed TDS and salinity were 0 - 900 mg/L and 300 - 380 mg/L, respectively. Turbidity and dissolved oxygen were 4.5 – 5.5 NTU and 6.5 - 8.0 mg/L, respectively which are compliance with ISI standards.

Table 8. Physico-chemical properties of various water sources

S.No.	Water source	pH	TDS (mg/L)	Salinity (mg/L)	Turbidity (NTU)	Dissolved Oxygen (mg/L)
1.	RO water	7.6	74	313.7	4.2	6.7
2.	Tap water	7.4	128.7	313.3	4.3	7.3
3.	Well water	8.1	234.3	324.0	4.1	7.8
4.	Bore water	7.6	274.7	324.3	5.4	7.7
5.	Treated water	8.4	362.7	341.0	5.1	7.6
Mean		7.84	252.81	327.62	4.84	7.25
SEC ±		0.13	1.78	2.99	0.09	0.07
CD at P = 0.05:		0.23	3.18	5.33	0.16	0.12

Source: IS 10500: 2012



Water analysis by using pH and TDS Meters

6.3.5. Water consumption rate

Since several variables are influenced water consumption by various stakeholders of an organization; it is hard enough to precisely assess the water quantity demanded by the public. Water is an immense requirement of any living organism. Though it is a natural resource,we are exploiting water for various purposes in day-to-day activities. As an educationalinstitution, water requirement for various activities may differ. Per capita Domestic Consumption in Hostels combined with Canteen ranges between 90 - 125 litres. Industrial or laboratory demand for water is estimated ranges between 100 - 300 litres. Losses as leakages and routine consumption accounts approximately 30 - 50 litres (per capita) and other uses daily usage uses accounts another 50 litres.

Table 9. Water consumption for various purposes

S. No.	Types of consumption	Normal range (L/capita/day)	Average
1.	Per capita domestic consumption at hostel and canteen	93-126	114
2.	Industrial and commercial demand at laboratories	124 - 255	175
3.	Public uses including fire demand, transport washes	2378-3345	2750
4.	Losses and waste as routine consumption	37-53	38
5.	Daily use (day-to-day use)	64	31

7. Air Quality Audit

7.1. Introduction

When the air is clear and contains only small amounts of solid particles and pollutant then the air quality is determined as good. Air is the mixture of gases, as air is moving its quality can be changed day to day. Temperature, wind movements are also major reason for air quality.

7.2. 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.

7.3. Air quality audit observations (NBC Checkpoint 12.4.3.)

It is observed that carbon dioxide and oxygen values are acceptable range. The air circulation is very good in all the places which in turn useful to give pure air to the stakeholders. The observation showed that the concentration of CO_2 in the atmosphere is found to be optimal which did not exceed the critical limit of CO_2. It is further revealed that all the selected locations are having pure air without any air contaminants with good air exchange/circulation in the campus. Some of the places like Canteen and Class Roomsare recorded with high level of carbon dioxide level due to student mobilization and themaximum number of electrical items fixed from which the carbon dioxide emission were observed followed by all laboratories and seminar and auditorium halls (Table 10).

Table 10. Measurement of CO_2 concentration in the Organization

S. No.	Different locations of the Organization's Campus	Carbon dioxide level (ppm)*	Remarks
1.	Classroom	345.7	Within permissible limits
2.	Auditorium	417.3	Within permissible limits
3.	Seminar Hall	520.6	Within permissible limits
4.	Library	435.0	Within permissible limits
5.	Laboratory	453.3	Within permissible limits
6.	Canteen	463.3	Within permissible limits
7.	Open Area	467.0	Within permissible limits
8.	Car Parking area	480.0	Within permissible limits
Mean		398.04%	
SEC ±		2.52	
CD at P=0.05%		4.49	

