ENERGY AUDIT REPORT
FOR
JECRC ENGINEERING COLLEGE & RESEARCH CENTRE
Jaipur

Carried On
26th November, 2020

Carried Out By

ELION TECHNOLOGIES & CONSULTING PVT LTD
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PRINCIPAL
Jaipur Engineering College & Research Centre
Tonk Road, Jaipur-302022

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EXECUTIVE SUMMARY

The National Society for Education Research and Development (NSERD) was registered in the year 1999 in Jaipur with the major objective of providing quality education and research environment in Rajasthan. It established its first college, Jaipur Engineering College & Research Centre (JECRC) in Jaipur, in the year 2000. Encouraged by its splendid achievements and overwhelming public patronage, it ventured into establishing second college, UDML College of Engineering (which is known as JECRC UDML College of Engineering) in the year 2007.

The JECRC Foundation having 21 years of existence, is amongst the most reputed educational groups in Higher and Technical Education in North India which has 2 large campuses with 10,000 students enrolled as on date in various courses alongside engineering courses, the major chunk of the admissions being routed through JEE examinations. The engineering colleges are approved by the AICTE, New Delhi and are affiliated to the Rajasthan Technical University, Kota. The final year batch size going to complete the graduation in session 2018-2019 is 2123 across all the courses.

JECRC has become the most sought-after institutions for admissions as evident by the REAP admission! Patterns. The JECRC Foundation has now become a brand name in professional education in Rajasthan.

JECRC was established in 2000. The institution started with three branches namely, Computer Science Engineering, Electrical Engineering and Electronics and Communication Engineering, with 180 students. The very next year one more branch introduced Information and Technology. After the introduction of the new branch total intake is increases by 240 students. In 2003, with the addition of Mechanical Engineering intake increased by 60. In 2009, college came up one more branch, Civil Engineering. With this new advancement, the student's sanctioned intake increased to 480. By 2013, second shift for Computer Science Engineering and Mechanical Engineering came into effect and at present the total sanctioned intake of 990 students in all.

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The JECRC Engineering College is approved by the AICTE, New Delhi and is affiliated to the Rajasthan Technical University, Kota. The total strength of the students in the session 2018-19 is 3998.

Electricity is supplied by Jaipur Vidyut Vitran Nigam Ltd and for backup powers supply DG Set of 200 and 125KVA are available.

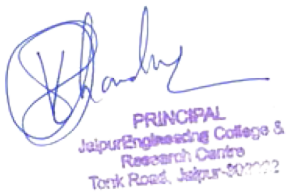
Also solar power plant of capacity 500kW is installed in the college.

On analysis of electricity bill it was found that JECRC college is producing energy instead of consuming. Total 13,979 units have been exported by the college

It can be seen from above data that energy consumed is much less than energy generated.

Elion Technologies and Consulting Pvt Ltd team conducted the Detail Energy audit on 26th November 2020. The energy audit was carried out remotely due to COVID-19 by Narinder Khanna BEE Certified Energy Auditor (EA-1192).

The remote energy audit included detailed data collection, analysis of data and identification of specific energy saving proposals.



CHAPTER – I
INTRODUCTION

M/S JECRC, Jaipur evinced interest in availing the services of Elion Technologies and Consulting Pvt Ltd for conducting remote energy audit of their premises.

Elion Technologies and Consulting Pvt Ltd team conducted the Detail Energy audit on 26th November 2020.

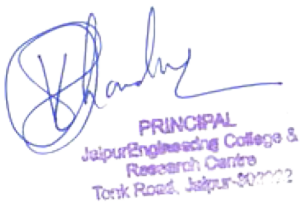
This report is on the energy audit carried out M/S JECRC, Jaipur. The detailed energy audit comprised of the following activities:

- Data collection of power consuming equipment's.
- A brief session on energy management was conducted to seek more inputs from the personnel engaged in operation and maintenance of electro mechanical services.
- Analysis of collected data.
- Discussion with the officials on the identified proposals.
- Discussion and reporting of the findings of energy audit with the Engineers and management staff.

All the identified energy savings proposals have been discussed with the executives concerned before finalizing the projects.

The contents of the report are based solely on the data provided by JECRC, Jaipur officials during the energy audit.

The management should implement the suggestions made in the report after verifying requisite safety aspects.



Methodology for Energy Audit:

The following is a list of general procedure and information undertaken during the energy audit:

1. General information of the plant.
2. Baseline energy description.
3. Past energy consumption bills which includes electricity bills.
4. On site data collection
5. Energy analysis of different sectors.
6. Recommendation of energy conservation measures.

The primary goal of the energy audit was to identify sources and areas of potential energy savings and cost saving throughout the Plant by measures of optimization, replacement, retrofitting, and on the other hand, to also provide recommendations on operational and maintenance practices improvements.

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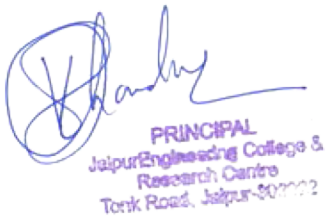
CHAPTER – II
ACKNOWLEDGEMENT

Elion Technologies and Consulting Pvt Ltd places on record it's thanks to M/S JECRC, Jaipur for entrusting the task of conducting energy audit study.

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



CHAPTER – III
PROCESS DESCRIPTION & ENERGY CONSUMPTION DETAILS

PROCESS DESCRIPTION

The main areas of energy consumption as observed during the audit are as follows:

- Pumps
- Air Conditioner
- Lighting

The main sources of energy to meet the required consumptions are as follows:

- Electricity supply from Power distribution company
- DG set of 200KVA and 125KVA
- Solar Power Plant of 500kW

Consumption pattern for energy is given below:

ELECTRICITY CONSUMPTION PATTERN

Month	Billed Unit	Units Exported
Jul-19	8500	0
Aug-19	0	17740
Sep-19	5660	0
Oct-19	12500	0
Nov-19	0	9740
Dec-19	0	11290
Jan-20	0	3700
Feb-20	3580	0
Mar-20	0	8300
Apr-20	11460	0
May-20	8490	0
Jul-20	6780	0
Sep-20	0	6760
Oct-20	0	13419
Total	**56970**	**70949**

JECRC is generating energy instead of consuming.

No power cuts have happened in the facility so DG operation is not considered.

