Union Education Society's

MAHILA MAHAVIDYALAYA

Senior College of Arts, Solapur

Affiliated to Punyashlok Ahilyadevi Holkar Solapur University

UNION EDUCATION SOCIETY'S MAHILA MAHAVIDYALAYA ESTABLISHED ON 13 JULY 1989

ENERGY, ENVIRONMENT AND GREEN AUDIT REPORT

PREPARED BY

ENVIRO TECH CONSULT PRIVATE LIMITED

AND

NSVK ENGINNERS

Enviro Techno Consult Private Limited
68, MAHAKALI NAGAR-2, NEAR MANEWADA SQUARE, NAGPUR 440 024 (MS)
GST NO. : 27AADCE6102B1ZA CIN. : U74140MH2014PTC252686
E-mail : etcpl@envirotechnoconsult.in, Web site : www.envirotechnoconsult.in

CERTIFICATE

GREEN AUDIT CERTIFICATE

This is to certify that Union Education Society's MAHILA MAHAVIDYALAYA Senior College of Arts, Solapur Tal-Malshiras Dist.- Solapur, Maharashtra has taking and implementing respectable initiatives for conservation and protection of Environment.

We, Enviro Tech Consult Private Limited have satisfactory and successfully completed the work of audit based on the site situation and information provided with support of Principal, staff of Union Education Society's MAHILA MAHAVIDYALAYA Senior College of Arts, Solapur

Signature & Seal

Enviro Techno Consult Private Limited

Date:-23/04/2019

NSVK ENGINEERS

Electrical Supervisor, Energy Audit, Electrical Safety Audit

Mb.9373553743 Mail: nsvkengg@gmail.com GSTN:27ABRPK1951G1ZG

Certificate

of

Energy Audit

This is Certified that NSVK ENGINEERS conducted ENERGY AUDIT of Union *Education Society's MAHILA MAHAVIDYALAYA*. The initiatives taken by the institute for energy conservations and towards environmental protections are satisfactory.

Date:-23/04/2019

Place:- Solapur

For, NSVK ENGINEERS

Proprietor

QUALITY COUNCIL OF INDIA
Creating an Ecosystem for Quality

National Accreditation Board for Education and Training

Certificate of Accreditation

Enviro Techno Consult Private Limited, Nagpur

68, Mahakali Nagar – 2, Near Manewada Square, Nagpur – 440024

*The organization is accredited as **Category-A** under the QCI-NABET Scheme for Accreditation of EIA Consultant Organization, Version 3: for preparing EIA-EMP reports in the following Sectors –*

S.No	Sector Description	Sector (as per)		Cat.
		NABET	MoEFCC	
1	Mining of minerals including both opencast and underground mining	1	1 (a) (i)	A
2	Thermal power plants	4	1(d)	A
3	Cement plants	9	3(b)	A
4	Manmade fibers manufacturing	19	5(d)	B

***Note**: Names of approved EIA Coordinators and Functional Area Experts are mentioned in RAAC minutes dated Nov 18, 2022 and posted on QCI-NABET website.*

The Accreditation shall remain in force subject to continued compliance to the terms and conditions mentioned in QCI-NABET's letter of accreditation bearing no QCI/NABET/ENV/ACO/23/2640 dated Jan 16, 2023. The accreditation needs to be renewed before the expiry date by Enviro Techno Consult Private Limited, Nagpur following due process of assessment.

Sr. Director, NABET
Dated: Jan 16, 2023

Certificate No.
NABET/EIA/2225/RA 0266

Valid up to
Feb 26, 2025

For the updated List of Accredited EIA Consultant Organizations with approved Sectors please refer to the QCI-NABET website.

सूचना का अधिकार
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सत्यमेव जयते

भारत सरकार
विज्ञान और प्रौद्योगिकी मंत्रालय
वैज्ञानिक और औद्योगिक अनुसंधान विभाग
टेक्नोलॉजी भवन, नया महरौली मार्ग,
नई दिल्ली - 110016

GOVERNMENT OF INDIA
MINISTRY OF SCIENCE AND TECHNOLOGY
Department of Scientific and Industrial Research
Technology Bhavan, New Mehrauli Road,
New Delhi - 110016

Dated: 5th March, 2020

F. No. TU/IV-RD/1711/2019

To

M/s Enviro Techno Consult Pvt. Ltd.
68, Mahakali Nagar-2,
Near Manewada Square,
Nagpur – 440 024 (Maharashtra)

Subject: RENEWAL OF RECOGNITION OF IN-HOUSE R&D UNIT(s)

Dear Sirs,

This has reference to your application for renewal of recognition of your in-House R&D unit(s) beyond 31-03-2019 by the Department of Scientific and Industrial Research.

2. This is to inform you that it has been decided to accord renewal of recognition to the in-House R&D unit(s) of your firm at **Plot No. 68, Mahakali Nagar-2, Near Manewada Square, Nagpur (Maharashtra)** upto **31.03.2024.** Terms and conditions pertaining to this recognition are given overleaf.

3. Kindly acknowledge the receipt of this letter.

Yours faithfully,

Deshpande

(Dr S. K. Deshpande)
Scientist - 'G'

Certificate of Registration

ISO 9001:2015

This is to Certify that
Quality Management System of

ENVIRO TECHNO CONSULT PRIVATE LIMITED

68, MAHAKALI NAGAR - 2, NEAR MANEWADA SQUARE, NAGPUR - 440024, MAHARASHTRA, INDIA

has been assessed and found to conform to the requirements of

ISO 9001:2015

for the following scope :

PROVIDING CONSULTANCY SERVICES IN ENVIRONMENTAL IMPACT ASSESSMENT, LABORATORY ANALYSIS & INVESTIGATIONS.

Certificate No	: 22IQJV24		
Initial Registration Date	: 18/02/2022	Issuance Date	: 18/02/2022
Date of Expiry	: 17/02/2025		
1st Surve. Due	: 18/01/2023	2nd Surve. Due	: 18/01/2024

Director

IAS ACCREDITED Management Systems Certification Body MSCB-119

MEMBER OF MULTILATERAL RECOGNITION ARRANGEMENT IAF

AQC MIDDLE EAST LLC

Head Office: Office No. 02, Ground Floor, Sharjah Media City, Sharjah, UAE. e-mail : info@aqcmetl.com,
Key Location: A-60, Sector - 2, Noida, Uttar Pradesh, 201301, India.

**Validity of the Certificate is subject to successful completion of surveillance audit on or before of due date. (in case surveillance audit is not allowed to be conducted, this certificate shall be suspended/withdrawn).*

Certificate Verification: Please Re-check the validity of certificate at http://www.aqcmetl.com/certificate.aspx or www.aqcmetl.com at Active Clients.

Certificate is the property of AQC Middle East LLC and shall be returned immediately when demanded

Certificate of Registration

ISO 14001:2015

This is to Certify that
Environmental Management System of

ENVIRO TECHNO CONSULT PRIVATE LIMITED

68, MAHAKALI NAGAR - 2, NEAR MANEWADA SQUARE,
NAGPUR - 440024, MAHARASHTRA, INDIA.

has been assessed and found to conform to the requirements of

ISO 14001:2015

for the following scope :

PROVIDING CONSULTANCY SERVICES IN ENVIRONMENTAL IMPACT ASSESSMENT, LABORATORY ANALYSIS & INVESTIGATIONS.

Certificate No	: **20IEFS76**		
Initial Registration Date	: 10/12/2020	Issuance Date	: 10/12/2020
Date of Expiry*	: 09/12/2023		
1st Surv. Due	: 10/11/2021	2nd Surv. Due	: 10/11/2022

Director

IAS ACCREDITED Management Systems Certification Body MSCB-119

MEMBER OF MULTILATERAL RECOGNITION ARRANGEMENT IAF

AQC MIDDLE EAST FZE.

Head Office: E1-1401 E Amber Gem Tower, Sheikh Khalifa Bin Zayed Road, 2, Ajman, UAE. e-mail: info@aqcworld.com

Certificate of Registration

ISO 45001:2018

This is to Certify that
Occupational Health & Safety Management System of

ENVIRO TECHNO CONSULT PRIVATE LIMITED

68, MAHAKALI NAGAR - 2, NEAR MANEWADA SQUARE, NAGPUR - 440024, MAHARASHTRA, INDIA

has been assessed and found to conform to the requirements of

ISO 45001:2018

for the following scope :

PROVIDING CONSULTANCY SERVICES IN ENVIRONMENTAL IMPACT ASSESSMENT, LABORATORY ANALYSIS & INVESTIGATIONS

Certificate No	: 20IOFE03		
Initial Registration Date	: 30/07/2020	Issuance Date	: 30/07/2020
Date of Expiry	: 29/07/2023		
1st Surve. Due	: 30/06/2021	2nd Surve. Due	: 30/06/2022

Director

IAS ACCREDITED Management Systems Certification Body MSCB-119

AQC MIDDLE EAST FZE.

Head Office: E1-1401 E Amber Gem Tower, Sheikh Khalifa Bin Zayed Road, 2, Ajman, UAE.
Key Location: 403, Madhukan Building, 35, Nehru Place, New Delhi - 110019, India. e-mail : info@aqcworld.com,
"Validity of the Certificate is subject to successful completion of surveillance audit on or before of due date. In case surveillance audit is not allowed to be conducted, this certificate shall be suspended/withdrawn."
Certificate Verification: Please Re-check the validity of certificate at http://www.aqcworld.com/certificates.aspx or www.aqcworld.com at Active Clients.
Certificate is the property of AQC Middle East FZE and shall be returned immediately when demanded.

Certificate of Registration

This is to Certify that
Quality Management System of

NSVK ENGINEERS

BHUMAPAN KRAMANK 14/2/A/2/P/12/B, AT YESHWANT NAGAR, POST AKLUJ, TALUKA MALSHIRAS, YESHWANT NAGAR, SOLAPUR- 413118, MAHARASHTRA, INDIA

has been assessed and found to conform to the requirements of

ISO 9001:2015

for the following scope :

PROVIDING CONSULTANCY FOR ENERGY& GREEN AUDIT (INDUSTRIES AND INSTITUTIONS), ELECTRICAL CONTRACTING, ELECTRICAL SAFETY AUDIT, FIRE SAFETY AUDIT, SOLAR LAMP MANUFACTURING, ANNUAL MAINTENANCE CONTRACT, SKILLED -SEMISKILLED AND UNSKILLED MANPOWER SUPPLIER TO INDUSTRIES AND INSTITUTIONS.

Certificate No	: **22EQIM74**		
Initial Registration Date	: 17/10/2022	Issuance Date	: 17/10/2022
Date of Expiry	: 16/10/2025		
1st Surve. Due	: 17/09/2023	2nd Surve. Due	: 17/09/2024

mms
EGAC Accredited
QMS Certification
CAB # 118005

MEMBER OF MULTILATERAL RECOGNITION ARRANGEMENT IAF

Director

Magnitude Management Services Pvt. Ltd.
B-55, Lower Ground Floor, Sector 02, Noida-201301, U.P, India
e-mail: info@mmscertification.com, website: www.mmscertification.com

* Subject to Successful Surveillance

ACKNOWLEDGEMENT

We would to express our deepest appreciation to all those who have assigned the project of Energy, Environmental & Green Audit. We would also like to acknowledge with much appreciation the crucial role of the staff of Union Education Society's MAHILA MAHAVIDYALAYA Senior College of Arts, Solapur, who gave the permission to access all required premises and the necessary materials to complete the task "Energy, Environmental & Green Audit."

