



**GREEN AUDIT REPORT
FOR
POORNIMA INSTITUTE OF
ENGINEERING AND TECHNOLOGY**



Elion Technologies & Consulting Private Limited

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Acknowledgment

Elion Technologies and Consulting Pvt Ltd places on record it's thanks to Poornima Institute of Engineering and Technology for entrusting the task of conducting green audit study.

We acknowledge with gratitude the whole hearted support and cooperation extended by all team members while carrying out the study.



Site Information

Name of College	Poornima Institute of Engineering and Technology
College Address	ISI - 2, Poornima Marg, Sitapura, Jaipur, Rajasthan, 302022
Execution Partner	ELION Technologies & Consulting Pvt Ltd
Communication Address	307, 3rd Floor DDA Lal Market H-Block Vikas Puri, New Delhi-110018
Date of Audit	6 th July 2023
Year of Audit	2023 – 2024
Audit Participants	Dr. Gautam Singh – Registrar & Chief Proctor Dr. Sama Jain – Professor & HOD First Year Mr. Ashwani Lata – Director (Student Welfare)
Total Area of College	96267.19 sq. ft.
Total Built up Area of College	3314 sq. ft.



Overview of Institute

Poornima Institute of Engineering and Technology, was established in 2007 with the aim of imparting pragmatic technical education. In its magnificent journey of 12 years, PIET has set benchmarks and reached at new pinnacles in Engineering Education with dedication, perseverance and devotion. PIET is spearheading its outstanding voyage with the motto 'Success is not a destination, it's a journey'.

Vision

To create knowledge based society with scientific temper through cutting-edge technologies, innovative research and to become valuable resource for enriching mankind.

Mission

- To provide an environment that will allow students and faculty members to be skilled in creation and implementation of new ideas.
- To provide platform to improve questioning, observing, testing, analyzing and communication skills.
- To provide qualitative education and generate new knowledge with integration of emerging technologies and research.
- To practice and promote high standard of potential ethics, transparency and accountability.

List of courses offered by the college:

- Computer Science Engineering
- Computer Science Engineering(R)
- Computer Science- Data Science (DS)
- Computer Science- Artificial Intelligence (AI)
- Artificial Intelligence & Data Science (AI & DS)
- Computer Science – IOT



Introduction

Green Audit is a process of systematic identification, quantification, recording, reporting and analysis of components of environmental diversity of institute. It aims to analyse environmental practices within and outside of the concerned place, which will have an impact on the eco-friendly atmosphere. Green audit is a valuable means for a University to determine how and where they are using the most energy or water or other resources; the University can then consider how to implement changes and make savings. It can create health consciousness and promote environmental awareness, values and ethics. It provides staff and students' better understanding of Green impact on campus. If self-enquiry is a natural and necessary outgrowth of a quality education, it could also be stated that institutional self-enquiry is a natural and necessary outgrowth of a quality educational institution. Thus it is imperative that the University evaluate its own contributions toward a sustainable future. As environmental sustainability is becoming an increasingly important issue for the nation, the role of higher educational institutions in relation to environmental sustainability is more prevalent.

The rapid urbanization and economic development at local, regional and global level has led to several environmental and ecological crises. On this background it becomes essential to adopt the system of the Green Campus for the institutes which will lead for sustainable development and at the same time reduce a sizable amount of atmospheric CO₂ from the environment. The National Assessment and Accreditation Council, New Delhi (NAAC) has made it mandatory that all Higher Educational Institutions should submit an annual Green Audit Report. Moreover, it is part of Corporate Social Responsibility of the Higher Educational Institutions to ensure that they contribute towards the reduction of global warming through carbon footprint reduction measures.

Advantages of Green Audit:

