7.1.6:Quality audit on environmental and energy regularly undertaken by the institution and any awards received for such green campus initiatives

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Ahmednagar Jilha Maratha Vidya Prasarak Samaj's
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Approved by AICTE New Delhi, Govt. of Maharashtra & Affiliated To Savitribai Phule Pune University.

Environmental Policy

Shri Chhatrapati Shivaji Maharaj College of Engineering Nepti Ahmednagar

Ahmednagar Jilha Maratha Vidya Prasarak Samaj's
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Ref No. : SCSMCOE / 2017 - 2018 / 830 - 2 Date : 27 / 12 / 2017

Environmental Policy

A green campus is a place where environmental friendly practices and education combine to promote sustainable and eco-friendly practices in the campus.

Shri Chhatrapati Shivaji Maharaj College of Engineering, Ahmednagar is a quality conscious institution. It protects its own environment with its green campus initiative and keeps campus pollution free. Environment development is its basic work with the educational policies implemented on the campus. Environmental conscious administration, the management and the students of the college look after the environment carefully. Every year, during rainy season, we do tree plantation and carefully look after it. It's our own responsibility to preserve the work done on the campus related to the environment.

The college always raises awareness of environmental issues among its students/staff/visitors and creates awareness regarding environmental policy amongst the students and encourages initiatives leading towards a clean environment by following ways.

1. Maintaining pollution free campus by avoiding tobacco, pan-masala chewing on the campus. As per the government rules and regulations regarding the instructions of tobacco free campus, signboards are displayed at strategic places in the institution.
2. Maintaining plastic free campus by avoiding use of plastic and its toxic impact on people and the environment.
3. Using Solar Energy as alternate energy source by installing Solar PV plant and Solar water Heaters.
4. Progressive replacement of light bulbs with energy efficient ones.

Shri Chhatrapati Shivaji Maharaj College of Engineering Nepti Ahmednagar

5. Sensitizing the students and staff regarding the use of drinking water properly for which, we have provided purified drinking water facilities on the campus.
6. Harvesting rain water through 'Rain Water Harvesting' system in the campus. Right now 'Rain water harvesting' unit is under construction.
7. Maximizing the use of ICT tools and minimizing the use of paper. It will help to go towards 'Paperless Office'.
8. Decomposing the solid waste through vermicomposting plant and using it as a fertilizer for trees and plants in the campus.
9. Using dust bins to keep college campus clean.
10. Minimizing the consumption of electricity where opportunities arise by.
11. Conserving the energy by promoting use of daylight.

Shri Chhatrapati Shivaji Maharaj College of Engineering ★ Nepti Ahmednagar

PRINCIPAL
Shri. Chhatrapati Shivaji Maharaj College of Engineering, Nepti, Ahmednagar

Shri Chhatrapati Shivaji Maharaj College of Engineering ★ Nepti Ahmednagar

PRINCIPAL
Shri. Chhatrapati Shivaji Maharaj College of Engineering, Nepti, Ahmednagar

A

Report

on

Environmental Audit

For

Ahmednagar Jilha Maratha Vidya Prasharak Samaj's

Shri Chhatrapati Shivaji Maharaj College of Engineering, Ahmednagar

Prepared by

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2023-2024

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ACKNOWLEDGEMENT

Environmental audit Assessment Team thanks the **Shri Chhatrapati Shivaji Maharaj College of Engineering, Ahmednagar** for assigning this important work of Environmental Audit. We appreciatethe cooperation extended to our team during the entire process.

Our special thanks are due to Principal – Dr. Y. R. Kharde & Team of colleagues for giving us necessary inputs to carry out this very vital exercise of Environmental Audit.

We are also thankful to Department Heads and other staff members who were actively involved while collecting the data and conducting field measurements.

Susheel Pote

Director

Sarvashree Technogreen Private Limited

DISCLAIMER

Environmental audit Team has prepared this report for **Shri Chhatrapati Shivaji Maharaj College of Engineering, Ahmednagar** based 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 recommendations are arrived following best judgments 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.

Prepared by:

Mr. Sujitkumar Pote

Sarvashree Technogreen Private Limited

WATER MANAGEMENT OF EDUCATION INSTITUTES

Higher education institutions (HEIs) enjoy tremendous autonomy in terms of managing their natural resources. They are virtually independent and are internally regulated, while civilians, businesses, industries and others are subjected to, with close external monitoring and accountability. This opportunity of self-regulation available to them with their own heads of universities presiding over their internal resource management system as the final authority can be the springboard to water conservation. Water conservation needs to be ingrained in not only the consciousness but also practices of every citizen and system. HEIs have to make unremitting efforts through faculty, staff and students to make the Jal Shakti Abhiyan successful. Key Water challenges include Water Conservation, Water Quality Management, Watershed Management, Storm water Management and Wastewater Management

1. INTRODUCTION

Background

Ahmednagar Jilha Maratha Vidya Prasarak Samaj's, Shri Chhatrapati Shivaji Maharaj College of Engineering, is affiliated by Savitribai Phule Pune University. The journey of Shri Chhatrapati Shivaji Maharaj College of Engineering began on year 2011 with a vision and mission of Shri Chhatrapati Shivaji Maharaj College of Engineering "to impart quality education through effective teaching learning methodologies".

Today, the college has four faculties – Civil Engineering, Mechanical Engineering, Electronics and Telecommunication Engineering and Computer Engineering. This is also certified by ISO 9001:2015. The campus has strength of 1091 students and 50 teaching faculty. The campus includes a Main Block, Canteen, Lecture Rooms, a Central Library, Auditorium, Laboratories and Computer Labs. The major water source is Mula Dam. MIDC supplies water to Institutes. Electricity power needs for the entire campus is met through Off-grid solar power and MSEB.

Table 1.1 Key facts about the site

Name of the Institute	Shri Chhatrapati Shivaji Maharaj College of Engineering
Address	Survey No. 162 and 163, Nagar-Kalyan Road, Nepti, Ahmednagar (MH) - 414005
Campus Area	22 acres
Build up area	6500 sq.mts
Average Annual Rainfall	562.69 mm
Water Source	MIDC Supplies Water
Waste Treatment System	Septic Tanks
Average daily water consumption	~ 39.64KL
Average daily water supply	~ 39.91 Units
Average daily waste water	~ 29.70KL

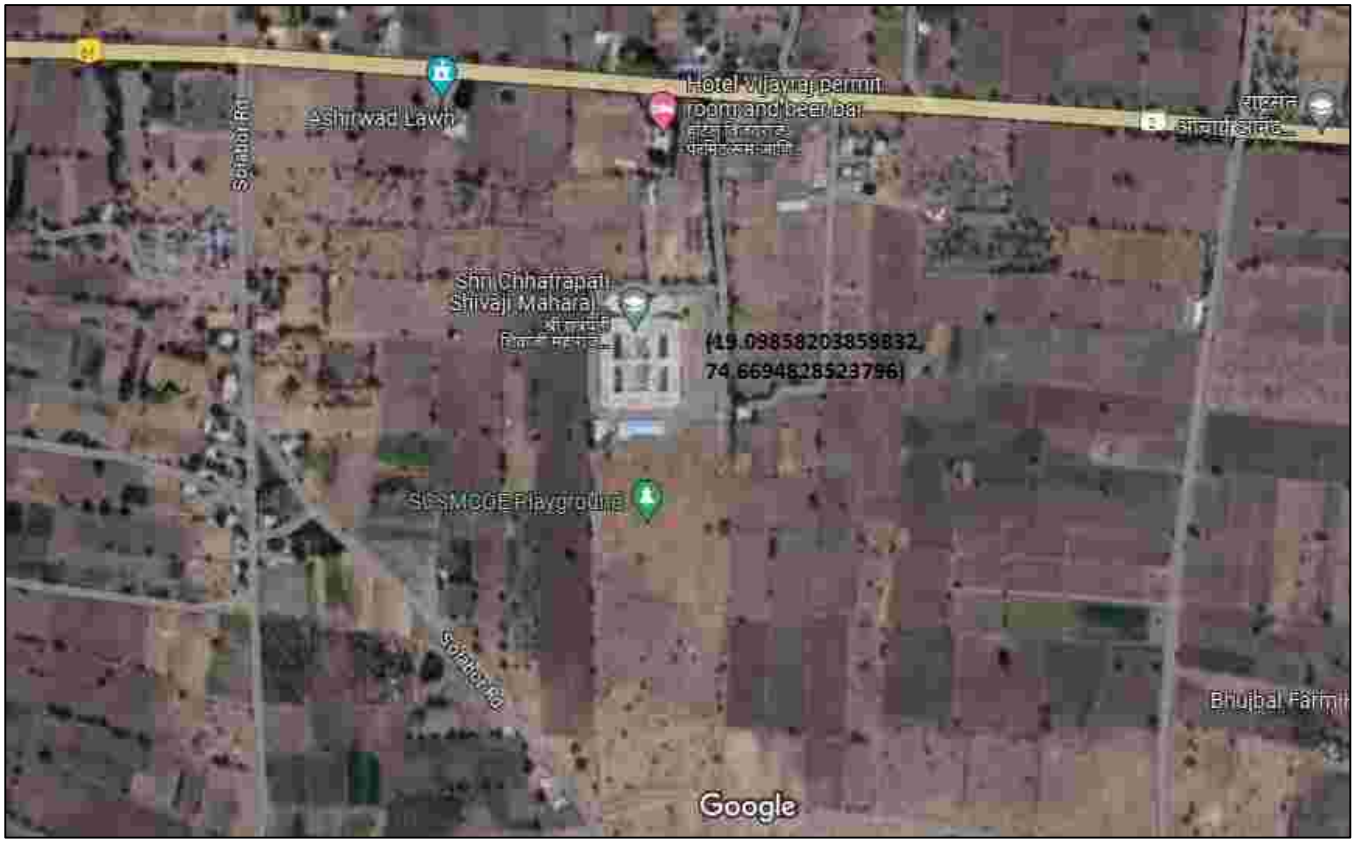


Figure 1.1. Location of Shri Chhatrapati Shivaji Maharaj College of Engineering, Nepti

1.1 Environmental Policy of the College

Shri Chhatrapati Shivaji Maharaj College of Engineering is an environment and quality conscious college. It has taken initiative to protect its own environment with its Green Campus initiative and keeps pollution free campus. Environment development is its focal area with the educational policies implemented on the campus.

Being environment conscious administration, the management and the student of the college look after the environment carefully. Every year, during rainy season, tree plantation is carried out. All the avenues and roads within the College campus are therefore adorned with tall trees bearing emerald green leaves and beautiful flowers to create a homogenous feeling amongst everyone within the campus.

1.2 Role of Higher Education Institutions in Water Conservation

- Build consensus on the need for water conservation on campus with students, administration, faculty and other internal as well as external stakeholders
- Facilitate design of specific interventions for making the campus water sufficient and water efficient by following best available standards and accepted parameters
- Monitor the existing water management in the campus with participation and transparency
- Present a step-by-step guide for conserving water on the campus

- Generate case studies on best water conservation practices adopted on the campus and in the villages the campuses are engaged with. These instances can serve as models for other institutions and villages to adopt
- A core team consisting of the leadership of the institution along with key stakeholders may be formed. The team shall work as “Campus Jal Shakti Team”.
- The team that would be involved in all aspects of exploring, surveying, fact-finding, recording, planning, taking action and monitoring will also include all relevant stakeholders viz., citizens, student teams, their teachers, village leaders apart from administrative officials concerned in both campuses and villages
- Water Conservation Initiative can be a successful only if the Head of the Institution ignites the spirit of everybody in the organization. S/he needs to direct the departments, pay attention to the findings of student teams and ensure that their valuable suggestions are followed in letter and spirit by all students, faculty members as well as administrative, non-teaching and support staff. A motivated leader can bring a sea-change in the system and therefore s/he is the cornerstone of this campaign. An advisory committee may be constituted to guide the initiative.

Table 1.2 Departments

Departments:
Electronics and Tele Communication
Computer
Mechanical
Civil

Table 1.3 Total population

Current Population in Campus:				
Sr. No.	**No of students**	**No of Teachers**	**No of non-teaching staff**	**Total**
1	**1091**	**50**	**29**	**1170**

1.3 AUDITORS FOR WATER AUDIT

Sr.No.	Name of Auditor	Designation
1	Mr. Sujitkumar Pote	Environmental Engineer, Sarvashree Technogreen Private Limited, Ahmednagar
2	Mr. Santosh Sanap	Environmental Engineer, Sarvashree Technogreen Private Limited, Ahmednagar

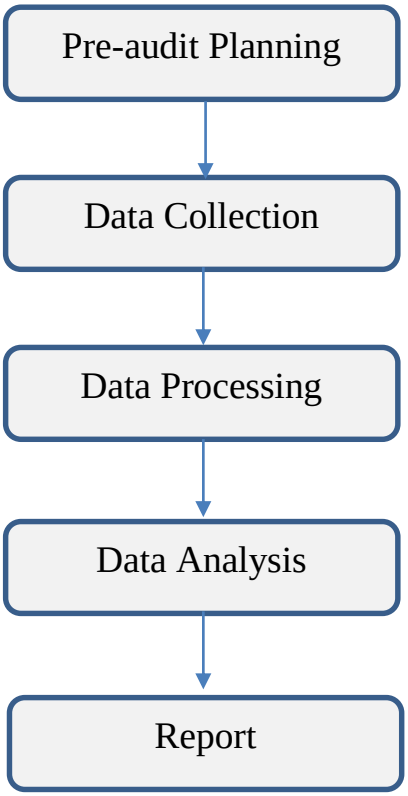
2. OBJECTIVES OF ENVIRONMENTAL AUDIT

The main aim objectives of this environmental audit are to assess the environmental quality and themanagement strategies being implemented in Shri Chhatrapati Shivaji Maharaj College of Engineering. The specific objectives are:

1. Environmental education through systematic environmental management approach
2. Developing an environmental ethic and value systems in young people
3. To assess the quality of the water in the Shri Chhatrapati Shivaji Maharaj College of Engineering. campus
4. Financial savings through a reduction in resource use
5. Curriculum enrichment through practical experience
6. To monitor the water consumption pattern of the college
7. To quantify the liquid waste generation and management plans in the campus
8. To assess whether the measures implemented by Shri Chhatrapati Shivaji Maharaj College of Engineering have helped to reducethe wastage of water.
9. To impart environment management plans to the college
10. Providing a database for corrective actions and future plans
11. To assess whether extracurricular activities of the Institution support the collection, recovery, reuse and recycling of solid wastes
12. To identify the gap areas and suggest recommendations to improve the Green Campus status of the of Shri Chhatrapati Shivaji Maharaj College of Engineering.

3. METHODOLOGY

Key components of water source and assessment report with an environmental audit conducted at Shri Chhatrapati Shivaji Maharaj College of Engineering, Ahmednagar included:



i. Pre-audit planning

a) Preliminary literature review of concepts and methodologies related to an environmental audit.
b) Discussion with the management staff on various systems installed in the campus.
c) Awareness creation and interaction with the staff and student on the concept of environmental audit.
d) Walk through the entire campus to understand the nature of water source, water use and waste management systems in the campus.

ii. Data collection

a) Development of questionnaire format to identify all water using fixtures/ equipment and examine water use patterns for individual buildings in the campus.
b) Collection of secondary data from compilation of water bills, collecting records of pumps, water quality analysis reports etc.
c) Semi-structured interview with maintenance manager, technicians, plumber and housekeeping staff on current situation and the past trends in water consumption, waste management, waste generation etc.

iii. Data Processing and analysis

The existing trends and patterns in water usage and waste generation and management is analyzed in this step from the data collected from the previous step.

iv. Audit Recommendations and reporting:

Based on the understanding from the environmental audit, recommendations are given to improve the existing environmental performance of the campus and are documented in a report format. In order to perform water audit, the methodology included different tools such as preparation of questionnaire, physical inspection of the campus, observation and review of the documentation, interviewing key persons and data analysis, measurements and recommendations. The studycovered the following areas to summarize the present status of environment management in the campus.

- Water management

i) Raw Water

ii) Drinking Water

iii) Laboratory Waste Water

iv) Sewage Water

v) Rain Strom Drain Water

4. ENVIRONMENTAL AUDIT

An environmental audit is a systematic review of a site to identify opportunities to improve its water use efficiency. The site may be a public water utility, facility (institutional or commercial properties like malls, office, schools etc.) or a household. Audit recommendations are developed based on surveys and assessments of water-using hardware, fixtures, equipment, landscaping, and management practices at the site. Environmental audit involves tracking, assessing and validating all components of flow from the site of withdrawal or treatment through the water distribution system and into the consumer's properties. Environmental auditing examines the major areas of water use, including human consumption, personal hygiene & sanitation, washing, cleaning, laundry, gardening etc. Environmental auditing is an on-going process and rarely stays consistent in a site or system over time. Therefore, in order to gauge progress from adopted water conservation and cutbacks, environmental audit should be performed on a regular basis. In addition, it provides convincing overview of the water use trends, effectiveness of conservation measures and potential cost and water savings.

5. WATER SUPPLY

Around 39.64 kilo litres of water is used in the campus daily. Source of water for the entire campus is Mula Dam. MIDC supplies water to the institute. Water is stored in the main tank of 2500 kilo liter and is pumped to tanks (Make – Sintex, 1KL capacity, Total Nos. 8) located on building terrace from where it is distributed to toilets and bathroom of the main block , Hostel. The tanks (Make – Sintex, 2KL capacity, Total Nos. 2) is located on building terrace from where it is distributed to Water Cooler/RO Plant of 150 L capacity for drinking purpose as well as for laboratory. The tanks (Make – Sintex, 500L capacity, Total Nos. 1) is located on canteen building terrace from where it is distributed to canteen. The other source of water used in the College is bore wells present in the campus.

Sources of Water:

- MIDC Water
- Bore Well
- No. of flow meters attached and their locations.: One near OHT

The details of the pump used for pumping the water in overhead tanks are as follows-

Table 5.1 Details of of water pump

Sr.No/	No. of Pumps	Power	Location
1	1	3HP	Main water tank
2	1	1.5HP	Bore Well

6. WATER MANAGEMENT

This indicator addresses water consumption, water sources, irrigation, storm water, appliances and fixtures. An environmental audit is an on-site survey and assessment to determine the water use and hence improving the efficiency of its use.

Water conservation is a key activity as water availability effects on the development of the campus as well as on all area of development such as farming, tree plantation etc. Keeping this view water conservation activity is carried out.

MIDC supplies water to the institutes. MIDC has variable charges as basis on supply of water with monthly water bill. Water added to this source to main water tank of 2500m^3. Water is also extracted to full the requirement. The main tank is installed with 03 HP pump and is operated for 01 hours daily. The duration of pump operation is measured for electricity consumption but the quantum of water extracted is not measured by the management of the college.