Our Deepest Gratitude to

- Adv.Zaid Naeem Shaikh- Chairman College Development Committee
- Dr..F.M.Shaikh- In-charge Principal and Secretary College Development Committee
- Smt N.M.Shaikh- NAAC-Co Ordinator

For giving us necessary inputs to carry out this very vital exercise of Green Audit. We are also thankful to other staff members who were actively involved while collecting the data and conducting field measurements.

Profile of Audit Team Members

Mr.S.B.Wankhade

Rtd.SupridentEngineer
P.W.D.(Electrical)
Certified Energy Auditor-(EA-0915)
Government Electrical Contractor (M.C. No.19833)

Dr. Prashil Shukla
QCI-NABET Accredited EIA Consultant
NABL Quality Assurance
Laboratory Accredited

Mr. Vijay Kumbhar

Director, Yash Agro Laboratory
ISO 9001:2015 Certified Laboratory

DISCLAIMER

Audit Team has prepared this report for Union Education Society's Mahila Mahavidyalaya Senior College of Arts, Solapurbased on input data submitted by the representatives of college complemented with the best judgment capacity of the expert team. While all reasonable care has been taken in its preparation, details contained in this report have been compiled in good faith based on information gathered. It is further informed that the calculations are arrived following best estimates and no representation, warranty or undertaking, express or implied is made and no responsibility is accepted by Audit Team in this report or for any direct or consequential loss arising from any use of the information, statements or forecasts in the report.

Contents

1.Introduction

Energy, Environmental & green audit is one of major parameters for institute development. These parameters covered under criteria 7 of NAAC, National Assessment and Accreditation Council which is a self-governing organization of India which declares the institutions as Grade A, B or C according to the scores assigned during the accreditation.

Definition & Objectives of Energy Management

The fundamental goal of energy management is to produce goods and provide services with the least cost and least environmental effect.
Energy Audit defines as "The strategy of adjusting and optimizing energy, using systems and procedures so as to reduce energy requirements per unit of output while holding constant or reducing total costs of producing the output from these systems"
The objective of Energy Management is to achieve and maintain optimum energy procurement and utilization, throughout the organization and:

- To minimize energy costs / waste without affecting production & quality.
- To minimize environmental effects.

The ICC defines Environmental Auditing as:

"A management tool comprising a systematic, documented, periodic and objective evaluation of how well environmental organization, management and equipment are performing with the aim of safeguarding the environment and natural resources in its operations/projects." Green audit is a valuable means for a college to determine how and where they are using the most energy or water or other resources; the college can then consider how to implement changes and make savings. It can create health consciousness and promote environmental awareness, values and ethics. It provides staff and students better understanding of Green impact on campus. If self-enquiry is a natural and necessary outgrowth of a quality education, it could also be stated that institutional self-enquiry is a natural and necessary outgrowth of a quality educational institution. Thus, it is imperative that the college evaluate its own contributions toward a sustainable future. As environmental sustainability is becoming an increasingly important issue for the nation, the role of higher educational institutions in relation to environmental sustainability is more prevalent.

1.1 ABOUT THE COLLEGE

1.2 Details of Programme/ Level

To Impart formal and informal education to the children's of minority communitys in solapur city Late Mr,Abdul Karim Bawala Vakil, a noted advocate and muslim leader took initiative and setup an educational institution and the name UNION EDUCATION SOCIETY, SOLAPUR In 1944.

The education activities of the institution started with the establishment of M.A Pangal Anglo Urdu Highschool, Solapur in 1963. subsequently the instite felt the need of setting junior college for girls and boys,consequently M.A Pangal Anglo Urdu Junior College and Begum Qamrunnissa Karigar Girls Junior College came into existence in the year 1975 and 1983 respectively. The next milestone in higher education achieved in year 1989 by starting U.E.S Mahila Mahavidyalaya, Solapur. the main architect of senior college was Late Abdul Aziz Sultan Saheb Shaikh, ex-president of Union Education Society. This Education Society achived its glorius year under the supervision of Late Naeem Aziz Shaikh, ex-president of our institution from 2007 onwords the current president Adv.Zaid Naeem Shaikh became the mentor of this academic premises.

Late Mr.A.Aziz Sultan Saheb Shaikh was the Chairman of the institution. At present the institution is run under the Chairmanship of Mr.Zaid Naeem Shaikh the grandson of late A.Aziz Sultan Saheb Shaikh . Late Mr. Azeez Saheb the former chairman had an urge to establish a senior College specially for girls, for he had observed the lack of higher studies in girls of our community and at last his hard efforts bore the fruit with the establishment of Mahila College in the year 1989. This academic year it is successfully completing its 30 years.

The institution is situated in the heart of the city. It has a large and safe campus. The main purpose of this college is to provide education to all the girls especially of Muslim minority.

In spite of B.A. degree college also offers some unique short term courses viz, Fashion Designing, Montessori, Beauty Parlour, Calligraphy, Mahendi, Zardozi etc.

Sr. No.	**Programme/ Level**	**Name of Programme, Course**	**Duration**
1.	U.G.(Arts)	Urdu	3 Years
		Hindi	
		English	

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1.3 Location of College

The institution is situated in the heart of the city.

Location: - 17.66818264151982, 75.91014584058453

2.1 Energy Audit: Types and Methodology

Energy Audit is the key to a systematic approach for decision-making in the area of energy management. It attempts to balance the total energy inputs with its use, and serves to identify all the energy streams in a facility. It quantifies energy usage according to its discrete functions. Industrial energy audit is an effective tool in defining and pursuing comprehensive energy management programme.

As per the Energy Conservation Act, 2001, Energy Audit is defined as "the verification, monitoring and analysis of use of energy including submission of technical report containing recommendations for improving energy efficiency with cost benefit analysis and an action plan to reduce energy consumption"

2.2 Need for Energy Audit

In any institution, the three top operating expenses are often found to be energy (both electrical and thermal), staff and materials. If one were to relate to the manageability of the cost or potential cost savings in each of the above components, energy would invariably emerge as a top ranker, and thus energy management function constitutes a strategic area for cost reduction. Energy Audit will help to understand more about the ways energy and fuel are used in any industry, and help in identifying the areas where waste can occur and where scope for improvement exists.

The Energy Audit would give a positive orientation to the energy cost reduction, preventive maintenance and quality control programme which are vital for production and utility activities. Such an audit programme will help to keep focus on variations which occur in the energy costs, availability and reliability of supply of energy, decide on appropriate energy mix, identify energy conservation technologies, retrofit for energy conservation equipment etc. In general, Energy Audit is the translation of conservation ideas into realities, by lending technically feasible solutions with economic and other organizational considerations within a specified time frame.

The primary objective of Energy Audit is to determine ways to reduce energy consumption per unit of product output or to lower operating costs. Energy Audit provides a " bench-mark" (Reference point) for managing energy in the

organization and also provides the basis for planning a more effective use of energy throughout the organization.

2.3 Type of Energy Audit

The type of Energy Audit to be performed depends on: - Function and type of industry - Depth to which final audit is needed, and - Potential and magnitude of cost reduction desired Thus Energy Audit can be classified into the following two types.

- Preliminary Audit
- Detailed Audit

2.4 Energy Audit Methodology

2.4.1 Preliminary Energy Audit Methodology

Preliminary energy audit is a relatively quick exercise to:

- Establish energy consumption in the organization
- Estimate the scope for saving
- Identify the most likely (and the easiest areas for attention
- Identify immediate (especially no-/low-cost) improvements/ savings
- Set a 'reference point'
- Identify areas for more detailed study/measurement
- Preliminary energy audit uses existing, or easily obtained data

2.4.2 Detailed Energy Audit Methodology

A comprehensive audit provides a detailed energy project implementation plan for a facility, since it evaluates all major energy using systems. This type of audit offers the most accurate estimate of energy savings and cost. It considers the interactive effects of all projects, accounts for the energy use of all major equipment, and includes detailed energy cost saving calculations and project cost. In a comprehensive audit, one of the key elements is the energy balance. This is based on an inventory of energy using systems, assumptions of current operating conditions and calculations of energy use. This estimated use is then compared to utility bill charges.

3.0 Preliminary Audit

3.1 About the Unit (College)

The college offers degree courses in Arts, Commerce and Science as well as various Diplomas and Certificate courses. This college infrastructure including internet and computer facilities, well equipped laboratories, research Center, Library, huge premises and playgrounds, and learning resources facilitating to the career building of the students. We have qualified and research-oriented faculties.

3.1.1 LT/ HT-

For the institute LT connections observed during the walk-through audit.

Sr.No.	Energy/Power Suppler	Meter No.	Remark
1	Maharashtra State Electricity Distribution Company Limited.	074643183855	073/LT-VII 0-20kW Pub Ser Oth

3.2 Energy Scenario

Sr. No.	Particulars	Any one month	Annual
1.	Electrical Units (kWh)	178	3824
2.	Power Factor	0.94	0.95

3.3.3 Energy Cost of each as % of Total Electrical Cost

From the electricity connection total electricity annual cost for the unit has been calculated. Unit consumed by the college annually is 3824.Total lighting load is calculated annually is 9.45% of total lighting load. Other 90.54% load consist of other electrical & electronics load like Computers, CCTV, UPS Laptops & other devices.

3.3.4 kW of each as % of Total Electrical Consumption

As per directives from power/energy supplier college has maintained power factor above 0.94. On date of visit to college power factor measured is 0.95. So total active power is achieved is 95% of total energy consumed.

3.3.5 Energy Efficient Technologies Applicability

Sr. No.	Name of EET	Applicability	Estimated Energy Consumption / hr (or any relevant energy indicator) by existing Equipment	Hours of operation / day	Nos	Estd Potential for Savings (%) - Order of magnitude of savings margin indicated in brackets
1.	Efficient lamps (T5, CFL, Metal Halide, HPSV)	Applicable	18 Watt (T5 LED/Solar Street light)	06 hrs/Day	11	(30-50 % of existing lighting kW)

4.0 Detailed Audit

4.1 Need for Energy Conservation

Power shortage hampers the economic growth of any State. Energy Conservation is the cheapest, easiest and cleanest way for bridging the gap between demand and supply. It is estimated that energy conservation projects require only one fifth of investment compared to the investment required for installation of new power projects.

4.2 Recommended frequency of Energy Audit

The interval time for the conduct and completion of subsequent energy audit shall be **three years** with effect from date of the report of the first energy audit conducted and completed by Energy Auditor.

4.3 General Aspects about Building

4.3.1.1 Connected Load or Contract Demand

The college runs more than 3 courses in level of graduation and post-graduation. also runs some certification courses. College have different electrical and electronics equipment's. Its connected load is calculate das follows.