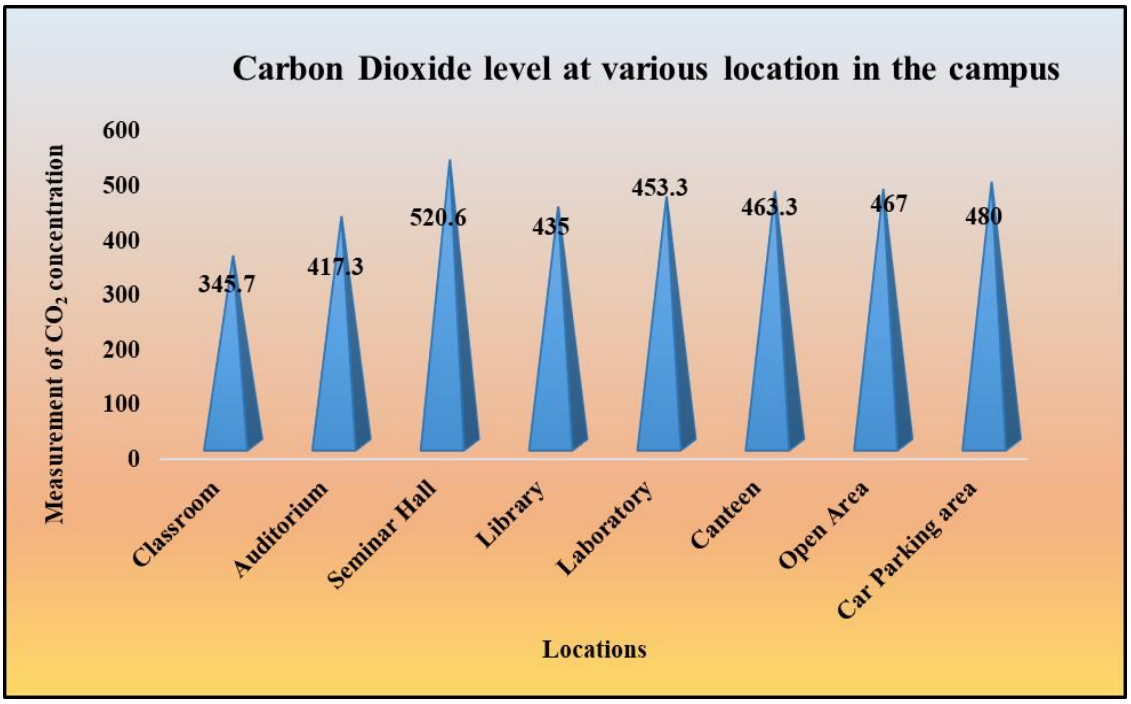


Figure 5. Measurement of CO_2 concentration in the Organization

7.4. 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 11).

Table 11. The oxygen concentration at different places of audited organization

S. No	Location	Oxygen Level (%)*	Remarks
1.	Classroom	19.3	O_2 level is good
2.	Auditorium	19.5	O_2 level is good
3.	Seminar Hall	19.5	O_2 level is good
4.	Library	19.4	O_2 level is good
5.	Laboratory	19.9	O_2 level is good
6.	Canteen	18.9	O_2 level is good
7.	Open Area	20.6	O_2 level is good
8.	Car Parking area	19.4	O_2 level is good
Mean		17.39%	
SEC ±		0.22	
CD at P=0.05%		0.39	