The organization does not have any automatic leak detection system and all the leakages are controlled by manual observation hence leak quantum water is another issue which shall be considered in designing the water conservation scheme.

No leakage of water from pipes is observed from pipes by auditor team but leakages in taps were observed in some urinals.

There are 125 Taps in the college premises from which the water is used for different use. There is no tap maintenance schedule with the maintenance department; the leakage problem will be solved by them only when they get any compliant.

Table 6.1 Avg. consumption of water per day

Location/ Area	Avg. total consumption of water per day (in Liters)
1.College	32952
2. Gardening	2361
3. Labs	100
4. Canteen	4225

A) Availability of Water from source MIDC

The water bill for last 12 months is as given below:

Table 6.2 Water Bill for last 12 Months

	Apr 23	May 23	June 23	July 23	Aug 23	Sept 23	Oct 23	Nov 23	Dec 23	Jan 24	Feb 24	Mar 24
Bill in Rs.	9750	12051	19188	16010	7781	7352	0	0	7176	5109	7313	8093
Unit in Cu. Meter	500	618	984	821	399	377	0	0	368	262	375	415

*Availability of Water from source MIDC= 5119 Cub Meter =5119000 liter per year

*Availability of Water (Lit) from source MIDC = 5119000/365= 14025 liter per day

Table 6.3 Availability of Water from source Bore well

	Apr 2022	May 2022	June 2022	July 2022	Aug 2022	Sept 2022	Oct 2022	Nov 2022	Dec 2022	Jan 2023	Feb 2023	Mar 2023
Unit in Cu. Meter	435	447	485	487	645	784	478	698	584	748	856	745

*Availability of Water from source Borewell= 9449 Cub Meter =9449 000 liter per year

* Availability of Water (lit) from source Borewell= 9449 000 /365= 25888 liter per day

B) Availability of water from Rain Water Harvesting

Rainwater is the main water from natural source. Every campus can harvest water depending upon the area on the campus. This could be both paved area and unpaved area. For the purpose of location specific groundwater recharge and for harvesting efficiency, paved water catches and provides higher quantity of water. Rainwater is also universal carrier of waste on its route. It is essential to keep the rainwater route clean to ensure free flow of clean water and better recharge of rainwater.

For this, the following calculations and data are required.

- Area of the Campus Land: 22 Acre = 89030 sqm
- Institution's Paved Area: 8500 sqm
- Institution's Unpaved Area: 80530 sqm

Annual Rainfall in Metres (Rainfall in MM/1000) = Area of the Institution's Land x Annual rainfall in metres

Rainwater that can be harvested in an area can be arrived at by the following calculations:

- Paved area x Volume of Rainfall X 0.85(run off coefficient) = 8500 X 0.56269X 0.85 = 4065 m^3
- Unpaved area x Volume of rainfall x Runoff coefficient (Runoff coefficient for unpaved area = 0.35)

= 80530 X 0.56269 X 0.35 = 15860 m^3

X. Rainwater that can be harvested: Quantity of rainwater harvested is: i + ii = 19925 (m^3 per annum).

Earlier the rainwater storage tank was used for low quality uses like watering plants etc. But, presently storage has been replaced and all the water is recharged into the ground.

Waste Water System at College

The source waste water is categorized in two types (i) Laboratory Waste Water which can be said as Effluent and (ii) Domestic Waste Water i.e. Sewage Water.

The effluent produced in this college is about liters per week per laboratory and there are two such laboratories producing effluent is first year Chemistry Laboratory and the Environment Laboratory in Civil Engineering department. The effluent produced is released to the common drainage without any treatment which is damaging to the environment and have very big concerned with ground water contamination.

The Sewage water mainly comes from Toilets of college and hostel. The sewage is released to septic tank and sock pit.

Major Observations in regard of Water Usages and Conservation Plan

1) At present waste water after treatment is not recycled or reused in any form in the college premises.

2) Drip irrigation and sprinklers are used for watering the garden. The garden is also watered with water pipe, one times a day for 02 hours each time.

3) The roof top rain water is drained by storm water drain and released to artificial pond and terrain of the college campus.

4) Campus farming

The college has started a novel venture of cultivation of fruit trees in a 30 cent area of the campus.

5) Routine Green Practices

Every year college celebrates World Environment Day, World Water Day and Ozone Day in the campus. The main focus of these programs was to provide awareness to the students about the importance of the environment, its conservation and sustainable use of environmental resources. The programs are conducted through seminars, poster presentation, quiz competition debates etc.

7. CALCULATION OF WATER CONSUMPTION PATTERN

Water use diagram

The various blocks of Shri Chhatrapati Shivaji Maharaj College of Engineering, Ahmednagar such as main block, work shop, hostel and canteen were surveyed in this study with the questionnairedeveloped based on literature review and observations and discussions during the pre-auditphase Figure 7.1 shows the water usage by various activities of college campus based on the survey. It can be seen that toilet flushing (38%), wash basin (38%), gardening (6%), cooking (10%), cleaning (5%) and drinking (3%) are the activities that dominates water usage.

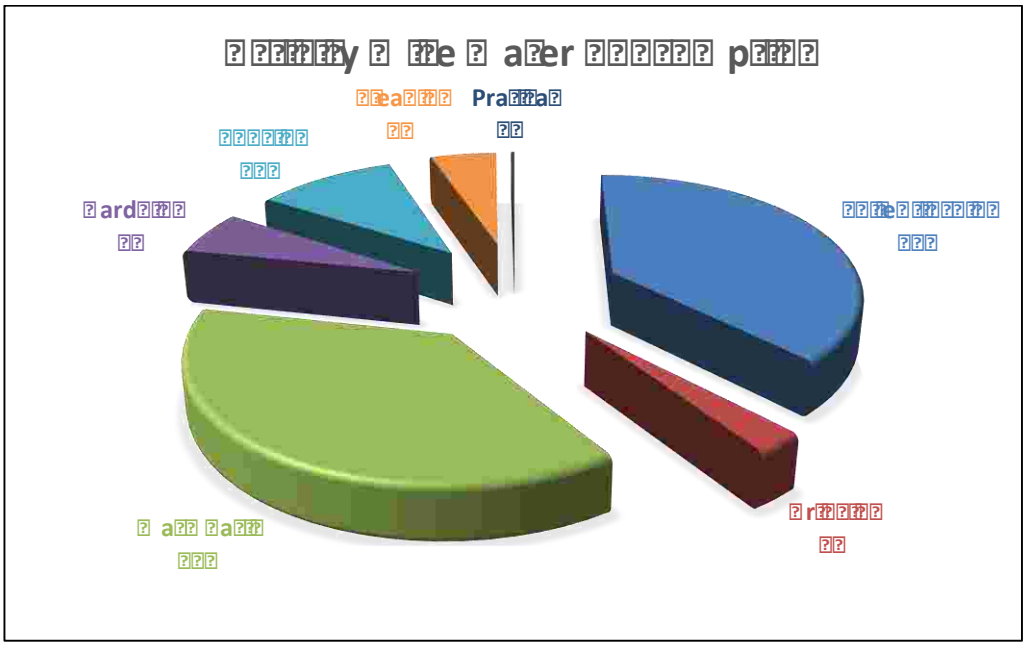


Fig. 7.1 Activity Wise Water Consumption

A) Calculation for water consumption per day for laboratory

Table7.1 Water Consumption for laboratory

Sr. No.	Location	Practical per year	Batches	Water use per Practical in liter	Water consumption in liter per year	Water consumption in liter per month	Water consumption in liter per day
1	Chemistry Lab	10	8	100	8000	667	22
2	Environmental Lab	10	4	200	8000	667	22
3	Geotech Lab	10	4	250	10000	833	28
4	Fluid Mechanics Lab	10	2	250	5000	417	14
5	Hydraulics lab	10	2	250	5000	417	14
Total (A)					**36000**	**3000**	**100**

b) Calculation for block wise water consumption per day

Table7.2 Block wise Water Consumption

Sr. No.	Location	Student / Staff	Water Consumption LPD	Working Day per year	Total water consumption in liter per year	Total water consumption in liter per day
1	**Canteen**	200	30*	257	1542000	4225
2	**College building**	1170	40*	257	12027600	32952
Total (B)					**10439340**	**37177**

*rates per capita per day by Indian Standard Code of Basic Requirements for Water Supply, Drainage and Sanitation

c) Calculation for water demand of landscape per day

The SLIDE equation for estimating the water demand of an established landscape is:

Water Demand (gal.) = PF X LA X 0.623

Where, PF = Plant factor for given plant type categories

LA = Landscape Area in sq. feet

0.623= Convert ET0 inches of water to volume in galleon

Furthermore, SLIDE recognizes the research findings that:

- Landscape plants are usually capable of using more water than they need in order to provide acceptable performance and function.
- The ETo × PF concept has limited accuracy in landscapes due to the biological physical complexities of these systems, and adding other ETo-adjustment factors to an equation does little to improve its accuracy.
- Most species tolerate moderate managed drought and can provide acceptable performance over a range of PF's.

Water Demand (gal.) = 0.7 X 435600 X 0.623 = 189965 gallon

Water Demand (lit) = 189965 X 3.79 = 719968 liter per annum for land scape

Water demand (lit) = 719968/305 = 2361 lit per day.

Assumption, Mixed Plantings (mixed landscape beds): Perennials have highest PF, so PF = 0.7.

Subtract rainfall days from annual water demand.

Total Water consumption per day = A+ B+C

= 100+37177+2361

= 39638 lit

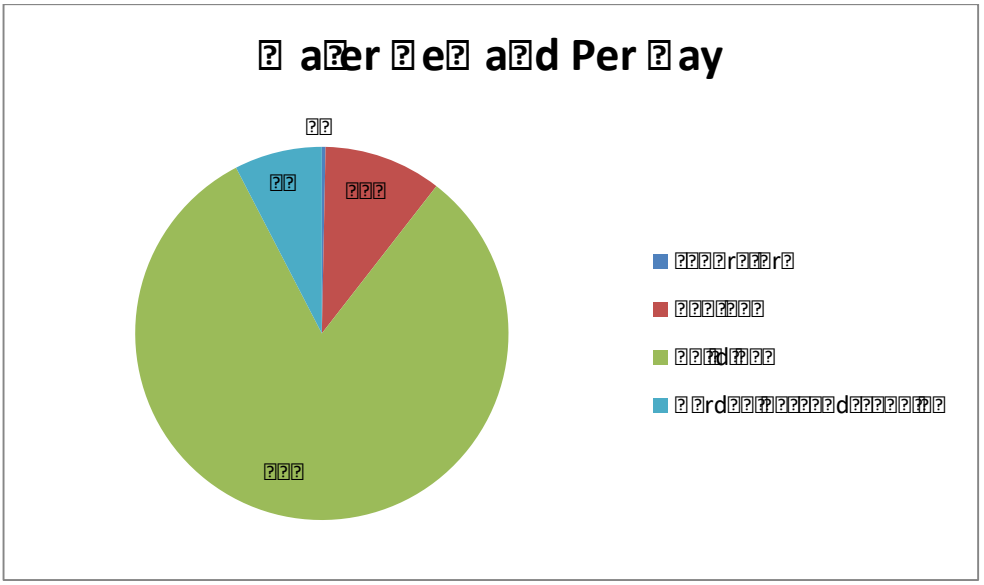


Fig 7.2 Block wise total water consumption (39638 Litre/day) (in percentage)

Percentage of Water Drawn

$$= \frac{\text{Quantity of water drawn from a particular source}}{\text{Total quantity of water used for a specific purpose}} \times 100$$

= (14025 / 39638) X 100

= 35.38%

Conclusion: 35% water drawn from Mula dam through pipeline of MIDC for daily use of Institute.

Percentage of Water Drawn

$$= \frac{\text{Quantity of water drawn from a particular source}}{\text{Total quantity of water used for a specific purpose}} \times 100$$

= (25888 / 39638) X 100

= 65.31%

Conclusion: 65% water drawn from Bore-well for daily use of Institute

Table 7.3: Total Water Supply and Use at College

S. No	Heads	Water use (in litres)
1.	Average daily water supply, to the overhead tanks from the underground tank	39912
2.	Total calculated water consumption from the environmental audit	39638
3.	Difference between water consumption fromoverhead tanks and actual water use for various purposes	274

8. AUDITING FOR WASTE MANAGEMENT

Pollution from waste is aesthetically unpleasing and results in large amounts of litter in our communities which can cause health problems. Plastic bags and discarded ropes and strings can be very dangerous to birds and other animals. This indicator addresses waste production and disposal, plastic waste, paper waste, food waste, andrecycling. Solid waste can be divided into two categories: general waste and hazardous waste. General wastes include what is usually thrown away in homes andschools such as garbage, paper, tins and glass bottles. Hazardous waste is waste thatis likely to be a threat to health or the environment like cleaning chemicals and petrol. Unscientific landfills may contain harmful contaminants that leach into soil and water supplies, and produce greenhouse gases contributing to global climate change.

Furthermore, solid waste covering Bio Degradable, Non Bio Degradable and Hazardous Wastes. There wastes are either in to recycling or reuse or combination ofboth. Thus, the minimization of solid waste is essential to a sustainable University. The auditor diagnoses the prevailing waste disposal policies and suggests the best way to combat the problems. It is therefore essential that any environmentally responsible institution examine its waste processing practices.

College students, staff, and faculty often lead busy lives and value convenience; as they go about their day rushing between activities and classes, the purchase of single-use products is often the most convenient choice. The consequence of this convenience comes in the form of high quantities of waste. In an era where societies around the world are becoming more conscious of the issues surrounding waste, students, faculty, and staff must be properly educated on proper waste management practices. Although the introduction of more recycling bins on campus may help increase recycling rates, a study noted that any recycling or waste management system depends not only on technical factors and availability, but also the motivation of the users to participate in the process. It can be understood that waste management education is essential in reducing waste, increasing diversion rates and encouraging environmentally friendly behavior.

OBJECTIVES:

The main objective of the solid waste management system in the campus is to promote the Environment Management and Conservation in the College Campus. The purpose of the current available system is

1. To identify, quantify, describe and prioritize framework of Environment Sustainability in compliance with the applicable regulations, policies and standards.
2. To introduce and aware students to real concerns of environment and its sustainability
3. To secure the environment and cut down the threats posed to human health by analyzing the

pattern and extent of resource use on the campus.

4. To establish a baseline data to assess future sustainability by avoiding the interruptions in environment that are more difficult to handle and their corrections requires high cost.
5. To bring out a status report on environmental compliance.

Waste Generation

S. No	Description	Apr 23	May 23	Jun 23	Jul 23	Sep 23	Oct 23	Nov 23	Dec 23	Jan 24	Feb 24	Mar 24
1	Bio Degradable-Other than Food (in kgs)	19	16	13	12	16	14	13	15	16	13	14
2	Bio Degradable - Food Waste (in kgs)	14	12	12	14	14	20	19	17	18	13	15
3	Non Bio Degradable (in kgs)	13	14	12	13	12	10	17	18	11	10	11
4	Hazardous Waste (in litres)	35	30	44	25	28	30	30	32	35	35	20

S. No	Description	Apr 22	May 22	Jun 22	Jul 22	Sep 22	Oct 22	Nov 22	Dec 22	Jan 23	Feb 23	Mar 23
5	E-Waste (in Kgs)	-	-	110	-	-	-	-	-	-	-	-

Areas of Improvement:

- Water Meter should be installed and maintain the inventory of ground water extraction resource bore well.
- Internal inspection system should be developed for various aspects of environment available in campus
- Waste Management plan should be prepared for the campus.
- Display of environment awareness posters should be there in the prominent areas of campus.

9. ENVIRONNEMENTAL MONITORING

Environmental Awareness Course (EVS): Environmental Studies Courses (Audit Course-I and Audit Course-II) introduced by Savitribai Phule Pune University, Pune for first year students for all faculties. Under thiscourse students learn to be environmental friendly. They are made aware of

1) Renewable and Non-renewable energy sources
2) Energy conservation.

9.1 **Air Monitoring:**

Air quality in the academic institute is very important for health of the students, faculty and staff of the institute. The air pollution sources in the college campus are wind storm, pollen grains, natural dust, vehicular emissions, generators, fires and laboratory fumes etc.

9.2 **Noise Environment:**

The noise levels measurements were carried out using Noise level meter. The noise levelsurvey was carried out at seven locations, at outside as well inside thestudy area. The Noise levels monitored in the college campus as well as inside the classroom and found the noise level within the permissible limit.

Sr.No	Location	Minimum Reading In dB	Maximum Reading In dB	Limits
1.	Near Main Gate	27.9	27.9	75
2.	Near Back Gate	29.0	28.3	75
3.	Inside Class room	26.8	29.1	75
4.	Outside Classroom	27.6	28.5	75
5.	Inside Library	28.3	28.7	75
6.	Inside lab	28.6	28.9	75
7.	Garden	27.2	27.7	75

9.3 Ventilation Study:

Sr. No	Location	Reading In m/s	Limits
1.	Inside Class room	1.5	>0.5
2.	Inside Library	1.5	>0.5
3.	Inside Engg lab	1.3	>0.5
4.	Inside Workshop	1.5	>0.5

9.4 Illumination Study:

The Illumination measurements were carried out using Luxmeter at five locationsinside the study area and light intensity found adequate in monitored area.

Sr. No	Location	Reading In Lux	Limits
1.	Inside Class room	280	>100
2.	Inside Library	250	>100
3.	Inside Engg lab	210	>100
4.	Workshop Premises	320	>100

10. ENERGY USE AND CONSERVATION

This indicator addresses energy consumption, energy sources, energy monitoring, lighting, appliance, natural gas and vehicles. Energy use is clearly an important aspect of campus sustainability and thus requires no explanation for its inclusion in the assessment.