Sr.No.	Particular/Equipment	Total No	Wattage Per Equipment	Total Power in Watts
1	Fan	21	80	1680
2	Electronic Tube light	7	40	280
3	Electrical Chock Tube Light	4	70	280
4	Tube light & Bulb (LED)	15	8/12/20	300
5	Computers	5	200	1000
6	Printer	3	50	450
7	LED Projector & CPU	1	500	500
8	Speaker	9	50	450
9	Sockets (Including Power)	8	200/1000	3200
10	Camera	2	50	100
11	UPS With Batteries	1	800	800
12	Water Filter	1	1200	1200

Total Connected Load	10300 Watts

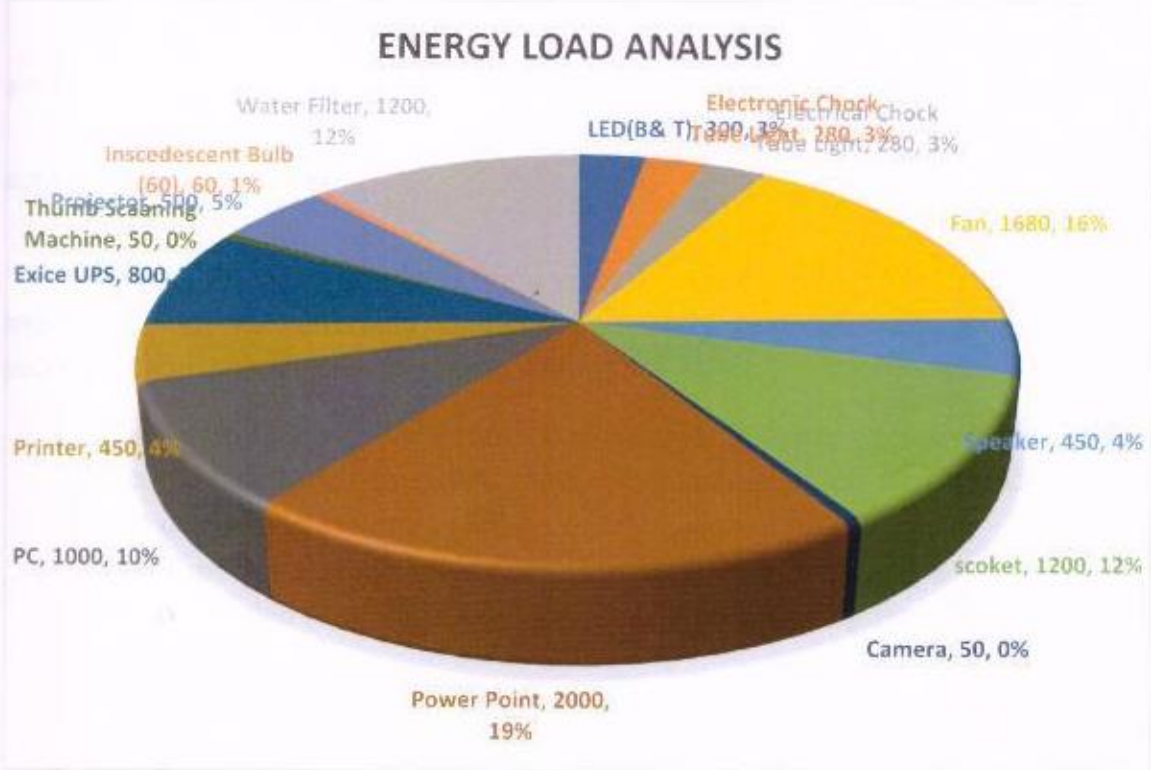
Form the above table connected load is 10.33 kW .

4.3.1.4 Total electricity purchased from utilities

In Maharashtra state main supplier of electricity is Maharashtra state Electricity distribution company limited. Almost all the electricity has been purchased from same supplier. In emergency college has generator unit for supply of electricity.

4.3.2 Load distribution pattern (total lighting load, air cooling load and other loads)

For the unit major load is air cooling (Fan) and lighting. Lighting and air cooling load.The detailed load distribution is shown in below load distribution pattern



4.4 payment of electricity bills

Supplier i.e., Maharashtra state Electricity distribution company limited took monthly reading and send energy/electricity bill to consumer. Also on web portal of supplier monthly electricity bill and history of payment and last 12 month energy consumption.

4.4.1 Authority responsible for payment of electricity bills and payment mechanism

Head of the institute is responsible for payment of bill assistance with office staff. Monthly received bill has been procced and paid through bank check, NEFT or RTGS. Sometimes bill has been paid at supplier bill collection center.

4.4.2 Status of Bill Payments on time/Delay in Bill Payments, percentage paid

No delay in payment has been observed since last 12 month. Bill payment has been made time to time to avoid charges and penalty.

4.7 Energy Saving Majors and Payback period calculation

4.7.1 Energy Saving Majors

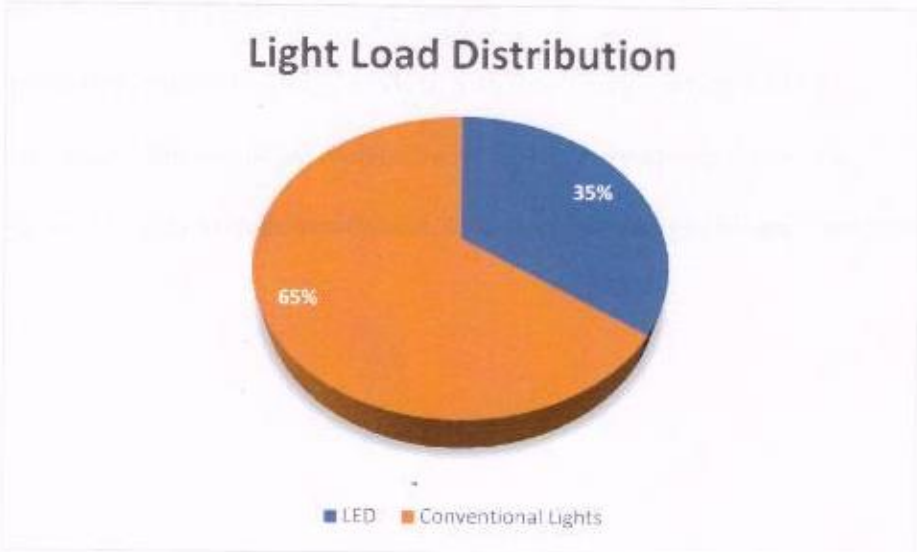
When our energy engineering's visited institute and find out energy saving measures. Our measurement, analysis and study find following suggestion & recommendations for energy conservation.

- It is found that 11 no old luminaries (tube lights) are operative in institute. We recommended to replace these luminaries which will reduce energy cost of lighting system to 50%
- It is observed that 3 old fans are operative in college campus. We recommended to replace with energy efficient cooling fans.

4.7 Requirement of NAAC

4.7.1 Percentage of lighting power requirement met through LED bulbs

Type	Quantity	Load in Watts	% Load
LED	15	300	34.88%
Conventional Lights	11	560	65.11 %
Total	26	860	100%



4.8 CONCLUSION

After detailed energy audit of institute it is observed that institute has taking energy conservation majors like LED installation and solar street lights. Still Institute require to take many entitative towards energy conservation. Some of recommendations are as follows

Audit team recommended following Recommendations for Energy Conservation

- Install rooftop solar system
- Install Solar street lights in college campus
- Replace conventional lighting devices with new energy saving LED's
- Conventional fan should be replaced with new energy saving BLDC fans
- Establish a Facility Management System, exclusively for energy efficiency activities.

5.0 Environment And Green Audit

5.1 Introduction

The main objective of the Environment/Green audit is to promote the management and conservation of Environment in the College Campus. The purpose of the audit is to identify, quantify, describe and prioritize framework of Environment Sustainability in compliance with the applicable regulations, policies and standards.

The main objectives of carrying out Green Audit are:

- *Green Plantation and Plant Diversity*
- *To Document the Water Analysis report of the college*
- *To document the waste disposal system*
- *To document the ambient environmental condition of air, Soil and noise of the college*

5.2 Methodology

In order to conduct the green audit, the methodology included different tools such as

- Preparation of questionnaire,
- Preparation of data collection formats
- Collection of data
- Physical checking of the campus,
- Observation and review of the documentation,
- Interview of key persons and data analysis, measurements and recommendations.

The study covered the following areas to summarize the present status of environment management in the campus:

- Green area management
- Waste management
- Water Analysis Report
- Ambient environmental condition of air, Soil and noise

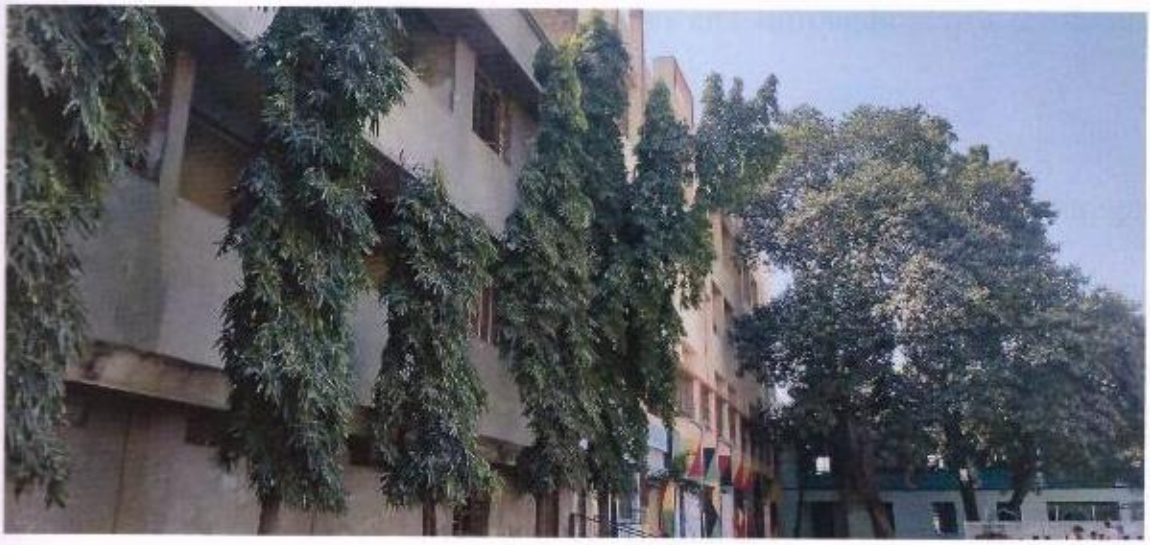
5.3 Green Audit

Green audit was initiated with the beginning of 1970s with the motive of inspecting the work conducted within the organizations whose exercises can cause risk to the health of inhabitants and the environment. It exposes the authenticity of the proclamations made by multinational companies, armies and national governments with the concern of health issues as the consequences of environmental pollution. It is the duty of organizations to carry out the Green Audits of their ongoing processes for various reasons such as; to make sure whether they are performing in accordance with relevant rules and regulations, to improve the procedures and ability of materials, to analyze the potential duties and to determine a way which can lower the cost and add to the revenue. Through Green Audit, one gets a direction as how to improve the condition of environment and there are various factors that have determined the growth of carrying out Green Audit. Some of the incidents like Bhopal Gas Tragedy (Bhopal; 1984), Chernobyl Catastrophe (Ukraine; 1986) and ExxonValdez Oil Spill (Alaska; 1989) have cautioned the industries that setting corporate strategies for environmental security elements have no meaning until they are implemented. The intention of organizing Green Audit is to upgrade the environment condition in and around the institutes, colleges, companies and other organizations. It is carried out with the aid of performing tasks like waste management, energy saving and others to turn into a better environmental friendly institute.