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CHAPTER – IV
LIGHTING SYSTEM

The inventory of lighting was collected and following is the summary:

Type-LED/CFL/Conventional -Bulb/Tube Light	Location	Rating	Qty	Number of Hours being turned on
LED	BLOCK -A	15 W	60	5
		22 W	60	6
		40 W	10	5
		100 W	65	6
	BLOCK -B	22W	40	5
	BLOCK -C	10 W	50	6
		22 W	60	7
		40 W	10	5
	BLOCK -D	22 W	250	
		40 W	300	
	BH-I	15 W	15	10
		20 W	20	9
		40 W	10	9
	BH-II	20 W	15	9
	GH	20 W	40	9
CFL	BLOCK -A	18 W	60	5
		36 W	70	6
	BLOCK -B	36 W	70	6
	BLOCK -C	18 W	40	5
	BLOCK -E	18 W	40	5
TUBELIGHT	BLOCK -A	36 W	250	3
		40 W	100	4
	BLOCK -B	36 W	580	3
	BLOCK -C	36 W	600	4
	BLOCK -E	36 W	100	3
	BH-I	36 W	120	6
	BH-II	36 W	180	7
	GH	36 W	120	7

Observation:

Most of the lighting used are LED.CFL and Tube light are being used in certain location. It was informed that college has planned to replace CFL and Tube light in phased manner with replacement of faulty lights with LED.

Recommendation:

- Sticker to SWITCH OFF LIGHT and SAVE ENERGY to be displayed
- CFL and tube lights to be changed to LED

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CHAPTER – V
PUMPS

Pumps are used for pumping of water. The details of the pumps and motors are given below:

PUMPS:

- 5 HP – Submersible Pump of depth 400 feet at Main Gate
- 5 HP – Submersible Pump of depth 500 feet in Garden of Girls Hostel.
- 3 HP – Submersible Pump of depth 500 feet in D block.
- 5 HP – Submersible Pump of depth 200 feet in C block (Library).

Observation:

All pumps and motors are functioning properly and well maintained.

Recommendation:

Proper maintenance and upkeep of pump to be done.

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CHAPTER – VI
AIR CONDITIONING

Windows and Split an AC's are used in facility for air conditioning. Temperature maintained is 27°C which is a good practice. Following is the summary of air conditioners installed:

Type Windows/Split/Package and Location	Capacity in Ton	Whether any star rating available	Set temperature	Running Hours
Air Conditioner-Window/BLOCK -A-15	2	3	27	7
Air Conditioner-Split/BLOCK -A-40	2	3	27	7
Air Conditioner-Package-BLOCK -A-3	10		27	7
Air Conditioner-Window/BLOCK -B-9	2	3	27	7
Air Conditioner-Split/BLOCK -B-10	2	3	27	7
Air Conditioner-Window/BLOCK -C-20	2	3	27	7
Air Conditioner-Split/BLOCK -C-22	2	3	27	7
Air Conditioner-Split/BLOCK -D-3	2	3	27	8
Air Conditioner-Split/BLOCK -E-6	2	3	27	8
Air Conditioner-Window/BH-I-1	2	3	27	9
Air Conditioner-Split/BH-I-5	2	3	27	9
Air Conditioner-Window/BH-II-1	2	3	27	9

Observation:

All air conditioners are found to be functioning properly and well maintained.

Recommendation:

All doors to be kept closed while using the air conditioner and regular annual services of AC should be carried out.

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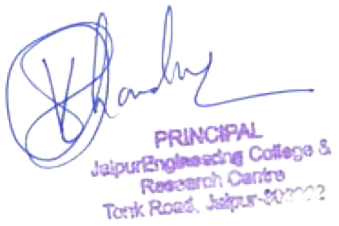
CONCLUSION

The energy audit conducted at M/S JECRC, Jaipur has revealed that JECRC is doing good work in having sustainable college. In house solar power plant is generating power more than the required is exporting. The college is sustainable in energy consumption. To further reduce energy consumption college should implement the recommendation made in report.



PHOTOGRAPHS

LED Light

Window AC

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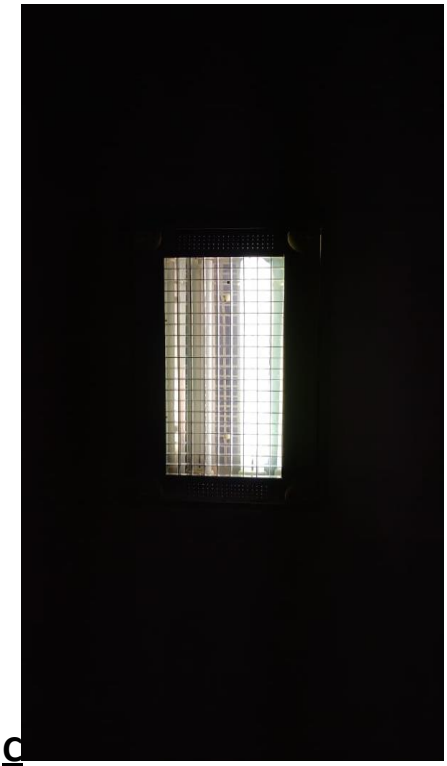
Lights



C

Lights

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Pump

Air Conditioner

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DG Set

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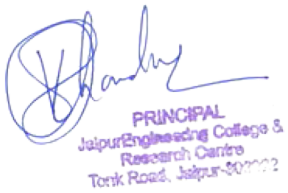
ACKNOWLEDGEMENT

Elion Technologies and Consulting Pvt Ltd thanks the management of **Jaipur Engineering College And Research Centre** for assigning this important work of Environmental Audit. We appreciate the co-operation to our team for completion of study.

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

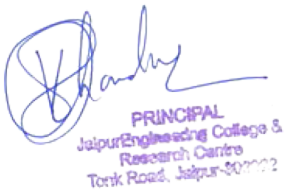


CONCEPT

The term 'Environmental audit' means differently to different people. Terms like 'assessment', 'survey' and 'review' are also used to describe similar activities. Furthermore, some organizations believe that an 'environmental audit' addresses only environmental matters, whereas others use the term to mean an audit of health, safety and environment-related matters. Although there is no universal definition of Environmental Audit, many leading companies/institutions follow the basic philosophy and approach summarized by the broad definition adopted by the International Chambers of Commerce (ICC) in its publication of Environmental Auditing (1989).

The ICC defines Environmental Auditing as:
"A management tool comprising a systematic, documented, periodic and objective evaluation of how well environmental organization, management and equipment are performing with the aim of safeguarding the environment and natural resources in its operations/projects."

The European Commission, in its proposed regulation on environmental auditing, has also adopted the ICC definition of Environmental Audit.