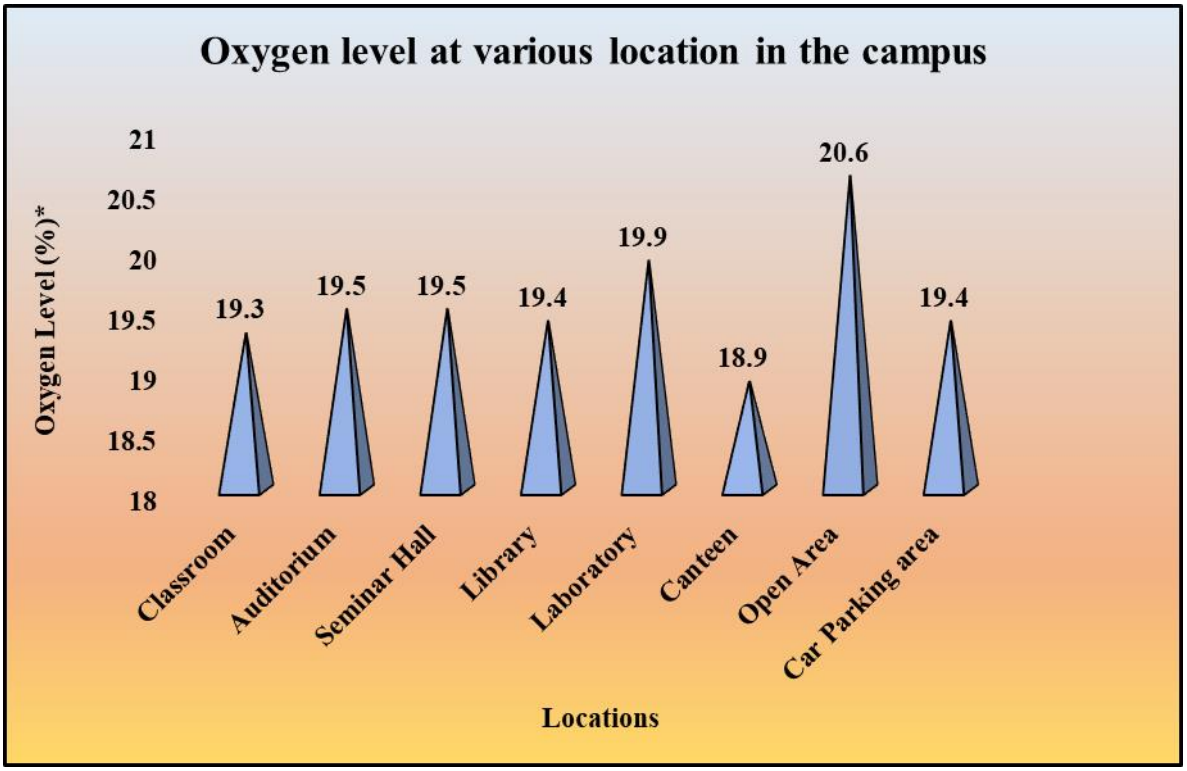


Figure 6. The oxygen concentration in the Organization

Analysis of CO_2 and O_2 level at the Campus

8. HYGIENE AUDIT

8.1. Introduction

A hygiene audit will provide an insight into how an organization operates in a sustainable manner in terms of hygiene environment to the stakeholders as per the International Standard for Occupational Health and Safety Management Systems (ISO HSMS). If an organization has a hygiene auditing process implemented already, then it should apply environmental context into a clean environment. Environmental audit is a natural management tool and it will become more effective when hygiene audit is added to it. It is an essential requirement to adopt an audit process for a sustained utilization of resources in a hygienic way in both developed and developing countries like India. Hygiene will be of different types such as personal hygiene, environmental hygiene, medical hygiene and public hygiene which are all interrelated between each other in terms of maintaining a hygienic atmosphere to the stakeholders.

To ensure that the hygienic environmental management system, maintenance of environmental and personal hygiene, availability of clean resources, maintenance of water supply and hygiene, cleanliness ensured at the site of disposal of human waste materials and personal safety in the campus should be implemented effectively. Each year a plan for the hygiene audit should be prepared by the management of an organization. A committee of faculties and student representatives and social aware members appointed to take this plan forward in the beginning of every year will ensure that the entire hygienic environmental management system is implemented in the organization without any hindrance. An effective hygiene practice should be followed among the stakeholders which in turn useful to control a wide variety of disease outbreaks. Every organization should have applicable regulations, policies and standards with respect to hygienic environment.

A healthy population is the essential component of a country's wealth in terms of political, economic and environmental sustainability. In terms of population growth statistics, India is the fastest populating country to strike the second position in total population cover which is about 138 million and constitutes 17.25% of the total global population. Demographic status of India revealed that if the population increase continues to be at this rate, India is expected to be the most populated country by 2050. Along with the birth rate, social and environmental issues are also increasing and alarming now-a-days. As consequences of over population, social well-being of man and status of quality environment of the country get affected by the developing pressure on food, clothes, housing and other basic necessities, unemployment, loss of standard of living, decrease of forest cover, environmental pollution, energy crisis, ecological degradation and lack of hygienic condition-resulting in the distortion of well-being of a country. The hygiene audit is playing important role for both people and the environment of any organization in terms of safety. In order to achieve an effective ecofriendly hygiene by promoting the hygiene management practices and sanitization standards in the enterprise.