OBSERVATIONS:

10.1 APPLIANCES/LIGHTING LOAD

Sr No.	Location	Name of Appliance	Power Rating (Watt)	Quantity	Power Consumption (Watt)	Usage per Day Hr	Power Consumption/ day (Watt)
1	Principal Office	Fan	80	2	160	2	320
		CFL	40	2	80	2	160
		LED	9	6	54	2	108
		PC	60	1	60	2	120
		Printer HP1020	150	1	150	0.5	75
		LED TV 43Inch	40	1	40	2	80
		AC 1 Tonn	1750	2	3500	2	7000
		CCTV	5	1	5	24	120
		Modem	5	1	5	4	20
2	Principal Office Entrance	Fan	80	1	80	2	160
		FTL	40	1	40	8	320
		LED	40	3	120	8	960
3	Main Corridor	Electronic Bell	5	1	5	2	10
		Speaker	50	1	50	0.5	25
		Router	100	1	100	3	300
		D-Link	5	1	5	3	15
		CCTV	5	2	10	24	240
		FTL	40	1	40	8	320
4	Conference Room	FTL	40	2	80	2	160
		Fan	80	2	160	2	320
		Projector	180	1	180	0.5	90
		AC 1 Tonn	1750	1	1750	2	3500
5	Administration Office	FTL	40	3	120	8	960
		LED	18	3	54	8	432
		Fan	80	4	320	2	640
		PC	80	7	560	0.5	280

		Printer	150	4	600	0.5	300
		CCTV	5	2	10	24	240
		Thumb Machine	15	1	15	0.5	7.5
6	Ground Floor Corridor	D link	5	4	20	3	60
		Incandescent Bulb	60	4	240	3	720
		LED Bulb	50	5	250	8	2000
		Display	20	1	20	3	60
		CCTV	5	1	5	24	120
		FTL	40	8	320	1	320
		Router	150	2	300	2	600
7	Room No. 038	FTL	40	2	80	1	80
		Fan	80	1	80	2	160
		PC	80	1	80	1	80
		Printer	150	1	150	0.25	37.5
8	Gymnasium	FTL	40	3	120	1	120
		Fan	80	4	320	1	320
9	Sport Section	LED	9	1	9	2	18
		Fan	80	3	240	2	480
		PC	80	2	160	1	160
		Printer	150	2	300	0.5	150
10	IQAC Cell	FTL	40	2	80	2	160
		LED	9	5	45	2	90
		Fan	80	3	240	2	480
		PC	80	5	400	1	400
		Printer	150	2	300	0.5	150
		Scanner	150	1	150	2	300
		Projector	150	1	150	0.5	75
11	Geotechnical Laboratory	Fan	80	4	320	2	640
12	CE HOD Cabin	FTL	40	2	80	2	160
		PC	80	1	80	3	240
		Printer	150	1	150	0.5	75
13	Fluid Mechanics	Incandescent Bulb	60	1	60	0	0
		Fan	80	3	240	1	240
14	Transportation Lab	FTL	40	3	120	1	120
		Fan	80	2	160	1	160
15	Concrete Technology	FTL	40	1	40	1	40

	Laboratory	Incandescent Bulb	60	2	120	1	120
		Fan	80	3	240	1	240
16	Project Lab, Room No. 109	Fan	80	3	240	1	240
		FTL	40	2	80	1	80
17	Strength of Material	LED	18	1	18	2	36
		Fan	80	3	240	1	240
		PC	80	1	80	1	80
18	CAD Laboratory	LED	9	1	9	2	18
		Fan	80	3	240	1	240
		PC LCD	80	16	1280	1	1280
		Printer	150	2	300	0.5	150
		Laptop	80	1	80	3	240
		Projector	150	1	150	0.5	75
19	Environmental Laboratory	FTL	40	3	120	1	120
		Fan	80	1	80	1	80
20	Geology Laboratory	Fan	80	1	80	1	80
		Laptop	80	1	80	1	80
21	Classroom 106 to 113	Fan	80	32	2560	1	2560
		CCTV	5	8	40	24	960
22	MQC Laboratory	Fan	80	2	160	1	160
23	Fluid Mechanics	Fan	80	1	80	1	80
		Advance Hydraulic pump, 1HP/0.75w	0.75	1	0.75	1	0.75
		Fan	80	3	240	1	240
		FTL	40	1	40	1	40
24	IC Engine Laboratory	Fan	80	4	320	1	320
26	Theory of Machine Lab	Fan	80	2	160	2	320
		PC	80	1	80	1	80
27	Girls Common Room	Fan	80	2	160	3	480
		FTL	40	1	40	1	40
28	Applied Thermodynamics	Fan	80	3	240	1	240

30	Basic Electronics Lab	Fan	80	2	160	1	160
31	Digital System Laboratory	Fan	80	1	80	1	80
32	Electronic and Communication Lab 1	Fan	80	1	80	1	80
34	Embedded & VLSL Lab	FTL	40	2	80	1	80
		DLink Switch	5	1	5	1	5
		PC	80	8	640	1	640
		Fan	80	1	80	1	80
35	Computer Lab E&TC	FTL	40	2	80	1	80
		Fan	80	3	240	2	480
		PC	80	8	640	1	640
37	Classroom No.139,143,144,145, 146	Fan	80	20	1600	1	1600
		FTL	40	8	320	1	320
		PC	80	4	320	1	320
		CCTV	5	5	25	24	600
38	Physics	FTL	40	2	80	1	80
		Fan	80	3	240	1	240
39	Electronics and Telecommunication Lab	DTH Set Top	15	1	15	3	45
		Power Supply	15	1	15	3	45
		Fan	80	3	240	1	240
40	Room No. 135, 137	Fan	80	2	160	1	160
		PC	80	1	80	1	80
41	Computer Center	Fan	80	6	480	1	480
		PC	80	40	3200	2	6400
		CCTV	5	4	20	24	480
		D-Link Switch	5	4	20	1	20
42	Room No. 122	Fan	80	1	80	1	80
		PC	80	6	480	1	480
43	Room No. 122	FTL	40	1	40	2	80
		Fan	80	1	80	1	80
		PC	80	4	320	1	320
44	Hardware Lab	Fan	80	1	80	1	80
		FTL	40	1	40	1	40
		PC	80	1	80	1	80

		BSNL Internet Router, Batteries 12v, 42Ah	10	3	30	4	120
		Modem	5	1	5	4	20
45	Network Lab	Fan	80	3	240	1	240
		PC	80	4	320	1	320
46	Programming Lab	Fan	80	3	240	2	480
		PC	80	18	1440	1	1440
		D-Link Switch	5	1	5	2	10
		CCTV	5	1	5	24	120
47	Computer Graphics lab	PC	80	19	1520	5	7600
		Fan	80	4	320	1	320
		FTL	40	2	80	2	160
		D-Link Switch Connector	5	1	5	2	10
		CCTV	5	1	5	24	120
48	Network Lab	FTL	40	3	120	1	120
		PC	80	22	1760	5	8800
		D-Link Switch Connector	5	1	5	2	10
		CCTV	5	1	5	24	120
49	Project Lab 1	FTL	40	2	80	2	160
		Fan	80	3	240	2	480
		CCTV	5	2	10	24	240
		PC	80	20	1600	4	6400
		D-Link Switch Connector	5	1	5	2	10
50	Project Lab 2	FTL	40	1	40	2	80
		Fan	80	4	320	2	640
		CCTV	5	2	10	24	240
		PC	80	27	2160	0.5	1080
		D-Link Switch Connector	5	1	5	2	10

51	Server Room	PC	80	2	160	1	160
		Fan	80	1	80	1	80
		FTL	40	1	40	1	40
		CCTV	5	1	5	24	120
		Power Supply 3.9A, 150-235v,50-60Hz	15	1	15	4	60
52	Yoga Meditation Hall	FTL	40	8	320	1	320
53	First Floor Corridor	CCTV	5	8	40	24	960
		Display Board	80	1	80	1	80
54	Library	Xerox Machine	500	2	1000	1	1000
		Fan	80	10	800	1	800
		FTL	40	2	80	1	80
		PC	80	8	640	1	640
		Printer	150	1	150	0.5	75
		CCTV	5	3	15	24	360
55	Tutorial Room	Router	100	1	100	3	300
		FTL	40	1	40	1	40
56	UPS Room	UPS Inverter 7.5KVA	750	2	1500	3	4500
		Batteries 160 A	150	16	2400	12	28800
		Batteries 150 A	150	16	2400	12	28800
58	Water Cooler/RO/	150 Lit	150	2	300	2	600
59	**Canteen**	Referigerator; 200 liter	430	8	3440	12	41280
		FTL	40	6	240	2	480
		Fan	80	4	320	4	1280
		Cooler Water	800	1	800	2	1600
60	**Porch**	FTL	40	2	80	8	640
		CCTV	5	2	10	24	240

61	**Campus**	Outdoor Flood LED	200	4	800	8	6400
		Pole Light LED	100	15	1500	5	7500
62	**Entry Security Cabin**	FTL	40	2	80	8	640
		Fan	80	2	160	2	320
63	**Main Gate**	CCTV	5	2	10	24	240
		Outdoor Flood LED	150	1	150	10	1500
64	**Second Floor**	FTL	40	15	600	4	2400
		Fan	80	15	1200	6	7200
		LED Bulb	12	3	36	5	180
		Outdoor FTL	40	4	160	5	800
	2nd Floor Toilet	LED Bulb	9	4	36	5	180
	2nd Floor Wash room	LED Bulb	9	4	36	5	180
					Total Load	**Daily (Watt)**	**219917.8**
						Daily Kw	**219.9178**
						Monthly Kw	**5717.862**
						Yearly Kw	**68614.34**

10.2 TOTAL LOAD YEARLY

Sr No.	Location	Name of Appliance	Power Rating (Watt)	Qty	Power Consumption (Watt)	Usage per Year (HR)	Power Consumption/ day (Watt)
1	Concrete Technology Lab	Sieve Shaker;0.5HP/0.37kw	370	1	370	18	6660
		Direct Share Testing M/c; 50Hz	300	1	300	18	5400
		Compression Testing machine	500	1	500	18	9000
		Oven;1.5kw	1500	1	1500	18	27000
		Vane Share Testing Machine	35	1	35	18	630
		Infrared Moisture Balance	300	1	300	18	5400
		Weighnig Machine 1kg	300	1	300	5	1500
2	Hydraulics Lab	Venturi/ Orifice meter Motor;0.25HP	186	2	372	2	744
		Bernollies Theorem Motor;0.25HP	186	1	186	2	372
		Multitube Manometer Speed Controller;3PH, 380v	150	1	150	2	300
		Tilting Fumes;1.5Hp/1.1 Kw	1100	1	1100	2	2200
		Centrifugal Pump; 440v	500	1	500	2	1000
		Energy Regulator;230v	300	1	300	2	600
3	Geo Technical Laboratory	Marshall Stability Test	150	1	150	2	300
		Los Angel Test	0.75	1	0.75	2	1.5
		Ductility Test	500	1	500	2	1000
		Ring and Ball Testing Machine;2HP	1500	1	1500	2	3000
		Stipping Valve	150	1	150	2	300

		Test Apparatus; 230v					
4	Concrete Technology Laboratory	Weighing Machine 100kg	150	1	150	2	300
		Compression Testing machine,220v	600	1	600	2	1200
		Vibrating Machine;0.8HP	597	1	597	2	1194
		Vibrating Machine; 0.75HP	560	1	560	2	1120
5	Strength of Material Laboratory	Tile Abrasion Testing Machine; 0.37kw	370	1	370	2	740
		Torsion Testing, 1Hp	750	1	750	2	1500
		UTM 100 KN	1000	1	1000	2	2000
6	Environmental Laboratory	Flocculator; 0.5HP	375	1	375	2	750
		Conductivity Meter, 230v	300	1	300	2	600
		COD, 1kw	1000	1	1000	2	2000
		Soxhlet Extraction Heater, 220v	300	1	300	2	600
		Flame Photometer, 220v	300	1	300	2	600
		Compressor, 220v	300	1	300	2	600
		Weighing balance, 220v	300	1	300	2	600
		Microbial Colony Counter, 220v	300	1	300	2	600
		Oven Furnace, 2.5Kw	2500	1	2500	2	5000
		BOD Incubator, 0.75kw	750	1	750	2	1500
		High Volume Sampler, 0.75kw	750	1	750	2	1500
7	MQC & I.C Engine Lab	Reciprocating Pump Test, 0.5HP	375	1	375	2	750
8	Fluid Mechanics	Pnumatic Trainer , 1HP	750	1	750	2	1500
		Gear Pump Rig	0.75	1	0.75	2	1.5

		Centrifugal Pump, 1HP/0.75w	0.75	1	0.75	2	1.5
		Impact Jet Apparatus, 0.5HP	375	1	375	2	750
		Turbo Kirloskar Pump, 3.7kw/5HP	3700	1	3700	2	7400
		Turbine Test Rig, 15HP	11190	1	11190	2	22380
9	Heat Transfer Lab	Incandescent Bulb	60	1	60	2	120
		Emissivity Measurement Apparatus	300	1	300	2	600
		Flux Meter	300	1	300	2	600
		Pin Fin Apparatus, 0.5HP	375	1	375	2	750
		Thermal Conductivity Meter	300	1	300	2	600
10	Tom Lab	Cam Analysis	500	1	500	2	1000
		Epicyclic Gear Train, 0.5HP	375	1	375	2	750
11	Girls Common Room	CFL	40	2	80	2	160
		Weighing Machine220gm	300	1	300	2	600
		Weighing Machine120gm	300	1	300	2	600
13	Basic Electronic Lab	Dimmer, 8AMPS	180	1	180	2	360
		Dc Shunt, 50Hz	50	1	50	2	100
		3PH Induction Motor	750	1	750	2	1500
		Slip Rig	300	1	300	2	600
		Squirrel Cage I.M 1 hp	750	1	750	2	1500
		DC Motor, 2HP	1500	1	1500	2	3000
14	Wave Theory and Antenna Lab	RF Motor 10 - 600MHZ	300	1	300	2	600
		Oscillator 50Oh,10-600MHz	300	1	300	2	600

		Communication System Trainer	300	1	300	2	600
15	Basic Electronic Lab	Frequency controller 50Hz	300	1	300	2	600
		Oscilloscope	300	1	300	2	600
16	Classrooms	Internet Connector Switch	50	5	250	2	500
17	Physics	Digital Gauss Meter; 200v	300	1	300	2	600
		Hall Effect Set up;200v	300	1	300	2	600
		Ultrasonic Interferometer, 200v	300	2	600	2	1200
		Regulator Power Supply;	300	1	300	2	600
18	Electronics & Communication Engineering Lab	CRT TV 220v	100	3	300	2	600
		HDTV Trainer	300	1	300	2	600
		Dicots	300	1	300	2	600
		PhotoeTech	300	1	300	2	600
		VSWR Meter	300	1	300	2	600
19	Hardware Lab	Catalyst	300	1	300	2	600
20	Yoga Meditation Hall	Incandescent Bulb	60	3	180	2	360
21	First Floor Corridor	Incandescent Bulb	60	10	600	2	1200
		Incandescent Bulb	60	1	60	2	120
22	Workshop	Lath Machine, 3HP	1500	8	12000	2	24000
		Surface planning M/C Motor, 3HP	1500	1	1500	2	3000
		R. Drilling M/C, 3PH, 0.75kw	750	1	750	2	1500
		R. Drilling M/C, 3PH, 0.37kw	750	1	750	2	1500

		Power Hexa M/C,1HP	750	1	750	2	1500
		Grinding M/C, 1.5HP	750	1	750	2	1500
		Drill M/C, 1.5 HP	750	1	750	2	1500
		welding M/C	300	1	300	2	600
		Cutter Machine	300	1	300	2	600
		Lath Machine, 2HP	750	2	1500	2	3000
					Total	**Yearly**	**183914.5**
						Month ly	**15326.21**
						Daily	**589.47**

10.3 SOLAR POWER GENARTAION

Sr. No.	**Details of Solar Panel installed**				**Capacity Factor**	**Assessed Annual Energy Generation in KWH**	**Avg. Cost of Utility Power Rs./KWH**	**Total Assessed Annual Cost Saving in Rs.**
	Make	**Watt/ Panel**	**No. of Panel**	**Total installed generation capacity in KW**				
1	Vikram Solar	325	63	60	5	42,258	30.11	12,72,388.38

Calculations:

1. **Total Calculated Load = Yearly Daily load + Yearly Equipment's load**
   A = 68,614+184 =68,798 units
2. **Solar Power Generated= B= 56,817 units approx...**
3. **Difference of Load calculated and Solar power generated**
   =C= 68,798- 42,258=26,540 units
4. **Yearly approximate units consumed =Electric Unit Consumed + Solar Energy Generated**
   =8,843 + 42,258 = 51,101 units
5. **Difference of Total Calculated Load and Yearly Load Consumed**
   =D=68,798 – 51,101=17,697 units

General Observations based on Electricity Bill:

1. For College Campus the Contract Demand (CD) is 60 kVA and minimum billing Demand is less than 50% of the Contract Demand, Maximum Demand recorded whichever is higher. Since, the MD recorded is less than 24 kVA.
2. The average electricity cost is Rs.30.11 considering the last twelve months average units and bill.
3. Average monthly Power Factor is maintained near P.F. 0.99.
4. Power factor is affected during June 2023 is 0.96, which need to improve power factor up to 0.9.

11 RECOMMENDATIONS

Management of College may consider on top priority:-

1) To establish and implement the Water Conservation and Management Plan as per Environment Protection Act 1986

2) The water Conservation Awareness Program to be conducted on World Water Day on 22nd March every year.

3) To eliminate the spillage and over usage of water in washbasins, urinals and toiler push tapsare highly recommended.

4) Rain Water Harvesting as per the guidelines of Central Ground Water Board shall be done.

5) Installation of APFC panels for Power Factor improvement and thereby KVAh Consumption reduction.

6) 80 % of total quantum of ground water extracted shall be recharged to ground either by Artificial Recharge Structures within the college premises

7) Special Internal Environmental audit to be conducted quarterly and should be headed by HOD Civil Department

8) Reuse of Sewage Treated water for flushing in toilets is highly recommended.

9) Solar power production in shortfalls can result from plant operation contingencies, such as component failures (serial and otherwise), latent defects, forced outages, module degradation, and resource variability. So, Check the same for reduce overcomes contingencies in production.

SARVASHREE TECHNOGREEN PVT LTD
Environmental and Agricultural
Engineering Consultancy Services

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ISO 9001 | ISO 14001 | ISO 45001 | FSSAI
GSTIN: 27ABECS0697R1ZG

AUDIT CERTIFICATE

This is to certify that **Shri Chhatra□ati Shi□a□i Mahara□ College of Engineering□ Ahmednagar** has successfully undergone an **"Environmental Audit 2023-2024"** to access the eco-friendly initiatives planning and efforts practiced in college campus were found satisfactory.

The efforts ta□en by the management and the faculty towards environment and sustainability are appreciated.

Place: Ahmednagar
Date: 2□th May 2024

Susheel Pote
Director

SARVASHREE TECHNOGREEN PVT. LTD. U74999 PN2020 PTC192445

Anil Dube
Certified Energy Auditor
EA-4973

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Report

On

GREEN AUDIT

For

Ahmednagar Jilha Maratha Vidya Prasarak Samaj's

Shri Chhatrapati Shivaji Maharaj College of Engineering, Nepti, Ahmednagar

Prepared by

SARVASHREE TECHNOGREEN PVT LTD

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2023-2024

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ACKNOWLEDGEMENT

We express our sincere gratitude to the management **Ahmednagar Jilha Maratha Vidya Prasarak Samaj's, Shri Chhatrapati Shivaji Maharaj College of Engineering, Ahmednagar** for giving us an opportunity to carry out the project of Green Audit.