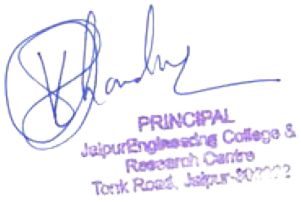


INTRODUCTION

A clean and healthy environment aids effective learning and provides a conducive learning environment. There are various efforts around the world to address environmental education issues.

Environmental Management Systems (EMS) is very popular in the industrial sector, but the general belief is that EMS is something pertaining to industries only. Other parts of the world have started adopting compatible environmental management systems either voluntarily or for promoting standards by external certification. International environmental standards do not suit the existing Indian educational system.

A very simple indigenized system has been devised to monitor the environmental performance of educational institutions. It comes with a series of questions to be answered on a regular basis. Environmental conditions may be monitored from angles that are relevant to Indian requirements, without stress on legal issues or compliance. This innovative scheme is user- friendly and totally voluntary. The environmental monitoring system helps the institution to set environmental examples for the community and to educate young learners. It can be adapted to urban and / or rural situations.



OVERVIEW OF INSTITUTE

The National Society for Education Research and Development (NSERD) was registered in the year 1999 in Jaipur with the major objective of providing quality education and research environment in Rajasthan. It established its first college, Jaipur Engineering College & Research Centre (JECRC) in Jaipur, in the year 2000. Encouraged by its splendid achievements and overwhelming public patronage, it ventured into establishing second college, UDML College of Engineering (which is known as JECRC UDML College of Engineering) in the year 2007.

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JECRC has become the most sought-after institutions for admissions as evident by the REAP admission! Patterns. The JECRC Foundation has now become a brand name in professional education in Rajasthan.

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College is approved by the AICTE, New Delhi and is affiliated to the Rajasthan Technical University, Kota. The total strength of the students in the session 2018-19 is 3998.

Elion Technologies and Consulting Pvt Ltd (Elion) team carried out remote audit of premises on 26th November. The audit was carried out using online meeting platform google hangout, prior to Audit questionnaire and checklists was shared with the client. During the audit Elion team carried out virtual visit of entire campus i.e. classrooms, library, washrooms, staff rooms, administration department, accounts department and hostels.

Campus Information

The college is offering courses in following fields:

- Applied Science
- Computer Science Engineering
- Mechanical Engineering
- Electronics and Communication Engineering
- Information Technology
- Civil Engineering
- Electrical Engineering

Details of the infrastructure of JRM college is as per below:

Building Name	Areas (Sq. Mtr.)	Number of Floors
Block A	4500	3
Block B	8372	5
Block C	10224	5
Block D	6698	6
Block E	1228	4
Workshop	242	1
BH 1	3000	3
BH 2	4400	4
GH	3600	4

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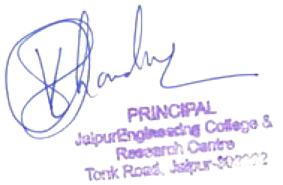
AUDIT OBJECTIVES

The broad aims/ benefits of the eco-auditing system would be –

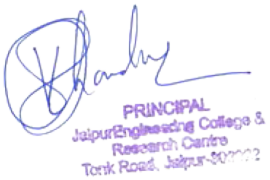
- Environmental education through systematic environmental management approach
- Improving environmental standards
- Benchmarking for environmental protection initiatives
- Reduction in resource use
- Financial savings through a reduction in resource use
- Curriculum enrichment through practical experience
- Development of ownership, personal and social responsibility for the university campus and its environment
- Enhancement of university profile
- Developing an environmental ethic and value systems in young people



AUDIT PARTICIPANTS

On behalf of Institute:

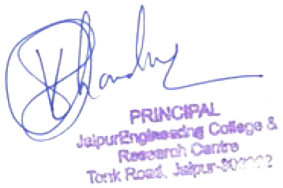
Name	Designation
Er. Yogendra Sharma	Asst. Proff.
Narendra Sipani	Estate Engineer
Rajesh Sir	Electrician
Abhilasha Ma'am	Asst. Proff.
Mukesh Sir	Asst. Proff.
Ashish Boraida	Asst. Proff.
Sumit Saini	Asst. Proff.
Narendra Sipani	Asst. Proff.



EXECUTIVE SUMMARY

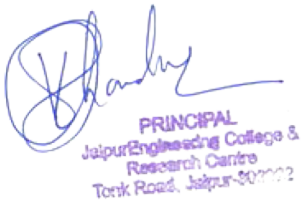
An environmental audit is a snapshot in time, in which one assesses campus performance in complying with applicable environmental laws and regulations. Though a helpful benchmark, the audit almost immediately becomes outdated unless there is some mechanism in place to continue the effort of monitoring environmental compliance.

This is very first environmental audit of institute for NACC affiliation; QS Program and doing their bid towards environmental protection and environmental awareness at local and global front. Audit criterion is environmental cognizance, waste minimization and management, biodiversity conservation, water conservation, energy conservation and environmental legislative compliance by the campus. A questionnaire is used during audit. This audit report contains observations and recommendations for improvement of environmental consciousness.



AREA OF IMPROVEMENTS

- Environment Policy to be adopted by the University Campus.
- Metering of Water from bore well and other sources in different uses are not available.
- Water Meter should be installed and maintain the inventory of water resource
- Storage of chemicals like; paints, gums resins, oils, lubricants, acids etc. in designated place and safety/warning signs should be displayed.
- Internal inspection system should be developed for various equipment's available in campus.
- Waste Management plan should be prepared for the campus.
- Environmental drills for response against spillage and leakage of chemicals in the campus
- Sewage Treatment Plant to be provided for treating of solid waste



ENVIRONMENTAL AUDIT - QUESTIONARE

The areas of eco/environmental/green auditing to be followed/practiced by participating institutions:

I. Waste Minimization and Recycling
II. Greening
III. Energy Conservation
IV. Water Conservation
V. Clean Air
VI. Animal Welfare
VII. Environmental Legislative
VIII. General Practices

Dose any Environmental Audit conducted earlier?
No, this is first time a systematic way of monitoring their environmental eminence initiative taken by university for environment protection.

What is the total permanent population of the Institute?

	Male	Female	Total
Students	3138	678	**3816**
Teachers	143	85	**228**
Non-Teaching Staff	100	15	**115**
Sub Total	3381	778	**4159**
Approximate Number of Visitors (Per day)			**100**
What is the total number of working days of your campus in a year?			**260**

Where is the campus located?
The campus is Located in Jaipur city.

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Which of the following are available in your institute?

1	Garden area	Yes
2	Play ground	Yes
3	Kitchen	Yes
4	Toilets	Yes
5	Garbage or Waste Store Yard	Yes
6	Laboratory	Yes
7	Canteen	Yes
8	Hostel Facility (numbers)	Yes (16)
9	Guest House	Yes

Which of the following are found near your institute?