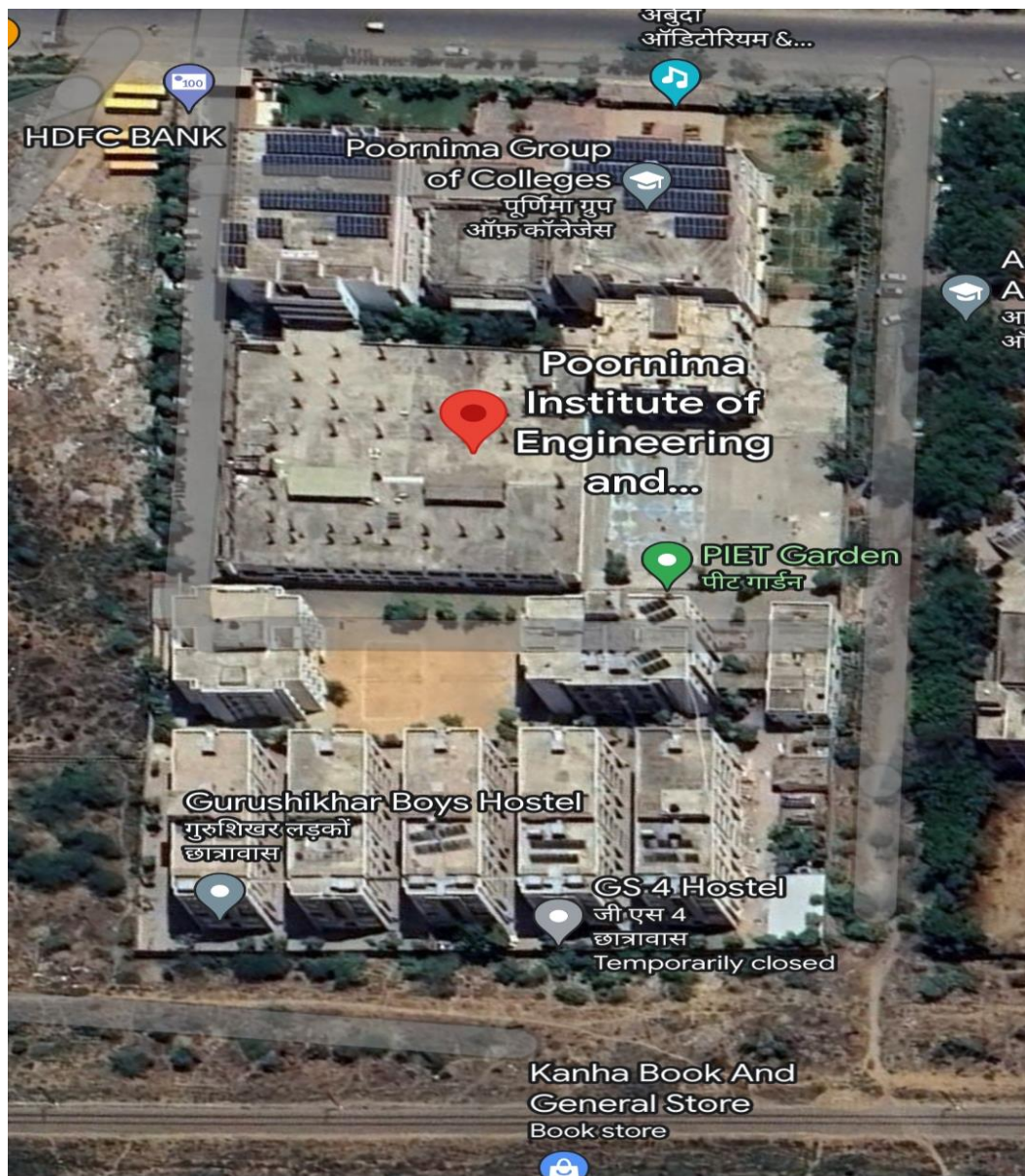
Green Audit is assigned to the Criteria 7 of NAAC, National Assessment and Accreditation Council which is a self-governing organization of India that declares the institutions as Grade A, Grade B or Grade C according to the scores assigned at the time of accreditation. Some main advantages of green Audit are:

- It helps to shield the environment.
- Minimizing the waste and managing the cost.
- Authenticate conformity with the implemented laws.
- Minimizing the energy consumptions and focus on green and clean energy.
- Ambient Environmental Condition.
- Awareness and Training on Sustainability for Students.
- Awareness about environmental guidelines and duties.