We are extremely thankful to all the staffs for their support in carrying out the studies and for input data, and measurements related to the project of Green audit. We also congratulate our Green audit team members for successfully completing the assignment in time and making their best efforts to add value.

Susheel Pote

Director

Sarvashree Technogreen Private Limited

DISCLAIMER

Green Audit Team has prepared this report for **Ahmednagar Jilha Maratha Vidya Prasarak Samaj's, Shri Chhatrapati Shivaji Maharaj College of Engineering, Ahmednagar** based on input data submitted by the representatives of Campus complemented with the best judgment capacity of the expert team. The audit was conducted on the sample basis by visiting the campus and interacting with the various stakeholders. Audit was conducted by interviewing the concerned persons, observing on-site implementation and verifying the documents and records.

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 recommendations are arrived following best judgments 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.

Prepared by:

Mr.Sujitkumar Pote
Sarvashree Technogreen Private Limited

EXECUTIVE SUMMARY

Ahmednagar Jilha Maratha Vidya Prasarak Samaj's, Shri Chhatrapati Shivaji Maharaj College of Engineering, Ahmednagar is deeply concerned and unconditionally believes that there is an urgent need to address these fundamental problems and reverse the trends. Being a premier institution of higher learning, the campus has initiated 'The Green Campus' program two years back that actively promote the various projects for the environment protection and sustainability.

The purpose of the audit was to ensure that the practices followed in the campus are in accordance with the Green Policy adopted by the institution. The methodology includes: preparation and filling up of questionnaire, physical inspection of the campus, observation and review of the documentation, interviewing key persons, data analysis, measurements and recommendations.It works on the several facets of 'Green Campus' including Water Conservation, Tree Plantation, Waste Management, Paperless Work, Alternative Energy and Mapping of Biodiversity.

With this in mind, the specific objectives of the audit are to evaluate the adequacy of the management control framework of environment sustainability as well as the degree to which the departments are in compliance with the applicable regulations, policies and standards. It can make a tremendous impact on student's health and learning campus operational costsand the environment. The criteria, methods and recommendations used in the audit are based on the identified risks.

INTRODUCTION

Green Audit can be defined as systematic identification, quantification, recording, reporting and analysis of components of environmental diversity. Green accounting can be defined as systematic identification quantification, recording, reporting & analysis of components of ecological diversity & expressing the same in financial or social terms.

The term "Green" means eco-friendly or not damaging the environment. This can acronymically be called as "Global Readiness in Ensuring Ecological Neutrality" (GREEN). "Green Auditing", an umbrella term, is known by another name "Environmental Auditing".

The 'Green Audit' aims to analyse environmental practices within and outside the campus, which will have an impact on the eco-friendly ambience. It was initiated with the motive of inspecting the work conducted within the organizations whose exercises can cause risk to the health of inhabitants and the environment.

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.

On the occasion of World Environment Day – 2023 an initiative was taken by **Ahmednagar Jilha Maratha Vidya Prasarak Samaj's, Shri Chhatrapati Shivaji Maharaj College of Engineering, Ahmednagar** and expressed its commitment to sustainability while forming a committee to conduct audit of campus and its facilities.

Institute has taken a number of positive steps to reduce its environmental impact. But many areas remain in which substantial improvements can be made. This report serves to highlight some accomplishments of and to make recommendations for improving the campus Green and environmental sustainability.

We examine the performance of College's on each of these indicators, and offer recommendations about how the campus can reduce its environmental impact within each indicator.

We have focused on certain indicators, covering an extremely wide range of environmental impacts. For each indicator, we establish a benchmark to evaluate College's overall performance.

We examine the performance of College's on each of these indicators, and offer recommendations about how the campus can reduce its environmental impact within each indicator.

We hope that the time to time Green Audit will provide an accurate snapshot of University's environmental impact at this point in time, and that it will aid the campus in prioritizing positive steps it can take to improve overall sustainability. We intend this document to be revisited annually and updated by the Institute.

The 'Green Audit' aims to analyze environmental practices within and outside the campus, which will have an impact on the eco-friendly ambience. It was initiated with the motive of inspecting the work

conducted within the organizations whose exercises can cause risk to the health of inhabitants and the environment. 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 by carrying out Green Audit.

1. ABOUT

Background

Ahmednagar Jilha Maratha Vidya Prasarak Samaj's, Shri Chhatrapati Shivaji Maharaj College of Engineering, is affiliated by Savitribai Phule Pune University. The journey of Shri Chhatrapati Shivaji Maharaj College of Engineering began on year 2011 with a vision and mission of Shri Chhatrapati Shivaji Maharaj College of Engineering "to impart quality education through effective teaching learning methodologies".

Today, the college has four faculties – Civil Engineering, Mechanical Engineering, Electronic and Telecommunication Engineering and Computer Engineering. This is also certified by ISO 9001:2015. The campus has strength of 1091 students and 50 teaching faculty. The campus includes a Main Block, Canteen, Lecture Rooms, a Central Library, Auditorium, Laboratories and Computer Labs. The major water source is Mula Dam. MIDC supplies water to Institutes. Electricity power needs for the entire campus is met through Off-grid solar power and MSEB.

Table 1.1 Departments

Departments:
Electronics and Tele Communication
Computer
Mechanical
Civil

Table 1.2 Total population

Current Population in Campus:				
Sr. No.	**No of students**	**No of Teachers**	**No of non-teaching staff**	**Total**
1	**1091**	**50**	**29**	**1170**

Table 1.3 Environment Conservation Committee

Sr. No.	**Name of Teacher**	**Designation**	**Post**
1	Dr. Y.R. Kharde	Principal	Chairman
2	Dr. M. K. Bhosale	Assistant Professor	Coordinator
3	Prof. M.G. Kale	Assistant Professor	Member
4	Prof. A.R. Gawali	Assistant Professor	Member
5	Prof. K.S. Bhole	Assistant Professor	Member
6	Prof. S. V. Chitale	Assistant Professor	Member

Table 1.4 Key facts about the site

Name of the Institute	Shri Chhatrapati Shivaji Maharaj College of Engineering
Address	Survey No. 162 and 163, Nagar-Kalyan Road, Nepti, Ahmednagar (MH) - 414005
Campus Area	22 acres
Build up area	6500 sq.mts
Average Annual Rainfall	562.69 mm
Water Source	MIDC Supplies Water
Waste Treatment System	Septic Tanks
Average daily water consumption	~ 39.64KL
Average daily water supply	~ 39.91 Units
Average daily waste water	~ 29.70KL

Table 1.5 Auditors for green audit

Sr.No.	Name of Auditor	Designation
1	Mr. Sujitkumar Pote	Environmental Engineer, Sarvashree Technogreen Private Limited, Ahmednagar
2	Mr. Lokesh Jawale	Civil Engineer, Sarvashree Technogreen Private Limited, Ahmednagar

2. OBJECTIVES OF THE STUDY

The main objective of the green audit is to promote the Environment Management and Conservation in the 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:

1. To understand the awareness of employees and learners towards environmental conservation.
2. To recognize the initiative taken by organization towards environmental conservation.
3. To understand and recognize the effects of an organization on the environment and vice versa.
4. To ensure that the natural resources are utilized properly as per national policy of environment.
5. To study waste minimization and safe disposal of waste particularly hazardous wastes.
6. Initiatives for water and energy conservation
7. To focus on certain indicators, covering an extremely wide range of environmental impacts. For each indicator, we establish a benchmark to evaluate College's overall performance.
8. To take a number of positive steps to reduce its environmental impact.
9. To introduce and make students aware of real concerns of environment and its sustainability.
10. To secure the environment and cut down the threats posed to human health by analyzing the pattern and extent of resource use on the campus.
11. To establish a baseline data to assess future sustainability by avoiding the interruptions in environment that are more difficult to handle and theircorrections require high cost.
12. To bring out a status report on environmental compliance.
13. To identify and analyze significant environmental issues.
14. Setup goal, vision and mission for practices in campus.
15. Continuous assessment for betterment in performance in green practices and its evaluation.

In order to perform Green, Environment and Energy audit, the methodology included different tools such as preparation of questionnaire, physical inspection of the campus, observation and review of the documentation, interviewing 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:

3. METHODOLOGY

Key components of water source and assessment report with water audit conducted at **Shri Chhatrapati Shivaji Maharaj College of Engineering, Ahmednagar** included:

i. Pre-audit planning

a) Preliminary literature review of concepts and methodologies related to environmental audit.

b) Discussion with the management staff on various systems installed in the campus.

c) Awareness creation and interaction with the staff and student on the concept of water audit.

d) Walk through the entire campus to understand the nature of water source, water use and waste management systems in the campus.

ii. Data collection

a) Development of questionnaire format to identify all water using fixtures/ equipment and examine water use patterns for individual buildings in the campus.

b) Collection of secondary data from compilation of water bills, collecting records of pumps, water quality analysis reports etc.

c) Semi-structured interview with maintenance manager, technicians, plumber and housekeeping staff on current situation and the past trends in water consumption, waste management, waste generation etc.

d) Detailed analysis of data collected include: calculation of energy consumption, analysis of latest electricity bill of the campus, Water consumption, Waste Generation and Greenery Management.

iii. Data Processing and analysis

The existing trends and patterns in water usage and waste generation and management is analyzed in this step from the data collected from the previous step.

iv. Audit Recommendations and reporting:

Based on the understanding from the water audit, recommendations are given to improve the existing environmental performance of the campus and are documented in a report format

In order to perform water audit, the methodology included different tools such as preparation of questionnaire, physical inspection of the campus, observation and review of the documentation, interviewing key persons and data analysis, measurements and recommendations. The studycovered the

following areas to summarize the present status of environment management in the campus.

1. Water management

i) Raw Water

ii) Drinking Water

iii) Laboratory Waste Water

iv) Sewage Water

v) Rain Strom Drain Water

vi) STP/ETP

2. Environment & Waste Management

3. Energy Management

4. Waste Management

i) Hazardous Waste

ii) Non- Biodegradable Solid Waste

iii) Biodegradable Municipal Solid waste Bio- Medical Waste

iv) Kitchen Waste

v) E-waste management

4. WATER MANAGEMENT

In our planet 70% area is covered by water but only 3% of it is fresh water. Around 1.1 billion people of the word face water crisis. Water is a valuable natural resource for all living organisms. It is freely available depending on the climate and topographic features of a region. Although water is natural freely available but portable (drinkable) water is not available freely for human consumption. Water pollution and wastage plays a vital role in water crisis. Water contaminations are taking place at an alarming rate. Drinking or using contaminated water leads to many diseases or death. That is why it is important to ensure that drinking water is safe, clean and free from bacteria and disease. It is also important to conserve protect and manage the water resources availability and usage so that it is sustainably used. Our team examines the quality and usage of water in the campus. Water auditing is conducted for the evaluation of facilities of raw water intake and determining the facilities for water treatment and reuse. The concerned auditor investigates the relevant method that can be adopted and implemented to balance the demand and supply of water.

Sources of Water:

- Bore Wells
- MJP

Table 4.1 Water consumption in different activity in campus

Activity	Water used per activity (in Lit)	Average water used Person/Day	No. of people usingwater	Total water consumption per Day
Hand and face wash	4-6 L	16-24L	950	19000
Drinking Water	0.2-0.4L	1.2-2.4L	912	1459
Toilet Flush	8-10L	32-40L	890	17800

Table 4.2 Drinking water analysis report:

Sr. No.	**Parameter**	**Result**	**Acceptable Limit as perIS 10500: 2012**
Organoleptic & Physical Parameters			
1.	Colour	**1**	*Max.* 5
2.	Odour	**Agreeable**	Agreeable
3.	pH Value	**8.2**	6.5 to 8.5
4.	Turbidity	**0.8**	*Max.* 1
5.	Total Dissolved Solids	**102**	*Max.* 500
6.	Calcium (as Ca)	**2.4**	*Max.* 75
7.	Chloride (as Cl)	**9.2**	*Max.*250
8.	Fluoride (as F)	**0.8**	*Max.* 1
9.	Iron (as Fe)	**BDL(DL:0.06)**	*Max.*0.3
10.	Magnesium (as Mg)	**0.94**	*Max.* 30
11.	Nitrate (as NO3)	**2.5**	*Max.*45
12.	Sulphate (as SO4)	**5.3**	*Max.* 200
13.	Total Alkalinity (as CaCO3)	**45**	*Max.*200
14.	Total Hardness (as CaCO3)	**24**	*Max.* 200
Bacteriological Analysis			
15.	*E.coli*	**Absent**	Not Detectable
16.	Total Coliforms	**Absent**	Not Detectable

5. ENVIRONMENTAL MONITORING

Environmental Awareness Course (EVS): Environmental Studies Courses (Audit Course-I and Audit Course-II) introduced by Savitribai Phule Pune University, Pune for first year students for all faculties. Under this course students learn to be environmental friendly. They are made aware of

1) Renewable and Non-renewable energy sources
2) Energy conservation.

5.1 Air Monitoring:

Air quality in the academic institute is very important for health of the students, faculty and staff of the institute. The air pollution sourcesin the campus are wind storm, pollen grains, natural dust, vehicular emissions, generators, fires and laboratory fumes etc.

5.2 Noise Environment:

The noise levels measurements were carried out using Noise level meter. The noise level survey was carried out at seven locations, at outside as well inside thestudy area. The Noise levels monitored in the campus as well as inside the classroom and found the noise level within the permissible limit.

Sr. No	Location	Minimum Reading In dB	Maximum Reading In dB	Limits
1.	Near Main Gate	27.9	27.9	75
2.	Near Back Gate	29.0	28.3	75
3.	Inside Class room	26.8	29.1	75
4.	Outside Classroom	27.6	28.5	75
5.	Inside Library	28.3	28.7	75
6.	Inside lab	28.6	28.9	75
7.	Garden	27.2	27.7	75

5.3 Ventilation Study:

Sr. No	Location	Reading In m/s	Limits
1.	Inside Class room	1.5	>0.5
2.	Inside Library	1.5	>0.5
3.	Inside Engg lab	1.3	>0.5
4.	Inside Workshop	1.5	>0.5

5.4 Illumination Study:

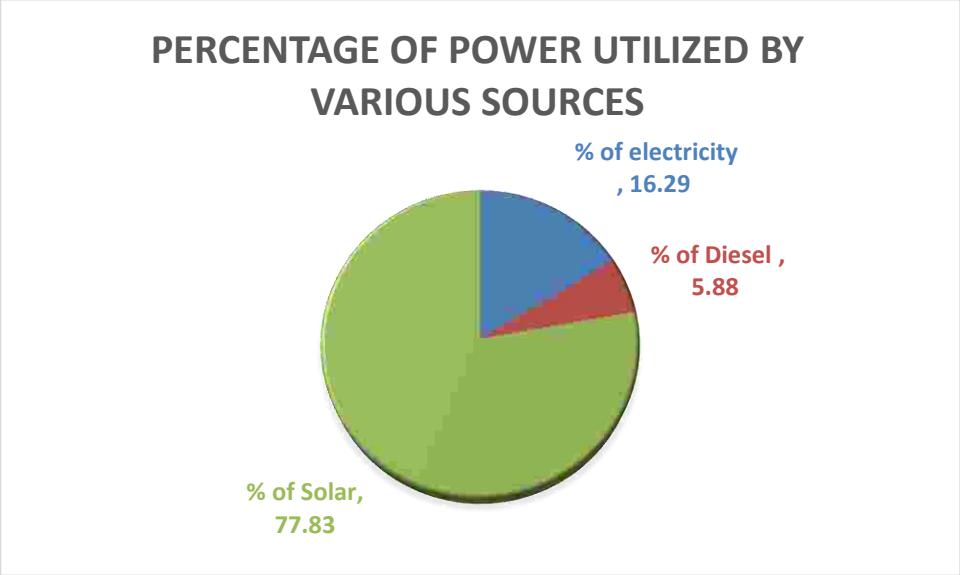
The Illumination measurements were carried out using Luxmeter at five locations inside the study area and light intensity found adequate in monitored area.

Sr. No	Location	Reading In Lux	Limits
1.	Inside Class room	280	>100
2.	Inside Library	250	>100
3.	Inside Engg lab	210	>100
4.	Workshop Premises	320	>100

6. ENERGY USE AND CONSERVATION

6.1 Electricity supply and consumption

Electricity (INR)	Diesel (INR)	Solar Energy	Total Cost of Energy	% of electricity	% of Diesel	% of Solar
2,66,225.00	96,155.40	12,72,388.38	20,73,140.27	16.29	5.88	77.83



1. **Production shortfalls can result from plant operation contingencies, such as component failures (serial and otherwise), latent defects, forced outages, module degradation, and resource variability. So, Check the same for reduce overcomes contingencies in production.**

2. **Institute level student community that keeps track of the energy consumption. Parameters of the various departments, class rooms, halls, areas, meters, etc**

3. **Energy auditing inside the campus has to be done on a regular basis and report should be made public to generate awareness.**

4. **College should take initiative to arrange seminars, lectures, paper presentation competition among students and staff for general awareness.**

This indicator addresses energy consumption, energy sources, energy monitoring, lighting, appliance, natural gas and vehicles. Energy use is clearly animportant aspect of campus sustainability and thus requires no explanation for its inclusion in the assessment.

a) Observations

Energy source utilized by all the departments and common facility center is electricity only. Campus has provided class rooms and laboratories with proper light and ventilation provision for energy conservation. Earth Leakage Circuit Breaker has been installed at various locations on the campus to prevent current leakage and protect other electrical installations. Campus has placed notice boards for employees and students to off the lights and fans whenever not needed also Conducted internal Energy Audit Regular maintenance of electrical appliances to save the energy consumption

Campus has used of Light Emitting Diode (LED) and Compact Fluorescent Lights (CFL) bulbs which have revolutionized energy-efficient lighting. Approximately 500 LED was counted during survey.

Equipment like Computers is used with power saving mode. The electricity was shut down after occupancy time as one of the practices for energy conservation. Non-conventional energy sources like Solar and wind energy was adopted for reducing dependency on conversional sources.