1	Municipal dump yard	No
2	Garbage heap	No
3	Public convenience	Yes
4	Sewer line	No
5	Stagnant water	No
6	Open drainage	No
7	Industry – (Mention the type)	No
8	Bus / Railway station	Yes
9	Market / Shopping complex / Public halls	Yes

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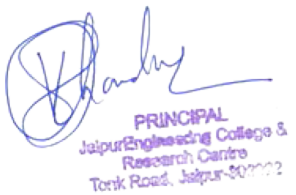
I WASTE MINIMIZATION AND RECYCLING

1.	Does your institute generate any waste? If so, what are they?	Yes Paper and Residential Waste
2.	What is the approximate amount of waste generated per day? (in Kilograms/month) (approx.)	150 kg/day 4500 kg/Month
3.	How is the waste generated in the institute managed? By Composting Recycling Reusing Others (specify)	WMT plant of capacity 2KLD is applied to DST, Govt. of India. It is under process
4.	Do you use recycled paper in institute?	No
5.	Do you use reused paper in institute?	Yes
6.	How would you spread the message of recycling to others in the community? Have you taken any initiatives? If yes, please specify.	Awareness through posters
7.	Can you achieve zero garbage in your institute? If yes, how?	It is under process, not yet achieved.



II GREENING THE CAMPUS

1.	Is there a garden in your institute?	Yes
2.	Do students spend time in the garden?	Yes
3.	Total number of Plants in Campus	500 Trees and Plants
4.	Suggest plants for your campus. (Trees, vegetables, herbs, etc.)	Trees = 500 Herbs = 20 Other Plants = 500
5.	Is the university campus have any Horticulture Department	Not Applicable
	Number of Staff working in Horticulture Department	Not Applicable
6.	Number of Tree Plantation Drives organized by School per annum. (If Any)	Environment Day, Earth Day, Milap culture event
7.	Number of Trees Planted in Last FY.	200
	Survival Rate	90%
8.	Plant Distribution Program for Students and Community	Yes (Giloy Distribution) With the help of Rajasthan state medicinal plant board, Jaipur
9.	Plant Ownership Program	Yes, Till date 100 trees adopted under FRUITFULL JECRC campaign.

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III ENERGY

1.	List ten ways that you use energy in your institute. (Electricity, LPG, firewood, others). Using this list, try to think of ways that you could use less energy every day.	Electricity / LPG
2.	Are there any energy saving methods employed in your institute? If yes, please specify. If no, suggest some	Yes, All street lights are LED based.
3.	How many CFL/LED bulbs has your institute installed?	250
4.	Are any alternative energy sources employed / installed in your institute? (photovoltaic cells for solar energy, windmill, energy efficient stoves, etc.,) Specify.	Solar Energy
5.	Do you run "switch off" drills at institute?	Yes
6.	Are your computers and other equipment's put-on power-saving mode?	Yes (Auto Saving Mode)
7.	Does your machinery (TV, AC, Computer, weighing balance, printers, etc.) run on standby modes most of the time? If yes, how many hours?	6 hours/day

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IV WATER CONSERVATION

1.	List four uses of water in your institute	1. Drinking 2. Flushing 3. Washing clothes 4. Cooking 5. Gardening
2.	How does your institute store water? Are there any water saving techniques followed in your institute?	Yes, There are 4 tube wells in institute, all water is collected in underground water tank and then pumped to all academic blocks and hostel blocks.
3.	If there is water wastage, specify why and How can the wastage be prevented / stopped?	Regular inspection by estate office is being done regarding the same.
4.	Locate the point of entry of water and point of exit of waste water in your institute. Entry- Exit-	UGT Main Gate to road
5.	Write down four ways that could reduce the amount of water used in your institute	1. Reorganize Landscape design 2. Check for leak in pipes, hoses and coupling 3. Smart flushing system 4. Water free urinals
6.	Record water use from the institute water meter for six months (record at the same time of each day). At the end of the period, compile a table to show how many liters of water have been used.	Water meters are currently not installed.
7.	Does your institute harvest rain water?	Yes
8.	Is there any water recycling System?	Yes

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V CLEAN AIR

1.	Are the Rooms in Campus being Well Ventilated?	**Yes**				
2.	Window Floor ratio of the Rooms	**0.17**				
3.	What is the ownership of the vehicles used by your school? (Please Tick * only one)		Yes			
			Operator-owned vehicles			
		*	College-owned vehicles			
			A combination of campus-owned and operator-owned vehicles			
4.	Provide details of school-owned motorized vehicles?	Buses	Cars	Vans	Other	Total
	No. of vehicles	9	7	-	-	16
	No. of vehicles more than five years old	9	5	-	-	14
	No. of Air-conditioned vehicles	-	7	-	-	7
	PUC done	Done	Done			
5.	Specify the type of fuel used by your school's vehicles:	Buses	Cars	Vans	Other	
	Diesel	*	*			
	Petrol		**			
	CNG					
	LPG					
	Electric					
6.	Air Quality Monitoring Program (If Any)	Plantation & Green gardens				
7.	Students suffer from respiratory ailments? (If Any)	No				
8.	Details of Genset	Two gen Set (200 kVA & 125 kVA)				

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VI ANIMAL WELFARE

1.	List the animals (wild and domestic) found on the campus (dogs, cats, squirrels, birds, insects, etc.)	Birds and Squirrels are commonly found in campus. A variety of birds species and other flora and fauna available but these are not harmful to human so institute doing their bid for its conservation.
2.	How many dogs in your area have undergone Animal Birth Control - Anti Rabies (ABC - AR)?	4Nil
3.	Does your institute have a Biodiversity Program?	Students have undergone such activities

VII ENVIRONMENTAL LEGISLATIVE COMPLIANCE

1.	Are you aware of any environmental Laws pertaining to different aspects of environmental management?	Yes
2.	Does your institute have any rules to protect the environment? List possible rules you could include.	Yes
3.	Dose Environmental Ambient Air Quality Monitoring conducted by the Institute?	Yes
4.	Dose Environmental Water and Wastewater Quality monitoring conducted by the Institute?	Yes
5.	Dose stack monitoring of DG sets conducted by the Institute?	Yes
6.	Is any warning notice, letter issued by state government bodies?	No
7.	Dose any Hazardous waste generated by the Institute? If yes explain its category and disposal method	No
8.	Dose any Bio medical waste generated by the Institute? If yes explain its category and disposal method	No