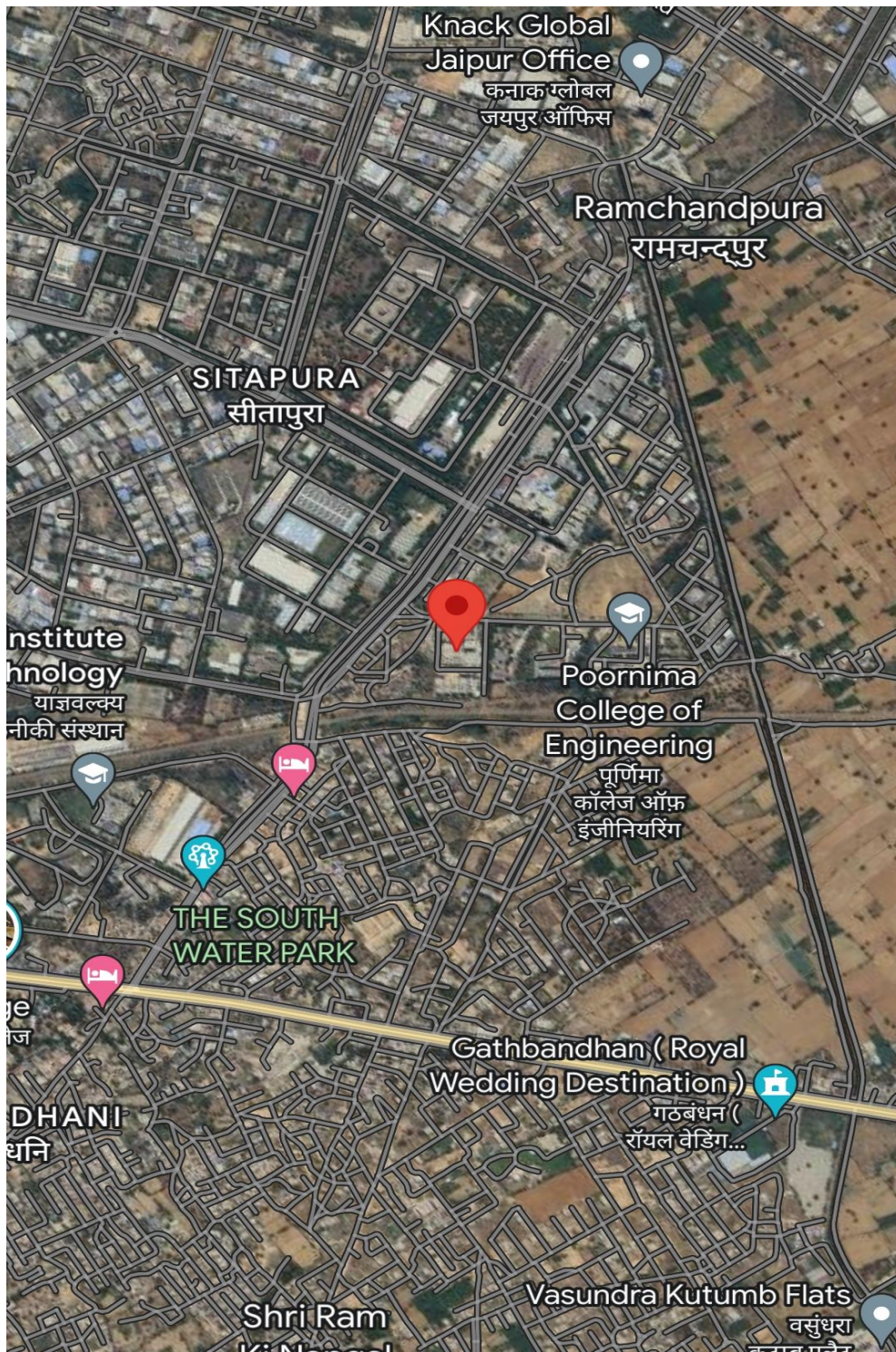


Environment Setting

The land use around the campus is mainly mix of residential and commercial area. There are educational institutes such as Apex Institute of Engineering and Technology and Swasthya Kalyan Institute, Garden and Hospital.



Poornima Institute of Engineering and Technology Campus



Location of Poornima Institute of Engineering and Technology Campus



Green Audit

For Green Audit following 13 major areas (including their subsections) were covered and compliance/ initiatives under these areas were verified/ validated.