5..4 GREEN AREA/ PLANTATION

Green area or plantation includes the plant, greenery and landscaping of the campus to enhance the environment of the area. This will help to increase the beauty of the campus. The college area is diverse with a variety of plant species performing a variety of functions. Most of the plant species are planted through various plantation programs organized by the college.

The plantation in college have increased the quality of life, not only in college campus but also the surrounding area in term of temperature control, contributing to improving air quality, soil conservation, water conservation and habitat for birds and small animals etc.



Greenery at College Building

5.5 Plant Diversity

- Total 8 plant species are observed in the college campus area.
- About 30 number of total trees are planted in college campus area.
- College conducted and participated in various Planation activity programs are being organized at college campus and surrounding villages through NSS unit.
- This program conducted through the students and helps in encouraging eco-friendly environment which provides pure oxygen within the campus and awareness among nearer villagers.
- The plantation program includes various types of indigenous species of ornamental and medicinal wild plant species.
- College actively participated in 2 Cr tree plantation programme of Government of Maharashtra.

Recommendations:

- Review yearly the list of trees planted in the college campus, botanical garden, and allots numbers to the trees along with scientific /botanical and local/common name to the trees
- Select endemic or local species for the planation
- Considerations for selection of plant species

  o Plants that show vigorous growth, and higher forage value

  o Plants having ability of fixing nitrogen

  o Preferably indigenous, endemic and rare species

  o Plant that serves as nesting, feeding and breeding site for fauna

  o Plants species having high fodder and fuel value

  o Plant that enhances the aesthetics of the surrounding areas

  o Plants species having importance in soil binding

  o Plant species with different height, growth habits and bole shapes

  o Species tolerant to specific conditions or capacity to endure water stress and climatic extremes after initial establishment

  o Economically important plant species
- Avoid plantation of exotic plant species in college campus.
- Promote environmental awareness as a part of course work in various curricular areas, independent research projects, and community service.

- Conduct small workshop or training programme for the students on medicinal plants
- Establish Environment Policy for the environment conservation nd protection of college.
- The Environmental cell shall be the source of advice and guidance to staff and students on how to implement this Policy.
- Conduct six monthly internal audit to ensure that implementation of activities for the environment planned for the year, action is taken on the basis of audit report, recommendation and findings.
- Celebrate every year 5th June as „Environment Day", wildlife week and plant trees on this day to make the campus more Green.
- Establish Green library for the students.
- Prepare five year planation programme /Plan in consultation with management and students.
- Establish nature club
- Organize exhibitions like plant painting, flower painting, flowers, posters etc.
- Develop seed bank under botanical garden programme

6.0 SOLID WASTE MANAGEMENT

To reduce waste in the college campus, recycling efforts are taken. Waste is collected and segregated properly. Students, faculty, and staff are aware and educated on proper waste management practices such as waste source and disposal, plastic waste, paper waste, food waste, and recycling. Solid waste is divided into two categories: dry waste and wet waste.

- Wet waste: biodegradable waste
- Dry waste: no Biodegradable waste

Solid Waste is hand overed to the Solapur municipal corporations waste collection vehicle.

7.0 Water Analysis Report

Water quality testing is important because it identifies contaminants and prevents waterborne diseases. Drinking or using contaminated water can result in severe illness or death. That is why it is important to ensure that drinking water is safe, clean and free from bacteria and disease.

The parameters for water quality are determined by the intended use. Work in the area of water quality tends to be focused on water that is treated for human consumption, or in the environment

Source of water is borewell and from municipal corporation water supply

Drinking water indicators:

The following is a list of indicators often measured by situational category:

Alkalinity

- Color of water
- pHvalue
- Taste and odor (geosmin, 2-Methylisoborneol (MIB),etc.)
- Dissolved metals and salts (sodium, chloride, potassium, calcium, manganese,magnesium)
- Microorganisms such as fecal coliform bacteria (Escherichia coli), Cryptosporidium,and Giardia lamblia; see Bacteriological wateranalysis
- Dissolved metals and metalloids (lead, mercury, arsenic,etc.)

- Dissolved organics: colored dissolved organic matter (CDOM), dissolved organic
- carbon(DOC)
- Heavymetals

Sr.No.	Contains	Unit	Results	Reference Value	Remark
1	**pH**		**7.47**	**6.5-7.5**	**Safe**
2	**Electrical Conductivity (EC)**	**mmhos/cm**	**1.91**	**0.1-1.4**	**Unsafe**
3	**TDS**	**mg/L**	**281**	**<700**	**Safe**
4	**Total Hardness**	**mg/L**	**450**	**<600**	**Safe**
5	**Carbonate**	**mg/L**	**Absent**	**-**	**-**
6	**Bicarbonate**	**mg/L**	**251**	**<600**	**Safe**
7	**Alkalinity**	**mg/L**	**135**	**<500**	**Safe**
8	**Potassium**	**mg/L**	**2.48**	**<75**	**Safe**
9	**Calcium**	**mg/L**	**165**	**<600**	**Safe**
10	**Magnesium**	**mg/L**	**26**	**<400**	**Safe**
11	**Na**	**mg/L**	**42.1**	**<50**	**Safe**
12	**So_4**	**mg/L**	**23**	**<300**	**Safe**
13	**Chloride (Cl)**	**mg/L**	**241**	**<300**	**Safe**
14	**mg:ca**	**-**	**0.21**	**<1.50**	**Safe**
15	**Sodium Adsorption Ratio (SAR)**	**meq/L**	**0.95**	**<10**	**Safe**
16	**Residual Sodium Carbonate (RSC)**	**meq/L**	**-4.75**	**<1.25**	**Safe**
Water Type :- C3 : S1					

With help of Yash Agrotech Laboratory (ISO 9001:2015) water analysis completed. It is observed that EC is more in water and deviated from slandered.

8.0 Ambient environmental condition of air, Soil and noise

8.1 Air Quality

Ambient air quality monitoring was carried out in the college campus to understand the air quality of the campus. Ambient air quality monitored at center of the campus

Air quality is measure by SMILEDRIVE Portable Air Quality Pollution Meter.

The results are given below Table

Parameter	Unit	Result	NAAQ Standards for 24hrs
PM10	µg/m3	73	100
PM2.5	µg/m3	54	60

Remark:- The results show the concentrations of PM_{10} $PM_{2.5}$ were found within the National Ambient Air Quality Standards (NAAQ).

8.3 Noise Level Campus

The human ear is constantly being assailed by man-made sounds from all sides, and there remain few places in populous areas where relative quiet prevails. There are two basic properties of sound:

- Loudnessand ¬
- Frequency

Loudness is the strength of sensation of sound perceived by the individual. It is measured in terms of Decibels. Just audible sound is about 10 dB, a whisper about 20 dB, library place 30 dB, normal conversation about 35-60 dB, heavy street traffic 60-0 dB, boiler factories 120 dB, jet planes during take-off is about 150 dB, rocket engine about 180 dB. The loudest sound a person can stand without much discomfort is about 80 dB. Sounds beyond 80 dB can be safely regarded as Pollutant as it harms hearing system. The WHO has fixed 45 dB as the safe noise level for a city. For international standards a noise level up to 65 dB is considered tolerate. Loudness is also expressed in sones. One sone equals the loudness of 40 dB sound pressure at 1000 Hz. Frequency is defined as the number of vibration per second. It is denoted as Hertz(Hz).

Noise Level is measure by MECO 970p(35dB-130dB) Digital sound level meter.

Sr no.	Description	Location-College Main Building
1.	Max in dBA	78
2.	Min in dBA	65

8.4 Soil Analysis

9001:2015) soil analysis completed. Results are shown as follows

Sr.No.	Contains	Unit	Results	Reference Value	Remark
1	सामू (pH)		7.75	6.5-8.5	In Limit
2	Electrical Conductivity (EC)	mhos/cm	1.75	<1	More
3	Free Lime	%	2.45	1-5	More
4	Cation exchange apacity(CEC)	Meq/100gm	16.3	15-25	In Limit
5	organic matter (OM)	%	2.30	1.72-3.5	In Limit
6	Organic carbon (OC)	%	1.38	0.41-0.60	More
8	Available-N(Avail-N)	Kg/ha	478	280-420	More
9	Available -P	Kg/ha	198	30-50	More
10	Available -K	Kg/ha	248	180-240	More
11	Available -Ca	%	6.78	0.1-3.30	More
12	Available -Mg	%	1.18	0.12-0.30	More
13	Available -S	PPM	10	26-50	Less
14	Available -Na	%	2.8	< 5	In limit
15	zinc - (Zn)	PPM	2.45	0.60	In Limit
16	Copper (Cu)	PPM	2.02	0.25-0.50	In Limit
17	Iron (Fe)	PPM	2.2	4.50	Less
18	Manganese (Mn)	PPM	5.42	2	In Limit
19	Boron (B)	PPM	0.07	<1	In Limit
20	Molybdenum (Mo)	PPM	-	-	-
21	C:N	-	3.45	10-20	Less
22	Ca:Mg	-	6.5	5.5-6.5	In Limit
23	Mg:k	-	5.03	1.5-2.5	More
24	Ca : K	-	2.76	1.25-1.35	More
25	Fe Fe:Mn M	-	0.68 : 1	1.10 : 1	Less
26	Plasmodesmata (PD)	-	0.98	2.65	Less
27	Integrity (P)	%	35	40-50	Less
28	soil water holding	%	38	41-50	Less

9.0 E-Waste Management

9.1 Introduction

In India, the quantity of "e-waste" or electronic waste has now become a major problem. Disposal of e-waste is an emerging global environmental and public health issue, as this waste has become the most rapidly growing segment of the formal municipal waste stream in the world. E-waste or Waste Electrical and Electronic Equipment (WEEE) are loosely discarded, surplus, obsolete, broken, electrical or electronic devices.

9.2 Burden of E-Wastesss

In India most of the waste electronic items are stored at households as people do not know how to discard them. This ever-increasing waste is very complex in nature and is also a rich source of metals such as gold, silver, and copper, which can be recovered and brought back into the production cycle.

9.3 Health Impacts

Electronic equipment's contain many hazardous metallic contaminants such as lead, cadmium, and beryllium and brominated flame-retardants. The fraction including iron, copper, aluminum, gold, and other metals in e-waste is over 60%, while plastics account for about 30% and the hazardous pollutants comprise only about 2.70%. Of many toxic heavy metals, lead is the most widely used in electronic devices for various purposes, resulting in a variety of health hazards due to environmental contamination. Lead enters biological systems via food, water, air, and soil. Children are particularly vulnerable to lead poisoning – more so than adults because they absorb more lead from their environment and their nervous system and blood get affected

9.4 E-Waste Management Initiative

CPCB India is finalizing the set of rules and most recently issued a formal set of guidelines for proper and eco-friendly handling and disposal of the electronic waste. The Ministry of Environment and Forests is now processing the rules framed by electronics equipment manufacturers with the help of NGOs.