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VIII GENERAL

1.	Are you aware of any environmental Laws pertaining to different aspects of environmental management?	Yes
2.	Does your institute have any rules to protect the environment? List possible rules you could include.	No plucking of trees or plants.
3.	Does housekeeping schedule in your campus?	Yes
4.	Are students and faculties aware of environmental cleanliness ways? If Yes Explain	Yes. Regular awareness being carried out.
5.	Dose Important Days Like World Environment Day, Earth Day, and Ozone Day etc. eminent in Campus?	Yes Environment Day, Earth Day
6.	Dose Institute participated in National and Local Environmental Protection Movement?	No
7.	Dose Institute has any Recognition/certification for environment friendliness?	No
8.	Dose Institute using renewable energy?	No
9.	Dose Institution conducts a green/ environmental audit of its campus?	No
10.	Has the institution been audited / accredited by any other agency such as NABL, NABET, TQPM, NAAC etc.?	NAAC, NBA, AICTE

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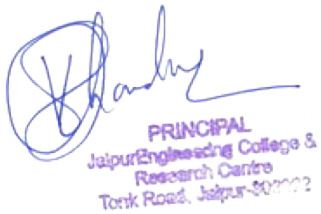
RECOMMENDATIONS

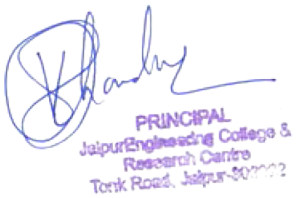
- Environment Policy to be adopted by the University Campus.
- Metering of Water from bore well and other sources in different uses are not available.
- Water Meter should be installed and maintain the inventory of water resource
- Storage of chemicals like; paints, gums resins, oils, lubricants, acids etc. in designated place and safety/warning signs should be displayed.
- Internal inspection system should be developed for various equipments available in campus.
- Waste Management plan should be prepared for the campus.
- Environmental drills for response against spillage and leakage of chemicals in the campus
- Sewage Treatment Plant to be provided for treating of solid waste



CONCLUSION

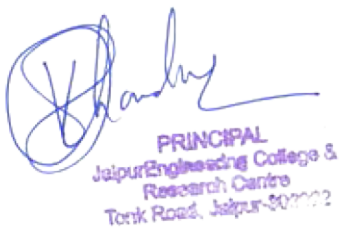
This audit involved extensive consultation with all the campus team, interactions with key personnel on wide range of issues related to Environmental aspects. Overall, 30% of university campus is for landscaping. The audit has identified several observations for making the campus premise more environmentally friendly. The recommendations are also mentioned with observations for college team to initiate actions.

The audit team opines that the overall site is maintained well from environmental perspective. There are no major observations but few things are important which if implemented would further strengthen the environment setting in the college.



REFERENCE

- The Environment [Protection] Act – 1986 (Amended 1991) & Rules-1986 (Amended 2010)
- The Petroleum Act: 1934 – The Petroleum Rules: 2002
- The Central Motor Vehicle Act: 1988 (Amended 2011) and The Central Motor Vehicle
- Rules:1989 (Amended in 2005)
- Energy Conservation Act 2010.
- The Water [Prevention & Control of Pollution] Act – 1974 (Amended 1988) & the Water (Prevention & Control of Pollution) Rules – 1975
- The Water [Prevention & Control of Pollution] Cess Act-1977 (Amended 2003) and Rules- 1978
- The Air [Prevention & Control of Pollution] Act – 1981 (Amended 1987) The Air (Prevention & Control of Pollution) Rules – 1982
- The Gas Cylinders Rules – 2016 (Replaces the Gas Cylinder Rules – 1981
- E-waste management rules 2016
- Electrical Act 2003 (Amended 2001) / Rules 1956 (Amended 2006)
- The Hazardous Waste (Management and Handling and Trans-boundary Movement) Rules, 2008 (Amended 2016)
- The Noise Pollution Regulation & Control rules, 2000 (Amended 2010)
- The Batteries (Management and Handling) rules, 2001 (Amended 2010)
- Relevant Indian Standard Code practices



ANNEXURE –
PHOTOGRAPHS OF ENVIRONMENT CONSIOUSNESS

Green Campus

TREE Plantation

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Playground

Playground

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Tress on Boundary

Tree Plantation

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Playground

Tree Plantation

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Tree Plantation

Tree Plantation

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Tree Plantation

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Tree Plantation

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GREEN AUDIT REPORT
FOR
JECRC ENGINEERING COLLEGE & RESEARCH CENTRE
JAIPUR

Carried On
26th November, 2020

Carried Out By

ELION TECHNOLOGIES & CONSULTING PVT LTD
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Order Number	Document Number	Date
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CONTENT

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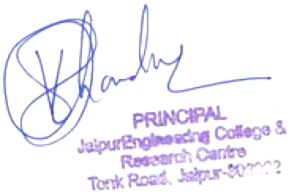
1. INTRODUCTION

The National Society for Education Research and Development (NSERD) was registered in the year 1999 in Jaipur with the major objective of providing quality education and research environment in Rajasthan. It established its first college, Jaipur Engineering College & Research Centre (JECRC) in Jaipur, in the year 2000. Encouraged by its splendid achievements and overwhelming public patronage, it ventured into establishing second college, UDML College of Engineering (which is known as JECRC UDML College of Engineering) in the year 2007.

The JECRC Foundation having 21 yeara of existence, is amongst the most reputed educational groups in Higher and Technical Education in North India which has 2 large campuses with 10,000 students enrolled as on date in various courses alongside engineering courses, the major chunk of the admissions being routed through JEE examinations. The engineering colleges are approved by the AICTE, New Delhi and are affiliated to the Rajasthan Technical University, Kota. The final year batch size going to complete the graduation in session 2018-2019 is 2123 across all the courses.

JECRC has become the most sought-after institutions for admissions as evident by the REAP admission! Patterns. The JECRC Foundation has now become a brand name in professional education in Rajasthan.

JECRC was established in 2000. The institution started with three branches namely, Computer Science Engineering, Electrical Engineering and Electronics and Communication Engineering, with 180 students. The very next year one more branch introduced Information and Technology. After the introduction of the new branch total intake is increases by 240 students. In 2003, with the addition of Mechanical Engineering intake increased by 60. In 2009, college came up one more branch, Civil Engineering. With this new advancement, the student's sanctioned intake increased to 480. By 2013, second shift for Computer Science Engineering and Mechanical Engineering came into effect and at present the total sanctioned intake of 990 students in all.