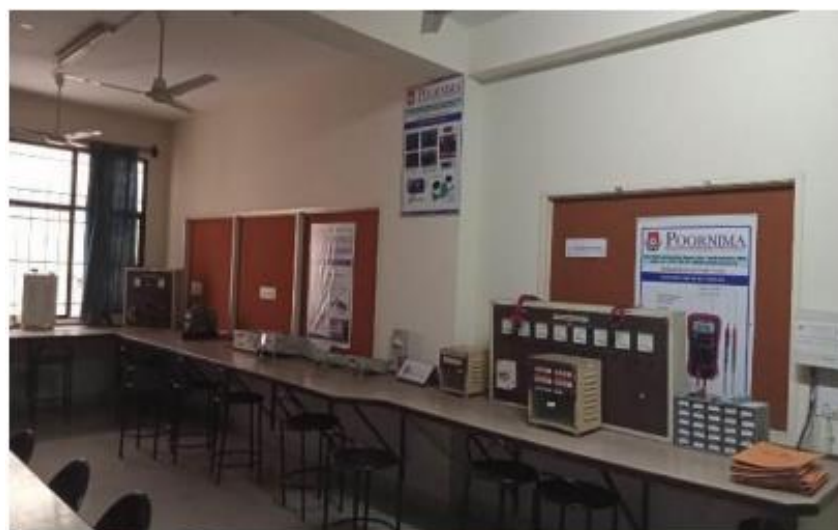
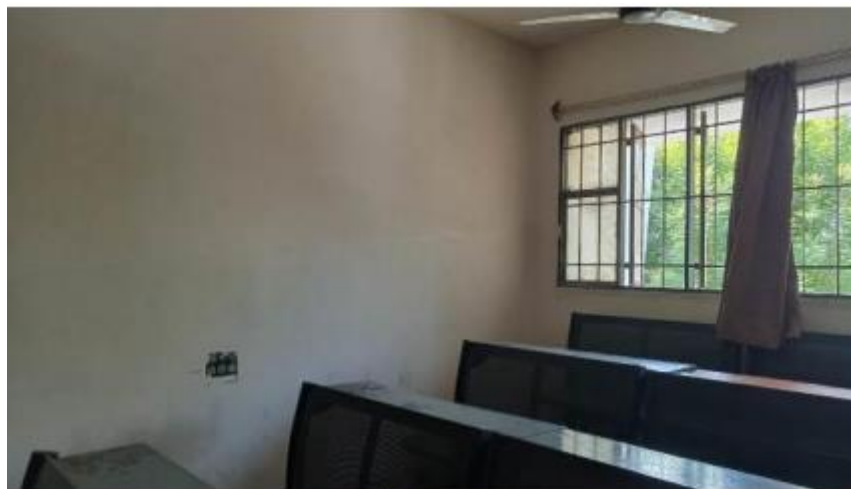
- a) Good Daylight Design and Ventilation
- b) Water Efficiency
- c) Wastewater Management
- d) Indoor Air Quality
- e) Energy Efficiency
- f) On-site Energy Generation
- g) Temperature and Acoustic Control
- h) Paper Waste Management
- i) E-Waste Management
- j) Canteen and Solid Waste Management
- k) Universal Access and Efficient Operation and Maintenance of Building
- l) Green Belt
- m) Green Programs (Green initiatives)

3.1 Good Daylight Design and Ventilation

- a) Corridors are wide with good ceiling height. All the corridors receive good daylight.
- b) Classrooms, Labs and Library have large windows. Adequate daylight is received through the windows during daytime.
- c) Classroom walls, corridors and labs are white-washed, this enhances the daylight received.
- d) Curtains are provided on some of the windows to avoid glare.
- e) Laboratories and washrooms are provided with exhaust fans to disperse heat, fumes and odors.
- f) Stair cases receive daylight through windows provided at various levels.



Wide Corridors with natural light and ventilation



Classrooms and labs with huge windows and natural daylight



Staircase receiving daylight through windows

3.2 Water Efficiency:

- a) Ground water (Submersible) is the main source for water supply in the campus.
- b) Water is stored in number of overhead and underground tanks.

Location	Tank Capacity	Type (Underground/Overhead)
In front of Arbooda convention Centre	85000	Underground
OAT	85000	Underground
Block C	31880	Roof
	15790	
GS2	31880	Roof
	15790	
GS3	27410	Roof
	12900	
GS6	32350	Roof
	16170	
GS7	13240	Roof
	11940	

- c) Water coolers are provided for drinking purpose.
- d) Normally mops are used for floor cleaning and hose is used for cleaning once a week
- e) Dual flushing system is provided in the washrooms.
- f) Signages are provided in washrooms emphasizing water conservation.