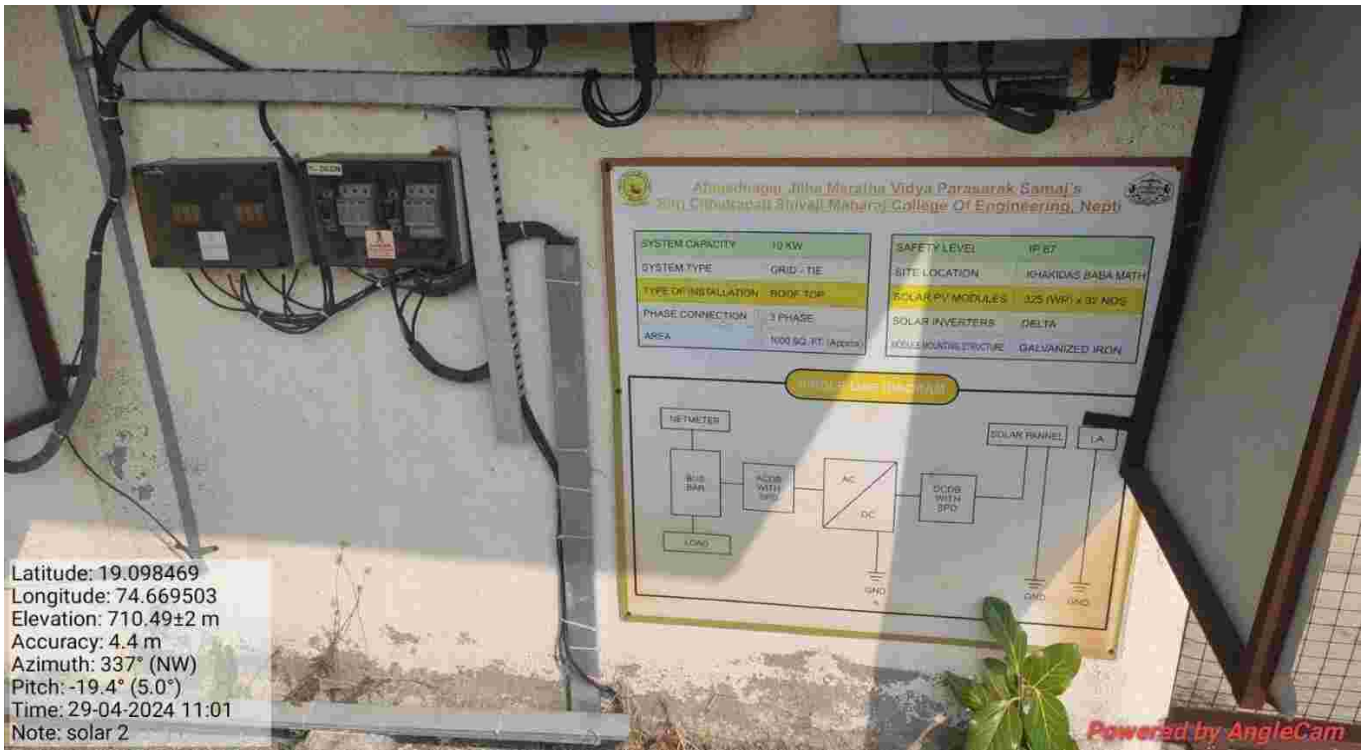
b) Recommendations

i) Support renewable and carbon-neutral electricity options on any energy- purchasing consortium, with the aim of supplying all campus properties with electricity that can be attributed to renewable and carbon-neutral sources.

ii) Appreciate that it is preferable to purchase electricity from a company that invests in new sources of renewable and carbon-neutral electricity.

iii) More improvement is required to improve their campus lighting; if possible they can convert to solar lights.


Latitude: 19.098162
Longitude: 74.669576
Elevation: 711.89±14 m
Accuracy: 4.0 m
Azimuth: 356° (N)
Pitch: -12.4° (6.6°)
Time: 29-03-2024 10:57
Note: solar 3
Powered by AngleCam


Ahmednagar Jilha Maratha Vidya Parasarak Samaj's
SYSTEM CAPACITY 10 KW
SYSTEM TYPE GRID - TIE
TYPE OF INSTALLATION ROOF TOP
PHASE CONNECTION 3 PHASE
AREA 1000 SQ. FT. (Approx)
SAFETY LEVEL IP 67
SITE LOCATION KHAKIDAS BABA MATH
SOLAR PV MODULES 325 (WP) x 02 NOS
SOLAR INVERTERS DELTA
MODULE MOUNTING STRUCTURE GALVANIZED IRON
NETMETER
BUS BAR
ACDB WITH SPD
AC
DC
DCDB WITH SPD
SOLAR PANNEL
LA
LOAD
GND
Latitude: 19.098469
Longitude: 74.669503
Elevation: 710.49±2 m
Accuracy: 4.4 m
Azimuth: 337° (NW)
Pitch: -19.4° (5.0°)
Time: 29-04-2024 11:01
Note: solar 2
Powered by AngleCam

7. WASTE GENERATION

This indicator addresses waste production and disposal of different wastes like paper, food, plastic, biodegradable waste, glass, dust etc. and recycling. Furthermore, solid waste often includes wasted material resources that could otherwise be channeled into better service through recycling, repair and reuse. Solid waste generation and management is a burning issue. Unscientific handlingof solid waste can create threats to everyone. The survey focused on volume, type and current management practice of solid waste generated in the campus.

a) Observations

The total solid was be collected in the campus is 10.5 kg/day. Waste generated from dead organic matter is a major solid waste in the campus. The waste is segregated at source by providing separate dustbins for Bio-degradable and Non Bio-degradable waste. Segregation of chemical waste generated in laboratoriesis also practiced.

Single sided used papers are reused for writing and printing in all departments. Important and confidential reports/ papers are sent for recycling after completion of their preservation period. Very less plastic waste (3 kg/day) is generated by some departments, office, garden etc. but it is neither categorized at point source nor sent for recycling. Metal waste and wooden waste is stored and given to authorized scrap agents for further processing. The tree droppings are sent for composting plant.

Table No.7.1 Category wise solid waste generated (kg/year)

Sr.No	Section	Category of waste(kg)		Total Solid Waste(kg)	Description(Level0f waste high/medium/low)
		Dry waste	Wet Waste		
1	Main Building	3100	0	3100	low
2	Canteen	500	200	700	low
				3800 kg/year	

Vermicomposting Project

Vermicompost is produced from the garden waste and plant matter which are scattered in the campus. This compost is used as manure for plants. The Vermicompost is able to fulfil the need of fertilizers. This Vermi compost project is very useful for the college garden.

Vermicomposting Plant

b) Recommendations

i) Make full use of all recycling facilities provided by private suppliers including glass, cans, white coloured and brown paper, plastic bottles, batteries, print cartridges, cardboard and furniture.

j) Provide sufficient, accessible and well-publicized collection points for recyclable waste, with responsibility for recycling clearly allocated.

k) Develop biogas plant to recycle biodegradable waste.

8. GREEN BELT AREA & BIO-DIVERSITY

The Green Belt Area is meant for conservation of nature and aesthetic value of the campus. The Green Area in the college includes the plants, greenery and sustainability of the campus to ensure that the buildings conform to green standards This also helps in ensuring that the Environmental Policy is enacted, enforced and reviewed using various environmental awareness programs.

Cultivated Organic Vegetables and Grain in Garden

List the species planted by the students			
Sr. No	**Common Name**	**Botanical Name**	**No of Plants**
1	Mango	*Mangifera indica* L.	45
2	Nandurk	*Toona ciliata*	26
3	Neem	*Azadirachta indica* A.Jass.	95
4	Pomegranate	*Punica granatum*	10
5	Palm tree	*Cocus nucifera*	25
6	Pimpal	*Ficus religiosa*	15
7	Saptaparni	*Alstonia scholaris*	15
8	Ashoka	*Polyalthia longifolia* Sonn.	10
9	Bamboo	*Bambusoideae*	45
10	Badam	*Prunus dulsis*	35
11	Cherry	*Prunus avium*	12
12	Gulab	*Rosa hybrid* L.	30
13	Gulmohar	*Royal Poinciana*	55
14	Kashid	*Peltophorum pterocprum*	40
15	Bottle plam	Hyophorbe lagenicaulis	40
16	Chapha (Red)	Plumeria(Red)	25
17	Nilmohar	Peltophorum pterocarpum	15
18	Coconut	Cocos Nucifera	15
19	Jambhul	Syzygium cumini	65

20	Faycus	*Ficus benjamina*	45
21	Chapha (White)	Plumeria	15
22	Kaner	*Yellow oleander*	94
23	Jaswand	Hibiscus	20
24	Mogara	Jasminum sambac	20
25	Sadafuli	Catharanthus roseus	40
26	Pear tree	Pyrus	30
27	Lemon	Citrus limon	10
28	Plane tree	Platanus	25
29	Foxtail plam	*Foxtail plam*	18
30	Laxmitaru	Simarouba glauca	25
31	Karanj	Millettia pinnata	60
32	Bakul	Mimusops elengi	12
33	Areka plam	Areka plam	12
34	Cycas	Cycas	10
35	Banyan Tree	Ficus benghalensis	25
36	Chinch	Tamarindus indica	44
37	Aamlpat	Cassia fistula	15
38	Shisav	Dalbergia sissoo	30
39	Chikoo	Manilkara Zapota	65
40	Custard Apple	Annona squamosa	32
41	River Tamarind	Leucaena leucocephala	15
Total			**1280**

Green Practices in the Campus:

Hon. R. H. Dare, Vice President & Hon. Shri G. D. Khandeshe, Secretary, AJMVPS Ahmednagar Openeing the Tree Plantation Drive

Hon. R. H. Dare, Vice President & Hon. Shri G. D. Khandeshe, Secretary, AJMVPS Ahmednagar Openeing the Tree Plantation Drive.planting the tree

Hon. Mrs. Vishwasrao Athare Patil Planting the tree

Faculty members planting the Trees

जनता आवाज

आवाज जागरूक जनतेचा

छत्रपती अभियांत्रिकीमध्ये राष्ट्रीय सेवा योजना अंतर्गत पालक व विद्यार्थ्यांकडून वृक्षारोपण

Ground Water Recharge Pit


Latitude: 19.097902
Longitude: 74.669688
Elevation: 711.99±2 m
Accuracy: 3.0 m
Azimuth: 285° (W)
Pitch: -17.7° (10.8°)
Time: 06-01-2023 16:12
Note: vermi compost 1
Powered by AngleCam


Latitude: 19.09789
Longitude: 74.669615
Elevation: 711.99±13 m
Accuracy: 9.9 m
Azimuth: 181° (S)
Pitch: -34.7° (2.5°)
Time: 06-01-2023 16:13
Note: vermi compost 3
Powered by AngleCam

9. RECOMMENDATIONS

The Management of Campus may consider on top priority that:-

- Arrange training programmes on environmental management system and nature conservation for schools and local people
- Establish an E-waste collection center in campus.
- Flow rate of taps should be checked, it should not be more than 2.5 litres/minute.
- Declare the campus plastic free and implement it thoroughly.
- The selection of trees species to be based on environmental conservation andcarbon sequestration value.
- Composting of bio degradable waste to be scientifically done
- Artificial nests and water ponds are recommended to attract different birds intheir migrating and breeding season.
- Watering schedule to be planned according the season.
- Reuse of the water shall be done instead of use of fresh water.
- Waste water management still needs to be practiced and designed in the campus
- Rain Water Harvesting as per the guidelines of Central Ground Water Board shall be done
- Lab waste water quantity is not measured.

SARVASHREE TECHNOGREEN PVT LTD
Environmental and Agricultural Engineering Consultancy Services

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Branch 2: Flat No. 203, B3, Vansaaz Apartment, Be.Singapore Garden Bungalows, Tapovan Road, Nashik - 422001. **M:** +91 9420643007
E: director@sstechnogreen.in, **W:** www.sstechnogreen.in
ISO 9001 | ISO 14001 | ISO 45001 | FSSAI
GSTIN: 27ABECS0697R1ZG

AUDIT CERTIFICATE

This is to certify that a **"Green Audit"** for **Shri Chhatrapati Shivaji Maharaj College of Engineering, Ahmednagar** has been conducted for **2023-2024** to access the green initiatives planning and efforts practiced in college campus like Green Campus Management, Plantations, Waste Management, Rain Water Harvesting, Conservation of Energy for maintenance of eco-friendly campus.

Place: Ahmednagar

Date: 30th May 2024

SARVASHREE TECHNOGREEN PVT. LTD. U74999 PN2020 PTC192445

Susheel Pote
Director

Anil Dube
Certified Energy Auditor
EA-4973

A

Report

On

Energy Audit

For

Ahmednagar Jilha Maratha Vidya Prasharak Samaj's

Shri Chhatrapati Shivaji Maharaj College of Engineering, Ahmednagar

Prepared by

SARVASHREE TECHNOGREEN PVT LTD

Sarvashree Technogreen Private Limited,

Plot No. 16, Link Road, Near Sawali, Bhushannagar, Kedgaon,
Ahmednagar - 414001
Contact No. 7020756278

May - 2024

ACKNOWLEDGEMENT

We express our sincere gratitude to the management of for Ahmednagar Jilha Maratha Vidya Prasarak Samaj's, Shri Chhatrapati Shivaji Maharaj College of Engineering for giving us an opportunity to carry out the project of Energy Audit.

We are extremely thankful to all the staffs for their support in carrying out the studies and for input data, and measurements related to the project of Energy audit. We also congratulate our Energy audit team members for successfully completing the assignment in time and making their best efforts to add value.

We do hope that you will find the recommendations given in this report will be useful to save energy. We welcome any suggestions from your side as to serve you better.

Mr.Sujitkumar Pote

Sarvashree Technogreen Private Limited

DISCLAIMER

Energy Audit Team has prepared this report for **Ahmednagar Jilha Maratha Vidya Prasarak Samaj's, Shri Chhatrapati Shivaji Maharaj College of Engineering** based on input data submitted by the representatives of Campus complemented with the best judgment capacity of the expert team. The audit was conducted on the sample basis by visiting the campus and interacting with the various stakeholders. Audit was conducted by interviewing the concerned persons, observing on-site implementation and verifying the documents and records.

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 recommendations are arrived following best judgments 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.

Mr. Sujitkumar Pote

Sarvashree Technogreen Private Limited

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SEC	-	Specific Energy Consumption

List of Units

^{o}C	-	Degree Celsius
CFM	-	Cubic Feet per Minute
CMH	-	Cubic Meter per Hour
LPM	-	Litres Per Minute
Kg/cm^{2}	-	Kilogram per centimetre square
kW	-	Kilo Watt
kWh	-	Kilowatt hour
KOE	-	Kg of Oil equivalent
m^{3} /hr.	-	Meter cube per hour
Nm^{3} /hr.	-	Normal Meter cube per hour
MW	-	Mega Watt
MWh	-	Megawatt hour

1. ENERGY CONSUMPTION PROFILE

The working details of assignment are as follows:

Project	Energy Audit
Client	Ahmednagar Jilha Maratha Vidya Prasarak Samaj's, Shri Chhatrapati Shivaji Maharaj College of Engineering.
Industry	Private Educational Engineering Institute
Contact	Mr. Gawali Sir
Site	Shri Chhatrapati Shivaji Maharaj College of Engineering, Ahmednagar-Kalyan Road, Nepti, Tal and Dist Ahmednagar
Consultant	Sarvashree Technogreen Private Limited
Duration	15-05-2024 to 25-05-2024
Project Work Scope	Detailed Energy Audit in the institute to study energy consumption and assess the loss in the system.
Report	This report gives Detail Energy consumption, suggestions to minimize energy losses

Table.1.Assignment

1.1 About Shri Chhatrapati Shivaji Maharaj College of Engineering

Ahmednagar Jilha Maratha Vidya Prasarak Samaj's, Shri Chhatrapati Shivaji Maharaj College of Engineering, is affiliated by Savitribai Phule Pune University. The journey of Shri Chhatrapati Shivaji Maharaj College of Engineering began on year 2011 with a vision and mission of Shri Chhatrapati Shivaji Maharaj College of Engineering "to impart quality education through effective teaching learning methodologies".

Today, the college has four faculties – Civil Engineering, Mechanical Engineering, Electronic and Telecommunication Engineering and Computer Engineering. This is also certified by ISO 9001:2015.

Source of Energy:

Shri Chhatrapati Shivaji Maharaj College of Engineering, Nepti, Ahmednagar, uses Energy in following forms:

a. Electricity from MSEDCL :

Shri Chhatrapati Shivaji Maharaj College of Engineering receives Electricity from Ahmednagar, Nepti Circle.

b. High Speed Diesel Generator (HSDG):

HSD is used as a fuel for Diesel Generator which is run whenever power supply from MSEDCL is not available. Kirloskar 15KW and GPWLL 62.5KVA.

c. Roof Top PV Solar System (60 KW) installed on terrace of Annex Building.

Following are the major consumers of electricity in the facility:

Computers	Xerox machines
Lighting	CCTV
Air-Conditioning	UPS
Fans	LCD Projector
Other Lab Equipment	Router system
Printers	Flood light
	Pumping motor

2. APPROACH AND METHODOLOGY

2.1 Approach

A team of 4 engineers were involved in carrying out the study; the scope of study was as follows:

- Identify areas of opportunity for energy saving and recommend an action plan to bring down total energy cost
- Conduct energy performance evaluate on and process optimization on study
- Conduct efficiency test of equipment and make recommendations for replacement (if required) by more efficient equipment with projected benefits
- Suggest improved opera on & maintenance practices
- Provide details of investment for all the proposals for improvement
- Evaluate benefits that accrue through investment and payback period
- Analyze various energy conservation on measures and to prioritize based on the maximum energy saving & investment i.e. short, medium and long term.

Prioritization	Payback Period
Short Term Project	Less than 6 months
Medium Term Project	Between 6 to 12 months
Long Term Project	More than 12 months

Table 2.Scope of Study

- Discuss with the plant personnel, the individual Energy Saving Projects (ESPs) for agreement for implementation.

2.2 Methodology

- The general methodology followed is captured in the following figure –

Figure 1. Methodology flow

The study was conducted in 3 stages:

- Stage 1: Walk through audit to understand process energy drivers, measurability and formula one of audit plan

- Stage 2: Detailed Energy audit
- Stage 3: Off-site work for data analysis and report preparation

2.3. List of Equipment & Instruments Used for Energy Audit:

The following portable instruments were used for data measurement:

- 3 – phase Power Analyzer
- Single phase Power Analyzer
- Ultrasonic Water Flow Meter
- Anemometer
- Hygrometer
- Sling Hygrometer
- Digital Thermometer
- Infrared Thermometer
- Pressure gauge
- Thermal Imager
- Flue Gas Analyzer
- Lux Meter

3. HISTORICAL DATA ANALYSIS

3.1 Electricity supply and consumption

The electricity consumed through MSEDC is Charges: Rs. 2, 66,225.00/-

The Diesel as a thermal energy source is used mainly in DG Sets of

Total Consumption on of Diesel in the Apr-2023 to March-2024 was:

Total Diesel in Ltr.1, 020

Cost of Diesel: Rs. 96,155.40/-

The Institute has a solar power generating system of .