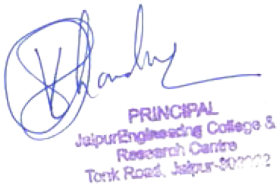
The JECRC Foundation, is in its 18th year of existence, is amongst the most reputed educational groups in Higher and Technical Education in North India which has 2 large campuses with 10,000 students enrolled as on date in various courses along with engineering courses, the major chunk of the admissions being routed through JEE examinations. The JECRC Engineering College is approved by the AICTE, New Delhi and is affiliated to the Rajasthan Technical University, Kota. The total strength of the students in the session 2018-19 is 3998.

Elion Technologies and Consulting Pvt Ltd (Elion) team carried out remote audit of premises on 26th November. The audit was carried out using online meeting platform google hangout, prior to Audit questionnaire and checklists was shared with the client. During the audit Elion team carried out virtual visit of entire campus i.e. classrooms, library, washrooms, staff rooms, administration department, accounts department and hostels.

Campus Information

The college is offering courses in following fields:

- Applied Science
- Computer Science Engineering
- Mechanical Engineering
- Electronics and Communication Engineering
- Information Technology
- Civil Engineering
- Electrical Engineering

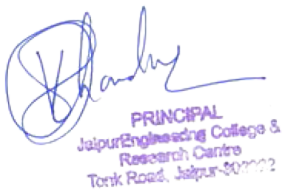


Details of the infrastructure of JRM college is as per below:

Building Name	Areas (Sq. Mtr.)	Number of Floors
Block A	4500	3
Block B	8372	5
Block C	10224	5
Block D	6698	6
Block E	1228	4
Workshop	242	1
BH 1	3000	3
BH 2	4400	4
GH	3600	4

During Audit, ELION team interacted with following stakeholders:

Name	Designation
Er. Yogendra Sharma	Asst. Proff.
Rajesh Sir	Electrician
Abhilasha Ma'am	Asst. Proff.
Mukesh Sir	Asst. Proff.
Ashish Boraida	Asst. Proff.
Sumit Saini	Asst. Proff.
Narendra Sipani	Asst. Proff.



2. ENVIRONMENTAL SETTING

The land use around the campus is mainly educational institute and residential area. There are educational institutes like RR college of nursing, Anand Agricultural University, Apex Institute of Engineering and Technology situated in vicinity of the college.

JECRC Campus

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Location of JECRC College

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3. 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. Windows are kept open to adequate daylight.
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 are provided with exhaust fans to disperse heat, fumes and odours.
f) Stair cases receive daylight through windows provided at various levels.

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Good daylight and Ventilation in classrooms Main staircase which receives daylight

Daylight in Labs

3.2 Water Efficiency:

a) Submersible pump is used for water supply in the campus
b) For drinking water supply water cooler are installed at various location in the campus.
c) Currently water meter is not installed to monitor the quantity of water extracted.
d) It is recommended water meter to be installed and daily/monthly water consumption to be recorded.
e) Water coolers & purifiers are installed at drinking water supply points.
f) Normally mops are used for floor cleaning and hose is used for cleaning once a week
g) Water conservation faucets in washrooms were not seen. Installation of such faucets can save water and will help in minimizing the water footprint of the institute.
h) Dual flushing system is not provided in the washrooms.
i) Signage are not provided in washrooms emphasizing water conservation.
j) Water from air conditioning unit and reject water from water purifiers is used for watering plants within premises.
k) Rain water harvesting system is installed in all the blocks.

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3.3 Wastewater Management:

a) Sanitary wastewater generated from washrooms is discharged into septic tank
b) Wastewater/ sewage recycle is not practiced in the College as grey water/ sewage treatment/recycle facility is not provided.
c) Sewage Treatment plant should be provided and all water to be recycle

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:

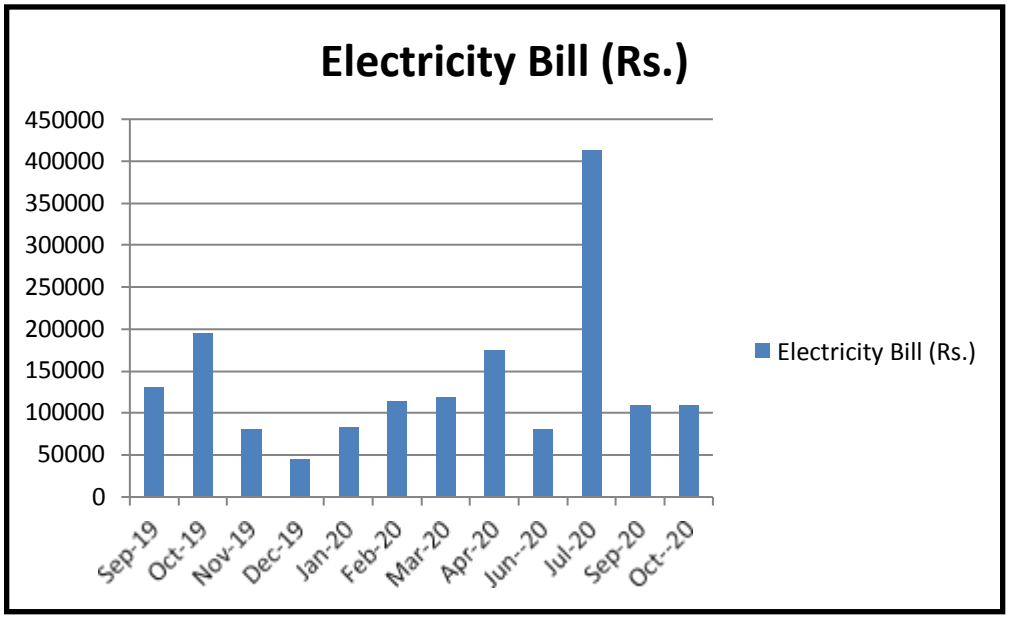
a) In classrooms the mode of ventilation is natural (through windows) and is enhanced by fans. Air conditioners are used in some of rooms/ labs e.g. computer labs, computer server room.
b) Heating Ventilation and Air Conditioning (HVAC) system does not exist. Split and Windows Air conditioner are used.
c) Exhaust fans are provided only in labs and washroom
d) Indoor plants are seen in the College. Indoor plants can be plotted not only for the aesthetic appearance but also for health benefits. Refer **Annexure 1** for details.
e) Green belts have been set up in campus area.
f) IAQ awareness signage was missing in College. Information on sources, impacts and mitigation of indoor air pollution to be displayed within College for increasing awareness about indoor air pollution.