- g) Water from air conditioning unit and reject water from water purifiers is used for gardening and sanitary purpose.
- h) Rain water harvesting system is available in the campus and all the water is seeped into the ground.



Signages for water conservation

3.3 Wastewater Management:

- a) Sewage treatment plant is not available in the campus.

3.4 Indoor Air Quality;

Indoor Air Quality (IAQ) refers to the air quality within and around buildings and structures, as it relates to the health and comfort of building occupants. Some common indoor pollutant are listed as below:

- Molds and other allergens – This may arise from water seeping into the building envelope or skin, plumbing leaks, condensation due to improper ventilation, or from ground moisture penetrating a building part.
- Carbon monoxide – Sources of carbon monoxide are incomplete combustion of fossil fuels.
- Volatile organic compounds (VOCs) – VOCs are emitted by paints and lacquers, paint strippers, pesticides, office equipment such as copiers and printers, correction fluids and carbonless copy paper, graphics and craft materials including glues and adhesives, permanent markers, and photographic solutions etc.
- Carbon dioxide – Due to human respiration
- Particulate matter – Due to construction and maintenance activities



Major observations under indoor air quality are as below:

- a) Split and Windows Air conditioners are used in all the blocks of the college campus. Heating Ventilation and Air Conditioning (HVAC) system does not exist.
- b) Indoor plants are seen in the University. Indoor plants can be plotted not only for the aesthetic appearance but also for health benefits. Refer Annexure 1 for details.
- c) Exhaust fans are provided labs for dispersion of heat.
- d) Management has done plantation around college campus.



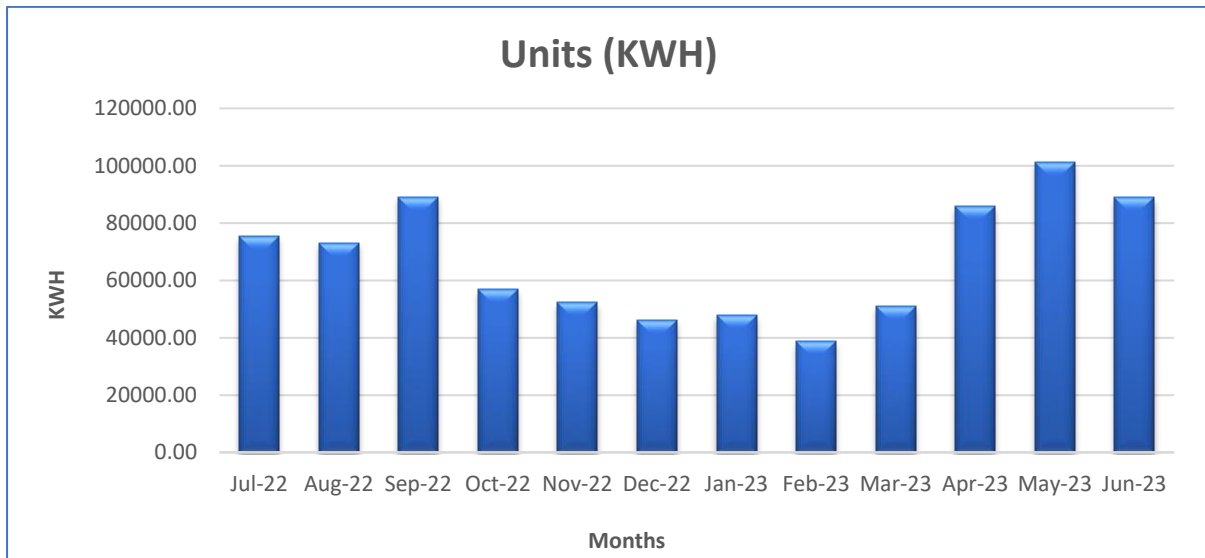
Exhaust fans in labs

3.5 Energy Efficiency:

Electricity:

Power is supplied by Jaipur Vidyut Vitran Nigam Limited. The major electricity consuming equipment installed in the campus are Air Conditioners, Lighting, Fans, Desktops, Printers, etc.

Following is details of energy consumption:



It was observed that:

- a) Campus has air conditioners which are in good working condition.
- b) College is in process of periodic replacement of conventional lights with energy efficient LED lights.
- c) In house solar power plant of capacity 150KW is present and college is also exporting electricity.



Rooftop solar power plant

3.6 On Site Energy Generation (usage of LPG/ Natural Gas):

- a) LPG is provided in the canteen for cooking.