The Institute initiative for E-waste management is they are sent their electrical and electronic waste to M/s Green Tech solutions Industries which is Maharashtra pollutions control board certified agency for dismantling E waste using environmental sound technology as per E waste (M) Rule 2016.M/s Green Tech Solutions Industries has consent no BO/MPCB/RO(HQ)/CO/B-1801001022 dt. 25/01/2018

10. CONCLUSIONS

- Adopt an environmental policy for the college
- Install solar roof top of 10 kw which saves electricity bill
- Plant more no and verities of trees to reduce noise and pollution due to dust
- Establish Environment management Committee of the college.
- Establish a purchase policy for Eco friendly materials
- Conduct seminars and group discussions on environmental education and environment protection
- Involve Students and staff in local environmental problems to solve along with local body and people.
- Establish waste water Treatment and harvesting system/Plant.

Union Education Society's

MAHILA MAHAVIDYALAYA

Senior College of Arts, Solapur

Affiliated to Punyashlok Ahilyadevi Holkar Solapur University

UNION EDUCATION SOCIETY'S MAHILA MAHAVIDYALAYA ESTABLISHED ON 13 JULY 1989

ENERGY, ENVIRONMENT AND GREEN AUDIT REPORT

PREPARED BY

ENVIRO TECH CONSULT PRIVATE LIMITED

AND

NSVK ENGINNERS

ACKNOWLEDGEMENT

We would to express our deepest appreciation to all those who have assigned the project of Energy, Environmental & Green Audit. We would also like to acknowledge with much appreciation the crucial role of the staff of Union Education Society's MAHILA MAHAVIDYALAYA Senior College of Arts, Solapur, who gave the permission to access all required premises and the necessary materials to complete the task "Energy, Environmental & Green Audit."

Our Deepest Gratitude to

- Adv.Zaid Naeem Shaikh- Chairman College Development Committee
- Dr..F.M.Shaikh- In-charge Principal and Secretary College Development Committee
- Smt N.M.Shaikh- NAAC-Co Ordinator

For giving us necessary inputs to carry out this very vital exercise of Green Audit. We are also thankful to other staff members who were actively involved while collecting the data and conducting field measurements.

Profile of Audit Team Members

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Certified Energy Auditor-(EA-0915)
Government Electrical Contractor (M.C. No.19833)

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NABL Quality Assurance
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Mr. Vijay Kumbhar

Director, Yash Agro Laboratory
ISO 9001:2015 Certified Laboratory

DISCLAIMER

Audit Team has prepared this report for Union Education Society's Mahila Mahavidyalaya Senior College of Arts, Solapurbased on input data submitted by the representatives of college complemented with the best judgment capacity of the expert team. While all reasonable care has been taken in its preparation, details contained in this report have been compiled in good faith based on information gathered. It is further informed that the calculations are arrived following best estimates and no representation, warranty or undertaking, express or implied is made and no responsibility is accepted by Audit Team in this report or for any direct or consequential loss arising from any use of the information, statements or forecasts in the report.

Contents

1.Introduction

Energy, Environmental & green audit is one of major parameters for institute development. These parameters covered under criteria 7 of NAAC, National Assessment and Accreditation Council which is a self-governing organization of India which declares the institutions as Grade A, B or C according to the scores assigned during the accreditation.

Definition & Objectives of Energy Management

The fundamental goal of energy management is to produce goods and provide services with the least cost and least environmental effect.
Energy Audit defines as "The strategy of adjusting and optimizing energy, using systems and procedures so as to reduce energy requirements per unit of output while holding constant or reducing total costs of producing the output from these systems"
The objective of Energy Management is to achieve and maintain optimum energy procurement and utilization, throughout the organization and:

- To minimize energy costs / waste without affecting production & quality.
- To minimize environmental effects.

The ICC defines Environmental Auditing as:

"A management tool comprising a systematic, documented, periodic and objective evaluation of how well environmental organization, management and equipment are performing with the aim of safeguarding the environment and natural resources in its operations/projects." Green audit is a valuable means for a college to determine how and where they are using the most energy or water or other resources; the college can then consider how to implement changes and make savings. It can create health consciousness and promote environmental awareness, values and ethics. It provides staff and students better understanding of Green impact on campus. If self-enquiry is a natural and necessary outgrowth of a quality education, it could also be stated that institutional self-enquiry is a natural and necessary outgrowth of a quality educational institution. Thus, it is imperative that the college evaluate its own contributions toward a sustainable future. As environmental sustainability is becoming an increasingly important issue for the nation, the role of higher educational institutions in relation to environmental sustainability is more prevalent.

1.1 ABOUT THE COLLEGE

1.2 Details of Programme/ Level

To Impart formal and informal education to the children's of minority communitys in solapur city Late Mr,Abdul Karim Bawala Vakil, a noted advocate and muslim leader took initiative and setup an educational institution and the name UNION EDUCATION SOCIETY, SOLAPUR In 1944.

The education activities of the institution started with the establishment of M.A Pangal Anglo Urdu Highschool, Solapur in 1963. subsequently the instite felt the need of setting junior college for girls and boys,consequently M.A Pangal Anglo Urdu Junior College and Begum Qamrunnissa Karigar Girls Junior College came into existence in the year 1975 and 1983 respectively. The next milestone in higher education achieved in year 1989 by starting U.E.S Mahila Mahavidyalaya, Solapur. the main architect of senior college was Late Abdul Aziz Sultan Saheb Shaikh, ex-president of Union Education Society. This Education Society achived its glorius year under the supervision of Late Naeem Aziz Shaikh, ex-president of our institution from 2007 onwords the current president Adv.Zaid Naeem Shaikh became the mentor of this academic premises.

Late Mr.A.Aziz Sultan Saheb Shaikh was the Chairman of the institution. At present the institution is run under the Chairmanship of Mr.Zaid Naeem Shaikh the grandson of late A.Aziz Sultan Saheb Shaikh . Late Mr. Azeez Saheb the former chairman had an urge to establish a senior College specially for girls, for he had observed the lack of higher studies in girls of our community and at last his hard efforts bore the fruit with the establishment of Mahila College in the year 1989. This academic year it is successfully completing its 30 years.

The institution is situated in the heart of the city. It has a large and safe campus. The main purpose of this college is to provide education to all the girls especially of Muslim minority.

In spite of B.A. degree college also offers some unique short term courses viz, Fashion Designing, Montessori, Beauty Parlour, Calligraphy, Mahendi, Zardozi etc.

Sr. No.	**Programme/ Level**	**Name of Programme, Course**	**Duration**
1.	U.G.(Arts)	Urdu	3 Years
		Hindi	
		English	

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Sr. No.	**Programme/ Level**	**Name of Programme, Course**	**Duration**
1.	U.G.(Arts)	Urdu	3 Years
		Hindi	
		English	

1.3 Location of College

The institution is situated in the heart of the city.

Location: - 17.668182641519 82, 75.91014584058453

Enviro Techno Consult Private Limited
68, MAHAKALI NAGAR-2, NEAR MANEWADA SQUARE, NAGPUR 440 024 (MS)
GST NO. : 27AADCE6102B1ZA CIN. : U74140MH2014PTC252686
E-mail : etcpl@envirotechnoconsult.in, Web site : www.envirotechnoconsult.in

CERTIFICATE

GREEN AUDIT CERTIFICATE

This is to certify that Union Education Society's MAHILA MAHAVIDYALAYA Senior College of Arts, Solapur Tal-Malshiras Dist.- Solapur, Maharashtra has taking and implementing respectable initiatives for conservation and protection of Environment.

We, Enviro Tech Consult Private Limited have satisfactory and successfully completed the work of audit based on the site situation and information provided with support of Principal, staff of Union Education Society's MAHILA MAHAVIDYALAYA Senior College of Arts, Solapur

Signature & Seal

Enviro Techno Consult Private Limited

Date:-23/04/2019

NSVK ENGINEEERS

Electrical Supervisor, Energy Audit, Electrical Safety Audit
Mb.9373553743 Mail: nsvkengg@gmail.com GSTN:27ABRPK1951G1ZG

Certificate
of
Energy Audit

This is Certified that NSVK ENGINEERS conducted ENERGY AUDIT of Union *Education Society's MAHILA MAHAVIDYALAYA*. The initiatives taken by the institute for energy conservations and towards environmental protections are satisfactory.

Date:-23/04/2019

Place:- Solapur

For, NSVK ENGINEERS

Proprietor

2.1 Energy Audit: Types and Methodology

Energy Audit is the key to a systematic approach for decision-making in the area of energy management. It attempts to balance the total energy inputs with its use, and serves to identify all the energy streams in a facility. It quantifies energy usage according to its discrete functions. Industrial energy audit is an effective tool in defining and pursuing comprehensive energy management programme.

As per the Energy Conservation Act, 2001, Energy Audit is defined as "the verification, monitoring and analysis of use of energy including submission of technical report containing recommendations for improving energy efficiency with cost benefit analysis and an action plan to reduce energy consumption"

2.2 Need for Energy Audit

In any institution, the three top operating expenses are often found to be energy (both electrical and thermal), staff and materials. If one were to relate to the manageability of the cost or potential cost savings in each of the above components, energy would invariably emerge as a top ranker, and thus energy management function constitutes a strategic area for cost reduction. Energy Audit will help to understand more about the ways energy and fuel are used in any industry, and help in identifying the areas where waste can occur and where scope for improvement exists.

The Energy Audit would give a positive orientation to the energy cost reduction, preventive maintenance and quality control programme which are vital for production and utility activities. Such an audit programme will help to keep focus on variations which occur in the energy costs, availability and reliability of supply of energy, decide on appropriate energy mix, identify energy conservation technologies, retrofit for energy conservation equipment etc. In general, Energy Audit is the translation of conservation ideas into realities, by lending technically feasible solutions with economic and other organizational considerations within a specified time frame.

The primary objective of Energy Audit is to determine ways to reduce energy consumption per unit of product output or to lower operating costs. Energy Audit provides a " bench-mark" (Reference point) for managing energy in the

organization and also provides the basis for planning a more effective use of energy throughout the organization.

2.3 Type of Energy Audit

The type of Energy Audit to be performed depends on: - Function and type of industry - Depth to which final audit is needed, and - Potential and magnitude of cost reduction desired Thus Energy Audit can be classified into the following two types.

- Preliminary Audit
- Detailed Audit

2.4 Energy Audit Methodology

2.4.1 Preliminary Energy Audit Methodology

Preliminary energy audit is a relatively quick exercise to:

- Establish energy consumption in the organization
- Estimate the scope for saving
- Identify the most likely (and the easiest areas for attention
- Identify immediate (especially no-/low-cost) improvements/ savings
- Set a 'reference point'
- Identify areas for more detailed study/measurement
- Preliminary energy audit uses existing, or easily obtained data

2.4.2 Detailed Energy Audit Methodology

A comprehensive audit provides a detailed energy project implementation plan for a facility, since it evaluates all major energy using systems. This type of audit offers the most accurate estimate of energy savings and cost. It considers the interactive effects of all projects, accounts for the energy use of all major equipment, and includes detailed energy cost saving calculations and project cost. In a comprehensive audit, one of the key elements is the energy balance. This is based on an inventory of energy using systems, assumptions of current operating conditions and calculations of energy use. This estimated use is then compared to utility bill charges.