3.5 Energy Efficiency:

Electricity:

Power is supplied by local electricity department. The major electricity consuming equipment installed in the campus are Windows and Split AC, Submersible Motor, Motors, Air Cooler, RO Plant, Desktop, Printer, Fan, Tube light, LED Bulb, Halogen Bulb, Mercury Bulb, Mosquito Replete, Fire Alarm System.

Following is details of energy consumption



It was observed that:

a) LED tube lights & fans are installed in classrooms and labs. CFL and conventional tube lights are also used. College is in the process of replacing periodically the dysfunctional conventional tube lights with LED lights.
b) JECRC has air conditioner which are in good working condition.
c) It was observed that reflectors are not provided for tube lights which can reduce electricity consumption.
d) Signage are not present near every electrical switch board encouraging users to switch off light and fans to save electricity.
e) The college is exporting power using solar power plant and is net positive.

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

a) Canteen facility is present in JECRC
b) Natural gas pipeline and LPG is provided in the canteen for cooking.
c) Back Up diesel generators are available.
d) Solar Power plant of capacity 500kW is provided in the college.

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

Green Campus

Green Campus

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c) JECRC has done tree plantation all around the building which helps in reducing temperature

Tree Plantation all around campus

3.8 Paper Waste Management:

Being academic institution, waste paper is the main solid waste generated in the premises. The College 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/SMS.
c) Faculty and administration staff uses old papers and envelops for internal usages as rough work, file markers, page separators etc.
d) Paper notices are displayed on the notice boards. Most of the storage is in library and staff room. After couple of years, old submissions and answer papers will be archived and stored in record room.
e) Old papers are given to vendor in exchange of new papers, in the ratio.

3.9 E-Waste Management:

a) JECRC is digitalized to a large extent. This includes classrooms, library, internal mails etc.
b) E-waste is collected and stored in respective department. Once in a year this e-waste is collected from respective department and given to vendor

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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) Biodegradable waste is mainly generated in canteen
c) The Biodegradable waste is kept in forest area and over period of time it is converted into manure.
d) Scrapped benches are repaired and reused.

3.11 Universal Access and Efficient Operation and Maintenance of Building:

It was observed that:

a) College is easily accessible. Staircase is provided for staff and students.
b) Since the access and staircases are wide and uncluttered, it is possible to have a safe evacuation during emergency.
c) Fire extinguishers and fire hydrants are provided in few areas for emergency. They are inspected and serviced by fire protection Service Company annually.
d) There is no signage for emergency fire exit. This is of crucial importance during emergency.

3.12 Green belt/ Landscaping:

a) Large trees are planted in the premises. Plantation also helps maintaining lower temperatures of the area. .
b) Potted plants are kept at the back side which are brought indoors on certain occasions.
c) Indoor plants are kept along the corridors and entrance of the building.

3.13 Green Initiatives:

College is regularly celebrating Milap, Environment Day, and Earth Day.

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4. RECOMMENDATIONS/ SUGGESTIONS

4.1 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) Installation of automatic lights with sensors can be considered.
c) Conduct energy audit every two or three years and determine the lux levels within College. Energy audit can help in reduction in number of light fittings/ energy usage in the College.
d) 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.
e) 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.
f) Usage of light reflectors is recommended as the reflectors can spread light to relatively large areas.
g) If possible, computers should be switched off from main power connections.
h) Notices/ signages can be put up/ displayed near switches and on notice boards, informing students and staff to switch off all electricals when not in use.
i) 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.
j) Raise awareness:
   - Encourage students to help in monitoring energy consumption & implement corrective actions
   - Integrate energy education into classroom learning.

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4.2 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) Dual flushing system can be installed for toilet flushing which saves considerable amount of water.
e) Grey water/ sewage recycling system can be installed for flushing toilets. This will reduce the fresh water footprint.
f) Installation of waterless urinals can be considered to reduce water consumption.
g) 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.

4.3 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 college 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.

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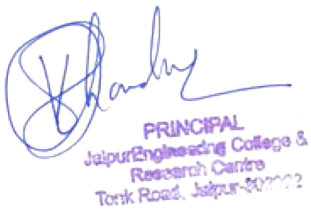
4.4 Others:

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
 **Aloe Vera**	Formaldehyde, Trichloroethylene and Benzene	Chemical based cleaners and paints	Easy to grow with enough sunlight
 **Bamboo Plant**	Formaldehyde, Trichloroethylene and Benzene	Paints, Plastics, Wood products etc.	Thrives under low light conditions as well as easy to maintain
 **Chinese Evergreen**	Benzene	Paints	Low maintenance plant that prefers low light conditions.
 **English Ivy**	Formaldehyde, Benzene, Air borne fecal matter particles	Wood, Paper products, Air borne fecal – matter particles from pests	Easy to maintain

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 **Janet Craig**	Formaldehyde, Benzene and Trichloroethylene	Paints, Plastics, Wood products etc.	Medium to low light tolerant plant. Requires little water for growth.
 **Golden Pothos or Devils Ivy**	Formaldehyde, Cleanses air	Exhaust fumes, carpeting materials, panelling and furniture products made with particle board	Extremely easy to maintain under low to bright light conditions. Fast growing and grows well under Fluorescent light.
 **Mass Cane**	Formaldehyde, benzene and trichloroethylene	Paints, Plastics, Wood products etc.	Medium to low light tolerant plant. Requires little water for growth.
 **Snake plant**	Formaldehyde and trichloroethylene	cooking fuels, wood products, facial tissues, personal care products and waxed papers	Drought resistant and Tolerates a variety Of light conditions. Hard to damage or kill.

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

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ANNEXURE 2
GREEN AUDIT CHECKLIST

Good Daylight Design

Sr. No.	Design Feature	
1	Broad door opening	✓
2	Clerestory/ High windows	✓
3	Openings at the eastern and southern side	✓
4	Rectangular building so that sunlight can reach all areas	✓
5	Sunshade	-
6	Double or triple glazing on windows	-
7	Enough illumination	✓
8	Light coloured fabric curtain or blind for window covering	✓
9	Operable/ openable windows	✓
10	Ultraviolet (UV) filtering windows	-
11	Use of exterior louvers to control glare	-
12	Use of glass as facilitator of natural light	✓
13	Use of insulated and tinted glass to filter heat gain	-

Ventilation

Sr. No.	Design Feature	
1	Downdraft cooling system (a downward flow of air)	-
2	Ceiling height	✓
3	Self-movement ventilators in the roof	-
4	Wide corridors	✓
5	Operable windows	✓
6	Use of exhaust fans	✓