- b) Back Up diesel generators of 125KVA & 250KVA are available in the campus.

3.7 Temperature and Acoustic Control

- a) White washed rooms & corridors and white/off-white flooring improve the lighting conditions.
- b) The entire campus has green area.
- c) The campus has done tree plantation all around which helps in reducing temperature.
- d) There is no noise pollution around the campus.



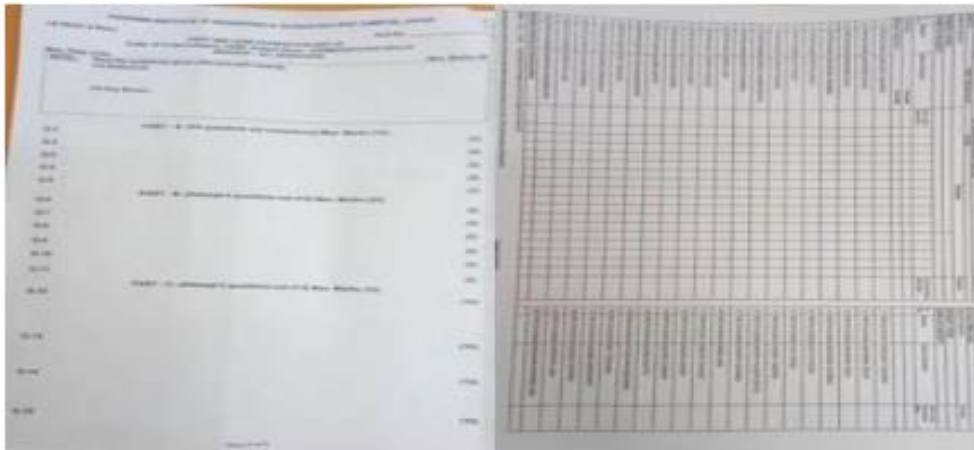
Tree Plantation

3.8 Paper Waste Management:

Being academic institution, waste paper is the main solid waste generated in the college buildings. The University has taken steps to minimize and avoid paper usage.

It was observed that:

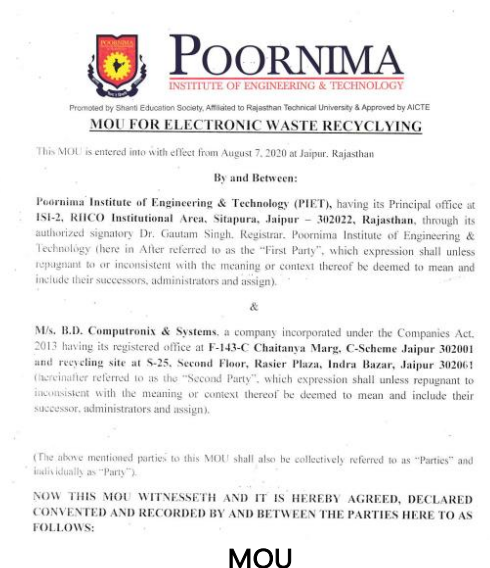
- a) Prints and photocopies are taken on both sides of the pages to avoid excess paper usage. Rather than photocopy, digitalization (scanning) is practiced.
- b) Internal notices and communications are through E-mail/Whatsapp.
- c) Faculty and administration staff uses old papers and envelopes for internal usages as rough work, file markers, page separators etc.



Copy of notice on notice boards

3.9 E-Waste Management:

- a) MOU is present with an external agency for recycling and disposal of e-waste.



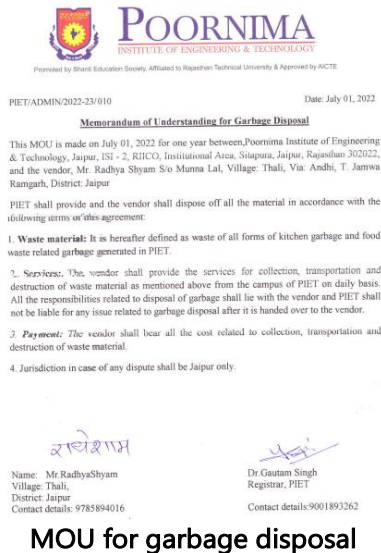
3.10 Solid Waste Management:

It was observed that:

- a) Wet waste and dry waste segregation is practiced in the premises. Separate bins are provided for wet biodegradable and dry recyclable waste.
- b) Waste generated in the campus is disposed through third party as an MOU is



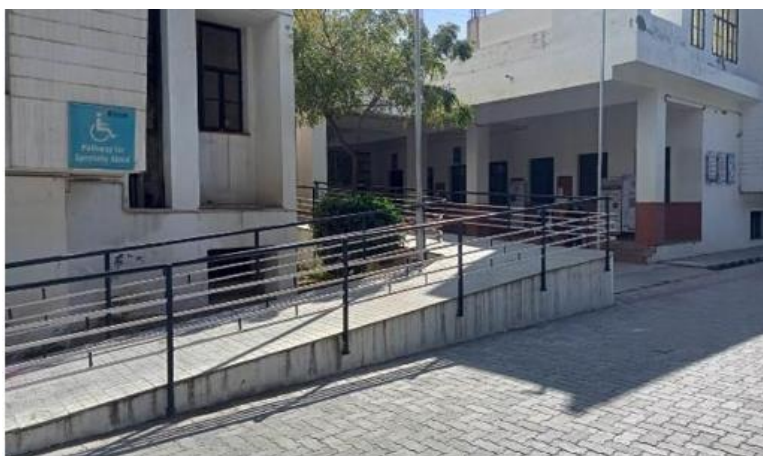
there with an external agency.



3.11 Universal Access and Efficient Operation and Maintenance of Building:

It was observed that:

- College is easily accessible. Staircase and ramps are provided for staff and students.
- Since the access and staircases are wide and uncluttered, it is possible to have a safe evacuation during emergency.
- Firefighting installations are provided for emergency.
- Directional exit signages and floor markings are present on every floor of the campus.
- Fire safety training is provided to the teaching as well as non-teaching staff.



Ramps for specially abled



Fire extinguishers

3.12 Green belt/ Landscaping:

- a) Large trees and plants are planted in the premises. Plantation also helps maintaining lower temperatures of the area.

3.13 Green Initiatives:

College is regularly celebrating cultural programs along with important days such Environment Day, Yoga Day, Earth Day, Forest Day etc.





Independence Day



Tree Plantation



Recommendations/Suggestions

For Improving Energy Consumption:

- a) Every classroom and lab with central switch board can have a diagram linking location of a tube light, fan etc. with corresponding switch. This will ensure that correct fitting is switched on/ off and can save time & unnecessary operation.
- b) Standard Operation Procedures (SOPs) should be prepared and followed for green purchasing. Equipment with star rating, using eco-friendly materials; with safe disposal policy to be preferred. Policy of returning equipment at the end of life span to the supplier to be preferred.
- c) For purchasing new electronic appliances, star rating provided by Bureau of Energy Efficiency (BEE) should be considered. The equipment which has maximum star ratings could be purchased, which will consume less energy, ensure environmental sustainability and also operate at low cost.
- d) Usage of light reflectors is recommended as the reflectors can spread light to relatively large areas.
- e) If possible, computers should be switched off from main power connections.
- f) Control sensors can help to reduce consumption by automatically dimming lights when people are not around, and keeping blinds open to use natural light & reduce energy consumption.
- g) Raise awareness:
 - Encourage students to help in monitoring energy consumption & implement corrective actions
 - Integrate energy education into classroom learning.

Water Conservation:

- a) Provide information on water usage and savings to students/ staff through notices, screen savers in computer labs.
- b) Dry sweep or use a sponge broom when possible, instead of using a hose to clean floors, sidewalks, or other hard surfaces.
- c) Minimize/ reduce water usage by installing water saving faucets such as pressmatic taps, tap aerators, jet sprays etc.
- d) Installation of waterless urinals can be considered to reduce water consumption.
- e) Water balance diagram can be prepared to quantify the water consumption by installing water meters at key points. Based on data gathered, appropriate measures can be taken to reduce the water consumption.