3.0 Preliminary Audit

3.1 About the Unit (College)

The college offers degree courses in Arts, Commerce and Science as well as various Diplomas and Certificate courses. This college infrastructure including internet and computer facilities, well equipped laboratories, research Center, Library, huge premises and playgrounds, and learning resources facilitating to the career building of the students. We have qualified and research-oriented faculties.

3.1.1 LT/ HT-

For the institute LT connections observed during the walk-through audit.

Sr.No.	Energy/Power Suppler	Meter No.	Remark
1	Maharashtra State Electricity Distribution Company Limited.	074643183855	073/LT-VII 0-20kW Pub Ser Oth

3.2 Energy Scenario

Sr. No.	Particulars	Any one month	Annual
1.	Electrical Units (kWh)	178	3824
2.	Power Factor	0.94	0.95

3.3.3 Energy Cost of each as % of Total Electrical Cost

From the electricity connection total electricity annual cost for the unit has been calculated. Unit consumed by the college annually is 3824.Total lighting load is calculated annually is 9.45% of total lighting load. Other 90.54% load consist of other electrical & electronics load like Computers, CCTV, UPS Laptops & other devices.

3.3.4 kW of each as % of Total Electrical Consumption

As per directives from power/energy supplier college has maintained power factor above 0.94. On date of visit to college power factor measured is 0.95. So total active power is achieved is 95% of total energy consumed.

3.3.5 Energy Efficient Technologies Applicability

Sr. No.	Name of EET	Applicability	Estimated Energy Consumption / hr (or any relevant energy indicator) by existing Equipment	Hours of operation / day	Nos	Estd Potential for Savings (%) - Order of magnitude of savings margin indicated in brackets
1.	Efficient lamps (T5, CFL, Metal Halide, HPSV)	Applicable	18 Watt (T5 LED/Solar Street light)	06 hrs/Day	11	(30-50 % of existing lighting kW)

4.0 Detailed Audit

4.1 Need for Energy Conservation

Power shortage hampers the economic growth of any State. Energy Conservation is the cheapest, easiest and cleanest way for bridging the gap between demand and supply. It is estimated that energy conservation projects require only one fifth of investment compared to the investment required for installation of new power projects.

4.2 Recommended frequency of Energy Audit

The interval time for the conduct and completion of subsequent energy audit shall be **three years** with effect from date of the report of the first energy audit conducted and completed by Energy Auditor.

4.3 General Aspects about Building

4.3.1.1 Connected Load or Contract Demand

The college runs more than 3 courses in level of graduation and post-graduation. also runs some certification courses. College have different electrical and electronics equipment's. Its connected load is calculate das follows.

Sr.No.	Particular/Equipment	Total No	Wattage Per Equipment	Total Power in Watts
1	Fan	21	80	1680
2	Electronic Tube light	7	40	280
3	Electrical Chock Tube Light	4	70	280
4	Tube light & Bulb (LED)	15	8/12/20	300
5	Computers	5	200	1000
6	Printer	3	50	450
7	LED Projector & CPU	1	500	500
8	Speaker	9	50	450
9	Sockets (Including Power)	8	200/1000	3200
10	Camera	2	50	100
11	UPS With Batteries	1	800	800
12	Water Filter	1	1200	1200

Total Connected Load	10300 Watts

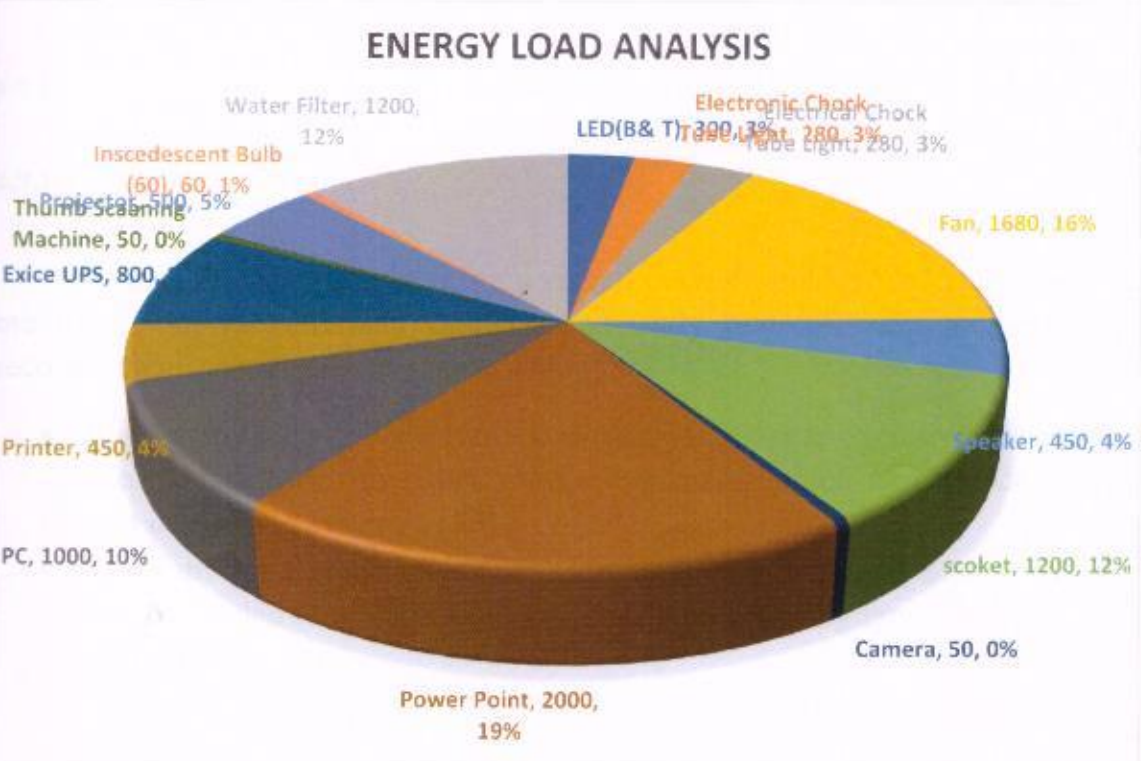
Form the above table connected load is 10.33 kW .

4.3.1.4 Total electricity purchased from utilities

In Maharashtra state main supplier of electricity is Maharashtra state Electricity distribution company limited. Almost all the electricity has been purchased from same supplier. In emergency college has generator unit for supply of electricity.

4.3.2 Load distribution pattern (total lighting load, air cooling load and other loads)

For the unit major load is air cooling (Fan) and lighting. Lighting and air cooling load.The detailed load distribution is shown in below load distribution pattern



4.4 payment of electricity bills

Supplier i.e., Maharashtra state Electricity distribution company limited took monthly reading and send energy/electricity bill to consumer. Also on web portal of supplier monthly electricity bill and history of payment and last 12 month energy consumption.

4.4.1 Authority responsible for payment of electricity bills and payment mechanism

Head of the institute is responsible for payment of bill assistance with office staff. Monthly received bill has been procced and paid through bank check, NEFT or RTGS. Sometimes bill has been paid at supplier bill collection center.

4.4.2 Status of Bill Payments on time/Delay in Bill Payments, percentage paid

No delay in payment has been observed since last 12 month. Bill payment has been made time to time to avoid charges and penalty.

4.7 Energy Saving Majors and Payback period calculation

4.7.1 Energy Saving Majors

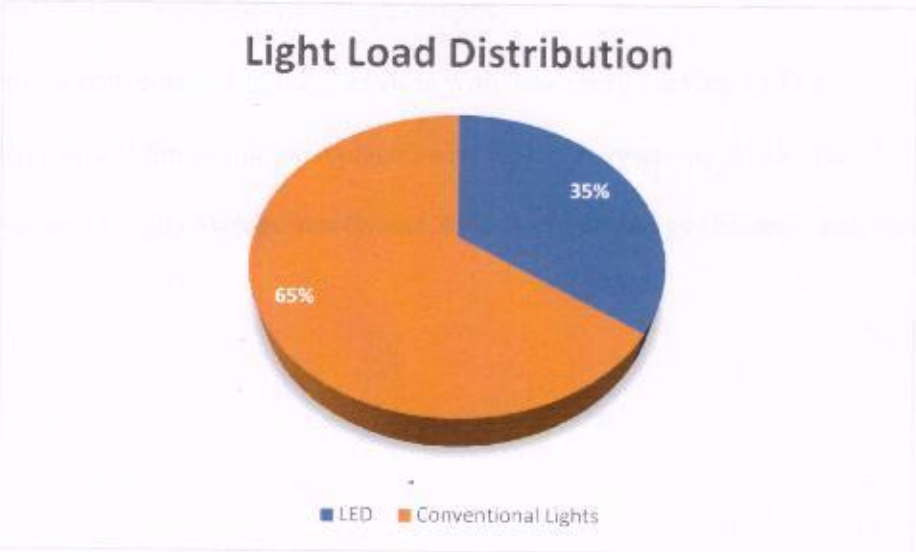
When our energy engineering's visited institute and find out energy saving measures. Our measurement, analysis and study find following suggestion & recommendations for energy conservation.

- It is found that 11 no old luminaries (tube lights) are operative in institute. We recommended to replace these luminaries which will reduce energy cost of lighting system to 50%
- It is observed that 3 old fans are operative in college campus. We recommended to replace with energy efficient cooling fans.

4.7 Requirement of NAAC

4.7.1 Percentage of lighting power requirement met through LED bulbs

Type	Quantity	Load in Watts	% Load
LED	15	300	34.88%
Conventional Lights	11	560	65.11 %
Total	26	860	100%



4.8 CONCLUSION

After detailed energy audit of institute it is observed that institute has taking energy conservation majors like LED installation and solar street lights. Still Institute require to take many entitative towards energy conservation. Some of recommendations are as follows

Audit team recommended following Recommendations for Energy Conservation

- Install rooftop solar system
- Install Solar street lights in college campus
- Replace conventional lighting devices with new energy saving LED's
- Conventional fan should be replaced with new energy saving BLDC fans
- Establish a Facility Management System, exclusively for energy efficiency activities.

5.0 Environment And Green Audit

5.1 Introduction

The main objective of the Environment/Green audit is to promote the management and conservation of Environment in the College Campus. The purpose of the audit is to identify, quantify, describe and prioritize framework of Environment Sustainability in compliance with the applicable regulations, policies and standards.

The main objectives of carrying out Green Audit are:

- *Green Plantation and Plant Diversity*
- *To Document the Water Analysis report of the college*
- *To document the waste disposal system*
- *To document the ambient environmental condition of air, Soil and noise of the college*

5.2 Methodology

In order to conduct the green audit, the methodology included different tools such as

- Preparation of questionnaire,
- Preparation of data collection formats
- Collection of data
- Physical checking of the campus,
- Observation and review of the documentation,
- Interview of key persons and data analysis, measurements and recommendations.