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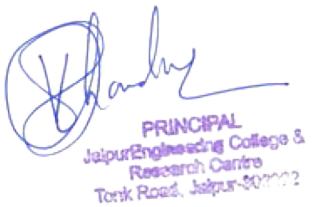
Temperature and Acoustic Control

Sr. No.	Design Feature	
1	Double roof	-
2	Earth air tunnel (cools air in summer and heat it in winter)	-
3	Green roof	-
4	Mud roof	-
5	Openings at the eastern and southern side	✓
6	Roof with reflective tile/aluminium/asbestos	-
7	Sand stone cladding outside the walls	✓
8	Special walls for temperature control (Thick/Double/cavity/fire/composite /green)	-
9	Use of cool roofing material (mineral wool, rock wool, vermiculite, foams, expanded polystyrene, extruded polystyrene etc.)	-
10	Use of daylight design (Building is constructed in such a way that diffused sunlight allows light but not the heat)	✓
11	Use of insulation material (e.g. autoclaved aerated blocks, hollow blocks, Thermocrete or higher R- value material)	-
12	Use of water bodies/fountain	-
13	Climbing creepers fitted to window in summer	-
14	Lime coating for cool roof	-
15	Retrofitting the existing roofs with cool roof technology	-
16	White wash on the roof	✓
17	Use of landscaping as sound barrier	-



Water Efficiency & Wastewater Management

Sr. No.	Measures	
1	Aerators to water taps	-
2	Automatic toilet faucets	-
3	Drip irrigation (for plant watering system)	-
4	Dual flush toilet with cistern	-
5	Efficient plumbing system	✓
6	Sewage treatment plant for sewage recycle	-
7	Rainwater harvesting	✓
8	Regular maintenance for leakage free plumbing system	✓
9	Use of low flow/flow control water equipment or gadget	-
10	Water free urinals (No flush urinals/Zero flush urinals/Water less urinals/air based flushing system these save water used in toilet)	-

Energy Efficiency and On-site Energy Generation Mechanism

Sr. No.	Measures	
1	Avoid excessive lighting	✓
2	Computerized monitoring of electrical system	-
3	Integrated energy saving design for natural cooling/heating	✓
4	On-site energy generation	-
5	Photocell occupancy sensor for automatic light control	-
6	Regular maintenance of electrical system	✓
7	Use of day lighting system	✓
8	Use of energy efficient equipment	✓
9	Use of energy saving bulbs (Compact florescent light/LED lights)	✓
10	Solar panel	✓

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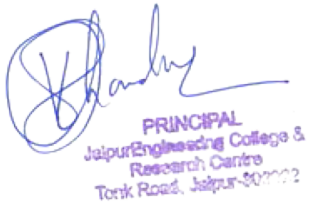
Sustainable Material for Building and Interior

Sr. No.	Strategy adopted	
1	Use of biodegradable material	✓
2	Use of locally sourced material	✓
3	Use of material with low embedded energy(i.e. stabilized earth blocks, straw bales, stones, sand stone chips, fly ash)	✓
4	Use of nontoxic recycled content material and furniture	✓
5	Use of post-consumer recycled material	✓
6	Use of salvaged (Discarded or refused) material	✓
7	Use of material which can recycled at end of useful life	✓
8	Use of material which is simple to install without dangerous adhesive	✓



Waste Management

Sr. No.	Measures	
1	Sale of books to its user for minimal charges	-
2	Sale of books to store or other library	-
3	Sale of weeded books to needy students	-
4	Send books and used papers to recycling organization	✓
5	Avoid use of paper by going digital (Paper)	✓
6	Lessen the margins while printing	-
7	Printing on both sides of paper	✓
8	Reuse of printed paper/ envelops	✓
9	Segregation of dry and wet waste	✓
10	Setting up recycling area/ composting area	✓
11	Creation of specified junctions for collection of E-waste(E-waste)	-
12	Donation of computers to NGO's to refurbish and give it to needy people	-
13	Hand over to organization or recycler who knows proper disposal system	✓
14	Implementation of any recycling project or program	-
15	Purchase of electronic products from company's which have after sales service for the disposal of product with buyback policy	✓
16	Installation of bins to collect garbage	✓
17	Outsourcing recycling of garbage to agency	-
18	Recreating in to new sustainable products	-
19	Use of coloured bins with code to collect garbage	✓

Environmental Audit

Sr. No.	Type of audit	
1	Energy audit (includes energy consumption, thermal comfort, visual comfort)	✓
2	Sound/ Noise audit (includes indoor noise level, outdoor noise level)	✓
3	Water and waste audit (includes water quality, solid waste generation, solid waste disposal process)	-

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Universal Access and Efficient Operation and Maintenance of Building

Sr. No.	Design feature	
1	Easy access to the main entrance of the building	✓
2	Elevator	✓
3	Preferred car park spaces for specially abled	✓
4	Ramp/ stairs with handrails on at least one side	-
5	Restrooms (toilets) in common areas	✓
6	Uniformity in floor level	✓
7	Audio guidance for specially abled	-
8	Availability of wheel chair	-
9	Braille assistance for specially abled	-
10	Personalized services by staff for differently abled	✓
11	Visual warning signage in common and exterior areas	-
12	Follow standard procedures for commissioning of electrical/plumbing system	✓
13	Purchase of standardized and quality material for repair	✓
14	Regular maintenance of building	✓
15	Use of chemical free products for cleaning	-
16	User awareness program to minimize damage of property	✓

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Green Program

Sr. No.	Green program	
1	Buying recycled material	✓
2	Creation of "Green Team" in the institution/library	-
3	Green education i.e. to become leader in environmental awareness	-
4	College conduct graduate program by library science/Any other department	✓
5	Outreach relationships with local groups interested in environmental concern and satisfy their information needs	✓
6	Providing external membership to small and local libraries (MOU with other colleges, -internal collegiate library loan)	-
7	Recycling beyond books i.e. paper, aluminum, plastic, e-waste	-
8	Reduce, Reuse and recycle of the products (At the time of disposal of library material)	✓
9	Regular purchase of books/ magazines related to sustainability	✓
10	Selection of material content of which informs and assesses green practices (green computing, energy conservation, organic gardening etc.)	-
11	Contribute library information on sustainability resources to a campus publication, blog or website	-
12	Creation of topical online resource guide (on sustainability etc.)	✓
13	Disseminating expert advice about sustainability to other colleges to make their own college greener	-
14	E Publishing reviews of new green resources in the newsletter or news	P
15	Digitization	✓
16	E-archiving	P
17	E-resources : E books, Online Journals, membership of consortium	P
18	Subscription to databases	✓

✓ Provided P - Planned

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