Total Solar Generated Electricity by unit is 56817 KWH of cost approx.12,72,388.38/-

Electricity (INR)	Diesel (INR)	Solar Energy	Total Cost of Energy	% of electricity	% of Diesel	% of Solar
2,66,225.00	96,155.40	12,72,388.38	20,73,140.27	16.29	5.88	77.83

Table 3. **Total Cost of Energy Consumed by Institute in the Last 12 Months**

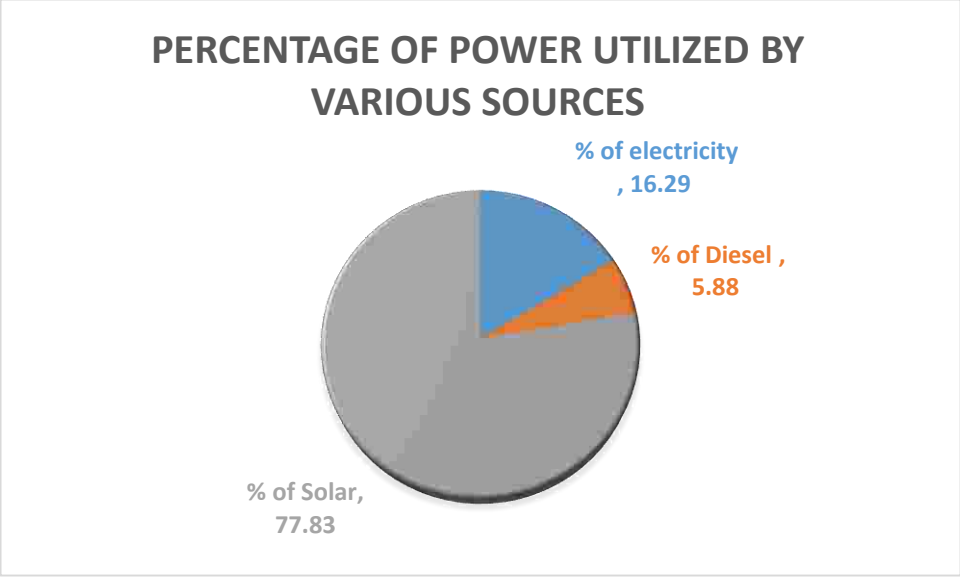

Fig.2 Percentage of Power utilized

3.2 Study of Variation of Monthly Units consumption, Electricity bill & Power Factor

In this Chapter, we study the details of the 12 month Electricity Bills.

Sr. No.	Month	Power Factor	Unit Consumption (KWH)	Bill Amount (RS)	Demand KVA
1.	Apr-23	0.99	1484	30548.06	24
2.	May-23	0.98	964	24532.9	24
3.	Jun-23	0.96	1153	26804.58	24
4.	Jul-23	0.99	1130	26383.34	24
5.	Aug-23	0.99	414	18119.19	24
6.	Sep-23	0.99	429	18542.26	24
7.	Oct-23	0.99	573	20429.43	24
8.	Nov-23	0.98	523	19848.95	24
9.	Dec-23	0.99	571	20741.87	24
10.	Jan-24	0.98	521	19839.69	24
11.	Feb-24	0.99	514	19733.74	24
12.	Mar-24	0.99	567	20701.07	24
	Average	**0.99**	**736.92**	**22185.42**	**24**
	Yearly Total		**8843**	**266225.08**	

Table No 4 V a r i a t i o n in Units Consumption & Power Factor (PF)

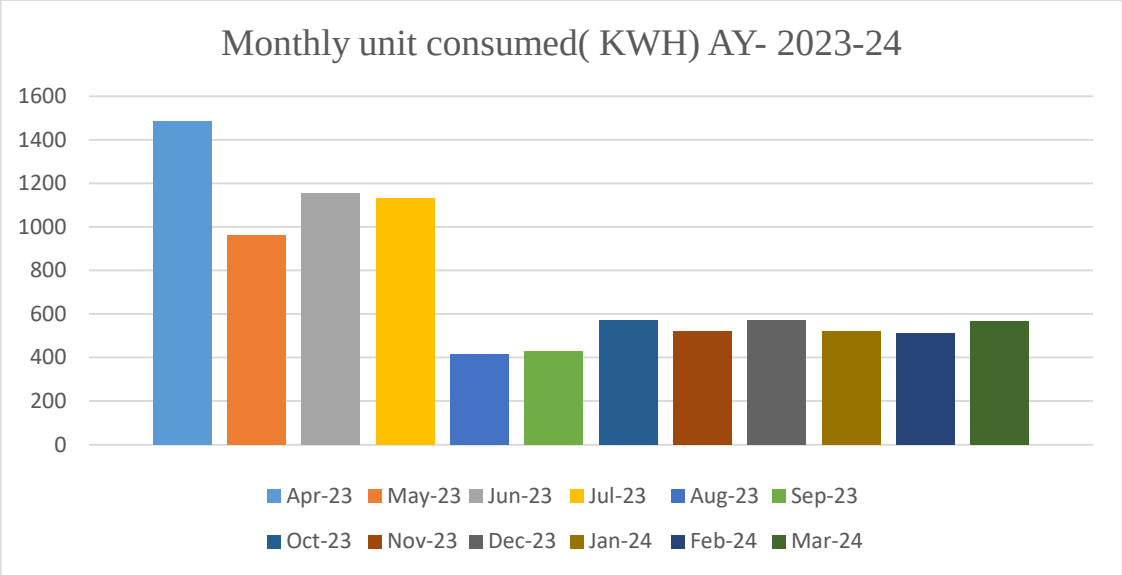

Figure 3. Electrical Energy Consumption month wise

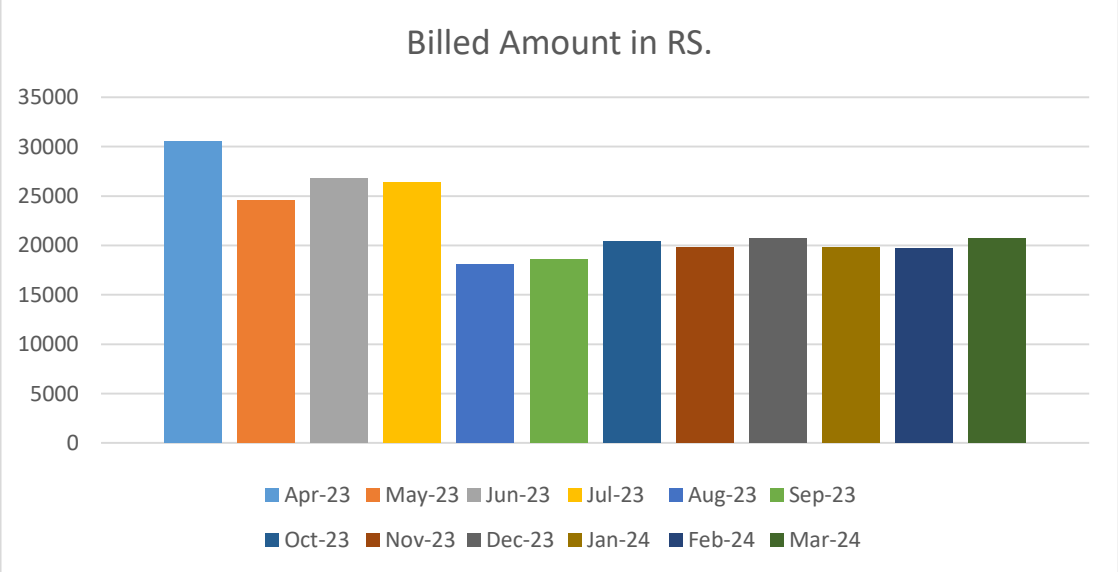

Figure 4. Billed Amount in last 12 months

- It can be seen from figure 1, that electricity consumption on in the month of April and June 23' is the highest. Average Power Factor in the period of Apr-23 to Mar-24 is 0.99. It is recommended to install Automatic Power Factor Control Panel to achieve Power Factor near to 1.00 .

- It is recommended to have a regular check on the Power Factor to maintain it. Capacitors shall be tested every quarter and replaced if not working properly. **Conclusion:** Variation of PF, The Power Factor to reduce the utility power bill. Most utility bills are influenced by KVAR usage. A good Power Factor provides a better voltage. Reducing the pressure on electrical distribution network. Reducing cable heating, cable over loading and cable losses. Reducing over loadings of control gears and switch-gears etc.

Whenever the average power factor over a billing cycle or a month, whichever is lower, of a High Tension consumer is below 90%, Penal charges shall be levied to the consumer at the rate of 2 % (two %) of the amount of monthly energy bill (excluding of Demand Charges, FOCA, Electricity Duty and Regulatory Liability Charge etc.)

For power factor of 0.99, the effective incentive will amount to 5% (five percent) reduction in the energy bill and for unity power factor; the effective incentive will amount to 7% (seven percent) reduction in the energy bill.

3.3 General Observations based on Electricity Bill

1. For College Campus the Contract Demand (CD) is 60 kVA and minimum billing Demand is less than 50% of the Contract Demand, Maximum Demand recorded whichever is higher. Since, the MD recorded is less than 24 kVA.
2. The average electricity cost is Rs.30.11 considering the last twelve months average units and bill.
3. Average monthly Power Factor is maintained near P.F. 0.99.
4. Power factor is affected during June 2023 is 0.96, which need to improve power factor up to 0.9.

4. ACTUAL LOAD MEASUREMENT

4.1 APPLIANCES/LIGHTING LOAD

Sr No.	Location	Name of Appliance	Power Rating (Watt)	Quantity	Power Consumption (Watt)	Usage per Day Hr	Power Consumption/ day (Watt)
1	Principal Office	Fan	80	2	160	2	320
		CFL	40	2	80	2	160
		LED	9	6	54	2	108
		PC	60	1	60	2	120
		Printer HP1020	150	1	150	0.5	75
		LED TV 43Inch	40	1	40	2	80
		AC 1 Tonn	1750	2	3500	2	7000
		CCTV	5	1	5	24	120
		Modem	5	1	5	4	20
2	Principal Office Entrance	Fan	80	1	80	2	160
		FTL	40	1	40	8	320
		LED	40	3	120	8	960
3	Main Corridor	Electronic Bell	5	1	5	2	10
		Speaker	50	1	50	0.5	25
		Router	100	1	100	3	300
		D-Link	5	1	5	3	15
		CCTV	5	2	10	24	240
		FTL	40	1	40	8	320
4	Conference Room	FTL	40	2	80	2	160
		Fan	80	2	160	2	320
		Projector	180	1	180	0.5	90
		AC 1 Tonn	1750	1	1750	2	3500
5	Administration Office	FTL	40	3	120	8	960
		LED	18	3	54	8	432
		Fan	80	4	320	2	640
		PC	80	7	560	0.5	280

		Printer	150	4	600	0.5	300
		CCTV	5	2	10	24	240
		Thumb Machine	15	1	15	0.5	7.5
6	Ground Floor Corridor	D link	5	4	20	3	60
		Incandescent Bulb	60	4	240	3	720
		LED Bulb	50	5	250	8	2000
		Display	20	1	20	3	60
		CCTV	5	1	5	24	120
		FTL	40	8	320	1	320
		Router	150	2	300	2	600
7	Room No. 038	FTL	40	2	80	1	80
		Fan	80	1	80	2	160
		PC	80	1	80	1	80
		Printer	150	1	150	0.25	37.5
8	Gymnasium	FTL	40	3	120	1	120
		Fan	80	4	320	1	320
9	Sport Section	LED	9	1	9	2	18
		Fan	80	3	240	2	480
		PC	80	2	160	1	160
		Printer	150	2	300	0.5	150
10	IQAC Cell	FTL	40	2	80	2	160
		LED	9	5	45	2	90
		Fan	80	3	240	2	480
		PC	80	5	400	1	400
		Printer	150	2	300	0.5	150
		Scanner	150	1	150	2	300
		Projector	150	1	150	0.5	75
11	Geotechnical Laboratory	Fan	80	4	320	2	640
12	CE HOD Cabin	FTL	40	2	80	2	160
		PC	80	1	80	3	240
		Printer	150	1	150	0.5	75
13	Fluid Mechanics	Incandescent Bulb	60	1	60	0	0

		Fan	80	3	240	1	240
14	Transportation Lab	FTL	40	3	120	1	120
		Fan	80	2	160	1	160
15	Concrete Technology Laboratory	FTL	40	1	40	1	40
		Incandescent Bulb	60	2	120	1	120
		Fan	80	3	240	1	240
16	Project Lab, Room No. 109	Fan	80	3	240	1	240
		FTL	40	2	80	1	80
17	Strength of Material	LED	18	1	18	2	36
		Fan	80	3	240	1	240
		PC	80	1	80	1	80
18	CAD Laboratory	LED	9	1	9	2	18
		Fan	80	3	240	1	240
		PC LCD	80	16	1280	1	1280
		Printer	150	2	300	0.5	150
		Laptop	80	1	80	3	240
		Projector	150	1	150	0.5	75
19	Environmental Laboratory	FTL	40	3	120	1	120
		Fan	80	1	80	1	80
20	Geology Laboratory	Fan	80	1	80	1	80
		Laptop	80	1	80	1	80
21	Classroom 106 to 113	Fan	80	32	2560	1	2560
		CCTV	5	8	40	24	960
22	MQC Laboratory	Fan	80	2	160	1	160
23	Fluid Mechanics	Fan	80	1	80	1	80
		Advance Hydraulic pump, 1HP/0.75w	0.75	1	0.75	1	0.75

		Fan	80	3	240	1	240
		FTL	40	1	40	1	40
24	IC Engine Laboratory	Fan	80	4	320	1	320
26	Theory of Machine Lab	Fan	80	2	160	2	320
		PC	80	1	80	1	80
27	Girls Common Room	Fan	80	2	160	3	480
		FTL	40	1	40	1	40
28	Applied Thermodynamics	Fan	80	3	240	1	240
30	Basic Electronics Lab	Fan	80	2	160	1	160
31	Digital System Laboratory	Fan	80	1	80	1	80
32	Electronic and Communication Lab 1	Fan	80	1	80	1	80
34	Embedded & VLSL Lab	FTL	40	2	80	1	80
		DLink Switch	5	1	5	1	5
		PC	80	8	640	1	640
		Fan	80	1	80	1	80
35	Computer Lab E&TC	FTL	40	2	80	1	80
		Fan	80	3	240	2	480
		PC	80	8	640	1	640
37	Classroom No.139,143,144,145 ,146	Fan	80	20	1600	1	1600
		FTL	40	8	320	1	320
		PC	80	4	320	1	320
		CCTV	5	5	25	24	600

38	Physics	FTL	40	2	80	1	80
		Fan	80	3	240	1	240
39	Electronics and Telecommunication Lab	DTH Set Top	15	1	15	3	45
		Power Supply	15	1	15	3	45
		Fan	80	3	240	1	240
40	Room No. 135, 137	Fan	80	2	160	1	160
		PC	80	1	80	1	80
41	Computer Center	Fan	80	6	480	1	480
		PC	80	40	3200	2	6400
		CCTV	5	4	20	24	480
		D-Link Switch	5	4	20	1	20
42	Room No. 122	Fan	80	1	80	1	80
		PC	80	6	480	1	480
43	Room No. 122	FTL	40	1	40	2	80
		Fan	80	1	80	1	80
		PC	80	4	320	1	320
44	Hardware Lab	Fan	80	1	80	1	80
		FTL	40	1	40	1	40
		PC	80	1	80	1	80
		BSNL Internet Router, Batteries 12v, 42Ah	10	3	30	4	120
		Modem	5	1	5	4	20
45	Network Lab	Fan	80	3	240	1	240
		PC	80	4	320	1	320
46	Programming Lab	Fan	80	3	240	2	480
		PC	80	18	1440	1	1440
		D-Link Switch	5	1	5	2	10
		CCTV	5	1	5	24	120
47	Computer Graphics lab	PC	80	19	1520	5	7600
		Fan	80	4	320	1	320

		FTL	40	2	80	2	160
		D-Link Switch Connector	5	1	5	2	10
		CCTV	5	1	5	24	120
48	Network Lab	FTL	40	3	120	1	120
		PC	80	22	1760	5	8800
		D-Link Switch Connector	5	1	5	2	10
		CCTV	5	1	5	24	120
49	Project Lab 1	FTL	40	2	80	2	160
		Fan	80	3	240	2	480
		CCTV	5	2	10	24	240
		PC	80	20	1600	4	6400
		D-Link Switch Connector	5	1	5	2	10
50	Project Lab 2	FTL	40	1	40	2	80
		Fan	80	4	320	2	640
		CCTV	5	2	10	24	240
		PC	80	27	2160	0.5	1080
		D-Link Switch Connector	5	1	5	2	10
51	Server Room	PC	80	2	160	1	160
		Fan	80	1	80	1	80
		FTL	40	1	40	1	40
		CCTV	5	1	5	24	120
		Power Supply 3.9A, 150-235v,50-60Hz	15	1	15	4	60

52	Yoga Meditation Hall	FTL	40	8	320	1	320
53	First Floor Corridor	CCTV	5	8	40	24	960
		Display Board	80	1	80	1	80
54	Library	Xerox Machine	500	2	1000	1	1000
		Fan	80	10	800	1	800
		FTL	40	2	80	1	80
		PC	80	8	640	1	640
		Printer	150	1	150	0.5	75
		CCTV	5	3	15	24	360
55	Tutorial Room	Router	100	1	100	3	300
		FTL	40	1	40	1	40
56	UPS Room	UPS Inverter 7.5KVA	750	2	1500	3	4500
		Batteries 160 A	150	16	2400	12	28800
		Batteries 150 A	150	16	2400	12	28800
58	Water Cooler/RO/	150 Lit	150	2	300	2	600
59	**Canteen**	Referigerator; 200 liter	430	8	3440	12	41280
		FTL	40	6	240	2	480
		Fan	80	4	320	4	1280
		Cooler Water	800	1	800	2	1600
60	**Porch**	FTL	40	2	80	8	640
		CCTV	5	2	10	24	240
61	**Campus**	Outdoor Flood LED	200	4	800	8	6400
		Pole Light LED	100	15	1500	5	7500