The study covered the following areas to summarize the present status of environment management in the campus:

- Green area management
- Waste management
- Water Analysis Report
- Ambient environmental condition of air, Soil and noise

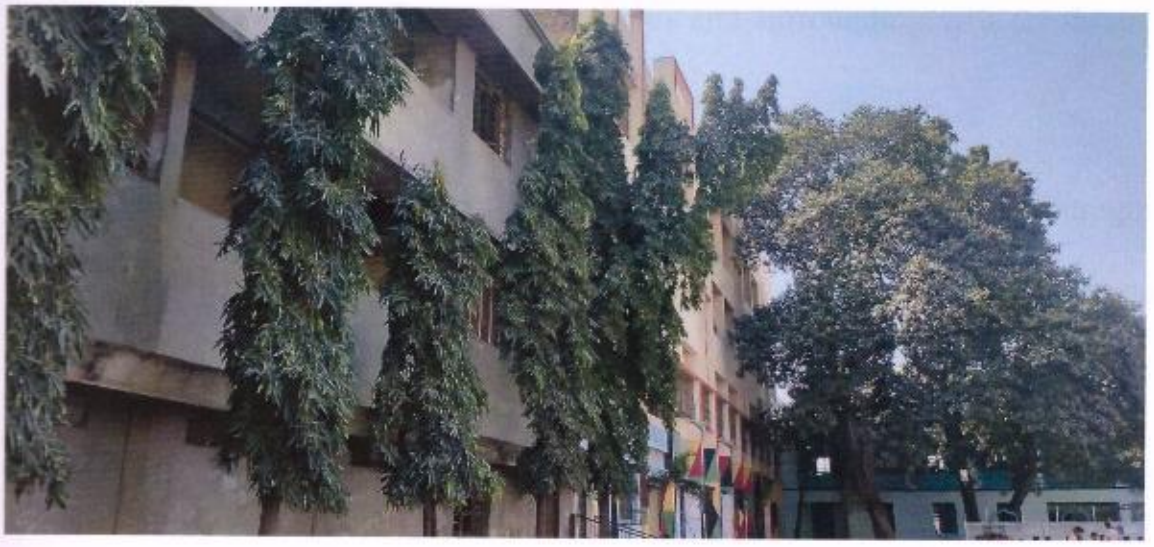
5.3 Green Audit

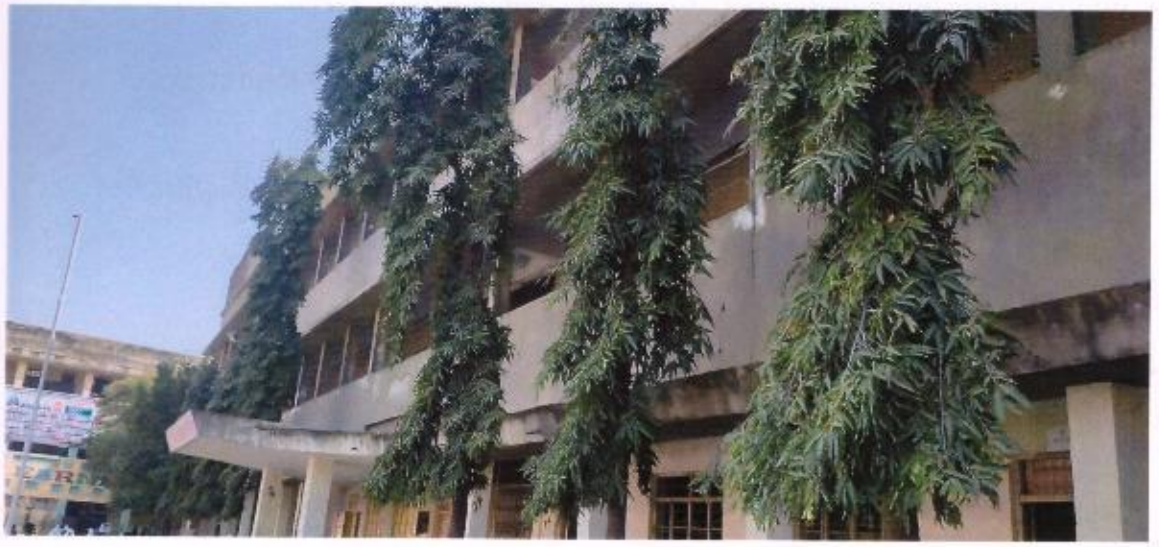
Green audit was initiated with the beginning of 1970s with the motive of inspecting the work conducted within the organizations whose exercises can cause risk to the health of inhabitants and the environment. It exposes the authenticity of the proclamations made by multinational companies, armies and national governments with the concern of health issues as the consequences of environmental pollution. It is the duty of organizations to carry out the Green Audits of their ongoing processes for various reasons such as; to make sure whether they are performing in accordance with relevant rules and regulations, to improve the procedures and ability of materials, to analyze the potential duties and to determine a way which can lower the cost and add to the revenue. Through Green Audit, one gets a direction as how to improve the condition of environment and there are various factors that have determined the growth of carrying out Green Audit. Some of the incidents like Bhopal Gas Tragedy (Bhopal; 1984), Chernobyl Catastrophe (Ukraine; 1986) and ExxonValdez Oil Spill (Alaska; 1989) have cautioned the industries that setting corporate strategies for environmental security elements have no meaning until they are implemented. The intention of organizing Green Audit is to upgrade the environment condition in and around the institutes, colleges, companies and other organizations. It is carried out with the aid of performing tasks like waste management, energy saving and others to turn into a better environmental friendly institute.

5..4 GREEN AREA/ PLANTATION

Green area or plantation includes the plant, greenery and landscaping of the campus to enhance the environment of the area. This will help to increase the beauty of the campus. The college area is diverse with a variety of plant species performing a variety of functions. Most of the plant species are planted through various plantation programs organized by the college.

The plantation in college have increased the quality of life, not only in college campus but also the surrounding area in term of temperature control, contributing to improving air quality, soil conservation, water conservation and habitat for birds and small animals etc.





Greenery at College Building

5.5 Plant Diversity

- Total 8 plant species are observed in the college campus area.
- About 30 number of total trees are planted in college campus area.
- College conducted and participated in various Planation activity programs are being organized at college campus and surrounding villages through NSS unit.
- This program conducted through the students and helps in encouraging eco-friendly environment which provides pure oxygen within the campus and awareness among nearer villagers.
- The plantation program includes various types of indigenous species of ornamental and medicinal wild plant species.
- College actively participated in 2 Cr tree plantation programme of Government of Maharashtra.

Recommendations:

- Review yearly the list of trees planted in the college campus, botanical garden, and allots numbers to the trees along with scientific /botanical and local/common name to the trees
- Select endemic or local species for the planation
- Considerations for selection of plant species
  - o Plants that show vigorous growth, and higher forage value
  - o Plants having ability of fixing nitrogen
  - o Preferably indigenous, endemic and rare species
  - o Plant that serves as nesting, feeding and breeding site for fauna
  - o Plants species having high fodder and fuel value
  - o Plant that enhances the aesthetics of the surrounding areas
  - o Plants species having importance in soil binding
  - o Plant species with different height, growth habits and bole shapes
  - o Species tolerant to specific conditions or capacity to endure water stress and climatic extremes after initial establishment
  - o Economically important plant species
- Avoid plantation of exotic plant species in college campus.
- Promote environmental awareness as a part of course work in various curricular areas, independent research projects, and community service.

- Conduct small workshop or training programme for the students on medicinal plants
- Establish Environment Policy for the environment conservation nd protection of college.
- The Environmental cell shall be the source of advice and guidance to staff and students on how to implement this Policy.
- Conduct six monthly internal audit to ensure that implementation of activities for the environment planned for the year, action is taken on the basis of audit report, recommendation and findings.
- Celebrate every year 5th June as „Environment Day", wildlife week and plant trees on this day to make the campus more Green.
- Establish Green library for the students.
- Prepare five year planation programme /Plan in consultation with management and students.
- Establish nature club
- Organize exhibitions like plant painting, flower painting, flowers, posters etc.
- Develop seed bank under botanical garden programme

6.0 SOLID WASTE MANAGEMENT

To reduce waste in the college campus, recycling efforts are taken. Waste is collected and segregated properly. Students, faculty, and staff are aware and educated on proper waste management practices such as waste source and disposal, plastic waste, paper waste, food waste, and recycling. Solid waste is divided into two categories: dry waste and wet waste.

- Wet waste: biodegradable waste
- Dry waste: no Biodegradable waste

Solid Waste is hand overed to the Solapur municipal corporations waste collection vehicle.

7.0 Water Analysis Report

Water quality testing is important because it identifies contaminants and prevents waterborne diseases. Drinking or using contaminated water can result in severe illness or death. That is why it is important to ensure that drinking water is safe, clean and free from bacteria and disease.

The parameters for water quality are determined by the intended use. Work in the area of water quality tends to be focused on water that is treated for human consumption, or in the environment

Source of water is borewell and from municipal corporation water supply

Drinking water indicators:

The following is a list of indicators often measured by situational category:

Alkalinity

- Color of water
- pHvalue
- Taste and odor (geosmin, 2-Methylisoborneol (MIB),etc.)
- Dissolved metals and salts (sodium, chloride, potassium, calcium, manganese,magnesium)
- Microorganisms such as fecal coliform bacteria (Escherichia coli), Cryptosporidium,and Giardia lamblia; see Bacteriological wateranalysis
- Dissolved metals and metalloids (lead, mercury, arsenic,etc.)

- Dissolved organics: colored dissolved organic matter (CDOM), dissolved organic
- carbon(DOC)
- Heavymetals

Sr.No.	Contains	Unit	Results	Reference Value	Remark
1	pH		7.47	6.5-7.5	Safe
2	Electrical Conductivity (EC)	mmhos/cm	1.91	0.1-1.4	Unsafe
3	TDS	mg/L	281	<700	Safe
4	Total Hardness	mg/L	450	<600	Safe
5	Carbonate	mg/L	Absent	-	-
6	Bicarbonate	mg/L	251	<600	Safe
7	Alkalinity	mg/L	135	<500	Safe
8	Potassium	mg/L	2.48	<75	Safe
9	Calcium	mg/L	165	<600	Safe
10	Magnesium	mg/L	26	<400	Safe
11	Na	mg/L	42.1	<50	Safe
12	So_4	mg/L	23	<300	Safe
13	Chloride (Cl)	mg/L	241	<300	Safe
14	mg:ca	-	0.21	<1.50	Safe
15	Sodium Adsorption Ratio (SAR)	meq/L	0.95	<10	Safe
16	Residual Sodium Carbonate (RSC)	meq/L	-4.75	<1.25	Safe
Water Type :- C3 : S1					

With help of Yash Agrotech Laboratory (ISO 9001:2015) water analysis completed. It is observed that EC is more in water and deviated from slandered.

8.0 Ambient environmental condition of air, Soil and noise

8.1 Air Quality

Ambient air quality monitoring was carried out in the college campus to understand the air quality of the campus. Ambient air quality monitored at center of the campus

Air quality is measure by SMILEDRIVE Portable Air Quality Pollution Meter.