8.2. Hygiene audit observations

- No person is suffering from a disease or illness or with open wounds or burns among the students, teaching and non-teaching staff members including supportive staff and management people across the campuses observed during the hygiene audit which indicated the campus is very keen interest in providing good hygiene atmosphere to the stakeholders.
- The sanitizing materials such as soap, liquid detergent, tissue paper role, hand gloves, hand towels, etc. are made available nearby the washbasins and restrooms focusing towards the personal hygiene and sanitation related concerns to the stakeholders.
- Appropriate dustbins and eco-friendly covers are made available at laboratories, canteens, food courts, cafeteria and hostels across the campuses to control the spread of wastes and contaminants from one place to another place and without harming the environmental health.
- The pest management strategies adopted (cockroach traps, rodents control measures, insect repellents and other control facilities) at the campus is very good. The laboratories, classrooms, hostels, canteens, foot courts and toilets / restrooms are very neat and clean with proper ventilation and exhaust system.
- Food and Waste handlers are equipped with suitable personal safety materials like disposable hand gloves, full cover aprons and caps to minimize contamination and fire hazards at hostel dining halls and canteens to minimize contamination and fire hazards.
- Maintenance of equipment and machinery items are very good and being carried out regularly as per the instructions of the manufacturer. They are neatly maintained without any dusts and covered with the appropriate covers. They college management has signed a MoU to maintain Hygienic environment.
- Pest control programmes for cockroach, house flies, mosquitos, rodents etc. are effectively implemented and pest control activities (eggs, larvae, pupa, faeces, etc.) are carried out by trained and experienced personnel and no signs of pest activity or infestation in the Organization premises is noticed.
- Medical facilities are available for the laborers with physician to diagnose.

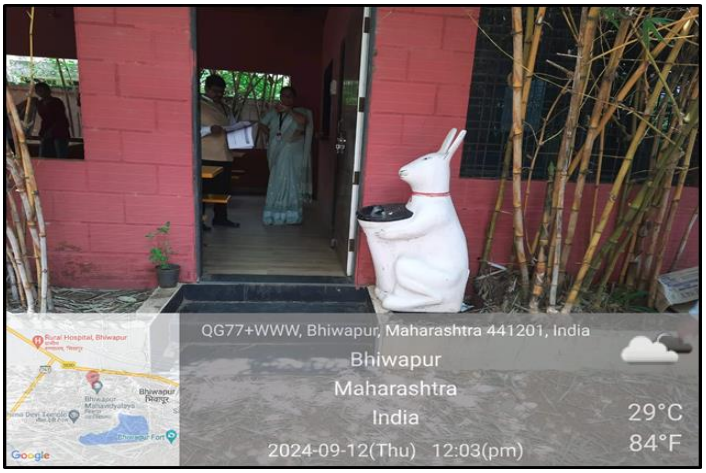
8.2.1. Observation on Personal Hygiene and Safety measures (NBC Checkpoint 12.3.6 and 12.3.7.)

Hand wash with a soap

As far as the stakeholders and employees are concerned, the safety and convenience of everyone working/access to the organization, the following safety rules should be observed at all times. Wearing a laboratory coat or apron along with hand gloves and caps before entering a working environment for protecting clothes from contamination or accidental discoloration by staining solutions are always mandatory in Organization's hygiene. The observation on providing hygiene environment to the stakeholders at campus revealed that sanitizing materials such as soap, liquid detergent, tissue paper role, hand gloves, hand towels are made available nearby washbasins and restrooms focusing towards personal hygiene

and sanitation related concerns. It is observed that working tables and benches are kept clean at laboratories across the Departments. Appropriate dustbins and eco-friendly covers are made available at laboratories, canteens, food courts, cafeteria and hostels across the campuses. At hostel dining halls and canteens, food suppliers are tied their long hairs properly and wear disposable hand gloves, full cover aprons and caps to minimize contamination and fire hazards. Canteen is functioning hygienically and authorized by the management.