62	**Entry Security Cabin**	FTL	40	2	80	8	640
		Fan	80	2	160	2	320
63	**Main Gate**	CCTV	5	2	10	24	240
		Outdoor Flood LED	150	1	150	10	1500
64	**Second Floor**	FTL	40	15	600	4	2400
		Fan	80	15	1200	6	7200
		LED Bulb	12	3	36	5	180
		Outdoor FTL	40	4	160	5	800
	2nd Floor Toilet	LED Bulb	9	4	36	5	180
	2nd Floor Wash room	LED Bulb	9	4	36	5	180
					Total Load	**Daily (Watt)**	**219917.8**
						Daily Kw	**219.9178**
						Monthly Kw	**5717.862**
						Yearly Kw	**68614.34**

Table No.5 APPLIANCES/LIGHTING LOAD

4.2 LAB EQUIPMENT LOAD YEARLY

Sr No.	Location	Name of Appliance	Power Rating (Watt)	Qty	Power Consumption (Watt)	Usage per Year (HR)	Power Consumption/ day (Watt)
1	Concrete Technology Lab	Sieve Shaker;0.5HP/0.37kw	370	1	370	18	6660
		Direct Share Testing M/c; 50Hz	300	1	300	18	5400
		Compression Testing machine	500	1	500	18	9000
		Oven;1.5kw	1500	1	1500	18	27000
		Vane Share Testing Machine	35	1	35	18	630
		Infrared Moisture Balance	300	1	300	18	5400
		Weighnig Machine 1kg	300	1	300	5	1500
2	Hydraulics Lab	Venturi/ Orifice meter Motor;0.25HP	186	2	372	2	744
		Bernollies Theorem Motor;0.25HP	186	1	186	2	372
		Multitube Manometer Speed Controller;3PH, 380v	150	1	150	2	300
		Tilting Fumes;1.5Hp/1.1 Kw	1100	1	1100	2	2200
		Centrifugal Pump; 440v	500	1	500	2	1000
		Energy Regulator;230v	300	1	300	2	600
3	Geo Technical	Marshall Stability Test	150	1	150	2	300

	Laboratory	Los Angel Test	0.75	1	0.75	2	1.5
		Ductility Test	500	1	500	2	1000
		Ring and Ball Testing Machine;2HP	1500	1	1500	2	3000
		Stipping Valve Test Apparatus; 230v	150	1	150	2	300
4	Concrete Technology Laboratory	Weighing Machine 100kg	150	1	150	2	300
		Compression Testing machine,220v	600	1	600	2	1200
		Vibrating Machine;0.8HP	597	1	597	2	1194
		Vibrating Machine; 0.75HP	560	1	560	2	1120
5	Strength of Material Laboratory	Tile Abrasion Testing Machine; 0.37kw	370	1	370	2	740
		Torsion Testing, 1Hp	750	1	750	2	1500
		UTM 100 KN	1000	1	1000	2	2000
6	Environmental	Flocculator; 0.5HP	375	1	375	2	750
		Conductivity Meter, 230v	300	1	300	2	600
		COD, 1kw	1000	1	1000	2	2000
		Soxhlet Extraction Heater, 220v	300	1	300	2	600
		Flame Photometer, 220v	300	1	300	2	600
		Compressor, 220v	300	1	300	2	600
		Weighing balance, 220v	300	1	300	2	600
		Microbial Colony Counter, 220v	300	1	300	2	600
		Oven Furnace, 2.5Kw	2500	1	2500	2	5000

	Laboratory						
		BOD Incubator, 0.75kw	750	1	750	2	1500
		High Volume Sampler, 0.75kw	750	1	750	2	1500
7	MQC & I.C Engine Lab	Reciprocating Pump Test, 0.5HP	375	1	375	2	750
8	Fluid Mechanics	Pnumatic Trainer , 1HP	750	1	750	2	1500
		Gear Pump Rig	0.75	1	0.75	2	1.5
		Centrifugal Pump, 1HP/0.75w	0.75	1	0.75	2	1.5
		Impact Jet Apparatus, 0.5HP	375	1	375	2	750
		Turbo Kirloskar Pump, 3.7kw/5HP	3700	1	3700	2	7400
		Turbine Test Rig, 15HP	11190	1	11190	2	22380
9	Heat Transfer Lab	Incandescent Bulb	60	1	60	2	120
		Emissivity Measurement Apparatus	300	1	300	2	600
		Flux Meter	300	1	300	2	600
		Pin Fin Apparatus, 0.5HP	375	1	375	2	750
		Thermal Conductivity Meter	300	1	300	2	600
10	Tom Lab	Cam Analysis	500	1	500	2	1000
		Epicyclic Gear Train, 0.5HP	375	1	375	2	750
11	Girls Common Room	CFL	40	2	80	2	160
		Weighing Machine220gm	300	1	300	2	600

		Weighing Machine120gm	300	1	300	2	600
13	Basic Electronic Lab	Dimmer, 8AMPS	180	1	180	2	360
		Dc Shunt, 50Hz	50	1	50	2	100
		3PH Induction Motor	750	1	750	2	1500
		Slip Rig	300	1	300	2	600
		Squirrel Cage I.M 1 hp	750	1	750	2	1500
		DC Motor, 2HP	1500	1	1500	2	3000
14	Wave Theory and Antenna Lab	RF Motor 10 - 600MHZ	300	1	300	2	600
		Oscillator 50Oh,10-600MHz	300	1	300	2	600
		Communication System Trainer	300	1	300	2	600
15	Basic Electronic Lab	Frequency controller 50Hz	300	1	300	2	600
		Oscilloscope	300	1	300	2	600
16	Classrooms	Internet Connector Switch	50	5	250	2	500
17	Physics	Digital Gauss Meter; 200v	300	1	300	2	600
		Hall Effect Set up;200v	300	1	300	2	600
		Ultrasonic Interferometer, 200v	300	2	600	2	1200
		Regulator Power Supply;	300	1	300	2	600
18	Electronics & Communication Engineering Lab	CRT TV 220v	100	3	300	2	600
		HDTV Trainer	300	1	300	2	600
		Dicots	300	1	300	2	600
		PhotoeTech	300	1	300	2	600

		VSWR Meter	300	1	300	2	600
19	Hardware Lab	Catalyst	300	1	300	2	600
20	Yoga Meditation Hall	Incandescent Bulb	60	3	180	2	360
21	First Floor Corridor	Incandescent Bulb	60	10	600	2	1200
		Incandescent Bulb	60	1	60	2	120
22	Workshop	Lath Machine, 3HP	1500	8	12000	2	24000
		Surface planning M/C Motor, 3HP	1500	1	1500	2	3000
		R. Drilling M/C, 3PH, 0.75kw	750	1	750	2	1500
		R. Drilling M/C, 3PH, 0.37kw	750	1	750	2	1500
		Power Hexa M/C,1HP	750	1	750	2	1500
		Grinding M/C, 1.5HP	750	1	750	2	1500
		Drill M/C, 1.5 HP	750	1	750	2	1500
		welding M/C	300	1	300	2	600
		Cutter Machine	300	1	300	2	600
		Lath Machine, 2HP	750	2	1500	2	3000
					Total	**Yearly**	**183914.5**
						Monthly	**15326.21**
						Daily	**589.47**

Table No.6 LAB EQUIPMENT LOAD YEARLY

4.3 SOLAR POWER GENARTAION

Sr. No.	Details of Solar Panel installed				Capacity Factor	Assessed Annual Energy Generation in KWH	Avg. Cost of Utility Power Rs./KWH	Total Assessed Annual Cost Saving in Rs.
	Make	Watt/ Panel	No. of Panel	Total installed generation capacity in KW				
1	Vikram Solar	325	63	60	5	42,258	30.11	12,72,388.38

Table No.7 ***SOLAR POWER GENARTAION***

**** This is total load consumption considered approximately. Actual load consumption might be different according to actual use of power for particular time period.***

Calculations:

1. **Total Calculated Load = Yearly Daily load + Yearly Equipment's load**
   A = 68,614+184 =68,798 units

2. **Solar Power Generated= B= 56,817 units approx...**
3. **Difference of Load calculated and Solar power generated**
   =C= 68,798- 42,258=26,540 units

4. Yearly approximate units consumed =Electric Unit Consumed + Solar Energy Generated

=8,843 + 42,258 = 51,101 units

5. Difference of Total Calculated Load and Yearly Load Consumed

=D=68,798 – 51,101=17,697 units

The difference in Total load calculated and actual units utilized is due to the fact that majority of labs are used in semester pattern remains closed or unutilized, so the difference is near about 17,697 units per year or 49 units per day.

Remarks:

- It has been observed that in college majority of electrical power consumption is through light load such as fan, FTL & power load such a etc. unnecessary use of electrical equipment must be avoided.
- As per individual department level load consumption, we understand the scope for improvement of energy saving. Hence our electricity bill will be reduced by proper load management techniques along with optimum utilization of resources.

Observations and suggestions:

- **Losses in Solar Power (kW) Generation:**

Solar Power Generation Capacity at Location	Actual Solar Power (kW) Generation Per Year at Location	Actual Solar Power (kW) Generation Per Month	Power (kW) Generation per month by 1kw Solar Panel	Theoretically Solar power (kW) generation per month for 60 kW	Losses in Power (kW) Generation or in to transmit
60kW	42258	3521.5	120	7200	3678.5

- There has to be regular cleaning of solar panel to increasing generation capacity of solar panel.
- It is found that FTL, Bulbs, CFLs is installed in the facility.
- It is recommended that some tube lights in this area be switched off when sufficient daylight is available.
- Presently, there are no reflectors installed for tube lights.
- Every light or electric gadget left on when not needed is wasting energy and money and is causing pollution that is totally unnecessary.

Don't forget to power down these things when not in use:

- Lights
- Heaters and fans (or air-conditioning)
- Printers and scanners
- Battery and phone chargers
- Computers
- Gaming consoles
- TVs, DVD players

- Stereos
- Kitchen gadgets such as blenders, kettles, toasters etc.

4.4 Merits/Existing Features for Energy Savings

1. Staff vigilance.
2. Computers are connected in LAN.
3. Printers are shared in LAN.
4. Screen savers facility implemented for every computer.
5. AC's used are of three STARS.
6. Refrigerators are of three STARS.
7. Incandescent Bulbs are nowhere used.
8. They are replaced by CFL tubes with electronic choke.
9. Maximum use of natural light.
10. Cross Ventilation is provided in laboratory & class rooms, which reduced number of fans.
11. Most of the practical's are scheduled in noon time where Billing Rate in normal.
12. Walls are painted with off white colour to have sufficient brightness.
13. Solar powered street lamp is used.
14. LED flash light is used in Seminar hall.
15. PV solar system (60KW) is installed which is expected to generate 240 Unit/day.

This saves Rs. 12,72,388.38/Year

5. STUDY OF AIR CONDITIONERS

In the facility for air conditioning there is no centralized system with AHU (air handling unit), but mostly spilt air conditioners are installed.

Load of ACs was as follows:

Item	**Rated Power (kW)**	**Qty**	**Voltage**	**Current Amp**	**Actual Power**
ACs	4	3	406	8.4	3.5

Observations and suggestions:

1. Normal air conditioning temperature should be kept as high as possible (I.e.24 d.cel.).
   By thumb rule, increase in 3 degrees in indoor air temperatures can save 1% of electricity.
2. The ventilation in area can be provided with installation of natural ventilation. Natural Ventilation will also minimize the requirement of exhaust fans.

6. ENERGY CONSERVATION PROPOSALS

6.1 Providing Energy Saver Circuit to the Air Conditioners

The **energy saver circuits for the air conditioners, intelligently reduces the operating hours** of the compressors either by timing or temperature difference logic without affecting the human comfort. This can save around 15% to 30% of the electricity depending on the weather conditions and temperature settings.

There are total 3 split type air conditioners. It is Recommended that the old air conditioners are being replaced with new energy efficient BEE STAR labeled (3 Star and above) air conditioners in a phased manner.

6.2 Replacing Fluorescent Tube Lights (FTL) with LED Tube Lights

The CFLs and FTLs can be replaced with the LED tube lights 16 W. These changes can be made at the places where the life is higher. Usually minimum of 3 years warranty is given and approximate burning hours is 40 000. (15 years considering 8 hours per day running).

6.3 General Recommendations

- Installation of APFC panels for Power Factor improvement and thereby KVAh Consumption reduction.
- **Keep systems clear and unobstructed:** Need to make sure that the conditioned air is not obstructed by furniture or equipment and also keep filters clean. This ensures better circulation of air into the space and reduces the energy required to meet the cooling and heating demand.
- Regular monitoring of equipment in all laboratories and immediate rectification of any problems.
- All Class Rooms and labs to have **Display Messages** regarding optimum use of electrical appliances in the room like, lights, fans, computers and projectors. Save electricity. **Display the stickers of save electricity**, save nature everywhere in the campus. So that all stakeholders encouraged to save the electricity.
- Trying to get the benefit of -01.50 rates in addition to actual rate for per unit consumption of **electric motor pumping during 2200 – 0600 Hrs.**
- All computers to have power saving settings to turn off monitors and hard discs, say after10 minutes/30 minutes.
- The comfort/Default air conditioning temperature to be set between 24˚C to26˚C.

- Use AUTOMATIC POWER FACTOR CORRECTION (APFC) Panel FOR PF improvement
- Need to use power saver circuits for AC.
- Need to replace FTL by smart LED Tube.
- Need to replace ordinary bulb by LED bulb.
- Need to replace ordinary CRT monitor by LED.
- Need to replace ordinary refrigerator by BEE power saver refrigerator if possible.

6.4 Executive Recommendations

Losses in Solar Power (kW) Generation:

Solar Power Generation Capacity at Location	Actual Solar Power (kW) Generation Per Year at Location	Actual Solar Power (kW) Generation Per Month	Power (kW) Generation per month by 1kw Solar Panel	Theoretically Solar power (kW) generation per month for 60 kW	Losses in Power (kW) Generation or in to transmit
60kW	42258	3521.5	120	7200	3678.5

1. **Production shortfalls can result from plant operation contingencies, such as component failures (serial and otherwise), latent defects, forced outages, module degradation, and resource variability. So, Check the same for reduce overcomes contingencies in production.**

2. **Institute level student community that keeps track of the energy consumption. Parameters of the various departments, class rooms, halls, areas, meters, etc**
3. **Energy auditing inside the campus has to be done on a regular basis and report should be made public to generate awareness.**

4. **College should take initiative to arrange seminars, lectures, paper presentation competition among students and staff for general awareness.**

7. REFERENCES

1) "Energy Management, Audit and Conservation" by Barun Kumar De

2) "Guide to Energy Management" by Barney L

3) "Energy Audits: A Workbook for Energy Management in Buildings" by Tarik Al–Shemmeri

4) "Fundamentals of Energy Conservation and Audit" by Agarkar Santosh Vyankatro and Mateti Naresh Kumar

5) "Industrial Energy Conservation (UNESCO Energy Engineering)" by Charles MGottscha

SARVASHREE TECHNOGREEN PVT LTD
Environmental and Agricultural
Engineering Consultancy Services

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Branch 2: Flat No. 203, B3, Vansaaz Apartment, Be.Singapore Garden Bungalows,
Tapovan Road, Nashik - 422001. **M:** +91 9420643007
E: director@sstechnogreen.in, **W:** www.sstechnogreen.in
ISO 9001 | ISO 14001 | ISO 45001 | FSSAI
GSTIN: 27ABECS0697R1ZG

AUDIT CERTIFICATE

This is to certify that an Energy Audit for **Shri Chhatrapati Shivaji Maharaj College of Engineering, Ahmednagar** has been conducted in May 2024 for year 2023-2024 to access energy costs, availability and reliability of supply of energy, energy conservation technologies and ways to reduce energy consumption.

Place: Ahmednagar

Date: 25th May 2024

SARVASHREE TECHNOGREEN PVT. LTD. U74999 PN2020 PTC192445

Susheel Pote
Director

Anil Dube
Certified Energy Auditor
EA-4973

Regn. No. EA-4973

No. 2487

National Productivity Council

(National Certifying Agency)

PROVISIONAL CERTIFICATE

This is to certify that Mr. / Ms. Anil Siddhanarayan Dube

son / daughter of Mr. Siddhanarayan Dube

has passed the National Certification Examination for Energy Auditors in 2008, conducted on behalf of the Bureau of Energy Efficiency, Ministry of Power, Government of India.

He / She is qualified as Certified Energy Manager as well as Certified Energy Auditor.

He / She shall be entitled to practice as Energy Auditor under the Energy Conservation Act 2001, subject to the fulfillment of qualifications for the Accredited Energy Auditor and issue of certificate of Accreditation by the Bureau of Energy Efficiency under the said Act.

This certificate is valid till the issuance of an official certificate by the Bureau of Energy Efficiency.

Place : Chennai, India

Date : 30th April 2007

Controller of Examination

Ahmednagar Jilha Maratha Vidya Prasark Samaj's

Shri. Chhatrapati Shivaji Maharaj College of Engineering, Ahmednagar

Survey.No. 162 & 163 Nepti, Nagar- Kalyan Road, Ahmednagar

Phone No :- 0241 -2568383 Unipune ID CEGA019270 Fax No: - 0241 -2568384

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Approved by AICTE New Delhi, Govt. of Maharashtra & Affiliated To University of Pune.

SCSMCOE/2023-24/05-1 05/06/2023

Notice

All students, teaching and Non-Teaching staff are hereby informed that, we are celebrating **World Environmental Day** on dated **05th June 2023** at 11.00 AM in Seminar hall of college.

All HODS are informed to send students and faculty members from their department to attend expert talk on environment day.

Copy to:-

All HODS.

Prof. G. S. Patil
N.S.S. Programme Officer
Shri Chhatrapati Shivaji Maharaj College of Engineering, Nepti, Ahmednagar

Dr. Y. R. Kharde
PRINCIPAL
Shri. Chhatrapati Shivaji Maharaj College of Engineering, Nepti, Ahmednagar

NATIONAL SERVICE SCHEME

Name of Event: World Environment Day

Name of Coordinator: Prof. G. S. Patil

Name of Guest:- Prof. Girish Kukreja

Participants: Faculties, Teaching, Non-Teaching Staff and Students

Date: 05/06/2023

Event Report:

The world environment day is celebrated every year on 5th June to raise global awareness to take positive environmental action to protect nature and the planet earth. It is a day that reminds everyone on the planet to get involved in environment friendly activities. From school children to community groups, companies, and governments, all come together to pledge towards building a greener planet. Keeping this aim in view, the NSS Department of Shri Chhatrapati Shivaji Maharaj College of Engineering, organise lecture on this day.

The Chief Guest for the programme was Mr. Girish Kukreja, Head of Microbiology Department, New Arts Commerce and Science College, Ahmednagar. The programme began by enlightening the students on environmental issues, by playing a few short videos related to environmental degradation by anthropogenic activities such plastic pollution. Mr Kukreja spoke on the topic "Plastic Pollution and its solution." He appealed all to minimize plastic pollution and spread the message of environmental awareness in their surroundings. He reminds that people's actions on plastic pollution matters. It is time to accelerate the action to reduce plastic pollution and transition to a circular economy. He also stressed on how to tackle this problem of continuous destruction.