The results are given below Table

Parameter	Unit	Result	NAAQ Standards for 24hrs
PM10	µg/m3	73	100
PM2.5	µg/m3	54	60

Remark:- The results show the concentrations of PM_{10} $PM_{2.5}$ were found within the National Ambient Air Quality Standards (NAAQ).

8.3 Noise Level Campus

The human ear is constantly being assailed by man-made sounds from all sides, and there remain few places in populous areas where relative quiet prevails. There are two basic properties of sound:

- Loudnessand ¬
- Frequency

Loudness is the strength of sensation of sound perceived by the individual. It is measured in terms of Decibels. Just audible sound is about 10 dB, a whisper about 20 dB, library place 30 dB, normal conversation about 35-60 dB, heavy street traffic 60-0 dB, boiler factories 120 dB, jet planes during take-off is about 150 dB, rocket engine about 180 dB. The loudest sound a person can stand without much discomfort is about 80 dB. Sounds beyond 80 dB can be safely regarded as Pollutant as it harms hearing system. The WHO has fixed 45 dB as the safe noise level for a city. For international standards a noise level up to 65 dB is considered tolerate. Loudness is also expressed in sones. One sone equals the loudness of 40 dB sound pressure at 1000 Hz. Frequency is defined as the number of vibration per second. It is denoted as Hertz(Hz).

Noise Level is measure by MECO 970p(35dB-130dB) Digital sound level meter.

Sr no.	Description	Location-College Main Building
1.	Max in dBA	78
2.	Min in dBA	65

8.4 Soil Analysis

9001:2015) soil analysis completed. Results are shown as follows

Sr.No.	Contains	Unit	Results	Reference Value	Remark
1	सामू (pH)		7.75	6.5-8.5	In Limit
2	Electrical Conductivity (EC)	mhos/cm	1.75	<1	More
3	Free Lime	%	2.45	1-5	More
4	Cation exchange apacity(CEC)	Meq/100gm	16.3	15-25	In Limit
5	organic matter (OM)	%	2.30	1.72-3.5	In Limit
6	Organic carbon (OC)	%	1.38	0.41-0.60	More
8	Available-N(Avail-N)	Kg/ha	478	280-420	More
9	Available -P	Kg/ha	198	30-50	More
10	Available -K	Kg/ha	248	180-240	More
11	Available -Ca	%	6.78	0.1-3.30	More
12	Available -Mg	%	1.18	0.12-0.30	More
13	Available -S	PPM	10	26-50	Less
14	Available -Na	%	2.8	< 5	In limit
15	zinc - (Zn)	PPM	2.45	0.60	In Limit
16	Copper (Cu)	PPM	2.02	0.25-0.50	In Limit
17	Iron (Fe)	PPM	2.2	4.50	Less
18	Manganese (Mn)	PPM	5.42	2	In Limit
19	Boron (B)	PPM	0.07	<1	In Limit
20	Molybdenum (Mo)	PPM	-	-	-
21	C:N	-	3.45	10-20	Less
22	Ca:Mg	-	6.5	5.5-6.5	In Limit
23	Mg:k	-	5.03	1.5-2.5	More
24	Ca : K	-	2.76	1.25-1.35	More
25	Fe Fe:Mn M	-	0.68 : 1	1.10 : 1	Less
26	Plasmodesmata (PD)	-	0.98	2.65	Less
27	Integrity (P)	%	35	40-50	Less
28	soil water holding	%	38	41-50	Less

9.0 E-Waste Management

9.1 Introduction

In India, the quantity of "e-waste" or electronic waste has now become a major problem. Disposal of e-waste is an emerging global environmental and public health issue, as this waste has become the most rapidly growing segment of the formal municipal waste stream in the world. E-waste or Waste Electrical and Electronic Equipment (WEEE) are loosely discarded, surplus, obsolete, broken, electrical or electronic devices.

9.2 Burden of E-Wastesss

In India most of the waste electronic items are stored at households as people do not know how to discard them. This ever-increasing waste is very complex in nature and is also a rich source of metals such as gold, silver, and copper, which can be recovered and brought back into the production cycle.

9.3 Health Impacts

Electronic equipment's contain many hazardous metallic contaminants such as lead, cadmium, and beryllium and brominated flame-retardants. The fraction including iron, copper, aluminum, gold, and other metals in e-waste is over 60%, while plastics account for about 30% and the hazardous pollutants comprise only about 2.70%. Of many toxic heavy metals, lead is the most widely used in electronic devices for various purposes, resulting in a variety of health hazards due to environmental contamination. Lead enters biological systems via food, water, air, and soil. Children are particularly vulnerable to lead poisoning – more so than adults because they absorb more lead from their environment and their nervous system and blood get affected

9.4 E-Waste Management Initiative

CPCB India is finalizing the set of rules and most recently issued a formal set of guidelines for proper and eco-friendly handling and disposal of the electronic waste. The Ministry of Environment and Forests is now processing the rules framed by electronics equipment manufacturers with the help of NGOs.

The Institute initiative for E-waste management is they are sent their electrical and electronic waste to M/s Green Tech solutions Industries which is Maharashtra pollutions control board certified agency for dismantling E waste using environmental sound technology as per E waste (M) Rule 2016.M/s Green Tech Solutions Industries has consent no BO/MPCB/RO(HQ)/CO/B-1801001022 dt. 25/01/2018

10. CONCLUSIONS

- Adopt an environmental policy for the college
- Install solar roof top of 10 kw which saves electricity bill
- Plant more no and verities of trees to reduce noise and pollution due to dust
- Establish Environment management Committee of the college.
- Establish a purchase policy for Eco friendly materials
- Conduct seminars and group discussions on environmental education and environment protection
- Involve Students and staff in local environmental problems to solve along with local body and people.
- Establish waste water Treatment and harvesting system/Plant.

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Certificate of Accreditation

Enviro Techno Consult Private Limited, Nagpur

68, Mahakali Nagar – 2, Near Manewada Square, Nagpur – 440024

*The organization is accredited as **Category-A** under the QCI-NABET Scheme for Accreditation of EIA Consultant Organization, Version 3: for preparing EIA-EMP reports in the following Sectors –*

S.No	Sector Description	Sector (as per)		Cat.
		NABET	MoEFCC	
1	Mining of minerals including both opencast and underground mining	1	1 (a) (i)	A
2	Thermal power plants	4	1(d)	A
3	Cement plants	9	3(b)	A
4	Manmade fibers manufacturing	19	5(d)	B

Note: Names of approved EIA Coordinators and Functional Area Experts are mentioned in RAAC minutes dated Nov 18, 2022 and posted on QCI-NABET website.

The Accreditation shall remain in force subject to continued compliance to the terms and conditions mentioned in QCI-NABET's letter of accreditation bearing no QCI/NABET/ENV/ACO/23/2640 dated Jan 16, 2023. The accreditation needs to be renewed before the expiry date by Enviro Techno Consult Private Limited, Nagpur following due process of assessment.

Sr. Director, NABET
Dated: Jan 16, 2023

Certificate No.
NABET/EIA/2225/RA 0266

Valid up to
Feb 26, 2025

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टेक्नोलॉजी भवन, नया महरौली मार्ग,
नई दिल्ली - 110016
GOVERNMENT OF INDIA
MINISTRY OF SCIENCE AND TECHNOLOGY
Department of Scientific and Industrial Research
Technology Bhavan, New Mehrauli Road,
New Delhi - 110016

Dated: 5th March, 2020

F. No. TU/IV-RD/1711/2019

To

M/s Enviro Techno Consult Pvt. Ltd.
68, Mahakali Nagar-2,
Near Manewada Square,
Nagpur – 440 024 (Maharashtra)

Subject: RENEWAL OF RECOGNITION OF IN-HOUSE R&D UNIT(s)

Dear Sirs,

This has reference to your application for renewal of recognition of your in-House R&D unit(s) beyond 31-03-2019 by the Department of Scientific and Industrial Research.

2. This is to inform you that it has been decided to accord renewal of recognition to the in-House R&D unit(s) of your firm at **Plot No. 68, Mahakali Nagar-2, Near Manewada Square, Nagpur (Maharashtra)** upto **31.03.2024.** Terms and conditions pertaining to this recognition are given overleaf.

3. Kindly acknowledge the receipt of this letter.

Yours faithfully,

Deshpande

(Dr S. K. Deshpande)
Scientist - 'G'

Certificate of Registration

ISO 9001:2015

This is to Certify that
Quality Management System of

ENVIRO TECHNO CONSULT PRIVATE LIMITED

68, MAHAKALI NAGAR - 2, NEAR MANEWADA SQUARE, NAGPUR - 440024, MAHARASHTRA, INDIA

has been assessed and found to conform to the requirements of

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PROVIDING CONSULTANCY SERVICES IN ENVIRONMENTAL IMPACT ASSESSMENT, LABORATORY ANALYSIS & INVESTIGATIONS.

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Initial Registration Date	: 18/02/2022	Issuance Date	: 18/02/2022
Date of Expiry	: 17/02/2025		
1st Surve. Due	: 18/01/2023	2nd Surve. Due	: 18/01/2024

Director

IAS ACCREDITED Management Systems Certification Body MSCB-119

MEMBER OF MULTILATERAL RECOGNITION ARRANGEMENT IAF

AQC MIDDLE EAST LLC

Head Office: Office No. 02, Ground Floor, Sharjah Media City, Sharjah, UAE. e-mail : info@aqcworld.com,
Key Location: A-60, Sector - 2, Noida, Uttar Pradesh, 201301, India

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Date of Expiry*	: 09/12/2023		
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Director

IAS ACCREDITED Management Systems Certification Body MSCB-119

MEMBER OF MULTILATERAL RECOGNITION ARRANGEMENT IAF

AQC MIDDLE EAST FZE.

Head Office: E1-1401 E Amber Gem Tower, Sheikh Khalifa Bin Zayed Road, 2, Ajman, UAE. e-mail: info@aqcworld.com,

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Date of Expiry	: 29/07/2023		
1st Surve. Due	: 30/06/2021	2nd Surve. Due	: 30/06/2022

Director

IAS ACCREDITED Management Systems Certification Body MSCB-119

AQC MIDDLE EAST FZE.

Head Office: E1-1401 E Amber Gem Tower, Sheikh Khalifa Bin Zayed Road, 2, Ajman, UAE.
Key Location: 403, Madhukan Building, 55, Nehru Place, New Delhi - 110019, India. e-mail : info@aqcworld.com.
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for the following scope :

PROVIDING CONSULTANCY FOR ENERGY& GREEN AUDIT (INDUSTRIES AND INSTITUTIONS), ELECTRICAL CONTRACTING, ELECTRICAL SAFETY AUDIT, FIRE SAFETY AUDIT, SOLAR LAMP MANUFACTURING, ANNUAL MAINTENANCE CONTRACT, SKILLED -SEMISKILLED AND UNSKILLED MANPOWER SUPPLIER TO INDUSTRIES AND INSTITUTIONS.

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Date of Expiry	: 16/10/2025		
1st Surve. Due	: 17/09/2023	2nd Surve. Due	: 17/09/2024

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MEMBER OF MULTILATERAL RECOGNITION ARRANGEMENT IAF

Director

Magnitude Management Services Pvt. Ltd.
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