Details of pest management strategies adopted (cockroach traps, rodents control measures, insect repellents and other control facilities) at the campus is very good. Food preparation (kitchen) area at hostels and canteen is very clean, free of insect pests and in good state of ventilation and exhaust system along with proper water supply and drainage. It is observed that waste disposal area and waste disposal collection center are neat and regularly cleaned, free of insect pests and free of spillage with no stagnation of water in food zones.



Appropriate dustbin observed in college canteen

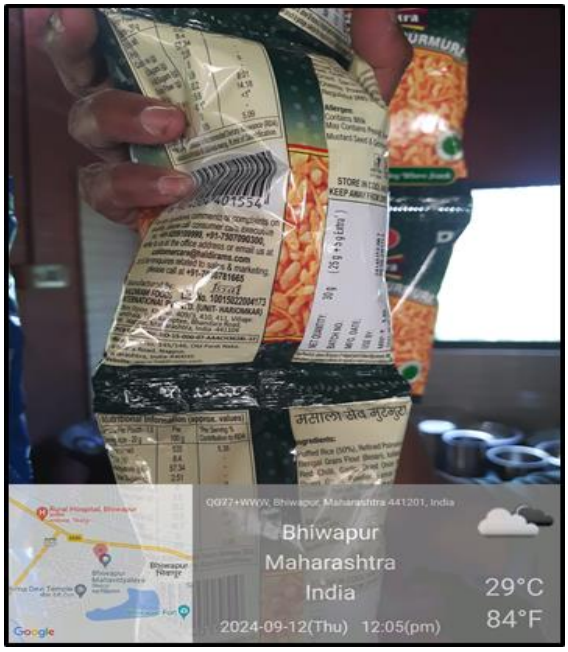
8.2.2. Napkin disposal facility

The Campus is implementing the safe practices of disposing of napkins using small scale incinerators in ladies hostels. Incinerators facility and disposal structures in the proper directions and other social stigmas connected to menstruation influences the sanitary waste disposal conduct of women within the campus is very much appreciated. The Management is taking care of adolescent girls and ladies significantly in terms of their personal hygiene and safety.

Napkin vending machine observed in the campus

8.3. Legal compliances

In this campus, they following legal appliances are verified as per the National Building Code (Part 11 – Approach to Sustainability). Some of the following documents verified are Building approval plan, MoU for e-waste and construction waste, canteen approval license to procure FSSAI certified food products and maintain environment and personal hygiene from the management.



FSSAI approved products were observed in the canteen

9. Conclusion

Considering the fact that the organization is a well-established academic institution and there is significant scope for conserving green, environment, energy, waste management, soil & water management, air quality and hygiene which in turn make the campus as self-sustained. The organization has taken enormous efforts to maintain green campus in a sustainable manner. It has conducting a large number of activities for the benefit of rural and tribal community people without disturbing the natural environment. The installation of a rainwater harvesting system and irrigation system to conserve rainwater and improve the ground water levels are noteworthy. The Organization has created medicinal, herbal and ornamental gardens at small scale level for establishing a massive reforestation / afforestation programme in which a large number of trees and shrubs species were planted together for providing an eco-friendly atmosphere to the stakeholders in a sustainable manner.

The energy conservation initiatives taken by the organization are substantial. Water and Soil conservation activities are also implemented and practiced. Proper facilities and procedures are followed for waste collection, segregation, disposal, recycle and reuse. Quality of soil and water observed to be good. Hygienic practices are monitored and maintained considering the health and sustainability of the stakeholders at canteen and hostel premises. 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). The organization has made significant progressive contributions with respect to teaching learning, research and consultancy, innovation and transfer of technology, community service and value education, in toto. It imparts quality education to rural, tribal and urban people across the nation which is excellent in terms of academic activities and providing an eco-friendly atmosphere to the stakeholders.

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