To create seriousness about the problems associated with environmental deterioration there was administration of oath by Prof. G. S. Patil. And then vote of thanks given by Prof A. G. Dekhane.

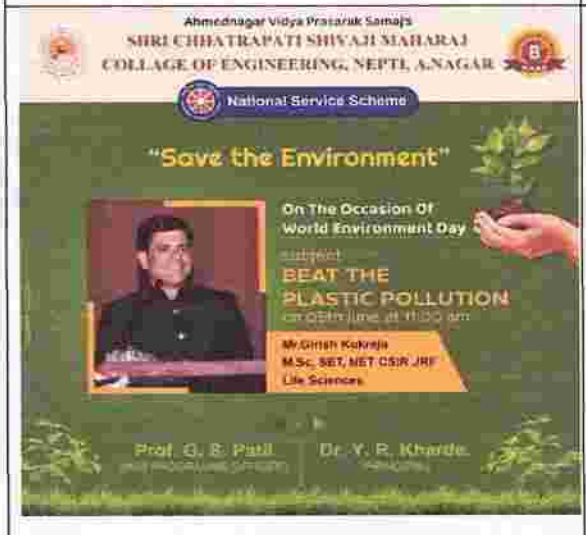
Declaration of Oath

"We the Staff and Students of Shri Chhatrapati Shivaji Maharaj College of Engineering pledge to practice everything in our power to protect, preserve, and enhance the beauty and glory of nature. We understand that we are responsible for sustaining the only livable planet "Mother Earth "and save it as a gift to the future generations."

The program was organised on Google Meet Platform. More than 100 students were present for this programme.

EVENT PHOTOGRAPHS

EVENT PHOTOGRAPH




छत्रपती शिवाजी महाराज अभियांत्रिकीमध्ये प्लास्टिक प्रदूषणावरव्याख्यान संपन्न

पर्यावरणाचे संरक्षण करणे आपली सर्वांची जबाबदारी : प्रा. कुकरेजा

Prof. G. B. Patil

N.S.S. Programme Officer
Shri Chhatrapati Shivaji Maharaj College
of Engineering, Nepti, Ahmednagar

PRINCIPAL
Shri. Chhatrapati Shivaji Maharaj College
of Engineering, Nepti, Ahmednagar

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SCSMCOE/2023-24/133-2

Date: -18/08/2023

Notice

All students, teaching and Non-Teaching staff are hereby informed that, we are organize **Tree Plantation Drive** on dated **21st August 2023** at 11.00 AM at college campus ground.

For the inauguration celebration, all are informe to assemble in front of the workshop at 11:00 a.m.

Copy to:-

All HODS.

Prof. G. S. Patil
N.S.S. Programme Officer
Shri Chhatrapati Shivaji Maharaj College of Engineering, Nepti, Ahmednagar

Dr. Y. R. Kharde
PRINCIPAL
Shri. Chhatrapati Shivaji Maharaj College of Engineering, Nepti, Ahmednagar

NATIONAL SERVICE SCHEME

Name of Event: Tree Plantation

Name of Coordinator: Prof. G. S. Patil

Participants: Teaching, Non-Teaching Staff and Students

Date: 21/08/2023

Event Report:-

It was 21st August, 2023 Shri Chhatrapati Shivaji Maharaj College of Engineering, Ahmednagar, organized a program to plant 30 saplings and young trees. The objective of this event was to teach students, how we can save our climate from pollution. This was a great initiative to make our atmosphere neat and clean. By tree plantation, we can develop a climax ecosystem free of greenhouse gases to reduce global warming.

The program started with welcome function of Hon Shri R. H. dare, Vice Prsident and Hon. ShriG. D. Khandeshe, secretary, Ahmednagar Jilha Maratha Vidya Prasarak samaj, Ahmednagar was invited as a chief guest there. He started the event by planting the first sapling in the corner of the college garden with his hand. Along with chief guest parents, all HoD, faculty members and NSS volunteers plant tree. Plants were provided such as "Parlour Palm" And "Ficus." About 30 seedlings were planted by the students of our campus and then watered by gardeners of the school.

At the end, the principal addressed and thanks to the chief guest for coming and participating in that fruitful activity. Giving their precious time. Overall, this was an excellent and glorious event for all.

EVENT PHOTOGRAPHS

Hon. R. H. Dare, Vice President & Hon. Shri G. D. Khandeshe, Secretary, AJMVPS Ahmednagar Openeing the Tree Plantation Drive

Hon. R. H. Dare, Vice President & Hon. Shri G. D. Khandeshe, Secretary, AJMVPS Ahmednagar Openeing the Tree Plantation Drive.planting the tree

Hon. Mrs. Vishwasrao Athare Patil Planting the tree

Faculty members planting the Trees

जनता आवाज

आवाज जागरूक जनतेचा

छत्रपती अभियांत्रिकीमध्ये राष्ट्रीय सेवा योजना अंतर्गत पालक व विद्यार्थ्यांकडून वृक्षारोपण

N.S.S. Programme Officer
Shri Chhatrapati Shivaji Maharaj College of Engineering, Nepti, Ahmednagar

PRINCIPAL
Shri. Chhatrapati Shivaji Maharaj College of Engineering, Nepti, Ahmednagar

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SCSMCOE/2024-25/419

Date: -29/09/2023

Notice

All students, Teaching and Non-Teaching staff are hereby informed that, we are **celebrating Ghandhi Jayanti** on dated **02nd Oct 2023** at 10.00 AM in College front porch. Along with college campus cleanliness drive is arranged at 1.00 PM.

Copy to:-

All HODS.

Prof. G. S. Patil
N.S.S. Programme Officer
Shri Chhatrapati Shivaji Maharaj College of Engineering, Nepti, Ahmednagar

Dr. Y. R. Kharde
PRINCIPAL
Shri. Chhatrapati Shivaji Maharaj College of Engineering, Nepti, Ahmednagar

NATIONAL SERVICE SCHEME

Name of Event: Gandhi Jayanti

Name of Coordinator: Prof. G. S. Patil

Participants: Teaching, Non-Teaching Staff and Students

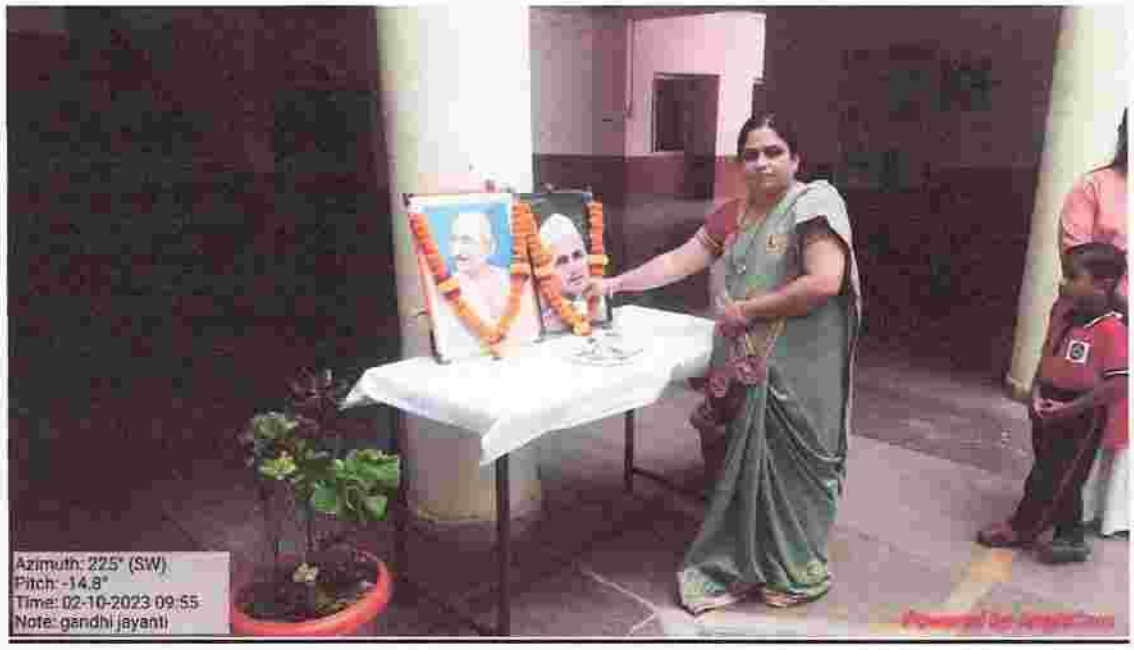
Date: 01/10/2023

Event Report:-

On this occasion Shri Chhatrapati Shivaji Maharaj College of Engineering, Ahmednagar, celebrated Gandhi Jayanti, It was celebrated to remember the birth of Mohandas Karamchand Gandhi who is regarded as the leader of the Indian freedom struggle and is highly appreciated for his simplicity and principle follower. On this occasion a cleanliness drive was conducted to reminisce Gandhiji's philosophy. The main purpose of this programme was to create awareness among the students regarding Cleanliness and its benefits. Gandhiji was a torchbearer of cleanliness. He dwelt on cleanliness and pointed out its close relation with good health.

The program was started with remembering the Gandhiji by Poojan. Swachha Bharat Mission a nation-wide cleanliness campaign which has been started by our honourable Prime Minister Shri Narendra Modi, is a step to fulfill this dream of Mahatma Gandhi, of having a clean India. Conducted cleaning in our college all students was cleaning ground and college campus. This activity took place in this day.

EVENT PHOTOGRAPHS




Latitude: 19.098153
Longitude: 74.669413
Elevation: 746.19±4 m
Accuracy: 2.4 m
Time: 09-30-2023 10:24
Note: Cleanliness Program


Latitude: 19.098153
Longitude: 74.669413
Elevation: 746.19±4 m
Accuracy: 2.4 m
Time: 09-30-2023 10:24
Note: Cleanliness Program

This Document Shows a News Paper Cutting Published in Pudhari News Paper regarding student active participation in Cleaning Drive at SCSMCOE College

छत्रपती अभियांत्रिकीच्या विद्यार्थ्यांच्या श्रमदानाचे प्राचार्यांकडून कौतुक

नगर : 'स्वच्छतेचे संदेश ध्यानी धरू, आपले आरोग्य निरोगी बनवू' हे घोषवाक्य घेऊन नेप्ती येथील छत्रपती शिवाजी महाराज अभियांत्रिकी महाविद्यालयातील विद्यार्थ्यांनी महाविद्यालय परिसरात स्वच्छता अभियान राबविले. राष्ट्रीय सेवा योजनेच्या विद्यार्थ्यांनी पुढाकाराने 'स्वच्छता हीच सेवा' या अभियानामध्ये विद्यार्थ्यांबरोबर शिक्षक सहभागी झाले. स्वच्छतेची परंपरा लाभलेल्या महाराष्ट्रामध्ये निरोगी अन् शांततापूर्ण जीवन जगण्यासाठी सर्वांनी स्वच्छतेचे महत्त्व समजून घेणे आणि ते कायम राखणे आवश्यक आहे. स्वच्छता माणसाचे आत्मदर्शन घडविते, असे वक्तव्य प्राचार्य डॉ. वाय. आर. खर्डे यांनी केले. स्वच्छता अभियानाला सुरुवात प्राचार्यांनी कचरा उचलून केली. या अभियानामध्ये सिव्हील विभागाचे प्रमुख प्रा. पी. जी. निकम, इलेक्ट्रॉनिक्स ॲण्ड टेलिकम्युनिकेशन विभागाच्या प्रमुख प्रा. एस. एम. वाळके, प्रथम वर्ष समन्वयक डॉ. एम. के. भोसले, कम्प्युटर इंजिनिअरिंग विभाग प्रमुख प्रा. व्ही. व्ही. जगताप, मेकॅनिकल विभाग प्रमुख प्रा. ए. बी. काळे, राष्ट्रीय सेवा योजना अधिकारी प्रा. जी. एस. पाटील, प्रा. अक्षय देखणे, प्रा. अमेय कलकर्णी आदी उपस्थित होते.

My Ahmednagar Edition
Oct 2, 2023 Page No. 4
newspaper.pudhari.co.in

N.S.S. Programme Officer
Shri Chhatrapati Shivaji Maharaj College of Engineering, Nepti, Ahmednagar

PRINCIPAL
Shri. Chhatrapati Shivaji Maharaj College of Engineering, Nepti, Ahmednagar

Ahmednagar Jilha Maratha Vidya Prasark Samaj's

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Approved by AICTE New Delhi, Govt. of Maharashtra & Affiliated To University of Pune.

SCSMCOE/2024-25/497

Date: -27/11/2023

Notice

All students are hereby informed that, we are going to conduct cleanliness drive at a historicasl place "**Chandbibi Mahal"** in association with Sakal YIN group on 30th Nov. 2023. All students gather in college front porch at 9.30am.

Copy to:-

All HODS.

Prof. G. S. Patil

N.S.S. Programme Officer
Shri Chhatrapati Shivaji Maha[illegible]
of Engineering, Nepti, A[illegible]

Dr. T. R. Kharde
PRINCIPAL
Shri. Chhatrapati Shivaji Maharaj Colle[illegible]
of Engineering, Nepti, Ahmednagar

NATIONAL SERVICE SCHEME

Name of Event: Cleaniness Drive At Chandbibi Mahal

Name of Coordinator: Prof. A. G. Dekhane

Participants: Teaching, Non-Teaching Staff and Students

Date: 30/11/2023

Event Report:-

National Service Scheme (NSS) and Young Inspirators Network (YIN) of SCSMCOE, Ahmednagar organized "Cleanliness Drive" at Chand Bibi Mahal, a historical monument located in Ahmednagar.

The Objective of this drive was to spread awareness amongst people and enlighten them about the importance of the environment. The journey started at 9:00 am from college and reached at 10.00 am at Chandbibi Mahal. All the teaching and non-teaching staff, NSS volunteers and college students participated actively in this drive under the valuable guidance of Principal Dr. Y. R. Kharde Sir. All the volunteer members cleaned and collected all the garbage from the whole area of Chandbibi Mahal and made it plastic free and also to set an example on how to keep our nature clean. The staff even raised awareness among the visitors about the cleanliness to be maintained in the area and spread the message of make the environment clean and pollution free.

EVENT PHOTOGRAPHS


Azimuth: 270° (W)
Pitch: -0.1° (-1.4°)
Time: 11-30-2023 12:30
Note: nss


Azimuth: 147° (SE)
Pitch: -0.4° (-2.3°)
Time: 11-30-2023 13:05
Note: nss

This Document Shows a News Paper Cutting Published in Sakal News Paper regarding student active participation in Cleaning Drive at Chand bibi Mahal, Ahmednagar

अहमदनगर: विद्यार्थ्यांनी चांदबिबी महालावरील कचरा गोळा करून त्याची विल्हेवाट लावली.

विद्यार्थ्यांनी दिला स्वच्छतेचा संदेश

'सकाळ यिन' व 'श्री छत्रपती शिवाजी महाराज इंजिनिअरिंग'चा उपक्रम

YOUNG INSPIRATORS NETWORK

अहमदनगर, दि. ३० : शहराजवळील चांदबिबी महालावर साचलेला कचरा गोळा करून विद्यार्थ्यांनी स्वच्छतेचा संदेश दिला. 'सकाळ यिन' आणि श्री छत्रपती शिवाजी महाराज इंजिनिअरिंग महाविद्यालयाच्या वतीने हा उपक्रम राबविण्यात आला. विद्यार्थ्यांनी संपूर्ण महाल परिसरातील कचरा गोळा करून त्याची योग्य ठिकाणी विल्हेवाट लावली. विद्यार्थ्यांनी उत्स्फूर्तपणे हा उपक्रम राबविला.

चांदबिबी महाल हे शहरापासून हाकेच्या अंतरावरील ऐतिहासिक ठिकाण आहे. या ठिकाणी शहरासह जिल्हाभरातून पर्यटक येतात. मात्र, येथील स्वच्छतेबाबत अनेकांकडून दुर्लक्ष होते. त्यामुळे महाल परिसरात मोठ्या प्रमाणात कचरा दिसून येतो. हाच कचरा उचलण्याचे काम विद्यार्थ्यांनी केले. 'सकाळ यिन' आणि श्री छत्रपती शिवाजी महाराज इंजिनिअरिंग महाविद्यालयातील एनएसएसच्या विद्यार्थ्यांनी आज सकाळी संपूर्ण महाल परिसरात स्वच्छता अभियान राबविले. 'सकाळ'चे आवृत्ती प्रमुख प्रकाश पाटील, वितरण व्यवस्थापक देविदास ओंबळे, यिनचे समन्वयक गौरव राऊळे, महाविद्यालयाचे प्राचार्य डॉ. वाय. आर. खर्डे, एनएसएसचे प्रा. गिरीश पाटील.

पान ४ वर >

"'सकाळ' आणि श्री छत्रपती शिवाजी महाराज इंजिनिअरिंग कॉलेजचे अनेक दिवसांचे ऋणानुबंध आहेत. शहराजवळील ऐतिहासिक चांदबिबी महालावर स्वच्छता अभियान राबवून चांगला संदेश दिला आहे. ऐतिहासिक वास्तूंचे जतन करणे, ही आपली सर्वांचीच नैतिक जबाबदारी आहे."

-डॉ. वाय. आर. खर्डे,
प्राचार्य, श्री छत्रपती शिवाजी महाराज इंजिनिअरिंग कॉलेज.

"'सकाळ'ने राबविलेल्या स्वच्छता अभियानात सहभागी झाल्याने सामाजिक स्वच्छतेची जाणीव झाली. ऐतिहासिक वास्तू किती महत्त्वाच्या आहेत, हे देखील समजले. अशा वास्तू पाहण्यासाठी गेल्यानंतर प्रत्येकाने तेथील स्वच्छता राखणे गरजेचे आहे."

-ओंकार कांडेकर, विद्यार्थी.

"ऐतिहासिक चांदबिबीच्या महालावर मोठ्या प्रमाणात कचरा साचलेला होता. अनेक जण या ठिकाणी फिरण्यासाठी येतात, परंतु येथील स्वच्छतेकडे दुर्लक्ष होते. ऐतिहासिक वास्तू आपला ठेवा आहे, तो जपण्याचे काम प्रत्येकाने केले पाहिजे."

-सिद्धी जपे, विद्यार्थिनी.

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N.S.S. Programme Officer
Shri Chhatrapati Shivaji Maharaj College of Engineering, Nepti, Ahmednagar

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