Paper and other Solid Waste Reduction:

- a) Inventories of all solid waste generated in the premises must be maintained.
- b) Enhance recycling. This can be done by creating a group where students can recycle books, personal clothes and other material to needy students. This can be an initiative under green program.
- c) Standard Operating Procedures (SOP) for Solid and E-waste management and for recycling of waste should be prepared & practiced. The SOP's may include collection, segregation and reuse of different types of wastes, if any (e.g. biodegradable waste for composting). This will help in safe disposal of waste to recycle agencies.
- d) Training as well as awareness programs should be organized on segregation of biodegradable waste and recycling of waste. Efforts should be taken to inform students about recycling options and signs should be posted on appropriate bins indicating what could be dumped in each bin.
- e) The University can introduce online app, which can be useful for conducting internal exams, assignment/ reports submission. This system can also be used for displaying important notices, timetables.
- f) Paper usage shall be monitored to understand the impact of digitization in the facility.




Others:

- a) Environmental advisory committee could be formed. The discussions/ information sharing among different departments can generate lot of ideas and awareness on green issues.
- b) Maintain minutes of meetings of environmental committees; evaluate the effectiveness of various environmental programs conducted by the institutes. Set annual targets for Green Initiatives & monitor them closely. Create 'Green Champions'.
- c) Since each student uses computer lab, the screen savers can be set up for creating environmental awareness. (Ergonomics, water conservation etc.). Short 30 second pop up can be displayed on computer screens when they are on standby mode. Or wallpapers informing students about environment conservation can be created.
- d) Consider detailed energy audit (energy consumption, thermal emission, visual comfort) and water audit.
- e) Adopt environmentally responsible purchasing policy, and work towards creating and implementing a strategy to reduce environmental impact of its purchasing decision.







Annexure 1 – Indoor Gardening Details





Indoor plants are commonly used for their aesthetics benefits but they also have vital role reducing airborne pollution. The right choice of plants can be an excellent way of improving indoor air quality and general health. Local landscape contractor can be contacted for supply and rotation of these plants.

Plants	VOC it removes	Indoor source of VOC's	Plant care
 <p>Aloe Vera</p>	<p>Formaldehyde, Trichloroethylene and Benzene</p>	<p>Chemical based cleaners and paints</p>	<p>Easy to grow with enough sunlight</p>
 <p>Bamboo Plant</p>	<p>Formaldehyde, Trichloroethylene and Benzene</p>	<p>Paints, Plastics, Wood products etc.</p>	<p>Thrives under low light conditions as well as easy to maintain</p>
 <p>Chinese Evergreen</p>	<p>Benzene</p>	<p>Paints</p>	<p>Low maintenance plant that prefers low light conditions.</p>




 <p>English Ivy</p>	<p>Formaldehyde, Benzene, Air borne fecal matter particles</p>	<p>Wood, Paper products, Air borne fecal – matter particles from pests</p>	<p>Easy to maintain</p>
 <p>Janet Craig</p>	<p>Formaldehyde, Benzene and Trichloroethylene</p>	<p>Paints, Plastics, Wood products etc.</p>	<p>Medium to low light tolerant plant. Requires little water for growth.</p>
 <p>Golden Pothos or Devils Ivy</p>	<p>Formaldehyde, Cleanses air</p>	<p>Exhaust fumes, carpeting materials, panelling and furniture products made with particle board</p>	<p>Extremely easy to maintain under low to bright light conditions. Fast growing and grows well under Fluorescent light.</p>
 <p>Mass Cane</p>	<p>Formaldehyde, benzene and trichloroethylene</p>	<p>Paints, Plastics, Wood products etc.</p>	<p>Medium to low light tolerant plant. Requires little water for growth.</p>



 <p>Snake plant</p>	<p>Formaldehyde and trichloroethylene</p>	<p>cooking fuels, wood products, facial tissues, personal care products and waxed papers</p>	<p>Drought resistant and Tolerates a variety Of light conditions. Hard to damage or kill.</p>
 <p>Peace Lily</p>	<p>Formaldehyde, benzene and trichloroethylene</p>	<p>Paints, Plastics, Wood products etc.</p>	<p>Relatively easy to maintain. Survives in low light conditions.</p>
 <p>Red-edged Dracaena</p>	<p>Formaldehyde and trichloroethylene</p>	<p>cooking fuels, wood products, facial tissues, personal care products and waxed papers</p>	<p>Drought resistant and Tolerates a variety of light conditions. Hard to damage or kill.</p>
 <p>Spider Plant</p>	<p>Formaldehyde, benzene, carbon monoxide and xylene</p>	<p>cooking fuels, wood products, Printing</p>	<p>Easy to maintain under medium to bright light condition.</p>



	Purifies indoor air	-	Easy to maintain
Parlor Palm			



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